Integrate Workspace ONE UEM with Directory Service

VMware Workspace ONE UEM 2011

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Integrating Workspace ONE UEM with your Directory Services

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Workspace ONE UEM powered by AirWatch integrates with your organization's existing directory service – such as Active Directory, Lotus Domino, and Novell e-Directory – to provide directory-based account access. This type of account access lets users authenticate with Workspace ONE UEM apps and enroll devices using their existing directory service credentials.

Integrating with directory services eliminates the need to create basic user accounts in your organization. Such integration can also help simplify the enrollment process for end users by applying information they already know.

Ongoing LDAP synchronization detects any changes within the system. This synchronization performs necessary updates across all devices for affected users. In cases where administrative approval is required before changes occur, this synchronization obtains such approval.

You may also migrate Basic Users to LDAP Users, checking against existing directory users. For more information, please see the KB article: Migrating Basic users to Directory (AD) users.

Integrating Workspace ONE UEM with your directory service provides many benefits.

- Conduct enrollment for both users and administrators.
- Map directory groups to Workspace ONE UEM user groups.
- Control UEM console access.
- Apply existing credentials for VMware Content Locker access.
- Assign apps, profiles, and policies by user group.
- Automatically retire end users when they go inactive.

The following sections explain how to integrate your Workspace ONE UEM environment with your directory service of choice. Also, how to add directory user accounts to Workspace ONE UEM and how to integrate user groups in Workspace ONE UEM.

Requirements, Setup, and User Integration

Workspace ONE UEM supports integration with Lightweight Directory Access Protocol (LDAP)-based directory services.

- Microsoft Active Directory Functional Level (2016, 2012, or 2008)
- Lotus Domino

- Novell e-Directory

The default port for an unencrypted LDAP communication is 389. Software as a Service (SaaS) environments can use SSL encrypted traffic using port 636.

- Ensure the Directory Sync Service and the Scheduler Service are running on the same server, since they write to and read from the same queues.

You must designate an existing organization group (OG) as the primary root OG from which you manage devices and users.

Directory services (and VMware Enterprise Systems Connector when used) must be enabled in Workspace ONE UEM at the level of this root OG.

Directory User Group Integrations

If you have user groups in your active directory structure, you can make the same user groups in Workspace ONE UEM. Enable integrated updates so when you change your active directory user group assignments, those same changes get made in Workspace ONE UEM. For more information, see Chapter 4 Managing Directory User Group Integration in Workspace ONE UEM.

Directory Services Setup 2

Directory services setup requires you to integrate your Workspace ONE UEM environment with your directory service including attribute mapping for users and user groups. Currently we support multi-domain single forest integration. However, if you are using LDAP - Active Directory, multi-domain multi forest integration works when there is a two-way transitive trust is available at Forest level. Use the **Directory Services** page to configure the settings that let you integrate your Workspace ONE UEM server with your domain controller (the server hosting your directory services).

Security Assertion Markup Language (SAML) settings can also be configured on this page.

After entering server settings, you can filter searches to identify users and groups. You can set options to auto merge and sync between your Workspace ONE UEM configured groups and directory service groups. You can also map attribute values between Workspace ONE UEM user attributes and your directory attributes.

Note For Software as a Service (SaaS) customers, directory services integration requires you to install the VMware Enterprise Systems Connector. For more information, see the VMware Workspace ONE Quick Configuration Guide.

This chapter includes the following topics:

Set up Directory Services with a Wizard

The Workspace ONE UEM console provides a simplified wizard to streamline the directory services setup process. The wizard includes steps to integrate either Security Assertion Markup Language (SAML), Lightweight Directory Access Protocol (LDAP) or both.

The wizard also automates the provisioning of Workspace ONE UEM applications to VMware Identity Manager, greatly simplifying the process.

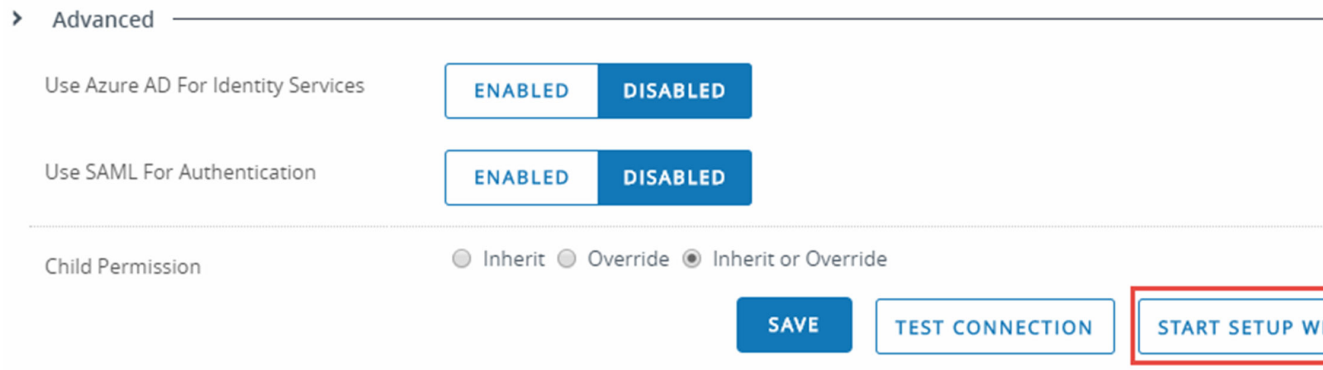
For more information about integrating Workspace ONE UEM with Workspace ONE Access and deploying Workspace ONE with single sign-on to devices, see the Workspace ONE Quick Configuration Guide.

Note If SAML or LDAP settings are already configured on your directory services server, the UEM console detects it automatically.

Procedure

1 Access the directory services setup wizard from two places.

- The main UEM console Getting Started Wizard.
- Navigate to **Groups & Settings > All Settings > System > Enterprise Integration > Directory Services** and select **Start Setup Wizard**.



2 Upon launching the wizard, select **Configure** to follow the steps.

Alternately, you can **Skip wizard and configure manually** to configure settings on your own. See Set Up Directory Services Manually.

Set Up Directory Services Manually

If you want to customize your directory service settings, you can skip the wizard and configure your settings manually to get up and running with Workspace ONE Express or Workspace ONE UEM powered by AirWatch.

Navigate to **Accounts > Administrators > Administrator Settings > Directory Services** to manually configure the Server, User, and Group settings for the Directory service.

1 Navigate to **Accounts** > **Administrators** > **Administrator Settings** > **Directory Services** > **Server** and configure **LDAP** settings.

Setting	Description
Directory Type	Select the type of directory service that your organization uses. Workspace ONE UEM and Workspace ONE Express supports open-source LDAP for directory services. For more information on the best practices that can be followed while configuring open-source LDAP Directory Service, see the Workspace ONE UEM Directory Service Integration guide.
DNS SRV	Allow the Domain Name System Service Record to decide which server in its prioritized list of servers can best support LDAP requests. This feature ensures continuity of services in a high availability environment. The default setting is Disabled. With this option disabled, Workspace ONE UEM uses your existing directory server, the address of which you enter in the Server setting. Supported DNS servers: ■ Active Directory integrated Microsoft DNS servers ■ Standalone Microsoft DNS servers
Server	Enter the address of your directory server. This setting is only available when **Enable DNS SRV** is Disabled.
Encryption Type	Select the type of encryption to use for a directory services communication. The options available are **None** (unencrypted), **SSL**, and **Start TLS**.
Port	Enter the Transmission Control Protocol (TCP) port used to communicate with the domain controller. The default for the unencrypted LDAP directory service communication is port 389. To view a KnowledgeBase article that lists the most up-to-date Workspace ONE UEM SaaS data center IP ranges, refer to https://support.air-watch.com/articles/115001662168. ■ When you change the **Encryption Type** setting to **SSL**, the **Port** setting automatically changes to 636. ■ When you select the **Add Domain** button, the **Port** setting automatically changes to 3268.
Verify SSL Certificate.	This setting is only available when the **Encryption Type** is **SSL** or **Start TLS**. Receive SSL errors by selecting the SSL check box.
Protocol Version	Select the version of the Lightweight Directory Access Protocol (LDAP) that is in use. Active Directory uses LDAP versions 2 or 3. If you are unsure of which Protocol Version to use, try the commonly used value of '3'.
Use Service Account Credentials.	Use the App pool credentials from the server on which the VMware Enterprise Systems Connector is installed for authenticating with the domain controller. Enabling this option hides the **Bind user name** and **Bind Password** settings.
Bind Authentication Type.	Select the type of bind authentication to enable the AirWatch server to communicate with the domain controller. You can select **Anonymous**, **Basic**, **Digest**, **Kerberos**, NTLM, or **GSS-NEGOTIATE**. If you are unsure of which Bind Authentication Type to use, start by setting the bind authentication type to **Basic**. You know if your selection is not correct when you click **Test Connection**.

