Pre-class setup for attendee's computer

4-day Masterclass with John Craddock

Microsoft Identity solutions with Azure AD, on-premises AD FS and AD

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IMPORTANT

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We cannot not endorse the suitability of the tools for your environments. Downloading any tools, installing and using them should only be done at your own risk after you have evaluated and security checked the tools in a test environment.

Table of Contents

1 Pre-class requirements

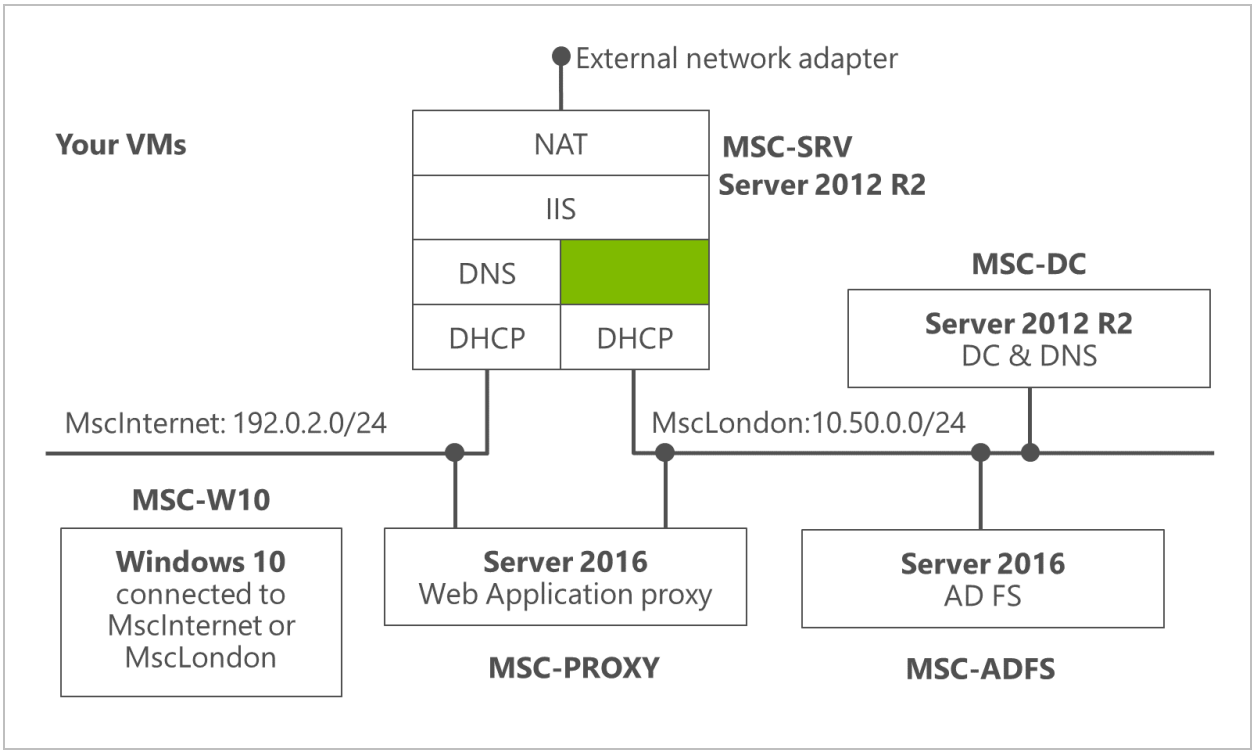
If you bringing your own laptop that has been preconfigured with the classroom lab environment. You must confirm that you have preconfigured your environment and tested it before you arrive at the class.

You will configure 5 VMs on your laptop using Hyper-V running on Windows 10.

1.1 Laptop requirements

- Windows 10
- Must support Hyper-V
- Must be capable of running 5 VMs
    - 3 x Server 2012 R2
    - 2 x Server 2016
- 16 GB memory
- Ideal resolution 1920 x 1080
    - Less will work but you will need to run the VMs full screen
- 250 GB free space
- High-spec CPU

2 Classroom Lab environment



All the VMs should be self-explanatory with the exception of MSC-SRV. This VM is running NAT to support the MscInternet and MscLondon private networks. NAT allows both of the networks to reach the classroom network and Internet.

