opentext™

OpenText™ Exstream™

Installation and Upgrade Information

Design and Production Documentation

Release 16.6.0

OpenText™ Exstream
Installation and Upgrade Information
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This documentation has been created for software version 16.6.0.

It is also valid for subsequent software versions as long as no new document version is shipped with the product or is published at https://knowledge.opentext.com.

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2 Installing Exstream software and documentation

Design and Production software is available as part of the Exstream platform.

You must use the common installers to install the Design and Production platform on the Windows and Linux platforms. The common installers are available on My Support at http://support.opentext.com. The other applications that are available in the Exstream platform are also installed using these installers.

This section provides supplemental information for installing the Design and Production environment. For information about using the common installers to install the Exstream platform on Windows and Linux platforms, see *OpenText Exstream: Installation Guide* on My Support at http://support.opentext.com.

Exstream user documentation is available from within the software as well as on My Support at https://knowledge.opentext.com/go/ExstreamDocumentation. The online documentation that can be accessed from the software is hosted on the OpenText Global Help Server and provides users with live access to the latest version of the documentation. In the Design Manager and Designer, you can access the documentation by pressing `F1`, or selecting **Help > Search Documentation**, which opens the online documentation in a browser. The HTML and PDF versions of the documentation are also available on My Support.

You can also deploy an OpenText Private Help Server instance to provide local access to downloaded documentation. The Private Help Server lets users access the online documentation within their private corporate network. After you set up the server, you can then redirect help requests from Exstream Design and Production software to the Private Help Server instance rather than the Global Help Server. For information about setting up the Private Help Server, see *System Administration* in the Exstream Design and Production documentation.

This section includes the following information:

2 Installing the Design Environment

The Design and Production design environment is used to design and set up customer communications in the form of Design and Production applications. The design environment is connected to the shared service layer in the platform and Design and Production users can interact with other platform components using these shared services.

After you install your design environment, make sure you also download and install the appropriate Exstream engine for your production environment. If you are upgrading to Exstream 16.6.0 from an earlier version of Exstream, see "Upgrading Design and Production" on page 33.

2.1 Installing Design and Production

You can install and use only Design and Production as your design environment or use it as part of the integrated Exstream platform. If you want to use the integrated platform features, you must install the complete Exstream platform using the Runtime and Design Tools common installers. For information about the common installers and silent installation options for all Exstream components, see *OpenText Exstream: Installation Guide*.

2.1.1 System requirements

Make sure your system meets the following minimum requirements:

Note: The following table lists the system requirements for installing and using Design and Production. For any specific requirements for additional Exstream components in your design environment, see the related installation information for that component.

System requirements

Platform	Supported operating systems	Required hardware and software
Windows	**Note:** The Exstream design environment version 16.2.0 and later requires a 64-bit operating system. • Microsoft Windows 7 • Microsoft Windows 8 • Microsoft Windows 8.1 • Microsoft Windows 10 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2016	• Minimum screen resolution of 1366x768 Add-ins work best with monitors that are set to a resolution of 1920 x 1080. • 4GB RAM (minimum 2GB) • 10GB free disk space (minimum 800MB) You must have enough disk space to handle all production files you use in design and test applications. The actual space needed depends on the size of the files used. • Java Runtime Environment (JRE) version 1.4.2 or later For more information about JRE, see the Oracle Technology Network website. • Microsoft Visual C++ 2017 Redistributable Package. • Microsoft .NET Framework version 4.6.1 or later

2.1.2 Installation options for Design and Production

To install only Design and Production, download and run the Design Tools installer (`exstream-design-<version>-win.zip`), and select the **Design Manager** option in the installation wizard to install Design Manager, Designer, and Logic Designer.

Required Exstream platform components

If you are using Design and Production in the Exstream platform, you must also install and configure the following components:

Installer	Component	Description
Runtime	• Communications Server • Web Applications	Communications Server must be installed on the same system as the Exstream production engine in order to use the production engine and delivery orchestration features. The management gateway is installed as part of Exstream framework installed alongside the Communications Server component. The management gateway is required to connect to the common asset service (CAS). The Web Applications component includes the following applications: • CAS Browser • Control • Communications Orchestrator • ReTouch • StoryBoard • Supervisor • Workshop
Design Tools	• Communications Builder • Control Center • Design Manager	Communications Builder is required to use the production engine and output delivery orchestration features in the Exstream platform. You can use Communications Builder to set up the communication workflows for engine orchestration using the Exstream engine plugin. Control Center is required to run and administer Communications Server applications that are deployed from Communications Builder projects. The Design Manager component installs Design and Production on your system.

Post-installation steps

After you install Design and Production, you must perform the following steps in Design Manager to complete the installation:

1. In the Design and Production installation directory, double-click `DesignManager.exe` to open Design Manager.
2. From the **Select a Database** dialog box, select a design database, and click **OK**.
3. On the User Login screen, enter your design user name in the **User** box and your password in the **Password** box, and click **OK**.

   If it is the first time you have opened the database, or if the key has expired, you receive a message and you must enter a new license key to use the software.
4. In the **Enter a New License Key** dialog box, browse to the Design and Production license key (`*.ekf` file) provided to you to enable modules that you have licensed. Depending on your licensing agreement, you might also be required to select a license file before you can use the software.

   For information about Design and Production keys and licenses, see *System Administration* in the Exstream Design and Production documentation.

Depending on your Exstream implementation, you might need to install additional Exstream design environment components that are not included in the common installer. Use the installation packages that are available separately from My Support at http://support.opentext.com to do the following:

- Install add-ins to extend your design capabilities in Designer.
- Install the Exstream web application to use Communications Designer and Exstream Content Author. To use these web applications, you must also install and configure the Exstream platform services and Communications Server.
- Install Exstream Live to create interactive documents from Design and Production applications.
- Install Exstream Empower to add browser-based interactive editing functionality for personalizing communications. For information about installing Empower, see *Installing or Upgrading Exstream Empower*.

2.2 Installing and configuring Exstream web applications

The `exstream-<version>.zip` file is available from My Support at http://support.opentext.com, and it gives you access to the following web applications:

- Communications Designer—Provides an intuitive web-based design environment for designers to create communications that can leverage resources that are set up in Design Manager—such as fonts, styles, data files, variables, and output queues. You can then fulfill the resulting personalized customer communications using the engine orchestration features in Communications Server.
- Content Author—Lets business users add content to Design and Production designs by creating and modifying communications based on Design and Production applications that have been uploaded to CAS. When you publish the modified communication, the content is included in the next engine run without requiring you to re-package your application.

For information about using the Exstream web applications, see *Using Exstream Web Applications* in the Exstream Design and Production documentation.

Important: You must license the Exstream web applications separately from other components in the Exstream platform. For information about licensing Communications Designer and Content Author in your environment, contact your Exstream account manager or a sales representative.

Before you can use the web applications, you must also configure the platform connection settings for Design and Production.

For more information, see *System Administration* in the Exstream Design and Production documentation.

2.2.1 System requirements

Make sure your system meets the following minimum requirements:

System requirements

Supported operating systems	Required software

• Windows
• Linux
	• Exstream platform
	For information about the system requirements for the Exstream platform, see the *Exstream Release Notes*.
	• One of the following:
	  • Apache Tomcat application server
	  • Apache Web Server
	  • NGINX application server
	• At least one of the following web browsers:
	  • Google Chrome, latest stable release
	  • Mozilla Firefox, latest stable release
	  • Microsoft Internet Explorer version 11
	  • Microsoft Edge

2.2.2 Deploying the Exstream web applications

The Communications Designer and Content Author web applications are contained in the `exstream-<version>.zip` file, which is available from My Support at http://support.opentext.com.

To deploy the Exstream web applications:

1. Rename the `exstream-<version>.zip` file to `exstream.zip`.
2. Extract the contents of the ZIP file into the web applications root directory on your server. Depending on the server that you are using, the web application root directory will vary:

Server type	Web application root directory
Apache Tomcat	`<Tomcat>\webapps\ROOT`

Server type	Web application root directory
Apache Web Server	`<Apache>\htdocs`
NGINX	`<ManagementGateway>\<version>\root\revproxy\html`

After you extract the contents of the ZIP file, you will see a directory named `exstream` that contains all of the files that are necessary to run the Exstream web applications.

3. Locate the `cc-webapp-config.xml` configuration file. Depending on the server that you are using, the location of the directory where the file is located will vary:

Server type	Configuration file directory
Apache Tomcat	`<Tomcat>\webapps\ROOT\config`
Apache Web Server	`<Apache>\htdocs\config`
NGINX	`<Tomcat>\webapps\ROOT\config`

If the configuration file is not present, use the `cc-webapp-config.xml` template to create the file. The template is located in the `<Exstream>\<version>\Server\solutions\management\web` directory.

4. Make sure that the `cc-webapp-config.xml` file contains the following line to specify the management gateway URL:

```
<mgw-url>https://<host>:<port>/management/rest/v1/servicegateways</mgw-url>
```

where

- `host` is the fully qualified domain name (FQDN), host name, or IP address of the management gateway server. Open Text recommends that you use the FQDN to specify the host, and that you do not use `localhost`.
- `port` is the management gateway port

Important: If you are using NGINX as reverse proxy, OpenText recommends that you use the proxy host and port to specify the management gateway URL. For more information about configuring reverse proxy settings for Exstream, see the *OpenText Exstream: Communications Server Administration Guide*.

You can use additional `mgw-url` lines to specify multiple management gateway URLs. When several management gateways are configured, the service gateway calls them in the order in which they are specified in this connection properties file. For example, if the first management gateway is called, and that call fails, then the next management gateway is called.

For information about using the Exstream web applications, see *Using Exstream Web Applications* in the Exstream Design and Production documentation.

2.2.3 Disabling cascading approvals

Cascading approvals are not supported for Communications Designer and Content Author. To make sure that the approval workflow for your communications works correctly, you must disable cascading approvals on the management gateway.

To disable cascading approvals:

1. In Control Center, stop the service gateway.
2. In Windows Service Control Manager, stop the StreamServe Management Gateway service.
3. Edit the `mgmgateway.xml` file to change the cascading approvals setting to `<cascadeapprovestate defaultEnabled="false">`. The file is located in the `C:\Program Files\OpenText\Exstream\<version>\Server\solutions\management` directory.
4. In Windows Service Control Manager, start the StreamServe Management Gateway service.
5. In Control Center, restart the service gateway.

Important: Before you can fulfill your Communications Designer or Content Author communications, you must make sure that all of the resources associated with the communications are approved. Because you have to disable cascading approvals, you might have to use Workshop to manually approve any resources—such as images—that are not approved using the approval workflow in the Communications Designer or Content Author interface.

For information about approving content in Workshop, see *Using Exstream Web Applications* in the Exstream Design and Production documentation.

2.3 Enabling audit logging

If you want workflow history to be available for communications in Communications Designer and Content Author, you must enable audit logging for your Exstream environment. Additionally, you must configure Control Center to allow your database to store the service gateway audit logs.

Note: This documentation describes the basic procedure for enabling audit logging for the web applications. For additional information about audit logging, see the *OpenText Exstream: Communications Server Administration Guide*.

To enable audit logging for your Exstream environment, and database logging for the service gateway:

1. Open the `sgw-securitymanager.xml` file, located in the `<ManagementGateway_home>\<version>\root\applications\ServiceGateway\wd` directory.
2. Search for `Auditlog`.
3. On the line below `<!-- Auditlog service -->`, delete `<!--`.
4. On the line below `</service>`, delete `-->`.
5. In Control Center, right-click the service gateway node, and then click **Log Configuration**.
6. In the **Log Configuration** dialog box, expand the **Database** provider node, and then set the value for the **Enabled** field to **Yes**.
7. Click **OK**.
8. Restart the service gateway.

The audit logs are stored in a file called `audittrail.log` that is located in the `<ManagementGateway_home>\<version>\root\applications\ServiceGateway\wd` directory.

2.4 Configuring online help

The online help that is available from within the Exstream web applications is hosted on the OpenText Global Help Server. However, if you have end users who are not able to access websites outside your corporate firewall, you can use the OpenText Private Help Server to host the online help on a server on your company intranet.

For information about deploying a Private Help Server, see *System Administration* in the Exstream Design and Production documentation.

After you have set up a Private Help Server, you must update the configuration file in the web application installation directory to redirect help requests from Communications Designer and Content Author.

To update the help configuration file:

1. Verify that the following items are present in the help directory:

Software product	Help directory	Required items
Communications Designer	`<helpRoot>\help\ex-cdr\<version>\<language>`	• `designer` folder • `context.properties` file
Content Author	`<helpRoot>\help\ex-bca\<version>\<language>`	• `editor` folder • `context.properties` file

2. Stop the web server running your instance of the Exstream platform.
3. In your `<appServer>\webapps\exstream\configurations\` directory, open the `config.json` file in a text editor.
4. Populate the `urlRoot` element with the URL for your Private Help Server. The value for the URL should use the following format:

   `"http://<host>:<port>/docsapimapper/mapper"`

   The `<host>` and `<port>` values should specify the server where the Private Help Server is deployed (for example, `http://myserver.mydomain:8080/docsapimapper/mapper`).

   Important: You must place the URL within quotation marks.

5. Save the `config.json` file and restart your web server.

   Accessing the Communications Designer or Content Author online help will now open the help from your locally hosted Private Help Server, instead of the OpenText-hosted Global Help Server.

2.5 Installing Design and Production add-ins

Design and Production add-ins extend the design capabilities of your design environment by providing new design features that can be quickly and easily integrated into your existing version of Designer.

