

Hyper-V Windows 8 Server Failover Clustering mit Live Migration - Part I

Part I beschreibt die Einrichtung des Windows Server 8 Cluster mit Live Migration
Part II beschreibt die Integration in SCVMM 2012 (welche mir bisher noch nicht gelungen ist ☹)

Testumgebung:

- Zwei physikalische Windows 8 Server (Developer Preview) mit jeweils 16 GB RAM, 2 SATA Disk, 2 NIC
- Ein virtueller Windows 8 Server als DC
- Ein virtueller Windows 2008 R2 Server mit SCVMM 2012 Beta
- QNAP TS-410 Storage mit iSCSI Target

Quellen zur Grundkonfiguration:

<http://www.it-training-grote.de/download/Hyper-v-livemig-1.pdf>

<http://www.it-training-grote.de/download/Hyper-v-livemig-2.pdf>

<http://www.it-training-grote.de/download/SCVMM-SCOM-PRO.pdf>

<http://www.it-training-grote.de/download/SCVMM2012-Beta.pdf>

<http://www.it-training-grote.de/download/scvmm-2008.pdf>

iSCSI Target konfigurieren

The screenshot shows the 'iSCSI Quick Configuration Wizard' window. The title bar reads 'iSCSI Quick Configuration Wizard'. The main content area is titled 'Create New iSCSI Target'. On the left, there is a logo for 'QNAP TURBO NAS'. The configuration fields are as follows:

- iSCSI Target Profile
- Target Name:
- iSCSI Target IQN:
- Target Alias:
- CRC/Checksum (optional):
 - Data Digest
 - Header Digest

At the bottom, it indicates 'Step 2 of 6' and has three buttons: 'BACK', 'NEXT', and 'CANCEL'.

Keine Authentifizierung

The screenshot shows the 'iSCSI Quick Configuration Wizard' window. The title bar reads 'iSCSI Quick Configuration Wizard'. The main content area is titled 'CHAP Authentication Settings'. On the left, there is a logo for 'QNAP TURBO NAS'. The configuration options are:

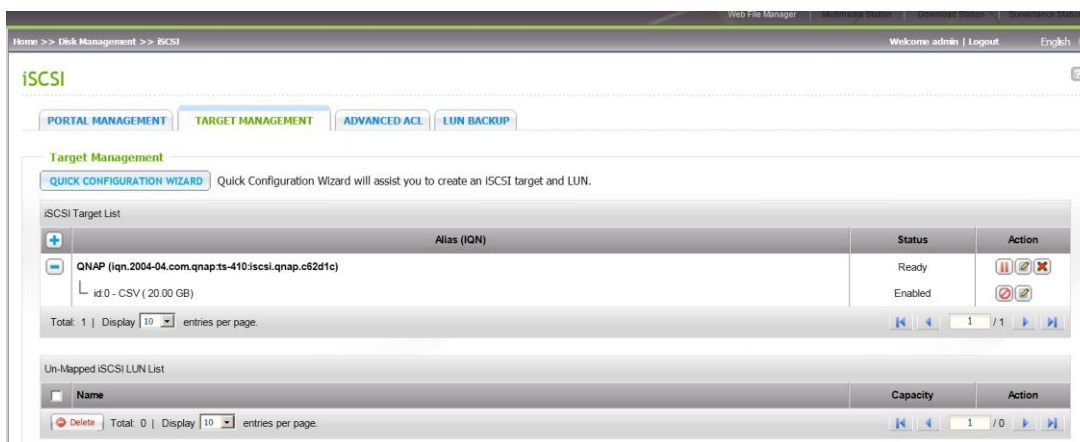
- Use CHAP authentication
 - User Name:
 - Password:
 - Re-enter Password:
- Mutual CHAP
 - User Name:
 - Password:
 - Re-enter Password:

At the bottom, it indicates 'Step 3 of 6' and has three buttons: 'BACK', 'NEXT', and 'CANCEL'.

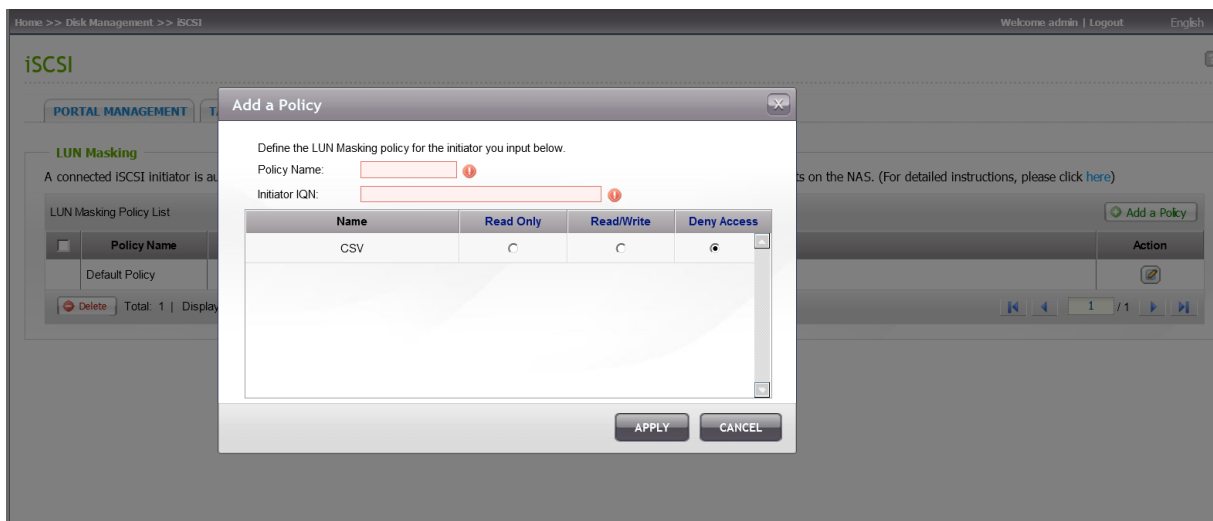
Neue iSCSI LUN fuer CSV und eine LUN fuer das Cluster Quorum



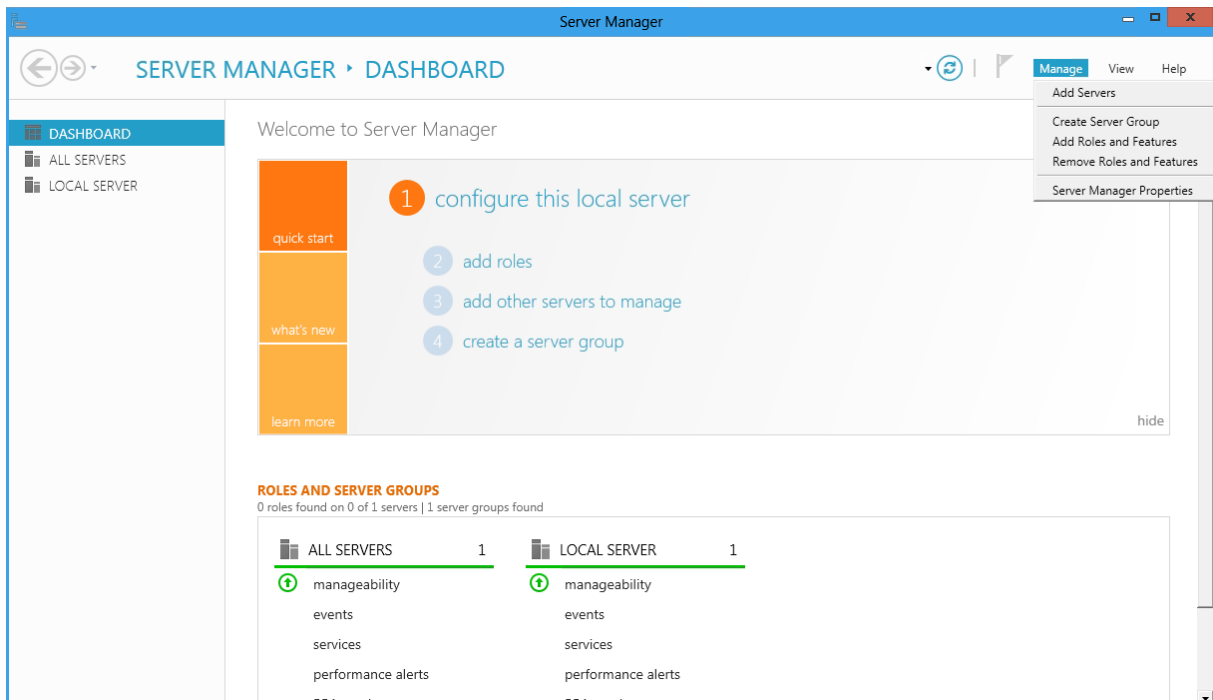
Fertiges Target



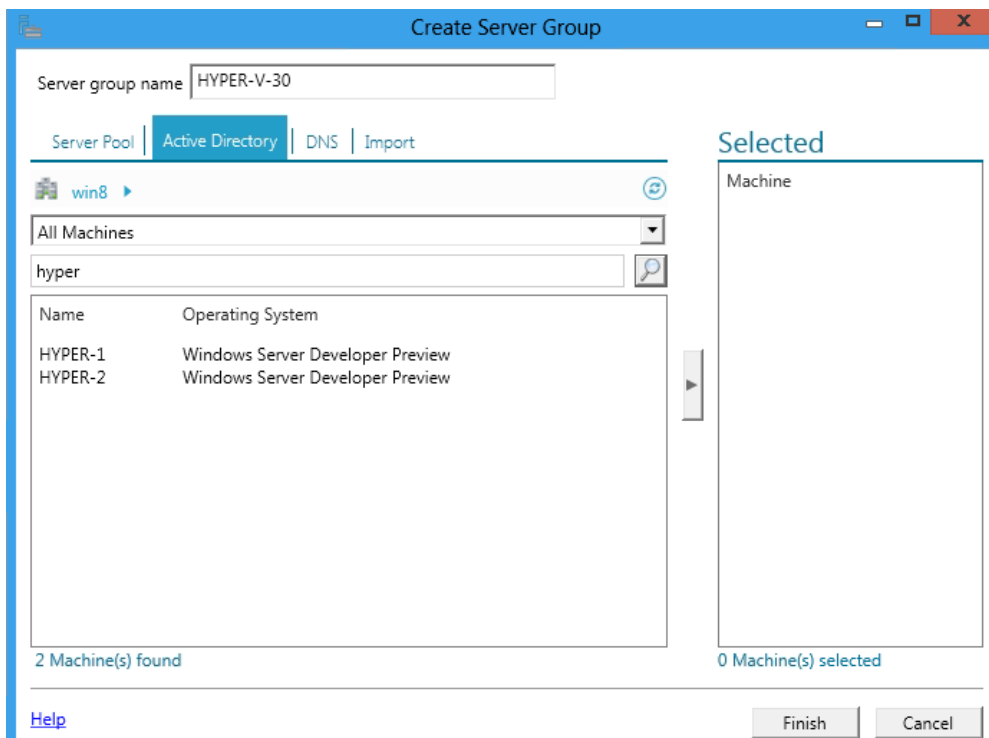
Kein LUN Masking



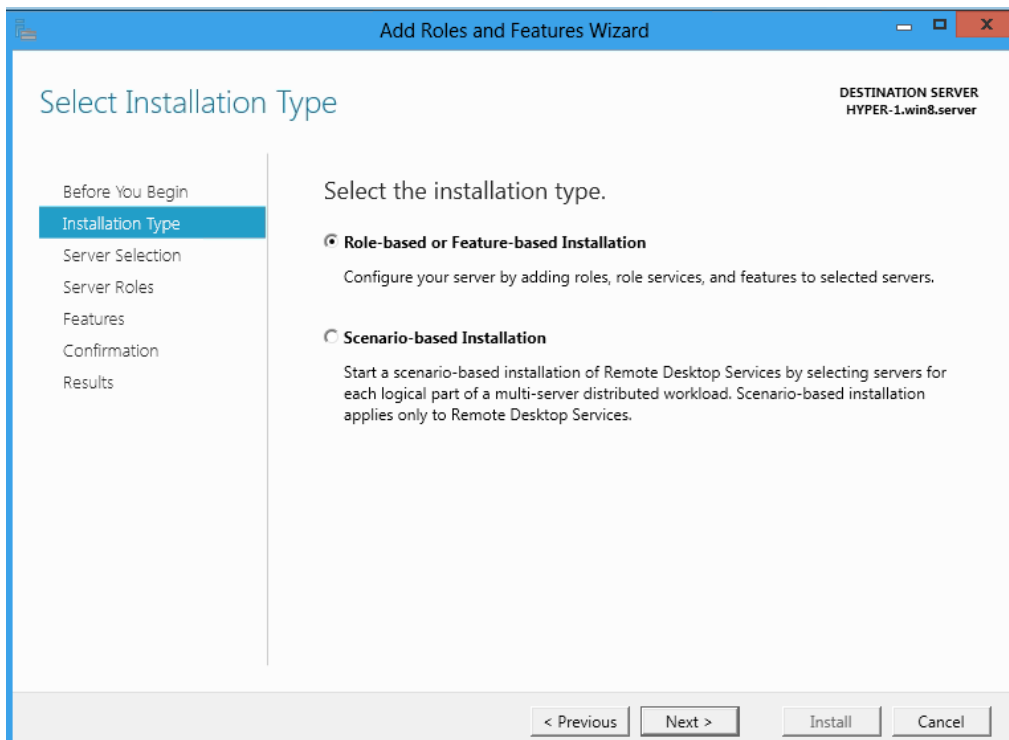
Nach der Grundkonfiguration der Windows 8 Server die Hyper-V Rolle hinzufuegen



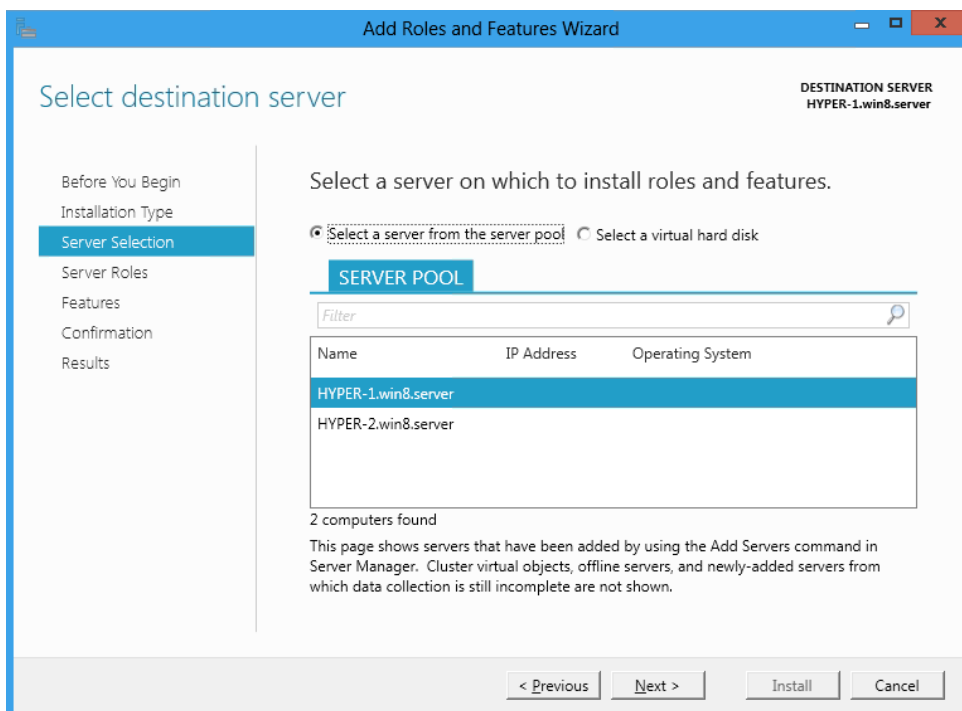
In Windows Server 8 koennen jetzt Servergruppen erstellt werden, um mehrere Systeme gleich konfigurieren zu koennen



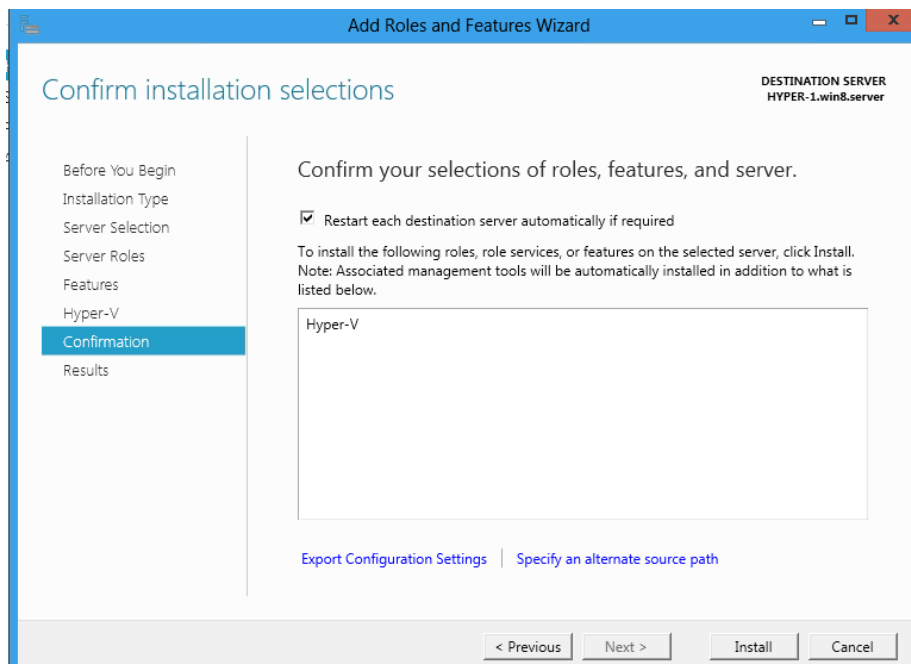
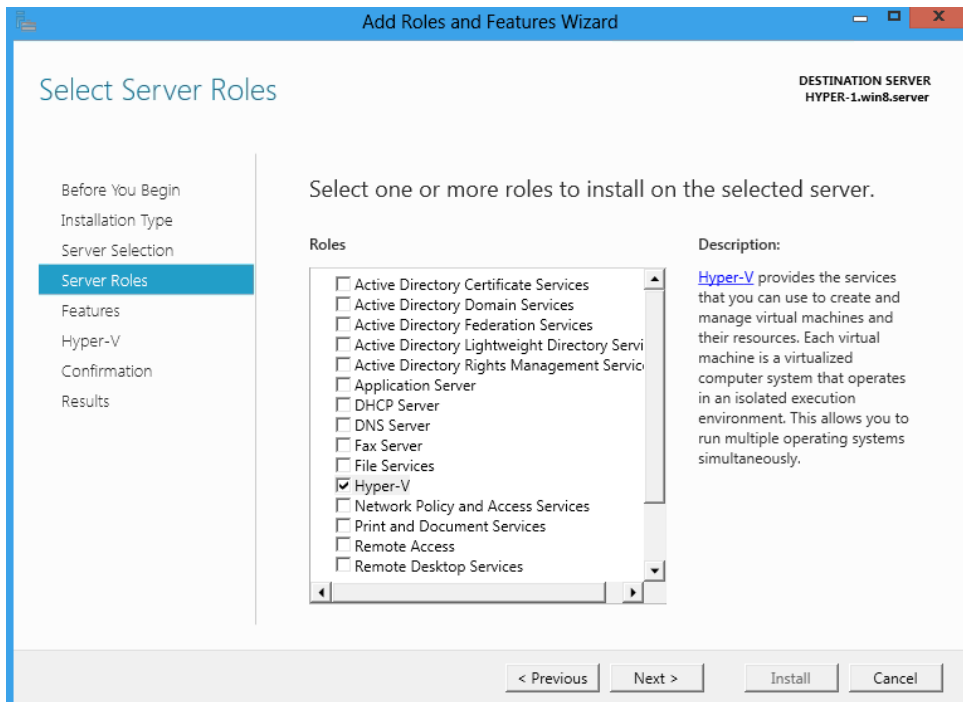
Rollenbasierte Installation



