



BlackBerry UEM Cloud Configuration

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Configuring BlackBerry UEM Cloud for the first time

The following table summarizes the configuration tasks covered in this guide. The tasks are optional based on your organization's needs. Use this table to determine which configuration tasks you should complete.

After you complete the appropriate tasks, you are ready to set up administrators, set up device controls, create users and groups, and activate devices.

| Task | Description |
|--|--|
| Connect to your organization's on-premises company directory and enable secure connectivity features | You can install, activate, and configure the BlackBerry Connectivity Node to provide access to your organization's on-premises company directory and to enable secure connectivity features. |
| Configure the BlackBerry Connectivity Node to send data through a proxy server | You can configure the BlackBerry Connectivity Node components to send data through a proxy server in your organization's environment. |
| Connect BlackBerry UEM to Microsoft Azure | If you want to connect BlackBerry UEM to Azure Active Directory, use BlackBerry UEM to deploy iOS and Android apps managed by Microsoft Intune, or manage Windows 10 apps in BlackBerry UEM, connect BlackBerry UEM to Microsoft Azure. |
| Link company directory groups to BlackBerry UEM groups | If you connect BlackBerry UEM to your company directory, you can enable directory-linked groups to simplify onboarding and managing users. |
| Obtain and register an APNs certificate | If you want to manage and send data to iOS or macOS devices, you must obtain a signed CSR from BlackBerry, use it to obtain an APNs certificate from Apple, and register the APNs certificate with the BlackBerry UEM domain. |
| Configure BlackBerry UEM to support Android devices that have a work profile | To support Android devices that have a work profile, you need to configure your G Suite or Google Cloud domain to support third-party mobile device management providers and configure BlackBerry UEM to communicate with your G Suite or Google Cloud domain. |
| Configure BlackBerry UEM for the Apple Device Enrollment Program | If you want to use the BlackBerry UEM management console to manage iOS devices that your organization purchased from Apple for DEP, you must configure this feature. |
| Configure BlackBerry UEM Cloud to support BlackBerry Dynamics apps | If you want to allow users to use BlackBerry Dynamics apps, you can set up BlackBerry UEM Cloud to support the apps. |
| Migrate users, groups, and other data from BlackBerry UEM | You can use the management console to migrate users, devices, groups, and other data from a source on-premises BES12 or BlackBerry UEM database. |

Administrator permissions required to configure BlackBerry UEM

When you perform the configuration tasks in this guide, log in to the management console using the administrator account that you created when you installed BlackBerry UEM. If you want more than one person to complete configuration tasks, you can create additional administrator accounts. For more information about creating administrator accounts, [see the Administration content](#).

If you create additional administrator accounts to configure BlackBerry UEM, you should assign the Security Administrator role to the accounts. The default Security Administrator role has the necessary permissions to complete any configuration task.

Obtaining and activating licenses

To activate devices you must obtain the necessary licenses. You should obtain licenses before you follow the configuration instructions in this guide and before you add user accounts.

For more information about licensing options and the features and products supported by the various license types, [see the Licensing content](#).

Installing the BlackBerry Connectivity Node to connect to resources behind your organization's firewall

The BlackBerry Connectivity Node is a collection of components that you can install on a dedicated computer to enable additional features for BlackBerry UEM Cloud. The following components are included in the BlackBerry Connectivity Node.

| Component | Purpose |
|--------------------------------|--|
| BlackBerry Cloud Connector | <p>The BlackBerry Cloud Connector allows BlackBerry UEM Cloud to access your organization's on-premises company directory. You can create directory user accounts by searching for and importing user data from the company directory. User data is synchronized with the directory daily. BlackBerry UEM Cloud must be able to access your company directory if you want to use SCEP.</p> <p>Directory users can use their directory credentials to access BlackBerry UEM Self-Service. If you assign an administrative role to directory users, the users can also use their directory credentials to log into the management console.</p> |
| BlackBerry Proxy | <p>BlackBerry Proxy maintains a secure connection between your organization and the BlackBerry Dynamics NOC, which allows BlackBerry Dynamics apps to communicate securely with your organization's resources behind the firewall. It also supports BlackBerry Dynamics Direct Connect, which allows app data to bypass the BlackBerry Dynamics NOC. For more information, see Configuring BlackBerry UEM Cloud to support BlackBerry Dynamics apps.</p> |
| BlackBerry Secure Connect Plus | <p>BlackBerry Secure Connect Plus gives users access to work resources behind your organization's firewall while ensuring the security of data using standard protocols and end-to-end encryption. For more information, see the Administration content.</p> |
| BlackBerry Secure Gateway | <p>The BlackBerry Secure Gateway provides iOS devices that use the MDM controls activation type with a secure connection to your organization's mail server through the BlackBerry Infrastructure. For more information, see the Administration content.</p> |
| BlackBerry Gatekeeping Service | <p>The BlackBerry Gatekeeping Service makes it easier to control which devices can access Exchange ActiveSync. For more information, see the Administration content.</p> |

The installation and activation files for the BlackBerry Connectivity Node are available in the management console. You can use these files to install new instances of the BlackBerry Connectivity Node and upgrade existing instances. You must upgrade existing instances of the BlackBerry Connectivity Node after a roll out of a new version of BlackBerry UEM Cloud.

BlackBerry Connectivity Node planning information

Before you install the BlackBerry Connectivity Node, consider the following information.

Hardware

The BlackBerry Connectivity Node must be installed on a dedicated computer that is reserved for technical purposes, instead of a computer that is used for everyday work. The computer must be able to access the Internet and your company directory. You cannot install the BlackBerry Connectivity Node on a computer that already hosts an on-premises BlackBerry UEM instance.

The computer that hosts the BlackBerry Connectivity Node must meet the following minimum hardware requirements:

- 6 processor cores, 2.7 GHz
- 12 GB of available memory
- 64 GB of disk space

If you enable single-service performance mode, the computer that hosts the BlackBerry Connectivity Node must meet the following minimum hardware requirements:

| | |
|---|--|
| BlackBerry Connectivity Node with single-service performance mode enabled for BlackBerry Proxy only | <ul style="list-style-type: none">• 6 processor cores, 2.7 GHz• 12 GB of available memory• 64 GB of disk space |
| BlackBerry Connectivity Node with single-service performance mode enabled for BlackBerry Secure Connect Plus only | <ul style="list-style-type: none">• 4 processor cores, 2.7 GHz• 12 GB of available memory• 64 GB of disk space |
| BlackBerry Connectivity Node with single-service performance mode enabled for BlackBerry Secure Gateway only | <ul style="list-style-type: none">• 8 processor cores, 2.7 GHz• 12 GB of available memory• 64 GB of disk space |

Software

To verify that your environment meets the requirements for installing the BlackBerry Connectivity Node, [see the Compatibility matrix](#).

Scalability and high availability

Each BlackBerry Connectivity Node can support up to 5000 devices. You can install additional BlackBerry Connectivity Nodes to support up to 50,000 additional devices.

You can install one or more instances of the BlackBerry Connectivity Node to provide redundancy. You must install each instance on a dedicated computer. Use the same company directory configuration for all instances.

Deploy more than one BlackBerry Connectivity Node in a server group to allow for high availability and load balancing.

Optionally, you can designate each BlackBerry Connectivity Node in a server group to handle a single connection type: BlackBerry Secure Connect Plus only, BlackBerry Secure Gateway only, or BlackBerry Proxy only. This frees up server resources to allow fewer servers required for the same number of users or containers. Each BlackBerry Connectivity Node enabled for single-service performance mode can support up to 10,000 devices.

Steps to install and activate the BlackBerry Connectivity Node

To install and activate the BlackBerry Connectivity Node, perform the following actions:

| | |
|---|---|
| 1 | Verify that your organization meets the prerequisites to install the BlackBerry Connectivity Node. |
| 2 | Download the installation and activation files for the BlackBerry Connectivity Node from the management console. |
| 3 | Install, activate, and configure the BlackBerry Connectivity Node. |
| 4 | If necessary, configure proxy settings for the BlackBerry Connectivity Node components. |
| 5 | Perform additional configuration for BlackBerry Secure Connect Plus , the BlackBerry Secure Gateway , the BlackBerry Gatekeeping Service , and BlackBerry Dynamics apps . |

Prerequisites: Installing the BlackBerry Connectivity Node

- Verify that the computer is running Windows PowerShell 2.0 or later. This is required for the setup application to install RRAS for BlackBerry Secure Connect Plus and the BlackBerry Gatekeeping Service.
Note: If the setup application cannot install RRAS on the computer, you must stop the installation, install RRAS manually, and restart the installation.
- Choose a directory account with read permissions that the BlackBerry Cloud Connector can use to access the company directory.
- Use a BlackBerry UEM Cloud account with permissions to download the BlackBerry Connectivity Node installation and activation files (for example, Security Administrator).
- Use a Windows account with permissions to install and configure software on the computer that will host the BlackBerry Connectivity Node.
- Verify that the following outbound ports are open in your organization's firewall so that the BlackBerry Connectivity Node components (and any associated proxy servers) can communicate with the BlackBerry Infrastructure (*region.bbsecure.com*):
 - 443 (HTTPS) to activate the BlackBerry Connectivity Node
 - 3101 (TCP) for all other outbound connections


Installing or upgrading the BlackBerry Connectivity Node

Follow the instructions in this section to install or upgrade the BlackBerry Connectivity Node.

You can install one or more instances of the BlackBerry Connectivity Node to provide redundancy.

You must install each instance on a dedicated computer. Use the same company directory configuration for all instances.

Download the installation and activation files for the BlackBerry Connectivity Node

1. In the management console, on the menu bar, click **Settings > External integration > BlackBerry Connectivity Node setup**.
2. Click .
3. Click **Download**.
4. On the software download page, answer the required questions and click **Download**. Save the installation package.
5. If you want to add the BlackBerry Connectivity Node instance to an existing server group when you activate it, in the **Server group** drop-down list, click the appropriate server group.
6. Click **Generate**.
7. Save the activation file (.txt).

The activation file is valid for 60 minutes. If you wait longer than 60 minutes before you use the activation file, you must generate a new activation file. Only the latest activation file is valid.

After you finish: [Install and configure the BlackBerry Connectivity Node](#).

Install and configure the BlackBerry Connectivity Node

Before you begin: [Download the installation and activation files for the BlackBerry Connectivity Node](#).

1. Open the BlackBerry Connectivity Node installation file (.exe) that you downloaded from the management console.

If a Windows message appears and requests permission to make changes to the computer, click **Yes**.
2. Choose your language. Click **OK**.
3. Click **Next**.
4. Select your country or region. Read and accept the license agreement. Click **Next**.
5. The installation program verifies that your computer meets the installation requirements. Click **Next**.
6. To change the installation file path, click ... and navigate to the file path that you want to use. Click **Install**.
7. When the installation completes, click **Next**.

The address of the BlackBerry Connectivity Node console is displayed (http://localhost:8088). Click the link and save the site in your browser.
8. Select your language. Click **Next**.
9. When you activate the BlackBerry Connectivity Node, it sends data over port 443 (HTTPS) to the BlackBerry Infrastructure (<region>.bbsecure.com). After it is activated, the BlackBerry Connectivity Node uses port 3101 (TCP) for all other outbound connections through the BlackBerry Infrastructure. If you want to send data from the BlackBerry Connectivity Node through an existing proxy server behind your organization's firewall, click **Click here to configure the proxy settings for your organization's environment**, select the **Proxy server** option, and do any of the following:
 - To send activation data through a proxy server, in the **Enrollment proxy** fields, type the FQDN or IP address and the port number of the proxy server. The proxy server must be able to send data over port 443 to <region>.bbsecure.com. Click **Save**.
 - To send other outbound connections from the components of the BlackBerry Connectivity Node through a proxy server, in the appropriate fields, type the FQDN or IP address and the port number of the proxy server. The proxy server must be able to send data over port 3101 to <region>.bbsecure.com. Click **Save**.
10. In the **Friendly name** field, type a name for the BlackBerry Connectivity Node. Click **Next**.
11. Click **Browse**. Select the activation file that you downloaded from the management console.
12. Click **Activate**.

If you want to add a BlackBerry Connectivity Node instance to an existing server group when you activate it, your organization's firewall must allow connections from that server over port 443 through the BlackBerry Infrastructure (<region>.bbsecure.com) to activate the BlackBerry Connectivity Node and to the same bbsecure.com region as the main BlackBerry Connectivity Node instance.

13. In the drop-down list, click the type of company directory that your organization uses.

14. Click **Configure**.

15. Follow the steps for your organization's directory type:

| Directory type | Steps |
|----------------------------|--|
| Microsoft Active Directory | <ol style="list-style-type: none"> a. In the Username field, type the username of the Microsoft Active Directory account. b. In the Domain field, type the FQDN of the domain that hosts Microsoft Active Directory. For example, domain.example.com. c. In the Password field, type the password of the Microsoft Active Directory account. d. In the Domain controller discovery drop-down list, click one of the following: <ul style="list-style-type: none"> • If you want to use automatic discovery, click Automatic. • If you want to specify the domain controller computer, click Select from list below. Click + and type the FQDN of the computer. Repeat this step to add more computers. e. In the Global catalog search base field, type the search base that you want to access (for example, OU=Users,DC=example,DC=com). To search the entire Global Catalog, leave the field blank. f. In the Global catalog discovery drop-down list, click one of the following: <ul style="list-style-type: none"> • If you want to use automatic catalog discovery, click Automatic. • If you want to specify the catalog computer, click Select from list below. Click + and type the FQDN of the computer. If necessary, repeat this step to specify more computers. g. If you want to enable support for linked Microsoft Exchange mailboxes, in the Support for linked Microsoft Exchange mailboxes drop-down list, click Yes. To configure the Microsoft Active Directory account for each forest that you want BlackBerry UEM Cloud to access, in the List of account forests section, click +. Specify the forest name, user domain name (the user can belong to any domain in the account forest), username, and password. h. Click Save. |


| Directory type | Steps |
|----------------|--|
| LDAP directory | <ol style="list-style-type: none"> a. In the LDAP server discovery drop-down list, click one of the following: <ul style="list-style-type: none"> • If you want to use automatic discovery, click Automatic. In the DNS domain name field, type the DNS domain name. • If you want to specify the LDAP computer, click Select server from list below. Click + and type the FQDN of the computer. Repeat this step to add more computers. b. In the Enable SSL drop-down list, select whether you want to enable SSL authentication for LDAP traffic. If you click Yes, click Browse and select the SSL certificate for the LDAP computer. c. In the LDAP port field, type the port number of the LDAP computer. d. In the Authorization required drop-down list, select whether BlackBerry UEM Cloud must authenticate with the LDAP computer. If you click Yes, type the username and password of the LDAP account. The username must be in DN format (for example, CN=Megan Ball,OU=Sales,DC=example,DC=com). e. In the Search base field, type the search base that you want to access (for example, OU=Users,DC=example,DC=com). f. In the LDAP user search filter field, type the filter that you want to use for LDAP users. For example: (&(objectCategory=person)(objectclass=user)(memberOf=CN=Local,OU=Users,DC=example,DC=com)). g. In the LDAP user search scope drop-down list, click one of the following: <ul style="list-style-type: none"> • If you want user searches to apply to all levels below the base DN, click All levels. • If you want to limit user searches to one level below the base DN, click One level. h. In the Unique identifier field, type the attribute for each user's unique identifier (for example, uid). The attribute must be immutable and globally unique for every user. i. In the First name field, type the attribute for each user's first name (for example, givenName). j. In the Last name field, type the attribute for each user's last name (for example, sn). k. In the Login attribute field, type the attribute for each user's login attribute (for example, cn). This attribute is used for the value that users type to log in to BlackBerry UEM Self-Service with their directory credentials. l. In the Email address field, type the attribute for each user's email (for example, mail). m. In the Display name field, type the attribute for each user's display name (for example, displayName). n. To enable directory-linked groups, select the Enable directory-linked groups check box. For more information about directory-linked groups, see Linking company directory groups to BlackBerry UEM groups. o. Click Save. |

16. In the management console, click **Settings > External integration > BlackBerry Connectivity Node setup**.

17. In the **Step 4: Test connection** section, click **Next**.

To view the status of a BlackBerry Connectivity Node instance, in the management console, on the menu bar, click **Settings > External integration > BlackBerry Connectivity Node status**.


After you finish:

- To install a second BlackBerry Connectivity Node instance for redundancy, download another set of installation and activation files and repeat this task on a different computer. Use the same directory configuration. This should be done after the first instance has been activated.
- If necessary, configure proxy settings for the BlackBerry Connectivity Node. For instructions, see [Configuring the BlackBerry Connectivity Node to use the BlackBerry Router or a TCP proxy server](#).
- To change the directory settings that you configured, in the BlackBerry Connectivity Node console (<http://localhost:8088>), click **General settings > Company directory**. Click  for the directory connection.
- If you want to send data through an HTTP proxy before it reaches the BlackBerry Dynamics NOC, in the BlackBerry Connectivity Node console (<http://localhost:8088>), click **General settings > BlackBerry Router and proxy**. Select the **Enable HTTP proxy** checkbox and configure the proxy settings.
- For instructions for enabling BlackBerry Secure Connect Plus, see ["Using BlackBerry Secure Connect Plus for connections to work resources"](#) in the Administration content.
- For more information about enabling the BlackBerry Secure Gateway, see ["Protecting email data using the BlackBerry Secure Gateway"](#) in the Administration content.
- For instructions for configuring the BlackBerry Gatekeeping Service, see ["Controlling which devices can access Exchange ActiveSync"](#) in the Administration content.

Change the default settings for BlackBerry Connectivity Node instances

By default, the BlackBerry Gatekeeping Service in each BlackBerry Connectivity Node instance is active. If you want gatekeeping data to be managed only by the BlackBerry Gatekeeping Service that is installed with the primary BlackBerry UEM components, you can change the default behavior to disable the BlackBerry Gatekeeping Service in each instance. You can also specify the default logging settings for all BlackBerry Connectivity Node instances.