Add-ins can be downloaded separately from My Support at http://support.opentext.com. When you install individual add-ins, you can use a distributed or centralized installation method. For the distributed method, you install the add-ins on each workstation individually. To use a centralized method of installation, you install the add-ins in a shared network folder. You might choose the centralized method to simplify the management of add-ins for multiple design users.

Before you can install add-ins, you must have installed Design and Production.

2.5.1 System requirements

Make sure your system meets the following minimum requirements:

System requirements

Add-in type	Supported operating systems	Required hardware and software
Bar, line, and pie charts	• Windows • Linux • AIX (64-bit, DBCS only)	• Minimum screen resolution of 1366x768 Add-ins work best with monitors that are set to a resolution of 1920x1080 • Designer version 9.5.305 or later • Exstream production engine 9.5.305 or later

2.5.2 Installing your add-ins

By default, add-ins are installed in `C:\Users\Public\Documents\OpenText\Exstream Add-Ins`. However, you can change the add-ins directory in Design Manager. When you install new add-ins, they are automatically added to the add-ins directory that is specified in Design Manager.

Depending on the installation option you choose, complete the tasks described in the following table:

To	Do this
Install add-ins on individual workstations	1. From each workstation, download the Design and Production add-in that you want to install from My Support. 2. Double-click the file to run the installation wizard, and follow the prompts. The installation wizard places the add-in in the directory that is specified in Design Manager. 3. To view or change the location of the add-in directory, in Design Manager, go to **Tools > Options**. The directory used for add-ins is shown in the **Add-in directory** box.

To	Do this
Install add-ins on a shared network folder	1. Download the Design and Production add-in that you want to install from My Support. 2. Copy the downloaded `.exa` file to the designated network folder. 3. On each workstation, change the add-in directory to point to the network folder by completing the following steps: a. In Design Manager, click **Tools > Options**. b. In the **Add-in directory** box, enter the network path to where the `.exa` file is installed, or click  to select the directory where the `.exa` file is installed. c. Click **OK**.

2.6 Installing Exstream Live

When installing Exstream Live (LiveEditor and LiveViewer), keep in mind that Exstream Live is a separate program from the Exstream platform and the Design and Production environments.

2.6.1 System Requirements

Before you begin, make sure your system meets the following minimum requirements:

System requirements

Supported operating systems	Hardware and software requirements
Windows	• Minimum screen resolution of 1366x768 • 4GB RAM (minimum 2GB) • 10 GB free disk space (minimum 800MB) • Internet Explorer version 7 or later LiveEditor or LiveViewer as an add-on is supported only in Internet Explorer versions 6, 7, 8, 9, 10, and 11.

2.6.2 Installing LiveEditor and LiveViewer

Important: Do not install Exstream Live in the same directory as the 64-bit Design and Production environment (version 16.2.0 and later). This is because LiveEditor and LiveViewer share some dynamic link library (DLL) files with the 64-bit Exstream design environment.

You must download the LiveEditor installation files separately from My Support at http://support.opentext.com. Separate installers are provided for LiveEditor and LiveViewer, and the following types of installers are available for each application:

- **Standard installer**—This installer provides a traditional, wizard-like installation experience and offers you the opportunity to change defaults. You might choose to use the standard installer if you must customize the installation path, or if you can easily administer the installation process for end users.
- **Silent installer**—This installer is designed for installations in an enterprise environment. It runs "silently" and does not offer you the opportunity to change defaults. This installer also overrides any existing installations and installs components in their default locations. You might choose to use the silent installer if you want to provide a seamless installation experience for remote end users, or if you want all installations of the program to use the same installation settings.

You can use the following switches and parameters when installing LiveEditor or LiveViewer in silent mode from the command line:

Switch	Parameters	Syntax	Notes
`/V`	`INSTALLDIR`—This parameter lets you specify the installation directory on the end user's computer. `USERSTARTFOLDER`—This parameter lets you specify the default start folder on the end user's computer.	`/v"/qn INSTALLDIR=\"C:\Program Files\OpenText\Exstream\""`	• If there are spaces in the path you enter, then you must surround the path name with quotation marks, and then use `\` as an escape character. • In the syntax, `/qn` must be used in order for the installer to remain in silent mode.
`/S`	None	None	This switch prevents the startup progress bar and all other startup windows from being displayed during installation.

Switch	Parameters	Syntax	Notes
/L	1031—German 1033—English 1034—Spanish 1036—French 1041—Japanese 1046—Brazilian Portuguese 2052—Chinese	/L "1033"	This switch controls the language of the installed version.

Note: If you want end users to import EPS images, for best results, install Ghostscript, which is a commercially available PostScript and PDF rendering tool. If an end user imports an image in LiveEditor without first installing Ghostscript, the image might appear distorted in LiveEditor. However, EPS images are still stored correctly and appear correctly in output that is produced during fulfillment. To download a commercial license version of Ghostscript, go to www.ghostscript.com/download.

The installers for both programs install the Internet Explorer plug-in. By default, the plug-in capability is enabled. To disable the plug-in capability, go to **Tools > Manage Add-ons > Enable or Disable Add-ons** in Internet Explorer.

2 Installing the Production Environment

The production environment is installed and upgraded separately from the design environment because the production environment has different requirements and installation procedures for each platform. Design and Production offers a 32-bit version and a 64-bit version of the production engine.

Beginning with the 16.2.0 release, the following versions of the Design and Production production engine are available as part of the Runtime installer:

- 64-bit DBCS production engine for Windows platforms
- 64-bit DBCS production engine for Linux platforms

In addition, the engine ZIP files for all supported environments are available as separate downloads from My Support at http://support.opentext.com.

You can install the Design and Production production engine on the following platforms:

Supported operating systems

Platform	Supported 32-bit and 64-bit versions
Windows	• Microsoft Windows 7 • Microsoft Windows 8 • Microsoft Windows 8.1 • Microsoft Windows 10 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2016
z/OS	z/OS 2.1 and later
UNIX	• IBM AIX (RISC) 6.1 and later • Oracle Solaris 10 (SPARC) and later (32-bit only) • HP-UX Itanium 11i v2 and later (64-bit only)
Linux	• SuSE version 10 (Intel) and later • Red Hat ES 6.0 (Intel) and later
IBM i (AS/400)	IBM i 7.1 and later (using AS/400 PASE run-time environment)

For more information about the production engine, see *Preparing Applications for Production* in the Exstream Design and Production documentation.

For information about installing the production engine using the engine ZIP files that are available on My Support, see the following topics:

- “Windows Production Environment Installation” below
- “UNIX/Linux Production Environment Installation” on page 21
- “IBM i (AS/400) Production Environment Installation” on page 26
- “z/OS Production Environment Installation” on page 28

2.1 Windows Production Environment Installation

2.1.1 System Requirements

Before you begin, make sure that you meet the following minimum requirements:

System requirements

Platform	Supported operating systems	Required hardware and software
Windows	• Microsoft Windows 7 • Microsoft Windows 8 • Microsoft Windows 8.1 • Microsoft Windows 10 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2016	• 512MB RAM (minimum 1024MB of RAM to run the DBCS production environment) • 50MB free disk space

2.1.2 Installing the Production Environment on Windows

1. Download the latest Runtime Installer ZIP file from My Support and extract the contents of the ZIP file to a local setup directory.
2. Double-click the `ExstreamSetup.exe` file.

   An installation wizard opens.
3. Use the wizard to install the Exstream engine.

2.1.3 Installing the Production Environment using an Engine ZIP File

1. Download the latest Windows engine ZIP file from My Support.
2. Extract the engine to the production folder on your hard disk on the Windows production machine. Do not move any file to another directory.

   Caution: For the DBCS engine only, make sure `icuuc`*`xx`*`.dll` and `icudt`*`xx`*`.dll` are in the same directory as the engine. The `icuuc`*`xx`*`.dll` and `icudt`*`xx`*`.dll` files are included in the Windows DBCS engine download.

3. If you plan to use the orchestration features available with the integrated Exstream platform, you must register the Exstream engine in the management gateway to enable Communications Server to invoke the engine.

   Note: This step is not required if you use the Runtime installer wizard to install the engine. The wizard automatically registers the engine in the management gateway. If you do not use the wizard to upgrade your production environment, you must manually register the engine.

   For information about how to register the engine, see *OpenText Exstream: Installation Guide*.

   For information about setting up the integrated Exstream platform, see *System Administration* in the Exstream Design and Production documentation.

2.1.4 Installing GhostScript to Use the Dynamic Content Import and Design PDF Modules

If you have licensed the Dynamic Content Import module or the PDF Import as Image module and want to import PostScript and PDF content, you must install Ghostscript, which is a commercially available PostScript and PDF conversion and rendering tool.

To install Ghostscript on Windows:

1. Download a commercial license version of Ghostscript from www.ghostscript.com/download.
2. Add the location of the Ghostscript executable to your system path.

2.2 UNIX/Linux Production Environment Installation

2.2.1 System Requirements

Before you begin, make sure you meet the following minimum requirements:

System requirements

Platform	Supported operating systems	Required hardware and software
Linux	• SuSE version 10 (Intel) and later • Red Hat ES 6.0 (Intel) and later	• 512MB RAM • 43MB free disk space (SBCS) • 75MB free disk space (DBCS)
UNIX	• IBM AIX (RISC) 6.1 and later • Oracle Solaris 10 (SPARC) and later (32-bit only) • HP-UX Itanium 11i v2 and later (64-bit only)	• 400 MHz or faster processor • 512MB RAM • 200MB hard drive space IBM AIX • 100MB free disk space (SBCS) • 120MB free disk space (DBCS) • IBM XL C/C++ for AIX, version 13.1.3 (32-bit engine only) • GNU Compiler Collection (GCC) low-level runtime library, libgcc-7.2.0-6.ppc (64-bit engine only) • GNU Standard C++ Library, libstdc++-4.9.2-1.ppc (64-bit engine only) Oracle Solaris • 56MB free disk space (SBCS) • 79MB free disk space (DBCS) HP-UX • 45MB free disk space (SBCS) • 60MB free disk space (DBCS)

Note: When you are running the DBCS engine, the current locale must include a Unicode code page. An example of an AIX locale containing a Unicode code page is EN_US.UTF-8.

2.2.2 Installing the Production Environment on UNIX/Linux

1. Download the appropriate UNIX-based engine ZIP file.

   For information on downloading software, see "Installing Exstream software and documentation" on page 5.

2. Extract the downloaded file.

   You produce a file with the `tar.Z` extension.

3. Transfer the file to your UNIX/Linux system.
4. On the UNIX/Linux system, verify there is sufficient disk space to install the software.

   The requirements are as follows:

   - 515MB of free disk space (SBCS)
   - 600MB of free disk space (DBCS)

5. Make sure that the directory you choose is included in your PATH environment variable.
6. Decompress the `tar.Z` file into the directory where you want the engine to reside. You can use a UNIX command such as:

   ```
   uncompress [filename].tar.Z
   ```

7. At the command prompt, extract the engine files.

   For example:

   ```
   tar -xvf[filename].tar
   ```

   Various executable, verification, and test files appear in the directory.

   Note: When using the DBCS engine with AIX installations, delete existing `libicudata.so` and `libicuuc.so` files before extracting `engine.tar.Z`. When you extract `engine.tar.Z`, the SO files are not overwritten on AIX. The AIX operating system caches all shared libraries after they are invoked for faster execution.

8. Test the engine using the files provided.

   The following table lists the files and their contents:

   Content of compressed file

File	Contents
`Engine`	Executable engine file
`MsgResource_<language>.dat`	Text file containing messages that are shown to the user by the engine For more information on specifying the message resource, see the MSGLANGUAGE and MSGRESOURCE switches in *Preparing Applications for Production* in the Exstream Design and Production documentation.

9. If you plan to use the orchestration features available with the integrated Exstream platform, you must register the Exstream engine in the management gateway to enable Communications Server to invoke the engine.

   For information about how to register the engine, see *OpenText Exstream: Installation Guide*.

   For information about setting up the integrated Exstream platform, see *System Administration* in the Exstream Design and Production documentation.

2.2.3 Installing Ghostscript to Use the Dynamic Content Import and PDF Import as Image Modules

If you have licensed the Dynamic Content Import module or the PDF Import as Image module and want to import PostScript and PDF content, you must install Ghostscript, which is a commercially available PostScript and PDF conversion and rendering tool.

To install Ghostscript on UNIX/Linux:

1. Download a commercial license version of Ghostscript from www.ghostscript.com/download.
2. Extract the file.

   The file contains `ghostscript-X.XX.tar`.
3. Transfer `ghostscript-X.XX.tar` to UNIX Server in Binary mode.
4. Untar file (`tar –xvf ghostscript-X.XX.tar`) into the directory where Ghostscript is to reside. (This directory can be anywhere.)
5. Add the directory where Ghostscript resides to your PATH.

   For example, export `PATH=$PATH:/ghostscript_dir`.
6. Set the GS_LIB environment variable to `<gsdir>/gsfonts:<gsdir>/gslib` where `<gsdir>` is your Ghostscript directory.

   Note: To use Ghostscript to rasterize PDFs, users must have write permission to the directory where the package file resides when they run the engine.

2.2.4 Using the IBM DB2 CLI Driver on AIX and Linux

To obtain the required driver libraries, install the DB2 Application Development Client. If you are setting it up on a DB2 Server, you might already have the necessary software installed. To use

the IBM CLI driver as an ODBC driver, install an ODBC Manager called UNIXODBC. When installing, choose default options when possible.

