



VOSS-4-UC Microsoft Configuration Guide

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1 Deployment Topology Options

1.1. VOSS-4-UC PowerShell Proxy Configuration

VOSS-4-UC utilizes the Web Services-Management protocol (WSMan) to create the PowerShell sessions used to manage Microsoft UC applications. On Windows computers, WSMan is implemented by the Windows Remote Management (WinRM) service.

This section defines how to configure WinRM on a PS Proxy.

1.1.1. Domain Membership

All PS Proxy computers must be joined to the Active Directory domain under VOSS-4-UC management.

1.1.2. Enable PowerShell Remoting

PowerShell Remoting must be enabled on any computer with the PS Proxy role.

Starting with Windows Server 2012, all server versions of Windows have PowerShell remoting enabled by default.

On older versions of Windows Server, and on Windows client machines, you must enable PowerShell remoting manually. To do this, issue the following command from an elevated PowerShell prompt:

Enable-PsRemoting

1.1.3. Remote Management Service Account

Clients, including VOSS-4-UC, that connect to the WinRM service must provide credentials for an account with the characteristics listed below.

Remote Management Service Account

Account Type	Local Computer Account (Note: Not a domain account)
Local Group membership	Administrators Remote Management Users

1.1.4. WinRM Configuration

Configure WinRM with the appropriate settings for VOSS-4-UC by issuing the following commands from an elevated PowerShell session:

Enable-WSManCredSSP -Role Server -Force

Enable-WSManCredSSP -Role Client -DelegateComputer * -Force

Set-Item WSMan:\localhost\Service\AllowUnencrypted \$true

Set-Item WSMan:\localhostServiceAuth\Basic \$true

Set-Item WSMan:\localhost\Client\AllowUnencrypted \$true

Set-Item WSMan:\localhost\Client\Auth\Basic \$true

Set-Item WSMan:\localhost\Client\TrustedHosts "localhost" -force

1.1.5. Firewall Settings

Any firewalls between VOSS-4-UC and the computer hosting the WinRM service, including Windows Firewall on that computer, must permit the connections listed in the table below.

Note: These firewall exceptions are automatically created by the **Enable-PSRemoting** cmdlet.

WinRM Firewall Settings

Service	Protocol	Port
WinRM 2.0 (HTTP)	TCP	5985
WinRM 2.0 (HTTPS)	TCP	5986

1.1.6. Software Prerequisites

To manage a UC application such as Skype for Business Server, the management software specific to that application must be installed on the PowerShell Proxy. For example, to manage Skype for Business Server, the Skype for Business Server Administrative Tools must be installed on the PS Proxy.

Refer to *Required Management Software and Prerequisites* for details.

1.2. Domain Service Accounts

A domain account with the appropriate privileges is required for each of the applications managed by VOSS-4-UC: Active Directory, Skype for Business Server, Exchange Server, Skype for Business Online / Teams, and Exchange Online. You may use the same domain account for all of these applications, or you may create a separate account for each. The choice will depend on your organization's security requirements.

The minimum privileges required to manage each application are listed in the table below.

Important: In addition, any domain service account used by VOSS-4-UC to manage a UC application must be a member of the local Remote Management Users security group on the PowerShell Proxy.

Minimum Privileges by UC Application

UC Application	Service Account Minimum Required Privileges
Active Directory	AD (general ¹): Read AD (managed OU ²): Read + Write
Skype for Business Server	Security group membership: <ul style="list-style-type: none"> • RTCUniversalServerAdmins
Exchange Server	Security group membership: <ul style="list-style-type: none"> • Recipient Management • UM Management
Microsoft Online / Skype for Business Online	Office 365 admin role: <ul style="list-style-type: none"> • Skype for Business administrator
Exchange Online	Create a custom role group with the following assigned roles: <ul style="list-style-type: none"> • Address Lists • Mail Recipient Creation • Mail Recipients • Mailbox Import Export • Migration • Move Mailboxes • Reset Password • SendMailApplication • UM Mailboxes

1.3. Required Management Software and Prerequisites

Download links and installation directions are listed below. [Management Software Requirements by UC Application](#) summarizes the required software and prerequisites.

Be sure to install all available critical and security Microsoft Windows updates before attempting to install the management software or prerequisites.

1.3.1. Active Directory

Management of Active Directory requires that the ActiveDirectory Powershell module be installed on any PS Proxy used for this purpose. If the PS Proxy is running a server version of Windows you can install this module by running the following cmdlet from an elevated PowerShell session:

¹ As an Authenticated User, the service account should already have read access to Active Directory.

² Read and write permissions are required for the parent OU containing the user and contact objects managed by VOSS-4-UC. Be sure to apply those permissions to the parent OU and all descendant objects.

Add-WindowsFeature RSAT-ADDS

If the PS Proxy is running on a client version of Windows (Windows 7 Professional through Windows 10 Professional), download and install the appropriate version of Remote Server Administration Tools. Select the applicable version from the links on this page:

<https://support.microsoft.com/en-us/help/2693643/remote-server-administration-tools-rsat-for-windows-operating-systems>

1.3.2. Skype for Business Server

Skype for Business Server is managed with the Skype for Business Administrative Tools. Install those tools on the PS Proxy from the Skype for Business Server installation media.

1.3.3. Exchange Server

There are no specific software requirements for managing Exchange Server.

1.3.4. Office 365

Management of Office 365 requires the following software, which you should install in the order listed:

- Online Services Sign-in Assistant

Download and install the `.msi` from this link:

https://download.microsoft.com/download/5/0/1/5017D39B-8E29-48C8-91A8-8D0E4968E6D4/en/msoidcli_64.msi

- Windows Management Framework 5.1

If your PS Proxy is running Windows Server 2016 or later, or Windows 10 Professional or later, then you already have WMF 5.1 and can skip this step.

For older Windows versions download the appropriate version of WMF 5.1 from the link below, then install it:

<https://docs.microsoft.com/en-us/powershell/wmf/5.1/install-configure>

- Azure Active Directory Module for Windows PowerShell

Once WMF 5.1 has been installed, you can download and install this module directly from an elevated PowerShell session:

Install-Module AzureAD

1.3.5. Skype for Business Online

The Skype for Business Online, Windows PowerShell Module is used for managing Skype for Business Online. This module has several prerequisites, which must be installed in the order listed below:

- Office 365 Management

The Skype for Business Online, Windows PowerShell Module requires the Office 365 tools listed above, under *Office 365*, to be installed on the same PS Proxy. Install the Online Services Sign-in Assistant, WMF 5.1, and Azure Active Directory Module for Windows PowerShell before proceeding.

- KB2919442

Download and run the installer, which can be found here:

<https://www.microsoft.com/en-us/download/details.aspx?id=42153>

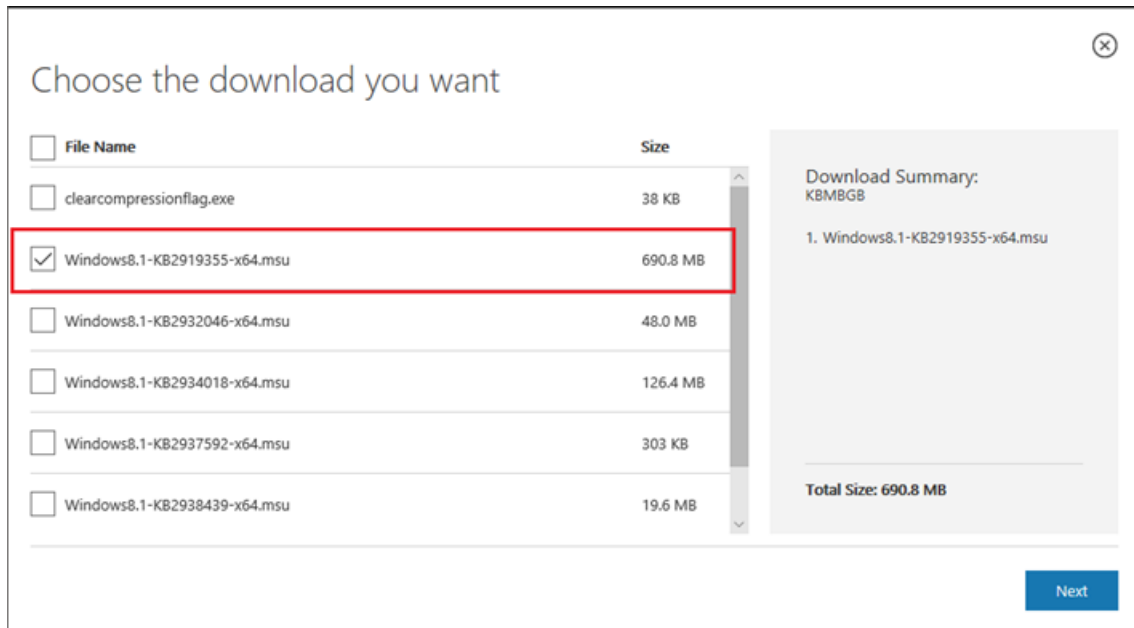
- KB2919355

Download the package found at this link:

<https://www.microsoft.com/en-us/download/details.aspx?id=42335>

This package contains multiple updates. Of those, the only update required for the Skype for Business Online PowerShell module is KB2919355 itself.

Restart the computer after installing KB2919355 and before proceeding with the next prerequisite.



- .NET Framework 4.7

Download and install the package:

<https://www.microsoft.com/en-us/download/details.aspx?id=55170>

Once the prerequisites are installed you can install the Skype for Business Online, PowerShell Module. You can find the installer at the link below:

<https://www.microsoft.com/en-us/download/details.aspx?id=39366>

1.3.6. Exchange Online

There is no specific management software required to manage Exchange Online.

The table below identifies the management software that must be installed on the PowerShell Proxy to support management of each of the UC Applications.

Management Software Requirements by UC Application

UC Application	Management Software Required
Active Directory	ActiveDirectory PowerShell module
Skype for Business Server	Skype for Business Administrative Tools
Exchange Server	No Exchange Server-specific management software required
Office 365	<ul style="list-style-type: none">• Online Services Sign-in Assistant• Windows Management Framework 5.1• Azure Active Directory Module for Windows PowerShell
Skype for Business Online	<ul style="list-style-type: none">• KB2919442• KB2919355• .NET Framework 4.7• Skype for Business Online, Windows PowerShell Module
Exchange Online	No Exchange Online-specific management software required

2 Step-by-Step Walk-Through

2.1. Walk-Through Overview

In this section we will walk through setting up a Microsoft domain for management by VOSS-4-UC, using a lab environment for demonstration purposes. As this is a lab setup, we will be taking a couple of shortcuts that are not recommended for a production environment. Those shortcuts will be highlighted where appropriate, and best practices will be noted.

