

# HP and Intel's RISC Migration Methodology

Tools and best practices to maximize the benefits of migrating and porting to Linux



## The value of migrating to Linux

It is widely acknowledged today that Intel® Xeon® processor-based HP servers running the Linux operating system deliver better cost/performance ratios than Reduced Instruction Set Computer (RISC) systems. However, companies are still hesitating to migrate their RISC-based applications onto systems with Intel Xeon processors. They first need to clearly examine the costs and benefits of migration, and guarantee continuity and quality of service for mission-critical applications.

It is the RISC platform's limitations that are driving the move to Linux, and companies postponing migrations must be aware of significant issues on the horizon:

- Justifying the cost of continuing to operate and maintain an aging RISC infrastructure, where options for hardware and software upgrades are becoming increasingly limited and costly
- Reducing overall capital expenditure (CAPEX) when RISC platforms require an amortization period two to three times longer than equivalent Intel Architecture (IA) systems
- Handling the high consumption costs (of electrical power, data center space, and sophisticated cooling systems) associated with RISC systems
- Coping with a loss of specialist knowledge as the IT industry slowly loses interest in RISC

The HP and Intel partnership provides many benefits when migrating from RISC to Intel Xeon processor-based ProLiant platforms:

- **Intel's clear and stable roadmap** for the Intel Xeon processor
- **Intel's unequivocal commitment** to open source software
- **HP's support for and promotion of freedom of choice** in both operating system and application software
- **Better cost/performance** ratios from HP systems than equivalent RISC systems

- **Commitment to Linux development** and distribution, focused on improving functionality, performance, and scalability as well as reliability, availability, and serviceability (RAS)

As shown in Figure 1, there is already a steady upward trend in customers adopting Linux and solutions running on Intel Xeon processor-based ProLiant servers.

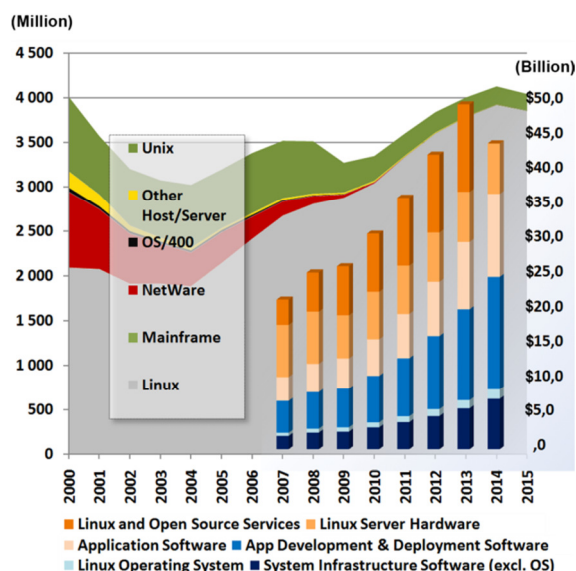


Figure 1: While UNIX installations decline, Linux is rising

There is already a steady upward trend in customers adopting Linux and solutions running on Intel Xeon processor-based ProLiant servers





## Migration and application porting challenges

Once a decision to migrate has been taken, companies may encounter a number of obstacles:

- Existing applications are likely to be deeply embedded in the processes and structures of their organization
- People naturally fear the disruption that inevitably follows changes in technology

The more traditional challenges of a migration project also need to be considered:

- Replicating the functionality and performance of the original applications
- Achieving projected cost reduction and Total Cost of Ownership (TCO) objectives
- Leveraging in-house engineering expertise
- Facilitating the required change management
- Streamlining software development operations

## Comparing RISC and Intel Xeon processor-based HP ProLiant systems

The HP Intel Communications, Media, and Entertainment (CME) Solution Centers have conducted a number of customer workshops. These workshops concluded that Intel Xeon processor-based HP ProLiant systems:

- **Offer better cost/performance** ratios than RISC systems, with a lower TCO
- **Enable improved RAS**
- **Provide features and energy efficiency** to address genuine customer business needs
- **Require lower CAPEX**

## HP and Intel's RISC migration methodology

HP has developed a tried and tested methodology for driving RISC to Intel Xeon processor-based ProLiant migration projects. This methodology involves

specialist tools and resources at each stage of the migration process.

The following points should be taken into consideration when using this methodology:

- IT governance may need to integrate specific aspects of open source software (licensing, distribution, and contribution considerations)
- IT infrastructures may require new tool sets to support the Linux operating system (security, management, virtualization, and so on).
- Parts of applications—such as application code, dependencies, and third-party products<sup>1</sup>—may need porting to Linux

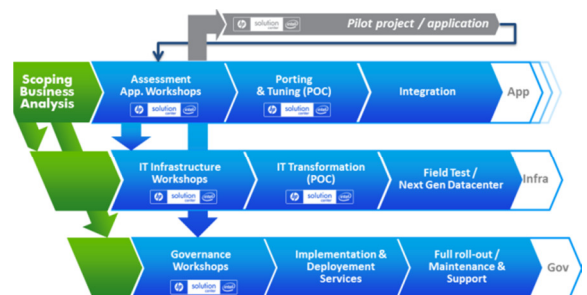


Figure 2: HP RISC to IA migration methodology

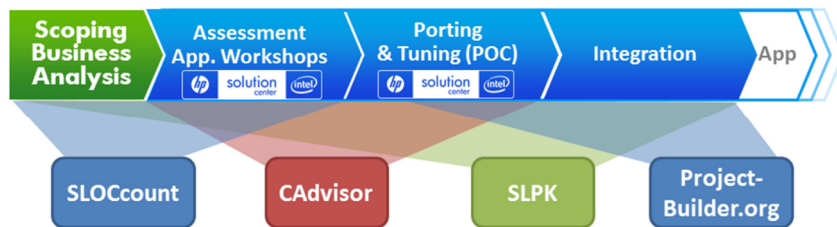
The tools and best practices provided by HP and Intel currently focus on application porting, which companies typically undertake before dealing with the aspects of infrastructure and governance.

