Emulator for OpenVMS on Windows Platform
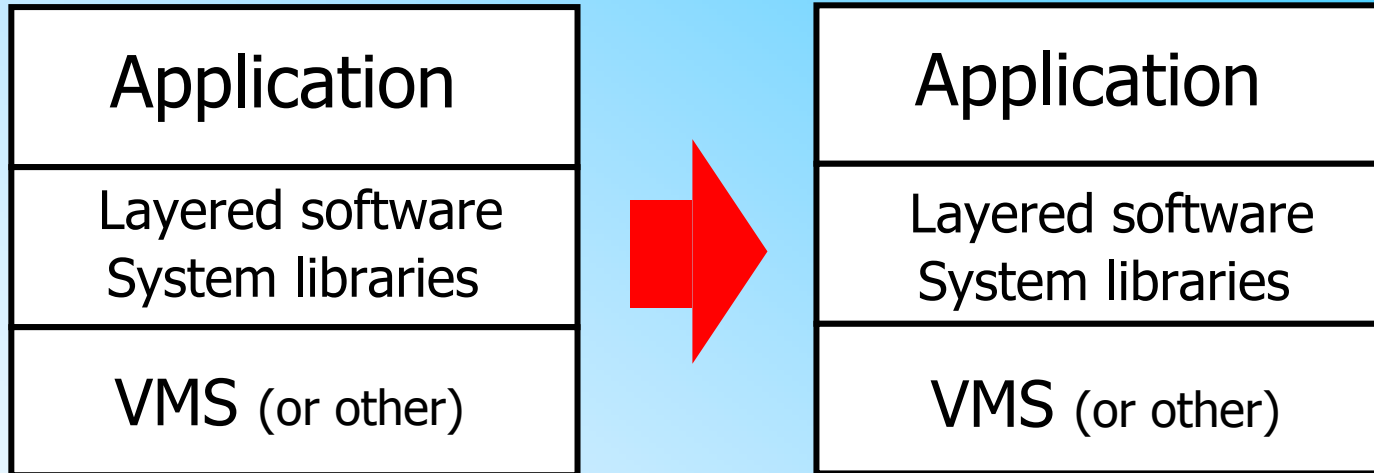

Introduction of Charon-VAX, possibilities, configuration and use.
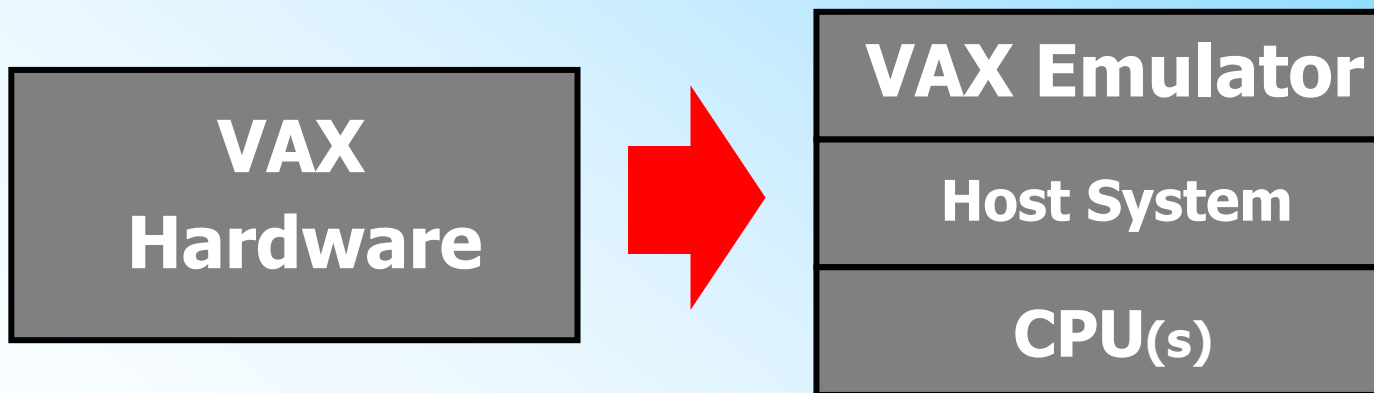
Why a VAX Emulator?