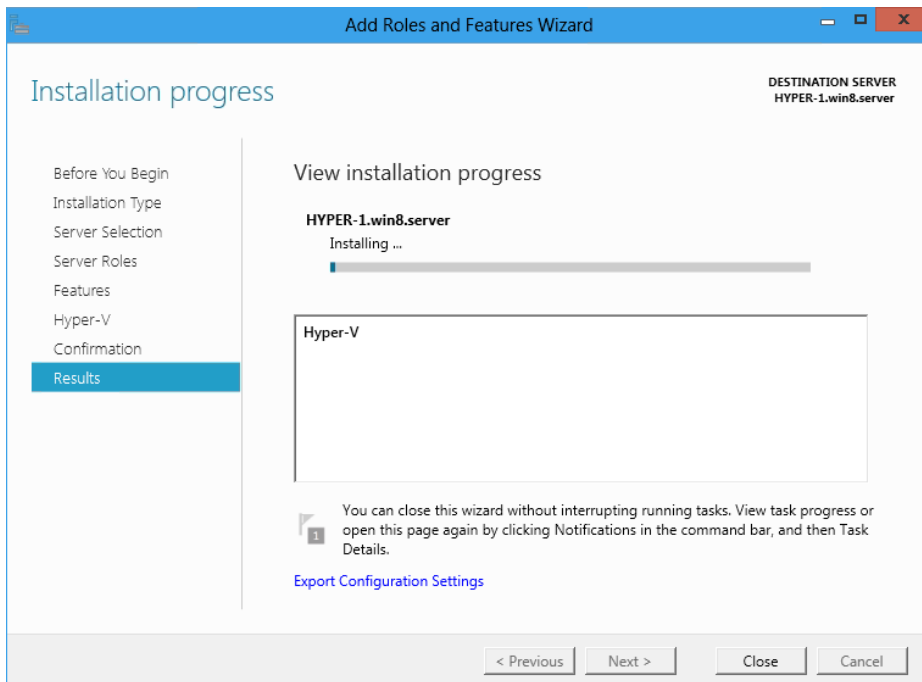
Server auswählen



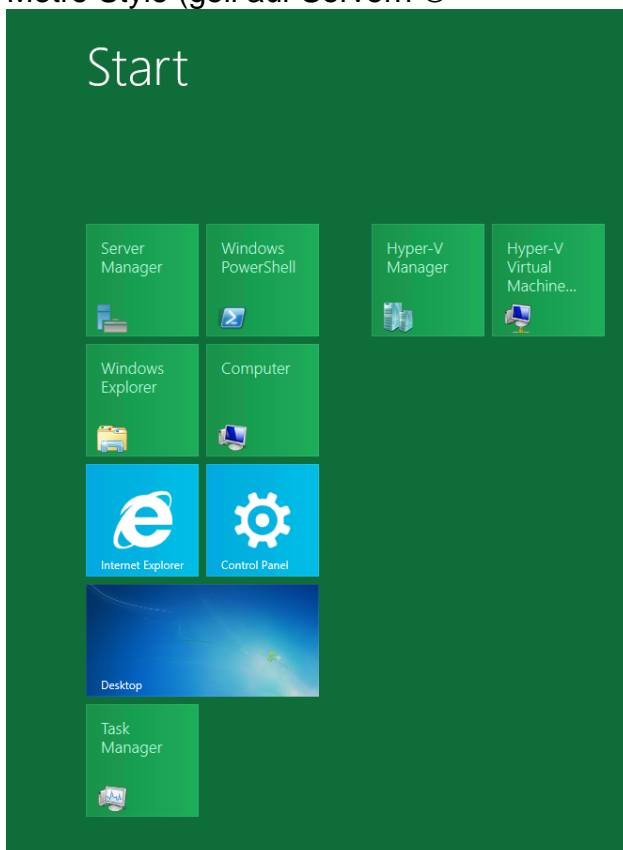
Hyper-V Rolle auswaehlen



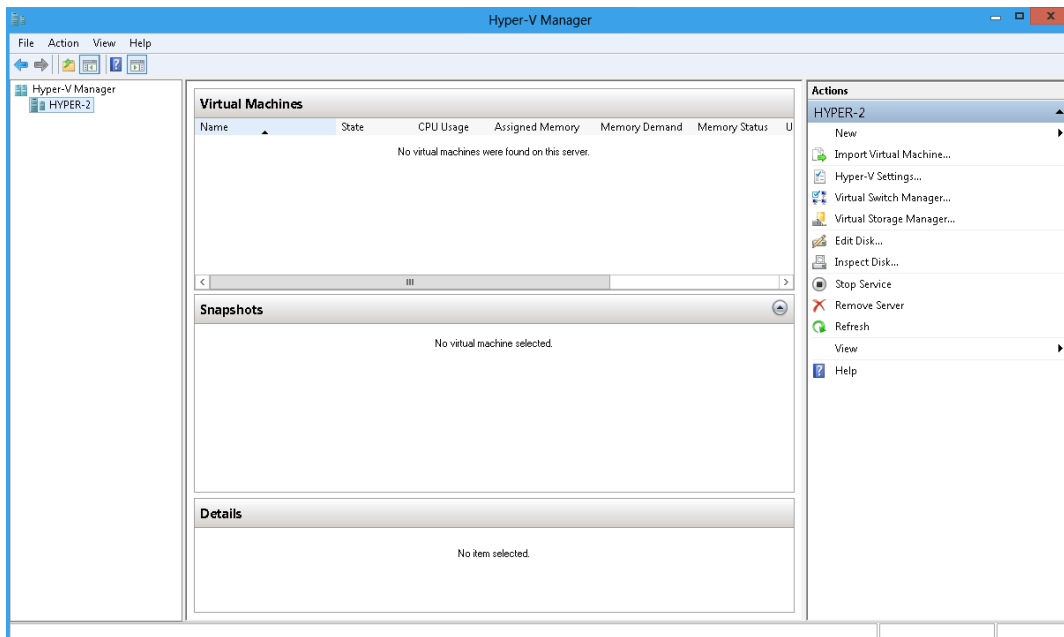
Hyper Geschwindigkeit



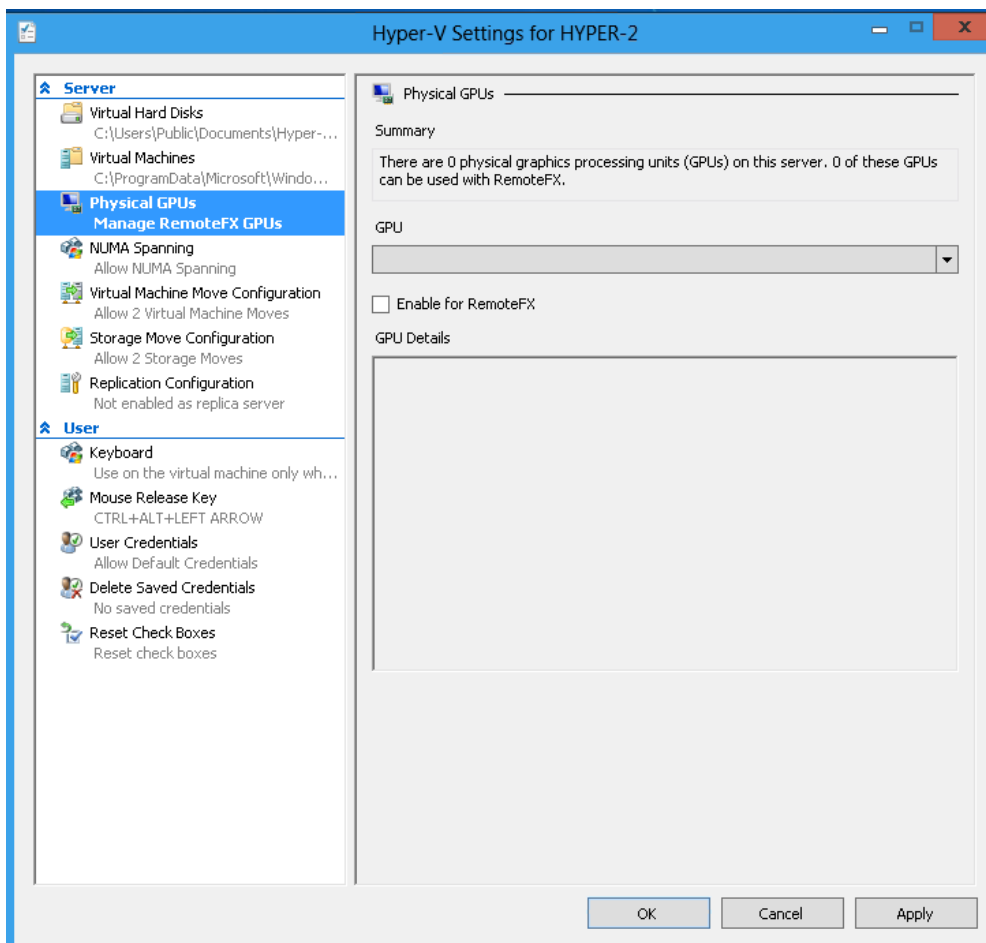
Metro Style (geil auf Servern 😊)



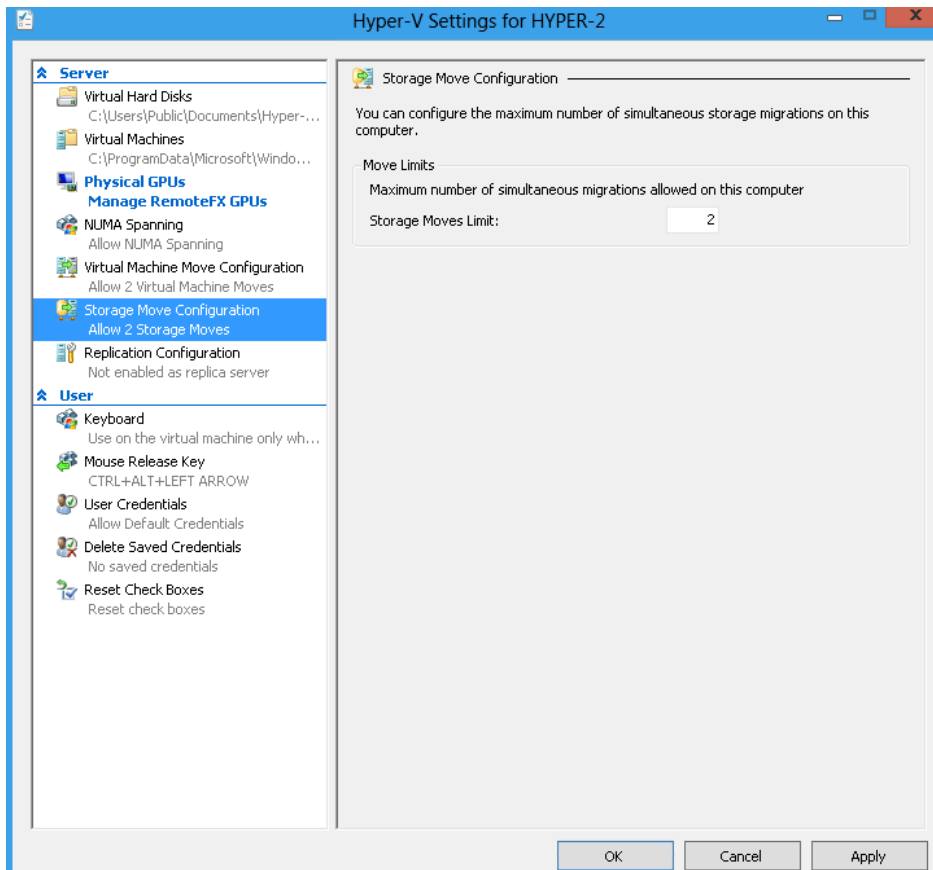
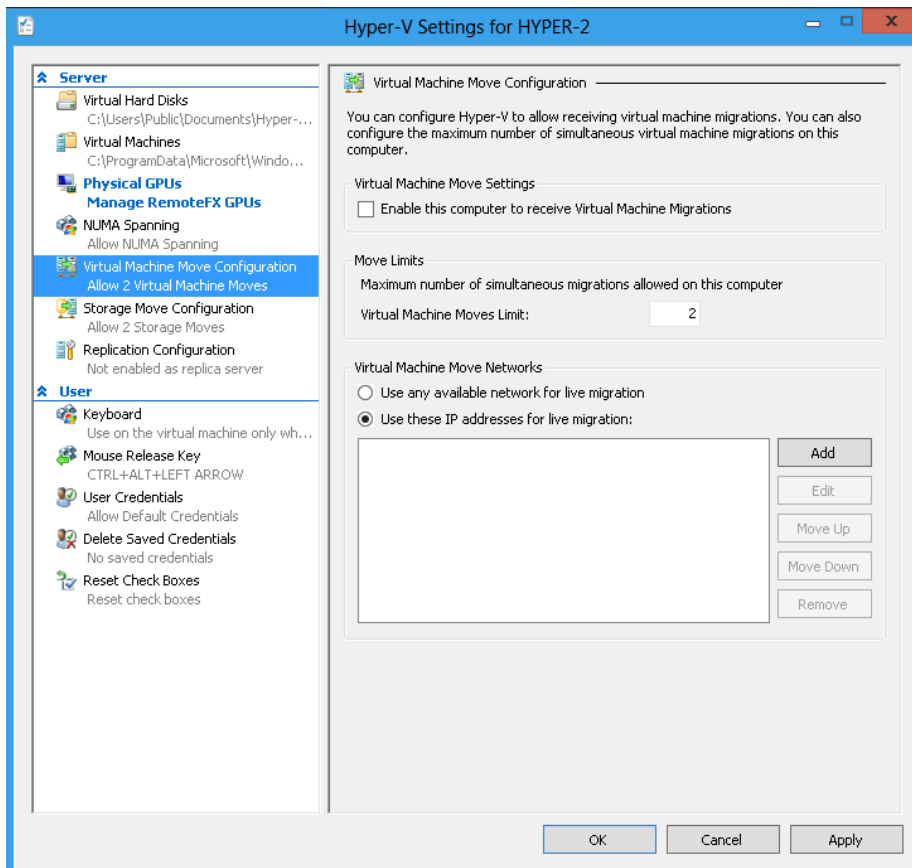
Hyper-V Manager

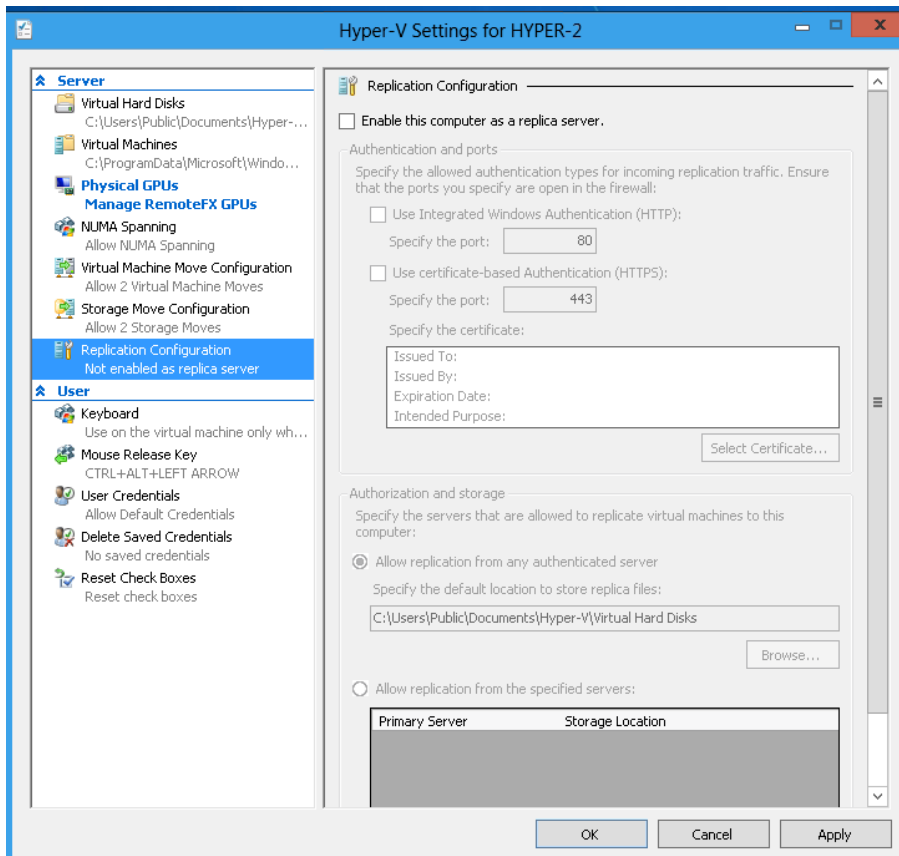


Ein paar kleine / feine und auch groessere Neuerungen!

