

Windows Azure Pack

Deployment and Evaluation Guide

Contents

- Introduction..... 5
 - What is Windows Azure Pack? 5
 - Why use Windows Azure Pack? 6
 - Windows Azure Pack components 6
 - Required components 6
 - Optional components 6
- Evaluation guide..... 8
 - Install Windows Azure Pack for Windows Server 8
 - Hardware requirements 8
 - Software requirements 8
 - Network requirements 10
 - Physical host machines 11
 - Related components 14
 - Deploy components for Windows Azure Pack 18
 - Deploy required components 18
 - Deploy optional components 23
 - Add the FileShareOwners group to the local Administrators group to enable WinRM 27*
 - Configure access control to the shares..... 28*
- Management Portal configuration..... 75
 - Add cloud services 75
 - Configure Management Portal for administrators of Web Sites service..... 75
 - Configure Management Portal for administrators of virtual machine clouds 78
 - Import Gallery resources for virtual machine clouds 79
 - Configure Management Portal for administrators of the Service Bus cloud 81
 - Configure Management Portal for administrators of SQL Server 82
 - Configure Management Portal for administrators of MySQL Server 83
 - Configure Management Portal for administrators of Automation services 85

OPTIONAL: Use trusted certificates for Windows Azure Pack	87
Install a Certificate Authority server	87
Configure the Certificate Authority server	87
Issue certificates	88
Change Web Sites service to use certificates	89
OPTIONAL: Install & Configure Active Directory Federation Services.... Error! Bookmark not defined.	
Management Portal walk-through.....	90
Management Portal for administrators	90
Manage plans and add-ons.....	90
Manage user accounts.....	95
Management Portal for tenants	98
Deploy a new web application.....	98
Deploy a virtual machine role	101
Deploy a new standalone virtual machine	103
Deploy the Service Bus	105
Deploy a SQL Server database.....	105
Deploy a MySQL Server database.....	106
Deploy a virtual network.....	107
Summary	109
Appendix.....	111
Distributed Installation for Windows Azure Pack	111
Deploy required components	111
References	128

Introduction

This document provides step-by-step instructions to install the Windows Azure Pack environment on two physical servers for evaluation purposes. It also includes a short walk-through of the configured environment from the perspective of tenant and service administrators.

For the easiest and smoothest installation experience, we recommend that you complete steps in the order provided in this document. After you complete the steps, you will have a working Windows Azure Pack environment for evaluation purposes.

What is Windows Azure Pack?

Windows Azure Pack for Windows Server is a collection of Windows Azure technologies that enable you to experience rich, self-service, multitenant cloud services that are consistent with the public Windows Azure experience. Windows Azure Pack is available to Microsoft customers at no additional cost for installation in your datacenter. Windows Azure Pack provides the following key capabilities:

- **Management Portal for tenants.** A customizable self-service portal experience that is consistent with Windows Azure, for provisioning, monitoring and management of services such as Web Sites, Virtual Machines, and Service Bus.
- **Management Portal for administrators.** A portal for administrators to configure and manage resource clouds, user accounts, tenant offers, quotas, and pricing.
- **Web Sites service.** Consistent with Windows Azure Web Sites, this service helps to provide a high-density, scalable, shared web-hosting platform for ASP.NET, PHP, and Node.js web applications. The service also includes a customizable web application gallery of popular open-source web applications and integrates with source control systems for custom-developed websites and applications.
- **Virtual Machines service.** Consistent with Windows Azure Virtual Machines, this service helps provide infrastructure-as-a-service (IaaS) capabilities for Windows and Linux virtual machines. It includes a virtual machine template gallery, scaling options, and virtual networking capabilities.
- **Virtual Networks.** Virtual Networks enables you to create a logically isolated section in Windows Azure Pack and securely connect it to other datacenters or to single-client machines by using an Internet Protocol Security (IPsec) connection. Virtual Networks makes it easy to extend datacenters by using Windows Azure Pack much in the same way that you would set up and connect to a remote branch office. You maintain full control over the network topology, configuration, and management. Also, you can build a range of hybrid IT scenarios by using Virtual Networks.
- **Databases.** Through Windows Azure Pack, you can create cloud-based database offerings that are easy to provision and administer by using SQL Server and MySQL.
- **Service Bus service.** Consistent with Windows Azure Service Bus, this service helps to provide reliable messaging services between distributed applications. The service includes queued and topic-based publish/subscribe capabilities.
- **Automation and extensibility.** Windows Azure Pack also includes capabilities for automating and integrating additional custom services into the services framework, including a runbook editor and execution environment.

Why use Windows Azure Pack?

Enterprises typically want the flexibility and affordability that cloud environments offer, while service providers want the ability to win and easily set up more enterprise customers. Windows Azure Pack builds on the power of Windows Server and Microsoft System Center to deliver an enterprise-class, cost-effective solution for self-service, multitenant cloud infrastructure and application services.

Windows Azure Pack provides a multitenant, self-service cloud that works on top of your existing software and hardware investments. Because it builds on the familiar foundation of Windows Server and System Center, Windows Azure Pack offers a flexible and familiar solution to help your business deliver self-service provisioning and manage infrastructure (infrastructure as a service) and application services (platform as a service) such as Web Sites and Virtual Machines.

Windows Azure Pack components

Windows Azure Pack provides a core set of required components to manage services and tenants through its Admin Portal, and it supports several optional components (such as IaaS, Web Sites, and more). You must install the required components, and then determine which optional components to support based on your requirements.

Required components

- **Service Management API** exposes a unified interface to manage Windows Azure Pack services through management portals.
- **Authentication sites** provide authentication services for Management Portal for administrators and Management Portal for tenants:
 - **Admin Authentication Site.** By default, Windows Azure Pack uses Windows authentication for Management Portal for administrators. You also have the option to use Windows Azure Active Directory Federation Services to authenticate users.
 - **Tenant Authentication Site.** Windows Azure Pack uses an ASP.NET membership provider to provide authentication for Management Portal for tenants.
- **Management portals** facilitate interactions with Windows Azure Pack for administrators and tenants (subscribers).
 - **Management Portal for administrators** helps administrators to configure and manage resource clouds, user accounts, tenant plans, quotas, and pricing. Administrators can use this portal to create Web Site clouds, virtual machine private clouds, and plans; and to manage user subscriptions.
 - **Management Portal for tenants** is a customizable self-service portal to provision, monitor, and manage Windows Azure Pack services such as Web Sites, Virtual Machines, and Service Bus. In this portal, users can sign up for services and create services, virtual machines, and databases.

Optional components

- **Web Sites** is a service that helps you provide a high-density, scalable, shared web hosting platform for ASP.NET, PHP, and Node.js web applications. Web Sites service includes a customizable web application gallery of open source web applications and integration with source control systems for custom-developed websites and applications.

- **Virtual Machines** and **Virtual Networking** are services that provide IaaS capabilities for Windows and Linux virtual machines. Virtual Machines service includes a virtual machine template gallery, scaling options, and virtual networking capabilities.
- **Service Bus** provides reliable messaging services between distributed applications. Service Bus service includes queued and topic-based publish/subscribe capabilities.
- **Service Management Automation** is a workflow management solution that helps you to automate the creation, monitoring, and deployment of resources in your environment. This document explains how to deploy Service Management Automation.
- **SQL Server and MySQL Server.** You can add one or more Microsoft SQL Server or MySQL Server instances for tenants to deploy and use. Tenants also use these databases with the Web Sites service.

Evaluation guide

This guide explains how to deploy Windows Azure Pack, including all required and many optional components, to support platform as a service (PaaS), infrastructure as a service (IaaS), data as a service (DaaS), and others. The process starts from the installation of Windows Server 2012 R2 as the base server, installation of System Center Virtual Machine Manager, and then installation of Windows Azure Pack. It concludes with a tour of Windows Azure Pack service and tenant administration.

Install Windows Azure Pack for Windows Server

Windows Azure Pack is built on the foundation of Windows Server and Microsoft System Center. The various components of the Windows Azure Pack are installed on multiple machines—physical or virtual. This guide explains how to install Windows Azure Pack components on the recommended virtual machines.

Hardware requirements

The Windows Azure Pack evaluation environment defined in this guide requires two host machines that have at least two physical network adapters on each machine. The host machines also require Windows Server 2012 R2 (Standard edition or Datacenter edition) with the Hyper-V role enabled.

Name	CPU	Memory	Disk	Network adapters
HOST1	At least 8 cores	At least 32 gigabytes (GB)	500 GB divided into a 120 GB C: drive with the remainder as D: drive	2 physical
HOST2	At least 8 cores	At least 32 GB	500 GB divided into a 120 GB C: drive with the remainder as D: drive	2 physical

Important notes regarding the servers:

- The host machine should have an x64-based processor with hardware-assisted virtualization and hardware-enforced Data Execution Prevention (DEP) enabled.
- The host machine should have two physical network adapters to create separate networks for management and tenants.
- For purposes of this guide, we use local storage. But for production, we recommend SAN or SMB-based clustered storage nodes.

Software requirements

Setting up the evaluation environment for Windows Azure Pack requires you to install the following software, roles, and components. In this guide, we will use the “Express Installation” which consolidates WAP Portal roles to a single server. In production, you would use the distributed install for scale and performance (The distributed installation process is available in this document through the appendix). The evaluation software is not for production use. You can use the following table for reference.

Required software

Windows Server 2012 R2	<p>To install Windows Azure Pack, you need the image file (either ISO or VHD) for Windows Server 2012 R2:</p> <ul style="list-style-type: none">• Configure Active Directory Directory Service, Domain Name System (DNS), and Dynamic Host Configuration Protocol (DHCP)• Use the recommended configuration for Microsoft Internet Information Services• Enable Microsoft .NET Framework 3.5 SP 1 in Server Manager• For Windows 8, enable Microsoft .NET Framework 4.5 Extended, with ASP.NET• Install all available Windows and Microsoft .NET Framework updates http://www.microsoft.com/en-us/server-cloud/products/windows-server-2012-r2/default.aspx#fbid=odKOIzLc3EW
Microsoft Web Platform Installer 4.6	Hosts the required files to deploy the Windows Azure Pack core features and many optional services
Microsoft SQL Server 2012 SP1	Supports Windows Azure Pack deployment of core features and optional services; also used for tenant DaaS http://technet.microsoft.com/en-us/library/bb500469.aspx
Microsoft System Center 2012 R2 Virtual Machine Manager	Supports the implementation of private clouds, Virtual Network, and Gallery artifacts that support IaaS
Service Provider Foundation	Supports the integration of Windows Azure Pack Virtual Machine Clouds and System Center Virtual Machine Manager
MySQL Server	Offered as an optional service for DaaS solutions on MySQL Server
Windows Assessment and Deployment Kit	Required to install Windows Azure Pack
Microsoft System Center 2012 R2 Service Management Automation	Available as part of System Center 2012 R2 Orchestrator to help you automate the creation, monitoring, and deployment of resources in your environment

Required software

Windows Azure Pack components (available as part of the Web Platform Installer)

Required components (Express install)*:

- Windows Azure Pack: Portal and API Express

Optional components:

- Web Sites
- Service Bus 1.1

*In this guide we will use the express installation. If you want to use the distributed method, please refer to the install steps included in the appendix

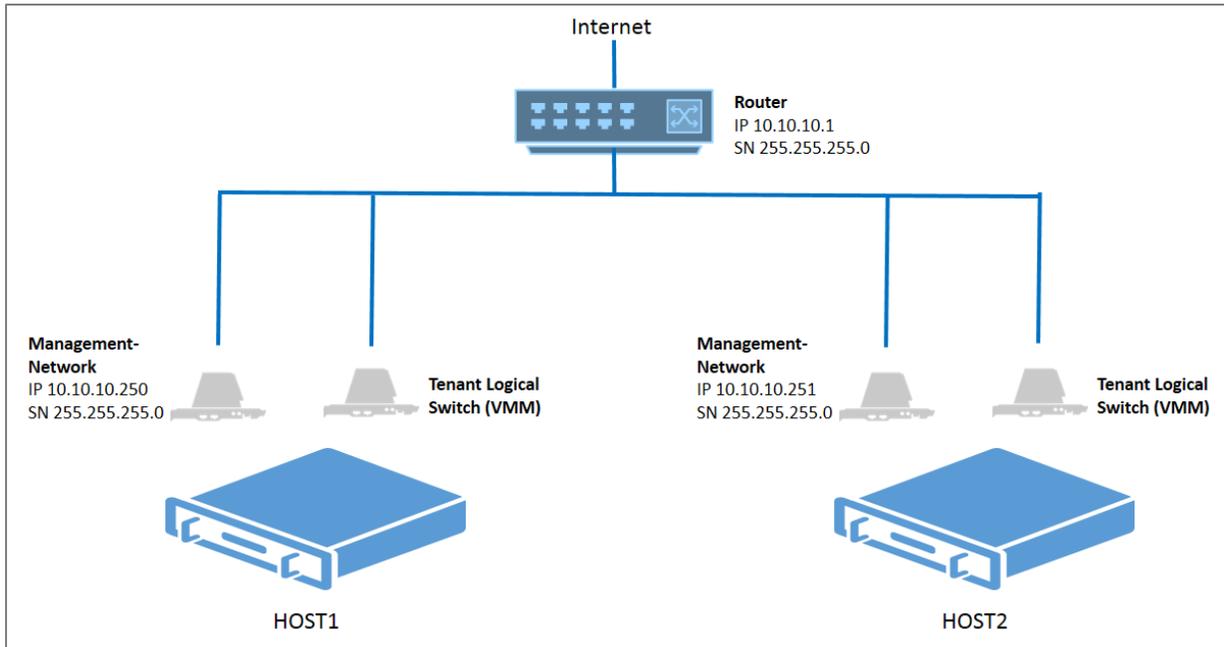
Network requirements

The evaluation environment requires two physical network adapters on each host machine, and access to a router that acts as a gateway on the same subnet.

One physical network adapter is used for management of host and virtual machines, and the other is for the tenant network. A tenant logical network that is separate from the management physical network is created in Virtual Machine Manager. For ease of evaluating the lab environment, the tenant logical network uses the same IP scheme as the management network. In a production scenario, to isolate network traffic, you typically will use different subnets for management and tenant logical networks.

In this guide, we assume all servers have Internet access, which you need to install services for many of the Windows Azure Pack virtual machines. If necessary, you can use an offline installation: <http://blogs.technet.com/b/privatecloud/archive/2013/11/06/troubleshooting-installation-and-configuration-of-windows-azure-pack.aspx>.

The following diagram shows a typical physical network topology.



Network schema for Windows Azure Pack evaluation lab

HOST1	10.10.10.250 / 255.255.255.0
HOST2	10.10.10.251 / 255.255.255.0
Router (Internet access)	10.10.10.1 / 255.255.255.0
WAPAD (Active Directory Directory Services / DNS / DHCP Server)	10.10.10.10 / 255.255.255.0
DHCP range	10.10.10.100 till 10.10.10.150
Tenant logical network	10.10.10.0/24

Physical host machines

The evaluation environment requires two hosts running Windows Server 2012 R2 to support multiple virtual machines for the Windows Azure Pack environment, in addition to acting as Virtual Machine Manager hosts for the IaaS service. To set up the host machines, you must complete several tasks, which are detailed in the sections that follow:

- Set up network topology as described earlier (network adapters in each server must be plugged into the same network accessible to the router)
- Install Windows Server 2012 R2
- Configure host network adapters
- Add Hyper-V roles and create virtual switches

Install Windows Server 2012 R2

You can use the following TechNet resources to install Windows Server evaluation on the two physical host machines.

1. Follow instructions to download Windows Server 2012 R2 evaluation ISO at <http://technet.microsoft.com/en-us/evalcenter/dn205286.aspx>, and then install it from your media of choice.
2. Install Windows Server 2012 R2 with a graphical user interface by using the following recommendations for storage allocation:
500 GB divided into a 120 GB C: drive with the remainder as a D: drive
3. Rename each server to its correct host name (**HOST1** and **HOST2**)
4. To facilitate the evaluation, configure these optional elements (in production, you would not disable these components):
 - a. Disable the firewall.
 - b. Disable Internet Explorer enhanced security configuration.

Configure host network adapters

1. On each server, choose a suitable network adapter for the management network (this is the network that will be used for host-to-host communication and host-to-virtual machine communication).
 - a. For HOST1, configure the network adapter as follows:
 - NIC name: **Management**
 - IP: **10.10.10.250**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 - b. For HOST2, configure the network adapter as follows:
 - NIC name: **Management**
 - IP: **10.10.10.251**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
2. On each host, rename the unallocated NIC to **WAP Tenant**. We will use this later in the VMM configuration. No other configuration needs to be done on these NICs.
3. Note which adapters you are using (in **Network Connections**, record the device name).
4. On each host, make sure you can communicate with the other host (via ping), and that you have access to the Internet.

Add Hyper-V roles and create virtual switches

The Hyper-V role provides the hypervisor that is needed on both the servers to host and manage the virtual machines. On each host (HOST1 and HOST2):

1. If Server Manager is already open, go to the next step. If Server Manager is not already open, open it by doing one of the following:
 - On the Windows desktop, in the Windows taskbar, click **Server Manager**.
 - On the Windows Start page, click the shortcut for Server Manager.
2. On the **Manage** menu, click **Add Roles and Features**.
3. On the **Before you begin** page, verify that your destination server and network environment are prepared for the role and feature you want to install, and then click **Next**.
4. On the **Select installation type** page, select **Role-based or feature-based installation**, and then click **Next**.
5. On the **Select destination server** page, select a server from the server pool, and then click **Next**.
6. On the **Select server roles page**, select **Hyper-V**.
7. To add the tools that you use to create and manage virtual machines, click **Add Features**; on the **Features** page, click **Next**.
8. On the **Create Virtual Switches** page, **Virtual Machine Migration** page, and **Default Stores** page, select the appropriate options.
9. On the **Confirm installation selections** page, select **Restart the destination server automatically if required**, and then click **Install**.

After the installation is finished, open Hyper-V Manager:

1. On the Windows Start page, type any part of the name **Hyper-V Manager**.
2. When you see the shortcut for Hyper-V Manager on the Start page in the Apps results, click it. (To pin the Server Manager shortcut to the Start page and taskbar, right-click the shortcut, and then click **Pin to Start** and **Pin to taskbar**).
3. In Hyper-V Manager, select the host name in the left hand windows (**HOST1** or **HOST2**). (You need to complete these steps on both servers.)
4. Right-click the host name (**HOST1** or **HOST2**), and then select **Hyper-V Settings**.
5. For the Virtual Hard Disks destination setting, change it to **D:\VMs\Virtual Hard Disks**.
6. For the Virtual Machines destination setting, change it to **D:\VMs**.
7. Click **Apply**, and then click **OK**.
8. In the action column at the right, select **Virtual Switch Manager**.
9. In the create virtual switch windows, make sure that **External** is selected, and then select **Create Virtual Switch Button**.
10. Name the switch **Management-Network**.
11. In connection type, make sure **External Network** is selected, and then select the applicable network adapter (this will be the network adapter you recorded earlier, to which you allocated the static IP address).
12. Make sure **Allow management OS to share this network adapter** is selected, click **Apply**, and then **OK**.
13. Confirm that you have a virtual switch configured, and then retest your network access from the server.

Related components

To set up Windows Azure Pack Evaluation Lab, you need to deploy related components to build the environment *before* you deploy Windows Azure Pack components. Related components include the domain controller, SQL Server for Windows Azure Pack required components, and the base virtual machine.

Create a Windows Server 2012 R2 image for deployment

The lab includes required and optional components of Windows Azure Pack, and related services require Windows Server 2012 R2 virtual machines. To save the effort of installing Windows Server 2012 R2 for each virtual machine, you can use the evaluation VHD image to deploy multiple computers. Follow instructions to download Windows Server 2012 R2 evaluation at <http://technet.microsoft.com/en-us/evalcenter/dn205286.aspx>, and then store it in a suitable directory (such as **c:\products**).

Create a domain controller for the Windows Azure Pack evaluation lab

To create virtual environment for deploying Windows Azure Pack, first create a virtual machine with Windows Server 2012 R2 as a domain controller. For the domain controller, configure the following services:

1. Create the virtual machine from the Windows Server 2012 R2 image for deployment:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPAD**.
 - e. Select the **Store the virtual machine in a different location** option.
 - f. Browse to the location **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **2048** MB.
 - i. In **Configure Networking**, select **Management-Network** (the virtual network you created), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy **Windows Server 2012 R2 Evaluation VHD image** and paste the image into the **D:\VMs\WAPAD\Virtual Hard Disks** folder.
 - i. **NOTE:** You will need to create the Virtual Hard Disks folder for each new Virtual Machine.
 - l. Rename the copied deployment image to **WAPAD-HDD**.
 - m. In Hyper-V Manager, select the **WAPAD** virtual machine.
 - n. Go to **Action**, and then click **settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, ensure **Hard Drive** is selected, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPAD\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you just copied.
 - r. Select **Processor**, and change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
 - u. Right click **WAPAD-HDD** and click **Connect**.
 - v. Log in to the machine and proceed through Setup.
 - w. Specify the Administrator Password as **Passw0rd!**
 - x. Rename the machine name to **WAPAD**.

2. Provide a static IP address to the machine:
 - IP address: **10.10.10.10**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
3. Follow instructions to promote this server to a domain controller at http://technet.microsoft.com/en-us/library/jj574166.aspx#BKMK_SMForest.
 - a. For the lab, enter **WAP.Local** for the domain name and **WAPAD** for the machine name.
 - b. Set the domain administrator password to **Passw0rd!**.

4. Follow instructions to add Dynamic Host Configuration Protocol (DHCP) services at http://technet.microsoft.com/en-us/library/hh831538.aspx#config_dhcp1.

For the lab, use the following for the DHCP scope:

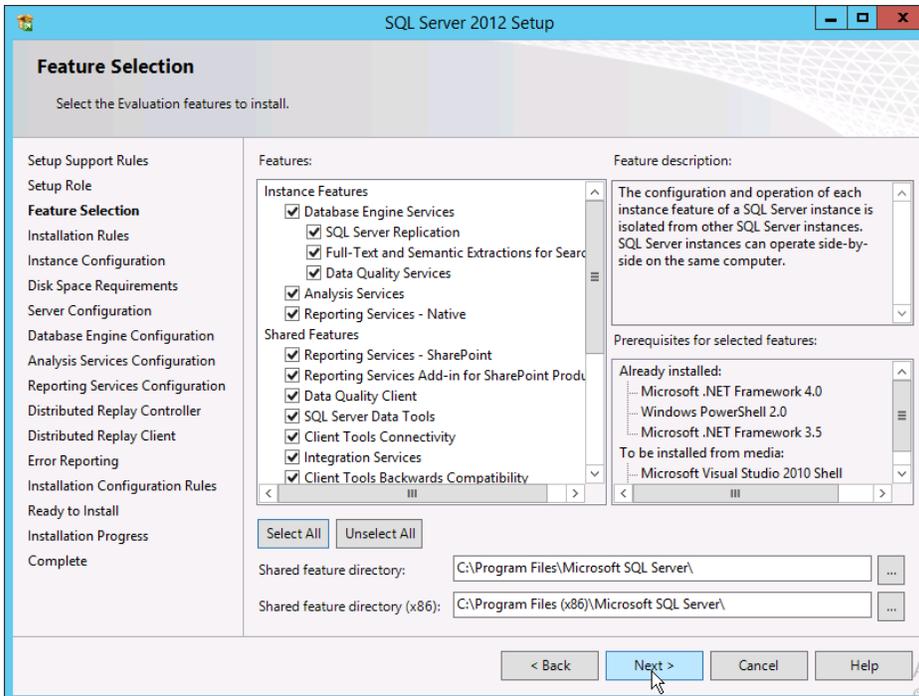
- IP address range: **10.10.10.100** to **10.10.10.150**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
5. Add physical hosts to the new domain—for HOST1 and HOST2, add both servers to the new Windows Azure Pack local domain:
 - a. First, add HOST2
 - b. Restart, and then continue with HOST1.
 - c. **Important:** Do not shut down the WAPAD virtual machine before you restart this server (it automatically moves to Save state when the physical server is restarted—resume to allow the physical server to continue its domain join after restarting).

Create an instance of SQL Server for components required by Windows Azure Pack

After installing Windows Server for the domain controller and configuring all services mentioned in the previous section, you need to create a virtual machine for the SQL Server 2012 SP1 instance on HOST1. This instance is used to deploy the database for management servers such as Virtual Machine Manager.

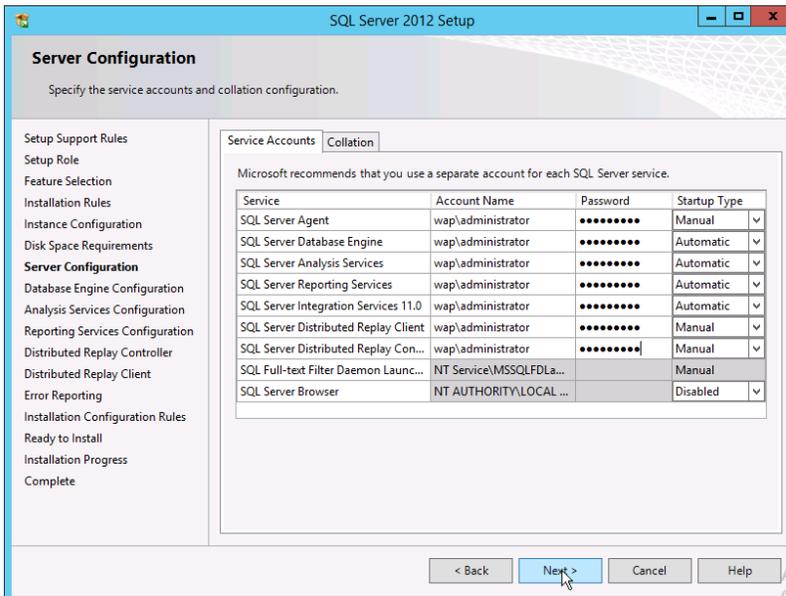
1. Create the virtual machine from the Windows Server 2012 R2 image for deployment:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine as **WAPSQL**.
 - e. Select the **Store the virtual machine in a different location** option.
 - f. Browse the location to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **16384** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.

- k. Copy the **Windows Server 2012 R2 Evaluation VHD image** and paste the image into the **D:\VMs\WAPSQL\Virtual Hard Disks** folder.
 - l. Rename the copied deployment image to **WAPSQL-HDD**.
 - m. In Hyper-V Manager, select the **WAPSQL** virtual machine.
 - n. Go to **Action**, and then click **settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPSQL\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you just copied.
 - r. Select **Processor**, and then change **Number of virtual processors** to **8**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name to **WAPSQL**.
 3. Provide a static IP address to the machine:
 - IP address: **10.10.10.11**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add this machine in the **WAP.Local** domain.
 5. Log on as **Domain Administration**.
 6. Download the **SQL Setup** file from <http://www.microsoft.com/en-in/download/details.aspx?id=35575>.
 7. Extract the ISO file to your C:\SQL Server location, and then run the **Setup** file.
Setup opens a SQL Server Installation Center.
 8. In the Installation Center, click the **Installation** tab, and then click **New SQL Server stand-alone installation** (or add features to an existing installation).
 9. After all prerequisite checks are successful, in **Setup Support Rules**, click **OK**. Otherwise, follow guidance to fix any issues, and then click **Re-run**.
The SQL Server 2012 Setup wizard starts.
 10. In the wizard, enter the product key for SQL Server, and then click **Next**.
NOTE: For this lab environment, in the **Specify a free edition** menu, select **Evaluation**.
 11. Select the **I accept the license terms** check box, and then click **Next**.
Setup completes a scan and shows the list of required updates for SQL Server installation.
 12. Click **Next**.
Setup downloads and installs required updates, and opens the new window showing the system scanning result for SQL Server support rules.
 13. After the status check is completed successfully, click **Next**; and in the next window, select **SQL Server feature installation**, and then click **Next**.
 14. Click the **Select All** button, and then click **Next**.



15. In the next window, after the result for failed is **0**, click **Next**.
16. On the **Instance Configuration** page, leave the default values, and then click **Next**.
17. On the **Disk Usage Summary** page, click **Next**.
18. On the **Server Configuration** page, leave the default values; or change the account details for different services as required, and then click **Next**.

NOTE: For the lab environment, we have used **WAP\Administrator** for the top seven services and **Passw0rd!** as the password.



19. On the **Database Engine Configuration** page, select **Mix Mode authentication**, and define the password for the SA account (for user, enter **SA**; for password, enter **Passw0rd!**).

NOTE: This password is not the same as the standard password Passw0rd!

20. Click **Add Current User**, and then click **Next**.
21. On the **Analysis Services Configuration** page, click **Add Current User**, and then click **Next**.
22. On the **Reporting Services Configuration** page, make sure that the install and configure options for **Reporting Services Native Mode** and **Install only for Reporting Services SharePoint Integrated Mode** are selected, and then click **Next**.
23. On the **Distributed Replay Controller** page, click **Add Current User**, and then, click **Next**.
24. For controller machine name, enter **SQLServer**; leave the default location for the working and result directory, and then click **Next**.
25. On the **Error Reporting** page, click **Next**.
26. On the **Installation Configuration Rule** page, click **Next**, and then click **Install**.
27. After installation of SQL Server 2012 is successful, click **Close**.

Deploy components for Windows Azure Pack

This section explains how to deploy required and optional components for the Windows Azure Pack portal. Required components include Service Management APIs, authentication sites for administrators and tenants, and Management Portal for administrators and tenants which will be installed via the Express Installation process. This process consolidates these components to a single instance (in this case a single VM). This is used for testing or POC environments. In production deployments, the recommended approach is to use the Distributed Installation which can be found in the appendix.

Optional Service components to extend your WAP installation include Web Sites service, Virtual Machine service, Service Bus service, SQL Server service, MySQL Server service, and Automation service.

Deploy required components

For the evaluation lab, we will create a single virtual machines for all Windows Azure Pack components.

The following table shows the required Windows Azure Pack components that will be installed.

Required component
Admin API
Tenant API
Tenant public API
Admin Authentication Site
Tenant Authentication site
Management Portal for administrators
Management Portal for tenants

Prerequisites for deploying components required by Windows Azure Pack

Before installing any of the required Windows Azure Pack components, you must install the following software prerequisites on the virtual machine running the WAP Portal components:

- Windows Server 2012 R2 operating system
- Microsoft Web Platform Installer 4.6
- Microsoft .NET Framework 3.5 Service Pack (SP) 1
- Internet Information Services 8.5 (role of Windows Server 2012 R2)
- Microsoft .NET Framework 4.5 Extended, with ASP.NET for Windows 8

For more information, go to <http://technet.microsoft.com/en-us/library/dn469335.aspx>.

Install Windows Azure Pack: Portal and API Express

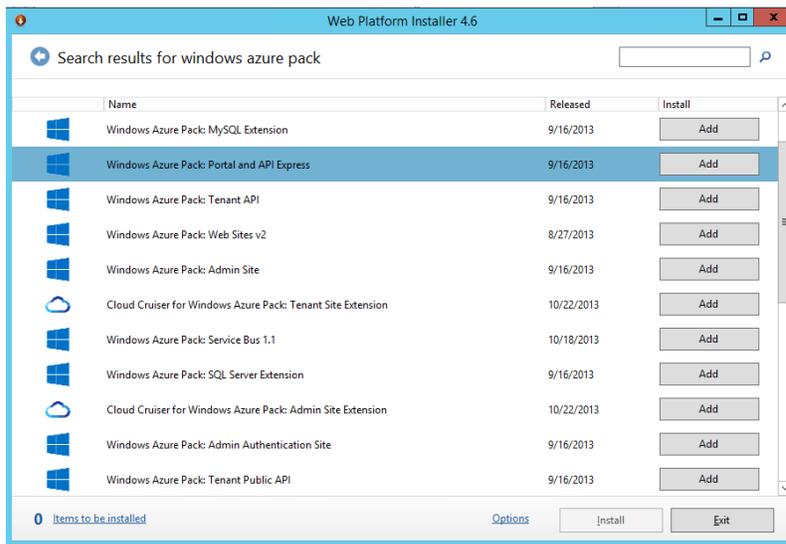
You can use the Windows Azure Pack for Windows Server Express installation option that is available in the Microsoft Web Platform Installer to install the required components of Windows Azure Pack on a single system. Use this installation option to create a proof-of-concept deployment but not to deploy Windows Azure Pack to production.

Install Portal and API Express Option

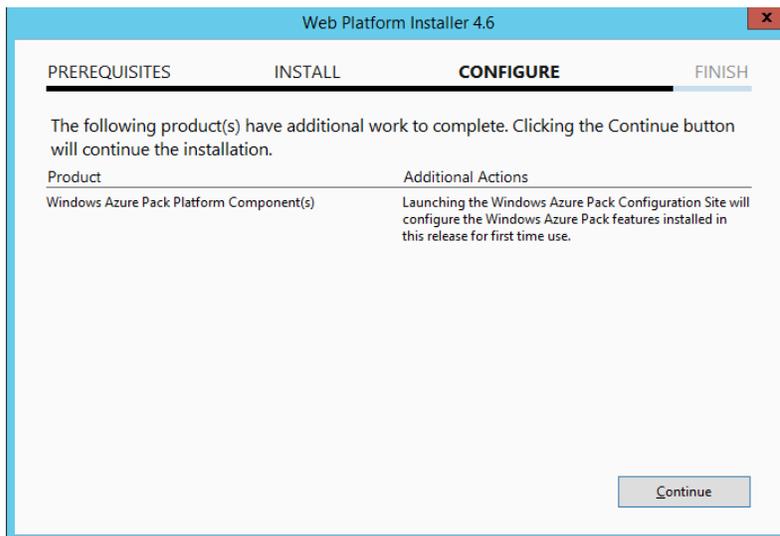
1. From the Windows Server 2012 R2 image for deployment, create the **Wapadmin** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **Wapadmin**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then, click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\Wapadmin\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **Wapadmin-VHD**.
 - m. In Hyper-V Manager, select the **Wapadmin** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\Wapadmin\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine **Wapadmin**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10.12**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**

- DNS: **10.10.10.10**
- DNS: **10.10.10.1**

4. Add the machine to the **WAP.Local** domain.
 5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 6. Log on to the machine named **Wapadmin** as domain administrator (**WAP\Administrator**).
 7. Start Microsoft Web Platform Installer.
- NOTE:** If the Web Platform Installer is not installed, please refer to the [Prerequisites](#) in this section of the guide.
8. In the search box, type **Windows Azure Pack**; look for **Windows Azure Pack: Portal and API Express**, click **Add**; and then click **Install**.

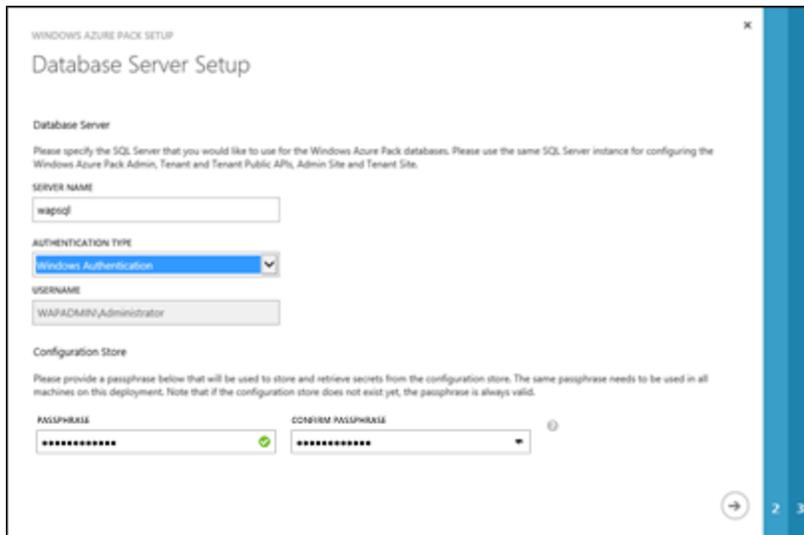


9. To accept the terms and conditions on the Prerequisites page, click **I Accept**.
 10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**.
- After the installation is completed, you see a prompt for site configuration.



11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site `https://localhost:30101/` opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type the name of the database server as **WAPSQL**.
13. For **Authentication Type**, select **Windows Authentication**.
14. Define a pass phrase for encrypting and decrypting data in the configuration store, and then click **Next**.

NOTE: Use the same pass phrase for all Windows Azure Pack components. For this scenario, we use **Passw0rd!**.



15. Select **YES, I am willing to participate anonymously in the Customer Experience Improvement Program (CEIP)**, and then click **Next**.
16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.

