Risks vs. Benefits of VAX/Alpha Emulation

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Today's Goals

- Recognizing candidates for emulation
- Preparing for emulation
- Minimizing migration time
- Validating the migration
- How to discuss the **value** of a solution, not just the **cost**
- Available emulators

Shameless Plug Alert ™

- Quayle Consulting Inc. is a Value-Added Reseller (VAR) of the CHARON-VAX and CHARON-AXP products manufactured by Stromasys.

Everybody's Doing It

- Virtual Systems are everywhere!
  - VMware, Xen, etc. for Intel
  - AS/400 emulators
  - Data General emulators
  - OpenVMS under HP-UX

What are the Benefits?

- Improve up-time and reliability
- Save floor space, power, maintenance costs
- Make the application faster
- Make the system "fit" into the current data center design
- Preserve the past investment in the application

The hope is that an emulator will allow the use of new hardware in the future, without having to change the application

When **Not** to Emulate – Part 1

- Dependent on instruction timing
  - Example: MicroVAX II controlling linear accelerator
- "Magic" hardware
  - Example: Space Shuttle ground test equipment
  - Q-bus is supported by some emulators
  - Other DEC buses are not supported by anything
- Some equipment doesn't have modern interfaces
  - 8" floppies
  - DSSI disks, CI, video disks
  - DECtalk

When **Not** to Emulate – Part 2

- Applications that provide life support
- No way to "image" existing system to emulator
  - Do you have the original media?
  - Is it readable?
  - And how do you get the data over?
- Is it acceptable to validation authorities?

When **Not** to Emulate – Part 3

- Impossible validation requirements
  - Can you **really** test 2^{32} cases?
  - Got any missiles handy?
- Impossible contracting requirements
  - Is it wise to replace a system that comes with a 12" thick contract?

Good Candidates for Emulation

The emulator maps modern hardware into something that the old application and OS recognizes:

- Network connections
- Serial ports
    - Terminal servers are "network" devices
- Disks
- Tape drives

What are the Risks?

- The emulator may not replicate the original system faithfully
- The emulator may fail, dropping users or even corrupting data
- The host system could fail, making the virtual environment inaccessible
- Non-VMS system administrators don't understand the solution
- Some customers try to go "cheap"
  - Run under VMware
  - Non-server hardware

Risk vs. Benefits

- The emulation provider and the customer must work together to decide whether emulation is the best solution
- How about VEST/AEST instead?
  - Middleware dependencies
  - Licensing dependencies
- Do you have **current** OS and application experience?
- I tell customers:

  "If you like your application before emulation, you'll like it more after. If you hate your application before emulation, you'll hate it just as much."

Preparing for Emulation – Part 1

- Evaluate all software licenses for validity on emulated system
  - HP, Oracle, Process Software transfer licenses
  - Other 3rd-party licenses, especially Ross Systems licenses
- Develop a validation plan
  - Customer's disaster-recovery plan can be a good starting point
  - Heavy customer involvement – to "buy" the migration, they need to "buy" the validation
- A proof-of-concept migration might be necessary

Preparing for Emulation – Part 2

- Do everything on the original system that you can
  - Load migration scripts
  - Test disks for integrity (ANALYZE/DISK for VMS)
- Get temporary addresses (IP, DECnet, etc.) to use on emulator while copying the OS and application
- Install emulator and build empty disk files
- Quiesce the system
  - Shut down databases
  - Lock out users
  - Stop queues

Minimizing Migration Time

- The data copied fastest is the data that isn't copied
  - Delete/purge log files and other cruft
  - Compress stuff that won't be needed immediately
    - ZIP and similar tools are widely available
- Find stuff that can be copied before the migration
- For a network copy, make sure you get max bandwidth
- Parallel streams help
  - Example: Three source VAX systems each with a tape drive, copying to 3 tape drives on the emulator

Validating the Migration – Part 1

- Attempt to mount the disks

- Validate the disk structures

- Boot from the system disk image, bypassing any application startup

  – Analyze & fix any startup errors, or prove that they're identical to those on the original system

- Verify access to disk drives, tape drives, serial ports, network, etc.

Validating the Migration – Part 2

- ## Make changes as necessary
  - In VMS, create logical names to map old device names to new names, etc.

- ## Have client execute validation plan
  - You might have to help the customer, or even **do** the validation yourself
    - Quote this up-front on a T&M basis, so there are no surprises

Value vs. Cost

- You must be able to demonstrate that the solution will provide more value (reliability, etc.) than it costs
  - No one buys a computer to just take up floor space – they need to run an application
  - If price was the only consideration, we wouldn't have cars
- Technical people are generally not trained in sales
- Emulation should be just one of many tools you have

Emulator Choices – SIMH

SIMH is an open-source VAX and PDP-11 emulator

- The price is right: free
- Some support is available
- If it breaks, you own all the pieces
- No direct access to hardware
- Not certified by HP as being a true emulation of a VAX

Emulator Choices – CHARON-VAX

CHARON-VAX is a commercial-grade VAX emulator

- Certified by HP as being a true emulation of a VAX
- Support is available through VARs and Stromasys
- Products range from 128 MB single-processor systems to 3 GB, 6-processor SMP systems
- Can access physical disk and tape drives, including SAN storage
- Some support for some other devices in CHARON-TB version
- Thousands of systems installed world-wide
- Hosted on Windows or Integrity OpenVMS

Emulator Choices – NuVAX

NuVAX is a commercial-grade VAX emulator

- Certified by HP as being a true emulation of a VAX
- Support is available through VARs and The Logical Company
- Comes with dedicated server and optional Q-bus card cage
- Real-time host OS (QNX)
- Replicates most original VAX instruction times

Free Alpha Emulators

These emulators are a way to "give back" to the VMS
community. They also provide a pool of volunteer beta
testers. They offer limited memory, disks, and performance.

- PersonalAlpha (Stromasys)
    - Limited version of CHARON-AXP
    - Not for commercial use
- FreeAXP (Migration Specialities)
    - Can be used for low-performance commercial applications

Both run on 32-bit Windows

Emulator Choices – CHARON-AXP

CHARON-AXP is a commercial-grade Alpha emulator

- Passes all Alpha architecture validation tests
- Support is available through VARs and Stromasys
- Products range from AlphaStation 200 to 32-processor AlphaServer GS320
- Can access physical disk and tape drives
- Installed base in the low hundreds
- Requires 64-bit Windows host

Emulator Choices – Avanti

Avanti is a commercial-grade Alpha emulator

- Support is available through VARs and Migration Specialities

- Will be available soon

- Host OS can be 64-bit Windows, Linux, or Integrity

Emulator Choices – PDP-11

- Some emulators:
  - SIMH
  - NuPDP from The Logical Company
  - CHARON-TB from Stromasys
  - Osprey from Strobe Data
  - Ersatz-11 from D Bit

Questions?