

Transitioning From HP-UX 10.20

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Agenda

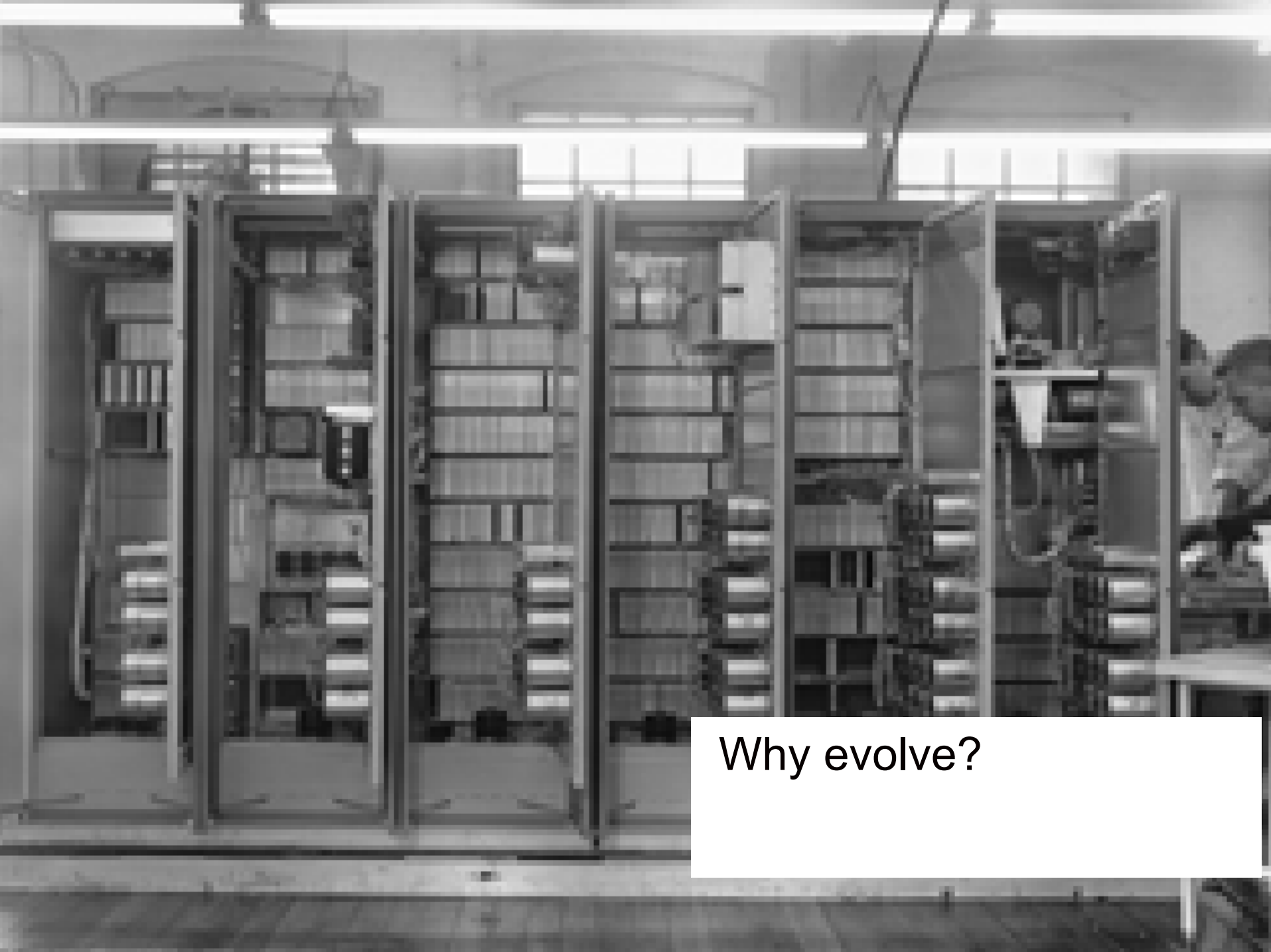
Why evolve?

What are your options?

