



# VMware Infrastructure 3

Roland Kurz – Stemmer GmbH – Niederlassung Stuttgart / Empingen





# VMware ESX 3.0 und VC 2.0



# Storage

Storage



## ESX 2.x Roadmap

- ESX 2.5.2 Patch4
  - NIC Intel 1000P Dual PCIExpress supported
- ESX 2.5.3
  - New COS based on RH AS 2.1 (Security issues solved)
- ESX 2.5.4
  - New Hardware support added (GA Q4 2006)
  - Support of LSI1068, Intel 1000P Dual, BCM 5706 / 5708
- ESX 2.5.5 (Termin offen)
  - New Hardware support added (Read of vmfs 3 ???)
- VC 1.3.1 Patch 1
  - DualCore Processes are showed correctly
  - Cold Migration of VM with more then one disk on different LUN solved



## Storage

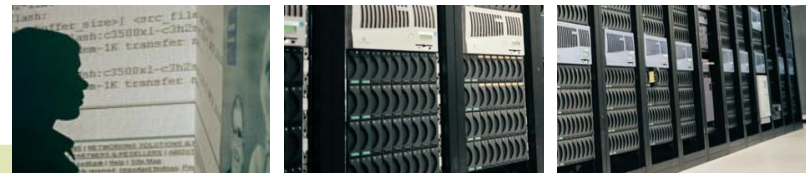
Storage



### ESX 3.0 – VC 2.0 Überblick (1)

- much better Performance – VM boot faster – less load when booting VM
- NEW COS OS RH ES 3.0 – COS is now a VM
- The vmkernel owns all HW – no sharing with COS (COS is a VM)
- No direct support of Intel VT and AMD Pacifica\*
- Support von 64Bit Guest OS in einer VM, 4 CPU vSMP, 16GB RAM
- Support von NAS (NFS) und iSCSI
- Clusters (HA, DRS)
- Backupfeatures mit Consolidated Backup (CB)
- License Server – License model

\*planned in next version – additional performance gain



## Storage



### ESX 3.0 – VC 2.0 Überblick (2)

- Locked W2K and W2K3 Systems are now also stopped during ESX shutdown
- RDM supported when ESX boots from SAN
- VM Tools mass upgrade possible over “cmdline” from VC Server
- One VI Client for ESX and VC (no Web MUI)  
WebCenter for heterogeneous Admin over Browser (limited function)
- No double registered VM in VC
- All config relevant files are at the same place as the .vmdk file
- Support of more then one SnapShot (Snap of Memory selectable)
- Hot-Add of LAN-Adapters and SCSI Disk Resources  
Support in Guest OS required



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## Requirements VI3 ESX-Host

- Prozessor:           max. 16 SingleCore mit HT  
                          max. 8 DualCore mit HT  
                          max. 16 DualCore **ohne** HT  
                          max. 128 virtuelle Prozessoren
- RAM:                 64GB RAM
- Adapters:           max. 64 Adapter aller Typen inkl. HBA und NIC  
                          max. 16 HBA's mit max. 15 Targets pro HBA  
                          max. 20 GB oder 10/100 Ethernet-**Ports**  
                          max. 1024 Ports pro virtuellem Switch
- Storage:            max. 128 VMFS-Volumes a 2TB



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## Requirements VM

Virtual Prozessor: max. 4 CPU Intel Pentium II and later. (dependent on System Processor)

Virtual Chip Set: Intel 440BX-based Motherboard with NS338 SIO Chip

Virtual BIOS PhoenixBIOS™ 4.0 Release 6

VM Memory: max. 16GB (WinNT max. 3,45GB)

Virtual Adapters: max. 6x virtual PCI-Slots

Virtual NIC: max. 4x GBE

Virtual FDD: max. 2x 1,44MB FDD's

Virtual CD: max. 4x CD-LW's

Legacy Devices: max. 4x serielle Ports

max. 3x parallele Ports

Achtung: Swap ist jetzt nicht mehr Common sondern pro VM!!! Bitte Beachten beim LUN-Sizing!!! Swapgrösse = vRAM-Grösse



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### Release Notes VI 3.01 (GA 03. October 2006)

- Support for selected 64-bit guest operating systems.
- Support for servers based on the AMD 2000/8000 series processors and Intel Xeon 7100 (codename Tulsa) series of processors.
- A self-certification program for iSCSI arrays.
- Support for iSCSI arrays such as EqualLogic PS300 and NetApp FAS3000.
- Addition of German and Japanese product versions.
- Critical bug fixes related to ESX Server 3.0 and VirtualCenter 2.0.
- Experimental support for iSCSI 4050/4052 HBA from Qlogic.
- Improved upgrade support from Virtual Infrastructure 2 to VMware Infrastructure 3.
- Support for Symmetric Multiprocessing (SMP) on Windows XP virtual machines

[http://www.vmware.com/products/beta/esx-vc/vi301/releasenotes\\_vi3.html](http://www.vmware.com/products/beta/esx-vc/vi301/releasenotes_vi3.html)



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## ESX 3 Produkte (Lizenz pro 2 Socket)

	Starter	Standard	Enterprise
<b>ESX Server 3</b>	<p>X</p> <ul style="list-style-type: none"> <li>■ NAS or local storage</li> <li>■ Limited to servers with               <ul style="list-style-type: none"> <li>■ up to 4PCPU</li> <li>■ up to 8GB physical memory</li> </ul> </li> </ul>	X	X
<b>VC Agent</b>	X	X	X
<b>VMFS</b>		X	X
<b>VSMP</b>		X	X
<b>VMotion</b>			X
<b>HA</b>			X
<b>DRS</b>			X
<b>Consolidated Backup</b>			X
<b>Target Market</b>	SMB / Branch offices / Depts		
			“Dynamic Datacenter”



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## Virtual Infrastructure (VI) Produkte

Name	Lizenz
VMware VirtualCenter Management Server	Per Server
VMware VMotion	
VMware HA	Per 2 Sockets
VMware DRS	
VMware Consolidated Backup	



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## License Server

- License Server
  - FlexLM for Managed license
  - like Citrix Presentation Manager – same Server can be used
- Unmanaged License as alternative to Managed License with FelxLM



