IBM OpenPages GRC Platform
Version 8.0.0

OpenPages - Business Process Manager Installation Guide

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 57.

Contents

Introduction

You can use IBM® Business Process Manager to develop and implement automated business process solutions that meet the needs and requirements of IBM OpenPages® GRC Platform.

Audience

The *IBM OpenPages GRC - Business Process Manager Installation Guide* is intended for users who want to integrate IBM OpenPages GRC Platform and IBM Business Process Manager.

Please read the following important information regarding IBM OpenPages GRC documentation

IBM maintains one set of documentation serving both cloud and on-premise IBM OpenPages GRC deployments. The IBM OpenPages documentation describes certain features and functions which may not be available in OpenPages GRC on Cloud. For example, OpenPages GRC on Cloud does not include integration with IBM Business Process Manager and certain administrative functions.

If you have any questions about the functionality available in the product version that you are using, please contact IBM OpenPages Support via the IBM Support Community.

Finding information

To find product documentation on the web, including all translated documentation, access IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter).

Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products. IBM OpenPages GRC Platform documentation has accessibility features. PDF documents are supplemental and include no added accessibility features.

Forward-looking statements

This documentation describes the current functionality of the product. References to items that are not currently available may be included. No implication of any future availability should be inferred. Any such references are not a commitment, promise, or legal obligation to deliver any material, code, or functionality. The development, release, and timing of features or functionality remain at the sole discretion of IBM.

Chapter 1. Plan for the integration of OpenPages and BPM

You need to have a solid understanding of IBM Business Process Manager before you begin the integration with IBM OpenPages GRC Platform.

To find information about IBM Business Process Manager, access IBM Business Process Manager on IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter/SSFPJS_8.5.7/com.ibm.wbpm.main.doc/kc-homepage-bpm.html).

Environments

Plan the environments that you need for the integration of IBM OpenPages GRC Platform and IBM Business Process Manager.

You cannot integrate a single IBM OpenPages GRC Platform environment with multiple IBM Business Process Manager servers (either with BPM Process Center or with BPM Process Server). For each BPM Process Server and BPM Process Center, you need a separate IBM OpenPages GRC Platform environment.

For example, if you have four OpenPages environments called Dev, Test, UAT, and Prod, you need one BPM Process Center (for Dev) and three BPM Process Servers (for Test, UAT, and Prod).
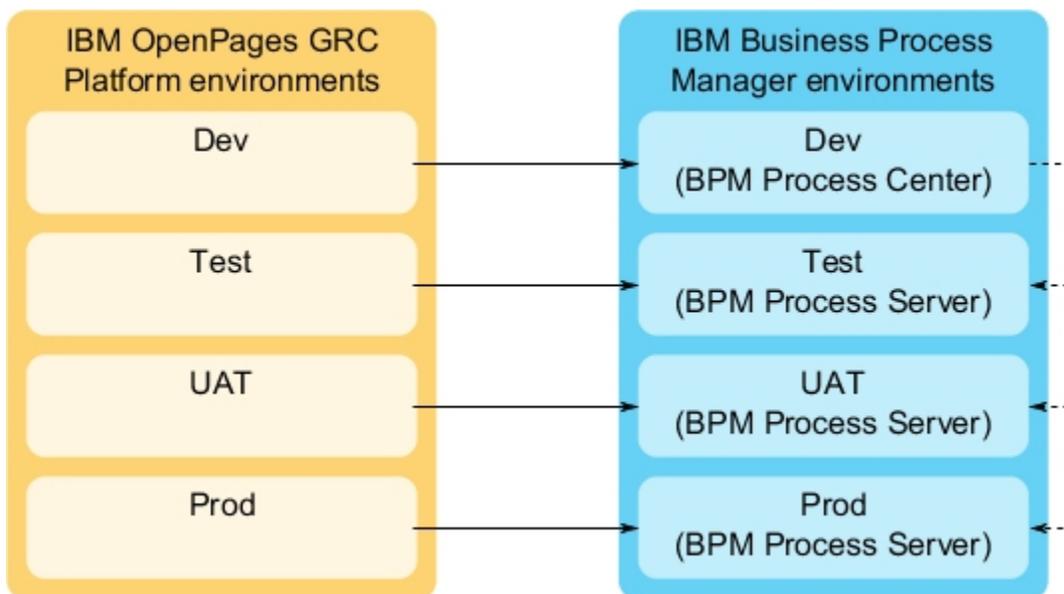
Figure 1. Environments

Follow these guidelines to prepare the environments.

- Set up the integration for each pair of IBM Business Process Manager and IBM OpenPages GRC Platform environments.

  For example, set up the integration for Dev, Test, UAT, and Prod.

- Run the toolkit generator only on the pair that uses BPM Process Center. The generated toolkits are deployed to BPM Process Servers when you install a process application on the BPM Process Server.

  For example, run the toolkit generator on the Dev environment.

- Because the OpenPages Solution Toolkit is generated with one OpenPages environment, all other OpenPages environments must have the same object schema in order to run BPM processes. You can use the export/import configuration utility to keep the object schema in sync.

  For example, if you generated the OpenPages Solution Toolkit in the Dev environment, the Test, UAT, and Prod environments must have the same object schema as Dev. You can export the schema from Dev and import it to the Test, UAT, and Prod environments to keep the object schema in sync.

- Run the command-line utility to replicate user emails and locales on each pair of BPM and OpenPages environments. The BPM Process Servers and BPM Process Center have their own databases to manage user locales and user e-mail addresses.

  For example, run the `syncUsers` tool on Dev, Test, UAT, and Prod.

- Do not set up multiple Process Centers even if you have multiple OpenPages development systems. If you run the toolkit generator multiple times for multiple BPM Process Center environments, it is not easy to maintain the toolkit dependencies for your process applications. Instead, use only one BPM Process Center and set up BPM Process Servers for all other environments.

- The **Process Portal** tab of the OpenPages homepage will not work until you install your first process application from BPM Process Center to BPM Process Server. The process application must include the OpenPages Solution Toolkit and the OpenPages Platform Toolkit in the dependency list.

- You can also set up OpenPages with IBM Business Process Manager by using Docker. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

Data encryption

Consider the security requirements for each of your environments.

When you integrate IBM OpenPages GRC Platform with IBM Business Process Manager, you choose the server URLs that OpenPages uses to connect to the BPM Process Center or BPM Process Servers.

For production environments, use a secure URL with Secure Sockets Layer (SSL), and use SSL certificates that are signed by a certificate authority (CA).

For non-production environments, you might choose to use the default certificates that are provided with IBM Business Process Manager or you might choose to use HTTP.

For more information, see "Secure Sockets Layer (SSL) for IBM Business Process Manager" on page 51.

Chapter 2. Set up the integration

You can integrate IBM Business Process Manager into your IBM OpenPages GRC Platform deployment. Use this section if you are integrating IBM Business Process Manager for the first time.

Note: If you upgraded IBM OpenPages GRC Platform and you previously integrated IBM Business Process Manager, see Chapter 3, "Update the integration after upgrading OpenPages," on page 23.

When you set up the integration, you can choose one of the following methods:

- Use the IBM OpenPages GRC Platform installation app
- Set up the integration manually

The method that you select determines the tasks that you need to do.

Setting up the integration by using the installation app

You can set up the integration by using the installation app.

Note: If you are upgrading IBM OpenPages GRC Platform and you used IBM Business Process Manager in your previous environment, see Chapter 3, "Update the integration after upgrading OpenPages," on page 23.

If you want to use the installation app to integrate IBM Business Process Manager and IBM OpenPages GRC Platform, do these tasks:

- Install IBM Business Process Manager, if it is not already installed. For more information, see "Install IBM Business Process Manager" on page 4.
- Create the IBM OpenPages GRC Platform database manually. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.
- Create a user for IBM Business Process Manager in the OpenPages database. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4 or "Setting up a user for IBM Business Process Manager (Oracle)" on page 6.
- Install IBM OpenPages GRC Platform. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide.*
  - When you fill in the **Database Server** card, for the **Install Database** option, select **Already Installed**.
  - Add the **Workflow Server** card to your deployment. Enter the values for your IBM Business Process Manager server. For more information, see "Adding a workflow server for a new integration" on page 7.
  - Complete the installation of IBM OpenPages GRC Platform.

  Note: If you already have a cell for IBM Business Process Manager, you cannot use it as a shared-cell for the OpenPages deployment.
- Set up auto-login. For more information, see "Setting up auto-login" on page 17.
- Generate and import the toolkits. For more information, see "Generating and importing the toolkits" on page 17.
- Load the registry settings. For more information, see "Loading registry settings" on page 19.
- Replicate user email addresses and locales. For more information, see "Replicating user email addresses and locales" on page 20.
- Establish the user interface elements for IBM Business Process Manager. For more information, see "Enabling the user interface elements for IBM Business Process Manager" on page 21.
- Complete any additional tasks, such as setting up SSL or LDAP. See Chapter 5, "Additional tasks ," on page 49.

Figure 2. Setting up a new integration

Install IBM Business Process Manager

Download and install IBM Business Process Manager.

Note: If IBM Business Process Manager is already installed, you can use your existing installation.

You can download the IBM Business Process Manager installation packages from IBM Passport Advantage.

For information about how to install IBM Business Process Manager, see the IBM Business Process Manager documentation.

If you have an OpenPages account with the user name admin, use a different account name for the IBM WebSphere® Application Server deployment that you use for IBM Business Process Manager. You can set the account name when you install IBM Business Process Manager.

If you use admin for both accounts, conflicts can occur in both the federated repository and the default user registry that is provided by IBM WebSphere Application Server. It can also cause authentication issues with the OpenPages REST API security.

If you already installed IBM Business Process Manager and your user name is admin, remove the WebSphere admin user from the default user registry and create a new administrator with a different name. For information, see the IBM WebSphere documentation.

Setting up a user for IBM Business Process Manager (DB2)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.
   Ensure that you have write permissions on the directory.
3. Locate the op-bpm-install.zip file.

The file is located in the /OP_*<version>*_Non_Embedded/OP_*<version>*_Configuration/ IBM_BPM_Integration/ directory.

4. Extract the op-bpm-install.zip file to the temporary directory that you created.

5. Create a database user, for example bpmaccnt.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using IBM DB2® on Linux, the database user name is limited to 8 characters. For example, you can use bpmaccnt or bpmauth1.

   Note: The database user name must be unique. Do not use openpages, opworkflow, or workflow.

6. Create the new user account on the operating system.

   • If you are using Linux, run the following commands as a user who has sudo privileges:

     Replace bpmaccnt with the user name of the database user account that you created.

     ```
     $ useradd -m -d /home/bpmaccnt bpmaccnt
     $ passwd bpmaccnt
     ```

     Enter the password for the bpmaccnt user.

   • If you are using Microsoft Windows, create the user account by using **Control Panel** > **Administrative Tools** > **Users and Groups**.

7. Complete the following steps to set up the bpmaccnt user, the database user that you created in step 5.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

   b) Run the setup_op_bpm_user_DB2_step_1.sql script as the user who is the OpenPages database schema owner.

      ```
      clpplus -nw <op_schema_user>@<host>:<port>/<DB>
          @setup_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
      ```

Table 1. Parameters of the setup_op_bpm_user_DB2_step_1.sql script	
Parameter	Description
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example bpmaccnt

   c) Run the setup_op_bpm_user_DB2_step_2.sql script as the user that you created, for example bpmaccnt.

      ```
      clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
          @setup_op_bpm_user_DB2_step_2.sql <op_schema_name>
      ```

Table 2. Parameters of the setup_op_bpm_user_DB2_step_2.sql script	
Parameter	Description
<bpm_auth_user>	The name of the database user that you created, for example bpmaccnt

Table 2. Parameters of the `setup_op_bpm_user_DB2_step_2.sql` script (continued)	
Parameter	**Description**
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<op_schema_name>	The name of the OpenPages database schema

8. Stop all OpenPages, node agents, and deployment manager (Dmgr).
9. Restart the OpenPages deployment manager (Dmgr), node agents, and servers.

Results

The new `bpmaccnt` user is configured.

Setting up a user for IBM Business Process Manager (Oracle)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the `op-bpm-install.zip` file.

   The file is located in the `/OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/` directory.
4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. Create a database user, for example `bpmaccnt`.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using Linux, the database user name is limited to 8 characters. For example, you can use `bpmaccnt` or `bpmauth1`.

   Note: The database user name must be unique. Do not use `openpages`, `opworkflow`, or `workflow`.
6. Complete the following steps to set up the `bpmaccnt` user.

   Run the `setup_op_bpm_user_ORA.sql` script as the system DBA user for the OpenPages database.

   ```
   sqlplus <dba_user>/<password>@<SID> @setup_op_bpm_user_ORA.sql
       <bpm_auth_user> <bpm_auth_user_password> <op_schema_name>
   ```

   The script uses the following parameters.

Table 3. Parameters of the `setup_op_bpm_user_ORA.sql` script	
Parameter	**Description**
<dba_user>	The system DBA user for the OpenPages database
<password>	The password of the `system` DBA account
<SID>	The service name (system identifier) of the OpenPages database

Table 3. Parameters of the `setup_op_bpm_user_ORA.sql` script (continued)	
Parameter	Description
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<bpm_auth_user_password>	The password of the database user that you created
<op_schema_name>	The name of the OpenPages database schema

7. Stop all OpenPages servers and node agents.
8. Restart the OpenPages Deployment Manager (Dmgr).

Results

The new `bpmaccnt` user is configured and OpenPages is ready for integration with IBM Business Process Manager.

Adding a workflow server for a new integration

Configure a workflow server if you want to use IBM Business Process Manager with IBM OpenPages GRC Platform. You can use one workflow server in your IBM OpenPages GRC Platform deployment. The workflow server is optional.

Before you begin

- IBM Business Process Manager is installed.
- The OpenPages database is fully installed.
- The user account for IBM Business Process Manager exists in the OpenPages database.

About this task

When you create your IBM OpenPages GRC Platform deployment, add a **Workflow Server** card.

Fill in the card with the details of the IBM Business Process Manager server that you want to use with OpenPages.

Procedure

1. Open your deployment in the installation app.

2. Click the server list, select **Workflow Server**, and then click . Click **Continue** to confirm.
   A **Workflow Server** card is added in the left pane.
3. Type a **Nickname** for the server.
   The name is displayed on the server card.
4. Type the **Host Name** of the server. Use the fully qualified domain name (FQDN).

   - If you are deploying a development environment, type the host name of IBM BPM Process Center.
   - If you are deploying a production environment, type the host name of IBM BPM Process Server.
5. Select the **Operating System** of the server.
6. If the server is on a different physical machine than the installation server, enable the **Remote Deploy** option.