Setting	Description
Bind User Name.	Enter the credentials used to authenticate with the domain controller. For example, you can enter either "Username or Domain\username". This account (which the entered user name identifies) allows a read-access permission on your directory server and binds the connection when authenticating users. If you are unsure of which Bind Authentication Type to use, try the commonly used GSS-NEGOTIATE. You know if your selection is not correct when you click Test Connection. Clear the bind password from the database by selecting the **Clear Bind Password** check box.
Bind Password	Enter the password for the bind user name to authenticate with the directory server.
Domain /Server	Enter the default domain and server name for any directory-based user accounts. If only one domain is used for all directory user accounts, fill in the text box with the domain. This entry means that users are authenticated without explicitly stating their domain. You can add more domains by selecting the **Add Domain** option. Make sure that all the domains are in the same forest. In this case, Workspace ONE UEM automatically changes the port setting to 3268 for global catalog. You can change the port setting to 3269 for SSL encrypted traffic, or override it completely by entering a separate port.
Is there a trust relationship between all domains?	This setting is available only when you have more than one domain added. Select **Yes** if the binding account has permission to access other domains you have added. This added permission means that the binding account can successfully log in from more domains.

a Complete the following options are available after selecting the Advanced section drop-down.

Setting	Description
Search Subdomains	Enable subdomain searching to find nested users. Leaving this option disabled can make searches faster and avoids network issues. However, users and groups located in subdomains under the base Domain Name (DN) are not identified.
Connection Timeout	Enter the LDAP connection timeout value (in seconds).
Request Timeout	Enter the LDAP query request timeout value (in seconds).
Search without base DN	Enable this option when using a global catalog and when you do not want to require a base DN to search for users and groups.
Use Recursive OID at Enrollment.	Verify the user group membership at the time of enrollment. As the system runs this feature at enrollment time, your performance can decrease with some directories.
Use Recursive OID For Group Sync.	Verify the user group membership at the time of Group synchronization.
Object Identifier Data Type	Select the unique identifier that never changes for a user or group. The options available are **Binary** and **String**. Typically, the Object Identifier is in a **Binary** format.
Sort Control	Option to enable sorting. If this option is disabled, it can make searches faster and you can avoid sync timeouts.

b (Optional) Configure Azure AD For Identity Services.

The following settings are available only if enabling **Use Azure AD for Identity Services** and are only applicable if you are integrating with Azure Active Directory.

Azure AD integration with Workspace ONE UEM must be configured at the tenant where Active Directory (such as LDAP) is configured.

Setting	Description
MDM Enrollment URL	Enter the URL address used to enroll devices.
MDM Terms of Use URL	Enter the URL address of your terms of use agreement. There is a helpful link that displays exactly where in the Workspace ONE UEM in the Azure AD config panel these MDM URLs belong. This link is labeled, "Where in AAD do I paste this info?"
Directory ID	Enter the identification number used to authenticate your Azure AD license. The Azure **Directory ID** is found in your Azure AD Directory Instance URL. For example, if your URL is acme.com/WS/ADExt/Dir/0a12bc34-56d7-93f1-g2h3-i4-jk56lm78n, only the last section (0a12bc34-56d7-93f1-g2h3-i4-jk56lm78n) is your **Directory ID**.
Tenant Name	Enter the tenant name of your Azure AD instance. There is a helpful link that displays exactly how to obtain the tenant info from your AAD Directory Instance. This link is labeled, "How To Obtain Tenant Info"
Immutable ID-Mapping Attribute	The Immutable ID-Mapping Attribute points to the sourceAnchor field in Active Directory that is mapped to Azure AD. This setting enables Workspace ONE UEM to match the Azure AD immutable ID to the correct local active directory attribute.
Mapping Attribute Data Type	Select the mapping attribute data type of the field used by Workspace ONE UEM as the sourceAnchor for Azure AD. The default type is Binary.
Automatically revoke user tokens when wiping devices.	Enable this option to revoke Microsoft Azure AD user tokens when a device or enterprise wipe is run. It is not a best practice to disable this functionality as it might reduce the security posture of your configuration. If a wiped device is lost, it can still contain a valid AAD authentication token.

c (Optional) Configure SAML For Authentication.

The following Security Assertion Markup Language (SAML) options are available after enabling **Use SAML for Authentication**.

These options are only applicable if you are integrating with a SAML identity provider.

Setting	Description
Enable SAML authentication For	You have the choice of using SAML authentication for **Admin**, **Enrollment**, or **Self Service Portal**. UEM console administrators can select all three, or any combination of two, or select any one of the three components.
Use new SAML Authentication endpoint	A new SAML authentication endpoint has been created for end-user authentication (device enrollment and login to SSP). This authentication replaces the two dedicated enrollment and SSP endpoints with a single endpoint. While you may choose to keep your existing settings, Workspace ONE UEM suggests updating your SAML settings to take advantage of the new combined endpoint. If you want to use the new endpoint, enable this setting and save the page. Then use the **Export Service Provider Settings** to export the new metadata file and upload it to your IdP. Doing so establishes trust between the new endpoint and your IdP.

Table 2-1. SAML 2.0

Setting	Description
Import Identity Provider Settings	Upload a metadata file obtained from the identity provider. This file must be in Extensible Markup Language (XML) format.
Service Provider (Workspace ONE UEM**) ID**	Enter the Uniform Resource Identifier (URI) with which Workspace ONE UEM identifies itself to the identity provider. This string must match the ID that has been established as trusted by the identity provider.
Identity Provider ID	Enter the URI that the identity provider uses to identify itself. Workspace ONE UEM reviews authentication responses to verify that the identity matches the ID provided here.

Table 2-2. RESPONSE

Setting	Description
Response Binding Type	Select the binding types of the response. The options include **Redirect**, **POST**, and Artifact.
Sp Assertion URL	Enter the Workspace ONE UEM URL that the identity provider configures to direct its authentication responses. “Assertions” regarding the authenticated user are included in success responses from the identity provider.
Authentication Response Security	This value specifies whether the IdP signs the response. You can select between **None**, **Validate Response Signatures**, and **Validate Assertions Signatures**. Consider selecting Validate Response Signatures for a more secure authentication.

Table 2-3. CERTIFICATE

Setting	Description
Identity Provider Certificate	Upload the identity provider certificate.
Service Provider (AirWatch) Certificate	Upload the service provider certificate.**Note:**Currently we only support SHA256 based algorithms. For more information on all the providers that support SHA256, see https://docs.microsoft.com/en-us/windows/desktop/SecCertEnroll/cryptoapi-cryptographic-service-providers.
Export Service Provider Settings button	Exports the metadata file for uploading to your Identity Provider (IdP). This setting establishes trust between the new SAML endpoint (for enrollment and SSP login) and your IdP.

2 Navigate to **Accounts** > **Administrators** > **Administrator Settings** > **Directory Services** > **User** and configure the **User** settings.

Setting	Description
User Object Class	Enter the appropriate Object Class. In most cases, this value is "user."
User Search Filter	Enter the search parameter used to associate user accounts with Active Directory accounts. The suggested format is "<LDAPUserIdentifier>={EnrollmentUser}" where <LDAPUserIdentifier> is the parameter used on the directory services server to identify the specific user. ■ For AD servers, use "(&(objectCategory=person)(sAMAccountName={EnrollmentUser}))" exactly. ■ For other LDAP servers, use "CN={EnrollmentUser}" or "UID={EnrollmentUser}"

Advanced

Setting	Description
Auto Merge	Enable setting to allow user group updates from your directory service to merge with the associated users and groups in Workspace ONE UEM automatically.
Automatically Sync Enabled Or Disabled User Status	Select Enabled to deactivate the associated user in Workspace ONE UEM when that user is disabled in your LDAP directory service (for example, Active Directory, Novell e-Directory, and so on). ■ **Value For Disabled Status** – Enter a numeric value and select the type of Lightweight Directory Access Protocol (LDAP) attribute used to represent a user's status. Select "Flag Bit Match" if the user status is designated by a bitwise flag (which is the default for Active Directory). Select "Flag Bit Match" if the user status is designated by a bitwise flag (which is the default for Active Directory). When "Flag Bit Match" is selected, Directory Services will consider the user to be disabled if any bits from the property match the given value. **Note:**If you select this option and you disable users in your directory service, the corresponding user account in Workspace ONE UEM is marked inactive and those administrators and users are not able to log in. In addition, enrolled devices assigned to users who are set as inactive in your directory service are automatically unenrolled.
Enable Custom Attributes	Enable custom attributes. Custom Attributes is a section that appears under the main **Attribute** – Mapping Value table. You must scroll down to the bottom of the page to see the Custom Attributes.

Setting	Description
Attributes	Review and edit the **Mapping Values** for the listed Attributes, if necessary. These columns show the mapping between Workspace ONE UEM user attributes (left) and your directory service attributes (right). By default these attributes are values most commonly used in Active Directory (AD). Update these mapping values to reflect the values used for your own or other directory service types. If you add or remove a custom attribute, you should initiate a manual sync afterward by selecting the **Sync Attributes** button.
Sync Attributes button	Manually sync the attributes mapped here to the user records in Workspace ONE UEM. Attributes sync automatically on the time schedule configured for the Workspace ONE UEM environment.

3 Navigate to **Accounts** > **Administrators** > **Administrator Settings** > **Directory Services** > **Group** and configure **Group** settings.

