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Introduction

This manual is focused on the creation of a SharePoint 2013 farm in Microsoft Azure's Infrastructure as a Service (IaaS). This manual also includes current best practices for SharePoint, SQL, and Active Directory Domain Services (ADDS) in IaaS. Deploying IaaS components (virtual network, storage, and virtual machines) for high availability has also been added as part of this update.

REFERENCES
- The TechNet documentation for installing SharePoint is at Install and Configure SharePoint 2013.
- Documentation for SharePoint on IaaS
  - SharePoint 2013 on Windows Azure Infrastructure Services
- SQL Server
  - SQL Server AlwaysOn Availability Groups
  - How to Configure Windows Failover Cluster in Azure for AlwaysOn Availability Groups

You’ll provision the following tiers of servers:
- Active Directory Domain Services
- SQL Server
- SharePoint Server
  - Application Servers
  - Web Front Ends (WFE)

Here are the steps you’ll follow to stand up a SharePoint farm in IaaS:
- Create the Microsoft Azure IaaS components required for your farm
- Provision a server and create an Active Directory domain
- Provision a server to run SQL Server
- Provision a server to be a SharePoint 2013 Application Server (AS)
- Provision a server to be a SharePoint 2013 Web Front End (WFE)
- Install and configure SharePoint 2013
- Add an endpoint to allow users to get to SharePoint
This is the Microsoft Azure Management Portal for a brand-new Azure tenant:

**HINT:** The Azure Management Portal provides a **New** button that can be used for each Azure component (e.g. Virtual Machines, Cloud Services, etc.). It’s located in the lower left-hand corner of the browser window.
Step 1 Create Azure Components

You’ll start by creating the basic components of your infrastructure:

1. Virtual network
   - A subnet for each tier of the farm
2. Storage Account
3. Cloud Services for the following tiers:
   a. Active Directory
   b. SQL Server
   c. SharePoint

Step 1.1 Virtual Network

Click on “Networks” in the list of Azure components that runs down the left side of the management portal.

Click on the “New” button. You’ll be presented with a user interface for creating a virtual network. Click “Custom Create” to start a wizard that creates a virtual network:
Step 1.1.1 Virtual Network Details

The initial screen enables you to name the network. You’ll also see an option to create an affinity group or to use an existing group. Virtual networks require an affinity group.

Name your network “CONTOSOHIRNET”.

REFERENCE A complete description of this wizard is available at About Configuring a Virtual Network in the Management Portal. REFERENCE Information about virtual networks is available at Windows Azure Virtual Network Overview.
Step 1.1.2 DNS Servers and VPN Connectivity

This screen enables you to set up a DNS server and VPN connectivity. The domain controllers (which will be created in Step 2) will have IP addresses of 10.10.10.4 and 10.10.10.5:

**HINT:** You’ll need to join your SQL and SharePoint servers to the CONTOSO domain. The DNS services provided by Microsoft Azure do not enable these two servers to see the domain controller. This requires the addition of DNS server addresses in this step.
Step 1.1.3 Virtual Network Address Spaces

This screen enables you to accept the default subnet configuration or to add additional subnets. You’re going to create a subnet for each tier of the SharePoint farm. One of the consequences of this is that the domain controllers, which will be located on the subnet named “DC”, will always have an IP address of 10.10.10.4 or 10.10.10.5. This will allow the servers in our farm to always find the domain controllers and the DNS service running on them and thereby communicate with each other.

Configure the subnet as shown in the following table:

<table>
<thead>
<tr>
<th>Address Space</th>
<th>Starting IP</th>
<th>CIDR (Address Count)</th>
<th>Usable Address Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0.0.0/8</td>
<td>10.0.0.0</td>
<td>/8 (16777…)</td>
<td>10.0.0.0 – 10.255.255.255</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBNETS</th>
<th>Starting IP</th>
<th>CIDR (Address Count)</th>
<th>Usable Address Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>10.10.10.0</td>
<td>/29 (8)</td>
<td>10.10.10.0 – 10.10.10.7</td>
</tr>
<tr>
<td>SQL</td>
<td>10.10.11.0</td>
<td>/29 (8)</td>
<td>10.10.11.0 – 10.10.11.7</td>
</tr>
<tr>
<td>SPAS</td>
<td>10.10.12.0</td>
<td>/29 (8)</td>
<td>10.10.12.0 – 10.10.12.7</td>
</tr>
<tr>
<td>SPWFE</td>
<td>10.10.13.0</td>
<td>/29 (8)</td>
<td>10.10.13.0 – 10.10.13.7</td>
</tr>
</tbody>
</table>

After you’re done, the screen should look like this:

Click the checkmark in the lower right-hand corner to complete the wizard and create the virtual network.