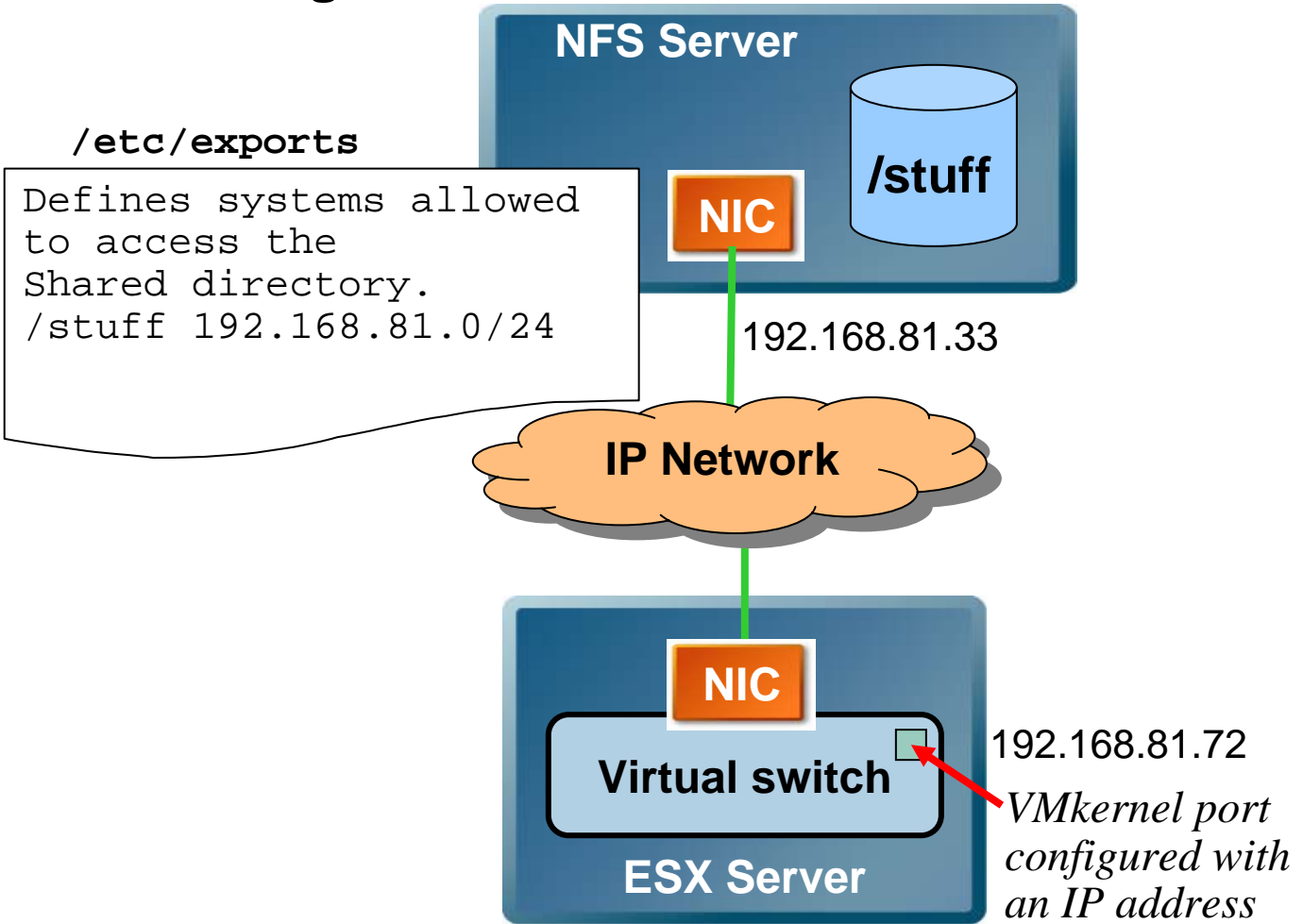
# Storage-Anbindungen



# Storage



## Anbindung über NFS



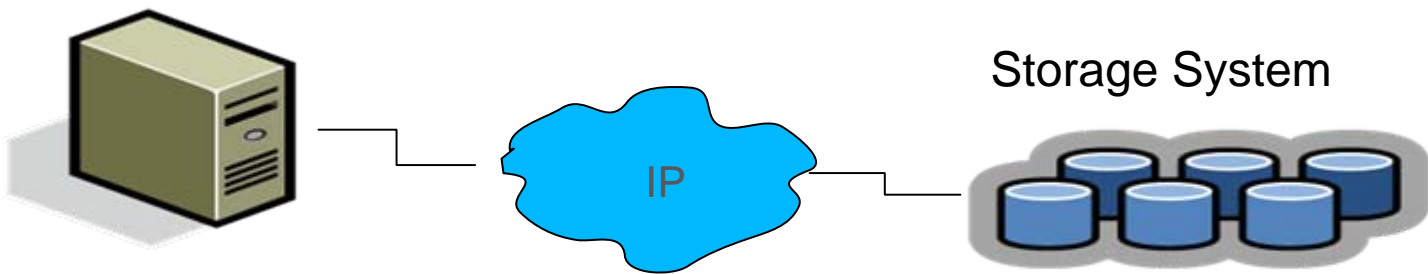


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## Anbindung über iSCSI

- A SCSI transport protocol, enabling access to storage devices over standard TCP/IP networks
  - Maps SCSI block-oriented storage over TCP/IP
  - Similar to mapping SCSI over Fibre Channel



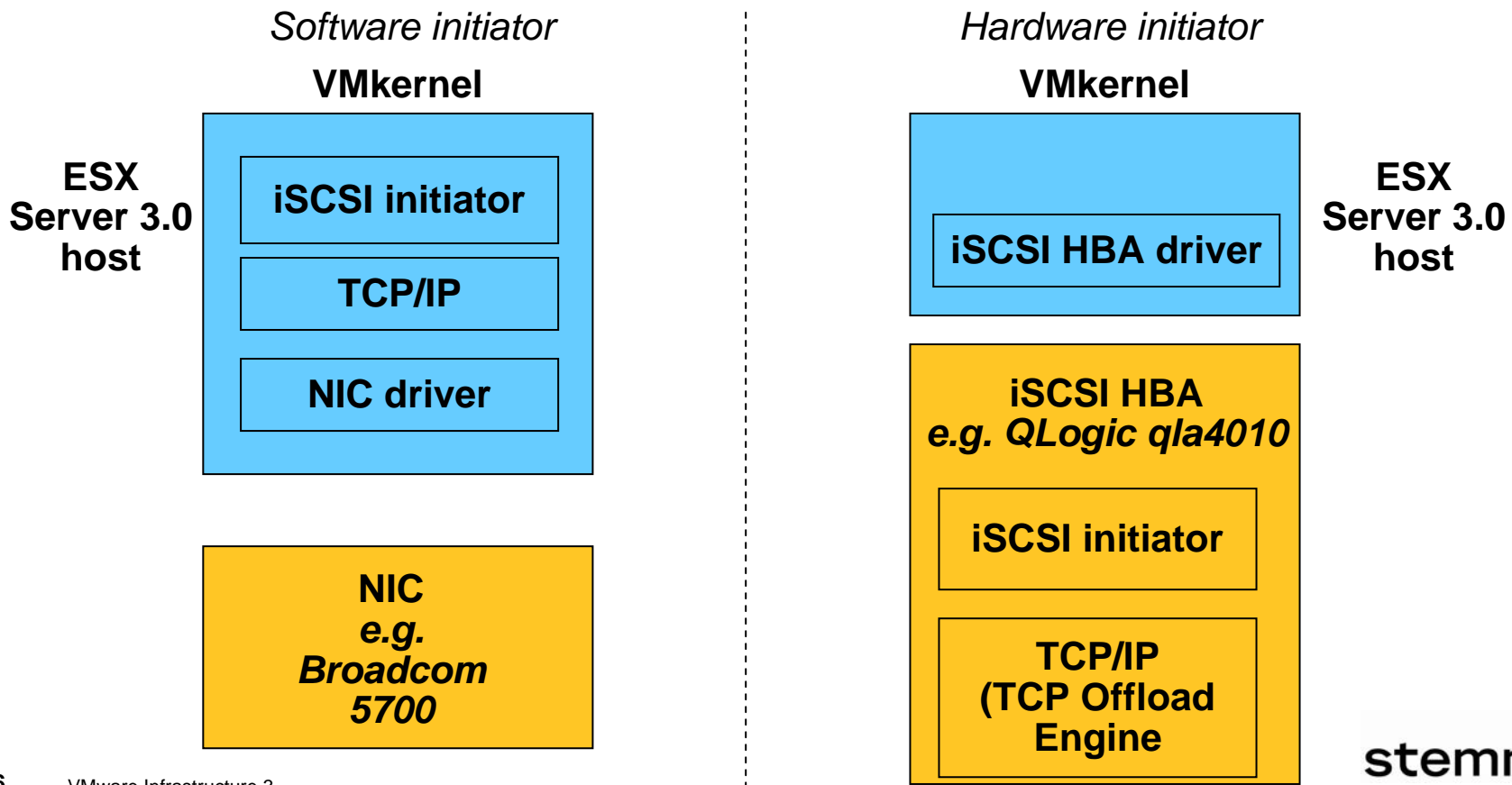


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## iSCSI Connectivity

- ESX Server supports both software and hardware initiators





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## Software initiator vs. Hardware initiator

### ■ Software initiator

- Use existing NICs
- Use native vmkernel stack
- Used when performance IS NOT an issue, as server and application performance can degrade significantly!
- Used when cost IS an issue
- Used when no PCI slots are available
- Used for simple connectivity to storage or tape backup

### ■ iSCSI storage adapters (hardware initiator)

- Uses less ESX Server resources, especially CPU
- Initially supported adapter-Qlogic qla4010