- Hardware is end-of-life and failing

- Service costs have increased significantly

- Application rewriting expensive

- Experts and/or application source code not always available

- Use modern platforms with same User interface

- No interuption in Production Process

CHARON-VAX Principle

Application
Layered software System libraries
VMS (or other)

➡

Application
Layered software System libraries
VMS (or other)

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

VAX Hardware

➡

VAX Emulator
Host System
CPU(s)

CHARON-VAX Characteristics

VAX Operating System Independent:

- Supports VMS, VAXEln, Ultrix, NetBSD, etc

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, disk shadowing, striping
- DECnet, Ethernet, LAT, etc…

Fully Compatible with Hardware VAX Systems

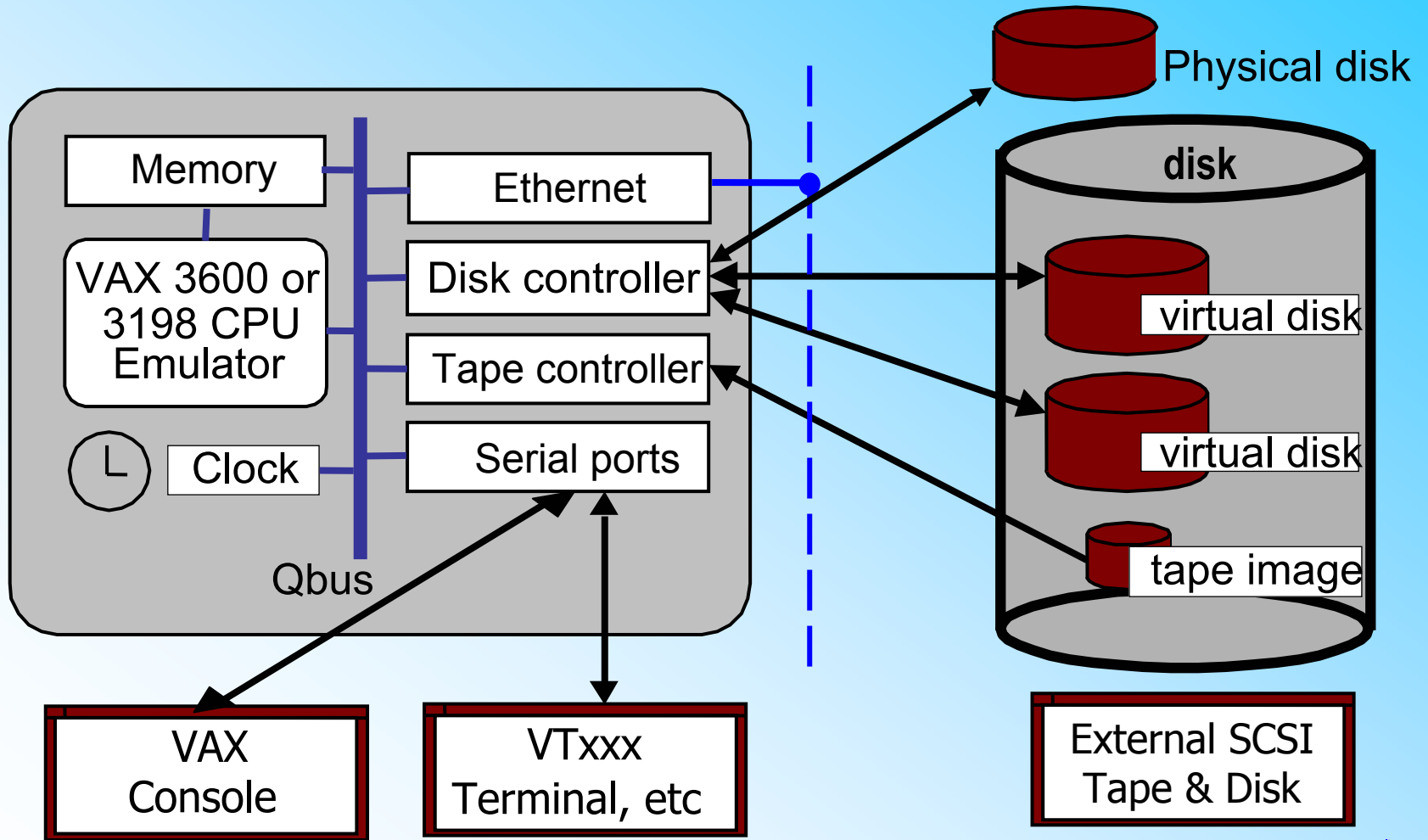**Tools Used to Obtain Compatibility:**

- Hardware Diagnostics (XXDP, MDM)

- AXE: VAX Architecture Exerciser

- Running VMS, VAXEln, Ultrix, NetBSD

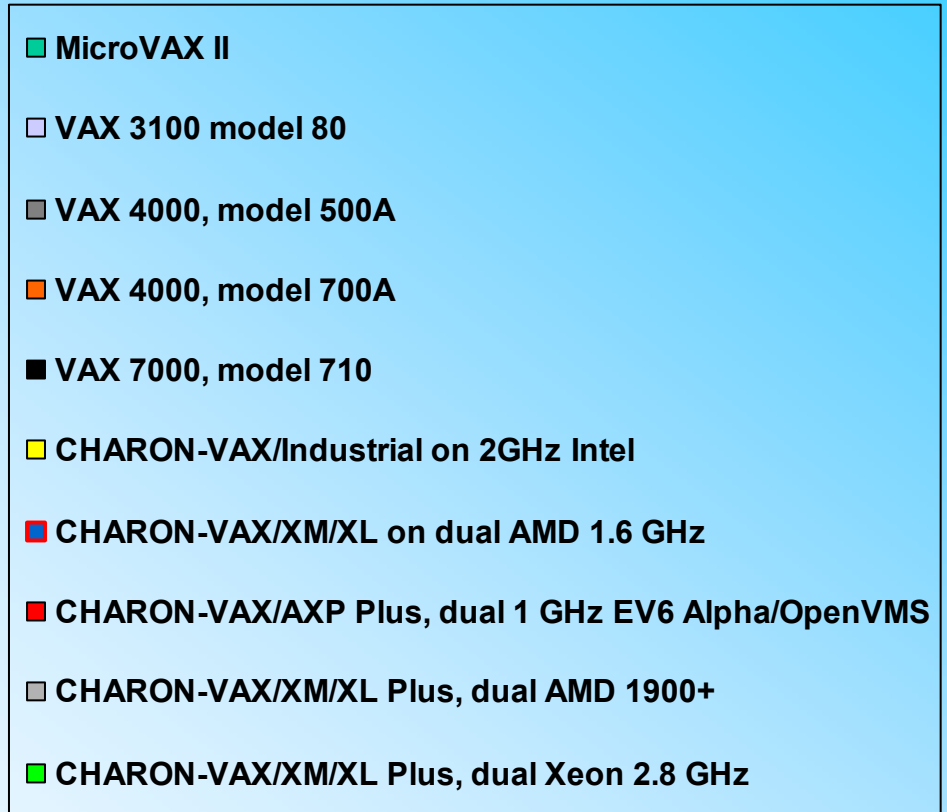**Recent HP/Compaq QA Tests Proved Compatibility:**
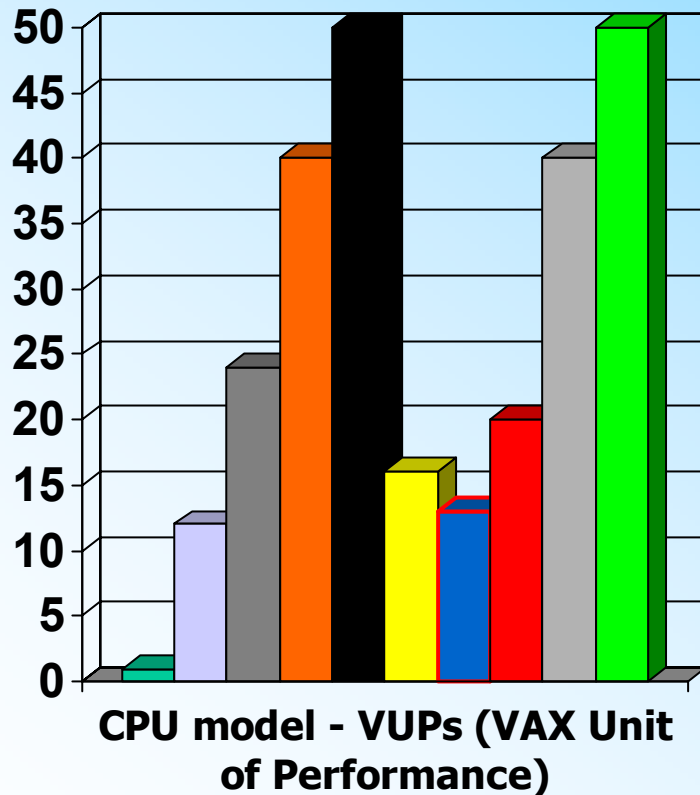
- 100K error-free AXE test loops per instruction group

