

# ITAS 267

## Project 1

Rylan Redberger

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## Objective

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This document will cover completion of ITAS 267 Project 1. This project includes setting up 2 VMware Replication Appliances. It also includes creating an infrastructure of 2 ESXi instances, 2 vCenter instances, as well as creating a domain with 2 domain controllers, and a failover cluster file server cluster.

## Demonstration Video

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Here is the link to the [demonstration video](#), showcasing the entire setup.

## Setting up The Infrastructure

This section documents the networking setup and machines required to complete all requirements. Below is the network diagram outlining the setup. I will give more details as we go farther in depth to my setup.

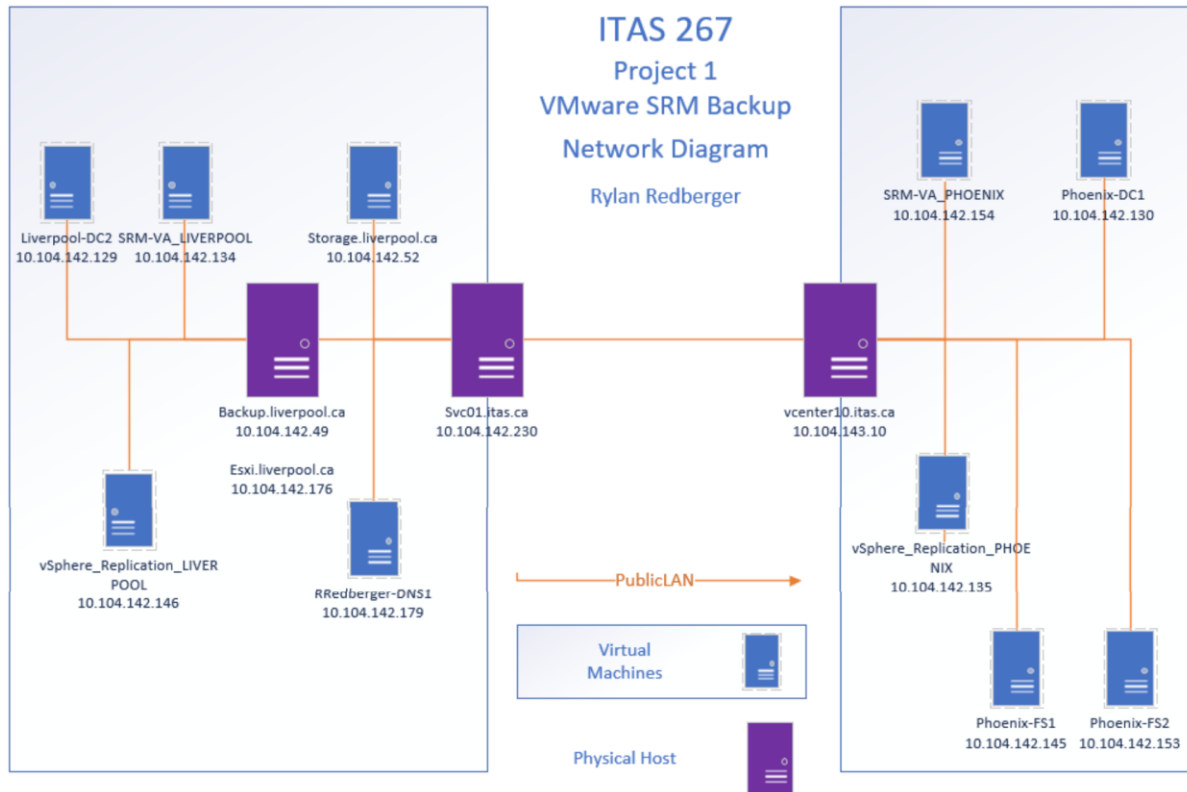


Figure 1 Network Diagram

### IP Table

Host Name	IP Address
Liverpool-DC2	10.104.142.129
Srm.liverpool.ca	10.104.142.134
Srm.phoenix.ca	10.104.142.154
Replication.phoenix.ca	10.104.142.135
Replication.liverpool.ca	10.104.142.146
RRedberger-DNS1	10.104.142.179
Phoenix-DC1	10.104.142.130
Phoenix-FS1	10.104.142.145
Phoenix-FS2	10.104.142.153
Vcenter10.itas.ca	10.104.143.10
Backup.liverpool.ca	10.104.142.49
Esxi.liverpool.ca	10.104.142.176