**HINT:** IaaS will release the IP address of your VM if you shut it down. This network configuration will avoid problems (in particular, the absence of DNS services if the IP address of a DNS server changes) as long the two domain controllers are the only VMs placed on the DC subnet. This will guarantee that at least one of the IP addresses will point to an active DNS server (as long as one of them is turned on).
NOTE: User provided values THAT ARE REQUIRED TO BE GLOBALLY UNIQUE will be indicated by bold green text. Where you see this text, make sure you are using YOUR OWN VALUES NOT THE ONES IN THE LAB MANUAL. The following values need to be globally unique:

- Storage account name
- Cloud service names

### Step 1.2 Storage Account

Click on “New” and select “Data Service” then “Storage” and click on “Quick Create”. Enter a unique name for your storage account. As with the cloud services that will be created in Step 1.6, it has be globally unique. The UI will let you know via a red X if it’s not unique or a green checkmark if it is. Pick the same location that you used for your virtual network. This guide will use CONTOSOAZSTORE.core.windows.net:

![Storage Account Creation UI](image)

Click on “Create Storage Account” to create the storage account.
Step 1.3 Cloud Services

Click on “New”, click on “Computer”, click on “Cloud Service” and then click “Custom Create”:

Your cloud service URLs have to be unique. You will have a cloud service for each tier of the SharePoint farm.

Type in a host name. This manual uses CONTOSOADDS33. If you see a green check at the far-right side of the text box, Azure has confirmed that this host name is not taken. For the “Region or Affinity Group” dropdown, select the same region that you chose earlier:

Click the checkmark in the lower right-hand corner to create the cloud service.

Repeat this step twice more and choose cloud service names for SQL and SharePoint. This guide will use CONTOSOADDS33.cloudapp.net, CONTOSOSQL33.cloudapp.net, and CONTOSOSP33.cloudapp.net.
Step 2 Create the Domain Controller

You’ll need an Active Directory domain for your SharePoint farm.


You can pick from an extensive list of pre-made platform images. This list includes server operating systems, application servers for SharePoint and SQL, as well as non-Microsoft operating systems. This list is updated as new products are introduced.

Your domain controller will be running Windows Server 2012 R2 Datacenter.

**Step 2.1 Virtual machine image selection**

Click on “New”, click “Computer”, click “Virtual Machine”, and choose “From Gallery”. This will start the “Create a Virtual Machine” wizard.

**REFERENCE** A complete description of this wizard is available at [How to Create a Custom Virtual Machine](#).

**REFERENCE** Information about virtual machines in Microsoft Azure is available at [Virtual Machines](#).
For the domain controller, choose Windows Server 2012 Datacenter:

Step 2.2 Virtual machine configuration

This screen enables you to choose which release version of Windows Server 2012 Datacenter to use as well as the name, size, and initial admin user account and password.

Enter the following values:

<table>
<thead>
<tr>
<th>VERSION RELEASE DATE</th>
<th>6/17/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIRTUAL MACHINE NAME</td>
<td>CONTOSODC</td>
</tr>
<tr>
<td>TIER</td>
<td>STANDARD</td>
</tr>
<tr>
<td>SIZE</td>
<td>A1 (1 core, 1.75 GB memory)</td>
</tr>
<tr>
<td>NEW USER NAME</td>
<td>dadmin</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>(provide your own password)</td>
</tr>
</tbody>
</table>

REFERENCE: Information about virtual machines, including the difference between Basic and Standard tier virtual machines, is available at Virtual Machine and Cloud Service Sizes for Azure.

Pick your own unique password.

The “current” image may have a later “VERSION RELEASE DATE” than what’s shown in this manual. Choose the most recently released version.
The screen should look like this:

![Virtual machine configuration screen](image)

Click the right arrow at the bottom right-hand side of the window.

**Step 2.3 Virtual machine configuration**

This screen enables you to associate the VM with the other components of the cloud infrastructure. These choices affect load balancing, where the VMs are located, which storage account is used, and whether you want your VMs to be highly available.