   The agent software is installed on the remote server automatically.

   Complete the following fields:

   - **Agent Port**: Type the port number for the agent software to use.

Note: If the host name is the same in any two cards, port synchronization will work only if you complete the host information before you complete the **Agent Port** field. Ensure that the port number is the same on any two cards where the host name is the same. If the port number is not the same on both cards, you will encounter exceptions during the validation phase where agents are installed automatically on target systems.

- **SSH Port** (Linux/AIX only): Type the Secure Shell (SSH) port number of the remote server.
- **Local User Name** and **Local User Password**: Type the credentials of the OpenPages installation user on the remote server. The account is used to install the agent software on the remote server. You can specify a local account that is on the remote server or a service account, for example *<domain>/<user name>*.

    Note: If you installed the agent manually and you are using the 8.0.0.1 or earlier version of the installation server, you can use Agent for the **Local User Name** and **Local User Password**.

    Note: If you installed the agent manually and you are using the 8.0.0.2 or later version of the installation server, you can leave the **Local User Name** and **Local User Password** fields empty. Ensure that the agents are started before you install OpenPages.

- **Agent Directory**: Type the absolute path to the directory on the remote server where you want the agent software installed.

    Note: If you are using Microsoft Windows, the maximum length of the path is 25 characters.

7. Type the name of the IBM WebSphere profile of the IBM Business Process Manager Deployment Manager in the **BPM DMGR Profile Name** field.
8. Type the SOAP port number of the IBM BPM Deployment Manager in the **BPM DMGR SOAP Port** field.
9. Type the IBM WebSphere node name of the IBM Business Process Manager server in the **BPM Node Name** field.
10. Type the name of the IBM WebSphere profile of the IBM Business Process Manager server in the **BPM Server Profile Name** field.
11. Type the port number of the IBM Business Process Manager server in the **BPM Server Port** field.
12. Type the **BPM Home Directory**.

    The home directory is the installation location of IBM Business Process Manager.
13. Type the **BPM Integration Directory**

    The integration directory is where the OpenPages Platform toolkit and OpenPages Solutions toolkit are installed on the IBM Business Process Manager server.
14. Type the **BPM JDBC Username** and **BPM JDBC Password**.
15. If you want to use the rollback feature for this server, enable the **Rollback on failure** option.

    When **Rollback on failure** is enabled and an error occurs, the operation that caused the failure is rolled back. You can then fix the error and continue with the installation. The installation process resumes at the operation that was rolled back.

    For example, if an error occurs during the **Install** process, fix the error and then click **Install** to continue.
16. Optional: Click **Save**.
17. Complete the installation of IBM OpenPages GRC Platform.
18. Verify the workflow server configuration:
    a) On the Workflow server host, navigate to the **BPM Integration Directory** that is set up in step 13.
    b) In a text editor, open the installBPMIntegrationConfig.[cmd|sh] file.
    c) Locate the line that contains "opBaseURL", and verify that the URL value is the OpenPages application URL (for example, http://opserver.com:10108/). In some cases, it contains "undefined" for the port number of the URL.
    d) When the URL value is not as expected, follow the steps in .

e) When the integration script has completed successfully, you can set up auto-login. For more information, see "Setting up auto-login" on page 17.

Setting up the integration manually

You can set up the integration manually.

If you want to use manual steps to integrate IBM Business Process Manager and IBM OpenPages GRC Platform, do these tasks:

- Install IBM Business Process Manager, if it is not already installed. For more information, see "Install IBM Business Process Manager" on page 4.
- Install IBM OpenPages GRC Platform

  Do not add the **Workflow Server** card to your deployment.

  For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.
- Create a user for IBM Business Process Manager in the OpenPages database. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4 or "Setting up a user for IBM Business Process Manager (Oracle)" on page 6.
- Prepare IBM Business Process Manager for the integration. For more information, see "Preparing IBM Business Process Manager for integration with OpenPages" on page 13.
- Run the integration script. For more information, see "Running the integration script" on page 13.
- Set up auto-login. For more information, see "Setting up auto-login" on page 17.
- Generate and import the toolkit. For more information, see "Generating and importing the toolkits" on page 17.
- Load registry settings. For more information, see "Loading registry settings" on page 19.
- Replicate user email addresses and locales. For more information, see "Replicating user email addresses and locales" on page 20.
- Establish the user interface elements for IBM Business Process Manager. For more information, see "Enabling the user interface elements for IBM Business Process Manager" on page 21.
- Complete any additional tasks, such as setting up SSL or LDAP. See Chapter 5, "Additional tasks," on page 49.
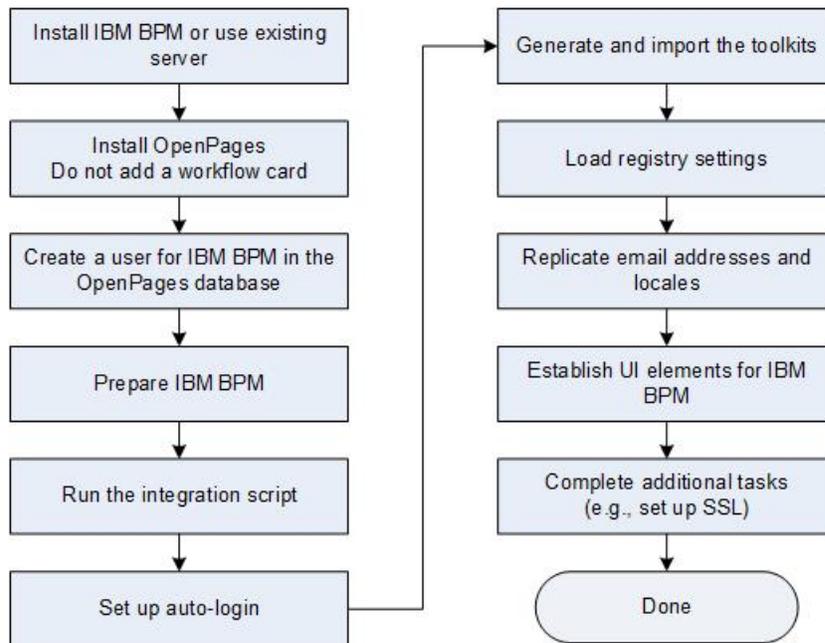
Figure 3. Setting up a new integration

Install IBM Business Process Manager

Download and install IBM Business Process Manager.

Note: If IBM Business Process Manager is already installed, you can use your existing installation.

You can download the IBM Business Process Manager installation packages from IBM Passport Advantage.

For information about how to install IBM Business Process Manager, see the IBM Business Process Manager documentation.

If you have an OpenPages account with the user name admin, use a different account name for the IBM WebSphere Application Server deployment that you use for IBM Business Process Manager. You can set the account name when you install IBM Business Process Manager.

If you use admin for both accounts, conflicts can occur in both the federated repository and the default user registry that is provided by IBM WebSphere Application Server. It can also cause authentication issues with the OpenPages REST API security.

If you already installed IBM Business Process Manager and your user name is admin, remove the WebSphere admin user from the default user registry and create a new administrator with a different name. For information, see the IBM WebSphere documentation.

Setting up a user for IBM Business Process Manager (DB2)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the op-bpm-install.zip file.

   The file is located in the /OP_*<version>*_Non_Embedded/OP_*<version>*_Configuration/ IBM_BPM_Integration/ directory.

4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. Create a database user, for example `bpmaccnt`.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using IBM DB2 on Linux, the database user name is limited to 8 characters. For example, you can use `bpmaccnt` or `bpmauth1`.

   Note: The database user name must be unique. Do not use `openpages`, `opworkflow`, or `workflow`.
6. Create the new user account on the operating system.

   - If you are using Linux, run the following commands as a user who has `sudo` privileges:

     Replace `bpmaccnt` with the user name of the database user account that you created.

     ```
     $ useradd -m -d /home/bpmaccnt bpmaccnt
     $ passwd bpmaccnt
     ```

     Enter the password for the `bpmaccnt` user.
   - If you are using Microsoft Windows, create the user account by using **Control Panel** > **Administrative Tools** > **Users and Groups**.
7. Complete the following steps to set up the `bpmaccnt` user, the database user that you created in step 5.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

   b) Run the `setup_op_bpm_user_DB2_step_1.sql` script as the user who is the OpenPages database schema owner.

   ```
   clpplus -nw <op_schema_user>@<host>:<port>/<DB>
       @setup_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
   ```

   Table 4. Parameters of the `setup_op_bpm_user_DB2_step_1.sql` script

Parameter	Description
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`

   c) Run the `setup_op_bpm_user_DB2_step_2.sql` script as the user that you created, for example `bpmaccnt`.

   ```
   clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
       @setup_op_bpm_user_DB2_step_2.sql <op_schema_name>
   ```

   Table 5. Parameters of the `setup_op_bpm_user_DB2_step_2.sql` script

Parameter	Description
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<op_schema_name>	The name of the OpenPages database schema

8. Stop all OpenPages, node agents, and deployment manager (Dmgr).
9. Restart the OpenPages deployment manager (Dmgr), node agents, and servers.

Results

The new `bpmaccnt` user is configured.

Setting up a user for IBM Business Process Manager (Oracle)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the `op-bpm-install.zip` file.

   The file is located in the `/OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/` directory.
4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. Create a database user, for example `bpmaccnt`.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using Linux, the database user name is limited to 8 characters. For example, you can use `bpmaccnt` or `bpmauth1`.

   Note: The database user name must be unique. Do not use `openpages`, `opworkflow`, or `workflow`.
6. Complete the following steps to set up the `bpmaccnt` user.

   Run the `setup_op_bpm_user_ORA.sql` script as the system DBA user for the OpenPages database.

   ```
   sqlplus <dba_user>/<password>@<SID> @setup_op_bpm_user_ORA.sql
       <bpm_auth_user> <bpm_auth_user_password> <op_schema_name>
   ```

   The script uses the following parameters.

Table 6. Parameters of the `setup_op_bpm_user_ORA.sql` script	
Parameter	**Description**
<dba_user>	The system DBA user for the OpenPages database
<password>	The password of the `system` DBA account
<SID>	The service name (system identifier) of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<bpm_auth_user_password>	The password of the database user that you created
<op_schema_name>	The name of the OpenPages database schema

7. Stop all OpenPages servers and node agents.
8. Restart the OpenPages Deployment Manager (Dmgr).

Results

The new `bpmaccnt` user is configured and OpenPages is ready for integration with IBM Business Process Manager.

Preparing IBM Business Process Manager for integration with OpenPages

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to copy the integration scripts and files to the IBM Business Process Manager server.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.
2. Create a new temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the `op-bpm-install.zip` file.

   The `op-bpm-install.zip` file is in the `/OP_<version>_Non_Embedded/ OP_<version>_Configuration/IBM_BPM_Integration/` directory on the IBM OpenPages GRC Platform installation media.
4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. If you are using Linux, change the file permissions on the `installBPMIntegration.sh` and `installBPMIntegrationConfig.sh` scripts to allow the `execute` permission.
6. Log on to the OpenPages database server.
7. Copy the following `jar` files from the OpenPages database server to the temporary directory on your IBM Business Process Manager server.

   - If you are using IBM DB2, copy `<DB2_Home>`/sqllib/java/db2jcc_license_cu.jar and `<DB2_Home>`/sqllib/java/db2jcc4.jar.
   - If you are using Oracle, copy `<Oracle_Home>`/jdbc/lib/ojdbc7.jar.
8. Stop all IBM Business Process Manager servers and node agents.

   For more information, see Starting and stopping your environment on the IBM Business Process Manager Knowledge Center.
9. Restart the IBM Business Process Manager Deployment Manager (Dmgr).

   For more information, see Starting and stopping deployment managers on the IBM Business Process Manager Knowledge Center.

Running the integration script

Run the integration script to integrate IBM Business Process Manager with IBM OpenPages GRC Platform.

Before you begin

- IBM Business Process Manager Deployment Manager (Dmgr) must be running.
- The IBM Business Process Manager server and the node agents must be stopped.
- OpenPages Deployment Manager (Dmgr) must be running.
- OpenPages servers and node agents must be stopped.
- Ensure that you have write permissions on the temporary directory where you copied the integration scripts.

About this task

The integration script performs a series of configuration operations. Run the script when you initially integrate IBM Business Process Manager with IBM OpenPages GRC Platform. You can also run the script when you need to reconfigure the integration.

The integration script does the following:

- Configures the user registry. The user registry enables users to log in to IBM Business Process Manager with their OpenPages credentials.
- Sets up automatic sign-on. Automatic sign-on enables users to access the OpenPages REST API from a IBM Business Process Manager process without logging in to OpenPages.
- Stores the credentials for an OpenPages system task account. The user account enables processes to access the OpenPages REST API from a IBM Business Process Manager process system task.
- Sets the URL for OpenPages to provide access to the OpenPages REST API from IBM Business Process Manager.
- Configures the OpenPages Login Trust Association Interceptor (TAI). TAI enables users to access IBM Business Process Manager without the need to log in. Users can access IBM Business Process Manager from an embedded home page tab and from links in OpenPages.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.
2. Open a command line and run the integration script.

   Replace *<temp_dir>* with the temporary directory where you copied the integration scripts.

   Microsoft Windows

   ```
   cd <temp_dir>
   installBPMIntegration.cmd
   ```

   Linux

   ```
   cd <temp_dir>
   ./installBPMIntegration.sh
   ```

3. Enter a value for each prompt.

Table 7. Parameters of the `installBPMIntegration.cmd`|`.sh` script	
Parameter	**Description**
BPM installation Home dir	Type the installation location of IBM Business Process Manager. Example: `/opt/ibm/BPM/<version>` (Linux) or `c:\IBM\BPM\<version>`
BPM admin user	Type the IBM BPM administrator user name.
BPM admin user password	Type the password of the IBM BPM administrator.
BPM dmgr fully qualified host name	Type the host name of the IBM BPM Deployment Manager server. Example: `bpmserver.com`
BPM dmgr SOAP port	Type the SOAP port number of the IBM BPM Deployment Manager server. Example: 8879

Table 7. Parameters of the `installBPMIntegration.cmd|.sh` script (continued)	
Parameter	**Description**

Database JDBC URL	Type the database JDBC URL to use to connect to the OpenPages database instance for the JDBC driver for your database type: IBM DB2 or Oracle.
	
	• For IBM DB2, use the syntax `jdbc:db2//`
	`<connection_string>`
	
	The *<connection string>* must specify the database host, port number, and database name.
	
