HANDS-ON LABS MANUAL - 2022

HOL-2210-91-SDC Lightning Lab

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Lab Overview - HOL-2210-91-SDC - vSphere Distributed Switch - Lightning Lab

Lab Guidance

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Note: It may take more than 30 minutes to complete this lab. However, you may take this lab as many times as you want. The modules are independent of each other so you can start at the beginning of any module and proceed from there. Use the Table of Contents to access any module in the lab. The Table of Contents can be accessed in the upper right-hand corner of the Lab Manual.

Welcome to the Working with the vSphere Distributed Switch Lightning Lab.

We have developed Lightning Labs, to help you learn about VMware products in small segments of time.

In this lab, you will get an introduction to the vSphere Distributed Switch. It covers a comparison with the vSphere Standard Switch, creating a vSphere Distributed Switch and migrating a virtual machine from a vSphere Standard Switch to the new vSphere Distributed Switch.

Lab Module List:

• Module 1 - Working with the vSphere Distributed Switch (30 minutes) (Basic) Explore an existing Virtual Distributed switch,

then build a new one and migrate a virtual machine to it.

Lab Captains:

- AJ Ciampa, Senior Solutions Engineer, United States
- Dave Cook, Sr. Technical Marketing Architect, United States
- Milena Chen, Associate Content Architect, Costa Rica
- Sandy Visoso, Content Architect, United States

This lab manual can be downloaded from the Hands-on Labs document site found here:

http://docs.hol.vmware.com

This lab may be available in other languages. To set your language preference and view a localized manual deployed with your lab, utilize this document to guide you through the process:

http://docs.hol.vmware.com/announcements/nee-default-language.pdf

Below are the lab modules included in the complete Virtualization 101: Getting Started with vSphere:

- Module 1 Introduction to Management with vCenter Server
- Module 2 Introduction to vSphere Networking and Security
- Module 3 Introduction to vSphere Storage

If you have never taken a lab, view the *Appendix - Lab Guidance* to see best practices and tips on how to use the lab environment console.



First time using Hands-on Labs?



Welcome! If this is your first time taking a lab navigate to the Appendix in the Table of Contents to review the interface and features before proceeding.

For returning users, feel free to start your lab by clicking next in the manual.

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You are ready....is your lab?



Please verify that your lab has finished all the startup routines and is ready for you to start. If you see anything other than "Ready", please wait a few minutes. If after 5 minutes your lab has not changed to "Ready", please ask for assistance.

Module 1 - vSphere Distributed Switch

Introduction to the Distributed vSwitch

The ability to connect virtual machines through a logical switch that is part of the vSphere hypervisor is a necessity for operating systems and applications to communicate on the physical network. Traditionally this was done through a Standard vSwitch, configured individually at each ESXi host in the datacenter.

Since its introduction, the vSphere Distributed Switch quickly became the recommended type of virtual switch to use for most if not all types of network traffic in and out of the ESXi host. This is due mostly in part to its ability to be created and managed centrally through vCenter, as well as the advanced networking features it provides.

Let's spend some time reviewing the similarities and differences between the two types of switches.

Types of virtual switches

There are two types of virtual switches in ESXi/ESX 4.x, ESXi 5.x, and ESXi 6.x, vNetwork Standard Switch and vNetwork Distributed Switch (vDS).

vNetwork Standard Switch (vSwitch, vSS)

As in VMware Infrastructure 3, the configuration of each vSwitch resides on the specific ESXi/ESX host. The VI administrators have to manually maintain consistency of the vSwitch configuration across all ESXi/ESX hosts to ensure that they can perform operations such as vMotion.

vSwitches are configured on each ESXi/ESX host.

vNetwork Distributed Switch (dvSwitch, vDS)

The configuration of vDS is centralized to the vCenter Server. The ESXi/ESX 4.x, ESXi 5.x, and ESXi 6.x hosts that belong to a dvSwitch do not need further configuration to be compliant.

Distributed switches (vDS) provide similar functionality to the vNetwork Standard Switch (vSS). dvPortgroups are made up of a set of dvPorts. The vDS equivalent of portgroups is a set of ports in a vSS. The configuration is inherited from dvSwitch to dvPortgroup, just as from vSS to Portgroup.

