Replacing VAXen with VAX Emulation

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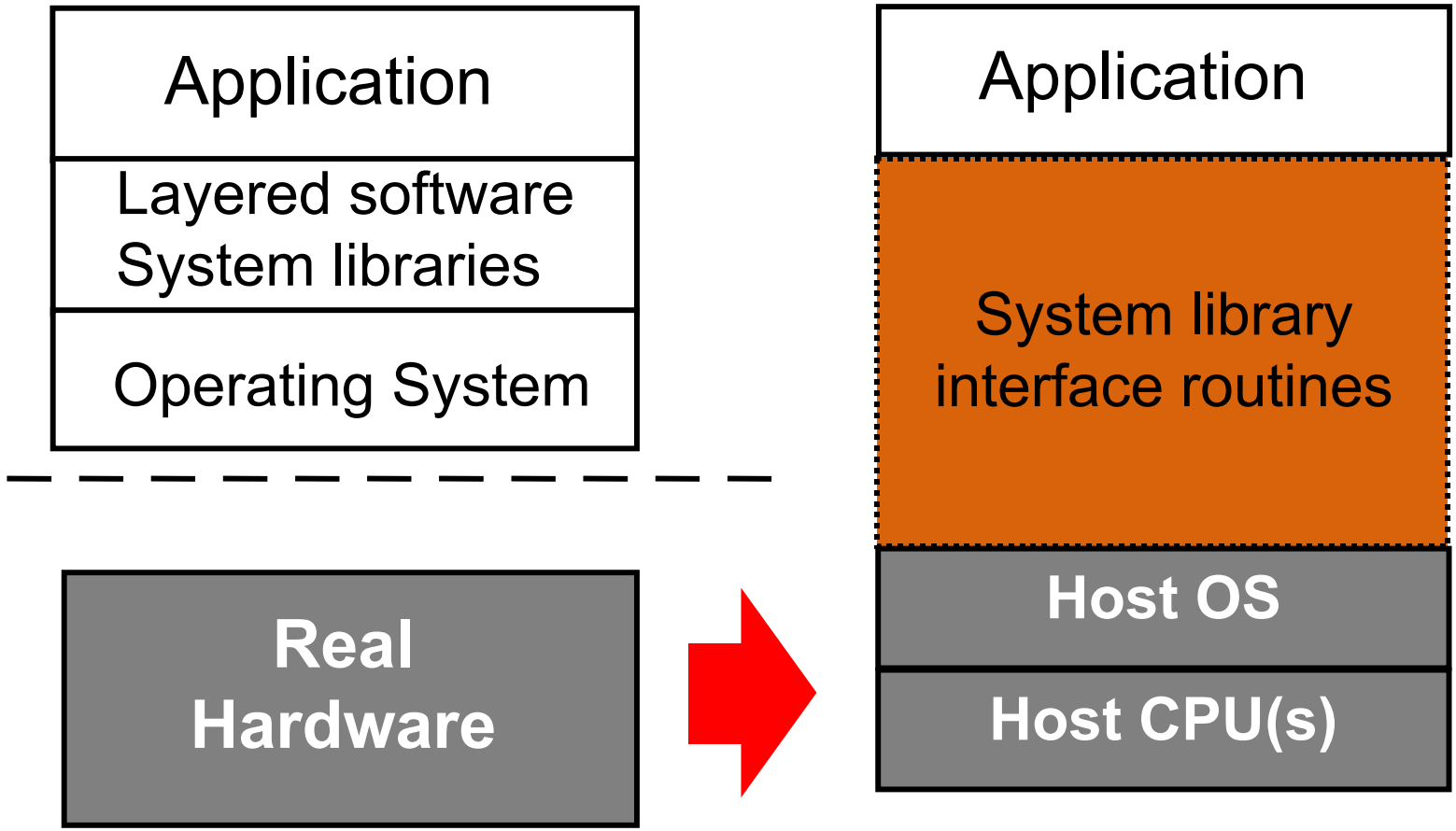
Session goals

- Whether VAX emulation makes sense
- How to choose the best emulator and platform
- How to get started

