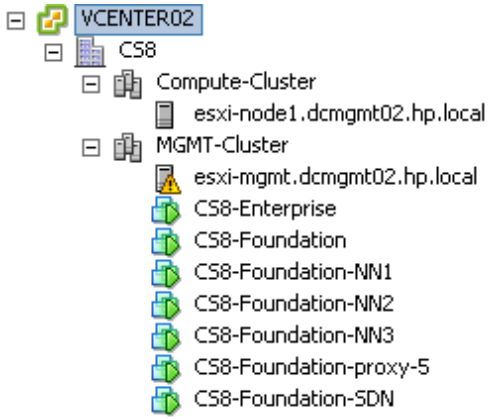
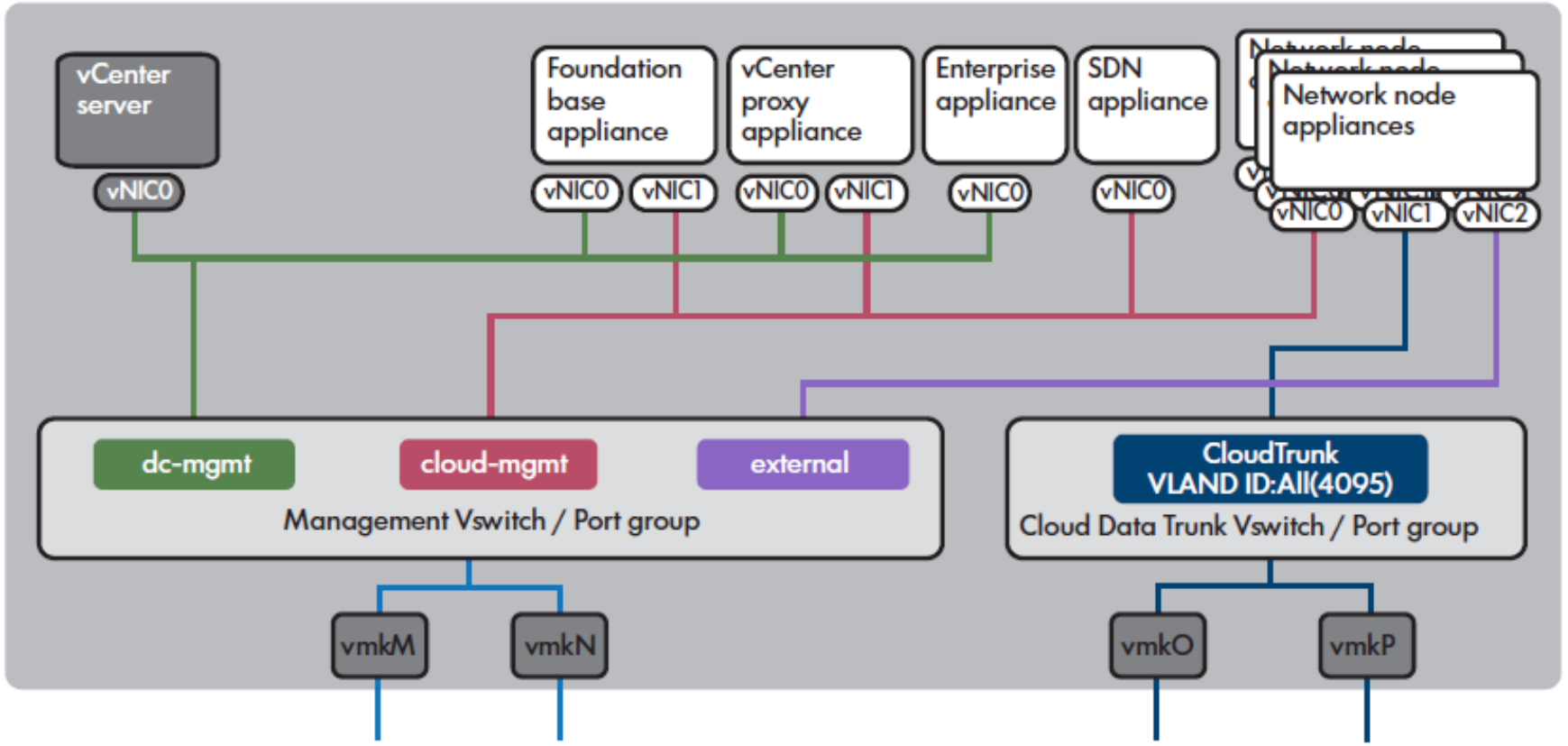
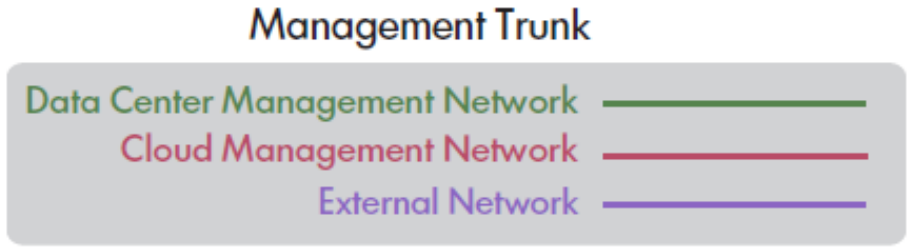
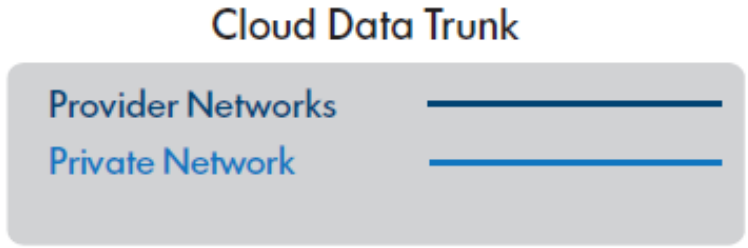
CS8 Networking

