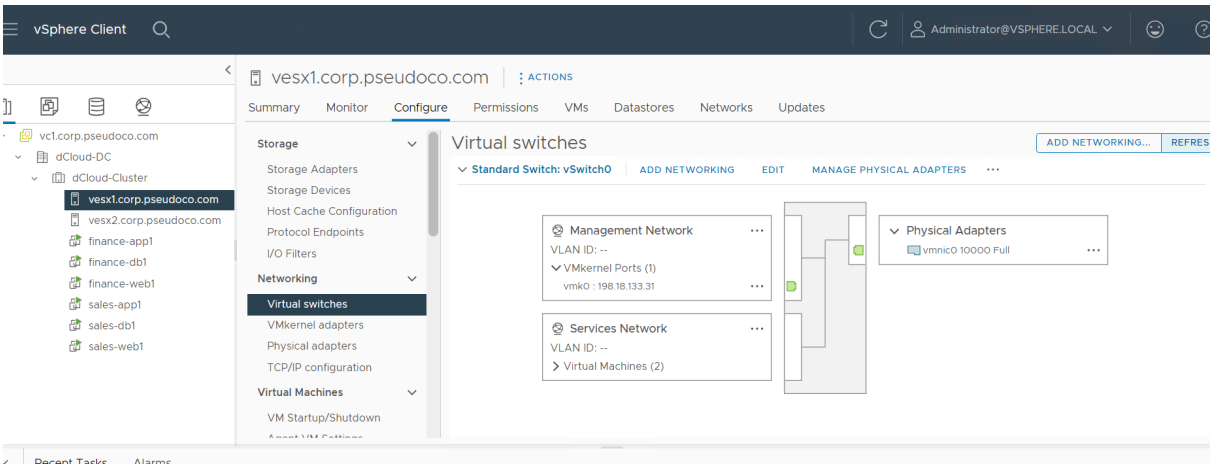
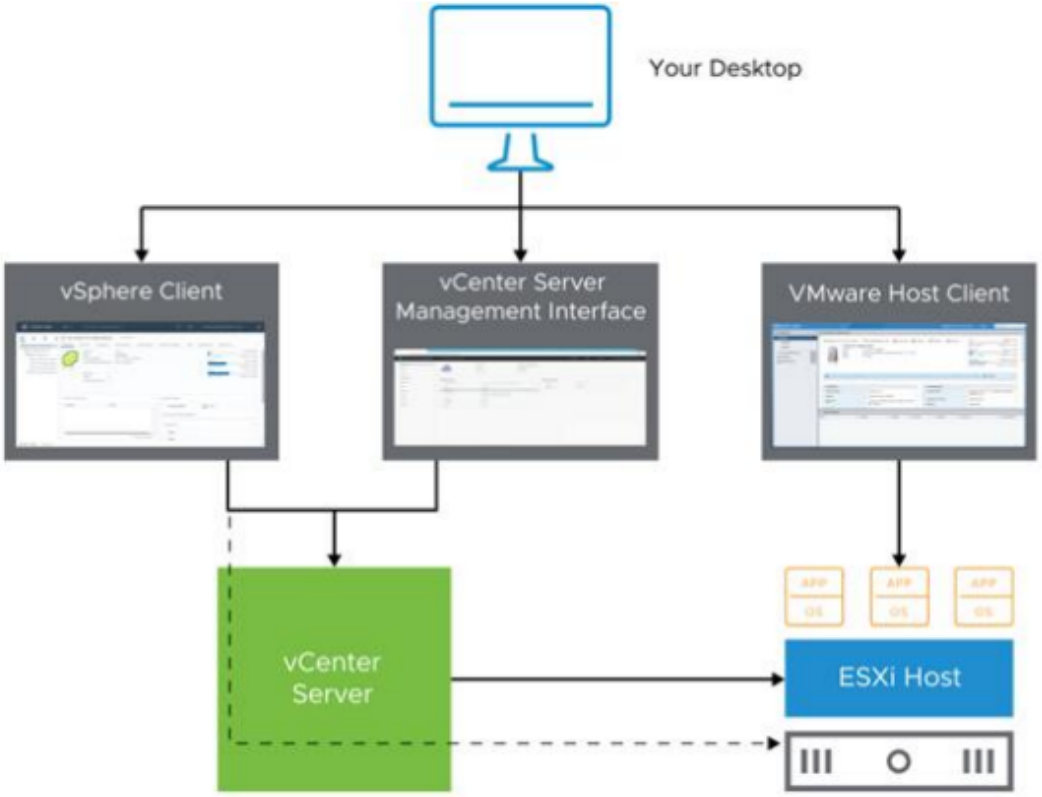
VM웨어 9일차 (가상화)

vSwitch



- 관리용 스위치 포트, 서비스 네트워크 포트 각각 관리'

VM과 vCenter 관리



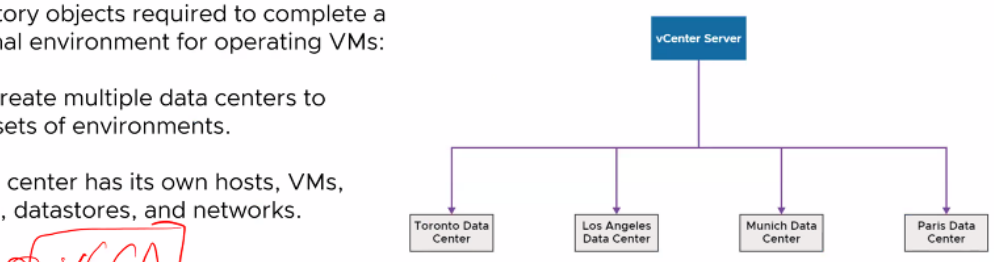
- vCenter server를 관리하고 싶으면 Managerment Interface에서 관리
- VMware host client를 사용해서 vm 관리

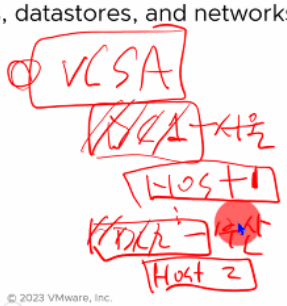
vCenter Server Aplience

Data Center Objects

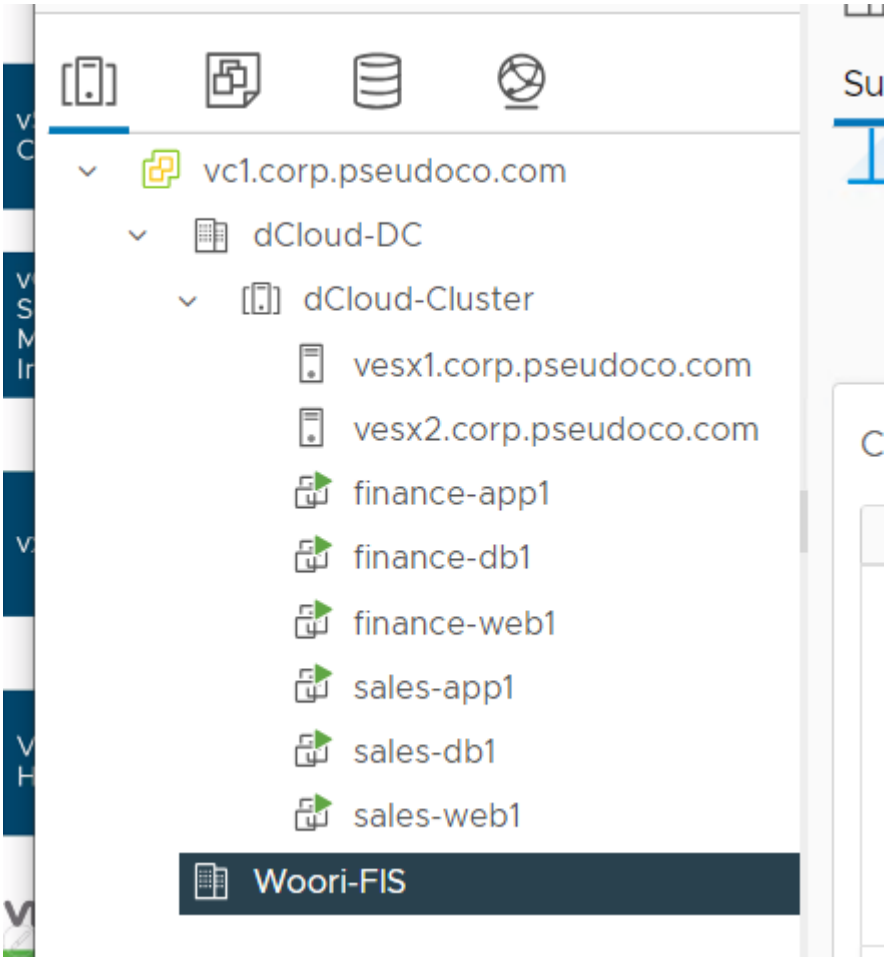
A virtual data center is a logical organization of all the inventory objects required to complete a fully functional environment for operating VMs:

- You can create multiple data centers to organize sets of environments.
- Each data center has its own hosts, VMs, templates, datastores, and networks.