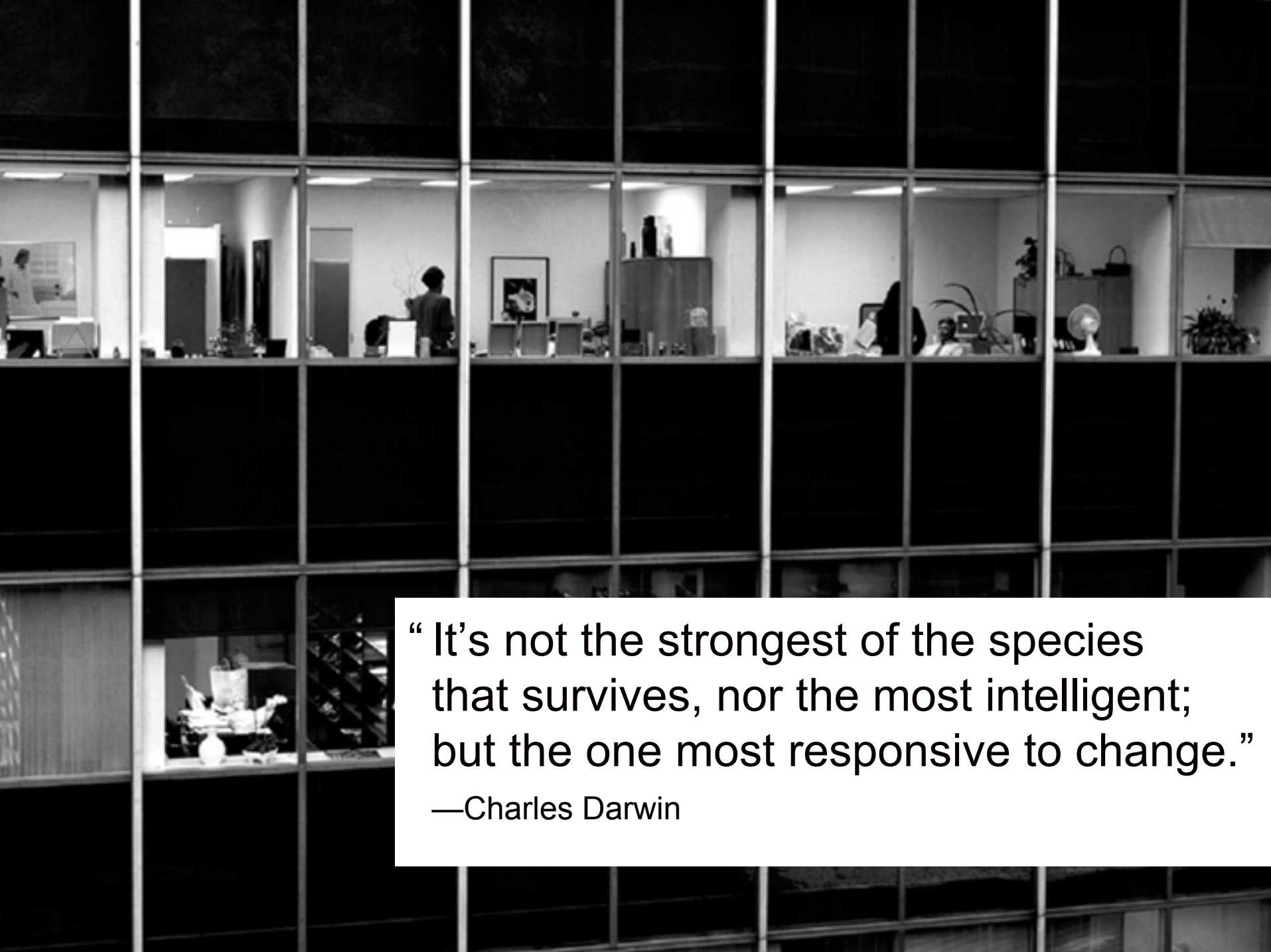
Making it easy

Next steps





Why evolve?



“It’s not the strongest of the species
that survives, nor the most intelligent;
but the one most responsive to change.”

—Charles Darwin

Managing change

Your computer environment is constantly evolving.....