To start, we need 2 ESXi hosts to replicate VMs between. In this case, I have my tower *vcenter10.itas.ca* and I am replicating over *PublicLAN* to the *backup.liverpool.ca* which is hosted on *svc01.itas.ca*. With this basic configuration complete, all of the problems must be addressed. First, everything is only able to be completed with DHCP, as I am operating on the *PublicLAN*. This is not a problem unless the IPs change. If this were to happen, a singular place to reconfigure the new IP address is ideal. This is solved by a DNS server, and using DNS to manage all hosts. Above, you can see the DNS server located on *svc01.itas.ca*. Below is a screenshot of all the records that the DNS server provides.

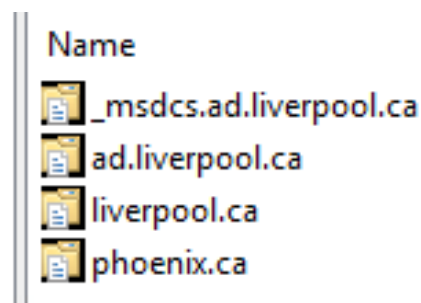


Figure 2 DNS domains

IS			
REDBERGER-DNS1	Name	Type	Data
Forward Lookup Zones	(same as parent folder)	Start of Authority (SOA)	[4], rredberger-dn
> _msdcs.ad.liverpool.c	(same as parent folder)	Name Server (NS)	rredberger-dns1.
> ad.liverpool.ca	files	Host (A)	10.104.142.147
> liverpool.ca	replication	Host (A)	10.104.142.135
phoenix.ca	srm	Host (A)	10.104.142.154
Reverse Lookup Zones			

Figure 3 Phoenix.ca DNS entries

REDBERGER-DNS1			
Forward Lookup Zones	Name	Type	Data
> _msdcs.ad.liverpool.c	ad	Start of Authority (SOA)	[13], rredberger-dns1., hos...
> ad.liverpool.ca	(same as parent folder)	Name Server (NS)	rredberger-dns1.
> liverpool.ca	backup	Host (A)	10.104.142.49
phoenix.ca	esxi	Host (A)	10.104.142.176
Reverse Lookup Zones	replication	Host (A)	10.104.142.146
Trust Points	srm	Host (A)	10.104.142.134
Conditional Forwarders	storage	Host (A)	10.104.142.52

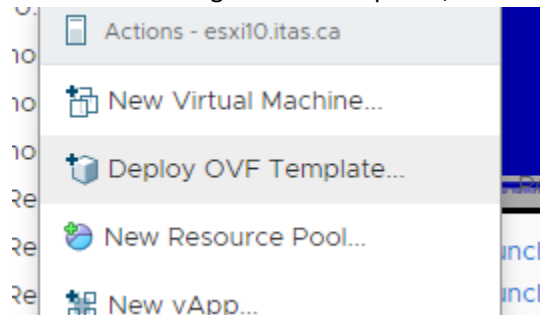
Figure 4 Liverpool.ca DNS entries

As you might have noticed, I also used this DNS server to be a Domain Controller to allow SSO login into the Liverpool vCenter server.

Each ESXi host has vCenter installed on top, as well as an SRM VM, and a Replication VM. This setup was most of the project, but the next section of documentation will cover setting up and deploying both replication VMs.

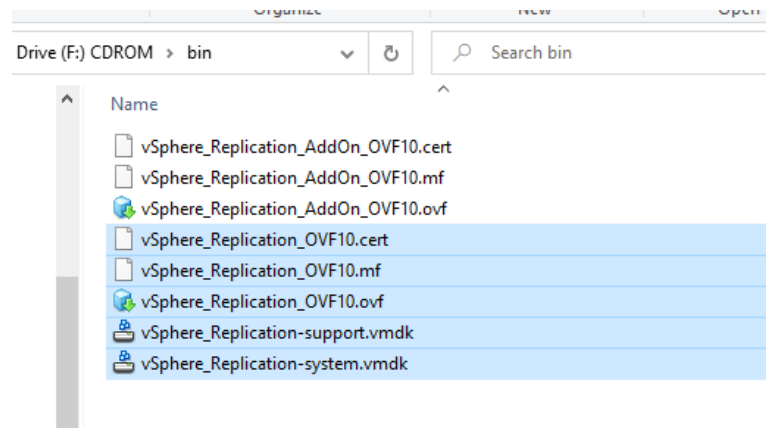
## Deploying Replication VMs

After downloading the OVF templates, I could begin deployment in vCenter.