Once the domain setup is complete we will configure VOSS-4-UC to communicate with the domain.

2.2. Lab Topology

The lab used in this example is a hybrid environment: it includes both an on-premises deployment and an Office 365 tenant. The on-premises domain is the fictitious `flexcorp.com`, and in addition to Active Directory this deployment includes Skype for Business Server and Exchange Server.

When selecting a vanity domain name for our Office 365 tenant we had to use a domain that we actually owned. Thus, our end users' email addresses and SIP addresses use the domain `vossilab.net`.

It is not necessary to reveal the underlying topology - Exchange Server addresses, Skype for Business front end pools, and so on. As you will see, all that VOSS-4-UC requires is the addresses of the PowerShell proxies that it will use to communicate with the UC applications.

2.3. PowerShell Proxies

For this example we will configure two PowerShell proxies. One of these will be used to for the connections on the on-premises components - Active Directory, Skype for Business Server, and Exchange Server. We will use the other proxy to connect with the applications hosted in Office 365: Skype for Business Online and Exchange Online.

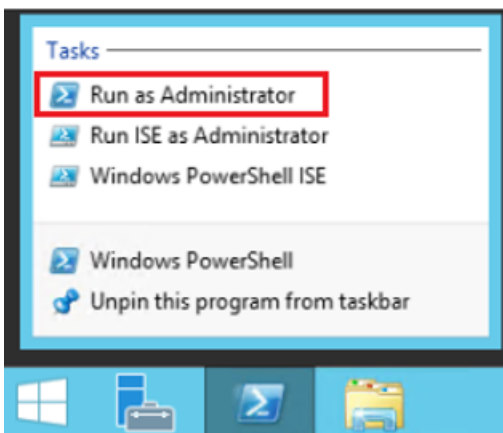
The decision to use two proxies rather than one - or five, or some other number in between - was somewhat arbitrary in this case; we chose two proxies mainly to demonstrate both how to divide the proxy duties between hosts, and how to combine multiple applications into a single proxy. We will install two new servers for this purpose, and we'll call them `psproxy01` and `psproxy02`, with the respective IP addresses of `10.5.25.240` and `10.5.25.241`. After installing Windows Server 2012 R2 on both machines, we join them to the `flexcorp.com` domain. We can now start configuring them.

2.4. PowerShell Proxy for On-Premises Applications

2.4.1. Enable PS Remoting

We'll start with the PS Proxy for the on-premises components, `pxproxy01`. The first task is to enable PowerShell Remoting. Since this is a Windows Server installation, PowerShell Remoting should already be enabled. Let's confirm that:

1. Open an elevated PowerShell session by right-clicking on the PowerShell icon in the task bar and choosing **Run as Administrator**.



2. Run the cmdlet **New-PSSession** with no arguments. If PowerShell Remoting is enabled the cmdlet should return information about the new session. (If we were running a client version of Windows, such as Windows 10 Professional Edition, PowerShell Remoting would not be enabled by default. We would have to manually enable it with the **Enable-PsRemoting** cmdlet.)

Do not close the PowerShell window - we will use it again in a later step.

 A screenshot of an Administrator: Windows PowerShell console window. The window title is 'Administrator: Windows PowerShell'. The output shows the command 'New-PSSession' being executed, resulting in a table of session information.


```

Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2013 Microsoft Corporation. All rights reserved.

PS C:\Users\administrator.FLEXCORP> New-PSSession

Id Name      ComputerName State      ConfigurationName Availability
-- --      -
1  Session1 localhost Opened     Microsoft.PowerShell Available

PS C:\Users\administrator.FLEXCORP>
  
```

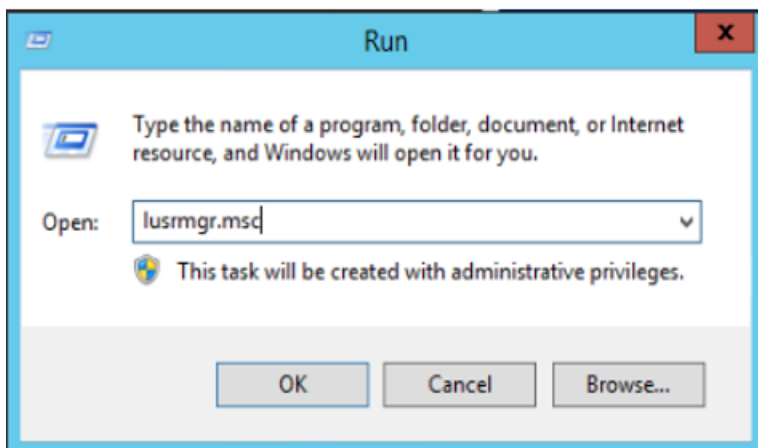
2.4.2. Create Remote Management Service Account

Next, we'll create the Remote Management Service Account and assign it to the correct security groups.

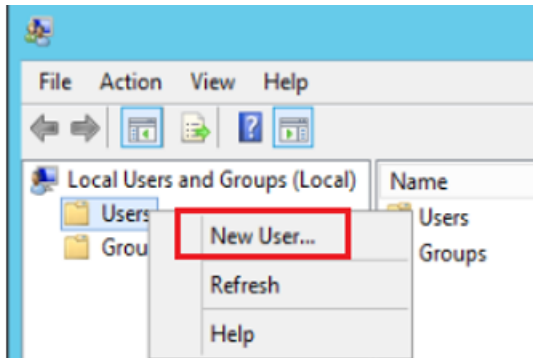
This is a local account on `psproxy01`, and we'll call it `WSMan-svc`.

1. Launch the **Local Users and Groups** console.
2. Right-click on the **Start** icon and choose **Run** to open the **Run** dialog.

3. Type `lusrmgr.msc` in the **Open** field and click **OK**.



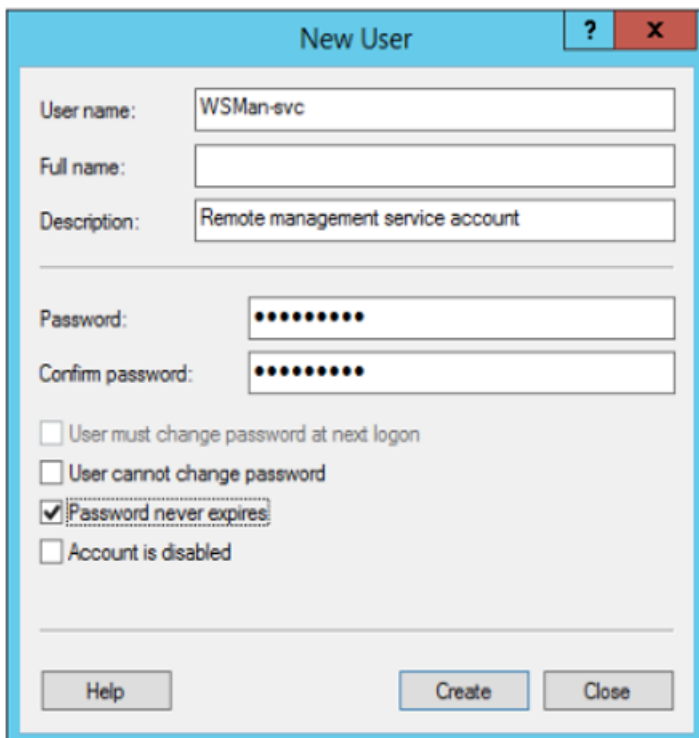
4. Right-click **Users** under **Local Users and Groups (Local)** and choose **New User...** to open the **New User** dialog.



5. On the **New User** dialog:
 - a. Enter the **User name** and **Password**.
 - b. Clear the **User must change password at next logon** check box.
 - c. Leave the **Account is disabled** check box cleared.
 - d. Select or clear the **User cannot change password** and **Password never expires** check boxes according to your organization's security policies.

Note: If you have to change the password, then you will also have to update VOSS-4-UC with the new password at the same time.

- e. Optionally enter a **Full name** and **Description**.
- f. Click **Create** and then **Close** to open the **Local Users and Groups (Local)** window.



New User

User name: WSMAN-svc

Full name:

Description: Remote management service account

Password: ●●●●●●●●

Confirm password: ●●●●●●●●

User must change password at next logon

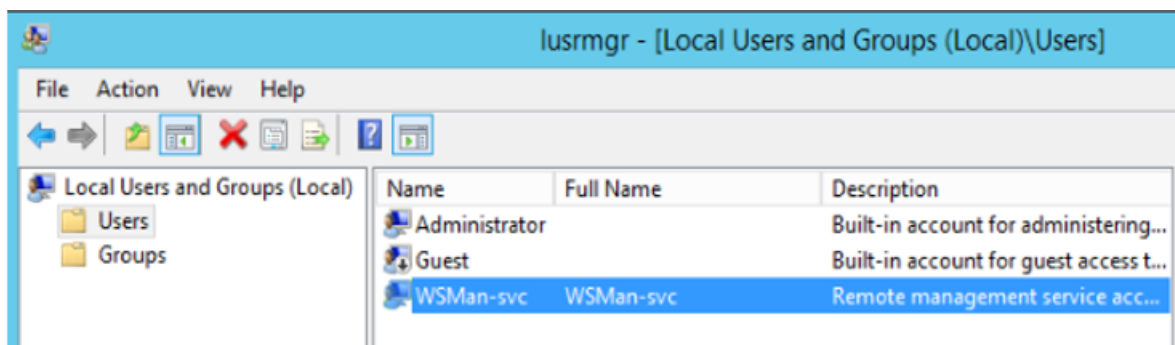
User cannot change password

Password never expires

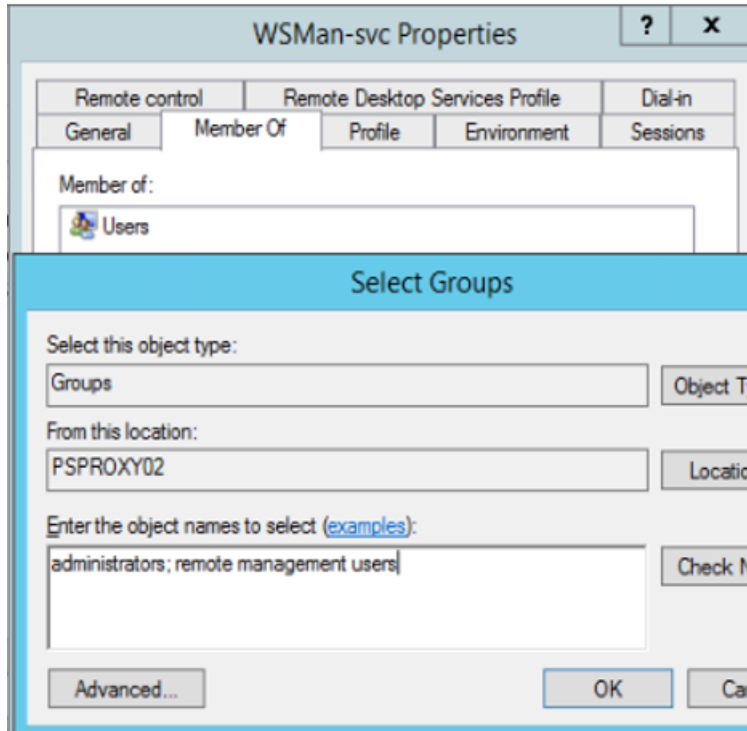
Account is disabled

Help Create Close

6. Choose **Users** from the navigation pane, then double-click the user you just created to open the **Properties** dialog for that user.



