
**SAS® Document Conversion 1.2: Developer's Guide**

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# Contents

**About This Book** .................................................................................................1
  Audience ................................................................................................................1
  Prerequisites ..........................................................................................................1
  Conventions ...........................................................................................................1

**1 About SAS Document Conversion** .................................................................3
  1.1 What is SAS Document Conversion? .................................................................3
  1.2 Benefits to Using SAS Document Conversion .................................................4
  1.3 How Does SAS Document Conversion Work? ..............................................5

**2 Installation** .....................................................................................................7
  2.1 Overview ..........................................................................................................7
  2.2 Prerequisite System Requirements ...............................................................7
  2.3 Install SAS Document Conversion .................................................................9

**3 C API and Sample Program** ........................................................................15
  3.1 Overview .........................................................................................................15
  3.2 The C API .......................................................................................................16
  3.3 Client Class ....................................................................................................17
    *init_file_converter_client* .............................................................................17
  3.4 Input Class ......................................................................................................18
    *init_file_converter_input* .............................................................................18
    *free_file_converter_input* ..........................................................................19
    *clear_file_converter_input* .........................................................................20
    *set_content_file_converter_input* ..............................................................21
    *set_file_name_file_converter_input* ..........................................................22
    *set_mime_type_file_converter_input* .........................................................23
  3.5 Output Class ..................................................................................................24
    *init_file_converter_output* .........................................................................24
    *free_file_converter_output* .........................................................................25
    *clear_file_converter_output* ......................................................................26
    *get_title_file_converter_output* ...............................................................27
About This Book

Audience

SAS Document Conversion is designed for the C developer who installs SAS Document Conversion onto a server and who writes the code to convert an input document.

Prerequisites

Here are the prerequisites for using SAS Document Conversion:

- third-party programs for the documents that you want to convert
- SAS Document Conversion loaded onto your server
- access to documents that you want to convert into text

Conventions

This manual uses the following typographical conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGM_ROOT</td>
<td>The root directory where SAS Document Conversion is installed, typically the following:</td>
</tr>
<tr>
<td></td>
<td><strong>Windows</strong>: C:/Program Files/SAS/SAS Document Conversion</td>
</tr>
<tr>
<td>.sam</td>
<td>The code examples for the C program are shown in a fixed-width font.</td>
</tr>
<tr>
<td>Top</td>
<td>The names of taxonomy nodes appear in a fixed-width font.</td>
</tr>
<tr>
<td><a href="http://www.sas.com">www.sas.com</a></td>
<td>The hypertext links are shown in a light blue, fixed-width font, and are underlined.</td>
</tr>
</tbody>
</table>
1. About SAS Document Conversion

- What is SAS Document Conversion?
- Benefits to Using SAS Document Conversion
- How Does SAS Document Conversion Work?

1.1 What is SAS Document Conversion?

Most organizations require access to information that is created by using a number of different software applications. This requirement poses a challenge because data is often stored in various types of formats. For example, you might use Microsoft Word to write proposals and Microsoft Excel to analyze financial data. Preprocessing is required in order to obtain the information in these documents.

Use SAS Document Conversion when you want to obtain metadata on your data using SAS Content Categorization Studio. You can also choose to use SAS Document Conversion to preprocess your files into .txt documents before you build an index.

SAS Document Conversion provides a client-server solution with a server that runs on Windows and a C API to develop your client. This configuration provides optimal conversion capabilities enabling you to address your organization’s textual information requirements.

SAS Document Conversion automatically leverages third-party software installed on your server, for example, Microsoft Office. When you load more third-party programs onto your server, you extend the conversion capabilities of SAS Document Conversion.
Easy file conversion
   load the application onto your server and use the custom application that you write to automatically convert your files.

Custom application
   use the program code provided to write your custom application.

Convert many types of files
   easily convert the types of files created by the third-party software loaded on your server.

Use the output files with many applications
   choose to use the output files with a wide variety of applications including SAS Content Categorization Studio and SAS Search and Indexing.

Expansive conversion capabilities
   install several programs on your server to expand these document conversion capabilities.