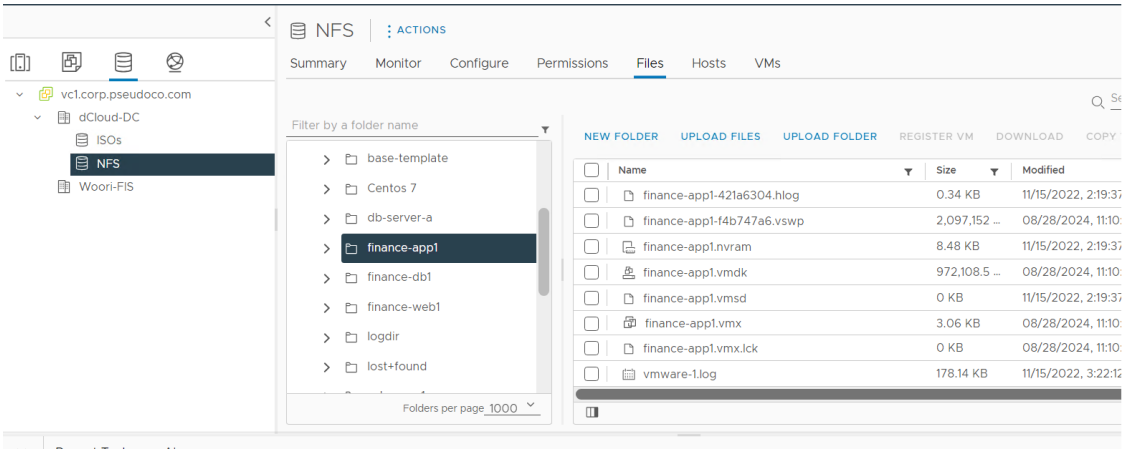


- v센터 어플라이언스 밑에 각각의 데이터 센터(클러스터)
- 각각의 호스트 1,2,3이 있음



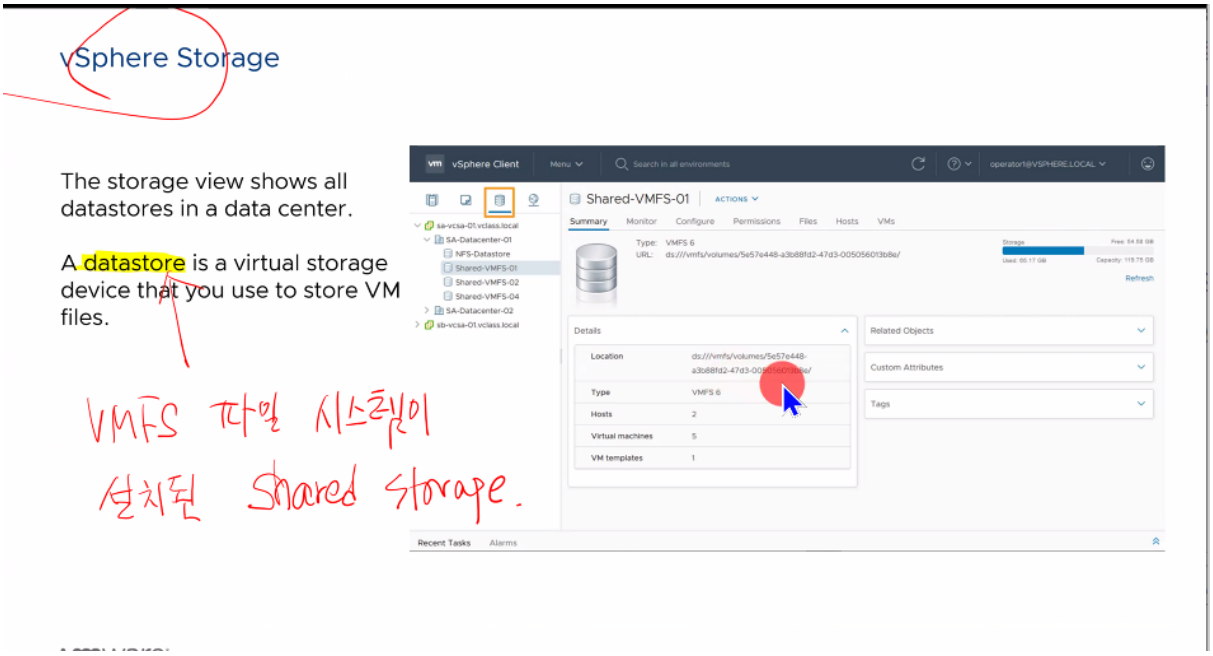
- vCenter → Cluster → host1,2,3 → vm 1,2,3

VM에 구성된 파일들



- vmdk
- vmx
- 파일 기억

vSphere Storage



- VMFS 파일 시스템이 설치된 Sphere Storage

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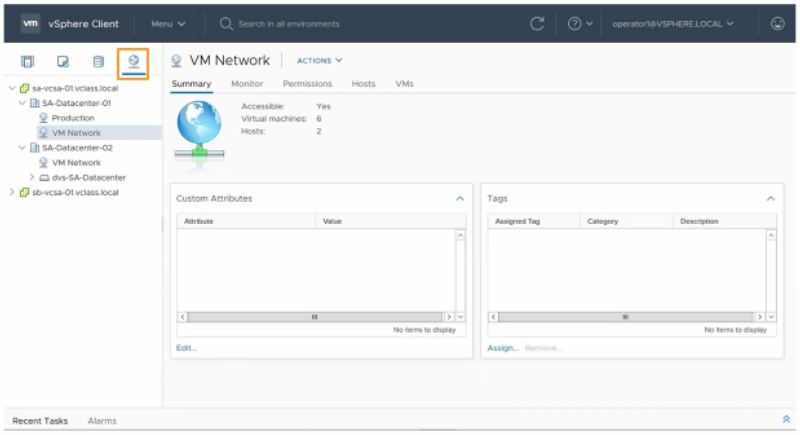
vSphere Networking

The networking view shows all the virtual switches in a data center.

A virtual switch is the software equivalent of a physical switch. It controls the communication between VMs and other virtual parts of the network.



- 가상스위치, 물리스위치 L2 동작은 같으나 vlan 처럼 나눌 수 없다.
- 멀티레벨 스위치가 안된다?

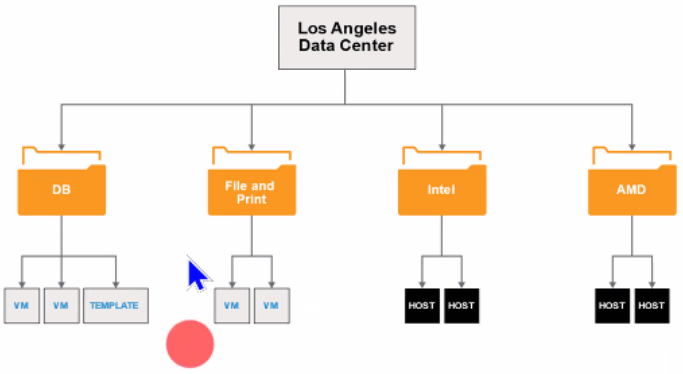
vCenter 관리

Using Folders

You organize the objects in a data center by placing them into folders and subfolders.

For example, you can separate VMs by application type, or separate hosts by CPU family.

Each inventory view has its own folder type. If you create a Host and Cluster folder type, the folder is only visible in the Hosts and Clusters inventory view.



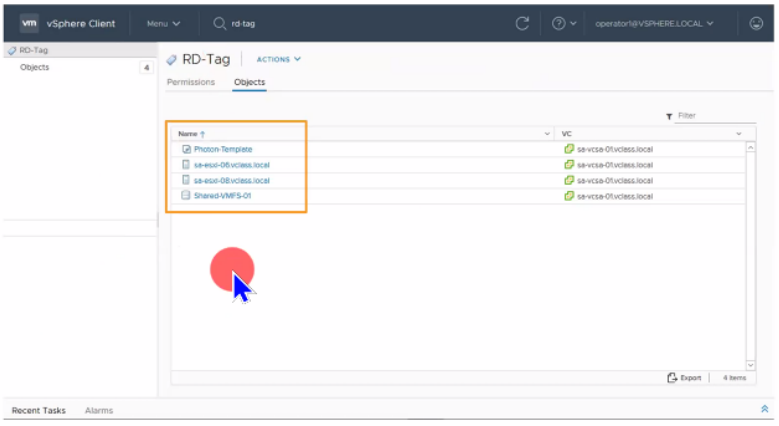
- 폴더링 관리

Viewing Objects that Share a Tag

You can use the search box to browse and select objects in the vSphere Client inventory.