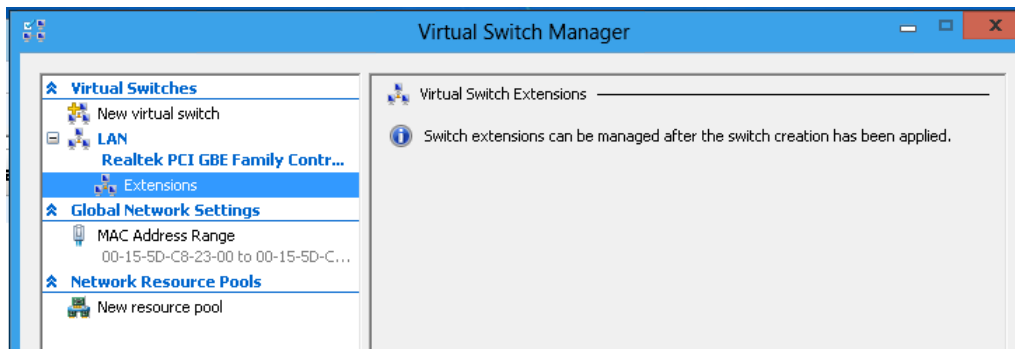
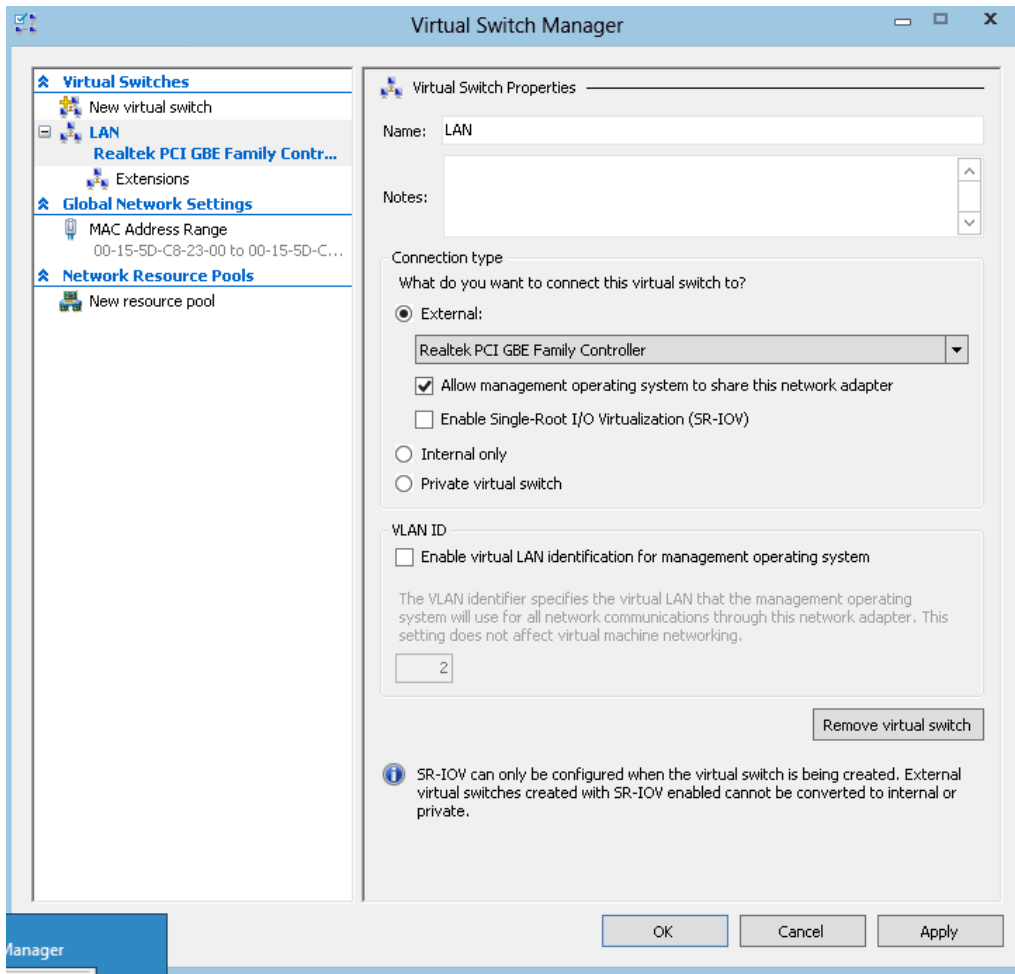


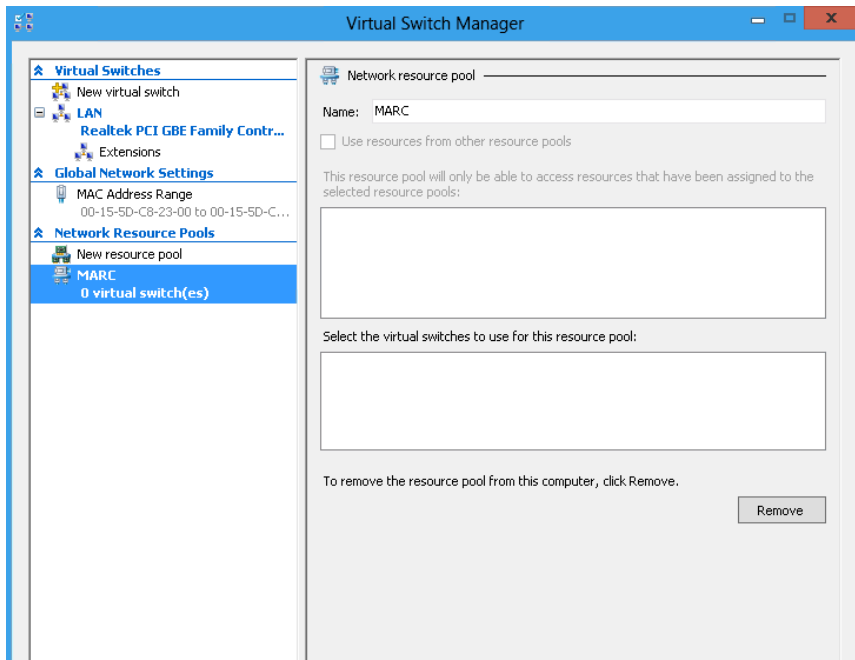
Storage Move – dazu mehr spaeter!



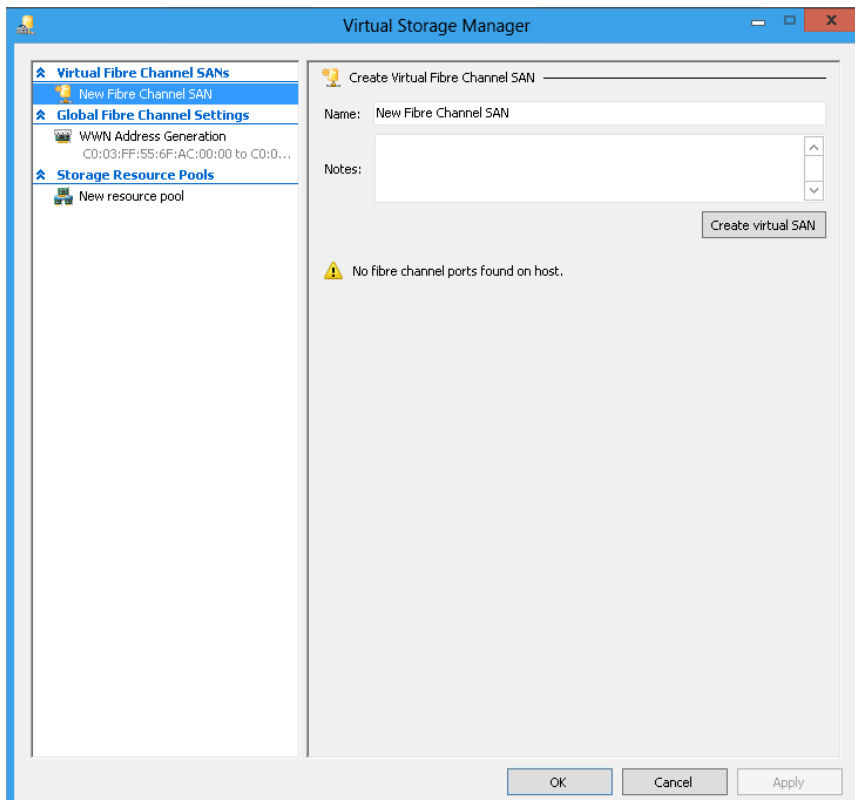


Im Bereich Netzwerk viele der angekuendigten Neuerungen wie SR-IOV, Switch Extensibility usw. Die bisherigen Whitepaper und Videos, welche ich zu dem Thema bisher verschlungen habe, lassen viel vermuten!

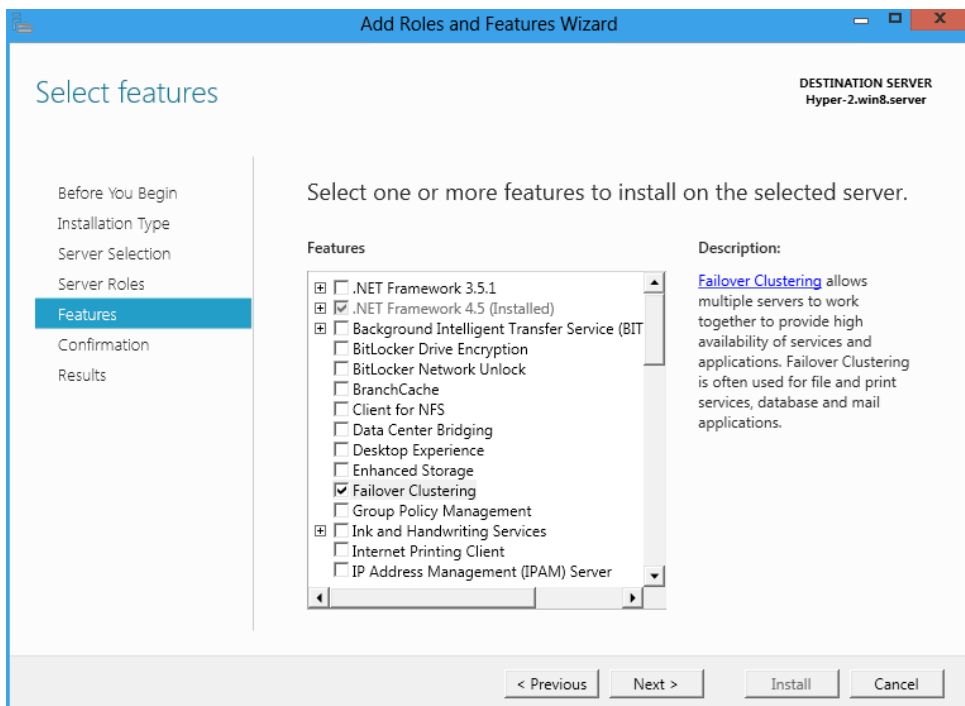




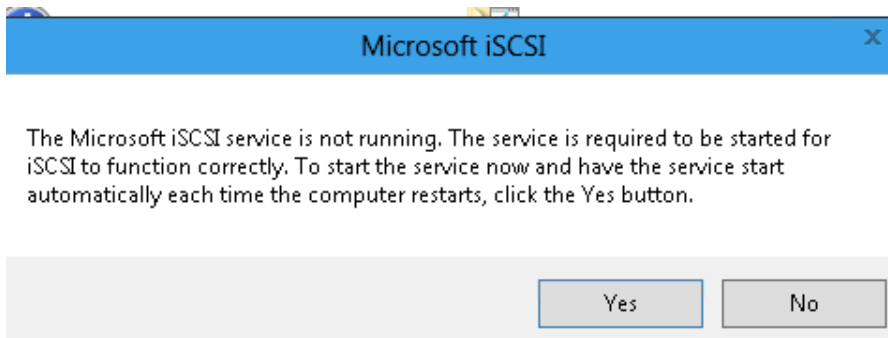
Virtual Storage Manager / Virtual FC 😊



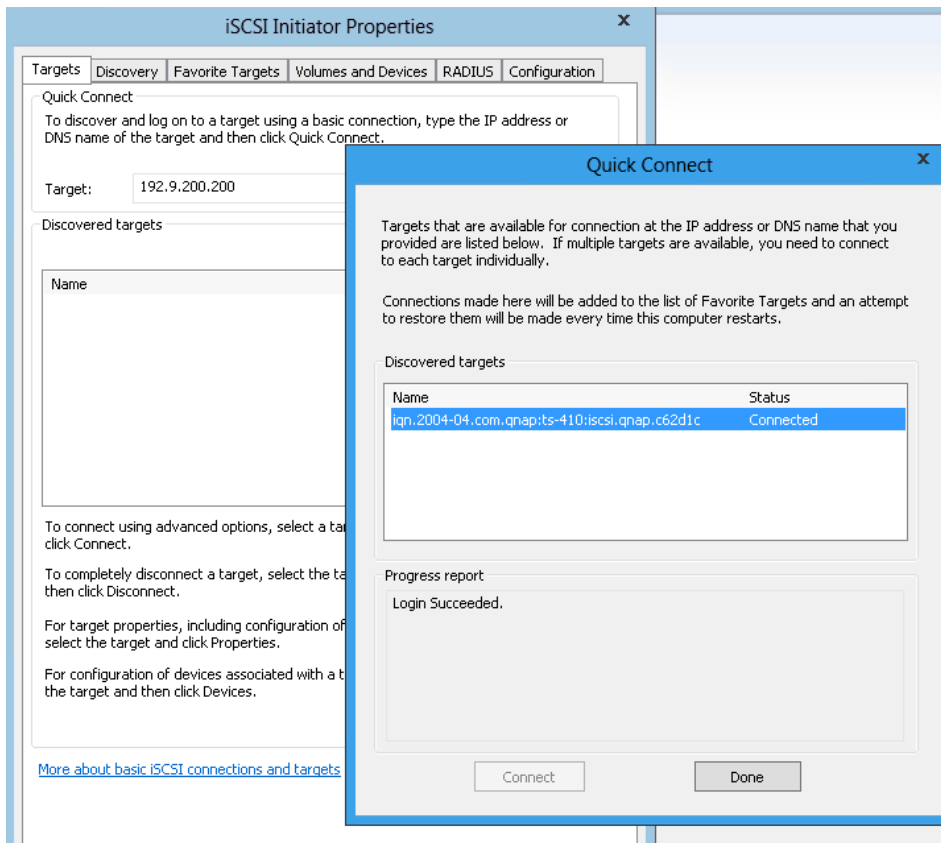
So, dann mal Failover Clustering einrichten



iSCSI Initiator einrichten



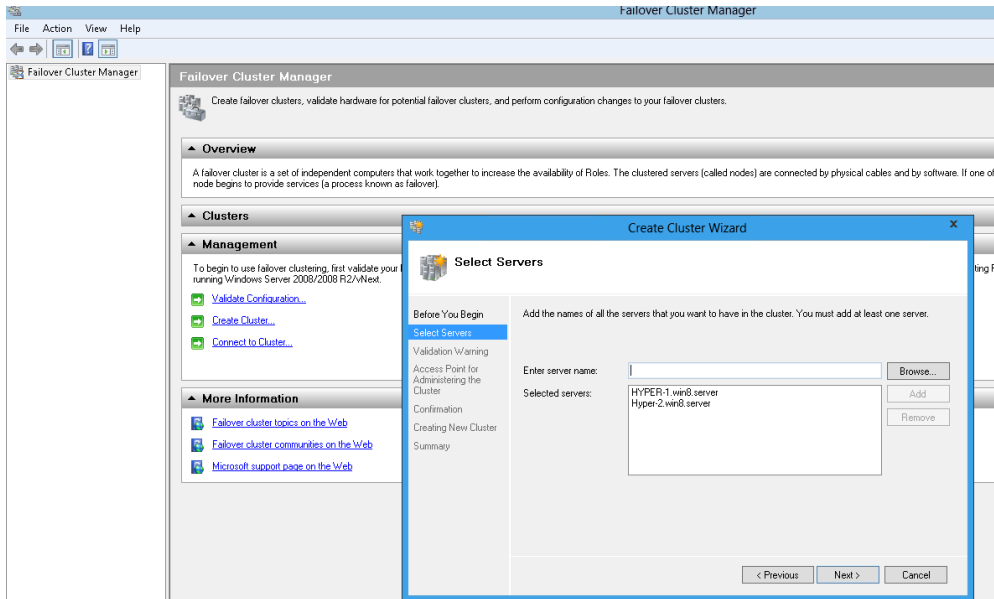
Mit Target verbinden



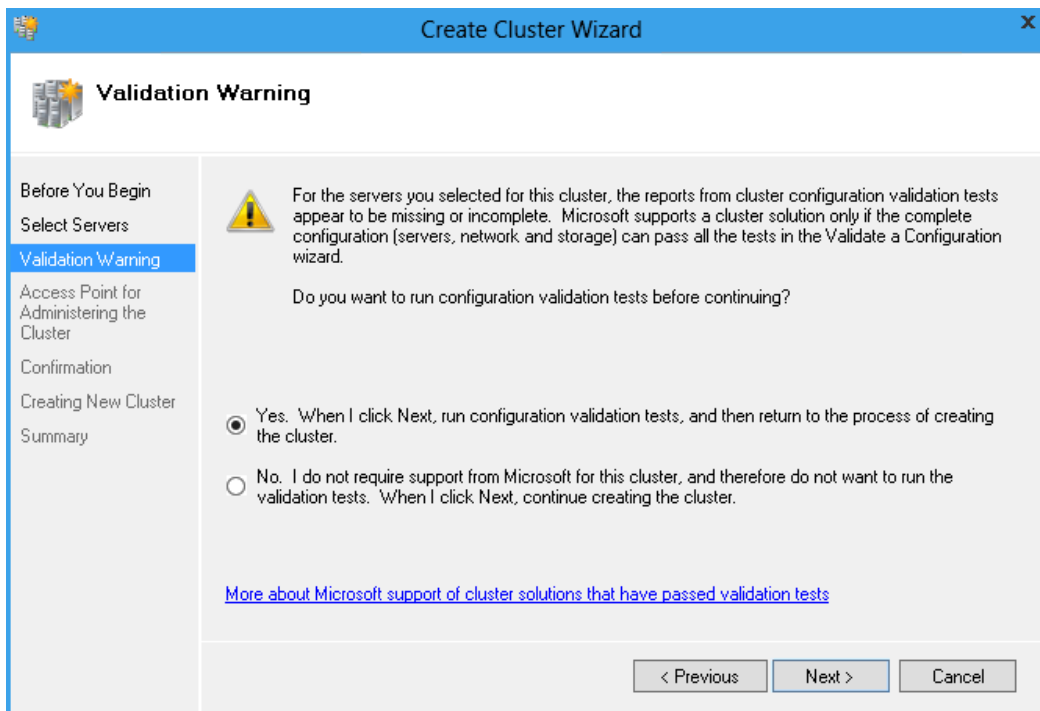
LUN(s) sind das

Basic 149,05 GB Online	(D:) 149,05 GB NTFS Healthy (Primary Partition)
Disk 2 Basic 20,00 GB Online	20,00 GB Unallocated
CD-ROM 0	

