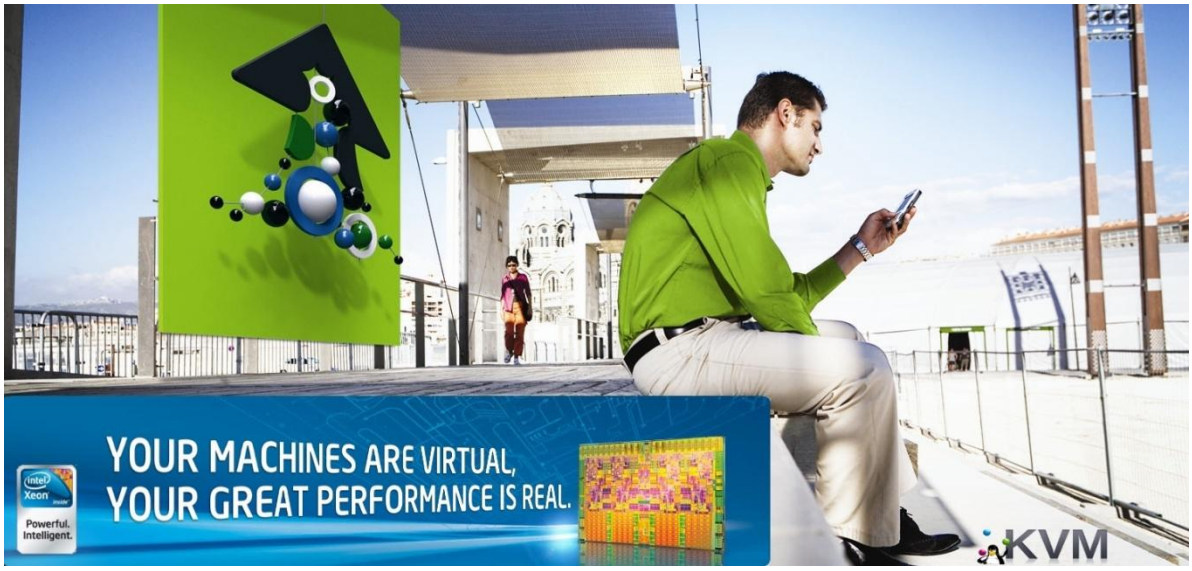


Virtualization of the HP Open Call Media Platform

Reducing costs and improving performance with open source Linux KVM

Benefits of data center virtualization

The combination of blade server architecture and virtualization techniques is helping IT organizations to dramatically improve data center productivity. The major benefits include:

- **Reduced IT infrastructure costs**. Virtualization requires fewer and less expensive hardware resources, which can be used more efficiently to lower the total cost of ownership.
- **Improved performance**. Applications take significantly less time to launch.
- **Increased flexibility**. Resources can be provisioned and reallocated as needed. For example, workload can be rapidly redistributed by moving running applications from one virtual server to another.
- **Greater availability**. Simplified backup, failover, and disaster recovery solutions result in applications that are better protected from unforeseen events and reduced downtime.
- **Increased efficiency in maintenance and management**. Standardized configurations make it easier to centrally manage servers and applications.

A virtualized environment can reduce total costs by up to 52% per user per year

Studies have shown that an infrastructure with more than 25% virtual server penetration, using storage virtualization and systems management tools, can deliver total cost reductions of up to **52% per user per year**.[1]

Server virtualization at HP and Intel

HP ProLiant BladeSystem servers provide the ideal platform for hypervisor-based virtualization.

HP Virtual Connect abstracts network connections to servers and virtual machines, greatly simplifying server management.

HP Virtual Connect Flex-10 allows a single network port to be configured as multiple hardware-virtualized NIC devices, eliminating the overhead and latency of software-based implementations.

HP Insight Dynamics–VSE and **HP Insight Orchestrator** simplify the management and provisioning of pooled resources, especially in environments containing both physical and virtual machines.

HP also **integrates selected third-party hypervisors** on HP ProLiant platforms, allowing customers to quickly and easily implement virtual machine environments.

The Intel® Xeon® processor 5500 series is optimized for virtualization due to its many unique hardware-assisted features.

At the processor level, Intel Virtualization Technology **(Intel VT-x)** improves the flexibility and robustness of software-based virtualization by reducing Virtual Machine Monitor (VMM) interventions.