The UNIXODBC application is an Open Source ODBC Manager. Exstream has been tested with UNIXODBC version 2.2.11. You can download this program from the following website: http://www.unixodbc.org/

To install UNIXODBC, refer to IBM's installation instructions at:

http://publib.boulder.ibm.com/infocenter/db2help/index.jsp?topic=/com.ibm.db2.udb.doc/ad/t0010406.htm

2.2.5 UNIXODBC Configuration

Initialization files are used to configure the UNIXODBC.

odbcinst.ini

You must set up an `odbcinst.ini` file. The path depends on your installation directory. Assuming you used the default (`/usr/local`), create this file in `/usr/local/etc`.

Note: The driver path depends upon your installation location of DB2. The [ODBC] trace section is optional, but might be useful while setting it up.

```
[DEFAULT]
Description = Default Driver
Driver = /home/db2inst1/sqllib/lib/db2.o
fileusage=1
dontdlclose=1
[DB2]
Description= DB2 Driver
Driver= /home/db2inst1/sqllib/lib/db2.o
FileUsage= 1
DontDLClose= 1
[ODBC]
trace = yes
tracefile = /usr/local/etc/trace.log
```

odbc.ini

To set up a DSN for the SAMPLE database installed when you install DB2, configure the `odbc.ini` file as follows: `/usr/local/etc/odbc.ini`. This file path contains DSNs visible to all users. You can also set up a . `odbc.ini` file visible to individual users.

```
[DEFAULT]
Driver=DB2
[SAMPLE]
Description= Connection to DB2
Driver= DB2
```

2.2.6 Verifying Installation

To confirm that UNIXODBC is installed and configured correctly, you can execute a simple query using the `isql` utility installed as part of UNIXODBC:

```
isql –v SAMPLE db2inst1 password
SQL> select * from STAFF
SQLRowCount returns -1
35 rows fetched
SQL> quit
```

Return table

ID	Name	Dept	Job	Years	Salary	Comm
10	Sanders	20	Mgr	17	18357.50	1
20	Pernal	20	Sales	18	18171.25	612.45
30	Marenghi	38	Mgr	15	17506.75	

Note: If you see the following error, set your DB2INSTANCE: `[IM004][unixODBC][Driver Manager]Driver's SQLAllocHandle on SQL_HANDLE_HENV failed [ISQL]ERROR: Could not SQLConnect`

To set your DB2INSTANCE, enter the following: `export DB2INSTANCE=DB2INST1`

2.3 IBM i (AS/400) Production Environment Installation

2.3.1 System Requirements

Before you begin, make sure that you meet the following minimum requirements:

System requirements

Platform	Supported operating systems	Required hardware and software
IBM i (AS/400)	IBM i 7.1 and later	• Portable Application Solutions Environment (PASE) • 800MB free disk space • IBM XL C/C++ for AIX, version 13.1.3 (32-bit engine only) • GNU Compiler Collection (GCC) low-level runtime library, libgcc-7.2.0-6.ppc (64-bit engine only) • GNU Standard C++ Library, libstdc++-4.9.2-1.ppc (64-bit engine only)

2.3.2 Installing the Production Environment on IBM i (AS/400)

1. Create an Exstream directory.
2. Download the 64-bit AIX engine ZIP file.

   For information on downloading software, see "Installing Exstream software and documentation" on page 5.
3. Extract the downloaded file.

   An `engine.tar.Z` file is produced.
4. Using FTP or your usual method of binary file transfer, transfer this file to the Exstream directory you created on your AS/400 system. For example:
   a. Start up FTP in a command window.
   b. At the FTP prompt, enter `quote site namefmt 1`.

      The system replies that it is now using naming format "1."
   c. At the FTP prompt, enter `bin`.

      The system replies that the restoration type is a binary image.

      At the FTP prompt, change the directory to Exstream (for example, `cd /exstream`).

      The system confirms the change to the Exstream directory.
   d. At the FTP prompt, send the `engine.tar.Z` file to this directory. For example, `put engine.tar.Z`. When complete, you receive a message.
5. Return to the PASE window (in your 5250 Emulator program).

6. Decompress the tar executable file to the Exstream directory by entering the `uncompress engine.tar.Z` command.

   The command prompt returns when the decompression finishes. The Z extension drops from the name of the `engine.tar` file.

7. Extract the executable and test files to a tar folder underneath the Exstream directory with the `tar –xvf engine.tar` command.

   When the extraction finishes, the command prompt appears.

8. Remove the `engine.tar file`: `rm engine.tar`.

   For more information on specifying the message resource file, see the MSGLANGUAGE switch in *Switch Reference* in the Exstream Design and Production documentation.

2.3.3 Creating an Exstream Directory

Although you can use any location for the installation, the default is an Exstream directory that you create off the root. These procedures use a Windows machine to complete the entire installation. Adjust the steps accordingly if you have a 5250 terminal operating off the AS/400 machine.

1. On a Windows machine, load a 5250 Emulator of your choice. (The default is to use IBM Personal Communications, workstation version.)
2. Start the terminal Emulator and log in to the AS/400 machine.
3. Access the PASE environment from the Main menu (for example: `call qp2term`).

   In PASE, you emulate a UNIX environment.

4. Create a directory called `Exstream` under the root directory.
5. Leave the PASE window open as you complete the next procedure.

2.3.4 Control/Batch Files

Point to the directory containing the engine and `MsgResource-xx-xx.dat` files when you identify the location of the engine in your control/batch files. A batch script must change directory `(cd)` to this location before the batch file runs the engine. Also, upload the package files for applications into this same directory.

2.4 z/OS Production Environment Installation

Before you begin, make sure you meet the following minimum requirements:

System requirements

Platform	Supported operating systems	Required hardware and software
z/OS	z/OS 2.1 and later	• IBM mainframe • 50MB free disk space (SBCS) • 80MB free disk space (DBCS) • IBM's terse utility

To install the production environment on z/OS:

1. Reserve sufficient DASD to install and run the engine.
2. Verify that you have disk space available that is three times the sum of all the data files in your largest application.

   (Allow at least 15,000 tracks on z/OS.)
3. Download the engine ZIP file for z/OS.

   For information on downloading software, see "Installing Exstream software and documentation" on page 5.
4. Extract the zipped files.
5. Configure IBM's terse utility (if not already installed).

   Note: When you install the DBCS version of Exstream on z/OS, the ICU data file, called `icudata.trs`, must be called in the JCL you use to run the engine using DD Statement `ICUDT20E`.

   For example:

   `//ICUDT20E DD DSN=HLEV1.HLEV2.ICUDATA(NEWDATA),DISP=SHR` `HLEV1` and `HLEV2` are high-level qualifiers pointing to your Exstream install file naming convention on z/OS.

   If you do not include the DD statement in your JCL, the engine cannot run.
6. Edit the `sendtrs.txt` file, which is called by the `sendtrs.bat` file. The `sendtrs.bat` file uses the FTP program that comes with Windows to transfer the terse files and required files to the mainframe.
7. In the `sendtrs.txt` file, change the following settings:
   - Change IBM6000 to the URL or IP address of your mainframe.
   - Change P390A (USERID) to your FTP user name.
   - Change P390A6 (PASSWORD) to your FTP password.

8. Double-click the `sendtrs.bat` file.
9. Edit the `VERUNP` file.
   - Add or edit your job card as appropriate.
   - Replace SYS1.MIGLIB with the DSN of the library containing the terse utility.
   - Replace P390A with your high-level qualifier where you loaded your terse files.
10. Submit `VERUNP` and verify installation.

2.4.1 Setting Up to Run XML Transformations on z/OS

Exstream uses built-in XSLTs to validate XML data, transform XML data, and to create Multi-Channel XML output.

In order to run these XSLTs on the z/OS platform, you must complete the following steps:

1. Make sure you have licensed one or both the following modules:
   - License the XML/JSON Input module if you want to validate XML data or transform XML data.
   - License the XML (Multi-Channel) module if you want to create Multi-Channel XML output.
2. Download and install the "XML Toolkit for z/OS" from the IBM website.
3. Point your engine to run Job Control Language (JCL) to the installed Partitioned Data Set Extended (PDSE).

For more information about validating and transforming XML data, see *Using Data to Drive an Application* in the Exstream Design and Production documentation.

For more information about creating Multi-Channel XML output, see *Creating Output* in the Exstream Design and Production documentation.

z/OS Terse Files List

Unpacking the terse files creates PDSs by the same name. The following table lists each set and its intended content (members).

Note: To use the MSGLANGUAGE engine switch, you must have the language-specific version of Exstream.

z/OS terse files

File	Content
`icudata.trs` (DBCS)	Lets you access the ICU data file, which is used in DBCS applications to enable conversion between native encodings and Unicode
`jcl.trs`	All the jobs needed to verify the engine installation
`jsl.trs`	Several JSLs to assist with loading jobs on Metacode printers
`load.trs)`	The z/OS engine (ENGEXE), a program called EXHOSTID that identifies the host ID of your mainframe, and a program called HYPHDLL that handles hyphenation
`DMSG <language>.trs`	The message resource file for the z/OS engine. You can specify English (DMSGENUS).

2.4.2 Tracking, z/OS, and DB2

If you use `UPTRACK` to update a DB2 database on z/OS (tracking databases only) from the text files created by the engine, perform the following edits.

Note: This information assumes that you have already created a tracking database.

1. EXSTREAM.JCL(VERTRACK) - JCL to run program:
   a. Edit the job card as appropriate.
   b. In the definition of the RUNTRK proc:

      Change the HLQ symbolic parameter default from `p390a` to your desired high-level qualifier.
   c. Change `P390LOC(PARM='-DSN=P390LOC')` to the name in the SYSIBM.LOCATION location field that refers to the DB2 database to which you want to connect.

      ```
      C P390LOC < name in SYSIBM.LOCATION Location field > all
      ```
   d. Change DSN510 to your high-level qualifier of your DB2 System.

      ```
      DSN510 <new high level qualifier> all
      ```
   e. Change SYS1 to your high-level qualifier of your System Directory.

      ```
      SYS <new high level qualifier> all
      ```
   f. Change CBC to your high-level qualifier of the location of SCLBDLL.

      ```
      CBC <new high level qualifier> all
      ```
2. EXSTREAM.JCL(ODBCINI)

a. Change `MVSDEFAULTSSID= DSN1` to the SSID of your DB2 system.

```
C DSN1 < SSID> all
```

b. Change `PLANNAME= EXSTREAM` to the Plan Name of your DB2 system where the tracking tables were created.

```
C Exstream <Plan Name>
```

3. The EXSTREAM.JCL(MVSENGTB) script that creates tables in DB2 must be run from the DB2 ISPF Panel.
4. Submit `EXSTREAM.JCL (VERTRACK)` if you are using DB2 on z/OS as the tracking database.

2.4.3 License Key in a Control File in z/OS

The z/OS operating system uses uppercase characters; however, the license key must consist of the original mixed case characters (uppercase and lowercase as required). On z/OS, if you edit a control file that contained only uppercase characters, the ISPF editor automatically sets itself to CAPS ON. The characters you enter for the key are then converted to uppercase.

Enter the ISPF editing command `CAPS OFF` before entering the mixed case key. If you have issues, you can edit the file on your PC:

1. Using FTP, copy your control file to your PC.
2. Open the control file in a text-editing program, such as Notepad.
3. Edit or copy the KEY switch and key characters to the control file exactly as they appear in your original control file.
4. Using FTP, return the control file to the mainframe in ASCII mode.

Chapter 3: Upgrading Design and Production

This section contains various topics to assist you in upgrading Design and Production and in understanding the differences you might encounter in existing applications upgraded to the 16.6.0 version of Exstream. You can use this chapter to help you understand how you can best prepare for the upgrade process. The topics in this chapter will also help you anticipate issues you might encounter, as well as understand how specific enhancements and improvements to the software will affect your applications.

Important: When you upgrade from Design and Production version 16.4.0 to version 16.4 Update 1, you must also update your design and tracking databases to the new version.

For information about updating design and tracking databases, see *System Administration* in the Exstream Design and Production documentation.

This chapter discusses the following topics:

3.1 Preparing for an Upgrade

This section will help you plan for and perform an upgrade of Design and Production that best suits your systems and processes.

For additional help with upgrades and to learn about the upgrade services available, contact your Exstream account manager. You can also submit "how-to" questions and open cases for technical problems in OpenText Customer Support site at http://www.opentext.com/support.

Note: The information in this section does not include specific upgrade approaches and considerations for Exstream Live applications. For additional help in upgrading Exstream Live applications, contact your Exstream account manager.

This section discusses the following topics:

3.1.1 Eight Best Practices for Upgrading Design and Production

For best results when performing an upgrade, consider the following best practices.

1. Back Up Your Database

Before you begin an upgrade, make sure that you create a backup of your database, using the appropriate backup method for the type of database you are using. The backup might be valuable during the upgrade process if you need to use the previous version to get any problematic applications quickly back into production, or for creating baseline output for comparison purposes.

2. Conduct a Proof of Concept

First, create a copy of your database, and run local tests. You can run all your applications if you have time, or otherwise run a representative subset. Thorough testing in parallel with normal business activities at this stage will help you to anticipate issues that might arise during the process and will thus minimize downtime during the actual upgrade.

3. Use an Appropriate Set of Test Data

When testing, avoid using a large data set such as you might use in production, but still try to include a variety of data that exercises all the rules in each application. Large amounts of data will slow your testing because of the increased number of pages that must be compared. Using a smaller but still comprehensive set of data allows you to perform effective tests more quickly.

To help capture an appropriate set of data, you can use the Test Data Capture module, which lets you collect a minimal amount of test data to fully exercise all named and unnamed rules in an application. You can also use the Test Data Capture module to generate a new customer driver file and a test data capture report.

