Town of Caledon – Disaster Recovery Playbook			
System: Administration Building Data Centre			
Role (Key Stakeholders)	Name	Email	Phone
Owner	Ankur Arora	Ankur.Arora@caledon.ca	xxx-xxx-xxxx
Approver			
Contributor (Technical)			
Contributor (DBA)			
Contributor (Network)			
Contributor (Vendor)			

Document Control

Document creation and edit records should be maintained by the Town's disaster recovery coordinator (DRC) or business continuity manager (BCM).

Document Name	
Version	
Date Created	
Date Last Modified	
Last Modified By	

Document Change History

Version	Date	Description	Approval

Contact Information

This section will list the Town's internal IT contacts along with external service providers (if applicable). This is the team that will conduct ongoing disaster recovery operations for this service, along with

Town Contact	Title	Phone	Email
Service Provider Contact	**Role**	**Phone**	**Email**

Data Centre Access Control List

Maintain an up-to-date access control list (ACL) specifying who, within the Town and any service partners, has access to the data centre and resources herein.

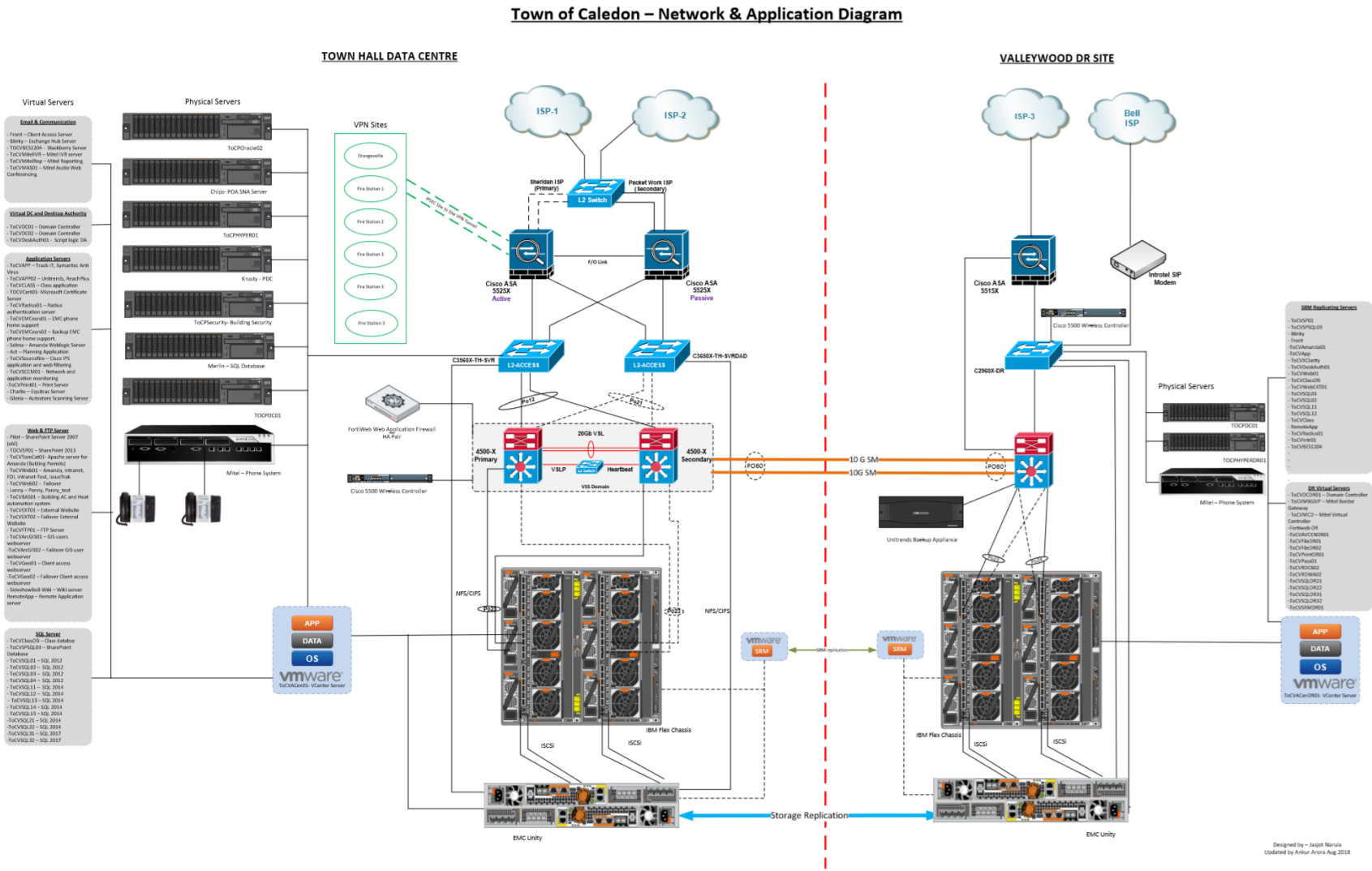
Be sure to specify which individuals can introduce guests to the data centre. This is required for determining, in the event of an emergency, who may be the designated point person for facilitating access to critical infrastructure. During a recovery event, the Town's primary operations team will be involved in system recovery, making contact and data centre access information critical to the success of the recovery process.

Name	Role	Contact Info	Access Level

Part 2 – System Level Procedures

Data Centre Recovery

Infrastructure Overview – Primary Data Centre (Administration Building) & DR Site (Snelcrest Drive)



Order of Restoration Table – Core Infrastructure & IT Business Systems

This table assumes all items listed as "active" in **Appendix A – DR Site Current State** are enabled and require no intervention by the recovery team.

This section includes instructions for recovery personnel that lay out which infrastructure components to restore and in which order. It should take into account application dependencies, authentication, middleware, database and third-party elements and list restoration items by system or service type. Ensure this order of restoration in understood before engaging in recovery activities.

Task #	Activity (*business system)	System/Service Description	Notes
1	Assemble Recovery Team	Ensure that the required recovery team members have been contacted	Refer to "Contact Information" in Section 1 of this document
2	Secure Internet	Move to a location with Internet access	Recovery team must secure a corporate laptop with a configured VPN client
3	VPN Testing	Test VPN access to DR site	Must be on a corporate laptop. Please refer to **Appendix D – VPN Access**
4	Primary DC Shutdown	Perform a soft shutdown of the primary DC	Refer to **Appendix C – Primary DC Shutdown**
5	Telephony (VOIP)	Automatic failover of corporate phones	Refer to **Appendix E – VOIP Testing**
6	Email Testing	Exchange 2010 standard	Refer to **Appendix F – Email Testing**
7	Database Recovery	Oracle & SQL database recovery	Refer to **Appendix G – Database Recovery**
8	File/Print Recovery	Desktop Authority (Quest) & Print Server	Refer to **Appendices H/I – File and Print Recovery**
9	Physical Infrastructure Checklist	Review physical infrastructure checklist to ensure availability of services	Refer to **Appendix B –DR Infrastructure Checklist** (items 1-11)
10	Core Infrastructure Services Checklist	Ensure core infrastructure services are active	Refer to **Appendix B – DR Infrastructure Checklist** (items 15-18)
11	Helpdesk Recovery	TrackIT	Refer to **Appendix J – Helpdesk System Recovery**
12	*GIS Recovery		Refer to **Appendix K – GIS System Recovery**

Appendix A – DR Site Current State

Appendix B – DR Infrastructure Checklist

Current State		active	warning	issue

Item#	Description	Status	Notes
Physical Infrastructure			
Facilities (power, cooling, space)			
1	Power		Generator – natural gas (Enbridge) – May affect major power outage due to close proximity (22km) from Town Hall. There has been power spikes in the past
2	Cooling		Could be an issue with cooling
3	Fire Suppression		Does not exist at DR site
4	Space		Adequate
5	Access		Need to clarify who actually has access to the facility (IT Infrastructure) – Does database team? (No) Need a list of names. Facilities group also has access to the room. Door code for access (may want to review). AA
Resource Layers (network – routers/switches/firewalls, storage – SAN/NAS/DAS, compute – physical servers/hosts)			
6	Switches (2)		Cisco 4500x, Cisco 2960x Document steps to confirm connectivity
7	Firewall (1)		Cisco 5515x Document steps to confirm connectivity
8	Backup Appliance		Unitrends Document steps to confirm connectivity
9	Server Chassis		IBM Flex Chassis (5 nodes) 5 x VMware Hosts
10	Physical Servers (2)		IBM (need model number) (HyperV 2012 host + Windows 2016 DC)
11	SAN		EMC Unity – 80TB(RAW) – 60TB usable (Ankur to provide details)
Software-Defined			
12	VMware (SRM)		Total 20 servers (25 licenses) Replication schedule – every 5 minutes
13	Virtual servers (16)		VMware v6.5 (Gary to add server details) (RDS, load-balancer, phone system) some of these servers are live. There are production servers running within this environment that need to be identified.

Current State		active	warning	issue

Item#	Description	Status	Notes
14	Oracle VM (2)		HyperV 2012 – (passive). Replication from production. Manual activation required **NOTE:** licensing only permits 10-days of activity in DR site
Core Infrastructure Services (DNS/DHCP/Security/Password Management)			
15	DNS (AD integrated)		Running on a physical server and also virtual server (live today). May be a delay at TOD (propagation)
16	DHCP		Running on a virtual server (in production today for about 30% of addressing) Can it handle 100%? (Yes). Has not been tested (active/active)
17	Password Management		In production - no work necessary at TOD
18	Internet		Will be available
Essential Infrastructure Services (Authentication/AD/File&Priint/Apps/DB/Remote Access/Internet/Monitoring/MDM/Backup)			
19	Authentication		Domain Controller is currently active (1 VM + 1 Physical)
20	Remote Access (VPN)		
21	SQL		Requires Database team to recover (SRM)
22	Oracle		Requires Database team to recover (SRM)
23	File/Print		Need to test printing recovery
IT Business Services (Helpdesk/VOIP/Email/GIS/Reporting/Project Management/Development Services)			
24	Helpdesk		TrackIT – fat client - DB is replicating (SQL)
25	GIS		Need recovery steps
26	Email		Will be moving to O365 first week of April

Current State			active	warning	issue
Item#	Description	Status	Notes		
27	VOIP (phone system)		Should failover but this needs to be tested		
28	External Websites (5)		Hosted by third-party + internal (not currently replicated)		
29	Reporting				

Appendix C – Primary DC Shutdown

Primary Datacenter Shutdown Steps

Note: This section assumes you have the ability to connect to the Primary DC through the DR site network VPN connection. Depending on the scenario a site visit and/or modification of the steps in this section may be required.

In a partial disaster scenario (e.g. a power outage threat). There may be a need to shutdown the Primary DC. Below is the order and steps to shut down the critical components.

VMs → Hosts → Chassis & Physical Servers → SAN

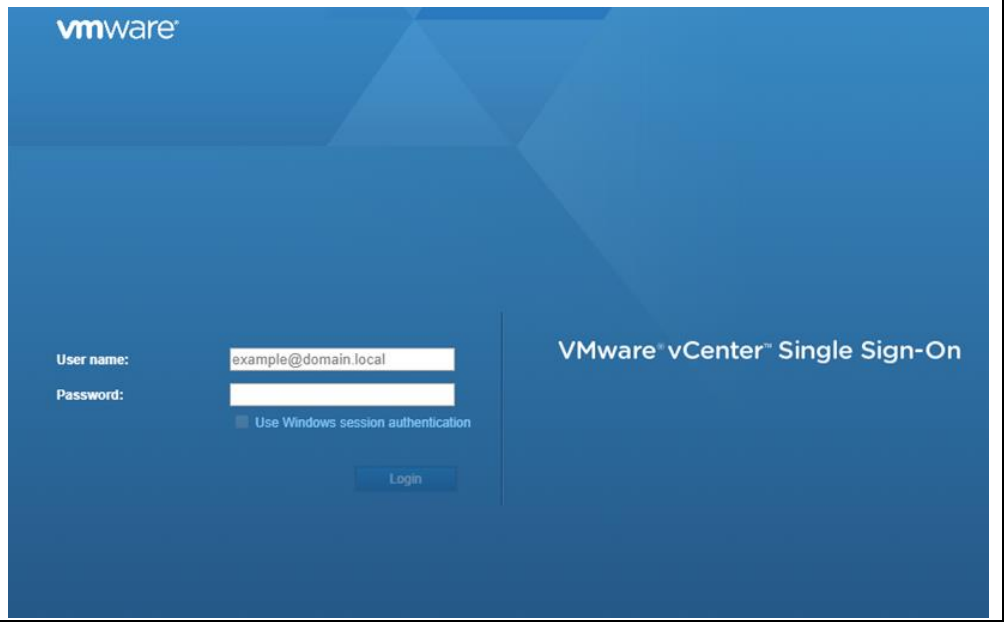
*Networking gear doesn't need to be shutdown

VMware Recovery Steps

1. Open a web browser and browse to https://tocvavcen01

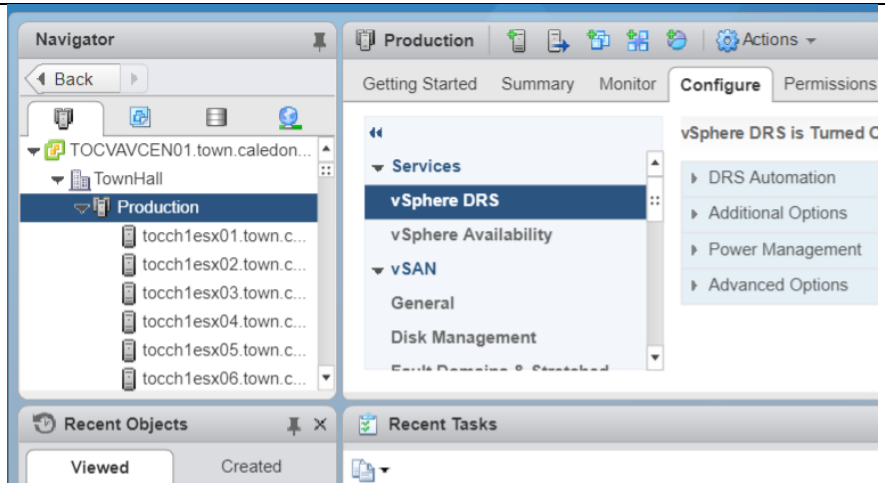
2. Click on vSphere Web Client (Flash)

3. Login with your Domain Admin account



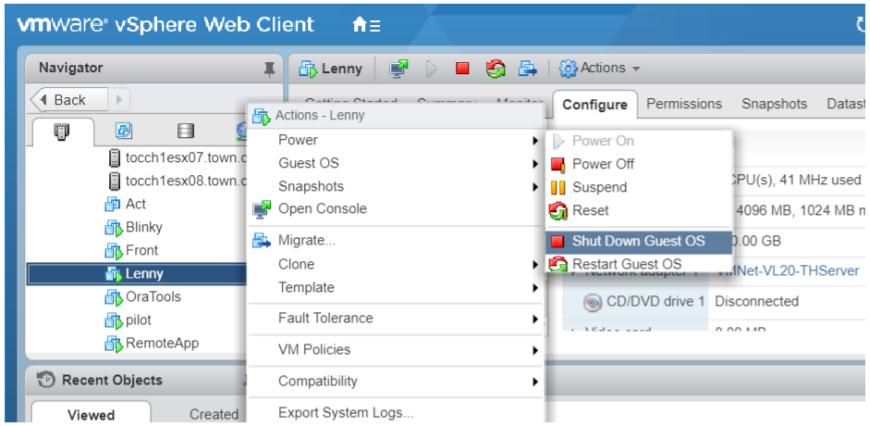
Primary Datacenter Shutdown Steps (continued)

4. Expand the **Production** Cluster under **Host and Clusters**



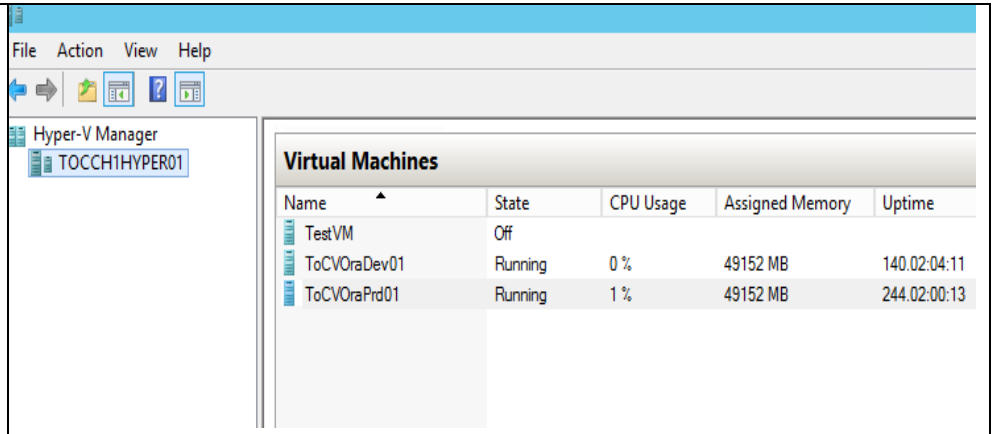
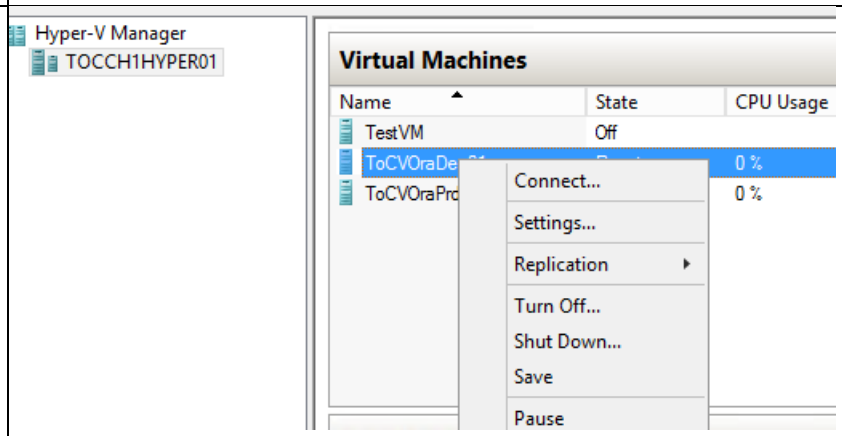
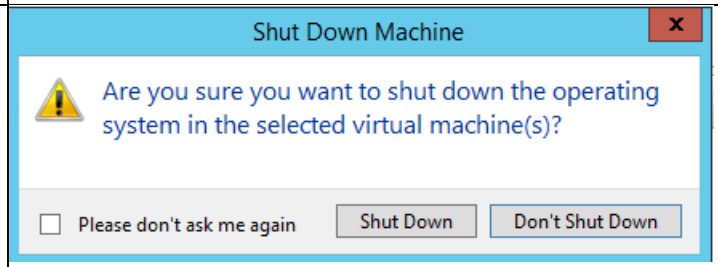
5. Right click the VM you wish to shutdown and select Power then click Shut Down Guest OS

Important: Make a note of VMs that are already shutdown as they won't need to be powered on when bringing the VMs back online at the Primary DC.



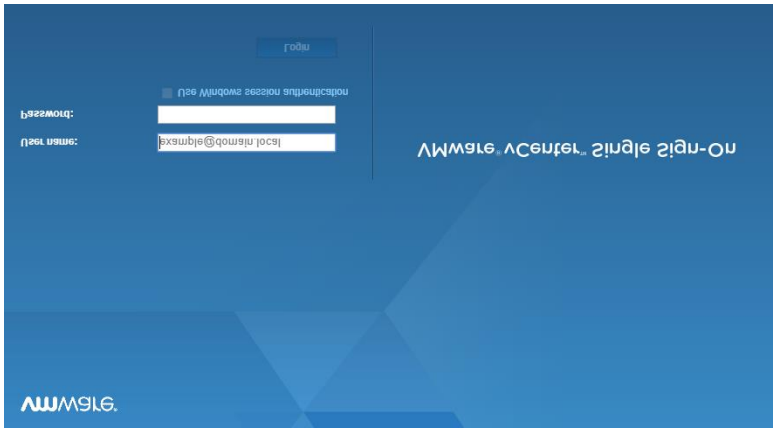
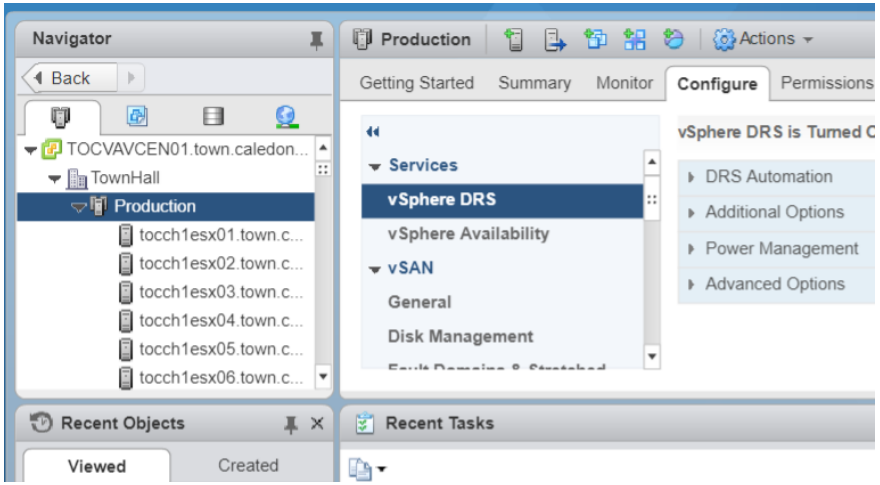
Hyper-V Recovery Steps

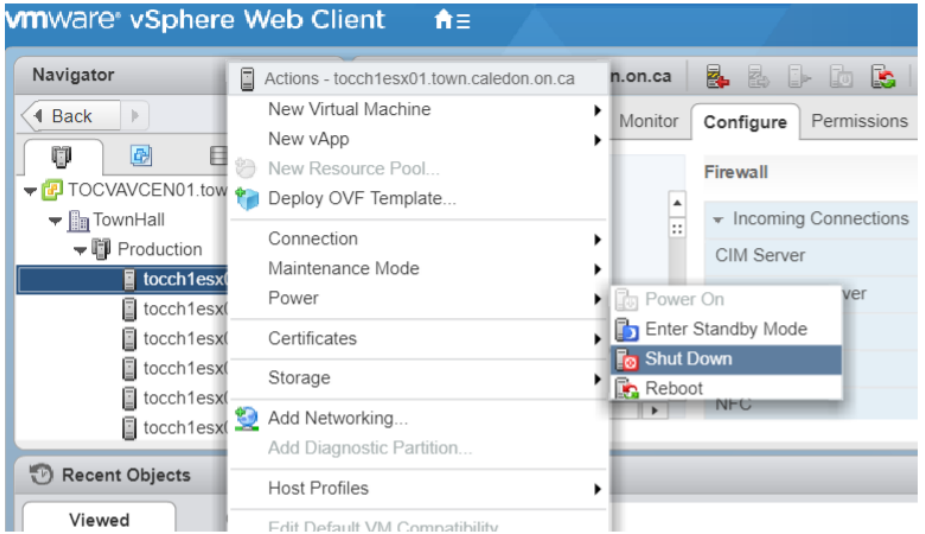
1. RDP to Hyper-V host - Server name: **TOCCH1HYPER01**

2. Launch “Hyper-V Manager”	
3. Right click the VM you wish to shutdown and click Shut Down. **Important:** Make a note of VMs that are already shutdown as they won’t need to be powered on when bringing the VMs back online at the Primary DC.	
4. Click “Shutdown” again to confirm	

Chassis Nodes

VMware: The chassis nodes can be shutdown through vsphere web client used in the previous section to shutdown VMs

1. Open a web browser and browse to:**https://tocvavcen01**	
2. Click on vSphere Web Client (Flash)	
3. Login with your domain admin account	
4. Expand the Production Cluster under Host & Clusters	

5. Right click the Host and select Power then click "Shut Down" **Note:** Ensure all VMs are shutdown on the Host	
6. Repeat the previous step for all the Hosts.	
Hyper-V	
1. RDP to Hyper-v host - Server name: TOCCH1HYPER01	
2. Click on Start and shutdown - **Ensure the VMs are powered off first	
SAN	
Follow the steps below to shutdown the Unity SAN at Town Hall. **Note:** Complete shutdown and verification requires personnel on site.	
1. Log into to Unisphere Prod (https://unity-prod/)	2. In Unisphere, select Service, under the System heading, then select Service Tasks.
3. Select Storage System > Shut Down Storage System, then Execute. Check the status of the shutdown process by looking at the SP LED indicators. The shutdown process is complete when the two power supply LEDs are solid green and amber, the network management port LEDs are flashing amber and green, and all other SP LEDs are off.	

