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INF-NET2207

VMware vSphere Distributed Switch— Technical Deep Dive

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#vmworldinf

What We'll Cover

- The purpose of this session is to give you a good understanding of the vSphere Distributed Switch (VDS)
 - That includes complexity, features, cost, deployment considerations, and management
- My goal is for you to see how this could fit your environment and decide if you want to migrate
- This is a very open presentation so feel free to ask questions – Will be around after

Quickly Discuss vSwitches

- Standard vSwitches are not all bad
 - Easy to understand
 - Very easy to troubleshoot
 - Great deal of flexibility
- But they are also not all good
 - Not many advancement of features
 - Can become very cumbersome

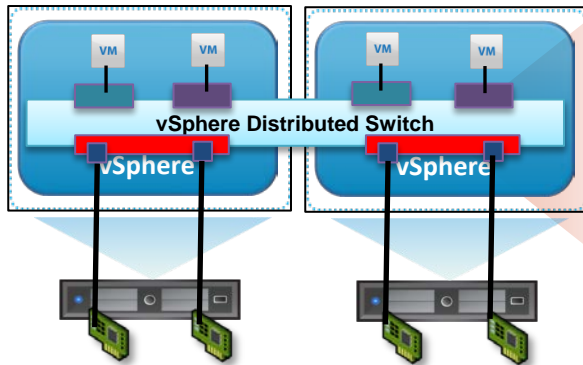
Why Bother With the VDS?

- VDS is the second vSwitch included with vSphere
- Easier administration for medium and larger environments
 - Add a Port-Group once and all servers can use it
- Provides features that standard vSwitches don't
 - Network I/O Control (NIOC)
 - Port mirroring
 - NetFlow
 - Private VLANs
 - Ingress and egress traffic shaping
- Not JUST for large environments
 - Many can take advantage of the advanced features

Compared to Others?

- Right now you have three distributed options
 - VDS (vSphere Distributed Switch)
 - Cisco Nexus 1000v
 - IBM 5000V (very little out there)
- VDS competes very well in all areas
 - Significant advancements in 5.0 and 5.1
- Many other requirements filled by vShield suite

VDS Enhancements in 5.1



Manageability

- Roll back and Recovery
- Config. Backup and Restore
- MAC Address Management
- Elastic Port Groups

Performance & Scale

- LACP
- SR-IOV
- VDS Scale enhancements
- Data plane performance improvements

Visibility & Troubleshooting

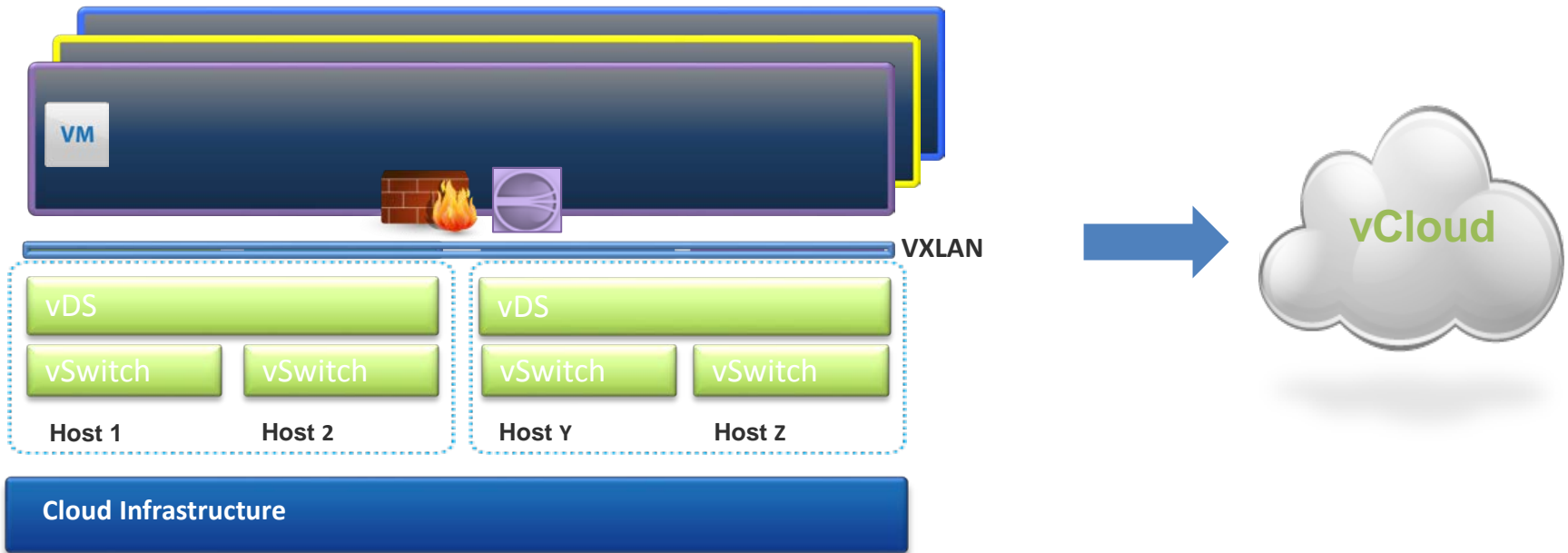
- Network Health Check
- RSPAN, ERSPAN
- IPFIX (NetFlow v10)
- SNMP – MIBs
- Netdump

