Windows 2012 NPIV on UCS配置示例

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简介

本文档介绍如何在统一计算系统(UCS)版本2.1(2a)上配置Windows Server 2012 N_Port ID Virtualization(NPIV)。 通过此功能,在服务器上运行的虚拟机(VM)可以共享单个适配器,并且仍然 可以独立访问其自己的受保护存储。

先决条件

要求

Cisco 建议您了解以下主题:

- 与UCS Manager(UCSM)版本2.1(2)兼容的Windows交换矩阵网络接口控制器(fNIC)驱动程序
- UCSM版本2.1(2)虚拟接口卡(VIC)固件映像
- 交换矩阵互联/I/O模块(IOM)上的UCSM版本2.1(2)
- Hyper-V 2012和Windows 2012访客

使用的组件

本文档中的信息基于以下软件和硬件版本:

- Hyper-V版本3.0
- Windows Server 2012
- NetApp存储
- UCS机箱、交换矩阵互联和B系列服务器
- Cisco Nexus 5000 系列交换机

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原 始(默认)配置。如果您使用的是真实网络,请确保您已经了解所有命令的潜在影响。

配置

要配置NPIV,请完成以下步骤:

从UCS的角度来看,您必须使用两个虚拟主机总线适配器(vHBA)配置服务配置文件,每个交换矩阵一个。此图显示了一个服务配置文件的vHBA。您可以将全球端口名称(WWPN)与文档后面显示的输出中的服务配置文件关联。

注意:当您使用存储区域网络(SAN)存储来引导Hyper-V主机时,强烈**建**议将一组单独的 vHBA用于VM流量和设备引导。本示例概述了使用两个vHBA的基本配置。

| Equipment Servers LAN SAN VM Admin | Storage FSM | | | | |
|---|---|--|--|---|---------------|
| Filter: Al | Actions | | orld Wide Node Name | | |
| Servers Servers Servers Servers Servers Se | Image World Wild Image Local Edd Imag | e Hode flame Configuration Policy Plocement ess Lo Lo SA | orid Wide Node Name: 21 WWNIN Pool 37 WWNIN Pool Instance: 0 Local Disk Policy Instance: N Connectivity Policy SAN Connectivity N Connectivity Policy Inst | 0:00:00:25:85:02:00:8F 700_WWNN groot/wwn-pool-7700_WWNV rPolicy 7700_RAID0 org-root/local-disk-config-770 Policy: config-770 Policy: config-770 | N NO_FAIDO |
| H- TO PSPEXI | Name | WWPN | Desired Order | Actual Order | Fabric ID |
| A Sub-Organizations | - VHBA VHBAO-FabricA | 20:00:00:25:85:02:A0:8F | 3 | 5 | A |
| Service Profile Templates | H vHBA vHBA1-Fabric8 | 20:00:00:25:65:02:81:8F | 4 | 6 | 8 |

- 2. 从Hyper-V管理器配置虚拟存储区域网络(VSAN)。您必须创建两个VSAN,每个交换矩阵一个。在其他Hyper-V主机中创建VSAN时,请确保使用相同的名称;否则,实时迁移将不起作用
 - 。单击主机,然后单击Virtual SAN Manager。

| | | Actions |
|------------------|---------------------------------|---|
| Virtual Machines | | 7700HV1 |
| Virtual Machines | Virtual SAN Manager for 7700HV1 | Actions 7700HV1 New import Virtual Machine import Virtual Machine import Virtual Machine import Virtual SAN Manager import Disk |
| | OK Cancel Apply | Enable Replication |

3. 创建名**为FabricA的**新光纤通道SAN,并选**择与vHBA0-FabricA对应的全**球范围节点名称 (WWNN)/WWPN。

| <mark>.</mark> | | Virtual SAN Manager for 77 | 00HV1 | × |
|----------------|--|---|------------------|----------------|
| * | Virtual Fibre Channel SANs Vertical Fabrica Fabrica FabricB Global Fibre Channel Settings World Wide Names CD03FF69D15C0000 to C003FF69 | FabricA Name: FabricA Notes: FabricA_VSAN10 | | |
| | | www | WWPN | Status |
| | | 200000258502008F | 20000025B502A08F | 'FabricA' |
| | | 200000258502008F | 20000025B502B18F | 'FabricB' |
| | | | Remo | ve virtual SAN |
| | | [| OK Cancel | Apply |

