

KeyView

Software Version 12.0

Filter SDK C Programming Guide



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Part I: Overview of Filter SDK

This section provides an overview of the Micro Focus KeyView Filter SDK and describes how to use the C implementation of the API.

Chapter 1: Introducing Filter SDK

This section describes the Filter SDK package.

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Overview

Micro Focus KeyView Filter SDK enables you to incorporate text extraction functionality into your own applications. It extracts text and metadata from a wide variety of file formats on numerous platforms, and can automatically recognize over 300 document types. It supports both file-based and stream-based I/O operations, and provides in-process or out-of-process filtering.

Filter SDK is part of the KeyView suite of products. KeyView provides high-speed text extraction, conversion to web-ready HTML and well-formed XML, and high-fidelity document viewing.

Features

- Document readers are threadsafe. The benefit of a threadsafe technology is that you can successfully extract text from hundreds of documents simultaneously. Documents are not queued for sequential filtering, but are actually filtered at the same time.
- Filter supports popular word processing, spreadsheet, and presentation formats. Body text, endnotes, footnotes, and additional items such as document metadata are all included as part of the filtering process.
- Sample programs are provided to demonstrate the functionality of the APIs.
- You can extract files embedded within files, such as email attachments or embedded OLE objects, by using the File Extraction API.
- You can configure memory management. If using the C API, you can provide your own memory allocator to the document readers.
- Filter allows for redirected input and output. You can provide an input stream that is not restricted to file system access.

- Filter automatically recognizes the file type being filtered and uses the appropriate filter. Your application does not need to rely on file name extensions to determine file types.
- You can filter documents to specific character encodings, such as Unicode or UTF-8.
- You can use Filter SDK in conjunction with other KeyView technologies, such as the Index, Highlight, and Annotate APIs.
- You can write custom document readers for formats not directly supported by KeyView.

Platforms, Compilers, and Dependencies

This section lists the supported platforms, supported compilers, and software dependencies for the KeyView software.

Supported Platforms

- CentOS 7
- FreeBSD 8.1 x86
- IBM AIX L6.1 PowerPC 32-bit and 64-bit
- IBM AIX L7.1 PowerPC 32-bit and 64-bit
- Mac OS X Mountain Lion 10.8 or higher on 32- and 64-bit Apple-Intel architecture
- Microsoft Windows Vista Business Edition x86 and x64. Other editions of Vista have not been tested, but are likely supported.
- Microsoft Windows 2008 Server Enterprise Edition x86 and x64
- Microsoft Windows 2008 Server R2
- Microsoft Windows 7 x86 and x64
- Microsoft Windows 8 x86 and x64
- Oracle Solaris 10 SPARC
- Oracle Solaris 10 x86 and x64
- Red Hat Enterprise Linux 5.0 x86 and x64
- Red Hat Enterprise Linux 6.0 x86 and x64
- SuSE Linux Enterprise Server 10, 10.1, 11, x86 and x64

Supported Compilers

Platform	Architecture	Compiler Name	Compiler Version
Microsoft	x86	cl	Microsoft 32-bit C/C++ Optimizing Compiler

Platform	Architecture	Compiler Name	Compiler Version
Windows			Version 16.00.30319.01 for x86
	x64	cl	Microsoft C/C++ Optimizing Compiler Version 16.00.30319.01 for x64
Sun Solaris	x86 64-bit	Sun Studio 12	Sun C 5.9 SunOS_i386 Patch 124868-01 2007/07/12
	SPARC 64-bit	Sun Studio 11	Sun C 5.8 Patch 121015-06 2007/10/03
Linux	x86	gcc / g++	3.4.3 (Redhat 4), 4.1.0 (SuSE Linux 10)
	x64	gcc / g++	4.1.0 (Redhat 4), 4.1.0 (SuSE Linux 10)
IBM AIX	Power	xLC_r / cc_r	IBM XL C/C++ Enterprise Edition V8.0
Mac OSX	Apple-Intel 32-bit and 64-bit	LLVM	Apple LLVM 5.1 (clang-503.0.40) (based on LLVM 3.4svn)
FreeBSD	BSD x86	gcc / g++	4.2.1 [FreeBSD] 20070719

Supported Compilers for Java Components

Component	Compiler
Java components	Java 1.5

Software Dependencies

Some KeyView components require specific third-party software:

- Java Runtime Environment (JRE) or Java Software Developer Kit (JDK) version 1.5 is required for Java API and graphics conversion in Export SDK.
- Outlook 2002 client or later versions is required when processing Microsoft Outlook Personal Folders (PST) files using the MAPI-based reader (`pstsr`). The native PST reader (`pstnsr`) does not require an Outlook client.

NOTE:

If you are using 32-bit KeyView, you must install 32-bit Outlook. If you are using 64-bit KeyView, you must install 64-bit Outlook.

If the bit editions do not match, an error message from Microsoft Office Outlook is displayed:

Either there is a no default mail client or the current mail client cannot

fulfill the messaging request. Please run Microsoft Outlook and set it as the default mail client.

Additionally, KeyView displays the following return code:

```
Error 32: KVErrror_PSTAccessFailed.
```

- Lotus Notes or Lotus Domino is required for Lotus Notes database (NSF) file processing. The minimum requirement is 6.5.1, but version 8.5 is recommended.
- The Microsoft .NET Framework is required if you are using the .NET implementation of the API.
- Microsoft Visual C++ 2013 and Microsoft Visual C++ 2010 Redistributables (Windows only).

Windows Installation

To install the SDK on Windows, use the following procedure.

To install the SDK

1. Run the installation program, `KeyViewProductNameSDK_VersionNumber_OS.exe`, where *ProductName* is the name of the product, *VersionNumber* is the product version number, and *OS* is the operating system.

For example:

```
KeyViewFilterSDK_12.0_Windows_X86_64.exe
```


The installation wizard opens.

2. Read the instructions and click **Next**.

The License Agreement page opens.

3. Read the agreement. If you agree to the terms, click **I accept the agreement**, and then click **Next**.

The Installation Directory page opens.

4. Select the directory in which to install the SDK. To specify a directory other than the default, click , and then specify another directory. After choosing where to install the SDK, click **Next**.

The License Key page opens.

5. Type the company name and license key that were provided when you purchased KeyView, and then click **Next**.
 - The company name is case sensitive.
 - The license key is a string that contains 31 characters.

NOTE:

The installation program validates the company name and license key and generates the

file `install\OS\bin\kv.lic` (where `install` is your chosen installation folder and `OS` is the name of the operating system platform). The license information is validated when the KeyView API is used. If you do not enter a license key at this step, or if you enter invalid information, the KeyView SDK is installed, but the API does not function. When you obtain a valid license key, you can either re-install the KeyView SDK, or manually update the license key file (`kv.lic`) with the new information. For more information, see [License Information, on page 20](#).

The Pre-Installation Summary dialog box opens.

6. Review the settings, and then click **Next**.

The SDK is installed.

7. Click **Finish**.

UNIX Installation

To install the SDK, use one of the following procedures.

To install the SDK from the graphical interface

- Run the installation program and follow the on-screen instructions.

To install the SDK from the console

1. Run the installation program from the console as follows:

```
./KeyViewFilterSDK_VersionNumber_Platform.exe --mode text
```

where:

`VersionNumber` is the product version.

`Platform` is the name of the platform.

2. Read the welcome message and instructions and press `Enter`.

The first page of the license agreement is displayed.

3. Read the license information, pressing `Enter` to continue through the text. After you finish reading the text, and if you accept the agreement, type `y` and press `Enter`.

You are asked to choose an installation folder.

4. Type an absolute path or press `Enter` to accept the default location.

You are asked for license information.

5. At the **Company Name** prompt, type the company name that was provided when you purchased KeyView, and then press `Enter`. The company name is case sensitive.
6. At the **License Key** prompt, type the license key that was provided when you purchased

KeyView, and then press `Enter`. The license key is a string that contains 31 characters.

NOTE:

The installation program generates the file `install\OS\bin\kv.lic` (where `install` is your chosen installation folder and `OS` is the name of the operating system platform). The license information is validated when the KeyView API is used. If you do not enter a license key at this step, or if you enter invalid information, the KeyView SDK is installed but the API does not function. When you obtain a valid license key, you can either re-install the KeyView SDK, or manually update the license key file (`kv.lic`) with the new information. For more information, see [License Information, on the next page](#).

The Pre-Installation summary is displayed.

7. If you are satisfied with the information displayed in the summary, press `Enter`.

The SDK is installed.

Package Contents

The Filter SDK installation contains:

- All the libraries and executables necessary for extracting text from a wide variety of formats.
- The include files that define the functions and structures used by the application to establish an interface with Filter:

<code>adapi.h</code>	<code>kvfilter.h</code>
<code>adinfo.h</code>	<code>kvioobj.h</code>
<code>kvcfsr.h</code>	<code>kvtoken.h</code>
<code>kvxtract.h</code>	<code>kvtypes.h</code>
<code>kvfilt.h</code>	<code>kvxtract.h</code>
<code>kvfilt2.h</code>	<code>kwautdef.h</code>

- The Java API implemented in the package `com.verity.api.filter` contained in the file `KeyView.jar`.
- The .NET API implemented in the namespace `Autonomy.API.Filter` in the library `FilterDotNet.dll`.
- The C++ SDK, which can be found in the `cppapi` folder.
- Sample programs that demonstrate File Extraction and Filter functionality using the APIs.
- The files necessary to create a custom document reader, and the source for a sample document reader for UTF-8. See [Develop a Custom Reader, on page 350](#).

License Information

During installation, the installation program validates the organization name and license key that you enter, and generates the *install/OS/bin/kv.lic* file, where *install* is the directory in which you installed KeyView, and *OS* is the operating system. This file is opened and validated when the KeyView API is used.

The *kv.lic* file contains the organization name and the 31-digit license key you specified during installation. The contents of a *kv.lic* file looks similar to the following:

```
Company Name  
XXXXXXXX-XXXXXXXX-XXXXXXXX-XXXXXXXX
```

The license key controls whether the following are enabled:

- the full version of the KeyView SDK
- the trial version of the KeyView SDK
- language detection and advanced document readers—The following components are considered advanced features, and are licensed separately:
 - Microsoft Outlook Personal Folders (PST) reader (*pstsr* and *pstnsr*)
 - Lotus Notes database (NSF) reader (*nsfsr*)
 - Mailbox (MBX) reader (*mbxsr*)
 - Character set detection library (*kvlangdetect*)

If you change the license key at any time, you must update the licensing information in the *kv.lic* file. See [Update License Information](#).

Enable Advanced Document Readers

To enable advanced readers in one of the KeyView SDKs, you must obtain an appropriate license key from Micro Focus and update the installed license key with the new information as described in [Update License Information](#).

If you are enabling the MBX reader in an existing installation of Filter, in addition to updating the license key, change the parameter *208=eml* to *208=mbx* in the *formats.ini* file.

Update License Information

If you currently have an evaluation version of KeyView and have purchased a full version of the SDK, or you are adding a document reader (for example, the PST reader), you must update the license information that was installed with the original version of the KeyView SDK.

If you installed a full version of KeyView, but did not enter licensing information at the time of installation, you must also update the license information.

To update the information, do one of the following:

- Manually update the license information that is stored in the text file named `kv.lic`.
- Re-install the product and enter the new license information when prompted.

To update the KeyView license information

1. Open the license key file, `kv.lic`, in a text editor. The file is in the `install\OS\bin` directory, where `install` is the directory in which you installed KeyView, and `OS` is the operating system. The file contains the following text:

```
COMPANY NAME  
XXXXXXX-XXXXXXX-XXXXXXX-XXXXXXX
```

2. Replace the text `COMPANY NAME` with the company name that appears at the top of the License Key Sheet provided by Micro Focus. Enter the text exactly as it appears in the document.
3. Replace the characters `XXXXXX-XXXXXXX-XXXXXXX-XXXXXXX` with the appropriate license key from the License Key Sheet provided by Micro Focus. The license key is listed in the **Key** column in the **Standalone Products** table. The key is a string that contains 31 characters, for example, `2TQD22D-2M6FV66-2KPF23S-2GEM5AB`. Enter the characters exactly as they appear in the document, including the dashes, but do not include a leading or trailing space.
4. The finished `kv.lic` file looks similar to the following:

```
Autonomy  
24QD22D-2M6FV66-2KPF23S-2G8M59B
```

5. Save the `kv.lic` file.

Directory Structure

The following table describes the directories created during the Filter SDK installation. The variable `install` is the path name of the Filter installation directory (for example, `/usr/autonomy/KeyviewFilterSDK` on UNIX, or `C:\Program Files\Autonomy\KeyviewFilterSDK` on Windows).

The variable `OS` is the operating system for which the SDK is installed. For example, the `bin` directory on a standard 32-bit Windows installation would be located at `C:\Program Files\Autonomy\KeyviewFilterSDK\WINDOWS\bin`.

Installed directory structure

Directory	Description
<code>install\OS\bin</code>	Contains the libraries, the format detection file <code>formats.ini</code> , the license key file <code>kv.lic</code> , and other supporting files.
<code>install\OS\lib</code>	(Solaris installations only) Contains the redistributable <code>libstlport.so.1</code> library, which is required to run KeyView on Solaris platforms.

Installed directory structure, continued

Directory	Description
<code>install\dotnetapi</code>	Contains the source files for the .NET API.
<code>install\dotnetapi\dotnethelp</code>	Contains the help for the .NET API.
<code>install\dotnetapi\sample</code>	Contains the sample programs for the .NET API.
<code>install\cppapi</code>	Contains the source files for the C++ API.
<code>install\cppapi\sample</code>	Contains the sample programs for the C++ API.
<code>install\guide</code>	Contains the KeyView Filter SDK programming guides in PDF and HTML format.
<code>install\include</code>	Contains the header files required for Filter.
<code>install\javaapi\javadoc</code>	Contains the Javadoc for the Java API.
<code>install\javaapi\sample</code>	Contains the source files and sample programs for the Java API.
<code>install\rel_notes</code>	Contains the <i>KeyView Filter SDK Release Notes</i> in PDF format.
<code>install\samples\filter</code>	Contains a sample program demonstrating the Filter interface for the C API.
<code>install\samples\filterca</code>	Contains a C sample program demonstrating extraction of a content access stream.
<code>install\samples\pdfini</code>	Contains the initialization file used to extract custom metadata from PDF documents.
<code>install\samples\tstxtract</code>	Contains a C sample program demonstrating the File Extraction interface.
<code>install\samples\utf8sr</code>	Contains the source for the sample document reader for UTF-8 files. You can use this to create your own custom document readers.
<code>install\samples\utf8sr\bin</code>	Contains the C program <code>filtertest</code> . You can use this program to test your custom document readers. See Develop a Custom Reader, on page 350 .

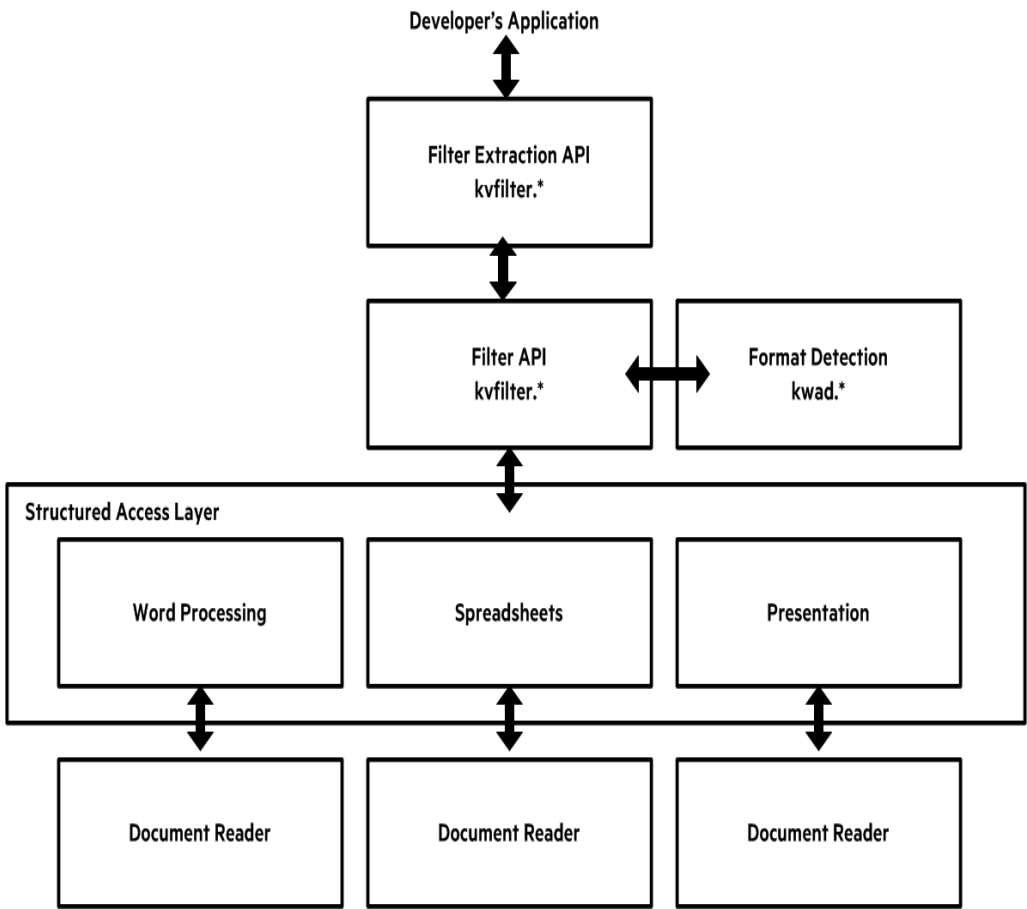
Chapter 2: Getting Started

This section provides an overview of Filter SDK, and describes how to use the C implementation of the API.

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Architectural Overview

The general architecture of the KeyView Filter technology is the same across all supported platforms and is illustrated in the following diagram:



Each component is described in the following table.

Architectural Components

Component	Description
Developer's Application	The developer's application interfaces directly with the Filter API through either a C-language or Java implementation.
File Extraction API	The File Extraction API opens a file and extracts the file's subfiles so that they are exposed for filtering. See Use the File Extraction API, on page 37 .
Filter API	The Filter API exposes the filtering functionality and controls all other modules during the filtering process. See Use the Filter API, on page 59 .
Format Detection	This module determines the file type of the input stream, allowing the Filter API to return that information to the developer's application, or to load the appropriate structured access layer for further processing. See File Format Detection, on page 302 for more information on format detection.

Architectural Components , continued

Component	Description
Structured Access Layer	There are three modules that reside in the structured access layer—one each for word processing, spreadsheet, and presentation formats. The file detection result determines which structured access layer module is used during the filtering process. That module loads the appropriate document reader and proceeds with text extraction or metadata retrieval.
Document Readers	Each document reader reads a specific file format and sends a text stream of the document to the structured access layer. Each filter is loaded as required by the structured access layer. See Document Readers, on page 343 for a complete list of document readers.

Enhance Performance

KeyView is designed for optimal performance out of the box. However, there are some parameters that you can adjust to improve system performance according to your needs.

File Caching

To reduce the frequency of I/O operations, and consequently improve performance, the KeyView readers load file data into memory. The readers then read the data from the cache rather than the physical disk. You can configure the amount of memory used for file caching through the `formats.ini` file. Generally, when you increase the memory, performance improves.

By default, KeyView uses a maximum of 1 MB of memory for each thread—assuming a thread contains only one instance of `pContext` that is returned from the session initialization (see [fpInit\(\)](#), on [page 147](#)). If the file data is larger than 1 MB, up to 1 MB of data is cached and the data beyond 1 MB is read from disk. The minimum amount of memory that can be used for file caching is 64 KB.

To determine a reasonable value, divide the maximum amount of memory you want KeyView to use for file caching by the total number of threads. For example, if you want KeyView to use a maximum of 50 MB of memory and have 10 threads, set the value to 5 MB.

To modify the memory allocated for file caching, change the value for the following parameter in the `[DiskCache]` section of the `formats.ini` file:

```
DiskCacheSize=1024
```

The value is in kilobytes. If this parameter is not set or is set to 0 (zero), the minimum value of 64 KB is used.

Filtering

Filter SDK enables you to *filter* many different types of documents. Filtering is the process of extracting the text from a document without the application-specific markup. However, the filtering process can also include the following:

- Subfile extraction—this process exposes all subfiles for filtering. See [Use the File Extraction API, on page 37](#).
- File format extraction—this process detects a file's format, and reports the information to the API, which in turn reports the information to the developer's application. See [File Format Detection, on page 302](#).
- Metadata extraction—this process extracts selected metadata (document properties) from a file. See [Extract Metadata, on page 62](#).
- Character set conversion—this process controls the character set of both the input and the output text. See [Convert Character Sets, on page 64](#).

Subfile Extraction

To filter a file, you must first determine whether the file contains any subfiles (attachments, embedded OLE objects, and so on). A file that contains subfiles is called a *container* file. Archive files (such as ZIP), mail messages with attachments (such as Microsoft Outlook Express), mail stores (such as Microsoft Outlook Personal Folders), and compound documents with embedded OLE objects (such as a Microsoft Word document with an embedded Excel chart) are examples of container files.

If the file is a container file, the container must be opened and its subfiles extracted using the File Extraction interface. The extraction process is done repeatedly until all subfiles are extracted and exposed for filtering. After a subfile is extracted, you can use the Filter API to filter the file.

If a file is not a container, you should pass it directly to the Filter API for filtering without extraction.

The [tstxtract](#) sample program demonstrates the application logic for extracting and filtering files. See [Use the File Extraction API, on page 37](#) for more information.

Memory Abstraction

Dynamic memory allocations in the Filter modules are abstracted through a C interface. This memory allocation interface is defined in the `KVMemoryStream` structure in `kvtypes.h`. You can override all memory allocations by providing a C structure that contains pointers to functions identical in nature to their standard ANSI C counterpart.

Use the C-Language Implementation of the API

The C-language implementation of the Filter API is divided into the following function suites:

- [File Extraction API Functions](#)—Open and extract subfiles in a container file. These functions also extract metadata and file format information, and control character set conversion on extraction. The [tstxtract](#) sample program demonstrates these functions.
- [Filter API Functions](#)—Extract document information (metadata character set, format), create an input/output stream, and filter a file or stream. The [filter](#) sample program demonstrates these functions.

Input/Output Operations

In Filter, the source input can be either a physical file accessed through a file path, or a filter stream created from a data source. A *filter stream* in the C API implementation is a C data structure that contains pointers to I/O functions similar to their standard ANSI C counterparts. This structure is passed to filter functions in place of the standard input source. The input stream is defined by the [KVInputStream](#) structure in `kvtypes.h`.

You can create an input stream by using the [fpFiletoInputStreamCreate\(\)](#) function, or by using code similar to the code in the Filter sample program. The `fpFiletoInputStreamCreate()` function assigns C equivalent I/O functions to `fpOpen()`, `fpRead()`, `fpSeek()`, `fpTell()`, and `fpClose()`. The code in the Filter sample program is shown below. This code assigns the file I/O functions (`myOpen`, `myRead`, and so on) to `KVInputStream`.

```
typedef struct
{
    char    *pszName;
    FILE    *fp;
}
MyOpenInfo;

KVInputStream  IO;
MyOpenInfo    o;

/* Initialize the input stream */
o.pszName = pszFileIn;
IO.pInputStreamPrivateData = (void *)&o;
IO.fpOpen   = myOpen;
IO.fpRead   = myRead;
IO.fpSeek   = mySeek;
IO.fpTell   = myTell;
IO.fpClose  = myClose;
```

The output for extracted content is either a physical file accessed through a file path and specified in the call to [fpFilterFile\(\)](#), or an *output buffer* specified in the call to [fpFilterStream\(\)](#). The buffer is defined by the [KVFilterOutput](#) data structure in `kvtypes.h`.

Filtering in File Mode

To use the Filter file-based I/O

1. Load the `kvfilter` library and obtain the `KV_GetFilterInterfaceEx()` entry point by calling [KV_GetFilterInterfaceEx\(\)](#). The filter sample program contains sample code for all platforms.
2. Initialize a filter session by calling [fpInIt\(\)](#). This function's return value, `pContext`, is passed as the first argument to the File Extraction interface and all other Filter functions.

3. Pass the context pointer from `fpInit()` and the address of a structure that contains pointers to the File Extraction API functions in the call to `KVGetExtractInterface()`.
4. Declare the file path in the `KVOpenFileArg` structure.
5. Open the file by calling `fpOpenFile()` and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.
6. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling `fpGetMainFileInfo()`.
7. If the call to `fpGetMainFileInfo()` determined that the source file contains subfiles, proceed to step 8; otherwise, proceed to step 11.
8. Determine whether the subfile is a container file by calling `fpGetSubFileInfo()`.
9. Extract the subfile or subfiles to a file by calling `fpExtractSubFile()` and setting `filePath` and `extractDir` in the `KVExtractSubFileArg` structure.
10. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 4 through step 9 until all subfiles are extracted; otherwise, proceed to step 11.
11. Filter the file by calling `fpFilterFile()`.
12. Close the file by calling `fpCloseFile()`.
13. Repeat step 4 through step 12 as required for additional source files.
14. Terminate the filter session by calling `fpShutdown()`.

Filtering in Stream Mode

To use the Filtering stream-based I/O

1. Load the `kvfilter` library and obtain the `KV_GetFilterInterfaceEx()` entry point. The `filter` sample program contains sample code for all platforms.
2. Initialize a filter session by calling `fpInit()`. This function's return value, `pContext`, is passed as the first argument to all other Filter functions.
3. Pass the context pointer from `fpInit()` and the address of a structure that contains pointers to the File Extraction API functions in the call to `KVGetExtractInterface()`. See [KVGetExtractInterface\(\)](#), on page 95.
4. Create an input stream (`KVInputStream`) by calling `fpFiletoInputStreamCreate()` or by using code similar to the example code in the `Filter` sample program.
5. Open the stream by calling `fpOpenStream()`.
6. Declare the input stream in the `KVOpenFileArg` structure.
7. Open the source file by calling `fpOpenFile()` and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.
8. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling `fpGetMainFileInfo()`.

9. If the call to `fpGetMainFileInfo()` determined that the source file is a container file, proceed to step 10; otherwise, proceed to step 13.
10. Determine whether the subfile is a container file by calling `fpGetSubFileInfo()`.
11. Extract the subfile to a stream by calling `fpExtractSubFile()`.
12. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 4 through step 11 until all subfiles are extracted; otherwise, proceed to step 13.
13. Filter the stream by calling `fpFilterStream()`. Call `fpFilterStream()` repeatedly until the entire output buffer is processed.
14. Close the stream by calling `fpCloseStream()`.
15. Free the memory allocated for the input stream by calling `fpFileToInputStreamFree()`.
16. Close the file by calling `fpCloseFile()`.
17. Repeat [Step 4](#) through [Step 16](#) as required for additional source files.
18. Terminate the filter session by calling `fpShutdown()`.

Multithreaded Filtering

To make sure that multithreaded filter processes are thread-safe, you must create a unique context pointer for every thread by calling `fpInit()`. In addition, threads must not share context pointers, and the same context pointer must be used for all API calls in the same thread. This applies to in-process and out-of-process API calls. Creating a context pointer for every thread does not affect performance because the context pointer uses minimal resources.

For example, C code for file filtering must have the following logic in a thread:

```
fpInit()  
    KVGetExtractInterface()  
    fpOpenFile()  
    fpGetMainFileInfo()           /* container file */  
    fpGetSubFileInfo()  
    fpExtractSubFile  
    fpGetSubFileMetadata()  
    fpFilterFile()  
    fpCloseFile()  
  
    fpOpenFile()  
    fpGetMainFileInfo()           /* not a container file */  
    fpGetDocInfoFile()  
    fpGetOLESummaryInfoFile()  
    fpFilterFile()  
    fpCloseFile()  
    ...  
fpShutdown()
```

The Filter Process Model

By default, Filter runs independently from the calling application process. This is called *out-of-process* filtering. Out-of-process filtering protects the stability of the calling application in the rare case when a malformed document causes Filter to fail. You can configure Filter to run in the same process as the calling application. This is called *in-process* filtering. However, Micro Focus strongly recommends that you run Filter out of process whenever possible.

With the exception of Solaris and AIX, the creation of child processes on UNIX adheres to Portable Operating System Interface (POSIX) standards. Solaris and AIX use thread semantics. If required, a version of `kvfilter` with POSIX thread semantics is available for Solaris and AIX. For Solaris, the file is `kvfilter_posix.so`. For AIX, the file is `kvfilter_nsl.a`. These files must be renamed `kvfilter.so` or `kvfilter.a` to be used by Filter.

To monitor and debug filtering operations during out-of-process filtering, you can generate an error log at run time. See [Generate an Error Log, on page 59](#).

The following functions can run both in process or out of process:

Filter API

<code>fpCanFilterFile()</code>	<code>fpCanFilterStream()</code>
<code>fpFilterFile()</code>	<code>fpFilterStream()</code>
<code>fpGetDocInfoFile()</code>	<code>fpGetDocInfoStream()</code>
<code>fpGetOLESummaryInfo()</code>	<code>fpGetOLESummaryInfoFile()</code>
<code>fpGetDocInfoFile()</code>	<code>fpGetDocInfoStream()</code>

File Extraction API

<code>fpCloseFile()</code>	<code>fpExtractSubFile()</code>
<code>fpFreeStruct()</code>	<code>fpGetMainFileInfo()</code>
<code>fpGetSubFileInfo()</code>	<code>fpGetSubFileMetaData()</code>
<code>fpOpenFile()</code>	<code>KVGetExtractInterface()</code>

Other Filter API functions always run in process.

Persist the Child Process

By default, in out-of-process filtering, the parent process maintains a persistent connection with the child server after each file is filtered. When the connection is preserved in this way, subsequent filtering requests are processed more quickly because the server is already prepared to receive data.

You can restart the server at regular intervals by using a function or a configuration setting.

In the API

To force KeyView to restart, call the [fpRefreshFilterKVOOP\(\)](#) function.

In the formats.ini File

To control whether Filter persists the server, use the `kvoopRefresh` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file:

`kvoopRefresh=0` When you set `kvoopRefresh` to 0 (zero), the connection to the server persists for as long as the parent process is running or until the server fails. This is the default.

`kvoopRefresh=n` When you set `kvoopRefresh` to *n* (where *n* is a positive number), the connection persists for *n* filter requests. After the *n*th request, the server is shut down and restarted before processing the next request.

For example, if you set `kvoopRefresh` to 5, the connection to the server persists for five filter requests. For the sixth request, the server is shut down and restarted.

To control whether the parent process attempts to filter a file after the file has caused the server to fail, use the `kvoopRetry` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file:

`kvoopRetry=0` When you set `kvoopRetry` to 0 and the server fails, the parent process does not resend the file to a new server.

`kvoopRetry=n` When you set `kvoopRetry` to *n* (where *n* is a positive number) and the server fails, the parent process resends the file to a new server *n* times. By default, `kvoopRetry` is set to 1, and the file is resent to a server once.

NOTE:

The `kvoopRefresh` and `kvoopRetry` parameters do not apply when you run the File Extraction functions out of process. See [Run File Extraction Functions Out of Process, on the next page](#).

Run Filter In Process

By default, Filter runs out of process. However, you can enable in-process filtering through the API or in the `formats.ini` file. If the type of process is not specified in the `formats.ini` or in the API, Filter is run out of process. If the type of process is specified in the `formats.ini` *and* in the API, the setting in the API takes precedence.

In the API

To run Filter in process

1. Set the final argument (`dwFlags`) of either [fpInit\(\)](#) or [fpOpenStreamEx2\(\)](#) to `KVF_INPROCESS`.
2. `dwFlags |= KVF_INPROCESS`

3. Call a filtering function or a metadata extraction function. See [Filter API Functions, on page 121](#).
4. Optionally, call a metadata extraction function if a filter function was called in the previous step. See [fpGetDocInfoFile\(\), on page 138](#) or [fpGetDocInfoStream\(\), on page 139](#).

In the formats.ini File

To run Filter in process, set the `default_inprocess` parameter in the `[FilterSDK_Config]` section of the `formats.ini` file to 1.

By default this parameter is set to 0 (zero), which enables out-of-process filtering.

Run File Extraction Functions Out of Process

The out-of-process setting specified in the call to `fpInit()` or in the `formats.ini` file is automatically propagated to the File Extraction API in the call to `KVGetExtractInterface()`. In `KVGetExtractInterface()`, you pass a context pointer from `fpInit()` and the address of a structure that contains pointers to the File Extraction functions.

When you extract subfiles from container files and pass the files for filtering out of process, Filter generates a server called `kvoop.exe` for filtering and a duplicate server (also called `kvoop.exe`) for file extraction. These servers are independent, so that if the filtering service stops responding, the file extraction service can continue extracting files.

Restart the File Extraction Server

If the file extraction server fails with either the `KVError_InvalidOopDriverSignature` error, or the `KVError_InvalidOopServiceSignature` error, you must restart the server by calling `KVGetExtractInterface()` and passing the original extraction structure. (Restarting the server in this way does not affect performance beyond the cost of restarting the server.)

If you restart the file extraction server before the recursive extraction of subfiles is complete, the new server has no history of the subfiles extracted prior to the restart. If you then call a File Extraction function on one of the extracted files, the `KVError_InvalidOopServiceSignature` error is generated, because the server that extracted the files is no longer running and was replaced with a new `kvoop` server. Micro Focus recommends that you do not make calls to the File Extraction functions by using an invalid container context structure (`KVContainerContext`) after you restart the server.

NOTE:

Micro Focus recommends that whenever possible you restart the file extraction server only after the file recursion is complete. There must be only one out-of-process session per file recursion.

Out-of-Process Logging

Logging is available for out-of-process filtering. The `kvoop` server can now create a log file that captures information on the files being processed, storing one entry per process. The generated log file is called `xxxx_kvoop.log`, where `xxxx` is a unique number identifying the process.

In the rare case when the `kvoop` server fails, you can use the log files to determine which file caused the failure. After processing is complete and the system shuts down, the logs are automatically

deleted. To keep the log files after processing is successfully completed, see [Keep Log Files, on the next page](#).

NOTE:

Out-of-process logging is not supported on AIX.

Enable Out-of-Process Logging

To enable out-of-process logging, set the `KVOOP_LOGS_DIR` environment variable to the directory in which you want the log files to be stored. By default, logging is not enabled.

On UNIX, set the variable as follows:

```
setenv KVOOP_LOGS_DIR /tmp
```

On Windows, set the variable as follows:

```
set KVOOP_LOGS_DIR=c:\tmp
```

The following log file is created in the directory:

```
process_id_kvoop.log
```

where *process_id* is a numeric value that represents the logged process. New messages are appended to the file, and truncation is disabled by default.

If KeyView terminates unexpectedly and Windows minidump is enabled, a *process_id_crash_info.txt* file is generated (see [Enable Windows Minidump, below](#)). If logging was not enabled at the time of termination, this file contains instructions on how to enable logging.

Set the Verbosity Level

You can control how much information is written to the file by setting the `KVOOP_LOG_VERBOSITY` environment variable.

Set the variable to one of the following options:

- 1 Include only error messages.
- 2 Include errors and warnings.
- 3 Include errors, warnings, and general information. This is the default.
- 4 Include all possible information. This setting is useful for debugging purposes.

Enable Windows Minidump

KeyView can use the Windows minidump feature to provide additional logging information, which can be useful for debugging purposes.

The Windows minidump is disabled by default. To enable the Windows minidump, set `KVOOP_DUMP_ENABLE` to 1. If an unexpected termination occurs after the minidump is enabled, three files are generated:

- **`process_id_crash_info.txt`**. This file contains KVOOP state and runtime information at the time of termination. If logging was not enabled at the time of termination, this file contains instructions on how to enable logging.
- **`process_id_process_list.txt`**. This file contains information from the DLLs that were loaded at the time of the termination.
- **`process_id_report.dmp`**. The Windows dump file, which contains further information about the termination. You can open it with either a Windows debugger or `autnhelper.exe` (you must copy this file to the same directory).

You can control the amount of information presented in the Windows dump file by creating the following files in the directory:

```
dumper.NORMAL  
dumper.WITHDATASEG  
dumper.WITHFULLMEMORY  
dumper.WITHHANDLEDATA
```

Keep Log Files

After processing is complete and the system is shut down, the log files are automatically deleted from the directory. To keep the log files after a successful run, set the `KVOOP_KEEP_LOGS` environment variable.

On UNIX, set the variable as follows:

```
setenv KVOOP_KEEP_LOGS 1
```

On Windows, set the variable as follows:

```
set KVOOP_KEEP_LOGS=1
```

Run File Detection In or Out of Process

By default, detection runs in out-of-process mode. However, you can enable in-process detection through the API or in the `formats.ini` file. If the type of process is not specified in the `formats.ini` or in the API, detection runs in out-of-process mode. If the type of process is specified in the `formats.ini` *and* in the API, the setting in the API takes precedence.

Specify the Process Type In the `formats.ini` File

Add the `default_detect_inprocess` flag to a `[FilterSDK_Config]` section in the `formats.ini` file to control the default behavior for detection. Set the flag to `0` for out-of-process detection, and `1` for in-process detection. For example,

```
[FilterSDK Config]  
default_detect_inprocess=0
```

If this flag is not specified, the file detection behavior is determined by the `default_inprocess` flag for filtering. For example, if you set `default_inprocess` to `1`, filtering and file detection runs in in-process

mode by default; if you set `default_inprocess` to 0, filtering and file detection runs in out-of-process mode by default.

If you set both the `default_inprocess` and `default_detect_inprocess` flags, `default_inprocess` controls the default filtering behavior and `default_detect_inprocess` controls the default file detection behavior.

Specify the Process Type In the API

Set the final argument (`dwFlags`) of either `fpInit()` or `fpOpenStreamEx2()` to `KVF_DETECT_INPROCESS` or `KVF_DETECT_OUTOFPROCESS`.

Part II: Use Filter SDK

This section explains how to perform some basic tasks by using the File Extraction and Filter APIs, and describes the sample programs.

Chapter 3: Use the File Extraction API

This section describes how to extract subfiles from a container file by using the File Extraction API.

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Introduction

To filter a file, you must first determine whether the file contains any subfiles (attachments, embedded OLE objects, and so on). A file that contains subfiles is called a *container* file. A container file has a main file (parent) and subfiles (children) embedded in the main file.

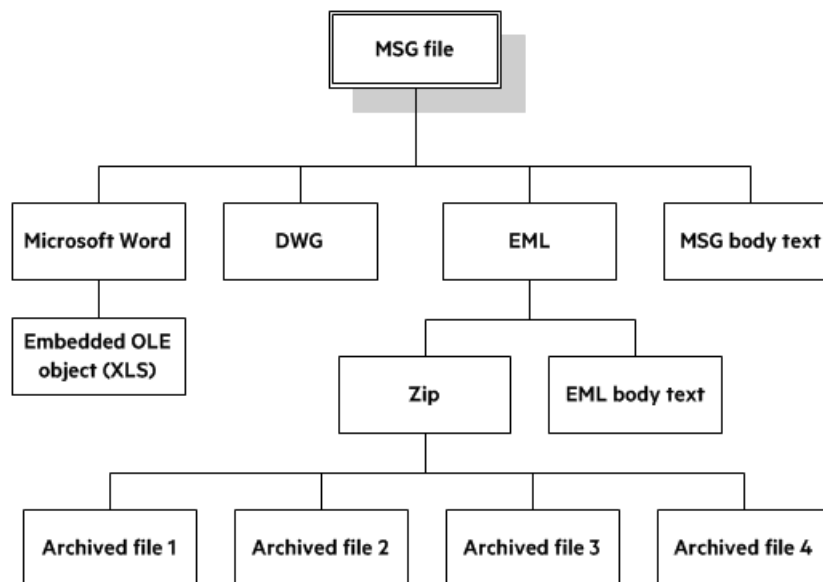
The following are examples of container files:

- Archive files such as ZIP, TAR, and RAR.
- Mail messages such as Outlook (MSG) and Outlook Express (EML).
- Mail stores such as Microsoft Outlook Personal Folders (PST), Mailbox (MBX), and Lotus Notes database (NSF).
- PDF files that contain file attachments.
- Compound documents with embedded OLE objects such as a Microsoft Word document with an embedded Excel chart.

NOTE: [Supported Formats, on page 189](#) indicates which formats are treated as container files and are supported by the File Extraction API.

The subfiles might also be container files, creating a file hierarchy of multiple levels. For example, an MSG file (the root parent) might contain three attachments:

- a Microsoft Word document that contains an embedded Microsoft Excel spreadsheet.
- an AutoCAD drawing file (DWG).
- an EML file with an attached Zip file, which in turn contains four archived files.



NOTE: The parent MSG file contains four first-level children. The body text of a message file, although not a standalone file in the container, is considered a child of the parent file.

Extract Subfiles

To filter all files in a container file, you must open the container and extract its subfiles by using the *File Extraction API*. The extraction process is done repeatedly until all subfiles are extracted and exposed for filtering. After a subfile is extracted, you can call Filter API functions to filter the file.

If you want to filter a container file and its subfiles to a single file, you must extract all files from the container, filter the files, and then append each filtered output file to its parent.

To extract subfiles

1. Pass the context pointer from `fpInit()` and the address of a structure that contains pointers to the File Extraction API functions in the call to `KVGetExtractInterface()`.
2. Declare the input stream or file name in the `KVOpenFileArg` structure.
3. Open the source file by calling `fpOpenFile()` and passing the `KVOpenFileArg` structure. This call defines the parameters necessary to open a file for extraction.
4. Determine whether the source file is a container file (that is, whether it contains subfiles) by calling `fpGetMainFileInfo()`.

5. If the call to `fpGetMainFileInfo()` determined that the source file is a container file, proceed to step 6; otherwise, filter the file.
6. Determine whether the subfile is itself a container (that is, whether it contains subfiles) by calling `fpGetSubFileInfo()`.
7. Extract the subfile by calling `fpExtractSubFile()`.
8. If the call to `fpGetSubFileInfo()` determined that the subfile is a container file, repeat step 2 through step 7 until all subfiles are extracted and the lowest level of subfiles is reached; otherwise, filter the file.

Extract Images

You can use the File Extraction API to extract images within the file by specifying the following in the `formats.ini` file:

```
[Options]
ExtractImages=TRUE
```

If you set this option, images within the file behave in the same way as any other subfile. Extracted images have the name `image[X].[Y]`, where `[X]` is an integer, and `[Y]` is the extension. The format of the image is the same as the format in which it is stored in the document.

This option can also be enabled by passing `KVFLT_EXTRACTIMAGES` to the `fpFilterConfig` function.

NOTE:

Turning on `ExtractImages` can reduce the speed of the filtering operation.

Recreate a File's Hierarchy

When you extract a container file, any relationships between the subfiles in the container are not maintained. However, the File Extraction interface provides information that enables you to recreate the hierarchy. You can use the hierarchy to create a directory structure in a file system, or to categorize documents according to their relationship to each other. For example, if you use `KeyView` to generate text for a search engine, the hierarchical information enables your users to search for a document based on the document's parent or sibling. In addition, when the document is returned to the user, the parent and sibling documents can be returned as recommendations.

The information needed to recreate a file's hierarchy is provided in the call to `fpGetSubFileInfo()`. The members `KVSubFileInfo->parentIndex` and `KVSubFileInfo->childArray` provide information about a subfile's parent and children. Because you can only retrieve the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted.

Create a Root Node

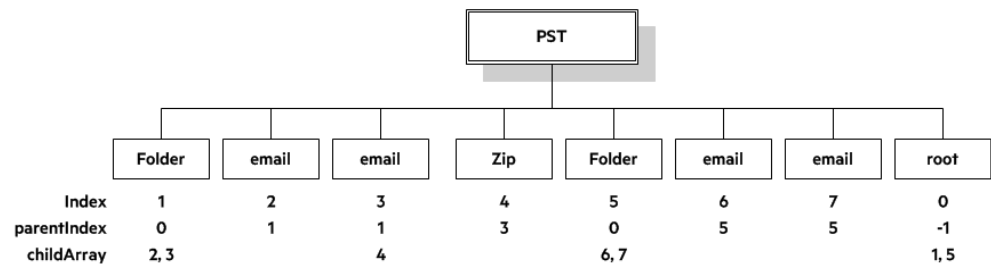
Because of their structure, some container files do not contain a subfile or folder which acts as a root directory on which the hierarchy can be based. For example, subfiles in a Zip archive can be extracted, but none of the subfiles represent the root of the hierarchy. In this case, you must create an artificial

root node at the top of the file hierarchy as a point of reference for each child, and ultimately to recreate the relationships. This artificial root node is an internal object, and is extracted to disk as a directory called *root*. Its index number is 0.

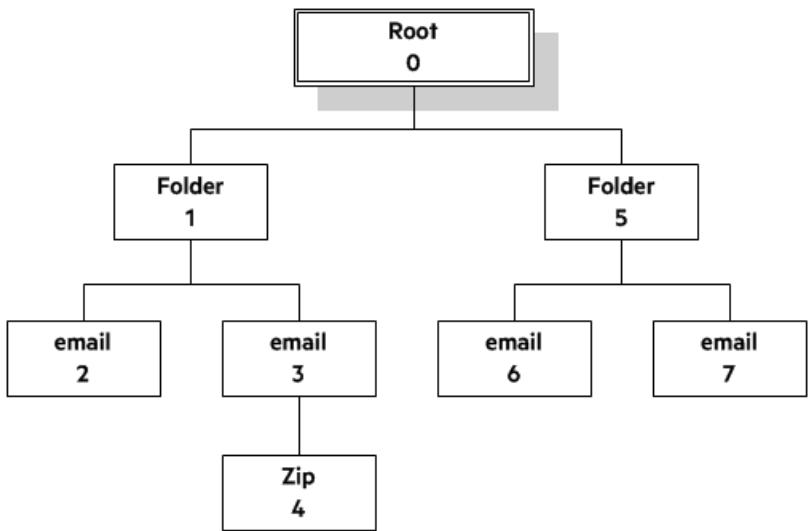
To create the root node, set `openFlag` to `KVOpenFileFlag_CreateRootNode` in the call to `fpOpenFile()`. When you create a root node, the value of `numSubFiles` in `KVMainFileInfo` includes the root node. For example, when you call `fpGetMainFileInfo()` on a Microsoft Word document with three embedded OLE objects and the root node is disabled, `numSubFiles` is 3. If you create a root node, `numSubFiles` is 4.

Recreate a File’s Hierarchy—Example

For example, you might extract a PST file that contains seven subfiles with a root node enabled. The call to `fpGetMainFileInfo()` returns the number of subfiles as eight (seven subfiles and one root node). The following diagram shows the structure and the available hierarchy information after the subfiles are extracted:



The `parentIndex` specifies the index number of a subfile’s parent. The `childArray` specifies an array of a subfile’s children. With this information, you can recreate the hierarchy shown in the following diagram.



Extract Mail Metadata

You can extract metadata, such as subject, sender, and recipient, from MSG, EML, MBX, PST, and NSF files, by calling the `fpGetSubFileMetaData()` function. You can extract a predefined set of metadata fields, individual fields, or both, that are unique to a file format.

Default Metadata Set

KeyView internally defines a set of common mail metadata fields that you can extract as a group from mail formats. This default metadata set is listed in the following table. When you retrieve *all* metadata for a file—that is, pass `NULL` for the array of metadata—the complete set of default metadata, not all available metadata in the file, is returned.

Default Mail Metadata List

Field Name (string to specify)	Description
From	The display name and email address of the sender.
Sent	The time that the message was sent.
To	The display names and email addresses of the recipients.
Cc	The display names and email addresses of recipients who receive copies of the email.
Bcc	The display names and email addresses of recipients who received blind copies of the email.
Subject	The text in the subject line of the message.
Priority	The priority applied to the message.

Because mail formats use different terms for the same fields, the format's reader maps the default field name to the appropriate format-specific name. For example, when retrieving the default metadata set, the NSF field *Importance* is mapped to the name *Priority* and is returned.

You can also extract the default field names individually by passing the field name (such as *From*, *To*, and *Subject*); however, in this case, the string is not mapped to the format-specific name. For example, if you pass *Priority* in the call, you retrieve the contents of the *Priority* field from an MBX file, but do not retrieve the contents of the *Importance* field from an NSF file.

NOTE: You cannot pass the field names listed in the table individually for PST files. However, you can pass either the MAPI tag number or the MAPI tag name as integers. See [Microsoft Personal Folders File \(PST\) Metadata, on page 45](#).

Extract the Default Metadata Set

To extract the default metadata set, call the [fpGetSubFileMetaData\(\)](#) function, and pass 0 for metaNameCount and NULL for metaNameArray.

```
KVGetSubFileMetaArgRec metaArg;  
KVSubFileMetaData pMetaData = NULL;  
KVStructInit(&metaArg);  
  
metaArg.index = subFileIndex;  
metaArg.metaNameCount = 0;  
metaArg.metaNameArray = NULL;  
  
error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);  
...  
extractInterface->fpFreeStruct(pFile, pMetaData);  
pMetaData = NULL;
```

Microsoft Outlook (MSG) Metadata

In addition to the default metadata set, you can extract the metadata fields listed in the following table for MSG files. You must pass the field name to metaNameArray in the call to the fpGetSubFileMetadadata() function.

MSG-specific Metadata List

Field Name (string to specify)	Description
AttachFileName	An attachment's long file name and extension, excluding the path.
ConversationTopic	The topic of the first message in a conversation thread. A conversation thread is a series of messages and replies. This is the first message's subject with any prefix removed.
CreationTime	The time that the message or attachment was created. This value is displayed in the Sent field in the message's Properties dialog in Outlook.
InternetMessageID	The identifier for messages that come in over the Internet. This is the MAPI property PR_INTERNET_MESSAGE_ID. This property is not in the MAPI headers or MAPI documentation.
LastModificationTime	The time that the message or attachment was last modified. This value is displayed in the Modified field in the message's Properties dialog in Outlook.
Location	The physical location of the event specified in the Outlook calendar entry.
MessageID	The message transfer system (MTS) identifier for the message transfer

MSG-specific Metadata List, continued

Field Name (string to specify)	Description
	agent (MTA). This value is displayed on the Message ID tab in the message's Properties dialog in Outlook.
Received	The date and time a message was delivered. This value is displayed in the Received field in the message's Properties dialog in Outlook.
Sender	<p>The name and email address of the message sender. This value is a concatenation of two MAPI properties in the following format:</p> <p>"PR_SENDER_NAME" <PR_SENDER_EMAIL_ADDRESS></p> <p>The Sender value might be the same as or different than the default metadata From value (see Default Metadata Set, on page 41), depending on which MAPI properties exist in the MSG file.</p>
Sensitivity	The value indicating the message sender's opinion of the sensitivity of a message. For example, Personal, Private, or Confidential. This value is displayed in the Sensitivity field in the message's Properties dialog in Outlook.
TransportMsgHeaders	Transport-specific message envelope information. This value corresponds to the MAPI property PR_TRANSPORT_MESSAGE_HEADERS.
StartDate	An appointment start date. This value corresponds to the PR_START_DATE MAPI property.
EndDate	An appointment end date. This value corresponds to the PR_END_DATE MAPI property.

Extract MSG-Specific Metadata

To extract specific metadata fields from an MSG file, call the [fpGetSubFileMetaData\(\)](#) function, and pass the field name defined in [Default Metadata Set, on page 41](#) to metaNameArray (the string is not case sensitive).

For example, the following code extracts the contents of the ConversationTopic and MessageID fields:

```
KVGetSubFileMetaArgRec metaArg;  
KVSubFileMetaData pMetaData = NULL;  
KVStructInit(&metaArg);  
KVMetaNameRec names[2];  
KVMetaName pname[2];  
  
names[0].type = KVMetaNameType_String;  
names[0].name.sname = "conversationtopic";  
names[1].type = KVMetaNameType_String;
```

```
names[1].name.sname = "MessageID";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;

error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Microsoft Outlook Express (EML) and Mailbox (MBX) Metadata

In addition to the default metadata set, you can extract any metadata field that exists in the header of an EML or MBX file by passing the field's name. If the name is a valid field in the file, the content of the field is returned. For example, to retrieve the name of the last mail server that received the message before it was delivered, you can pass the string "Received".

Extract EML- or MBX-Specific Metadata

To extract specific metadata fields from an EML or MBX file, call the [fpGetSubFileMetaData\(\)](#) function, and pass the metadata name to `metaNameArray` (the string is *not* case sensitive).

For example, the following code extracts the contents of the `Received` and `Mime-version` fields:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);
KVMetaNameRec names[2];
KVMetaName      pname[2];

names[0].type = KVMetaNameType_String;
names[0].name.sname = "Received";
names[1].type = KVMetaNameType_String;
names[1].name.sname = "Mime-version";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;
error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);
pMetaData = NULL;
```

Lotus Notes Database (NSF) Metadata

In addition to the default metadata set, you can extract any Lotus field name that exists in an NSF file by passing the field's name. (You can extract fields from mail NSF files and non-mail NSF files.) If the name is a valid field in the file, the field is returned. For example, to retrieve the date when a document in an NSF file was last accessed, you would pass the string "\$LastAccessedDB".

NOTE: A complete list of NSF fields is provided in the Lotus Notes file `stdnames.h`. This header file is available in the Lotus API Toolkit.

Extract NSF-Specific Metadata

To extract specific metadata fields from an NSF file, call the [fpGetSubFileMetaData\(\)](#) function, and pass the metadata name to `metaNameArray` (the string is *not* case sensitive).

