

# Adding Zadara Storage to VMware Cloud on AWS



## Revision History

Row	Version	Date	Description
1	1.0	26 Nov 2018	Initial release
2	1.1	15 Jan 2019	Updates for VMware style guide compliance, plus trademark acknowledgements

# Introduction

## VMware Cloud on AWS

Amazon describes VMware Cloud® on Amazon Web Services (AWS®) as an “integrated cloud offering jointly developed by AWS and VMware delivering a highly scalable, secure and innovative service that allows organizations to seamlessly migrate and extend their on-premises VMware vSphere®-based environments to the AWS Cloud running on next-generation Amazon Elastic Compute Cloud® (Amazon EC2®) bare metal infrastructure.”

## Problem

Unfortunately, the architecture of VMware Cloud on AWS (VMC-AWS) has, until now, made it impossible to present third-party storage located outside of Amazon's data centers to software-defined data center (SDDC) compute elements via AWS Direct Connect (DX). This restriction limited users' ability to present storage with full enterprise functionality to SDDCs hosted within AWS and forced users to scale storage and compute capacities in lock-step.

## Purpose

This document describes a new method of leveraging VMware's network virtualization and security platform, VMware NSX®, to enable users to take full advantage of Zadara's data centric, location agnostic storage solution. In this example implementation, we will present Zadara iSCSI Block, SMB and NFS NAS to guest VM's running in a new SDDC within VMware Cloud for AWS.

## Sample Use Cases

- Present the same Zadara file, block, and object storage to all compute elements, whether located on-premises, within one or more SDDCs, across multiple Virtual Private Clouds (VPCs), across multiple data centers, or across multiple cloud providers
- Scale storage capacity and compute elements independently
- Enhance availability with remote replication across regions, continents, or cloud providers
- Maximize application data security with user-managed encryption keys

- Ensure consistent high storage performance with 100% dedicated resources (i.e., no “noisy neighbors”)
- Match storage performance to application requirements when one size does not fit all

## Requirements

- SDDC v1.5 or later (NSX-T functionality enabled)
- AWS permissions to launch Cloud Formation script
- Zadara Virtual Private Storage Array (VPSA) in the same region as the SDDC in use

## Configuration Tested

- VMware Cloud on AWS using NSX-T (required)
- Single Host SDDC “starter configuration”<sup>1</sup>
  - 10 TB usable SSD capacity split between VSAN datastore to support management virtual machines (VMs - vCenter, NSX, etc.) and Workload data store to host application VMs
- VMware SDDC v1.5.0.29
- NSX flags
  - enableNsxtDeployment
  - enableNsxtCspAuth
  - reverseProxyUrl
  - installNsxtCert
  - enableNsxtTransitiveRouting
  - dxForMgmtApplianceAndWorkload
- Zadara 1000 engine, v18.07-104 (any appropriately sized engine may be used)
- Zadara VPSA configured with (any valid VPSA configuration may be used)
  - 8 x 10 TB SATA HDDs
  - Extended mirrored SSD cache (480 GB)

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<sup>1</sup> <https://cloud.vmware.com/vmc-aws/get-started>