The default settings apply to each BlackBerry Connectivity Node instance that is not in a server group. When an instance is part of a server group, it uses the default settings configured for that server group.

1. In the BlackBerry UEM management console, on the menu bar, click **Settings > External integration > BlackBerry Connectivity Node setup**.
2. Click .
3. If you want to disable the BlackBerry Gatekeeping Service in each instance, select the **Override BlackBerry Gatekeeping Service settings** check box.
4. If you want to configure logging settings, select the **Override logging settings** check box. Perform any of the following tasks:
 - In the **Server log debug levels** drop-down list, select the appropriate log level.
 - If you want to route log events to a syslog server, select the **Syslog** check box and specify the host name and port of the syslog server.
 - If you want to specify maximum limits for log file size and age, select the **Enable local file destination** check box. Specify the size limit (in MB) and the age limit (in days).
5. Click **Save**.

After you finish: If you disabled the BlackBerry Gatekeeping Service instances and you want to enable them again, select the **Enable the BlackBerry Gatekeeping Service** check box. Each instance must be able to access your organization's gatekeeping server.

Upgrade the BlackBerry Connectivity Node

When you are notified of an update to BlackBerry UEM Cloud, use the following instructions to upgrade the BlackBerry Connectivity Node components to the latest version.

1. On the computer that hosts the BlackBerry Connectivity Node, open the BlackBerry Connectivity Node console (<http://localhost:8088>).
2. Record the current directory configuration settings.
3. Log in to the BlackBerry UEM Cloud management console.
4. Download the BlackBerry Connectivity Node installation and activation files. For instructions, see [Download the installation and activation files for the BlackBerry Connectivity Node](#).
5. Install and configure the BlackBerry Cloud Connector using the information you recorded in step 2. For instructions, see [Install and configure the BlackBerry Connectivity Node](#).

Creating server groups

You can set up regional connections for enterprise connectivity features by deploying one or more BlackBerry Connectivity Node instances in a dedicated region. This is known as a server group.




When you create a server group, you specify the regional data path that you want the components to use to connect to the BlackBerry Infrastructure. You can associate email and enterprise connectivity profiles with a server group. Any device that is assigned those profiles uses that server group's regional connection to the BlackBerry Infrastructure when it uses any of the components of the BlackBerry Connectivity Node.

Deploying more than one BlackBerry Connectivity Node in a server group also allows for high availability and load balancing.

You can install one or more instances of the BlackBerry Connectivity Node to provide redundancy.

Create a server group

Before you begin: Install an additional BlackBerry Connectivity Node

1. On the menu bar, click **Settings > External integration > BlackBerry Connectivity Node setup**.
2. Click .
3. Type a name and description for the server group.
4. In the **Country** drop-down list, select the country where one or more instances of the BlackBerry Connectivity Node will be installed. The BlackBerry Connectivity Node instances that are added to the server group will use the selected country's regional connection to the BlackBerry Infrastructure.
Note: You cannot change this setting after the server group is created.
5. By default, each BlackBerry Connectivity Node instance must be configured to the same company directory. If you want to disable the company directory connector for the BlackBerry Connectivity Node instances in the server group, select the **Override Directory Service settings** check box.
6. By default, the BlackBerry Gatekeeping Service in each BlackBerry Connectivity Node instance is active. If you want gatekeeping data to be managed only by the main BlackBerry Connectivity Node instance, select the **Override BlackBerry Gatekeeping Service settings** check box to disable each BlackBerry Gatekeeping Service in the server group.
7. If you want to use DNS settings for BlackBerry Secure Connect Plus that are different from the default settings that are configured at **Settings > Infrastructure > BlackBerry Secure Connect Plus**, select the **Override DNS servers** check box. Perform the following tasks:
 - a) In the **DNS servers** section, click . Type the DNS server address in dot-decimal notation (for example, 192.0.2.0). Click **Add**. Repeat as necessary.
 - b) In the **DNS search suffix** section, click . Type the DNS search suffix (for example, domain.com). Click **Add**. Repeat as necessary.

For more information, see ["Using BlackBerry Secure Connect Plus for connections to work resources" in the Administration content](#).



8. If you want to configure logging settings for the BlackBerry Connectivity Node instances in the server group, select the **Override logging settings** check box. Perform any of the following tasks:
 - In the **Server log debug levels** drop-down list, select the appropriate log level.
 - If you want to route log events to a syslog server, select the **Syslog** check box and specify the host name and port of the syslog server.
 - If you want to specify maximum limits for log file size and age, select the **Enable local file destination** check box. Specify the size limit (in MB) and the age limit (in days).
9. If you want to designate the BlackBerry Connectivity Node for only one connection type, select the **Enable single-service performance mode** check box. In the drop-down menu, select the connection type (**BlackBerry Secure Connect Plus only**, **BlackBerry Secure Gateway only**, or **BlackBerry Proxy only**).
10. Click **Save**.

After you finish:

- If you disabled the BlackBerry Gatekeeping Service instances in a server group and you want to enable them again, in **Settings > External integration > BlackBerry Connectivity Node setup**, select the server group and select the **Enable the BlackBerry Gatekeeping Service** check box. Each instance must be able to access your organization's gatekeeping server.
- [Install and configure the BlackBerry Connectivity Node](#) and then [add the instance to a server group](#).

Manage server groups

You can add a BlackBerry Connectivity Node instance to a server group at any time, or remove an instance from a server group at any time. If you add an instance to a server group, that instance uses the settings that have been configured for that server group (for example, the components of that instance will use the specified regional connection to the BlackBerry Infrastructure). If you remove an instance from a server group, that instance uses the default settings that are configured on the BlackBerry Connectivity Node setup screen (see [Change the default settings for BlackBerry Connectivity Node instances](#)).

1. In the BlackBerry UEM management console, on the menu bar, click **Settings > External integration > BlackBerry Connectivity Node setup**.
2. Select a BlackBerry Connectivity Node instance.
3. Perform one of the following tasks:
 - a) To add an instance to a server group, click . Select the appropriate server group. Click **OK**.
 - b) To remove an instance from a server group, click . In the confirmation dialog box, click **OK**.

Troubleshooting BlackBerry Connectivity Node issues

When you troubleshoot issues with the BlackBerry Connectivity Node, consider the following common issues.

For more information about BlackBerry support resources, visit [BlackBerry Technical Support](#).

The BlackBerry Connectivity Node does not activate with BlackBerry UEM Cloud

Description

After you upload the activation file and click **Activate**, you receive an error message that the activation was not successful.

Possible solutions

Try any of the following:

- Verify that you uploaded the latest activation file that you generated in the management console. Only the latest activation file is valid.
- Activation files expire after 60 minutes. Generate and upload a new activation file, then try to activate again.
- Visit <http://support.blackberry.com/kb> to read article KB38964.

The BlackBerry Connectivity Node does not connect with the company directory

Description

After you specify the information for your company directory and click Save, you receive an error message that the BlackBerry Connectivity Node cannot connect with the company directory.

Possible solutions

Try any of the following:

- Verify that you specified the correct settings for the company directory.
- Verify that you specified the correct login information for the directory account and that the account has the necessary permissions to access the company directory.
- Verify that the correct ports are open in your organization's firewall.
- Verify that you did not use the same activation file for two different installations.
- Verify that you are using the most recent activation file.
- Review the most recent log file for details about why the BlackBerry Connectivity Node cannot access the company directory. By default, the log files for the BlackBerry Connectivity Node are located in `<drive>:\Program Files\BlackBerry\BlackBerry Connectivity Node\Logs`.
- If you are using Microsoft Active Directory, visit <http://support.blackberry.com/kb> to read article KB36955.

The BlackBerry Connectivity Node does not connect with BlackBerry UEM Cloud

Description

When you test the connection between the BlackBerry Connectivity Node and BlackBerry UEM Cloud, you receive an error message that the test was not successful.

Possible solutions

Try any of the following:

- Verify that the following outbound ports are open in your organization's firewall so that the BlackBerry Connectivity Node components (and any associated proxy servers) can communicate with the BlackBerry Infrastructure (*region.bbsecure.com*):
 - 443 (HTTPS) to activate the BlackBerry Connectivity Node
 - 3101 (TCP) for all other outbound connections
- Review the most recent log file for information about why the BlackBerry Connectivity Node cannot connect with BlackBerry UEM Cloud. By default, the log files for the BlackBerry Cloud Connector are located in `<drive>:\Program Files\BlackBerry\BlackBerry Connectivity Node\Logs`.

A list of BlackBerry Connectivity Node instances does not load in the management console

Description

When you try to view a list of BlackBerry Connectivity Node instances in the management console, a "Loading..." message displays but the list of instances does not appear.

Possible solution

Visit <http://support.blackberry.com/kb> to read article KB38878.

Configuring the BlackBerry Connectivity Node to use the BlackBerry Router or a TCP proxy server

To use a proxy server with the BlackBerry Connectivity Node, you can install the BlackBerry Router to act as a proxy server, or use a TCP proxy server that is already installed in your organization's environment.

You can install the BlackBerry Router or a proxy server outside your organization's firewall in a DMZ. Installing the BlackBerry Router or a TCP proxy server in a DMZ provides an extra level of security. Only the BlackBerry Router or the proxy server connects to the BlackBerry Connectivity Node from outside the firewall. All connections to the BlackBerry Infrastructure between the BlackBerry Connectivity Node and devices go through the BlackBerry Router or the proxy server.

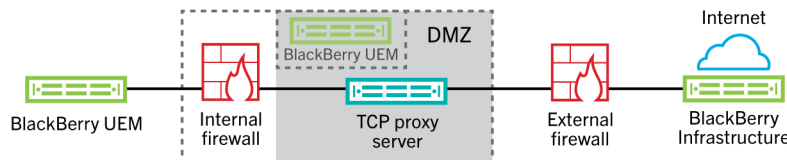
By default, the BlackBerry Connectivity Node connects directly to the BlackBerry Infrastructure using port 3101. However, if your organization's security policy requires that internal systems cannot connect directly to the Internet, you can install the BlackBerry Router or a TCP proxy server. The BlackBerry Router or TCP proxy server acts as an intermediary between the BlackBerry Connectivity Node and the BlackBerry Infrastructure.

This image shows the following options for sending data through a proxy server to the BlackBerry Infrastructure: no proxy server, a TCP proxy server deployed in a DMZ, and the BlackBerry Router deployed in a DMZ.

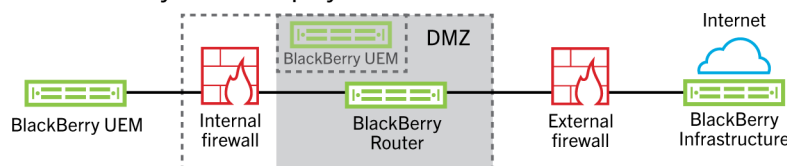
Option 1 - No proxy server




Option 2 - TCP proxy server deployed in the DMZ



Option 3 - BlackBerry Router deployed in the DMZ



 Optional

Sending data through a TCP proxy server to the BlackBerry Infrastructure

When you activate the BlackBerry Connectivity Node, it sends data over port 443 (HTTPS) to activate with BlackBerry UEM Cloud. After it is activated, the BlackBerry Connectivity Node sends and receives data over port 3101 (TCP). You can configure the BlackBerry Connectivity Node to route HTTPS or TCP data through a proxy server that is behind your organization's firewall. The BlackBerry Connectivity Node does not support authentication with a proxy server.

You can configure multiple TCP proxy servers configured with SOCKS v5 (no authentication) to connect to BlackBerry UEM. Multiple TCP proxy servers configured with SOCKS v5 (no authentication) can provide support if one of the active proxy server instances is not functioning correctly.

You configure only a single port that all SOCKS v5 service instances must listen on. If you are configuring more than one TCP proxy server with SOCKS v5, each server must share the proxy listening port.

Comparing TCP proxies

| Proxy | Description |
|-----------------------|--|
| Transparent TCP proxy | <ul style="list-style-type: none"> Intercepts normal communication at the network layer without requiring any special client configuration Requires no client browser configuration Usually located between the client and the Internet Performs some of the functions of a gateway or router Often used to enforce acceptable use policy Commonly used by ISPs in some countries to save upstream bandwidth and improve customer response times through caching |
| SOCKS v5 proxy | <ul style="list-style-type: none"> An Internet protocol for handling Internet traffic through a proxy server Can be handled with virtually any TCP/UDP application, including browsers and FTP clients that support SOCKS Can be a good solution for Internet anonymity and security Routes network packets between a client and server through a proxy server Can provide authentication so only authorized users can access a server Proxies TCP connections to an arbitrary IP address Can anonymize UDP protocols and TCP protocols like HTTP |

Configure BlackBerry UEM to use a transparent TCP proxy server

Before you begin: Install a compatible transparent TCP proxy server in the BlackBerry UEM domain.

1. In the BlackBerry Connectivity Node console (<http://localhost:8088>), click **General settings > Proxy**.
2. Select the **Proxy server** option.
3. Perform any of the following tasks:

| Task | Steps |
|--|---|
| Route HTTPS activation data for the BlackBerry Connectivity Node through a proxy server. | <p>In the Enrollment proxy fields, type the FQDN or IP address and the port number of the proxy server.</p> <p>The proxy server must be able to send data over port 443 to <code><region>.bbsecure.com</code>.</p> |

| Task | Steps |
|--|--|
| Route outbound connections from the components of the BlackBerry Connectivity Node through a proxy server. | <p>In the appropriate fields, type the FQDN or IP address and the port number of the proxy server.</p> <p>The proxy server must be able to send data over port 3101 to <i><region>.bbsecure.com</i>.</p> |

4. Click **Save**.

Enable SOCKS v5 on a TCP proxy server

Before you begin: Install a compatible TCP proxy server with SOCKS v5 (no authentication) in the BlackBerry UEM domain.

1. In the BlackBerry Connectivity Node console (<http://localhost:8088>), click **General settings > Proxy**.
2. Select the **Proxy server** option.
3. Select the **Enable SOCKS v5** check box.
4. Click **+**.
5. In the **Server address** field, type the IP address or host name of the SOCKS v5 proxy server.
6. Click **Add**.
7. Repeat steps 1 to 6 for each SOCKS v5 proxy server that you want to configure.
8. In the **Port** field, type the port number.
9. Click **Save**.

Installing a standalone BlackBerry Router

The BlackBerry Router is an optional component that you can install in a DMZ outside your organization's firewall. The BlackBerry Router connects to the Internet to send data between the BlackBerry Connectivity Node and devices that use the BlackBerry Infrastructure.

The BlackBerry Router functions as a proxy server and can support SOCKS v5 (no authentication).

Note: If your current environment contains a TCP proxy server, you do not need to install the BlackBerry Router.

Install a standalone BlackBerry Router

Before you begin:

- You must install a standalone BlackBerry Router on a computer that does not host any other BlackBerry UEM components. You cannot install the BlackBerry Router on a computer that hosts the BlackBerry Connectivity Node.
 - Verify that you have the name of the SRP host. The SRP host name is usually *<country code>.srp.blackberry.com* (for example, *us.srp.blackberry.com*). To verify the SRP host name for your country, [visit the SRP Address Lookup](#) page.
1. In the management console, on the menu bar, click **Settings > External integration > BlackBerry Cloud Connector**.
 2. Click **Add BlackBerry Connectivity Node**.
 3. In the **Step 1: Download BlackBerry Connectivity Node** section, click **Download**.

4. On the software download page, answer the required questions and click **Download**. Save and extract the installation package.
5. In the **router** folder, extract the **setupinstaller** .zip file. This .zip file contains an **Installer** folder with the **Setup.exe** file that you use to install the BlackBerry Router.
6. Double-click the **Setup.exe** file.
The installation runs in the background and displays no dialog boxes. Once the installation completes, the BlackBerry Router service appears in the Services window.

Sending data through the BlackBerry Router to the BlackBerry Infrastructure

You can configure multiple instances of the BlackBerry Router for high availability. You configure only one port for BlackBerry Router instances to listen on.

By default, the BlackBerry Connectivity Node connects to the BlackBerry Router using port 3102. The BlackBerry Router supports all outbound traffic from the BlackBerry Connectivity Node components.

Note: If you want to use a port other than the default port for the BlackBerry Router, visit support.blackberry.com/community to read article 36385.

Configure BlackBerry UEM to use the BlackBerry Router

Before you begin: [Install a standalone BlackBerry Router](#).

1. In the BlackBerry Connectivity Node console (<http://localhost:8088>), click **General settings > Proxy**.
2. Select the **BlackBerry Router** option.
3. Click **+**.
4. Type the IP address or host name of the BlackBerry Router instance that you want to connect to BlackBerry UEM.
5. Click **Add**.
6. Repeat steps 1 to 5 for each BlackBerry Router instance that you want to configure.
7. In the **Port** field, type the port number that all BlackBerry Router instances listen on. The default value is 3102.
8. Click **Save**.

Connecting BlackBerry UEM to Microsoft Azure

Microsoft Azure is the Microsoft cloud computing service for deploying and managing applications and services.

Connecting BlackBerry UEM to Azure provides your organization with the following features:

- Connect BlackBerry UEM to Azure Active Directory and create directory user accounts in BlackBerry UEM by searching for and importing user data from the company directory. Directory users can use their directory credentials to access BlackBerry UEM Self-Service. If you assign an administrative role to directory users, the users can also use their directory credentials to log into the management console.
- Use BlackBerry UEM to deploy iOS and Android apps managed by Microsoft Intune.
- Manage Windows 10 apps in BlackBerry UEM

If your organization uses Microsoft Active Directory instead of Azure Active Directory, to connect with Azure you must [install the most recent version of the BlackBerry Connectivity Node](#) to allow BlackBerry UEM Cloud to access your company directory.