MscInternet simulates the Internet for the Labs and uses the 192.0.2.0/24 network which is reserved in RFC 5737 as a network for documentation and examples, I.E. it will never be used on the public Internet. Both private networks have their own DHCP scopes which are served from MSC-SRV. The DNS on MSC-SRV servers the MscInternet network and simulates an ISP's DNS.

The MscLondon network simulates the corporate network and DNS is served by the Server 2012 R2 domain controller.

3 Creating the VMs

3.1 Installing Hyper-V

Before starting you will need Hyper-V installed. If you are not familiar with Hyper-V, help is readily available on the Internet. See:

- https://msdn.microsoft.com/en-us/virtualization/hyperv_on_windows/quick_start/walkthrough_install
- http://blogs.technet.com/b/canitpro/archive/2014/10/02/step-by-step-creating-and-running-a-windows-10-vm-on-windows-8-1.aspx

3.2 Setting up the virtual switches (networks)

If you already have Hyper-V running or have set up Hyper-V using the given references as guidance make a note of the name of the Virtual switch (network) that is connected to the external network. And connect to this network when the VM configuration shows the network connected to MscExternal.

From the Hyper-V management console, select Actions | Virtual Switch Manager…

Create the following virtual switches using the indicated parameters:

Virtual switch 1 **ONLY CREATE THIS IF an EXTERNAL network has not been previously configured**	
Connection type	External
Name	MscExternal
Network Interface	Select your laptops external (wired) network interface that is connected to the Internet
Allow management OS to Share…	Select this option to allow your desktop to connect to the external network

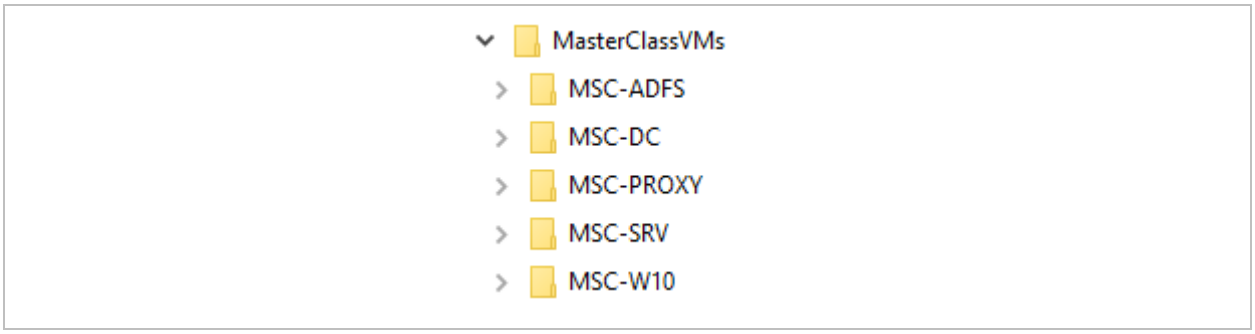
Virtual switch 2	
Connection type	Private
Name	MscLondon

Virtual switch 3	
Connection type	Private
Name	MscInternet

Virtual switch 4 – this is only required if you are going to connect the labs to the Internet via wireless (see Section 5)	
Name	192.168.137net
Connection type	Internal

3.3 Creating the Virtual Machines (VMs)

It is recommended to create your VMs under in a single folder called MasterClassVMs – after creating the VMs you will end up with the following directory structure:



Create the VMs as follows – leave all settings not specified below at their defaults.

Before starting the creation of the VMs create the <your path>MasterClassVMs folder where you want to store the VMs. It is recommended to create the folder as c:\MasterClassVMs.

For all VMs:

Set the location to store the virtual machine to <your path>\masterclassvms\<VM name (as below)>.

Choose a "Generation 1" VM.

Allocate 2GB and dynamic memory to each VM.

Connect to your external network (MscExternal).

