Deploying Windows Azure Pack for Windows Server

Microsoft Corporation

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Contents

Deploy Windows Azure Pack for Windows Server

Windows Azure Pack for Windows Server enables you to offer rich, self-service, multi-tenant cloud services that are consistent with the public Windows Azure experience. Windows Azure Pack runs on top of the System Center 2012 R2 and is available to Microsoft customers at no additional cost for installation in your data center.

The following content provides deployment and configuration information for Windows Azure Pack:

- Windows Azure Pack components
- Windows Azure Pack architecture
- Windows Azure Pack installation checklist
- Windows Azure Pack installation requirements
- Install an express deployment of Windows Azure Pack
- **Install a distributed deployment of Windows Azure Pack**
- Configure Active Directory Federation Services for Windows Azure Pack
- Post-installation best practices
- Next steps

Note that this deployment guide does not provide information about deploying Windows Azure Pack: Web Services, System Center 2012 R2 Virtual Machine Manager, Service Provider Foundation, or the Windows Azure Service Bus service. For information about deploying these products and services, see the following documentation:

- **Deploy Windows Azure Pack: Web Sites**
- Deploying System Center 2012 – Virtual Machine Manager
- How to Install Service Provider Foundation 2012 R2
- **Using SQL Server or MySQL with Windows Azure Pack**
- Getting Started with the Service Bus for Windows Server

> **Note**
> For Windows Azure Pack, install Service Bus 1.1 Preview, instead of Service Bus 1.0, as instructed in the topic.

Windows Azure Pack components

Windows Azure Pack provides a core set of required components to support several optional components, such as Windows Azure Web Services or Windows Azure Service Bus. You must install the required components and then decide which specific service components to install, based on your hosting requirements.

Required components

- Service Management API. The Service Management API exposes a unified interface to manage the Windows Azure Pack services through the management portals. There are three API interfaces:
  - The Windows Azure Pack Admin API exposes functionality to complete administrative tasks from the management portal for administrators or through the use of Windows PowerShell cmdlets.
  - The Windows Azure Pack Tenant API enables users, or tenants, to manage and configure cloud services that are included in the plans that they subscribe to.
  - The Windows Azure Pack Tenant Public API enables end users to manage and configure cloud services that are included in the plans that they subscribe to. The Tenant Public API is designed to serve all the requirements of end users that subscribe to the various services that a hosting service provider provides.
- Authentication sites. These sites provide authentication services for the management portal for administrators and the management portal for tenants.
  - Admin Authentication Site. By default, Windows Azure Pack uses Windows authentication for the administration portal. You also have the option to use Windows Azure Active Directory Federation Services (AD FS) to authenticate users. For more information, see Configure Active Directory Federation Services for Windows Azure Pack.
  - Tenant Authentication Site. Windows Azure Pack uses an ASP.NET Membership provider to provide authentication for the management portal for tenants.
- Service management portals. The management portals enable you and your tenants to interact with Windows Azure Pack:
  - Management portal for administrators. A portal for administrators to configure and manage resource clouds, user accounts, tenant plans, quotas, and pricing. In this portal, administrators create Web Site clouds, virtual machine private clouds, create plans, and manage user subscriptions.
  - Management portal for tenants. A customizable self-service portal to provision, monitor, and manage services, such as Windows Azure Pack: Web Sites, Windows Azure Virtual Machines, and Windows Azure Pack: Service Bus. In this portal, users sign up for services and create services, virtual machines, and databases.

Optional components

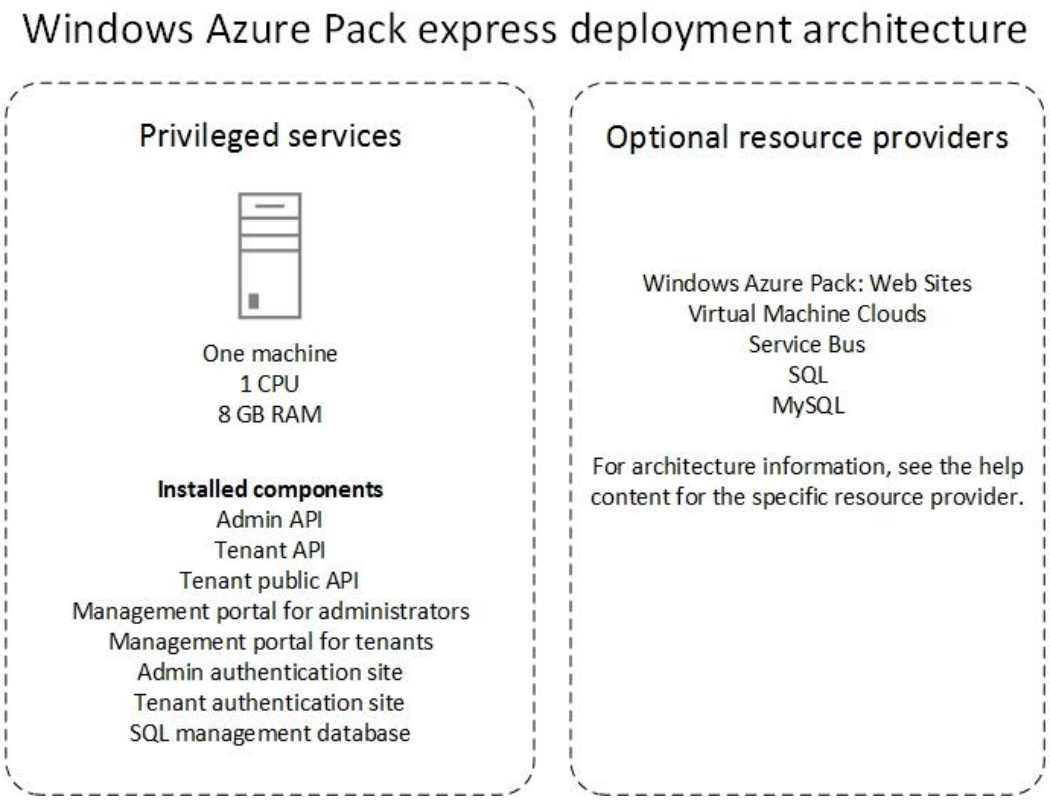
- Web Sites. A service that helps provide a high-density, scalable shared web hosting platform for ASP.NET, PHP, and Node.js web applications. The Web Sites service includes a customizable web application gallery of open source web applications and integration with source control systems for custom-developed websites and applications. For more information and instructions about how to deploy the Web Sites service, see **Deploy Windows Azure Pack: Web Sites**.
- Virtual Machines. A service that provides infrastructure-as-a-service (IaaS) capabilities for Windows and Linux virtual machines. The Virtual Machines service includes a virtual machine template gallery, scaling options, and virtual networking capabilities. For more information and instructions about how to deploy the Virtual Machines service, see **Provision Virtual Machine Clouds**.
- Service Bus. A service that provides reliable messaging services between distributed applications. The Service Bus service includes queued and topic-based publish/subscribe capabilities. For more information and instructions on how to deploy the Service Bus service, see Integrate Service Bus into Windows Azure Pack.
- Automation and Extensibility. The capability to automate and integrate additional custom services into the services framework, including a runbook editor and an execution environment. For more information and instructions about how to enable Automation, see **Deploy Service Management Automation**.
- SQL and MySQL. You can provision Microsoft SQL and MySQL databases for tenant use. For more information see **Using SQL Server or MySQL with Windows Azure Pack**.

Windows Azure Pack architecture

Windows Azure Pack for Windows Server is made up of several required and optional components. This architectural overview provides suggested machine topologies for these components in both an express and distributed deployments.

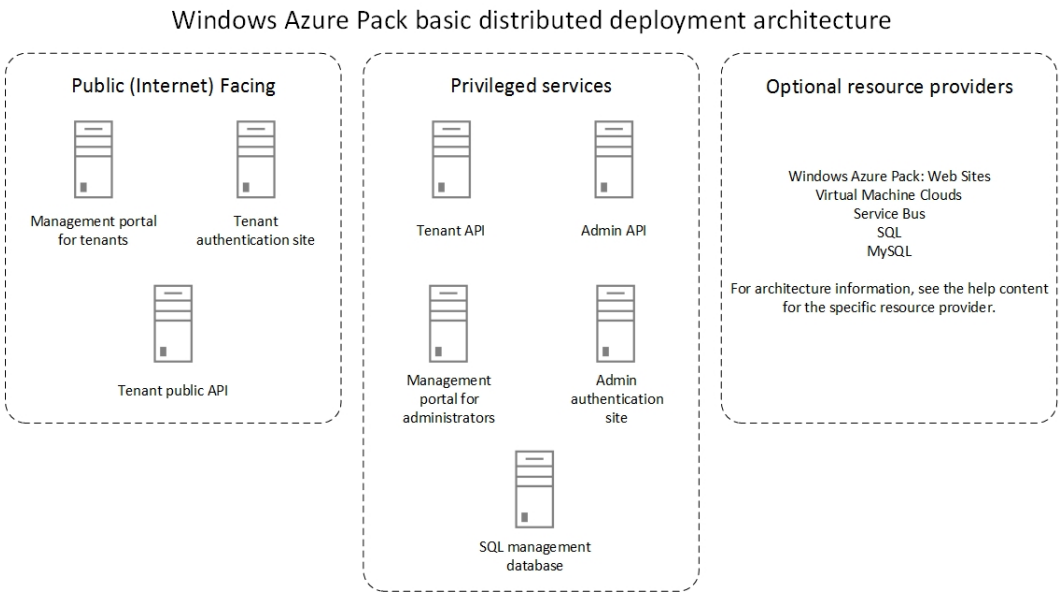
Express deployment architecture

You can use the express installation to create a proof of concept deployment. In an Express deployment, all of the Windows Azure Pack required components are installed on the same machine. If you want to also install optional components you will need additional machines. The express deployment should not be used in a production environment.



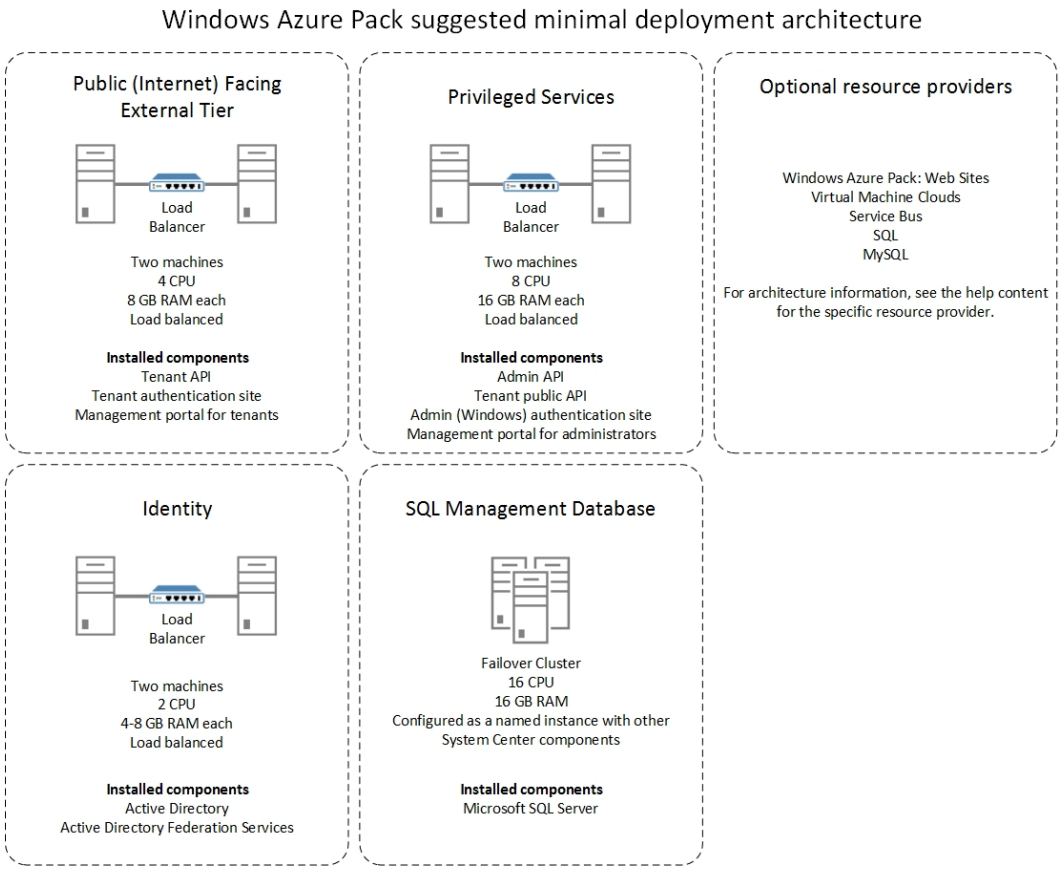
Basic distributed deployment architecture

In a distributed deployment, you can install the required components on up to 8 machines. A distributed deployment can be used in a production environment. The following diagram shows a basic distributed architecture of required components for a system designed to provide services to external customers.



