Lifecycle Integration Adapter for Aras Innovator
Version 1.0

Installation Guide

IBM

Contents

Before you install Lifecycle Integration Adapter for Aras Innovator

Before you install, check the following prerequisites and the system requirements and decide whether you want to use an evaluation, departmental, or enterprise topology.

Prerequisites to install Lifecycle Integration Adapter for Aras Innovator

The adapter is a web application that connects Aras Innovator® and Rational® solution for Collaborative Lifecycle Management (CLM) applications. This version of the adapter works with two CLM applications: Rational Team Concert™ (the Change Management application) and Rational DOORS® Next Generation (the Requirements Management application). The adapter also works with the same two applications in IBM Internet of Things (IoT) Continuous Engineering solution.

The adapter supports the Open Services for Lifecycle Collaboration (OSLC) standard. OSLC is an HTTP-based protocol that uses unique URLs to identify data so that you can link to resources in other products. See the OSLC standard at https://open-services.net/

Before you begin installation, ensure that you installed:

- The application server where the adapter services will be installed. This document explains how to install the adapter on Apache Tomcat and WebSphere Application Server Liberty.
- Aras Innovator 11 SP9 or higher.
  Important: It is recommended that you configure Aras Innovator on HTTPS. For more information, see the **Security Considerations** on page 8.
- Aras Innovator Import-Export Utility.

Verify the system requirements for Aras Innovator and CLM:

- For Aras Innovator:
  a. Go to http://www.aras.com/support/documentation/
  b. Select Aras Innovator version **11.0 SP9**
  c. In the **Installation and Configuration** section, click **Aras Innovator 11.0 – Platform Specifications.pdf**

- For CLM applications:
  a. Go to
     https://jazz.net/wiki/bin/view/Deployment/CLMSystemRequirements603
  b. Select the CLM component (application) or the platform, to view the system requirements.

See the next section for the version details and general system requirements for the adapter.

System requirements for the adapter

- **Windows operating systems**:

Operating System Name	OS Version	Maintenance	Hardware	Application bitness
Windows Server 2008	Standard Edition R2	And future OS fix packs	x86-64	64-Exploit
Windows Server 2012	Standard Edition R2	And future OS fix packs	x86-64	64-Exploit
Windows Server 2012	Standard Edition	And future OS fix packs	x86-64	64-Exploit

Table: *Operating systems supported by the adapter*

- **Operating system restrictions for application servers**:
  There are no operating system restrictions for any of these application servers.

- **Application servers:**
  o Apache Tomcat 7.0.59 and fix packs
  o Apache Tomcat 8.5.11 and fix packs
  o WebSphere Application Server Liberty version 16.0.0.4

  You can download these Apache Tomcat versions from:
  https://tomcat.apache.org/

- **Supported applications from the Rational solution for Collaborative Lifecycle Management (CLM) or the Internet of Things (IoT) Continuous Engineering solution**:
  o Rational® Team Concert™ 6.0.3 and 6.0.4, and their fix packs
  o Rational® DOORS® Next Generation 6.0.3 and 6.0.4, and their fix packs

- **Web browsers**:
  o Microsoft Internet Explorer 11 and fix packs
  o Mozilla Firefox ESR 38 and fix packs
  o Mozilla Firefox ESR 45 and fix packs
  o Google Chrome minimum version 55 and fix packs

- **Java™ (JRE)**:
  IBM Java Runtime Environment, Java Technology Edition 1.7.0 or later

- **Hardware requirements**:

Category	Adapter Components	Requirement	Operating Systems
Disk space	Aras Innovator Server	Minimum requirement is 8 GB	As in [Table 1](#)
	Aras Innovator installation	Same as the Aras Innovator installation	
	LIA for Aras Innovator	Minimum requirement is 25 MB	
	LIA for Aras Innovator extensions	Minimum requirement is 10 MB	
Memory	Aras Innovator Server	Minimum requirement is 8 GB	
	Aras Innovator installation	Same as the Aras Innovator installation	
	LIA for Aras Innovator	Memory consumption for evaluation topology is insignificant.	
	LIA for Aras Innovator extensions	Memory consumption for evaluation topology is insignificant.	

Table: The hardware requirements for adapter installation

The installation components

This section details the components that you must deploy to install LIA for Aras Innovator. There are four installation components, collectively called "the adapter":

- **Aras Innovator Extensions for OSLC**
- **Aras item content package**
- **Lifecycle Integration Adapter for Aras Innovator**
- **Aras Innovator custom UI HTML and JavaScript files**

Deploy these components on your application server. Each of these components serves an independent purpose in establishing two-way communication with CLM applications.

The following figure illustrates how the adapter and the various installation components connect with Aras Innovator:
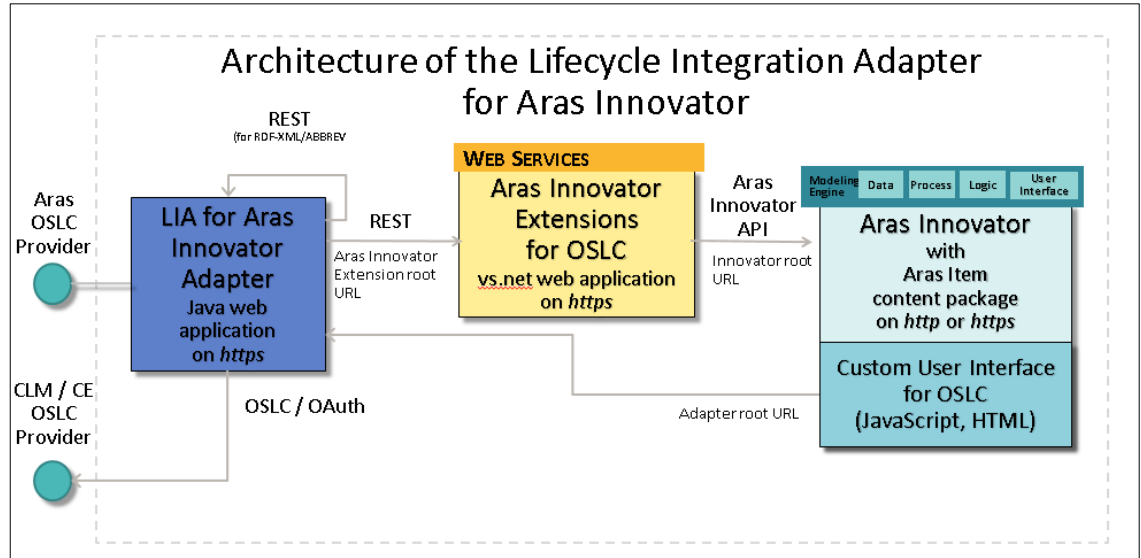
LIA for Aras Innovator architecture

The following sections explain the installation components in detail.

Aras Innovator Extensions for OSLC

The `Aras Innovator Extension` folder contains the Aras Innovator Extensions for OSLC application. It is a Microsoft .NET web application that establishes communication between Aras Innovator and the adapter. Deploy this application on the Internet Information Services (IIS) for Windows Server. This application collects data from the Aras Innovator database and sends it to the adapter.

Tip: After deploying this application on the IIS server, an Aras Innovator Extensions URL is generated. Make a note of the URI; you need it when you configure data exchange between the adapter and Aras Innovator.

Aras item content package

The `LIAContentPackage` folder contains the content package for Aras Innovator. It contains seven item types and relationship types that you must import during the installation. Use the Aras Innovator Import Export Utility to import this package. The following table lists the default item types and relationship types in this package:

Content Package Definition	Description
Jazz™ Team Server Item Type	Establishes communication between the server that hosts the CLM applications and the Aras Innovator server.
Project Association Relationship Type	Associates Aras Innovator with a CLM project. You can see this relationship type in the relationship grid of the **Jazz Team Server** item type.
OSLC Resource Item Type	Enables the OSLC links for an Aras Innovator item type.
OSLC Link Relationship Type	Establishes a relationship with an Aras Innovator item type. Use this relationship type to add or link to existing CLM work items or requirements.
LIA for Aras Innovator Relationship Type	Stores the adapter URI. When you install the adapter, you store the adapter URL here. See this relationship type in the **Preference** item type.
OSLC UI Preview Relationship Type	Shows the properties of an OSLC-enabled item type. If you add `name` and `description` as the item type properties, you can preview them in the in CLM applications when you hover over a linked item type.
OSLC Create Dialog Property Relationship Type	From this relationship type, add the properties for an OSLC-enabled item type. If you add `name` and `description` as the properties, then in a CLM application, when you add an item type in Aras Innovator, you are prompted to enter values for these properties.

Content package definitions

LIA for Aras Innovator adapter

Deploy this web archive (WAR file) file on your application server to install the adapter services. After you deploy the WAR file, you must configure Aras Innovator to establish two-way communication between Aras Innovator and CLM applications.

Aras Innovator custom UI HTML and JavaScript files

The `CustomUserInterfaceForOSLC` folder contains the HTML and JavaScript files required for linking:

- Manage the OSLC linking between Aras Innovator item types and tasks, defects, stories, and requirements in the CLM applications.
- Associate a project in a CLM application with Aras Innovator. After the projects are associated, the adapter can link an OSLC-enabled item type with a CLM artifact.

