Hyper-v Replciation – Test & Planned Failover

Test Failover

Below document prepared by taking the example "MOB-Rep" VM

Prerequisites:

 No prerequisites are required as this is a test failover and will not have any impact towards production

POA:

Test Failover activity need to execute from Replica Server

- 1. Login to Hyper-v Replica server and open either Hyper-v Manager or Failover console ->Select VM MOB-Rep
- Go to MOB-Rep VM Settings -> Expand Network Adapter ->Select Existing "VM_Vlan" network

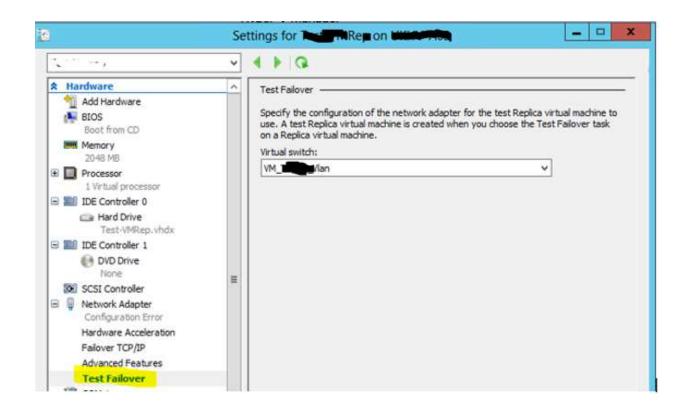
 Note: Best practice is to perform "Test Failover" in isolated network.
- 3. Go to Test Failover under Network adapter ->Select "VM_Traffic_Vlan"
- 4. Right click MOB-Rep VM-> Replication ->Test Failover ->Select latest recovery point
- 5. New VM will be created with **_test** i.e, "MOB-Rep_test" will be created
 - a. Note: Here, differential disks are created and linked to the virtual hard disks of the replica VMs, working similarly to a checkpoint (snapshot)
- 6. Start the VM manually "**MOB-Rep_test**" which is created newly
- 7. Ask respective teams to check functionality & data whether it is in synch with production or not
- 8. Upon testing ->Stop Test failover (MOB-Rep VM->right click ->Replication ->stop test failover)
- 9. Test VM will be deleted automatically.
- 10. Go back to MOB-Rep and revert the changes under Network settings
- 11. Make sure replication is working post activity.

Roll Back:

Stop the Test Failover at any time

Test Failover Procudure Screenshots for MOB-Rep VM

At Replica Site



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	Settings		Running Running	0%	8192 MB	05:22:07	
	Start			0%	16384 MB	05:23:11	
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napshot	Replication		Failover Test Failover Pause Replication View Replication Health Remove Replication				
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Select the VM (MOB-Rep) and click Test Failover

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Select latest recovery point

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New VM will be created with "MOB-Rep_Test"

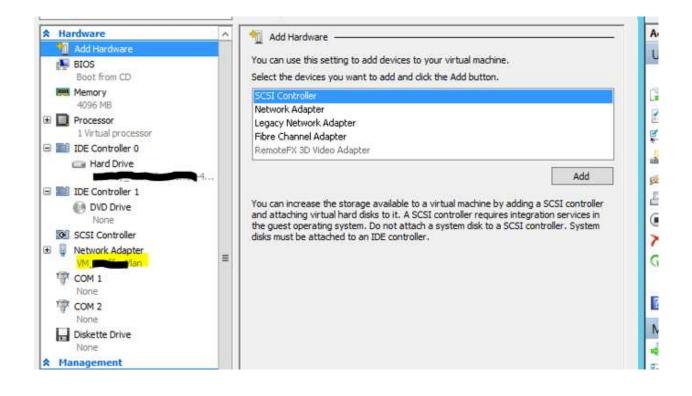
Below screenshot show the differencing disk created for "MOB-Rep_Test" VM