4. 添**加FabricB**,并选择**与vHBA1-FabricB**对应的WWNN/WWPN。



5. 配置Windows Server 2012 VM的设置,并添加两个光纤通道适配器。关闭VM电源后,右键单 击并选择**Settings**。由于这些主机是集群的一部分,因此使用故障转移集群管理器可以完成此 操作。



6. 单击Add Hardware(添加硬件),选择Fibre Channel Adapter(光纤通道适配器),然后单击 Add(添加)。



7. 为第一个适配器选择虚拟SAN FabricA,为第二个适配器选择虚拟SAN FabricB。



这些映像显示适配器及其各自的WWNN/WWPN。

| 12 | | | 1 | Settings for BDHTEST on 7700H | V1 | - | | x |
|--|------------|--|----------|---|--|-------------------|--------|---------|
| | | | | | | | | |
| r an | Ha | Add Hardware | <u>^</u> | 💷 Fibre Channel Adapter | | | | - |
| | | BIOS Boot from CD | | You can review and edit the World Wide adapter, and connect the adapter to a | Names (WWNs) assigned to the virtual storage area network (SA | e Fibre C NN). | hannel | |
| | <u>u</u> u | Memory | | Virtual SAN: | | | | - |
| | _ | 2048 MB | | FabricA | | | ~ | <u></u> |
| ± | | 4 Virtual processors | | Click Edit Addresses to edit the port add | iresses. | | | |
| E | | IDE Controller 0 | | | [| Edit Add | resses | |
| | | BOHTEST DISK 1 VHDV | | Port addresses | | | | |
| | | IDE Controller 1 | | Address set A: | | | | |
| | | DVD Drive | | World Wide Node Name (WWNN): | C003FF0000FFFF00 |] | | |
| | • | SCSI Controller | = | World Wide Port Name (WWPN): | C003FF69D15C000E |] | | |
| | @ P | Fibre Channel Adapter FabricA | - | Address set B: | | | | |
| | | Fibre Channel Adapter | | World Wide Node Name (WWNN): | C003FF0000FFFF00 |] | | |
| Œ | Q | BOHTEST | | World Wide Port Name (WWPN): | C003FF69D15C000F |] | | |
| | 1 | HyperVCL1_VirtualSwitch | | | Create Addresses |] | | |
| | ä | None | | | | - | | |
| | ি | COM 2 | | Click Copy to copy the addresses to the | clipboard. | | | |
| | | None | | | | C | oov | |
| | | Diskette Drive | | | | | ~~ 1 | - |
| | M | anagement | | To remove the adapter from this virtual | machine, click Remove. | | | |
| Ê | Ţ) | Name | | | | Rer | nove | |
| | 8 | BUHIEST Integration Services | | | | | | |
| | 11 | All services offered | | | | | | |
| | 3 | Snapshot File Location C:\ClusterStorage\Volume3\BD | | | | | | |
| | 2 3 MM | Smart Paging File Location | × | | | | | |
| | | | | | OK Cancel | 1 | 4pply | |

| * | Hart | dware | ^ | 🖘 Fibre | e Channel Adapter | | | | |
|---|----------------|--|---|-----------------------|--|--------------------|--|---------------------|----------|
| | A آلا ا 🛃 ا | Add Hardware BIOS Boot from CD | | You can i adapter, | review and edit the World and connect the adapter | l Wide r to a n | Names (WWNs) assigned to virtual storage area network | the Fihre (3AN). | Channel |
| | | femory . | | Virtual SA | an: | | | | |
| _ | _ : | 2048 MB | | FabricB | | | | | |
| ŧ | P P | 4 Virtual processors | | Click Edit | Addresses to edit the po | rt add | resses. | | |
| | | DE Controller 0 | | | | | | Edit A | ddresses |
| | 6 | 🗈 Hard Drive | | -Port ad | drasses | | | | |
| _ | | BDHTEST_DISK_1.VHDX | | Addre | ss set A: | | | | |
| Ξ | | DE Controller 1 | | World | Wide Mode Marrie AVAUNI | NR- | 0032550000555500 | | |
| | | None | | 10.0112 | value noue name (a whi | ng. | 00001000011100 | | |
| | S 🔊 | SCSI Controller | _ | World | Wide Port Name (WWPN) | }: | C003FF69D15C0010 | | |
| | car F | Fibre Channel Adapter | | | | | | | |
| | ł | FabricA | | Naare | SS GET B: | | | | |
| | | fibre Channel Adapter Fabric® | | World | Wide Node Name (W/W/W | N): | C003FFC000FFFF00 | | |
| Ŧ | ₽ B | BOHTEST | | World | Wide Port Name (WWPN) | 1: | C003FF69D15C0011 | | |
| | . 1 | HyperVCL1_VirtualSwitch | | | | | Crusha Addraman | | |
| | 77 q | DOM 1 | | | | | Greate Addresses | | |
| | 100 0 | COM 2 | | Click Con | v to convitte addresses : | to the | diaboard | | |
| | - T | Nane | | Ciex Sep | 1 10 0003 110 000 0000 | 000 | | | |
| | L D | Jiskette Drive | | | | | | | Cony |
| | | None | | lo remov | e the adapter from this v | vrtual | machine, dick Remove. | | |
| ~ | The state | lagement | | | | | | | ennovie |
| | - | BDHIEST | | | | | | F | conove |
| | | ntegration Services | | | | | | | |
| | | All services offered | | | | | | | |
| | S ا | snapphot Hile Location C: \ClusterStorageWolume3\80 | | | | | | | |
| | 88 s | imart Paging File Location | | | | | | | |

