VMware NSX

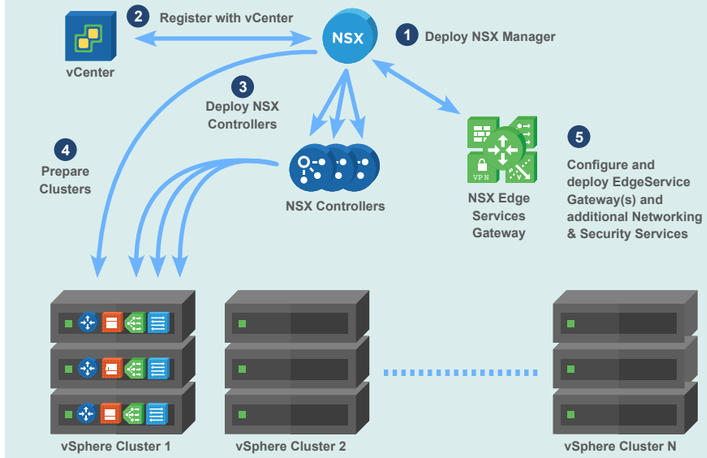
NSX Licensing

Product Features	Standard	Advanced	Enterprise
Distributed switching and routing	•	•	•
NSX edge firewall	•	•	•
NAT	•	•	•
SW L2 bridging to physical environment	•	•	•
Dynamic routing with ECMP (active-active)	•	•	•
API-driven automation	•	•	•
Integration with vRealize and OpenStack	•	•	•
Log Management with vRealize Log Insight for NSX	•	•	•
Automation of security policies with vRealize		•	•
NSX edge load balancing		•	•
Distributed firewalling		•	•
Integration with Active Directory		•	•
Server activity monitoring		•	•
Service insertion (third-party integration)		•	•
Integration with AirWatch		•	•
Cross vCenter NSX			•
Multi-site NSX optimizations			•
VPN (IPSec and SSL)			•
Remote Gateway			•
Integration with hardware VTEPs			•

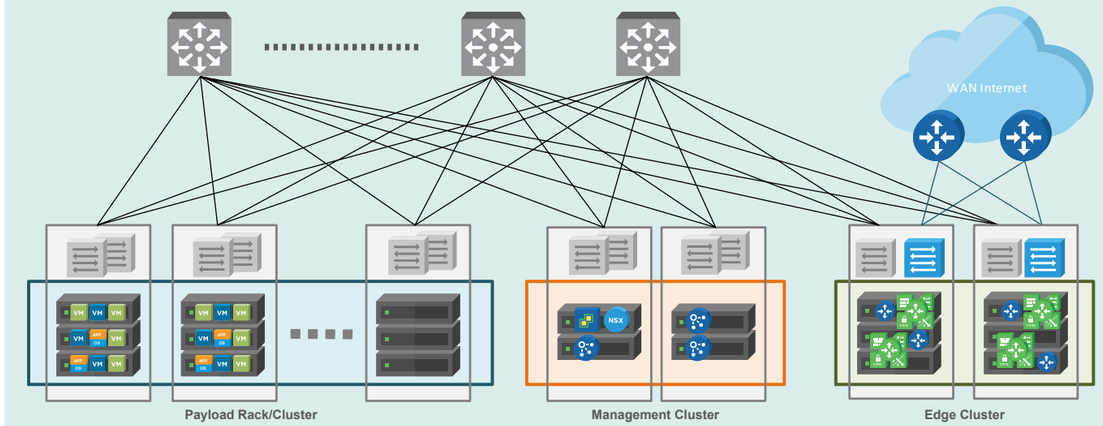
NSX Edge Sizes

Flavours	vCPU	Memory	General Guideline
Compact	1	512MB	- Tests - POCs
Large	2	1GB	- Medium performance firewall - Single Services
Quad-Large	4	1GB	- High performance firewall
X-Large	6	8GB	- High performance Firewall - Load Balancing

NSX Implementation Steps



NSX Reference Architecture



Load Balancer commands

Shows load balancer configuration
```
# show configuration loadbalancer
```
Shows VIPs
```
# show configuration loadbalancer virtual "vipName"
```
Shows load balancer pool configuration
```
# show configuration loadbalancer pool "poolName"
```
Shows load balancer pool member state
```
# show service loadbalancer pool "poolName"
```

