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Oracle VM 3 Network Fundamentals

Presenter's Name
Presenter's Title
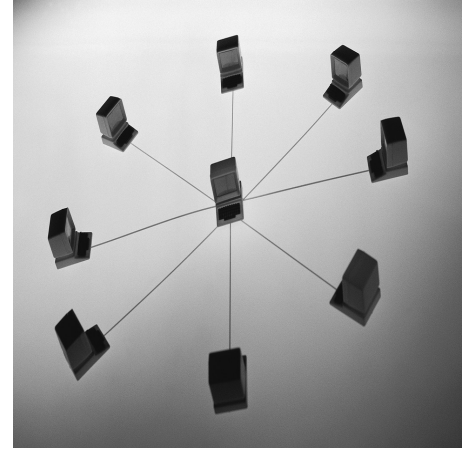
Overview:

Oracle VM Networks

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Oracle VM Networking

- Physical Network
  - Hubs, switches, HBAs, physical network ports
  - Connects all physical hardware
    - VM servers
    - VM manager
    - Storage
- Logical Network
  - Oracle VM Network Use
    - Ties physical ports/networks to logical (VM) ports
- Physical networks should be setup first
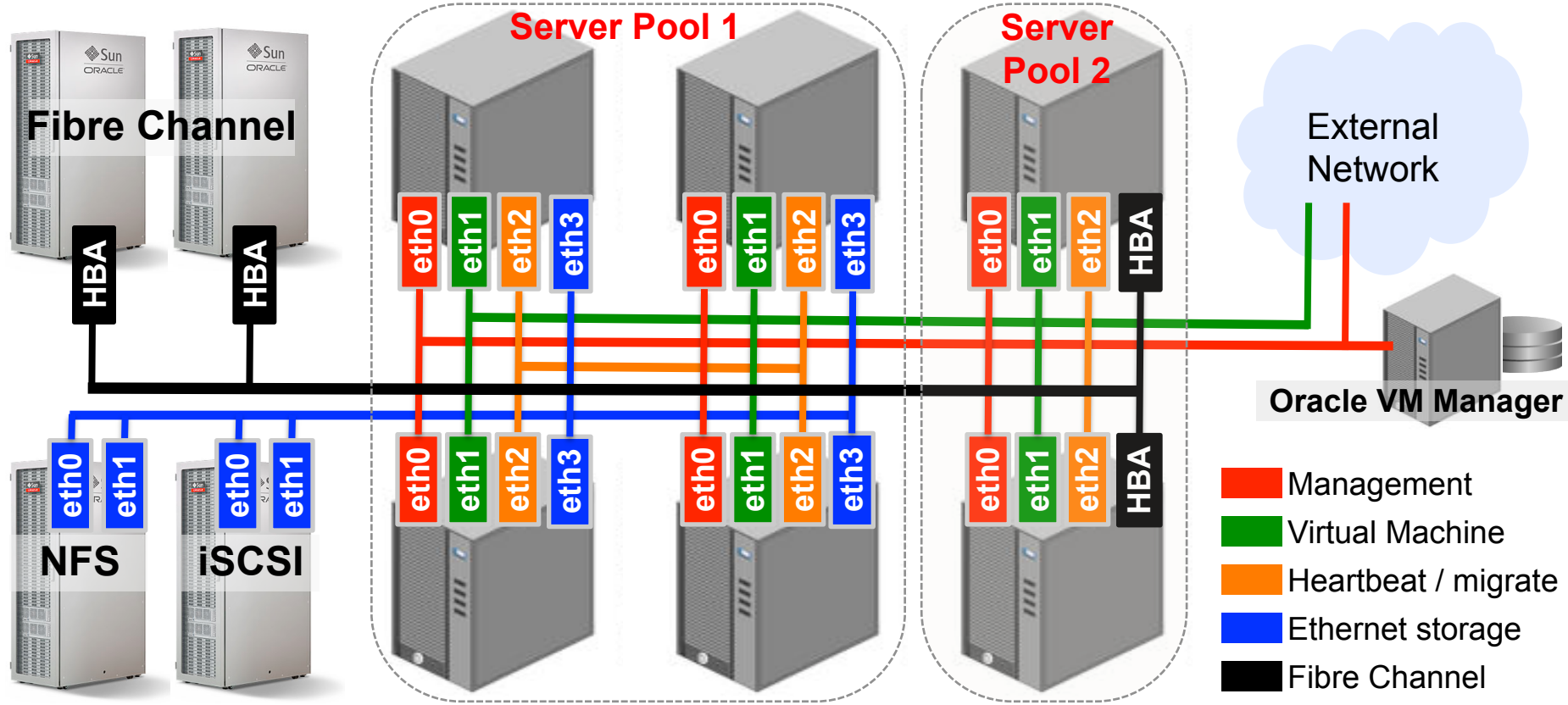
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Oracle VM Network Types

- Server Management
  - Initial network created
  - Bond0
- Cluster Heartbeat
  - Server pool file system
  - Timeouts will fence server nodes
- Live Migrate
  - Secure and unsecure migrations