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## Verwendung von iSCSI

- Boot ESX Server from iSCSI storage
  - Using hardware initiator only
- Create a VMFS on iSCSI LUN
  - To hold VM State, ISO images, and templates
- Allows VM access to a raw iSCSI LUN
- Allows VMotion migration of a VM whose disk resides on iSCSI LUN



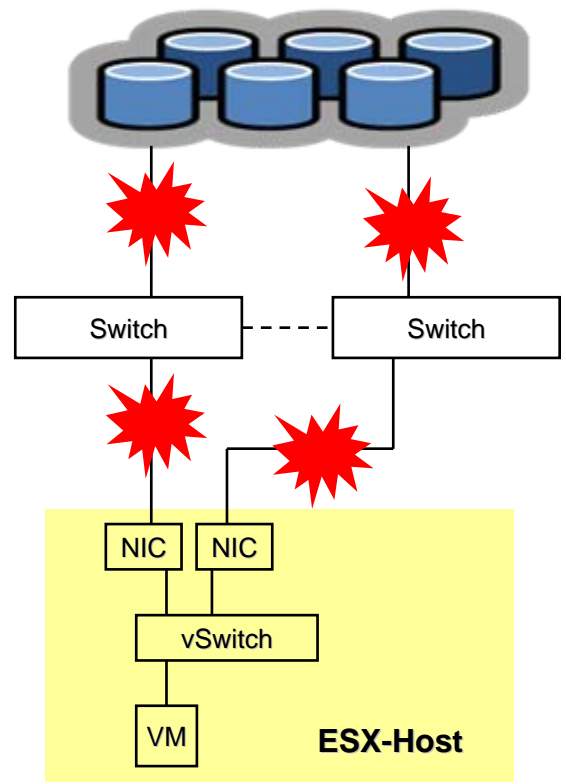
# Storage

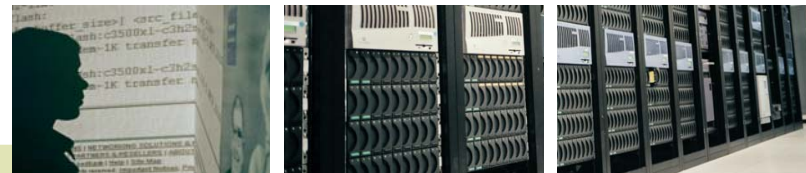


## Pfadredundanz bei iSCSI

- Redundanz in ESX Konfigurierbar
  - Beide NIC's aktiv
  - Aktiver NIC und Passiver NIC
- Redundanz über Ethernetswitch
  - z.B. Port Channeling bei Cisco
- Bei Ausfall eines Pfades sind im Betrieb keine Umschaltzeiten spürbar. Vergleich zu FibreChannel: Umschaltzeiten bis zu 60s je nach Stagesystem

### Storage System





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## Unterstützte StorageSysteme für iSCSI

### Network Appliance

- FAS 200 series (250, 270) Data ONTAP 7.x current
- FAS 900 series (920, 940, 960, 980) Data ONTAP 6.5.3 p4
- FAS 3000 Serie Data ONTAP 7.x current

### EMC

- Celerra/NS700/500

### Fujitsu Siemens

- AX100i
- CX300i
- CX500i



# Fibre Channel vs. iSCSI vs. NAS



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## Vergleich FibreChannel vs. iSCSI vs. NAS (NFS) (1)

<i>Technology</i>	<i>Protocols</i>	<i>Transfers</i>	<i>Interface</i>	<i>Performance</i>
Fibre Channel	FC/SCSI	Block access of data/LUN	FC HBA	High (due to dedicated network)
iSCSI	IP/SCSI	Block access of data/LUN	iSCSI HBA or NIC	Medium (depends on integrity of LAN)
NAS	IP/NFS	File (no direct LUN access)	NIC and IP switches	Medium (depends on integrity of LAN)

**For best performance and security, consider putting iSCSI and NAS on separate and isolated IP network!**



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## Vergleich FibreChannel vs. iSCSI vs. NAS (NFS) (2)

<i>Technology</i>	<i>Boot VM</i>	<i>Boot ESX Server</i>
<b>Fibre Channel</b>	<b>Yes</b>	<b>Yes</b>
<b>iSCSI</b>	<b>Yes</b>	<b>Yes</b>
<b>NAS</b>	<b>Yes</b>	<b>No</b>



## Vergleich FibreChannel vs. iSCSI vs. NAS (NFS) (3)

<i>Technology</i>	<i>Clustering</i>	<i>Raw Disk</i>	<i>RDM</i>
<b>Fibre Channel</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>iSCSI</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
<b>NAS</b>	<b>No</b>	<b>No</b>	<b>No</b>