For more information about using the Test Data Capture module to capture appropriate testing data, see *Preparing Applications for Production* in the Exstream Design and Production documentation.

Alternatively, if you already have a set of data that you prefer to use for testing, you can verify that the data exercises all rules in your applications by using the Rule Analyzer module. You can use the Rule Analyzer module to generate a rule analysis report that lists which rules are executed and how many times they are executed when an application is run.

For more information about using the Rule Analyzer module to generate a rule analysis report, see *Preparing Applications for Production* in the Exstream Design and Production documentation.

4. Run Database Maintenance

Before you begin an upgrade, use the Database Maintenance tool in Design Manager to check the design database for data integrity and correct error conditions.

Note: The Database Maintenance tool does make changes to the design database. Make sure you have created a backup of the database before using the Database Maintenance tool.

For more information about running database maintenance, see *System Administration* in the Exstream Design and Production documentation.

5. Run Multiple Versions of the Engine

You can maintain stability in production by keeping the previous version of the Exstream engine installed when you install the new version. Maintaining the previous version of the engine lets you upgrade the design database and start new development in the latest version, but you can continue to run existing applications with the previous version of the engine until the need arises to update those applications.

You can also increase flexibility in production by using multiple versions of the engine. If you encounter an issue with one of your applications, you can perform an engine-only upgrade for that particular application, leaving the design database intact and the rest of your applications running in the previous version of the engine.

For more information about engine-only upgrades, see “Approaches to Upgrading” on the next page.

6. Use Batch Scripts for Testing

By using batch scripts to perform multiple packaging operations and engine runs from the command prompt, you can reduce manual testing time. Scripts that automate the tests let you run multiple tests faster, as well as easily re-execute the same tests when necessary.

For more information about packaging applications from the command prompt and using the command prompt to execute a production engine run, see *Preparing Applications for Production* in the Exstream Design and Production documentation.

7. Use Multiple Design Databases When Appropriate

Using multiple design databases allows you to upgrade individual databases as necessary and leave others at a previous version. However, a disadvantage of using multiple databases is that maintaining common objects across those databases might require additional administration. Be sure to consider the advantages and disadvantages of using multiple design databases as they apply to your specific needs.

For more information about moving content between design databases in Design Manager, see *System Administration* in the Exstream Design and Production documentation.

8. Use a Comparison Tool

You can use Output Compare, Exstream Compare, Exstream Batch Compare, or another comparison tool to compare output during testing. Using a comparison tool allows you to quickly locate any changes that occur when upgrading the database or the engine.

For more information about Exstream Compare or Exstream Batch Compare, see *Preparing Applications for Production* in the Exstream Design and Production documentation.

For more information about Output Compare, contact your Exstream account manager.

3.1.2 Approaches to Upgrading

There are several basic approaches that you can take to upgrading. You can choose to upgrade fully, upgrade on an as-needed basis, upgrade only the engine, or upgrade incrementally. This section explains each method so that you can understand the range of options that you have for upgrading. Keep in mind that you can tailor these approaches to suit your business needs.

For more information about how to choose the best approach for your organization, see "Which Upgrade Approach Is Best for You?" on page 38.

Full Upgrade

In a full upgrade, you upgrade all parts of Design and Production at the same time, including the desktop design software, the design database, package files, and the production engine. This type of upgrade completely removes the previous version of the software. Because all components are changing, a robust backup and testing plan is a necessity.

The main benefit of this approach is that you do not have to manage multiple versions of the desktop design software, the engine, or package files.

For an example of a situation where you might choose to upgrade fully, see "Scenario 2: Moving to a Supported Version" on page 39.

As-Needed Upgrade

You might be able to minimize downtime in production by performing an as-needed upgrade. In an as-needed upgrade, you upgrade the desktop design software and the design database. You also install the new version of the production engine, but you keep the previous version of the engine installed. You can continue to run existing package files with the previous version of the engine. Then, as changes are required in each application, or as time permits, you can repackage each application individually.

The benefits of this approach are as follows:

- You can start developing new applications in the new version of Design and Production immediately.
- You have more time to test and upgrade existing applications, and there is less downtime because you can continue to run existing applications during the upgrade.
- You might not have to repackage applications that never change.

For an example of a situation where you might choose to upgrade on an as-needed basis, see "Scenario 1: Taking Advantage of New Features" on page 39.

Engine-Only Upgrade

If you need to take advantage of a software fix, but you are not yet ready to upgrade databases and develop applications in a new version of Design and Production, you might want to perform an engine-only upgrade. Under this approach you keep your databases, the desktop design software, and all package files in a previous version, but you install the new version of the engine in your production environment.

Though you might choose to run all applications with the new version of the engine, consider transitioning only the specific applications that require the software fix. This approach allows you to maintain consistency in other applications. After the engine-only upgrade, you might begin testing for an as-needed upgrade, during which you would eventually transition the rest of your applications to the newer version of the engine.

Some fixes that affect your applications might also occur in other parts of Design and Production, rather than in just the engine. If you are not sure whether an engine-only upgrade will resolve your specific issue, contact your Exstream account manager for more information.

Keep in mind that with this approach, the engine installed with your existing design environment will still be the previous version, while the production engine has been upgraded to a different version. Therefore, when testing applications locally in your design environment, your output might be different from production output.

The benefits of this approach are that you can take advantage of software fixes provided in newer versions of the engine, but you do not have to upgrade your applications or manage multiple versions of the desktop design software or package files.

Incremental Upgrade by Means of Loading/Unloading (XOB)

An incremental upgrade by means of loading and unloading databases (sometimes known as an XOB upgrade), is similar to an as-needed upgrade in that you continue to run existing applications on a previous version of the engine. However, whereas in an as-needed upgrade you upgrade the database but wait to repackage each application, in an incremental upgrade, you keep the database at the previous version and upgrade each application individually by using an interim database. This approach lets you continue development of existing applications in the previous version of Exstream at the same time that you start development of new applications in the new version.

In an incremental upgrade, you install the new version of the desktop design software and the production engine, but you keep the previous version of both installed, and you do not upgrade the database. You can continue to run existing package files with the previous version of the engine, and you can continue to make changes to existing applications in the previous version of the desktop design software.

When you want to upgrade each application, you can unload the application from the old database and load it into an interim database that you upgrade and test. Then, you unload the upgraded application from the interim database, load it into the new database you created in the new version of the software, and test again.

When using this approach, make sure that you load applications in the new database carefully, so that you do not overwrite existing objects in the new database.

The benefits of this approach are as follows:

- You can start developing new applications in the new version of Design and Production immediately.
- You can continue to make changes to existing applications without first upgrading them.
- You have more time to test and upgrade existing applications, and there is less downtime because you can continue to run existing applications during the upgrade.
- You might not have to upgrade applications that never change.

Note: This approach should only be used for upgrades from version 8.0 or later.

For more information about moving applications between databases (unloading and loading), see *System Administration* in the Exstream Design and Production documentation.

3.1.3 Which Upgrade Approach Is Best for You?

No single upgrade solution fits all business processes universally. The way in which you upgrade should be based on your business requirements, restrictions, and deadlines.

To help select the best upgrade approach for your business needs, consider the following questions:

- **Why are you upgrading?**

  If you are upgrading to take advantage of new features in version 16.6.0 in new applications, you might select any of the upgrade approaches except for an engine-only upgrade. Narrowing the selection further depends on your other requirements. On the other hand, if you need to upgrade to take advantage of fixes that affect specific applications, you might select an engine-only upgrade.

- **Do you need to upgrade all applications at once, or can some applications stay in a previous version for now?**

  If you make frequent changes to most of your applications, and you want to manage them all in a single version of Design and Production, you might choose a full upgrade. On the other hand, if you have several applications that seldom require changes, you might choose an as-needed upgrade or an incremental upgrade.

- **If you have multiple databases, can you upgrade one at a time?**

  Just as you can upgrade applications on an as-needed basis, you can choose to run multiple versions of Design and Production and upgrade individual databases as required or as time permits.

- **Do you have the ability to run multiple versions of the engine in production?**

  If so, you can take advantage of an as-needed upgrade or an incremental upgrade. If you do not have the ability to run multiple versions of the engine, you might need to perform a full upgrade.

The following scenarios offer real-life examples of how you might choose an upgrade approach:

Scenario 1: Taking Advantage of New Features

After evaluating your business needs, you determine that the driving factor for an upgrade is to take advantage of an enhancement in version 16.6.0 that adds features that you want to use in a new marketing campaign that your company plans to initiate. You are currently running multiple versions of the engine in production to support existing applications, and most of your applications change infrequently.

Because you want to start development of new applications in the latest version, but you can run multiple versions of the engine and do not need to update existing applications immediately, it makes sense to perform an as-needed upgrade.

Scenario 2: Moving to a Supported Version

After evaluating your business needs, you determine that the driving factor for an upgrade is to remain on a supported version of Design and Production. You have only five applications in a single database, and each application is updated every quarter.

Because you need to upgrade for support reasons, and because you have few applications but they are updated regularly, it makes sense to perform a full upgrade.

3.1.4 Understanding Why Differences in Applications and Outputs Might Occur

When testing applications during an upgrade, you might encounter differences in your applications or output, sometimes caused by enhancements and fixes within Design and Production. This section includes some examples of why differences might occur and how you might address them.

Example 1: A Difference in Output Results from a Software Fix in a New Version

Suppose you developed an application in a previous version. Upon upgrading to version 16.6.0, you notice that a different value is now being written to a post-sort report file.

Consider these solutions:

If	Then
You are confident that the new output is correct	Accept the difference in output, and take no further action.
You prefer the output from the previous version	Contact Exstream to explore whether a solution might be available for backward compatibility.

Example 2: A Packaging Error Results from a Software Fix in a New Version

Suppose you developed an application in a previous version, and you are upgrading to version 16.6.0. When repackaging, you encounter an error indicating that a message frame cannot be empty.

Consider these solutions:

If	Then
You have an easily manageable number of affected design pages	For each affected design page: 1. Open the page. 2. For each empty frame, select the appropriate message template. 3. Save and close the page.
You have a very large number of affected design pages	Contact Exstream to explore whether a more automated solution might be available.

Example 3: A Difference in Output Results from a Workaround to a Problem in a Previous Version

Suppose you developed an application in a previous version. During development, you encountered an issue wherein a formula produced an incorrect result. You implemented a workaround to the issue by adding "1" to the result of the formula.

After upgrading to version 16.6.0 you notice that there is a difference in output. After investigating the issue, you find that the workaround in the formula now produces an incorrect result due to the issue being fixed in version 16.6.0.

To resolve this difference, you should remove the workaround that you implemented in the previous version.

> **Tip:** To help minimize unexpected differences, make sure that you keep a list of workarounds that you implement so that you can easily locate and remove them during an upgrade.

Example 4: A Difference in Output Results from an Enhancement in the Software

Suppose you developed an application in a previous version. Upon upgrading to version 16.6.0, you notice an image has moved slightly in customer output.

Consider these solutions:

If	Then
The difference is acceptable	Accept the difference in output, and take no further action.
The difference is unacceptable	Open each affected design page, make the necessary adjustments. If you cannot resolve the differences manually, contact Exstream to explore whether a solution might be available for backward compatibility.

For more information about known differences that you might encounter when upgrading, see "Differences in Output After an Upgrade" on page 67.

For more information about design changes that might be necessary during or after the upgrade, see "Upgrade Considerations for New and Enhanced Features" on page 44.

3.2 Upgrading the Design Environment

You can install multiple major versions (for example, versions 8.0 and 9.0) and minor versions (for example, versions 8.0.105 and 8.0.215) of Design and Production on a single Windows workstation. When you upgrade, you can choose to replace your current version or install a

separate new version in addition to the existing version already on your workstation. However, when you install an earlier version, that version does not overwrite the newer, existing version.

You can use either the typical or the silent installation method to upgrade your design environment. To upgrade the design environment using the typical installation method:

1. Exit all Windows applications.
2. Download the latest Design Tools ZIP file from My Support and extract the contents of the ZIP file to a local directory.

   For information about downloading software, see "Installing Exstream software and documentation" on page 5.
3. Use one of the following setup files to upgrade your design environment:

To	Do this
Replace your existing version	Double-click the `<setup directory>\ExstreamSetup.exe` file.
Install the new version in addition to the existing version	Double-click the `<setup directory>\Software\DesignManager\OpenTextExstream_setup_x64_<version>.exe` file

   Note: You must have administrative privileges to run the installer.

4. Use the wizard to install Design and Production.

   If you are using the `OpenTextExstream_setup_x64_<version>.exe` setup file, you can choose to replace your current version or install a separate new version in addition to the existing version already on your workstation.
5. Some version upgrades might require you to upgrade your design database as well as Design and Production. To perform the database upgrade, you must run the Database Administrator utility.
6. To complete the upgrade, open Design Manager and enter your user name and license key information.

   For more information about entering your user name and license key information in Design Manager, see "Installing Design and Production" on page 6.

3.3 Upgrading the Production Environment

You can install multiple major versions (for example, versions 8.0 and 9.0) and minor versions (for example, versions 8.0.105 and 8.0.215) of the Exstream engine on a single system. When you upgrade, you can choose to replace your current version or install a separate new version in addition to the existing version already on your system.

3.3.1 Upgrading the Windows Production Environment

When you upgrade the production environment on a Windows system, you can use either the Runtime installer or an engine ZIP file that you download from My Support.