The deployment topologies

The integration can be deployed in different ways:

- **Evaluation topology**: It is intended for demonstration or training purposes only. It has all software installed on a single system. This topology includes one instance of a Jazz Team Server with Rational Team Concert and Rational DOORS Next Generation installed. Trial versions of the Jazz Team Server and applications may be downloaded from https://jazz.net/
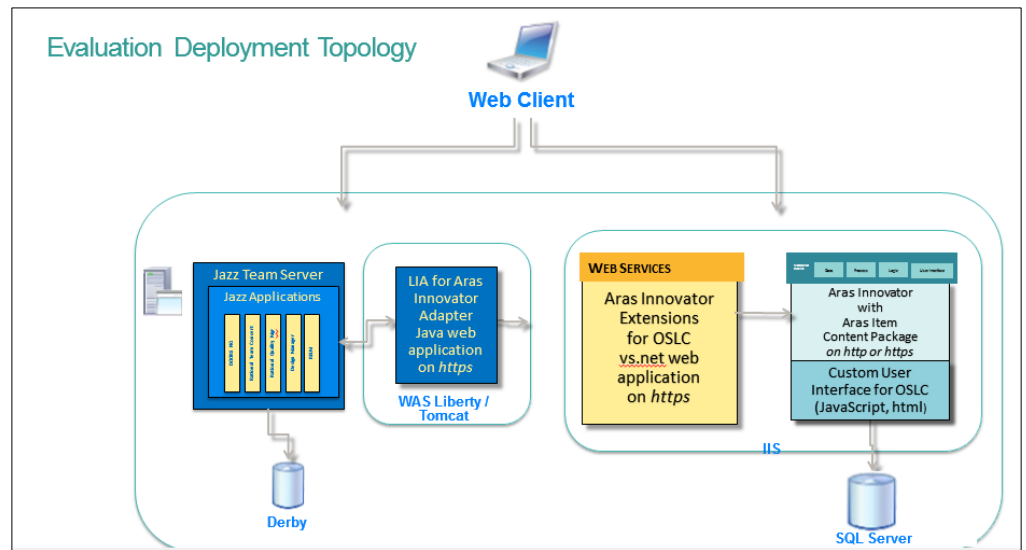
Evaluation deployment topology

- **Departmental topology**: It is intended for small to medium sized organizations using one or more Jazz Team Servers and one instance of Aras Innovator. Each Jazz Team Server is installed on a separate system. All the LIA for Aras Innovator components are installed on the same server as Aras Innovator.
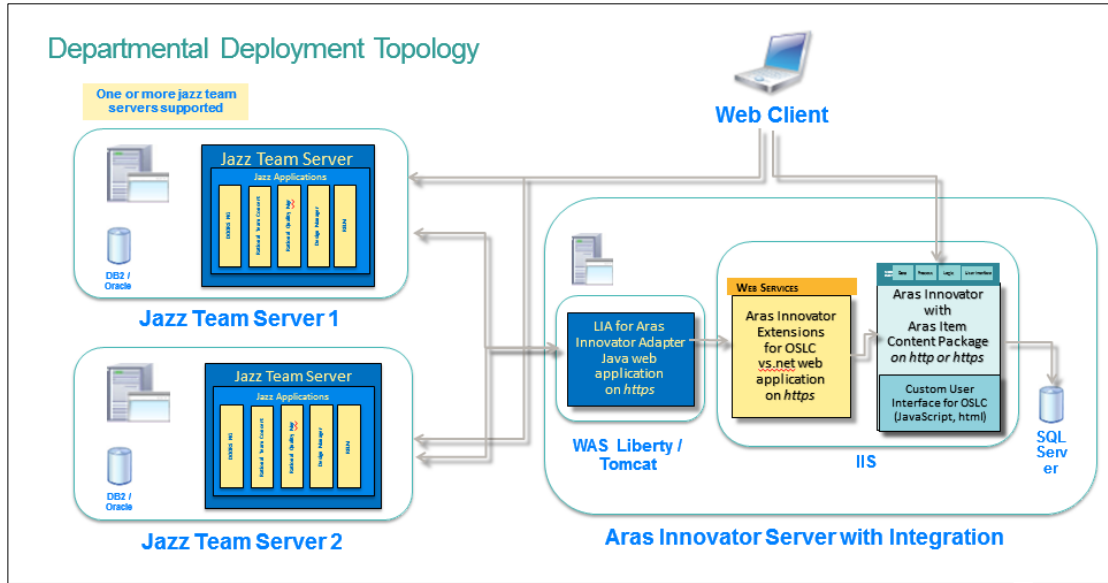
Departmental deployment topology

- **Enterprise topology**: It is intended for large organizations. The LIA for Aras Innovator Adapter is deployed on its own system to separate the CPU load from the production Aras Innovator Server. SQL server is also installed on a separate system. Since Aras Innovator and LIA for Aras Innovator are installed on separate systems, a gateway is used to define a public URL for the integration.
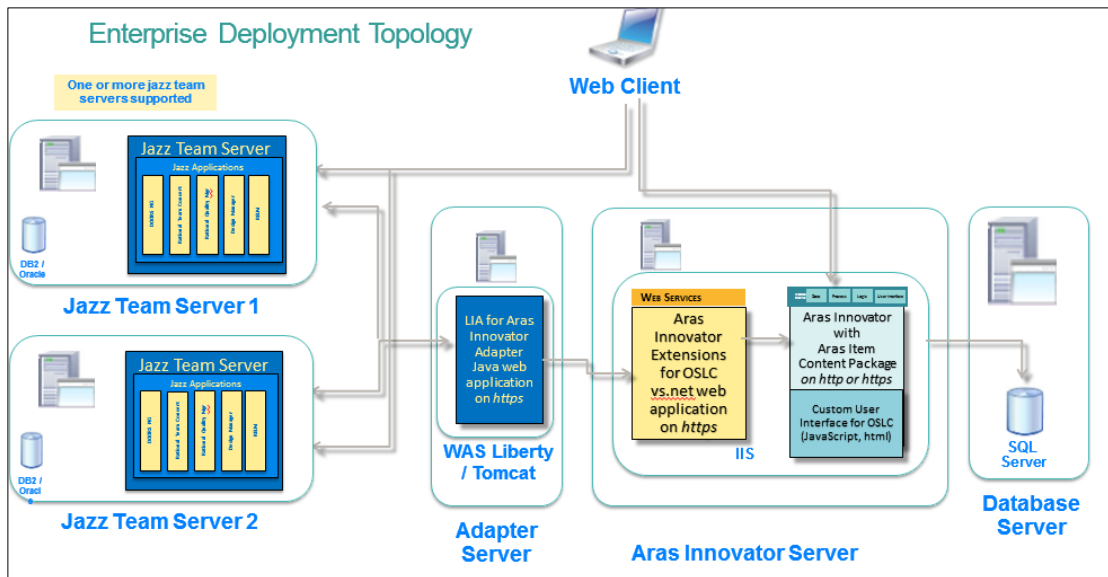
Enterprise deployment topology

Security considerations

You can take actions to ensure that your installation is secure, customize your security settings, and set up user access controls. You can also ensure that you know about any security limitations that you might encounter with this application.

- Enabling security during the install process
- Ports, protocols, and services
- Customizing your security settings
- Setting up user roles and access
- Privacy policy considerations

Enabling security during the install process

- Make sure that production systems are using HTTPS certificates that are signed by an authority.
- In production, the adapter and the extension must be deployed using HTTPS; follow the steps in the *LIA for Aras Innovator Installation Guide*.
- In production, it is recommended to deploy Aras Innovator using HTTPS, because the custom UI and the data stored in Aras Innovator are on HTTPS after the adapter is installed.
- See the Apache Tomcat and WAS Liberty application server documentation to deploy the signed certificates.
- For production deployment, you should deploy the Aras Innovator Extension for OSLC on HTTPS.

Verifying the integration is securely deployed

Make sure the adapter is deployed only on HTTPS. The adapter home page shows the URL for Aras Innovator Extension for OSLC. Make sure that this URL uses HTTPS. In production deployment, verify that the site used by the extension is only HTTPS. For details, see "Optional: On production deployments, configuring the extension to run on HTTPS" on page 11.

Ports, protocols, and services

The Aras Innovator Extension for OSLC uses the Aras Innovator API with the credentials provided by the CLM user when prompted for Aras Innovator credentials. Access to the API uses the ports, protocols, and services configured for Aras Innovator Extension using IIS. The adapter access the services in the Aras Innovator Extension. Access to the adapter uses the ports, protocols, and services configured using either Apache Tomcat or Websphere Application Server Liberty.

Customizing your security settings

You can implement the HTTPS configuration for the Aras Innovator Extension for OSLC after installing the integration. See the IIS documentation for the HTTPS configuration steps.

Privacy policy considerations

This software offering does not use cookies or other technologies to collect personally identifiable information.

Removing sensitive information

You can remove sensitive data from applications after a data spill, such as information that is now confidential but wasn't before, or information that should not be revealed to a wider audience. Information can be permanently deleted from the CLM applications, but it still exists in the Aras Innovator database. For instructions, see "Deleting sensitive data" on page 33.

Installing the adapter

Notice: The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.   Proceeding with the installation constitutes acceptance of the terms in the license agreement. Review the following documents before proceeding:

- *LIA for Aras Innovator License.pdf*
- *LIA for Aras Innovator non_ibm_license.pdf*
- *LIA for Aras Innovator Notices.pdf*

The adapter installation has four main steps.

Step 1: Installing Aras Innovator Extensions for OSLC
Step 2: Installing the content package
Step 3: Installing the adapter WAR File
Step 4: Copying the HTML and JavaScript files

Important: After installation, you must configure and customize Aras Innovator to establish two-way communication with Rational DOORS Next Generation or Rational Team Concert. See the next section on page 23.

Step 1: Installing the Aras Innovator Extension for OSLC

To deploy Aras Innovator Extension for OSLC on IIS manager, you have to complete these steps:

- Add an **Aras Innovator Extension for OSLC** website.
- Optional: For production deployments, configure the extension on HTTPS.
- Deploy the extension zip file on the **Aras Innovator Extension for OSLC** website.

Adding an Aras Innovator Extension for OSLC website

Go to the Internet Information Services (IIS) manager, add a new website, and deploy the application server on it.