NSX Edge commands

FIREWALL

Shows the firewall configuration
```
# show the firewall configuration
```
Shows specific firewall rule information
```
# show firewall rule-id "ruleID"
```
Show IP address group
```
# show configuration ipset
```
Show application set
```
# show configuration application-set
```

DYNAMIC ROUTING

Shows entries on table
```
# show ip [bgp/ospf]
```
Shows neighbors
```
# show ip [bgp/ospf] neighbors
```
Shows routes learned
```
# show ip route [bgp/ospf]
```
Shows configuration
```
# show configuration [bgp/ospf]
```

NSX Manager

CONTROLLERS

Shows controller nodes status
```
# show controller list all
```

EDGES

Shows information for all edges
```
# show edge all
```
Shows specific Edge information
```
# show edge "edgeID"
```

LOGICAL ROUTERS

List all logical router instance
```
# List all logical router instance
```
List which host received routing information
```
# show logical-router list dlr "dlrID" host
```
List routing table for a specific host
```
# show logical-router host "hostID" dlr "dlrID" route
```
Shows Logical router's statistics
```
# show logical-router controller master dlr "dlrID" statistics
```
Show the ARP table for a Logical router on a specific host
```
# show logical-router host "hostID" dlr "dlrID" arp
```

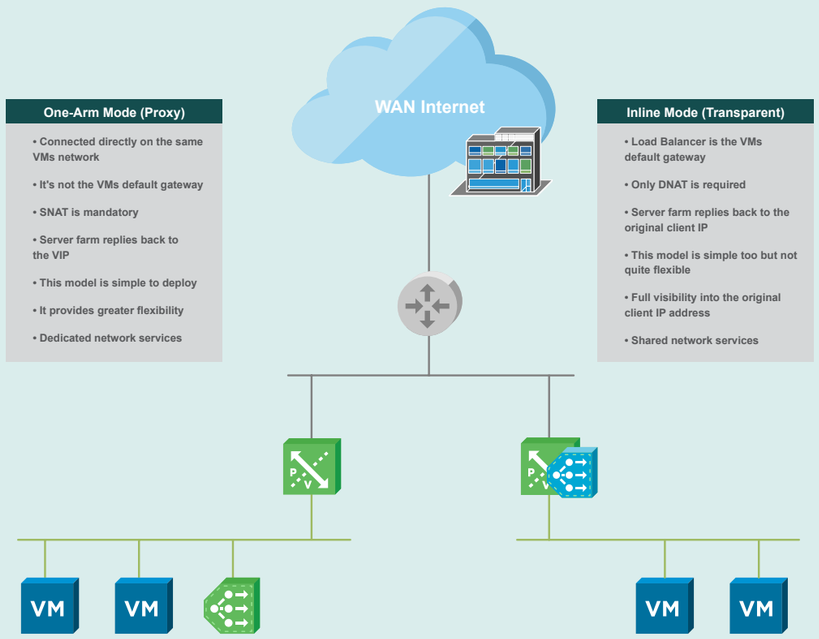
LOGICAL SWITCHES

Shows Logical Switches
```
# show logical-switch list all
```
Shows connected logical switch on a host
```
# show logical-switch controller "controllerID" host "hostIP" joined-vnis
```
Shows MAC Address table for a logical switch
```
# show logical-switch controller master vni "vniID" mac
```
Shows VTEP table for a host
```
# show logical-switch controller "controllerID" host "hostIP" vtep
```
Shows the ARP table for a host
```
# show logical-switch controller "controllerID" host "hostIP" arp
```
Shows MAC address table for a host
```
# show logical-switch controller "controllerID" host "hostIP" mac
```
Shows logical switch statistics
```
# show logical-switch controller master vni "vniID" statistics
```
Shows all hosts on which a logical switch is available
```
# show logical-switch list vni "vniID"host
```