Typical ESX management host configuration

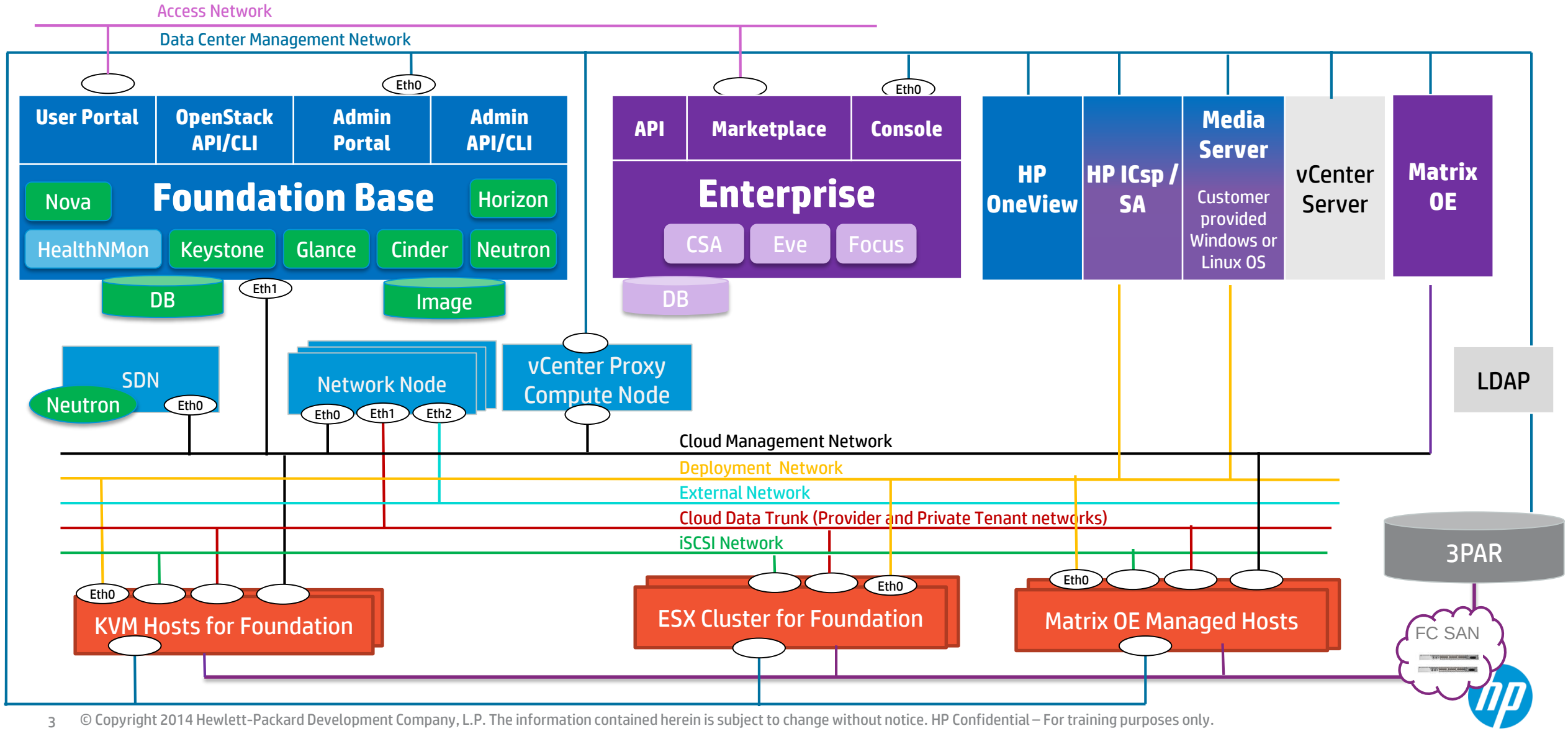




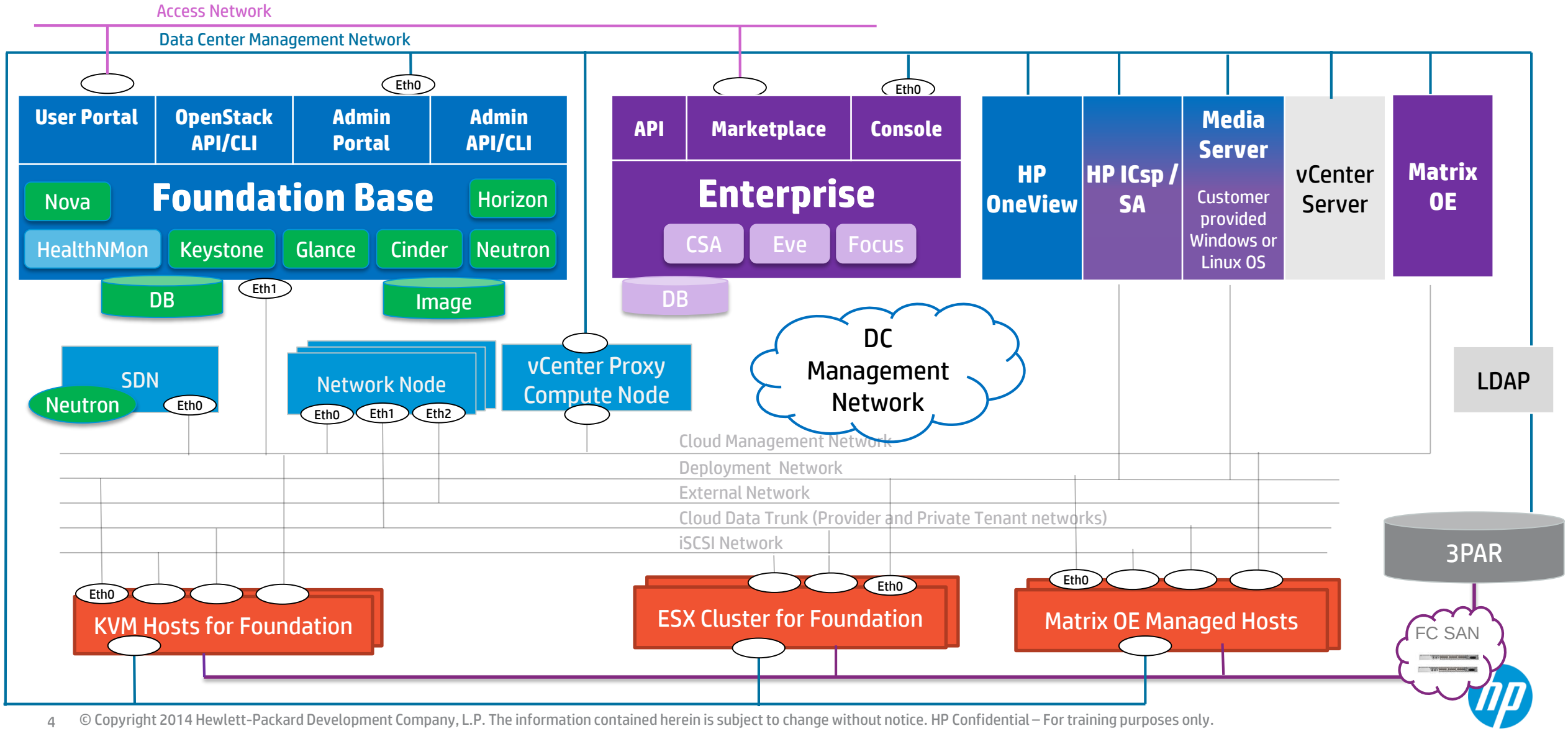




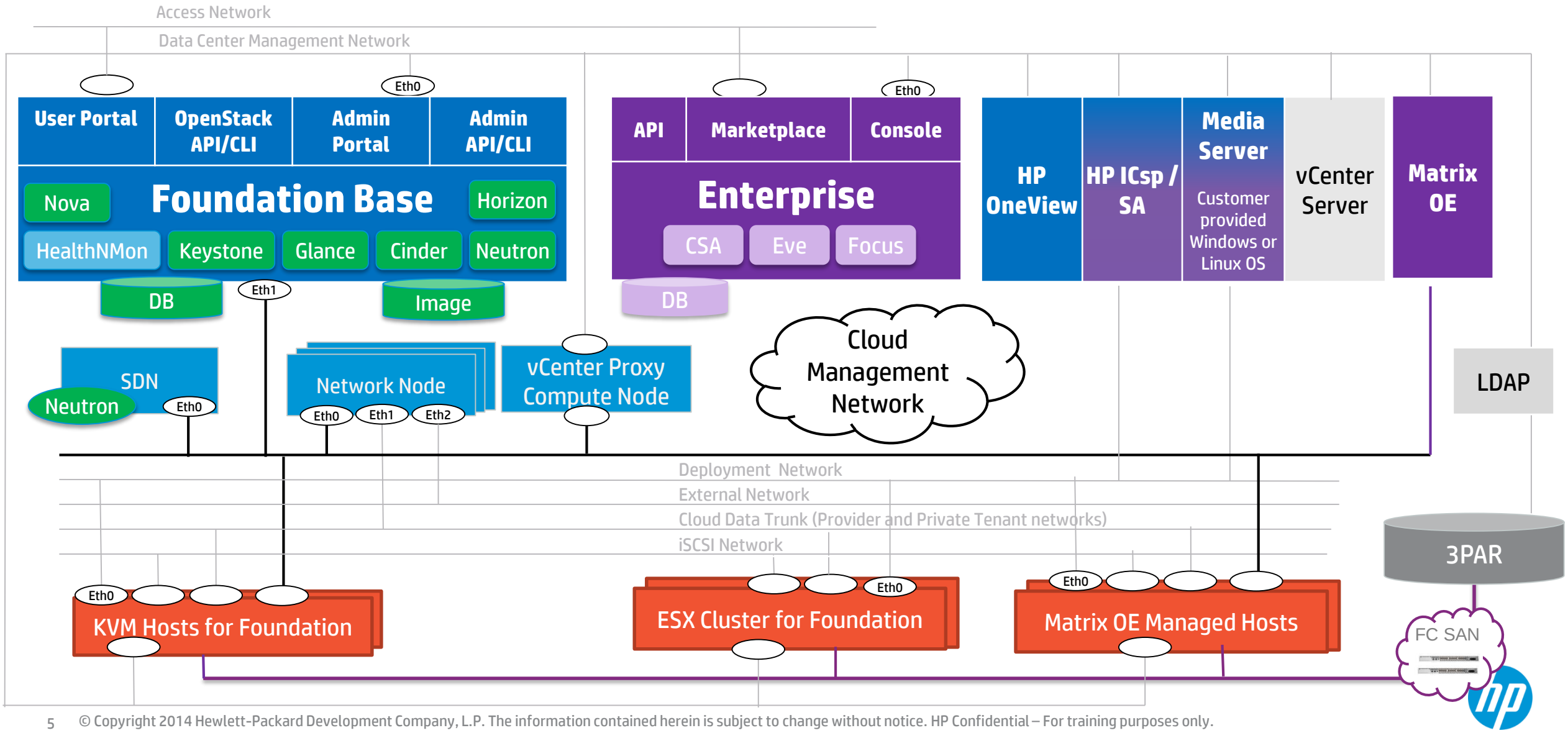
HP CloudSystem v8.0 network architecture