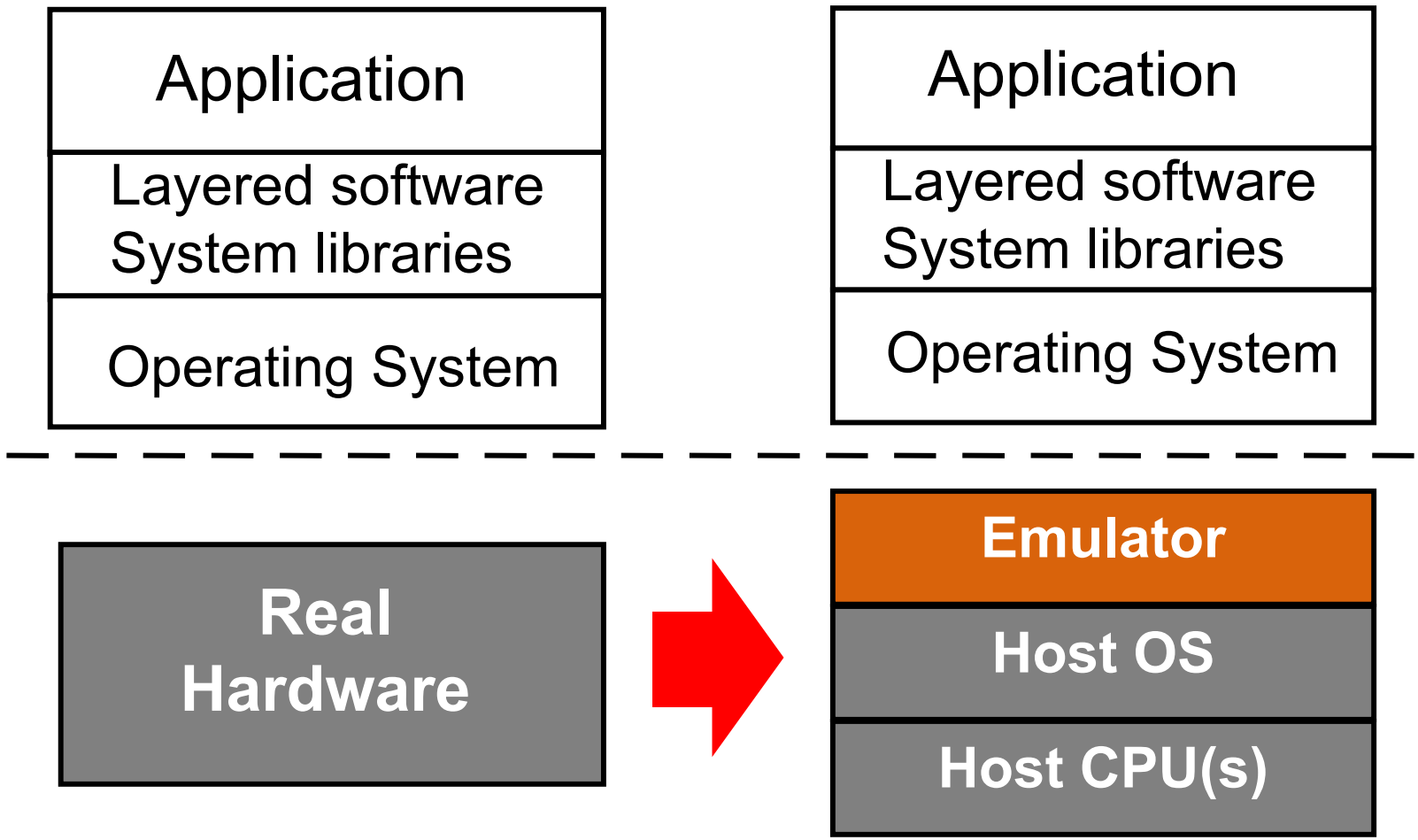
What about porting?

- Do you have the design documentation?
- Do you have **all** the source code?
  - What about DECmigrate (OMSVA)?
  - VAX SCAN, Dibol, LISP, OPS5, RPG
- Operating system dependency?
- Hardware dependency?
- Target platform
  - Can code **really** be reused?
  - What about stability?
- Can you validate the result?

