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DIGICOMP

XenServer Advanced

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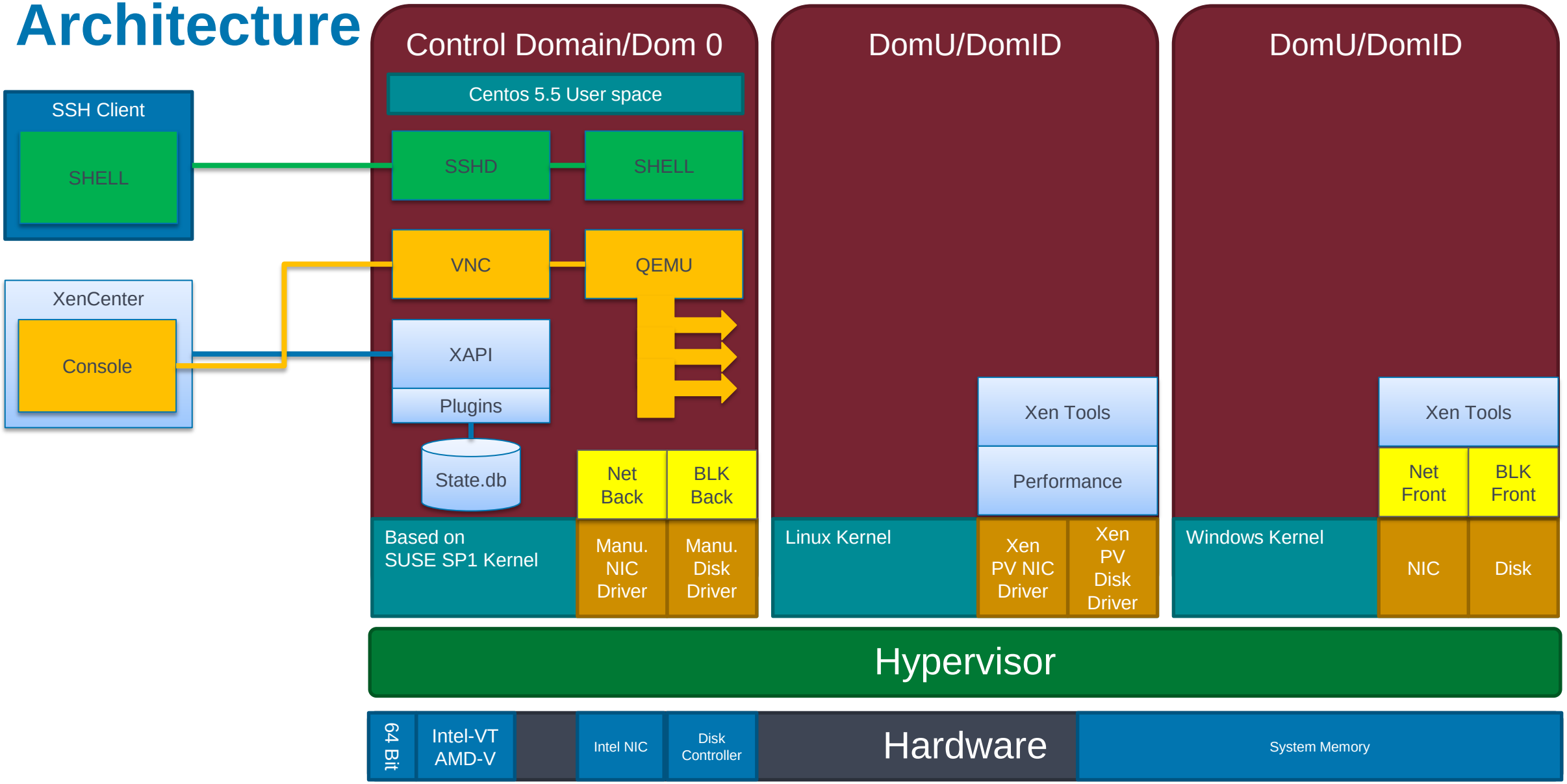
Server Virtualization

Architecture

Architecture



Citrix use only - Do Not Distribute

Command Line Interface (CLI)

