

# Tru64 UNIX to HP-UX 11i Transition Options and Timeline Evaluation



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## Overview

This paper addresses high-level questions you may have about transitioning from Tru64 UNIX on AlphaServers to HP-UX 11i on Itanium<sup>®</sup>-based HP Integrity servers or PA-RISC-based HP 9000 servers, such as:

- How should I approach planning this transition?
- What are the major subcomponents of the project?
- What are the overall concerns beyond those of individual technological areas?
- What are HP's roadmap plans for the enterprise UNIX operating systems, Tru64 UNIX and HP-UX 11i?
- What transition tools are available and how will they help to ensure a smooth transition?
- What are the major transition options?

This paper is divided into the following topic areas:

- Incentive for change

The first step to understanding and planning your transition from Tru64 UNIX to HP-UX is to know HP's plans, timelines, and major feature enhancements for both operating systems. This section reviews HP's plans for its enterprise UNIX operating systems, describes the features of HP-UX, explains what transition resources are available, and introduces the three different transition options:

- Continued use of Tru64 UNIX AlphaServers
- Transition to HP-UX 11i on HP Integrity servers
- Transition to HP-UX 11i on PA-RISC based servers

- Transition option selection and general timeline consideration

This section explains the importance of identifying high-level goals, constraints, and opportunities for the transition project. It also describes the information about your current environment that you need to gather to evaluate the full impact and potential of transitioning. Finally, this helps you review the different transition options in terms of advantages, challenges, methodology, and timeline.

To complete the analysis, you need to review the *whole solution* to determine how high-level IT goals of the application relate to lower-level plans for the Tru64 UNIX AlphaServer platforms.

- Executing a transition

This section introduces an IT project execution methodology. It also describes the resources available to you in the Tru64 UNIX to HP-UX 11i transition modules (TMs). Through the TMs, HP provides you with detailed resources and tools to help you plan and design your transition.

## Incentive for change

This section discusses the incentives for migrating from Tru64 UNIX to HP-UX 11i.

### Future roadmap for HP enterprise UNIX offerings

HP announced in 2002 that Tru64 UNIX and the AlphaServer platforms would continue to be sold through 2006, and supported for a minimum of five years following the last sales date. In addition, options for these newer AlphaServers would continue to be sold through September 2007. On the other hand, the combination of HP-UX 11i key features such as virtualization, partitioning, and workload management will provide you with a robust enterprise UNIX, enabling you to create a more

flexible IT environment that is more responsive to the unique needs of your business. Coupled with the transition resources from HP, you have many positive opportunities.

The major points of HP's product plans for enterprise UNIX solutions are:

- Additional Tru64 UNIX functionality and capability, primarily in the area of new hardware and storage support and interoperability, are still being introduced.  
Tru64 UNIX upgrades and AlphaServer models will be offered until October 2006. The last sale of options will be October 2007. Full support will be available through 2011. The operating system and server product availability window is long, allowing substantial time for planning, designing, and implementing your transition.
- Tru64 UNIX Version 5.1B will be the final version, and it provides the longest support window (five years after the last sales date for AlphaServer). With the planned transition, over time, to HP-UX 11i, the HP Tru64 UNIX development strategy focuses on two areas: preserving binary compatibility to ensure ISV stability and improving operating system stability, resiliency, and performance tuning. HP preserves the value of your Tru64 UNIX solution ecosystem by isolating future minor enhancements from application interfaces to ensure application binary compatibility on all future Tru64 UNIX releases.
- HP's long-term going forward strategy for enterprise class UNIX platforms is HP-UX 11i.
- HP will be enhancing the HP-UX 11i product in 2005 with a Cluster File System and the most recent versions of the VERITAS VxFS File system and VxVM volume manager. These additions will provide comparable features and capabilities to the Tru64 UNIX TruCluster Cluster File System and AdvFS File System.

The previous dates are used in the planning sections of this paper. Before you start any detailed planning, check the latest versions of the roadmaps to see if any updates or changes have been made (see Reference [1](#)).

## HP-UX 11i features

HP servers running HP-UX 11i today offer a successful and mature full-featured enterprise UNIX with features comparable to and, in several cases, better than those in Tru64 UNIX.

Features of the current HP-UX 11i operating system include:

- Comparable or better application performance of HP Integrity servers or as compared with AlphaServer running Tru64 UNIX.  
Full line of server hardware available with either Intel Itanium with CPU counts up to 128 and memory up to 1 TB. The performance capabilities of these servers are evidenced by recent public benchmark results (see Reference [2](#)).
- Facilities and capabilities to deploy enterprise class solutions  
HP-UX11i is deployed in more industries and in larger numbers than Tru64 UNIX. It has a larger independent software vendor (ISV) base and associated product base than Tru64 UNIX.
- Attractive features for large platform and resource management with no equivalent in Tru64 UNIX. In particular, HP-UX 11i supports:
  - A Virtual Server Environment (VSE) for flexible and efficient sharing of platform resources within the same and between multiple HP-UX 11i servers
  - A Partitioning Continuum that includes hard (`nparts`) and soft (`vpars`) partitioning of large server platforms.
  - Workload management tools based on preset resource allocations (Process Resource Manager (PRM)) and application service-level criteria (Workload Manager (WLM)). These tools are fully integrated with clustering and are foundation technologies for HP's Utility Server Environment and Adaptive Enterprise initiatives.

These capabilities represent a unique opportunity for you if you are interested in server consolidation and efficient reuse of IT resources not available in Tru64 UNIX.

For more information on these capabilities and their relevance to sites using Tru64 UNIX, refer to the *Large System & Resource/Workload Management* webcast (see Reference [3](#)).

## Transition resources

HP is committed to providing you with extensive transition documentation, robust tools, and other assistance to ensure a smooth transition to HP Integrity server.

This paper is a small example of the resources that HP is providing to help you manage the eventual transition from your Tru64 UNIX platforms. The resources are structured to support different transition scenarios. For example, you might implement all of the transition yourself or implement some of the transition and engage fee-based HP Services resources for the remaining transition tasks.

The resources available cover every aspect of a complete IT transition:

- Planning whitepapers, guides, and collateral information
- Tru64 UNIX transition training (see Reference [4](#))
- HP-UX 11i training through a variety of course delivery methods (there is general training and customized training for IT professionals with Tru64 UNIX experience; see Reference [4](#))
- Tools, checklists, and defined methodologies for transitioning platform infrastructure, custom code, ISV software, and Oracle databases (see the Tru64 UNIX to HP-UX transition modules section for more information).
- Financial investment protection plans and programs to offset risk and build in a manageable window for transitioning (see Reference [5](#))

For more information on transition resources, refer to the Alpha RetainTrust website:

<http://www.hp.com/go/alpha-retaintrust/>

HP has committed resources and programs, and made product roadmap decisions to be the leading provider of enterprise UNIX solutions. Key to achieving this objective is to ensure that you have compelling reasons to transition from the Tru64 UNIX to HP-UX operating system with minimal disruption to your IT operations. HP's primary objective in structuring products and resources is that you can transition at a schedule that makes the most sense for you and your IT goals.