When searching for key words such as the tag name, you can view related objects, regardless of type.

In the example, objects under the RD-Tag include a template, two hosts, and one datastore.



- 태그로 관리

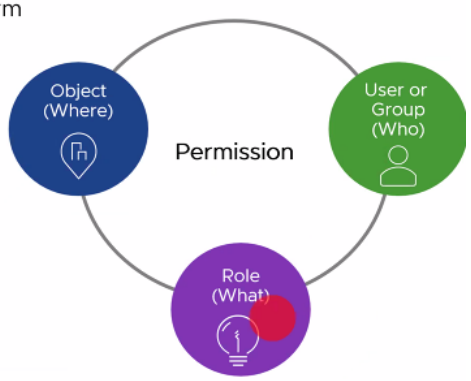
권한설정

Components of vCenter Server Permissions

A vCenter Server permission allows one user or group to perform a set of actions on a vCenter Server inventory object.

To create a permission, you must define three components: user or group, role, and object. In other words, you define the who, what, where of vSphere actions.

For example, your user account is xuser. With this account, you can manage VMs in your data center:
- User: xuser
- Role: Virtual Machine Power User
- Object: Data Center



vCenter Server Permission Model

vmware

- 누구한테?, 어떤 권한?, VM? 클러스터, DC 어떤 것에 적용할 것인지

Components of vCenter Server Permissions

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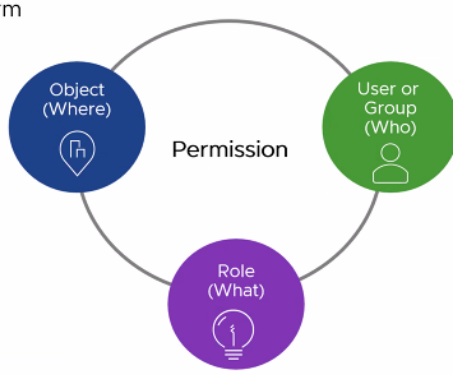
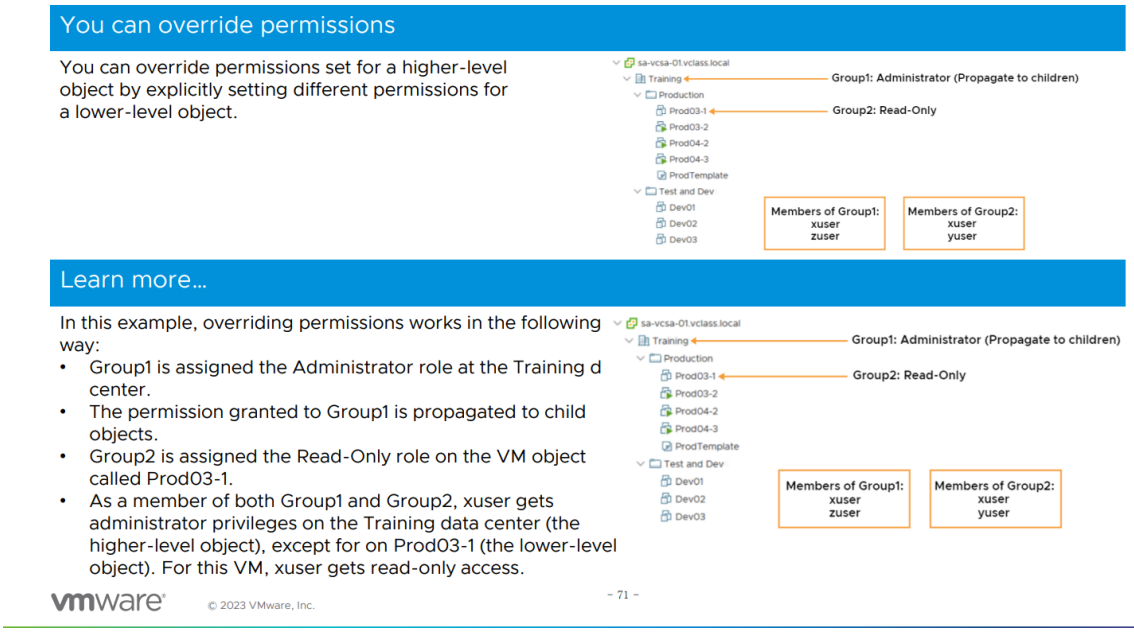


