

Solaris to Linux Virtualization

HP and Intel's recommended virtualization technologies



Benefits of data center virtualization

According to a recent report by Global Industry Analysts, Inc,¹ the global market for server virtualization software will reach \$5.6 billion by 2015. This growth is being driven by the need to improve server utilization, reduce costs, and ensure business continuity.

IT departments, service providers, and enterprises need to support a wide range of applications and maintain multiple operating systems. This support is consuming more and more resources.

Data center infrastructures are often still based on legacy network services such as naming services and enterprise directories, which do not require great computing power or Input/Output (I/O) capacity. Servers, meanwhile, are increasingly powerful. By consolidating multiple servers into virtualization platforms, businesses can lower the Total Cost of Ownership (TCO) and increase their Return On Investment (ROI).

Successful virtualization projects can reduce support costs by 45% a year (by leveraging standard server spare parts and training), increase flexibility and scalability twofold, improve performance and manageability by 60%, and minimize risk to ensure 100% availability.

The global market for server virtualization software will reach \$5.6 billion by 2015

Solaris SPARC to Linux on Intel® Architecture (IA) is a well-traveled migration path with proven business benefits². Enterprise Linux excels in platform support and viability, while its open source heritage provides great customer value. These are key factors when considering platform migration.

Virtualization software is included as standard with both Red Hat® Enterprise Linux (RHEL) and SUSE® Linux Enterprise Server.

Note that the solutions discussed hereafter are specific to telecommunications environments, but may be applicable to other environments and customer needs.

HP and Intel's virtualization expertise

HP and Intel are working together to optimize the server performance of virtualization platforms and make the changes available in both commercial open source virtualization environments.

Intel is a major contributor, working on both server hardware and software by integrating virtualization instructions and features directly into Linux. HP already supplies open source virtualization software as part of its cloud and management offering.

HP solution architects are building enterprise virtualization solutions. The objectives are to:

- **Study virtualization design approaches** to address customer needs
- **Closer align virtualization functionality** to IT business services, application support, and delivery models
- **Enable flexible technical capabilities** to deploy virtualization in both Small and Midsize Businesses (SMBs) and enterprise markets

HP and Intel virtualization experts have examined Solaris SPARC virtualization solutions in great detail and have now created a reference architecture with equivalent functionality based on an Linux/IA RHEL platform.

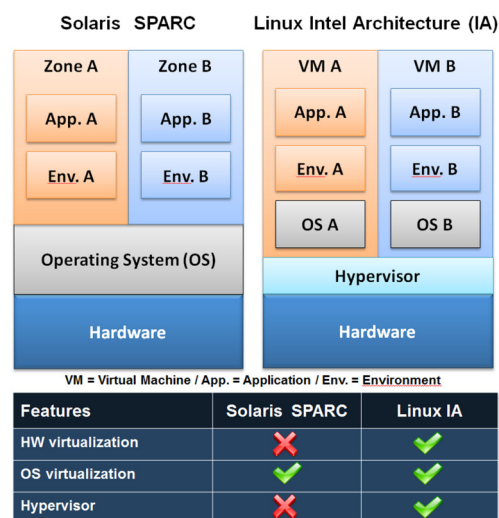


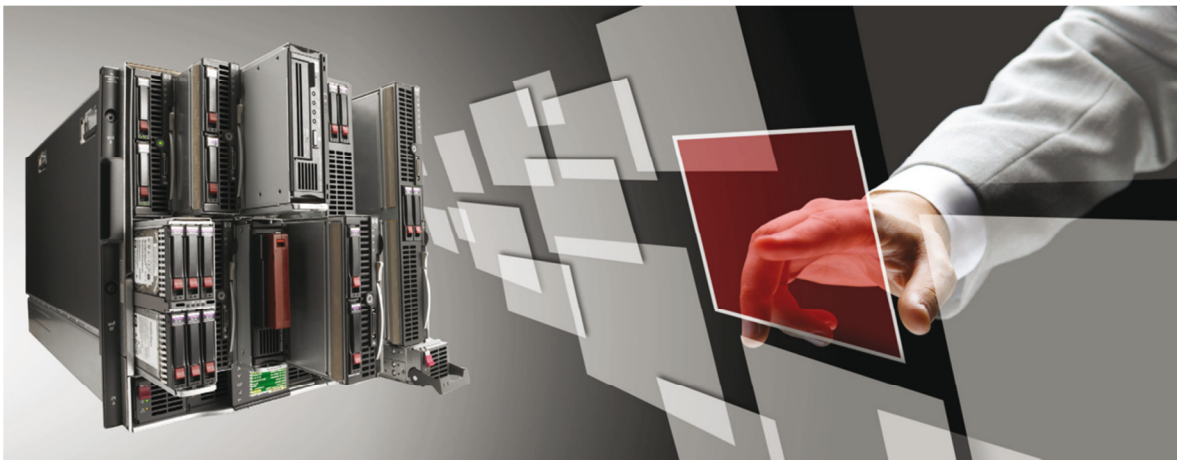
Figure 1: Virtualization technologies compared

¹ Reference: Global Industry Analysts, Inc, April 2010, "Virtualization Software – A Global Strategic Business Report"

² Reference: HP Intel CME Solution Center, January 2009, "Solaris SPARC to Solaris or Linux Xeon Migration Workshop"

³ Reference: HP Intel CME Solution Center, April 2011, "HP and Intel's RISC Migration Methodology"





Virtualization design solutions

HP and Intel's reference architecture (see Figure 1) uses the following technologies:

- **Hardware virtualization** is only available on Linux/IA platforms. A lightweight layer called a hypervisor manages access to hardware resources. The entire hardware platform is virtualized and another Operating System (OS) can be installed to manage the virtual machine.
- **OS virtualization** ("containers") is a technology available on both Solaris and Linux platforms. The hardware itself is not virtualized. Instead, a single kernel runs on the hardware platform and allocates hardware resources to applications running in containers.

HP and Intel have implemented a virtualization platform based on the Kernel-based Virtualization Machine (KVM) hypervisor. This platform is production ready and far cheaper to implement than other functionally equivalent virtualization platforms. KVM was first installed at the HP Intel Solution Center as part of a proof-of-concept for a major European customer, who subsequently put KVM into production following the complete success of this proof-of-concept. HP's migration team has also highlighted³ the capabilities of Intel's virtualization technologies, including Intel Virtualization Technology (Intel VT) for processors (VT-x), chipsets (VT-d), and networks (VT-c), Single Root I/O Virtualization (SR-IOV), and Virtual Machine Device Queue (VMDq).

HP Intel CME Solution Center's team and facilities

The HP Intel CME Solution Center has implemented two virtualization solutions based on HP ProLiant servers; one using Solaris 10 containers, the other running RHEL with Linux containers and KVM virtual machines. Both solutions are now available for demonstrations, either online or at our premises. With its team of dedicated experts from HP and Intel, the HP Intel CME Solution Center also offers consultation, integration, and support services for service providers wanting to increase their portfolio of services to better target the SMB and enterprise markets. The solution centers also offer a range of service-specific programs, including innovation workshops and proofs-of-concept.

HP and Intel key hardware components

HP Blade System c7000 enclosure

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