	– *Database host*: The domain name or IP address of the database host.
	– *Port number*: The TCP/IP server port number that is assigned to the data source
	– *Database name*: The name of the database
	
	For example, if you want to connect to the OpenPages database on a host that is called db2server.com that has a listener on port 50000, and the name of the database is OPX, type: `jdbc:db2//db2server.com:50000/OPX`
	
	• For Oracle, use the syntax `jdbc:oracle:thin:@//`
	`<connection_string>`
	
	The *<connection string>* must specify the database host, port number, and SID.
	
	– *Database host*: The domain name or IP address of the database host.
	– *Port number*: The TCP/IP server port number of the listener
	– *SID*: The service name of the database (system identifier)
	
	For example, if you want to connect to the OpenPages database on a host that is called `oracleserver.com` that has a listener for port 1521, and the SID of the database is OPX, type: `jdbc:oracle:thin:@//`
	`oracleserver.com:1521/OPX`

Database openpages user name	Type the user name of the database user with limited privileges that you created when you prepared OpenPages for integration with IBM BPM. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4.
Database openpages user password	Type the password of the OpenPages database user.
Database openpages schema name	Type the name of the OpenPages database schema.
OP Application Base URL	Type the URL of the OpenPages application. Example: `http://opserver.com:10108/`
OP Application URL Root Context	Type the root context of the OpenPages application URL. For example, if you customized the URL to remove "openpages", type / If you did not customize the OpenPages URL, type /openpages

Table 7. Parameters of the `installBPMIntegration.cmd`|`.sh` script (continued)	
Parameter	**Description**
OP WAS admin user	Type the IBM WebSphere Application Server administrator user name.
OP WAS admin user password	Type the password of the IBM WebSphere administrator.
OP dmgr fully qualified host name	Type the host name of the OpenPages Deployment Manager server. Example: `opserver.com`
OP dmgr SOAP port	Type the SOAP port number of the OpenPages Deployment Manager server. Example: `8879`
OP System Task User Name	Type the user name of the OpenPages administrator. Example: `OpenPagesAdministrator`
OP System Task User Password	Type the password of the OpenPages administrator.

4. Review the values, and then type y to run the script.
5. Synchronize the IBM Business Process Manager nodes.

   - On Microsoft Windows operating systems, go to the *<BPM_Home>*\profiles *<BPM_server_profile>*\bin directory. Run `syncNode.bat`.
   - On Linux operating systems, go to the *<BPM_Home>*/profiles/*<BPM_server_profile>*/bin directory. Run `syncNode.sh`.

   Use the following syntax:

   ```
   syncNode.bat|.sh <Dmgr_hostname> -username <BPM_WAS_admin_username>
       -password <BPM_WAS_admin_password>
   ```

6. Synchronize the OpenPages nodes.

   - On Microsoft Windows operating systems, go to the *<OP_Home>*\profiles*<host_name>*-OPNode1\bin directory. Run `syncNode.bat`.
   - On UNIX operating systems, go to the *<OP_Home>*/profiles/*<host_name>*-OPNode1/bin directory. Run `syncNode.sh`.

   Use the following syntax:

   ```
   syncNode.bat|.sh <admin_host_name> <OP_SOAP_PORT>
       -username <OP_WAS_admin_user_name> -password <OP_WAS_admin_password>
   ```

   For example, on Linux operating systems, run the following command:

   ```
   /home/opuser/OP/OpenPages/profiles/opserver-OPNode1/bin/syncNode.sh
       localhost 8879 -username admin -password openpages
   ```

7. Restart the OpenPages GRC Platform services.
8. Restart the IBM Business Process Manager services and IBM BPM Process Center.
9. Log in to OpenPages as a user with administrative privileges.
10. Configure IBM Business Process Manager. For more information, see the *IBM OpenPages GRC Administrator's Guide.*

Run the integration script silently

You can run the integration script silently.

Open the integration script (`installBPMIntegrationConfig.sh|cmd`) in a text editor. Set the values and save the file. Run the script with the `--silent` option.

Use the following syntax. Replace *<temp_dir>* with the temporary directory where you copied the integration script.

- Windows

```
cd <temp_dir>
installBPMIntegration.cmd --silent
```

- Linux

```
cd <temp_dir>
./installBPMIntegration.sh --silent
```

For more information about the integration script, see .

Setting up auto-login

You can set up auto-login. When auto-login is enabled, IBM OpenPages GRC Platform users can use the IBM Business Process Manager menu items in OpenPages without having to log in to IBM BPM.

Procedure

1. Log on to OpenPages GRC Platform as a user with administrative privileges.
2. Go to **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM**.
3. Set the **Enable Login SSO** registry setting to **true**.
4. Click **Save**.
5. Edit the *<OP_HOME>*/aurora/conf/aurora.properties file on the OpenPages application server. Create a property that is named `logout.url.ibmbpm`, or edit the property if it exists. Set it to the `https://` URL of your IBM BPM server hostname/FQDN.
   For example:

   ```
   https\://bpm.server.com\:9443/ProcessPortal/logout.jsp
   ```

6. Stop all OpenPages application servers, node agents, and deployment manager (Dmgr).
7. Restart the OpenPages deployment manager (Dmgr), all node agents, and application servers.

Generating and importing the toolkits

Use the toolkit generator to create and import the OpenPages Platform Toolkit and the OpenPages Solutions Toolkit to IBM Business Process Manager. The toolkits contain elements that enable you to create business processes that use OpenPages objects.

About this task

The toolkit generator reads the OpenPages object schema and generates IBM Business Process Manager business objects that correspond to the OpenPages object types.

Generate and import the toolkits in the following cases:

- When you initially integrate IBM Business Process Manager with IBM OpenPages GRC Platform.
- After you update the integration, for example when you upgrade OpenPages.
- When the OpenPages object schema changes.

Run the toolkit generator on environments that use the BPM Process Center, not on those that use the BPM Process Server. The generated toolkits are deployed to BPM Process Servers when you install a process application on the BPM Process Server.

Procedure

1. Log on to the IBM Business Process Manager server.
2. Go to the temporary directory where you extracted the `op-bpm-install.zip` file.
3. Locate the `<temp_dir>/synctool/op-bpm-tool.jar` file.
4. Run the toolkit generator.

   The generator uses the following syntax:

   ```
   java -jar op-bpm-tool.jar genToolkit -insecure
     <OpenPages URL> <OpenPages username> <OpenPages password>
     <IBM BPM URL> <IBM BPM username> <IBM BPM password>
   ```

   For the `<IBM BPM URL>`, specify the `https://` URL and port number of IBM Business Process Manager.

   For example:

   ```
   java -jar op-bpm-tool.jar genToolkit -insecure
     http://opserver.com:10108
     OpenPagesAdministrator password
     https://bpmserver.com:9443
     admin openpages
   ```

5. Verify that the toolkits are available.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Verify that the OpenPages Platform and OpenPages Solutions toolkits are listed.

6. If you upgraded from OpenPages 7.3.0.0 with IBM Business Process Manager and you previously gave the **tw_allusers** group Read access to the OpenPages Platform toolkit, remove the group.

   Note: If you are integrating OpenPages and IBM Business Process Manager for the first time, you can ignore this step.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Click the OpenPages Platform toolkit.

   d) Click **Manage**.

   e) Remove the **tw_allusers** group.

7. Activate the OpenPages Platform toolkit.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Click the OpenPages Platform toolkit.

   d) Click the down-arrow next to the most recent snapshot. Click **Activate**.

8. If you are regenerating the toolkits after upgrading OpenPages, update your process apps to use the updated toolkits.

   a) Open IBM BPM Process Center in your web browser.

   b) Open each process application that you have created and update the dependencies to the OpenPages Platform toolkit and OpenPages Solutions toolkit.

      For more information, see Creating, changing, and deleting a toolkit dependency in the Designer view in the IBM Business Process Manager documentation (http://www.ibm.com/support/knowledgecenter/en/SSFPJS_8.5.7/com.ibm.wbpm.admin.doc/topics/managing_toolkits_E.html)

Loading registry settings

Load the registry settings for IBM Business Process Manager into OpenPages GRC Platform.

Before you begin

Load the registry settings after you have generated the toolkits. For more information, see "Generating and importing the toolkits" on page 17.

About this task

The toolkit generator creates a registry settings configuration file, `op-bpm-registry-entries-op-config.xml`. Load the `op-bpm-registry-entries-op-config.xml` file to configure the registry settings that are required to integrate IBM Business Process Manager with OpenPages GRC Platform.

- **Enable Login SSO**
- **Portal Page Path**
- **Server URL**

For more information about these registry settings, see the *IBM OpenPages GRC Administrator's Guide*.

Procedure

1. Log on to the OpenPages GRC Platform application server as a user with administrative privileges.
2. Ensure that the `op-bpm-registry-entries-op-config.xml` file contains the correct **Server URL**.
   - If the OpenPages GRC Platform application server is integrated with BPM Process Center, the `op-bpm-registry-entries-op-config.xml` file requires no changes. The toolkit generator set the **Server URL** to the BPM Process Center URL.
   - If the OpenPages GRC Platform application server is integrated with BPM Process Server, open the `op-bpm-registry-entries-op-config.xml` file in a text editor. Change **Server URL** to the BPM Process Server URL. Save the file.
3. Copy the `op-bpm-registry-entries-op-config.xml` file from the IBM Business Process Manager server to the OpenPages application server.
4. Load the file by using the ObjectManager command-line utility.
   a) Go to the *<OP_Home>*/bin directory.
   b) Run ObjectManager to load the `op-bpm-registry-entries-op-config.xml` file.
      Use the following syntax:

      ```
      ObjectManager.cmd|.sh l config|c <user> <password>
          <loader-file-path> <file-name>
      ```

      Example (Windows)

      ```
      ObjectManager.cmd l c OpenPagesAdministrator OpenPagesAdministrator
      c:\temp op-bpm-registry-entries
      ```

      Example (Linux or AIX®)

      ```
      ./ObjectManager.sh l c OpenPagesAdministrator OpenPagesAdministrator
      /temp op-bpm-registry-entries
      ```

Replicating user email addresses and locales

Replicate email addresses and locales for user accounts from your IBM OpenPages GRC Platform environment to IBM Business Process Manager.

About this task

After you integrate IBM Business Process Manager and IBM OpenPages GRC Platform, users can log in to IBM Business Process Manager with their OpenPages credentials. However, you need to do an additional step to replicate the email addresses and locales for user accounts.

You can use a command line tool to replicate the email addresses and user locales from OpenPages to IBM Business Process Manager in bulk.

Run the script when you set up IBM Business Process Manager integration initially. You can also run the script whenever you have added or changed user accounts in OpenPages. You can also run the script on a scheduled basis by using third-party scheduling software or the scheduler software that is provided with the operating system.

Procedure

1. Log on to the IBM Business Process Manager server.
2. Go to the temporary directory where you copied the integration scripts.
3. Locate the `<temp_dir>`/`synctool`/`op-bpm-tool.jar` file.
4. Run the `syncUsers` tool.

   Syntax

   ```
   java -jar op-bpm-tool.jar syncUsers -insecure [-groups|-users]
       <OpenPages URL> <OpenPages username> <OpenPages password>
       <IBM BPM URL> <IBM BPM username> <IBM BPM password>
   ```

Table 8. Parameters for the `syncUsers` tool	
Parameter	**Description**
`[-groups|-users]`	Use the `-groups` option to limit the operation to specific user groups.
	Use the `-users` option to limit the operation to specific user accounts.
	Use a comma-separated list to specify multiple groups or users.
	If a group or user name contains spaces or special characters, surround the list with single (') or double quotation marks (").
`<OpenPages URL>`	The IBM OpenPages GRC Platform application URL
`<OpenPages username>`	The OpenPages administrator user name
`<OpenPages password>`	The password of the OpenPages administrator
`<IBM BPM URL>`	The `https://` URL of the IBM Business Process Manager application
`<IBM BPM username>`	The IBM Business Process Manager administrator user name

Table 8. Parameters for the `syncUsers` tool (continued)	
Parameter	Description
<IBM BPM password>	The password of the IBM Business Process Manager administrator

This example replicates email addresses and locales for all user accounts:

```
java -jar op-bpm-tool.jar syncUsers -insecure http://opserver.com:10108
    OpenPagesAdministrator password https://bpmserver.ibm.com:9443
    admin openpages
```

This example replicates email addresses and locales for users that belong to the Auditors group:

```
java -jar op-bpm-tool.jar syncUsers -insecure -groups Auditors
    http://opserver.com:10108 OpenPagesAdministrator password
    https://bpmserver.com:9443 admin openpages
```

This example replicates email addresses and locales for the users `jsmith` and `rb sethi`:

```
java -jar op-bpm-tool.jar syncUsers -insecure –users 'jsmith,rb sethi'
    http://opserver.com:10108 OpenPagesAdministrator password
    https://bpmserver.com:9443 admin openpages
```

Enabling the user interface elements for IBM Business Process Manager

You need to do some additional steps to complete the integration.

Before you begin

- The **Server URL** registry setting must be set in OpenPages GRC Platform. The location of the setting is **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM** > **Server URL**. For more information, see the *IBM OpenPages GRC Administrator's Guide.*
- Decide which profiles and role templates you want to use to manage access to IBM Business Process Manager in OpenPages GRC Platform.

Procedure

1. Log on to OpenPages GRC Platform as a user with administrative privileges.
2. Add the **Process Portal** tab to the home page.
   a) Click **Administration** > **Profiles** and click a profile.
   b) Go to the **Home Page Tab Configuration** section.
   c) Locate the **Process Portal** row and click the **Show** link.
   d) Use the **Order** column to specify the order of the home page tabs.
   e) Repeat this step for each profile that you use for IBM Business Process Manager users.

   For more information about configuring home page tabs, see the *IBM OpenPages GRC Administrator's Guide.*
3. Add the IBM Business Process Manager menu items to the **Administration** > **Management** menu.
   a) Log on to OpenPages GRC Platform as a user with the Role Templates application permission set.
   b) Click **Administration** > **Role Templates**
   c) Click a role template.
   d) In the **Role Permissions** section, locate **SOX** > **Administration** > **IBM BPM**.
   e) Ensure that the check box is selected.
      If the check box is not selected, click **Edit**, click the check box, and then click **Save**.

f) Repeat this step for each role template that you use to manage access to IBM Business Process Manager.

For more information about role templates, see the *IBM OpenPages GRC Administrator's Guide*.

Chapter 3. Update the integration after upgrading OpenPages

After you upgrade IBM OpenPages GRC Platform, you need to update the integration of IBM OpenPages GRC Platform and IBM Business Process Manager.

When you update the integration, you can choose one of the following methods:

- Use the IBM OpenPages GRC Platform installation app
- Update the integration manually

The method that you select determines the tasks that you need to do.