7. Choose the **Member Of** tab and click **Add...** to open the **Select Groups** dialog.
8. Type `administrators;remote management users` in the **Enter the object names to select** text box.
9. Click **OK** twice.



2.4.3. Configure WinRM Service

Now we'll configure the WinRM service. We will use the elevated PowerShell session we used earlier. (If you have closed it, just open another one by right-clicking the **PowerShell** task bar icon and choosing **Run as Administrator**.) In this PowerShell session run the following cmdlets exactly as shown under *WinRM Configuration*.

```

PS C:\Users\administrator.FLEXCORP> Enable-WSManCredSSP -Role Server -Force

cfg           : http://schemas.microsoft.com/wbem/wsman/1/config/service/auth
lang          : en-US
Basic        : false
Kerberos     : true
Negotiate    : true
Certificate   : false
CredSSP      : true
CbtHardeningLevel : Relaxed

PS C:\Users\administrator.FLEXCORP> Enable-WSManCredSSP -Role Client -DelegateComputer * -Force

cfg           : http://schemas.microsoft.com/wbem/wsman/1/config/client/auth
lang          : en-US
Basic        : true
Digest       : true
Kerberos     : true
Negotiate    : true
Certificate   : true
CredSSP      : true

PS C:\Users\administrator.FLEXCORP> Set-Item WSMan:\localhost\Service\AllowUnencrypted $true
PS C:\Users\administrator.FLEXCORP> Set-Item WSMan:\localhost\Service\Auth\Basic $true
PS C:\Users\administrator.FLEXCORP> Set-Item WSMan:\localhost\Client\AllowUnencrypted $true
PS C:\Users\administrator.FLEXCORP> Set-Item WSMan:\localhost\Client\Auth\Basic $true
PS C:\Users\administrator.FLEXCORP> Set-Item WSMan:\localhost\Client\TrustedHosts "localhost" -force
PS C:\Users\administrator.FLEXCORP>

```

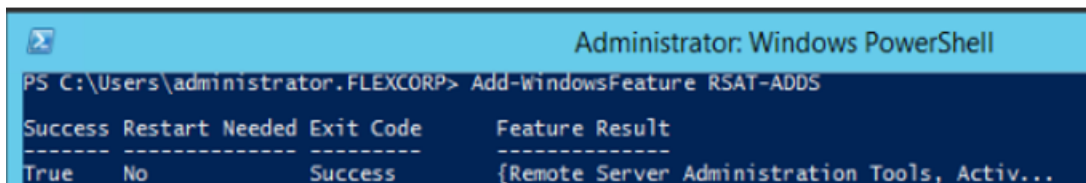
As noted above, we do not need to do anything to configure firewall exceptions as those are configured automatically by the **Enable-PsRemoting** cmdlet. So the next step is to install the software prerequisites.

2.4.4. Install Remote Server Administration Tools

We are configuring this machine to proxy PowerShell sessions to the on-premises environment - specifically Active Directory, Skype for Business Server, and Exchange Server. Of those three, there are specific software requirements for the first two.

For Active Directory we need the Remote Server Administration Tools. This feature is already installed on Windows Server editions, and simply needs to be enabled. Do this by running the cmdlet **Add-WindowsFeature RSAT-ADDS**. Note that if this were a client version of Windows we would have had to download and install Remote Server Administration Tools.

See *Software Prerequisites* for details on where to find the download.



```

Administrator: Windows PowerShell
PS C:\Users\administrator.FLEXCORP> Add-WindowsFeature RSAT-ADDS

Success Restart Needed Exit Code      Feature Result
-----
True     No             Success          {Remote Server Administration Tools, Activ...

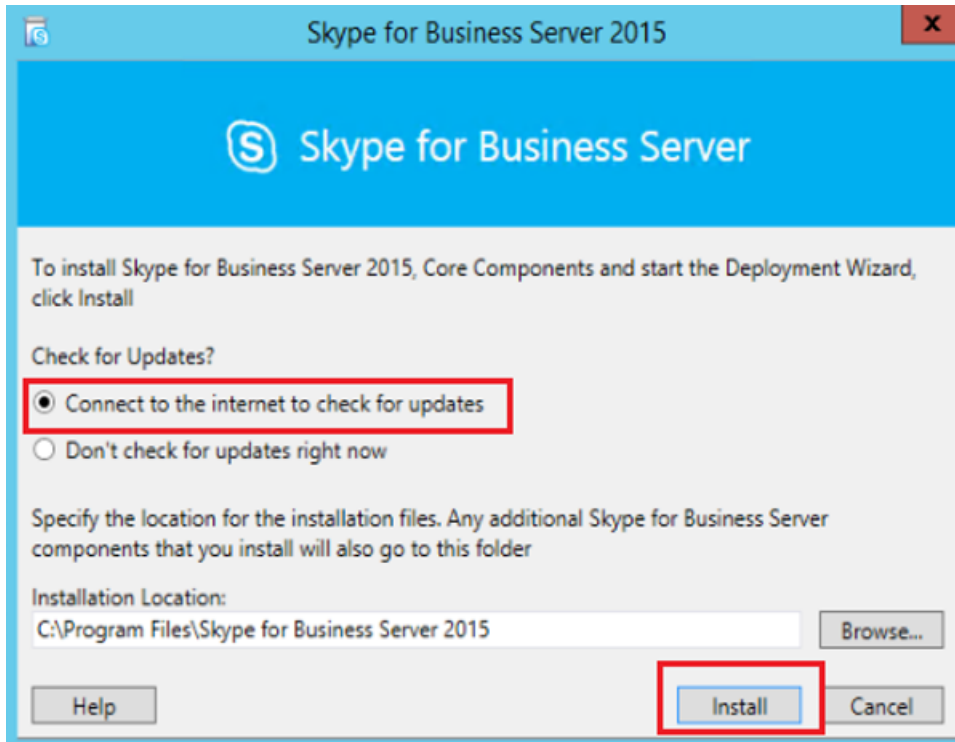
```

2.4.5. Install Skype for Business Administrative Tools

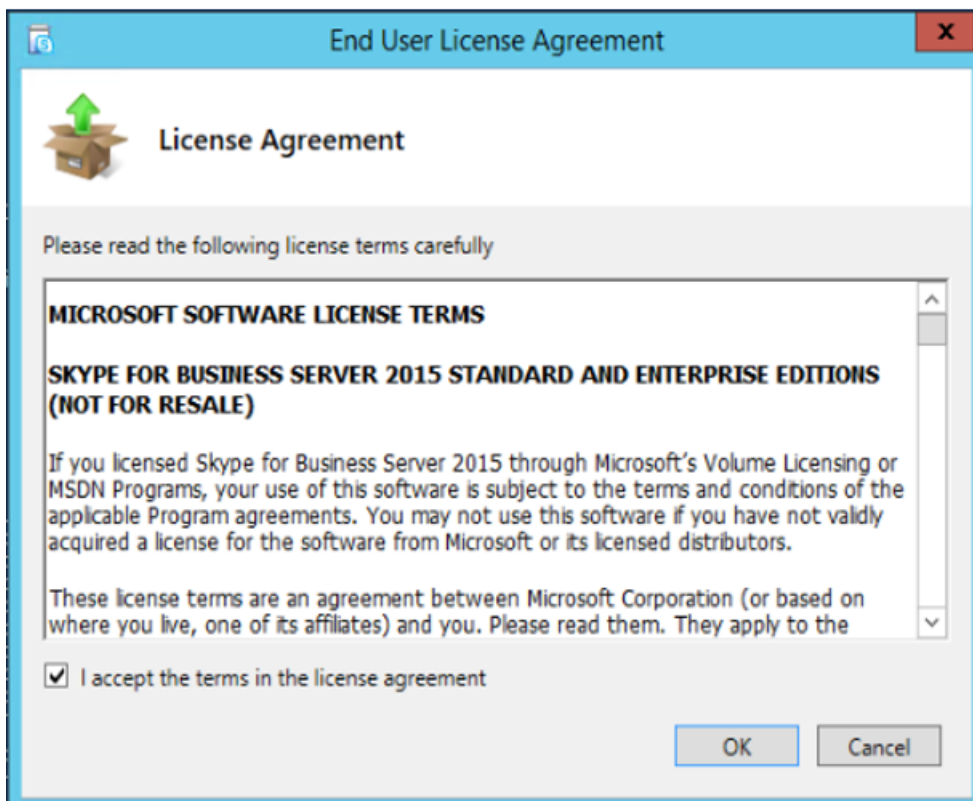
Next, we need the Skype for Business Administrative Tools. For that we will need the Skype for Business Server installation media corresponding to your Skype for Business Server deployment. In this sample lab

we have this mounted on drive D :

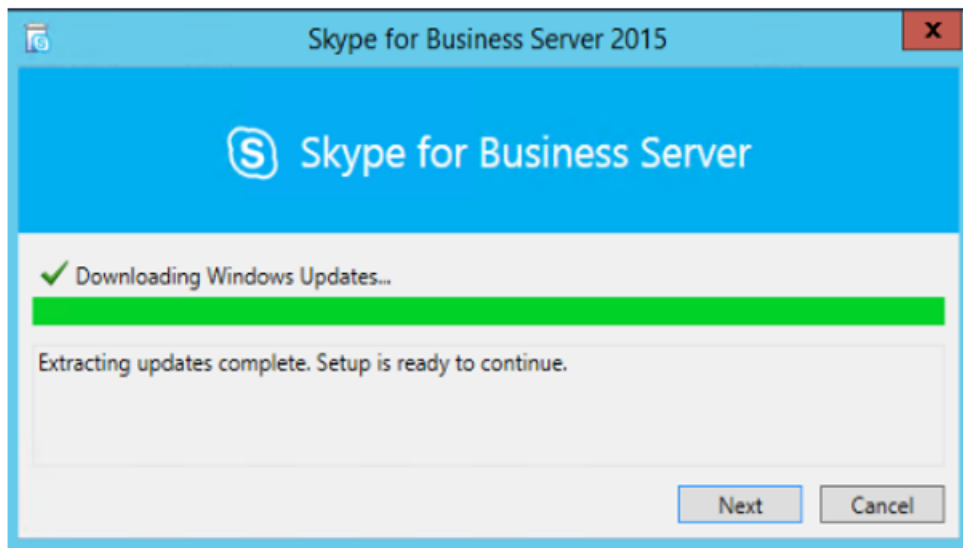
1. From Windows Explorer navigate to **This PC** and double-click the icon for your DVD drive (or navigate to the folder containing the Skype for Business Server ISO image and double-click that icon). If the Skype for Business Server installer does not start automatically, navigate to the `Setup\amd64` directory and double-click `Setup.exe`. The installer launches.
2. Choose **Connect to the internet to check for updates** radio button and click **Install**.



