



VAX system replacement with CHARON-VAX

“Preserving your software investment across hardware generations”

Dogan Baser / April 2005



Software Resources International SA

- Created in Oct 1993 as a DEC software Migration Center
- Software porting and system engineering (predominantly VMS)
- Designed a PDP-11 emulator (CHARON-11) for ABB and Agfa
- 1999 Compaq takeover; Management buyout:
 - Created Software Resources International SA Geneva.
 - Transfer of all projects and Intellectual Property.
- Executed large migration projects for Compaq / HP:
- DFS Germany, VMS/Alpha to Itanium binary converter, etc
- Established offices in GY, FR, Benelux, Sweden, USA, UK



Contents:

- Why a VAX Emulator?
- How does CHARON-VAX work?
- Compatibility
- Connecting Qbus hardware
- Limitations and "extra"s of a system emulator
- The CHARON-VAX product family
- Performance
- Clustering
- Support
- Business case: THALES Netherlands
- Business case: SPIDA Switzerland
- Summary

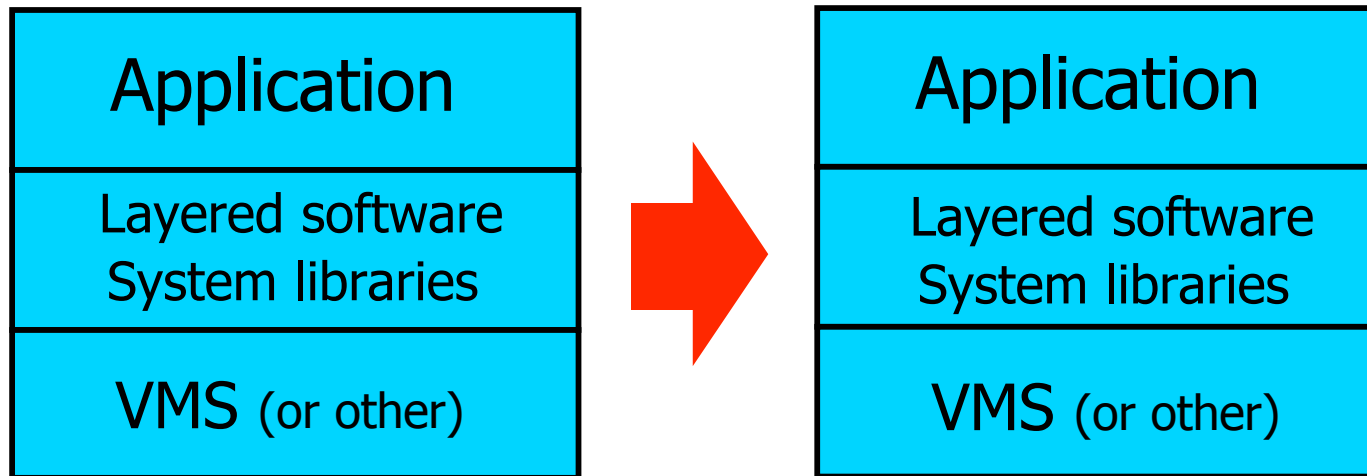


Why a VAX Emulator?

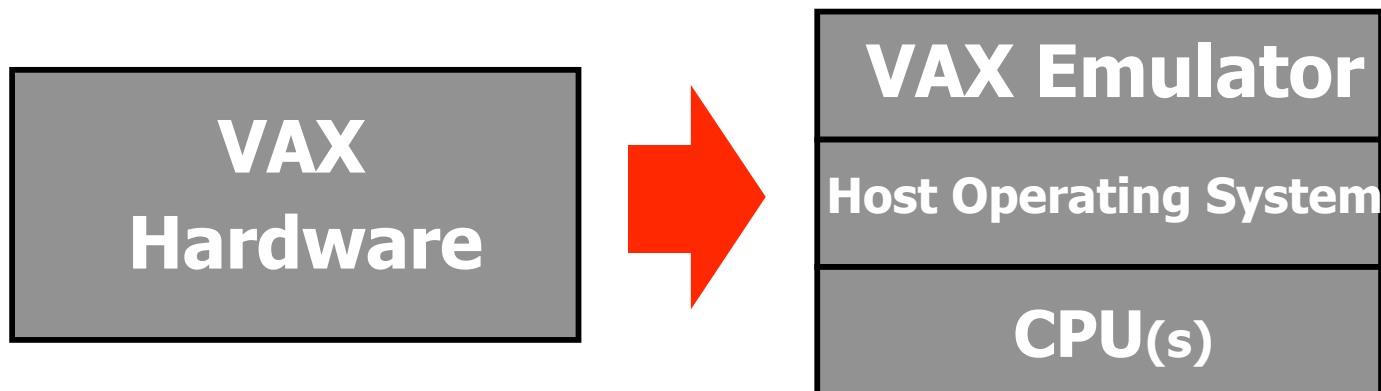
- Hardware is end-of-life and failing, especially disks
- Service costs have increased significantly (if available)
- Application rewriting expensive relative to the new system cost
- Experts and/or application source code not always available
- Automatic conversion (OMSVA, OMSAI) does not always work
- Market expects modern platforms
- There are still ~200,000 operational VAX systems worldwide



CHARON-VAX Principle



Direct copy or re-install of VAX software, no conversion process





CHARON-VAX Characteristics

VAX Operating System Independent:

- Runs VMS, VAXEIn, Ultrix, NetBSD, etc
- No special host system or VAX Operating System drivers

Full VAX Hardware Compatibility:

- Tested with diagnostics and architecture tests (AXE)
- No VAX binary code changes
- No VAX application source code required
- Supports NI clustering, shared disk clustering, shadowing, striping
- DECnet, Ethernet, TCP/IP, LAT...