Later sections of this paper will outline how to identify those goals and opportunities.

## Three different transition options

HP believes that HP-UX 11i on HP Integrity servers will be the next destination for customer IT solutions currently utilizing Tru64 UNIX on AlphaServer platforms today. HP Integrity servers, based on the Itanium®2 processor, deliver industry-leading performance across multiple workloads. HP Integrity servers are highly scaleable and provide rock-solid reliability with ECC memory error checking and machine-check architecture to ensure data integrity.

HP recognized that the price/performance of the industry-standard Itanium® 2 microprocessors would soon supersede that of those of proprietary RISC microprocessors, such as Alpha and PA-RISC, and partnering with Intel® to manufacture the Itanium® 2 would yield the benefits of standardization. HP chose to deliver value on top of industry-standard 64-bit Itanium® microprocessors to deliver a flexible, high-performance server product portfolio: HP Integrity servers.

Within this long-term vision, short-term options, and individual business requirements, there are three broad transition options. Each option has potential benefits depending on the circumstances, goals,

and constraints in your environment, and the solution you have deployed on Tru64 UNIX on AlphaServer. The three transition options are:

- *Continue to use existing Tru64 UNIX on AlphaServer for the foreseeable future*  
You can take advantage of HP's commitment to continue to support the Tru64 UNIX environment for many years to come and, as needed, utilize the exiting window while still opening on new sales to implement hardware refreshes to lower support costs or increase performance head room. There are two variants of this option. If you are satisfied with the performance that your present AlphaServer delivers and your applications are certified for usage on Tru64 UNIX Version 5.1, then you should consider an upgrade to Tru64 UNIX Version 5.1-B to provide you with a stable solution environment for several years, extending the value of your AlphaServer investment.

If you are not satisfied with the performance of your current AlphaServer(s), but want to continue with Tru64 UNIX, consider an upgrade to the latest generation of AlphaServer systems. These systems deliver high performance to meet the most demanding workloads, and are excellent choices for customers requiring outstanding performance, reliability and expansion. All systems (HP AlphaServer ES47, ES80, and GS1280) have the same core capabilities: hard partitions, clustering, dynamic multipath I/O, RAID memory, and integrated server management tools.

This option is the least disruptive to current IT environments, but the timeframe where this is viable is generally contingent on the continued support and competitiveness of the ISV software being used in the IT environment, and whether it still meets or exceeds your business requirements.

#### *Transition to HP-UX 11i running on HP Integrity servers from HP*

A full line of HP Integrity servers from 1 to 128 CPU counts is now available. HP leveraged the engineering experience it has in developing enterprise systems to extend the capabilities of the Itanium® 2 microprocessor through the HP Scalable Processor Chipset zx1 for entry-level servers, and the HP Super-Scalable Processor Chipset sx1000 for midrange and high-end servers that increase memory and I/O subsystem scalability.

Recent public industry benchmark results have validated the performance expectations for the Itanium® processor. The major decision factor in when this option is viable for you is in the area of ISV software availability.

ISV support momentum for Itanium® is rapidly increasing. As of January 2005 more than 3100 certified ISV applications are now available.

HP is now increasing focus on key horizontal portfolios: ERP, BI, HPC. HP, through its DSPP program is targeted the smaller ISVs, providing them the support they need to port their applications to Integrity. The third category is addressing those situations which occur periodically where a customer wants to transition to Integrity, but one of their applications is not available on Integrity. We work with those ISVs to help them plan and accelerate a port to Integrity server. Most of these ISVs have an HP-UX 11i or Linux port, so the work to move that application to Integrity server can be fast-tracked.

Finally, as with HP-UX 11i on HP 9000 servers, if you are currently using and dependent on the Cluster File System of Tru64 TruCluster Server and the advanced features of the Tru64 UNIX AdvFS file system, the transition impact can be minimized by transitioning after the comparable Cluster File System has been added to HP-UX 11i Serviceguard clustering and the latest versions of the VxFS file system and VxVM volume manager have been added to HP-UX 11i in 2005.

- *Transition to HP-UX 11i running on HP 9000 servers*

HP-UX 11i on PA-RISC represents a mature and full enterprise computing environment, providing a full portfolio of supporting software and a large IT professional community. In addition, the Integrity server family was designed and developed so that the evolution path from a PA-RISC to Integrity is as seamless as possible.

HP-UX on HP 9000 is a useful option when business or platform drivers are in place to precipitate a transition from Tru64 UNIX, but inhibitors exist to Integrity adoption in the same time frame. The transition from Tru64 to PA-RISC could be planned as an end point in itself for the foreseeable future or as a step in an ultimate plan to transition to Integrity servers.

Moreover, since these HP 9000 servers use the same chipsets as the Integrity server family — the zx1 chipset (for entry-level servers) and the sx1000 chipset (for midrange and high-end servers) — it is easy to start with a PA-8800 or PA-8900 processor and replace them with future Itanium® processors (in-box upgrade).

## Transition option selection and general timeline consideration

This section explains the importance of identifying high-level goals, constraints, and opportunities for your transition project.

### Identifying high-level goals, constraints, and opportunities

Replacement of an operating system and server platform architecture can affect the entire *solution stack* and IT framework in which it is deployed. The first step in planning the transition is to identify the high-level goals, constraints, and opportunities for not only the transition project but the entire IT solution stack that it sits in.

The total solution stack will include some or all of the following:

- **Server, storage, and network hardware:** In addition to the minimal components, there are often specific options or enabled features of hardware that are an essential part of the overall solution.
- **Operating system software:** Along with the overall operating system, there may be specific features or options of the operating system that the solution relies upon.
- **ISV software:** Software purchased from an external software vendor and run on your system (for example, Oracle Server, SAP R/3, and so on).
- **Database software:** Software that lets you access, manage, and store large amounts of data, and also provides you with the ability to access and manipulate the data.
- **Internally developed software (also referred to as custom code):** Software that is developed internally by your company or under contract for which your company controls and manages the development, deployment, and support. This could include complete large, complex software programs or extensions/customizations to purchased packages.
- **IT infrastructure and management frameworks:** Console management and logging, backup and hierarchical storage services, error, event and performance management software.
- **IT staff:** The skill set and utilization of the existing IT staff.

**High-level goals:**

- Minimize cost, increase value
- Minimize intrusiveness, increase capabilities
- Minimize risk, increase stability

Within this framework of goals, there are constraints in terms of schedule, feature availability, configuration, and cost that immutably lay outside the boundaries that the transition project must address. Additionally, there are opportunities to optimize, increase and, in some cases, trade off against each other the maximization of these goals.

