VEEAM

Backup and recovery of vSphere VCSA and Platform Services Controllers

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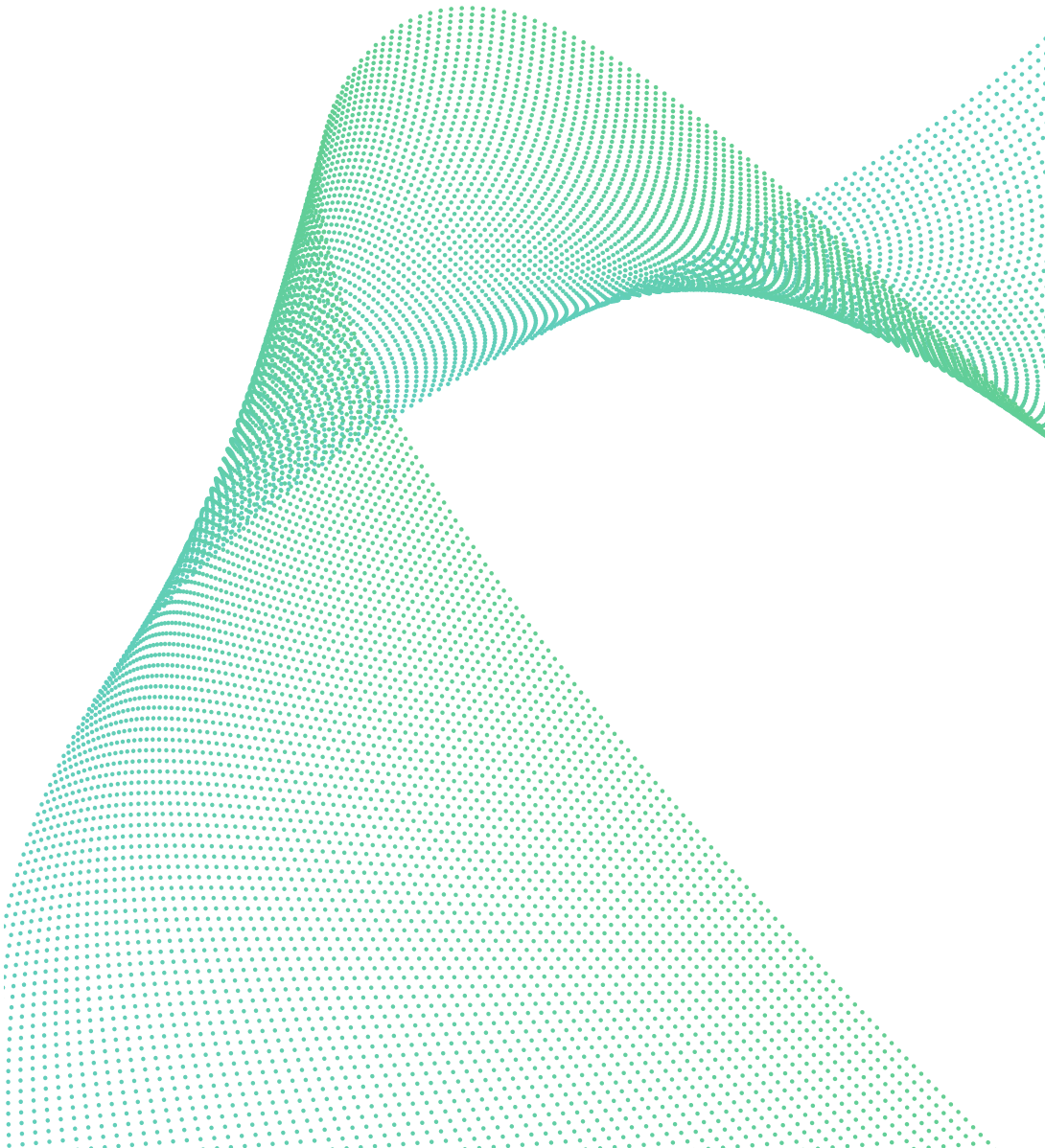

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Introduction

VMware has many customers in the world, and so does Veeam®. At events, I have been able to see that we have many customers in common. The center of the virtualization stack from VMware is vCenter Server, and the importance of vCenter Server is known by most of us. Keeping it available is important and this paper will help you learn how you can maximize the uptime and minimize the downtime of your vCenter Server environment.

Audience

This guide is for system administrators and system engineers who are experienced with Veeam Backup & ReplicationTM as well as VMware vSphere.

What you will learn

In this paper, you will learn how to protect the vCenter Server Appliance (VCSA) and the Platform Services Controllers (PSC). When you have the VCSA — which is both vCenter Server and the PSC in one VM — it is easy to back up and restore but it is becoming more common for customers to have more than one PSC and then you need a process to recovery them successfully. This paper will provide all the necessary information to backup and restore in both simple and complex environments.

Background information

VMware

VMware vSphere is the most popular virtualization environment in the enterprise and is composed of hosts called ESXi that can run virtual workloads and vCenter Server which provides the control and management. vCenter Server can take the form of an appliance or windows based. This paper is primarily concerned with the VCSA, which is VMware's stated direction of vCenter Server.