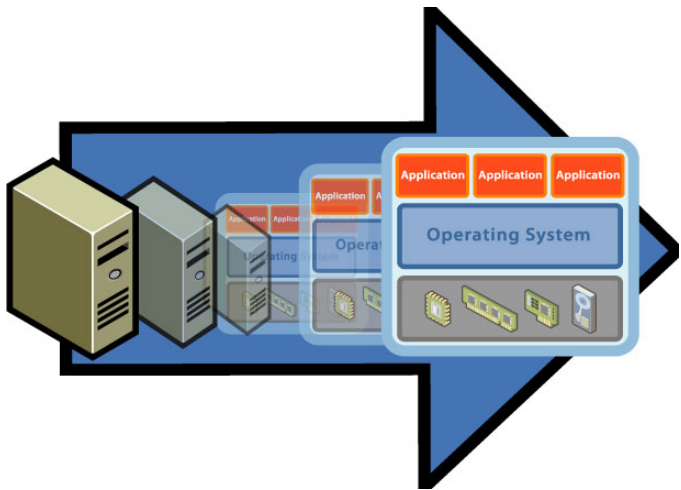
# Funktionalität VC 2



# Storage



## Funktionalität von VC



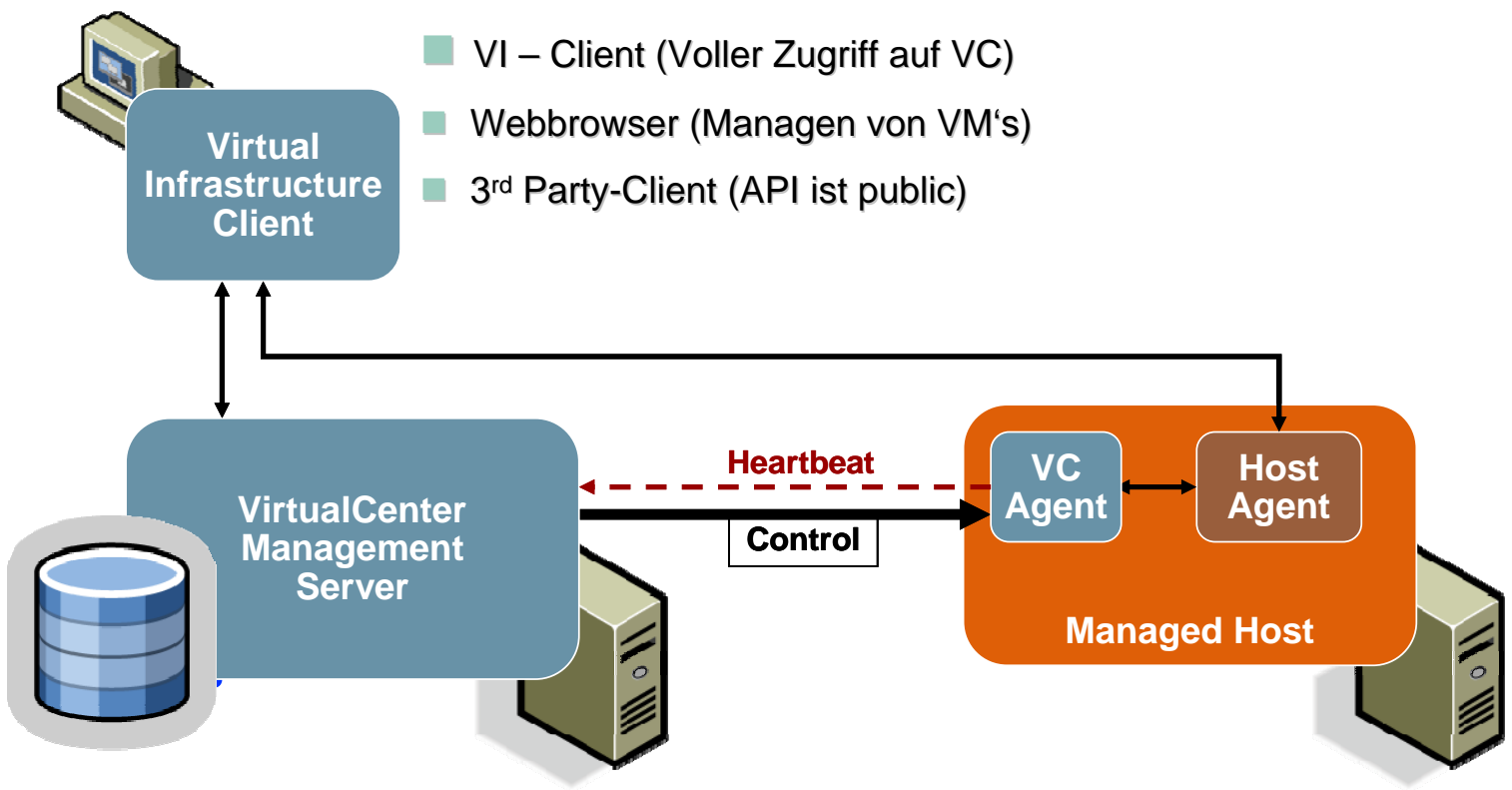
- Virtualization everywhere
  - Extensions for cost-sensitive environments
  - Bigger, higher-performance VMs
  - Expanded guest OS support
- Enterprise manageability
  - Simplified management
  - Enterprise scalability and security
- New services in distributed virtualization layer
  - DRS and resource pools
  - VMware HA
  - Consolidated backup



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## Client für Zugriff auf ESX-Host und VC



- VI – Client (Voller Zugriff auf VC)
- Webbrowser (Managen von VM's)
- 3rd Party-Client (API ist public)



# Storage



## Screenshot der Inventory-Ansichten

**10.17.25.45 - Virtual Infrastructure Client**

File Edit View Inventory Administration Help

Scheduled Tasks Events Admi

Hosts & Clusters

- New Datacenter
  - vCluster
    - pmstaff-esx1.eng.vmware.com
    - pmstaff-esx2.eng.vmware.com
    - PMstaff
      - rh9-bus\_2
      - rh9-bus\_3
      - rh9-lsi\_2
      - rh9-lsi\_3
      - w2kas-busC
      - w2kent-busB
      - w2kent-busC
      - w2kent-busD
    - VI-PM
      - Production VMs
        - new name
        - PMwiki
        - Sugar (win2k3)
        - Twiki4
        - VirtualCenter Server (Win2k3)
        - VM Importer 2.0 Sandbox (Win2k3)
        - w2k3ent-lsi
      - Test - Dev VMs
        - pmstaff-esx1-rh9-lsi
        - w2kas-bus
        - w2kas-busB
        - w2kent-busA

Callouts: Datacenter, Cluster, Stand-alone Host, Resource Pool

**10.17.25.45 - Virtual Infrastructure Client**

File Edit View Inventory Administration Help

Inventory Scheduled Tasks Events Adr

Virtual Machines & Templat

- New Datacenter
  - new Datacenter
    - pmstaff-esx1-rh9-lsi
    - PMwiki
    - rh9-bus\_2
    - rh9-bus\_3
    - rh9-lsi\_2
    - rh9-lsi\_3
    - Sugar (win2k3)
    - Twiki4
    - VirtualCenter Server (Win2k3)
    - VM clone
    - VM Importer 2.0 Sandbox (Win2k3)
    - w2k3ent-lsi
    - w2kas-bus
    - w2kas-busB
    - w2kas-busC
    - w2kent-busA
    - w2kent-busB
    - w2kent-busC
    - w2kent-busD