3. Accept the license agreement and click **OK**.



4. After updates have been downloaded and extracted, click **Next**.

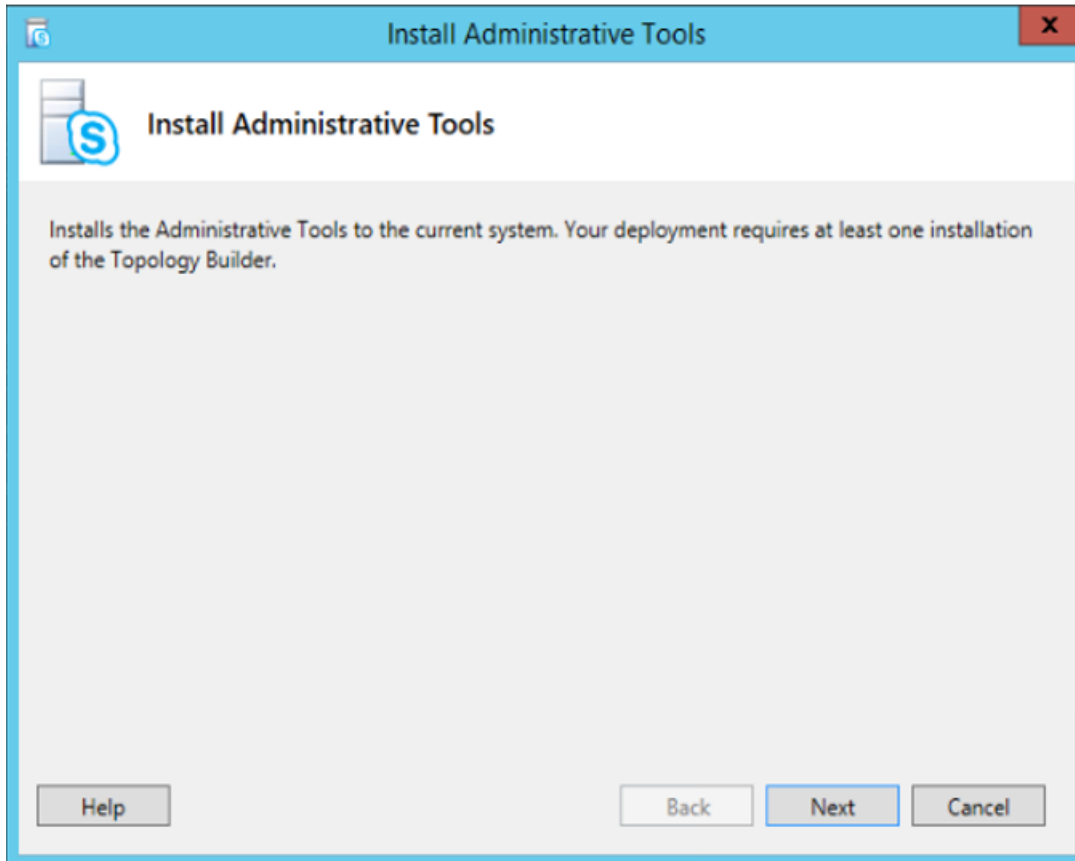


5. After the core components are installed, the Skype for Business Server 2015 Deployment Wizard launches. On the **Welcome to Skype for Business Server 2015** Deployment screen choose **Install Administrative Tools**.

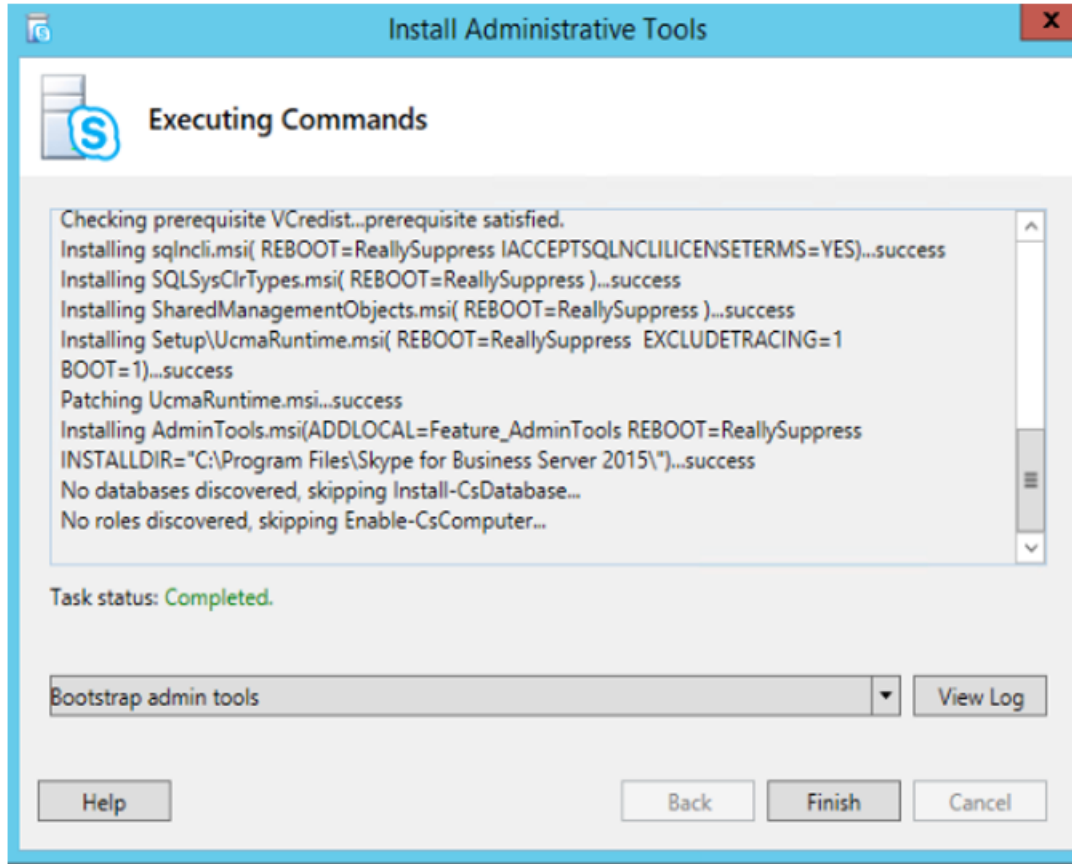
Install Administrative Tools

Installs the Administrative Tools to the current system.
Your deployment requires at least one installation of the Topology Builder.

6. Click **Next** on the **Install Administrative Tools** dialog.



7. Click **Finish**, and then click **Exit**. The administrative tools are now installed.



2.5. PowerShell Proxy for Online Applications

2.5.1. PowerShell Proxy for Online Applications

We have finished with `psproxy01`. The steps for `psproxy02` are the same until we come to the software prerequisites: we will do the following exactly as we did for `psproxy01`. Repeat on `psproxy02` the first four sections under “PowerShell Proxy for On-Premises Applications”, above.

- Join `psproxy02` to the `flexcorp.com` domain.
- Verify the PowerShell Remoting is enabled.
- Create the Remote Management Service Account. For consistency we will give this account the same name as on `psproxy01`.
- Make the Remote Management Service Account a member of the two local security groups Administrators and Remote Management Users.
- Configure the WinRM service.

2.5.2. Install Online Services Sign-in Assistant

We are now ready to install the software prerequisites.

Since this PS Proxy is going to be used to manage the cloud components we are going to need the Online Services Sign-in Assistant, Azure Active Directory Module for Windows PowerShell, and Skype for Business Online, Windows PowerShell Module, and any prerequisites required by these modules.

1. Download the Online Services Sign-in Assistant (`msoidcli_64.msi`) and the Skype for Business Online, Windows PowerShell Module (`SkypeOnlinePowershell.exe`) from the links in [Required Management Software and Prerequisites](#) and copy it to the PS Proxy.
2. On the PS Proxy navigate to the folder where you copied the installer. Double-click `msoidcli_64.msi` to launch it, then follow the on-screen instructions.

2.5.3. Install Windows Management Framework 5.1

Our PS Proxy is running Windows Server 2012 R2, which means that it does not come with WMF 5.1. We'll go to the link documented in [Required Management Software and Prerequisites](#) and download the installer `Win8.1AndW2K12R2-KB3191564-x64.msu`.

Double-click the installer to get started. The process is straightforward; finish by restarting the computer.

Note: If the PS Proxy had been running Windows Server 2016 or later, or Windows 10 Professional or later, then WMF 5.1 is already part of the operating system and we would not have needed to install it manually.

2.5.4. Install Azure Active Directory Module for Windows PowerShell

Open an elevated PowerShell session, if you don't already have one open.

In that session enter the following command:

Install-Module AzureAD

If you are prompted to install the NuGet provider, answer **Yes**.

If you receive a warning about "PSGallery" being an untrusted repository, answer **Yes** to the "Are you sure..." prompt.

