



## **IBM Driving Linux on "z" for Enterprise Solutions**

December 11, 2009 - IDC Link

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Hosting Linux workloads on IBM's System/z platform is not new — but the pace and the energy with which IBM is building up its inventory of enterprise Linux solutions for the "z" mainframe is new. These [Enterprise Solutions for System/z](#) address several market realities: that mainframe skill-sets are limited compared to Linux skill-sets; that Linux is "growing up" to take on new roles in the enterprise; and that some degree of workload migration from Unix systems to Linux is happening on high-end servers.

The Enterprise Solutions components of [IBM's December 9, 2009, announcement](#) are the latest evidence for this approach to Linux. (This announcement for mainframe solutions came two weeks after a [broad software announcement for IBM System/z](#), including the Rational software-development environment.)

The approach IBM has taken with its IBM solutions for System/z suggests that IBM is leveraging Linux in several dimensions:

- As a flexible host operating system that can support virtualized instances, for workload consolidation and workload isolation
- As a foundation for cloud computing services, which need to add resources, on-demand, as user requests to the cloud service increase
- As a platform that can carry forward older mainframe workloads, while doing so in an updated, modular approach to computing
- As an alternative to Unix workloads that are running on competitors' servers

Historically, Linux is a well-established operating environment for the IBM System/z. We have seen that in the Integrated Facility for Linux (IFL) deployments on System/z, which support databases and line-of-business (LOB) applications on the IFL specialty processors (which some call coprocessors). We have seen evidence of that with multiple Linux instances, running under the IBM z/VM hypervisor, supporting application development and smaller workloads. And we have seen it when Linux supports a variety of open-source and Web-centric workloads (e.g., IBM WebSphere, IBM Lotus Domino) on System/z mainframes.

This ability to consolidate Linux workloads, and to host high numbers of programmer sessions under z/VM and virtualized Linux instances, is supported by an important virtualization capability for mainframe architecture that began with LPARs on IBM mainframes in the 1960s. Now, IBM is looking forward, to a world in which the mainframe's high reliability, availability and security will make it attractive as a vehicle for business continuity — both within the enterprise datacenter and in the merging world of cloud computing. That could help to increase IBM System/z shipments, which have seen a decline in unit shipments in 2009, even though IBM said the total number of MIPS shipped increased during 2009.

First, a number of [Solutions were announced last summer](#), including one supporting SAP workloads. The latest round of IBM Solutions, as announced on December 9, are:

- The Solution Edition for Enterprise Linux, designed to support Linux workload consolidation onto the IBM System/z. IBM will market this as a consolidation platform for Linux applications that formerly ran on other types of server platforms, including those based on x86, Itanium and RISC servers. The model for workload consolidation is already well-established for IBM System/z (using the z/VM hypervisor) and for IBM PowerSystems, using

PowerVM. What is new here is the total solution, as supported by IBM, which aims at encouraging migration of Linux workloads to the System/z platform.

- Introduction of "The Enterprise Linux Server," an IBM System/z system dedicated to running only Linux workloads. The solution will be delivered with an IBM System/z Model z10 Enterprise Class (EC) or z10 Business Class (BC) server running either the Red Hat or Novell SUSE Linux distributions — and the z/VM hypervisor to support multiple Linux virtual machines. IBM is including three to five years of hardware maintenance and three to five years of subscription and support for the z/VM software.
- The Solution Edition for Chordiant Applications, which address customer relationship management and decision support. Among the Chordiant applications supported are Chordiant Customer Experience Management, Chordiant Decision Management, Chordiant Recommendation Advisor, and Chordiant Foundation Servers (CFS). Chordiant, a company based in Cupertino, California, already supports IBM's WebSphere Process Server Connector software, which is a vehicle to deliver IBM/Chordiant end-to-end SOA-based solutions to the telecommunications industry.

With these new solutions, and others announced earlier this year, IBM is clearly building up a portfolio of Linux solutions for System/z designed to attract evaluations of the mainframe as a platform for Linux applications, databases and business intelligence (BI) workloads that require high levels of uptime.