Setting	Description
Group Object Class	Enter the appropriate Object Class. In most cases this value should be **group**.
Organizational Unit Object Class	Enter the appropriate Organizational User Object Class.

Advanced

Setting	Description
Group Search Filter	Enter the search parameter used to associate user groups with directory service accounts.
Auto Sync Default	Select this checkbox to automatically add or remove users in Workspace ONE UEM configured user groups based on their membership in your directory service.
Auto Merge Default	Select this check box to automatically apply sync changes without administrative approval.
Maximum Allowable Changes	Enter the number of maximum allowable group membership changes to be merged into Workspace ONE UEM. Any number of changes detected upon syncing with the directory service database under this number are automatically merged. If the number of changes exceed this threshold, an administrator must manually approve the changes before they are applied. A single change is defined by a user either leaving or joining a group. A setting of 100 Maximum Allowable Changes means the Console does not need to sync with your directory service as much.
Conditional Group Sync	Enable this option to sync group attributes only after changes occur in Active Directory. Disable this option to sync group attributes regularly, regardless of changes in Active Directory.

Setting	Description
Auto-Update Friendly Name	When enabled, the friendly name is updated with group name changes made in active directory. When disabled, the friendly name can be customized so admins can tell the difference between user groups with identical common names. This can be useful if your implementation includes organizational unit (OU)-based user groups with the same common name.
Attribute	Review and edit the **Mapping Value** for the listed **Attribute**, if necessary. These columns show the mapping between Workspace ONE UEM user attributes (left) and your directory service attributes (right). By default these attributes are values most commonly used in AD. Update these mapping values to reflect the values used for your own or other directory service types.

4 Verify that you have established proper connectivity by selecting the Test Connection button.

The server connection is tested for all the domains listed on the page using the server name, bind user name, and the password provided by the administrator. You can rerun the test by clicking the **Test Again** button.

5 Select **Save**.

Best Practices for Configuring Open Source LDAP Directory Service Type

Workspace ONE UEM supports open source LDAP for directory services. For instance, similar to Microsoft Active Directory, Novell e-Directory, Lotus Domino, we have Samba OpenLDAP server for Directory services. Samba OpenLDAP is a widely used LDAP server in Linux environment.

If you choose to select any other LDAP server other than Active Directory, Novell e-Directory or Lotus Domino, you can refer through the following configuration tips that covers the most critical steps while configuring open source LDAP directory service.

Bind Authentication Type

You are required to select the type of bind authentication to enable the AirWatch server to communicate with the domain controller.

You can select **Anonymous**, **Basic**, **Digest**, **Kerberos**, **NTLM**, or **GSS-NEGOTIATE**. If unsure start by setting the bind authentication type to **Basic**. You will know if your selection is not correct when you click **Test Connection**.

Bind User Name

Enter the credentials used to authenticate with the domain controller. This account (which the entered user name identifies) allows a read-access permission on your directory server and binds the connection when authenticating users. It is considered to be a best practice to use the full base distinguished name for the bind username. For example, you can use **CN=admin**,**DC=domain**,**DC=com**.

User Search Filter

In the User Tab, enter the search parameter that is used to associate user accounts with Active Directory accounts and make sure your user search filter is appropriately configured. You could expect appropriate results if you set the search filter as **(&(objectCategory=person)(sAMAccountName={EnrollmentUser}))**.

Use Compliance data in Azure AD Conditional Access policies by integrating Workspace ONE UEM with Microsoft

Workspace ONE UEM integration with Microsoft allows customers to use Workspace ONE UEM device data such as device compliance state in the Azure AD conditional access policies. The integration gives you the ability to set different conditional access policies for individual Office 365 applications. Platform support for this feature is limited to iOS, Android, and Windows 10 OOBE enrolled devices.

You can restrict access to individual Office 365 applications if the device is unmanaged and not compliant. For instance, you can opt to allow users to access Microsoft Word on any device while restricting access to OneDrive to only managed and compliant devices.

Prerequisites

Note We currently do not support FedRamp Workspace ONE UEM environment, Government Cloud Computing (GCC) and GCC high Azure environment.

1 Navigate to **Monitor > Intelligence**, check the **Opt-in** box, and complete the process. For more information, see VMware Workspace ONE Intelligence documentation. You do not need the VMware Workspace ONE Intelligence license to enable the integration.

2 This feature is also supported for on-premise Workspace ONE UEM environment, however ETL connector is required to be installed and connected to the nearest Intelligence data center. For more information, see Workspace ONE Intelligence requirement.

   Note It is important that you create a publicly resolvable URL for the UEM console and open the network for VMware Workspace ONE Intelligence to reach the publicly available console URL over port 443.

3 Workspace ONE Intelligent Hub 20.3 and above.

4 For all your iOS and Android legacy devices make sure you install and register Microsoft Authenticator.

5 For all Android enterprise devices, Microsoft Authenticator and all the applications used for conditional access must be pushed as a managed app.

6 You require a valid subscription to Microsoft Intune, and the Microsoft Intune licenses must be assigned to the users supported by this integration. For more information, see the Microsoft subscription.

Warning You cannot disable or re-enable the integration under the following circumstances:

- If you remove VMware Workspace ONE mobile compliance partner from the partner compliance management in the Azure Active Directory.
- If you remove Workspace ONE Conditional Access app in the enterprise applications from Azure Active Directory.

If you want to disable the integration, complete the following:

- Disable conditional access settings in Workspace ONE UEM console.
- Look up for the security group and manually remove the existing device records in the Azure Active Directory.

If you are making changes on the Azure device partner compliance, complete the following.

- Navigate to **Groups & Settings > All Settings > System > Enterprise Integration > Directory Service > Sync Azure Services** to sync the latest information from the Azure portal.

Procedure

1 Log into the Azure portal as an admin. Add **VMware Workspace ONE mobile compliance** as a device partner for the Android and iOS device type. For more information, see support third-party device compliance partners in the Microsoft Intune documentation.

2 In the Workspace ONE UEM console, navigate to **Groups & Settings > All Settings > System > Enterprise Integration > Directory Services**.

3 Enter Azure **Directory ID** in the Directory ID text box. The Azure **Directory ID** is found in your Azure AD Directory Instance URL. For example, if your URL is `acme.com/WS/ADExt/Dir/0a12bc34-56d7-93f1-g2h3-i4-jk56lm78n`, only the last section `0a12bc34-56d7-93f1-g2h3-i4-jk56lm78n` is your **Directory ID**.

Note Currently, we only support mapping one Azure tenant to one Workspace ONE UEM Customer OG.

4 Enable **Use Azure AD for Compliance**.

Note This setting is visible only for a customer OG. Child OGs inherits this setting but is not visible in the user interface.

A pop-up menu appears that redirects you to Microsoft for authenticating the Azure AD.

5 Click **Proceed**.

You are directed to a Microsoft webpage to authenticate and approve your permit.

6 Accept the permissions.

Once you accept the permissions, the **Workspace ONE conditional access** app is added to your Azure portal. For the Windows OOBE device type, admin must manually add the **AirWatch By VMware** application.

7 Navigate to the Workspace ONE UEM console and complete the integration.

UEM performs a validation. If the permissions have been accepted. A pop-up box appears. If you do not accept the permissions in step 6, the complete integration step is greyed out.

If you have accepted the permissions in step 6, the complete integration step will be active and upon completing the step, a success message is displayed.

A success message is displayed after the integration is complete. Once you have successfully completed the integration, navigate to Azure AD to configure conditional access policies. Under **Enable Policy** select **On** to enable the desired policy. For more information, see Create a device-based Conditional Access policy.

Note Users are blocked, and redirected to register their Workspace ONE enrolled devices with Intune and AAD only when they attempt to run an application with a AAD conditional access policy applied to it. Configuring Azure AD conditional access policies as **Report Only** does not direct users through registration.

8 If any changes are made to the Device partner compliance page in Intune, then the **Sync** button syncs the information.

9 If you want to manually send the compliance state of the device and management state of the device to Azure, of then they can Resync the data by clicking **Re-sync**.

Note Once the resync is done, it is grayed for next four hours.

10 Once you have successfully completed the migration, navigate to Azure AD to configure conditional access policies. Under **Enable Policy**, select On to enable the desired policy. For more information, see Create a device-based Conditional Access policy.

Workspace ONE Boxer and iOS Native Mail client Configuration for Microsoft Conditional Access

Microsoft Conditional Access is available for the applications that contain Microsoft Authentication Library (MSAL). This feature can be extended to applications that support SafariViewController and supports SSO extension. Since the iOS Boxer client and iOS native mail client leverages SafariViewController it can support Microsoft Conditional Access for iOS devices 13 and above.

Complete the following steps to configure the profile.