BlackBerry UEM supports configuring only one Azure tenant. To connect BlackBerry UEM to Azure, you perform the following actions:

| Step | Action |
|------|--|
| 1 | Create a Microsoft Azure account . |
| 2 | If your organization uses Azure Active Directory, configure BlackBerry UEM Cloud to synchronize with Azure Active Directory . |
| 3 | If your organization uses an on-premises Microsoft Active Directory and you want to use BlackBerry UEM to deploy apps managed by Microsoft Intune or manage Windows 10 apps, Synchronize Microsoft Active Directory with Microsoft Azure . |
| 4 | Create enterprise applications in Azure to allow BlackBerry UEM Cloud to connect to Microsoft Intune and the Windows Store for Business. |
| 5 | Configure BlackBerry UEM to synchronize with Microsoft Intune and the Windows Store for Business . |

Create a Microsoft Azure account

To deploy apps protected by Microsoft Intune to iOS and Android devices or manage Windows 10 apps in BlackBerry UEM, you must have a Microsoft Azure account and authenticate BlackBerry UEM with Azure.

Complete this task if your organization doesn't have a Microsoft Azure account.

Note: To ensure you have the correct licenses and account permissions for Microsoft Intune, visit support.blackberry.com/community to read article 50341.

1. Go to <https://azure.microsoft.com> and click **Free account**, then follow the prompts to create the account.
You are required to provide credit card information to create the account.
2. Sign in to the Azure management portal at <https://portal.azure.com> and log in with the username and password you created when you signed up.

Configure BlackBerry UEM to synchronize with Azure Active Directory

If your organization uses Microsoft Azure Active Directory, you can connect it to BlackBerry UEM to create directory user accounts in BlackBerry UEM by searching for and importing user data from the company directory. Directory users can use their directory credentials to access BlackBerry UEM Self-Service.

You can connect to more than one instance of Azure Active Directory. If you install the BlackBerry Connectivity Node you can also connect to an on-premises directory.

1. Log in to the [Azure portal](#).
2. Go to **Microsoft Azure > Azure Active Directory > App registrations**.
3. Click **+ New registration**.
4. In the **Name** field, enter a name for the app.
5. Select which account types can use the application or access the API.
6. In the **Redirect URI** section, in the drop-down list, select **Web** and enter `http://localhost`.
7. Click **Register**.
8. Copy **Application ID** of your application and paste it to a text file.
This is the **Client ID** required in BlackBerry UEM.
9. In the **Manage** section, click **API permissions**.
10. Click **+ Add a permission** and perform the following actions:
 - a) Select **Microsoft Graph**.
 - b) Select **Application permissions**.
 - c) Set the following permissions:
 - Group.Read.All (Application)
 - User.Read (Delegated)
 - User.Read.All (Application)
 - d) Click **Add permissions**.
 - e) Under **Grant consent**, click **Grant admin consent**.
Note: You must be a global administrator to grant permissions.
 - f) When you are prompted, click **Yes** to grant permissions for all accounts in the current directory.
11. In the **Management** section, click **Certificates and secrets**. Perform the following actions:
 - a) Under **Client secrets**, click **New client secret**.
 - b) Type a description for the client secret.
 - c) Select a duration for the client secret.
 - d) Click **Add**.
 - e) Copy the value of the new client secret.
This is the Client key that is required for BlackBerry UEM.
12. In the management console, click **Settings > External integration > + Company directory > Microsoft Azure Active Directory connection**.
13. Enter a **Directory connection name** and the **Domain** for your Azure Active Directory.
14. Do one of the following:
 - If this is a new connection to Azure, enter the information you copied from the Azure portal when you created the enterprise application in Azure.
 - **Client ID:** The application ID generated by the Azure application registration
 - **Client key:** The client secret generated by the Azure application registration

- If this is an existing connection to Azure, click **Enable single tenant application registration** and enter the information you copied from the Azure portal when you created the enterprise application in Azure.
 - **Client ID:** The application ID generated by the Azure application registration
 - **Client key:** The client secret generated by the Azure application registration

15. Click **Continue**.

16. Click **Save**.

After you finish: [Link company directory groups to BlackBerry UEM groups](#)

Synchronize Microsoft Active Directory with Microsoft Azure

To allow Windows 10 users to install online apps or to send apps protected by Microsoft Intune to iOS and Android devices, users must exist in the Microsoft Azure Active Directory. If you are using an on-premises Active Directory, you must synchronize users and groups between your on-premises Active Directory and Azure Active Directory using Microsoft Azure Active Directory Connect. For more information, visit <https://docs.microsoft.com/en-us/azure/active-directory/connect/active-directory-aadconnect>.

Before you begin: [Create a Microsoft Azure account](#)

1. Download Azure AD Connect from <http://www.microsoft.com/en-us/download/details.aspx?id=47594>.
2. Install the Azure AD Connect software.
3. Configure Azure AD Connect to connect your on-premises Active Directory with the Azure Active Directory.

After you finish: [Create an enterprise endpoint in Azure](#)

Create an enterprise endpoint in Azure

To provide BlackBerry UEM access to Microsoft Azure, you must create an enterprise endpoint within Azure. The enterprise endpoint allows BlackBerry UEM to authenticate with Microsoft Azure. For more information, see <https://docs.microsoft.com/en-us/azure/active-directory/active-directory-app-registration>.

If you are connecting BlackBerry UEM to both Microsoft Intune and the Windows Store for Business, use a different enterprise application for each purpose due to differences in permissions and potential future changes.

Before you begin:

- If your organization uses an on-premises Microsoft Active Directory, [Synchronize Microsoft Active Directory with Microsoft Azure](#)
- If you use modern authentication, make sure that you have the Reply URL. For instructions on obtaining the Reply URL for modern authentication, see [Configure BlackBerry UEM to synchronize with Microsoft Intune](#).

1. Log in to the [Azure portal](#).
2. Go to **Microsoft Azure > Azure Active Directory > App registrations**.
3. Click **Endpoints**.
4. Copy the **OAuth 2.0 token endpoint (v1)** value and paste it to a text file.
This is the **OAuth 2.0 token endpoint** required in BlackBerry UEM.
5. Close the **Endpoints** list and click **New registration**.
6. In the **Name** field, enter a name for the app.
7. Select which account types can use the application or access the API.
8. In the **Redirect URI** section, in the drop-down list, select **Web** and enter a valid URL. The URL format is `https://<FQDN_of_the_BlackBerry_UEM_server>:<port>/admin/intuneauth`

- If you use client credentials authentication or don't have a registered domain, you can use: `http://localhost/`
- If you use modern authentication, enter the Reply URL from the BlackBerry UEM. For instructions, see [Configure BlackBerry UEM to synchronize with Microsoft Intune](#).

9. Click **Register**.

10. Copy the **Application ID** of your application and paste it to a text file.

This is the **Client ID** required in BlackBerry UEM.

11. If you are creating the application to use Microsoft Intune, click **API permissions** in the **Manage** section. Perform the following steps:

- Click **Add a permission**.
- Select **Microsoft Graph**.
- Select **Delegated permissions**.
- Scroll down in the permissions list and under **Delegated Permissions**, set the following permissions for Microsoft Intune:
 - Read and write Microsoft Intune apps (**DeviceManagementApps > DeviceManagementApps.ReadWrite.All**)
 - Read all groups (**Group > Group.Read.All**)
 - Read all users' basic profile (**User > User.ReadBasic.All**)
- Click **Add permissions**.
- Under **Grant consent**, click **Grant admin consent**.

Note: You must be a global administrator to grant permissions.

g) When you are prompted, click **Yes** to grant permissions for all accounts in the current directory.

You can use the default permissions if you are creating the app to connect to the Windows Store for Business.

12. Click **Certificates and secrets** in the **Manage** section. Perform the following actions:

- Under **Client secrets**, click **New client secret**.
- Type a description for the client secret.
- Select a duration for the client secret.
- Click **Add**.
- Copy the value of the new client secret.

This is the **Client Key** that is required in BlackBerry UEM.



Warning: If you do not copy the value of your key at this time, you will have to create a new key because the value is not displayed after you leave this screen.

After you finish: [Configure BlackBerry UEM to synchronize with Microsoft Intune](#) or [Configure BlackBerry UEM to synchronize with the Windows Store for Business](#).

Linking company directory groups to BlackBerry UEM groups

You can create groups in BlackBerry UEM that are linked to groups in your company directory. By enabling directory-linked groups, you can take advantage of the following features:

- Ability to add groups in BlackBerry UEM that are linked to company directory groups for the purpose of assigning and managing the IT policies, profiles, and apps for users. These groups are called directory-linked groups.

For information about creating directory-linked groups, [see the Administration content](#).

- Ability to add groups in BlackBerry UEM that are linked to company directory groups for the purpose of automatically synchronizing group membership. These groups are called onboarding directory groups. See [Enabling onboarding](#).

Enable directory-linked groups

Before you begin: Verify that a company directory synchronization is not in progress. You cannot save the changes you make to the company directory connection until the synchronization is complete.

1. On the menu bar, click **Settings > External integration > Company directory**.
2. Click the company directory name that you want to edit.
3. On the **Sync settings** tab, select the **Enable directory-linked groups** check box.
4. To force the synchronization of company directory groups, select the **Force synchronization** check box.
If selected, when a group is removed from your company directory, the links to that group are removed from directory-linked groups and onboarding directory groups. If all of the company directory groups associated with a directory-linked group are removed, the directory-linked group is converted to a local group. If they are not selected, and a company directory group is not found, the synchronization process is canceled.
5. In the **Sync limit** field, type the maximum number of changes you want to allow for each synchronization process.
The default setting is five. If the number of changes to be synchronized exceeds the synchronization limit, you can prevent the synchronization process from running. Changes are calculated by adding the following: users to add to groups, users to remove from groups, users to be onboarded, users to be offboarded.
6. In the **Maximum nesting level of directory groups** field, type the number of nested levels to synchronize for company directory groups.
7. Click **Save**.

After you finish: Create directory-linked groups. For more information, [see the Administration content](#).

Enabling onboarding

Onboarding allows you to automatically add user accounts to BlackBerry UEM based on user membership in a universal or global company directory group. User accounts are added to BlackBerry UEM during the synchronization process.

You can also choose to automatically send onboarded users an email message and activation passwords or access keys for BlackBerry Dynamics apps.

Offboarding

If you enable onboarding, you can also choose to configure offboarding. When a user is removed from all company directory groups in the onboarding directory groups, BlackBerry UEM can automatically offboard the user in any of the following ways:

- Delete work data or all data from the users' devices
- Delete the user account from BlackBerry UEM

You can use offboarding protection to delay the deletion of device data or user accounts by one synchronization cycle to avoid unexpected deletions because of directory replication latency. Regardless of the synchronization interval, the offboarding protection delay requires a minimum of two hours.

Note: The offboarding settings also apply to existing directory users in BlackBerry UEM. It is recommended that you click the preview icon to generate the directory synchronization report and verify the changes.

Synchronization



After you enable offboarding, during the next synchronization, the offboarding rules are applied to any users that you manually added in the management console before offboarding was turned on and that are not members of any onboarding directory-linked groups.



After you enable onboarding, you can manually add users to BlackBerry UEM even if they are already in a directory-linked group. If offboarding is enabled, users that you manually add to BlackBerry UEM will have offboarding rules applied to their devices when the next synchronization occurs if they are not members of an onboarding synchronization group at the time of the synchronization.

Enable and configure onboarding and offboarding

You can automatically onboard users that are members of universal and global groups. Onboarding is not supported for domain local groups.

Before you begin:

- Verify that a company directory synchronization is not in progress. You cannot save the changes you make to the company directory connection until the synchronization is complete.
 - To onboard members of global groups, you must enable support for global groups in your [Microsoft Active Directory](#) connection settings.
1. On the menu bar, click **Settings > External integration > Company directory**.
 2. Click the company directory name that you want to edit.
 3. On the **Sync settings** tab, select the **Enable directory-linked groups** check box.
 4. Select the **Enable onboarding** check box.
 5. Perform the following actions for each group that you want to configure for onboarding with a device activation option:
 - a) Click .
 - b) Type a company directory group name. Click .
 - c) Select the group. Click **Add**.
 - d) Optionally, select **Link nested groups**.
 - e) In the **Device activation** section, select whether you want onboarded users to receive an autogenerated activation password or no activation password. If you select the autogenerated password option, configure the activation period and select an activation email template.
 6. To onboard users with BlackBerry Dynamics, select the **Onboard users with BlackBerry Dynamics apps only** check box.

7. Perform the following actions for each group that you want to onboard with activation for BlackBerry Dynamics apps only:
 - a) Click .
 - b) Type a company directory group name. Click .
 - c) Select the group. Click **Add**.
 - d) Optionally, select **Link nested groups**.
 - e) Select the number of access keys to generate per user added, the access key expiration, and the email template.
8. To delete device data when a user is offboarded, select the **Delete device data when the user is removed from all onboarding directory groups** check box. Select one of the following options:
 - Delete only work data
 - Delete all device data
 - Delete all device data for corporate owned/delete only work data for individually owed
9. To delete a user account from BlackBerry UEM when a user is removed from all onboarding groups, select **Delete user when the user is removed from all onboarding directory groups**. The first time that a synchronization cycle occurs after a user account is removed from all onboarding directory groups, the user account is deleted from BlackBerry UEM.
10. To prevent user accounts or device data from being deleted from BlackBerry UEM unexpectedly, select **Offboarding protection**.
Offboarding protection means that users will not be deleted from BlackBerry UEM until two hours after the next synchronization cycle.
11. To force the synchronization of company directory groups, select the **Force synchronization** checkbox.
If selected, when a group is removed from your company directory, the links to that group are removed from onboarding directory groups and directory-linked groups. If not selected, if a company directory group is not found, the synchronization process is canceled.
12. In the **Sync limit** field, type the maximum number of changes you want to allow for each synchronization process. The default setting is five.
If the number of changes to be synchronized exceeds the synchronization limit, you can prevent the synchronization process from running. Changes are calculated by adding the following: users to add to groups, users to remove from groups, users to be onboarded, users to be offboarded.
13. In the **Maximum nesting level of directory groups** field, type the number of nested levels to synchronize for company directory groups.
14. Click **Save**.

Synchronize a company directory connection


Before you begin: [Preview a synchronization report](#)

1. On the menu bar, click **Settings > External integration > Company directory**.
2. In the **Sync** column, click .

After you finish: [View a synchronization report](#)

Preview a synchronization report

Previewing a synchronization report allows you to verify that the planned updates are what you expect before the synchronization occurs.

1. On the menu bar, click **Settings > External integration > Company directory**.
2. In the **Preview** column, click .
3. Click **Preview now**.
4. When the report finishes processing, click on the date in the **Last report** column.
5. To view synchronization reports that were generated previously, click on the drop-down menu.

View a synchronization report


1. On the menu bar, click **Settings > External integration > Company directory**.
2. In the **Last report** column, click the date.
3. To view synchronization reports that were generated previously, click on the drop-down menu.

Add a synchronization schedule

You can add a synchronization schedule to automatically synchronize BlackBerry UEM with your organization's company directory. There are three types of synchronization schedules:

- **Interval:** You specify the length of time between each synchronization, the time frame, and the days on which it will occur.
- **Once a day:** You specify the time of day that the synchronization starts and the days on which it will occur.
- **No recurrence:** You specify the time and day for a one time synchronization.

On the Company directory screen, you can manually synchronize BlackBerry UEM with company directory at any time.

1. On the menu bar, click **Settings > External integration > Company directory**.
2. Click the company directory name you want to edit.
3. On the **Sync schedule** tab, click .
4. To reduce the amount of information that gets synchronized, in the **Synchronization type** drop-down list, choose one of the following options:
 - **All groups and users:** This is the default setting. If you choose this option users will be onboarded and offboarded and linked to the appropriate directory linked groups during the synchronization, users that are not onboarded or offboarded but change directory linked groups, and users with changes to their attributes will be synchronized.
 - **On-boarding groups:** If you choose this option users will be onboarded and offboarded and linked to the appropriate directory linked groups during the synchronization, and users with changes to their attributes will be synchronized. Users that are not onboarded or offboarded but change directory linked groups are not synchronized.
 - **Directory linked groups:** If you choose this option users will not be onboarded and offboarded during the synchronization. Users with changes to their directory linked groups will be linked appropriately. Users with changes to their attributes will be synchronized.
 - **User attributes:** If you choose this option users will not be onboarded and offboarded during the synchronization. Users with changes to their directory linked groups are not synchronized. Users with changes to their attributes will be synchronized.
5. In the **Recurrence** drop-down list, select one of the following options:

| Option | Steps |
|----------------------|---|
| Interval | <ul style="list-style-type: none"> a. In the Interval field, type the time, in minutes, between synchronizations. b. Specify the synchronization time frame. c. Select the days of the week when you want synchronizations to occur. |
| Once a day | <ul style="list-style-type: none"> a. Specify when you want the synchronization to start. b. Select the days of the week when you want the synchronizations to occur. |
| No recurrence | <ul style="list-style-type: none"> a. Specify when you want the synchronization to start. b. Select the day when you want the synchronization to occur. |

6. Click **Add**.

Obtaining an APNs certificate to manage iOS and macOS devices

APNs is the Apple Push Notification Service. You must obtain and register an APNs certificate if you want to use BlackBerry UEM to manage iOS or macOS devices.

You can obtain and register the APNs certificate using the first login wizard or by using the external integration section of the administration console.

Note: Each APNs certificate is valid for one year. The management console displays the expiry date. You must renew the APNs certificate before the expiry date, using the same Apple ID that you used to obtain the certificate. You can note the Apple ID in the management console. You can also [create an email event notification](#) to remind you to renew the certificate 30 days before it expires. If the certificate expires, devices do not receive data from BlackBerry UEM. If you register a new APNs certificate, device users must reactivate their devices to receive data.

For more information, visit <https://developer.apple.com> to read *Issues with Sending Push Notifications* in article TN2265.

It is a best practice to access the administration console and the Apple Push Certificates Portal using the Google Chrome browser or the Safari browser. These browsers provide optimal support for requesting and registering an APNs certificate.