- ✓ Updating / modernizing equipment
- ✓ Consolidating systems to become more cost-effective
- ✓ Maintaining / replacing existing equipment
- ✓ Balancing / maintaining existing infrastructure and evolving towards higher-performance, more cost-effective environment
- ✓ Changes in business processes, supporting new applications
- ✓ Deployment of new applications
- ✓ Taking advantages of new technologies to deliver competitive advantage to your organization

.....What is the best strategy for managing this?

What are your choices

Discard



Preserve the value of
your investments

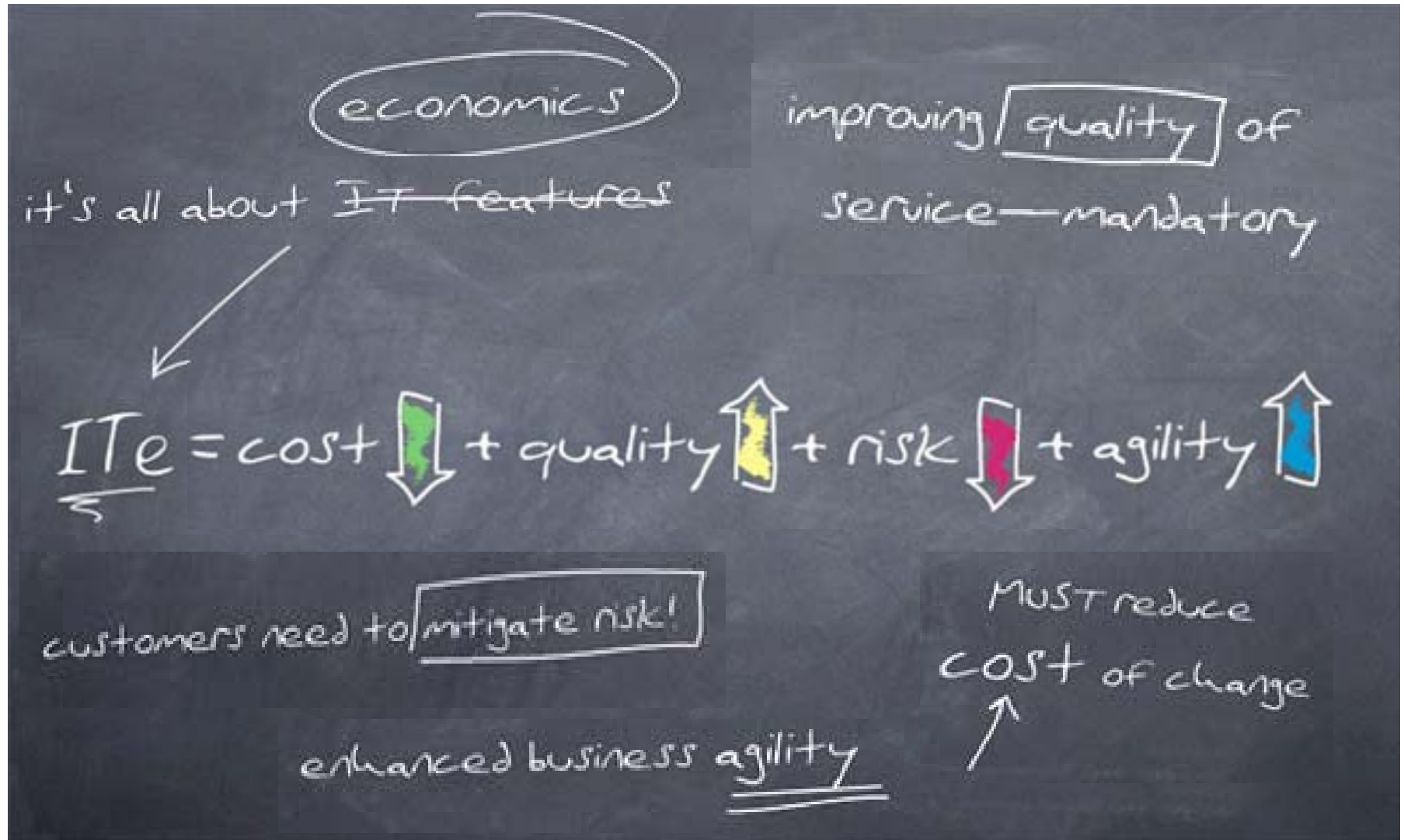
or

Evolve ?