When vCenter Server needs to scale, such as to handle distance / latency, or it needs High Availability, there are additional designs possible. Generally, what happens is the introduction of additional components called PSC. What this might look like is seen below:

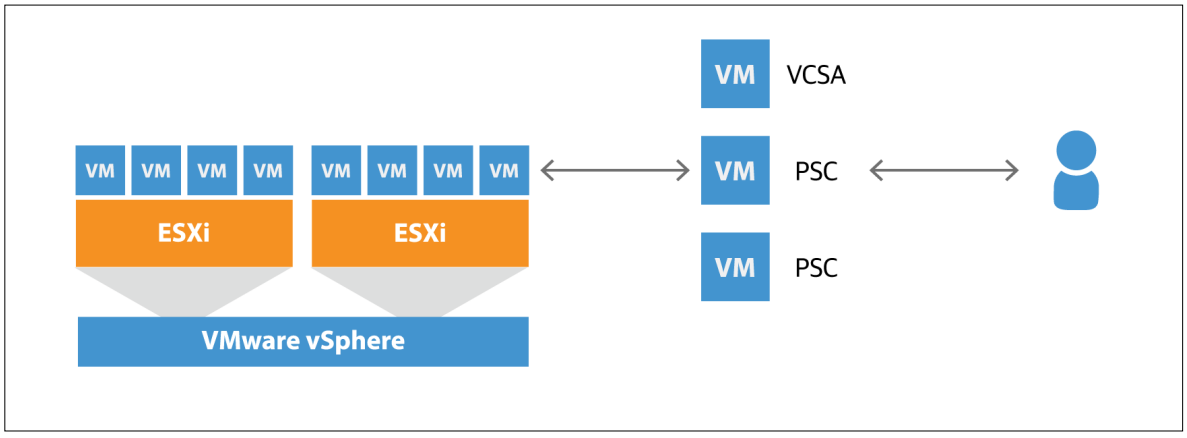

Figure 1 — VMware infrastructure

In the diagram above (Figure 1), we have a single VCSA managing two hosts with a collection of VMs running on them. There are two PSCs that provides some redundancy. The load balancer is not seen but can be assumed in the diagram.

Veeam

Veeam is one of the most popular and fastest growing Availability products in the virtualization space.

Veeam has a backup server that provides management and control, and proxy servers that provide the scale necessary to backup an enterprise. VMs are normally the source, but storage snapshots can also be the source for backups. VMs can be restored as VMs, but you can also restore elements of databases in the form of Microsoft SQL Server/Oracle, mail from Exchange, or Active Directory elements such as Group Policy Objects (GPOs) or user passwords. An example architecture is seen below.