Note: You can avoid this warning in the future by executing this cmdlet:

Set-PSRepository -Name PSGallery -InstallationPolicy Trusted

Installing Azure Active Directory Module for Windows PowerShell

```

Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Users\administrator.FLEXCORP> Install-Module AzureAD

NuGet provider is required to continue
PowerShellGet requires NuGet provider version '2.8.5.201' or newer to interact with NuGet-based repositories. The NuGet
provider must be available in 'C:\Program Files\PackageManagement\ProviderAssemblies' or
'C:\Users\administrator.FLEXCORP\AppData\Local\PackageManagement\ProviderAssemblies'. You can also install the NuGet
provider by running 'Install-PackageProvider -Name NuGet -MinimumVersion 2.8.5.201 -Force'. Do you want PowerShellGet
to install and import the NuGet provider now?
[Y] Yes [N] No [S] Suspend [?] Help (default is "Y"):

Untrusted repository
You are installing the modules from an untrusted repository. If you trust this repository, change its
InstallationPolicy value by running the Set-PSRepository cmdlet. Are you sure you want to install the modules from
'PSGallery'?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"): y
PS C:\Users\administrator.FLEXCORP>

```

2.5.5. Install Skype for Business Online, Windows PowerShell Module

1. Download the installers for:

- KB2919442 (Windows8.1-KB2919442-x64.msu)
- KB2919355 (Windows8.1-KB2919355-x64.msu)
- .NET Framework 4.7 (NDP47-KB3186500-Web.exe)
- Skype for Business Online, Windows PowerShell Module (SkypeOnlinePowershell.exe)

from the links provided in *Required Management Software and Prerequisites* and copy them to the PS Proxy.

2. Install KB2919442 by double-clicking the installer Windows8.1-KB2919442-x64.msu and following the on-screen instructions.
3. Install KB2919355 by double-clicking the installer Windows8.1-KB2919355-x64.msu and following the on-screen instructions. Restart the computer when the installation is complete.
4. Install .NET Framework 4.7 by double-clicking the installer NDP47-KB3186500-Web.exe and following the on-screen instructions.
5. Install Skype for Business Online, PowerShell Module by double-clicking the installer SkypeOnlinePowershell.exe and following the on-screen instructions.

2.6. Domain Service Account

2.6.1. Domain Service Account Overview

We have the option of designating a separate service account for each application. We could also have designated one account for on-premises applications (Skype for Business Server and Exchange Server) and a different one for online services (Office 365, Skype for Business Online, and Exchange Online).

You can mix and match service accounts in any way that makes sense for your organization.

For this example, we will use a single domain service account for managing all of the on-premises and online applications.

2.6.2. Create the Domain Service Account

There are various ways of creating a domain account in Active Directory.

For the purposes of this example we will use the **Active Directory Users and Computers Management** console. You may have a specific Organizational Unit (OU) for service accounts. For this installation we will simply put the service account in the built-in **Users OU**.

Note: To execute this procedure you must be a domain administrator.

1. Choose **Users** OU in the navigation pane of the **Active Directory Users and Computers Management** window.
2. Right-click **Users** and choose **New User** to open the **New Object - User** dialog.
3. Type "V4UC-Service" in the **Full name** and **User logon name** text boxes.
4. Choose the required domain from the drop-down, and click **Next**.

Create New Service Account

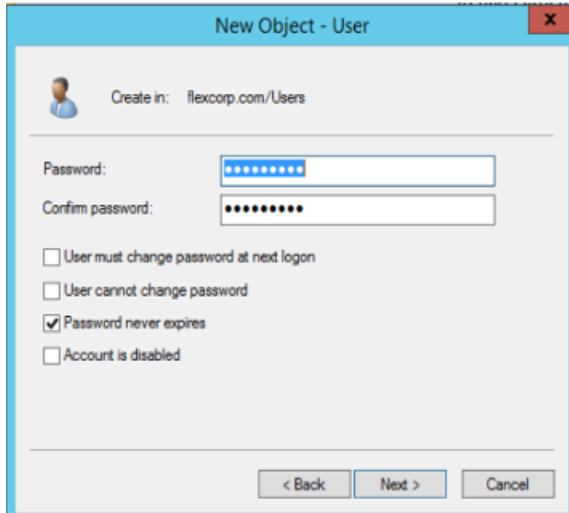
The screenshot shows the 'New Object - User' dialog box. At the top, it says 'Create in: flexcorp.com/Users'. Below that are several input fields: 'First name', 'Initials', 'Last name', 'Full name' (containing 'V4UC-Service'), 'User logon name' (containing 'V4UC-Service' and a dropdown menu showing '@flexcorp.com'), and 'User logon name (pre-Windows 2000)' (containing 'FLEXCORP\' and 'V4UC-Service'). At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

5. Enter and confirm your password, making sure that the password complies with your Provider's password standards for the Windows domain.
6. Clear the **User must change password at next logon** check box.
7. Select the **Password never expires** check box.

Note: Your organization's policy may require periodically changing service account passwords. If that is the case, be sure and change the password in VOSS-4-UC at the same time. See the "Provision VOSS-4-UC" section.

8. Click **Next**, and then click **Finish**.

Service Account Security Settings

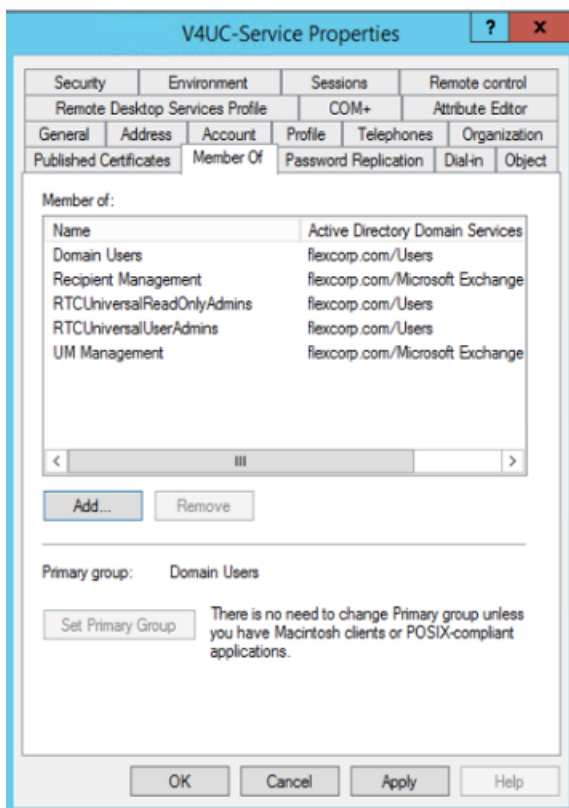
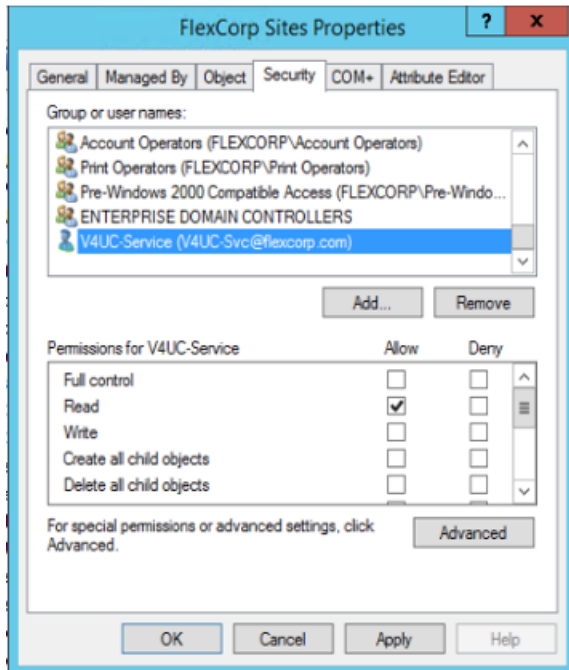


2.6.3. Add Service Account to On-Premises Security Groups

We need to give this account permission to manage Skype for Business Server users and Exchange mailboxes. To do this we will add it to the specific security groups that enable this access.

1. Right-click the service account in the details pane of the **Active Directory Users and Computers Management** console and choose **Properties** from the context menu.
2. Click the **Member Of** tab.
3. Click **Add** and enter the following group names separated by semicolons:
RTCUniversalServerAdmins, Recipient Management, and UM Management.
4. Click **OK** twice.

Domain Service Account Security Group Membership



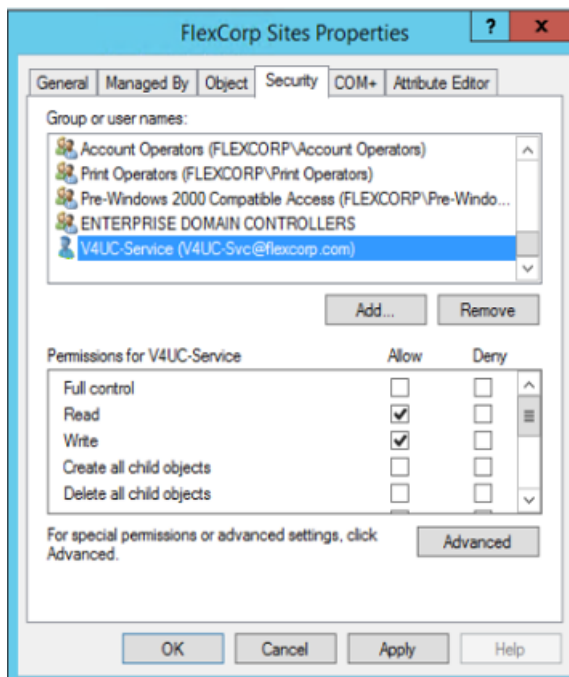
2.6.4. Grant Access to the Users' OU

By default all domain users have read access to user information in Active Directory. We need to give this service account the additional permission to update AD user and contact objects. This is accomplished by modifying specific ACLs in Active Directory.

In our example, all our users are in the Organization Unit called `FlexCorp Sites`. This OU contains multiple sub-units, each of which can contain user and contact objects. We will use the **Active Directory Users and Computers Management** console to modify the ACL of the FlexCorp Sites Organizational Unit.