Procedure

1 Navigate to **Resources** > **Profiles & Baselines** > **Profiles** .

2 Select **Add** > **Apple iOS** > **Device Profile**.

3 Configure **Profile** General settings.

4 Select **SSO Extension payload**.

5 Configure the profile settings.

Settings	Description	Recommended Settings
Extension Type	Select the type of SSO extension for the application. If Generic is selected, provide the Bundle ID of the application extension that performs SSO for the specified URLs in the Extension Identifier field. If Kerberos is selected, provide the Active Directory Realm and Domains.	Generic SSO extension type settings.
Extension Identifier	Enter the Team Identifier of the application extension that performs SSO for the specified URLs.	As a best practice, you can enter **`com.microsoft.azureauthenticator.ssoextension`**.
Type	Select either Credential or Redirect as extension type. Credentials extension is used for the challenge/response authentication. Redirect extension can use OpenID Connect, OAuth, and SAML authentication.	It is a best practice to select **Redirect** as the extension type.
URLs	Enter one or more URL prefixes of identity providers where the application extension performs SSO.	As a best practice, you can enter the following : ■ https://login.microsoftonline.com ■ https://login.windows.net ■ https://sts.windows.net ■ https://login.microsoft.com
Additional Settings	Enter one or more URL prefixes of identity providers where the application extension performs SSO.	As a best practice, you can enter the following : **`<dict> <key>TeamIdentifier</key> <string>SGGM6D27TK</string> </dict>`** **Note** SGGM6D27TK is the identifier for Office apps

6 Select **Save and Publish**.

7 Configure the Authenticator application.

a Do not use `sharedDeviceMode` as a configuration key. If the configuration key value is set, configure the value to be **false** under **Resources** > **Apps** > **Native or Purchased** > **Select iOS Microsoft Authenticator** > **Assign** > **Select Assignment Name** > **Application Configuration**.

Configuration Key -`{sharedDeviceMode}`

Value Type - Boolean

Configuration Value - False

Description - Do not use `sharedDeviceMode`. Apps like Microsoft Teams or Microsoft Onedrive do not have the support for `sharedDeviceMode` and could result in login failure.

What to do next

Configure conditional access on Azure portal for native mail client.

Include Apple Internet Accounts under Cloud apps or action in your conditional access policy. For more information on creating a conditional access policy, see Create a device-based Conditional Access policy. After applying the policy, you may need to restart the device to take it int effect.

VMware Identity Manager with Directory Services

VMware Identity Manager together with Workspace ONE UEM enables you to consolidate a list of your organization's suggested Web apps and native mobile apps in unified application catalogs. This functionality does not allow for Workspace ONE UEM to receive directory changes from Identity Manager. After configuring directory integration settings between your Workspace ONE UEM instance and VMware Identity Manager, your end users must sign in only once using Workspace ONE. Single sign-on enables access to all your organization's available apps without the need to sign in each time.

For more information about integrating Workspace ONE UEM with Workspace ONE Access and deploying Workspace ONE with single sign-on to devices, see the Workspace ONE Quick Configuration Guide.

Requirements

Before you can integrate directory services with VMware Identity manager, complete the following:

- Set up and configure VMware Enterprise Systems with your Workspace ONE UEM environment.
- Set up and configure Directory service integration for the selected organization group and not inheriting settings from a parent organization group.
- Accept the End User License Agreement (EULA) found in the VMware Identity Manager console. This EULA displays when you first open the console.

Synchronization Between Workspace ONE UEM and VMware Identity Manager

Synchronization of directory information between Workspace ONE UEM and VMware Identity Manager occurs on the same schedule as the Workspace ONE UEM directory sync. Users are also synced to VMware Identity Manager immediately when added by an administrator manually or from a bulk import.

Also, the integration with VMware Identity Manager supports Just-in-Time provisioning (JIT). Users with directory accounts have their accounts synced to VMware Identity Manager the first time they log in using an enrollment or self-service portal. Manual synchronization is not required to add a single user to VMware Identity Manager immediately.

Manage VMware Identity Manager Integration with Directory Services

After you bind your directory settings between Workspace ONE UEM and Identity Manager, you can perform some management actions on the settings page. Navigate to**Groups & Settings > All Settings > System > Enterprise Integration > VMware Identity Manager > Configuration**.

You can perform the following actions on the settings page:

- Edit the VMware Identity Management for Directory Services configuration by selecting the **Edit** button.
- Delete the configuration by selecting the **Delete** button.
- Initiate a synchronization of the structures within your directory services and VMware Identity Management by selecting the **Sync Now** button.

Integrate VMware Identity Manager with Directory Services

VMware Identity Manager together with Workspace ONE UEM enable you to consolidate a list of your organization's suggested Web apps and native mobile apps in unified application catalogs. This functionality does not allow for Workspace ONE UEM to receive directory changes from Identity Manager. Use the following instructions to configure server-related settings.

For more information about integrating Workspace ONE UEM with Workspace ONE Access and deploying Workspace ONE with single sign-on to devices, see the Workspace ONE Quick Configuration Guide.

1 Navigate to **Groups & Settings** > **All Settings** > **System** > **Enterprise Integration** > **VMware Identity Manager** > **Configuration**.

2 Enter your server information.

Setting	Description
URL	Bind to Workspace ONE UEM by entering the URL of your VMware Identity Manager tenant. A valid license for VMware Identity Manager is required.
Admin user name	Enter the administrator user name, which is case-sensitive.
Admin Password	Enter the administrator password, which is case-sensitive.

3 Verify that you have established proper connectivity by selecting the **Test Connection** button.

4 Click **Next** to save your selections and proceed to the next configuration screen.

Setting	Description
Directory	Workspace ONE UEM imports the directory name based on your existing directory in Workspace ONE UEM. Enter the same directory name as used by VMware Identity Manager.
Enable Custom Mapping	Enable custom mapping as applicable to map the directory integration in Workspace ONE UEM to VMware Identity Manager so they are in sync. Most directory service configurations use **Standard** mapping. **Custom** mapping attributes are for customers who have a non-standard directory service database value mapping or an otherwise customized configuration between a directory service and Workspace ONE UEM.
ExternalID	Identifies the source of a user, in case multiple users have the same user name.
Password	Directory services user's password.
UserStore	The name of the user store to which a user belongs.
Disabled	Indicates whether the directory account is disabled.
DistinguishedName	Select the distinguished name for the directory services user from the drop-down listing.
Domain	Select the domain name from the drop-down listing.
Email	Directory service user's email address. The email address mapped according to this attribute must be the same email which was used in the original configuration between directory services and Workspace ONE UEM. Otherwise this setting, and by extension the user's entire account, syncs incorrectly.
EmployeeID	Select the employee ID from the drop-down listing.
First name*	Directory service user's first name.
Last name*	Directory service user's last name.
Phone	Phone number of the directory service user.
Roles	Default role of the directory service user.

Setting	Description
User name*	User name associated with the directory services.
UserPrincipalName	Select the principal user name for the Directory services user from the drop-down listing.

* Required settings for both Standard and Custom attribute mapping. The mapping attribute settings presented here are default settings. You can add more attributes.

5 Click the **Save** button to save your configuration and refresh the page.You can view all the details in the Summary page.

6 Initiate a synchronization of the structures within your directory services and VMware Identity Management by selecting the **Sync Now** button.

Enable and Export AirWatch Certificate Authority

When VMware Identity Manager is enabled in Workspace ONE UEM, you can generate the AirWatch issuer root certificate and export the certificate for use with the Mobile SSO for iOS authentication on managed iOS 9 mobile devices.

1 Navigate to **Groups & Settings** > **All Settings** > **System** > **Enterprise Integration** > **VMware Identity Manager** > **Configuration**. To enable AirWatch Certificate Authority, the organization group type must be Customer. To view or change the group type, navigate to **Groups & Settings** > **Groups** > **Organization Groups** > **Organization Group Details**.

2 In the Certificate section, click **Enable**.The section displays the issuer root certificate details.

3 Click **Export** and save the file.

Managing Directory Service Users in Workspace ONE UEM

3

Every directory user you want to manage through Workspace ONE UEM must have a corresponding user account in the UEM console. You can directly add your existing directory services users to Workspace ONE UEM

To directly add your existing directory services users to Workspace ONE UEM, you can choose one of the following methods.

- Batch upload a file containing all your directory services users. The act of batch importing automatically creates a user account.
- Create user accounts one at a time by entering the directory user name and selecting **Check User** to auto-populate remaining details.
- Do not import in bulk nor manually create user accounts and instead allow all directory users to self-enroll at enrollment time.

A fourth option, applying Workspace ONE UEM user groups linked to directory service groups, is explained in the next section. This option can be used with these methods or by itself.

Note For information about how these methods affect various directory services enrollment options, refer to the **VMware AirWatch Mobile Device Management Guide**, available on docs.vmware.com.

There are other considerations.

- **Pros** – Requires the least amount of effort while still supporting the ability to sync changes to user attributes that are made in your directory service. Self-enrollment also creates a Workspace ONE UEM user account.
- **Cons** – Does not allow you to restrict the enrollment to specific users or user groups. This lack of restriction means that any directory user with a valid email address can enroll a device.

Managing Directory Service Users in Workspace ONE UEM

If you choose to use directory services in Workspace ONE UEM, note the following.

- Directory users can only be created at the same level as the organization group (OG) where directory services settings are enabled. You can see users at the organization group level where they have a device enrolled. However, users can only be managed at the same level as the directory service settings.
- To delete or edit a user account, you must be at the same level as the directory services settings.
- To add a device to an existing Workspace ONE UEM user account, you must be at a lower level than the root OG where directory services are enabled.