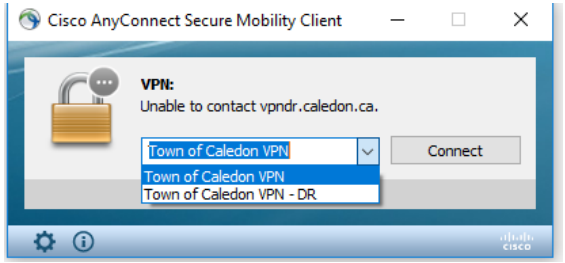
4. After confirming successful SP shutdown, remove all power from the SPs by disconnecting the two power cables from the Disk Processor Enclosures (DPE). Wait 10 seconds and confirm that both the green and amber LEDs have turned off after the power cables are removed.
5. If you are relocating hardware, also disconnect the two power cables from each Disk Array Enclosure (DAE) to power them down.

Appendix D – VPN Access

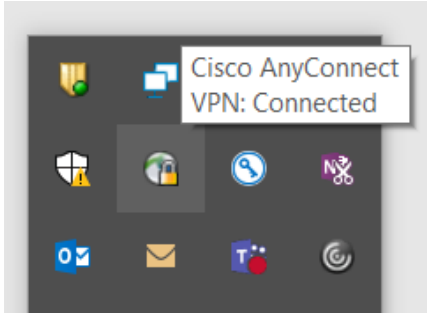
VPN Access Recovery Steps

VPN access to the Town of Caledon Network requires a corporate laptop. If not on-site at DR or Town Hall you will need establish the VPN connection via the DR site firewall.

1. From the corporate laptop Go to the Start Menu to search and launch “Cisco AnyConnect Secure Mobility Client”.
2. Once launched select “Town of Caledon – DR” from the drop down.



1. Click Connect and enter your username and password.
2. Confirm you are Connected by hovering the mouse pointer over the AnyConnect icon in the system tray.



Note: If unable to establish a VPN connection to the DR site firewall:
-Confirm internet connectivity
-Confirm local firewall is not blocking a VPN connection

If still unable to connect – a visit to the DR site would be required to troubleshoot further. Once on-site steps in Appendix L and M can be used for reference

Appendix E – VOIP Testing

Telephony (VOIP) Recovery

Steps to Failover

The following should failover automatically to DR site:

- The main phone number for Caledon (905-574-2272) should failover automatically to DR site.
- Phones at sites with connectivity to DR site should automatically connect to phone controller at DR site.

The following steps need to be done manually:

- Need to failover a VM named TOCVMAS01 (Voicemail/AutoAttendant) to the DR site through VMware SRM.
- For steps on SRM failover, refer to Annex X and use ‘Mitel_Prod_ProtectionGroup’ as the group being failed over.

Testing

Once the telephone system has been failed over as indicated in the previous section. Test the following to confirm availability of services:

- Ensure a successful call to an external number (from a site with connectivity to DR site e.g. CCRW)
- From a mobile phone call the Town of Caledon main line (905-574-2272) and confirm the Auto Attendant answers and you are able to reach an extension (at sites with connectivity to DR site e.g CCRW)

Troubleshooting: Confirm Core Infrastructure and Physical Infrastructure services are available. Refer to Appendix L and M.

Appendix F – Email Testing

Email Recovery

Steps to Failover

- The email system is provided through O365.
- Mailboxes reside in O365 and mail routing is done through O365.
- Users simply need an internet connection in order to access email.

Exception:
The only exception to this is systems that rely on internal mail relay e.g. If an application sends an email internally or externally, it would connect to the on-premise exchange server. The exchange server (Blinky) will need to be failed over through SRM.

Refer to Appendix H and use 'Prod_ProtectionGroup' as the group being failed over.

Important: Don't failover 'Prod_ProtectionGroup' until you have completed Step X (Database Recovery) in the restoration table. Initiating the failover will power on the VMs at the DR site which would require the Databases to be available first, in order for the application to function.

Testing

- Confirm Outlook can connect to exchange on a machine located at DR site or at a site with connectivity to DR site.

Troubleshooting: Confirm Core Infrastructure and Physical Infrastructure services are available. Refer to Appendix L and M.

Appendix G – Database Recovery

Database Recovery

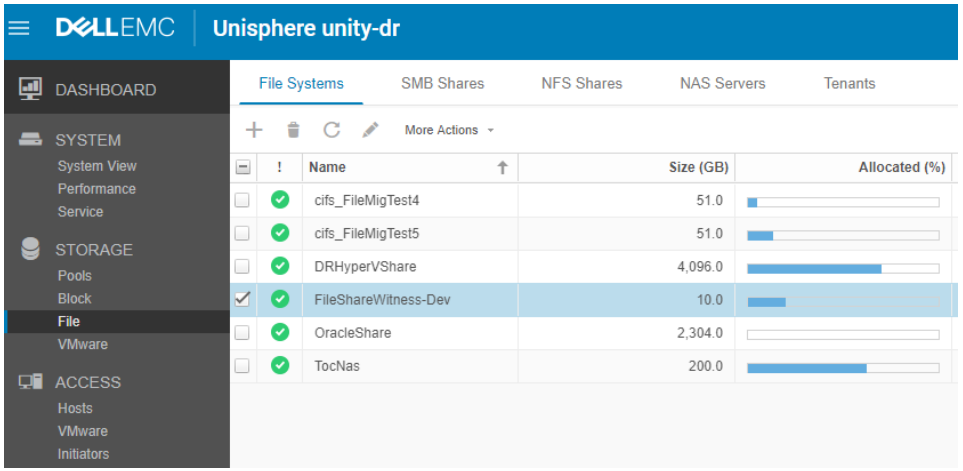
SQL Database

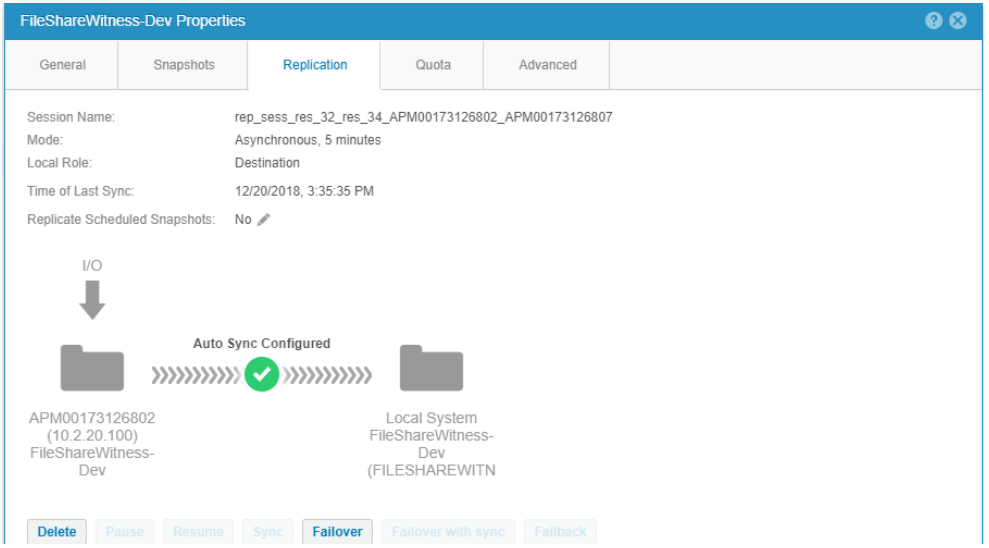
The SQL servers are setup in a Geo-Cluster which requires manual intervention in order to failover to the DR site. The following procedures apply if the SQL database servers at TH site are shutdown or not reachable through the network.

1. Log into the Unity-DR to move over the Fileshare Witness: Log into https://10.10.8.100

2. From the left menu click on **File** under the Storage heading

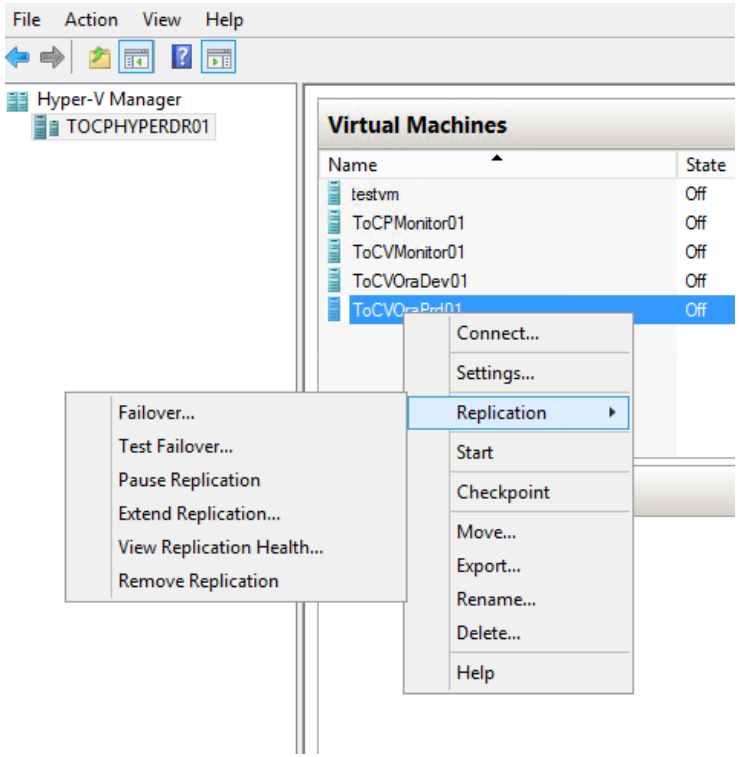
3. Select the **FileShareWitness-Prod** File System and click the edit icon.

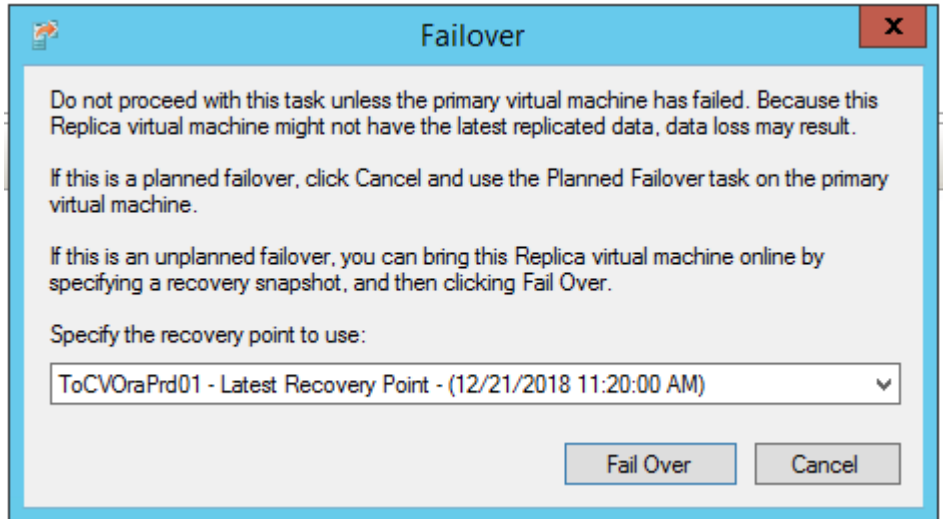


4. Click on the **Replication** tab and click **Failover** to initiate the process.	
5. The SQL instances should now be UP at DR site	Connect to the appropriate SQL server at the DR and launch Failover Cluster Manager to confirm. Currently, the following production servers exist at DR site: • TOCVSQLDR31 • TOCVSQLDR32 • TOCSQLDR22 • TOCVSQLDR21

Oracle Database Recovery

Oracle databases servers run in a clustered Hyper-V environment, with a host at each site (Towhall and DR site). In a DR scenario, we will connect to the DR site host and initiate failover of the VM.
1. RDP to the Hyper-V host at DR site - **Hostname:** TOCPHYPERDR01 **IP:** 10.2.23.14
2. Launch Hyper-V Manager - Click start and type ‘Hyper-V Manager’
3. Right click on ‘ToCVOraPrd01’

4. Click on **Failover** under **Replication**.	

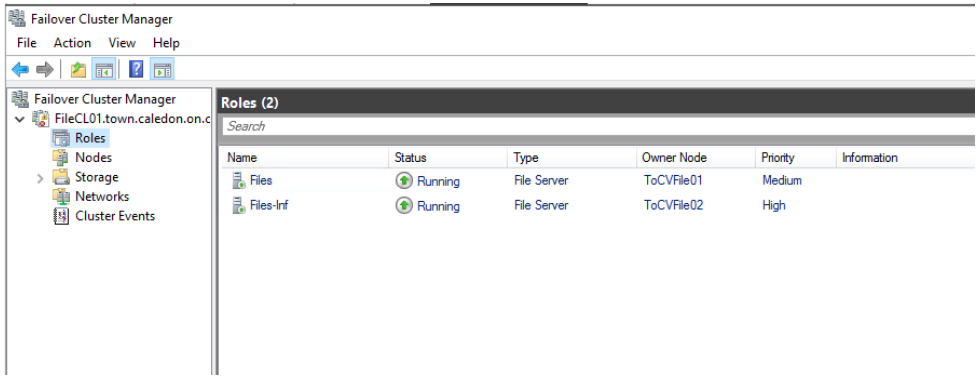
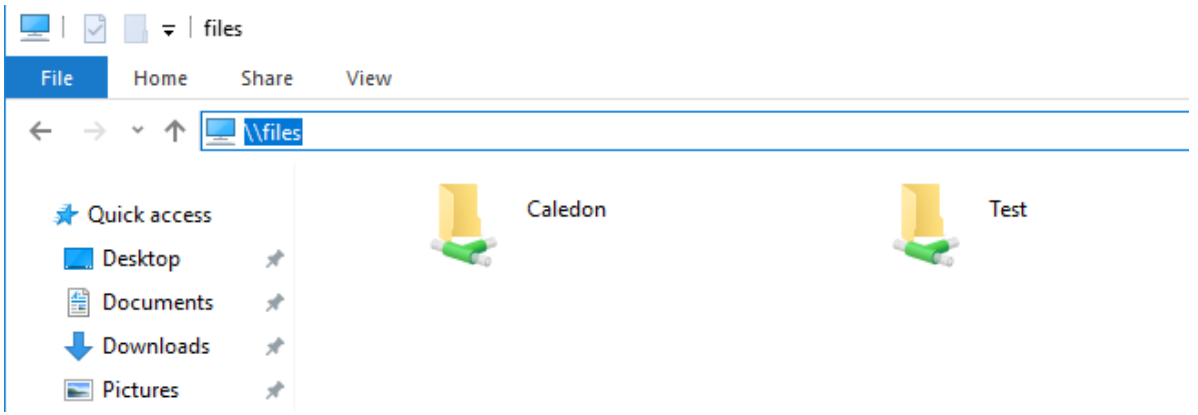
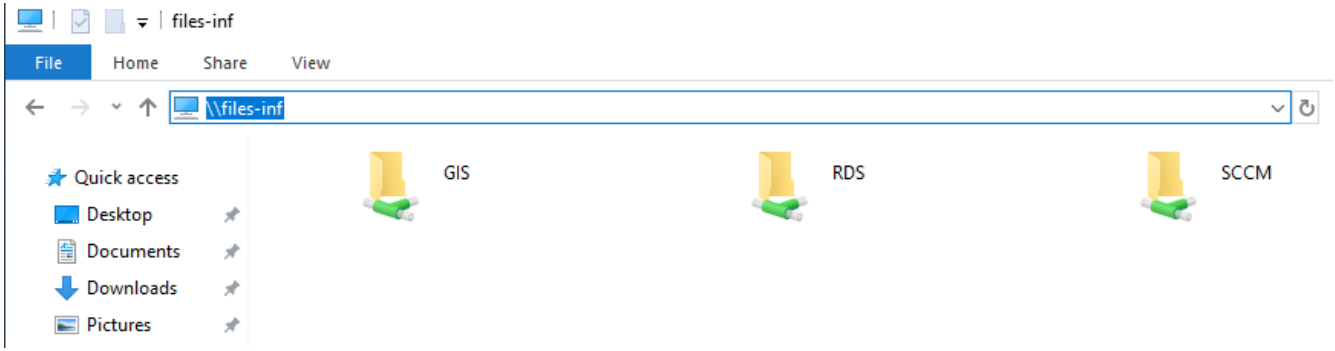
5. Select the Latest Recovery Point and click **Fail Over**.	

