StreamServe Persuasion SP5 Code pages and Unicode support

User Guide

Rev A

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About code pages and Unicode support

The Unicode standard provides a code point for every character in modern use worldwide. It enables plain text data to be transported through different platforms, systems, and programs without corruption. Unicode standardizes three encoding forms and seven encoding schemes:

Encoding forms

- UTF-8
- UTF-16
- UTF-32

Mapping from a character set definition to the actual code units used to represent the data.

Encoding schemes

- UTF-8
- UTF-16BE
- UTF-16LE
- UTF-16
- UTF-32
- UTF-32BE
- UTF-32LE

Encoding form plus byte serialization, and possible use of Byte Order Mark (BOM).

A code page is a coded character set, in which each character is assigned a unique code within the Unicode code space. Code pages usually cover only a small subset of the Unicode characters.

For more information about the Unicode standard, see http://www.unicode.org.

Code pages and Unicode support in StreamServe

The StreamServer and the StreamServe tools support Unicode version 2.1, in the following encoding schemes:

- UTF-8 (with and without BOM)
- UTF-16
- UTF-16BE
- UTF-16LE

In Unicode version 2.1, the support is restricted to characters in the Basic Multilingual Plane (BMP) for all Unicode encoding schemes. UTF-16 in the BMP is referred to as UCS-2 in the StreamServe tools.

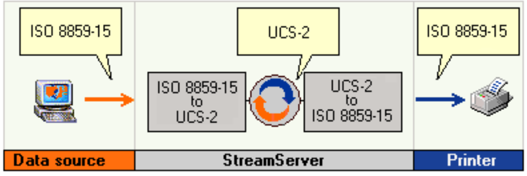
How the StreamServer handles character encoding

Internally, the StreamServer handles all data in the UCS-2 encoding form. This means that the input data must be converted to UCS-2 before the StreamServer starts processing the data. When the StreamServer has finished processing the data, the output is encoded using the appropriate code page.

In order to convert the input to UCS-2, without corrupting the input data, the StreamServer must know which code page is used to encode the input data. You must specify this when you configure your Project. You must also specify which code page to use to encode the output data.

Example 1 *ISO 8859-15 encoded input and output.*

In this example, input data is ISO 8859-15 encoded. The StreamServer converts the input data to UCS-2, processes the data, and uses ISO 8859-15 to encode the output data before sending it to the printer.



Preparing the workstation environment

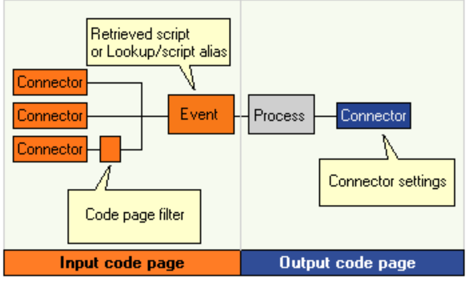
Before you configure your Projects in the Design Center you may have to prepare your workstation environment with respect to the fonts and code pages to be used, and to the language version of your operating system.

Whenever possible you should use the appropriate language version of the operating system. For example, always try to configure a Greek Project on a Greek operating system.

You must make sure all required fonts are available, as well as complex script support (e.g. for Arabic or Hebrew) if needed. Consult the Microsoft® Windows® documentation or your System Administrator for information on how to do this.

Specifying code pages for input and output data

Code pages for the input can be specified as filters in filter chains that you add to the input connector. A code page can also be specified for the Event, either by using the scripting function *ConvCurrMsgToUC* in a retrieved script, or by using lookup tables or script aliases. Code pages for the output are specified in the output connector configuration (Platform).



See *Specifying code pages for input data* on page 13 and *Specifying code pages for output data* on page 21.

If you do not specify a code page for the input data, the StreamServer may fail to process the data correctly. However, if input data conforms to ISO 8859-1 (Latin 1) you do not have to specify a code page for the input. Similarly, if both the input and output data conforms to ISO 8859-1 you do not have to specify a code page for the output.