Adding your Directory Users Into Workspace ONE UEM

You can add directory users into Workspace ONE UEM one at a time or use a batch import process. Adding individual directory users one at a time is ideal for when you have a few users to add. It is preferable to batch import directory users when you have multiple users to add.

Using the batch import method means uploading a list of directory services users in a CSV (comma-separated values) template file, which has specific columns. To make converting your existing directory service user data easier, consider mapping the text boxes Workspace ONE UEM requires to existing attributes in your database. You can then use custom queries to create a spreadsheet which you can copy and paste.

- **Pros** – This option creates Workspace ONE UEM user accounts, which enable you to use enrollment options that require user accounts, such as registration tokens. If you have users not included in Mobile Device Management (MDM), you can omit them from the CSV file. Such omission restricts an enrollment to only known users.
- **Cons** – Back-end configuration is required to automate the creation of a CSV batch file that can be used to upload users. The alternative is to enter each user manually. Manual entry means that user assignment to organization groups must be thought out beforehand to ensure proper profile, policy, content, and app assignments.

Add Individual Directory Users to Workspace ONE UEM

Workspace ONE UEM enables you to add directory users in small numbers or if you have a 'one-off' addition to make.

1 Navigate to **Accounts** > **Users** > **List View** and select **Add** and then **Add User**. The **Add / Edit User** page displays.

2 In the **General** tab, complete the following settings to add a directory user.

Setting	Description
Security Type	Add an Active Directory user by choosing **Directory** as the Security Type.
Directory Name	This pre-populated setting identifies the Active Directory name.
Domain	Choose the domain name from the drop-down menu.
User name	Enter the user's directory user name and select **Check User**. If the system finds a match, the user's information is automatically populated. The remaining settings in this section are only available after you have successfully located an active directory user with the **Check User** button.
Full Name	Use **Edit Attributes** to allow any option that syncs a blank value from the directory to be edited. Edit Attributes also enables you to populate matching user's information automatically. If a setting syncs an actual value from the directory, then that setting must be edited in the directory itself. The change takes effect on the next directory sync. Complete any blank option returned from the directory in **Full Name** and select **Edit Attributes** to save the addition.
Display Name	Enter the name that displays in the admin console.
Email Address	Enter or edit the user's email address.
Email user name	Enter or edit the user's email user name.
Domain (email)	Select the email domain from the drop-down menu.
Phone Number	Enter the user's phone number including plus sign, country code, and area code. If you intend to use SMS to send notifications, the phone number is required.
Enrollment Organization Group	Select the organization group into which the user enrolls.
Allow the user to enroll into additional Organization Groups	Choose whether or not to allow the user to enroll into more than one organization group. If you select **Enabled**, then complete the **Additional Organization Groups**.
User Role	Select the role for the user you are adding from this drop-down menu.
Message Type	Choose the type of message you may send to the user, **Email**, **SMS**, or **None**. Selecting SMS requires a valid entry in the **Phone Number** text box.
Message Template	Choose the template for email or SMS messages from this drop-down setting. Optionally, select the **Message Preview** to preview the template and select the **Configure Message Templates** link to create a template.

3 (Optional) Select the **Advanced** tab and complete the following settings.

Setting	Description
Email Password	Enter the email password of the user you are adding.
Confirm Email Password	Confirm the email password of the user you are adding.

Setting	Description
Distinguished Name	For directory users recognized by Workspace ONE UEM, this text box is pre-populated with the distinguished name of the user. Distinguished Name is a string representing the user name and all authorization codes associated with an Active Directory user.
Manager Distinguished Name	Enter the distinguished name of the user's manager. This text box is optional.
Category	Choose the user category for the user being added.
Department	Enter the user's department for your company's administrative purposes.
Employee ID	Enter the user's employee ID for your company's administrative purposes.
Cost Center	Enter the user's cost center for your company's administrative purposes.
Custom Attribute 1–5 (for Directory users only)	Enter your previously configured custom attributes, where applicable. You may define these custom attributes by navigating to **Groups & Settings** > **All Settings** > **Devices & Users** > **Advanced** > **Custom Attributes**. **Note** Custom attributes can be configured only at Customer organization groups.
Use S/MIME	Enable or disable the use of Secure/Multipurpose Internet Mail Extensions (S/MIME). If enabled, you must have an S/MIME-enabled profile and you must upload an S/MIME certificate by selecting **Upload**.
Separate Encryption Certificate	Enable or disable the use of a separate encryption certificate. If enabled, you must upload an encryption certificate using **Upload**. Generally, the same S/MIME certificate is used for signing and encryption, unless a different certificate is expressly being used.
Old Encryption Certificate	Enable or disable a legacy version encryption certificate. If enabled, you must **Upload** an encryption certificate.
Enable Device Staging	Enable or disable the staging of devices. If enabled, you must choose between **Single User Devices** and **Multi User Devices**. If **Single User Devices**, you must select between **Standard**, where users themselves log in and **Advanced**, where a device is enrolled on behalf of another user.

4 Select **Save** to save only the new user or select **Save and Add Device** to save the new user and proceed to the **Add Device** page.

Batch Import your Directory Users

If you have many directory users to add to Workspace ONE UEM , you can save time by initiating a batch import process.

1 Navigate to **Accounts** > **Users** > **Batch Status** or **Devices** > **Lifecycle** > **Enrollment Status** > **Add** and select **Batch Import**.

2 Enter the basic information including a **Batch Name** and **Batch Description**.

3 Select the applicable batch type from the **Batch Type** drop-down menu.

4 Select and download the template that best matches the kind of batch import you are making.

- **Blacklisted Devices**

  Import a list of known, non-compliant devices by IMEI, Serial Number, or UDID. Blacklisted devices are not allowed to enroll. If a blacklisted device attempts to enroll, it is automatically blocked.

- **Whitelisted Devices**

  Import pre-approved devices by IMEI, Serial Number, or UDID. Use this template to import a list of known, trusted devices. The ownership and group ID associated to this device is automatically applied during enrollment.

- **User and/or Device**

  Select between a **Simple** and an **Advanced** CSV template. The simple template features only the most often-used options while the advanced template features the full, unabridged compliment of import options.

- **Change Organization Group**

  Move users to a different organization group.

5 Open the CSV file. Confirm whether or not users are part of the enrollment organization group (OG).The CSV file features several columns corresponding to the options on the **Add / Edit User** page. When you open the CSV template, notice that sample data has been added to each column in the template. The sample data is presented to inform you what kind of data is required and what format it must be in. Do not stray from the format presented by the sample data.

Note

A CSV file (comma-separated values) is simply a text file whose extension has been changed from "TXT" to "CSV". It stores tabular data (text and numbers) in plain text. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. It can be opened and edited with any text editor. It can also be opened and edited with Microsoft Excel.

a Navigate to **Groups & Settings** > **All Settings** > **Devices & Users** > **General** > **Enrollment** and select the **Grouping** tab.For a directory-based enrollment, the **Security Type** for each user must be **Directory**.If the **Group ID Assignment Mode** is set to **Default**, your users are part of the enrollment OG.

6 Enter data for your organization's users, including device information (if applicable) and save the file.

7 Return to the Batch Import page and select **Choose File** to locate and upload the CSV file that you had previously downloaded and filled out.

8 Select **Save**.

Filter Your Searches to Map the Directory Services User Information

After entering server settings, you can filter searches to identify users and map values between Workspace ONE user attributes and your directory attributes.

1 Navigate to **Accounts** > **Administrators** > **Administrator Settings** > **Directory Services**.

2 Select the **User** tab. By default, only the **Base DN** information displays.

3 Select the **Fetch DN** plus sign (+) next to the **Base DN** column.This plus sign displays a list of Base DNs from which you can select to populate this text box. If it does not, revisit the settings you entered on the **Server** tab before continuing.

4 Enter data in the following settings.

Setting	Description
User Object Class	Enter the appropriate Object Class. In most cases, this value is "user."
User Search Filter	Enter the search parameter used to associate user accounts with Active Directory accounts. The suggested format is "<LDAPUserIdentifier>={EnrollmentUser}" where <LDAPUserIdentifier> is the parameter used on the directory services server to identify the specific user. ■ For AD servers, use "(&(objectCategory=person)(sAMAccountName={EnrollmentUser}))" exactly. ■ For other LDAP servers, use "CN={EnrollmentUser}" or "UID={EnrollmentUser}"

5 Display more settings by selecting **Show Advanced**.

Setting	Description
Auto Merge	Enable setting to allow user group updates from your directory service to merge with the associated users and groups in Workspace ONE UEM automatically.
Automatically Sync Enabled Or Disabled User Status	Select Enabled to deactivate the associated user in Workspace ONE UEM when that user is disabled in your LDAP directory service (for example, Active Directory, Novell e-Directory, and so on). ■ **Value For Disabled Status** – Enter a numeric value and select the type of Lightweight Directory Access Protocol (LDAP) attribute used to represent a user's status. Select "Flag Bit Match" if the user status is designated by a bitwise flag (which is the default for Active Directory). Select "Flag Bit Match" if the user status is designated by a bitwise flag (which is the default for Active Directory). When "Flag Bit Match" is selected, Directory Services will consider the user to be disabled if any bits from the property match the given value. **Note:** If you select this option and you disable users in your directory service, the corresponding user account in Workspace ONE UEM is marked inactive and those administrators and users are not able to log in. In addition, enrolled devices assigned to users who are set as inactive in your directory service are automatically unenrolled.
Enable Custom Attributes	Enable custom attributes. **Custom Attributes** is a section that appears under the main **Attribute** – **Mapping Value** table. You must scroll down to the bottom of the page to see the Custom Attributes.

