Integrate and Troubleshoot Virtual Machine Manager

Contents

Introduction Overview VMM Integration Configuration High Level Procedure VMM Specific Tasks VMM Integration Verification Troubleshoot Verify Workflow and Troubleshooting Checklist

Introduction

This document provides a high level checklist for how to set up Virtual Machine Manager (VMM) integration, then is followed by some common mistakes/errors and faults to look for. It also covers additional commands used to troubleshoot common VMM domain-related issues.

Overview

VMM integration allows a VMM (vCenter, SCVMM, and so on) to be linked to Application Centric Infrastructure (ACI) so that policies can be made available for virtual machines in the same way as bare metal. ACI supports multiple VMM domains to be configured, which can be a mix of Hypervisor managers. At First Customer Ship only vCenter wil be supported, but expect HyperV and other Hypervisors to be added not long after.

End Point Groups (EPGs) are used in the same way with virtual machines as they are with bare metal servers. The only difference is that with bare metal endpoints you normally statically bind an EPG to a leaf/interface, whereas with virtual machines you bind the VMM domain to the EPG. This allows the Application Policy Infrastructure Controller (APIC) to create a distributed virtual switch (DVS) within vCenter to which hosts can be added. Once the Hypervisor hosts (ESX) are added to the DVS, the EPG becomes available to the virtual machines as a network binding (also known as Port Group).

In this figure, ACI EPG is shown in vCenter as a Virtual Machine Network Port Group.

ardware Options Resources	Profiles VServices	Virtual Machine Version
Show All Devices	Add Remove	Device Status Connected
lardware	Summary	Connect at power on
Memory CPUs Video card VMCI device SCSI controller 0 Hard disk 1 Network adapter 1	2048 MB 2 Video card Restricted LSI Logic Parallel Virtual Disk IxVM_Backplane	Adapter Type Current adapter: VMXNET 3 MAC Address 00:50:56:94:00:08 C Automatic C Manual APIC EPG
 Network adapter 2 Network adapter 3 	vmm-ucs ixia Ix_Intern vmm-ucs ixia Ix_Intern	DirectPath I/O
 Network adapter 4 Network adapter 5 Network adapter 6 Network adapter 7 	vmm-ucs ixia Ix_Intern vmm-ucs ixia Ix_Intern vmm-ucs ixia Ix_Intern vmm-ucs ixia Ix_Intern	Network Connection Network label:
Network adapter 9 Network adapter 9	vmm-ucs ixia Ix_Intern vmm-ucs ixia Ix_Intern	vmm-ucs ixia Ix_Internal-2 (vmm-ucs-vcenter) Port: 254

VMM Integration Configuration

There are a number of steps required when you configure VMM integration. A missed step will result in the configuration not applied to vCenter or VMs being able to pass traffic through the fabric. The high level steps are listed with an explanation as to what each step enables. For full details and procedures, see the configuration guides and/or training NPI.

High Level Procedure

The prerequisite tasks are:

- Create the tenant
- Create the bridge domain (BD)
- Assign appropriate IP subnets to the BD
- Create an Associated Attachable Entity Profile (AEP)
- Create the switch profile
- Create the Interface Policy Group
- Create the Interface Profile

VMM Specific Tasks

 Create the vCenter domain. VM Networking > VM Provider VMware > Create VM ProviderHere you configure the logical VM Domain which includes the defining vCenter Credentials, the vCenter Host details then binding them together. You also create/assign the VLAN pool which will be used by this VM Domain. The VLAN Pool should include all VLANs that your VMs utilize. The last step is to assign this VMM Domain to the AEP previously created. The AEP should have been previously linked to the Interface Policy Group and Interface Profile respectfully. This allows the VM Domain to be accessible on defined leaf interfaces. Essentially you tell ACI where Hypervisors for this VM Domain connect to the fabric. If you fail to associate the AEP, the leaf will never program itself with the related EPGs. Be sure the vCenter Datacenter name matches exactly. This figure shows the VMM Controller Datacenter name in APIC vs.



2. Bind EPG to the VMM domain. Tenants > Tenant X > Application Profiles > Application X > Application EPGs > EPG X > Domains (VMs and Baremetal) This task makes the EPG available to the VMM domain, which includes all VMs on the associated DVS hosts. The only option other than choosing the VMM Domain Profile is to set the policy deployment and resolution immediacy. This tells the APIC to either push the EPG and related configuration to the associated AEP leafs immediately, or only when a VM comes online which is associated with that EPG/Port Group (On Demand). On Demand is the default and preferred choice for resource scaling. This figure shows how to add a VMM Domain Associate to

noose the vivin domai	n to associate	0	
VMM Domain Profile:	vmm-ucs-vcenter	× 6	
Deploy Immediacy:	Immediate		
	On Demand		
Resolution Immediacy:	Immediate		
	On Demand		

the prerequisite tasks were completed, the configuration is complete.