**Constraints:**

- Specific events that compromise the validity of the solution stack. For example the end-of-support of a component by a vendor
- Financial milestones such as expired leases or the availability of new budget
- Deadlines imposed by the organization for major accomplishments
- Specific dates for the availability of new products/versions that are a planned or potential part of the future solution
- Dictates within the organization about vendor preference or strategy

**Opportunities:**

- Use of assets as long as they are supported, serviceable, and continue to meet the operational requirements of the solution stack
- An evaluation of the complete IT solution stack and its overall current position in its life cycle:
  - Winding down; new replacement solution being planned anyway
  - Planning major functionality and/or scaling increases
  - Under cost-cutting pressures
- Identification of where node count reductions or CPU count reductions can decrease spending on ISV software licenses and support costs
- Server consolidation to reduce administration, equipment floorspace, power consumption, and required network services
- Enhance applications with additional access mechanisms such as Web-based browsers and new middleware portals to increase accessibility, value, and serviceability
- The introduction of front-end processing systems on lower-cost platforms
- The use of technologies available in HP-UX 11i that are not in Tru64 UNIX, such as virtualization, partitioning, and advanced workload management (PRM/WLM)
- The possible role of multi-OS capability in HP Integrity servers (Linux, HP-UX 11i, Windows®, OpenVMS)
- An evaluation of equipment leases and depreciation of assets as triggers for redeployment
- A reduction of current service and support costs with fewer, newer, and/or smaller boxes

Goals, constraints, and opportunities are interlinked and often overlap so an iterative process of evaluating them is frequently required. At the highest level, the goals for an operating system/platform transition are no different from any change being planned by an IT staff.

**General planning guidelines**

When planning a transition, use:

- Conservative estimates for new product availability.
- Conservative estimates for existing product retirement.
- Conservative estimates for new product features and rollout roadmaps.

- Pilot, prototype, and/or sandbox environments when introducing new solutions.

## Gathering necessary information about the current environment

To evaluate the full impact and potential of the transition options, you need a complete description of your current environment, including hardware, operating system versions, ISV software (vendor, product, and version), and a description of any custom code. Be sure to include all layers of software as well as any management software tools used in your environment.

As you gather information about each Tru64 UNIX server you are going to transition, fill out the *Current environment* worksheets. These worksheets are provided in an Excel workbook and correspond to descriptions in the following sections.

S-Transition-options-gathering-information-matrix-cc1.xls		
A	B	C
<b>Tru64 UNIX to HP-UX transition -- Current environment</b>		
<b>Platform features worksheet</b>		
		<b>Which platforms?</b>
	Availability/failover	
6	TruCluster	Parallel scale-out of tightly coupled applications
7		Single image storage and ease of management
9	Volume Manager LSM	
11	Disaster tolerance (DT)/ Disaster recovery (DR)	
13	Standard networking services (e.g., NFS, NIS, DHCP, CIFS)	
15	Hardware partitioning	
17		Multivolume domains
18	AdvFS	Online file system growth
19		Multifilesystem domains
20		Cloning
22	Advanced hardware storage features	
24	General level of performance utilization	
26	Site monitoring, management, & access tools	
27		



## Platform description

You need a thorough knowledge of the existing platforms to evaluate the potential benefit of possible replacement platforms, understand the current and future expected utilization, and identify recurring costs to the organization for the currently deployed server hardware.

## Platform servers

The specific information to gather about your current Tru64 UNIX AlphaServer environment includes:

- **Internal project name:** An internal reference to the solution stack/IT project that the system is a part of.
- **Platform name:** Internal platform name or default IP address name used to refer to the system.
- **Platform role:** The production level of the system (production, development, and so on) and the application role or major software (application tier, backend database, PeopleSoft, SAP R/3m, and so on).
- **Platform model:** AlphaServer hardware model.
- **CPU count (Hz) x memory (GB):** Number of CPUs, their clock speed or model number, and the amount of memory in the system.
- **Hardware partition (if applicable):** If this server is a hardware partition of a large AlphaServer, then find out the name for the overall platform or the names of the other partitions.
- **Operating system version/patch kit:** Tru64 UNIX version and patch kit currently being used on the server.
- **Current performance loading:** General assessment of the utilization and performance loading on the server.
- **Lease details (if applicable):** If the server is under lease, identify when the lease expires and if there are other systems or storage on the same lease.
- **Support contract details (if applicable):** If the server is covered by a support contract, determine the level (Gold, Silver, or Bronze) and what the monthly charge is for that support.

## Platform storage

The use of Fibre Channel-based storage greatly simplifies the reuse of storage between different servers. You need to check your storage system's details to verify support of your existing storage on future servers. Also, the amount of storage attached to a server is an indicator of the complexity and duration of a platform migration. Finally, storage is often on the same lease as the servers, so the replacement/upgrade of storage naturally coincides with migration of the server.

The specific information to gather about the storage currently being used on your Tru64 UNIX AlphaServers includes:

- **Storage hardware vendor:** Storage vendor of the hardware (HP, EMC, Hitachi, others).
- **Storage model:** Model of the array/storage enclosure.
- **Attached server platforms:** Determine which server platforms utilize storage provided by the array.
- **Amount of storage attached:** Find out how much storage being served by the array is utilized by each server.
- **Supported on HP-UX 11i Integrity servers:** Find out if the storage array is supported by HP or the storage vendor when it is attached to an HP-UX 11i Integrity server, as well as which HP-UX 11i releases are used and any special restrictions in terms of adapters, OS drivers, array firmware, patches, and so on.
- **Supported on HP-UX 11i PA-RISC servers:** Determine if the storage array is supported by HP or the storage vendor when it is attached to an HP-UX 11i PA-RISC server. Which HP-UX 11i releases? Determine if there are any special restrictions in terms of adapters and other hardware.

- **Lease details if applicable:** If the storage is leased, identify when the lease expires and if there is any other storage or server hardware on the same lease.

### Platform features

In some cases, the operating system features being used can be an important indicator of the complexity of the migration and the level of hardship if migration occurs before a Cluster File System and the latest versions of VxFS and VxVM are available on HP-UX 11i. For information on the differences between Tru64 UNIX and HP-UX 11i, see Reference [3](#).

Use the following checklist to list the significant Tru64 UNIX features to consider:

- **TruCluster:** Is the TruCluster product from HP for Tru64 UNIX being used?  
HP-UX 11i currently offers a mature and full featured clustering product called Serviceguard, which offers high availability and shared storage for tightly coupled, parallel scale-out applications such as Oracle 9i RAC. A future update to the Serviceguard product will include the addition of a Cluster File System (CFS) planned by the end of 2005. If you do not rely on the CFS capabilities in TruCluster Server, you should give HP-UX 11i v2 with Serviceguard serious consideration. If you rely on CFS capability, typically used in scale-out environments, you should wait for the release of a CFS in HP-UX 11i v2 on Integrity servers.
- **Availability/failover:** Is the cluster being used to obtain high availability for single instance applications using automated failover provided by the cluster?
- **Parallel scale-out of tightly coupled applications:** Is the cluster being used as an environment to run tightly parallel multi-instance applications such as Oracle 9i RAC?
- **CFS and ease of file sharing:** Is the integrated simultaneous sharing storage model of TruCluster Server CFS being used to simplify data sharing and reconfiguration between multiple cluster members?
- **Volume Manager LSM:**
  - Is the volume manager Logical Storage Manager (LSM) being used on Tru64 UNIX?
  - If so, what basic capabilities are being used (for example, striping, mirroring, concatenation, and so on)?