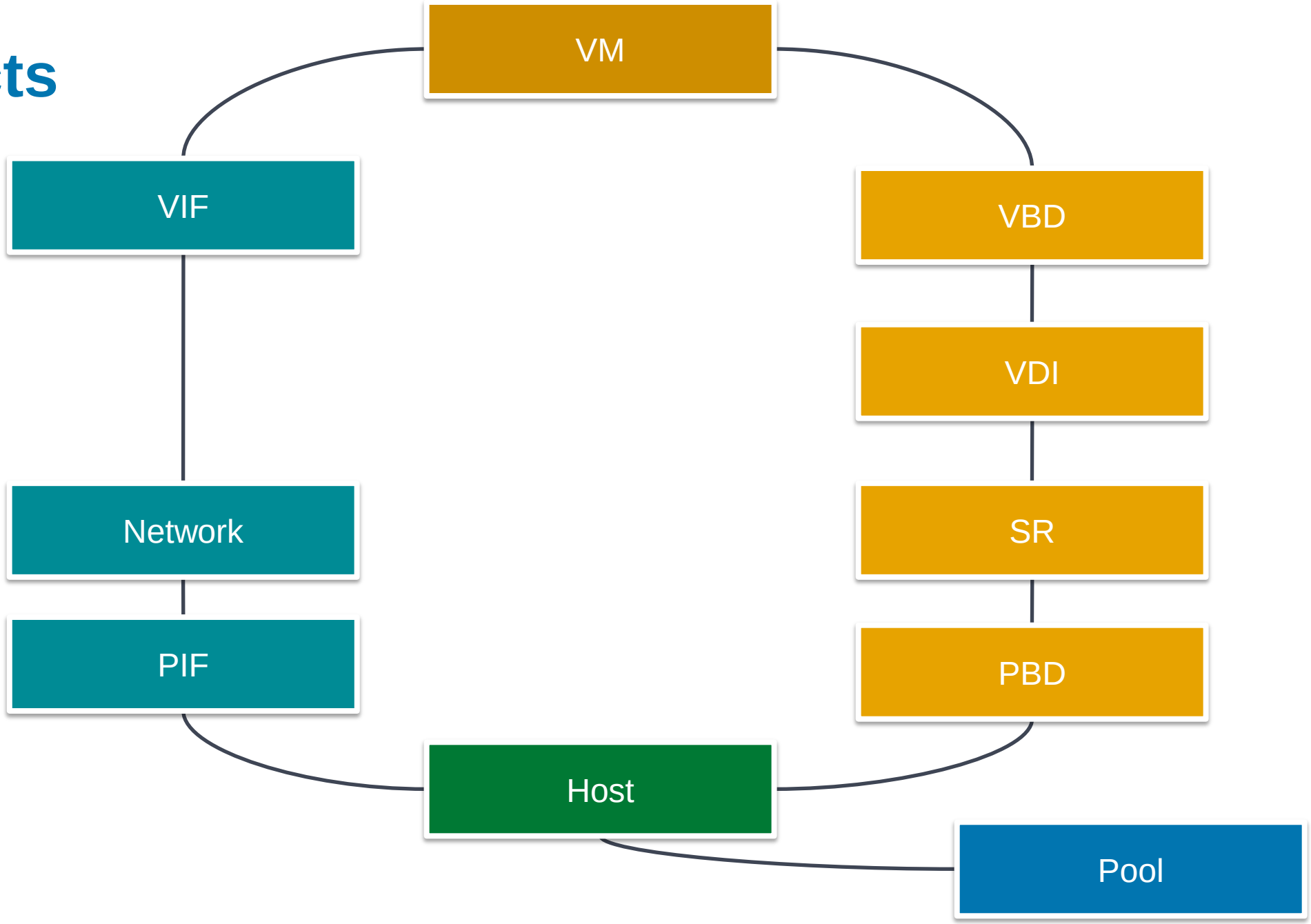
xe Command

- Runs CLI binary
  - Local in Dom0
  - Remote on Linux and Windows
  - Syntax: `xe help` or `xe help` command or `xe help –all`
- Network Communication
  - SSL, TCP 443
- Objects such as a VM or Server Addressed by
  - Name e.g. WindowsAppServer
  - unique UUID e.g. 79372186-1db3-4928-ac1f-5ae7feb5fd19

CLI

- Filtering
  - `vm-list HVM-boot-policy="BIOS order" power-state=halted`
- Parameterization
  - `xe vm-list params=name-label`
- Parameterization and filtering can be combined
  - `xe vm-list HVM-boot-policy="BIOS order" power-state=halted params=name-label`
- Minimal Output
  - `xe vm-list HVM-boot-policy="BIOS order" power-state=halted params=name-label --minimal`

Objects



XenServer Log Files

- XenServer XAPI Agent
  - `/var/log/messages` - system
  - `/var/log/xensource.log` – XenServer only
  - `/var/log/xha.log` – HA logging

  *Logs can be sent to remote syslog daemon
- Domain 0
  - Hypervisor boot messages: `xe host-dmesg`
  - Domain 0 boot messages: `dmesg`