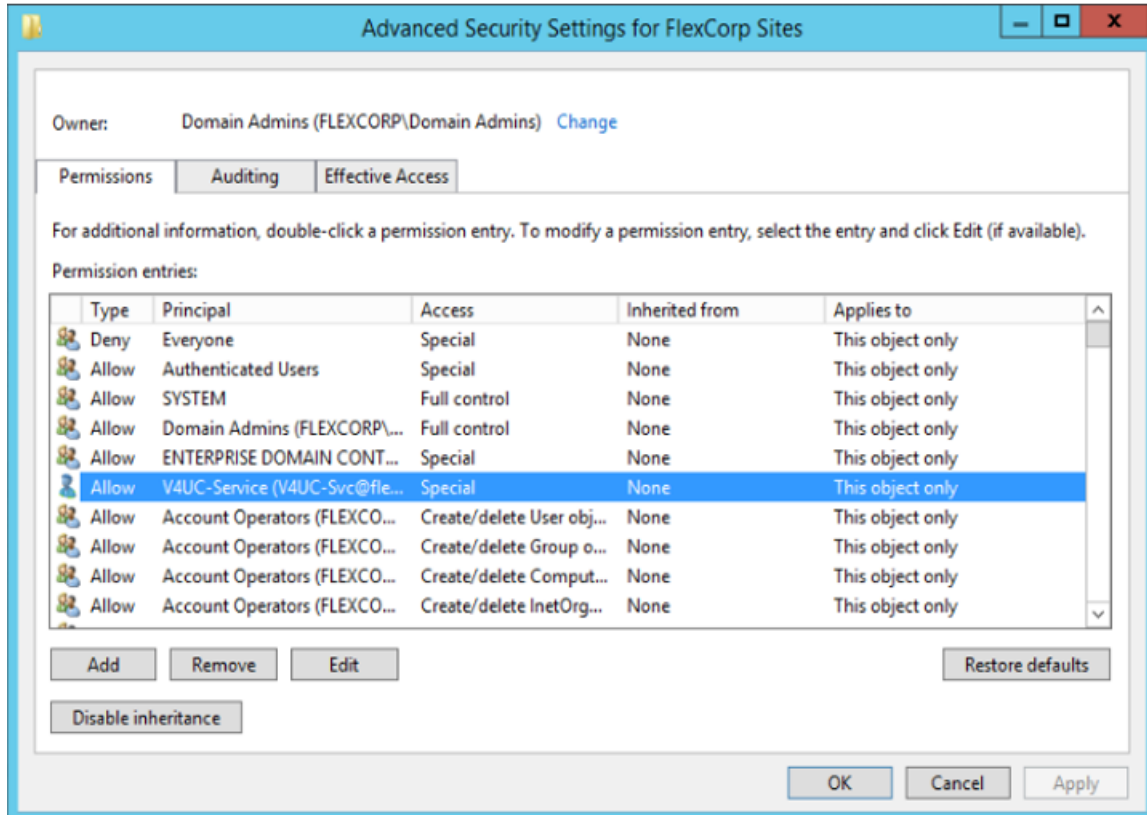
1. Navigate to the FlexCorp Sites in the navigation pane.
2. Right-click **FlexCorp Sites** and choose **Properties** from the context menu.
3. Click the **Security** tab and click **Add...**
4. Enter the name of your service account in the **Enter the object names to select** text box and click **OK**.
5. Select the **Write** check box and confirm that the **Read** check box is already selected in the **Allow** column.

Organizational Unit Security Tab



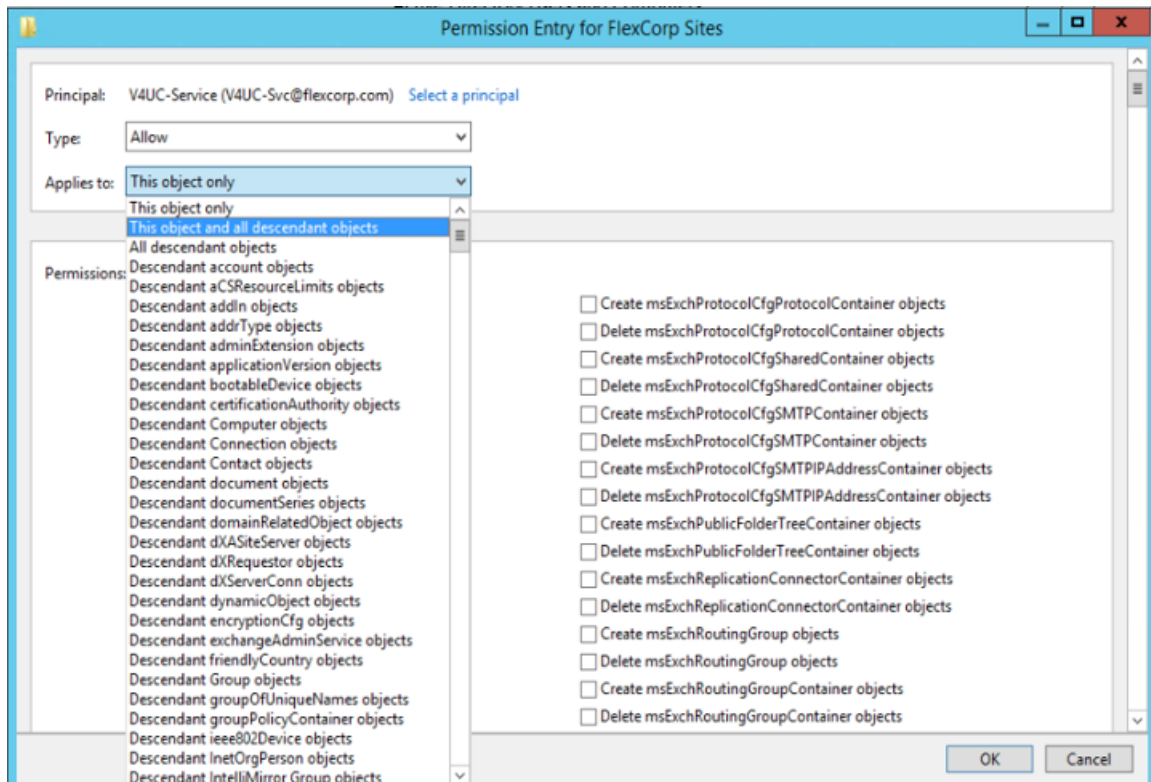
6. Click **Advanced** to open the **Advanced Security Settings for FlexCorp Sites** dialog.
7. Click the **Permissions** tab, then choose the **V4UC-Service** account and click **Edit**.

Service Account Advanced Security Settings



8. Choose the **This object and all descendant objects** option from the drop-down list in the **Applies to** column.
9. Click **OK** three times.

Service Account Permission Entry

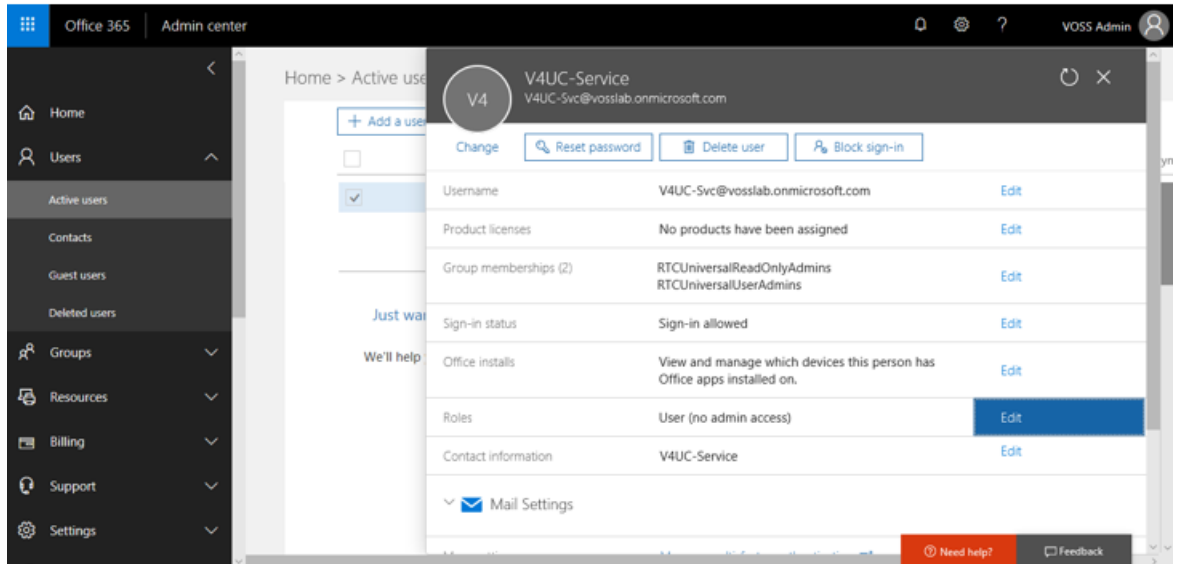


2.6.5. Enable Skype for Business Online Administration

Now we'll enable the service account to manage Skype for Business Online users.

1. Browse to <https://portal.office.com>, and sign in with administrative credentials.
2. Navigate to the **Office 365 Admin Center**.
3. Locate and select the service account, on the **Active Users** page to display the user's property sheet.

Service Account Office 365 Properties



4. Click **Edit** in the **Roles** row.
5. Choose the **Customized administrator** radio button, and then select the **Skype for Business administrator** check box.
6. Click the **Save** button, and then click **Close**.

User (no administrator access)
 Global administrator
 Customized administrator

- Billing administrator
- Dynamics 365 service administrator
- Exchange administrator
- Password administrator
- Skype for Business administrator
- Power BI service administrator
- Reports reader
- Service administrator
- SharePoint administrator
- User management administrator

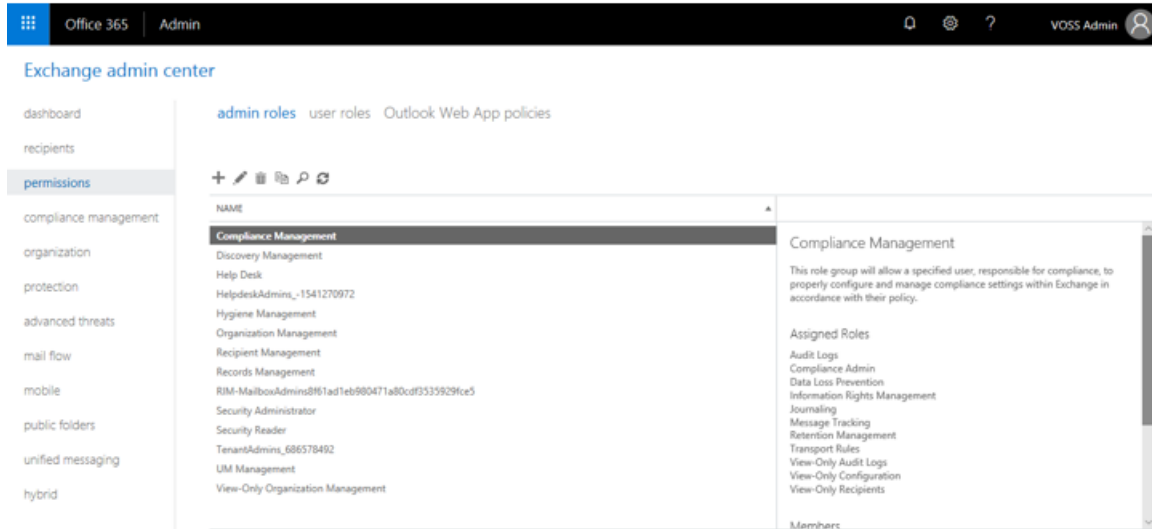
Alternative email address [Edit](#)

2.6.6. Create Exchange Online Custom Role Group

To assign the least privileges necessary for VOSS-4-UC to manage your Exchange Online mailboxes you will need to create a custom role group in Exchange Online. These steps will walk you through that process.