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	Hard Drive	Gener	al			
- 11	IDE Controller 1					
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17	COM 2	Cu	rrent File Size:	236 KB		
	None	Ma	ximum Disk Size:	80 GB		
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I	Name Mobility - Test				Insp	ect Parent
	Integration Services All services offered					Close
	Snapshot File Location					Close

Below screenshot provides the size of differencing disk before VM starts (Reference screenshot only)

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eds	MOBILITY MODEL	4.avhd	6/23/2016 11:10 AM	AVHD File	707 KB	
alaces	Mobilities and	62E.vhd	6/23/2016 11:10 AM	Hard Dok Image F	236 KB	

Before VM start, check the network if it is assigned or not



Start VM "MOB-Rep_Test"

Mot - Test	Running	0 %	4096 MB	00:00:00	Starting - Succeeded
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You can observe below options at replica VM (MOB-Rep) in replica site

Motor Test	Connect	4096 MB	00:02:05	
	Settings	2048 MB	05:25:32	
	Start	8192 MB	05:27:15	
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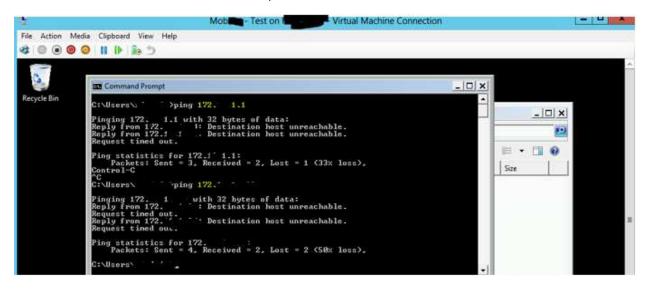


1 GB file created after booting (Reference screenshot only)

Shar	e View				
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5	MOB MOB	6/23/2016 11:13 AM	AVHD File	79,119 KB	
ices	Ca Moto Carlos C	6/23/2016 11:17 AM	Hard Disk Image F	1,038,484 KB	

Note:

In Test Failover activity, you will observe that Gateway will not be reachable as it is in Test Network and no isolated network was there to reach required destinations



Upon confirmation from respective teams, stop the failover by accessing the MOB-Rep VM

Mob Off Mob Off	Connect		-		
Distant Dist	Settings	2048 MB		05:42:25	
Rur Rur	Start	8192 MB 16384 MB	05:44:08		
	Snapshot Revert Move Export Rename Delete				
apshots					
5%	Replication	•	Failover		
Now	Help		Stop Test Fa	ilover	
sbility		Pause Replic View Replica Remove Rep	tion Health		

	V 1				nocenting energies (55%)
Mobile	Off				Stop Test Failover
	Running	0 %	2048 MB	05:42:49	

Stop Test Failover, will automatically deletes the newly created VM and the files.

Hyper-v Replication – Planned Failover

Planned Failover

Below procedure prepared by taking the example "MOB-REP-TEST" VM

Prerequisites:

- Ensure latest full VM backup for MOB-REP-TEST was taken by backup team Additional precautionary measure.
- Secure the local admin credentials as it will be helpful if VM is unable to login in domain post failover
- Capture IP Details of MOB-REP-TEST from primary site –Good to have
- Secure the DR subnet IP for MOB-REP-TEST as it needs to be injected before planned failover.
- Need to shut down the application/ database services by application team during DR Drill.

POA:

- If customer has requirement to inject DR IP in replica site, then Inject the Guest IP in replica VM by accessing VM settings-> Network(Expand)-> Failover TCP (Refer procedure screenshot's at the end of document)
 - Note that integration service should be latest to work this feature.
- 2. Get the confirmation from application team or delivery team whether application/ database service is brought down in MOB-REP-TEST or not -> upon confirmation, proceed to next step
- 3. At Replica site, make sure you assign the network card to VM as VM will be started automatically after planned failover
- 4. Login to Primary Hyper-v Server BHHV-A03 -> Open either Failover console or Hyper-v Manager
- 5. Shutdown the VM MOB-REP-TEST
- Select the VM "MOB-REP-TEST" and initiate "Planned Failover" action from right click-> Replication -> Planned Failover