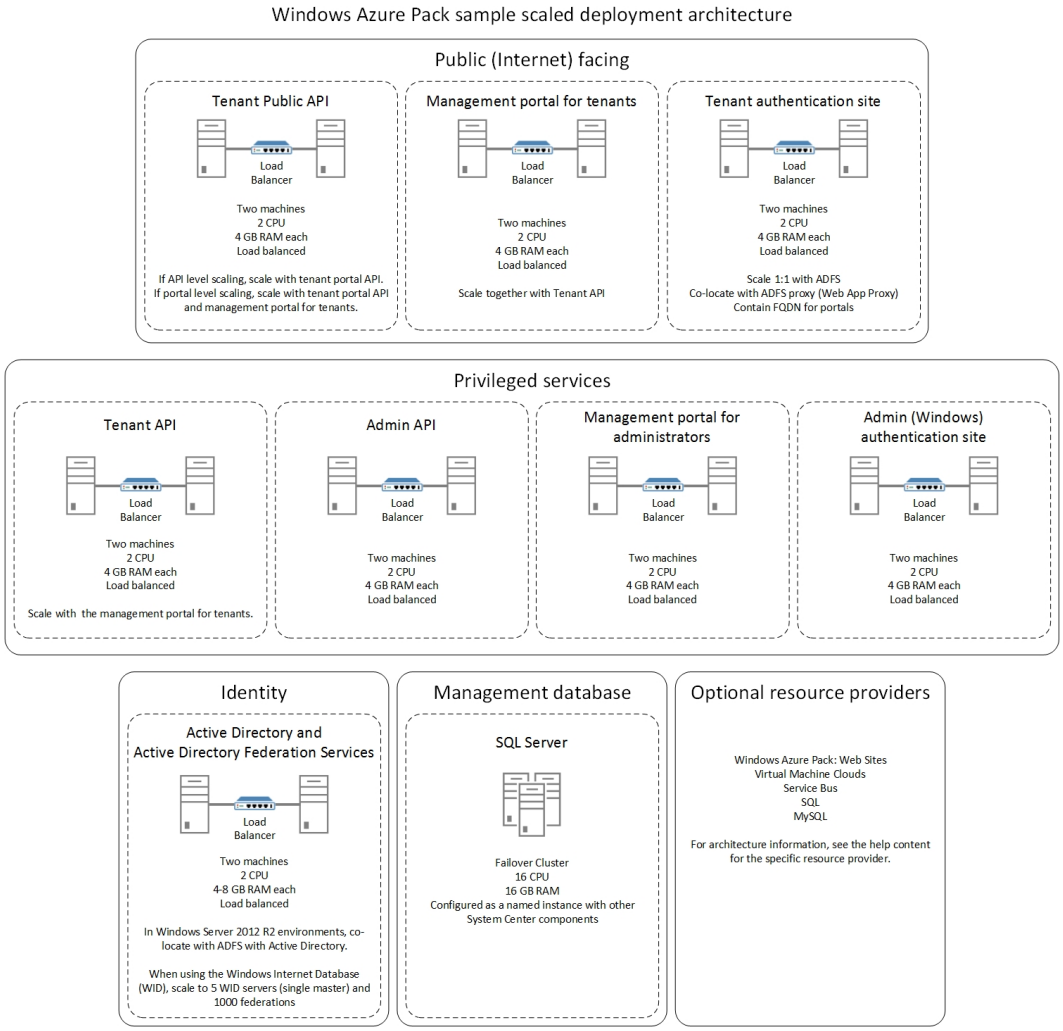
Minimal distributed deployment architecture

The following diagram depicts the suggested minimal architecture for a distributed deployment.



Scaled distributed deployment architecture

The following diagram shows a distributed deployment with scaling information.



Optional resource provider architecture

For sample topologies of the optional components, see the following help content.

- **Deploy Windows Azure Pack: Web Sites**
- [Integrate Service Bus into Windows Azure Pack]
- **Provision Virtual Machine Clouds**
- **Deploy Service Management Automation**
- **Using SQL Server or MySQL with Windows Azure Pack**

Windows Azure Pack installation checklist

This checklist walks you through a distributed deployment of a Windows Azure Pack. It uses the machine names that are suggested in the Naming conventions topic.

	Task	References
☐	Install Microsoft SQL Server for the management databases.	Install Microsoft SQL Server
☐	Install prerequisites for the Admin API on the AdminAPI machine.	Windows Azure Pack installation requirements
☐	Install the Windows Azure Pack: Admin API on the WAPAdminAPI machine.	Install the Windows Azure Pack Service Management APIs
☐	Install prerequisites for Tenant API on the WAPTenantAPI machine.	Windows Azure Pack installation requirements
☐	Install the Windows Azure Pack: Tenant API on the WAPTenantAPI machine.	Install the Windows Azure Pack Service Management APIs
☐	Install prerequisites for Tenant Public API on the WAPTenPubAPI machine.	Windows Azure Pack installation requirements
☐	Install the Windows Azure Pack: Tenant Authentication Site on the WAPTenantAuth machine.	Install the Windows Azure Pack Service Management APIs
☐	Install prerequisites for the management portal for administrators on the WAPAdmin machine.	Windows Azure Pack installation requirements
☐	Install the Windows Azure Pack: Admin Site on the WAPAdmin machine.	Install the Windows Azure Pack management portals
☐	Install prerequisites for the management portal for tenants on the WAPTenant machine.	Windows Azure Pack installation requirements
☐	Install the Windows Azure Pack: Tenant Site on the WAPTenant	Install the Windows Azure Pack management portals

	Task	References
	machine.	
☐	If you do not use Active Directory Federation Services (AD FS), follow the next two steps:	
☐	SUBSTEP: Install prerequisites for Admin Authentication Site on the WAPAdminAuth machine.	Windows Azure Pack installation requirements
☐	SUBSTEP: Install the Windows Azure Pack: Admin Authentication Site on the WAPAdminAuth machine.	Install the authentication sites
☐	If you use AD FS, configure the trust settings for AD FS and the management portals.	Configure Active Directory Federation Services for Windows Azure Pack
☐	If you want to add more cloud services, follow the steps below:	
☐	Deploy Automation service.	**Deploy Service Management Automation**
☐	Deploy Windows Azure Pack: Web Services.	**Deploy Windows Azure Pack: Web Sites**
☐	Deploy Virtual Machine services.	**Provision Virtual Machine Clouds**
☐	Deploy Service Bus service.	Integrate Service Bus into Windows Azure Pack
☐	Add SQL and MySQL providers to Windows Azure Pack.	**Using SQL Server or MySQL with Windows Azure Pack**
☐	Validate the Windows Azure Pack deployment by using the Best Practices Analyzer for Windows Azure Pack.	Test your deployment
☐	Create plans.	**Administer plans and add-ons**

Windows Azure Pack installation requirements

Windows Azure Pack can be installed in an express, proof-of-concept deployment on a single machine, or in a fully distributed, multi-machine production environment. The hardware and software prerequisites for each of these deployments are provided in the following topics.

Naming conventions

As a best practice, use descriptive machine names for each machine. Ensure the machine names are not longer than 15 characters. Otherwise, you receive a NetBIOS error, and the name is truncated. The rest of this deployment guide uses the following sample machine names:

Component	Sample machine name
Single Express installation machine	WAPPortal
Admin API	WAPAdminAPI
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
SQL server hosting the management databases	WAPSQL

Express deployment hardware and software prerequisites

For a proof-of-concept or Express installation, you must deploy all of the following Windows Azure Pack required components on a single physical or virtual machine.

- Microsoft SQL Server prerequisite for management databases
- Admin API
- Tenant API
- Tenant public API
- Admin authentication site
- Tenant authentication site
- Admin site (management portal for administrators)
- Tenant site (management portal for tenants)

The machine to which you deploy the Express installation requires the following:

- 8 gigabytes (GB) of RAM. Do not use dynamic memory.
- 40 gigabytes (GB) of available hard disk space.

Before you install any of the required Express components, you must install the following software as described in **Install software prerequisites**.

- Windows Server® 2012 or Windows Server 2012 R2
- Microsoft Web Platform Installer 4.6
- Microsoft .NET Framework 3.5 Service Pack (SP) 1
- Internet Information Services (IIS) 8 (built in component of Windows Server® 2012) or IIS 8.5 (built in component of Windows Server 2012 R2
- .NET Framework 4.5 Extended, with ASP.NET for Windows 8

Distributed deployment hardware and software prerequisites

In a production environment, the components that Windows Azure Pack requires are intended to run on a minimum of eight machines. These machines can be physical or virtual.

Install the required components in the following order:

1. Microsoft SQL Server for Windows Azure Pack management databases
2. Admin API
3. Tenant API
4. Tenant public API
5. Admin authentication site
6. Tenant authentication site

7. Admin site (management portal for administrators)
8. Tenant site (management portal for tenants)

Each deployment machine has the following system recommendations:

- 2 CPUs.
- 4 gigabytes (GB) of RAM.
- 40 gigabytes (GB) of available hard disk space.

Before you install any of the required Windows Azure Pack components, you must install the following software, as described in **Install software prerequisites**.

- Windows Server® 2012 or Windows Server 2012 R2
- Microsoft Web Platform Installer 4.6
- Microsoft .NET Framework 3.5 Service Pack (SP) 1
- Internet Information Services (IIS) 8 (built in component of Windows Server® 2012) or IIS 8.5 (built in component of Windows Server 2012 R2
- .NET Framework 4.5 Extended, with ASP.NET for Windows 8

Install software prerequisites

Follow these steps to install software prerequisites on machines where you want to install Windows Azure Pack to ensure correct registration of the Microsoft .NET Framework assemblies.

1. Install the Windows Server® 2012 operating system or the Windows Server 2012 R2 operating system.
2. Disable Internet Explorer Enhanced Security Configuration (ESC) for Administrators by using Server Manager.
3. Install Microsoft Web Platform Installer 4.6 - Web Platform Installer.
4. If you are using Windows Server 2012, install the following software through Web Platform Installer, in this order:
    a. Internet Information Services (IIS) recommended configuration
    b. Enable Microsoft .NET Framework 3.5 SP 1 in Server Manager.
    c. .NET Framework 4.5 Extended, with ASP.NET for Windows 8
5. If you are using Windows Server 2012 R2, install the following software through Web Platform Installer, in this order:
    a. Enable Microsoft .NET Framework 3.5 SP 1 in Server Manager.
    b. .NET 4.5 Extended, with ASP.NET for Windows 8
    c. IIS recommended configuration
6. Install all available Windows and .NET Framework updates. Use Microsoft Update to ensure that you have all available updates installed.

Install Microsoft SQL Server

Windows Azure Pack requires an instance of Microsoft SQL Server to handle the management databases. Windows Azure Pack supports the following versions.

1. SQL Server 2008 Service Pack 3
2. SQL Server 2008 R2 Service Pack 2
3. SQL Server 2012 Service Pack 1

For an express deployment, you can use SQL Server Express on a machine in the Windows Azure Pack topology. For a distributed deployment in production, use the full version of SQL Server.

Important
You must enable SQL authentication on the SQL server before installing other Windows Azure Pack components. Also, if you are going to use Windows authentication during configuration you must add the current user as an administrator on the SQL server.

Required firewall ports

Windows Azure Pack automatically sets the following Windows firewall ports. If you use other firewall software, you'll need to manually set the ports.

For optimal security, you should further restrict access to the specific services that require it.

Windows Azure Pack services	Required firewall port	Scope
Admin API	30004	Any IP address
Management portal for administrators	30091	Any IP address
Authentication site	30071	Any IP address
Configuraton site	30101	Local subnet
Monitoring	30020	Any IP address
MySQL resource provider	30012	Any IP address
SQL Server or MySQL resource provider	30010	Any IP address
Tenant API	30005	Any IP address
Tenant public API	30006	Any IP address
Management portal for tenants	30081	Any IP address

Windows Azure Pack services	Required firewall port	Scope
Usage	30022	Any IP address
WebAppGallery	30018	Any IP address
Windows authentication site	30072	Any IP address

Install an express deployment of Windows Azure Pack

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.

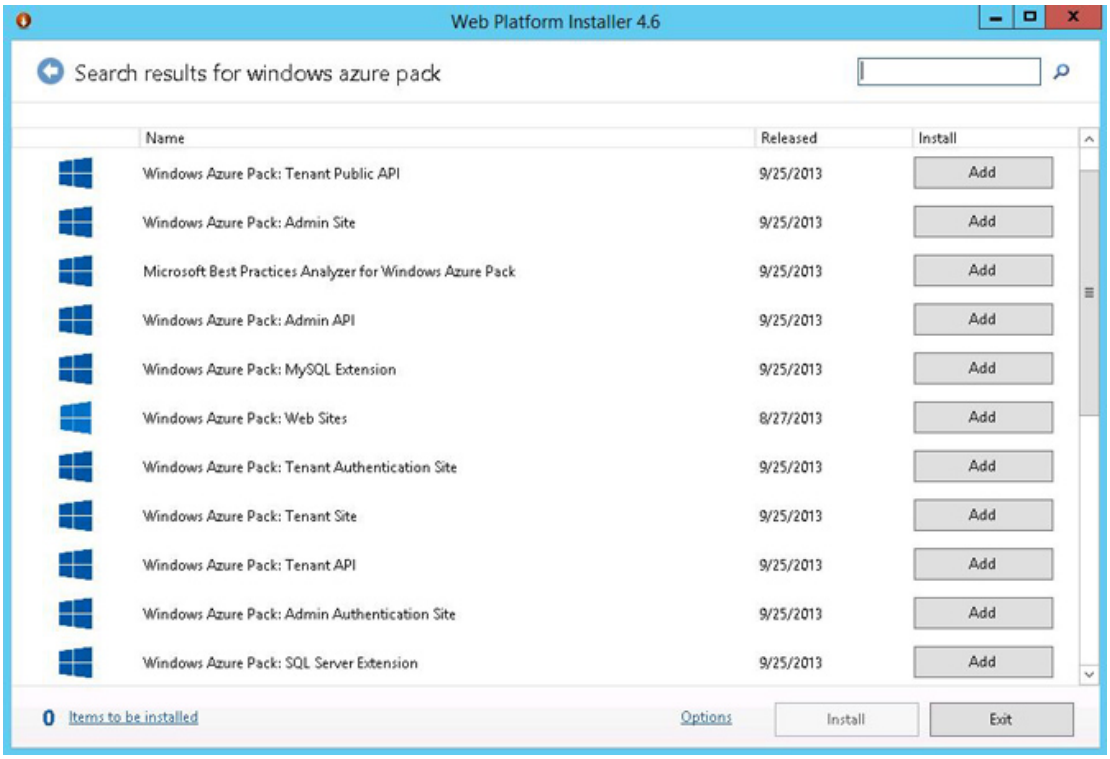
Before you install the Windows Azure Pack Express, ensure that you have complied with the Windows Azure Pack installation requirements.