Use the following naming for your VMs:

VM	Name
1	MSC-W10
2	MSC-DC
3	MSC-SRV
4	MSC-PROXY
5	MSC-ADFS

3.4 Installing the operating systems

If you have access to the operating systems via your company or an MSDN subscription you can install from the supplied media. If you don't have access to the media, evaluation copies can be downloaded from:

Servers: https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-technical-preview

Windows 10: https://www.microsoft.com/en-us/evalcenter/evaluate-windows-10-enterprise x64

Install the operating systems as follows:

Please make sure you install with the language set to English, otherwise you are not going to get any help in the class!

VM	OS	Language	Initial user	password
MSC-W10	Windows 10 Version 1607	English	John	Class2016
When prompted choose: Join a domain				
MSC-DC	Windows Server 2012 R2 Datacenter (Server with a GUI)	English	Administrator	Class2016
MSC-SRV	Windows Server 2012 R2 Datacenter (Server with a GUI)	English	Administrator	Class2016
MSC-PROXY	Windows Server 2016 (Datacenter with Desktop Experience)	English	Administrator	Class2016
MSC-ADFS	Windows Server 2016 (Datacenter with Desktop Experience)	English	Administrator	Class2016

3.5 Windows update

3.5.1 On each VM run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

Configuring the VMS – to be done in sequence

3.6 MSC-W10

3.6.1 Switch to MSC-W10.

3.6.2 Configure the computer as shown below. (On Windows 10 to change the name of the computer, click on the start icon, select settings and type "name" into the search field.)

VM Name	OS	Computer name	Roles:
MSC-W10	Windows 10 Enterprise	msc-w10	N/A

Network interface name	Connected to virtual switch	IP address	Subnet	Default gateway	DNS address
Ethernet	MscLondon	DHCP	DHCP	DHCP	DHCP

3.7 MSC-DC

3.7.1 Switch to MSC-DC.

Configure the VM as shown in the table below.

VM Name	OS	Computer name	Roles:
MSC-DC	Server 2012 R2	msc-dc	TBD

Network interface name	Connected to virtual switch	IP address	Subnet	Default gateway	DNS address
Ethernet	MscLondon	10.50.0.10	255.255.255.0	10.50.0.1	10.50.0.10

3.7.2 Restart.

3.7.3 In the Server Manager console, click the Local Server node and turn off the "IE Enhanced Security Configuration" for Administrators.

3.7.4 Using Add Roles and Features add the following (add the associated features when automatically prompted):

- Active Directory Domain Services

3.7.5 Click through the remaining steps in the wizard leaving all the default choices.

Configuring AD DS

3.7.6 Once the installation has completed, in the Server Manager Console click on the yellow notification icon and select "Promote this server to a domain controller".

3.7.7 Promote the server using the default setting except if show differently in the following table:

Parameter	Value
Add a new forest	Select
Root domain name	example.com
DSRM password	Class2016

Installing and configuring AD CS

3.7.8 Using Add Roles and Features add the following (add the associated features when automatically prompted):

- Active Directory Certificate Services

3.7.9 Click through the remaining steps in the wizard leaving all the default choices.

3.7.10 Once the installation has completed, in the Server Manager Console click on the yellow notification icon and select "Configure Active Directory Certificate Services…".

3.7.11 Use the default setting except if show differently in the following table:

Select a role to configure	Certificate Authority
Cryptography for CA	SHA 256
Common name for this CA	Example-CA

To avoid the need to publish CRLs we are going to create a certificate template that can be used as a TLS/SSL certificate, but does not include revocation information.

3.7.12 Go to Server Manager and select Tools | Certificate Authority. Expand the tree, right-click Certificate Templates and select Manage.