Enter the following values:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUD SERVICE</td>
<td>CONTOSOADDS33.cloudapp.net</td>
</tr>
<tr>
<td>CLOUD SERVICE DNS NAME</td>
<td>CONTOSOADDS33.cloudapp.net (this should be grayed out)</td>
</tr>
<tr>
<td>REGION/AFFINITY GROUP/VIRTUAL NETWORK</td>
<td>CONTOSOVRINET</td>
</tr>
<tr>
<td>VIRTUAL NETWORK SUBNETS</td>
<td>DC(10.10.10.0/29)</td>
</tr>
<tr>
<td>STORAGE ACCOUNT</td>
<td>CONTOSOAZSTORE</td>
</tr>
<tr>
<td>AVAILABILITY SET</td>
<td>Create a new availability set</td>
</tr>
<tr>
<td>AVAILABILITY SET NAME</td>
<td>ADDS-VMS</td>
</tr>
</tbody>
</table>

Do not change the default endpoint (Remote Desktop and PowerShell) configurations.
The screen should look like this:

Click the right arrow at the bottom of the window.
Step 2.4 Virtual machine configuration

The last screen of the wizard allows the installation of various add-ons to the virtual machine. Click the right-hand arrow at the bottom of the screen to accept the default configuration (which installs the VM Agent):

Click the checkmark in the lower right-hand corner to provision the virtual machine.

IaaS will take a few minutes to provision the virtual machine. Once it is provisioned, go into the DASHBOARD for the VM.

You’ll notice a message marked “IMPORTANT” at the top of the dashboard:
REFERENCE: Click on “Learn more” to get to Manage the Availability of Virtual Machines. It gives an overview of important concepts related to availability and service level agreements in IaaS.

Step 2.5 (Optional) Add a data disk to the domain controller

You’re going to add a data disk to the domain controller VM in order to allow Active Directory Directory Services to store persistent data on a separate disk.

Once you’ve selected the CONTOSODC virtual machine, and selected the dashboard display, you’ll see a list of options at the bottom of the page:

Click on “Attach” and then “Attach empty disk”.

Leave “Virtual Machine Name”, “Storage Location”, and “File Name”, and “Host Cache Preference” set to the default values. Change “Size (GB)” to “200” and click on the checkmark to create the disk and attach it to the domain controller:
Step 2.5.1 Add the data disk to the OS

You should see CONTOSODC in the list of VMs. Click on the line displaying the VM’s information to select it. The black bar at the bottom of the screen will display the following:

HINT: Don’t click on the name of the VM itself. Doing this will open the quick start screen. If you do click on the name, click on the arrow in the top left-hand corner of the screen to get back to the list of virtual machines.

Click on “Connect” to have IaaS retrieve and download a RDP file that enables you to RDP to CONTOSODC. Use the ID and password that you defined in Step 2.2.
Remote Desktop Connection displays information about the computer that you're connecting to. Click “Connect”:

![Remote Desktop Connection](image)

The domain controller will ask you for credentials. Use the “contosodc\dcadmin” local machine account.

![Windows Security](image)
You might also be prompted from Remote Desktop about the certificate that is being presented by the virtual machine. Click “Yes” to connect to the domain controller VM:

You’ll need to initialize the disk that was attached after the VM was created. Move the mouse pointer to the lower left-hand corner of the screen and right-click. This will open a set of administrative tools. Click on “Disk Management”.

You’ll be presented with an “Initialize Disk” dialog. Click on “OK”:
This will initialize the disk and close the dialog. You’ll see the system disk (C:), temporary storage disk (D:), and the newly initialized disk. Right-click on the box labeled “200.00 GB Unallocated”. Click on “New Simple Volume...”:

This opens the “New Simple Volume Wizard”. Click “Next”:
Accept the default values. Click “Next”:

Accept the default drive assignment of F. (If it defaults to E then change it to F.) Click “Next”:
Accept the default values for “File system:” and “Allocation unit size:”. Change “Volume label:” to “Data”. Click “Next >”:

Click “Finish” to complete the wizard. It will format the drive and map it to the “F:” drive path.

You may see an additional dialog confirming that you want to format the disk. Click “Format disk”:

Click “Cancel”. Completing the “New Simple Volume Wizard” should have formatted the disk.
You'll see the Disk Management console with the Data drive indicated as “Data (F:)”:

Close the “Disk Management” management console.
**Step 2.6 Configure the Domain Controller**

Once you've connected to the server, you'll create a domain named contoso.local and promote the server to be a domain controller using the following instructions.


In order to make the windows server 2012 domain controller you will install the ADDS (Active Directory Domain Services) role from the server manager on Windows Server 2012.

**INSTALLING AD DS ROLE**

Click on “Add roles and features” in the Server Manager Dashboard:
The initial screen provides an overview of the wizard:

On Installation Type page, select the first option “Role-based or Feature-based Installation“.
On the “Select destination server” page, select CONTOSODC from the server pool and click “Next”.

To install AD DS, select Active Directory Domain Services. This will open a dialog box to add other AD DS related tools. Click on “Add Features”.
The pop-up with close. Click “Next”:

On the “Select Features” page, note that the Group Policy Management feature is automatically installed. Click “Next”.

