

BigFix
Self-Service Application Installation
and Configuration Guide



Special notice

Before using this information and the product it supports, read the information in Notices.

Edition notice

This edition applies to version 10.0 of BigFix and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

- Chapter 1. What's new in Self-Service Application..... 5**
- Chapter 2. System requirements..... 9**
- Chapter 3. Installation..... 10**
- Chapter 4. The Self-Service Application Configuration File..... 15**
- Chapter 5. Add Metadata: Manual Method..... 18**
- Chapter 6. Reference: More About Self-Service..... 19**
- Chapter 7. Troubleshooting..... 20**
- Appendix A. Support..... 21**
- Notices.....xxii

Chapter 1. What's new in Self-Service Application

BigFix for SSA updates can contain a set of features, improvements, and bug fixes for the SSA.

What is new in Version 3.3.1

The following updates were released with SSA Version 3.3.1.

Offerings Get All button is now hidden by default

It can be enabled/made visible by setting "enableGetAllButton: true" in ssa.config.

New Fixlet 323 on Software Distribution site

With Fixlet 322, it is now possible to show/hide the "Get All" button in the Offerings tab.

What is new in Version 3.3.0

The following updates were released with SSA Version 3.3.0

Catalog restyle

Action requests and offerings are now in different tabs.

Multi-Actions feature

It is now possible to accept, snooze, or decline multiple actions at the same time.

Confirmation Message

SSA now supports displaying a confirmation message before running an action.

Snooze button available in Summary Notification

The snooze choice will be applied to all the elements included in the Summary Notification.

Log rework

Default logs now report more information.

New Fixlet 322 on Software Distribution site

With Fixlet 322, it is now possible to enable/disable debug logging in SSA.

Fixlet 317 on Software Distribution site is now superseded

Fixlet 317 which sets the default view is no longer applicable on the current SSA 3.3.0.

What is new in Version 3.2.6

The following updates were released with SSA Version 3.2.6.

Custom duration of the complete notification on screen

You can choose the desired amount of time. After the chosen duration, the notification will be automatically dismissed.

What is new in Version 3.2.4

The following updates were released with SSA Version 3.2.4.

Bug Fixing

Fixed some bugs on custom tabs.

What is new in Version 3.2.3

The following updates were released with SSA Version 3.2.3.

Customization to the SSA pop-up message

The message description now allows you to enter a selected subset of HTML tags.

Custom snooze time and date

You can specify a custom date and time to postpone an action with custom value in the action details view.

Summary panel with actions including deadline

You can define a threshold for maximum number of SSA panels with deadline allowed on the screen. When the threshold is exceeded, the panels collapse into a single summary panel.

What is new in Version 3.2.2

The following updates were released with SSA Version 3.2.2.

Minimize SSA interface

Allows the user to minimize a topmost SSA main interface of a mandatory action.

SSA interface configuration

Configure SSA main interface to be directly opened, disabling toast-notifications.

Snooze time

More snooze options such as 5, 15, 30 minutes and so on has been added to SSA notifications.

What is new in Version 3.2.0

The following updates were released with SSA Version 3.2.0.

Apple Silicon Support

SSA now supports the new Apple Silicon Architecture.

Bug Fixing

Fixed some bugs.

What is new in Version 3.1.0

The following updates were released with SSA Version 3.1.0.

Send Message

Support for the new Send Message feature: Now SSA can handle the messages sent by the BigFix WebUI Administrator. For more information, see Scenario 4: Managing messages.

Bug Fixing

Fixed some bugs.

List View

New **List View** is available in the Catalog tab.

What is new in Version 3.0.0

The following updates were released with SSA Version 3.0.0.



Important:

- For Correlation, Persistence and Prerequisite, BigFix Platform and Agent version 9.5.11 or later must be installed.
- For Messaging, BigFix Platform and Agent version 9.5.7 or later must be installed.

Correlation

A new way to manage the Lifecycle of your software products with the new Install and Uninstall correlated task.

When a software package is made available to the end user, SSA verifies if it is already installed or not and provides the end user with the appropriate task.