Use the **Portal and API Express** option to install the following components on one machine:

- Admin API
- Tenant API
- Tenant public API
- Admin authentication site
- Tenant authentication site
- Admin site (management portal for administrators)
- Tenant site (management portal for tenants)

To install the Portal and API Express option

1. Log on to the machine on which you want to install your proof-of-concept deployment. If you followed the recommended naming scheme, log on to WAPPortal.
2. Start the Web Platform Installer.
3. Type *Windows Azure Pack* in the search box. Click **Add** next to **Windows Azure Pack: Portal and API Express**, and then click **Install**.



4. Accept the terms and conditions on the **Prerequisites** page.

   Indicate whether you want to use Microsoft Update to keep Windows Azure Pack up to date. We recommend that you do use Microsoft Update. This ensures that any fixes we need to create are automatically installed.

   The installation begins.

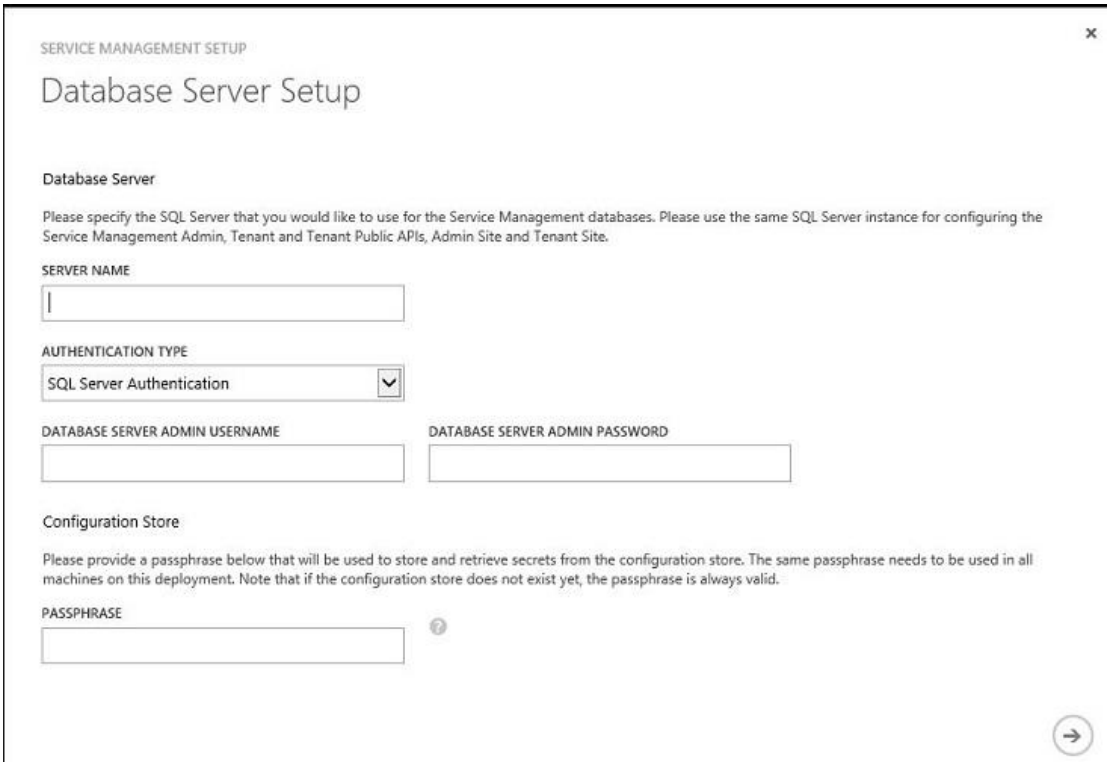
   Your machine might restart during the installation.

5. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the Service Management Configuration site.
6. The Configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

7. On the **Database Server Setup** page, enter the name of the database server or instance of Microsoft SQL Server.



8. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

   If you select SQL Server Authentication, enter the database server administrator user name and password.

9. Enter a passphrase that is to be used to encrypt and to decrypt data in the Configuration Store. Enter the passphrase again to confirm it, and then click the next arrow.

   Important

   Ensure that you write down the passphrase. If you forget or lose this passphrase, there is no way to recover it.

10. The features that are to be installed are listed on the **Features Setup** page.

    After the features are successfully configured, click the check mark in the bottom right corner of the **Features Setup**.

11. To go to the management portal for administrators, open an internet browser and go to https://localhost:30091/#Workspaces/WebSystemAdminExtension/quickStart.

    Note

    You might have to log out of your system and log back on before you can access the management portal for administrators. This requirement is due to Windows Authentication and the requirement to add the security group to your security token.

    If you continue to get an "Access denied" error message, even after you log back

on, close all Internet Explorer windows. Run Internet Explorer as an administrator.

12. To go to the management portal for tenants, open an internet browser and go to https://localhost: 30081/#Workspaces/All/dashboard.
13. The first time that you log on to either the management portal for administrators or the management portal for tenants, a tour of the portal is displayed. Click through the pages in the tour for an introduction to the management portal.

Next steps

- At this point, you have installed the required components of your Windows Azure Pack Express deployment. If you want to add services, such as Windows Azure Pack: Web Sites or Virtual Machine Clouds, to your proof-of-concept, you will have to install them on different machines. For more information, see **Provision and configure services in Windows Azure Pack**.

Install a distributed deployment of Windows Azure Pack

A production environment installation of Windows Azure Pack for Windows Server requires a distributed deployment. In such a deployment, required and optional components of Windows Azure Pack are installed on multiple machines. For more information, see Windows Azure Pack architecture. For information about hardware and software prerequisites, see Windows Azure Pack installation requirements.

All components are installed by using the Microsoft Web Platform Installer.

Follow these steps to install a distributed deployment:

1. Install the Windows Azure Pack Service Management APIs
2. Install the Windows Azure Pack management portals
3. Install the authentication sites
4. Upgrade from the Preview version of Windows Azure Pack
5. OPTIONAL: Configure Active Directory Federation Services for Windows Azure Pack
6. OPTIONAL: Decide which services to deploy, such as Windows Azure Pack: Web Sites, Automation, Virtual Machine Clouds, SQL and MySQL. For more information see, **Provision and configure services in Windows Azure Pack**.
7. Test your deployment.
8. Post-installation best practices

Install the Windows Azure Pack Service Management APIs

The Windows Azure Pack for Windows Server Service Management API includes three separate components:

- Windows Azure Pack: Admin API
- Windows Azure Pack: Tenant API
- Windows Azure Pack: Tenant Public API

For security reasons, you should install the Windows Azure Pack Admin API and the Windows Azure Pack Tenant API on machines that are behind a firewall or that are otherwise not accessible by the public. The Windows Azure Pack Tenant Public API should not be installed behind a firewall.

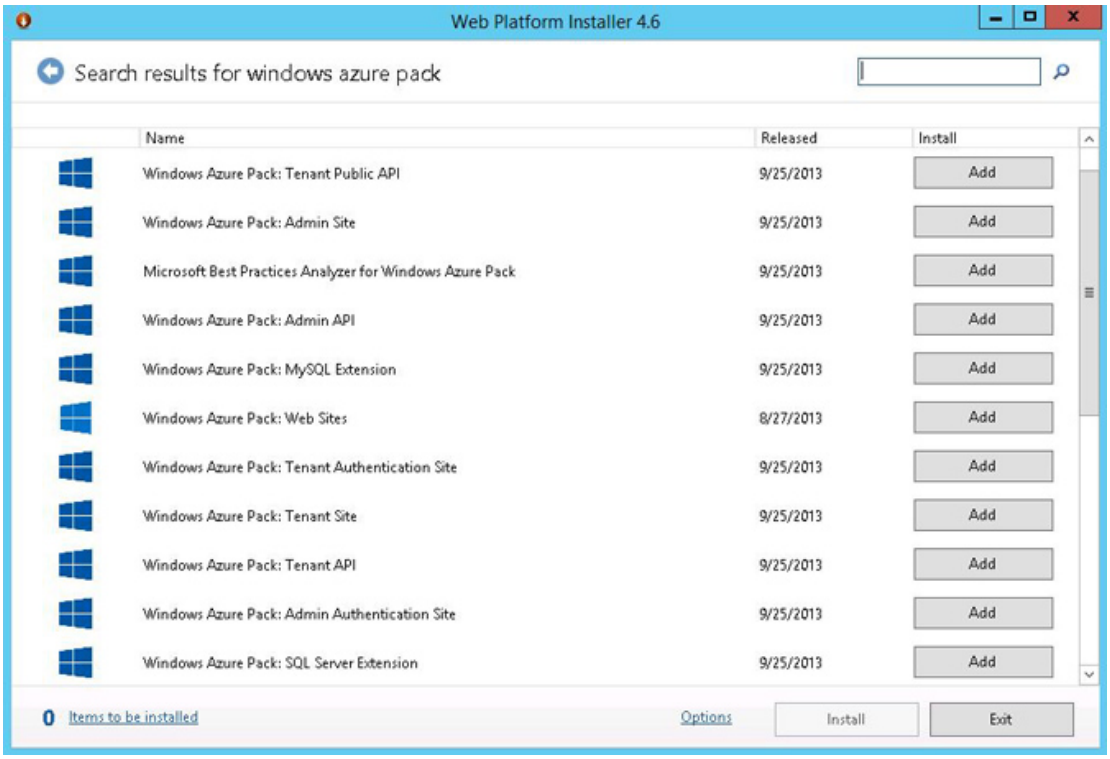
API component	Sample machine name	Publicly accessible?
Admin API	WAPAdminAPI	No
Tenant API	WAPTenantAPI	No
Tenant Public API	WAPTenPubAPI	Yes

For more information about suggested machine configurations, see Windows Azure Pack architecture.

You must complete the following steps three times, one time for each API component, the Admin API, the Tenant API, and the Tenant Public API.

To install the Admin API, Tenant API, and Tenant Public API

1. Ensure that the machine on which you want to install the API complies with all the hardware and software prerequisites that are listed in the Windows Azure Pack installation requirements.
2. Log on to the machine on which you want to install the API. If you followed the recommended Naming conventions, log on to WAPAdminAPI, WAPTenantAPI, or WAPTenPubAPI.
3. Start the Microsoft Web Platform Installer.
4. Type *Windows Azure Pack* in the search box. Click **Add** next to the Service Management API component that you want to install, for example, **Windows Azure Pack: Admin API**, and then click **Install**.



5. Review the software to be installed. To view the privacy information for each component, click **Privacy Terms**.

   To accept the terms and conditions on the **Prerequisites** page, click **I Accept**.

6. On the next page, scroll down and indicate whether you want to use Microsoft Update to keep the Windows Azure Pack component up to date. Then click **Continue**.

   Tip

   We recommend that you do use Microsoft Update. This ensures that any fixes we need to create for the Windows Azure Pack component are automatically installed.

   The installation begins.

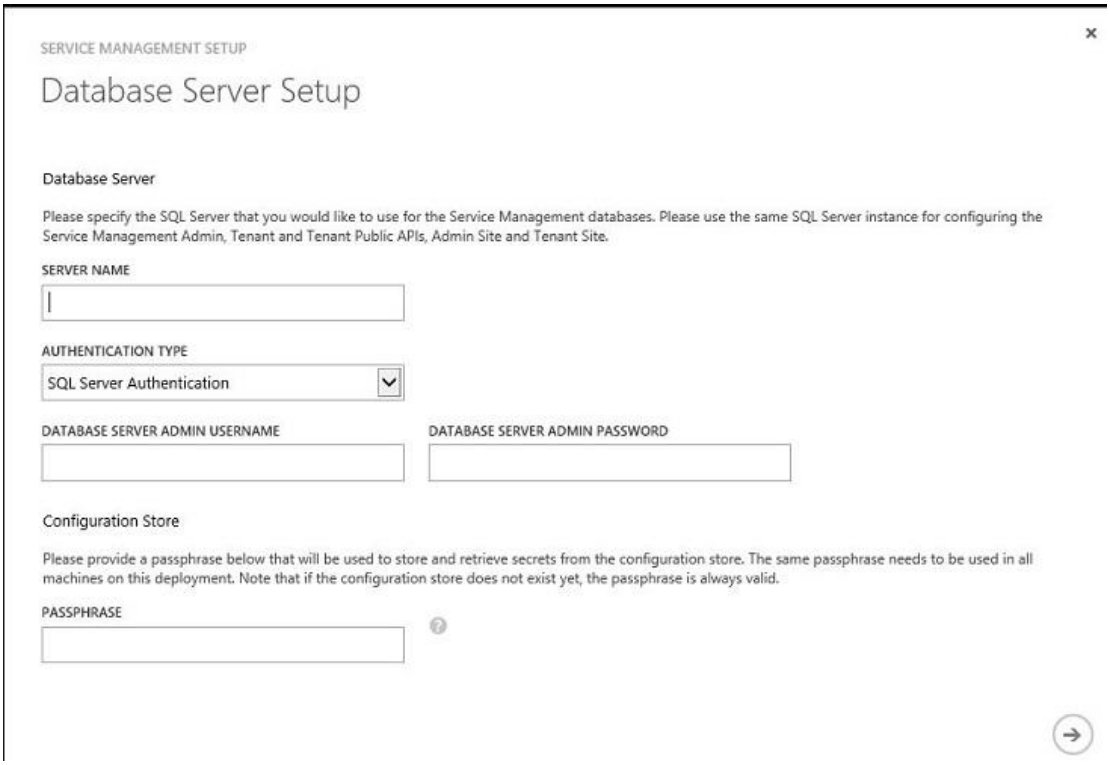
7. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.

8. The configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

9. On the **Database Server Setup** page, enter the name of the database server.



10. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

    If you select SQL Server Authentication, enter the database server administrator user name (sa) and password.

11. Enter a passphrase that is to be used to encrypt and to decrypt data in the Configuration Store, and then click the next arrow.

    Important
    Ensure that you write down the passphrase. Each component must use the same passphrase. If you forget or lose this passphrase, there is no way to recover it.

12. Indicate whether you want to participate in the Customer Experience Improvement Program (CEIP), and then click the next arrow.

    Warning
    If possible, please participate in the CEIP. We use the data collected by CEIP (data that contains no personal information) to understand how you are using the controller and to identify any issues that you run into.