Virtual machines, Service Console interfaces (vswif), and VMKernel interfaces can be connected to dvPortgroups just as they could be connected to portgroups in vSwitches.

Comparing vNetwork Standard Switch with vNetwork Distributed Switch

These features are available with both types of virtual switches:

- Can forward L2 frames
- Can segment traffic into VLANs
- Can use and understand 802.1q VLAN encapsulation
- Can have more than one uplink (NIC Teaming)
- Can have traffic shaping for the outbound (TX) traffic

These features are available only with a Distributed Switch:

- Can shape inbound (RX) traffic
- Has a central unified management interface through vCenter Server
- Supports Private VLANs (PVLANs)
- Provides potential customization of Data and Control Planes

vSphere 5.x provides these improvements to Distributed Switch functionality:

- Increased visibility of inter-virtual machine traffic through Netflow.
- Improved monitoring through port mirroring (dvMirror).
- Support for LLDP (Link Layer Discovery Protocol), a vendor-neutral protocol.
- The enhanced link aggregation feature provides choice in hashing algorithms and also increases the limit on the number of link aggregation groups.
- · Additional port security is enabled through traffic filtering support.
- Improved single-root I/O virtualization (SR-IOV) support and 40GB NIC support.

vSphere 6.x provides these improvements to Distributed Switch functionality:

- Network IO Control New support for per virtual machine Distributed vSwitch bandwidth reservations to guarantee isolation and enforce limits on bandwidth.
- Multicast Snooping Supports IGMP snooping for IPv4 packet and MLD snooping for IPv6 packets in VDS. Improves performance and scale with multicast traffic.
- Multiple TCP/IP Stack for vMotion Allows vMotion traffic a dedicated networking stack. Simplifies IP address management with a dedicated default gateway for vMotion traffic.

vSS vs vDS architecture

Spend a few minutes reviewing the differences between the Standard vSwitch and Distributed vSwitch architectures.

Pay special attention to how the port groups and uplinks are designed.



vSphere Standard Switch Architecture



vSphere Distributed Switch Architecture



Let's get started!

Now that we have a better understanding of what a Distributed vSwitch is and why we would want to use it, let's spend a little time exploring an example of one.



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Explore a vDS

Before we walk through the process of building our own Distributed vSwitch, let's take a minute to explore an existing vDS.

In this lab, we will see how a Distributed vSwitch compares to a Standard vSwitch, how it is configured, and how it is connected to a running virtual machine.

Open Chrome Browser from Windows Quick Launch Task Bar



1. Click on the Chrome Icon on the Windows Quick Launch Task Bar.

Log in to vSphere Client



1. Click on the vSphere Web Client bookmark.



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1. Click the Use Windows session authentication check box.

2. Click Login.

Navigate to networking



1. Click on the Networking icon.

View Standard vSwitch



1. Expand RegionA01.

2. Select VM Network.

VM Network

Summary Monito	r Permissions	Hosts	VM	s (1	
Sammary Monito			-		-
					- 1
Virtual Machines	VM Templates				
Virtual Machines	VM Templates				- 1
Virtual Machines	VM Templates	J			
Name ↑	VM Templates	State	~	Status	v

1. Click on the VMs tab.

Take note of the virtual machines that are connected to this vSwitch. You should see a VM called TinyLinux2.

Hosts

immary Monitor Pe	ermissi	Hosts	VMs				
Name ↑	~	State	~	Status	~	Cluster	
Name ↑	~	State Connected	~	Status	~	Cluster	01-CC

1. Click on the Hosts tab.

Take note of the hosts connected to the VM Network vSwitch. You should see esx-Ola.corp.local and esx-O2a.corp.local.

View Distributed Switch

vm vSphere Client Me	enu 🗸 🛛 🔍 Search in all environments
 vcsa-01a.corp.local vcsa-01a.corp.local RegionA01 VM Network M RegionA01-vDS-COMP 	Image: Summary Monitor Configure 2 missions Summary Monitor Configure 2 missions Settings ✓ Properties Topology LACP Private VLAN NetFlow Port Mirroring

- 1. Click on RegionA01-vDS-COMP.
- 2. Select the **Configure** tab.
- 3. Select Properties.