- Storage
  - Network access to iSCSI and/or File Servers
  - Not applicable if using only Fibre Channel arrays
- Virtual Machine
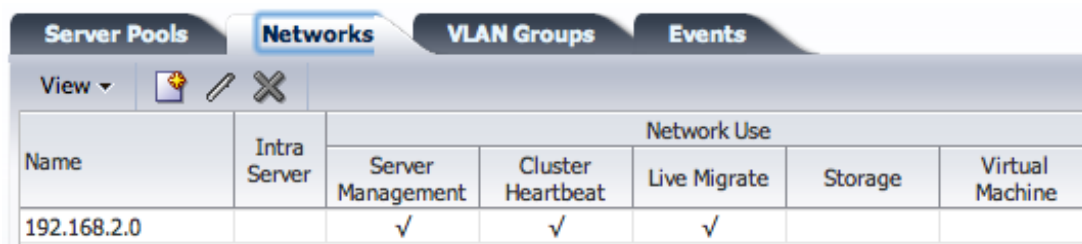 - Access to/from a VM

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Oracle VM Network Types

- ***Goal***: To isolate high-traffic or critical networks to avoid overtaxing a single network segment.

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Example Network Setup

Oracle VM Networks

		Network Use				
Name	**Intra Server**	**Server Management**	**Cluster Heartbeat**	**Live Migrate**	**Storage**	**Virtual Machine**
192.168.2.0		√	√	√		

- Default network
  - 192.168.2.0 – Default name taken from network IP of bond0
    - Recommend assigning more meaningful network names
  - Server Management, Cluster Heartbeat, Live Migrate
  - Can add Storage and Virtual Machine
    - Not suitable for production use

Network Bonding

- Team multiple interfaces for redundancy
- Three bonding modes are available within Oracle VM:

Description of Bonding Mode	Standard Terminology	Bonding Mode	Improves Resiliency?	Improves Throughput?	Switch support?
Active-Backup	active-backup	1	Yes	No	None
Link Aggregation	802.3ad	4	Yes	2x	Yes
Adaptive load balancing	balance-alb	6	Yes	Possibly	None

Source: http://www.linuxfoundation.org/collaborate/workgroups/networking/bonding#Configuring_Bonding_for_Maximum_Throughput

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Network Bonding

- **Note**: before configuring 802.3ad bonding on a server, make sure that the network switch supports LACP bonding, that it is licensed, and the switch has it enabled!

- Bonding normally requires 2 ports
  - Management network is the only exception
    - Only one port in bond0 initially
    - Management network cannot be modified, except to add an additional interface to bond0

Network Bonding

Active-Backup

- Only one link is active, the other inactive, until a failure is detected.

- Management network (bond0) supports only this type of bonding.

- Redundancy should be with a port on a separate NIC.

- Very simple to setup.

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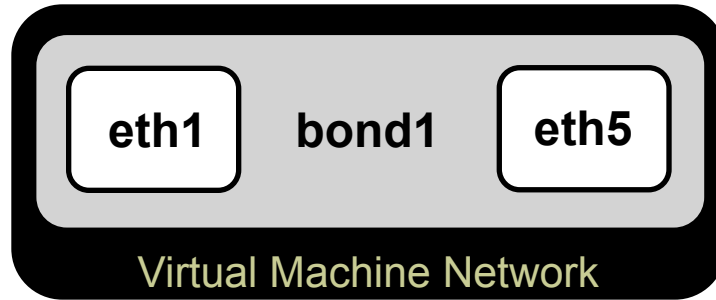
Network Bonding

Dynamic Link Aggregation

- Two 1 Gb ports = 2 Gb throughput.

- Two 10 Gb ports = 20 Gb throughput.

- Note that Active-Active configurations are normally unsupported across different switches.

- Switch must have LACP support enabled!

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Network Bonding

Adaptive Load Balancing

- Active-active form of bonding
- Network traffic is equally balanced across both NICs
- Uses ARP negotiation to achieve receive load balancing
- More info about bonding in MOS Note 1354071.1

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Network Building Blocks

```
┌─────────────────────────────────┐
│  ┌────────┐          ┌────────┐  │
│  │  eth1  │  bond1   │  eth5  │  │
│  └────────┘          └────────┘  │
│        Virtual Machine Network   │
└─────────────────────────────────┘
```

- eth1/eth5 are discovered during server discovery

- Bond1 is created manually over both ports (eth1 & eth5)

- A network is then created using bond1
  - Network Use Type is assigned during the network creation

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Network Building Blocks

Virtual Network Cards (VNICs)

- The VNIC is a switch abstraction within Oracle VM that connects a virtual machine's interfaces (such as *eth0*) with an appropriate network on the Oracle VM Server (such as *bond1*).

- VNICs have a MAC address, prefixed 00:21:f6:

- MAC uniqueness is enforced for a VM Manager instance.
  - Be aware of potential for MAC collisions when multiple Oracle VM Managers are deployed.
  - MAC addresses should be unique within the enterprise.

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Network Building Blocks

Virtual Network Cards (VNICs)

- You can create a "pool" of VNICs to assign when you are creating virtual machines.

- Use same UI to track assignments once the VNICs are assigned.

- Lab 03: Bonding & Virtual Machine Networks

- Lab 04: Create 10 vNIC addresses

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