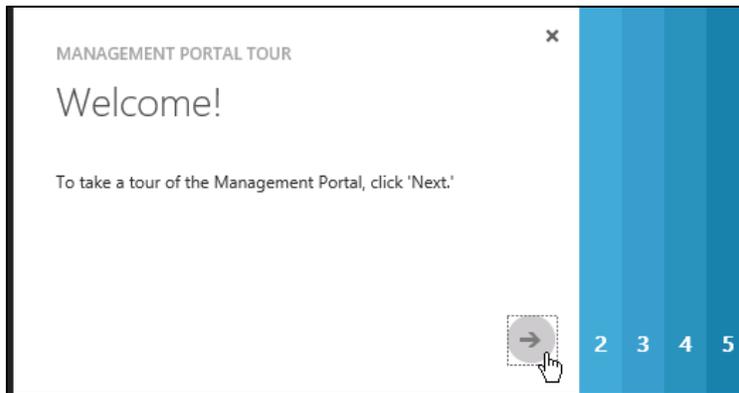


Testing the successful installation of the WAP Portal and API Express Option

1. Open an Internet browser and go to <https://localhost:30091>.

NOTE: You may have to log off your system and log back on before you can access Management Portal for administrators so Windows Authentication can add the security group to your security token.

2. The first time you log on to Management Portal for administrators, you have the opportunity to take a tour of the portal.

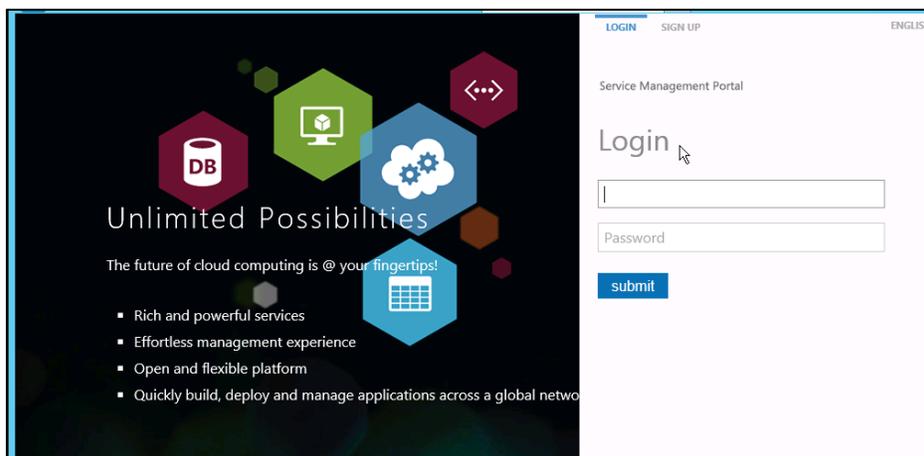


NOTE: By default, Management Portal for administrators works on port number 30091. Ensure port connectivity for this machine.

3. Open an Internet browser and go to <https://localhost:30081>.

NOTE: You may have to log off your system and log back on before you can access Management portal for tenants so Windows Authentication can add the security group to your security token.

You see a log-on page for tenants.



Deploy optional components

Optional Windows Azure Pack components are the cloud services you want to include as part of Windows Azure Pack in your environment. These machines can be physical or virtual. For the evaluation lab, we create virtual machines.

The following table shows optional Windows Azure Pack components that you can install.

Optional component	Sample machine name
Web Site Cloud	SitesCN (Web Sites Cloud Controller) SitesMN (Web Sites Cloud Management Server) SitesFE (Web Sites Cloud Front End) SitesPB (Web Sites Cloud Publisher) SitesWWS (Web Sites Cloud Shared Web Worker) SitesWWR (Web Sites Cloud Reserved Web Worker) SitesFS (Web Sites Cloud File Server)
VM Cloud	WAPSPF (Service Provider Foundation) WAPVMM (Virtual Machine Manager)
Service Bus Cloud	WAPSB (Service Bus for Windows Server)
SQL Servers	SQLServer (Microsoft SQL Server for Tenants)
MySQL Servers	MySQL (MySQL Server for Tenants)
Automation	WAP SMA (Service Management Automation)

Install and configure the Windows Azure Pack Web Sites service

Web Sites service uses a minimum of six server roles:

- Controller
- Management Server
- Front End
- Web Worker
- File Server
- Publisher

Also required is a SQL Server database for the Web Sites runtime database. You can install roles on physical servers or virtual machines. For the evaluation lab, we deploy these roles as virtual machines.

Before you configure Web Sites service, and to help ensure a successful installation, it important to follow pre-installation steps at http://technet.microsoft.com/en-us/library/dn469319.aspx#BKMK_CreateServers.

Create servers for Web Sites service roles

Before you install Web Sites service, prepare one server per Web Site role that has Windows Server 2012 R2 installed (the servers can be either physical or virtual machines). Later, for higher availability, you can add more than one server per role. For ease of maintenance, use descriptive computer names as follows:

- **Web Sites Cloud Controller.** Use the machine name **SitesCN**. The controller provisions and manages the other Web Sites roles.
- **Web Sites Cloud Management Server.** Use the machine name **SitesMN**. This server exposes a REST endpoint that handles management traffic to the Windows Azure Pack Web Sites Management API.
- **Web Sites Cloud Front End.** Use the machine name **SitesFE**. This server accepts web requests from clients, routes requests to web workers, and returns web worker responses to clients. Front end servers are responsible for load-balancing and SSL termination.
- **Web Sites Cloud Publisher.** Use the machine name **SitesPB**. This server provides content publishing to the Web Sites farm for FTP clients, Microsoft Visual Studio, and WebMatrix through the Web Deploy and FTP protocols.
- **Web Sites Cloud Shared Web Worker.** Provision two machines and use the machine names **SitesWWS** and **SitesWWR**. These are web servers that process client web requests. Web workers are either **Shared** or **Reserved** (at minimum, one of each is required) to provide differentiated levels of service to customers. Reserved workers are categorized into small, medium, and large sizes.
- **Web Sites Cloud File Server.** Use the machine name **SitesFS**. File Share provides file services for hosting web site content. The file server houses all of the application files for every website that runs on the Web Sites Cloud.

The following table shows lab configuration details for creating the servers required for Windows Azure Pack Web Sites roles.

Web Sites role	Virtual machine name	VHD name	IP address
Web Sites Cloud Controller	SitesCN	SitesCN-VHD	10.10.10.20
Web Sites Cloud Management Server	SitesMN	SitesMN-VHD	10.10.10.21
Web Sites Cloud Front End	SitesFE	SitesFE-VHD	10.10.10.22
Web Sites Cloud Publisher	SitesPB	SitesPB-VHD	10.10.10.23
Web Sites Cloud Shared Web Worker - Shared	SitesWWS	SitesWWS-VHD	10.10.10.24
Web Sites Cloud Shared Web Worker – Reserved	SitesWWR	SitesWWR-VHD	10.10.10.25
Web Sites Cloud File Server	SitesFS	SitesFS-VHD	10.10.10.26

NOTE: Subnet, gateway, and DNS details will be same across all the Web Sites roles. And each machine should be member of WAP.Local domain.

- Subnet: **255.255.255.0**
- Gateway: **10.10.10.1**
- DNS: **10.10.10.10**
- DNS: **10.10.10.1**

Create an environment for each virtual machine role

Before starting Web Sites deployment, you need to deploy a virtual machine for each Web Sites role (for a total of seven). For specific server names and IP addresses, see the table in the previous section.

To create each virtual machine:

1. Create the **<VM NAME>** virtual machine from the Windows Server 2012 R2 image for deployment:

- On HOST2, open **Hyper-V Manager**.
- In Hyper-V Manager, select **HOST2**.
- Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
- Name the virtual machine **<VM NAME>**.
- Select **Store the virtual machine in a different location**.
- Browse to **D:\VMs**, and then click **Next**.
- For **Specify Generation**, select **Generation 1**, and then click **Next**.
- In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
- In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then, click **Next**.
- In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
- Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\<VM NAME>\Virtual Hard Disk** folder.
- Rename the copied deployment image to **<VM NAME>-VHD**.
- In Hyper-V Manager, select the **<VM NAME>** virtual machine.
- Go to **Action**, and then click **Settings** to open the virtual machine settings.
- Select **IDE Controller 0**, and then click **Add**.
- Click **Browse**, and then go to **D:\VMs\<VM NAME>\Virtual Hard Disk**.
- Select the **Windows Server 2012 R2 Evaluation VHD image you** copied in earlier.
- Select **Processor**, and then change **Number of virtual processors** to **2**.
- Click **Apply**, and then click **OK**.
- Right-click the virtual machine, and then click **Start**.

2. Rename the machine **<WEB VM NAME>**.

3. Give a static IP address to the machine:

- IP Address: **<Refer to the table above>**
- Subnet: **255.255.255.0**
- Gateway: **10.10.10.1**
- DNS: **10.10.10.10**
- DNS: **10.10.10.1**

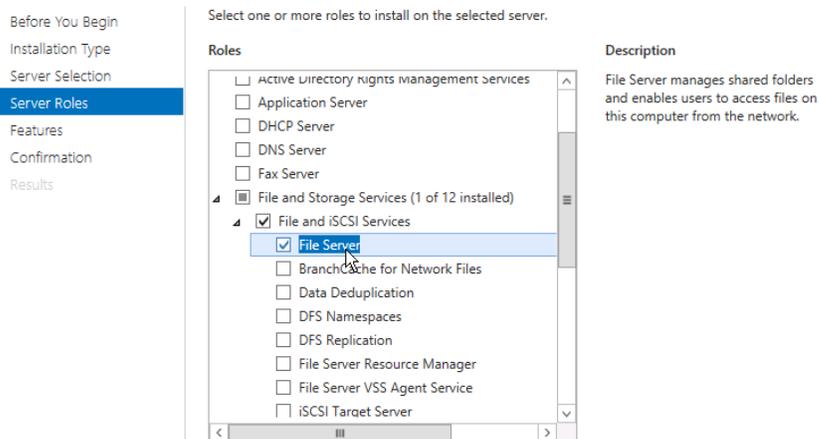
4. Add the machine to the **WAP.Local** domain.

Install and configure the file share server

Before starting Web Sites deployment, you need to install and configure Windows File Server and File Server Cluster. For this scenario, we are configuring a single file server.

Add the File Server role

1. Log on to the machine named **SitesFS** as domain administrator (**WAP\Administrator**).
2. Go to **Server Manager**, and then click **Add Roles and Feature**.
3. On the **Before you begin** page, click **Next**.
4. Make sure the **Role-based** or **Feature-based installation** option is selected, and then click **Next**.
5. On the **Select destination server** page, click **Next**.
6. Expand **File and Storage Services**, then **File and iSCSI Services**; select **File Server**, and then click **Next**.



7. On the **Features** page, click **Next**; on the **Configuration** page, click **Next**; then, click **Install**.
8. After successful installation of File Server, click **Finish**.

Provision groups and accounts in Active Directory

1. On WAPAD Server, create the following Active Directory global security groups:
 - FileShareOwners
 - FileShareUsers
 - CertStoreFSUsers
2. Create the following Active Directory accounts as service accounts:
 - FileShareOwner
 - FileShareUser
 - CentralCertStoreUser
3. Define the password as **Passw0rd!** for all three users and set the following conditions:
 - Enable **Password never expires**
 - Enable **User cannot change password**
 - Disable **User must change password at next logon**
4. Add accounts to the group memberships as follows:
 - Add **FileShareOwner** to the **FileShareOwners** group
 - Add **FileShareUser** to the **FileShareUsers** group
 - Add **CentralCertStoreUser** to the **CertStoreFSUsers** group

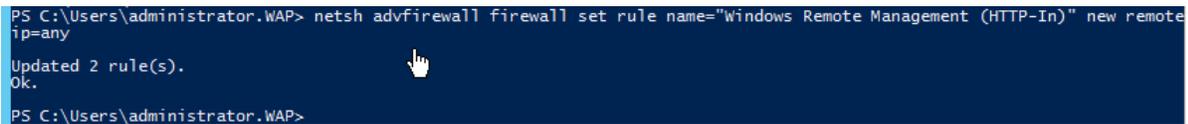
Enable Windows Remote Management (WinRM)

Log on to the machine named **SitesFS** as domain administrator (**WAP\Administrator**).

For the File Server role, run the following commands at an elevated command prompt to configure WinRM:

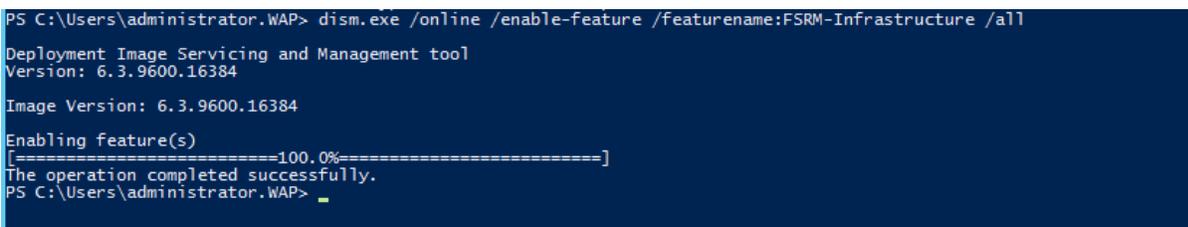
```
Enable-PSRemoting -Force
```

```
netsh advfirewall firewall set rule name="Windows Remote Management (HTTP-In)" new remoteip=any
```



```
PS C:\Users\administrator.WAP> netsh advfirewall firewall set rule name="Windows Remote Management (HTTP-In)" new remoteip=any
Updated 2 rule(s).
Ok.
PS C:\Users\administrator.WAP>
```

```
dism.exe /online /enable-feature /featurename:FSRM-Infrastructure /all
```



```
PS C:\Users\administrator.WAP> dism.exe /online /enable-feature /featurename:FSRM-Infrastructure /all
Deployment Image Servicing and Management tool
Version: 6.3.9600.16384
Image Version: 6.3.9600.16384
Enabling feature(s)
[=====100.0%=====]
The operation completed successfully.
PS C:\Users\administrator.WAP>
```

Provision the Content Share and the Certificate Share

The Content Share contains tenant website content, whereas the Certificate Share contains custom tenant certificates.

5. Open a admin Command Prompt, and type (or cut & paste) the following commands

```
set WEBSITES_SHARE=WebSites
set CERTIFICATES_SHARE=Certificates
set WEBSITES_FOLDER=C:\WebSites
set CERTIFICATES_FOLDER=C:\Certificates
```

```
md %WEBSITES_FOLDER%
md %CERTIFICATES_FOLDER%
```

```
net share %WEBSITES_SHARE% /delete
net share %WEBSITES_SHARE%=%WEBSITES_FOLDER% /grant:Everyone,full
```

```
net share %CERTIFICATES_SHARE% /delete
net share %CERTIFICATES_SHARE%=%CERTIFICATES_FOLDER% /grant:Everyone,full
```

Add the FileShareOwners group to the local Administrators group to enable WinRM

In order for Windows Remote Management to work properly, you must add the FileShareOwners group to the local Administrators group.

6. Execute the following command at an elevated command prompt on the File Server

```
net localgroup Administrators WAP\FileShareOwners /add
```

Configure access control to the shares

Execute the following commands at an elevated command prompt on the File Server or on the File Server Failover Cluster node which is the current cluster resource owner. Replace values in italics with values specific to your environment.

```
set DOMAIN=WAP
set WEBSITES_FOLDER=C:\WebSites
set CERTIFICATES_FOLDER=C:\Certificates

icacls %WEBSITES_FOLDER% /reset
icacls %WEBSITES_FOLDER% /grant Administrators:(OI)(CI)(F)
icacls %WEBSITES_FOLDER% /grant %DOMAIN%\FileShareOwners:(OI)(CI)(M)
icacls %WEBSITES_FOLDER% /inheritance:r
icacls %WEBSITES_FOLDER% /grant %DOMAIN%\FileShareUsers:(CI)(S,X,RA)
icacls %WEBSITES_FOLDER% /grant *S-1-1-0:(OI)(CI)(IO)(RA,REA,RD)

icacls %CERTIFICATES_FOLDER% /reset
icacls %CERTIFICATES_FOLDER% /grant %DOMAIN%\FileShareOwners:(OI)(CI)(F)
icacls %CERTIFICATES_FOLDER% /inheritance:r
icacls %CERTIFICATES_FOLDER% /grant %DOMAIN%\CertStoreFSUsers:(OI)(CI)(RX)
```

Install and configure Web Sites Cloud Controller

Before you complete steps in this section, make sure you have created virtual machines for each Web Site role (SitesMN, SitesFE, SitesPB, SitesWWS, and SitesWWR).

1. Log on to the machine named **SitesCN** as domain administrator (**WAP\Administrator**).
2. On the **SitesCN** server, install and start Web Platform Installer at <http://www.microsoft.com/web/downloads/platform.aspx>.
3. Search for **Windows Azure Pack: Web Sites v2**, click **Add**, and then click **Install**.
4. After installation is complete, click **Continue** to open the Configuration site.

NOTE: If your browser displays a certificate security warning (a self-signed certificate is being used at this point), click **Continue to this website (not recommended)**. You see the **Web Sites Setup** configuration page.

5. On the **Database Server Setup** page, in the **Server Name** field, enter the name of the SQL Server instance that the Controller will use to store the Web Sites Runtime database. This database stores the website hosting and resource usage information.
6. Enter the SQL server name **WAPSQL**, the database server administrator user name **sa**, and password **Passw0rd!**

NOTE: SQL Server is required in Windows Azure Pack: Websites to store the Web Sites runtime database. In the production environment, we recommend that you plan capacity for the scalability and availability of database. For more information, go to <http://technet.microsoft.com/en-us/library/dn457757.aspx>.

7. Enter the DNS suffix **websitecloud.wap.local**, and then click the Next arrow at the lower-right corner of the page.

WEB SITES SETUP

Database Server Setup

Database Server

Please specify the SQL server that you would like to use for the Windows Azure Pack databases.

SERVER NAME

SQLSERVER.wap.local

DATABASE SERVER ADMIN USERNAME

sa

DATABASE SERVER ADMIN PASSWORD

.....

DNS Settings

Enter the domain to be used for user site creation, GIT repository creation, and publishing.

DNS SUFFIX

websitecloud.wap.local

8. On the **Web Sites Role Setup** page, in the **Management Server Name** field, enter the name of the server that will run the management server role; for example, **SitesMN**.
9. For **Machine Credentials to install Management roles**, enter the administrator user name **WAP administrator** and password **Passw0rd!**.
10. For **Machine Credentials to install Worker roles**, enter the administrator user name **WAP administrator** and password **Passw0rd!**.

Web Sites Role Setup

Management Server (Web Sites REST API)

Provide the name of a server that will host the web sites administration REST API.

MANAGEMENT SERVER NAME

Machine Credentials to Install Management Roles

Provide machine administrator credentials required to provision the Web Sites ManagementServer, FileServer, FrontEnd, and Publisher roles.

ADMIN USERNAME

ADMIN PASSWORD

Machine Credentials to Install Worker roles.

Provide machine administrator credentials required to provision the Web Sites Worker roles.

ADMIN USERNAME

ADMIN PASSWORD

Service Endpoint Credentials

11. Scroll down to provide Service endpoint credentials—enter the user name as **CloudAdmin** and password as **Passw0rd!**—these credentials are used to connect to the REST endpoint. Confirm the password by entering it again.

NOTE: Make a note of these credentials. They are required to register your Web Sites REST endpoint in the management portal for administrators.

Service Endpoint Credentials

Please provide the basic authentication credentials for connecting to the Web Sites administration REST API. These credentials will be needed when registering the Web Site cloud.

USERNAME

PASSWORD

PASSWORD CONFIRMATION

12. Click the Next arrow at the lower-right corner of the page.
13. Select the type of file server you are using: **Standalone, Pre-configured Windows File Server**, or a **Pre-configured Non-Windows File Server**. For the Windows Azure Pack lab, we use **Use a Pre-configured Windows File Server**.
14. For **Content Share Network Path**, enter **\\SitesFS\WebSites**.
15. For **FileShareOwner** user, enter **Passw0rd!**; confirm the password by entering it again.

File Server Setup

- CREATE A NEW STANDALONE WINDOWS FILE SERVER
 USE A PRE-CONFIGURED WINDOWS FILE SERVER
 USE A PRE-CONFIGURED NON-WINDOWS FILE SERVER

Site Store

Please specify the UNC share that you would like to use to store customer web sites.

CONTENT SHARE NETWORK PATH

File Share Owner

Provide credentials for the privileged account used to manage web sites.

FILE SHARE OWNER USERNAME

16. For **FileShareUser** user, enter **Passw0rd!**; confirm the password by entering it again.

File Share User

Provide credentials for the limited account used to run customer web sites.

FILE SHARE USER USERNAME

FileShareUser

FILE SHARE USER PASSWORD

••••••••

FILE SHARE USER PASSWORD CONFIRMATION

••••••••

17. For **Certificate Share Network Path**, enter `\\SitesFS\Certificates`.
18. For **CertificateShareUser** user, enter **Passw0rd!**; confirm the password by entering it again.

File Server Setup

CREATE A NEW STANDALONE WINDOWS FILE SERVER

USE A PRE-CONFIGURED WINDOWS FILE SERVER

USE A PRE-CONFIGURED NON-WINDOWS FILE SERVER

FILE SHARE USER PASSWORD

FILE SHARE USER PASSWORD CONFIRMATION

Certificate Store

Please specify the UNC share that you would like to use to store customer certificates.

CERTIFICATE SHARE NETWORK PATH

\\SitesFS\Certificates

Certificate Store Account

Provide credentials for the account used to read customer certificates.

USERNAME

CertificateShareUser

PASSWORD

PASSWORD CONFIRMATION

19. Click the Next arrow at the lower-right corner of the page.
20. On the next page, select **Yes, I am willing to participate anonymously in the Customer Experience Improvement Program**, select **On** for Microsoft Updates, and then click **Next**.
21. On the Features Setup page, click the checkmark to finish the setup.

Install and configure Windows Azure Pack for virtual machines

Create a virtual machine for System Center Virtual Machine Manager

Microsoft System Center Virtual Machine Manager is a management solution for the virtualized data center that enables configuration and management of virtualization host, networking, and storage resources to create and deploy virtual machines and services. When you use Windows Azure Pack, you can deploy Virtual Machine Manager to manage hosts and provide advanced networking capabilities for isolation and management.

To deploy Virtual Machine Manager as a virtual machine on HOST1:

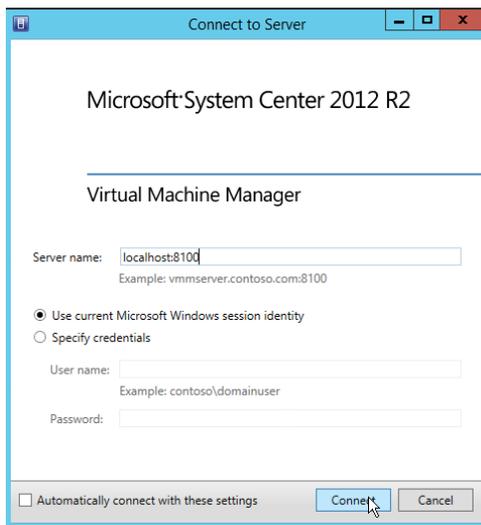
1. From the Windows Server 2012 R2 image for deployment, create the **WAPVMM** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPVMM**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.

- h. In **Assign Memory**, for **Startup Memory**, enter **8192** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPVMM\Virtual Hard Disks** folder.
 - l. Rename the copied deployment image to **WAPVMM-HDD**.
 - m. In Hyper-V Manager, select the **WAPVMM** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPVMM\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **4**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPVMM**.
 3. Give a static IP address to the machine:
 - IP address: **10.10.10.13**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add the machine to the **WAP.Local** domain.
 5. Log on as domain administrator.
 6. Download System Center Virtual Machine Manager 2012 R2 by following steps at <http://technet.microsoft.com/en-US/evalcenter/dn205295>.
 7. Download and install Windows Assessment and Deployment Kit by following steps at <http://www.microsoft.com/en-us/download/details.aspx?id=30652>.
You only need to install **Deployment Tools** and the **Windows Preinstallation Environment** features.
 8. Install Virtual Machine Manager:
 - a. Microsoft recommends using a dedicated service account for the VMM management service. For this lab, in Active Directory, create a new user **WAP\vmmsa** as a VMM service account with the password **PasswOrd!**. To make things easier, make the WAP\vmmsa account a domain admin.
 - b. Run Setup.exe.
 - c. Click **Install**.
 - d. Select **VMM Management Server** and **VMM Console**.
 - e. For **Product Registration**, enter a product key for a licensed version; otherwise, **Eval** is installed with a timeout. Click **Next**.
 - f. Accept the license agreement and click **Next**.
 - g. Configure the **Customer Experience** settings and click **Next**.
 - h. Configure **Microsoft Update** and click **Next**.
 - i. Accept or change the default install path and click **Next**.
 - j. If you get any Prerequisite errors, check the guidance to resolve them; if you get any warnings, understand them and click **Next** to proceed.

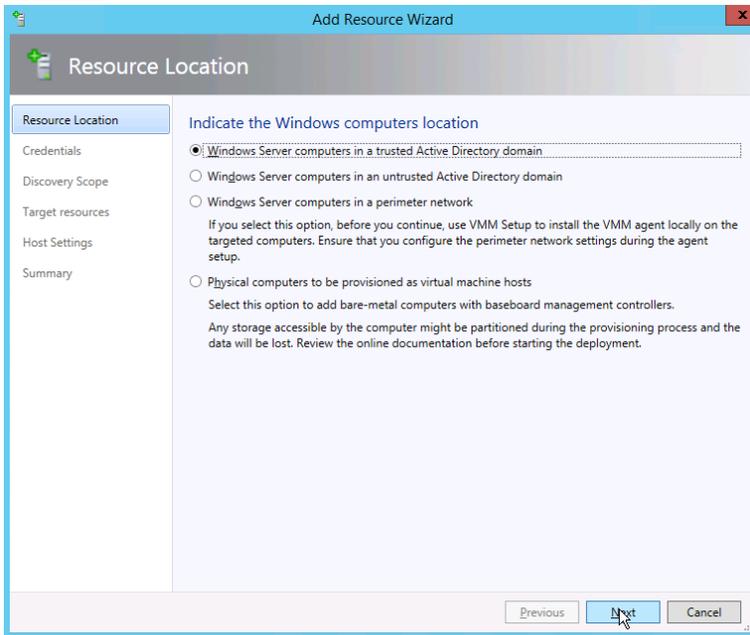
- k. On the **Database Configuration** screen, enter the name of your SQL database server (**WAPSQL**) and leave port blank.
- l. For the Instance Name, select the instance you want to install to.
- m. Make sure **New Database** is selected; use the default name, or change it to align with your naming standards, and then click **Next**.
- n. On the **Account Configuration** page, enter the domain account for the VMM service account you created earlier (**WAP\vmmsa**). Use the default to store encryption keys locally for this simple deployment, and then click **Next**.
- o. On the **Port configuration** page, accept defaults, and then click **Next**.
- p. On the **Library configuration** page, change the library path or accept the default location, and then click **Next**.
- q. Click **Install**.
Setup installs all roles and completes the installation.

9. Add host machines to VMM:

- a. Log on to Virtual Machine Manager using current credentials.

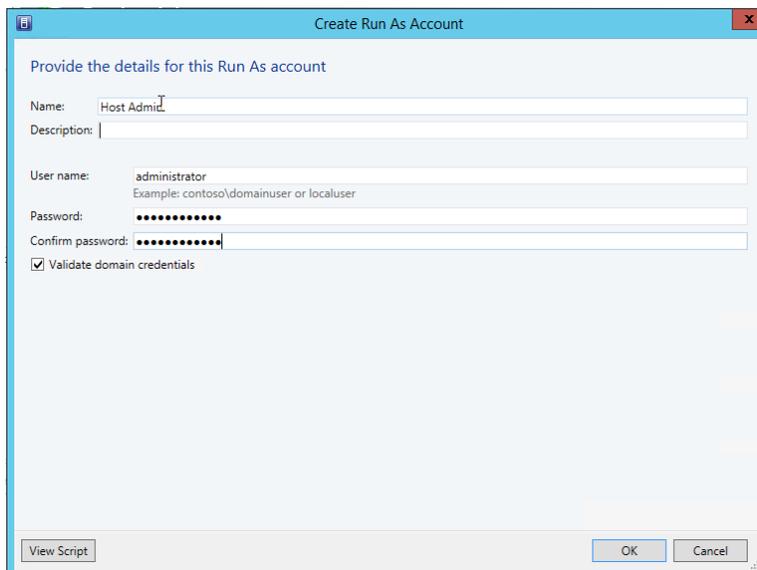


- b. On the **VMs and Services** tab, right-click **All Hosts**.
- c. Click **Create Host Group**.
- d. Name the host group **WAP-Host-Group**.
- e. Right-click **WAP-Host-Group**.
- f. Select **Add Hyper-V Hosts and Clusters**.
- g. Select **Windows Server computers in a trusted Active Directory domain**.

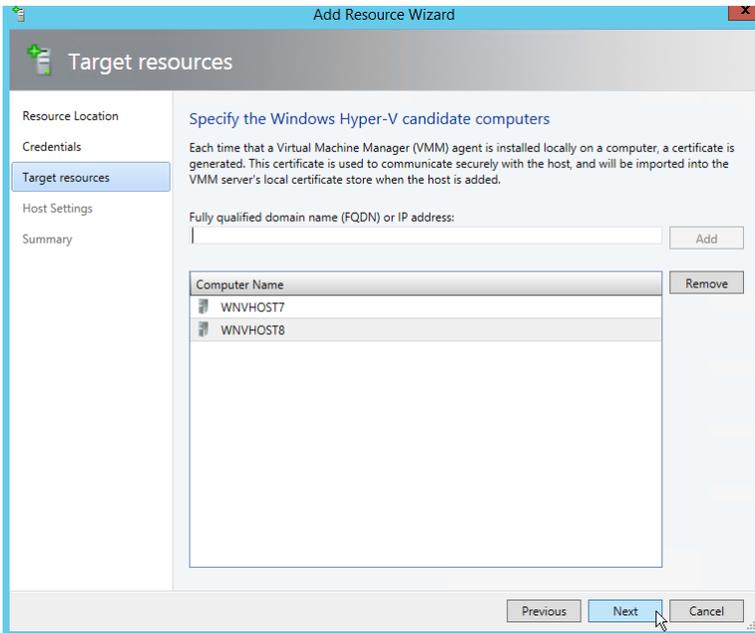


h. Create the **Run As** account as follows:

- Name: **VMM Admin**
- User name: **WAP\administrator**
- Password: **Passw0rd!**



i. Add host machines with FQDN or IP (in the lab use HOST1 or 10.10.10.250, and HOST2 or 10.10.10.251).



- j. On the **Host Settings** page, click **Next**, and then click **Finish** to add the host machines to VMM.
- k. Make sure the job has completed successfully before you continue.

Create virtual machine network tenants

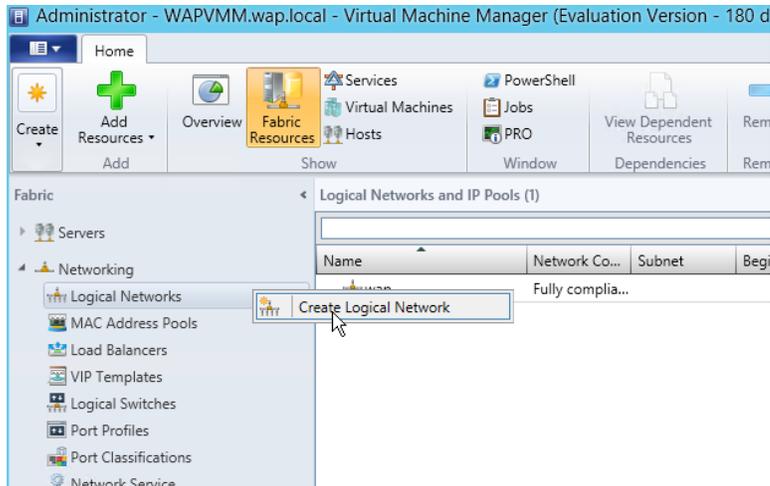
Virtual machine networks can be used for virtual machines provisioned by using virtual machine clouds. You can create logical networks in Virtual Machine Manager to provide networking capabilities for tenants in Management Portal for tenants. Tenants can create their own virtual machine networks (or virtual networks) on top of logical networks. The following sections provide steps to create a logical network.

Create a logical network

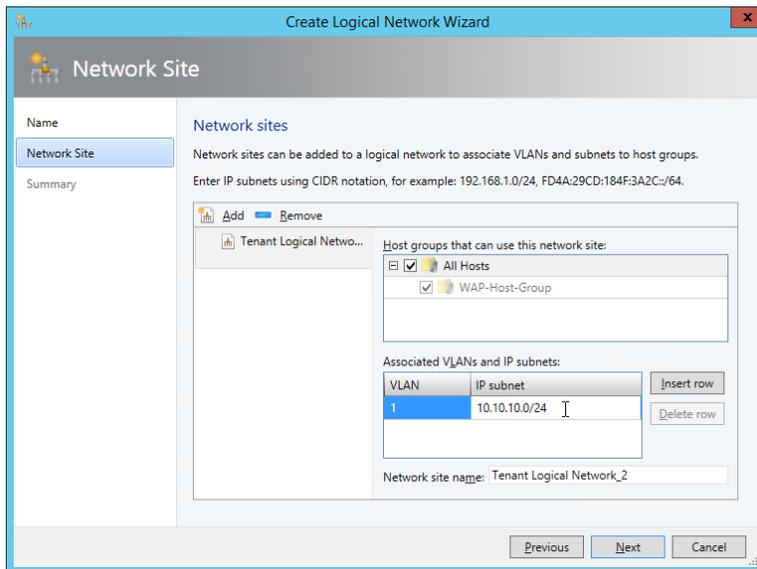
A *logical network* is used to organize and simplify network assignments for hosts, virtual machines, and services. As part of logical network creation, you can create network sites to define the VLANs, IP subnets, and IP subnet/VLAN pairs that are associated with the logical network in each physical location.

To create a logical network:

1. Open the Virtual Machine Manager console.
2. Navigate to the **Fabric** workspace and expand **Networking**.
3. Right-click **Logical Networks** and click **Create Logical Networks**.



4. In the **Create Logical Network** wizard, on the **Name** tab, enter the name **Tenant Logical Network** for the network.
5. Select **One Connected Network**, select **Allow new VM Networks created on this logical network to use network virtualization**, and then click **Next**.
6. On the **Network Site** tab, click **Add** to add a new network site.
7. Select the **All Hosts** check box or select the host that this logical network must be associated with.
8. Click **Insert row** and provide the subnet: set VLAN to **1** and subnet to **10.10.10.0/24**, and leave the network site name as the default.

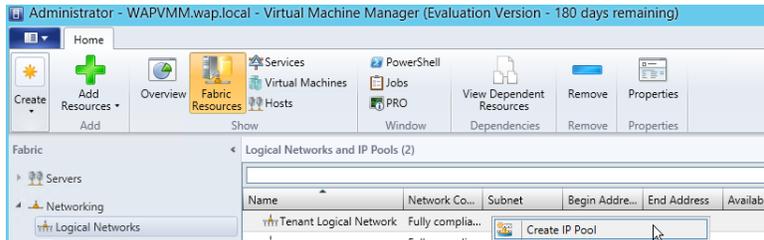


9. Click **Next**, and then click **Finish**.

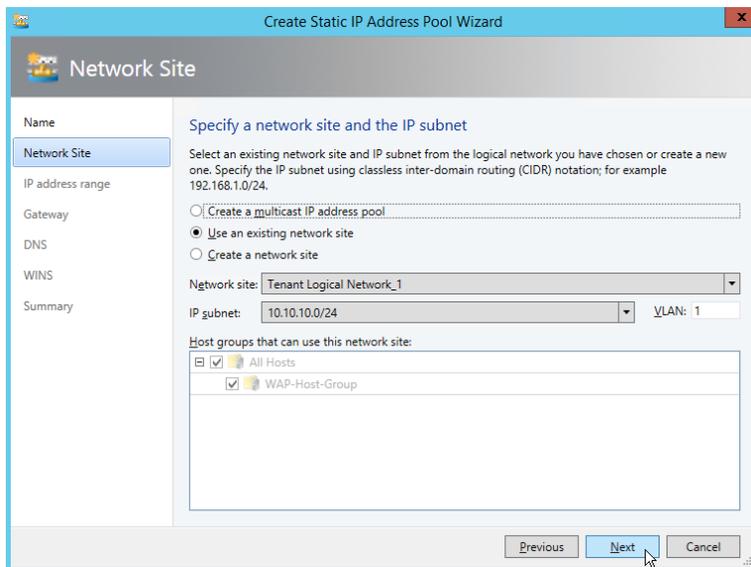
Create an IP pool for the logical network

To enable a virtual machine network access through a logical network, you must create an IP address pool. The IP address pool assigns static IP addresses to virtual machines.