Update the integration by using the installation app

You can update the integration by using the installation app.

If you want to use the installation app, do these tasks:

- Create the IBM OpenPages GRC Platform database manually. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.
- Create a user for IBM Business Process Manager in the OpenPages database. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4 or "Setting up a user for IBM Business Process Manager (Oracle)" on page 6.
- Install IBM OpenPages GRC Platform. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

  - When you fill in the **Database Server** card, for the **Install Database** option, select **Already Installed**.
  - Add the **Workflow Server** card to your deployment. Enter the values for the IBM Business Process Manager server that you used with the previous version of OpenPages. For more information, see "Adding a workflow server for an upgrade" on page 27.
  - Complete the installation of IBM OpenPages GRC Platform.

    Note: The IBM Business Process Manager server will shut down and restart multiple times during the installation.

- Stop the IBM Business Process Manager services.

  For more information, see Starting and stopping your environment in the IBM Business Process Manager documentation.

- Upgrade IBM OpenPages GRC Platform. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

  You have two options for the database upgrade:

  - You can do an in-place upgrade of the OpenPages database. Use this option if you want to use your existing database server.
  - You can restore the 7.3.x database onto new hardware and then upgrade it.

  If you plan to restore your 7.3.x database and then upgrade it to 7.4, you need to do some additional steps to re-establish the bpmaccnt user.

  - If you are using IBM DB2 for the OpenPages database, restore the OpenPages database, drop the IBM Business Process Manager user (bpmaccnt), and then re-create the user. For more information, see "Re-create the bpmaccnt user in the OpenPages database (DB2)" on page 29.
  - If you are using Oracle, verify that the IBM Business Process Manager user name is the same in the source and target databases. If the name is different, remap the schema name when you restore the

OpenPages database. (The user name is also the schema name.) For more information, see "Remap the schema name (Oracle)" on page 32.

- Set up auto-login. For more information, see "Setting up auto-login" on page 17.
- Generate and import the toolkits. Update your process apps to use the updated toolkits. For more information, see "Generating and importing the toolkits" on page 17.
- Load the registry settings. For more information, see "Loading registry settings" on page 19.
- Complete any additional tasks, such as setting up SSL or LDAP. See Chapter 5, "Additional tasks ," on page 49.

```
Create the OpenPages database
manually
        │
        ▼
Create a user for IBM BPM in the
OpenPages database
        │
        ▼
┌─────────────────────────────────────┐
│ Install OpenPages                    │
│ ┌──────────────────────────────────┐ │
│ │ Select Already Installed on the  │ │
│ │ Database Server card             │ │
│ └──────────────────────────────────┘ │
│ ┌──────────────────────────────────┐ │
│ │ Add a Workflow Server card and   │ │
│ │ enter the values for your BPM    │ │
│ │ server                           │ │
│ └──────────────────────────────────┘ │
│ ┌──────────────────────────────────┐ │
│ │ Complete the OpenPages installation│
│ └──────────────────────────────────┘ │
└─────────────────────────────────────┘
        │
        ▼
Stop IBM BPM
        │
        ▼
Upgrade OpenPages  ────────▶  If you plan to restore your pre-7.4 database and then upgrade it,
        │                     you need to do some additional steps.
        ▼
Set up auto-login
        │
        ▼
Generate and import the toolkits,
then update apps
        │
        ▼
Load registry settings
        │
        ▼
Complete additional tasks
(e.g., set up SSL)
        │
        ▼
     ( Done )
```

If you plan to restore your pre-7.4 database and then upgrade it, you need to do some additional steps.

IBM DB2
- Restore the pre-7.4 OpenPages database
- Drop the IBM BPM user (bpmaccnt)
- Re-create the IBM BPM user

Oracle
- Verify that the IBM BPM user name is the same in the source and target
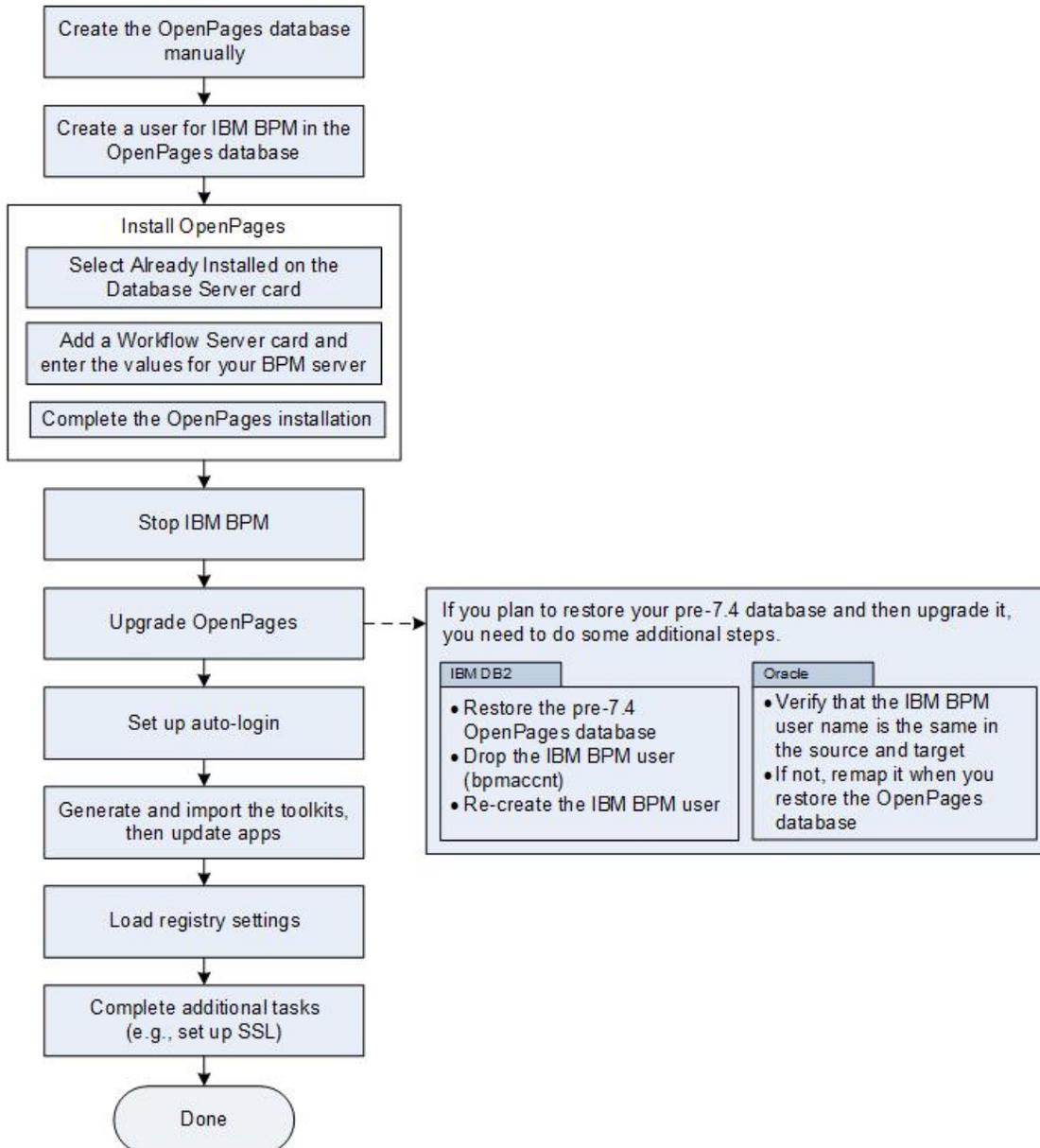- If not, remap it when you restore the OpenPages database

Figure 4. Updating the integration by using the installation app

Setting up a user for IBM Business Process Manager (DB2)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the op-bpm-install.zip file.

   The file is located in the /OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/ directory.
4. Extract the op-bpm-install.zip file to the temporary directory that you created.
5. Create a database user, for example bpmaccnt.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using IBM DB2 on Linux, the database user name is limited to 8 characters. For example, you can use bpmaccnt or bpmauth1.

   Note: The database user name must be unique. Do not use openpages, opworkflow, or workflow.
6. Create the new user account on the operating system.

   - If you are using Linux, run the following commands as a user who has sudo privileges:

     Replace bpmaccnt with the user name of the database user account that you created.

     ```
     $ useradd -m -d /home/bpmaccnt bpmaccnt
     $ passwd bpmaccnt
     ```

     Enter the password for the bpmaccnt user.

   - If you are using Microsoft Windows, create the user account by using **Control Panel** > **Administrative Tools** > **Users and Groups**.
7. Complete the following steps to set up the bpmaccnt user, the database user that you created in step 5.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

   b) Run the setup_op_bpm_user_DB2_step_1.sql script as the user who is the OpenPages database schema owner.

   ```
   clpplus -nw <op_schema_user>@<host>:<port>/<DB>
       @setup_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
   ```

Table 9. Parameters of the setup_op_bpm_user_DB2_step_1.sql script	
Parameter	**Description**
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example bpmaccnt

   c) Run the setup_op_bpm_user_DB2_step_2.sql script as the user that you created, for example bpmaccnt.

```
clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
    @setup_op_bpm_user_DB2_step_2.sql <op_schema_name>
```

Table 10. Parameters of the `setup_op_bpm_user_DB2_step_2.sql` script

Parameter	Description
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<op_schema_name>	The name of the OpenPages database schema

8. Stop all OpenPages, node agents, and deployment manager (Dmgr).
9. Restart the OpenPages deployment manager (Dmgr), node agents, and servers.

Results

The new `bpmaccnt` user is configured.

Setting up a user for IBM Business Process Manager (Oracle)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the `op-bpm-install.zip` file.

   The file is located in the `/OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/` directory.
4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. Create a database user, for example `bpmaccnt`.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using Linux, the database user name is limited to 8 characters. For example, you can use `bpmaccnt` or `bpmauth1`.

   Note: The database user name must be unique. Do not use `openpages`, `opworkflow`, or `workflow`.
6. Complete the following steps to set up the `bpmaccnt` user.

   Run the `setup_op_bpm_user_ORA.sql` script as the system DBA user for the OpenPages database.

```
sqlplus <dba_user>/<password>@<SID> @setup_op_bpm_user_ORA.sql
    <bpm_auth_user> <bpm_auth_user_password> <op_schema_name>
```

The script uses the following parameters.

Table 11. Parameters of the `setup_op_bpm_user_ORA.sql` script

Parameter	Description
<dba_user>	The system DBA user for the OpenPages database

Table 11. Parameters of the `setup_op_bpm_user_ORA.sql` script (continued)	
Parameter	Description
<password>	The password of the `system` DBA account
<SID>	The service name (system identifier) of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<bpm_auth_user_password>	The password of the database user that you created
<op_schema_name>	The name of the OpenPages database schema

7. Stop all OpenPages servers and node agents.
8. Restart the OpenPages Deployment Manager (Dmgr).

Results

The new `bpmaccnt` user is configured and OpenPages is ready for integration with IBM Business Process Manager.

Adding a workflow server for an upgrade

If you are upgrading IBM OpenPages GRC Platform, you can use the installation app to update the integration of IBM Business Process Manager and OpenPages.

About this task

When you create your IBM OpenPages GRC Platform deployment, add a **Workflow Server** card.

Fill in the card with the details of the IBM Business Process Manager server that you used with the previous version of OpenPages.

Tip: The `installIBMIntegrationConfig.sh|cmd` file from your 7.3.x deployment contains the information that you need to enter. The file is stored in the directory where you extracted the 7.3.x `op-bpm-install.zip` file.

Procedure

1. Open your deployment in the installation app.
2. Click the server list, select **Workflow Server**, and then click ⊕. Click **Continue** to confirm.
   A **Workflow Server** card is added in the left pane.
3. Type a **Nickname** for the server.
   The name is displayed on the server card.
4. Type the **Host Name** of the IBM Business Process Manager server that you used with your previous version of OpenPages. Use the fully qualified domain name (FQDN).
5. Select the **Operating System** of the server.
6. If the server is on a different physical machine than the installation server, enable the **Remote Deploy** option.

   The agent software is installed on the remote server automatically.

   Complete the following fields:

   • **Agent Port**: Type the port number for the agent software to use.

   Note: If the host name is the same in any two cards, port synchronization will work only if you complete the host information before you complete the **Agent Port** field. Ensure that the port

number is the same on any two cards where the host name is the same. If the port number is not the same on both cards, you will encounter exceptions during the validation phase where agents are installed automatically on target systems.

- **SSH Port** (Linux/AIX only): Type the Secure Shell (SSH) port number of the remote server.
- **Local User Name** and **Local User Password**: Type the credentials of the OpenPages installation user on the remote server. The account is used to install the agent software on the remote server. You can specify a local account that is on the remote server or a service account, for example `<domain>/<user name>`.

  Note: If you installed the agent manually and you are using the 8.0.0.1 or earlier version of the installation server, you can use `Agent` for the **Local User Name** and **Local User Password**.

  Note: If you installed the agent manually and you are using the 8.0.0.2 or later version of the installation server, you can leave the **Local User Name** and **Local User Password** fields empty. Ensure that the agents are started before you install OpenPages.

- **Agent Directory**: Type the absolute path to the directory on the remote server where you want the agent software installed.

  Note: If you are using Microsoft Windows, the maximum length of the path is 25 characters.

7. Type the name of the IBM WebSphere profile of the IBM Business Process Manager Deployment Manager in the **BPM DMGR Profile Name** field.
8. Type the SOAP port number of the IBM BPM Deployment Manager in the **BPM DMGR SOAP Port** field.
9. Type the IBM WebSphere node name of the IBM Business Process Manager server in the **BPM Node Name** field.
10. Type the name of the IBM WebSphere profile of the IBM Business Process Manager server in the **BPM Server Profile Name** field.
11. Type the port number of the IBM Business Process Manager server in the **BPM Server Port** field.
12. Type the **BPM Home Directory**.

    The home directory is the installation location of IBM Business Process Manager.
13. Type the **BPM Integration Directory**

    The integration directory is where the OpenPages Platform toolkit and OpenPages Solutions toolkit are installed on the IBM Business Process Manager server.
14. Type the **BPM JDBC Username** and **BPM JDBC Password**.
15. If you want to use the rollback feature for this server, enable the **Rollback on failure** option.

    When **Rollback on failure** is enabled and an error occurs, the operation that caused the failure is rolled back. You can then fix the error and continue with the installation. The installation process resumes at the operation that was rolled back.