For example, the following code extracts the contents of the `Description` and `Categories` fields:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVStructInit(&metaArg);
KVMetaNameRec names[2];
KVMetaName pname[2];

names[0].type = KVMetaNameType_String;
names[0].name.sname = "description";
names[1].type = KVMetaNameType_String;
names[1].name.sname = "Categories";

pname[0] = &names[0];
pname[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pname;
metaArg.index = subFileIndex;

error = extractInterface->fpGetSubFileMetaData(pFile, &metaArg, &pMetaData);
...
extractInterface->fpFreeStruct(pFile, pMetaData);
pMetaData = NULL;
```

Microsoft Personal Folders File (PST) Metadata

In addition to the default metadata set, you can extract Messaging Application Programming Interface (MAPI) properties from a PST file. These properties describe all elements of an Outlook item in a PST file (such as subject, sender, recipient, and message text). Because the properties are stored in the PST file itself, you can retrieve them *before* you extract the contents of the PST. This enables you to determine whether an Outlook item should be extracted based on its attributes. Some MAPI properties

are also stored for Outlook attachments that are *not* mail messages (such as an attached Microsoft Word document or Lotus 1-2-3 file).

NOTE: Because all elements of a message (except non-mail attachments) are represented by MAPI properties, you can extract all components of a subfile, including the header and message text, by calling the `fpGetSubFileMetadata()` function.

MAPI Properties

Each MAPI property is identified by a property tag, which is a constant that contains the property type and a unique identifier. For example, the property that indicates whether a message has attachments has the following components:

Property	PR_HASATTACH
Identifier	0x0E1B
Property type	PT_BOOLEAN (000B)
Property tag	0x0E1B000B

The Microsoft MAPI documentation on the Microsoft Developer Network website lists all available MAPI properties, their tags, and types.

You can retrieve any MAPI property that is of one of the MAPI property types listed below:

PT_I2	PT_DOUBLE	PT_STRING8
PT_I4	PT_FLOAT	PT_TSTRING
PT_BINARY	PT_LONG	PT_SYSTIME
PT_BOOLEAN	PT_SHORT	PT_UNICODE

NOTE: Properties with a `PT_TSTRING` type have the property type recompiled to either a Unicode string (`PT_UNICODE`) or to an ANSI string (`PT_STRING8`) depending on the operating system's character set. To retrieve the Unicode property, pass in the Unicode version of the tag. For example, the property tag for `PR_SUBJECT` is either `0x0037001E` for an ANSI string, or `0x0037001F` for a Unicode string.

Extract PST-Specific Metadata

In the call to extract subfile metadata, you can pass either the MAPI tag number (such as `0x0070001e`) or the MAPI tag name (such as `PR_CONVERSATION_TOPIC`). If you specify the MAPI tag name, you must include the `mapitags.h` and `mapidefs.h` Windows header files, in which the MAPI tag name is defined as a tag number.

To extract specific MAPI properties from a PST file, call the [fpGetSubFileMetaData\(\)](#) function, and pass the property tag to `metaNameArray`. The tag is passed as an integer.

For example, the following code extracts the MAPI properties `PR_SUBJECT` and `PR_ALTERNATE_RECIPIENT`:

```
KVGetSubFileMetaArgRec metaArg;
KVSubFileMetaData pMetaData = NULL;
KVMetaNameRec names[2];
KVMetaName pName[2];

names[0].type = KVMetaNameType_Integer;
names[0].name.iname = PR_SUBJECT;

names[1].type = KVMetaNameType_Integer;
names[1].name.iname = 0x3A010102;

pName[0] = &names[0];
pName[1] = &names[1];

KVStructInit(&metaArg);

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pName;
metaArg.index = SubFileIndex;

error = extractInterface->fpGetSubFileMetaData (pFile,&metaArg,&pMetaData);
...
extractInterface->fpFreeStruct(pFile,pMetaData);

pMetaData = NULL;
```

NOTE: You must include the `mapitags.h` and `mapidefs.h` Windows header files, in which `PR_SUBJECT` is defined as `0x0037001E`.

Exclude Metadata from the Extracted Text File

When you extract a mail message, the message text and header information (To, From, Sent, and so on) is also extracted. You can prevent the header information from appearing in the text file.

To exclude the header information, set `extractFlag` to `KVExtractionFlag_ExcludeMailHeader` in the call to [fpExtractSubFile\(\)](#).

Extract Subfiles from Outlook Files

When you extract an Outlook file (MSG) to disk, the message text and header information (To, From, Sent, and so on) is extracted to a text file. (If you do not want the header information to appear in the text file, see [Exclude Metadata from the Extracted Text File, above](#).) If the Outlook file contains a non-mail attachment, the attachment is extracted in its native format to a subdirectory. If the Outlook file contains a mail attachment, the attachment's message text is extracted to a subdirectory.

Extract Subfiles from Outlook Express Files

When you extract an Outlook Express (EML) file to disk, the message text and header information (To, From, Sent, and so on) is extracted to a text file. (If you do not want the header information to appear in the text file, see [Exclude Metadata from the Extracted Text File, on the previous page.](#)) If the Outlook file contains a non-mail attachment, the attachment is extracted in its native format to the same directory as the message text file. If the Outlook file contains a mail attachment, the complete attachment (including message text and attachments), the message text file, and any non-mail attachments are extracted to the same directory as the main message.

NOTE: When the MBX reader (`mbxsr`) is enabled, it is used to filter MBX *and* EML files. If the MBX reader is not enabled, the EML reader (`emlsr`) is used.

Extract Subfiles from Mailbox Files

A Mailbox (MBX) file is a collection of individual emails compiled with RFC 822 and RFC 2045 - 2049 (MIME), and divided by message separators. There are many mail applications that export to an MBX format, such as Eudora Email and Mozilla Thunderbird.

When an MBX file is extracted to disk, the message text and header information (To, From, Sent, and so on) from each mail file is extracted to text files. (If you do not want the header information to appear in the text file, see [Exclude Metadata from the Extracted Text File, on the previous page.](#))

In Eudora MBX files, attachments are inserted as a link and are stored externally from the message. These attachments are not extracted, but the path to the attachment is returned in the call to the [fpGetSubFileInfo\(\)](#) function. You can write code to retrieve the attachment based on the returned path.

For MBX files from other clients, KeyView extracts attachments when they are embedded in the message.

The Mailbox (MBX) reader is an advanced feature and is sold and licensed separately. To enable this reader in a KeyView SDK, you must obtain the appropriate license key from Micro Focus. See [Update License Information, on page 20](#) for information on adding a new license key to an existing installation.

Extract Subfiles from Outlook Personal Folders Files

KeyView can extract Outlook items such as messages, appointments, contacts, tasks, notes, and journal entries from a PST file. When a PST file is extracted to disk, the text and header information (To, From, Sent, and so on) from each Outlook item is extracted to a text file. (If you do not want the header information to appear in the text file, see [Exclude Metadata from the Extracted Text File, on the previous page.](#))

You can also extract messages from PST files as MSG files, including all their attachments, by setting the `KVExtractionFlag_SaveAsMSG` flag in the [KVExtractSubFileArg](#) structure when you call `fpExtractSubFile()`.

If an Outlook item contains a non-mail attachment, the attachment is extracted in its native format to a subdirectory. If an Outlook item contains an Outlook attachment, the attached item's text and any attachments are extracted to a subdirectory.

NOTE: The Microsoft Outlook Personal Folders (PST) reader is an advanced feature and is sold and licensed separately. To enable this reader in a KeyView SDK, you must obtain the appropriate license key from Micro Focus. See [Update License Information, on page 20](#) for information on adding a new license key to an existing installation.

Use the Native or MAPI-based Reader

KeyView accesses PST files in one of two ways:

- indirectly using the Microsoft Messaging Application Programming Interface (MAPI) reader named `pstsr`.
- directly using the native PST reader named `pstnsr`.

On UNIX platforms, the native reader is always used to process PST files because the MAPI-based reader only runs on Windows x86 and x64. On Windows, you can specify either reader; however, the MAPI-based reader is used by default.

The differences between the two readers are summarized in the following table:

Feature/Requirement	Native Reader (pstnsr)	MAPI-based Reader (pstsr)
All platforms supported	Yes	Windows x86 and x64 only
Outlook client required	No	Yes
MAPI properties supported	Yes All properties defined in <code>mapitags.h</code> . Object properties are not supported.	Yes All properties defined in <code>mapitags.h</code> . Object properties are not supported.
Password protection supported	Yes	Yes (using <code>KVCredential</code> structure)
Compressible encryption supported	Yes	Yes
High encryption supported	No	Yes

To use the MAPI-based reader for PST files, change the PST entry in the `formats.ini` file as follows:

```
297=pst
```

To use the native reader for PST files, change the PST entry in the `formats.ini` file as follows:

```
297=pstn
```

NOTE: You must make sure that the PST that you are extracting is not open in the Outlook client, and that the Outlook process is not running.

Use the Native PST Reader (pstnsr)

The native PST reader accesses PST files directly without relying on the Microsoft interface to the PST format. It runs on both Windows and UNIX, and does not require an Outlook client on the system processing the PST files. However, the native reader does not support password-protected PST files that use high encryption.

Use the MAPI Reader (pstsr)

The `pstsr` reader accesses PST files indirectly by using Microsoft's Messaging Application Programming Interface (MAPI). MAPI is a standard Windows message interface that enables different mail programs and other mail-aware applications (such as word processors and spreadsheets) to exchange messages and attachments with each other. MAPI allows KeyView to open a PST file, traverse the folders and Outlook items, and extract the items inside the PST file.

NOTE: When extracting subfiles from PST files, information on the distribution list used in an email is extracted to a file called `emailname.dist`. This applies to the MAPI reader (`pstsr`) only.

System Requirements

Because MAPI is supported on Windows platforms only, you can filter PST files on Windows only. Because MAPI relies on functionality in Microsoft Outlook, a Microsoft Outlook client must be installed on the same machine as the application filtering PST files, and must be the default email application. KeyView supports the following PST formats and Outlook clients:

- Outlook 97 or higher PST files
- Outlook 2002 or later clients

NOTE: The Outlook client must be the same version as, or newer than, the version of Outlook that generated the PST file.

NOTE: The bit edition of Microsoft Outlook must match that of the KeyView software. For example, if 32-bit KeyView is used, 32-bit Outlook must be installed. If 64-bit KeyView is used, 64-bit Outlook must be installed.

If the bit editions do not match, an error message from Microsoft Office Outlook is displayed:

Either there is a no default mail client or the current mail client cannot fulfill the messaging request. Please run Microsoft Outlook and set it as the default mail client.

Additionally, KeyView displays the following return code:

Error 32: `KVError_PSTAccessFailed`.

MAPI Attachment Methods

The way in which you can access the contents of a PST message attachment is determined by the MAPI *attachment method* applied to the attachment. For example, if the attachment is an embedded OLE object, it uses the ATTACH_OLE attachment method. KeyView can access message attachments that use the following attachment methods:

ATTACH_BY_VALUE

ATTACH_EMBEDDED_MSG

ATTACH_OLE

ATTACH_BY_REFERENCE

ATTACH_BY_REF_ONLY

ATTACH_BY_REF_RESOLVE

Attachments using the ATTACH_BY_VALUE, ATTACH_EMBEDDED_MSG, or ATTACH_OLE attachment methods are extracted automatically when the PST file is extracted. An "attach by reference" method means that the attachment is not in Outlook, but Outlook contains an absolute path to the attachment. Before you can extract these types of attachments, you must retrieve the path to access the attachment.

To extract "attach by reference" attachments

1. Determine whether the attachment uses an ATTACH_BY_REFERENCE, ATTACH_BY_REF_ONLY, or ATTACH_BY_REF_RESOLVE method by retrieving the MAPI property PR_ATTACH_METHOD.
2. If the attachment uses one of the "attach by reference" methods, get the fully qualified path to the attachment by retrieving the MAPI properties PR_ATTACH_LONG_PATHNAME or PR_ATTACH_PATHNAME.
3. You can then either copy the files from their original location to the path where the PST file is extracted, or use the Filter API functions to filter the attachment.

Open Secured PST Files

KeyView enables you to specify a user name and password to use to open a secured PST file for extraction.

NOTE: To open password-protected PST files that use high encryption, you must use the MAPI-based PST reader (*pstsr*). The native PST reader (*pstnsr*) returns the error message KVERR_PasswordProtected if a PST is encrypted with high encryption.

Detect PST Files While the Outlook Client is Running

If you are running an Outlook client while running the File Extraction API, the KeyView format detection module (*kwad*) might not be able to open the PST file to determine the file's format because Outlook has

the file locked. In this case, you can do one of the following:

- Close Outlook when using the Extraction API.
- Detect PST files by extension only and bypass the format detection module. To enable this option, add the following lines to the `formats.ini` file:

```
[container_flags]
detectPSTbyExtension=1
```

NOTE: The `detectPSTbyExtension` option applies only when you are using the MAPI reader (`pstsr`).

NOTE: If you use this option, you must make sure in your code that valid PST files are passed to `KeyView`, because the format detection module is not available to verify the file type and pass the file to the appropriate reader.

Extract Subfiles from Lotus Domino XML Language Files

When you extract a Lotus Domino XML Language (.DXL) file, the message text and header information (*To*, *From*, *Sent*, and so on) is extracted to a text file.

NOTE: To prevent header information from being extracted, see [Exclude Metadata from the Extracted Text File, on page 47](#).

You can make sure that dates and times extracted from Lotus Domino .DXL files are displayed in a uniform format.

To extract custom date/time formats

- In the `formats.ini` file, set the `DateTimeFormat` option in the `[dxlsr]` section. For example:

```
[dxlsr]
DateTimeFormat=%m/%d/%Y %I:%M:%S %p
```

In this example, dates and times are extracted in the following format:

02/11/2003 11:36:09 AM

The format arguments are the same as those for the `strftime()` function. See <http://msdn.microsoft.com/en-us/library/fe06s4ak%28VS.71%29.aspx> for more information.

Extract .DXL Files to HTML

You can use the file extraction API to process .DXL files with an XSLT engine. The XSLT engine then transforms the extracted .DXL to .mail HTML files.

To extract .DXL files to HTML

- Set the following options in the `formats.ini` file:

```
[nsfsr]
ExportDXL=1
ExportDXL_PureXML=1

[dxlsr]
LNDParser=2
```

Extract Subfiles from Lotus Notes Database Files

A Lotus Notes database is a single file that contains multiple documents called *notes*. Notes include design notes (such as forms, views, folders, navigators, outlines, pages, framesets, agents, and resources), data document notes, profile document notes, access control list notes, and collection (index) notes. KeyView can extract text items, attachments, and OLE objects from *data document notes* only. Data document notes include emails, journal entries, discussion threads, documents (Microsoft Office and Lotus SmartSuite), and so on.

All components of a note are prefixed by field names such as "SendTo:", "Subject:", and "Body:". When a note is extracted, the field names are not included in the extracted output; only the field values are extracted.

When a mail message in an NSF file is extracted to disk, the body text and header information (such as the values from the `SendTo`, `From`, and `DeliveredDate` fields) in each message is extracted to a text file. (If you do not want the header information to appear in the message text file, see [Exclude Metadata from the Extracted Text File, on page 47](#).)

NOTE: The Lotus Notes Database (NSF) reader is an advanced feature and is sold and licensed separately. To enable this reader in a KeyView SDK, you must obtain the appropriate license key from Micro Focus. See [Update License Information, on page 20](#) for information on adding a new license key to an existing installation.

System Requirements

The NSF format is proprietary. Therefore, KeyView accesses NSF files indirectly by using the Lotus Notes API. Because the NSF reader relies on functionality in Lotus Notes, a Lotus Notes client or Lotus Domino server must be installed and configured on the same machine as the application filtering NSF files. On UNIX and Linux, the Lotus Domino server is required. On Windows, the Lotus Notes client or Lotus Domino server is required.

KeyView supports the following Lotus Notes clients and Domino servers:

- Lotus Notes 6.5.1
- Lotus Domino 6.5.1

KeyView supports NSF files on the same platforms supported by Lotus Notes and Lotus Domino:

- Windows XP x86 (Service Pack 1 and 2)
- Windows 2000 x86 (Service Pack 2)
- Solaris 8.0 and 9.0 (built on Solaris 8.0)
- Red Hat Enterprise Linux AS 3.0 (x86)
- SuSE Linux Enterprise Server 8 and 9 (x86)
- IBM AIX 5.1, 5L version 5.2

Installation and Configuration

Before KeyView can filter NSF files, you must set up the Lotus Notes client or Lotus Domino server. Full configuration is not required. The following steps outline the minimal setup for NSF filtering:

Windows

1. Install the Lotus Notes client or Lotus Domino server. You do not need to configure the client or server.
2. Make sure that the `notes.ini` file is in the proper location.
 - If Lotus Notes is installed, the file should appear in the `install\lotus\notes` directory, where `install` is the installation directory.
 - If only Lotus Domino is installed, the file should appear in the `install\lotus\domino` directory, where `install` is the installation directory.

If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

```
[Notes]
```

3. Add the KeyView `bin` directory and the `install\lotus\notes` or `install\lotus\domino` directory to the `PATH` environment variable (the KeyView `bin` directory must be first in the path). Micro Focus recommends that you add the KeyView `bin` directory because the Lotus Notes or Domino server installation might contain older KeyView OEM libraries.

Solaris

1. Install Lotus Domino server. You do not need to configure the server.
2. Make sure that the `notes.ini` file is in the `install/lotus/notes/latest/sunspa` directory, where `install` is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named `notes.ini`, and add the following text:

```
[Notes]
```

3. Add the `install/lotus/notes/latest/sunspa` directory to the `PATH` environment variable:

```
setenv PATH install/lotus/notes/latest/sunspa:$PATH
```
4. Add the `install/lotus/notes/latest/sunspa` and the KeyView `bin` directory to the `LD_LIBRARY_PATH` environment variable:

```
setenv LD_LIBRARY_PATH keyview_bin:install/lotus/notes/latest/sunspa:$LD_
LIBRARY_PATH
```

where *keyview_bin* is the location of the KeyView bin directory. Micro Focus recommends that you add the KeyView bin directory because the Lotus Notes installation might contain older KeyView OEM libraries.

AIX 5.x

1. Install the *bos.iocp.rte* file set if it is not already installed, and reboot the machine. See the Lotus Domino server documentation for more information.
2. Install Lotus Domino server. You do not need to configure the server.
3. Make sure that the *notes.ini* file is in the *install/lotus/notes/latest/ibmpow* directory, where *install* is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named *notes.ini*, and add the following text:

```
[Notes]
```

4. Add the *install/lotus/notes/latest/ibmpow* directory to the PATH environment variable:

```
setenv PATH install/lotus/notes/latest/ibmpow:$PATH
```

5. Add the *install/lotus/notes/latest/ibmpow* and the KeyView bin directory to the LIBPATH environment variable:

```
setenv LIBPATH keyview_bin:install/lotus/notes/latest/ibmpow:$LIBPATH
```

where *keyview_bin* is the location of the KeyView bin directory. Micro Focus recommends that you add the KeyView bin directory because the Lotus Notes installation might contain older KeyView OEM libraries.

Linux

1. Install Lotus Domino server. You do not need to configure the server.
2. Make sure that the *notes.ini* file is in the *install/lotus/notes/latest/linux* directory, where *install* is the directory where Lotus Notes is installed. If the file does not exist, create an ASCII file named *notes.ini*, and add the following text:

```
[Notes]
```

3. Add the *install/lotus/notes/latest/linux* directory to the PATH environment variable:

```
setenv PATH install/lotus/notes/latest/linux:$PATH
```

4. Add the *install/lotus/notes/latest/linux* and the KeyView bin directory to the LD_LIBRARY_PATH environment variable:

```
setenv LD_LIBRARY_PATH keyview_bin:install/lotus/notes/latest/linux:$LD_
LIBRARY_PATH
```

where *keyview_bin* is the location of the KeyView bin directory. Micro Focus recommends that you add the KeyView bin directory because the Lotus Notes installation might contain older KeyView OEM libraries.

Open Secured NSF Files

KeyView enables you to specify a user ID file and password to use to open a secured NSF file for extraction.

Format Note Subfiles

The KeyView NSF reader uses XML templates to format note subfiles. You can customize the templates to approximate the look and feel of the original notes as closely as possible. For more information, see [Extract and Format Lotus Notes Subfiles, on page 289](#).

Extract Subfiles from PDF Files

KeyView can extract document-level and page-level attachments from a PDF document. Document-level attachments are added by using the **Attach A File** tool, and can include links to or from the parent document or to other file attachments. Page-level attachments are added as comments by using various tools. Page-level or comment attachments display the File Attachment icon or the Speaker icon on the page where they are located.

When a PDF's attachments are extracted to disk, the attachments are saved in their native format.

Improve Performance for PDFs with Many Small Images

To improve performance when processing PDF files that contain many small images, you can choose to ignore images unless they exceed a minimum width and/or height. If an image is smaller than the minimum width or height, KeyView does not extract the image.

For example, to ignore images that are less than 16 pixels wide or less than 16 pixels in height, add the following to the [pdf_flags] section of the `formats.ini` file:

```
[pdf_flags]
process_images_with_min_width=16
process_images_with_min_height=16
```

Extract Embedded OLE Objects

The File Extraction API can extract embedded OLE objects from the following types of documents:

- Lotus Notes (DXL)
- Microsoft Excel
- Microsoft Word
- Microsoft PowerPoint
- Microsoft Outlook

- Microsoft Visio
- Microsoft Project
- OASIS Open Document
- Rich Text Format (RTF)

When an embedded OLE object is extracted from its parent file, the location of the embedded file in the original document is not available. The parent and child are extracted as separate files.

Extract Subfiles from ZIP Files

You can extract ZIP files that are not password-protected by using the general method (see [Extract Subfiles, on page 38](#)). However, some ZIP files use password protection, in which case you must use a different method to enter the required credentials. See [Password Protected Files, on page 370](#) for more information.

Default File Names for Extracted Subfiles

When you do not specify a file name in the call to `fpExtractSubFile()`, in some cases a default file name is applied to the extracted subfile.

Default File Name for Mail Formats

To avoid naming conflicts and problems with long file names, KeyView applies its own names to the extracted mail items when you do not supply a name in the call to `fpExtractSubFile()`. A non-mail attachment retains its original file name and extension.

When the contents of a mail store or the message body of a mail message are extracted, the extracted file names can include the following:

- The first valid eight characters of the original folder name or "Subject" line of the mail message. If the "Subject" line is empty, the characters `kvext` are used, where `ext` is the format's extension. For example, the characters would be `kvmsg` for MSG and `kvnsf` for NSF.

For notes, the file name is derived from the first 24 characters of the note text. For contact entries, the file name is derived from the full name of the contact.

The following special characters are considered invalid and are ignored:

any non-printing character with a value less than `0x1F`

angle brackets (< >)

double quotation marks (")

asterisk (*)

forward slash (/)

back slash (\)

pipe (|)

colon (:)

question mark (?)

- The characters `_kvn`, where *n* is an integer incremented from 0 for each extracted item.
- One of the following extensions:

Type	File Extension
email message	.mail
calendar appointment	.cal
contact entry	.cont
task entry	.task
note	.note
journal entry	.jrn1
distribution list	.dist
posting note	.post

- If the type cannot be determined for an MSG or PST file, the file is given a `.mail` extension.
- If the type cannot be determined for a NSF file, the file is given a `.tmp` extension.
- The format of a MAIL file is plain text by default, but can be set to RTF with the `KVExtractionFlag_GetFormattedBody` flag.

For example, an MSG mail message with the subject line *RE: Product roadmap* that contains the Microsoft Excel attachment `release_schedule.xls` is extracted as:

```
RE produ_kv0.mail  
release_schedule.xls
```

If an extracted message contains an embedded OLE object or any attachment that does not have a name, the object or attachment is extracted as `_kv#.tmp`.

Default File Name for Embedded OLE Objects

KeyView can apply a default name to an extracted embedded OLE object when you do not supply a name in the call to `fpExtractSubFile()`. When an embedded OLE object is extracted, the extracted file name can include the following:

- The characters `subfile_kvn`, where *n* is an integer incremented from 0 for each extracted object.
- If KeyView can determine the embedded OLE is a Microsoft Office document, the original extension is used. If the file type cannot be determined, the file is given a `.tmp` extension.

For example, a Microsoft Word document (`sales_quarterly.doc`) might contain two embedded OLE objects: a Microsoft Excel file called `west_region.xls`, and a bitmap created in the Word document. The embedded objects are extracted as `subfile_kv0.xls` and `subfile_kv1.tmp`.

Chapter 4: Use the Filter API

This section describes how to perform some basic filtering tasks by using the Filter API.

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Generate an Error Log

You can monitor and debug filtering operations by enabling a detailed error log. This enables you to see errors that are generated at run time, and to track problem files in stream or file mode.

NOTE:

Error logs are not generated when in-process filtering is enabled.

The error log might include the following information:

- Generated error codes.
- A time stamp.
- The path and file name of the file in which the error occurred.
- The length of the file in which the error occurred. If the name of the original file or the name of the temporary file are not obtained in stream mode, the file length is reported.

The following is a sample log file:

```
-KV00PE 12 # Time: 11:14:32 # File Len = 68140
-KV00PE 13 # Time: 11:23:05 # H:\files\WP\Word97\fnldmsa.doc
-KV00PE 5 # Time: 12:15:54 # H:\files\SS\XL2000\corporate.xsl
-KV00PE 5 # Time: 12:45:19 # H:\files\WP\WPerf5\wp501.doc
-KV00PE 12 # Time: 14:25:33 # H:\files\PG\PPoint95\95.ppt
-KV00PE 26 # Time: 16:26:04 # File Len = 19117568
-KV00PE 10 # Time: 20:27:40 # File Len = 19117568
```

You can specify the information that is written to the log file by using either the API or environment variables. To configure a log file for a single filtering session, use environment variables. To configure a log file for all filtering sessions, use the API. Configuring the log file by using the API overrides the same settings in the environment variables. You can also specify additional settings in the `formats.ini` file.

You can configure the following features of the log file:

- Enable or disable logging. See [Enable or Disable Error Logging, below](#).
- Change the default path and file name of the log file. See [Change the Path and File Name of the Log File, below](#).
- Include memory errors in the log file. See [Report Memory Errors, on the next page](#).
- Specify a memory guard that is used to generate memory overwrite errors in the log. See [Specify a Memory Guard, on the next page](#).
- Include the input file name in the log file when filtering a stream. See [Report the File Name in Stream Mode, on the next page](#).
- Include extended error codes that provide more detail on a general error (KVERR_General). See [Report Extended Error Codes, on page 62](#).
- Specify the maximum size of the log file. See [Specify the Maximum Size of the Log File, on page 62](#).

Enable or Disable Error Logging

You can enable or disable error logging by using either the API or environment variables. By default, a file called `kvoop.log` is created in the system temporary directory; however, you can change the path and file name of this file (see [Change the Path and File Name of the Log File, below](#)).

Use the API

To enable or disable logging, set the final argument (`dwFlags`) of `fpInit()` or `fpOpenStreamEx2()` to either `KVF_OOPLOGON` or `KVF_OOPLOGOFF`.

Use Environment Variables

To enable logging, add the `KVOOPLOGON` environment variable, and set the variable value to `1`. To disable logging, do not set the `KVOOPLOGON` environment variable.

Change the Path and File Name of the Log File

You can change the default path and file name of the log file. The default is `C:\temp\kvoop.log` on Windows and `/tmp/kvoop.log` on UNIX.

To change the path and file name of the log file, add the following to the `formats.ini` file:

```
[kvooplog]
KvoopLogName=filepath
```

Report Memory Errors

You can report memory leaks and memory overwrites in the log file by enabling the memory trace system, either by using the API or environment variables. If the memory trace system is enabled, the extended error codes for memory leaks and memory overwrites (26 and 27, respectively) are reported in the log file when they are generated. The extended error codes are defined in `KVErrorCodeEx` in `kvtypes.h`.

NOTE:

To report memory overwrites, you must also set a memory guard. See [Specify a Memory Guard, below](#).

Use the API

To enable or disable the memory trace system, set the final argument (`dwFlags`) of `fpInit()` or `fpOpenStreamEx2()` to either `KVF_OOPMEMTRACEON` or `KVF_OOPMEMTRACEOFF`.

Use Environment Variables

To enable the memory trace system, add the `KVOOPMT` environment variable, and set its value to `1`. To disable the memory trace system, do not set the `KVOOPMT` environment variable.

Specify a Memory Guard

To report memory overwrites in the log file, you must set a memory guard that protects against memory overwrites. Normally, this is set in the range of 100-200 bytes. For example, if a memory guard of 100 is set and 20 bytes of memory are specified, a total of 120 bytes of memory are allocated. The additional memory is used to monitor and identify memory overwrites.

To configure the memory guard, add the following section to the `formats.ini` file:

```
[Kvooploug]
mg=100
```

Report the File Name in Stream Mode

When you run Filter in file mode, the file name is always reported in the log file. To report the file name in stream mode, you must extract it through the API.

To add the input file name to the log, call the `fpFilterConfig()` function with the following arguments:

Argument	Parameter
nType	KVFLT_SET00PSRCFILE
nValue	TRUE
pData	<i>input_filename</i>

For example:

```
char    inputfile[250];  
(*fpFilterConfig)(pKVFilter, KVFLT_SET00PSRCFILE, TRUE, input_filename);
```

Report Extended Error Codes

When a general error (KVERR_General) is generated during out-of-process filtering, *extended* error codes can also be generated and reported in the error log. The extended error codes provide more information about the error, and are defined in [KVErrorCodeEx](#) in `kvtypes.h`.

To report extended errors, call the function [fpGetKvErrorCodeEx\(\)](#). Extended error codes are generated in the C sample program, `Filter`.

Specify the Maximum Size of the Log File

You can specify the maximum size of the log file. When this size is reached and new entries are logged, either the first entry in the file is overwritten or the new entries are not reported.

To configure the maximum log size and whether old entries are overwritten, add the following section to the `formats.ini` file:

```
[Kvooplog]  
LogFileSize=10  
OverWriteLog=1
```

Option	Description
LogFileSize	This option specifies the maximum size of the log file in KB. The minimum is 1 K. If you do not specify a size, the default of 2 MB is used.
OverWriteLog	This option determines whether the log file is overwritten when the maximum log file size (LogFileSize) is reached. If you set this option to 1, the first entry in the log file is overwritten. If you set this option to 0, new entries are not reported in the log file.

Extract Metadata

When a file format supports metadata, KeyView can extract and process that information. Metadata includes document information fields such as title, author, creation date, and file size. Depending on the file's format, metadata is referred to in a number of ways: for example, "summary information," "OLE summary information," "file information," and "document properties."

The metadata in mail formats (MSG and EML) and mail stores (PST, NSF, and MBX) is extracted differently than other formats. For information on extracting metadata from these formats, see [Extract Mail Metadata, on page 41](#).

NOTE:

KeyView can only extract metadata from a document if metadata is defined in the document, and if the document reader can extract metadata for the file format. The section [Supported](#)

[Formats, on page 189](#) lists the file formats for which metadata can be extracted. KeyView does not generate metadata automatically from the document contents.

The sample program `filter` demonstrates how to extract metadata. See [Sample Programs, on page 89](#).

Extract Metadata for File Filtering

To extract metadata for file filtering

1. Call [fpFilterFile\(\)](#).
2. Declare a pointer to the [KVSummaryInfoEx](#) structure.
3. Call [fpGetOLESummaryInfoFile\(\)](#) to extract the metadata.
4. Call [fpFreeOLESummaryInfo\(\)](#) to free the memory allocated for metadata extraction.

Extract Metadata for Stream Filtering

To extract metadata for stream filtering

1. Call [fpOpenStream\(\)](#) or [fpOpenStreamEx2\(\)](#) to open a stream.
2. Call [fpFilterStream\(\)](#) to filter the stream.
3. Call [fpCloseStream\(\)](#) to close the input stream.
4. Declare a pointer to the [KVSummaryInfoEx](#) structure.
5. Call [fpGetOLESummaryInfo\(\)](#) to extract the metadata.
6. Call [fpFreeOLESummaryInfo\(\)](#) to free the memory allocated for metadata extraction.

Example

Below is an example of a call to `fpGetOLESummaryInfo()`:

```
{
    KVSummaryInfoEx    si;
    memset( &si, 0, sizeof(si) );
    if ( KVERR_Success != (*pInterface->fpGetOLESummaryInfo)( pKVFilter, pInput, &si
) )
    {
        fprintf( fpOut, "Error obtaining summary information\n" );
        return;
    }
    if ( si.nElem == 0 )
    {
        fprintf( fpOut, "No summary information\n" );
        goto end;
    }
}
```

```

    }
    PrintSummaryInfo(&si, fpOut);
end:
    (*pInterface->fpFreeOLESummaryInfo)( pKVFilter, &si );
}

```

where:

- pKVFilter** A pointer returned from `fpInit()`.
- pInput** A pointer to the developer-assigned instance of [KVInputStream](#). The structure `KVInputStream` defines the input stream that contains the source.
- si** Points to the structure [KVSummaryInfoEx](#). In the structure, `nElem` provides a count of the number of metadata elements, and `pElem` points to the first element of the array of individual elements, as defined by the structure [KVSumInfoElemEx](#).

To interpret the metadata after `fpGetOLESummaryInfo()` is called and returns a non-zero status:

- If `si.nElem` is zero, the document did not contain metadata. If `si.nElem` is not zero, `si.nElem` is the number of metadata elements contained in the array.
- Each `KVSumInfoElemEx` structure contains the following information for each metadata element:

- si.pElem** Specifies whether the data value is present in the document. 1 specifies that the value is valid. For example, if the "Title" element was not populated in the document, `si.pElem[1].isValid == 0` would evaluate to true.
- si.pElem** Specifies the data type of the metadata element. The types are defined in the structure [KVSumInfoType](#) in `kvtypes.h`.
- si.pElem** A pointer to the content of the element.
- [n].data** If type is `KV_Int4` or `KV_Bool`, then data contains the actual value. Otherwise, data is a pointer to the actual value.

 `KV_DateTime` and `KV_IEEE8` point to an 8-byte value.

 `KV_String` and `KV_Unicode` point to the beginning of the string that contains the text. `KV_Unicode` is replaced with `KV_String` when the UNICODE value has been character mapped to the desired output character set, as specified in the call to `fpInit()`.
- si.pElem** The name of the metadata field.
- [n].pcType**

Convert Character Sets

Filter can convert the character set of a document to an arbitrary character set specified in the API, or to the character set of the operating system on which the output text is viewed. For this conversion to occur, a source character set *must* be identified. The source character set can either be determined by the document reader, or can be set in the API. The section [Supported Formats, on page 189](#) lists file

formats for which character set information can be determined by the document reader. The character sets are enumerated in `KVCharSet` of `kvtypes.h`.

Determine the Character Set of the Output Text

To determine the output character set of a filtered document, Filter considers the following:

- Whether the document reader can determine the character set of the file format. If the document reader cannot determine the character set information for the document type, set the source character set in the API.
- Whether the *source* character set is specified in the API.
- Whether the *target* character set is specified in the API.

Guidelines for Character Set Conversion

Below are some rules for the determination of character set mapping:

- If the source is not determined by the document reader or configured in the API, the character set of the output text is always unknown, regardless of the target character set configuration. The document cannot be converted to a target character set or the operating system's code page unless the source character set is known.
- If the target character set is *not* specified in the API, and the source character set is identified, the operating system's code page is used for the output text.
- If the source character set is identified, and the target character set is specified in the API, the target character set specified in the API is used for the output text.
- For documents that contain multiple character sets, Micro Focus recommends that the target character set be forced to UNICODE or UTF-8.

The following table illustrates how Filter determines the character set of the output text.

Determining the Output Character Set—Example

Source charset read by Filter	Source charset specified in API	Target charset specified in API	Output charset
No	No	No	no conversion
No	KVCS_936	No	OS code page
No	No	UNICODE	no conversion
No	KVCS_936	UNICODE	UNICODE
Yes	No	No	OS code page

Determining the Output Character Set—Example, continued

Source charset read by Filter	Source charset specified in API	Target charset specified in API	Output charset
Yes	KVCS_936	No	OS code page
Yes	No	UNICODE	UNICODE
Yes	KVCS_936	UNICODE	UNICODE

Set the Character Set During Filtering

You can convert the character set of a file at the time the file is filtered.

To specify the source character set of a file, after calling `fpInit()`, call `fpSetSrcCharSet()`, and set the `eCharSet` argument to any value in the enumerated list in `KVCharSet` of `kvtypes.h`.

To determine the final output character set, call the `fpGetTrgCharSet()` function after filtering is complete.

To specify the target character set, set the `outputCharSet` argument of `fpInit()` to any value in the enumerated list in `KVCharSet` of `kvtypes.h`.

Not all values of the enumerated list can be used as a target character set. [Coded Character Sets, on page 240](#) lists character sets that can be used as output.

Set the Character Set During Subfile Extraction

You can convert the character set of a subfile at the time the subfile is extracted from the container and before it is filtered. This is most often used to set the character set of a mail message's body text. See [Filter PDF Files, on the next page](#) for more information.

To specify the source character set of a subfile, call the `fpExtractSubFile()` function, and set the `KVExtractSubFileArg->srcCharSet` argument to any value in the enumerated list in `KVCharSet` of `kvtypes.h`.

To specify the target character set of a subfile, call the `fpExtractSubFile()` function, and set the `KVExtractSubFileArg->trgCharSet` argument to any value in the enumerated list in `KVCharSet` of `kvtypes.h`.

Prevent the Default Conversion of a Character Set

You can prevent the default conversion of text to the operating system code page, and specify that Filter retain the original character encoding of the document when it is available. Any document identified as containing more than one character encoding is converted to the first encoding encountered in the file.

To prevent the default conversion, set the flag `KVF_NODEFAULTCHARSETCONVERT` as the last argument of the call to `fpInit()`. This setting overrides the source or target character set specified in the API.

This setting overrides the source or target character set specified in the API.

Extract Deleted Text Marked by Tracked Changes

The revision tracking feature in applications—such as Microsoft Word's **Track Changes**—marks changes to a document (typically, strikethrough for deleted text and underline for inserted text) and tracks each change by reviewer name and date.

If revision tracking was enabled when text was deleted from a source document, you can configure Filter to extract the deleted text. Filter does not extract the reviewer name and revision date.

To extract deleted text from a document and include it in the filtered output

1. Call the `fpInit()` function.
2. Call the `fpFilterConfig()` function with the following arguments:

Argument	Parameter
nType	KVFLT_INCLREVISIONMARK
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_INCLREVISIONMARK, TRUE, NULL);
```

3. Call the `fpFilterFile()` or `fpFilterStream()` function.

Filter PDF Files

Filter has special configuration options that allow greater control over the conversion of Adobe Acrobat PDF files.

Filter PDF Files to a Logical Reading Order

The PDF format is primarily designed for presentation and printing of brochures, magazines, forms, reports, and other materials with complex visual designs. Most PDF files do not contain the *logical structure* of the original document—the correct reading order, for example, and the presence and meaning of significant elements such as headers, footers, columns, tables, and so on.

KeyView can filter a PDF file either by using the file's internal unstructured paragraph flow, or by applying a structure to the paragraphs to reproduce the logical reading order of the visual page. Logical reading order enables KeyView to output PDF files that contain languages that read from right-to-left (such as Hebrew and Arabic) in the correct reading direction.

NOTE:

The algorithm used to reproduce the reading order of a PDF page is based on common page

layouts. The paragraph flow generated for PDFs with unique or complex page designs might not emulate the original reading order exactly.

For example, page design elements such as drop caps, callouts that cross column boundaries, and significant changes in font size might disrupt the logical flow of the output text.

By default, KeyView produces an *unstructured* text stream for PDF files. This means that PDF paragraphs are extracted in the order in which they are stored in the file, not the order in which they appear on the visual page. For example, a three-column article could be output with the headers and title at the end of the output file, and the second column extracted before the first column. Although this output does not represent a logical reading order, it accurately reflects the internal structure of the PDF.

You can configure KeyView to produce a *structured* text stream that flows in a specified direction. This means that PDF paragraphs are extracted in the order (logical reading order) and direction (left-to-right or right-to-left) in which they appear on the page.

The following paragraph direction options are available:

Paragraph Direction Option	Description
Left-to-right	Paragraphs flow logically and read from left to right. You should specify this option when most of your documents are in a language that uses a left-to-right reading order, such as English or German.
Right-to-left	Paragraphs flow logically and read from right to left. You should specify this option when most of your documents are in a language that uses a right-to-left reading order, such as Hebrew or Arabic.
Dynamic	Paragraphs flow logically. The PDF filter determines the paragraph direction for each PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified.

NOTE:

Filtering might be slower when logical reading order is enabled. For optimal speed, use an unstructured paragraph flow.

The paragraph direction options control the direction of paragraphs on a page; they do not control the text direction in a paragraph. For example, a PDF file might contain English paragraphs in three columns that read from left to right, but 80% of the second paragraph might contain Hebrew characters. If the left-to-right logical reading order is enabled, the paragraphs are ordered logically in the output—title paragraph, then paragraph 1, 2, 3, and so on—and flow from the top left of the first column to the bottom right of the third column. However, the *text* direction of the second paragraph is determined independently of the page by the PDF filter, and is output from right to left.

NOTE:

Extraction of metadata is not affected by the paragraph direction setting. The characters and words in metadata fields are extracted in the correct reading direction regardless of whether logical reading order is enabled.

Enable Logical Reading Order

You can enable logical reading order by using either the API or the `formats.ini` file. Setting the paragraph direction in the API overrides the setting in the `formats.ini` file.

Use the C API

To enable PDF logical reading order in the C API, call the `fpFilterConfig()` function with the following arguments:

Argument	Parameter
nType	KVFLT_LOGICALPDF
nValue	<p>Set to one of the following flags which are defined in <code>kvtypes.h</code> (see LPDF_DIRECTION, on page 187):</p> <ul style="list-style-type: none">• LPDF_LTR. Logical reading order and left-to-right paragraph direction.• LPDF_RTL. Logical reading order and right-to-left paragraph direction.• LPDF_AUTO. Logical reading order. The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified.• LPDF_RAW. Unstructured paragraph flow. This is the default behavior. If logical reading order is enabled, and you want to return to an unstructured paragraph flow, set this flag.
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_LOGICALPDF, LPDF_LTR, NULL);
```

Use the formats.ini File

To enable logical reading order by using the formats.ini file

1. Change the PDF reader entry in the `[Formats]` section of the `formats.ini` file as follows:

```
[Formats]  
200=1pdf
```

2. Optionally, add the following section to the end of the `formats.ini` file:

```
[pdf_flags]  
pdf_direction=paragraph_direction
```

where *paragraph_direction* is one of the following:

Flag	Description
LPDF_ LTR	Left-to-right paragraph direction.
LPDF_ RTL	Right-to-left paragraph direction.
LPDF_ AUTO	The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. Filter uses this option when a paragraph direction is not specified.
LPDF_ RAW	Unstructured paragraph flow. This is the default behavior. If logical reading order is enabled, and you want to return to an unstructured paragraph flow, set this flag.

Rotated Text

When a PDF that contains rotated text is filtered, the rotated text is extracted after the text at the end of the PDF page on which the rotated text appears. If the PDF is filtered with logical order enabled, and the amount of rotated text on a page surpasses a predefined threshold, the page is automatically output as an unstructured text stream. You cannot configure this threshold.

Extract Custom Metadata from PDF Files

You can extract custom metadata from PDF files either by specifying individual metadata tag names, or by extracting all custom metadata at once.

Extract Custom Metadata by Tag

To extract custom metadata by metadata tag, add the custom metadata names to the `pdfsr.ini` file provided, and copy the modified file to the `bin` directory. You can then extract metadata as you normally would.

The `pdfsr.ini` is in the directory `samples\pdfini`, and has the following structure:

```
<META>
<TOTAL>total_item_number</TOTAL>,
/metadata_tag_name datatype,
</META>
```

Parameter	Description
<i>total_item_number</i>	The total number of metadata tags that are listed.
<i>metadata_tag_name</i>	The metadata tag name used in the PDF files.
<i>datatype</i>	The data type of the metadata field. Data types are defined in KVSumInfoType .

For example:

```
<META>
<TOTAL>4</TOTAL>
/part_number      INT4
/volume           INT4
/purchase_date    DATETIME
/customer         STRING
</META>
```

Extract All Custom Metadata

You can extract all metadata through the API.

To extract all metadata by using the API

- 1. Call the `fpInit()` function.
- 2. Call the `fpFilterConfig()` function with the following arguments:

Argument	Parameter
nType	KVFLT_EXPORTALLMETADATA
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_EXPORTALLMETADATA, TRUE, NULL);
```

- 3. Call the `fpGetOLESummaryInfo()` or `fpGetOLESummaryInfoFile()` function.

Filter Tagged PDF Content

A tagged PDF contains an additional layer of text for visually impaired readers. This text is used in text-to-speech features in various PDF viewing programs. You can enable filtering of tagged PDF text in the API.

Filtering the extra layer of tagged content might result in duplicate text in the output. This is the expected behavior.

To filter tagged PDF content

- 1. Call the `fpInit()` function.
- 2. Call the `fpFilterConfig()` function with the following arguments:

Argument	Parameter
nType	KVFLT_EXPORTTAGGEDCONTENT
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_EXPORTTAGGEDCONTENT, TRUE, NULL);
```

Skip Embedded Fonts

Text in PDF files sometimes contains embedded fonts. If you experience difficulties filtering embedded fonts, there are options in the API, the `formats.ini` file, and the filter sample program that enable you to skip this type of text.

NOTE:

If you skip embedded fonts, none of the content that contains embedded fonts is included in the output.

Use the `formats.ini` File

When you use `formats.ini` to skip embedded fonts, you can also specify an *embedded font threshold*, which is an arbitrary percentage probability that the glyph in the embedded text maps to a character value in the output character set (ASCII, UTF-8, and so on).

For example, if you specify a threshold of 75, embedded text glyphs that have a 75% or greater probability of correctly matching the character in the output character set are included in the output; glyphs that have a probability of less than 75% of matching the output character set are omitted from the output.

To skip embedded fonts by using the `formats.ini` file

- Set the following parameters:

```
[pdf_flags]
skipembeddedfont=TRUE
embedded_font_threshold=threshold
```

where *threshold* is a value between 0 and 100. A threshold of 100 skips all embedded font text; a threshold of 0 retains all embedded font text. Set `skipembeddedfont` to `TRUE` to enable the `embedded_font_threshold` parameter.

The default value of `embedded_font_threshold` is 100. if you set `skipembeddedfont` to `TRUE` and do not specify the `embedded_font_threshold` parameter, Filter skips all embedded text.

Use the C API

To skip embedded fonts by using the C API, call the [fpFilterConfig\(\)](#) function with the following arguments:

Argument	Parameter
nType	KVFLT_SKIPEMBEDDEDFONT
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SKIPEMBEDDEDFONT, TRUE, NULL);
```

Control Hyphenation

There are two types of hyphens in a PDF document:

- A *soft hyphen* is added to a word by a word processor to divide the word across two lines. This is a discretionary hyphen and is used to ensure proper text flow in justified text.
- A *hard hyphen* is intentionally added to a word regardless of the word's position in the text flow. It is required by the rules of grammar or word usage. For example, compound words (such as *three-week vacation* and *self-confident*) contain hard hyphens.

By default, KeyView skips the source document's soft hyphens in the Filter output to provide more searchable text content. However, if you want to maintain the document layout, you can keep soft hyphens in the Filter output. To keep soft hyphens, you must enable the soft hyphen flag in `formats.ini` or in the API.

Use the formats.ini File

To keep soft hyphens by using the `formats.ini` file, set the following parameter:

```
[pdf_flags]  
keepsofthyphen=TRUE
```

Use the C API

To keep soft hyphens by using the C API, call the [fpFilterConfig\(\)](#) function with the following arguments:

Argument	Parameter
nType	KVFLT_KEEPSOFTHYPHEN

Argument	Parameter
nValue	TRUE
pData	NULL

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_KEEPSOFTHYPHEN, TRUE, NULL);
```

Filter Spreadsheet Files

Filter has special configuration options that enable greater control over the conversion of spreadsheet files.

Filter Worksheet Names

Normally, Filter does not extract worksheet names from a spreadsheet because it is assumed that the text should not be exposed. To extract worksheet names, add the following lines to the `formats.ini` file:

```
[Options]
getsheetnames=1
```

Filter Hidden Text in Microsoft Excel Files

Normally, Filter does not filter hidden text from a Microsoft Excel spreadsheet because it is assumed that the text should not be exposed. To extract text from hidden rows, columns, and sheets from Excel spreadsheets, add the following lines to the `formats.ini` file:

```
[Options]
gethiddeninfo=1
```

NOTE:

You can also set an API flag to filter text from hidden sheets. See [Hidden Data in Microsoft Excel Documents, on page 84](#) for more information.

Specify Date and Time Format on UNIX Systems

In Microsoft Excel you can choose to format dates and times according to the system locale. On Windows, KeyView uses the system locale settings to determine how these dates and times should be formatted. In other operating systems, KeyView uses the U.S. short date format (*mm/dd/yyyy*). You can change this by specifying the formats you wish to use in the `formats.ini` file.

To specify the system date and time format on UNIX systems

- In the `formats.ini` file, specify the following options:
 - `SysDateTime`. The format to use when a cell is formatted using the system format including both the date and the time.
 - `SysLongDate`. The format to use when a cell is formatted using the system long date format.
 - `SysShortDate`. The format to use when a cell is formatted using the system short date format.
 - `SysTime`. The format to use when a cell is formatted using the system time format.

NOTE:

These values cannot contain spaces.

For example, if you specify `SysDateTime=%d/%m/%Y`, dates and times are extracted in the following format:

`28/02/2008`

The format arguments are the same as those for the `strftime()` function.

See <http://linux.die.net/man/3/strftime> for more information.

Filter Very Large Numbers in Spreadsheet Cells to Precision Numbers

By default, numbers are extracted in the format specified by the Excel file (for example, *General*, *Currency* and *Date*). Spreadsheets might contain cells that have very large numbers in them. Excel displays the numbers in a scientific notation that rounds or truncates the numbers.

To extract numbers without formatting, add the following options in the `formats.ini` file:

```
[Options]
ignoredefnumformats=1
```

Extract Microsoft Excel Formulas

Normally, the actual value of a formula is extracted from an Excel spreadsheet; the formula from which the value is derived is not included in the output. However, KeyView enables you to include the value as well as the formula in the output. For example, if Filter is configured to extract the formula and the formula value, the output might look like this:

`245 = SUM(B21:B26)`

The calculated value from the cell is 245 and the formula from which the value is derived is `SUM(B21:B26)`.

NOTE:

Depending on the complexity of the formulas, enabling formula extraction might result in slightly slower performance.

To set the extraction option for formulas

- Add the following lines to the `formats.ini` file:

```
[Options]
getformulastring=option
```

where *option* is one of the following:

Option	Description
0	Extract the formula value only. This is the default. If formula extraction is enabled, and you want to return to the default, set this option.
1	Extract the formula only.
2	Extract the formula and the formula value.

NOTE:

You can also set an API flag to filter formulas and formula values. See [Hidden Data in Microsoft Excel Documents, on page 84](#) for more information.

If a function in a formula is not supported or is invalid, and option 1 or 2 is specified, only the calculated value is extracted. See [Supported Microsoft Excel Functions, below](#) for a list of supported functions.

When formula extraction is enabled, Filter can extract Microsoft Excel formulas that contain the functions listed in the following table.

Supported Microsoft Excel Functions

=ABS()	=ACOS()	=AND()	=AREAS()
=ASIN()	=ATAN2()	=ATAN2()	=AVERAGE()
=CELL()	=CHAR()	=CHOOSE()	=CLEAN()
=CODE()	=COLUMN()	=COLUMNS()	=CONCATENATE()
=COS()	=COUNT()	=COUNTA()	=DATE()
=DATEVALUE()	=DAVERAGE()	=DAY()	=DCOUNT()
=DDB()	=DMAX()	=DMIN()	=DOLLAR()
=DSTDEV()	=DSUM()	=DVAR()	=EXACT()
=EXP()	=FACT()	=FALSE()	=FIND()
=FIXED()	=FV()	=GROWTH()	=HLOOKUP()
=HOUR()	=ISBLANK()	=IF()	=INDEX()
=INDIRECT()	=INT()	=IPMT()	=IRR()

=ISERR()	=ISERROR()	=ISNA()	=ISNUMBER()
=ISREF()	=ISTEXT()	=LEFT()	=LEN()
=LINEST()	=LN()	=LOG()	=LOG10()
=LOGEST()	=LOOKUP()	=LOWER()	=MATCH()
=MAX()	=MDTERM()	=MID()	=MIN()
=MINUTE()	=MINVERSE()	=MIRR()	=MMULT()
=MOD()	=MONTH()	=N()	=NA()
=NOT()	=NOW()	=NPER()	=NPV()
=OFFSET()	=OR()	=PI()	=PMT()
=PPMT()	=PRODUCT()	=PROPER()	=PV()
=RATE()	=REPLACE()	=REPT()	=RIGHT()
=ROUND()	=ROUND()	=ROW()	=ROWS()
=SEARCH()	=SECOND()	=SIGN()	=SIN()
=SLN()	=SQRT()	=STDEV()	=SUBSTITUTE()
=SUM()	=SYD()	=T()	=TAN()
=TEXT()	=TIME()	=TIMEVALUE()	=TODAY()
=TRANSPOSE()	=TREND()	=TRIM()	=TRUE()
=TYPE()	=UPPER()	=VALUE()	=VAR()
=VLOOKUP()	=WEEKDAY()	=YEAR()	

Standardize Cell Formats

This options enables the standardization of cell formats within Microsoft Excel files. KeyView formats any cell where a number has been entered according to the following rules.

Numbers

These include:

- rounded numbers
- exponentials
- fractions
- percentages

Numbers are printed to the maximum length entered—that is, the full number put into the cell, without any rounding. Negative numbers are printed with a dash in front of them (as opposed to, for example, bracket form).

Text

All text that is part of the format string is stripped, including currency symbols.

Dates

All dates are printed in full ISO-8601 format (that is YYYY-MM-DDTHH:MM:SS). There are two exceptions to this rule:

- Cases where the date format contains a time delta (that is, "[h]", "[m]", or "[s]"). In this case, the time is displayed as an interval, which is the number of days (where a day is defined as a period of 24 hours). The time is printed in the ISO-8601 time interval form, for example P1.234D.
- Cases where the absolute value of the cell is less than 1.0, and the date format contains only time components. In Excel, values between 0.0 and 1.0 correspond to the fictional date 1900-01-00, and are used to express times without an associated date. For example:

Value	Date format	KeyView output
0.5	hh:mm:ss	12:00:00
0.5	dd hh	1900-01-00 12:00:00
1.5	hh:mm:ss	1900-01-01 12:00:00
1.5	dd hh	1900-01-01 12:00:00

You can enable this option by adding the following to the `formats.ini` file:

```
[Options]
StandardizeCellFormats=TRUE
```

Alternatively, you can enable this option programmatically by passing `KVFLT_STANDARDIZECELLFORMATS` to `fpFilterConfig`.

Filter XML Files

Filter enables you to extract all or selected content from source XML files. You can specify the elements and attributes to extract from a document by using either the API or an INI file (see [Configure Element Extraction for XML Documents, on the next page](#)). Filter detects the following XML formats:

- generic XML
- Microsoft Office 2003 XML (Word, Excel, and Visio)
- StarOffice/OpenOffice XML (text document, presentation, and spreadsheet)

See [File Format Detection, on page 302](#) for more information on format detection.

Configure Element Extraction for XML Documents

When filtering XML files, you can specify which elements and attributes are extracted according to the file's format ID or *root element*. This is useful when you want to extract only relevant text elements, such as abstracts from reports, or a list of authors from an anthology.

A root element is an element in which all other elements are contained. In the following XML sample, `book` is the root element:

```
<book>
  <title>XML Introduction</title>
  <product id="33-657" status="draft">XML Tutorial</product>
  <chapter>Introduction to XML
    <para>What is HTML</para>
    <para>What is XML</para>
  </chapter>
  <chapter>XML Syntax
    <para>Elements must have a closing tag</para>
    <para>Elements must be properly nested</para>
  </chapter>
</book>
```

For example, you could specify that when filtering files with the root element `book`, the element `title` is extracted as metadata, and only `product` elements with a `status` attribute value of `draft` are extracted. When you extract an element, the child elements within the element are also extracted. For example, if you extract the element `chapter` from the previous sample, the child element `para` is also extracted.

Filter defines default element extraction settings for the following XML formats:

- generic XML
- Microsoft Office 2003 XML (Word, Excel, and Visio)
- StarOffice/OpenOffice XML (text document, presentation, and spreadsheet)

These settings are defined internally and are used when filtering these file formats; however, you can modify their values.

In addition to the default extraction settings, you can also add custom settings for your own XML document types. If you do not define custom settings for your own XML document types, the settings for the generic XML are used.

Modify Element Extraction Settings

You can modify configuration settings for XML documents through either the API or the `kvxconfig.ini` file.

Use the C API

You can use the C API to modify the settings for the standard XML document types or add configuration settings for your own XML document types.

To modify settings

1. Call the [fpInit\(\)](#) function.
2. Define the [KVXConfigInfo](#) structure.
3. Call the [fpFilterConfig\(\)](#) function with the following arguments:

Argument	Parameter
nType	KVFLT_SETXMLCONFIGINFO
nValue	0
pData	the address of the KVXConfigInfo structure

For example:

```
KVXConfigInfo xinfo; /* populate xinfo */  
  
(*fpFilterConfig)(pKVFilter, KVFLT_SETXMLCONFIGINFO, 0, &xinfo);
```

4. Repeat step 2 and step 3 until the settings for all the XML document types that you want to customize are defined.
5. Call the [fpFilterFile\(\)](#) function.

Use an Initialization File

You can use the initialization file to modify the settings for the standard XML document types or add configuration settings for your own XML document types.

To modify settings

1. Modify the `kvxconfig.ini` file.
2. Use the initialization file when processing the XML file. See [Modify Element Extraction Settings in the kvxconfig.ini File, below](#).

The C sample program (`filter`) demonstrates how to use the initialization file in the filtering process. See [Sample Programs, on page 89](#).

Modify Element Extraction Settings in the kvxconfig.ini File

The `kvxconfig.ini` file contains default element extraction settings for supported XML formats. The file is in the directory `install\OS\bin`, where `install` is the path name of the Filter installation directory and `OS` is the name of the operating system. For example, the following entry defines extraction settings for the Microsoft Visio 2003 XML format:

```
[config3]  
eKVFormat=MS_Visio_XML_Fmt  
szRoot=  
szInMetaElement=DocumentProperties  
szExMetaElement=PreviewPicture  
szInContentElement=Text
```



```
szExContentElement=
szInAttribute=
```

The following options are available:

Configuration Option	Description
eKVFormat	<p>The format ID as detected by the KeyView detection module. This determines the file type to which these extraction settings apply. See File Format Detection, on page 302 for more information on format ID values.</p> <p>If you are adding configuration settings for a custom XML document type, this option is not defined.</p>
szRoot	<p>The file's root element. When the format ID is not defined, the root element is used to determine the file type to which these settings apply.</p> <p>To further qualify the element, specify its namespace. See Specify an Element's Namespace and Attribute, on the next page.</p>
szInMetaElement	<p>The elements extracted from the file as metadata. All other elements are extracted as text.</p> <p>Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on the next page.</p>
szExMetaElement	<p>The child elements in the included metadata elements that are not extracted from the file as metadata. For example, the default extraction settings for the Visio XML format extract the <code>DocumentProperties</code> element as metadata. This element includes child elements such as <code>Title</code>, <code>Subject</code>, <code>Author</code>, <code>Description</code>, and so on. However, the child element <code>PreviewPicture</code> is defined in <code>szExMetaElement</code> because it is binary data and should not be extracted.</p> <p>You cannot exclude any metadata elements from the output for StarOffice files. All metadata is extracted regardless of this setting.</p> <p>Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on the next page.</p>
szInContentElement	<p>The elements extracted from the file as content text. Enter an asterisk (*) to extract all elements including child elements.</p> <p>Separate multiple entries with commas. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on the next page.</p>
szExContentElement	<p>The child elements in the included content elements that are not extracted from the file as content text.</p> <p>Separate multiple entries with commas. To further qualify the element,</p>

Configuration Option	Description
	specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute , below.
szInAttribute	<p>The attribute values extracted from the file. If attributes are not defined here, attribute values are not extracted.</p> <p>Enter the namespace (if used), element name, and attribute name in the following format:</p> <p><i>namespace:elementname@attributename</i></p> <p>For example:</p> <p>keyview:division@name</p> <p>Separate multiple entries with commas.</p>

Specify an Element's Namespace and Attribute

To further qualify an element, you can specify that the element must exist in a certain namespace, must contain a specific attribute, or both. To define the namespace *and* attribute of an element, enter the following:

ns_prefix:elemname@attribname=attribvalue

NOTE:

Attribute values that contain spaces must be enclosed in quotation marks.

For example, the entry `bg:language@id=xml` extracts a `language` element in the namespace `bg` that contains the attribute name `id` with the value of `"xml"`. This entry extracts the following element from an XML file:

```
<bg:language id="xml">XML is a simple, flexible text format derived from  
SGML</bg:language>
```

but does not extract:

```
<bg:language id="sgml">SGML is a system for defining markup  
languages.</bg:language>
```

or

```
<adv:language id="xml">The namespace should be a Uniform Resource Identifier  
(URI).</adv:language>
```

Add Configuration Settings for Custom XML Document Types

You can define element extraction settings for custom XML document types by adding the settings to the `kvxconfig.ini` file. For example, for files that contain the root element `keyviewxml`, you could add the following section to the end of the initialization file:

```
[config101]
eKVFormat=
szRoot=keyviewxml
szInMetaElement=dc:title,dc:meta@title,dc:meta@name=title
szExMetaElement=

szInContentElement=keyview:division@name=dev,keyview:division@name=export,p@style="
Heading 1"
szExContentElement=
szInAttribute=keyview:division@name
```

The custom extraction settings must be preceded by a section heading named `[configN]`, where *N* is an integer starting at 100 and increasing by 1 for each additional file type, for example `[config100]`, `[config101]`, `[config102]`, and so on. The default extraction settings for the supported XML formats are numbered `config0` to `config99`. Currently only 0 to 6 are used.

Because a custom XML document type is not recognized by the KeyView detection module, the format ID is not defined. The file type is identified by the file's root element only.

If a custom XML document type is not defined in the `kvxconfig.ini` file or by the `fpFilterConfig()` function, the default extraction settings for a generic XML document are used.

Configure Headers and Footers

You can configure custom header and footer tags for word processing and spreadsheet documents by editing the `formats.ini` file.

To configure headers and footers

1. Open the `formats.ini` file.
2. In the `[Options]` section, add the following items:

```
header_start_tag=HeaderStart
header_end_tag=HeaderEnd
footer_start_tag=FooterStart
footer_end_tag=FooterEnd
```

For example:

```
header_start_tag=<myHeaderTag>
header_end_tag=</myHeaderTag>
footer_start_tag=<myFooterTag>
footer_end_tag=</myFooterTag>
```

NOTE:

You must encode custom tags in UTF-8.

Filter Hidden Data

Some documents contain hidden information, which is not filtered by default. Depending on the type of hidden data that you want to filter and the type of document that you are filtering, you can either use the API or set parameters in the `formats.ini` file.

Hidden Data in Microsoft Excel Documents

There are several types of hidden data in Microsoft Excel documents, each of which has a corresponding flag in the `KV_CONFIG_Arg` structure, which you can toggle to determine whether the hidden data is shown.

The following table lists each data type, its default behavior, and its corresponding configuration API flag.

Hidden data settings

Hidden Data Type	Default Behavior	KV_CONFIG_Arg flag
Hidden sheets	Not output	KV_SS_SHOWHIDDENINFOR
Formulas	Calculated value	KV_SS_SHOWFORMULA
Values and formulas	Calculated value	KV_SS_SHOWVALUESANDFORMULAS

To toggle the display of any type of hidden data

1. Define the configurable argument variable to use in the `KV_CONFIG_Arg` structure. For example:

```
KV_CONFIG_Arg setArg = {0}
```

2. Set the `KV_ALL_OVERWRITECONFIGFILE` flag to overwrite the configuration file settings. For example:

```
setArg.keyID = KV_ALLFLAGS;  
setArg.keyType = KV_INT32ARG;  
setArg.keyData.intArg = KV_ALL_OVERWRITECONFIGFILE;
```

NOTE:

To re-enable configuration file settings later, set `!KV_ALL_OVERWRITECONFIGFILE`.

3. Assign values to the members of the variable. For example:

```
setArg.keyID = KV_SSFLAGS;  
setArg.keyType = KV_INT32ARG;  
setArg.keyData.intArg = KV_SS_SHOWHIDDENINFOR;
```

4. Call `fpFilterConfig()` with the following arguments to set the variable:

Argument	Parameter
nType	KVFLT_SetConfigurableArguments
nValue	TRUE
pData	The variable defined in step 1.

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg)
```

Example

The following example overwrites the configuration file settings and enables filtering of formulas.

```
KV_CONFIG_Arg setArg = {0};
```

```
setArg.keyID = KV_ALLFLAGS;  
setArg.keyType = KV_INT32ARG;  
setArg.keyData.intArg = KV_ALL_OVERWRITECONFIGFILE;
```

```
fpKV_FilterConfig(pFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg);
```

```
setArg.keyID = KV_SSFLAGS;  
setArg.keyType = KV_INT32ARG;  
setArg.keyData.intArg = KV_SS_SHOWFORMULAS;
```

```
fpKV_FilterConfig(pFilter, KVFLT_SetConfigurableArguments, TRUE, &setArg);
```

Toggle Hidden Excel Data Settings in the formats.ini File

You can control Microsoft Excel hidden data settings through parameters in the `formats.ini` file.

To toggle hidden Excel data settings in the formats.ini file

1. Open the `formats.ini` file in a text editor.
2. Under `[Options]`, set one or both of the following parameters.
 - To filter text from hidden sheets, set `gethiddeninfo` to 1. See [Filter Hidden Text in Microsoft Excel Files, on page 74](#) for more information.
 - To filter formulas and formula values, set `getformulastring` to the appropriate value. See [Extract Microsoft Excel Formulas, on page 75](#) for more information.

Hidden Data in HTML Documents

KeyView can filter comments from HTML documents. To enable comment filtering, you must set a flag in the `formats.ini` file.

To enable filtering of comments from HTML files

1. Open the `formats.ini` file in a text editor.
2. Under `[Options]`, set the following flag.

```
GetHTMLHiddenInfo=1
```

Tab Delimited Output for Embedded Tables

You can use KeyView to convert embedded tables in Word Processing documents (for example, Microsoft Word) to tab-delimited form, by specifying the following option in the `formats.ini` file:

```
[Options]  
TabDelimitedOutput=TRUE
```

This option inserts a tab character between each cell, and a line break between each row. Tab and line break characters in the cells are replaced with spaces.

Table Detection for PDF Files

PDF files often contain data presented in a tabular form. However, there is no information about the table stored within the PDF itself – the text is simply placed in an arrangement that looks like a table to the human eye. When this data is filtered, it can be very difficult to reconstruct the table.

If table detection is enabled, KeyView attempts to recognize tables within PDF pages, and to reconstruct them before they are output. For each page of the document, KeyView outputs the contents of each table first, and then outputs all remaining text on the page.

Micro Focus recommends that tab delimited output is also enabled when using table detection. This means that any tables detected appear in the output text in tab delimited format.

To enable table detection and tab delimited output, specify the following in the `formats.ini` file:

```
[Options]  
TableDetection=TRUE  
TabDelimited=TRUE
```

Alternatively, you can enable these options programmatically by setting `KVFLT_TABLEDETECTION` and `KVFLT_TABDELIMITED` to `true` in `fpFilterConfig()`.

NOTE:

Table detection is only available with the `pdf2sr` reader. To enable this reader, set the following configuration parameter:

```
[Formats]  
200=pdf2
```

Exclude Japanese Guide Text

This option prevents output of Japanese phonetic guide text when Microsoft Excel (.xlsx) files are processed.

To prevent output of Japanese phonetic guide text

- Set NoPhoneticGuides to TRUE in the formats.ini file:

```
[Options]
NoPhoneticGuides=TRUE
```

You can also enable this option programatically when filtering by passing KVFLT_NOPHONETICGUIDES to fpFilterConfig.

Source Code Identification

When KeyView auto-detects a file that contains source code, it can attempt to identify the programming language that it is written in.

NOTE:
Source code identification is a new, experimental feature in KeyView 12.0.

You can set source code identification to different levels.