1.2 Benefits to Using SAS Document Conversion

SAS Document Conversion provides the following benefits:
Empowers business owners by converting many forms of data into text
   SAS Document Conversion provides the text conversion functionality that is required to convert your data into text.

Improves the business value of IT and the corporate data that it manages
   SAS Document Conversion provides you with a simple, easy-to-use data conversion program that is flexible and customizable.

Saves money on training and support costs
   SAS Document Conversion is so simple that you can quickly become self-sufficient, with minimal IT support and no need for extensive training. Once you start using SAS Document Conversion you are no longer dependent on the IT staff.
1.3 How Does SAS Document Conversion Work?

SAS Document Conversion enables you to load the program to the server and then to write a customized client that sends the documents to the server for preprocessing. Use the C language API included in this manual to develop your client.
2 Installation

- Overview
- Prerequisite System Requirements
- Install SAS Document Conversion

2.1 Overview

SAS Document Conversion comes with an installer and works with Microsoft Windows running on your server. SAS Document Conversion (using Microsoft IFilter technology) extracts text from your input documents, for example, Word documents.

SAS Document Conversion enables you to use your text files with SAS applications and third-party solutions. For example, you can use SAS Document Conversion to convert Word files into text before extracting their entities using SAS Content Categorization Studio.

When you install SAS Document Conversion on your server, where third-party programs are also running, you enable the converter to expand its capabilities. This means that plain text can be extracted from documents where it could not otherwise be obtained. For example, if you are running Microsoft Office, you could convert the text in PowerPoint presentations into text format.

2.2 Prerequisite System Requirements

The installation prerequisites include optional third-party software, for example, Microsoft Office. However, you can install third-party software after you install SAS Document Conversion. In this case, SAS Document Conversion also works with the newly-installed program.
Configure the server where you install SAS Document Conversion according to the recommended system configuration:

**CPU:** x86 with 1 GHz or higher required. 2+ CPUs of 2 GHz or higher, each, are recommended.

**RAM:** 1 GB or higher is recommended, but this base number depends on the size of the project that you have loaded.

Use Table 2-1 below to learn about the supporting operating systems and the platforms required to run SAS Document Conversion:

### Table 2-1: Supported Operating Systems

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux, (Red Hat 7.x, 8, 9, Fedora 1-3, RHEL 2.1 and higher), Suse</td>
<td>x86, x86-64</td>
</tr>
<tr>
<td>IBM AIX</td>
<td>PPC</td>
</tr>
<tr>
<td>FreeBSD</td>
<td>x86</td>
</tr>
<tr>
<td>HP-UX 32</td>
<td>PA-RISC</td>
</tr>
<tr>
<td>Sun Solaris (32-bit)</td>
<td>x86</td>
</tr>
<tr>
<td>Sun Solaris (32-bit)</td>
<td>SPARC</td>
</tr>
<tr>
<td>Sun Solaris (64-bit)</td>
<td>UltraSPARC</td>
</tr>
<tr>
<td>Tru64 UNIX</td>
<td>HP Alpha</td>
</tr>
<tr>
<td>Windows</td>
<td>x86, x86-64</td>
</tr>
</tbody>
</table>

Run the SAS Document Conversion application on a Windows machine running .NET, or on a UNIX machine running Python.
2.3 Install SAS Document Conversion

To install SAS Document Conversion on your server, complete these steps:

1. Double-click on the `SAS_DocConversion_Setup.exe` and the splash page appears.
2. Click **Next** in the Welcome page that appears.
The Choose Install Location page appears.

3. (Optional) Click **Browse** to open the Browse For Folder dialog box where you can select a different install location.

4. Compare the **Space required** with the **Space available** numbers to see if there is enough room on your hard drive to install this program.
5. Click **Next** and the Enter TCP Port page appears.

![Enter TCP Port page](image)

a. (Optional) Type a new TCP port number in the **Please enter a TCP port number for the server** field.
b. Click **Next** and the Select Conversion Mechanisms page appears.