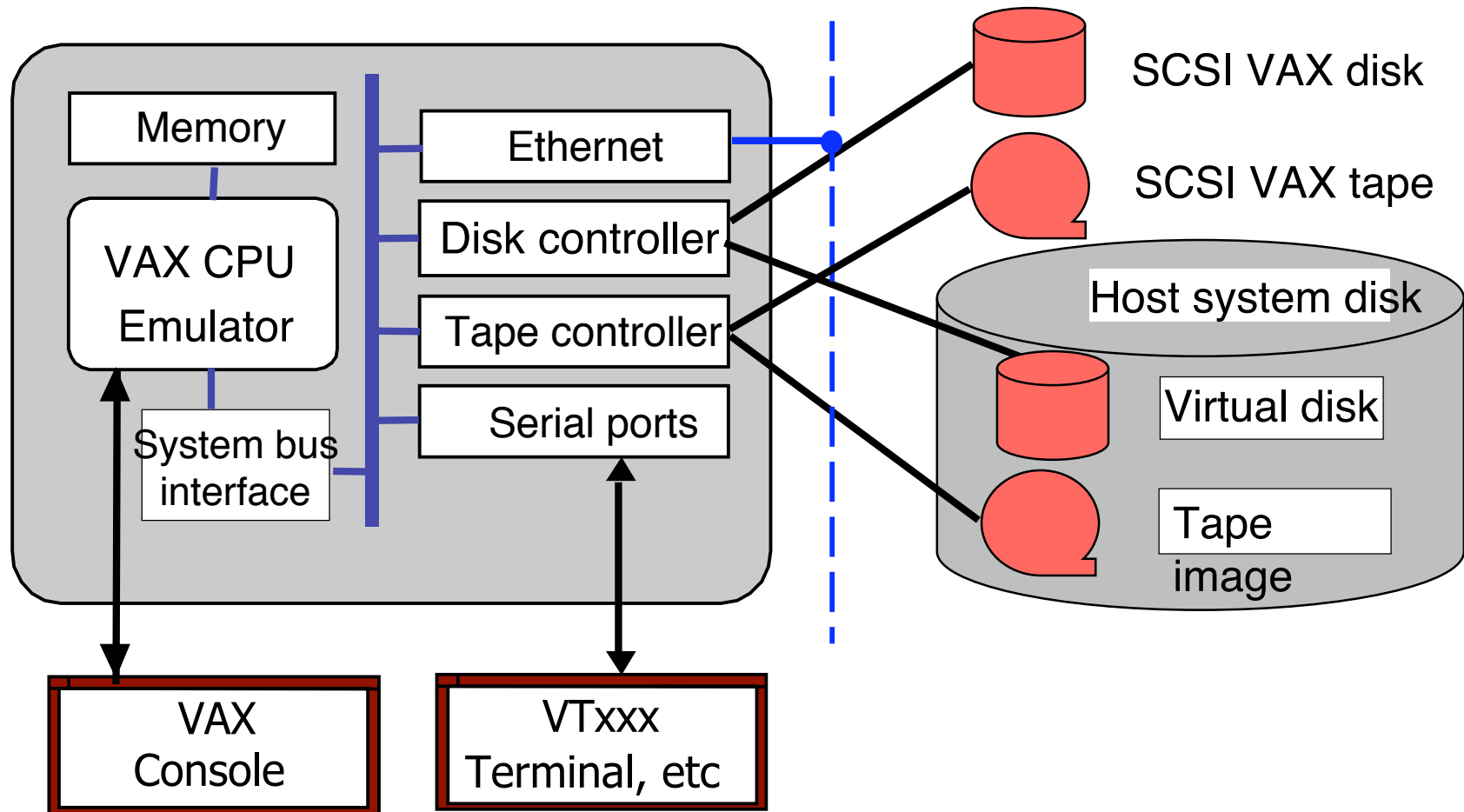


CHARON-VAX History

- Initial design based on a 3th generation PDP-11 emulator
- Start in April 1999 (VAX CPU for emulated PDP-11 Qbus)
- First VMS logon: March 2000
- First Customer Ship: September 2000, 10 VUPS
- High-End Product : June 2002, 50+ VUPS
- Shared Disk Clustering: August 2004
- VAX SMP Emulation : Sept 2004, 250+ VUPS (3 CPU)
- Performance grows with host system
- Lightweight and Portable (100% in C++)



Inside CHARON-VAX





Compatibility with hardware VAX systems

Tools Used to Obtain Compatibility:

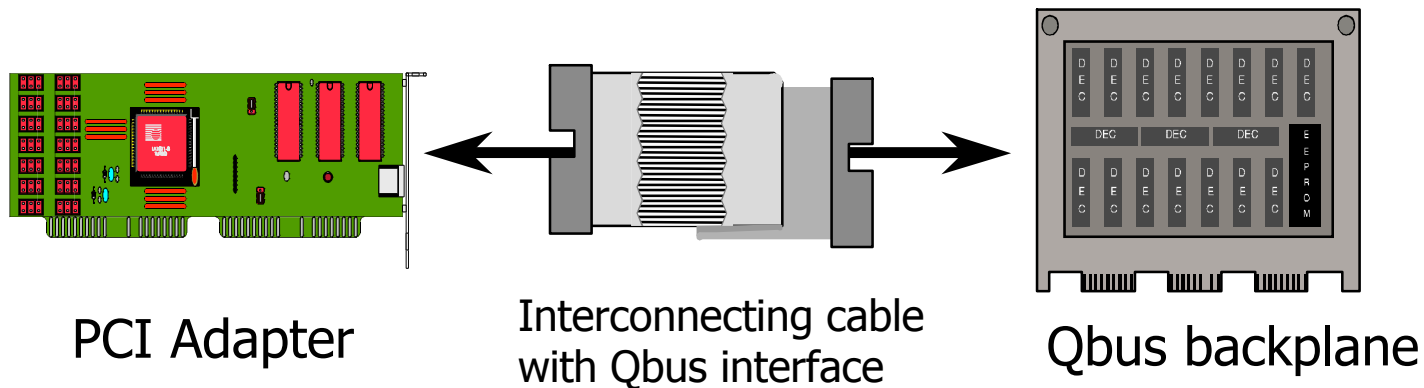
- Hardware Diagnostics (XXDP, MDM)
- AXE: VAX Architecture Exerciser
- Running VMS, VAXEIn, Ultrix, NetBSD