3.7.13 Right-click the Workstation Authentication template and select Duplicate Template.

3.7.14 Leave all the settings at their defaults except the changes that are shown in the following table:

General tab	
Template display name	TLS no CRL
Validity period	2 years
Click Apply	
Compatibility tab	
Certificate Authority	Windows Server 2012 R2
Certificate recipient	Windows 8.1 / Windows Server 2012 R2
Click Apply	
Request Handling tab	
Select	Allow private key to be exported
Click Apply	

Extensions Tab	
Edit the Application Policies	Remove: Client Authentication
	Add: Server Authentication
Click Apply	
Server tab	
Select	Do not include revocation information in the issued certificates
Click Apply	
Security tab	
Add Domain Controllers	
Set the permission to Apply	Read + Enroll
Click Apply	
Subject Name tab	
Select	Supply in the request
Click OK on the warning	
Click Apply & OK	

3.7.15 Close the Certificate Template Console.

3.7.16 In the CA console, right-click the certificate templates node and click New, select the template you just created which was called "TLS no CRL".

Testing the CA

3.7.17 Click on the start button and type MMC to open an empty console.

3.7.18 Click File, select Add/Remove Snap-ins and add the Certificates Snap-in, set it to the computer account.

3.7.19 Save the snap-in on the desktop with the name Certificates.

3.7.20 Expand the tree and select Personal\certificates, right-click on a blank part of the center pane and choose All Tasks, Request New Certificate.

3.7.21 Go through the wizard, leave all the settings at their defaults except the changes that are shown in the following table:

In the AD Enrolment Policy list	Select: TLS no CRL
Click on "More information is required…"	
Subject name: Type	Common name
Subject name: Value	test.example.com
Click Add	
Alternative name: Type	DNS
Alternative name: Value	test.example.com
Click OK	
Click Enrol	

3.7.22 Confirm that the certificate has been added to the store.

3.7.23 Examine the details of the certificate and confirm that there is no CRL Distribution Points Field.

3.7.24 Check that the signature hash algorithm is sha256.

3.8 MSC-SRV

3.8.1 Switch to MSC-SRV.

3.8.2 In the network connections dialog, rename the network adapter to "External".

Adding two Network adapters

3.8.3 Shut down the VM and from the Hyper-V management console, select MSC-SRV, right-click and choose settings. Under Add Hardware, select Network Adapter, click Add and connect the adapter to the MScInternet virtual switch.

3.8.4 Click Apply

3.8.5 Add another network adapter, but do **not** connect it to a virtual switch.

3.8.6 Start the VM. In the network connections dialog, rename the new connected adapter to "Internet" and the new disconnected adapter to "Corpnet".

3.8.7 Using the Hyper-V management console, connect the disconnected adapter to the MscLondon network.

3.8.8 Complete the computer name and TCP/IP configuration as per the following table.

VM Name	OS	Computer name	Roles:
MSC-SRV	Server 2012 R2	msc-srv	TBD

Network interface name	Connected to virtual switch	IP address	Subnet	Default gateway	DNS address
Corpnet	MscLondon	10.50.0.1	255.255.255.0	Not set	10.50.0.10
Internet	MscInternet	192.0.2.1	255.255.255.0	Not set	Not set
External	MscExternal	DHCP	DHCP	DHCP	DHCP

3.8.9 Restart.

3.8.10 In the Server Manager console, click the Local Server node and turn off the "IE Enhanced Security Configuration" for Administrators.

3.8.11 Open Explorer and verify that the VM is connected to your external network and that you can reach the Internet (reach Google). Due to the current DNS configuration this may take a few seconds.

3.8.12 Add the VM to the example.com domain. Logon as example\administrator.

3.8.13 Using Add Roles and Features add the following (add the associated features when automatically prompted):

- DHCP Server
- DNS Server
- Remote Access
- Web Server (IIS)

3.8.14 Click Next and in the Features list leave all the current settings and:

- Select .NET Framework 3.5 Features
- Expand .NET Framework 4.5 Features and select ASP.NET 4.5
- Expand Windows Process Activation Service and select:
  - Process Model
  - Configuration APIs

3.8.15 Click Next four times and in the Role services list leave all the current settings and:

- Select Routing – DirectAccess and VPN will be automatically added.