**Figure 5 Deploy OVF Template**

Next I simply selected the required OVF files.



**Figure 6 OVF files selection**

After agreeing to the license, I could choose how many vCPUs to deploy.

ie

der

source

Configuration

Select a deployment configuration

☒ 2 vCPU

☐ 4 vCPU

**Figure 7 2vCPU selection**

I then selected the datastore, as well as the destination network. To finish deployment, I set all the passwords on the final page, and let the VM deploy.

ate

2 properties have invalid values

Application

6 settings

Enable SSHD

Determines whether the SSHD service will be enabled and started by default in the appliance.

☐

Initial root password

This will be used as an initial password for the root user account.

Password

Confirm Password

Initial admin user password

This will be used as an initial password for the admin user account.

Password

Confirm Password

NTP Servers

A comma-separated list of hostnames or IP addresses of NTP Servers.

Hostname

The hostname for this VM. Leave blank to try to reverse lookup the IP address.

File Integrity Flag

This will be used as flag whether to enable file integrity.

**Figure 8 Passwords input**

All the deployments are very similar, and since I am using DHCP I was able to get IP's without statically setting them. Now all I needed to do is create DNS entries as well as point the applications to the DNS server manually.

## Configuring the Replication VMs

This section covers configuration of the replication appliances, including creating a site pair, creating protection groups, and recovery plans.

### Creating a Site Pair

To start with creating a site pair, simply click the *New Site Pair* option.

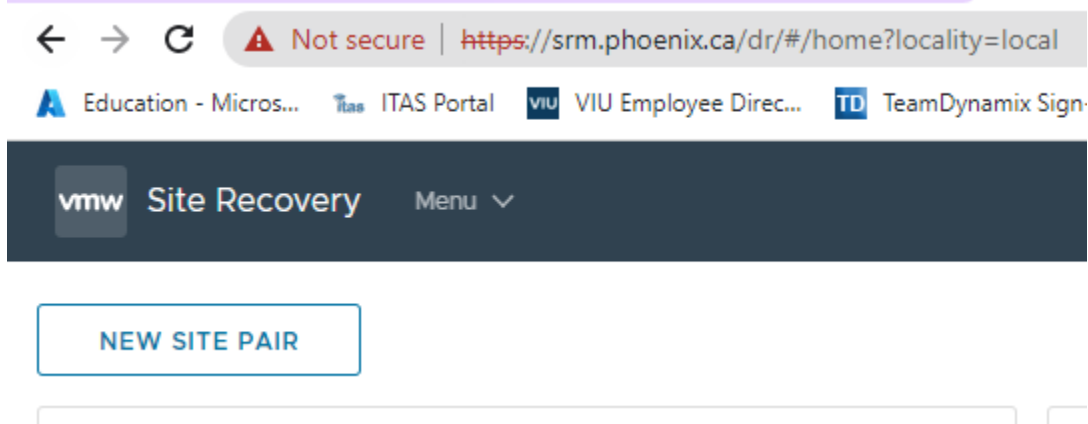



Figure 9 New Site Pair button

Leave the pair type at the default and input the hostname as well as the logon password and username.

### Peer vCenter Server

All fields are required unless marked (optional)

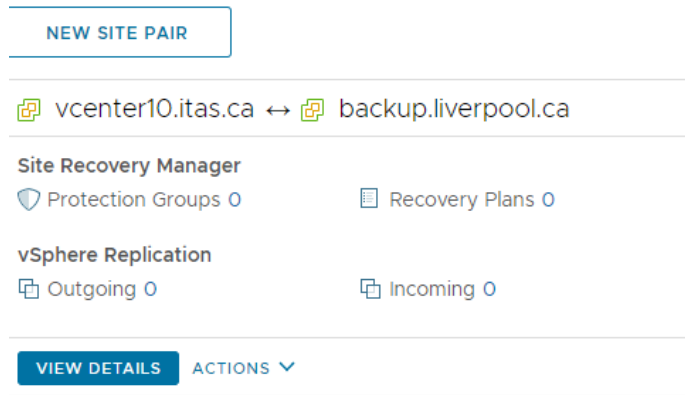
Enter the Platform Services Controller details for the peer vCenter

PSC host name	<input type="text"/>
PSC port	<input type="text" value="443"/>
User name	<input type="text"/>
Password	<input type="password"/> 

**FIND VCENTER SERVER INSTANCES**

Figure 10 Find vCenter Server Instances

Click through the installer and select both the replication services. Finally, complete the installer and click on details on the site pair.