Review vDS configuration

Summary Monitor	Configure Permissions	Ports Hosts	VMs	Network
Settings	Properties			
Properties	General			
Topology	Name	RegionA01-vD	S-COMP	
LACP	Manufacturer	VMware, Inc.		
Private VLAN	Number of uplinks	4		
NetFlow	Number of ports	520		
Port Mirroring	Network I/O Control	Disabled		
Port Milloring	Advanced			
Health Check	MTU	1500 Bytes		
Resource Allocation	 Multicast filtering mode 	IGMP/MLD sno	oping	
System traffic	Discovery protocol			
Network resource pool	Туре	Cisco Discover	y Protocol	
Alarm Definitions	Operation	Listen		
Alarm Delinitions	Administrator contact			
	Name			
	Other details			

Basic settings of Distributed Switch are displayed. Such as MTU settings, the version of the switch, and the discovery protocol being used.

Topology



- 1. Click on Topology.
- 2. On the left side of the diagram, you will see the port groups associated with the distributed switch **RegionA01-vDS-COMP**. These port groups are how the virtual machines and kernel ports are connected to the vDS. Note how there are VMkernel ports for Management, Storage, and vMotion. This is very similar to the configuration you would see on a Standard vSwitch, except that these are defined and configured in one central location instead of individually at each host.
- 3.On the right, you will see the uplinks associated with this vDS. These are used to connect the vDS directly to the physical NICs on the hosts that are tied to this Distributed vSwitch.

VM Port Group



1. Expand Virtual Machines on the VM-RegionA01-vDS-COMP port group.

Again, note how there are virtual machines tied to this distributed port group just like you would see in a port group on a standard vSwitch.

Path to Uplinks



1. Click on TinyLinux.

Note that a path to an uplink is drawn out and highlighted in orange to show the uplinks, hosts, and vmnics it is associated with.

Build a new vDS

Now that we have had a chance to explore an existing vDS, let's build one of our own.

In this lab, we will create a new Distributed vSwitch, add ESXi hosts to it, build port groups and connect them to uplinks so that we can use it to forward virtual machine traffic onto the physical network.

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Navigate to Site A Datacenter



1. In the vSphere Web Client, click on RegionA1 Datacenter.

Create a new Distributed Switch

vm vSphere Client	Menu V Q Search in all environ	nme C ? ~ Adr
vcsa-01a.corp.local	Actions - RegionA01	Permissions Hosts & Clu
RegionA01 VM Network D RegionA01 vDS_COMP.	New Folder	CPU Used: 144 MHz
ESXi-RegionA01-vDS-COMP	Distributed Switch	Sew Distributed Switch
Uplink-RegionA01-vD Constant of the second	Storage	Used: 23.09 GB

1. In the navigator, right-click the RegionA01 Datacenter.

2. Select Distributed Switch > New Distributed Switch.

This will open the New Distributed Switch wizard.

Name the Distributed Switch

1 Name and location 2 Select version	Name and locati Specify distribut	ion ed switch name and location.	
3 Configure settings 4 Ready to complete	Name	1 New vDS	
	Location	RegionA01	
			2

1. Type New vDS in the Name field.

2. Click Next.

Select the version

1 Name and location	Select version
2 Select version	Specify a distributed switch version.
4 Peady to complete	
4 Ready to complete	• 7.0.0 - ESXi 7.0 and later
	6.6.0 - ESXi 6.7 and later
	650 - ESXi 65 and later
	The multicast filtering mode on the switch will be set to IGMP/MLD snooping if you continue with the selected version.
	Features per version
	-
	2
	CANCEL BACK NEXT

1. Leave the default setting of 7.0.0 - ESXi 7.0 and later.

2. Click Next.

Configure settings

1 Name and location 2 Select version	Configure settings Specify number of upli	ik ports, resource allocation and default port group.
3 Configure settings 4 Ready to complete	Number of uplinks	4
	Network I/O Control	Enabled 🗸
	Default port group	Create a default port group
	Port group name	DPortGroup
		(1

1. On the Configure Settings page, leave the default options and click Next.

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Complete the build



1. Review your settings on the Ready to Complete page and click Finish if everything looks good.

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Add hosts to new Distributed Switch