HP-UX 11i offers the Logical Volume Manager (LVM) from HP or the VERITAS Volume Manager (VxVM) as volume managers. VxVM is similar to LSM and will be the volume manager supported with CFS in Serviceguard when it is available.

- **Disaster tolerance (DT)/Disaster recovery (DR):** What mechanism, if any, is being used as a provision for continued operation or recovery in the face of a site disaster? Backup tapes at a remote site? Parallel development environment at a remote site?  
Is there a specific DT product at the application, platform, or storage level? HP-UX 11i offers a number of mature DT products fully integrated with the operating system and Serviceguard cluster products.
- **Standard networking services:** Are standard UNIX networking services being utilized by the server, particularly in a server role? For example, NFS serving, NIS serving, DHCP, CIFS serving (Windows on Intel shares using Samba or HP Pathworks for Tru64 UNIX), and so on?
- **Hardware partitioning:** Are larger AlphaServers being partitioned into separate, smaller server instances, each with its own operating system installation and applications using hardware-partitioning capabilities on AlphaServers?  
HP 9000 servers support both hard partitions with more fault isolation (*npars*) as well as soft partitions with more dynamic reconfiguration capability (*vpars*). HP Integrity servers currently support hard partitions (*npars*) and, by the end of 2005, will also support soft partitions (*vpars*).

- **AdvFS:** Is AdvFS being utilized and if so, how is it being used?

The current enterprise file system with roughly equivalent features to AdvFS in HP-UX 11i is the VERITAS File System (VxFS). A new version of the VERITAS file system 4.1 is planned to be available in the operating system by the end of 2005. This version will include features comparable to AdvFS's advanced features of multivolume domains and persistent point in time file system copies.

- **Multivolume domains:** Is the capability to have multiple storage volumes part of a common AdvFS domain being used?

VxFS currently has only a single volume storage model for all file systems. VxFS Version 4.1 in combination with VxVM 4.1 will include volumesets/multivolume file systems that are functionally equivalent to AdvFS domains.

- **Online file system growth:** Is the capability of online storage growth through the `addvol` and `rmvol` commands, or is the Tru64 UNIX Version 5.1B `mount -e expand` capability being utilized?

VxFS currently offers expansion but only in conjunction with growing the underlying volume using the volume manager or array controller external to the file system. VxFS version 4.1, in combination with VxVM 4.1, will include volumesets/multivolume file systems that allow the equivalent to AdvFS `addvol/rmvol`.

- **Multifileset domains:** Is the ability to define multiple filesets in a single AdvFS storage domain being utilized?

This feature is not a part of VxFS.

- **Cloning:** Is the AdvFS ability to create a point-in-time, read-only copy of a file system being used?

A similar capability exists in VxFS and is referred to as snapshots and checkpoints.

- **Advanced hardware storage features:** Are the capabilities for hardware snapshots, clones, or replication being utilized?

AdvFS and VxFS both support "freeze and thaw" interfaces to temporarily disable a file system prior to replicating its storage at the hardware level.

- **General level of performance utilization:** How heavily utilized are the performance capabilities of the servers? Can it be broken down further by memory, CPU, and I/O utilization?
- **Site monitoring, management, and access tools:** What special infrastructure tools are being used for site management and expected for any replacement servers? Site event management, performance monitoring, console access, backup, and so on?

### ISV software and support on Tru64 UNIX and HP-UX 11i

Determining the availability of ISV software on the respective platforms is critical to evaluating which transition option to select. In each case, the platform choice is secondary to your chosen software architecture solution. Once you have inventoried all the ISV software running on the current Tru64 UNIX AlphaServers, determine whether a version of the product exists or will be released soon on the respective OS/hardware combination:

- Tru64 UNIX Version 5.1B on AlphaServers (Version 5.1B is the final version of Tru64 UNIX; it will have the longest support window of any Tru64 UNIX version)
- HP-UX 11i v2 on Integrity servers
- HP-UX 11i v2 on HP 9000 servers

To determine ISV software availability:

- Refer to the packaged applications transition module available from:  
<http://www.hp.com/go/transition-modules>

- Use the information generated by the ISV roadmap advisory tool.

The ISV roadmap advisory tool helps identify the availability of key applications on Tru64 UNIX and HP-UX 11i. HP provides this information to help you understand the roadmaps for your key applications and to help you determine an optimal time to transition your particular packaged application environment.

Please contact your HP account representative or Solution Architect to receive information about the ISV roadmap information of interest to you.

The ISV-related information to gather is as follows:

- **Internal project name:** Internal IT organizational project name that is using the software product
- **ISV name:** ISV vendor name
- **Application name:** ISV application name (where multiple options exist or multiple modules are available within a product family, be sure to list each separately)
- **Current in-house versions:** Versions of the product that are currently being run in-house on Tru64 UNIX
- **Server platforms:** Which inhouse Tru64 UNIX servers are running the software?
- **Supported on Tru64 UNIX Version 5.1B versions:** What versions of the product are available (certified/supported) by the vendor on Tru64 UNIX Version 5.1B? If no version is currently available, are any planned?
- **Supported on HP-UX 11i Integrity servers:** What versions of the product are available (certified/supported) by the vendor on HP-UX 11i HP Integrity servers for the current version of HP-UX 11i v2? If no version is currently available, are any planned?
- **Supported on HP-UX 11i 9000 servers:** What versions of the product are available (certified/supported) by the vendor on HP 9000 servers for the current version of HP-UX 11i? If no version is currently available, are any planned?
- **Special considerations:**
  - Are there important features in future product versions your organization would like to utilize?
  - Is the product naturally a tiered architecture with server and client, or server and application tiered components, that can run on separate servers and may have different platform certifications from the vendor?

### Custom code

In addition to vendor-supplied software, you must also inventory internally supplied software to evaluate its current status on Tru64 UNIX and its potential status on HP-UX 11i.

The custom code-specific information to gather includes:

- **Internal project name:** Internal name for the IT project that uses the software
- **Internal group/DRI:** Contact information for the development group responsible for the software
- **Application name:** Software product name
- **Current in-house versions:** Versions of the product that are currently being run inhouse on Tru64 UNIX
- **Source languages:** Programming languages the software is written in (C/C++, Java, COBOL, Fortran, UNIX scripts, PERL, and so on)

- **Required middleware or development tools:** Are there any special run-time middleware or libraries that are utilized to develop or run the program?

Note that this information would also appear in the ISV software worksheet.