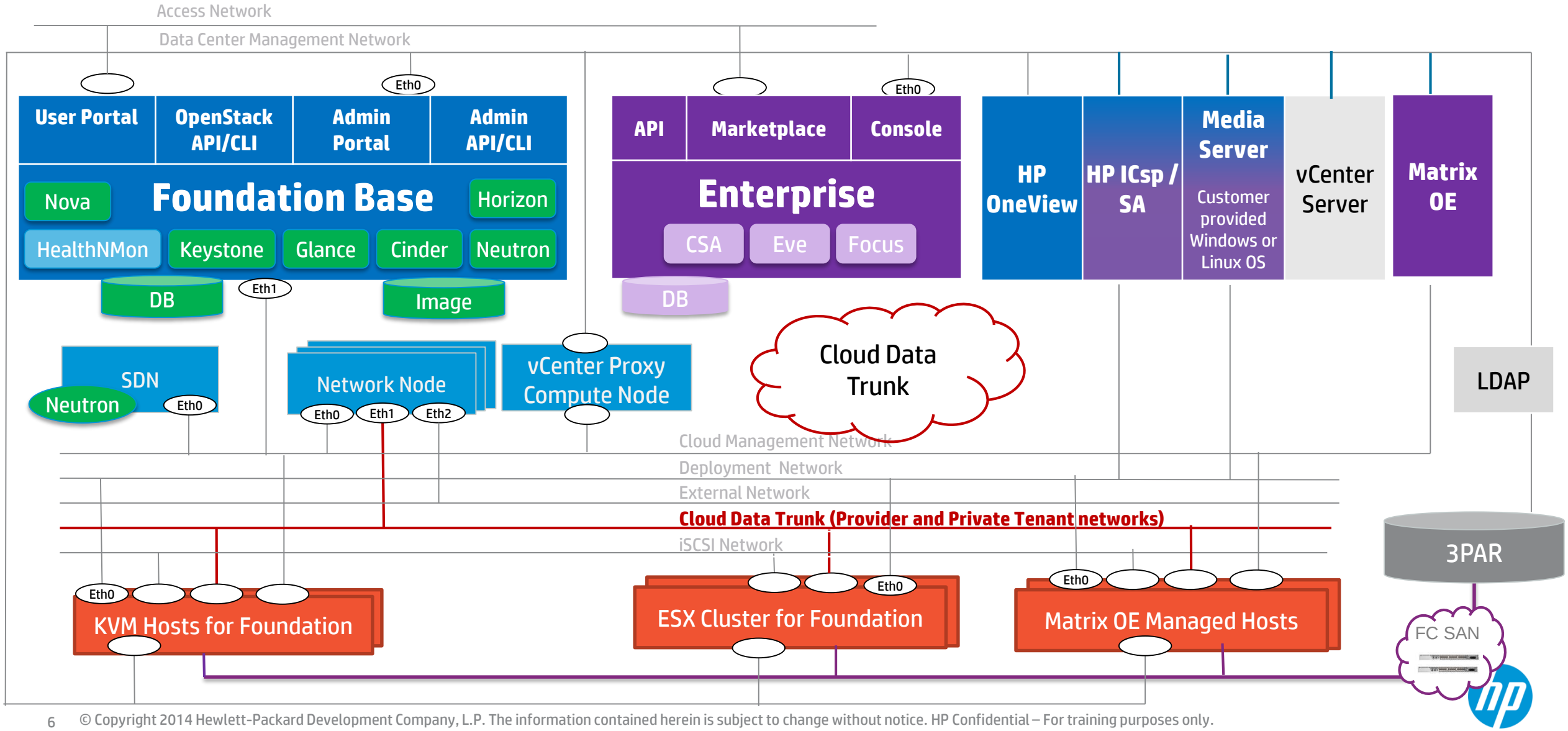
Data center network



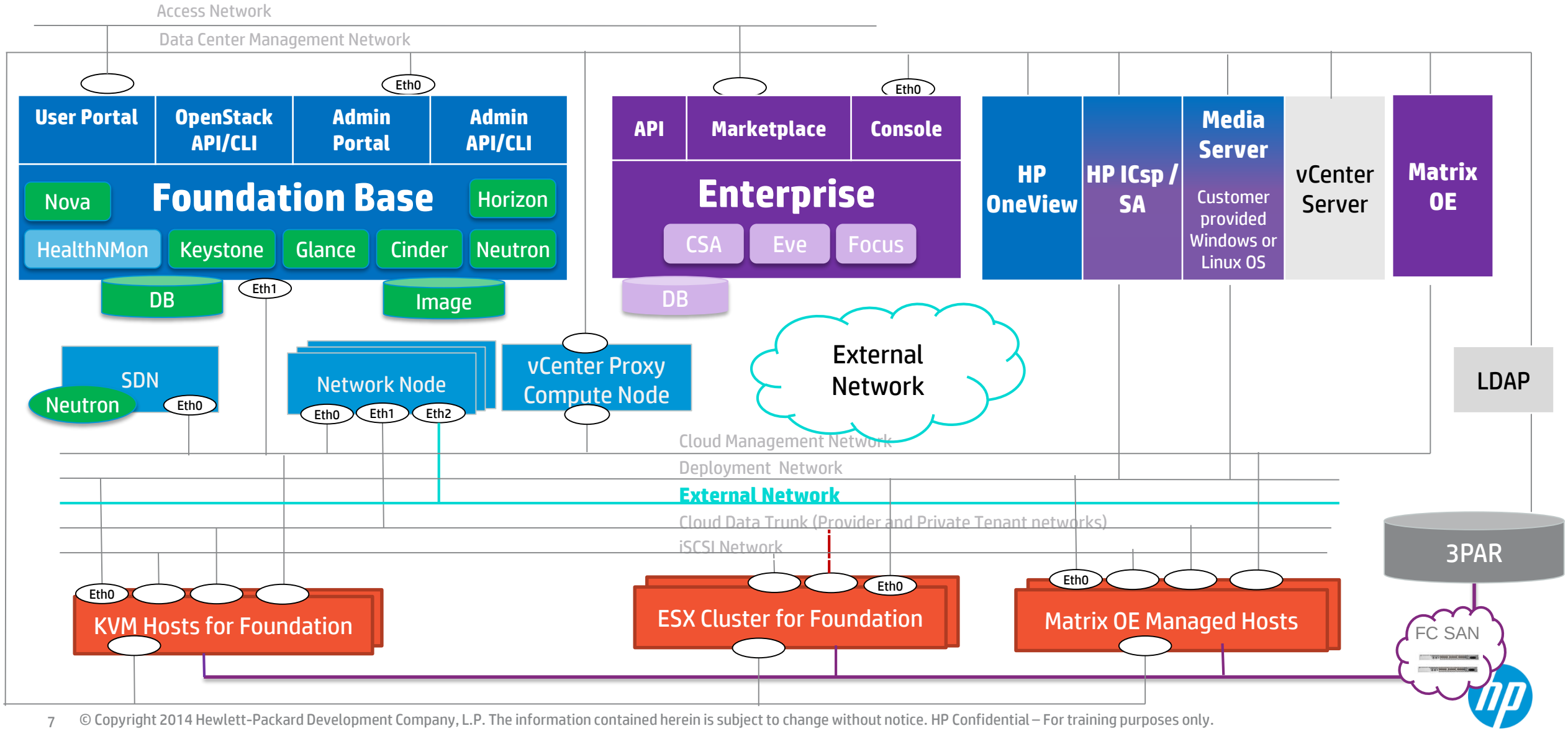
Cloud management network



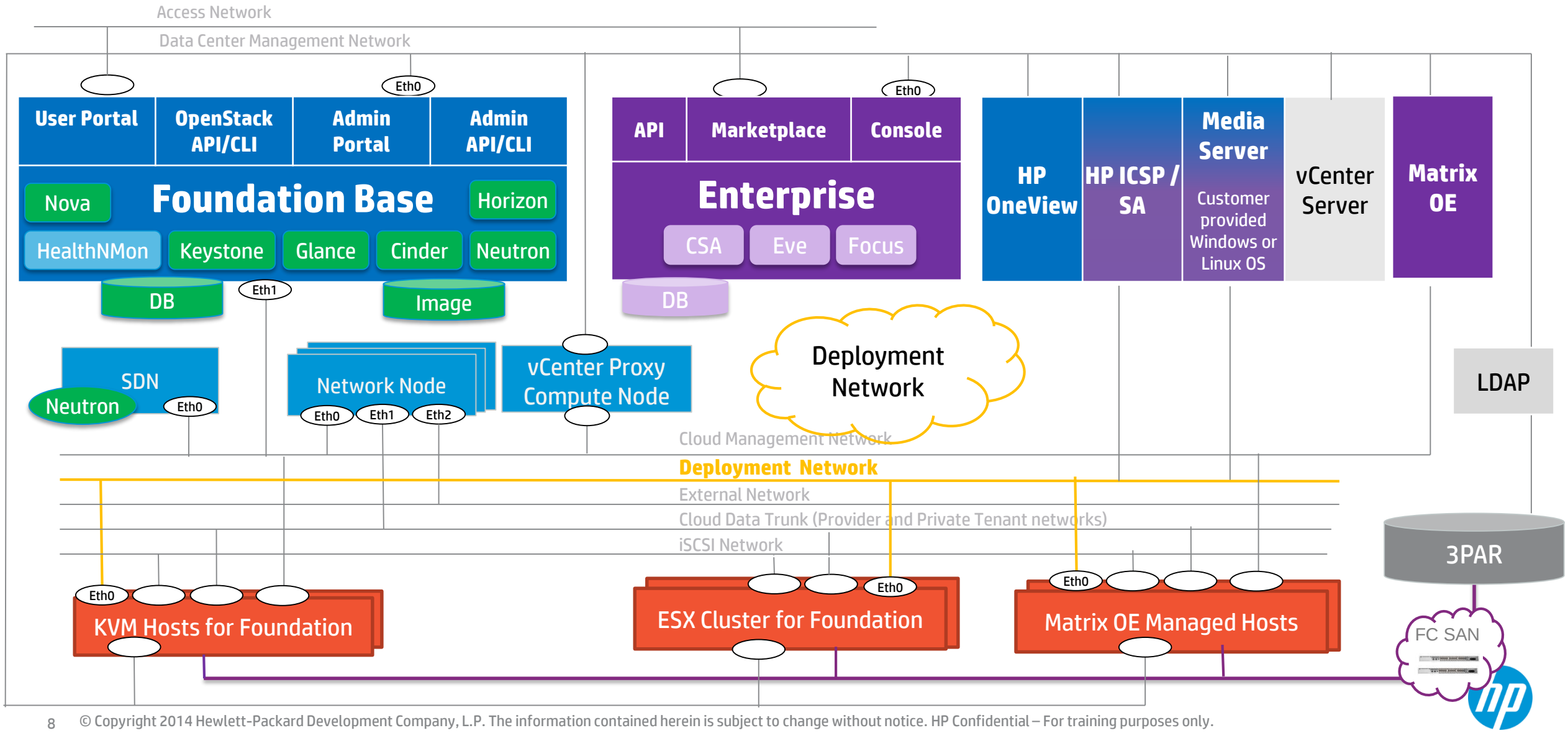
Cloud data trunk



External network