13. Review the features and then click the check mark in the bottom right corner of the **Features Setup** page.
14. After the features are successfully configured, click the check mark in the bottom right corner of the **Features Setup** page.
15. In the Web Platform Installer, click **Finish**.
16. Repeat these steps for each of the Service Management APIs, Admin API, Tenant API, and Tenant Public API.

Next steps

- After you installed each of the API components, you should install the management portal for administrators and management portal for tenants, as described in Install the Windows Azure Pack management portals.

Install the Windows Azure Pack management portals

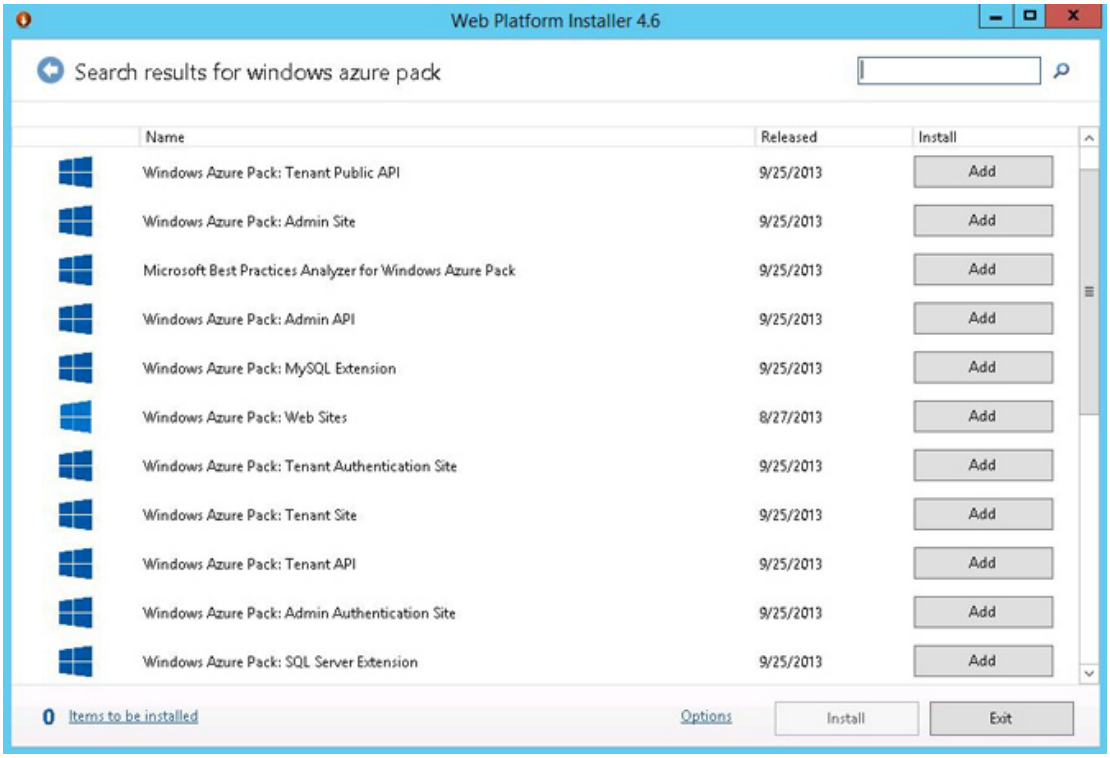
Before users can interact with Windows Azure Pack, either as administrators or as tenants, you must install the management portal for administrators and the management portal for tenants.

To install the management portal for administrators

1. Ensure that the machine on which you want to install the management portal for administrators complies with all the hardware and software prerequisites that are listed in

Windows Azure Pack installation requirements.

2. Log on to the machine on which you want to install the management portal for administrators. If you followed the recommended Naming conventions, log on to WAPAdmin.
3. Start the Microsoft Web Platform Installer.
4. Type *Windows Azure Pack* in the search box. Click **Add** next to **Windows Azure Pack: Admin Site**, and then click **Install**.



5. Review the software to be installed. To view the privacy information for each component, click **Privacy Terms**.

   To accept the terms and conditions on the **Prerequisites** page, click **I Accept**.
6. On the next page, scroll down and indicate whether you want to use Microsoft Update to keep the Windows Azure Pack component up to date. Then click **Continue**.

   Tip

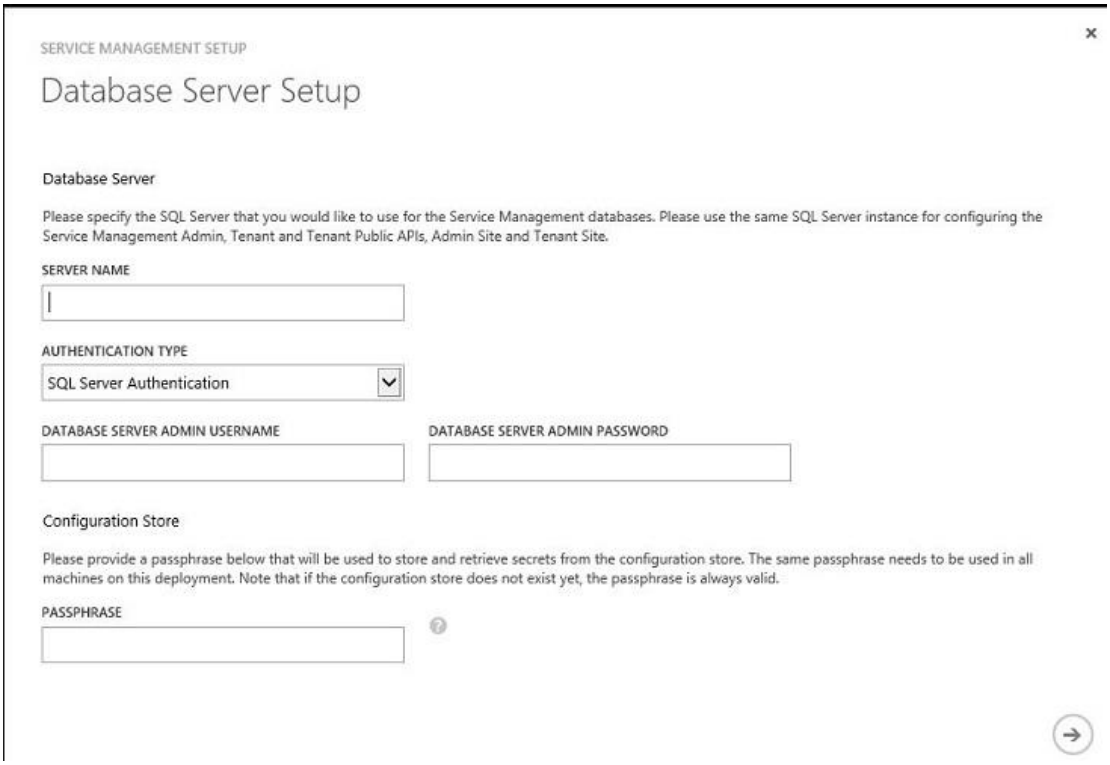
   We recommend that you do use Microsoft Update. This ensures that any fixes we need to create for the Windows Azure Pack component are automatically installed.

   The installation begins.
7. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the management portal.
8. The configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

9. On the **Database Server Setup** page, enter the name of the database server.



10. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

    If you select SQL Server Authentication, enter the database server administrator user name (sa) and password.

11. Enter a passphrase to be used to encrypt and decrypt data in the Configuration Store, and then click the next arrow.

    Important
    Ensure that you write down the passphrase. Each component must use the same passphrase. If you forget or lose this passphrase, there is no way to recover it.

12. Indicate whether you want to participate in the Customer Experience Improvement Program (CEIP), and then click the next arrow.

    Warning
    If possible, please participate in the CEIP. We use the data collected by CEIP (data that contains no personal information) to understand how you are using the controller and to identify any issues that you run into.

13. Review the features and then click the check mark in the bottom right corner of the **Features Setup** page.
14. In the Web Platform Installer, click **Finish**.
15. Open an internet browser and go to https://localhost:30091/#Workspaces/WebSystemAdminExtension/quickStart.
16. If you have not yet deployed the Service Management API in the environment, you get a notification that the management portal requires the Service Management API. In this case, your next step is to deploy the Service Management API.

    After you deploy the Service Management API, return to this machine, and then click **Try Again** to open the management portal for administrators.

    Note
    You might have to log out of your system and log back on before you can access the Service management portal for administrators. This step is due to Windows Authentication and the requirement to add the security group to your security token.

    If you continue to see an "Access denied" error, even after you log back on, close all Internet Explorer windows, and run Internet Explorer as an administrator.

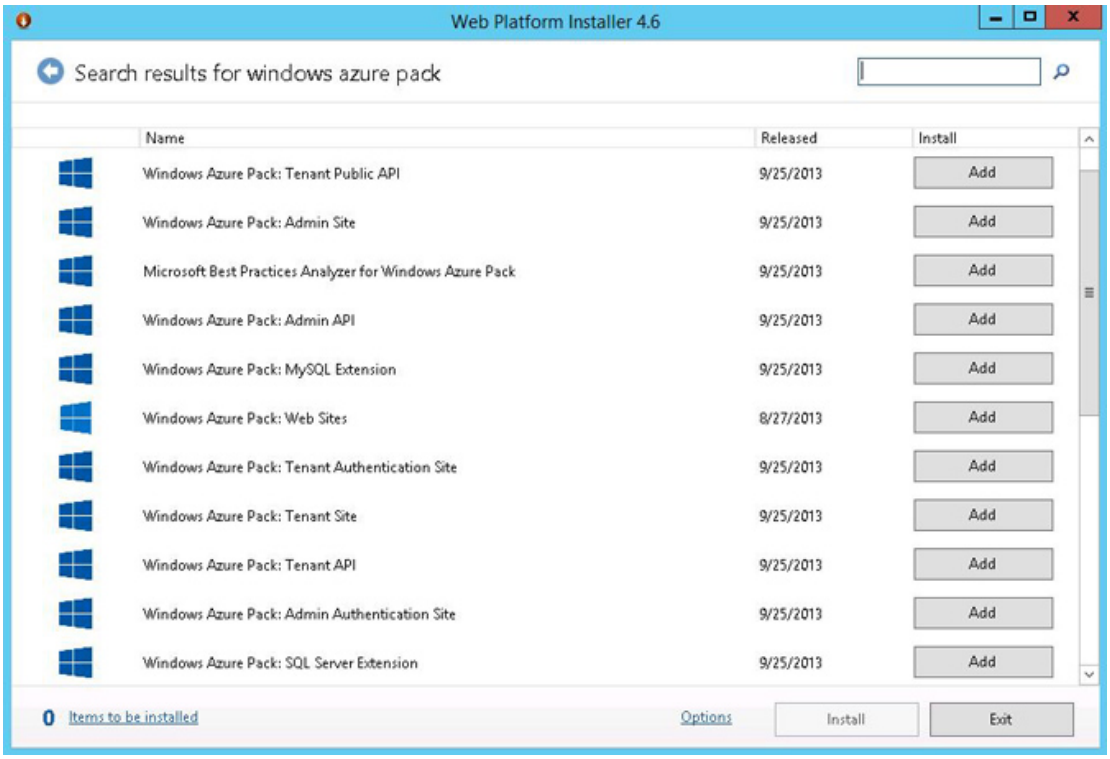
17. The first time that you log on to the management portal for administrators, a tour of the portal is displayed. Click through the pages in the tour for an introduction to the portal.
18. For the next step, see **Install the service management portal for tenants**.

To install the management portal for tenants

1. Ensure that the machine on which you want to install the management portal for tenants complies with all the hardware and software prerequisites that are listed in Windows

Azure Pack installation requirements.

2. Log on to the machine on which you want to install the management portal for tenants. If you followed the recommended Naming conventions, log on to WAPTenant.
3. Start the Web Platform Installer.
4. Type *Windows Azure Pack* in the search box. Click **Add** next to **Windows Azure Pack: Tenant Site**, and then click **Install**.



5. Review the software to be installed. To view the privacy information for each component, click **Privacy Terms**.

   To accept the terms and conditions on the **Prerequisites** page, click **I Accept**.
6. On the next page, scroll down and indicate whether you want to use Microsoft Update to keep the Windows Azure Pack component up to date. Then click **Continue**.

   Tip

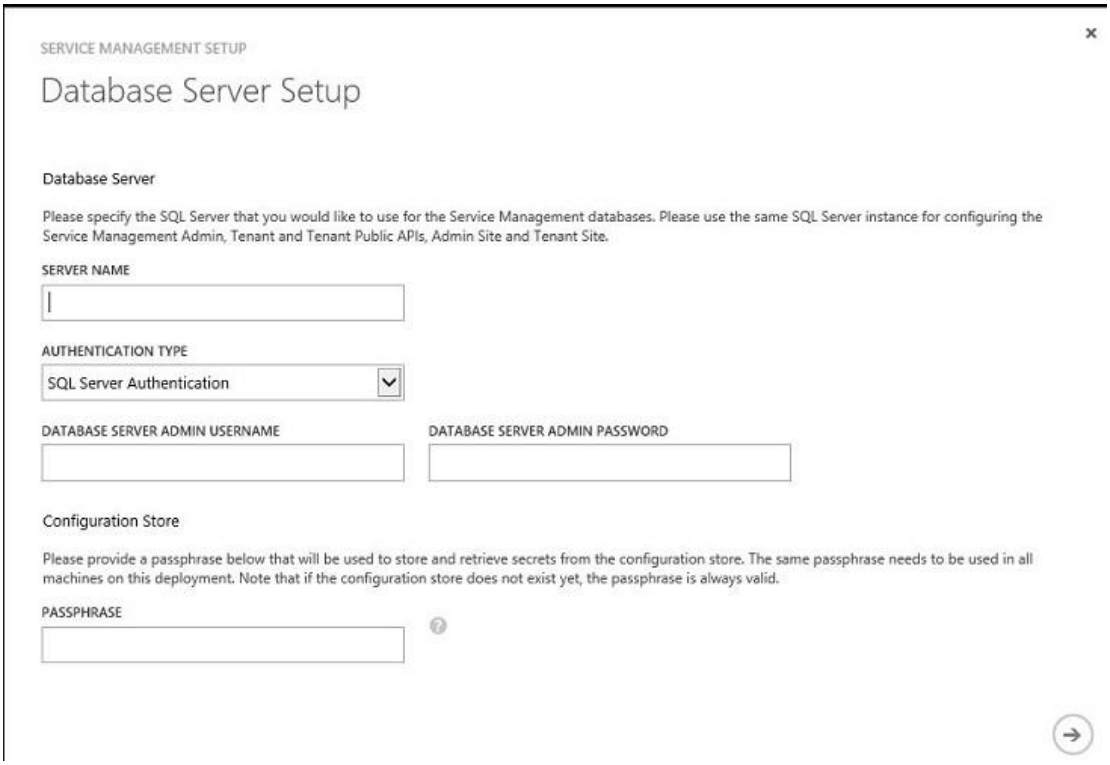
   We recommend that you do use Microsoft Update. This ensures that any fixes we need to create for the Windows Azure Pack component are automatically installed.