![Image of the Add Roles and Features Wizard with Group Policy Management feature selected]
On the “Active Directory Domain Services” page, basic information about AD DS is provided. Click “Next”.

On the “Confirmation” Page, you need to confirm this to continue with this configuration. It will provide you an option to export the configuration settings and also if you want the server to be restarted automatically as required. Click “Install”.
The following screen will be displayed when the wizard is finished. Click “Close”.

![Add Roles and Features Wizard](image)

SharePoint 2013 in Infrastructure as a Service
You’ll be presented with the Server Manager Dashboard. In the upper right-hand corner, click on the flag with the yellow triangle contained the exclamation point. Click on “Promote this server to a domain controller” link in the dropdown:

To create a new AD forest called “contoso.local”, select “Add a new forest” and enter “contoso.local” in the “Root domain name:” text box. Click “Next” afterwards:
Accept the default values for the forest functional level and domain functional levels and whether or not it should be a DNS server. You'll need to enter a Directory Services Restore Mode administrator password. Click “Next” afterwards:
You’ll see a warning regarding the DNS server role. Click “Next”:

On the “Additional Options” screen, enter “Contoso” in the “The NetBIOS domain name:” text box. Click “Next” afterwards.
If you added and configured the F: data disk (Step 2.5) then change the default paths to point to F: folders. If not, accept the default values and click “Next”:

You’ll be presented with a list of the configuration settings. Click “Next”:
All prerequisites are checked before the installation actually occurs. If all prerequisite checks are passed successfully then click “Install”:

After the promotion of the server to a DC, the server will restart automatically. This will cause your remote desktop session to close.

Once the server is booted and you logon to it, click on Server Manager and then click on Tools. You’ll notice that following features have been installed:

- Active Directory Administrative Center
- Active Directory Domains and Trusts
- Active Directory Module for Windows PowerShell
- Active Directory Sites and Services
- Active Directory Users and Computers
- ADSI Edit
- DNS
- Group Policy Management
35 | Page
Step 3 Create and Configure SQL Server

The process for creating the SQL Server 2012 VM is essentially the same as for the domain controller except for the image that you will choose.

Step 3.1 Choose a SQL image

Start the “Create a virtual machine” wizard. On the first screen of “create a virtual machine” wizard, there is a list of available images. Click on the “SQL Server” filter and then choose “SQL Server 2012 SP1 Enterprise on WS 2012.”

Subsequent steps in the wizard look the same as steps 2.2, 2.3, and 2.4 except for the information entered. The following tables provide the information for the SQL VM:

Step 3.2 Virtual machine configuration

VERSION RELEASE DATE refers to the image. In this case, the image contains SQL Server 2012 and Windows Server 2012. Use the following values:

<table>
<thead>
<tr>
<th>VERSION RELEASE DATE</th>
<th>5/29/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIRTUAL MACHINE NAME</td>
<td>CONTOSOSQL</td>
</tr>
<tr>
<td>SIZE</td>
<td>A4 (8 cores, 14 GB memory)</td>
</tr>
<tr>
<td>NEW USER NAME</td>
<td>sqladmin</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>(provide your own password)</td>
</tr>
</tbody>
</table>
### Step 3.3 Virtual machine configuration

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUD SERVICE</td>
<td>CONTOSOSQL33</td>
</tr>
<tr>
<td>CLOUD SERVICE DNS NAME</td>
<td>CONTOSQL33.cloudapp.net</td>
</tr>
<tr>
<td>REGION/AFFINITY GROUP/VIRTUAL NETWORK</td>
<td>CONTOSOVIRNET</td>
</tr>
<tr>
<td>VIRTUAL NETWORK SUBNETS</td>
<td>SQL(10.10.11.0/29)</td>
</tr>
<tr>
<td>STORAGE ACCOUNT</td>
<td>CONTOSOAZSTORE</td>
</tr>
<tr>
<td>AVAILABILITY SET</td>
<td>Create an availability set</td>
</tr>
<tr>
<td>AVAILABILITY SET</td>
<td>SQL-VMS</td>
</tr>
</tbody>
</table>

The default port mappings don’t need to be changed. Click the right-arrow in the lower right-hand corner.
Accept the defaults on the last page of the wizard by clicking on the checkmark in the lower right-hand corner.
Step 3.4 Add SQL Server to the CONTOSO Domain

Remote into the SQL server and login with the “CONTOSOSQL\sqladmin” local admin account.

Once you’ve logged in, you should see the server manager dashboard:

Click on “Local Server” to bring up the Properties display:
Click on “Workgroup” to bring up the “System Properties” dialog:

![System Properties dialog](image)

Click on “Change...” to bring up the “Computer Name/Domain Changes” dialog box.