vCenter Server Permission Model

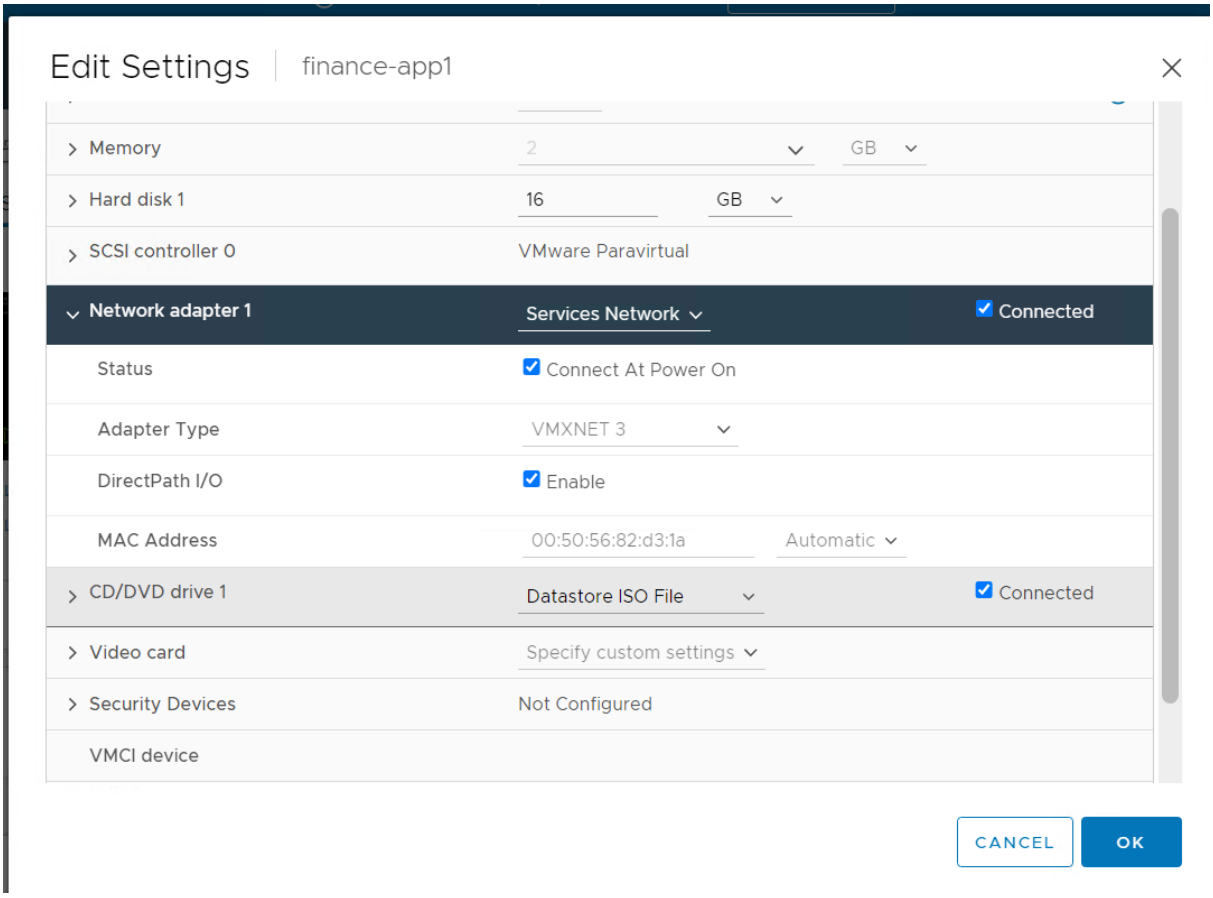
vmware

- xuser에게 VM의 전원만 끄고 킬 수 있도록

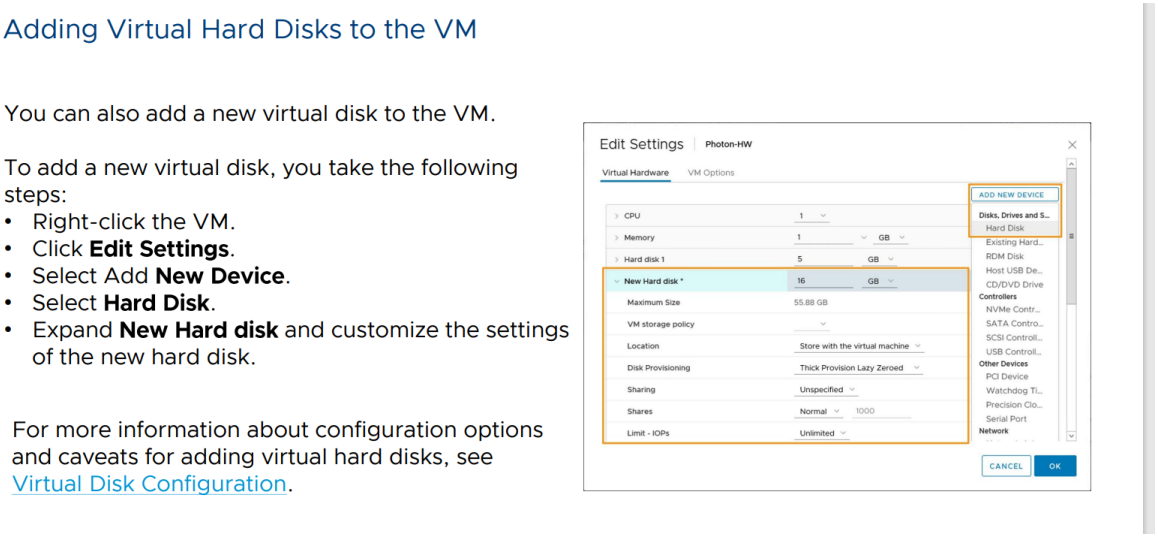
/



- 하위에 걸어둔 권한이 우선순위가 높다.
- 데이터센터 위치에서 어드민을 걸었어도 특정 VM에서 엑세스 제한을 걸었다면 해당 vm에서는 어드민 권한이 있더라도 엑세스가 제한됨



- 하나의 vm의 하드웨어 설정을 변경할 수 있는데 00:50:56은 vm웨어의 벤더사의 mac 주소
- Network adapter를 10개까지 늘릴 수 있다.



Adding Virtual Hard Disks to the VM

You can also add a new virtual disk to the VM.

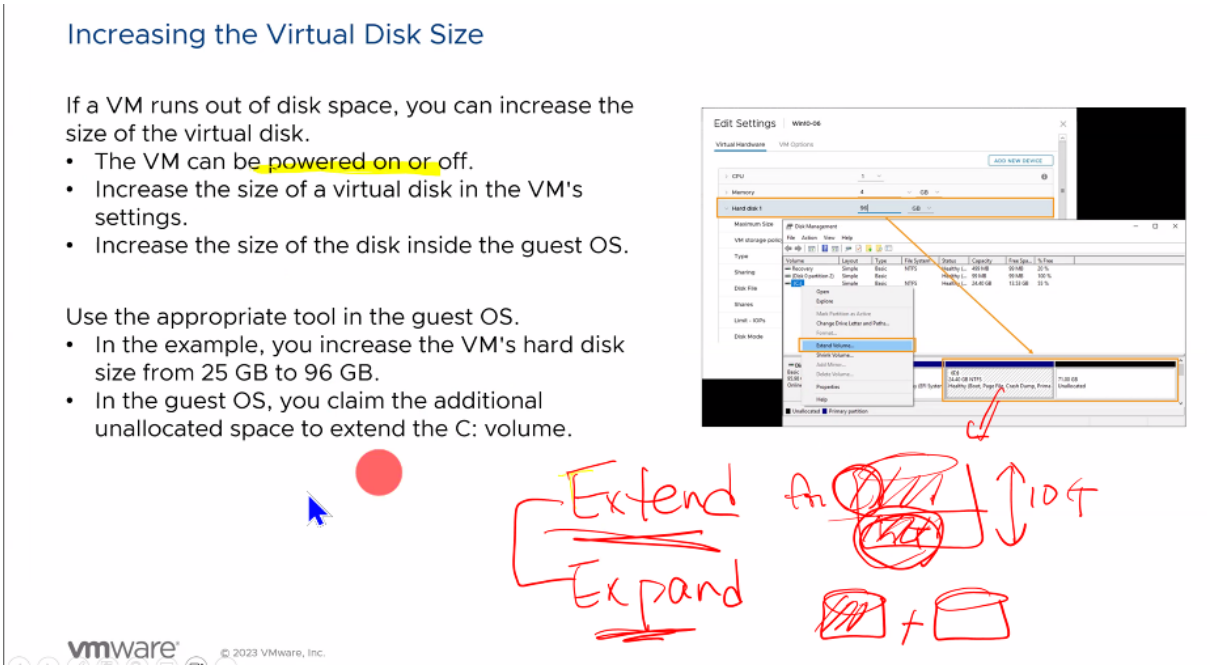
To add a new virtual disk, you take the following steps:

- Right-click the VM.
- Click **Edit Settings**.
- Select Add **New Device**.
- Select **Hard Disk**.
- Expand **New Hard disk** and customize the settings of the new hard disk.

For more information about configuration options and caveats for adding virtual hard disks, see Virtual Disk Configuration.

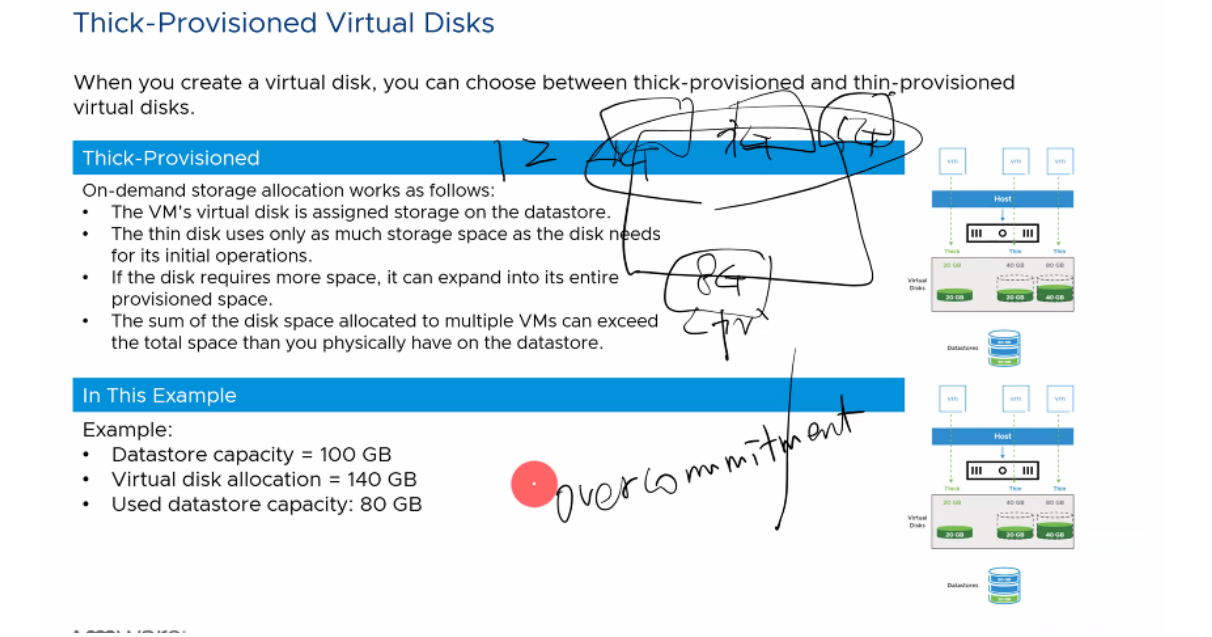
- 논리적 하드웨어를 추가하거나 수정할 수 있음

vStorage



- 자유롭게 storage의 용량 할당 가능

스토리지 할당 방식 - Thick 방식



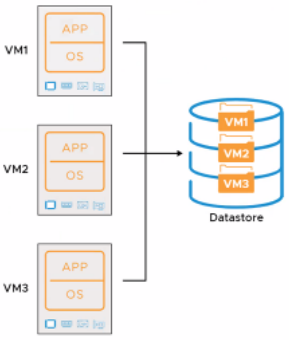
- 할당량은 100g가 넘지만 사용량은 100g가가 넘지 않기 때문에 오버커밋이 가능한 방식