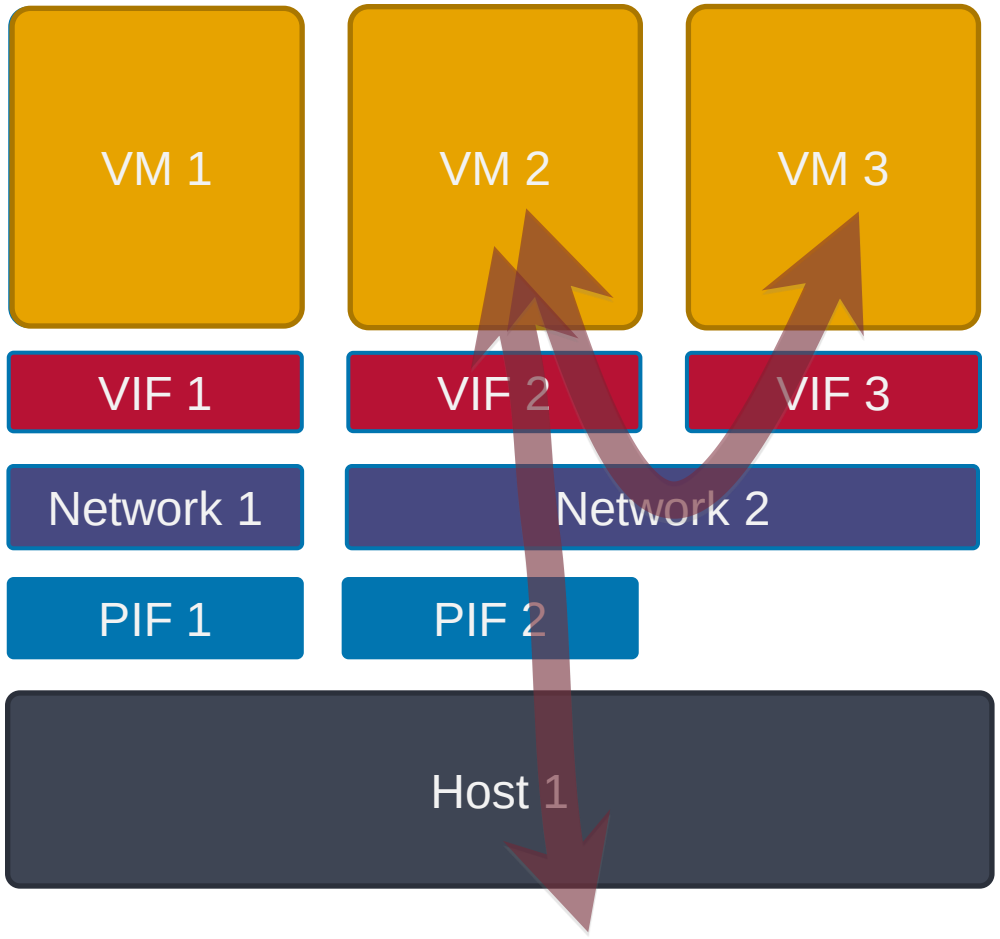
XenServer logging

- Log files are rotated on a daily base
- Rotated log files can be seen as .<number> files
- Max of 20 log files is saved by default
- Create specific log files volume http://support.citrix.com/article/CTX130245
- Change logging options http://support.citrix.com/article/CTX130327

```
Last login: Fri Mar 25 23:54:48 on pts/0
Type "xsconsole" for access to the management console.
[root@xsmaster-1 ~]# cd /var/log
[root@xsmaster-1 log]# ls
audit.log      messages        user.log.1              xenstored-access.log.15
audit.log.1    messages.1      v6d.log                 xenstored-access.log.16
blktap         openvswitch     v6d.log.1               xenstored-access.log.17
boot.log       pm              VMPRlog                 xenstored-access.log.18
btmp           rpmpkgs         VMPRlog.1               xenstored-access.log.19
crit.log       sa              wtmp                    xenstored-access.log.2
cron           samba           xen                     xenstored-access.log.3
daemon.log     secure          xensource.log           xenstored-access.log.4
daemon.log.1   secure.1        xensource.log.1         xenstored-access.log.5
dmesg          SMlog           xenstored-access.log    xenstored-access.log.6
faillog        SMlog.1         xenstored-access.log.1  xenstored-access.log.7
installer      spooler         xenstored-access.log.10 xenstored-access.log.8
kern.log       squeezed.log    xenstored-access.log.11 xenstored-access.log.9
kern.log.1     squeezed.log.1  xenstored-access.log.12
lastlog        tallylog        xenstored-access.log.13
maillog        user.log        xenstored-access.log.14
[root@xsmaster-1 log]#
```