Security

- BPDU Filter
- ACL's via vCloud Networking and Security App

VDS as a Platform

- VDS is a platform for the future of the virtual datacenter
- Network virtualization and extensibility through protocols like VXLAN and other 3rd parties



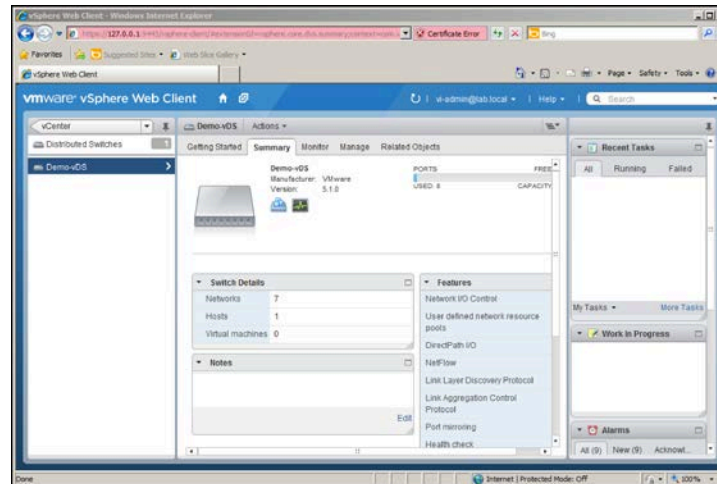
More on New 5.1 Features

**Attend following sessions to get
more details on new VDS capabilities**

**INF-NET 1590 – What's New in vSphere – Networking
On Monday at 2:30 PM
And on Wednesday at 4:00 PM**

Using the New Features

- Just a note...all new features require use of the vSphere 5.1 web interface
 - Won't see them in the VI Client
- Can do all legacy actions in the full client



Let's Look at the VDS

- The Good

- Innovative features such

- Network I/O Control (NIOC)
- Load-based Teaming

- Very low complexity

- No external components to deploy or manage

- Included in Enterprise Plus licensing

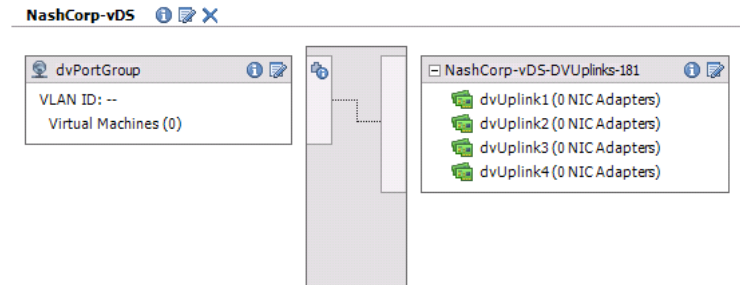
- No special hardware (NICs or switches) required