Bidirectional text

Plain text data that contains Arabic or Hebrew text in logical order is treated the same way as data that contains unidirectional left-to-right text. Arabic/Hebrew text in visual order must be reordered to logical order before the StreamServer processes the text. Output from the StreamServer can also be reordered from logical to visual order if required (e.g. Arabic text in PDF output). See *Bidirectional text* on page 27.

Export files from the Design Center

All configuration files included in the export from the Design Center are UTF-8 encoded.

Table files and function files

All table files and function files must be UTF-8 encoded. See *Specifying code pages for table files* on page 23 and *Specifying code pages for function files* on page 24.

Log files

If you want the StreamServer log to display “non-Latin 1” characters you can use the startup arguments `-logfilecp` and `-logcp`. See *Specifying code pages for the log* on page 25.

ODBC scripting functions

The following ODBC scripting functions can be used to specify code pages when retrieving input from an ODBC data source:

- *OdbcSetCodepage*
- *OdbcConnectW*

See the *Scripting reference* for information.

Specifying a default code page for the Design Center

You can specify a default code page for the Design Center. This code page will be the default code page for all Projects you create. For each Project you can override the Design Center default code page, and specify a new default code page for the Project. When you create a code page filter for an input connector, or a code page for an output connector, the Project’s default code page is selected by default.

To specify a default code page for the Design Center

1. In the Design Center, select **Tools** > **Design Center Settings**. The Design Center Settings dialog box opens.
2. From the **Default code page** drop-down list, select the appropriate code page.

To specify a default code page for a Project

1. Open the Project in the Design Center.
2. In the Project browser, right-click the top node and select **Settings**. The Project Settings dialog box opens.
3. From the **Default code page** drop-down list, select the appropriate code page.

Known limitations

The StreamServe Unicode support has some limitations:

- Unicode encoded text in overlays, created in the StreamServe Overlay Editor, is not supported.
- The StreamServe MailOUT Process does not support Unicode. Instead, you must use an SMTP (MIME) output connector and the appropriate Process.
- Do not use characters outside the ASCII range in executable scripts or for variables.
- The Lotus Notes Fetch Wizard does not support Unicode, only ASCII.

Code pages supported by the StreamServer

Name	Description
BIG5	Traditional Chinese, Taiwan
CNS 11643	Traditional Chinese, Taiwan
cp437_DOSLatinUS	Microsoft DOS US
cp737_DOSGreek	Microsoft DOS Greek
cp775_DOSBaltRim	Microsoft DOS Baltic Rim
cp850_DOSLatin1	Microsoft DOS Latin1 (Western Europe)
cp852_DOSLatin2	Microsoft DOS Latin2 (Eastern Europe)
cp855_DOSCyrillic	Microsoft DOS Cyrillic (Russia)
cp857_DOSTurkish	Microsoft DOS Turkish
cp860_DOSPortuguese	Microsoft DOS Portuguese
cp861_DOSIcelandic	Microsoft DOS Icelandic
cp862_DOSHebrew	Microsoft DOS Hebrew (Israel)
cp863_DOSCanadaF	Microsoft DOS CanadaF (Canada French)
cp864_DOSArabic	Microsoft DOS Arabic
cp865_DOSNordic	Microsoft DOS Nordic
cp866_DOSCyrillicRussian	Microsoft DOS Cyrillic (Russia)
cp874_DOSThai	Microsoft DOS Thai
cp932_ShiftJIS	Microsoft ShiftJIS (Japanese industrial standard)