   The installation begins.
7. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the management portal.
8. The configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

9. On the **Database Server Setup** page, enter the name of the database server.



10. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

    If you select SQL Server Authentication, enter the database server administrator user name (sa) and password.

11. Enter a passphrase that is to be used to encrypt and to decrypt data in the Configuration Store, and then click the next arrow.

    Important
    Ensure that you write down the passphrase. Each component must use the same passphrase. If you forget or lose this passphrase, there is no way to recover it.

12. Indicate whether you want to participate in the Customer Experience Improvement Program (CEIP), and then click the next arrow.

    Warning
    If possible, please participate in the CEIP. We use the data collected by CEIP (data that contains no personal information) to understand how you are using the controller and to identify any issues that you run into.

13. Review the features and then click the check mark in the bottom right corner of the **Features Setup** page.
14. In the Web Platform Installer, click **Finish**.
15. Open an internet browser and go to https://localhost: 30081/#Workspaces/All/dashboard.
16. The first time that you log on to the management portal for tenants, a tour of the portal is displayed. Click through the pages in the tour for an introduction to the portal.

Optional: Enable HTTP endpoints on the management portal for administrators and management portal for administrators for HTTP-HTTPS redirection

- By default, the management portals are configured to use only HTTPS. The Web.config file for each portal website contains a redirect rule to route all HTTP traffic to HTTPS, but this redirect is only of use if the respective portals are bound to a valid HTTP endpoint. To accept traffic over HTTP port 80, the portal websites must be manually configured with additional bindings. Complete the following steps to enable the portal websites to accept traffic on HTTP port 80 and enable redirection of this traffic by using the redirect rule in the Web.config file:
  a. Replace the self-signed Secure Sockets Layer (SSL) certificate that is used by the management portal websites with a certificate that is issued by a recognized trusted root certification authority (CA).
  b. Add an HTTP site binding on port 80 for the management portal websites.
  c. Modify the existing HTTPS site bindings on port 30091 for the management portal for administrators and on port 30081 for the management portal for tenants with HTTPS site bindings on the default port of 443.

Optional: Configure the certificates for the management portal for tenants to ensure WebMatrix "One-click" installation functionality

- If the management portal for tenants is configured to use an untrusted certificate, end users cannot install Microsoft WebMatrix from the tenant portal and instead receive an error message. To address this issue and ensure that end users can complete a "One-click" installation of WebMatrix, replace the default self-signed SSL certificate that is used by the tenant portal website with a certificate that is issued by a trusted root certification authority.

Verify TCP/IP configuration of administrator and tenant portal websites

- By default, the management portals are configured to use only HTTPS that is bound to port 30091 and to port 30081 respectively. Ensure that the management portal websites are bound to a TCP/IP port that end users and system administrators expect, such as port 443 for HTTPS and port 80 for HTTP.

Next steps

- After you have installed each of the management portals, you should install the administrator and tenant authentication sites, as described in Install the authentication sites.

Install the authentication sites

Windows Azure Pack for Windows Server uses the following authentication services.

Component	Sample machine name	Default authentication service	Optional authentication service
Management portal for administrators	WAPAdminAuth	Windows Authentication	Active Directory Federation Services
Management portal for tenants	WAPTenantAuth	ASP.Net Membership Provider	Active Directory Federation Services

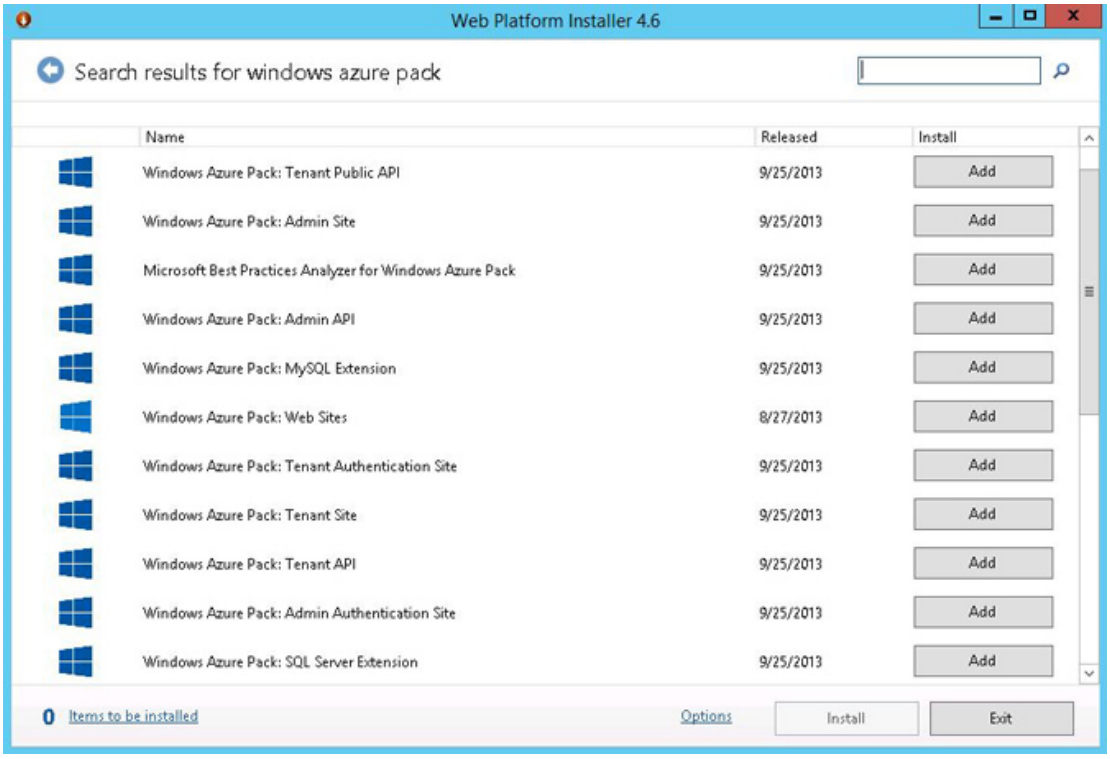
By default, Windows Azure Pack uses Windows Authentication for the management portal for administrators. You also have the option of using Active Directory Federation Services (AD FS) to authenticate users. For more information, see Configure Active Directory Federation Services for Windows Azure Pack.

To install the admin authentication site

1. Ensure that the machine on which you want to install the admin authentication site

complies with all the hardware and software prerequisites that are listed in the Windows Azure Pack installation requirements.

2. Log on to the machine on which you want to install the admin authentication site. If you followed the recommended Naming conventions, log on to WAPAdminAuth.
3. Start the Microsoft Web Platform Installer.
4. Type *Windows Azure Pack* in the search box. Click **Add** next to **Windows Azure Pack: Admin Authentication Site**, and then click **Install**.



5. Review the software to be installed. To view the privacy information for each component, click **Privacy Terms**.

   To accept the terms and conditions on the **Prerequisites** page, click **I Accept**.
6. On the next page, scroll down and indicate whether you want to use Microsoft Update to keep the Windows Azure Pack component up to date. Then click **Continue**.

   Tip

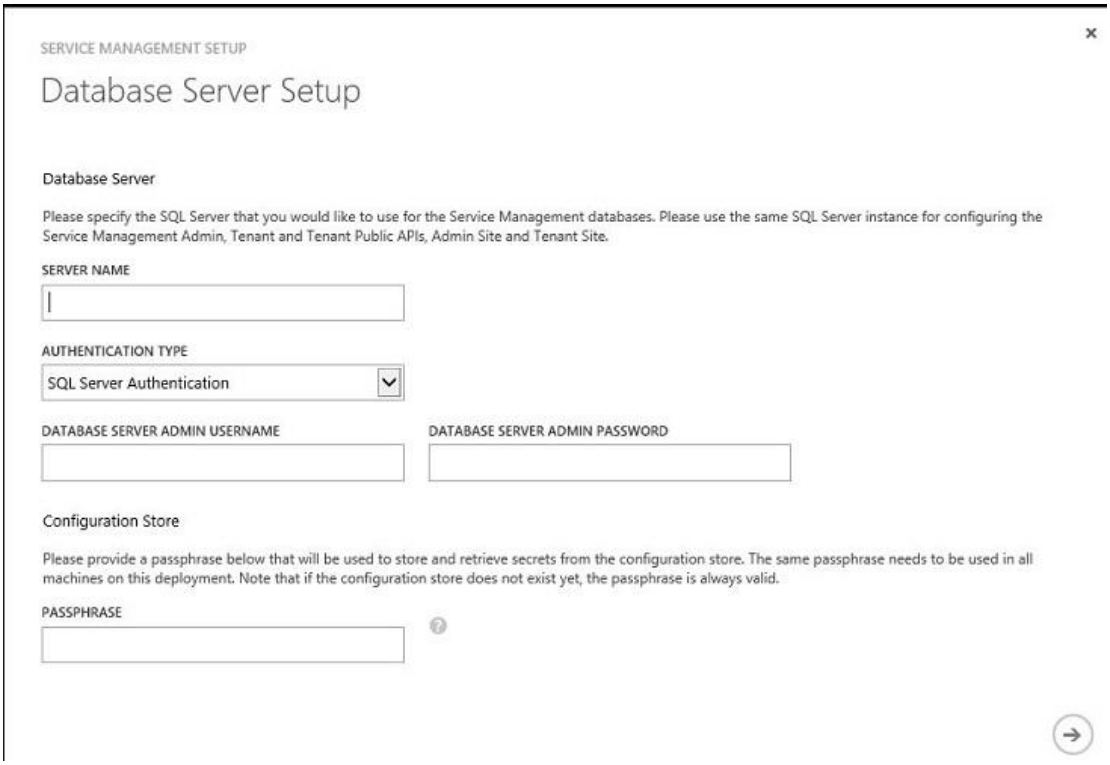
   We recommend that you do use Microsoft Update. This ensures that any fixes we need to create for the Windows Azure Pack component are automatically installed.

   The installation begins.
7. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the configuration site.
8. The configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

9. On the **Database Server Setup** page, enter the name of the database server.



10. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

    If you select SQL Server Authentication, enter the database server administrator user name (sa) and password.

11. Enter the passphrase for the Configuration Store, and then click the next arrow.

    Important
    Ensure that you write down the passphrase. Each component must use the same passphrase. If you forget or lose this passphrase, there is no way to recover it.

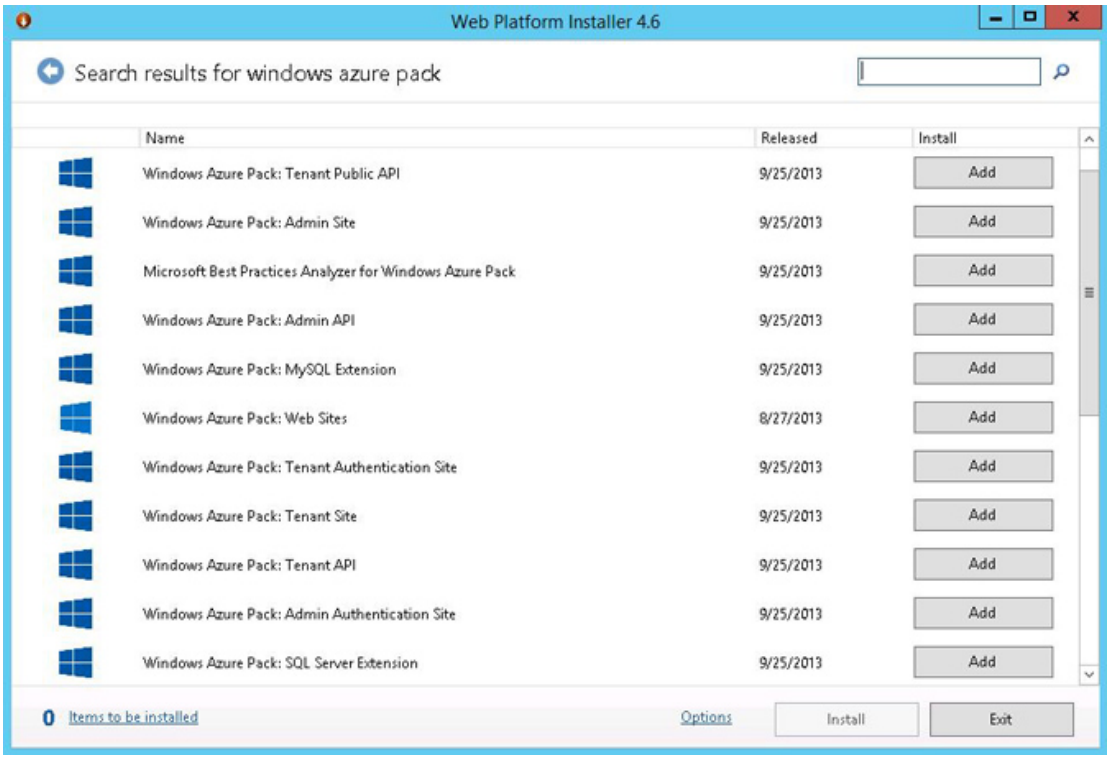
12. Indicate whether you want to participate in the Customer Experience Improvement Program (CEIP), and then click the next arrow.