To create Install and Uninstall correlated tasks, they must be created from BigFix WebUI and belong to the same configuration of a software package.

Persistence

Software packages are now persistent in SSA and always visible in the Software Catalog.

Prerequisites

A new way to define and manage the software package prerequisites, extremely useful to prevent software installation failures.

If a software package prerequisite is not met, the end user is notified about it, and will be able to retry installing the software after satisfying the prerequisite.

Prerequisites must be created only through BigFix WebUI using Software app.

Messaging

A new messaging feature to keep the end user constantly and effectively informed about required software, needed restarts, and software installation progress (displaying messages before the installation, during the installation and after the installation).

Chapter 2. System requirements

This topic describes the requirements before you install and use SSA.

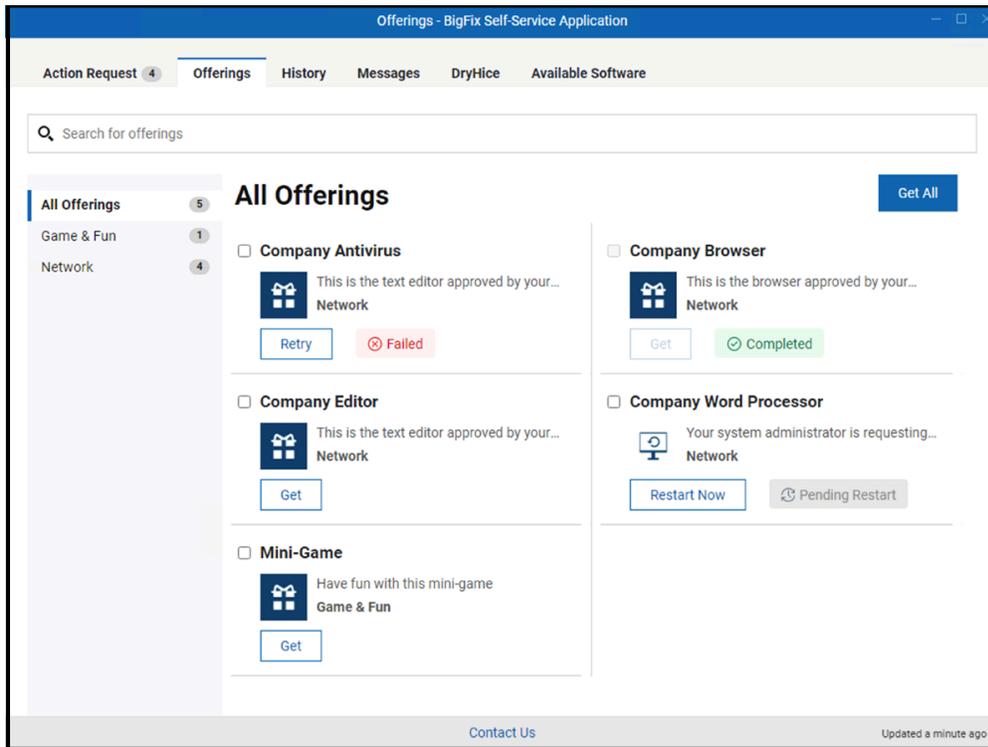
You must meet the following requirements to use SSA.

- BigFix Platform 9.5.3 or later.
- A subscription to the Software Distribution content site version 78 or later.
- Either of these operating systems installed on all relevant endpoints:
 - Windows OS version 7 and later.
 - Mac OS X version 10.15 and later.
- To display Client UI dashboards in SSA, BigFix Platform 9.5.7 or later is required.
- The minimum supported resolution is 1280 x 768 pixels.

You must be a BigFix Master Operator to use the WebUI's **Configure Self-Service Application** page.

Chapter 3. Installation

Use this guide to deploy and configure the BigFix Self-Service Application (SSA). SSA provides device owners with tools for managing BigFix offers, and includes live updates, installation status, action history, and BigFix Client UI dashboards. To learn more about creating BigFix offers, using the Self-Service application on endpoints, and other self-service-related tasks, see the [Reference \(on page 19\)](#) section.