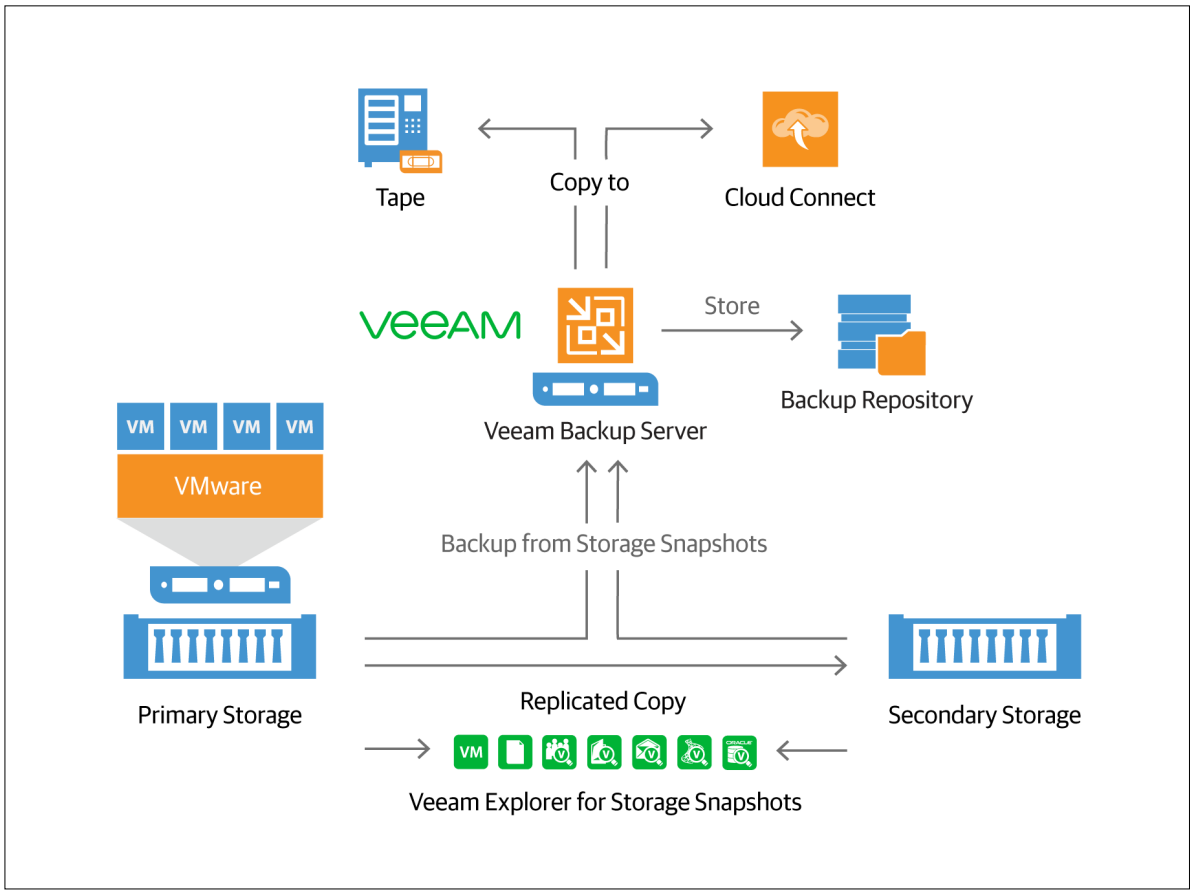

Figure 2 — Veeam backup infrastructure

In the diagram (Figure 2) above, we have a VM that has Veeam Backup & Replication management and a co-located proxy that does the actual backup. It backs up to a repository that is local, as well as a Veeam Cloud Connect repository at a Veeam Cloud & Service Provider (VCSP) partner. It also shows how Veeam can perform backups (or restores) from the storage array. This makes sure that regardless of what kind of an outage occurs, restores can happen. Yes, the tape drive in the diagram is, in fact, supported and you would be surprised how popular tape drives are with Veeam!

Backup models

The simple model below is one VCSA with an embedded PSC. This means one VM and that does make it simple. The not simple model below is when there is one or more external PSC. Regardless of your simple or not simple model, make sure to schedule your backup of VCSA / PSCs to occur in a time period when the least amount of changes are occurring — probably late at night.

Important note: *You should backup your vSphere Distributed Switch environment as often as you backup your VCSA. It is easy to script that and a link to the script is in the Additional Resources section. You can execute that script as part of a pre-action in your backup so you always have a current backup of your vSphere Distributed Switch (vDS).*

Simple

In this example, you have just the VCSA, and so you back up the whole thing, and you can restore the whole thing. It is always best to backup or restore the whole appliance. You do not do anything with the database. You will sometimes hear a file backup, or a non-image, backup is possible. It is important to know that with all commercial backup software, you must do an image backup. It is only possible to do a file based backup by using the VCSA management user interface (UI).

Not simple

In this example, we have one VCSA, and we have it supported with two PSC. In this case, the backup would still be a VM level image backup of all three VMs.

Important note: *You use the VCSA in the form of the vSphere Web Client to create and manage the Distributed Switches but the configuration is stored on the hosts. It is worth doing a regular backup and you may need to restore the vSphere Distributed Switch (vDS) at some point after you have restore the VCSA and you are having network issues. So, make sure you have a current backup of the vDS as suggested above.*

Restore models

Once you have a backup, there are many ways to restore it as a VM, file, object and much more. In fact, Veeam has 57 ways to restore, but with the VCSA and PSC, it is important to only ever restore the whole VM.

Simple

Restore the VM over the old one. If you have completely lost your VCSA, you may need to attach your backup software to an ESXi host first, and then do the restore of the VCSA.

Use the steps below to get you started on your restore when you have to restore your VCSA.

1. You need to attach a host to Veeam so that you can restore to it. The VCSA is not available to orchestrate your restore since it is gone. In Veeam, change to the **Backup Infrastructure**, followed by a right click in the white area to add your host, as seen below in Figure 4.

2. Add your host — you will need some credentials for that host.

3. Then right-click again and hit **Refresh**.

4. Now start the restore — see where in Figure 3.

5. Select **Entire VM**.

6. Select your backed up VM to restore.

7. ou must select **Restore to a new location** — see what that looks like in Figure 5.