... .. And evolve your
business with an
adaptive infrastructure
provided by HP

Focus on IT economics



Why move up to HP-UX 11i

Evolve to HP-UX 11i based solutions:

- The #1 UNIX operating system *
- Helps to evolve IT infrastructure while controlling costs
- The key to getting the greatest value from HP's UNIX servers
- The first step towards an evolution to Itanium®
- Binary compatibility with 10.20 so as to help remove application roadblocks
- HP-UX 11i has a large catalog of ISV applications
- An important step in evolving to an adaptive infrastructure that is agile enough to meet tomorrow's business demands

* DH Brown 2002 UNIX function review

HP-UX 11i features you do not get with 10.20



- **Java:** JVM 1.2, 1.3 or 1.4, native threads and hotspot for superior performance
- **High availability:** dynamic tunable kernel parameters, I/O online addition and replacement and hot patching, virtual IP addresses
- **Scalability:** instant capacity on demand (iCOD), pay-per-use & pay-per-forecast, 64-bit kernel & app support
- **Hardware & CPU support:** superdome, rp8400, rp7410
- **Partitioning capability:** hard partitions, virtual partitions (VPAR), goal-based resource partitioning (Workload Manager)
- **Better system management:** GUI based kernel config
- **Built-in security and directory services:** Host firewall, Kerberos server and HP-UX secure shell

HP-UX 11i recognized leadership



2002 UNIX Function
Review Report

#1 Scalability

#1 Reliability, availability, and serviceability

#1 Systems management

#1 Internet and Web application services

#1 Directory and security services

Butler Group

Server Operating Systems Report: Winners and losers in the open/proprietary OS market

Gartner

HP Superdome listed as top UNIX® server platform (Gartner, Inc.'s OLTP Server Evaluation Model report, 2002 and Data Warehousing Server Evaluation Model, 2002)



“HP climbs to the top of the enterprise operating system market”; “2002 VARBusiness Annual Report Card . . . voted it to the top . . . in the enterprise operating platforms category.”



hp

What are your options?

HP-UX 10.20 history

What HP 9000 servers use HP-UX 10.20?

- E-class
- F-class
- G-class
- H-class
- I-class
- D-class
- K-class
- T-Class



- ✓ HP-UX 10.20 was the version that complied with y2k
- ✓ Support for HP-UX 10.20 ended on June 30, 2003
- ✓ Support for E, F, G, H, I – class servers ends in early 2004

HP-UX 10.20 options

1) Update and stay supported:

Update existing HP-UX 10.20 server to version 11i

2) Rehost and optimize costs:

Rehost HP-UX 10.20 apps onto a different server with open capacity

3) Consolidate and evolve technology:

Consolidate or upgrade HP-UX 10.20 server(s) to a new server(s)

4) Stay on HP-UX 10.20:

Stay on HP-UX 10.20 and accept the risk of running in a non-supported environment

Option #1: Update and stay supported

HP-UX 10.20

Your current HP-UX 10.20 servers

option #1

Update



Same servers now
with HP-UX 11i

Your HP-UX 10.20 servers with significant remaining book value (D, K, T) and no need to grow the capacity

..... Updated to have HP-UX 11i now running on the same servers – thus maximizing the value of your current hardware

Option #1: Update and stay supported

option #1



Benefits:

Supported environment that is ready to accept new version of the application. Get the best of current platform with the #1 UNIX in the market – HP-UX 11i.

Offerings:

Update services available from HP and/or HP partners. Education curriculum with 20% discount. A Software Transition Kit (STK) tool for helping to port and/or qualify your existing software on HP-UX 11i. Valupack 10.20 migration services.

Option #2: Rehost and optimize costs

HP-UX 10.20

Your current HP-UX 10.20 servers



HP-UX 11i

Your other HP-UX 11i servers

Your HP-UX 10.20 servers with little remaining book value (E, F, G, H, I)

..... Rehosted onto your other HP-UX 11i servers, with spare capacity, to form a consolidated solution with HP-UX 11i – thus optimizing your costs

Option #2: Rehost and optimize costs

option #2



Rehost

Benefits:

New consolidated environment provides lower total cost of ownership, simplified management and reduced resource requirements. Ready to accept new version of the application. Ready to grow and add more users and functionalities.