You can install and deploy the Self-Service Application two ways. You can create a customized SSA Deployment Fixlet in the WebUI, or use Fixlets provided in the BigFix Console Software Distribution site. Instructions for both methods appear below.

Create a Custom SSA Deployment Fixlet in the WebUI



You must be a BigFix Master Operator to use the WebUI's **Configure Self-Service Application** page.

Displaying Client UI Dashboards in SSA

Client UI dashboards appear as tabs across the top of the Self-Service Application.

The screenshot displays the 'Computer Health Monitoring' dashboard within the BigFix console. The top navigation bar includes 'Catalog', 'History', 'Technician', 'Device Report', and 'Your Power Footprint'. The dashboard title is 'Computer Health Monitoring' with a subtitle 'Endpoint Security Platform Unified Management Platform by BigFix'. A 'Refresh' button is visible. The main content is divided into two sections:

Computer Information

Computer Name	JYW2016-01
Operating System	Microsoft Windows Server 2016 Standard
CPU	Intel(R) Xeon(R) CPU L7555 @ 1.87GHz
Memory	8192 MB
Hard Disks	C: 53160 MB (10 percent free) E: 59052 MB (53 percent free)
IP Address	9.39.155.186

Core Protection Module: Version Information

Anti-rootkit Driver	N/A
Core Protection Module Version	
Core Protection Module Build	
Core Protection Module Hotfix	
Core Protection Module Patch	
Core Protection Module Language	
IntelliTrap Exception Pattern	Unknown

Updated a minute ago

To include dashboards in your SSA deployment:

- Specify each dashboard that you want to include on the **Configure Self-Service Application** page. Any dashboards that are not listed, including the SWD Client UI dashboard and custom dashboards, will be removed from the endpoint when the Configure Self-Service Application task is run.
- Use the BFArchive tool to prepare and compress your custom dashboards before you upload them to the **Configure Self-Service Application** page. The [BFArchive utility](#) is available on the BigFix DeveloperWorks wiki.

To learn more about dashboards, see *"Creating Custom Client Dashboards"* in the *BigFix Configuration Guide*.

Procedure

1. From the WebUI **Settings** menu, select **Self-Service Application** to open the **Configure Self-Service Application** page.
2. Complete the fields to create an SSA installation task.

Configure Self-Service Application

Task Name *

Site *

Application Name on Devices *

Operating System * Windows OS X

 Supported Formats: .ico
Maximum Size: 150KB
Recommended Dimensions: 128x128
[Change Icon](#)

Brand Color * [Preview](#) BigFix Self-Service Application

Help Message
This message will appear on the footer of the Self-Service Application.

B **I** **U** 

[Load previous settings](#)
This will clear and load this configuration with the last known Self-Service Application settings you've created.

- **Task Name** – Use the default name or enter your own, for example, *“Install SSA on OS X Machines,”* or *“Upgrade Self Service App from V2 to V3.”*
- **Site** – Select the custom content site where you want this SSA Installation task to be stored.
- **Application Name on Devices** – Enter the text that you want to appear in the SSA title bar, or use the default.
- **Operating System** – Select one. If you have both Windows and OS X endpoints on your system, create a separate SSA installation task for each one.
- **Change Icon** – Click to change the icon image device owners use to open the Self-Service Application. Use .ico files on Windows systems and .png files on OS X systems. The default is the BigFix icon.
- **Brand Color** – Use this option to change the banner color behind the application name. Enter a specific hex value or click the field to select from a palette. The **Preview** field displays the application name and selected color.
- **Help Message** – Enter any text that you want to display in the SSA footer. For example, *“For assistance updating this device go to <http://support.ucmc.org>.”* Keep the message to a single line.
- **Catalog Tab** – Set the list view as default after every SSA startup
- **History Tab** – Set the number of days past actions appear on the **History** tab.