To obtain and register an APNs certificate, perform the following actions:

| Step | Action |
|------|---|
| 1 | Obtain a signed CSR from BlackBerry. |
| 2 | Use the signed CSR to request an APNs certificate from Apple. |
| 3 | Register the APNs certificate. |

Obtain a signed CSR from BlackBerry

You must obtain a signed CSR from BlackBerry before you can obtain an APNs certificate.

1. On the menu bar, click **Settings > External integration > Apple Push Notification**.
2. If you do not yet have an APNs certificate, in the **Step 1 of 3 - Download signed CSR certificate from BlackBerry** section, click **Download certificate**.


If you want to [renew the current APNs certificate](#), click **Renew certificate** instead.

3. Click **Save** to save the signed CSR file (.scsr) to your computer.

After you finish: [Request an APNs certificate from Apple](#).

Request an APNs certificate from Apple

Before you begin: [Obtain a signed CSR from BlackBerry.](#)

1. On the menu bar, click **Settings > External integration > Apple Push Notification**.
2. In the **Step 2 of 3 - Request APNs certificate from Apple** section, click **Apple Push Certificate Portal**. You are directed to the Apple Push Certificates Portal.
3. Sign in to the Apple Push Certificates Portal using a valid Apple ID.
4. Follow the instructions to upload the signed CSR (.scsr).
5. Download and save the APNs certificate (.pem) on your computer.
6. (Optional) Click  to display a **Note** window.
7. In the **Note** window, type the Apple ID that you used to request the APNs certificate.
You must use the same Apple ID to renew the certificate.
8. Click anywhere outside of the **Note** window to close it.

After you finish: [Register the APNs certificate.](#)

Register the APNs certificate

Before you begin: [Request an APNs certificate from Apple.](#)

1. On the menu bar, click **Settings > External integration > Apple Push Notification**.
2. In the **Step 3 of 3 - Register APNs certificate** section, click **Browse**. Navigate to and select the APNs certificate (.pem).
3. Click **Submit**.

After you finish: To test the connection between BlackBerry UEM and the APNs server, click **Test APNs certificate**.

Renew the APNs certificate

The APNs certificate is valid for one year. You must renew the APNs certificate each year before it expires. The certificate must be renewed using the same Apple ID that you used to obtain the original APNs certificate.

You can [create an email event notification](#) to remind you to renew the certificate 30 days before it expires.

Before you begin: [Obtain a signed CSR from BlackBerry.](#)

1. On the menu bar, click **Settings > External integration > Apple Push Notification**.
2. Click **Renew certificate**.
3. In the **Step 1 of 3 - Download signed CSR certificate from BlackBerry** section, click **Download certificate**.
4. Click **Save** to save the signed CSR file (.scsr) to your computer.
5. In the **Step 2 of 3 - Request APNs certificate from Apple** section, click **Apple Push Certificate Portal**. You are directed to the Apple Push Certificates Portal.
6. Sign in to the Apple Push Certificates Portal using the same Apple ID that you used to obtain the original APNs certificate.
7. Follow the instructions to renew the APNs certificate (.pem). You will need to upload the new signed CSR.
8. Download and save the renewed APNs certificate on your computer.

9. In the **Step 3 of 3 - Register APNs certificate** section, click **Browse**. Navigate to and select the renewed APNs certificate.
10. Click **Submit**.

After you finish: To test the connection between BlackBerry UEM and the APNs server, click **Test APNs certificate**.

Troubleshooting APNs

This section helps you troubleshoot APNs issues.

The APNs certificate does not match the CSR. Provide the correct APNs file (.pem) or submit a new CSR.

Description

You may receive an error message when you try to register the APNs certificate if you did not upload the most recently signed CSR file from BlackBerry to the Apple Push Certificates Portal.

Possible solution

If you downloaded multiple CSR files from BlackBerry, only the last one that you downloaded is valid. If you know which CSR is the most recent, return to the Apple Push Certificates Portal and upload it. If you are not sure which CSR is the most recent, obtain a new one from BlackBerry, then return to the Apple Push Certificates Portal and upload it.

I get "The system encountered an error" when I try to obtain a signed CSR

Description

When you try to obtain a signed CSR, you get the following error: "The system encountered an error. Try again."

Possible solution

Visit <https://support.blackberry.com/community/s/article/37266> to read article 37266.

I cannot activate iOS or macOS devices

Possible cause

If you are unable to activate iOS or macOS devices, the APNs certificate may not be registered correctly.

Possible solution

Perform one or more of the following actions:

- In the administration console, on the menu bar, click **Settings > External integration > Apple Push Notification**. Verify that the APNs certificate status is "Installed." If the status is not correct, try to register the APNs certificate again.
- Click **Test APNs certificate** to test the connection between BlackBerry UEM and the APNs server.

- If necessary, obtain a new signed CSR from BlackBerry and a new APNs certificate.

Configuring BlackBerry UEM for DEP

You must configure BlackBerry UEM to use Apple's Device Enrollment Program before you can synchronize BlackBerry UEM with DEP. After you configure BlackBerry UEM, you can use the BlackBerry UEM management console to manage the activation of the iOS devices that your organization purchased for DEP.

You can use an Apple Business Manager account to synchronize BlackBerry UEM with DEP. Apple Business Manager is a web-based portal in which you can enroll and manage iOS devices in DEP, and manage Apple VPP accounts. If your organization uses DEP or VPP, you can upgrade to Apple Business Manager.

When you configure BlackBerry UEM for Apple's Device Enrollment Program, you perform the following actions:

| Step | Action |
|------|--|
| 1 | Create a DEP account. |
| 2 | Download a public key. |
| 3 | Generate a server token. |
| 4 | Register the server token with BlackBerry UEM. |
| 5 | Add the first enrollment configuration. |

Create a DEP account

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. In step 1 of 4: **Create an Apple DEP account**, click **Create an Apple DEP account**.
3. Complete the fields and follow the prompts to create your account.

After you finish: [Download a public key](#).

Download a public key

Before you begin: [Create a DEP account](#).

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. Click **+**.
3. In step 2 of 4: **Download a public key**, click **Download public key**.
4. Click **Save**.

After you finish: [Generate a server token](#).

Generate a server token

Before you begin: [Download a public key.](#)

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. Click **+**.
3. In step **3 of 4: Generate server token from Apple DEP account**, click **Open the Apple DEP portal**.
4. Sign in to your DEP account.
5. Follow the prompts to generate a server token.

After you finish: [Register the server token with BlackBerry UEM.](#)

Register the server token with BlackBerry UEM

BlackBerry UEM uses a server token for authentication when it communicates with Apple's Device Enrollment Program.

Before you begin: [Generate a server token.](#)

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. Click **+**.
3. In step **4 of 4: Register the server token with BlackBerry UEM**, click **Browse**.
4. Select the **.p7m** server token file.
5. Click **Open**.
6. Click **Next**.

After you finish: [Add the first enrollment configuration.](#)

Add the first enrollment configuration

Before you begin: [Register the server token with BlackBerry UEM](#) before you add your first enrollment configuration.

After you register a server token, BlackBerry UEM automatically displays the window where you add your first enrollment configuration.

1. Type a name for the configuration.
2. Complete one of the following tasks:
 - If you want BlackBerry UEM to automatically assign the enrollment configuration to devices when you register them in Apple's Device Enrollment Program, select the "Automatically assign all new devices to this configuration" checkbox.
 - If you want to use the BlackBerry UEM console to manually assign the enrollment configuration to specific devices, leave the "Automatically assign all new devices to this configuration" checkbox unchecked.
3. Optionally, type a department name and support phone number to be displayed on devices during setup.
4. In the **Device configuration** section, select from the following checkboxes:
 - Allow pairing - if selected, users can pair the device with a computer
 - Enable supervised mode - if selected, devices are activated in supervised mode. You must select at least one of "Enable supervised mode" or "Allow removal of MDM profile."

- Mandatory - if selected, users can activate devices using their company directory username and password
 - Allow removal of MDM profile - if selected, users can deactivate devices. You must select at least one of "Enable supervised mode" or "Allow removal of MDM profile."
 - Wait until device is configured - if selected, users cannot cancel the device setup until activation with BlackBerry UEM is completed. This setting is valid only if you select "Enable supervised mode."
5. In the **Skip during setup** section, select the items that you do not want to include in the device setup:
- Passcode - if selected, users are not prompted to create a device passcode
 - Location services - if selected, location services are disabled on the device
 - Restore - if selected, users cannot restore data from a backup file
 - Move from Android - if selected, you cannot restore data from an Android device
 - Apple ID - if selected users are prevented from signing in to Apple ID and iCloud
 - Terms and conditions - if selected, users do not see the iOS terms and conditions
 - Siri - if selected, Siri is disabled on devices
 - Diagnostics - if selected, diagnostic information is not automatically sent from the device during setup
 - Biometric - if selected, users cannot setup Touch ID
 - Payment - if selected, users cannot set up Apple pay
 - Zoom - if selected, users cannot set up Zoom
 - Home button setup - if selected, users cannot adjust the Home button's click
 - Screen Time – if selected, the option to setup Screen Time is skipped during DEP enrollment
 - Software update – if selected, users do not see the mandatory software update screen on the device
 - iMessage and Face Time – if selected, users do not see the iMessage and Face Time screen on the device
6. Click **Save**.
- If the message "An error was encountered. The server token file could not be decrypted." appears, visit support.blackberry.com/community to read article 37282.
7. If you selected "Automatically assign new devices to this configuration," click **Yes**.
- After you finish:** Activate iOS devices. For more information about activating devices that are enrolled in DEP, [see the Administration content](#).

Update the server token

The server token is valid for one year. You must renew the token each year before it expires. To see the status of the token, see the Expiry date in the Apple Device Enrollment Program window.

Before you begin: If the public key has changed, [Download a new public key](#).

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. Click the name of a DEP account.
3. In the **Expiry date** section, click **Update server token**.
4. In **Step 1 of 2: Generate a Server Token from Apple DEP account**, click **Open the Apple DEP portal**.
5. Sign in to your account for DEP.
6. Follow the prompts to generate a server token.
7. In **step 2 of 2: Register the Server Token with BlackBerry UEM**, click **Browse**.
8. Select the **.p7m** server token file.
9. Click **Open**.
10. Click **Save**.

Remove a DEP connection



CAUTION: If you remove all DEP connections, you cannot activate new iOS devices in Apple's Device Enrollment Program. If you assigned enrollment configurations to devices and the configurations have not been applied, BlackBerry UEM removes the enrollment configurations assigned to the devices. Removing the connection does not affect devices that are active on BlackBerry UEM.

If your organization no longer deploys iOS devices that use DEP, you can remove the BlackBerry UEM connections to DEP.

1. On the menu bar, click **Settings > External integration > Apple Device Enrollment Program**.
2. Click **Remove DEP connection**.
3. Click **Remove**.
4. Click **OK**.

Configuring BlackBerry UEM to support Android Enterprise devices

Android Enterprise devices provide additional security for organizations that want to manage Android devices. For more information about Android Enterprise devices, visit <https://support.google.com/work/android/>.

For detailed instructions on configuring BlackBerry UEM to support Android Enterprise devices, visit support.blackberry.com/community to read article 37748.

There are two ways to configure BlackBerry UEM to support Android Enterprise devices:

1. Connect BlackBerry UEM to a Google Cloud or G Suite domain.

Note: You can connect only one BlackBerry UEM domain to a Google domain.

2. Allow BlackBerry UEM to manage Android Enterprise devices that have managed Google Play accounts. You don't need to have a Google domain to use this option. For more information, see <https://support.google.com/googleplay/work/>.

The following table summarizes the different options for configuring Android Enterprise devices:

| Method to configure BlackBerry UEM to support Android Enterprise devices | When to choose this method | User account type | Supported Google services |
|--|---|--|---|
| Connect BlackBerry UEM to your G Suite domain | You have a G Suite domain in your organization | G Suite accounts (for organizations) | Supports all G Suite services such as Gmail, Google Calendar, and Drive. Supports app management through Google Play. |
| Connect BlackBerry UEM to your Google Cloud domain | You have a Google Cloud domain in your organization | Google Cloud accounts, also known as Managed Google accounts (for organizations) | Similar to G Suite but without access to paid products such as Gmail, Google Calendar, and Drive. Supports app management through Google Play. |

| Method to configure BlackBerry UEM to support Android Enterprise devices | When to choose this method | User account type | Supported Google services |
|---|--|---|---|
| Allow BlackBerry UEM to manage Android Enterprise devices as managed Google Play accounts | <p>You don't have a Google domain in your organization</p> <p>or</p> <p>You have a Google domain that is already connected to one BlackBerry UEM domain and you want to use Android Enterprise devices on a second BlackBerry UEM domain</p> | Android Enterprise devices that have managed Google Play accounts | <p>Supports app management through Google Play.</p> <p>Google Services are not supported.</p> |

Configure BlackBerry UEM to support Android Enterprise devices

You can connect only one BlackBerry UEM domain to your Google domain. Before you connect another BlackBerry UEM domain, you must remove the existing connection. See [Remove the connection to your Google domain](#).

1. On the menu bar, click **Settings > External integration > Android enterprise**.
2. Perform one of the following tasks:

| Task | Steps |
|---|---|
| Use Android Enterprise devices that have managed Google Play accounts | <ol style="list-style-type: none"> a. Select Allow BlackBerry UEM to manage Google Play Accounts. b. Click Next. c. In the Bring Android to Work window, sign in using a Google account. You can use any Google or Gmail account. The account that you use will become the administrator account for the Bring Android to Work service. d. Click Get Started. e. Type the name of your organization. Click Confirm. f. Click Complete registration. You will be returned to the BlackBerry UEM management console. |
| Use a Google domain | <ol style="list-style-type: none"> a. Select Connect BlackBerry UEM to your existing Google domain. b. Click Next. c. Complete the fields to create a service account and click Next. For step-by-step instructions, visit support.blackberry.com/community to read article 37748. |

3. Specify how you want app configurations to be sent to a device. Any information that you added in the app configuration can be either provided using the BlackBerry Infrastructure or provided using the Google infrastructure. Do one of the following:

- Select **Send app configuration using UEM Client** to send app configuration details using the BlackBerry Infrastructure.
 - Select **Send app configuration using Google Play** to send app configurations details using the Google infrastructure.
4. When you are prompted, click **Accept** to accept the permissions set for some or all of the following apps:
 - Google Chrome
 - BlackBerry Connectivity
 - BlackBerry Hub+ Services
 - BlackBerry Hub
 - BlackBerry Calendar
 - Contacts by BlackBerry
 - Notes by BlackBerry
 - Tasks by BlackBerry
 5. Click **Done**.

After you finish: Complete the steps to activate Android Enterprise devices. For more information about device activation, see ["Device activation" in the Administration content](#).

Remove the connection to your Google domain

You can connect only one BlackBerry UEM domain to your Google Cloud or G Suite domain. Before you connect another BlackBerry UEM domain, you must remove the existing connection.

Remove the connection to your Google domain before you complete any of the following tasks:

- Decommission a BlackBerry UEM domain
- Connect another BlackBerry UEM instance to your Google Cloud or G Suite domain

If you do not remove the connection to your Google domain, you may be unable to connect your Google Cloud or G Suite domain to a new BlackBerry UEM instance. If you remove the connection in BlackBerry UEM, all devices that are activated with an Android Enterprise activation type will be deactivated.

1. On the menu bar, click **Settings > External integration**.
2. Click **Google domain connection**.
3. Click **Remove connection**.
4. Click **Remove**.

Remove the Google domain connection using your Google account


If you configured BlackBerry UEM to support Android Enterprise devices, you can remove the connection in Google.

1. Using the Google account that you used to set up Android Enterprise devices, log in to <https://play.google.com/work>.
2. Click **Admin Settings**.
3. In the **Organization information** section, click ⋮.
4. Click **Delete Organization**.
5. Click **Delete**.
6. In the BlackBerry UEM console, on the menu bar, click **Settings > External integration**.

7. Click **Google domain connection**.
8. Click **Test connection**.
9. Click **Remove connection**.
10. Click **Remove**.

Edit or test the Google domain connection

You can edit the Google domain connection in BlackBerry UEM to change the type of Google domain that you use to manage Android Enterprise devices, or to test the Google domain connection. When you edit or test the connection, devices that are already activated are not affected.

1. On the menu bar, click **Settings > External integration**.
2. Click **Google domain connection**.
3. Click .
4. Complete one of the following tasks:
 - Click **Test connection** to see the current status of the connection.
 - Select the type of domain to manage Android Enterprise devices and click **Save**.

Simplifying Windows 10 activations

You can simplify the activation of Windows 10 devices with UEM using the following methods:

- **Deploy a discovery service:** If you use the discovery service, users don't need to type a server address during the activation process. If you choose not to use a discovery service, users can still activate Windows 10 devices but they will be required to type the server address when prompted. A UEM certificate can be installed manually or administrators can deploy the certificate using SCCM. For information about how to deploy the discovery service, see the [BlackBerry UEM configuration content](#).
- **Integrate BlackBerry UEM with Azure Active Directory join:** When Azure Active Directory join is configured, users can activate their devices using only their Azure Active Directory username and password. A UEM certificate can be installed manually or administrators can deploy the certificate using SCCM. An Azure Active Directory premium license is required.
- **Configure Windows Autopilot:** When you configure Windows Autopilot, the enrollment is part of the out-of-box setup experience and the device is automatically activated when the user completes it using only their Azure Active Directory username and password. A UEM certificate must be installed manually before the user completes the out-of-box setup. Integration with Azure Active Directory join and an Azure Active Directory premium license are required.

Integrating UEM with Azure Active Directory join

You can integrate BlackBerry UEM with Azure Active Directory join for a simplified enrollment process for Windows 10 devices. When it's configured, users can enroll their devices with UEM using their Azure Active Directory username and password. Azure Active Directory join is also required to support Windows Autopilot, which allows Windows 10 devices to be automatically activated with UEM during the Windows 10 out-of-the-box setup experience.