![Select Conversion Mechanisms](image)

**Note**: You should only select a **System** operation if you are sure that the specified software is installed, otherwise unexpected behaviors might occur.
6. Click **Install** and the Installation Complete page appears.

![Installation Complete Page](image)

7. (Optional) Click **Show details** to view a list of the extracted files.

8. Click **Close**.
3
C API and Sample Program

- Overview
- The C API
- Client Class
- Input Class
- Output Class
- Sample Program

3.1 Overview

This chapter contains the client, input, and output classes and their methods for the C API. A sample program is also included in this chapter for reference purposes. Use the C API methods to build the SAS Document Conversion application that converts files of various formats into text.
3.2 The C API

The C API is comprised of the following methods:

Table 3-1:

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Client Class</strong></td>
<td></td>
</tr>
<tr>
<td><code>init_file_converter_client</code></td>
<td>Initializes a FILE_CONVERTER_CLIENT object.</td>
</tr>
<tr>
<td><strong>Input Class</strong></td>
<td></td>
</tr>
<tr>
<td><code>init_file_converter_input</code></td>
<td>Initializes an input document.</td>
</tr>
<tr>
<td><code>free_file_converter_input</code></td>
<td>Frees a FILE_CONVERTER_CLIENT_INPUT object.</td>
</tr>
<tr>
<td><code>clear_file_converter_input</code></td>
<td>Resets a FILE_CONVERTER_CLIENT_INPUT object to empty, for reuse purposes.</td>
</tr>
<tr>
<td><code>set_content_file_converter_input</code></td>
<td>Sets the content to be converted.</td>
</tr>
<tr>
<td><code>set_file_name_file_converter_input</code></td>
<td>Sets the file name.</td>
</tr>
<tr>
<td><code>set_mime_type_file_converter_input</code></td>
<td>Sets the mime type.</td>
</tr>
<tr>
<td><strong>Output Class</strong></td>
<td></td>
</tr>
<tr>
<td><code>init_file_converter_output</code></td>
<td>Initializes a File Converter output object.</td>
</tr>
<tr>
<td><code>free_file_converter_output</code></td>
<td>Frees a FILE_CONVERTER_OUTPUT object.</td>
</tr>
<tr>
<td><code>clear_file_converter_output</code></td>
<td>Resets a FILE_CONVERTER_CLIENT_OUTPUT object to empty for reuse purposes.</td>
</tr>
<tr>
<td><code>get_title_file_converter_output</code></td>
<td>Gets the title of the File Converter output object.</td>
</tr>
<tr>
<td><code>get_author_file_converter_output</code></td>
<td>Gets the author of the File Converter output object.</td>
</tr>
<tr>
<td><code>get_text_file_converter_output</code></td>
<td>Gets the text of the File Converter output object.</td>
</tr>
</tbody>
</table>
3.3 Client Class

This method is used to initialize the client object.

**init_file_converter_client**

Initializes a `FILE_CONVERTER_CLIENT` object.

**C Synopsis**

```c
FILE_CONVERTER_CLIENT init_file_converter_client
    (char *hostname, int port);
```

**Description**

This C method initializes a `FILE_CONVERTER_CLIENT` that communicates with the server and its hosts on the connections that are made to the specified port.

**Arguments**

<table>
<thead>
<tr>
<th>Arguments</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hostname</td>
<td>Specifies the client for the File Converter server.</td>
</tr>
<tr>
<td>port</td>
<td>The number of the port for the server.</td>
</tr>
</tbody>
</table>

**Return Values**

- `FILE_CONVERTER_CLIENT` object: success
- `NULL`: failure
3.4 Input Class

These methods are used for input documents.

**init_file_converter_input**

Initializes an input document.

**C Synopsis**

```c
FILE_CONVERTER_INPUT init_file_converter_input(void);
```

**Description**

This C method initializes an input object that is used to specify the input parameters for document conversion.
**free_file_converter_input**

Frees a FILE_CONVERTER_CLIENT_INPUT object.

**C Synopsis**

```c
void free_file_converter_input (FILE_CONVERTER_INPUT input);
```

**Description**

This C method frees a FILE_CONVERTER_CLIENT_INPUT object.
clear_file_converter_input

Resets a FILE_CONVERTER_CLIENT_INPUT object to empty for reuse purposes.