To upgrade your Windows production environment:

1. Download the latest Runtime ZIP file or the Windows engine ZIP file from My Support.

   For information about downloading software, see "Installing Exstream software and documentation" on page 5.

2. Use one of the following methods to install the Exstream engine:

To	Do this
Install a new version of the engine using the Runtime installer	a. Extract the contents of the Runtime installer ZIP file to a local setup directory b. Double-click the `[setup directory]\ExstreamSetup.exe` file and use the wizard to install the Exstream engine.
Install a new version or replace the current version of the engine using the contents of the Runtime installer ZIP file	a. Extract the contents of the Runtime installer ZIP file to a local setup directory. b. Copy the contents of the `Engine` folder in `[setup directory]\Software` to an engine installation folder on the hard disk of your Windows production machine. Do not move any file to another directory.
Install a new version or replace the current version of the engine using an engine ZIP file	a. Extract the contents of the engine ZIP file to a local setup directory. b. Copy the contents of the setup directory to an engine installation folder on the hard disk of your Windows production machine. Do not move any file to another directory.

   Caution: If you are replacing the current version of your engine, you can copy the contents directly to the production folder on your Windows production machine. However, to maintain stability in production, OpenText recommends that you keep the previous version of the Exstream engine installed when you install a new version. For more upgrade recommendations, see "Eight Best Practices for Upgrading Design and Production" on page 34.

3. Verify that you have all of the files that should be included in the engine installation. You can use the `ReadmeFile-<language>.html` file available in your new engine installation folder to verify the contents of your engine installation folder.

4. If you plan to use the production engine and output delivery orchestration features in the integrated Exstream platform, you must register the Exstream engine in the management gateway to enable Communications Server to invoke the engine.

   Note: This step is not required if you use the Runtime installer wizard to install the engine. The wizard automatically registers the engine in the management gateway. If you do not use the wizard to upgrade your production environment, you must manually register the engine.

   For information about how to register the engine, see *OpenText Exstream: Installation Guide*.

   For information about setting up the integrated Exstream platform, see *System Administration* in the Exstream Design and Production documentation.

3.3.2 Upgrading UNIX/Linux, IBM i (AS/400), or z/OS Production Environments

To upgrade the production environment on UNIX/Linux, IBM i (AS/400), and z/OS systems, download the appropriate engine ZIP file from My Support and follow the installation instructions for your system type.

For more information about installing the Exstream engine in a non-Windows environment, see the following topics:

- "UNIX/Linux Production Environment Installation" on page 21
- "IBM i (AS/400) Production Environment Installation" on page 26
- "z/OS Production Environment Installation" on page 28

3.4 Upgrade Considerations for New and Enhanced Features

Due to changes in each version of Exstream, there are upgrade considerations for existing designs that contain the following features when you upgrade to Exstream version 16.6.0:

Version	Upgrade considerations
16.4 Update 1	"Database Conversion from SBCS to DBCS" on the next page
16.4.0	"System Requirements for IBM AIX Platforms in 16.4.0 and Later" on page 46

Version	Upgrade considerations
16.3.0	"Floating Licenses" on the next page
16.2.1	"PostgreSQL Databases" on page 47
16.2.0	"64-bit Design Environment" on page 49
16.2.0	"System Requirements for Windows Platforms in 16.2.0 and Later" on page 51
9.5.304	"System Requirements for IBM AIX Platforms in 9.5.304 and Later" on page 52
9.5.301	"Collection of Anonymous Usage Data" on page 53
9.5.201	"Bar Charts, Stacked Bar Charts, and Floating Bar Charts " on page 52
9.5	"Complex Text Support" on page 53
9.5	"Container Designs" on page 57
9.5	"Data Sections and Recipients in XML Data" on page 57
9.5	"HTML (Web) Output" on page 59
9.5	"Multiplicity for Arrays" on page 61
9.5	"System Requirements for Windows Platforms in 9.5 and Later" on page 61
9.0	"Hyperlinks and Live Documents" on page 62
9.0.112 or 9.5.201	"PDF Accessibility" on page 62
8.5	"Superscripted and Subscripted Text" on page 63
8.0.3	"Keys and Licensing" on page 63
8.0.3	"Local User Dictionaries" on page 63
8.0.3	"Spelling Dictionaries" on page 64
8.0.2	"Database Changes Due to Design User Name Conversion" on page 64
8.0	"RGB Images and AFP Output" on page 65
8.0	"Tables" on page 65

3.4.1 Database Conversion from SBCS to DBCS

Beginning with Exstream version 16.4 Update 1, the Design and Production installation directory contains only the double-byte character set (DBCS) version of the Database

Administrator utility (`DBAdmin.exe`, which replaces `DBAdmin_dbcs.exe`). The single-byte character set (SBCS) version of the DBAdmin utility is not supplied, and Design and Production no longer provides the ability to convert SBCS databases to the DBCS data structure.

If you are using an SBCS database and are upgrading Exstream from a version of Design and Production earlier than 8.0, then you must first upgrade to a version between 8.0 and 16.4.0, and then convert all of your SBCS databases to the DBCS data structure.

If you are upgrading to the current version of Exstream from 8.0 or later, or if you are using a DBCS database from an earlier version of Exstream, then there are no additional upgrade considerations for your database.

For more information about converting SBCS databases in Exstream version 8.0 to version 16.4.0, see *Converting SBCS Databases for Exstream Design and Production 8.0 and Later* for the version that you are using.

For more information about upgrading your database to the current version of Exstream, see *System Administration* in the Exstream Design and Production documentation.

3.4.2 System Requirements for IBM AIX Platforms in 16.4.0 and Later

The 64-bit Exstream production engine version 16.4.0 and later requires the following software:

- GNU Compiler Collection (GCC) low-level runtime library, libgcc-7.2.0-6.ppc
- GNU Standard C++ Library, libstdc++-4.9.2-1.ppc

When you upgrade your production environment from a previous version of Exstream, you must make sure that you have installed the correct version of the required runtime libraries.

> **Note:** These runtime libraries are required only for the 64-bit Exstream engine for the AIX platform. The system requirements for the 32-bit engine are unchanged.

For more information about the system requirements for the Exstream production engine, see "Installing the Production Environment" on page 18.

3.4.3 Floating Licenses

If you are using floating licenses with Exstream Design and Production version 16.3.0 or later, you must use the FlexNet Installer version 1.1 to update your FlexNet Publisher License Server Manager to version 11.14.1.2.

The updated installer is available in `License_Server_Install_1_1_0000.zip` on My Support at http://support.opentext.com.

For information about installing the License Server, see the Exstream License Server Installation Readme that is included in the ZIP file.

3.4.4 PostgreSQL Databases

Beginning with Exstream version 16.3.0, PostgreSQL design and tracking databases are supported in Design and Production. You can use PostgreSQL to create DBCS design and tracking databases and use PostgreSQL with ODBC data source files; SBCS PostgreSQL design and tracking databases are *not* supported.

Before using PostgreSQL databases, review the following upgrade considerations:

- "Installing and Using PostgreSQL ODBC Drivers" below
- "Creating the PostgreSQL Database Structure" below
- "Converting an Existing Database to a PostgreSQL Database" on the next page

Installing and Using PostgreSQL ODBC Drivers

If you are using a PostgreSQL database, you must install the PostgreSQL ODBC driver on the workstation of each Design and Production user who will access the database. Design and Production supports the 32-bit and 64-bit versions of the PostgreSQL ODBC Driver (psqlODBC).

The PostgreSQL ODBC Driver is available as both a Unicode driver and an ANSI driver. When you create the DSNs for your design and tracking databases, you must select the appropriate driver for your engine:

- Use the PostgreSQL Unicode driver when you create DSNs for use with the Design and Production design tools (Design Manager, Designer, and Logic Designer) and the DBCS engine.
- Use the PostgreSQL ANSI driver when you create DSNs for use with the SBCS engine.

The PostgreSQL ODBC Driver is available as a free download from the PostgreSQL website. For information about the PostgreSQL versions supported in Design and Production, see Supported Databases.

Creating the PostgreSQL Database Structure

When you create the database structure for a PostgreSQL database, keep in mind the following considerations:

PostgreSQL Database Structure Considerations

Item	Consideration
Schemas	When you connect to a DSN using the Database Administrator utility, you have the option to select a schema from the **Database schema** list or to enter a schema name. For PostgreSQL databases, the schema you enter will be created if it does not exist and if you have permission on the database server. By default, PostgreSQL converts all schema names to lower case unless the name is enclosed in double quotes. It is important to keep this in mind when entering schema names because Design and Production does not support upper case or mixed case schema names that were created using double quotes.
Tablespaces	When you create the database structure using the Database Administrator Utility, PostgreSQL selects the default tablespace (typically, the `pg_default` tablespace) if you select the **Automatically use Exstream defaults** option. You must select **Manually choose existing tablespaces** from the **Tablespaces** list to specify a tablespace other than the detault tablespace. In addition, if you use switches to create or modify the table structure, you must keep the following exceptions in mind: • If you use the AUTOCREATE switch to create the database structure, any tablespaces specified in the switch arguments are ignored and the default PostgreSQL tablespace (`pg_default`) is used instead. • If you use the AUTOCREATE switch in conjunction with the TABLESPACE switch, the tablespace specified in the TABLESPACE switch is ignored andthe default PostgreSQL tablespace (`pg_default`) is used instead. • If you use the AUTODROP switch to drop tables, any tablespaces specified in the switch arguments are ignored.
Data types	The `text` data type is not supported in ODBC data source data files. If you are using PostgreSQL with ODBC data source data files, use the `varchar` data type with no size specification instead.

For information about creating the database structure, see *System Administration* in the Exstream Design and Production documentation.

Converting an Existing Database to a PostgreSQL Database

If you are converting an existing design or tracking database to PostgreSQL, you must first update your existing database to the current version of Design and Production before you can convert the database to PostgreSQL.

The following table provides an overview of the steps required to convert an existing design or tracking database to a PostgreSQL database:

Step	Explanation	Links
1. Update your existing design or tracking database to the current version of Design and Production.	This step involves using the Database Administrator utility in Design and Production version 16.2.1 or later to update your existing design database. You must use the Database Administrator utility in Design and Production version 16.3.0 or later to update your tracking database. If you are converting an existing SBCS database to a PostgreSQL database, you must first upgrade the database structure to DBCS. You can then convert the DBCS database to a PostgreSQL database. **Important:** If you are using a single-byte character set (SBCS) database and are upgrading Exstream from a version of Design and Production earlier than 8.0, then you must first upgrade to a version between 8.0 and 16.4.0, and then convert all of your SBCS databases to the double-byte character set (DBCS). If you are upgrading to the current version of Exstream from 8.0 or later, or if you are using a DBCS database from an earlier version of Exstream, then there are no additional upgrade considerations for your database. For more information about upgrading SBCS databases, see "Database Conversion from SBCS to DBCS" on page 45.	• *System Administration* in the Exstream Design and Production documentation
2. Open the updated database in Design Manager.	If the existing database was created in a version earlier than 16.2.1, you must open the updated database in Design Manager to ensure that any additional updates performed by Design Manager are complete and your database has been correctly updated to the current version.	
3. Copy the updated database to a PostgreSQL database.	This step involves using the Database Administrator utility to perform the following actions: 1. Create an empty PostgreSQL database. 2. Copy the updated database into the empty PostgreSQL database.	*System Administration* in the Exstream Design and Production documentation

3.4.5 64-bit Design Environment

As of version 16.2.0, Design and Production provides a 64-bit design environment. The 64-bit environment provides better memory allocation for several processes, such as being able to package much larger applications without running out of memory.

However, as a result of the 64-bit installation, compatibility with some previously-supported components has changed.

This section discusses the following topics:

32-bit Incompatibility

Because the design environment of Design and Production version 16.2.0 is a 64-bit installation, some 32-bit Exstream tools are no longer compatible. The following tools are not supported for Design and Production version 16.2.0 and later:

- Exstream Remote Collaboration
- Exstream Application Manager (EAM)

Note: Both Remote Collaboration and EAM are still supported for previous 32-bit installations, so if you have installed a version prior to 16.2.0, you can still use these tools with the 32-bit version.

Sample and Tracking Databases

Sample database

Beginning with Design and Production version 16.2.0, a sample design Access database is no longer provided during installation. Application XOB files that contain sample applications are available and can be downloaded from My Support at http://support.opentext.com.

Tracking database

A default tracking database is no longer provided during installation of Design and Production version 16.2.0 or later. You can set up your own tracking database using the instructions found in *Managing Marketing Messages* in the Exstream Design and Production documentation.

SBCS DB2 Databases

Due to database page size limitations, if you are using an SBCS DB2 database from a Design and Production version earlier than 8.0, you must upgrade the database in order to use it with version 16.2.0 or later. Follow the steps below to convert the database from an SBCS to a DBCS data structure, and then upgrade it to work with version 16.2.0.

To convert and upgrade an SBCS DB2 database:

1. Convert the SBCS DB2 database to a DBCS database using an Exstream version between 8.0 and 9.5.3.

> **Important:** Before continuing, Exstream version 16.2.0 or later must be installed.

2. Using the Database Administrator utility (`DBAdmin.exe`) from the 16.2.0 installation, update the new database.

3.4.6 System Requirements for Windows Platforms in 16.2.0 and Later

Design and Production version 16.2.0 and later requires updated versions of the following software:

- The following operating system updates:
  - **Windows 8.1 or Windows Server 2012 R2:** April 2014 update rollup for Windows RT 8.1, Windows 8.1, and Windows Server 2012 R2 (KB2919355)
  - **Windows 7 or Windows Server 2008 R2:** Service Pack 1 for Windows 7 or Windows Server 2008 R2
  - **Windows Server 2008:** Service Pack 2 for Windows Server 2008
- Microsoft Visual C++ 2013 Redistributable Package (x64)
- Microsoft Visual C++ 2015 Redistributable Package (x64)

> **Important:** The operating system updates need to be installed prior to installing the Microsoft Visual C++ 2015 package, otherwise the redistributable package will have to be reinstalled.