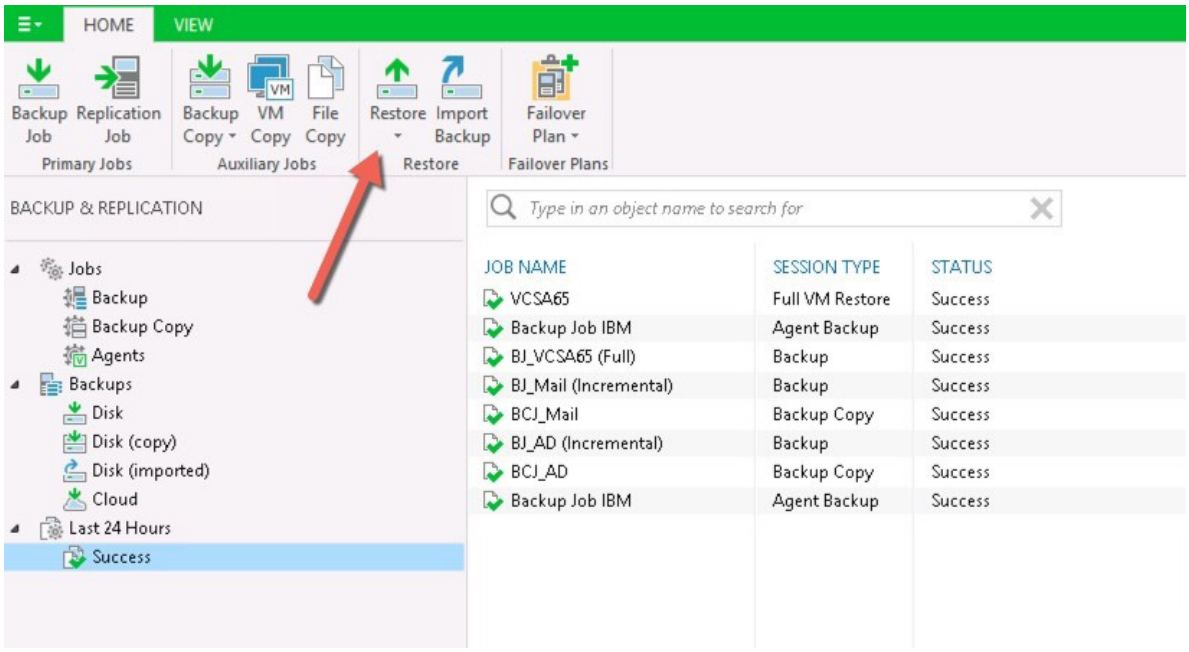

Figure 3 — Start a restore

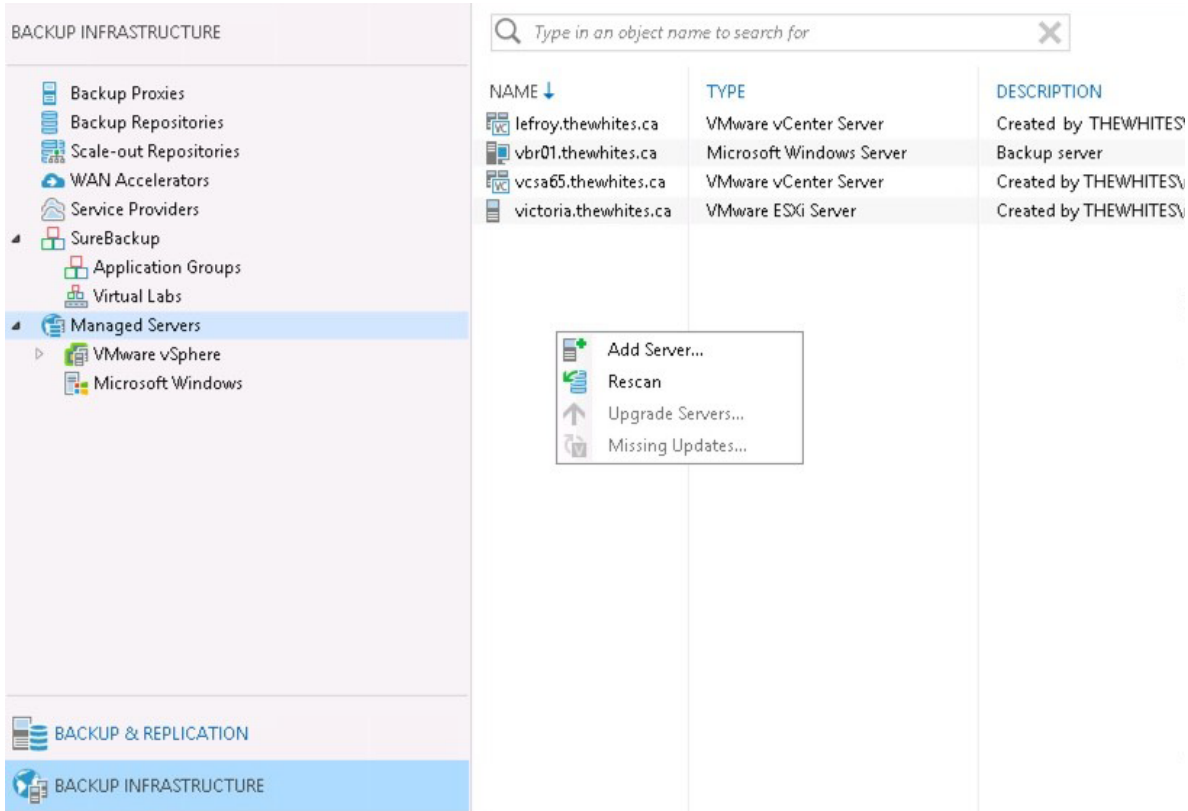

Figure 4 — Add a server

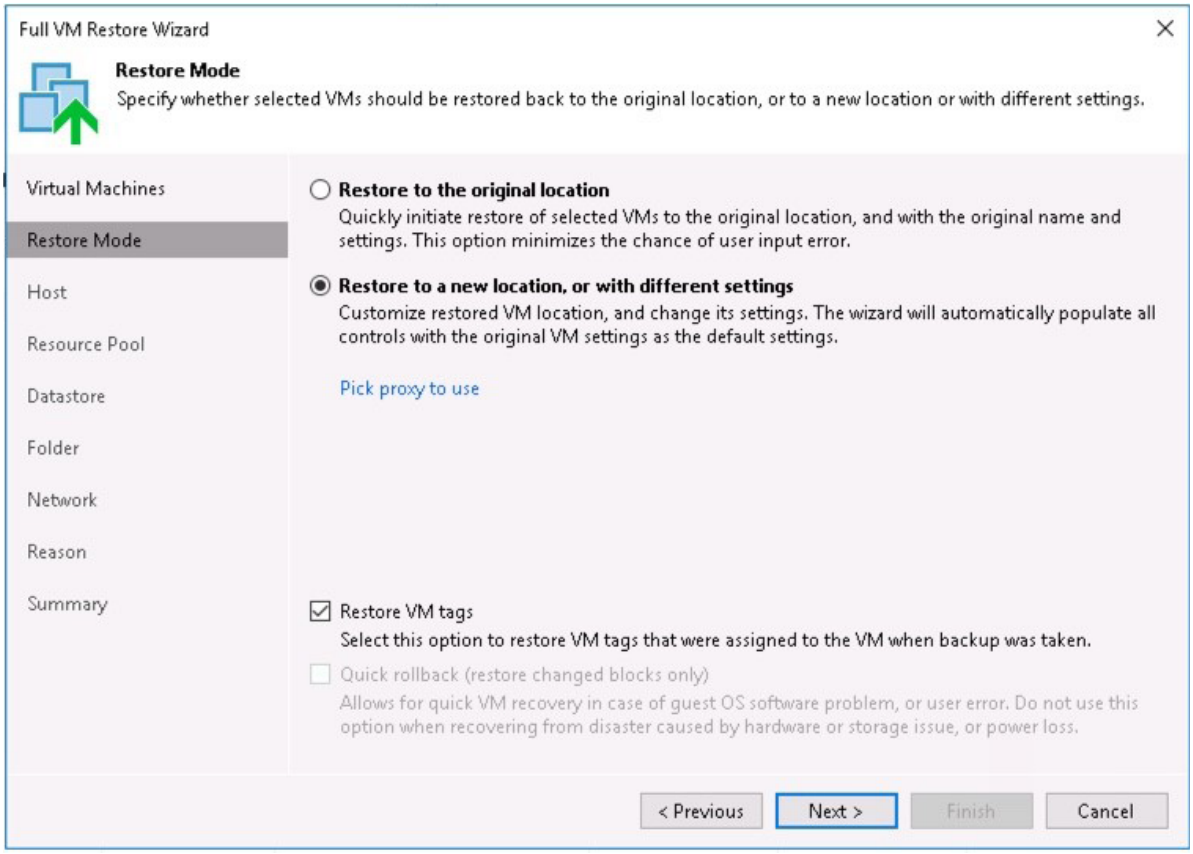

Figure 5 — Restore to a new location

8. It is **important** in the next screen — even if you see your **host** — that you use the Host button to select your host again. See the screen in Figure 6. This host should be the one you added as a host to Veeam. If you do not do this, you will have errors!