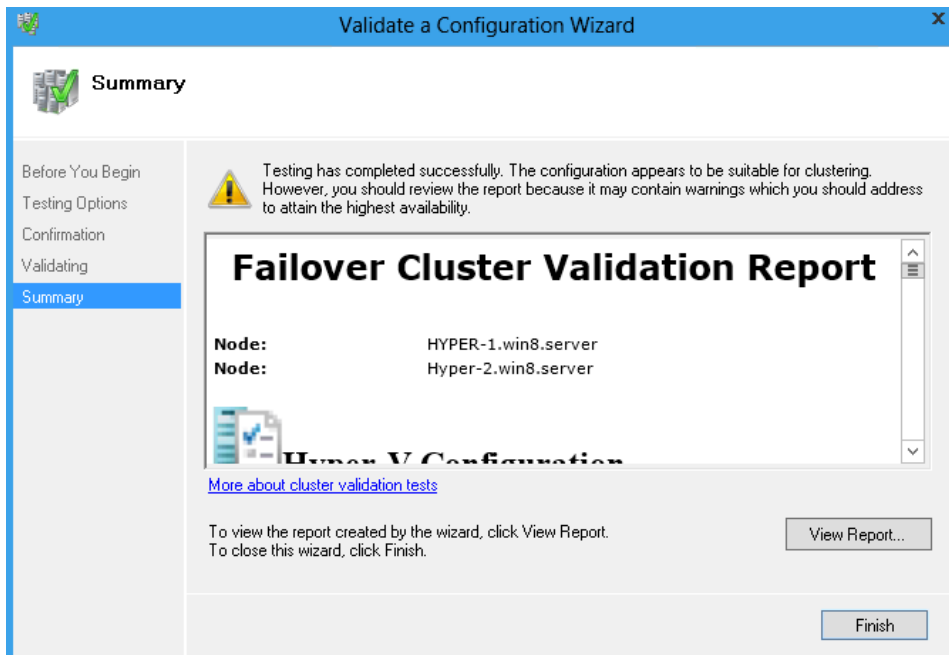
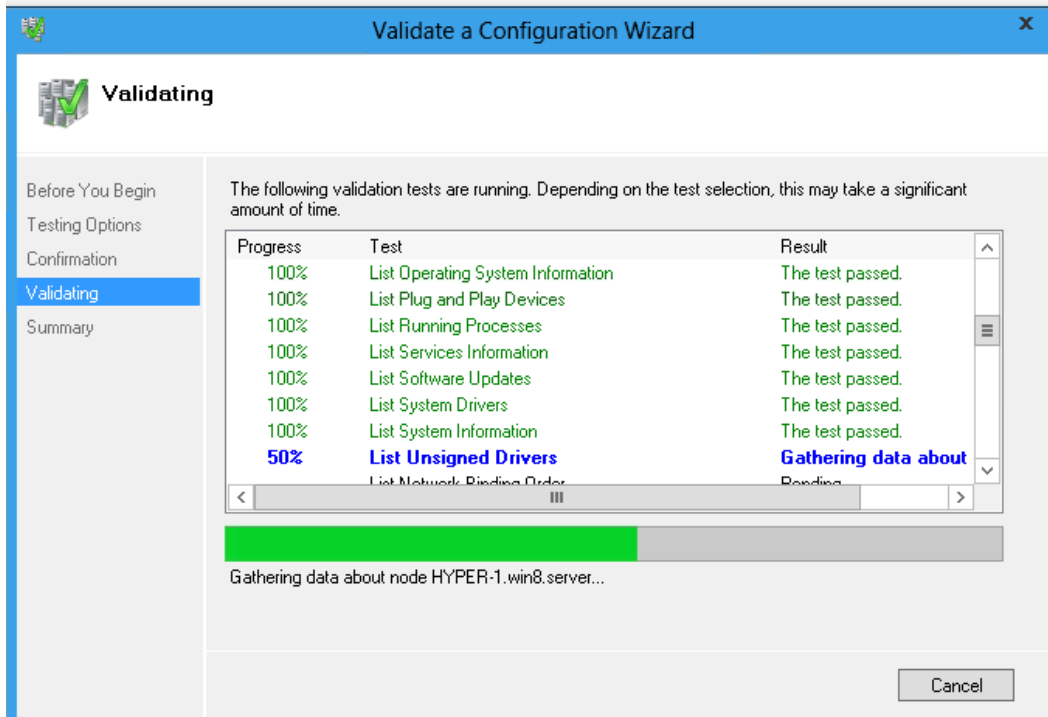
Cluster einrichten / Cluster Validierungsreport. Der Cluster Validierungsreport kann jetzt uebrigens auch mit SCVMM 2012 durchgefuehrt werden. Dazu mehr in Teil II dieser kleinen Artikelserie.



Ja, die CPU meiner beiden Hyper-V Hosts sind nicht identisch. Wie trotzdem Live Migration funzt, spaeter mehr!



Sonst sieht es gut aus!



Validate Matching Processor Manufacturers

Validate that all specified nodes share the same processor manufacturer.

Validating processor manufacturer compatibility.

Node	Processor Manufacturer	Version
HYPER-1.win8.server	GenuineIntel	Intel64 Family 6 Model 23 Stepping 10
Hyper-2.win8.server	GenuineIntel	Intel64 Family 6 Model 15 Stepping 6

The processor version is not consistent across all of the nodes. This is important because Hyper-V may not be able to live migrate a virtual machine between CPUs of different versions.

Cluster einrichten

The screenshot shows the 'Create Cluster Wizard' window with the title 'Access Point for Administering the Cluster'. The left sidebar contains a list of steps: 'Before You Begin', 'Select Servers', 'Access Point for Administering the Cluster' (highlighted), 'Confirmation', 'Creating New Cluster', and 'Summary'. The main area contains the following text and elements:

Type the name you want to use when administering the cluster.

Cluster Name:

i The NetBIOS name is limited to 15 characters. One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.

	Networks	Address
<input checked="" type="checkbox"/>	192.9.200.0/24	192 . 9 . 200 . 111

< Previous Next > Cancel

Form mal schoen. Dauert auch nur ein paar Minuten

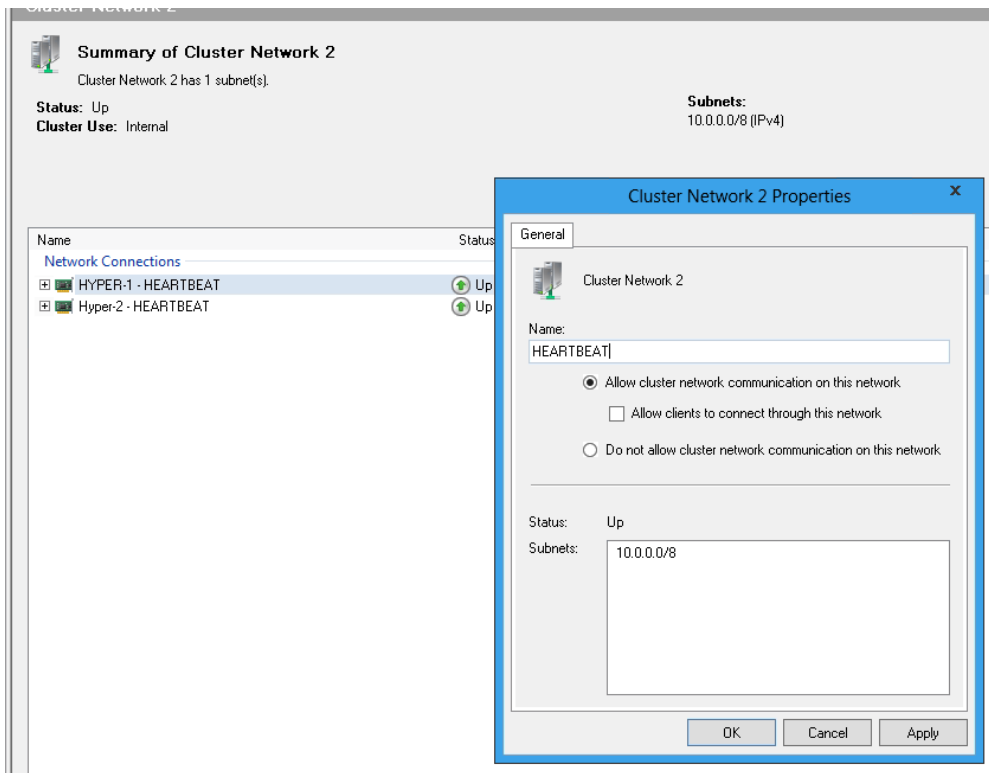
The screenshot shows the 'Create Cluster Wizard' window with the title 'Creating New Cluster'. The left sidebar contains a list of steps: 'Before You Begin', 'Select Servers', 'Access Point for Administering the Cluster', 'Confirmation', 'Creating New Cluster' (highlighted), and 'Summary'. The main area contains the following text and elements:

Please wait while the cluster is configured.

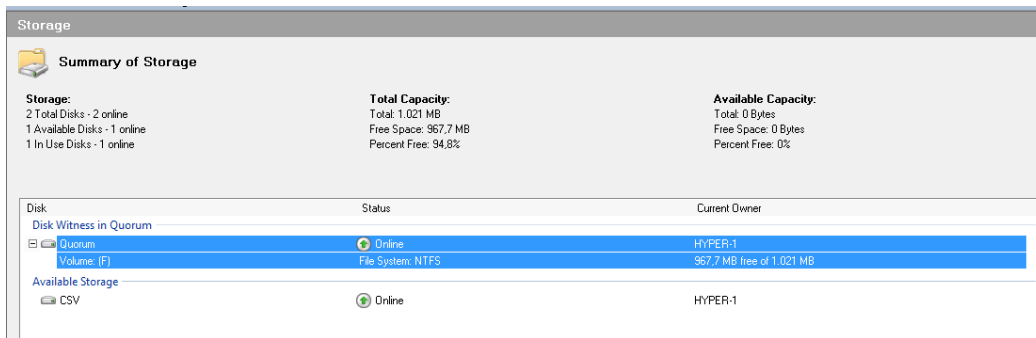
Forming cluster 'MARCIMARC'.

Cancel

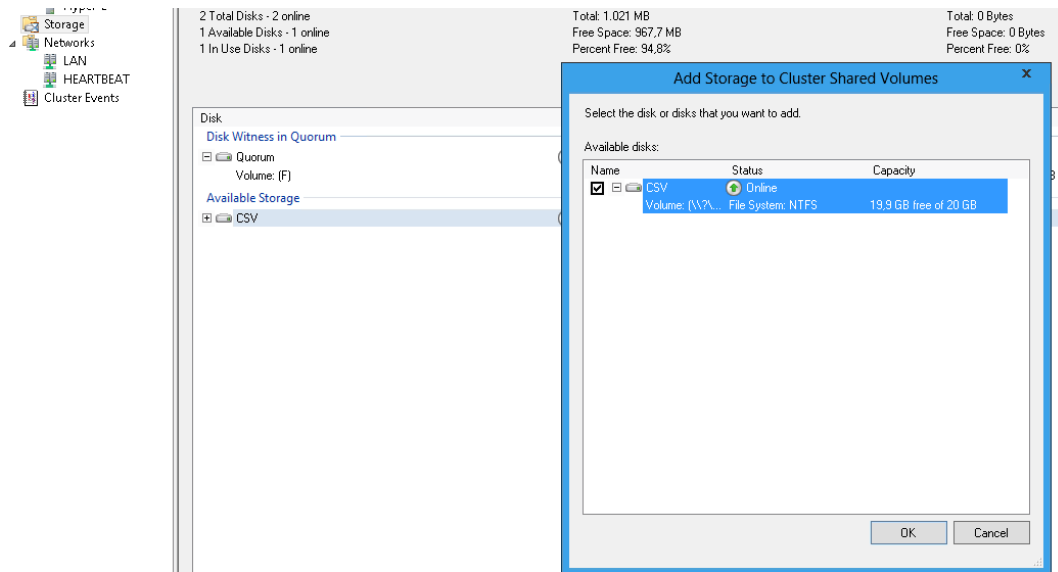
Da isser schon. So, jetzt Netzwerke benennen, Platten benennen um den Ueberblick zu behalten.



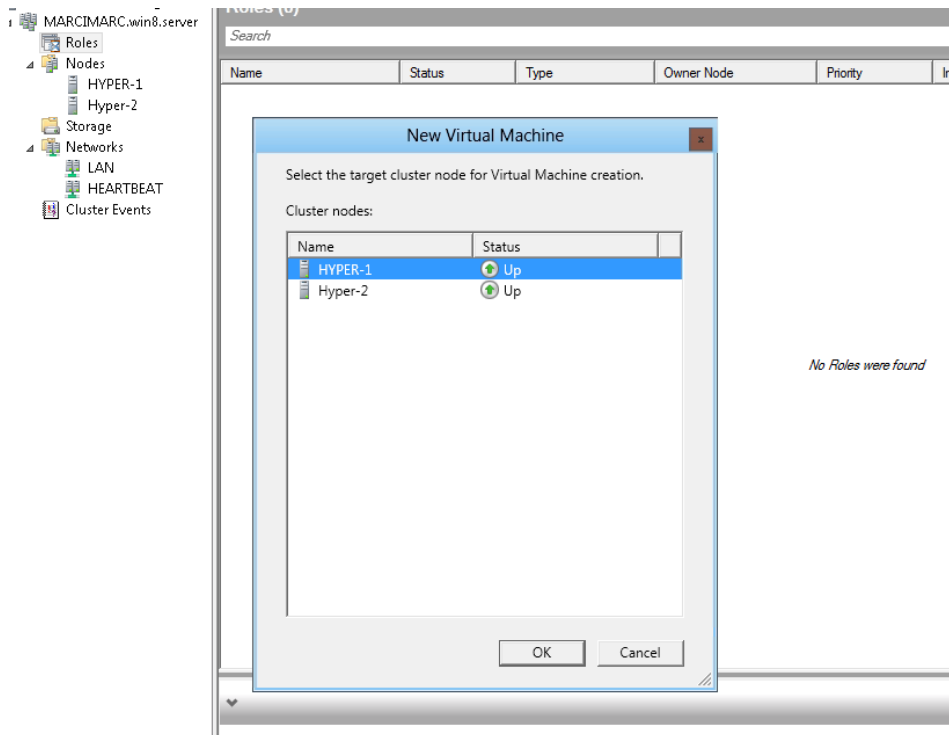
Quorum und CSV sind Online



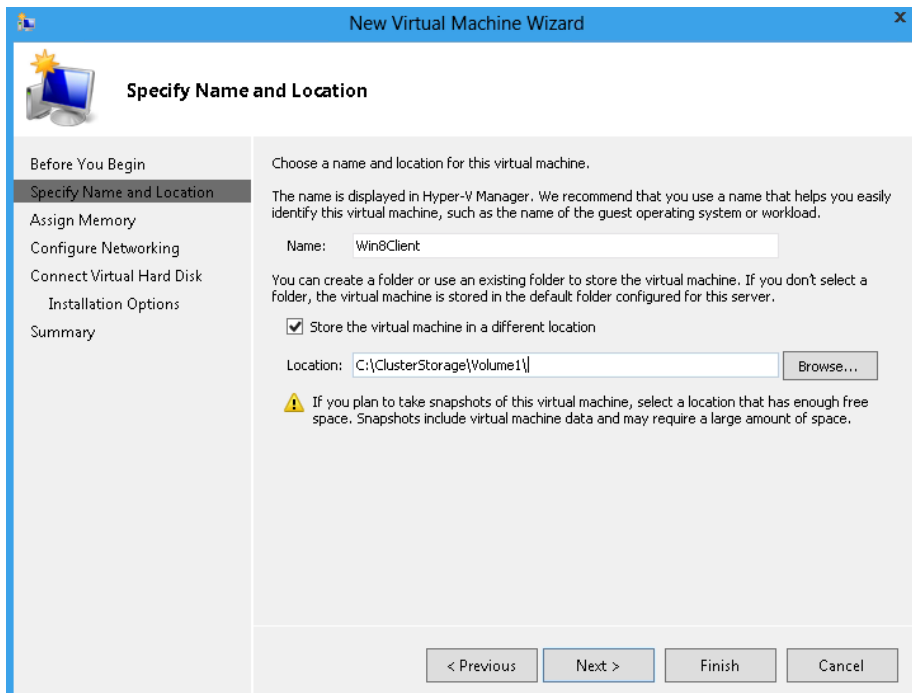
Wow, 20 GB fuer das Quorum. Reicht aber fuer nen virtuellen Windows 8 Client



Neue HA VM erstellen



Den Anweisungen des Wizard folgen!



