



Product Support Notice

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PSN # PSN005416u

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Original publication date: May 24, 2019. This is Issue #04, published date: Aug 17, 2020

Severity/risk level

High

Urgency

ASAP

Name of problem

Need to create DRS Affinity Rules for Oceana applications in a Pod/ACP solution updated for inclusion of Analytics 4.0.0.1

Products affected

Avaya Oceana™ 3.5.0.1, 3.6.0.0, 3.6.0.1, 3.7.0.0, 3.7.0.1

Avaya Analytics 4.0.0.1

Problem description

The Oceana solution does not currently support vMotion or VMware HA. As a result, when Oceana is deployed in a Pod/ACP solution, DRS functionality is being disabled across the cluster. This is not an optimal configuration for the private Cloud environment. There are many Aura applications that can leverage DRS functionality and should. Customers pay premium licenses prices for the VMware DRS functionality and want it utilized in their ACP/Pod solutions.

Since the GA of Avaya Analytics 4.0.0.1 April 2020, there is now a requirement to share a common VMWare cluster with DRS and HA enabled for Analytics. Details of how to configure VMWARE feature DRS and HA are covering in a corresponding PSN (PSN005633u) at this link - <https://downloads.avaya.com/css/P8/documents/101067348>

Resolution

In order to share a common VMWARE cluster for Avaya Oceana and Avaya Analytics please follow the instructions in this PSN and the corresponding Avaya Analytics PSN mentioned in the table below.

Please note carefully the new table of VMWARE features in this document in terms of support by either Oceana 3.7.0.1 or Avaya Analytics 4.0.0.1 only.

VMWARE Features Support Table (Oceana 3.7.0.1 and Analytics 4.0.0.1) Updated June 2020

All the statements in the following tables apply to Oceana 3.7.0.1 and Analytics 4.0.0.1 onwards. They do not apply to previous versions of Oceana and / or Analytics.

VMWare Feature	Oceana 3.7.0.1	Analytics 4.0.0.1
Single VMWARE Cluster shared between Oceana 3.7.x and Analytics 4.x - Cluster contains Virtual Machines for both Oceana 3.7.x and Analytics 4.x - Cluster may also contain other application virtual machines without contention	Yes ☐ See PSN005416u for instructions on enabling Affinity Rules in a DRS enabled VMWARE cluster ☐ https://downloads.avaya.com/css/P8/documents/101057845	Yes - See PSN005633u for implications for enabling VMWARE HA and DRS on a shared cluster https://downloads.avaya.com/css/P8/documents/101067348
Cloning	No	No ☐ Alternate mechanisms using BOSH
Distributed Resource Scheduler (DRS)	Yes Subject to documented guidelines in conjunction with Affinity rules in PSN: https://downloads.avaya.com/css/P8/documents/101057845 – search support.avaya.com for	Yes Subject to guidelines outlined in PSN005633u for HA & DRS rules for Analytics 4.x: https://downloads.avaya.com/css/P8/documents/101067348 - search support.avaya.com for

	PSN005416U	PSN005633u
Storage DRS	No Oceana can does not support this feature. impacts to datastores and I/O load balancing occurring in Production can cause outages	No Analytics 4.x does not support Datastore Clusters
Distributed Power Management (DPM)	No	No
Distributed Switch (Network)	Yes <i>Requires VMware Enterprise Plus license</i> - Note: Loss of vCenter means there no way to manage the data networks on the hosts. - If using Standard vSwitch, management can still be done from each Host.	Yes <i>Requires VMware Enterprise Plus license</i> - Note: Loss of vCenter means there no way to manage the data networks on the hosts. - If using Standard vSwitch, management can still be done from each Host.
Fault Tolerance	No	No ☐ Alternate mechanism using BOSH
High Availability (HA)*	No - Oceana does not support impacts to Oceana Virtual Machines occurring in Production - See Avaya Analytics PSN005633u for Detailed Information on how to configure VMWare HA in an Oceana & Avaya Analytics single cluster deployment	Yes - Mandatory for Analytics 4.x High Availability feature - Subject to guidelines outlined in PSN005633u for HA & DRS rules for Analytics 4.x: https://downloads.avaya.com/css/P8/documents/101067348 - search support.avaya.com for PSN005633u
Snapshots***	Partial - Yes, as part of Maintenance** Procedures for upgrades/patching only - Snapshots must be removed before the contact center is put back into Production Mode	Partial - Yes, as part of Maintenance** Procedures for upgrades/patching only for the following Analytics applications only - CCM – Snapshot Must be Removed before the contact center is put back into Production Mode - All other Analytics Servers BOSH and 3 Analytics VM's do not support use of snapshots
Storage Thin Provisioning	Partial - Yes, for SAN Storage - No for Local Hard Disk Storage	Yes - Yes, for SAN Storage - No Local Storage Supported - See PSN005633u specifics on thin provisioning https://downloads.avaya.com/css/P8/documents/101067348
vMotion	No Oceana does not support any	No Avaya Analytics does not

	form of vMotion as it may impact virtual machines to halt processing	support any form of vMotion as it may impact virtual machines to halt processing
Storage vMotion	No Oceana does not support any form of vMotion including Storage vMotion as it may impact virtual machines to halt processing	No Avaya Analytics does not support any form of vMotion including Storage vMotion as it may impact virtual machines to halt processing
Suspend and Resume	No	No
Cold Migration	Yes - Cold Migration can only be performed on a virtual machine in a powered off state. (use of vMotion) - Oceana uses Static IP's therefore the new ESXI host(s) must have access to the original data network and datastore for the migrated virtual machines.	Yes - Cold Migration can only be performed on a virtual machine in a powered off state. (use of vMotion) - Avaya Analytics uses Static IP's therefore Analytics Virtual Machines can only be migrated to hosts in the same VMWARE cluster who have the same access to all elements in the cluster as existing hosts
Reservations on vCPU and Memory Required to be Enabled	Yes - Must to set to Yes for production Oceana customer provided VMWare deployments where there is Contention for resources - Physical Hosts running Oceana Virtual Machines can have other virtual machines running co-resident with the Oceana Virtual Machines - On Avaya PODfx systems – No Reservations not required as Avaya supplied h/w are engineered not to be over provisioned.	No Analytics 4.x reservations on vCPU and memory not mandatory as long as the environment is not over provisioned or contending with other virtual machines
Hyperthreading	No ☐ Oceana requires Reservations therefore Hyper threading does not add any extra benefit - Can be enabled on the VMWARE infrastructure for other applications	Yes

Important additional information is provided in both the Oceana and Analytics Deployment guides available on support.avaya.com.