2	Planned Failover	x					
1	Click Fail Over to start the planned failover process for Mobility. Any changes on the primary virtual machine that have not already been replicated will be replicated, and the Replica virtual machine will be prepared to start.						
	Prerequisite check]					
	Check that virtual machine is turned off.	Not Started					
1	Check configuration for allowing reverse replication.	Not Started					
	Send data that has not been replicated to Replica server.	Not Started					
	Fail over to Replica server.	Not Started					
-	Reverse the replication direction.	Not Started					
	Start the Replica virtual machine.	Not Started					
		Fail Over Cancel					

Note: In Windows 2012 R2 Replication, you will find additional option for Reverse replication as shown in below screenshot, whereas in windows 2012, Reverse replication will start automatically

Planned Failover						
Click Fail Over to start the planned failover process for 'Test-VMRep'. An machine that have not already been replicated will be replicated, and the prepared to start. Reverse the replication direction after failover. Start the Replica virtual machine after failover.						
Prerequisite check Check that virtual machine is turned off.	Not Started					
Check Replica virtual machine state.	Not Started					
Check configuration for allowing reverse replication.	Not Started					
Actions Send data that has not been replicated to Replica server.	Not Started					
Fail over to Replica server.	Not Started					
Reverse the replication direction.	Not Started					
Start the Replica virtual machine.	Not Started					
	Fail Over Cancel					

- 7. Revere replication will start and sometimes it get failed (in windows 2012) -> Ignore this error, as you can initiate reverse replication based on customer requirement.
- 8. If Reverse replication is required, follow the screenshots which are attached at the end of document. Proceed to Next step, if Reverse replication not required
- 9. After Planned Failover, VM will be started automatically, if not, start VM in replica site
- 10. Check the View Replication Health

Failback POST DR Activity:

- 1. Login to Primary Server
- 2. Select VM "MOB-REP-TEST" ->Right Click ->Replication -> Cancel Failover
 - Make sure Cancel Failover option should not appear at both sites as it take times to reflect the same
- 3. Cancel Failover will automatically shut down the replica VM by cancelling Failover (Wait till VM shutdown completely)
- 4. Login Primary Server and Start the VM(MOB-REP-TEST)
- 5. Replication will resume automatically, if not Resume the replication and make sure replication health is NORMAL upon starting of VM

Roll Back:

- Go to Replica Server and Cancel Failover at any time by Selecting VM MOB-REP-TEST->Right click Replication->Cancel Failover
- Make sure other side (replica) VM reflected the same i.e., Cancel Failover should not appear at both ends as sometime's reflecting may get delay.

If above procedure does not work and VM Is not in tact with current configuration or any other issue then proceed with below step..

• Restore the VM from backup by taking customer confirmation.

Planned Failover Procedure with Screen shots for the VM MOB-REP-TEST

As a Prerequisite part, make sure Replication is in synch with Replica site.

eplication		
Replication State:	Replication enabled	
Replication Mode:	Replica	
Current Primary Server:		
Current Replica Server:		L
Replication Health:	🕢 Normal	
Statistics for past 12 Hours 7 Minutes		
From time:	7/8/2016 9:00:02 PM	É .
To time:	7/9/2016 9:07:53 AM	ſ
Average size:	418 MB	
Maximum size:	7.63 GB	
Average latency:	0:00:06	
Errors encountered:	0	
Last synchronized at:	7/9/2016 9:06:22 AM	
est Fallover		
Test failover status:	Not Applicable	
ast test failover initiated at:	Not Applicable	

Login to Primary Hyper-v Server -> Open either Failover console or Hyper-v Manager

- 1. Shutdown the VM MOB-REP-TEST
- 2. Select the VM "MOB-REP-TEST" and initiate "Planned Failover" action from right click-> Replication -> Planned Failover

Note: Below screenshot is from Windows 2012. In Windows 2012R2, you will be additional option Reverse Replication.