To integrate Azure Active Directory join with UEM, you do the following:

| Step | Description |
|------|---|
| 1 | <p>Use the value of the %ClientlessActivationURL% default variable in UEM to determine the following URLs so that you can integrate UEM with Azure Active Directory join. For example, in the user details screen of a user that uses the default activation email template, you can click View activation email to find the value of %ClientlessActivationURL% in the Windows 10 server name field.</p> <ol style="list-style-type: none"> Determine the MDM terms of use URL. The URL uses the following structure: <code>%ClientlessActivationURL%/azure/termsfuse</code> For example, if the %ClientlessActivationURL% variable resolves to <code>https://enrol.example.net/S123456789/win/mdm</code>, then use <code>https://enrol.example.net/S123456789/win/mdm/azure/termsfuse</code>. Determine the MDM discovery URL. The URL uses the following structure: <code>%ClientlessActivationURL%/azure/discovery</code> For example, if the %ClientlessActivationURL% variable resolves to <code>https://enrol.example.net/S123456789/win/mdm</code>, then use <code>https://enrol.example.net/S123456789/win/mdm/azure/discovery</code>. Determine the App ID URI using only the host name of the %ClientlessActivationURL% default variable. For example, if the %ClientlessActivationURL% variable resolves to <code>https://enrol.example.net/S123456789/win/mdm</code>, then use <code>https://enrol.example.net</code>. |
| 2 | Integrate UEM with Azure Active Directory join. |

Integrate UEM with Azure Active Directory join

Before you begin: Determine the MDM terms of use URL, MDM discovery URL, and App ID URI. For more information, see [Integrating UEM with Azure Active Directory join](#).

1. Sign in to the Microsoft Azure management portal at <https://portal.azure.com>.
2. Navigate to **Mobility (MDM and MAM)**.
3. Click **Add application**.
4. Click **On-premise MDM application**. Enter a friendly name (for example, BlackBerry UEM).
5. Click **Add**.
6. Click on the application that you added in the previous step to configure its settings.
7. Specify the user scope, **Some** or **All**. If applicable, select the groups.
8. In the **MDM terms of use URL** field, specify the URL.
9. In the **MDM discovery URL** field, specify the URL.
10. Click **Save**.
11. Click **On-premises MDM application settings > Properties**.
12. In the **App ID URI** field, specify the URL.
13. Click **Save**.

Configuring Windows Autopilot in Microsoft Azure

To support Windows Autopilot device activation, you do the following:

| Step | Description |
|------|---|
| 1 | Integrate UEM with Azure Active Directory join. |
| 2 | Create a Windows Autopilot deployment profile in Azure and assign it to user groups in Azure. |
| 3 | Import Windows Autopilot devices to Azure. |

Create a Windows Autopilot deployment profile in Azure

You must assign a Windows Autopilot deployment profile to the appropriate user groups in Azure to allow users to activate their device using Windows Autopilot.

1. Sign in to the Microsoft Azure management portal at <https://portal.azure.com>.
2. Navigate to **Device enrollment > Windows enrollment > Windows Autopilot deployment profiles**.
3. Create a Windows Autopilot deployment profile.
4. Enter a name and description for the profile.
5. Configure the out-of-box experience settings.
6. Assign the profile to the appropriate user groups.
7. Click **Save**.

Import Windows Autopilot devices to Azure

Complete these steps to import each Windows 10 device that you want to allow to be activated with Windows Autopilot.

1. Turn on the Windows 10 device to load the device out-of-the-box setup.
2. Connect to a Wi-Fi network with an internet connection.
3. On the keyboard, press **CTRL + SHIFT + F3** or **CTRL+Fn+SHIFT+F3**. The device restarts and enters audit mode.
4. Run **Windows PowerShell** as an administrator.
5. Run `Save-Script -Name Get-WindowsAutoPilotInfo -Path C:\Windows\Temp` to inspect the Windows PowerShell script.
6. Run `Install-Script -Name Get-WindowsAutoPilotInfo` to install the script.
7. Run `Get-WindowsAutoPilotInfo.ps1 -OutputFile C:\Windows\Temp\MyComputer.csv` to save the device information to a .csv file.
8. To import the .csv file into Microsoft Azure, perform the following actions:
 - a) In the Azure portal, navigate to **Device enrollment > Windows enrollment > Windows Autopilot devices**.
 - b) Click **Import**.
 - c) Select the .csv file.
9. In the **System Preparation Tool** dialog, do the following:

- a) In the **System Cleanup Action** field, select **Enter System Out-of-Box Experience (OOBE)** and deselect **Generalize**.
- b) In the **Shutdown Options** field, select **Reboot**.

Configuring BlackBerry UEM Cloud to support BlackBerry Dynamics apps

Follow the instructions in this section to configure BlackBerry UEM Cloud to support BlackBerry Dynamics apps.

Manage BlackBerry Proxy clusters

When you install the first instance of BlackBerry Connectivity Node, BlackBerry UEM creates a BlackBerry Proxy cluster named "First". If only one cluster exists, additional instances of BlackBerry Proxy are added to the cluster by default. You can create additional clusters and move BlackBerry Proxy instances between any of the available clusters. When more than one BlackBerry Proxy cluster is available, new instances are not added to a cluster by default; the new BlackBerry Connectivity Node instances are considered to be unassigned and must be added to one of the available clusters manually.

1. In the management console, on the menu bar, click **Settings > BlackBerry Dynamics**.
2. Click **Clusters**.
3. Perform any of the following tasks:

| Task | Steps |
|---|--|
| Create a new BlackBerry Proxy cluster. | <ol style="list-style-type: none">a. Click +.b. Type a name for the cluster.c. Click Save. |
| Rename a BlackBerry Proxy cluster. | <ol style="list-style-type: none">a. Click a cluster name.b. Change the cluster name. Each cluster must have a unique name.c. Click Save. |
| Move a BlackBerry Proxy instance to a different BlackBerry Proxy cluster. | <ol style="list-style-type: none">a. In the Servers column, click the name of a BlackBerry Proxy instance.b. In the BlackBerry Proxy cluster drop-down list, select the cluster that you want to add the instance to.c. Click Save. |
| Delete an empty BlackBerry Proxy cluster. | <ol style="list-style-type: none">a. Click × for that cluster.b. Click Remove. |
| Set app proxy settings for a cluster | <ol style="list-style-type: none">a. Click Settings > BlackBerry Dynamics > Clustersb. Click the cluster name.c. Click Override global settings <p>See Configure BlackBerry Dynamics app proxy settings for the BlackBerry Cloud Connector for more information.</p> |
| Download PAC file updates for all clusters | <ul style="list-style-type: none">• Click Refresh PAC cache |

| Task | Steps |
|--|--|
| Specify a trusted root certificate to download PAC files from the server | <ol style="list-style-type: none"> Verify that you have the certificate in X.509 format (*.cer, *.der) stored in a network location that you can access from the management console. On the menu bar, click Settings > External Integration > Trusted certificates. Click + beside PAC server trusts. Click Browse. Select the certificate file that you want to use. Click Open. Type a description for the certificate. Click Add. |

Configure Direct Connect using port forwarding

Before you begin:

- Configure a public DNS entry for each BlackBerry Connectivity Node server (for example, bp01.mydomain.com, bp02.mydomain.com, and so on).
 - Configure the external firewall to allow inbound connections on port 17533 and to forward that port to each BlackBerry Connectivity Node server.
 - If the BlackBerry Connectivity Node instances are installed in a DMZ, ensure that the appropriate ports are open between each BlackBerry Connectivity Node and any application servers that the BlackBerry Dynamics apps need to access (for example, Microsoft Exchange, internal web servers, and the BlackBerry UEM Core).
- In the management console, on the menu bar, click **Settings > BlackBerry Dynamics**.
 - Click **Direct Connect**.
 - Click a BlackBerry Proxy instance.
 - To turn on Direct Connect, select the **Turn on Direct Connect** check box. In the **BlackBerry Proxy host name** field, verify that the host name is correct. If the public DNS entry you created is different from the FQDN of the server, specify the external FQDN instead.
 - Repeat steps 3 and 4 for all BlackBerry Proxy instances in the cluster.
To enable only some BlackBerry Proxy instances for Direct Connect, create a new BlackBerry Proxy cluster. All servers in a cluster must have the same configuration. For more information, see [Manage BlackBerry Proxy clusters](#) in the Configuration content.
 - Click **Save**.

Connecting BlackBerry Proxy to the BlackBerry Dynamics NOC

If you plan to use BlackBerry Proxy to allow BlackBerry Dynamics apps to connect to your organization's resources, your organization's firewall must allow TCP connections to the following IP ranges so that BlackBerry Proxy can connect to the BlackBerry Dynamics NOC:

- 206.124.114.1 to 206.124.114.254 (206.124.114.0/24) on port 443
- 206.124.121.1 to 206.124.121.254 (206.124.121.0/24) on port 443
- 206.124.122.1 to 206.124.122.254 (206.124.122.0/24) on port 443

Alternatively, you can configure your organization's firewall to allow connections to the following host names:

- gdentgw.good.com on port 443
- gdrelay.good.com on port 443
- gdweb.good.com on port 443
- gdmcd.good.com on port 443

Overriding global HTTP proxy settings for a BlackBerry Connectivity Node

If you have the BlackBerry Connectivity Node installed, you can override global BlackBerry UEM Cloud proxy settings to send BlackBerry Dynamics app data through an HTTP proxy between BlackBerry Proxy and an application server. BlackBerry Dynamics apps support both manual proxy settings and PAC files for connections to application servers. To use a PAC file, apps must be developed with BlackBerry Dynamics SDK 7.0 and later. If you configure both manual and PAC file settings, the PAC file takes precedence for apps that support it. Apps developed using an older version of the BlackBerry Dynamics SDK use the manual settings.

BlackBerry Access also supports manual proxy and PAC file app configuration settings that apply only to browsing with BlackBerry Access Proxy configuration settings for BlackBerry Access, or other apps that have separate proxy settings, override the BlackBerry UEM proxy settings. For more information, [see the BlackBerry Access Administration Guide](#).

PAC file considerations

You should be aware of the following support considerations if you are using PAC files with BlackBerry Proxy.

BlackBerry UEM supports the following PAC file directives:

- DIRECT
- PROXY (treated as HTTPS proxy - connection established using HTTP CONNECT)
- HTTPS (connection established using HTTP CONNECT)

BlackBerry UEM doesn't support the following PAC file directives:

- BLOCK (treated as DIRECT)
- SOCKS (connection error will occur)
- SOCKS4 (connection error will occur)
- SOCKS5 (connection error will occur)
- HTTP (connection error will occur)
- Custom "NATIVE" directive defined by BlackBerry Access (connection error will occur)

BlackBerry UEM has the following additional limitations for PAC files:

- The dnsDomainIs function can't include the "_" and "*" characters.
- The shExpMatch function can't include the expressions "[0-9]", "?", "/^d", or "d+."
- The option to strip the path and query from the URI is not supported.

Configure BlackBerry Dynamics app proxy settings for the BlackBerry Cloud Connector

You can configure BlackBerry Cloud Connector proxy settings for BlackBerry Dynamics apps manually or using a PAC file.

1. In the BlackBerry Cloud Connector, click **General settings > BlackBerry Router and proxy**.
2. Select **Global settings**.

3. Select one of the following options.

- **Enable manual HTTP proxy**
- **Enable PAC**

PAC files are supported only for connections to application servers. If you configure both options, the PAC configuration takes precedence for connections to application servers. PAC files are supported only for apps developed with BlackBerry Dynamics SDK 7.0 and later.

4. If you selected **Enable manual HTTP proxy**, perform the following steps:

- a) Select one of the following options.
 - **Use proxy to connect only to BlackBerry Dynamics NOC servers**
 - **Use proxy to connect to all servers**
 - **Use proxy to connect only to specified servers**
- b) If you want to use the proxy to connect to specified servers, click **+** to specify any additional servers.
- c) In the **Address** field, type the address for the proxy server.
- d) In the **Port** field, type the port number that the proxy server listens on.
- e) If the proxies specified in the PAC file require authentication, select **Use authentication** and specify the **Username**, **Password**, and, if necessary, **Domain** that the app should use for authentication.

5. If you selected **Enable PAC**, perform the following steps:

- a) In the **PAC URL** field, type the URL for the PAC file.
- b) If the proxy server requires authentication, select **Support proxy authentication** and specify the **Username**, **Password**, and, if necessary, **Domain** that the app should use for authentication.

End-user authentication credentials aren't supported for proxy authentication.

6. Click **Save**.

Configure email notifications for BlackBerry Work

BEMS Cloud accepts push registration requests from devices, such as iOS and Android, and then communicates with the on-premises Microsoft Exchange Server or Microsoft Office 365 server to check the user's mailbox for changes. When you specify the on-premises Microsoft Exchange Server or Microsoft Office 365 server information, you specify the settings to create the BEMS Cloud tenant for your organization.

When the tenant is created, the following services are automatically enabled:

- **BlackBerry Directory Lookup:** This service allows users to look up other users by first name, last name, and associated photo or avatar from the company directory.
- **BlackBerry Follow-Me:** This feature supports the BlackBerry Dynamics Launcher on BlackBerry Work.

Before you begin:

- [Verify that the service account has application impersonation permissions applied.](#)
- In a Microsoft Office 365 environment, if you plan to enable modern authentication, verify that you completed the following:
 - [If you enable modern authentication using credential authentication, obtain the client application ID.](#)
 - If you enable modern authentication using client-certificate authentication, do one of the following:
 - [Obtain the client application ID with certificate-based authentication](#)
 - [Create and associate a self-signed .pfx certificate to the Azure app ID for BEMS](#)
 - In an on-premises Microsoft Exchange environment, make sure that the Microsoft Exchange Server is updated to support TLS 1.2 or push notifications will fail. Weaker cipher suites such as TLSv1 or TLS 1.0 are disabled by default. Disabling the cipher suites provides enhanced security.

1. In the management console, click **Settings > BlackBerry Dynamics > Email notifications**.
2. In the **Authentication type** section, select an authentication type based on your environment and complete the associated tasks to allow BEMS to communicate with the Microsoft Exchange Server or Microsoft Office 365:

| Authentication type | Description | Task |
|---------------------|---|---|
| Credential | This option uses the BEMS username and password to authenticate to the Microsoft Exchange Server or Microsoft Office 365. | <ol style="list-style-type: none"> a. In the Service account username field, enter the username of the BEMS service account. <ul style="list-style-type: none"> • For Microsoft Office 365, enter the service account's User Principal Name (UPN). • For on-premises Microsoft Exchange Server, use the format <code><domain>\<username></code>. b. In the Service account password field, enter the password for the service account. |
| Client Certificate | This option uses a client certificate to allow the BEMS service account to authenticate to the Microsoft Exchange Server or Microsoft Office 365. | <ol style="list-style-type: none"> a. Beside the Certificate file (.pfx) field, click Browse. Navigate to and select the client certificate file. b. In the Password field, enter the password for the client certificate. |

3. If you connect to a Microsoft Office 365 environment, do the following to enable modern authentication:
 - a) Select the **Enable Modern Authentication** check box.
 - b) In the **Authentication authority** field, enter the Authentication Server URL that BEMS accesses to retrieve the OAuth token for authentication with Microsoft Office 365 (for example, `https://login.microsoftonline.com/<tenantname>`).
 - c) In the **Client application ID** field, enter one of the following Azure app IDs depending on the authentication type you selected. Do one of the following to obtain an Azure app ID:
 - [Obtain an Azure app ID for BEMS with credential authentication](#)
 - [Obtain an Azure app ID for BEMS with certificate-based authentication](#)
 - d) In the **Server name** field, enter the FQDN of the Microsoft Office 365 server.
 - e) Optionally, select the **Use credentials if modern authentication fails** check box to allow BEMS to communicate with Microsoft Office 365 in the event that BEMS can't access the modern authentication source. When you select this check box, you must provide the BEMS service account credentials.

Note: When you configure modern authentication, all nodes use the specified configuration.

4. In the **Service account username** field, enter the username that is used to log in to the Microsoft Exchange Server or Microsoft Office 365 server. The username must be in one of the following formats:
 - If your environment uses an on-premises Microsoft Exchange Server, use `<Domain>\<Username>` or UPN.
 - If your environment uses Microsoft Office 365, use `<username>@<domain>.com`.
5. In the **Service account password** field, enter the password for the service account username you provided.
6. Optionally, in the **Autodiscover URL override** field, enter the Autodiscover URL to allow BEMS to obtain user information from the Microsoft Exchange Server or Microsoft Office 365 server when it discovers users for BlackBerry Push Notifications.

Note: If you don't enter a URL, BEMS uses Autodiscover to locate the Microsoft Exchange Server or Microsoft Office 365 server to obtain user information.

7. Select the **Allow HTTP redirection and DNS SRV record** check box to allow HTTP Redirection and DNS SRV lookups for retrieving the Autodiscover URL when discovering users for BlackBerry Push Notifications. By default, this feature is enabled.
8. Select the **Use BlackBerry Connectivity Node route** to allow BEMS Cloud to connect to the BlackBerry Infrastructure instead of using an inbound port. This setting requires that the BlackBerry Connectivity Node is installed and configured in your environment.
9. If your environment uses an internal URL to access and communicate with an on-premises Microsoft Exchange Server, select the **Use internal Exchange Web Services URL** check box. This setting requires that the **Use BlackBerry Connectivity Node route** is enabled. This option is not available if modern authentication is enabled.
10. Optionally, in the **User email address** field, enter an email address to test the connection to the Microsoft Exchange Server or Microsoft Office 365 server. Click **Test connection**. If the test fails, resolve the issues that are identified and try the test again. You can delete the email address after you complete the test.
11. Click **Save**.