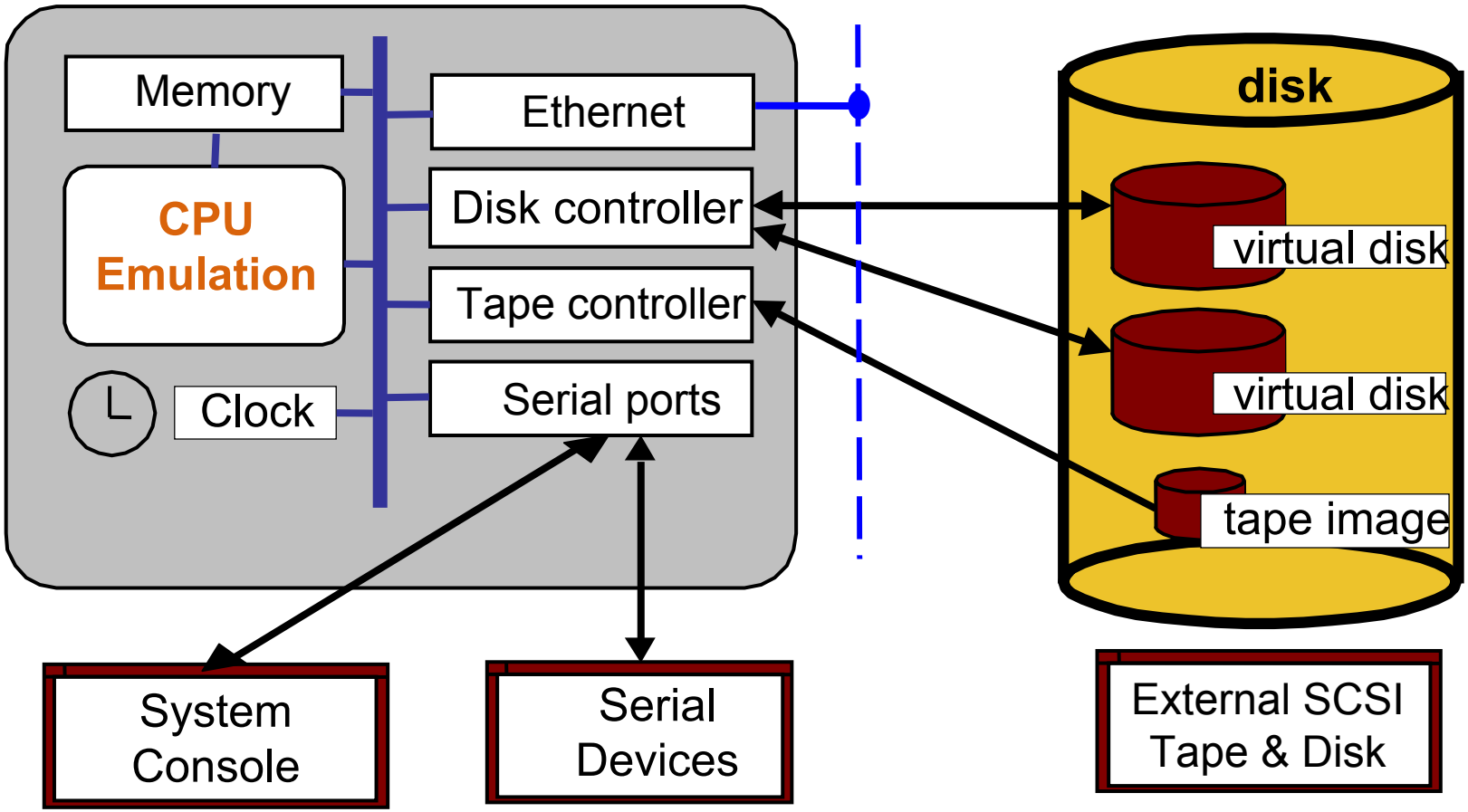
Wine, FreeVMS, and ACCELR8



How hardware emulation works



The emulator task

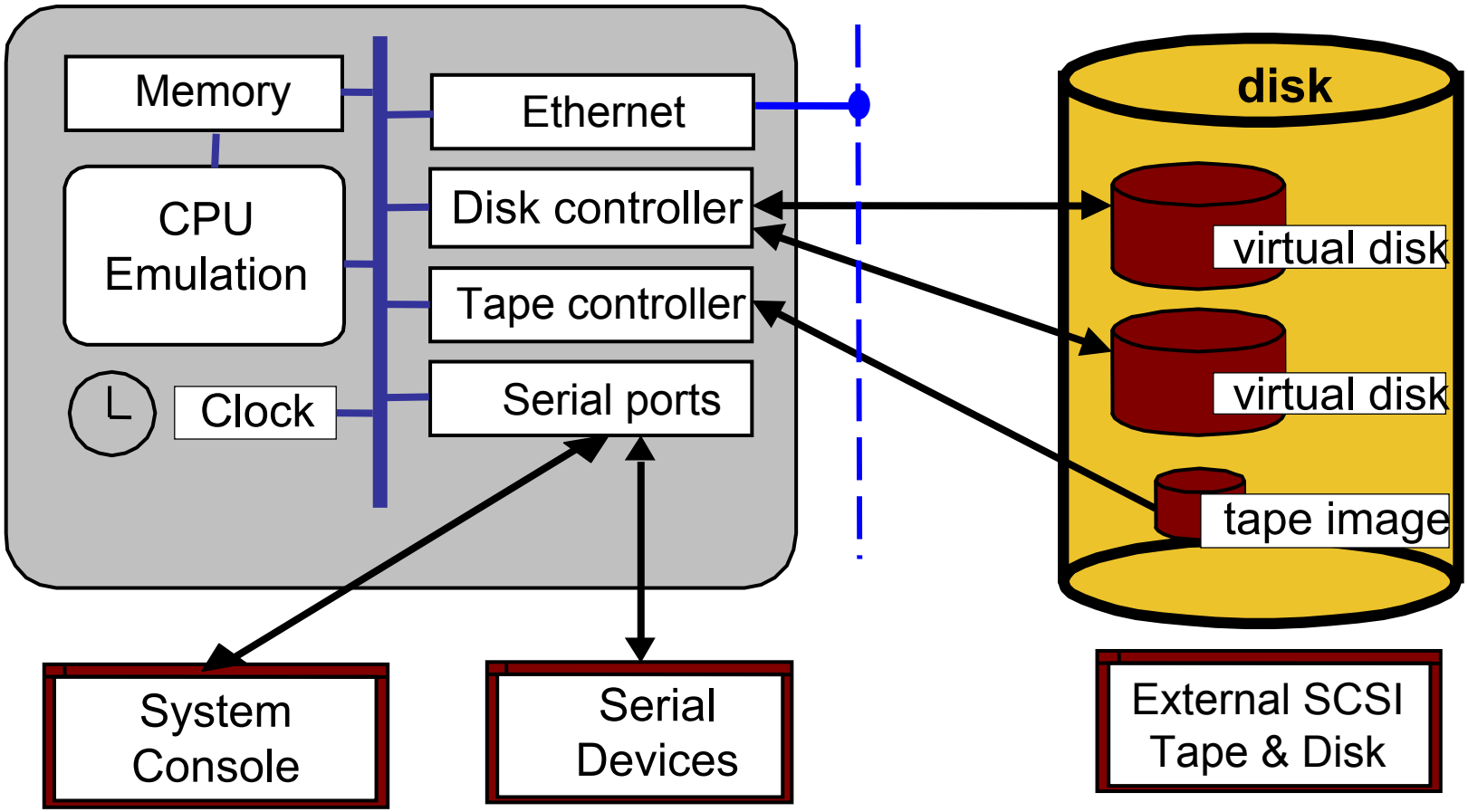


CPU emulation

"TSTL XYZ"

- Retrieve state information from internal registers
- Fetch the instruction from memory
- Decode the operation to be performed
- Retrieve inputs from memory as needed
- Perform the operation
- Write results to memory as needed
- Update internal registers with the new state

The emulator task



Cost versus benefit

- The high cost of downtime
  - Customer impact
  - “Above the Fold” on Wall Street Journal
  - Data Loss
- Saving money on maintenance
  - It’s **cheap** to replace a PC
  - Limited support vendor choices
  - Hardware support for some VAXen is unavailable
- Improved performance

Available emulators

- Open-Source
  - SIMH
  - TS-10
  - Others
- Freeware
  - PicoVAX
- Commercial Product
  - CHARON-VAX

Open source or commercial?