Name	Description
cp936_GBK	Microsoft GBK (Simplified Chinese)
cp949_UnifiedHangul	Microsoft Unified Hangul (Korea)
cp950_Big5	Microsoft Big5 (Traditional Chinese, Taiwan)
cp950_Big5_HKSCS-2001	Microsoft Big5 (Hong Kong Supplementary Character Set)
cp1250_WinLatin2	Microsoft Windows Latin2 (Eastern Europe)
cp1251_WinCyrillic	Microsoft Windows Cyrillic (Russia)
cp1252_WinLatin1	Microsoft Windows Latin1 (Western Europe & USA)
cp1253_WinGreek	Microsoft Windows Greek
cp1254_WinTurkish	Microsoft Windows Turkish
cp1255_WinHebrew	Microsoft Windows Hebrew (Israel)
cp1256_WinArabic	Microsoft Windows Arabic
cp1257_WinBaltic	Microsoft Windows Baltic
cp1258_WinVietnamese	Microsoft Windows Vietnamese
GB2312-80	Simplified Chinese
IBM CP 37	Common Europe EBCDIC
IBM CP 256	IBM Netherlands EBCDIC
IBM CP 273	Austria/Germany EBCDIC
IBM CP 277	Denmark/Norway EBCDIC
IBM CP 278	Finland/Sweden EBCDIC
IBM CP 280	Italian EBCDIC
IBM CP 284	Spanish EBCDIC
IBM CP 285	UK EBCDIC
IBM CP 297	French EBCDIC
IBM CP 423	Greek EBCDIC
IBM CP 424	Hebrew EBCDIC
IBM CP 500	International EBCDIC
IBM CP 852	Latin 2 PC-DATA
IBM CP 870	Latin-2 EBCDIC

Name	**Description**
IBM CP 875	Greek EBCDIC
IBM CP 1026	IBM Turkey Latin-5
IBM CP 1140	US-Canada-Euro EBCDIC
IBM CP 1141	Germany-Euro EBCDIC
IBM CP 1142	Denmark-Norway-Euro EBCDIC
IBM CP 1143	Finland-Sweden-Euro EBCDIC
IBM CP 1144	Italy-Euro EBCDIC
IBM CP 1145	Spain-Euro EBCDIC
IBM CP 1146	UK-Euro EBCDIC
IBM CP 1147	France-Euro EBCDIC
IBM CP 1149	Icelandic-Euro EBCDIC
ISO 8859-1	Western Europe
ISO 8859-2	Eastern Europe
ISO 8859-3	Southern Europe, Malta
ISO 8859-4	Northern Europe, Baltic countries, Greenland
ISO 8859-5	Cyrillic (Russia)
ISO 8859-6	Arabic
ISO 8859-7	Greek
ISO 8859-8	Hebrew
ISO 8859-9	Turkish
ISO 8859-10	Nordic
ISO 8859-13	Baltic Rim
ISO 8859-14	Celtic languages
ISO 8859-15	ISO 8859-1 + Euro sign and extra characters for France/Finland
JIS 0212	Japanese Industrial standard
Roman-8	HP-Roman8
Shift-JIS	Japanese Industrial standard
Unified Hangeul KSC5601-87	Korean DBCS

Name	Description
Unified Hangeul KSC5601-92	Korean DBCS
Unified Hangeul KSX1001	Korean DBCS
Unicode (UCS-2)	Unicode encoding schemes UTF-16, UTF-16BE, UTF-16LE (restricted to the BMP)
UTF8	Unicode encoding scheme(s) UTF-8, with or without BOM (restricted to the BMP)

Specifying code pages for input data

You must specify which code page the source application uses to encode the input to the StreamServer. First, you identify the code page used for encoding the input (see *Identifying the code page used to encode input data* on page 14), then you select this code page when you configure the code page settings for the input in the Design Center. Where possible, use a Unicode encoding scheme for the input data.

Code pages applied per input connector

If the same code page is used for all input data received by an input connector, you can specify a code page for the input connector. See *Specifying code pages per input connector* on page 15.

Code pages applied per input type

If the input connector receives different types of input, and if the input types are encoded using different code pages, you can specify one code page per input type. See *Specifying code pages per input type* on page 17.