3.8.16 Click Next twice and in the Role services list leave all the current settings and:

- Under the Health and Diagnostics add
  - Logging Tools
  - Request Monitoring
- Under Security add
  - Basic Authentication
  - Digest Authentication
  - Windows Authentication
- Under Application Development add
  - .NET Extensibility 4.5
  - ASP.NET 4.5
  - CGI
  - ISAPI Extensions
  - ISAPI Filters

3.8.17 Click Next and Install.

Run Windows Update for the installed roles

3.8.18 Run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

Configure DHCP

3.8.19 In the Server Manager Console click on the yellow notification icon and select "Complete DHCP configuration".

3.8.20 Click through the options choosing the defaults to authorize the server.

3.8.21 In the Server Manager Console, select Tools | DHCP.

3.8.22 In the DHCP console, expand the tree, select the IPv4 node, right-click and select New Scope...

Configure as shown:

Parameter	Value
Name	Internet
Start IP address	192.0.2.50
End IP address	192.0.2.100
Length	24
Exclusions	NONE
Lease Duration	DEFAULT
Yes I Want to configure these options now	
Router (Default Gateway)	192.0.2.1
DNS - Parent domain	isp.example.net
DNS - Server name	NONE
DNS - IP Address	192.0.2.1
Remove any other DNS IP addresses	
WINS	NONE
Activate scope and finish	

Create another scope:

Parameter	Value
Name	Corpnet
Start IP address	10.50.0.100
End IP address	10.50.0.150
Length	24
Exclusions	NONE
Lease Duration	DEFAULT
Yes I Want to configure these options now	
Router (Default Gateway)	10.50.0.1
DNS - Parent domain	NONE
DNS - Server name	NONE
DNS - IP Address	10.50.0.10
Remove any other DNS IP addresses	
WINS	NONE
Activate scope and finish	

Testing DHCP

3.8.23 On MSC-W10 run ipconfig /all confirm that you have the correct TCP/IP settings from the Corpnet scope. If necessary release and renew the configuration:

```
Ipconfig /release
Ipconfig /renew
```

3.8.24 Using Hyper-V Manager, connect MSC-W10 to the MscInternet virtual switch and confirm that you have TCP/IP settings from the Internet scope.

Configuring NAT

3.8.25 Go back to MSC-SRV.

3.8.26 Open Server Manager and select Tools | Remote Access Management, in the console that opens, select Direct Access and VPN.

3.8.27 In the Task pane select "Open RRAS Management".

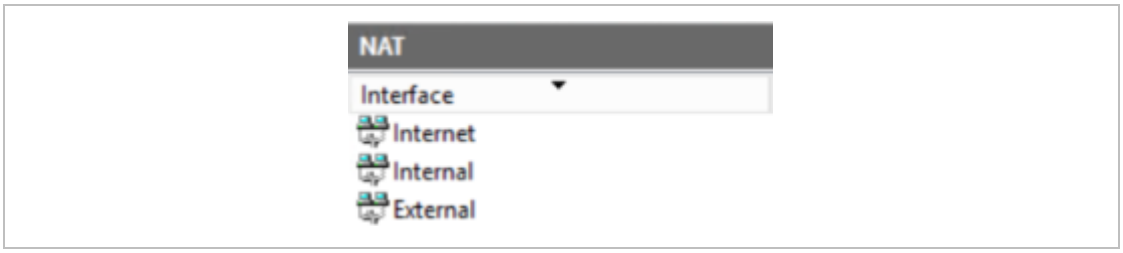
3.8.28 In the window that opens, right-click on MSC-SRV and select "Configure and Enable Routing and Remote Access"

3.8.29 Configure with the following:

Parameter	Value
Network address translation(NAT)	Select
Interface to connect to the Internet	External
Select the interface that will have access to the internet	Internet
Finish	

3.8.30 Close and reopen the RRAS Management console.

3.8.31 Expand the IPv4 node in the tree and select NAT. In the right hand pane you should see:



3.8.32 If you see all three interfaces skip to step 3.8.34. If any of the interfaces are missing add them using the following steps.

3.8.33 In the right-hand pane right-click in a blank space and select "New Interface...". Add the interfaces and appropriate NAT configurations as per the following table:

Interface	NAT configuration
Internal	Private interface connected to a private network
External	Public interface connected to the Internet Select: Enable NAT on this interface
Internet	Private interface connected to a private network

3.8.34 In the right-hand pane right-click in a blank space and select "New Interface...".

3.8.35 Configure with the following:

Interface	NAT configuration
Corpnet	Private interface connected to a private network

You should now have successfully configured the MscLondon, and the MscInternet networks to be NATed onto the external network. Consequently hosts on both networks will be able to reach the Internet.