1. Log on to the web server computer as an administrator.
2. Create the `ArasInnovatorExtension` folder on your local computer to hold the Aras Innovator Extension for OSLC application.
3. Open **Internet Services Manager**.
4. From the **Connections** pane, right-click the IIS server and then click **Add Web Site**.
5. In the **Site name** field, enter a name for the website.

Tip: Enter **Aras Innovator Extension for OSLC** as the website name. When setting the system properties, the public URL is generated with `ArasInnovatorExtension` in the context path. For more information on how to set the system properties, see "Adding the URLs to " on page 17.

6. In the **Content directory** area, click the ellipsis icon to browse to the path. Select the path to the `ArasInnovatorExtension` folder.
7. In the **Binding** area:
   a. In the **Type** list, select **HTTP**.
   b. Select the IP address to use for the website.
      Important: If you select **All Unassigned**, the website is accessible on all interfaces and all configured IP addresses.
   c. In the **Port** field, enter the TCP port number to publish the site on.
   d. Optional: In the **Host name** field, enter the host header name (the real name that is used to access this site).
8. By default, the **Start Web site immediately** check box is selected. Do not clear this check box.
9. Click **OK** to add the website.

Optional: On production deployments, configuring the extension to run on HTTPS

1. Click the **Aras Innovator Extension for OSLC** website.
2. From the **Actions** pane, click **Bindings**.
3. From the Site Binding window, click **Add**.
4. In the **Type** list, select **HTTPS**.
5. Select the IP address to use for the website.
   Important: If you select **All Unassigned**, the website is accessible on all interfaces and all configured IP addresses.
6. In the **Port** field, enter the TCP port number to publish the site on.
7. In the SSL certificate list, select the self-signed certificate.
   Tip: You can create a new self-signed certificate, if you don't have one.
8. Click **OK** to configure the HTTPS setting. You can see **HTTPS** listed in the **Site Bindings** window.

Deploying the Extension zip file on the Aras Innovator Extension for OSLC website

After you add the new website in IIS Manager, deploy the Aras Innovator Extensions application to this website.

1. From the **Connections** pane, right-click the newly added website and click **Deploy** > **Import Application**.
   Tip: If you don't see the **Deploy** option, download and install Microsoft Web Deploy v3.5 package. After you install this package, go to the command prompt and run the `iisreset` command.
2. Click **Browse** and select `ArasInnovatorExtension.zip` and click **Open**.

This file is in the `Aras Innovator Extension` folder.

3. Click **Next**. The package contents are listed in the **Package contains** section. By default, all the package contents are selected.
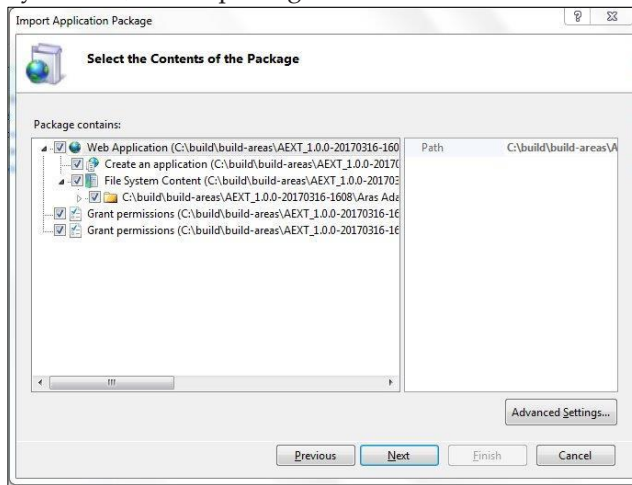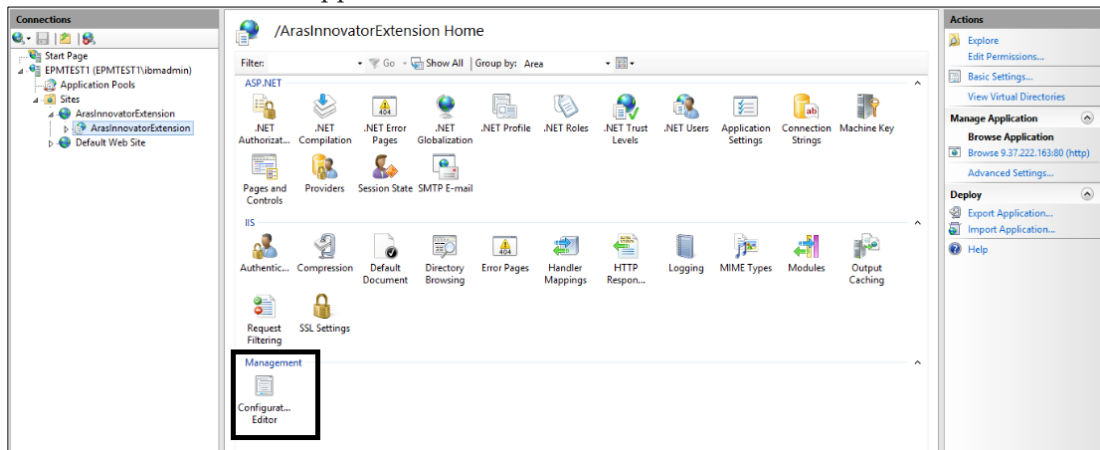

Contents in the Aras Innovator Extensions package

4. Click **Next** through the rest of the wizard until the Aras Innovator Extensions package is deployed and the system shows the successful installation message.
5. Click **Finish** to complete the installation.

Adding the Aras Innovator URL and database name to the Aras Innovator Extensions

Set the configuration of the web application to refer to the correct Innovator Server and database.

1. Go to IIS Manager and in the website that you added on page 10, open the **ArasInnovatorExtension** application.


*The **Management** section at the bottom of the **ArasInnovatorExtension** application home page.*

2. From the **Management** section, double-click **Configuration Editor**.

3. From the table on the **Configuration Editor** page, click the ellipses [⋯] icon.
4. In the **Collection Editor** window, for the `InnovatorUrl` key, enter the Aras Innovator URL: `http://<servername>/InnovatorServer`
5. For the `db` key, enter **InnovatorSolutions**.
   Important: When adding the database entry, you must add only one key-value pair. This installation document assumes the database name is **InnovatorSolutions**, but yours might be different.
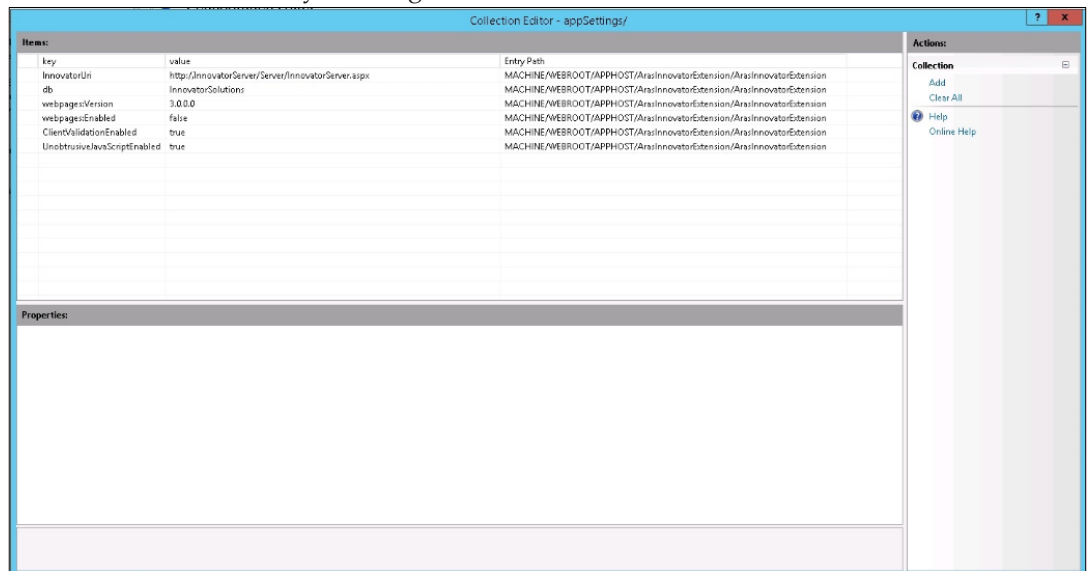
Aras Innovator URL and Aras Innovator database values added

6. Close the **Collection Editor** window and go to the website home in **IIS Manager**. From the **Actions** section, click **Apply** to save the changes. The system displays the changes saved successfully message.

After installing the package, go to IIS Manager and browse the **ArasInnovatorExtension** application that is created after you deploy the Aras Innovator Extension for OSLC. If the package is successfully deployed, the following page opens in a web browser.
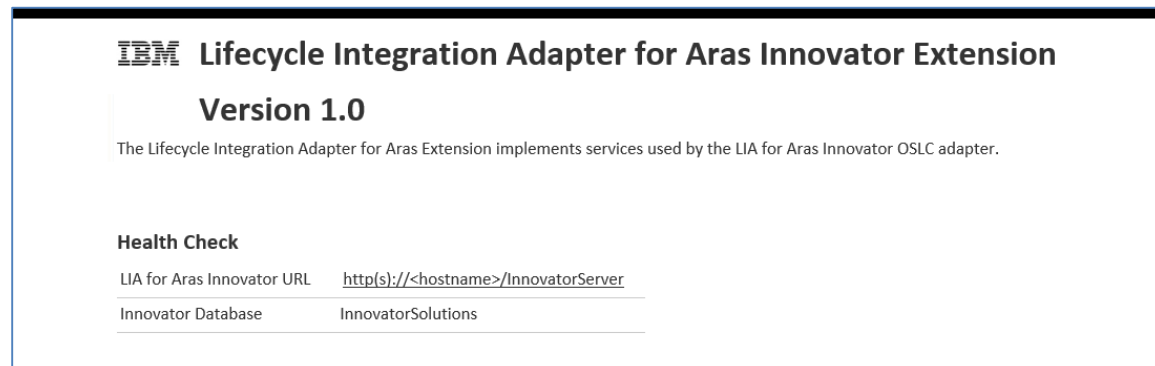

Home page for Aras Innovator Extensions

Tip: After browsing the application, make a note of the URL in the following

format:
`https://<hostname>:<portnumber>/ArasInnovatorExtension`. You
will need it later during the configuration stage. If you get a configuration error
while browsing the application, see the Troubleshooting section on page 31.