![Computer Name/Domain Changes dialog](image)
Click on the “Domain” option button and enter “contoso.local” in the text box. Click “OK”.

You should be prompted for domain authentication to add a machine to the Contoso.Local domain. Use the “contoso\dcadmin” id and password.

Note that “contoso\dcadmin” is now a domain administrator account. As part of the domain promotion process, the local admin account on the domain controller was promoted to be a domain administrator.

You'll get a “Welcome to the contoso.local domain” message box. Reboot the server to complete the process. Your remote desktop session will close.

**Step 3.5 Set “Max Degree of Parallelism”**

After the server reboots, login with the local admin account contososql\sqladmin. At this point, this is the only account with any permissions for your SQL instance.

Press the Windows Key to get to the Start screen. Type “sql server management”. The list of apps will filter automatically as you type. The characters you type will cause the Search UI to show up on the right of your monitor and will contain each character as you type it. You should only see one App at this point:
Press Enter to open SQL Management Studio. It may take a few minutes to open the “Connect to Server” dialog:

Click on “Connect” to connect to SQL.

**HINT**: If you can’t connect to SQL, make sure that you are logged in with the CONTOSOSQL\sqladmin local machine account.

You need to configure SQL’s “Max Degree of Parallelism” setting in order for SharePoint to install. Right-click on the upper-most database icon in the “Object Explorer”: 
Click on “Properties”.

This brings up the “Server Properties – CONTOSQL” dialog.
Click on “Advanced”. Scroll down on the right side of the dialog and look under “Parallelism” until you see “Max Degree of Parallelism”. Change this to 1.

Click “OK” to close the dialog and close SQL Server Management Studio.

**NOTE:** A production deployment of this farm would look a bit different than what you’re doing. This lab manual is written to fit into the current 20-core limit for the Azure subscription that comes as part of the MSDN subscription.
Step 4 Create the SharePoint Application Server

The process for creating the SharePoint 2013 Server VM is essentially the same as for the other two VMs except for the image that you will choose.

Step 4.1 Virtual machine image selection

Start the “Create a virtual machine” wizard. On the first screen of “create a virtual machine” wizard, there is a list of available images. Click on the “SharePoint” filter and then choose “SharePoint Server 2013 Trial”:

Subsequent steps in the wizard look the same as steps 2.2, 2.3, and 2.4 except for the information entered. The following tables provide the information for the SharePoint VM:

Step 4.2 Virtual machine configuration

Provide the following values:

<table>
<thead>
<tr>
<th>VIRTUAL MACHINE NAME</th>
<th>CONTOSOSPAS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>A3 (4 cores, 7 GB memory)</td>
</tr>
<tr>
<td>NEW USER NAME</td>
<td>spasadmin</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>(provide your own password)</td>
</tr>
</tbody>
</table>
Step 4.3 Virtual machine configuration

<table>
<thead>
<tr>
<th>CLOUD SERVICE</th>
<th>CONTOSOSP33</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUD SERVICE DNS NAME</td>
<td>CONTOSOSP33.cloudapp.net</td>
</tr>
<tr>
<td>REGION/AFFINITY GROUP/VIRTUAL NETWORK</td>
<td>CONTOSOVRNET</td>
</tr>
<tr>
<td>VIRTUAL NETWORK SUBNETS</td>
<td>SPAS(10.10.12.0/29)</td>
</tr>
<tr>
<td>STORAGE ACCOUNT</td>
<td>CONTOSOAZSTORE</td>
</tr>
<tr>
<td>AVAILABILITY SET</td>
<td>Create an availability set</td>
</tr>
<tr>
<td>AVAILABILITY SET NAME</td>
<td>SPAS-VMS</td>
</tr>
</tbody>
</table>

The default port mappings don’t need to be changed. Click the right-arrow in the lower right-hand corner.

Accept the defaults on the last page of the wizard by clicking on the checkmark in the lower right-hand corner.

**Step 4.4 Add SharePoint Server to the CONTOSO Domain**

You can follow the same sequence detailed in step 3.5 to join the SharePoint server to the CONTOSO domain. Use the domain ID (CONTOSO\dcadmin) and password if you are prompted to authenticate.
Step 5 Create the SharePoint Farm

The Azure-provided SharePoint image is a server that has completed the first two parts of a normal SharePoint installation:

1. Installation of SharePoint prerequisites
2. Installation of SharePoint files

This allows you to configure your farm to support SharePoint without worrying about obtaining the SharePoint 2013 installation media or downloading the prerequisite files. As this is the first server in the farm, the process requires a few extra steps that are not required to add subsequent SharePoint servers to the farm.