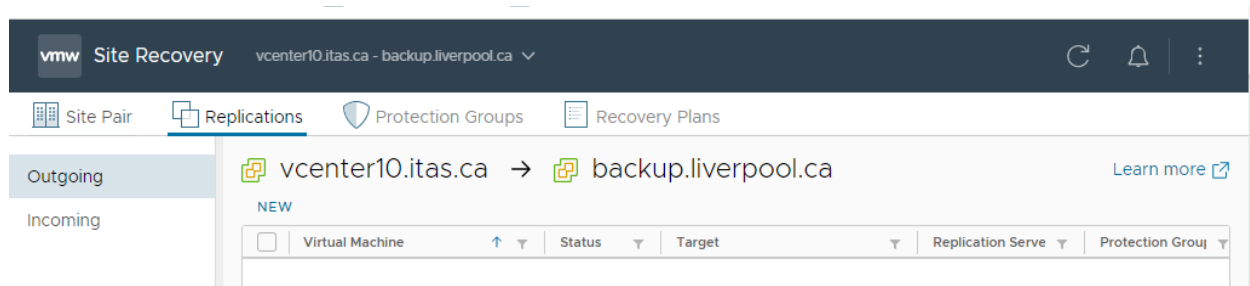


**Figure 11 Site pair completed**

In this management interface, replications as well as protection groups and recovery plans can be created.

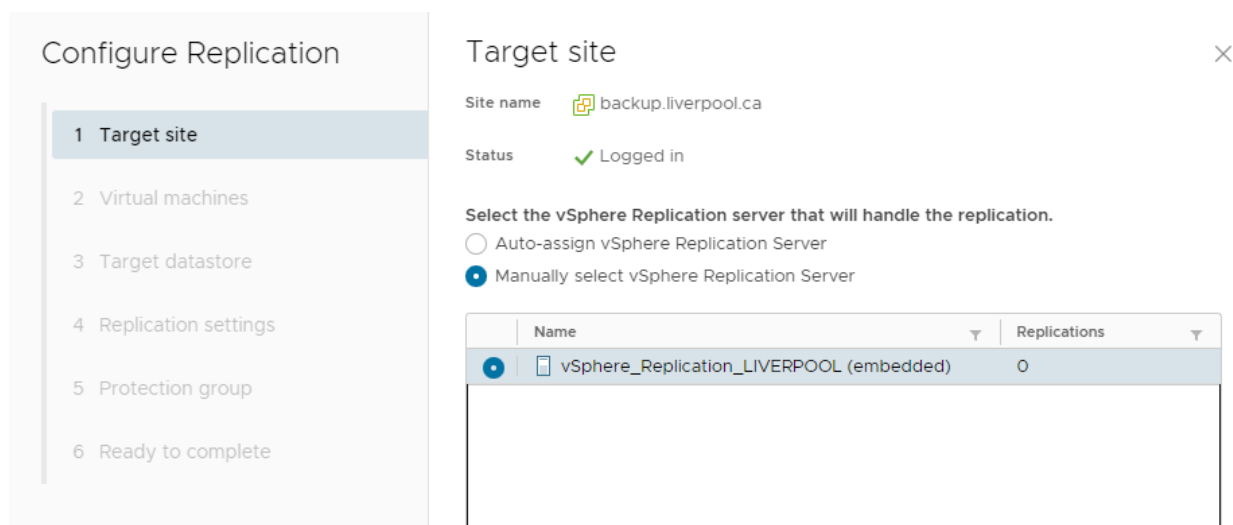
## Creating Replications

To create replications simply navigate to the replications tab and create a new outgoing replication by using the outgoing tab and clicking new.



**Figure 12 Replications tab**

Next, select the target replication server.