## Step 2: Installing the content package

1. Open the Aras Package Import Utility.
    Tip: The Package Import Utility is included in the Package Import Export
    Utility that can be downloaded from the Aras website
    (`https://www.aras.com/projects/project-`
    `view.aspx?id=DD32FF42D8B14CB28CD4732AAF2F5349`).
2. Enter the Aras Innovator URL in the **Server** field and the user name **admin**.
3. Click the ellipsis icon [...] besides the **Database** list. **InnovatorSolutions** is
    the default database created when Aras Innovator is installed.
    Note: The installation document assumes the database name is
    InnovatorSolutions, although it might be different.
4. From the **Database** list, select **InnovatorSolutions** and in the **Password** field,
    enter the password to log in to the Aras Innovator instance.
5. Click **Login**. You see the list of packages in the **Existing Packages in the
    Database** section in the lower right.
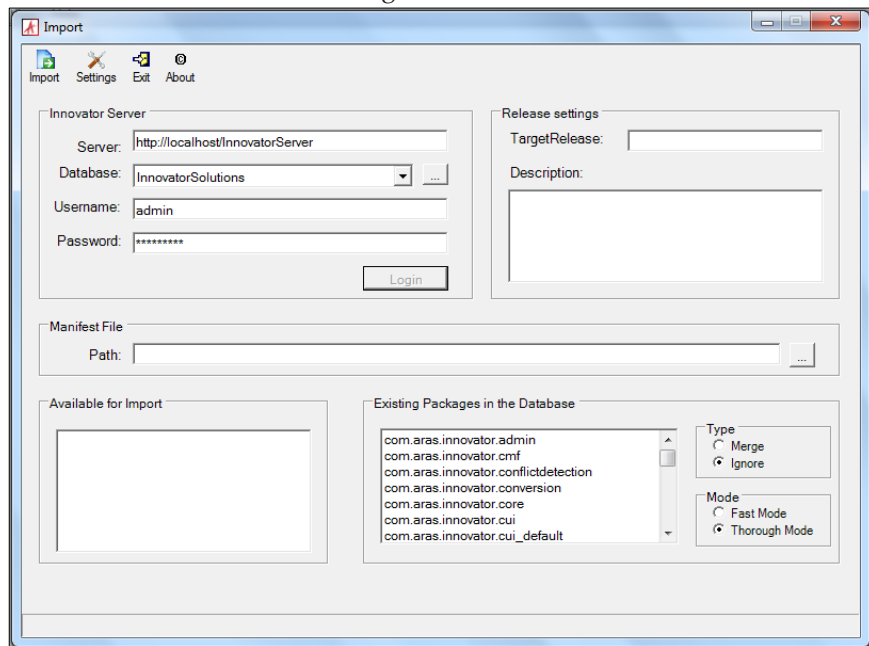
List of packages in the database

6. In the **Manifest File** section, click the ellipsis icon [...]. Browse and select
    the `imports.mf` file in the `Aras Item Content Package` folder. Copy it
    to your local computer.

7. Click **Open**. In the **Available for Import** section in the lower left you can see `com.ibm.epm.LIAContentPackage`. Import this content package.
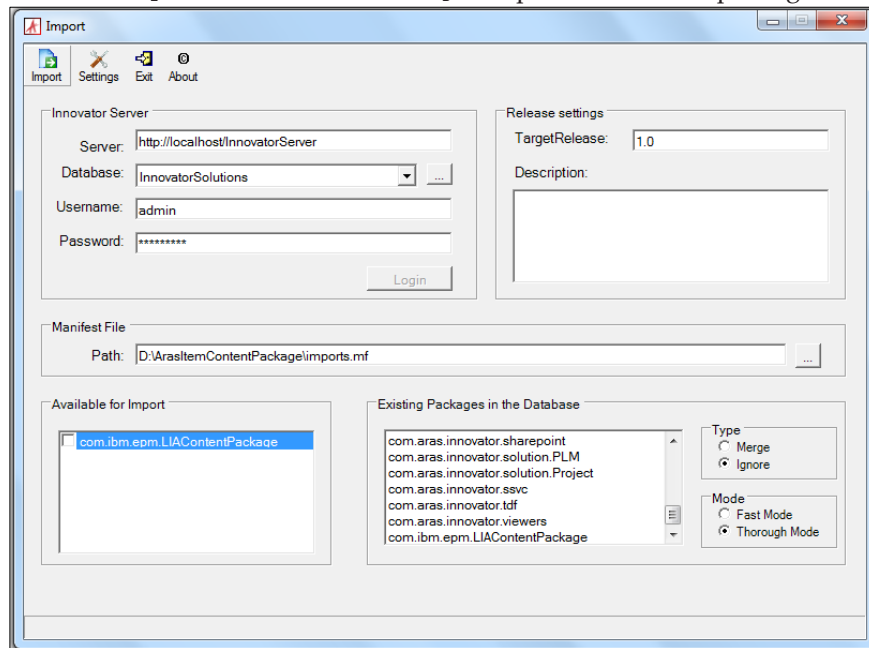
*The content package in the **Available for Import** section*

8. Select `com.ibm.epm.LIAContentPackage`.
9. In the **Release settings** section at the upper right, in the **TargetRelease** field, enter the content package version. It is the same as the LIA for Aras Innovator version.
10. Click the **Import** icon at the upper left. After a successful import, you see **completed** at the lower left.
11. Click **Exit** to exit the Aras Innovator Import Export utility tool.
    Remember: While importing, if you are logged in to Aras Innovator, you must log out of Aras Innovator and then log in again.

After a successful installation, the following item and relationship types are imported into Aras Innovator:

- Jazz Team Server item type
- OSLC Resource item type
- Project Associations relationship type
- OSLC Link relationship type, which contains these six OSLC links:
    o Part_OSLC_Link
    o ECN_ OSLC_Link
    o ECR_ OSLC_Link
    o Express_OSLC_Link
    o Express OSLC_Link
    o PR_OSLC_Link

- LIA for Aras Innovator relationship type
- OSLC UI Preview relationship type
- OSLC Create Dialog Property relationship type

If the content package is not correctly imported, see page 32.

Step 3: Installing the WAR file

This version of the adapter is installed on the following application servers:

- Apache Tomcat server version 7.x or 8.x
- WebSphere Application Server Liberty

Configuring the Apache Tomcat server before installing the WAR file

You must enable the Apache Tomcat server for HTTPS communication. If the server is already configured for HTTPS communication, go directly to "Installing the WAR file on the Apache Tomcat" on page 17.

Configure the Apache Tomcat server to run on HTTPS with a self-signed certificate. Do not run the application server on HTTP.

1. Open the command prompt and go to the `conf` directory of the Apache Tomcat `webapp` for the adapter, that is `C:\Program Files\Apache Software Foundation\Tomcat 8.5_Tomcat8_Aras_Adapter\conf`
2. Run this command:
   `"%JAVA_HOME%\bin\keytool" -genkey -alias ArasAdapter -keyalg RSA -keystore "localhost-rsa.jks"`
   This creates a `<localhost>-rsa.jks` keystore file in the `conf` directory.
   Tip: Replace `localhost` with the host name of the server.
3. Choose a password for your keystore. Make a note of this password because you will need it later.
   Important: The keytool prompts you for your first and last name. Don't use your name; use the fully qualified system name. The rest of the information can be whatever you choose. Do not enter a key password (If you don't enter a password, it will be same as the keystore password).

4. Open the `server.xml` file and search for the following connector tag:

```
<!--
<Connector port="8443" protocol="org.apache.coyote.http11.Http11NioProtocol"
           maxThreads="150" SSLEnabled="true" scheme="https" secure="true"
           clientAuth="false" sslProtocol="TLS" />
-->
```

The 8443 connector tag

5. Remove the comment wrapping the 8443 connector and add the following text to the 8443 connector element: `keyAlias="ArasAdapter"` `keystorePass="`*`password`*`"` `keystoreFile="<`*`localhost`*`>-rsa.jks"`

   Remember: The *`password`* must be same as the password entered in step 3.

6. Search for the following connector tag:

```
<Connector port="8080" protocol="HTTP/1.1"
           connectionTimeout="20000"
           redirectPort="8443" />
```

The 8080 connector tag

7. Comment out the 8080 port so that every application on the Apache Tomcat server runs exclusively on HTTPS.

8. Restart the Apache Tomcat server.

9. Open the adapter home page using HTTPS and your new port (8443).
   Tip: See the Tomcat logs file located in the logs folder if you face problems with starting the Aras Adapter.

Installing the WAR file on the Apache Tomcat server

1. From the LIA for Aras Innovator download, copy the WAR file.
2. On your local system, go to the `Apache-Tomcat` > `webapps` directory.
3. Paste the WAR file into the `webapps` directory.
4. Reboot the Apache Tomcat server to deploy the WAR file. To reboot using the command prompt:
   a. Go to `Apache-Tomcat` > `bin` and enter `shutdown.bat` to shut down the Apache Tomcat server.
   b. Enter `startup.bat -run` to reboot the server.