Recent HP/Compaq QA Tests Proved Compatibility:

- 100K error-free AXE test loops per instruction group
- MDM fault-free 'hardware'
- UETP application level tests



Connecting Qbus Hardware



BCI-2104 solution provided by The Logical Company, USA

- Adapter maps Qbus I/O space in the virtual VAX environment
- Existing device drivers can be used, no code changes

Limitations:

- Requires emulated Qbus: CHARON-VAX/Industrial (Plus)
- Keeps the physical Qbus cage and the legacy I/O option
- Individual calibration required for some real-time peripherals
- Alternate solutions exist for high-volume applications



Emulation limitations

- VAX software timing loops
 - Sometimes found in industrial/military software
- No connection to hardware DSSI/CI storage on Windows hosts
 - But legacy disk are low speed compared to SCSI-3
- SCSI peripheral connections
 - SCSI-1 device timing and speed (TK50)
- Legacy peripheral connections
 - Bus adapter for Qbus options; host influences operation
- Ethernet connections
 - VAX = 10 Mbps. 100 Mbps adapters do not run at full speed
- In case of uncertainty, prior testing is recommended



Emulator “Extra’s”

- Disk/tape storage alternatives
 - Physical disk/tape, disk/tape image, fast backup (DVD)
- Architecture extensions
 - 512 MB, 24 disk controller MV 3600
 - KDM70 that supports disks, disk images, tapes, tape images
- VAX CPU emulation speed control
 - Used with Military / Industrial applications
- Archiving of VAX system “snapshots”
 - Keeping configuration + disk images in archive

CHARON-VAX Products Overview



<u>Product</u>	<u>Platform</u>	<u>Earliest VMS version supported</u>	<u>Emulated Memory Size</u>
CHARON-VAX/XM for Windows	Windows 2003 or XP	4.6 (*)	128 MB (*)
CHARON-VAX/XM <i>Plus</i> for Windows	Windows 2003 or XP	4.6 (*)	128 MB (*)
CHARON-VAX/XK <i>Plus</i> for Windows	Windows 2003 or XP	5.5-2H4	256 MB
CHARON-VAX/XL for Windows	Windows 2003 or XP	5.5-2H4	512 MB
CHARON-VAX/XL <i>Plus</i> for Windows	Windows 2003 or XP	5.5-2H4	512 MB
CHARON-VAX/6610 <i>Plus</i> for Windows	Windows 2003 or XP	5.5-2H4	1 GB
CHARON-VAX/6620 <i>Plus</i> for Windows	Windows 2003 or XP	5.5-2H4	2 GB
CHARON-VAX/6630 <i>Plus</i> for Windows	Windows 2003 or XP	5.5-2H4	2 GB
CHARON-VAX/Industrial for Windows	Windows 2000 or XP	4.6	64 MB
CHARON-VAX/Industrial <i>Plus</i> for Windows	Windows 2000 or XP	4.6	64 MB
CHARON-VAX/AXP <i>Plus</i> for OpenVMS/Alpha	OpenVMS Alpha	5.5-2H4	512 MB

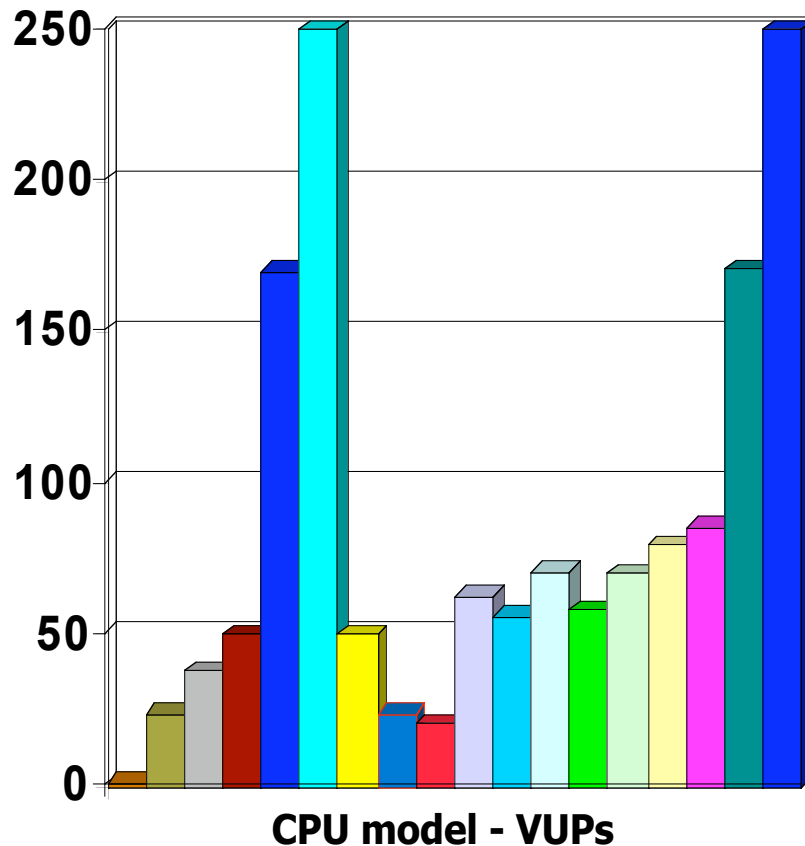
(*) Depends on the CPU emulated



Decision factors for CHARON-VAX version

- Replacement platform preference
- VMS version to run
- Memory size need
- Performance need

Relative VUP Performance Comparison (Sep 2004)



- VAX 11/780
- VAX 4000-500A
- VAX 3100-98
- VAX 7000-710
- VAX 7000-740
- VAX 7000-760
- CH-VAX/Industrial+ on dual Xeon, 2.8 GHz
- CH-VAX/AXP Plus on Alpha EV68, 1GHz
- CH-VAX/XM on dual P4, 3.4 GHz
- CH-VAX/XM+ on dual P4, 3.4 GHz
- CH-VAX/XL+ on dual AMD MP2800+, 2.1 GHz
- CH-VAX/XL+ on dual AMD 64, 2.4 GHz
- CH-VAX/XL+ on dual Xeon, 3.0 GHz
- CH-VAX/XL+ on dual AMD 248, 2.2 GHz
- CH-VAX/XL+ on dual AMD 250, 2.4 GHz
- CH-VAX/6610+ on DL585 2x AMD 850 CPUs, 2.4 GHz
- CH-VAX/6620+ on DL585 3x AMD 850 CPUs, 2.4 GHz
- CH-VAX/6630+ on DL585 4x AMD 850 CPUs, 2.4 GHz