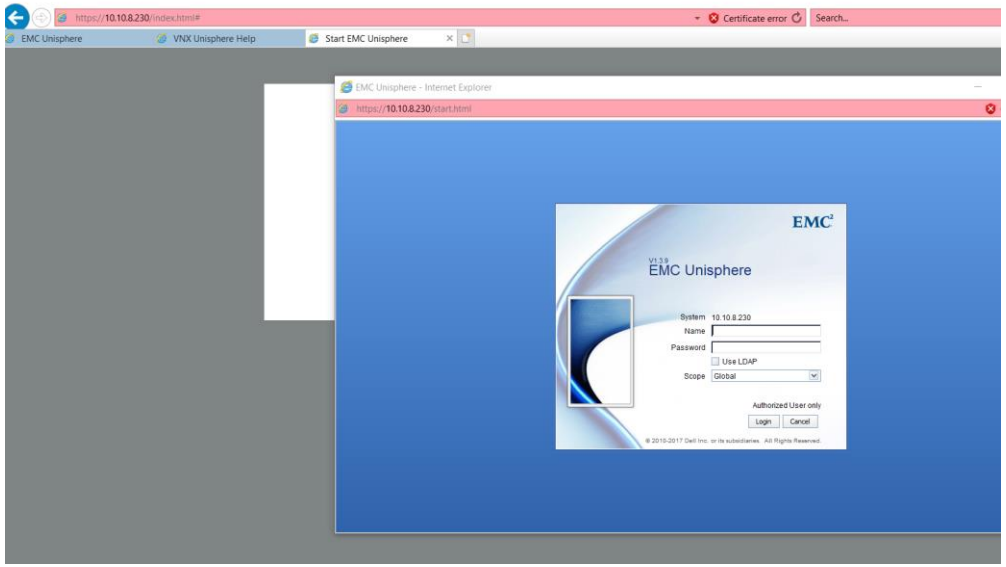
Appendix H – File Services Recovery

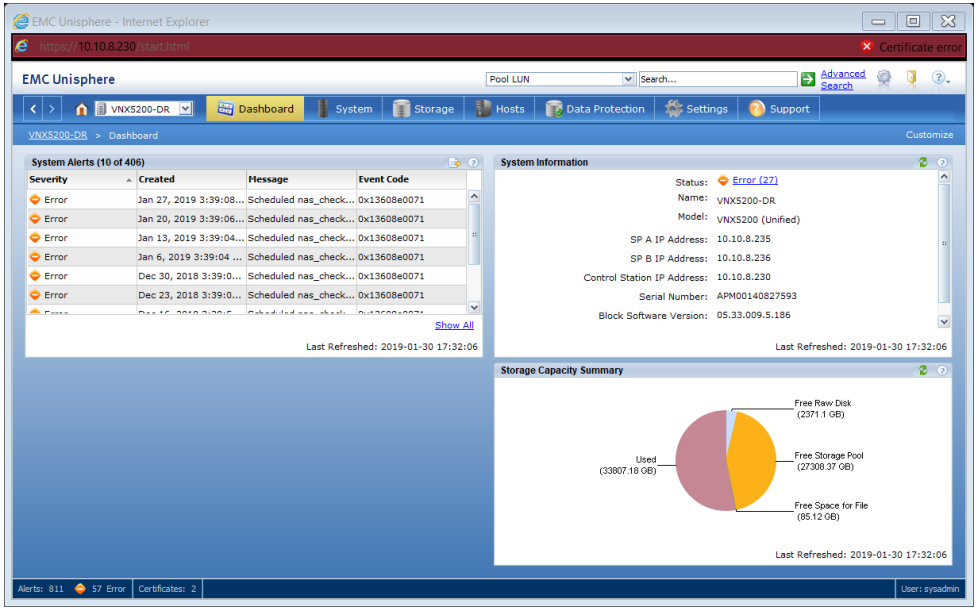
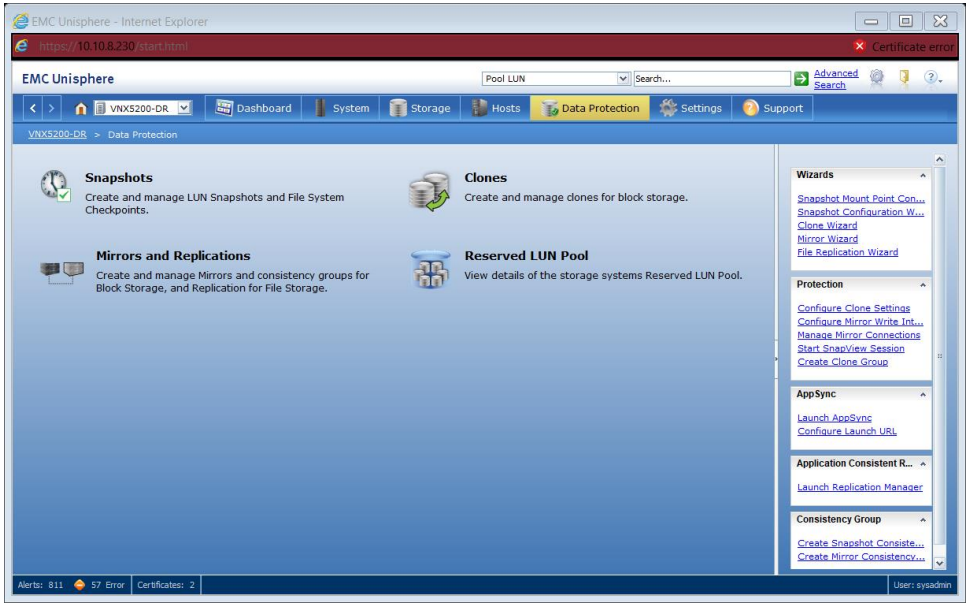
Currently the FileShares are hosted on 2 different platforms:

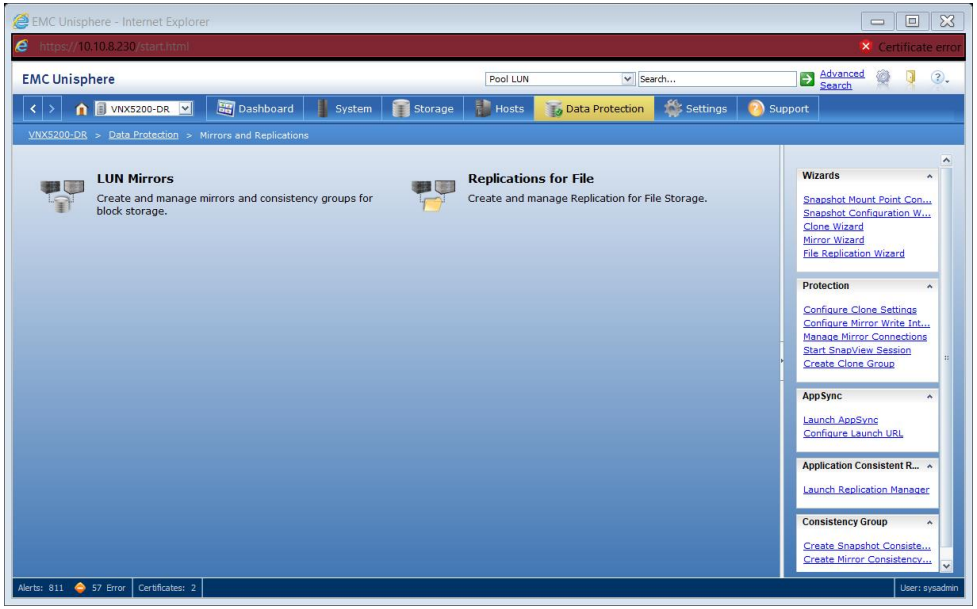
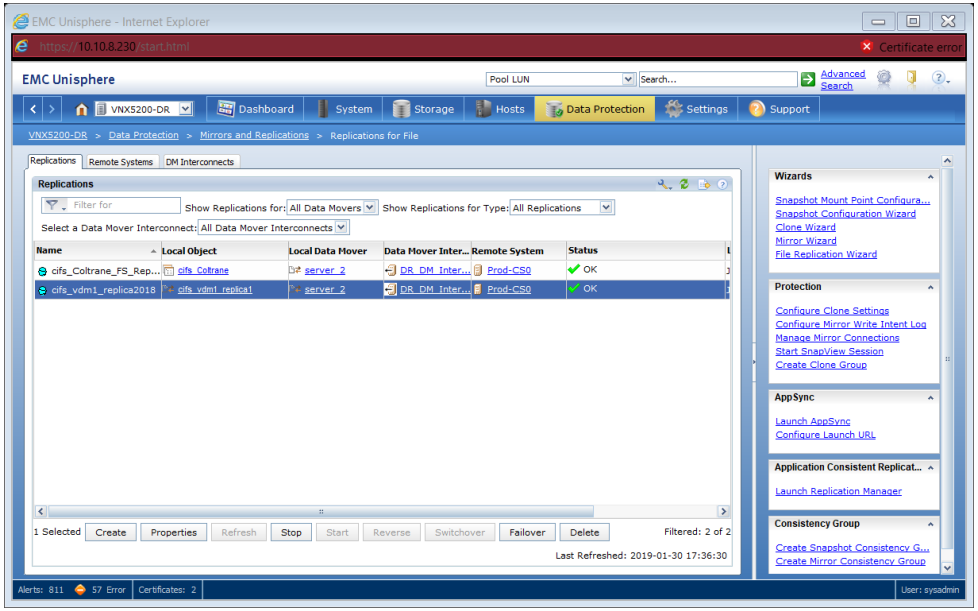
Share Name/Drive	Platform	Notes
U drive	VNX SAN	
K drive	Windows File Server Cluster	\\Files and \\Files-Inf shares
S drive	VNX SAN	
W drive	VNX SAN	
N drive	VNX SAN	
V drive	VNX SAN	

Steps to Failover Windows File Server Cluster (\\Files and \\Files-Inf shares)	
1. Ensure the cluster witness share has already been failed over.	Ensure that steps 1 – 4 for SQL Database Recovery listed in Annex C have already been completed and the 'FileShareWitness-Prod' has already been failed over to DR site.
2. RDP to TOCVFILEDR01 and launch Failover Cluster Manager	
3. Click on the Cluster object and confirm the File Share Witness is visible	INSERT SCREENSHOT

4. Expand the cluster object and click on Roles	
5. Confirm the '**Files**' and '**Files-inf**' roles are running on TOCVFILEDR01 and TOCVFILEDR02	
6. Confirm the file share(s) can be accessed through Windows Explorer	 

Steps to Failover File Shares on EMC VNX (Coltrane)	
1. Connect to EMC VNX SAN at DR site - https://10.10.8.230 **Note**: The web application requires Java. You will likely need to add the IP address to trusted sites under Java Exception site list (from the control panel). Additionally, there are several security related pop-ups and warnings that must be accepted to get to the login screen.	
2. Enter the credentials **Note:** Credentials can be found in PasswordState	

3. Select **VNX5200-DR** from the drop down menu.	
4. Click on **Data Protection** and then **Mirrors and Replications**	

5. Click on **Replications for File**	
6. First select **cifs_dm1_replica2018** and then click on **Failover** **Note:** Once the data mover is failed-over we can move the file system as follows: *Select c**ifs_Coltrane_FS_Replication** and then click **Failover***	

7. Once failed over DNS might need a manual update:

*Go to **TOCVDCDR01** and Open DNS and see if Corane now points to "10.10.9.232". If not modify the A record for Coltrane as needed.*

Note: The TTL for Coltrane is set to 20 mins so it could take up to 20 mins before clients will get the updated DNS record.

Appendix I – Print Services Recovery

Printing Services Recovery

There are 3 main components to printing at Town of Caledon.

1. Printer server
2. Equitrac Cluster (Follow-you-Printing)

Note: Servers related to both of these components need to be failed over in order for follow-you printing to work.

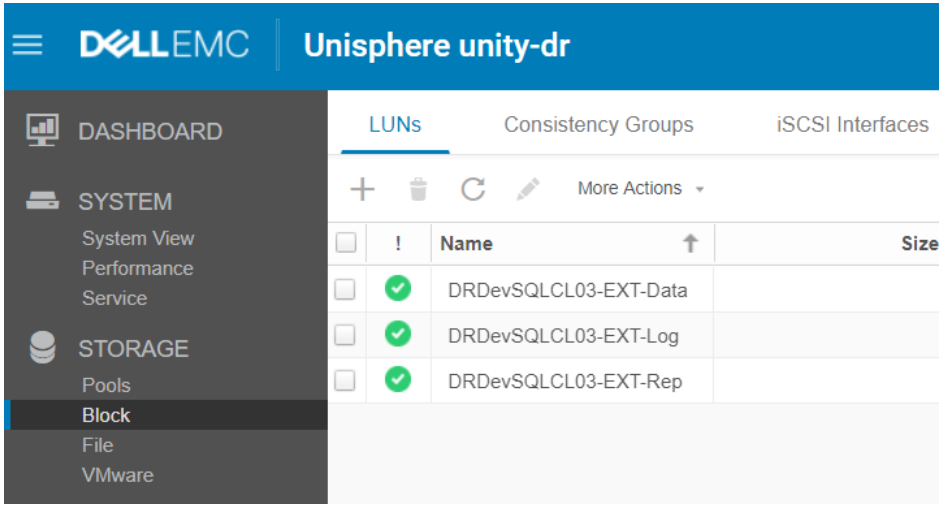
Print Server failover:

- The print server (TOCPRINT01) is failed over and powered on as part of VMware SRM (Annex X) which was done previously.
- Confirm you can connect to TOCVPRINT01 and it appears to be in a healthy state.

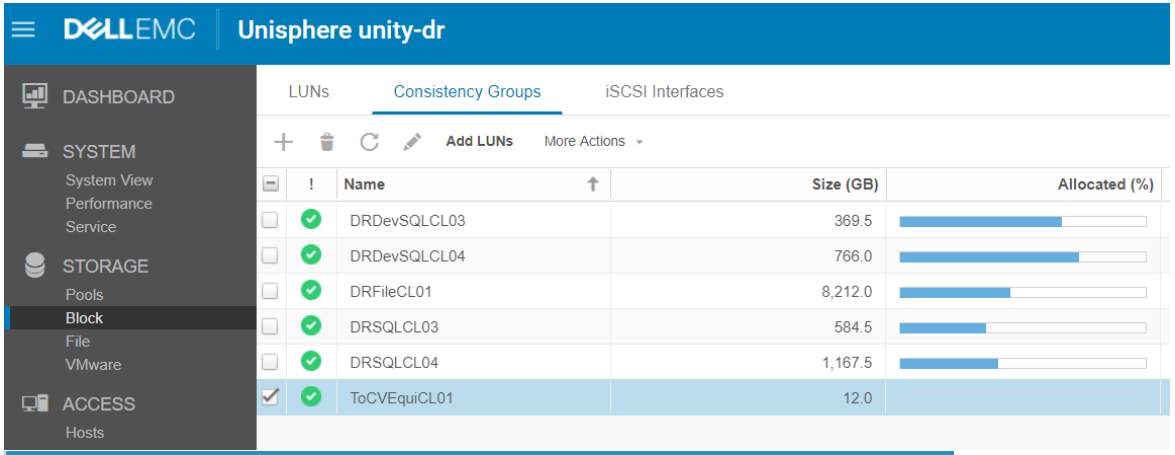
Equitrac Cluster failover:

Note: The steps below are not complete due to the nature of the failover. Please review all the steps below and devise a plan of action for the missing steps before proceeding.

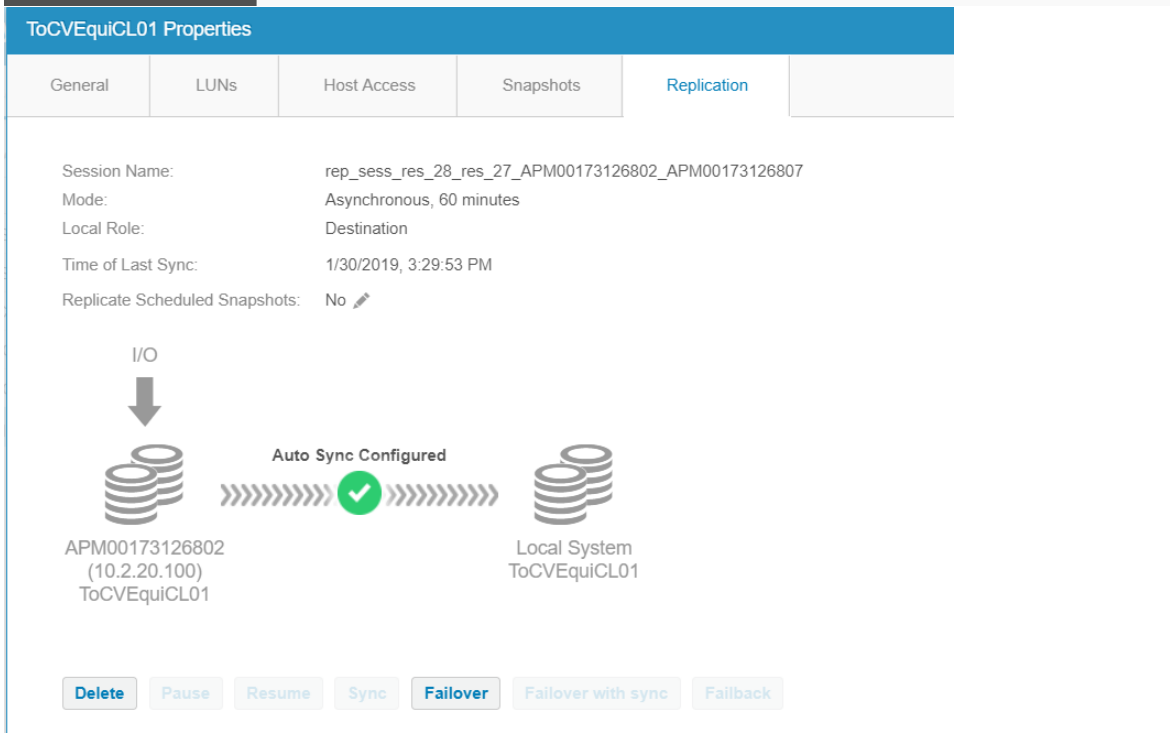
1. Log into the Unity SAN at DR site.
2. From the left menu click on Block under Storage



3. From tabs at the top Select Conistency Groups and then ToCVEquiCL01



4. Click the Edit icon to open the Properties. Then click on the Replication tab.



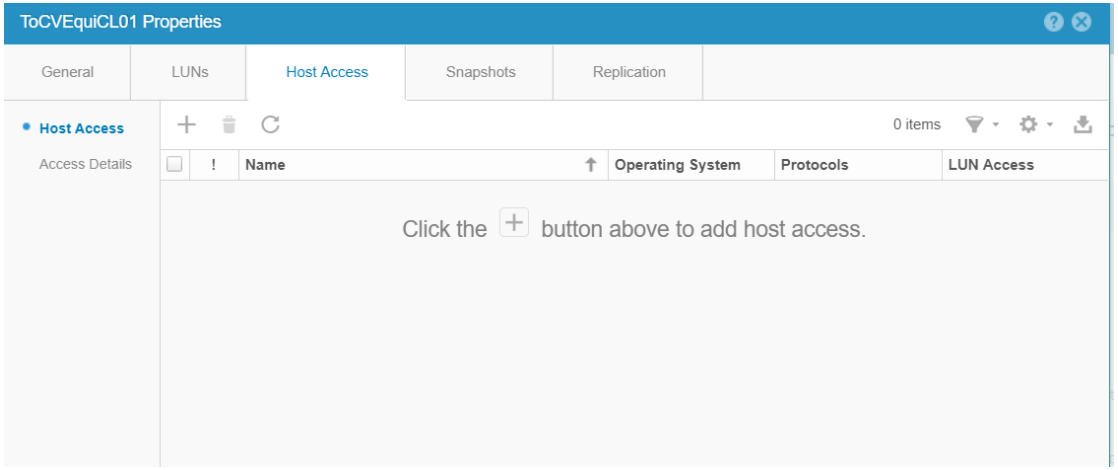
5. Click on Failover to initiate failover of the disks.

6. Ensure both servers in the Equitrac are failed over

Note: Following the steps to manally failover VMware VMs (as indicated in Appendex X), make sure you failover and power on TOCVEQUI01 and TOCVEQUI02

7. Return to the DR SAN web console and add host access to the storage

Note: Add TOCEQUI01 and TOCEQUI02 under Host Access of ToCVEQUICL01 storage



8. Final steps not determined.

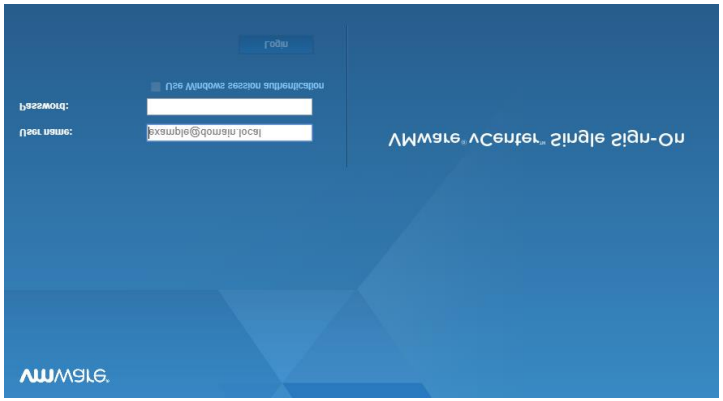
At a high level the following would need to be accomplished:

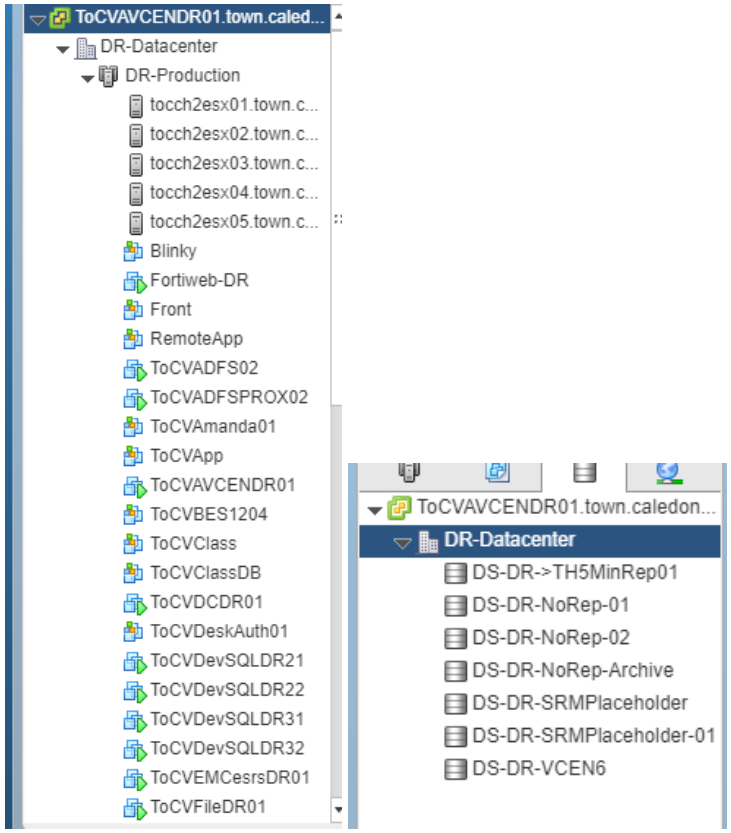
1. Connect both server Equi01 and Equi02 to the storage using isci initiator configuration
2. Ensure the storage is visiable under the cluster
3. Ensure the Disk Witness is visible
4. Once the Windows Cluster is healthy, attempt to start the application (Equitrac).