The first task should be to provide cost estimates for each step of the application porting process.

A number of cost evaluation models are available to help quantify the work required to migrate an application to Linux. These models are being continuously improved upon, using the experience gained from earlier migration projects.

<sup>1</sup> Third-party products: intellectual property not under the control of the porting team, but which the application relies on





## Migration tool descriptions

One of the recommended tools is SLOccount, which is used during the assessment, sizing, and scoping of the porting project. SLOccount is an implementation of a software cost estimation model called the Constructive Cost Model (COCOMO).

The outputs from this tool provide information about an application's source code (size, complexity, and so on). This information can then be used to make the decision to port an application with much greater confidence.

Based on previous porting experiences, on average 3% to 5% of the application source code actually needs to be adapted.

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Moving on to the process of physically porting an application's code, HP relies on a number of software tools to help development teams identify and manage the required code changes.

HP's Code Advisor runs on Linux, HP-UX, and Solaris. It operates on C and C++ source code and assists developers to isolate code that is dependent on specific hardware features, as well as to uncover potential security breaches hidden within code.

Another porting tool is the Solaris to Linux Porting Kit (SLPK). The SLPK automates much of the porting process while identifying potential issues and providing guidance on resolving them. It also generates information on the total number of lines of code to migrate.

The SLPK, developed by HP and operating on C and C++ source code, currently only runs on Linux, but can operate on source code hosted on a Solaris machine. A particularly interesting feature of SLPK is the porting aid it provides. This includes compiler, library, and build wrappers that implement certain Solaris-specific system and compiler calls in a Linux environment.

Using the SLPK, an application can usually be compiled for a Linux target without code changes.

Work on the application's source code porting is only part of the migration process. Once the code has been ported and compiled, the application must be thoroughly tested and then deployed.

## Developing solutions for multiple platforms

To help address multiple-platform software development and delivery, it may be advantageous to improve the build chain by providing native packages for the target platforms.

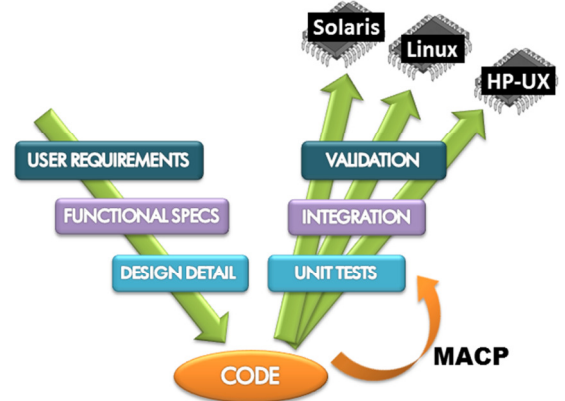


Figure 3: MACP eases the build process up to delivery

To achieve this goal, HP uses an approach called Multi-Architecture Continuous Packaging (MACP). MACP is based on Project-Builder.org, an open source software project.

MACP generates packages for various Linux distributions, as well as Solaris. Packages are tightly integrated into the build process, allowing:

- Ease of deployment and installation (upgrades and dependency management)
- Replication of functionality at each step, from internal testing through to customer delivery
- Generation of source code and metadata without duplication





## The needs of OEMs and ISVs in the field of telecommunications

Original equipment manufacturers (OEMs) and independent software vendors (ISVs) have very specific application migration needs:

- **Develop reliable applications** ready for deployment in fast-evolving markets
- **Anticipate change** and stay ahead of the competitors
- **Support multiple architectures** from legacy, current, and future platforms and operating systems

HP's extensive experience working with major telecommunications OEMs has shown the added value that its migration methods and tools can have in this field.

## Future developments

HP is continuously developing and enhancing the previously described migration tools.

Recognizing that the usage of third-party products is a very important consideration, HP plans to take an existing tool, FOSSology (used to track and monitor the use of free and open source software), and add components to simplify the process of identifying and extracting third-party products in existing applications.

Investigations are planned to expand Project-Builder.org capabilities to address other UNIX systems, including HP-UX and IBM AIX.

## HP Intel CME Solution Center's team and facilities

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The HP Intel CME Solution Centers located in France, China, and the United States host reference laboratories providing application migration methodology and innovative IT processes.

Demonstrations are available at customer sites, online, or on our premises. Technical experts and consultants from HP and Intel are available to deliver assistance, support and answer questions. The Solution Centers also offer a range of practical programs, including innovation workshops and proofs-of-concept.

## HP and Intel key hardware components

### HP Blade System c7000 enclosure

Provides all the power, cooling, and I/O infrastructure needed to support modular server, interconnect, and storage components today and throughout the next several years.

### Intel® Xeon® Processor 7500 Series

Exceptional scalable performance with advanced reliability for your most data-demanding applications and intelligent performance that automatically adapts to the diverse needs of a virtualized environment.

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