- Open Source
  - Free: Can be downloaded from the Internet, including source code
  - User-extensible
- CHARON-VAX
  - Certified by HP as being a true emulation of a VAX
  - Supports Q-bus hardware
  - Dynamic Instruction Translation
  - Training, installation, configuration, migration, and support are available

Evaluating the current system

Major Items to Check

- CPU usage, memory size, number of users/processes
- Network
  - Protocols: DECnet, IP, LAT, cluster, IEEE 802
  - DECwindows
  - Connections
- Disk drives: size, type, shadowing
- Tape drives

Evaluating the current system

Major Items to Check

- VMS version
- Layered product versions
- Application

Evaluating the current system

Risky areas

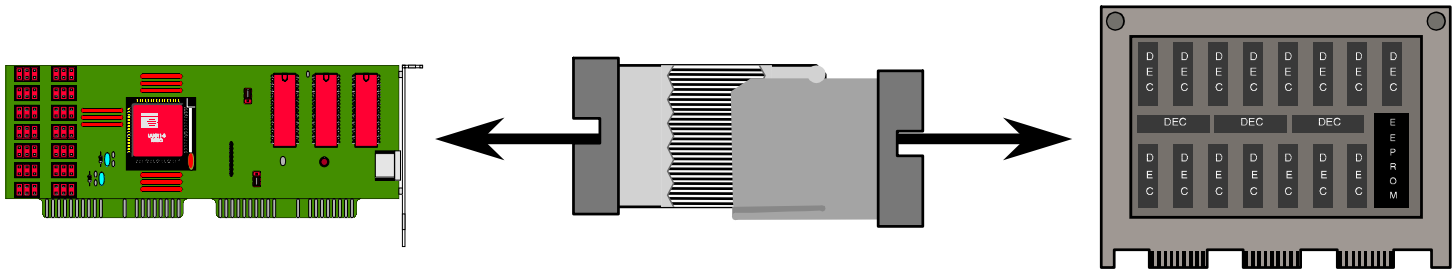
- Serial lines
  - Terminal servers
  - VAX serial lines
    - Console
    - Modem
  - H3104, DHV-11, etc
- Licenses
  - Network MAC address as “key”
  - CPU characteristics as “key”
  - VMS license requirements vs. emulated system
  - “It works” vs. “Is it legal”

Evaluating the current system

There Be Dragons Here

- Operating systems
  - NetBSD
  - Digital Unix
  - AT&T System V
  - VAXELN
- Special hardware
  - Bus: CI, M-bus, SBI, Turbochannel, UNIBUS, VAXBI, XMI
  - Disk interface: MASSBUS, SDI, ST-506 (MFM)
  - Some hope for: DSSI, Q-bus