C Synopsis

```c
void clear_file_converter_input
   (FILE_CONVERTER_INPUT input);
```

Description

This C method resets a FILE_CONVERTER_CLIENT_INPUT object to empty for reuse purposes.

Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Specifies the FILE_CONVERTER_CLIENT_INPUT object.</td>
</tr>
</tbody>
</table>
**set_content_file_converter_input**

Sets the content to be converted.

**C Synopsis**

```c
void set_content_file_converter_input
    (FILE_CONVERTER_INPUT input,
     unsigned char *content,
     int32_t length);
```

**Description**

This C method sets the content to be converted for SAS Document Conversion.

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Specifies the File Converter input.</td>
</tr>
<tr>
<td>content</td>
<td>The opaque byte array.</td>
</tr>
<tr>
<td>length</td>
<td>The length of the byte array.</td>
</tr>
</tbody>
</table>
**set_file_name_file_converter_input**

Sets the file name.

**C Synopsis**

```c
void set_file_name_file_converter_input
    (FILE_CONVERTER_INPUT input,
     unsigned char* name);
```

**Description**

This C method sets the file name.

**Argument**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Specifies the File Converter input.</td>
</tr>
<tr>
<td>name</td>
<td>This is the name of the passed file.</td>
</tr>
</tbody>
</table>
set_mime_type_file_converter_input

Sets the mime type.

C Synopsis

```c
void set_mime_type_file_converter_input
(FILE_CONVERTER_INPUT input,
unsigned char* MimeType);
```

Description

This C method sets the mime type.

Argument

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Specifies the File Converter input.</td>
</tr>
<tr>
<td>MimeType</td>
<td>The file format that is reported by either a Web server or an e-mail client, in other words, <code>.html</code> or application.</td>
</tr>
</tbody>
</table>
3.5 Output Class

The following methods are used for output objects.

**init_file_converter_output**

Initializes a File Converter output object.

**C Synopsis**

```c
FILE_CONVERTER_OUTPUT init_file_converter_output (void);
```

**Description**

This C method initializes a File Converter output object.
free_file_converter_output

Frees a FILE_CONVERTER_OUTPUT object.

C Synopsis

void free_file_converter_output (FILE_CONVERTER_OUTPUT output);

Description

This C method frees a FILE_CONVERTER_CLIENT_OUTPUT object.
**clear_file_converter_output**

Resets a `FILE_CONVERTER_CLIENT_OUTPUT` object to empty for reuse purposes.

**C Synopsis**

```c
void clear_file_converter_output
    (FILE_CONVERTER_OUTPUT output);
```

**Description**

This C method resets a `FILE_CONVERTER_CLIENT_OUTPUT` object to empty for reuse purposes.

**Argument**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>output</td>
<td>Specifies the <code>FILE_CONVERTER_CLIENT_OUTPUT</code> object.</td>
</tr>
</tbody>
</table>
get_title_file_converter_output

Gets the title of the File Converter output object.

C Synopsis

    unsigned char* get_title_file_converter_output (FILE_CONVERTER_OUTPUT output);

Description

This C method gets the title of the File Converter output object.

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>output</td>
<td>Specifies the File Converter output object.</td>
</tr>
</tbody>
</table>

Returns

- document title: as extracted from the document
- empty string: if the document title is unavailable
get_author_file_converter_output

Gets the author of the File Converter output.

C Synopsis

```c
unsigned char* get_author_file_converter_output(FILE_CONVERTER_OUTPUT output);
```

Description

This C method gets the author of the File Converter output.

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>output</td>
<td>Specifies the File Converter output object.</td>
</tr>
</tbody>
</table>

Returns

- document author: as extracted from the document
- empty string: if the document author is unavailable
**get_text_file_converter_output**

Gets the text of the File Converter output object.

**C Synopsis**

```c
unsigned char* get_text_file_converter_output(FILE_CONVERTER_OUTPUT output);
```

**Description**

This C method gets the text of the File Converter output.