Retrieved script or lookup/script alias on the Event

You can use a retrieved script, or lookup/script aliases to dynamically select which code page to use for the input to an Event. See *Dynamically selecting code pages for the input to an Event* on page 19.

Identifying the code page used to encode input data

Information about the code page used to encode the input data is often available from the data source documentation or from the System Administrator.

You can also open a sample input data file in StreamServe UTF Edit to identify the code page used.

To use UTF Edit to identify the code page

1. In UTF Edit, select **Edit** > **Set Font**.
2. From the **Fonts** drop-down list, select a font that supports a wide range of code pages (e.g. Arial) and click **OK**.
3. Open the sample input data file.
4. Select **Edit** > **Code Page** and select a code page that displays all characters correctly in UTF Edit.

If you cannot find the accurate code page, repeat the procedure with another font. If you still cannot find the accurate code page, you must install a more suitable font.

Specifying code pages per input connector

If the same code page is used for all input data received via an input connector, you can specify the code page when you configure the input connector in the Platform.

To specify the code page

1. Create a filter chain, or use an existing filter chain.
2. Open the filter chain.
3. In the filter chain editor, right-click the flow bar and select **Add Filter** > **Codepage Filter**. A new code page filter is added to the flow bar.
4. From the **Code page** drop-down list, select the appropriate code page.
5. Save the filter chain and close the filter chain editor.
6. Activate the generic layer in the Platform view.
7. In the Platform view, double-click the input connector. The Input Connector Settings dialog box opens.
8. Click the **Filter Chain** icon and browse to and select the filter chain that contains the code page filter.

To specify the byte order for UCS-2 encoded data

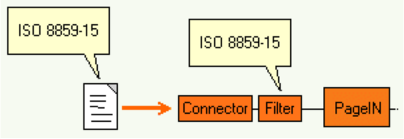
For the UTF-16 encoding schemes, each character code unit is represented by two bytes. When you select UCS-2 as code page, you must also specify how the bytes are ordered for each code unit – most significant byte first or last.

From the **Byte order** drop-down list, select the appropriate option.

Option	When to select
Most significant byte first (Big Endian)	When the input is encoded using the encoding schemes UTF-16BE (big endian without byte order mark) or UTF-16 (big endian with or without byte order mark)
Most significant byte last (Little Endian)	When the input is encoded using the encoding schemes UTF-16LE (little endian without byte order mark) or UTF-16 (little endian with byte order mark.

Example 2 *Code page filter connected to the input connector (Platform).*

In this example, input data received via the input connector is ISO 8859-15 encoded. A code page filter with the code page ISO 8859-15 is connected to the input connector.



Specifying code pages per input type

If an input connector receives different types of input (XML, page formatted, etc.), and if the input types are encoded using different code pages, you can specify one code page per input type. See the *Design Center* documentation for information about filter chains per input type.

To specify the code pages

1 Create a filter chain, or use an existing filter chain.

2 Open the filter chain.

3 In the filter chain editor, right-click the flow bar and select **Add Filter** > **Codepage Filter**. A new code page filter is added to the flow bar.

4 From the **Code page** drop-down list, select the appropriate code page.

5 Save the filter chain and close the filter chain editor.

6 Repeat steps *1* through *5* for each input type and code page.

7 In the Project browser, right-click the Project node and select **Project Export Settings**. The Project Export Settings dialog opens.

8 Select the **InputAnalyzer** tab.

9 In the **Available connectors** list, select the connector.

10 For each input type in the **Input Analyzer settings** list, click the **Select a Filter Chain** icon and browse to and select the filter chain that contains the code page filter for the input type.

Note: If you connect a code page filter to the connector in both the Platform and in the Project Export Settings dialog, the StreamServer will not start.