Adding the URLs to the adapter

You must add the Aras Innovator Extensions URL to the adapter. First, add an administrator user and then reboot the `Apache Tomcat` service, so that the adapter can read the properties from the `catalina.properties` file:

1. From the Windows Start menu, search for **Run**, and enter `services.msc`.
2. Right-click the Apache Tomcat service and click **Properties**. Then go to the **Log On** tab, select **This account**, and click **Browse**.
3. Add the administrator user details and click **OK** to save.
4. From the **Services** window, right-click the **Apache Tomcat** service and then click **Restart**.

To enter the Aras Innovator Extensions URL:

1. From the Apache Tomcat root directory, open the `conf` directory.
2. Edit the `catalina.properties` file.
3. Enter the following text:

   `com.ibm.lia4ai.extensions_url=http://<hostname:port`
   `number>/ArasInnovatorExtension`
4. Restart the server to implement the changes.

Use the adapter root URL to verify if the WAR file is successfully deployed. The adapter root URL contains the port on which the application server is configured. For example, if the Apache Tomcat server is configured on port 8443, the adapter root URL is:
[https://<*servername*>:8443/ArasAdapter/](https://<servername>:8443/ArasAdapter/)

Open a web browser and enter the adapter root URL in the address bar. If the WAR file is successfully deployed, the Aras Adapter index page opens.

Home page for LIA for Aras Innovator

Important: After installation, the adapter log file can be found at the following location: `TOMCAT_HOME\temp`

Configuring the WebSphere Application Server Liberty before installing the WAR file

Before you install the WAR file, configure these files:

- Configuring the jvm.options file
- Generating the keystore file
- Configuring the `server.xml` file
- Installing the features in WebSphere Application Server Liberty

Configuring the jvm.options file

Add the `jvm.options` file at the following location: `wlp\usr\shared.` You must enter the Aras Innovator Extensions URL in this file, so that the adapter can read this property:

```
com.ibm.lia4ai.extensions_url=http://<fully qualified host name:portnumber>/ArasInnovatorExtension
```

Generating the keystore file

Configure the WebSphere Application Server Liberty to run on HTTPS with a self-signed certificate.

1. From the command window, go to the `bin` directory of the WebSphere Application Server Liberty.
2. Run this command:
   ```
   "%JAVA_HOME%\bin\keytool" -genkey -alias <name> -keyalg RSA -keystore <filename>.keystore
   ```
   This command creates a keystore file in the `bin` directory; the file is named `<filename>.keystore`
   Tip: You must add the path of this keystore file in the `server.xml` file.

3. Choose a password for your keystore file.
   Important: The Keytool prompts you for your first and last name. Don't use your own name; instead, use the fully qualified system name. The rest of the information can be whatever you choose. Don't enter a key password, so it will be same as the keystore password.
4. To encode the password for the keystore file, run the following command: `securityUtility encode`.
5. Enter the keystore file password twice. You see the encoded password in the command window. Make a note of this password, you will need it later to configure the `server.xml` file.

Configuring the `server.xml` file

1. Open the `server.xml` file. You can find this file at the location where the LIAServer is created.
2. Locate the `<featureManager>` tag and enter the following features:

```
<featureManager>
    <feature>jsp-2.2</feature>
    <feature>servlet-3.0</feature>
    <feature>appSecurity-2.0</feature>
    <feature>ssl-1.0</feature>
    <feature>localConnector-1.0</feature>
</featureManager>
```

3. Configure the HTTP and HTTPS ports. To access this server from a remote client, add a host attribute to the following element:

```
<httpEndpoint httpPort="<port number>" httpsPort="<port
 number>" id="defaultHttpEndpoint" host="*"/>
```

4. In case of an invalid request, if you want the session manager to invalidate a session, set the value of following property as true:

```
<httpSession
invalidateOnUnauthorizedSessionRequestException="true"/>
```
If you don't, the session manager issues the following exception:
```
UnauthorizedSessionRequestException
```

5. To run the adapter on HTTPS, add the following SSL configuration:

```
<ssl id="AuthSSL" keyStoreRef="<name>"/>
<keyStore id="<name>" location="<path where the keystore
file is added>.keystore" password="<encoded password>"
type="JKS"/>
```

Add the keystore ID (any name), location of the keystore file, and the password you encoded in step 4 in *Generating the keystore file* on page 19. Keep the type as JKS.
Tip: The values for **keyStoreRef** and **keyStore id** must be same.

6. Optional: To use jar: or wsjar: URLs for referencing files in archives, set the following property as true.

```
<classloading useJarUrls="true"/>
<webApplication contextRoot="ArasAdapter" id="ArasAdapter"
location="ArasAdapter.war" name="ArasAdapter"/>
```

7. Add the following tag to the `server.xml` file and set its value as true so that the WebSphere Application Server Liberty does not detect changes to the WAR file:

```
<applicationManager autoExpand = "true">
```

Installing the features in WebSphere Application Server Liberty

Install the following WebSphere Application Server Liberty features:

- jsp-2.2
- servlet-3.0
- appSecurity-2.0
- ssl-1.0
- localConnector-1.0

To install these features, open the command window, go to the `bin` directory of

the WebSphere Application Server Liberty, and run the following command:

```
featureManager install <feature>
```

Installing the WAR file

1. Create a repository space for the adapter on your application server using the `server.bat` file. Open the command prompt and enter the following command to create a directory structure used for the WAR file deployment:
    ```
    Root directory\bin\server.bat create LIAServer
    ```

    Tip: The `server.bat` file can be found in the WebSphere Application Server Liberty root directory > `bin` directory.

2. Deploy the WAR file on the application server:

    a. Copy the WAR file from the adapter download.
    b. Go to the `wlp` > `user` > `servers` > `LIAServer` > `dropins` directory.
    c. Paste the WAR file into the `dropins` directory.

3. In the command prompt, enter the following command to reboot the server:
    ```
    Root Directory\bin\server.bat start LIAServer
    ```

Important: After installation, the adapter log file can be found in the following directory: `%temp%`

You can use the adapter root URL to verify whether the WAR file is successfully deployed on the application server. The adapter root URL contains the port on which the application server is configured, for example, if WebSphere Application Server Liberty server is configured on port 9443, then the adapter root URL will be:
https://<servername>:9443/ArasAdapter/

Open a web browser and enter adapter root URL in the address bar. If the WAR file is successfully deployed, the Aras Adapter index page opens:

Home page for LIA for Aras Innovator

Step 4: Copying the HTML and JavaScript files

From the adapter download, copy the `CustomUserInterfaceForOSLC` folder, navigate to the directory where you installed Aras Innovator, and paste it there. With the default installation, you paste the folder in the following directory:

```
C:\ProgramFiles(X86)\Aras\Innovator\Innovator\Client\
scripts
```
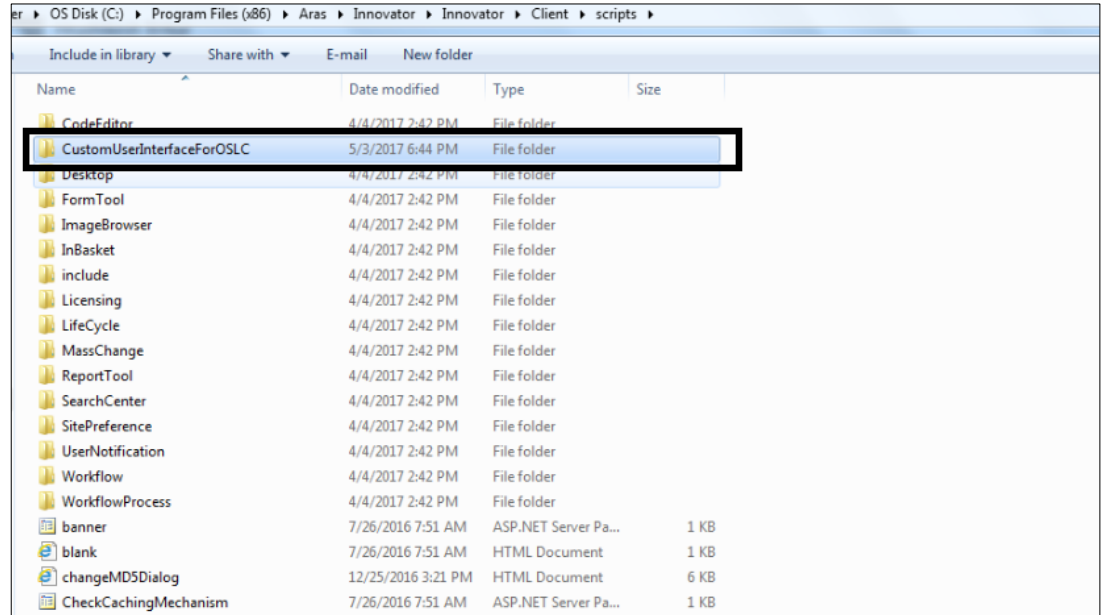

The `CustomUserInterfaceForOSLC` folder pasted in the `Scripts` directory

Post-installation tasks

After installing the adapter, you must configure and customize Aras Innovator to establish two-way communication between Aras Innovator and CLM applications.

Configurations

The following configurations establish communication between Aras Innovator and the adapter installation components.

- Adding the adapter URL to Aras Innovator
- Adding the Jazz Team Server URL to Aras Innovator
- Adding Open Authorization properties in Aras Innovator

Adding the adapter URL to Aras Innovator

To configure Aras Innovator to call the adapter services, you must link the adapter to Aras Innovator. To establish this link, add the adapter URL to the **Preferences** item type of Aras Innovator.

