

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”¹
 - 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)

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

Overview

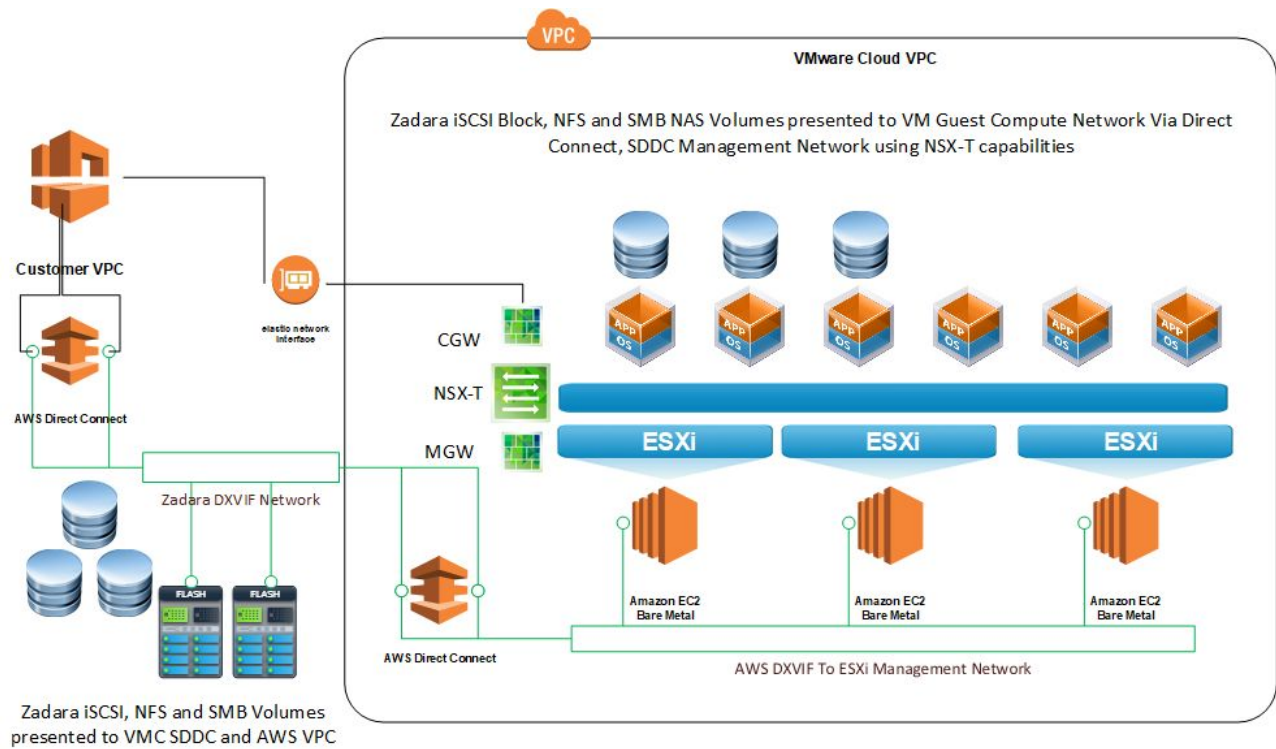


Figure 1. Overview diagram

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)

The screenshot shows the '1. SDDC Properties' step of the VMware Cloud on AWS SDDC creation wizard. The interface is a form with the following fields and options:

- AWS Region:** A dropdown menu set to 'EU West (London)'. A note says 'More regions coming later'.
- Deployment:** Three radio buttons: 'Single Host' (selected), 'Multi-Host', and 'Stretched Cluster'.
- SDDC Name:** A text input field containing 'Zadara NFS Poc'.
- Number of Hosts:** A text input field set to '1'. A tooltip indicates '1-host SDDCs expire in 30 days' with a 'LEARN MORE' link.
- Host Capacity:** A text input field showing '2 Sockets, 36 Cores, 512 GB RAM, 10.7 TB Storage'.
- Total Capacity:** A text input field showing '2 Sockets, 36 Cores, 512 GB RAM, 10.7 TB Storage'.

At the bottom of the form is a blue 'NEXT' button. Below the form, a progress bar shows four steps: '1. SDDC Properties' (active), '2. Connect to AWS', '3. VPC and subnet', and '4. Configure Network'.