The remainder of this PSN is the same as the previous two versions. All the procedures described below apply to all Oceana versions prior to 3.7.0.1

Overview

When deployed in an ACP/Podfx solution, the Oceana application suite, release > 3.6, requires specific VM orientation rules to be configured in the Distributed Resource Scheduler (DRS) of the ACP vCenter. This document is intended to guide technical staff through the process of configuring DRS affinity rules for Oceana through the web client of vCenter 6.x.

The goal of the rules is to prevent vMotion activity for any Oceana virtual machine (VM). The potential packet loss resulting from vMotion activity is reported by VMware to be 1-6 seconds and will vary based on host load and application activities during the last few milliseconds of an application hand-off between servers/hosts. The Oceana specific applications, under load, do not currently support vMotion activity. The disabling of DRS functionality across the virtual solution is not an optimal option; it has been used recently as a temporary measure to address Oceana application needs until a more suitable solution could be identified. The process noted, herein, is the official solution.

Disabling DRS greatly diminishes the value of the ACP virtual solution by inhibiting the use of vMotion and VMware HA by other Aura applications that can successfully leverage the functionality. The use of affinity rules between VMs and hosts will allow administrators to link each Oceana application VM to a specific server, locking the VMs in place on those designated servers. Once this "lock down" administration is completed, DRS may be re-enabled for all other Aura applications in the ACP/Pod solution.

The DRS configuration noted in this document was evaluated in an Oceana solution with a 45,000 busy hour calls + WFO call recording. vMotion functionality was exercised on the Aura applications that can support it and outcomes were found to be acceptable with no impacts to the Oceana VMs observed. At the close of this document, test outcomes are shared.

Document the Deployment Strategy

The ACP solution that arrives will have enough server capacity to support all the required applications. Those deploying Oceana on site will have located the applications across all available server hosts, taking care to keep the same-service applications on different host to optimize application HA behaviours.

1. Identify and document all the application elements in the Oceana solution and the ESXi hosts where each one resides.
2. Confirm same-service type applications are not located on the same server host.

There may be DRS separation rules already in place to prevent the colocation of same-service applications. If there are same-service applications on the same host, they will need to be separated. To coordinate the relocation of applications, contact an Avaya services representative for assistance.

1. Build a spreadsheet to document all the Oceana applications and associate them with the ESXi hosts they will be assigned based on lock-down rules and application separation needs.

Example: Oceana Spreadsheet

Oceana App	Description	App Host Name	CPU / Memory	ESXi Host Location <i>EXAMPLES</i>	Comments
CCC1	Call Server Connector Cluster	<app names in vCenter>	16/98	IP of Host 3	Separate from other CCC apps
CCC2	Call Server Connector Cluster		16/98	IP of Host 7	Separate from other CCC apps
CCC3	Call Server Connector Cluster		16/98	IP of Host 5	Separate from other CCC apps
CL1	Centralized Logging		4/16	IP of Host 6	Separate from other CL app
CL2	Centralized Logging		4/16	IP of Host 3	Separate from other CL app
EDM1	External Datamart Database		8/32	IP of Host 6	Separate from other EDM app if present
EDM2	External Datamart Database		8/32		*optional application*
MMDB1	Omni-Channel Multi-Media Cache Database		8/32	IP of Host 5	Separate from other MMDB app if present
MMDB2	Omni-Channel Multi-Media Cache Database		8/32		*optional application*
OBI	Oracle Business Intelligence		8/49	IP of Host 1	Separate from OSA Analytics app in green
OCP1	Omni Channel Provider		8/32	IP of Host 2	Separate from other OCP app
OCP2	Omni Channel Provider		8/32	IP of Host 5	Separate from other OCP app
ODB	Oracle Database		8/49	IP of Host 2	Separate from OSA Analytics app in green
OSA	Oracle Streams Analytics		16/98	IP of Host 6	Separate from Analytics apps
SA	Avaya Analytics Stream Server		8/30	IP of Host 4	Separate from OSA Analytics app in green
UCA1	Unified Agent Controller		8/32	IP of Host 1	Separate from other UCA app
UCA2	Unified Agent Controller		8/32	IP of Host 4	Separate from other UCA app
WFO1	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO2	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO3	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO4	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO-DB	Workforce Optimization Database		16/24	TBD	*optional application*
WFO-APP	Workforce Optimization App Server		8/16	TBD	*optional application*

In this example, there are 7 available servers to support the largest of the Oceana configurations. All applications have been properly separated across hosts. The Applications should be dispersed as equitably as possible, with consideration given to the need to support all Aura core applications within the solution. Since DRS will eventually be enabled, the VMware hypervisor will likely vMotion the core Aura applications to balance memory and CPU allocations. Once VMware settles the Aura applications into their preferred server locations, they will not be moved again unless there is a critical need based on CPU or Memory starvation. Once you have created the spreadsheet, confirming applications appropriately located, sort the spreadsheet based on the ESXi host IP addresses.