- The Bad

- Bit of a learning curve, but not much

- Increases reliance on a robust vCenter deployment

- Requires Enterprise Plus licensing



Architecture

- The vDS architecture has two main components
 - Management or Control Plane – Integrated in to vCenter
 - I/O or Data Plane – Made up of hidden vSwitches on each vSphere host that is part of the VDS
- The Control plane is responsible for all configuration and management
- The I/O plane handles data flow in and out of each vSphere host
- No extra modules or components to install, manage, or upgrade

VDS Deployment Considerations

- Controlled and managed by vCenter, so making VC resilient becomes important
 - Backup that database!
 - vCenter outage won't affect general VM operation
- Virtual vCenter or Physical vCenter?
 - Both fully supported just a few things to think about
- Couple of ways to physically separate traffic
 - DMZ or other SSLF (Specialized Security Limited Functionality) environments
 - NAS or iSCSI traffic
- Confirm standard physical switch port config
 - Make them all the same!

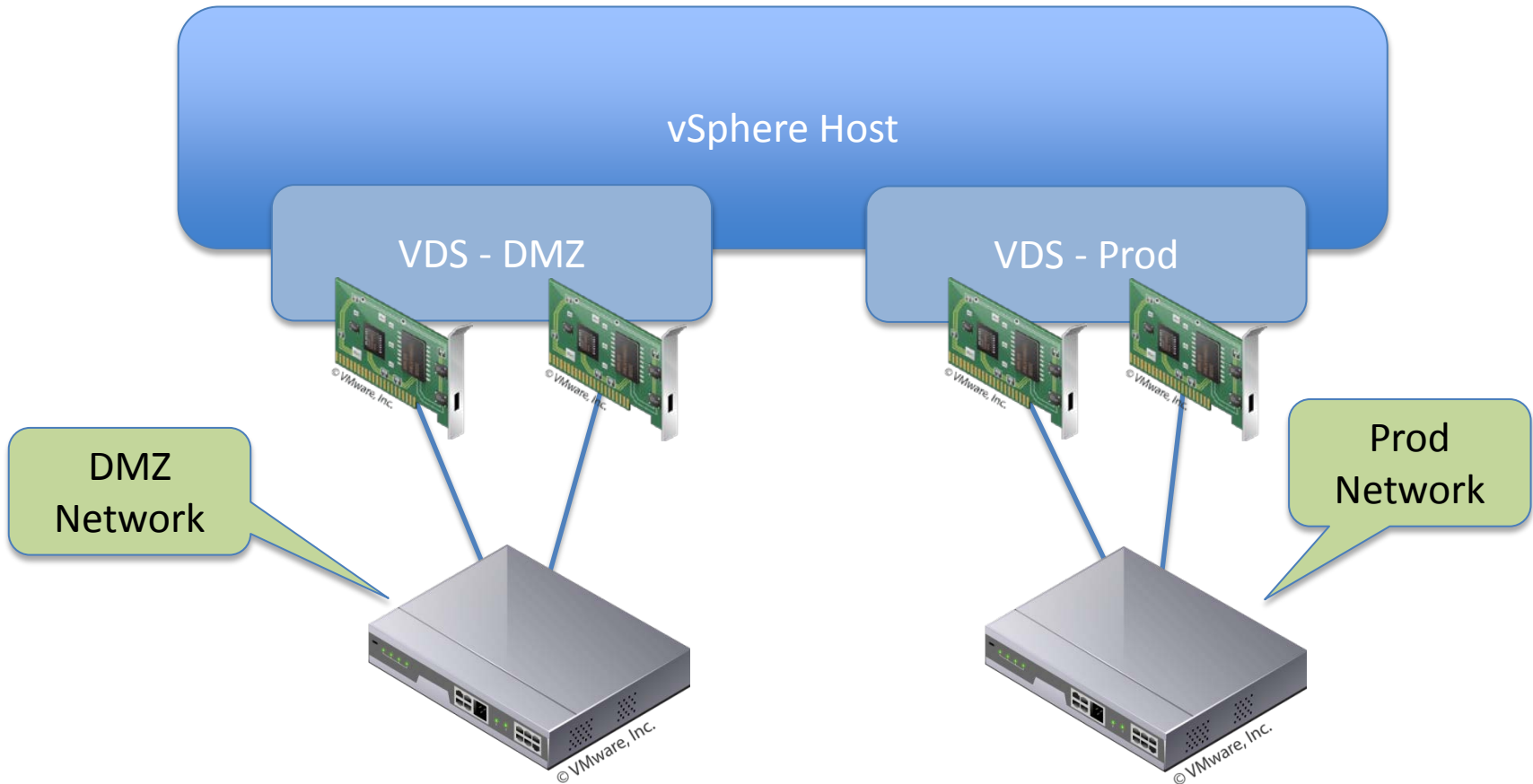
Design Considerations

- Designing the deployment of your VDS can be simple or a bit more involved
 - Depends on depth of features you plan to use
- Can get a bit more complex if you want to physically separate traffic
 - Storage on its own set of NICs
 - DMZ or other network with different security requirements
- Suggested to start with basic deployment and then start adding in other features such as NIOC

Traffic Separation with VDS

- A single VDS can only have one uplink configuration
 - This means all pNICs added to the VDS must trunk the same VLANs
- What if you want to physically separate traffic?
- Two options:
 - **Active/Standby/Unused** – In each Port-Group configure Active/Standby/Unused configurations for NICs
 - **Multiple VDS Switches** – Yes, you can have more than one VDS in a cluster, each with their own uplinks
- Usually prefer a single VDS
 - Except in cases such where risk of configuration mistakes are a concern

VDS Uplink Diagram – Multiple VDS



VDS Uplink Table – Single VDS with 1Gb

Traffic	Port-Group	Teaming	Active	Standby	Unused