    For example, if an error occurs during the **Install** process, fix the error and then click **Install** to continue.
16. Optional: Click **Save**.
17. Complete the installation of OpenPages.
18. Verify the workflow server configuration:
    a) On the Workflow server host, navigate to the **BPM Integration Directory** that is set up in step 13.
    b) In a text editor, open the `installBPMIntegrationConfig.[cmd|sh]` file.
    c) Locate the line that contains "opBaseURL", and verify that the URL value is the OpenPages application URL (for example, http://opserver.com:10108/). In some cases, it contains "undefined" for the port number of the URL.
    d) When the URL value is not as expected, follow the steps in "Running the integration script after upgrading OpenPages" on page 39.

e) When the integration script has completed successfully, drop and then re-create the bpmaccnt user. For more information, see "Re-create the bpmaccnt user in the OpenPages database (DB2)" on page 29.

Re-create the bpmaccnt user in the OpenPages database (DB2)

If you use IBM DB2 for the OpenPages database and you restored the OpenPages database, you need to drop and then re-create the bpmaccnt user.

The method that you use to drop the bpmaccnt user depends on your environment.

- If you are upgrading from IBM OpenPages GRC Platform 7.3.0.0, see "Dropping the IBM Business Process Manager user manually (DB2)" on page 30.
- If you are upgrading from IBM OpenPages GRC Platform 7.3.0.1 or later, see "Dropping the IBM Business Process Manager user (DB2)" on page 29.

After you drop the bpmaccnt user, re-create the user. See "Setting up a user for IBM Business Process Manager (DB2)" on page 4.

Dropping the IBM Business Process Manager user (DB2)
You need to drop the database user account for IBM Business Process Manager in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Go to the directory where you extracted the op-bpm-install.zip file.
3. Complete the following steps to drop the bpmaccnt user.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

   b) Run the following script as the user who is the OpenPages database schema owner.

   ```
   clpplus -nw
   <op_schema_user>@<host>:<port>/<DB>
   @drop_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
   ```

Table 12. Parameters of the setup_op_bpm_user_DB2_step_1.sql *script*

Parameter	Description
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user for IBM BPM, for example bpmaccnt

   c) Run the following script as the bpmaccnt user.

   ```
   clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
   @drop_op_bpm_user_DB2_step_2.sql
   ```

Table 13. Parameters of the `drop_op_bpm_user_DB2_step_2.sql` script	
Parameter	**Description**
<bpm_auth_user>	The name of the database user for IBM BPM, for example `bpmaccnt`
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database

4. Stop all OpenPages servers and node agents.
5. Restart the OpenPages Deployment Manager (Dmgr).

Results

The `bpmaccnt` user is removed from the OpenPages database.

Dropping the IBM Business Process Manager user manually (DB2)

If you upgraded from IBM OpenPages GRC Platform 7.3.0.0, you must drop the database user account for IBM Business Process Manager manually.

If you upgraded from IBM OpenPages GRC Platform 7.3.0.1 or later, you can use a script to drop the user. See "Dropping the IBM Business Process Manager user (DB2)" on page 29.

Do these steps after you restore the OpenPages 7.3.0.0 database into your 7.4 environment.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. If you are using Microsoft Windows, start the IBM DB2 command line processor.
3. Run the following commands as a DBA user.

   Replace *<bpmaccnt>* with the name of the IBM Business Process Manager user in the OpenPages 7.3.0.0 database.

   ```
   Declare
      vcBPMAcct Varchar2(100) := '<bpmaccnt>';
   Begin
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.ACTORS';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.ACTORINFO';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.USERS';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.USERINFO';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.GROUPMEMBERSHIPS';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.ENCRYPTIONKEYS';
      Execute Immediate 'Drop Alias '||vcBPMAcct||'.ENCRYPTIONMODULES';
   End;
   /
   ```

4. Verify that all the aliases have been removed by running the following query.

   Replace *<bpmaccnt>* with the name of the IBM Business Process Manager user in the OpenPages 7.3.0.0 database.

   ```
   Select Count(*) From SYSCAT.TABLES Where Type = 'A'
      And Tabname In ('ACTORS','ACTORINFO','USERS','USERINFO','GROUPMEMBERSHIPS',
         'ENCRYPTIONKEYS','ENCRYPTIONMODULES') And Tabschema = upper('<bpmaccnt>');
   ```

   The count should be 0.

What to do next

Re-create the user. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4.

Setting up a user for IBM Business Process Manager (DB2)

Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the `op-bpm-install.zip` file.

   The file is located in the `/OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/` directory.
4. Extract the `op-bpm-install.zip` file to the temporary directory that you created.
5. Create a database user, for example `bpmaccnt`.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using IBM DB2 on Linux, the database user name is limited to 8 characters. For example, you can use `bpmaccnt` or `bpmauth1`.

   Note: The database user name must be unique. Do not use `openpages`, `opworkflow`, or `workflow`.
6. Create the new user account on the operating system.

   - If you are using Linux, run the following commands as a user who has `sudo` privileges:

     Replace `bpmaccnt` with the user name of the database user account that you created.

     ```
     $ useradd -m -d /home/bpmaccnt bpmaccnt
     $ passwd bpmaccnt
     ```

     Enter the password for the `bpmaccnt` user.
   - If you are using Microsoft Windows, create the user account by using **Control Panel** > **Administrative Tools** > **Users and Groups**.
7. Complete the following steps to set up the `bpmaccnt` user, the database user that you created in step 5.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.
   b) Run the `setup_op_bpm_user_DB2_step_1.sql` script as the user who is the OpenPages database schema owner.

      ```
      clpplus -nw <op_schema_user>@<host>:<port>/<DB>
          @setup_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
      ```

Table 14. Parameters of the `setup_op_bpm_user_DB2_step_1.sql` script	
Parameter	**Description**
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`

   c) Run the `setup_op_bpm_user_DB2_step_2.sql` script as the user that you created, for example `bpmaccnt`.

```
clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
    @setup_op_bpm_user_DB2_step_2.sql <op_schema_name>
```

Table 15. Parameters of the `setup_op_bpm_user_DB2_step_2.sql` script

Parameter	Description
<bpm_auth_user>	The name of the database user that you created, for example `bpmaccnt`
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<op_schema_name>	The name of the OpenPages database schema

8. Stop all OpenPages, node agents, and deployment manager (Dmgr).
9. Restart the OpenPages deployment manager (Dmgr), node agents, and servers.

Results

The new `bpmaccnt` user is configured.

Remap the schema name (Oracle)

If the name of the IBM Business Process Manager user in the OpenPages database is different in your 7.3.x and 7.4 databases, remap the name when you restore the OpenPages database.

Note: If you are doing an in-place upgrade of the OpenPages database, you do not need to do this task.

The user name is also the name of the schema for IBM Business Process Manager in the OpenPages database.

If the user name is different, you must remap the schema name. You must also run the import command as a DBA user.

Add the following clause to the import command for the OpenPages database:

```
remap_schema=<bpmuser_source>:<bpmuser_target>
```

Replace *<bpmuser_source>* with the name of the IBM Business Process Manager user in the 7.3.x database.

Replace *<bpmuser_target>* with the name of the IBM Business Process Manager user in the 7.4 database.

Example : In this example, the user was named `bpmuser` in the 7.3.x database and is named `bpmaccnt` in the 7.4 database.

```
impdp <dba_user>/<dba_password>@OP
    DIRECTORY=OP_DATAPUMP_DIRECTORY
    DUMPFILE=openpages_backup_YYYY_MM_DD_HH_MI_SS.dmp
    LOGFILE=openpages_import.log remap_schema=bpmuser:bpmaccnt
    exclude=statistics
```

For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

Updating the integration manually

You can update the integration manually.

- Install IBM OpenPages GRC Platform. When you create your deployment, do not add a **Workflow** card. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.
- Stop the IBM Business Process Manager services.

For more information, see Starting and stopping your environment in the IBM Business Process Manager documentation.

- Upgrade IBM OpenPages GRC Platform. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

  You have two options for the database upgrade:

  – You can do an in-place upgrade of the OpenPages database. Use this option if you want to use your existing database server.

  – You can restore the 7.3.x database onto new hardware and then upgrade it.

  If you choose to restore your 7.3.x database and then upgrade it to 7.4, you need to do some additional steps to re-establish the `bpmaccnt` user.

  – If you are using IBM DB2 for the OpenPages database, restore the OpenPages database, drop the IBM Business Process Manager user (`bpmaccnt`), and then re-create the user. For more information, see "Re-create the bpmaccnt user in the OpenPages database (DB2)" on page 29.

  – If you are using Oracle, verify that the IBM Business Process Manager user name is the same in the source and target databases. If the name is different, remap the schema name when you restore the OpenPages database. (The user name is also the schema name.) For more information, see "Remap the schema name (Oracle)" on page 32.

- Prepare IBM Business Process Manager for the update. For more information, see "Preparing to update the IBM Business Process Manager integration " on page 38.

- Run the integration script. Use the `installIBMIntegrationConfig.sh|cmd` file from your existing environment. For more information, see "Running the integration script after upgrading OpenPages" on page 39.

- Set up auto-login. For more information, see "Setting up auto-login" on page 17.

- Generate and import the toolkits. Update your process apps to use the updated toolkits. For more information, see "Generating and importing the toolkits" on page 17.

- Load the registry settings. For more information, see "Loading registry settings" on page 19.

- Complete any additional tasks, such as setting up SSL or LDAP. See Chapter 5, "Additional tasks ," on page 49.
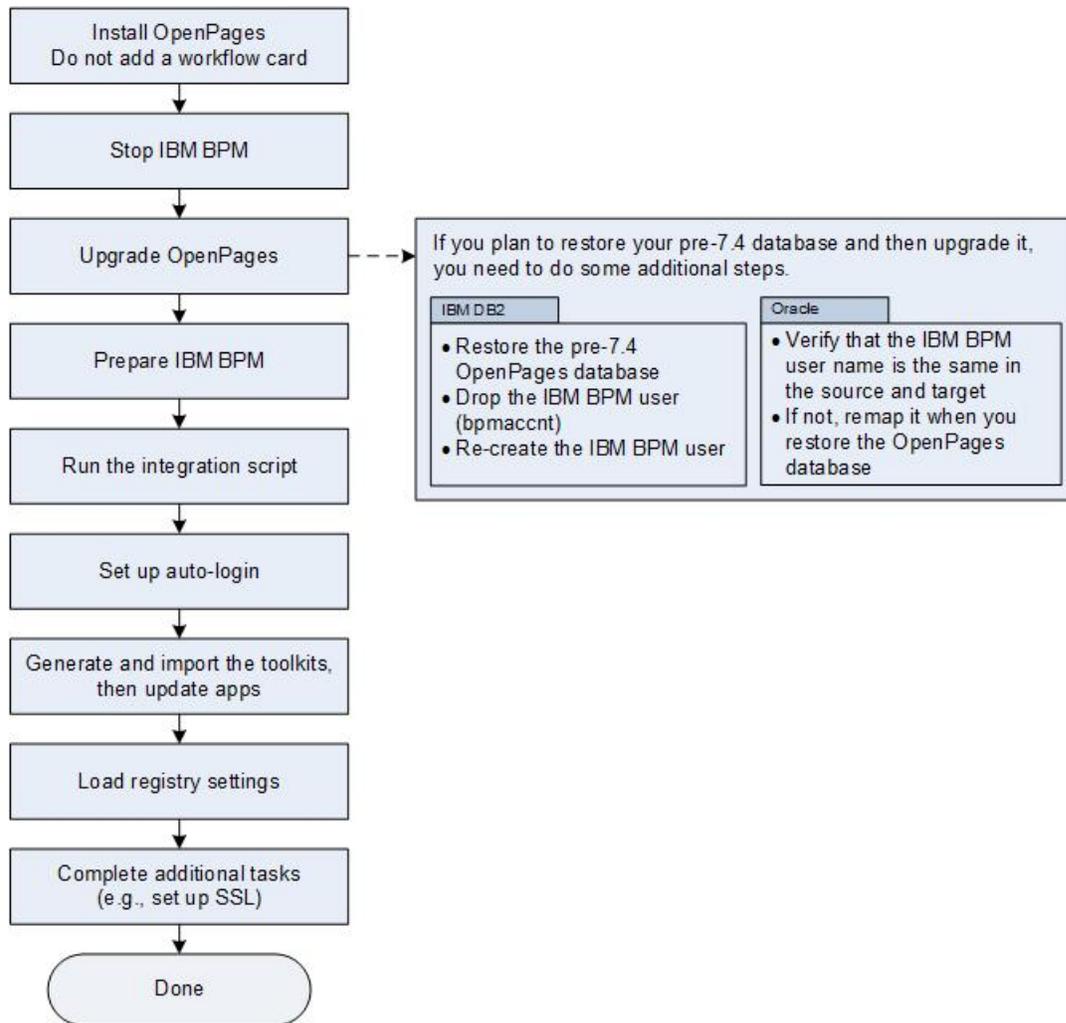
Figure 5. Updating the integration manually

Re-create the `bpmaccnt` user in the OpenPages database (DB2)

If you use IBM DB2 for the OpenPages database and you restored the OpenPages database, you need to drop and then re-create the `bpmaccnt` user.

The method that you use to drop the `bpmaccnt` user depends on your environment.

- If you are upgrading from IBM OpenPages GRC Platform 7.3.0.0, see "Dropping the IBM Business Process Manager user manually (DB2)" on page 30.
- If you are upgrading from IBM OpenPages GRC Platform 7.3.0.1 or later, see "Dropping the IBM Business Process Manager user (DB2)" on page 29.

After you drop the `bpmaccnt` user, re-create the user. See "Setting up a user for IBM Business Process Manager (DB2)" on page 4.

Dropping the IBM Business Process Manager user (DB2)

You need to drop the database user account for IBM Business Process Manager in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Go to the directory where you extracted the `op-bpm-install.zip` file.
3. Complete the following steps to drop the `bpmaccnt` user.

a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

b) Run the following script as the user who is the OpenPages database schema owner.

```
clpplus -nw
<op_schema_user>@<host>:<port>/<DB>
@drop_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
```

Table 16. Parameters of the `setup_op_bpm_user_DB2_step_1.sql` script	
Parameter	Description
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user for IBM BPM, for example bpmaccnt

c) Run the following script as the bpmaccnt user.

```
clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
@drop_op_bpm_user_DB2_step_2.sql
```

Table 17. Parameters of the `drop_op_bpm_user_DB2_step_2.sql` script	
Parameter	Description
<bpm_auth_user>	The name of the database user for IBM BPM, for example bpmaccnt
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database

4. Stop all OpenPages servers and node agents.

5. Restart the OpenPages Deployment Manager (Dmgr).

Results
The bpmaccnt user is removed from the OpenPages database.

