



## CQURE Academy

# MasterClass: Windows Server 2016

## PART 3

Version 1.2

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## 1 Network Setup – Important

Here are the control steps that need to be made before the training:

1. Passwords are set to P@ssw0rd – if you have US keyboard layout (for example for Nano machines) the @ sign may be obtained by pressing Shift+2
2. Addresses for machines in labs are:
  - a. DC: 10.10.10.10 netmask 255.0.0.0
  - b. SRV1: 10.10.10.101 netmask 255.0.0.0
  - c. SRV: 10.10.10.102 netmask 255.0.0.0
  - d. Nano1: 10.10.10.111 netmask 255.0.0.0 -it will be set during one of labs
  - e. NAT: 10.10.10.1 – there is no need to logon on this machine. It works as NAT to provide Internet access when needed.
3. Machines have automatic updates disabled through gpedit console. It makes labs lighter and faster if you do not have to face with “you have to restart now” messages. Machines have updates till March 2017.
4. Local administrator account name is localadmin.

## 2 iSCSI

1. Logon to the DC Machine
2. Launch Server Manager
3. Click on “Add roles and features”
4. Install File and Storage Services \ File and iSCSI Services, iSCSI Target Server sub role
5. Wait until the installation finishes.
6. In the left pane click on the “File and Storage Services” and then on “iSCSI”
7. Add the iSCSI drive
  - a. Under iSCSI VIRTUAL DISKS click on “Tasks” and “New iSCSI Virtual Disk”
  - b. Leave the default path – it will create virtual disks in the c:\iSCSIVirtualDisks folder
  - c. Name the disk iSCSIDisk1.
  - d. Specify the size 2GB and select “Dynamically expanding” as a type.
8. Create new iSCSI Target
  - a. Name the target target1.
  - b. Add SRV1 and SRV2 machines as initiators.
  - c. Do not enable any authentication
  - d. Finish the wizard
9. Create three additional iSCSI Virtual Disks with names iSCSIDisk2, iSCSIDisk3 and iSCSIDisk4, 8GB, dynamically expanding each. These disks should use “Target1” iSCSI Target. Pay attention to make sure all disks are dynamically expanding.
10. Connect to the iSCSI drive
  - a. Switch to the SRV1.
  - b. Go to the Windows Administrative Tools and launch iSCSI Initiator applet.
  - c. Answer “Yes” when prompted about starting the service.

- d. Specify “dc.cqure.lab” as a target name and click “Quick connect”
  - e. Go to the “Volumes and Devices” tab and click “Auto configure”
  - f. Click OK to close the applet
11. Launch the Device Management (devmgmt.msc) console and verify disk devices present in your system.
12. Launch the Disk Management (diskmgmt.msc) console
13. Switch all disks to Online
14. Initialize all disks as GPT
15. Create new simple volume on each disk. The volume should take 100% of the disk space.
16. Quick format each volume as NTFS.
17. Open Windows Explorer and verify if drives appeared in your server.

### 3 Preparing disks for clustering

1. Stay on the SRV1
2. If you open any file or folder on any of your iSCSI drives close it now.
3. Open Disk Management (diskmgmt.msc) console
4. Switch each of your four iSCSI drives to “Offline”. This will prevent any conflict happen when you connect to the same drive from another machine.
5. Close the Disk Management console.
6. Switch to the SRV2 machine.
7. Connect to your drives
  - a. Go to the Windows Administrative Tools and launch iSCSI Initiator applet.
  - b. Answer “Yes” when prompted about starting the service.
  - c. Specify “dc.cqure.lab” as a target name and click “Quick connect”
  - d. Go to the “Volumes and Devices” tab and click “Auto configure”
  - e. Click OK to close the applet
8. Launch the Disk Management (diskmgmt.msc) console and observe if your drives appeared here. DO NOT switch them online. Close Disk Management

### 4 Create cluster

1. Use Server Manager on SRV1 and SRV2 machines and install “Failover Clustering” feature. Accept additional features suggested by the wizard.
2. Go to Windows Administrative Tools and launch “Failover Cluster Manager” console.
3. On the right pane click on “Validate Configuration...”
4. Enter SRV1 and SRV2 as names of nodes to validate.
5. Leave “Run all tests” selected and start the validation.
6. Click on the “View report”
7. Try to find all errors and warnings.
8. Close the report
9. Click “Finish”.

10. Click “Create Cluster...” in the right pane.
11. Specify SRV1 and SRV2 as cluster nodes.
12. Specify Cluster01 as the cluster name.
13. Use 10.10.10.150 as the IP Address.
14. Pay attention at “Add all eligible storage...” checkbox. Leave it checked.
15. Finish the wizard.