From vCenter, click on the cluster level and select the Hosts tab and the Hosts sub-option. Review the Consumed Memory % column to the far right to view how the applications are distributed across the cluster prior to this activity. If there is an obvious imbalance of Oceana applications on one or more hosts, contact Avaya services for assistance in creating a more equitable distribution.

Name	State	Status	Cluster	Consumed CPU %	Consumed Memory %
10.129.94.31	Connected	Normal	CPOD4-Cluster	16	36
10.129.94.33	Connected	Normal	CPOD4-Cluster	5	45
10.129.94.35	Connected	Normal	CPOD4-Cluster	36	31
10.129.94.37	Connected	Normal	CPOD4-Cluster	1	37
10.129.94.39	Connected	Normal	CPOD4-Cluster	25	31
10.129.94.41	Connected	Normal	CPOD4-Cluster	3	28
10.129.94.43	Connected	Normal	CPOD4-Cluster	6	31
10.129.94.45	Connected	Alert	CPOD4-Cluster	2	30
10.129.94.47	Connected	Normal	CPOD4-Cluster	3	48

Important:

If the WFO (call recording) application is deployed in the solution, each WFO VM will also be required to be anchored to server hosts in the same manner the Oceana VMs will be configured. To optimize application HA behaviours, each WFO VM should be located on a server where there are no other WFO VMs. Using the information previously gathered about the cluster load distribution, determine how to best distribute the WFO VM load. If you need assistance with this activity, please contact an Avaya services representative.

Avaya Aura Media Servers, when virtualized, are also required to be locked-down to specific server hosts. Like Oceana and WFO, application HA is the do-to recovery functionality, not VMware HA or vMotion. Administrative Process

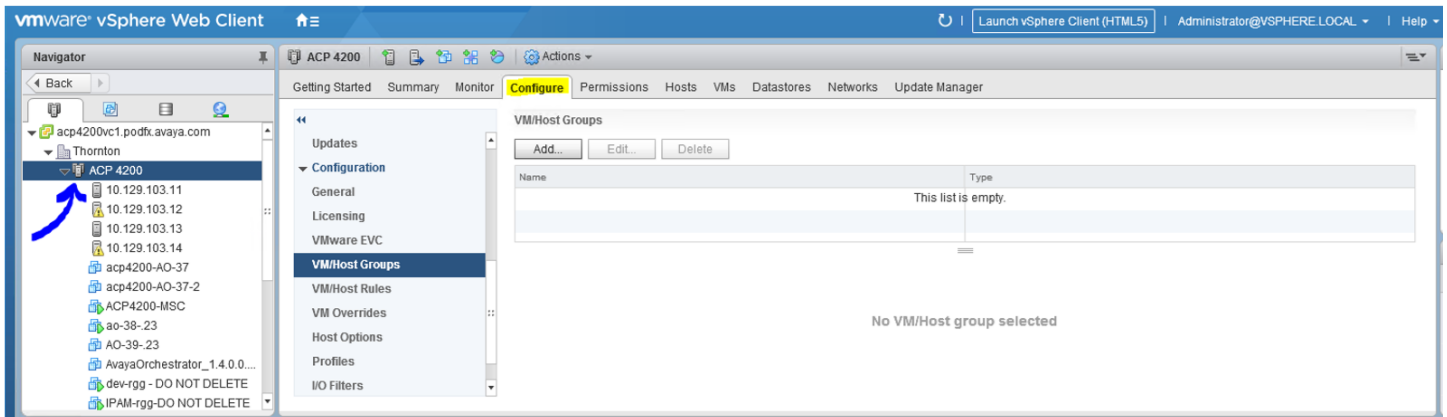
Administer Virtual Machine Groups

In this activity, you will build the DRS groupings of virtual machines, i.e., Oceana applications. Each group will consist of the Oceana applications that will be deployed on the same host. In the example below, The UCA1 and OBI applications will be a virtual machine group since they will both be deployed and locked-down on Host 1.

