# Practice M7: Centralized Management

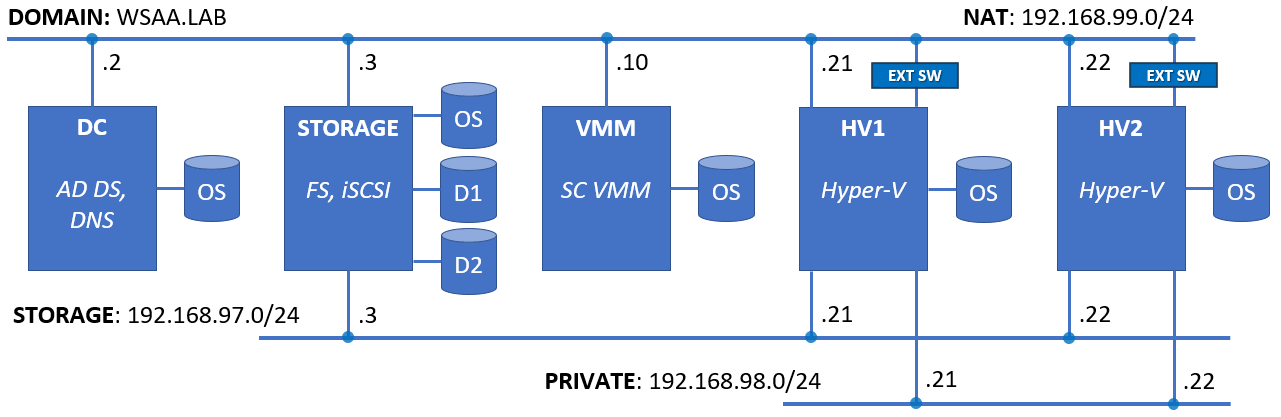
For the purpose of this lab and the course, we will consider that we are working in a pure Windows environment either on-premise or in the cloud and using **Hyper-V** as a virtualization solution. All tasks can be achieved under different configuration (another host OS or virtualization solution) with the appropriate adjustments

The expected lab infrastructure (it will evolve throughout the practice) consists of up to five machines. **Windows Server 2019 Standard** is enough, Desktop experience or core (managed remotely) – it is up to you

If you are short on resources, you can shrink the infrastructure down by combining for example the DC and STORAGE in one VM. All tasks should be adjusted accordingly

## Part 1: System Center VMM 101

The overall picture should look like:



**DC** and **STORAGE** can be with 1GB or 1,5GB of dynamic RAM. The rest should be at least with 3GB or 4GB

### Prerequisites

Make sure that you downloaded **SQL Server** installation media and **Service Center Virtual Machine Manager** installation files before you continue

**SQL Server** can be downloaded from here: <https://go.microsoft.com/fwlink/?linkid=866662>

**SQL Server Management Tools**: <https://aka.ms/ssmsfullsetup>

**Windows ADK**: <https://go.microsoft.com/fwlink/?linkid=2086042>

**Windows PE** add-on for **Windows ADK**: <https://go.microsoft.com/fwlink/?linkid=2087112>

**SCVMM** can be download from here: <https://www.microsoft.com/en-us/evalcenter/evaluate-system-center-2019>

### Preparation

Use the provided script (**M7-Scirpt-Lab-Setup.ps1**) to create and make the initial configuration of the virtual machines

Explore the script and adjust it if needed or come up with your own script

You should continue only if and when you have implemented infrastructure similar to the one depicted above

### SQL Server Database Installation

Mount the SQL installation media on the **VMM** machine

Log on **VMM** machine with account that has administrative privileges

Navigate to the virtual optical drive and start the installation process

Select the **Installation** option in the left section

Click on the **New SQL Server stand-alone installation or add features to an existing installation** option

Make sure that the **Developer** edition is selected and click **Next**

Check the **I accept the license terms and Privacy Statement** and click **Next**

On the **Microsoft Update** screen click **Next**

Click **Next** on the **Product Updates** screen

Click **Next** on the **Install Rules** screen

Make sure that the **Database Engine Services** option is selected and click **Next**

On the **Instance Configuration** screen accept the default values and click **Next**

On the **Server Configuration** screen click **Next**

Change the authentication to **Mixed Mode (SQL Server authentication and Windows authentication)**

Enter **Password1** in both password-related fields and click **Next**

Click on **Add Current User** button and click **Next**

Review the information on the **Ready to Install** screen and click **Install**

Monitor the installation progress

Once the process is done, click on **Close**

You can now install the **SQL Server Management Tools** if needed

### Windows Assessment and Deployment Kit Installation

Log on to the **VMM** machine with account that has administrative privileges

Navigate to the folder where the **Windows ADK** installation files are stored

Double-click on the **adksetup.exe** file

Accept the default installation location and click **Next**

Select either to send (**Yes**) or not (**No**) anonymous usage statistics and click **Next**

Click on the **Accept** button

Either accept the default features selection or adjust it according to your liking and click **Install**