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	State	CPU Usage	Assigned	Uptime	Status	Replication Health	1
	0f					Normal	
	Running	0%	4096 ME	13.11:54:45		Nomal	
	Buttering.	.0.5	ADSK MR	13.14-16-45		Normal	
	2		PI	anned Failo	/er	×	
1 - 1 230	that have start.	Over to start the plo a not already been n the Replica virtual r	splicated will be n	plicated, and the	. Any changes on the p Replica virtual machin	nimary virtual machine se will be prepared to	
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					Fail O	ver: Cancel	

Planned Failover	
Click Fail Over to start the planned failover process for BH-PM1. Any char that have not already been replicated will be replicated, and the Replica v start.	
Prerequisite check Check that virtual machine is turned off. Check configuration for allowing reverse replication.	Successful Successful
Actions Send data that has not been replicated to Replica server. Fail over to Replica server. Reverse the replication direction.	Successful In progress Not Started
	Fail Over Cancel

Below Screenshot is from Windows 2012 R2(Additional option for Reverse Replica)

Planned Failover				
Click Fail Over to start the planned failover process for 'Test-VMRep'. machine that have not already been replicated will be replicated, and t prepared to start.				
 Reverse the replication direction after failover. Start the Replica virtual machine after failover. 				
Prerequisite check				
Oheck that virtual machine is turned off.	Successful			
Check Replica virtual machine state.	Successful			
Check configuration for allowing reverse replication.	Successful			
Actions				
Send data that has not been replicated to Replica server. Successful				
V Fail over to Replica server. Successful				
Reverse the replication direction. Successful				
Start the Replica virtual machine.	In progress (10%)			
	Fail Over Cancel			

	Planned Failover	
	art the planned failover process for 'Test-VMRep' not already been replicated will be replicated, and Planned Failover	
Reverse the F Start the F Prerequisit Check tha Check Re	Failover completed successful Virtual machine on With Started successfully.	has been
Check co Actions		Close
🖉 Send data tha	t has not been replicated to Replica server.	Successiu
🛛 🕑 Fail over to Re	eplica server.	Successful
🛛 🕜 Reverse the re	eplication direction.	Successful
Start the Repli	ca virtual machine.	Successful
L		Fail Over Cancel

Note:

- Reverse Replication will start automatically or can be initiated manually from Replica Site. Revere Replication steps attached at the end of document.
- Revere Replication is based on customer requirement, now we are proceeding without Reverse Replication.
- DO NOT Check Reverse Failover if your servers are configured with Extended Replica.

Name	State *	COULD ALL ALL ALL ALL ALL ALL ALL ALL ALL A		
		CPU Usage Assigned	Memory Uptime Status	Replication
-	Running Running	Connect	000102 1.07/03/56 1.07/03/46	Not Applicable Not Applicable
	Running	Replication +	Reverse Replication	Not Applicate
Shad	OF OF OF OF	Turn Off Shut Down Save	Remove Recovery Points Cancel Failover View Replication Health	Net Applicati Net Applicati Net Applicati Net Applicati
· · · ·	or	Pause Reset	Remove Replication	Normal
		Checkpoint		
()		Move Export	c.	

After Failover complete, below replication health screenshot can be observed

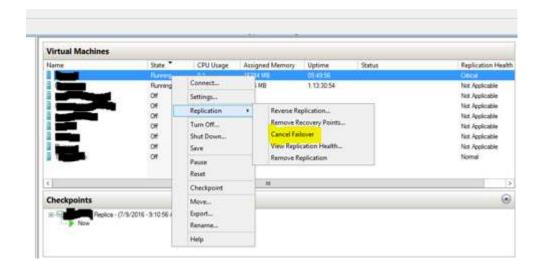
Replication State:	Failover complete
Replication Mode:	Replica
Current Primary Server:	
Current Replica Server:	
Replication Health:	Waming
	Choose Reverse Replication to resume replication for the virtual machine
Statistics for past 12 Hours 18 Minutes	
From time:	7/8/2016 9:00:02 PM
To time:	7/9/2016 9:18:17 AM
Average size:	415 MB
Maximum size:	7.63 GB
Average latency:	0:00:06
Errors encountered:	0
Last synchronized at:	7/9/2016 9:10:52 AM
fest Fallover	
Test failover status:	Not Applicable
Last test failover initiated at:	Not Applicable