Example: Administration Worksheet

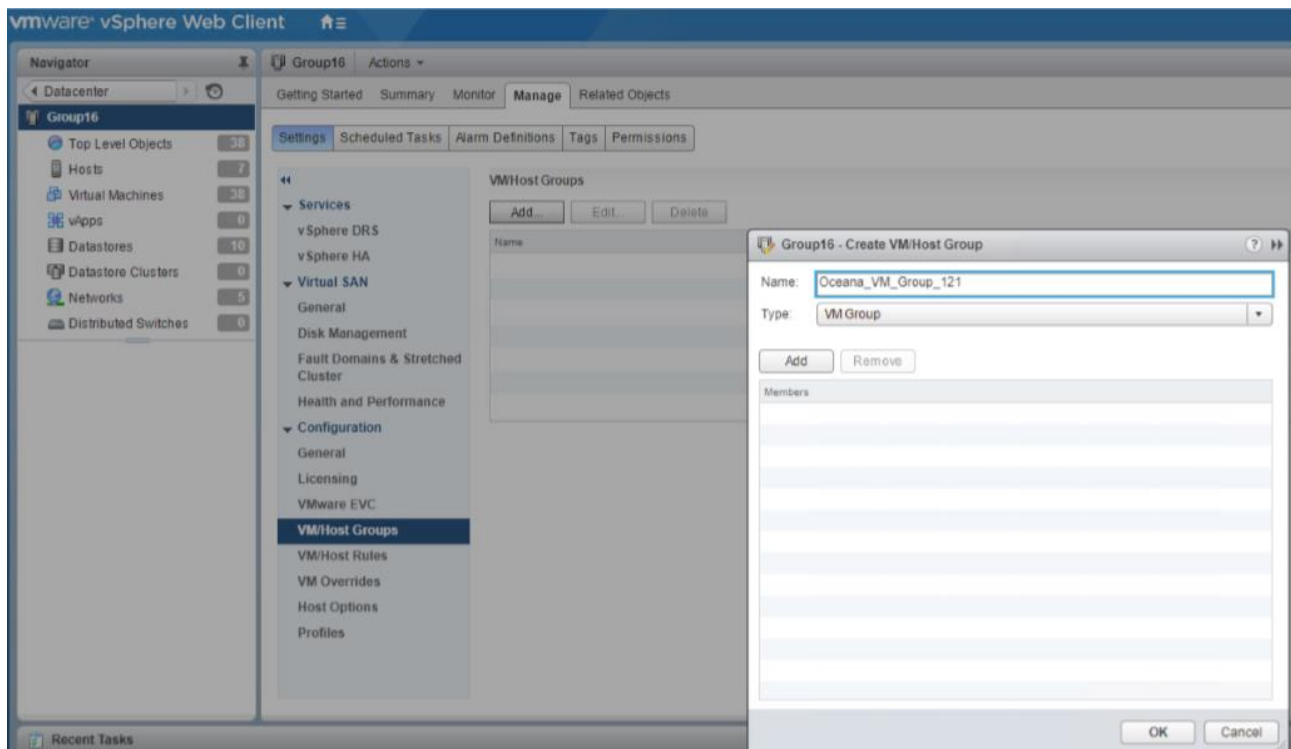
Oceana App	Description	App Host Name	CPU / Memory	ESXi Host Location <i>EXAMPLES</i>	Comments
OBI	Oracle Business Intelligence	<app names in vCenter>	8/49	IP of Host 1	Separate from OSA Analytics app in green
UCA1	Unified Agent Controller		8/32	IP of Host 1	Separate from other UCA app
OCP1	Omni Channel Provider		8/32	IP of Host 2	Separate from other OCP app
ODB	Oracle Database		8/49	IP of Host 2	Separate from OSA Analytics app in green
CL2	Centralized Logging		4/16	IP of Host 3	Separate from other CL app
CCC1	Call Server Connector Cluster		16/98	IP of Host 3	Separate from other CCC apps
SA	Avaya Analytics Stream Server		8/30	IP of Host 4	Separate from OSA Analytics app in green
UCA2	Unified Agent Controller		8/32	IP of Host 4	Separate from other UCA app
CCC3	Call Server Connector Cluster		16/98	IP of Host 5	Separate from other CCC apps
MMDB1	Omni-Channel Multi-Media Cache Database		8/32	IP of Host 5	Separate from other MMDB app if present
OCP2	Omni Channel Provider		8/32	IP of Host 5	Separate from other OCP app
CL1	Centralized Logging		4/16	IP of Host 6	Separate from other CL app
EDM1	External Datamart Database		8/32	IP of Host 6	Separate from other EDM app if present
OSA	Oracle Streams Analytics		16/98	IP of Host 6	Separate from Analytics apps
CCC2	Call Server Connector Cluster		16/98	IP of Host 7	Separate from other CCC apps
WFO1	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO2	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO3	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO4	Workforce Optimization Recorder		8/16	TBD	*optional application*
WFO-DB	Workforce Optimization Database		16/24	TBD	*optional application*
WFO-APP	Workforce Optimization App Server		8/16	TBD	*optional application*
EDM2	External Datamart Database		8/32		*optional application*
MMDB2	Omni-Channel Multi-Media Cache Database		8/32		*optional application*

1. Access vCenter and click on the left pane menu tab for Hosts and Clusters.
2. Click on the cluster where the Oceana solution has been deployed.
3. From the tab displayed, select Configure.
4. From the Configure tab, under Configuration, highlight/select VM/Host Groups.

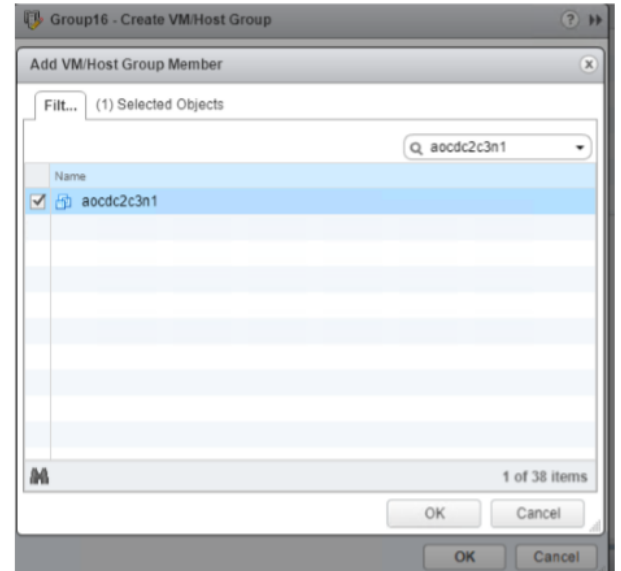
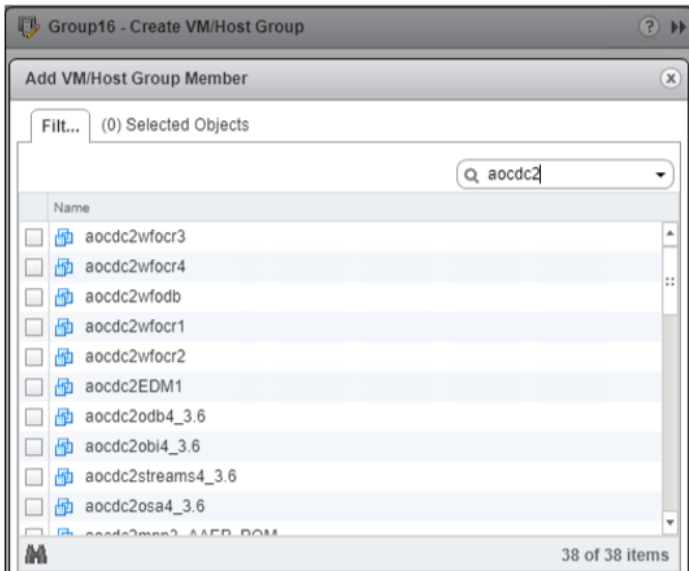


5. Click the Add button for VM/Hosts Groups.
6. In the subsequent Create VM/Host Group window, administer the Name to be assigned to the Oceana application group (virtual machine group). It is recommended you make some note of the host associated with the group to help make any needed visual identification faster.