- **Server platforms:** Which Tru64 UNIX servers in-house are running the software?
- **Supported on Tru64 UNIX 5.1B versions:** What versions of the product are available (certified/supported) by the internal development group to run on Tru64 UNIX Version 5.1B? If no version is currently available, are any planned?
- **Supported on HP-UX Integrity servers:** What versions of the product are available (certified/supported) by the internal development group on HP-UX HP Integrity servers for the current version of HP-UX 11i v2? If no version is currently available, are any planned?
- **Supported on HP-UX PA-RISC servers:** What versions of the product are available (certified/supported) by the internal development group on HP-UX PA-RISC servers for the current version of HP-UX 11i? If no version is currently available, are any planned?
- **Estimated lead time for a new Tru64 UNIX version support or port to another platform environment:** To determine the timelines for transition options, rough estimates are needed to determine how long it would take to make a version of the internally-developed application available on later versions of Tru64 UNIX or HP-UX 11i.

## Review advantages, challenges, and timeline for each transition option

Once you determine your high-level goals, constraints, and opportunities, and have gathered the necessary information about your current environment, evaluate each of the transition options in terms of its advantages, challenges, methodology, and timeline. The transition options are:

- Transitioning to HP-UX 11i on HP Integrity servers
- Continuing with Tru64 AlphaServers
- Transitioning to HP-UX 11i on HP 9000

### Transitioning to HP-UX 11i on HP Integrity servers

HP has been selling HP-UX 11i UNIX platforms based on the Itanium® processor since 2001. By the end of 2004, HP had released Integrity servers that support up to at least 128 processors based on the mature Superdome server architecture that provide industry-leading enterprise computing power and functionality.

The major factor in determining when you should transition to HP-UX 11i on Integrity servers is the availability of required ISV software on the platform. Although ISV adoption of HP-UX 11i on Integrity servers is rapidly growing, some products that you use might not be certified on the platform yet. For many of these unavailable products, the vendor has announced a planned release date.

A secondary consideration is the tradeoff of waiting for CFS in HP-UX 11i Serviceguard for those environments where your solution on Tru64 UNIX depends on a CFS environment.

#### Advantages

The major advantage of transitioning to HP-UX 11i on HP Integrity servers is that you are investing in an environment that:

- Is the strategic, long-term direction of HP for enterprise servers
- Provides a multi-OS capability and partitioning capability for server consolidation
- Delivers industry-leading performance with a projected performance growth curve greater than that of AlphaServer or PA-RISC technology

- Employs an industry recognized enterprise UNIX with some key differentiating features over Tru64 UNIX, particularly in the area of large platform resource management
- Provides the industry's best price performance

### Challenges

The major challenges of moving from Tru64 UNIX on AlphaServer to HP-UX 11i on HP Integrity server are:

- ISV availability  
The number of ISVs releasing products on HP Integrity servers is large and increasing daily. HP has a program in place to ensure that any remaining key ISVs will be in place by 2005 (see Reference [6](#)).
- Relative newness of larger server products to conservative IT organizations  
HP Integrity servers are fully enterprise-capable systems. These systems have been under development for some time and are being integrated into pre-existing, mature HP 9000 (PA-RISC) server environments.
- OS change and associated potential staff retooling burden  
Operators, administrators, and application developers may need to be retrained in HP-UX 11i and related technologies if currently unfamiliar with them. HP has many resources in place to ease this activity. Consult <http://www.education.hp.com/curr-hptru64-unix.htm> for more information
- Short-term lack of equivalents to Tru64 UNIX AdvFS domains and Cluster File System on HP-UX 11i until later in 2005.

### Factors you need to determine

You need to determine the following items for each unique solution running on Tru64 UNIX in your specific environment:

- The date when versions of all ISV products your solution requires will be supported on HP-UX 11i with HP Integrity servers.
- Which HP Integrity servers are suitable; include your current requirements and anticipated future growth when sizing servers. Your HP or reseller account representative can help you with this process.
- Dependencies on some Tru64 UNIX features that do not currently have equivalents on HP-UX 11i. Based on the OS platform features that you are currently using (as identified in the [Platform features being used](#) section), evaluate the following:
  - AdvFS domains and clones — the current alternative in-place on HP-UX 11i is the VERITAS VxFS file system
  - Device location-independent naming and built-in multipathing in Tru64 UNIX — the current alternative in-place on HP-UX 11i is to use capabilities in the Volume Manager or add-on driver specific to the storage array (such as StorageWorks SecurePath) to provide multipathing
  - TruCluster Cluster File System — the current alternative in-place on HP-UX 11i is the failover clustering solution Serviceguard

In each case, assess the impact to your application architecture and IT staff of transitioning prior to these features being available in HP-UX 11i.

### A methodology

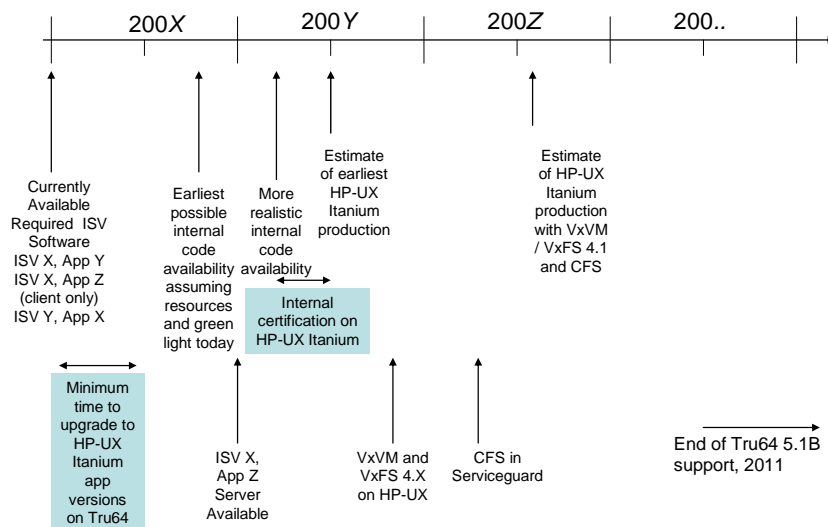
Based on the information gathered, analysis of the information, and dates established in the previous section, use the following process to determine the earliest possible date for HP Integrity server deployment:

- Examine any minimum internal adoption time by operation staff for new HP-UX 11i on HP Integrity servers (training, sandboxes, and so on). This could be negligible if your site is already deploying HP-UX 11i-based solutions elsewhere in the organization.
- Examine the ISV product availability on HP-UX 11i v2
- Examine the state of any custom code on the platform
- Examine other external factors affecting the ability to deploy a HP-UX 11i v2 solution
- Determine if the solution stack be divided up into layers (client/server — application tier/database) and transitioned separately from Tru64 UNIX to HP-UX 11i. Determine the impact to overall operations?

#### Timeline

After examining the factors in the previous section and comparing all the resulting dates for availability, one date will be the furthest out in time and represent the earliest possible date when all factors could be in place to deploy HP-UX 11i v2 on an HP Integrity server. You should create a timeline chart which lists the major milestones. The following is an example timeline from a hypothetical customer.