At the chipset level, Intel Virtualization Technology for Directed I/O **(Intel® VT-d)** increases data movement speed and cuts performance overhead by reducing the VMM's involvement in I/O management.

At the network level, Intel Virtualization Technology for Connectivity **(Intel VT-c)** integrates hardware assists into the I/O devices that connect servers to network, storage, and other external devices. As a result, VMM and server processor loads are reduced and performance improved.

[1] IDC report, 2008 "Business Value of Virtualization: Realizing the benefits of Integrated Solutions"

Open source virtualization

Although one of virtualization's main attractions is lower hardware costs, the software can still be very expensive. The open source community is responding, though, and virtualization software is increasingly appearing in open source formats and being integrated into Linux distributions.

Major Linux and open source providers are actively supporting these efforts. In 2008, for example, Red Hat acquired Qumranet, a major contributor to the Kernel-based Virtual Machine (KVM) hypervisor, and stated that "KVM represents the next generation of virtualization technology." [2]

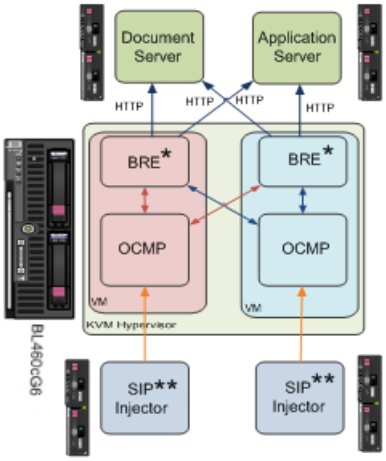
Two virtualized OCMPs can handle 20% more calls simultaneously than one native OCMP

Open source virtualization of a media platform

When several customers inquired about using HP's Open Call Media Platform (OCMP) software in environments sensitive to licensing costs, HP and Intel agreed to test HP OCMP together with KVM. The configuration implemented at the HP Intel Communications, Media, and Entertainment (CME) Solution Center runs on an HP ProLiant BL460c G6 server equipped with two Intel Xeon quad-core processors.

This proof-of-concept successfully validated HP OCMP running in a KVM virtual machine environment with Intel Xeon processor-based servers. It also showed that two virtualized HP OCMPs can handle a total of 20% more calls simultaneously than one native OCMP. Network I/O did appear to be a bottleneck, however.

[2] "The Evolution of Virtualization: Qumranet joins Red Hat", 2008. http://www.redhat.com/promo/qumranet/



* BRE: OCMP VoiceXML manager
**SIP: Session Initiation Protocol

Figure 1: Open Source Virtualization Architecture

HP Intel CME Solution Center team and facilities

The promising results of the proof-of-concept prompted the HP Intel CME Solution Center team of experts to undertake additional research to try and improve network I/O performance. In collaboration with Red Hat experts, they are building a configuration that includes VirtIO—the main platform for I/O virtualization in future versions of KVM—at the storage and network levels. The objective is to handle 20% more calls simultaneously.

This work can now be demonstrated to customers on our premises as part of an innovation workshop. It could also form the basis for additional proof-of-concept projects or benchmarking programs specifically tailored to customers' needs.

Key HP and Intel hardware components

HP Blade System c7000 Enclosure

The BladeSystem 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. The enclosure is 10U high and holds up to 32 servers or 16 storage blades plus optional redundant network and storage interconnect modules.

Intel® Xeon® processors

The Intel Xeon processor 5500 series is built using the latest 45nm Nehalem micro architecture with up to eight cores in a two-processor configuration. This new micro architecture delivers more performance in the same platforms and at the same power consumption, giving customers the flexibility to match performance, power, and cost requirements with their unique requirements and delivering advantages beyond just pure performance.

intel Xeon inside
Powerful. Intelligent.

hp invent solution center intel

The HP Intel Solution Centers provide complete telecom infrastructures for demonstrating the Communications, Media, and Entertainment Solution Portfolio to HP customers and partners. The centers are located in the three regions: Grenoble, France for EMEA; Richardson, Texas, USA for Americas, and Shanghai, China for APJ. These unrivalled technical facilities offer our customers and partners, the unique opportunity to evaluate new services in real-world environments, test new technologies and select the solutions most likely to succeed.

Technology for better business outcomes

For more information, visit http://www.hpintelco.net

Open Source Virtualization, April 2010.