- MDM fault-free 'hardware', UETP application level tests

Inside CHARON-VAX

Memory

VAX 3600 or 3198 CPU Emulator

Clock

Qbus

Ethernet

Disk controller

Tape controller

Serial ports

Physical disk

disk

virtual disk

virtual disk

tape image

VAX Console

VTxxx Terminal, etc

External SCSI Tape & Disk

VUP Performance Comparison
(October 2002)

Chart Y-axis: 50, 45, 40, 35, 30, 25, 20, 15, 10, 5, 0

Chart X-axis label: CPU model - VUPs (VAX Unit of Performance)

Legend:
- MicroVAX II
- VAX 3100 model 80
- VAX 4000, model 500A
- VAX 4000, model 700A
- VAX 7000, model 710
- CHARON-VAX/Industrial on 2GHz Intel
- CHARON-VAX/XM/XL on dual AMD 1.6 GHz
- CHARON-VAX/AXP Plus, dual 1 GHz EV6 Alpha/OpenVMS
- CHARON-VAX/XM/XL Plus, dual AMD 1900+
- CHARON-VAX/XM/XL Plus, dual Xeon 2.8 GHz

MAP

Charon-VAX products

- Charon-VAX /Industrial

- Charon-VAX /XM

- Charon-VAX /XL

- Charon-VAX Plus versions
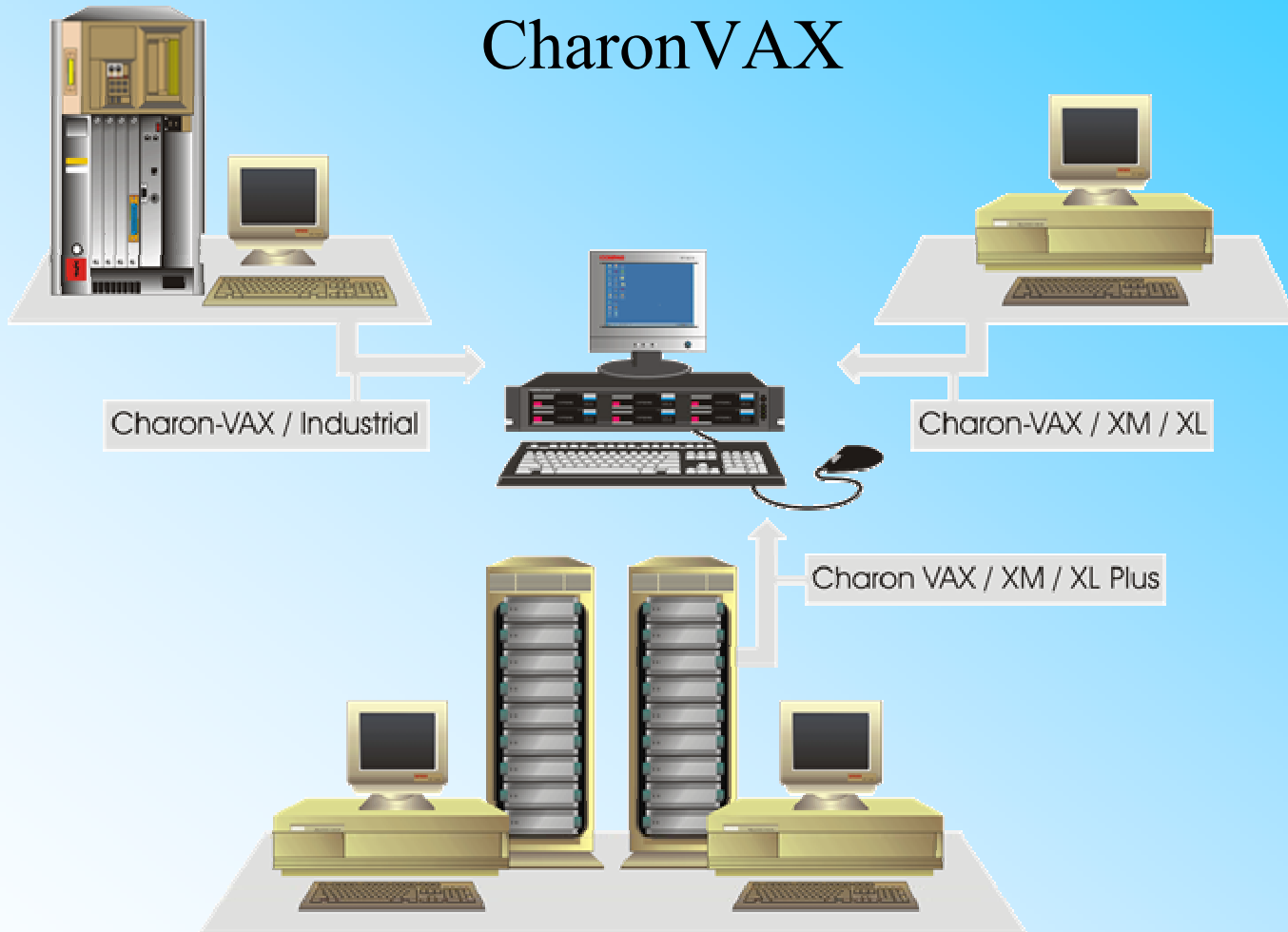
CharonVAX

Charon-VAX Industrial

- MicroVAX II 16MB

- MicroVAX3500-3600 64MB

- Console

- Built-in Terminal Emulator

- MSCP disk controllers

- TMSCP tape controllers

- DHV11 serial lines

- DEQNA, DELQA nad DESQA

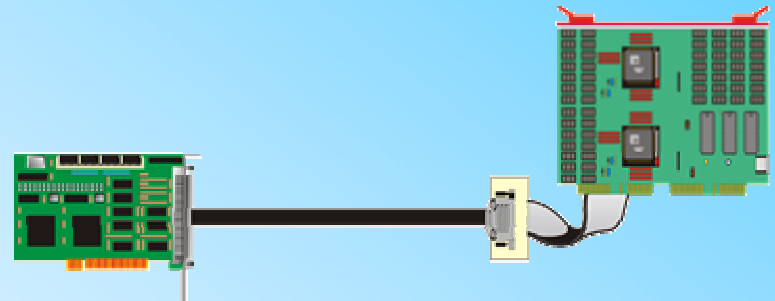- BCI adapter for Qbus devices

- DRV11-WA and IEQ11

Connecting Qbus Hardware

BCI-2104 solution from TheLogical Company:

- Adapter maps Qbus I/O space in the virtual VAX environment

- Existing device drivers can be used, no code changes

Limitations:

- Only available with CHARON-VAX/Industrial (Plus)

- Individual calibration required for some real-time peripherals

Charon-VAX /XM

- MicroVAX3100 model 98 server (N-VAX processor and KA59A main board)

- Console (QUART - 4 lines)