4U/4P – HP ProLiant DL585 with 4 x Opteron 850



The ideal platform for CHARON-VAX/66x0 Plus for Windows
for large data center deployments

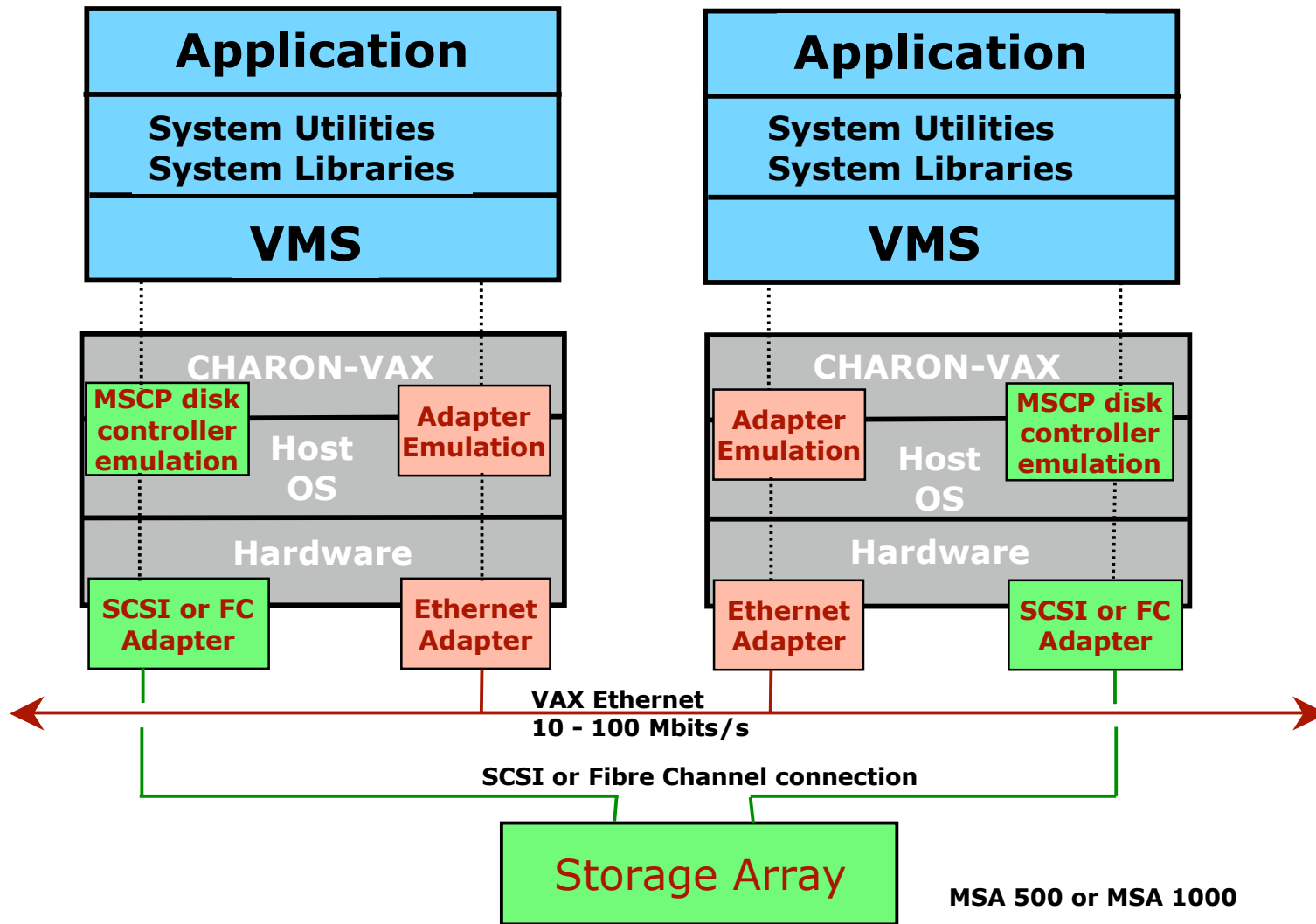
- ✓ Top performance, CHARON-VAX: 258 VUPs (VAX 7760: 250 VUPs)
- ✓ Scalability
- ✓ Outstanding uptime
- ✓ ProLiant management