**Figure 13 Target site**



Choose the VMs you would like to replicate over to the secondary site.

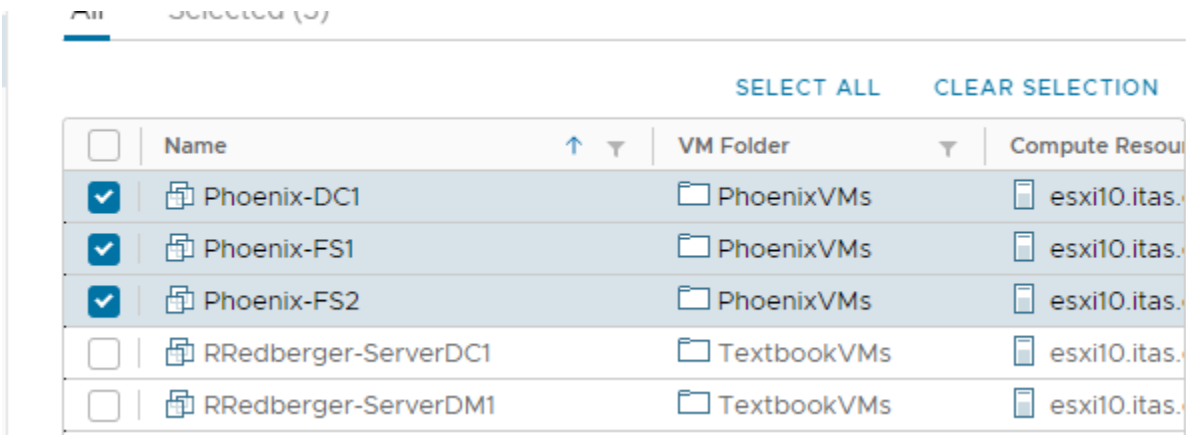


Figure 14 Replication VM selection

Select the target datastore.

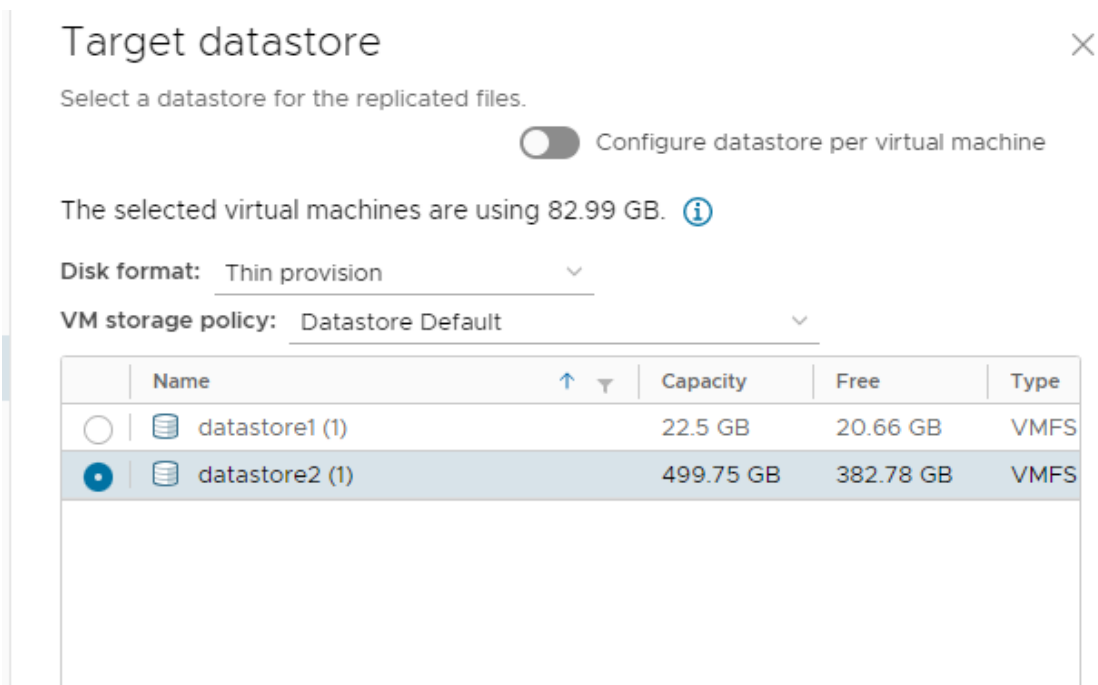


Figure 15 Choose target datastore

Select the replication settings that are required. In my case I chose to replicate every hour and **Enable Guest OS Quiescing**.