Once the installation process is done, click **Close**

### Windows PE Add-on Installation

Log on to the **VMM** machine with account that has administrative privileges

Navigate to the folder where the **Windows ADK** installation files are stored

Double-click on the **adkwinpesetup.exe** file

Accept the default installation location and click **Next**

Select either to send (**Yes**) or not (**No**) anonymous usage statistics and click **Next**

Click on the **Accept** button

Accept the feature selection offered and click **Install**

Once the installation process is done, click **Close**

### System Center VMM Installation

Log on to the **VMM** machine with account that has administrative privileges

Navigate to the folder where the **VMM** installation files are stored

Double-click on the **SCVMM\_2019.exe** file

Click **Next** on the welcome screen

Make sure that the **I accept the agreement** option is selected and click **Next**

Accept the default extraction path and click **Next**

Start the extraction process by clicking **Extract**

Once the extraction is done, click **Finish**

Navigate to the folder where the extracted files are and double-click on the **setup.exe**

Click on **Install**

Select both **VMM management server** and **VMM console** options and click **Next**

Enter **Product registration information** (skip the **Product key**) and click **Next**

Select the **I have read, understood, and agree with terms of the license agreement** and click **Next**

On the **Diagnostic and Usage Data** screen click **Next**

Usually, you would like to turn on Windows updates, but for now, select the **Off** option and click **Next**

Accept the default installation location and click **Next**

If there are any errors detected on the prerequisites screen, correct them, and restart the setup. If there aren’t any or there are just warnings, click **Next**

On the **Database configuration** screen, accept the settings for **Server name** and **Port** because the database is installed on the same machine

Select the **Use the following credentials** option and enter **WSAA\Administrator** in the **User name** field and **Password1** in the **Password** field. Click **Next**

Change the **Virtual Machine Manager Service Account** selection to **Local System Account** and click **Next**

Adjust the proposed port values on the **Port configuration** screen or accept them as they are (write them down) and click **Next**

On the **Library configuration** screen accept the default settings and click **Next**

Examine the information on the **Installation summary** screen and click **Install**

Once the installation process is done, remove the selection for **Check for the latest Virtual Machine Manager updates** and click the **Close** button

### First Steps in the VMM Console

When the **Connect to Server** window appears, leave all values as they are and click **Connect**

Click here and there to get familiar with the interface

### Prepare Hyper-V Hosts

Remember that you must execute the same actions **on both Hyper-V machines**

Log on to **HV1** host with account that has administrative privileges

#### Network Settings

Open **Server Manager**, navigate to **Tools** and select **Hyper-V Manager**

Click on **Virtual Switch Manager** under **Actions** menu

Create a new **External** switch, name it **VM Network** and link it to **network adapter #4** and click **OK**

You can safely deselect the **Allow management operating system to share this network adapter** option

Close the **Hyper-V Manager**

#### Roles

While still in the **Server Manager**, navigate to **Manage** and then click **Add Roles and Features**

On the **Before you begin** screen, click **Next**

Make sure that the **Role-based or feature-based installation** option is selected and click **Next**

On the **Select destination server** screen make sure that the **HV1** sever is selected and click **Next**

On the **Select server roles** screen click **Next**

On the **Select features** screen, select the **Multipath I/O** feature and click **Next**

Click **Install** on the **Confirm installation selections** screen

Once the installation process is done, click **Close**

*You may want to install the* ***Failover Cluster*** *component as well in order to speed up the process later*

Restart the **HV1** machine

### VMM Run As Account

Log on to the **VMM** machine with account that has administrative privileges

Open the **VMM Console** if not already open

Click on **Settings** (bottom-left)

Click on the **Create Run As Account** button in the tool bar

Enter **VMM Run As Account** in the **Name** field

Enter **WSAA\VMMRunAs** in the **User name** field

Enter **Password1** in both password fields

You can click the **View Script** button to examine what command will be executed. Close the script window

Click **Finish**

Switch to **Run As Accounts** section to explore what other accounts exist

### Adjust Network Settings

While still in the **Settings** mode, click on **General** and then double-click on **Network Settings**

Change the **Match logical networks by** to **Disabled** and click **Finish**

### Add Hyper-V Hosts

Switch to **Fabric** mode

Select the **All Hosts** node under **Servers**

Click on **Add Resources** button in the tool bar

Select the **Hyper-V Hosts and Clusters** option

Make sure that the **Windows Server computers in a trusted Active Directory domain** is selected and click **Next**

Click **Browse** and select the **Run As Account** we created earlier and confirm with **OK**

Click **Next** to move on the next step

Enter **HV1** and **HV2** in the **Computer names** field, each on a separate line, and click **Next**

On the next screen, put a checkmark for each server and click **Next**

On the next screen, accept the proposed **Host group** and click **Next**

Check the summary and click **Finish**

You can monitor the job progress

After a while, the process will complete successfully but will indicate that a restart is required for both **Hyper-V** hosts

Log on to each of the **Hyper-V** hosts and restart them

### Host Group Settings

While still in **Fabric** mode, right-click the **All Hosts** node and select **Properties**

Make sure to tick the **Allow unencrypted BITS file transfers** in order to enable faster operations on VMs’ files