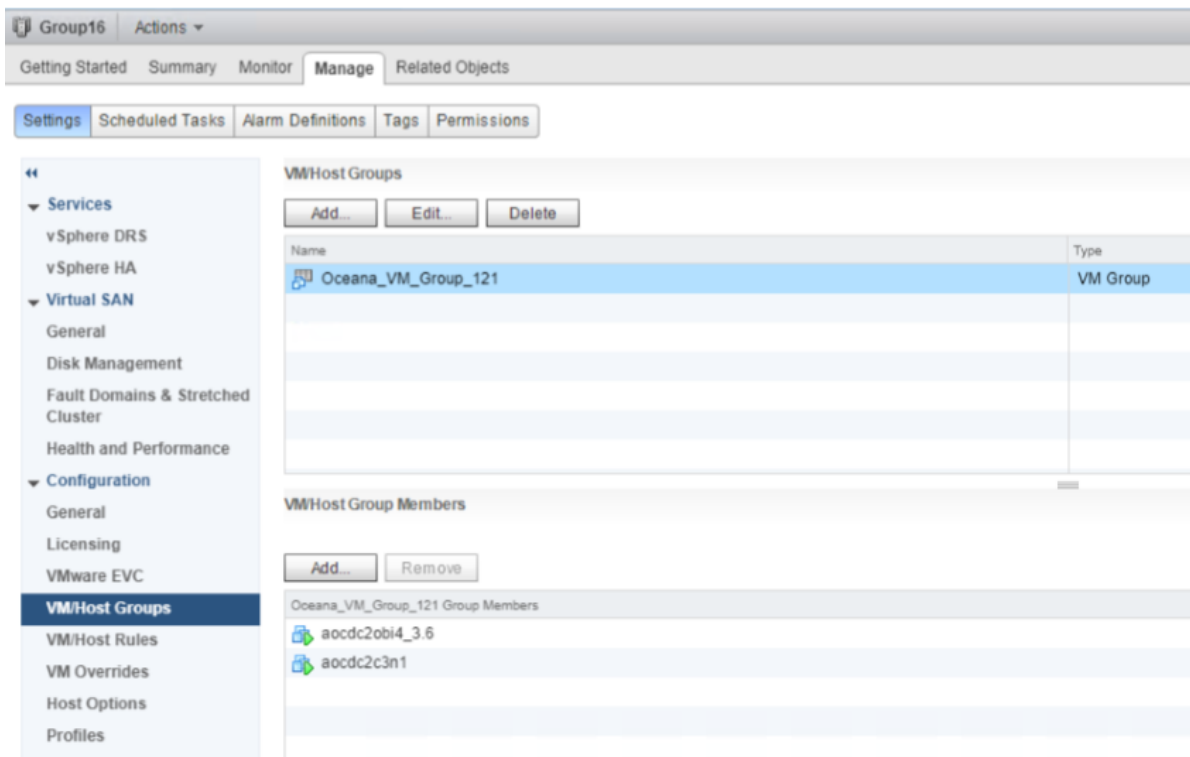
In the example below, the name “Oceana_VM_Group_121” represents the applications that will be assigned to the host that has an IP address ending in 121.



7. The drop-down menu for the Type may be left at the default value of VM Group.
8. Click the Add button to administer the virtual machine that will be part of the new grouping.
9. When the new selection window option appears, you may scroll down the list and click next to the names of all applications that apply to the group, or you may enter the same in the search option (as seen below).



10. Click the OK button at the bottom of the window and then the OK button at the bottom of the subsequent window to complete adding the new group.



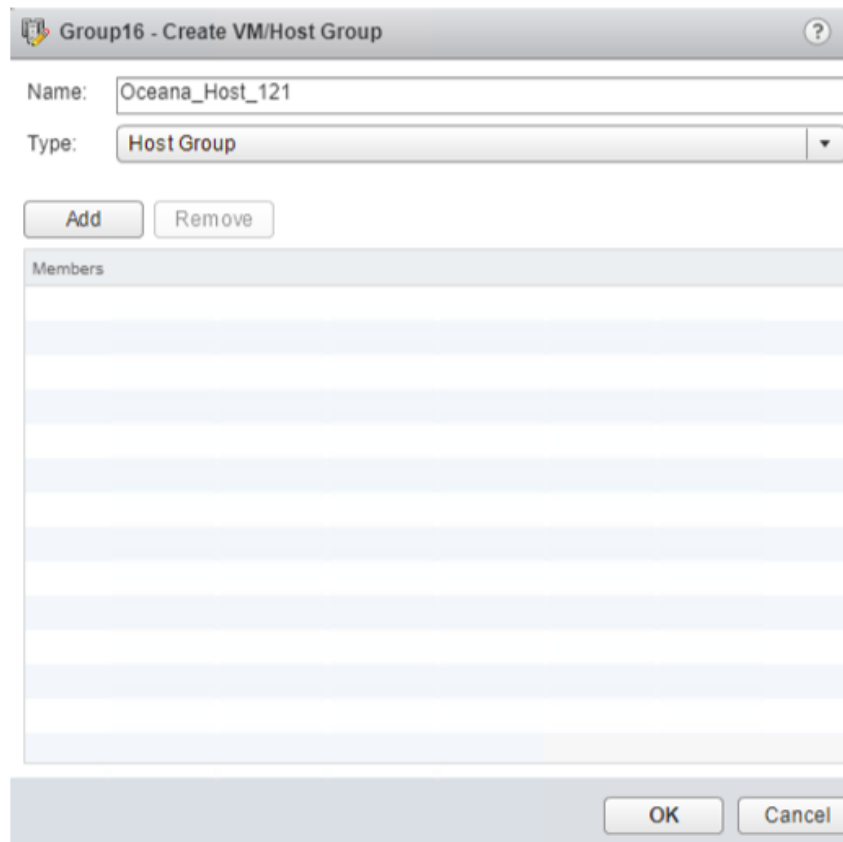
In the example above, you see the new group name and, since it is highlighted, you can also see the members represented at the bottom of the window.