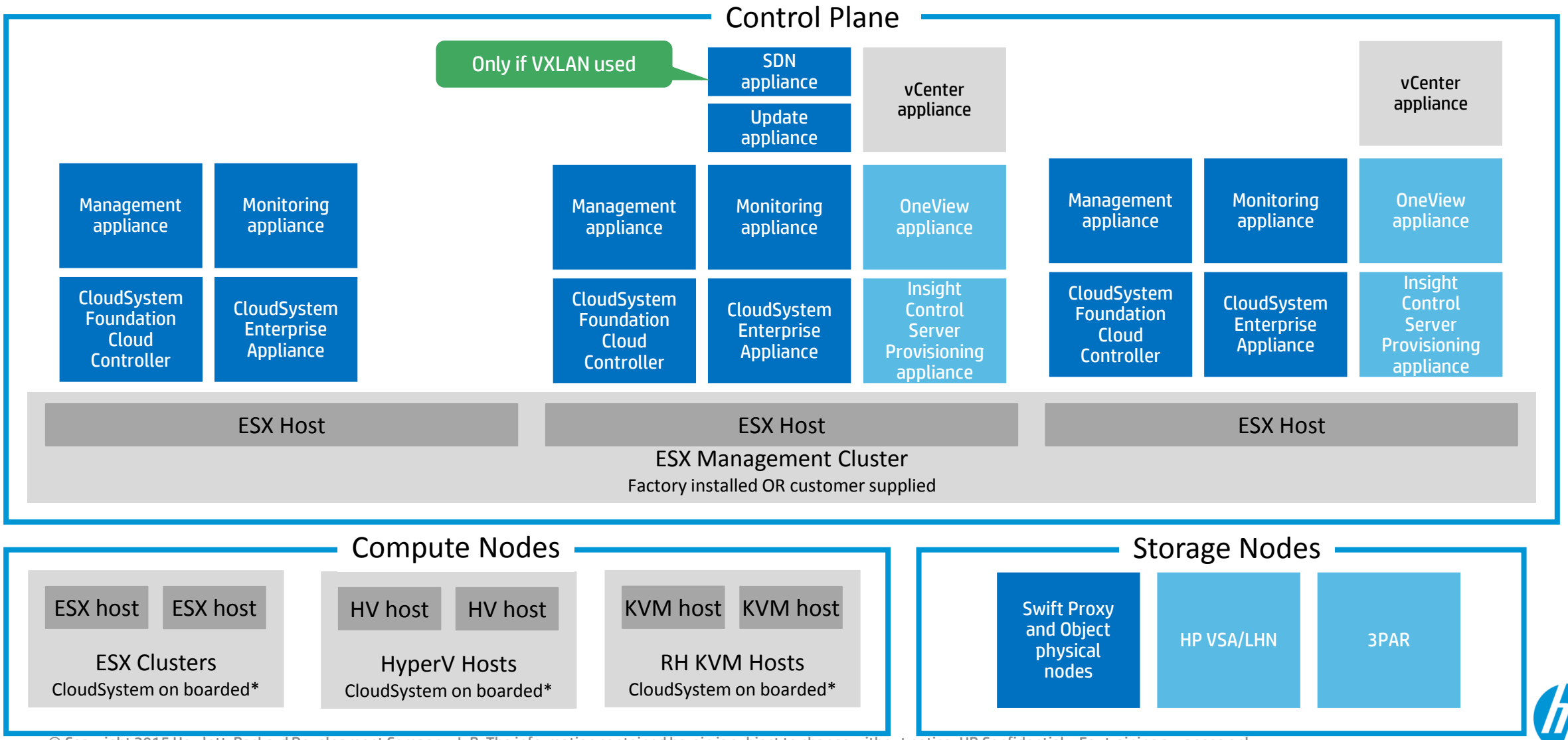


Deployment network

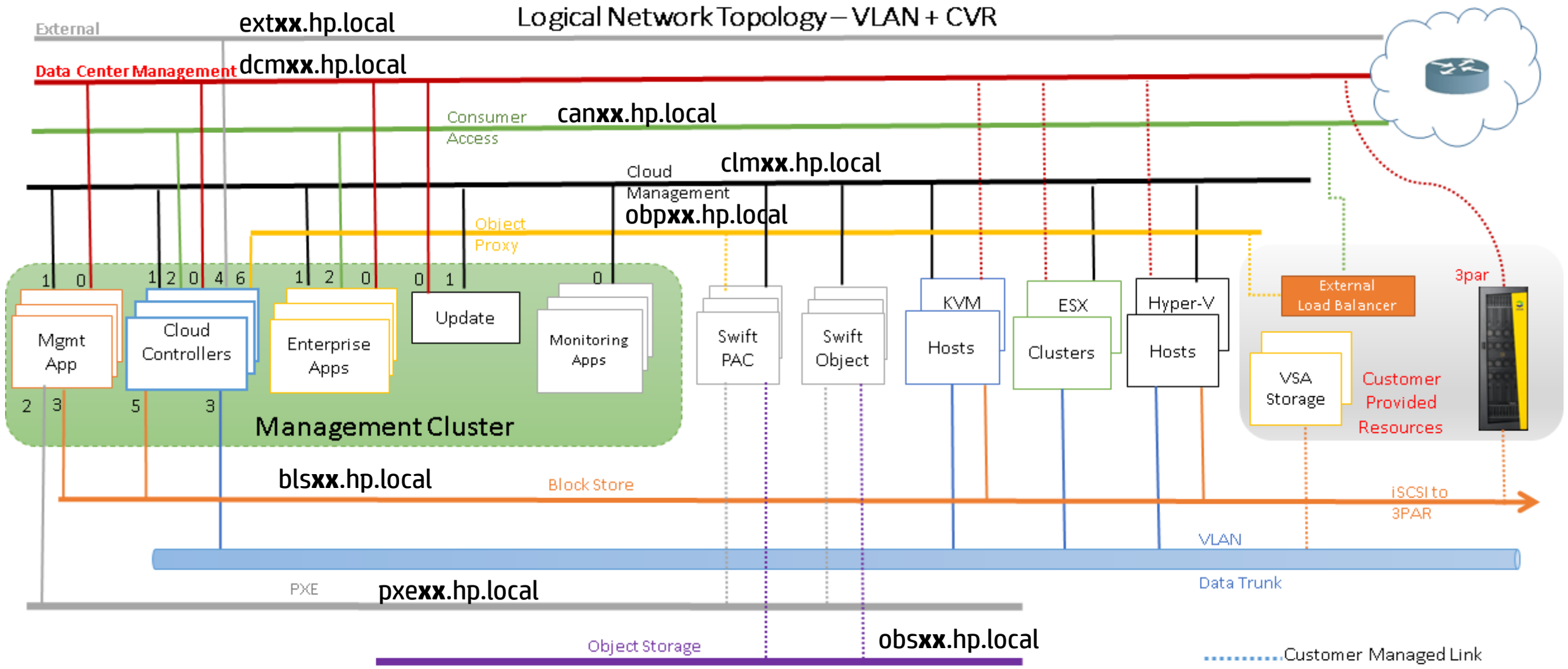


CS9 Networking

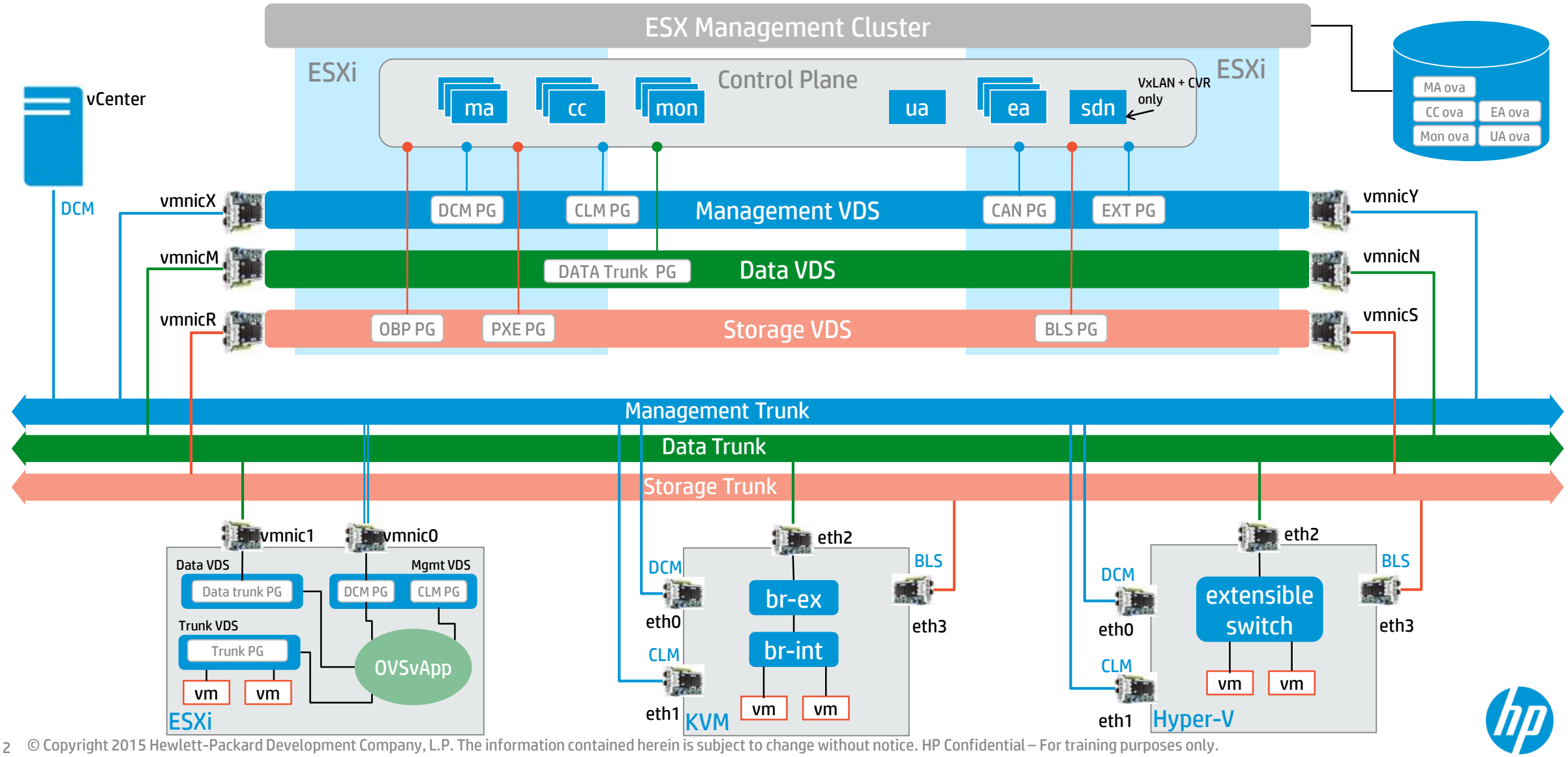
CloudSystem 9 high availability configuration



