IT 3300 : Virtualization

Pools

- A resource pool comprises multiple XenServer host installations, bound together into a single managed entity which can host Virtual Machines.
- Why?
  - move hosts
  - minimize downtime
  - failover
- 16 hosts per pool

Pools Requirements

A pool always has at least one physical node “master”.

- CPUs on server joining pool are same as CPUs in the pool
- same version of xenserver
- no shared storage configured
- no running or suspended vms on joining host
- no active operations on vms
- clock synchronized to master

Pool Master

The master acts as the single management interface for all other hosts in the pool. Master will forward all commands to pool members ensuring consistency. If master fails, pool is unmanageable until a member is promoted to master or master regains stability. If HA is enabled, pool master will automatically be re-elected upon failure.

Maintenance mode

Allows us to perform operations on a server. Running and suspended vms will be migrated to other server in the pool. We can also forcibly ‘migrate’ a vm to another host.

XenMotion

XenMotion is a feature that allows VMs to migrate from one server to another without any downtime. This functionality can be used when performing maintenance on a particular server that needs to be taken offline in order to perform a hardware replacement or even replacing a server.

XenMotion requirements

- VM’s hosted on shared storage
- VM’s can only be moved within pool
XenServer Tools must be installed on the migrating VM
- DVD drive of VM must be empty
- Enough free memory on target server

Note: The target server must be the same or a newer version of XenServer. A VM that has migrated to a host running a newer version of XenServer cannot be migrated back to the older host.

### Storage XenMotion

存储 XenMotion 允许你从一个 SR 到另一个 SR 迁移 VDI，当机器正在运行时。可以将本地存储迁移到共享存储。也可以不使用共享存储将 VDI 从一个服务器迁移到另一个服务器。

### Storage XenMotion Requirements

- The migrating VM must have XenServer Tools installed
- If the CPUs on the source and target server are different, then the CPU on the target must support all the features of the source server
- The migrating VM can have no more than one snapshot
- The migrating VM can have no more than six attached VDIs
- The target SR must have enough free space to accommodate the migrating VMs
- There must be enough free memory on the target server to support the migrating VMs
- The target server must have the same version of XenServer or later as the source server

### High Availability

HA 是一组自动功能，旨在计划并安全地从导致 XenServer 主机不可用或无法访问的问题中恢复。例如，物理上中断的网络或主机硬件故障。

应该始终与多路径存储和绑定网络一起使用。

### What is multipathed storage?

使用超出一个物理路径在主机和存储设备之间传输数据。

### What is bonded networking?

Nic Bonding: 配置两个或更多 NIC 作为一个。所有绑定的 NIC 共享相同的 MAC 地址。如果一个 NIC 网路出现问题，其流量自动通过另一个 NIC 网路重路由。

### Nic bonding image

- Network heartbeats - 管理网络被利用。绑定它。
- Storage heartbeats - 主机在 HA 集群中周期性地写入到一个存储心跳 SR 作为保持心跳的机制。这个 SR 需要至少 356M。

### HA Heartbeats

- Network heartbeats - 管理网络被利用。绑定它。
- Storage heartbeats - 主机在 HA 集群中周期性地写入到存储心跳 SR 作为保持心跳的机制。这个 SR 需要至少 356M。

### Server Fencing

在主机被认为是不可用的情况下，主机将被关闭并重新启动，以防止主机从网络中断的状态下继续运行。

In the event a host is deemed unreachable, the host is powered off and restarted to prevent the host from
writing to the shared storage and potentially corrupting data.

**HA requirements reviewed**

- A shared storage SR is required to support the protected virtual machines
- An iSCSI, Fibre Channel, or NFS SR of 356 MB or greater is required for the heartbeat SR
- The virtual machine’s network must be a pool-wide network
- The protected virtual machine must not be connected to a local DVD drive

**HA VM settings**

See the start options sections of vm’s properties.

- Restart priority: used to define the order of precedence used when there is contention for capacity on the remaining hosts in the resource pool.
  - restart: host will restart if there is capacity in pool
  - restart if possible: will only restart on other host if there is capacity after hosts with HIGHER priority have been restarted.
  - Do not restart: the vm will not restart after a host failure.

**HA VM settings**

The start order determines the order in which VMs are booted after a host failure. This functionality allows VMs that provide services to other VMs such as a database server to be started first.

**HA VM settings**

Delay interval: how long to wait before next set of vms starts. Makes sure that systems other vms rely on have adequate time to boot.