# Overview

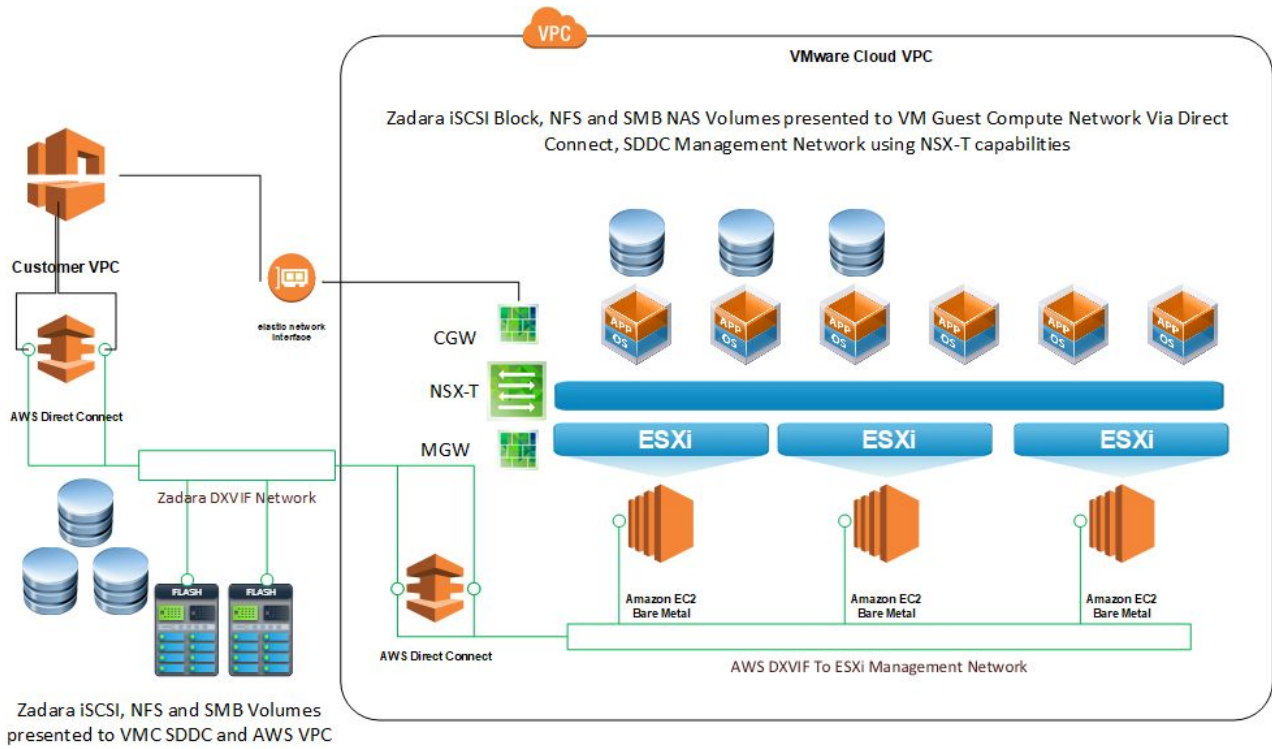


Figure 1. Overview diagram

# Walkthrough

## Planning Notes

- Make sure that you have Cloud Formation rights in your AWS account
- Review the latest Zadara Setup Guide (<http://guides.zadarastorage.com/>)
- By default, the SDDC will utilize a 10.0.0.0/20 network for management functions. Please ensure that this is not in use
- Zadara VPSAs will typically be on a 172.x.x.x network, depending upon region. However, Zadara supports custom networks and this can be set to a customer specific range if required

## Steps

1. Create an organization account on AWS and VMware Cloud
2. **CRITICAL:** make sure to request that the NSX-T flags are enabled on your organization before proceeding
3. Request a new SDDC at <https://cloud.vmware.com/vmc-aws>
4. Step through the SDDC creation wizard
  - a. Configure basic SDDC properties.

< Create Software-Defined Data Center (SDDC)

1. SDDC Properties Give your SDDC a name, choose a size, and specify the AWS region where it will be created.

AWS Region	EU West (London) More regions coming later
Deployment	<input checked="" type="radio"/> Single Host <input type="radio"/> Multi-Host <input type="checkbox"/> Stretched Cluster ⓘ
SDDC Name	Zadara NFS POC
Number of Hosts	1 ⓘ 1-host SDDCs expire in 30 days. <a href="#">LEARN MORE</a>
Host Capacity	2 Sockets, 36 Cores, 512 GB RAM, 10.7 TB Storage
Total Capacity	2 Sockets, 36 Cores, 512 GB RAM, 10.7 TB Storage