Class deployment scenario: ESX management cluster

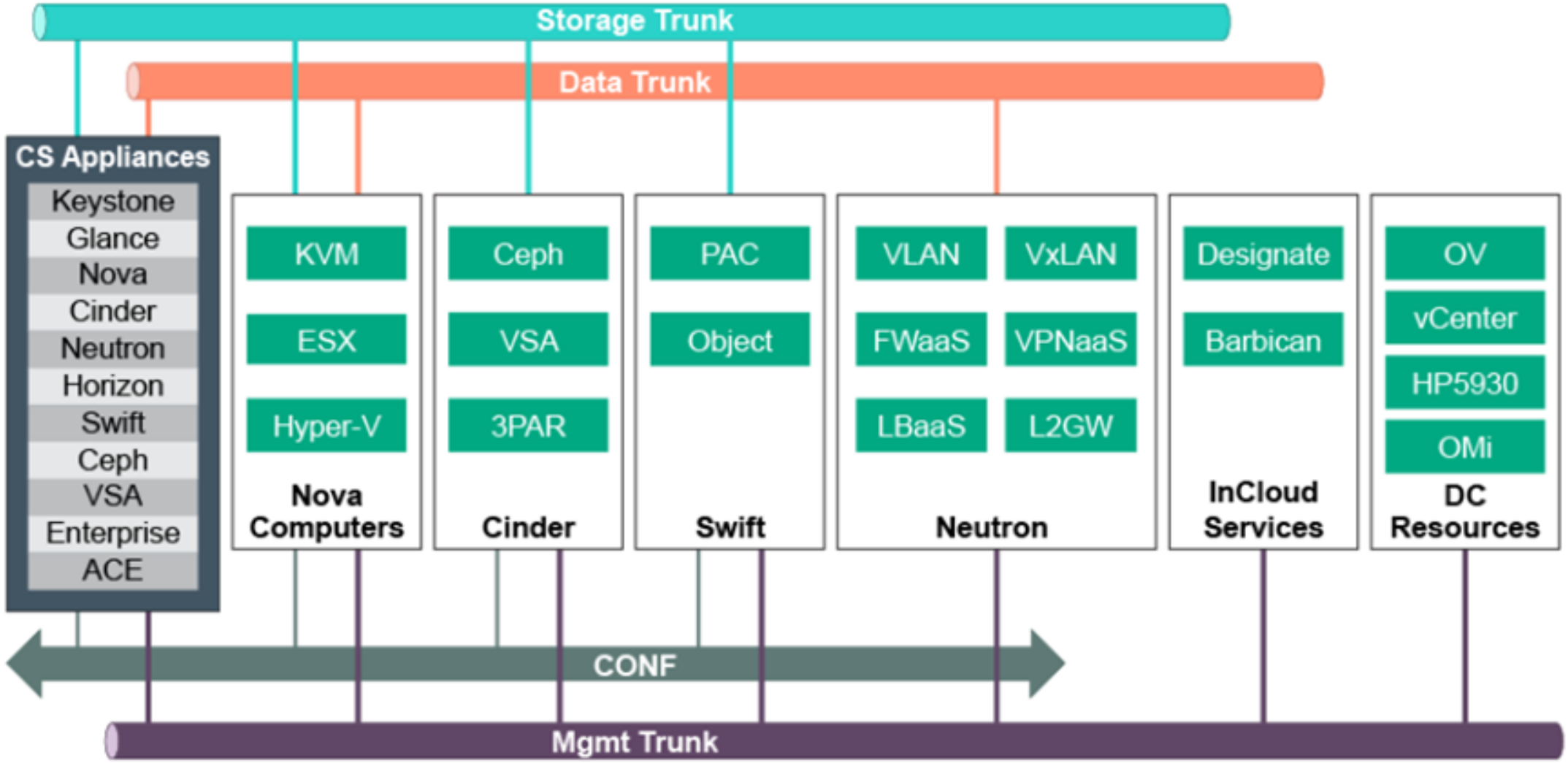


CloudSystem ESX Reference Installation



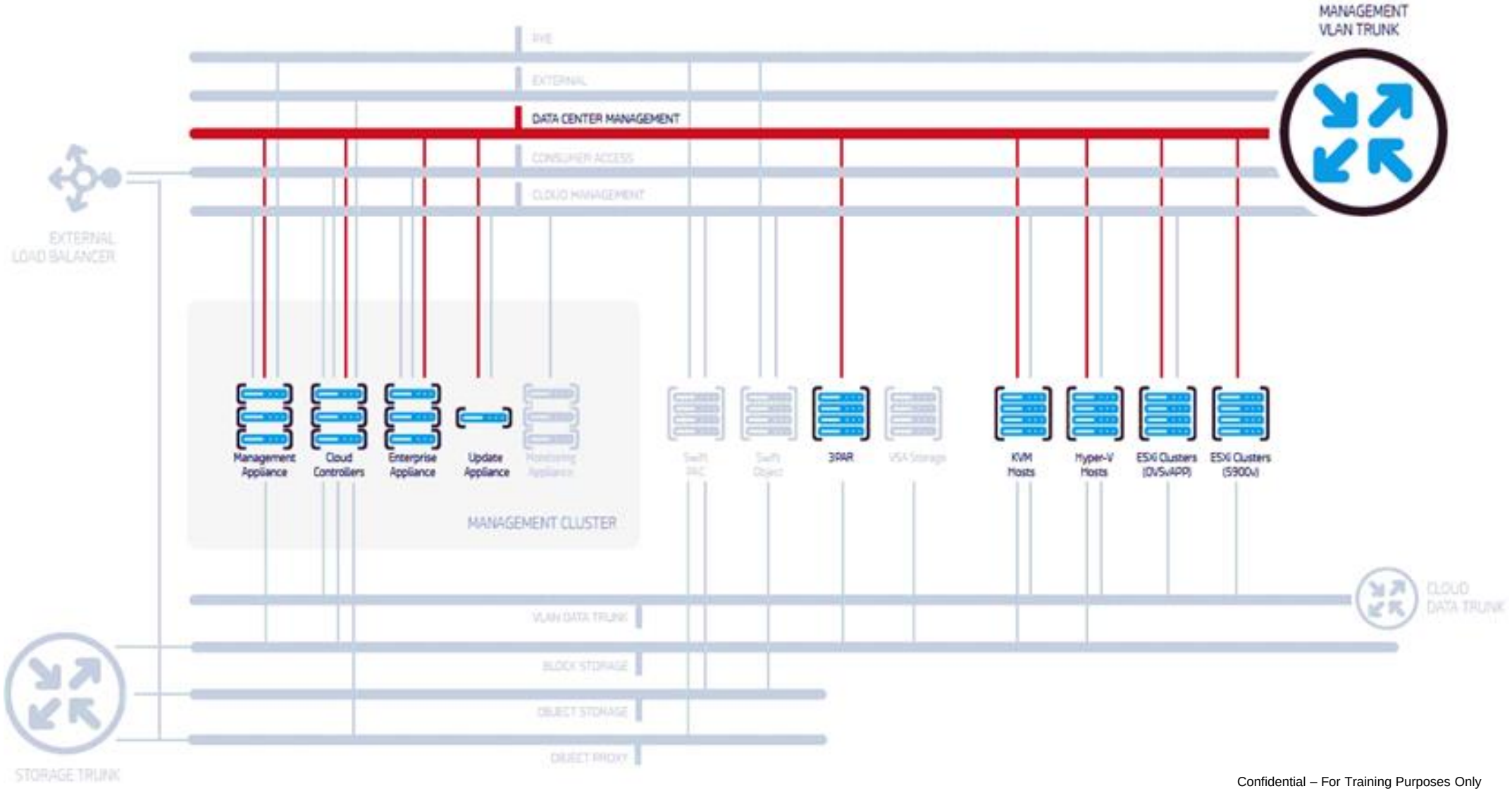
CS10 Networking

Planning the CloudSystem network



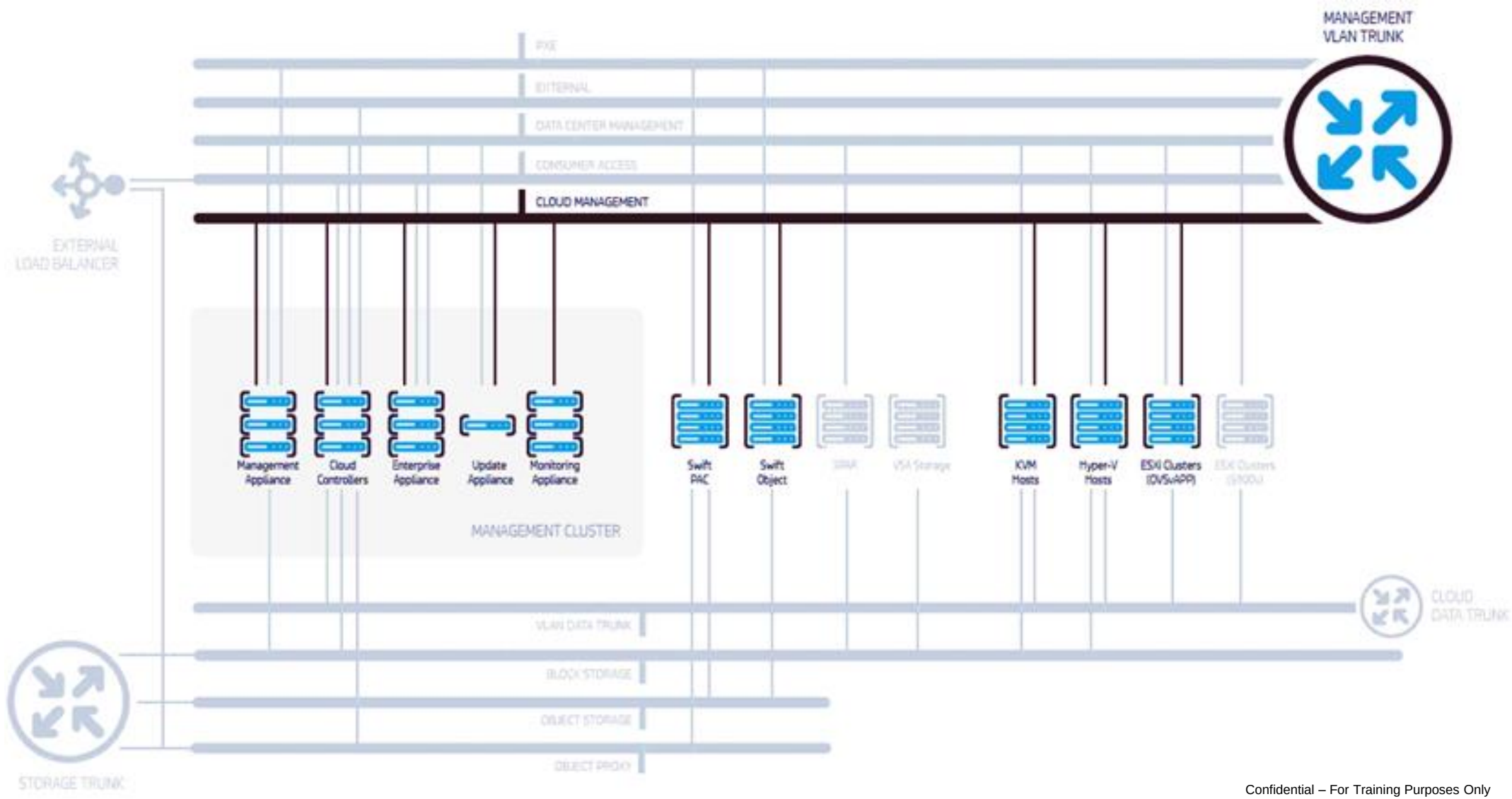
Management trunk diagrams

DCM network



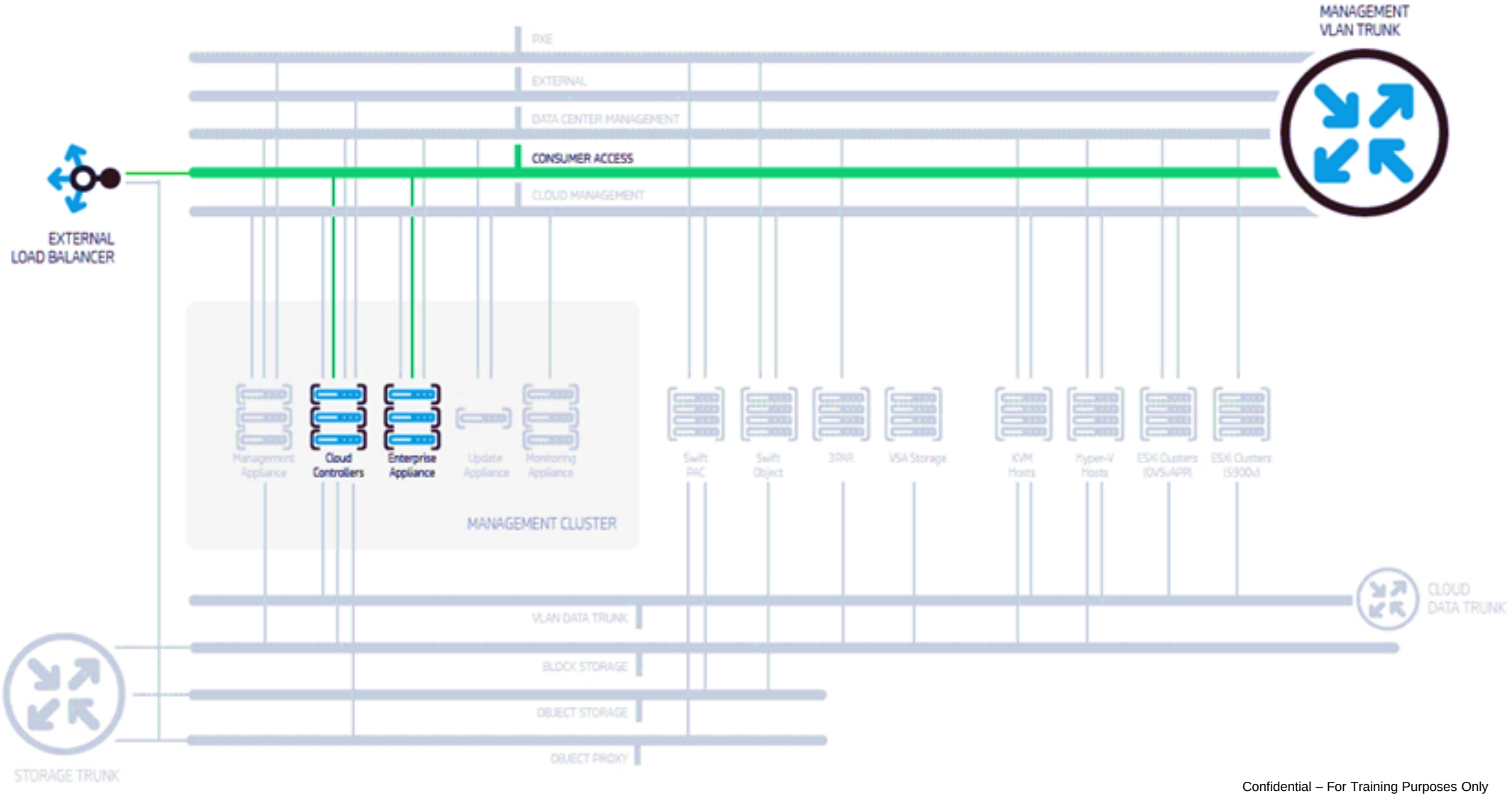
Management trunk diagrams

CLM network



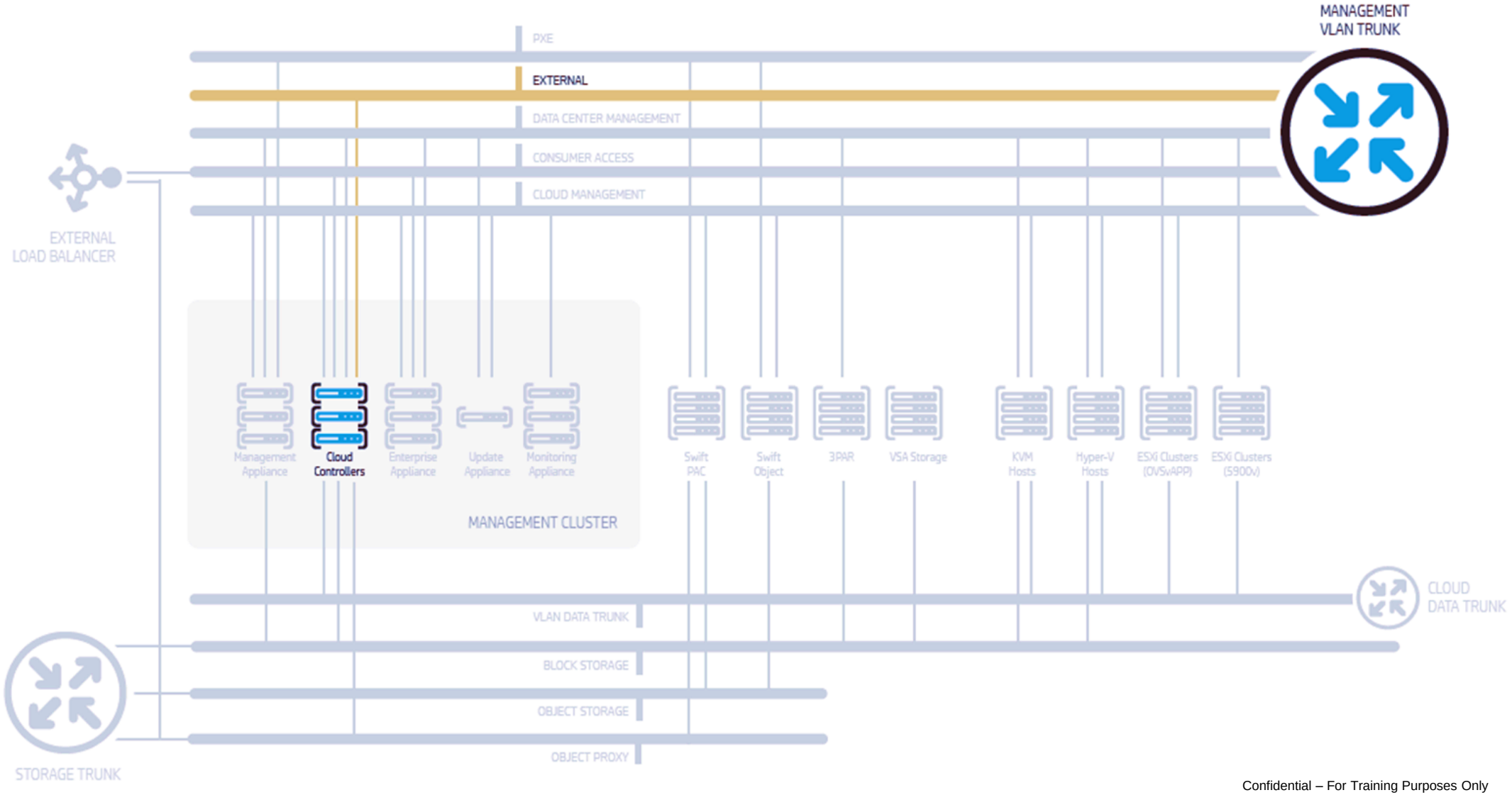
Management trunk diagrams

CAN



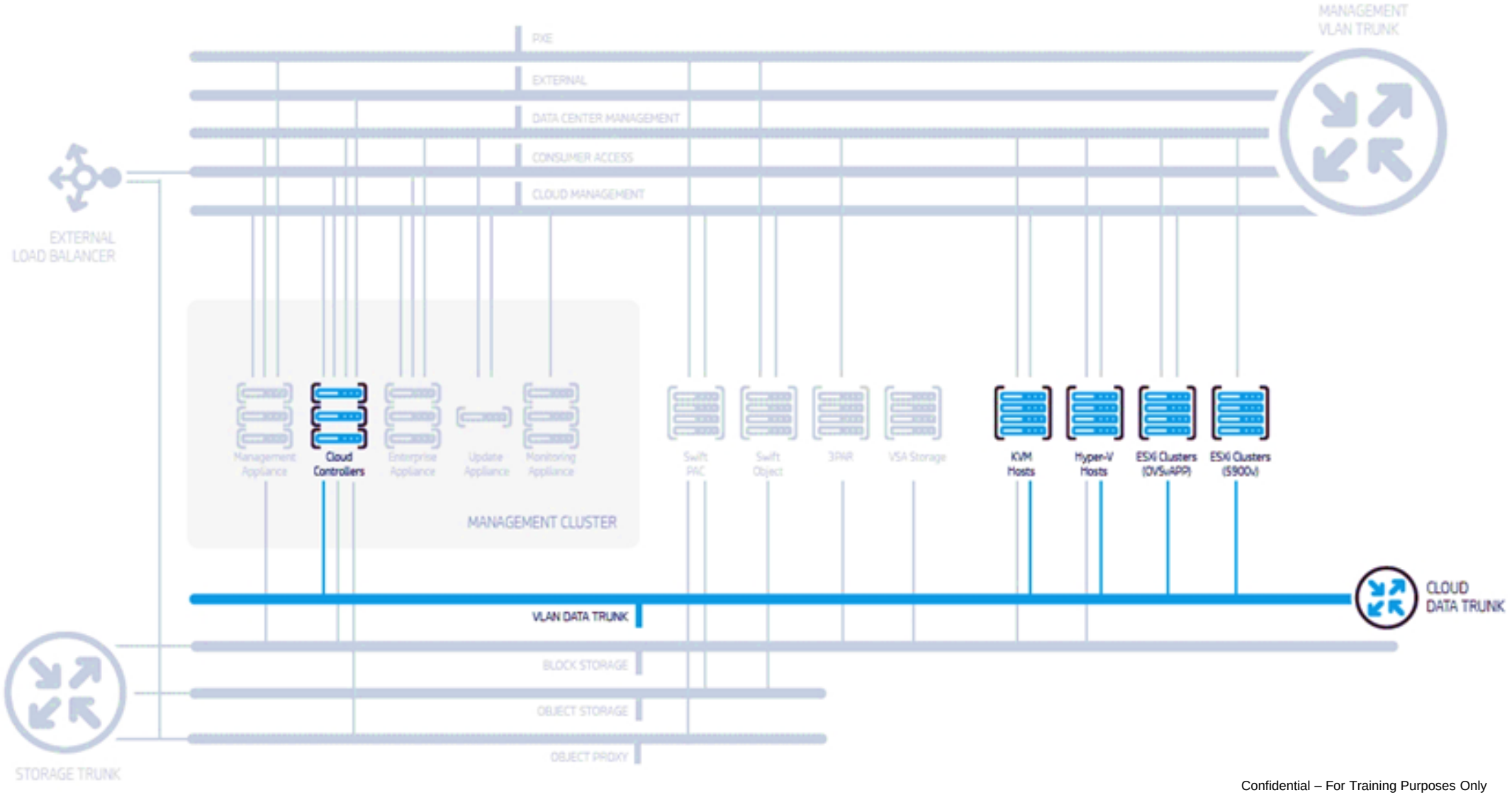
Management trunk diagrams

EXT network



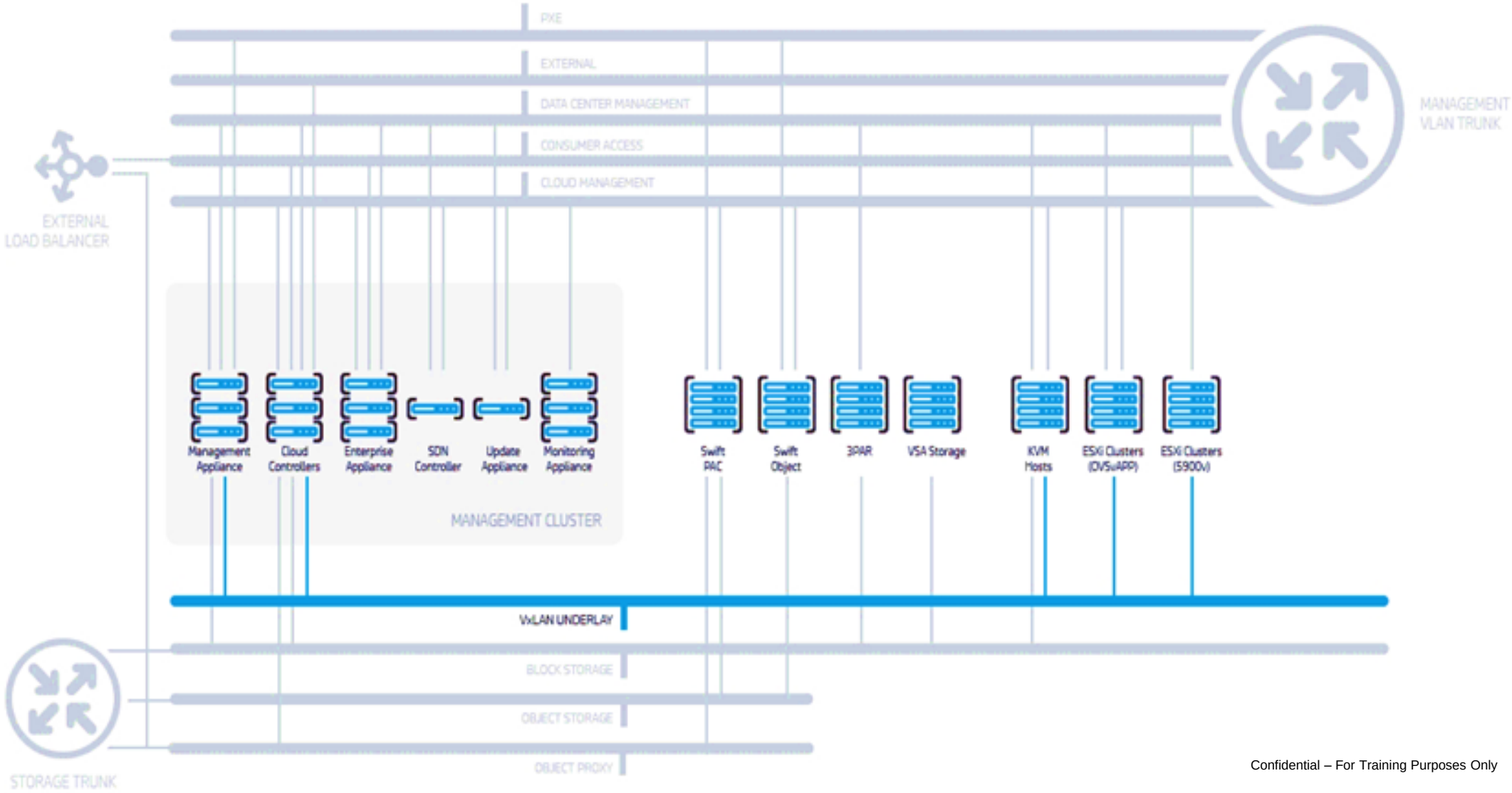
Cloud data trunk diagrams

Cloud data trunk with VLAN



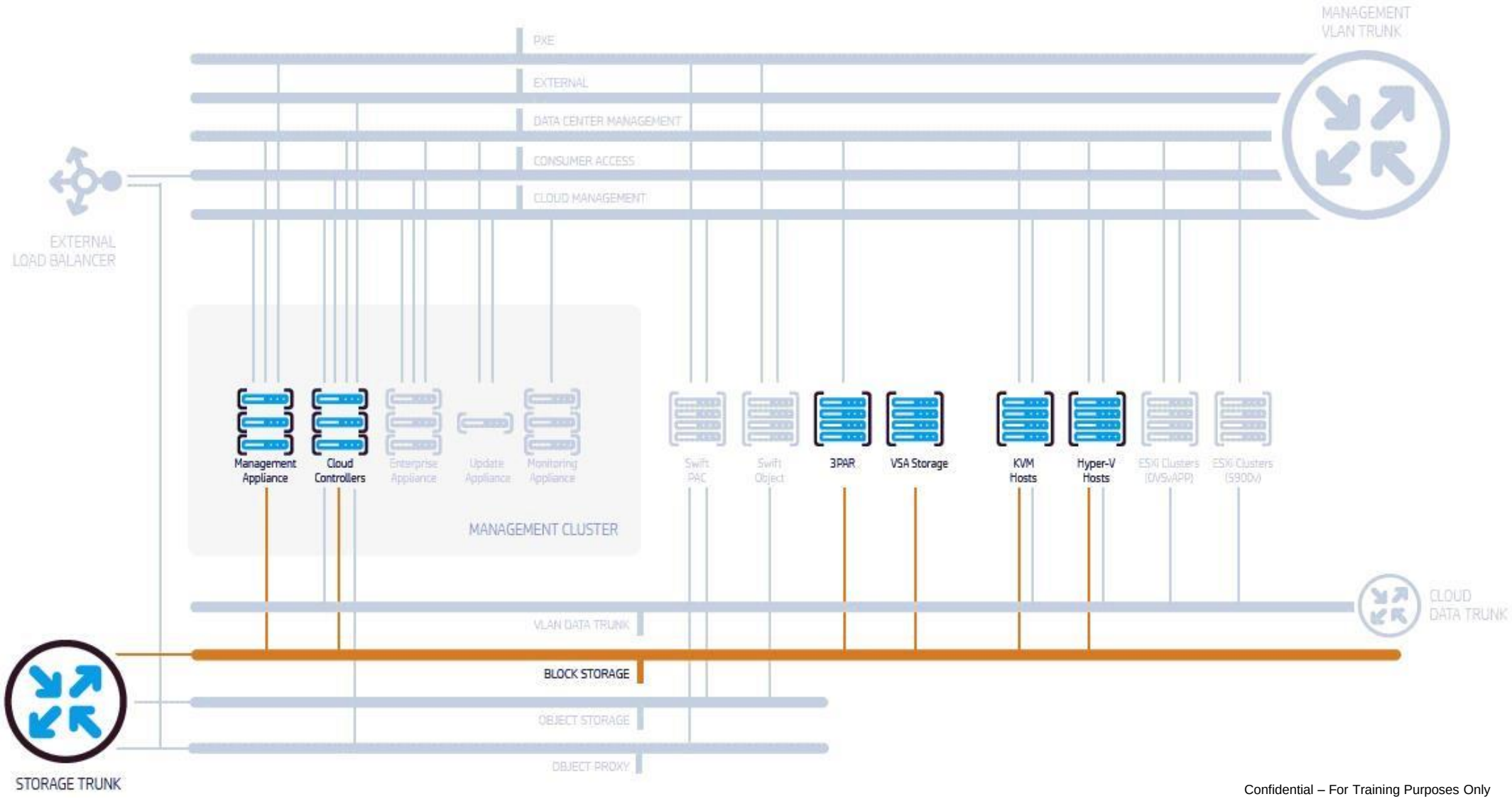
Cloud data trunk diagrams

Cloud data trunk with VxLAN



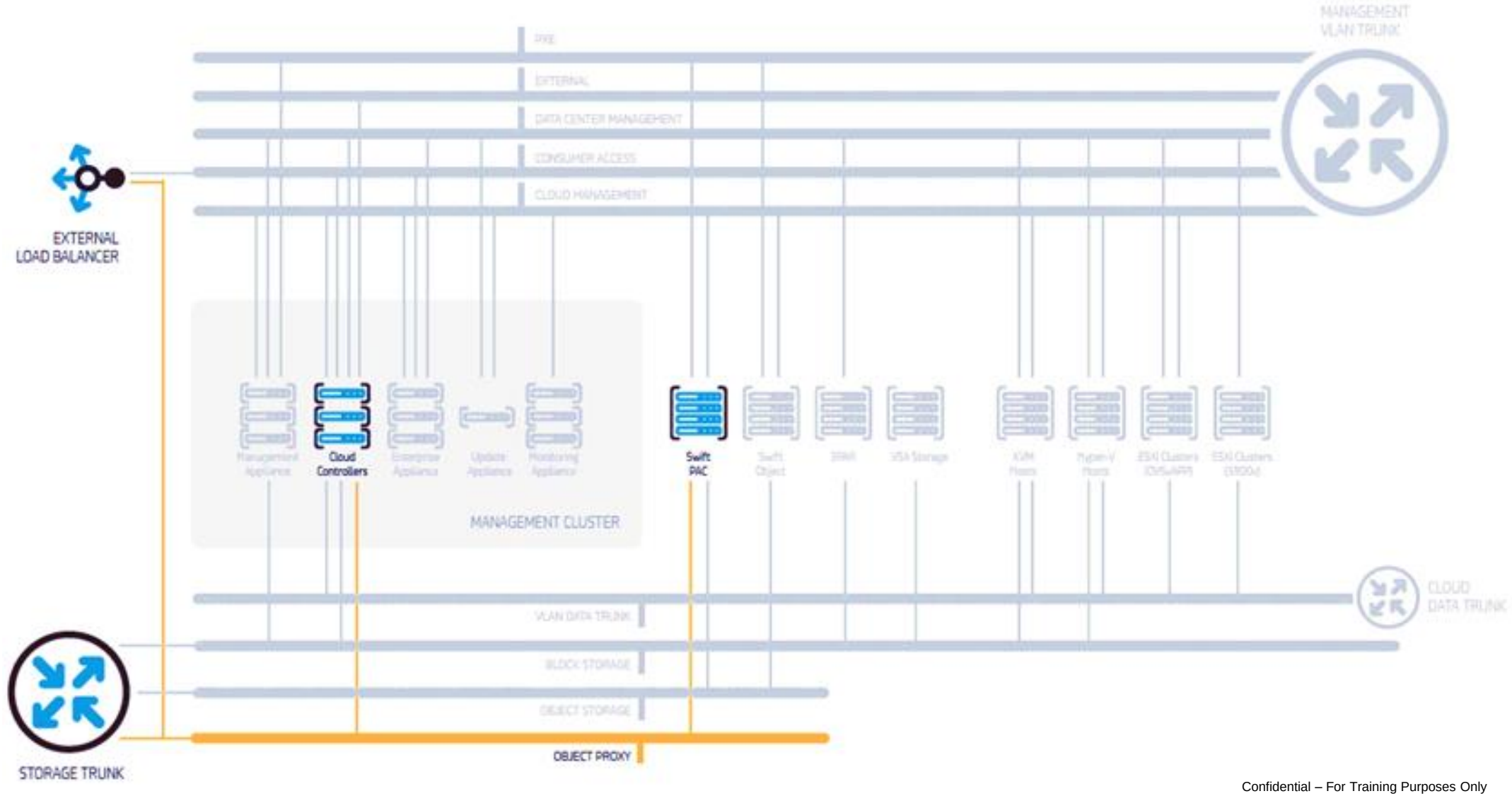
Storage trunk diagrams

Block storage network



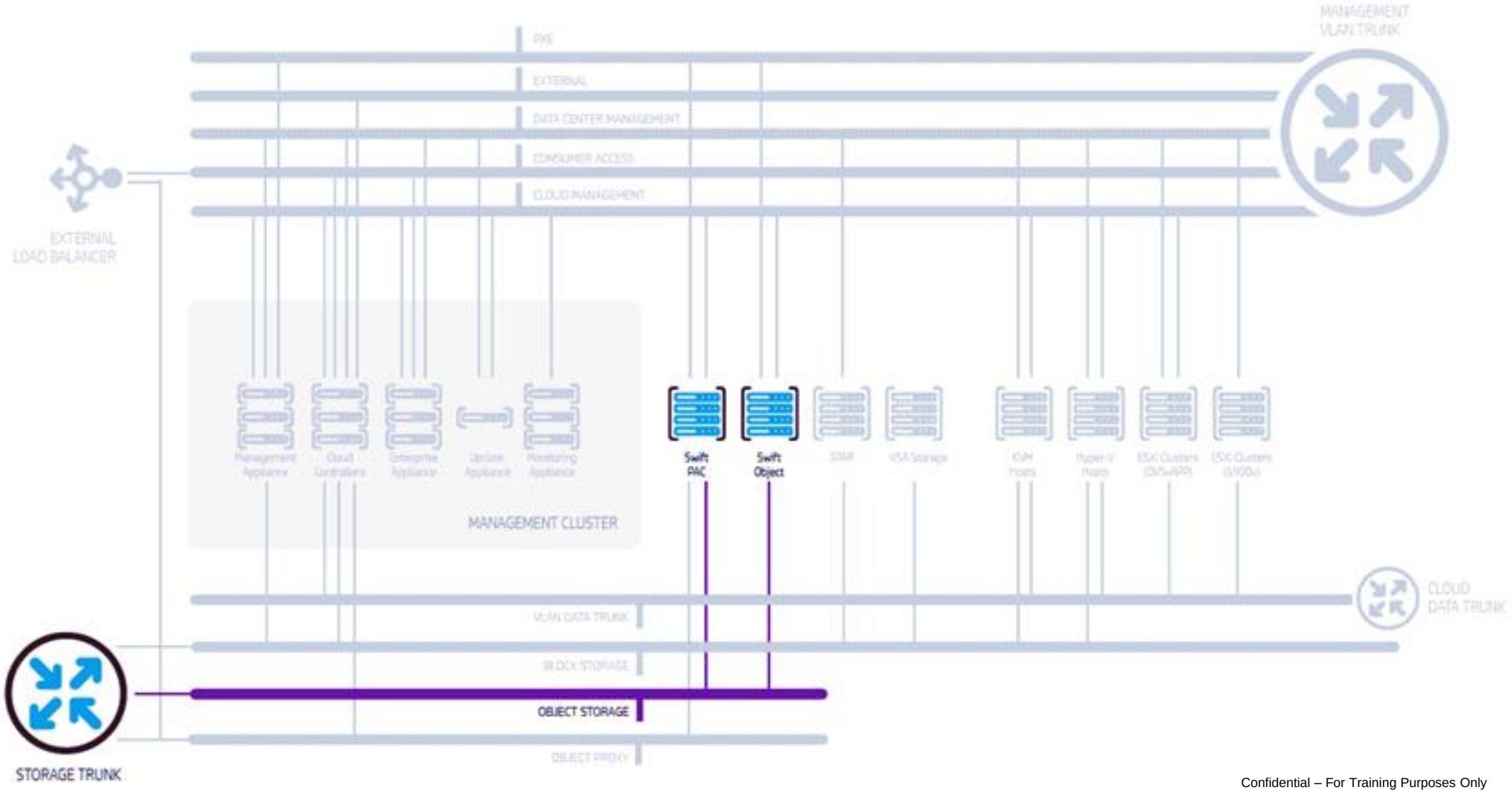
Storage trunk diagrams

Object proxy network



Storage trunk diagrams

Object storage network



Best practice network configuration

Network	Network type	Required/optional	Recommended network set	Externally routed
CONF	hlm	Required	Management network set 1	Y
DCM	admin	Required	Management network set 1	Y
CLM	internal	Required	Management network set 1	N
CAN	public	Optional	Management network set 1	Y
EXT	external	Required	Management network set 1	Y
Tunnel underlay network	tul	Required	Data network set 1	N
VLAN data trunk	vul	Required	Data network set 2	N
iSCSI network	bls	Required	Storage network set 1	N
Swift	obs	Required	Storage network set 1	N
Object Proxy Network	obp	Required	Storage network set 1	N
OSDI network	osdi	Required	Storage network set 1	N
OSDC network	osdc	Required	Storage network set 1	N

Best practice for configuring control plane interfaces

Network name	Type	Tagged
CONF	L3	No
DCM	L3	Yes
CLM	L3	Yes
CAN	L3	Yes
External network	L3	Yes

Quick view of control plane networks

IMPORTANT: You must decide on the networking options and choice of hypervisors before installing CloudSystem because they cannot be changed later

CONF

Compute host scale	Prefix length	IP address count
1 – 32 compute hosts	25	120
33 – 128 compute hosts	23	480
129 – 200 compute hosts	22	1000

– CONF is new to CloudSystem 10

– It is required to deploy the CloudSystem control plane

– It is also used to configure an operating system or to PXE boot new servers

– Best practice is to have a dedicated CONF network

IMPORTANT: IP addresses from pre-existing compute nodes or compute nodes you plan to install must be inside the range of CONF IP addresses specified during deployment

CONF network considerations