Step 5.1 Add Domain Accounts

On CONTOSODC:

- Create 2 domain accounts:
  - SPSETUP – Setup account for SharePoint
  - SPFARM – Account required during the Configuration Wizard (PSCONFIG)

Remote into CONTOSODC and login with “CONTOSO\dcadmin”.

From the Server Manager Dashboard, click on Tools (in the upper right-hand corner). In the dropdown menu that this open, click on “Active Directory Users and Computers”:

This opens the “Active Directory Users and Computers” management console.
Click on “contoso.local” to expand the list of groups. Right-click on “Users” and select “New”. From the next dropdown, click on “User”:

This opens up the New Object – User wizard. You’ll create two new domain users. The first is used to run the SharePoint Configuration Wizard. Use the logon name **spsetup**. Type “spsetup” in the “First name” and “User logon name:” text boxes as shown. This will automatically populate the “Full name:” and “User logon name (pre-Windows 2000):” text boxes. Click “Next” when you’ve done this.

Enter in a password for this account in the “Password:” text box and then confirm it in the “Confirm password:” text box. Click the “Password never expires” checkbox. This will clear the “User must change password at next logon” checkbox. Click “Next”.


Click “Finish” on the last dialog of the wizard.

Repeat these steps to create a domain account named “spfarm” with a password that never expires.

**Step 5.2 Add SPSETUP to SQL and Assign Permissions**

Remote into CONTOSOSQL and start “SQL Management Studio” as you did before. Connect to the default instance of SQL by clicking “Connect” as before.

In the Object Explorer, expand “Security” and then expand “Logins”. Right-click “Logins”
This opens the “Login – New” dialog. Click on “Search”:

This opens the “Select User or Group” dialog. Click on “Locations...” If you're prompted for authentication, use the domain account “contoso\dcadmin”. Change the location to be “Entire Directory”.

In the “Enter the object name to select (examples)” text box, type in “spsetup” and click “Check Names”. This will resolve to “spsetup (spsetup@contoso.local)” as shown:
Click “OK”.

Click on “Server Roles” and select the “dbcreator” and “securityadmin” roles (“public” should be set be default). Click “OK” to close the dialog.

Close SQL Management Studio.
Step 5.3 Create a Firewall Rule for SQL

Server Manager should still be open. If it’s closed, go to the Desktop Taskbar and click on the icon at the far left of the taskbar.

Click on “Tools” in the upper right-hand corner. Click on “Windows Firewall with Advanced Security”:
This opens the “Windows Firewall with Advanced Security” management console.

Click on “Inbound Rules”. Click on “New Rule…” in the “Inbound Rules” section of the console:

This opens the “New Inbound Rule Wizard”:

Step through the wizard and use the following values for the new inbound rule:

<table>
<thead>
<tr>
<th>Rule Type</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does this rule apply to TCP or UDP?</td>
<td>TCP</td>
</tr>
<tr>
<td>Does this rule apply to all local ports or specific local ports:</td>
<td>Specific local ports: 1433</td>
</tr>
<tr>
<td>What action should be taken...</td>
<td>Allow the connection</td>
</tr>
<tr>
<td>When does this rule apply?</td>
<td>Leave Domain, Private, and Public selected.</td>
</tr>
<tr>
<td>Name:</td>
<td>SQL Inbound</td>
</tr>
</tbody>
</table>

Click Finish on the last screen to create your rule.
Step 5.4 Install SharePoint

This step connects SharePoint to SQL and creates your SharePoint farm.

Remote into CONTOSOSP using “contoso\dadmin” id and password. The Server Manager Dashboard will open. In the upper right-hand corner, click on “Tools” and then click on “Computer Management”:

![Computer Management console](image1)

This opens the Computer Management management console. Expand “Local Users and Groups” and click on the “Groups” folder.

![Computer Management groups](image2)

Right-click on the Administrators group and select “Add to Group”:
This opens the “Administrators Properties” dialog.

Click on “Add” and type in “spsetup”. Click “OK”. (If “spsetup” does not resolve to “CONTOSO\spsetup (spsetup@contoso.local)”) then make sure the location is set to “Entire Directory” or “contoso.local”. If you used the CONTOSO\dcadmin account to login then you will not be prompted to authenticate. If you used a local account, you will be prompted to authenticate in order to do this. Use the “CONTOSO\dcadmin” domain account to authenticate.)
Click “OK” to exit this dialog.
Click “OK” to exit the “Administrators Properties” dialog.

Repeat this process to add CONTOSO\spsetup to a member of “Remote Desktop Users” as well.

Log off and remote back in to CONTOSOSPAS as “CONTOSO\spsetup”.