After you finish:

- Test the connection to the on-premises Microsoft Exchange Server or Microsoft Office 365 server and Autodiscover. Refresh or reopen the Email notifications screen. Click **Test connection**.
Note: Make sure that the connection test is successful before provisioning devices to avoid any Autodiscover issues. If devices are activated prior to configuring the email notification service, have users log out of BlackBerry Work and then log in. If the test returns an error message, complete the tasks to resolve the issue and test the connection again.
- Assign the BlackBerry Cloud Enterprise Services (com.blackberry.gdservice-entitlement.cloud) entitlement to users to receive email notifications for BlackBerry Work. For instructions, see the following administration content:
 - [Assign an app to a user group](#)
 - [Assign an app group to a user group](#)
 - [Assign an app to a user account](#)
 - [Assign an app group to a user account](#)
- Optionally, create a trusted connection between the BEMS Cloud and Microsoft Exchange Server. For instructions, see [Create a trusted connection between BEMS Cloud and Microsoft Exchange Server](#).
- Configure BlackBerry Work. For instructions, see the [BlackBerry Work, Notes, and Tasks administration content](#).
- Optionally, configure the BEMS-Docs service. For instructions, see [Enable the BEMS-Docs service](#).

Grant application impersonation permission to the service account

For the BlackBerry Push Notifications service to monitor mailboxes for updates, the BlackBerry Push Notifications service account, must have impersonation permissions.

Execute the following Microsoft Exchange Management Shell command to apply Application Impersonation permissions to the service account:

- [Grant application impersonation permission using Exchange Administration Center](#)
- [Grant application impersonation permission using Microsoft Exchange Management Shell](#)

Grant application impersonation permission using Exchange Administration Center

1. Depending on your environment, sign in to one of the following consoles:

| Console | Steps |
|--|---|
| Microsoft Office 365 Exchange Administration Center console | <ol style="list-style-type: none"> Sign in to https://portal.office.com. Click the App Launcher icon in the top left hand corner. Click Admin. In the Microsoft 365 admin center console menu, click Show all. In the Admin centers section, click All admin centers. Click Exchange. |
| On-premises Microsoft Exchange Administration Center web console | <ol style="list-style-type: none"> Open a browser open <code>https://<url_to_on-premises_client_access_server>/ecp</code> and sign in with a valid account. |

- Click **permissions**.
- Click **+**.
- Type a name and description for the role group.
- In the **Roles** section, click **+**. Click **ApplicationImpersonation > add > OK**.
- In the **Members** section, click **+**. Click an account to add and then click **add > OK**.

Grant application impersonation permission using Microsoft Exchange Management Shell

- Open Microsoft Exchange Management Shell.
- Type `New-ManagementRoleAssignment -Name:<ImpersonationAssignmentName> -Role:ApplicationImpersonation -User:<ServiceAccount>`. For example, `New-ManagementRoleAssignment -Name:BlackBerryAppImpersonation -Role:ApplicationImpersonation -User:BEMSAdmin`.

After you finish:

For more information on how to restrict Application Impersonation rights to specific users, organizational units, or security groups, visit the [MSDN Library](#) to see [How to: Configure impersonation](#).

Obtain an Azure app ID for BEMS with credential authentication

- Log on to portal.azure.com.
- In the left column, click **Azure Active Directory**.
- Click **App registrations**.
- Click **New application registration**.
- In the **Name** field, enter a name for the application.
- In the **Application type** drop-down list, select **Native**.
- In the **Redirect URI** field, enter `https://localhost:8443`.
- Press **Enter**.
- Click **Create**.
- Select the application name that you created.
- Click **Settings**.
- Click **Required permissions**.
- Click **Add**.
- Click **Select an API**.

15. Select **Office 365 Exchange Online (Microsoft Exchange)**.
16. Click **Select**.
17. Set the **Access mailboxes as the signed-in user via Exchange Web Service** permission for Microsoft Office 365.
18. Click **Select**.
19. Click **Done**.
20. Click **Grant Permissions**.
21. Click **Yes**.
22. Click **Add**.
23. Click **Select an API**.
24. Click **Microsoft Graph**.
25. Click **Select**.
26. In the **Delegated Permissions** section, select the **Sign in and read user profile** checkbox.
27. Click **Select**.
28. Click **Done**.
29. Click **Grant Permissions**.
30. Click **Yes**.
31. Copy the **Application ID**. The Application ID is displayed in the main **App Registrations** page for the specified app. This is used as the **Client application ID**.

Obtain an Azure app ID for BEMS with certificate-based authentication

1. Log in to portal.azure.com.
2. In the left column, click **Azure Active Directory**.
3. Click **App registrations**.
4. Click **New application registration**.
5. In the **Name** field, enter a name for the app.
6. In the **Application type** drop-down list, select **Web app / API**.
7. In the **Sign-on URI** field, enter `http://<name of the app given in step 5>`.
This app is a daemon, not a web app, and does not have a sign-on URL.
8. Press **Enter**.
9. Click **Create**.
10. Select the app name that you created.
11. Click **Settings**.
12. In the **Settings** column, click **Properties**.
13. In the **Properties** column, copy the **App ID URI**.
14. Click **Required permissions**.
15. Click **Add**.
16. Click .
17. Select **Office 365 Exchange Online (Microsoft Exchange)**Select an API.
18. Click **Select**.
19. In the **Select an Application Permissions** section, select the **Use Exchange Web Service with full access to all mailboxes** checkbox.
20. Click **Select**.
21. Click **Done**.

22. Click **Grant Permissions**.
23. Click **Yes**.
24. Click **Add**.
25. Click **Select an API**.
26. Click **Microsoft Graph**.
27. Click **Select**.
28. In the **Delegated Permissions** section, select the **Sign in and read user profile** checkbox.
29. Click **Select**.
30. Click **Done**.
31. Click **Grant Permissions**.
32. Click **Yes**.
33. Copy the **Application ID**. The Application ID is displayed in the main **App Registrations** page for the specified app. This is used as the **Client application ID**.
34. Do not close portal.azure.com.


After you finish: [Associate a certificate with the Azure app ID for BEMS](#)

Associate a certificate with the Azure app ID for BEMS

You can use an existing certificate from your CA server or the New-SelfSignedCertificate command to create a self-signed certificate. For more information, visit docs.microsoft.com and read New-SelfSignedCertificate.

Before you begin: Verify that you have the app name you assigned in BEMS with certificate-based authentication.

1. If you have a certificate issued by a CA server, go to step 2. Create a self-signed certificate.
 - a) On the computer running Microsoft Windows, open the Windows PowerShell.
 - b) Enter the following command: `$cert=New-SelfSignedCertificate -Subject "CN=<app name>" -CertStoreLocation "Cert:\CurrentUser\My" -KeyExportPolicy Exportable -KeySpec Signature`.
 - Where <app name> is the name you assigned the app in step 5 of [Obtain an Azure app ID for BEMS with certificate-based authentication](#).
 - c) Press **Enter**.
2. Export the certificate from the Certificate Manager. This creates the public certificate. Make sure to save the public certificate as a .CER or .PEM.
 - a) On the computer running Windows, open the Certificate Manager for the logged in user.
 - b) Expand **Personal**.
 - c) Click **Certificates**.
 - d) Right-click the <user>@<domain> and click **All Tasks > Export**.
 - e) In the **Certificate Export Wizard**, click **No, do not export private key..**
 - f) Click **Next**.
 - g) Select **Base-64 encoded X.509 (.CER)**. Click **Next**.
 - h) Provide a name for the certificate and save it to your desktop.
 - i) Click **Next**.
 - j) Click **Finish**.
 - k) Click **OK**.
3. Upload the public certificate to associate the certificate credentials with the Azure app ID for BEMS.
 - a) In portal.azure.com, open the <app name> you assigned the app in step 5 of [Obtain an Azure app ID for BEMS with certificate-based authentication](#).
 - b) Click **Settings > Keys**.

- c) Click **Upload Public Key**.
- d) Click  and navigate to the location where you exported the certificate in step 2.
- e) Click **Open**.
- f) Click **Save**.


After you finish: Export the certificate in .pfx format using the Manage User Certificate MMC snap-in. Make sure to include the private key. For instructions, visit docs.microsoft.com and read Export a Certificate with the Private Key.

Create a trusted connection between BEMS Cloud and Microsoft Exchange Server

By default, BEMS is only aware of public CA certificates. If you enable email notifications for BlackBerry Work and your organization's Microsoft Exchange Server doesn't use an SSL certificate issued by a trusted CA, the connection between BEMS Cloud and Microsoft Exchange Server isn't trusted. To create a trusted connection to the Microsoft Exchange Server upload the server's SSL certificate (or the root or intermediate certificate chain) to the BEMS Cloud database. You can upload a base64-encoded or binary-encoded file that includes one or more SSL certificates. When you upload a single file that includes multiple SSL certificates, the certificates are displayed in the management console and can be deleted and replaced individually as required. BEMS Cloud supports the following file extensions: .der, .cer, .pem, and .crt.

Before you begin:

- Configure the email notifications for BlackBerry Work. For instructions, see [Configure email notifications for BlackBerry Work](#).
- Export the SSL certificate from the Microsoft Exchange Server in a base64-encoded or binary-encoded format and store it in a network location that you can access from the management console. For more information about digital certificates and encryption in Microsoft Exchange Server, visit <https://docs.microsoft.com/en-us/exchange/architecture/client-access/certificates?view=exchserver-2016>

1. On the menu bar, click **Settings > BlackBerry Dynamics**.
2. Click **Email notifications**.
3. Click the **Certificates** tab.
4. Click .
5. Click **Add**.
6. Click **Browse** and navigate to the location of the certificate file that you want to upload.
7. Click **Add**.
8. If you upload individual SSL certificates, repeat steps 5 to 7 for each additional file.


Replace or delete the trusted connection SSL certificates

When you replace the SSL certificates (for example, when the certificates expire), you replace all of the existing SSL certificates in the BEMS database. You can choose to upload individual SSL certificates as required or include multiple SSL certificates in a single file. The following file types are supported: .der, .cer, .pem, and .crt.

Before you begin:

- Export the new SSL certificates from the Microsoft Exchange Server in a base64-encoded or binary-encoded format and store it in a network location that you can access from the management console. For more information about digital certificates and encryption in Microsoft Exchange Server, visit <https://docs.microsoft.com/en-us/exchange/architecture/client-access/certificates?view=exchserver-2016>

1. On the menu bar, click **Settings > BlackBerry Dynamics**.
2. Click **Email notifications**.
3. Click the **Certificates** tab.

4. Click .
5. Click **Remove** under the certificate that you want to delete.
6. Click **Remove** to confirm the deletion.
7. Add the new certificate. For instructions, see [Create a trusted connection between BEMS Cloud and Microsoft Exchange Server](#).

Configuring BEMS-Docs

You can use the BlackBerry UEM console to configure and maintain document and file repositories and user access policies for mobile app users of the service. When it is enabled, users can access, synchronize, and share documents using the following storage services: Microsoft SharePoint Online, Microsoft SharePoint, Microsoft OneDrive for Business, and Box. File Share and CMIS-based repository storage providers are not supported.

Note: If your environment requires users to access File Shares or CMIS-based repositories, configure BEMS-Docs in an on-premises BEMS instance. Enabling BEMS-Docs in BlackBerry UEM Cloud and in an on-premises BEMS in a BlackBerry UEM Cloud environment is not supported. For more information, see [Configuring an on-premises BEMS in a BlackBerry UEM Cloud environment](#).

Repositories: The BEMS-Docs service provides your users with access to stored work data from their mobile devices. A Docs repository (also called a "share") exists on a work server. The repository contains files shared by authorized users. For more information about setting up and maintaining your shares in BlackBerry UEM and the associated user access, see [Managing Repositories](#). Before you configure your repositories, enable and configure the BEMS-Docs service and configure BlackBerry Work in BlackBerry UEM to allow your users to access the repositories that you add and define from their device

Storage services: The BEMS-Docs service supports a number of storage services.

Enable the BEMS-Docs service

To allow users access to document and file repositories in your environment, you must enable the BEMS-Docs service. When you enable this service, a BEMS tenant is created and the BlackBerry Cloud Docs Service (com.blackberry.gdservice-entitlement.docs.cloud) entitlement is added to the BlackBerry Dynamics connectivity profile. If your environment uses both the BEMS-Docs service and email notifications for BlackBerry Work, configure the email notifications first. For instructions, see [Configure email notifications for BlackBerry Work](#).

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Enable**.

Configure BEMS-Docs settings

Before you begin:

- Verify that the BEMS-Docs service is enabled.
- If your environment is configured for Microsoft SharePoint Online or Azure-IP, make sure that the BlackBerry Work app is registered in Azure so that it can access the BEMS-Docs Azure app. For instructions, see [Obtain an Azure app ID for BlackBerry Work](#) in the BlackBerry Work, Notes, and Tasks administration content.
- If your environment is configured for Azure-IP, have the following information available:
 - Azure tenant name
 - BEMS service Azure application ID
 - BEMS service Azure application key
- If BEMS-Docs is configured to communicate with an on-premises Microsoft SharePoint, make sure that Microsoft SharePoint repositories are using https secure ports. Using http non-secure ports is not supported.

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click the **Settings** tab.
3. Complete one or both of the following tasks.

| Environment | Steps |
|---|---|
| Your environment is configured to use Microsoft SharePoint Online or Azure-IP and Microsoft SharePoint Online | <ol style="list-style-type: none"> a. Optionally, select the Enable Azure Information Protection check box to allow BEMS-Docs to authenticate to Azure-IP. b. Enter the Azure tenant name. c. Enter the BEMS service Azure application ID that you obtained when you registered the BEMS-Docs component service. For instructions, see Obtain an Azure app ID for the BEMS-Docs component service. d. Enter the BEMS service Azure application key that you obtained when you registered the Docs app in Azure. For instructions, see Obtain an Azure app ID for the BEMS-Docs component service. |
| Your environment is configured to use an on-premises Microsoft SharePoint | <ol style="list-style-type: none"> a. Select the Enable BlackBerry Connectivity Node route check box to allow BEMS Cloud to connect to the BlackBerry Infrastructure instead of using an inbound port. This setting requires that the BlackBerry Connectivity Node is installed and configured in your environment. b. To allow BEMS-Docs to communicate with an on-premises Microsoft SharePoint server, extract the Microsoft SharePoint server certificate and send it to BlackBerry Support. If the on-premises Microsoft SharePoint sites use certificates that are not publicly trusted (for example, self-signed or enterprise CA certs), then send these certificates to BlackBerry Support. |

4. Click **Save**.

Obtain an Azure app ID for the BEMS-Docs component service

When your environment is configured for Microsoft SharePoint Online, Microsoft OneDrive for Business, or Microsoft Azure-IP you must register the BEMS component services in Azure.

If your environment uses both Microsoft SharePoint Online and Microsoft Azure-IP or Microsoft OneDrive for Business and Microsoft Azure-IP, you must register the Microsoft SharePoint Online or Microsoft OneDrive for Business service. Microsoft Azure-IP will use the same information as the registered service.

Before you begin: To grant permissions, you must use an account with tenant administrator permissions.

1. Sign in to portal.azure.com.
2. In the left column, click **Azure Active Directory**.
3. Click **App registrations**.
4. Click **New registration**.
5. In the **Name** field, enter a name for the app. For example, AzureAppIDforBEMS.
6. Select a supported account type.
7. In the **Redirect URI** drop-down list, select **Web** and enter `https://localhost:8443`.
8. Click **Register**.
9. Record the **Application (client) ID**. This is used as the **BEMS Service Azure Application ID** value in the BlackBerry UEM management console.
10. In the **Manage** section, click **API permissions**.
11. Click **Add a permission**.

12. In the **Select an API** section, click **APIs my organization uses**.

13. If your environment is configured for Azure-IP, search for and click **Microsoft Information Protection Sync Service**. Set the following permission:

- In delegated permissions, select the **Read all unified policies a user has access to** checkbox (**UnifiedPolicy > UnifiedPolicy.User.Read**).

14. Click **Add permissions**.

15. Click **Add a permission**.

16. Complete one or more of the following tasks:

| Service | Permissions |
|--|---|
| If you configure BEMS-Docs to use Microsoft SharePoint Online or Microsoft OneDrive for Business | <p>a. Search for and click SharePoint.</p> <p>b. Set the following permissions:</p> <ul style="list-style-type: none">• In application permissions, clear all of the permissions.<ol style="list-style-type: none">1. Click Application permissions.2. Click expand all. Make sure that all options are cleared.• In delegated permissions, select the Read and write items and item lists in all site collections checkbox. None. Clear the check boxes for all options.• Delegated permissions Select the Read and write items and lists in all site collections checkbox. (AllSite > AllSites.Manage) <p>c. Click Add permissions.</p> |
| If you use Microsoft Azure-IP | <p>a. Click Microsoft Graph. If Microsoft Graph is not listed, add Microsoft Graph.</p> <p>b. Set the following permissions:</p> <ul style="list-style-type: none">• In application permissions, select the Read directory data checkbox (Directory > Directory.Read.All).• In delegated permissions, select the Read directory data checkbox (Directory > Directory.Read.All). <p>c. Click Update permissions.</p> |

17. Wait a few minutes, then click **Grant admin consent**. Click **Yes**.

Important: This step requires tenant administrator privileges.

18. To allow autodiscovery to function as expected, set the authentication permissions. Complete the following steps:

- a) In the **Manage** section, click **Authentication**.
- b) Under the **Implicit grant** section, select the **ID Tokens** checkbox.
- c) In the **Default client type**, select **No**.
- d) Click **Save**.

19. Define the scope and trust for this API. In the **Manage** section, click **Expose an API**. Complete the following tasks.

| Task | Steps |
|--------------------------|--|
| Add a scope | <p>The scope restricts access to data and functionality protected by the API.</p> <ol style="list-style-type: none"> Click Add a scope. Click Save and continue. Complete the following fields and settings: <ul style="list-style-type: none"> Scope name: Provide a unique name for the scope. Who can consent: Click Admins and user. Admin consent display name: Enter a descriptive name. Admin consent description: Enter a description for the scope. State: Click Enabled. By default, the state is enabled. Click Add Scope. |
| Add a client application | <p>Authorizing a client application indicates that the API trusts the application and users shouldn't be prompted for consent.</p> <ol style="list-style-type: none"> Click Add a client application. In the Client ID field, enter the client ID that you recorded in step 9 above. Select the Authorized scopes checkbox to specify the token type that is returned by the service. Click Add application. |

20. In the **Manage** section, click **Certificates & secrets** and add a client secret. Complete the following steps:

- Click **New client secret**.
- In the **Description** field, enter a key description up to a maximum of 16 characters including spaces.
- Set an expiration date (for example, In 1 year, In 2 years, Never expires).
- Click **Add**.
- Copy the key **Value**.