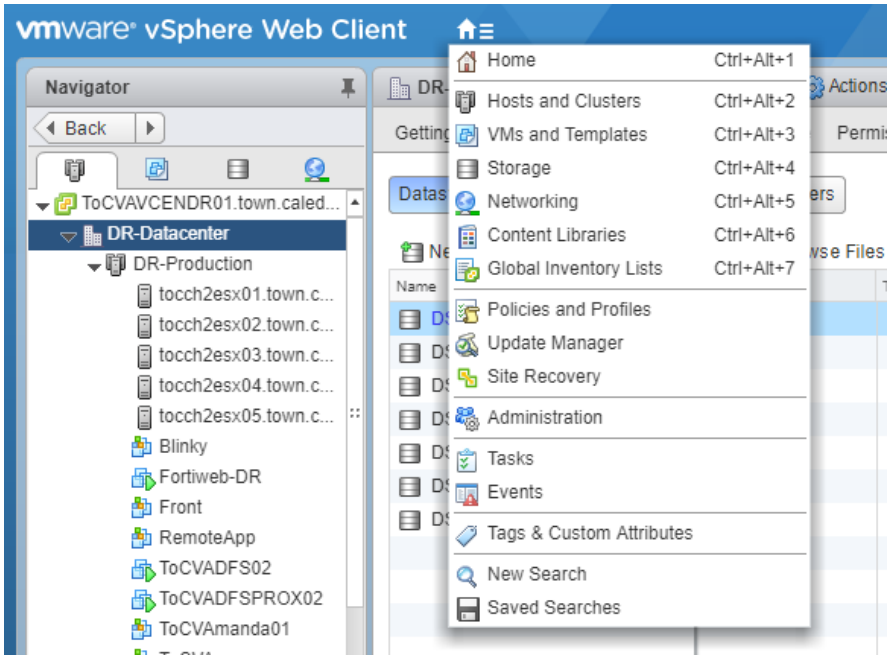
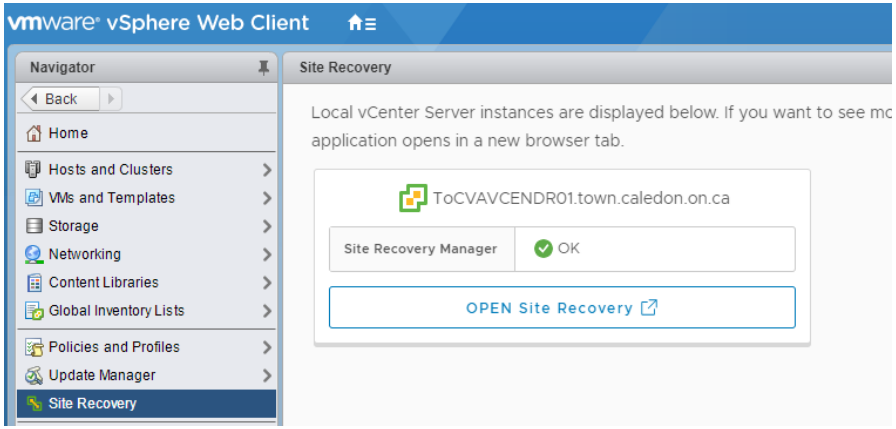
Appendix J – Helpdesk Recovery

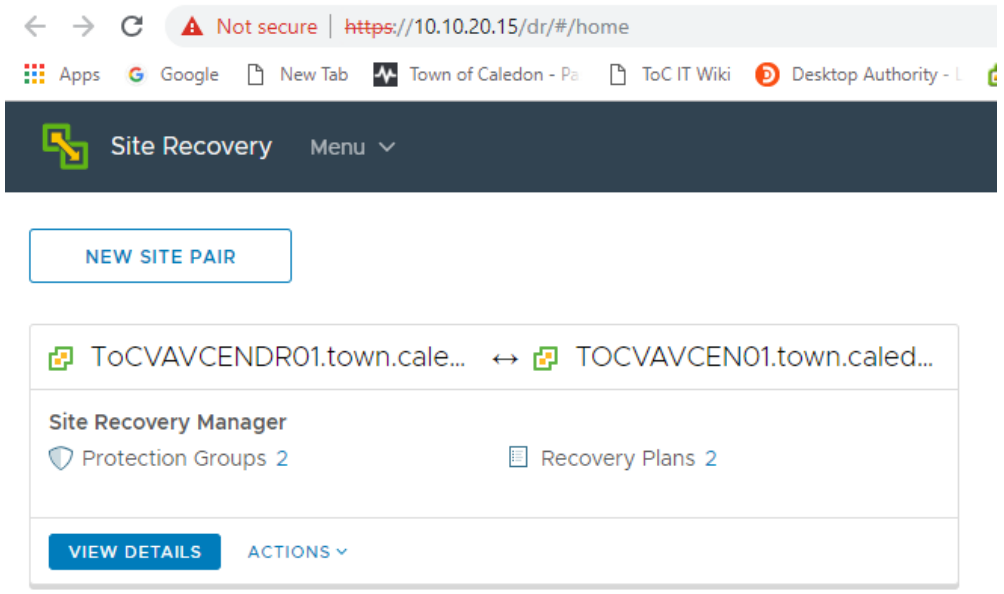
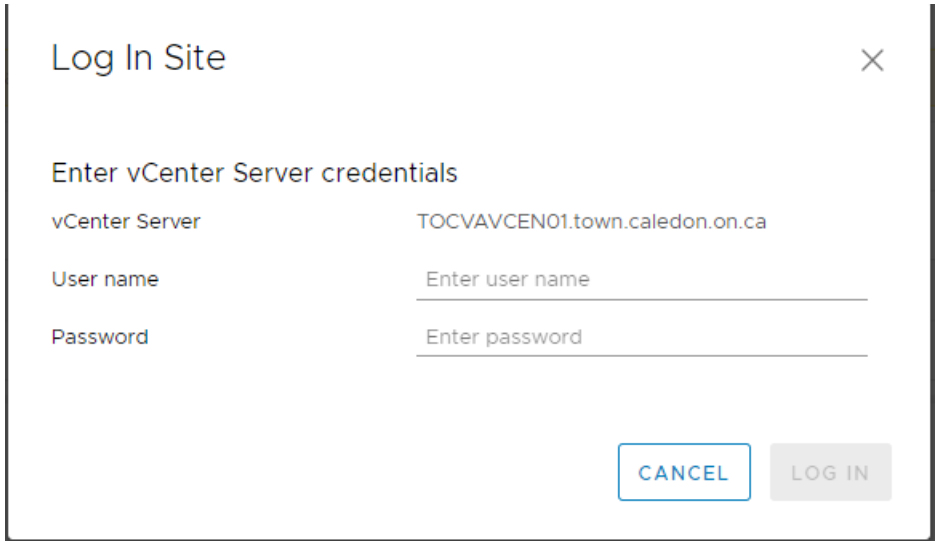
Appendix K – GIS Recovery

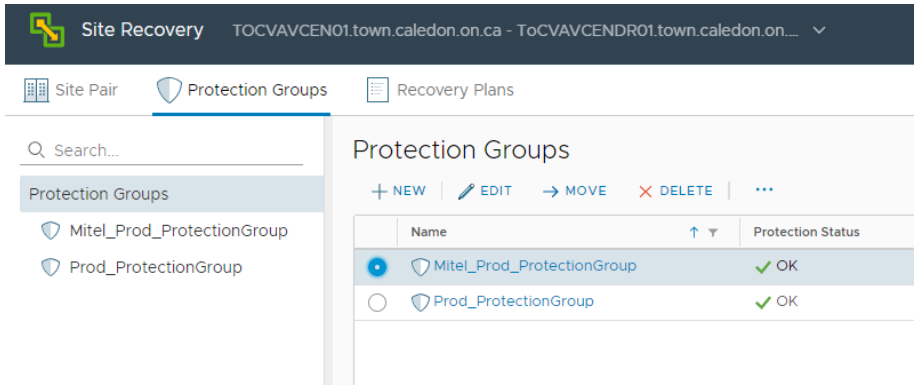
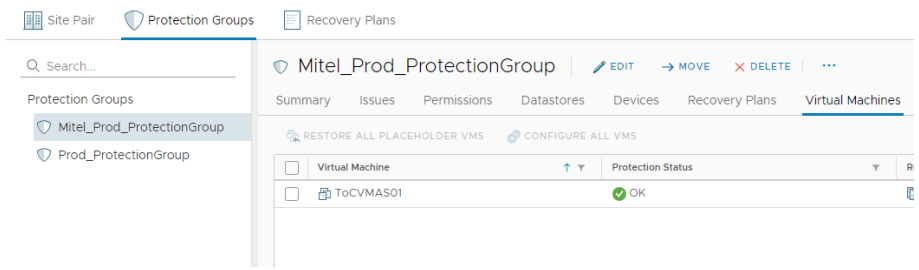
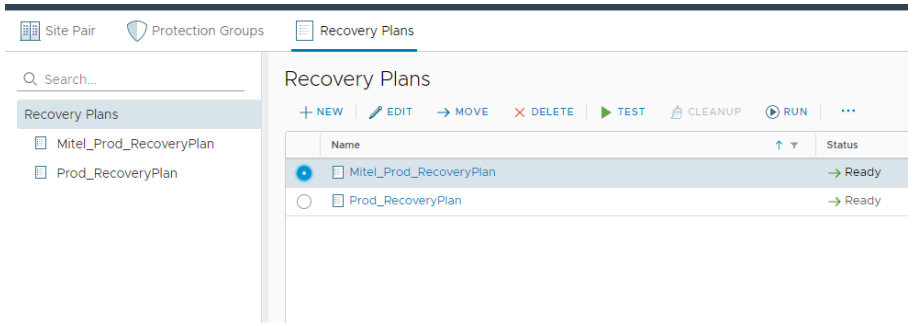
Appendix L – Software Defined Infrastructure Recovery

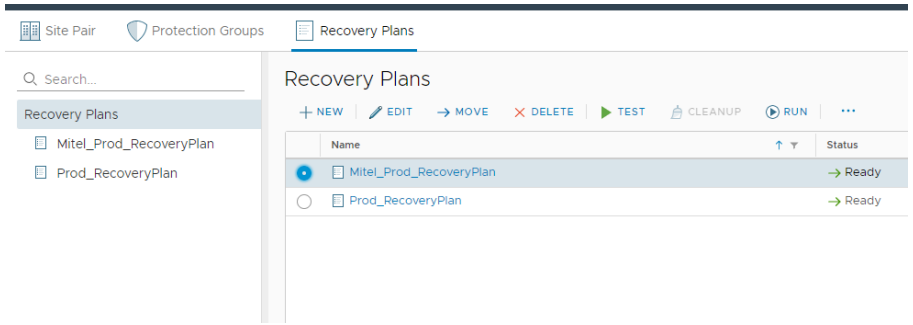
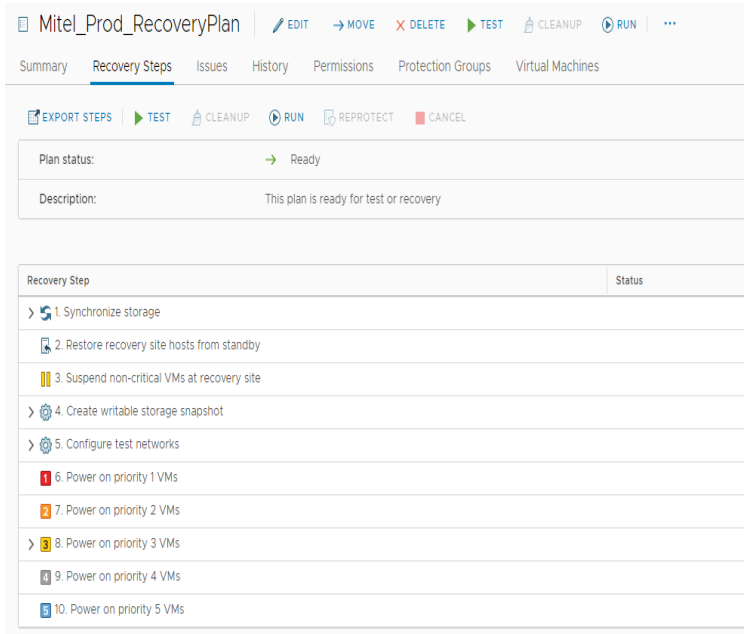
VMware (SRM) Failover	
1. Open a web browser and browse to: https://tocvavcendr01 2. Click on vSphere Web Client (Flash)	
3. Login with your Domain Admin account	

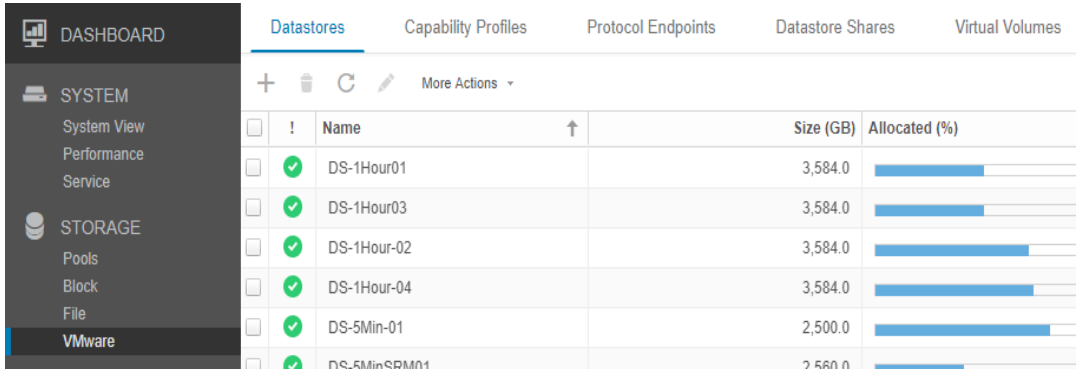
4. After a successful login, confirm the hosts and storage are connected to the DR site VMware environment and there are no Alarms or errors.	

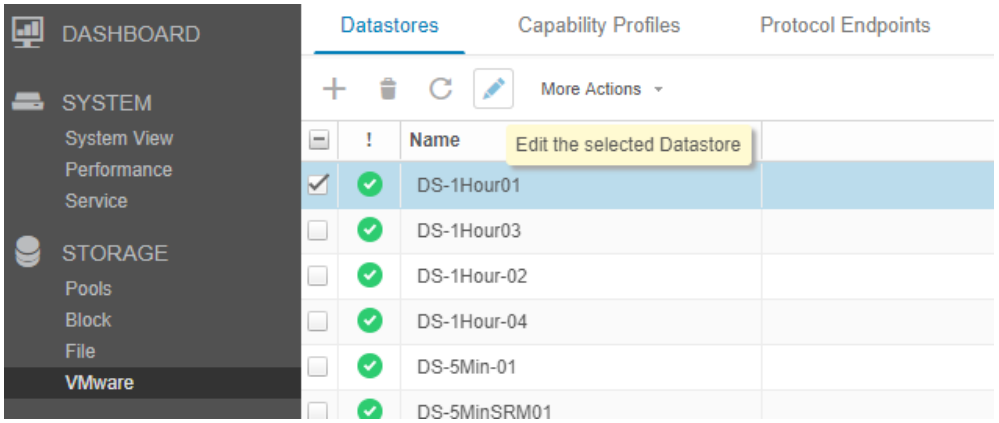
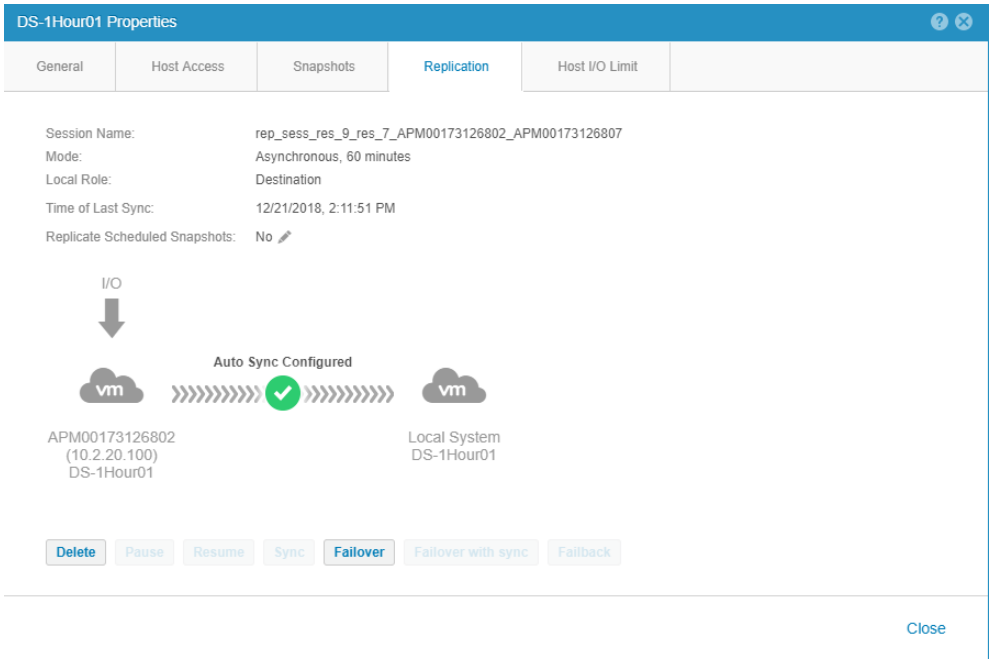
5. From the top left – click on the Home icon and select Site Recovery.	
6. Click on “Open Site Recovery”. This will launch a new browser window.	

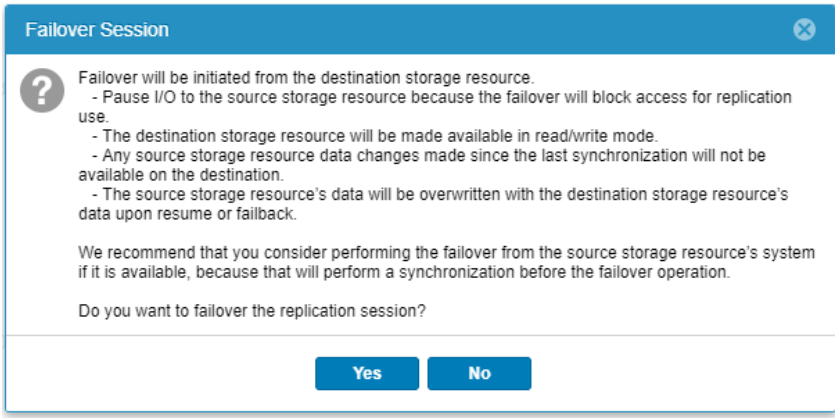
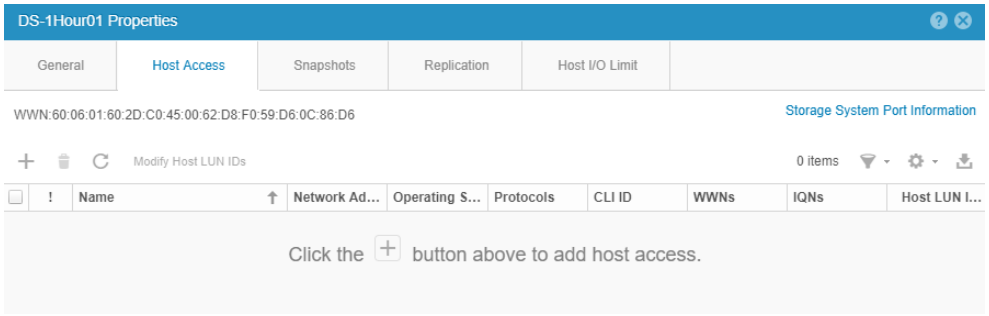
7. Once the Site Recovery window opens. Click on "View Details"	
8. Enter your login information. Make sure to prefix with domain name. (Domain admin credentials)	

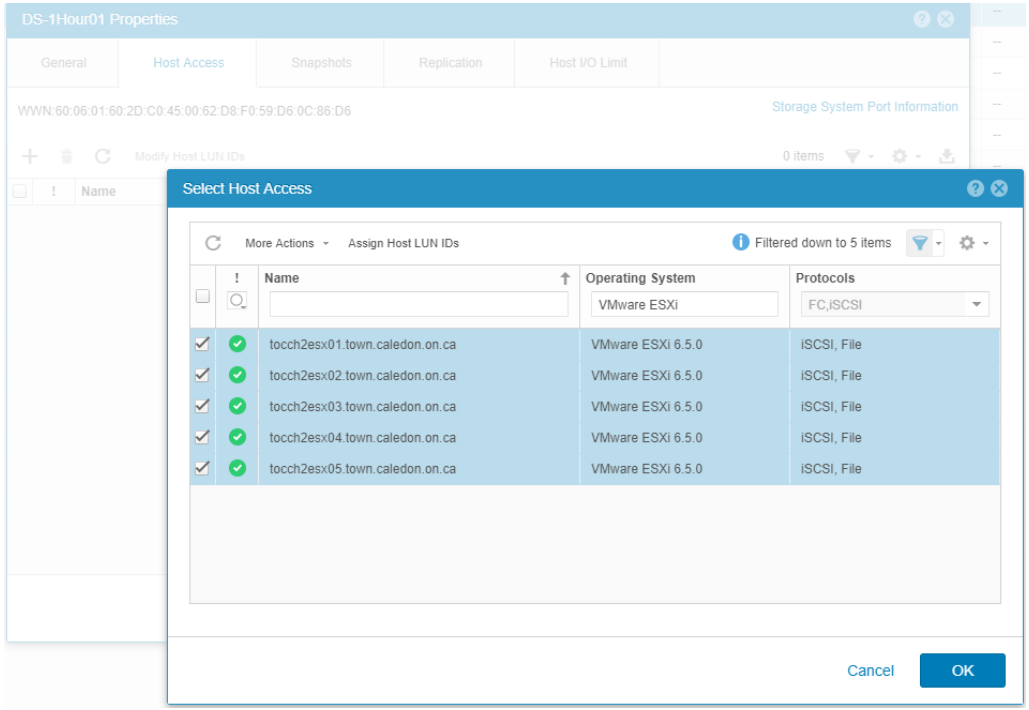
9. Click on “Protection Groups”. Then click on “Mitel_Prod_ProtectionGroup”.	
10. Click on the Virtual Machines tab to review the list of VMs that will be recovered.	
11. Click on the Recovery Plans tab and Select the associated recovery plan.	