Callouts: Virtual Machine, Template

**No templates in hosts & clusters view**



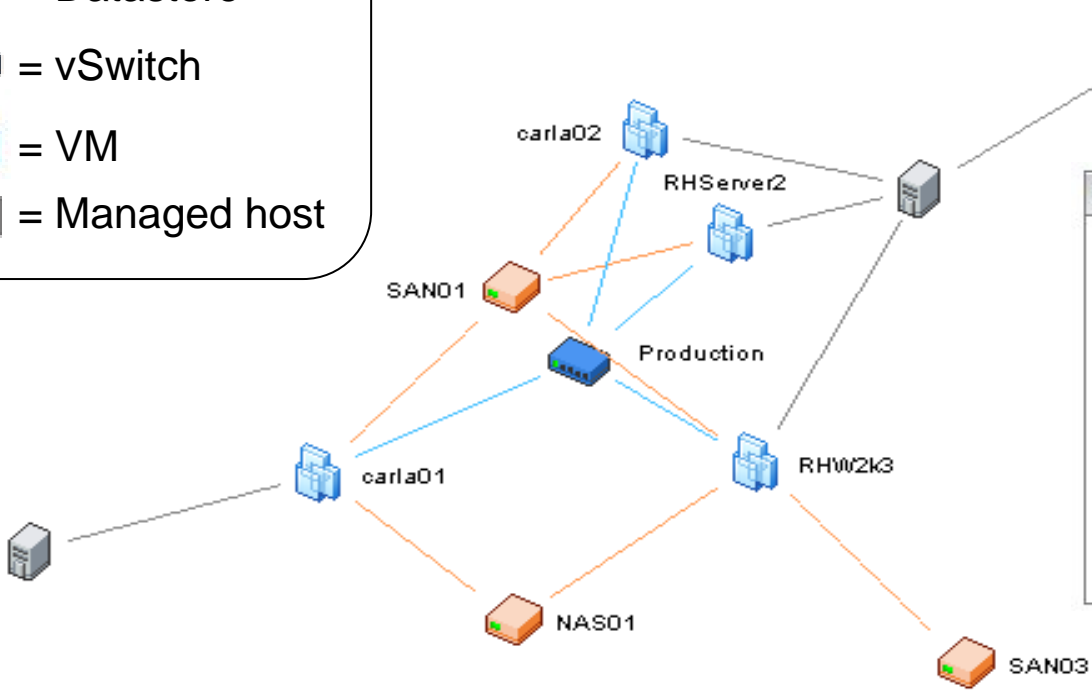
# Storage



## VI Übersichtskarte

**Legende**

- = Datastore
- = vSwitch
- = VM
- = Managed host



**Map Relationships:**

**Virtual Machine Resources** ▾

Host Options

- Host To VM
- Host To Network
- Host To Datastore

VM Options

- VM to Network
- VM to Datastore

**Apply Relationships**

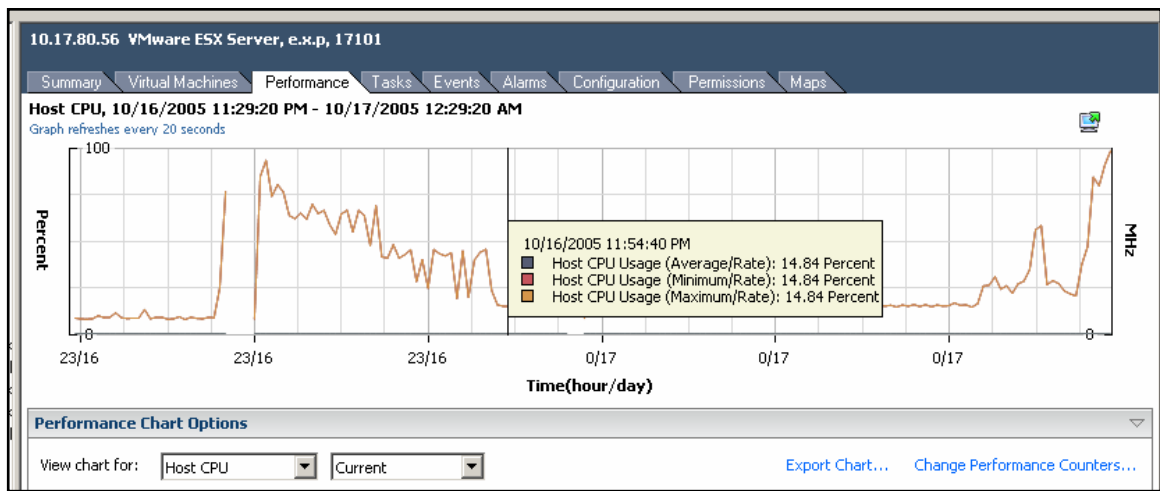


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## Performance Charts

- Redesigned to include more data, allow customization
  - Subsumes details previously only in tools such as vmkusage and esxtop
  - Objects in the inventory and their metrics can be selected for display
- Several levels of granularity & time-intervals
  - Real-time statistics at a 20-second sampling rate
  - Archived statistics for the past hour, day, month, etc.
  - OR for a specific time interval specified
- Full exportable to Excel or HTML format





# Storage



## Optionen für das Performancechart

### CPU

Description	Units
<input checked="" type="checkbox"/> CPU Usage (Average/Rate)	Percent
<input type="checkbox"/> CPU Usage in MHz (Average/Rate)	MHz
<input type="checkbox"/> CPU Guaranteed	Millisecond
<input type="checkbox"/> CPU Extra	Millisecond
<input type="checkbox"/> CPU Ready	Millisecond
<input type="checkbox"/> CPU System	Millisecond
<input type="checkbox"/> CPU Wait	Millisecond

### Network

Description	Units
<input checked="" type="checkbox"/> Network Usage (Average/Rate)	KBps
<input checked="" type="checkbox"/> Network Data Transmit Rate	KBps
<input type="checkbox"/> Network Packets Transmitted	Number
<input type="checkbox"/> Network Packets Received	Number
<input checked="" type="checkbox"/> Network Data Receive Rate	KBps

### Disk

Description	Units
<input checked="" type="checkbox"/> Disk Read Rate	KBps
<input checked="" type="checkbox"/> Disk Write Rate	KBps
<input checked="" type="checkbox"/> Disk Usage (Average/Rate)	KBps
<input type="checkbox"/> Disk Write Requests	Number
<input type="checkbox"/> Disk Read Requests	Number

### CPU for Resource Pool

Description	Units
<input type="checkbox"/> CPU Throttled (15 min. average)	Percent
<input type="checkbox"/> CPU Running (1 min. peak)	Percent
<input type="checkbox"/> CPU Running (5 min. peak)	Percent
<input type="checkbox"/> CPU Throttled (1 min. average)	Percent
<input type="checkbox"/> CPU Active (15 min. peak)	Percent
<input type="checkbox"/> CPU Throttled (5 min. average)	Percent
<input type="checkbox"/> CPU Running (15 min. average)	Percent
<input type="checkbox"/> Group CPU Sample Count	Number
<input type="checkbox"/> CPU Active (1 min. peak)	Percent
<input type="checkbox"/> CPU Running (1 min. average)	Percent
<input checked="" type="checkbox"/> CPU Active (5 min. peak)	Percent
<input checked="" type="checkbox"/> CPU Running (5 min. average)	Percent
<input type="checkbox"/> CPU Running (15 min. peak)	Percent
<input type="checkbox"/> Group CPU Sample Period	Millisecond
<input type="checkbox"/> CPU Active (1 min. average)	Percent
<input checked="" type="checkbox"/> CPU Active (5 min. average)	Percent
<input type="checkbox"/> CPU Active (15 min. average)	Percent

### Memory

Description	Units
<input type="checkbox"/> Memory Swap In (Average/Absolute)	KB
<input type="checkbox"/> Memory Balloon Target (Average/Absolute)	KB
<input checked="" type="checkbox"/> Memory Balloon (Average/Absolute)	KB
<input type="checkbox"/> Memory Swap Out (Average/Absolute)	KB
<input type="checkbox"/> Memory Usage (Average/Absolute)	Percent
<input type="checkbox"/> Memory Overhead (Average/Absolute)	KB
<input type="checkbox"/> Memory Zero (Average/Absolute)	KB
<input checked="" type="checkbox"/> Memory Active (Average/Absolute)	KB
<input type="checkbox"/> Memory Shared (Average/Absolute)	KB
<input checked="" type="checkbox"/> Memory Granted (Average/Absolute)	KB
<input type="checkbox"/> Memory Swap Target (Average/Absolute)	KB
<input type="checkbox"/> Memory Swapped (Average/Absolute)	KB

### System

Description	Units
<input type="checkbox"/> Heartbeat	Number
<input checked="" type="checkbox"/> Uptime	Second





# Storage



## VC2-Server als Lizenz-Server für die VI

10.17.25.45 - Virtual Infrastructure Client

File Edit View Inventory Administration Help

Inventory Scheduled Tasks Events Admin Maps

Roles Sessions Licenses System Logs

VirtualCenter License Source: 27000@license-1.eng.vmware.com [Host Configuration...](#)

License Feature	Cost	Remaining	Total
VirtualCenter 2.0	1/Server	652	750
ESXHOST_base	1/CPU Package	1200	1200
ESXHOST_capacity	1/Server	1196	1200
VMOTION_base	1/CPU Package	1200	1200
VMOTION_capacity	1/Server	1196	1200
DAS_base	1/CPU Package	1200	1200
DAS_capacity	1/Server	1200	1200
DRS_base	1/CPU Package	1200	1200
DRS_capacity	1/Server	1200	1200
VirtualCenter ESX Server m...	1/CPU Package	9258	10000
VMotion	1/CPU Package	836	1200
VirtualCenter HA	1/CPU Package	1144	1200
VirtualCenter DRS	1/CPU Package	1060	1200
VirtualCenter GSX Server m...	1/Server	1200	1200
ESX Server 3.0 Enterprise	1/Server	8632	10000
Up to 4-way virtual SMP	1/CPU Package	8684	10000
ESX Consolidated Backup	1/CPU Package	8694	10000
ESX Server 3.0 Standard	1/Server	1200	1200

Name

- pmstaff-esx1.eng.vmware.com
- pmstaff-esx2.eng.vmware.com

Host Edition: ESX Server 3.0 Enterprise

iSCSI Usage  
NAS Usage  
SAN Usage

VirtualCenter ESX Server management Licensed for 2 CPUs  
 VMotion Not Used  
 VirtualCenter DRS Licensed for 2 CPUs  
 VirtualCenter HA Licensed for 2 CPUs  
 Up to 4-way virtual SMP Licensed for 2 CPUs  
 ESX Consolidated Backup Licensed for 2 CPUs

Recent Tasks

Name	Target	Status	Reason	Time
Generate Diagnostic Bundles		33%	Administrator	4/22/2006 2:20:44 PM