CHARON-VAX/AXP for OpenVMS/Alpha

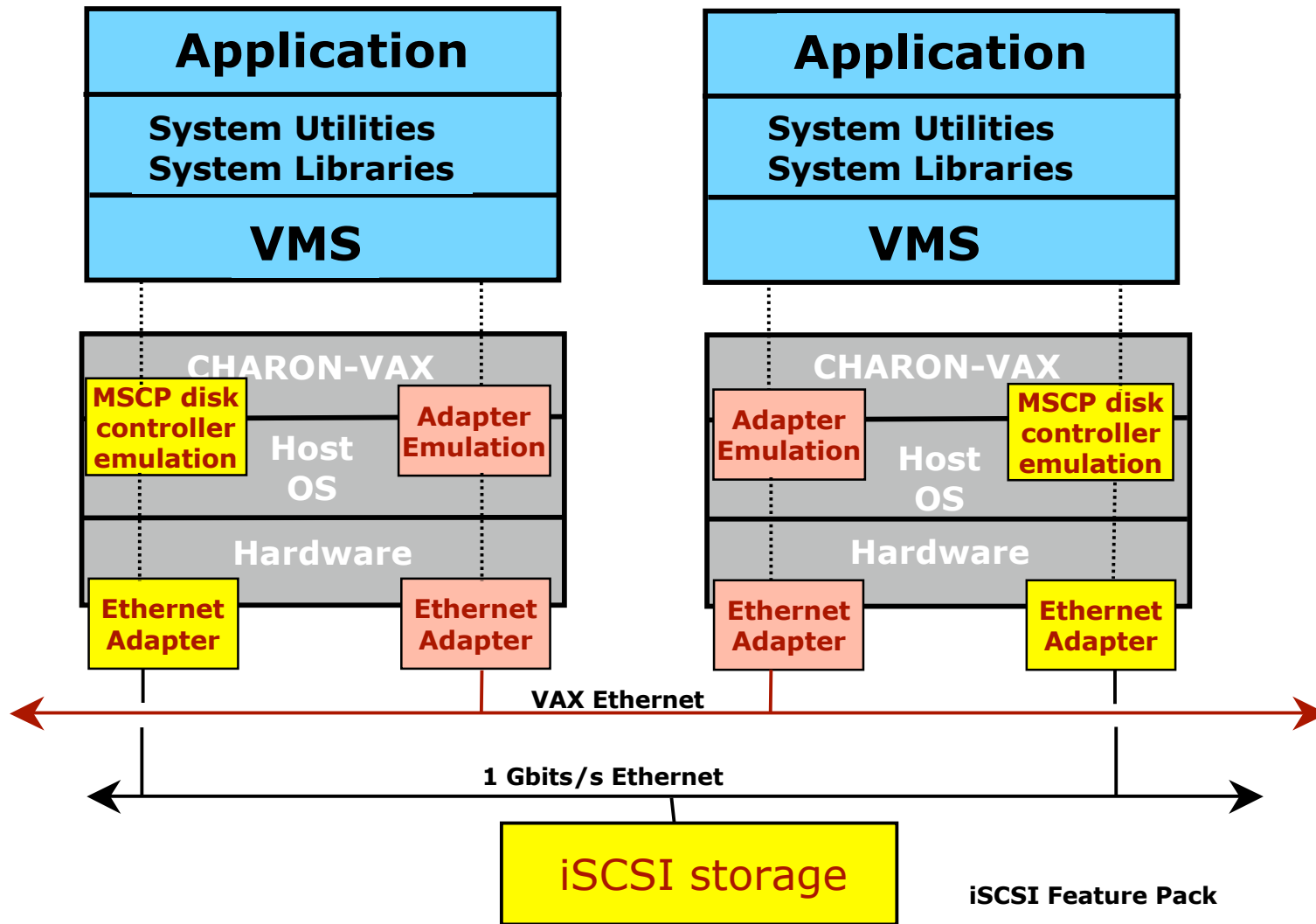


- Good replacement for older VAX 3000, 3100 and 4000 models up to ~25 VUPs
- Ideal for users who want to limit their IT environment to OpenVMS
- Trusted OpenVMS qualities: Stability, availability, bullet-proof security
- Inexpensive HP transfer licenses

Shared Disk Clustering with Storage Array

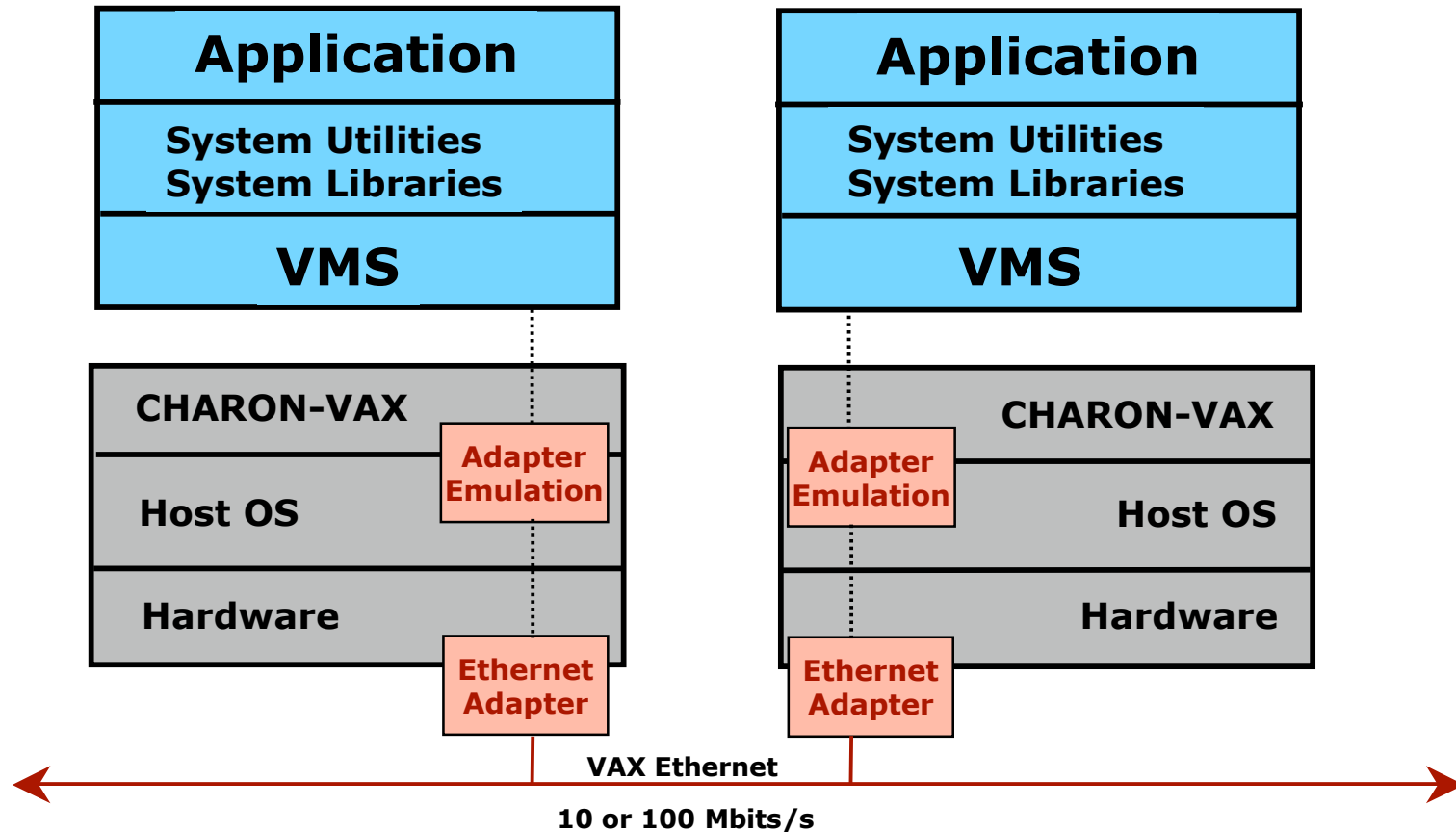


Shared disk clustering with iSCSI





Traditional VAX/VMS NI Cluster





HP Transfer Licenses

HP Contact for Transfer Licenses and Support:

<http://h71000.www7.hp.com/openvms/sri-charon-vax-emulator.html>

OpenVMS/Alpha Host

- Right to transfer VAX/VMS \$ 500
- All supported layered products \$ 500

Other Hosts (Windows)

- Right to transfer VAX/VMS \$ 1000
- All supported layered products \$ 1000



Obtaining Support

■ VMS and Layered Products Support

- From HP, as usual
- <http://h71000.www7.hp.com/openvms/sri-charon-vax-emulator.html>

■ Oracle Support

- From Oracle Corp, as usual
- http://www.oracle.com/technology/products/rdb/htdocs/rdb7/charon_vax.html

■ CHARON Product Support

- From SRI or an SRI-certified support organization
- GOLD Support: 5 days / 8 hours
- PLATINUM Support: 7 days / 24 hours*

* Subject to geographical availability

CHARON-VAX

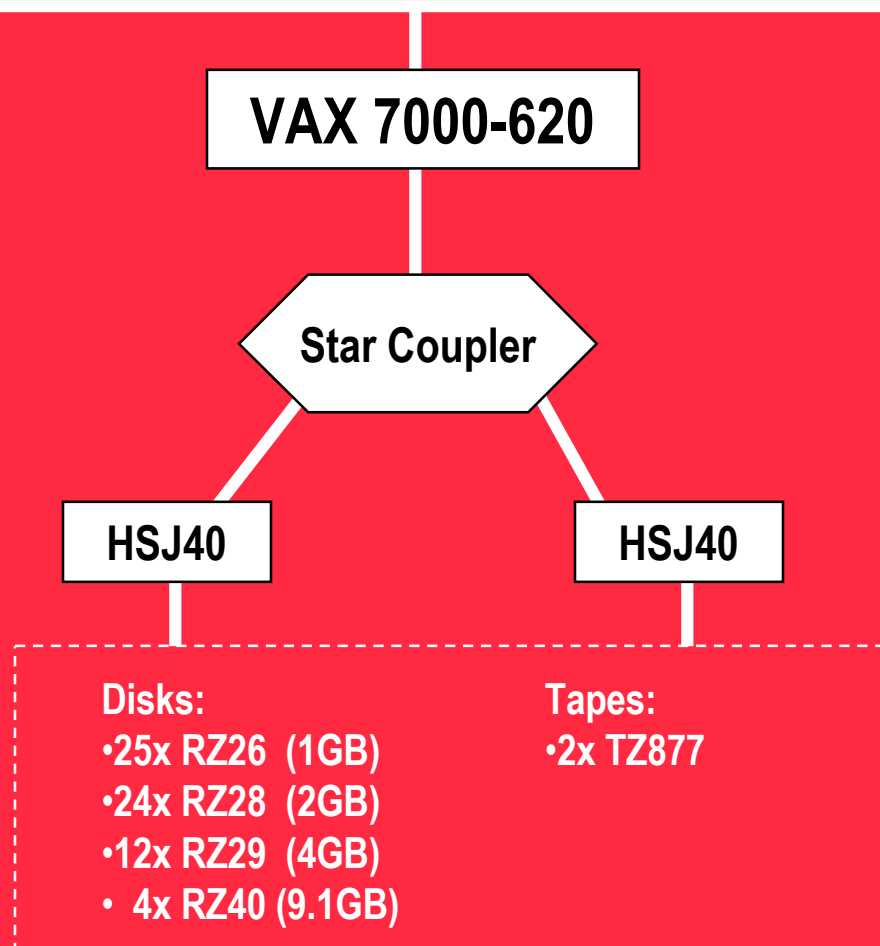
Business Case at Thales Group The Netherlands