When you install the Design and Production design environment, the Microsoft Visual C++ 2013 Redistributable Package (x64) and Microsoft Visual C++ 2015 Redistributable Package (x64) are automatically installed.

When you install only the production environment, you must manually install the Microsoft Visual C++ 2013 Redistributable Package (x64) and Microsoft Visual C++ 2015 Redistributable Package (x64), and run the following executables (included in the engine zip file) based on your production environment:

32-bit production environment

- vcredist_x86.exe
- vc_redist.x86.exe

64-bit production environment

- vcredist_x64.exe
- vc_redist.x64.exe

For more information about the system requirements for Design and Production, see "System requirements" on page 6.

3.4.7 System Requirements for IBM AIX Platforms in 9.5.304 and Later

The Exstream production engine version 9.5.304 and later requires the following software:

- IBM AIX, version 6.1 or later
- IBM XL C/C++ for AIX, version 13.1.3

When you upgrade your production environment from a previous version of Exstream, you must make sure that you have installed the correct version of the IBM AIX operating system and the required runtime library.

For more information about the system requirements for the Exstream production engine, see "Installing the Production Environment" on page 18.

3.4.8 Bar Charts, Stacked Bar Charts, and Floating Bar Charts

Exstream versions 9.5.201 and later provide the capability of adding a line chart overlay to the bar chart and stacked bar chart types. This new functionality is also available in version 8.6.117 and later maintenance releases, and in version 9.0.112 and later maintenance releases. Previously, you could add an overlay only to the floating bar chart or scattergram chart types.

As part of the change in overlay functionality, the floating bar chart type was removed from Designer because its functionality has been merged with that of the stacked bar chart. Although the floating bar chart is no longer available for new designs, any floating bar charts used in existing designs will still work as designed when you upgrade to Exstream version 9.5.201. Existing floating bar charts will be automatically converted to stacked bar charts with overlays if they are edited and saved in Designer.

For information about adding overlays to bar charts, see *Designing Customer Communications* in the Exstream Design and Production documentation.

Additionally, the floating bar chart type is still supported for the import of legacy DXF files, and for exporting to DXF from a legacy design containing floating bar charts. If you edit and save an existing floating bar chart in Designer, it will be automatically converted to a stacked bar chart with overlay, and any new export to DXF from that point forward will contain the stacked bar chart type.

For information about using DXF files, see *DXF Reference* in the Exstream Design and Production documentation.

3.4.9 Collection of Anonymous Usage Data

Beginning with Exstream version 9.5.301, OpenText collects and analyzes anonymous data about how Designer and Design Manager are being used. This data is used to continually improve the performance and functionality of Exstream. To learn more about OpenText data collection and view the OpenText privacy policy, visit http://www.opentext.com/who-we-are/copyright-information/site-privacy.

When you use the Database Administrator utility to update or create a database for use with Exstream version 9.5.301 or later, you receive a message that notifies you of the OpenText data collection and privacy policy. To continue with the database update or creation process, you must accept the anonymous data collection and usage statement by clicking **OK** on the message dialog box.

> **Note:** If you run the Database Administrator utility from the command line to update or create a database for use with the software versions specified above, then you must use the ACCEPT_PRIVACY_STATEMENT switch when initiating the database update or creation process. This switch acknowledges that you have read and accept the anonymous data collection and usage statement provided at https://analytics.exstream.com/privacy/en-US/index.html.
>
> For more information about updating or creating databases from the command line, see AUTOCREATE and AUTOUPDATE.

You can write a sample of the usage data being collected by OpenText to a local file, so that you can review the kinds of data being collected and verify that no sensitive information is included. For more information about compiling a sample of the usage data collected by OpenText, see *System Administration* in the Exstream Design and Production documentation.

If you have additional questions about Exstream usage analytics, contact OpenText Customer Support at http://support.opentext.com.

3.4.10 Complex Text Support

Exstream provides settings to properly render complex text in designs that use non-Latin DBCS character sets (such as Arabic, Cambodian (Khmer), Farsi, and Hebrew). These settings enhance the appearance of complex text both on the screen in Designer, as well as in output produced by the engine. Complex text layout functionality is available for the following output types:

Output type	Specific formats
AFP	
DLF	
DOCX	
HTML	EDGAR HTML, HTML, and HTML (email)
PDF	
PostScript	
RTF	
XML	XML (composed), XML (content), XML/JSON (data), and XML (multi-channel)

What do we mean by complex text? For the purposes of Exstream, text is considered complex if it exhibits one or more of the following characteristics:

- Is written right to left
- Can be written bidirectionally (can contain a mixture of right-to-left and left-to-right text)
- Uses context-sensitive shaping (characters that are shaped differently depending upon the characters that surround them), combined characters, and/or ligatures
- Uses fonts that contain multiple representations of a particular non-Latin DBCS character

The complex text functionality introduced in Exstream version 9.5 consists of three main controls in Design Manager:

- The **Enable complex text layout** check box—This system-wide setting is located in the **System Settings** (**Environment > System > System Settings > Text and Fonts** tab) and applies to all applications in your database. When you select this check box, Exstream includes extra font information in your package files so that complex text characters are rendered properly in output produced by the engine. Selecting this check box also ensures that complex text characters appear correctly in Designer. For best results, you should always use this setting if your design contains languages that use context-sensitive shaping, combined characters, and/or ligatures (such as Arabic, Cambodian (Khmer), Farsi, and Hebrew).

  Depending on the number of fonts that your application contains, when you enable complex text layout, you will likely see an increase in the time needed to package your applications, the size of the package file, and the time it takes to run the engine. If your database contains a large number of fonts, you should expect to see more of an increase in those three areas. Additionally, because of the extra positioning information necessary to properly render complex text characters, enabling complex text layout functionality in your database will likely result in larger output files produced by the engine.

Keep in mind that the **Enable complex text layout** setting affects non-Latin DBCS languages, including those that do not use context-sensitive shaping, combined characters, and/or ligatures. For such languages, enabling complex text layout will cause minor pixel differences in the position of characters in output when you compare it to output produced in earlier versions of Exstream. You should keep this pixel shift in mind as you test engine output.

Important: If your database uses only SBCS character sets and/or Latin-based DBCS character sets, then you should *not* select the **Enable complex text layout** check box.

- When you select the **Enable complex text layout** check box, a drop-down list becomes available that allows you to limit complex text functionality to certain scripts, which can be helpful if you have existing applications that contain non-Latin DBCS languages that do not require complex language support. For example, if your application contains Chinese, Greek, and Farsi, and you do not want to have to retest your Chinese and Greek output because of the minor pixel differences created by complex text functionality, you can apply this setting to only the Arabic script so that you receive the benefit from complex text layout in Farsi but your Chinese and Greek output remain unchanged.
- The **Language system tag** field—This field is available on DBCS language objects (in the **DBCS settings** section of the language object properties) only when the **Enable complex text layout** check box is selected in the **System Settings**. This setting lets you specify an optional language code so that Exstream can properly display the specific font characters used by the language object. Although this setting is optional, specifying a language system tag is especially useful when there are multiple options within a font for how a particular glyph or ligature can appear. The **Language system tag** setting does not affect packaging time or size.

Note: After you have upgraded to Exstream version 9.5 or later, you should first validate that your applications work properly before enabling the complex text layout functionality.

Keep in mind that complex text functionality is not necessary for all languages. Use the following table to determine whether you should enable complex text layout for your database:

Which languages should use complex text layout functionality

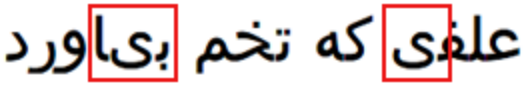
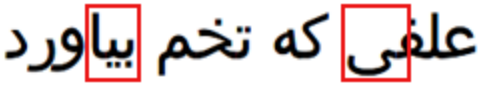
Language	Script	Complex text layout	Language system tag*
Any SBCS language	Multiple	Do not use	N/A
Any Latin-based DBCS language	Multiple	Do not use	N/A
Arabic	Arabic	Recommended	ARA
Cambodian	Khmer	Required	KMH
Chinese	Han	Recommended	ZHS

Which languages should use complex text layout functionality, continued

Language	Script	Complex text layout	Language system tag*
Dari	Arabic	Required	DRI
Farsi	Arabic	Required	FAR
Hebrew	Hebrew	Recommended	IWR
Japanese	Han, Kana	Recommended	JAN
Korean	Han, Hangul	Recommended	KOR
Lao	Lao, Thai	Recommended	LAO
Thai	Thai	Recommended	THA
Urdu	Arabic	Required	URD

*You can use language system tags not specified by Exstream, but your results might vary. If you use an unrecognized language system tag, characters in the affected language might not appear as expected in Designer or in output produced by the engine. It is important that you test language system tags thoroughly before using them in a production environment.

Notice that, for a handful of the languages in the table, complex text layout is required; for the remainder, complex text layout is simply recommended. For the languages that require it, if you do not enable complex text layout, the text for those languages will not be correct in Designer or in the output produced by the engine. For example, when you compare snippets of Farsi text with complex text layout on against the same snippets with complex text layout off, you significant differences in context-sensitive shaping, combined characters, and ligatures:

Farsi text with complex text layout OFF	
Farsi text with complex text layout ON	

For the languages in the table listed as recommended but not required, you can weigh the pros and cons of enabling complex text layout on a case-by-case basis. For example, if you have used a complex text language prior to Exstream version 9.5 and you are happy with its appearance in Designer and in output produced by the engine, you can exclude the script associated with that language so that complex text layout is not applied. However, with complex text layout enabled, you will likely see improvements in overall appearance for each recommended language. You should individually test each recommended language that you use in order to determine whether the overall improved appearance is worth the extra resources necessary to process complex text during packaging and engine runs. (See *System Administration* in the Exstream Design and Production documentation for more information about how complex text layout affects packaging and engine performance.)

For more information about using complex text layout functionality in Exstream, see the "Languages" section of "Chapter 4: Working with Languages and Locations" in *System Administration* in the Exstream Design and Production documentation.

3.4.11 Container Designs

Exstream version 9.5 provides an improved method for handling drawing objects that you want to use in one or more container designs but not the standard design for a particular page object. In previous versions, you had to manually move any such objects out of the standard design and into the pasteboard area. In version 9.5 and later, objects that you create while working with a container design are no longer placed directly into the standard design by default, but instead are added to the new **Available Objects** section in the Outline Viewer.

Keep in mind that when you upgrade a design to Exstream version 9.5 or later, any drawing objects that you previously placed in the pasteboard area of the standard design stay in place and are not automatically moved to the **Available Objects** section. Objects in the standard design that appear in the pasteboard area (outside of the printable area) still do not appear in output that you produce from the standard design, but they remain in the **In Use Objects** section of the Outline Viewer. If you want to use the new Available Objects functionality with existing objects in the pasteboard area of the standard design, you can manually remove them from the standard design (by right-clicking and selecting **Remove from standard design**).

For more information about creating container designs, see *Designing Customer Communications* in the Exstream Design and Production documentation.

3.4.12 Data Sections and Recipients in XML Data

Exstream version 9.5 provides an improved method for identifying the end of data sections and recipients in XML data. In previous versions, data sections and recipients automatically ended when the next data section or recipient start tag occurred in the data, or ended when the next customer tag occurred in the data. However, in version 9.5 and later, by default any data sections or recipients in the new XML data files that you create end at the end tag for that data section or recipient. The following table illustrates how the different methods for identifying the end of data sections and recipients can impact the way in which the engine reads the data:

Ending method	Example in XML data

End data sections and recipients at the next starting tag	In the following data example, the content in bold represents Section A:
	`<customer>`
	`<name>Fred</name>`
	`<sectionA>`
	`<transaction>200.00</transaction>`
	`</sectionA>`
	`<address>Lexington</address>`
	`<sectionB>`
	`<date>October</date>`
	`</sectionB>`
	`</customer>`
	Notice that if you choose to end data sections and recipients at the next starting tag, then any additional data that exists between the data section or recipient end tag and the next data section or recipient start tag is included as a part of the previous data section or recipient, regardless of where the data section or recipient end tag is in the data source. For example, in the above XML data sample, the `<address>` tag is a part of `<sectionA>`.
	NOTE: Ending data sections and recipients at the next starting tag is recommended only for backward compatibility with Exstream version 9.0 and earlier. Ending data sections and recipients at the next starting tag can limit your access to some XML data resources, depending on your XML data source.

End data sections and recipients at the end tag of the data section or recipient	In the following data example, the content in bold represents Section A:
	`<customer>`
	`<name>Fred</name>`
	`<sectionA>`
	`<transaction>200.00</transaction>`
	`</sectionA>`
	`<address>Lexington</address>`
	`<sectionB>`
	`<date>October</date>`
	`</sectionB>`
	`</customer>`
	Notice that if you choose to end data sections and recipients at the end tag of the data section or recipient, then any additional data that exists between the data section or recipient end tag and the next data section or recipient start tag belongs to the next level up in the data hierarchy. For example, in the XML data sample above, the `<address>` tag is customer level data.