– CONF must be an untagged network

– It cannot be modified after CloudSystem is installed

– An address range is required; the recommended prefix is /23

– The gateway IP is the only CONF network property that can be modified after CloudSystem is deployed

– CONF can be routed to IPMI/iLO to support physical provisioning

– If FQDNs are used, the DNS server must be available from CONF

– In an ESXi configuration, vCenter must be accessible from CONF

– CONF is externally routed and must be routed to a remote desktop/laptop/jumpbox network to allow the administrator to access the Deployer appliance on the CONF network

– CONF IP addresses from pre-existing or planned compute nodes must be inside the large address range identified for CONF

Data center management network

Compute host scale	Prefix length	IP address count
1 – 20 compute hosts (small)	26	60
21 – 80 compute hosts (medium)	24	192
81 – 200 compute hosts (large)	23	330

IMPORTANT: IP addresses from pre-existing compute nodes or compute nodes you plan to install must be inside the range of CONF IP addresses specified during deployment

DCM network considerations

– The recommended prefix length is /24

– OpenStack Keystone uses this network for the admin endpoint for all services

– The load balancer VIP admin endpoint is configured on this network

– If you combine the internal and public network roles on the DCM, the first IP address is reserved for the internal VIP

– Make sure that the public VIP and admin VIP are unique IP addresses

– The DCM is an externally routed network and must be routed to networks with HPE 3PAR, HPE OneView, VMware vCenter, DNS, and NTP servers

– The Operations Console and OpenStack API admin URLs and the CSA APIs are also on this network

– The default gateway for the control plane is on the DCM

– If the CAN is not configured in the environment, the DCM is used for both admin and public traffic

– Use the Operations Console to update the DCM after deploying Helion CloudSystem

Cloud management network

Compute host scale	Prefix length	IP address count
1 – 20 compute hosts (small)	26	60
21 – 80 compute hosts (medium)	24	192
81 – 200 compute hosts (large)	23	330

CLM IP resource requirements by compute host scale

CLM network considerations

– CLM is a private network that does not require external routing

– The load balancer VIP internal endpoint is on this network

– The VIP is always the first IP address in the specified range

– The default CIDR value for this network is 192.168.0.0/23

– Use the Operations Console to update the CLM after deploying CloudSystem