Tasks 1 Alarms



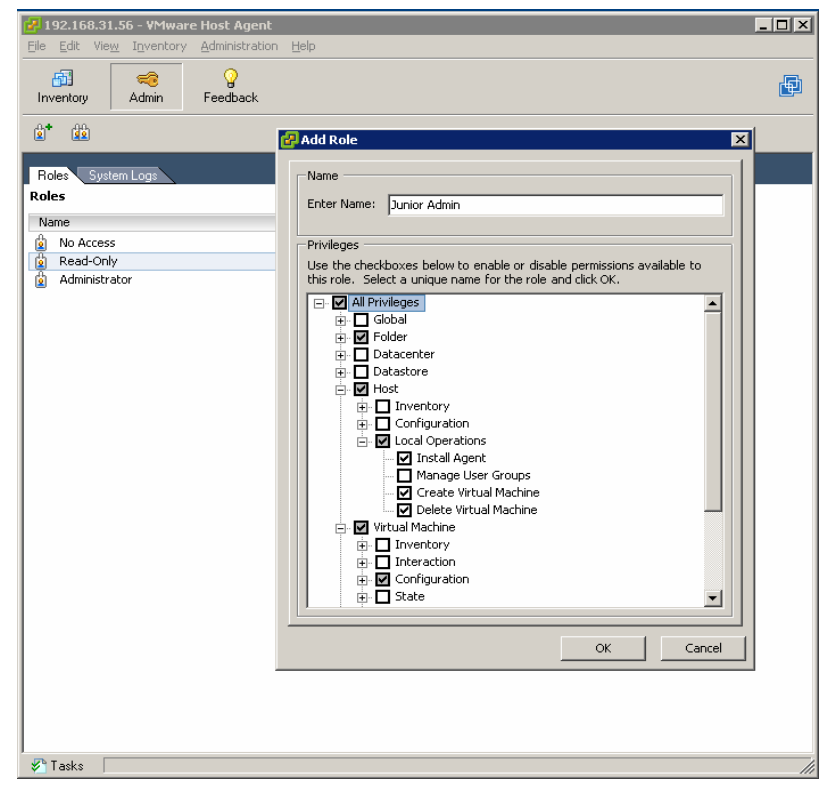


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## User-Rollen

- Fest definierte Rollen (Nicht Änderbar)
  - No Access
  - Read – Only
  - Administrator
- Eigene Rollen (Frei definierbar)
  - z.B. Administrator für Nachtbetrieb
- User bezogene Rollen (Default-Privilegien die angepasst werden können)
  - VM Administrator
  - Datacenter Administrator
  - VM Provider
  - VM Power User
  - VM User
  - Resource Administrator





# Resource Pools (DRS)

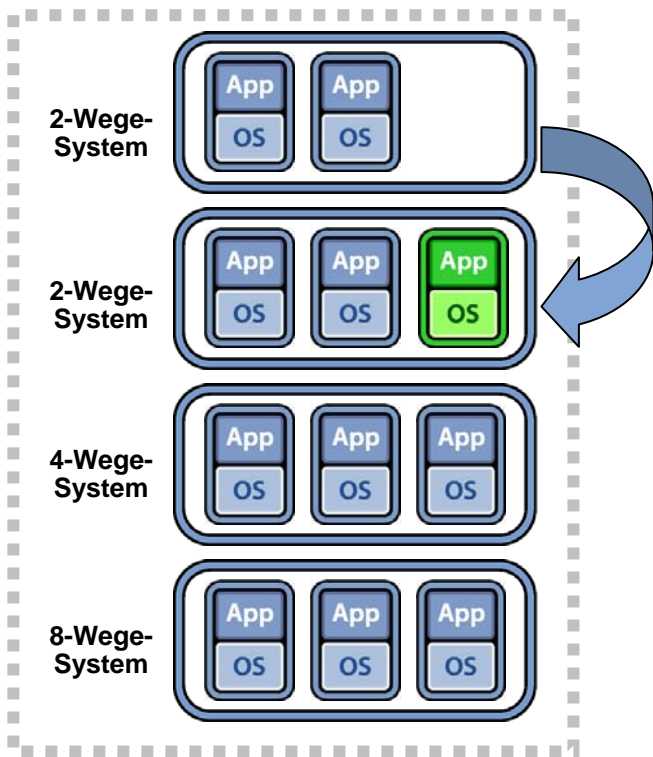


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## Dynamische Ressourcenzuweisung (DRS)

### Server-Farm



- Erlaubt manuelle oder automatisches Resourcebalancing in einem DataCenter
  - Optimiert Load-balance über ESX-Hosts.
  - Entscheidet ob, wann und wohin migriert wird.
  - Reagiert auf dynamische Laständerungen
- Als VirtualCenter-Zusatzmodul verfügbar (Lizenz)
- Einflussnehmende Core-Technologien
  - VMotion
  - Dynamic Resource Management
- Erlaubt Cluster weites Resource Management
  - Arbeitet über eine Gruppe von Hosts, wird als Cluster bezeichnet.



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## Wo kann DRS helfen

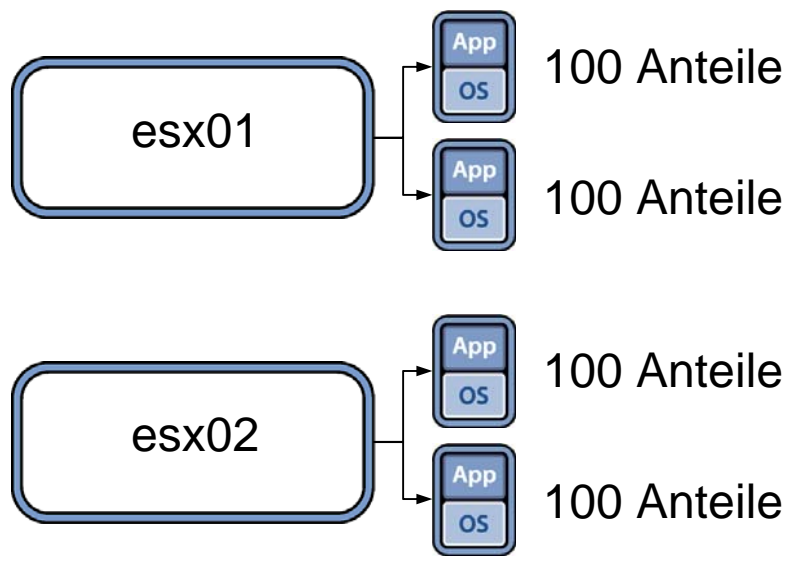
- DRS managed variable Last
  - Workloads sind oft dynamisch, Zeitabhängig
  - Schnell ändernde Last Bedarfsabhängig
- DRS erlaubt die Administration von vielen VM's
  - Hirarchische Organistation
  - Delegierte Administration
- DRS hilft bei der Umsetzung von Utility Computing
  - Abkehr von individuellen Hosts
  - Hinwendung zu kummulierten Ressourcen Pools (Cluster)



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## Ressourcen-Zuteilung heute



Hochflexible Ressourcen-Zuteilung für End-User-Management

Second-Level-Administratoren und Power-Users müssen Zugriff auf den gesamten ESX-Server haben, um neue virtuelle Rechner zu versorgen

