

# Replacing VAXen with VAX Emulation

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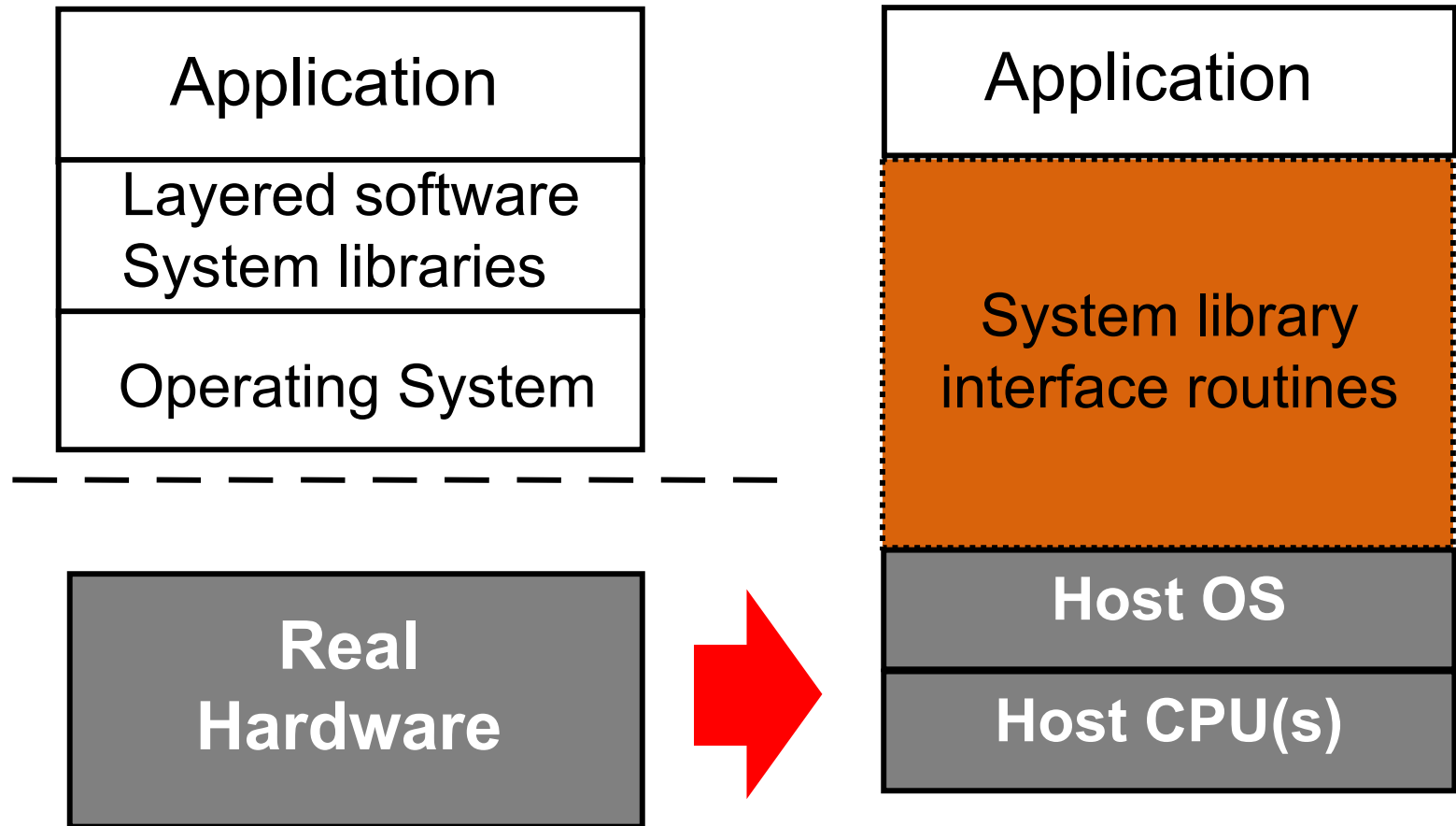
# Session goals