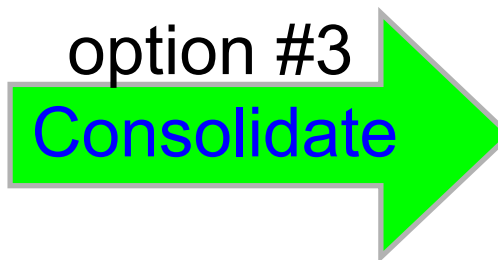
Offerings:

Rehosting services available from HP and/or HP partners. Education with 20% discount. Hardware and storage trade-up. Application re-architecting and re-testing. Free demo license for SW partitioning technology (VPAR). Software Transition Kit (STK). Valupack 10.20 migration services.

Option #3: Consolidate and evolve technology

HP-UX 10.20

Your current HP-UX 10.20 servers



HP-UX 11i
Internet critical. Performance ready.

New HP servers
with HP-UX 11i

Your HP-UX 10.20 servers with little remaining book value or a need to evolve the application

..... To a new consolidated solution based on HP's newest HP-UX 11i server family.

Option #3: Consolidate and evolve technology

option #3



Consolidate

Benefits:

Lower TCO, simplified management, reduced resource requirements. Ready to accept new version of application. Ready to grow/add more users and functionalities.

Offerings:

Consolidation services available from HP and/or HP partners. Valupack 10.20 migration services. 20% discount on education. 2X server trade-up rebate (E-I). Storage trade-up. Application re-architecting and re-testing. Free VPAR demo license. Special financing including 0% leasing. 10% to 20% discounts on support agreements. Assessments & TCO studies. Software Transition Kit (STK). 50% off select Storage Software. 20% discount on select servers when upgrading to latest Oracle Database/Apps.

IT Consolidation

Why consolidate:

- Save money by stacking applications on a single server
- Cost savings of 24% - 40% per year

Resource sharing:

- Manage multiple applications in a single partition
- Cost effective approach
- PRM - process resource manager
- Workload manager

Partitioning:

- Hard partitions, dynamically reallocatable soft partitions (VPARS)
- Isolate applications from one another
- Each partition has its own instance of the operating system
- Available with HP-UX 11i (not available with HP-UX 10.20)

HP-UX 10.20 success story

Starkey Laboratories, Inc.

Challenge

- Difficulty in pooling information centrally and having a global view of the operations
- Hardware was coming up for replacement
- Had to be ready to handle the imminent introduction of the Euro currency
- Needed to reduce cost of equipment, associated support outlay and operational expenses

Solution

- Consolidate hardware and software to one central data center
- Implement the latest HP rp7400, rp5400 and rp2400 servers
- Upgrade to Oracle E-Business Suite Release 11i
- MC/ServiceGuard and event monitoring services ensure the high availability of the solution

Results

- Upgraded three countries within a few months to meet support for Euro currency
- Global instance data will provide management with coherent decision support information
- Common business practices can be globally implemented and managed
- Consolidated server environment costs less than replacing legacy servers in situ

HP-UX 10.20 success story

“As part of our HP-UX 10.20 server upgrade project, HP and the design team took advantage of the high availability and scalability features of HP-UX 11i and are creating a custom solution that now meets the future needs of our worldwide operation. We consolidated our globally dispersed systems, reducing cost and complexity, and configured an efficient, highly available new environment, which allows us immediate access to coherent decision support information.”

Laurie Wondra
Director of Information Technology
Starkey Laboratories, Inc.