Virtual Machine Encapsulation

In its most basic form, a VM is just a set of files. When you create a VM, ESXi places the VM files encapsulated in one folder, and stores the folder in a datastore:

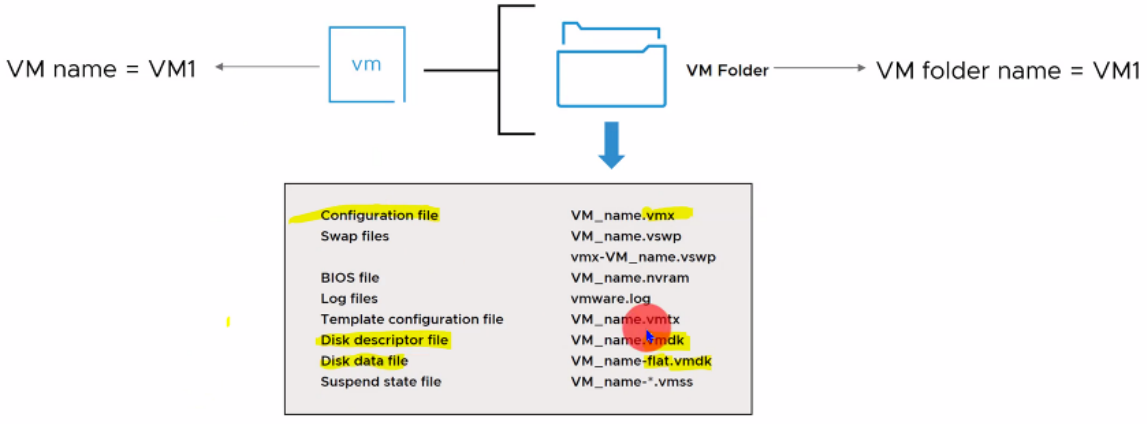
- Multiple ESXi hosts can access the datastore.
- Any host accessing the datastore can power on the VM and run it.

If you must reboot a host, you can move the VM to another host that can access to the same datastore.

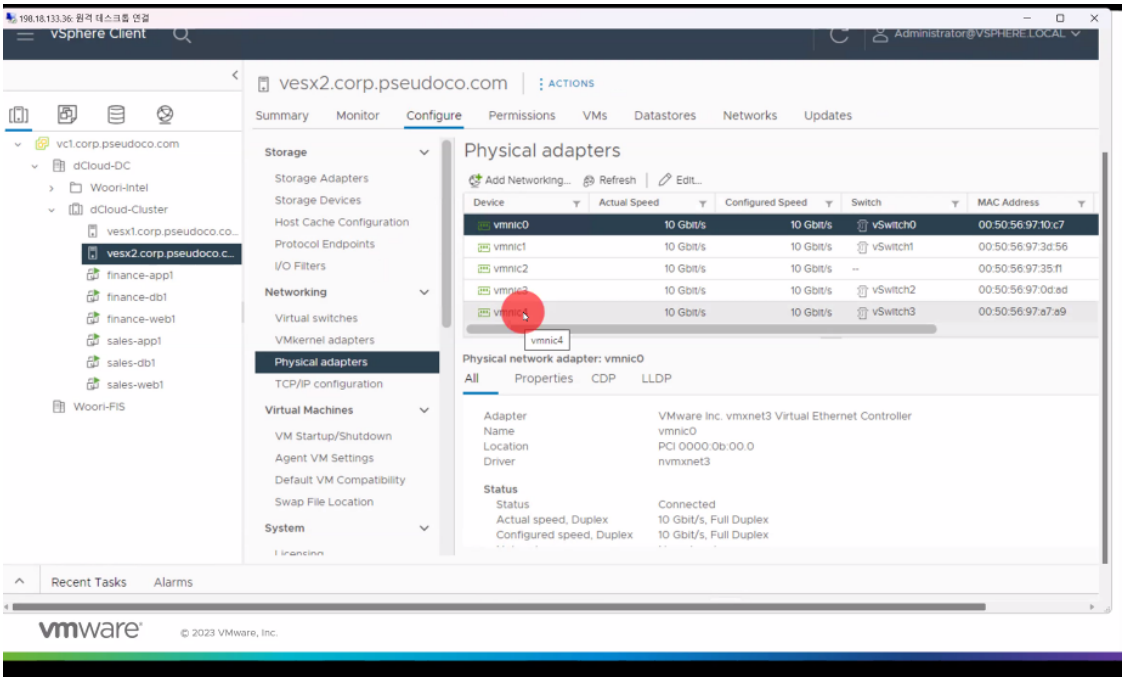


- 가상 머신을 파일로 구성함.
- 이것을 인캡슐레이션이라고 vm웨어에서 부름

Exploring VM Files



- vmdk 파일은 포인터 파일이고 호스트내에 flat.vmdk가 진짜 파일이다.



- 여기서 물리 NIC 카드를 볼 수 있고, 어디 스위치와 연결되어 있는지 맥은 무엇인지 케이블은 몇G 케이블인지 확인 가능

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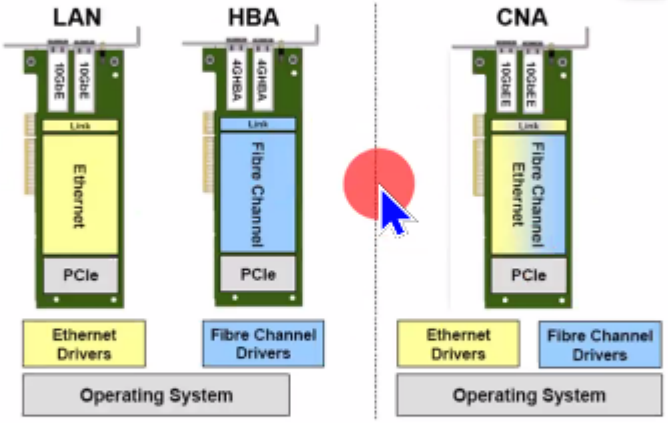
infrastructure, simplifying network architecture and reducing costs in data center environments.

NIC (Network Interface Card) vs HBA (Host Bus Adapter) vs CNA (Converged Network Adapter):



Here's a comparing the features and functionalities of NICs, HBAs, and CNAs:

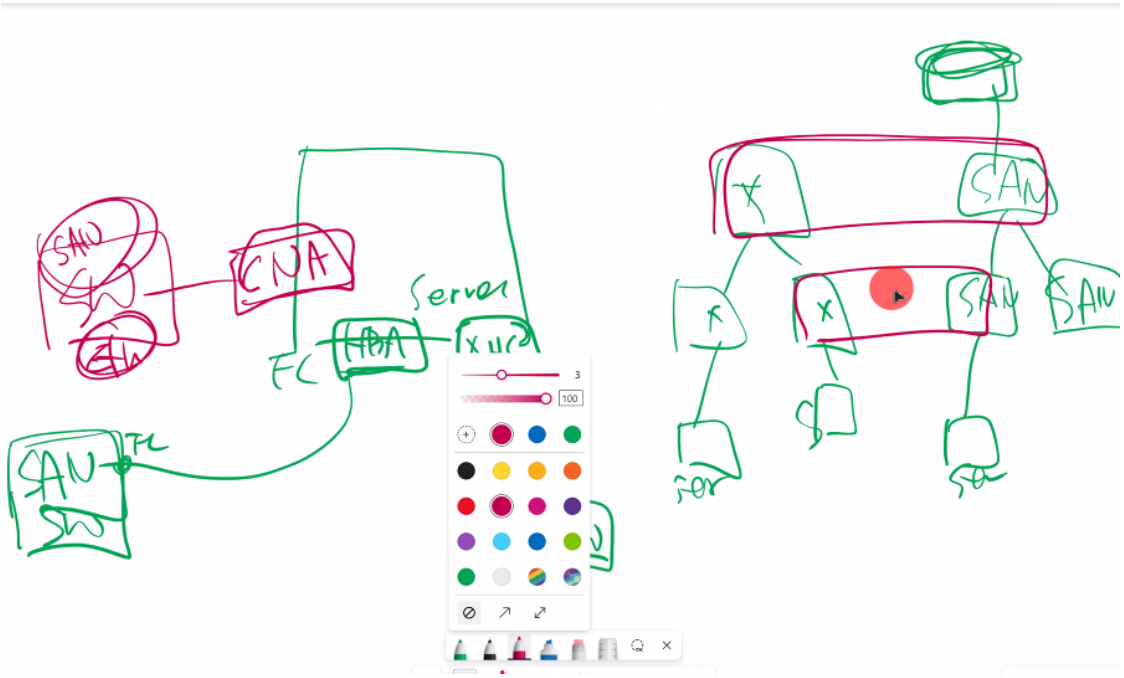
Feature	NIC (Network Interface Card)	HBA (Host Bus Adapter)	CNA (Converged Network Adapter)
Primary Function	Provides connectivity for data networking	Provides connectivity for storage networking	Combines data networking and storage networking connectivity into a single adapter
Protocols Supported	Ethernet	Fibre Channel	Ethernet, Fibre Channel (via FCoE)
	Carries data traffic over		Carries data traffic over Ethernet