9. Now click **Next** through but make decisions as you need. For example, I changed the storage that I wanted the restored VM to end up on.

10. Once you have proceeded through the wizard, you can start the restore.

Once restored, it takes maybe five minutes for your VM to start up and be usable.

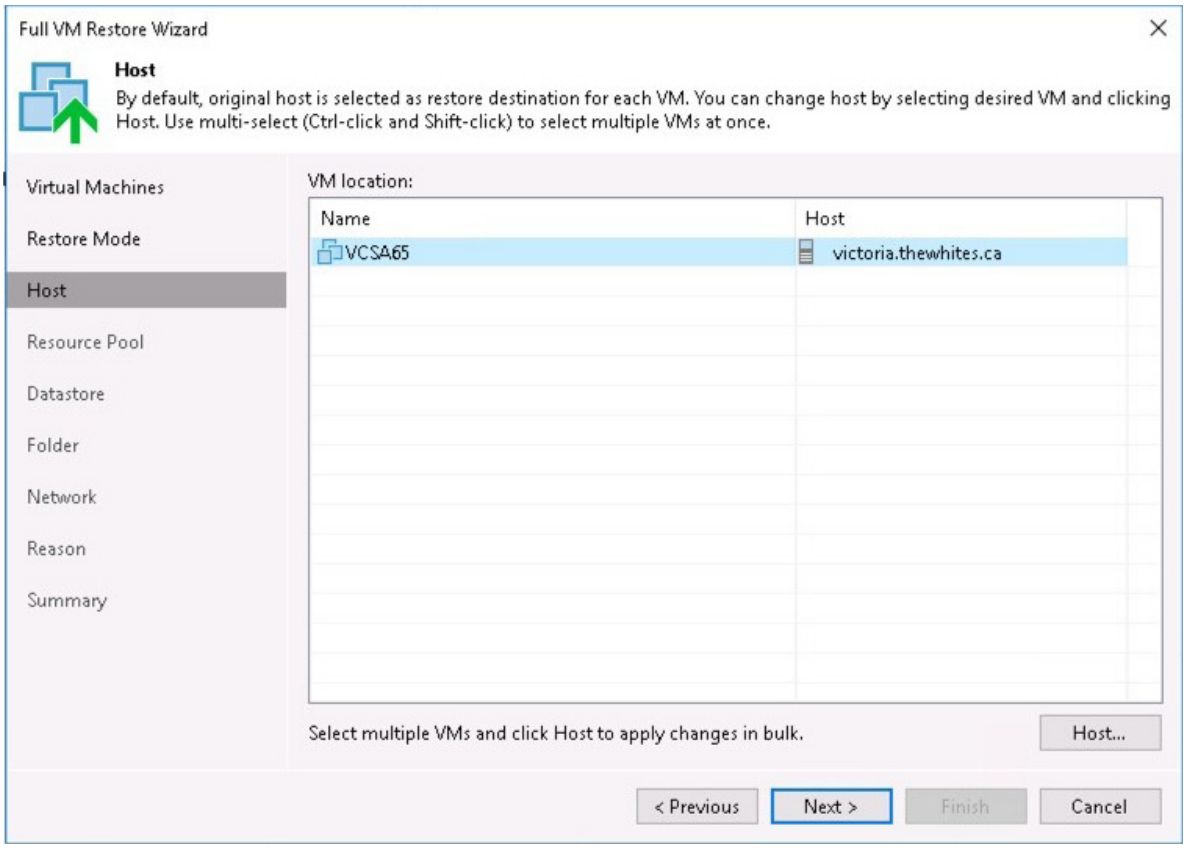

Figure 6 — Use the Host button to select your host.