Setting	Description
Attributes	Review and edit the **Mapping Values** for the listed **Attributes**, if necessary. These columns show the mapping between Workspace ONE UEM user attributes (left) and your directory service attributes (right). By default these attributes are values most commonly used in Active Directory (AD). Update these mapping values to reflect the values used for your own or other directory service types. If you add or remove a custom attribute, you should initiate a manual sync afterward by selecting the **Sync Attributes** button.
Sync Attributes button	Manually sync the attributes mapped here to the user records in Workspace ONE UEM. Attributes sync automatically on the time schedule configured for the Workspace ONE UEM environment.

6 Select **Test Connection** to verify connectivity.

The server connection is tested for all the domains listed on the page, using the server name, bind user name, and the password provided by the administrator. You can rerun the test by clicking the **Test Again** button.

From the **User** tab, you can perform the following actions:

a Select the **Domain** name from the drop-down menu.

b Enter the user's directory user name and select **Check User**. If the system finds a match, the user's information is auto-populated. The remaining settings in this section are only available after you have successfully located an active directory user with the **Check User** button.

From the **Group** tab, you can perform the following actions:

a Select the **External Type** of the group you are adding.

- **Group** – Refers to the group object class on which your user group is based. Customize this class by navigating to **Groups & Settings > All Settings > System > Enterprise Integration > Directory Services > Group**.
- **Organizational Unit** – Refers to the organizational unit object class on which your user group is based. Customize this class by navigating to **Groups & Settings > All Settings > System > Enterprise Integration > Directory Services > Group**.

b Enter the directory user group name in the **Search** text.

c **Directory Name** is the pre-populated setting that identifies the Active Directory name.

d Select the **Domain** name from the drop-down menu.

e **Group Base DN** displays a list of Domain Names from which you can select.

f Select **Check Group** to verify the group information.

Directory Service User Self-Enrollment

User Self-Enrollment applies your existing directory service environment to auto discover users based on their email.

You can enable all your directory users to enroll themselves based on their email addresses. This option requires the least amount of effort while retaining the ability to sync user attributes. However, you are unable to restrict the enrollment to specific users or user groups.

1 Navigate to **Groups & Settings > All Settings > Devices & Users > General > Enrollment** and select the **Restrictions** tab.

2 Scroll to the **Enrollment Restrictions** section of this page. Ensure that **Restrict Enrollment To Known Users** and **Restrict Enrollment To Configured Groups** check boxes are both deselected.

   When deselected, all directory users and user groups members (as configured in the directory services settings page) are allowed to enroll with a valid email address.

Note For additional information about enrolling with directory services integration, refer to "Device Enrollment" in the **VMware AirWatch Mobile Device Management Guide**, available on docs.vmware.com.

Managing Directory User Group Integration in Workspace ONE UEM

4

An alternative to custom user groups without active directory integration is through user group integration that applies your existing active directory structure, providing many benefits.

Once you import existing directory service user groups as Workspace ONE UEM user groups, you can perform the following actions:

- **User Management**: Reference your existing directory service groups (such as security groups or distribution lists) and align user management in Workspace ONE UEM with the existing organizational systems.
- **Profiles and Policies**: Assign profiles, applications, and policies across the Workspace ONE UEM deployment to groups of users.
- **Integrated Updates**: Automatically update user group assignments based on group membership changes.
- **Management Permissions** : Set management permissions to allow only approved administrators to change policy and profile assignments for certain user groups.
- **Enrollment**: Allow users to enroll with existing credentials and automatically assign an organization group.

This chapter includes the following topics:

Organization Groups vs. User Groups

Organization groups (OG) are still the primary means of performing the following tasks in Workspace ONE UEM. User groups do not replace organization groups in Workspace ONE UEM, rather, they are used to represent security groups and business roles.

Organization Groups

- The primary difference between organization groups and user groups is that devices are always tied to an OG.
- You set the administration management permissions in the UEM console through an organization group.
- Profiles, policies, and applications are assigned to organization groups.
  - Even though it is possible to assign these resources to user groups, user groups only act as an extra filter on top of organization groups.
- Tracking assets on Workspace ONE UEM dashboards. Organization groups are still the primary filter on all console pages for all dashboards and views. OGs define at which business units the devices live, so consider the device groupings you want to view on the Workspace ONE UEM dashboards.
- Configuring system config settings. System settings are tied to organization groups. If you need different system settings, then you must define different organization groups. Examples of important settings to consider include the following.
  - Enrollment Settings and Restrictions
  - Terms of Use
  - Privacy Policies

Existing MDM assignments are not affected once you import user groups. Facilitate the transition process and ensure that users do not experience any disruption to their current configurations by applying policies to user groups manually as needed.

User Groups

- Use user groups to represent security groups or business roles within your organization.
- Users can belong to multiple user groups, but devices still belong to only one organization group.
- Workspace ONE UEM currently supports the assignment of profiles, policies, and internal apps to user groups.

Transition Options for Best Practices

When defining OGs to represent user groups, one of the following options may help you reconfigure your OG and user group structure to be more streamlined.

- Reconfigure your system to associate profiles, applications, and enrollment restrictions with user groups.
  - Assign each profile, app, and enrollment restriction to the appropriate user groups.
  - Change the organization group assignment to one organization group up.
  - Add a user group assignment.
- You may choose to reconfigure your hierarchy to remove old or unused organization groups.
  - Move up devices one organization group (from child to parent).
  - Delete old organization groups.
- You can choose to leave your structure as-is.
  - At this point, the organization group can be considered the “Primary Security Group” of the device.
  - The user groups are used for assigning profiles and policies.
  - The old, unused organization groups can remain for asset tracking purposes.

Add your Directory Service User Groups to Workspace ONE UEM

You can add directory service user groups into Workspace ONE UEM one at a time or use a batch import process. Adding directory user groups one at a time is ideal for when you have a limited number of groups to add. It is preferable to batch import directory user groups when you have multiple groups to add.

Using the batch import method means uploading a list of your existing directory service groups in a .csv (comma-separated values) template file. This method does not immediately create user accounts for each of your directory service accounts. However, it ensures Workspace ONE UEM recognizes them as belonging to a configured group. You can then use this recognition as a means of restricting who can enroll.

User groups in Workspace ONE UEM can be synced – automatically when configured with a scheduler – with your directory service groups to merge changes or add missing users.

- **Pros** – You have the option of restricting an enrollment to only known groups, which lets you restrict on a user group level who can enroll. This method also keeps your existing directory service group infrastructure and allows you to assign profiles, policies, content, and apps based on these existing group setups.

- **Cons** – Uploading directory service user groups does not automatically create Workspace ONE UEM user accounts. If you have restricted enrollment for known users, you must add those user accounts into the UEM console manually.

Add Individual Directory User Group to Workspace ONE UEM

If you have just a few user groups to add to Workspace ONE UEM, then take the following steps to add a directory service user group.

1 Navigate to **Accounts** > **User Groups** > **List View**, select **Add**, then **Add User Group**.

2 Complete the settings in the **Add User Group** screen as applicable, ensuring the user group **Type** is **Directory**.

Setting	Description
Type	Select the type of User Group. ■ **Directory** – Create a user group that is aligned with your existing active directory structure. ■ **Custom** – Create a user group outside of your organization's existing Active Directory structure. This user group type grants access to features and content for basic and directory users to customize user groups according to your deployment. Custom user groups can only be added at a customer level organization group.
External Type	Select the external type of group you are adding. ■ **Group** – Refers to the group object class on which your user group is based. Customize this class by navigating to **Groups & Settings** > **All Settings** > **System** > **Enterprise Integration** > **Directory Services** > **Group**. ■ **Organizational Unit** – Refers to the organizational unit object class on which your user group is based. Customize this class by navigating to **Groups & Settings** > **All Settings** > **System** > **Enterprise Integration** > **Directory Services** > **Group**. ■ **Custom Query** – You can also create a user group containing users you locate by running a custom query. Selecting this external type replaces the Search Text function but displays the Custom Query section.
Search Text	Identify the name of a user group in your directory by entering the search criteria and selecting **Search** to search for it. If a directory group contains your search text, a list of group names displays. This option is unavailable when **External Type** is set to **Custom Query**.
Directory Name	Read-only setting displaying the address of your directory services server.
Domain and **Group Base DN**	This information automatically populates based on the directory services server information you enter on the **Directory Services** page (**Groups & Settings** > **System** > **Enterprise Integration** > **Directory Services**). Select the **Fetch DN** plus sign (+) next to the **Group Base DN** setting, which displays a list of distinguished name elements from which you can select.
Custom Object Class	Identifies the object class under which your query runs. The default object class is 'person' but you can supply a custom object class to identify your users with a greater success and accuracy. This option is available only when **Custom Query** is selected as **External Type**.