ľ	P		<u> </u>	🗅 New	vDS
V 🗗 VCS	sa-01a.cor	p.local		Summary	Monitor
~ 🗈	RegionA0	1			Manut
9	🖉 VM Net	work			Versio
	New v)S	O Arti	ans New yDS	-
~~~	Region	A01-vDS-	C C ACU	OIS - New VDS	
	🙈 ESXi	-RegionA	C Dist	tributed Port Gr	oup 🕨
	🔏 Stora	age-2	Add	d and Manage H	losts
	📇 Uplir	ik-R	4		
	🙈 VM-I	RegionAC	1 Edit	t Notes	
	🛆 vMot	tion-Regio	D Upg	grade	•
			Set	tings	t.

- 1. Right-click on the newly created switch, New vDS.
- 2. Select Add and Manage Hosts...

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## Select task

1 Select task 2 Select hosts	Select task Select a task to perform on this distributed switch.			
3 Manage physical adapters 4 Manage VMkernel adapt 5 Migrate VM networking	Add hosts     Add new hosts to this distributed switch.			
5 Ready to complete	<ul> <li>Manage host networking</li> <li>Manage networking of hosts attached to this distributed switch.</li> </ul>			
	Remove hosts Remove hosts from this distributed switch.			
		CANCEL	BACK	2 NEXT

1. On the Select task page, select Add hosts.

2. Click Next.

### Select hosts



1. On the Select hosts page, click New hosts.

## Select New Hosts

n			SHOW INCOMPATIBLE HOSTS
			T Filter
✓ Host	Host State	Cluster	Compatibility
esx-01a.corp.local	Connected	🗍 RegionA01-COMP01	✓ Compatible
esx-02a.corp.local	Connected	RegionA01-COMP01	✓ Compatible

1. Click the check box next to Host to select both hosts in the datacenter.

2. Click OK.



## Manage Hosts

Select task 2 Select hosts	Select hosts Select hosts to add to this distributed s	witch.		
4 Manage physical adapters 4 Manage VMkernel adapt	🕂 New hosts 🔀 Remove			
5 Migrate VM networking	Host	Ŧ	Host Status	т
6 Ready to complete	(New) esx-01a.corp.local		Connected	
	(New) esx-02a.corp.local		Connected	
				2 it. 1
				2 10

1. Verify the two hosts are listed, then click Next.

## Assign physical adapters

1 Select task 2 Select hosts	Manage physical adapters Add or remove physical network adapters to this distributed switch.			
3 Manage physical adapters 4 Manage VMkernel adapt	Assign uplink 2 Jassign adapter	• View settings		
5 Migrate VM networking	Host/Physical Network Adapters	In Use by Switch	Uplink	Uplink Port Group
6 Ready to complete	⊿ 🔋 esx-01a.corp.local			
	On this switch			
	On other switches/unclaimed			
	🐖 vmnic0	RegionA01-vDS-CO	1.11	144
	🔎 vmnic1	RegionA01-vDS-CO		
	Vmnic2	vSwitch0		U
	🛤 vmnic3			

On the Manage physical adapters page, we want to configure which physical NICs will be used on the distributed switch.

- 1. From the On other switches/unclaimed list, highlight vmnic3.
- 2. Click Assign uplink.

## Assign uplinks to hosts

Uplink	Assigned Adapter
Uplink 1	^
Uplink 2	
Uplink 3	
Uplink 4	
(Auto-assign)	
	5 items
poly this uplink assi	anment to the rest of the hosts (i)

- 1. From the Select an Uplink page, select Uplink 1.
- 2. Check the box next to Apply this uplink assignment to the rest of the hosts.

This will automatically configure any other hosts that you are adding to this distributed switch with the same vmnic and uplink settings.

3.Click OK.

## **Review settings**

elect task Gelect hosts	Manage physical adapters Add or remove physical network adapters to this distributed switch.					
lanage physical adapters lanage VMkernel adapt	📹 Assign uplink 🛛 🗙 Unassign adapter	📹 Assign uplink 🗙 Unassign adapter				
ligrate VM networking	Host/Physical Network Adapters	In Use by Switch	Uplink	Uplink Port.		
Ready to complete	⊿ 👕 esx-01a.corp.local	1				
	▲ On this switch					
	属 vmnic3 (Assigned)		Uplink 1	New vDS		
	On other switches/unclaimed					
	💌 vmnic0	RegionA01-vDS-CO				
	💌 vmnic1	RegionA01-vDS-CO				
	💌 vmnic2	vSwitchO				
	🔺 👕 esx-02a.corp.local					
	▲ On this switch					
	属 vmnic3 (Assigned)		Uplink 1	New vDS		
	On other switches/unclaimed					

1. Review vmnic and uplink settings for the hosts you are adding and click Next if everything is correct.

## Manage VMkernal adapters

Select task Select hosts	Manage VMkernel adapters Manage and assign VMkernel network	adapters to the distrib	outed switch.	