Important note: *Sometimes when you restore your VCSA, you may not be able to connect to it, and you may not be able to ping it. This can occur when you are NOT using an ephemeral switch port. You need to change the network that the VCSA is connected to — meaning it should be connected to a distributed port group of type ephemeral. You can change the connection back to whatever you want once the VCSA is running properly and accessible. Some customers will keep a distributed port group of the ephemeral type just for this situation and not use it normally.*

Not simple

Since we need to restore several different components, such as the VCSA and several PSCs, the restore is a little different.

Important note: *You may not be able to execute PSC (or VCSA) command line commands, and if so, use the following commands:*

Service-control --start applmgmt

Shell.set --enabled true

Scenario 1 — Lost one PSC and VCSA / PSC still remaining

In this situation, you would do the following:

1. Repoint VCSA
2. Decommission lost PSC
3. Deploy a new PSC

This would make sure the existing PSC is pointed at and working with the VCSA, and remove the name of the old PSC, and then the new deployed PSC would take over the place of the lost PSC.

Repoint

The command on the VCSA to repoint is: **cmsso-util repoint --repoint -psc <pscname>**. See the example below. Be aware it does take a few minutes.

```
VMware vCenter Server Appliance 6.5.0.5600

Type: vCenter Server with an external Platform Services Controller

Last login: Tue Jul 25 13:22:36 2017 from 192.168.9.134
root@vcsa65 [ ~ ]#
root@vcsa65 [ ~ ]# cmsso-util repoint --repoint-psc vcsa65psc02.thewhites.ca
Validating Provided Configuration ...
Validation Completed Successfully.
Executing repointing steps. This will take few minutes to complete.
Please wait ...
Stopping all the services ...
All services stopped.
Starting all the services ...
Started all the services.
The vCenter Server has been successfully repointed to the external Platform Services Controller vcsa65psc02.thewhites.ca.
root@vcsa65 [ ~ ]#
```

Figure 7 — Repointing VCSA to look to new PSC

You can test by logging in which should now work once the VCSA is pointed to the surviving PSC. However, it may fail if you have not prepared by having all PSC configured for Active Directory! If that is true, you should be able to log in as the administrator and configure Active Directory. I do suggest that every PSC has Active Directory configured.

Decommission

The command on the PSC to decommission is: **cmsso-util unregister --node-pnid <pscname> --username --passwd**

In this example, pscname is the old PSC to be decommissioned.

```
root@vcsa65psc02 [ ~ ]#
root@vcsa65psc02 [ ~ ]# cmsso-util unregister --node-pnid vcsa65psc01.thewhites.ca --username administrator@vsphere.local --passwd
2017-07-25T17:27:21.246Z   Running command: ['/usr/lib/vmware-vmafd/bin/dir-cli', 'service', 'list', '--login', 'administrator@vsphere.local']
2017-07-25T17:27:21.274Z   Done running command
Success

root@vcsa65psc02 [ ~ ]#
```

Figure 8 — Decommission a lost PSC

Now, you test to confirm things are working. Can you log in?

Scenario 2 — Multiple PSC gone

In this situation, we have VCSA(s) still running but have lost all PSC.

1. Restore one PSC.
2. You should be able to log in now, but if you cannot, then it means the PSC that was restored is not the one that the VCSA is pointing at. So, do the repoint using the info above.
3. You should be able to log in now. If not, make sure the PSC is configured for Active Directory.
4. Deploy new PSC to replace missing.

Now test! Make sure you can log into the vSphere Web Client and see what you would expect.

Scenario 3 — VCSA and PSC all gone

In this case, you would restore first a PSC, then the VCSA and then deploy the remaining missing PSC as new.

1. Connect Veeam to a host since the VCSA that Veeam is configured with is missing. You can find help with that above.
2. Restore and start a PSC. Wait approximately five minutes for it to start.
3. Restore VCSA.
4. If the restored PSC is not the one that the VCSA points to, you may need to do a repoint (see above how to do that).
5. Deploy additional PSC as required if necessary.

Now test! Make sure you can log into the vSphere Web Client and see what you would expect.

Scenario 4 — VCSA and some PSC gone but some remain

In this case, we would restore the VCSA, repoint it and deploy the remaining PSC as new.

1. Restore VCSA.
2. Can you log in?
3. If not, repoint it to existing PSC (see above how to do that).
4. Confirm you can log in successfully.
5. Deploy as new the remaining PSC that is missing.

Do not restore more than one PSC at a time as the pairing is sequential.

Now test carefully.

Veeam-specific information

It is important when you back up your VCSA and PSC that you do so with no application consistent configuration.