Important: The Value is available only when you create it. You cannot access it after you leave the page. This is used as the **BEMS Service Azure Application Key** value in the BlackBerry UEM console.

Allow authentication to BEMS-Docs using an alternate email address

You can configure BEMS Cloud to allow users to authenticate to Microsoft SharePoint Online and Microsoft OneDrive for Business with an email address that is different from the email address that was used to install and activate BlackBerry Work. To enable this feature, contact BlackBerry Technical Support.

Managing Repositories

BEMS Cloud has the following repository storage providers:

| Storage repository | Description |
|--------------------|---|
| SharePoint | A secure web server containing shared files which are accessed via the Internet. |
| SharePoint Online | If your environment is configured for Microsoft OneDrive for Business the SharePoint Online storage repository is used. |

| Storage repository | Description |
|--------------------|---|
| Box | A secure cloud storage account furnished by box.com containing shared files which can be accessed via the Internet. |

A repository is further categorized in the BEMS-Docs service by who added and defined.

| Storage repository | Description |
|--------------------|---|
| Admin-defined | Storage provider sites added and maintained by BlackBerry UEM administrators to which individual users and user groups are granted access. |
| User-defined | Sites added by individual end users from their mobile devices to which you, as the BlackBerry UEM administrator, may rescind and reinstate mobile-based access in accordance with your enterprise IT acceptable-use policies. |

Configuring repositories

The Repository configuration page has the following three tabs that you can configure:

| Tabs | Description |
|---------------|--|
| Admin defined | Allows you to create and manage repositories, add and remove users and user groups, and assign users and user groups file access and use permissions. |
| User defined | Allows you to add and remove users and user groups, enable and disable user and user group the ability to create user-defined repositories, and grant and rescind permissions to perform a range of file-related actions on their user-defined repositories. |

Admin-defined shares

Shares are document repositories for a particular storage provider.

When you define repositories and lists, you perform the following actions:

| Step | Action |
|------|--|
| 1 | Define a repository. |
| 2 | Define user and user group access permissions. |


Granting User Access Permissions

Access permissions are defined for a single repository or inherited from an existing list of repositories. Permissions can be selectively granted to existing Microsoft Active Directory domain users and user groups. At least one user or user group must be added to the repository definition to configure access permissions.

The following table lists the access permissions and the default setting that are available.

| Permission | Permissions Attributes | Default setting |
|-----------------------|---|------------------------------|
| List (Browse) | View and browse repository content (for example, subfolders and files) in a displayed list, and sort lists by Name, Date, Size, or Kind | Enabled |
| Delete Files | Remove files from the repository | Enabled |
| Read (Download) | Download repository files to the user's device and open them to read | Enabled |
| Write (Upload) | Upload files (new/modified) from user's device to the repository for storage | Enabled |
| Cache (Offline Files) | Temporarily store a cache of repository files on the device for offline access | Enabled |
| Open In | Open a file in a format-compatible app on the device | Enabled |
| Create Folder | Add new folders to the repository | Enabled |
| Copy/Paste | Copy repository file content and paste it into a different file or app | Enabled |
| Check In/Check Out | When a file is checked out, the user can edit, close, reopen, and work with the file offline. Other users cannot change the file or see changes until it is checked back in | Enabled (SharePoint only) |
| Generate Shared Link | Users can generate a link to a file and folder and send the link to recipients The Generate Shared Link requires an updated BlackBerry Work app. | Enabled (Box only) |


Change access permissions

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Repositories**.
3. Click the **Admin defined** tab.
4. Click a repository.
5. Under **Access Permissions**, beside the user or user group, select or clear the permission checkbox that you want to change.
6. Click  beside a user or user groups that you want to remove.
7. Click **Save**.


Define a repository

Microsoft Active Directory users and groups must be added to a repository definition before access permissions can be configured. Users and groups that are added automatically receive the default access permissions.

Before you begin: For users to access their Microsoft SharePoint repositories on their devices, make sure that they have the "Read" permission level and the "Browse Directories" permission assigned.

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Repositories**.
3. Click the **Admin defined** tab.
4. Click .
5. In the **Name** field, type the name of the repository to that will be displayed to users granted mobile access to the repository.
The repository name must be unique and can contain spaces. The following special characters cannot be used due to third-party limitations:
 - Microsoft SharePoint 2010, 2013, and 2016: ~ " # % & * : < > ? / \ { | }
 - Box: \ / |
6. In the **Storage** drop-down list, select a storage provider.
If you select **SharePoint** or **SharePoint Online**, and the share is running SharePoint 2013 or later, select the **Add sites followed by users on this site** check box to make this feature available to users of this share. This setting only applies for personal (my) SharePoint or OneDrive for Business sites.
If your environment is configured for Microsoft OneDrive for Business, select the SharePoint Online storage provider.
7. In the **Path** field, specify the path to the share. Complete one of the following tasks based on the storage type that you selected in step 6.

| Storage type | Description |
|-------------------|--|
| Box | Enter a fully qualified URL with or without Microsoft Active Directory attributes. |
| SharePoint | If your storage provider is Microsoft OneDrive for Business, complete this task. |
| SharePoint Online | <p>Enter a fully qualified URL with or without Microsoft Active Directory attributes.</p> <p>To add "my" or personal SharePoint sites, specify the URL for the "my" site. For example,</p> <ul style="list-style-type: none"> • If your environment uses SharePoint and SharePoint Online, <code>https://<Microsoft SharePoint server>/my</code>. • If your environment uses Microsoft OneDrive for Business, <code>https://<your O365 domain>-my.sharepoint.com/personal/admin_<domain>_onmicrosoft_com/_layouts/15/onedrive.aspx</code> <p>If the personal site includes usernames or other Microsoft Active Directory attributes, enter the path including these attributes. For example, <code>https://<Microsoft SharePoint server>/my/<SAMAccountName></code>.</p> <p>Optionally, to automatically add followed sites, complete the following steps:</p> <ol style="list-style-type: none"> a. Add a repository for the "my" or personal SharePoint site. b. Select the Add sites followed by users on this site for the repository. c. On the User-defined tab, enable a user-defined repository permission. Make sure that you select the Enable 'User Defined Shares' and Automatically add sites followed by users check boxes. For instructions, see Enable user-defined repository permissions. |

8. In the **Access permissions** section, click .
9. Select one of the following:

- **Users:** In the **Add a user** dialog box, field, type a full or partial search string. Click the user that you want to add.
- **Groups:** In the **Add a group** screen, select one or more groups. Click ➡. Click **Add**.

10. Click **Add**.

11. Click **Save**.

Add users and user groups to repositories

Microsoft Active Directory users and groups must be added to a repository definition before access permissions can be configured. Users and groups added automatically receive the default access permissions.

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Repositories**.
3. Click the **Admin Defined** tab.
4. Click a repository
5. Under **Access permissions**, click +.
6. Select one of the following:
 - **Users:** In the **Add a user** dialog box, field, type a full or partial search string. Click the user that you want to add.
 - **Groups:** In the **Add a group** screen, select one or more groups. Click ➡. Click **Add**.
7. Click **Add**.
8. Click **Save**.

After you finish: Grant user and user groups access permissions.

Edit a repository

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Repositories**.
3. Click the **Admin defined** tab.
4. Click a repository you want to edit.
5. Make the required changes.
6. Click **Save**.

Allow user-defined repositories

You can allow users to define their own "named" data sources on admin-defined repositories for which they have already been granted permission.

When you allow users to define their own repositories, you perform the following actions:

1. [Enable user-defined repository permissions](#)
2. [Change user access permissions](#)

Enable user-defined repository permissions

Before you begin: For users to access their Microsoft SharePoint repositories on their devices, make sure that they have the "Read" permission level and the "Browse Directories" permission assigned.

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**

2. Click **Repositories**.
3. Click the **User defined** tab.
4. Select the **Enable 'User Defined Shares'** checkbox to allow your mobile users to define their own data sources.
5. Optionally, select the **Automatically add sites followed by users** checkbox for authorized Microsoft SharePoint repositories with the required MySite plugin enabled.
To automatically add followed sites, complete the following steps:
 - a. On the Admin-defined tab, add a repository for the "my" or personal SharePoint site. For instructions, see [Define a repository](#).
 - b. Select the **Add sites followed by users on this site** for the repository.
 - c. On the User-defined tab, make sure that you select the **Enable user-defined shares** and **Automatically add sites followed by users** check boxes.
6. In the **Storage** section, select one or more storage services.
If you do not select at least one storage option, the user-defined option is disabled.
7. In the **Access Permissions** section, click **+**.
8. Select **Users** or **Groups**.
9. Select one of the following:
 - **Users:** In the **Add a user** dialog box, field, type a full or partial search string. Click the user that you want to add.
 - **Groups:** In the **Add a group** screen, select one or more groups. Click **➔**. Click **Add**.
10. Click **Add**. The users and groups added automatically receive the default access permissions.
11. Click **Save**.

Access permissions


Permissions can be selectively granted to existing Microsoft Exchange ActiveSync domain users and user groups. The most restrictive permissions (admin-defined or user-defined) are applied.

The following table lists the permissions that are provided by default when you add users and groups to the User-defined repositories.

| Permission | Permissions Attributes | Default setting |
|-----------------------|---|-----------------|
| List (Browse) | View and browse repository content (for example, subfolders and files) in a displayed list, and sort lists by Name, Date, Size, or Kind | Enabled |
| Delete Files | Remove files from the repository | Enabled |
| Read (Download) | Download repository files to the user's device and open them to read | Enabled |
| Write (Upload) | Upload files (new/modified) from user's device to the repository for storage | Enabled |
| Cache (Offline Files) | Temporarily store a cache of repository files on the device for offline access | Enabled |
| Open In | Open a file in a format-compatible app on the device | Enabled |

| Permission | Permissions Attributes | Default setting |
|----------------------|---|---------------------------|
| Create Folder | Add new folders to the repository | Enabled |
| Copy/Paste | Copy repository file content and paste it into a different file or app | Enabled |
| Check In/Check Out | When a file is checked out, the user can edit, close, reopen, and work with the file offline. Other users cannot change the file or see changes until it is checked back in | Enabled (SharePoint only) |
| Add New Repositories | Permits new repositories to be added from the user's mobile device | Disabled |
| Generate Shared Link | Users can generate a link to a file and folder and send the link to recipients The Generate Shared Link requires an updated BlackBerry Work app. | Enabled (Box only) |

Change user access permissions

1. In the management console, click **Settings > BlackBerry Dynamics > Docs**.
2. Click **Repositories**.
3. Click the **User defined** tab.
4. Under **Access Permissions**, beside the user or user group, select or clear the permission checkbox that you want to change.
5. Click  beside a user or user groups that you want to remove.
6. Click **Save**.

Configuring an on-premises BEMS in a BlackBerry UEM Cloud environment

You can configure an on-premises BEMS to communicate with the BlackBerry Proxy to authenticate GDAuth tokens in a BlackBerry UEM Cloud environment. When you configure your environment with an on-premises BEMS, you allow iOS and Android users to use the BEMS-Connect, BEMS-Presence, and BEMS-Docs services, in addition to the BEMS Cloud email notifications and BEMS-Docs service for BlackBerry Work.

If your environment requires users to access File Shares or CMIS- based repositories, configure BEMS-Docs in an on-premises BEMS. Enabling BEMS-Docs in BlackBerry UEM Cloud and in an on-premises BEMS in a BlackBerry UEM Cloud environment is not supported.

Note: You can configure BEMS with only one on-premises BlackBerry UEM or BlackBerry UEM Cloud environment at a time.

Steps to configure BlackBerry UEM Cloud to communicate with on-premises BEMS

When you configure BlackBerry UEM Cloud to communicate with on-premises BEMS, you perform the following actions:

Note: Some of the following tasks might have already been completed when you configured BlackBerry UEM Cloud.

| Step | Action |
|------|--|
| 1 | Configure BlackBerry UEM Cloud in your environment. |
| 2 | <p>In the BlackBerry UEM Cloud console, install the BlackBerry Connectivity Node or upgrade it to the latest version.</p> <ol style="list-style-type: none">1. Verify that your organization meets the prerequisites to install the BlackBerry Connectivity Node2. Download the installation and activation files for the BlackBerry Connectivity Node from the management console3. Install, activate, and configure the BlackBerry Connectivity Node |
| 3 | <p>If you are using Connect, install and configure the following on-premises BEMS services. For instructions, see the BEMS in a BlackBerry UEM environment installation content and BEMS in a BlackBerry UEM environment configuration content.</p> <ul style="list-style-type: none">• BEMS-Connect• BEMS-Presence• BEMS-Docs |

| Step | Action |
|------|--|
| 4 | <p>In the BEMS Dashboard, Configure the BlackBerry Dynamics server in BEMS. Optionally, configure SSL communication between the BlackBerry Connectivity Node and the on-premises BEMS on port 17433.</p> <ol style="list-style-type: none"> 1. Export the BlackBerry Proxy certificate to the local computer 2. Import the certificate to the BEMS Windows keystore 3. Import the certificate into the Java keystore on BEMS <p>Note: If you don't configure SSL communication, clear the Enforce SSL Certificate Validation when communicating with BlackBerry Dynamics check box.</p> |
| 5 | <p>In the BEMS Dashboard, Configure BEMS connectivity with BlackBerry Dynamics.</p> |
| 6 | <p>In the BlackBerry UEM Cloud console, assign BlackBerry Connect and BlackBerry Presence Service apps to users.</p> <ul style="list-style-type: none"> • You can assign the apps using one of the following methods. For instructions, see the following BlackBerry UEM Cloud administration content: <ul style="list-style-type: none"> • Assign an app to a user group • Assign an app group to a user group • Assign an app to a user account • Assign an app group to a user account |
| 7 | <p>In the BlackBerry UEM Cloud console, create a BlackBerry Dynamics Connectivity profile and add the app server that hosts the BlackBerry Connect and BlackBerry Presence Service, and Feature - Docs Service Entitlement apps.</p> |

Import the certificate to the BEMS Windows keystore

For the Connect service to trust the BlackBerry Proxy server's certificate, you must import BlackBerry Proxy certificate to the Connect service Windows keystore. Repeat this task on each BEMS instance.

Before you begin: Save a copy of the ca.cer certificate you exported to a convenient location on the computer that hosts BEMS. For instructions, see [Export the BlackBerry Proxy certificate to the local computer](#).

1. Open the Microsoft Management Console.
2. Click **Console Root**.
3. Click **File > Add/Remove Snap-in**.
4. Click **Certificates**.
5. Select **Computer Account > Local computer > OK**.
6. Expand **Certificates (Local Computer) > Trusted Root Certification Authorities**.
7. Right-click **Certificates**, and click **All Tasks > Import**.
8. Click **Next**.
9. Browse to where you saved the certificate that you exported (for example <drive>:\bemscert\ca.cer). Click **Open**.
10. Click **Next**.

11. Click **Finish**. Click **OK**.

After you finish: Configure the Core BEMS service for communicating to BlackBerry Dynamics. For instructions, see [Configure BEMS connectivity with BlackBerry Dynamics](#).

Import the certificate into the Java keystore on BEMS

For the Presence and Docs service to trust the BlackBerry Proxy server's certificate, you must import BlackBerry Connectivity Node certificate. Use the DBmanager to import the certificate into the BEMS Java keystore. By default, DBmanager is located in the installation folder at `<drive>:\GoodEnterpriseMobilityServer<version>\GoodEnterpriseMobilityServer\DBManager`.

Before you begin: Save a copy of the ca.cer certificate you exported to a convenient location on the computer that hosts BEMS. For instructions, see [Export the BlackBerry Proxy certificate to the local computer](#).

1. On the computer that hosts the on-premises BEMS, verify that the PATH System variable includes the path to the JAVA directory.
 - a) In a command prompt, type `set | findstr "Path"`.
 - b) Press **Enter**.

For more information about setting the Path system variable, see ["Configure the Java Runtime Environment" in the BEMS in a BlackBerry UEM environment installation content](#).
2. Make a backup of the Java keystore file. The Java keystore file is located at `%JAVA_HOME%\lib\security\cacerts`, where JAVA_HOME is confirmed in Step 1.
3. Import the root BlackBerry Proxy certificate.
 - a) Open a command prompt and navigate to the DBManager folder. For example, if the installation files are saved to your Downloads folder, type `C:\Users\besadmin\Downloads\GoodEnterpriseMobilityServer<version>\GoodEnterpriseMobilityServer\DBManager`
 - b) Import the certificate. Type `java -jar dbmanager-<version>-jar-with-dependencies.jar -moduleName pushnotify -dbType sqlserver -dbName <SQL_server_DB_name> -dbHost <Name of the computer hosting the SQL DB> -dbPort 1433 -userName gems_sa -password <BEMS_service_account_password> -action addcertificate -pemFile "C:\<path to the pemfile location>\<certificate name>.cer" -alias gdcert`
4. Restart the Good Technology Common Services service in the Windows Service Manager.

After you finish: Configure the Core BEMS service for communicating to BlackBerry Dynamics. For instructions, see [Configure the BlackBerry Dynamics server in BEMS](#).

Configure the BlackBerry Dynamics server in BEMS

Your BEMS environment must be configured to trust the Root CA for the BlackBerry Proxy HTTPS configuration or implement the Karaf workaround. For instructions, see [Importing and configuring certificates in the BEMS in a BlackBerry UEM environment configuration content](#).