Manage physical adapters Manage VMkernel adapt	🐣 Assign port group 🛛 🕜 Reset chan	ges 🚯 View setting:	S	
Migrate VM networking	Host/VMkernel Network Adapters	In Use by Switch	Source Port Group	Destination Port Gr
Ready to complete	🖌 🔋 esx-01a.corp.local			L
	On this switch			
	On other switches/unclaimed			
	M vmk0	RegionA01-vD	ESXi-RegionA01-v	Do not migrate
	MI vmk1	RegionA01-vD	Storage-RegionA0	Do not migrate
	vmk2	RegionA01-vD	vMotion-RegionA0	Do not migrate
	esx-02a.corp.local			
	On this switch			
	In other switches/unclaimed			
	vmk0	RegionA01-vD	ESXi-RegionA01-v	Do not migrate
	vmk1	RegionA01-vD	Storage-RegionA0	Do not migrate
	re vmk2	RegionA01-vD	vMotion-RegionA0	Do not migrate

1. Since we will not be using this distributed switch for any VMkernel functions, just click Next here.

## Migrate VM networking

Select hosts	et virtual machines or network adapt	Migrate VM networking		
	ct virtual machines of network adapte	ers to migrate	to the distributed swit	ch.
Manage physical adapters				
Manage VMkernel adapt	Migrate virtual machine networking			
Migrate VM networking	Assign port group 🛛 🖍 Reset change	s 🚯 View se	ettings	
Ready to complete	Host/Virtual Machine/Network Adapter	NIC Count	Source Port Group	Destination Port Group
	⊿ 1 esx-01a.corp.local			
	🕨 🗗 TinyLinux2	1		
	⊿ 🔋 esx-02a.corp.local			
	🕨 🗗 TinyLinux	1		
	▶ 🗗 Windows10	1		

The Add and Manage Hosts wizard also gives us the ability to migrate VMs from one distributed switch to another. While this action can be done here, we will be doing this in the next lesson.

1. Select the Migrate virtual machine networking checkbox.

2. Click Next.

Also, note that this wizard is not the typical place where you would migrate VMs from one virtual switch to another. The process we will be using later is the recommended method.

## Complete the host add wizard

1 Select task	Ready to complete			
2 Select hosts	Review your settings selection	ons before finishing the	wizard.	
3 Manage physical adapters	North and a start and have	_		
4 Manage VMkernel adapt	Number of managed hosts	5		
5 Migrate VM networking	Hosts to add	2		
6 Ready to complete	Number of network adapt	ers for update		
	Physical adapters	2		
				•

1. On the Ready to complete page, click Finish.

Explore your new vDS

New VDS	is 🗸					
ummary Monitor Confi	igure	Permissions	Po	rts	Hosts	VN
Name ↑	~	State	~	Stat	us	,
Name ↑ esx-01a.corp.local	~	State Connected	~	Stat	us Normal	,

With your new Distributed Switch highlighted, feel free to explore the associated tabs to get a feel for the setup and configuration.

1. Click on the Hosts tab to see the newly connected hosts.

## Topology



- 1. Click Configure.
- 2. Click Topology.
- 3.Note that your distributed port group DPortGroup does not have any VMs connected to it.

The next lesson will walk you through the process of migrating VMs to the new vDS.

### Migrate a VM from a vSS to a vDS

Now that we have created a new vDS, we want to take advantage of its capabilities. In this lab, we will migrate a running virtual machine from a virtual standard switch to the newly created distributed virtual switch.

In the vSphere Client, there are numerous ways to accomplish the task of VM network migration. However, we will be walking through the procedures specifically outlined in the vSphere product documentation.

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## Navigate to your datacenter



1. To get started, click on RegionA01 Datacenter.

#### Migrate VMs



1. Right-click on RegionA01 Datacenter.

2. Select Migrate VMs to Another Network.

### Select source network

1 Select source and destina 2 Select VMs to migrate 3 Ready to complete	Select source and destination networks Select source and destination networks for the migration of virtual machine network adapters
	Source network
	• Specific network
	All virtual machine network adapters that are connected to this network will be migrated.
	O No network
	All virtual machine network adapters that are not connected to any network will be migrated.
	Destination network