Dropping the IBM Business Process Manager user manually (DB2)
If you upgraded from IBM OpenPages GRC Platform 7.3.0.0, you must drop the database user account for IBM Business Process Manager manually.

If you upgraded from IBM OpenPages GRC Platform 7.3.0.1 or later, you can use a script to drop the user. See .

Do these steps after you restore the OpenPages 7.3.0.0 database into your 7.4 environment.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.

2. If you are using Microsoft Windows, start the IBM DB2 command line processor.

3. Run the following commands as a DBA user.

Replace *<bpmaccnt>* with the name of the IBM Business Process Manager user in the OpenPages 7.3.0.0 database.

```
Declare
    vcBPMAcct Varchar2(100) := '<bpmaccnt>';
Begin
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.ACTORS';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.ACTORINFO';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.USERS';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.USERINFO';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.GROUPMEMBERSHIPS';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.ENCRYPTIONKEYS';
    Execute Immediate 'Drop Alias '||vcBPMAcct||'.ENCRYPTIONMODULES';
End;
/
```

4. Verify that all the aliases have been removed by running the following query.

   Replace *<bpmaccnt>* with the name of the IBM Business Process Manager user in the OpenPages 7.3.0.0 database.

```
Select Count(*) From SYSCAT.TABLES Where Type = 'A'
    And Tabname In ('ACTORS','ACTORINFO','USERS','USERINFO','GROUPMEMBERSHIPS',
      'ENCRYPTIONKEYS','ENCRYPTIONMODULES') And Tabschema = upper('<bpmaccnt>');
```

   The count should be 0.

What to do next

Re-create the user. For more information, see "Setting up a user for IBM Business Process Manager (DB2)" on page 4.

Setting up a user for IBM Business Process Manager (DB2)
Before you integrate IBM Business Process Manager with IBM OpenPages GRC Platform, you need to create a new database user account in the OpenPages database. Give the user account access to the user registry in the OpenPages database.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Create a temporary directory.

   Ensure that you have write permissions on the directory.
3. Locate the op-bpm-install.zip file.

   The file is located in the /OP_*<version>*_Non_Embedded/OP_*<version>*_Configuration/ IBM_BPM_Integration/ directory.
4. Extract the op-bpm-install.zip file to the temporary directory that you created.
5. Create a database user, for example bpmaccnt.

   The database user name can be defined by you, but it must meet the requirements of your operating system. For example, if you are using IBM DB2 on Linux, the database user name is limited to 8 characters. For example, you can use bpmaccnt or bpmauth1.

   Note: The database user name must be unique. Do not use openpages, opworkflow, or workflow.
6. Create the new user account on the operating system.

   • If you are using Linux, run the following commands as a user who has sudo privileges:

     Replace bpmaccnt with the user name of the database user account that you created.

```
$ useradd -m -d /home/bpmaccnt bpmaccnt
$ passwd bpmaccnt
```

     Enter the password for the bpmaccnt user.

- If you are using Microsoft Windows, create the user account by using **Control Panel** > **Administrative Tools** > **Users and Groups**.

7. Complete the following steps to set up the bpmaccnt user, the database user that you created in step 5.

   a) If you are using Microsoft Windows, start the IBM DB2 command line processor.

   b) Run the setup_op_bpm_user_DB2_step_1.sql script as the user who is the OpenPages database schema owner.

   ```
   clpplus -nw <op_schema_user>@<host>:<port>/<DB>
       @setup_op_bpm_user_DB2_step_1.sql <bpm_auth_user>
   ```

Table 18. Parameters of the setup_op_bpm_user_DB2_step_1.sql script	
Parameter	**Description**
<op_schema_user>	The schema owner of the OpenPages database
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<bpm_auth_user>	The name of the database user that you created, for example bpmaccnt

   c) Run the setup_op_bpm_user_DB2_step_2.sql script as the user that you created, for example bpmaccnt.

   ```
   clpplus -nw <bpm_auth_user>@<host>:<port>/<DB>
       @setup_op_bpm_user_DB2_step_2.sql <op_schema_name>
   ```

Table 19. Parameters of the setup_op_bpm_user_DB2_step_2.sql script	
Parameter	**Description**
<bpm_auth_user>	The name of the database user that you created, for example bpmaccnt
<host>	The host name of the database server
<port>	The port of the database server
<DB>	The name of the OpenPages database
<op_schema_name>	The name of the OpenPages database schema

8. Stop all OpenPages, node agents, and deployment manager (Dmgr).

9. Restart the OpenPages deployment manager (Dmgr), node agents, and servers.

Results

The new bpmaccnt user is configured.

Remap the schema name (Oracle)

If the name of the IBM Business Process Manager user in the OpenPages database is different in your 7.3.x and 7.4 databases, remap the name when you restore the OpenPages database.

Note: If you are doing an in-place upgrade of the OpenPages database, you do not need to do this task.

The user name is also the name of the schema for IBM Business Process Manager in the OpenPages database.

If the user name is different, you must remap the schema name. You must also run the import command as a DBA user.

Add the following clause to the import command for the OpenPages database:

```
remap_schema=<bpmuser_source>:<bpmuser_target>
```

Replace *<bpmuser_source>* with the name of the IBM Business Process Manager user in the 7.3.x database.

Replace *<bpmuser_target>* with the name of the IBM Business Process Manager user in the 7.4 database.

Example : In this example, the user was named bpmuser in the 7.3.x database and is named bpmaccnt in the 7.4 database.

```
impdp <dba_user>/<dba_password>@OP
    DIRECTORY=OP_DATAPUMP_DIRECTORY
    DUMPFILE=openpages_backup_YYYY_MM_DD_HH_MI_SS.dmp
    LOGFILE=openpages_import.log remap_schema=bpmuser:bpmaccnt
    exclude=statistics
```

For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.

Preparing to update the IBM Business Process Manager integration

After you upgrade IBM OpenPages GRC Platform, you need to update the integration of IBM Business Process Manager with OpenPages. You need to prepare IBM Business Process Manager before you run the integration script update.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.
2. Back up the installIBMIntegrationConfig.sh|cmd file from your current environment.

   The installIBMIntegrationConfig.sh|cmd file contains the parameter values that you need for the integration script.
3. Create a new temporary directory.

   Ensure that you have write permissions on the directory.
4. Go to the OP_*<version>*_Non_Embedded/OP_*<version>*_Configuration/ IBM_BPM_Integration/ directory on the installation media. Locate the op-bpm-install.zip file.
5. Extract the op-bpm-install.zip file to the temporary directory that you created.
6. Replace the installIBMIntegrationConfig.sh|cmd file in the temporary directory with the backup copy that you created in step 2.
7. If you are using Linux, change the file permissions on the installBPMIntegration.sh and installBPMIntegrationConfig.sh scripts to allow the execute permission.
8. Stop all IBM Business Process Manager servers and node agents.

   For more information, see Starting and stopping your environment on the IBM Business Process Manager Knowledge Center.
9. Restart the IBM Business Process Manager Deployment Manager (Dmgr).

   For more information, see Starting and stopping deployment managers on the IBM Business Process Manager Knowledge Center.

What to do next
Run the integration script. See "Running the integration script after upgrading OpenPages" on page 39.

Running the integration script after upgrading OpenPages

Run the integration script to update the integration of IBM Business Process Manager with IBM OpenPages GRC Platform.

Before you begin

IBM Business Process Manager Deployment Manager (Dmgr) must be running.

The IBM Business Process Manager server and the node agents must be stopped.

OpenPages Deployment Manager (Dmgr) must be running.

OpenPages servers and node agents must be stopped.

Ensure that you have write permissions on the temporary directory where you copied the integration scripts.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.
2. Go to the temporary directory where you extracted the `op-bpm-install.zip` file.
3. Ensure that the `installIBMIntegrationConfig.sh|cmd` file contains the parameter values for your environment.
4. Open a command line and run the integration script.

   Replace *<temp_dir>* with the temporary directory where you extracted the `op-bpm-install.zip` file.

   Microsoft Windows

   ```
   cd <temp_dir>
   installBPMIntegration.cmd --silent
   ```

   Linux

   ```
   cd <temp_dir>
   ./installBPMIntegration.sh --silent
   ```

5. Synchronize the IBM Business Process Manager nodes.

   - On Microsoft Windows operating systems, go to the *<BPM_Home>*\profiles *<BPM_server_profile>*\bin directory. Run `syncNode.bat`.
   - On Linux operating systems, go to the *<BPM_Home>*/profiles/*<BPM_server_profile>*/bin directory. Run `syncNode.sh`.

   Use the following syntax:

   ```
   syncNode.bat|.sh <Dmgr_hostname> -username <BPM_WAS_admin_username>
       -password <BPM_WAS_admin_password>
   ```

6. Synchronize the OpenPages nodes.

   - On Microsoft Windows operating systems, go to the *<OP_Home>*\profiles*<host_name>*-OPNode1\bin directory. Run `syncNode.bat`.
   - On UNIX operating systems, go to the *<OP_Home>*/profiles/*<host_name>*-OPNode1/bin directory. Run `syncNode.sh`.

   Use the following syntax:

   ```
   syncNode.bat|.sh <admin_host_name> <OP_SOAP_PORT>
       -username <OP_WAS_admin_user_name> -password <OP_WAS_admin_password>
   ```

For example, on Linux operating systems, run the following command:

```
/home/opuser/OP/OpenPages/profiles/opserver-OPNode1/bin/syncNode.sh
    localhost 8879 -username admin -password openpages
```

7. Restart the OpenPages GRC Platform services.
8. Remove the following third-party libraries from the *<BPM_Home>*/lib/ext directory.
   - commons-codec-1.8.jar
   - guava-13.0.jar
9. Restart the IBM Business Process Manager services and IBM BPM Process Center.

What to do next

Generate and import the toolkits. See "Generating and importing the toolkits" on page 17.

Setting up auto-login

You can set up auto-login. When auto-login is enabled, IBM OpenPages GRC Platform users can use the IBM Business Process Manager menu items in OpenPages without having to log in to IBM BPM.

Procedure

1. Log on to OpenPages GRC Platform as a user with administrative privileges.
2. Go to **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM**.
3. Set the **Enable Login SSO** registry setting to **true**.
4. Click **Save**.
5. Edit the *<OP_HOME>*/aurora/conf/aurora.properties file on the OpenPages application server. Create a property that is named logout.url.ibmbpm, or edit the property if it exists. Set it to the https:// URL of your IBM BPM server hostname/FQDN.
   For example:

   ```
   https\://bpm.server.com\:9443/ProcessPortal/logout.jsp
   ```

6. Stop all OpenPages application servers, node agents, and deployment manager (Dmgr).
7. Restart the OpenPages deployment manager (Dmgr), all node agents, and application servers.

Generating and importing the toolkits

Use the toolkit generator to create and import the OpenPages Platform Toolkit and the OpenPages Solutions Toolkit to IBM Business Process Manager. The toolkits contain elements that enable you to create business processes that use OpenPages objects.

About this task

The toolkit generator reads the OpenPages object schema and generates IBM Business Process Manager business objects that correspond to the OpenPages object types.

Generate and import the toolkits in the following cases:

- When you initially integrate IBM Business Process Manager with IBM OpenPages GRC Platform.
- After you update the integration, for example when you upgrade OpenPages.
- When the OpenPages object schema changes.

Run the toolkit generator on environments that use the BPM Process Center, not on those that use the BPM Process Server. The generated toolkits are deployed to BPM Process Servers when you install a process application on the BPM Process Server.

Procedure

1. Log on to the IBM Business Process Manager server.
2. Go to the temporary directory where you extracted the `op-bpm-install.zip` file.
3. Locate the `<temp_dir>/synctool/op-bpm-tool.jar` file.
4. Run the toolkit generator.

   The generator uses the following syntax:

   ```
   java -jar op-bpm-tool.jar genToolkit -insecure
     <OpenPages URL> <OpenPages username> <OpenPages password>
     <IBM BPM URL> <IBM BPM username> <IBM BPM password>
   ```

   For the `<IBM BPM URL>`, specify the `https://` URL and port number of IBM Business Process Manager.

   For example:

   ```
   java -jar op-bpm-tool.jar genToolkit -insecure
     http://opserver.com:10108
     OpenPagesAdministrator password
     https://bpmserver.com:9443
     admin openpages
   ```

5. Verify that the toolkits are available.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Verify that the OpenPages Platform and OpenPages Solutions toolkits are listed.

6. If you upgraded from OpenPages 7.3.0.0 with IBM Business Process Manager and you previously gave the **tw_allusers** group Read access to the OpenPages Platform toolkit, remove the group.

   Note: If you are integrating OpenPages and IBM Business Process Manager for the first time, you can ignore this step.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Click the OpenPages Platform toolkit.

   d) Click **Manage**.

   e) Remove the **tw_allusers** group.

7. Activate the OpenPages Platform toolkit.

   a) Open IBM BPM Process Center in your web browser. Or, open IBM Process Designer.

   b) Click **Toolkits**.

   c) Click the OpenPages Platform toolkit.

   d) Click the down-arrow next to the most recent snapshot. Click **Activate**.

8. If you are regenerating the toolkits after upgrading OpenPages, update your process apps to use the updated toolkits.

   a) Open IBM BPM Process Center in your web browser.

   b) Open each process application that you have created and update the dependencies to the OpenPages Platform toolkit and OpenPages Solutions toolkit.

   For more information, see Creating, changing, and deleting a toolkit dependency in the Designer view in the IBM Business Process Manager documentation (http://www.ibm.com/support/knowledgecenter/en/SSFPJS_8.5.7/com.ibm.wbpm.admin.doc/topics/managing_toolkits_E.html)

Loading registry settings

Load the registry settings for IBM Business Process Manager into OpenPages GRC Platform.

Before you begin

Load the registry settings after you have generated the toolkits. For more information, see "Generating and importing the toolkits" on page 17.

About this task

The toolkit generator creates a registry settings configuration file, `op-bpm-registry-entries-op-config.xml`. Load the `op-bpm-registry-entries-op-config.xml` file to configure the registry settings that are required to integrate IBM Business Process Manager with OpenPages GRC Platform.

- **Enable Login SSO**
- **Portal Page Path**
- **Server URL**

For more information about these registry settings, see the *IBM OpenPages GRC Administrator's Guide*.