8. 在Nexus 5k交换机上添加分区。

以下是Nexus 5000系列交换机外观示例(未显示UCS vHBA的WWPN分区):

! Zoning for HYVERTEST Fabric A fcalias name HYPERVTEST vsan 10 member pwwn c0:03:ff:69:d1:5c:00:0e member pwwn c0:03:ff:69:d1:5c:00:0f zone name HYPERVTEST_to_NetApp1 vsan 10 Member fcalias HYPERVTEST Member fcalias NetApp1 zoneset name HyperVZoneset1 vsan 10 member HYPERVTEST_to_NetApp1 zoneset activate name HyperVZoneset1 vsan 10

```
!Zoning for HYPERVTEST Fabric B
fcalias name HYPERVTEST vsan 11
member pwwn c0:03:ff:69:d1:5c:00:10
member pwwn c0:03:ff:69:d1:5c:00:11
zone name HYPERVTEST_to_NetApp2 vsan 11
Member fcalias HYPERVTEST
Member fcalias NetApp2
zoneset name HypervZoneset2 vsan 11
member HYPERVTEST_to_NetApp2
zoneset activate name HyperVZoneset2 vsan 11
```

9. 将WWPN添加到NetApp,以确保它们可以访问逻辑单元号(LUN)。

| LUN Management Initiator Groups | | | | | | |
|--|-------------|------------------|---------|-----------------|--------|--|
| 🗟 Create 🔡 Edit 🗙 Delete 🖏 Refresh | | | | | | |
| Name | Туре | Operating System | ALUA | Initiator Count | 11 | |
| BOHTEST | FC/FCoE | Hyper-V | Enabled | 4 | | |
| HV1_7700 | FC/FCoE | Windows | Enabled | 2 | \sim | |
| HV2_7700 | FC/FCoE | Windows | Enabled | 2 | | |
| HV3_7700 | FC/FCoE | Windows | Enabled | 2 | | |
| HV4_7700 | FC/FCoE | Windows | Enabled | 2 | | |
| MSPEX1 | FC/FCoE | Windows | Enabled | 2 | | |
| RELASQL | FC/FCoE | Windows | Enabled | 2 | | |
| | | | | | ~ | |
| Initiators c0:03:ff:69:d1:5c:00:0e c0:03:ff:69:d1:5c:00:11 c0:03:ff:69:d1:5c:00:10 c0:03:ff:69:d1:5c:00:0f | | | | | | |
| Initiators | Mapped LUNs | | | | | |