IMPORTANT: If a gateway IP address is defined for the CLM, use the addresses field to define an IP address range that excludes the gateway IP address to prevent the network from consuming the entire CIDR

Consumer access network

– CAN is a public network used to provide cloud and end users with access to portals and APIs

– To determine the IP address requirements for a cloud environment, choose a compute host scale that most closely resembles the resources planned for the cloud

Compute host scale	Prefix length	IP address count
1 – 20 compute hosts (small)	28	7
21 – 80 compute hosts (medium)	28	7
81 – 200 compute hosts (large)	28	7

CAN IP resource requirements by compute host scale

CAN network considerations

– The OpenStack user portal public access and the Keystone public endpoint are on the network

– The load balancer VIP public endpoint is defined on the network

– The endpoint can be part of or outside of the specified range

– After deploying Helion CloudSystem, use the Operations Console to update the CAN

– The network properties that can be modified after deployment are IP address ranges and the gateway IP

– You can remove the CAN network and combine the network function with a different network

External network

– EXT is required to support floating IP addresses and to support access to external networks

– To determine the IT IP address requirements for a cloud environment, choose a compute host scale that most closely resembles the resources planned for the cloud

Compute host scale	Prefix length	IP address count
1 – 20 compute hosts (small)	22	1022
21 – 80 compute hosts (medium)	21	2046
81 – 200 compute hosts (large)	20	4094

External IP resource requirements by compute host scale

External network considerations

- EXT is not needed if you are installing CloudSystem Enterprise only
- When configuring multiple EXT networks:
  - EXT can be part of the management network set or part of a separate EXT network set
  - External networks that share an interface must have different VLAN IDs
  - External networks that use different interfaces can use the same VLAN ID
  - Neutron assigns IP addresses automatically when a floating IP is needed
- When an EXT network is created in the OpenStack user portal after CloudSystem is deployed, the provider network type must be flat
- If instances in the environment require access to OpenStack services or if you plan to use Stackato, create an active route between the EXT network and the CAN
- To update the EXT network after deploying Helion CloudSystem, use the `csoperate` CLI commands

Data networks