- Clock and Time-Of-Year clocks

- RAM (NMC RAM) – up to 128Mb, ROM

- 2 SCSI Adapters (PKA and PKB), disks with size more than 4.3Gb is supported

- Ethernet Adapter (SGEC)

- Main buses (N-DAL, C-DAL, E-DAL, EPRBUS)

- Controllers (NCA, SSC)
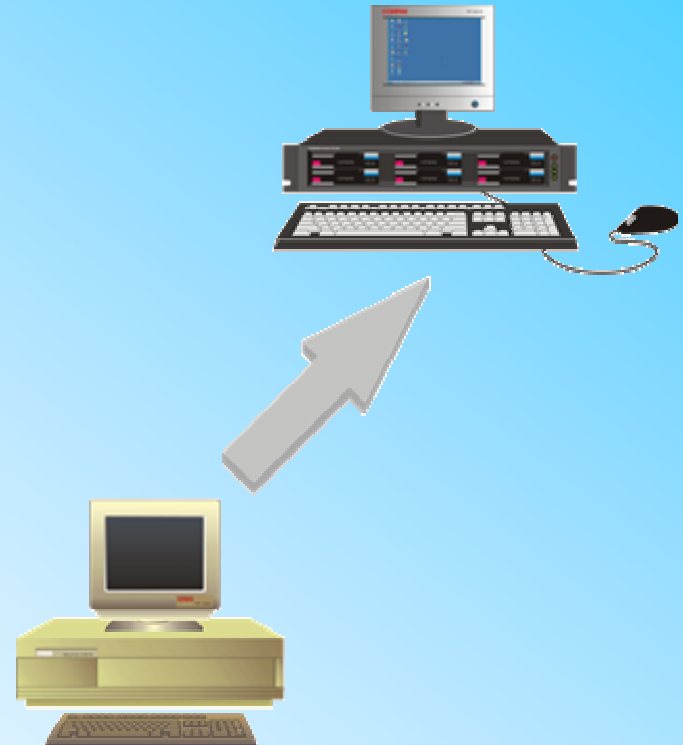
Charon-VAX

- Charon-VAX does not support Graphics hardware.

- Graphic and character cell terminals can be connected via Ethernet.

- Pathworks32 is recommended as flexible tool for X-terminal and VT525 emulation.

- Does not support :

  VMS version below 5.5-2H4

Charon-VAX /XL

- The same functionality as Charon-VAX/XM

- CHARON-VAX/XL is the high end version of the emulator.

- The only difference with CHARON-VAX/XM is the maximum of 512 MB VAX memory.