Switch to **Host Reserves**

Change for example the **Memory** reserve to **512 MB**

Check the other sections as well

Click **OK** to apply the changes

### Add Block-based Storage

While still in **Fabric** mode, expand the **Storage** node

Right-click on **Providers** and select **Add Storage Devices** option

Make sure that the **SAN and NAS devices discovered and managed by a SMI-S provider** is selected and click **Next**

Change the **Protocol** selection to **SMI-S WMI**

Enter **storage.wsaa.lab** in the **Provider IP address or FQDN** field

Click the **Browse** button and select the **Run As Account** created earlier and then click **OK**

Click **Next**

*If you encounter an error, then check if the* ***Windows Standards-Based Storage Management*** *service is running on the* ***VMM*** *host and if not, start it*

Select the discovered **STORAGE** server and click **Next**

Select drive **X** and click on **Create classification**

Enter **iSCSI Storage** in the **Name** field and click **Add**

Then, while the drive **X** is highlighted, choose the newly created classification in the **Classification** field and click **Next**

Check the summary and click **Finish**

### Define a LUN

Now, select the **Classification and Pools** node

Select the listed iSCSI target and click the **Create Logical Unit** button in the tool bar

Enter **iscsi-lun1** in the **Name** field

Enter **50** in the **Size (GB)** field

Click **OK**

### Add File-based Storage

Select the **File Servers**, right-click and select **Add Storage Devices**

Make sure that the **Windows-based file server** option is selected and click **Next**

Enter **storage.wsaa.lab** in the **Provider IP address or FQDN** field

Click the **Browse** button and select the **Run As Account** created earlier and click **OK**

Click **Next** button to move on

Select the discovered server and click **Next**

Select again the server and click **Next**

Examine the summary screen and click **Finish**

### Define a Share

Select the **File Servers**, right-click and select **Create File Share**

Enter **smb-share1** in the **Name** field

Click the **New** button next to the **Classification** drop-down list

Enter **SMB Storage** in the **Name** field and click **Add**

Enter **Y:\SMB-SHARE1** in the **Local path** field and click **Next**

Examine the information on the summary screen and click **Finish**

### Assign the iSCSI Storage to Hyper-V Hosts

Navigate to **All Hosts** and select **HV1**

Right-click and select **Properties**

Go to **Storage**

Click the **Add** button and select **Add iSCSI Array**

Select **STORAGE** from the drop-down list

Select the **Use advanced settings** option

Select the **192.168.97.3 / 3260** option in the **Target portal** drop-down list

Select the **192.168.97.21 ()** option in the **Initiator IP** drop-down list

Click **Create**

Click **OK**

Repeat the same procedure on **HV2** host

### Allocate the iSCSI Storage to the Hosts Group

Select the **All Hosts** node, right-click and select **Properties**

Select **Storage**

Click **Allocate Storage Pools** button

Make sure that the **Display as …** option is selected

Select the storage pool and click **Add**

Click **OK**

Click **Allocate Logical Units** button

Make sure that the **Display as …** option is selected

Select the LUN and click **Add**

Click **OK**

Click **OK** to close the **All Hosts Properties** window

### Assign the SMB Storage to Hyper-V Hosts

Navigate to **All Hosts** and select **HV1**

Right-click and select **Properties**

Go to **Storage**

Click the **Add** button and select **Add File Share**

Select the only item in the **File share path** the drop-down list

Click **OK**

Repeat the same procedure on **HV2** host

### Manage VM Placement

Navigate to **All Hosts** and select **HV1**

Right-click and select **Properties**

Select **Hardware**

For every volume under **Storage** de-select the **Available for placement** option

Click **OK**

Repeat the same procedure on **HV2** host

### Logical Network

Open the **Networking** node and select the **Logical Networks**

Click the **Create Logical Network** button in the tool bar

Enter **VM Logical Network** in the **Name** field and click **Next**

Make sure that the **One connected network** option is selected and click **Next**

Click the **Add** button

Check the **All Hosts** node

Click the **Insert row** button and enter **0** for **VLAN** and **192.168.99.0/24** for **IP subnet**

Change the **Network site name** to **VM Logical Network Site**

Click **Next**

On the summary screen, click **Finish**

### IP Address Pool

Select the newly created logical network, right-click and select **Create IP Pool**

Enter **VM IP Address Pool** in the **Name** field and click **Next**

Make sure that the **Use an existing network site** option is selected and click **Next**

Change **Starting IP address** to **192.168.99.200**

Change **Ending IP address** to **192.168.99.249**

Enter **192.168.99.249** in the **IP addresses reserved for load balancer VIPs** field and click **Next**

Click **Insert** button under **Default gateways** and enter **192.168.99.1** and click **Next**

Click **Insert** button under **DNS Server Address** section an enter **192.168.99.2**

Enter **wsaa.lab** in the **Connection specific DNS suffix** field and click **Next**

On the WINS screen, click **Next**

Examine the summary screen and click **Finish**

### VIP Templates

Select the **VIP Templates** node under **Networking**

Click the **Create VIP Template** button in the tool bar

Enter **Web Server VIP Template** in the **Template name** field

Enter **80** both in the **Virtual IP port** and the **Backend port** fields and click **Next**