New Virtual Machine Wizard

Specify Name and Location

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name:

You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

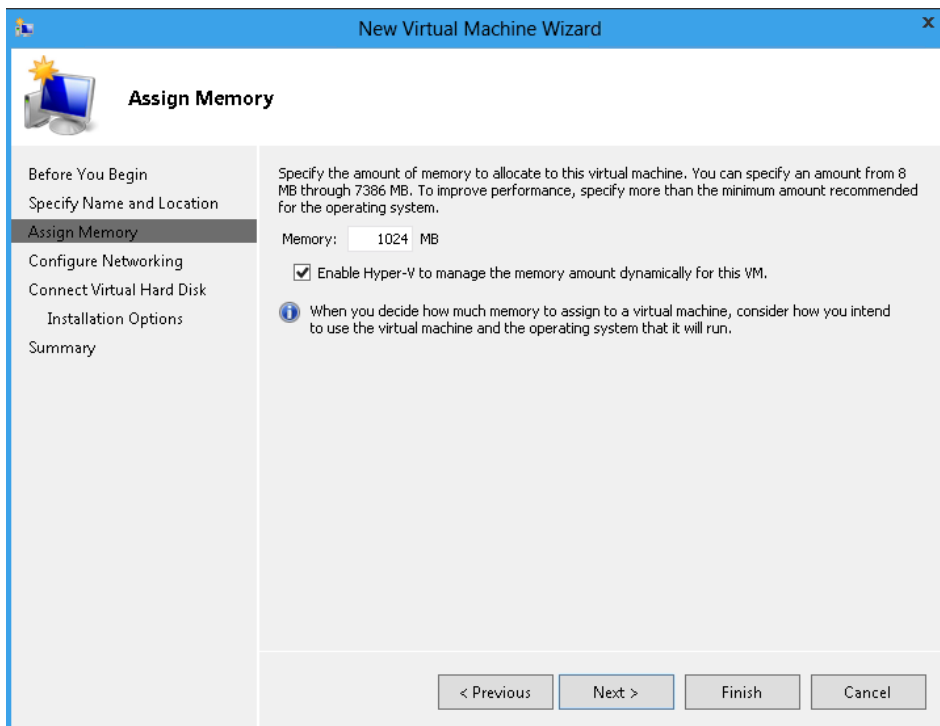
Store the virtual machine in a different location

Location:

! If you plan to take snapshots of this virtual machine, select a location that has enough free space. Snapshots include virtual machine data and may require a large amount of space.

< Previous Next > Finish Cancel

Dynamic Memory im Wizard



New Virtual Machine Wizard

Assign Memory

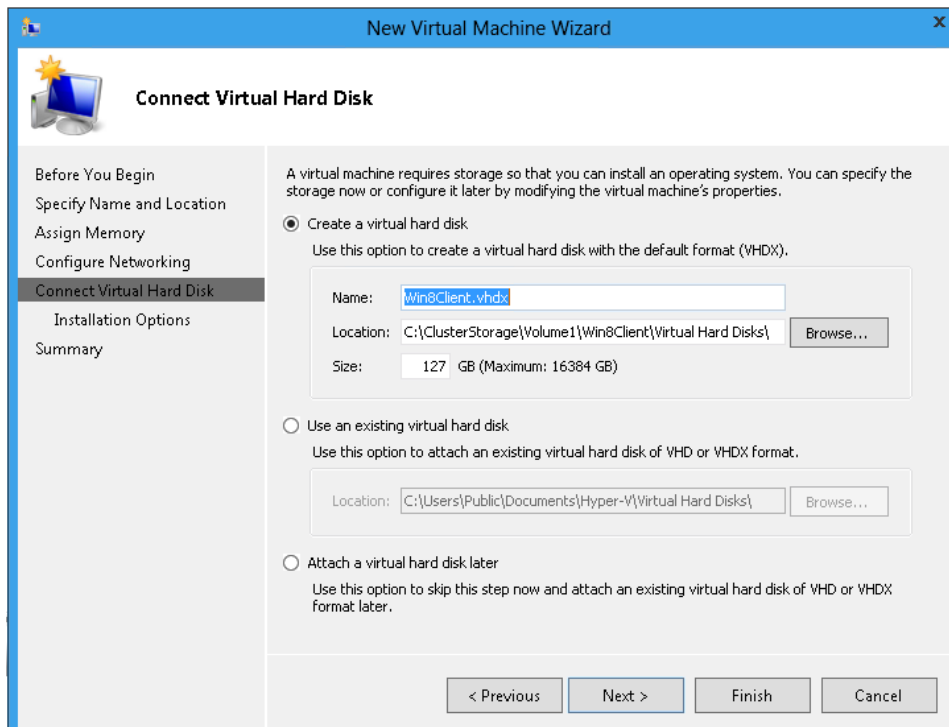
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 8 MB through 7386 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Memory: MB

Enable Hyper-V to manage the memory amount dynamically for this VM.

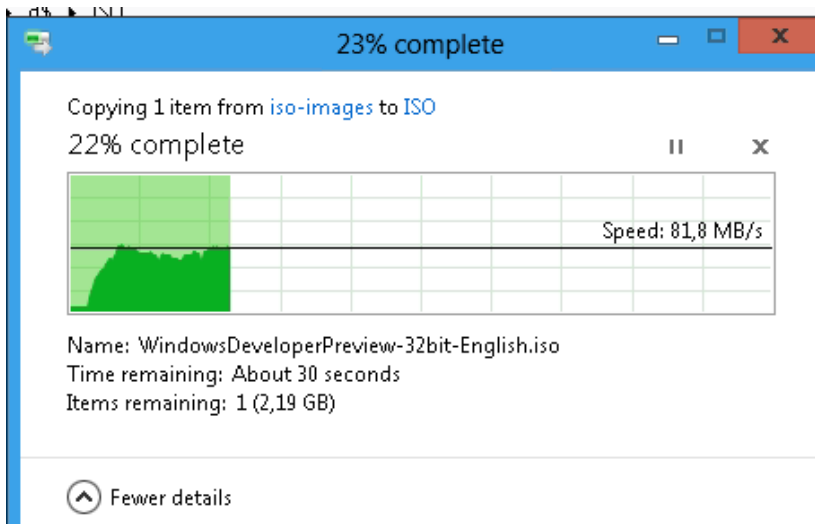
i When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

< Previous Next > Finish Cancel

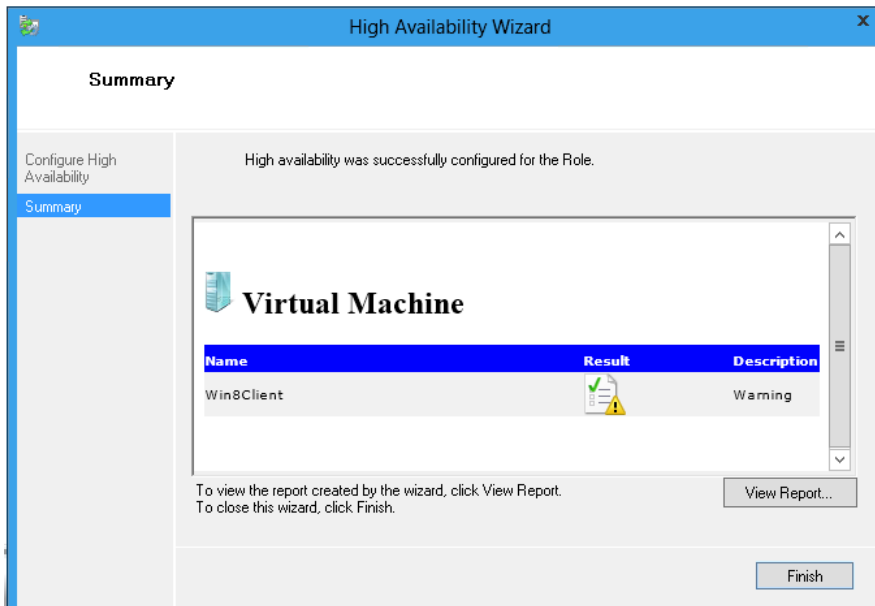


Das ISO Image auf alle Cluster Knoten in das gleiche Verzeichnis / Volume kopieren, sonst schlaegt bei gemounteten ISO die Live Mig fehl.

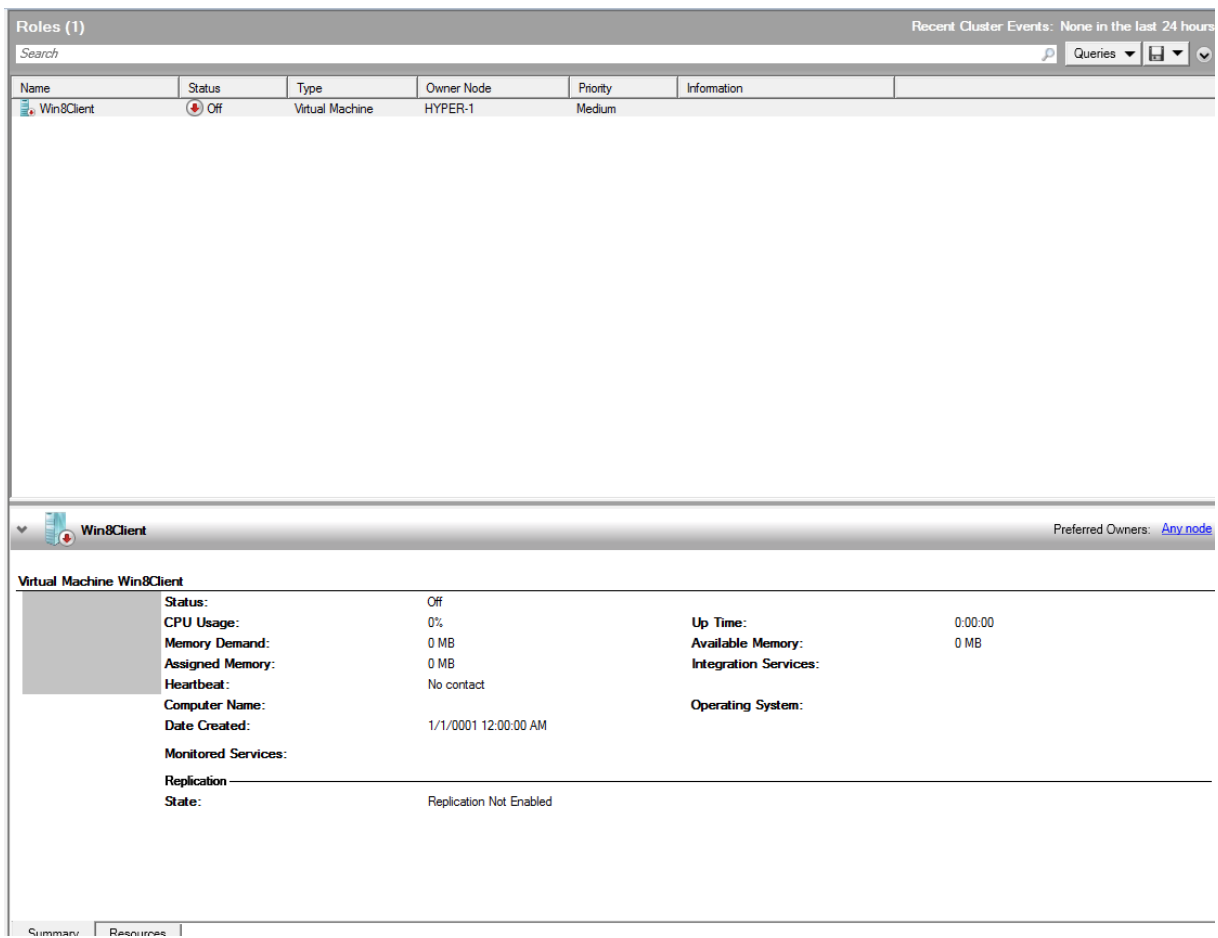
Anbei der neue Kopierdialog von Windows 8 ☺



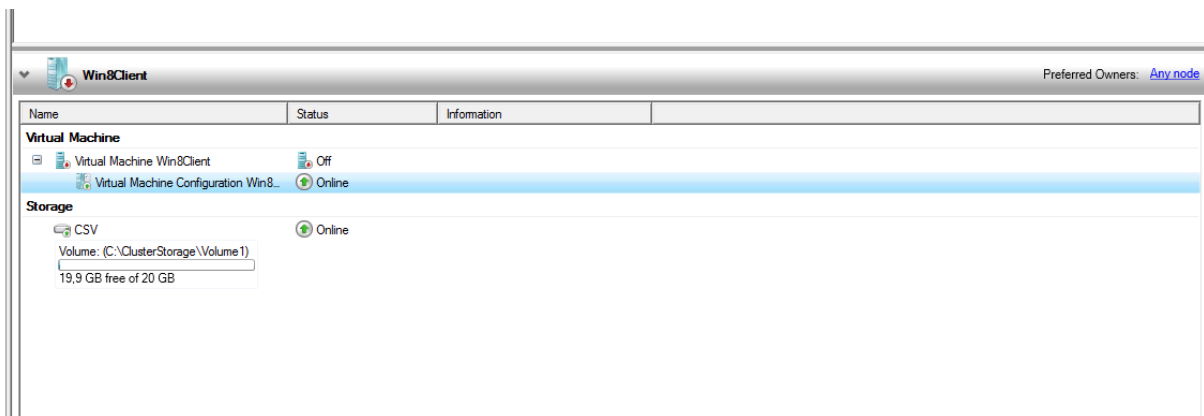
Fertig



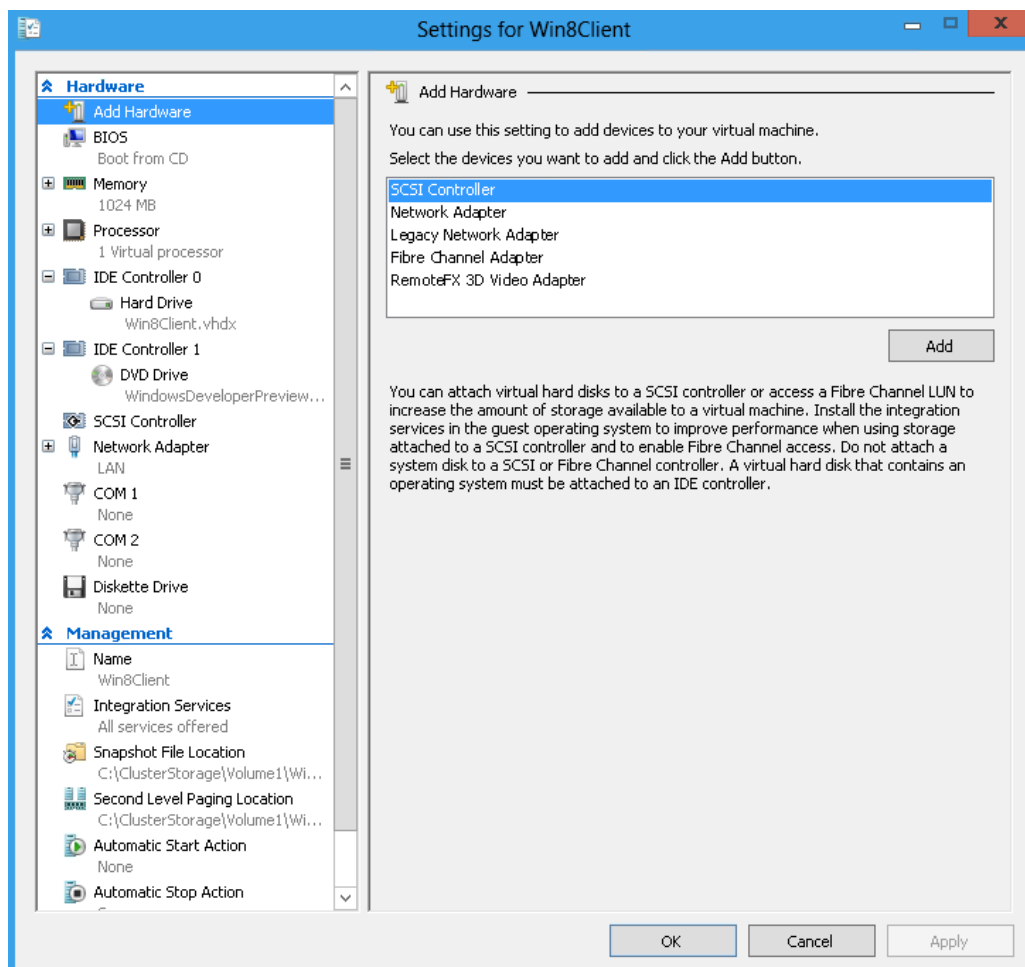
So siehts im Failover Manager aus



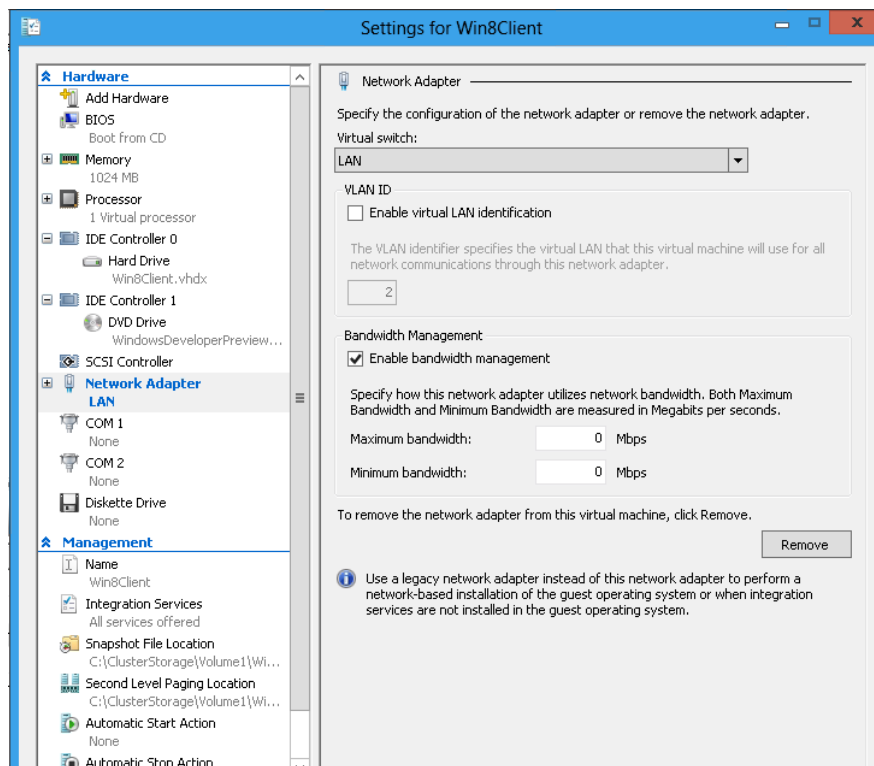
Und so ...