	BROWSE

1. In the Select source and destination networks section, click on Browse under Source network.

## VM Network

		T Filter
Name	NSX Port Group ID	Distributed Switch
📤 DPortGroup		New vDS
🖀 ESXI-RegionA01-vD		RegionA01-vDS-COMP
🙈 Storage-RegionA01		RegionA01-vDS-COMP
VM Network	- 1	
🚔 VM-RegionA01-vDS		RegionA01-vDS-COMP
A vMotion-RegionA01		RegionA01-vDS-COMP
		2

1. Select VM Network.

2. Click OK.

This is the network associated with the virtual standard switch where our VM is currently connected that we want to migrate.

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## Select destination network

1 Select source and destina 2 Select VMs to migrate 3 Ready to complete	Select source and destination networks Select source and destination networks for the migration of virtual	machine network adapters
	Source network	
	• Specific network	
	VM Network	BROWSE
	All virtual machine network adapters that are connected to this	network will be migrated.
	O No network	
	All virtual machine network adapters that are not connected to	any network will be migrated.
	Destination network	BROWSE
		CANCEL BACK NEXT

1. Under Destination network select Browse.

## DPortGroup

		- nter
Name	NSX Port Group ID	Distributed Switch
🛆 DPortGroup		New vDS
A ESXI-RegionA01-vD	Ŭ,	RegionA01-vDS-COMP
🙈 Storage-RegionA01		RegionA01-vDS-COMP
VM Network		
A VM-RegionA01-vDS		RegionA01-vDS-COMP
A vMotion-RegionA01		RegionA01-vDS-COMP
		CANCEL OK

#### 1. Select DPortGroup.

#### 2. Click OK.

This is the port group on the new Distributed Switch that you created. This is the new port group that will be used to connect the VM being migrated to the network.

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## Migrate VMs

Migrate VMs to Anoth	ner Network	
1 Select source and destina 2 Select VMs to migrate 3 Ready to complete	Select source and destination networks Select source and destination networks for the migration of virtue	al machine network adapters
	Source network	
	• Specific network	
	VM Network	BROWSE
	All virtual machine network adapters that are connected to th	is network will be migrated.
	O No network	
	All virtual machine network adapters that are not connected t	o any network will be migrated.
	Destination network	
	DPortGroup	BROWSE
		-
		CANCEL BACK NEXT

1. Click Next.



## Select VM to migrate

2 Select VMs to migrate	Select Select	t VMs to migrate t virtual machines to r	nigrate to the destination netw	work								
3 Ready to complete	Select	Select virtual machines to migrate from VM Network to DPortGroup:										
		Virtual Machine	Network Adapter	Host	Destination Network							
		TinyLinux2	Network adapter 1	esx-01a.corp.local	Accessible							

1. Select the checkbox for TinyLinux2.

Note that there is only one adapter associated with this VM. If there was more than one, you would have the option of choosing which one you would want to connect to the new vDS.

2. Click Next.

## Ready to Complete



1. Click Finish to migrate the VM from a Standard Switch to the new Distributed Switch.

## Explore your changes



1. Click on the new Distributed Switch and expand it to see all associated port groups and uplinks.

### **Topology Map**



- 1. Click Configure.
- 2. Click Topology.
- 3. Under DPortGroup, click on the drop-down arrow to expand the view.

Select the TinyLinux2 VM and note the highlighted path through the new vDS and Uplink.

### Lightning Lab Conclusion

#### You have taken the Lightning Lab!

Thank you for taking the Working with the vSphere Distributed Switch Lightning Lab HOL-2210-91-SDC

New to virtualization or vSphere and want to learn more? Explore the full Virtualization 101: Getting Started with vSphere lab:

HOL-2210-01 Virtualization 101:Getting Started with vSphere

Below are the lab modules included in the complete Virtualization 101: Getting Started with vSphere:

- Module 1 Introduction to Management with vCenter Server
- Module 2 Introduction to vSphere Networking and Security
- Module 3 Introduction to vSphere Storage