Testing NAT

3.8.36 Ping www.google.com and record the IP address.

3.8.37 On MSC-W10 which should be connected to the MscInternet virtual switch confirm you can ping the IP address you just recorded.

3.8.38 Connect MSC-W10 to the MscLondon virtual switch and confirm you can ping the IP address from MSC-W10.

3.8.39 These tests confirm that NAT is working from both the virtual networks.

Configuring DNS

3.8.40 Back on MSC-SRV.

3.8.41 Go to Server Manager and select Tools | DNS.

3.8.42 In the console expand the tree and right-click the Forward Lookup Zone, click New Zone and configure as follows:

Parameter	Value
Primary Zone	Select
Zone name	isp.example.net
Create a new file with this name	isp.example.net.dns
Do not allow dynamic updates	Select
Finish	

3.8.43 Open the isp.example.net zone and right-click to create a new host record as follows:

Parameter	Value
Name	www
FQDN	www.isp.example.net.
IP Address	192.0.2.1

3.8.44 Right-click the Forward Lookup Zone, click New Zone and configure as follows:

Parameter	Value
Primary Zone	Select
Zone name	xts.local
Create a new file with this name	xts.local.dns
Do not allow dynamic updates	Select
Finish	

3.8.45 Open the xts.local zone and right-click to create three new host records as follows:

Parameter	Value
Record 1	
Name	srv
FQDN	srv.xts.local.
IP Address	192.168.0.15
Record 2	
Name	claims
FQDN	claims.xts.local.
IP Address	192.168.0.15
Record 3	
Name	openidconnect
FQDN	openidconnect.xts.local.
IP Address	192.168.0.15

3.8.46 In the console tree right-click the server and select properties, select the Interfaces tab and deselect all listening interfaces other than 192.0.2.1 click Apply.

3.8.47 Select the forwarders tab and enter the addresses 8.8.8.8 and 8.8.4.4 which are the address for the free Google global DNS resolution service that you can use as an alternative to your current DNS provider.

Testing DNS

3.8.48 Connect MSC-W10 to the MscInternet virtual switch.

3.8.49 Go to MSC-W10.

3.8.50 From a command (PowerShell) window, run NSlookup and confirm you can resolve the following:

FQDN	IP
www.isp.example.net	192.0.2.1
srv.xts.local	192.168.0.15
claims.xts.local	192.168.0.15
openidconnect.xts.local	192.168.0.15

3.8.51 Open a browser go to www.isp.example.net and confirm that the default IIS page is returned. If not check that IIS is running, you installed it earlier.

3.8.52 At this stage because the Corpnet interface is configured to use MSC-DC for DNS resolution, resolving Internet FQDNs will be very slow. Wait until the MSC-DC configuration is complete before testing internet access.

3.9 MSC-DC – further configuration

Now that NAT is running and we have Internet access from both networks we can complete the configuration of DNS on the domain controller. DNS will have been automatically installed when the domain controller was promoted but we need to set it up to use the Google DNS as forwarders.

3.9.1 Switch to MSC-DC.

3.9.2 From Server Manager open the DNS console.

3.9.3 In the tree select the server, right-click and select properties.

3.9.4 Select the forwarders tab and enter the addresses 8.8.8.8 and 8.8.4.4 which are the address for the free Google global DNS resolution service that you can use as an alternative to your current DNS provider. Remove any forwarder that are already present.