Making it easy

Applications: Removing the roadblocks



■ Binary compatibility:

- Full binary compatibility between HP-UX 10.20 and 11i
- No complex application migrations required
- Many ISV applications are already available on HP-UX 11i

■ 64-bit functionality:

- Take advantage of HP-UX 11i's 64-bit functionality when you're ready
- Software transition kit
- Software transition services
- Consolidation services

Software transition services portfolio *



- **Preliminary software migration assessment**
 - ✓ Uncover migration needs
 - ✓ Provide a project proposal
- **Detailed software migration assessment**
 - ✓ Conduct detailed application migration analysis
 - ✓ Architect the destination software environment
 - ✓ Recommend software enhancements
- **Application pilot**
- **Porting and migration solution delivery**
 - ✓ Perform software engineering
 - ✓ Migrate applications to HP servers running on HP-UX 11i
- **Application maintenance and support services**
 - ✓ Provide on-going maintenance and support for the software

* Available from HP services or through HP channel partners

Benefits of transitioning to HP-UX 11.0/11i from HP-UX 10.20



- Large memory addressing (up to 4 TB of RAM), allows:
 - Execution of large applications and data sets
 - New hardware enablement
 - Additional software functionality
- Very large file systems allows systems to achieve faster performance by avoiding performance-reducing disk swapping which can benefit:
 - decision support
 - data warehousing
 - online transaction processing
 - scaling to support thousands of online users simultaneously
- Allows for
 - 32-bit version for PA-7x00-based systems
 - K- and T-Class systems (based on PA-8x00) the choice of either a 32- or 64-bit operating
 - For 64-bit HP-UX 11.0/11i, you can run 32-bit applications and 64-bit applications at the same time on 64-bit platforms

Situations for 64-bit mode

- Applications limited by the 32-bit address space. Examples include:
 - database management systems
 - on-line transaction processing systems
 - engineering and mechanical design automation systems
 - simulation and modeling programs
 - decision support applications
- Large file caches on systems with large physical memory. Database servers have improved performance when they can load significant portions of the database into memory
- Large process data space mapped in a large virtual address space. Simulation programs need to be able to map the entire simulation model into virtual memory
- Large file support using standard system library calls. Some databases require data sets larger than 2 GB

STK (software transition kit)

- Tools and documentation to help you transition from older to newer versions of HP-UX. Assists you with questions such as:
 - What new features does the latest HP-UX release offer, and how can I take advantage of them?
 - Do I want a 32-bit or 64-bit version of my software?
 - Can I qualify my software (for example, run a 10.x executable on HP-UX 11.x) or do I need to port (create a new HP-UX executable on my destination platform)?
 - How can I transition my software to Itanium Processor Family (IPF), the new Intel and HP architecture?

STK tools

- For source code transitions, the HP-UX STK contains two command line tools to help you identify API transition impacts in your C, C++, Fortran, and COBOL source files. These tools can also identify opportunities for using enhanced HP-UX features
 - scansummary helps you determine how many and what type of API impacts are in your source files
 - scandetail helps you perform a transition by indicating exactly what API impacts occur on each line of your source files
- For system transitions, Ignite-UX:
 - Software product to do initial configuration and software installation of HP-UX systems
 - Able to install the 10.20 and 11.x HP-UX releases on PA systems
 - Allows deployment on a large scale and a means for creating and reusing standard system configurations

STK documentation

- Transition documents help decide how to transition and provide step-by-step instructions for each type of transition
- Reference materials include
 - white papers,
 - HP-UX Release Notes
 - supplementary technical information
- Impact classification overview document summarizes classifications of API impacts when transitioning source code
- Impact pages, accessible through the output reports from the HP-UX STK file scanners, describe each individual source code transition impact and how to resolve the problem

Prerequisites for using the HP-UX STK



Familiar with:

- HP-UX platform, including shell scripts
- Web (HTML document) browsers
- Source code you are transitioning
- Software development processes (editing, compiling, debugging, and testing)
- Programming language(s) of your source base

Installing the STK

- HP-UX operating system, version 10.x or 11.x
- Web server. Netscape FastTrack server is shipped with the HP-UX 11.x operating system, and includes a Web browser, Netscape Communicator. It can also be downloaded at no charge from <http://www.software.hp.com/> A Web server allows you be able to take advantage of the extensive search capabilities in the STK documentation
- Web browser, supporting at least 3.2
- Adobe Acrobat Reader (version 3.0 or greater), to view the PDF files included in the STK. You can download the Adobe Acrobat Reader at no charge from Adobe's Web page at <http://www.adobe.com/prodindex/acrobat/readstep.html>