Operating System * **Windows** OS X

Supported Formats: .ico
Maximum Size: 150KB
Recommended Dimensions: 128x128
[Change Icon](#)

Brand Color * Preview **BigFix Self-Service Application**

Help Message
This message will appear on the footer of the Self-Service Application.

B I U

Catalog tab
 List View as default

History Tab
Display Actions from the last * days
 Display Administrative Actions

Messages Tab
 Enable Messages Tab

Technician Tab
 Enable Technician tab
Tab name [Upload \(archive\) file](#)

Custom Tabs
Tab name Default Tab
[Delete tab](#) [Upload \(archive\) file](#)
Please enter a valid tab name and upload an archive file. Tab name cannot contain the following characters: \\/: * ? " < > |

- **Messages Tab** – Select the check box to show the Messages tab in SSA. Messages tab allows the logged in user to view and manage messages sent through BigFix WebUI.
- **Display Administrative Actions** – Check the box to include actions taken by a BigFix administrator on the **History** tab.
- **Enable Power Management Tab** – Check the box to include the Power Management dashboard in SSA. The Power Management dashboard displays an endpoint's power footprint. BigFix customers who are not subscribed to the BigFix Power Management site do not see this option. The Power Management dashboard will not function correctly unless it is configured properly. See [“Manage Power Tracking”](#) in the *BigFix Power Management Setup Guide*.
- **Technician Tab** – Check the box to include a Technician dashboard in SSA. Hidden by default, a Technician dashboard is often used to provide diagnostic information available to an endpoint administrator. Use the key combination **Ctrl+Alt+Shift+T** to display a Technician dashboard, and hide it again. An endpoint can have only one Technician dashboard at a time.
- **Custom Tab** – Click **Add New Tab** to add custom dashboards to SSA and upload their archive files.

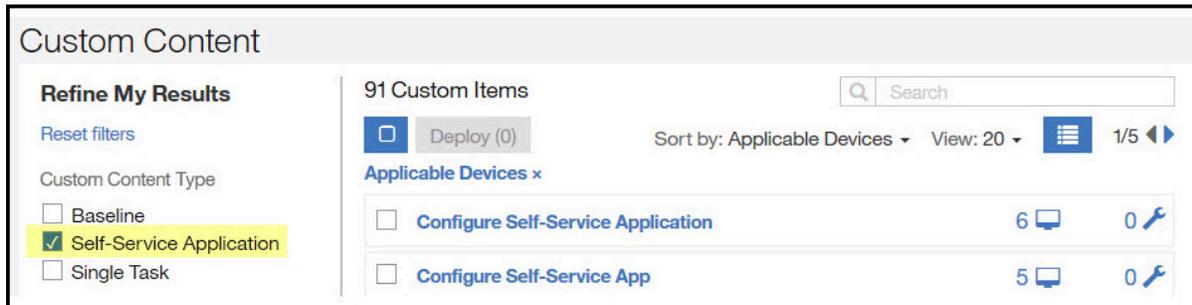
Important: The name of the custom tab should not contain the following words: Offers, Progress, Available Software, Your Power Footprint, Dashboard.

Click **Delete Tab** to remove or cancel adding a custom tab. Select **Default Tab** to automatically select the Custom Tab after every SSA startup.

3. Deploy the task to all relevant endpoints.

Use the **Load Previous Settings** link to create multiple SSA tasks with similar settings. To use the **Configure Self-Service Application** page to update the settings and options on an existing SSA installation, create an installation task with the new parameters and deploy it to all relevant machines.

Self-Service Application tasks are part of your custom content library. To see them on the Custom Content list, use the **Self-Service Application** filter.