## 5 Managing the cluster

1. Launch cmd.exe and try to ping cluster01.cqure.lab – does it reply? Why?
2. Change the Quorum disk settings:
  - a. Right click on the cluster name in the left pane.
  - b. Select “More actions” and “Configure Cluster Quorum Settings”.
  - c. Select “Select the quorum witness”.
  - d. Leave the “Configure a disk witness” option selected.
  - e. Uncheck the selected 2GB disk and select any of 8GB disks. In most cases 2GB is enough for the quorum, but please pay attention that the cluster creation wizard picks the drive without asking you and you can change it later.
  - f. Finish the wizard
3. Click on the “Nodes” in the left pane. Verify if all your nodes are present and up.
4. Move disks to another node
  - a. Click on “Storage\Disks” in the left pane. Check which node “owns” the disk.
  - b. Click on the “Move Available Storage” in the right pane and select “Select node...”
  - c. Select the node to move your storage to and observe the result.

## 6 Adding cluster role

1. Select “Roles” in the left pane. Which roles can you see? Why?
2. Use Server Manager on SRV1 and SRV2 to install “Simple TCP/IP Services” feature.
3. Open the port TCP/19 on SRV1 and SRV2.
  - a. You can type in cmd.exe: `netsh advfirewall firewall add rule name="chargen" dir=in action=allow protocol=TCP localport=19`
4. Return to the “Failover Clustering Management” console
5. Click on “Roles” in the left pane and then “Configure Role...” in the right pane.
6. Select “Generic Service” to make it highly available and click “Next”.
7. Select “Simple TCP/IP Services” and click “Next”.
8. Provide the “chargen” as the name and 10.10.10.151 as IP and click “Next”.
9. Do not select any drive – Simple TCP/IP Services do not need any storage.
10. Do not configure registry settings.
11. Finish the wizard.

## 7 Working with clustered service

1. Switch to the DC machine and grab the putty.exe
2. Start putty and connect to the chargen.cqure.lab using raw connection type and port 19
3. Observe if the chargen protocol is sending any data.
4. Leave Putty connected.
5. Return to the “Failover Cluster Management” console on your cluster node.
6. Right click on your role and select “Move” --> “Select Node” and select the node. Observe the lower part of the central pane.
7. Switch back to the DC machine. What happened in putty? Is this reasonable?
8. Try to reconnect Putty: click on the message, and then click the icon in the upper left corner and select “Restart Session”. Can putty connect again?

## 8 Install another role

1. Download to VM files CQCriticalService.exe and tcpclient.exe from <http://cqlabs.net/WS16>
2. Copy CQCriticalService.exe to c:\program files on SRV1 and SRV2.
3. On SRV1 and SRV2 Install CQCritical Service by typing: "c:\program files\CQCriticalService.exe" /install
4. Open the TCP/11111 on SRV1 and SRV2: netsh advfirewall firewall add rule name="cqcritical" dir=in action=allow protocol=TCP localport=11111
5. Create new cluster role:
  - a. Generic Service
  - b. CQURE Critical Service
  - c. Name: cqcritical
  - d. IP: 10.10.10.152
  - e. Find and select the 2TB disk
6. Right click on the freshly created role and select “More actions” and then “Show dependency report”.
7. Copy tcpclient.exe to the desktop of DC machine.
8. Switch to DC, launch cmd.exe and type c:\users\Administrator\Desktop\tcpclient.exe 10.10.10.152 11111
9. Observe the host name the CQURE Critical Service “thinks” it runs on.
10. Return to the Failover Cluster Manager, select the cqcritical role and then scroll to the end of the lower pane. Find the section “Roles”, right click “CQURE Critical Service” and select “Properties”.
11. Uncheck “Use Network Name for computer name” and click “Yes” when prompted about restarting service.
12. Observe the result in tcpclient.exe application. What is the difference?

13. Go to SRV1, open the registry editor and find the HKLM\SOFTWARE\CQURE\CQCritical key. Set the param1 value to some random string.
14. Try to move role between nodes and observe the result in tcpclient. Question: does it make sense to have different configuration settings if your service moves to another node? Why?
15. Configure registry replication:
  - a. Return to the Failover Cluster Manager, select the cqcritical role and then scroll to the end of the lower pane. Find the section "Roles", right click "CQURE Critical Service" and select "Properties".
  - b. Open the "Registry replication" tab.
  - c. Add the SOFTWARE\CQURE\CQCritical key to the replicated registry settings.
  - d. Click OK
16. Move cqcritical role between your nodes and observe the result.
17. In the cluster management console try to find the node cqcritical is active on and then find the drive letter it uses.
18. Switch to the node hosting the "cqcritical" role.
19. Open the drive your service is using and try to find files responsible for registry replication.
20. Open Task Manager and try to kill the CQCriticalService.exe process. Wait couple of seconds. What happened? Do not repeat this too often because cluster will not bring up the service failing frequently. You can set failover parameters on "Failover" tab within properties of the role.

## 9 Destroying the cluster

1. Switch to the cluster management console.
2. Right click and remove all roles you have present.
3. In the left pane right-click on the cluster name and select "More Actions" and then "Destroy Cluster".
4. Answer "Yes".
5. Go to the iSCSI Initiator applet, select your target and click on "Disconnect" button. Repeat this step on another node.