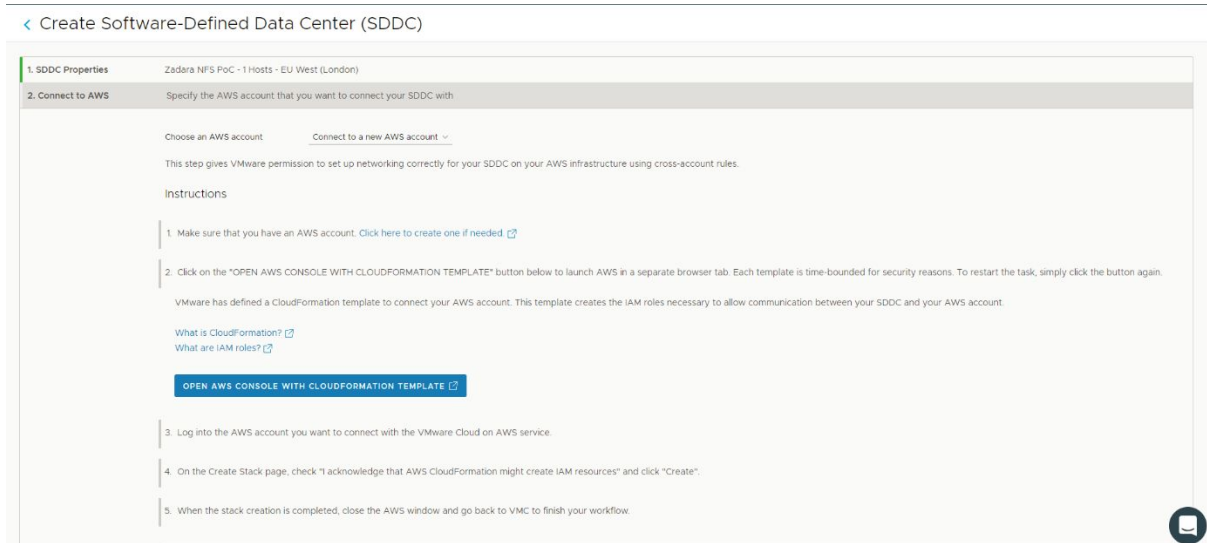
[NEXT](#)

2. Connect to AWS Specify the AWS account that you want to connect your SDDC with

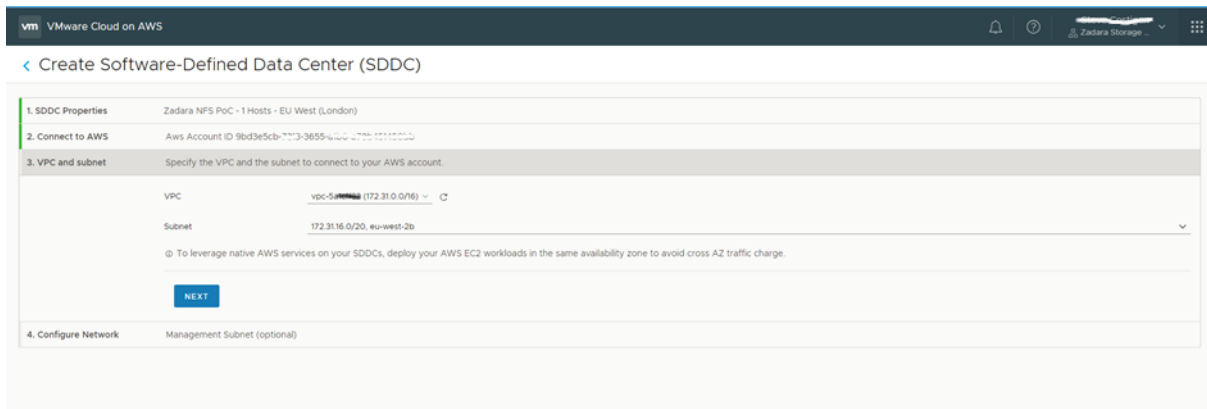
3. VPC and subnet Specify the VPC and the subnet to connect to your AWS account.