3.9.5 Right-click the Forward Lookup Zone, click New Zone and configure as follows:

Parameter	Value
Primary Zone	Select
Store the zone in AD	Clear
Zone name	xts.local
Create a new file with this name	xts.local.dns
Do not allow dynamic updates	Select
Finish	

3.9.6 Open the xts.local zone and right-click to create three new host records as follows:

Parameter	Value
Record 1	
Name	srv
FQDN	srv.xts.local
IP Address	192.168.0.15
Record 2	
Name	claims
FQDN	claims.xts.local
IP Address	192.168.0.15
Record 3	
Name	openidconnect
FQDN	openidconnect.xts.local
IP Address	192.168.0.15

Run Windows Update for the installed roles

3.9.7 Run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

3.10 MSC-W10 – further configuration

Now that Internet is fully available, you will finish the configuration of MSC-W10

3.10.1 Connect MSC-W10 to the MscLondon VS and verify that you can access the Internet.

Installing Fiddler

3.10.2 Switch to MSC-W10.

3.10.3 Go to https://www.telerik.com/download/fiddler (the URL is in the URLs.txt file) and download and install the .NET 4 version of Fiddler.

3.10.4 Join the computer to the example.com domain. Using example\administrator.

3.10.5 Reboot.

3.10.6 Logon as example\administrator.

3.11 MSC-SRV – further configuration

Installing PHP on IIS

Some of the example programs that you will use in the class are written in PHP. A PHP app is fairly transparent in the way that it operate, whereas a .NET app hides a lot of the complexity. We use the PHP apps to aid learning.

3.11.1 Switch to MSC-SRV.

3.11.2 Open Internet Explorer and go to Tools | Internet options.

3.11.3 Under the security tab select the Internet Zone and click Custom level…

3.11.4 Locate the Downloads node and enable File download.

3.11.5 Go to Google, search for, download and install the **x86** version of "Visual C++ Redistributable for Visual Studio 2012 Update 4 ". Make sure you download from the Microsoft site.

3.11.6 Search for, download and install the 64-bit version of "Web Platform Installer 5.0".

3.11.7 Run the Installer, click Products | Frameworks.

3.11.8 Verify that .NET 3.5, .NET 4.5 and .NET 4.5 extended are already installed. If not review the roles and features that you installed earlier.

3.11.9 Locate and select PHP 5.6.24 (**not** the version for IIS Express) click Add and Install.

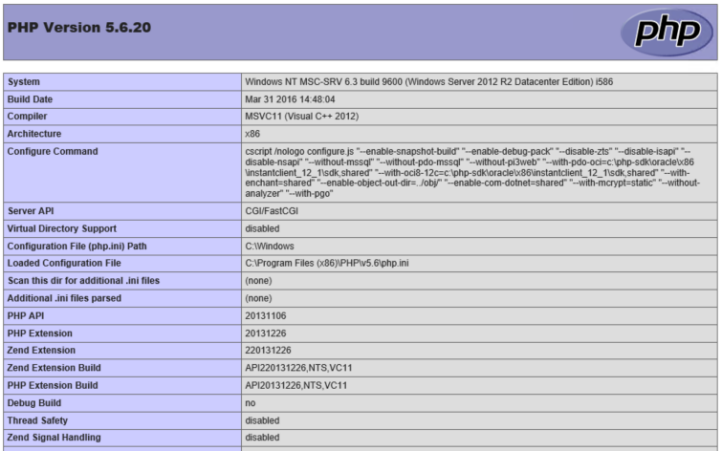
3.11.10 Read and accept the license agreement.

3.11.11 To test the installation, open Notepad and add the following text:

```
<?php phpinfo(); ?>
```

3.11.12 Save the file as C:\inetpub\wwwroot\phpinfo.php. (Put the file name in quotes otherwise it will be saved as phpinfo.php.txt.)