Hyper-V Einstellungen fuer die VM (man beachte die + Zeichen vor einigen Einstellungen, das erspart die Suche 😊)



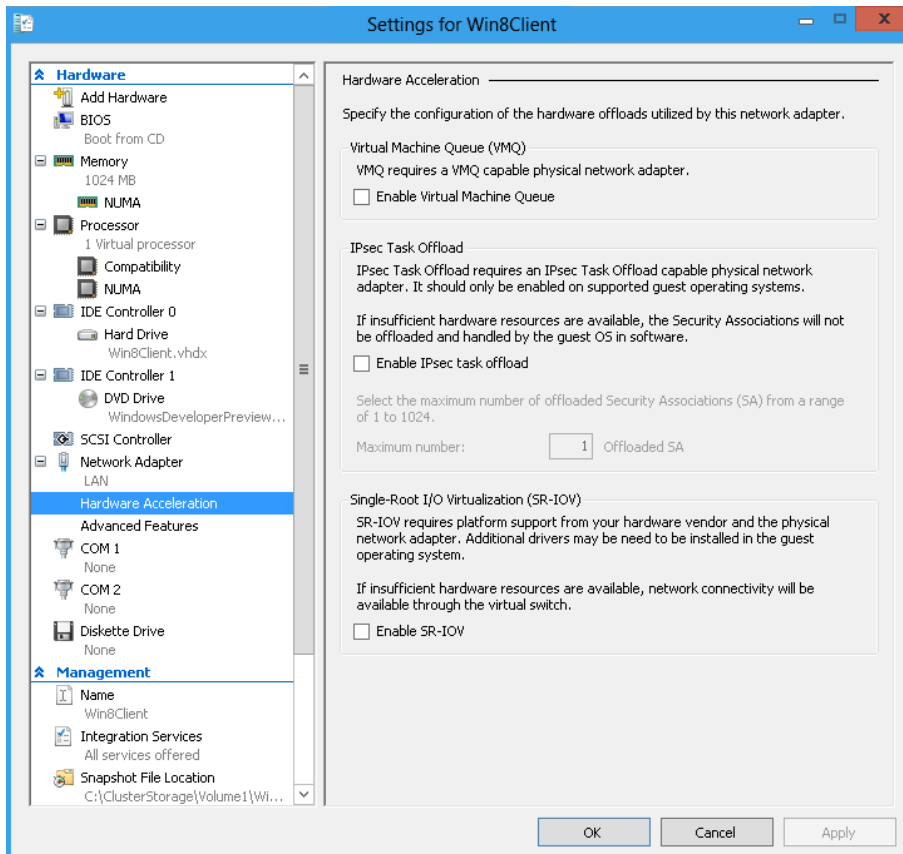
Yes, Bandbreitenmanager – Switch Extensibility sei Dank!



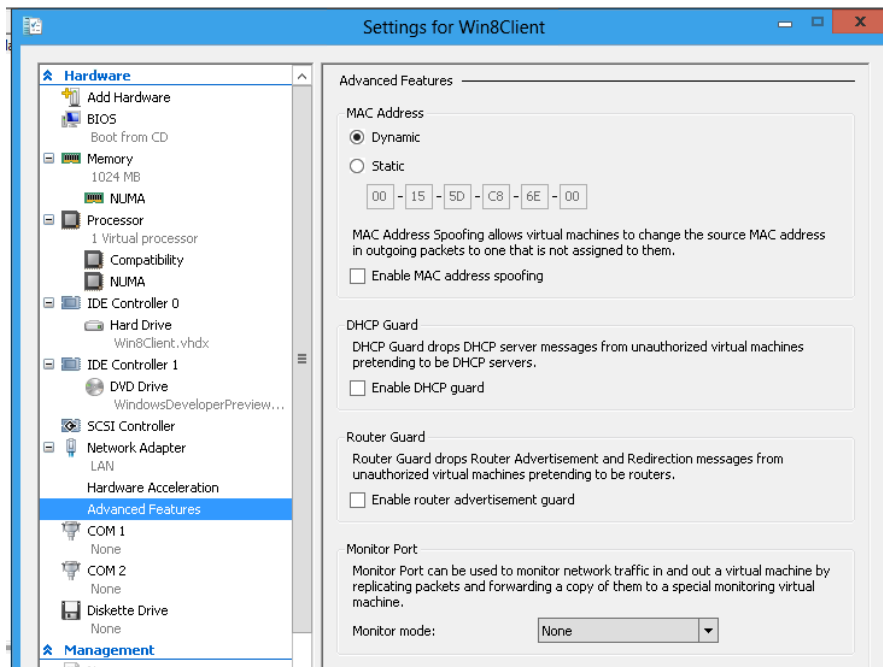
Sehr viel neues in den virtuellen Netzwerken

VMM-Queue
IPSEC Task Offload
Switch Extensibility
SR-IOV

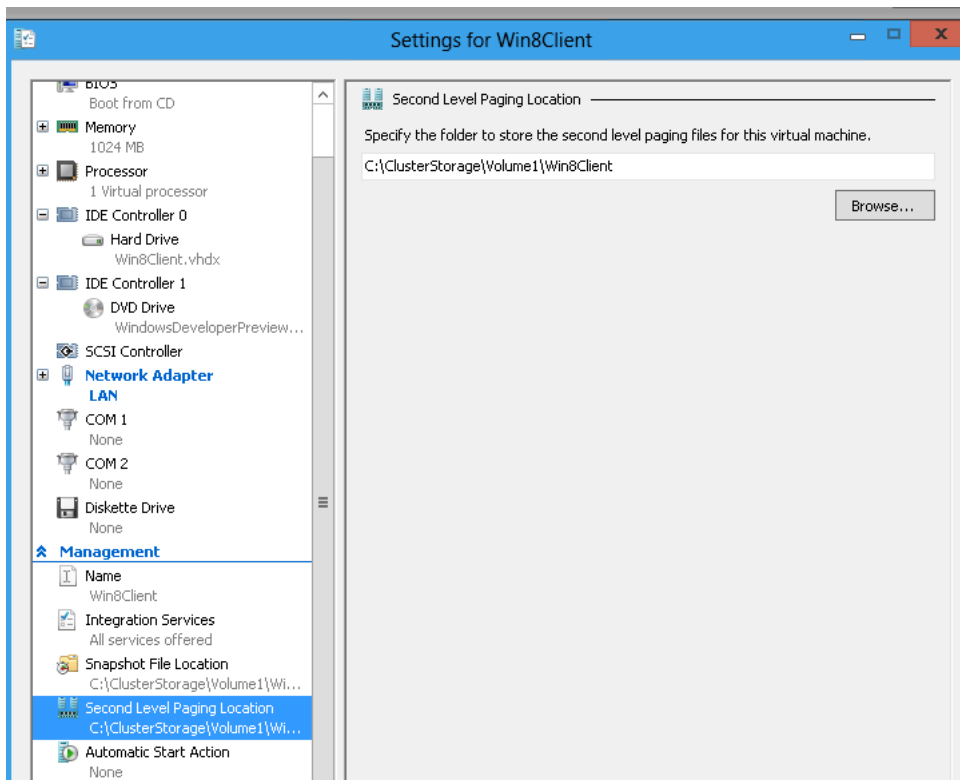
Vieles setzt aber neue Netzwerkkarten / neue Treiber und eine enge Kooperation der HW Hersteller mit MS voraus.



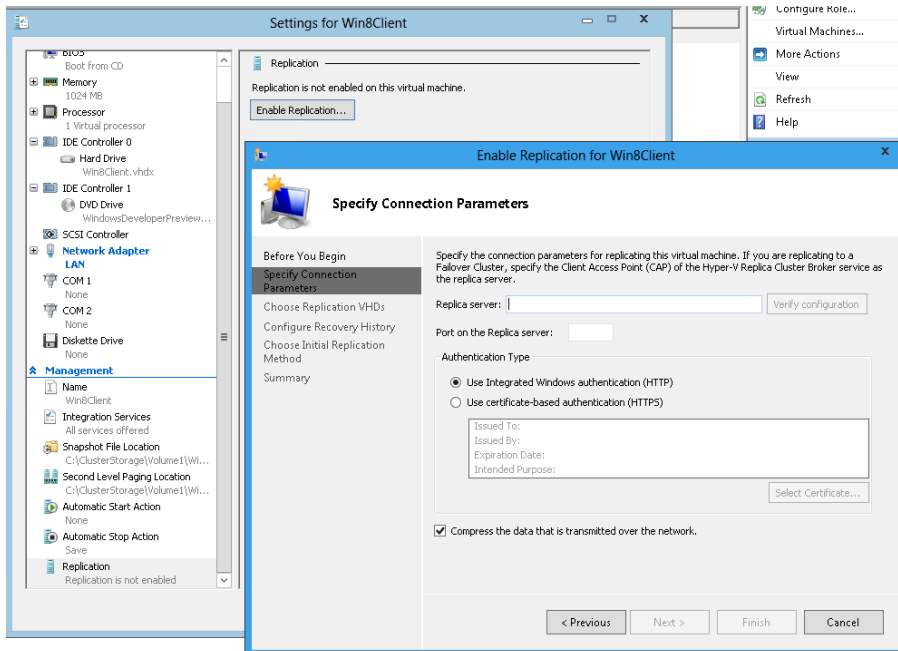
DHCP Guard / Router Guard



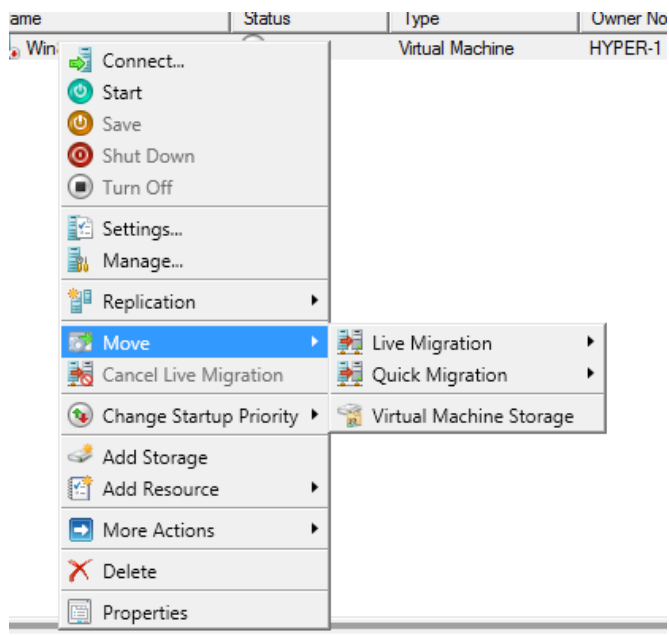
VM liegt im CSV



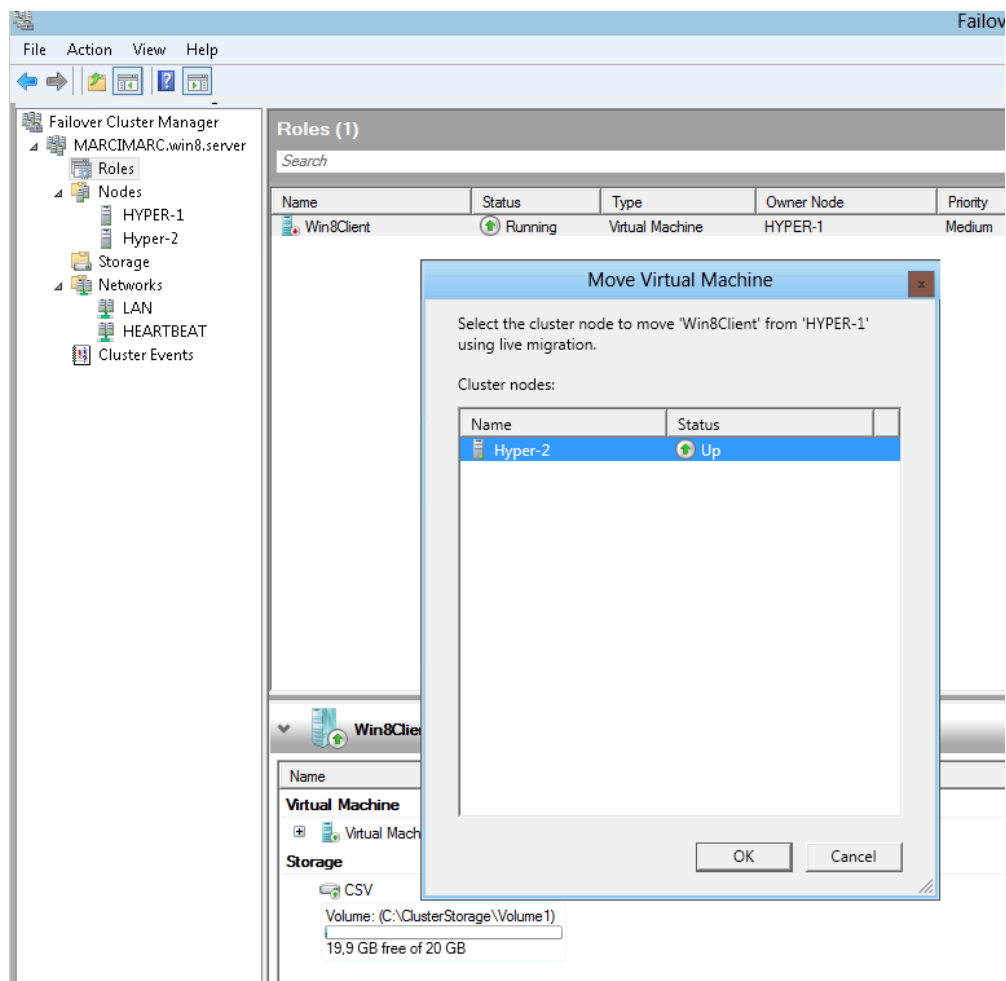
Storage VM Move konfigurierbar – mehr dazu spaeter



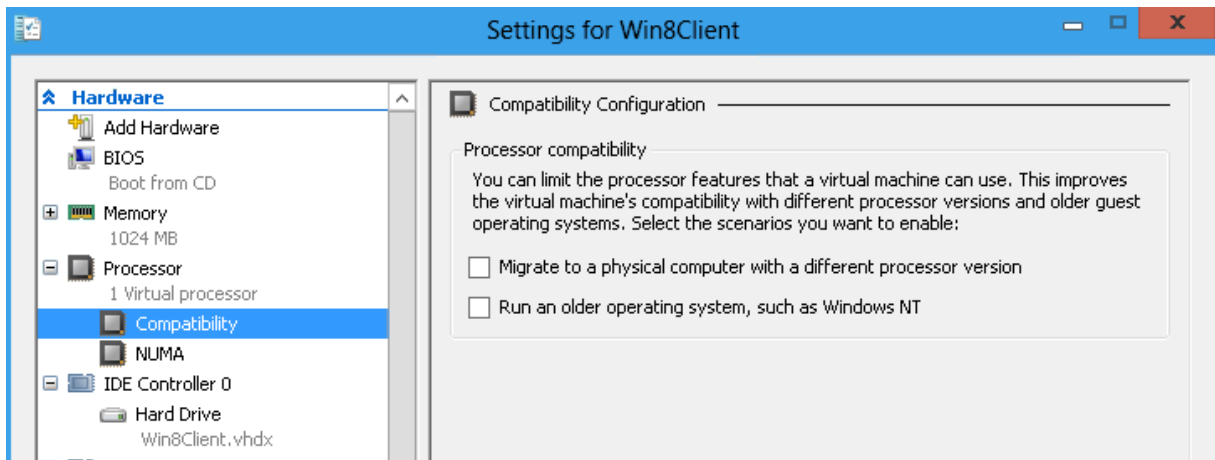
Live Migration / Quick Migration / Storage Migration



Machen wir mal eine Live Migration



Leider fehlgeschlagen! Warum? Unterschiedliche CPU in meinen Hyper-V Hosts was die Intel Core Modelle angeht. Loesung: „Migrate to different processor version“. Man beachte das + in den VM Einstellungen, welches ein Submenue aufklappt ☺



Jetzt gehts

Roles (1)						Recent Cluster Events
Search						
Name	Status	Type	Owner Node	Priority	Information	
Win8Client	Live Migrating	Virtual Machine	Hyper-2	Medium	Live Migrating, 54% completed	