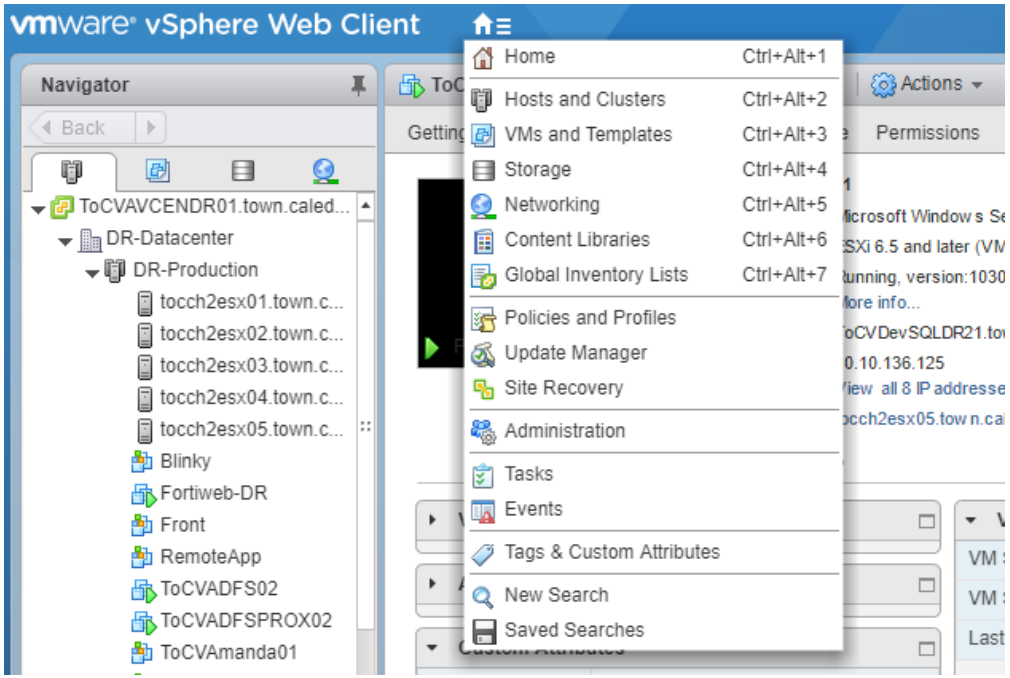
12. Click Run to initiate the recovery.	
13. The previous step will initiate recovery and the screen will display the steps and their progress.	
14. Repeat steps 9 to 12 for the other Protection group -“Prod_ProtectionGroup”	**Important:** Don’t failover ‘Prod_ProtectionGroup’ until you have completed Step X (Database Recovery) in the restoration table. Initiating the failover will power on the VMs at the DR site which would require the Databases to be available first, in order for the application to function.

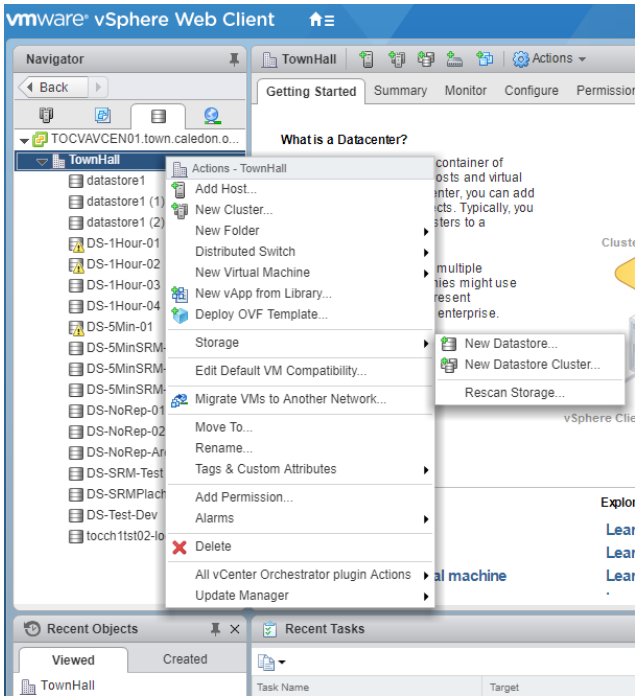
VMware (non-SRM) Failover	
Up to 25 VMs can be automatically failed over using SRM. Any additional VMs that need to be failed over must be moved over manually. In order to qualify for manual failover, the VM must be stored on one of the following datastores (the naming convention is based on the recovery point the datastore offers). • DS-1Hour-01 • DS-1Hour-02 • DS-1Hour-03 • DS-1Hour-04 • DS-5Min-01	
1. Log into the Unity SAN at DR site.	https://10.10.8.100
2. From the left menu click on VMware under Storage	

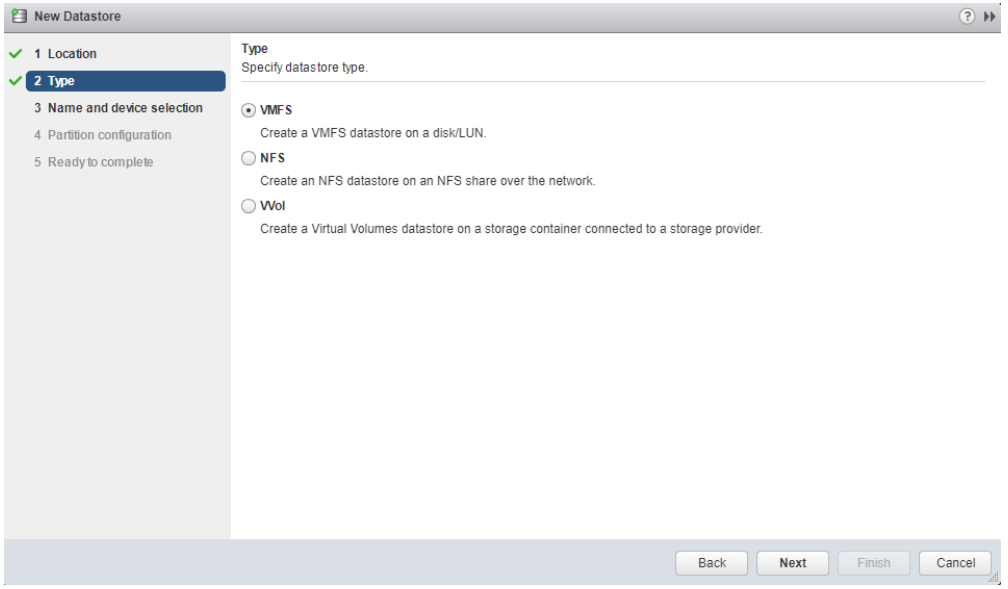
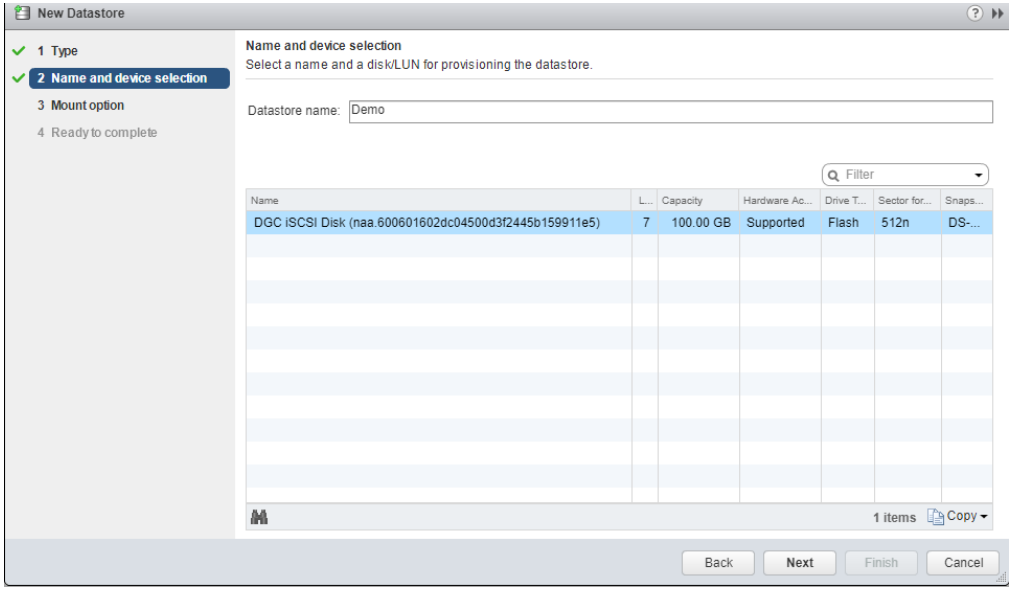
3. Select Datastore that needs to be failed over and click the edit icon. e.g. DS-1Hour01	
4. Click on the Replication tab and then Failover	

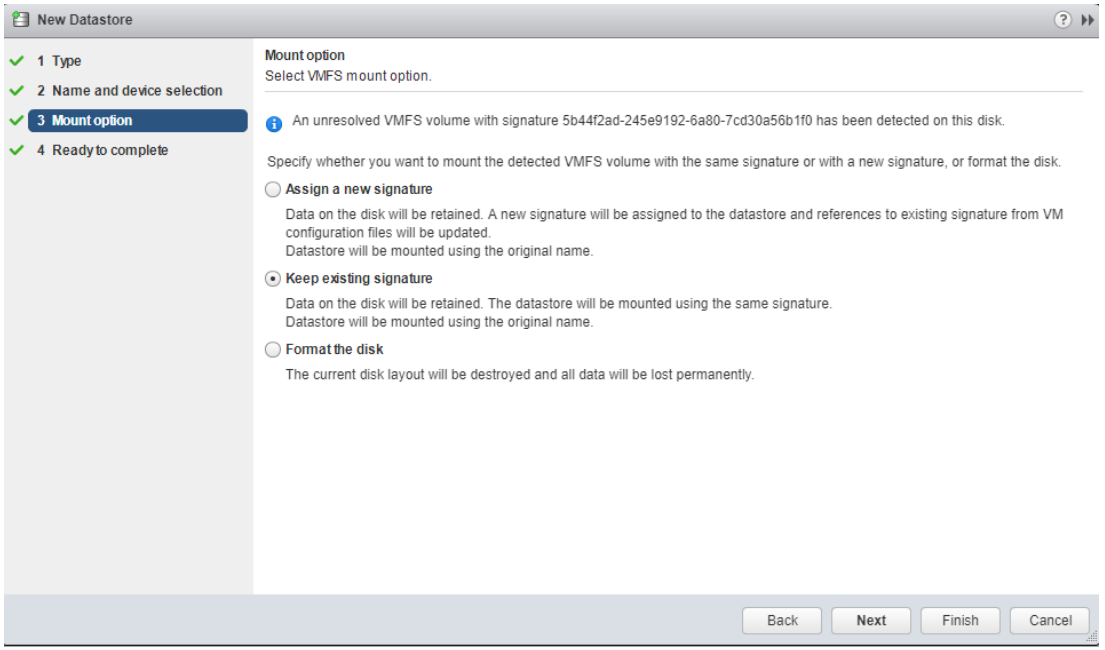
5. Confirm the source datastore is no longer being used. Then Click Yes **Note:** This may involve manually shutting down the VMs at the source datastore (Depending on the nature of the DR scenario)	
6. Once the datastore is failed over – provide the DR hosts access to the Datastore **Note:** Under the datastore properties click on Host Access	

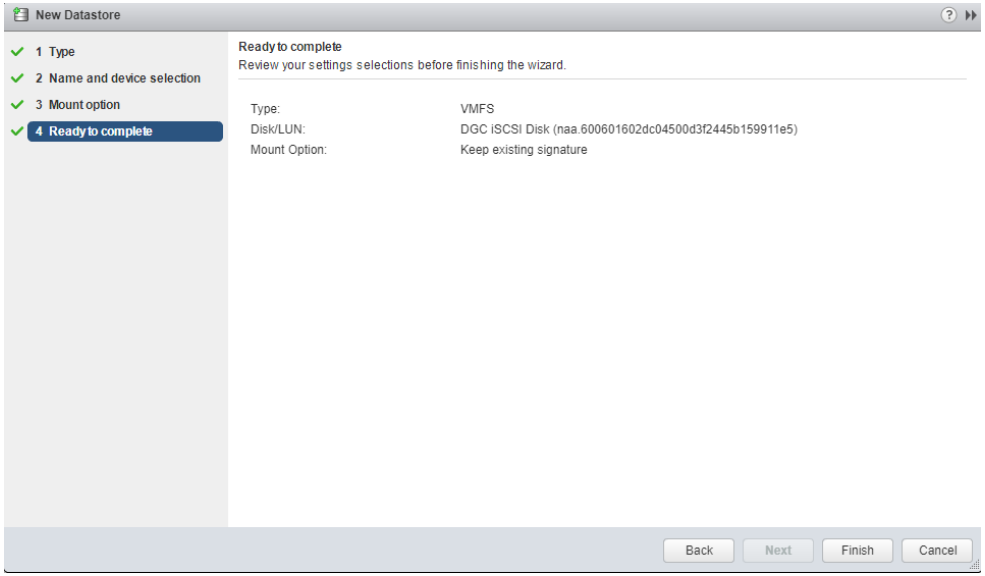
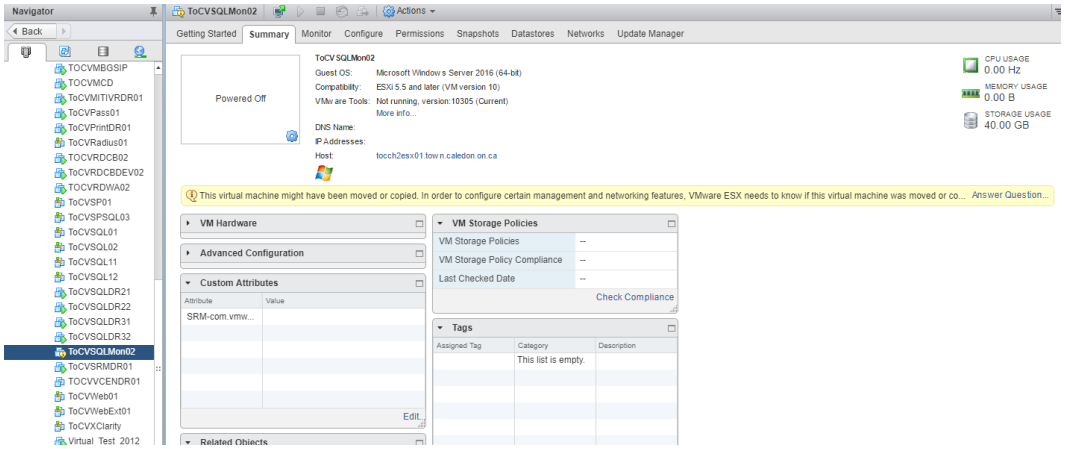
7. Click the + sign to add access. Select all the hosts and click OK.	
8. Log into vCenter at DR site	https://tocvavcendr01/

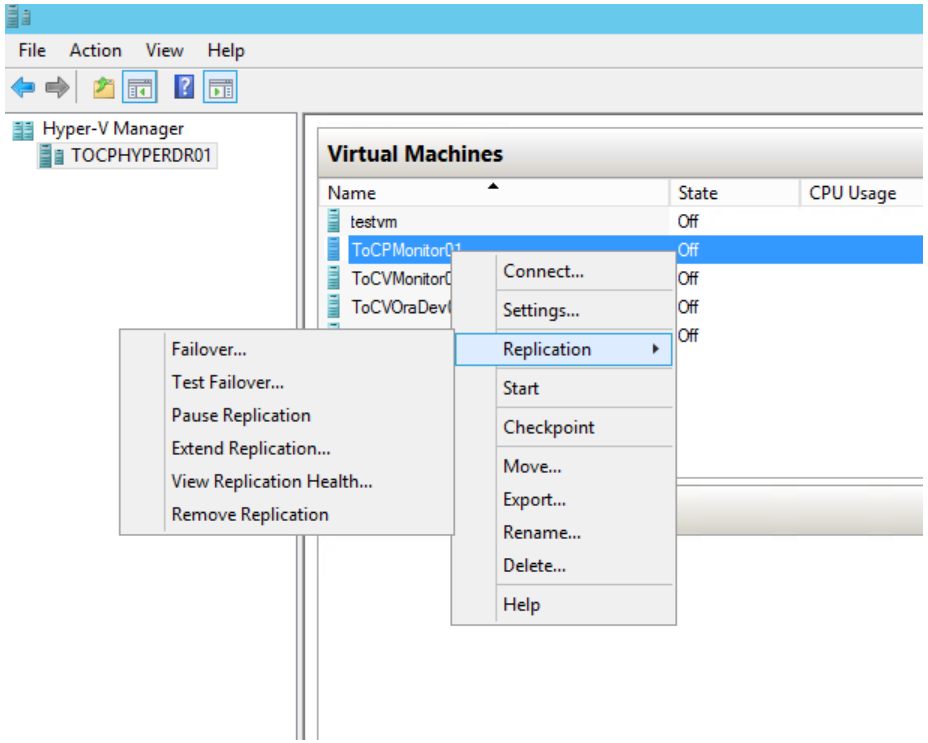
9. From the top menu select Storage.	

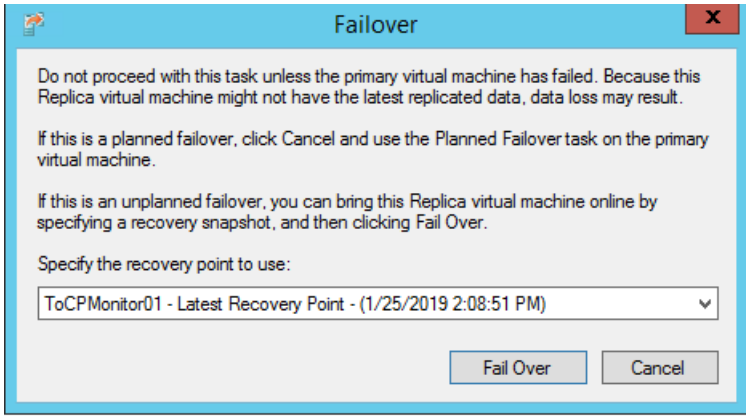
10. Right click ‘TownHall’ and select ‘New Datastore’ under Storage.	

11. Click Next on the location page and Select 'VMFS' for the database type.	
12. Select the disk/LUN listed there and click Next. (the name field can be left as is)	

13 Select to ‘Keep the existing signature’.	

14. Click Finish to complete the wizard.	
15. Repeat Steps for additional datastores	
16. Attempt to Power on the VM(s) – At which point you will receive a message asking if the VM was moved or copied.	
17. Click on answer question.	Select “Moved it”

Hyper-V Failover	
1. RDP to the Hyper-V host at DR site	Hostname: TOCPHYPERDR01 IP: 10.2.23.14
2. Launch Hyper-V Manager	Click start and type ‘Hyper-V Manager’
3. Right click on ‘ToCPMonitor01’	
4. Click on Failover under Replication.	

5. Select the Latest Recovery Point and click Fail Over.	

Testing

VMware SRM:

1. Confirm you can connect (RDP) to one of the VMs that has been failed over through SRM. E.g. RDP to the email server (Blinky) and confirm it appears to be in a healthy state.

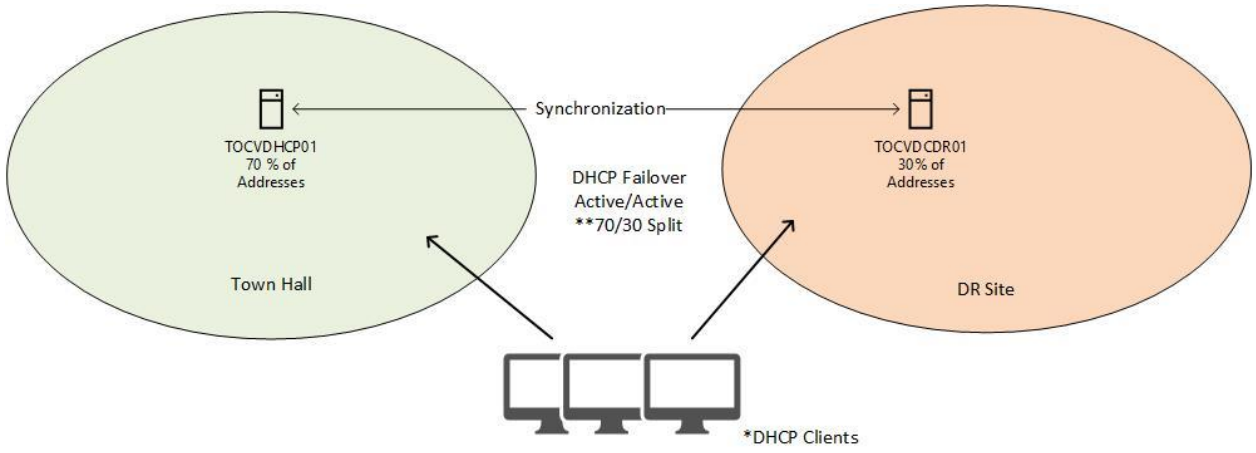
Hyper-V

2. Confirm you can connect (RDP) to one of the VMs that has been failed over through Hyper-V. E.g. RDP to the monitoring server (TOCPMONITOR01) and confirm it appears to be in a healthy state.
3. *Additional application specific testing maybe required for which the application team would need to be engaged.
4. Troubleshooting
5. If you encounter issues during the previous steps, please confirm the physical infrastructure and core services are operational, refer to Appendix L and M.

Appendix M – Core Infrastructure Services Checklist

DHCP

DHCP is setup in a High Availability architecture with a DHCP server at each site (TownHall and DR site) in an active/active configuration. See diagram below for details:



*Only clients with connectivity to both sites would be able to failover between sites.
**Clients at DR site have a 30/70 split with Town Hall and DR site respectively.

In a DR scenario (where the DHCP server at TownHall is unavailable), sites with network connectivity to the DR site should automatically failover to DR site DHCP server.

DNS

Internal DNS

DNS services are integrated with Active Directory – As such they are present on every domain controller in the environment and DNS replication occurs between all domain controller servers as part of AD replication.

The DR site has 2 servers that can provide DNS services.

1. TOCVDCDR01
2. TOCPDCDR01

External DNS

External DNS services are provided by Easy DNS. There is monitoring and failover configured on EasyDNS for the following services. These services will automatically failover to public IPs associated with the DR site internet (Frontier) in case of an outage at Primary site (Sheridan).

Service/URL	Sheridan IP	Frontier IP (DR Site)
Eservices.caledon.ca	142.55.249.40	67.21.149.39
ftp.caledon.ca	142.55.249.37	67.21.149.36
Maps.caledon.ca	142.55.249.39	67.21.149.38
Webapp.caledon.ca	142.55.249.44	67.21.149.44
Mail1.caledon.ca	142.55.249.45	67.21.149.43

Password Management

In a DR scenario at TownHall, the password management solution should still be accessible via https://passwordstate.caledon.ca:9119 or https://10.10.23.2:9119 as the VM resides at the DR site. If you have access to PasswordState, you should be able to login with your regular credentials. If regular credentials are not working, please try the emergency access URL https://passwordstate.caledon.ca:9119/emergency/. The emergency login details can be found here.