Option	Description
KVSOURCECODE_OFF	Do not enable source code identification.
KVSOURCECODE_ENABLED	Enable source code identification for the most common source code formats.
KVSOURCECODE_EXTENDED	Enable source code identification for all supported source code formats. This option might lead to false positives in some cases (for example, a C++ file might get identified as a rarer format).

For the complete list of source code formats supported for both options, see [File Format and Extension Table, on page 245](#).

You can enable source code identification by setting the appropriate level in the formats.ini file. For example:

```
[Options]
SourceCodeDetection=KVSOURCECODE_ENABLED
```

You can also enable this option by passing KVFLT_SOURCECODEIDENTIFICATION to the fpFilterConfig() function. For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SOURCECODEDETECTION, KVSOURCECODE_ENABLED,  
NULL);
```

Setting the option through `fpFilterConfig` overrides any settings in `formats.ini`.

For more information, see [fpFilterConfig\(\)](#), on page 129.

Chapter 5: Sample Programs

This section describes the sample programs provided with Filter SDK.

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• tstxtract	89
• filter	91

Introduction

The C sample programs demonstrate how to use the C implementation of the Filter API. The sample code is intended to provide a starting point for your own applications or to be used for reference purposes.

The following C sample programs are provided:

- [tstxtract](#)
- [filter](#)

The source code and makefile (*program_name_platform.mak*) for the programs are in the directory *install*\KeyviewFilterSDK\samples\program_name, where *install* is the path name of the Filter installation directory, and *program_name* is the name of the sample program.

The executable for the programs is in the directory *install*\KeyviewFilterSDK\OS\bin, where *OS* is the name of the operating system.

To compile the sample programs, use the makefile provided for the appropriate platform. Make sure that the Filter *include* directory is specified in the include path of the project. After the executable is compiled and built, you must place it in the same directory as the Filter libraries.

tstxtract

The *tstxtract* sample program demonstrates the File Extraction API. It opens a file, extracts subfiles from the file, and repeats the extraction process until all subfiles are extracted. It also demonstrates how to extract the default set of metadata and pass integer or string names to extract specific metadata. After the files are extracted, you can filter the files by using the *filter* sample program. The *filter* sample program demonstrates the functionality of the Filter API.

The source code for the *tstxtract* sample program is the same for the Filter and Export SDKs. A flag in the makefile specifies whether the program is compiled for Filter, HTML Export, or XML Export.

To run *tstxtract*, type the following at the command line:

```
tstxtract [options] input_file output_directory bin_directory
```

where:

- *options* is one or more of the following:

Option	Description
-c charset	Specify the target character set, for example KVCS_SJIS. See Coded Character Sets, on page 240 for a full list of supported character sets.
-cf keyfile1, keyfile2,...	Specify one or more credential files (private keys) to use to decrypt encrypted .EML, .MBX, .PST, or .MSG files.
-l logfile	Specify the path and file name of the log file in which metadata is written.
-lm	Retrieve metadata and write the data to the log file.
-lms metaname1, metaname2,...	Retrieve metadata with string metanames and write the data to the log file for .MSG, .EML, .MBX, and .NSF files.
-lmi metaint1, metaint2,...	Retrieve metadata with integer (hexadecimal) metanames and write the data to the log file for .PST files.
-lma	Retrieve all metadata from an .NSF file and write the data to the log file.
-to <value in seconds>	Specify the timeout value in seconds. This timeout allows for large files that take longer than the default 7 minute timeout.
-i	Run the file extraction in-process.
-r	<p>Recursively extract second-level subfiles to the specified output directory. For example, if a .ZIP file contains a Microsoft Word file and the Word file contains an embedded Microsoft Excel file, set the -r option to extract both the Word and Excel files.</p> <p>If this option is not set, only first-level subfiles are extracted. In this case, only the Word file would be extracted.</p>
-msg	Extract mail messages in a .PST file as an .MSG file, including all of its attachments. If this flag is not set, the mail message is extracted as text. This applies to PST files on Windows only.
-f	Extract the formatted version of the message body (HTML or RTF) from mail files when possible. If neither an HTML nor RTF version of the message body exists in the mail file, it is extracted as plain text. If you do not set this flag, the message body is extracted as plain text when possible.
-e	Run the file extraction in stream mode.
-p password1, password2,...	Specify one or more passwords to open the input or credential file or files.
-t	Preserve the timestamp of embedded files when possible.
-h	Extract hidden text.

- *input_file* is the full path and file name of the source document.
- *output_directory* is the directory to which the files are extracted.
- *bin_directory* is the path to the Filter `bin` directory. This is required if you do **not** run the program from the `install\Filter SDK\bin` directory.

filter

The `filter` sample program demonstrates the advanced functionality of the Filter API. It is composed of the following files:

- `filter.c`—command line interface
- `filtersupport.c`—contains core functionality, such as file filtering, stream filtering, metadata extraction, and format detection.
- `filtersupport.h`—structure and variable definitions

To run `filter`, type the following at the command line:

```
filter [options] input_file output_file
```

where:

options is one or more of the options listed in [Options for the Filter Sample Program](#), below.

input_file is the full path and file name of the source document.

output_file is the full path and file name of the output file.

Options for the Filter Sample Program

Option	Description
-i	Extract metadata. See Extract Metadata, on page 62 .
-c	Run Filter in the same process as the calling application (in process). See Run Filter In Process, on page 31 .
-e	Run Filter in stream mode. See Filtering in Stream Mode, on page 28 .
-h	Extract headers and footers, as well as the body text. See fpInit(), on page 147 .
-d	Extract the file format information using the fpGetDocInfoFile() function.
-mt	Enable the memory trace system in error logs. The memory trace system reports memory leaks and memory overwrites in the log file. See Report Memory Errors, on page 61 . Error logs are not generated when in-process filtering is enabled.
-mtN	Disable the memory trace system in error logs. The memory trace system reports memory leaks and memory overwrites in the log file. See Report Memory Errors, on page 61 . Error logs are not generated when in-process filtering is enabled.
-L	Enable error logging. See Enable or Disable Error Logging, on page 60 . Error logs

Options for the Filter Sample Program , continued

Option	Description
	are not generated when in-process filtering is enabled.
-LN	Disable error logging. See Enable or Disable Error Logging, on page 60 . Error logs are not generated when in-process filtering is enabled.
-AF	Include the input file name in an error log. See Report the File Name in Stream Mode, on page 61 .
-r	Filter a container file and the subfiles in the container file to a single output file. This option uses the Container API, which is obsolete.
-rm	If you set this option, text that was deleted from a document with revision tracking enabled is extracted from the document and included in the filtered output. See Extract Deleted Text Marked by Tracked Changes, on page 67 .
-x <i>xmlconfigfile</i>	Filter an XML file by using customized extraction settings defined in the <code>kvxconfig.ini</code> file. If you do not enter the full path to the INI file, the program looks for the file in the current working directory. See Filter XML Files, on page 78 for more information.
-z <i>tempdirectory</i>	Specify a temporary directory where temporary files generated by the filtering process are stored. The default is the current working directory. On Windows systems, there is a 64 K size limit to the temporary directory. When the limit is reached, you must either create a new directory or delete the contents of the existing directory; otherwise, you might receive an error message.
-ps <i>password</i>	Specify a password to open a password-protected PST file. This option uses the Container API, which is obsolete.
-pdfauto	Specify that PDF files are output in a logical reading order. The PDF filter determines the paragraph direction (left-to-right or right-to-left) for each PDF page, and then sets the direction accordingly. See Filter PDF Files, on page 67 .
-pdfltr	Specify that PDF files are output in a logical reading order, and that the paragraph direction is left to right. See Filter PDF Files, on page 67 .
-pdfrtl	Specify that PDF files are output in a logical reading order, and that the paragraph direction is right to left. See Filter PDF Files, on page 67 .
-pdfraw	Specify that PDF files are output in an unstructured paragraph flow. This is the default option . If logical reading order is enabled, and you want to return to an unstructured paragraph flow, set this flag. See Filter PDF Files, on page 67 .
-xmp	Parse and return XMP metadata as path and value pairs, and include the original XMP packet. See fpGetXmplInfoFile(), on page 145 and fpGetXmplInfo(), on page 144 .

Options for the Filter Sample Program , continued

Option	Description
-xmpr	Return XMP metadata as a raw XMP packet. See fpGetXmplInfoFile() , on page 145 and fpGetXmplInfo() , on page 144.
-embeddedfont	If you use this option, text that contains embedded fonts is not filtered from PDF documents. See fpFilterConfig() , on page 129.

Part III: C API Reference

This section provides detailed reference information for the C-language implementation of the File Extraction and Filter APIs.

Chapter 6: File Extraction API Functions

This section describes the functions in the File Extraction API. The File Extraction functions open a container file, and extract the container's subfiles so that the subfiles are exposed and available for filtering. Subfiles can be files within a Zip archive, messages in a mail store, attachments in a mail message, or OLE objects embedded in a compound document.

Each function appears as a function prototype followed by a description of its arguments, its return value, and a discussion of its use.

• KVGetExtractInterface()	95
• fpCloseFile()	96
• fpExtractSubFile()	97
• fpFreeStruct()	98
• fpGetMainFileInfo()	99
• fpGetSubFileInfo()	100
• fpGetSubFileMetaData()	101
• fpOpenFile()	103
• fpSetExtractionTimeout()	104

KVGetExtractInterface()

This function is the entry point to obtain the file extraction functions. It supplies pointers to the file extraction functions, and in the case of out-of-process mode starts the `kvoop.exe` server and initializes out-of-process extraction services. When `KVGetExtractInterface()` is called, it assigns the function pointers in the structure `KVExtractInterface` to the functions described in this section.

Syntax

```
int pascal KVGetExtractInterface (  
    void                *pContext,  
    KVExtractInterface  pIextract);
```

Arguments

pContext A pointer returned from `fpInit()`.

pIextract A pointer to the [KVExtractInterface](#) structure, which contains function pointers that `KVGetExtractInterface()` assigns to all other file extraction functions.

Before you initialize the `KVExtractInterface` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.

Returns

- If the call is successful, the return value is `KVERR_Success`.
- If the call is not successful, the return value is an error code.

Example

```
fpKVGetExtractInterface =  
(int (pascal *) ( void *, KVExtractInterface))myGetProcAddress(hKVFilter, (char*)  
"KVGetExtractInterface");  
/*Initialize file extraction interface structure using KVStructInit*/  
KVStructInit(&extractInterface);  
/* Retrieve file extraction interface */  
error = (*fpKVGetExtractInterface)(pFilter,&extractInterface))
```

Discussion

You can define only one extraction structure for one context pointer. For example, the following is not allowed:

```
fpInit()  
    KVGetExtractInterface(pFilter, &extractInterface1)  
  
    fpOpenFile()  
    fpGetMainFileInfo()  
    fpGetSubFileInfo()  
    fpExtractSubFile  
    fpGetSubFileMetadata()  
    fpFilterFile()  
    fpCloseFile()  
    ...  
  
    KVGetExtractInterface(pFilter, &extractInterface2)  
    fpOpenFile()  
    fpGetMainFileInfo()  
    fpGetDocInfoFile()  
    fpGetOLESummaryInfoFile()  
    fpFilterFile()  
    fpCloseFile()  
    ...  
fpShutdown()
```

fpCloseFile()

This function frees the memory allocated by [fpOpenFile\(\)](#) and closes the file.

Syntax

```
int (pascal *fpCloseFile) (void *pFile);
```

Arguments

pFile The identifier of the file. This is a file handle returned from [fpOpenFile\(\)](#).

Returns

- If the file is closed, the return value is `KVERR_Success`.
- If the file is not closed, the return value is an error code.

Example

```
extractInterface->fpCloseFile(pFile);  
pFile = NULL;
```

fpExtractSubFile()

This function extracts a subfile from a container file to a user-defined path or output stream. This call returns file format information when file is extracted to a path.

Syntax

```
int (pascal *fpExtractSubFile) (  
    void *pFile,  
    KVExtractSubFileArg extractArg,  
    KVSubFileExtractInfo *extractInfo);
```

Arguments

pFile	The identifier of the file. This is a file handle returned from fpOpenFile() .
extractArg	<p>A pointer to the structure KVExtractSubFileArg, which defines the subfile to be extracted.</p> <p>Before you initialize the <code>KVExtractSubFileArg</code> structure, use the macro <code>KVStructInit</code> to initialize the <code>KVStructHead</code> structure.</p>
extractInfo	A pointer to the structure <code>KVSubFileExtractInfo</code> , which defines information about the extracted subfile.

Returns

- If the subfile is extracted from the container file, the return value is `KVERR_Success`.
- If the subfile is not extracted from the container file, the return value is an error code.

Discussion

- After the file is extracted, call [fpFreeStruct\(\)](#) to free the memory allocated by this function.
- If the subfile is embedded in the main file as a link and is stored externally, `extractInfo->infoFlag` is set to `KVSubFileExtractInfoFlag_External`.

For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of subfile cannot be extracted. You must write code to access the subfile based on the path in the member `extractInfo->filePath` or `extractInfo->fileName`. See [KVSubFileExtractInfo](#), on page 116.

Example

```
KVSubFileExtractInfo    extractInfo = NULL;

KVStructInit(&extractArg);

extractArg.index = index;
extractArg.extractionFlag = KVExtractionFlag_CreateDir | KVExtractionFlag_Overwrite;
extractArg.filePath = subFileInfo->subFileName;

/*Extract this subfile*/
error=extractInterface->fpExtractSubFile(pFile,&extractArg,&extractInfo);
if ( error )
{
    extractInterface->fpFreeStruct(pFile,extractInfo);
    subFileInfo = NULL;
}
```

fpFreeStruct()

This function frees the memory allocated by `fpGetMainFileInfo()`, `fpGetSubFileInfo()`, `fpGetSubFileMetadata()`, and `fpExtractSubFile()`.

Syntax

```
int (pascal *fpFreeStruct) (
    void      *pFile,
```

```
void      *obj);
```

Arguments

pFile The identifier of the file. This is a file handle returned from [fpOpenFile\(\)](#).

obj A pointer to the result object returned by [fpGetMainFileInfo\(\)](#), [fpGetSubFileInfo\(\)](#), [fpGetSubFileMetaData](#), or [fpExtractSubFile\(\)](#).

Returns

- If the allocated memory is freed, the return value is `KVERR_Success`.
- Otherwise, the return value is an error code.

Example

The example below frees the memory allocated by [fpGetSubFileInfo\(\)](#):

```
if ( subFileInfo )
{
    extractInterface->fpFreeStruct(pFile,subFileInfo);
    subFileInfo = NULL;
}
```

fpGetMainFileInfo()

This function determines whether a file is a container file—that is, whether it contains subfiles—and should be extracted further.

Syntax

```
int (pascal *fpGetMainFileInfo) (
    void      *pFile,
    KVMainFileInfo *fileInfo);
```

Arguments

pFile The identifier of the file. This is a file handle returned from [fpOpenFile\(\)](#).

fileInfo A pointer to the structure [KVMainFileInfo](#). This structure contains information about the file.

Returns

- If the file information is retrieved, the return value is `KVERR_Success`.
- If the file information is not retrieved, the return value is an error code.

Discussion

- After the file information is retrieved, call [fpFreeStruct\(\)](#) to free the memory allocated by this function.
- If the file is a container (`fileInfo->numSubFiles` is non-zero), call [fpGetSubFileInfo\(\)](#) and [fpExtractSubFile\(\)](#) for each subfile.
- If the file is not a container (`fileInfo->numSubFiles` is 0) and contains text (`fileInfo->infoFlag` is set to `KVMainFileInfoFlag_HasContent`), pass the file directly to the filtering functions.

Example

```
KVMainFileInfo  fileInfo    = NULL;
if( (error=extractInterface->fpGetMainFileInfo(pFile,&fileInfo)))
{
    /* Free result object allocated in fileInfo */
    extractInterface->fpFreeStruct(pFile,fileInfo);
    fileInfo = NULL;
}
```

fpGetSubFileInfo()

This function gets information about a subfile in a container file.

Syntax

```
int (pascal *fpGetSubFileInfo) (
    void                *pFile,
    int                  index,
    KVSubFileInfo        *subFileInfo);
```

Arguments

- | | |
|--------------------------|--|
| <code>pFile</code> | The identifier of the main file. This is a file handle returned from fpOpenFile() . |
| <code>index</code> | The index number of the subfile for which to retrieve information. |
| <code>subFileInfo</code> | A pointer to the KVSubFileInfo structure, which defines information about the subfile. |

Returns

- If the file information is retrieved, the return value is `KVERR_Success`.
- If the file information is not retrieved, the return value is an error code.

Discussion

- After the subfile information is retrieved, call [fpFreeStruct\(\)](#) to free the memory allocated by this function.
- If the root node is *not* enabled, the first subfile is index 0. If the root node is enabled, the first subfile is index 1. The root node is required to recreate a file's hierarchy. See [Create a Root Node, on page 39](#).
- The members `subFileInfo->parentIndex` and `subFileInfo->childArray` enable you to recreate a file's hierarchy. Because `childArray` retrieves only the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted. See [Recreate a File's Hierarchy, on page 39](#).
- If the subfile is embedded in the main file as a link and is stored externally, `subFileInfo->infoFlag` is set to `KVSubFileInfoFlag_External`. For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of subfile cannot be extracted. You must write code to access the subfile based on the path in the member `subFileInfo->subFileName`. See [KVSubFileInfo, on page 117](#).
- The `KVSubFileInfoFlag_External` flag is not set for an OLE object that is embedded as a link in a Microsoft PowerPoint file. KeyView can detect linked objects in a Microsoft PowerPoint file only when the object is extracted. See [fpExtractSubFile\(\), on page 97](#).

Example

```
KVSubFileInfo    subFileInfo = NULL;
for ( index = 0; index < fileInfo->numSubFiles; index++)
{
    error=extractInterface->fpGetSubFileInfo(pFile,index,&subFileInfo);
    if ( error )
    {
        extractInterface->fpFreeStruct(pFile,subFileInfo);
        subFileInfo = NULL;
    }
}
```

fpGetSubFileMetaData()

This function extracts metadata from mail stores, mail messages, and non-mail items in an NSF file. See [Extract Mail Metadata, on page 41](#).

Syntax

```
int (pascal *fpGetSubFileMetaData) (
    void *pFile,
    KVGetSubFileMetaArg metaArg,
    KVSubFileMetaData *metaData);
```

Arguments

- | | |
|-----------------|--|
| pFile | The identifier of the file. This is a file handle returned from fpOpenFile() . |
| metaArg | A pointer to the KVGetSubFileMetaArg structure, which defines metadata tags whose values are retrieved.

Before you initialize the KVGetSubFileMetaArg structure, use the KVStructInit macro to initialize the KVStructHead structure. |
| metaData | A pointer to the KVSubFileMetaData structure, which contains the retrieved metadata values. |

Returns

- If the metadata is retrieved, the return value is [KVERR_Success](#).
- If the metadata is not retrieved, the return value is an error code.

Discussion

- When you pass in 0 for `metaArg->metaNameCount`, and NULL for `metaArg->metaNameArray`, a set of default metadata is retrieved. See [Extract Mail Metadata, on page 41](#).
- After the metadata is retrieved, call [fpFreeStruct\(\)](#) to free the memory allocated by this function.
- If a field is repeated in an EML or MBX mail header, the values in each instance of the field are concatenated and returned as one field. The values are separated by five pound signs (#####) as a delimiter.

Example

```
KVSubFileMetaData  metaData = NULL;

KVStructInit(&metaArg);

/* retrieve all the default metadata elements */
metaArg.metaNameCount = 0;
metaArg.metaNameArray = NULL;
metaArg.index = Index;
```

```
error = extractInterface->fpGetSubFileMetaData(pFile,&metaArg,&metaData);
...

extractInterface->fpFreeStruct(pFile,metaData);
metaData = NULL;

/* retrieve specific metadata fields */
KVMetaName  pName[2];
KVMetaNameRec names[2];

names[0].type = KVMetaNameType_Integer;
names[0].name.iname = KVPR_SUBJECT;

names[1].type = KVMetaNameType_Integer;
names[1].name.iname = KVPR_DISPLAY_TO;

pName[0] = &names[0];
pName[1] = &names[1];

metaArg.metaNameCount = 2;
metaArg.metaNameArray = pName;
metaArg.index = Index;

error = extractInterface->fpGetSubFileMetaData (pFile,&metaArg,&metaData);
...
extractInterface->fpFreeStruct(pFile,metaData);
metaData = NULL;
```

fpOpenFile()

This function opens a file to make the file accessible for subfile extraction or filtering.

Syntax

```
int (pascal *fpOpenFile) (
    void                *pContext,
    KVOpenFileArg       openArg,
    void                **pFile);
```

Arguments

pContext A pointer returned from `fpInit()`.

openArg A pointer to the [KVOpenFileArg](#) structure. This structure defines the input parameters

necessary to open a file for extraction, such as credentials, and the default extraction directory.

Before you initialize the `KVOpenFileArg` structure, use the macro `KVStructInit` to initialize the `KVStructHead` structure.

`pFile` A handle for the opened file. This handle is used in subsequent file extraction calls to identify the source file.

Returns

- If the file is opened, the return value is `KVERR_Success`.
- If the file is not opened, the return value is an error code and `pFile` is `NULL`.

Discussion

Call [fpCloseFile\(\)](#) to free the memory allocated by this function.

Example

```
KVOpenFileArgRec      openArg;

/*Initialize the structure using KVStructInit*/
KVStructInit(&openArg);
openArg.extractDir = destDir;
openArg.filePath    = srcFile;

/*Open the main file */
if ( (error = extractInterface->fpOpenFile(pFilter,&openArg,&pFile)))
{
    extractInterface->fpCloseFile(pFile);
    pFile = NULL;
}
```

fpSetExtractionTimeout()

This function specifies the length of time that should elapse before assuming that out-of-process extraction has stopped responding.

Syntax

```
BOOL pascal fpSetExtractionTimeout( void *pContext,
long lTimeout );
```


Arguments

- pContext** A pointer returned from `fpInit()`.
- lTimeout** The length of time, in seconds, that must elapse before assuming that out-of-process extraction has stopped responding.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

If this API is not used in out-of-process mode, the filter timeout duration is used on the [fpOpenFile\(\)](#) call. See [fpSetTimeout\(\)](#), on page 155.

Example

```
/* set extraction timeouts to 10 minutes */

if (FALSE == extractInterface->fpSetExtractionTimeout(pContext, 600))
{
    /* could not set the extraction timeout */
}
```

Chapter 7: File Extraction API Structures

This section provides information on the structures used by the File Extraction API. These structures define the input and output parameters required to extract subfiles from a container file, and are defined in `kvextract.h`.

• KVCredential	106
• KVCredentialComponent	107
• KVExtractInterface	107
• KVExtractSubFileArg	108
• KVGetSubFileMetaArg	110
• KVMainFileInfo	111
• KVMetadataElem	113
• KVMetaName	113
• KVOpenFileArg	114
• KVOutputStream	115
• KVSubFileExtractInfo	116
• KVSubFileInfo	117
• KVSubFileMetaData	119

KVCredential

This structure contains a count of the number of credential elements, and a pointer to the first element of the array of individual elements. The structure is initialized by calling [fpOpenFile\(\)](#), and is defined in `kvextract.h`.

```
typedef struct tag_KVCredential
{
    int                itemCount;
    KVCredentialComponent *items;
}
KVCredentialRec, *KVCredential;
```

Member Descriptions

<code>itemCount</code>	The number of credentials defined for this file.
<code>items</code>	A pointer to the KVCredentialComponent structure. This structure contains the individual credential elements used to open a protected file.

KVCredentialComponent

This structure contains the value of a credential item. The structure is defined in `kvxtract.h`.

```
typedef struct tag_KVCredentialComponent
{
    KVCredKeyType    keytype;
    union
    {
        void          *pkey;
        char          *skey;
        unsigned int   ikey;
    }
    keyobj;
}
KVCredentialComponentRec, *KVCredentialComponent;
```

Member Descriptions

- keytype** The type of credential (such as a user name or password). The types are defined by the [KVCredKeyType](#) enumerated type.
- pkey** A pointer to a structure defining credentials. Reserved for future use.
- skey** A pointer to a string credential key.
- ikey** An integer credential key.

KVExtractInterface

The members of this structure are pointers to the file extraction functions described in [File Extraction API Functions, on page 95](#). When you call the [KVGetExtractInterface\(\)](#) function, this structure assigns pointers to the functions. The structure is defined in `kvxtract.h`.

```
typedef struct tag_KVExtractInterface
{
    KVStructHeader;
    int (pascal *fpOpenFile) (void *pContext, KVOpenFileArg openArg, void
**pFileHandle);
    int (pascal *fpCloseFile) (void *pFileHandle);
    int (pascal *fpGetMainFileInfo) (void *pFile, KVMainFileInfo *MainFileInfo);
    int (pascal *fpGetSubFileInfo) (void *pFile, int index, KVSubFileInfo
*subFileInfo);
    int (pascal *fpGetSubFileMetaData) (void *pFile, KVGetSubFileMetaArg metaArg,
KVSubFileMetaData *metaData);
    int (pascal *fpExtractSubFile) (void *pFile, KVExtractSubFileArg extractArg,
KVSubFileExtractInfo *extractInfo);
```

```
int (pascal *fpFreeStruct) (void *pFile, void *obj);  
}  
KVExtractInterfaceRec, *KVExtractInterface;
```

Member Descriptions

The member functions are described in [File Extraction API Functions, on page 95](#).

Discussion

Before you initialize a File Extraction structure, use the `KVStructInit` macro to initialize the `KVStructHead` structure. This process sets the revision number of the File Extraction API and supports binary compatibility with future releases.

KVExtractSubFileArg

This structure defines the input parameters required to extract a subfile. See [fpExtractSubFile\(\), on page 97](#). The structure is defined in `kvxtract.h`.

```
typedef struct tag_KVExtractSubFileArg  
{  
    KVStructHeader;  
    int            index;  
    KVCharSet      srcCharset;  
    KVCharSet      trgCharset;  
    int            isMSBLSB;  
    DWORD          extractionFlag;  
    char           *filePath;  
    char           *extractDir;  
    KVOutputStream *stream;  
}  
KVExtractContainerSubFileArgRec, *KVExtractContainerSubFileArg;
```

Member Descriptions

<code>KVStructHeader</code>	The KeyView version of the structure. See KVStructHead, on page 166 .
<code>index</code>	The index number of the subfile to be extracted.
<code>srcCharset</code>	Specifies the source character set of the subfile when the file format's reader cannot determine the character set. The character sets are enumerated in <code>KVCharSet</code> of <code>kvtypes.h</code> . See Discussion, on page 110 .
<code>trgCharset</code>	If the file type is <code>KVFileType_Main</code> , this is the target character set of the extracted file. Otherwise, this is ignored. The character sets are enumerated in <code>KVCharSet</code> in <code>kvtypes.h</code> . See Discussion, on page 110 .

isMSLSB	This flag indicates whether the byte order for Unicode text is Big Endian (MSLSB) or Little Endian (LSBMSB).
extractionFlag	<p>A bitwise flag that defines additional parameters for file extraction. The following flags are available:</p> <ul style="list-style-type: none">KVExtractionFlag_CreateDir <p>This flag indicates whether the directory structure of a subfile should be created. If you set this flag, the path defined in <code>filePath</code> is created if it does not already exist. If you do not set this flag, the path is not created, and the function returns <code>FALSE</code>.</p>KVExtractionFlag_Overwrite <p>If you set this flag, and the file being extracted has the same name as a file in the target path, the file in the target path is overwritten without warning. If you do not set this flag, and a subfile has the same name as a file in the target path, the error <code>KVError_OutputFileExists</code> is generated.</p>KVExtractionFlag_ExcludeMailHeader <p>If you set this flag, header information (To, From, Sent, and so on) in a mail file is not included in the extracted data. If you do not set this flag, the extracted data contains header information and the message's body text. See Exclude Metadata from the Extracted Text File, on page 47.</p>KVExtractionFlag_GetFormattedBody <p>If you set this flag, the formatted version of the message body (HTML or RTF) is extracted from mail files when possible. If neither an HTML nor RTF version of the message body exists in the mail file, it is extracted as plain text. If you do not set this flag, the message body is extracted as plain text when possible.</p> <div><p>NOTE: When an HTML or RTF message body is extracted, the message's mail headers (such as "From," "To," and "Subject,") are extracted, saved in the same format, and added to the beginning of the subfile. This applies to PST (MAPI-based reader), MSG, and NSF files only.</p></div> <ul style="list-style-type: none">KVExtractionFlag_SaveAsMSG <p>If you set this flag, the mail message is extracted as an MSG file, including all of its attachments. If you do not set this flag, the mail message is extracted as text. This applies to PST files on Windows only.</p> <div><p>NOTE: In file mode, when the application sets this flag in fpExtractSubFile(), it must also check the KVSubFileExtractInfo structure's <code>filePath</code> parameter to verify the file name used for extraction.</p></div>
filePath	A pointer to the suggested path or file name to which the subfile is extracted. This can be a file name, partial path, or full path. You can use this in conjunction with <code>extractDir</code> to create the full output path. See Discussion, on the next page .
extractDir	A pointer to the directory to which subfiles are extracted. This directory must

exist. If you set this flag, the path specified in `KVOpenFileArg->extractDir` is ignored. You can use this in conjunction with `filePath` to create the full output path.

`stream` A pointer to an output stream defined by [KVOutputStream](#). See [Discussion, below](#).

Discussion

- If the document character set is detected and is also specified in `srcCharset`, the detected character set is overridden by the specified character set. If the source character set is *not* detected and is *not* specified, character set conversion does not occur. The [Supported Formats, on page 189](#) section lists the formats for which the source character set can be determined.
- The `KVSubFileExtractInfoFlag_CharsetConverted` flag in the [KVSubFileExtractInfo](#) structure indicates whether the character set of the subfile was converted during extraction.
- The following applies when the output is to a file:
 - If `filePath` is a valid full path, `filePath` is the output path, and the path in `extractDir` is ignored.
 - If `filePath` is a file name or partial path, the target directory specified in either `KVExtractSubFileArg->extractDir` or `KVOpenFileArg->extractDir` is used to create the full path. See [KVOpenFileArg, on page 114](#).
 - If `filePath` is a full path or partial path, and `createDir` is `TRUE`, the directory is created if it does not already exist.
 - If `filePath` is not specified, a default name and the target directory specified in either `KVExtractSubFileArg->extractDir` or `KVOpenFileArg->extractDir` are used to create a full path.
 - If both `filePath` and `extractDir` are not specified or are invalid, an error is returned.
 - If `filePath` is valid, but `extractDir` is not valid, an error is returned.
- The following applies when the output is to a stream:
 - Set `filePath` and `extractDir` to `NULL`.
 - The file format (`docInfo`) and extraction file path (`filePath`) are not returned in [KVSubFileExtractInfo](#).
 - The `KVExtractionFlag_CreateDir` and `KVExtractionFlag_Overwrite` flags are ignored.

KVGetSubFileMetaArg

This structure defines the metadata tags whose values are retrieved by [fpGetSubFileMetaData\(\)](#). This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVGetSubFileMetaArg
{
    KVStructHeader;
```

```
    int            index;  
    int            metaNameCount;  
    KVMetaName     *metaNameArray;  
    KVCharSet      srcCharset;  
    KVCharSet      trgCharset;  
    int            isMSBLSB;  
}  
KVGetSubFileMetaArgRec, *KVGetSubFileMetaArg;
```

Member Descriptions

KVStructHeader	The KeyView version of the structure. See KVStructHead, on page 166 .
index	The index number of the subfile for which metadata is extracted.
metaNameCount	The number of metadata fields to be extracted.
metaNameArray	A pointer to the KVMetaName structure that contains an array of metadata tags whose values are retrieved.
srcCharset	Specifies the source character set of the metadata when the format's reader cannot determine the character set. The character sets are enumerated in KVCharSet of kvtypes.h. See Discussion, below .
trgCharset	The target character set of the extracted metadata. The character sets are enumerated in KVCharSet in kvtypes.h.
isMSBLSB	This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).

Discussion

- If the character set is detected and is also specified in `srcCharset`, the detected character set is overridden by the specified character set. If the source character set is *not* detected and is *not* specified, character set conversion does not occur. The section [Supported Formats, on page 189](#) lists the formats for which the source character set can be determined.
- To retrieve a predefined list of metadata, pass 0 for `metaNameCount` and NULL for `metaNameArray`. The metadata in [Extract Mail Metadata, on page 41](#) is extracted.

KVMainFileInfo

This structure contains information about a main file that is open for extraction. It is initialized by calling [fpGetMainFileInfo\(\)](#). This structure is defined in `kvextract.h`.

```
typedef struct tag_KVMainFileInfo  
{  
    KVStructHeader;  
    int            numSubFiles;
```

```
    ADDOCINFO      docInfo;  
    KVCharSet      charset;  
    int            isMSLSB;  
    unsigned long  infoFlag;  
}  
KVMMainFileInfoRec, *KVMMainFileInfo;
```

Member Descriptions

KVStructHeader	The KeyView version of the structure. See KVStructHead , on page 166.
numSubFiles	The number of subfiles in the main file.
docInfo	The file's major format (such as Microsoft Word or Corel Presentation), as defined by the structure ADDOCINFO. See ADDOCINFO , on page 161.
charset	The character set of the main file.
isMSLSB	This flag indicates whether the byte order for Unicode text is Big Endian (MSLSB) or Little Endian (LSBMSB).
infoFlag	<p>A bitwise flag that provides additional information about the main file. The following flag is available:</p> <p>KVMMainFileInfoFlag_HasContent—The main file contains text that can be filtered. Below are some examples of how this flag is used:</p> <ul style="list-style-type: none">• For an MSG file without attachments, numSubFiles is 1 (message body text), and this flag is FALSE because the MSG file itself does not contain text.• For a Zip file with three files, numSubFiles is 3, and this flag is FALSE because a Zip file does not contain text.• For a Microsoft Word file with an embedded OLE object, numSubFiles is 1 (OLE object), and this flag is TRUE (Word file contains text to be filtered).

Discussion

- If numSubFiles is non-zero, get information on the subfile by calling [fpGetSubFileInfo\(\)](#), and then extract the subfiles by using [fpExtractSubFile\(\)](#).
- If numSubFiles is 0, the file does not contain subfiles and does not need to be extracted further. If the KVMMainInfoFlag_HasContent flag is set, the file contains body text and can be passed directly to the filtering functions. See [Filter API Functions](#), on page 121.
- If openFlag is set to KVOpenFileFlag_CreateRootNode in the call to fpOpenFile(), numSubFiles also includes the root object (index 0) which is created by KeyView for reconstructing the file's hierarchy. See [KVOpenFileArg](#), on page 114.

KVMetadataElem

This structure contains metadata field values extracted from a mail file. This structure is defined in `kvtypes.h`.

```
typedef struct tag_KVMetadataElem
{
    int            isValid;
    int            dataID;
    KVMetadataType dataType;
    char*          strType;
    void*          data;
    int            dataSize;
}
KVMetadataElem;
```

Member Descriptions

<code>isValid</code>	Specifies whether the metadata returned from the API is valid data.
<code>dataID</code>	The integer name of the extracted metadata field.
<code>dataType</code>	The data type of the metadata field. The types are defined in KVMetadataType in <code>kvtypes.h</code> .
<code>strType</code>	A pointer to the string name of the metadata field.
<code>data</code>	The contents of the metadata field. If the type member is <code>KVMetadata_Int4</code> or <code>KVMetadata_Bool</code> , this member contains the actual value. Otherwise, this member is a pointer to the actual value. <code>KVMetadata_DateTime</code> points to an 8-byte value. <code>KVMetadata_String</code> and <code>KVMetadata_Unicode</code> point to the beginning of the string that contains the text. The strings are NULL terminated. <code>KVMetadata_Binary</code> points to the first element of a byte array.
<code>dataSize</code>	The byte count of data when the type is <code>KVMetadata_Binary</code> , <code>KVMetadata_Unicode</code> , or <code>KVMetadata_String</code> .

KVMetaName

This structure defines the names of the metadata fields to be extracted from a mail file. This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVMetaName
{
    KVMetaNameType type;
    union
```

```
    {  
        void          *pname;  
        int           iname;  
        char          *sname;  
    }name;  
}  
KVMetaNameRec, *KVMetaName;
```

Member Descriptions

type The type of metadata name (such as integer or string). The types are defined by the [KVMetaNameType](#) enumerated type.

NOTE:
MAPI property names are of type integer.

pname A pointer to a structure defining the metadata fields to be retrieved.

iname The name of a metadata field of type integer.

sname A pointer to the name of a metadata field of type string.

Discussion

If you specify the MAPI tag name (for example, `PR_CONVERSATION_TOPIC`), you must include the `mapitags.h` and `mapidefs.h` Windows header files, in which `PR_CONVERSATION_TOPIC` is defined as `0x0070001e`.

KVOpenFileArg

This structure defines the input arguments necessary to open a file for extraction. It is initialized by calling [fpOpenFile\(\)](#). This structure is defined in `kvextract.h`.

```
typedef struct tag_KVOpenFileArg  
{  
    KVStructHeader;  
    KVCredential    cred;  
    KVInputStream   *stream;  
    char            *filePath;  
    char            *extractDir;  
    DWORD           openFlag;  
    DWORD           reserved;  
    void            *pReserved;  
}  
KVOpenFileArgRec, *KVOpenFileArg;
```

Member Descriptions

KVStructHeader	The KeyView version of the structure. See KVStructHead , on page 166.
cred	The credentials required to open a protected PST or NSF file. This is a pointer to the KVCredential structure. Your application can define multiple credentials to this member for multiple formats.
stream	<p>A pointer to the developer-assigned instance of KVInputStream. The KVInputStream structure defines the input stream that contains the source. See KVInputStream, on page 164.</p> <p>If you are using a file as input, this is <code>NULL</code>.</p>
filePath	<p>A pointer to the full file path to the source file.</p> <p>If you are using a stream as input, this is <code>NULL</code>.</p>
extractDir	<p>A pointer to the default directory to which subfiles are extracted. This directory must exist.</p> <p>You can use this in conjunction with <code>KVExtractSubFileArg->filePath</code> to create the full output path. See KVExtractSubFileArg, on page 108.</p>
openFlag	<p>A bitwise flag that defines additional parameters for opening the file. The following flag is available:</p> <p><code>KVOpenFileFlag_CreateRootNode</code>—If you set this flag, KeyView creates a root object when extracting this file's subfiles. This root node does not have a parent and is at the highest level of the file's tree structure. It is used internally to provide a reference point from which all other child nodes are determined, and the file's hierarchy is created.</p> <p>If you want to maintain the file's hierarchy when you extract subfiles from a container, you must set this flag. See Recreate a File's Hierarchy, on page 39 for more information.</p> <p>The root node has an index of zero. Although not all container formats require an artificial root node, the root is created for all container formats regardless of whether the file itself contains a root directory or file.</p>
reserved	Reserved for future use. It must be <code>NULL</code> .
pReserved	Reserved for future use. It must be <code>NULL</code> .

KVOutputStream

This structure defines an output stream for the extracted subfile.

```
typedef struct tag_OutputStream
{
    void *pOutputStreamPrivateData;
```

```
BOOL (pascal *fpCreate)(struct tag_OutputStream *,TCHAR *);
UINT (pascal *fpWrite) (struct tag_OutputStream *, BYTE *, UINT);
BOOL (pascal *fpSeek) (struct tag_OutputStream *, long, int);
long (pascal *fpTell) (struct tag_OutputStream *);
BOOL (pascal *fpClose) (struct tag_OutputStream *);
}
KVOutputStream;
```

Member Descriptions

All member functions are equivalent to their counterparts in the ANSI standard library.

KVSubFileExtractInfo

This structure contains information about an extracted subfile. It is initialized by calling [fpExtractSubFile\(\)](#). This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVSubFileExtractInfo
{
    KVStructHeader;
    char          *filePath;
    char          *fileName;
    unsigned long  infoFlag;
    ADDOCINFO     docInfo;
}
KVSubFileExtractInfoRec, *KVSubFileExtractInfo;
```

Member Descriptions

<code>KVStructHeader</code>	The KeyView version of the structure. See KVStructHead , on page 166.
<code>filePath</code>	<p>The full path to which the subfile was extracted.</p> <p>If the subfile is embedded in the main file as a link, this is the external path to the subfile.</p> <p>If you output the data to a stream, the extraction path is not returned.</p>
<code>fileName</code>	<p>The original path, file name, or path and file name of the subfile.</p> <p>If the subfile is embedded in the main file as a link, this is the external path to the subfile.</p>
<code>infoFlag</code>	<p>A bitwise flag that provides additional information about the extracted subfile. The following flags are available:</p> <ul style="list-style-type: none">• <code>KVSubFileExtractInfoFlag_NeedsExtraction</code>—The file might contain subfiles and should be extracted further.• <code>KVSubFileExtractInfoFlag_FileCreated</code>—The file was created on disk.

- `KVSubFileExtractInfoFlag_CharsetConverted`—The subfile's character set was converted.
- `KVSubFileExtractInfoFlag_External`—The subfile is embedded in the main file as a link and is stored externally. For example, the subfile might be an object that was embedded in a Word document using "Link to File," or an attachment that is referenced in an MBX message. This type of file cannot be extracted. You must write code to access the subfile based on the path in the member `filePath` or `fileName`.
- `KVSubFileExtractInfoFlag_FolderCreated`—A folder was created.
- `KVSubFileExtractInfoFlag_NonFormattedBodyExtracted`—Indicates that a plain text version of the message was extracted due to an error extracting the formatted version of the message.

`docInfo` The file's major format (such as Microsoft Word or Corel Presentation), as defined by the structure `ADDDOCINFO`. See [ADDDOCINFO](#), on page 161.

If you output the data to a stream, the file format is not returned.

KVSubFileInfo

This structure contains information about a subfile in a container file. It is initialized by calling [fpGetSubFileInfo\(\)](#). This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVSubFileInfo
{
    KVStructHeader;
    char          *subFileName;
    int           subFileType;
    long          subFileSize;
    unsigned long infoFlag;
    KVCharSet     charset;
    int           isMSBLSB;
    BYTE          fileTime[8];
    int           parentIndex;
    int           childCount;
    int           *childArray;
}
KVContainerSubFileInfoRec, *KVSubFileInfo;
```

Member Descriptions

`KVStructHeader` The KeyView version of the structure. See [KVStructHead](#), on page 166.

`subFileName` The path, file name, or path and file name of the subfile.

If the subfile is the body text of a mail file or is an embedded OLE object, KeyView provides a default file name. See [Default File Names for Extracted Subfiles](#), on

[page 57](#).

subFileType	<p>The subfile's position in the container file's hierarchy. The following options are available:</p> <ul style="list-style-type: none">• <code>KVSubFileType_Main</code>—The subfile is at the top level of the main file. This is the default subfile type. See Discussion, on the next page.• <code>KVSubFileType_Attachment</code>—The subfile is an attachment in a file.• <code>KVSubFileType_OLE</code>—The subfile is an embedded OLE object in a compound document.• <code>KVSubFileType_Folder</code>—The subfile is a folder or the artificial root node (see Create a Root Node, on page 39).
subFileSize	<p>The size of the subfile in bytes. This information might be useful if you do not want to extract very large files.</p> <p>This value is approximate and is the maximum size of the subfile. The subfile is usually smaller than this value when it is extracted.</p>
infoFlag	<p>A bitwise flag that provides additional information about the subfile. The following flags are available:</p> <ul style="list-style-type: none">• <code>KVSubFileInfoFlag_NeedsExtraction</code>—The subfile might contain subfiles. It must be extracted further to conclusively determine whether it contains subfiles.• <code>KVSubFileInfoFlag_Secure</code>—The subfile is secured and credentials (such as user name and password) are required to extract it. This flag applies to ZIP, RAR, and PDF files only.• <code>KVSubFileInfoFlag_SMIME</code>—The subfile is S/MIME-encrypted and credentials are required to extract it. This applies to .eml and .pst files only.• <code>KVSubFileInfoFlag_External</code>—The subfile is embedded in the main file as a link and is stored externally. For example, the subfile might be an object that was embedded in a Word document by using "Link to File," or an attachment that is referenced in an MBX message. This type of file cannot be extracted. You must write code to access the subfile based on the path in the member <code>subFileName</code>.• <code>KVSubFileInfoFlag_MailItem</code>—When the subfile type is <code>KVSubFileType_Attachment</code>, this indicates that the attachment is a mail item. This flag applies to PST, MSG, and NSF files only.
charset	<p>If the subfile is not an attachment, this is the character set of the subfile. If the subfile is an attachment, the character set is <code>KVCS_UNKNOWN</code>.</p>
isMSBLSB	<p>This flag indicates whether the byte order for Unicode text is Big Endian (MSBLSB) or Little Endian (LSBMSB).</p>
fileTime	<p>When the subfile is a mail message, this is the file's <code>Sent</code> time. Otherwise, it is the last modified time. The file time is not available for the following file types:</p>

	<ul style="list-style-type: none">• EML attachments• OLE objects in a Microsoft Office document• Embedded images
parentIndex	The index number of this file's parent. For example, the index of a folder in which the subfile is stored, or the file to which the subfile is attached. If a file does not have a parent, the parentIndex is -1.
childCount	The number of first-level children in the subfile.
childArray	A pointer to an array of first-level children in the subfile.

Discussion

The `KVSubFileType_Main` type applies to the following for each file format:

File format	KVSubFileType_Main applies to...
MSG and EML	The message body.
Zip files	A file inside the archive.
PST files	An item that is not an attachment, an OLE object, or a root node.
MBX files	A message in the MBX file.
NSF files	An item that is not an attachment, an OLE object, or a root node.
PDF files	An item that is not an attachment or a root node.

- If you set the `KVSubFileInfoFlag_NeedsExtraction` flag, open the subfile and extract its children. See [fpOpenFile\(\)](#), on page 103 and [fpExtractSubFile\(\)](#), on page 97.
- The `parentIndex` and `childArray` members provide information about the subfile's parent and children. You can use this information to recreate the file hierarchy on extraction. Because `childArray` retrieves only the first-level children in the subfile, you must call `fpGetSubFileInfo()` repeatedly until information for the leaf-node children is extracted. See [Recreate a File's Hierarchy](#), on page 39.

KVSubFileMetaData

This structure contains a count of the number of metadata elements extracted from a mail file, and a pointer to the first element of the array of elements. It is initialized by calling [fpGetSubFileMetaData\(\)](#). This structure is defined in `kvxtract.h`.

```
typedef struct tag_KVSubFileMetaData
{
    KVStructHeader;
    int          nElem;
    KVMetadataElem** ppElem;
```

```
        unsigned long    infoFlag;  
    }  
    KVSubFileMetaDataRec, *KVSubFileMetaData;
```

Member Descriptions

KVStructHeader	The KeyView version of the structure. See KVStructHead, on page 166 .
nElem	The number of metadata fields contained in the array.
ppElem	A pointer to an array of pointers that are the memory addresses of metadata field values in the KVMetadataElem structure.
infoFlag	<p>A bitwise flag that defines additional properties of the extracted metadata. The following flag is available:</p> <p>KVSubFileMetaInfoFlag_CharsetConverted—Indicates that the metadata's character set was converted.</p>

Chapter 8: Filter API Functions

This section describes the functions in the Filter API. Each function appears as a function prototype followed by a description of its arguments, its return value, and a discussion of its use.

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KV_GetFilterInterfaceEx()

This function supplies pointers to other Filter functions. When `KV_GetFilterInterfaceEx()` is called, it assigns the function pointers in the structure `KVfltInterfaceEx` to other functions described in this chapter. For example, `KVfltInterfaceEx.fpInit` is assigned to point to the function `Init()`.

NOTE:

This is used as an entry point to Filter API versions 7.4 and higher.

Syntax

```
KVErrorCode pascal KV_GetFilterInterfaceEx(  
    KVfltInterfaceEx *pInterfaceEx,  
    int version );
```

Arguments

- `pInterfaceEx` A pointer to the structure [KVfltInterfaceEx](#), which contains function pointers that `KV_GetFilterInterfaceEx()` assigns to all other API functions.
- `version` The version number of the current Filter interface. This is a symbolic constant (`KVFLTINTERFACE_REVISION`) defined in `kvflt.h`.

Returns

If the revision number of the Filter interface API is unknown, this function returns a general error (`KVERR_General`).

Discussion

- One of the initial steps in using the Filter API is to create an instance of a `KVfltInterfaceEx` structure and use this function to gain access to all other functions. The sample programs provide examples of how to do this.
- You can call the API functions directly. For example, you can call `GetOLESummaryInfo()` instead of using `fpGetOLESummaryInfo()` in `KVfltInterfaceEx`. However, Micro Focus recommends that you assign the function pointers in `KVfltInterfaceEx` to the functions for efficiency.

Example

```
void *pKVFILTER;  
KVfltInterfaceEx FilterFunc;  
KVErrorCode nRet = KVERR_Success;  
KVErrorCode (pascal *fpGetFilterInterfaceEx)( KVfltInterfaceEx *FilterFunc, int version );
```

```
pKVFILTER = myLoadLibrary(szDllName);

fpGetFilterInterfaceEx = (KVErrCode (pascal *) (KVfltInterfaceEx *, int ))
myGetProcAddress(pKVFILTER, "KV_GetFilterInterfaceEx");
```

fpCanFilterFile()

This function determines whether a file's format is supported by KeyView. The supported formats are listed in [Supported Formats, on page 189](#).

If `KVERR_ General` is returned, you can retrieve the extended error code by using [fpGetKvErrorCodeEx\(\)](#), on page 140.

Syntax

```
KVErrorCode pascal fpCanFilterFile(  
    void      *pContext,  
    char      *szFile );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`szFile` The name of the input file to be filtered.

Returns

- If the file format is supported, the return value is `KVERR_Success`.
- If the file format is not supported, the return value is an error code. See [KVErrorCode, on page 175](#).

fpCanFilterStream()

This function determines whether the format of the file to which a stream points is supported by KeyView.

Syntax

```
KVErrorCode pascal fpCanFilterStream(  
    void      *pcontext,  
    void      *pStreamContext );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`pStreamContext` A pointer returned from [fpOpenStream\(\)](#) or [fpOpenStreamEx2\(\)](#).

Returns

- If the file format is supported, the return value is `KVERR_Success`.
- If the file format is not supported, the return value is an error code. See [KVErrorCode](#), on page 175.

fpCloseStream()

This function closes a document stream opened by using `fpOpenStream()`.

Syntax

```
BOOL pascal fpCloseStream( void *pContext, void *pStreamContext );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`pStreamContext` A pointer returned from [fpOpenStream\(\)](#) or [fpOpenStreamEx2\(\)](#).

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

After filtering is complete, call this function to free the memory allocated by `fpOpenStream()` or `fpOpenStreamEx2()`.

fpFileToInputStreamCreate()

This function creates an input stream from a file.

Syntax

```
BOOL pascal fpFileToInputStreamCreate(  
    void          *pContext,  
    char          *pszFileName,  
    KVInputStream *pInput)
```

Arguments

pContext	A pointer returned from fpInit().
pszFileName	A pointer to the name of the input file to be filtered.
pInput	A pointer to the developer-assigned instance of KVInputStream . The structure KVInputStream defines the input stream that contains the source.

Returns

- If the call is successful, the return value is TRUE.
- If the call is unsuccessful, the return value is FALSE.

Discussion

- After filtering is complete, call fpFileToInputStreamFree() to free the memory allocated by this function.
- You can access this function through the [KV_GetFilterInterfaceEx\(\)](#) function, or call it directly.

fpFileToInputStreamFree()

This function frees the memory allocated for the input stream created from a file.

Syntax

```
BOOL pascal fpFileToInputStreamFree(  
    void          *pContext,  
    KVInputStream *pInput)
```

Arguments

pContext A pointer returned from `fpInit()`.

pInput A pointer to the developer-assigned instance of [KVInputStream](#). The structure `KVInputStream` defines the input stream that contains the source.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

- After filtering is complete, call this function to free the memory allocated by `fpFileToInputStreamCreate()`.
- You can access this function through the [KV_GetFilterInterfaceEx\(\)](#) function, or call it directly.

fpFilterConfig()

This function provides a way to enable and configure various options prior to document filtering, such as providing a password for a file, or enabling hidden text extraction.

Syntax

```
BOOL pascal fpFilterConfig(
    void    *pContext,
    int      nType,
    int      nValue,
    void     *pData );
```

Arguments

- pContext** A pointer returned from `fpInit()`.
- nType** The configuration flag. This is a symbolic constant defined in `kvtypes.h`. The available options are described in the [Filter Configuration Flags, below](#) table.
- nValue** The integer value defined for the flags above.
- pData** The data for the configuration flag.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

- You must call this function after the call to `fpInit()` and before the call to `fpFilterStream()` or `fpFilterFile()`.
- Although `fpFilterConfig()` does not run out of process, any configuration flags that are set through `fpFilterConfig()` are passed to the out-of-process session.
- The configuration flags are described in the following table.

Filter Configuration Flags

Flag	Description
KVFLT_SET00PSRCFILE	If you set this flag to <code>TRUE</code> , the input file name is reported in the out-of-process error log when the file generates an error in stream mode.

Filter Configuration Flags, continued

Flag	Description
	<p>See Report the File Name in Stream Mode, on page 61. The default is FALSE.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is the name of the input file generating errors.</p>
KVFLT_SETTEMPDIRECTORY	<p>This flag enables you to specify the directory where temporary files created during filtering processes are stored.</p> <p>nValue is set to 0.</p> <p>pData is the path name of the directory where temporary files are stored.</p>
KVFLT_LOGICALPDF	<p>This flag extracts paragraphs from a PDF file in the order in which they appear on the page (logical reading order). The nValue argument specifies the paragraph direction. See Filter PDF Files, on page 67.</p> <p>nValue is one of the paragraph direction options defined in the LPDF_DIRECTION enumerated type in <code>kvtypes.h</code>.</p> <p>pData is NULL.</p>
KVFLT_SETXMLCONFIGINFO	<p>This flag enables you to define which elements and attributes are extracted from XML documents with a specified format ID or root element. You can use this option to override the default settings for the supported XML formats (see Filter XML Files, on page 78), or to define settings for custom XML document types.</p> <p>The settings are defined in the KVXConfigInfo structure. To set custom settings for more than one document type, call the <code>fpFilterConfig()</code> function once for each type.</p> <p>You can also modify element extraction settings by using the <code>kvxconfig.ini</code> file. See Configure Element Extraction for XML Documents, on page 79.</p> <p>nValue is set to 0.</p> <p>pData is a pointer to the KVXConfigInfo structure.</p>
KVFLT_INCLREVISIONMARK	<p>If you set this flag to TRUE, text that was deleted from a document with revision tracking enabled is extracted from the document and included in the filtered output.</p> <p>To reset the flag and exclude deleted text from the filtered output, set the flag to FALSE (the default). See Extract Deleted Text Marked by Tracked Changes, on page 67.</p> <p>nValue is TRUE or FALSE.</p>

Filter Configuration Flags, continued

Flag	Description
	pData is NULL.
KVFLT_SETSRCPASSWORD	<p>This flag enables you to define a password used to open a password-protected file for filtering. See Filter Password Protected Files, on page 371.</p> <p>nValue is TRUE.</p> <p>pData is the source file password, which can have a maximum length of 255 characters (the final byte is null).</p>
KVFLT_NOEMBEDDEDOBJECT	<p>If you set this flag to TRUE, embedded objects in Microsoft Word documents are not extracted.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_SHOWHIDDENTEXT	<p>If you set this flag to TRUE, hidden text from Microsoft Word, Excel, and PowerPoint documents is extracted.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_NOCOMMENTS	<p>If you set this flag to TRUE, comments from Microsoft Word, PowerPoint, or Excel documents are not extracted.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_SKIPEMBEDDEDFONT	<p>If you set this flag to TRUE, text that contains embedded fonts is not filtered from PDF documents. See Filter PDF Files, on page 67.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_SHOWDATEFIELDPCODE	<p>If you set this flag to TRUE, date/time field codes are extracted from Microsoft Word, PowerPoint, and Rich Text Format documents instead of the date/time values.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_SHOWFILENAMEFIELDPCODE	<p>If you set this flag to TRUE, file name field codes are extracted from Microsoft Word documents.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>

Filter Configuration Flags, continued

Flag	Description
KVFLT_KEEPSOFTHYPHEN	<p>If you set this flag to <code>TRUE</code>, soft hyphens are retained when text is filtered from PDF documents. See Filter PDF Files, on page 67.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is <code>NULL</code>.</p>
KVFLT_EXPORTALLMETADATA	<p>If you set this flag to <code>TRUE</code>, all custom metadata is filtered from PDF documents when the metadata APIs are used. See Extract Custom Metadata from PDF Files, on page 70.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is <code>NULL</code>.</p>
KVFLT_EXPORTTAGGEDCONTENT	<p>If you set this flag to <code>TRUE</code>, tagged PDF content is filtered from PDF documents. See Filter Tagged PDF Content, on page 71.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is <code>NULL</code>.</p>
KVFLT_SetConfigurableArguments	<p>If you set this flag to <code>TRUE</code>, the pData is a variable of configurable arguments.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is a variable of configurable arguments.</p>
KVFLT_SETOUTPUTCHARSET	<p>This flag enables the output character set to be changed.</p> <p>pData is one of the character encodings defined in the <code>KVCharSet</code> enumerated type in <code>kvtypes.h</code>.</p>
KVFLT_SHOWHIDDENTEXT	<p>If you set this flag to <code>TRUE</code>, hidden text from Microsoft Word, Excel, PowerPoint, and PDF documents is extracted.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is <code>NULL</code>.</p>
KVFLT_EXTRACTIMAGES	<p>If you set this flag to <code>TRUE</code>, the extract API also extracts images contained within the file. See Extract Images, on page 39 for more details.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p> <p>pData is <code>NULL</code>.</p>
KVFLT_TABDELIMITED	<p>If you set this flag to <code>TRUE</code>, tables in word processing formats are output in tab delimited formats. See Tab Delimited Output for Embedded Tables, on page 86 for more details.</p> <p>nValue is <code>TRUE</code> or <code>FALSE</code>.</p>

Filter Configuration Flags, continued

Flag	Description
	pData is NULL.
KVFLT_ STANDARDIZECELLFORMATS	<p>If you set this flag to TRUE, standardization of cell formats in Microsoft Excel files is enabled. See Standardize Cell Formats, on page 77.</p> <p>nValue is TRUE or FALSE.</p> <p>pData is NULL.</p>
KVFLT_ SOURCECODEDETECTION	<p>If you enable this option, KeyView attempts to identify the programming language of any source code files that it finds. The nValue argument specifies the level of identification to attempt. See Source Code Identification, on page 87.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>NOTE: Source code identification is a new, experimental feature in KeyView 12.0.</p> </div> <p>nValue is KVSOURCECODE_OFF, KVSOURCECODE_ENABLED, or KVSOURCECODE_EXTENDED.</p> <p>pData is NULL.</p>

Examples

- To specify a password to open a password-protected file for filtering:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SETSRCPASSWORD, TRUE, password);
```

where *password* is a null-terminated string of 255 or fewer characters.
- To extract hidden text from Microsoft Word, Excel, or PowerPoint files:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SHOWHIDDENTEXT, TRUE, NULL);
```
- To extract all custom metadata fields from PDF documents:

```
(*fpFilterConfig)(pKVFilter, KVFLT_EXPORTALLMETADATA, TRUE, NULL);
```

fpFilterFile()

This function filters text from an input file to an output file.

If the output file path refers to an existing directory, an extended error code is set in `pContext` and returns `KVERR_General`. If `KVERR_General` is returned, you can retrieve the extended error code by using [fpGetKvErrorCodeEx\(\)](#), on page 140.

Syntax

```
KVErrorCode pascal fpFilterFile(
    void          *pContext,
    char          *szInputFile,
    char          *szOutputFile,
    KVSummaryInfoEx *pSummaryInfo );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`szInputFile` A pointer to the input file.

`szOutputFile` A pointer to the output file.

`pSummaryInfo` This argument is reserved. It must be `NULL`.

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

This function runs in process or out of process. See [The Filter Process Model](#), on page 30.

Example

```
error = (int)(*pFilterInterface->fpFilterFile)( pFilter, srcFile, outFile, NULL );
```

fpFilterStream()

This function filters text from an input stream to an output buffer.

Syntax

```
KVErrorCode pascal fpFilterStream(
    void          *pContext,
    void          *pStreamContext
    KVFilterOutput *pFilterOutput,
    KVSummaryInfoEx *pSummaryInfo);
```

Arguments

<code>pContext</code>	A pointer returned from <code>fpInit()</code> .
<code>pStreamContext</code>	A pointer returned from fpOpenStream() or fpOpenStreamEx2() .
<code>pFilterOutput</code>	A pointer to the KVFilterOutput structure. This structure defines the output buffer.
<code>pSummaryInfo</code>	This argument is reserved. It must be <code>NULL</code> .

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

- This function processes data in chunks. To return the entire output stream, you must call this function repeatedly until the entire output buffer is processed, that is, until the following condition occurs:

```
pFilterOutput-> cbText == 0
```

- This function runs in process or out of process. See [The Filter Process Model](#), on page 30.

Example

```
error = (int)(*pFilterInterface->fpFilterStream)( pFilter, pStream, &filterOut,
NULL );
```

fpFreeOLESummaryInfo()

This function frees the memory allocated by `fpGetOLESummaryInfoFile()` or `fpGetOLESummaryInfo()` for metadata extraction.

Syntax

```
BOOL pascal fpFreeOLESummaryInfo(  
    void          *pContext ,  
    KVSummaryInfoEx *pSummaryInfo );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`pSummaryInfo` A pointer to the [KVSummaryInfoEx](#) structure.