Keep in mind that your preferences for ending data section and recipient mappings are applied to all data sections and recipients within a data file. This means that you cannot mix preferences for ending data sections and recipients within the same data file. For example, you cannot have one data section that ends at the corresponding end tag and have a separate data section that ends at the next starting tag. However, you can choose different ending preferences for different data files, based on the needs of your data source setup.

You can change the ending preferences for data sections and recipients as needed for backward compatibility using the **End section(s) or recipient(s) at closing tag** check box on the **Advanced** tab of the XML data file properties. When you upgrade, the **End section(s) or recipient(s) at closing tag** check box is cleared by default on all existing XML data files to maintain the original functionality, and data sections and recipients end at the next instance of the starting tag, or end at the next customer. However, if you create a new XML data file, the

End section(s) or recipient(s) at closing tag check box is selected by default, and data sections and recipients end at the end tag of the data section or recipient.

To change the end tag preferences for data sections and recipients in XML data for backward compatibility:

1. Drag the XML data file to the Property Panel.
2. Click the **Advanced** tab.
3. Clear the **End section(s) or recipient(s) at closing tag** check box.

   NOTE: Ending data sections and recipients at the next starting tag is recommended only for backward compatibility with Exstream version 9.0 and earlier. Ending data sections and recipients at the next starting tag can limit your access to some XML data resources depending on your XML data source.

4. From the Menu bar, select **Edit > Save**.

3.4.13 HTML (Web) Output

Exstream version 9.5 provides the capability to produce HTML5 output using an HTML output object, and some of the properties of the HTML output object have changed.

This section discusses the following topics:

Selecting an HTML Version and Producing MIME HTML

In previous versions, the HTML output object produced either HTML 4.01 Transitional output, or, if you selected the **Create web archive with all files** check box, MIME HTML (MHTML) output. A new **Version** drop-down list has been added to the HTML output object, which allows you to select HTML5 output, HTML 4.01 Transitional output, or MIME HTML output. Note that the new drop-down list also replaces the old **Create web archive with all files** check box.

To avoid unexpected changes in your existing HTML (web) output, when you upgrade an existing database that includes an HTML output object (or when you use an XOB file to load an HTML output object that was unloaded from a database in a version earlier than 9.5), one of the following selections will automatically be made in the new **Version** drop-down list:

If, prior to the upgrade	Then, after the upgrade
The **Create web archive with all files** check box was cleared	The **4.01 Transitional** option is automatically selected from the **Version** drop-down list.
The **Create web archive with all files** check box was selected	The **MIME** option is automatically selected from the **Version** drop-down list.

Keep in mind that when you create a new HTML output object in Exstream version 9.5 or later, the default selection from the **Version** drop-down list is **5**.

For more information about selecting the version of HTML output, see *Creating Output* in the Exstream Design and Production documentation.

Specifying Where Styles are Included in HTML (Web) Output

In version 9.5, the **Include styles at top of each file** check box has been replaced by the new **Create external cascading style sheet** check box, which specifies whether the styles used in the HTML (web) output are defined in an external Cascading Style Sheets (CSS) file, or are included at the top of each HTML file. When you upgrade an existing database that includes an HTML (web) output object (or when you use an XOB file to load an HTML (web) output object that was unloaded from a database in a version earlier than 9.5), the appropriate selection is automatically made for the new check box, and the location of styles in your output is not changed. The following table correlates the selection on the previous check box to the selection you'll see on the new check box, and the resulting location of styles in the output:

If, prior to the upgrade	Then, after the upgrade	Location of styles in the output, both before and after the upgrade
The **Include styles at top of each file** check box was cleared	The **Create external cascading style sheet** check box is selected.	An external CSS file produced with the HTML output (or a separate file part in MHTML output)
The **Include styles at top of each file** check box was selected	The **Create external cascading style sheet** check box is cleared.	At the top of each HTML file

Keep in mind that HTML 4.01 Transitional output and MIME HTML output can also include inline styles that are specified within individual elements.

For more information about specifying where styles are included in HTML (web) output, see *Creating Output* in the Exstream Design and Production documentation.

Producing HTML (Web) Output with Included Styles on a z/OS Platform

Beginning in version 9.5, when you include style information at the top of the HTML file, the engine uses a temporary file to generate HTML 4.01 Transitional or HTML5 output. If you are producing HTML 4.01 Transitional or HTML5 output on a z/OS platform, you must now allocate a temporary file (`DD:TEMP`) before running the engine. The space allocated for the temporary file must be at least as large as the entire HTML file, including style information.

3.4.14 Multiplicity for Arrays

To make sure that **Multiplicity for arrays** options are applied accurately and to only the appropriate data files, the behaviors of the options in the **Multiplicity for Arrays** area of the **Tag Mapping Properties** dialog box changed in version 9.5. If you use **Multiplicity for Arrays** options in your database, review the following table to see how changes to these options in 9.5 can affect the settings in your database when you upgrade:

Version	Behavior
9.5 or later	As of version 9.5 and later, the **Multiplicity for arrays** options are available only for Report files, Post-sort report files, and Auxiliary layout files. The **Multiplicity for arrays** area no longer appears on the UI for Customer driver files, Reference files, Initialization files, and Post-sort Initialization files. The **Multiplicity for arrays** options are not applicable to these data file types.

8.0	If you upgrade from version 8.0 to version 9.5 or later, you encounter the following behaviors:
	
	• For Customer driver files, Reference files, Initialization files, and Post-sort Initialization files, the **Multiplicity for arrays** area no longer appears on the UI. The **Multiplicity for arrays** options are not applicable to these data file types. This change should not impact your output.
	
	Note: If you used any non-default settings in the **Multiplicity for arrays** options, and also selected the **Use previous value if missing** check box, then the **Use previous value if missing** check box is cleared upon upgrade. Otherwise, the check box settings persist based on your original settings.
	
	• For Report files, Post-sort report files, and Auxiliary layout files, you encounter one of the following behaviors depending on the I/O timing of the data file that you upgrade:
	  • If the **I/O timing** of the data file is set to **As determined by record properties**, the **Multiplicity for arrays** options are not applicable to data files with this **I/O timing** setting. As of version 9.5 and later, the **Multiplicity for arrays** area no longer appears on the UI for data files with this **I/O timing** setting. These changes should not impact your output.
	  • For all other **I/O timing** settings the **Multiplicity for arrays** options persist based on your original settings.

7.0	The **Multiplicity for arrays** options persist based on your original settings.

3.4.15 System Requirements for Windows Platforms in 9.5 and Later

Design and Production version 9.5 and later requires updated versions of the following software:

- Microsoft Visual C++ 2013 Redistributable Package
- Microsoft .NET Framework version 4.5.2

When you upgrade from a previous version of Exstream, you must make sure that you have installed the correct version of the Microsoft .NET Framework. When you install the design environment, the Microsoft Visual C++ 2013 Redistributable Package is automatically installed.

When you install only the production environment, you must install the Microsoft Visual C++ 2013 Redistributable Package separately. This package is included in the engine ZIP file.

Previous versions of Exstream required the Microsoft Visual C++ 2008 Redistributable Package and the Microsoft .NET Framework version 3.5 SP1.

For more information about the system requirements for Design and Production, see "System requirements" on page 6.

3.4.16 Hyperlinks and Live Documents

Exstream version 9.0 provides updates to features that you use when you apply hyperlinks to text.

For applications that produce Live documents, if you previously included hyperlinks on text, such as www.opentext.com, you must now select the action that an end user will perform to follow the hyperlink address. You can choose whether an end user will use a single click or use `CTRL + Click` to follow a hyperlink on text. The previous default action was a single click. The new default action is `CTRL + Click`.

For more information about applying hyperlinks to text that is included in Live documents, see *Designing for LiveEditor* in the Exstream Design and Production documentation.

3.4.17 PDF Accessibility

In Exstream version 9.5.201, and in version 9.0.112 and later maintenance releases, the **Use accessibility tags** check box has been replaced by the new **Accessibility standard** drop-down list, which specifies the accessibility standard to apply to the PDF output for use with screen readers and text-to-speech converters. When you upgrade an existing database that includes a PDF output object (or when you use an XOB file to load a PDF output object that was unloaded from a database in a version earlier than 9.0), the appropriate selection is automatically made from the new drop-down list, and the accessibility settings in your output are not affected.

The following table shows the correlation between the original check box setting and the corresponding option on the new drop-down list:

If, prior to the upgrade	Then, after the upgrade
The **Use accessibility tags** check box was cleared	The **Accessibility standard** drop-down list is set to **None**.
The **Use accessibility tags** check box was selected	The **Accessibility standard** drop-down list is set to **WCAG 2.0**.

For more information about optimizing a design for PDF accessibility tools, see *Designing Customer Communications* in the Exstream Design and Production documentation.

3.4.18 Superscripted and Subscripted Text

Exstream version 8.5 and later provides updates to features used to apply superscript and subscript formatting to text.

If you use tag sets in your design, you can use the **Superscript** and **Subscript** features on the **Text** tab of the tag set object properties in Design Manager to define tags that apply superscript and subscript formatting to the tagged text at run time.

For all other text, you can use the following formatting features in Designer:

- The **Adjust Baseline** feature on the **Format** menu—This feature lets you adjust the point size by which to adjust text above or below the baseline without changing the font size of the text.

  > **Note:** The **Nudge Superscript** and **Nudge Subscript** features on the **Format** menu have been renamed to **Nudge Baseline Up** and **Nudge Baseline Down**. The functionality has not changed.

- The **Superscript** and **Subscript** buttons on the Formatting toolbar—These features adjust the text above or below the baseline and change the font size proportionally to the surrounding text. For best results in existing designs, update all superscripted or subscripted text (for example, trademark or copyright symbols) using these features.

3.4.19 Keys and Licensing

Exstream 8.0.301 and later now supports floating licensing, as well as node-locked licensing. Due to expanded licensing support, all customers upgrading to Exstream 8.0.301 and later must obtain and install a new key.

When you upgrade to Exstream 8.0.301 or later, you can decide which licensing method you will use going forward. You can continue with your current licensing method (node-locked), or you can upgrade to the floating license method. You can switch to floating licensing any time after you have upgraded to Exstream 8.0.301 or later.

For information about installing a license key and using node-locked and floating licenses, see*System Administration* in the Exstream Design and Production documentation.

3.4.20 Local User Dictionaries

Exstream creates the local user dictionary the first time you right-click a word in Designer and select **Spell Check > Add Word**.

Exstream versions 7.0.613 and earlier create the local user dictionary (`ExstreamPersonal.tlx`) as a `.tlx` file in the install directory.

For example:

```
C:\Program Files\Hewlett-Packard\HP Exstream\HP Exstream <version>\
ExstreamPersonal.tlx
```

Exstream versions 8.0.3 and later create the local user dictionary (`ExstreamPersonal.txt`) as a `.txt` file in the user's document directory.

For example:

```
C:\Users\<username>\Documents\OpenText\Exstream\ExstreamPersonal.txt
```

When you upgrade from Exstream version 7.0.613 or earlier to Exstream version 8.0.3 or later, the `ExstreamPersonal.tlx` file is converted to a `.txt` format (`ExstreamPersonal.txt`).

However, if you want to retain your local user dictionary when you upgrade to Exstream version 7.0.613 and later, you must copy your existing `ExstreamPersonal.tlx` file from the install directory of the previous version of Exstream to the corresponding location.

Note: When you upgrade to Exstream version 8.0.3 or later, you receive a message asking if you want to convert the local user dictionary from a `.tlx` file to a `.txt` file. You cannot use the local user dictionary file until it has been converted to the `.txt` format.

3.4.21 Spelling Dictionaries

Due to the changes related to the expanded support of dictionary languages in Exstream 8.0.301 and later, you will notice slight differences in spell check functionality after upgrading. Examples of these differences include the following:

- You no longer must select a check box to check for lowercase words for improper case because the engine now handles it automatically.
- You can no longer select to ignore all words that are fully capitalized (for example, acronyms or abbreviations). Unless it is a well-known acronym or abbreviation, or you have added it to the local user dictionary or the Exstream dictionary, words that are fully capitalized will be marked as misspelled.

For information about setting up spelling dictionaries, see *System Administration* in the Exstream Design and Production documentation.

3.4.22 Database Changes Due to Design User Name Conversion

Exstream 8.0.201 and later versions uses Object Identifier (OI) integer values instead of strings to associate users with database objects. Therefore, when you upgrade to 8.0.201 or later, Exstream must convert all user name strings to OI integer values during the first login to Design Manager, Designer, or Logic Designer. Exstream automatically runs the conversion during your

first login after upgrading. The conversion occurs in design databases. Design user names do not change and appear the same in your Library. External users (previously known as "system users") that are included in a design group are converted to design users and will appear in the Library. During conversion, the **User Management Conversion** dialog box appears. This dialog box is for informational purposes only and does not require a response.

Before conversion, some user fields, such as the **Created** field on the **Administration** dialog box, might be populated with strings that do not represent actual design users. The conversion process creates design users for these strings. By default, these design user logins are disabled.

After the conversion is complete, Exstream adds an event log record to the Exstream event log. To view the Exstream event log, select **Tools > View event log**.

3.4.23 RGB Images and AFP Output

Exstream version 8.0 and later no longer supports the utility that previously allowed you to apply image optimization settings to AFP output and create CMYK FS45 resources from RGB images. In Designer, the utility was previously controlled using the **Image Optimization** drop-down list on the **Advanced** tab of an AFP output object.

If you previously used this utility to prepare print resources for post-processing tools, such as InfoPrint, you must now apply image optimization to images externally from Exstream before you import the images into your design. For more information about image processing utilities, refer to the IBM documentation.