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>output</td>
<td>Specifies the File Converter output object.</td>
</tr>
</tbody>
</table>

**Returns**

- document text: as extracted from the document
- empty string: if the document text is unavailable
3.6 Sample Program

The following SAS Document Conversion sample program is for the C API:

```c
#ifdef HAVE_CONFIG_H
#include <config.h>
#endif

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <tg/tg_std.h>
#include "file_converter_client.h"

static void usage(char *program_name)
{
    fprintf(stderr, "Usage: %s --server <hostname>:<port>
        [ --mime-type <type> ] <filename>\n", program_name);
    exit(1);
}

int main(int argc, char **argv)
{
    int i;
    char hostname[256];
    int port = -1;
    unsigned char *mime_type = NULL;
    unsigned char *file_name = NULL;

    prarg(&argc, &argv);

    for (i = 1; i < argc; i++)
    {
        if (strncmp(argv[i], "--help") == 0)
```
{ 
    usage(argv[0]);
}
else if (strcmp(argv[i], "--server") == 0) 
{
    if (++i == argc) usage(argv[0]);
    if (sscanf(argv[i], "%256[^:]:%d", hostname, &port) != 2) usage(argv[0]);
}
else if (strcmp(argv[i], "--mime-type") == 0) 
{
    if (++i == argc) usage(argv[0]);
    mime_type = (unsigned char *)(argv[i]);
} 
else 
{
    file_name = (unsigned char *)(argv[i]);
}
}
if ((port < 0) || (file_name == NULL)) usage(argv[0]);
{ 
    D_STRING content = init_d_string(1024);
    FILE_CONVERTER_CLIENT client = 
        init_file_converter_client(hostname, port);
    FILE_CONVERTER_INPUT input = 
        init_file_converter_input();
    FILE_CONVERTER_OUTPUT output = 
        init_file_converter_output();

    if (load_filename_d_string_3(content, file_name))
    { 
        if (mime_type != NULL)
            set_mime_type_file_converter_input (input, mime_type);
        set_file_name_file_converter_input(input, file_name);
    }
set_content_file_converter_input(input,
    get_buff_d_string(content),
    last_c_d_string(content));

if (convert_file_converter_client(client, input,
        output) == FILE_CONVERTER_STATUS_SUCCESS)
{
    printf("Title: %s
",
            get_title_file_converter_output(output));
    printf("Author: %s
",
            get_author_file_converter_output(output));
    printf("%s
",
            get_text_file_converter_output(output));
}
else
{
    fprintf(stderr, "Error: Cannot convert
    file.\n");
}
else
{
    fprintf(stderr, "Error: Cannot load
    file.\n");
}

free_d_string(content);
free_file_converter_client(client);
free_file_converter_input(input);
free_file_converter_output(output);
}

return 0;
}
Index

C

clear_file_converter_input ........................................................................................20
clear_file_converter_output ......................................................................................26
Client class
.NET ..................................................................................................................17
client/server solution .............................................................................................3
CPU .......................................................................................................................8

F

File Converter
usage ...................................................................................................................3, 7
free_file_converter_input .......................................................................................19
free_file_converter_output .......................................................................................25

G

get_author_file_converter_output ............................................................................28
get_text_file_converter_output ............................................................................29
get_title_file_converter_output ............................................................................27

I

init_file_converter_client ........................................................................................17
init_file_converter_input .......................................................................................18
init_file_converter_output ......................................................................................24
Input class
.NET ..................................................................................................................18
installer ...............................................................................................................7

M

MimeType
defined .............................................................................................................23
operating systems
  supported ............................................................................................................. 8
Output class
  .NET .................................................................................................................. 24

sample program
  C ........................................................................................................................ 30
  set_content_file_converter_input ................................................................. 21
  set_file_name_file_converter_input ............................................................... 22
  set_mime_type_file_converter_input .............................................................. 23
system configuration
  specified .............................................................................................................. 8

TCP port ................................................................................................................... 12
third-party software .................................................................................................. 3
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- If you have comments about the software, please send them to suggest@sas.com.