Make sure that **Specific** option is selected

Then select **Microsoft** in the **Manufacturer** drop-down list

Finally, select **Microsoft Load Balancing (NLB)** in the **Model** drop-down list and click **Next**

Make sure the **TCP** option is selected and click **Next**

Select **Enable persistence**

Select **Source IP** in the **Persistence type**

Select **Single** in the **Subnet mask to apply**

Click **Next**

Examine the summary screen and click **Finish**

### VM Network

With **Logical Networks** node still selected, click on the **Create VM Network** button in the tool bar

Enter **VM Network** in the **Name** field

Make sure that the **VM Logical Network** is selected

Click **Next** and then click **Finish**

### Attach Network to Hyper-V Hosts

Select the **All Hosts** node

Select **HV1**, right-click and select **Properties**

Go to **Hardware**

Select the **Private** network adapter and remove both checks for **Available for placement** and **Used by management**

Select the **Ethernet** network adapter and make sure that only the **Used by management** option is selected

Select the **Ethernet 4** network adapter and make sure that only the **Available for placement** option is selected

While here, select the **Logical network connectivity** and make sure that the **VM Logical Network** is selected

Select the **Storage** network adapter and remove both checks for **Available for placement** and **Used by management**

Switch to **Virtual Switches** and de-select the **Allow management operating system to share this network adapter**

Click **OK**

Repeat the same procedure on **HV2**

## Part 2: System Center VMM 102

We continue with the same set of machines that we used during the first part and from the same point we left

### Cluster Preparation

Log on to the **VMM** machine with account that has administrative privileges

Open the **VMM Console** if not already open

Click on **Fabric** (bottom-left)

Select **Classifications and Pools** under the **Storage** node

Click on the **Create Logical Unit** button in the tool bar

Enter **iscsi-quorum** in the **Name** field

Select **All Hosts** in the **Host group** drop-down list and click **OK**

### Hyper-V Cluster

Select **All Hosts** node under **Servers**

Click the **Create** buttonand select **Hyper-V Cluster**

Enter **HVCluster** in the **Cluster name** field and click **Next**

Click the **Browse** button and select the **Run As Account** create earlier and click **OK**

Make sure that **Existing servers running a Windows Server operating system** option is selected

You can select the **Skip cluster validation** item to save some time (not suitable for production) and click **Next**

Select both hosts and click **Next**

Make sure that the **iscsi-quorum** LUN is selected and click **Next**

Select the network and then select **VM IP Address Pool** item in the drop-down menu and click **Next**

Examine the information on the summary screen and click **Finish**

Sit back and relax while monitoring the cluster creation process as it can take while. Depending on the hardware, this can take anywhere between 15 and 30 minutes or even more (an hour or so)

### Cluster Storage

Right-click the newly created cluster and select **Properties**

Select **General**

Change **Cluster reserve (nodes)** to **0**

Switch to **Shared Volumes**

Click the **Add** button

Select the **iscsi-lun1**

Enter **iscsi-cluster1** in the **Volume Label** field, select **Quick Format** and **Force Format** and click **OK**

Switch to the **File Share Storage** and check if the file share is there

Finally, click **OK**

### Constrained Delegation

Log on to the **DC** with account that has administrative privileges

Open **Server Manager**, navigate to **Tools** and select **Active Directory Users and Computers**

Select the **Computers** container

Select **VMM**, right-click and select **Properties**

Switch to **Delegation** tab

Select **Trust this computer for delegation to specified services only**

Select **Use any authentication protocol**

Click the **Add** button

Click **Users or Computers** button

Enter **HV1;HV2** and click **OK**

Select both **cifs** and **Microsoft Virtual System Migration Service** and click **OK**

Click **OK**

Select **HV1**, right-click and select **Properties**

Switch to **Delegation** tab

Select **Trust this computer for delegation to specified services only**

Select **Use any authentication protocol**

Click the **Add** button

Click **Users or Computers** button

Enter **HV2** and click **OK**

Select both **cifs** and **Microsoft Virtual System Migration Service** and click **OK**

Click the **Add** button again

Click **Users or Computers** button

Enter **VMM** and click **OK**

Select **cifs** and click **OK**

Click **OK**

Repeat the same procedure for **HV2**

### Cloud

Return on **VMM** machine and open the **VMM Console** if not already open

Select the **VMs and Services** item (bottom-left)

Then, select the **Clouds** item in the upper-left section

Click the **Create Cloud** button in the tool bar

Enter **VM Cloud** in the **Name** field and click **Next**

Select **All Hosts** and click **Next**

Select **VM Logical Network** and click **Next**

Select any available load balancer and click **Next**

Select any available **VIP Template** and click **Next**

Skip the port classification section by clicking **Next**

Select **iSCSI Storage** and **SMB Storage** and click **Next**

Skip the **Library** section by clicking **Next**

Accept the default capacity values and click **Next**

Select **Hyper-V** and click **Next**

On **Replication Groups** click **Next**

On **Storage QoS Policies** click **Next**

Examine the information on the summary screen and click **Finish**

### VMM Library

Select the **Library** item in the bottom-left section

Expand the **Library Servers** node in the upper-left section

Right-click on **VMM.WSAA.LAB** node and select **Properties**

In the **General** section select **All Hosts** from the **Host group** drop-down list