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

Call this function after `fpGetOLESummaryInfo()` or `fpGetOLESummaryInfoFile()` has successfully filled `pSummaryInfo`, and the data is no longer required.

fpFreeXmpInfo()

This function frees the memory allocated by `fpGetXmpInfoFile()` or `fpGetXmpInfoStream()` for metadata extraction.

Syntax

```
BOOL pascal fpFreeXmpInfo(  
    void *pContext ,  
    K VXmpInfo *pXmpInfo );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`pXmpInfo` A pointer to the structure [KVXmpInfo](#).

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

Discussion

Call this function after `fpGetXmpInfoFile()` or `fpGetXmpInfoStream()` has successfully filled `pXmpInfo`, and the data is no longer required.

fpGetDocInfoFile()

This function gets the following format information for a file and populates the `ADDOCINFO` structure:

- File format
- File class
- Major version
- Other attributes

The possible values are defined in `adinfo.h`.

An extended error code is set in `pContext` if an invalid input file is provided. You can retrieve the error code by using [fpGetKvErrorCodeEx\(\)](#), on page 140.

Syntax

```
BOOL pascal fpGetDocInfoFile(
    void      *pContext,
    char      *szFile,
    ADDOCINFO *pADDOcInfo );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`szFile` A pointer to the input file.

`pADDOCINFO` The format, file class, and version of the source document. A pointer to the [ADDOCINFO](#) structure. The structure of `ADDOCINFO` is defined in `adinfo.h`.

Returns

- If the format information is extracted, the return value for this function is `TRUE`.
- If the format information is not extracted, the return value is `FALSE`. If `FALSE` is returned, you can retrieve the extended error code by using [fpGetKvErrorCodeEx\(\)](#), on page 140.

Discussion

This function runs in process or out of process. See [The Filter Process Model](#), on page 30.

fpGetDocInfoStream()

This function gets the following format information for a stream and populates the `ADDOCINFO` structure:

- Format
- File Class
- Major version
- Other attributes

The possible values are defined in `adinfo.h`.

Syntax

```
BOOL pascal fpGetDocInfoStream(  
    void *pContext,  
    KVInputStream *pInput,  
    ADDOCINFO *pADDocInfo );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`pInput` A pointer to the input stream.

`pADDOCINFO` The format, file class, and version of the source document. A pointer to the [ADDOCINFO](#) structure. The structure of `ADDOCINFO` is defined in `adinfo.h`.

Returns

- If the format information is extracted, the return value for this function is `TRUE`.
- If the format information is not extracted, the return value is `FALSE`.

Discussion

This function runs in process or out of process. See [The Filter Process Model, on page 30](#).

fpGetKvErrorCodeEx()

This function gets an extended error code defined in `KVErrorCodeEx`. It is called to provide additional information when `fpFilterFile()` or `fpFilterStream()` returns the error `KVERR_General`. See [KVErrorCode](#), on page 175.

Syntax

```
KVErrorCodeEx pascal fpGetKvErrorCodeEx ( void *pContext )
```

Arguments

`pContext` A pointer returned from `fpInit()`.

Returns

The return value is an error code from `KVErrorCodeEx`.

Discussion

You can access this function through the [KV_GetFilterInterfaceEx\(\)](#) interface.

Example

```
KVErrorCode    nReturnCode = 0;
if ( nReturnCode == KVERR_General )
{
    int kvErrorEx;
    if ( lsv->fpKV_GetKvErrorCodeEx )
    {
        kvErrorEx = (*lsv->fpKV_GetKvErrorCodeEx)( pFilter );
        if ( kvErrorEx != KVError_Last )
            printf("KvErrorCodeEx = %d \n ", kvErrorEx );
    }
    ...
}
```

fpGetOLESummaryInfo()

This function extracts document metadata from an input stream.

Syntax

```
KVErrorCode pascal fpGetOLESummaryInfo(
    void          *pContext,
    KVInputStream *pInput,
    KVSummaryInfoEx *pSummaryInfo );
```

Arguments

<code>pContext</code>	A pointer returned from <code>fpInit()</code> .
<code>pInput</code>	A pointer to the developer-assigned instance of KVInputStream . The structure <code>KVInputStream</code> defines the input stream that contains the source.
<code>pSummaryInfo</code>	A pointer to the structure KVSummaryInfoEx . In the structure, <code>nElem</code> provides a count of the number of metadata elements, and <code>pElem</code> points to the first element of the array of individual elements as defined by the structure KVSumInfoElemEx .

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

- After the `pSummaryInfo` argument is successfully filled, and its data is no longer required, call [fpFreeOLESummaryInfo\(\)](#) to free the memory allocated by this function.
- This function runs in process or out of process. See [The Filter Process Model](#), on page 30.

fpGetOLESummaryInfoFile()

This function extracts document metadata from a file.

Syntax

```
KVErrorCode pascal fpGetOLESummaryInfoFile(  
    void          *pContext,  
    char          *szFile,  
    KVSummaryInfoEx *pSummaryInfo);
```

Arguments

pContext	A pointer returned from fpInit().
szFile	The name of the input file.
pSummaryInfo	A pointer to the KVSummaryInfoEx structure. In the structure, nElem provides a count of the number of metadata elements, and pElem points to the first element of the array of individual elements as defined by the KVSumInfoElemEx structure.

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

- After the pSummaryInfo argument is successfully filled, and its data is no longer required, call [fpFreeOLESummaryInfo\(\)](#) to free the memory allocated by this function.
- This function runs in process or out of process. See [The Filter Process Model](#), on page 30.

fpGetTrgCharSet()

This function verifies that the character set requested was actually used.

Syntax

```
KVCharSet pascal fpGetTrgCharSet(void *pContext);
```

Arguments

`pContext` A pointer returned from `fpInit()`.

Returns

The return value is one of the character sets listed in `kvtypes.h`.

fpGetXmpInfo()

This function extracts XMP metadata in stream mode.

Syntax

```
KVErrorCode pascal fpGetXmpInfo(  
    void *pContext,  
    KVInputStream *pInput,  
    KVXmpInfo *pXmpInfo,  
    DWORD dwXmpOptions );
```

Arguments

pContext	The pointer returned by fpInit() , on page 147.
pInput	A pointer to the input stream.
pXmpInfo	A pointer to the KVXmpInfo structure.
dwXmpOptions	Set this argument to 1 to return charset information, the raw XMP packet, and the path and value pairs of all XMP elements. Set this argument to 2 to return the raw XMP packet.

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

- After the `pXmpInfo` argument is successfully filled, and its data is no longer required, call [fpFreeXmpInfo\(\)](#) to free the memory allocated by this function.
- This function runs in process or out of process. See [The Filter Process Model](#), on page 30.
- XMP extraction is supported only for PDF, JPG, TIFF, and XML files.
- XMP extraction is supported on the Windows, Linux, AIX, FreeBSD, and OSX platforms.

fpGetXmpInfoFile()

This function extracts XMP metadata from a file.

Syntax

```
KVErrorCode pascal fpGetXmpInfoFile(
    void          *pMainContext,
    char          *szInputFile,
    KVXmpInfo     *pXmpInfo,
    DWORD         dwXmpOptions );
```

Arguments

- pMainContext** A pointer to the `TPMainContext` structure, which is defined in `kvtypes.h`.
- szInputFile** A pointer to the input file.
- pXmpInfo** A pointer to the [KVXmpInfo](#) structure.
- dwXmpOptions** Set this argument to 1 to return charset information, the raw XMP packet, and the path and value pairs of all XMP elements.
Set this argument to 2 to return the raw XMP packet.

Returns

The return value is an error code. See [KVErrorCode](#), on page 175.

Discussion

- After the `pXmpInfo` argument is successfully filled, and its data is no longer required, call [fpFreeXmpInfo\(\)](#) to free the memory allocated by this function.
- This function runs in process or out of process. See [The Filter Process Model](#), on page 30.
- XMP extraction is only supported for the PDF, JPG, TIFF, and XML files.
- XMP extraction is supported for the following platforms:
 - Windows x86 32-bit and 64-bit
 - Linux x86 32-bit and 64-bit
 - Linux x86 32-bit and 64-bit using libc6 library
 - Linux x86 32-bit and 64-bit for Redhat 4
 - Linux Itanium 64-bit

- AIX Risk 32-bit and 64-bit
- FreeBSD 32-bit
- OSX 32-bit Universal

fpInit()

This function initializes a Filter session. Its return value, `pContext`, is passed as the first argument to the File Extraction interface and all other Filter functions.

Syntax

```
void * pascal fpInit(
    KVMemoryStream *pMemAllocator,
    KVDynLink       *pDynLink,
    char            *pszKeyViewDir,
    KVCharSet       outputCharSet,
    DWORD           dwFlags );
```

Arguments

<code>pMemAllocator</code>	A pointer to a developer-defined memory allocator. If <code>NULL</code> is passed, the default C run-time memory allocation is used.
<code>pDynLink</code>	This argument is reserved. It must be <code>NULL</code> .
<code>pszKeyViewDir</code>	A pointer to the directory where the Filter components (such as the <code>formats.ini</code> file, license key file (<code>kv.lic</code>), and file filters) are located. This is normally the <code>install\OS\bin</code> directory.
<code>outputCharSet</code>	The character set to use for textual output when the source character set can be determined from the document or is specified by fpSetSrcCharSet() . The character sets are enumerated in <code>KVCharSet</code> in <code>kvtypes.h</code> .
<code>dwFlags</code>	Instructions on how to process a file or stream. See Flags for dwFlags, below for more information.

Flags for dwFlags

<code>KVF_CONTENTACCESS</code>	Reserved for internal use.
<code>KVF_METADATA</code>	Reserved for internal use.
<code>KVF_OUTOFPROCESS</code>	Enables out-of-process filtering. This is enabled by default. See The Filter Process Model, on page 30 .
<code>KVF_INPROCESS</code>	Enables in-process filtering. See The Filter Process Model, on page 30 .
<code>KVF_HEADERFOOTERTAGS</code>	Puts tags around header and footer data.
<code>KVF_HEADERFOOTER</code>	Extracts headers and footers.

KVF_UNICODEMSLSB	Uses the byte order for Big Endian systems (MSLSB) for Unicode text. MSLSB is the "Most Significant Byte Least Significant Byte."
KVF_UNICODELSMSB	Uses the byte order for Little Endian systems (LSBMSB) for Unicode text. LSBMSB is the "Least Significant Byte Most Significant Byte."
KVF_UNICODEMARKER	Generates the byte order marker for Unicode text.
KVF_NOCHARSETCONVERT	Prevents default conversion of document character encoding. See Prevent the Default Conversion of a Character Set, on page 66 .
KVF_OOPLOGON	Enables the out-of-process error log. See Enable or Disable Error Logging, on page 60 .
KVF_OOPMEMTRACEON	Enables memory trace for the out-of-process error log. See Report Memory Errors, on page 61 .
KVF_OOPLOGOFF	Disables the out-of-process error log. Enable or Disable Error Logging, on page 60 .
KVF_OOPMEMTRACEOFF	Disables memory trace for the out-of-process error log. See Report Memory Errors, on page 61 .
KVF_FILTERCONTAINERCONTENT	This flag is used by the Container API which is obsolete. It filters the main file and subfiles of a container file by using the standard filtering functions, and extracts the text to a single file.
KVF_DETECT_OUTOFPROCESS	Set these flags in <code>fpInit()</code> or <code>fpOpenStreamEx2()</code> to specify whether files are detected out of process or in process for a filtering session.
KVF_DETECT_INPROCESS	These flags override the <code>default_detect_inprocess</code> flag in <code>formats.ini</code> . If you set neither of these flags, file detection behavior is determined by the <code>KVF_OUTOFPROCESS</code> or <code>KVF_INPROCESS</code> flags in these calls. If you do not set these flags, behavior is determined by <code>default_detect_inprocess</code> in <code>formats.ini</code> . See Run File Detection In or Out of Process, on page 34 .

Returns

- If the call is successful, the return value is the pointer `pContext` which is passed as the first argument to all other File Extraction API and Filter API functions.
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- If this function returns `NULL`, check `stderr` for the KeyView installation error messages "KeyView Filter SDK License Key has Expired" and "KeyView Filter SDK License Key is Invalid", and pass them to your application.

- To make sure that multithreaded filter processes are thread-safe, you must create a unique context pointer for every thread by calling `fpInit()`. In addition, threads must not share context pointers, and you must use the same context pointer for all API calls in the same thread. Creating a context pointer for every thread does not affect performance because the context pointer uses minimal resources.
- When the filtering context is no longer required, call `fpShutdown()` to terminate it.

fpOpenStream()

This function opens a stream for filtering.

Syntax

```
void * pascal fpOpenStream(  
    void          *pContext,  
    KVInputStream  *pInput );
```

Arguments

pContext A pointer returned from `fpInit()`.

pInput A pointer to the developer-assigned instance of [KVInputStream](#). The structure `KVInputStream` defines the input stream that contains the source.

Returns

- If the call is successful, the return value is a `void *` pointer passed to [fpFilterStream\(\)](#), [fpCanFilterStream\(\)](#), and [fpCloseStream\(\)](#).
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- Before you call this function, you must create an input stream either by using the [fpFiletoInputStreamCreate\(\)](#) function, or by using code similar to the coding example in the Filter sample program. See [Use the C-Language Implementation of the API, on page 26](#) for more information.
- After filtering is complete, call [fpCloseStream\(\)](#) to free the memory allocated by this function.

fpOpenStreamEx2()

This function opens a stream for filtering and enables you to set bitwise flags for each stream.

Syntax

```
void * pascal fpOpenStreamEx2(  
    void          *pContext,  
    KVInputStream  *pInput,  
    DWORD          dwFlags);
```

Arguments

pContext A pointer returned from `fpInit()`.

pInput A pointer to the developer-assigned instance of [KVInputStream](#). The `KVInputStream` structure defines the input stream that contains the source.

dwFlags Instructions on how to process a stream. See [Flags for dwFlags, on page 147](#).

Returns

- If the call is successful, the return value is a `void *` pointer passed to [fpFilterStream\(\)](#), [fpCanFilterStream\(\)](#), and [fpCloseStream\(\)](#).
- If the call is unsuccessful, the return value is `NULL`.

Discussion

- Before you call this function, you must create an input stream either by using the [fpFiletoInputStreamCreate\(\)](#) function, or by using code similar to the coding example in the Filter sample program. See [Use the C-Language Implementation of the API, on page 26](#) for more information.
- After filtering is complete, call [fpCloseStream\(\)](#) to free the memory allocated by this function.

fpRefreshFilterKVOOP()

This function forces the out-of-process filtering server (`kvoop.exe`) to restart. This function is optional.

Syntax

```
int (pascal *fpRefreshFilterKVOOP)( void *pContext );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

Returns

- If the restart is successful, the return value is `KVERR_Success`.
- If the restart is unsuccessful, the return value is an error code.

NOTE:

There are several different error codes.

fpSetReplacementChar()

This function specifies a replacement character to use when a character cannot be mapped. This function is optional.

Syntax

```
B00L pascal fpSetReplacementChar( void *pContext, char c );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

`c` The replacement character to use when a character cannot be mapped. If you do not call this function, the default character is used.

The default is a question mark ("?").

Returns

- If the call is successful, the return value is `TRUE`.
- If the call is unsuccessful, the return value is `FALSE`.

fpSetSrcCharSet()

This function specifies a character set for the source document. Use this function if the character set information cannot be determined from the source document.

Syntax

```
B00L pascal fpSetSrcCharSet( void *pContext, KVCharSet eCharSet );
```

Arguments

pContext A pointer returned from fpInit().

eCharSet Specifies the source character set when the document reader for the document type cannot determine the character set. The character sets are enumerated in KVCharSet of kvtypes.h.

Returns

- If the call is successful, the return value is TRUE.
- If the call is unsuccessful, the return value is FALSE.

fpSetTimeout()

This function specifies the length of time that should elapse before assuming that the filtering process has stopped responding.

Syntax

```
B00L pascal fpSetTimeout( void *pContext, long lTimeout );
```

Arguments

pContext A pointer returned from fpInit().

lTimeout The length of time, in seconds, that must elapse before assuming that the filtering process has stopped responding.

Returns

- If the call is successful, the return value is TRUE.
- If the call is unsuccessful, the return value is FALSE.

fpShutdown()

This function terminates a filtering session that was initialized by `fpInit()`, and frees allocated system resources. It is called when the filtering context is no longer required.

Syntax

```
void pascal fpShutdown( void *pContext );
```

Arguments

`pContext` A pointer returned from `fpInit()`.

Returns

None.

Chapter 9: Filter API Structures

This section describes the data structures used by the Filter API. These structures are defined in `kvflt.h`, `kwautdef.h`, and `adinfo.h`.

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• KVFilterOutput	163
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KVFltInterfaceEx

The members of this structure are pointers to the functions described in [Filter API Functions, on page 121](#). When you call the [KV_GetFilterInterfaceEx\(\)](#) function, this structure assigns pointers to the functions. The structure is defined in `kvflt.h`.

```
typedef struct tag_KVFltInterfaceEx
{
    void *      (pascal *fpInit) ( KVMemoryStream *, KVDynLink *, char *, KVCharSet, DWORD
);
    void        (pascal *fpShutdown) (void *);
    void *      (pascal *fpOpenStream)( void *, KVInputStream * );
    void *      (pascal *fpOpenStreamEx2) (void *, KVInputStream *, DWORD);
    BOOL        (pascal *fpCloseStream)( void *, void * );
    BOOL        (pascal *fpCanFilterCharMap)( void *, adDocDesc * );
    KVErrCode    (pascal *fpCanFilterFile)( void *, char * );
    KVErrCode    (pascal *fpCanFilterStream) (void *, void *);
    KVErrCode    (pascal *fpFilterStream)( void *, void *, KVFilterOutput *,
KVSummaryInfoEx * );
    KVErrCode    (pascal *fpFilterFile)( void *, char *, char *, KVSummaryInfoEx * );
    KVErrCode    (pascal *fpGetOLESummaryInfo)( void *, KVInputStream *, KVSummaryInfoEx *
);
    KVErrCode    (pascal *fpGetOLESummaryInfoFile)( void *, char *, KVSummaryInfoEx * );
    BOOL        (pascal *fpFreeOLESummaryInfo)( void *, KVSummaryInfoEx * );
    KVCharSet    (pascal *fpGetTrgCharSet)( void * );
    BOOL        (pascal *fpSetTimeout)( void *, long );
    BOOL        (pascal *fpSetSrcCharSet)( void *, KVCharSet );
    BOOL        (pascal *fpSetReplacementChar)( void *, char );
    BOOL        (pascal *fpGetDocInfoStream)( void *, KVInputStream *, ADDOCINFO * );
    BOOL        (pascal *fpGetDocInfoFile)( void *, char *, ADDOCINFO * );
    BOOL        (pascal *fpIsArchiveFile)( void *, char * );
    BOOL        (pascal *fpIsArchiveFileSupported)( void *, char * );
    void *      (pascal *fpOpenArchiveFile)( void *, char * );
    int          (pascal *fpGetNumFilesInArchiveFile)( void * );
    KVErrCode    (pascal *fpGetArchiveFileInfo)( void *, int, TPArchiveFileInfo * );
    KVErrCode    (pascal *fpExtractArchiveFile)( void *, int, char * );
    BOOL        (pascal *fpCloseArchiveFile)( void * );
    /* Revision 1 of Filter Interface API starts here (#define KVFLTINTERFACE_REVISION). */
    BOOL        (pascal *fpFileToInputStreamCreate)(void *, char *, KVInputStream *);
    BOOL        (pascal *fpFileToInputStreamFree)(void *, KVInputStream *);
    KVErrCode    (pascal *fpCanFilterAsContainer)(void *, KVInputStream *);
    void *      (pascal *fpOpenContainerStream)(void *, KVInputStream *);
    BOOL        (pascal *fpCloseContainerStream)( void *, void *);
    int          (pascal *fpGetNumFilesInContainer)( void *, void *);
    KVErrCode    (pascal *fpGetContainerSubFileInfo)( void *, void *, int,
TPContainerSubFileInfo *);
    BOOL        (pascal *fpSetExtractionPath)(void *, void *, char *, BOOL);
    void        (pascal *fpSetExtractionOverwrite)( void *, void *, BOOL);
    KVErrCode    (pascal *fpExtractContainerSubFile)( void *, void *, int,
```

```

TPContainerSubFileInfo *);
KVErrCode (pascal *fpGetContainerContent)( void *, void *, KVFilterOutput *,
BOOL * );
KVErrCodeEx (pascal *fpGetKvErrCodeEx)( void *pContext );
BOOL (pascal *fpFilterConfig)( void *pContext, int nType, int nValue, void
*p );
/* Revision 2 of Filter Interface API starts here (#define KVFLTINTERFACE_REVISION)
*/
KVErrCode (pascal *fpGetSubFileMetadada)( void *, void *, int, int *, int,
KVSummaryInfoEx *, int );
KVErrCode (pascal *fpFreeSubFileMetadada)( void *, void *, KVSummaryInfoEx * );
}
KVfltInterfaceEx;
KVErrCode pascal KV_GetFilterInterfaceEx( KVfltInterfaceEx *pInterfaceEx, int
version );

```

Member Descriptions

The member functions are described in [Filter API Functions, on page 121](#).

Discussion

The following functions are deprecated:

- fpIsArchiveFile
- fpIsArchiveFileSupported
- fpOpenArchiveFile
- fpGetNumFilesInArchiveFile
- fpGetArchiveFileInfo
- fpExtractArchiveFile
- fpCloseArchiveFile
- fpCanFilterCharMap
- fpCanFilterAsContainer
- fpCloseContainerStream
- fpGetNumFilesInContainer
- fpGetContainerSubFileInfo
- fpSetExtractionPath
- fpSetExtractionOverwrite
- fpExtractContainerSubFile

- `fpGetContainerContent`
- `fpFreeSubFileMetadada`

ADDOCINFO

This structure contains the format, file class, and version number of the source document. The structure is defined in `adinfo.h`, and is initialized by calling the [fpGetDocInfoFile\(\)](#) or [fpGetDocInfoStream\(\)](#) functions.

```
typedef struct
{
    ENdocClass      eClass;
    ENdocFmt        eFormat;
    long            lVersion;
    unsigned long    ulAttributes;
}
ADDOCINFO, *ADDOCINFOPTR;
```

Member Descriptions

<code>eClass</code>	The file class of the source document (for example, spreadsheet, word processor, or encapsulation format), as defined by the enumerated type <code>ENdocClass</code> in <code>adinfo.h</code> .
<code>eFormat</code>	The major format of the source document (for example Microsoft Word XML format or Corel Presentation), as defined by the enumerated type <code>ENdocFmt</code> in <code>adinfo.h</code> . The <code>ENdocFmt</code> type provides a unique ID for each major format.
<code>lVersion</code>	The version number of the file format. The number is multiplied by 1,000 (for example, 1.02 is represented by 1020).
<code>ulAttributes</code>	Other attributes of the document, as defined by the enumerated type <code>ENdocAttributes</code> in <code>adinfo.h</code> .

Discussion

When format detection is enhanced in future releases, new format IDs might be added to the `ENdocFmt` enumerated type. When using this type, your code should ensure binary compatibility with future releases. For example, if you use an array to access format information based on a format ID, your code should check that the format ID is less than `Max_Fmt` before accessing the data. This ensures that new format codes are detected when you add KeyView binary files from new releases to your existing installation.

KV_CONFIG_Arg

This structure defines configurable arguments to use as the data in the [fpFilterConfig\(\)](#) function when you set the `KVFLT_SetConfigurableArguments` flag to `TRUE`. The structure is described in `kvtypes.h`.

Use this structure to control the filtering of hidden data from Microsoft Excel documents. See [Filter Hidden Data, on page 84](#).

```
typedef struct _KV_CONFIG_ARG_TAG
{
    unsigned int    keyID;
    int             keyType;
    KV_CONFIG_DATA  keyData;
    unsigned int    keyDataSize;
}
KV_CONFIG_Arg;
```

Member Descriptions

<code>keyID</code>	Determines the kind of configuration flags that you can use as values of <code>keyData</code> . If you use the same <code>keyID</code> more than once, the most recent setting overrides the previous setting.
<code>keyType</code>	The type of data for the <code>keyData</code> element. Set to <code>KV_INT32ARG</code> .
<code>keyData</code>	<code>KV_CONFIG_DATA</code> is a union defined in <code>kvtypes.h</code> . Only <code>intArg</code> is supported, where the value of <code>intArg</code> is one of the flags in the corresponding <code>keyID</code> .
<code>keyDataSize</code>	The size of <code>keyData</code> . This is reserved for future use.

KVFilterOutput

This structure defines an output buffer for filtering. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVFilterOutput
{
    BYTE      *pcText;
    int       cbText;
}
KVFilterOutput;
```

Member Descriptions

`pcText` A pointer to the text returned from [fpFilterStream\(\)](#).

`cbText` The number of valid bytes in `pcText`.

KVInputStream

This structure defines an input stream for filtering. The structure is defined in `kvtypes.h`.

```
typedef struct tag_InputStream
{
    void *pInputStreamPrivateData;
    long lcbFilesize;
    BOOL (pascal *fpOpen) (struct tag_InputStream *);
    UINT (pascal *fpRead) (struct tag_InputStream *, BYTE *, UINT);
    BOOL (pascal *fpSeek) (struct tag_InputStream *, long, int);
    long (pascal *fpTell) (struct tag_InputStream *);
    BOOL (pascal *fpClose)(struct tag_InputStream *);
}
KVInputStream;
```

Member Descriptions

- All member functions are equivalent to their counterparts in the ANSI standard library, except `fpOpen()`, which returns `FALSE` on failure.
- On `fpOpen()`, if the size of the stream is known, assign that value to `lcbFilesize`. Otherwise, set `lcbFilesize` to 0.

KVMemoryStream

This structure defines an optional memory allocator to be used by Filter. Behavior for all functions is the same as for their C run-time equivalents. The structure is defined in `kvtypes.h`.

```
typedef struct tag_MemoryStream
{
    void *pMemoryStreamPrivateData;
    void * (pascal *fpMalloc) (struct tag_MemoryStream*, size_t );
    void (pascal *fpFree) (struct tag_MemoryStream*, void *);
    void * (pascal *fpRealloc) (struct tag_MemoryStream*, void *, size_t);
    void * (pascal *fpCalloc) (struct tag_MemoryStream*, size_t, size_t);
}
KVMemoryStream;
```

Member Descriptions

- All member functions are equivalent to their counterparts in the ANSI standard library.
- `fpRealloc()` must handle a `NULL` pointer.

KVStructHead

This structure contains the current KeyView version number, and is the first member of other structures. It enables Micro Focus to modify the structures in future releases, but to maintain backward compatibility. Before you initialize a structure that contains the `KVStructHead` structure, use the macro `KVStructInit` to initialize `KVStructHead`. The structure and macro are defined in `kvtypes.h`.

```
typedef struct _KVStructHead
{
    WORD        version;
    WORD        size;
    DWORD       reserved;
    void        *internal;
}
KVStructHeadRec, *KVStructHead;
```

Member Descriptions

<code>version</code>	The current KeyView version number. This is a symbolic constant (<code>KeyviewVersion</code>) defined in <code>kvxtract.h</code> . This constant is updated for each KeyView release.
<code>size</code>	The size of the <code>KVStructHeadRec</code> .
<code>reserved</code>	Reserved for internal use.
<code>internal</code>	Reserved for internal use.

Example

```
KVOpenFileArgRec    openArg;
KVStructInit(&openArg);
```

KVSumInfoElemEx

This structure contains the individual metadata elements. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVSumInfoElemEx
{
    int                isValid;
    KVSumInfoType      type;
    void               *data;
    char               *pcType;
}
KVSumInfoElemEx;
```

Member Descriptions

- | | |
|----------------------|---|
| <code>isValid</code> | Specifies whether the data value is present in the document. The setting 1 specifies that the value is valid and exists. For example, if the "Title" element is not populated in the document, <code>pSummaryInfo.pElem[1].isValid == 0</code> evaluates to true. |
| <code>type</code> | The data type of the metadata element. The types are defined in KVSumInfoType in <code>kvtypes.h</code> . |
| <code>data</code> | <p>The content of the metadata field.</p> <p>If the <code>type</code> member is <code>KV_Int4</code>, or <code>KV_Bool</code>, this member contains the actual value. Otherwise, this member is a pointer to the actual value.</p> <p><code>KV_DateTime</code> and <code>KV_IEEE8</code> point to an 8-byte value.</p> <p><code>KV_String</code> and <code>KV_Unicode</code> point to the beginning of the string that contains the text. <code>KV_Unicode</code> is replaced with <code>KV_String</code> when the UNICODE value has been character mapped to the desired output character set as specified in the call to <code>fpInit()</code>.</p> |
| <code>pcType</code> | A pointer to the name of the metadata field. |

KVSummaryInfoEx

This structure contains a count of the number of metadata elements, and a pointer to the first element of the array of individual elements. The structure is defined in `kvtypes.h`.

```
typedef struct tag_KVSummaryInfoEx
{
    int                nElem;
    KVSumInfoElemEx    *pElem;
}
KVSummaryInfoEx;
```

Member Descriptions

- nElem** The number of metadata elements contained in the array. A value of zero indicates that the document did not contain metadata, such as an ASCII text document.
- pElem** A pointer to the first element of the array of metadata elements defined by the structure [KVSumInfoElemEx](#).

KVXConfigInfo

This structure defines an XML document type and the element extraction settings for that type. You can apply the settings based on the file format ID, or the root element of the file. This structure is in `kvtypes.h`.

```
typedef struct TAG_KVXConfigInfo
{
    ENdocFmt      eKVFormat;
    char*         pszRoot;
    char*         pszInMeta;
    char*         pszExMeta;
    char*         pszInContent;
    char*         pszExContent;
    char*         pszInAttribute;
}
KVXConfigInfo;
```

Member Descriptions

eKVFormat	<p>The format ID as detected by the KeyView detection module. This determines the file type to which these extraction settings apply. The format ID is defined by the enumerated type <code>ENdocFmt</code>. See File Format Detection, on page 302 for more information on format ID values.</p> <p>If you are adding configuration settings for a custom XML document type, this is not defined.</p>
pszRoot	<p>The root element of the file. If the format ID is not defined, the root element is used to determine the file type to which these settings apply.</p> <p>To further qualify the element, specify its namespace. See Specify an Element's Namespace and Attribute, on page 82.</p>
pszInMeta	<p>The elements extracted from the file as metadata. All other elements are extracted as text. Separate multiple entries with commas.</p> <p>To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 82.</p>
pszExMeta	<p>The child elements in the included metadata elements that are not extracted from the file as metadata. For example, the default extraction settings for the Visio XML format extract the <code>DocumentProperties</code> element as metadata. This element includes child elements such as <code>Title</code>, <code>Subject</code>, <code>Author</code>, <code>Description</code>, and so on. However, the child element <code>PreviewPicture</code> is defined in <code>pszExMeta</code> because it is binary data and should not be extracted.</p> <p>You cannot exclude any metadata elements from the output for StarOffice files. All metadata is extracted regardless of this setting.</p>

	To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 82 .
pszInContent	The elements extracted from the file as content text. An asterisk (*) extracts all elements including child elements. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 82 .
pszExContent	The child elements in the included content elements that are not extracted from the file as content text. To further qualify the element, specify its namespace, its attributes, or both. See Specify an Element's Namespace and Attribute, on page 82 .
pszInAttribute	The attribute values extracted from the file. If attributes are not defined, attribute values are not extracted. You must define the namespace (if used), element name, and attribute name in the following format: <i>namespace:elementname@attributename</i> For example: microfocus:division@name

KVXmpInfo

This structure contains the XMP metadata, and is defined in `kvtypes.h`.

```
typedef struct tag_KVXmpInfo
{
    KVCharSet          encoding;
    BOOL               bIsLittleEndian;
    UINT               nNoOfElements;
    KVXmpInfoElem      *pXmpInfoElems;
    KV_I18NSTR          usXpacketData;
    void               *pExtension;
}
KVXmpInfo;
```

Member Descriptions

<code>encoding</code>	The type of encoding.
<code>bIsLittleEndian</code>	Indicates whether little-endian byte ordering is used.
<code>nNoOfElements</code>	The total number of elements.
<code>pXmpInfoElems</code>	A pointer to the KVXmpInfoElems structure.
<code>usXpacketData</code>	A copy of the XMP data.
<code>pExtension</code>	A reserved pointer.

KVXmpInfoElems

This structure contains the individual XMP metadata elements, and is defined in `kvtypes.h`.

```
typedef struct tag_KVXmpInfoElem
{
    KV_I18NSTR      usXPathToElement;
    KV_I18NSTR      usValue;
}
KVXmpInfoElem;
```

Member Descriptions

`usXPathToElement` The path to the XMP element.

`usValue` The value of the XMP element.

Chapter 10: Enumerated Types

This section provides information on some of the enumerated types used by the Filter API.

- [Introduction](#) 173
- [KVCredKeyType](#) 174
- [KVErrorCode](#) 175
- [KVErrorCodeEx](#) 176
- [KVMetadataType](#) 180
- [KVMetaNameType](#) 182
- [KVSumInfoType](#) 182
- [KVSumType](#) 183
- [LPDF_DIRECTION](#) 187

Introduction

The enumerated types are in `adinfo.h`, `kvtypes.h`, `kv.h`, and `kvxtract.h`. These header files are in the `include` directory. The first entry in an enumerated type structure should be set to zero (0). Each subsequent entry is increased by 1. For example, the first five entries of `KVCharSet` in `kvtypes.h` are:

```
KVCS_UNKNOWN
KVCS_SJIS
KVCS_GB
KVCS_BIG5
KVCS_KSC
```

They would be set in the following way:

Enumerated Type	Setting
-----------------	---------

KVCS_UNKNOWN	0
KVCS_SJIS	1
KVCS_GB	2
KVCS_BIG5	3
KVCS_KSC	4

You can also set many enumerated types by entering the appropriate symbolic constant, or `TRUE` or `FALSE`.

Programming Guidelines

When KeyView is enhanced in future releases, some enumerated types might be expanded. For example, new format IDs might be added to the `ENdocFmt` enumerated type, or new error codes might be added to the `KVErrorCodeEx` enumerated type. When you use these expandable types, your code should ensure binary compatibility with future releases.

For example, if you use an array to access error messages based on an error code, your code should check that the error code is less than `KVError_Last` before accessing the data. This ensures that new error codes are detected when you add KeyView binary files from new releases to your existing installation.

The following enumerated types are expandable:

`KVErrorCodeEx`

`KVMetadataType`

`KVCharSet`

`KVLanguageID`

`KVSubfileType`

`ENdocFmt`

KVCredKeyType

This enumerated type defines the type of credential used to open a protected file. See [KVCredentialComponent](#), on page 107. This enumerated type is defined in `kvextract.h`.

Definition

```
typedef enum tag_KVCredKeyType
{
    KVCredKeyType_UserName,
    KVCredKeyType_UserIdFile,
    KVCredKeyType_Password,
}
KVCredKeyType;
```

Enumerators

<code>KVCredKeyType_UserName</code>	The credential in <code>KVCredentialComponent</code> is a user name.
<code>KVCredKeyType_UserIdFile</code>	The credential in <code>KVCredentialComponent</code> is a path to a file that contains user IDs.

KVCredKeyType_Password The credential in KVCredentialComponent is a password.

KVErrorCode

This enumerated type defines the type of error generated if Filter fails. This enumerated type is defined in kvtypes.h.

Definition

```
typedef enum tag_KVErrorCode
{
    KVERR_Success,                /* 0  Success*/
    KVERR_DLLNotFound,           /* 1  DLL or shared library not found*/
    KVERR_OutOfCore,             /* 2  memory allocation failure*/
    KVERR_processCancelled,      /* 3  fpContinue() returns FALSE*/
    KVERR_badInputStream,        /* 4  Invalid/corrupt input stream*/
    KVERR_badOutputType,         /* 5  Invalid output type requested*/
    KVERR_General,               /* 6  General error.... */
    KVERR_FormatNotSupported,    /* 7  Format not supported*/
    KVERR_PasswordProtected,     /* 8  File is Password Protected*/
    KVERR_ADSNotFound,           /* 9  Adobe Document Server not found*/
    KVERR_AutoDetFail,           /* 10 Autodetect error*/
    KVERR_AutoDetNoFormat,       /* 11 Unable to detect file format*/
    KVERR_ReaderInitError,       /* 12 Error initializing the reader*/
    KVERR_NoReader,              /* 13 No reader available for this format*/
    KVERR_CreateOutputFileFailed, /* 14 Unable to create output file*/
    KVERR_CreateTempFileFailed,  /* 15 Unable to create temp file*/
    KVERR_ErrorWritingToOutputFile, /* 16 Error writing to output file*/
    KVERR_CreateProcessFailed,   /* 17 Error creating a child process*/
    KVERR_WaitForChildFailed,     /* 18 Wait for child process failed*/
    KVERR_ChildTimeOut,          /* 19 Child process hung / timed out*/
    KVERR_ArchiveFileNotFound,   /* 20 Attempt to extract nonexistent file*/
    KVERR_ArchiveFatalError      /* 21 Fatal error processing archive - should abort*/
}
KVErrorCode;
```

Enumerators

KVERR_SUCCESS	The function completed successfully.
KVERR_DLLNotFound	A DLL or shared library was not found.
KVERR_OutOfCore	Memory allocation failure.
KVERR_processCancelled	The callback function fpContinue() returns FALSE.

KVERR_badInputStream	Invalid or corrupt input stream.
KVERR_badOutputType	Invalid output is requested.
KVERR_General	General error. To return a more detailed message for KVERR_General, call fpGetKvErrorCodeEx() .
KVERR_FormatNotSupported	The file format is not supported.
KVERR_PasswordProtected	The file is encrypted or password-protected. KeyView supports only secure PST files.
KVERR_ADSNotFound	Adobe Document Server not found. This error is obsolete.
KVERR_AutoDetFail	Autodetect error.
KVERR_AutoDetNoFormat	Unable to detect file format.
KVERR_ReaderInitError	Error initializing the reader.
KVERR_NoReader	No reader is available for this format.
KVERR_CreateOutputFileFailed	Unable to create output file. This error is generated if the overwrite flag in KVExtractSubFileArg is FALSE, and a subfile has the same name as a file in the target path.
KVERR_CreateTempFileFailed	Unable to create temporary file.
KVERR_ErrorWritingToOutputFile	There was an error writing to the output file.
KVERR_CreateProcessFailed	There was an error creating a child process.
KVERR_WaitForChildFailed	The wait for child process failed.
KVERR_ChildTimeOut	The child process hung or timed out.
KVERR_ArchiveFileNotFound	Attempt to extract nonexistent file.
KVERR_ArchiveFatalError	A fatal error occurred processing an archive file.

KVErrorCodeEx

This enumerated type defines extended error codes. The type is defined in `kvtypes.h`.

Some of these error codes provide more information when `fpFilterFile()` or `fpFilterStream()` returns the error KVERR_General. To return these error codes, call [fpGetKvErrorCodeEx\(\)](#).

Definition

```
typedef enum tag_KVErrorCodeEx
{
    KVErrror_OpenStreamFailure = KVERR_ArchiveFatalError + 1, /* 22 KVOpen stream
failure */
    KVErrror_InterfaceFunctionNotFound, /* 23 Interface function not found */
    KVErrror_InputFileNotFound, /* 24 Cannot find input file*/
    KVErrror_OpenOutputFileFailed, /* 25 Cannot open output file*/
    KVErrror_MemoryLeak, /* 26 Memory leak*/
    KVErrror_MemoryOverwrite, /* 27 Memory overwrite*/
    KVErrror_GPF, /* 28 Exception during oop filtering*/
    KVErrror_OopCore, /* 29 Core dump in child process*/
    KVErrror_KVoopLogFailed, /* 30 Creation of oop error log failed*/
    KVErrror_OverNestedFileLimit, /* 31 File exceeds nested file limit*/
    KVErrror_PSTAccessFailed, /* 32 Access failed on PST files*/
    KVErrror_PasswordRequired, /* 33 Password required to access file*/
    KVErrror_InvalidArgs /* 34 Input argument/structure is invalid*/
    KVErrror_ReaderUsageDenied, /* 35 Reader requires a valid license*/
    KVErrror_OopBadConfig, /* 36 Config buffer data was incomplete*/
    KVErrror_OopBrokenPipe, /* 37 Read/write to/from pipe failed*/
    KVErrror_OopPipeOEF, /* 38 Pipe was closed prior to read/write*/
    KVErrror_IPCTimeOut, /* 39 Pipe/socket timed out on poll/select*/
    KVErrror_InvalidOopDriverSignature, /* 40 Client sent request to OOP server but
context driver does not exist on the server*/
    KVErrror_InvalidOopServiceSignature, /* 41 Client sent request to OOP service that
does not exist*/
    KVErrror_ZeroFile, /* 42 Input file is empty or zero bytes */
    KVErrror_CompressionNotSupported /* 43 File or subfile is compressed with
unsupported method *//KVErrror_NoTemplates /* 44 No templates found (nsfsr) */
    KVErrror_NoMainTemplate /* 45 No main template found (nsfsr) */
    KVErrror_InvalidTemplate /* 46 Invalid template (nsfsr) */
    KVErrror_TemplateError /* 47 Template error (nsfsr) */
    KVErrror_IsADirectory /* 48 A directory exists at the given pathname */
    KVErrror_Last /* 49 */
}
KVErrorCodeEx;
```

Enumerators

KVErrror_OpenStreamFailure = KVERR_ArchiveFatalError +1	Failed to open a stream during out-of-process filtering. This is an extended error for the KVERR_General code.
KVErrror_ InterfaceFunctionNotFound	An interface function was not found during out-of-process filtering. This is an extended error for the KVERR_General code.

<code>KVError_InputFileNotFound</code>	Could not find the input file during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_OpenOutputFileFailed</code>	Could not open the output file during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_MemoryLeak</code>	A memory leak occurred during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_MemoryOverwrite</code>	A memory overwrite occurred during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_GPF</code>	An exception occurred during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_OopCore</code>	A memory dump was generated in a child process during out-of-process filtering. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_KVoopLogFailed</code>	The creation of the out-of-process error log failed. This is an extended error for the <code>KVERR_General</code> code.
<code>KVError_OverNestedFileLimit</code>	The container file has more than the allowable number of child documents. One or more child documents were not converted. Currently, this enumerator is not used.
<code>KVError_PSTAccessFailed</code>	<p>The PST file could not be converted. This error might be returned when a call to <code>fpOpenFile()</code> returns <code>NULL</code> for one of the following reasons:</p> <ul style="list-style-type: none"> • A Microsoft Outlook client is not installed. • A Microsoft Outlook client is installed, but is not the default email client. • A Microsoft Outlook client is installed, but is not configured correctly. • The PST file is corrupt. • The PST file is read-only (PST files must allow read and write access). • The MAPI call fails. • The bit editions of Microsoft Outlook do not match the bit editions of the KeyView software. <p>For example, if 32-bit KeyView is used, 32-bit Outlook must be installed. If 64-bit KeyView is used, 64-bit Outlook must be installed.</p>
<code>KVError_PasswordRequired</code>	To open the file, you must provide credentials. This error might be returned when a call to <code>fpOpenFile()</code> returns <code>NULL</code> .

KVError_InvalidArgs	The input argument or structure is invalid. This error is generated by the File Extraction APIs.
KVError_ReaderUsageDenied	<p>The current license key does not enable the document reader required to filter the file. This error might be returned when a call to <code>fpOpenFile()</code> returns <code>NULL</code>.</p> <p>Some document readers are considered advanced features and are licensed separately from the KeyView SDK (for example, the PST and MBX readers). Contact your Micro Focus sales representative to get an updated license key.</p>
KVError_OopBadConfig	Information in the <code>kvxconfig.ini</code> file is incomplete and cannot be used to filter the XML file.
KVError_OopBrokenPipe	Data was not transferred between the parent and child processes during out-of-process filtering because either the parent or child failed.
KVError_OopPipeOEF	Data was not transferred between the parent and child processes during out-of-process filtering because the parent process was shut down.
KVError_IPCTimeOut	Either the parent or child process is waiting for a reply or request during out-of-process filtering.
KVError_InvalidOopDriverSignature	A client sent a request to an out-of-process server, but the context driver does not exist on the server.
KVError_InvalidOopServiceSignature	<p>A client sent a request to a File Extraction service that does not exist.</p> <p>If this error is generated on the call to <code>fpClose()</code>, you can ignore it.</p>
KVError_ZeroFile	The input file is empty or zero bytes.
KVError_CompressionNotSupported	The file or subfile is compressed with an unsupported compression method.
KVError_NoTemplates	
KVError_NoMainTemplate	
KVError_InvalidTemplate	
KVError_TemplateError	
KVError_IsADirectory	
KVError_Last	

Discussion

- When error reporting is enhanced in future releases, new error messages might be added to this enumerator type. When you use this type, your code must ensure binary compatibility with future releases. See [Programming Guidelines, on page 174](#).
- If an extended error code is called for a format to which the error does not apply, the `KVError_Last` code is returned.

<code>VectorPictureAnchor</code>	An anchor for embedded vector graphics.
<code>RasterPictureAnchor</code>	An anchor for embedded raster graphics.
<code>H1Anchor</code>	An anchor for level 1 heading blocks (H1).
<code>H2Anchor</code>	An anchor for level 2 heading blocks (H2).
<code>H3Anchor</code>	An anchor for level 3 heading blocks (H3).
<code>H4Anchor</code>	An anchor for level 4 heading blocks (H4).
<code>H5Anchor</code>	An anchor for level 5 heading blocks (H5).
<code>H6Anchor</code>	An anchor for level 6 heading blocks (H6).
<code>XAnchor</code>	An anchor for an external file.
<code>AnimatedGIFAnchor</code>	An anchor for embedded animated GIF graphics.
<code>CSSAnchor</code>	An anchor for an external CSS file.
<code>GeneralAnchor</code>	Reserved for future use.
<code>DBAnchor</code>	Used internally.
<code>JPEGAnchor</code>	An anchor for an embedded JPEG graphic.

KVMetadataType

This enumerated type defines the data type of metadata that can be extracted from a subfile in a mail message or mail store. If a metadata field has a corresponding KeyView type in `KVMetadataType`, the metadata is converted to the [KVMetadataElem](#) structure, and the structure member `isDataValid` is 1. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum
{
    KVMetadata_Unknown    = 0,
```

```

KVMetadata_Bool          = 1,
KVMetadata_Binary        = 2,
KVMetadata_Int4          = 3,
KVMetadata_UInt4         = 4,
KVMetadata_Int8          = 5,
KVMetadata_UInt8         = 6,
KVMetadata_String        = 7,
KVMetadata_Unicode       = 8,
KVMetadata_DateTime      = 9,
KVMetadata_Float         = 10,
KVMetadata_Double        = 11,
KVMetadata_Last
}
KVMetadataType;

```

Enumerators

KVMetadata_Unknown	The value in the property is of an unknown type.
KVMetadata_Bool	The value in the property is a Boolean value. The corresponding MAPI type is PT_BOOLEAN.
KVMetadata_Binary	The value in the property is a byte array. The corresponding MAPI type is PT_BINARY.
KVMetadata_Int4	The value in the property is a signed 4-byte integer. The corresponding MAPI types are PT_I2, PT_SHORT, PT_I4, and PT_LONG.
KVMetadata_UInt4	The value in the property is an unsigned 4-byte integer. This type is not currently supported.
KVMetadata_Int8	The value in the property is a signed 8-byte integer. This type is not currently supported.
KVMetadata_UInt8	The value in the property is an unsigned 8-byte integer. This type is not currently supported.
KVMetadata_String	The value in the property is a string. The corresponding MAPI type is PT_STRING8.
KVMetadata_Unicode	The value in the property is a Unicode string. The corresponding MAPI type is PT_UNICODE.
KVMetadata_DateTime	The value in the property is a date and time. The corresponding MAPI type is PT_SYSTIME.
KVMetadata_Float	The value in the property is a 4-byte float. The corresponding MAPI type is PT_FLOAT.
KVMetadata_Double	The value in the property is an 8-byte double. The corresponding MAPI type is PT_DOUBLE.

Discussion

New types might be added to this enumerated type. When you use this type, your code should ensure binary compatibility with future releases. See [Programming Guidelines, on page 174](#).

KVMetaNameType

This enumerated type defines the type of metadata fields extracted from a subfile in a mail message or mail store. See [KVMetaName, on page 113](#). This enumerated type is defined in `kvextract.h`.

Definition

```
typedef enum
{
    KVMetaNameType_Integer = 0,
    KVMetaNameType_String  = 1
}
KVMetaNameType;
```

Enumerators

`KVMetaNameType_Integer` The metadata field is an integer.

`KVMetaNameType_String` The metadata field is a string.

KVSumInfoType

This enumerated type defines the data type of the metadata field extracted from a document. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum tag_KVSumInfoType
{
    KV_String      = 0x1,
    KV_Int4        = 0x2,
    KV_DateTime    = 0x3,
    KV_ClipBoard   = 0x4,
    KV_Bool        = 0x5,
    KV_Unicode     = 0x6,
    KV_IEEE8       = 0x7,
    KV_Other       = 0x8
}
KVSumInfoType;
```

Enumerators

<code>KV_String</code>	The value in the metadata field is a string.
<code>KV_Int4</code>	The value in the metadata field is an integer.
<code>KV_DateTime</code>	<p>The value in the metadata field is a date and time. This type is a 64-bit value representing the number of 100-nanosecond intervals since January 1, 1601 (Windows FILETIME EPOCH). You might need to convert this value into another format.</p> <p>The Filter sample program demonstrates how to convert this value to another format. The program translates <code>KV_DATETIME</code> to a UNIX timestamp, that is, the number of seconds since 00:00:00 (UTC), January 1, 1970. It then uses the <code>ctime</code> system library call, which works on UNIX and Windows, to print the date in the following format:</p> <p>Thu Aug 22 16:19:07 2002</p>
<code>KV_ClipBoard</code>	Currently not supported.
<code>KV_Bool</code>	The value in the metadata field is a Boolean value.
<code>KV_Unicode</code>	The value in the metadata field is a Unicode string.
<code>KV_IEEE8</code>	The value in the metadata field is an IEEE 8-byte integer.
<code>KV_Other</code>	The value in the metadata field is user-defined.

KVSumType

This enumerated type defines the metadata fields that can be extracted from a document. This enumerated type is defined in `kvtypes.h`.

- Types 0 to 34 and type 42 are Office summary fields.
- Types 35 to 40 are computer-aided design (CAD) metadata fields.
- Type 41, `KV_OrigAppVersion`, is shared by Office software and CAD.

Types 43 or greater are reserved for any non-standard metadata field defined in a document.

Definition

```
typedef enum tag_KVSumType
{
    KV_CodePage          = 0,
    KV_Title              = 1,
    KV_Subject            = 2,
    KV_Author             = 3,
    KV_Keywords           = 4,
```

```
KV_Comments           = 5,  
KV_Template           = 6,  
KV_LastAuthor         = 7,  
KV_RevNumber          = 8,  
KV_EditTime           = 9,  
KV_LastPrinted        = 10,  
KV_Create_DTM         = 11,  
KV_LastSave_DTM       = 12,  
KV_PageCount          = 13,  
KV_WordCount          = 14,  
KV_CharCount          = 15,  
KV_ThumbNail          = 16,  
KV_AppName            = 17,  
KV_Security           = 18,  
KV_Category           = 19,  
KV_PresentationTarget = 20,  
KV_Bytes              = 21,  
KV_Lines              = 22,  
KV_Paragraphs         = 23,  
KV_Slides             = 24,  
KV_Notes              = 25,  
KV_HiddenSlides       = 26,  
KV_MMClips            = 27,  
KV_ScaleCrop          = 28,  
KV_HeadingPairs       = 29,  
KV_TitlesofParts      = 30,  
KV_Manager            = 31,  
KV_Company            = 32,  
KV_LinksUpToDate      = 33,  
KV_HyperlinkBase      = 34,  
KV_Layouts            = 35,  
KV_Objects            = 36,  
KV_FileVersion        = 37,  
KV_LastFileVersion    = 38,  
KV_OrigFileVersion    = 39,  
KV_OrigFileType       = 40,  
KV_OrigAppVersion     = 41,  
KV_ContentStatus      = 42,  
KV_UserDefined        = 43  
}  
KVSumType;
```

Enumerators

KV_CodePage	The code page of the document.
KV_Title	The contents of the "Title" property field taken from the source document.

KV_Subject	The contents of the "Subject" property field taken from the source document.
KV_Author	The contents of the "Author" property field taken from the source document.
KV_Keywords	The contents of the "Keywords" property field taken from the source document.
KV_Comments	The contents of the "Comments" property field taken from the source document.
KV_Template	The contents of the "Template" property field taken from the source document.
KV_LastSavedby	The contents of the "Last saved by" property field taken from the source document.
KV_RevNumber	The contents of the "Revision number" property field taken from the source document.
KV_EditTime	The contents of the "Total editing time" property field taken from the source document.
KV_LastPrinted	The contents of the "Printed" property field taken from the source document.
KV_Create_DTM	The contents of the "Created" property field taken from the source document.
KV_LastSave_DTM	The contents of the "Modified" property field taken from the source document.
KV_PageCount	The contents of the "Pages" property field taken from the source document. The field provides the number of pages in the document.
KV_WordCount	The contents of the "Words" property field taken from the source document. The field provides the number of words in the document.
KV_CharCount	The contents of the "Characters" property field taken from the source document. The field provides the number of characters in the document.
KV_ThumbNail	A thumbnail image of a document.
KV_AppName	The contents of the "Type" property field taken from the source document. This field identifies the application used to read the document.
KV_Security	The contents of the "Attributes" property field taken from the source document.
KV_Category	The contents of the "Category" property field taken from the source document.
KV_PresentationTarget	The target format for presentations (35mm, printer, video, and so on).
KV_Bytes	The contents of the "Size" property field taken from the source document. The field provides the size of the file in bytes.

KV_Lines	The contents of the "Lines" property field taken from the source document. The field provides the number of lines in the document.
KV_Paragraphs	The contents of the "Paragraphs" property field taken from the source document. The field provides the number of paragraphs in the document.
KV_Slides	The contents of the "Slides" property field taken from a presentation document. The field provides the number of slides in the document.
KV_Notes	The contents of the "Notes" property field taken from a presentation document. The field provides the number of notes in the document.
KV_HiddenSlides	The contents of the "Hidden slides" property field taken from a presentation document. The field provides the number of hidden slides in the document.
KV_MMClips	The contents of the "Multimedia clips" property field taken from a presentation document. The field provides the number of multimedia clips in the document.
KV_ScaleCrop	A Boolean value that specifies whether thumbnails are cropped or scaled.
KV_HeadingPairs	An internally-used property indicating the grouping of different document parts and the number of items in each group.
KV_TitlesofParts	The contents of the "Document Contents" property field taken from the source document. The field contains a list of the parts of the file, such as the names of macro sheets in Microsoft Excel or the headings in Word.
KV_Manager	The contents of the "Manager" property field taken from the source document.
KV_Company	The contents of the "Company" property field taken from the source document.
KV_LinksUpToDate	A Boolean value that specifies whether links in the document are resolved and current.
KV_HyperlinkBase	The base address used for all relative links in the file.
KV_Layouts	The number of layouts in the AutoCAD drawing.
KV_Objects	The approximate number of objects in the AutoCAD drawing.
KV_FileVersion	The AutoCAD version (for example, R13, R14) of the drawing.
KV_LastFileVersion	The AutoCAD version (for example, R13, R14) that the AutoCAD drawing was last saved as.
KV_OrigFileVersion	The AutoCAD version (for example, R13, R14) of the original source file.
KV_OrigFileType	The AutoCAD file type (for example, DWG, DXF, or DWB) of the original source file.
KV_OrigAppVersion	The AutoCAD version (for example, R13, R14) of the application that created the original source file.

KV_ContentStatus	The status of the content, for example <i>Draft</i> , <i>Reviewed</i> , or <i>Final</i> .
KV_UserDefined	The contents of the first entry in the array of non-standard metadata. This could be user-defined metadata, or metadata unique to a file type.

LPDF_DIRECTION

This enumerated type defines the paragraph direction of extracted paragraphs from a PDF file when logical order is enabled. This enumerated type is defined in `kvtypes.h`.

Definition