### Configure Replication - 3 VMs

- Target site
- Virtual machines
- Target datastore
- Replication settings**
- Protection group
- Ready to complete

## Replication settings

Configure the replication settings for the virtual machines.

**Recovery point objective (RPO)** ⓘ

5 minutes 
24 hours
 1 hour

☐ Enable point in time instances ⓘ

Instances per day

Days

Keep 3 instances per day for the last 5 days.

If the RPO period is longer than 8 hours, you might want to decrease the RPO value to allow vSphere Replication to create the number of instances that you want to keep.

☒ Enable guest OS quiescing ⓘ

☐ Enable network compression for VR data ⓘ

☐ Enable encryption for VR data ⓘ

⚠ 3 of the selected VMs do not support encryption.  
Encryption is enabled only for the VMs that support it. [Details](#)

CANCEL BACK NEXT

**Figure 16 Set replication settings**

Next, I added a new Protection Group and named it PhoenixOutProtection. On the next page, I created a Recovery Group named PhoenixRecovery.

## Protection group

You can add these virtual machines to a protection group.

☐ Add to existing protection group  
☒ Add to new protection group  
☐ Do not add to protection group now

Protection group name:

60 characters remaining

**Figure 17 Protection group creation**

Next, I assigned all the missing mappings for network, folder, and resources.