Press the Windows key and type in “SharePoint Config” to filter the apps so that only the “SharePoint Products Configuration Wizard” is left. Click on this app. You’ll get a User Access Control prompt. Click “Yes” to let the program run.

You’ll be presented with the first screen of the “SharePoint Products Configuration Wizard”:

Click “Next”. You’ll be shown a warning dialog regarding 3 services. Click “Yes” to move past it.
Select “Create a new server farm”. Click “Next”.

Specify Configuration Database Settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database server</td>
<td>CONTOSOSQL</td>
</tr>
<tr>
<td>Username</td>
<td>CONTOSO\spfarm</td>
</tr>
<tr>
<td>Password</td>
<td>Use the password created in step 5.1</td>
</tr>
</tbody>
</table>
Specify Farm Security Settings:

Passphrase: *(provide your own passphrase)*

You'll need this passphrase to add other servers to the SharePoint farm.
Configure SharePoint Central Administration Web Application: Accept default values and click “Next”:

Completing the SharePoint Products Configuration Wizard: Accept the default values and click “Next”
Task 3, “Creating the configuration database...” is usually an indicator of whether everything else was set up correctly. Once it gets to step 4, it’s all downhill from there! This can take 10 to 15 minutes though so now’s a good time to get out of your chair and walk around a little. 😊

Configuration Successful!
Click “Finish”. SharePoint will open up the Central Admin site.

Let the wizard create all of the services using “CONTOSO\spfarm”. This would run under a different account in a production farm.

REFERENCE: Best practices for service accounts are available at Plan for administrative and service accounts in SharePoint 2013.

Select “Use existing managed account” and click “Next”:

This will start the wizard and it will create ALL of the service applications that this version of SharePoint provides. The screen will show “Working on it... This shouldn’t take long.” Unfortunately, it will take 15 – 20 minutes.

Create a site collection called “IaaS Demo” and use the root path (indicated by the “/” in the URL dropdown. Use the “Team Site” template (although you really can use any site template that you’d like).
Click “OK” to create the site collection.
Step 6 Create the SharePoint Web Front End (WFE)

The process for creating the SharePoint 2013 Server WFE VM is essentially the same as for the SharePoint Application Server. Repeat Step 4 with the information from the following tables.

**Step 6.1 Virtual machine configuration**

<table>
<thead>
<tr>
<th>VIRTUAL MACHINE NAME</th>
<th>CONTOSOSPWF1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>A3 (4 cores, 7 GB memory)</td>
</tr>
<tr>
<td>NEW USER NAME</td>
<td>spwfeadmin</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>(provide your own password)</td>
</tr>
</tbody>
</table>

**Step 6.2 Virtual machine configuration**

<table>
<thead>
<tr>
<th>CLOUD SERVICE</th>
<th>CONTOSOSP33</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLOUD SERVICE DNS NAME</td>
<td>CONTOSOSP33.cloudapp.net</td>
</tr>
<tr>
<td>REGION/AFFINITY GROUP/VIRTUAL NETWORK</td>
<td>CONTOSOVIRNET</td>
</tr>
<tr>
<td>VIRTUAL NETWORK SUBNETS</td>
<td>SPWFEE(10.10.13.0/29)</td>
</tr>
<tr>
<td>STORAGE ACCOUNT</td>
<td>CONTOSOAZSTORE</td>
</tr>
<tr>
<td>AVAILABILITY SET</td>
<td>Create an availability set</td>
</tr>
<tr>
<td>AVAILABILITY SET NAME</td>
<td>SPWF-E-VMS</td>
</tr>
</tbody>
</table>

**Step 6.3 Virtual machine configuration**

Accept the default port mappings and click the checkmark complete the wizard.

**Step 6.4 Add the WFE to the CONTOSO Domain**

You can follow the same sequence detailed in step 3.5 to join the SharePoint server to the CONTOSO domain. Use the “CONTOSO\dadmin” account when you are prompted to authenticate.

**Step 6.5 Install SharePoint on the Web Front End**

Repeat the initial part of Step 5.3 to add “CONTOSO\spsetup” to the local Administrators and Remote Desktop Users groups.

Log off and remote back in to CONTOSOSPAS as “CONTOSO\spsetup”.

Press the Windows key and type in “SharePoint Config” to filter the apps so that only the “SharePoint Products Configuration Wizard” is left. Click on this app. You’ll get a User Access Control prompt. Click “Yes” to let the program run.

You’ll be presented with the first screen of the “SharePoint Products Configuration Wizard”: 
Click “Next”. You’ll be shown a warning dialog regarding 3 services. Click “Yes” to move past it.
Select “Connect to an existing server farm”. Click “Next”.