Use Fixlets Provided in the BigFix Console Software Distribution Site

Procedure

1. Upgrade your environment to BigFix Platform version 9.5.3, if you have not already done so. The Fixlet is available in the BES Support Content site.
2. Enable the BES Client UI.
 - a. From the BigFix console go to **Sites > External Sites > BES Support > Fixlets and Tasks**.
 - b. Locate the Fixlet **BES Client Setting: BESClientUI Enable Mode**.
 - c. Scroll down to Actions. Review the Fixlet descriptions to find which setting is best for your environment. Use either:
 - i. "...set the BES Client UI to be shown for all sessions" or
 - ii. "...set the BES Client UI to be shown for only local sessions"
3. In the BigFix console's Software Distribution site, locate the SSA Fixlet for your operating system and deploy it to all relevant endpoints.
 - Windows: **Deploy BigFix Self Service Application (Windows)**
 - Mac OS: **Deploy BigFix Self Service Application (Mac OS X)**



Note:

- The uninstall Fixlet, **Remove BigFix Self Service Application** is available in the same location. Deploying or removing the Self-Service Application automatically restarts the BES Client.
- Configure the string setting `_BESClient_ActionManager_SSAv2Mode` to `SSAv2UIAll`. If set, the BESClient and BESClientUI will inhibit all existing BESClientUI visual components, enable the new data flow, expect the SSA to recognize the new data, and expect the SSA to supply the required requests to support existing BESClientUI functionality.

Chapter 4. The Self-Service Application Configuration File

When Self-Service Application is installed it adopts your current BES Client UI settings, preserving the BES Client UI's current action history visibility. In addition to using the **Configure SSA Application** page, you can modify the Self Service Application's behavior by using the settings in its configuration file.

- Windows - <BigFix installation directory>, usually `C:\Program Files (x86)\BigFix Enterprise\BigFix Self Service Application\resources\ssa.config`
- Mac OS X - `/Library/Application Support/BigFix/BigFixSSA/ssa.config`

For any changes made to the configuration file to take effect, restart the Self-Service Application.

- `customBrandColor` - string (no default value)

Changes the theme color of the SSA. Choose a dark color as the text color is white, and cannot be changed.

Color values can be in one of the following forms:

- 3- or 6-digit hexadecimal value, for example, #ABC, #ABC123
 - Comma-separated numbers that represent the RGB color value. Example: 0,0,255
- `applicationName` - string (no default value)

This name will replace the default name of the application. By default, it is URI encoded.

- `hideSystemActions` - true or false (default: true)

Determines whether the SSA displays actions taken on a device by a BigFix administrator (along with those taken by the device owner). True displays the actions, false hides them.

As an alternative to the `hideSystemActions` setting, use the Fixlet, **Self Service Application Setting: Show/Hide Administrator Actions in History View** to:

- `historyDays` - number (default: 30)

Number of days of action history to display in the SSA. Note: the maximum number is determined by the BES Client setting: `_BESClient_ActionManager_HistoryKeepDays`, which has a default value of 365 days.

- `debugLevel` - number (default: 0)

Option to display debug level logging in the log file. 0 is to not have debug logs, while 1 is to display it.

- `logCleanRate` - number (default: 14)

Number of days SSA retains logs before deleting them.

- `maxLogSizeMB` - number (default: 20)

The maximum size of a log in MB before SSA backs up the current log file and creates a new log file.

- `numLogsPerDay` - number (default: 2)

Number of log files SSA retains per day.

- `disableMessagesTab` - true or false (default: true) Determines whether the SSA displays the Messages Tab. True hides the tab, false displays it.

As an alternative to the `disableMessagesTab` setting, use the Fixlet, **Self-Service Application Setting: Show/Hide Messages Tab** to Show/Hide the Messages tab.

- `listViewEnabled` - true or false (default: false) Determines whether the SSA shows the Catalog Tab with the list view. True uses the list view, false uses the tiles view.



Note: This parameter is no longer available on SSA 3.3.0 and later versions.

- `allowMinimizeAtDeadline` - true or false (default: false)

Determines whether the SSA main window shows when an action reaches its deadline.

- `disableToastNotifications` - true or false (default: false)

Determines whether the SSA displays the toast notification. If toast notifications are disabled then the messages are directly shown in the SSA main window. This configuration parameter is related to required, suggested, and post messages.

- `CollapsingThreshold` - number (default: 10)

It is a non-negative integer to set the number of panels with deadline shown on screen before a summary panel is shown.