4. Configure Network Management Subnet (optional)

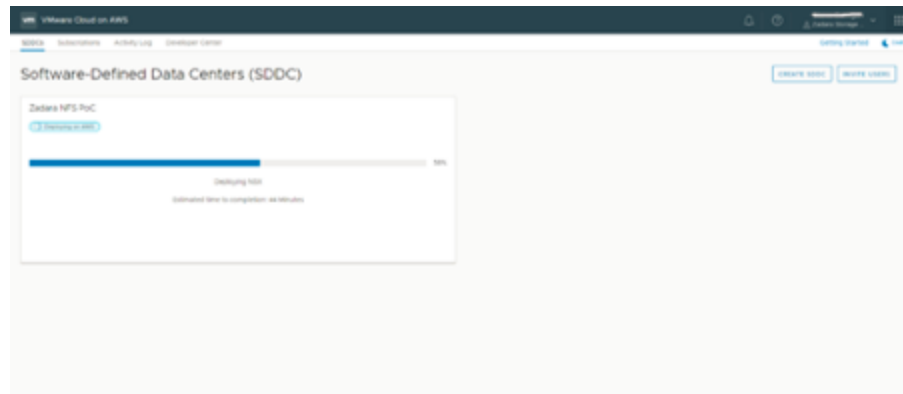
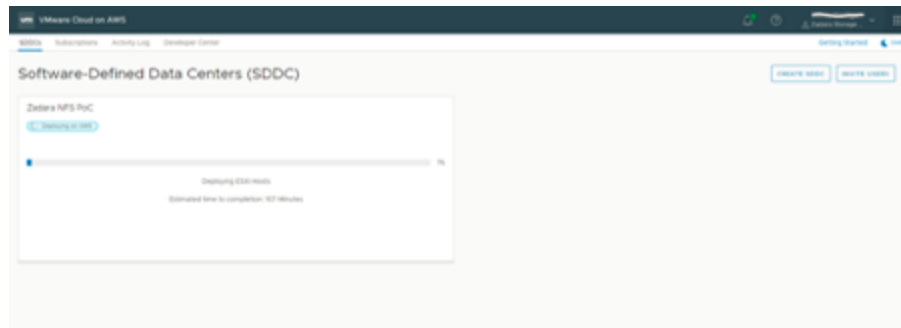
b. Link AWS account (you must have cloud formation rights).



c. Identify the VPC and subnet that the SDDC will be connected to.

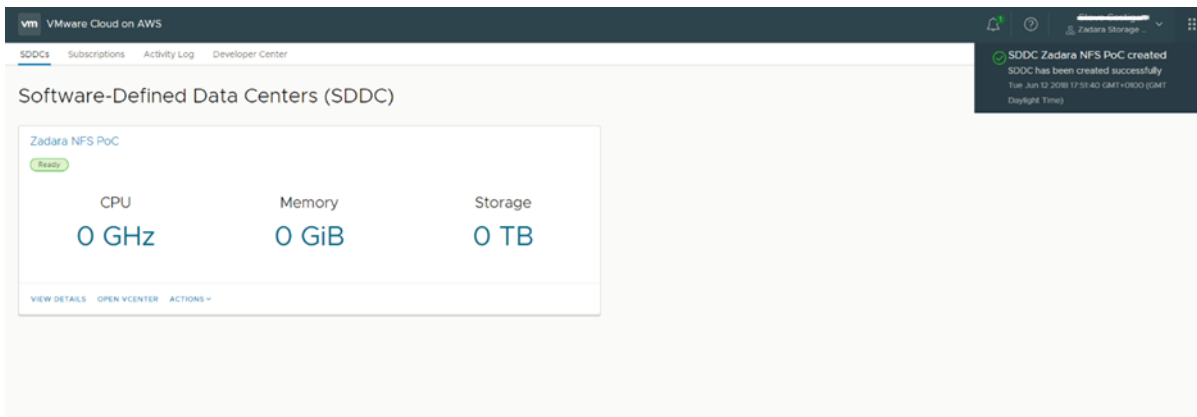


- d. When configuration has been completed and submitted, the provisioning progress screen is presented (the bar will move).