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

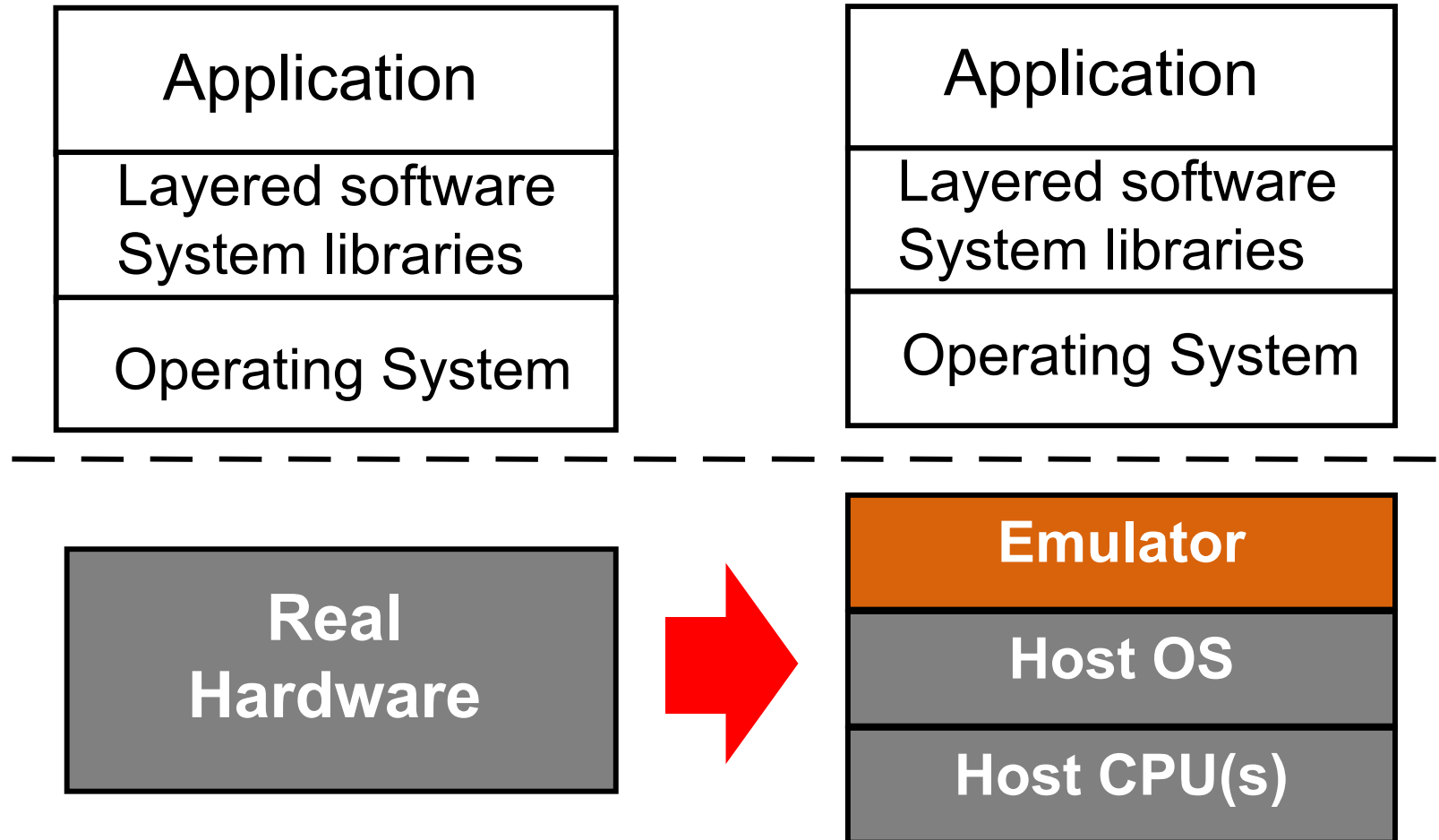
# What about porting?

- 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?