Individuelle ESX-Server sind die Bausteine für die Ressourcenverwaltung

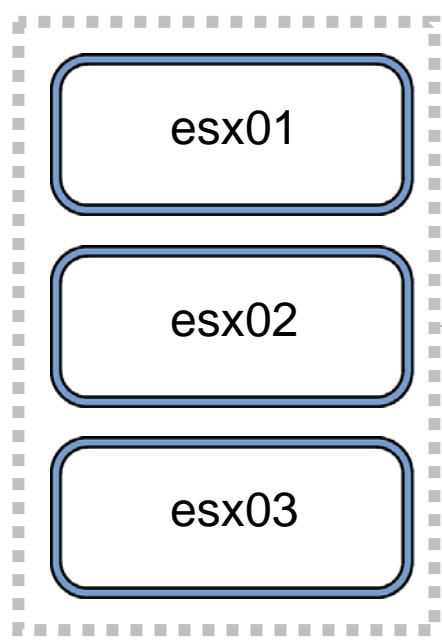


# Storage

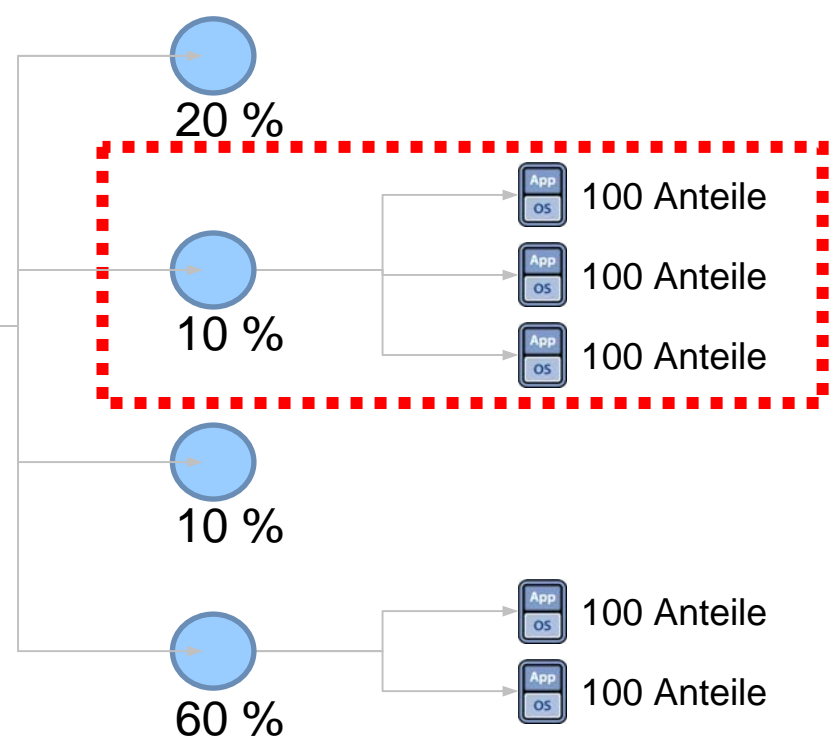


## DRS-Ressourcen-Zuteilung

### Server-Farm



### Ressourcengruppen\*



\*Ressourcengruppen werden über Anteile definiert



# Hochverfügbarkeit (HA)

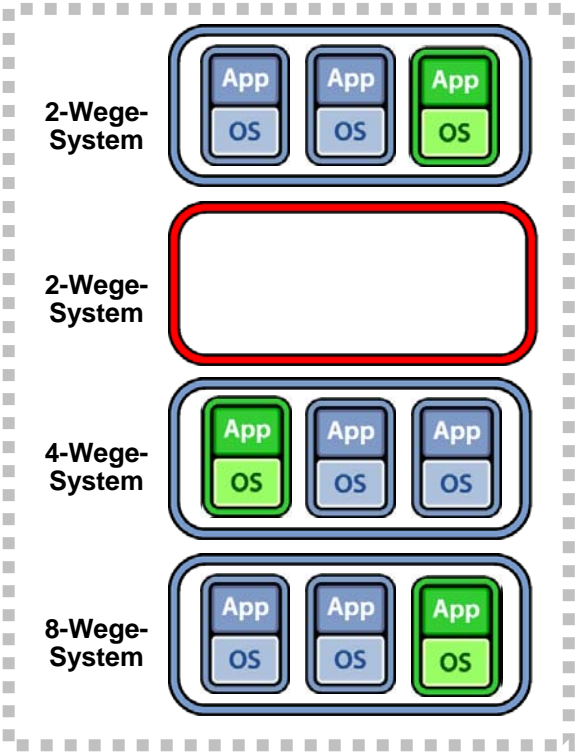


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## Dynamischer Verfügbarkeitservice (HA)

### Server-Farm



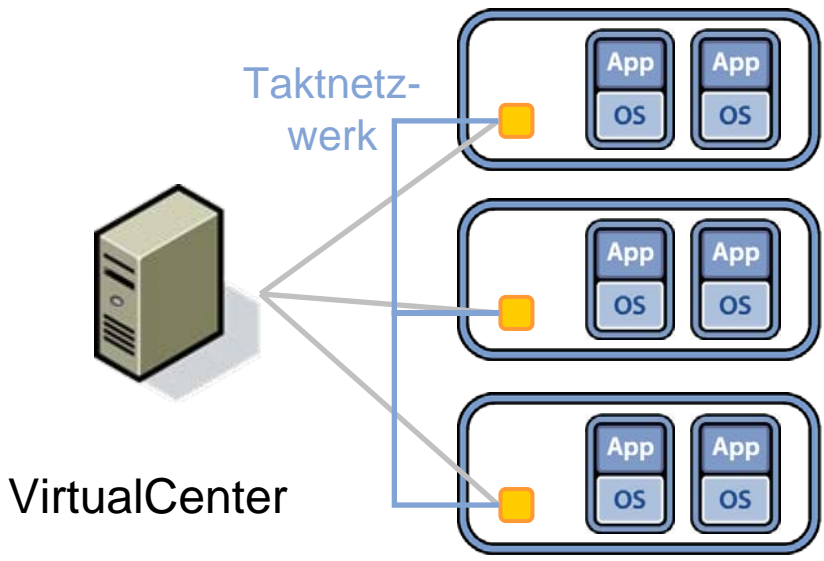
- Entdecken von Hardware-Ausfällen und Ausfällen von virtuellen Rechnern
  - Automatischer Neustart von ausgewählten virtuellen Rechnern
  - Intelligente Zuweisung mit DRS
  - Erfordert geteilten Speicher
- Eingebaute Alternative zu Clustering (für ausgewählte Anwendungen)
- Als VirtualCenter-Zusatzmodul erhältlich



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## HA: Konfigurierung



- Agenten auf ESX-Servern halten Taktnetzwerk aufrecht**
- Automatische Installation und Konfigurierung über VirtualCenter**
- Nach anfänglicher Konfigurierung unabhängig von VirtualCenter**
- Verwendung von DRS-Algorithmen zur Ermittlung von optimaler Zuweisung**



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### Integration von HA mit VC und DRS

- HA und VirtualCenter
  - Ausschalten einer VM wird nicht als Fehler gewertet
  - Ausgeschaltete und entsprechend Markierte VM's werden nicht mit Failover behandelt
  - HA ist in der Lage eine VM zu restarten auf dem ursprünglichen Host, einem definierten Zielhost oder einem anderen verfügbaren Host (wenn beide Hosts wegfallen).
- HA und DRS
  - HA erste Priorität ist das Restarten von fehlerhaften VM's
  - DRS korrigiert nicht optimale Auslastungen (Priorität hat das Loadbalancing über Cluster)