```
typedef enum{
    LPDF_RAW = 0,
    LPDF_LTR,
    LPDF_RTL,
    LPDF_AUTO
} LPDF_DIRECTION ;
```

Enumerators

LPDF_RAW Unstructured paragraph flow. This is the default behavior.

LPDF_LTR Logical reading order and left-to-right paragraph direction.

LPDF_RTL Logical reading order and right-to-left paragraph direction.

LPDF_AUTO Logical reading order. The PDF reader determines the paragraph direction for each PDF page, and then sets the direction accordingly. This is the default when logical order is enabled.

Appendixes

This section lists supported formats, supported character sets, and redistributed files, and provides information on format detection and developing a custom document reader.

Appendix A: Supported Formats

This section lists information about the file formats that can be detected and processed (either filtered, converted, or displayed) by the KeyView suite of products. The KeyView suite includes KeyView Filter SDK, KeyView Export SDK, and KeyView Viewing SDK.

- [Supported Formats](#) 189
- [Supported Formats \(Detected\)](#) 218

Supported Formats

The tables in this section provide the following information:

- The file formats supported by the Filter API, Export API, Viewing API, and File Extraction API. The supported versions and the format's extension are also listed.

The formats listed in this section can also be detected by the KeyView format detection module (kwad). The [Supported Formats \(Detected\)](#) section lists formats that can be detected, but cannot be filtered, converted, or displayed.

- The file formats for which KeyView can detect and extract the character set and metadata information (properties such as title, author, and subject).

Even though a file format might be able to provide character set information, some documents might not contain character set information. Therefore, the document reader would not be able to determine the character set of the document. In this case, either the operating system code page or the character set specified in the API is used.

- The document reader used to filter each format.

Key to Support Tables

Symbol	Description
Y	The format is supported. You can extract metadata for this format. You can determine the character set for this format.
N	The format is not supported. You cannot extract metadata for this format. You cannot determine the character set for this format.
P	Partial metadata is extracted from this format. Some non-standard fields are not extracted.

Key to Support Tables, continued

Symbol	Description
T	Only text is extracted from this format. Formatting information is not extracted.
M	Only metadata (title, subject, author, and so on) is extracted from this format. Text and formatting information are not extracted.

Archive Formats

Supported Archive Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
7-Zip	4.57	z7zsr, multiarcsr ¹	7Z	N	N	Y	Y	N	n/a	N
AD1	n/a	ad1sr	AD1	N	N	Y	Y	N	n/a	N
ARJ	n/a	multiarcsr	ARJ	N	N	N	Y	N	n/a	N
B1	n/a	b1sr	B1	N	N	Y	Y	N	n/a	N
BinHex	n/a	kvhqxsr	HQX	N	N	Y	Y	N	n/a	N
Bzip2	n/a	bzip2sr	BZ2	N	N	Y	Y	N	n/a	N
Expert Witness Compression Format (EnCase)	6	encasesr	E01, L01	N	N	Y	Y	N	n/a	N
	7	encase2sr	Lx01	N	N	Y	Y	N	n/a	N
GZIP	2	kvgzsr	GZ	N	N	N	Y	N	n/a	N
		kvgz	GZ	N	N	Y	N	N	n/a	N
ISO	n/a	isosr	ISO	N	N	Y	Y	N	n/a	N
Java Archive	n/a	unzip	JAR	N	N	Y	Y	N	n/a	N

¹7zip is supported with the multiarcsr reader on some platforms for Extract.

Supported Archive Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Legato EMailXtender Archive	n/a	emxsr	EMX	N	N	Y	Y	N	n/a	N
MacBinary	n/a	macbinsr	BIN	N	N	Y	Y	N	n/a	N
Mac Disk Copy Disk Image	n/a	dmgsr	DMG	N	N	Y	Y	N	n/a	N
Microsoft Backup File	n/a	bkfsr	BKF	N	N	Y	Y	N	n/a	N
Microsoft Cabinet format	1.3	cabsr	CAB	N	N	Y	Y	N	n/a	N
Microsoft Compiled HTML Help	3	chmsr	CHM	N	N	Y	Y	N	n/a	N
Microsoft Compressed Folder	n/a	lzhsr	LZH LHA	N	N	N	Y	N	n/a	N
Microsoft Power BI Desktop format	n/a	unzip	PBIX	N	N	N	Y	N	n/a	N
PKZIP	through 9.0	unzip	ZIP	N	N	Y	Y	N	n/a	N
RAR archive	2.0 through 3.5	rarsr	RAR	N	N	N	Y	N	n/a	N
RAR5 archive	5	multiarcsr	RAR5	N	N	N	Y	N	n/a	N
Tableau Packaged Data Source format	n/a	unzip	TSDX	N	N	N	Y	N	n/a	N
Tableau Packaged Workbook format	n/a	unzip	TWBX	N	N	N	Y	N	n/a	N

Supported Archive Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Tape Archive	n/a	tarsr	TAR	N	N	Y	Y	N	n/a	N
UNIX Compress	n/a	kvzeesr	Z	N	N	N	Y	N	n/a	N
		kvzee	Z	N	N	Y	N	N	n/a	N
UUEncoding	all versions	uudsr	UUE	N	N	Y	Y	N	n/a	N
XZ	n/a	multiarcsr	XZ	N	N	N	Y	N	n/a	N
Windows Scrap File	n/a	olesr	SHS	N	N	N	Y	N	n/a	N
WinZip	through 10	unzip	ZIP	N	N	Y	Y	N	n/a	N
Zipped Keyhole Markup Language	n/a	unzip	ZIP	N	N	N	Y	N	n/a	N

Binary Format**Supported Binary Formats**

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Executable	n/a	exesr	EXE	N	N	Y	N	N	n/a	N
Link Library	n/a	exesr	DLL	N	N	Y	N	N	n/a	N

Computer-Aided Design Formats

Supported CAD Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
AutoCAD Drawing	R13, R14, R15/2000, 2004, 2007, 2010, 2013	kpODArdr kpDWGrdr ¹	DWG	Y	Y ²	Y ³	N	Y	Y	N
AutoCAD Drawing Exchange	R13, R14, R15/2000, 2004, 2007, 2010, 2013	kpODArdr kpDXFrdr ⁴	DXF	Y	Y ⁵	Y ⁶	N	Y	Y	N
CATIA formats	5	kpCATrdr	CAT ⁷	Y	N	N	N	Y	N	N

¹On Windows platforms, kpODArdr is used for all versions up to 2007 and graphic rendering is supported; for later versions, only text extraction is supported through the kpDWGrdr or kpDXFrdr reader.

²On non-Windows platforms, graphic rendering is supported through the kpDWGrdr reader for versions R13, R14, R15, and R18 (2004); for other versions, only text extraction is supported.

³On non-Windows platforms, graphic rendering is supported through the kpDWGrdr reader for versions R13, R14, R15, and R18 (2004); for other versions, only text extraction is supported.

⁴On Windows platforms, kpODArdr is used for all versions up to 2007 and graphic rendering is supported; for later versions, only text extraction is supported through the kpDWGrdr or kpDXFrdr reader.

⁵On non-Windows platforms, graphic rendering is supported through the kpDXFrdr reader for versions R13, R14, R15, and R18 (2004); for other versions, only text extraction is supported.

⁶On Windows platforms, kpODArdr is used for all versions up to 2007 and graphic rendering is supported; for later versions, only text extraction is supported through the kpDWGrdr or kpDXFrdr reader.

⁷All CAT file extensions, for example CATDrawing, CATProduct, CATPart, and so on.

Supported CAD Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Visio	4, 5, 2000, 2002, 2003, 2007, 2010 ¹	vsdsr	VSD	Y	Y	Y	Y ²	Y	Y	N
		kpVSD2rdr	VSD, VSS VST	Y	Y	Y	N	Y	Y	N
	2013	ActiveX components	VSDM VSSM VSTM VSDX VSSX VSTX	N	N	Y ³	N	Y	N	N
		kpVSDXrdr	VSDM VSSM VSTM VSDX VSSX VSTX	Y	Y	Y ⁴	Y	Y	Y	N
Unigraphics (UG) NX		kpUGrdr	PRT	Y	N	N	N	N	N	N

¹Viewing and Export use the graphic reader, kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions. Image fidelity in Viewing and Export is therefore only supported for versions 2003 and above. Filter uses the graphic reader kpVSD2rdr for Microsoft Visio 2003, 2007, and 2010, and vsdsr for all earlier versions.

²Extraction of embedded OLE objects is supported for Filter on Windows platforms only.

³Visio 2013 is supported in Viewing only, with the support of ActiveX components from the Microsoft Visio 2013 Viewer. Image fidelity is supported but other features, such as highlighting, are not.

Database Formats

Supported Database Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
dBase Database	III+, IV	dbfsr	DBF	Y	Y	Y	N	N	N	N
Microsoft Access	95, 97, 2000, 2002, 2003, 2007, 2010, 2013, 2016	mdbsr	MDB, ACCDB	Y	T	T	N	N	Y ¹	N
Microsoft Project	2000, 2002, 2003, 2007, 2010, 2013	mppsrs	MPP	Y	Y	Y	Y	Y	Y	N

Desktop Publishing

Supported Desktop Publishing Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Publisher	98 to 2016	mspubsr	PUB	Y	T	T	Y	Y	Y	N

¹Charset is not supported for Microsoft Access 95 or 97.

Display Formats

Supported Display Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Adobe PDF	1.1 to 1.7	pdfsr	PDF	Y	Y	N	Y ¹	Y	Y	N
		pdf2sr	PDF	N	Y	N	N	N	N	N
		kppdfldr	PDF	N	Y	Y	N	N	N	N
		kppdf2rdr ²	PDF	N	N	Y	N	N	N	N

Graphic Formats

Supported Graphic Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Computer Graphics Metafile	n/a	kpcgmrdr ³	CGM	Y	Y	Y	N	N	N	N
CorelDRAW ⁴	through 9.0	kpcdrdr	CDR	N	Y	Y	N	N	N	N

¹Includes support for extraction of subfiles from PDF Portfolio documents.

²kppdf2rdr is an alternate graphic-based reader that produces high-fidelity output but does not support other features such as highlighting or text searching.

³Files with non-partitioned data are supported.

⁴CDR/CDR with TIFF header.

Supported Graphic Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
	10, 11, 12, X3									
DCX Fax System	n/a	kpdcxrdr	DCX	N	Y	Y	N	N	N	N
Digital Imaging & Communications in Medicine (DICOM)	n/a	dcmsr	DCM	M	N	N	N	Y	N	N
Encapsulated PostScript (raster)	TIFF header	kpepsrdr	EPS	N	Y	Y	N	N	N	N
Enhanced Metafile	n/a	kpemfrdr	EMF	Y	Y	Y	N	Y	N	N
GIF	87, 89	kpgifrdr	GIF	N	Y	Y	N	N	N	N
		gifsr		M	M	N	N	Y	N	N
ISO-BMFF JPEG 2000 compound image	n/a	kpjp2000rdr	JPM	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
ISO-BMFF JPEG 2000 image	n/a	kpjp2000rdr	JP2	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
ISO-BMFF JPEG 2000 with extensions	n/a	kpjp2000rdr	JPX	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
JBIG2	n/a	kpJBIG2rdr	JBIG2	N	Y	Y	N	N	N	N

Supported Graphic Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
JPEG	n/a	kpjpgdrdr	JPEG	N	Y	Y	N	N	N	N
		jpgsr		M	M	N	N	Y	N	N
JPEG 2000	n/a	kpjp2000rdr	JP2, JPF, J2K, JPWL, JPX, PGX	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
JPEG 2000 PGX Verification Model image	n/a	kpjp2000rdr	PGX	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
Lotus AMIDraw Graphics	n/a	kpsdwrdr	SDW	N	Y	Y	N	N	N	N
Lotus Pic	n/a	kppicdrdr	PIC	Y	Y	Y	N	N	N	N
Macintosh Raster	2	kppctrdr	PIC PCT	N	Y	Y	N	N	N	N
MacPaint	n/a	kpmacrdr	PNTG	N	Y	Y	N	N	N	N
Microsoft Office Drawing	n/a	kpmsordr	MSO	N	Y	Y	N	N	N	N
Omni Graffle	n/a	kpGFLrdr	GRAFFLE	Y	N	N	N	Y	Y	N
PC PaintBrush	3	kppcxrdr	PCX	N	Y	Y	N	N	N	N
Portable Network Graphics	n/a	kppngrdr	PNG	N	Y	Y	N	N	N	N
		pngsr	PNG	M	M	N	N	Y	N	N
Scalable Vector Graphics	n/a	xmlsr	SVG	Y	T	T	N	Y	Y	N

Supported Graphic Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
SGI RGB Image	n/a	kpsgirdr	RGB	N	Y	Y	N	N	N	N
Sun Raster Image	n/a	kpsunrdr	RS	N	Y	Y	N	N	N	N
Tagged Image File	through 6.0 ¹	tifsr	TIFF	M	M	N	N	Y	N	N
		kptifdr	TIFF	N	Y	Y	N	N	N	N
Truevision Targa	2	kpTGArdr	TGA	N	Y	Y	N	N	N	N
Windows Animated Cursor	n/a	kpanirdr	ANI	N	Y	Y	N	N	N	N
Windows Bitmap	n/a	kpbmprdr	BMP	N	Y	Y	N	N	N	N
		bmpsr	BMP	M	M	N	N	Y	N	N
Windows Icon Cursor	n/a	kpicordr	ICO	N	Y	Y	N	N	N	N
Windows Metafile	3	kpwmfrdr	WMF	Y ²	Y	Y	N	N	N	N
WordPerfect Graphics 1	1	kpwpgrdr	WPG	N	Y	Y	N	N	N	N
WordPerfect Graphics 2	2, 7	kpwg2rdr	WPG	N	Y	Y	N	N	N	N

¹The following compression types are supported: no compression, CCITT Group 3 1-Dimensional Modified Huffman, CCITT Group 3 T4 1-Dimensional, CCITT Group 4 T6, LZW, JPEG (only Gray, RGB and CMYK color space are supported), and PackBits.

²Windows Metafiles can contain both raster images (KeyView file class 4) and vector graphics (KeyView file class 5). Filtering is supported only for vector graphics (class 5).

Mail Formats

Supported Mail Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Documentum EMCMF	n/a	msgsr	EMCMF	N	N	Y	Y	Y	Y	N
Domino XML Language ¹	n/a	dxlsr	DXL	N	N	Y	Y	Y	N	N
GroupWise FileSurf	n/a	gwfssr	GWFS	N	N	Y	Y	Y	N	N
Legato Extender	n/a	onmsr	ONM	N	N	Y	Y	Y	N	N
Lotus Notes database	4, 5, 6.0, 6.5, 7.0, 8.0	nsfsr	NSF	N	N	Y	Y	Y	N	N
Mailbox ²	Thunderbird 1.0, Eudora 6.2	mbxsr ³	MBX	N	N	T	Y	Y	Y	N
Microsoft Entourage Database	2004	entsr	various	N	N	Y	Y	Y	Y	N

¹Supports non-encrypted embedded files only.

²KeyView supports MBX files created by Eudora Email and Mozilla Thunderbird. MBX files created by other common mail applications are typically filtered, converted, and displayed.

³This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

Supported Mail Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Outlook	97, 2000, 2002, 2003, 2007, 2010, 2013, 2016	msgsr ¹	MSG, OFT	Y	T	T	Y	Y	Y ²	N
Microsoft Outlook DBX	5.0, 6.0	dbxsr	DBX	N	N	Y	Y	Y	Y	N
Microsoft Outlook Express	Windows 6 MacIntosh 5	emlsr ³	EML	Y	T	T	Y	Y	Y	N
		mbxsr ⁴	EML	N	N	T	Y	Y	Y	N
Microsoft Outlook iCalendar	1.0, 2.0	icssr	ICS, VCS	N	N	Y	Y	Y	Y	N
Microsoft Outlook for Macintosh	2011	olmsr	OLM	N	N	Y	Y	N	Y	N
Microsoft Outlook Offline Storage File	97, 2000, 2002, 2003, 2007, 2010, 2013	pffsr ⁵	OST	N	N	Y	Y	Y	Y	N

¹This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

²Returns "Unicode" character set for version 2003 and up, and "Unknown" character set for previous versions.

³This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

⁴This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

⁵The reader pffsr is available only on Windows and Linux.

Supported Mail Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Outlook Personal Folder	97, 2000, 2002, 2003, 2007, 2010, 2013, 2016	pstsr ¹²	PST	N	N	Y	Y	Y	N	N
	97, 2000, 2002, 2003, 2007, 2010, 2013	pstnsr	PST	N	N	Y	Y	Y	Y	N
Microsoft Outlook vCard Contact	2.1, 3.0, 4.0	vcfsr	VCF	Y	Y	T	N	Y	N	N
Text Mail (MIME)	n/a	emlsr ³	various	Y	T	T	Y	Y	Y	N
		mbxsr ⁴	various	Y	T	T	Y	Y	Y	N
Transport Neutral Encapsulation Format	n/a	tnfsr	various	N	N	Y	Y	Y	Y	N

¹This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

²Uses Microsoft Messaging Application Programming Interface (MAPI). The MAPI reader (*pstsr*) works only on Windows, and requires that you have Microsoft Outlook installed. As an alternative, the native PST reader (*pstnsr*) runs on all platforms, and does not require Microsoft Outlook. For more information on using the native PST reader or the MAPI reader, see the sections 'Use the Native PST Reader (*pstnsr*)' and 'Use the MAPI Reader (*pstsr*)' in Chapter 3.

³This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

⁴This reader supports both clear signed and encrypted S/MIME. KeyView supports S/MIME for PST, EML, MBX, and MSG files.

Multimedia Formats

Viewing SDK plays some multimedia files using the Windows Media Control Interface (MCI). MCI is a set of Windows APIs that communicate with multimedia devices.

Supported Multimedia Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
3GPP video file	n/a	mpeg4sr	3GP	M	N	N	N	Y	N	N
3GPP2 video file	n/a	mpeg4sr	3G2	M	N	N	N	Y	N	N
Adobe Flash Player audio	n/a	mpeg4sr	F4A	M	N	N	N	Y	N	N
Adobe Flash Player audio book	n/a	mpeg4sr	F4B	M	N	N	N	Y	N	N
Adobe Flash Player protected video	n/a	mpeg4sr	F4P	M	N	N	N	Y	N	N
Adobe Flash Player video	n/a	mpeg4sr	F4V	M	N	N	N	Y	N	N
Apple ISO-BMFF QuickTime video	n/a	MCI	QT MOV	N	N	Y	N	N	N	N
Apple MPEG-4 Part 14 audio	n/a	mpeg4sr	M4A	M	N	N	N	Y	N	N
Apple MPEG-4 Part 14 audio book	n/a	mpeg4sr	M4B	M	N	N	N	Y	N	N
Apple MPEG-4 Part 14 protected audio	n/a	mpeg4sr	M4P	M	N	N	N	Y	N	N
Apple MPEG-4 Part 14	n/a	mpeg4sr	M4V	M	N	N	N	Y	N	N

Supported Multimedia Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
video										
Audible Enhanced Audiobook	n/a	mpeg4sr	AAX	M	N	N	N	Y	N	N
KDDI video file	n/a	MCI		N	N	Y	N	N	N	N
Advanced Systems Format	1.2	asfsr	ASF WMA WMV	N	N	N	N	Y	N	N
Audio Interchange File Format	n/a	MCI	AIFF	N	N	Y	N	N	N	N
		aiffsr	AIFF	M	N	N	N	Y	N	N
ISO-BMFF MPEG-4 with AVC extension	n/a	mpeg4sr		M	N	N	N	Y	N	N
Microsoft Wave Sound	n/a	MCI	WAV	N	N	Y	N	N	N	N
		riffr	WAV	M	N	N	N	Y	N	N
MIDI	n/a	MCI	MID	N	N	Y	N	N	N	N
Mobile QuickTime video	n/a	mpeg4sr	MQV	M	N	N	N	Y	N	N
Motion JPEG 2000	n/a	kpjp2000rdr	MJ2 MJP2	N	Y	Y	N	N	N	N
		jp2000sr		M	M	N	N	Y	N	N
MPEG-1 Audio layer 3	ID3 v1 and v2	MCI	MP3	N	N	Y	N	N	N	N
		mp3sr	MP3	M	M	Y	N	Y	N	N

Supported Multimedia Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
MPEG-1 Video	2, 3	MCI	MPG	N	N	Y	N	N	N	N
MPEG-2 Audio	n/a	MCI	MPEGA	N	N	Y	N	N	N	N
MPEG-21	n/a	mpeg4sr		M	N	N	N	Y	N	N
MPEG-4 Audio	n/a	mpeg4sr	MP4 3GP	M	N	N	N	Y	N	N
Nero AAC audio	n/a	mpeg4sr		M	N	N	N	Y	N	N
Nero MPEG-4 profile	n/a	mpeg4sr		M	N	N	N	Y	N	N
Nero MPEG-4 profile with AVC extension	n/a	mpeg4sr		M	N	N	N	Y	N	N
NeXT/Sun Audio	n/a	MCI	AU	N	N	Y	N	N	N	N
NTT MPEG-4	n/a	mpeg4sr		M	N	N	N	Y	N	N
QuickTime Movie	2, 3, 4	MCI	QT MOV	N	N	Y	N	N	N	N
Sony PSP MPEG-4	n/a	mpeg4sr	MP4	M	N	N	N	Y	N	N
Sony XAVC video	n/a	mpeg4sr		M	N	N	N	Y	N	N
Windows Video	2.1	MCI	AVI	N	N	Y	N	N	N	N

NOTE:

Depending on the default multimedia player installed on your computer, the View API might not be able to play some supported multimedia formats. To play multimedia files, the View API uses the Windows Media Control Interface (MCI) to communicate with the multimedia player installed on your computer. If the player does not play a multimedia file that is supported by the Viewing SDK, the View API cannot

play the file.

If you cannot play a supported multimedia file by using the View API, install a different multimedia player or compressor/decompressor (codec) component.

Presentation Formats

Supported Presentation Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Apple iWork Keynote	2, 3, '08, '09	kplWPGGrdr	GZ	Y	Y	Y	N	Y	Y	N
	'13, '16 iCloud 2018	kplWPG13rdr ¹	KEY	Y	N	N	N	N	N	N
Applix Presents	4.0, 4.2, 4.3, 4.4	kpagrdr	AG	Y	Y	Y	N	N	N	N
Corel Presentations	6, 7, 8, 9, 10, 11, 12, X3	kpshwrdr	SHW	Y	Y	Y	N	N	N	N
Extensible Forms Description Language	n/a	kpXFDLrdr	XFD XFDL	Y	Y	Y	N	Y	Y	N
Lotus Freelance Graphics	96, 97, 98, R9, 9.8	kpprzrdr	PRZ	Y	Y	Y	N	N	N	N
Lotus Freelance Graphics 2	2	kprrdr	PRE	Y	Y	Y	N	N	N	N

¹This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.

Supported Presentation Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Macromedia Flash	through 8.0	swfsr	SWF	Y	Y	Y	N	N	Y ¹	N
Microsoft OneNote	2007, 2010, 2013, 2016	kpONErdr	ONE ONETOC2	Y	Y	Y	Y	N	Y	N
Microsoft PowerPoint Macintosh	98	kpp40rdr	PPT	Y	Y	Y	N	N	N	N
	2001, v.X, 2004	kpp97rdr	PPT PPS POT	Y	Y	Y	N	P	Y	N
Microsoft PowerPoint PC	4	kpp40rdr	PPT	Y	Y	Y	N	P	N	N
Microsoft PowerPoint Windows	95	kpp95rdr	PPT	Y	Y	Y	N	P	Y	N
Microsoft PowerPoint Windows	97, 2000, 2002, 2003	kpp97rdr	PPT PPS POT	Y	Y	Y	Y	P	Y	Y ²
Microsoft PowerPoint Windows XML	2007, 2010, 2013, 2016	kpppxrdr	PPTX PPTM POTX POTM PPSX PPSM	Y	Y	Y	Y	Y	Y	Y

¹The character set cannot be determined for versions 5.x and lower.²Slide footers are supported for Microsoft PowerPoint 97 and 2003.

Supported Presentation Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
			PPAM							
OASIS Open Document Format	1, 2 ¹	kpodfrdr	SXD SXI ODG ODP	Y	Y	Y	Y ²	Y	Y	N
OpenOffice Impress, LibreOffice Impress	1 to 5	sosr	SXI SXP ODP	Y	T	T	N	Y	Y	N
StarOffice Impress	3, 4, 5	kpsddrdr	SDA SDD	Y	N	N	N	N	N	N
	6, 7, 8, 9	sosr	SXI SXP ODP	Y	T	T	N	Y	Y	N

¹Generated by OpenOffice Impress 2.0, StarOffice 8 Impress, and IBM Lotus Symphony Presentation 3.0.

²Supported using the olesr embedded objects reader.

Spreadsheet Formats

Supported Spreadsheet Formats

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Apple iWork Numbers	'08, '09	iwsssr	GZ	Y	Y	Y	N	Y	Y	N
	'13, '16 iCloud 2018	iwss13sr ¹	NUMBERS	Y	T	T	N	N	Y	N
Applix Spreadsheets	4.2, 4.3, 4.4	assr	AS	Y	Y	Y	N	N	Y	N
Comma Separated Values	n/a	csvsr	CSV	Y	Y	Y	N	N	N	N
Corel Quattro Pro	5, 6, 7, 8	qpssr	WB2 WB3	Y	Y	Y	N	P	Y	N
	X4	qpwsr	QPW	Y	N	Y	N	P	Y	N
Data Interchange Format	n/a	difsr		Y	Y	Y	N	N	N	N
Lotus 1-2-3	96, 97, R9, 9.8	l123sr	123	Y	Y	Y	N	P	Y	N
Lotus 1-2-3	2, 3, 4, 5	wkssr	WK4	Y	Y	Y	N	N	Y	N
Lotus 1-2-3 Charts	2, 3, 4, 5	kpchtrdr	123	N	Y	Y	N	N	N	N
Microsoft Excel Charts	2, 3, 4, 5, 6, 7	kpchtrdr	XLS	N	Y	Y	N	N	N	N

¹This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.

Supported Spreadsheet Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Excel Macintosh	98, 2001, v.X, 2004	xlssr	XLS	Y	Y	Y	Y ¹	Y	Y	N
Microsoft Excel Windows	2.2 through 2003	xlssr	XLS XLW XLT XLA	Y	Y	Y	Y ²	Y	Y	Y
Microsoft Excel Windows XML	2007, 2010, 2013, 2016	xlxsxr	XLSX XLTX XLSM XLTM XLAM	Y	Y	Y	Y	Y	Y	Y
Microsoft Excel Binary Format	2007, 2010, 2013, 2016	xlsbsr	XLSB	Y	Y	Y	N	N	N	N
Microsoft Works Spreadsheet	2, 3, 4	mwssr	S30 S40	Y	Y	Y	N	N	Y	N
OASIS Open Document Format	1, 2 ³	odfsssr	ODS SXC STC	Y	Y	Y	Y ⁴	Y	Y	N
OpenOffice Calc, LibreOffice Calc	1 to 5	sosr	SXC ODS OTS	Y	T	T	N	Y	Y	N

¹Supported using the embedded objects reader `olesr`.²Supported for versions 97 and higher using the embedded objects reader `olesr`.³Generated by OpenOffice Calc 2.0, StarOffice 8 Calc, and IBM Lotus Symphony Spreadsheet 3.0.⁴Supported using the embedded objects reader `olesr`.

Supported Spreadsheet Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
StarOffice Calc	3, 4, 5	starcsr	SDC	Y	N	N	N	N	N	N
	6, 7, 8, 9	sosr	SXC ODS	Y	T	T	N	Y	Y	N

Text and Markup Formats**Supported Text and Markup Formats**

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
ANSI	n/a	afsr	TXT	Y	Y	Y	N	N	N	N
ASCII	n/a	afsr	TXT	Y	Y	Y	N	N	N	N
HTML	3, 4	htmsr	HTM	Y	Y	Y	N	P	Y	N
Microsoft Excel Windows XML	2003	xmIsr	XML	Y	T	T	N	Y	Y	N
Microsoft Word Windows XML	2003	xmIsr	XML	Y	T	T	N	Y	Y	N
Microsoft Visio XML	2003	xmIsr	VDX VTX	Y	T	T	N	Y	Y	N
MIME HTML	n/a	mhtsr	MHT	Y	Y	Y	N	Y	Y	N
Rich Text Format	1 through 1.7	rtfsr	RTF	Y	Y	Y	N	P	Y	Y
Tableau Data Source format	n/a	xmIsr	TDS	Y	T	T	N	Y	Y	N

Supported Text and Markup Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Tableau Map Source format	n/a	xmlsr	TMS	Y	T	T	N	Y	Y	N
Tableau Preferences format	n/a	xmlsr	TPS	Y	T	T	N	Y	Y	N
Tableau Workbook format	n/a	xmlsr	TWB	Y	T	T	N	Y	Y	N
Unicode HTML	n/a	unihtmsr	HTM	Y	Y	Y	N	Y	Y	N
Unicode Text	3, 4	unisr	TXT	Y	Y	Y	N	N	Y	N
Vector Open Diagnostic Data Exchange Format	n/a	xmlsr	ODX	Y	T	T	N	Y	Y	N
XHTML	1.0	htmsr	HTM	Y	Y	Y	N	Y	Y	N
XML (generic)	1.0	xmlsr	XML	Y	T	T	N	Y	Y	N

Word Processing Formats**Supported Word Processing Formats**

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Adobe FrameMaker Interchange Format	5, 5.5, 6, 7	mifsr	MIF	Y	Y	Y	N	N	Y	N
Apple iChat Log	1, AV 2 AV 2.1, AV 3	ichatsr	ICHAT	Y	Y	Y	N	N	N	N

Supported Word Processing Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Apple iWork Pages	'08, '09	iwwpsr	GZ	Y	Y	Y	N	Y	Y	N
	'13, '16 iCloud 2018	iwwp13sr ¹	PAGES	Y	T	T	N	N	N	N
Applix Words	3.11, 4, 4.1, 4.2, 4.3, 4.4	awsr	AW	Y	Y	Y	N	N	Y	Y
Corel WordPerfect Linux	6.0, 8.1	wp6sr	WPS	Y	Y	Y	N	P	Y	N
Corel WordPerfect Macintosh	1.02, 2, 2.1, 2.2, 3, 3.1	wpmsr	WPM	Y	Y	Y	N	N	Y	N
Corel WordPerfect Windows	5, 5.1	wosr	WO	Y	Y	Y	N	P	Y	Y
Corel WordPerfect Windows	6, 7, 8, 9, 10, 11, 12, X3	wp6sr	WPD	Y	Y	Y	N	P	Y	Y
DisplayWrite	4	dw4sr	IP	Y	Y	Y	N	N	Y	N
Folio Flat File	3.1	foliosr	FFF	Y	Y	Y	N	Y	Y	Y
Founder Chinese E- paper Basic	3.2.1	cebsr ²	CEB	Y	N	N	N	N	N	N

¹This reader is available only on Windows (32-bit and 64-bit), Linux (32-bit and 64-bit), and Solaris x86-64.²This reader is only supported on Windows 32-bit platforms.

Supported Word Processing Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Fujitsu Oasys	7	oa2sr	OA2	Y	Y	Y	N	P	N	N
Haansoft Hangul	97	hwpsr	HWP	Y	Y	Y	N	Y	Y	N
	2002, 2005, 2007, 2010	hwposr	HWP	Y	Y	Y	Y	Y	Y	N
Health level7	2.0	hl7sr	HL7	Y	Y	Y	N	Y	Y	N
IBM DCA/RFT (Revisable Form Text)	SC23-0758-1	dcasr	DC	Y	Y	Y	N	N	Y	N
JustSystems Ichitaro	8 through 2013	jtdsr	JTD	Y	Y	Y	N	P	N	Y
Lotus AMI Pro	2, 3	lasr	SAM	Y	Y	Y	N	P	Y	Y
Lotus AMI Professional Write Plus	2.1	lasr	AMI	Y	Y	Y	N	N	N	Y
Lotus Word Pro	96, 97, R9	lwpsr	LWP	Y	Y	Y	N	P	N	Y
Lotus SmartMaster	96, 97	lwpsr	MWP	Y	Y	Y	N	N	N	N
Microsoft Word Macintosh	4, 5, 6, 98	mbsr	DOC	Y	Y	Y	N	Y	N	Y
	2001, v.X, 2004	mw8sr	DOC DOT	Y	Y	Y	Y ¹	Y	Y	N
Microsoft Word PC	4, 5, 5.5, 6	mwsr	DOC	Y	Y	Y	N	N	N	Y

¹Supported using the embedded objects reader olesr.

Supported Word Processing Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Microsoft Word Windows	1.0, 2.0	misr	DOC	Y	Y	Y	N	N	N	Y
Microsoft Word Windows	6, 7, 8, 95	mw6sr	DOC	Y	Y	Y	N	Y	Y	Y
Microsoft Word Windows	97, 2000, 2002, 2003	mw8sr	DOC DOT	Y	Y	Y	Y ¹	Y	Y	Y
Microsoft Word Windows XML	2007, 2010, 2013, 2016	mwxsr	DOCM DOCX DOTX DOTM	Y	Y	Y	Y	Y	Y	Y
Microsoft Word Windows Flat XML	2007, 2010, 2013, 2016	mwxsr	XML	Y	Y	Y	Y	Y	Y	Y
Microsoft Works	1, 2, 3, 4	mswsr	WPS	Y	Y	Y	N	N	N	Y
Microsoft Works	6, 2000	msw6sr	WPS	Y	Y	Y	N	N	N	Y
Microsoft Windows Write	1, 2, 3	mwsr	WRI	Y	Y	Y	N	N	Y	N
OASIS Open Document Format	1, 2 ²	odfwpsr	ODT SXW STW	Y	Y	Y	Y ³	Y	Y	Y

¹Supported using the embedded objects reader `olesr`.²Generated by OpenOffice Writer 2.0, StarOffice 8 Writer, and IBM Lotus Symphony Documents 3.0.³Supported using the embedded objects reader `olesr`.

Supported Word Processing Formats, continued

Format	Version	Reader	Extension	Filter	Export	View	Extract	Metadata	Charset	Header/Footer
Omni Outliner	v3, OPML, OOutline	oo3sr	OO3 OPML OOUTLINE	Y	Y	Y	N	N	Y	N
OpenOffice Writer, LibreOffice Writer	1 to 5	sosr	SXW ODT	Y	T	T	N	Y	Y	N
Open Publication Structure eBook	2.0, 3.0	epubsr	EPUB	Y	Y	Y	N	Y	Y	N
StarOffice Writer	3, 4, 5	starwsr	SDW	Y	N	N	N	N	N	N
	6, 7, 8, 9	sosr	SXW ODT	Y	T	T	N	Y	Y	N
Skype Log	3	skypesr	DBB	Y	Y	Y	N	N	N	N
WordPad	through 2003	rtfsr	RTF	Y	Y	Y	N	P	Y	N
XML Paper Specification	n/a	xpssr	XPS	Y	T	T	N	N	N	N
XyWrite	4.12	xywsr	XY4	Y	Y	Y	N	N	N	N
Yahoo! Instant Messenger	n/a	yimsr ¹	DAT	Y	Y	Y	N	N	N	N

¹To successfully use this reader, you must set the KV_YAHOO_ID environment variable to the Yahoo user ID. You can optionally set the KV_OTHER_YAHOO_ID environment variable to the other Yahoo user ID. If you do not set it, "Other" is used by default. If you enter incorrect values for the environment variables, erroneous data is generated.

Supported Formats (Detected)

The file formats listed in this section can be detected by the KeyView format detection module (`kwad`), but cannot be filtered, converted, or displayed. The detection module determines a file's format and reports the information to the developer's application.

The formats listed in [Supported Formats, on page 189](#) can be detected as well as filtered, exported, and viewed.

In addition to the formats listed here, KeyView can detect many source code formats, when you turn on source code detection. See [Source Code Identification, on page 87](#).

- 3D Systems STL format
- 4X Movie File
- Abaqus ODB Format
- Ability Office (SS, DB, GR, WP, COM)
- AC3 audio
- Acorn RISC ARMovie video format
- ACT
- Adaptive Multi-Rate audio format
- Adobe Font Metrics ASCII format
- Adobe FrameMaker
- Adobe FrameMaker Markup Language
- Adobe InDesign document
- Adobe Multiple master font format
- Adobe PostScript Printer Description file
- Adobe Printer Font ASCII format
- Adobe Printer Font Metrics format
- AES Multiplus Comm
- Aldus Freehand (Macintosh)
- Aldus PageMaker (DOS)
- Aldus PageMaker (Macintosh)
- Amiga IFF-8SVX sound
- Amiga Metafile
- Amiga MOD sound
- AMV video file

- Apple Binary Property List
- Apple Core Audio Format
- Apple Desktop Services Store file
- Apple Double
- Apple iWork
- Apple Photoshop Document
- Apple Single
- Apple XML Property List
- Apple/NeXT typedstream data format
- AppleScript Binary Source Code
- Appleworks
- Applix Alis
- Applix Asterix
- Applix Bitmap image format
- Applix Builder format
- Applix Graphics
- ARC/PAK Archive
- ART image format
- ASCII-armored PGP encoded
- ASCII-armored PGP Public Keyring
- ASCII-armored PGP signed
- AT&T DjVu format
- AutoDesk Animator FLIC Animation
- AutoDesk Animator Pro FLIC Animation
- Autodesk Design Web Format
- Autodesk Maya ASCII file format
- Autodesk Maya binary file
- AutoDesk WHIP
- AutoShade Rendering
- B1 Archive
- BBC Dirac video format
- Bink audio-video container format

- BlackBerry Activation File
- CAD Binary Logging Format
- CAD Measurement Data Format
- CADAM Drawing
- CADAM Drawing Overlay
- Calamus Desktop Publishing
- Canon Digital Camera image
- Canon Raw image
- Casio Digital Camera image
- CCITT Group 3 1-Dimensional (G31D)
- Chinese AVS video format
- COMET TOP Word
- Confifer Software WavPack
- Convergent Design file
- Convergent Tech DEF Comm.
- Corel Draw CMX
- cpio Archive (UNIX/VAX/SUN)
- CPT Communication
- Creative Signal Processor codec
- Creative Voice (VOC) sound
- Curses Screen Image (UNIX/VAX/SUN)
- Data Point VISTAWORD
- DCX Fax
- Debian binary package format
- DEC WPS PLUS
- DECdx
- Desktop Color Separation (DCS)
- Device Independent file (DVI)
- DG CEOwrite
- DG Common Data Stream (CDS)
- DIF Spreadsheet
- Digital Document Interchange Format (DDIF)

- Digital Imaging and Communications in Medicine (DICOM)
- Digital Interface Format (DIF) DV video
- Digital Media Project Content Format
- Digital Video Broadcast format
- Disk Doubler Compression
- DLS Downloadable Sounds format
- DMB MAF audio
- DMB MAF video
- EBCDIC Text
- eFax
- Embedded OpenType font
- Embedded OpenType font
- ENABLE
- ENABLE Spreadsheet (SSF)
- Envoy (EVY)
- Executable UNIX/VAX/SUN
- FileMaker (Macintosh)
- Flash video
- Flash video
- Flexible Image Transport System FITS image
- FPX format
- Framework
- Framework II
- Free Lossless Audio Codec format
- Freehand 11
- FTP Session Data
- GEM Bit Image
- General Ogg Container format
- Ghost Disk Image
- GIMP XCF image
- Git Packfile format
- GNU Message Catalog format

- Google SketchUp
- Graphics Environment Manager (GEM VDI)
- Harvard Graphics
- Hewlett Packard
- Hierarchical Data Format HDF4
- Hierarchical Data Format HDF5
- High Efficiency Image Format HEVC image
- High Efficiency Image Format HEVC image sequence
- High Efficiency Image Format image
- High Efficiency Image Format image sequence
- Honey Bull DSA101
- HP Graphics Language (HP-GL)
- HP Graphics Language (Plotter)
- HP PCL and PJJ Languages
- HP Word PC
- IBM 1403 Line Printer
- IBM DCA-FFT
- IBM DCF Script
- IFF Amiga animated raster graphics format
- IFF Animated Bitmap
- IFF Glow Icon image
- IFF Planar BitMap
- IFF TDDD and Imagine Object animation format
- IFF-DEEP TVPaint image
- IFF-FAXX Facsimile image
- IFF-MAUD MacroSystem audio format
- Informix SmartWare II
- Informix SmartWare II Communication File
- Informix SmartWare II Database
- Informix SmartWare Spreadsheet
- InstallShield Cabinet Archive format
- InstallShield Uninstall format

- InstallShield Z archive format
- Interleaf
- Interleaved BitMap image
- International Color Consortium files
- Internet Archive ARC format
- Interplay MVE video format
- IRIX Silicon Graphics moviemaker video file
- ISMACryp 2.0 Encrypted format
- ISO 10303-21 STEP format
- ISO-BMFF Dirac Wavelet compression
- Java Class file
- Java JCE Key Store format
- Java Key Store format
- JPEG File Interchange Format (JFIF)
- JPEG Network Graphics
- JPEG Network Graphics
- Keepass Password file
- Keyhole Markup Language
- KW ODA G31D (G31)
- KW ODA G4 (G4)
- KW ODA Internal G32D (G32)
- KW ODA Internal Raw Bitmap (RBM)
- Lasergraphics Language
- LightWave Object format
- Link Library UNIX/VAX/SUN
- Lotus Notes Bitmap
- Lotus Notes CDF
- Lotus Screen Cam
- LS-DYNA binary output (binout) format
- LS-DYNA State Database format
- Lyrinx
- LZMA compressed data format

- Macromedia Director
- MacWrite
- MacWrite II
- MAF Photo Player
- Magick Image File Format
- MASS-11
- MATLAB MAT Format
- Matroska video
- Matroska video
- Micrografx Designer
- Microsoft Access 2007
- Microsoft Access 2007 Template
- Microsoft Common Object File Format (COFF)
- Microsoft Compiled HTML Help
- Microsoft Device Independent Bitmap
- Microsoft DirectDraw Surface container format
- Microsoft Document Imaging (MDI)
- Microsoft Excel 2007 Macro-Enabled Spreadsheet Template
- Microsoft Excel 2007 Spreadsheet Template
- Microsoft Exchange Server Database File
- Microsoft Help 2.0 format
- Microsoft MS-DOS installation compression
- Microsoft Object File Library
- Microsoft Office Drawing
- Microsoft Office Groove
- Microsoft Outlook Restricted Permission Message File
- Microsoft Power BI Desktop format
- Microsoft Program Database format
- Microsoft Virtual Hard Disk format
- Microsoft Windows Cursor (CUR) Graphics
- Microsoft Windows Group File
- Microsoft Windows Help File

- Microsoft Windows Icon (ICO)
- Microsoft Windows Imaging Format WIM
- Microsoft Windows NT Event Log
- Microsoft Windows OLE 2 Encapsulation
- Microsoft Windows Registry format
- Microsoft Windows Vista Event Log
- Microsoft Word (UNIX)
- Microsoft Works (Macintosh)
- Microsoft Works Communication (Macintosh)
- Microsoft Works Communication (Windows)
- Microsoft Works Database (Macintosh)
- Microsoft Works Database (PC)
- Microsoft Works Database (Windows)
- Microsoft Works Spreadsheet (Macintosh)
- Microstation
- Milestone Document
- MORE Database Outliner (Macintosh)
- Mozilla XUL Fastload format
- MPEG Sequence format
- MPEG Transport Stream data
- MPEG4 (ISO IEC MPEG4)
- MPEG-PS container with CDXA stream
- MS DOS Batch File format
- MS DOS Device Driver
- MultiMate 4.0
- Multiplan Spreadsheet
- Multiple-image Network Graphics
- Multiple-image Network Graphics
- Musepack audio format
- MySQL table definition file
- Nastran OP2 format
- National Instruments LabVIEW file format

- Navy DIF
- NBI Async Archive Format
- NBI Net Archive Format
- Nero Encrypted File
- Netscape Address Book format
- Netscape Bookmark file
- Netware Loadable Module format
- NeWS font file (SUN)
- NIOS TOP
- NIST SPeech HEader Resources format
- NOFF 3D Object File Format
- Nota Bene
- Notation Interchange File Format
- NTT TwinVQ audio format
- NURSTOR Drawing
- Object Module UNIX/VAX/SUN
- ODA/ODIF
- ODA/ODIF (FOD 26)
- Office Writer
- Ogg Container FLAC audio format
- Ogg OGM video format
- Ogg Opus audio format
- Ogg Speex audio format
- Ogg Theora Video format
- OLE DIB object
- OLIDIF
- OMA DRM Format
- Open Inventor ASCII format
- Open Inventor Binary format
- Open PGP (new format packets)
- OpenEXR image format
- OpenType Font

- OpenType Font
- Origin Wing Commander III MVE movie format
- OS/2 PM Metafile Graphics
- Outlook Express DBX folder database format
- PaintShop Pro image
- Panasonic Digital Camera image
- PaperPort image file
- Paradox (PC) Database
- PC COM executable (detected in file mode only)
- PC Library Module
- PC Object Module
- PC True Type Font
- PCD Image
- PeachCalc Spreadsheet
- PEM-encoded RSA private key
- PEM-encoded SSL certificate
- Persuasion Presentation
- PEX Binary Archive (SUN)
- PGP Compressed Data
- PGP Encrypted Data
- PGP Public Keyring
- PGP Secret Keyring
- PGP Signature Certificate
- PGP Signed and Encrypted Data
- PGP Signed Data
- Philips Script
- Pixar RenderMan Interface Bytestream file
- PKCS #12 (p12) Format
- Plan Perfect
- Portable Bitmap Utilities (PBM)
- Portable Greymap Utilities (PGM)
- Portable Pixmap Utilities (PPM)

- PostScript File
- PostScript Type 1 Font File
- PowerISO Direct Access Archive format
- PRIMEWORD
- Program Information File
- PTC Creo
- Q & A for DOS
- Q & A for Windows
- Qt binary translation file format
- Quadratron Q-One (V1.93J)
- Quadratron Q-One (V2.0)
- Qualcomm QCP audio
- Quark Xpress (Macintosh)
- QuarkXPress Intel format
- QuickDraw 3D Metafile (3DMF)
- Real Audio
- RealLegal E-Transcript
- Reflex Database (R2D)
- RIFF Device Independent Bitmap
- RIFF MIDI
- RIFF Multimedia Movie
- Ross video
- RPM Package Manager file
- SAMNA Word IV
- Samsung Electronics JungUm Global format
- Samsung stereoscopic stream
- SAP compression archive SAR format
- SAS7BDAT database storage format
- SDA SD Memory Card video
- Sega FILM video format
- SEG-Y Seismic Data format
- Serialized Object Format (SOF) Encapsulation

- SGML
- Shapefile
- Shapefile
- Shapefile binary spatial index format
- Simple Vector Format (SVF)
- SMTP document
- SolidWorks
- Sony WAVE64 format
- SoundFont file
- Speedo Font format
- SQLite database format
- Star Office Calc Spreadsheet (versions 3-5)
- Star Office Impress Presentation (versions 3-5)
- Star Office Math (versions 3-5)
- Star Office Writer Text (versions 3-5)
- Steinberg CuBase file
- StuffIt Archive (Macintosh)
- Subversion Dump format
- SUN vfont definition
- SYLK Spreadsheet
- Symphony Spreadsheet
- Synthetic music Mobile Application Format
- Tableau Extract format
- Targon Word (V 2.0)
- TCPdump packet stream capture savefile format
- True Audio format
- TrueType font collection format
- Unigraphics NX
- Uniplex (V6.01)
- Universal 3D file format
- UNIX SHAR Encapsulation
- Usenet format

- Vector CAD ASCII ASC format
- VICAR image format
- Visualization Toolkit VTK ASCII format
- Visualization Toolkit VTK Binary format
- Vivo audio-video format
- VMware Virtual Disk Format 5.0
- Volkswriter
- Vorbis OGG format
- VRML
- VRML 2.0
- WANG PC
- Wang WITA
- WANG WPS Comm.
- Web ARChive (WARC)
- Web Open Font Format
- Web Open Font Format
- WebM video file
- WebP image
- Westwood Studios Vector Quantized Animation video file
- Wildfire YAFA animation
- Windows C++ Object Storage
- Windows Journal
- Windows Micrografx Draw (DRW)
- Windows Palette
- Windows scrap file (SHS)
- Windows shortcut file
- Windows Television DVR format
- Wireless Markup Language
- Wolfram Mathematica Computable Document Format
- Wolfram Mathematica Notebook Format
- Word Connection
- WordMARC word processor

- WordPerfect General File
- WordStar
- WordStar 2000
- WordStar 6.0
- WriteNow
- Writing Assistant word processor
- X Bitmap (XBM)
- X Image
- X Pixmap (XPM)
- X Window Dump image
- X11 Portable Compiled Font file
- Xara X Xar image format
- Xerox 860 Comm.
- Xerox DocuWorks
- Xerox Writer word processor
- XPConnect Typelib Format
- Yahoo! Messenger chat log

Appendix B: Character Sets

This section provides information on the handling of character sets in the KeyView suite of products, which includes KeyView Filter SDK, KeyView Export SDK, and KeyView Viewing SDK.

- [Multibyte and Bidirectional Support](#) 232
- [Coded Character Sets](#) 240

Multibyte and Bidirectional Support

The KeyView SDKs can process files that contain multibyte characters. A multibyte character encoding represents a single character with consecutive bytes. KeyView can also process text from files that contain bidirectional text. Bidirectional text contains both Latin-based text which is read from left to right, and text that is read from right to left (Hebrew and Arabic).

The following table indicates which character encodings are supported by KeyView for each format.

Multibyte and bidirectional support

Format	Single-byte	Multibyte	Bidirectional
Archive			
7-Zip (7Z)	n/a	n/a	n/a
AD1 Evidence file	n/a	n/a	n/a
ADJ	n/a	n/a	n/a
B1	n/a	n/a	n/a
BinHex (Hqx)	n/a	n/a	n/a
Bzip2 (BZ2)	n/a	n/a	n/a
EnCase – Expert Witness Compression Format (E01)	n/a	n/a	n/a
GZIP (GZ)	n/a	n/a	n/a
ISO (ISO)	n/a	n/a	n/a
Java Archive (JAR)	n/a	n/a	n/a
Legato EMailXtender Archive (EMX)	n/a	n/a	n/a
MacBinary (BIN)	n/a	n/a	n/a
Mac Disk Copy Disk Image (DMG)	n/a	n/a	n/a
Microsoft Backup File (BKF)	n/a	n/a	n/a
Microsoft Cabinet format (CAB)	n/a	n/a	n/a

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Microsoft Compiled HTML Help (CHM)	n/a	n/a	n/a
Microsoft Compressed Folder (LZH)	n/a	n/a	n/a
PKZip (ZIP)	n/a	n/a	n/a
Microsoft Outlook DBX (DBX)	Y	Y	Y
Microsoft Outlook Offline Storage File (OST)	Y	Y	Y
RAR Archive (RAR)	n/a	n/a	n/a
Tape Archive (TAR)	n/a	n/a	n/a
UNIX Compress (Z)	n/a	n/a	n/a
UUEncoding (UUE)	n/a	n/a	n/a
Windows Scrap File (SHS)	n/a	n/a	n/a
WinZip (ZIP)	n/a	n/a	n/a
Binary			
Executable (EXE)	n/a	n/a	n/a
Link Library (DLL)	n/a	n/a	n/a
Computer-aided Design			
AutoCAD Drawing (DWG)	Y	Y	Y
AutoCAD Drawing Exchange (DXF)	Y	Y	Y
CATIA formats (CAT)	Y	N	N
Microsoft Visio (VSD)	Y	Y	Y
Database			
dBase Database	Y	N	N
Microsoft Access (MDB)	Y	Y	N
Microsoft Project (MPP)	Y	Y	N
Desktop Publishing			
Microsoft Publisher	N	Y	N
Display			

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Adobe Portable Document Format (PDF)	Y	Y ¹	Y
Graphics			
Computer Graphics Metafile (CGM)	Y	N	N
Corel DRAW (CDR)	n/a	n/a	n/a
DCX Fax System (DCX)	Y	N	N
DICOM – Digital Imaging and Communications in Medicine (DCM)	n/a	n/a	n/a
Encapsulated PostScript (EPS)	Y	N	N
Enhanced Metafile (EMF)	Y	Y	N
Graphic Interchange Format (GIF)	n/a	n/a	n/a
JBIG2	n/a	n/a	n/a
JPEG	n/a	n/a	n/a
JPEG 2000	n/a	n/a	n/a
Lotus AMIDraw Graphics (SDW)	n/a	n/a	n/a
Lotus Pic (PIC)	n/a	n/a	n/a
Macintosh Raster (PICT/PCT)	n/a	n/a	n/a
MacPaint (PNTG)	n/a	n/a	n/a
Microsoft Office Drawing (MSO)	n/a	n/a	n/a
Omni Graffiti (GRAFFLE)	Y	N	N
PC PaintBrush (PCX)	n/a	n/a	n/a
Portable Network Graphics (PNG)	n/a	n/a	n/a
SGI RGB Image (RGB)	n/a	n/a	n/a
Sun Raster Image (RS)	n/a	n/a	n/a

¹ Multibyte PDFs are supported, provided the PDF document is created by using either Character ID-keyed (CID) fonts, predefined CJK CMap files, or ToUnicode font encodings, and does not contain embedded fonts. See the Adobe website and the Adobe Acrobat documentation for more information. Any multibyte characters that are not supported are displayed using the replacement character. By default, the replacement character is a question mark (?).

To determine the type of font encodings that are used in a PDF, open the PDF in Adobe Acrobat, and select File > Document Info > Fonts. If the Encoding column lists Custom or Embedded encodings, you might encounter problems converting the PDF.

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Tagged Image File (TIFF)	Y	N	N
Truevision Targa (TGA)	n/a	n/a	n/a
Windows Animated Cursor (ANI)	n/a	n/a	n/a
Windows Bitmap (BMP)	n/a	n/a	n/a
Windows Icon Cursor (ICO)	n/a	n/a	n/a
Windows Metafile (WMF)	Y	Y	N
WordPerfect Graphics 1 (WPG)	Y	N	N
WordPerfect Graphics 2 (WPG)	Y	N	N
Mail			
Documentum EMCDF Format	Y	Y	Y
Domino XML Language (DXL)	Y	Y	N
GroupWise FileSurf	Y	N	N
Legato Extender (ONM)	Y	Y	N
Lotus Notes database (NSF)	Y	Y	Y
Mailbox (MBX)	Y	Y	Y
Microsoft Entourage Database	Y	Y	Y
Microsoft Outlook (MSG)	Y	Y	Y
Microsoft Outlook Express (EML)	Y	Y	Y
Microsoft Outlook iCalendar	Y	Y	Y
Microsoft Outlook for Macintosh	Y	Y	Y
Microsoft Outlook Offline Storage File	Y	Y	Y
Microsoft Outlook Personal File Folders (PST)	Y	Y	Y
Microsoft Outlook vCard Contact			
Text Mail (MIME)	Y	Y	Y
Transport Neutral Encapsulation Format	Y	Y	Y
Multimedia			
Advanced Systems Format (ASF)	n/a	n/a	n/a

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Audio Interchange File Format (AIFF)	n/a	n/a	n/a
Microsoft Wave Sound (WAV)	n/a	n/a	n/a
MIDI (MID)	n/a	n/a	n/a
MPEG 1 Audio Layer 3 (MP3)	n/a	n/a	n/a
MPEG 1 Video (MPG)	n/a	n/a	n/a
MPEG 2 Audio (MPEGA)	n/a	n/a	n/a
MPEG 4 Audio (MP4)	n/a	n/a	n/a
NeXT/Sun Audio (AU)	n/a	n/a	n/a
QuickTime Movie (QT/MOV)	n/a	n/a	n/a
Windows Video (AVI)	n/a	n/a	n/a
Presentations			
Apple iWork Keynote (GZ)	Y	Y	N
Applix Presents (AG)	character set 1252 only	N	N
Corel Presentations (SHW)	character set 1252 only	N	N
Extensible Forms Description Language (XFD)	Y	Y	N
Lotus Freelance Graphics 2 (PRE)	character set 850 only	N	N
Lotus Freelance Graphics (PRZ)	Y	Japanese, Simple Chinese, Traditional Chinese, Thai only	N
Macromedia Flash (SWF)	Y	Y	N
Microsoft OneNote	Y	Y	N
Microsoft PowerPoint PC (PPT)	character set 1252 only	Traditional Chinese only	N
Microsoft PowerPoint Windows (PPT)	Y	Japanese, Simple Chinese, Traditional Chinese, Korean only	Hebrew only
Microsoft PowerPoint Macintosh (PPT)	Y	N	N
Microsoft PowerPoint Windows XML	Y	Y	Y

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
2007 and 2010 (PPTX)			
OASIS Open Document (ODP)	Y	Y	N
OpenOffice Impress (ODP)	Y	Y	N
StarOffice Impress (ODP)	Y	Y	N
Spreadsheets			
Apple iWork Numbers (GZ)	Y	Y	N
Applix Spreadsheets (AS)	character set 1252 only	N	N
Comma Separated Values (CSV)	character set 1252 only	N	N
Corel Quattro Pro (QPW/WB3)	Y	N	N
Data Interchange Format (DIF)	Y	Y	Y ¹
Lotus 1-2-3 (123)	Y	Y	Y
Lotus 1-2-3 (WK4)	Y	Y	N
Lotus 123 Charts (123)	Y	Y	N
Microsoft Excel Charts (XLS)	Y	Y	N
Microsoft Excel Macintosh (XLS)	Y	N	N
Microsoft Excel Windows (XLS)	Y	Y	Y ²
Microsoft Excel Windows XML 2007 (XLSX)	Y	Y	N
Microsoft Office Excel Binary Format (XLSB)	Y	Y	N
Microsoft Works Spreadsheet (S30/S40)	Y	N	N
OASIS Open Document (ODS)	Y	Y	N
OpenOffice Calc (ODS)	Y	Y	N
StarOffice Calc (ODS)	Y	Y	N
Text and Markup			
ANSI (TXT)	Y	Y	Y ²
ASCII (TXT)	Y	Y	Y ²

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
HTML (HTM)	Y	Y	Y ^{2, 2}
Microsoft Excel Windows XML 2003	Y	Y	Y
Microsoft Word for Windows XML 2003	Y	Y	Y
Microsoft Visio XML 2003	Y	Y	Y
Rich Text Format (RTF)	Y	Y	Y ³
Unicode HTML	Y	Y	Y ^{2, 3}
Unicode Text (TXT)	Y	Y	Y ²
XHTML	Y	Y	Y ³
XML	Y	Y	Y
Word Processing			
Adobe Maker Interchange Format (MIF)	character set 1252 only	N	N
Apple iChat Log (ICHAT)	Y	Y	N
Apple iWork Pages (GZ)	Y	Y	N
Applix Words (AW)	character set 1252 only	N	N
DisplayWrite (IP)	character set 500, 1026 only	N	N
Folio Flat File (FFF)	character set 1252 only	N	N
Founder Chinese E-paper Basic (CEB)	Y	Y	N
Fujitsu Oasys (OA2)	Y	Y	N
Hangul (HWP)	Y	Y	N
Health level7 (HL7)	Y	Y	Y
IBM DCA/RTF (DC)	character sets 500, 1026 only	N	N
JustSystems Ichitaro (JTD)	Y	Y	N
Lotus AMI Pro (SAM)	Y	Simple Chinese, Traditional Chinese, Japanese, Thai only	Y

Multibyte and bidirectional support, continued

Format	Single-byte	Multibyte	Bidirectional
Lotus AMI Professional Write Plus (AMI)	Y	Simple Chinese, Traditional Chinese, Japanese, Thai only	N
Lotus Word Pro (LWP)	Y	Y	Y ³
Lotus SmartMaster (MWP)	Y	Y	N
Microsoft Word PC (DOC)	character set 1252 only	N	N
Microsoft Word Windows V1-2 (DOC)	Y	N	N
Microsoft Word Windows V6, 7, 8, 95 (DOC)	Y	Y	Hebrew only ³
Microsoft Word Windows V97 through 2003 (DOC)	Y	Y	Y ³
Microsoft Word Windows XML 2007 and 2010 (DOCX)	Y	Y	Y ³
Microsoft Word Macintosh (DOC)	Y	N	Y ³
Microsoft Works (WPS)	Y	Japanese only	N
Microsoft Write (WRI)	Y	Japanese only	N
OASIS Open Document (ODT)	Y	Y	N
Omni Outliner (OO3)	Y	Y	N
OpenOffice Writer (ODT)	Y	Y	N
Open Publication Structure eBook (EPUB)	Y	Y	Y
StarOffice Writer (ODT)	Y	Y	N
Skype Log (DBB)	Y	Y (null-terminated charsets)	N
WordPad (RTF)	Y	Y	Y
WordPerfect Linux (WPS)	Y	N	N
WordPerfect Macintosh (WPS)	Y	N	N
WordPerfect Windows (WO)	Y	N	N
XML Paper Specification (XPS)	Y	Y	N
XYWrite Windows (XY4)	character set 1252 only	N	N
Yahoo! Instant Messenger (DAT)	Y	Y (null-terminated charsets)	N

¹The text direction in the output file might not be correct.

²In Export SDK, a bidirectional right-to-left (RTL) tag is extracted from this format and included in the direction element (`<dir=RTL>`) of the output.

Coded Character Sets

This section lists which character set you can use to specify the target character set. The coded character sets are enumerated in `kvtypes.h` and defined in the Filter class.

Code Character Sets

Coded Character Set	Description	Can be set as target charset?
KVCS_UNKNOWN	Unknown character set	N
KVCS_SJIS	Japanese (uses multibyte encoding), cp932	Y
KVCS_GB	Simplified Chinese (China, Singapore, Malaysia) cp936	Y
KVCS_BIG5	Traditional Chinese (Taiwan, Hong Kong, Macaw) cp950	Y
KVCS_KSC	Korean, cp949	Y
KVCS_1250	Windows Latin 2 (Central Europe)	Y
KVCS_1251	Windows Cyrillic (Slavic)	Y
KVCS_1252	Windows Latin 1 (ANSI)	Y
KVCS_1253	Windows Greek	Y
KVCS_1254	Windows Latin 5 (Turkish)	Y
KVCS_1255	Windows Hebrew	Y
KVCS_1256	Windows Arabic	Y
KVCS_1257	Windows Baltic Rim	Y
KVCS_1258	Windows Vietnamese	Y
KVCS_8859_1	ISO 8859-1 Latin 1 (Western Europe, Latin America)	Y
KVCS_8859_2	ISO 8859-2 Latin 2 (Central Eastern Europe)	Y
KVCS_8859_3	ISO 8859-3 Latin 3 (S.E. Europe)	Y

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_8859_4	ISO 8859-4 Latin 4 (Scandinavia/Baltic)	Y
KVCS_8859_5	ISO 8859-5 Latin/Cyrillic	Y
KVCS_8859_6	ISO 8859-6 Latin/Arabic	Y
KVCS_8859_7	ISO 8859-7 Latin/Greek	Y
KVCS_8859_8	ISO 8859-8 Latin/Hebrew	Y
KVCS_8859_9	ISO 8859-9 Latin/Turkish	Y
KVCS_8859_14	ISO 8859-14	Y
KVCS_8859_15	ISO 8859-15	Y
KVCS_437	DOS Latin US	Y
KVCS_737	DOS Greek	Y
KVCS_775	DOS Baltic Rim	Y
KVCS_850	DOS Latin 1	Y
KVCS_851	DOS Greek	Y
KVCS_852	DOS Latin 2	Y
KVCS_855	DOS Cyrillic	Y
KVCS_857	DOS Turkish	Y
KVCS_860	DOS Portuguese	Y
KVCS_861	DOS Icelandic	Y
KVCS_862	DOS Hebrew	Y
KVCS_863	DOS Canadian French	Y
KVCS_864	DOS Arabic	Y
KVCS_865	DOS Nordic	Y
KVCS_866	DOS Cyrillic Russian	Y
KVCS_869	DOS Greek 2	Y
KVCS_874	Thai	Y
KVCS_	PDF MAC DOC	N

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
PDFMACDOC		
KVCS_ PDFWINDOC	PDF WIN DOC	N
KVCS_STDENC	Adobe Standard Encoding	N
KVCS_PDFDOC	Adobe standard PDF character set	N
KVCS_037	EBCDIC code page 037	Y
KVCS_1026	EBCDIC code page 1026	Y
KVCS_500	EBCDIC code page 500	Y
KVCS_875	EBCDIC code page 875	Y
KVCS_LMBCS	Lotus multibyte character set Group 1 and Group 2	N
KVCS_UNICODE	Unicode, UCS-2	Y
KVCS_UTF16	16-bit Unicode transformation format	Y
KVCS_UTF8	8-bit Unicode transformation format	Y
KVCS_UTF7	7-bit Unicode transformation format	Y
KVCS_2022_JP	ISO 2022-JP, Japanese mail and news safe encoding (JIS-7)	N
KVCS_2022_CN	ISO 2022-CN, Chinese mail and news safe encoding	N
KVCS_2022_KR	ISO 2022-KR, Korean mail and news safe encoding	N
KVCS_WP6X	Word Perfect 6.x and higher character mapping	N
KVCS_10000	Western European (Macintosh)	Y
KVCS_KSC5601	Unified Hangul	Y
KVCS_GB2312	Simplified Chinese (China, Singapore, Hong Kong)	Y
KVCS_GB12345	Traditional Chinese (China) - analogue of GB2312	Y
KVCS_CNS11643	Traditional Chinese - Taiwan. Supplement to Big5	Y
KVCS_JIS0201	Japanese - contains ASCII character set (JIS-Roman)	N

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_JIS0212	Japanese. Supplement to JIS0208.	Y
KVCS_EUC_JP	Japanese Extended UNIX Code	Y
KVCS_EUC_GB	Simplified Chinese Extended UNIX Code	Y
KVCS_EUC_BIG5	Traditional Chinese Extended UNIX Code	N
KVCS_EUC_KSC	Korean Extended UNIX Code	N
KVCS_424	EBCDIC Hebrew	N
KVCS_856	PC Hebrew (old)	N
KVCS_1006	IBM AIX Pakistan (Urdu)	N
KVCS_KOI8R	Cyrillic (Russian)	Y
KVCS_PDF_JAPAN1	Adobe-Japan1-2 character collection	N
KVCS_PDF_KOREA1	Adobe-Korea1-0 character collection	N