For more information about image optimization in AFP output, see “Differences in Output After an Upgrade” on page 67

3.4.24 Tables

In the 8.0 release, the **Table Properties** dialog box was updated to provide a more consistent design experience for interactive documents. These changes are visible in both interactive and non-interactive design environments.

If you have not licensed the Live Design module, you will notice the following change: the **Enable expand/collapse** check box (previously located on the **Table** tab of the **Table Properties** dialog box) has been disabled for non-interactive environments. This features is intended for use in interactive documents only, and has therefore been moved to the **Interactive** tab of the **Row Properties** dialog box to provide a more intuitive design experience. If you used this features in traditional Design and Production applications, you should check your output after the upgrade is complete.

If you have licensed the Live Design module, in addition to the previously described change, other differences will be apparent in the **Table Properties** dialog box. Since it is intended for use only in Live documents, the **Enable show/hide rows** check box has been removed from the **Table Properties** dialog box and moved to the **Interactive** tab of the **Row Properties** dialog box. In addition, several other properties related to editing tables in Live documents have been

moved from the **Interactive** tab on the table properties to the **Interactive** tab on row properties to provide you with more granular control over the types of changes that can be made to tables. Any properties previously set in applications will be transferred to the new location after the applications are upgraded, and the previous table behavior will remain the same.

The following table describes all the table property differences affecting Live users in Design and Production 8.0 and later:

Changes in table properties

Pre-8.0 Features	Changes in 8.0 and later versions
Enable expand/collapse check box and **Enable show/hide rows** check box	Previously, the **Enable expand/collapse** check box and the **Enable show/hide rows** check box were located on the **Table** tab of the **Table Properties** dialog box. These check boxes have been moved from the **Table** tab to the **Interactive** tab on row properties and are therefore now supported only in Live applications. The accompanying **Expand/collapse variable** box (previously on the **Automated Row Properties** tab) has been moved to the **Interactive** tab of row properties that start the section header.
Text edit check box on the **Interactive** tab	This check box is now disabled for all table types except for simple. Editing table contents is controlled using Interactive areas and/or variables in table cells.
Text format check box on the **Interactive** tab	This check box is disabled for all table types except for simple.
Properties check box on the **Interactive** tab	This check box has been removed.
Duplicate rows check box on the **Interactive** tab	This check box has been moved to the **Interactive** tab of individual automated row properties.
Remove rows check box on the **Interactive** tab	This check box has been moved to the **Interactive** tab of individual automated row properties.
Size rows check box on the **Interactive** tab	This check box has been moved to the **Interactive** tab of individual non-automated row properties and renamed to **User can adjust height**.
Insert rows check box on the **Interactive** tab	This check box has been moved to the **Interactive** tab of individual automated row properties.
Content change drop-down list on the **Interactive** tab	The **Required** option has been removed, since in previous versions, **Required** behaved the same as **Optional**. Upon upgrade, any tables with the **Content change** property set to **Required** will be changed to **Optional**.

3.5 Upgrade Considerations for Font Appearance on Windows 7 or later

Due to changes made to the core fonts in the Microsoft Windows 7 operating system, some fonts might appear slightly different than fonts packaged on an earlier version of Windows. For

example, when using Arial bold, the lowercase "w" appears slightly different on Windows 7 than on Window XP Professional. This difference might not be visibly discernible for smaller font sizes, but if you are using tools (such as Exstream Output Compare) to electronically compare outputs, pixel-level changes might be detected. However, font metrics (that is, character widths, character heights, and kerning values) are not affected.

You can retain the original appearance of fonts by overriding the Windows 7 version of a font in the Windows settings.

To override the Windows 7 version of a font:

1. From the source of your choice (for example, an earlier version of Windows), retrieve a copy of the Windows font that you want.
2. Add the font to a folder on the Windows 7 computer.

   Do not add the font to the main Windows font folder.
3. Open the registry on your Windows 7 computer.
4. Navigate to the following key:

   ```
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Fonts\
   ```
5. Locate the font subkey that you want to override and modify its value to the path and filename that you added in step 2.
6. Close the registry and restart your computer.

   After you restart your computer, Windows uses the added font rather than the font that was pre-loaded on Windows 7.

3.6 Differences in Output After an Upgrade

Due to the many feature enhancements and defect fixes available in Exstream version 16.6.0, upgrading from a previous version can cause differences—some visual, some not—in your output.

In some cases, you can use backward compatibility switches to revert behavior to a previous version. For more information about using backward compatibility switches, see “Using Backward Compatibility Switches to Manage Differences” on page 70.

The following table sections identify which features used in an application might be affected during the upgrade process, and provide instructions on how to revert to your application's previous behavior or output appearance when applicable:

Known differences in output after upgrading to Design and Production version 16.6.0

Related feature	Previous version(s)	Description of differences/resolution
Complex text languages	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, if you are using complex text languages and you are working with languages that do not use spaces between words—for example, Cambodian (Khmer), Lao, and Thai—you might notice a change in the line breaks in your output. This visual difference is the result of upgrades made to the International Components for Unicode (ICU) libraries. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the line breaks in your previous output, you can fine-tune where your text can break using the break control options available in Designer. For information on how to use break control options, see *Designing Customer Communications* in the Exstream Design and Production documentation
HTML output, HTML (email) output	All	**Description:** After upgrading to version 16.3.0, you might notice binary differences in your HTML or HTML (email) output. These differences are due to a change in the way that Exstream formats automatically-generated HTML `id` attribute values. In version 16.3.0, the default format was changed to include the prefix `ex-` (for example, `id="ex-textbox1"`). Note that this change does not affect custom HTML `id` attribute values in the HTML output, only the engine-generated `id` values. **Resolution:** This is expected behavior. If you want to revert to the previous output that does not include the prefix, add the USE_UNPREFIXED_INTERNAL_HTML_IDS switch to the control file and run the engine.
HTML (email) output	All	**Description:** After upgrading to version 16.3.0, you might notice HTML structure and binary differences in your HTML (email) output. These differences are due to an upgrade of HTML (email) output to use the 8-bit UTF-8 character set instead of the previously used 7-bit ASCII character set. **Resolution:** This is expected behavior. If you want to revert to the previous output, add the USE_7BIT_EMAIL switch to the control file and run the engine.
HTML import	9.5	**Description:** After upgrading to version 16.2.0 or later, you might notice a change in text wrapping around floated objects that follow an HTML placeholder variable in Designer. This visual difference in the output is the result of the addition of float and clear support in Designer. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the CLEAR_FLOATS_FROM_HTML_IMPORT switch to the control file and run the engine.

Known differences in output after upgrading to Design and Production version 16.6.0, continued

Related feature	Previous version(s)	Description of differences/resolution
HTML output	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, you might notice a change in the font applied to bullets in lists that included a mix of bullets and numbers. This visual difference is the result of a change that fixed how bulleted and numbered lists are formatted in HTML output. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the USE_OLD_HTML_NUMBERING_FONT_AFTER_BULLETS switch to the control file and run the engine.
HTML output, HTML (email) output	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, you might notice additional paragraph breaks between consecutive text paragraphs that had any of the following styles applied to both of them: first line indent, space above, space below, a frame style, or a clear. This visual difference is the result of a change that fixed the HTML structure in the output. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the DONT_FORCE_NEW_PARAS_WITH_STYLES_IN_HTML switch to the control file and run the engine.
HTML (email) output	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, you might notice a change in the formatting of bulleted and numbered lists when viewing the output in some mail clients or web browsers. This visual difference is the result of a change that fixed how bulleted and numbered lists are formatted in HTML (email) output. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the USE_OLD_EMAIL_LISTS switch to the control file and run the engine.
RTF output	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, if you have a table with multiple header rows, all of them will now appear in the output. This visual difference is the result of a change that fixed how tables are created in RTF output. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the SKIP_MULTIPLE_HEADER_ROWS_IN_RTF switch to the control file and run the engine.

Known differences in output after upgrading to Design and Production version 16.6.0, continued

Related feature	Previous version(s)	Description of differences/resolution
RTF output	8.0, 8.6, 9.0, or 9.5	**Description:** After upgrading to version 16.2.0 or later, you might notice table header rows in your output that were not previously marked as header rows. This visual difference is the result of a change that fixed how table header rows are marked in RTF output. **Resolution:** This is expected behavior and requires no action on your part. However, if you want to revert to the previous output, add the ONLY_USE_REPEATING_HEADER_ROWS_FOR_RTF_TABLES switch to the control file and run the engine.

3.7 Using Backward Compatibility Switches to Manage Differences

If you notice differences in output after an upgrade, and you want the output to appear the same as it did in a previous version of Exstream, you can use backward compatibility switches as a temporary measure to suppress changes in the output that were caused by enhancements and fixes in the newer version of Exstream. For information about specific backward compatibility switches, contact your Exstream account manager.

To collectively apply all of the backward compatibility switches that have been implemented since a specific previous version of Exstream, you can use the ENABLE_BACKWARD_COMPAT engine switch. When you use the ENABLE_BACKWARD_COMPAT switch, the output that you produce approximates the output that would be produced if you were using the version of the engine that you specify for the switch.

For example, suppose that you are using Exstream version 9.0.102, but you are producing output using an application that was designed in Exstream version 7.0.601. If you notice differences in the output and you want the output to appear the same as the output that you produced using Exstream 7.0.601, you can specify `-ENABLE_BACKWARD_COMPAT=7.0.601` so that the engine applies the specific backward compatibility switches that were implemented in versions and maintenance releases later than Exstream version 7.0.601.

Furthermore, you can specify a second version number in order to exclude backward compatibility switches that were implemented in versions or maintenance releases that are later than that version. That is, the engine applies only the backward compatibility switches that were implemented between the two versions that you specify.

The engine also produces a list of all of the specific backward compatibility switches that apply to the version or versions that you specify, as well as a list of a subset of those switches that actually apply to your application. The lists appear either in the engine message file or in the output file that you specify as an argument.

Note: Using the ENABLE_BACKWARD_COMPAT switch or specific backward compatibility switches might roll back software fixes that were applied later than the version that you specify. Use this switch only for testing output and for temporary use when you want to maintain the appearance of output from existing applications after an upgrade. For best results, make the updates to your application that are necessary to discontinue using backward compatibility switches as your time and business requirements permit.

This switch has no default value. Use one of the following syntaxes with the ENABLE_BACKWARD_COMPAT switch:

Argument syntax	Description
`-ENABLE_BACKWARD_COMPAT=`*`version`*	Specify an earlier version of Exstream with which you want your output to be backward compatible. When you produce output, the engine applies all of the backward compatibility switches that were implemented since the version that you specify. The engine adds the lists of applicable switches to the engine message file. **Note:** You cannot specify a version earlier than 3.0.000.
`-ENABLE_BACKWARD_COMPAT=`*`version1,version2`*	Specify two earlier versions of Exstream, between which you want to apply relevant backward compatibility switches. When you produce output, the engine applies all of the backward compatibility switches that were implemented since the first version that you specify, but excludes switches that were implemented after the second version that you specify. The engine adds the lists of applicable switches to the engine message file.
`-ENABLE_BACKWARD_COMPAT=`*`version1,filepath`*	Specify an earlier version of Exstream with which you want your output to be backward compatible, and the path of an output file in which you want to record the applicable backward compatibility switches. When you produce output, the engine applies all of the backward compatibility switches that were implemented since the version that you specify. The engine adds the lists of applicable switches to the output file that you specify.
`-ENABLE_BACKWARD_COMPAT=`*`version1,version2,filepath`*	Specify two earlier versions of Exstream, between which you want to apply relevant backward compatibility switches, and the path of an output file in which you want to record the applicable backward compatibility switches. When you produce output, the engine applies all of the backward compatibility switches that were implemented since the first version that you specify, but excludes switches that were implemented after the second version that you specify. The engine adds the lists of applicable switches to the engine message file and to the output file that you specify.

Note: For the first version, you can specify any existing version of Exstream between version 3.0.000 and the version that you are using. However, if you specify a second version, you can specify only one of the following:

- 95101
- 90102
- 90101
- 86107
- 86106
- 86105
- 86103
- 86101
- 86999
- 80333
- 80331
- 80330
- 80325
- 80324
- 80323
- 80322
- 80317
- 80316
- 80312
- 80311
- 80309
- 80304
- 80301
- 80300
- 82999
- 80200
- 80100
- 79999
- 70638
- 70629
- 70619
- 70617
- 70612
- 70608
- 70606
- 70604
- 70601
- 70600
- 70599
- 70408
- 70406
- 70403
- 70402
- 70400
- 70300
- 70004
- 62003
- 62001
- 61999
- 61032
- 61029
- 61028
- 61025
- 61015
- 61014
- 61010
- 61008
- 61006
- 61005
- 61004
- 60999
- 60017
- 60016
- 60015
- 60014
- 60013
- 60012
- 60009
- 60008
- 60000
- 55408
- 55406
- 55305
- 55303
- 55302
- 55207
- 54999
- 50075
- 50074
- 50064
- 50054
- 50048
- 50045
- 50022
- 50020
- 45400
- 45102
- 40120
- 40086
- 40075
- 40039
- 40009

Tip: You can specify version numbers with or without periods. For example, `8.6.102` is equivalent to `86102`.

For example:

```
-ENABLE_BACKWARD_COMPAT=8.6.102
```

```
-ENABLE_BACKWARD_COMPAT=8.6.102,9.0.102
```

```
-ENABLE_BACKWARD_COMPAT=8.6.102,C:\logs\switchoutput.txt
```

```
-ENABLE_BACKWARD_COMPAT=8.6.102,9.0.102,C:\logs\switchoutput.txt
```