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

< Create Software-Defined Data Center (SDDC)

1. SDDC Properties	Zadara NFS PoC - 1 Hosts - EU West (London)
2. Connect to AWS	Specify the AWS account that you want to connect your SDDC with

Choose an AWS account [Connect to a new AWS account](#)

This step gives VMware permission to set up networking correctly for your SDDC on your AWS infrastructure using cross-account rules.

Instructions

1. Make sure that you have an AWS account. [Click here to create one if needed](#)
2. Click on the "OPEN AWS CONSOLE WITH CLOUDFORMATION TEMPLATE" button below to launch AWS in a separate browser tab. Each template is time-bounded for security reasons. To restart the task, simply click the button again.
VMware has defined a CloudFormation template to connect your AWS account. This template creates the IAM roles necessary to allow communication between your SDDC and your AWS account.
[What is CloudFormation?](#)
[What are IAM roles?](#)
[OPEN AWS CONSOLE WITH CLOUDFORMATION TEMPLATE](#)
3. Log into the AWS account you want to connect with the VMware Cloud on AWS service.
4. On the Create Stack page, check "I acknowledge that AWS CloudFormation might create IAM resources" and click "Create".
5. When the stack creation is completed, close the AWS window and go back to VMC to finish your workflow.

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

VMware Cloud on AWS

< Create Software-Defined Data Center (SDDC)

1. SDDC Properties	Zadara NFS PoC - 1 Hosts - EU West (London)
2. Connect to AWS	Aws Account ID 9bd3e5cb-***3-3655-***3-3655
3. VPC and subnet	Specify the VPC and the subnet to connect to your AWS account.

VPC [vpc-5a1b1a1a \(172.31.0.0/16\)](#)

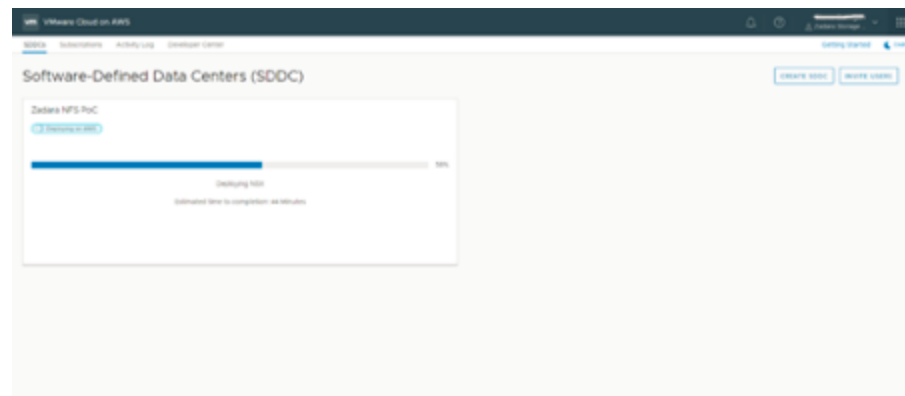
Subnet [172.31.16.0/20, eu-west-2b](#)

To leverage native AWS services on your SDDCs, deploy your AWS EC2 workloads in the same availability zone to avoid cross AZ traffic charge.

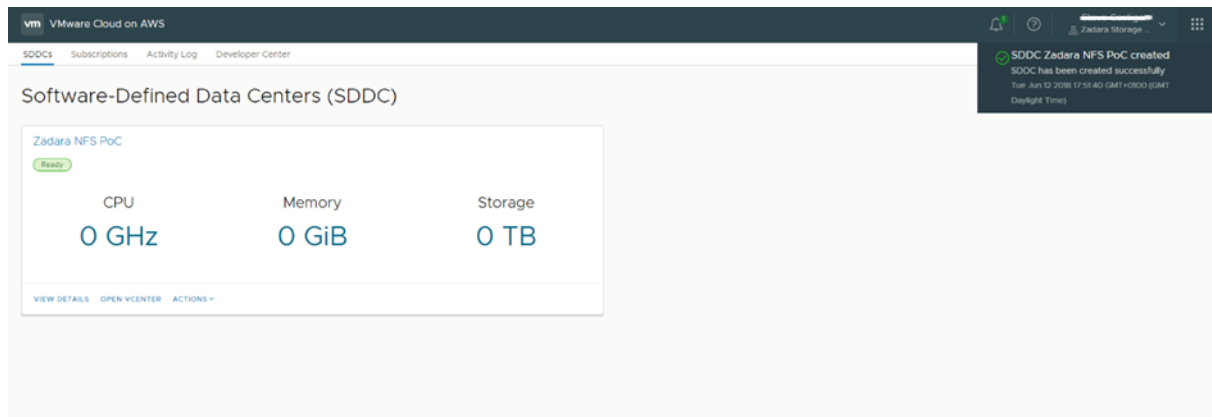
[NEXT](#)