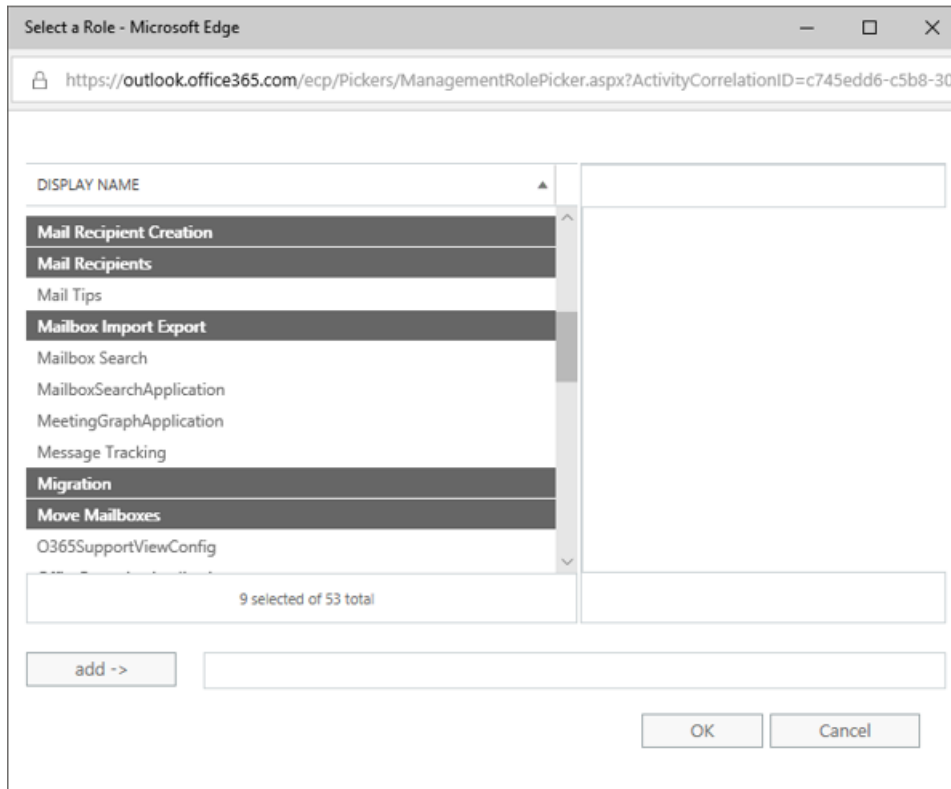
1. Browse to <https://portal.office.com>, and sign in with administrative credentials.
2. Navigate to the **Office 365 Admin Center**.
3. Navigate to the **Exchange Admin Center** and choose **permissions** from the navigation pane.
4. Choose the **admin roles** option at the top of the screen.

Exchange Online Admin Roles page



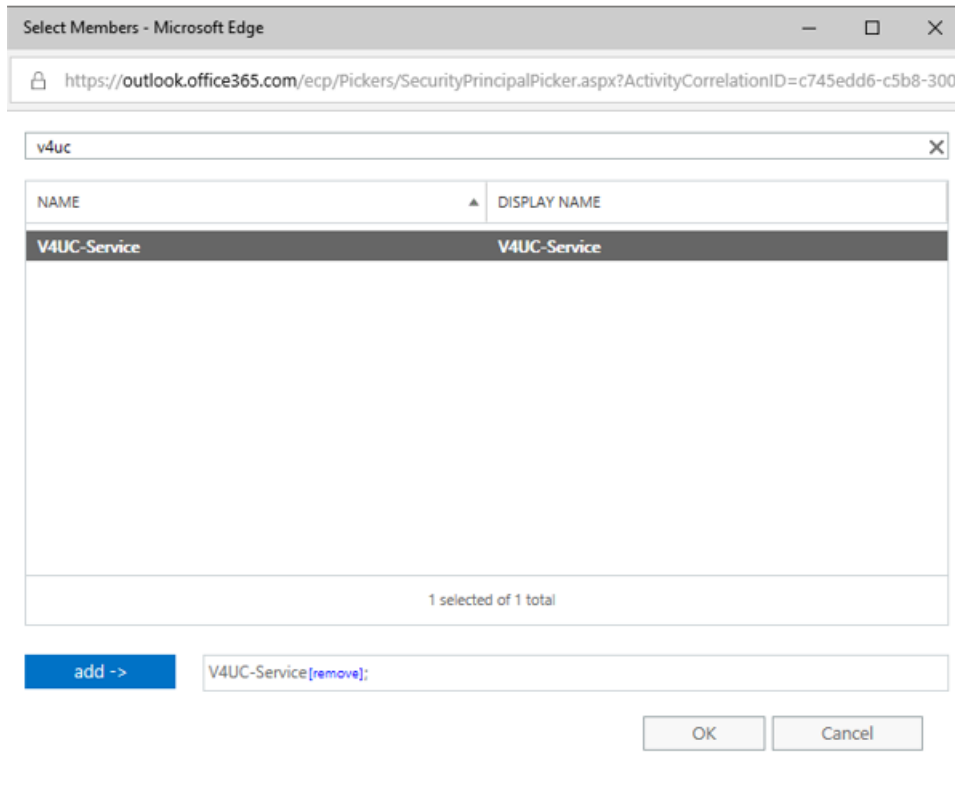
5. Click the **+** icon to add a new role group.
6. Enter a group **Name** and an optional **Description**. Leave the **Write scope** as **Default**.
7. Click the **+** icon under **Roles** to add the following roles. **Ctrl + left mouse click** to select multiple roles. Click **OK** when complete:
 - Address Lists
 - Mail Recipient Creation
 - Mail Recipients
 - Mailbox Import Export
 - Migration
 - Move Mailboxes
 - Reset Password
 - SendMailApplication
 - UM Mailboxes

Exchange Online Role Group - Role Selection



8. Click the **+** icon on the **new role group** sheet, under **Members:** to add the service account to this group.
9. Choose the service account from the list of user accounts, click **Add ->**, and then click **OK**.

Exchange Online Role Group - Add Members



10. Click **Save** on the new role group sheet.
Exchange Online Role Group

Role Group - Microsoft Edge

https://outlook.office365.com/ecp/UsersGroups/EditAdminRoleGroup.aspx?ActivityCorr

V4UC

*Name:

Description:

Write scope:
Roles were assigned to this role group using multiple write scopes or exclusive write scopes. Therefore, you can't view the write scope or manage the assigned roles here.

Roles:
+ -

NAME
Address Lists
Mail Recipient Creation
Mail Recipients
Mailbox Import Export
Migration

Members:
+ -

NAME	DISPLAY NAME
V4UC-Service	V4UC-Service

Save Cancel

2.6.7. Add to PS Proxy local administrators group

Repeat these steps on all PS Proxies in your deployment. In this lab we have two PS Proxies, and will complete these steps on both of them.

1. On the PS Proxy launch `lusrmgr.msc`.
2. Choose **Groups** from the navigation pane, right-click **Administrators** and then choose **Properties** from the context menu.
3. Click **Add...**
4. Enter the name of your domain service account in the **Enter the object names to select** text box. If you have more than one domain service account using this PS Proxy, enter all of them, separated by semicolons.
5. Click **OK** twice.

2.7. Example: Provision VOSS-4-UC

2.7.1. Provision VOSS-4-UC Workflow

1. Sign into VOSS-4-UC as an administrator at a hierarchy level at or above where you will be adding the Microsoft devices. You can add Microsoft devices at the customer level, the provider level, or at any intermediate node above customer.
2. Open the **Device Management** menu.

2.7.2. Active Directory

1. Choose **Active Directory** from the Device Management menu.
2. Choose **AD Server** and click **Add**.

Active Directory Server Configuration Page

Base	Model Relation Mapping
Version*	1.0
Host Name*	10.5.25.218
Username*	WSMan-svc
Password*	.....
Repeat Password*	.....
Domain Name*	flexcorp.com
Domain Username*	V4UC-Svc
Domain Password*	.....
Repeat Domain Password*	.....
Active Directory Filter*	*
Active Directory SearchBase	OU=FlexCorpInc Sites,DC=flexcorp,DC=com

3. Enter the following values on the **Base** tab:
Sample Active Directory Configuration Parameters

Parameter	Example Value	Comments
Version	1.0	This is the only version currently supported
Host Name	10.5.25.240	The IP address of the PS Proxy handling Active Directory connections. We could have also entered <code>psproxy01.flexcorp.com</code> , which is the FQDN of that proxy.
User-name	WSMan-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain User-name	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Active Directory Filter	*	We will use a simple wildcard that filters nothing - all results are returned.
Active Directory Search-Base	OU=FlexCorp Sites, DC=flexcorp, DC=com	This is the Distinguished Name of the Organizational Unit containing the users and contacts that VOSS-4-UC will manage. Note that this is the OU for which we granted write privileges to the domain service account in the Grant Access to the Users' OU section.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

2.7.3. Skype for Business Server

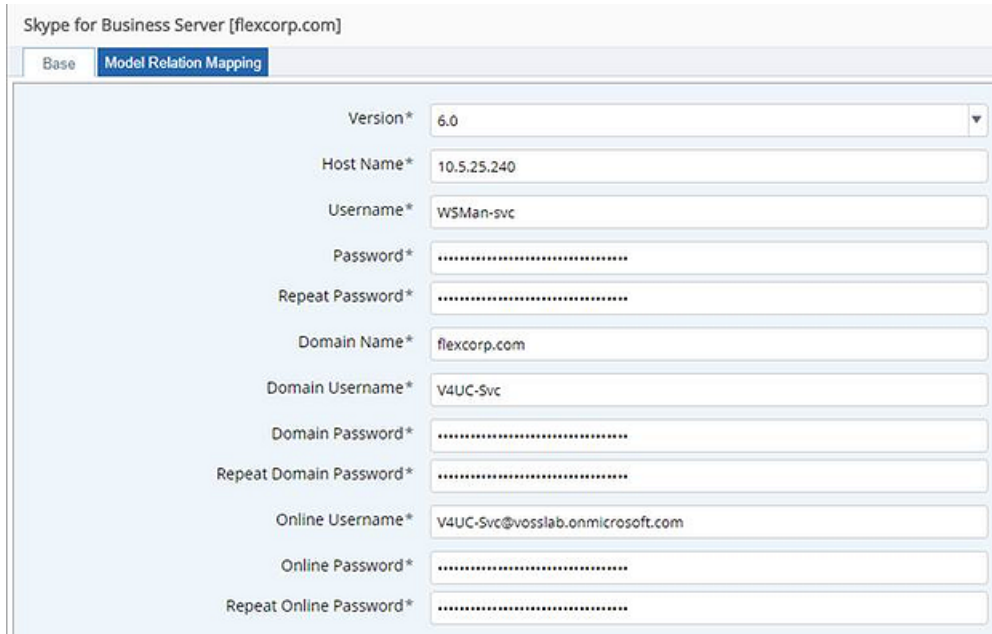
1. Choose **Skype for Business** from the **Device Management** menu.
2. Choose the **Skype for Business Server** and click **Add**.