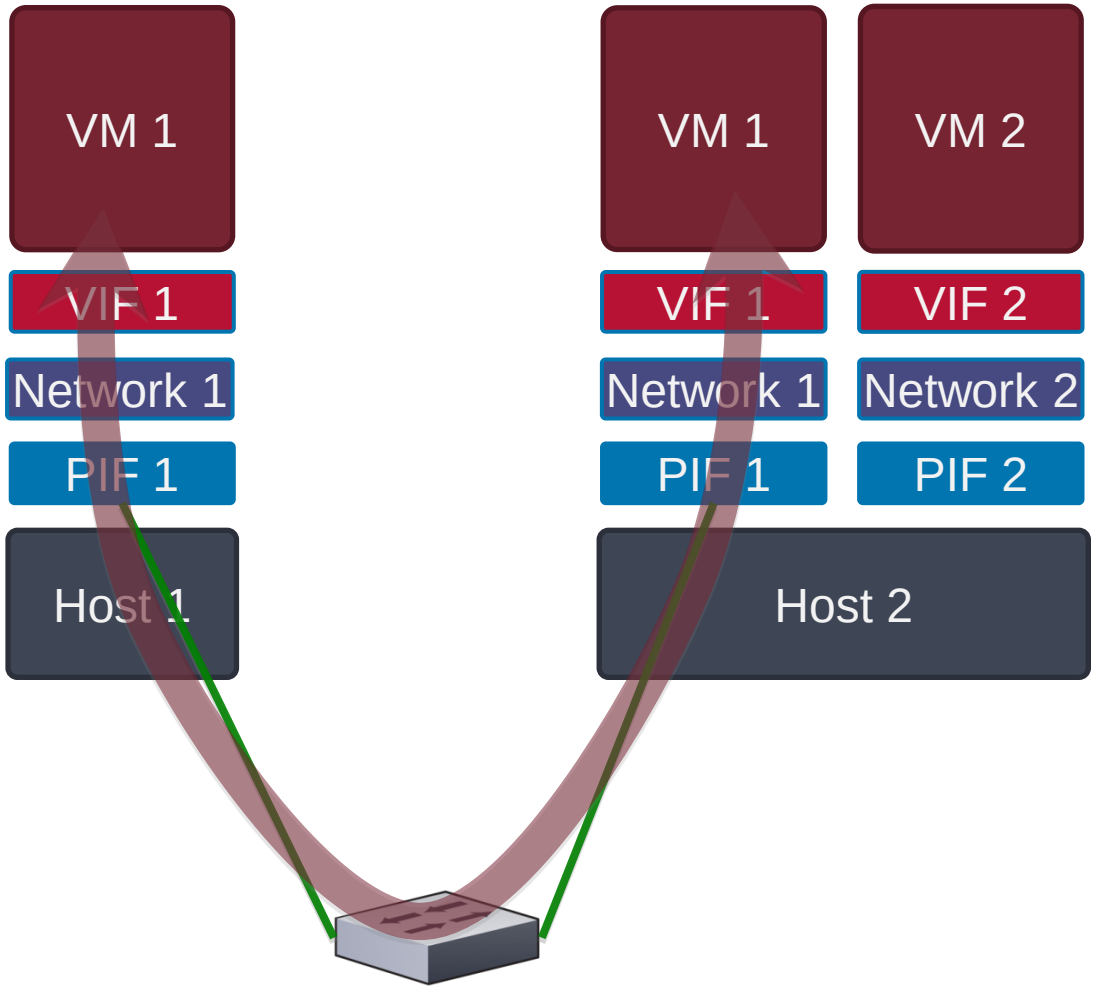
XenServer Networking

Networking: single host



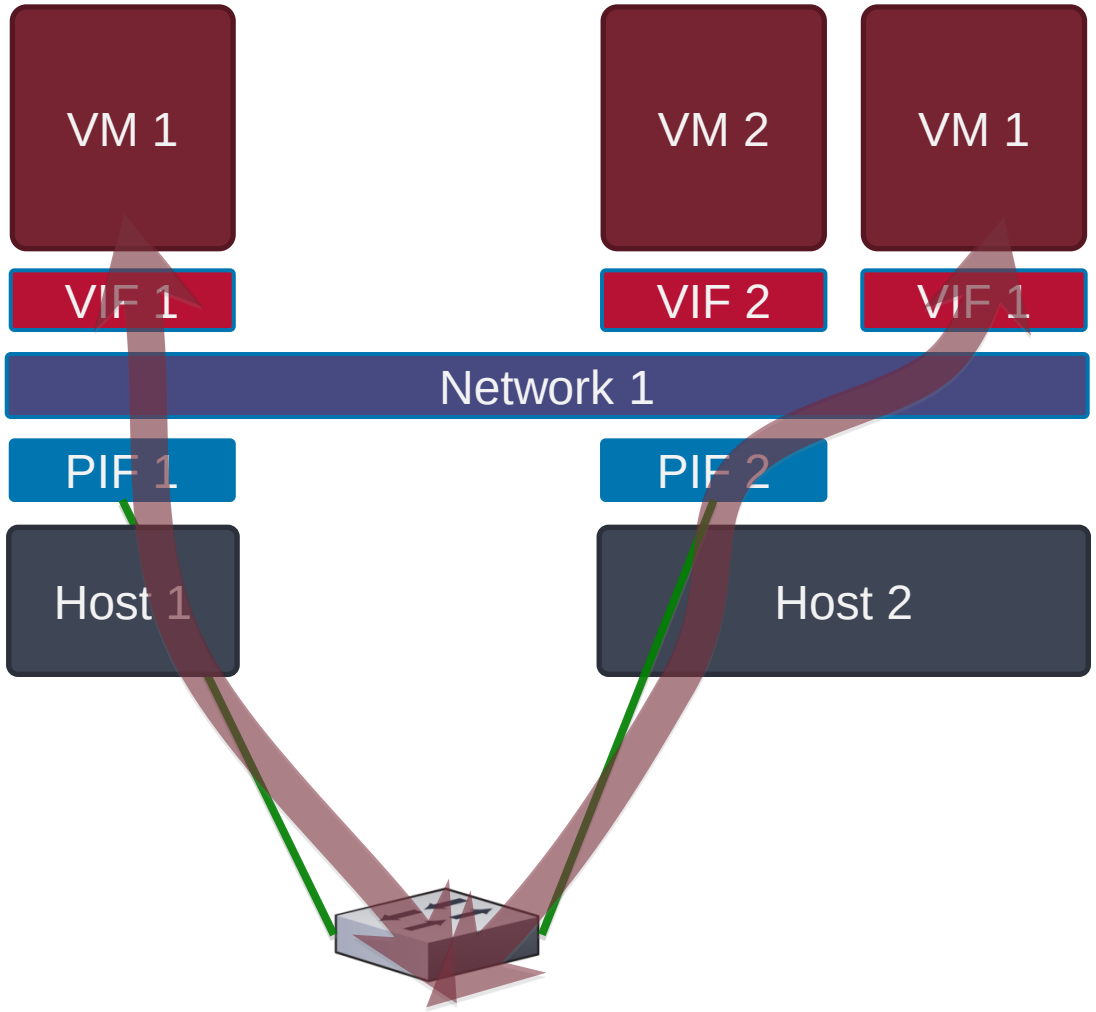
- VMs are connected to virtual interfaces
- Virtual interfaces are also connected to the Network
- PIFs connected to Network
- Each NIC has a “PIF” object
- Host is connected to 2 NICs

Networking: two hosts, not pooled