1. Go to Aras Innovator. In the navigation tree, click **Administration** and then click **Preferences**.
2. Enter ***admin** to perform a simple search for the administrators.
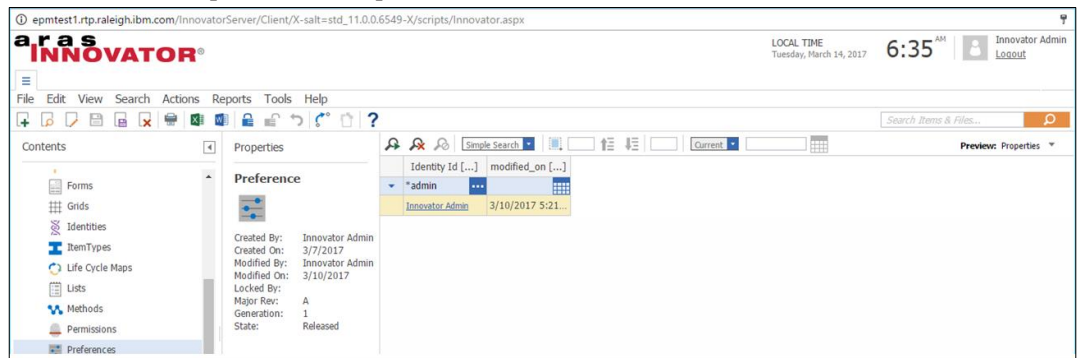
Search results for *admin

3. Open the **Innovator Admin** preference and lock it.

   Go to the **LIA for Aras Innovator** tab and click to add a relationship. Aras Innovator makes the grid available for editing and adds a row at the bottom of the grid.

4. In the **Preferences** column, enter **Adapter URL**, and in the **Value** column, enter the adapter URL

```
https://<hostname>:<portnumber>/ArasAdapter/
```
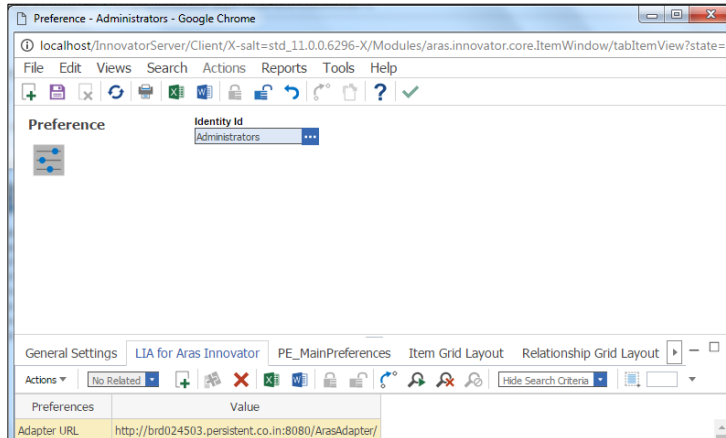

*LIA for Aras Innovator URL entered in the **Value** column*

5. Click **Save** and unlock the preference. The grid shows the newly added adapter URL.

Adding the Jazz Team Server URL to Aras Innovator

You must add a new item to the Jazz Team Server item type to associate the projects from CLM applications. Add this new item after installing the adapter for the first time. Later, you can either add a new or open the same Jazz Team Server item and associate the projects.

1. Go to Aras Innovator. In the navigation tree, expand **Administration > OSLC** and then click **Jazz Team Servers**.

2. From the menu bar at the top, click [icon] to add a new Jazz Team Server item.

3. In the **Server Name** field, enter the server name for the Aras Innovator instance.

4. In the **Public URL** field, enter the Jazz Team Server public URL:
    ```
    https://<jtsservername>:<port>/jts
    ```

5. Click **Save**. The grid on the **Jazz Team Server** page shows the Jazz Team Server instance that you added.

Configuring the Open Authorization properties

Jazz Team Servers communicate with each other and share data by establishing OAuth keys to create friend relationships between the servers and to manage the list of cooperating servers. Configuring the Open Authorization (OAuth) properties requires two steps:

Step 1: Adding a consumer and corresponding consumer properties. These properties are required when you set the OAuth properties.

Step 2: Setting the OAuth properties

Adding a consumer and consumer properties

Before you add the OAuth properties, you must add the adapter as a consumer and enter its properties. These properties are used by Aras Innovator to authenticate a user.

To add the consumer for Rational Team Concert or Rational DOORS Next Generation:

1. For Rational Team Concert:
   Log in to the **Administration** page of Rational Team Concert.

   For Rational DOORS Next Generation:
   Go to the Jazz Team Server **Administration** page and from the top menu bar, click **Server**.

2. Go to the **Communication** pane and click **Consumers (Inbound)**.
3. On the **OAuth Consumers** page you must register a new consumer.
4. Enter the following consumer properties:
   a. **Consumer Key**: The system generates this key after you register the adapter as a consumer. You will need it to add the OAuth properties in Aras Innovator.
   b. **Consumer Name**: Enter a name to identify the adapter.
   c. **Consumer Secret**: Enter the password twice. Remember this password for the adapter. You need it to add the OAuth properties in Aras Innovator.
5. Select the **Trusted** check box.
6. Click **Register** to add the adapter as a new consumer. You can view it in the **Authorized Keys** section.

Adding Open Authorization properties in Aras Innovator

After you register the adapter as a consumer and its properties, add the OAuth properties in Aras Innovator:

1. Go to Aras Innovator. In the navigation tree, expand **Administration > OSLC** and then click **Jazz Team Servers**.
2. Open the Jazz Team Server item that you added above and go to the **Jazz Authentication** tab.
3. Click [+] to add the OAuth properties.
4. Enter the following properties, see the figure on page 26:
   a. **OSLC Domain**:
      For Change Management, add `http://open-services.net/ns/cm#`
      For Requirements Management, add `https://open-services.net/ns/rm#`
   b. **Consumer Secret**: Enter the value provided while adding this consumer property in Rational Team Concert or Rational DOORS Next Generation.

c. **Consumer Key**: Enter the value that you provided while adding this consumer property in Rational Team Concert or Rational DOORS Next Generation.

Application Type: To associate the change management projects, enter **Change Management**. To associate the requirements management projects, enter **Requirements Management**.

d. **Application URL**: Go to the **Administrator** page of Rational Team Concert or Rational DOORS Next Generation and from the **Status Summary** section copy the URL from the **Public URI** field. Enter this URL as the application URL.

OSLC Domain	Consumer Secret	Consumer Key	Application Type	Application URL
http://open-services.net/ns/cm#	Password	4157dc505562482198a5ce8276d40257	Change Management	https://brd024506.persistent.co.in:9443/ccm
http://open-services.net/ns/rm#	Password	b54c393050db41b4be8f855c771847d5	Requirements Management	https://brd024506.persistent.co.in:9443/rm

Details entered in the Jazz Authentication tab

Customizing Aras Innovator

You can customize Aras Innovator and CLM applications to associate Aras Innovator with projects in the CLM applications. After this association, you can view the associated projects in Aras Innovator. You can select these projects and link them with an OSLC-enabled item type. To associate Aras Innovator with the projects in Rational DOORS Next Generation or Rational Team Concert:

1. Go to Aras Innovator. In the navigation tree, expand **Administration** > **OSLC**, and then open the **Jazz Team Servers** item type.

2. Open the item that you added in *Adding the Jazz Team Server URL to Aras Innovator on page 24.*

   From the **Project Associations** tab, click to add a new relationship. Both the **CLMAuthentication** window and the **OSLC Project Association** window open. **Important**: If you are using the adapter for evaluation topologies, for the first time you don't see the **CLMAuthentication** window. To open this window, enter the adapter URL in the web browser and accept the self-signed certificate. You must log into this window to fetch the registered applications and the related project areas from the CLM application. Remember that the active session times out every five minutes.

3. Enter your CLM login credentials.

4. In the **OSLC Project Association** window, from the **Registered Application Name** list, select either **Change Management** or **Requirements Management** as the registered application.

5. From the **Project Area** list, select the project. **Tip**: You see only the projects

that you have access to.

6. Click **Add** to associate the project. The grid shows the application and the added project.

If you are using the Internet Explorer browser and if you get the following error: "LIA for Aras Innovator may be down." see the Troubleshooting section on page 31.

If you successfully associated the projects, the project is listed in the **Select Provider** list when adding a new relationship with a CLM application from an OSLC-enabled item type. By default, the adapter installation adds the following OSLC-enabled item types to your Aras Innovator instance:

- Express DCO
- PR
- Part
- ECR
- Express ECO
- ECN

Apart from these, if you want to add any other OSLC-enabled item type, in the *LIA for Aras Innovator User's Guide*, see "Enabling OSLC links for item types".

Customizing the CLM applications

There are three customization tasks to establish communication between Rational DOORS Next Generation or Rational Team Concert with Aras Innovator:

- Creating friend relationships with servers
- Whitelisting the CLM applications
- Associating projects

Creating friend relationships with servers

For applications such as Rational DOORS Next Generation or Rational Team Concert to interact with Aras Innovator, you must establish communication between the Jazz Team Server that hosts these CLM applications and the LIA for Aras Innovator server. This relationship between the two servers is called a *friend link*. A friend link indicates that the requests coming from the servers can be trusted and the two servers can communicate with each other. By creating this friend link and associating the project with the adapter, you can use the adapter to link a task, defect, story, or a requirement from the CLM applications with an OSLC-enabled Aras Innovator item type.

Remember: To establish the friend links between Jazz Team Server and the adapter, you must be logged into Jazz Team Server with an account that has Jazz Project Administrator privileges. If you establish friend links between JTS and the adapter, you do not have to log into individual applications such as

Rational DOORS Next Generation or Rational Team Concert to establish the friend link with adapter.