3.11.13 Open a browser and go to http://localhost/phpinfo.php you should see:



PHP Version 5.6.20

System	Windows NT MSC-SRV 6.3 build 9600 (Windows Server 2012 R2 Datacenter Edition) i586
Build Date	Mar 31 2016 14:48:04
Compiler	MSVC11 (Visual C++ 2012)
Architecture	x86
Configure Command	cscript /nologo configure.js "--enable-snapshot-build" "--enable-debug-pack" "--disable-zts" "--disable-isapi" "--disable-nsapi" "--without-mssql" "--without-pdo-mssql" "--without-pi3web" "--with-pdo-oci=c:\php-sdk\oracle\x86\instantclient_12_1\sdk,shared" "--with-oci8-12c=c:\php-sdk\oracle\x86\instantclient_12_1\sdk,shared" "--with-enchant=shared" "--enable-object-out-dir=../obj/" "--enable-com-dotnet=shared" "--with-mcrypt=static" "--without-analyzer" "--with-pgo"
Server API	CGI/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	C:\Windows
Loaded Configuration File	C:\Program Files (x86)\PHP\v5.6\php.ini
Scan this dir for additional .ini files	(none)
Additional .ini files parsed	(none)
PHP API	20131106
PHP Extension	20131226
Zend Extension	220131226
Zend Extension Build	API220131226,NTS,VC11
PHP Extension Build	API20131226,NTS,VC11
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	disabled

If you don't have the x86 redistribution you get a CGI error when you invoke the webpage.

If you don't have .NET 3.5 installed the PHP IIS manager installation fails.

Installing WebMatrix

To simplify the updating of the web sites we will install WebMatrix.

3.11.14 Run the Web Platform Installer and in the search box enter WebMatrix.

3.11.15 Install WebMatrix 3.

Installing x64 Chrome

3.11.16 Go to Google, search for and install the x64 version of Chrome – do not set it as the default browser.

3.11.17 Open Chrome and search for "chrome web store – jsonview".

3.11.18 Find JSONView in the webstore and click the button to add it to Chrome.

Installing Fiddler

3.11.19 Go to https://www.telerik.com/download/fiddler (the URL is in the URLs.txt file) and download and install the .NET 4 version of Fiddler.

Run Windows Update for the installed roles

3.11.20 Run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

3.12 MSC-PROXY

3.12.1 Switch to MSC-PROXY.

3.12.2 In the network connections dialog, rename the network adapter to "Corpnet".

3.12.3 Shut down the VM and add a new network adapter connected to MScInternet.

3.12.4 Connect the original adapter to MscLondon.

3.12.5 Start the VM and in the network connections dialog, rename the new network adapter to "Internet".

3.12.6 Set the TCP/IP configuration and name as shown in the table.

VM Name	OS	Computer name	Roles:
MSC-PROXY	Server 2016	**msc-proxy**	TBD

Network interface name	Connected to virtual switch	IP address	Subnet	Default gateway	DNS address
Corpnet	MscLondon	10.50.0.20	255.255.255.0	10.50.0.1	10.50.0.10
Internet	MscInternet	192.0.2.10	255.255.255.0		

3.12.7 Add the VM to the example.com domain. Logon as example\administrator. Verify that you can ping www.google.com.

Run Windows Update

3.12.8 Run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

3.13 MSC-ADFS

3.13.1 Switch to MSC-ADFS.

3.13.2 Set the TCP/IP configuration and name as shown in the table.

VM Name	OS	Computer name	Roles:
MSC-ADFS	Server 2016	**msc-adfs**	TBD

Network interface name	Connected to virtual switch	IP address	Subnet	Default gateway	DNS address
Corpnet	MscLondon	10.50.0.30	255.255.255.0	10.50.0.1	10.50.0.10

3.13.3 Add the VM to the example.com domain. Logon as example\administrator. Verify that you can ping www.google.com.

Run Windows Update

3.13.4 Run Windows Update to fully update the VM, if a reboot is required, reboot the system and then run update again to check that the updates are complete.

4 Hyper-V

4.1.1 Disconnect all ISOs from the VMs

5 Accessing the Internet

5.1.1 The recommended connection for the attendees' computers is via a cable.

5.1.2 If it is necessary to use wireless, the following steps have provided the best results and avoids MSC-SRV having to connect directly to the wireless router. This can be problematic if the wireless connection requires authenticating as credentials are needed for the host and MSC-SRV.

5.1.3 Connect the classroom workstations to the Wireless network.

5.1.4 On the host open the Network Connections window and right-click the WiFi adapter. Select Properties | Sharing and use ICS to share the Internet with the 192.168.137net virtual switch.

5.1.5 Connect the external interface of MSC-SRV to the 192.168.137net virtual switch and test the results.

END OF SETUP FOR ATTENDEE COMPUTER