Normal IP networking rules, dependant on how PIFs are configured

Networking: two hosts, pooled



- Pooled NIC require same MTU size
- Normal IP networking rules, dependant on how PIFs are configured
- Network shared across pool

Network objects: PIF

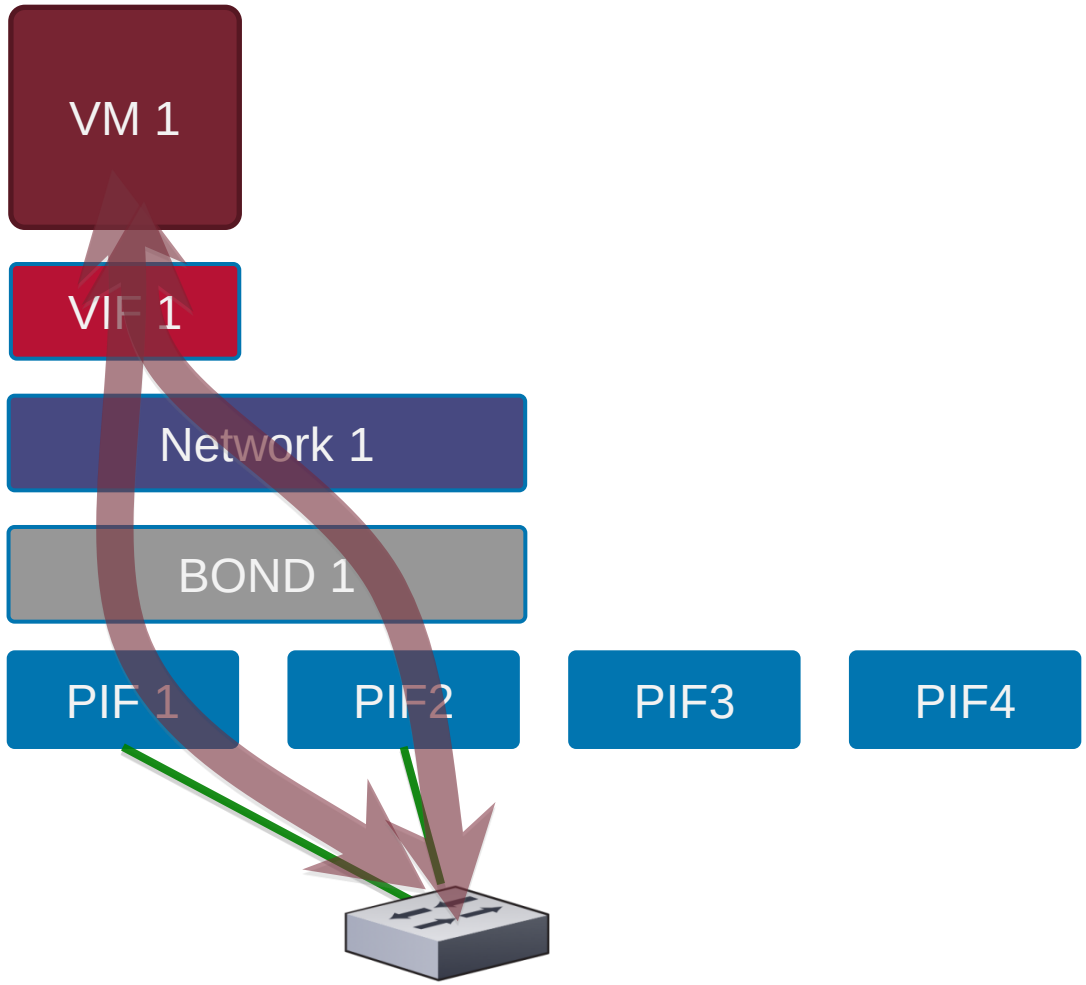
- XAPI view:
  - `xe pif-list params=all`
- Dom0 view:
  - `ifconfig`