4. Configure Network	Management Subnet (optional)
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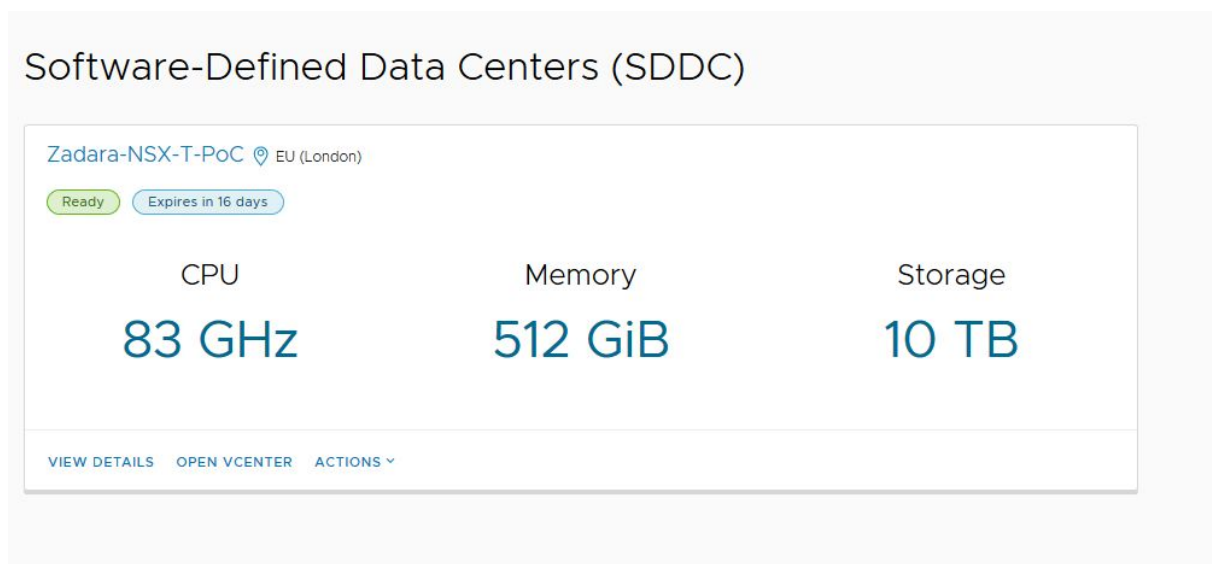
- d. When configuration has been completed and submitted, the provisioning progress screen is presented (the bar will move).



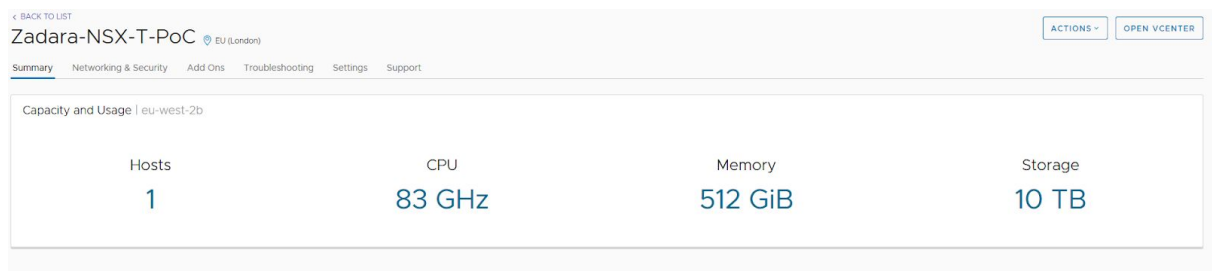
- e. When the process completes, you should see the following:



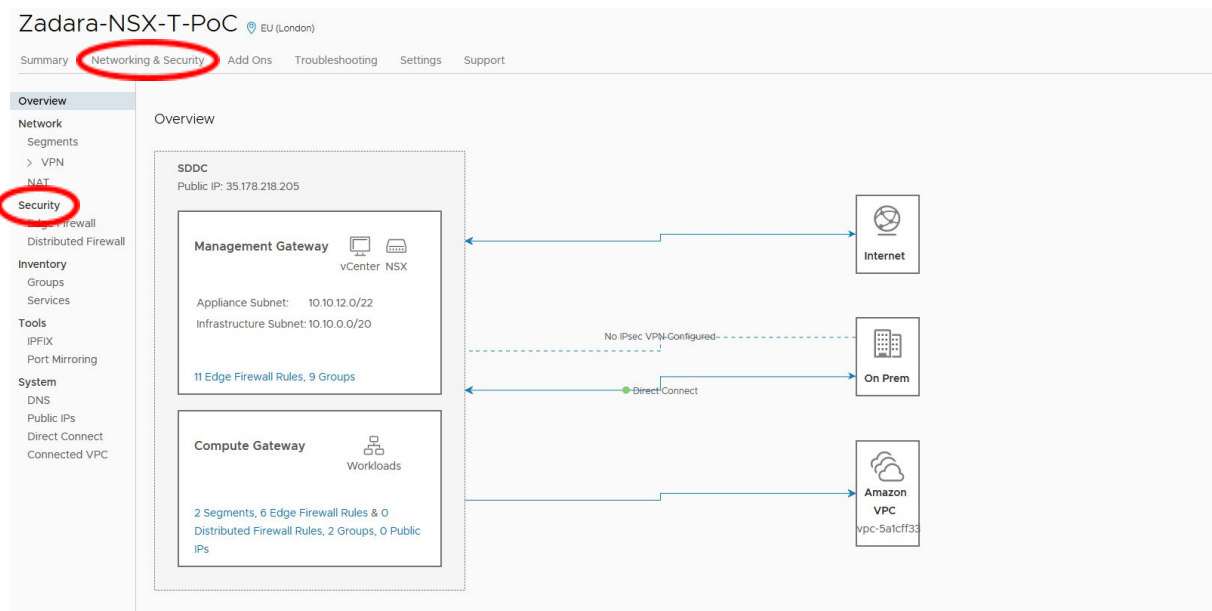
5. After logging into VMware in AWS console you will see the following:



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



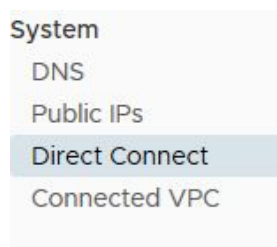
7. Clicking on Networking & Security displays an overview of connections



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.

⋮	Matt_VC	Matt_VC	vCenter	ICMP (ALL ICMP), SSO (TCP 7444), HTTPS (TCP 443) show less	Allow	Disabled
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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.

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

Name	iSCSI / FC Connectivity	IP or CIDR Block	iSCSI ION	IPsec iSCSI	IPsec NFS	Registered	OS
AWS_Demo_Server	Active	172.31.31.0/24	iqn.1991-05.com.microsoft:win-u9q...	Disabled	Disabled	no	Windows
ESX_NFS_Servers	Active	10.10.0.0/20	iqn.1991-05.com.microsoft:win-u9q...	Disabled	Disabled	no	ESXi
ZADARA-WIN-DC1	Active	192.168.100.10	iqn.1991-05.com.microsoft:win-u9q...	Disabled	Disabled	yes	Microsoft Windows Server 2016...
WIN-VEEAM-01	Active	192.168.100.11	iqn.1991-05.com.microsoft:win-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	netitious_zss
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
VMwareCS1	1 TB	In-use		File-System	SSD_Pool1	Multiple(2)
VMwareCS2	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 or call us at +1-949-251-0360 (US) or +1-949-284-0713 (International).

Transform your business with zero-risk enterprise storage.

Zadara transforms storage-related costs from a variable mix of equipment and management expenses to a predictable, on-demand, pay-per-use, elastic service that greatly simplifies planning, streamlines budgeting, and improves return on investment (ROI). Find out how zero-risk enterprise storage can help transform your business. Call or email today.

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