To specify the byte order for UCS-2 encoded data

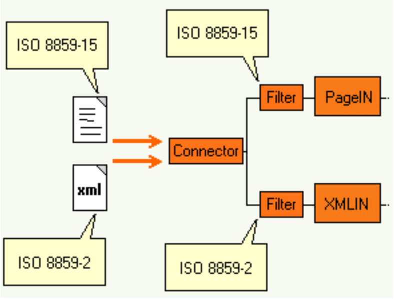
For the UTF-16 encoding schemes, each character code unit is represented by two bytes. When you select UCS-2 as code page, you must also specify how the bytes are ordered for each code unit – most significant byte first or last.

From the **Byte order** drop-down list, select the appropriate option.

Option	When to select
Most significant byte first (Big Endian)	When the input is encoded using the encoding schemes UTF-16BE (big endian without byte order mark) or UTF-16 (big endian with or without byte order mark)
Most significant byte last (Little Endian)	When the input is encoded using the encoding schemes UTF-16LE (little endian without byte order mark) or UTF-16 (little endian with byte order mark).

Example 3 *Code page filters in the Runtime configuration.*

In this example the input connector receives ISO 8859-15 encoded page formatted data, and ISO 8859-2 encoded XML formatted data. A code page filter with the code page ISO 8859-15 is connected to the PageIN branch, and a code page filter with the code page ISO 8859-2 is connected to the XMLIN branch.



Dynamically selecting code pages for the input to an Event

You can use lookup/script aliases or retrieved scripts to dynamically select the appropriate code page for the input to an Event.

Prerequisites

- The input data must be represented by single-byte characters.
- No code page filter is added to the input connector that receives the input data.

To select code pages using a retrieved script

Add a retrieved script that includes the *ConvCurrMsgToUC* scripting function to the Event. See the *Scripting reference* for information.

To select code pages using lookup/script aliases

1. In the Runtime configuration view, right-click the Event and select **Settings**. The Runtime Event Settings dialog box opens.
2. On the Code Page tab, select **Lookup** or **Variable** and specify the alias settings. See the *Design Center* documentation for information about alias selection methods.

Lookup table syntax

```
<key value>    <code page>
```

Comments:

- Use TAB to separate `<key value>` and `<code page>`.
- Use quotation marks if `<key value>` contains white spaces.
- `<code page>` must be a name listed in *Code pages supported by the StreamServer* on page 9.

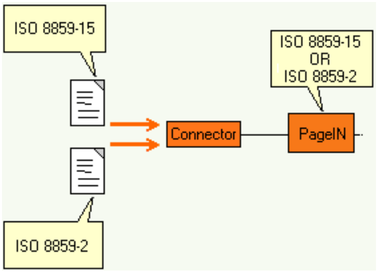
Example 4 *Lookup table*

```
"Western Europe"   ISO 8859-1
"Eastern Europe"   ISO 8859-2
Turkish            ISO 8859-9
```

Example 5 *Code page selection using a lookup table.*

In this example the PageIN Event receives both ISO 8859-15 and ISO 8859-2 encoded input. The following lookup table is used to dynamically select the appropriate code page:

```
Western    ISO 8859-15
Eastern    ISO 8859-2
```



Specifying code pages for output data

The output can inherit the code page specified for the input, or you can specify a new code page for the output. The code page you specify must be supported by the output device (e.g. a printer).

To specify a code page for the output

1. Activate the generic layer in the Platform view.
2. In the Platform view, double-click the output connector. The Output Connector Settings dialog box opens.
3. Click the **Code page** icon and select **Inherit code page** or select the appropriate code page from the **Code page** drop-down list.

Option	When to select
Inherit code page	If you want to use the same code page for both input and output
Select a code page	If you want to select a different code page for the output. This code page must cover at a minimum all the characters covered in the code page for the input.

Dynamically selecting code pages for the output

You cannot apply scripting or aliases to the output in order to dynamically select code pages. However, if you specify dynamic selection of code pages for the input, and select **Inherit code page** for the output, the code pages for the output will be dynamically selected as well.