Source code transition

- Qualify your application: run an existing executable on both the source platform and the destination platform
- Port your application: create a new executable by building the application on the destination platform
- You could choose different options for each executable

Qualify your application

- You have a well-behaved application
- When you want to provide a single executable for both your source platform and your destination platform
- Want to run your executable on your destination platform with minimal effort, and you can accept less than optimal performance
- Do not need to take advantage of new features in the destination platform

Well-behaved applications

Do not make assumptions in the following areas:

- run-time architecture
- platform architecture
- object file format
- how data is read from or written to memory
- using ambiguously defined data types or data types that have changed size

Data differences

- C longs and ints and pointers are now different sizes
- Check your source code for:
 - pointer assignments or pointer arithmetic
 - assignments across types (e.g. casting a type to another type)
 - arithmetic across types (e.g. int - long)
 - bit shifts and bit masks
 - bit fields
 - enumerated types (e.g. enums)
 - system data types (e.g. off_t)

Data problem areas

- data truncation (e.g. int = long). This can happen during:
 - initialization
 - assignment
 - parameter passing
 - function returns
 - casts
- data type promotion (e.g. long = int;)
- data alignment and data sharing (e.g. an integer data array created with ILP32-built application but read with LP64-built application)

Porting tips

- data truncation
 - avoid assigning longs to ints
 - avoid storing pointer addresses in ints
 - avoid truncating function return values
 - use appropriate print specifiers
- data promotion
 - avoid arithmetic between signed and unsigned numbers
- pointers
 - avoid pointer arithmetic between longs and ints
 - avoid casting pointers to ints or ints to pointers
 - avoid storing pointer addresses in ints
 - avoid truncating function return values

Porting tips (cont)

- structures
 - avoid using unnamed and unqualified bit fields
 - avoid passing invalid structure references
- hardcoded constants
 - avoid using literals and masks that assume 32 bits
 - avoid hardcoding size of data
 - avoid hardcoding bit shift values
 - avoid hardcoding constants with `malloc(3)`, `memory(3)`, `string(3)`
 - use appropriate print specifiers

Reasons to port your application

- Application needs to run with optimal performance
- Converting 32-bit executable to a 64-bit executable
- Need to transition CMA threads-based executable to kernel threads
- Software compiles or links at run time (installation, execution, and patch)
- Software generates relocatable objects (for example, archive or shared libraries, or object modules) during run time
- Willing to support separate executables for source and destination platforms
- Software is a library
- Upgrading your compiler

Porting your application

- Set up your user environment as described in Configuring the HP-UX STK Tools
- Scan your source files using scansummary and scandetail
- Resolve impacts in your source files
- Set up your new development and build environments
- Upgrade your compiler (if required)
- Build and test your application on your source platform
- Build and test your application on your destination platform

Scandetail and scansummary

- scansummary provides:
 - number of instances of API impacts
 - brief description of each impact identified in your source files
 - magnitude of your application transition
 - indication of potential problems
- scandetail provides for each API impact:
 - file name
 - line number
 - a brief description of each API impact

File types scanned with STK

File Type	File Name or Extension
makefiles	Makefile, makefile, *.mak
C	.c, .h, .ec, .l, .y
C++	.C, .H, .cpp, .hpp, .cxx, .hxx, .cc, .hh
free format Fortran	.f90, .F90, .r
.f90, .F90, .r	.f, .F
COBOL	.cob, .COB, .cbl, .CBL
script	.sh, .csh, .ksh, .pl, .awk, .bash, .tcsh, .gawk, .nawk, .tcl, .tk

STK scanners

- Find changed or obsolete
 - functions, subroutines (Fortran), or callables (COBOL)
 - commands
 - path names
 - macros
 - structures and structure members
 - header files
 - language keywords and compiler directives
 - libraries
 - variables and specifiers (Fortran)
- Identify opportunities for using enhanced features of HP-UX

64-bit tools

- HP C
- HP aC++
- HP Fortran 90
- HP Assembler
- HP WDB (debugger bundled with compilers)
- HP CXperf (performance toolkit)
- HP Linker toolset (bundled with the operating system)
- MicroFocus COBOL