Setting	Description
Group Name	Select a **Group Name** from your **Search Text** results list. Selecting a group name automatically alters the value in the Distinguished Name setting. This option is available only after you have completed a successful search with the **Search Text** setting.
Distinguished Name	This read-only setting displays the full distinguished name of the group you are creating. This option is available only when **Group** or **Organizational Unit** is selected as **External Type**.
Custom Base DN	Identifies the base distinguished name which serves as the starting point of your query. The default base distinguished name is 'AirWatch' and 'sso'. However, if you want to run the query with a different starting point, you can supply a custom base distinguished name. This option is available only when **Custom Query** is selected as **External Type**.
Organization Group Assignment	This optional setting enables you to assign the user group you are creating to a specific organization group. This option is available only when **Group** or **Organizational Unit** is selected as **External Type**.
User Group Settings	Select between **Apply default settings** and **Use Custom settings for this user group**. See the **Custom Settings** section for additional setting descriptions. You can configure this option from the permission settings after the group is created. This option is available only when **Group** or **Organizational Unit** is selected as **External Type**.
Custom Query - **Query**	This setting displays the currently loaded query that runs when you select the **Test Query** button and when you select the **Continue** button. Changes you make to the **Custom Logic** setting or the **Custom Object Class** setting are reflected here.
Custom Logic	Add your custom query logic here, such as user name or admin name. For example, "cn=jsmith". You can include as much or as little of the distinguished name as you like. The **Test Query** button allows you to see if the syntax of your query is correct before selecting the **Continue** button.
Custom Settings - **Management Permissions**	You can allow or disallow all administrators to manage the user group you are creating.
Default Role	Select a default role for the user group from the drop-down menu.
Default Enrollment Policy	Select a default enrollment policy from the drop-down menu.
Auto Sync with Directory	This option enables the directory sync, which detects user membership from the directory server and stores it in a temporary table. Administrators approve changes to the console unless the Auto Merge option is selected. If you want to prevent user groups from automatically syncing during a scheduled sync, this setting must be disabled.
Auto Merge Changes	Enable this option to apply sync changes automatically from the database without administrative approval.
Maximum Allowable Changes	Use this setting to set a threshold for the number of automatic user group sync changes that can occur before approval must be given. Changes more than the threshold need admin approval and a notification is sent to this effect. This option is available only when **Auto Merge Changes** is enabled.

Setting	Description
Add Group Members Automatically	Enable this setting to add users to the user group automatically. If you want to prevent user groups from automatically syncing during a scheduled sync, this setting must be disabled.
Send Email to User when Adding Missing Users	Enable to send an email to users when missing users are being added to the user group. Adding missing users means combining the temporary user group table with the Active Directory table.
Message Template	This option is available only when **Send Email to User when Adding Missing Users** is enabled. Select a message template to be used for the email notification during the addition of missing users to the user group. When adding active directory users new to the Workspace ONE UEM console, the message template availability depends upon the enrollment mode as configured in **Groups & Settings** > **All Settings** > **Devices & Users** > **General** > **Enrollment** selecting **Authentication**, and making a choice in the **Devices Enrollment Mode** option. When **Open Enrollment** is selected as the **Devices Enrollment Mode**, a User Activation email template is available in the **Message Template** drop-down. This email message enables the new AD user to enroll. When **Registered Devices Only** is selected as the **Devices Enrollment Mode**, a Device Activation email template is available in the **Message Template** drop-down. This email message enables the new AD user to enroll their devices. If **Require Registration Token** is enabled, the device can be registered with the token embedded in the message.

For more information on Distinguished Name, search for Microsoft's TechNet article entitled "Object Naming" at https://technet.microsoft.com/.

3 Select **Save**.

Add your Directory User Groups to Workspace ONE UEM using the Batch Import process

If you have many directory service user groups to add to Workspace ONE UEM you can save time by initiating a batch import process.

1 Navigate to **Accounts** > **User Groups** > **List View** and select **Add**.

2 Select **Batch Import**.

3 Enter the basic information including **Batch Name** and **Batch Description** in the

4 Workspace ONE UEM console.

5 Under **Batch File (.csv)**, select the **Choose File** button to locate and upload the completed CSV file.

a Alternately, select the link **Download template for this batch type** and save the comma-separated values (CSV) file and use it to prepare a new importation file.

b Open the CSV file, which has several columns corresponding to the settings that display on the **Add User Group** page.Columns with an asterisk are required and must be entered with data.

c Save the file.

The last column heading in the CSV file template is labeled "GroupID/Manage(Edit and Delete)/Manage(Users and Enrollment)/UG assignment/Admin Inheritance." This column heading corresponds to the settings and abides by the logic of the **Permissions** tab of the **Edit User Group** page.

6 Select **Import**.

Merge and Sync Changes Between Your Directory Service Groups and Groups in Workspace ONE

Note You can set options to auto merge and sync changes between your directory service groups and groups in Workspace ONE Express and Workspace ONE UEM powered by AirWatch.

AD passwords are not stored in the Workspace ONE UEM database except the Bind account password used to link directory services into your Workspace ONE UEM environment.

The Bind account password is stored in an encrypted form in the database and is not accessible from the console. Unique session keys are used for each sync connection to the Active Directory server. This AD password storage arrangement is the same for Workspace ONE Express.

In some instances, global catalogs are used to manage multiple domains or AD Forests. Delays while searching for or authenticating users might be due to a complex directory structure. You can integrate directly with the global catalog to query multiple forests using one Lightweight Directory Access Protocol (LDAP) endpoint for better results.
To integrate with the global catalog directly, configure the following settings:

- **Encryption Type** = None
- **Port** = 3268
- Verify that your firewall allows for this traffic on port 3268.

Complete the following steps to auto merge and sync changes between your Directory Service Groups and Groups in the Workspace ONE UEM console.

1 Navigate to **Accounts** > **Administrators** > **Administrator Settings** > **Directory Services**.

2 If necessary, select 'Override' as the **Current Setting** so that changes can be made to this settings page.

3 Ensure your organization's Directory Service is selected in the **Directory Type**.

4 Select the **Group** tab. By default, only the **Base DN** information displays.

5 For **Base DN**, select the **Fetch DN** plus sign (+) next to the B

6 ase DN setting to display a list of Base DNs. Populate this text box by selecting from the list.

   a If a list of Base DNs does not display, revisit the settings you entered on the **Server** tab before continuing.

7 Enter data in the following settings.

Setting	Description
Group Object Class	Enter the appropriate Object Class. In most cases this value should be **group**.
Organizational Unit Object Class	Enter the appropriate Organizational User Object Class.

8 To display more settings, select **Advanced**. Enter data in the following text boxes.

Setting	Description
Group Search Filter	Enter the search parameter used to associate user groups with directory service accounts.
Auto Sync Default	Select this checkbox to automatically add or remove users in Workspace ONE UEM configured user groups based on their membership in your directory service.

Edit Your User Group Permissions

Fine-tuning user group permissions allows you to reconsider who inside your organization can edit certain groups. For example, if your organization has a user group for company executives, you might not want lower-level administrators to have management permissions for that user group.

Use the **Permissions** page to control who can manage certain user groups and who can assign profiles, compliance policies, and applications to user groups.

Procedure

1. Navigate to **Accounts > User Groups > List View**.
2. Select the **Edit** icon of an existing user group row.
3. Select the **Permissions** tab, then select **Add**.
4. Select the **Organization Group** you want to define permissions for.

   You must select an organization group (OG) that is within the root OG hierarchy of the user group.
5. Select the **Permissions** you want to enable.
   - **Manage Group (Edit/Delete)** – Activate the ability to edit and delete user groups.
   - **Manage Users Within Group and Allow Enrollment** – Manage users within the user group and to allow a device enrollment in the OG. This setting can only be enabled when Manage Group (Edit/Delete) is also enabled. If Manage Group (Edit/Delete) is disabled, then this setting is also disabled.
   - **Use Group For Assignment** – Use the group to assign security policies and enterprise resources to devices. This setting can only be changed if Manage Group (Edit/Delete) is disabled. If Manage Group (Edit/Delete) is enabled, then this setting becomes locked and uneditable.
     - This setting is disabled when the user group is managed by a parent OG and you want to assign the group from one of its children OGs.
6. Select the **Scope** of these permissions, that is, which groups of administrators are allowed to manage or use this user group. Only **one** of the following options may be active.
   - **Administrator Only** – The permissions affect only those administrators at the parent OG.
   - **All Administrators at or below this Organization Group** – The permissions affect the administrators in the OG and all administrators in all child OGs underneath.
7. Select **Save**.

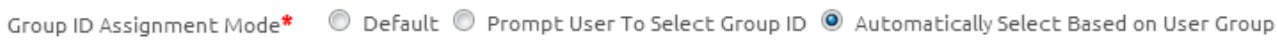
Mapping your User Groups for Enrollment and Console Access

After you add your directory service groups to Workspace ONE UEM, you can use the resulting user groups for enrollment and role-based access. In terms of a device enrollment, you can map user groups to existing organization groups and automatically select a Group ID based on a user group. In terms of console access, you can restrict the level of UEM console access users have (roles) based on their user group membership

You can configure settings to select a Group ID automatically based on a user group or allow users to select a Group ID from a list.