Networking

Default Route on Switches:
OSPF is used to distribute the default gateway to different sites. In a DR scenario, the DR site core switch should takeover as the default gateway automatically and its default gateway should be the DR site firewall.

Log into the core switch of another site that has a direct fiber connection to DR site (e.g. CCRW) and confirm default route:

Log into the CCRW core switch	IP: 172.31.0.49 Username: root Password: **search 2018 switches in password state**
Enter enable mode	Type enable password
Check routing table	Type “show ip route”
The output should indicate DR site core switch as the default gateway (example shown)	Look for the following text: *Gateway of last resort is 172.31.0.58 to network 0.0.0.0*

Log into the DR site core switch and confirm default route”

Log into the DR site core switch	IP: 172.31.1.2 Username: root Password: **search 2018 switches in password state**
Enter enable mode	Type enable password
Check routing table	Type “show ip route”
The output should indicate DR site firewall as the default gateway (example shown)	Look for the following text: *Gateway of last resort is 10.10.0.1 to network 0.0.0.0*

NAT rules on Firewall:
In a DR scenario – access to the Internet should failover to the Frontier (ISP) connection at DR site. The public IP in use for browsing would be 67.21.149.34.

In order for services hosted by the Town to be available through the DR site internet – certain NAT rules need to be disabled on the DR site firewall. These NAT rules allow for DR site to be a tertiary internet backup for services hosted at town hall. But if the servers hosting the services have been moved over to DR site in a disaster recovery scenario, we need to disable these NAT rules, so the rules below it can take over and direct traffic to DR site.

Log into the DR site firewall using Putty. Note: You might need to use a jump server if you can't connect directly via VPN.	IP: 10.10.0.1 Username: netadmin Password: ** search ASA firewall in password state**
Enter enable mode	Type "enable" on the prompt
Enter configuration mode	Type "Conf t"
Enter the commands (as shown) to disable the appropriate NAT rules. (Current as of Jan 11, 2018)	1. nat (any,DMZ-TH) source dynamic any interface destination static Outside_67.21.149.36_ftp.caledon.ca DMZ29_ToCVFTPGW01 inactive 2. nat (any,DMZ-TH) source dynamic any interface destination static Outside_67.21.149.38_Fortiweb-ExternalServices DMZ_Fortiweb-ExternalServices_10.0.0.40 inactive 3. nat (any,DMZ-TH) source dynamic any interface destination static Outside_67.21.149.39_Fortiweb-ExternalServicesForceHTTPS DMZ_Fortiweb-ExternalServicesForceHTTPS_10.0.0.41 inactive 4. nat (any,DMZ-TH) source dynamic any interface destination static Outside_67.21.149.44_webapp DMZ_Fortiweb-ExternalServicesForceHTTPS_10.0.0.41 inactive

ForiWeb (Web Application Firewall)

The WAF is responsible for handling all web related traffic originating externally and some traffic originating internally. It plays a critical role in providing access to web applications.

There is a HA pair of FortiWeb WAFs at Town Hall and a single virtual Fortiweb WAF at DR site. At this time the configuration is not pushed from TH WAFs to the WAF at DR site.

Manual configuration is required on WAF at DR site in order to enable services in a DR scenario. This section will be updated once the configuration of DR site WAF has been updated to allow for more automated failover and a process has been put in place to sync the configuration.

Appendix N – Physical Infrastructure Checklist

Note: Passwords can be found in PasswordState: https://passwordstate.caledon.ca:9119 (For more details on PasswordState refer to Appendix L)

If you are unable to connect to any of these devices, it could be due to the following and could require a visit to the DR site to troubleshoot further:

1. Network connectivity
2. Device offline/ service unavailable

Device	Steps to check	Location
Switches	Open a Terminal Emulator program (e.g. Putty) and confirm you can SSH and log into the following switches at DR site. 172.31.1.2 (4500 core Switch) 10.10.8.3 (2960X switch)	DR Site
Firewall	If you are able to VPN to the DR site firewall using steps in Appendix B then firewall itself is up and operational. If on-site, you should be able to SSH to the firewall using IP 10.10.0.1	DR Site
Backup Appliance	Confirm you can log into the Unitrends Backup Appliance through https://tocpunitrends2/ui/#/ or https://10.2.22.2 Note: the appliance utilizes local authentication only.	DR Site
Server Chassis	Confirm Server Chassis is operational by connecting to the onboard CMM. https://10.10.8.10 using recovery_id.	DR Site
Physical Servers	RDP to TOCPDCDR01 (10.10.22.18) RDP to TOCPHYPERDR01 (10.2.23.14). Browse to	DR Site
SAN	Confirm you can connect to the DR site SAN and it is operational. https://unity-dr	DR Site

Appendix O – Primary Data Centre Failback Procedures

Failback to Town Hall

This document is intended to be a guide on restoring services at the Primary Data Center (Town Hall) after a failover to DR site has occurred.

Assumptions:

1. The Primary Data Center is in a state to start hosting services again and services are being reverted to the original systems (physical and logical).
2. Additional steps could be required if systems at the Primary Data Center had to be replaced (e.g. new SAN or Server Chassis). This guide doesn't cover those steps.

The following is an overview of the steps that need to be taken:

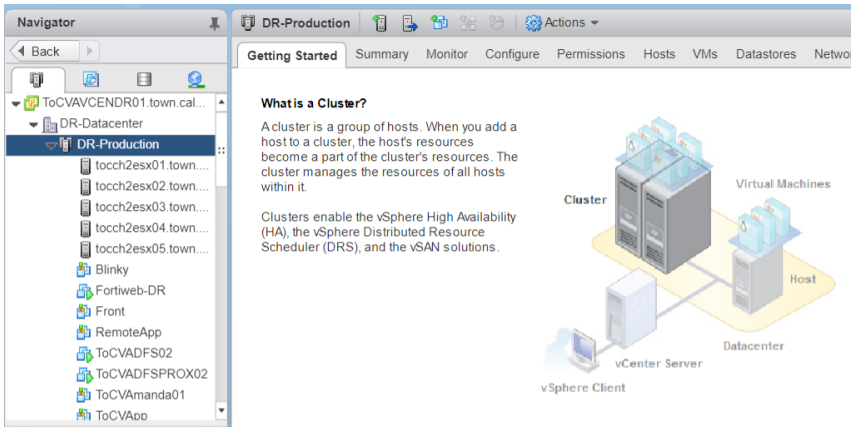
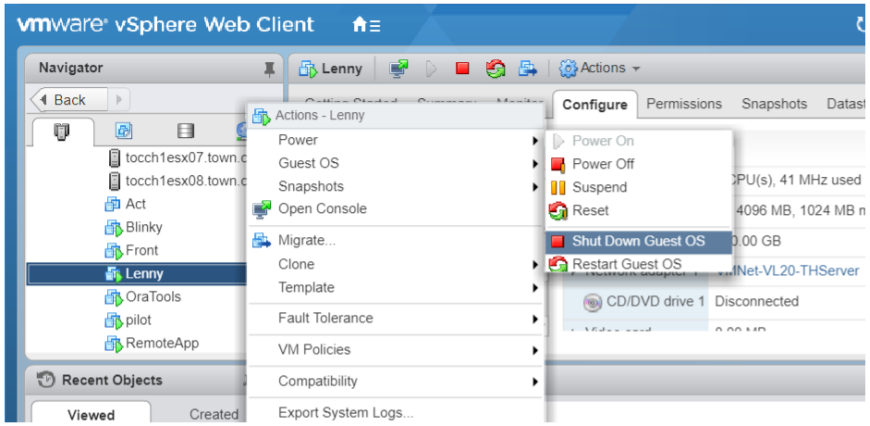
1. Shutdown of certain services at DR-Site
2. Power On equipment at Town Hall (SAN, Chassis, Switch)
3. Failback vCenter Server
4. Revert Telephone system
5. Revert Email System
6. Revert Databases
7. Revert File Shares
8. Revert Software Defined Infrastructure (VMware, Hyper-V)
9. Bring services online

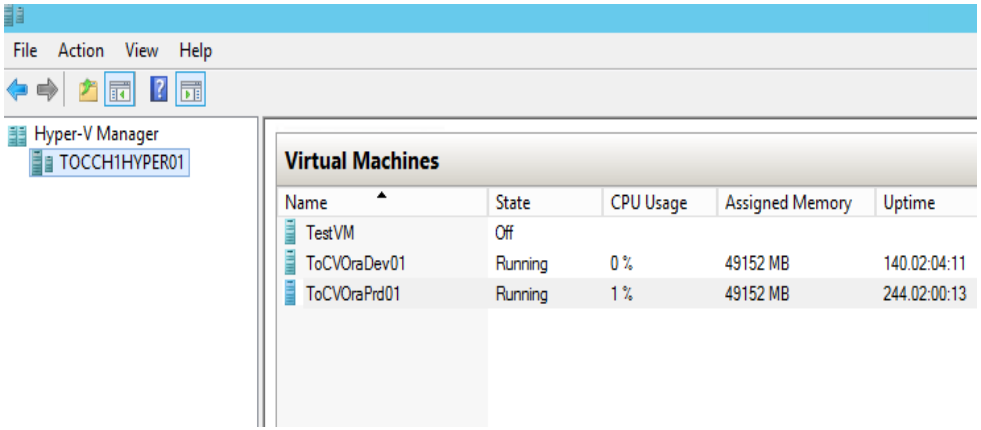
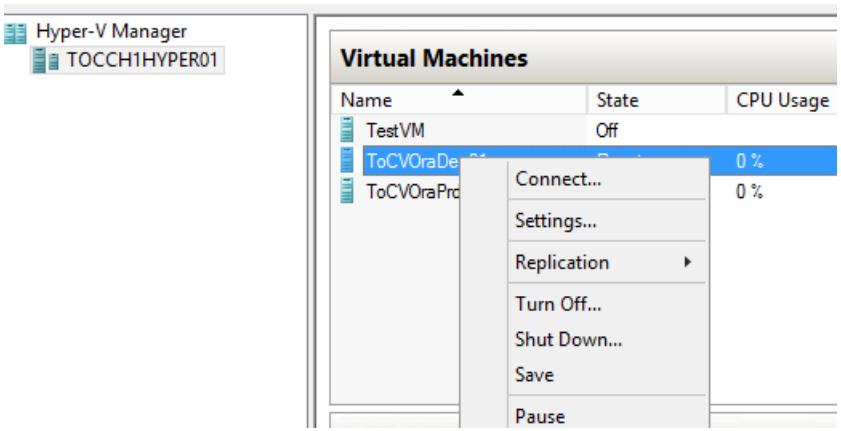
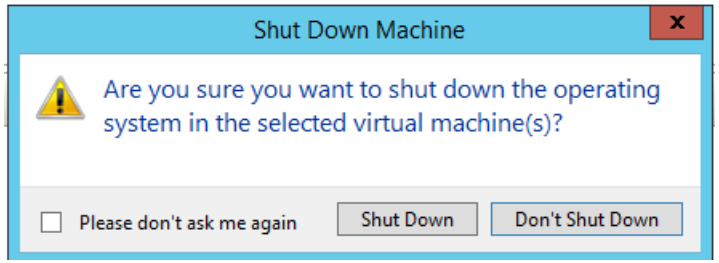
Step 1 - Shutdown of Services at DR Site

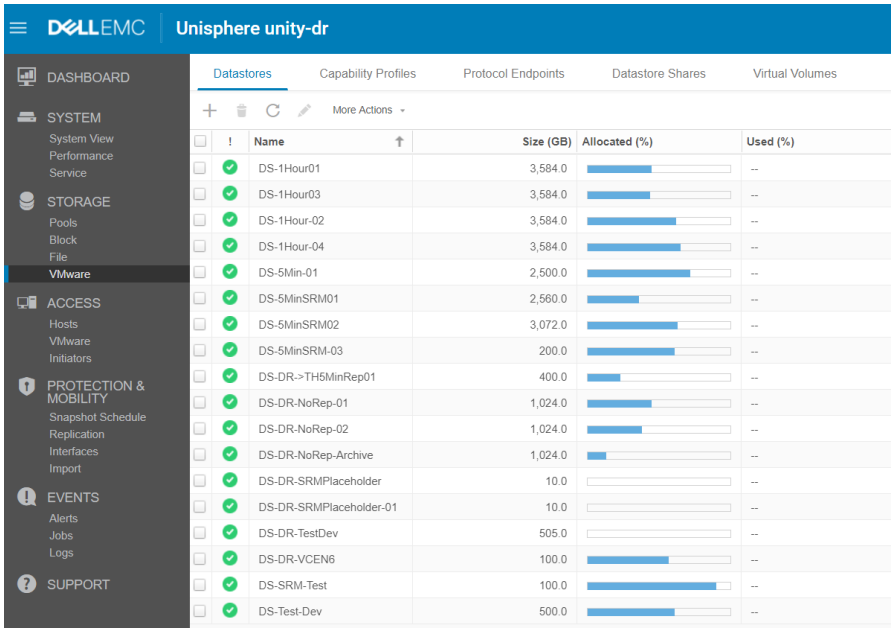
VMware

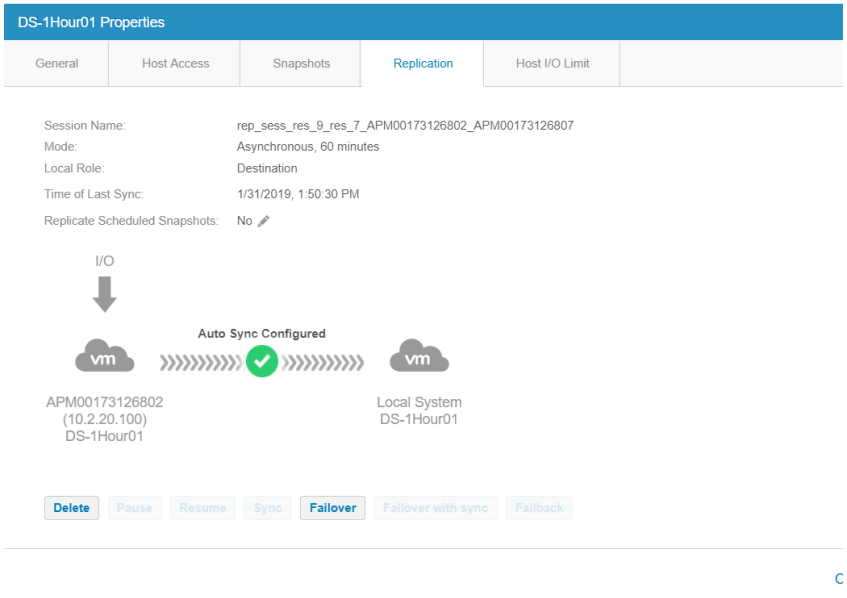
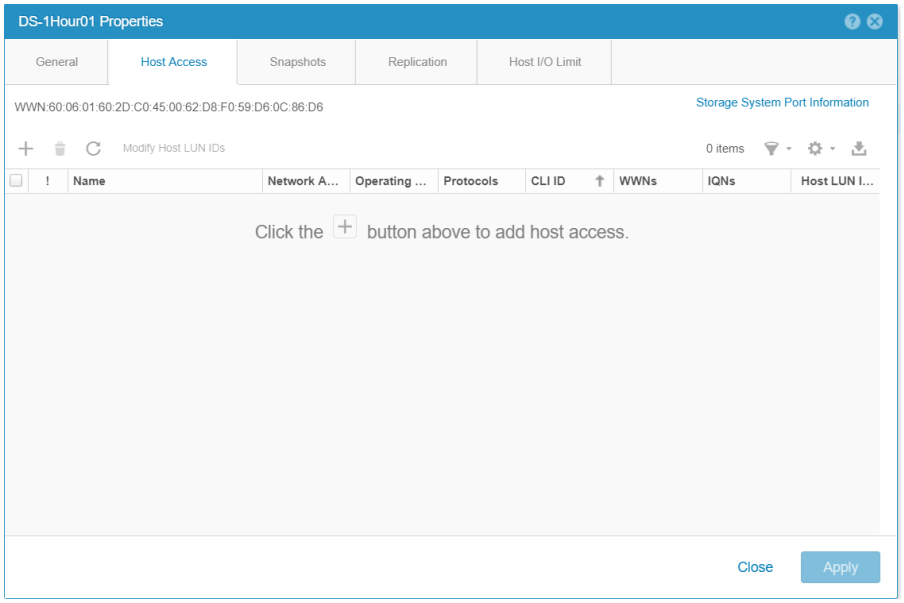
We will be shutting down VMs that were manually migrated to the DR site in the original failover. Shutdown all VMs that reside on Datastores migrated from Town Hall. Below is the list of datastores (at the time of writing):

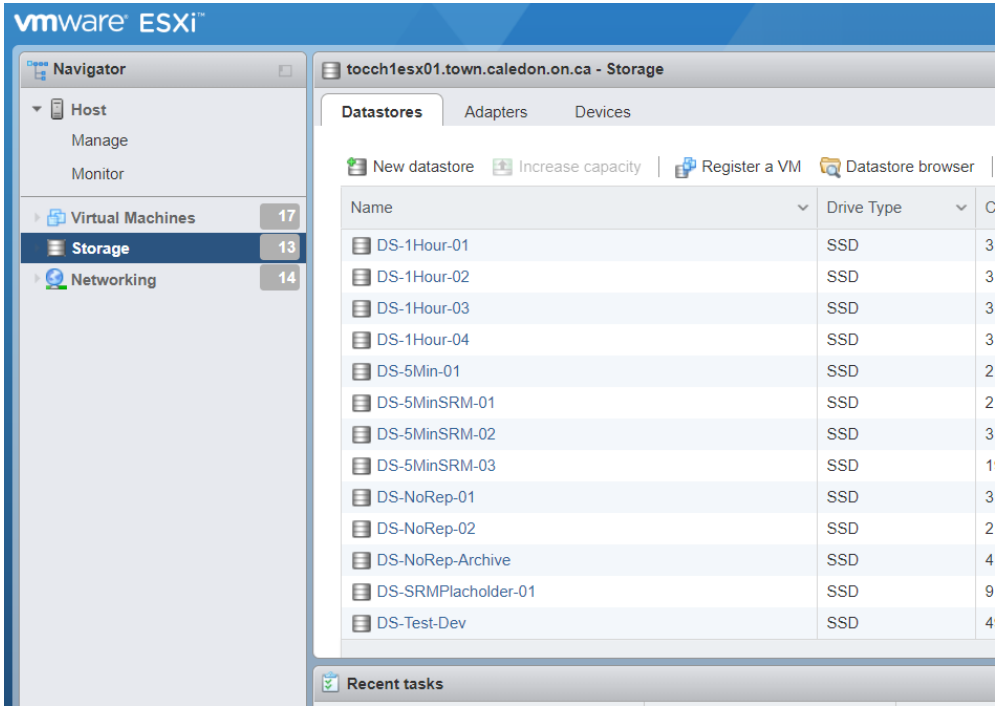
- DS-1Hour-01
- DS-1Hour-02
- DS-1Hour-03
- DS-1Hour-04
- DS-5Min-01

1. Open a web browser and browse to: https://tocvavcendr01	
2. Click on vSphere Web Client (Flash)	
3. Login with your domain admin account	
4. Expand the **Production** Cluster under **Host and Clusters**	
5. Right click the VM you wish to shutdown and select **Power** then click **Shut Down Guest OS**	
Hyper-V	
1. RDP to hyper-v host at DR site.	Server name: **TOCCH1HYPERDR01**

2. Launch 'Hyper-V Manager'	
3. Right click the VM you wish to shutdown and click **Shut Down.**	
4. Click **Shutdown** again to confirm	

Step 2 - Failback vCenter Server	
If the Datastore hosting the Town Hall vCenter server was failed over during a DR scenario - We will need to failback it back so the Town Hall VMware environment can start hosting services again and can be managed through a vCenter.	
1. Identify the Datastore hosting ToCVAVCEN01	From the DR site VMware environment identify the datastore hosting ToCVACEN01
2. After confirming no machines are running on the datastores Failback the Datastores through the DR site SAN.	Log into Unity-DR SAN (https://unity-dr) and failback all Datastores that were previously failed over. See list below for reference: - DS-1Hour-01 - DS-1Hour-02 - DS-1Hour-03 - DS-1Hour-04 - DS-5Min-01 

3. Click on the edit icon and under **Replication** click on **Failback.** Do this for all datastores that need to be failed back **Greyed out in this screenshot*	
4. On the Town Hall SAN confirm the VMware hosts have access to the datastore that has been failed back. If they don't have access – add them under host access.	

5. Directly connect to a host at Town Hall which has access form the previous step. e.g tocch1esx01	You can directly connect to a host by typing its IP address on the web browser. User local login credentials (available in password state).
6. Confirm you can connect to the datastore which was identified as hosting the vcenter server (in Step 1) If its present under storage. Add it through "New Datastore"	
7. ADDITIONAL STEPS NEEDED	

Step 3 – Telephone System

The following should failback automatically once network connectivity has been restored between Townhall and DR site and Town Hall and SIP provider.

- The main phone number for Caledon (905-574-2272) should failback automatically to Town Hall.
- Phones at sites with connectivity to DR site should automatically failback to phone controller at Town Hall.

The following steps need to be done manually:

- Need to failback a VM named TOCVMAS01 (Voicemail/AutoAttendant) from the DR site through VMware SRM.
- For steps on SRM failover, refer to Appendix X and use '**Mitel_Prod_ProtectionGroup**' as the group being failed over.

Step 4 - Email

The email system is provided through O365. Mailboxes reside in O365 and mail routing is done through O365. Users simply need an internet connection in order to access email.

External DNS provider (EasyDNS) should automatically failover the dns records required to maintain mail flow to O365.

Exception:

The only exception to this is systems that rely on internal mail relay e.g. If an application sends an email internally or externally, it would connect to the on-premise exchange server. The exchange server (Blinky) will need to be failed back to Town Hall through SRM.