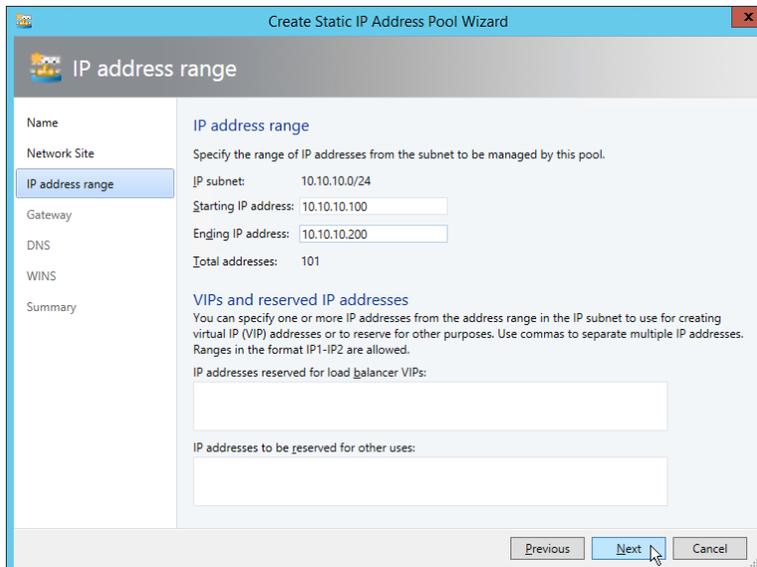
1. In the Virtual Machine Manager console, right-click the logical network you created, and then click **Create IP Pool**.



2. In the Create Static IP Address Pool wizard, on the **Name** tab, enter the name **Tenant Network IP Pool** for the IP pool.
3. For **Logical network**, select the logical network you created earlier, and then click **Next**.
4. On the **Network Site** page, click **Use an existing network site**, select the network site you created for the logical network, and then click **Next**.



5. On the **IP address range** page, for **Starting IP address**, enter **10.10.10.100**; for **Ending IP address**, enter **10.10.10.200**; then, click **Next**.

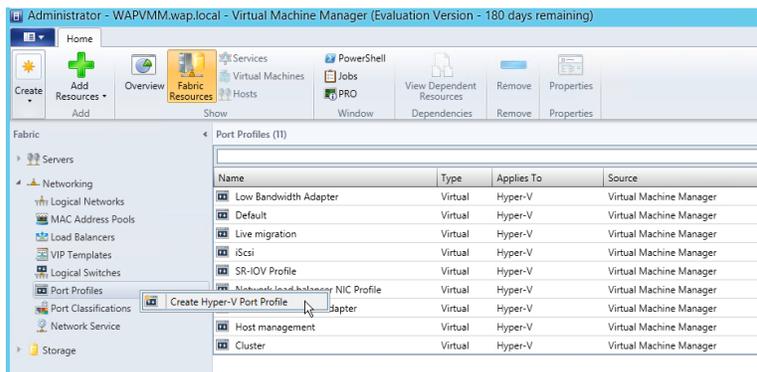


6. On the **Gateway** page, click **Insert**; for **Gateway Address**, enter **10.10.10.1**; then, click **Next**.
7. On the **DNS** page, click **Insert**; for **DNS Server Address**, enter **10.10.10.1**; then, click **Next**.
8. On the **WINS** page, no values are required for your network; click **Next**.
9. On the **Summary** page, review the values you provided, and then click **Finish**.

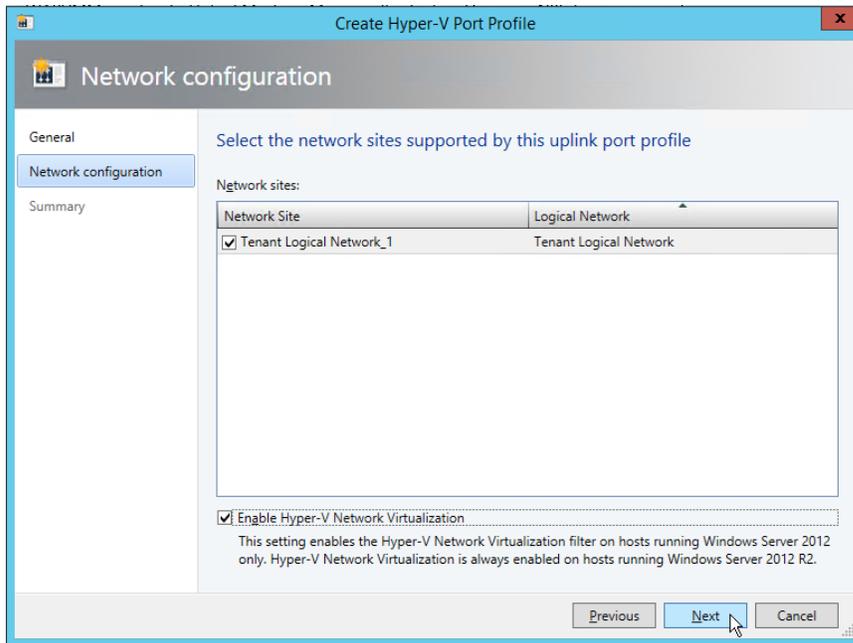
Create a port profile

To create a port profile:

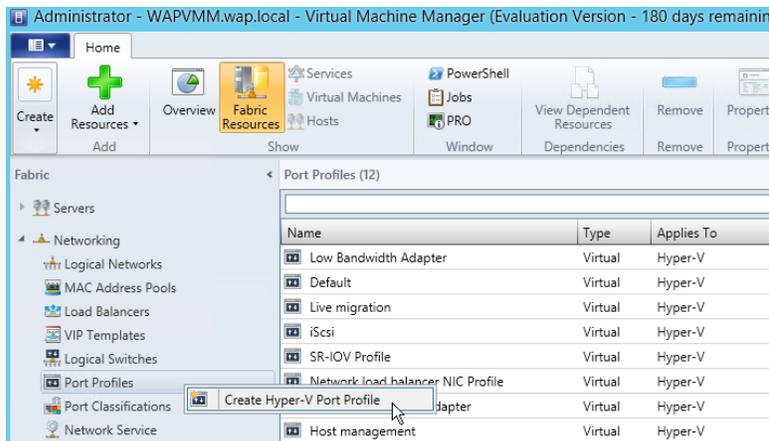
1. For the Uplink port profile, in the Virtual Machine Manager console, in the **Fabric** workspace, expand **Networking** and right-click **Port Profiles**.
2. Click **Create Hyper-V Port Profile**.



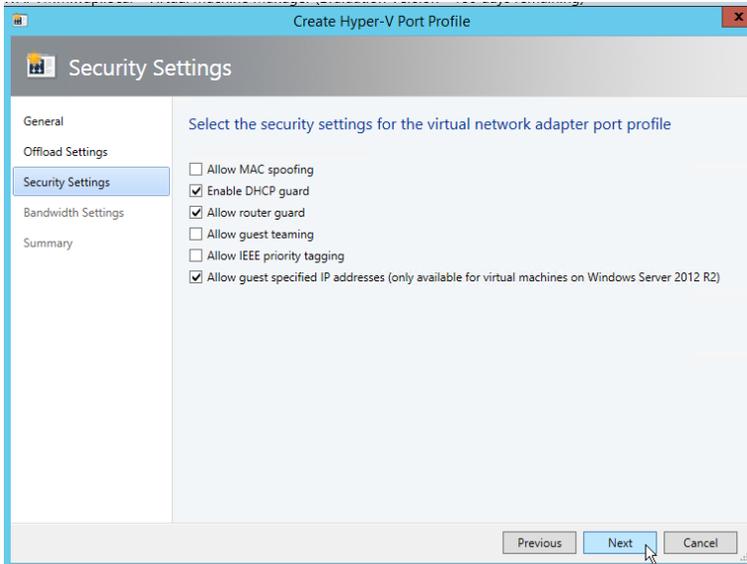
3. In the Create Hyper-V Port Profile wizard, on the **General** page, specify the name **Tenant Uplink Profile** for the profile.
4. Select **Uplink port profile**.
5. For **Load balancing algorithm**, select **Host Default**; for **Teaming mode**, select **Switch Independent**; then, click **Next**.
6. On the **Network Configuration** page, select the network site you created earlier; select **Enable Hyper-V Network Virtualization**, and then click **Next**.



7. On the **Summary** page, review the values you provided, and then click **Finish**.
8. For the virtual network adapter profile, in the Virtual Machine Manager console, in the **Fabric** workspace, expand **Networking**, and right-click **Port Profiles**.
9. Click **Create Hyper-V Port Profile**.
10. In the Create Hyper-V Port Profile wizard, on the **General** page, enter the name **Tenant VM Profile** for the profile.



11. Select the **Virtual network adapter** port profile, and then click **Next**.
12. On the **Offload Settings** page, clear all check boxes, and then click **Next**.
13. On the **Security Settings** page, select **Enable DHCP guard**, **Allow router guard**, and **Allow guest specific IP addresses**, and then click **Next**.



14. On the **Bandwidth Settings** page, keep default settings, and then click **Next**.

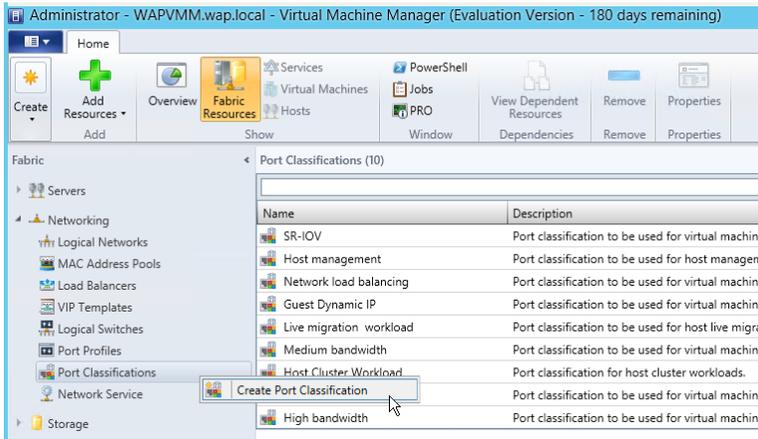
15. On the **Summary** page, review the values you provided, and then click **Finish**.

Create port classifications

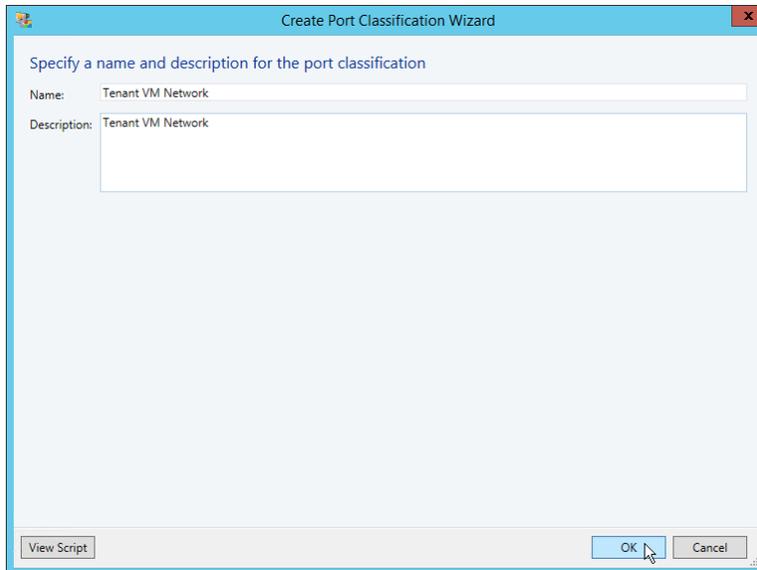
Port classifications provide global names for identifying different types of virtual network adapter port profiles.

To create port classifications:

1. In the Virtual Machine Manager console, in the **Fabric** workspace, expand **Networking**, and right-click **Port Classifications**.
2. Click **Create Port Classification**.



3. In the **Create Port Classification** wizard, enter the name **Tenant VM Network**, and then click **OK**.

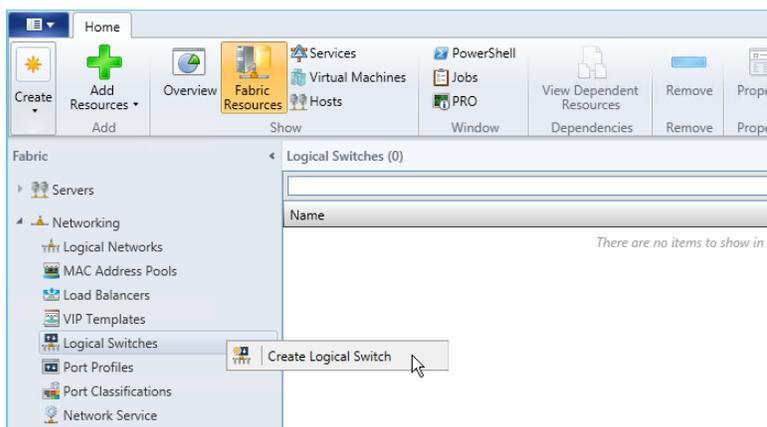


Create a logical switch that references the port profile

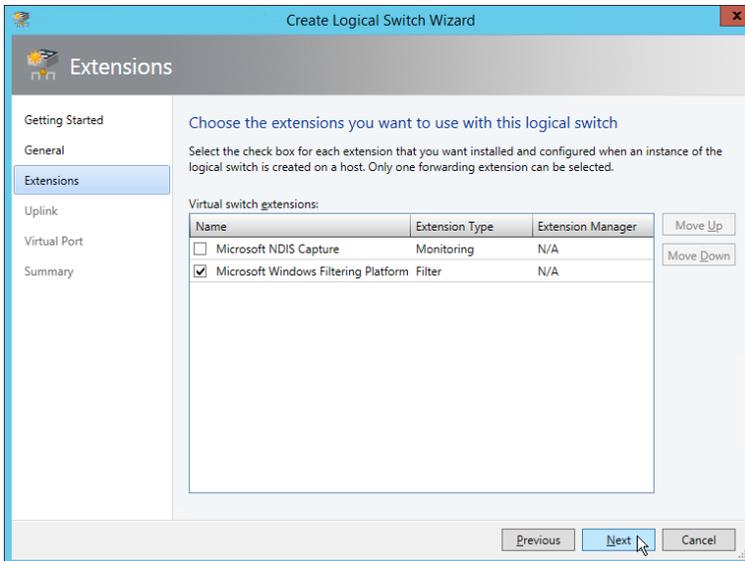
Port profiles and logical switches act as containers for the properties or capabilities that you want your network adapters to have. Instead of configuring individual properties or capabilities for each network adapter, you can specify the capabilities in port profiles and logical switches, which you can then apply to the appropriate adapters.

To create a logical switch:

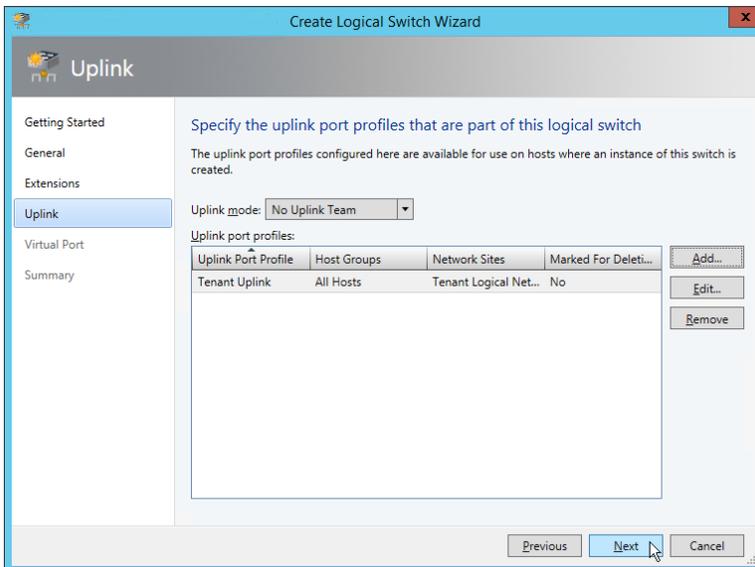
1. In the Virtual Machine Manager console, in the **Fabric** workspace, expand **Networking**, right-click **Logical Switches**, and then click **Create Logical Switch**.



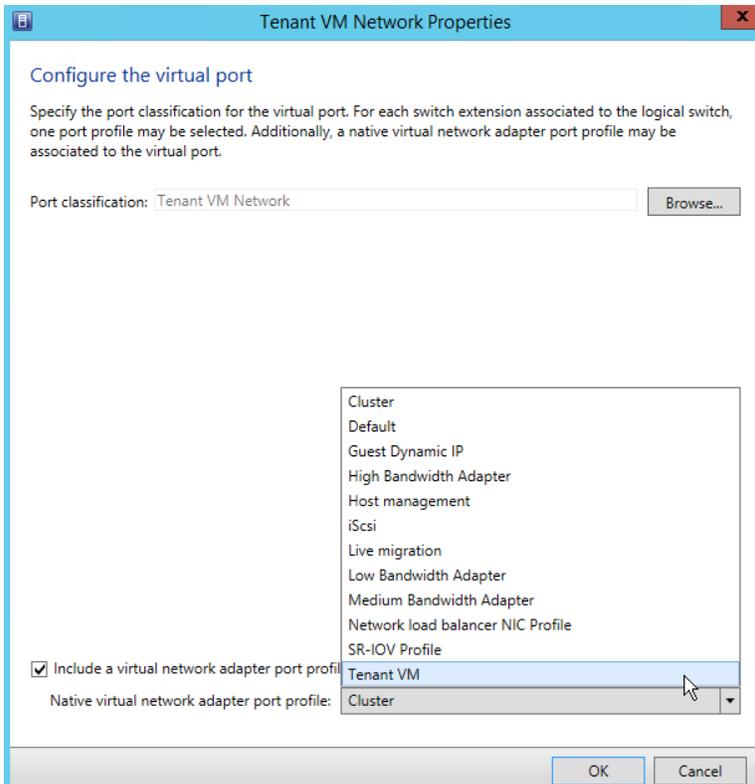
2. In the **Create Logical Switch** wizard, review the information on the **Getting Started** page, and then click **Next**.
3. On the **General** page, enter name **Tenant Logical Switch** for the logical switch, and then click **Next**.
4. On the **Extensions** page, select the **Microsoft Windows Filtering Platform** extension, and then click **Next**.



5. On the **Uplink** page, click **Add**, and in the **Add Uplink Port Profile** dialog box, select the **Tenant Uplink** port profile you created earlier; click **OK**, and then click **Next**.



6. On the **Virtual Port** page, click **Add** to add virtual ports.
7. For **Port classification**, click **Browse**, select the **Tenant VM Network** port classification, and select the **Include a virtual network adapter port profile in this virtual port profile** option to select **Tenant VM** as the native virtual network adapter port profile you created earlier; then, click **Next**.

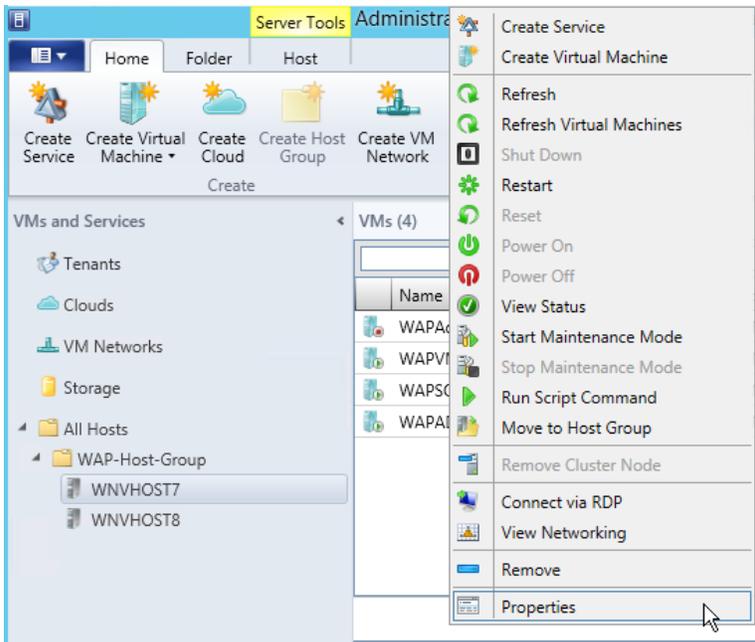


8. On the **Summary** page, review the values you provided, and then click **Finish**.

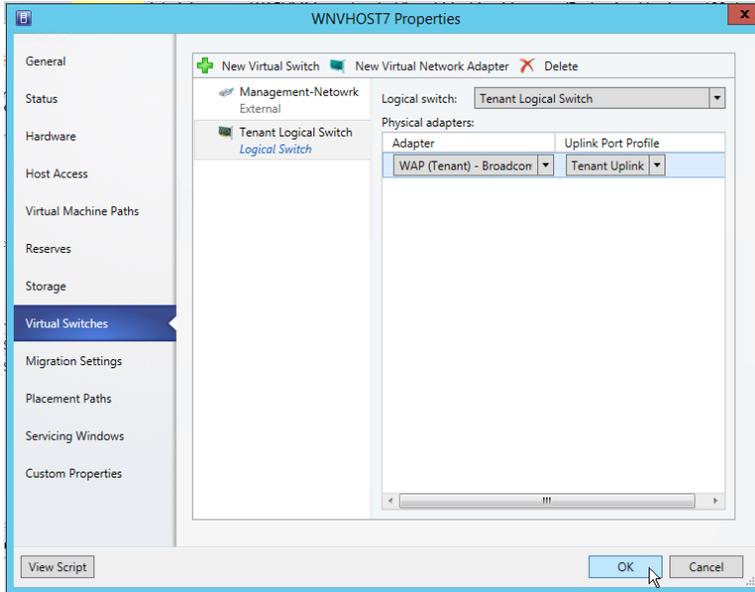
Assign the logical switch to the host

To assign the logical switch you created earlier to a host:

1. In the Virtual Machine Manager console, in the **VMs and Services** workspace, expand **All Hosts**, right-click the **HOST1** on which you want to associate the logical switch, and then click **Properties**.



2. In the Host Properties window, go to the **Virtual Switches** page, and from the right pane, do the following:
 - a. Click **New Virtual Switch**, and then click **New Logical Switch**.
 - b. For **Logical switch**, select **Tenant Logical Switch**.
 - c. For **Adapter**, select the physical adapter **WAP (Tenant)** to apply the logical switch to it.
 - d. For **Uplink Port Profile**, select the **Tenant Uplink** port profile that you created previously, and then click **OK**.

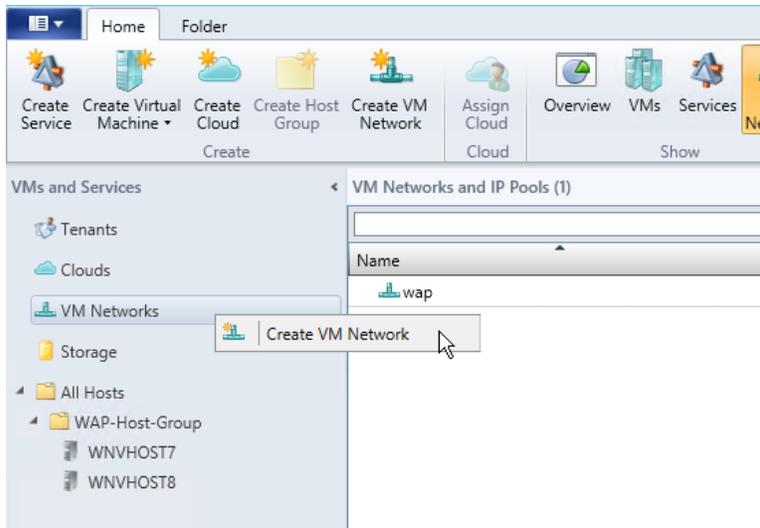


3. Repeat the steps for **HOST2** to add the logical switch to that host.

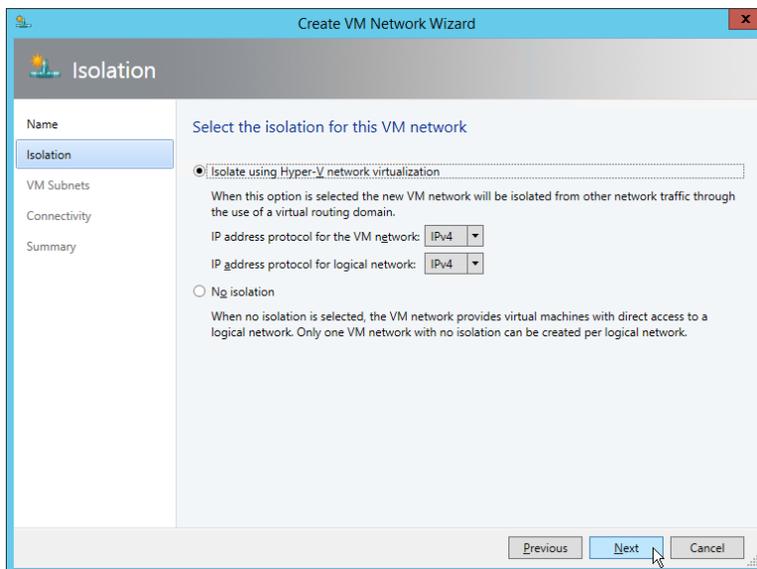
Create a virtual machine network

Virtual machines must be connected to a virtual machine network to be able to use and gain access to network resources. By using Windows Azure Pack, tenants can create custom virtual machine networks through their management portal. This capability is possible because we will associate logical networks to the cloud.

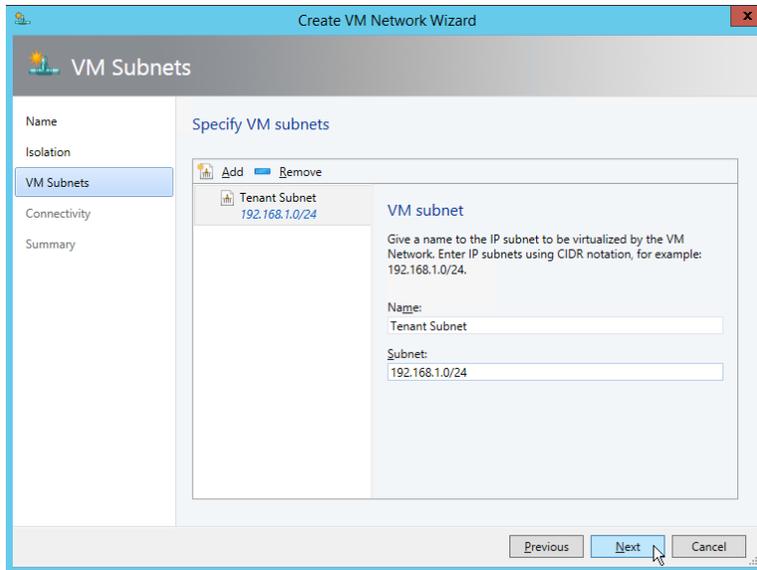
1. In the Virtual Machine Manager console, in the **VMs and Services** pane, right-click **VM Networks**, and then click **Create VM Network**.



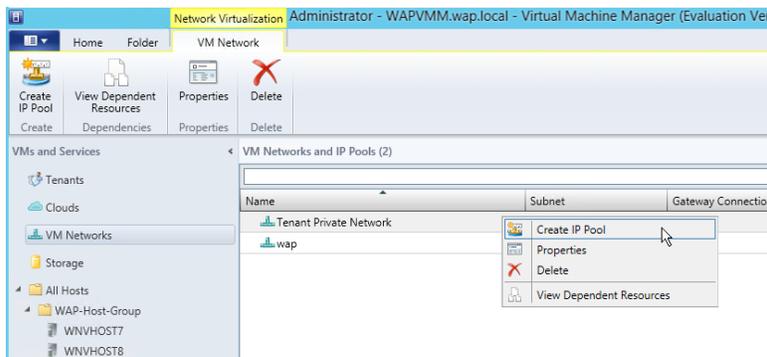
2. In the Create VM Network wizard, on the **Name** page, enter the name **Tenant Private Network** for the network, select **Logical network** as the **Tenant Logical Network**, and then click **Next**.
3. On the **Isolation** page, select **Isolate using Hyper-V network virtualization**, and then click **Next**.



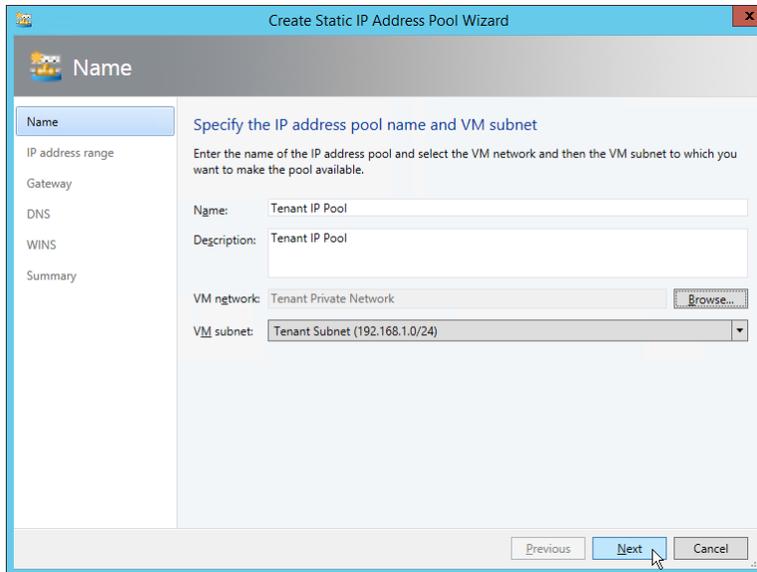
4. On the **VM Subnet** page, click **Add** to add a virtual machine subnet; for **Name**, enter **Tenant Subnet**; for **Subnet**, enter **192.168.1.0/24**; then, click **Next**.



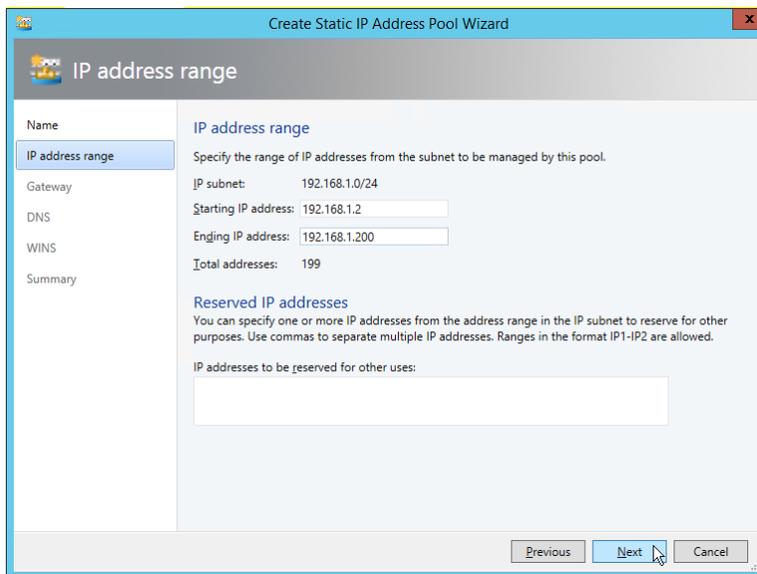
5. On the **Connectivity** page, keep the default settings, and then click **Next**.
6. On the **Summary** page, review the values you provided, and then click **Finish**.
7. Right-click **VM Network Tenant Private Network** (created earlier), and then select **Create IP Pool**.



8. In the **Create IP Pool** wizard, on the **Name** tab, enter the name **Tenant IP Pool** for the pool; keep default settings for **VM network** and **VM subnet** (Tenant Private Network and Tenant Subnet (192.168.1.0/24)), and then click **Next**.



- On the **IP address range** page, for **Starting IP address**, enter **192.168.1.2**; for **Ending IP address**, enter **192.168.1.200**; then, click **Next**.



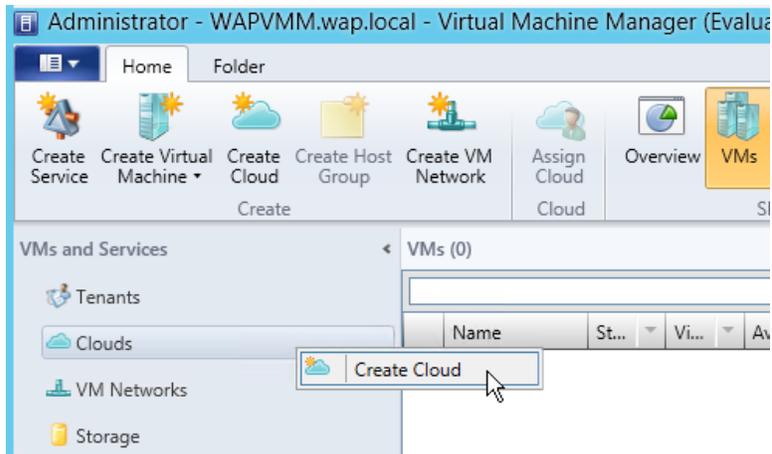
- Keep the default settings for **Gateway**, **DNS**, and **WINS** pages, and then click **Next**.
- On the **Summary** page, review the values you provided, and then click **Finish**.

Create a cloud and assign the logical network

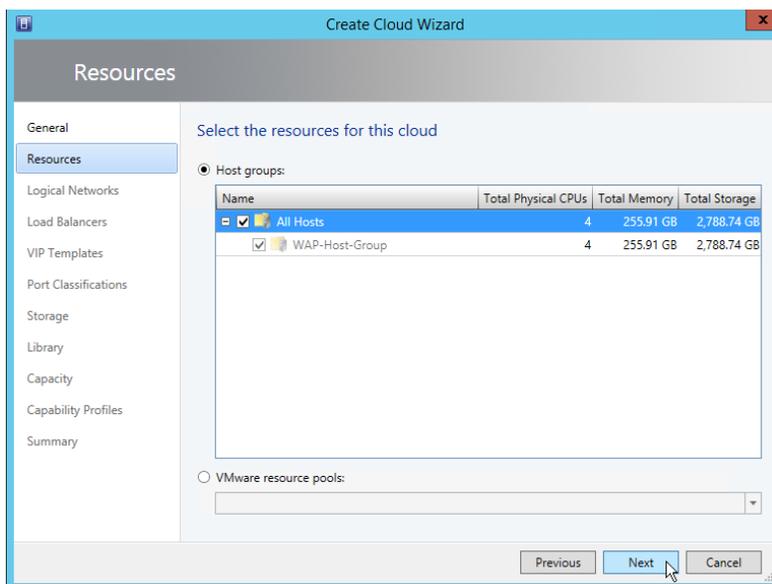
When the logical network is associated with the cloud, tenants using the management portal for tenants can create virtual machine networks by using the logical network. Additionally, the logical networks associated with the cloud are used by administrators to create virtual machine networks that use Management Portal for administrators as part of the plan.

To create a cloud and assign the logical network:

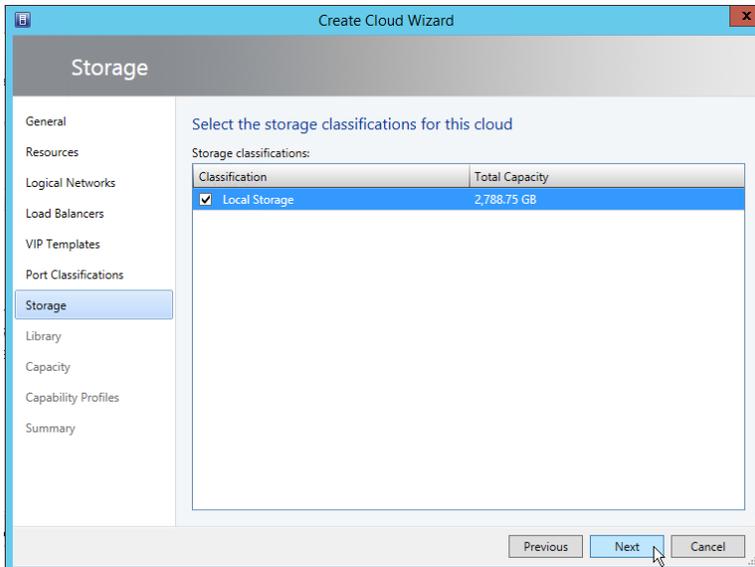
- In the Virtual Machine Manager console, in the **VMs and Services** workspace, expand **Clouds**, right-click the cloud, and select **Create Cloud**.