Procedure

1. Navigate to **Groups & Settings > All Settings > Devices & Users > General > Enrollment** and select the **Grouping** tab.
2. Choose **Automatically Select Based on User Group** as the **Group ID Assignment Mode**.



   This option works only when your existing directory service is already replete with user group assignments independent from Workspace ONE UEM.

   Enabling this option ensures that users are automatically assigned to organization groups based on their directory service group assignments. Once selected, the **Group Assignment Settings** section displays all the organization groups (OG) for the environment and their associated directory service user groups.

   When the **Apply mapping on enrollment only** setting is enabled, the user group assignment applies at enrollment time only. After enrollment, devices can be manually moved to another organization group. However, if the **Apply mapping on enrollment only** check box is still enabled, the device does not honor any new user group mapping. The event log captures the identity of the admin requesting this mapping at enrollment time.

   For more information about the Event Log, see the **VMware AirWatch Logging Guide**, available on docs.vmware.com.

3. Modify the organization group/user group associations and set the rank of precedence for each group by selecting **Edit Group Assignment**. Select **Save** when you are finished.

   If a user belongs to multiple user groups, the rank determines which user group takes precedence. The user is associated to the OG of the highest-ranked user group to which they belong.

4 Similar to user group mapping to an OG assignment, map roles, or console permissions, based on user groups. Enable the editing of role-based access levels by selecting **Enable Directory Group-Based Mapping** in the **User Role Mapping** section. To edit roles and rank user groups, similar to the method used in step 3, select **Edit Assignment**.

   For each user group, set the rank of precedence and associated role each group has. Just as in step 3, if a user belongs to multiple user groups, the rank determines which user group, and therefore role, takes precedence. The user receives permissions for the highest-ranked user group to which they belong. Select **Save** when you are finished.

   Access the Roles page and define new or edit existing Roles by navigating to **Accounts > Roles**.

5 Select **Save** when you are done mapping user groups to enrollment organization groups and roles.

What to do next

You can restrict an enrollment to only known users or configured groups. For more information, refer to the **VMware AirWatch Mobile Device Management Guide**, available on docs.vmware.com.

Deploying Apps, Policies, and Profiles by User Group

After you import your directory groups into Workspace ONE UEM you can use them as more criteria when assigning profiles, compliance policies, apps, and content. If you assign a profile, policy, or application to both an Organization Group (OG) and a user group, the user group serves as an extra filter. Workspace ONE UEM uses this extra filter to assign settings or content. Even if you select an OG with many users, Workspace ONE UEM only assigns to users in the group with a device that is in the assigned OG. The administrator can use both organization groups and user groups to configure more advanced settings.

As a good example, there may be different OGs set up for countries with different privacy policies. If any of the user groups include users from various countries, ensure only the devices that belong to the appropriate OG receive the setting or content. By selecting the appropriate Organization Group together with the user group, you can ensure that only the members in both groups receive the setting or content.

User Groups and Smart Groups

When configuring your Mobile Device Management environment, use user groups to define security authentication groups and business roles within your organization. User groups offer a simple one-to-one relationship between your users and the groups to which they belong.

Smart Groups, however, offer a flexible solution to push settings and content. This solution involves targeting selected devices by model, operating system, and device tags in addition to OGs and user groups. Smart Groups can also target individual users across multiple organization groups and user groups.

For more information on defining Smart Groups, refer to the **VMware AirWatch Mobile Device Management Guide**, available on docs.vmware.com.

Deactivate and Reactivate your Users Automatically

You can control how Workspace ONE UEM reacts when user accounts are removed or disabled in your directory service by using auto sync in the User tab of Directory Services. Auto sync monitors user statuses in Directory Services and when a user is removed from Directory Services, they are also removed from the associated AirWatch user group and unenrolled from the UEM console.

If you want to deactivate a user in AirWatch manually, regardless of what happens to their status in Directory Services, you can delete their UEM console user account. Do this by navigating to **Accounts > Users > List View** then locate the account you want to delete, select the account by clicking the check box to the left of its entry, select the **More Actions** button, select **Delete**, and then select **Save** at the **Bulk Action Message** screen, which serves as a delete confirmation.

Conversely, users that have been deactivated and then reactivated in your directory service are reactivated in the UEM console automatically.

Automatically Reactivating Workspace ONE EUM Users Upon Reactivation in Directory Service

When users deactivated in your directory service are later reactivated, Workspace ONE automatically reactivates their UEM console account. This feature is always on and requires no console setting. Also, the event log captures this event which can be referred to for troubleshooting purposes.

Perform Automatic Enterprise Wipe for Users That Do Not Belong to a User Group

You can automatically perform an enterprise wipe when users are removed from user groups. This check occurs at the same frequency as the Sync LDAP Groups scheduler task.

Note You can automatically perform an enterprise wipe when users are removed from user groups. This check occurs at the same frequency as the Sync LDAP Groups scheduler task.The **Restrict Enrollment To Configured Groups** option means that enrollment is limited in the following ways.

- Enrollment is limited to users belonging to any user group (All Groups).
- Enrollment is limited to users belonging to a particular user group (Selected Groups).

For more information, refer to the Enabling Directory Service-Based Enrollment section of the**VMware AirWatch Mobile Device Management Guide**, available on docs.vmware.com.

1 Navigate to **Groups & Settings** > **All Settings** > **Devices & Users** > **General** > **Enrollment** and select the **Restrictions** tab.

2 Select the Restrict Enrollment to the **Configured Groups option**.

3 If you want to enterprise wipe all devices **not** part of any user group automatically, then take the following steps.

   a Select **All Groups**.

   b Enable the **Enterprise Wipe devices of users not belonging to the configured groups** option.

4 If you want to enterprise wipe all devices **not** part of only selected user groups automatically, then take the following steps.

   a Choose **Selected Groups** and include the user group names.

   b Enable the **Enterprise Wipe devices of users not belonging to the configured groups** option.

5 Select **Save**.

Set all your Disabled Users accounts to Inactive

You can enable Workspace ONE UEM to detect when a user account is disabled in your directory service and automatically set its associated Workspace ONE UEM user account to inactive.

1 Navigate to **Accounts** > **Users Settings** > **Directory Services**.

2 Select the **User** tab.

3 See advanced configuration options by selecting the **Advanced** hyperlink.

4 Enable the **Automatically Sync Enabled Or Disabled User Status** slider.

   a For **Value For Disabled Status**, enter a numeric value and select the type of Lightweight Directory Access Protocol (LDAP) attribute used to represent a user's status.

   b Select "Flag Bit Match" if the user status is designated by a bitwise flag (which is the default for Active Directory).If any bits from the property match the value you enter, then the directory service considers the user to be disabled. But only when Flag Bit Match is selected.

   If you select this option, then Workspace ONE UEM administrators set as inactive in your directory service may not log in to the UEM console. In addition, enrolled devices assigned to users who are set as inactive in your directory service are automatically unenrolled.

Remove Users From User Groups Based on the Directory Service Group Membership

You can enable Workspace ONE UEM and Workspace ONE Express to detect when a directory service user account is removed and automatically remove its associated user account from the associated group.

1 Navigate to **Accounts** > **User Groups** > **Settings** > **Directory Services**.

2 Select the **Group** tab.

3 See advanced configuration options by selecting the **Advanced** drop-down.

4 Select the **Auto Sync Default** check box to add and remove users in user groups automatically based on membership in directory service.

Monitor the performance of your Directory Services

Workspace ONE UEM ensures that device management and syncing continues even during rare lapses in connectivity. You can improve the performance of Directory Services by ensuring that the server maximizes available resources.

Skipping a Tenant After Three Sync Timeouts

If a tenant's directory sync times out three times in a row, Workspace ONE UEM skips that tenant and proceeds to synchronize the next tenant, as applicable. A sync times out if a device does not respond for 15 minutes. This timing means that the maximum delay is 45 minutes before the next tenant sync attempt.

A console event log is created after the third sync timeout with the following properties.

- **Name of event** – EnterpriseIntegrationLDAPSyncError.
- **Event data** – OG name, error description (Sync failed three times in a row. Sync skipped.).
- **Event severity level** – Error.

Skipping a Tenant After VMware Enterprise Systems Connector Connection Error

Also, if the link to the VMware Enterprise Systems Connector is not working or if the test connection fails, then the sync fails to begin. The next tenant sync commences according to the Lightweight Directory Access Protocol (LDAP) configuration.

The console event log is created after an VMware Enterprise Systems Connector connection error with the following properties.

- **Name of event** – EnterpriseIntegrationACCConnectionFailed.
- **Event data** – Reason and OG name.
- **Event severity level** – Error.

For more information about the Event Log, see the **VMware AirWatch Logging Guide**, available on docs.vmware.com.

Troubleshooting Synchronization Errors

Ensure the Directory Sync Service and the Scheduler Service are running on the same server, since they write to and read from the same queues.