HBA 스토리지 전용 어뎁터 Fiber 채널전용

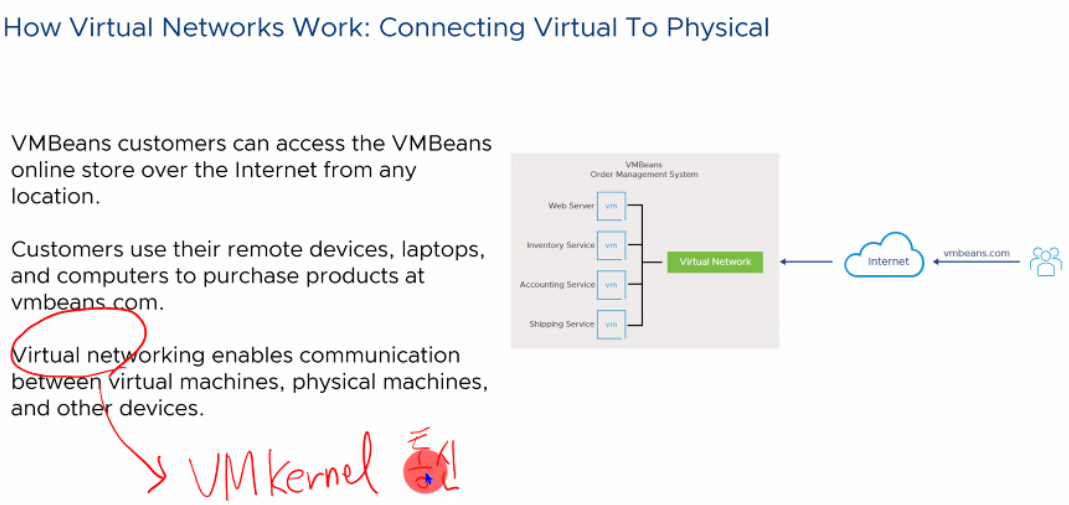
Lan 이더넷 전용 IP 헤더

Fiber 채널전용인데 이더넷을 붙이는 기술

- FCoE (FCover Ether)
- 이더넷 위에 파이버 채널 달기



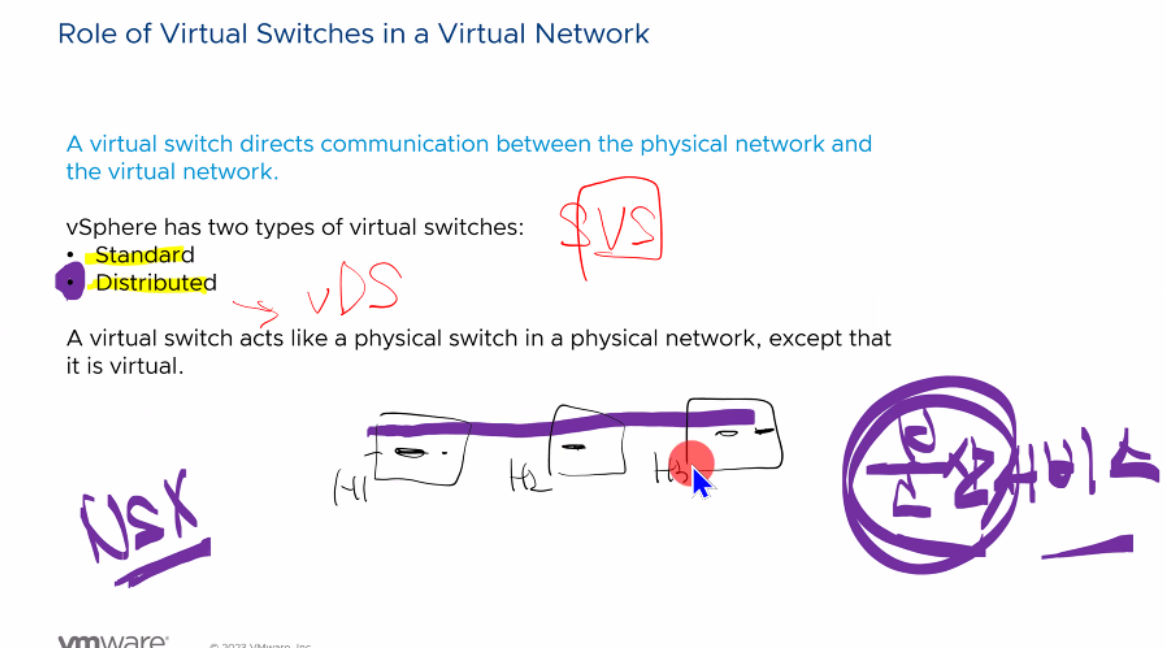
- 스위치와 san이 연결 가능해지는게 다른 영역이지만 FCoE 기술 덕분에 가능
- 하이퍼바이저에서도 지원가능



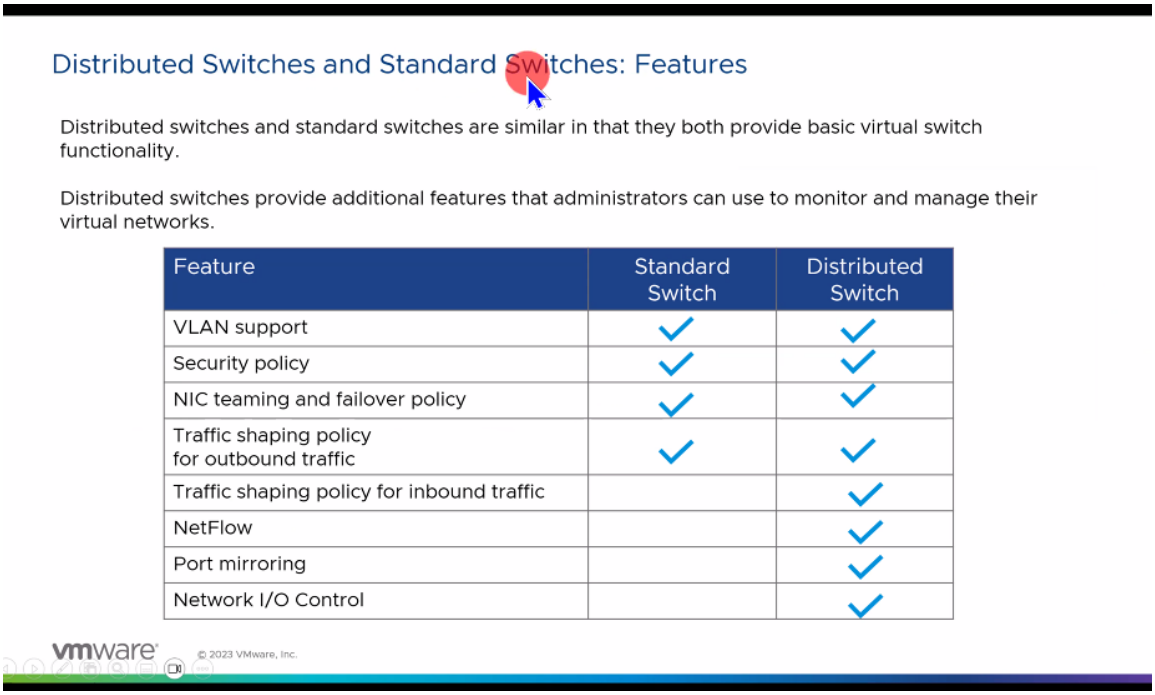
- VM 네트워크에서 커널통신도 가능하다?
  - 관리용
  - 스토리지연결

- vMotion 구현

분산스위치



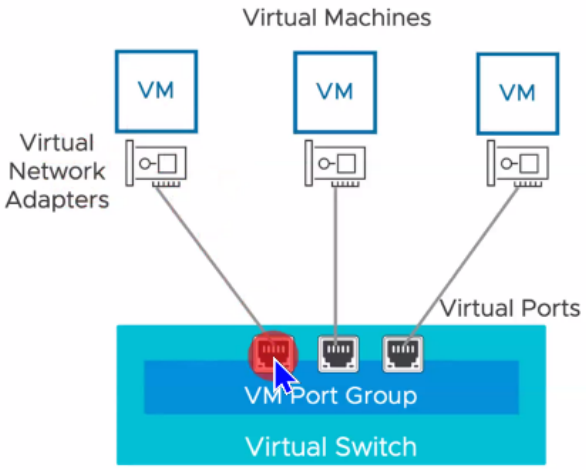
- 스위치에 호스트에 다 인스톨이 되어 있다.
- Distributed 스위치
- 어디에 분산?
  - 장비를 호스트에 분산
  - 표준스위치와 분산 스위치의 차이점?