Mgmt	PG-1	Explicit	dvuplink1	dvuplink2	3,4,5,6,7,8
vMotion	PG-2	None	dvuplink3	dvuplink4	1,2,5,6,7,8
vMotion	PG-3	None	dvuplink4	dvuplink3	1,2,5,6,7,8
FT	PG-4	Explicit	dvuplink2	dvuplink1	3,4,5,6,7,8
iSCSI	PG-5	None	dvuplink5	None	1,2,3,4,6,7,8
iSCSI	PG-6	None	dvuplink6	None	1,2,3,4,5,7,8
VM	PG-7	LBT	dvuplink7/8	None	1,2,3,4,5,6

This is a suggested configuration for a server with 8 NICs showing multi-link vMotion and iSCSI

Good blog post on this subject: <http://www.kendrickcoleman.com/index.php/Tech-Blog/vmware-vsphere-5-host-nic-network-design-layout-and-vswitch-configuration-major-update.html>

VDS Uplink Table – Single VDS with 10Gb

Traffic	Port-Group	Teaming	Active	Standby	Unused
Mgmt	PG-1	Explicit	dvuplink1	dvuplink2	None
vMotion	PG-2	Explicit	dvuplink2	dvuplink1	None
FT	PG-4	Explicit	dvuplink2	dvuplink1	None
iSCSI	PG-5	Explicit	dvuplink1	dvuplink2	None
VM	PG-7	LBT	Dvuplink1/2	None	None

This is a suggested configuration for a server with 2 10Gb NICs. The idea is to balance traffic types across the two NICs.

Good blog post on this subject: <http://www.kendrickcoleman.com/index.php/Tech-Blog/vmware-vsphere-5-host-nic-network-design-layout-and-vswitch-configuration-major-update.html>

Lab Time!

- Let's get away from slides and in to the lab
- In this lab we'll try and show a full VDS deployment
 - Create new switch
 - Configure uplink and main VDS
 - Create port-groups
 - Migrate hosts and VMs
 - Show advanced options

Best Practice Recommendations

- Use static port binding unless absolutely necessary
 - Especially if you have a virtual vCenter
- Try and let physical switches do tagging and trunk all VLANs
 - Not a fan of using native VLAN
- Recommended to use Load Based Teaming as it is simple and works about anywhere

Let's Recap

- The VDS gives you a lot more than just single point of management
- Many features and functions that are almost required for 10Gb, Tier 1, & dense consolidation
- Environment consistency & testing make for a very easy migration to the VDS
- Very little day-to-day management required
- The future

Questions?

- My Blog: <http://www.jasonnash.com>
- Twitter is @TheJasonNash
- My Email: jason@varrow.com





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