实时迁移

每个VM适配器有两组WWNN/WWPN。Hyper-V在实时迁移期间使用这些功能。此图显示每个 WWPN在实时迁移期间的使用方式。



来源:<u>Hyper-V虚拟光纤通道概述</u>

请注意,两个WWPN都登录到交换矩阵时会出现重叠。

这保证了存储上的连续工作而不会中断,即使在迁移失败的情况下也是如此。

"验**证实时迁**移"部分显示实时迁移过程中的flogi数据库,因此您可以在该过程中查看适配器flogi的两 个WWPN。

快速迁移

与实时迁移不同,快速迁移会暂停移动的VM。

因此,没有理由从集中登录两个WWPN。相反,VM可以从一个节点注销并从新节点登录。

验证实时迁移

如果所有配置都正确,您应在UCS vHBA和VM光纤通道适配器的flogi数据库中看到flogi条目。

NEXUS1# show flogi database Interface VSAN FCID Port Name Node Name

```
fc1/31 10 0x930001 50:0a:09:83:8d:80:b7:ae 50:0a:09:80:8d:80:b7:ae
fc1/32 10 0x930000 50:0a:09:84:9d:80:b7:ae 50:0a:09:80:8d:80:b7:ae
San-po31 10 0x930002 24:1f:54:7f:ee:57:1d:c0 20:0a:54:7f:ee:57:1d:c1
San-po31 10 0x930003 20:00:00:25:b5:02:a0:8f 20:00:00:25:b5:02:00:8f <vHBAO-FabricA
San-po31 10 0x930004 20:00:00:25:b5:02:a0:9f 20:00:00:25:b5:02:00:9f
San-po31 10 0x930005 20:00:00:25:b5:02:a0:6f 20:00:00:25:b5:02:00:6f
San-po31 10 0x930006 20:00:00:25:b5:02:a0:7f 20:00:00:25:b5:02:00:7f
San-po31 10 0x930007 20:00:00:25:b5:02:a0:4f 20:00:00:25:b5:02:00:4f
San-po31 10 0x930008 20:00:00:25:b5:02:a0:5f 20:00:00:25:b5:02:00:5f
San-po31 10 0x930009 c0:03:ff:69:d1:5c:00:0e c0:03:ff:00:00:ff:ff:00 <Set A for
Adapter FabricA
```

NEXUS2# show flogi database

Interface VSAN FCID Port Name Node Name fc1/31 11 0x9f0001 50:0a:09:84:8d:80:b7:ae 50:0a:09:80:8d:80:b7:ae fc1/32 11 0x9f0000 50:0a:09:83:9d:80:b7:ae 50:0a:09:80:8d:80:b7:ae San-po32 11 0x9f0002 24:20:54:7f:ee:57:1a:80 20:0b:54:7f:ee:57:1a:81 San-po32 11 0x9f0003 20:00:00:25:b5:02:b1:8f 20:00:00:25:b5:02:00:8f <vHBA1-FabricB San-po32 11 0x9f0004 20:00:00:25:b5:02:b1:9f 20:00:00:25:b5:02:00:9f San-po32 11 0x9f0005 20:00:00:25:b5:02:b1:6f 20:00:00:25:b5:02:00:6f San-po32 11 0x9f0006 20:00:00:25:b5:02:b1:7f 20:00:00:25:b5:02:00:7f San-po32 11 0x9f0007 20:00:00:25:b5:02:b1:4f 20:00:00:25:b5:02:00:4f San-po32 11 0x9f0008 20:00:00:25:b5:02:b1:5f 20:00:00:25:b5:02:00:5f San-po32 11 0x9f0008 20:00:00:25:b5:02:b1:5f 20:00:00:25:b5:02:00:5f San-po32 11 0x9f000b c0:03:ff:69:d1:5c:00:10 c0:03:ff:00:00:ff:ff:00 <Set A for Adapter FabricB

要显示LUN,请在访客VM中打开磁盘管理,然后输入**rescan disks**命令。如果LUN出现两次,则未 启用多路径I/O(MPIO)。

在实时迁移期间,您应在每台交换机中看到地址集A和地址集B的WWPN。

NEXUS1# show flogi database

Interface VSAN FCID Port Name Node Name
fc1/31 10 0x930001 50:0a:09:83:8d:80:b7:ae 50:0a:09:80:8d:80:b7:ae
fc1/32 10 0x930000 50:0a:09:84:9d:80:b7:ae 50:0a:09:80:8d:80:b7:ae
San-po31 10 0x930002 24:1f:54:7f:ee:57:1d:c0 20:0a:54:7f:ee:57:1d:c1
San-po31 10 0x930003 20:00:00:25:b5:02:a0:8f 20:00:00:25:b5:02:00:8f
San-po31 10 0x930004 20:00:00:25:b5:02:a0:9f 20:00:00:25:b5:02:00:9f
San-po31 10 0x930005 20:00:00:25:b5:02:a0:6f 20:00:00:25:b5:02:00:6f
San-po31 10 0x930006 20:00:00:25:b5:02:a0:7f 20:00:00:25:b5:02:00:7f
San-po31 10 0x930006 20:00:00:25:b5:02:a0:4f 20:00:00:25:b5:02:00:4f
San-po31 10 0x930008 20:00:00:25:b5:02:a0:5f 20:00:00:25:b5:02:00:5f
San-po31 10 0x930008 20:00:00:25:b5:02:a0:5f 20:00:00:25:b5:02:00:5f
San-po31 10 0x930009 c0:03:ff:69:d1:5c:00:0e c0:03:ff:00:00:ff:ff:00 <Address Set A
San-po31 10 0x93000a c0:03:ff:69:d1:5c:00:0f c0:03:ff:00:00:ff:ff:00 <Address Set B</pre>