    Tip
    If possible, please participate in the CEIP. We use the data collected by CEIP (data that contains no personal information) to understand how you are using the controller and to identify any issues that you run into.

13. Review the features and then click the check mark in the bottom right corner of the **Features Setup** page.
14. In the Web Platform Installer, click **Finish**.

To install the tenant authentication site

1. Ensure that the machine where you want to install the tenant authentication site complies with all the hardware and software prerequisites listed in the Windows Azure Pack installation requirements.
2. Log on to the machine on which you want to install the tenant authentication site. If you followed the recommended Naming conventions, log on to WAPTenantAuth.
3. Start the Web Platform Installer.
4. Type *Windows Azure Pack* in the search box. Click **Add** next to **Windows Azure Pack: Tenant Authentication Site**, and then click **Install**.



5. Review the software to be installed. To view the privacy information for each component, click **Privacy Terms**.

   To accept the terms and conditions on the **Prerequisites** page, click **I Accept**. The installation begins.

6. On the next page, scroll down and indicate whether you want to use Microsoft Update to keep the Windows Azure Pack component up to date. Then click **Continue**.

   Tip

   We recommend that you do use Microsoft Update. This ensures that any fixes we need to create for the Windows Azure Pack component are automatically installed.

   The installation begins.

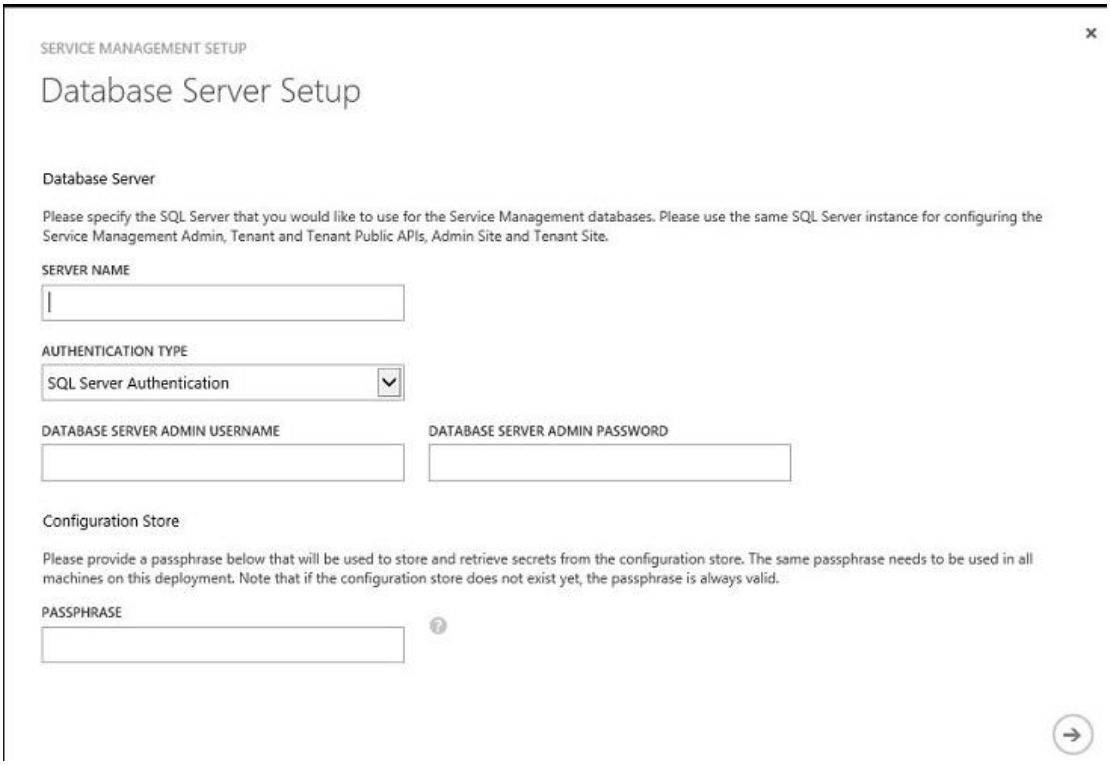
7. When the installation is completed, ensure that all Internet Explorer windows are closed, and then click **Continue** to start the Configuration site.

8. The Configuration site https://localhost:30101/ opens in Internet Explorer. If the Internet Explorer security certificate warning page is displayed, click **Continue to this website**.

Tip

If you need to restart Internet Explorer, be sure to use the **Run as administrator** option.

9. On the **Database Server Setup** page, enter the name of the database server.



10. Select the type of authentication that you want to use, SQL Server Authentication or Windows Authentication.

    If you select SQL Server Authentication, enter the database server administrator user name (sa) and password.

11. Enter the passphrase for the Configuration Store, and then click the next arrow.

    Important
    Ensure that you write down the passphrase. Each component must use the same passphrase. If you forget or lose this passphrase, there is no way to recover it.

12. Indicate whether you want to participate in the Customer Experience Improvement Program (CEIP), and then click the next arrow.

    Tip
    If possible, please participate in the CEIP. We use the data collected by CEIP (data that contains no personal information) to understand how you are using the controller and to identify any issues that you run into.

13. Review the features and then click the check mark in the bottom right corner of the **Features Setup** page.
14. In the Web Platform Installer, click **Finish**.

Next steps

- At this point, you have installed the required components of your Windows Azure Pack deployment. If you want to add services, such as Windows Azure Pack: Web Services, see **Provision and configure services in Windows Azure Pack**.

Upgrade from the Preview version of Windows Azure Pack

If you want to upgrade your express or distributed deployment from the preview version to the new version, follow these steps:

To upgrade from preview to Windows Server version of Windows Azure Pack

1. On each machine running a Windows Azure Pack component, stop all sites and IIS services.
2. To enable rollback in case of problems during the upgrade, back up all sites, virtual machines, and databases. The upgrade process does not automatically back up the current running versions of Windows Azure Pack components.
3. If you have created a custom theme for your tenant portal, follow these steps:

a. Create a new folder named app_CustomTheme on the tenant machine:

   C:\inetpub\MgmtSvc-TenantSite\app_CustomTheme

b. On the tenant machine, copy the content folder from the custom theming kit to C:\inetpub\MgmtSvc-TenantSite\app_CustomTheme

4. Locate and record the connection string information for the existing preview databases along with the current passphrase. Without this information, the upgrade will install a new installation instead of upgrading the previous version.
5. Using Windows Platform Installer, install the latest version of Windows Azure Pack components.

   If you are upgrading an express deployment, you can install the upgrade on the machine hosting your express deployment as explained in Install an express deployment of Windows Azure Pack. During configuration, be sure to use the existing preview database and current passphrase.

   If you are upgrading a distributed deployment, you must install the appropriate components on each machine in your deployment. Follow the instructions in Install a distributed deployment of Windows Azure Pack. During configuration, be sure to use the existing preview database and current passphrase.
6. The upgrade will automatically update your deployment to the new version, keeping your user, plan, and account data intact, with the following exceptions.
   - All tenant passwords must be reset.
   - The upgrade process resets IIS settings (including custom ports and host headers) of the portal and API machines to their default values. If you want to use non-default values you must manually reset them.
   - The upgrade process resets firewalls to default settings. If you want to use non-default firewall rules you must manually add them for tenant and API endpoints.

Next steps

- If you have optional components of Windows Azure Pack deployed be sure to consult the deployment guides for those services for information about upgrading to the new version of Windows Azure Pack for Windows Server.
  - **Deploy Windows Azure Pack: Web Sites**
  - Integrate Service Bus into Windows Azure Pack
  - **Provision Virtual Machine Clouds**
  - **Deploy Service Management Automation**
  - **Using SQL Server or MySQL with Windows Azure Pack**

Configure Active Directory Federation Services for Windows Azure Pack

By default, Windows Azure Pack for Windows Server uses the following authentication.

Service	Default authentication
Management portal for administrators	Windows authentication
Management portal for tenants	ASP.Net membership provider

Instead of using these default authentication types, you also have the option to configure Windows Azure Pack to use Windows Azure Active Directory Federation Services (AD FS) for authentication as described in the following steps.

Note
The following information assumes that you do not already have AD FS configured in your environment. If you have AD FS configured, you can skip the first step and proceed directly to **Configure AD FS to trust the management portals**.

1. Configure AD FS
2. Configure the management portals to trust AD FS
3. Configure the tenant authentication site to trust AD FS
4. Configure AD FS to trust the management portals

Best practices

Review the following best practices before you configure AD FS.

- The format of user groups that are provided by the AD FS installation should match the format that is entered in the UI. The prescribed format for adding AD groups as co-administrators is domain\alias.
- The subscription owner should be an individual user and not a group.
- It is generally a good practice to use an email address as the unique identifier. Custom Claims generators allow a GUID or other unique identifiers but their use complicates adding co-administrators or adding individual users and should generally be avoided.
- By default, AD FS sets a cookie on the client end to track the user's selection for authentication methods. You can disable this action by running the following AD FS Windows PowerShell cmdlet:

```
Set-ADFSWebConfig –HRDCookieEnabled $false
```

Configure AD FS

As the first step of enabling Windows Azure Active Directory Federation Services (AD FS) for Windows Azure Pack for Windows Server, you must configure AD FS as explained in the following steps.

To configure AD FS

1. If you use an existing AD FS, do the following:
   a. In AD FS, use the following address to add the management portal for administrators and management portal for tenants as relying parties:

      <Portal URI>/federationMetadata/2007-06/Federationmetadata.xml

      Replace <Portal URI> with the addresses of the management portal for administrators and the management portal for tenants.

      For example, https://www.contosotenant.com/federationMetadata/2007-06/Federationmetadata.xml
   b. Apply the following transformation rules to the management portal for tenants:
      - Transform AD Groups to 'Groups' Claims
      - Transform email address to UPN Claims
   c. Skip the remaining steps and go to **Configure the management portals to trust AD FS**.
2. If you are setting up a new AD FS, on the machine that you want to use for AD FS, enable the AD FS role.
3. Log on to the machine as the domain administrator. You have two options to configure AD FS: Run the `Install-AdfsFarm` cmdlet or run a script.
   - Run the `Install-AdfsFarm` cmdlet to configure AD FS.

     ```
     Install-AdfsFarm –CertificateThumbprint <String> -
     FederationServiceName <String> -ServiceAccountCredential
     <PSCredential> -SQLConnectionString <String>
     ```

     You must provide the following information to run the `Install-AdfsFarm` cmdlet.

Cmdlet parameter	Information needed
–CertificateThumbprint	Secure Socket Layer (SSL) Certificate thumbprint. The certificate should be installed in the <local_machine>\My store.
-FederationServiceName	Fully qualified domain name (FQDN) of

	the AD FS service.
-ServiceAccountCredential	The domain service account to run AD FS.
-SQLConnectionString	SQL connection string to an instance of a Microsoft SQL Server to host the AD FS databases.

- Or, run the following script to configure AD FS.

  Note
  You must install makecert.exe before running this script. Alternatively, you can use IIS to create a self-signed certificate and pass the thumbprint in this script.

```
# Set these values:
$domainName = 'contoso.com'
$adfsPrefix = 'AzurePack-adfs'
$username = 'username'
$password = 'password'
$dnsName = ($adfsPrefix + "." + $domainName)

# Generate Self Signed Certificate
Import-Module -Name 'PKI','WebAdministration'
# You must install makecert.exe before running this script.
Alternatively use the IIS UI to create a self-signed
certificate and pass the thumbprint in this script

$item = Get-Item -Path 'IIS:\SslBindings\0.0.0.0!443' -
ErrorAction SilentlyContinue
if (!$item)
{
MakeCert.exe -n "CN=$dnsName" -r -pe -sky exchange -ss My -sr
LocalMachine -eku 1.3.6.1.5.5.7.3.1
cert = ,(Get-ChildItem 'Cert:\LocalMachine\My' | Where-Object
{ $_.Subject -eq "CN=$dnsName" })[0]
}
```

```
$thumbprint = $cert.Thumbprint
$securePassword = ConvertTo-SecureString -String $password -
Force -AsPlainText
$adfsServiceCredential = New-Object -TypeName
System.Management.Automation.PSCredential -ArgumentList
($domainname + '\' + $username), $securePassword

# If you want to install AD FS with a database, provide this
data. Otherwise it will install with the Windows Internal
Database (which should be enabled
# prior to configuring AD fS)
$dbServer = 'AzurePack-SQl'
$dbUsername = 'sa'
$dbPassword = '<SQL_password>'
$adfsSqlConnectionString = [string]::Format('Data
Source={0};Initial Catalog=master;User ID={1};Password={2}',
$dbServer, $dbUsername, $dbPassword)

# Configure AD FS
Install-AdfsFarm `
    -CertificateThumbprint $thumbprint `
    -FederationServiceName $dnsName `
    -ServiceAccountCredential $adfsServiceCredential `
    -SQLConnectionString $adfsSqlConnectionString `
    -OverwriteConfiguration
```

Next steps

- Configure the management portals to trust AD FS

Configure the management portals to trust AD FS

After you configure Active Directory Federations Services (AD FS), you must configure management portal for administrators and management portal for tenants to trust AD FS. You can either run the `Set-MgmtSvcRelyingPartySettings` cmdlet or run a Windows PowerShell script.

Option 1: Run the Set-MgmtSvcRelyingPartySettings cmdlet

1. Run the `Set-MgmtSvcRelyingPartySettings` cmdlet on each machine where the administrator or tenant portal is installed.

   Before you run the `Set-MgmtSvcRelyingPartySettings` cmdlet, ensure that the machine that you configure can access the AD FS web service metadata endpoint. To verify access, open a browser and go to the same URI that you plan to use for the –MetadataEndpoint parameter. If you can view the .xml file, you can access the federation metadata endpoint.
2. Now, run the `Set-MgmtSvcRelyingPartySettings` cmdlet.

```
Set-MgmtSvcRelyingPartySettings -Target Tenant -
MetadataEndpoint https://<fqdn>/FederationMetadata/2007-
06/FederationMetadata.xml -DisableCertificateValidation -
ConnectionString 'Server=<some server>;User Id=<user with
write permissions to all config
databases>;Password=<password>;'
```

The following table shows required information to run the `Set-MgmtSvcRelyingPartySettings` cmdlet.