Wilm Boerhout, VX Company
Consultant



Source System

Ethernet



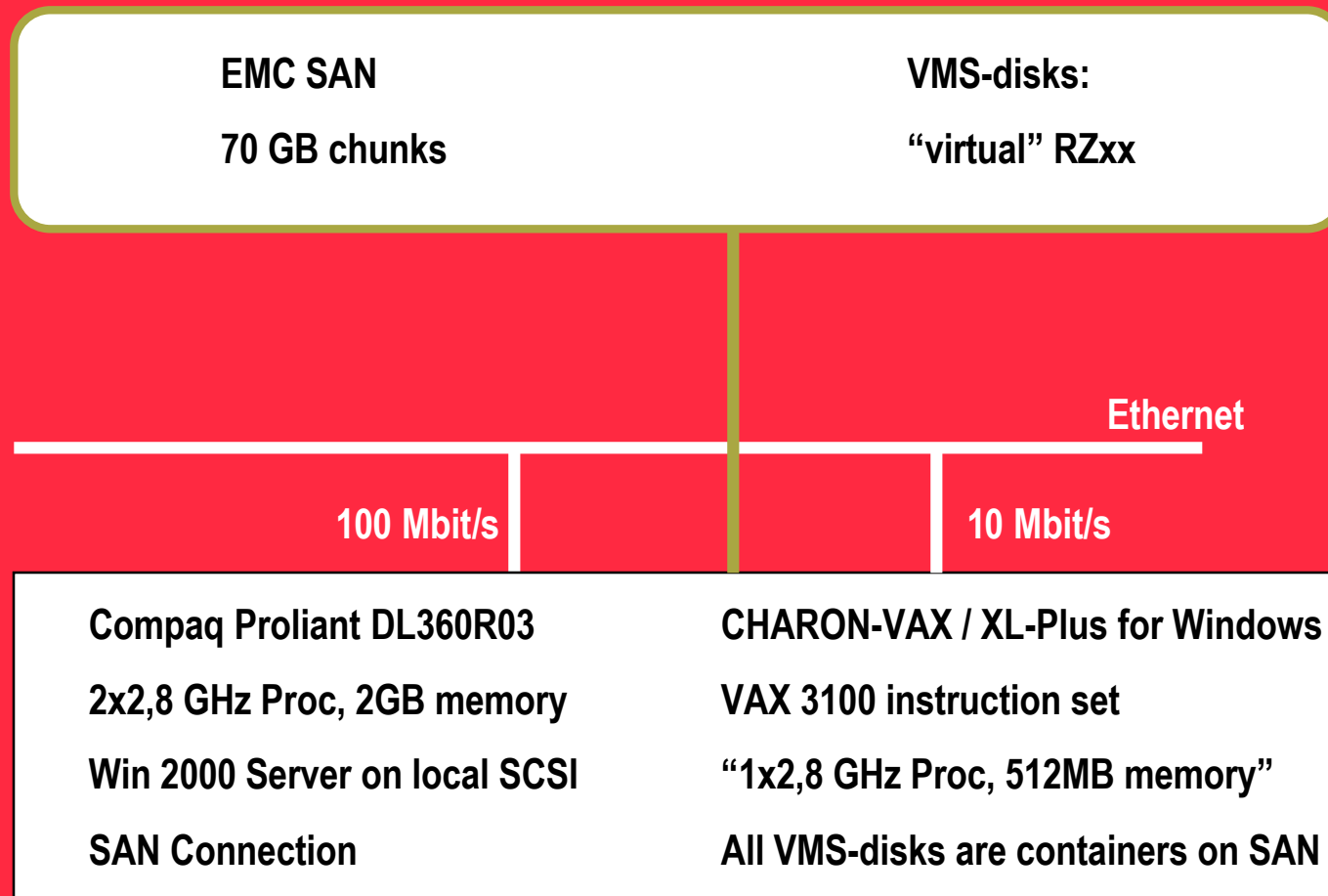


Source System characteristics

- Dual processor system
- VMS V5.5-2
- 500-800 interactive users
- Night batches with heavy load
- Stable system with lots of legacy applications and middleware
- Structured system disk with management shell



Target System





Target System considerations

■ **VMS Version:**

- emulator needs V5.5-2H4
- clean build not possible due to some sources lost or missing
- system disk upgrade to 7.3

■ **Ethernet connections:**

- Throughput optimized by setting of network switch configuration (10Mbit, 100Mbit)

■ **Backup solution:**

- Containers are backed up on SAN
- Restore of single files awkward
- Selected files and databases backed up via Veritas Netbackup client (Corporate Solution)

■ **I/O Performance:**

- I/O bound night batch runs significantly faster on emulated system!



Economies of Scale





Economies of Scale



+



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Performance Leap for SPIDA's VAX Applications

Götz Hoffmann Dipl. Ing. CEO HOLEON GmbH Switzerland

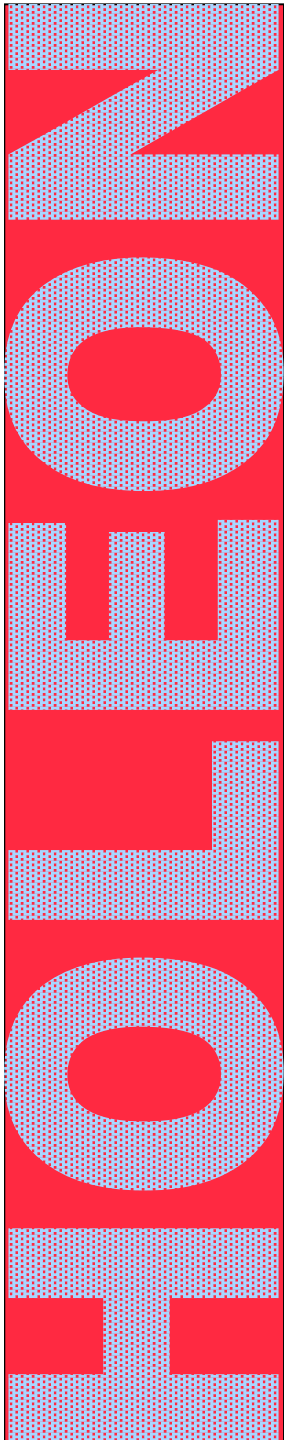


Business Case SPIDA

State Pension Fund

VAX 4000-500A

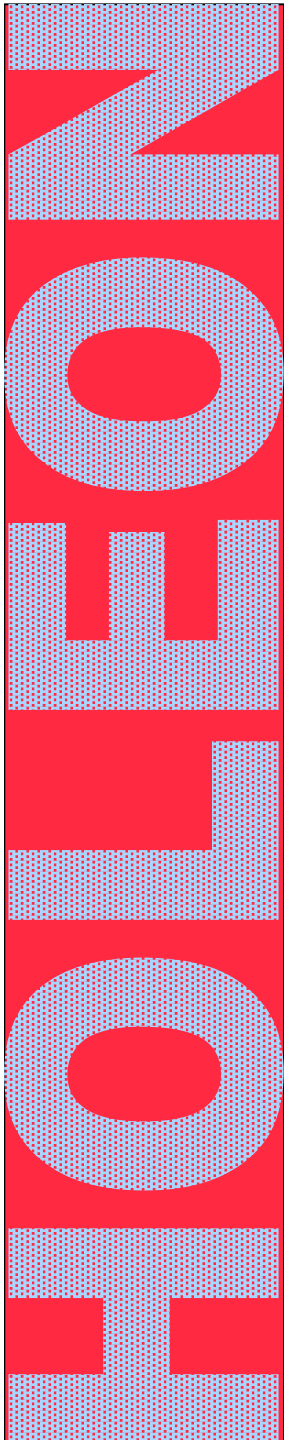
New application software available in ~3 years