MAP
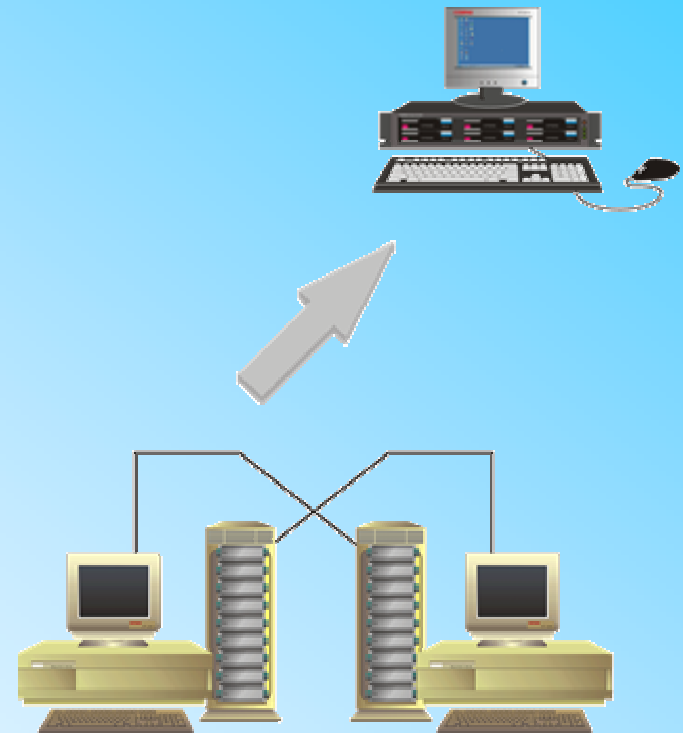
Charon-VAX Plus

- DIT Dynamic Instruction Translation
- Improves the speed of an emulated VAX

- Charon-VAX /Industrial Plus
- Charon-VAX /XM Plus
- Charon-VAX /XL Plus

CHARON-VAX Products Overview

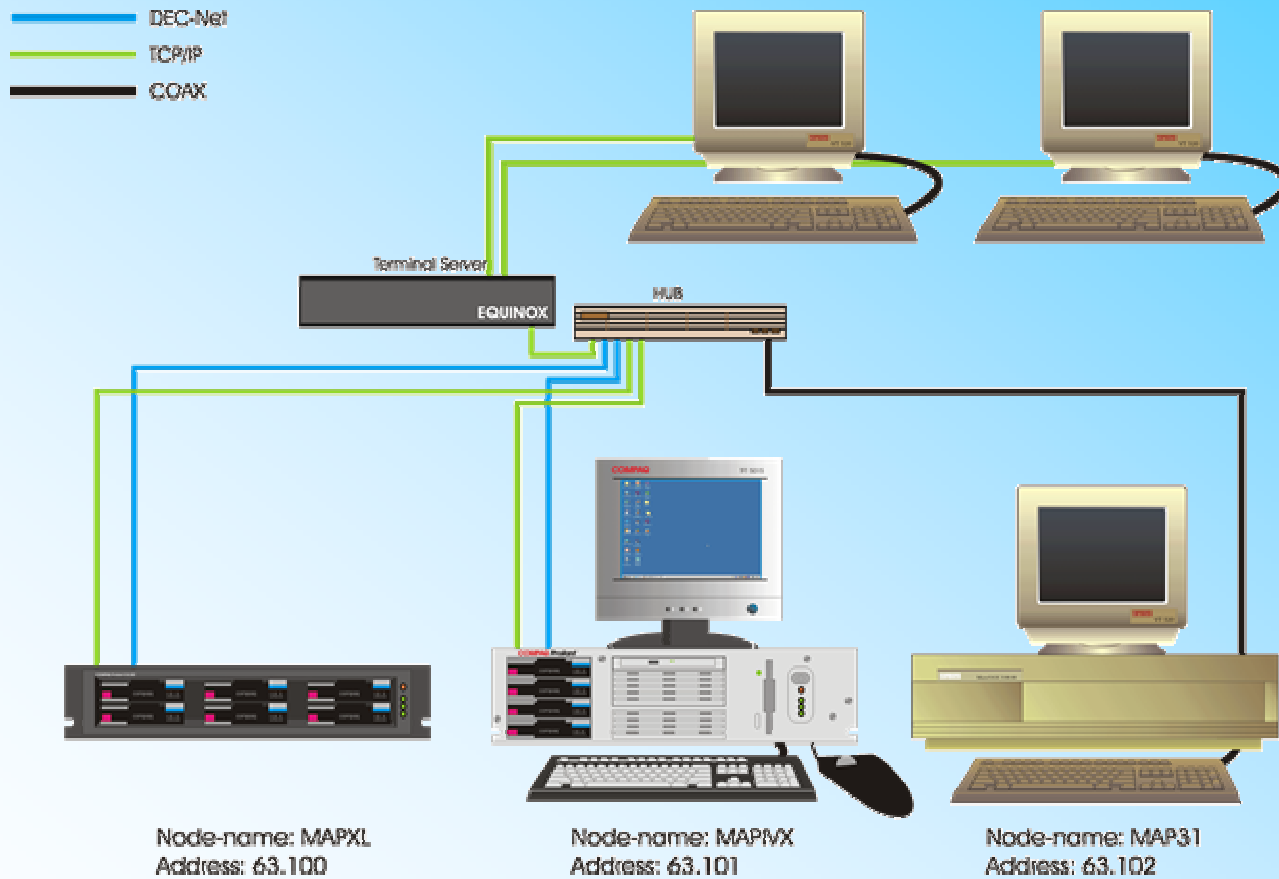| Product	Platform	Q-bus support	VAX type
CHARON-VAX/XM for Windows	**Windows 2000/XP**	**-**	**3100-98/128 MB**
CHARON-VAX/XM *Plus* for Windows	**Windows 2000/XP**	**-**	**3100-98/128 MB**
CHARON-VAX/XL for Windows	**Windows 2000/XP**	**-**	**3100-98/512 MB**
CHARON-VAX/XL *Plus* for Windows	**Windows 2000/XP**	**-**	**3100-98/512 MB**
CHARON-VAX/Industrial for Windows	**Windows 2000/XP**	**YES**	**3600/64 MB**
CHARON-VAX/Industrial *Plus* for Windows	**Windows 2000/XP**	**YES**	**3600/64 MB**
CHARON-VAX/AXP *Plus* for OpenVMS/Alpha	**OpenVMS/Alpha**	**-**	**3100-98/512 MB**