Switch to **VM Networks** section and select the **VM Network** item

Switch to **Settings** and click the **Browse** button to select the **Run As Account** we created earlier and click **OK**

Select the **Allow unencrypted BITS transfers** option and click **OK**

### VMM Library Access

Open a **File Explorer**

Navigate to **C:\ProgramData\Virtual Machine Manager Library Files**

Create folder **ISO** and copy the installation media for Windows Server 2019

Create additional folder **VM Templates**

Return to **C:\ProgramData** folder and right-click on **Virtual Machine Manager Library Files** folder and select **Properties**

Switch to the **Sharing** tab and click **Advanced Settings**

Click **Permissions**

Click **Add**

Click **Object Types** and select **Computers** and confirm with **OK**

Enter **HV1$;HV2$** and click **OK**

Click **OK**

Click **OK** to close the **Advanced Sharing** window

Switch to the **Security** tab

Click **Edit**

Click **Add**

Click **Object Types** and select **Computers** and confirm with **OK**

Enter **HV1$;HV2$** and click **OK**

Click **OK**

Click **Close**

Now, return to the **VMM Console** right-click the library and select **Refresh**

### Attach VMM Library to the Cloud

Switch to **VMs and Services**

Select the **VM Cloud** node and right-click and select **Properties**

Select **Library**

Click **Add**

Select the only option and click **OK**

Click **OK**

### Capability Profiles

Select the **Library** option

Then under **Profiles** select **Capability Profiles**

Select the **Hyper-V** record and right-click on it and select **Properties**

Select **Capabilities**

Select **Processors Range** and change the **Maximum** to **2**

Select **Memory Range** and change the **Maximum** to **2** and select **Required** option under **Dynamic memory**

Click **Close**

### Hardware Profiles

Select the **Library** option

Then under **Profiles** select **Hardware Profiles**

Right-click and select **Create Hardware Profile**

Enter **S-size VM** in the **Name** field

Set the **Generation** to **Generation 2**

Switch to **Hardware Profile**

Select **Cloud Capability Profiles** and make sure that **Hyper-V** is selected

Switch to **Memory** and select **Dynamic** and change the **Startup memory** to **512 MB**

Switch to **Network Adapters**

Select **Connected to a VM network**

Select **Static IP** option

Click **OK**

### Guest OS Profiles

Select the **Library** option

Then under **Profiles** select **Guest OS Profiles**

Right-click and select **Create Guest OS Profile**

Enter **Windows Server 2019 Standard** in the **Name**

Switch to **Guest OS Profile**

Select **Admin Password** and set the **Specify the password of the local administrator account**

Enter **Password1** in both password-related fields

Click **OK**

### VM Template

Select **VMs and Services** item in bottom-left section

Then, select **VM Cloud** in the upper-left section

Click the **Create Virtual Machine** button in the tool bar

Select **Create the new virtual machine with a blank virtual hard disk** and click **Next**

Enter **VM** in **Virtual machine name** field

Select **Generation 2** in the **Generation** drop-down list

Click **Next**

Select **S-size VM** from the **Hardware profile** drop-down list

Click **Next**

Make sure the **Deploy the virtual machine to a private cloud** option and click **Next**

Check the ratings and click **Next**

Then click **Next** again

Finally, click **Create**

When the creation process is complete, navigate to the VM and right-click and select **Properties**

Select **Windows Server 2019 Standard** in the **Operating system** drop-down list

Switch to **Hardware Configuration** and select the **Virtual DVD drive**

Select **Existing ISO image**

Click the **Browse** button, select the appropriate ISO and click **OK**

Select the **Share file instead of copying it** and click **OK**

Power-on the virtual machine

Right-click and select **Connect or View > Connect via Console**

Follow the OS installation

Once done, shutdown the machine

With the VM powered off check if the guest services are detected and if not, install them. If you install them, you may need to go through one more power-on-off cycle

Once the guest services are in place and the machine is powered off, right-click and select **Properties**

Switch to **Hardware Configuration**, select the **Virtual DVD drive** and remove the ISO file

Confirm with **OK**

Right-click again on the virtual machine but this time select **Create > Create VM Template**

When asked, answer **Yes**

Enter **W2K19 Std VM Template** in the **VM Template name** field and click **Next**

On the **Configure Hardware** screen, click **Next**

On the **Configure Operating System** screen select the guest OS profile created earlier and click **Next**

Confirm the library server by clicking **Next**

Select the path (**VM Templates**) on the library server and click **Next**

On the summary screen, click **Create**

Once the template is created, we can right-click on it and select **Properties** to do some final adjustments