### Hypothetical customer solution “InetTest” – Potential HP-UX Itanium adoption timeline



### Continuing with Tru64 UNIX AlphaServers

#### Advantages

As the current in-place solution, continuing with AlphaServer provides a number of advantages. The key variable is how long your current Tru64 UNIX AlphaServer platform environment can continue to meet the needs of the solution stack and IT environment where it is currently being used. However, be aware that new AlphaServer purchases will not be possible after October 2006, so this option is only realistic for workloads and environments that do not depend on significant and new hardware.

- Leverage your present investment with an EV7-based AlphaServer
  - If the solution stack continues to meet your business needs, it may be advantageous to upgrade your present AlphaServer environment to an EV7-based AlphaServer environment.
  - If you lease your systems, the AlphaServer Transition Lease Program, offered by HP Financial Services as part of the AlphaCustomer Assurance Program (ACAP), encourages you to upgrade to

EV68 or EV7 ES and GS-class servers to protect that investment. This lease program lets you establish the timeframe to transition to HP Integrity servers, lets you finance the services necessary for a smooth transition, and has a fixed monthly payment and term through the transition. For details, go to:

<http://h10016.www1.hp.com/hpfinancialservices/alphatrans.html>

As outlined earlier, HP is committed to continue selling Tru64 UNIX on AlphaServer platforms until at least 2006 and supporting them through 2011. However, a number of factors could cause you to migrate from the AlphaServer platform.

- Performance improvements and scaling potential  
If you need more performance headroom, the AlphaServer line continued adding performance improvements in the server architecture and CPU right through 2004. Upgrading your older existing AlphaServers to make use of these more recent performance speed ups or switching to newer and/or larger servers in the family are options to meet performance bandwidth needs for the foreseeable future.
- Planned enhancements to keep AlphaServers a viable option  
HP is committed to adding support options to ensure that your AlphaServer platform can interoperate with HP management software or the latest storage and network options until it is retired. In addition, HP will make sure that the client function of its major enterprise management tools such as OpenView will continue to support Tru64 UNIX on AlphaServers as they evolve.
- Long-term platform support  
As previously stated, HP is publicly committed to supporting the AlphaServer platform until at least 2011.

In summary, the advantages of continuing with Tru64 UNIX on AlphaServers are:

- Continued use of existing assets
- No disruption and associated risk due to change or new costs to your IT solution
- Ability to meet further capacity or increased performance by adding memory and CPUs or upgrading to newer AlphaServer platforms

### Challenges

There are several factors that might make it difficult or impractical to continue with Tru64 UNIX on AlphaServers. One or more of these factors might be the driving force in the decision to transition to HP-UX 11i and the time frame in which you do decide to do it.

- ISV continued support on AlphaServers  
The ultimate viability of the platform becomes largely a question of how long will the available ISV software for Tru64 UNIX continue to meet your business needs. HP is working closely with key ISVs to ensure that the latest versions of their products continue to be released for Tru64 in the near term as well as continue to support existing releases for the foreseeable future. That being said, ISV support should be evaluated for each of your critical ISV software packages.
- Business triggers such as end-of-lease  
Events such as end-of-lease or planned re-architecture of a business solution during the course of the next three to six years may be triggers to re-evaluate your platform technology and make transitions.
- Configuration limits associated with in-box system configuration capacity limits or running out of compute resources  
You may run out of computing capacity in your existing server hardware to the point where any future capacity requires an investment in a new server.

**Note:** If you have already decided on an immediate transition from Tru64 UNIX to HP-UX, continue with this exercise to determine the maximum timing window in which your transition must occur.

In summary, the major challenges of continuing with Tru64 UNIX on AlphaServers are:

- ISV availability and support — with the announced retirement of Tru64 UNIX, ISV support will eventually diminish
- End-of-lease or capitalization of Tru64 UNIX on AlphaServers triggers a decision point to re-invest in AlphaServers or introduce eventual replacement technology
- Perception of external and internal IT organizations that staying with Tru64 UNIX on AlphaServers when it has a defined end-of-life is a liability

What you need to determine

You need to determine the following for your specific environment:

- A rough date (quarter granularity) when your solution on Tru64 UNIX on AlphaServer is no longer viable. If different solutions within your organization have different trigger points, list them separately.
- Any platform, ISV software, or custom software upgrades that would be required to maintain use of Tru64 UNIX and how they relate to the previous item.
- Any other triggers in the environment which may affect the solution stack. For example:
  - Leases set to expire
  - Increased processing requirements
  - Need for additional features or changes based on your IT environment, such as new solution rollouts, anticipated mergers, and so on

A methodology

The following process will help you determine the possible timeline for Tru64 UNIX use. Be sure to perform the analysis for each unique, independent solution within your environment and even where it makes sense for application layers (server/client, applications tier, database tier). Since dates (especially for ISV support) are rarely available or exact, use conservative best-guess estimates to the quarter-year or half-year based on previous experience with the vendor.

- What version is the operating system at? What would be a typical internal timetable for an upgrade to Tru64 UNIX Version 5.1B?
- Examine the ISV product availability on Tru64 UNIX. For each ISV package:
  - Is a version available for Tru64 UNIX Version 5.1B? If not, are any future versions planned for Tru64 UNIX Version 5.1B?
  - For these current and/or planned versions, what is the published or expected support window (life cycle) of the product?
  - Even if supported on Tru64 UNIX, is there a future version that will not be on Tru64 UNIX that will be required because of needed features or the need to conform to business practices?

Based on the previous ISV analysis, list the ISV packages, in order, that the last available version is expected to become unsupported on Tru64 UNIX. Identify which ISV package will be a driving force in a transition decision and a rough date on when this may occur.

- Examine the state of any custom code on the platform
  - Is the code running on Tru64 UNIX Version 5.1B? What would be the typical internal time table for the application to be redeployed after an upgrade to Tru64 UNIX Version 5.1B?
- Examine other external factors affecting the viability of the solution:
  - Increased performance requirements

When would memory and CPU upgrades to existing AlphaServer platforms or replacements with more recent AlphaServer platforms no longer meet anticipated future processing requirements?

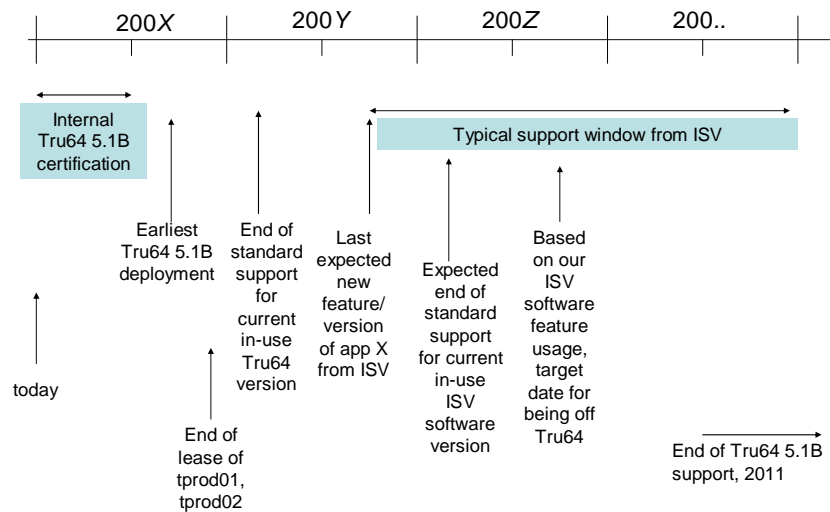
– Leases? Capitalization, lab reorganizations, or already planned retirement, and so on.