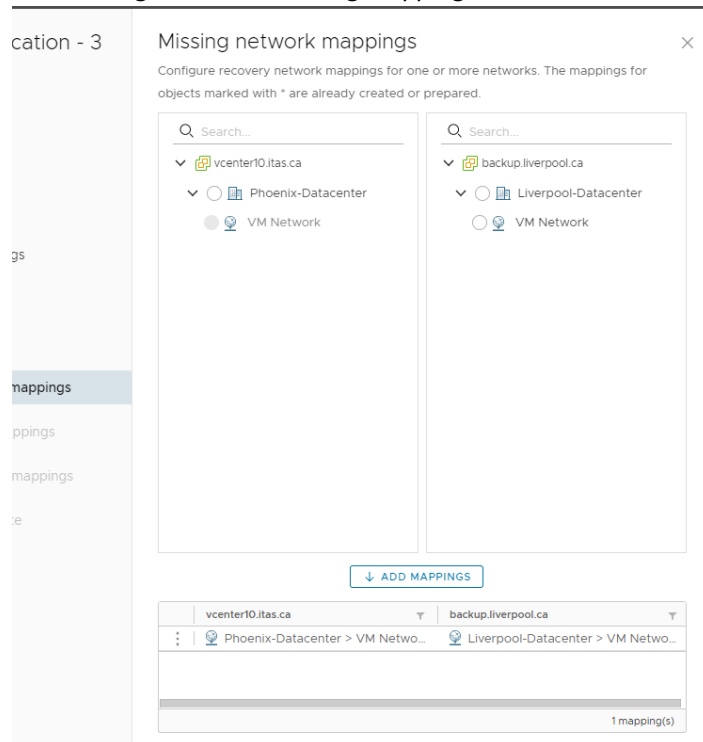


Figure 18 Network mappings

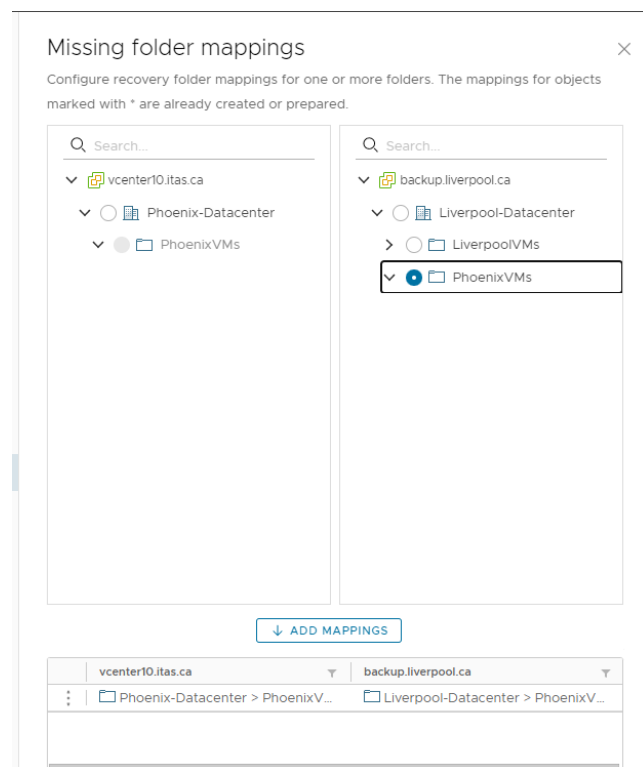
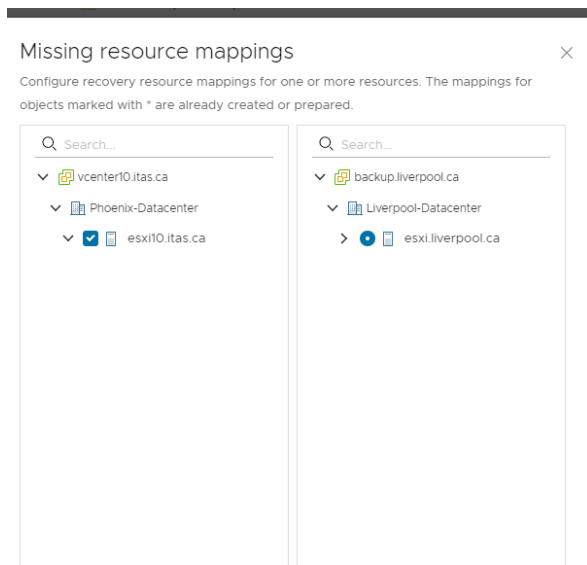
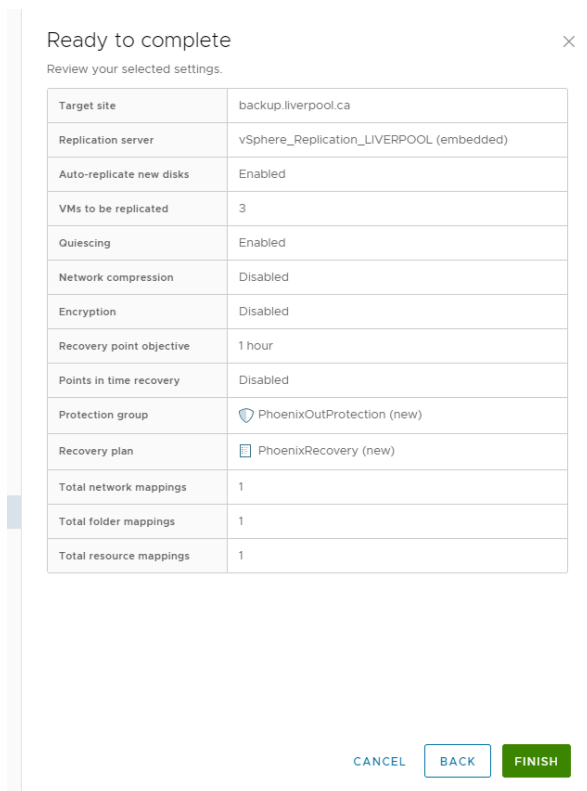