VMM Integration Verification

DVS is created on vCenter. As soon as the VMM domain is created, the DVS should be created in vCenter. In order to verify it was created, from the VI client navigate to **Home > Inventory > Networking**. The DVS should be present along with the name given to the VMM Provider.

🕝 localhost - vSphere Client		
File Edit View Inventory Administration Plug-ins Help		
🖸 🚺 🟠 Home 🕨 🚮 Inventory 🕨 🧟 Networking		
4 10 2 2		
E 🚱 localhost	vmm-ucs-vcenter	
	Summary Networks P	orts Reso
vmm-ucs-vcenter	General	
wmm-ucs-vcenter-DVUplinks-105	Manufacturer:	VM
vmm-ucs ixia ESX-201	Version:	5.1
vmm-ucs ixia Ix_Internal-1	Hosts:	9
ymm-ucs ixia Ix_Internal-2	Virtual Machines:	93
vmm-ucs ixia Ix_Internal-3	Networks:	10
vmm-ucs ixia ixia-test-no-cdp	Total Ports:	10
wmm-ucslixialixia-test-vc-down	Available Ports:	11-
vmm-ucsixia/ping	DirectPath I/O:	Su
vmm-ucsjixiajvmk-vmotion		
IV VM Backplane	Commands	

Troubleshoot

If you do not see the DVS created on vCenter, check the faults within the VM Networking > VMM Domain section. The likely culprit is simple Layer 2 connectivity. Ensure the management EPG associated with the vCenter host uses the correct BD. Typically this will be the inband BD.

EPGs programmed on leaf - As long as the DVS is created, and you have assigned VMs to the correct EPG/Port Group and powered up the VMs, you should see both the BD and EPG programmed on the Hypervisor connected leaf switches.

Verify

Connect to the leaf via SSH. You can do this directly or from the APIC. Connecting from the APIC allows you to reference the DNS name rather than determining the leaf IP and use 'tab' to autocomplete the leaf name.

13	enet	CE	vxlan-16777209, vlan-4093
21	enet	CE	vxlan-16646014
22	enet	CE	vlan-305

leaf101#

From here you can see that the BD is correctly programmed on the leaf with internal VLAN 21. For intrafabric transport across this BD, the system uses VXLAN 16646014. The encapsulation VLAN (wire-vlan) is 305. This is the VLAN the host will see on the DVS Port Group. This is one of the VLANs pulled from the attached VLAN pool.

👤 VMM-Test/VMM-Test-App 🕥		6
VLAN ID: 305		
Wirtual Machines (1)		

Check Visore for the expected configuration. In this example, the EPG name is 'Test_DB".

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APIC Object Store Brows	er					
		Filter				
Class or DN: uni/tn-VM	IM-Test/ap-VMM-Test-App	/epg-Test_DB				
Property:	Op: ==	▼ Val1:	Val2:			
Run Query						
Display URI of last que	<u>ary</u>			2		
/api/node/mo/uni/	tn-VMM-Test/ap-VMM-	fest-App/epg-Test	_DB.xml?query-target=children			

Display last response

Total objects shown: 5

	fvRsBd	2
childAction		
dn	uni/tn-VMM-Test/ap-VMM-Test-App/epg-Test_DB/rsbd 《 》IIII	
forceResolve	yes	
lcOwn	local	
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state	formed	
stateQual	none	
status		
tC1	fvBD	
tContextDn		

tDn	uni/tn-VMM-Test/BD-VMM-Test-BD 《 》III.I 🖤 🐠			
tRn	BD-VMM-Test-BD			
tType	name			
tnFvBDName	VMM-Test-BD			
uid	0			
	fvRsCustQosPol 2			
childAction				
dn	uni/tn-VMM-Test/ap-VMM-Test-App/epg-Test_DB/rscustQosPol & MIII			
forceResolve	yes			
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status				
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tRn	qoscustom-default			
tType	name			
tnQosCustomPolName				

	fvRsPathAtt	2
childAction		
dn	uni/tn-VMM-Test/ap-VMM-Test-App/epg-Test_DB/rspathAtt-[topology/pod-1/paths-101/pathep-[eth1/25]] 《 》Inl.	
encap	vlan-305	
forceResolve	no	
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lcC		
lcOwn	local	
modTs	2014-07-11T13:56:18.122+00:00	
mode	regular	
rType	mo	
state	unformed	
stateQual	none	
status		
tCl	fabricPathEp	
tDn	topology/pod-1/paths-101/pathep-[eth1/25] < > Id. 🕕 💯	
tType	mo	
uid	15374	

Workflow and Troubleshooting Checklist

This figure can be used for a pictorial representation as well as a checklist for VMM integration.