NSX Controller Commands

Restarts a controller. Restart only one controller at a time
```
# restart controller
```
Shows control-cluster status
```
# show control-cluster status
```
Shows controller, configuration, and status of the specified VNI
```
# show control-cluster logical-switches vni "vniID"
```
Shows the hosts that are connected to the specified VNI
```
# show control-cluster logical-switches connection-table "vniID"
```
Shows MAC records of the specified VNI
```
# show control-cluster logical-switches mac-table "vniID"
```
Shows the ARP records updated from the specified connection.
```
# show control-cluster logical-switches arp-records "hostIP"
```
Shows the MAC records updated from the specified connection
```
# show control-cluster logical-switches mac-records "hostIP"
```
Shows the VTEP table for the specified VNI
```
# show control-cluster logical-switches vtep-table "vniID"
```
Shows the VTEP records updated from the specified host
```
# show control-cluster logical-switch vtep-records "hostIP"
```

NSX Load Balancing Services



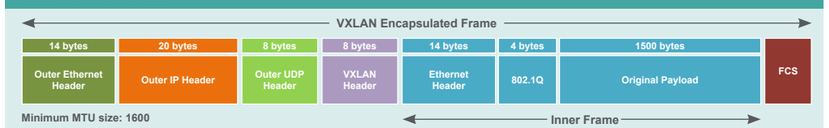
One-Arm Mode (Proxy)

- Connected directly on the same VMs network
- It's not the VMs default gateway
- SNAT is mandatory
- Server farm replies back to the VIP
- This model is simple to deploy
- It provides greater flexibility
- Dedicated network services

Inline Mode (Transparent)

- Load Balancer is the VMs default gateway
- Only DNAT is required
- Server farm replies back to the original client IP
- This model is simple too but not quite flexible
- Full visibility into the original client IP address
- Shared network services

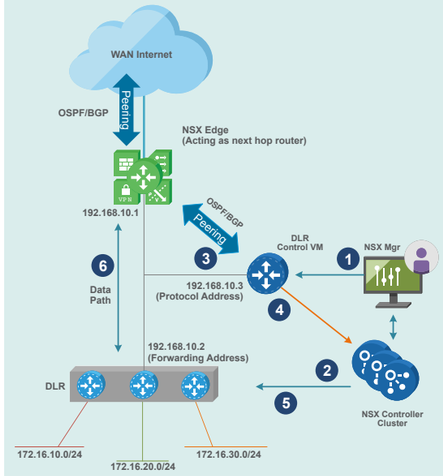
VXLAN Frame Format



Teaming and Failover Mode

Policy	NSX Support	Multi vTEP Support	Uplink Behavior
Route Based on Originating Port	✓	✓	Both NICs Active
Route Based on Source MAC Hash	✓	✓	Both NICs Active
Route Based on IP Hash	✓	✗	Flow Based
Route Based on NIC Load	✗	✗	✗
LACP	✓	✗	Flow Based
Explicit Failover Order	✓	✗	Only one NIC active

NSX Dynamic Routing



1. Dynamic routing protocol is configured on the logical router instance
2. Controller pushes new logical router configuration including to ESXi hosts
3. Dynamic routing peering between the NSX Edge and logical router control VM
4. New learned routes from the NSX Edge are pushed to the Controller for distribution
5. Controller sends the route updates to all ESXi hosts
6. Routing kernel modules on the hosts handle the data path traffic

ESXi Commands

Check NSX VIBs Installed
```
# esxcli software vib list | grep esx
```
Uninstalling NSX VIBs
```
# esxcli software vib remove --vibname=esx-vxlan
# esxcli software vib remove --vibname=esx-vsip
```
Display VXLAN Details
```
# esxcli network vswitch dvs vmware vxlan list
```
Test VTEP Connectivity
```
# vmkping ++netstack=vxlan -d -s "MTU_SIZE" "VTEP_IP_DEST"
```

NSX Resource Links

Documentation Center
https://www.vmware.com/support/pubs/nsx_pubs.html

Official Blog
http://blogs.vmware.com/networkvirtualization

VMware Hands-on Labs
http://hol.vmware.com/

Design Guide
http://bit.ly/2cHPGtJ

Trending support issues
http://kb.vmware.com/kb/2131154

Troubleshooting
https://kb.vmware.com/kb/2122691

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https://vmware.com/products/nsx