1. Log in to Jazz Team Server and go to the **Administration** page.
2. In your web browser, enter
   `https://<hostname>:<portnumber>/jts/admin`
   Remember: The *<hostname>* is the host name with the DNS domain reference of the computer where the Jazz Team Server is installed.
3. On the **Administration** page, click the **Servers** tab.
4. In the **Communication** pane, click **Friends (Outbound)**.
5. On the **Friends** page, in the **Friends List** section, click **Add**.
6. In the **Add Friend** window, provide the following information.
   a. Enter the adapter's root services URL in the following format:

      `https://<hostname>:<portnumber>/ArasAdapter/rootserv ices`

   b. Enter a name to identify the friend server. Use `Aras Innovator` as the friend server name.
   c. Click **Next**, and enter the password twice.
   d. Optional: Select the **Trusted** check box. Trusted consumers can share authorization with other trusted consumers and do not require user approval to access data.
   e. Click **Create Friend**.
   f. Click **Next**. You can see the provisional key.
   g. Click **Finish**.

Important: Log in with an administrator account because the friend server generates a provisional key and to authorize this key, you must have Jazz Administrator privileges on the friend server.

After creating the friend relationships, associate the projects from Rational DOORS Next Generation and Rational Team Concert with the adapter. The CLM applications and Aras Innovator can interact with each other because of this association.

Whitelisting CLM applications

The URL whitelist permits Aras Innovator to access the data of CLM applications such as Rational DOORS Next Generation and Rational Team Concert.

1. Log in to the **Administration** page of Rational DOORS Next Generation or Rational Team Concert.
2. For Rational DOORS Next Generation, go to `https://<fully qualified hostname>:9443/rm/admin`
   For Rational Team Concert, go to `https://<fully qualified`

`hostname>:9443/ccm/admin`

Remember: The `<fully qualified hostname>` is the host name with the DNS domain reference of the system on which the CLM application is installed.

3. In the **Communication** pane, click **Whitelist (Outbound)**.
4. To add a URL to the whitelist, in the **Add New Whitelist URL** section, in the **Enter Base URL** field:
   o Enter the URL of the system where Aras Innovator is installed in the following format and then click **Add**:
   `scheme://<hostname>`
   Remember: Don't add the port number. If you add it, and Internet Explorer is used to access Aras Innovator, you will have trouble to establish links to CLM applications.
   o If the adapter is deployed on a different system, you need to add a whitelist entry for the adapter. Type the adapter URL and click **Add**:
   `scheme://<hostname>`
5. Optional: To edit a domain name in the URL whitelist, hover over the domain name in the **Jazz Authentication Proxy Whitelist** section and click the 🖉 icon. After making changes, click **Save**.
6. Optional: To delete a domain name from the URL whitelist, hover over the domain name in the **Jazz Authentication Proxy Whitelist** section and click the ❌ icon.

Associating projects

Associate the projects from Rational DOORS Next Generation and Rational Team Concert with the adapter. After the association, you can link Aras Innovator items with CLM artifacts.

- For Rational DOORS Next Generation:
  1. Log in to the Jazz server by using an account that has Jazz Administrator privileges.
  2. Go to `https://<fully qualified hostname>:9443/rm/web`. You can see all the project areas that you have access to.
  3. From the project that you want to associate with adapter, click **Manage Project Area** and scroll to **Associations** section, and click **Add**.
  4. In the **Add Association** window in the **Application** drop-down list, select the application URL that you identified when establishing cross-server communication using **Friends (Outbound)**.
  5. From the **Connect to Aras Adapter** window, log in to LIA for Aras Innovator instance so that you can view the following adapter service providers in CLM applications:
     o Aras Innovator (Change Management)
     o Aras Innovator (Requirements Management)
  6. Select an association type. The association controls what service providers

you see in the **Artifact Containers** list. It also enables specific link types when adding or linking to item types. For how to link, see the *LIA for Aras Innovator User's Guide*.

In the **Association** field, select one of the following association types:

- o To enable the **References** link type, select **Provides – Related Requirements**.
- o To enable the **Tracked by** link type, select **Uses – Requirement Change Requests**.
- o To enable the **Implemented by** and **Affected by** link types, select **Uses – Implementation Requests**.

7. From **Artifact Containers**, select the service provider, click **OK,** and save the project area.

- For Rational Team Concert
  1. Log in to the Jazz server using a Jazz Administrator account.
  2. Go to `https://<fully qualified hostname>:9443/ccm/web`. You can see all the project areas that you have access to.
  3. From the project that you want to associate with adapter, click **Manage Project Area** and scroll to **Associations** section, and click **Add**.
  4. In the **Add Association** window in the **Application** list, select the adapter root services URL that you identified when establishing cross-server communication using **Friends (Outbound)**.
  5. From the **Connect to Aras Adapter** window, log in to the adapter so that you can view the adapter service providers in CLM applications:
     - o Aras Innovator (Change Management)
     - o Aras Innovator (Requirements Management)
  6. Select an association type. The association controls what service providers you see in the **Artifact Containers** list. It also enables specific link types when adding or linking to existing item types. For how to link, see the *LIA for Aras Innovator User's Guide*.

     In the **Association** list, you can select the following association types:
     - o To enable the **Add Related Change Request** link type, select **Provides – Related Change Requests**.
       Limitation: This choice also enables other link types that Version 1.0 does not support: **Affected by, Defect, Tracks, Contributes To, Affects Plan Item**. Users should not use these link types.
     - o To enable the **Add Tracks Requirement** link type, select **Provides – Requirement Change Requests**
     - o To enable the **Add Implements Requirement** and link types, select **Provides – Implementation Requests**.
   **Limitation**: In version 1.0 do not select **Uses – Change Sets**.
  7. From **Artifact Containers**, select the service provider, click **OK**, and save the project area.

Troubleshooting

This section lists out the steps to resolve two issues that might occur during installation. For the list of other known issues and workarounds, see the *LIA for Aras Innovator Version 1.0 Release Notes*.

Configuration error

After you install the Aras Innovator Extensions for OSLC, you might get the following configuration error while browsing for the newly added website:
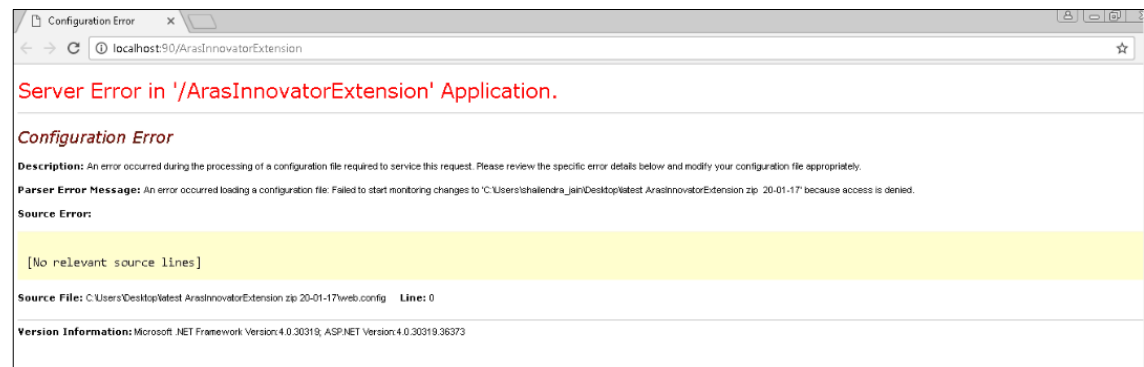

Error while browsing for the new website

To resolve this error, set the permission for IIS_IUSRS:

1. Right-click the new website directory and go to **Properties > Sharing** tab.
2. Click **Share** to open the **File Sharing** window.
3. Click the arrow to see the list and click **Find people**.
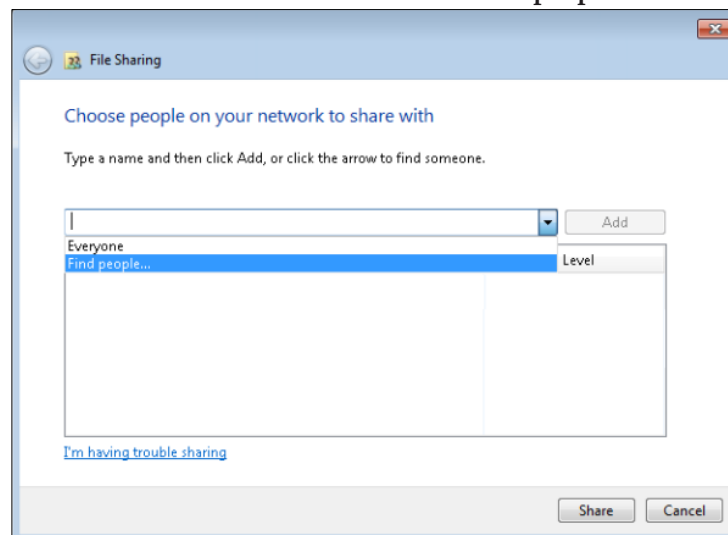
*The **Find people** option*

4. In the **Enter the object names to select** section, enter **IIS_IUSRS** and click **Check Names**.
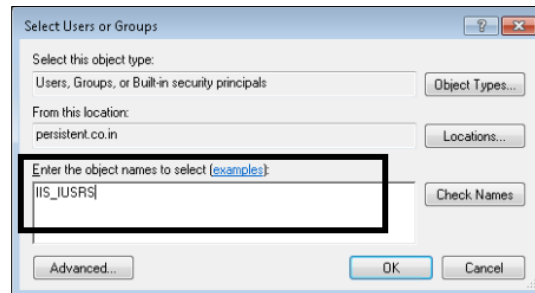
*The **IIS_IUSRS** object name*

5. Click **OK**. **IIS_IUSRS** is added to the table.
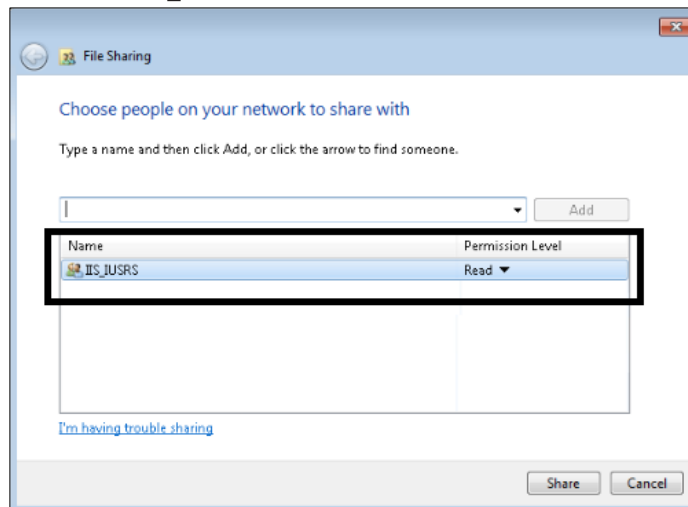
*The **IIS_USRS** object name is added to the table.*

6. From the **Permission Level** column, change the permission to **Read/Write**.
7. Click **Share**, and then click **Done** to update the permission for IIS_IUSRS and exit.