The next screen will provide a textbox for the database server. Enter “CONTOSOSQL” and click “Retrieve Database Names”. The “Database name” dropdown will be populated with a single entry: “SharePoint_Config”. Click “Next”.

The SharePoint Products Configuration Wizard will prompt you to connect to a server farm. Select “Connect to an existing server farm” and click “Next”.

Next, enter the database server name and database name as shown in the screenshots. Click “Next” to proceed with the configuration.
You'll need to provide the passphrase that you used when installed the Application Server. Enter it and click “Next”:

This opens a screen where you can confirm your Database information. Click “Next” to start the configuration wizard for this server.
When it’s completed, you should see the following screen:

![SharePoint Products Configuration Wizard](image)

Configuration Successful

The following configuration settings were successfully applied:

- Configuration Database Server: CONTOSO\SQL
- Configuration Database Name: SharePoint_Laring

Click Finish to close this wizard and launch the SharePoint Central Administration website to continue configuring your SharePoint installation. The user may be prompted by their web browser for the username in the form DOMAIN\User_Name and password to access the site. At that prompt, enter the credentials that you used to log in to this computer. Add the site to the list of trusted sites when prompted.

Cancel the farm provisioning wizard that starts after this. The Central Administration site from http://contosospas1 should open.

For the purposes of this lab, this completes the provisioning of your SharePoint servers.

**Step 7 Expose SharePoint to the Internet**

The SharePoint farm is now fully configured with a site just waiting to be used. There’s only one ID (CONTOSO/spsetup) with permissions to the site but that would be easy to fix (add users to Active Directory and give those users permissions to the site). The last step is to expose the site to the internet.

IaaS enables you to add an endpoint to the VM. Select the CONTOSOSPWF1 VM from the list of machines. Click on ENDPOINTS to get a list of the current endpoints:

![contosospwfe1](image)

There are 3 options at the bottom of the list of endpoints: Add, Edit, and Delete. Click on “Add”.
Step 7.1 Add an endpoint to a virtual machine

Click on “Add Standalone Endpoint” and the “Next” right-arrow:

The next screen enables you to choose from a set of predefined endpoints. Choose “HTTP” which will route incoming TCP traffic on port 80. Also check “Create a Load-Balanced Set”. Requests that come into port 80 will be directed to port 80 one of the two SharePoint servers: CONTOSOSPAS1 or CONTOSOSPWFE1.

Click the right-arrow.
The next screen allows you to configure the load-balanced set. Provide a name and accept the default values. Click the checkmark to create the set:
If you wanted to use the CONTOSOSPAS1 VM as a web front-end, you would repeat the process and define an endpoint on port 80 that was part of the SHAREPOINT load-balanced set.

**Step 7.2 Alternate Access Mapping**

The last step required is to configure an alternate access mapping for SharePoint. The public URL is the cloud service URL. It is http://CONTOSOSP33.cloudapp.net.

Remote into CONTOSOSPWFE1. Login with “CONTOSOSP\spsetup”.

Press the Windows key and type “central”. This will filter the applications so that only “SharePoint 2013 Central Administration” shows. Click this to open it.

The Central Administration site will open:

Click on “Application Management”. This opens the “Application Management” page. Click on “Configure alternate access mappings”:

This opens the “Alternate Access Mappings” page. Click on “Show All” and then click on “Change Alternate Access Mapping Collection”: 
This opens the “Select An Alternate Access Mapping Collection – Webpage Dialog”. Click on “SharePoint – 80”:

You should only see http://contosospas1 in your list of internal URLs. Click on “Edit Public URLs”:

Type your cloud service URL (http://contososp33.cloudapp.net) in the text box underneath the word “Internet”. Click “Save”.

Alternate Access Mappings

This opens the “Select An Alternate Access Mapping Collection – Webpage Dialog”. Click on “SharePoint – 80”:

You should only see http://contosospas1 in your list of internal URLs. Click on “Edit Public URLs”:

Type your cloud service URL (http://contososp33.cloudapp.net) in the text box underneath the word “Internet”. Click “Save”. 
Edit Public Zone URLs

Alternate Access Mapping Collection
Select an Alternate Access Mapping Collection.

Public URLs
Enter the public URL protocol, host, and port to use for this resource in any or all of the zones listed. The Default Zone URL must be defined. It will be used if needed where the public URL for the zone is blank and for administrative actions such as the URLs in Quote e-mail.

Default: http://contosoapp
Intranet: 
Internet: http://contosoapp33.cloudapp.net

Custom: 
Extranet: 

Save  Delete  Cancel
After you add the URL, the site will be publicly accessible. Type the URL into the address bar, authenticate with “CONTOSO\spsetup” and the site will come up.

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