Procedure

1. Log on to the OpenPages GRC Platform application server as a user with administrative privileges.
2. Ensure that the `op-bpm-registry-entries-op-config.xml` file contains the correct **Server URL**.
   - If the OpenPages GRC Platform application server is integrated with BPM Process Center, the `op-bpm-registry-entries-op-config.xml` file requires no changes. The toolkit generator set the **Server URL** to the BPM Process Center URL.
   - If the OpenPages GRC Platform application server is integrated with BPM Process Server, open the `op-bpm-registry-entries-op-config.xml` file in a text editor. Change **Server URL** to the BPM Process Server URL. Save the file.
3. Copy the `op-bpm-registry-entries-op-config.xml` file from the IBM Business Process Manager server to the OpenPages application server.
4. Load the file by using the ObjectManager command-line utility.
   a) Go to the *<OP_Home>*/bin directory.
   b) Run ObjectManager to load the `op-bpm-registry-entries-op-config.xml` file.
      Use the following syntax:

      ```
      ObjectManager.cmd|.sh l config|c <user> <password>
          <loader-file-path> <file-name>
      ```

      Example (Windows)

      ```
      ObjectManager.cmd l c OpenPagesAdministrator OpenPagesAdministrator
      c:\temp op-bpm-registry-entries
      ```

      Example (Linux or AIX)

      ```
      ./ObjectManager.sh l c OpenPagesAdministrator OpenPagesAdministrator
      /temp op-bpm-registry-entries
      ```

Chapter 4. Update the integration after installing an OpenPages fix pack

After you install an IBM OpenPages GRC Platform fix pack, you need to update the integration of IBM OpenPages GRC Platform and IBM Business Process Manager.

When you update the integration, you can choose one of the following methods:

- Use the IBM OpenPages GRC Platform installation app
- Update the integration manually

The method that you select determines the tasks that you need to do.

Update the integration by using the installation app

After you apply an IBM OpenPages GRC Platform fix pack, you can update the integration by using the installation app.

If you want to use the installation app, do these tasks:

- Open your deployment in the installation app. Review the settings on the **Workflow Server** card.
- Install the IBM OpenPages GRC Platform fix pack. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide*.
- Update the integration. For more information, see "Updating the integration of IBM Business Process Manager" on page 43.

Updating the integration of IBM Business Process Manager

If you integrated IBM Business Process Manager (BPM) with IBM OpenPages GRC Platform, update the integration after you install a fix pack.

About this task

Update the integration to get the latest enhancements and fixes.

For example, in version 7.4.0.0, random errors might occur when processes run in parallel. Complete this task to resolve the issue.

Procedure

1. Update IBM Business Process Manager 8.5.7 to cumulative fix pack 2017.06 with iFix JR60067 or later.
2. Ensure that the IBM Business Process Manager server is running.
3. Log on to the IBM Business Process Manager server as a user with administrative privileges.
4. Create a directory. Ensure that you have write permissions on the directory.
5. Locate the `op-bpm-install.zip` file in the fix pack kit.

   The file is stored in `/OP_<version>_Non_Embedded/OP_<version>_Configuration/ IBM_BPM_Integration/`.
6. Extract the `op-bpm-install.zip` file to the new directory that you created.
7. Generate and import the toolkits.
   a) Go to the directory where you extracted the `op-bpm-install.zip` file.
   b) Run the toolkit generator and activate the toolkits.

      For more information, see Generating and importing the toolkits.

8. Import the BPM portal page that is customized for OpenPages.

    a) Open IBM BPM Process Designer.

    b) In the Process Center, click the **Toolkits** tab.

    c) Click **Import Toolkit**.

    d) Go to the directory where you extracted the `op-bpm-install.zip` file and go to the `/synctool` directory.

    e) Select the `OpenPages_Custom_Process_Portal.twx` file, and then click **Import**.

9. Log in to OpenPages as an administrator.

10. Go to **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM** > **Portal Page Path**

11. Set **Portal Page Path** to "/teamworks/executecf?modelID=1.2326a4e1-8fe4-4be4-baa9-08b484b5cd0a&branchID=2063.b43deb6d-146e-4719-a534-3ca52e6f3500".

Updating the integration manually

After you apply an IBM OpenPages GRC Platform fix pack, you can update the integration manually.

If you want to update the integration manually, do these tasks:

- Install the IBM OpenPages GRC Platform fix pack. For more information, see the *IBM OpenPages GRC Installation and Deployment Guide.*
- Prepare IBM Business Process Manager for the update. For more information, see "Preparing to update the BPM integration for a fix pack " on page 44.
- Run the integration script. Use the `installIBMIntegrationConfig.sh|cmd` file from your existing environment. For more information, see "Running the integration script after installing an OpenPages fix pack" on page 45.
- Update the integration. For more information, see "Updating the integration of IBM Business Process Manager" on page 43.

Preparing to update the BPM integration for a fix pack

After you install an IBM OpenPages GRC Platform fix pack, you need to update the integration of IBM Business Process Manager with OpenPages. You need to prepare IBM Business Process Manager before you run the updated integration script.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.

2. Back up the `installIBMIntegrationConfig.sh|cmd` file from your current environment.

   The `installIBMIntegrationConfig.sh|cmd` file contains the parameter values that you need for the integration script.

3. Create a new temporary directory.

   Ensure that you have write permissions on the directory.

4. Go to the `/OP_<version>_Non_Embedded/OP_<version>_Configuration/IBM_BPM_Integration/` directory on the fix pack installation media. Locate the `op-bpm-install.zip` file.

5. Extract the `op-bpm-install.zip` file to the temporary directory that you created.

6. Replace the `installIBMIntegrationConfig.sh|cmd` file in the temporary directory with the backup copy that you created in step 2.

7. If you are using Linux, change the file permissions on the `installBPMIntegration.sh` and `installBPMIntegrationConfig.sh` scripts to allow the `execute` permission.

8. Stop all IBM Business Process Manager servers and node agents.

For more information, see Starting and stopping your environment on the IBM Business Process Manager Knowledge Center.

9. Restart the IBM Business Process Manager Deployment Manager (Dmgr).

    For more information, see Starting and stopping deployment managers on the IBM Business Process Manager Knowledge Center.

What to do next

Run the integration script. See "Running the integration script after installing an OpenPages fix pack" on page 45.

Running the integration script after installing an OpenPages fix pack

Run the integration script to update the integration of IBM Business Process Manager with IBM OpenPages GRC Platform.

Before you begin

Ensure that the following conditions are met:

- IBM Business Process Manager Deployment Manager (Dmgr) is running.
- The IBM Business Process Manager server and the node agents are stopped.
- The OpenPages Deployment Manager (Dmgr) is running.
- OpenPages servers and node agents are stopped.
- You have write permissions on the temporary directory where you copied the integration scripts.

Procedure

1. Log on to the IBM Business Process Manager server as a user with administrative privileges.
2. Go to the temporary directory where you extracted the `op-bpm-install.zip` file.
3. Ensure that the `installIBMIntegrationConfig.sh|cmd` file contains the parameter values for your environment.
4. Open a command line and run the integration script.

    Replace *<temp_dir>* with the temporary directory where you extracted the `op-bpm-install.zip` file.

    Microsoft Windows

    ```
    cd <temp_dir>
    installBPMIntegration.cmd --silent
    ```

    Linux

    ```
    cd <temp_dir>
    ./installBPMIntegration.sh --silent
    ```

5. Synchronize the IBM Business Process Manager nodes.

    - On Microsoft Windows operating systems, go to the *<BPM_Home>*\profiles *<BPM_server_profile>*\bin directory. Run `syncNode.bat`.
    - On Linux operating systems, go to the *<BPM_Home>*/profiles/*<BPM_server_profile>*/bin directory. Run `syncNode.sh`.

    Use the following syntax:

    ```
    syncNode.bat|.sh <Dmgr_hostname> -username <BPM_WAS_admin_username>
        -password <BPM_WAS_admin_password>
    ```

6. Synchronize the OpenPages nodes.

- On Microsoft Windows operating systems, go to the *<OP_Home>*\profiles*<host_name>*-OPNode1\bin directory. Run `syncNode.bat`.
- On UNIX operating systems, go to the *<OP_Home>*/profiles/*<host_name>*-OPNode1/bin directory. Run `syncNode.sh`.

Use the following syntax:

```
syncNode.bat|.sh <admin_host_name> <OP_SOAP_PORT>
    -username <OP_WAS_admin_user_name> -password <OP_WAS_admin_password>
```

For example, on Linux operating systems, run the following command:

```
/home/opuser/OP/OpenPages/profiles/opserver-OPNode1/bin/syncNode.sh
    localhost 8879 -username admin -password openpages
```

7. Restart the OpenPages GRC Platform services.
8. Restart the IBM Business Process Manager services and IBM BPM Process Center.

What to do next

Generate and import the toolkits. See "Updating the integration of IBM Business Process Manager" on page 43.

Updating the integration of IBM Business Process Manager

If you integrated IBM Business Process Manager (BPM) with IBM OpenPages GRC Platform, update the integration after you install a fix pack.

About this task

Update the integration to get the latest enhancements and fixes.

For example, in version 7.4.0.0, random errors might occur when processes run in parallel. Complete this task to resolve the issue.

Procedure

1. Update IBM Business Process Manager 8.5.7 to cumulative fix pack 2017.06 with iFix JR60067 or later.
2. Ensure that the IBM Business Process Manager server is running.
3. Log on to the IBM Business Process Manager server as a user with administrative privileges.
4. Create a directory. Ensure that you have write permissions on the directory.
5. Locate the `op-bpm-install.zip` file in the fix pack kit.

   The file is stored in /OP_*<version>*_Non_Embedded/OP_*<version>*_Configuration/ IBM_BPM_Integration/.
6. Extract the `op-bpm-install.zip` file to the new directory that you created.
7. Generate and import the toolkits.
   a) Go to the directory where you extracted the `op-bpm-install.zip` file.
   b) Run the toolkit generator and activate the toolkits.

      For more information, see Generating and importing the toolkits.
8. Import the BPM portal page that is customized for OpenPages.
   a) Open IBM BPM Process Designer.
   b) In the Process Center, click the **Toolkits** tab.
   c) Click **Import Toolkit**.
   d) Go to the directory where you extracted the `op-bpm-install.zip` file and go to the /synctool directory.

e) Select the `OpenPages_Custom_Process_Portal.twx` file, and then click **Import**.

9. Log in to OpenPages as an administrator.

10. Go to **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM** > **Portal Page Path**

11. Set **Portal Page Path** to "/teamworks/executecf?modelID=1.2326a4e1-8fe4-4be4-baa9-08b484b5cd0a&branchID=2063.b43deb6d-146e-4719-a534-3ca52e6f3500".

Chapter 5. Additional tasks

After you integrate IBM Business Process Manager with OpenPages GRC Platform, you can perform some additional tasks.

Configuring IBM Business Process Manager when you use a customized OpenPages application URL

If you customized the application URL for IBM OpenPages GRC Platform, you need to do some additional steps to integrate IBM Business Process Manager and IBM OpenPages GRC Platform

Procedure

1. Log on to the IBM WebSphere administrative console on the IBM Business Process Manager server as a user with administrative privileges.
2. Go to **Security** > **Global Security** > **Web and SIP security** > **Trust Association** > **Interceptors**.
3. Click **com.ibm.openpages.integration.bpm.sso.OpenPagesLoginTAI**.
4. Click **Edit** on the **op.app.root.context.path** custom property. Change the value to the new OpenPages context root path.

   For example, type / if you removed openpages from the URL.
5. Click **Apply** and then click **Save**.
6. Click **Environment** > **Naming** > **Name Space Bindings**. Ensure that the **Scope** is set to Cell=PCCell1.
7. Click **OP_ROOT_PATH**.
8. Change **String value** to the new OpenPages context root path, the same value that you entered in step 4.
9. Click **Apply** and then click **Save**.
10. Stop all IBM Business Process Manager servers.

    For more information, see Starting and stopping your environment on the IBM Business Process Manager Knowledge Center.
11. Restart the IBM Business Process Manager Deployment Manager (Dmgr) server only.

    For more information, see Starting and stopping deployment managers on the IBM Business Process Manager Knowledge Center.
12. Synchronize the IBM Business Process Manager nodes.

    - On Microsoft Windows operating systems, go to the *<BPM_Home>*\profiles *<BPM_server_profile>*\bin directory. Run syncNode.bat.
    - On Linux operating systems, go to the *<BPM_Home>*/profiles/*<BPM_server_profile>*/bin directory. Run syncNode.sh.

    Use the following syntax:

    ```
    syncNode.bat|.sh <Dmgr_hostname> -username <BPM_WAS_admin_username>
       -password <BPM_WAS_admin_password>
    ```
13. Start all IBM Business Process Manager servers.

    For more information, see Starting and stopping your environment on the IBM Business Process Manager Knowledge Center.

Setting up LDAP authentication

You can set up LDAP authentication.

About this task

Note the following:

- The user groups defined in OpenPages are not available to IBM Business Process Manager if both systems use LDAP authentication. When you create a **Team** in the process application, you need to list member users instead. Alternatively, you can create individual groups on the IBM Business Process Manager system or LDAP system with the same names as the names you have in OpenPages, and reference it in the **Team**.
- When the **Team Filter by Object Field** integration service is used, you need to set the `expandGroups` flag to `true` to list all the users and to avoid issues of having groups in the filtered team that do not exist in IBM Business Process Manager.

Procedure

1. Set up your LDAP server and verify that it is functional.
2. Configure OpenPages GRC Platform to use LDAP for authentication.

   For more information, see "LDAP user authentication" in the *IBM OpenPages GRC Administrator's Guide*
3. Configure the IBM OpenPages REST API to use LDAP for authentication.

   For more information, see Authentication for GRC REST API with a custom user realm for WebSphere
4. Configure IBM Business Process Manager to use LDAP.

   For more information, see Securely integrate an LDAP user registry with IBM Business Process Manager
5. Run the integration script (`installBPMIntegration.cmd|.sh`) but do not restart the server. For more information about running the script, see "Running the integration script" on page 13.
6. Customize the user registry:

   a) Open the IBM Business Process Manager admin console and log in to the console.

   An example of the URL is `https://bpmserver.com:9443/ibm/console`.

   b) Go to **Global Security** > **User account repository** > **Federated repositories** > **configure**.

   c) Remove the **urbOpenPages** repository.

   d) Save the configuration.
7. Synchronize the IBM Business Process Manager nodes.

   - On Microsoft Windows operating systems, go to the *<BPM_Home>*`\profiles` `\`*<BPM_server_profile>*`\bin` directory. Run `syncNode.bat`.
   - On Linux operating systems, go to the *<BPM_Home>*`/profiles/`*<BPM_server_profile>*`/bin` directory. Run `syncNode.sh`.

   Use the following syntax:

   ```
   syncNode.bat|.sh <Dmgr_hostname> -username <BPM_WAS_admin_username>
      -password <BPM_WAS_admin_password>
   ```
8. Synchronize the OpenPages nodes.