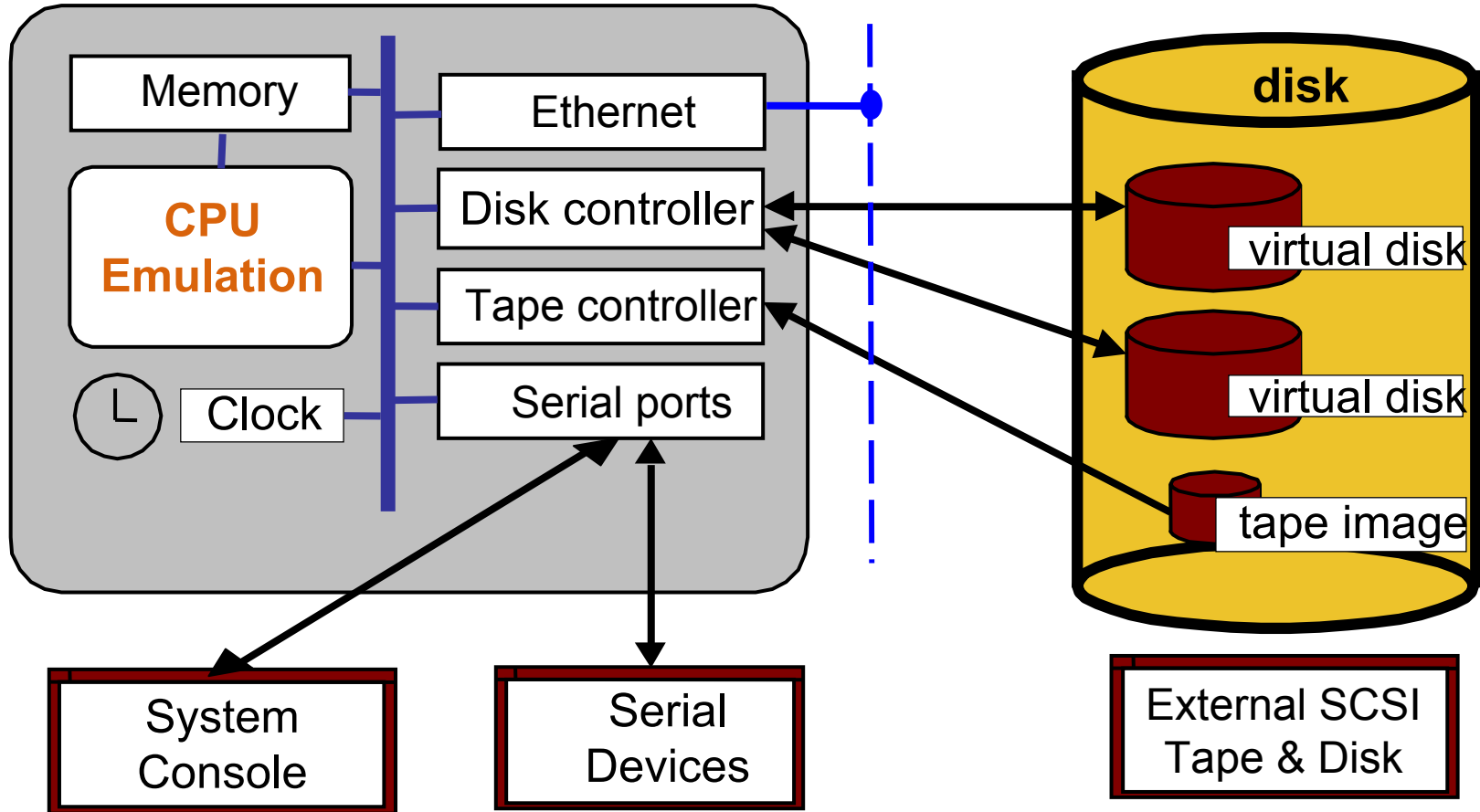
# Wine, FreeVMS, and ACCELR8



# How hardware emulation works



# The emulator task

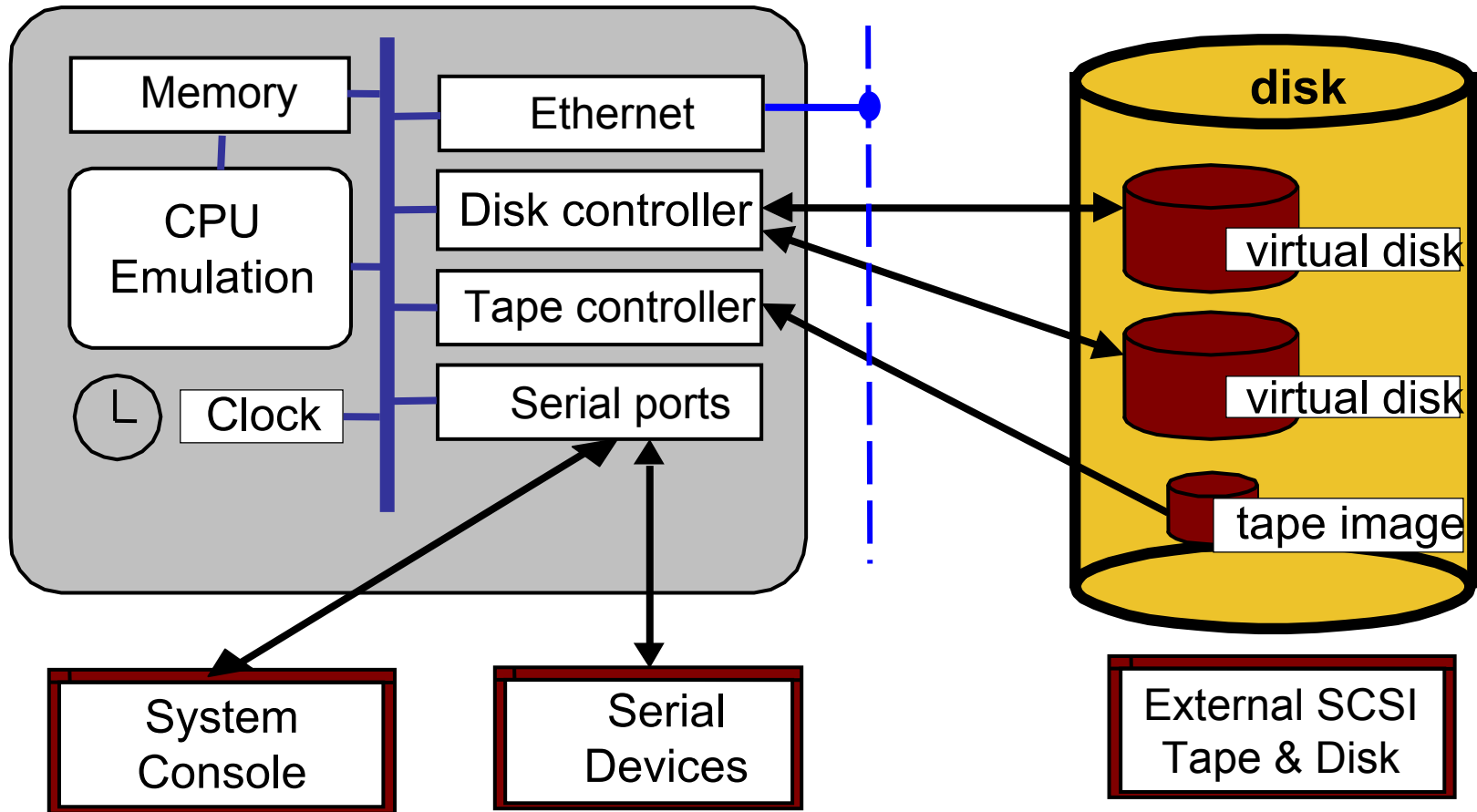


# CPU emulation

## *“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*