Cross-platform development

- Applications can be compiled and linked in both 32-bit and 64-bit mode on HP-UX 11.x 32-bit or 64-bit systems
- You can optionally install 64-bit versions of HP-UX 11.x system libraries on HP-UX 11.x 32-bit systems in separate directories from the 32-bit system libraries
- Linking 32-bit and 64-bit object files (.o, .sl, .a) together is not supported. All modules in a program must be linked from either 32-bit objects or 64-bit objects
- You need access to a 64-bit hardware platform running the 64-bit version of HP-UX 11.x in order to test 64-bit programs

Methods to move your system to 11i

- Installing:
 - Rebuild the root file system
 - Erase the existing OS and data
 - Install the new OS and specified software and data
- Update using the Software Distributor (SD-Ux) tools:
 - Selectively overwrite the OS and/or application software from a media or network source depot
 - In most cases, the user data and disk layout can be preserved when updating to a new OS
 - Updating to a new version of the OS is dependent on the version already on the system

Choosing install option

- When changes to the disk configuration require reinstallation. Examples are changes to:
 - Volume sizes
 - Volume manager
 - File system type
- Size of your current /stand partition is less than that required by the OS. This requires reformatting the root disk
- Requirement to accurately predict the transition time
- Need to load the same OS many times
- Need to load the OS 7 or more times with the same applications configured similarly
- User, data, and application files are on separate discs from the OS or are easily copied off
- Automated, generated record of the software load is a requirement

Methods of installing HP-UX

Listed in order of increasing complexity, they are:

- Media Install — Install from local physical media. For more information, see HP-UX 11.0 Installation and Update Guide
- Generic Operating System — Use an Ignite-UX server to push or pull a generic OS and associated software from an SD depot or CD-ROM using your network
- System Archive — Push or pull a customized (golden) image over the network using an Ignite-UX server

When to use media install

- 1-3 systems to install
- Require installation isolated from the network (standalone)

When to use generic OS install

- 1-3 systems with similar configurations to install
- Most of your systems configured uniquely from all others
- Want to manage the installations from one console
- Limited time to spend setting up the Ignite-UX server and user environments

When to use system archive install

- 7 or more systems with similar configurations to install
- Need to transition a lot of similarly configured systems in a short amount of time (over a week or weekend)
- Installing many systems with a minimum amount of user and system administration interaction
- Need to reinstall systems with their original configurations
- You have the resources (time and system) to set up an Ignite-UX server

Choosing an update option

- When adding a few patches or a single application to your system
- Each of your systems is configured uniquely by design
- Transitioning a few (1-3) systems to the new OS
- Need to preserve many local system changes that cannot be automated in an install process

Transitioning to Itanium

- Majority of applications running on HP-UX 11i v1 PA-RISC need no source code changes to run on HP-UX/Itanium®
- Using existing compiler language, optimization techniques, and engineering techniques, you may choose to rebuild your application for Itanium
- Rebuilding can be done on PA-RISC using cross compilers or natively on Itanium
- You may choose to run a 32-bit application on HP-UX/Itanium and will not need to move to 64-bit unless you choose to

More info on the STK

- STK documentation:
<http://docs.hp.com/hpux/os/11.0/index.html#programming>
- STK website: <http://devrsrc1.external.hp.com/STK/>
- STK download:
<http://devrsrc1.external.hp.com/STK/download.html>

PRESENT → FUTURE



SITUATIONS THAT ENABLE AN
ADAPTIVE INFRASTRUCTURE



ADAPTIVE INFRASTRUCTURE



RESOURCES / APPROACH

WHO

HOW

LOCATION
EFFECT

PROGRAM /

BARRIERS FOR PRAGMATIST MARKETS

Next Steps

Where to go for more information

- Visit the website: <http://www.hp.com/go/evolve>
 - Centralized resource for programs, white papers, tools, web-based training, etc.
 - Select your present platform (HP 9000)
 - Also includes info on HP e3000 and Alpha Servers
- Sign up for “Customer Times” newsletter for quarterly updates
- Contact your sales rep or channel partner





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HP-UX 11i release roadmap