Bottleneck: Performance

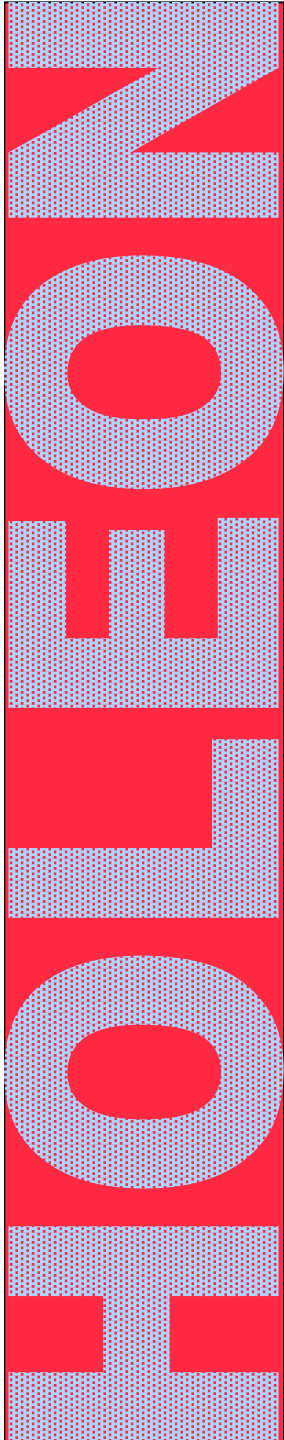
- End-of-month processing: 15 hrs
- Response time: In the magnitude of minutes





Challenge

- Increase performance
- ASAP
- No interruption of the operations





CHARON-VAX, final system configuration

HP Proliant ML530

- Dual-CPU Xeon 3 GHz, 2 GB
- Fast hot-swap SCSI drives 15'000rpm
- Two-channel RAID controller with 128 MB cache



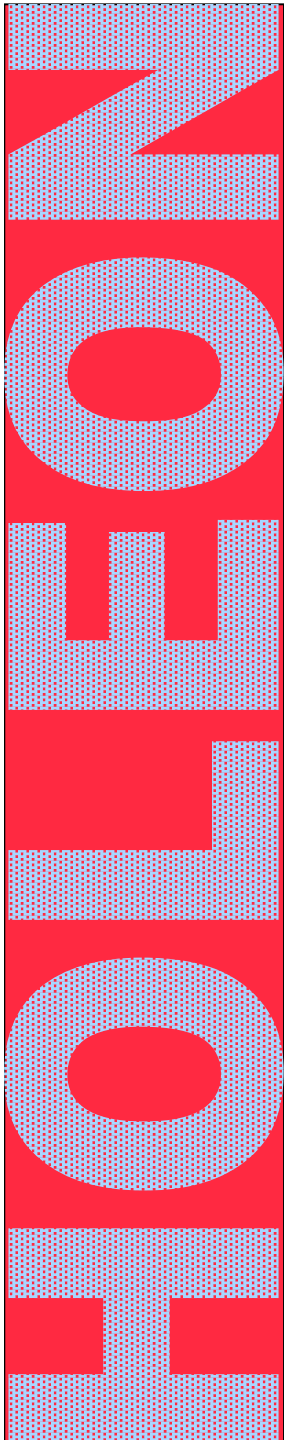
CHARON-VAX, final system implementation

- Back-up / restore
- Implementation in target environment
- Parallel operation of VAX and CHARON-VAX
- Final tests by multiple selected users
- Final system activation over a weekend
 - Stop VAX applications
 - Copy data to CHARON-VAX
 - Activate CHARON-VAX as host



Characteristics of the final solution

- Performance increase: 5x
- Cost reduction: 50%
- Implementation time: 1 to 6
- Disruption of operations: No
- Risks: Eliminated by stepwise implementation
- Sustainability: Yes





CHARON-VAX Benefits Summary - 1

- Emulates the VAX hardware, not VMS or any other OS
- Implements immediately, quickly, simply
- No risk
- Enthusiastic users: *set-up, install VMS, copy application, run*
- Replaces old HW by modern HW
- Increases performance automatically with modern CPU speeds
- Preserves current investments
 - Keep current applications
 - Keep current business processes, no impact on day-to day operations
 - No re-training, no re-staffing



CHARON-VAX Benefits Summary - 2

- Supports SCSI / iSCSI disk clustering – transparent to VAX/VMS
- Provides an API to add custom Qbus peripheral emulations
- Product variations available to match user application need
- Licensing:
 - Unlimited usage license, or
 - Initial one-year license + yearly license extensions
- TRIAL PURCHASE with money-back guarantee



CHARON-VAX Benefits Summary: System Manager Testimonials

- Ability to do VMS backups using WINDOWS/PC tools
- Ability to “add” DEC disks as needed
 - As virtual disks represented as CHARON container files
 - Up to the limit allowed by VMS
 - Up to the limit of PC disk space
- Ability to do VMS tape backups at PC server speeds
 - Backup first to DEC virtual tape drives (as CHARON container files)
 - Then backup PC files to modern media (local or networked)
- Reduce “VAX hardware footprint” substantially
 - Even with one-to-one VAX-to-PC replacement
 - Especially by consolidating multiple VAXes to high-performance CHARON-VAXes
- Reduces cost of ownership

For More Information



Software Resources International

P.O. Box 156
1228 Plan-les-Ouates
Switzerland
Tel. +41 22 794 1070
Fax +41 22 794 1073

www.softresint.com

www.vaxemulator.com

Product descriptions

www.softresint.com/charon-vax/index.htm

On-line demonstration

www.softresint.com/charon-vax/login_demo.htm

Documentation

www.softresint.com/charon-vax/app_notes.htm#docu

Utility downloads

www.softresint.com/charon-vax/Tools_and_tips.htm

Newsletters

www.softresint.com/Newsletter.html

Resellers

www.softresint.com/charon-vax/CHARON_partners.htm