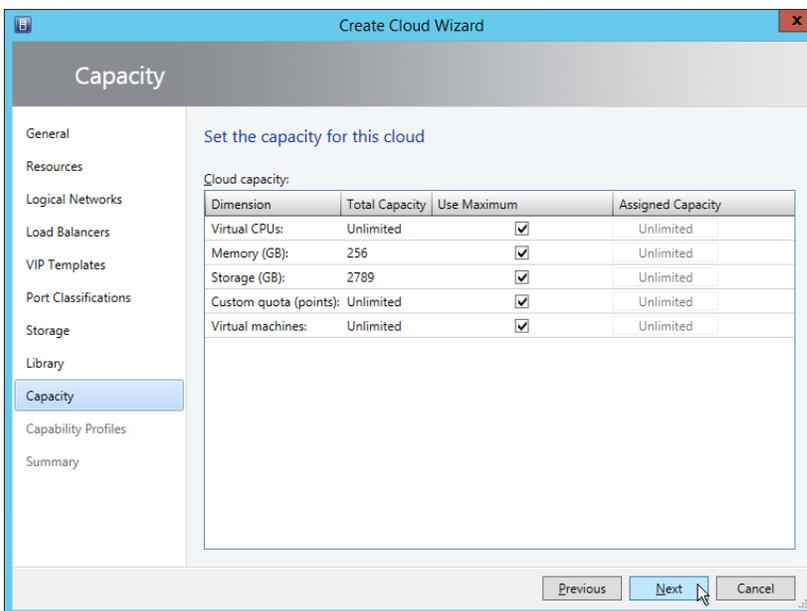
2. In the **Create Cloud** wizard, on the **General** page, enter the name **Gold Tenant Cloud** for the cloud, and then click **Next**.
3. On the **Resources** page, select **All Hosts**, and then click **Next**.



4. On the **Logical Networks** page, select **Tenant Logical Network**, and then click **Next**.
5. On the **Load Balancers** page, select **Microsoft Network Load Balancing (NLB)**, and then click **Next**.
6. On the **VIP Template** page, keep the default settings, and then click **Next**.
7. On the **Port Classifications** page, select **Tenant VM Network**, and then click **Next**.
8. On the **Storage** page, select **Local Storage** (in a real environment, you may use iSCSI or SMB storage for scalability and availability), and then click **Next**.



9. On the **Library** page, click **Add** to add a read-only library share; select the library shares, click **OK**, and then click **Next**.
10. On the **Capacity** page, keep the default settings, and then click **Next**.



11. On the **Capability Profiles** page, keep the default settings, and then click **Next**.
12. On the **Summary** page, review the values you provided, and then click **Finish**.
13. Repeat these steps to create two more clouds named **Silver Tenant Cloud** and **Bronze Tenant Cloud**. The only difference will be reduced capacity for silver and bronze levels, as shown in the following table.

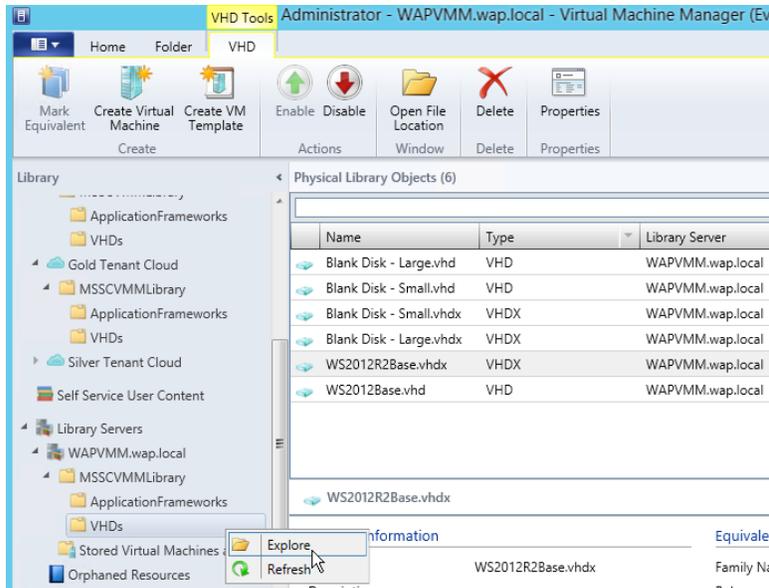
Cloud Capacity	
Silver Tenant Cloud	Virtual CPUs: 6 Memory (GB): 24 Storage (GB): 1000 Custom quota (points): 10 Virtual machines: 10
Bronze Tenant Cloud	Virtual CPUs: 4 Memory (GB): 12 Storage (GB): 500 Custom quota (points): 5 Virtual machines: 5

Create virtual machine templates

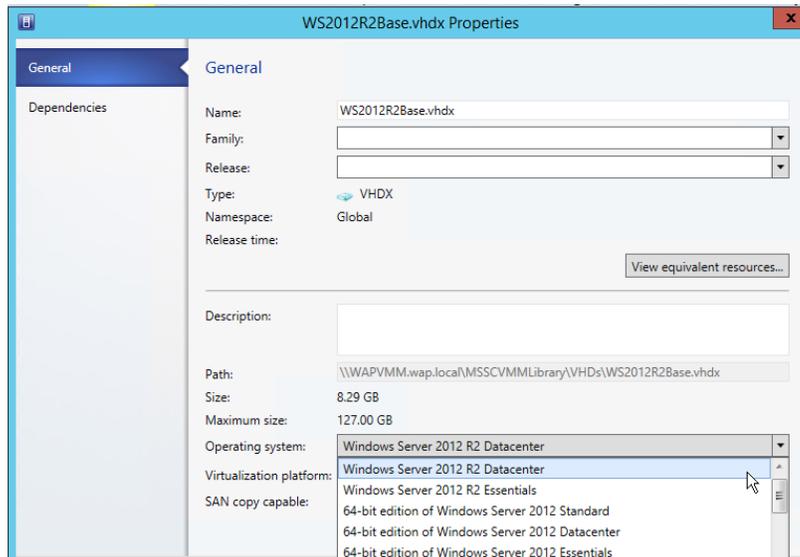
Virtual machine templates help you create new virtual machines from a default blueprint of virtual machine settings. Virtual machine templates can be created based on an existing virtual machine template or an existing virtual hard disk that is stored in a library. For the Windows Azure Pack evaluation lab, we will create standalone virtual machine templates of Windows Server 2012 and Windows Server 2012 R2.

To create virtual machine templates:

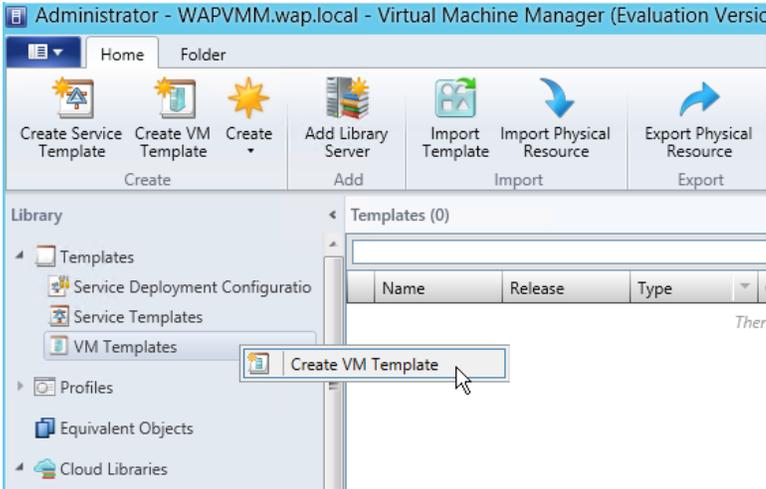
1. Download the images from Microsoft—both images are VHD files that are sysprepped and can be used directly as virtual machine templates:
 - **Windows Server 2012:** Go to <http://technet.microsoft.com/en-in/evalcenter/hh670538.aspx>. Rename the file **WS2012Base**.
 - **Windows Server 2012 R2:** Go to <http://technet.microsoft.com/en-us/evalcenter/dn205286.aspx>. Rename the file **WS2012R2Base**.
2. Copy the images to the Virtual Machine Manager Library:
 - a. In the Virtual Machine Manager console, click the **Library** workspace, expand **Library Servers**, **WAPVMM.wap.local** server, and **MSSCVMMLibrary**; right-click the **VHDs** folder, and then select **Explore**.



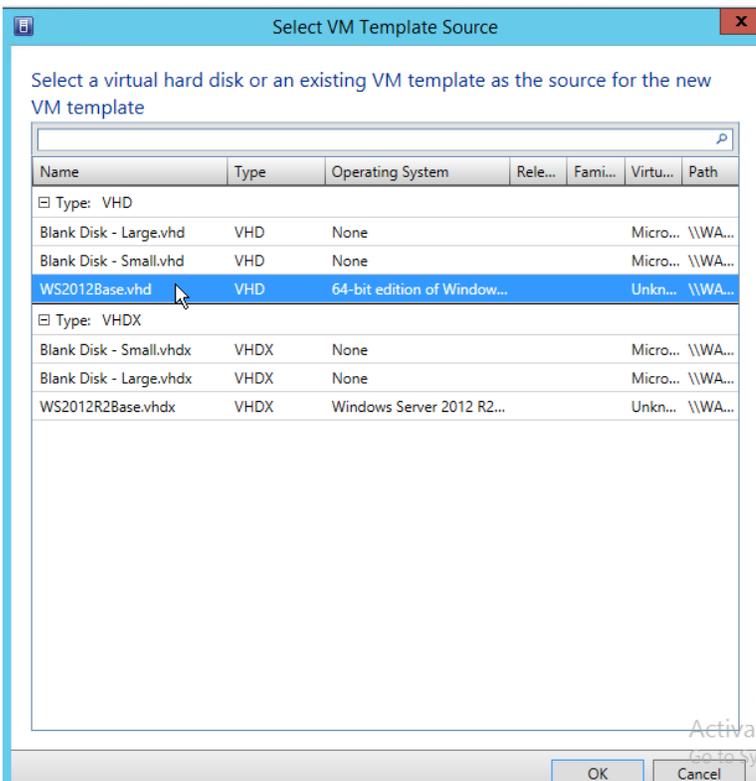
- b. Right-click the **VHDs** folder and click **Refresh**.
- c. In the **VHDs** folder in the **VMM console**, right-click the **WS2012R2Base Image**, and then click **Properties**.
- d. Change **Operating System** from unknown to **Windows Server 2012 R2 Datacenter**, and then click **OK**.



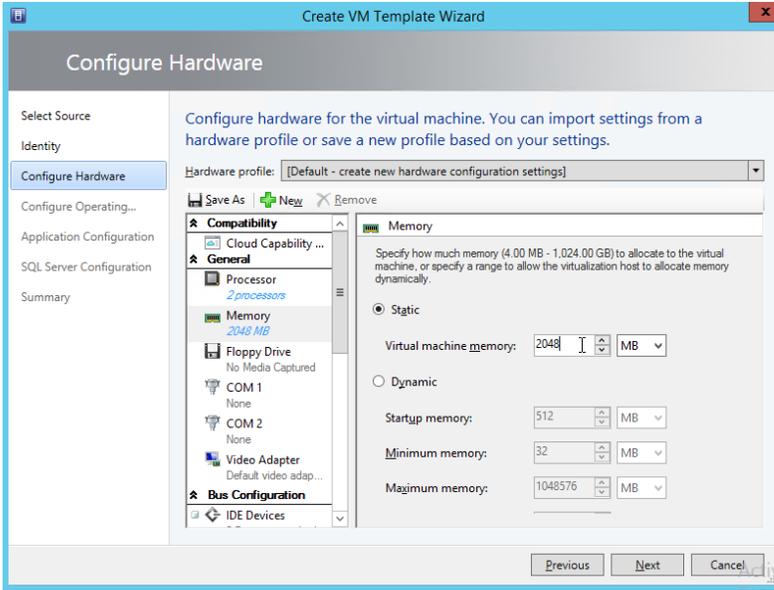
- e. Similarly, for **WS2012Base Image**, right-click the image from the **VHDs** folder in the **VMM console**, and then click **Properties**.
 - f. Change **Operating System** from unknown to **64-bit edition of Windows Server 2012 Datacenter**, and then click **OK**.
3. Create the virtual machine template for Windows Server 2012 and Windows Server 2012 R2:
 - a. In the Virtual Machine Manager console, in the **Library** workspace, click **Templates**; then, right-click **VM Templates**.
 - b. Click **Create VM Template**.



- c. Click **Use an existing VM template or a virtual hard disk stored in the library**, and then click **Browse**.
- d. In the Select VM Template Source window, click the virtual hard disk named **WS2012Base**, click **OK**, and then click **Next**.



- e. On the **Identity** page, enter **Windows Server 2012 Datacenter**, and then click **Next**.
- f. On the **Configure Hardware** page, click **Processor**, and change **Number of Processors** to **2**.
- g. Click **Memory**, click **Static**, set **Virtual machine memory** to **2048**, and then click **Next**.



- h. On the **Configure Operating System** page, for **Operating System**, enter **64-bit edition** for Windows Server 2012 Datacenter, and then click **Next**.
- i. On the **Application Configuration** page, keep the default settings, and then click **Next**.
- j. On the **SQL Server Configuration** page, keep the default settings, and then click **Next**.
- k. On the **Summary** page, review the values you provided, and then click **Create**.
- l. Repeat these steps to, create a virtual machine template for Windows Server 2012 R2.

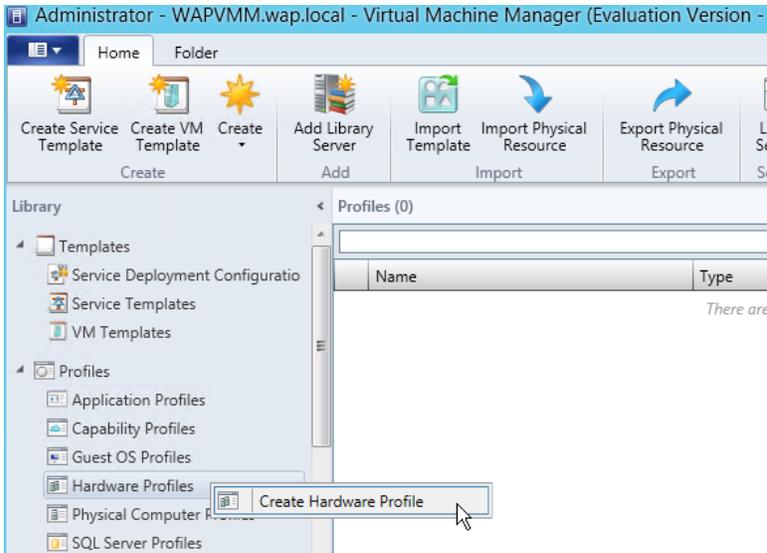
NOTE: Hyper-V and Virtual Machine Manager support multiple operating system types including different versions of Windows and Linux. You can create virtual machine templates for these versions and use them in Windows Azure Pack.

Create hardware profiles

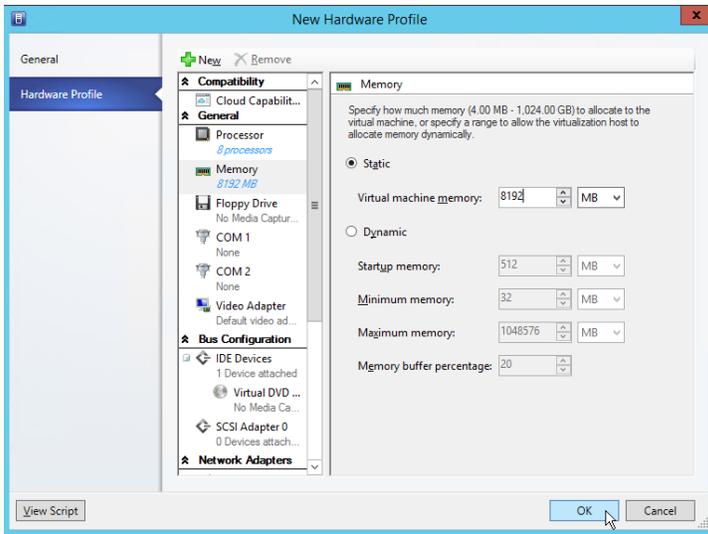
Hardware profiles help you to specify the hardware configuration for various virtual hardware components for virtual machines. Hardware profiles enable VM Clouds service in Windows Azure Pack to provide different instance types to tenants. We will create three hardware profiles for the lab: small, medium, and large, with variations in CPU and memory allocation.

To create hardware profiles:

1. In Virtual Machine Manager console, in the **Library** workspace, click **Profiles**, and then right-click **Hardware Profiles**.
2. Click **Create Hardware Profile**.



3. On the **General** page, for **Name**, enter **Small**; for **Generation**, keep **Generation 1**.
4. On the **Hardware Profile** page, click **Processor**, and change **Number of processes** to **2**.
5. Click **Memory**, click **Static**, change **Virtual machine memory** to **2048**, and then click **OK**.



6. Repeat these steps to create **Medium** and **Large** hardware profile using the configurations provided in the following table.

Hardware Profile	
Medium	Number of processors: 4 Virtual machine memory: 4096 MB
Large	Number of processors: 8 Virtual machine memory: 8192 MB

NOTE: While creating hardware profiles, make sure you do not select any of the cloud capability profiles (XenServer, ESX Server, Hyper-V) that are available.

Install Windows Azure Pack Gallery Resources

Virtual Machine Roles represent a scalable tier of virtual machines that can be provisioned by a tenant using a single process. Examples of workloads that can be created by Virtual Machine Roles could include a single virtual machine, an Active Directory Domain Controller, a SQL Cluster, or an Internet Information Services Web Farm. You can download these resources as sample virtual machine roles or create custom roles. Use Microsoft Web Platform Installer to download Windows Azure Pack Gallery Resources.

Install Web Platform Installer

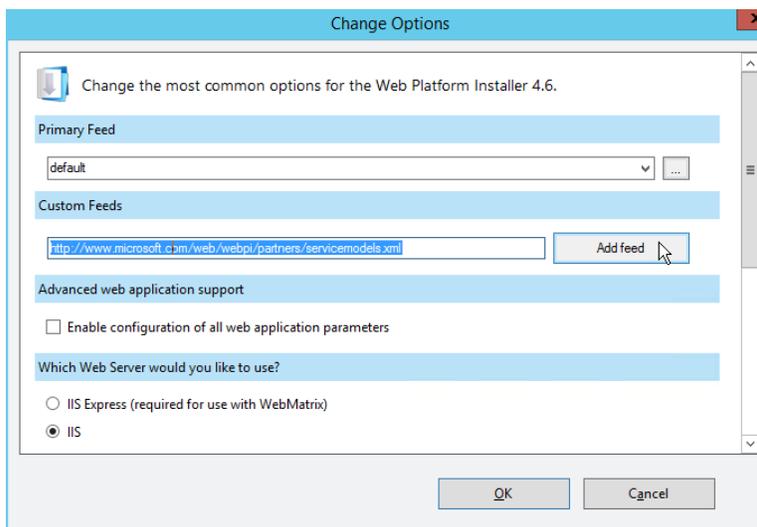
To install the Web Platform Installer, go to <http://www.microsoft.com/web/downloads/platform.aspx>.



Add the Service Model feed

To add the Service Model feed:

1. Start Web Platform Installer.
2. At the bottom of the window, click the **Options** link.
3. For **Custom Feeds**, enter <http://www.microsoft.com/web/webpi/partners/servicemodels.xml>.



4. Click **Add Feed**, and then click **OK**.
You see a Service Models option at the top of the window.

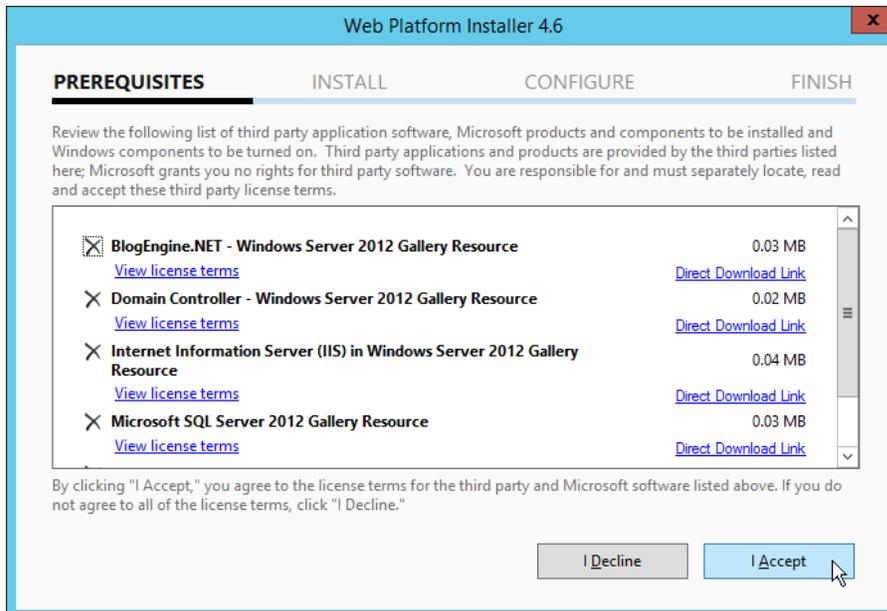
Download the Gallery Resource

1. Start Web Platform Installer.

- Go to the **Service Models** tab.
- In the navigation pane, click **Gallery Resources**.
- Select **Blogengine.NET – Windows Server 2012 Gallery Resource**, and then click **Add**.



- Select **Domain Controller - Windows Server 2012 Gallery Resource**, and then click **Add**.
- Select **Internet Information Server (IIS) in Windows Server 2012 Gallery Resource**, and then click **Add**.
- Select **Microsoft SQL Server 2012 Gallery Resource**, and then click **Add**.
- Select **SharePoint Foundation 2010 SP2 – Basic Gallery Resource**, and then click **Add**.
- Click **Install**.
- Accept the license terms.



- Click **Continue**.
You see a window for the folder on the local computer where the Gallery Resource has been downloaded.

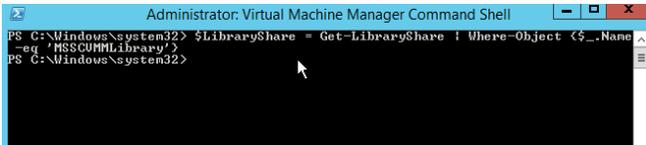
Import resources into Virtual Machine Manager

In this section, we import one of the Gallery Resources downloaded earlier into Virtual Machine Manager by using Windows PowerShell, so templates are available in Windows Azure Pack as Virtual Machine Role templates. The following Windows PowerShell scripts show you how to install these Resource Extension Packages to Virtual Machine Manager. (You can use this approach to import more as needed).

With the command given in the following steps, we will import the **Domain Controller - Windows Server 2012 Gallery Resource** Extension Package you downloaded previously using Web Platform Installer. To import resources into Virtual Machine Manager:

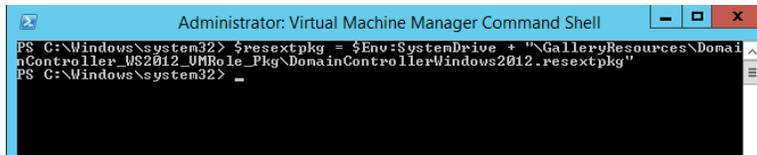
1. Rename the **Gallery Resources** folder that was downloaded earlier to **GalleryResources** to remove the space.
2. Open Virtual Machine Manager Command Shell as Administrator.
3. Enter the following command to add the **Library Share** variable to be used in the import cloud resource extension command:

```
$LibraryShare = Get-SCLibraryShare | Where-Object {$_.Name -eq 'MSSCVMLLibrary'}
```



4. Enter the following command to add the **Resource Extension Package** variable to be used in the import cloud resource extension command.

```
$resextpkg = $Env:SystemDrive +  
"\GalleryResources\DomainController_WS2012_VMRole_Pkg\  
DomainControllerWindows2012.resextpkg"
```



5. Run the import cloud resource extension command to add the resource extension in the Virtual Machine Manager Library.

```
Import-CloudResourceExtension -ResourceExtensionPath $resextpkg -SharePath  
$LibraryShare -AllowUnencryptedTransfer
```

NOTE: If you get an encryption error such as *"Resource ConfigurationFirewall.cr.cr\ConfigureFirewall.cmd is on a library server that requires Encryption"*, then remove `-AllowUnencryptedTransfer` from the import command.

Install and configure System Center Service Provider Foundation

Service Provider Foundation is a component of Microsoft System Center that empowers service providers and hosters to design and implement multitenant self-service portals that integrate IaaS capabilities that are available in System Center 2012 R2.

Create a virtual machine for Service Provider Foundation

To create a new virtual machine for Service Provider Foundation:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPSPF** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPSPF**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPSPF\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPADFS-HDD**.
 - m. In Hyper-V Manager, select the **WAPADFS** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPSPF\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPSPF**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10. 14**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
4. Add the machine to the **WindowsAzurePack.Local** domain.
5. Log on to the machine named **WAPSPF** as domain administrator (**Windows Azure Pack\Administrator**).
6. Make sure all the software prerequisites are installed before starting the Service Provider Foundation installation. For more information, see *System Requirements for Service Provider Foundation* at <http://technet.microsoft.com/en-us/library/jj642899.aspx>.

Install Service Provider Foundation

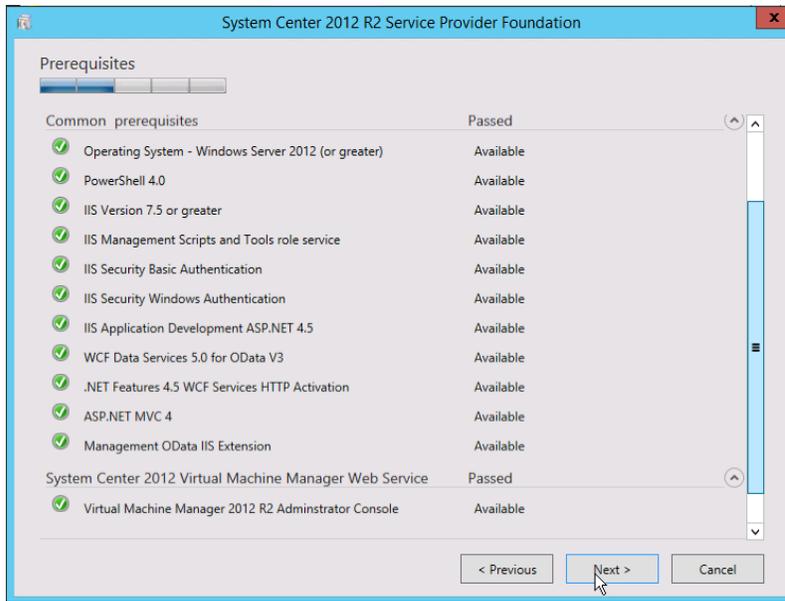
To install Service provider Foundation:

1. Create a new domain user **WAP\SPFSA**, and add the user to the domain administrators group.

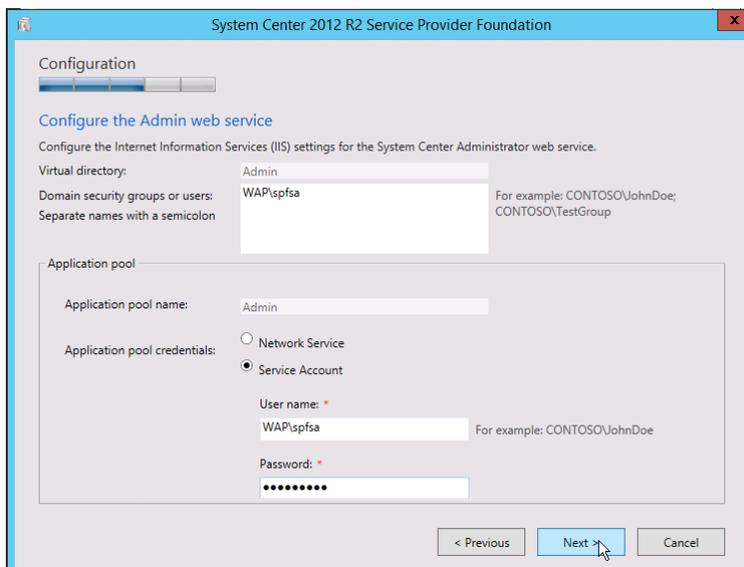
2. Add Windows Azure Pack\SPFSA user as Virtual Machine Manager administrator
 - a. Log on to the **WAPVMM** machine as domain administrator (**WAP\Administrator**).
 - b. Go to **Virtual Machine Manager Console** and go to the **Settings** tab.
 - c. Go to **Security**, and then click **User Roles**.
 - d. Double-click **Administrator**, and on the **Members** tab, add **WAP\SPFSA**.
3. Add the WAP\SPFSA user as the SQL database administrator:
 - a. Log on to the **WAPSQL** machine as domain administrator (**WAP\Administrator**).
 - b. Open **SQL Server Management Studio** and go to the **Security** tab.
 - c. Right-click **Logins**, and then click **New login**.
 - d. Add WAP\SPFSA as a SQL database sysadmin.
4. Log on to the **WAPSPF** machine as a **WAP\SPFSA** user.
5. Create a local user account called **SPFLocal** on **WAPSPF**.
6. Create local groups named **SPF_Admin**, **SPF_Provider**, **SPF_Usage**, and **SPF_VMM**.
7. Add the **SPFLocal** user to the local groups **Administrators**, **SPF_Admin**, **SPF_Provider**, **SPF_Usage**, and **SPF_VMM**.
8. Download System Center 2012 R2 Orchestrator from <http://technet.microsoft.com/en-US/evalcenter/dn205295.aspx>.
9. Run the SC2012_R2_SCO setup file extract the setup files at **C:\System Center SCO**.
10. Go to **C:\System Center SCO** and run the **SetupOrchestrator.exe** file.
11. On the main **Setup** page, under **Service Management**, click **Service Provider Foundation**.



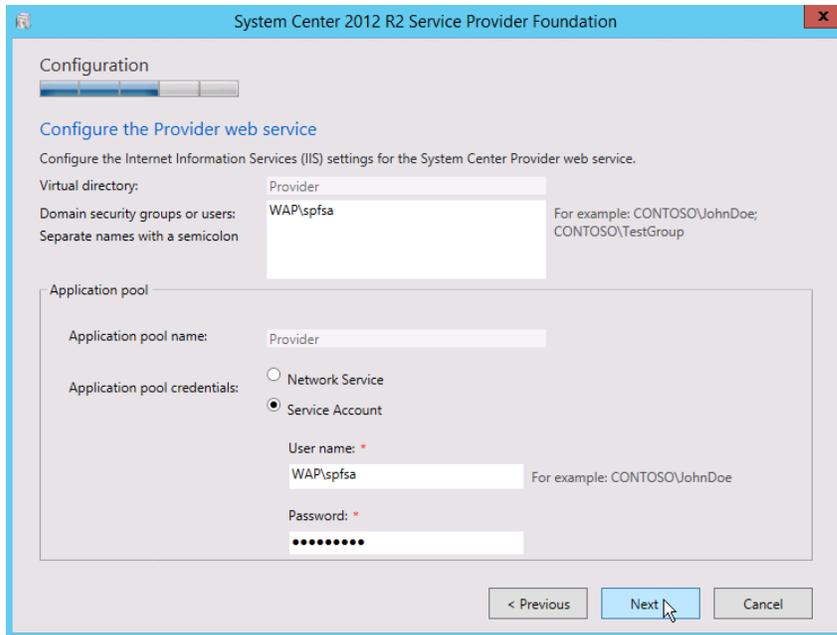
12. On the **Service Provider Foundation Setup** page, click **Install**.
13. On the **License Terms** page, accept the license agreement, and then click **Next**.
14. On the **Select the web services to install** page, select the **System Center Virtual Machine Manager 2012 Web Service** check box, and then click **Next**.
15. On the **Prerequisites** page, wait for the wizard to complete the prerequisite verification, and then review the results. If any of the prerequisites are missing, install the missing prerequisites, and then click **Check prerequisites again**; when all of the prerequisites are met, click **Next**.



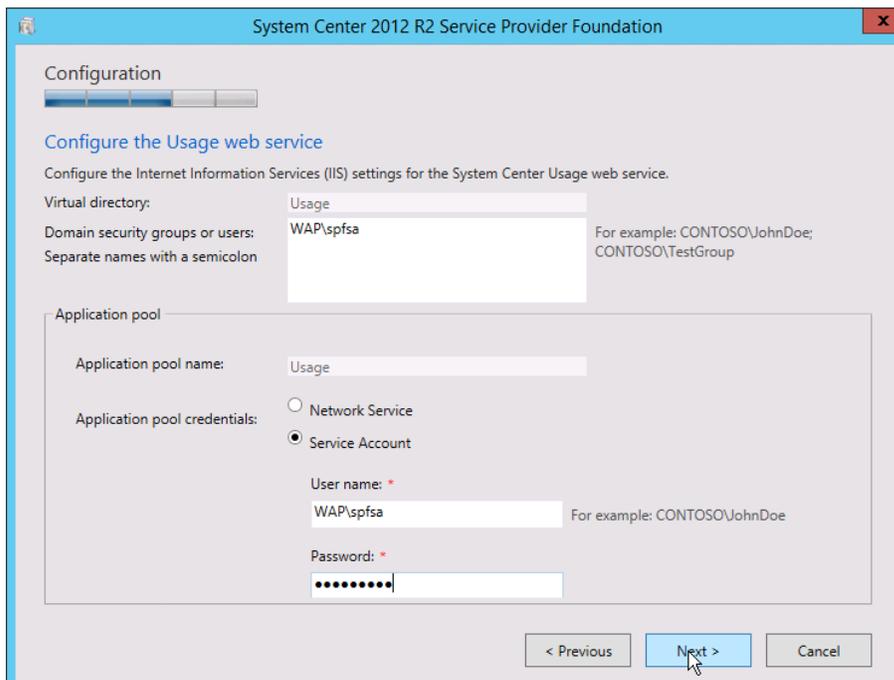
16. On the **Configure the database server** page, in the server text box, enter the name of the server that hosts SQL Server (**WAPSQL.WAP.Local**).
17. For **Port Number**, keep the default value **1433**, and then click **Next**.
18. On the **Specify a location for the SPF files** page, keep the default values, and then click **Next**.
19. On the **Configure the Admin web service** page, for **Domain security groups or users**, make sure the setting is **WAP\SPFSA**.



20. For **Application Pool credentials**, select **Service Account**, enter credentials for the WAP\SPFSA account, and then click **Next**.
21. On the **Configure the Provider web service** page, for **Domain security groups or users**, make sure the user name is **WAP\SPFSA**.
22. For **Application Pool credentials**, select **Service Account**, enter credentials for the WAP\SPFSA account, and then click **Next**.



23. On the **Configure the VMM web service** page, for **Domain security groups or users**, make sure the user name is **WAP\SPFSA**.
24. For **Application Pool credentials**, select **Service Account**, enter credentials for the WAP\SPFSA account, and then click **Next**.
25. On the **Configure the Usage web service** page, for **Domain security groups or users**, make sure the user name is **WAP\SPFSA**.
26. For **Application Pool credentials**, select **Service Account**, enter credentials for the WAP\SPFSA account and then click **Next**.



27. On the next page, select **Yes, I am willing to participate anonymously in the Customer Experience Improvement Program**; for **Microsoft Updates**, select **On**; then, click **Next**.

28. On the installation summary page, click **Install**.
29. After successful completion of Service Provider Foundation installation, click **Close**.

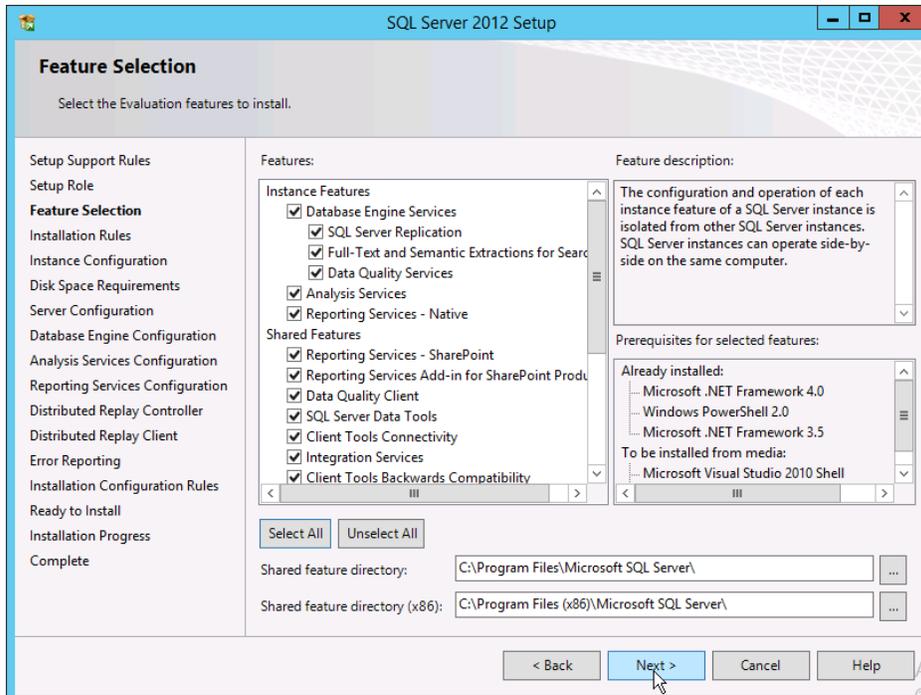
Install and configure Windows Azure Pack for SQL Server databases

Windows Azure Pack allows configuration of a separate instance of SQL Server to be used by tenants. For a separate SQL Server database for tenants, you need to install the SQL Server database server and then configure the database by connecting the SQL Server instance with Management Portal for administrators.