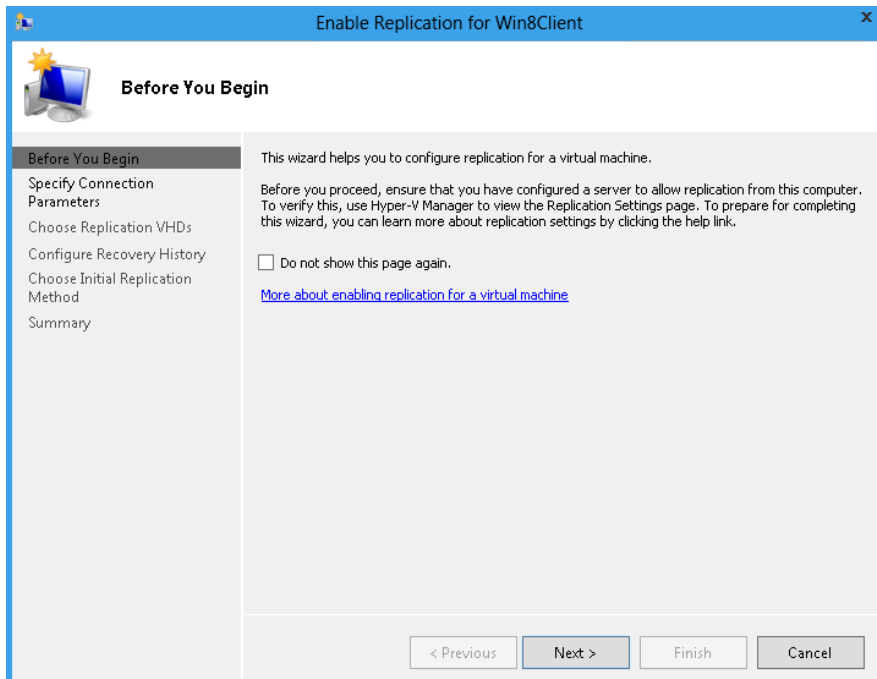
Quick Migration´

Funktioniert natuerlich auch

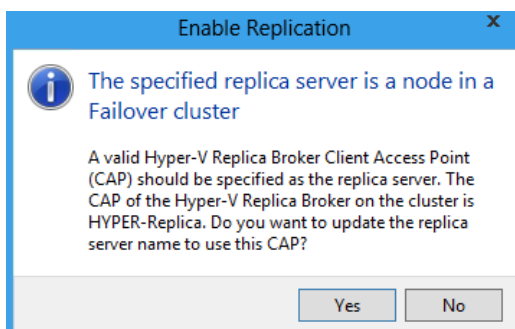
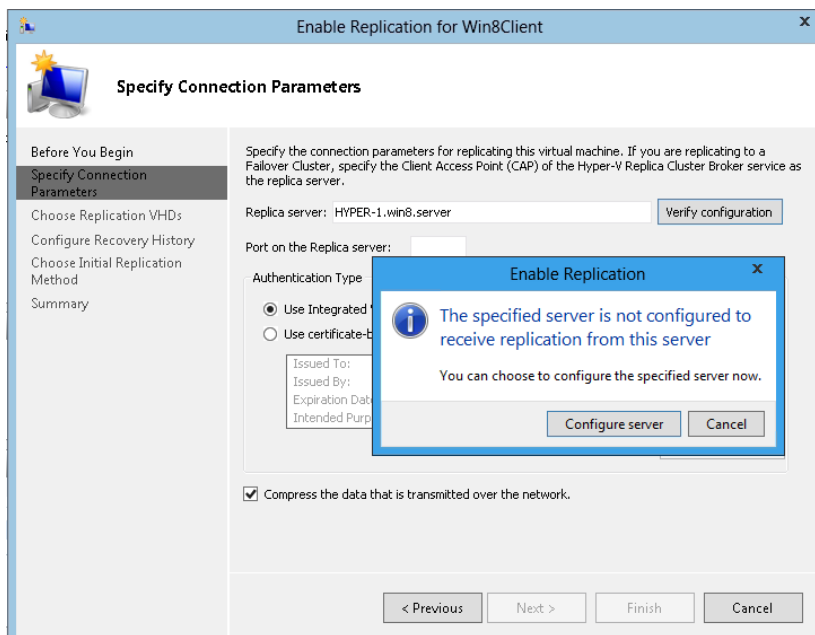
Roles (1)						Recent Cluster Events
Search						
Name	Status	Type	Owner Node	Priority	Information	
Win8Client	Saving	Virtual Machine	HYPER-1	Medium	Saving, 97% completed	

Replication

Hyper-V 3.0 kann zur Replication von virtuellen Maschinen konfiguriert werden, welche dann auf unterschiedlichen Storages liegen und in Sync gehalten werden

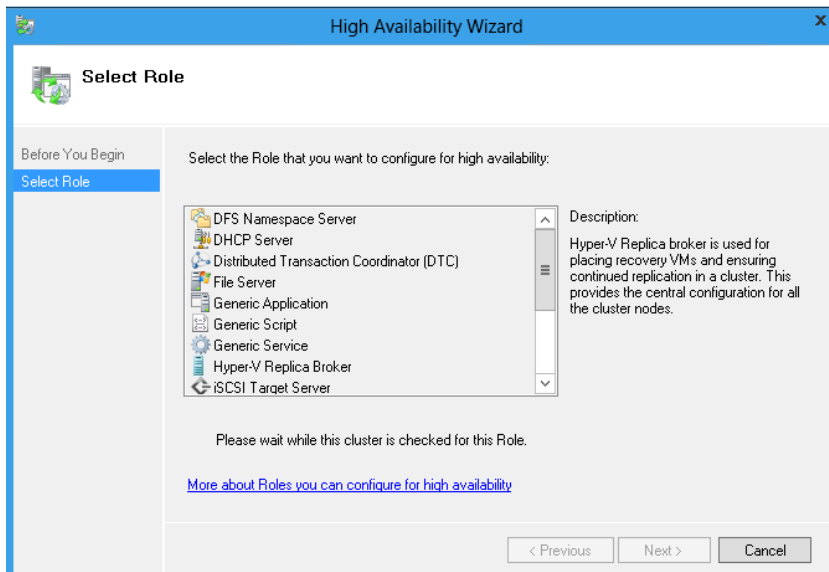


Replica Server konfigurieren



Hyper-V Virtual Machine Replication Broker

Die Replication Broker Rolle kann auch geclustered werden.

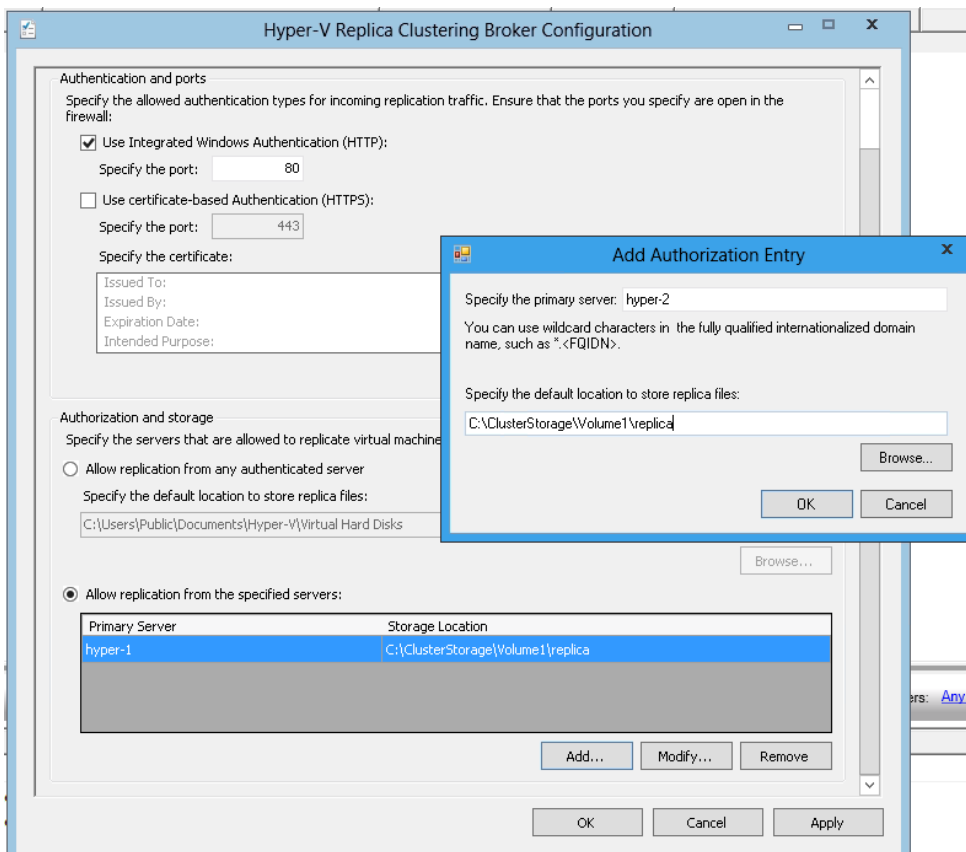


Angabe des Namen und der IP-Adresse fuer den CAS

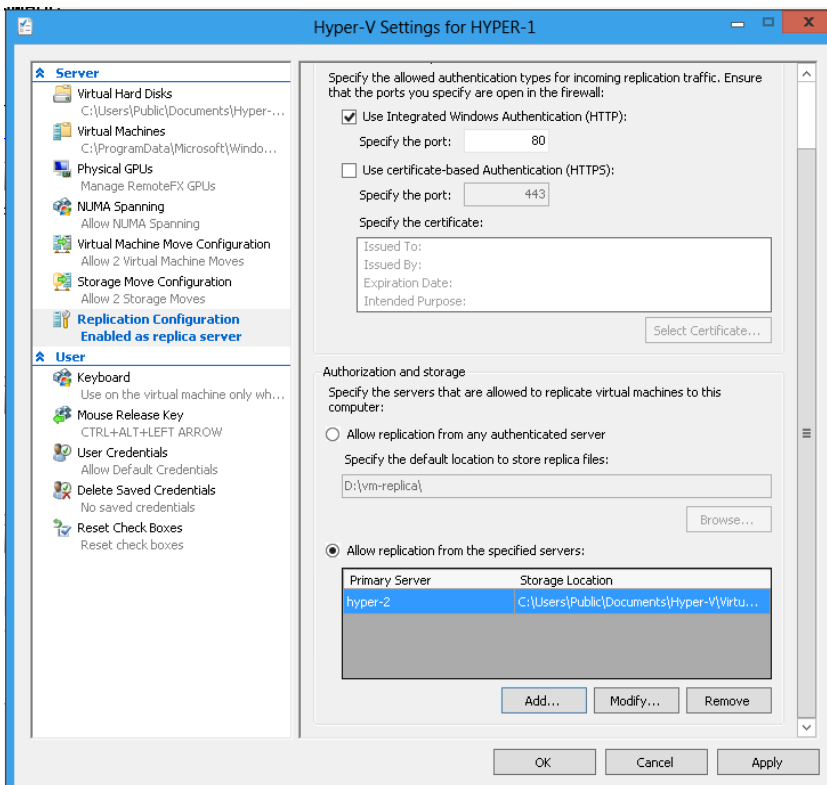
Name	Status	Type	Owner Node	Priority	Information
HYPER-Replica	Running	Hyper-V Replica Broker	HYPER-1	Medium	
WinSClnt	Running	Virtual Machine	HYPER-1	Medium	



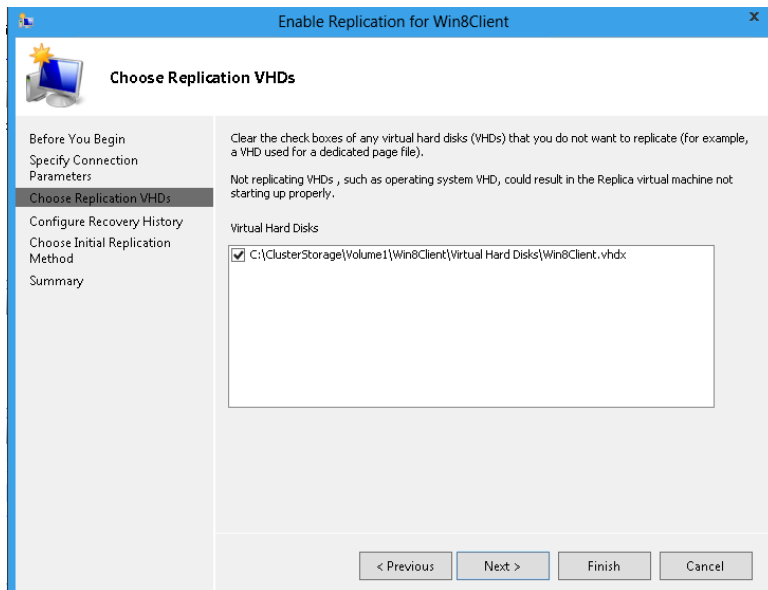
Replication konfigurieren



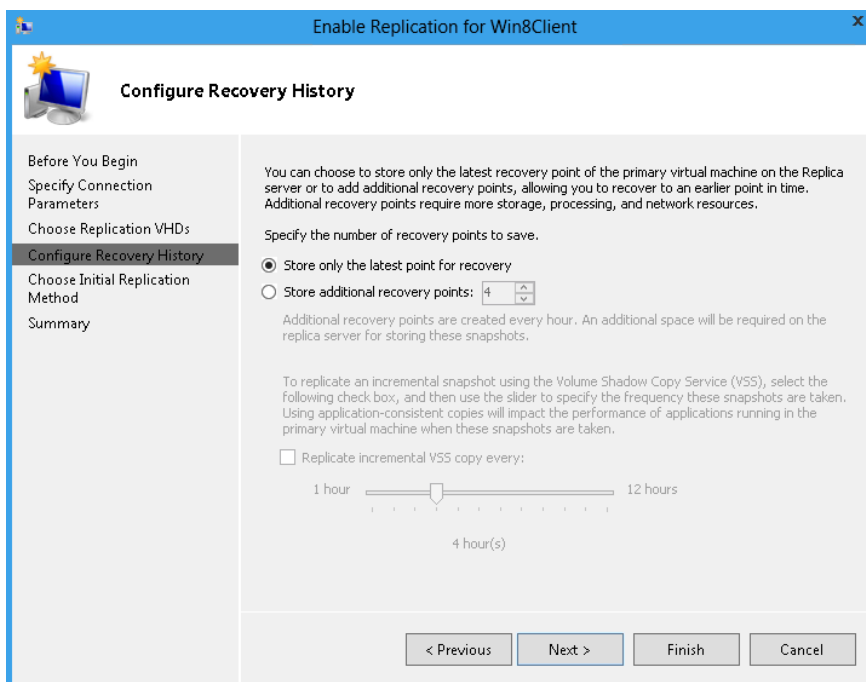
Da hat sich einiges getan!



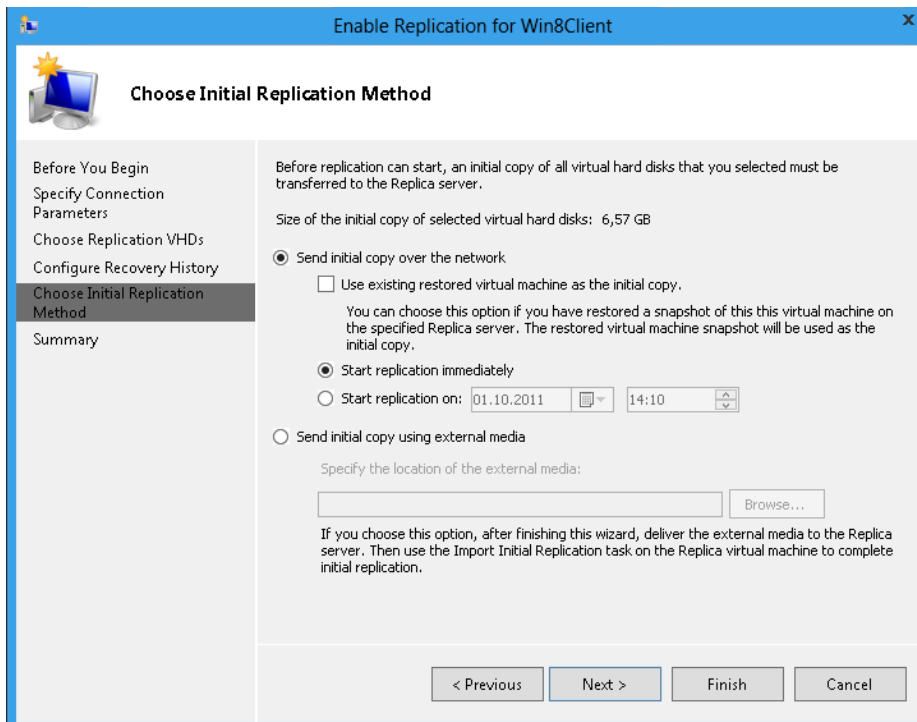
Source VHD Location fuer die Replication auswaehlen



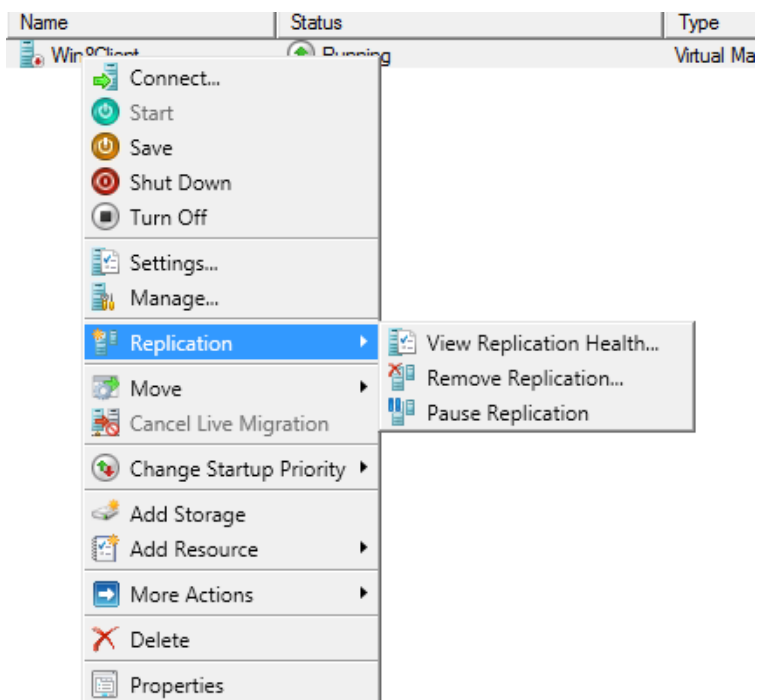
Anzahl Recovery Points angeben



Von wo soll die Initial Replikation erfolgen



Status der Arbeit anzeigen!