Special hardware: Q-bus



Choosing the host platform

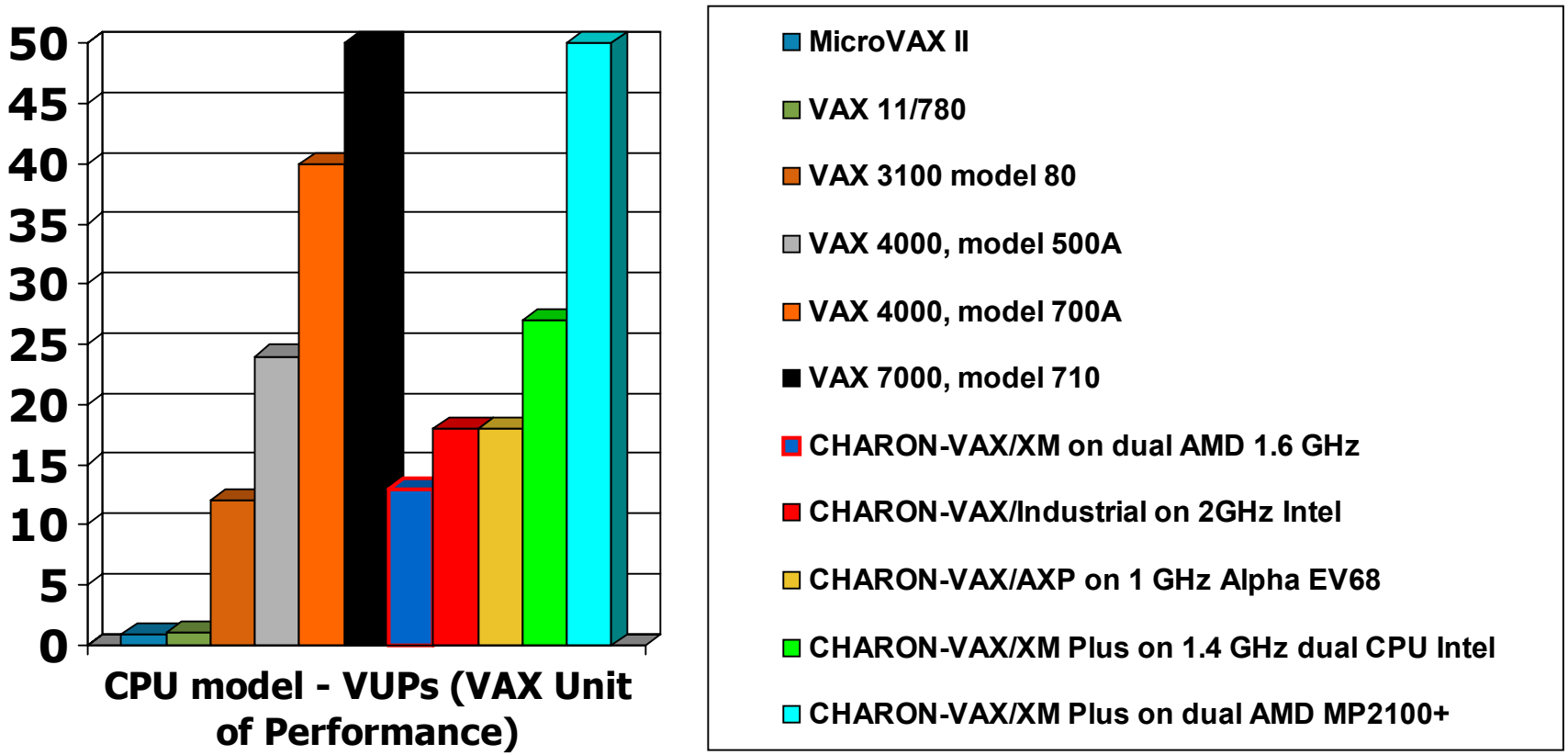
- Alpha OpenVMS
  - Unquestionable stability
- Linux
  - Inexpensive
- Windows
  - Inexpensive
  - Q-bus support
  - “Industry standard”

Sizing the host platform

"You can't have too much"

- Server-class
  - As fast as possible
- Memory
  - More with DIT
- Processor
  - Dual processors
- Disk
  - SCSI
- Network
  - Separate network adapter

Performance



Sources: HP and Software Resources International S.A.

Disk migration

- Direct disk access
  - SCSI? Just plug it in!
- Cluster
- Network
  - COPY or COPY/FTP
  - BACKUP
  - MKIMAGE
  - Poor Man disk driver
- Tape
- Serial

Backup strategies

- Tape
- Network
  - TCP/IP to host
  - NFS
- Host
  - Disk images offline
  - Disk images online
  - SCSI disks

Write a plan

- Disk migration
- Backup scheme
- Necessary updates
- Test
  - Connectivity
  - Application
  - Limited user access
- Going live
- Backout plan

Post-migration

And they lived happily ever after…

- Hardware support
- Software support
- System administration support
- New versions

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