  - eth0
  - eth0.33 (VLAN)
  - Bond0
  - __tmp56347856

Bonding

- SLB (Source Load Balancing)
- Load-balancing of VM and MGMT traffic
- Fail-over support for storage traffic
- Dynamic rebalancing (10 sec)
- Note: etherchannel or 802.3ad (LACP) not required

Bonding



Seamless failover if interface goes down

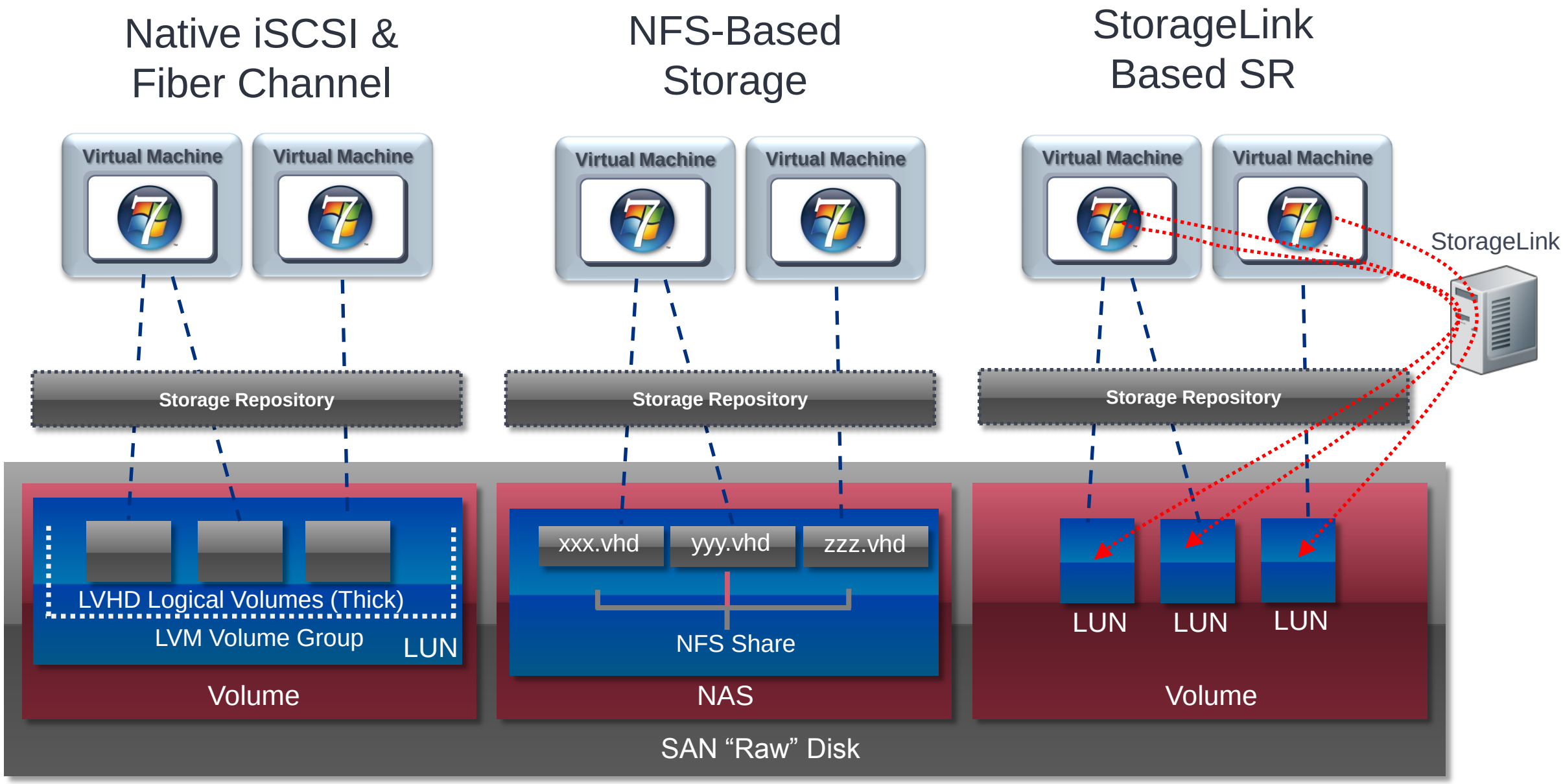
Traffic through one PIF at any one time (SLB)