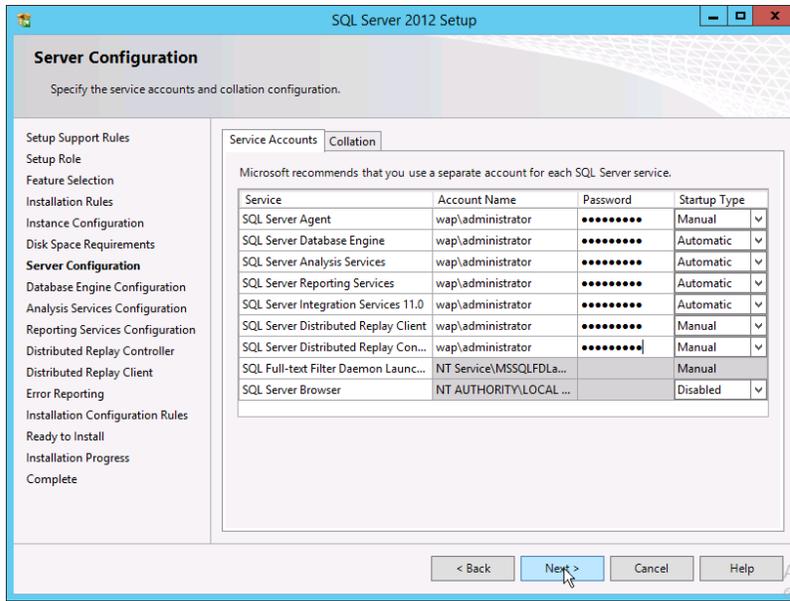
To create a virtual machine and install SQL Server:

1. From the Windows Server 2012 R2 image for deployment, create the **SQLServer** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **SQLServer**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\SQLServer\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image **SQLServer-HDD**.
 - m. In Hyper-V Manager, select the **SQLServer** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\SQLServer\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **SQLServer**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10. 15**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
4. Add this machine to the **WAP.Local** domain.
5. Log on to the machine named **SQLServer** as domain administrator (**WAP\Administrator**).
6. Download the SQL Setup file from <http://www.microsoft.com/en-in/download/details.aspx?id=35575>
7. Extract the ISO file to **C:\SQL Server** and run the **Setup** file.
8. In SQL Server Installation Center, go to the **Installation** tab.
9. Click **New SQL Server stand-alone installation**, or add features to an existing installation.

10. After prerequisite checks pass, in **Setup Support Rules**, click **OK**; otherwise, fix issues according to guidance, and click **Re-run**.
11. In the SQL Server 2012 Setup wizard, enter the product key for SQL Server, and then click **Next**.
12. For this lab environment, for **Specify a free edition**, select **Evaluation**; select **I accept the license terms**, and then click **Next**.
13. After setup shows the list of required updates for SQL Server installation, click **Next**. Setup downloads and installs the required updates.
14. In the results window for SQL Server support rules, after the scan passes, click **Next**.
15. In the next window, select **SQL Server feature installation**, and then click **Next**.
16. Click **Select All**, and then, click **Next**.



17. In the next window, after the result for failed is 0, click **Next**.
18. On the **Instance Configuration** page, keep the default values and click **Next**.
19. On the **Disk Usage Summary** page, click **Next**.
20. On the **Server Configuration** page, use **WAP\Administrator** for the top-seven services and enter **Passw0rd!** for the password., and then click **Next**.



21. On the **Database Engine Configuration** page, select **Mix Mode authentication**, and define the password for the SA account:

- User: **sa**
- Password: **Passw0rd!**

22. To add a Windows user, click **Add Current User**, and then click **Next**.

23. On the **Analysis Services Configuration** page, click **Add Current User**, and then click **Next**.

24. On the **Reporting Services Configuration** page, make sure that the install and configure options for **Reporting Services Native Mode** and **Install only for Reporting Services SharePoint Integrated Mode** are selected, and click **Next**.

25. On the **Distributed Replay Controller** page, click **Add Current User**, and then click **Next**.

26. Enter the controller machine name **SQLServer**, keep the default location for the working and result directory, and then click **Next**.

27. On the **Error Reporting** page, click **Next**; on the **Installation Configuration Rule** page, click **Next**; then, click **Install**.

28. After SQL Server 2012 is successful, click **Close**.

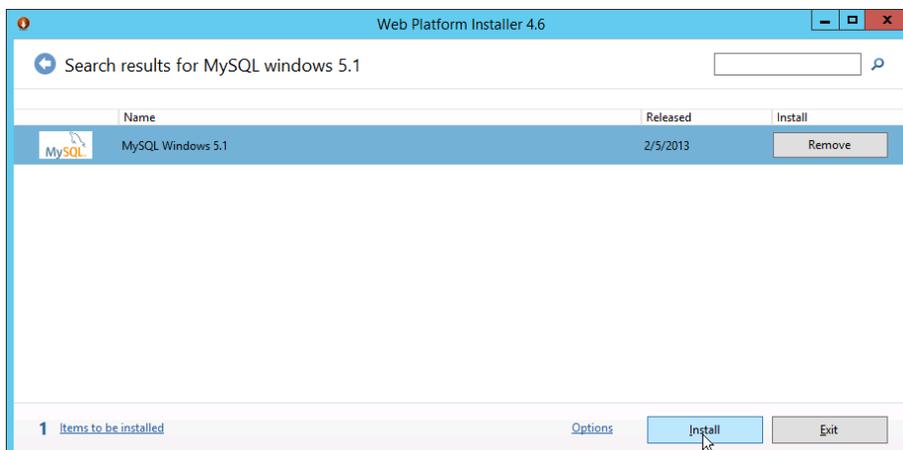
Install and configure Windows Azure Pack for MySQL databases

Windows Azure Pack allows configuration of a separate MySQL database server to be used by tenants. To set up a separate MySQL database for tenants, you must install the MySQL Server database server and configure the database by connecting the MySQL Server instance to Management Portal for administrators.

To create a virtual machine and install MySQL Server:

1. From the Windows Server 2012 R2 image for deployment, create the **MySQL** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, and click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **MySQL**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.

- g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\MySQL\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image **MySQL-HDD**.
 - m. In Hyper-V Manager, select the **MySQL** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\MySQL\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **MySQL**.
 3. Give a static IP address to the machine:
 - IP address: **10.10.10. 16**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add this machine to the **WAP.Local** domain.
 5. Log on to the machine named **MySQL** as domain administrator (**WAP\Administrator**).
 6. Open **Web Platform Installer** and search for **MySQL Windows 5.1**.
 7. In the search results, next to **MySQL Windows 5.1**, click **Add**, and then click **Install**.



8. In the **Prerequisites** window, enter the password, **Passw0rd!** for the default database admin account (root); type the password again to confirm it, and then click **Continue**.
9. Review the list of software to be installed, and then click **I Accept**.
MySQL is downloaded and installed.
10. Click **Finish** to close the install window.

11. From the **Start** menu, start MySQL Command Line, and enter the following commands:

```
GRANT ALL PRIVILEGES ON *.* TO 'root'@'%' IDENTIFIED BY 'Passw0rd!' WITH GRANT OPTION;
FLUSH PRIVILEGES;
use mysql;
update user set grant_priv='Y' where user='root';
exit;
```

12. Restart MySQL service with Server manager or by typing the following commands at an elevated command prompt:

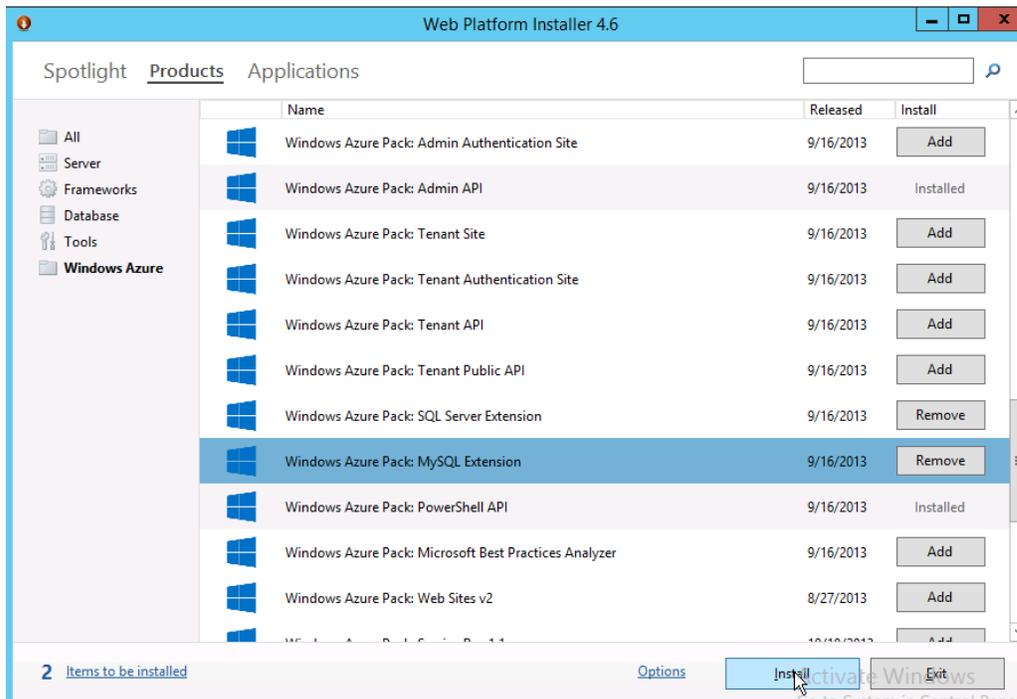
```
net stop mysql
net start mysql
```

Install and configure the SQL Server and MySQL resource providers

The SQL Server and MySQL resource providers enable provisioning of Microsoft SQL Server and MySQL Server databases for tenant use. These resource providers are installed by default if you deploy the express configuration on a single system. If you deploy the distributed configuration, you need to install the resource providers manually.

To install the SQL Server or MySQL Server resource provider:

1. Log on to the **Wapadmin** machine where you have to install the resource provider.
2. Open Web Platform Installer, click the **Products** tab, and then click **Windows Azure**.
3. Next to **Windows Azure Pack: SQL Server Extension** and **Windows Azure Pack: MySQL Extension**, click **Add**, and then click **Install**.



4. Review the software to be installed; accept the terms and conditions on the **Prerequisites** page by clicking **I Accept**.

5. After the installation is complete, make sure that all Internet Explorer windows are closed; then, click **Continue** in the Web Platform Installer to launch the Configuration site.
The Configuration site (<https:// Wapadmin.wap.local:30101>) opens in Internet Explorer. If you see the security certificate warning page, click **Continue to this website (not recommended)**.
6. On the **Database Server Setup** page, enter the name of the database server (for the lab, use **WAPSQL.WAP.Local**—the database server that was configured when you installed the Windows Azure Pack core components.)
7. Select **Windows Authentication**, enter the pass phrase for the Configuration Store (for the lab, use **PasswOrd!**—the pass phrase that was configured when you installed the core components), and then click the next arrow.

WINDOWS AZURE PACK SETUP

Database Server Setup

Database Server

Please specify the SQL Server that you would like to use for the Windows Azure Pack databases. Please use the same SQL Server instance for configuring the Windows Azure Pack Admin, Tenant and Tenant Public APIs, Admin Site and Tenant Site.

SERVER NAME

AUTHENTICATION TYPE

USERNAME

Configuration Store

Please provide a passphrase below that will be used to store and retrieve secrets from the configuration store. The same passphrase needs to be used in all machines on this deployment. Note that if the configuration store does not exist yet, the passphrase is always valid.

PASSPHRASE

Activate Window
Go to System in Contr
Windows.

8. Select the option to participate in the Customer Experience Improvement Program (CEIP) and click **Next**.
9. Review the features to be configured, and then click the checkmark to finish the configuration.

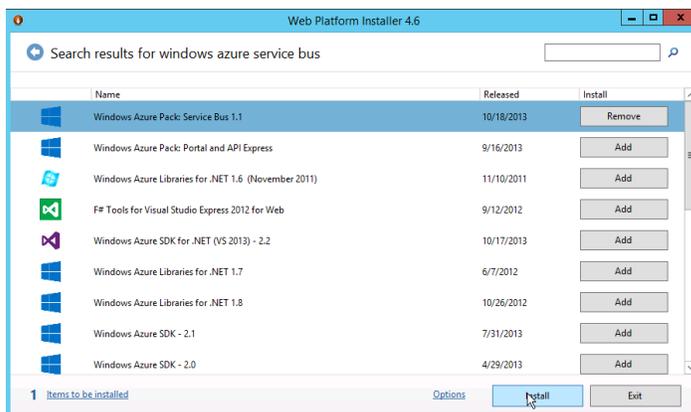
Install and configure Service Bus for Windows Azure Pack

Service Bus for Windows Server provides similar capabilities across Windows Azure and Windows Server, and enables flexibility in developing and deploying applications. It is built on the same architecture as the Service Bus cloud service and provides scale and resiliency capabilities. It provides a seamless experience while managing entities on the Windows Azure Management Portal consistently across on-premises and cloud versions.

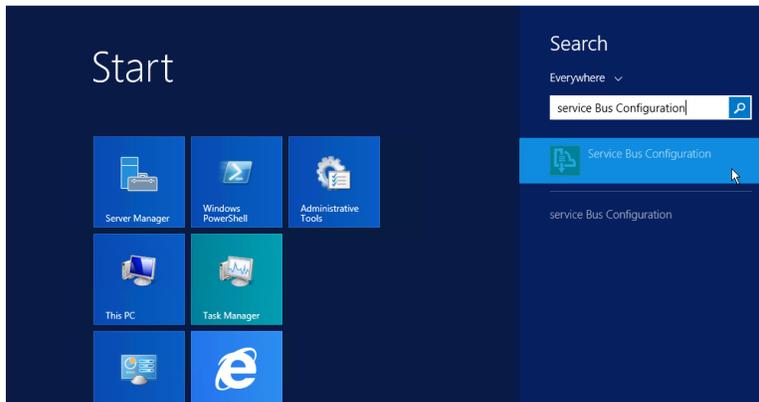
To create a virtual machine and install Service Bus:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPSB** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPSB**.
 - e. Select **Store the virtual machine in a different location**.

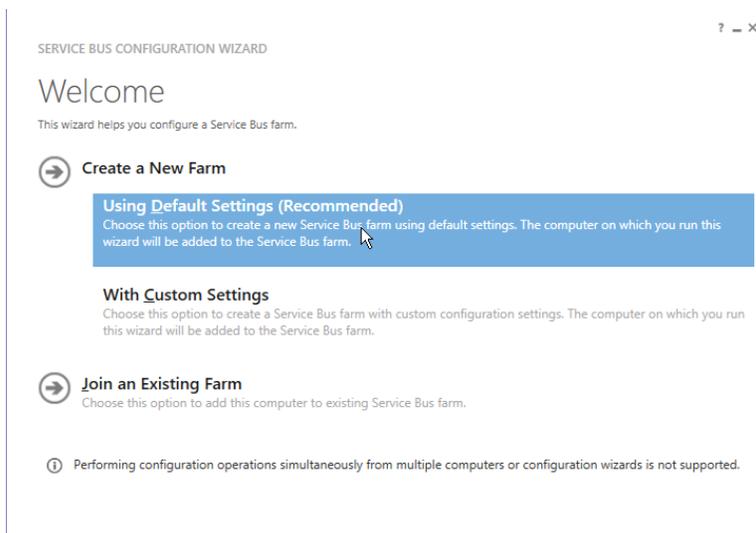
- f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPSB\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image **SQLServer-HDD**.
 - m. In Hyper-V Manager, select the **SQLServer** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPSB\Virtual Hard Disk**.
 - q. Select **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPSB**.
 3. Give a static IP address to the machine:
 - IP address: **10.10.10. 17**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add this machine to the **WAP.Local** domain.
 5. Log on to the machine named **WAPSB** as domain administrator (**WAP\Administrator**).
 6. Open Web Platform Installer, and then search for Windows Azure Service Bus.
 7. In the search results, next to **Windows Azure Service Bus 1.1**, click **Add**, and then click **Install**.



8. Review the prerequisites and click **I Accept**.
9. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**; after Service Bus is installed successfully, click **Finish**.
10. Open the Service Bus Configuration wizard.



11. For **Create a New Farm**, click **Using Default Settings (Recommended)**.



12. In the **SQL Server Instance** text box, for **Configure Farm Databases**, enter **SQLServer.WAP.Local**, and then click **Test Connection**.

13. After the connection successfully passes the test, you see a green icon; keep the default value for **Database name prefix**.

14. For the Service Bus account, enter user credentials as follows:

- User ID: **WAP\Administrator**
- Password: **Passw0rd!**

15. Define the Certificate Generation Key; confirm the key by retyping the same key in the next box.

NOTE: For the lab, enter **Passw0rd!** for the Certificate Generation Key.

16. Make sure **Enable firewall rules on this computer** is selected.

17. For **Configure Service Bus Namespace**, keep the default setting.

18. Select the down arrow to reveal Service Bus Management Portal settings, and then select **Manage this farm with the Service Bus Management Farm**.

19. For the Service Bus admin portal user, enter the following credentials:

- User name: **adminuser**
- Password: **Passw0rd!**

20. For the Service Bus tenant portal user, enter the following credentials:

- Username: **tentantuser**
- Password: **Passw0rd!**

21. Select the small right arrow to continue.

Install and configure Service Management Automation

Service Management Automation is a workflow management solution for Windows Azure Pack that helps you automate the creation, monitoring, and deployment of resources in your environment.

To create a virtual machine for Service Management Automation:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPSMA** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPSMA**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPSMA\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image **WAPSMA-HDD**.
 - m. In Hyper-V Manager, select the **WAPSMA** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPSMA\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and click **Start**.
2. Rename the machine name **WAPSMA**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10. 18**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
4. Add this machine to the **WAP.Local** domain.
5. Make sure the machine meets the following software requirements for Service Management Automation Installation:
 - Windows Server 2012 R2
 - SQL Server 2012 (not Express edition)

- Internet Information Services 7.5 (hosts the web service)
- Internet Information Services Basic Authentication
- Internet Information Services Windows Authentication
- Internet Information Services URL Authorization
- ASP.NET 4.5
- Microsoft .NET Framework 3.5 (for the Setup program)
- Microsoft .NET Framework 4.5
- Windows Communication Foundation HTTP activation

6. Install the Service Management Automation web service.

- In the folder where you downloaded the System Center 2012 R2 Orchestrator installation software, click **Setup** to start the Setup wizard.
- For **Service Management**, under **Automation**, click **Web Service**.



- Complete the product registration information and click **Next**.
- Review and accept the license terms; click **I have read, understood, and agreed to these license terms**, and then click **Next**.
The prerequisite check starts.
- Review the results of the prerequisite check; if all the required items are installed, click **Next**.
- Provide the following information for the database endpoint to use, and then click **Next**.
 - Server: **WAPSQL.WAP.Local**
 - Port no: **1433**
 - Database name: **SMA**
 - Authentication credentials: **WAP\Administrator and Passw0rd!**



- c. Complete the product registration information and click **Next**.
- d. Review and accept the license terms; click **I have read, understood, and agreed to these license terms**, and then click **Next**.
The prerequisite check starts.
- e. Review the results of the prerequisite check; if all the items are installed, click **Next**.
- f. Enter the following information for the database endpoint to use, and then click **Next**.
 - Server: **WAPSQL.WAP.Local**
 - Port no.: **1433**
 - Database name: **SMA**
 - Authentication credentials: **WAP\Administrator and Passw0rd!**
- g. On the **Configure the Web Service** page, enter credentials for WAP\Administrator, and then click **Next**.

Management Portal configuration

This section provides step-by-step instructions to configure Management Portal for administrators by adding different cloud services for tenants.

Add cloud services

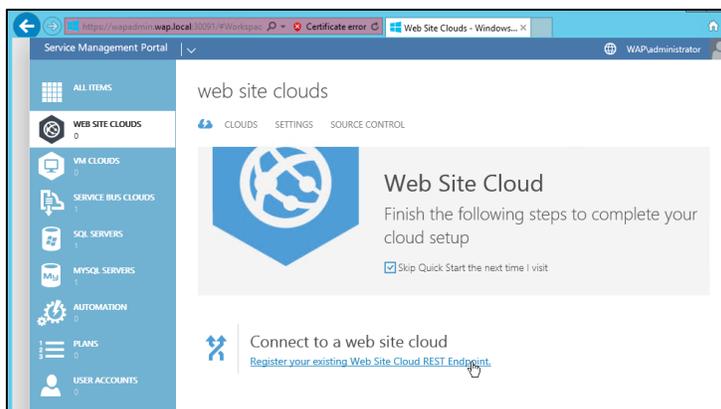
Windows Azure Pack provides a unique portal experience that enables administrators to configure and manage the services and resources that are made available to tenants. Administrators can create resource clouds that harness the raw computing, network, and storage resources in the datacenter and support finished services such as websites, databases, and virtual machines. Combinations of these services are added to the plans along with usage quotas and add-ons, which provide tenant-controlled, incremental quota increases. In Windows Azure Pack Management Portal for Administrators, you can add components you provisioned previously, such as websites, databases, and virtual machines, and use them as finished services.

Configure Management Portal for administrators of Web Sites service

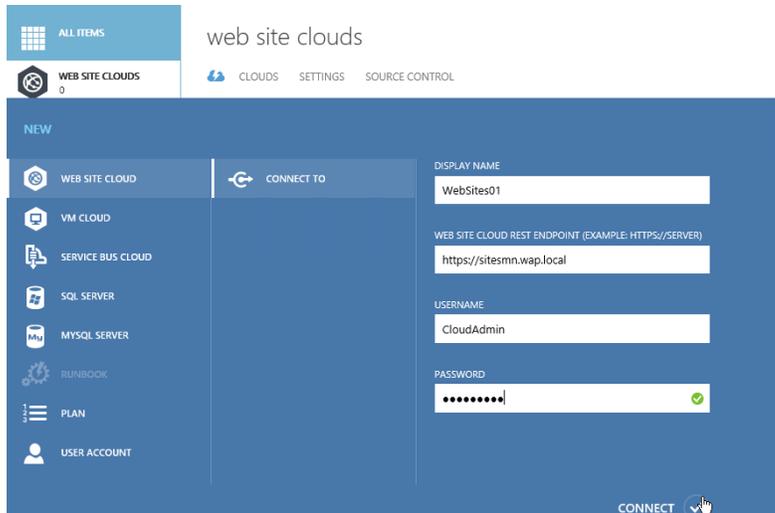
To provision the Web Sites service in Management Portal for administrators, you must add a Web Site Cloud REST Endpoint to enable Front End, Publisher, and Web Worker roles in the portal.

To register Web Site Cloud REST Endpoint in Windows Azure Pack Management Portal for Administrator:

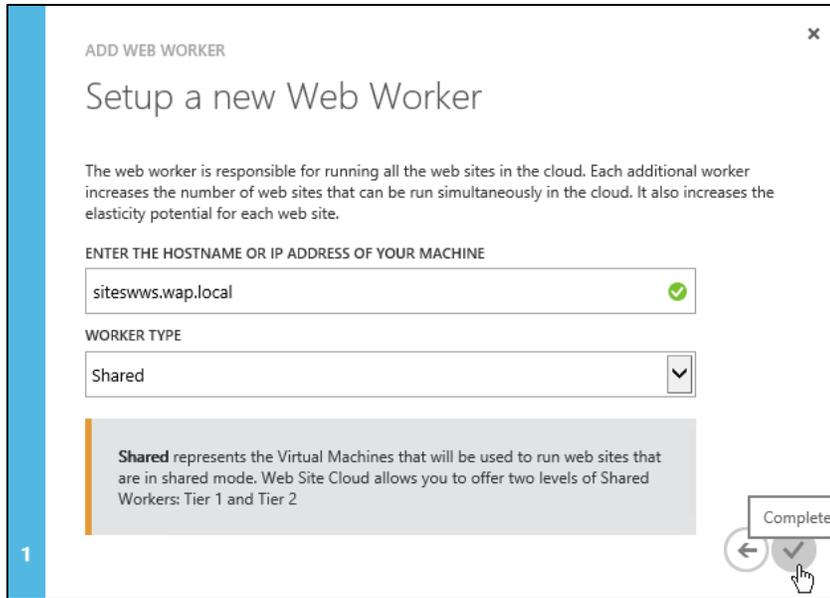
1. Log on to the management portal <https://wapadmin.wap.local:30091> by using the domain credentials **Administrator** and **Passw0rd!**.
2. Click **Web Site Cloud**, and then click **Register your Web Site Cloud REST Endpoint**.



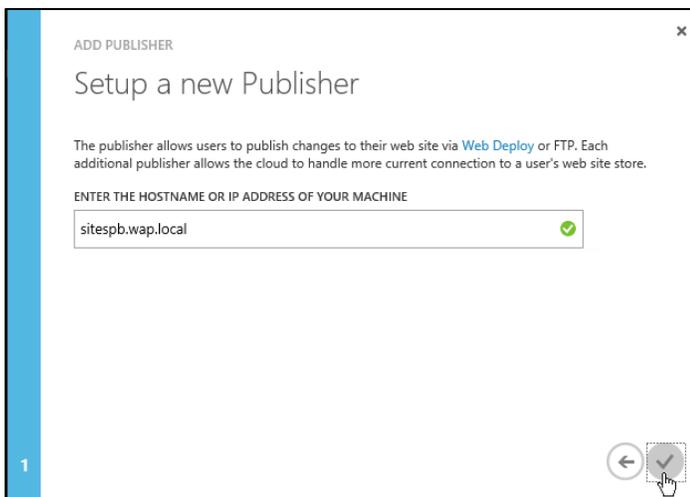
3. Enter the following information for the resource provider:
 - Display name: **Websites01**
 - Web Site Cloud REST Endpoint: **https://sitesmn.wap.local**
 - Username: **CloudAdmin**
 - Password: **Passw0rd!**



4. After the Web Site endpoint is configured, in **Admin Portal**, add **Website roles**:
 - a. Click the **Clouds** tab.
 - b. Add the front-end server:
 - i. Click the **Website01** Website Cloud added previously.
 - ii. On the **Roles** tab, click **Add Role**.
 - iii. Click **Add New Frontend**.
You see the **Setup a new frontend** dialog box.
 - iv. Enter the name of the server front end machine **SitesFE.wap.local** you created previously, and then click the checkmark to continue.
 - c. Add the Web Workers:
 - i. Click the **Website01** Website Cloud you added previously.
 - ii. On the **Roles** tab, click the **Add Role**, and then click **Add New Web Worker**.
You see the **Setup a new Web Worker** dialog box.
 - iii. Enter the name of the server web worker machine **SitesWWS.wap.local** you created previously.
 - iv. Select the **Shared** option, and then click the checkmark to continue.



- v. Repeat the process to create a Reserved (single-tenant) Web Worker role.
 - vi. Click **Add Role**, and then click **Add New Web Worker**. You see the **Setup a new Web Worker** dialog box.
 - vii. Enter the name of the server web worker machine **SitesWWR.wap.local** you created previously.
 - viii. Select **Reserved - Small**, and then click the checkmark to continue.
- d. Add the Publisher:
- i. Click **Add Role**, and then add the **Publisher** role.
 - ii. Enter the server name **SitesPB.wap.local** for the Publisher, and then click the checkmark to continue.



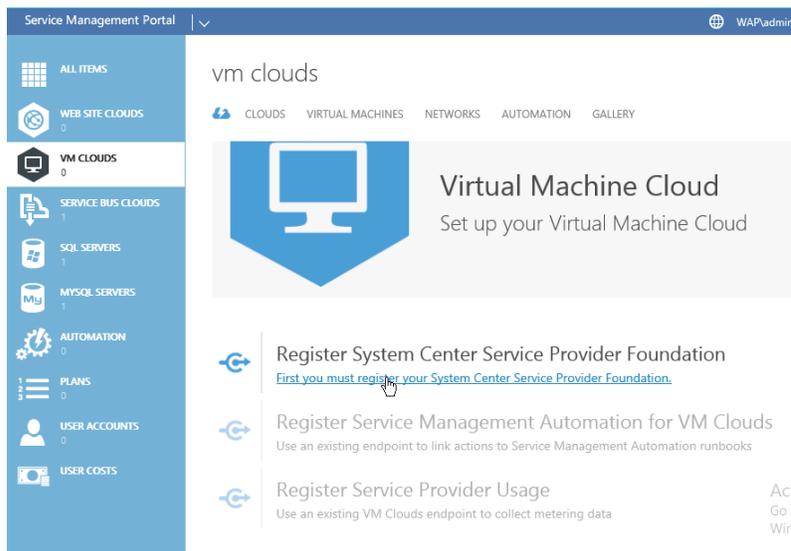
Configure Management Portal for administrators of virtual machine clouds

Before you add virtual machine clouds in Windows Azure Pack, you must register Service Provider Foundation, installed previously in Management Portal for administrators. After you register, you can create plans for tenants to provision virtual machines.

To register Service Provider Foundation in Management Portal for administrator:

1. Log on to the management portal <https://wapadmin.wap.local:30091> with domain credentials:
 - User: **Administrator**
 - Password: **Passw0rd!**
2. In Management Portal for administrators, go to the **VM Clouds** tab and then click **QuickStart**.
3. In Quick Start view, click **Register System Center Service Provider Foundation**, and then enter the URL for the Service Provider Foundation server.

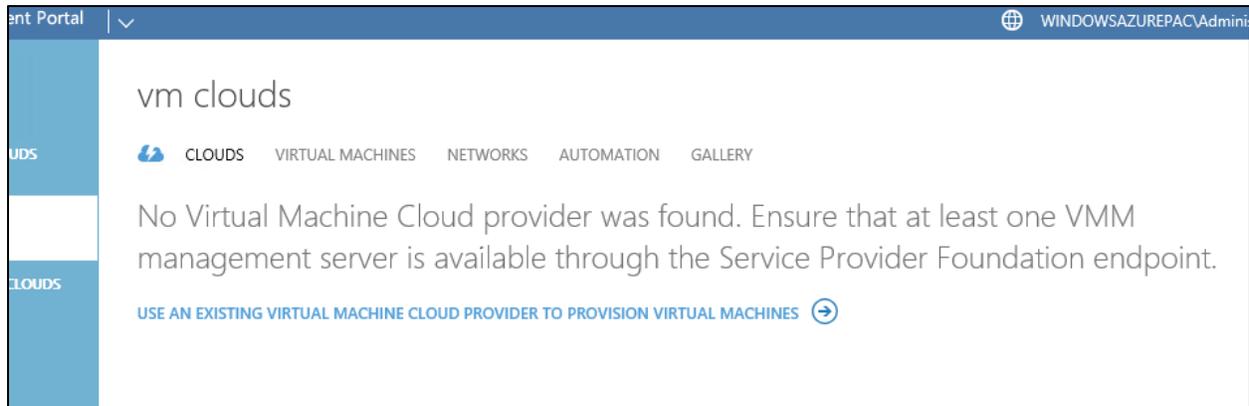
NOTE: For this lab, the endpoint URL for Service Provider Foundation is <https://WAPSPF.WAP.Local:8090>.



4. Enter the user name and password:

- User: **SPFLocal**
- Password: **Passw0rd!**

- Click the checkmark.
- Click on **Clouds**, and select **USE AN EXISTING VIRTUAL MACHINE CLOUD PROVIDER TO PROVISION VIRTUAL MACHINES**



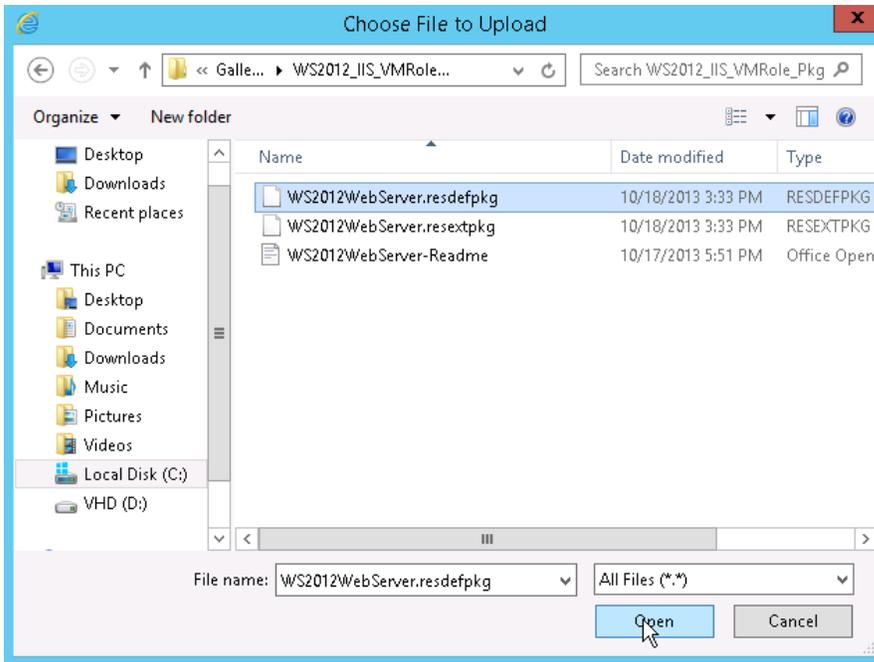
- Enter the following for VMM Server FQDN - **WAPVMM.WAP.LOCAL**, and click **register**.

- Ensure you can see the clouds previously created in the VMM setup section.

Import Gallery resources for virtual machine clouds

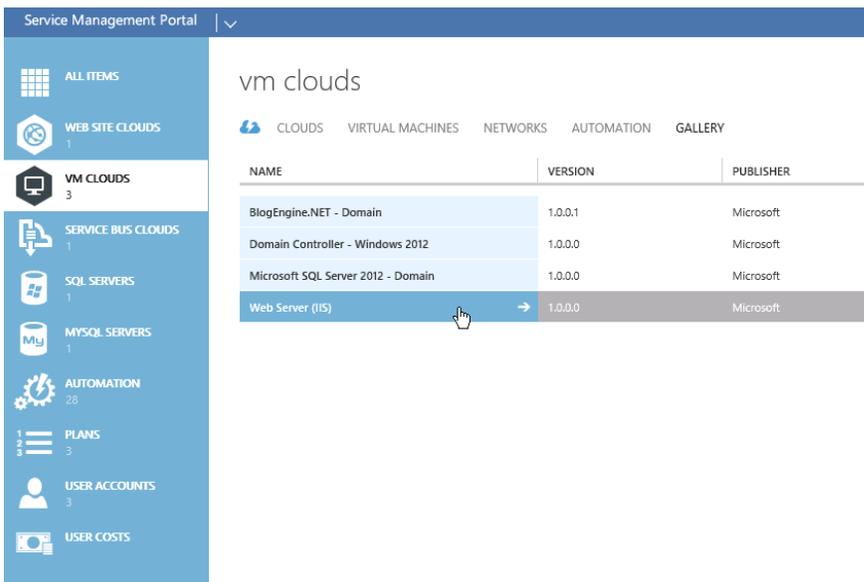
To import Gallery resources in the virtual machine cloud:

- Open Management Portal for administrators and go to the **VM Clouds** work space.
- On the **Gallery** tab, click **Import**.
- At the prompt, enter **\\wap-vmm\c\$\GalleryResources**, and then click **Open**.
- Go to the Gallery resources folder for Internet Information Services (**WS2012_IIS_VMRole_Pkg**), select the **WS2012WebServer.resdefpkg** file, and then click **Open**.



5. Click **Finish**.

You see a new gallery item on the Gallery tab.



6. Repeat the process and select **Domain Controller - Windows Server 2012 (DomainController_WS2012_VMRole_Pkg)**; then, select the **DomainController_WS2012.resdefpkg** file and click **Open**.

Configure Management Portal for administrators of the Service Bus cloud

After you configure the Service Bus for Windows Server farm, you can connect it to a Windows Azure Pack management site to enable administrators and tenants to use Service Bus for Windows Server through the Windows Azure Pack tenant site.

To register Service Bus Cloud in Management Portal for administrators:

1. Log on to the management portal <https://wapadmin.wap.local:30091> with domain credentials:

- User: **Administrator**
- Password: **Passw0rd!**

2. In Management Portal, click **New**, click **Service Bus Clouds**, and then click **Connect To**.

3. Enter a friendly, unique name to identify the Service Bus cloud on the Windows Azure Pack site.

NOTE: For this lab, use **WAP SB Cloud** as the friendly name.