To specify the byte order for UCS-2 encoded data

For the UTF-16 encoding schemes, each character code unit is represented by two bytes. When you select UCS-2 as code page, you must also specify how the bytes are ordered for each code unit – most significant byte first or last.

From the **Byte order** drop-down list, select **Most significant byte last (Little Endian)** or **Most significant byte first (Big Endian)**. The byte order to select depends on the application that receives the output.

To add a byte order mark to UTF-8 and UCS-2 encoded data

Select **Add byte order mark** if you want to add a byte order mark at the beginning of a UCS-2 (UTF-16) or UTF-8 encoded output file.

The application that receives the output can use this byte order mark to automatically determine the encoding (UTF-8 or UTF-16 encoding scheme) and the byte order used for the data in the UTF-16 encoding scheme.

Specifying code pages for support files and logs

This section describes how to specify code pages for support files and logs.

- *Specifying code pages for table files* on page 23
- *Specifying code pages for function files* on page 24
- *Specifying code pages for the log* on page 25

Specifying code pages for table files

All table files used in the Design Center must be UTF-8 encoded. In order to make the StreamServer interpret the table file as UTF-8 encoded, the file must begin with the following text string:

```
//!codePage UTF8!
```

Example 6 *UTF-8 encoded table file.*

```
//!codePage UTF8!
ENG    Printer_1
SWE    Printer_2
```

Table files created from within a resource set

If you create a new table file from within a resource set, the encoding is automatically set to UTF-8. When you open the table file in the resource editor, the code page information string `//!codePage UTF8!` is added by default.

Table files created using external text editors

You can create a table file using an external text editor, and then import the table file to a resource set. Before you import the file you must:

- enter `//!codePage UTF8!` as the first line of text
- save the file UTF-8 encoded.

Table files in upgraded Projects

If you are upgrading Projects prior to 4.1 you must modify the table files. Before you upgrade you must:

- enter `//!codePage UTF8!` as the first line of text
- save the file UTF-8 encoded.

Specifying code pages for function files

All function files used in the Design Center must be UTF-8 encoded. In order to make the StreamServer interpret the function file as UTF-8 encoded, the file must begin with the following text string:

```
CodePage UTF8
```

Example 7 *UTF-8 encoded function file.*

```
CodePage UTF8
func timetotal()
...
```

Function files created from within a resource set

If you create a new function file from within a resource set, the encoding is automatically set to UTF-8. When you open the function file in the resource editor, the code page information string `CodePage UTF8` is added by default.

Function files created using external text editors

You can create a function file using an external text editor, and then import the function file to a resource set. Before you import the file you must:

- enter `CodePage UTF8` as the first line of text
- save the file UTF-8 encoded.

Function files in upgraded Projects

If you are upgrading Projects prior to 4.1 you must modify the function files. Before you upgrade you must:

- enter `CodePage UTF8` as the first line of text
- save the file UTF-8 encoded.

Specifying code pages for the log

If the characters displayed in the StreamServer log conform to Latin 1 you do not have to specify a code page for the log. If you want the log to display other characters, you can use the startup arguments `-logfilecp` and `-logcp`. See the *Startup argument* reference.

StreamServer run from the Control Center

If you run the StreamServer from the Control Center, you can use the startup argument `-logfilecp` to specify a code page for the log file.

StreamServer run from the command line

If you run the StreamServer from command line, you can use the startup argument `-logcp` to specify a code page for the log.

Bidirectional text

Bidirectional text consists of mainly right-to-left text with left-to-right nested segments, or vice versa. In languages involving bidirectional text (the StreamServer supports Arabic and Hebrew), the general text flow proceeds horizontally from right to left, but numbers are written from left to right. In addition, embedded addresses, acronyms, and quotations in a left-to-right language are also written from left to right.