**DRS + HA = proactive + reactive solution**



# Consolidated Backup (VCB)

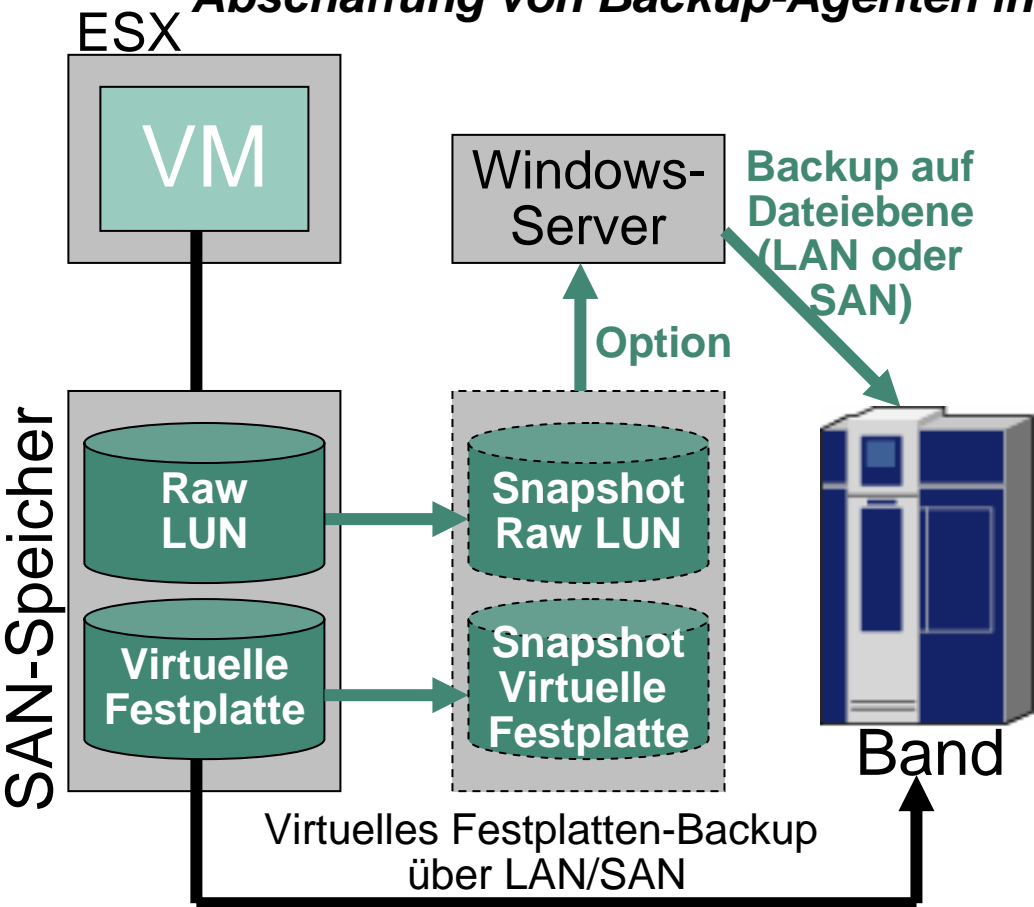


# Storage



## Konsolidiertes Backup

**Abschaffung von Backup-Agenten in allen VM; Vereinfachung von Backup**



### VSnap

- Für gesamtes Dateisystem einheitlicher Online-Snapshot von virtuellem Laufwerk
- Fähigkeit zu inkrementellen Snapshots
- „Virtuelles LUN-Masking“ auf physischem Server für Backup auf Dateiebene
- Verwendung von vorhandenen Backup-Produkten für Verwaltung von Backup auf Dateiebene
- Entfernung von Backup-Last von Produktionsserver



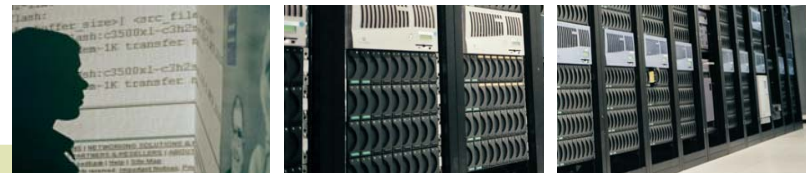
# Storage

Storage



## Funktionsablauf Backup

- Backup-Proxy
  - Backupsoftware stösst Backup an (Scheduler oder Manuell)
  - VCB Integrationmodul startet Prebackup-Script
  - VCB veranlasst die hostd des ESX-Hosts die betreffende VM zu stoppen
- ESX-Host
  - Hostd veranlasst die VM-Tools das Filesystem der VM zu stoppen
  - Hostd snapshotet die Disks (vmdk und Raw) der betreffenden VM
  - VM-Tools gibt das Filesystem wieder frei
- Backup-Proxy
  - VCB-Framework mounted den Snapshot (Virtualdisk)
  - Backupsoftware führt das Backup der ausgewählten Files durch
  - VCB startet das Post Backupsript



# Storage

Storage



## Restore

- Centralized Restore
  - Backupagent ist nur auf dem Backup-Proxy
  - Restore vom Backupstore auf den Backup-Proxy
  - Copy der Files über CIFS-Share zur VM
- Per Group Restore
  - Backupagent auf einer VM pro Backupgruppe
  - Restore vom Backupstore zur VM mit Backupagent
  - Copy der Files über CIFS-Share von der VM zu den VM's der Gruppe
- Self-Service Restore
  - Backupagent auf allen VM's
  - Restore vom Backupstore direkt auf die betreffende VM



# Storage



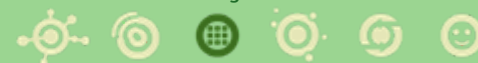
## Vergleich der Restoremethoden

Restore Methode	Vorteile	Nachteile
Centralized Backup	Minimale Anzahl von Agenten die zu managen sind	Administrator muss Restore auf File-Level durchführen
Per Group Backup	Restore kann delegiert werden. Guter Kompromiss zwischen Anzahl Agenten und „Ease of restore“	Restore muss über einen Zwischenschritt erfolgen
Self-Service	Unabhängiges Restore für jede VM	Jede VM benötigt einen eigenen Agenten



# Storage

Storage



## VCB Integrationen (1)

- Gruppe 1 Integrationen von VMWare
  - Nur Basisintegration (Commandline)
  - Pre- und Postscripts
  - Produkte:
    - Symantec/Veritas NetBackup und BackupExec
    - Legato Networker
    - Tivoli Storage Manager (TSM)
    - CommVault
- Gruppe 2 Komitment eigene VCB-Integrationen zu erstellen
  - Produkte
    - HP DataProtector
    - SyncSort
    - Atempo
    - BakBone
    - Danz
    - Innovation Data Processing



# Storage



## VCB Integrationen (2)

- Gruppe 3: Kein Komitment eigene VCB-Integrationen zu erstellen oder Integration durch VMWare
  - Produkte
    - CA Brightstore
    - Vizioncore



## Storage

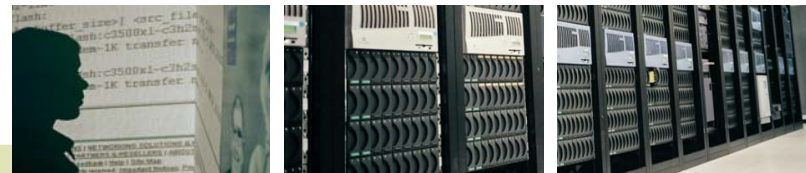


### ESX-Ranger Pro (Alternative zu VCB)

- Live Backup Of ESX Server Guests '.VMDK' Files While In Use
- Automatically Compresses Disk '.DSK' Files
- Backup Configuration '.VMX' Files
- Runs From A Central Windows Host
- No Manual Linux or PERL Commands Needed, No Complex Scripts Needed
- Customizable output of backup file names, Customizable output location of temporary staging files
- Automatic restore to original source ESX Server from command line interface
- Automatic detection of destination and source free disk space
- No Linux Or Windows Backup agents



# Migration nach ESX 3 / VC 2



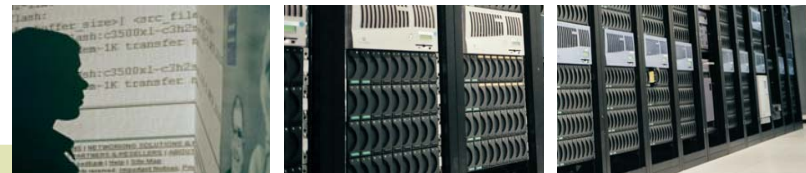
# Storage

Storage



## Migration Steps

- Backup VC DB , ESX Servers and VM
- Upgrade VC 1.x to VC 2.x
  - ESX 2.x can still be managed from VC 2.x
  - DB will be modified – no Rollback (Save DB!!!)  
Access DB is no longer not supportet – use real SQL Server
  - Check it VC Service in 1.x was started with SystemAcount or NN  
In some cases W2K3 SP1 did not allow VC Service to start with SystemAccount. Use same Policy with VC 2.x!!!
- Update ESX Servers (“in Place” or “Migration update”)
- Update Storage vmfs2 to vmfs3 (stop all VM)
- Update virtual Hardware from VM2 to VM3
- Update Tools



# Storage

Storage



## Migration ESX

- “in Place” Migration
  - Pro – no additional Servers and Disk Resources needed
  - Cons – longer downtime of BC VM, old SW on COS 2.x...
- “Migration update”
  - Pro – one by one migration of VM can be made
  - Cons – all VM have to be copied to new Storage (vmfs3)
- Unbedingt beachten für die Migrationsplanung  
[http://www.vmware.com/pdf/vi3\\_installation\\_guide.pdf](http://www.vmware.com/pdf/vi3_installation_guide.pdf)



# Storage



**Danke  
für Ihre Aufmerksamkeit**