4. Enter the Resource Provider endpoint of your farm (use something similar to <https://SB:9359>):

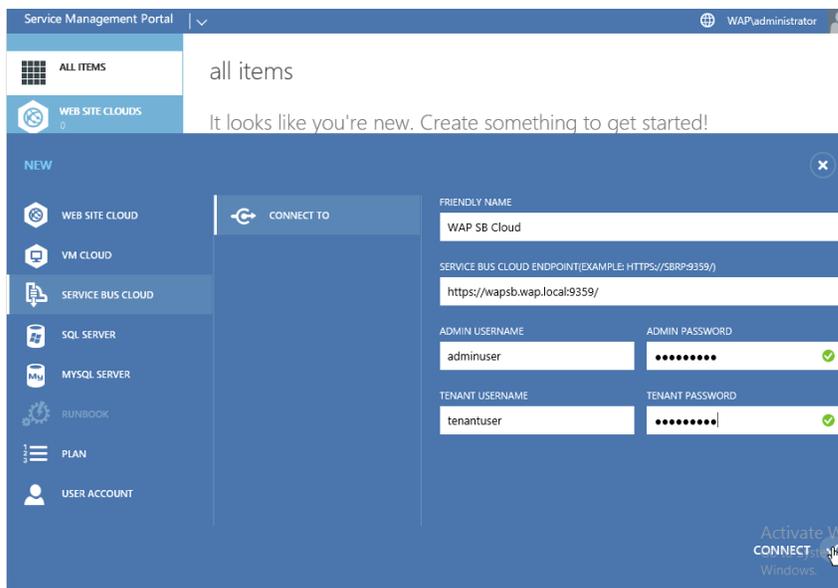
NOTE: For this lab, use <https://WAPSB.Wap.local:9359>.

5. Enter the administrator and tenant user names and passwords you provided when you created the farm from the Service Bus for Windows Server configuration wizard.

NOTE: For this lab, use the following users and credentials:

- Admin portal:
 - o User name: **adminuser**
 - o Password: **Passw0rd!**
- Tenant portal:
 - o User name: **tenantuser**
 - o Password: **Passw0rd!**

6. Click **Finish**.



7. When you are successfully authenticated by the Service Bus for Windows Server farm, you can see the newly created Service Bus for Windows Server cloud in the Windows Azure Pack site.

Configure Management Portal for administrators of SQL Server

Before you complete this section, make sure that SQL Server for Tenants, which you installed and configured previously, is connected to the Windows Azure Pack management site so you can enable it for tenants.

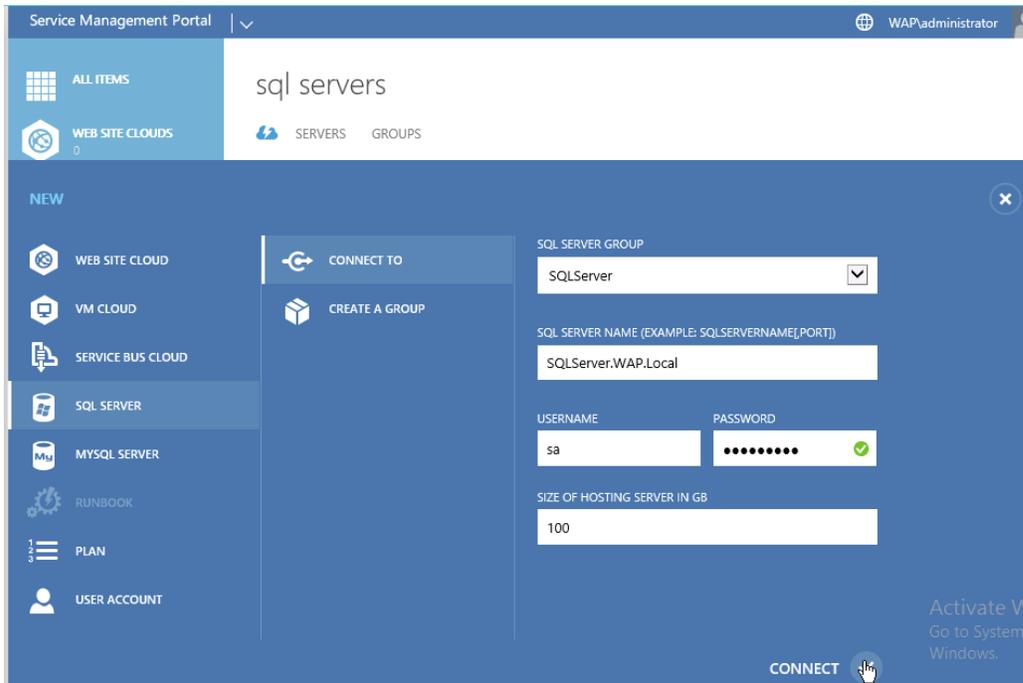
To connect SQL Server in Management Portal for administrators, complete steps in the following sections.

Create a group for SQL Server

1. Log on to the machine named **WAPAdmin** as domain administrator (WAP\Administrator).
2. Open Management Portal for administrators.
3. On the **SQL Servers** dashboard, click **Add**, and then click **Create a Group**.
4. For the type of group, select **Standalone Server**.
5. Name the group **Standard**.
6. Click **Create a Group**.

Connect to the SQL Server instance

1. In Management Portal for administrators, in the left navigation pane, click **SQL Servers**.
2. At the bottom of the window, click **New or Add**, and then click **Connect to**.
3. For **SQL Server Group**, select **SQLServer**.
4. For **SQL Server Name**, enter **SQLServer.WAP.Local**.
5. Enter credentials for the SQL Service Account:
 - User: **sa**
 - Password: **Passw0rd!**
6. Define the size of the hosting servers.
NOTE: For this lab environment, use **100** GB.
7. Click **Connect**.



You see a message at the bottom of the window indicating whether the action succeeded or failed.

8. Click **OK**.

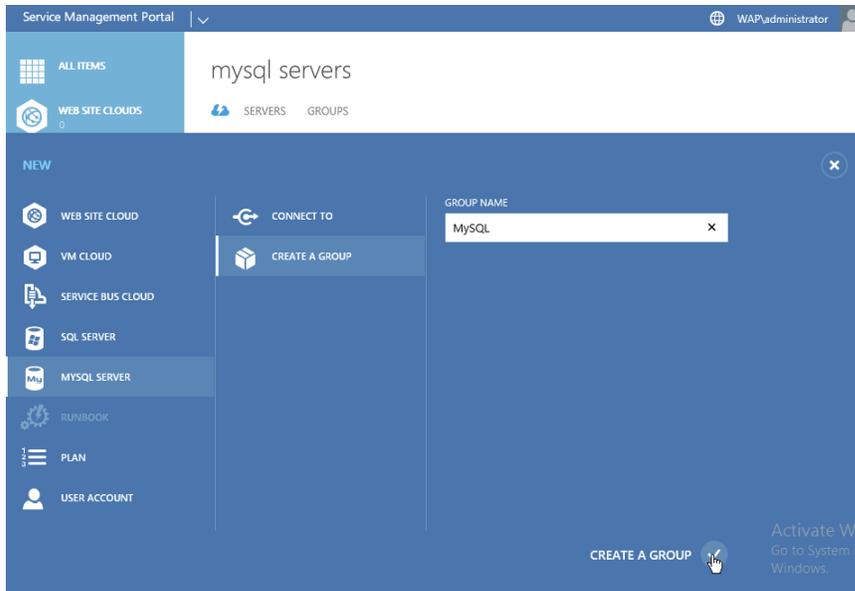
Configure Management Portal for administrators of MySQL Server

Before you complete this section, make sure that MySQL Server for Tenants, which you installed and configured previously, is connected to the Windows Azure Pack management site so you can enable it for tenants.

To connect MySQL Server in Management Portal for administrators, complete steps in the following sections.

Create a group for MySQL Server

1. Log on to the machine named **WAPAdmin** as domain administrator (WAP\Administrator).
2. Open Management Portal for administrators.
3. On the **MySQL Servers** dashboard, click **Add**, and then click **Create a Group**.
4. Name the group **Standard**.
5. Click **Create a Group**.



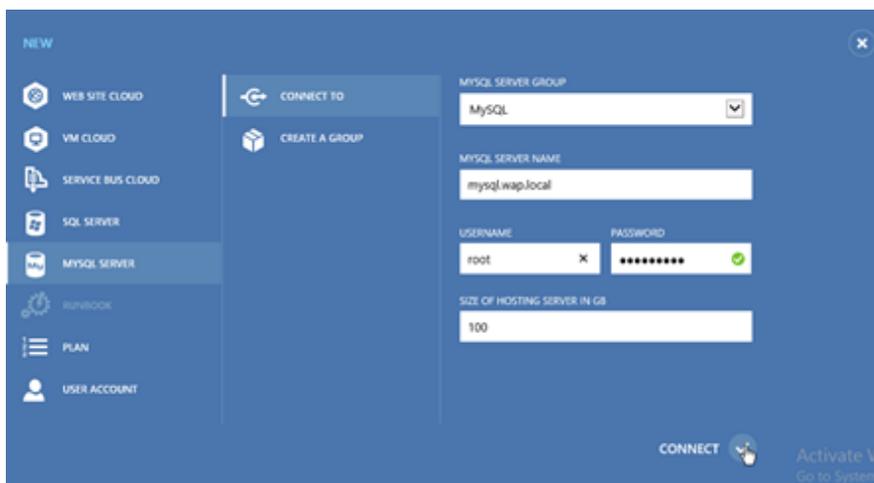
6. After the MySQL Server group is created, you can add MySQL Server servers to it from the **Groups** list.

Connect to the MySQL Server instance

1. In Management Portal for administrators, in the left navigation pane, click **MySQL Servers**.
2. At the bottom of the window, click **New** or **Add**, and then click **Connect to**.
3. For **MySQL Server Name**, select **MySQL.WAP.Local**.
4. Enter credentials for the MySQL Account.
 - User: **root**
 - Password: **Passw0rd!**
5. Define the size of the hosting servers.

NOTE: For this lab environment, use **100 GB**.

6. Click **Connect**.



You see message at the bottom of the window indicating whether the action succeeded or failed.

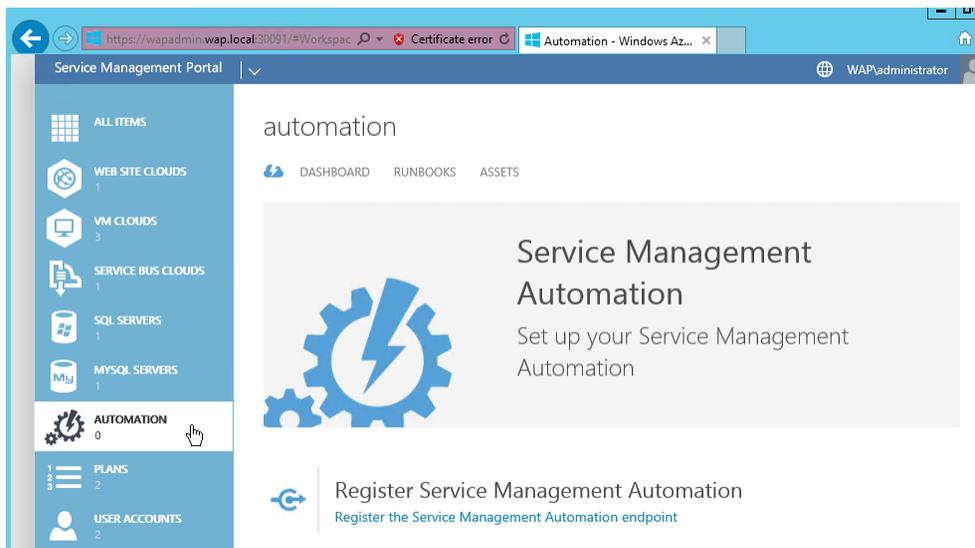
7. Click **OK**.

Configure Management Portal for administrators of Automation services

Before you complete this section, make sure that Service Management Automation web service, which you installed and configured previously, is connected to the Windows Azure Pack management site so you can automate the creation, monitoring, and deployment of resources in your Windows Azure Pack environment.

To register Service Management Automation:

1. Log on to Management Portal for administrators at **https://wapadmin.wap.local:30091** using domain credentials:
 - User: **Administrator**
 - Password: **Passw0rd!**
2. Go to Management Portal, and in the left navigation pane, click **Automation**.
3. Click **Register Service Management Automation**.



4. In the **Enter the URL and credentials** window, enter the service URL **https://wapsma.wap.local:9090/**, and then enter the following credentials:
 - User: **wap\administrator**
 - Password: **Passw0rd!**
5. Click **Complete** to add.

REGISTER SERVICE MANAGEMENT AUTOMATION ×

Enter the URL and credentials

SERVICE URL (EXAMPLE: HTTPS://SERVER:9090/)

USER NAME

PASSWORD



6. After you are successfully authenticated by the Service Management Automation web service, you can see default runbooks added in the Windows Azure Pack site.

OPTIONAL: Use trusted certificates for Windows Azure Pack

This section explains how to remove certificate warnings when you access Management Portal for both tenants and administrators. You can configure a local Certificate Authority to provide certificates to these sites or use a publically generated wildcard.

To use certificates signed by Certificate Authority in the PoC environment, you need to do the following:

- Install a Certificate Authority server
- Configure the Certificate Authority server
- Issue certificates
- Change Web Sites service to use certificates

Install a Certificate Authority server

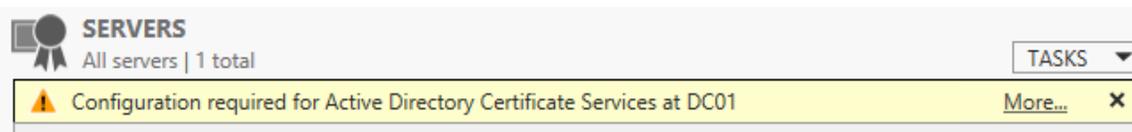
To install a Certificate Authority server:

1. Log on to the server that will be running the CA server (for this lab, use **WAPAD**).
2. Start **Server Manager**, click **Dashboard**, and then click **Add roles and features**.
3. Click **Next** to advance through **Before you begin**, **Installation type** and **Server selection** to **Server Roles**; under **Roles**, select **Active Directory Certificate Services**.
4. Click **Next** to advance to **Features**; and for **Role Services**, select the following: **Certification Services**, **Certificate Enrolment Policy Web Service**, **Certificate Enrolment Web Service**, and **Certification Authority Web Enrollment**.
5. Accept the add-ons, and then click **Next** to advance to **Web Role Services**.
6. Click **Install**.
7. Verify that the installation finishes successfully.

Configure the Certificate Authority server

To configure the newly installed Certificate Authority server:

1. On the Certificate Authority server, start Server Manager, and sign in as a user that is member of Enterprise Admins.
2. Select **AD CS**.
3. In the message, click **More**.



4. For server task details, click **Configure Active Directory Cert.**

5. Select **All Roles** to configure all except the **Certificate Enrollment Web Service**, and then click **Next**.
6. Select **Enterprise CA**, select **Root CA**, select **Create a new private key**, and then click **Next**.
7. For **Cryptography** keep the default settings, and then click **Next**.
8. For **CA Name**, keep the default settings (your settings may be different from those in the following image).

Common name for this CA:

Distinguished name suffix:

Preview of distinguished name:

9. Keep **5 years**, and then click **Next**.
10. For **Certificate Database**, select **Windows Integrated authentication**, and then click **Next**.
11. For **Server Certificate**, select **Choose and assign a certificate for SSL later**, click **Next**, and then click **Configure**.
12. Click **Close** (and chose not to configure services further).

Issue certificates

To issue certificates for Windows Azure Pack services:

1. Log on to the Windows Azure Pack Portal Server (**wapadmin**) as domain administrator.
2. On the Windows Azure Pack Portal Server, open Internet Information Services Manager.
3. For **Connections**, select the Internet Information Services server.
4. In the main window, for Internet Information Services, select **Server certificates**.
5. At the right side of the window, select **Create a domain certificate**.
6. Specify the following:
 - Common name: **wapadmin.wap.local**
 - Organization: **WAP**
 - Unit: **NA**
 - City: **NA**
 - State: **NA**
 - Country: **US**
7. Click **Next**.
8. Select a Certificate Authority and provide the friendly name for the certificate:
 - Certificate Authority: **WAP-WAPAD-CA\WAPAD.wap.local**
 - Friendly name: **wapadmin.wap.local**

Specify Online Certification Authority:

Example: CertificateAuthorityName\ServerName

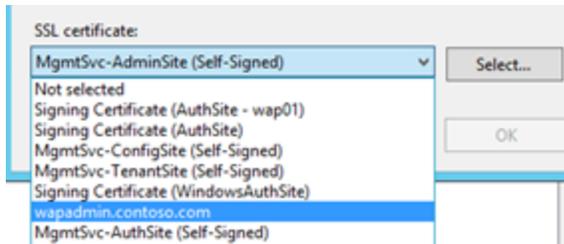
Friendly name:

9. Click **Finish**, and verify that the certificate shows in the list of certificates.

Change Web Sites service to use certificates

To change certificates for Management Portal for administrators:

1. Logon to the **Wapadmin** server as domain administrator, start Internet Information Services Manager, and then expand **IIS Server > Sites**.
2. Right-click **MgmtSvc-AdminSite**, and then select **Edit bindings**.
3. Select **https 30091**, and then click **Edit**.
4. Select the certificate **wapadmin.wap.local** and then click **OK**; in the message about binding change, click **Yes**.



5. From the action menu, restart the **MgmtSvc-AdminSite** Web Site.
6. Right click **MgmtSvc-WindowsAuthSite**, and then select **Edit bindings**.
7. Select **https 30072**, and then click **Edit**.
8. Select the certificate **wapadmin.wap.local** and then click **OK**; in the message about binding change, click **Yes**.
9. From the action menu, restart the **MgmtSvc-WindowsAuthSite** Web Site.

Change the certificate for Windows Azure Pack tenant portals

To change ports and certificates for the tenant portal:

10. Right click **MgmtSvc-TenantSite**, and then select **Edit bindings**.
11. Select **https 30081**, and then click **Edit**.
12. Select the certificate **wapadmin.wap.local** and then click **OK**; in the message about binding change, click **Yes**.
13. From the action menu, restart the **MgmtSvc-TenantSite** Web Site.
14. Right-click **MgmtSvc-AuthSite**, and then select **Edit bindings**.
15. Select **https 30071**, and then click **Edit**.
16. Select the certificate **wapadmin.wap.local** and then click **OK**; in the message about binding change, click **Yes**.
17. From the action menu, restart the **MgmtSvc-AuthSite** Web Site.

Management Portal walk-through

This section explains some important features enabled by Windows Azure Pack for administrators and tenants. The walk-through includes a tour of Management Portal for administrators and tenants.

Management Portal for administrators

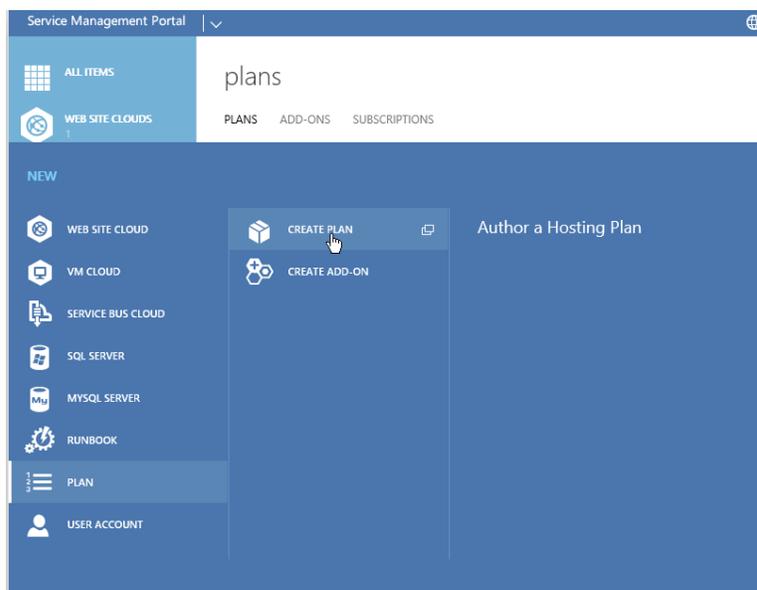
Manage plans and add-ons

By using Windows Azure Pack, you can define plans for your tenants to subscribe to that are based on whether they qualify for billing, capacity, usage, and other considerations.

Author a plan

To author a plan, you must specify the services to include with the plan and add-ons for tenants to optionally add to their subscription.

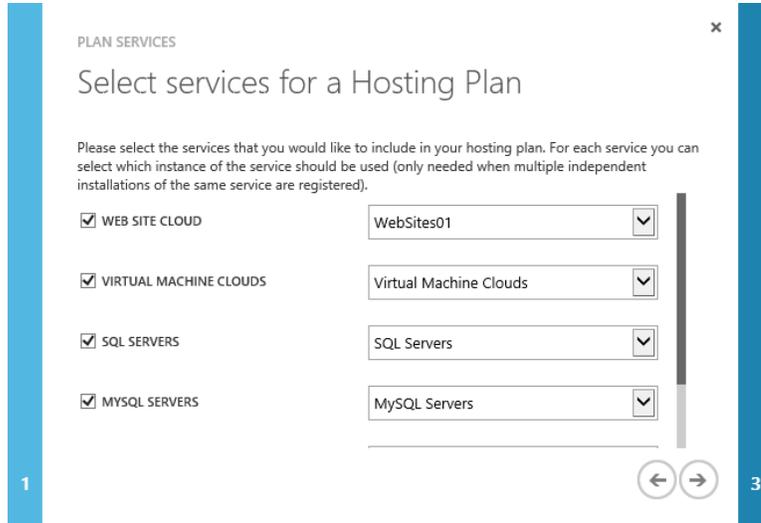
1. In the management portal, click **Plans**, and then click **New**.
2. Click **Create Plan**.



3. In the **Authoring a Hosting Plan** wizard, do the following:
 - a. Enter a friendly name for the plan.
For this lab, use **Plan 1**.
 - b. Select one or more of the following services to include in the hosting plan, provided that they are already provisioned. For each service, specify the available resource for that service.
 - Web Sites clouds
 - Virtual Machines clouds

- Service Bus clouds
- SQL Server servers
- MySQL Server servers

NOTE: For Plan 1, we have selected all the services.



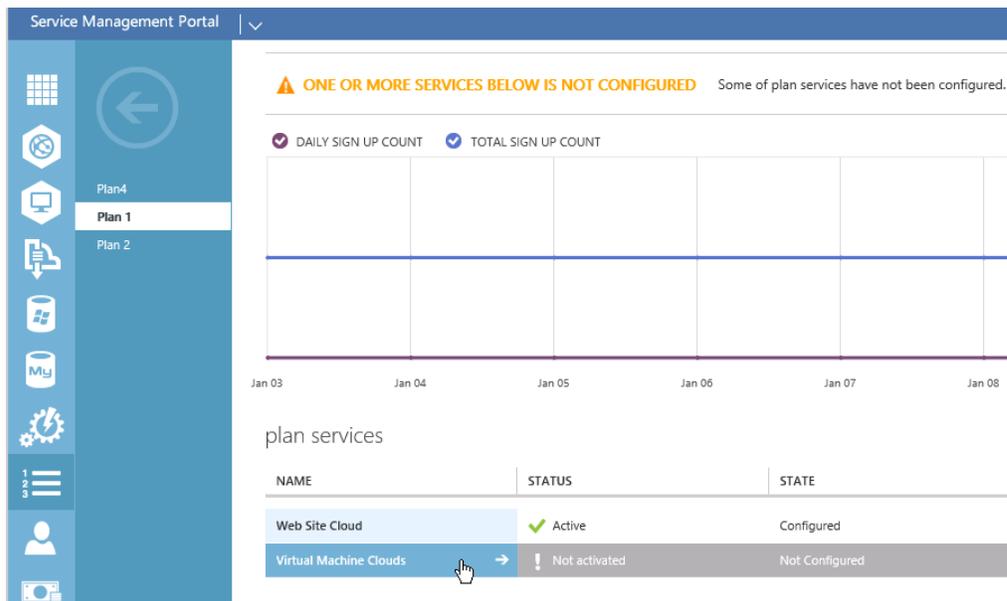
4. Select one or more of the available add-ons to include in the plan, and for each add-on, specify the available resource for that service.
After you create a plan, you can modify plan details such as adding or removing services.

Configure properties for plan

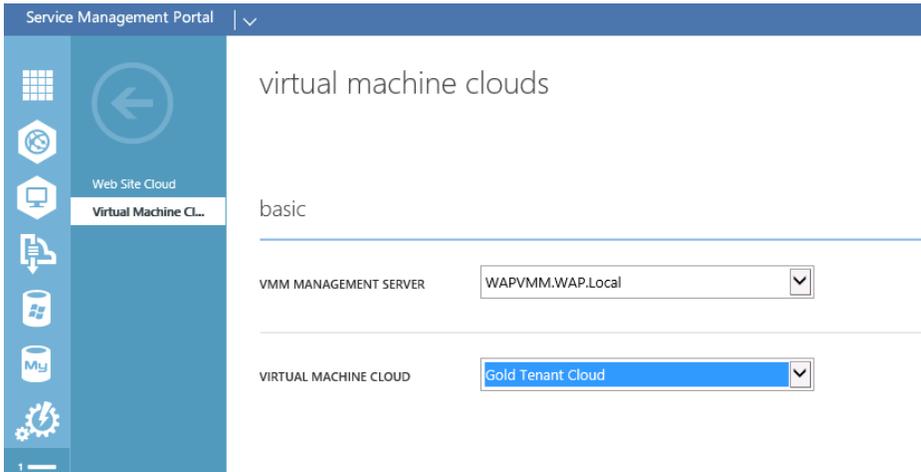
1. In Management Portal, click **Plans**.
2. Click the plan you want to modify. The **Dashboard** of the plan appears.
3. In the dashboard for the plan, for **Plan services**, select the services you want.

NOTE: For this lab, we configure properties for Virtual Machine Clouds.

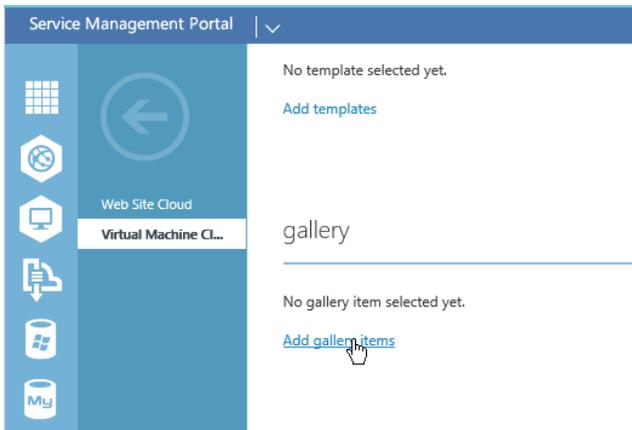
4. Click **Virtual Machine Clouds**.



- For **VMM Management Server**, select **WAPVMM.Wap.Local**.
- For **Virtual Machine Cloud**, selected **Gold Tenant Cloud**.



- For **Usage Limit**, keep the default values.
- Scroll down to **Gallery**, and then click **Add gallery items**.



- Select **Select All**, and then click **Finish**.

SELECT GALLERY ITEMS TO ADD TO THIS PLAN

Select gallery items to add to this plan

SELECT ALL

NAME	VERSION	PUBLISHER
<input checked="" type="checkbox"/> Web Server (IIS)	1.0.0.0	Microsoft
<input checked="" type="checkbox"/> Domain Controller - Windows Server 2012	1.0.0.0	Microsoft

- On the command bar, click **Save**.

Configure a plan

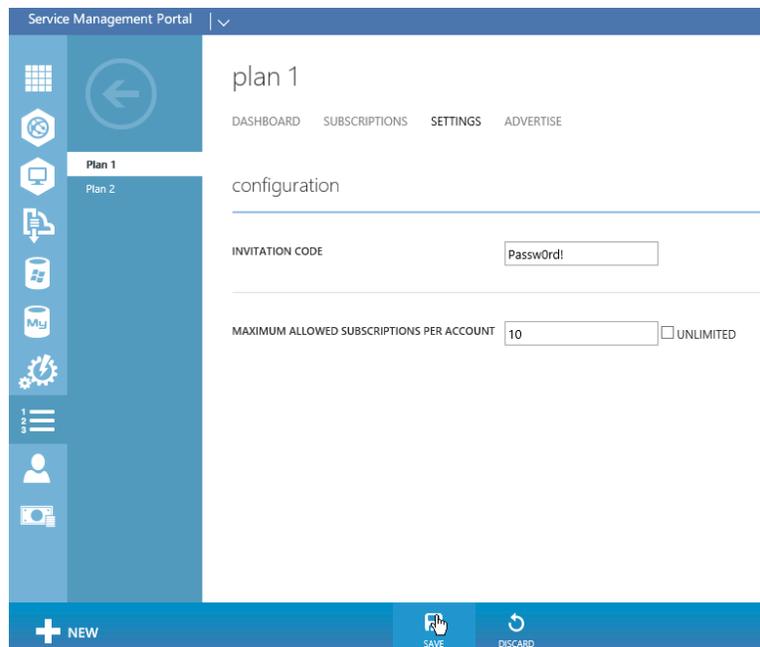
Before a plan can be made public, it must be configured. A configured plan has a specified invitation code so that tenants who know the code can subscribe to the plan. Configuring a plan also requires that you specify the maximum number of allowable subscriptions.

To configure a plan:

1. In the management portal, click **Plans**.
2. Click the plan you want to configure.
3. In the dashboard for the plan, click the **Settings** tab.
4. Enter an invitation code for tenants.

NOTE: The invitation code adds security that is required when tenants sign up for the plan. You must provide prospective tenants with the invitation code.

5. For **Maximum allowed subscriptions per account**, enter a number or select **Unlimited**. This number sets how many times tenants can add this plan to their subscriptions.



The screenshot shows the 'Service Management Portal' interface. The main content area is titled 'plan 1' and has four tabs: 'DASHBOARD', 'SUBSCRIPTIONS', 'SETTINGS', and 'ADVERTISE'. The 'SETTINGS' tab is active, and the sub-section is 'configuration'. There are two input fields: 'INVITATION CODE' with the text 'Passw0rd!' and 'MAXIMUM ALLOWED SUBSCRIPTIONS PER ACCOUNT' with the value '10'. To the right of the second field is an unchecked checkbox labeled 'UNLIMITED'. A left-hand navigation pane contains various icons, and a bottom command bar has 'NEW', 'SAVE', and 'DISCARD' buttons.

6. On the command bar, click **Save**.

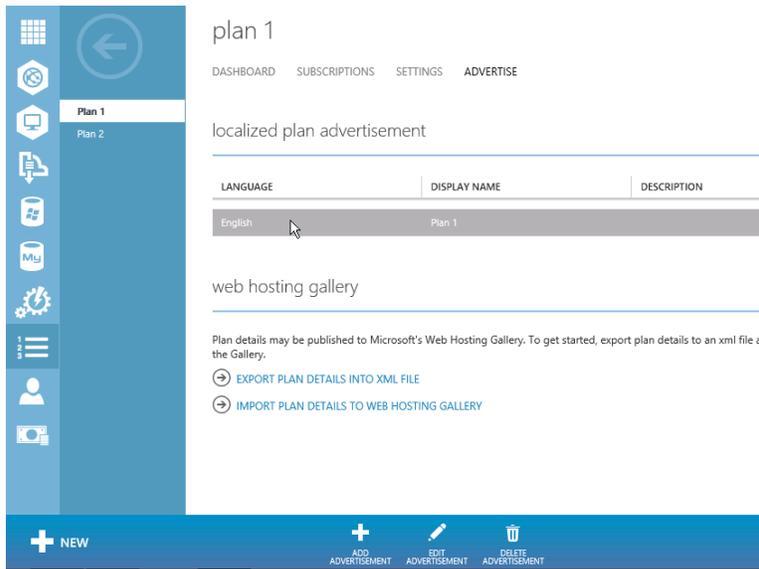
Advertise a plan

You can add, edit, and delete advertisements that are shown on the tenant portal when a tenant views the available plans. You also can export the plan details to an .xml file or publish them to the Microsoft Web Hosting Gallery.

To advertise a plan:

1. In the Management portal, click **Plans**.
2. Click the plan you want to advertise.
3. In the dashboard for the plan, click the **Advertise** tab.
4. On the command bar, click **Add Advertisement**, and enter text that describes your plan. For example, provide the number of virtual machines, resource capabilities, marketing promotions, and so on.

5. Click **Save**.



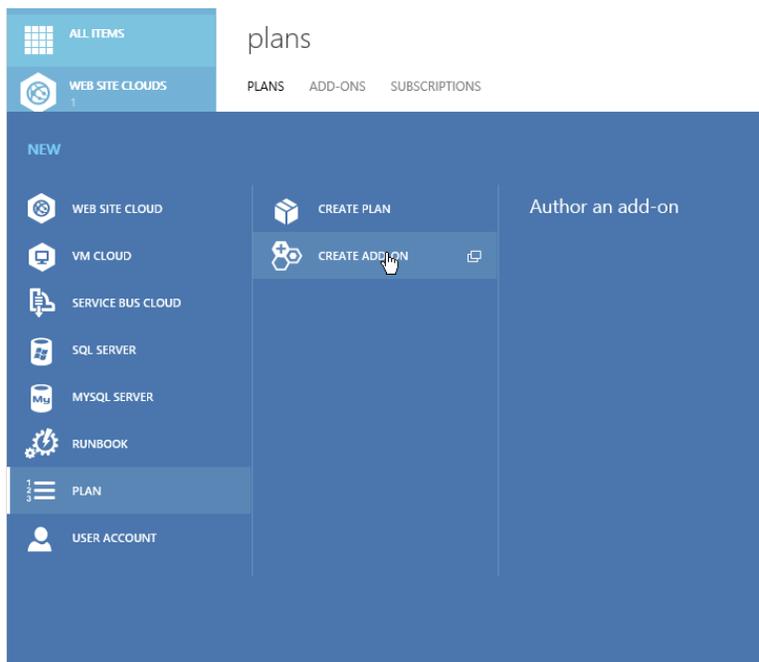
You also can edit and delete advertisements, and you can export or import functionality for plan details.

Author an add-on

Authoring an add-on is similar to authoring a plan, except that you choose a service or services that you want to provide as optional to your subscribers.

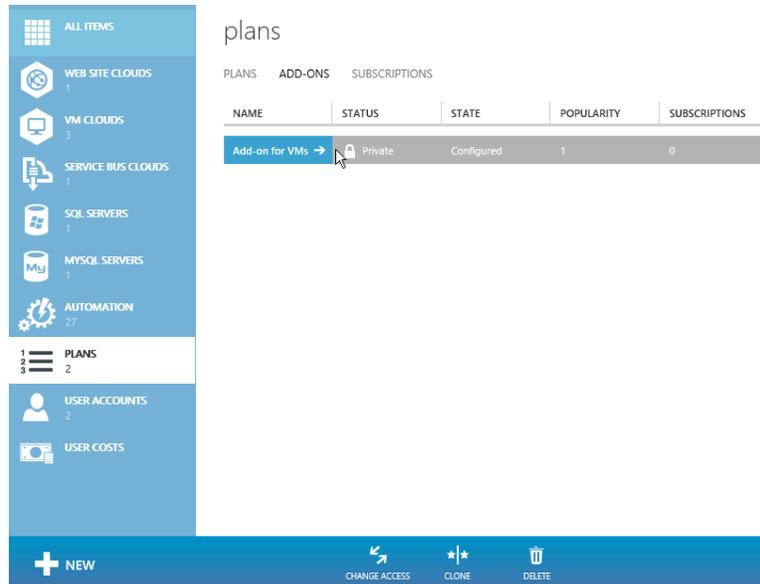
To author an add-on:

1. In the **All Items** navigation pane, click **Plans**, and then click **New**.
2. Click **Create Add-On**.



3. In the **Authoring a Hosting Add-On** wizard, do the following:
 - a. Specify a friendly name for the add-on.
 - b. Select one or more of the available services to include in the add-on.

The add-on that you create is listed on the **Add-ons** tab.