Select **Hardware Configuration** and navigate to the OS disk

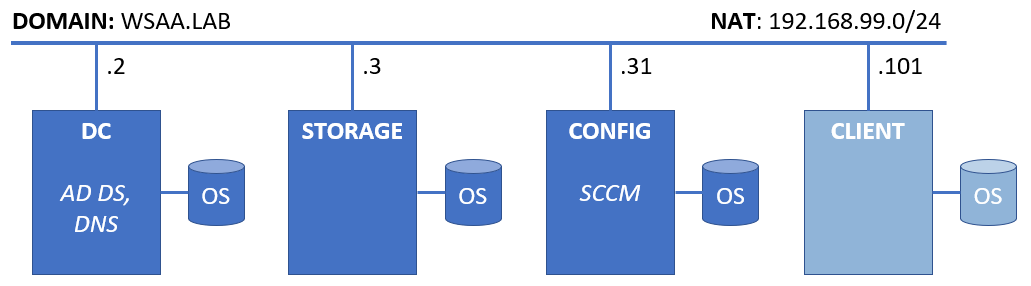
Select one of the two classifications created earlier and confirm with **OK**

### VM From Template

Test the newly created template

## Part 3: SCCM

The overall picture should look like:



Of course, we can continue working with the previous infrastructure and add the following two machines – CONFIG and CLIENT. Let’s follow this approach

### Prerequisites

Make sure that you downloaded SQL Server installation media and Microsoft Endpoint Manager Config Manager installation files before you continue

**SQL Server** can be downloaded from here: <https://go.microsoft.com/fwlink/?linkid=866662>

**SQL Server Management Tools**: <https://aka.ms/ssmsfullsetup>

**SQL Server Reporting Services**: <https://www.microsoft.com/en-us/download/details.aspx?id=100122>

**Windows ADK**: <https://go.microsoft.com/fwlink/?linkid=2086042>

**Windows PE** add-on for **Windows ADK**: <https://go.microsoft.com/fwlink/?linkid=2087112>

**MEMCM** can be download from here: <https://www.microsoft.com/en-us/evalcenter/evaluate-microsoft-endpoint-configuration-manager>

### Infrastructure Preparation

Use the provided script (**M7-Scirpt-Lab-Setup.ps1**) to create and make the initial configuration of the virtual machines

Explore the script and adjust it if needed or come up with your own script

You should continue only if and when you have an implemented infrastructure similar to the one depicted above

### Prerequisite Checker

Extract installation files of Configuration Manager in a folder, for example in **C:\MEM\_Configmgr\_2002**

We can navigate to **C:\MEM\_Configmgr\_2002\SMSSETUP\BIN\X64** and execute **prereqchk**

Please note, that this tool can be executed from a command prompt as well. So let’s follow this approach

Open a command prompt session with **Run as Administrator** and execute:

**cd C:\MEM\_Configmgr\_2002\SMSSETUP\BIN\X64**

**prereqchk.exe /LOCAL**

After a while, a window with list containing all finding will appear

### Fulfill Requirements

Depending on the installation, we must install a few items to meet the prerequisites

For our simple all-in-one setup, we must install the following tools

#### Install SQL Server (and Tools)

##### SQL Server

Navigate to the virtual optical drive and start the installation process

Select the **Installation** option in the left section

Click on the **New SQL Server stand-alone installation or add features to an existing installation** option

Make sure that the **Developer** edition is selected and click **Next**

Check the **I accept the license terms and Privacy Statement** and click **Next**

On the **Microsoft Update** screen click **Next**

Click **Next** on the **Product Updates** screen

Click **Next** on the **Install Rules** screen

Make sure that the **Database Engine Services** option is selected and click **Next**

On the **Instance Configuration** screen accept the default values and click **Next**

On the **Server Configuration** screen change the **SQL Server Database Engine** to **NT AUTHORITY\SYSTEM** and click **Next**

Change the authentication to **Mixed Mode (SQL Server authentication and Windows authentication)**

Enter **Password1** in both password-related fields and click **Next**

Click on **Add Current User** button and click **Next**

Review the information on the **Ready to Install** screen and click **Install**

Monitor the installation progress

Once the process is done, click on **Close**

##### SQL Server Tools

Download and install the **SQL Server Tools**

##### SQL Server Configuration

Use the **SQL Server Configuration Manager** console to enable the **TCP/IP** protocol

#### Install Roles and Features (IIS, .NET, etc.)

Open **Server Manager** and click on **Manage > Add Roles and Features**

On the first screen click **Next**

Make sure that the **Role-based or feature-based installation** option is selected and click **Next**

Ensure that the correct server is selected and click **Next**

Select the **Web Server (IIS)** role and confirm with **Add Features** button

Click **Next** to go to the **Features** step

Select the **.NET Framework 3.5 Features**

Select additionally the **HTTP Activation** item

Confirm with **Add Features** when asked

Select **HTTP Activation** under **.NET Framework 4.7 > WCF Services**

Select **Background Intelligent Transfer Service (BITS)** feature

Confirm with **Add Features** when asked

Scroll down and select the **Remote Differential Compression** feature

Navigate to **Remote Server Administration Tools > Role Administration Tools > Windows Server Update Services Tools**

Select the **User Interface Management Console** item

Confirm with **Add Features** when asked

Click the **Next** button to move on the next step

Click **Next** once again

Navigate to **Security** and select **Windows Authentication**

Navigate to **Application Development** and select both items **ASP.NET 3.5** and **ASP.NET 4.7**