– Are required if you plan to use compute resources in a CloudSystem Foundation environment

– Are added to the network configuration when performing initial deployment

Best practice for configuring data network interfaces

– You can have one tunnel underlay network and multiple VLAN data trunks in the cloud environment

– Assign one interface for the tunnel underlay network and one interface for each VLAN data trunk

– Add the tunnel underlay network to the management network set or storage network set if a limited number of interfaces are available

Tunnel underlay network

– The tunnel underlay network is VLAN-tagged to carry VxLAN traffic from tenant VMs across different hosts

– Use this when you have many tenant networks to support and do not want to assign individual VLAN IDs to each tenant

– A tunnel underlay network supports one ESXi and one KVM compute type

– The IP address count includes IP addresses for CloudSystem virtual appliances and services

Compute host scale	Prefix length	IP address count
1 – 20 compute hosts (small)	26	60
21 – 80 compute hosts (medium)	24	136
81 – 200 compute hosts (large)	24	208

Tunnel underlay network IP resource requirements by compute host scale

Tunnel underlay network considerations

- A separate, dedicated data network set is highly preferred to carry tenant network traffic
- VxLAN and VLAN networks in one cloud environment is supported if they are in separate data network sets
- Compute resources are supported according to these guidelines:
  - Tenant networks are created after CloudSystem is deployed
  - Tenant networks are automatically assigned a segmentation ID from the range specified in the VxLAN section of the installation configuration file
- Provider networks are created after CloudSystem is deployed and supported according to these guidelines:
  - In VxLAN/CVR configurations, an L2 gateway must be configured
  - Provider networks are not supported in VxLAN/DVR configurations
- To update the tunnel underlay network after deploying CloudSystem, use the Operations Console
- Use the `csoperate` command in the CLI to modify segmentation ID ranges

VLAN data trunk

– Is used to support VLAN tenant networks

– Carries 802.1Q tenant VLAN network traffic

VLAN data trunk considerations

– CloudSystem supports the use of both VxLAN and VLAN networks in one environment if they are in separate data trunks

– Each VLAN data trunk must have a unique name and must be part of its own unique data network set

– The VLAN network cannot be modified from the Operations Console after deploying CloudSystem

  – You can change the range using the `csoperate` commands