Bond joins network, instead of the underlying PIF devices

PIF0/PIF1: Form a NIC bond

XenServer Storage

XenServer Disk Layouts (Shared)



LVM

- Host storage virtualized using LVM
- Volume Group named "VG_XenStorage_<UUID>"
- Common commands
  - vgs - List of volume groups
  - lvs, lvdisplay - List of logical volumes
  - pvs, pvdisplay - List of physical volumes
  - man lvm - Other commands
- Mount guest disk in dom0
  - mount /dev/VG_XenStorage_<uuid>/<VM_uuid>.<disk> /path/to/mount/point

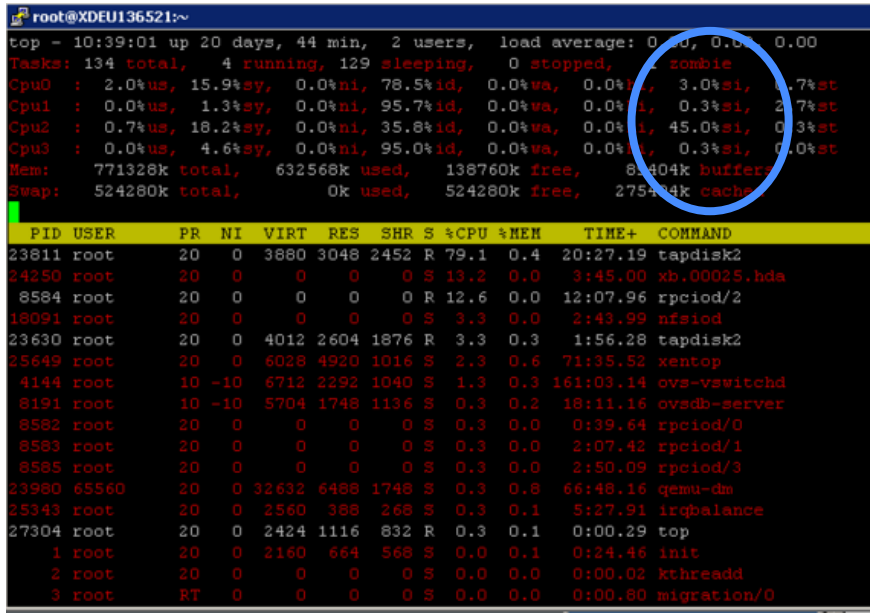
Common Issues

- Is the disk detected?
  - `fdisk -l` to show disks and partitions
- Is the module loaded?
  - `lsmod` – lists loaded modules
  - `insmod/modprobe` – inserts modules
  - `rmmod` – removes loaded modules
- Confirm device info?
  - `lspci`

Performance Analysis

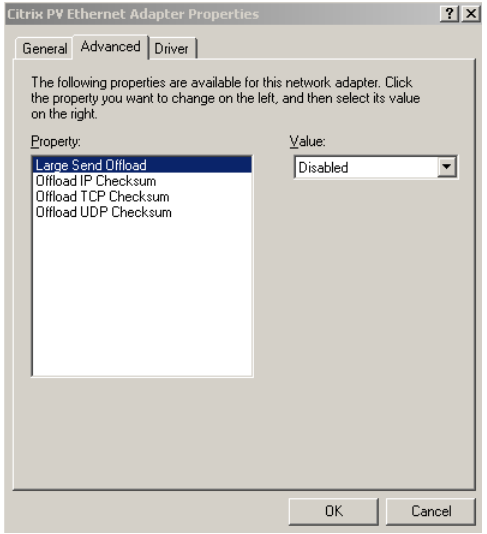
Check Network Performance

- Iperf
  - https://nocweboldcst.ucf.edu/files/iperf.exe
- Important: Use right parameters!!!!
  - e.g. Iperf ... –w 64k
- Check VM performance (Windows / Linux) + Dom-0
- Check interrupts
  - Command: top
  - Type: z
  - Type: 1
  - See interrupts as „si“