Logical and visual order

Bidirectional text can be visually or logically ordered:

- **Logical order** – the characters are ordered in the same way that they have been keyed. In this case, it does not matter if the text is Arabic, Hebrew, or Latin – direction has no meaning.
- **Visual order** – the characters are ordered as they are displayed on a screen, printed page, or other medium.

Visually ordered input must be reordered to logical order before the StreamServer processes the text. See *Reordering visually ordered input* on page 28. Output from the StreamServer can be reordered to visual order if required. See *Reordering output to visual order* on page 29.

Reordering visually ordered input

Visually ordered input must be reordered to logical order before the StreamServer processes the text. You can reorder the input for the following Events:

- **PageIN** – reordering is applied per line. See *Reordering page formatted input* on page 28.
- **StreamIN** – reordering is applied per field. See *Reordering field and record based input* on page 28.

Input to all other Events must be logically ordered.

Reordering page formatted input

You can enable reordering of the input when you configure the code page settings for the input. See *Specifying code pages for input data* on page 13.

To reorder the input using a code page filter

From the **Input order** drop-down list, select **Visual order (Arabic and Hebrew only)**.

To reorder the input using aliases (Runtime Event settings)

From the **Input order** drop-down list, select **Visual order (Arabic and Hebrew only)**.

To reorder the input using a retrieved script

In `ConvCurrMsgToUC(`*`codepage`*`,`*`visual_order`*`)`, set *`visual_order`* to 1. For example:

```
ConvCurrMsgToUC("UTF8",1);
```

Reordering field and record based input

You can enable reordering of the input when you configure the input connector.

To reorder the input

Enter the `ReorderRTLField` keyword to the input connector. See *Using custom commands and keywords* in the *Design Center* documentation for information on how to add custom commands and keywords to a connector.

Note: You must not enable reordering using code page filters, aliases, or retrieved script for input received via this connector if you use this keyword.

Reordering output to visual order

The StreamServer processes text in logical order. If required, the output can be reordered to visual order. You can reorder the output from the following Processes:

- **PageOUT** – reordering is applied per paragraph. See *Reordering page formatted output* on page 29.
- **StreamOUT** – reordering is applied per field. See *Reordering record based output* on page 30.

Reordering page formatted output

Page formatted bidirectional text displayed on the screen or as printed output is normally displayed in visual order. Some output devices reorder the text automatically, which means the output from the StreamServer must be in logical order when it is sent to such a device. The table below shows how to order the output from the StreamServer when using different types of drivers.

Driver	Output from the StreamServer
PCL drivers	Visual order.
Postscript drivers	Visual order.
GIF, BMP, etc.	Visual order.
RTF	Logical order.
PDF	Visual order.
Windows driver	Logical order.

Visually ordered page formatted Arabic text is in addition shaped – the glyphs for the letters are cursively joined, lam-alif ligatures are formed, and mirror characters (e.g. parentheses and brackets) are mirrored. Contextual shaping must therefore be performed on the text in order to create the correct sequences of glyphs. Shaping is automatically performed if you enable reordering of page formatted output. This functionality is restricted to be without vowel marks.

Note: Visually ordered Arabic PCL output must be UTF-8 encoded.

To reorder the output per output connector

1. Activate the generic layer in the Platform view.
2. In the Platform view, double-click the output connector. The Output Connector Settings dialog box opens.
3. Click the **Code page** icon and select **Reorder BiDi output in visual order**.

To reorder the output from mirrored PageOUT layouts

If you mirror PageOUT output, reordering is enabled automatically. See the *PageOUT* documentation for information on how to mirror page layouts.

Reordering record based output

Record based output should normally be in logical order. If required, the order of the output can be changed to visual order.

To reorder the output

1. Activate the generic layer in the Platform view.
2. In the Platform view, double-click the output connector. The Output Connector Settings dialog box opens.
3. Click the **Code page** icon and select **Reorder BiDi output in visual order**.