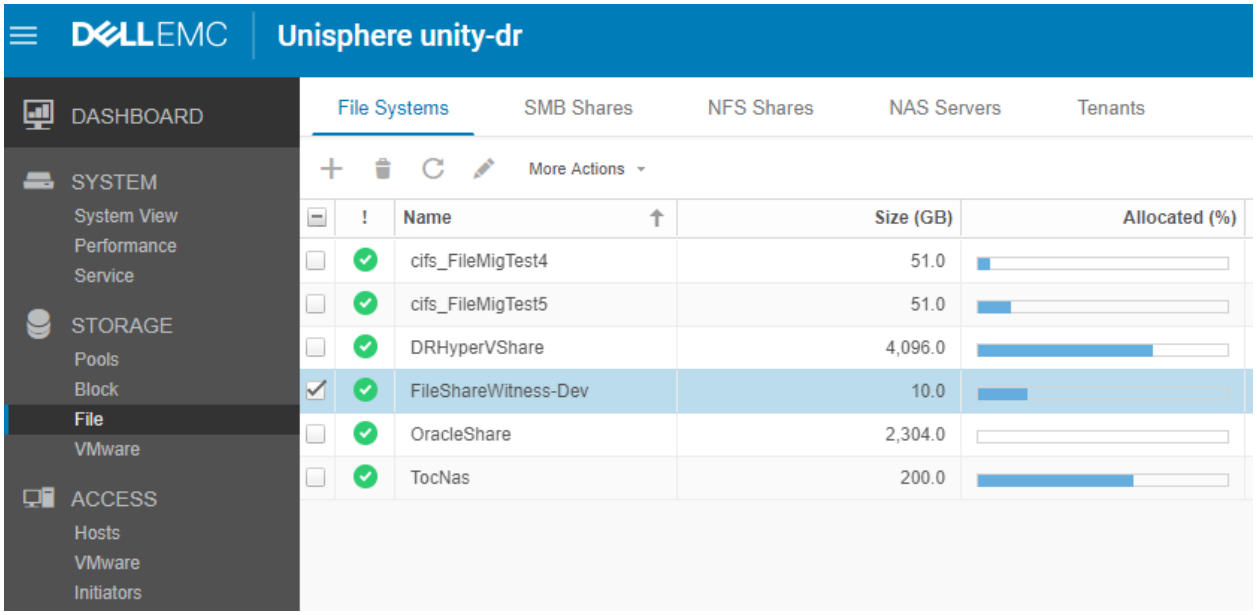
Refer to Annex X and use '**Prod_ProtectionGroup**' as the group being failed over.

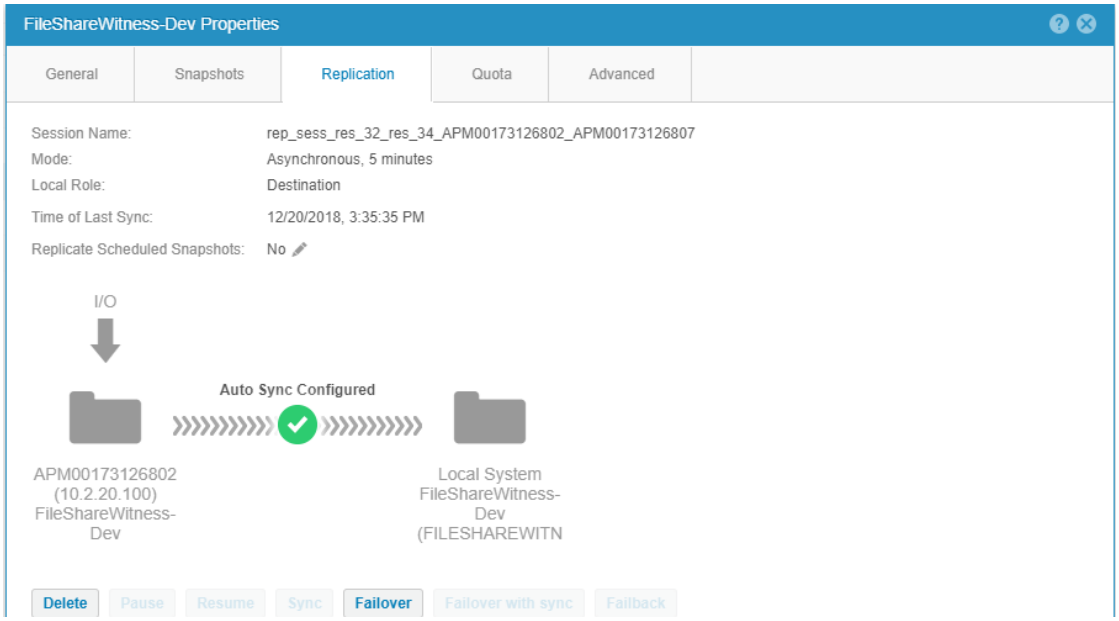
Important: Don't failover 'Prod_ProtectionGroup' until you have completed Step X (Database Recovery) in the failback table. Initiating the failback will power on the VMs at the Town Hall site which would require the Databases to be available first, in order for the application to function.

Step 5 – Database Failback

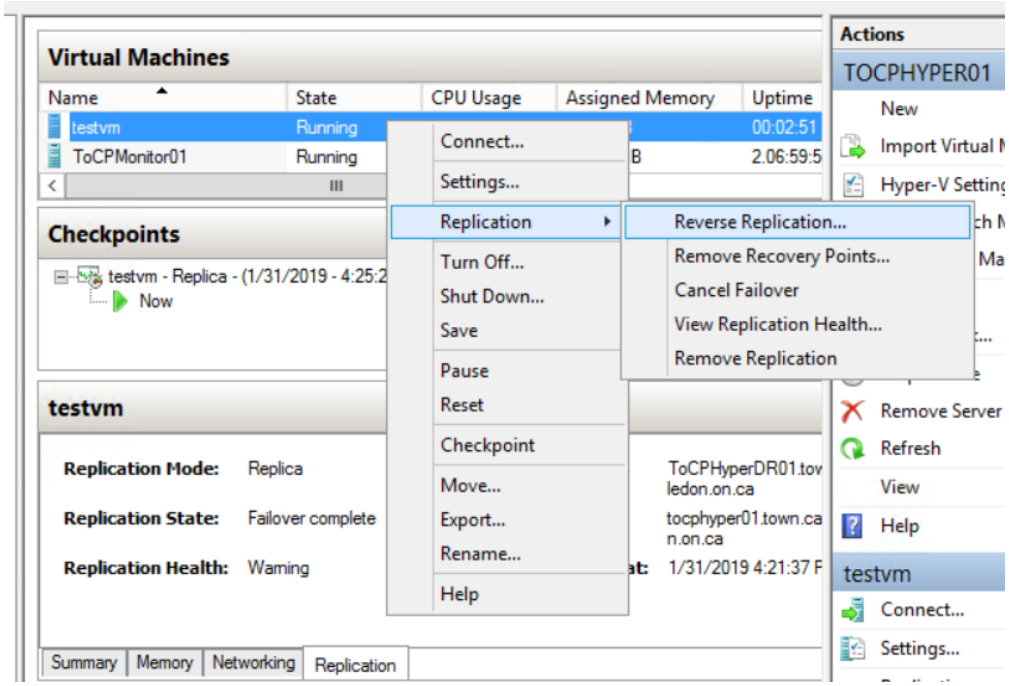
SQL

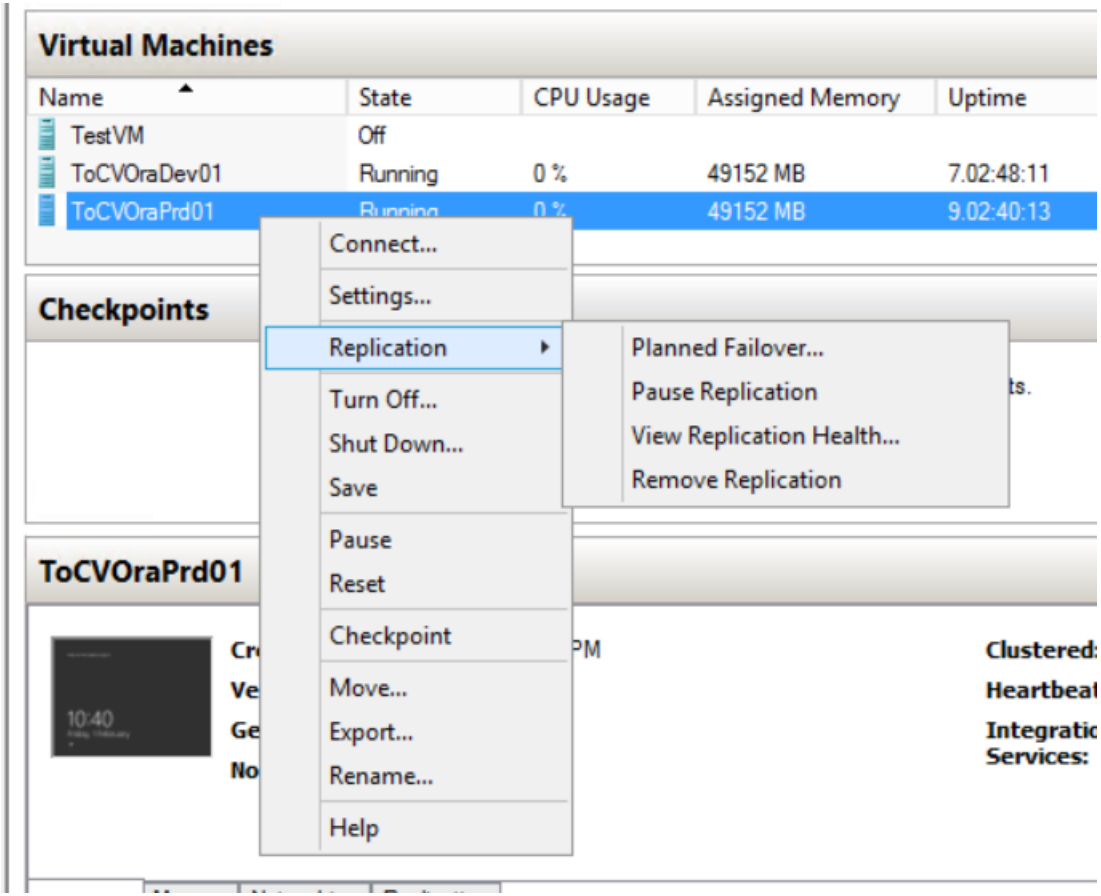
1. Shutdown all active cluster nodes utilizing FileShare witness at DR site	At the time of writing the following nodes rely on the production file share witness: - TOCVFILEDR01 - TOCFILEDR02 - TOCVSQLDR31 - TOCVSQLDR32

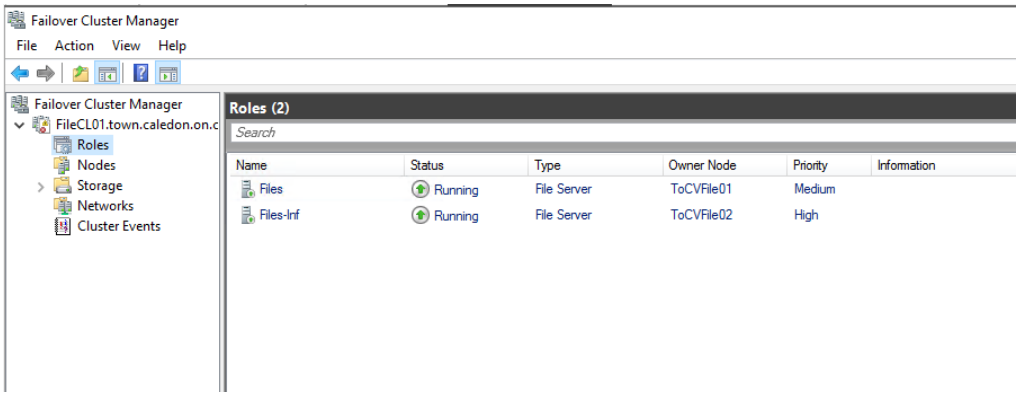
	- TOCVSQLDR22 - TOCVSQLDR21
2. From the left menu click on **File** under the Storage heading.	
3. Select the **FileShareWitness-Prod** File System and click the edit icon.	

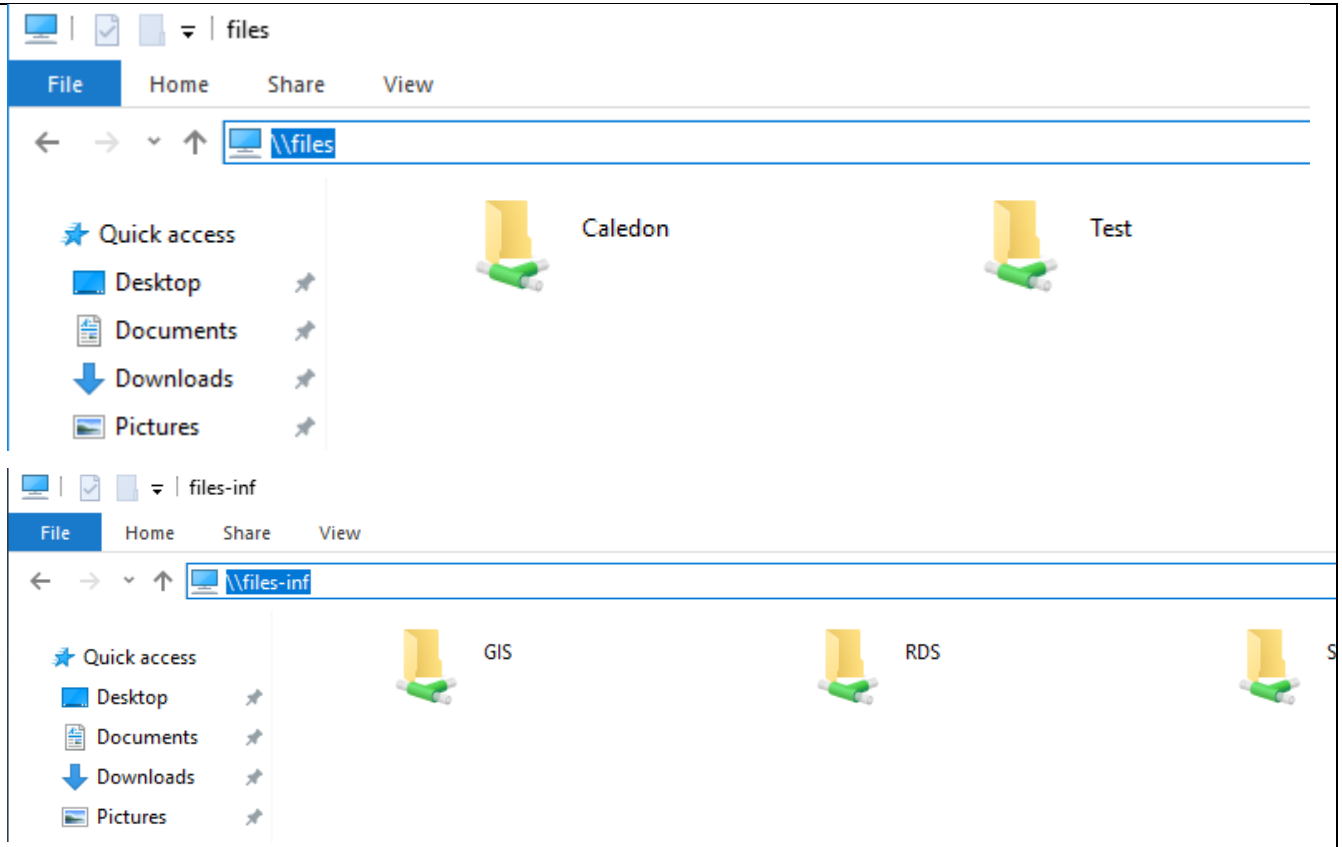
4. Click on the **Replication** tab and click **Failback** to initiate the process.	
5. The failback process can take some time as it will sync between DR site to Town Hall and then failback.	Note: the "**Filesharewitness-prod**" DNS record has a TTL of 5 mins so it can take that long for the file share witness to be accessible through the new IP address at Town Hall site.
6. Power on the servers in the SQL cluster at TH first and then DR site.	The following SQL server cluster nodes exist at Town Hall: - TOCVSQL31 - TOCVSQL32 - TOCVSQL21 - TOCVSQL22 The following SQL cluster nodes exist at DR site: - TOCVSQLDR31 - TOCVSQLDR32 - TOCVSQLDR22 - TOCVSQLDR21

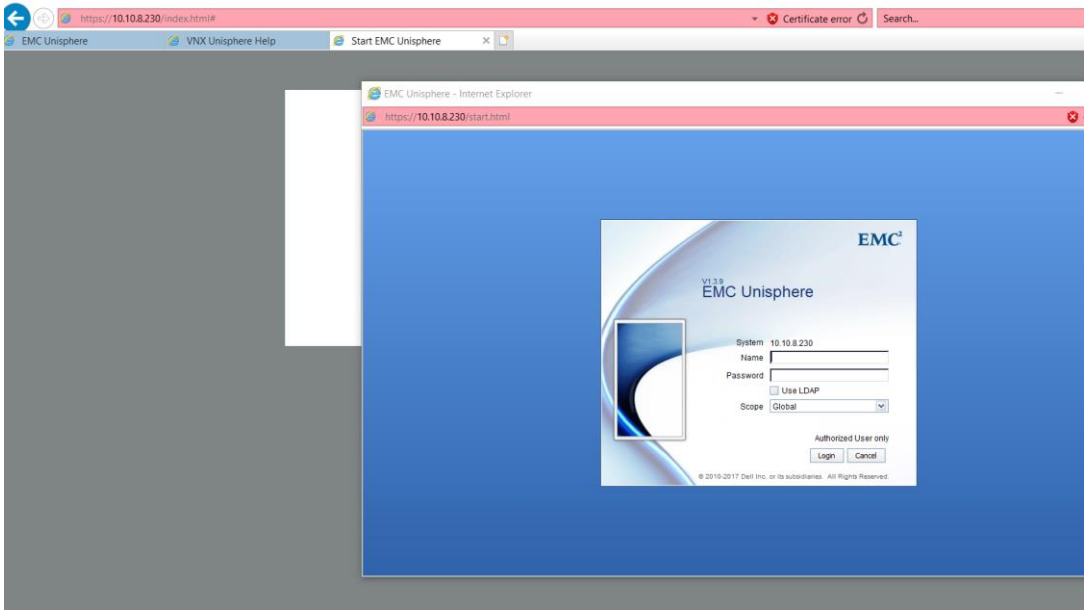
7. Connect to a SQL server cluster node and check health	Connect to the appropriate SQL server at the TH and launch Failover Cluster Manager to confirm health of the cluster.
8. Check health and connectivity.	Have a member of the database team check the health and connectivity to the databases residing on the cluster in question. Note: A reboot of all the nodes in the cluster maybe required
9. Repeat steps for other SQL clusters as needed.	
Oracle	
Oracle databases servers run in a clustered Hyper-V environment, with a host at each site (Towhall and DR site). In a Failback scenario, we will connect to the DR site host and first reverse replication of the VM (DR to Town Hall).	
1. RDP to the Hyper-V host at DR site	Hostname: TOCPHYPERDR01 IP: 10.2.23.14
2. Launch Hyper-V Manager	Click start and type ‘Hyper-V Manager’
3. Right click on **ToCVOraPrd01**	

4. Click on **Reverse Replicaiton** under **Replication**.	
5. Follow the wizard to configure replication from DR site to Town Hall	

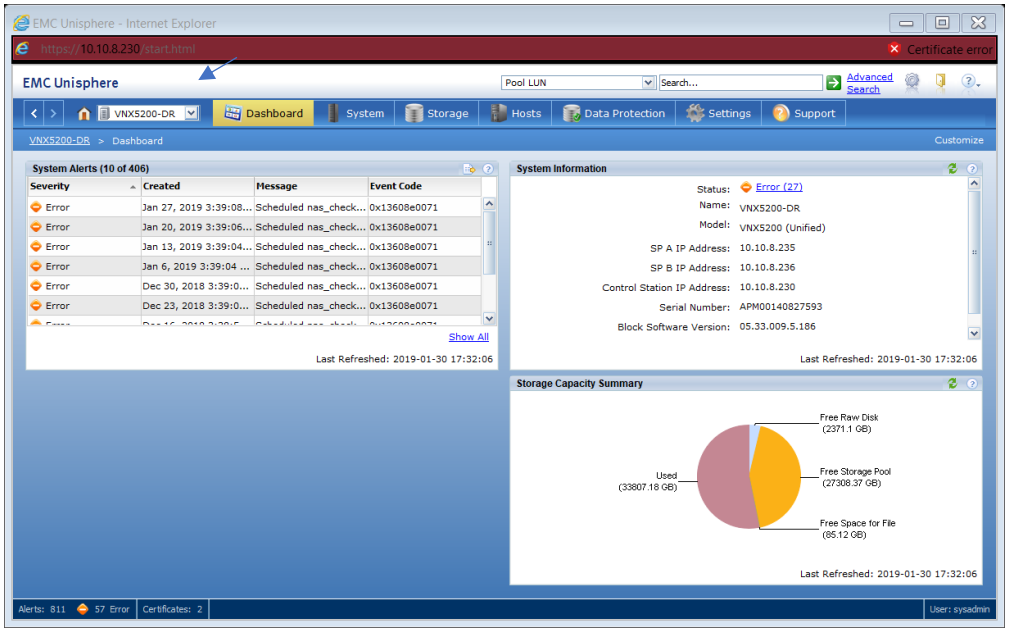
6. Once replication is setup – perform a **Planned Failover**.	
7. **ToCVOraPrd01** should now be running at Town Hall.	Confirm connectivity and health of the VM. Have the database team confirm the health and connecivity to the Oracle database.
Step 5 - File System	
Failback Windows File Server Cluster	