NEXUS2# show flogi database

Interface VSAN FCID Port Name Node Name fc1/31 11 0x9f0001 50:0a:09:84:8d:80:b7:ae 50:0a:09:80:8d:80:b7:ae fc1/32 11 0x9f0000 50:0a:09:83:9d:80:b7:ae 50:0a:09:80:8d:80:b7:ae San-po32 11 0x9f0002 24:20:54:7f:ee:57:1a:80 20:0b:54:7f:ee:57:1a:81 San-po32 11 0x9f0003 20:00:00:25:b5:02:b1:8f 20:00:00:25:b5:02:00:8f San-po32 11 0x9f0004 20:00:00:25:b5:02:b1:9f 20:00:00:25:b5:02:00:9f San-po32 11 0x9f0005 20:00:00:25:b5:02:b1:6f 20:00:00:25:b5:02:00:6f San-po32 11 0x9f0006 20:00:00:25:b5:02:b1:7f 20:00:00:25:b5:02:00:7f San-po32 11 0x9f0007 20:00:00:25:b5:02:b1:4f 20:00:00:25:b5:02:00:4f San-po32 11 0x9f0008 20:00:00:25:b5:02:b1:5f 20:00:00:25:b5:02:00:5f

故障排除

本部分提供了可用于对配置进行故障排除的信息。

常见问题

- 当Microsoft Windows 2012 FNIC驱动程序的版本不正确时, Hyper-V Manager > Virtual SAN Manager中的虚拟光纤通道SAN的"状态"列会显示设备或驱动程序不支持虚拟光纤通道消息。通 过转到Device Manager > Storage Controllers > Cisco VIC FCoE Storport Miniport > Properties > Driver,验证当前FNIC驱动程序版本。使用UCS互操作性矩阵以根据刀片型号、 UCS固件版本和适配器确定支持哪个驱动程序。如有必要,请更新驱动程序。
- 在某些情况下, Live Migration会与Synthetic FibreChannel端口**一起失败:未能完成保留资源** 消息。应验证以下几点:

WWPN是否添加到存储目标 — NetApp中的启动器组。分区信息是否用于访问分配给虚拟机的 两组WWPN。是否已从Microsoft应用了最新的修补程序,包括KB 2894032。

• 当设备使用相同的HBA对来引导和VM流量时,实时迁移可能会失败。这在Unified Computing System <u>Virtual Machine Live Migration Fails with Virtual Fibre Channel Adapters中描述</u>。

MPIO

为了恢复能力和容错能力,应在操作系统上启用MultiPath I/O。

1. 在NetApp上为特定启动器组启用非对称逻辑单元访问(ALUA)。

Edit Initiator Group 'VM1'

| General Initiators | | |
|--------------------|-----------------------------|---|
| Name: | VM1 | |
| Operating System: | Windows | * |
| Туре: | FC/FCoE | |
| Enable ALUA (Asymr | netric Logical Unit Access) | |

2. 在Microsoft端启用MPIO功能。在"添**加角色和功能**"中,确保已启用MPIO。

| a | Add Roles and Features Wizard | |
|-------------------|--|----------|
| Select features | | |
| Before You Begin | Select one or more features to install on the selected serve | r. |
| Installation Type | Features | |
| Server Selection | Ink and Handwriting Services | ^ |
| Server Roles | Internet Printing Client | |
| Features | IP Address Management (IPAM) Server | |
| Confirmation | iSNS Server service | |
| Results | LPR Port Monitor | |
| | Management OData IIS Extension | ≡ |
| | Media Foundation | |
| | Message Queuing | Π |
| | Multipath I/O (Installed) | |
| | Network Load Balancing | |
| | Peer Name Resolution Protocol | |
| | Quality Windows Audio Video Experience | |
| | RAS Connection Manager Administration Kit (CM/ | |
| | Remote Assistance | <u> </u> |
| | < III > | * |

相关信息

- Hyper-V虚拟光纤通道概述
- 虚拟机实时迁移概述
- <u>技术支持和文档 Cisco Systems</u>