**Co-location of Applications and Databases** IBM's central argument for moving Linux to scalable System z platforms is that co-location of the application/workload on the same system that already holds the corporate data yields benefits in terms of reduction in latency, resulting in improved application performance, as seen by end-users. Beyond that, any applications running on the System/z will "inherit" the system's high availability (HA) levels (ranging from 5-9s to 6-9s of uptime, or more, depending on configuration) — along with its encryption/de-encryption capabilities and its RACF security.

At least as important as those factors is the truism that Linux skill-sets, in terms of application development and systems management, are widely available, in contrast to the much smaller population of IT staff with mainframe-centric skill-sets, such as COBOL-style application development, knowledge of the CICS transaction system and IMS Fastpath database, and deep knowledge of mainframe-only operating systems, such as z/OS, DOS/VSE and TPF. In some deployment scenarios, Linux will play a key role in helping users of DOS/VSE and TPF to migrate, over time, to new software platforms.

For the Enterprise Linux Server offering, the customer is being presented with an all-Linux solution — but one that is based on IBM System/z hardware, RAS features, memory, I/O channels and RACF security. IBM had been selling a smaller all-Linux mainframe in past years, aimed mainly at Linux programmer/developers. IDC believes that this offering is more broadly aimed at the enterprise IT managers considering more scalable platforms for their Linux business applications.

**The IT Skill-Sets Issue** Although thousands of organizations worldwide depend on IBM System/z mainframes for mission-critical workloads, the continuing skill-sets issue is growing over time, as mainframe developers/programmers, systems operators and administrators change jobs or retire. To address that issue, IBM has fostered education and training of young college-age students and IT professionals — but the progress made there cannot compare with the much broader world of tapping into Linux open-source development, and accessing the broad community of IT personnel with Linux skills. If IBM can harness this energy around the Linux software environment — that could open the door to invigorating the growth of the IBM mainframe platform, which has seen slowing unit shipments in recent years.

Other vendors have also identified Linux — which runs on more types of platforms and architectures than any other operating system — as an important environment for their high-end servers. The central idea: Linux workloads on high-end host servers will benefit from very high levels of uptime, and strong security, as enforced by the server. Examples include HP with its Integrity Superdome and Integrity NonStop systems, Unisys with its ClearPath systems, and Fujitsu with its PRIMEQUEST systems, among others. It would also compete for business Intelligence workloads with Oracle's new Exadata systems, which run Linux on a "grid" of x86 servers made by Sun Microsystems.

**Two Kinds of High-End Servers: Unix Servers and Mainframes** For IBM, positioning of the scalable System z on Linux will require some discussion of IBM's own Unix servers, which support both Linux and IBM AIX Unix on IBM Power Systems. If, over time, more and more enterprise Unix workloads are adapted for use with enterprise Linux distributions (e.g., Novell SLE 11 and Red Hat RHEL), then customers will need to evaluate which scalable IBM platform would be best for each future deployment or project.

For this reason, it is entirely possible that, in some cases, System/z could vie for the same workloads that are being deployed on IBM Power Systems. Even so, IBM's Unix server market share is hovering around the 40% mark (as it did in Q309) — making IBM the market-share leader in Unix servers in Q309, followed in market share by HP and Sun. That is why some degree of platform contention for new projects, should it develop, might not concern IBM's server marketing team. Further, it is possible that IBM believes some customers may come to view a Linux-friendly mainframe as a replacement for competitors' older Unix servers, giving IBM two sales paths — IBM System/z and IBM Power Systems — to compete directly for Unix server replacement. Overall, the IBM Solutions offer the prospect of moving to the IBM System/z a number of Linux and Unix workloads that are today running on other servers in the datacenter. While, by raw numbers of unit shipments, mainframes will constitute just a small fraction of all unit shipments worldwide, this is a strategic move on IBM's part. IDC believes that it's being done for a variety of reasons:

- To maintain a longstanding franchise at the heart of the datacenter that generates \$4+ billion in hardware revenue alone each year
- To grow the IBM System/z mainframe TAM beyond the world's largest companies, where it is a mainstay
- To provide a scalable server alternative to Unix server sites beginning to consider replacing some of their older high-end Unix servers, which have been enterprise-workload workhorses since the 1990s

All of which means that the IBM System/z is a datacenter platform in which IBM is continuing to invest; the IBM mainframe is still evolving, while it is also being optimized to take on new workloads.

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