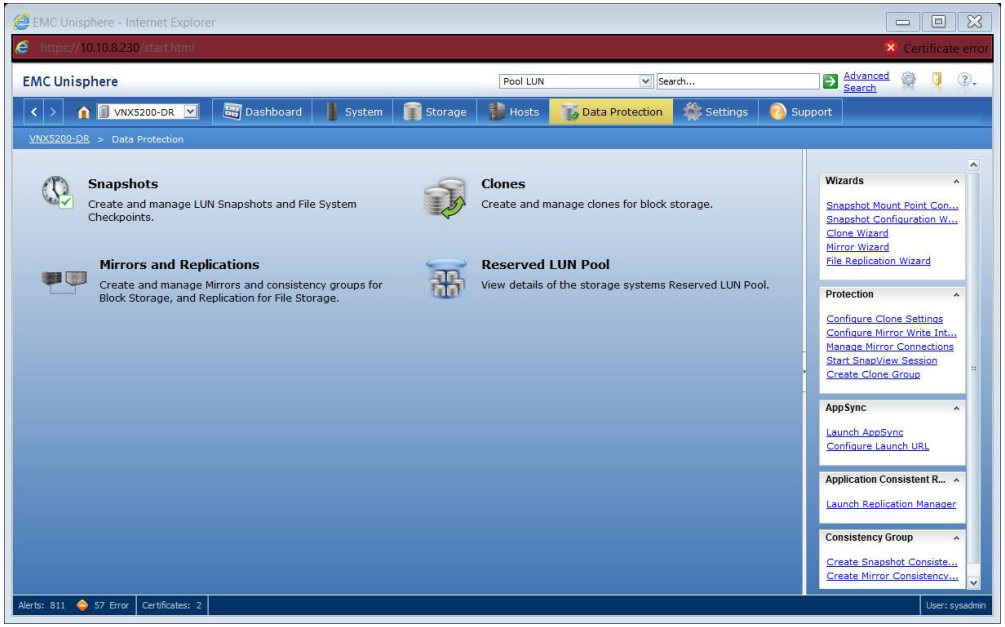
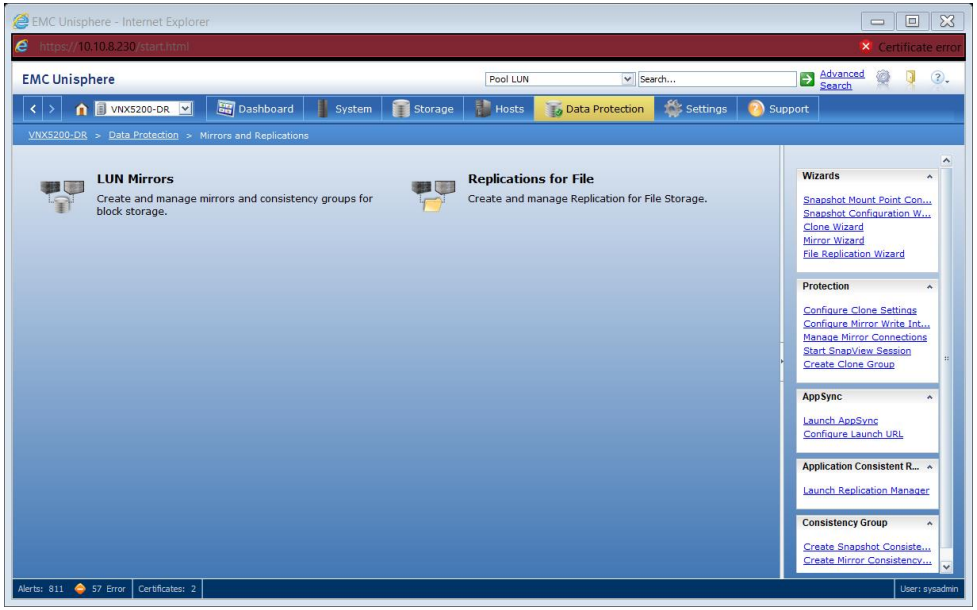
1. Ensure the cluster witness share has already been failed-back.	Ensure that steps 1 – 4 for SQL Database Recovery have already been completed and the '**FileShareWitness-Prod**' has already been failed back to Town Hall.
2. Power-on File server cluster nodes	Power-on file server cluster nodes at Town Hall and DR site: - TOCVFILE01 - TOCVFILE02 - TOCVFILEDR01 - TOCVFILEDR02
3. Connect to one of the nodes at TH and check health	Launch Failover Cluster Manager and confirm health of cluster and visibility of the file share witness.
4. Connect to one of the nodes at TH and check health	Launch Failover Cluster Manager and confirm health of cluster and visibility of the file share witness.
5. Expand the cluster object and click on Roles	
6. Confirm the roles are running	Confirm the '**Files**' and '**Files-inf**' roles are running on TOCVFILE01 and TOCVFILE02. If not, attempt to move the roles over to those nodes.

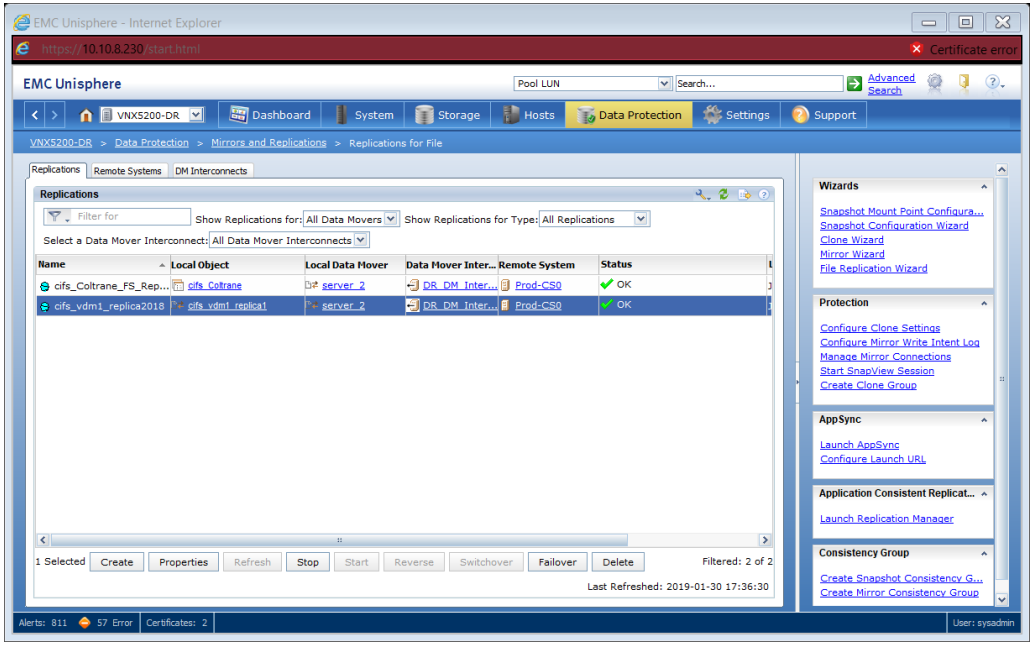
7. Confirm the file share(s) can be accessed through Windows Explorer.	
Steps to Failover FileShares on EMC VNX (Coltrane)	
1. Connect to EMC VNX SAN at DR site.	https://10.10.8.230 **Note**: The web application requires Java. You will likely need to add the IP address to trusted sites under Java Exception site list (from the control panel). Additionally, there are several security related pop-ups and warnings that must be accepted to get to the login screen.
2. Enter the credentials	Credentials can be found in PasswordState

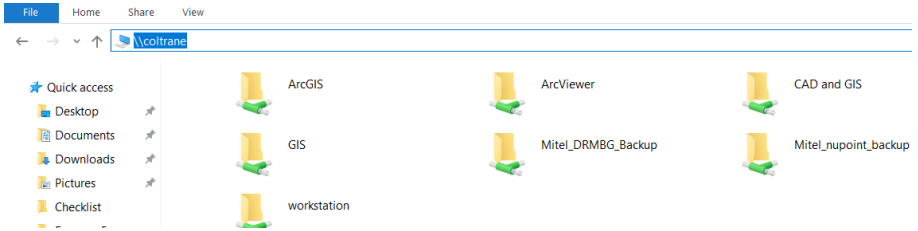
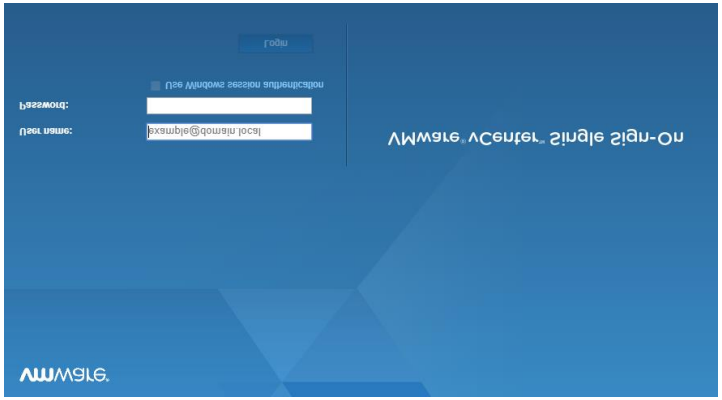


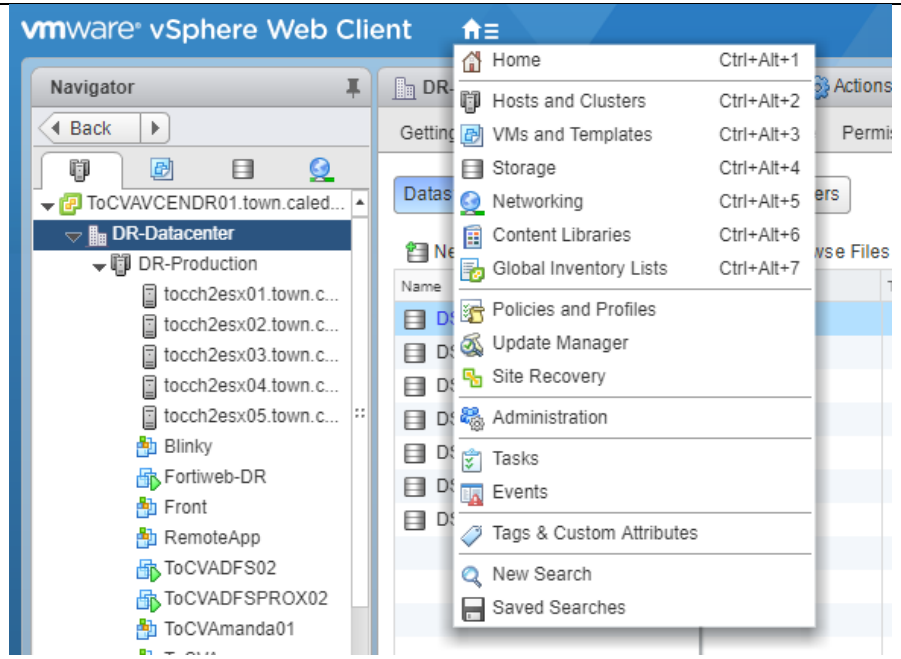
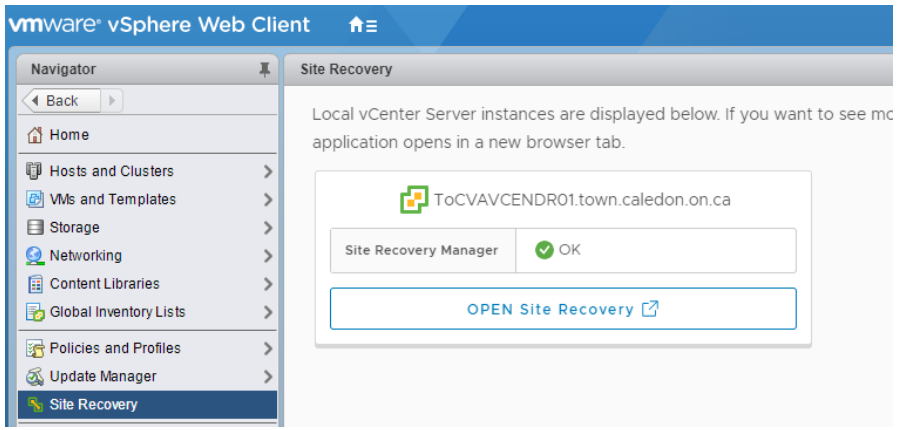
3. Select **VNX5200-DR** from the drop down menu.

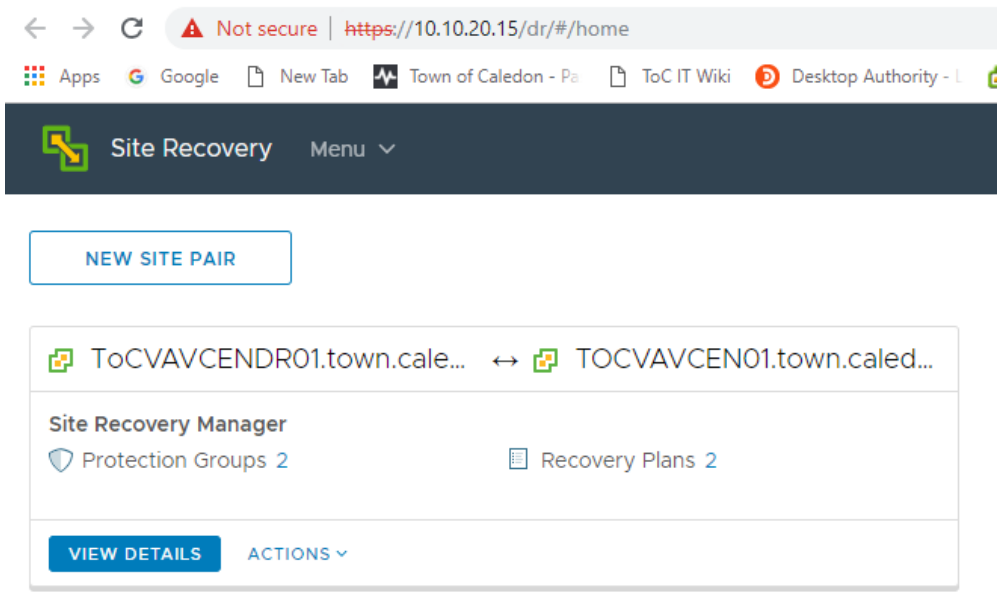
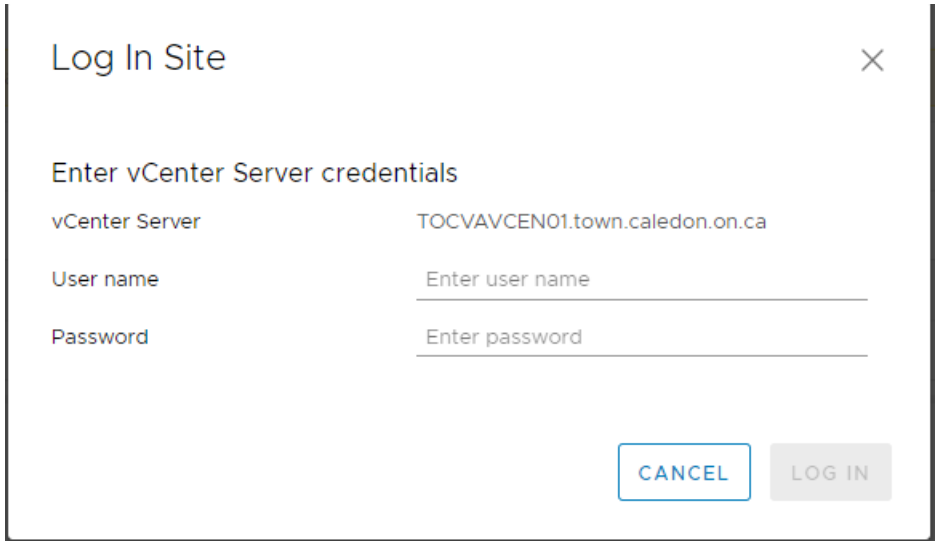


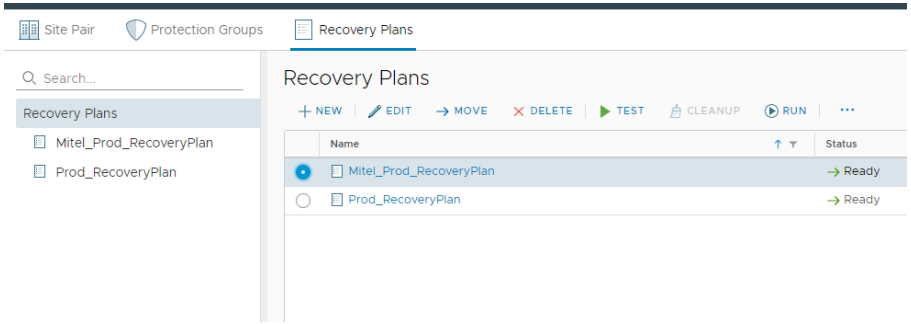
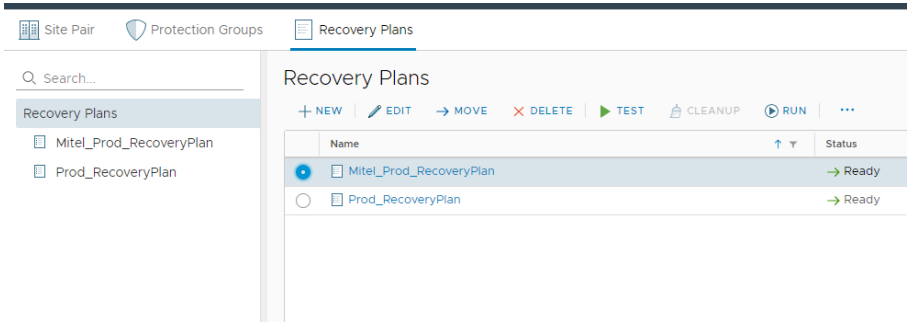
4. Click on **Data Protection** and then **Mirrors and Replications**	
5. Click on **Replications for File**	

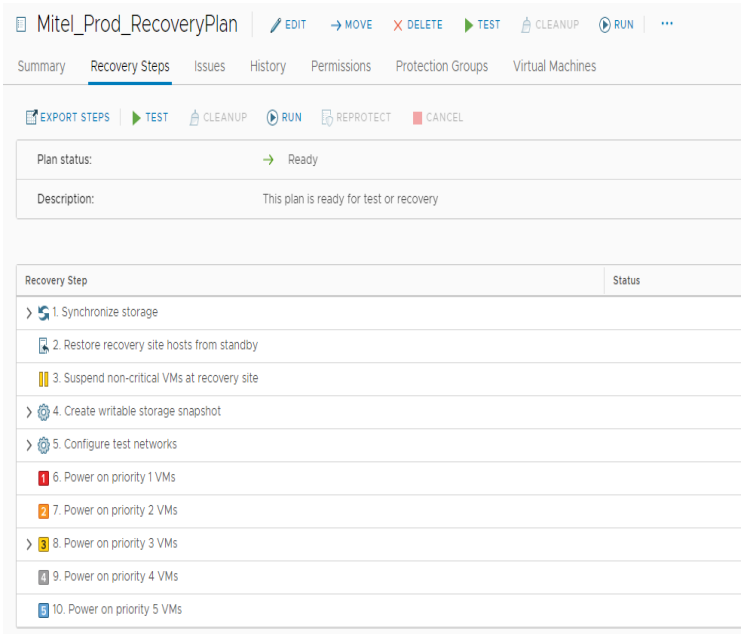
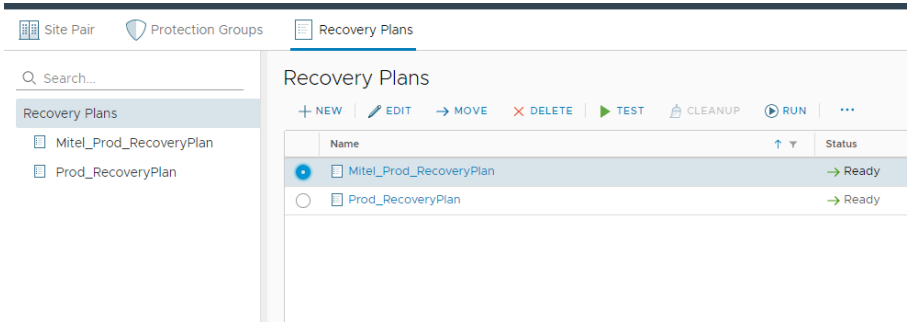
6. First select **cifs_dm1_replica2018** and then click on **Reverse** Once the data mover is failed back we can move the file system. Select: **cifs_Coltrane_FS_Replication** and then click **Reverse**	
7. Once replication is synced in the reverse direction. Select **cifs_dm1_replica2018** and click **Switchover.** Repeat for: **cifs_Coltrane_FS_Replication.**	
8. Once failed over DNS might need a manual update.	Go to TOCVDCDR01 and Open DNS and see if Coltrane now points to “172.20.0.232”. If not modify the A record for Coltrane as needed. **Note**: The TTL for Coltrane is set to 20 mins so it could take up to 20 mins before clients will get the updated DNS record.

9. Connect to the 'Coltrane' file share through Windows Explorer to confirm its accessible.	
Software-Defined Infrastructure Failback	
VMware (SRM) Failover Procedure	
1. Connect to DR site VM	
2. Open a web browser and browse to: https://tocvavcendr01 (10.10.20.11)	
3. Click on vSphere Web Client (Flash)	
4. Login with your domain admin account	

5. From the top left – click on the Home icon and select Site Recovery.	
6. Click on “Open Site Recovery”. This will launch a new browser window.	

7. Once the Site Recovery window opens. Click on “View Details”	
8. Enter your login information. Make sure to prefix with domain name. (Domain admin credentials)	

9. Click on the **Recovery Plans** tab and Select the associated recovery plan.	
10. Click **…** and then **Reprotect**	

11. Follow through the Wizard to enable re-protection. This will allow for failover from DR site to TownHall.	
12. Once reprotection steps are complete - We can click **Run** under **Recovery Plans**. This will fail back the SRM protected VMs from DR site to Town Hall.	
13. Repeat steps 9 to 12 for the other Protection group - "**Prod_ProtectionGroup**"	**Important**: Don't fail back '**Prod_ProtectionGroup**' until you have completed Step X (Database Fail back) in the restoration table. Initiating the fail back will power on the VMs at the Town Hall site which would require the Databases to be available first, in order for the application(s) to function.

VMs (Non-SRM)