Confirm with **Add Features** when asked

Navigate to **Management Tools > IIS 6 Management Compatibility**

Select the **IIS 6 WMI Compatibility** item

Finally, click the **Next** button

Make sure that the machine has Internet access and click **Install**

Once the installation process is done, click **Close**

#### Windows Assessment and Deployment Kit

##### Windows Deployment Tools and USMT

Download the **Windows ADK** setup file and start it

Select just the **Deployment Tools** and **User State Migration Tool (USMT)** items

Click the **Install** button

##### Windows PE

Download the **Windows Preinstallation Environment** setup file and start it

There are not any options here, so we install everything

#### Extend the AD Schema

Open a command prompt session with **Run as Administrator** and execute:

**cd C:\MEM\_Configmgr\_2002\SMSSETUP\BIN\X64**

**extadsch.exe**

Navigate to the **DC** machine and start the **ADSI Edit** tool

Select the **ADSI Edi**t node and from the context menu select **Connect to** option

Confirm the proposed values with the **OK** button

Expand the tree nodes and select the **CN=System** node

Invoke its context menu and select the **New > Object** option

Select the **container** item and click **Next**

Enter **System Management** in the **Value** field and click **Next**

Finally, click **Finish**

Select the newly added container and invoke its context menu

Select the **Properties** option

Switch to **Security** tab

Click the **Add** button

Click the **Object Types** button

Select the **Computers** item and click **OK**

Enter **config** and click on the **Check Names** button

Close the dialog box with the **OK** button

**Allow** the **Full control** right and click the **Advanced** button

Select the **CONFIGSRV** account and click the **Edit** button

Select the **This object and all descendant objects** item in the **Applies to** drop-down list and click **OK**

Click **OK** again and then once more

Close the **ADSI Edit** tool and return to the **CONFIGSRV** machine

### Actual Installation

We can re-run the prerequisites check again. Everything should be fine

First, create a **Downloads** folder under **C:\**

Then, let’s navigate to the installation folder (**C:\MEM\_Configmgr\_2002**) and start the **spash.hta** file

Click on the **Install** link

Read the information on the **Before You Begin** screen and click **Next**

Make sure that the first option is selected and click **Next**

Select the **Install the evaluation edition of this product** option and click **Next**

Accept the **Product License Terms** by selecting all three options and click **Next**

Make sure that the first option is selected and enter the path to the folder created earlier (**C:\Downloads**) and click **Next**

Make sure that **English** is selected and click **Next**

On the **Client Language Selection** screen select **English** as well and click **Next**

Enter **SUL** in the **Site code** field

Enter **SoftUni Lab Site** in the **Site name** field

Click **Next** to continue

Select the **Install the primary site as a stand-alone site** option and click **Next**

Confirm with **Yes**

Accept the proposed values and click **Next**

On the **Database Information** screen click **Next**

Accept the defaults on the **SMS Provider Settings** screen and click **Next**

Select **Configure the communication method on each site system role** and the option bellow and click **Next**

On the **Site System Roles** screen accept the default values and click **Next**

On **Diagnostic and Usage Data** screen click **Next**

On **Service Connection Point Setup** screen click **Next**

Explore the summary information and click **Next**

Finally, click the **Begin Install** button to initiate the installation process

Please note, that this process **can take up to 40 or more minutes**. So, be patient

Once, the installation is done, start the **Configuration Manager** console

Explore the menu items. For example, visit **Monitoring** and **Administration**

### Clients and Devices

While still in the **Configuration Manager** console, switch to A**dministration > Hierarchy Configuration > Discovery Methods**

Doble-click on **Active Directory Forest Discovery** and enable it

When asked, confirm with **Yes**

Doble-click on **Active Directory System Discovery** item

Select the **Enable Active Directory System Discovery** option

Click on the star-like button

Click **Browse** and select **Computers** container and confirm with **OK**

Click again **OK**

Explore the rest of the tabs

Confirm with **OK**

When asked, confirm with **Yes**

Switch to **Assets and Compliance > Overview > Devices**

We should see the rest of the machines in our AD

Select one of the machines and explore the tabs in the bottom section of the screen

Now, select **Device Collections** item in the left section and from the context menu select **Create Device Collection**

Enter **LAB Machines** in the **Name** text field

Click **Browse** and select **All Systems** as a limiting collection and click **Next**

Click **Add Rule > Direct Rule** button

Click **Next**

Select **Operating System Name and Version** in the **Attribute** **name** drop-down list

Enter **%Windows%** in the **Value** text field

Click **Next**

Select a few of the machines. For example, select **HV1**, **HV2**, and **CLIENTSRV**

Click **Next**

Again, click **Next** and then **Close**

Click **Next**, then again **Next**, and **Close**

### Boundaries, Groups, and Distribution Points

Navigate to **Administration > Overview > Hierarchy Configuration > Boundaries**

Invoke the context menu and select **Create Boundary** item

Enter **LAB** in the **Description** field

Explore the **Type** list and select **IP subnet**

Enter **192.168.99.0** in the **Subnet ID** field

Switch to **Site Systems** and make sure that **CONFIGSRV.WSAA.LAB** is added to the list