- 분산 스위치에서만 가능한 것
  - 트래픽 양 제한 가능
  - net flow 스위치는 mac 주소 기반이라 flow를 못보는데 볼 수 있게 해줄 수 있게 해줌. 플로우정보 확인
  - port mirroring 스위치는 A → C로 넘길 때 B로는 전달이 안되기 때문에 볼 수가 없는데 B까지 볼 수 있게 해주는 것 (span Swtich port Analyze)
    - 카피본을 떠서 넘김
  - 네트워크 I/O 제어
  - 분산스위치를 사용해야 NSX를 사용할 수 있다.

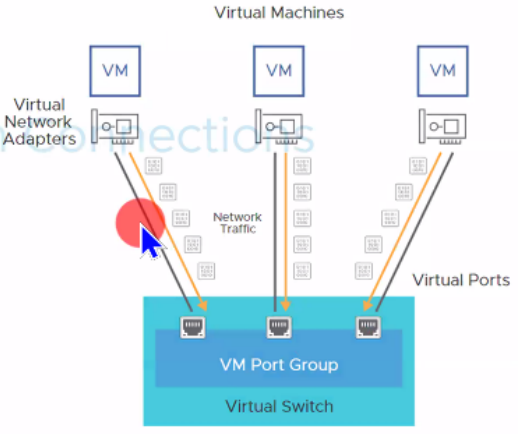
Virtual Network

A virtual network uses software versions of traditional physical network tools.



Virtual Switch

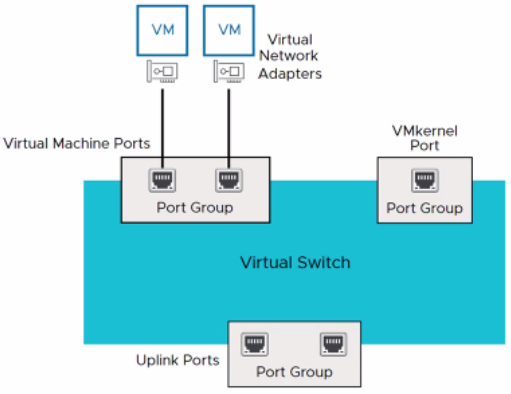
The virtual switch controls communication between the virtual parts of the network.



Virtual Switch Connections

To connect VMs and ESXi hosts to the network, a virtual switch uses specific types of connections, or ports.

- Virtual machine port:
  - Connects a VM to the virtual network
- VMkernel port:
  - Used by the ESXi hypervisor (VMkernel)
  - Manages ESXi system traffic
- Uplink:
  - Connects the virtual network to the physical network
  - Maps to a NIC on the ESXi host



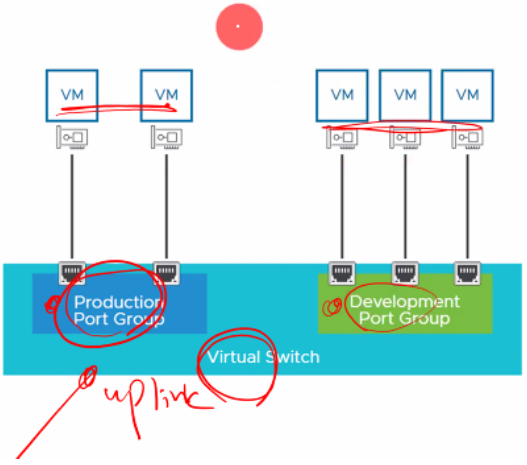
- VMNic이랑 붙는다는게 가상스위치 입장에선 uplink
- 포트그룹이라고 하는 이유는 db vm 2개, web vm 2개 묶어서 포트그룹으로 분류 가능
- 포트그룹, 커널포트, 업링크 3가지 암기

PortGroup 활용

VM Port Groups

A virtual switch can contain one or more port groups and can be used to logically group similar VMs.

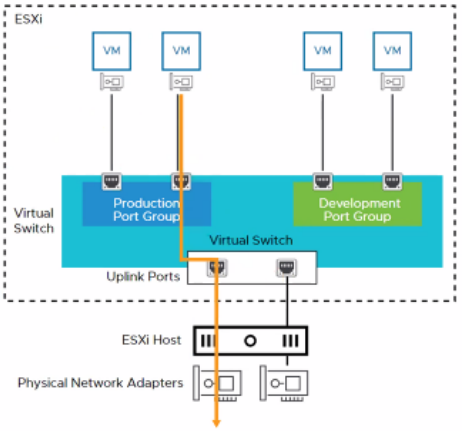
VMs can communicate with other VMs in the same port group and in different port groups.



Uplink Ports

Uplink ports enable VMs to communicate with computers on the physical network.

Uplink ports pass traffic from the VMs to the physical network adapters that they are associated with.



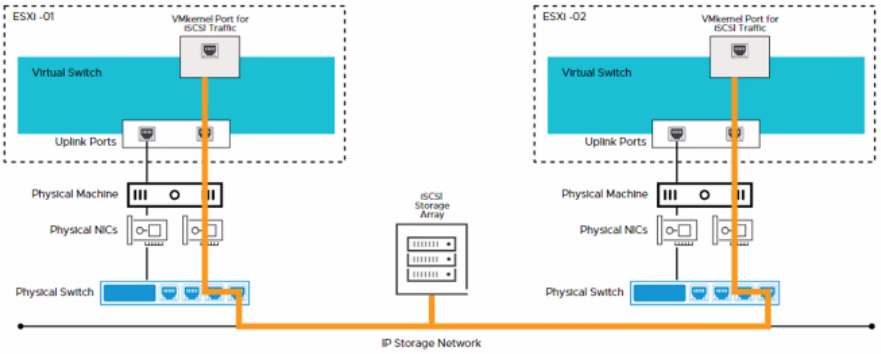
- 포트그룹 → 가상스위치 → 물리 랜카드 포트 → 물리 스위치

IP Storage Traffic

ESXi uses a VMkernel port to manage traffic between the ESXi host and IP storage, such as an iSCSI storage array.

IP storage is network-attached storage, for example, iSCSI and NFS storage.

ESXi uses IP storage to store its virtual machines.



Other Uses

VMkernel ports also manage other types of ESXi traffic:

- **vSphere vMotion**
This traffic flows between ESXi hosts. vSphere vMotion is a feature used to move a virtual machine from one host to another.

- **vSAN**
This traffic flows between hosts in a vSAN cluster. vSAN is a cluster feature that combines the direct-attached storage of ESXi hosts to create a datastore on which VMs are stored.

- **vSphere Fault Tolerance**
This traffic flows between the primary ESXi host and secondary ESXi host in a vSphere Fault Tolerance configuration. vSphere Fault Tolerance is a cluster feature that provides continuous availability (with no downtime) to virtual machines.

- **vSphere Replication**
This traffic flows between ESXi hosts. vSphere Replication is a data protection feature that replicates VMs from an ESXi host in the source site to an ESXi host in the target site.

- HA와 비교되는 기능 vSphere fault tolerance

Managing Traffic Using a Standard Switch

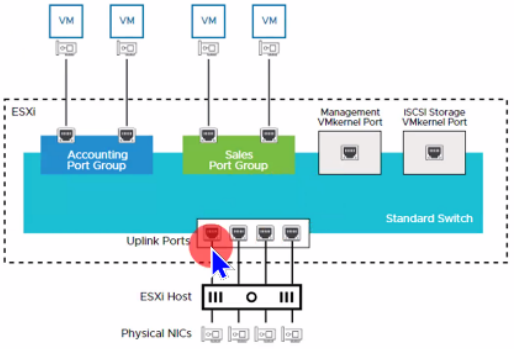
Single Standard Switch Is Used for Both VM and ESXi System Traffic

- The physical NICs are shared by all port groups.
- The uplink ports pass all traffic through to the physical NICs.