KVCS_PDF_GB1	Adobe-GB1-3 character collection	N
KVCS_PDF_CNS1	Adobe-CNS1-2 character collection	N
KVCS_2022_JP_8	ISO 2022-JP, Japanese mail and news safe encoding (JIS8)	N
KVCS_720	Arabic DOS-720	Y
KVCS_VISCII	Vietnamese VISCII	Y
KVCS_8859_10	ISO 8859-10 (Latin 6 Nordic)	Y ¹
KVCS_8859_13	ISO 8859-13 (Latin 7 Baltic)	Y ¹
KVCS_57002	ISCII Devanagari (x-iscii-de)	Y ¹
KVCS_57003	ISCII Bengali (x-iscii-be)	Y ¹
KVCS_57004	ISCII Tamil (x-iscii-ta)	Y ¹
KVCS_57005	ISCII Telugu (x-iscii-te)	Y ¹
KVCS_57006	ISCII Assamese (x-iscii-as)	Y ¹

Code Character Sets, continued

Coded Character Set	Description	Can be set as target charset?
KVCS_57007	ISCII Oriya (x-iscii-or)	Y ¹
KVCS_57008	ISCII Kannada (x-iscii-ka)	Y ¹
KVCS_57009	ISCII Malayalam (x-iscii-ma)	Y ¹
KVCS_57010	ISCII Gujarathi (x-iscii-gu)	Y ¹
KVCS_57011	ISCII Panjabi (x-iscii-pa)	Y ¹
KVCS_GB18030b2	Reserved for internal use	n/a
KVCS_GB18030	GB18030 (Chinese 4-byte character set)	Y
KVCS_8859_11	ISO 8859-11 (Thai)	Y
KVCS_8859_16	ISO 8859-16 (Latin-10 South-Eastern Europe)	Y
KVCS_ARABICMAC	Arabic Mac (x-mac-arabic)	Y
KVCS_KOI8U	Cyrillic (KOI8U Ukrainian)	Y
KVCS_HZGB2312	The 7-bit representation of GB 2312 / RFC 1842	n/a

¹The character set cannot be forced as output in Export SDK and Viewing SDK because the character set is not supported by the major browsers.

Appendix C: File Formats and Extensions

This section lists the KeyView file format numbers and their associated file extensions.

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File Format and Extension Table

This section lists the KeyView file format codes and the file extensions that they are most commonly associated with.

NOTE: This is not a complete list of file extensions. KeyView returns format codes based on file content, which cannot always be predicted from the file extension. Some file extensions might also be associated with multiple format numbers.

KeyView file formats and extensions

Format Name	Format Number	Format Description	Associated File Extension
AES_Multiplus_Comm_Fmt	1	Multiplus (AES)	PTF
ASCII_Text_Fmt	2	Text	
MSDOS_Batch_File_Fmt	3	MS-DOS Batch File	BAT
Applix_Alis_Fmt	4	APPLIX ASTERIX	AX
BMP_Fmt	5	Windows Bitmap	BMP
CT_DEF_Fmt	6	Convergent Technologies DEF Comm. Format	
Corel_Draw_Fmt	7	Corel Draw	CDR
CGM_ClearText_Fmt	8	Computer Graphics Metafile (CGM)	CGM ¹
CGM_Binary_Fmt	9	Computer Graphics Metafile (CGM)	CGM ¹
CGM_Character_Fmt	10	Computer Graphics Metafile (CGM)	CGM ¹
Word_Connection_Fmt	11	Word Connection	CN
COMET_TOP_Word_Fmt	12	COMET TOP	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
CEOWrite_Fmt	13	CEOWrite	CW
DSA101_Fmt	14	DSA101 (Honeywell Bull)	
DCA_RFT_Fmt	15	DCA-RFT (IBM Revisable Form)	RFT
CDA_DDIF_Fmt	16	CDA / DDIF	
DG_CDS_Fmt	17	DG Common Data Stream (CDS)	CDS
Micrografx_Draw_Fmt	18	Windows Draw (Micrografx)	DRW
Data_Point_VistaWord_Fmt	19	Vistaword	
DECdx_Fmt	20	DECdx	DX
Enable_WP_Fmt	21	Enable Word Processing	WPF
EPSF_Fmt	22	Encapsulated PostScript	EPS ¹
Preview_EPSF_Fmt	23	Encapsulated PostScript	EPS ¹
MS_Executable_Fmt	24	MSDOS/Windows Program	EXE
G31D_Fmt	25	CCITT G3 1D	
GIF_87a_Fmt	26	Graphics Interchange Format (GIF87a)	GIF ¹
GIF_89a_Fmt	27	Graphics Interchange Format (GIF89a)	GIF ¹
HP_Word_PC_Fmt	28	HP Word PC	HW
IBM_1403_LinePrinter_Fmt	29	IBM 1403 Line Printer	I4
IBM_DCF_Script_Fmt	30	DCF Script	IC
IBM_DCA_FFT_Fmt	31	DCA-FFT (IBM Final Form)	IF, FFT
Interleaf_Fmt	32	Interleaf	
GEM_Image_Fmt	33	GEM Bit Image	IMG
IBM_Display_Write_Fmt	34	Display Write	IP

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Fmt			
Sun_Raster_Fmt	35	Sun Raster	RAS
Ami_Pro_Fmt	36	Lotus Ami Pro	SAM
Ami_Pro_StyleSheet_Fmt	37	Lotus Ami Pro Style Sheet	
MORE_Fmt	38	MORE Database MAC	
Lyrix_Fmt	39	Lyrix Word Processing	
MASS_11_Fmt	40	MASS-11	M1
MacPaint_Fmt	41	MacPaint	PNTG
MS_Word_Mac_Fmt	42	Microsoft Word for Macintosh	DOC ¹
SmartWare_II_Comm_Fmt	43	SmartWare II	
MS_Word_Win_Fmt	44	Microsoft Word for Windows	DOC ¹ , WPS ¹
Multimate_Fmt	45	MultiMate	MM ¹
Multimate_Fnote_Fmt	46	MultiMate Footnote File	FNX ¹
Multimate_Adv_Fmt	47	MultiMate Advantage	
Multimate_Adv_Fnote_Fmt	48	MultiMate Advantage Footnote File	
Multimate_Adv_II_Fmt	49	MultiMate Advantage II	MM ¹
Multimate_Adv_II_Fnote_Fmt	50	MultiMate Advantage II Footnote File	FNX ¹
Multiplan_PC_Fmt	51	Multiplan (PC)	
Multiplan_Mac_Fmt	52	Multiplan (Mac)	
MS_RTF_Fmt	53	Rich Text Format (RTF)	RTF
MS_Word_PC_Fmt	54	Microsoft Word for PC	DOC ¹
MS_Word_PC_StyleSheet_Fmt	55	Microsoft Word for PC Style Sheet	DOC ¹

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
MS_Word_PC_Glossary_Fmt	56	Microsoft Word for PC Glossary	DOC ¹
MS_Word_PC_Driver_Fmt	57	Microsoft Word for PC Driver	DOC ¹
MS_Word_PC_Misc_Fmt	58	Microsoft Word for PC Miscellaneous File	DOC ¹
NBI_Async_Archive_Fmt	59	NBI Async Archive Format	
Navy_DIF_Fmt	60	Navy DIF	ND
NBI_Net_Archive_Fmt	61	NBI Net Archive Format	NN
NIOS_TOP_Fmt	62	NIOS TOP	
FileMaker_Mac_Fmt	63	Filemaker MAC	FP5, FP7
ODA_Q1_11_Fmt	64	ODA / ODIF	OD ¹
ODA_Q1_12_Fmt	65	ODA / ODIF	OD ¹
OLIDIF_Fmt	66	OLIDIF (Olivetti)	
Office_Writer_Fmt	67	Office Writer	OW
PC_Paintbrush_Fmt	68	PC Paintbrush Graphics (PCX)	PCX
CPT_Comm_Fmt	69	CPT	
Lotus_PIC_Fmt	70	Lotus PIC	PIC
Mac_PICT_Fmt	71	QuickDraw Picture	PCT
Philips_Script_Word_Fmt	72	Philips Script	
PostScript_Fmt	73	PostScript	PS
PRIMEWORD_Fmt	74	PRIMEWORD	
Quadratron_Q_One_v1_Fmt	75	Q-One V1.93J	Q1 ¹ , QX ¹
Quadratron_Q_One_v2_Fmt	76	Q-One V2.0	Q1 ¹ , QX ¹

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
SAMNA_Word_IV_Fmt	77	SAMNA Word	SAM
Ami_Pro_Draw_Fmt	78	Lotus Ami Pro Draw	SDW
SYLK_Spreadsheet_Fmt	79	SYLK	
SmartWare_II_WP_Fmt	80	SmartWare II	
Symphony_Fmt	81	Symphony	WR1
Targa_Fmt	82	Targa	TGA
TIFF_Fmt	83	TIFF	TIF, TIFF
Targon_Word_Fmt	84	Targon Word	TW
Uniplex_Ucalc_Fmt	85	Uniplex Ucalc	SS
Uniplex_WP_Fmt	86	Uniplex	UP
MS_Word_UNIX_Fmt	87	Microsoft Word UNIX	DOC ¹
WANG_PC_Fmt	88	WANG PC	
WordERA_Fmt	89	WordERA	
WANG_WPS_Comm_Fmt	90	WANG WPS	WF
WordPerfect_Mac_Fmt	91	WordPerfect MAC	WPM, WPD ¹
WordPerfect_Fmt	92	WordPerfect	WO, WPD ¹
WordPerfect_VAX_Fmt	93	WordPerfect VAX	WPD ¹
WordPerfect_Macro_Fmt	94	WordPerfect Macro	
WordPerfect_Dictionary_Fmt	95	WordPerfect Spelling Dictionary	
WordPerfect_Thesaurus_Fmt	96	WordPerfect Thesaurus	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
WordPerfect_Resource_Fmt	97	WordPerfect Resource File	
WordPerfect_Driver_Fmt	98	WordPerfect Driver	
WordPerfect_Cfg_Fmt	99	WordPerfect Configuration File	
WordPerfect_Hyphenation_Fmt	100	WordPerfect Hyphenation Dictionary	
WordPerfect_Misc_Fmt	101	WordPerfect Miscellaneous File	WPD ¹
WordMARC_Fmt	102	WordMARC	WM, PW
Windows_Metafile_Fmt	103	Windows Metafile	WMF ¹
Windows_Metafile_NoHdr_Fmt	104	Windows Metafile (no header)	WMF ¹
SmartWare_II_DB_Fmt	105	SmartWare II	
WordPerfect_Graphics_Fmt	106	WordPerfect Graphics	WPG, QPG
WordStar_Fmt	107	WordStar	WS
WANG_WITA_Fmt	108	WANG WITA	WT
Xerox_860_Comm_Fmt	109	Xerox 860	
Xerox_Writer_Fmt	110	Xerox Writer	
DIF_SpreadSheet_Fmt	111	Data Interchange Format (DIF)	DIF
Enable_Spreadsheet_Fmt	112	Enable Spreadsheet	SSF
SuperCalc_Fmt	113	Supercalc	CAL
UltraCalc_Fmt	114	UltraCalc	
SmartWare_II_SS_	115	SmartWare II	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Fmt			
SOF_Encapsulation_Fmt	116	Serialized Object Format (SOF)	SOF
PowerPoint_Win_Fmt	117	PowerPoint PC	PPT ¹
PowerPoint_Mac_Fmt	118	PowerPoint MAC	PPT ¹
PowerPoint_95_Fmt	119	PowerPoint 95	PPT ¹
PowerPoint_97_Fmt	120	PowerPoint 97	PPT ¹
PageMaker_Mac_Fmt	121	PageMaker for Macintosh	
PageMaker_Win_Fmt	122	PageMaker for Windows	
MS_Works_Mac_WP_Fmt	123	Microsoft Works for MAC	
MS_Works_Mac_DB_Fmt	124	Microsoft Works for MAC	
MS_Works_Mac_SS_Fmt	125	Microsoft Works for MAC	
MS_Works_Mac_Comm_Fmt	126	Microsoft Works for MAC	
MS_Works_DOS_WP_Fmt	127	Microsoft Works for DOS	WPS ¹
MS_Works_DOS_DB_Fmt	128	Microsoft Works for DOS	WDB ¹
MS_Works_DOS_SS_Fmt	129	Microsoft Works for DOS	
MS_Works_Win_WP_Fmt	130	Microsoft Works for Windows	WPS ¹
MS_Works_Win_DB_Fmt	131	Microsoft Works for Windows	WDB ¹
MS_Works_Win_SS_Fmt	132	Microsoft Works for Windows	S30, S40

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
PC_Library_Fmt	133	DOS/Windows Object Library	
MacWrite_Fmt	134	MacWrite	
MacWrite_II_Fmt	135	MacWrite II	
Freehand_Fmt	136	Freehand MAC	
Disk_Doubler_Fmt	137	Disk Doubler	
HP_GL_Fmt	138	HP Graphics Language	HPGL
FrameMaker_Fmt	139	FrameMaker	FM, FRM
FrameMaker_Book_Fmt	140	FrameMaker	BOOK
Maker_Markup_Language_Fmt	141	Maker Markup Language	
Maker_Interchange_Fmt	142	Maker Interchange Format (MIF)	MIF
JPEG_File_Interchange_Fmt	143	Interchange Format	JPG, JPEG
Reflex_Fmt	144	Reflex	
Framework_Fmt	145	Framework	
Framework_II_Fmt	146	Framework II	FW3
Paradox_Fmt	147	Paradox	DB
MS_Windows_Write_Fmt	148	Windows Write	WRI
Quattro_Pro_DOS_Fmt	149	Quattro Pro for DOS	
Quattro_Pro_Win_Fmt	150	Quattro Pro for Windows	WB2, WB3
Persuasion_Fmt	151	Persuasion	
Windows_Icon_Fmt	152	Windows Icon Format	ICO
Windows_Cursor_Fmt	153	Windows Cursor	CUR

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
MS_Project_Activity_Fmt	154	Microsoft Project	MPP ¹
MS_Project_Resource_Fmt	155	Microsoft Project	MPP ¹
MS_Project_Calc_Fmt	156	Microsoft Project	MPP ¹
PKZIP_Fmt	157	ZIP Archive	ZIP
Quark_Xpress_Fmt	158	Quark Xpress MAC	
ARC_PAK_Archive_Fmt	159	PAK/ARC Archive	ARC, PAK
MS_Publisher_Fmt	160	Microsoft Publisher	PUB ¹
PlanPerfect_Fmt	161	PlanPerfect	
WordPerfect_Auxiliary_Fmt	162	WordPerfect auxiliary file	WPW
MS_WAVE_Audio_Fmt	163	Microsoft Wave	WAV
MIDI_Audio_Fmt	164	MIDI	MID, MIDI
AutoCAD_DXF_Binary_Fmt	165	AutoCAD DXF	DXF ¹
AutoCAD_DXF_Text_Fmt	166	AutoCAD DXF	DXF ¹
dBase_Fmt	167	dBase	DBF
OS_2_PM_Metfile_Fmt	168	OS/2 PM Metafile	MET
Lasergraphics_Language_Fmt	169	Lasergraphics Language	
AutoShade_Rendering_Fmt	170	AutoShade Rendering	
GEM_VDI_Fmt	171	GEM VDI	VDI
Windows_Help_Fmt	172	Windows Help File	HLP

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Volkswriter_Fmt	173	Volkswriter	VW4
Ability_WP_Fmt	174	Ability	
Ability_DB_Fmt	175	Ability	
Ability_SS_Fmt	176	Ability	
Ability_Comm_Fmt	177	Ability	
Ability_Image_Fmt	178	Ability	
XyWrite_Fmt	179	XYWrite / Nota Bene	XY4
CSV_Fmt	180	CSV (Comma Separated Values)	CSV
IBM_Writing_Assistant_Fmt	181	IBM Writing Assistant	IWA
WordStar_2000_Fmt	182	WordStar 2000	WS2
HP_PCL_Fmt	183	HP Printer Control Language	PCL
UNIX_Exe_PreSysV_VAX_Fmt	184	Unix Executable (PDP-11/pre-System V VAX)	
UNIX_Exe_Basic_16_Fmt	185	Unix Executable (Basic-16)	
UNIX_Exe_x86_Fmt	186	Unix Executable (x86)	
UNIX_Exe_iAPX_286_Fmt	187	Unix Executable (iAPX 286)	
UNIX_Exe_MC68k_Fmt	188	Unix Executable (MC680x0)	
UNIX_Exe_3B20_Fmt	189	Unix Executable (3B20)	
UNIX_Exe_WE32000_Fmt	190	Unix Executable (WE32000)	
UNIX_Exe_VAX_Fmt	191	Unix Executable (VAX)	
UNIX_Exe_Bell_5_Fmt	192	Unix Executable (Bell 5.0)	
UNIX_Obj_VAX_	193	Unix Object Module (VAX Demand)	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Demand_Fmt			
UNIX_Obj_MS8086_Fmt	194	Unix Object Module (old MS 8086)	
UNIX_Obj_Z8000_Fmt	195	Unix Object Module (Z8000)	
AU_Audio_Fmt	196	NeXT/Sun Audio Data	AU
NeWS_Font_Fmt	197	NeWS bitmap font	
cpio_Archive_CRChdr_Fmt	198	cpio archive (CRC Header)	
cpio_Archive_CHRhdr_Fmt	199	cpio archive (CHR Header)	
PEX_Binary_Archive_Fmt	200	SUN PEX Binary Archive	
Sun_vfont_Fmt	201	SUN vfont Definition	
Curses_Screen_Fmt	202	Curses Screen Image	
UUEncoded_Fmt	203	UU encoded	UUE
WriteNow_Fmt	204	WriteNow MAC	
PC_Obj_Fmt	205	DOS/Windows Object Module	
Windows_Group_Fmt	206	Windows Group	
TrueType_Font_Fmt	207	TrueType Font	TTF
Windows_PIF_Fmt	208	Program Information File (PIF)	PIF
MS_COM_Executable_Fmt	209	PC (.COM)	COM
StuftIt_Fmt	210	StuftIt (MAC)	HQX
PeachCalc_Fmt	211	PeachCalc	
Wang_GDL_Fmt	212	WANG Office GDL Header	
Q_A_DOS_Fmt	213	Q & A for DOS	
Q_A_Win_Fmt	214	Q & A for Windows	JW

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
WPS_PLUS_Fmt	215	WPS-PLUS	WPL
DCX_Fmt	216	DCX FAX Format(PCX images	DCX
OLE_Fmt	217	OLE Compound Document	OLE
EBCDIC_Fmt	218	EBCDIC Text	
DCS_Fmt	219	DCS	
UNIX_SHAR_Fmt	220	SHAR	SHAR
Lotus_Notes_ BitMap_Fmt	221	Lotus Notes Bitmap	
Lotus_Notes_CDF_ Fmt	222	Lotus Notes CDF	CDF
Compress_Fmt	223	Unix Compress	Z
GZ_Compress_Fmt	224	GZ Compress	GZ ¹
TAR_Fmt	225	TAR	TAR
ODIF_FOD26_Fmt	226	ODA / ODIF	F26
ODIF_FOD36_Fmt	227	ODA / ODIF	F36
ALIS_Fmt	228	ALIS	
Envoy_Fmt	229	Envoy	EVY
PDF_Fmt	230	Portable Document Format	PDF
BinHex_Fmt	231	BinHex	HQX
SMTP_Fmt	232	SMTP	SMTP
MIME_Fmt	233	MIME ²	EML, MBX
USENET_Fmt	234	USENET	
SGML_Fmt	235	SGML	SGML
HTML_Fmt	236	HTML	HTM ¹ , HTML ¹
ACT_Fmt	237	ACT	ACT
PNG_Fmt	238	Portable Network Graphics (PNG)	PNG

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
MS_Video_Fmt	239	Video for Windows (AVI)	AVI
Windows_Animated_Cursor_Fmt	240	Windows Animated Cursor	ANI
Windows_CPP_Obj_Storage_Fmt	241	Windows C++ Object Storage	
Windows_Palette_Fmt	242	Windows Palette	PAL
RIFF_DIB_Fmt	243	RIFF Device Independent Bitmap	
RIFF_MIDI_Fmt	244	RIFF MIDI	RMI
RIFF_Multimedia_Movie_Fmt	245	RIFF Multimedia Movie	
MPEG_Fmt	246	MPEG Movie	MPG, MPEG ¹
QuickTime_Fmt	247	QuickTime Movie, MPEG-4 Audio	MOV, QT, MP4
AIFF_Fmt	248	Audio Interchange File Format (AIFF)	AIF, AIFF
Amiga_MOD_Fmt	249	Amiga MOD	MOD
Amiga_IFF_8SVX_Fmt	250	Amiga IFF (8SVX) Sound	IFF
Creative_Voice_Audio_Fmt	251	Creative Voice (VOC)	VOC
AutoDesk_Animator_FLI_Fmt	252	AutoDesk Animator FLIC	FLI
AutoDesk_AnimatorPro_FLC_Fmt	253	AutoDesk Animator Pro FLIC	FLC
Compactor_Archive_Fmt	254	Compactor / Compact Pro	
VRML_Fmt	255	VRML	WRL
QuickDraw_3D_Metafile_Fmt	256	QuickDraw 3D Metafile	
PGP_Secret_Keyring_Fmt	257	PGP Secret Keyring	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
PGP_Public_Keyring_Fmt	258	PGP Public Keyring	
PGP_Encrypted_Data_Fmt	259	PGP Encrypted Data	
PGP_Signed_Data_Fmt	260	PGP Signed Data	
PGP_SignedEncrypted_Data_Fmt	261	PGP Signed and Encrypted Data	
PGP_Sign_Certificate_Fmt	262	PGP Signature Certificate	
PGP_Compressed_Data_Fmt	263	PGP Compressed Data	
PGP_ASCII_Public_Keyring_Fmt	264	ASCII-armored PGP Public Keyring	
PGP_ASCII_Encoded_Fmt	265	ASCII-armored PGP encoded	PGP ¹
PGP_ASCII_Signed_Fmt	266	ASCII-armored PGP encoded	PGP ¹
OLE_DIB_Fmt	267	OLE DIB object	
SGL_Image_Fmt	268	SGL Image	RGB
Lotus_ScreenCam_Fmt	269	Lotus ScreenCam	
MPEG_Audio_Fmt	270	MPEG Audio	MPEGA
FTP_Software_Session_Fmt	271	FTP Session Data	STE
Netscape_Bookmark_File_Fmt	272	Netscape Bookmark File	HTM ¹
Corel_Draw_CMV_Fmt	273	Corel CMV	CMV
AutoDesk_DWG_Fmt	274	AutoDesk Drawing (DWG)	DWG

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
AutoDesk_WHIP_Fmt	275	AutoDesk WHIP	WHP
Macromedia_Director_Fmt	276	Macromedia Director	DCR
Real_Audio_Fmt	277	Real Audio	RM
MSDOS_Device_Driver_Fmt	278	MSDOS Device Driver	SYS
Micrografx_Designer_Fmt	279	Micrografx Designer	DSF
SVF_Fmt	280	Simple Vector Format (SVF)	SVF
Applix_Words_Fmt	281	Applix Words	AW
Applix_Graphics_Fmt	282	Applix Graphics	AG
MS_Access_Fmt	283	Microsoft Access	MDB ¹
MS_Access_95_Fmt	284	Microsoft Access 95	MDB ¹
MS_Access_97_Fmt	285	Microsoft Access 97	MDB ¹
MacBinary_Fmt	286	MacBinary	BIN
Apple_Single_Fmt	287	Apple Single	
Apple_Double_Fmt	288	Apple Double	
Enhanced_Metafile_Fmt	289	Enhanced Metafile	EMF
MS_Office_Drawing_Fmt	290	Microsoft Office Drawing	
XML_Fmt	291	XML	XML ¹
DeVice_Independent_Fmt	292	DeVice Independent file (DVI)	DVI
Unicode_Fmt	293	Unicode	UNI
Lotus_123_Worksheet_Fmt	294	Lotus 1-2-3	WK1 ¹
Lotus_123_Format_Fmt	295	Lotus 1-2-3 Formatting	FM3

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Fmt			
Lotus_123_97_Fmt	296	Lotus 1-2-3 97	WK1 ¹
Lotus_Word_Pro_96_Fmt	297	Lotus Word Pro 96	LWP ¹
Lotus_Word_Pro_97_Fmt	298	Lotus Word Pro 97	LWP ¹
Freelance_DOS_Fmt	299	Lotus Freelance for DOS	
Freelance_Win_Fmt	300	Lotus Freelance for Windows	PRE
Freelance_OS2_Fmt	301	Lotus Freelance for OS/2	PRS
Freelance_96_Fmt	302	Lotus Freelance 96	PRZ ¹
Freelance_97_Fmt	303	Lotus Freelance 97	PRZ ¹
MS_Word_95_Fmt	304	Microsoft Word 95	DOC ¹
MS_Word_97_Fmt	305	Microsoft Word 97	>DOC ¹
Excel_Fmt	306	Microsoft Excel	XLS ¹
Excel_Chart_Fmt	307	Microsoft Excel	XLS ¹
Excel_Macro_Fmt	308	Microsoft Excel	XLS ¹
Excel_95_Fmt	309	Microsoft Excel 95	XLS ¹
Excel_97_Fmt	310	Microsoft Excel 97	XLS ¹
Corel_Presentations_Fmt	311	Corel Presentations	XFD, XFDL
Harvard_Graphics_Fmt	312	Harvard Graphics	
Harvard_Graphics_Chart_Fmt	313	Harvard Graphics Chart	CH3, CHT
Harvard_Graphics_Symbol_Fmt	314	Harvard Graphics Symbol File	SY3
Harvard_Graphics_Cfg_Fmt	315	Harvard Graphics Configuration File	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Harvard_Graphics_Palette_Fmt	316	Harvard Graphics Palette	
Lotus_123_R9_Fmt	317	Lotus 1-2-3 Release 9	
Applix_Spreadsheets_Fmt	318	Applix Spreadsheets	AS
MS_Pocket_Word_Fmt	319	Microsoft Pocket Word	PWD, DOC ¹
MS_DIB_Fmt	320	MS Windows Device Independent Bitmap	
MS_Word_2000_Fmt	321	Microsoft Word 2000	DOC ¹
Excel_2000_Fmt	322	Microsoft Excel 2000	XLS ¹
PowerPoint_2000_Fmt	323	Microsoft PowerPoint 2000	PPT
MS_Access_2000_Fmt	324	Microsoft Access 2000	MDB ¹ , MPP ¹
MS_Project_4_Fmt	325	Microsoft Project 4	MPP ¹
MS_Project_41_Fmt	326	Microsoft Project 4.1	MPP ¹
MS_Project_98_Fmt	327	Microsoft Project 98	MPP ¹
Folio_Flat_Fmt	328	Folio Flat File	FFF
HWP_Fmt	329	HWP(Arae-Ah Hangul)	HWP
ICHITARO_Fmt	330	ICHITARO V4-10	
IS_XML_Fmt	331	Extended or Custom XML	XML ¹
Oasys_Fmt	332	Oasys format	OA2, OA3
PBM_ASC_Fmt	333	Portable Bitmap Utilities ASCII Format	
PBM_BIN_Fmt	334	Portable Bitmap Utilities Binary Format	
PGM_ASC_Fmt	335	Portable Greymap Utilities ASCII Format	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
PGM_BIN_Fmt	336	Portable Greymap Utilities Binary Format	PGM
PPM_ASC_Fmt	337	Portable Pixmap Utilities ASCII Format	
PPM_BIN_Fmt	338	Portable Pixmap Utilities Binary Format	
XBM_Fmt	339	X Bitmap Format	XBM
XPM_Fmt	340	X Pixmap Format	XPM
FPX_Fmt	341	FPX Format	FPX
PCD_Fmt	342	PCD Format	PCD
MS_Visio_Fmt	343	Microsoft Visio	VSD
MS_Project_2000_Fmt	344	Microsoft Project 2000	MPP ¹
MS_Outlook_Fmt	345	Microsoft Outlook	MSG, OFT
ELF_Relocatable_Fmt	346	ELF Relocatable	O
ELF_Executable_Fmt	347	ELF Executable	
ELF_Dynamic_Lib_Fmt	348	ELF Dynamic Library	SO
MS_Word_XML_Fmt	349	Microsoft Word 2003 XML	XML ¹
MS_Excel_XML_Fmt	350	Microsoft Excel 2003 XML	XML ¹
MS_Visio_XML_Fmt	351	Microsoft Visio 2003 XML	VDX
SO_Text_XML_Fmt	352	StarOffice Text XML	SXW ¹ , ODT ¹
SO_Spreadsheet_XML_Fmt	353	StarOffice Spreadsheet XML	SXC ¹ , ODS ¹
SO_Presentation_XML_Fmt	354	StarOffice Presentation XML	SXI ¹ , SXP ¹ , ODP ¹
XHTML_Fmt	355	XHTML	XML ¹
MS_OutlookPST_	356	Microsoft Outlook PST	PST

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Fmt			
RAR_Fmt	357	RAR	RAR
Lotus_Notes_NSF_Fmt	358	IBM Lotus Notes Database NSF/NTF	NSF
Macromedia_Flash_Fmt	359	SWF	SWF
MS_Word_2007_Fmt	360	Microsoft Word 2007 XML	DOCX, DOTX
MS_Excel_2007_Fmt	361	Microsoft Excel 2007 XML	XLSX, XLTX
MS_PPT_2007_Fmt	362	Microsoft PPT 2007 XML	PPTX, POTX, PPSX
OpenPGP_Fmt	363	OpenPGP Message Format (with new packet format)	PGP
Intergraph_V7_DGN_Fmt	364	Intergraph Standard File Format (ISFF) V7 DGN (non-OLE)	DGN ¹
MicroStation_V8_DGN_Fmt	365	MicroStation V8 DGN (OLE)	DGN ¹
MS_Word_Macro_2007_Fmt	366	Microsoft Word Macro 2007 XML	DOCM, DOTM
MS_Excel_Macro_2007_Fmt	367	Microsoft Excel Macro 2007 XML	XLSM, XLTM, XLAM
MS_PPT_Macro_2007_Fmt	368	Microsoft PPT Macro 2007 XML	PPTM, POTM, PPSM, PPAM
LZH_Fmt	369	LHA Archive	LZH, LHA
Office_2007_Fmt	370	Office 2007 document	XLSB
MS_XPS_Fmt	371	Microsoft XML Paper Specification (XPS)	XPS
Lotus_Domino_DXL_Fmt	372	IBM Lotus representation of Domino design elements in XML format	DXL
ODF_Text_Fmt	373	ODF Text	ODT ¹ , SXW ¹ , STW
ODF_Spreadsheet_Fmt	374	ODF Spreadsheet	ODS ¹ , SXC ¹ , STC

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
ODF_Presentation_Fmt	375	ODF Presentation	SXD ¹ , SXI ¹ , ODG ¹ , ODP ¹
Legato_Extender_ONM_Fmt	376	Legato Extender Native Message ONM	ONM
bin_Unknown_Fmt	377	n/a	
TNEF_Fmt	378	Transport Neutral Encapsulation Format (TNEF)	various
CADAM_Drawing_Fmt	379	CADAM Drawing	CDD
CADAM_Drawing_Overlay_Fmt	380	CADAM Drawing Overlay	CDO
NURSTOR_Drawing_Fmt	381	NURSTOR Drawing	NUR
HP_GLP_Fmt	382	HP Graphics Language (Plotter)	HPG
ASF_Fmt	383	Advanced Systems Format (ASF)	ASF
WMA_Fmt	384	Window Media Audio Format (WMA)	WMA
WMV_Fmt	385	Window Media Video Format (WMV)	WMV
EMX_Fmt	386	Legato EMailXtender Archives Format (EMX)	EMX
Z7Z_Fmt	387	7 Zip Format(7z)	7Z
MS_Excel_Binary_2007_Fmt	388	Microsoft Excel Binary 2007	XLSB
CAB_Fmt	389	Microsoft Cabinet File (CAB)	CAB
CATIA_Fmt	390	CATIA Formats (CAT*)	CAT ³
YIM_Fmt	391	Yahoo Instant Messenger History	DAT ¹
ODF_Drawing_Fmt	392	ODF Drawing	SXD ¹ , SX ¹ , ODG ¹
Founder_CEB_Fmt	393	Founder Chinese E-paper Basic (ceb)	CEB
QPW_Fmt	394	Quattro Pro 9+ for Windows	QPW
MHT_Fmt	395	MHT format ²	MHT

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
MDI_Fmt	396	Microsoft Document Imaging Format	MDI
GRV_Fmt	397	Microsoft Office Groove Format	GRV
IWWP_Fmt	398	Apple iWork Pages format	PAGES, GZ ¹
IWSS_Fmt	399	Apple iWork Numbers format	NUMBERS, GZ ¹
IWPG_Fmt	400	Apple iWork Keynote format	KEY, GZ ¹
BKF_Fmt	401	Windows Backup File	BKF
MS_Access_2007_Fmt	402	Microsoft Access 2007	ACCDB
ENT_Fmt	403	Microsoft Entourage Database Format	
DMG_Fmt	404	Mac Disk Copy Disk Image File	
CWK_Fmt	405	AppleWorks File	
OO3_Fmt	406	Omni Outliner File	OO3
OPML_Fmt	407	Omni Outliner File	OPML
Omni_Graffle_XML_Fmt	408	Omni Graffle XML File	GRAFFLE
PSD_Fmt	409	Photoshop Document	PSD
Apple_Binary_PList_Fmt	410	Apple Binary Property List format	
Apple_iChat_Fmt	411	Apple iChat format	
OOUTLINE_Fmt	412	OOutliner File	OOUTLINE
BZIP2_Fmt	413	Bzip 2 Compressed File	BZ2
ISO_Fmt	414	ISO-9660 CD Disc Image Format	ISO
DocuWorks_Fmt	415	DocuWorks Format	XDW
RealMedia_Fmt	416	RealMedia Streaming Media	RM, RA
AC3Audio_Fmt	417	AC3 Audio File Format	AC3
NEF_Fmt	418	Nero Encrypted File	NEF

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
SolidWorks_Fmt	419	SolidWorks Format Files	SLDASM, SLDPRT, SLDDRW
XFDL_Fmt	420	Extensible Forms Description Language	XFDL, XFD
Apple_XML_PList_Fmt	421	Apple XML Property List format	
OneNote_Fmt	422	OneNote Note Format	ONE
Dicom_Fmt	424	Digital Imaging and Communications in Medicine	DCM
EnCase_Fmt	425	Expert Witness Compression Format (EnCase)	E01, L01, Lx01
Scrap_Fmt	426	Shell Scrap Object File	SHS
MS_Project_2007_Fmt	427	Microsoft Project 2007	MPP ¹
MS_Publisher_98_Fmt	428	Microsoft Publisher 98/2000/2002/2003/2007/	PUB ¹
Skype_Fmt	429	Skype Log File	DBB
HL7_Fmt	430	Health level7 message	HL7
MS_OutlookOST_Fmt	431	Microsoft Outlook OST	OST
Epub_Fmt	432	Electronic Publication	EPUB
MS_OEDBX_Fmt	433	Microsoft Outlook Express DBX	DBX
BB_Activ_Fmt	434	BlackBerry Activation File	DAT ¹
DiskImage_Fmt	435	Disk Image	
Milestone_Fmt	436	Milestone Document	MLS, ML3, ML4, ML5, ML6, ML7, ML8, ML9
E_Transcript_Fmt	437	RealLegal E-Transcript File	PTX
PostScript_Font_Fmt	438	PostScript Type 1 Font	PFB
Ghost_DiskImage_Fmt	439	Ghost Disk Image File	GHO, GHS

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
JPEG_2000_JP2_File_Fmt	440	JPEG-2000 JP2 File Format Syntax (ISO/IEC 15444-1)	JP2, JPF, J2K, JPWL, JPX, PGX
Unicode_HTML_Fmt	441	Unicode HTML	HTM ¹ , HTML ¹
CHM_Fmt	442	Microsoft Compiled HTML Help	CHM
EMCMF_Fmt	443	Documentum EMCMF format	EMCMF
MS_Access_2007_Tmpl_Fmt	444	Microsoft Access 2007 Template	ACCDT
Jungum_Fmt	445	Samsung Electronics Jungum Global document	GUL
JBIG2_Fmt	446	JBIG2 File Format	JB2, JBIG2
EFax_Fmt	447	eFax file	EFX
AD1_Fmt	448	AD1 Evidence file	AD1
SketchUp_Fmt	449	Google SketchUp	SKP
GWFS_Email_Fmt	450	Group Wise File Surf email	GWFS
JNT_Fmt	451	Windows Journal format	JNT
Yahoo_yChat_Fmt	452	Yahoo! Messenger chat log	YCHAT
PaperPort_MAX_File_Fmt	453	PaperPort image file	MAX
ARJ_Fmt	454	ARJ (Archive by Robert Jung) file format	ARJ
RPMSG_Fmt	455	Microsoft Outlook Restricted Permission Message	RPMSG
MAT_Fmt	456	MATLAB file format	MAT, FIG
SGY_Fmt	457	SEG-Y Seismic Data format	SGY, SEGY
CDXA_MPEG_PS_Fmt	458	MPEG-PS container with CDXA stream	MPG ¹
EVT_Fmt	459	Microsoft Windows NT Event Log	EVT
EVTX_Fmt	460	Microsoft Windows Vista Event Log	EVTX

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
MS_OutlookOLM_Fmt	461	Microsoft Outlook for Macintosh format	OLM
WARC_Fmt	462	Web ARChive	WARC
JAVAClass_Fmt	463	Java Class format	CLASS
VCF_Fmt	464	Microsoft Outlook vCard file format	VCF
EDB_Fmt	465	Microsoft Exchange Server Database file format	EDB
ICS_Fmt	466	Microsoft Outlook iCalendar file format	ICS, VCS
MS_Visio_2013_Fmt	467	Microsoft Visio 2013	VSDX, VSTX, VSSX
MS_Visio_2013_Macro_Fmt	468	Microsoft Visio 2013 macro	VSDM, VSTM, VSSM
ICHITARO_Compr_Fmt	469	ICHITARO Compressed format	JTDC
IWWP13_Fmt	470	Apple iWork 2013 Pages format	IWA
IWSS13_Fmt	471	Apple iWork 2013 Numbers format	IWA
IWPG13_Fmt	472	Apple iWork 2013 Keynote format	IWA
XZ_Fmt	473	XZ archive format	XZ
Sony_WAVE64_Fmt	474	Sony Wave64 format	W64
Conifer_WAVPACK_Fmt	475	Conifer Wavpack format	WV
Xiph_OGG_VORBIS_Fmt	476	Xiph Ogg Vorbis format	OGG
MS_Visio_2013_Stencil_Fmt	477	MS Visio 2013 stencil format	VSSX
MS_Visio_2013_Stencil_Macro_Fmt	478	MS Visio 2013 stencil Macro format	VSSM
MS_Visio_2013_Template_Fmt	479	MS Visio 2013 template format	VSTX
MS_Visio_2013_	480	MS Visio 2013 template Macro format	VSTM

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Template_Macro_Fmt			
Borland_Reflex_2_Fmt	481	Borland Reflex 2 format	R2D
PKCS_12_Fmt	482	PKCS #12 (p12) format	P12, PFX
B1_Fmt	483	B1 format	B1
ISO_IEC_MPEG_4_Fmt	484	ISO/IEC MPEG-4 format	MP4
RAR5_Fmt	485	RAR5 Format	RAR5
Unigraphics_NX_Fmt	486	Unigraphics (UG) NX CAD Format	PRT
PTC_Creo_Fmt	487	PTC Creo CAD Format	ASM, PRT
KML_Fmt	488	Keyhole Markup Language	KML
KMZ_Fmt	489	Zipped Keyhole Markup Language	KMZ
WML_Fmt	490	Wireless Markup Language	WML
SO_Text_Fmt	492	Star Office Writer Text	SDW, SGL, VOR
SO_Spreadsheet_Fmt	493	Star Office Calc Spreadsheet	SDC
SO_Presentation_Fmt	494	Star Office Impress Presentation	SDD, SDA
SO_Math_Fmt	495	Star Office Math	SMF
STEP_Fmt	496	ISO 10303-21 STEP format	STEP
STL_Fmt	497	3D Systems STL format	STL
AppleScript_Fmt	498	AppleScript Source Code ⁴	APPLESCRIPT
Assembly_Fmt	499	Assembly Code ⁴	ASM
C_Fmt	500	C Source Code ⁴	C, H
Csharp_Fmt	501	C# Source Code ⁴	CS
CPlusPlus_Fmt	502	C++ Source Code ⁴	CPP, CC, H, HPP
Css_Fmt	503	Cascading Style Sheet ⁴	CSS

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Clojure_Fmt	504	Clojure Source Code ⁴	CLJ
CoffeeScript_Fmt	505	CoffeeScript Source Code ⁴	COFFEE
Lisp_Fmt	506	Common Lisp Source Code ⁴	LISP
Dockerfile_Fmt	507	Dockerfile ⁴	
Eiffel_Fmt	508	Eiffel Source Code ⁴	E
Erlang_Fmt	509	Erlang Source Code ⁴	ERL
Fsharp_Fmt	510	F# Source Code ⁴	FS
Fortran_Fmt	511	Fortran Source Code ⁴	F
Go_Fmt	512	Go Source Code ⁴	GO
Groovy_Fmt	513	Groovy Source Code ⁴	GROOVY
Haskell_Fmt	514	Haskell Source Code ⁴	HS
Ini_Fmt	515	Initialization (INI) file ⁴	INI
Java_Fmt ⁴	516	Java Source Code ⁴	JAVA
Javascript_Fmt	517	Javascript Source Code ⁴	JS
Lua_Fmt	518	Lua Source Code ⁴	LUA
Makefile_Fmt	519	Makefile ⁴	
Mathematica_Fmt	520	Wolfram Mathematica Source Code ⁴	
ObjC_Fmt	521	Objective-C Source Code ⁴	M
ObjCpp_Fmt	522	Objective-C++ Source Code ⁴	MM
ObjJ_Fmt	523	Objective-J Source Code ⁴	J
PHP_Fmt	524	PHP Source Code ⁴	PHP
PLSQL_Fmt	525	PLSQL Source Code ⁴	SQL
Pascal_Fmt	526	Pascal Source Code ⁴	PAS
Perl_Fmt	527	Perl Source Code ⁴	PL
Powershell_Fmt	528	PowerShell Source Code ⁴	PS1
Prolog_Fmt	529	Prolog Source Code ⁴	PL

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Puppet_Fmt	530	Puppet Source Code ⁴	PP
Python_Fmt	531	Python Source Code ⁴	PY
R_Fmt	532	R Source Code ⁴	R
Ruby_Fmt	533	Ruby Source Code ⁴	RB
Rust_Fmt	534	Rust Source Code ⁴	RS
Scala_Fmt	535	Scala Source Code ⁴	SC
Shell_Fmt	536	Shell Script ⁴	SH
Smalltalk_Fmt	537	Smalltalk Source Code ⁴	
ML_Fmt	538	Standard ML Source Code ⁴	ML
Swift_Fmt	539	Swift Source Code ⁴	SWIFT
Tcl_Fmt	540	Tool Command Language (Tcl) Source Code ⁴	TCL
Tex_Fmt	541	TeX Typesetting File ⁴	
TypeScript_Fmt	542	TypeScript Source Code ⁴	TS
Verilog_Fmt	543	Verilog Source Code ⁴	V
YAML_Fmt	544	YAML File ⁴	YML
Wiki_Fmt	545	MediaWiki File ⁴	WIKI
MS_Word_2007_Flat_XML_Fmt	546	Microsoft Word 2007 Flat XML	XML
Matroska_Fmt	547	Matroska video file	MKV
SVG_Fmt	548	Scalable Vector Graphics image	SVG
Shapefile_Fmt	549	Shapefile	SHP/SHX
Flash_Video_Fmt	550	Flash video file	FLV
Embedded_OpenType_Fmt	551	Embedded OpenType font	EOT
Web_Open_Font_Fmt	552	Web Open Font Format	WOFF

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
OpenType_Fmt	553	OpenType Font	OTF
MNG_Fmt	554	Multiple-image Network Graphics	MNG
JNG_Fmt	555	JPEG Network Graphics	JNG
AppleScript_Binary_Fmt	556	AppleScript Binary Source Code ⁴	SCPT
Maya_Binary_Fmt	557	Autodesk Maya binary file	MB
Jupiter_Tessellation_Fmt	558	UGS Jupiter Tessellation file	JT
OGV_Fmt	559	Ogg Theora Video format	OGV
OGG_Container_Fmt	560	General Ogg Container format	OGG
GNU_Message_Catalog_Fmt	561	GNU Message Catalog format	MO
Windows_Shortcut_Fmt	562	Windows shortcut file	LNK
Apple_Typedstream_Fmt	563	Apple/NeXT typedstream data format	
XCF_Fmt	564	GIMP XCF image	XCF
PaintShop_Pro_Fmt	565	PaintShop Pro image	PSP, PSPIMAGE
SQLite_Database_Fmt	566	SQLite database format	QHC
MySQL_Table_Fmt	567	MySQL table definition file	FRM
Microsoft_Program_DB_Fmt	568	Microsoft Program Database format	PDB
OpenEXR_Fmt	569	OpenEXR image format	EXR
XMV_Fmt	570	4X Movie File	
AMV_Fmt	571	AMV video file	AMV
NIFF_Fmt	572	Notation Interchange File Format	NIF
CuBase_Fmt	573	Steinberg CuBase file	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
SoundFont_Fmt	574	SoundFont file	
WebP_Fmt	575	WebP image	WEBP
ICC_Fmt	576	International Color Consortium files	ICC, ICM
PCF_Fmt	577	X11 Portable Compiled Font file	PCF
WebM_Fmt	578	WebM video file	WEBM
AMFF_Fmt	579	Amiga Metafile	AMF
ANBM_Fmt	580	IFF Animated Bitmap	
ANIM_Fmt	581	IFF Amiga animated raster graphics format	
DEEP_Fmt	582	IFF-DEEP TVPaint image	DEEP
FAXX_Fmt	583	IFF-FAXX Facsimile image	
ICON_Fmt	584	IFF Glow Icon image	
ILBM_Fmt	585	Interleaved BitMap image	IFF
LWOB_Fmt	586	LightWave Object format	LWOB
MAUD_Fmt	587	IFF-MAUD MacroSystem audio format	
PBM_Fmt	588	IFF Planar BitMap	
TDDD_Fmt	589	IFF TDDD and Imagine Object animation format	TDD
DjVu_Fmt	590	AT&T DjVu format	DJVU
InDesign_Fmt	591	Adobe InDesign document	
Calamus_Fmt	592	Calamus Desktop Publishing	
Adaptive_MultiRate_Fmt	593	Adaptive Multi-Rate audio format	AMR
FLAC_Fmt	594	Free Lossless Audio Codec format	FLAC
Ogg_FLAC_Fmt	595	Ogg Container FLAC audio format	OGG
SAS7BDAT_Fmt	596	SAS7BDAT database storage format	SAS7BDAT

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Design_Web_Format_Fmt	597	Autodesk Design Web Format	DWF
Adobe_Flash_Audio_Book_Fmt	598	Adobe Flash Player audio book	F4B
Adobe_Flash_Audio_Fmt	599	Adobe Flash Player audio	F4A
Adobe_Flash_Protected_Video_Fmt	600	Adobe Flash Player protected video	F4P
Adobe_Flash_Video_Fmt	601	Adobe Flash Player video	F4V
Audible_Audiobook_Fmt	602	Audible Enhanced Audiobook	AAX
Canon_Camera_Fmt	603	Canon Digital Camera image	
Canon_Raw_Fmt	604	Canon Raw image	CR3
Casio_Camera_Fmt	605	Casio Digital Camera image	
Convergent_Design_Fmt	606	Convergent Design file	
DMB_MAF_Audio_Fmt	607	DMB MAF audio	
DMB_MAF_Video_Fmt	608	DMB MAF video	
DMP_Content_Fmt	609	Digital Media Project Content Format	
DVB_Fmt	610	Digital Video Broadcast format	DVB
Dirac_Wavelet_Compression_Fmt	611	ISO-BMFF Dirac Wavelet compression	
HEICS_Image_Sequence_Fmt	612	High Efficiency Image Format HEVC image sequence	HEICS
HEIC_Image_Fmt	613	High Efficiency Image Format HEVC image	HEIC
HEIFS_Image_Sequence_Fmt	614	High Efficiency Image Format image sequence	HEIFS

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
HEIF_Image_Fmt	615	High Efficiency Image Format image	HEIF
ISMACryp_Fmt	616	ISMACryp 2.0 Encrypted format	
ISO_3GPP2_Fmt	617	3GPP2 video file	3G2
ISO_3GPP_Fmt	618	3GPP video file	3GP
ISO_JPEG2000_JP2_Fmt	619	ISO-BMFF JPEG 2000 image	JP2
ISO_JPEG2000_JPM_Fmt	620	ISO-BMFF JPEG 2000 compound image	JPM
ISO_JPEG2000_JPX_Fmt	621	ISO-BMFF JPEG 2000 with extensions	JPX
ISO_QuickTime_Fmt	622	Apple ISO-BMFF QuickTime video	QT, MOV
KDDI_Video_Fmt	623	KDDI Video file	
MAF_Photo_Player_Fmt	624	MAF Photo Player	
MPEG4_AVC_Fmt	625	ISO-BMFF MPEG-4 with AVC extension	
MPEG4_M4A_Fmt	626	Apple MPEG-4 Part 14 audio	M4A
MPEG4_M4B_Fmt	627	Apple MPEG-4 Part 14 audio book	M4B
MPEG4_M4P_Fmt	628	Apple MPEG-4 Part 14 protected audio	M4P
MPEG4_M4V_Fmt	629	Apple MPEG-4 Part 14 video	M4V
MPEG4_Sony_PSP_Fmt	630	Sony PSP MPEG-4	MP4
MPEG_21_Fmt	631	MPEG-21	
Mobile_QuickTime_Fmt	632	Mobile QuickTime video	MQV
Motion_JPEG_2000_Fmt	633	Motion JPEG 2000	MJ2, MJP2
NTT_MPEG4_Fmt	634	NTT MPEG-4	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Nero_MPEG4_AVC_Profile	635	Nero MPEG-4 profile with AVC extension	
Nero_MPEG4_Audio_Fmt	636	Nero AAC audio	
Nero_MPEG4_Profile	637	Nero MPEG-4 profile	
OMA_DRM_Fmt	638	OMA DRM Format	
Panasonic_Camera_Fmt	639	Panasonic Digital Camera image	
Ross_Video_Fmt	640	Ross video	
SDA_Video_Fmt	641	SDA SD Memory Card video	
Samsung_Stereoscopic_Fmt	642	Samsung stereoscopic stream	
Sony_XAVC_Fmt	643	Sony XAVC video	
JPEG_2000_PGX_Fmt	644	JPEG 2000 PGX Verification Model image	PGX
Apple_Desktop_Services_Store_Fmt	645	Apple Desktop Services Store file	DS_Store
Core_Audio_Fmt	646	Apple Core Audio Format	CAF
VICAR_Fmt	647	VICAR image format	IMG
FITS_Fmt	648	Flexible Image Transport System FITS image	FIT
DIF_Fmt	649	Digital Interface Format (DIF) DV video	DV
MPEG_Transport_Stream_Fmt	650	MPEG Transport Stream data	TS
MPEG_Sequence_Fmt	651	MPEG Sequence format	
Ogg_OGM_Fmt	652	Ogg OGM video format	OGM
Ogg_Speex_Fmt	653	Ogg Speex audio format	SPX

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Ogg_Opus_Fmt	654	Ogg Opus audio format	OGG
Musepack_Audio_Fmt	655	Musepack audio format	MPC
ART_Image_Fmt	656	ART image format	ART
Vivo_Fmt	657	Vivo audio-video format	VIV
QCP_Fmt	658	Qualcomm QCP audio	QCP
CSP_Codec_Fmt	659	Creative Signal Processor codec	CSP
TwinVQ_Fmt	660	NTT TwinVQ audio format	VQF
Interplay_MVE_Fmt	661	Interplay MVE video format	MVE
IRIX_Moviemaker_Fmt	662	IRIX Silicon Graphics moviemaker video file	MV, MOVIE
Sega_FILM_Fmt	663	Sega FILM video format	CPK, CAK
SMAF_Fmt	664	Synthetic music Mobile Application Format	MMF
NIST_SPHERE_Fmt	665	NIST SPeech HEader Resources format	NIST
Chinese_AVS_Fmt	666	Chinese AVS video format	
VQA_Fmt	667	Westwood Studios Vector Quantized Animation video file	VQA
YAFA_Fmt	668	Wildfire YAFA animation	YAFA
Origin_MVE_Fmt	669	Origin Wing Commander III MVE movie format	MVE
BBC_Dirac_Fmt	670	BBC Dirac video format	DRC
Maya_ASCII_Fmt	671	Autodesk Maya ASCII file format	MA
RenderMan_Fmt	672	Pixar RenderMan Interface Bytestream file	RIB
NOFF_Binary_Fmt	673	NOFF 3D Object File Format	NOFF
VTK_ASCII_Fmt	674	Visualization Toolkit VTK ASCII format	VTK

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
VTK_Binary_Fmt	675	Visualization Toolkit VTK Binary format	VTK
Wolfram_CDF_Fmt	676	Wolfram Mathematica Computable Document Format	CDF
Wolfram_Notebook_Fmt	677	Wolfram Mathematica Notebook Format	NB
HDF4_Fmt	678	Hierarchical Data Format HDF4	HDF, H4
HDF5_Fmt	679	Hierarchical Data Format HDF5	HDF, H5
ARMovie_Fmt	680	Acom RISC ARMovie video format	RPL
Windows_TV_DVR_Fmt	681	Windows Television DVR format	WTV
InstallShield_Z_Fmt	682	InstallShield Z archive format	Z
MS_DirectDraw_Surface_Fmt	683	Microsoft DirectDraw Surface container format	DDS
Bink_Fmt	684	Bink audio-video container format	BIK, BK2
LZMA_Fmt	685	LZMA compressed data format	LZMA
True_Audio_Fmt	686	True Audio format	TTA
Keepass_Fmt	687	Keepass Password file	KDB, KDBX
RPM_Fmt	688	RPM Package Manager file	RPM
Printer_Font_Metrics_Fmt	689	Adobe Printer Font Metrics format	PFM
Adobe_Font_Metrics_Fmt	690	Adobe Font Metrics ASCII format	AFM
Printer_Font_ASCII_Fmt	691	Adobe Printer Font ASCII format	PFA
Netware_Loadable_Module_Fmt	692	Netware Loadable Module format	NLM
TCPdump_pcap_Fmt	693	TCPdump packet stream capture savefile format	PCAP
Multiple_Master_Fmt	694	Adobe Multiple master font format	MMM

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Font_Fmt			
TrueType_Font_Collection_Fmt	695	TrueType font collection format	TTC
Shapefile_Spatial_Index_Fmt	696	Shapefile binary spatial index format	SBX, SBN
Java_Key_Store_Fmt	697	Java Key Store format	KS
Java_JCE_Key_Store_Fmt	698	Java JCE Key Store format	
Quark_Xpress_Intel_Fmt	699	QuarkXPress Intel format	QXB
Windows_Imaging_Fmt	700	Microsoft Windows Imaging Format WIM	WIM
VMware_Virtual_Disk_Fmt	701	VMware Virtual Disk Format 5.0	VMDK
XPConnect_Typelib_Fmt	702	XPConnect Typelib Format	XPT
MS_DOS_Compression_Fmt	703	Microsoft MS-DOS installation compression	
DLS_Fmt	704	DLS Downloadable Sounds format	DLS
MS_Windows_Registry_Fmt	705	Microsoft Windows Registry format	
Microsoft_Help_2_Fmt	706	Microsoft Help 2.0 format	HXD, HXW, HXH
Qt_Translation_Fmt	707	Qt binary translation file format	QM
PEM_SSL_Certificate_Fmt	708	PEM-encoded SSL certificate	CRT, PEM, CER, KEY
PostScript_Printer_Description_Fmt	709	Adobe PostScript Printer Description file	PPD
Speedo_Font_Fmt	710	Speedo Font format	SPD
InstallShield_Cabinet_Fmt	711	InstallShield Cabinet Archive format	

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
InstallShield_Uninstall_Fmt	712	InstallShield Uninstall format	ISU
MS_OEDBX_Folder_Fmt	713	Outlook Express DBX folder database format	DBX
LabVIEW_Fmt	714	National Instruments LabVIEW file format	VI
SAP_Archive_SAR_Fmt	715	SAP compression archive SAR format	SAR
Netscape_Address_Book_Fmt	716	Netscape Address Book format	NAB
Universal_3D_Fmt	717	Universal 3D file format	U3D
Open_Inventor_ASCII_Fmt	718	Open Inventor ASCII format	IV
Open_Inventor_Binary_Fmt	719	Open Inventor Binary format	IV
X_Window_Dump_Fmt	720	X Window Dump image	XWD
Git_Packfile_Fmt	721	Git Packfile format	PACK
Xara_Xar_Fmt	722	Xara X Xar image format	XAR
Internet_Archive_ARC_Fmt	723	Internet Archive ARC format	ARC
Applix_Builder_Fmt	724	Applix Builder format	AB
Applix_Bitmap_Fmt	725	Applix Bitmap image format	IM
PEM_RSA_Private_Key_Fmt	726	PEM-encoded RSA private key	PEM
MIFF_Fmt	727	Magick Image File Format	MIFF
Subversion_Dump_Fmt	728	Subversion Dump format	
Virtual_Hard_Disk_Fmt	729	Microsoft Virtual Hard Disk format	VHD
Direct_Access_	730	PowerISO Direct Access Archive	DAA

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Archive_Fmt		format	
Debian_Binary_Fmt	731	Debian binary package format	DEB
XUL_Fastload_Fmt	732	Mozilla XUL Fastload format	MFL
Nastran_OP2_Fmt	733	Nastran OP2 format	OP2
Binary_Logging_Fmt	734	CAD Binary Logging Format	BLF
Measurement_Data_Fmt	735	CAD Measurement Data Format	MDF
Abaqus_ODB_Fmt	736	Abaqus ODB Format	ODB
Open_Diagnostic_Data_Exchange_Fmt	737	Vector Open Diagnostic Data Exchange format	ODX
Vector_ASCII_Fmt	738	Vector CAD ASCII ASC format	ASC
LSDYNA_State_Database_Fmt	739	LS-DYNA State Database format	
LSDYNA_Binary_Output_Fmt	740	LS-DYNA binary output (binout) format	
MS_Power_BI_Fmt	741	Microsoft Power BI Desktop format	PBIX
Tableau_Workbook_Fmt	742	Tableau Workbook format	TWB
Tableau_Packaged_Workbook_Fmt	743	Tableau Packaged Workbook format	TWBX
Tableau_Extract_Fmt	744	Tableau Extract format	TDE
Tableau_Data_Source_Fmt	745	Tableau Data Source format	TDS
Tableau_Packaged_Data_Source_Fmt	746	Tableau Packaged Data Source format	TSDX
Tableau_Preferences_Fmt	747	Tableau Preferences format	TPS
Tableau_Map_Source_Fmt	748	Tableau Map Source format	TMS
ABAP_Fmt	749	ABAP Source Code ⁵	ABAP

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
AMPL_Fmt	750	AMPL Source Code ⁵	AMPL
APL_Fmt	751	APL Source Code ⁵	APL
ASN1_Fmt	752	ASN.1 Source Code ⁵	ASN
ATS_Fmt	753	ATS Source Code ⁵	
Agda_Fmt	754	Agda Source Code ⁵	AGDA
Alloy_Fmt	755	Alloy Source Code ⁵	ALS
Apex_Fmt	756	Apex Source Code ⁵	CLS
Arduino_Fmt	757	Arduino Source Code ⁵	INO
AsciiDoc_Fmt	758	AsciiDoc Source Code ⁵	ASC
AspectJ_Fmt	759	AspectJ Source Code ⁵	AJ
Awk_Fmt	760	Awk Source Code ⁵	AWK
BlitzMax_Fmt	761	BlitzMax Source Code ⁵	BMX
Bluespec_Fmt	762	Bluespec Source Code ⁵	BSV
Brainfuck_Fmt	763	Brainfuck Source Code ⁵	B, BF
Brightscript_Fmt	764	Brightscript Source Code ⁵	BRS
CLIPS_Fmt	765	CLIPS Source Code ⁵	CLP
CMake_Fmt	766	CMake Source Code ⁵	CMAKE
COBOL_Fmt	767	COBOL Source Code ⁵	CBL, CCP, COB, CPY
CWeb_Fmt	768	CWeb Source Code ⁵	W
CartoCSS_Fmt	769	CartoCSS Source Code ⁵	MSS
Ceylon_Fmt	770	Ceylon Source Code ⁵	CEYLON
Chapel_Fmt	771	Chapel Source Code ⁵	CHPL
Clarion_Fmt	772	Clarion Source Code ⁵	CLW
Clean_Fmt	773	Clean Source Code ⁵	DCL, ICL
Component_Pascal_Fmt	774	Component Pascal Source Code ⁵	CP

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
Cool_Fmt	775	Cool Source Code ⁵	CL
Coq_Fmt	776	Coq Source Code ⁵	V
Creole_Fmt	777	Creole Source Code ⁵	CREOLE
Crystal_Fmt	778	Crystal Source Code ⁵	CR
Csound_Fmt	779	Csound Source Code ⁵	ORC
Csound_Document_Fmt	780	Csound Document Source Code ⁵	CSD
Cuda_Fmt	781	Cuda Source Code ⁵	CU
D_Fmt	782	D Source Code ⁵	DCL, ICL
DIGITAL_Command_Language_Fmt	783	DIGITAL Command Language Source Code ⁵	COM
DTrace_Fmt	784	DTrace Source Code ⁵	D
Dart_Fmt	785	Dart Source Code ⁵	DART
E_Fmt	786	E Source Code ⁵	E
ECL_Fmt	787	ECL Source Code ⁵	ECL
Elm_Fmt	788	Elm Source Code ⁵	ELM
Emacs_Lisp_Fmt	789	Emacs Lisp Source Code ⁵	EL
EmberScript_Fmt	790	EmberScript Source Code ⁵	EM
Fantom_Fmt	791	Fantom Source Code ⁵	FAN
Forth_Fmt	792	Forth Source Code ⁵	FOR, FORTH
FreeMarker_Fmt	793	FreeMarker Source Code ⁵	FTL
Frege_Fmt	794	Frege Source Code ⁵	FR
G_code_Fmt	795	G-code Source Code ⁵	G
GAMS_Fmt	796	GAMS Source Code ⁵	GMS
GAP_Fmt	797	GAP Source Code ⁵	
GDScript_Fmt	798	GDScript Source Code ⁵	GD

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
GLSL_Fmt	799	GLSL Source Code ⁵	GLSL
Game_Maker_Language_Fmt	800	Game Maker Language Source Code ⁵	GML
Gnuplot_Fmt	801	Gnuplot Source Code ⁵	GNU, GP
Golo_Fmt	802	Golo Source Code ⁵	GOLO
Gosu_Fmt	803	Gosu Source Code ⁵	GS
Gradle_Fmt	804	Gradle Source Code ⁵	GRADLE
GraphQL_Fmt	805	GraphQL Source Code ⁵	GRAPHQL
Graphviz_DOT_Fmt	806	Graphviz (DOT) Source Code ⁵	DOT
HLSL_Fmt	807	HLSL Source Code ⁵	HLSL
Hack_Fmt	808	Hack Source Code ⁵	
Haml_Fmt	809	Haml Source Code ⁵	HAML
Handlebars_Fmt	810	Handlebars Source Code ⁵	HBS
Hy_Fmt	811	Hy Source Code ⁵	HY
IDL_Fmt	812	IDL Source Code ⁵	PRO
IGOR_Pro_Fmt	813	IGOR Pro Source Code ⁵	IPF
Idris_Fmt	814	Idris Source Code ⁵	IDR
Inform_7_Fmt	815	Inform 7 Source Code ⁵	I7X
Ioke_Fmt	816	Ioke Source Code ⁵	IK
Isabelle_Fmt	817	Isabelle Source Code ⁵	
J_Fmt	818	J Source Code ⁵	IJS
JSONiq_Fmt	819	JSONiq Source Code ⁵	JQ
JSX_Fmt	820	JSX Source Code ⁵	JSX
Jasmin_Fmt	821	Jasmin Source Code ⁵	J
Jolie_Fmt	822	Jolie Source Code ⁵	
Julia_Fmt	823	Julia Source Code ⁵	JL

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
KiCad_Layout_Fmt	824	KiCad Layout Source Code ⁵	
KiCad_Schematic_Fmt	825	KiCad Schematic Source Code ⁵	SCH
Kotlin_Fmt	826	Kotlin Source Code ⁵	KT
LFE_Fmt	827	LFE Source Code ⁵	LFE
LOLCODE_Fmt	828	LOLCODE Source Code ⁵	LOL
Lasso_Fmt	829	Lasso Source Code ⁵	LAS, LASSO
Limbo_Fmt	830	Limbo Source Code ⁵	
LiveScript_Fmt	831	LiveScript Source Code ⁵	LS
M_Fmt	832	M Source Code ⁵	M
MAXScript_Fmt	833	MAXScript Source Code ⁵	MS
Markdown_Fmt	834	Markdown Source Code ⁵	MD
Matlab_Fmt	835	Matlab Source Code ⁵	M
Max_Code_Fmt	836	Max Source Code ⁵	MXT
Mercury_Fmt	837	Mercury Source Code ⁵	
Modelica_Fmt	838	Modelica Source Code ⁵	MO
Modula_2_Fmt	839	Modula-2 Source Code ⁵	MOD
Monkey_Fmt	840	Monkey Source Code ⁵	MONKEY
Moocode_Fmt	841	Moocode Source Code ⁵	MOO
NL_Fmt	842	NL Source Code ⁵	NL
NSIS_Fmt	843	NSIS Source Code ⁵	NSI
NetLogo_Fmt	844	NetLogo Source Code ⁵	NLOGO
NewLisp_Fmt	845	NewLisp Source Code ⁵	NL
Nginx_Fmt	846	Nginx Source Code ⁵	VHOST
Nix_Fmt	847	Nix Source Code ⁵	NIX
Nu_Fmt	848	Nu Source Code ⁵	NU

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
OCaml_Fmt	849	OCaml Source Code ⁵	
OpenCL_Fmt	850	OpenCL Source Code ⁵	CL
OpenEdge_ABL_Fmt	851	OpenEdge ABL Source Code ⁵	
OpenSCAD_Fmt	852	OpenSCAD Source Code ⁵	SCAD
Ox_Fmt	853	Ox Source Code ⁵	OX
Oxygene_Fmt	854	Oxygene Source Code ⁵	OXYGENE
Oz_Fmt	855	Oz Source Code ⁵	OZ
PAWN_Fmt	856	PAWN Source Code ⁵	PWN
PLpgSQL_Fmt	857	PLpgSQL Source Code ⁵	PLSQL
Pan_Fmt	858	Pan Source Code ⁵	PAN
Parrot_Assembly_Fmt	859	Parrot Assembly Source Code ⁵	PASM
PicoLisp_Fmt	860	PicoLisp Source Code ⁵	
Pike_Fmt	861	Pike Source Code ⁵	PIKE
Pony_Fmt	862	Pony Source Code ⁵	PONY
Processing_Fmt	863	Processing Source Code ⁵	PDE
PureBasic_Fmt	864	PureBasic Source Code ⁵	PB
QMake_Fmt	865	QMake File ⁵	
RAML_Fmt	866	RAML Source Code ⁵	RAML
RDoc_Fmt	867	RDoc Source Code ⁵	RDOC
REXX_Fmt	868	REXX Source Code ⁵	REXX
Racket_Fmt	869	Racket Source Code ⁵	
Ragel_Fmt	870	Ragel Source Code ⁵	
Rascal_Fmt	871	Rascal Source Code ⁵	RSC
Rebol_Fmt	872	Rebol Source Code ⁵	REB, REBOL
Red_Fmt	873	Red Source Code ⁵	RED

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
RenPy_Fmt	874	Ren'Py Source Code ⁵	RPY
RenderScript_Fmt	875	RenderScript Source Code ⁵	RS
Ring_Fmt	876	Ring Source Code ⁵	RING
RobotFramework_Fmt	877	RobotFramework Source Code ⁵	ROBOT
SAS_Fmt	878	SAS Source Code ⁵	SAS
SPARQL_Fmt	879	SPARQL format ⁵	
SQL_Fmt	880	SQL format ⁵	
SQLPL_Fmt	881	SQLPL Source Code ⁵	
SaltStack_Fmt	882	SaltStack Source Code ⁵	SLS
Scheme_Fmt	883	Scheme Source Code ⁵	
Scilab_Fmt	884	Scilab Source Code ⁵	SCI
Squirrel_Fmt	885	Squirrel Source Code ⁵	NUT
Stan_Fmt	886	Stan Source Code ⁵	STAN
Stata_Fmt	887	Stata Source Code ⁵	
Stylus_Fmt	888	Stylus Source Code ⁵	STYL
SuperCollider_Fmt	889	SuperCollider Source Code ⁵	SC
SystemVerilog_Fmt	890	SystemVerilog Source Code ⁵	SV
TXL_Fmt	891	TXL Source Code ⁵	TXL
Turing_Fmt	892	Turing Source Code ⁵	T
Turtle_Fmt	893	Turtle Source Code ⁵	TTL
UrWeb_Fmt	894	UrWeb Source Code ⁵	UR, URS
Vim_script_Fmt	895	Vim script File ⁵	VIM
Visual_Basic_Fmt	896	Visual Basic Source Code ⁵	VB
WebAssembly_Fmt	897	WebAssembly Source Code ⁵	WAT
WebIDL_Fmt	898	WebIDL Source Code ⁵	WEBIDL

KeyView file formats and extensions, continued

Format Name	Format Number	Format Description	Associated File Extension
X10_Fmt	899	X10 Source Code ⁵	X10
XQuery_Fmt	900	XQuery Source Code ⁵	XQM
Xojo_Fmt	901	Xojo Source Code ⁵	
Xtend_Fmt	902	Xtend Source Code ⁵	XTEND
YANG_Fmt	903	YANG Source Code ⁵	YANG
Zephir_Fmt	904	Zephir Source Code ⁵	ZEP
eC_Fmt	905	eC Source Code ⁵	EC
reStructuredText_Fmt	906	reStructuredText Source Code ⁵	
xBase_Fmt	907	xBase Source Code ⁵	

¹This file extension can return more than one format number.

²MHT, EML, and MBX files might return either format 2, 233, or 395, depending on the text in the file. In general, files that contain fields such as **To**, **From**, **Date**, or **Subject** are considered to be email messages; files that contain fields such as **content-type** and **mime-version** are considered to be MHT files; and files that do not contain any of those fields are considered to be text files.

³All CAT file extensions, for example CATDrawing, CATProduct, CATPart, and so on.

⁴This format is returned only if you enable source code identification. See [Source Code Identification, on page 87](#).

⁵This format is returned only if you enable extended source code identification. See [Source Code Identification, on page 87](#).

Appendix D: Extract and Format Lotus Notes Subfiles

This section describes how to create XML templates to alter the appearance of extracted Lotus mail note subfiles so that they maintain the look and feel of the original notes.

- [Overview](#)289
- [Customize XML Templates](#)289
- [Template Elements and Attributes](#)291
- [Date and Time Formats](#)296

Overview

KeyView uses the NSF reader, `nsfsr`, to extract Lotus database files, and places Lotus mail notes in subfiles. The NSF reader uses a set of default XML templates to extract the notes and apply formatting, thereby approximating the look and feel of the original notes.

In some cases, you might need to customize the XML templates, for instance if your notes contain custom data. In such cases, you can modify the existing XML templates or create your own.

During extraction, the NSF reader loads all XML files in the `NSFtemplates` directory and its subdirectories (except for the `NSFtemplates\images` directory, which is reserved for images). During initialization, the KeyView XML parser verifies the XML templates. If the templates contain any invalid XML, elements, or attributes, initialization fails and errors are recorded in the `nsfsr.log` file.

Customize XML Templates

XML templates are enabled by default. In most cases, the default templates should be sufficient; however, you can customize them or create your own as required.

To customize XML templates for Lotus note extraction

1. Modify the template files in the following directory.

`install\OS\bin\NSFtemplates`

The `main.xml` file must exist in the `NSFtemplates` directory. It is the top-level template file that extracts all subfiles, usually by calling other templates.

2. Make sure that any modifications or additional XML files conform to the supported elements and attributes described in [Template Elements and Attributes, on page 291](#).
3. Extract the Lotus database file.

Use Demo Templates

For testing purposes, you can extract notes by using a set of demo templates, which are provided to demonstrate the proper usage of all the XML elements and attributes, because the default templates do not use all the XML elements.

The demo templates are available at:

install\OS\bin\NSFtemplates

To use the demo XML templates

1. In the `formats.ini` file, set the following parameter.