   - On Microsoft Windows operating systems, go to the *<OP_Home>*`\profiles\`*<host_name>*`-OPNode1\bin` directory. Run `syncNode.bat`.
   - On UNIX operating systems, go to the *<OP_Home>*`/profiles/`*<host_name>*`-OPNode1/bin` directory. Run `syncNode.sh`.

Use the following syntax:

```
syncNode.bat|.sh <admin_host_name> <OP_SOAP_PORT>
    -username <OP_WAS_admin_user_name> -password <OP_WAS_admin_password>
```

For example, on Linux operating systems, run the following command:

```
/home/opuser/OP/OpenPages/profiles/opserver-OPNode1/bin/syncNode.sh
    localhost 8879 -username admin -password openpages
```

9. Update the registry keys in OpenPages GRC Platform to set the IBM Business Process Manager base URL and enable single sign-on.

Secure Sockets Layer (SSL) for IBM Business Process Manager

Consider the security requirements for each of your environments.

When you integrate IBM OpenPages GRC Platform with IBM Business Process Manager, you choose the server URLs that OpenPages uses to connect to the IBM BPM Process Center or IBM BPM Process Servers.

If you want to use a secure HTTPS protocol for the IBM BPM server URL, then you must consider how you will configure IBM Business Process Manager for SSL and how your users will access the secure IBM BPM server URLs.

Note: A secure URL with SSL encryption is recommended.

By default, IBM Business Process Manager uses default certificates that are not issued by a trusted certificate authority (CA). This means that when a user accesses a IBM Business Process Manager URL over HTTPS, the certificate might not be trusted by the user's browser, depending on the browser the user has and on the browser security settings. The untrusted certificate can cause errors in the user's browser and possibly block the functions of the OpenPages integration, including the **Process Portal** home page.

To ensure that users can access the IBM BPM server URL over HTTPS, you must install valid, SSL certificates signed by a certificate authority (CA) that is trusted by your organization. For information about how to configure SSL in IBM Business Process Manager, see Configuring Secure Sockets Layer (SSL) for IBM Business Process Manager (http://www.ibm.com/support/knowledgecenter/SSFPJS_8.5.7/com.ibm.wbpm.imuc.sbpm.doc/topics/cins_cnfg_ssl_bpm.html).

Configuring SSL

If you configured IBM OpenPages GRC Platform to use SSL with the TLSv1.2 protocol, you must also configure IBM Business Process Manager to support TLS protocols of the same level. You can use TLSv1.2 or SSL_TLSv2 in IBM Business Process Manager.

Procedure

1. Log on to the IBM WebSphere administrative console on the IBM Business Process Manager server as a user with administrative privileges.
2. Go to **Security** > **SSL certificate and key management** > **SSL configurations** > **CellDefaultSSLSettings**.
3. Under **Additional Properties**, click **Quality of Protection**.
4. Verify that **Protocol** is set to **SSL_TLSv2**. Click **Save**.
5. If the host name of the SSL certificate that you are using for OpenPages is different from the host name that you specified for the *OP Application Base URL* parameter when you ran the `installBPMIntegration.cmd|.sh` script, you need to do some additional steps.

   a) In the IBM WebSphere administrative console, go to **Environment** > **Naming** > **Name space bindings**.
   b) Ensure that the **Scope** is set to **Cell=PCCell1**.
   c) Click **OP_SSL_BYPASS_HOSTNAME_VERIFICATION**.

d) Change **String value** to **true**.

   When set to **true**, the verification of host names on SSL certificates from the OpenPages application server is disabled.

6. Stop all IBM Business Process Manager servers, clusters, and node agents, and then synchronize the nodes and restart the servers.

   For more information, see Running the syncNode command after enabling security in the IBM Business Process Manager documentation (https://www.ibm.com/support/knowledgecenter/ SSFTN5_8.5.7/com.ibm.wbpm.mon.admin.doc/sec/sec_startnodeagent.html).

What to do next
Install a root certificate and a signed server certificate from a trusted third-party certificate authority on each IBM BPM server. For more information, see "Importing root and signer certificates to the local trust store " on page 52.

Importing root and signer certificates to the local trust store

When setting up SSL between IBM Business Process Manager and IBM OpenPages GRC Platform, you must install a root certificate and a signed server certificate for OpenPages from a trusted third-party certificate authority on each IBM Business Process Manager server.

Before you begin

- Determine the host name and port of the target secure OpenPages application server. The target secure server is the server that the IBM BPM server connects to in order to retrieve the certificates. The certificates are required for the integration with OpenPages.
- The target secure server application from which you are going to retrieve the certificate must be running and listening on the port.

About this task

The root certificate contains the public key and has been verified by the certificate authority (CA). Your web server sends the root certificate to clients that are trying to access that web server.

The server certificate is returned from the CA and is based on the certificate request that you generated.

Import the certificates on each IBM BPM server.

Procedure

1. Log on to the IBM WebSphere administrative console on the IBM Business Process Manager server as a user with administrative privileges.
2. Expand **Security** and click **SSL certificate and key management**.
3. Under **Configuration settings**, click **Manage endpoint security configurations**.
4. Select the appropriate outbound configuration to get to the **(cell):PCCell1** management scope.
5. Under **Related Items**, click **Key stores and certificates** and click the **CellDefaultTrustStore** keystore.
6. Under **Additional Properties**, click **Signer certificates** and **Retrieve From Port**.
7. Enter the HTTPS host and port information of the OpenPages application server.

   - **Host**: Enter the host name of the secure target server.
   - **Port**: Enter the port number of the secure target server application.
   - **Alias**: Enter a descriptive name for the certificate.

8. Click **Retrieve Signer Information**.
9. Verify that the certificate information is for a certificate that you trust.
10. Click **Apply** and then click **Save**.

11. Stop all IBM Business Process Manager servers, clusters, and node agents, and then synchronize the nodes and restart the servers.

For more information, see Running the syncNode command after enabling security in the IBM Business Process Manager documentation (https://www.ibm.com/support/knowledgecenter/SSFTN5_8.5.7/com.ibm.wbpm.mon.admin.doc/sec/sec_startnodeagent.html).

Options for non-production environments

In cases where it is not possible to obtain and install a trusted, signed certificate into your IBM Business Process Manager server, such as for non-production environments, you have two options.

You can follow the guidance that is provided in Simple SSL for BPM PoC environments (https://www.ibm.com/developerworks/community/blogs/d350350e-2c84-4d33-a25d-73b42c7fbb5e/entry/Simple_SSL_for_BPM_PoC_environments?lang=en).

Note: If you use an unsigned or not trusted certificate with SSL, each of your users must import the signer certificates into their browser and operating system's truststore or Trusted Root Certificates.

Alternatively, you can configure the non-production environment to allow HTTP instead of HTTPS. For more information, see "Unsecure HTTP connections for IBM Business Process Manager" on page 53.

Unsecure HTTP connections for IBM Business Process Manager

For a non-production environment, you can configure the IBM OpenPages GRC Platform integration with IBM Business Process Manager to use the unsecure, plain HTTP protocol for the IBM BPM server URLs, instead of secure HTTPS.

Configuring OpenPages to use HTTP for IBM Business Process Manager server URLs

If you want to use the HTTP protocol instead of HTTPS for IBM Business Process Manager server URLs, update the **Server URL** setting in IBM OpenPages GRC Platform.

Procedure

1. Log on to the OpenPages admin application server. Use an account that has administrative privileges and the **Settings** application permission.
2. Click **Administration** > **Settings** > **Platform** > **Workflow Implementations** > **IBM BPM**.
3. Edit the **Server URL** setting to use the HTTP protocol instead of HTTPS.
   - Type HTTP and the host name or the FQDN of IBM BPM Process Center or IBM BPM Process Server.
   - Change the port number to the non-SSL listening port for your IBM BPM server.

   For example, type `http://bpm.server.com:9080`

   For more information, see "Workflow implementations Settings" in the *IBM OpenPages GRC Administrator's Guide*.
4. If you are using the auto-login feature, configure the logout URL in the `aurora.properties` file.
   a) Edit the `<OP_HOME>/aurora/conf/aurora.properties` file on the OpenPages application server.
   b) Create a property that is named `logout.url.ibmbpm`, or edit the property if it exists.
   c) Set `logout.url.ibmbpm` to the HTTP hostname/FQDN and port that you used for the **Server URL** setting.

   For example, if you set **Server URL** to `http://bpm.server.com:9080`, type: `http\://bpm.server.com\:9080/ProcessPortal/logout.jsp`
5. Restart the OpenPages application.
6. Repeat these steps for each server in a load-balanced environment.

Configure IBM Business Process Manager to allow HTTP access

By default, IBM Business Process Manager does not allow unsecure HTTP access. Any request to an `http://` URL is redirected automatically to the `https://` equivalent. You can configure IBM Business Process Manager to allow HTTP.

Important: Do this procedure on non-production systems only. Do this procedure only if you use HTTP for both IBM OpenPages GRC Platform and IBM Business Process Manager URLs. If you use HTTPS to access OpenPages, do not do this procedure.

For information about how to configure IBM Business Process Manager to allow HTTP, see the IBM BPM documentation on IBM Knowledge Center, Allowing insecure access to Heritage Process Portal (https://www.ibm.com/support/knowledgecenter/en/SSFPJS_8.5.7/com.ibm.wbpm.imuc.ebpmps.doc/topics/tcfg_bsp_sec_https.html)

Note: IBM Business Process Manager version 8.5.7.0 has a known issue with the `configBSpaceTransport.py` script that is described in "Allowing insecure access to Heritage Process Portal". For more information, see http://www.ibm.com/support/docview.wss?uid=swg1JR56096. The issue is resolved in IBM BPM version 8.5.7 CF 2016.09 or later.

Example (Linux)

For example, suppose that your environment uses the following:

- Deployment manager profile: `/opt/ibm/BPM/v8.5/profiles/DmgrProfile`
- Script location: `/opt/ibm/BPM/v8.5/BusinessSpace/scripts`
- Application cluster name: `SingleCluster`

From the `dmgr_profile/bin` directory, run the following command:

```
./wsadmin.sh -user admin -password ****
   -f /opt/ibm/BPM/v8.5/BusinessSpace/scripts/configBSpaceTransport.py
   -allowhttp -clusterName SingleCluster
```

Known limitations of using HTTP with IBM Business Process Manager

You might encounter issues in some supported browsers when you use HTTPS with IBM OpenPages GRC Platform and HTTP with IBM Business Process Manager.

For example, suppose that your OpenPages server is accessed at `https://op.server:10111/openpages` and your IBM BPM server is configured to allow HTTP access on `http://bpm.server.com:9080`. This difference in protocol can cause browsers to consider any IBM Business Process Manager content in the OpenPages user interface to be mixed content.

Table 20. How browsers handle mixed content

Browser	Behavior
Chrome (v56)	Error: `Mixed Content` Content is blocked.
Internet Explorer (v11)	Error: `SEC7111: HTTPS security is compromised` Users might be given the option to **Show All Content**. Users can also work around the error by changing their security settings. Go to **Internet Options** > **Security Settings**. Click **Custom Level** and then select **Display Mixed Content**.

Hosting the OpenPages application server and IBM Business Process Manager on the same computer

If you host your IBM OpenPages GRC Platform application server and either IBM BPM Process Center or IBM BPM Process Server on the same host (as in a development or test environment), you need to perform some additional configuration.

About this task

To prevent conflicts, you need to alter the default **LTPA Token name** in the IBM WebSphere administrative console for the OpenPages admin application server. You also need to enable cookies and set the default session cookie name.

Procedure

1. Log in to the IBM WebSphere administrative console on the OpenPages admin application server as the administrator user.

   The URL for the WebSphere administrative console uses the following format: `https://<OpenPages_server>:<port>/ibm/console`.

2. Go to **Security** > **Global Security** > **Web and SIP Security** > **Single-sign on (SSO)**.
3. Change the value of **LTPA V2 cookie name** from a blank to a distinct name.
4. Click **Apply** and then click **Save**.
5. Go to **Servers** > **Server Types** > **WebSphere application servers** and click the name of your server.
6. Under **Container Settings**, expand **Web Container Settings** and click **Web container**.
7. Under **Additional Properties**, click **Session management**.
8. Click **Enable cookies**.
9. Enter opsosa in the **Cookie name** field.
10. Click **Apply** and then click **Save**.
11. Stop the OpenPages services.

    For more information, see "Starting and stopping servers" in the *IBM OpenPages GRC Administrator's Guide*

12. Restart the OpenPages Deployment Manager (Dmgr) server.

    For example, on Windows operating systems, run the following command:

    ```
    C:\OpenPages\profiles\OpenPagesDmgr\bin\startManager.bat
    ```

    For example, on Linux operating systems, run the following command:

    ```
    /home/opuser/OP/OpenPages/profiles/OpenPagesDmgr/bin/startManager.sh
    ```

13. Synchronize the OpenPages nodes.

    - On Microsoft Windows operating systems, go to the *<OP_Home>*\profiles*<host_name>*-OPNode1\bin directory. Run syncNode.bat.
    - On UNIX operating systems, go to the *<OP_Home>*/profiles/*<host_name>*-OPNode1/bin directory. Run syncNode.sh.

    Use the following syntax:

    ```
    syncNode.bat|.sh <admin_host_name> <OP_SOAP_PORT>
        -username <OP_WAS_admin_user_name> -password <OP_WAS_admin_password>
    ```

For example, on Linux operating systems, run the following command:

```
/home/opuser/OP/OpenPages/profiles/opserver-OPNode1/bin/syncNode.sh
    localhost 8879 -username admin -password openpages
```

14. Start all OpenPages services.

For more information, see "Starting and stopping servers" in the *IBM OpenPages GRC Administrator's Guide*

Dropping the IBM Business Process Manager user (Oracle)

If you encounter problems when you create the IBM Business Process Manager user , you can drop the user in the OpenPages database and then re-create it.

Procedure

1. Log on to the OpenPages database server as a user with administrative privileges.
2. Go to the directory where you extracted the `op-bpm-install.zip` file.
3. Run the following script as the system DBA user for the OpenPages database.

```
sqlplus <dba_user>/<password>@<SID>
@drop_op_bpm_ORA.sql <bpm_auth_user>
```

Table 21. Parameters of the `setup_op_bpm_user_ORA.sql` script	
Parameter	Description
<dba_user>	The system DBA user for the OpenPages database
<password>	The password of the `system` DBA account
<SID>	The service name (system identifier) of the OpenPages database
<bpm_auth_user>	The name of the database user for IBM BPM, for example `bpmaccnt`

4. Stop all OpenPages servers and node agents.
5. Restart the OpenPages Deployment Manager (Dmgr).

Results

The `bpmaccnt` user is removed from the OpenPages database.

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