11. Continue adding all remaining host groups using this process.

Administer the Host Groups

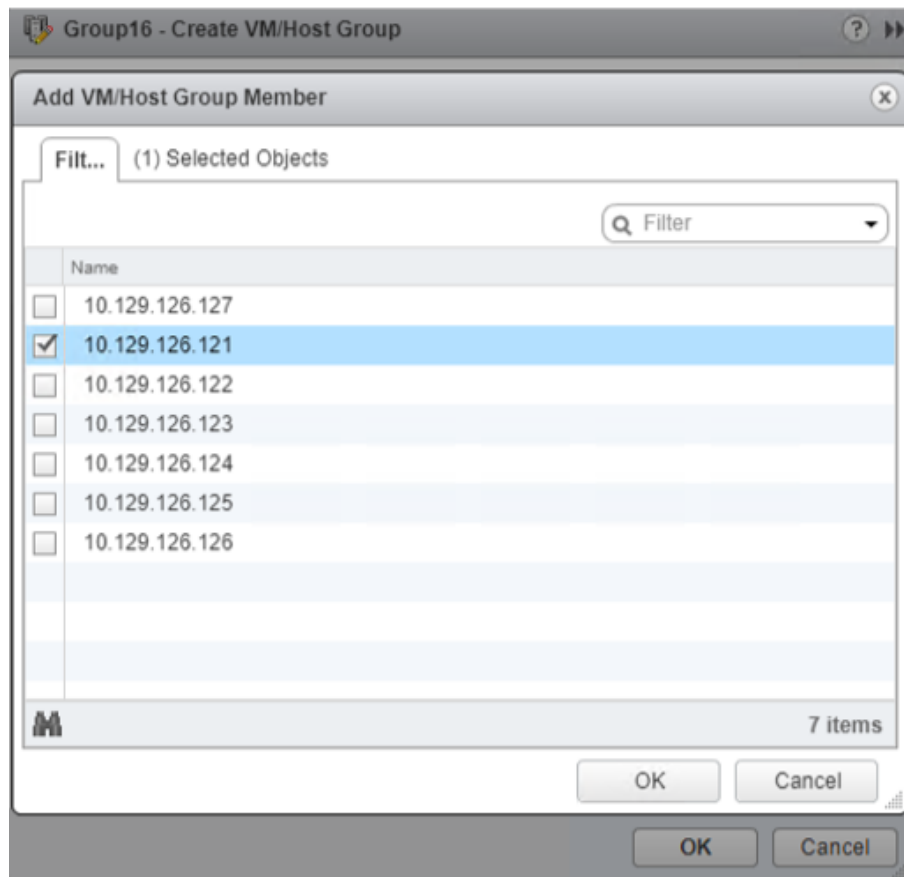
The VM Groups will need to be tied to specific hosts; this is done through binding groups together: VM Groups to Host Groups. Each Host Group will consist of a single server.

1. Once all VM Groups are administered, select the Add button from the previously displayed window.
2. As with the previous process, administer a meaningful name. This time click the Type drop-down menu and select the Host Group option.

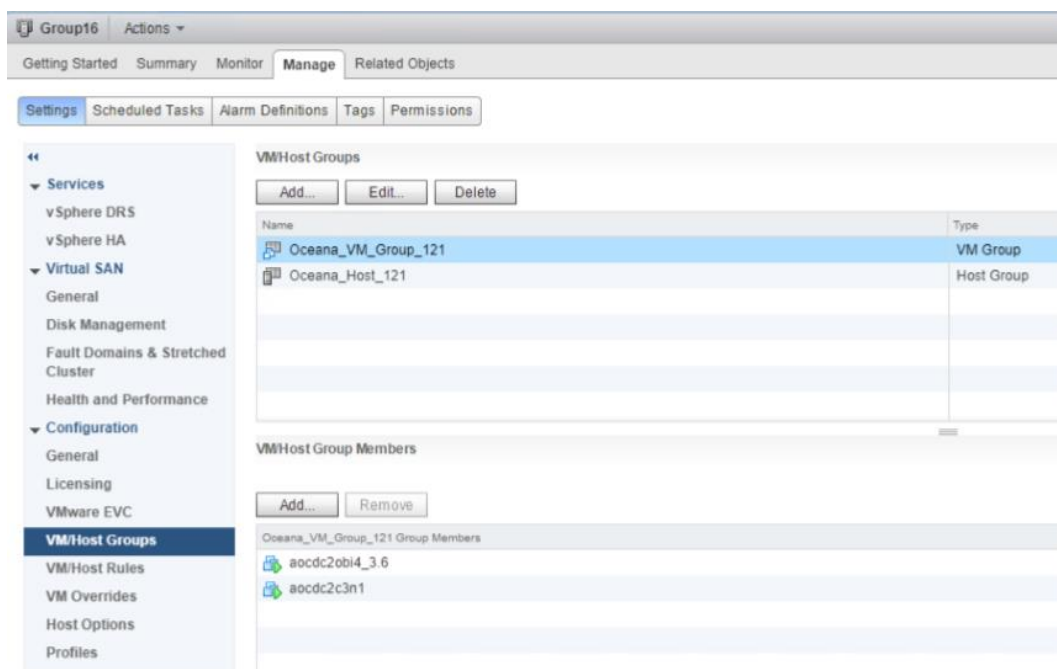


The screenshot shows a window titled "Group16 - Create VM/Host Group". It has a "Name:" label followed by a text box containing "Oceana_Host_121". Below that is a "Type:" label followed by a dropdown menu showing "Host Group". There are two buttons, "Add" and "Remove", above a list box labeled "Members". The list box is currently empty. At the bottom right of the window are "OK" and "Cancel" buttons.