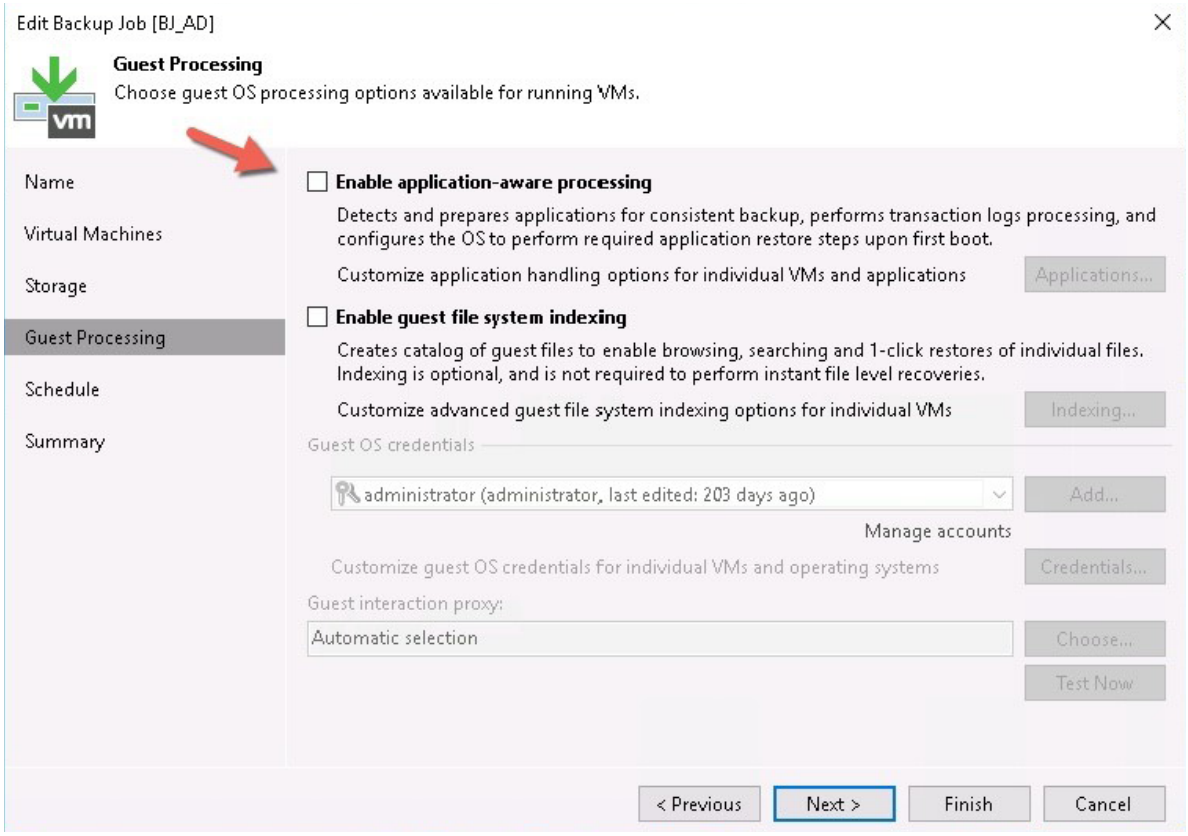

Figure 9 — Guest Processing is not enabled!

Note in Figure 9 above that the guest application-aware processing is not enabled. That is the way the backup job should be configured for your VCSA/PSC backup.

It is mentioned above that it is a good idea to backup your vDS switch configuration as part of your backup. There is a link to the script in the appendix. You can see where you would configure your backup job to execute the script in Figure 10.