Hardware

- CPU's 2 (Intel or AMD)

- 1GHz and more –Recommended speed

- Memory on emulator platform
  - 256Mb (XM),
  - 512Mb (XM with DIT),
  - 1Gb (XL) host memory

- 50Mb of free space for emulator, USB port

- Ethernet adapter

- SCSI adapters (when physical disks will be used)

Demonstration Charon-VAX

DEC-Net

TCP/IP

COAX

Terminal Server

EQUINOX

HUB

Node-name: MAPXL
Address: 63.100

Node-name: MAPIVX
Address: 63.101

Node-name: MAP31
Address: 63.102

MAP

Approximate performance guidelines

- Industrial, XM, XL Products:

    - 0.8 VUPs / 100 MHz Intel host CPU

    - 0.8 VUPs / 100 units of AMD CPU (e.g. XP 1800+)

- Industrial, XM, XL Plus Products:

    - 1.8 VUPs / 100 MHz Intel host CPU

    - 2.1 VUPs / 100 units of AMD CPU (e.g. XP 1800+)

- CHARON-VAX/AXP Plus:

    - 2 VUPs / 100 MHz Alpha EV6 / OpenVMS host

CHARON-VAX Benefits Summary

- Replaces old and expensive HW by modern HW

- Performance grows with faster CPU speeds

- Reduces cost of ownership significantly

- Preserves current investments

- Keeps current applications

- Keeps current business processes

- No impact on day-to day operations

- No re-training, no re-staffing

CHARON-VAX operational benefits

- Ability to backup VMS disk images using WINDOWS/PC tools

- Ability to 'add' VAX disks as needed
  - 'Virtual' disks represented as Windows or OpenVMS files
  - 'Virtual' disk generator provided
  - Physical SCSI disks connected to the Windows or OpenVMS host

- VAX/VMS tape support
  - Connect SCSI tape drive (on CHARON/XM/XL/AXP)
  - Alternative tape 'images' allow very fast operations

- Reduce 'VAX hardware footprint' substantially

Reference sites

- CHARON-VAX successfully selling since 2000

- Tested and certified by HP/Compaq to accurately replace VAX hardware

- Among current customers:

US Department of Defense (Pentagon)	ABB
US Navy and Air Force	Contraves
German Air Traffic Control Systems	Michelen
German Stock Exchange	Tele Denmark
Swedish Steel	HP
Raytheon	Est Enerji
General Electric	Scania
Nortel	Barco
Agfa	and many others

MAP

HP Transfer Licenses

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

MAP Services

- Consultancy

- Migration of PDP-11 and VAX systems

- Support companies with installed base
  - Consultancy
  - Install first project

- Support to application provider

Costs

- Dramatically reduced maintenance costs

- Consultancy per day   €   780,-
- Charon licence   €   5.900,-
- Test pilot project   €   6.000,-

- Implementation of a project   € 20.000,-
  (including all hardware, software & licences)

Conclusion

- VAX Conversion is a project and **not** a product

- Moving the application from the VAX to another system is time consuming

- Migration with an Emulator is preferred above writing a New Application

For additional information

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Product descriptions

Application notes

Documentation

MAP