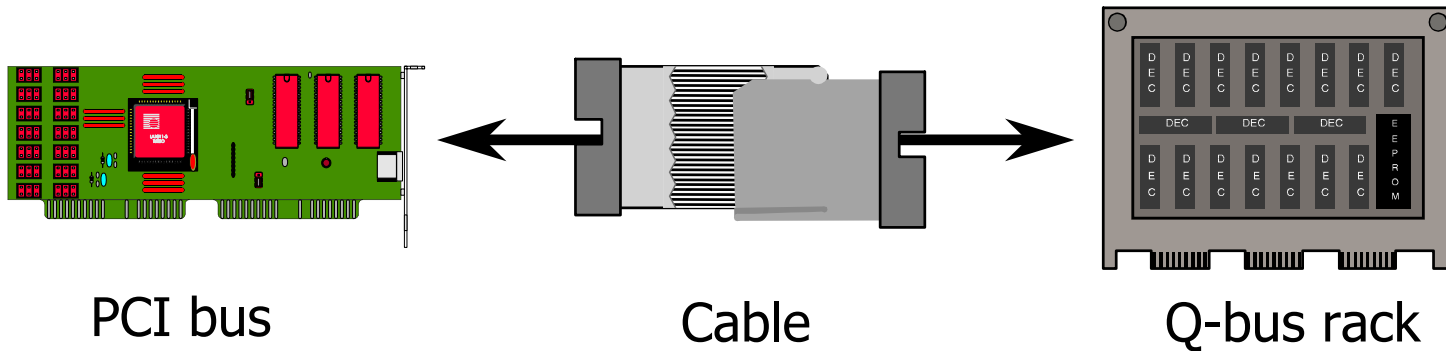
### ■ Operating systems

- 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

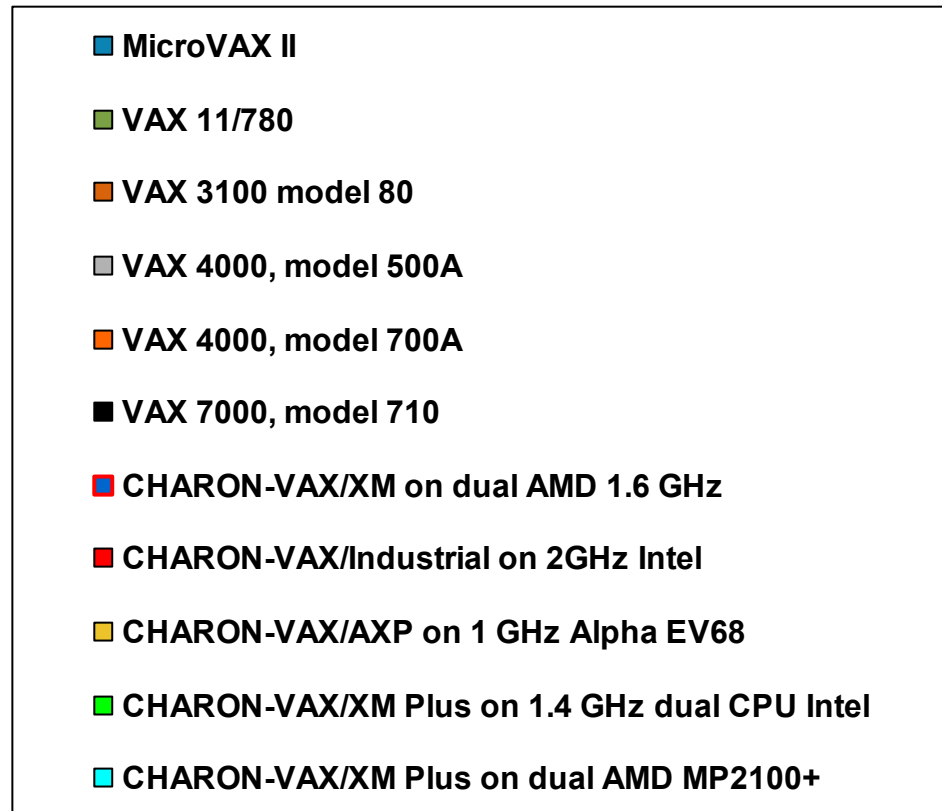
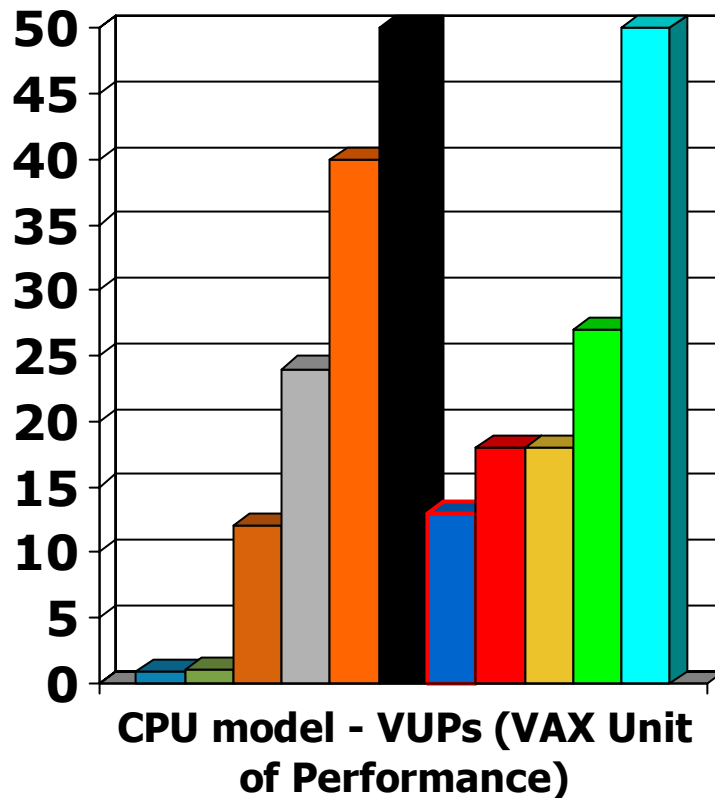
- Alpha OpenVMS
  - Unquestionable stability
- Linux
  - Inexpensive
- Windows
  - Inexpensive
  - Q-bus support
  - “Industry standard”

# 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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