For more information about our labs:

Try VMware Hands-on Labs

### How to End Lab

				▼ HELP	PRIVACY	MY PROFILE	LOC OUT	0
			END					
TIME REMAINING: 01:28:17	EXTEND		_	, 			~	

To end your lab click on the END button.

### Appendix - Hands-on Labs Interface

Welcome to Hands-on Labs! This overview of the interface and features will help you to get started quickly. Click next in the manual to explore the Main Console or use the Table of Contents to return to the Lab Overview page or another module.

## Location of the Main Console



- 1. The area in the large RED box contains the Main Console. The Lab Manual is on the tab to the right of the Main Console.
- 2. Your lab starts with 90 minutes on the timer. The lab can not be saved. Your lab will end when the timer expires. Click the EXTEND button to increase the time allowed. If you are at a VMware event, you can extend your lab time twice up to 30 minutes. Each click gives you an additional 15 minutes. Outside of VMware events, you can extend your lab time up to 9 hours and 30 minutes. Each click gives you an additional hour.



## Alternate Methods of Keyboard Data Entry

In this lab, you will input text into the Main Console. Besides directly typing it in, there are two very helpful methods of entering data which make it easier to enter complex data.

## Click and Drag Lab Manual Content Into Console Active Window

#### https://www.youtube.com/watch?v=xS07n6GzGuo

	OUTPUT
Apple assessed.	The sub-statement of the local distribution of the statement of the statem
	2 Construction of the second second second second by and features the larger method and
	Construction of the second sec
	Now cr. Inded is
	For Highlight the our
	complex CLI
	inual 2
And the second s	
	(Note you can use oup arrow key)
	240 -* 12141 -* 14 -* http://12.16.18.12/
	(Remember to use the SEND TEXT option.)
Eleveration (1) a (1) a	This should now fell.

You can also click and drag text and Command Line Interface (CLI) commands directly from the Lab Manual into the active window in the Main Console.

#### Accessing the Online International Keyboard



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You can also use the Online International Keyboard found in the Main Console.

1. Click on the keyboard icon found on the Windows Quick Launch Task Bar.

### Click once in active console window

- 🗆 X On-Screen Keyboard Home PgUp Nav Esc  $\langle X |$ q 1 8 Tab End PgDn Mv Up Del 0 u р Caps 2 Insert Pause Mv Dn f g h i k Enter PrtScn ScrLk Shift Shift b m Fn Ctrl Alt Alt Ctrl < Options Help Fade - x Administrator: Command Prompt C:1. Microsoft Windows [Version 6.3.9600] (c) 2013 Microsoft Corporation. All rights reserved. ~ ≡ C:\Users\Administrator> 

In this example, you will use the Online Keyboard to enter the "@" sign used in email addresses. The "@" sign is Shift-2 on US keyboard layouts.

- 1. Click once in the active console window.
- 2. Click on the Shift key.

## Click on the @ key

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1. Click on the "@" key.

Notice the @ sign entered in the active console window.

## Activation Prompt or Watermark

[68]



When you first start your lab you may notice a watermark on the desktop indicating that Windows is not activated.

A major benefit of virtualization allows virtual machines to be moved and run on any platform. Hands-on Labs utilizes this benefit and hosts labs from multiple datacenters. However, these datacenters may not have identical processors which triggers a Microsoft activation check through the Internet.

Rest assured VMware and Hands-on Labs are in full compliance with Microsoft licensing requirements. The lab that you are using is a self-contained pod and does not have full access to the Internet. Without this, the Microsoft activation process fails and you see this watermark.

This cosmetic issue has no effect on your lab.

#### Return to Lab Guidance

Use the Table of Contents to return to the Lab Overview page or another module.





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