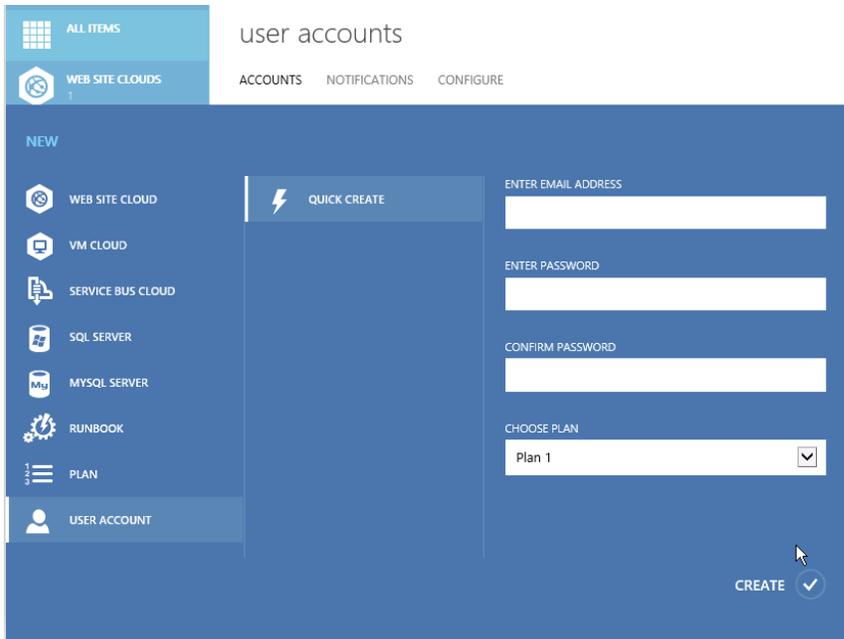


Manage user accounts

Service providers can create user accounts for tenants, and tenants can then become plan subscribers. Additionally, service providers can define password notifications for users and configure security.

Create an account for a tenant

1. In Management Portal, click **User Accounts**.
2. Enter an email address and a password. For this lab, use the following:
 - Email address: **user1@wap.local**
 - Password: **Passw0rd!**



3. Choose a plan for the tenant, and then click **Create**.
Doing so creates a subscription to the plan in addition to creating the user account.

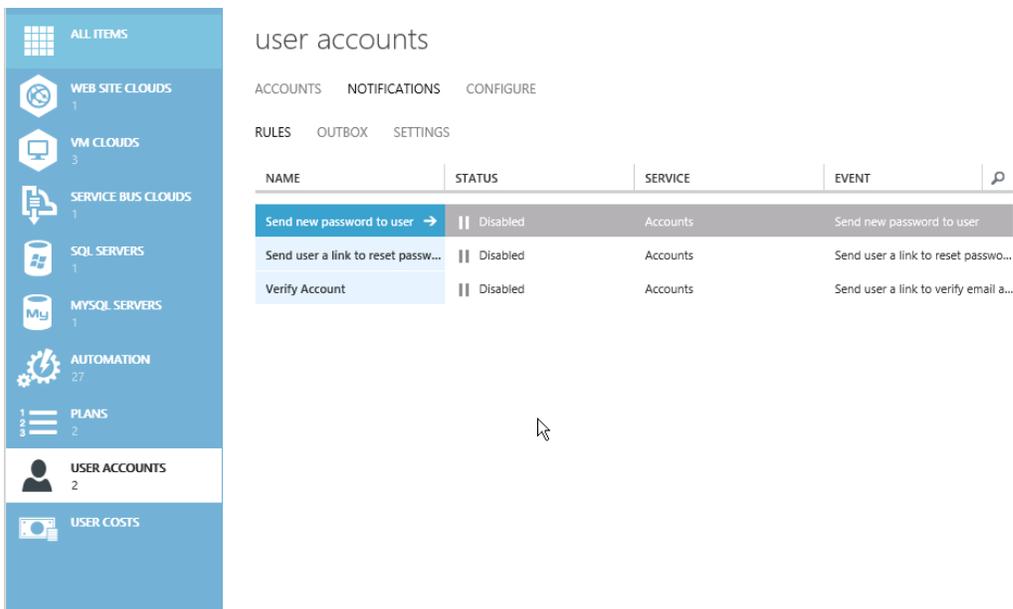
Create a notification

1. In Management Portal, click **User Accounts**, and then click **Notifications**.
2. Select a rule and specify settings to send the notification.

NOTE: In this lab, we enable account verification by sending the verification link in email.

You also can add a new rule and set the event to associate with the rule.

NOTE: Before configuring the notification for the user account, first configure the SMTP server (on the **Notifications** tab, click **Settings**).



Configure user accounts

1. In Management Portal, click **User Accounts**, and then click **Configure**.

You can configure the following values:

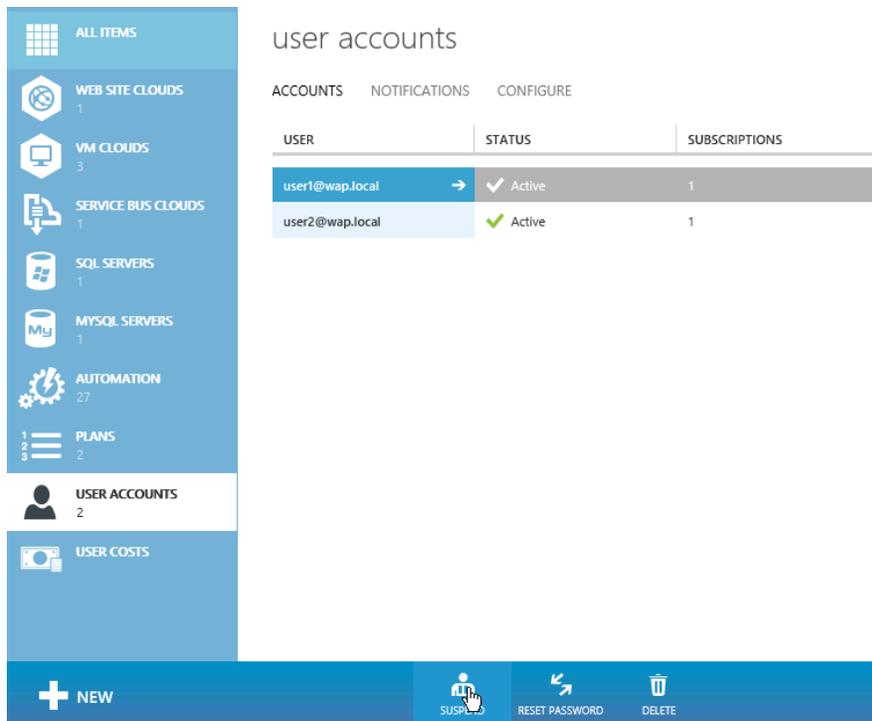
- Set password strength
- Enable or disable tenant subscription management
- Validate a tenant's account (email address)
- Enable or disable support for forgotten passwords. (Note that this option does not appear if the hosting service provider chooses not to implementing it in Windows Azure Pack.)

The screenshot shows the 'configuration' page in the Management Portal. On the left is a navigation pane with categories: ALL ITEMS, WEB SITE CLOUDS (1), VM CLOUDS (3), SERVICE BUS CLOUDS (1), SQL SERVERS (1), MYSQL SERVERS (1), AUTOMATION (27), PLANS (2), USER ACCOUNTS (2), and USER COSTS. The main content area is titled 'configuration' and contains four settings:

- REQUIRED PASSWORD STRENGTH:** Buttons for WEAK, FAIR (selected), and STRONG. Below the buttons, text states: 'Password must be at least 8 and at most 128 characters in length and contain characters from at least two of the following categories: - English uppercase characters (A through Z) - English lowercase characters (a through z) - Base 10 digits (0 through 9) - Non-alphabetic characters (for example: !, \$, #, %)'
- TENANT SELF-SERVICE SUBSCRIPTION MANAGEMENT:** Buttons for DISABLE and ENABLE (selected).
- ACCOUNT VALIDATION REQUIRED:** Buttons for YES and NO (selected).
- FORGOT PASSWORD ENABLED:** Buttons for YES and NO (selected).

Suspend a user account

1. In Management Portal, click **User Accounts**, and then click **Accounts**.
2. Select the user account you want to suspend, click **Suspend**, and then click **OK**.



Management Portal for tenants

Through Management Portal for tenants, tenant users get options to create web-based applications, virtual machines, SQL Server and MySQL Server databases, Service Bus, and virtual networks. These options are available to tenant users according to their assigned subscriptions and plans.

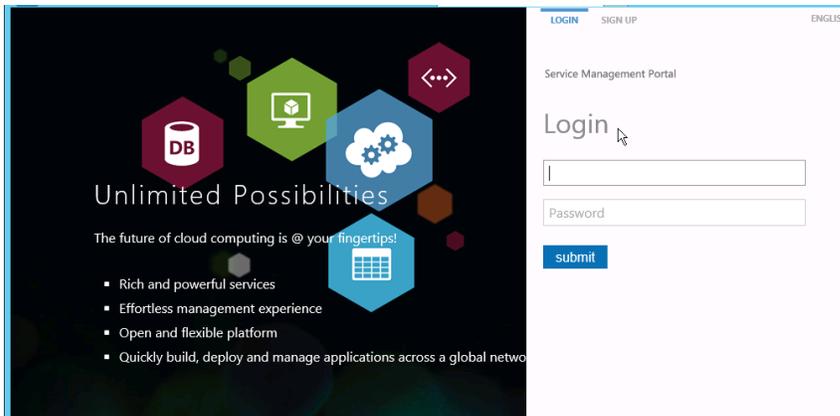
NOTE: For a simple overview of Management Portal for tenants, we have created user1@wap.local with Plan 1 assigned (all services are mapped in this plan).

Deploy a new web application

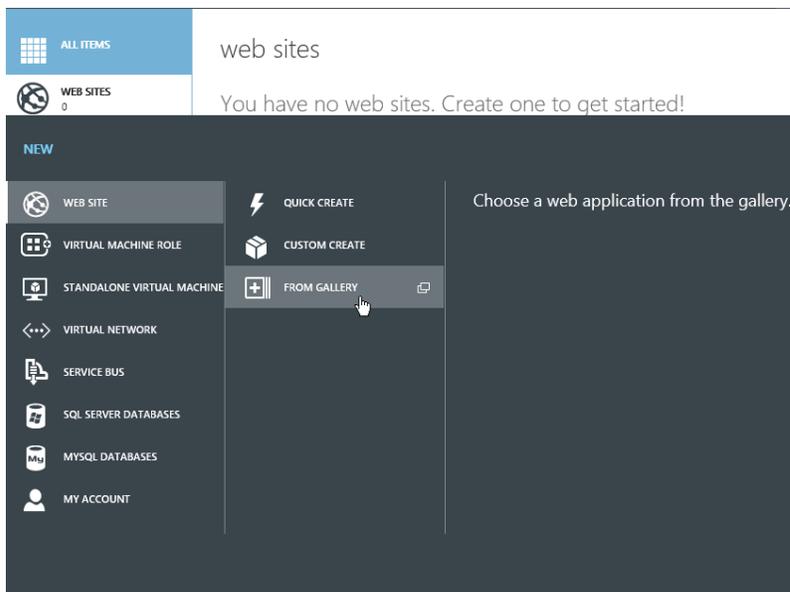
The Web Sites service simplifies the deployment and administration of multitenant, high-density website hosting services. Web App Gallery gives tenants access to popular web applications, while Windows Azure Pack delivers supporting SQL Server and MySQL Server database capabilities. Web Sites service also supports many application frameworks, including ASP.NET, classic ASP, PHP, and Node.js with full GitHub, BitBucket, DropBox, and Team Foundation Server integration for source code control.

To create a web application:

1. Open an Internet browser, and then open **https://waptenant.wap.local:30081** for a tenant management portal.
2. Sign in to the portal with the following credentials:
 - User: **user1@wap.local**
 - Password: **Passw0rd!**

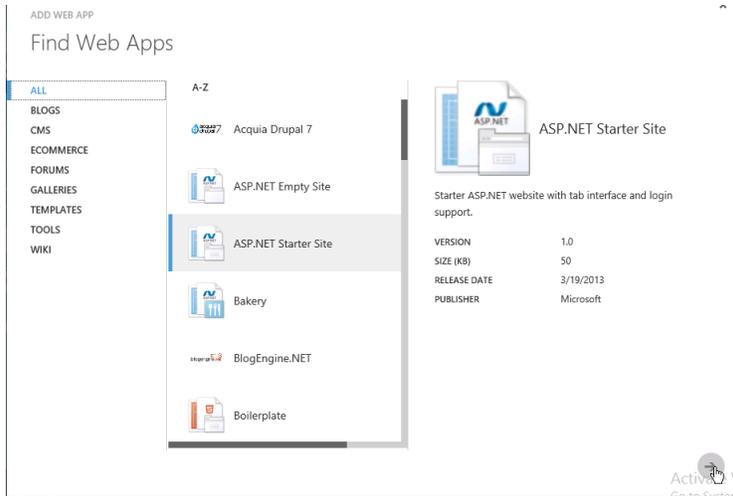


3. Click **Web Sites**, and then click **New**.
4. Click **From Gallery**.

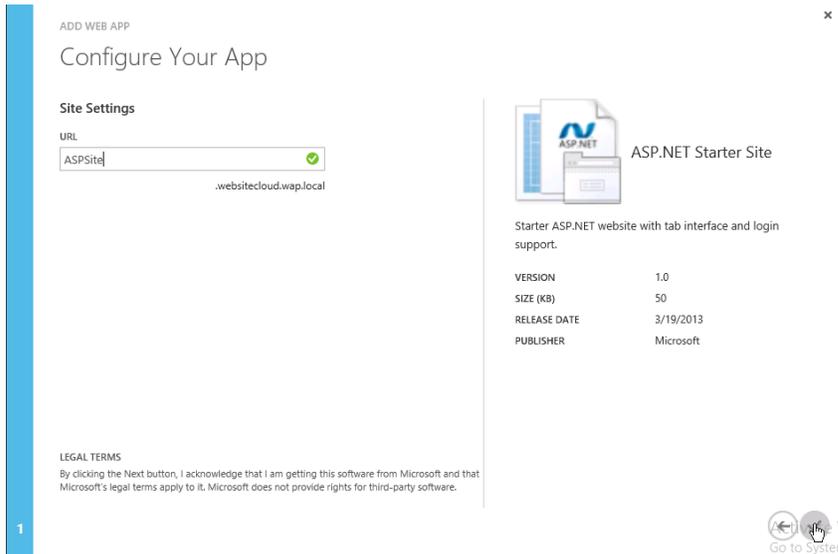


5. Select the web app you want to deploy for tenant users, and then click **Next**.

NOTE: For the lab environment, use **ASP.NET Starter Site**.

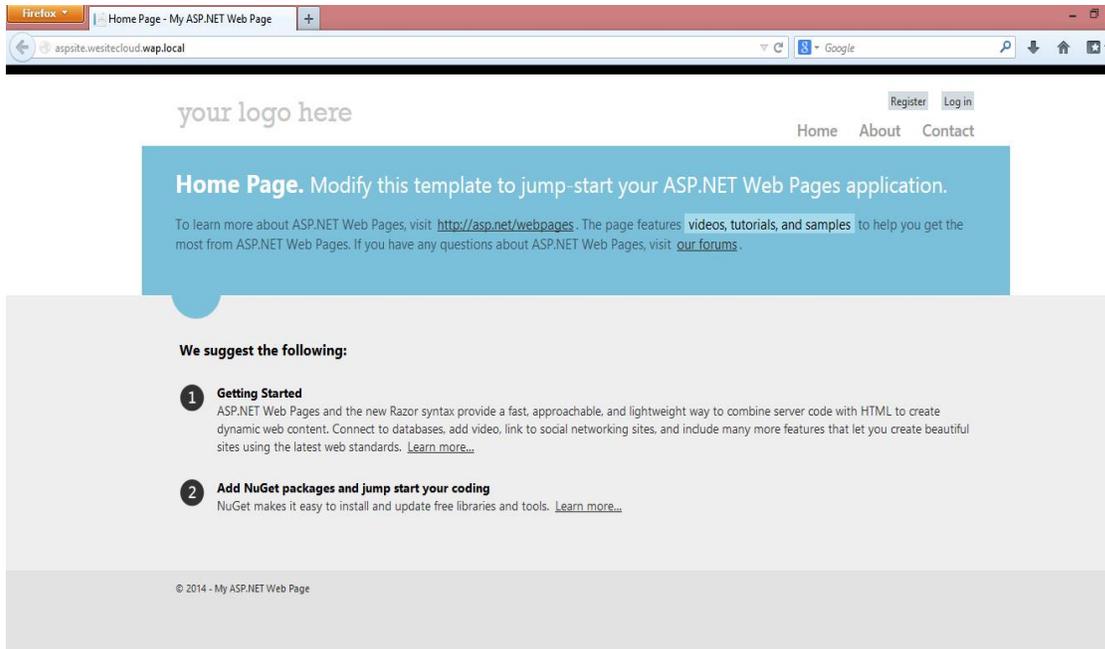


- For **Site Settings**, in the **URL** box, enter the web application URL, and then click **Next**. (For the lab, use **ASPSite**.)



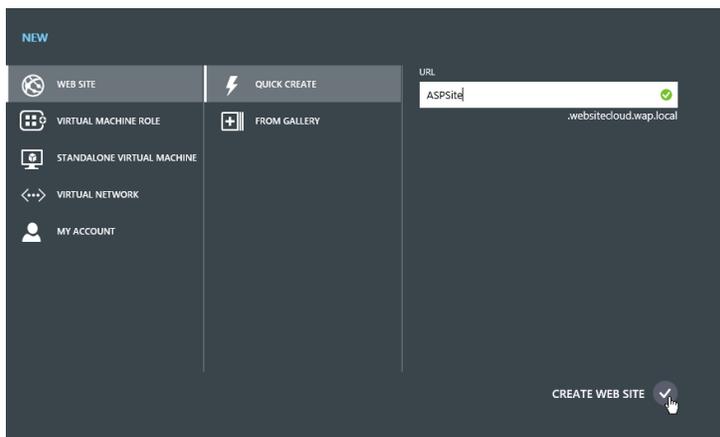
After the web application is successfully created, you see it on the **Web Sites** tab.

- To browse the web application, click the site URL.
The web application opens at the default landing page; later, you can customize the app according to your requirements.



To create a website quickly:

1. In the tenant console, click **Web Site**, and then click **New**.
2. Click **Quick Create**.
3. For URL, enter **ASPSite**, and then click **Create Web Site**.



4. You can browse the new site by using the site URL.

Deploy a virtual machine role

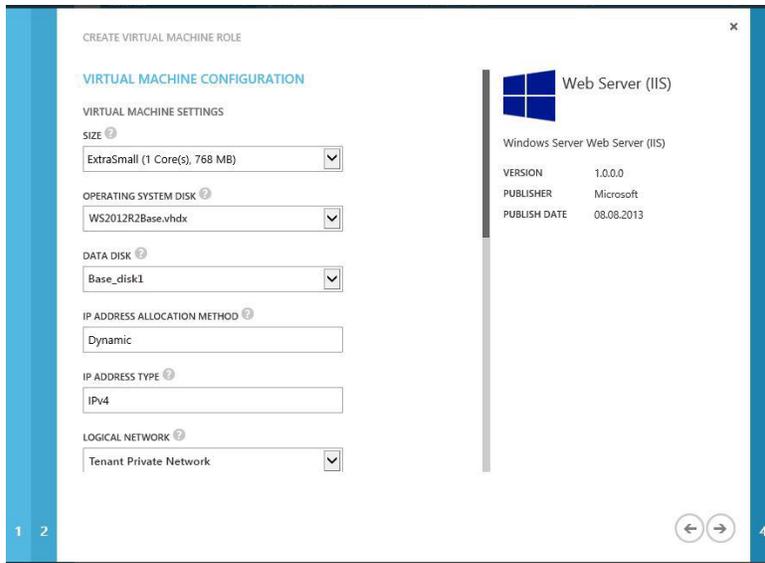
Virtual machine roles represent a scalable tier of Virtual Machines service that tenants can provision by using a single process. Examples of workloads that can be created by virtual machine roles might include a single virtual machine, an Active Directory Domain Controller, a SQL Server cluster, or an Internet Information Services web farm. The author of a virtual machine role model can define configuration information that the user interface must collect from the tenant. This information is then used to provision a new virtual machine or set of machines, configure it with required services, and then deploy specific applications that are part of the service offering being provided.

To deploy a new virtual machine role:

1. Open Management Portal for tenants.
2. Click **New**, and then click **Virtual Machine Role**.
3. Click **From Gallery**.
4. In the **Gallery** list, select **Web Server** (Internet Information Services), and then click **Next**.



5. Enter a name for the virtual machine role template.
6. Select the plan, and then click **Next**.
7. Enter virtual machine settings as follows:
 - Size: **ExtraSmall**
 - Operating system disk: **WS2012R2Base.vhdx**
 - Data disk: **Base_disk1**
 - IP address allocation: **Dynamic**
 - Logical network: **Tenant Private Network**
 - New user name: **Enter the username**
 - New password: **Assign a password**
 - Virtual machine name pattern: **Default**
 - Workgroup: **Workgroup**
 - Time zone: **Choose the time zone you want to use**
 - Initial instance count: **1**
 - Minimum instance count: **1**
 - Maximum instance count: **10**



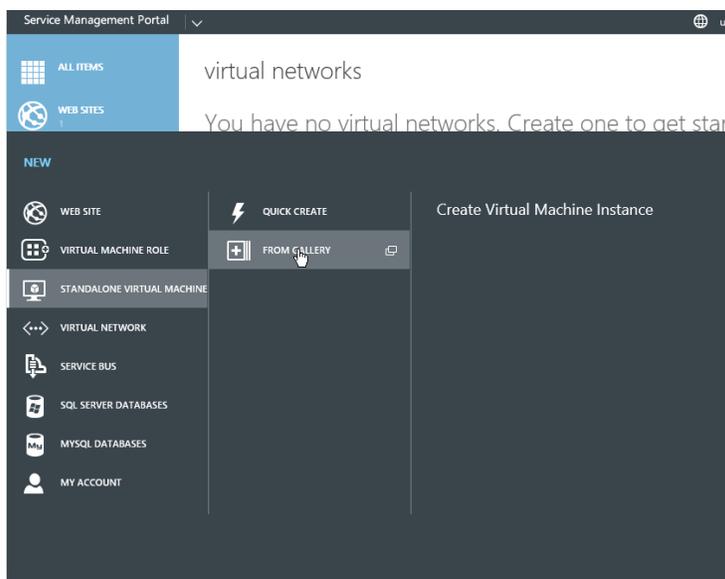
8. Click **Next**, and then click **Finish** to start the deployment.
In the portal, you see that the virtual machine role is being provisioned.

Deploy a new standalone virtual machine

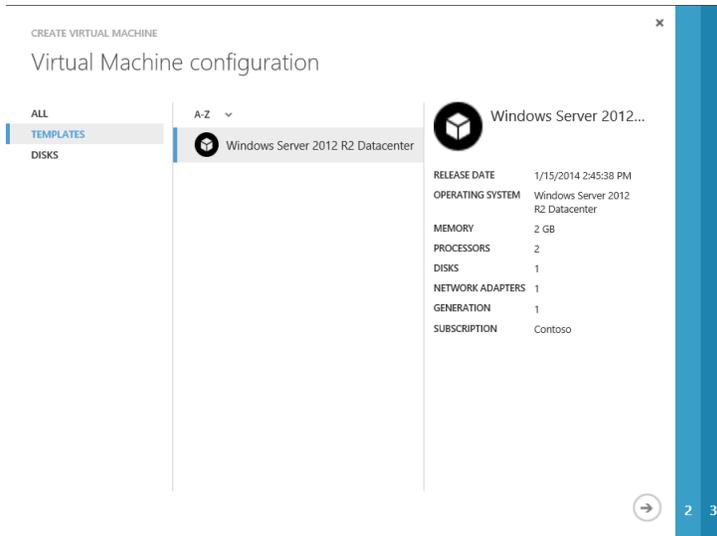
By using standalone virtual machines, tenants can self-provision Windows Server and Linux virtual machines from a gallery of predefined images (based on System Center Virtual Machine Manager virtual machine templates).

To create a standalone virtual machine:

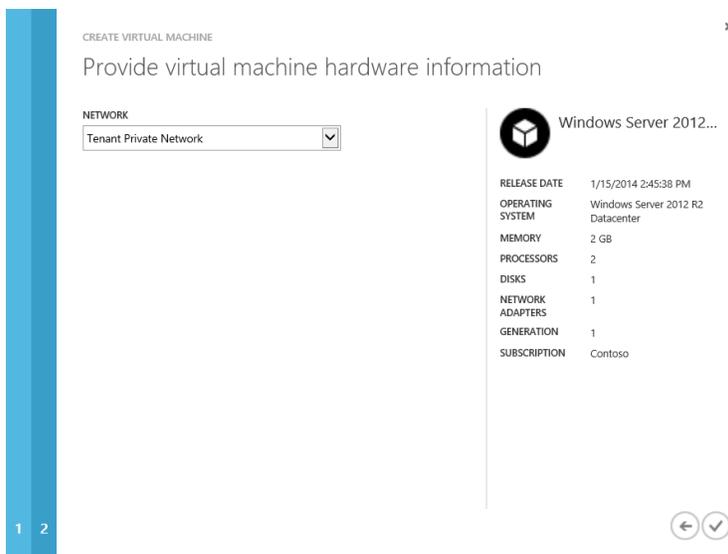
1. Open Management Portal for tenants.
2. Click **Virtual Machine**, and then click **New**.
3. Click **Standalone Virtual Machine**, and then click **From Gallery**.



4. Select **Templates** to filter the options, and then select **Windows Server 2012 R2 Datacenter** (this option uses the virtual machine template you created earlier; you also can deploy from a VHD).



5. Click **Next**.
6. Define the virtual machine name and password (you can leave the product key blank), and then click **Next**.
7. For **Network**, select **Tenant Private Network**.



8. Click the checkmark to create the virtual machine.
9. After the virtual machine is created successfully, click the machine to view management options. To access the virtual machine, select the virtual machine, and then and click **Dashboard**.
10. At the bottom of the window, click **Connect**.



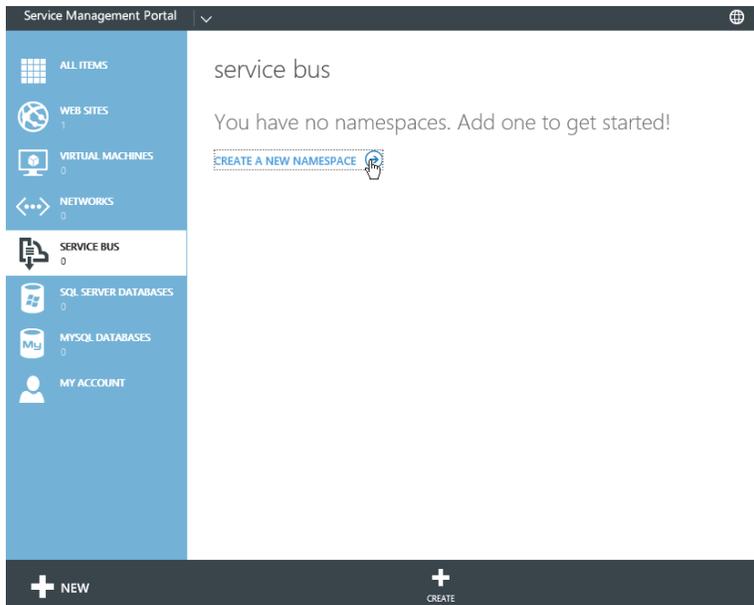
11. At the prompt, click **Open** to connect the virtual machine through RDP. You also can save the RDP file if you want to frequently access the virtual machine.

Deploy the Service Bus

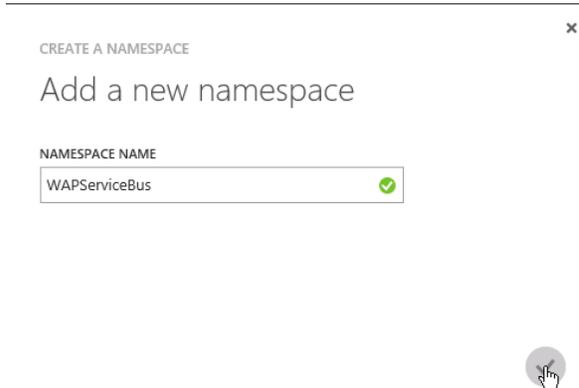
The Service Bus service in Windows Azure Pack enables applications to pass messages to each other when a synchronous handoff is not possible, but the sender needs assurance that the message will reach the recipient eventually.

To create a new service bus:

1. Open Management Portal for tenants.
2. Click **Service Bus**, and then, click **Create a New Namespace**.



3. Enter the name **WAPServiceBus** for the new namespace, and then click the checkmark.

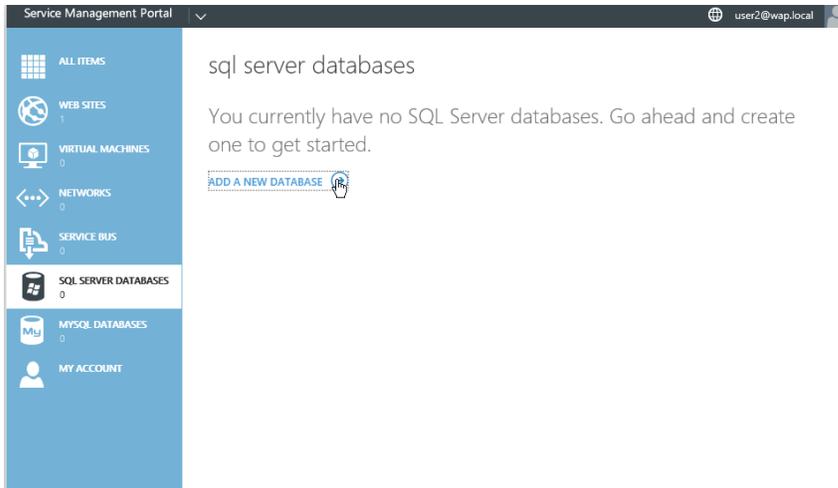


Deploy a SQL Server database

Windows Azure Pack allows tenants to deploy their own SQL Server databases to run within their environments.

To create an SQL Server database:

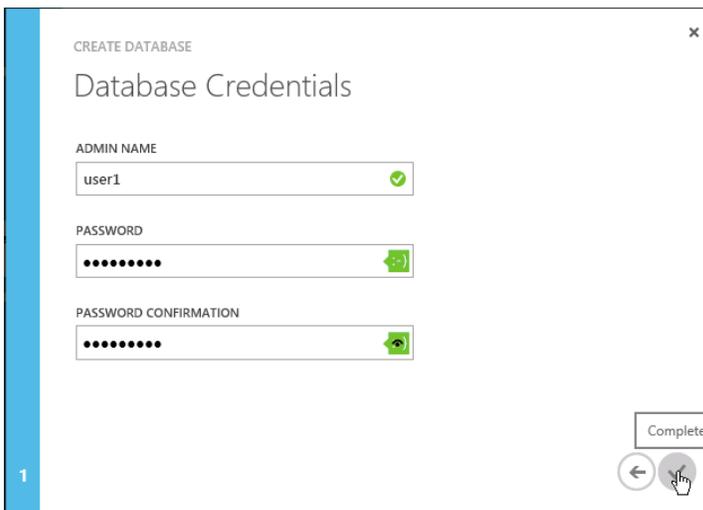
1. Open Management Portal for tenants.
2. Click **SQL Server Database**, and then click **Add a New Database**.



3. Enter a name for the new database.
4. For **Edition**, select **SQLServer**, and then click **Next**.
5. Define database credentials, and then click **Create**.

NOTE: For the lab environment, we use the following credentials:

- Admin name: **user1**
- Password: **Passw0rd!**



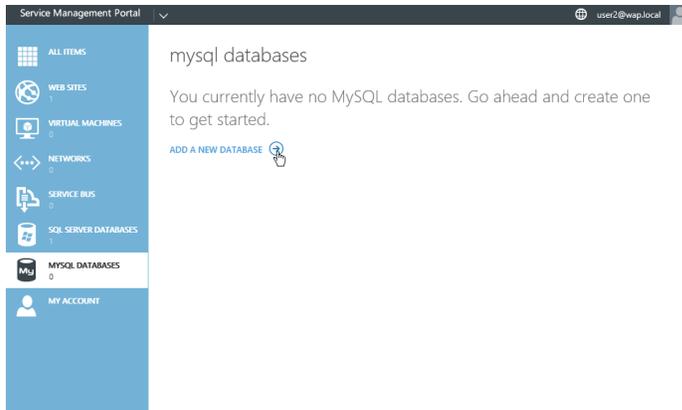
6. After the SQL Server database is successfully created, you see it in the SQL Server database list.

Deploy a MySQL Server database

With Windows Azure Pack, tenants can deploy MySQL Server databases to run within the tenant environment.

To create a database with MySQL Server:

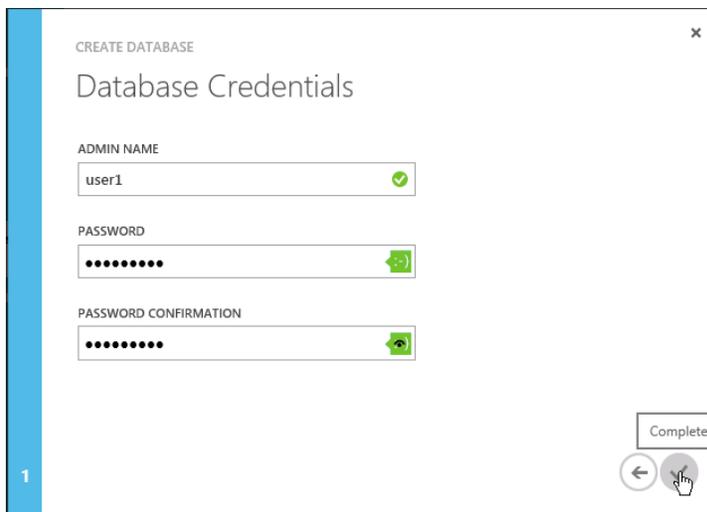
1. Open Management Portal for tenants.
2. Click **MySQL Server Database**, and then click **Add a New Database**.



3. Enter a name for the new database.
4. For **Edition**, select **MySQL**, and click **Next**.
5. Define database credentials, and then click **Create**.

NOTE: For the lab environment, use the following credentials:

- Admin name: **user1**
- Password: **Passw0rd!**



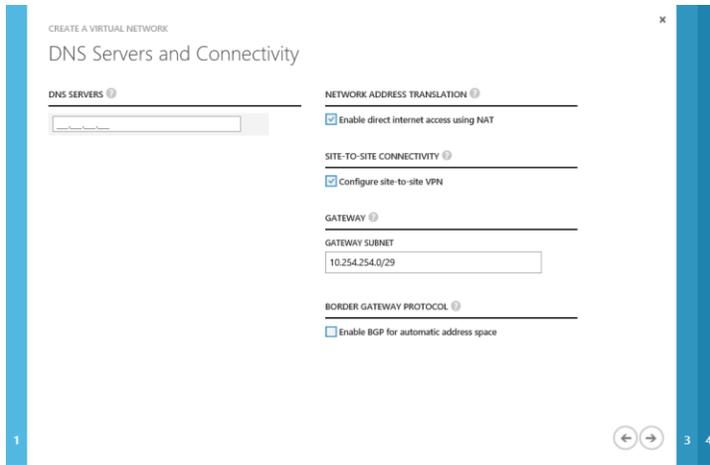
6. After the MySQL Server database is successfully created, you see it in the MySQL Server database list.

Deploy a virtual network

With Virtual Networks, you can use existing IP address schemes while remaining protected from other tenants and the underlying network infrastructure IP configuration.

To create a virtual network:

1. Open Management Portal for tenants.
2. Click **Networks**, click **Create a Virtual Network**, and then click **Custom Create**.
3. Enter the required network name, make sure the IP protocol is **IPV4**, and then click **Next**.
4. As needed, enter the DNS server address for **DNS servers**, and enter settings for **Network address translation** and **Site-to-site connectivity**; then, click **Next**.



- In the Address Space wizard, enter any custom address space required (the default is **10.0.0.0/24**).

CREATE A VIRTUAL NETWORK

Address Space

ADDRESS SPACE	STARTING IP	CIDR (ADDRESS COUNT)	USABLE ADDRESS RANGE
10.0.0.0/24	10.0.0.0	/24 (253)	10.0.0.2 - 10.0.0.254

[add address space](#)

- For **Starting IP**, select **10.0.0.0**, and type your custom address space (for example, **192.168.100.0**).
- For **CIDR (Address Cont)**, keep the setting **/24**, and then click the checkmark. On the **Networks** tab, you see the new virtual network.

virtual networks

NAME	STATUS	SUBSCRIPTION	BOUND NETWORK
My Network →	✓ Created	Contoso	Tenant Logical Network

Summary

Windows Azure Pack Deployment and Evaluation Guide has provided an overview of Windows Azure Pack, its required and optional components, and different types of Windows Azure Pack architectures for common scenarios found in many organizations. By completing these step-by-step instructions to build the lab environment, you are set up to build simplified solutions for multitenant cloud services. Tenants of these services can have an experience consistent with the public Windows Azure experience.