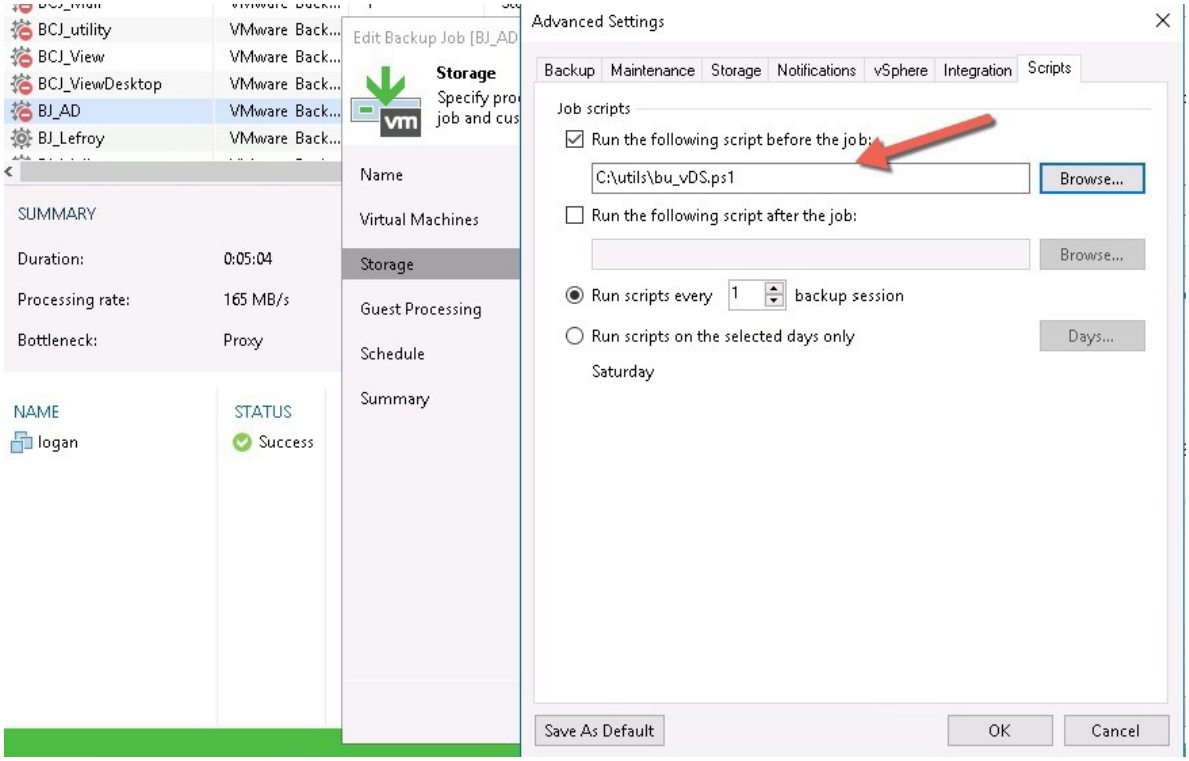

Figure 10 — Execute script during backup

Test

There are several things you can do to confirm that your backup and restore process works.

Test 1
Did you restore the VM(s) without error?

Test 2
Can you log on, and power on or off the VM(s)?

Test 3
Can you log in and see your environment as you expect?

Test 4
Are the PSCs successfully replicating?

Working in the Command Line Interface (CLI) on the PSC, you can use the following command to check the replication status: (in the /usr/lib/vmware-vmdir/bin folder) **./vdcrepadmin -f showpartnerstatus -h VCSA_FQDN -u administrator -w password**. You can see an example below.

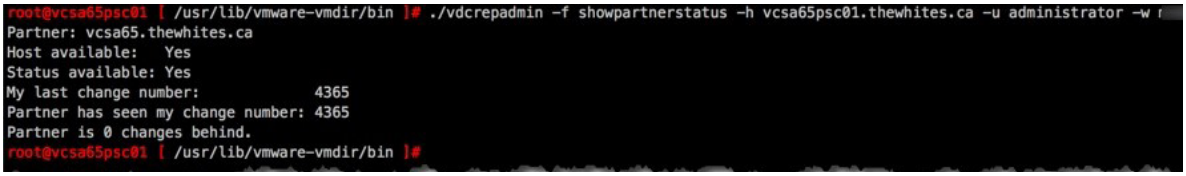

Figure 11 — replication status

Conclusion

In this paper, you have learned how to back up and successfully restore the VCSA and PSC and you have learned some things to make it a little easier!

Additional resources

You can find additional resources below.

VMware

- vCenter Server documentation — link
- Deploy PSC — link

Veeam

- Veeam Backup & Replication documentation — link
- How to restore vCenter Server without vCenter Server — link

Miscellaneous

- How to backup VDS by script — link

Some useful commands

- Reconfigure embedded PSC to External — link for more info. The screenshots show the command and the output for changing from an embedded PSC to an external.

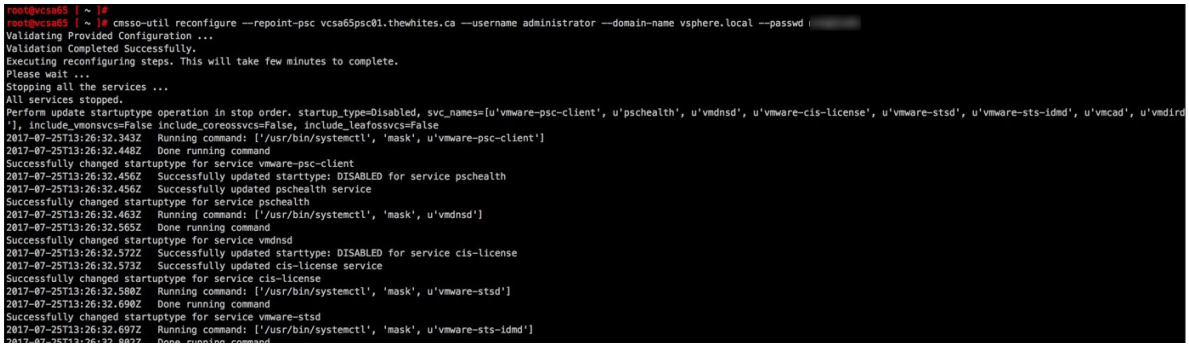

Figure 12 — Start of reconfigure process

Figure 13 — Finish of reconfigure process

- Show Single Sign-On (SSO) partners in PSC CLI — link

About the lab

We used the following components in our lab work that supported this paper.

- VMware vSphere 6.5 - vCenter Server 6.5 build 5705665, ESXi 6.5 build 5310538
- Veeam Backup & Replication 9.5 Update 2, build 9.5.0.1038

Acknowledgements

I want to thank **Emad Younis** for his help with this. In addition, we presented together on the same subject at VeeamON 2017 and I learned a lot. Thanks very much, Emad!

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Eugene Kashperovetsky was a huge help with the testing in this paper. There was a lot of conflicting information from documentation and even VMware people, and so we had to test everything and it was very good that we had two people doing the tests. I really appreciate the help, Eugene. Thanks very much.

About the Author

Michael White (vExpert, VMware VCAP6-DCV, Veeam Certified Engineer) was a Technical Evangelist at Veeam Software, but is currently part of Veeam R&D as a Product Manager. Michael is a popular blogger and speaker. Michael's current career started in Professional Services where he focused on virtualization. His main areas of expertise are VMware design and implementation, particularly around disaster recovery and business continuity. Follow Michael on twitter @mwVme or via his blog.

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