Note:

- **Panels with deadline:** To-do pre-messages (required and suggested) and to-do post-messages.
- **Panels without deadline:** Running actions, complete actions, offers, and notification messages.

The summary panel categorizes the actions as **Required**, **Suggested**, and **Other**. When you click on the summary panel all the included actions are snoozed by 15 minutes and the SSA catalog is opened with the items sorted by deadline. BigFix SSA Version 3.2.3 or later supports this feature.



Important:

- When you upgrade from an older version the threshold value is not defined.
- When an action has a deadline within 15 minutes, then that action will be snoozed to the deadline.

- `completeNotificationExpirationTime` - seconds (default: 604800)

This duration in seconds represents how long the complete notification stays on the screen. The notification will be automatically dismissed after the specified duration. BigFix SSA Version 3.2.6 or later supports this feature.



Note: 604800 = 1 week in seconds

- `enableGetAllButton` - true or false (default: false)

Determines if the **Get All** button is displayed (when set to true) or hidden (when set to false) in the Offerings tab.

SSA Logging and Paths

Logs and config file for the Self-Service Application can be found in the directory specified for your operating system.

SSA config file location -

- Windows: `<BigFix installation directory>\BigFix Self Service Application\resources\ssa.config`
- Mac OS X: `/Library/Application Support/BigFix/BigFixSSA/ssa.config`

Log location -

- Windows: `%LOCALAPPDATA%\BigFix\BigFixSSA\logs`
- Mac OS X: `~/BigFix/BigFixSSA/logs`

For more detailed logging, turn on debug logging by adding the option `debugLevel: 1` in the Self-Service Application configuration file.

The following folder and sub folder paths should be excluded from antivirus scans -

- Windows: `%DRIVE%:\Program Files (x86)\BigFix Enterprise\BigFix Self Service Application`
- Mac OS X: `/Library/Application Support/Bigfix/BigFixSSA`

Additionally the following processes should be excluded as well -

- Windows: `%DRIVE%:\Program Files (x86)\BigFix Enterprise\BigFix Self Service Application\BigFixSSA.exe`
- Mac OS X: `/Applications/BigFixSSA.app/Contents/MacOS/BigFixSSA`

Chapter 5. Add Metadata: Manual Method

Adding icon, version, and file size information (metadata) to software packages is typically done using the BigFix WebUI. You can also insert this information directly into a Fixlet with a text editor. This method may be useful to customers who are not using the WebUI, or who have created content using the BigFix Software Distribution Dashboard, which does not provide a method for including this metadata.

To add software package metadata manually:

1. In the BigFix console, right-click the Fixlet you want to add metadata to and select **Export**.
2. Open the resulting .BES file with a text editor.
3. Add the following four lines to the Fixlet's XML, substituting your own values for <version>, <size>, and <icon>. The values are optional: specify one, two, or all three. A completed example appears at the end of the procedure.

```
<MIMEField>
  <Name>action-ui-metadata</Name>
  <Value>{"version": "<version>", "size": "<size>", "icon": "<icon>"}</Value>
</MIMEField>
```

If you are including an icon:

- a. Convert the icon to Base64 encoding using the utility of your choice. For the best performance, limit the icon file size to 10Kb.
 - b. Substitute the icon's Base64-encoded value for the <icon> variable. Make sure the value starts with 'data:image/<type>;base64,' where <type> is the file type (png, or bmp).
4. Import the updated .BES file back to the BigFix Console.

Example

```
<MIMEField>
  <Name>action-ui-metadata</Name>
  <Value>{"version": "45.3.0", "size": " 41943040", "icon": "data:image/png;base64,
    iVBORw0KGgoAAAANSUHEUgAAACAAAAAgCAYAAABzenr0AAAAGXRFWHRTb2Z0d2FyZQBBZG9i
    ZSBJbWQ2ib6jzWagGmNbWIA09jUgxZPwFYpFqlFCFo5FoUVWdmXY3fZe2dm5/qut883O2uxsV
    GbJp3su9/Md7y/5X+G94+D7vhPH1O9fauv/BJV+bhVUrFsPn8+O9UxdwuCeFPDR0Zi....' }
  </Value>
</MIMEField>
```

Chapter 6. Reference: More About Self-Service

Use the links to read more about the Self-Service Application and related tasks.