Content package not correctly imported

If the content package is not imported correctly, a log is generated that documents the error. Please check the log file at the following location:

```
C:\Program Files(X86)\11.0> SP9 CD
Image\PackageImportExportUtilities\Import\log
```

This path might be different from the location where you saved the Aras Innovator Import-Export Utility package.

Deleting sensitive data

The Lifecycle Integration Adapter for Aras Innovator stores all data in the Aras Innovator database. Any sensitive data stored in Aras Innovator needs to be searched for and scrubbed following the Aras Innovator procedures.

Since the labels of OSLC links come from Rational Team Concert and DOORS Next Generation, data spills affecting those products must be handled first, before the spill can be fully contained in Aras Innovator. Links can be removed completely without containing spills in the related CLM products, and any updates will continue to contain the sensitive data.

Searching for sensitive data
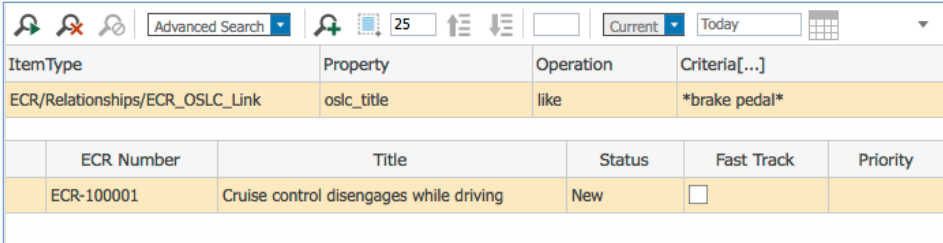
Labels from linked Rational Team Concert and DOORS Next Generation artifacts are stored in the Aras Innovator database. To find them, you need to determine the item types are used for OSLC linking. After you have the list of OSLC-enabled item types, search for instances of those types that contain the spilled data.

To determine the OSLC-enabled item types, see the *LIA for Aras Innovator User's Guide*, "Managing the OSLC links for item types" on page 3. By reviewing the list of OSLC resource types and the exposed item type for each, you can determine the set of item types that need to be searched.

To search each exposed item type for sensitive link data, you need to use the advanced search capability in Aras Innovator's search grid. The labels stored in any item's OSLC links are stored in a relationship called *<ItemName>*_OSLC_Link. For example, OSLC links for the ECR are stored in the ECR_OSLC_Link relationship. The title is stored in the oslc_title property. Therefore, add an advanced search criteria like this:

- Item Type: *ItemType*/**Relationship**/*ItemType*_**OSLC_Link**
- Property: **oslc_title**
- Operation: **like**

For example, here is the advanced search for all OSLC links for any ECR containing the text *brake pedal*.

Advanced search example

Deleting sensitive data

To delete sensitive data, open each instance of an item found during the search, and remove the link with the title containing spilled data. If the data spill has been contained in the linked product, then you need to remove the link and add it again to store the updated title in Aras Innovator. See the *LIA for Aras Innovator User's Guide*, "Linking an Aras item with an existing CLM artifact" on page 7.

If your data spill is in an item type that is versioned, previous generations of those items are not modifiable in Aras Innovator. See the Aras Innovator documentation for more information about item versions.

Determining the installed version

After you install the adapter components, you can open them in a web browser to see the version numbers.

For the Aras Innovator Extensions for OSLC, use this URL:
`https://<hostname>:<portnumber>/ArasInnovatorExtension`

For the LIA for Aras Innovator, use this URL:
`https://<hostname>:<portnumber/ArasAdapter/`

Error when associating projects using Internet Explorer browser

When you are associating projects from Aras Innovator, if you see the following error "LIA for Aras Innovator may be down", try these steps:

Adding the JTS server URL as a trusted site

1. From the Windows start menu, open "**Internet options**".
2. Go to the **Security** tab and then select "**Trusted sites**".
3. Click the **Sites** button.
4. In the **Add this website to the zone** field, enter the JTS server URL and click **Add** to add the trusted website, for example, `https://jtsserver`
5. Click **Close** to exit.

If these steps don't resolve the error, try the steps on the next page.

Resetting the Internet Explorer browser

1. From the Windows start menu, open "**Internet options**".
2. Go to the **Advanced** tab and then click the **Reset** button.
3. Select the Delete personal settings check box.
4. Click **Reset**. This resets the Internet settings.
5. Click **Close** to exit.

If the above steps **Resetting the Internet Explorer browser** and **Adding the JTS server URL as a trusted site** do not resolve the error, use other supported browsers (Mozilla Firefox or Google Chrome).

Uninstalling the adapter

When you uninstall the adapter, you remove each component in turn.

Step 1. Uninstalling Aras Innovator Extensions

Step 2. Uninstalling the content package

Step 3. Uninstalling the adapter WAR File

Step 4. Deleting the HTML and JavaScript files

Step 1: Uninstalling Aras Innovator Extensions

1. Open **IIS Manager** and from the **Connections** pane, go to **Sites** and right-click **ArasInnovatorExtension.**
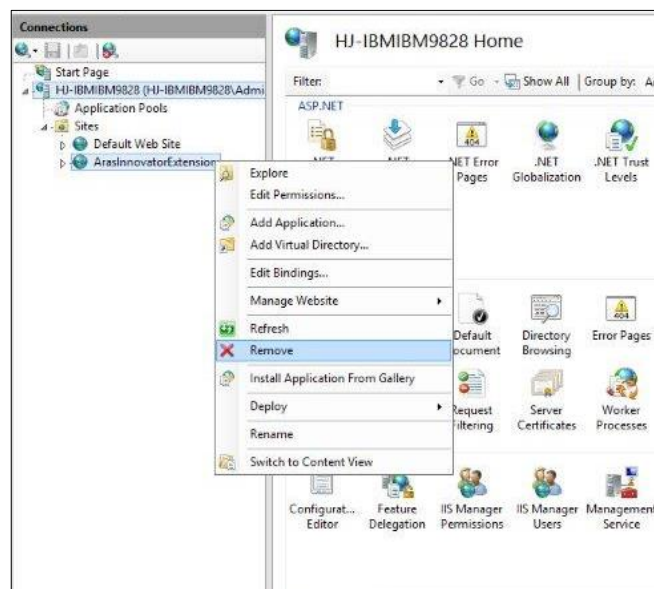
Removing the ArasInnovatorExtension website

2. Click **Remove** to uninstall the Aras Innovator Extensions for OSLC.
3. Go to the `ArasInnovatorExtension` folder and delete it.

Step 2: Uninstalling the content package

Delete the following item types and relationship types from Aras Innovator:

- Jazz Team Server Item Type
- OSLC Resource Item Type
- Project Associations Relationship Type
- OSLC Link Relationship Type. By default, there are six OSLC links:
    o Part OSLC Link
    o ECN OSLC Link
    o ECR OSLC Link
    o Express DCO OSLC Link
    o Express ECO OSLC Link
    o PR OSLC Link
- LIA for Aras Innovator Relationship Type
- OSLC UI Preview Relationship Type
- OSLC Create Dialog Property Relationship Type

Remember:

- Sequence is important. You must first delete the Item Type if it has a corresponding Relationship Type. For example, the **OSLC Resource Type** item type has the following two relationship types: **OSLC UI Preview** and **OSLC Create Dialog Property**. In this case, you must first delete the **OSLC Resource Type** item type.
- After you add an item from the **RelationshipType** item type, you can see it in some other item types, but you must delete it only from **RelationshipType** item type.
- Apart from the default, if you added any other OSLC Resource Type item type then delete the corresponding OSLC link that only from **Relationship Type** item type. For example, if you create an OSLC Resource Type with exposed item type PR, that is you enabled OSLC links for the PR item type and added the PR_OSLC_Links relationship to the PR item. You must delete this relationship from **Relationship Type** item type.

To delete each item type or relationship type:

1. Open the Aras Innovator Instance, from the navigation tree, go to the item type or relationship type.
2. Search for the item to delete.
3. From the search results, right-click the item and click **Delete**.

    Tip: If you can't see the **Delete** option, check if the item is unlocked.

To delete each item type or relationship type:

1. Open the Aras Innovator Instance, from the navigation tree, go to the item type or relationship type.
2. Search for the item to delete.
3. From the search results, right-click the item and click **Delete**.

   Tip: If you can't see the **Delete** option, check if the item is unlocked.

Step 3: Uninstalling the adapter WAR File

1. On your local system, go to the `Apache-Tomcat` > `webapps` directory.
2. Right-click the `ArasAdapter.war` file and click **Delete**.

Step 4: Deleting the HTML and JavaScript files

Go to the directory where you copied the HTML and JavaScript files and delete the *ArasInnovatorCustomUI* files.

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