Figure 19 Folder mappings

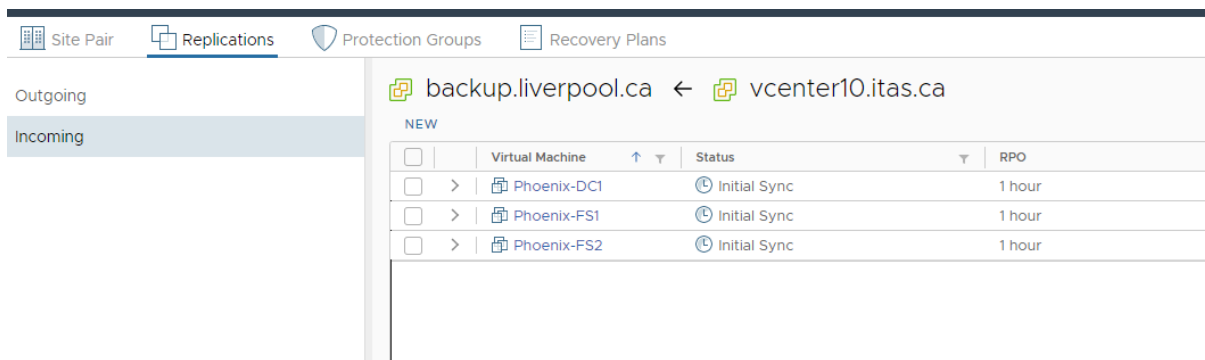


**Figure 20 Resource mappings**



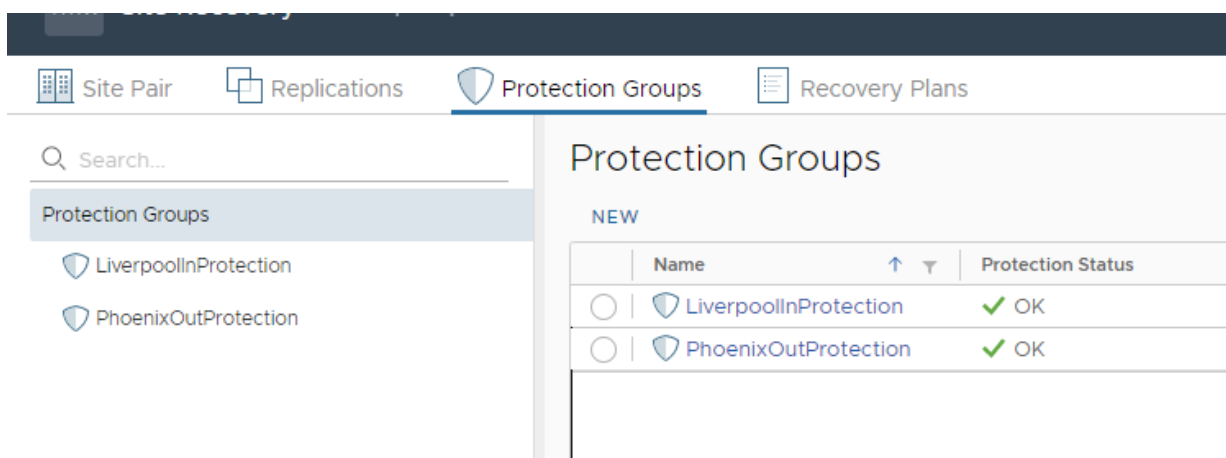
**Figure 21 Completion**

After completing the steps outlined above you will see your replicated VMs being synced.

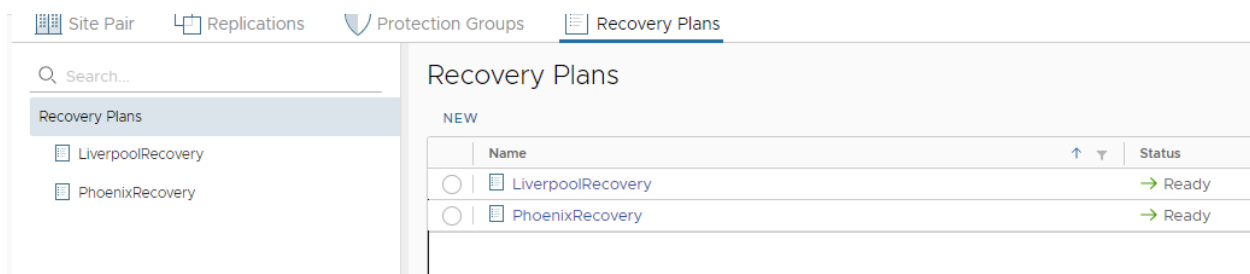


**Figure 22 VMs being replicated**

These VMs will be synced after some time. As you may have noticed the protection group, and recovery plan was created in the same installer and can be seen in their respective tabs.



**Figure 23 Protection groups created**



**Figure 24 Recovery plans created**

Your replications are now in progress and should happen hourly. At the top of this document is the video demonstration showing the whole system working.

## Summary

This document covered deploying and configuring VMware SRM, and VRMS. These tools allow VMs to be replicated across vCenter servers. Once the initial infrastructure was set up the VMware Appliances deployed quickly and were easy to set up and configure. This project taught me about replication using VMware tools.