- Evaluate hybrid solutions that offload software components with near-term end-of-support on Tru64 UNIX to alternative platforms, but continue core processing where possible on Tru64 UNIX to minimize risk or to increase the overall transition window. Client server architectures and tier architectures are natural fits for these types of hybrid solutions.

#### Timeline

Using the dates and schedule information collected, create a timeline chart showing the major milestones. The following figure shows how such a timeline might look for an individual solution stack of a hypothetical customer.

### Hypothetical customer solution “InetTest” – Tru64 UNIX timeline



#### Transitioning to HP-UX 11i on HP 9000

HP-UX 11i on HP 9000 platforms is a mature, full-featured, award-winning enterprise UNIX (see Reference [7]). It has a large customer base and is the foundation for an enterprise solution stack. Although HP Integrity servers are now shipping and are the long-term strategic direction, HP plans to continue to upgrade, sell, and support the PA-RISC based solutions for the foreseeable future.

The current version of HP-UX 11i for PA-RISC is HP-UX 11i v2, which is a converged release of HP-UX 11i available for both HP 9000 servers and HP Integrity.

The major trade-offs to evaluate with this transition option are the impact of a potential future evolution from PA-RISC to HP Integrity servers, and the impact of an immediate transition without the benefits of Tru64 UNIX features in HP-UX 11i versus a later migration when those features are available.

## Potential future evolution from PA-RISC to HP Integrity servers

With eventual adoption of Integrity servers by current PA-RISC customers in mind, HP has designed many aids into the server family, operating system, and application environment to minimize the impact of a future PA-RISC to HP Integrity server evolution. These include:

- Current and future PA-RISC (mid- and high-end) servers can be upgraded to HP Integrity servers by replacing boards
- No data transformation required

There are no data order issues since both HP 9000 and the HP Integrity servers are big endian, so that data written on HP 9000 systems is readable on HP Integrity servers. This includes complete file systems and volume groups that do not need to be reformatted and migrated.

- An operating system requires a reinstall but remains the same in terms of features, interfaces, and so on
- For optimization, application code will be recompiled for HP Integrity servers and ISV versions specific to the Itanium® CPU; for prototyping and testing, HP provides a run-time emulation environment that allows PA-RISC binaries to run on Itanium®.

In summary, an HP-UX 11i on HP 9000 to an HP-UX 11i on HP Integrity transition is a less complex transition than an AlphaServer on Tru64 UNIX to HP-UX 11i on Integrity server transition. If you make the transition to HP 9000 systems, you can move to HP-UX 11i today and be assured of a very smooth upgrade path to HP Integrity servers.

## Advantages

Major advantages of a HP-UX 11i PA-RISC based solution are:

- Large ISV portfolio — although ISV support cannot be taken for granted, it is generally not an issue for PA-RISC adoption
- Mature and stable with large successful installed base behind it (low risk)
- Designed for future evolution to HP Integrity servers with minimum impact
- Employs an industry recognized enterprise UNIX with some key differentiating features over Tru64 UNIX

## Challenges

The major challenges in transitioning from Tru64 UNIX to HP-9000 fall into two categories:

- Platform-related
  - Although HP 9000 will continue to be sold through for the foreseeable future, the PA-8900 CPU released in 2005 is the last planned CPU in the PA family by HP.
  - With Integrity servers as the long-term strategic platform for enterprise servers from HP, moving to PA-RISC means that at some date in the future, another transition will be required. Although this PA-RISC to Integrity transition may be well into the future and will be simpler to execute than a Tru64 AlphaServer to HP-UX 11i transition, it should still be considered.
- OS-related
  - OS change and associated potential staff retooling burden
  - Short-term lack of equivalents of Tru64 UNIX AdvFS domains and TruCluster like Cluster File System on HP-UX 11i until late in 2005.

## Factors you need to determine

You need to determine the following factors for each unique solution running on Tru64 UNIX in your specific environment:

- If all versions of all ISV products you use are available for HP-UX 11i on PA-RISC.

- Which PA-RISC systems are suitable; include your current requirements and anticipated future growth when sizing servers. Your HP or reseller account representative can help you with this process.
- Dependencies on some Tru64 UNIX features that do not currently have equivalents on HP-UX 11i. Based on the OS platform features that you are currently using (as identified in the [Platform features being used](#) section), evaluate the following:
  - AdvFS domains and clones – the current alternative in-place on HP-UX 11i is the VERITAS VxFS file system
  - Device location-independent naming and built-in multipathing in Tru64 UNIX — the current alternative in-place on HP-UX 11i is to use capabilities in the Volume Manager or add-on driver specific to the storage array (such as StorageWorks SecurePath) to provide multipathing
  - TruCluster Cluster File System — the current alternative in-place in HP-UX 11i is the failover clustering solution Serviceguard

### A methodology

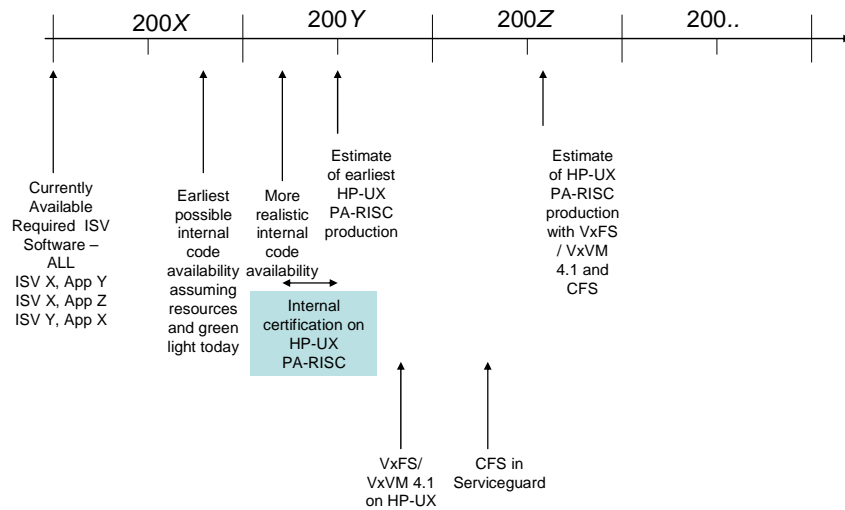
The following process will help you determine the required milestones and dates for planning:

- Examine any minimum internal adoption time by operation staff for new HP-UX 11i on PA-RISC servers, training, sandboxes, and so on. This could be negligible if your site is already using HP-UX 11i-based solutions elsewhere in the organization.
- Examine the ISV product availability on HP-UX 11i on PA-RISC.
- Examine the state of any custom code on the platform.
- Examine other external factors affecting the ability to deploy a HP-UX 11i on PA-RISC-based solution.