Skype for Business Server Configuration Page

¹ See: [Remote Management Service Account](#)

² See: [Create the Domain Service Account](#)

³ See: [Create the Domain Service Account](#)



3. Enter the following values on the **Base** tab:

Sample Skype for Business Server Configuration Parameters

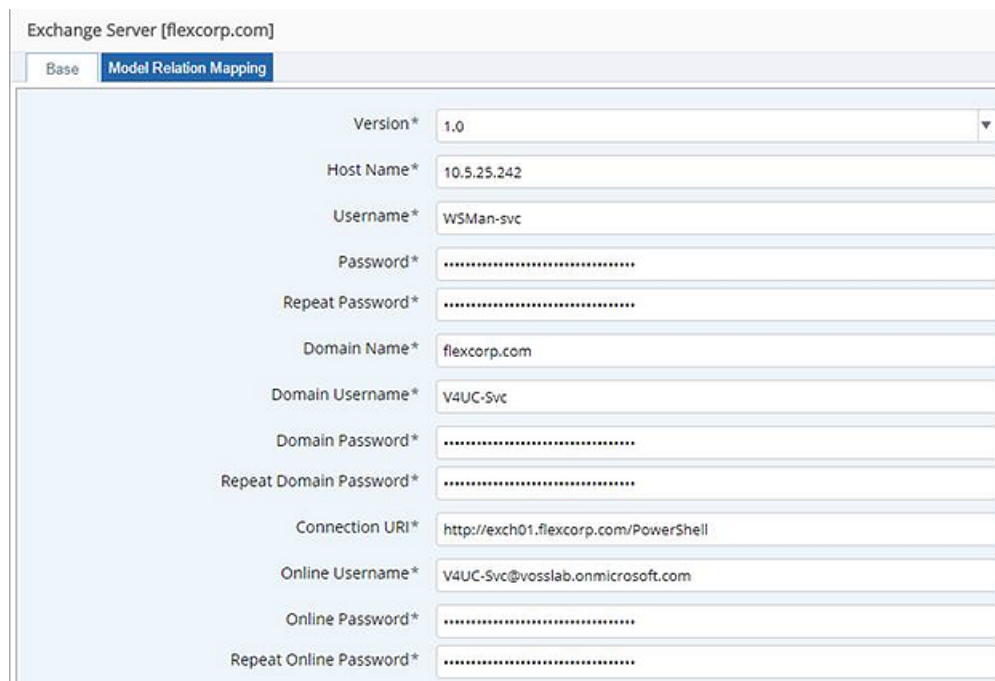
Parameter	Example Value	Comments
Version	6.0	This is the only version currently supported
Host Name	10.5.25.240	The IP address of the PS Proxy handling Skype for Business Server connections. We could have also entered <code>psproxy01.flexcorp.com</code> , which is the FQDN of that proxy.
Username	WSMan-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain Username	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Online Username	V4UC-Svc@voss1ab.onmicrosoft.com	The username of the domain service account as it appears in the Office 365 Admin Center.
Online Password / Repeat		The password for the online service account. This will be the same as "Domain Password", above.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

2.7.4. Exchange Server

1. Choose **Exchange** from the **Device Management** menu.
2. Choose **Exchange Server** and click **Add**.

Exchange Server Configuration Page



Exchange Server [flexcorp.com]

Base Model Relation Mapping

Version* 1.0

Host Name* 10.5.25.242

Username* WSMan-svc

Password*

Repeat Password*

Domain Name* flexcorp.com

Domain Username* V4UC-Svc

Domain Password*

Repeat Domain Password*

Connection URI* http://exch01.flexcorp.com/PowerShell

Online Username* V4UC-Svc@vosslab.onmicrosoft.com

Online Password*

Repeat Online Password*

3. Enter the following values on the **Base** tab:

Sample Exchange Server Configuration Parameters

¹ See: *Remote Management Service Account*

² See: *Create the Domain Service Account*

³ See: *Create the Domain Service Account*

Parameter	Example Value	Comments
Version	1.0	This is the only version currently supported
Host Name	10.5.25.240	The IP address of the PS Proxy handling Exchange Server connections. We could have also entered <code>psproxy01.flexcorp.com</code> , which is the FQDN of that proxy.
User-name	WSMan-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain User-name	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Connection URI	<code>http://exch01.flexcorp.com/PowerShell</code>	The URI starts with the FQDN of an on-premises Exchange server that hosts the Exchange Admin Center.
Online User-name	<code>V4UC-Svc@vosslab.onmicrosoft.com</code>	The username of the domain service account as it appears in the Office 365 Admin Center.
Online Password / Repeat		The password for the online service account. This will be the same as "Domain Password", above.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

2.7.5. Microsoft Online

1. Choose **Microsoft Online** from the **Device Management** menu.
2. Choose **Office365 Tenants** and click **Add**.

Microsoft Online (Office 365 Tenant) Configuration Page

¹ See: [Remote Management Service Account](#)

² See: [Create the Domain Service Account](#)

³ See: [Create the Domain Service Account](#)

Office365 Tenants [flexcorp.com]

Base **Model Relation Mapping**

Version* 1.0

Host Name* 10.5.25.241

Username* WSMAN-svc

Password*

Repeat Password*

Domain Name* flexcorp.com

Domain Username* V4UC-Svc

Domain Password*

Repeat Domain Password*

Online Username* V4UC-Svc@vosslab.onmicrosoft.com

Online Password*

Repeat Online Password*

3. Enter the following values on the **Base** tab:

Sample Microsoft Online Configuration Parameters

Parameter	Example Value	Comments
Version	6.0	This is the only version currently supported
Host Name	10.5.25.241	The IP address of the PS Proxy handling Office 365 connections. We could have also entered <code>psproxy02.flexcorp.com</code> , which is the FQDN of that proxy.
Username	WSMAN-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain Username	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Online Username	V4UC-Svc@vosslab.onmicrosoft.com	The username of the domain service account as it appears in the Office 365 Admin Center.
Online Password / Repeat		The password for the online service account. This will be the same as "Domain Password", above.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

2.7.6. Skype for Business Online

1. Choose **Skype for Business Online** from the **Device Management** menu.
2. Choose **Skype for Business Online Server** and click **Add**.

Skype for Business Online Configuration Page

The screenshot shows the 'Skype for Business Online Server [flexcorp.com]' configuration page. The 'Model Relation Mapping' tab is active. The form contains the following fields:

Field Name	Value
Version*	1.0
Host Name*	10.5.25.241
Username*	WSMan-svc
Password*	.....
Repeat Password*	.....
Domain Name*	flexcorp.com
Domain Username*	V4UC-Svc
Domain Password*	.....
Repeat Domain Password*	.....
Online Username*	V4UC-Svc@vosslab.onmicrosoft.com
Online Password*	.....
Repeat Online Password*	.....

3. Enter the following values on the **Base** tab:

Sample Skype for Business Online Configuration Parameters

¹ See: *Remote Management Service Account*

² See: *Create the Domain Service Account*

³ See: *Create the Domain Service Account*

Parameter	Example Value	Comments
Version	1.0	This is the only version currently supported
Host Name	10.5.25.241	The IP address of the PS Proxy handling Skype for Business Online connections. We could have also entered <code>psproxy02.flexcorp.com</code> , which is the FQDN of that proxy.
User-name	WSMan-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain User-name	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Online User-name	V4UC-Svc@voss1.onmicrosoft.com	The username of the domain service account as it appears in the Office 365 Admin Center.
Online Password / Repeat		The password for the online service account. This will be the same as "Domain Password", above.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

2.7.7. Exchange Online

1. Choose **Exchange Online** from the **Device Management** menu.
2. Choose **Exchange Online Server** and click **Add**.

Exchange Online Configuration Page

¹ See: [Remote Management Service Account](#)

² See: [Create the Domain Service Account](#)

³ See: [Create the Domain Service Account](#)

Exchange Online Server [flexcorp.com]

Base Model Relation Mapping

Version*	1.0
Host Name*	10.5.25.241
Username*	WSMan-svc
Password*	.....
Repeat Password*	.....
Domain Name*	flexcorp.com
Domain Username*	V4UC-Svc
Domain Password*	.....
Repeat Domain Password*	.....
Connection URI*	https://outlook.office365.com/powershell-liveid/
Online Username*	V4UC-Svc@vossilab.onmicrosoft.com
Online Password*	.....
Repeat Online Password*	.....

3. Enter the following values on the **Base** tab:
Sample Exchange Online Configuration Parameters

Parameter	Example Value	Comments
Version	1.0	This is the only version currently supported
Host Name	10.5.25.241	The IP address of the PS Proxy handling Exchange Online connections. We could have also entered <code>psproxy02.flexcorp.com</code> , which is the FQDN of that proxy.
User-name	WSMan-svc	The local service account that we created in the Remote Management Service Account section. ¹
Password / Repeat		The local service account's password.
Domain Name	flexcorp.com	The domain portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ²
Domain User-name	V4UC-Svc	The user name portion of the domain service account's account name. We created this account in the Create the Domain Service Account section. ³
Domain Password / Repeat		The domain service account's password.
Connection URI	<code>https://outlook.office365.com/powershell-liveid/</code>	Use this URI literally - it is the same for all Office 365 tenants.
Online User-name	<code>V4UC-Svc@vosslab.onmicrosoft.com</code>	The username of the domain service account as it appears in the Office 365 Admin Center.
Online Password / Repeat		The password for the online service account. This will be the same as "Domain Password", above.

4. Choose **Test Connection** from the **Action** menu.
5. Check the transaction log and confirm that the test was successful.

¹ See: [Remote Management Service Account](#)

² See: [Create the Domain Service Account](#)

³ See: [Create the Domain Service Account](#)