In this Example

In this example, different networks share the bandwidth.

The standard switch manages:
- VM traffic from the Accounting network
- VM traffic from the Sales network
- ESXi management network traffic
- iSCSI storage network traffic



- 스탠다드 스위치는 같은 망 통신 가능

Isolating Networks Using Multiple Standard Switches

Create a Standard Switch for Each VM Port Group and VMkernel Port

Each standard switch has its own physical NICs.

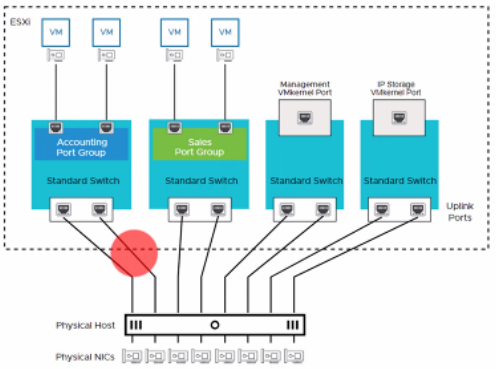
Traffic from each virtual network is physically separated by each standard switch.

ESXi host considerations:
- The ESXi host must have enough physical NICs to support this configuration.
- An ESXi host has limits to the number of physical NICs that it can support.

In this Example

Separate standard switches handle different types of traffic:
- VM traffic from the Accounting network
- VM traffic from the Sales network
- ESXi management network traffic
- iSCSI storage network traffic

Each standard switch has two uplink ports each, so the ESXi host requires eight physical NICs.



- 스탠다드 스위치 멀티사용

Standard Switch Properties

MTU

The MTU is the maximum transmission unit of a network packet. The default is 1,500 bytes.

By increasing the MTU value, you increase the amount of data transmitted in a single network packet.

A larger MTU size improves networking efficiency.

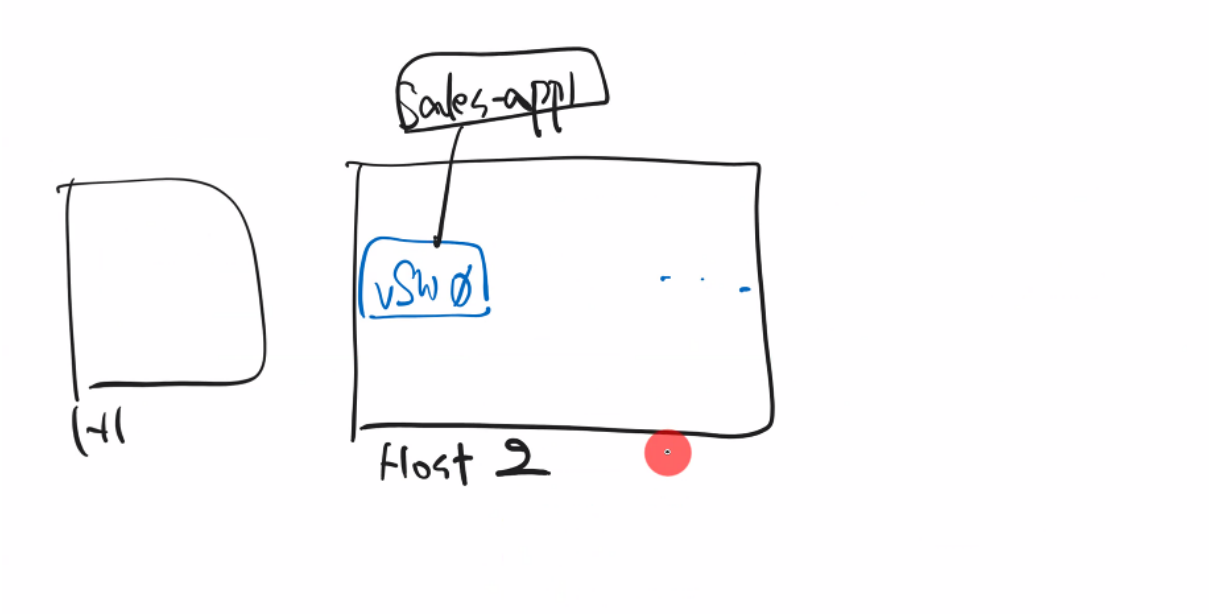
vSwitch0

All | Properties | Policies

Properties	
Standard switch	vSwitch0
MTU	1500
Security	
Promiscuous mode	Reject
MAC address changes	Reject
Forged transmits	Reject
Traffic shaping	
Average bandwidth	--
Peak bandwidth	--
Burst size	--
Teaming and failover	
Load balancing	Route based on originating virtual port
Network failure detection	Link status only
Notify switches	Yes
Failback	Yes
Active adapters	vmnic0, vmnic1
Standby adapters	--
Unused adapters	--

- 스탠다드 스위치는 mtu가 1500바이트가 넘으면 무조건 드랍이니 MTU 늘려주어야함.

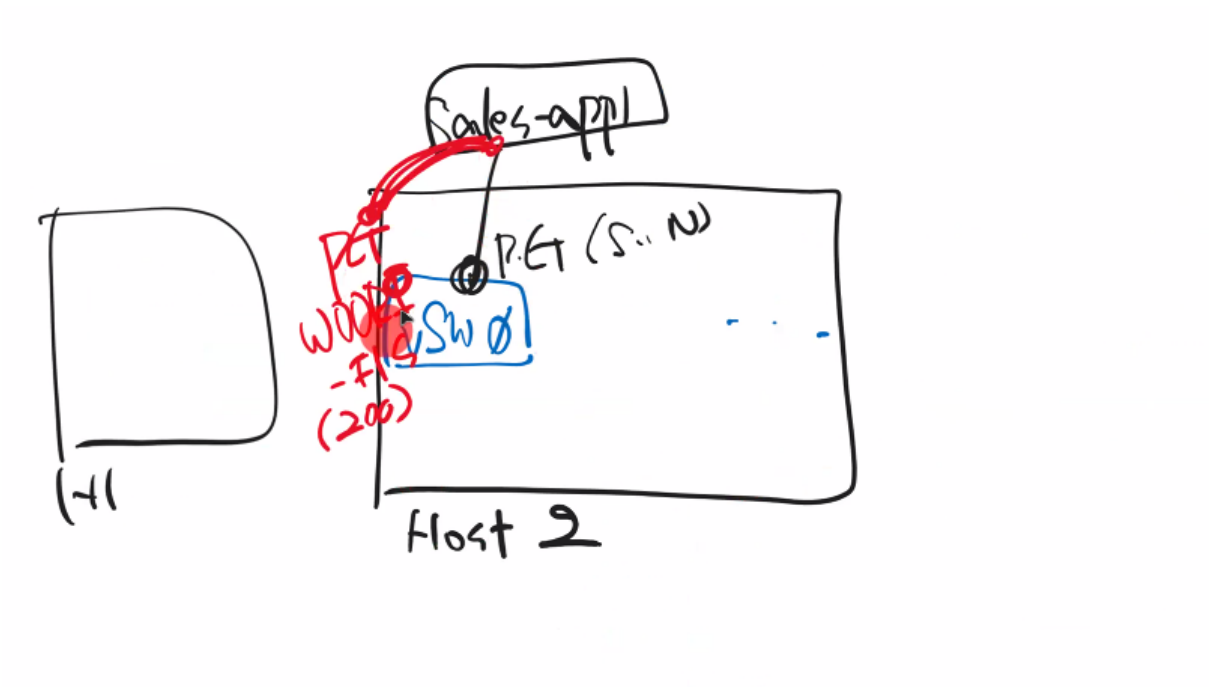
2번호스트가기 스위치 0에 서비스 네트웍으로 세일즈 1번이 붙어있다.



포트그룹은 Services network

다른 포트그룹을 만들어서 vSw0으로 붙이기

포트그룹으로 하나 만들기 Woori-fis Vlan 200번



호스트2번에있는 vsw 0에 만들어야함 이를 세일즈 앱1으로 붙인다.

스위치 에드 네트워킹 클릭

포트그룹 선택 후 넥스트

호스트2번에 스위치 0에 붙이기로 했으니 0선택

넥스트 네트웍 라벨로 Woori-fis

그다음에 vlan을 0로 되어 있으니 200으로 수정

그러면 호스트2번에 포트그룹이 하나 생김

세일즈 앱1로 이동

오른쪽 클릭 → 에딧세팅 → 네트웍 카드 → service network 드랍다운에 browser 선택 후 WooriFIs 선택

그러면 sw/0에서 포트그룹 이동된거

호스트2 네트워킹에 버추얼스위치에서 fis로 이동된거 확인