### Timeline

Create a timeline to visually show the milestones and events associated with the possible adoption of HP-UX 11i on a PA-RISC server. The following figure is an example timeline from a hypothetical customer.

## Hypothetical customer solution “InetTest” – Potential HP-UX PA-RISC adoption timeline



## Comparing and contrasting all options

The previous sections described how to look at each possible option individually. The final step is to compare and contrast the results of each. Ideally, the viability of continued use of Tru64 UNIX has a healthy overlap with the earliest adoption of HP Integrity servers. In cases where there is little overlap, the PA-RISC transition option usually represents an intermediate configuration once Tru64 UNIX is no longer viable as a solution and the pieces are not all in place for HP Integrity servers. An additional issue to look at is a staged transition for ISVs whose products end support early on Tru64 UNIX. You can do one of two things:

- Move those pieces off sooner to HP-UX 11i and separate them from the remaining solution stack
- Move the pieces to another pre-existing or alternative platform in the environment

## Executing a transition

Once you select a general plan of action based on a transition option, your IT organization needs to plan, design, and implement the transition. HP has a number of resources to help you with these tasks. HP recommends you use a project planning approach called *APDIM* and a set of resources, tools, and collateral information presented as transition modules (TMs).

### APDIM: An IT project execution methodology

HP has developed a five-stage framework for technology transitions:

1. **A**wareness, in which the opportunity for a technology transition presents itself
2. **P**lanning, in which the target for a technology transition is chosen
3. **D**esign, in which the actions needed to achieve the target transition are elaborated
4. **I**mplementation, in which the target transition is achieved
5. **M**anagement, in which the transitioned technology is now used on a long-term basis

The five stages apply independently in the four different transition content areas: platform infrastructure (servers, operating systems, storage, and tape devices), custom code applications, packaged applications from ISVs, and databases. The considerations arising in a technology transition are typical of the stage, rather than the content area.

The goals of the different stages are described in the following table.

Stage	Goal
Awareness	Assessing the current state and possible alternatives to that state
Planning	Determining the desired alternative to the current state
Design	Determining how to achieve the desired alternative to the current state
Implementation	Achieving the desired alternative to the current state
Management	Maintaining and retaining the desired alternative to the current state

To help you go through the different stages for each content area successfully, HP is developing corresponding transition modules (TMs).

## Tru64 UNIX to HP-UX 11i transition modules

Tru64 UNIX to HP-UX 11i transition modules (TMs) show you the business value of moving forward with HP, while mitigating the risk, by providing you information to plan and design your transition to HP-UX 11i on HP Integrity servers.

The TMs provide you with a method and framework to approach your transition across the planning, design, implementation, and management phases. The planning modules provide information to help you assess your own environment and conduct high-level planning. You will then use those high-level plans when entering the design phase, where more specific details on how the transition will be conducted are defined.

The following table lists the Tru64 UNIX to HP-UX 11i transition modules that are currently available.

Transition module	Description
Platform infrastructure planning module	Provides high-level planning information and recommendations to help assess your efforts to transition platform infrastructure, including servers, operating systems, storage and tape devices
Custom code planning & design module	Provides high-level planning and design information and recommendations to help assess your efforts to transition custom code applications and addresses programming-related transition issues
Packaged applications planning and design module	Provides planning and design information and recommendations to help assess your efforts to transition packaged applications from independent ISVs
Database for Oracle planning module	Provides planning information and recommendations to help assess your efforts to transition databases for Oracle

Specifically, these TMs will:

- Provide you with the means to start gauging the level of effort and transition duration
- Save you time and effort in planning and designing your transition
- Help you identify the areas within each module that require further planning or design and those that do not pose a problem to your transition
- Help you define a customized plan for those areas that require further planning and design

To get the most from these TMs, you should:

- Be familiar with your long-term business and technical goals
- Be familiar with the current hardware and operating system environment (platform infrastructure)
- Be familiar with the application development environment and with Tru64 UNIX (custom code applications)
- Be familiar with your current ISV packaged applications, if any
- If you are transitioning an Oracle database, understand the current overall database design and implementation; your database usage, characteristics, and resource demands; and your database access points and dependencies
- Be aware of the current overall architectural implementation
- Be aware of any system design goals that were used in the current implementation
- Be aware of any system design goals that are desired for the target platform

The key components of the module are the planning assessment documents (PADs), supporting documentation and training, and transition tools. The PADs provide a synopsis, analysis, and recommendations for each major functional area, which will save you time in your planning process. The transition tools will help you assess your environment and plan your transition process.

For more information refer to:

<http://www.hp.com/go/transition-modules>

## Summary recommendations

- Identify the complete solution stack that Tru64 UNIX on AlphaServers are part of and identify the goals, constraints, and opportunities during the transition.
- Evaluate each of the possible options in transitioning from Tru64 UNIX by identifying the major constraints, benefits, and drawbacks as outlined in the analysis section.
- Create a project plan that utilizes the APDIM model and the resources in the TMs
- Map your solution stacks to the layers outlined in the TMs for those that apply. Utilize the relevant TMs to further plan and execute your transition.

## References

1. Tru64 UNIX and HP-UX 11i roadmaps are available at:  
[http://www.hp.com/products1/evolution/alpha\\_retaintrust/products.html](http://www.hp.com/products1/evolution/alpha_retaintrust/products.html)  
Click the *HP Tru64 UNIX* link embedded in the text and then select *Tru64 UNIX roadmap* (under *Plans and policies*).
2. For recent public benchmark results, go to:  
<http://www.hp.com/products1/servers/integrity/performance.html>
3. The webcast Large System & Resource/Workload Management (in the program series Tru64 UNIX to HP-UX 11i: A Side by Side Comparison) is available at:  
[www.hp broadband.com](http://www.hp broadband.com)  
(Keyword is *tru64unix*.)
4. Training resources:
  - For Tru64 UNIX transition training, go to:  
<http://www.education.hp.com/curr-hptru64-unix.htm>
  - For HP-UX 11i training, go to:  
<http://www.education.hp.com/curr-unix.htm>
5. For Alpha RetainTrust business practices, go to:  
[http://www.hp.com/products1/evolution/alpha\\_retaintrust/practices.html](http://www.hp.com/products1/evolution/alpha_retaintrust/practices.html)

6. Regarding HP's program to ensure that any remaining key ISVs will be in place in 2005:  
As of January 2005, more than 3100 certified ISV applications were available.
7. For comparison information on enterprise servers by D.H. Brown Associates, Inc., go to:  
<http://dhhbrown.com>

## Further information

For additional information and assistance, contact:

[transition.modules@hp.com](mailto:transition.modules@hp.com)

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06/2005