- [Self-Service Application: Managing BigFix Offers on Your Device](#)

Creating Offers

- [WebUI Users Guide > Deploy Procedure > Configuration Options](#)
- [Console Guide > Actions > Taking Actions](#)

Creating Software Packages

- [WebUI Users Guide > Software Application > Software Catalog Operations](#)
- [Creating a package or Fixlet](#)

Adding Icon, Size, and Version Metadata to Software Packages

- [WebUI Users Guide > Software Application > Software Catalog Operations](#)
- [Manual Method \(on page 18\)](#)

Deploying Software Packages as Offers

- [WebUI Users Guide > Deploy Procedure > Configuration Options](#)
- [Deploying Application Management Groups](#)

Chapter 7. Troubleshooting

Troubleshooting information and known issues about the Self-Service Application.

- On Windows 7 platforms with a single core CPU only, the following electron issue is known:

When clicking a pre-message, a message displayed before the software installation, the opening of the Self-Service Application User Interface corresponding catalog entry is delayed.

- With macOS Dark Mode theme (available in macOS Mojave or later), if the user switches the current theme, then to see the updated tray icon of the Self Service Application, the user must log out and then log in again.

- Seamless SSO login limitation

When creating a Custom Tab within the BigFix Self Service Application to login via Seamless SSO, users need to provide credentials each time the BigFix Client service is restarted. This is due to limitations with Electron framework responsible for managing the SSA application, which cannot facilitate Seamless SSO login functionality.

Appendix A. Support

For more information about this product, see the following resources:

- [BigFix Support Portal](#)
- [BigFix Developer](#)
- [BigFix Playlist on YouTube](#)
- [BigFix Tech Advisors channel on YouTube](#)
- [BigFix Forum](#)

Notices

This information was developed for products and services offered in the US.

HCL may not offer the products, services, or features discussed in this document in other countries. Consult your local HCL representative for information on the products and services currently available in your area. Any reference to an HCL product, program, or service is not intended to state or imply that only that HCL product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any HCL intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-HCL product, program, or service.

HCL may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

For license inquiries regarding double-byte character set (DBCS) information, contact the HCL Intellectual Property Department in your country or send inquiries, in writing, to:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

HCL TECHNOLOGIES LTD. PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. HCL may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-HCL websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this HCL product and use of those websites is at your own risk.

HCL may use or distribute any of the information you provide in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

HCL

330 Potrero Ave.

Sunnyvale, CA 94085

USA

Attention: Office of the General Counsel

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by HCL under terms of the HCL Customer Agreement, HCL International Program License Agreement or any equivalent agreement between us.

The performance data discussed herein is presented as derived under specific operating conditions. Actual results may vary.

Information concerning non-HCL products was obtained from the suppliers of those products, their published announcements or other publicly available sources. HCL has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-HCL products. Questions on the capabilities of non-HCL products should be addressed to the suppliers of those products.

Statements regarding HCL's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to HCL, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. HCL, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS," without warranty of any kind. HCL shall not be liable for any damages arising out of your use of the sample programs.

Each copy or any portion of these sample programs or any derivative work must include a copyright notice as follows:

© (your company name) (year).

Portions of this code are derived from HCL Ltd. Sample Programs.

Trademarks

HCL Technologies Ltd. and HCL Technologies Ltd. logo, and hcl.com are trademarks or registered trademarks of HCL Technologies Ltd., registered in many jurisdictions worldwide.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other product and service names might be trademarks of HCL or other companies.

Terms and conditions for product documentation

Permissions for the use of these publications are granted subject to the following terms and conditions.

Applicability

These terms and conditions are in addition to any terms of use for the HCL website.

Personal use

You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative work of these publications, or any portion thereof, without the express consent of HCL.

Commercial use

You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of HCL.

Rights

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

HCL reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by HCL, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

HCL MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.