POST DR Activity

Login to Replica Server

Select VM"MOB-REP-TEST" ->Right Click ->Replication -> Cancel Failover

• Make sure Cancel Failover option should not appear at both sites as it take times to reflect the same



rtual Machines				1.00000000	1920/00	
hund	State *	CPU Usage	Assigned Memory	Uptime	Status	Replication Health
	Running	0.%	16384 MB	05:50:37		Otical
	Running	0%	4896 MB	1.13.31.34		Not Applicable
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	OF OF OF	12				Nut Applicable
	Off		Cancel Fail	over	X	Not Applicable
	Off	and the			Ashering and a	Not Applicable
			you sure you wa		ailover	Not Applicable
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			celing failover will result have occurred in the R			
			allover operation starts		Chine and	3
heckpoints		2016				0
Fill Parties Replica	(7/9/2016 - 9 10:56 AM)			Yes	No	
> Now				///		

Cancel Failover will automatically shut down the replica VM by cancelling Failover (Wait till VM shutdown completely)

Login primary Site and Start the VM (MOB-REP-TEST)

Replication will resumed automatically post cancel failover, if not Resume the replication and make sure replication health is NORMAL upon starting of VM

How to Inject Guest IP at replica site

Go to Replica Hyper-v server -> Access the VM settings and expand Network

	¥	4 1 9	
Hardware Add Hardware Add Hardware BIOS Boot from CD Memory 4096 MB Processor 1 Virtual processor 1 Virtual processor	~	machine uses when started at use a dynamically assigned IP Regardless of the fallover typ primary server and Replica se on must use the same version IPv4 TCP/IP settings	
Hard Drive		Use the following 1994 a	ddress scheme for the virtual machine:
HD		IPv4 Address*:	172.
🗄 🏬 IDE Controller 1		Subnet mask*:	255.255.255.0
Mone None		Default gateway:	172.
SCSI Controller		Preferred DNS server:	172.
Retwork Adapter Not connected Hardware Acceleration		Alternate DNS server:	172.
Failover TCP/IP		IPv6 TCP/IP settings	
Advanced Features Test Fallover		Use the following IPv6 a	ddress scheme for the virtual machine:
TOM 1		(Pv6 Address*)	
None		Subnet prefix length *:	
COM 2			
Diskette Drive		Default gateway:	
None		Preferred DNS servers	
A Hanagement		Alternate ONS perver:	1
I] Name	1.1	a sub-sub-sub-sub-sub-sub-sub-sub-sub-sub-	

Note:

> Inject the Guest IP at replica VM before planned Failover

- There may be scenarios, post failover replica VM may not able to bind this injected guest IP and this issue mostly due to outdated integration versions.
 - For successful IP injection, integration version should be latest else this feature may not work.

Reverse failover Procedure

There is no replication taking place from Primary Server to Replica Server after performing planned failover, The virtual machine continues to run on Replica Server. If you need to change the replication order (e.g. from Replica Server to Primary Server), you must use "Reverse Replicate" action on Right Click context menu of the Replica virtual Machine.

Note:

Primary Server must be configured to accept the incoming replication and Hyper-V Replica firewall rules must also be enabled.

Initiate Reverse failover from replica VM, subsequent wizards will be prompted-

Note: Screenshots were not captured as it is currently not executed in this test, will update the document once it is done

Ref:

https://blogs.technet.microsoft.com/virtualization/2012/07/31/types-of-failover-operations-in-hyper-v-replicapart-ii-planned-failover/

https://blogs.technet.microsoft.com/virtualization/2012/07/25/types-of-failover-operations-in-hyper-v-replica-part-i-test-failover/

https://blogs.technet.microsoft.com/virtualization/2012/08/08/types-of-failover-operations-in-hyper-v-replicapart-iii-unplanned-failover/