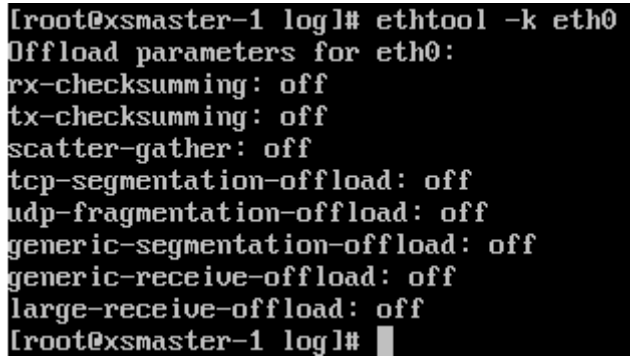
VM Networking Performance Improvement

- Task Offload is enabled by default
- Keep defaults, change when experiencing performance issues
- May require modification in specific situations
- Disable Task Offload
  - XenServer <= 5.5
    - http://support.microsoft.com/kb/888750
    - HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters DWORD DisableTaskOffload=1
  - Since XenServer 5.6 this can be done in the device properties of the network card under the „Advanced“-Tab



Server Networking Performance improvement

- Task Offload could be set on server level as well
- Check setting
  - *ethtool –k <ethernet device e.g. eth0>*
- Enabling / disabling settings during operation (non-persistent)
  - *ethtool –K <ethernet device> rx off*
  - (example, K is case sensitive!!!)
- Enabling / disabling settings during operation (persistent)
  - *xe host-list*
  - *xe pif-list host-uuid=<host-uuid von oben> device=<nic device z.B. eth4> VLAN=-1*
  - *xe pif-param-set uuid=<pif-uuid> other-config:ethtool-rx="off"*



Performance optimation NFS/iSCSI

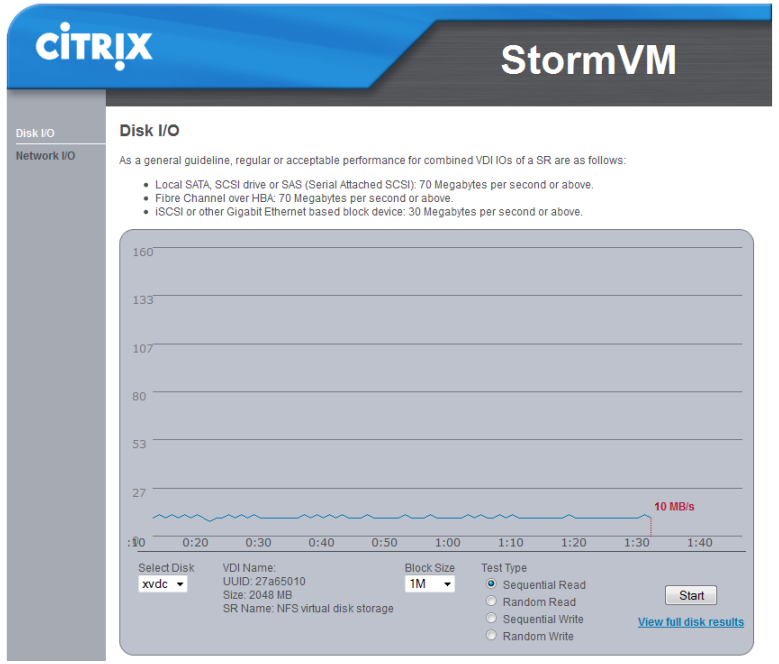
- Check large-receive-offload and enable it (ethtool –k), gain 80%
- Disable IOMMU in BIOS, gain up to 10%
- Enable JumboFrames (DVS)

Enabling IRQ Rebalancing on XS 5.6 SP2 and older

- http://blog.benpiper.com/2011/08/improving-network-throughput-in-xenserver-using-irqbalance/
- yum install irqbalance --enablerepo base
- Service irqbalance start
- Check interrupts
  - Cat /proc/interrupts
- Default in XenServer 6.0

Check storage performance

- Read performance: hdparm –t /dev/sdb (example)
- Tools like
  - IOMeter
  - Crystal Disk benchmark
- iostat –x
- XenServer performance VM
  - http://support.citrix.com/article/CTX127065



Multipath Configuration

	DMP	DMP RDAC	MPP RDAC	MPP RDAC
Default	Yes		No	No
XenServer version	>= 5.0		>= 5.0 Update 2	>=5.6 FP1
Management via XenCenter	Yes		No	No
Support	Wide range of storage	Only LSI controller based storage	Only LSI controller based storage	Only LSI controller based storage
Driver / Daemon	multipathd		mppVhba driver	mppVhba driver
CLI path check	`mpathutil status`		`mppUtil -g 0`	`mppUtil -g 0`

Configuration	`/etc/multipath-enabled.conf`	`/etc/multipath-enabled.conf` Hardware_handler „1 rdac“	`/etc/mpp.conf` (requires execution of `/opt/xensource/bin/update-initrd`)	`opt/xensource/libexec/mpp-rdac –enable`
				
				`opt/xensource/libexec/mpp-rdac –disable`

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