Appendix

Distributed Installation for Windows Azure Pack

This section explains how to deploy required components using the distributed installation method for the Windows Azure Pack portal. This requires a VM for each WAP component (7 all together). This is the recommend installation for production. Required components include Service Management APIs, authentication sites for administrators and tenants, and Management Portal for administrators and tenants. Optional components include Web Sites service, Virtual Machine service, Service Bus service, SQL Server service, MySQL Server service, and Automation service.

Deploy required components

In a production environment, the components required by Windows Azure Pack are intended to run on a minimum of eight machines. These machines can be physical or virtual. For the evaluation lab, we will create virtual machines for Windows Azure Pack components.¹

The following table shows the required Windows Azure Pack components you need to install.

Required component	Sample machine name
Admin API	Wapadmin
Tenant API	WAPTenantAPI
Tenant public API	WAPTenPubAPI
Admin Authentication Site	WAPAdminAuth
Tenant Authentication site	WAPTenantAuth
Management Portal for administrators	WAPAdmin
Management Portal for tenants	WAPTenant

Prerequisites for deploying components required by Windows Azure Pack

Before installing any of the required Windows Azure Pack components, you must install the following software prerequisites on each virtual machine running the WAP Portal components:

- Windows Server 2012 R2 operating system
- Microsoft Web Platform Installer 4.6

¹ For this guide, you deploy each required component to an individual virtual machine as recommended by Microsoft for deployment of Windows Azure Pack in a production environment. For testing and proof of concept scenarios, you can use the alternative Express Installation to install all required roles on a single server—and reduce the requirements for seven virtual machines to one virtual machine. For more information about Express Installation, go to <http://technet.microsoft.com/en-us/library/dn296439.aspx>.

- Microsoft .NET Framework 3.5 Service Pack (SP) 1
- Internet Information Services 8.5 (role of Windows Server 2012 R2)
- Microsoft .NET Framework 4.5 Extended, with ASP.NET for Windows 8

For more information, go to <http://technet.microsoft.com/en-us/library/dn469335.aspx>.

Install Service Management APIs

Windows Azure Pack provides a collection of Representational State Transfer (REST) APIs that extend service management, called Service Management API. Service Management API exposes a unified interface to manage Windows Azure Pack services through the Management Portal. Server Service Management API includes three different components of Windows Azure Pack, called Admin API, Tenant API, and Tenant Public API.

NOTE: Service Management API components Admin API and Tenant API need to be installed behind a firewall. Tenant Public API can be installed outside the firewall or made publicly accessible.

Install Admin API

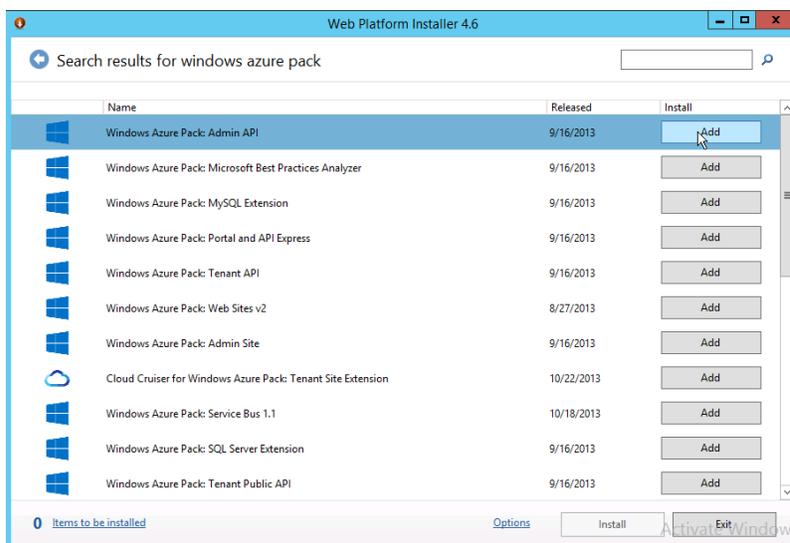
Windows Azure Pack Admin API exposes the functionality to complete administrative tasks from Management Portal for administrators or through the use of Windows PowerShell cmdlets. You can install Admin API on a physical or virtual server.

To install Admin API:

8. From the Windows Server 2012 R2 image for deployment, create the **Wapadmin** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **Wapadmin**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then, click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\Wapadmin\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **Wapadmin-VHD**.
 - m. In Hyper-V Manager, select the **Wapadmin** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\Wapadmin\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
9. Rename the machine **Wapadmin**.
10. Give a static IP address to the machine:
 - IP address: **10.10.10.13**

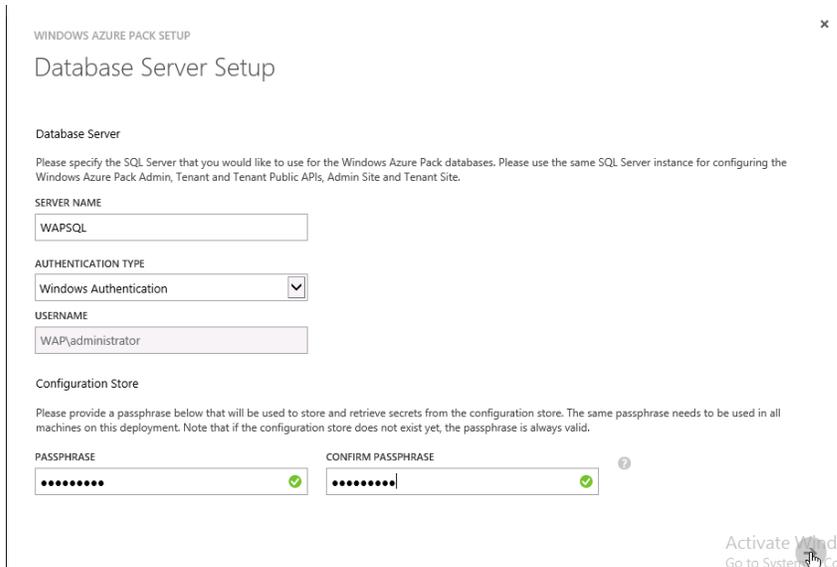
- Subnet: **255.255.255.0**
- Gateway: **10.10.10.1**
- DNS: **10.10.10.10**
- DNS: **10.10.10.1**

11. Add the machine to the **WAP.Local** domain.
 12. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 13. Log on to the machine named **Wapadmin** as domain administrator (**WAP\Administrator**).
 14. Start Microsoft Web Platform Installer.
- NOTE:** If the Web Platform Installer is not installed, please refer to the [Prerequisites](#) in this section of the guide.
15. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Admin API**, click **Add**; and then click **Install**.



16. To accept the terms and conditions on the Prerequisites page, click **I Agree**.
17. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**.
After the installation is completed, you see a prompt for site configuration.
18. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
19. On the **Database Server Setup** page, type the name of the database server as **WAPSQL**.
20. For **Authentication Type**, select **Windows Authentication**.
21. Define a pass phrase for encrypting and decrypting data in the configuration store, and then click **Next**.

NOTE: Use the same pass phrase for all Windows Azure Pack components. For this scenario, we use **Passw0rd!**.



22. Select **YES, I am willing to participate anonymously in the Customer Experience Improvement Program (CEIP)**, and then click **Next**.
23. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
24. In the Web Platform Installer, click **Finish**.

NOTE: By default, Admin API works on port number 30004. Ensure port connectivity for this machine.

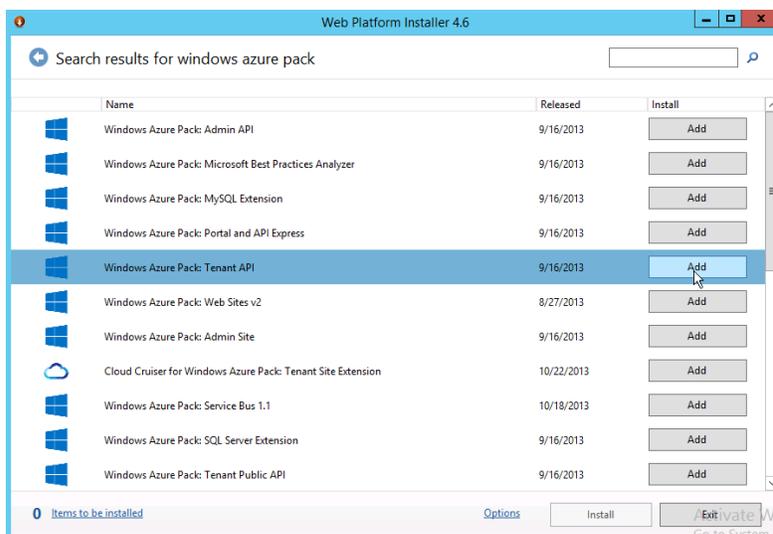
Install Tenant API

Windows Azure Pack Tenant API helps users, or tenants, to manage and configure cloud services included in plans they subscribe to.

To install Tenant API:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPTenantAPI** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPTenantAPI**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPTenantAPI\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPTenantAPI-HDD**.
 - m. In Hyper-V Manager, select the **WAPTenantAPI** virtual machine.
 - n. Go to **Action**, and then click **settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.

- p. Click **Browse**, and then go to **D:\VMs\WAPTenantAPI\Virtual Hard Disk**; select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - q. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - r. Click **Apply**, and then click **OK**.
 - s. Right-click the virtual machine, and then click **Start**.
2. Rename the machine **WAPTenantAPI**.
 3. Give a static IP address to the machine:
 - IP address: **10.10.10.14**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add the machine to the **WAP.Local** domain.
 5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 6. Log on to the machine named **WAPTenantAPI** as domain administrator (**WAP\Administrator**).
 7. Start Microsoft Web Platform Installer.
 8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Tenant API**, click **Add**; and then, click **Install**.



9. To accept the terms and conditions on the **Prerequisites** page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**; then, click **Continue**.
After installation is completed, you see a prompt for site configuration.
11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type **WAPSQL** for the name of the database server.
13. For **Authentication Type**, select **Windows Authentication**.
14. Enter the pass phrase **PasswOrd!** that you configured earlier.

WINDOWS AZURE PACK SETUP

Database Server Setup

Database Server

Please specify the SQL Server that you would like to use for the Windows Azure Pack databases. Please use the same SQL Server instance for configuring the Windows Azure Pack Admin, Tenant and Tenant Public APIs, Admin Site and Tenant Site.

SERVER NAME

AUTHENTICATION TYPE

USERNAME

Configuration Store

Please provide a passphrase below that will be used to store and retrieve secrets from the configuration store. The same passphrase needs to be used in all machines on this deployment. Note that if the configuration store does not exist yet, the passphrase is always valid.

PASSPHRASE

Activate Windows
Go to Settings to activate Windows.

15. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.
16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.

NOTE: By default, Tenant API works on the port numbered 30005. Ensure port connectivity for this machine.

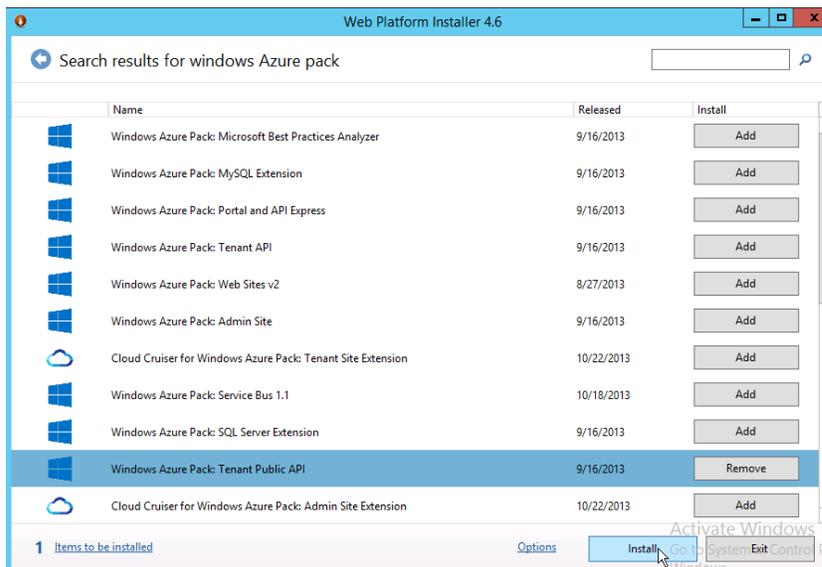
Install Tenant Public API

Windows Azure Pack Tenant Public API helps end users to manage and configure cloud services included in plans they subscribe to. Tenant Public API is designed to serve requirements of end users who subscribe to services offered by a hosting service provider.

To install Tenant Public API:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPTenPubAPI** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPTenPubAPI**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPTenPubAPI\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPTenPubAPI-HDD**.
 - m. In Hyper-V Manager, select the **WAPTenPubAPI** virtual machine.

- n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPTenPubAPI\Virtual Hard Disk**; select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - q. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - r. Click **Apply**, and then click **OK**.
 - s. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPTenPubAPI**.
 3. Give static IP address to the machine:
 - IP address: **10.10.10.15**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add the machine to the **WAP.Local** domain.
 5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 6. Log on to the machine named **WAPTenPubAPI** as domain administrator (**WAP\Administrator**).
 7. Start Microsoft Web Platform Installer.
 8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Tenant Public API**, click **Add**; and then click **Install**.



9. To accept the terms and conditions on the **Prerequisites** page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**.
After the installation is completed, you see a prompt for site configuration.
11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type **WAPSQL** for the name of the database server.

13. For **Authentication Type**, select **Windows Authentication**.
14. Enter the pass phrase **PasswOrd!** that you configured earlier.
15. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.
16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.

NOTE: By default, Tenant Public API works on port number 30006. Ensure port connectivity for this machine.

Install authentication sites

Windows Azure Pack Authentication Sites provide authentication services for Management Portal for administrators and tenants. These authentication services include authentication sites for administrators and tenants.

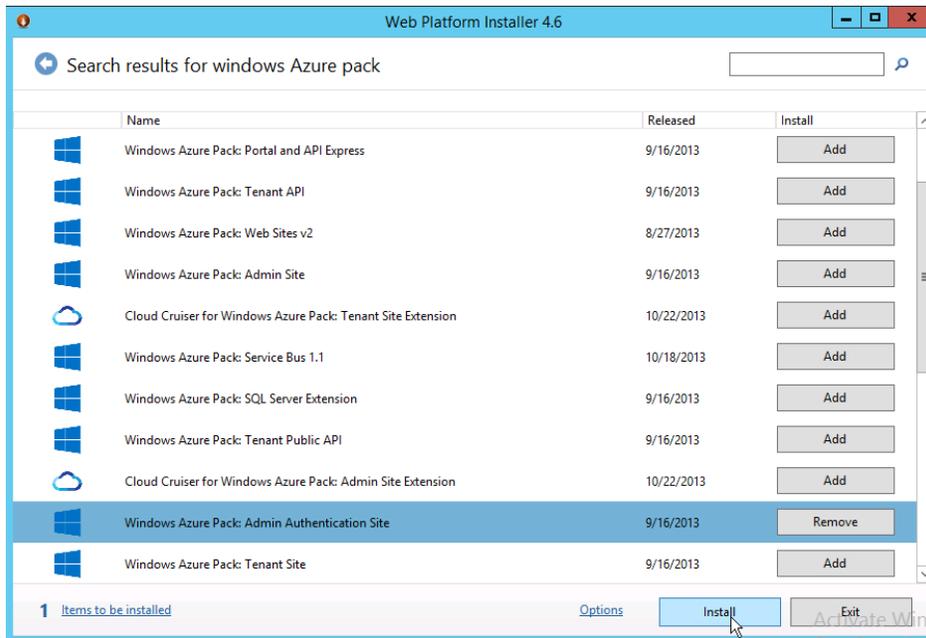
Install Admin Authentication Site

By default, Windows Azure Pack uses Windows authentication for the administration portal. To install the Admin Authentication Site:

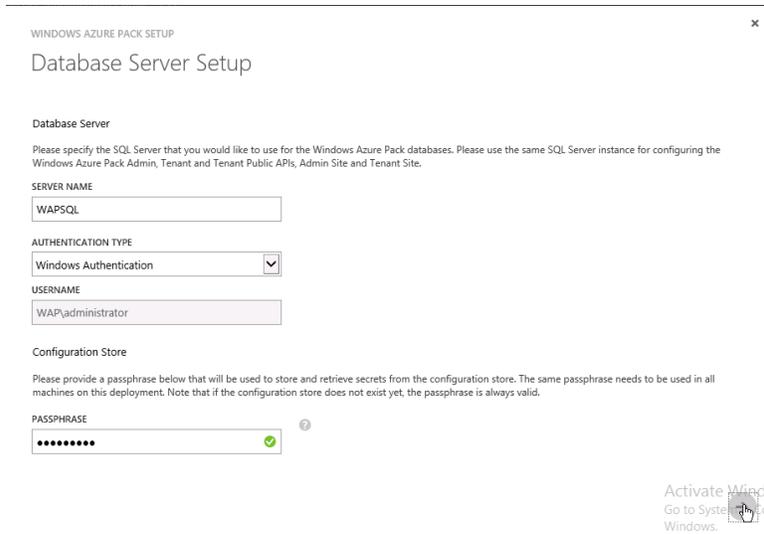
1. From the Windows Server 2012 R2 image for deployment, create the **WAPAdminAuth** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPAdminAuth**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then, click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPAdminAuth\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPAdminAuth-HDD**.
 - m. In Hyper-V manager, select the **WAPAdminAuth** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPAdminAuth\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPAdminAuth**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10.16**

- Subnet: **255.255.255.0**
- Gateway: **10.10.10.1**
- DNS: **10.10.10.10**

4. Add the machine to **WAP.Local** domain.
5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
6. Log on to the machine named **WAPAdminAuth** as domain administrator (**WAP\Administrator**).
7. Start Microsoft Web Platform Installer.
8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Admin Authentication Site**, click **Add**; and then click **Install**.



9. To accept the terms and conditions on the Prerequisites page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**.
After installation is completed, you see a prompt for site configuration.
11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type the name of database server as **WAPSQL**.
13. For **Authentication Type**, select **Windows Authentication**.



14. Enter the pass phrase **Passw0rd!** that you configured earlier.
15. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.
16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.

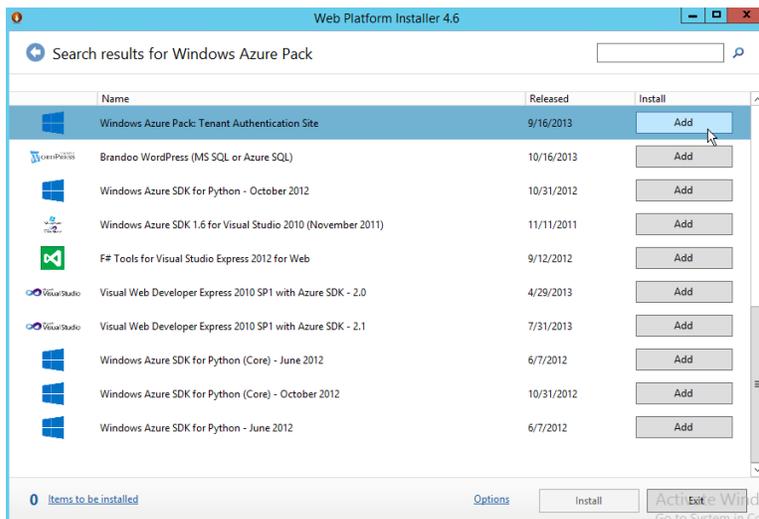
NOTE: By default, Admin Authentication Site works on port number 30072. Ensure port connectivity for this machine.

Install Tenant Authentication Site

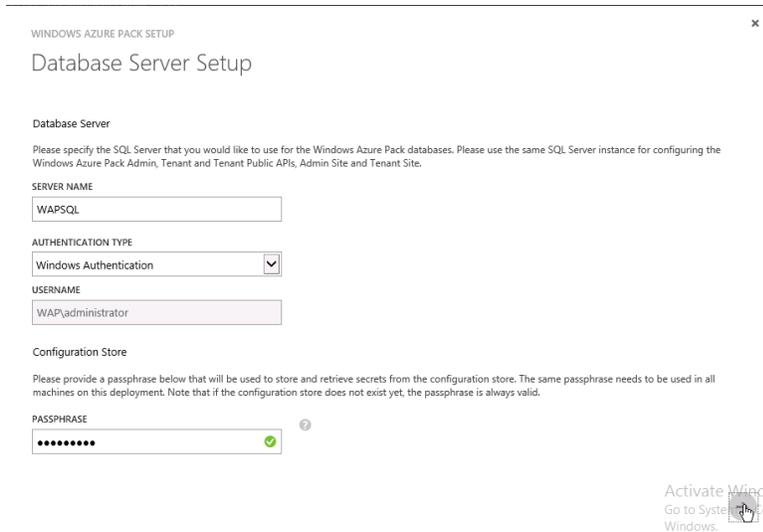
Windows Azure Pack uses an ASP.NET membership provider to authenticate the management portal for tenants. To install the authentication site for tenants:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPTenantAuth** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPTenantAuth**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier); then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPTenantAuth\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPTenantAuth-HDD**.
 - m. In Hyper-V Manager, select the **WAPTenantAuth** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.

- o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPTenantAuth\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPTenantAuth**.
 3. Give a static IP address to the machine:
 - a. IP address: **10.10.10.17**
 - b. Subnet: **255.255.255.0**
 - c. Gateway: **10.10.10.1**
 - d. DNS: **10.10.10.10**
 - e. DNS: **10.10.10.1**
 4. Add this machine in the **WAP.Local** domain.
 5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 6. Log on to the machine named **WAPTenantAuth** as domain administrator (**WAP\Administrator**).
 7. Start Microsoft Web Platform Installer.
 8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Tenant Authentication Site**, click **Add**; and then click **Install**.



9. To accept the terms and conditions on the Prerequisites page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then, click **Continue**.
11. After installation is completed, you see a prompt for site configuration.
12. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
13. On the **Database Server Setup** page, type the name of database server as **WAPSQL**.
14. For **Authentication Type**, select **Windows Authentication**.



15. Enter the pass phrase **PasswOrd!** that you configured earlier.
16. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.
17. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
18. In the Web Platform Installer, click **Finish**.

Install Management Portal

Management Portal enables administrators and tenants to interact with Windows Azure Pack. Windows Azure Pack includes two portals: one for administrators and another for tenants.

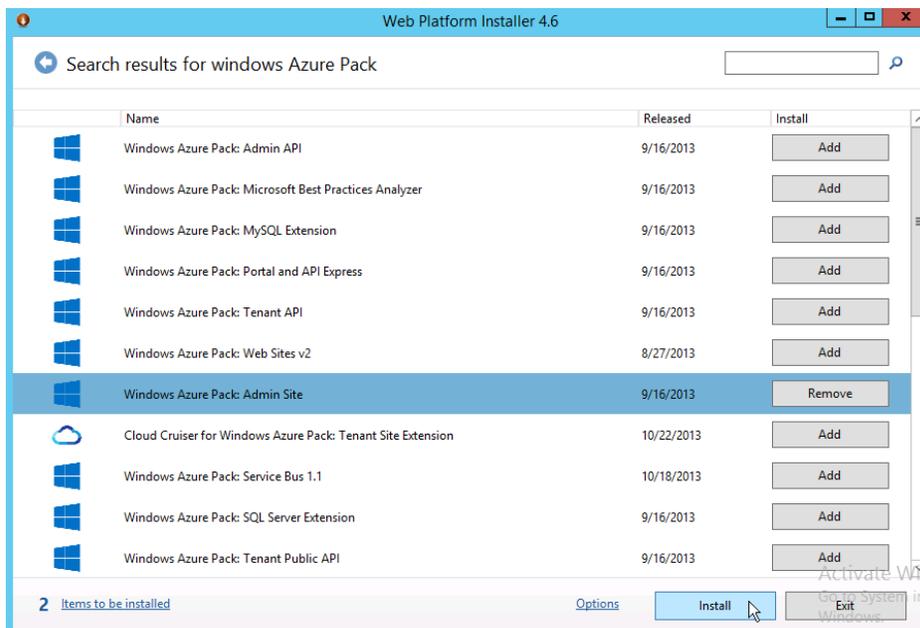
Install Management Portal for administrators

Management Portal for administrators allows administrators to configure and manage resource clouds, user accounts, tenant plans, quotas, and pricing. In this portal, administrators can create Web Site clouds, virtual machine private clouds, and plans; and they can manage user subscriptions.

To install Management Portal for administrators:

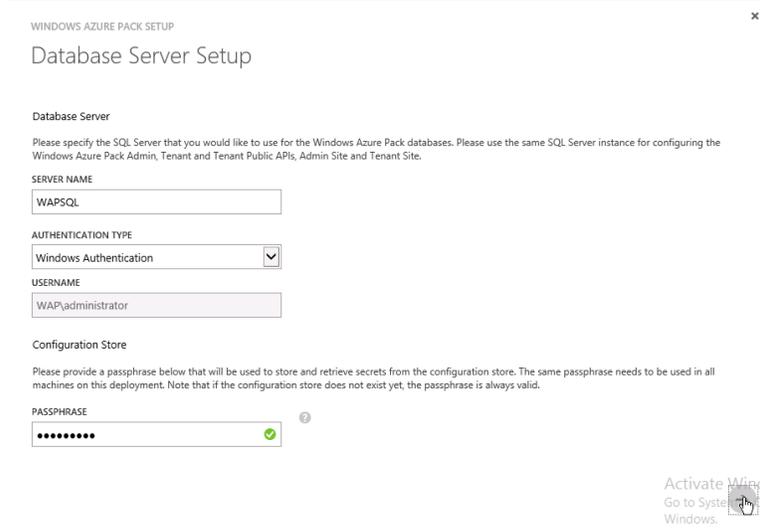
1. From the Windows Server 2012 R2 image for deployment, create the **WAPAdmin** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPAdmin**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPAdmin\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPAdmin-HDD**.

- m. In Hyper-V Manager, select the **WAPAdmin** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPAdmin\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPAdmin**.
 3. Give a static IP address to the machine:
 - IP address: **10.10.10.11**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
 4. Add the machine to **WAP.Local** domain.
 5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
 6. Log on to the machine named **WAPAdmin** as domain administrator (**WAP\Administrator**).
 7. Start Microsoft Web Platform Installer.
 8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Admin Site**, click **Add**; and then click **Install**.



9. To accept the terms and conditions on the Prerequisites page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then click **Continue**.
After installation is completed, you see a prompt for site configuration.

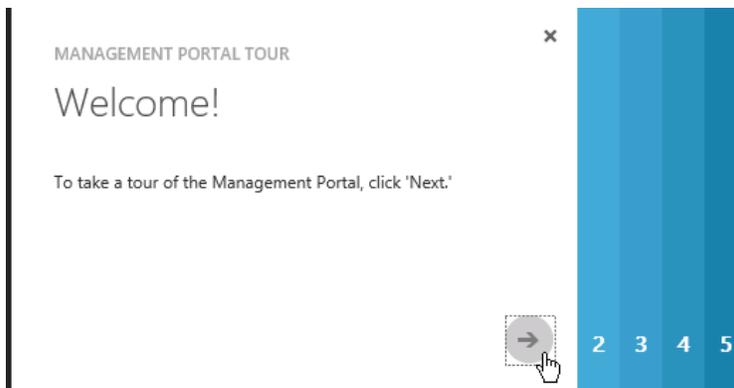
11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site <https://localhost:30101/> opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type **WAPSQL** for the name of the database server.
13. For **Authentication Type**, select **Windows Authentication**.



14. Enter the pass phrase **PasswOrd!** that you configured earlier.
15. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.
16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.
18. Open an Internet browser and go to <https://localhost:30091>.

NOTE: You may have to log off your system and log back on before you can access Management Portal for administrators so Windows Authentication can add the security group to your security token.

19. The first time you log on to Management Portal for administrators, you have the opportunity to take a tour of the portal.



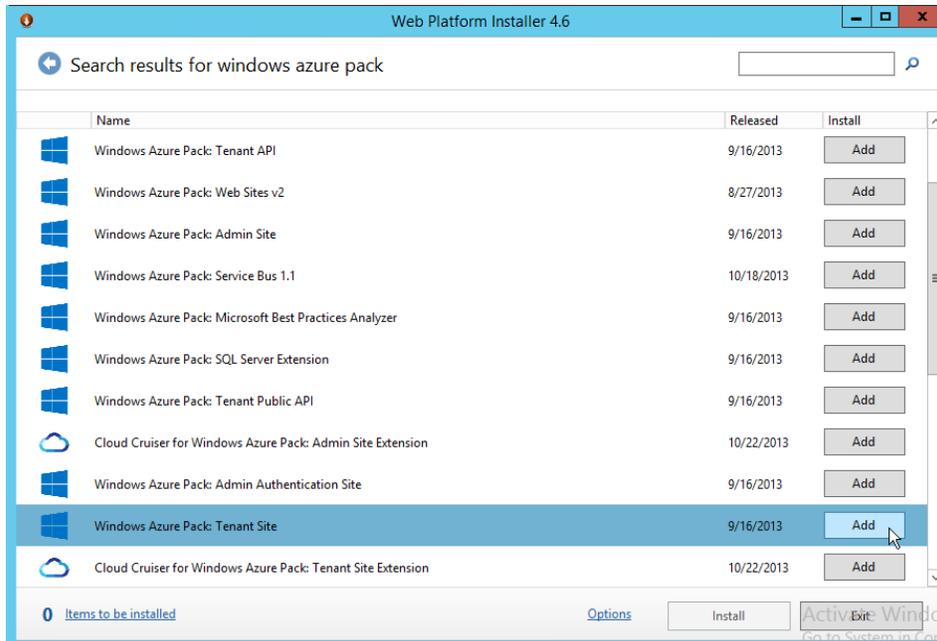
NOTE: By default, Management Portal for administrators works on port number 30091. Ensure port connectivity for this machine.

Install Management Portal for tenants

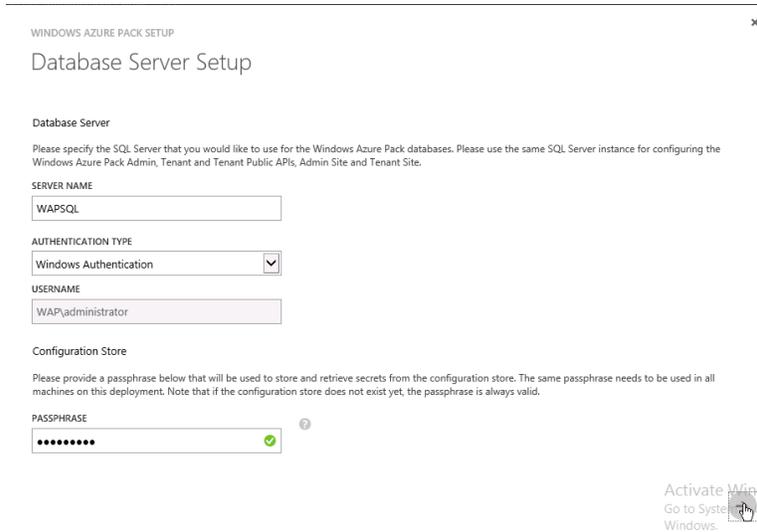
Management Portal for tenants provides a customizable self-service portal to provision, monitor, and manage services such as Web Sites, Virtual Machines, and Service Bus. In the portal for tenants, users can sign up for services and create services, virtual machines, and databases.

To install Management Portal for tenants:

1. From the Windows Server 2012 R2 image for deployment, create the **WAPTenant** virtual machine:
 - a. On HOST1, open **Hyper-V Manager**.
 - b. In Hyper-V Manager, select **HOST1**.
 - c. Under **Action**, go to **New**, click **Virtual Machine**, and then click **Next**.
 - d. Name the virtual machine **WAPTenant**.
 - e. Select **Store the virtual machine in a different location**.
 - f. Browse to **D:\VMs**, and then click **Next**.
 - g. For **Specify Generation**, select **Generation 1**, and then click **Next**.
 - h. In **Assign Memory**, for **Startup Memory**, enter **4096** MB.
 - i. In **Configure Networking**, select **Management-Network** (the external virtual network you created earlier), and then click **Next**.
 - j. In **Connect Virtual Hard Disk**, select **Attach a virtual hard disk later**, click **Next**, and then click **Finish**.
 - k. Copy the **Windows Server 2012 R2 Evaluation VHD image**, and then paste it into the **D:\VMs\WAPTenant\Virtual Hard Disk** folder.
 - l. Rename the copied deployment image to **WAPTenant-HDD**.
 - m. In Hyper-V Manager, select the **WAPTenant** virtual machine.
 - n. Go to **Action**, and then click **Settings** to open the virtual machine settings.
 - o. Select **IDE Controller 0**, and then click **Add**.
 - p. Click **Browse**, and then go to **D:\VMs\WAPTenant\Virtual Hard Disk**.
 - q. Select the **Windows Server 2012 R2 Evaluation VHD image** you copied earlier.
 - r. Select **Processor**, and then change **Number of virtual processors** to **2**.
 - s. Click **Apply**, and then click **OK**.
 - t. Right-click the virtual machine, and then click **Start**.
2. Rename the machine name **WAPTenant**.
3. Give a static IP address to the machine:
 - IP address: **10.10.10.12**
 - Subnet: **255.255.255.0**
 - Gateway: **10.10.10.1**
 - DNS: **10.10.10.10**
 - DNS: **10.10.10.1**
4. Add the machine to the **WAP.Local** domain.
5. Make sure all software is already installed on the machine as mentioned in the software prerequisites section, earlier.
6. Log on to the machine named **WAPTenant** as domain administrator (**WAP\Administrator**).
7. Start Microsoft Web Platform Installer.
8. In the search box, type **Windows Azure Pack**; for **Windows Azure Pack: Tenant Site**, click **Add**; and then click **Install**.



9. To accept the terms and conditions on the Prerequisites page, click **I Agree**.
10. On the next page, click **Use Microsoft Update to keep the Windows Azure Pack component up to date**, and then, click **Continue**.
After installation is completed, you see a prompt for site configuration.
11. Make sure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
The configuration site `https://localhost:30101/` opens in Internet Explorer; after you see the Internet Explorer security certificate warning page, click **Continue to this website**.
12. On the **Database Server Setup** page, type **WAPSQL** for the name of database server.
13. For **Authentication Type**, select **Windows Authentication**.

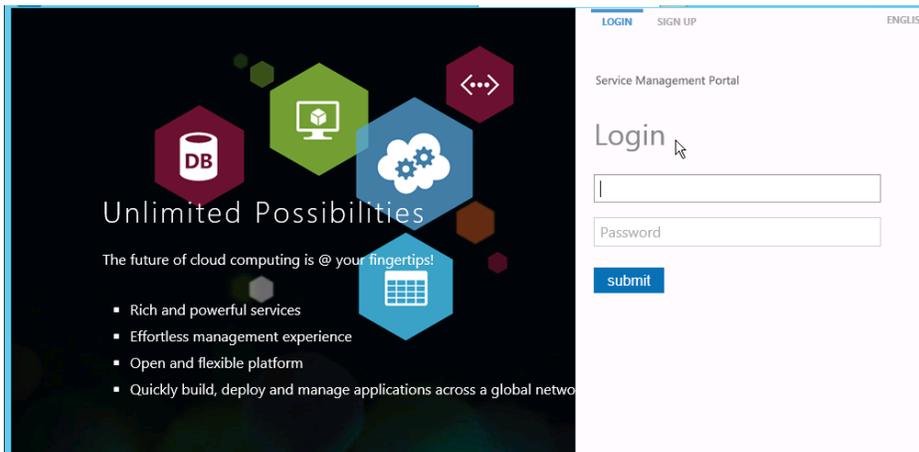


14. Enter the pass phrase **PasswOrd!** that you configured earlier.
15. Select the option to participate in the Customer Experience Improvement Program (CEIP), and then click **Next**.

16. Review the features, and after the features are configured successfully, click the checkmark in the lower-right corner of the Features Setup page.
17. In the Web Platform Installer, click **Finish**.
18. Open an Internet browser and go to <https://localhost:30081>.

NOTE: You may have to log off your system and log back on before you can access Management portal for tenants so Windows Authentication can add the security group to your security token.

You see a log-on page for tenants.



NOTE: By default, Management Portal for tenants works on port number 30081. Ensure port connectivity for this machine.

References

- Windows Azure Pack
<http://www.microsoft.com/en-us/server-cloud/products/windows-azure-pack>
- Windows Azure Pack data sheet
http://download.microsoft.com/download/9/B/4/9B42F2A5-9C1D-47C6-AB37-DDBD78F5D15E/Windows_Azure_Pack_Datasheet.pdf
- Download Windows Server 2012 R2
<http://technet.microsoft.com/en-us/evalcenter/dn205286.aspx>
- Software prerequisites for Windows Azure Pack
<http://technet.microsoft.com/en-us/library/dn469335.aspx>
- Microsoft Web Platform Installer 4.6
<http://www.microsoft.com/web/downloads/platform.aspx>