Cmdlet parameter	Required information
-Target	This parameter is used to indicate which portal to configure. Possible values: *Admin*, *Tenant*.
-MetadataEndpoint	The AD FS web service metadata endpoint. Use a valid, accessible, and complete URI, in the following format: https://<AD FS>/FederationMetadata/2007-06/FederationMetadata.xml. In the following cmdlets, replace $fqdn with an accessible AD FS fully qualified domain name (FQDN).

-ConnectionString	The connection string to the instance of Microsoft SQL Server that hosts the management portal configuration database.

Option 2: Run a Windows PowerShell script

- Instead of using the cmdlet, you can run the following Windows PowerShell script on each machine where the administrator or tenant portal is installed.

```
$domainName = 'mydomain.com'
$adfsPrefix = 'AzurePack-adfs'

$dnsName = ($adfsPrefix + "." + $domainName)

# Enter Sql Server details here
$dbServer = 'AzurePack-sql'
$dbUsername = 'sa'
$dbPassword = '<SQL_password>'
$connectionString = [string]::Format('Data Source={0};User
ID={1};Password={2}', $dbServer, $dbUsername, $dbPassword)

# Note: Use the "DisableCertificateValidation" switch only in
test environments. In production environments,
# all SSL certificates should be valid.
Set-MgmtSvcRelyingPartySettings -Target Tenant `
-MetadataEndpoint https://$dnsName/FederationMetadata/2007-
06/FederationMetadata.xml `
-DisableCertificateValidation -ConnectionString
$connectionString
```

Add users to have access to the management portal for administrators

- If you want to add users to have access to the management portal for administrators, you must run the `Add-MgmtSvcAdminUser` cmdlet on the machine hosting the Admin API. The connection string should point to the Management Portal Configuration database.

  The following code example shows how users are added to get access.

```
$adminuser = 'domainuser1@mydomain.com'
$dbServer = 'AzurePack-sql'
$dbUsername = 'sa'
$dbPassword = 'SQL_Password'
$connectionString = [string]::Format('Server= {0} ;Initial
Catalog=Microsoft.MgmtSvc.Store;User
Id={1};Password={2};',$dbServer, $dbUsername, $dbPassword)

Add-MgmtSvcAdminUser -Principal $adminuser -ConnectionString
$connectionstring
```

Note

- The format of the $dbuser must match the user principal name (UPN) that is sent by AD FS.
- Administrator users must be individual users. You cannot add AD groups as administrator users.

Next steps

- Configure the tenant authentication site to trust AD FS

Configure the tenant authentication site to trust AD FS

The next step is to add information about Windows Azure Active Directory Federation Services (AD FS) to the tenant authentication sites. By default, the management portal for tenants uses ASP.NET Membership Provider authentication. You can choose to use the same ASP.NET Membership Provider as a Claims Provider in AD FS. To do this, you must run the `Set-MgmtSvcIdentityProviderSettings` cmdlet on any machine where the tenant authentication site is installed.

Option 1: Run the Set-MgmtSvcIdentityProviderSettings cmdlet

1. Ensure that the machine that you configure can access the AD FS web service metadata endpoint. To verify the access, open a browser and go to the same URI that you plan to use for the –MetadataEndpoint parameter. If you can view the .xml file, you can access the federation metadata endpoint.

2. Run the `Set-MgmtSvcIdentityProviderSettings` cmdlet on any machine where the authentication site is installed.

```
Set-MgmtSvcIdentityProviderSettings -Target Membership -
MetadataEndpoint https://< fqdn>/FederationMetadata/2007-
06/FederationMetadata.xml -DisableCertificateValidation -
ConnectionString 'Server=<some server>;User Id=<user with
write permissions to all config
databases>;Password=<password>;'
```

The following table shows required information to run the `Set-MgmtSvcIdentityProviderSettings` cmdlet.

Cmdlet parameter	Required information
-Target	This parameter is used to indicate which component to configure. Possible values: *Membership*, *Windows*.
-MetadataEndpoint	The AD FS web service metadata endpoint. Use a valid, accessible, and complete URI, in the following format: https://<AD FS>/FederationMetadata2007-06/FederationMetadata.xml. In the following cmdlets replace $fqdn with an accessible AD FS fully qualified domain name (FQDN).
-ConnectionString	The connection string to the instance of Microsoft SQL Server that hosts the portal and API database.

Option 2: Run a Windows PowerShell script

1. Ensure that the machine that you configure can access the AD FS web service metadata endpoint. To verify the access, open a browser and go to the same URI that you plan to use for the –MetadataEndpoint parameter. If you can view the .xml file, you can access the federation metadata endpoint.
2. Instead of using the cmdlet, you can run the following Windows PowerShell script.

```
$domainName = 'mydomain.com'
$adfsPrefix = 'AzurePack-adfs'

$dnsName = ($adfsPrefix + "." + $domainName)

# Enter Sql Server details here
```

```
$dbServer = 'AzurePack-sql'
$dbUsername = 'sa'
$dbPassword = '<SQL_password>'
$connectionString = [string]::Format('Data Source={0};User
ID={1};Password={2}', $dbServer, $dbUsername, $dbPassword)

# Note: Use the "DisableCertificateValidation" switch only in
test environments. In production environments, all
# SSL certificates should be valid.

Set-MgmtSvcIdentityProviderSettings -Target Membership `
-MetadataEndpoint https://$dnsName/FederationMetadata/2007-
06/FederationMetadata.xml `
 -DisableCertificateValidation `
-ConnectionString $connectionString `
```

Next steps

- Configure AD FS to trust the management portals

Configure AD FS to trust the management portals

The last step in the configuration of Windows Azure Active Directory Federation Services (AD FS) for Windows Azure Pack is to configure AD FS to trust the management portals.

Configure AD FS to trust the management portals

1. Ensure that the machine that you configure can access the AD FS web service metadata endpoint for the management portal for administrators. To verify access, open a browser and go to https://<AdminPortal_endpoint>/FederationMetadata/2007-06/FederationMetadata.xml, where <AdminPortal_endpoint> is the fully qualified domain name (FQDN) for the management portal for administrators. If you can view the .xml file, you can access the federation metadata endpoint.
2. Ensure that the machine that you configure can access the AD FS web service metadata endpoint for the management portal for tenants. To verify access, open a browser and go to https://<TenantPortal_endpoint>/FederationMetadata/2007-06/FederationMetadata.xml, where <TenantPortal_endpoint> is the FQDN for the

management portal for tenants. If you can view the .xml file, you can access the federation metadata endpoint.

3. OPTIONAL. If you want to use the ASP.NET Membership Provider as the default Claims Provider for the management portal for tenants in AD FS, ensure that the machine that you configure can access the AD FS web service metadata endpoint for the Tenant Authentication Site. To verify access, open a browser and go to https://<TenantAuth_endpoint>/FederationMetadata/2007-06/FederationMetadata.xml, where <TenantAuth_endpoint> is the FQDN for the Tenant Authentication Site. If you can view the .xml file, you can access the federation metadata endpoint.
4. Locate the configure-adfs.ps1 configuration script that is installed with Windows Azure Pack in C:\Program Files\Management Service\MgmtSvc-PowerShellAPI\Samples\Authentication\.
5. Run the configure-adfs.ps1 script on the machine where AD FS is installed.

```
$tenantSite = 'tenant-AzurePack.contoso.com:30081'
$adminSite = 'admin-AzurePack.contoso.com:30091'
$authSite = 'auth-AzurePack.contoso.com:30071'

# Note: Use the "allowSelfSignCertificates" switch only in
test environments. In production environments, all
# SSL certificates should be valid.
& "C:\Program Files\Management Service\MgmtSvc-
PowerShellAPI\Samples\configure-adfs.ps1" `
–identityProviderMetadataEndpoint
"https://$authSite/federationmetadata/2007-
06/federationmetadata.xml" `
-
tenantRelyingPartyMetadataEndpoint  "https://$tenantSite/fede
rationmetadata/2007-06/federationmetadata.xml" `
-adminRelyingPartyMetadataEndpoint
"https://$adminSite/federationmetadata/2007-
06/federationmetadata.xml" `
–allowSelfSignCertificates
```

Replace <tenantSite> and <adminSite> with the locations for the management portal for tenants and the management portal for administrators. If you want to use ASP.NET Membership Provider as the default Claims Provider for the management portal for tenants in AD FS, replace <authSite> with the location for the authentication site.

Supply the following parameter information.

Parameter	Required information
-identityProviderMetadataEndpoint	OPTIONAL: Endpoint to obtain Federation Metadata for the Tenant Authentication Site. If you do not want to use ASP.NET Membership Provider as the default Claims Provider for the management portal for tenants in AD FS, then delete this line.
-tenantRelyingPartyMetadataEndpoint	Endpoint to obtain Federation Metadata for the management portal for tenants.
-adminRelyingPartyMetadataEndpoint	Endpoint to obtain Federation Metadata for the management portal for administrators.

Reconfigure FQDNs and Ports in Windows Azure Pack

Windows Azure Pack for Windows Server uses claim-based authentication system to authenticate and authorize users. This authentication is performed by an external Identity Provider Security Token Service (IdP-STS). The system trusts the IdP-STS to verify the identity of users and to provide a trusted set of claims about each user. A two-way trust relationship with the IdP-STS must be established during Windows Azure Pack configuration so the endpoint changes are properly communicated to the affected components.

To establish this trust relationship, the following Windows Azure Pack components expose metadata information.

- Management portal for tenants
- Management portal for administrators
- Tenant authentication site
- Admin authentication site

The exposed data includes all the necessary trust information, including the endpoint information of the different components. The endpoint information is used to redirect users to the IdP-STS and back to Windows Azure Pack.

Therefore, every time an endpoint configuration changes for a component, the metadata information must be updated and the trust relationship must be re-established using the updated metadata.

Windows Azure Pack installation and configuration provides default values for the exposed metadata and endpoint information. By default, Windows Azure Pack uses the machine and domain name as the Fully Qualified Domain Name (FQDN) of each component. It also sets pre-defined port numbers for each component.

For example, if your tenant machine hostname is “mytenantmachine” and your domain is “contoso.com”, the default configuration of the Tenant Portal will be `https://mytenantmachine.contoso.com:30081`.

In some scenarios, the default endpoint values must be changed. For example:

- If you update a component's default self-signed SSL certificate to a real certificate, the component's FQDN must match the certificate FQDN.
- If you use a load balancer across multiple instances of a component, you must use the load balancer endpoint instead of the endpoint of each component instance.
- If you change the pre-defined ports you must update the Windows Azure Pack port settings. For example, changing to the default HTTPS port 443 requires you to update the Windows Azure Pack port settings.

In such cases, the metadata information must be updated and the trust relationship must be re-established as explained in the following steps.

To update the FQDN and port settings

1. Run the `Set-MgmtSvcFqdn` cmdlet on the machine you want to update.

```
Set-MgmtSvcFqdn –Namespace <Namsepace Token> -
ConnectionString <Connection String> [-FQDN <FQDN>] [-Port
<port>] [-Verbose]
```

Parameter	Required/optional	Details
-ConnectionString	Required	This parameter defines the connection string to the SQL Server hosting the Windows Azure Pack configuration stores. A database name (Initial Catalog) is not required. Credentials included in the string must have write permissions to the configuration stores. For example: `$connectionString = "Data Source=$server;User ID=$userId;Password=$password"` *$server* – The address of the SQL Server hosting the management portal configuration databases.

		$userId – A SQL user with write permissions to the management portal configuration databases. *$password* – The password for the $userId account.
-FQDN	Optional	This parameter is used to specify the new FQDN for the machine. Replace $fqdn with the new FQDN, not including the protocol prefix. For example, mynewfqdn.contoso.com. You can omit this parameter if you are not changing the FQDN.
-Namespace	Required	This parameter is used to indicate which component to configure. Possible values: 'AdminSite', 'TenantSite', 'AuthSite', 'WindowsAuthSite'.
-Port	Optional	This parameter is used to define the new port. Replace $port with the new port. For example, 443. Note Using the default HTTPS port 443 will remove the port section from the endpoint. You can omit this parameter if you are not changing the port.

2. In Internet Information Services Manager, ensure that the FQDN and port values have been updated. Also ensure that the FQDN matches the SSL certificate.
3. The updated FQDN and port values will eventually propagate to the targeted components. To ensure that this happens immediately, restart the website.
4. Repeat steps 2 and 3 on all machines hosting the component.
5. If needed, set up your DNS to forward requests to the appropriate location.
6. Re-establish trust between all the affected components as instructed in the next section.

Re-establish trust

Windows Azure Pack is a claims-aware application that uses tokens and claims to authenticate and authorize end users. Such applications don't use the identity of the token issuer, as long as the token complies with some conditions, such as being signed by a trusted key. For more information, see Claims-aware applications.

With claims-based authentication, a system trusts an STS to issue its tokens. However, that doesn’t necessarily mean that this STS is actually performing the user authentication. It is possible that the STS delegates the user authentication request (or federation) to another STS which is trusted by the first STS. This chain of STSs trusting each other and delegating requests

is common and flexible. There are endless possible topologies of trust relationships. System administrators must choose the most appropriate topology to meet business requirements.

For example, you can configure Windows Azure Pack management portals to trust AD FS to authenticate users. Depending on the AD FS configuration, AD FS can then do either of the following:

- AD FS can authenticate users directly, using the management portal Active Directory credentials.
- AD FS can federate the request to another STS.

In the second case, you can use Windows Azure Access Active Directory Control Service (ACS) as the other STS, for example. ACS can then federate the request again to another STS, such as Windows Live. In this case, Windows Live actually authenticates the user using Windows Live credentials. This is one way to enable Windows Live, Google, or Facebook authentication in Windows Azure Pack.

Important

Because the endpoints are used to redirect users to the next component in the trust chain, all endpoints must be configured correctly in all components to ensure the federation is successful.