3. Click the Add button on the window and from the subsequent window, select the IP address of the host being assigned in the new Host Group.



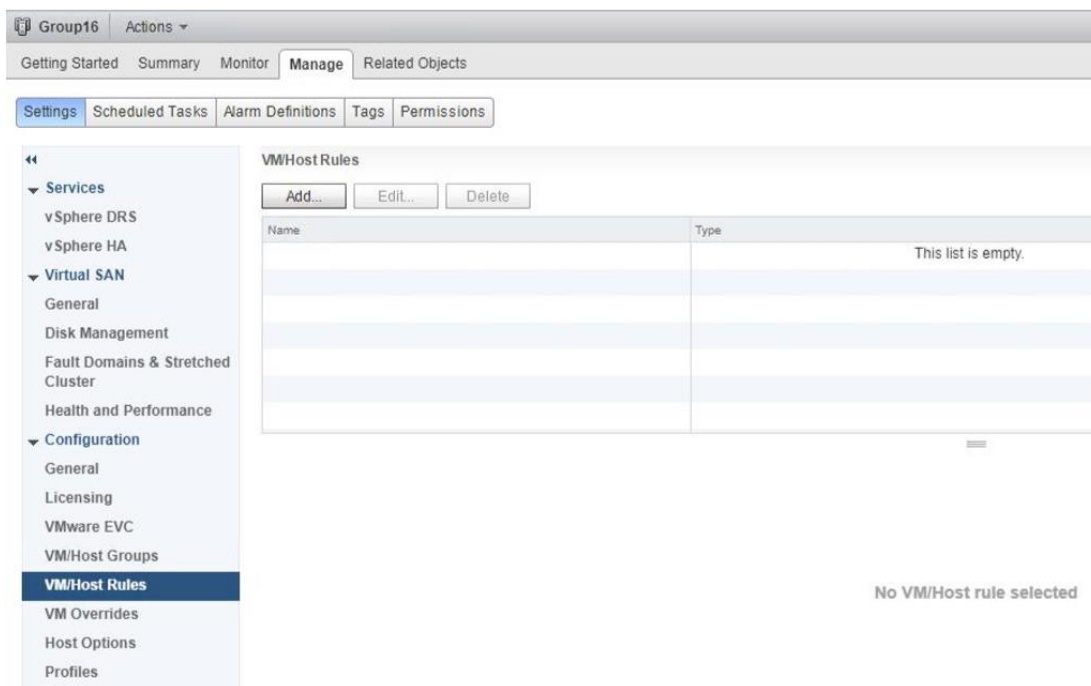
- Click OK at the bottom of the window and the click OK at the bottom of the subsequent window to complete the administration of each Host Group.



Administer VM/Host Rules

Once all VM and Host Groups have been administered, begin administering the group associations through the VM/Host Rules option. The previously sorted spreadsheet could be useful as a reference during this phase of administration.

1. From the same window, select VM/Hosts Rules from the left pane menu bar and then click Add to begin administering associations.



2. Administer a name for the first association that is meaningful. In the example below, the same IP address information has been used in the name (121) to help create an identity that can be quickly identified.
3. Select Enable Rule.
4. From the Type drop-down menu, select Virtual Machine to Hosts.

Group16 - Create VM/Host Rule

Name:

☒ Enable rule.

Type: **Keep Virtual Machines Together**

Description: **Keep Virtual Machines Together**

The listed: **Separate Virtual Machines**

Virtual Machines to Hosts

Members

5. After selecting the Type, a new subset of options will be presented.
6. From the VM Group drop down, select the Oceana group being addressed with the new rule.
7. From the associated drop-down menu below the VM Group menu, select Must run on hosts in group.
8. From the Host Group drop-down menu, select the Host Group (the single host) that will be supporting the VM Group in the new rule.
9. Click OK to submit the newly administered rule.

Group16 - Create VM/Host Rule

Name:
Oceana_LockDown_121

☒ Enable rule.

Type:
Virtual Machines to Hosts

Description:

Virtual machines that are members of the Cluster VM Group Oceana_VM_Group_121 must run on host group Oceana_Host_121.

VM Group:
Oceana_VM_Group_121

Must run on hosts in group

Host Group:
Oceana_Host_121

OK Cancel

Datacenter

Group16

- Top Level Objects 38
- Hosts 7
- Virtual Machines 38
- vApps 8
- Datastores 10
- Datastore Clusters 0
- Networks 5
- Distributed Switches 8

Group16 Actions

Getting Started Summary Monitor **Manage** Related Objects

Settings Scheduled Tasks Alarm Definitions Tags Permissions

Services

- vSphere DRS
- vSphere HA
- Virtual SAN
- General
- Disk Management
- Fault Domains & Stretched Cluster
- Health and Performance
- Configuration
 - General
 - Licensing
 - VMware EVC
 - VM/Host Groups
 - VM/Host Rules**
 - VM Overrides
 - Host Options
 - Profiles

Add Edit Delete

Name	Type	Enabled	Conflicts	Defined By
Oceana_LockDown_121	Run VMs on Hosts	Yes	0	User

VM/Host Rule Details

Virtual Machines that are members of the VM Group must run on hosts that are members of the Host Group.

Add Remove

Oceana_VM_Group_121 Group Members

aocd20b14_3.6
aocd2c3n1

Add Remove

Oceana_Host_121 Group Members

10.129.126.121

vSphere HA Rule Settings

vSphere HA can enforce VM/Host rules when restarting virtual machines.