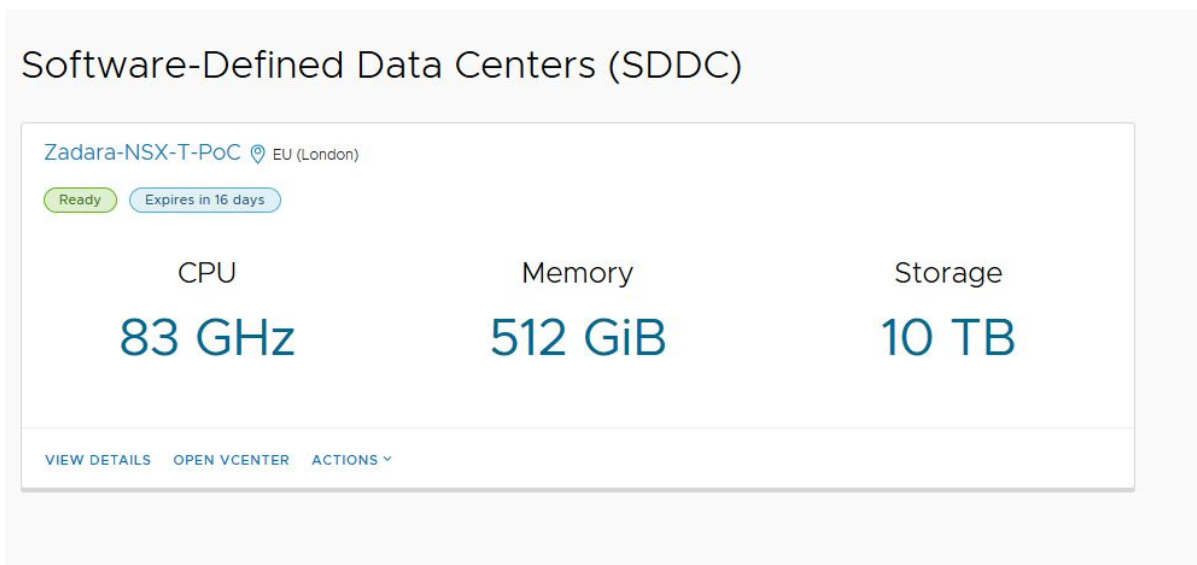




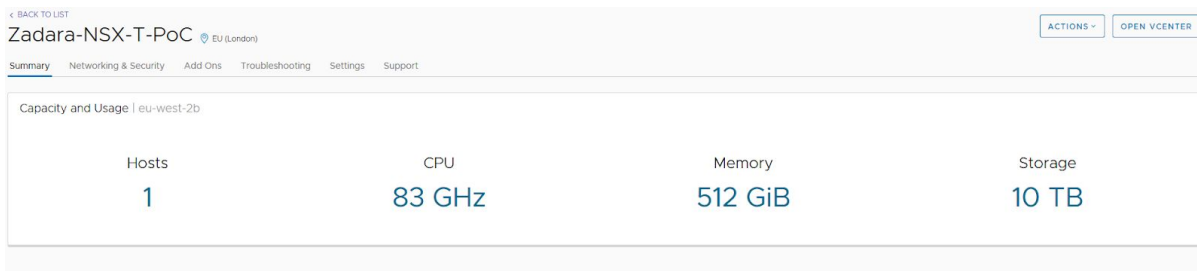
e. When the process completes, you should see the following:



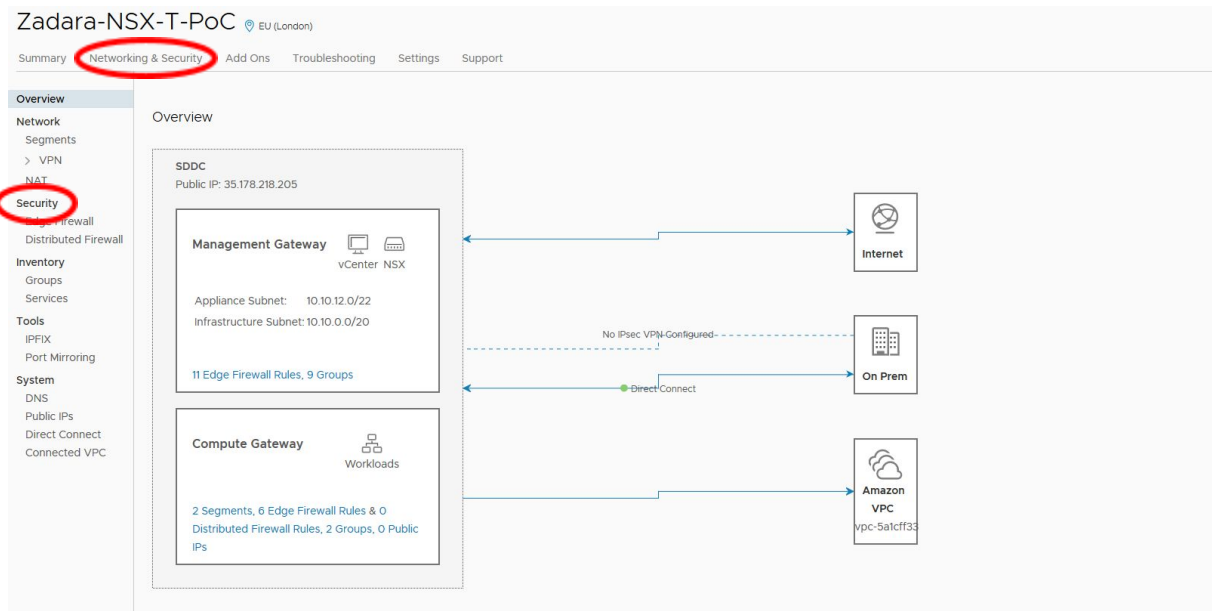
5. After logging into VMware in AWS console you will see the following:



6. View Details allows you to view a summary and set the Networking firewall rules for initial setup



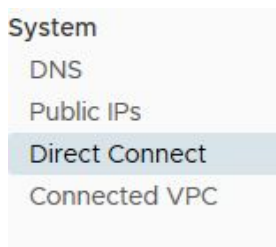
7. Clicking on Networking & Security displays an overview of connections



8. In the Security Tab, define access rules for management and access to vCenter (by default everything is denied). Create New Objects for specific IP's to allow access and grant access to vCenter, e.g.



9. Click on Direct Connect on the Networking & Security tab to get the AWS account ID.



- Open a new browser window to <https://manage.zadarastorage.com> and request a new AWS VPSA (make sure it's located in the same AWS region as the just-deployed SDDC).
- Send an email to Zadara support (support@zadarastorage.com) and outline the VPSA name, your account name, and the AWS account ID (from step 9, above).
- When you receive confirmation that the VPSA is ready, go back to the SDDC Direct Connect pane and accept the two new virtual interfaces.

13. After a few minutes you should see something similar to this, showing the learned and advertised routes from the SDDC and the Zadara sides.

Virtual Interface Name	Virtual Interface ID	Direct Connect ID	State	BGP Status	
Zadara_AWS_SDDC	dxvif-fg-01111111	dxcon-01111111	Attached	Up	DELETE
Zadara_AWS_SDDC	dxvif-fg-01111111	dxcon-01111111	Attached	Up	DELETE

REFRESH

**Advertised BGP Routes**

192.168.1.0/24 192.168.100.0/24 10.10.12.0/22

**Learned BGP Routes**

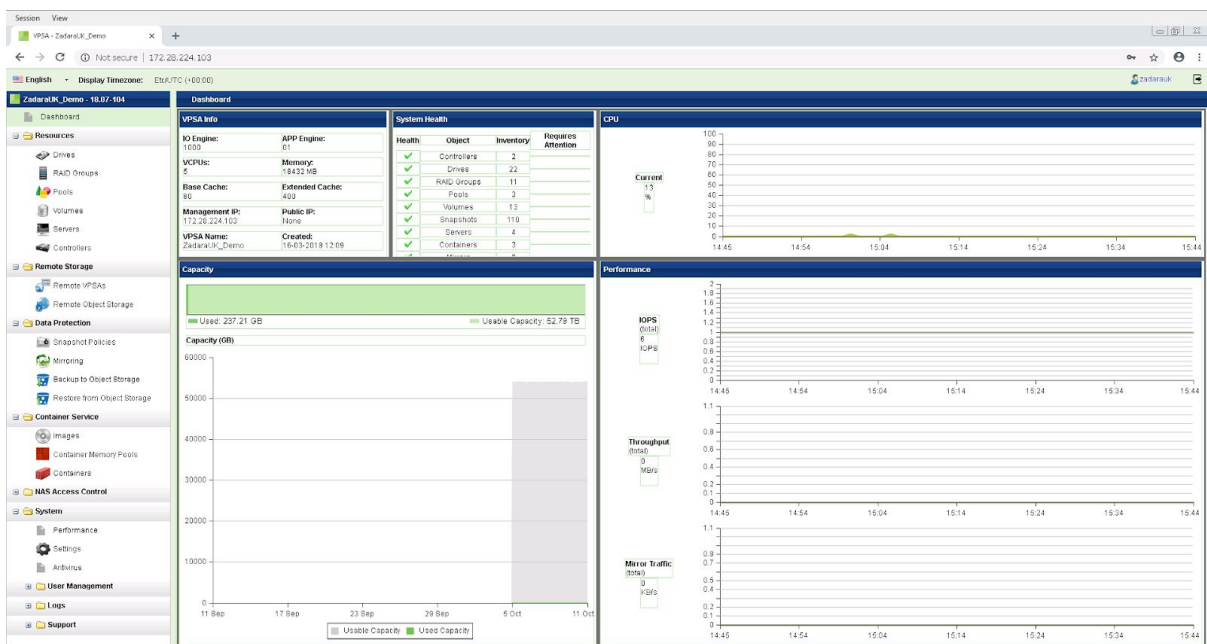
172.28.224.0/22 10.51.0.0/16 10.52.0.0/16 10.53.0.0/16