1. In the **BlackBerry Enterprise Mobility Server Dashboard**, under **BEMS System Settings**, click **BEMS Configuration**.
2. Click **BlackBerry Dynamics**.
3. Complete one of the following actions:

| Task | Steps |
|---|---|
| If a BlackBerry Proxy server is not defined | <ol style="list-style-type: none"> Click Add BlackBerry Proxy. In the Host Name field, type the BlackBerry Proxy server host name. In the Protocol drop-down list, select the protocol used to communicate with the BlackBerry Proxy server. <ul style="list-style-type: none"> If you select HTTPS, the Port field prepopulates to 17433. This is secure. If you select HTTP, the Port field prepopulates to 17080. <p>Note: If you configure your environment for HTTPS, you must Export the BlackBerry Proxy certificate to the local computer and then Import the certificate into the Java keystore on BEMS.</p> Click Test to test the connection. Repeat steps 1 to 4 to add additional BlackBerry Proxy servers for redundancy continuity. |
| If one or more BlackBerry Proxy servers are defined | No action is required. Previously defined BlackBerry Proxy servers are listed. |

- Select the **Apply to other nodes in the BEMS cluster** check box to communicate the BlackBerry Proxy server information to all of the BEMS nodes in the cluster.
- Optionally, select the **Enforce the SLL Certificate validation when communicating with BlackBerry Dynamics** check box when you use the https protocol to communicate with the BlackBerry Proxy server.
- Click **Save**.

Configure BEMS connectivity with BlackBerry Dynamics

Before you begin: Make sure that the BlackBerry Control and BlackBerry Proxy servers, are installed and operating. For more information, see the [BlackBerry UEM Installation and Upgrade content](#).

- In the **BlackBerry Enterprise Mobility Server Dashboard**, under **BlackBerry Services Configuration**, click **Connect**.
- Click **Service Account**.
- Enter the service account username and password.
- Click **Save**.
- Click **BlackBerry Dynamics**.
- In the **Hostname** field, type the BlackBerry Proxy server hostname.
- In the **Port** field, the port number is prepopulated based on the communication type that you select.
 - If you select HTTP, the Port field prepopulates to 17080.
 - If you select HTTPS, the Port field prepopulates to 17433. This is secure.

Note: If you configure your environment for HTTPS, you must [Export the BlackBerry Proxy certificate to the local computer](#) and then [Import the certificate to the BEMS Windows keystore](#).
- Click **Test** to verify the connection to the BlackBerry Proxy server.
- Click **Save**.

After you finish: If you selected HTTPS, you must configure the BlackBerry Connect app to use SSL communications. For instructions, see "Configuring BlackBerry Connect app settings" for your environment in the [BlackBerry Connect Administration content](#).

Add an app server hosting the entitlement apps to a BlackBerry Dynamics connectivity profile

1. On the menu bar, click **Policies and Profiles**.
2. Click **Networks and Connections > BlackBerry Dynamics connectivity**.
3. Click **+** to create a new connectivity profile or click the BlackBerry Dynamics connectivity profile that you want to add an app server to.
4. If necessary, click **✎**.
5. Under **App servers**, click **Add**.
6. Select the **Feature - Docs Service Entitlement** app that you want to add an app server for.
7. Click **Save**.
8. In the table for the app, click **+**.
9. In the **Server** field, specify the FQDN of the on-premises BEMS server.
10. In the **Port** field, specify the port of the BlackBerry Proxy cluster that is used to access the server. By default, the port is 8443.
11. In the **Priority** drop-down list, specify the priority of this or these servers as primary.
12. In the **Primary BlackBerry Proxy cluster** drop-down list, specify the name of the BlackBerry Proxy cluster that you want to set as the primary cluster.
13. In the **Secondary BlackBerry Proxy cluster** drop-down list, specify the name of the BlackBerry Proxy cluster that you want to set as the secondary cluster.
14. Click **Save**.
15. Repeat steps 5 to 14 for the following apps:
 - BlackBerry Connect
 - BlackBerry Presence Service

Export the BlackBerry Proxy certificate to the local computer

If you must configure SSL communication to allow communication between the BlackBerry Connectivity Node and on-premises BEMS services (for example, the Connect, Docs, and Mail services), export the BlackBerry Proxy root and intermediate certificate chains and import them into the Java keystore on BEMS and the Windows keystore.

Note: The following task is not browser-specific. For specific instructions, see the documentation for the browser you are using.

Before you begin: Verify that the BlackBerry Connectivity Node is installed with a status of Running.

1. On the computer that hosts the BlackBerry Connectivity Node, export the BlackBerry Proxy certificate to your computer. In a browser, type `https://localhost:17433`. A certificate error message is displayed because the certificate was signed by a CA that is not recognized as a well-known CA.
2. To open the Certificate dialog, click the certificate icon in the URL field.
3. Click **Certificate**.
4. Click **Certificate Path**.

5. Click the root certificate. The root certificate is the first item in the Certificate hierarchy.
6. Click **View Certificate**.
7. Click the **Details** tab.
8. Click **Copy to File**.
9. Click **Next**.
10. Select **Base-64 encoded X.509 (.CER)**.
11. Click **Next**.
12. Click **Browse**.
13. Enter a name for the certificate (for example, ca.cer) and export it to the local computer.
14. Click **Save**.
15. Click **Finish**.
16. Click **OK**.

After you finish:

- If you configure the Connect service, copy the exported BlackBerry Proxy certificate to the computer that hosts BEMS and [Import the certificate to the BEMS Windows keystore](#).
- If you configure the Presence service and Docs service, copy the exported BlackBerry Proxy certificate to the computer that hosts BEMS and [Import the certificate into the Java keystore on BEMS](#).

Migrating users, devices, groups, and other data from a source server

You can use the BlackBerry UEM management console to migrate users, devices, groups, and other data from a source on-premises BlackBerry UEM server.

To migrate users, devices, groups, and other data, perform the following actions:

| Step | Action |
|------|--|
| 1 | Review the migration prerequisites. |
| 2 | Connect to a source server. |
| 3 | Optionally, migrate IT policies, profiles, and groups. |
| 5 | Migrate users. |
| 6 | Migrate devices. |

Prerequisites: Migrating users, devices, groups, and other data from a source server

Complete the following prerequisites before you begin a migration.

| Prerequisite | Details |
|------------------------------|---|
| Log in | Log in to BlackBerry UEM as a Security Administrator. |
| Check the software version | To migrate data to BlackBerry UEM, the BlackBerry UEM instance you are migrating data from must be at the latest version of BlackBerry UEM, including any maintenance releases. |
| BlackBerry Connectivity Node | Activate at least one BlackBerry Connectivity Node instance. |

| Prerequisite | Details |
|---|---|
| Configure the BlackBerry UEM company directory connection | <p>Configure the destination BlackBerry UEM company directory connection in the same way that it is configured in the source. For example, if the source is configured for Active Directory integration and it is connected to the example.com domain, configure the destination BlackBerry UEM for Active Directory integration and connect it to the example.com domain.</p> <p>Important: Migration does not work if the company directory on the destination server does not match the company directory on the source server.</p> |
| Check that the required ports are not blocked by a firewall | <p>Ensure that port 8887 (TCP) is unblocked on the BlackBerry Connectivity Node.</p> <p>Ensure that port 1433 (TCP) and port 1434 (UDP) are unblocked on the Microsoft SQL Server.</p> |

Connect to a source server

You must connect BlackBerry UEM to the source server that you are migrating data from.

Note: If more than one BlackBerry Connectivity Node is activated, make sure that you configure all BlackBerry Connectivity Node instances to connect to the same source database.

Note: If you upgraded your source BlackBerry UEM server since the last time you performed a migration, you should recreate the source server configuration before you perform another migration.

1. In the BlackBerry Connectivity Node management console, on the menu bar, click **General settings > Migration**.
2. Click **+**.
3. In the **Display name** field, type a descriptive name for the source database.
4. In the **Database server** field, type the name of the computer that hosts the source database, using the <host> \<instance> format for a dynamic port and the <host>:<port> format for a static port.
5. In the **Database authentication type** drop-down list, select the type of authentication you use to connect to the source database.
6. Do one of the following:

| Option | Description |
|---|---|
| If you selected SQL authentication | <ol style="list-style-type: none"> a. In the SQL username and SQL password fields, type your login information to connect to the source database. b. In the Database name field, type the name of the source database. |
| If you selected Windows NT authentication | <ol style="list-style-type: none"> a. Change the Log On properties of the BlackBerry UEM - BlackBerry Cloud Connector service to the same account you used to install the source BlackBerry UEM. For more information about log on accounts, see the Microsoft TechNet article, Services permissions. Note: After the migration from this source is complete, return the Log On properties setting to Local System account. b. In the Database name field, type the name of the source database. |

7. Click **Save**.

8. In the BlackBerry UEM management console, on the menu bar, click **Settings > Migration > Configuration**.
9. Click **+**.
10. Type the display name of the source database you configured in the BlackBerry Connectivity Node management console.
11. Click **Save**.
12. To test the connection between the source and the destination, click **Test connection**.

After you finish:

- If you want to migrate IT policies, profiles, and groups, review the [best practices](#) and see [Migrate IT policies, profiles, and groups from a source server](#).
- If you want to migrate users, review the [considerations](#) and see [Migrate users from a source server](#).
- After you migrate users, see [Migrate devices from a source server](#).

Considerations: Migrating IT policies, profiles, and groups from a source server

A migration from a BlackBerry UEM source copies the following items to the destination database:

- Selected IT policies
- Email profiles
- Wi-Fi profiles
- VPN profiles
- Proxy profiles
- BlackBerry Dynamics profiles
- CA certificate profiles
- Shared certificate profiles
- SCEP profiles
- User credential profiles
- Certification authority settings
- Any policies and profiles that are associated with the policies and profiles you select

BlackBerry UEM

When you migrate BlackBerry UEM IT policies, profiles, and groups to another domain, consider the following guidelines:

| Item | Considerations |
|---------------------|---|
| IT policy passwords | If any of the source IT policies you selected for Android devices has a minimum password length of less than 4 or more than 16, no BlackBerry UEM IT policies or profiles can be migrated. Deselect or update the source IT policy and restart the migration. |
| Profile names | After migration, you must make sure that all SCEP, user credential, shared certificate, or CA certificate profiles have unique names. If two profiles of the same type have the same name, you must edit one of the profile names. |

| Item | Considerations |
|------------------------|--|
| Directory groups | To migrate directory groups, the source database and destination database must each have only one directory configured. This directory must be configured the same way on both the source and destination database. If the directories are not set up this way, directory groups are not migrated. |
| Nested groups | If the source and destination databases are BlackBerry UEM databases that have been integrated with BES5, you cannot migrate nested user groups. If you try to migrate nested groups, other groups, profiles, and PKI configuration information might not be migrated. |
| Good Dynamics profiles | You cannot migrate BlackBerry Dynamics profiles from BlackBerry UEM to BlackBerry UEM Cloud. |

Migrate IT policies, profiles, and groups from a source server

Optionally, you can migrate the IT policies, profiles, and groups from a source server.

1. On the menu bar, click **Settings**.
2. Click **Migration > IT policies, profiles, groups**.
3. Click **Next**.
4. Select the check boxes for the items that you want to migrate.
The name of the source server is appended to each policy and profile name when it is migrated to the destination.
5. Click **Preview** to review the policies and profiles you selected.
6. Click **Migrate**.
7. To configure the IT policies, profiles, and groups, click **Configure IT policies and profiles** to go to the **Policies and Profiles** screen.

After you finish: On the destination server, create the policies and profiles that could not be migrated and assign them to users before you migrate devices.

Considerations: Migrating users from a source server

Keep the following things in mind when you migrate users to a destination BlackBerry UEM:

| Item | Considerations |
|---------------------------|--|
| Maximum number to migrate | <p>You can migrate a maximum of 1000 users at a time from a source.</p> <p>If you select more than the maximum number of users, only the maximum number are migrated to the destination BlackBerry UEM. The remaining users are skipped. Repeat the migration process as many times as necessary to migrate all the users from the source server.</p> <p>Note: If BlackBerry UEM times out while migrating 1000 users, try migrating fewer users.</p> |

| Item | Considerations |
|---------------|---|
| Email address | <ul style="list-style-type: none"> • Users must have an email address before they can be migrated. • You cannot migrate a user who already uses the same email address in the destination BlackBerry UEM. These users do not appear in the list of users to migrate. • If two users in the source have the same email address, only one user is displayed on the Migrate users screen. • If two users in the source have the same email address, the user information displayed on the Migrate devices screen could be the information for either of the users. |
| Password | After migration, local users must change their password after they log in to BlackBerry UEM Self-Service for the first time. Users who did not have permission to access BES12 Self-Service or BlackBerry UEM Self-Service before migration are not automatically granted permission after migration. |
| Groups | You can filter users with no group assignment to include this set of users for a migration. |

Migrate users from a source server

You can migrate users from a source server to the destination BlackBerry UEM. The users remain in both source and destination after the migration is complete.

1. On the menu bar, click **Settings > Migration > Users**.
2. Click **Next**.
3. Select the users to migrate.
4. Click **Next**.
5. Assign one or more groups and assign an IT policy and one or more profiles to the selected users.
For more information, [see the Administration content](#).
6. Click **Preview**.
7. Click **Migrate**.

After you finish: [Migrate devices from a source server](#).

Considerations: Migrating devices from a source server

Keep the following things in mind when migrating devices to a destination BlackBerry UEM:

| Item | Considerations |
|----------------------------|--|
| Maximum number to migrate | You can migrate a maximum of 2000 devices at a time from a source server. |
| Destination BlackBerry UEM | Before you migrate devices verify that BlackBerry UEM supports the device type and OS. |

| Item | Considerations |
|-----------------|---|
| Users | <ul style="list-style-type: none"> The users must exist in the destination BlackBerry UEM domain For migrations from BlackBerry UEM, you cannot migrate more than five devices per user at the same time. |
| iOS devices | <ul style="list-style-type: none"> iOS devices must have the latest version of the BlackBerry UEM Client installed. All iOS devices must be trusted (untrusted iOS devices cannot be migrated). iOS devices that are assigned the App lock profile cannot be migrated because the BlackBerry UEM Client cannot be opened for the migration |
| Android devices | <ul style="list-style-type: none"> Android devices must have the latest version of the BlackBerry UEM Client installed. You cannot migrate Android devices that have a work profile. |
| Windows devices | You cannot migrate Windows devices. |
| macOS devices | You cannot migrate macOS devices. |
| MDM controls | Devices activated with "MDM controls" temporarily lose access to email when the migration begins. Email services are restored when the migration is complete. |

Migrate devices from a source server

After you migrate users from the source server to the destination BlackBerry UEM, you can migrate their devices. The devices move from the source server to the destination BlackBerry UEM and are no longer in the source after the migration.

Before you begin:

- Before you migrate devices, verify that the appropriate policies and entitlements are assigned to the users that you've migrated.
- Notify iOS device users that they must open the BlackBerry UEM Client to start the migration to BlackBerry UEM and that they must keep the BlackBerry UEM Client open until the migration is complete.

- On the menu bar, click **Settings > Migration > Devices**.
- Click **Next**.
- Select the devices to migrate.
- Click **Preview**.
- Click **Migrate**.
- To view the status of the devices being migrated, click **Migration > Status**.

Device migration quick reference

| Device type | Activation type/Configuration | Migration |
|---------------|-------------------------------|-----------|
| BlackBerry 10 | Any | Supported |

| Device type | Activation type/Configuration | Migration |
|--|--|---------------|
| Android | <ul style="list-style-type: none"> MDM controls BlackBerry 2FA | Supported |
| Android | <ul style="list-style-type: none"> BlackBerry Dynamics (UEM to UEM) | Not supported |
| Android devices that have a work profile | Any | Not supported |
| Android Samsung Knox Workspace devices | Any | Supported |
| iOS | <ul style="list-style-type: none"> MDM controls Device registration for BlackBerry 2FA only DEP devices that have the BlackBerry UEM Client installed | Supported |
| iOS | <ul style="list-style-type: none"> BlackBerry Dynamics (UEM to UEM) DEP devices that don't have the BlackBerry UEM Client installed | Not supported |
| Windows | Any | Not supported |
| macOS | Any | Not supported |

Migrating DEP devices

You can migrate iOS devices that are enrolled in Apple's Device Enrollment Program (DEP) from a source BES12 or BlackBerry UEM database to another BlackBerry UEM database.

Migrate DEP devices that have the BlackBerry UEM Client installed

You can migrate iOS devices that are enrolled in Apple's Device Enrollment Program (DEP) and are activated with the "Work and personal - full control" or "MDM controls" activation types.

Before you begin: In the app settings for the BlackBerry UEM Client, clear the **Remove the app from the device when the device is removed from BlackBerry UEM** check box.

1. In the DEP portal, create a new virtual MDM server.
2. Connect the destination BlackBerry UEM instance to the new virtual MDM server. For more information, see [Configuring BlackBerry UEM for DEP](#).
Make sure that the DEP profile of the destination BlackBerry UEM instance matches the DEP profile of the source BES12 or BlackBerry UEM instance.
3. Move the DEP devices from the source virtual MDM server to the new virtual MDM server.

4. In the BlackBerry UEM management console, migrate the DEP devices from the source instance to the destination BlackBerry UEM instance.

Migrate DEP devices that do not have the BlackBerry UEM Client installed

iOS devices that are enrolled in Apple's Device Enrollment Program (DEP) and do not have BlackBerry UEM Client installed appear in the list of devices that are unsupported for migration.

1. In the DEP portal, create a new virtual MDM server.
2. Connect the destination BlackBerry UEM instance to the new virtual MDM server. For more information, see [Configuring BlackBerry UEM for DEP](#).

Make sure that the destination BlackBerry UEM instance has the same DEP profile as the source instance.

3. Move the DEP devices from the source virtual MDM server to the new virtual MDM server.
4. Perform a factory reset of each DEP device.
5. Reactivate each DEP device.

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