VM anti-affinity rules

Ignore rules

VM to Host affinity rules

Ignore rules

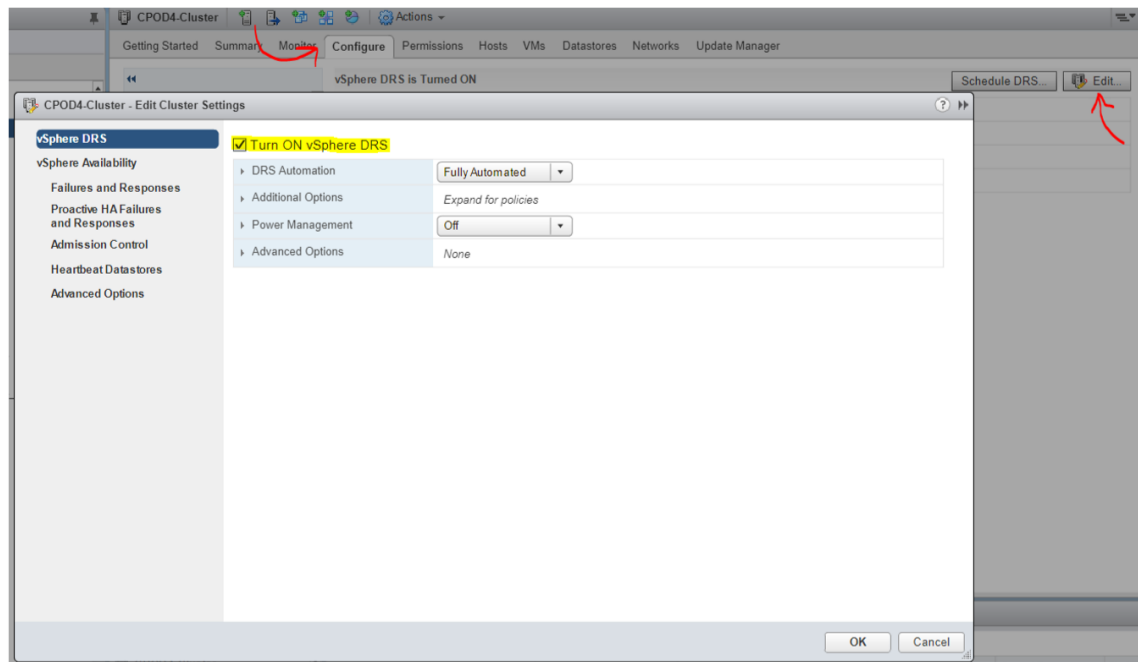
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Enable DRS

Once the rules have been administered, the Ocean applications will be locked in place and DRS may again be enabled for the other applications that may benefit from using the functionality.

1. From vCenter Hosts and Clusters view, highlight the cluster in the left pane menu bar.
2. Select the Configure tab for vSphere 6.5/Manage tab for vSphere 6.0, and under Services, highlight the vSphere DRS option in the left pane menu.
3. Click the Edit button and the window (below) will be presented.
4. Select the Turn ON vSphere DRS option and click OK to submit the change.



It is now possible for vSphere hypervisor to begin balancing some of the Aura core applications appropriately across the hosts in the cluster. Once in place, they should not move again (vMotion) until there is a new imbalance with CPU and memory that could negatively impact performance of the applications.

The vMotion activity and associated potential packet loss is preferable to applications remaining on a server host where there are significant performance impacts that could cause even greater and consistent packet loss.

Workaround or alternative remediation

n/a

Remarks

In an Oceana solution, the only applications that are subject to vMotion and VMware HA are those Aura applications that support the functionality. Some applications can more rapidly recover from the potential 1-6 seconds of packet loss (from vMotion) than others. Ones that can, like CM, SM, SMGR and AES rarely, if ever, show any form of impact from the activity. However, applications that tie together call processing activities across several applications simultaneously, can react noticeably to vMotion packet loss, e.g., Avaya Experience Portal (AEP).

The most common observed outcome to vMotion packet loss, during an AEP vMotion, has been Oceana call traffic defaulting to the back-up Call Center Elite schema, allowing contact center call processing to continue in the traditional call vector processing fashion rather than on the Breeze platform. The positive takeaway was that incoming calls that were unable to reach Oceana VMs, due to any brief loss of response between AEP and other Oceana VMs, were redirected to another contact center processing mechanism and were handled. This process is very short lived; any unresponsive behavior will only last for the period it takes the final vMotion handoff. Test data has shown 1 – 3 seconds is most common; once this period passes, incoming call traffic is immediately restored to Oceana processing.

Other random anomalous behaviors were easily remedied and short lived and yielded a far better outcome for call processing than leaving applications on server hosts suffering from HW, FW or SW mishaps. Until a server or application completely fails, there is no way to stop calls processing through applications being supported on hosts suffering performance degradation(s). Data sources from VMware, Cloud services teams and application testing indicate it is best to allow VMware to use vMotion as an automatic disaster recovery tool for Aura applications, and quickly recover contact center call traffic as opposed to depending on human monitoring and manual intervention to discover and act to restore a virtual solution.

Patch Notes

The information in this section concerns the patch, if any, recommended in the Resolution above.

Backup before applying the patch

n/a

Download

n/a

Patch install instructions

Service-interrupting?

n/a

No

Verification

n/a

Failure

n/a

Patch uninstall instructions

n/a

Security Notes

The information in this section concerns the security risk, if any, represented by the topic of this PSN.

Security risks

n/a

Avaya Security Vulnerability Classification

Not Susceptible

Mitigation

n/a

If you require further information or assistance please contact your Authorized Service Provider, or visit support.avaya.com. There you can access more product information, chat with an Agent, or open an online Service Request. Support is provided per your warranty or service contract terms unless otherwise specified in the Avaya support [Terms of Use](#).

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