Confirm with **OK**

Switch to **Boundary Groups** and from the context menu select **Create Boundary Group**

Enter **LAB Group** in the **Name** field

Click the **Add** button

Select the **LAB** boundary in the **Boundaries** section and confirm with **OK**

Switch to **References** tab

Select the **Use this boundary group for site assignment** option

Click the **Add** button

Select the only site system and confirm with OK

Close with **OK**

### Content Distribution

While still in the **Configuration Manager** console, switch to A**dministration > Distribution Points**

Explore the **Properties** of the only distribution point

Then select **Sites** in the left menu and the only site and from the context menu select **Configure Site Components > Software Distribution**

Explore the settings

Then select the **Client Settings** item in the left menu

Select Properties of the **Default Client Settings**

Explore the settings

### Client Deployment

Let’s deploy the client part of the software manually on the **CLIENTSRV** machine

Log on to it as **WSAA\Administrator**

Open **File Explorer** and navigate to **\\Configsrv\c$\Program Files\Microsoft Configuration Manager\Client**

Explore its content

Open a command prompt session and execute

**net use Z:** [**\\Configsrv\c$**](file:///\\Configsrv\c$)

Navigate to drive **Z:** and to the client installation folder

Execute:

**ccmsetup.exe /mp:CONFIGSRV.WSAA.LAB SMSSITECODE=SUL SMSMP=CONFIGSRV.WSAA.LAB DNSSUFFIX=WSAA.LAB**

Open **Task Manager** and monitor the process

Wait a while for the processor to settle down. You should see the **CcmExec.exe** process

Return to the **CONFIGSRV** machine

Explore the **Devices** node

We should see that the status of the client machine has changed

Now, we can add the client on the other two machines

Once done, open **Control Panel on** one of the client machines

Switch to **All Control Panel Items** and start the **Configuration Manager** applet

Explore its tabs and settings

### Reports

#### Reporting Services

Start the installation program

Select **Developer** edition

Accept the license and start the installation

Once the installation is done, click **Configure Report Server**

Click **Connect**

Select **Web Service URL** and hit **Apply**

Select **Database**

Click **Change Database**

Make sure that the **Create a new report server database** option is selected and click **Next**

Click on **Test Connection** and click **Next**

Click **Next**

Click **Next**

Click **Next**

And finally, click **Finish**

Select the **Web Portal URL** option and hit **Apply**

Click **Exit** to close the wizard

Navigate to <http://configsrv/reports/browse/> to test the reports portal

#### Reports Installation

Start the **Configuration Manager** console if not started

Navigate to **Administration > Site Configuration > Servers and Site System Roles**

Select **Add Site System Roles** from the context menu

Click **Next** and then again **Next**

Select **Reporting services point** and click **Next**

Click **Verify**

Click **Set > Add New Account**

Enter **WSAA\Administrator** with the corresponding password. Normally, we should user another account

Confirm with **OK**

Click **Next** and then again **Next**

Finally, click **Close**

Now, switch to **Monitoring > Reporting > Reports**

Here, we can find all available reports

Initially the list may appear to be empty. Reports will appear after a while. They are around 470

Once they are all deployed, we can test a few

### Software (EXE & MSI) Deployment

Create a shared folder, for example at **C:\Shared** and share it as [\\CONFIGSRV\Shared](file:///\\CONFIGSRV\Shared) for **Everyone**

Copy a sample **MSI** file, for example the one for **7zip**

#### Users Collection

Switch to **Administration > Hierarchy Configuration > Discovery Methods**

Select **Active Directory User Discover** and enter its properties

Enable it and click the star-like button

Click **Browse** and select the **Users** node and confirm with **OK**

Click **OK** and then again **OK**

After a while, switch to **Assets and Compliance > Overview > Users** and you will see a pair of users

Switch to **User Collections** and select **Create User Collection**

Enter **LAB Users** for **Name**

Click **Browse** and select **All Users** and confirm with **OK**

Click **Next**

Click **Add Rule > Direct Rule**

Click **Next**

Enter **%** in the **Value** field

Click **Next**

Select the **Administrator** user and click **Next**

Click **Next**

Finally, click **Close**

Click **Next**, once again click **Next**, and finally, click **Close**

#### Application

Switch to **Administration > Client Settings**

Open the **Default Settings** item properties

Explore **Computer Agent**

Change **PowerShell** execution policy to **Bypass** for example and confirm with **OK**

Switch to **Software Library > Application Management > Applications**

Click **Create Application**

Enter [\\CONFIGSRV\Share\7z1900-x64.msi](file:///\\CONFIGSRV\Share\7z1900-x64.msi) in the **Location** field

Click **Next**

Confirm with **Yes** when asked about the publisher confirmation

Click **Next**

Click **Next**

Click **Next**

Click **Close**

Select the application and click **Deploy**

Click **Browse** and select **LAB Users** collection and click **Next**

Click **Add > Distribution Point**

Select our only **DP** and click OK

Click six times **Next** and finally, click **Close**

Log on to the client (**CLNTSRV**) machine

Start **Software Center**

Select the application and click **Install**