14. Ensure you have created objects for the Zadara VPSA Network and have configured firewall rules to allow traffic to flow between the Compute Network and the Zadara Network via the SDDC Management Network and Direct Connect Network

15. To enable VPC to VM Compute connectivity make sure that two-way network traffic can flow between EC2 instances in the VPC and the SDDC via the Elastic Network Interface (ENI). Ensure that the ACL Rules applied to the ENI Interface allow two way traffic between the two networks.

16. If VPC EC2 compute instances require access to the same storage types (e.g., iSCSI/Block, CIFS/SMB, Object), then additional DX Virtual Interfaces (VIFs) will need to be provisioned – speak to your Zadara Account Manager to organise this.

17. Log into the newly provisioned VPSA to make sure the dashboard is available.



18. Click on the servers tab to register new clients and setup access volumes.

Name	iSCSI / FC Connectivity	IP or CIDR Block	iSCSI ION	iSPec iSCSI	iSPec NFS	Registered	OS
AWS_Demo_Server	Active	172.31.31.28	ign.1991-05.com.microsoftwin-u9a...	Disabled	Disabled	no	Windows
ESX_NFS_Servers		10.10.0.0/20		Disabled	Disabled	no	ESX
ZADARA-WIN-DC1	Active	192.168.100.10	ign.1991-05.com.microsoftzadara...	Disabled	Disabled	yes	Microsoft Windows Server 2016...
WIN-VEEAM-01	Active	192.168.100.11	ign.1991-05.com.microsoftwin-vee...	Disabled	Disabled	yes	Windows

In the above example, you can see we have defined access to the same array via iSCSI and NAS in both the VMware compute network on 192.168.100.0/24 and the AWS VPC 172.31.31.0/24.

**Note:** Servers can be registered manually or automatically via a setup script from the VPSA

19. Lastly, we can see the range of Volumes presented from the configured VPSA

Name	Capacity	Status	Protection	Data Type	Pool	Server(s)
AD_Block_Test	1 TB	In-use		BLOCK	R10_SATA_Pool	ZADARA-WIN-DC1
EC_Test	1 TB	In-use		BLOCK	R10_SATA_Pool	AWS_Demo_Server
ESX_Guest_Test	10 GB	In-use		BLOCK	R10_SATA_Pool	ZADARA-WIN-DC1
ESX_Guest_Vol2	25 GB	Available		BLOCK	R10_SATA_Pool	
lometer_test	10 GB	In-use		BLOCK	R10_SATA_Pool	AWS_Demo_Server
NexCloud	100 GB	In-use		File-System	R10_SATA_Pool	nextrious_zcs
SMBTest	10 GB	In-use		File-System	SSD_Pool1	Multiple(3)
veeam_Backups	1 TB	In-use		BLOCK	R10_SATA_Pool	WIN-VEEAM-01
veeam_SMB	10 TB	In-use		File-System	R10_SATA_Pool	WIN-VEEAM-01
VMWare_Templates	200 GB	In-use		BLOCK	R10_SATA_Pool	AWS_Demo_Server
VMwareDS1	1 TB	In-use		File-System	SSD_Pool1	Multiple(2)
VMwareDS2	10 TB	In-use		File-System	SSD_Pool1	Multiple(2)

## Conclusion

We have demonstrated how data residing on Zadara storage can be simultaneously presented to applications running in VMware Cloud for AWS environments, AWS EC2 instances, and on-premises servers. This data centric, location agnostic approach enables Zadara customers to enhance data availability, accelerate application performance, optimize flexibility, and capture maximum value from data.

To further explore Zadara solutions for AWS, please visit [https://www.zadara.com/sol\\_aws.php](https://www.zadara.com/sol_aws.php) or call us at +1-949-251-0360 (US) or +1-949-284-0713 (International).

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