Replication Health Report

Replication Health for "Win8Client"

Replication Health Report

Type: Primary
 Replication state: Replication enabled
 Replica server: HYPER-1.win8.server
 Last Successful Synchronization Time: 01.10.2011 14:10:57
 Data pending replication: 0 MB
 Replication Health: Not available

Replication Counters

Monitoring Interval	Total replication cycles attempted	Replication cycles missed	Total replication errors	Average replication latency (HH:MM:SS)	Average replication size (MB)
Current 01.10.2011 14:00:54 to 01.10.2011 14:11:01	3	0	0	0:01:00	2246,57
-	-	-	-	-	-

Save As... Close

Test Failover

Virtual Machines

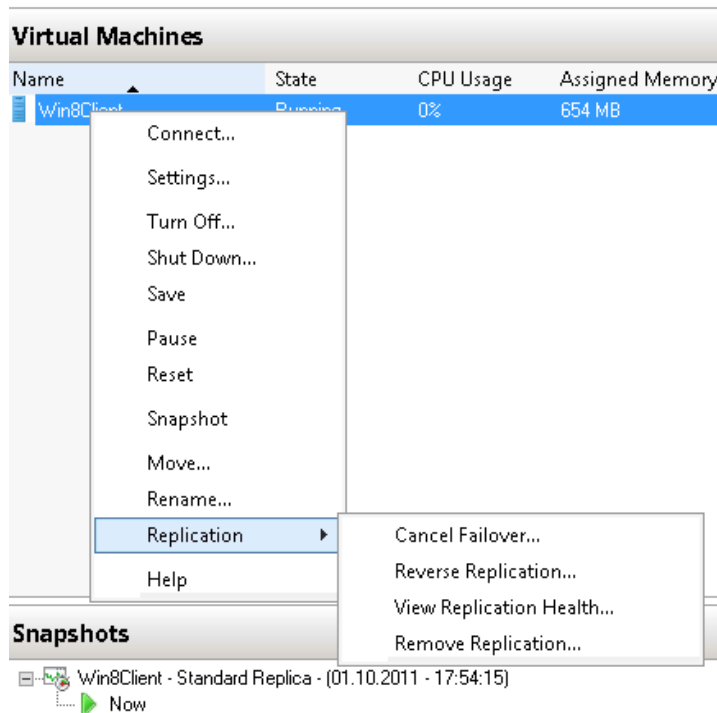
Name	State	CPU Usage	Assigned Memory	Memory Demand	Memory Status	Uptime	Status
Win8Client	Off						

- Connect...
- Settings...
- Start
- Snapshot
- Revert...
- Move...
- Export...
- Rename...
- Delete...
- Replication
 - Failover...
 - Test Failover...
 - Pause Replication...
 - View Replication Health...
 - Remove Replication...
- Help

Snapshots

- Win8Client - Standard Replica - (01.10.2011 - 17:52:54)
- Now

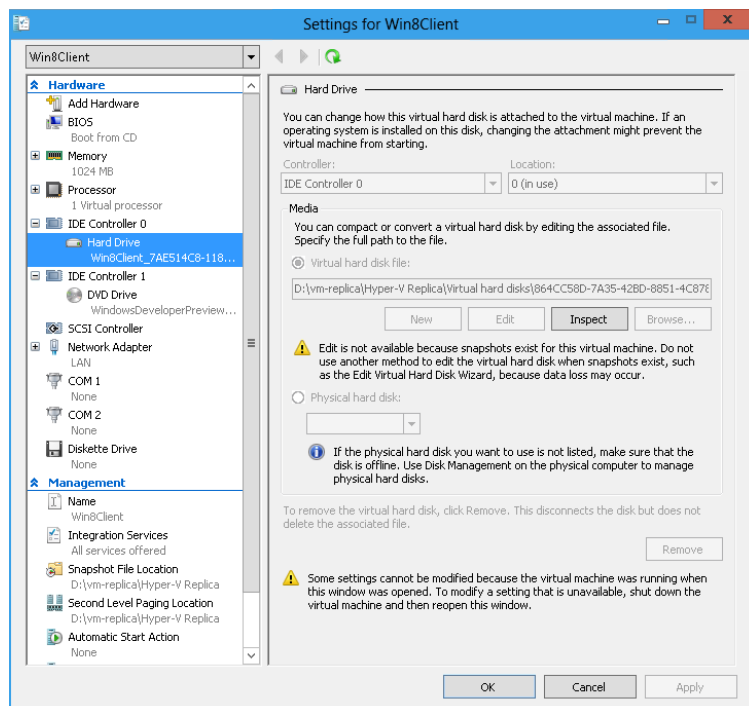
Reverse Replication (hier erhalte ich im Failover Manager noch eine Fehlermeldung, muss ich mir die naechsten Tae mal ansehen, im Hyper-V Manager funzt es).



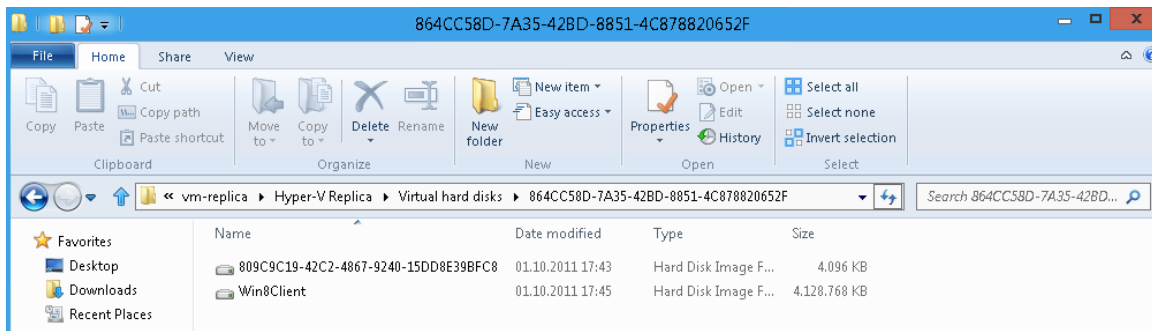
Initial Replication

Name	State	CPU Usage	Assigned Memory	Memory Demand	Memory Status	Uptime	Status
Win8Client	Running	1%	654 MB	379 MB	OK	00:05:19	Initial Replication (2%)

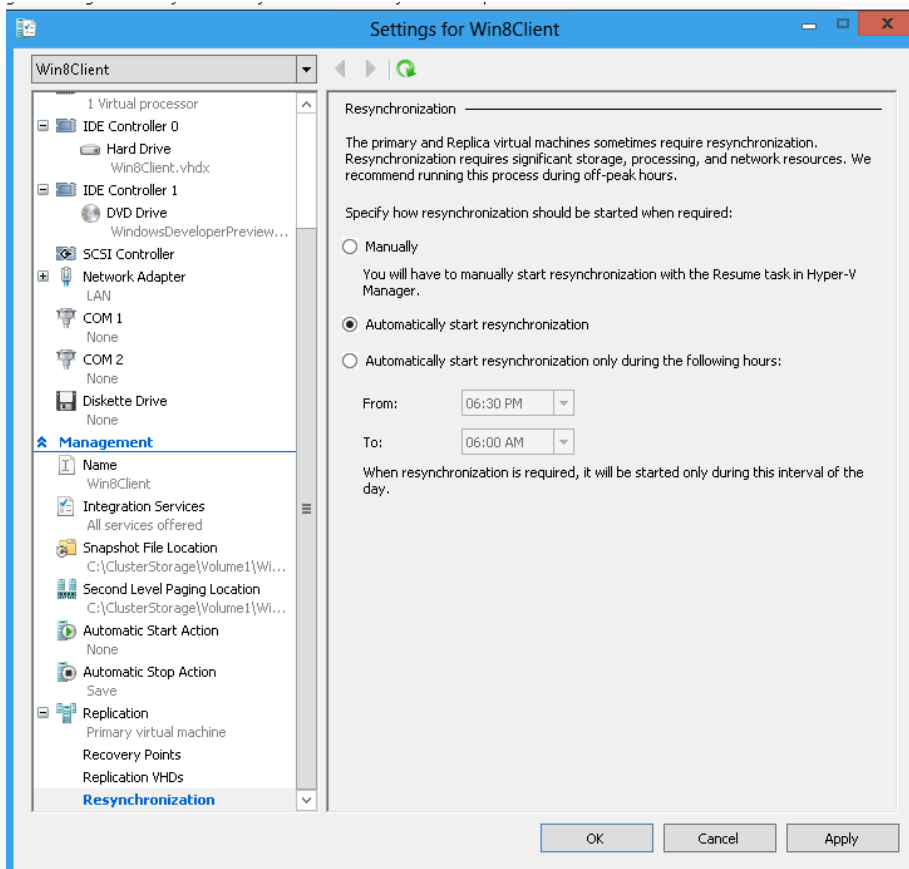
Und schon liegt die Replica VM wo anders



Und hier die Sicht auf das Dateisystem

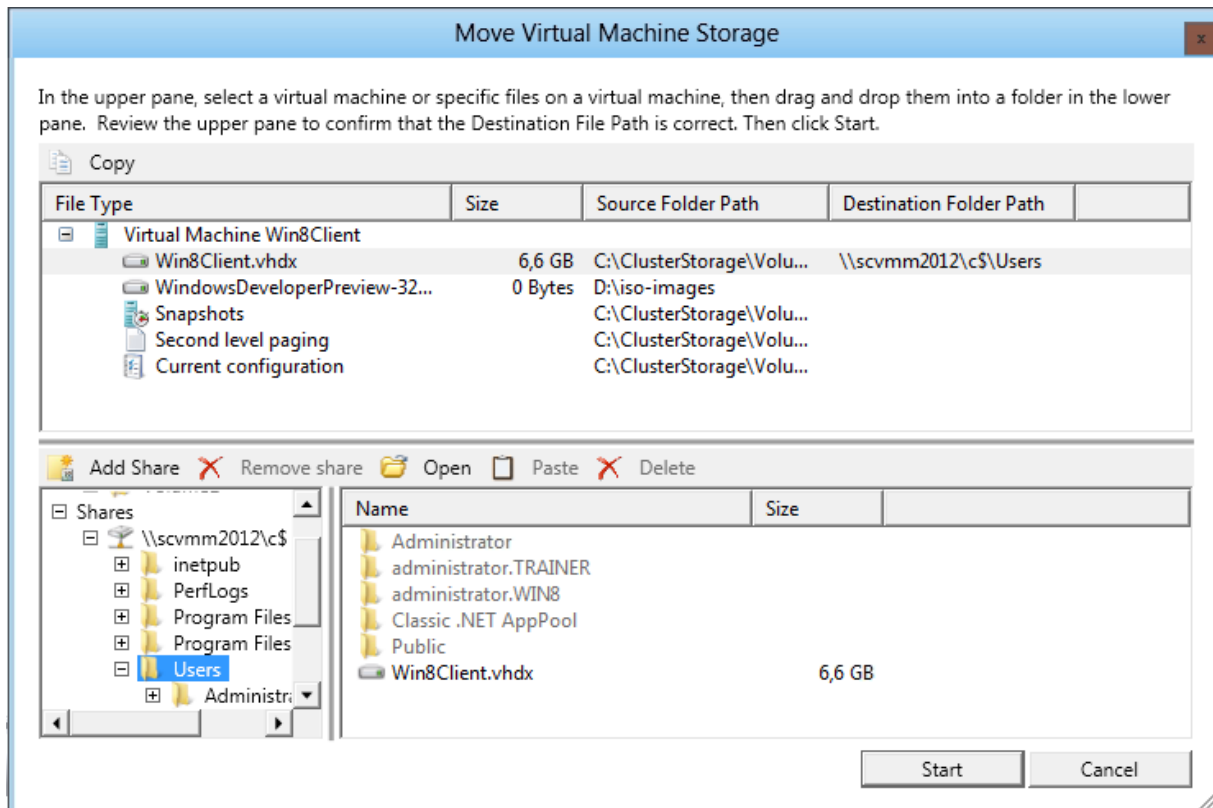


Wann erfolgt die Resynchronisation?



Virtual Machine Storage verschieben

Alles schoen einfach und komfortabel (und ONLINE ohne die VM auszuschalten)



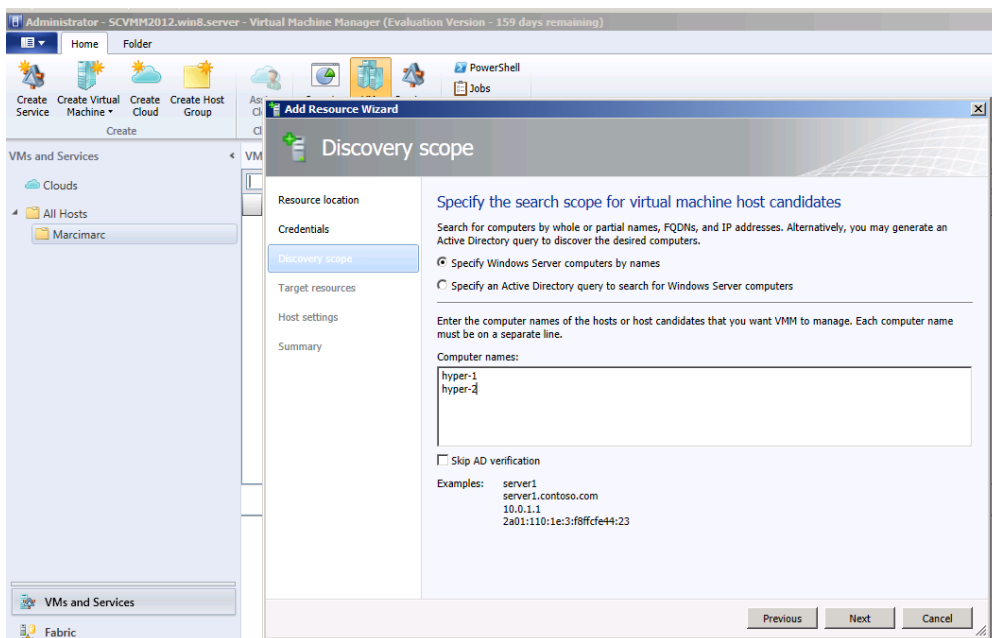
Storage Migration startet

Roles (2)						Recent C
Search						
Name	Status	Type	Owner Node	Priority	Information	
HYPER-Replica	Running	Hyper-V Replica Brok...	HYPER-1	Medium		
Win8Client	Off	Virtual Machine	Hyper-2	Medium	Starting virtual machine storage migration...	

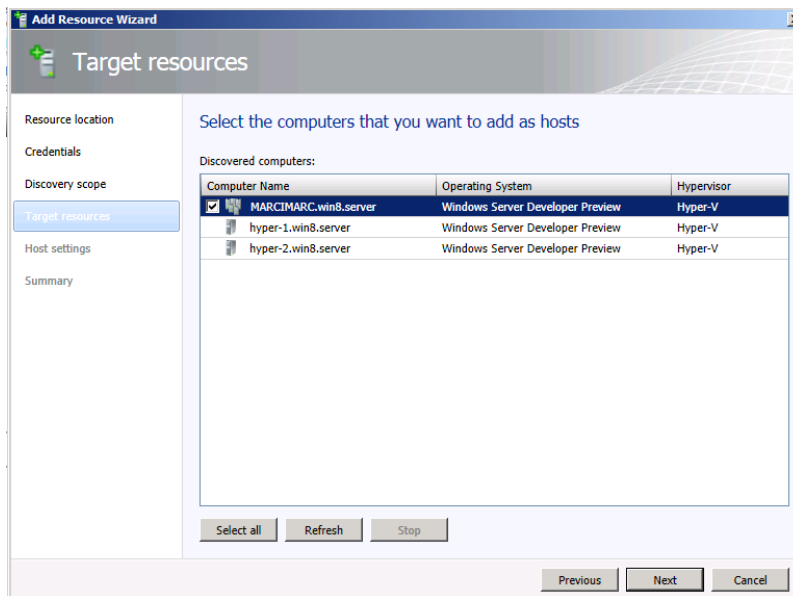


SCVMM 2012 Integration

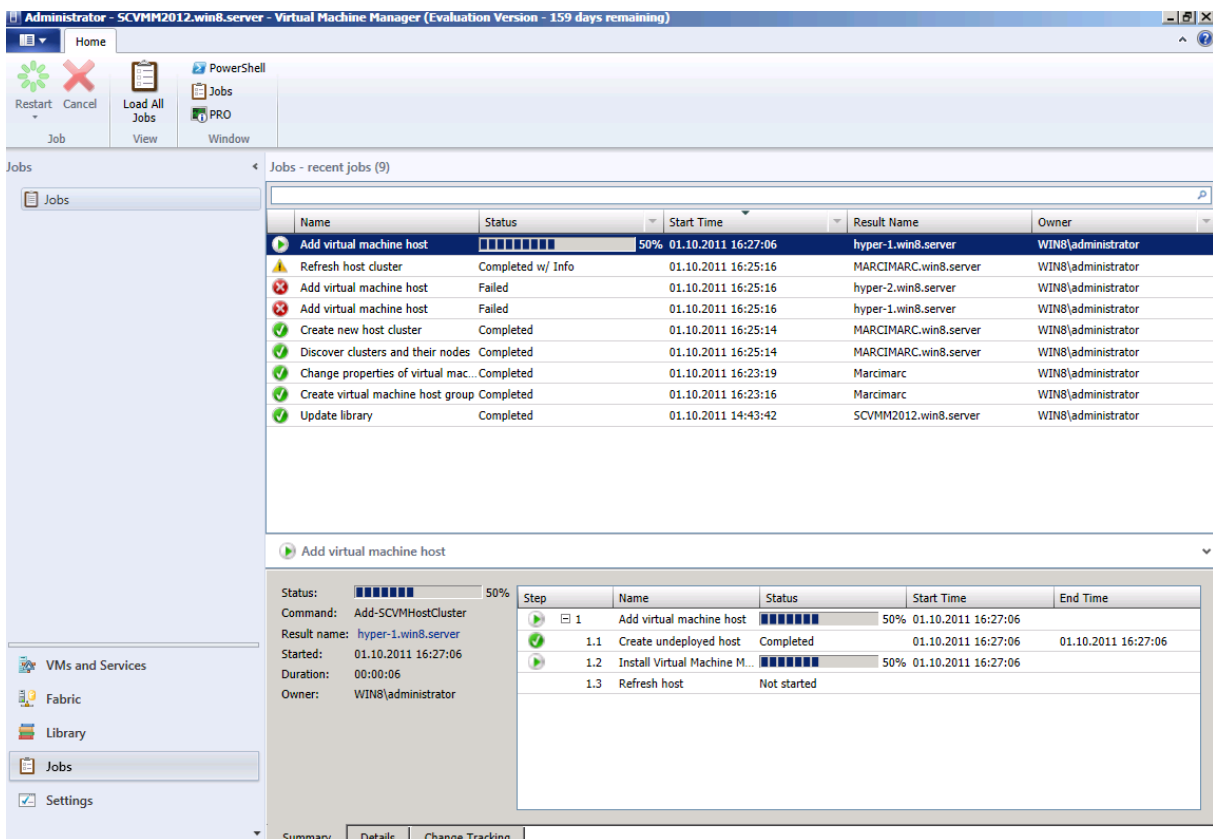
Neue Hostgruppe



Cluster auswaehlen



Baustelle! Der VMM-Agent wird zwar installiert, aber es gibt WMI Kommunikationsprobleme, welchen ich noch nicht auf die Spur gekommen bin. Loesung erfolgt in Teil II (hoffentlich)



Zum Schluss noch was nettes: Cluster Aware Updating. Nette Idee, Windows das Patching der Cluster Knoten zu ueberlassen. Konnte ich noch nicht testen, da meine beiden Hyper-V Host aktuell gepatched waren (sind).