If you change a management portal endpoint, you must update the STS that the portal immediately trusts.

Ensure that you update the FQDN and port changes in STS for the relying party federation metadata URL, and then refresh the metadata.

If you change an STS endpoint, you must update all the components directly trusted by it, such as the management portals and other STSs.

The system administrator should be familiar with the trust chain to understand which components must be updated following a configuration change.

Re-establish trust for the management portals

1. If the STS endpoint immediately trusted by a Windows Azure Pack management portal was changed, you must update the portals with the new endpoint information. You can do this by using the Set-MgmtSvcRelyingPartySettings PowerShell cmdlet on the relevant machines.

```
Set-MgmtSvcRelyingPartySettings -Target <Targets> –
MetadataEndpoint <Metadata Endpoint Full URL> [-
ConnectionString <Connection String>] [-
DisableCertificateValidation] [-PortalConnectionString
<Portal Configuration Store Connection String>] [-
ManagementConnectionString <Management Store Connection
String>]
```

Parameter	Required/optional	Details

Target	Required	This parameter defines which set of components to update. Permissible values for <*Targets*>: Tenant – Use this to configure the management portal for tenants, the tenant API layer, and the admin API layer. Admin – Use this to configure the management portal for administrators and the admin API layer. You can provide a single target or an array of targets.
MetadataEndpoint	Required	This parameter defines the full URL of the trusted IdP-STS metadata endpoint. Permissible values for <*Metadata Endpoint Full URL*>: A valid URL, for example: `http://mysts.contoso.com:1234/FederationMetadata/2007-06/FederationMetadata.xml`
ConnectionString	Required, unless PortalConnectionString and ManagementConnectionString are used.	This parameter defines the connection string to the SQL Server hosting the Windows Azure Pack portal configuration stores and management store. A database name (Initial Catalog) is not required. If the portal configuration stores or management store are hosted on different SQL Server instances or use non-default database names, use the PortalConnectionString and ManagementConnectionString parameters instead.
DisableCertificateValidation	Optional Not recommended for production environments	This parameter disables SSL certificate validation. If you don't use this parameter, the cmdlet will fail to retrieve the metadata information if the metadata endpoint uses a self-signed SSL certificate.
PortalConnection	Optional, unless ConnectionString	Use this parameter to override the default

String	is not provided	connection string just for the configuration store. You should do this when • The portal configuration store is located on a different SQL instance. • The portal configuration store uses different credentials. • You don't want to use the default connection string.
ManagementConnectionString	Optional, unless ConnectionString is not provided	Use this parameter to override the default connection string just for the management store. You should do this when • The WAP management store is located on a different SQL instance. • The management store uses different credentials. • You don't want to use the default connection string.

Example cmdlet:

```
Set-MgmtSvcRelyingPartySettings –Target Tenant –
MetadataEndpoint
'https://mysts.contoso.com:12345/FederationMetadata/2007-
06/FederationMetadata.xml' -ConnectionString "Data
Source=mysqlserver.contoso.com;User
ID=myprivilegeduser;Password=mypassword"
```

Tip

- This cmdlet can be used on any machine where the Windows Azure PowerShell updates for Windows Azure Pack are installed.
- The updated settings will eventually propagate to all affected components. For faster propagation, manually restart the affected components to immediately fetch the new configuration values. If the target is 'Tenant' you should restart all your management portals for tenants, tenant API, and admin API components. If the target is 'Admin' you should restart all your management portals for administrators and admin API components.

Re-establish trust for the authentication sites

1. If the STS endpoint immediately trusted by a Windows Azure Pack authentication site was changed, you must update the authentication sites with the new endpoint information. You can do this by using the PowerShell cmdlet `Set-`

`MgmtSvcIdentityProviderSettings` PowerShell cmdlet on the relevant machines.

```
Set-MgmtSvcIdentityProviderSettings -Target <Targets> –
MetadataEndpoint <Metadata Endpoint Full URL> [-
ConfigureSecondary] [-ConnectionString <Connection String>]
[-DisableCertificateValidation] [-PortalConnectionString
<Portal Configuration Store Connection String>]
```

Parameter	Required/optional	Details
Target	Required	This parameter defines which set of components to update. Permissible values for <*Targets*>: Membership – Use this to configure the tenant (Membership) authentication site. Windows – Use this to configure the admin (Windows) authentication site. You can provide a single target or an array of targets.
MetadataEndpoint	Required	This parameter defines the full URL of the trusted component metadata endpoint. Permissible values for <*Metadata Endpoint Full URL*>: A valid URL, for example: `http://mysts.contoso.com:1234/FederationMetadata/2007-06/FederationMetadata.xml`
ConfigureSecondary	Optional	Each authentication site supports up to two trusted relying parties. Include this parameter to configure a second relying party, instead of overwriting the default relying party.
ConnectionString	Required, unless PortalConnectionString is used	This parameter defines the connection string to the SQL Server hosting the Windows Azure Pack portal configuration stores. A database name (Initial Catalog) is not required. If portal configuration store uses a non-default database name, use the PortalConnectionString parameter instead.

DisableCertificateValidation	Optional Not recommended for production environments	This parameter disables SSL certificate validation. If you don't use this parameter, the cmdlet will fail to retrieve the metadata information if the metadata endpoint uses a self-signed SSL certificate.
PortalConnectionString	Optional, unless ConnectionString is not provided	Use this parameter to override the default connection string just for the configuration store. You should do this when • The portal configuration store uses different credentials. • You don't want to use the default connection string.

Example cmdlet:

```
Set-MgmtSvcIdentityProviderSettings –Target Membership  –
MetadataEndpoint
‘https://mytenantportal.contoso.com:23456/FederationMetadata/
2007-06/FederationMetadata.xml’ -ConnectionString “Data
Source=mysqlserver.contoso.com;User
ID=myprivilegeduser;Password=mypassword”
```

Tip

- This cmdlet can be used on any machine where the Windows Azure PowerShell updates for Windows Azure Pack are installed.
- The updated settings will eventually propagate to all affected components. For faster propagation, manually restart the affected components to immediately fetch the new configuration values. If the target is ‘Membership’ you should restart all your tenant (Membership) authentication sites. If the target is ‘Admin’ you should restart all your admin (Windows) authentication sites.

Post-installation best practices

After you install the Windows Azure Pack for Windows Server, perform the following best practices.

Replace untrusted self-signed certificates with trusted certificates

Each Windows Azure Pack component is installed on an Internet Information Services (IIS) website that, by default, is configured with a self-signed certificate. Because these self-signed certificates are not issued by any of the trusted root certification authorities that your browser loads on startup, your browser displays a security warning when you attempt to connect to any of the sites. To avoid this experience, we recommend that you replace the self-signed certificates that are used by the **MgmtSvc-TenantSite** (management portal for tenants) and **MgmtSvc-TenantPublicAPI** as publicly facing services with certificates that are issued by a trusted root certification authority. The **MgmtSvc-AdminSite** (management portal for administrators) can also benefit from a replacement of the self-signed certificate.

Note

By default, services that are not accessed by users, such as the APIs and resource providers, ignore certificate validation errors. Services are accessed via the ServicePointManager.ServerCertificateValidationCallback Property. If this action presents a security concern, you can replace the untrusted self-signed certificates with a valid certificate that is issued by a recognized certification authority and turn the validation override off, or set the value to **false**.

The configuration settings that govern this validation override are in each website's Web.config file as follows:

- For the management portal for administrators and for the management portal for tenants, **MgmtSvc-AdminSite** and **MgmtSvc-TenantSite**:

```
<configuration>
  <appSettings>
    <add
key="Microsoft.Azure.Portal.Configuration.AppManagementConfiguration.Rdfe2DisableCerti
ficateValidation" value="false" />
  </appSettings>
</configuration>
```

- For the Service Management API websites, **MgmtSvc-AdminAPI**, **MgmtSvc-TenantAPI**, and **MgmtSvc-TenantPublicAPI**:

```
<configuration>
  <appSettings>
    <add key="DisableSslCertValidation" value="false" />
  </appSettings>
</configuration>
```

For each of these keys, the default value is **true**. It grants permission to use untrusted certificates, so when the value is set to **false**, the use of untrusted certificates is disallowed.

Important

The `</appSettings>` section of the Web.config files are encrypted by default. To modify the `</appSettings>` section of the Web.config files, you must decrypt the file, apply changes, and then re-encrypt the files. To decrypt and re-encrypt the Web.config files, run the following Windows PowerShell cmdlets on the computer where the Web.config file is located:

- To decrypt: `Unprotect-MgmtSvcConfiguration –Namespace <namespace>`
- To re-encrypt: `Protect-MgmtSvcConfiguration –Namespace <namespace>`

Where `<namespace>` is one of the following:

- `TenantPublicAPI`
- `TenantAPI`
- `AdminAPI`
- `AdminSite`
- `TenantSite`

Test your deployment

You can test your deployment using the Microsoft Best Practices Analyzer (BPA) for Windows Azure Pack. BPA is a tool that analyzes your components of Windows Azure Pack. It helps you immediately identify many configuration, security, and performance issues, and it recommends best practices to resolve them.

Tip

A “best practice” is a rule or recommendation that is defined by the product’s experts. These rules are configurations or settings that are designed to optimize product performance and prevent security or functionality issues.

When to run BPA for Windows Azure Pack

You should run BPA for Windows Azure Pack to test your installation and to confirm that it is ready to use in a production environment. Ideally, you should run it at the following times:

- Immediately after installing and configuring Windows Azure Pack.
- After changing any Windows Azure Pack settings.
- When you believe Windows Azure Pack performance is suboptimal.

Correcting the issues that you find during these tests can help reduce your total cost-of-ownership for Windows Azure Pack by minimizing downtime and optimizing configuration, security, and performance.

If you’d like to make sure that the tool runs at automated intervals, you can use Task Scheduler. For more information, see Task Scheduler in the Windows Dev Center.

How BPA for Windows Azure Pack works

BPA for Windows Azure Pack works within Microsoft Baseline Configuration Analyzer (MBCA) 2.0 to scan the software configurations of the machine it is installed on. It automatically detects all components that are installed in Windows Azure Pack and compares their configurations against a set of rules. MBCA then lists all noncompliant issues.

Although rule violations, even critical ones, might not always cause problems, they do indicate issues that can result in poor performance, poor reliability, unexpected conflicts or increased security risks.

Warning

BPA for Windows Azure Pack identifies performance and security optimization issues for your installation of Windows Azure Pack, based on a set of rules. Your machines might have additional issues that these rules do not detect.

The following table describes the three possible severity levels for the rules.

Severity level	Description
Compliant	The component satisfies the conditions of a rule.
Warning	The component is compliant as it is operating currently, but it might not satisfy the conditions of a rule if changes are not made to its configuration or policy settings.
Error	The component does not satisfy the conditions of a best practice rule, and functionality issues can be expected.

BPA provides best practice recommendations in the following categories.

Category name	Description
Security	Security rules measure a component's relative risk for exposure to threats such as unauthorized or malicious users, or loss or theft of confidential or proprietary data.
Performance	Performance rules measure a component's ability to process requests and perform its prescribed duties, within the time periods that are expected for the component's workload.
Configuration	Configuration rules identify component settings that might require modification for the

Category name	Description
	component to perform optimally. Configuration rules can help prevent conflicts that can result in error messages or prevent the component from performing its prescribed duties.
Operation	Operation rules identify possible failures of a component to perform its prescribed duties.

BPA system requirements

Consider the following prerequisites for your servers and client computers before you install BPA for Windows Azure Pack:

- Windows Azure Pack installation requirements - Describes the hardware, software, and environment requirements for Windows Azure Pack.
- Microsoft Baseline Configuration Analyzer 2.0 - Download MBCA 2.0 from the Microsoft Download Center.

Important
Install MBCA 2.0 on every machine that has one or more components of Windows Azure Pack installed in order to analyze these local components using BPA.

Install BPA for Windows Azure Pack

To scan the components of Windows Azure Pack, you must install BPA for Windows Azure Pack on every machine that has components of Windows Azure Pack installed. There are two locations where you can download and install BPA for Windows Azure Pack:

- Microsoft Web Platform Installer 4.6 (This installation requires that you first download Web Platform Installer.)
- Microsoft Download Center

To install by using Microsoft Web Platform Installer

1. In Web Platform Installer, click **Products**.
2. In the product list, find Windows Azure Pack: Microsoft Best Practices Analyzer (scroll through the list or type in the search box), and then click **Add**.
3. Click **Install**, and then follow the instructions in the wizard.

To install from the Microsoft Download Center

1. On the BPA for Windows Azure Pack BPA for Windows Azure Pack page, click

Download.

2. After the download completes, double-click **MgmtSvc-BPA.msi**, and then follow the instructions in the wizard.

Scan components of Windows Azure Pack

Now that you have installed MBCA 2.0 and BPA for Windows Azure Pack, you can start analyzing the components of Windows Azure Pack.

To scan components

1. Sign in to a machine with components of Windows Azure Pack installed.
2. On the **Start** menu, click **Microsoft Baseline Configuration Analyzer 2.0**.
3. On the MBCA 2.0 Home page, under **Select a product**, click Windows Azure Pack in the drop-down list.
4. Click **Start Scan**. BPA for Windows Azure Pack applies the appropriate rules, based on the components of Windows Azure Pack that are detected on the local machine.
5. When the scan is complete, click **View Report** to see the results.
6. On the **All** tab, you can find all the noncompliant and the compliant results. Click the **Noncompliant** tab to see a list of error/warnings for rules that the machine violated. You can take the following actions to learn more about each warning:
   a. Click the **+** next to the machine name to see the list of rules.
   b. Click the rule to see details about the warning.
   c. If you don't want to see this warning again, click **Exclude this Result**. This is not recommended.
7. For each issue, you should follow the instructions that are described in **Resolution**.

   Tip
   For further information about MBCA 2.0, click **Help**.

Next steps

At this point, you have installed the required components of your Windows Azure Pack deployment. If you want to add services, such as Windows Azure Pack: Web Services, see **Provision and configure services in Windows Azure Pack**.