```
[nsfsr]
UseDemoTemplate=1
```

2. In the `main.xml` file, uncomment the following section.

```
<ifini name="UseDemoTemplate" text="1">
  <call file="demo.xml"/>
  <quit/>
</ifini>
```

Use Old Templates

For testing purposes, you can extract notes by using legacy templates, which produce MHTML output. You can generate similar output by disabling the XML templates, but using the old templates enables you to see the XML code and compare it to the standard and demo templates.

To use the old XML templates

1. In the `formats.ini` file, set the following parameter.

```
[nsfsr]
UseOldTemplate=1
```

2. In the `main.xml` file, uncomment the following section.

```
<ifini name="UseOldTemplate" text="1">
  <call file="default_old.xml">
  <quit>
</ifini>
```

Disable XML Templates

For testing purposes, you can disable XML templates; KeyView extracts the notes in MHTML format. You can compare the MHTML output directly by the NSF reader with the MHTML output indirectly by the NSF reader through the XML templates.

To disable XML templates

- 1. In the `formats.ini` file, set the following parameter.

```
[nsfsr]  
ExtractByTemplate=0
```

Template Elements and Attributes

This section lists the valid XML elements and attributes that you can use when creating or modifying templates. See the demo templates for examples.

Conditional Elements

The following table lists the valid conditional elements.

Conditional elements

Element	Description
<keyview>	The KeyView XML template container ("root") element
<if*>	<p>If the condition from the comparison is true, process the XML. Conditions can be nested up to 25 levels deep.</p> <p>Attributes</p> <ul style="list-style-type: none">• <code>name</code>. (Required) The name of the main item to compare to <code>item</code> or <code>text</code>.• <code>item</code>. (Required if no <code>text</code>) The name of the item to compare to the item specified by <code>name</code>.• <code>text</code>. (Required if no <code>item</code>) The text to compare to the item specified by <code>name</code>.
<ifex>, <ifnx>	<p>If <code>name</code> item exists and has a <code>text</code> value or not.</p> <p>The Notes item might have a value that cannot be converted to text, such as an image.</p>
<ifeq>, <ifne>, <iflt>, <ifle>, <ifgt>, <ifge>	<p>Respectively, if <code>text</code> ==, !=, <, >, <=, >, >=.</p> <p>Text comparison uses a case-insensitive string compare.</p>
<iftdeq>, <iftdne>, <iftdlt>, <iftdle>, <iftdgt>, <iftdge>	<p>Respectively, if time/date ==, !=, <, >, <=, >, >=.</p> <p>Time/date comparison converts dates to text in local time using the Notes default, <code>TZFMT_NEVER</code>, because Notes also sometimes converts fields to text internally. For example:</p> <p><code>text="06/30/2005 02:52:04 PM"</code></p>

Conditional elements, continued

Element	Description
<iftzeq>, <iftzne>	Respectively, if the time zone equals or does not equal the comparison text, for example CDT, EST, and so on.
<ifini>	If the value of the INI option specified in name equals the text value.
<else>	If the condition from the last <if> or <switch> was false, process XML.
<switch>	<p>If a name value exists, process XML.</p> <p>Attributes</p> <ul style="list-style-type: none"> name. (Required) The name of the main item to compare in <case> subelements.
<case>	<p>If the comparison condition is true, process XML, then stop processing the rest of <switch>.</p> <p>Attributes</p> <ul style="list-style-type: none"> text. (Required) The text to compare to the name item of <switch>.
<default>	If all <case> conditions were false, process XML. This element must be the last element in <switch>, after all the <case> elements. Any <case> elements after the <default> element are ignored.
<for>	<p>If a name value exists, process XML. Process for each part of the name item.</p> <p>Attributes</p> <ul style="list-style-type: none"> name. (Required) The name of the main item. max. (Optional) The maximum index to process. By default, all are processed.
<index>	Output <for> loop index (1-based). <index> is only valid within a <for> element.

Control Elements

The following table lists the valid control elements.

Control Elements

Element	Description
<call>	<p>Call another XML template. You can nest templates up to 10 levels deep.</p> <p>Attributes</p>

Control Elements, continued

Element	Description
	<ul style="list-style-type: none">• <code>file</code>. (Required) The template file name. This name must be unique.
<code><log></code>	<p>Log message to the NSF log file.</p> <p>Attributes</p> <ul style="list-style-type: none">• <code>text</code>. (Required) The text to log.• <code>type</code>. (Optional) The type of log message. The following values are valid:<ul style="list-style-type: none">◦ ERROR◦ WARN◦ INFO◦ DIAG (the default option)◦ DEBUG◦ DUMP
<code><quit></code>	<p>Stop processing the template. Exits without error.</p> <p>Attributes</p> <ul style="list-style-type: none">• <code>text</code>. (Optional) The text to log.• <code>type</code>. (Optional) The type of log message. See <log>, above.
<code><stop></code>	<p>Stop processing the template. Exits with an ERROR log message.</p> <p>Attributes</p> <ul style="list-style-type: none">• <code>text</code>. (Required) The text to log.

Data Elements

The following table lists the valid data elements.

Data elements

Element	Description
<code><text></code>	<p>Output text.</p> <p>Attributes</p> <ul style="list-style-type: none">• <code>name</code>. (Required if there is no parent) The name of the item to output.
<code><rich></code>	<p>Output rich text (MHTML). Images are output in the next part or parts of the MHTML, after the first <code><HTML></code> part.</p>

Data elements, continued

Element	Description
	Attributes <ul style="list-style-type: none"> name. (Required if there is no parent) The name of the item to output.
<body>	Output the message body in rich text (MHTML). As with <rich> , on the previous page, images are output in the next part or parts of the MHTML.
<form>	Output the message form (usually \$Body field) in rich text (MHTML). Attributes <ul style="list-style-type: none"> name. (Required if there is no parent) The name of the item to output.
<addr>	Output an address. Attributes <ul style="list-style-type: none"> name. (Required if there is no parent) The name of the item to output. type. (Optional) The type of address to output. Set this attribute to CN (Common Name), which is the only supported type.
<name>	Output the name of the last name item, or in other words the current main item. The item must exist.
<format>	Set the default format for <date> and <date_kv>. This element does not set the <text> format. See Date and Time Formats, on page 296 for a list of all Notes and KeyView date and time formats and integer values. Attributes <ul style="list-style-type: none"> format. (Optional. Omit to reset to defaults) The Notes and KeyView date and time format. You can set the following formats: <ul style="list-style-type: none"> TD=int. The Time Date format (TDFMT_*) TS=int. The Time Show format (TSFMT_*) TT=int. The Time Time format (TTFMT_*) TZ=int. The Time Zone format (TZFMT_*) KV=int. The KeyView date and time format <p>where int is an integer value that corresponds to the desired format.</p> <p>Separate multiple formats with commas. For example:</p> <pre>format="TD=0, TS=2, TT=1, TZ=1, KV=55"</pre>
<date>	Output a Notes date. Attributes <ul style="list-style-type: none"> name. (Required if there is no parent) The name of the item to output.

Data elements, continued

Element	Description
	<ul style="list-style-type: none"> format. (Optional) See <format>, on the previous page. You can set the following values: <ul style="list-style-type: none"> TD TS TT TZ
<date_kv>	<p>Output a KeyView date.</p> <p>Attributes</p> <ul style="list-style-type: none"> name. (Required if there is no parent) The name of the item to output. format. (Optional) See <format>, on the previous page. You can set the following values: <ul style="list-style-type: none"> TZ KV
<time>	<p>Output a time range, for example 1 hour, 30 minutes.</p> <p>Attributes</p> <ul style="list-style-type: none"> name. (Required if there is no parent) The item name of the start date or time. item. (Required) The item name of the end date or time.
<zone>	<p>Output a Notes time zone mnemonic, for example MST.</p> <p>Attributes</p> <ul style="list-style-type: none"> name. (Required if there is no parent) The name of date item to output.
<zone_utc>	<p>Output a time zone as UTC, for example (UTC-06:00).</p>
<logo>	<p>Output the mail header logo.</p> <p>The image link is included in the output; the actual image is output to a different part of the MHTML subfile.</p>
<image>	<p>Output an image.</p> <p>The image link is included in the output; the actual image is output to the MHTML next part, as with <rich>, on page 293 and <body>, on the previous page.</p>
<image_uri>	<p>Output an image URI, in quotation marks. The actual image is output to a different part of the MHTML subfile.</p> <p>Attributes</p>

Data elements, continued

Element	Description
	<ul style="list-style-type: none">• <code>link</code>. (Required if there is no <code>file</code>) The image link, such as a form or title name. For example:<ul style="list-style-type: none">• <code>link="StdNotesLtr0"</code>• <code>file</code>. (Required if there is no <code>link</code>) The name of the image file. The file must exist in the <code>.././templates/images</code> directory. For example:<ul style="list-style-type: none">• <code>file="boxcheck.gif"</code>

Date and Time Formats

This section lists the supported Notes and KeyView date and time formats for use with `<format>`, `<date>`, and `<date_kv>`.

Lotus Notes Date and Time Formats

This section lists supported Lotus Notes date and time formats, and the integer values that specify each one.

Lotus Notes date and time formats

Format	Integer Value	Description
TDFMT_FULL	0	(The Notes default) Year, month, and day
TDFMT_CPARTIAL	1	Month and day, year if not this year
TDFMT_PARTIAL	2	Month and day
TDFMT_DPARTIAL	3	Year and month
TDFMT_FULL4	4	Four-digit year, month, and day
TDFMT_CPARTIAL4	5	Month and day, four-digit year if not this year
TDFMT_DPARTIAL4	6	Four-digit year and month
TTFMT_FULL	0	(Notes default) Hour, minute, and second
TTFMT_PARTIAL	1	Hour and minute
TTFMT_HOUR	2	Hour

Lotus Notes date and time formats, continued

Format	Integer Value	Description
TZFMT_NEVER	0	(Notes default) All time zones are converted to the current time zone
TZFMT_SOMETIMES	1	Show only when outside the current time zone
TZFMT_ALWAYS	2	Show for all time zones
TSFMT_DATE	0	Date
TSFMT_TIME	1	Time
TSFMT_DATETIME	2	(The Notes default) Date and time
TSFMT_CDATETIME	4	Date and time, or time today or time yesterday

KeyView Date and Time Formats

This section lists KeyView date and time formats. The KeyView formats use the following syntax:

Month	<p>Month = full month name</p> <p>Mon = abbreviated month name</p> <p>m = month (number)</p> <p>mm = two-digit month (leading 0)</p>
Weekday	<p>Weekday = full weekday name</p> <p>Wday = abbreviated weekday name</p>
Year	<p>yy = two-digit year</p> <p>yyyy = four-digit year</p>
>Day	<p>d = day (number)</p> <p>dd = two-digit day (leading 0)</p>
Time	<p>h = 12-hour</p> <p>H = 24-hour</p> <p>m = minutes</p> <p>s = seconds</p> <p>P = AM/PM</p> <p>p = am/pm</p>

Separators _ = space
 c = comma
 s = slash
 a = dash
 o = dot

KeyView date and time formats

Format	Output	Integer Value
12-Hour and 24-Hour Time Formats		
KVDTF_P	P	1
KVDTF_P_hmm	P h:mm	2
KVDTF_hmm_P	h:mm P	3
KVDTF_P_hhmm	P hh:mm	4
KVDTF_hhmm_P	hh:mm P	5
KVDTF_P_hmmss	P h:mm:ss	6
KVDTF_hmmss_P	h:mm:ss P	7
KVDTF_P_hhmmss	P hh:mm:ss	8
KVDTF_hhmmss_P	hh:mm:ss P	9
KVDTF_Hmm	H:mm	10
KVDTF_HHmm	HH:mm	11
KVDTF_mmss	mm:ss	12
KVDTF_Hmmss	H:mm:ss	13
KVDTF_HHmmss	HH:mm:ss	14
Numerical Date Formats with Slashes		
KVDTF_mmsdd	mm/dd	15
KVDTF_msdsyy	m/d/yy	16
KVDTF_mmsddsyy	mm/dd/yy	17
KVDTF_mmsddsyyyy	mm/dd/yyyy	18
KVDTF_ddsmm	dd/mm	19

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_ddsmsyy	dd/mm/yy	20
KVDTF_ddsmsyy_Hmm	dd/mm/yy H:mm	21
KVDTF_ddsmm_P_hmm	dd/mm P h:mm	22
KVDTF_ddsmm_hmm_P	dd/mm h:mm P	23
KVDTF_ddsmm_P_hhmm	dd/mm P hh:mm	24
KVDTF_ddsmm_hhmm_P	dd/mm hh:mm P	25
KVDTF_ddsmsyy_P_hmm	dd/mm/yy P h:mm	26
KVDTF_ddsmsyy_hmm_P	dd/mm/yy h:mm P	27
KVDTF_ddsmsyy_P_hmmss	dd/mm/yy P h:mm:ss	28
KVDTF_ddsmsyy_hmmss_P	dd/mm/yy h:mm:ss P	29
KVDTF_ddsmsyy_P_hhmmss	dd/mm/yy P hh:mm:ss	30
KVDTF_ddsmsyy_hhmmss_P	dd/mm/yy hh:mm:ss P	31
KVDTF_yysmmsdd_P_hhmmss	yy/mm/dd P hh:mm:ss	32
KVDTF_yysmmsdd_hhmmss_P	yy/mm/dd hh:mm:ss P	33
KVDTF_msdsyy_Hmm	m/d/yy H:mm	34
KVDTF_mmsddsyy_Hmm	mm/dd/yy H:mm	35
KVDTF_msdsyy_P_hmm	m/d/yy P h:mm	36
KVDTF_msdsyy_hmm_P	m/d/yy h:mm P	37
KVDTF_mmsddsyy_hmm_P	mm/dd/yy h:mm P	38
KVDTF_mmsdd_P_hhmm	mm/dd P hh:mm	39
KVDTF_mmsdd_hhmm_P	mm/dd hh:mm P	40
KVDTF_mmsddsyy_P_hhmmss	mm/dd/yy P hh:mm:ss	41
KVDTF_mmsddsyy_hhmmss_P	mm/dd/yy hh:mm:ss P	42
KVDTF_msd	m/d	43
KVDTF_yysm	yy/m	44
KVDTF_yysmm	yy/mm	45

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_ysmsd	yy/m/d	46
KVDTF_ysmmsdd	yy/mm/dd	47
KVDTF_yyyysmmsdd	yyyy/mm/dd	48
Numerical Date Formats with Dashes		
KVDTF_ddammayy	dd-mm-yy	49
KVDTF_mmadd	mm-dd	50
KVDTF_mmayy	mm-yy	51
KVDTF_yyammadd	yy-mm-dd	52
KVDTF_yyyymmadd	yyyy-mm-dd	53
KVDTF_yyyymmaddaHHmmss	yyyy-mm-dd-HH:mm:ss	54
Numerical Date Formats with Dots		
KVDTF_yyomod	yy.m.d	55
KVDTF_yyommodd	yy.mm.dd	56
KVDTF_mod	m.d	57
KVDTF_mmodd	mm.dd	58
Numerical and String Date Formats with Dashes, Commas, and Spaces		
KVDTF_ddaMon	dd-Mon	59
KVDTF_daMonayy	d-Mon-yy	60
KVDTF_ddaMonayy	dd-Mon-yy	61
KVDTF_ddaMonayyyy	dd-Mon-yyyy	62
KVDTF_Mon	Mon	63
KVDTF_Monayy	Mon-yy	64
KVDTF_Monayyyy	Mon-yyyy	65
KVDTF_Monaddayy	Mon-dd-yy	66
KVDTF_yyammadd_P_hhmmss	yy-mm-dd P hh:mm:ss	67
KVDTF_mmadd_P_hhmm	mm-dd P hh:mm	68

KeyView date and time formats, continued

Format	Output	Integer Value
KVDTF_Mon_yy	Mon yy	69
KVDTF_Monc_yy	Mon, yy	70
KVDTF_Month	Month	71
KVDTF_Monthayy	Month-yy	72
KVDTF_Month_yy	Month yy	73
KVDTF_Monthc_yy	Month, yy	74
KVDTF_Monthayyyy	Month-yyyy	75
KVDTF_Month_yyyy	Month yyyy	76
KVDTF_Monthc_yyyy	Month, yyyy	77
KVDTF_Mon_dc_yyyy	Mon d, yyyy	78
KVDTF_d_Monc_yyyy	d Mon, yyyy	79
KVDTF_yyyy_Mon_d	yyyy Mon d	80
KVDTF_Month_dc_yyyy	Month d, yyyy	81
KVDTF_d_Monthc_yyyy	d Month, yyyy	82
KVDTF_yyyy_Month_d	yyyy Month d	83
Weekday Date Formats		
KVDTF_wday	wday	84
KVDTF_Weekday	Weekday	85
KVDTF_wdayc_Mon_dc_yyyy	wday, Mon d, yyyy	86
KVDTF_Weekdayc_Month_dc_yyyy	Weekday, Month d, yyyy	87
KVDTF_Weekdayc_d_Monthc_yyyy	Weekday, d Month, yyyy	88

Appendix E: File Format Detection

This section describes how file formats are detected in Filter SDK.

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• Extract Format Information	302
• Determine Format Support	302
• Translate Format Information	305
• Determine a Document Reader	306
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Introduction

The KeyView format detection module (*kwad*) detects a file's format, and reports the information to the API, which in turn reports the information to the developer's application. If the detected format is supported by the KeyView SDK, the detection module also loads the appropriate structured access layer and document reader for further processing. For a list of supported formats, see [Supported Formats, on page 189](#).

Extract Format Information

You can extract format information from a document by using either the `fpGetDocInfoStream()` or `fpGetDocInfoFile()` functions. If required, you can then report this information to the developer's application.

The `fpGetDocInfoStream()` and `fpGetDocInfoFile()` functions extract the major format, file class, version, and document attributes, and populate the `ADDDOCINFO` structure. This structure and values are defined in the header file `adinfo.h`. See [Filter API Functions, on page 121](#) for more information.

For information on how to translate the extracted format information, see [Translate Format Information, on page 305](#).

Determine Format Support

After the file format is extracted, the detection module uses the `formats.ini` file to determine whether the format is supported by KeyView, and the appropriate structured access layer and reader to load.

The `formats.ini` file is in the directory `install\OS\bin`, where *install* is the path name of the Filter installation directory and *OS* is the name of the operating system. It contains the following information:

- Coded format information. To translate this information, see [Translate Format Information, on page 305](#).
- The reader associated with each format. See [Determine a Document Reader, on page 306](#).
- Configuration parameters.
- Locale settings for internal use.

Example formats.ini file entries

```
123=mw
152=xyw
178=wp6
189=mw6
2=af
200=pdf
205=mb
210=htm
251=htm
```

NOTE:

The `formats.ini` file applies to all formats except graphics. Detection of graphics formats is handled by an internal module named KeyView Picture Interchange Format (KPIF).

Refine Detection of Text Files

During text detection, KeyView analyses the first 1 kB and last 1 kB of data in a document. If less than 10% of that data consists of non-ASCII characters, KeyView detects the document as a text file.

However, depending on the type of documents you are working with, the default settings might not provide the desired level of accuracy. Configuration flags enable you to change the amount of data to read at the end of a file, the percentage of non-ASCII characters permitted in a text file, and whether to use or ignore the file extension to determine the document format.

Change the Amount of File Data to Read

During file detection, KeyView reads characters from the beginning and end of a file—by default, it reads the first and last 1,024 bytes of data. Large text files might contain many irrelevant characters at the end of a file, so KeyView might not accurately detect the file format. You can set a configuration flag to increase the amount of data to read from the end of a file during detection.

To change the amount of data to read during detection

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

```
[detection_flags]
non_ascii_chars_end_block_size=kB
```

where *kB* is the number of kilobytes to read from the end of the file, from 0 to 10. The default value is 1.

NOTE:

The file size must be greater than the value specified in the flag. If the flag value is greater than the file size, KeyView does not use the flag.

Change the Percentage of Allowed Non-ASCII Characters

By default, if less than 10% of the analyzed data in a document consists of non-ASCII characters, it is detected as a text file. Depending on the type of files that you are working with, changing the default percentage might increase detection accuracy.

To change the percentage of non-ASCII characters allowed in text files

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

```
[detection_flags]
non_ascii_chars_in_text=N
```

where *N* is the percentage of non-ASCII characters to allow in text files. Files that contain a lower percentage of non-ASCII characters than *N* are detected as text files. The default value is 10.

Allow Consecutive NULL Bytes in a Text File

By default, if a document contains consecutive NULL bytes, it is not detected as text. Depending on the type of files that you are working with, changing the default might increase detection accuracy.

To allow consecutive NULL bytes of ASCII characters in text files

In the `formats.ini` file, set the following flag in the `detection_flags` section:

```
[detection_flags]
ascii_allow_null_bytes=1
```

The default value is 0 (do not allow consecutive NULL bytes).

Use the File Extension for Detection

Sometimes KeyView detects certain file formats, such as CSV, as ASCII because of the content of the documents. In such cases, you can configure KeyView to use the file extension to determine the document format. Using the file extension can improve detection of formats such as CSV, but might not detect text files successfully if they have incorrect file extensions.

To use the file extension for ASCII files during detection

- In the `formats.ini` file, set the following flag in the `detection_flags` section:

```
[detection_flags]
use_extension_for_ascii=1
```

The default is 0 (do not use the file extension).

Translate Format Information

Format information can include file attributes in the following categories:

- Major format
- File class
- Minor format
- Major version
- Minor version

Not all categories are required. Many formats only include major format and file class, or major format only.

The format information has the following structure:

MajorFormat.FileClass.MinorFormat.MajorVersion.MinorVersion

For example:

81.2.0.9.0

Each number in the format information represents a file attribute. The entry 81.2.0.9.0 represents a Lotus 1-2-3 Spreadsheet file version 9.0, where

81= Lotus 1-2-3 Spreadsheet (major format)

2 = Spreadsheet (file class)

0 = not defined (minor format)

9 = 9 (major version)

0 = 0 (minor version)

This example applies to the `formats.ini` file. When extracting format information using the `fpDocInfoFile()` or `fpDocInfoStream()` functions, the same format is represented as 294.2.9.0.

NOTE:

The format values returned from `fpDocInfoFile()` or `fpDocInfoStream()` differ from those in `formats.ini` because the former defines a unique ID for each major format, while the latter uses a major version, minor version, and minor format to distinguish between formats.

Distinguish Between Formats

The `ADDODCINFO` structure provides a unique ID for each major format. For example, a call to `fpGetDocInfoFile()` or `fpGetDocInfoStream()` would return 351.1.0 for a Microsoft Word XML format. The major format 351 is unique to this format.

Unlike `ADDODCINFO`, the `formats.ini` file distinguishes between formats by using the major version number. For example, in the `formats.ini` file, a Microsoft Word 2003 XML format is defined as 285.1.0.100.0. The major format 285 and file class 1 are the same values for generic XML. The major version 100 distinguishes the format as Microsoft Word 2003 XML.

The major version is used to specify the following formats:

- Microsoft Office 2003 XML. This format has the same major format and file class as generic XML (285.1). It is distinguished from generic XML by using the following major versions:
 - Word: 100
 - Excel: 101
 - Visio: 110
- The XHTML format has the same major format and file class as HTML (210.1). It is distinguished from HTML by using the major version 100.

Determine a Document Reader

The format detection module uses the `formats.ini` file to determine whether a format is supported, and to determine the reader to use to parse a format. The entries in the `formats.ini` file list each format's coded value, and an abbreviation for the format's reader.

The reader abbreviation is a truncated version of the reader's library name. Adding "sr" to the end of an abbreviation creates the name of the reader. For example, this example entry specifies that a Lotus 1-2-3 Spreadsheet file version 9.0 is parsed by the Lotus 1-2-3 filter, 1123sr:

```
81.2.0.9.0=1123
```

[List of Required Files for Redistribution, on page 342](#) lists the readers provided with KeyView.

Category Values in formats.ini

This section lists the possible category values for format information in the `formats.ini` file. The corresponding values for format information extracted by a call to `fpGetDocInfoFile()` or `fpGetDocInfoStream()` are listed in the header file `adinfo.h`.

- [Major Formats](#)
- [File Classes](#)
- [Minor Formats](#)

Major Formats

Number	Format	File Class
1	AES Multiplus Comm Format	Word processor
2	ASCII File word processor/MS DOS Batch File format	Word processor
3	Applix Asterix	Word processor
4	Microsoft Windows Bitmap image (BMP)	Raster image

Major Formats, continued

Number	Format	File Class
5	Convergent Tech DEF Comm. format	Word processor
6	Corel Draw (CDR)	Vector graphic
7	Keyword COM.FILE (KSIF)	
8	Computer Graphics Metafile (CGM)	Vector graphic
9	Word Connection	Word processor
10	COMET TOP Word	Word processor
11	DG CEOwrite	Word processor
12	Honey Bull DSA101	Word processor
13	IBM DCA-RFT	Word processor
14	DDIF	Word processor
15	Dummy File (Internal)	
16	DG Common Data Stream (CDS)	Word processor
17	Dummy Print File (Internal)	
18	Windows Micrografx Draw (DRW)	Vector graphic
19	Data Point VISTAWORD	Word processor
20	DECdx	Word processor
21	Enable	Word processor
22	Encapsulated PostScript (EPS)	Raster image
23	DOS/Windows Executable (EXE, DLL)	Executable
24	CCITT Group 3 1-Dimensional (G31D)	Raster image
25	Graphics Interchange format (GIF)	Raster image
26	Hewlett Packard	Word processor
27	IBM 1403 Line Printer	Word processor
28	IBM DCF Script	Word processor
29	IBM DCA-FFT	Word processor
30	Interleaf	Word processor

Major Formats, continued

Number	Format	File Class
31	GEM Bit Image	Raster image
32	IBM Display Write 4	Word processor
33	Raster Graphics	Raster image
34	Keywords PICL	
35	Lotus AMI Pro	Word processor
36	MORE Database Outliner (Mac)	Outline/planning
37	Lyrinx	Word processor
38	MASS-11	Word processor
39	MacPaint	Raster image
40	Microsoft Word Mac	Word processor
41	Informix SmartWare II Communication File	Communications
42	Microsoft Word for Windows	Word processor
43	MultiMate 4.0	Word processor
44	Multiplan Spreadsheet	Spreadsheet
45	Microsoft Rich Text Format (RTF)	Word processor
46	Microsoft Word 5.0 (PC)	Word processor
47	NBI Async Archive Format	Word processor
48	Navy DIF	Word processor
49	NBI Net Archive Format	Word processor
50	NIOS TOP	Word processor
51	FileMaker (Mac)	Database
52	ODA/ODIF	Word processor
53	OLIDIF	Word processor
54	Keyword OSM	
55	Office Writer	Word processor
56	PC Paint Brush Graphics (PCX)	Raster image

Major Formats, continued

Number	Format	File Class
57	CPT Communication Format	Word processor
58	Lotus PIC	Vector graphic
59	Macintosh Quick Draw Picture Format (PICT)	Raster image
60	Philips Script	Word processor
61	PostScript File	Vector graphic
62	PRIMEWORD	Word processor
63	Quadratron Q-One (V1.93J)	Word processor
64	Quadratron Q-One (V2.0)	Word processor
65	SAMNA Word IV	Word processor
66	Lotus AMI Pro Draw (SDW)	Raster image
67	SYLK Spreadsheet	Spreadsheet
68	Informix SmartWare II	Word processor
69	Symphony Spreadsheet	Spreadsheet
70	Truevision Targa	Raster image
71	Tagged Image File (TIFF)	Raster image
72	Targon Word (V 2.0)	Word processor
73	Uniplex Ucalc Spreadsheet	Spreadsheet
74	Uniplex (V6.01)	Word processor
75	Microsoft Word (UNIX)	Word processor
76	WANG PC	Word processor
77	WordERA (V 1.0)	Word processor
78	WANG WPS Comm. format	Word processor
79	WordPerfect Mac	Word processor
80	WordPerfect 5.2	Word processor
81	Lotus 1-2-3 Spreadsheet	Spreadsheet
82	WordMARC word processor	Word processor

Major Formats, continued

Number	Format	File Class
83	Microsoft Windows Metafile (WMF) Graphics	Raster image
84	Informix SmartWare II Database	Database
85	WordPerfect Graphics V1.0 (WPG)	Raster image
86	WordPerfect	Word processor
87	WordStar	Word processor
88	Wang WITA	Word processor
89	Xerox 860 Comm. format	Word processor
90	Microsoft Excel Spreadsheet	Spreadsheet
91	Xerox Writer word processor	Word processor
92	DIF Spreadsheet	Spreadsheet
93	ENABLE Spreadsheet	Spreadsheet
94	Supercalc Spreadsheet	Spreadsheet
95	Ultracalc Spreadsheet	Spreadsheet
96	Informix SmartWare Spreadsheet	Spreadsheet
97	Serialized Object Format (SOF) Encapsulation format	Encapsulation
98	Microsoft PowerPoint (PC)	Presentation
99	Microsoft PowerPoint (Mac)	Presentation
100	Aldus PageMaker (Mac)	Desktop Publishing
101	Aldus PageMaker (DOS)	Desktop Publishing
103	Microsoft Works (Mac)	Word processor
104	Microsoft Works Database (Mac)	Database
105	Microsoft Works Spreadsheet (Mac)	Spreadsheet
106	Microsoft Works Communication (Mac)	Communications
107	Microsoft Works (PC)	Word processor
108	Microsoft Works Database (PC)	Database
109	Microsoft Works Spreadsheet (PC)	Spreadsheet

Major Formats, continued

Number	Format	File Class
111	PC Library Module	Library module
112	MacWrite	Word processor
113	MacWrite II	Word processor
114	Aldus Freehand Mac	Vector graphic
115	Disk Doubler Compression format	Encapsulation
116	HP Graphics Language (HP-GL)	Vector graphic
117	Adobe Maker Interchange Format (MIF)	Desktop Publishing
118	JPEG File Interchange Format (JFIF)	Raster image
119	Reflex Database	Database
120	Framework II	Mixed format
121	Paradox (PC) Database	Database
123	Microsoft Windows Write	Word processor
124	Quattro Pro Spreadsheet (DOS)	Spreadsheet
126	Persuasion Presentation	Presentation
127	Corel Presentation	Presentation
128	Microsoft Windows Icon Format (ICO) Graphics	Raster image
129	Microsoft Project	Time scheduling
131	Harvard Graphics	Desktop publishing
132	Zip Archive Format	Encapsulation
133	Microsoft Windows Cursor (CUR) Graphics	Raster image
134	Quark Express (Mac)	Desktop publishing
135	ARC/PAK Archive format	Encapsulation
136	Adobe FrameMaker	Desktop publishing
137	Microsoft Publisher	Desktop publishing
138	Plan Perfect	Time scheduling
139	WordPerfect General File Format	Miscellaneous

Major Formats, continued

Number	Format	File Class
140	Lotus Freelance	Presentation
141	Microsoft Wave Sound File	Sound
142	MIDI Sound File	Sound
143	AutoCAD DXF Graphics	Vector graphic
144	dBase Database	Database
145	OS/2 PM Metafile Graphics	Vector graphic
146	Lasergraphics Language	Vector graphic
147	AutoShade Rendering File Format	Vector graphic
148	Graphics Environment Manager (GEM VDI)	Vector graphic
149	Microsoft Windows Help File	Miscellaneous
150	Volkswriter	Word processor
151	Ability Office (SS, DB, GR, WP, COM)	
152	XyWrite/Nota Bene	Word processor
153	Comma Separated Values (CSV)	Spreadsheet
154	Writing Assistant word processor	Word processor
155	WordStar 2000	Word processor
156	WordStar 6.0	Word processor
157	HP Printer Control Language (PCL)	Vector graphic
158	(UNIX/VAX/SUN) Executable	Executable
159	(UNIX/VAX/SUN) Object Module	Object module
160	(UNIX/VAX/SUN) Link Library	Library module
161	NeXT SUN Audio Data	Sound
162	NeWS font file (SUN)	Font
163	cpio Archive Format (UNIX/VAX/SUN)	Encapsulation
164	PEX Binary Archive (SUN)	Encapsulation
165	SUN vfont definition	Font

Major Formats, continued

Number	Format	File Class
166	Curses Screen Image (UNIX/VAX/SUN)	Raster image
167	UU Encoded Encryption File	Encapsulation
168	WriteNow	Word processor
169	PC Object Module	Object module
170	Microsoft Windows Group File	Miscellaneous
171	PC True Type Font	Font
172	Program Information File	Miscellaneous
173	PC COM executable file	Executable
174	Adobe FrameMaker Markup Language	Desktop publishing
175	Stuff It Archive (Mac)	Encapsulation
176	PeachCalc Spreadsheet	Spreadsheet
177	Wang Office GDL Header Encapsulation	Encapsulation
178	WordPerfect 6.0	Word processor
179	Q & A for DOS	Word processor
180	Q & A for Windows	Word processor
181	DEC WPS PLUS	Word processor
182	DCX Fax format	Fax
183	Microsoft Windows OLE 2 Encapsulation	Encapsulation
184	Quattro Pro for Windows	Spreadsheet
185	Keyword Viewer Markup Format	
186	EBCDIC Text	Word processor
187	DCS	Word processor
188	Microsoft Excel Spreadsheet 95, 2000	Spreadsheet
189	Microsoft Word for Windows 95	Word processor
190	UNIX SHAR Encapsulation	Encapsulation
191	Lotus Notes Bitmap	Raster image

Major Formats, continued

Number	Format	File Class
192	UNIX Compress Encapsulation	Encapsulation
193	Lotus Notes CDF	Word processor
194	UNIX TAR Encapsulation	Encapsulation
195	WordPerfect Graphics V2.0 (WPG2)	Raster image Vector graphic
196	ODA/ODIF (FOD 26)	Word processor
197	ALIS	Word processor
198	GZ Compress Encapsulation	Encapsulation
199	Envoy (EVY)	Word processor
200	Adobe Portable Document Format (PDF)	Word processor
201	KW ODA Internal Raw Bitmap (RBM)	Raster image
202	KW ODA G4 (G4)	Raster image
203	KW ODA G31D (G31)	Raster image
204	KW ODA Internal G32D (G32)	Raster image
205	Microsoft Word for Mac V 4.x/5.x	Word processor
206	BinHex 4.0 encoded file	Encapsulation
207	SMTP document	Encapsulation
208	MIME format - Microsoft Outlook Express (EML)/Mailbox (MBX)	Encapsulation
209	SGML document	Word processor
210	HTML document XHTML ¹	Word processor
211	ACT Format	Word processor
212	Microsoft PowerPoint 95	Presentation
213	Portable Network Graphics (PNG)	Raster image
214	Video for Windows	Movie
215	Windows Animated Cursor	Raster image

Major Formats, continued

Number	Format	File Class
216	Windows C++ Object Storage	Mixed format
217	Windows Palette	Raster image
218	RIFF Device Independent Bitmap	Raster image
219	RIFF MIDI	Sound
220	RIFF Multimedia Movie	Movie
221	MPEG Movie	Movie
222	QuickTime Movie	Movie
223	Audio Interchange File Format (AIFF) Sound	Sound
224	Amiga MOD Sound	Sound
225	Amiga IFF (8SVX) Sound	Sound
226	Creative Voice (VOC) Sound	Sound
227	Microsoft Works (Windows)	Word processor
228	Microsoft Works Spreadsheet (Windows)	Spreadsheet
229	AutoDesk Animator FLIC Animation	Animation
230	AutoDesk Animator Pro FLIC Animation	Animation
231	Microsoft Works Database (Windows)	Database
232	Microsoft Works Communication (Windows)	Communications
233	Compactor / Compact Pro Archive	Encapsulation
234	VRML	Vector graphic
235	QuickDraw 3D Metafile (3DMF)	Vector graphic
236	PGP Secret Keyring	Encapsulation
237	PGP Public Keyring	Encapsulation
238	PGP Encrypted Data	Encapsulation
239	PGP Signed Data	Encapsulation
240	PGP Signed and Encrypted Data	Encapsulation
241	PGP Signature Certificate	Encapsulation

Major Formats, continued

Number	Format	File Class
242	ASCII-armored PGP Public Keyring	Encapsulation
243	ASCII-armored PGP encoded	Encapsulation
244	ASCII-armored PGP signed	Encapsulation
245	OLE DIB object	Raster image
246	PGP Compressed Data	Encapsulation
247	SGI Image	Raster image
248	Lotus Screen Cam	Animation
249	MPEG Audio	Sound
250	FTP Session Data	Communications
251	Netscape Bookmark file	Word processor
252	Corel Draw CMX	Vector image
253	AutoCAD Drawing (DWG)	Vector graphic
254	AutoDesk WHIP	Vector graphic
255	Macromedia Director	Animation
256	Real Audio	Sound
257	MS DOS Device Driver	Executable
258	Micrografx Designer	Vector graphic
259	Simple Vector format (SVF)	Vector graphic
260	WordPerfect Office document (WPD)	
261	Applix Words	Word processor
262	Applix Graphics	Presentation
263	Microsoft Access	Database
264	Usenet format	Word processor
265	MacBinary	Encapsulation
266	Apple Single	Encapsulation
267	Apple Double	Encapsulation

Major Formats, continued

Number	Format	File Class
268	Lotus Word Pro	Word processor
269	Microsoft Word 97, 2000	Word processor
270	Enhanced Window Metafile	Vector graphic
271	Microsoft Office Drawing	Vector graphic
272	Microsoft PowerPoint 97, 2000	Presentation
273	Extended or Custom XML	Word processor
274	Device Independent file (DVI)	Vector graphic
275	Unicode	Word processor
276	Framework	Mixed
277	KPIF Chart Stream	
278	Applix Spreadsheet	Spreadsheet
279	Microsoft Device Independent Bitmap	Raster image
280	KeyView GPF Filter	
281	Microsoft Project 98, 2000, 2002	Time scheduling
282	Folio Flat file	Word processor
283	HWP (Arae-Ah Hangul)	Word processor
284	JustSystems Ichitaro	Word processor
285	Generic XML format Microsoft Office 2003 XML format ²	Word processor
286	Fujitsu Oasys	Word processor
287	Portable Bitmap Utilities (PBM)	Raster image
288	Portable Greymap Utilities (PGM)	Raster image
289	Portable Pixmap Utilities (PPM)	Raster image
290	X Bitmap (XBM)	Raster image
291	X Pixmap (XPM)	Raster image
292	X Image	Raster image

Major Formats, continued

Number	Format	File Class
293	PCD Image	Raster image
294	Microsoft Visio	Presentation
295	Microsoft Outlook (MSG)	Encapsulation
296	XHTML document	Word processor
297	Microsoft Outlook Personal Folders file (PST)	Encapsulation
298	WinRAR Compressed Archive format (RAR)	Encapsulation
299	Lotus Notes Database (NSF) Legato Extender ONM	Encapsulation
300	Macromedia Flash	Word processor
301	Microsoft Word 2007 (XML format)	Word processor
302	Microsoft Excel 2007 (XML format)	Spreadsheet
303	Microsoft PowerPoint 2007 (XML format)	Presentation
304	Open PGP (new format packets only)	Encapsulation
305	Intergraph version 7 DGN	Vector graphic
306	Microstation version 8 DGN	Vector graphic
307	Microsoft Word 2007 Macro	Word processor
308	Microsoft Excel 2007 Macro	Spreadsheet
309	Microsoft PowerPoint Macro	Presentation
310	Microsoft Compression folder (LZH)	Encapsulation
311	Office 2007 Document	Miscellaneous
312	XML Paper Specification	Word processor
313	Lotus Domino Extensible Language	Encapsulation
314	OASIS Open Document (ODT)	Word processor
315	OASIS Open Document (ODS)	Spreadsheet
316	OASIS Open Document (ODP)	Presentation
317	Legato EMailXtender Native Message	Word Processor

Major Formats, continued

Number	Format	File Class
319	Transfer Neutral Encapsulation Format (TNEF)	Encapsulation
320	CADAM Drawing	Vector graphic
321	CADAM Drawing Overlay	Vector graphic
322	NURSTOR Drawing	Vector graphic
323	HP Graphics Language (Plotter)	Vector graphic
324	Advanced Systems Format	Miscellaneous
325	Windows Media Audio Format	Sound
326	Windows Media Video Format	Movie
327	Legato EMailXtender Archive	Encapsulation
328	7-Zip	Encapsulation
329	Microsoft Office 2007 Excel Binary Format	Spreadsheet
330	Microsoft Cabinet File	Encapsulation
331	CATIA formats	Vector graphic
332	Yahoo! Instant Messenger	Word processor
333	Founder Chinese E-paper Basic	Word processor
334	Corel Quattro Pro X4	Spreadsheet
335	MIME HTML	Word processor
336	Microsoft Document Imaging Format	Raster image
337	Microsoft Office Groove File Format	Word processor
338	Apple iWorks Pages	Word processor
339	Apple iWorks Numbers	Spreadsheet
340	Apple iWorks Keynote	Presentation
341	Microsoft Backup File	Encapsulation
342	Microsoft Access 2007	Database
343	Microsoft Entourage Database	Encapsulation
344	Mac Disk Copy Disk Image File	Encapsulation

Major Formats, continued

Number	Format	File Class
345	Appleworks File	Word processor
346	Omni Outliner (OO3) File	Word processor
347	Omni Outliner (OPML) File	Word processor
348	Omni Graffle XML File	Vector graphic
349	Apple Photoshop Document	Raster image
350	Apple Binary Property List	Miscellaneous
351	Apple iChat Format	Word processor
352	Omni Outliner (OOUTLINE) File	Word processor
353	Bzip 2 Compressed File	Encapsulation
354	ISO-9660 CD Disc Image Format	Encapsulation
355	Xerox DocuWorks	Word processor
356	RealMedia Streaming Media	Movie
357	AC3 Audio File Format	Sound
358	Nero Encrypted File	Encapsulation
359	SolidWorks	Vector graphic
362	UniGraphics NX	Vector graphic
364	3D Systems STL format	Vector graphic
366	Extensible Forms Description Language	Presentation
367	Apple XML Property List	Miscellaneous
368	OneNote Note Format	Presentation
370	Digital Imaging and Communications in Medicine (DICOM)	Raster image
371	Expert Witness Compression Format	Encapsulation
372	Shell Scrap Object File	Encapsulation
373	Microsoft Project 2007	Time scheduling
374	Microsoft Publisher 98—	Desktop publishing
375	Skype Log File	Word processor

Major Formats, continued

Number	Format	File Class
376	Lotus Notes Bitmap Format (DXL embedded images)	Raster image
377	Health level7 message	Word processor
378	Microsoft Outlook Offline Storage File	Encapsulation
379	Open Publication Structure eBook	Word processor
380	Microsoft Outlook Express DBX	Encapsulation
381	BlackBerry Activation File	Word processor
382	Disk Image	Encapsulation
383	Milestone	Raster Image
384	RealLegal E-Transcript File	Word processor
385	PostScript Type 1 Font	Font
386	Ghost Disk Image File	Encapsulation
387	JPEG-2000 JP2 File Format Syntax (ISO/IEC 15444-1)	Raster Image
388	Unicode HTML	Word processor
389	Microsoft Compiled HTML Help	Encapsulation
390	Documentum EMC MF	Encapsulation
393	JBIG2 File	Raster image
395	AD1 Evidence file	Encapsulation
397	Group Wise File Surf email	Encapsulation
402	ARJ	Encapsulation
409	Microsoft Outlook for Macintosh	Encapsulation
412	Microsoft Outlook vCard Contact	Word processor
414	Microsoft Outlook iCalendar	Encapsulation
418	Apple iWork 2013 Pages	Word processor
419	Apple iWork 2013 Numbers	Spreadsheet
420	Apple iWork 2013 Keynote	Presentation
421	XZ	Encapsulation

Major Formats, continued

Number	Format	File Class
427	B1	Encapsulation
428	MP4	Movie
429	Rar5	Encapsulation
430	PTC Creo	Vector graphic
431	Keyhole Markup Language	
432	Zipped Keyhole Markup Language	
433	Wireless Markup Language	
435	Star Office Writer Text	
436	Star Office Calc Spreadsheet	
437	Star Office Impress Presentation	
438	Star Office Math	
439	ISO 10303-21 STEP format	Vector graphic
440	AppleScript Source Code	Source Code
441	Assembly Code	Source Code
442	C Source Code	Source Code
443	C# Source Code	Source Code
444	C++ Source Code	Source Code
445	Cascading Style Sheet	Source Code
446	Clojure Source Code	Source Code
447	CoffeeScript Source Code	Source Code
448	Common Lisp Source Code	Source Code
449	Dockerfile	Source Code
450	Eiffel Source Code	Source Code
451	Erlang Source Code	Source Code
452	F# Source Code	Source Code
453	Fortran Source Code	Source Code

Major Formats, continued

Number	Format	File Class
454	Go Source Code	Source Code
455	Groovy Source Code	Source Code
456	Haskell Source Code	Source Code
457	Initialization (INI) file	Source Code
458	Java Source Code	Source Code
459	Javascript Source Code	Source Code
460	Lua Source Code	Source Code
461	Makefile	Source Code
462	Wolfram Mathematica Source Code	Source Code
464	Objective-C Source Code	Source Code
465	Objective-C++ Source Code	Source Code
466	Objective-J Source Code	Source Code
467	PHP Source Code	Source Code
468	PLSQL Source Code	Source Code
469	Pascal Source Code	Source Code
470	Perl Source Code	Source Code
471	PowerShell Source Code	Source Code
472	Prolog Source Code	Source Code
473	Puppet Source Code	Source Code
474	Python Source Code	Source Code
475	R Source Code	Source Code
476	Ruby Source Code	Source Code
477	Rust Source Code	Source Code
478	Scala Source Code	Source Code
479	Shell Script	Source Code
480	Smalltalk Source Code	Source Code

Major Formats, continued

Number	Format	File Class
481	Standard ML Source Code	Source Code
482	Swift Source Code	Source Code
483	Tool Command Language (Tcl) Source Code	Source Code
484	TeX Typesetting File	Source Code
485	TypeScript Source Code	Source Code
486	Verilog Source Code	Source Code
487	YAML File	Source Code
488	MediaWiki File	Word processor
489	Matroska video	Movie
490	Scalable Vector Graphics image	Vector graphic
491	Shapefile	Miscellaneous
492	Flash video	Movie
493	Embedded OpenType font	Font
494	Web Open Font Format	Font
495	OpenType Font	Font
496	Multiple-image Network Graphics	Animation
497	JPEG Network Graphics	Raster image
498	AppleScript Binary Source Code	Source code
499	Autodesk Maya binary file	Computer-Aided Design
500	Ogg Theora Video format	Movie
501	General Ogg Container format	Miscellaneous
502	GNU Message Catalog format	Miscellaneous
503	Windows shortcut file	Miscellaneous
504	Apple/NeXT typedstream data format	Miscellaneous
505	GIMP XCF image	Raster image

Major Formats, continued

Number	Format	File Class
506	PaintShop Pro image	Raster image
507	SQLite database format	Database
508	MySQL table definition file	Database
509	Microsoft Program Database format	Database
510	OpenEXR image format	Raster image
511	4X Movie File	Movie
512	AMV video file	Movie
513	Notation Interchange File Format	Sound
514	Steinberg CuBase file	Sound
515	SoundFont file	Sound
516	WebP image	Raster image
517	International Color Consortium files	Miscellaneous
518	X11 Portable Compiled Font file	Font
519	WebM video file	Movie
520	Amiga Metafile	Vector graphic
521	IFF Animated Bitmap	Raster image
522	IFF Amiga animated raster graphics format	Raster image
523	IFF-DEEP TVPaint image	Raster image
524	IFF-FAXX Facsimile image	Raster image
525	IFF Glow Icon image	Raster image
526	Interleaved BitMap image	Raster image
527	LightWave Object format	Miscellaneous
528	IFF-MAUD MacroSystem audio format	Sound
529	IFF Planar BitMap	Raster image
530	IFF TDDD and Imagine Object animation format	Raster image
531	AT&T DjVu format	Word processor

Major Formats, continued

Number	Format	File Class
532	Adobe InDesign document	Desktop publishing
533	Calamus Desktop Publishing	Desktop publishing
534	Adaptive Multi-Rate audio format	Sound
535	Free Lossless Audio Codec format	Sound
536	Ogg Container FLAC audio format	Sound
537	SAS7BDAT database storage format	Database
538	Autodesk Design Web Format	Computer-Aided Design
539	Adobe Flash Player audio book	Sound
540	Adobe Flash Player audio	Sound
541	Adobe Flash Player protected video	Movie
542	Adobe Flash Player video	Movie
543	Audible Enhanced Audiobook	Sound
544	Canon Digital Camera image	Raster image
545	Canon Raw image	Raster image
546	Casio Digital Camera image	Raster image
547	Convergent Design file	Raster image
548	DMB MAF audio	Sound
549	DMB MAF video	Movie
550	Digital Media Project Content Format	Miscellaneous
551	Digital Video Broadcast format	Movie
552	ISO-BMFF Dirac Wavelet compression	Miscellaneous
553	High Efficiency Image Format HEVC image sequence	Raster image
554	High Efficiency Image Format HEVC image	Raster image
555	High Efficiency Image Format image sequence	Raster image
556	High Efficiency Image Format image	Raster image

Major Formats, continued

Number	Format	File Class
557	ISMACryp 2.0 Encrypted format	Raster image
558	3GPP2 video file	Movie
559	3GPP video file	Movie
560	ISO-BMFF JPEG 2000 image	Raster image
561	ISO-BMFF JPEG 2000 compound image	Raster image
562	ISO-BMFF JPEG 2000 with extensions	Raster image
563	Apple ISO-BMFF QuickTime video	Movie
564	KDDI Video file	Movie
565	MAF Photo Player	Miscellaneous
566	ISO-BMFF MPEG-4 with AVC extension	Movie
567	Apple MPEG-4 Part 14 audio	Sound
568	Apple MPEG-4 Part 14 audio book	Sound
569	Apple MPEG-4 Part 14 protected audio	Sound
570	Apple MPEG-4 Part 14 video	Movie
571	Sony PSP MPEG-4	Sound
572	MPEG-21	Miscellaneous
573	Mobile QuickTime video	Movie
574	Motion JPEG 2000	Movie
575	NTT MPEG-4	Movie
576	Nero MPEG-4 profile with AVC extension	Movie
577	Nero AAC audio	Sound
578	Nero MPEG-4 profile	Movie
579	OMA DRM Format	Miscellaneous
580	Panasonic Digital Camera image	Raster image
581	Ross video	Movie
582	SDA SD Memory Card video	Movie

Major Formats, continued

Number	Format	File Class
583	Samsung stereoscopic stream	Miscellaneous
584	Sony XAVC video	Movie
585	JPEG 2000 PGX Verification Model image	Raster image
586	Apple Desktop Services Store file	Miscellaneous
587	Apple Core Audio Format	Sound
588	VICAR image format	Raster image
589	Flexible Image Transport System FITS image	Raster image
590	Digital Interface Format (DIF) DV video	Movie
591	MPEG Transport Stream data	Miscellaneous
592	MPEG Sequence format	Miscellaneous
593	Ogg OGM video format	Movie
594	Ogg Speex audio format	Sound
595	Ogg Opus audio format	Sound
596	Musepack audio format	Sound
597	ART image format	Raster image
598	Vivo audio-video format	Movie
599	Qualcomm QCP audio	Sound
600	Creative Signal Processor codec	Miscellaneous
601	NTT TwinVQ audio format	Sound
602	Interplay MVE video format	Movie
603	IRIX Silicon Graphics moviemaker video file	Movie
604	Sega FILM video format	Movie
605	Synthetic music Mobile Application Format	Sound
606	NIST SPeech HEader Resources format	Sound
607	Chinese AVS video format	Movie
608	Westwood Studios Vector Quantized Animation video file	Animation

Major Formats, continued

Number	Format	File Class
609	Wildfire YAFA animation	Animation
610	Origin Wing Commander III MVE movie format	Movie
611	BBC Dirac video format	Movie
612	Autodesk Maya ASCII file format	Computer-Aided Design
613	Pixar RenderMan Interface Bytestream file	Vector graphic
614	NOFF 3D Object File Format	Vector graphic
615	Visualization Toolkit VTK ASCII format	Vector graphic
616	Visualization Toolkit VTK Binary format	Vector graphic
617	Wolfram Mathematica Computable Document Format	Miscellaneous
618	Wolfram Mathematica Notebook Format	Miscellaneous
619	Hierarchical Data Format HDF4	Miscellaneous
620	Hierarchical Data Format HDF5	Miscellaneous
621	Acorn RISC ARMovie video format	Movie
622	Windows Television DVR format	Movie
623	InstallShield Z archive format	Encapsulation
624	Microsoft DirectDraw Surface container format	Encapsulation
625	Bink audio-video container format	Movie
626	LZMA compressed data format	Encapsulation
627	True Audio format	Sound
628	Keepass Password file	Miscellaneous
629	RPM Package Manager file	Encapsulation
630	Adobe Printer Font Metrics format	Font
631	Adobe Font Metrics ASCII format	Font
632	Adobe Printer Font ASCII format	Font
633	Netware Loadable Module format	Miscellaneous

Major Formats, continued

Number	Format	File Class
634	TCPdump packet stream capture savefile format	Miscellaneous
635	Adobe Multiple master font format	Font
636	TrueType font collection format	Font
637	Shapefile binary spatial index format	Miscellaneous
638	Java Key Store format	Miscellaneous
639	Java JCE Key Store format	Miscellaneous
640	QuarkXPress Intel format	Desktop publishing
641	Microsoft Windows Imaging Format WIM	Miscellaneous
642	VMware Virtual Disk Format 5.0	Miscellaneous
643	XPConnect Typelib Format	Miscellaneous
644	Microsoft MS-DOS installation compression	Encapsulation
645	DLS Downloadable Sounds format	Sound
646	Microsoft Windows Registry format	Miscellaneous
647	Microsoft Help 2.0 format	Encapsulation
648	Qt binary translation file format	Miscellaneous
649	PEM-encoded SSL certificate	Encapsulation
650	Adobe PostScript Printer Description file	Miscellaneous
651	Speedo Font format	Font
652	InstallShield Cabinet Archive format	Encapsulation
653	InstallShield Uninstall format	Encapsulation
654	Outlook Express DBX folder database format	Encapsulation
655	National Instruments LabVIEW file format	Miscellaneous
656	SAP compression archive SAR format	Encapsulation
657	Netscape Address Book format	Miscellaneous
658	Universal 3D file format	Vector graphic
659	Open Inventor ASCII format	Vector graphic

Major Formats, continued

Number	Format	File Class
660	Open Inventor Binary format	Vector graphic
661	X Window Dump image	Raster image
662	Git Packfile format	Encapsulation
663	Xara X Xar image format	Vector graphic
664	Internet Archive ARC format	Encapsulation
665	Applix Builder format	Miscellaneous
666	Applix Bitmap image format	Raster image
667	PEM-encoded RSA private key	Encapsulation
668	Magick Image File Format	Raster image
669	Subversion Dump format	Encapsulation
670	Microsoft Virtual Hard Disk format	Encapsulation
671	PowerISO Direct Access Archive format	Encapsulation
672	Debian binary package format	Encapsulation
673	Mozilla XUL Fastload format	Miscellaneous
674	Nastran OP2 format	Computer-Aided Design
675	CAD Binary Logging Format	Computer-Aided Design
676	CAD Measurement Data Format	Computer-Aided Design
677	Abaqus ODB Format	Computer-Aided Design
678	Vector Open Diagnostic Data Exchange format	Computer-Aided Design
679	Vector CAD ASCII ASC format	Computer-Aided Design
680	LS-DYNA State Database format	Computer-Aided Design
681	LS-DYNA binary output (binout) format	Computer-Aided

Major Formats, continued

Number	Format	File Class
		Design
682	Microsoft Power BI Desktop format	BI and analysis tools
683	Tableau Workbook format	BI and analysis tools
684	Tableau Packaged Workbook format	BI and analysis tools
685	Tableau Extract format	BI and analysis tools
686	Tableau Data Source format	BI and analysis tools
687	Tableau Packaged Data Source format	BI and analysis tools
688	Tableau Preferences format	BI and analysis tools
689	Tableau Map Source format	BI and analysis tools
690	ABAP Source Code	Source code
691	AMPL Source Code	Source code
692	APL Source Code	Source code
693	ASN.1 Source Code	Source code
694	ATS Source Code	Source code
695	Agda Source Code	Source code
696	Alloy Source Code	Source code
697	Apex Source Code	Source code
698	Arduino Source Code	Source code
699	AsciiDoc Source Code	Source code
700	AspectJ Source Code	Source code
701	Awk Source Code	Source code
702	BlitzMax Source Code	Source code
703	Bluespec Source Code	Source code
704	Brainfuck Source Code	Source code
705	Brightscript Source Code	Source code
706	CLIPS Source Code	Source code

Major Formats, continued

Number	Format	File Class
707	CMake Source Code	Source code
708	COBOL Source Code	Source code
709	CWeb Source Code	Source code
710	CartoCSS Source Code	Source code
711	Ceylon Source Code	Source code
712	Chapel Source Code	Source code
713	Clarion Source Code	Source code
714	Clean Source Code	Source code
715	Component Pascal Source Code	Source code
716	Cool Source Code	Source code
717	Coq Source Code	Source code
718	Creole Source Code	Source code
719	Crystal Source Code	Source code
720	Csound Source Code	Source code
721	Csound Document Source Code	Source code
722	Cuda Source Code	Source code
723	D Source Code	Source code
724	DIGITAL Command Language Source Code	Source code
725	DTrace Source Code	Source code
726	Dart Source Code	Source code
727	E Source Code	Source code
728	ECL Source Code	Source code
729	Elm Source Code	Source code
730	Emacs Lisp Source Code	Source code
731	EmberScript Source Code	Source code
732	Fantom Source Code	Source code

Major Formats, continued

Number	Format	File Class
733	Forth Source Code	Source code
734	FreeMarker Source Code	Source code
735	Frege Source Code	Source code
736	G-code Source Code	Source code
737	GAMS Source Code	Source code
738	GAP Source Code	Source code
739	GDScript Source Code	Source code
740	GLSL Source Code	Source code
741	Game Maker Language Source Code	Source code
742	Gnuplot Source Code	Source code
743	Golo Source Code	Source code
744	Gosu Source Code	Source code
745	Gradle Source Code	Source code
746	GraphQL Source Code	Source code
747	Graphviz (DOT) Source Code	Source code
748	HLSL Source Code	Source code
749	Hack Source Code	Source code
750	HamI Source Code	Source code
751	Handlebars Source Code	Source code
752	Hy Source Code	Source code
753	IDL Source Code	Source code
754	IGOR Pro Source Code	Source code
755	Idris Source Code	Source code
756	Inform 7 Source Code	Source code
757	Ioke Source Code	Source code
758	Isabelle Source Code	Source code

Major Formats, continued

Number	Format	File Class
759	J Source Code	Source code
760	JSONiq Source Code	Source code
761	JSX Source Code	Source code
762	Jasmin Source Code	Source code
763	Jolie Source Code	Source code
764	Julia Source Code	Source code
765	KiCad Layout Source Code	Source code
766	KiCad Schematic Source Code	Source code
767	Kotlin Source Code	Source code
768	LFE Source Code	Source code
769	LOLCODE Source Code	Source code
770	Lasso Source Code	Source code
771	Limbo Source Code	Source code
772	LiveScript Source Code	Source code
773	M Source Code	Source code
774	MAXScript Source Code	Source code
775	Markdown Source Code	Source code
776	Max Source Code	Source code
777	Mercury Source Code	Source code
778	Modelica Source Code	Source code
779	Modula-2 Source Code	Source code
780	Monkey Source Code	Source code
781	Moocode Source Code	Source code
782	NL Source Code	Source code
783	NSIS Source Code	Source code
784	NetLogo Source Code	Source code

Major Formats, continued

Number	Format	File Class
785	NewLisp Source Code	Source code
786	Nginx Source Code	Source code
787	Nix Source Code	Source code
788	Nu Source Code	Source code
789	OCaml Source Code	Source code
790	OpenCL Source Code	Source code
791	OpenEdge ABL Source Code	Source code
792	OpenSCAD Source Code	Source code
793	Ox Source Code	Source code
794	Oxygene Source Code	Source code
795	Oz Source Code	Source code
796	PAWN Source Code	Source code
797	PLpgSQL Source Code	Source code
798	Pan Source Code	Source code
799	Parrot Assembly Source Code	Source code
800	PicoLisp Source Code	Source code
801	Pike Source Code	Source code
802	Pony Source Code	Source code
803	Processing Source Code	Source code
804	PureBasic Source Code	Source code
805	QMake File	Source code
806	RAML Source Code	Source code
807	RDoc Source Code	Source code
808	REXX Source Code	Source code
809	Racket Source Code	Source code
810	Ragel Source Code	Source code

Major Formats, continued

Number	Format	File Class
811	Rascal Source Code	Source code
812	Rebol Source Code	Source code
813	Red Source Code	Source code
814	Ren'Py Source Code	Source code
815	RenderScript Source Code	Source code
816	Ring Source Code	Source code
817	RobotFramework Source Code	Source code
818	SAS Source Code	Source code
819	SPARQL format	Source code
820	SQL format	Source code
821	SQLPL Source Code	Source code
822	SaltStack Source Code	Source code
823	Scheme Source Code	Source code
824	Scilab Source Code	Source code
825	Squirrel Source Code	Source code
826	Stan Source Code	Source code
827	Stata Source Code	Source code
828	Stylus Source Code	Source code
829	SuperCollider Source Code	Source code
830	SystemVerilog Source Code	Source code
831	TXL Source Code	Source code
832	Turing Source Code	Source code
833	Turtle Source Code	Source code
834	UrWeb Source Code	Source code
835	Vim script File	Source code
836	Visual Basic Source Code	Source code

Major Formats, continued

Number	Format	File Class
837	WebAssembly Source Code	Source code
838	WebIDL Source Code	Source code
839	X10 Source Code	Source code
840	XQuery Source Code	Source code
841	Xojo Source Code	Source code
842	Xtend Source Code	Source code
843	YANG Source Code	Source code
844	Zephir Source Code	Source code
845	eC Source Code	Source code
846	reStructuredText Source Code	Source code
847	xBase Source Code	Source code

1 If the major version is 100, the file format is XHTML.

2 The major version determines whether the Microsoft Office XML file is a Word, Excel or Visio document. The major version for each format is as follows:

Word: 100

Excel: 101

Visio: 110

File Classes

Attribute Number	File Class
0	No file class
01	Word processor
02	Spreadsheet
03	Database
04	Raster image
05	Vector graphic
06	Presentation

File Classes, continued

Attribute Number	File Class
07	Executable
08	Encapsulation
09	Sound
10	Desktop publishing
11	Outline/planning
12	Miscellaneous
13	Mixed format
14	Font
15	Time scheduling
16	Communications
17	Object module
18	Library module
19	Fax
20	Movie
21	Animation
22	Source Code
23	Computer-Aided Design
24	BI and analysis tools

Minor Formats

Attribute Number	Minor Format
00	Minor format not defined
01	Standard
02	Book
03	Chart
04	Macro

Minor Formats, continued

Attribute Number	Minor Format
05	Text
06	Binary
07	PC
08	Windows
09	DOS
10	Macintosh
11	RGB
12	TIFF
13	IFF
14	Experimental
15	Format Information
16	RLE
17	Symbol
18	Old
19	Footnote
20	Style
21	Palette
22	Configuration
23	Activity
24	Resource
25	Calculation
26	Glossary
27	Spelling
28	Thesaurus
29	Hyphenation
30	Miscellaneous

Minor Formats, continued

Attribute Number	Minor Format
31	UNIX
32	VAX
33	Driver
34	Archive

Appendix F: List of Required Files for Redistribution

This section lists the Filter files that can be redistributed in your applications under the licensing agreement. These files are in the directory *install\OS\bin*, where *install* is the path name of the Filter installation directory and *OS* is the name of the operating system.

NOTE:

On Windows systems, the libraries are .dll files. On UNIX systems, the libraries are .so, .a, or .sl files.

Core Files

The following core files can be redistributed with your application.

File	Description
formats.ini	Initialization file. For more information on this file, see Determine Format Support, on page 302 .
FilterDotNet.*	Required by .NET API.
KeyViewFilter.*	Required by the Java API.
kpifcnvt.*	For presentation graphics, converts from one picture format to another.
kpifutil.*	Utility for handling the internal picture interchange format for presentation graphics.
kvxtract.*	File Extraction API.
kvfilter.*	Filter API.
kvolefio.*	Embedded OLE object writer.
kvutil.*	Internal KeyView utility functions.
kvxpgsa.*	Interface between presentation readers and kvfilter. Required to extract metadata from AutoCAD files.
kvxssa.*	Interface between spreadsheet readers and kvfilter.
kvxwpsa.*	Interface between word processing readers and kvfilter.
kwad.*	File auto-recognition module.
txtcnv.*	Converter for document token stream.

Support Files

The following support files can be redistributed with your application.

File	Description
bentofio.*	Required by 1123sr and kpprzrdr.
cbmap.map	Character mappings for Adobe Portable Document Format (PDF).
chartbls.ux	Character mappings.
chmdl1.*	Required by chmsr.
kppng.*	Required for ZLIB decompression.
kvxconfig.ini	Contains element extraction settings for XML files.
kvoop.*	Required for out-of-process filtering.
kvthread.*	Required for multithreaded out-of-process filtering.
kv.lic	Contains license information for KeyView products. This file is opened and validated when a KeyView API is used.
MSVCP60.*	Microsoft Visual C++ Runtime library V6.0.
msvcrt.*	Microsoft Visual C Runtime library.
wpmap.*	Extended character mapping for WordPerfect and Corel Presentation.
xmlsh.*	Contains a library of content handlers for each XML file type. Required by the Expat XML parser.

Document Readers

The following readers can be redistributed with your application.

File	Description
ad1sr.*	AD1 Evidence file reader
afsr.*	ASCII reader
aiffsr.*	Audio Interchange Format File (AIFF) reader
asfsr.*	Advanced Systems Format reader
assr.*	Applix Spreadsheet reader
awsr.*	Applix Word reader

File	Description
b11sr.*	B1 archive reader
bkfsr.*	Microsoft Backup File reader
bmpsr.*	Windows bitmap (BMP) reader
bzip2sr.*	Bzip2 reader
cabsr.*	Microsoft Cabinet format reader
cebsr.*	Founder Chinese E-paper Basic reader
chmsr.*	Microsoft Compiled HTML Help reader
csvsr.*	Comma-Separated Values reader
dbfsr.*	dBase Database reader
dbxsr.*	Microsoft Outlook Express DBX reader
dcasr.*	Document Content Architecture/Revisable Form Text (DCA/RFT) reader
dcmsr.*	Digital Imaging and Communications in Medicine (DICOM) reader
difsr.*	Data Interchange Format reader
dmgsr.*	Mac Disk Copy Disk Image File reader
dw4sr.*	DisplayWrite reader
dx1sr.*	Domino XML Language reader
em1sr.*	Microsoft Outlook Express (EML) reader. This is used to filter EML files when the MBX reader is not licensed.
emxsr.*	Legato EMailXtender (EMX) reader
encasesr.*	Expert Witness Compression Format (EnCase) v6 reader
encase2sr.*	Expert Witness Compression Format (EnCase) v7 reader
entsr.*	Microsoft Entourage Database Format reader
epubsr.*	Open Publication Structure eBook reader
foliosr.*	Folio Flat File reader
gifsr.*	Graphics Interchange Format (GIF) reader
gwfssr.*	GroupWise FileSurf reader
h17sr.*	Health level7 reader (metadata only)
htmsr.*	HTML and XHTML reader

File	Description
hwpsr.*	Hangul 97 reader
hwposr.*	Hangul 2002, 2005, 2007 reader
ichatsr.*	Apple iChat Log reader
icssr.*	Microsoft Outlook iCalendar reader
isosr.*	ISO-9660 CD Disc Image Format reader
iwwpsr.*	Apple iWork Pages reader
iwsssr.*	Apple iWork Numbers reader
jp2000sr.*	JPEG 2000 metadata reader
jpgsr.*	JPEG metadata reader
jtdsr.*	JustSystems Ichitaro reader
kpagrdr.*	Applix Presentations reader
kpCATrdr.*	CATIA format reader
kpcgmrdr.*	Computer Graphics Metafile reader
kpDWGrdr.*	AutoCAD Drawing format reader
kpDXFrdr.*	AutoCAD Drawing Exchange format reader
kpemfrdr.*	Enhanced Metafile reader
kpGFLrdr.*	Omni Graffle reader
kpgifrdr.*	Graphic Interchange Format (GIF) reader
kpIWPGdrdr.*	Apple iWork Keynote reader
kpmssordr.*	Microsoft Office Drawing Objects (office 97, 2000, and XP) reader
kp0DArdr.*	AutoCAD reader (Windows only)
kpodfrdr.*	Oasis Open Document Format presentation (ODP) reader
kpONErdr.*	Microsoft OneNote reader
kpp40rdr.*	Microsoft PowerPoint PC 4.0 and PowerPoint Mac reader
kpp95rdr.*	Microsoft PowerPoint 95 reader
kpp97rdr.*	Microsoft PowerPoint 97 and higher reader
kppctrdr.*	Macintosh Quick Draw Picture (PICT) reader

File	Description
kppicrdr.*	Pictor PC Paint (PIC) reader
kpppxrdr.*	Microsoft PowerPoint XML reader 2007
kpprerdr.*	Lotus Freelance Graphics for Windows V2.0 reader
kpprzrdr.*	Lotus Freelance Graphics 96/97/98 reader
kpshwrdr.*	Corel Presentations reader
kpugrdr.*	Unigraphics (UG) NX reader
kpwg2rdr.*	WordPerfect Graphics 2 reader
kpwmfrdr.*	Windows Metafile reader
kwpgrdr.*	WordPerfect Graphics 1 reader
kpXFDLrdr.*	Extensible Forms Description Language reader
kvgzsr.*	GZIP reader
kvhqxsr.*	BinHex reader
kvzeesr.*	UNIX Compress reader
l123sr.*	Lotus 123 v96/97/98 reader
lasr.*	Lotus AMI Pro reader
ltbenn30.dll	Lotus Word Pro support (supported on Windows x86 platform only)
ltscsn10.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwpapin.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwppann.dll	Lotus Word Pro support (supported on Windows x86 platform only)
lwpsr.dll	Lotus Word Pro reader (supported on Windows x86 platform only)
lzhsr.*	Microsoft Compression Folder reader
macbinsr.*	MacBinary reader
mbsr.*	Microsoft Word Macintosh reader
mbxsr.*	Mailbox (MBX) and Microsoft Outlook Express (EML) reader ¹
mdbsr.*	Microsoft Access reader

¹This reader is an advanced feature and is sold and licensed separately from KeyView Filter SDK. See [License Information, on page 20](#)

File	Description
mhtsr.*	MIME HTML reader
mifsr.*	Adobe Maker Interchange reader
misr.*	Microsoft Word 2 reader
mp3sr.*	MP3 reader for metadata extraction reader
mpeg4sr.*	MPEG-4 Audio file reader
mppsр.*	Microsoft Project reader
msgsr.*	Microsoft Outlook (MSG) reader
mspubsr.*	Microsoft Publisher reader
msw6sr.*	Microsoft Works 6 and 2000 reader
mswsr.*	Microsoft Works V1 and 2 reader
multiarcsr	ARJ Reader
mw6sr.*	Microsoft Word 95 reader
mw8sr.*	Microsoft Word 97, 2000, and XP reader
mwsr.*	Microsoft Word for DOS and Microsoft Write reader
mwssr.*	Microsoft Works Spreadsheet reader
mwxsr.*	Microsoft Word 2007 XML reader
nsfsr.*	Lotus Notes database reader 1
oa2sr.*	Fujitsu Oasys reader
odfsssr.*	Oasis Open Document Format spreadsheets (ODS) reader
odfwpsr.*	Oasis Open Document Format word processing (ODS) reader
olesr.*	Embedded OLE object reader
olmsr.*	Microsoft Outlook for Macintosh reader
onmsr.*	Legato EMailXtender Native Message reader
oo3sr.*	Omni Outliner reader
pdfsr.*	Adobe Portable Document Format file (PDF) reader
pffsr.*	Microsoft Outlook Offline Storage File reader
pngsr.*	Portable Network Graphics (PNG) reader

File	Description
pstsr.dll	Microsoft Outlook Personal Folders file MAPI-based reader (supported on Windows platform only) ¹
pstnsr.*	Microsoft Outlook Personal Folders file native reader ¹
qpssr.*	Corel Quattro Pro spreadsheet reader
qpwsr.*	Corel Quattro Pro version X4 spreadsheet reader
rarsr.*	RAR Archive reader
riffsr.*	Microsoft WAVE reader
rtfsr.*	Microsoft Rich Text reader
skypesr.*	Skype log file reader
sosr.*	StarOffice/OpenOffice reader
sunadsr.*	Sun Audio Data reader
swfsr.*	Macromedia Flash reader
tarsr.*	Tape archive reader
tifsr.*	TIFF reader (metadata only)
tnefsr.*	Transfer Neutral Encapsulation Format
unihtmsr.*	Unicode HTML reader
unisr.*	Unicode reader
unzip.*	Zip file reader
utf8sr.*	UTF-8 reader
uudsr.*	UUEncoding reader
vcfsr.*	Microsoft Outlook vCard Contact reader
vsdsr.*	Microsoft Visio reader
wkssr.*	Lotus 123 v2.0 through 5.0 reader
wosr.*	WordPerfect 5.x reader
wp6sr.*	WordPerfect 6.0 through 10.0 reader
wpmsr.*	WordPerfect for Macintosh reader
xlsbsr.*	Microsoft Office 2007 Excel Binary Format reader
xlssr.*	Microsoft Excel reader

File	Description
xlxsr.*	Microsoft Excel 2007 XML reader
xmlsr.*	Generic XML reader
xpssr.*	XML Paper Specification reader
xywsr.*	XYWrite reader
yimsr.*	Yahoo! Instant Messenger reader
z7zsr.*	7-Zip reader

Appendix G: Develop a Custom Reader

This section describes how to develop a reader for a format not supported by KeyView.

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• How to Write a Custom Reader	351
• Development Tips	361
• Functions	362

Introduction

The Filter SDK enables you to write custom readers for formats not directly supported by KeyView. A reader is required to parse the file format and generate a KeyView token stream, which represents the content and format of the document. Filter can then use this token stream to generate a text version of the original document. The readers interact with a structured access layer and a writer to generate a text file in Filter, an HTML file in HTML Export, an XML file in XML Export, and a near-to-original view of the document in the Viewing SDK.

The complexity of a custom reader depends on the file format used by the source document type. A simple reader extracts only the textual content, but ignores formatting and all other non-textual content. Readers of increasing complexity must address one or more of the following:

- formatting (including fonts, foreground and background colors, paragraph borders and shading, character and paragraph styles)
- tables
- lists
- headers
- footers
- footnotes
- endnotes
- graphics
- bookmarks to internal links
- hyperlinks to external documents or webpages
- other structures, such as a table of contents or index

Even a simple reader might have to parse the following components of a document:

- word processing commands or tags
- encrypted or encoded text
- multiple character sets

- text modified, but retained within the file
- text displayed in an order other than its physical occurrence within the source file

It is very important to fully understand the file specification for the file format used by the document. This is essential in determining how to parse the source file and generate a token stream that accurately and effectively represents the original document.

Within Filter, the custom reader must interact with a structured access layer and the format detection API, which in turn interacts with the top-level API. For a description of the Filter architecture, see [Architectural Overview, on page 23](#).

The custom reader must have a module definition file (*.def) that defines the exported API function calls. In addition, the `formats.ini` file must be modified to identify the custom reader and its associated format detection function.

See the source code for the sample custom reader (`utf8sr`), which parses plain text files encoded in UTF-8. The source code is in the directory `install/samples/utf8sr`, where `install` is the path name of the Filter installation directory.

How to Write a Custom Reader

Two include files define the requirements for a custom reader: `kvcfsr.h` and `kvtoken.h`. The definitions of the KeyView tokens are in `kvtoken.h`. For more information on tokens, see [Token Buffer, on the next page](#). The file `kvcfsr.h` defines two structures: `TPReaderInterface` and `adTPDocInfo`.

The `TPReaderInterface` structure defines the API functions implemented by the custom reader. For basic readers, only the first four functions must be implemented. These functions are called by the structured access layer to parse the source file and generate the token stream.

All readers must be threadsafe. This means that global variables must not be used. To pass information between functions, it is necessary to define a "global" context structure that stores all information required throughout the life of the DLL. The initial parameter of all but one of the `TPReaderInterface` functions is a pointer to a global context structure defined for the custom reader.

The `adTPDocInfo` structure defines the information required for the format detection API, which associates the custom reader with the required file format.

Naming Conventions

Use the following naming conventions for functions and files:

- The initial letters of the custom reader file name should identify the file format being parsed. For example, `pdf` for Adobe PDF files, `rtf` for RTF files, and `xls` for Microsoft Excel files. In the examples in this appendix, this is represented by `xxx`.
- The name of the shared library must end with the letters `sr`.
- The name of the exported functions in the module definition file must be `xxxGetReaderInterface` and `xxxsrAutoDet`.

NOTE:

The letters `sr` are excluded from `xxxGetReaderInterface`, but are included in

```
xxxxsrAutoDet.
```

Basic Steps

The basic steps for developing a custom reader are as follows.

To develop a custom reader

1. Design the global context structure.
2. Write the basic API functions:

- [xxxAllocateContext\(\)](#)
- [xxxInitDoc\(\)](#)
- [xxxFillBuffer\(\)](#)
- [xxxFreeContext\(\)](#)
- [xxxCharSet\(\)](#)
- [xxxxsrAutoDet\(\)](#)

From within the `xxxFillBuffer()` function, it is necessary to call other functions that repeatedly read a chunk of a source file, parse the chunk, and generate a token stream until the entire source file is processed.

3. Map all but the last function to the `TPReaderInterface` structure.
4. Write the module definition file (`*.def`), exporting the reader interface and format detection functions.
5. Modify the `formats.ini` file to identify the custom reader and its associated format detection function. See [xxxxsrAutoDet\(\)](#), on page 362. For example, the following lines would be added to the `[Formats]` section of the `formats.ini` file for the UTF-8 reader:

```
456.1.0.0=utf8
[CustomFilters]
1=utf8sr
```

Token Buffer

Filter technology parses the native file structure to generate an intermediate stream called a *token buffer*. The token buffer consists of multiple sequences of tokens, which are defined in `kvtoken.h` and listed below.

```
#define KVT_TEXT          0x00 /* PutText() */
#define KVT_PARAINFO      0x01 /* SetParaInfo() */
#define KVT_SETTABS       0x02 /* SetTabs() */
#define KVT_TAB           0x03 /* Tab() */
#define KVT_MODE          0x04 /* SetMode() */
#define KVT_PARASPACE     0x05 /* SetParaSpace() */
#define KVT_ROWDEFN       0x06 /* DefineRow(), EndTable() */
```



```
#define KVT_COLUMNS      0x07 /* StartColumns(), etc. */
#define KVT_CELLSTART    0x08 /* NextCell() */
#define KVT_BITMAP       0x09 /* Reserved for annotations. */
#define KVT_PAGEOBJ      0x0A /* PutHeader(), PrintPage(), etc.*/
#define KVT_NOOP         0x0B /* Just skip a BYTE. */
#define KVT_PAGE_BREAK   0x0C /* PageBreak() */
#define KVT_PARA_BREAK   0x0D /* ParaEnd() */
#define KVT_LINE_BREAK   0x0E /* LineBreak() */
#define KVT_SET_FONT     0x0F /* SetFont() */
#define KVT_PAGE         0x10 /* SetPageInfo() */
#define KVT_HOTSPOT      0x11 /* StartHotSpot() */
#define KVT_LINESPACE    0x12 /* SetLineSpacing() */
#define KVT_COLOR        0x13 /* VESetTextColor(),VESetBkColor()*/
#define KVT_PICTURE      0x14 /* PutPicture() */
#define KVT_CELLMERGE    0x15 /* MergeCells() */
#define KVT_RULE         0x16 /* HorzRule() */
#define KVT_PATTERN      0x17 /* StartPattern(), etc. */
#define KVT_BORDER       0x18 /* StartParaBorder(), etc. */
#define KVT_HEADING      0x19 /* PutParaHeading() */
#define KVT_LISTING      0x1A /* StartList(), etc. */
#define KVT_CHARSET      0x1B /* SetCharSet() */
#define KVT_STYLE        0x1C /* PutCharStyle(), PutParaStyle()*/
#define KVT_BIDI         0x1D /* Set Bidirectional text */
#define KVT_LOCALE       0x1E /* Set locale of a document */
#define KVT_ZONE         0x1F /* StartZone(), EndZone() */
#define KVT_POSITION     0x20 /* SetPosition(), etc. */
#define KVT_AUTOREC      0x21 /* Reserved for Internal Use */
#define KVT_METADATA     0x22 /* Rsserved for Internal Use */
#define KVT_BYTEORDER    0x23 /* SetByteOrder() */
#define KVT_PARASPACEAUTO 0x24 /* SetParaSpaceAuto() */
#define KVT_ATTACH       0x25 /* PutAttachment() */
#define KVT_TOCPrintIMAGE 0x26 /* StartTOCPrintImage(), etc. */
#define KVT_STREAM       0x27 /* PutStream(),Reserved */
#define KVT_REVISIONMARK 0x28 /* StartRevisionMark(),
EndRevisionMark(), SetRMAuthor(), SetRMDateTime() */
#define KVT_DOCXTRINFO   0x29 /* SetDocXtrInfo() */
#define KVT_PCTEMDFT     0x30 /* SetPctEmdFt() */
```

A token is a single-byte identifier that corresponds to attributes in a document. Each token has one or more associated macros that provide detailed information about an attribute. Many of these tokens define components of the document, such as page margins, line indentation, and foreground and background color. Collectively, these are referred to as the *state* of the document. This state changes as the document is parsed.

Macros

Some of the macros are simple while others are complicated. An example of a simple macro is `ParaEnd (pcBuf)` which terminates the current paragraph.

```
#define ParaEnd(pcBuf) \
{ \
    *pcBuf++ = KVT_PARA_BREAK; \
    KVT_PUTINT(pcBuf, KVTSIZE_PARA_BREAK); \
}
```

In Filter SDK, this generates an `0x0d, 0x0a` pair of bytes on a Windows machine. In HTML Export this can generate a `<p style="...">` element, depending on the value of other paragraph attributes.

One of the more complicated macros is `PutPictureEx()`.

```
#define PutPictureEx(pcBuf, lpszKey, cx, cy, flags, \
    scaleHeight, scaleWidth, \
    cropFromL, cropFromT, cropFromR, cropFromB, \
    anchorHorizontal, anchorVertical, offsetX, offsetY)\
{\
    PutPic(pcBuf, lpszKey, cx, cy, flags, \
    scaleHeight, scaleWidth, \
    cropFromL, cropFromT, cropFromR, cropFromB, \
    anchorHorizontal, anchorVertical, offsetX, offsetY, \
    180, 0, 180, 0, -1, 0, 0, 0, 0) \
}
```

You can generate a representation of the token stream by running `filtertest.exe` with the `-d` command-line option. This stream does not include the tokens generated for headers or footers. The `filtertest.exe` is in the directory `install\samples\utf8\bin`, where `install` is the path name of the Filter installation directory.

Reader Interface

All custom readers use the reader interface defined in `kvcfsr.h`. The members of this structure are:

```
fpAllocateContext()
fpInitDoc()
fpFillBuffer()
fpFreeContext()
fpHotSpothit()
fpGetSummaryInfo()
fpOpenStream()
fpCloseStream()
fpGetURL()
fpGetCharSet()
```

NOTE:

`fpHotSpothit()` and `fpGetURL()` are currently reserved and must be `NULL`.

Function Flow

The structured access layer calls the functions as follows:

1. `fpAllocateContext()` is called and returns a pointer to the global context structure.
2. After further processing within the structured access layer, `fpInitDoc()` is called. This function performs all required initialization for the global context structure and then returns control to the structured access layer.
3. After further processing within the structured access layer, the `fpFillBuffer()` function is called repeatedly until the document is completely parsed.
4. Finally, `fpFreeContext()` is called. This function frees all memory allocated within the custom reader and then returns control to the structured access layer.

Related Topics

- [Functions, on page 362](#)

Example Development of `fffFillBuffer()`

The following is an example of how the `fpFillBuffer()` function in `foliosr` could be developed. The example demonstrates how the code changes as limitations of the implementation are identified. With each implementation, code revisions are shown in bold.

Implementation 1—`fpFillBuffer()` Function

```
/******  
*Function: fffFillBuffer()  
*Summary: Read fff input from stream and parse into kvtoken.h codes  
*****/  
int pascal _export fffFillBuffer(  
    void      *pCFContext,  
    BYTE      *pcBuf,  
    UINT      *pnBufOut,  
    int       *pnPercentDone,  
    UINT      cbBufOutMax )  
{  
    BOOL bRetVal;  
    TPfffGlobals *pContext = (TPfffGlobals *)pCFContext;  
    pContext->pcBufOut = pcBuf;  
    fffReadSourceFile(pContext);  
    bRetVal = fffProcessBuffer(pContext, pcBuf);  
    *pnPercentDone = (int)(pContext->unTotalBytesProcessed *  
        (UINT)100 / pContext->unFileSize);  
    *pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);  
    return (bRetVal ? KVERR_Success : KVERR_General);  
}
```

The parameters in `fffFillBuffer()` are as follows:

Parameter	In/Out	Description
pCFContext	In	A pointer to the context structure of the custom reader.
pcBuf	In/Out	A pointer to the token output buffer.
pnBufOut	Out	A pointer to the number of bytes written to the output buffer.
pnPercentDone	Out	A pointer to the percentage complete.
cbBufOutMax	In	The maximum number of bytes that the token output buffer can hold.

Structure of Implementation 1

1. The local variable `pContext` is set to the address of the `pCFContext` void pointer, cast to a pointer to the global context structure for the reader. This provides access to all members of this structure.
2. After setting the `pContext` variable, a call is made to read the source file.
3. Next, a call is made to `fffProcessBuffer()`. The second parameter in the call is a pointer to the token output buffer. If this call fails, usually because of memory allocation errors, it returns `FALSE`.
4. The percentage complete is calculated.
5. The number of `BYTES` written to the token output buffer is calculated. This is based on the value of `pContext->pcBufOut`, which is increased each time a token is written to the buffer.
6. The function returns to the structured access layer.
7. Subsequent calls to `fffFillBuffer()` are made by the structured access layer until the percentage complete is 100.

Problems with Implementation 1

- There is a limit to the size of the token output buffer, typically 4 KB. If `fffProcessBuffer()` generates a token stream larger than this, there is a memory overflow. If `fffProcessBuffer()` generates a small token stream and the entire file has not been read, the output token buffer is underutilized.
- It might not be possible to process the entire input buffer from the source file because of boundary conditions. An example of a "boundary condition" is when the input buffer terminates part way through a control sequence in the original document. Another file read operation is required before the complete control sequence can be parsed.
- This function might be interrupted by other calls from the structured access layer to process headers, footers, footnotes, and endnotes, or to retrieve the document summary information. This can cause values of variables in the global context to change, and the source file to be repositioned.

Implementation 2—Processing a Large Token Stream

Implementation 2 addresses the problem of processing a token stream that is larger than the output buffer size limit.

```

/*****
* Function:   fffFillBuffer()
* Summary:    Read fff input from stream and parse into kvtoken.h codes
*****/
int pascal _export fffFillBuffer(
    void      *pCfContext,
    BYTE      *pcBuf,
    UINT      *pnBufOut,
    int       *pnPercentDone,
    UINT      cbBufOutMax )
{
    BOOL bRetVal = TRUE;
    TPfffGlobals *pContext = (TPfffGlobals *)pCfContext;
    pContext->pcBufOut = pcBuf;
    pContext->cbBufOutMax = 9 * cbBufOutMax / 10; /* Process the portion of the
fff file that is in the input buffer but do * not return from the fffFillBuffer()
function unless the output buffer is * at least 90% full. If any of the memory
allocations fail during the * execution of fffProcessBuffer(), bRetVal will be
set to FALSE, resulting * in this conversion failing "gracefully".
    */
    do
    {
        if( pContext->bBufOutFull )
        {
            pContext->bBufOutFull = FALSE;
        }
        else
        {
            fffReadSourceFile(pContext);
        }
        bRetVal = fffProcessBuffer(pContext, pcBuf);
        *pnPercentDone = (int)(pContext->unTotalBytesProcessed *
            (UINT)100 / pContext->unFileSize);
    }while( bRetVal && !pContext->bBufOutFull && *pnPercentDone < 100 );
    *pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);
    return (bRetVal ? KVERR_Success : KVERR_General);
}

```

Structure of Implementation 2

1. cbBufOutMax is used to set pContext->cbBufOutMax. This is used in fffProcessBuffer() to monitor how full the token output buffer becomes as the source file is processed.
2. When the source file input buffer has been processed, fffProcessBuffer() returns, and the percentage complete is calculated.

3. If the token output buffer is not filled to a value greater than `pContext->cbBufOutMax`, `pContext->bBufOutFull` remains set to `FALSE`, and if the percentage complete is less than 100, the `do-while` loop is re-entered without returning from this function to the structured access layer. There is another call to `fffReadSourceFile()`, followed by `fffProcessBuffer()`.
4. When the token output buffer is filled to a value greater than `pContext->cbBufOutMax`, `pContext->bBufOutFull` is set to `TRUE`. In this case, the `do-while` loop ends, the number of bytes written to the token output buffer is calculated, and control returns to the structured access layer.
5. The structured access layer continues to make calls to `fffFillBuffer()` until the entire source file is processed.
6. Each time the structured access layer calls `fffFillBuffer()`, another empty token output buffer is provided for the custom reader to use.
7. If the previous call to `fffFillBuffer()` exited because the previous token output buffer exceeded allowable capacity, `pContext->bBufOutFull` is reset to `FALSE` and no call is made to read the next buffer from the input source file.

Problems with Implementation 2

- It might not be possible to process the entire input buffer from the source file because of boundary conditions.
- This function might be interrupted by other calls from the structured access layer to process headers, footers, footnotes, or endnotes, or to retrieve the document summary information. This can cause values of variables in the global context to change, and the source file to be repositioned.

Boundary Conditions

A boundary condition can result from many situations arising from input file processing. For example, the input buffer might end with an incomplete command. In Folio flat files, this could be an incomplete element. In other word processing documents, a boundary condition might result from an incomplete control sequence, a split double-byte character, or a partial UTF-7 or UTF-8 sequence. These can be handled jointly by `fffProcessBuffer()`, which must detect the boundary condition, and `fffReadSourceFile()`.

The following example shows partial code used in `fffReadSourceFile()`:

```
/* *****  
 *  
 * Function:    fffReadSourceFile()  
 *  
 * ***** */  
int pascal fffReadSourceFile(TPfffGlobals *pContext)  
{  
    int nBytes;  
    /* Transfer remaining data to beginning of buffer prior to next read */  
    if( pContext->nResidualBytes )  
    {  
        memcpy(pContext->cInputBuf, pContext->pcBufIn, pContext->nResidualBytes);  
    }  
}
```

```

/* Read from file, without over-writing any text from the previous buffer */
nBytes = (*pContext->pIO->kwReadFunc)(pContext->pIO,
    pContext->cInputBuf + pContext->nResidualBytes,
    BUFFERSIZE - pContext->nResidualBytes);
/* Update input buffer control parameters */
pContext->unTotalBytesRead += (UINT)nBytes;
pContext->pcBufIn = pContext->cInputBuf;
pContext->pcBufInMax = pContext->pcBufIn + pContext->nResidualBytes + nBytes;
pContext->nResidualBytes = 0;
return nBytes;
}

```

If `fffProcessBuffer()` is unable to process the entire input source file buffer, it sets the value for `pContext->nResidualBytes`. When the next call to `fffReadSourceFile()` is made, any residual bytes are copied to the beginning of the input source file buffer, and the number of bytes to be read is reduced to make sure that this buffer does not overflow.

A good way to test the code for boundary conditions is to vary the size of `BUFFERSIZE` and make sure that the results remain consistent.

NOTE:

With `ReadSourceFile()`, the source file can be read by calls to retrieve header or footer information. If this occurs, the value for `pContext->unTotalBytesRead` is incorrect.

Implementation 3—Interrupting Structured Access Layer Calls

Implementation 3 addresses the problem of boundary conditions and interrupting calls from the structured access layer.

```

/*****
* Function:   fffFillBuffer()
* Summary:    Read fff input from stream and parse into kvtoken.h codes
*****/
int pascal _export fffFillBuffer(
    void      *pCFContext,
    BYTE      *pcBuf,
    UINT      *pnBufOut,
    int       *pnPercentDone,
    UINT      cbBufOutMax )
{
    double dTotalBytesProcessed, dFileSize;
    BOOL bRetVal = TRUE;
    TPfffGlobals *pContext = (TPfffGlobals *)pCFContext;
    pContext->pcBufOut = pcBuf;
    pContext->cbBufOutMax = 9 * cbBufOutMax / 10;
    /* Process the portion of the fff file that is in the input buffer but do
    * not return from the fffFillBuffer() function unless the output buffer is
    * at least 90% full. If any of the memory allocations fail during the
    * execution of fffProcessBuffer(), bRetVal will be set to FALSE, resulting
    * in this conversion failing "gracefully". */

```

```
do
{
    if( pContext->bBufOutFull )
    {
        pContext->bBufOutFull = FALSE;
    }
    else
    {
        fffReadSourceFile(pContext);
    }
    bRetVal = fffProcessBuffer(pContext, pcBuf);
    if( pContext->bHeaderCompleted )

{
    *pnPercentDone = 100;
    pContext->bHeaderCompleted = FALSE;
}
    else if( pContext->bFooterCompleted )

{
    *pnPercentDone = 100;
    pContext->bFooterCompleted = FALSE;
}
    else

{
        if( pContext->unTotalBytesProcessed >= pContext->unFileSize )
        {
            *pnPercentDone = 100;
        }
        else if( pContext->unFileSize < FFF_MAX_ULONG )
        {
            *pnPercentDone = (int)(pContext->unTotalBytesProcessed *
(UINT)100 / pContext->unFileSize);
        }
        else

{
            dTotalBytesProcessed = pContext->unTotalBytesProcessed;
            dFileSize = pContext->unFileSize;
            *pnPercentDone = (int)(dTotalBytesProcessed * 100 / dFileSize);
        }
    }
}while( bRetVal && !pContext->bBufOutFull && *pnPercentDone < 100 );
*pnBufOut = (UINT)(pContext->pcBufOut - pcBuf);
return (bRetVal ? KVERR_Success : KVERR_General);
}
```


Structure of Implementation 3

- The most significant change in Implementation 3 is the addition of the code that checks whether the processing of the header or footer is complete. The variables for `pContext->bHeaderCompleted` and `pContext->bFooterCompleted` are set to `TRUE` in `fffProcessBuffer()` when a header or footer is processed and the end of that portion of the document is reached.
- The other piece of code added in Implementation 3 is unique to `foliosr`. Folio files can be 50 MB or larger. Therefore, an unsigned integer is too small to accurately calculate the percentage complete. If the file size exceeds `FFF_MAX_ULONG`, which is defined as `(UINT)(0xFFFFFFFF / 0x64)`, the doubles are used for that calculation.
- Prior to returning, the token output buffer is as full as possible and never overflows. The minimum number of calls is made.

Development Tips

- Avoid unnecessary initialization.

The context variable is allocated in `fpAllocateContext()`. This structure must be immediately `memset()` to zero. This sets all `BOOL` values to `FALSE`, all pointers to `NULL`, and all integers to 0. Only non-zero, non-`NULL` and `BOOL`s that must be `TRUE` need to be initialized. This is best done in `fpInitDoc()`.

- Know where you are in the input source file.

If you are processing headers, footers, notes, or (in the case of `rtfsr`) tables, you must be able to reposition the file pointer as required.

- Check buffer boundaries continuously.

Whenever you advance through the buffer, you need to know whether there is enough of the input stream to completely process the current command. If not, you need to append the next section of the input file before continuing.

- Strive for a "clean" token stream.

Use `filtertest` with the `-d` command-line option to generate a *token* version of the document. If there are redundant tokens, the reader is producing an inefficient token stream. You can keep the token stream free from redundancies by storing the state of the document and then applying the changes only when content is encountered. Content can be text, tabs, or picture objects. The `filtertest.exe` is in the directory `install\samples\utf8\bin`, where `install` is the path name of the Filter installation directory.

- Avoid large `switch()` statements whenever possible. They make both development and debugging more complicated than necessary. If there is a fixed set of commands, consider using a hash table that enables you to quickly identify a pointer to the function that handles that command.
- Filtering document metadata is a separate process.

Remember that `fpGetSummaryInfo()` is a completely separate process from the rest of your code. It creates its own context variable structure. It does not have to call `fpFillBuffer()`.

- Use caution when processing headers, footers, and notes.

If you need to process these items, the structured access layer calls `fpOpenStream()` and `fpCloseStream()`. It is critical that you save the state of your document and the file pointer position prior to returning from `fpOpenStream()`. Prior to returning from `fpCloseStream()`, you must restore the file pointer and the previous state of your document.

- Test your code.

The structured access layer for each SDK is unique. Test your code in Filter SDK, Export SDK, and Viewing SDK.

Functions

This section describes the functions used by custom readers to manage the source file and generate token streams required to convert a document.

xxxxsrAutoDetO

This function analyzes the source document and determines whether the detected file format requires the custom reader. It is called only when the `[CustomFilters]` section of the `formats.ini` file contains an entry identifying the complete file name of the custom reader. For more information on the `formats.ini` file, see [File Format Detection, on page 302](#).

Syntax

```
Bool pascal _export xxxxsrAutoDet(  
    adTPDocInfo    *pTPDocInfo,  
    KPTPIOobj      *pIO)
```

Arguments

`pTPDocInfo` A pointer to the `adTPDocInfo` structure provided by the structured access layer.

`pIO` A pointer to the I/O stream object for the document processed.

Returns

- TRUE if the file format matches that of the custom reader.
- FALSE if the file format does not match that of the custom reader.

Discussion

- Typically, only the first 1 KB of the file is read into a buffer and analyzed to determine if it matches the file format of the custom reader. If a match is determined, the following four members of the `adTPDocInfo` structure must be assigned before returning TRUE:

<code>adClass</code>	Must be set to 1.
<code>adFormat</code>	A numerical value assigned to this reader in the <code>[Formats]</code> section of the <code>formats.ini</code> file.
<code>descStr</code>	A string describing the file format.
<code>mMnmemStr</code>	The initial part of the custom reader file name with the "sr" excluded.

- If the return value is `TRUE`, the custom reader is used to parse the file and generate the token stream.
- If the return value is `FALSE`, all other readers in the `[CustomFilters]` section of the `formats.ini` file are tried. If no match is found, the file detection process continues checking for the formats supported by Filter SDK.
- The entry in the `[Formats]` section of the `formats.ini` file should be of the form `aaa.bbb.ccc.ddd`, where `aaa` is the value used for the `adFormat` parameter, `bbb` is the value of the file class, `ccc` is the value of the minor format, and `ddd` is the value of the major version.

xxxAllocateContext()

This function allocates a global memory block for a data context. A handle to this memory is returned to the structured access layer. The structured access layer passes this handle back to all reader entry points.

Syntax

```
void * pascal _export xxxAllocateContext(
    void *pSALContext,
    LPARAM (pascal *fp)(void *,
    UINT LPARAM),
    Bool *pbOpenDoc,
    TPVAPIServices *pVapi,
    DWORD dwFlags)
```

Arguments

<code>pSALContext</code>	A pointer to the global data context structure of the structured access layer.
<code>fp</code>	A pointer to a structure of callback functions supported by the structured access layer.
<code>pbOpenDoc</code>	You must set this <code>BOOL</code> value to <code>TRUE</code> if the allocation of memory for the global data context structure is successful.
<code>pVapi</code>	A pointer to a structure providing memory management and character conversion functions. Because this functionality is proprietary to Micro Focus, <code>TPVAPIServices</code> is redefined as <code>void</code> in <code>kvcfsr.h</code> .
<code>dwFlags</code>	Run-time flags controlled by the structured access layer.

Returns

- Upon success, a pointer to the global data context structure for the custom reader. This pointer is passed back to all other custom reader entry points.
- Upon error, a NULL pointer. This causes the structured access layer to shut down the process.

Discussion

The global context structure should be `memset()` to zero in this function.

xxxFreeContext()

This function terminates an instance of the custom reader.

Syntax

```
int pascal _export xxxFreeContext(void *pCFContext)
```

Arguments

`pCFContext` A pointer to the global context structure for the custom reader.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

All memory that still remains allocated within the custom reader must be freed within this function.

xxxInitDoc()

This function initializes non-zero, non-null members of `pContext`.

Syntax

```
int pascal _export xxxInitDoc(  
    void                *pCFContext,  
    adDocDesc           *pAutoInfo,  
    long                lcbFileSize,  
    KPTPIOobj           *pIO )
```

Arguments

<code>pCFContext</code>	A pointer to the global context structure for the custom reader.
<code>pAutoInfo</code>	A pointer to an <code>adDocDesc</code> structure defined in <code>kwautdef</code> .
<code>lcbFileSize</code>	The length of the source file in bytes.
<code>pIo</code>	A pointer to a <code>KPTPIOobj</code> structure defined in <code>kvioobj.h</code> .

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code. This causes the structured access layer to shut down the process.

Discussion

- For custom readers, the `pAutoInfo` variable can be ignored.
- If the structured access layer has determined the length of the source file, that value is provided by the `lcbFileSize` parameter. If it is zero, the file size must be determined in this function.
- The pointer `pIO` provides access to file management functions defined in `kvioobj.h`.
- In this function, all non-zero, non-NULL members of the global context structure should be initialized.

xxxFillBuffer()

This function controls parsing of the source file and generation of tokens defined in `kvtoken.h`.

Syntax

```
int pascal _export xxxFillBuffer(  
    void *pCFContext,  
    BYTE *pcBuf,  
    UINT *pnBufOut,  
    int *pnPercentDone,  
    UINT cbBufOutMax)
```

Arguments

<code>pCFContext</code>	A pointer to the global context structure for the custom reader.
<code>pcBuf</code>	A pointer to a memory buffer to which the tokens are written.
<code>pnBufOut</code>	A pointer to a variable that specifies the actual number of bytes written to the token

buffer.

pnPercentDone A pointer to a variable that specifies the percentage completed of the file parsing.

cbBufOutMax A pointer to a variable that specifies the maximum number of bytes written to the token buffer.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code. This causes the structured access layer to shut down the process.

Discussion

- Calls are made to read and parse the source file within this function.
- This function is called repeatedly by the structured access layer until either the return value is `FALSE` or the percentage complete is 100.
- The actual number of bytes written to the token buffer must not exceed the value of `cbBufOutMax`.

xxxGetSummaryInfo()

This function is required to extract document summary information.

Syntax

```
int  pascal _export xxxGetSummaryInfo(  
    void          *pCfContext,  
    KVSummaryInfoEx *pInfo,  
    BOOL          bFreeInfo)
```

Arguments

pCfContext A pointer to the global context structure for the custom reader.

pInfo A pointer to a `KVSummaryInfoEx` structure defined in `kvtypes.h`.

bFreeInfo A `BOOL` value indicating whether to free memory allocated for summary information.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

This function uses an instance of the global context structure that is different from the one used by all other reader interface functions.

This function can call the same functions used by `xxxFillBuffer()` or can be completely independent.

For more information, see [Extract Metadata, on page 62](#).

xxxOpenStream()

This function is required when initiating processing of peripheral elements such as document headers, footers, footnotes, and endnotes.

Syntax

```
int pascal _export xxxOpenStream(  
    void      *pCfContext,  
    int       type,  
    int       nOrdinal)
```

Arguments

- | | |
|-------------------------|---|
| <code>pCfContext</code> | A pointer to the global context structure for the custom reader. |
| <code>type</code> | An integer identifying a specific header, footer, footnote, or endnote. Options are defined in <code>kvcfsr.h</code> . |
| <code>nOrdinal</code> | An integer identifying a specific header, footer, footnote, or endnote. See the associated macros in <code>kvtoken.h</code> . |

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

A call to this function results in a call to `xxxFillBuffer()`. The function `xxxFillBuffer()` provides a new empty output buffer and a new token stream input buffer to process the alternate stream for peripheral elements. In this alternate stream, paragraph and character style properties are likely different from the main body. Therefore, as the document is parsed, the existing values from the main body must be saved. When the processing of the alternate stream is completed and processing of the main body resumes, these values must be restored in `xxxCloseStream()`.

xxxCloseStream()

This function is required when terminating processing for document headers, footers, footnotes, and endnotes.

Syntax

```
int pascal _export xxxCloseStream(  
    void      *pCFContext,  
    int       type)
```

Arguments

pCFContext A pointer to the global context structure for the custom reader.

type An integer identifying a specific header, footer, footnote, or endnote. Options are defined in `kvcfsr.h`.

Returns

- Upon success, `KVERR_Success`.
- Upon error, a non-zero error code.

Discussion

Prior to exiting this function, the previously saved values in the global context structure must be restored. This ensures that processing of the main body resumes with the correct document state.

xxxCharSet()

This function identifies the character encoding used within the source document.

Syntax

```
KVCharSet pascal _export xxxCharSet(  
    void      *pCFContext,  
    BOOL      *bMSBLSB)
```

Arguments

pCFContext A pointer to the global context structure for the custom reader.

bMSBLSB The `BOOL` value required for Unicode text. Set this argument to `TRUE` for Big Endian and `FALSE` for Little Endian.

Returns

One of the enumerated values defined in the `KVCharSet` structure of `kvtypes.h`.

Discussion

If the custom reader can determine the character encoding of the document, the corresponding enumerated value is returned. If the character encoding cannot be determined, `KVCS_UNKNOWN` is returned.

Appendix H: Password Protected Files

This section lists supported password-protected container and non-container files and describes how to open them.

- [Supported Password Protected File Types](#)370
- [Open Password Protected Container Files](#)371
- [Filter Password Protected Files](#)371

Supported Password Protected File Types

The following table lists the password-protected file types that KeyView supports.

Key to support table

Symbol	Description
Y	Format is supported.
N	Format is not supported.
S	Support for viewing subfiles.
V	Support for viewing content.
P	Password required.
C	Password and certificate or User ID file required.

Supported password-protected file types

File Type	Version	Filter	Export	Extract	View	Credentials
PST (Windows)	n/a	N	N	Y	S	P
PST (non-Windows) ¹	n/a	N	N	Y	S	N
ZIP	n/a	N	N	Y	S	P
7-Zip	n/a	N	N	Y	S	P
RAR	n/a	N	N	Y	S	P
SMIME in MSG, EML, MBX	n/a	N	N	Y	N	C

¹The native PST reader, `pstnsr`, does not require credentials to open password-protected PST files that use compressible encryption.

Supported password-protected file types, continued

File Type	Version	Filter	Export	Extract	View	Credentials
Lotus Notes NSF	n/a	N	N	Y	N	C
Adobe PDF	n/a	Y	Y	Y	V	P
Microsoft Office	97-2003 2007 2010	Y	Y	Y	V	P

Open Password Protected Container Files

This section describes how to extract password-protected container files by using the C API. The following guidelines apply to specific file types.

- **Lotus Notes NSF files.** If you are running a Notes client with an active user connected to a Domino server, you must specify the user's password as a credential regardless of whether the NSF files you are opening are protected. This enables KeyView to access the Notes client and the Lotus Notes API. If the Notes client is not running with an active user, KeyView does not require credentials to access the client.
- **PST files.** To open password-protected PST files that use high encryption (Microsoft Outlook 2003 only), you must use the MAPI-based PST reader (*pstsr*). The native PST reader (*pstnsr*) returns the error message *KVERR_PasswordProtected* if a PST is encrypted with high encryption.

To open container files

1. Define the credential information in the *KVOpenFileArg* data structure.
2. Pass *KVOpenFileArg* to the *fpOpenFile()* function.
3. Call *fpCloseFile()*.

Filter Password Protected Files

This section describes how to filter password-protected non-container files with the C API.

To filter password-protected files

1. Call the *fpInit()* function.
2. Call the *fpFilterConfig()* function with the following arguments:

Argument	Parameter
nType	KVFLT_SETSRCPASSWORD
nValue	TRUE
pData	The source file password. The password is a null-terminated string with a maximum length of 255 characters (the final byte is null).

For example:

```
(*fpFilterConfig)(pKVFilter, KVFLT_SETSRCPASSWORD, TRUE, password);
```

where *password* is a null-terminated string of 255 or fewer characters.

3. Call the [fpFilterFile\(\)](#) or [fpFilterStream\(\)](#) function.

Send documentation feedback

If you have comments about this document, you can [contact the documentation team](#) by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on Filter SDK C Programming Guide (Micro Focus KeyView 12.0)

Add your feedback to the email and click **Send**.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to swpdl.idoldocsfeedback@microfocus.com.

We appreciate your feedback!