Independent Assessment
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News Analysis: IBM zEnterprise System

Changing the way organizations think about mainframe computing

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Executive Summary

The introduction this week of IBM's newest family mainframe systems, the zEnterprise System, with the z196 as the first machine in the family, clearly is not simply the next upgrade of the top of the current line, the System z10. Beyond an impressive although not unexpected boost in performance—the speeds and feeds—the zEnterprise System has the potential to change the way organizations think about mainframe computing in four ways:

1. Breaks the boundary of the traditional mainframe system
2. Changes the way organizations think about mainframe costs, especially cost per workload
3. Extends the System z reliability, availability, scalability, quality of service (QoS) and management beyond the mainframe to select IBM platforms
4. Provides a serious alternative to the dominant commodity x86 platforms for cloud computing and private clouds.

Beyond these the zEnterprise System appears to be packed with a rich assortment of features and capabilities that Independent Assessment will explore in depth subsequent case studies and reports.

Please note: the report that follows constitutes a first look at the IBM zEnterprise System based on a set of initial IBM briefings. It is subject to revision as more information becomes available.

zEnterprise System z196—the basics

Here is what IBM announced this week: a new mainframe, the z196, running a 5.2GHz superscalar processor. It is the successor to the current System z10.

The z196 packs up to 96 cores, of which 80 can be configured for client use. It handles up to 3TB of memory, which IBM refers to as RAIM (Redundant Array of Independent Memory) rather than the conventional RAM; provides 1.5MB L2 Cache per core; and 24MB L3 Cache per processor chip. That's twice as much on-chip cache as the System z10, which should boost data serving. It also allows out-of-order execution, which will speed compute-intensive application performance. Finally, it handles data compression and cryptographic processing on the chip, another speed boost.

In addition, it comes with a water-cooled option, a throwback to the old days when mainframes were routinely water-cooled. It also employs a host of other energy management capabilities to enable significant energy savings and offers a high voltage direct current option.

The biggest surprise, however, is the addition of an extension cabinet that attaches directly to the z196 through a high speed private network. Called the BladeCenter Extension (zBX), the extension cabinet is used to house IBM POWER7 blades and IBM x86 blades as well as the DataPower appliance and the SmartAnalytics optimizer with the promise of additional optimizers in the future. The POWER7 blades can be used to run AIX. The x86 blades can run Linux on x. An interesting note: with the inclusion of x86 blades, the system conceivably could run Windows and .NET systems, which IBM, as of yet, does not rule out.

To make the zBX more than just any network-connected cabinet, IBM includes with the zEnterprise System what it calls the Unified Resource Manager as part of the System z Hardware Management Console. With the Unified Resource Manager—maybe it should more aptly be considered an integrated virtual hardware platform manager—the z196 becomes what IBM initially refers to as the system of systems. Through the hardware management console running the Unified Resource Manager an administrator can manage the server, storage, and network resources running on the z196 and the Power, x86 blade, and other components residing on the zBX as System z as virtual platform resources. What happens with Tivoli then is anybody's guess.

It was not clear at the initial zEnterprise briefings what specifically an administrator working through the new Unified Resource Manager can actually do or how easily. Can the administrator only see what's happening or can he/she take real actions? This has very interesting implications and Independent Assessment will examine these in future reports and on DancingDinosaur—mainframe computing in the 21st century, its independent mainframe blog.

Finally, the z196 is upgradeable from the System z9 or z10.

Performance considerations

With every new release of a mainframe system the industry has come to expect a significant performance boost right out of the box, not a small incremental boost but something immediately noticeable. That remains true with the introduction of the zEnterprise System z196. IBM reports the following:

- 40% performance boost running z/OS
- 60% performance improvement running Linux on z
- 60% more capacity with z/OS
- 35% lower cost running Linux on z

These are impressive figures, especially for the first release of a new machine. The zEnterprise certainly appears to deliver topnotch performance. However, these figures come directly from IBM. Until outside analysts like Independent Assessment can observe actual benchmark tests and speak with customers deploying the system in production, analysts can only report the IBM figures but cannot validate them.

Similarly, IBM claims that the new z196 lowers the cost of operations and performance across a variety of industries. For example:

- 44% lower cost per credit card transaction
- 67% lower cost per ATM transaction
- 24% lower cost per hospital bed
- 20% lower cost per airline passenger
- 25% lower cost per retail store

Taken at face value, these are attractive, even impressive numbers. Again, however, what exactly is being measured under what circumstances and what exactly these number may mean is not immediately clear. Until Independent Assessment can look more deeply into these numbers and the methodology used to arrive at them it can only report what IBM claims, not validate the numbers.

How organizations think about mainframe computing

Large organizations can be easily classified as those that have mainframe computers and those that don't. For the most part, sales of new mainframes go into organizations that already have a mainframe. The exceptions tend to be organizations in newly developing regions of the world, such as Asia, Southeast Asia, Russia, and more recently Africa.

One exception occurred around Linux on the System z. Companies that need to consolidate large numbers of distributed Linux servers have discovered they often can do better by running multiple virtual Linux instances on a System z mainframe. IBM encouraged this by lowering hardware and software costs in such a way that consolidated Linux servers on the mainframe were more than cost-competitive with multiple distributed Linux servers running on commodity processors. Plus, the reliability, availability, scalability, manageability, and security of Linux on System z were much greater. Independent Assessment has published numerous case studies about organizations doing exactly this.

Still, in general, organizations that don't use mainframe systems simply don't even consider them. The introduction of the zEnterprise System and z196 has the potential to change this mindset, especially among organizations that run UNIX on large enterprise servers or run Linux on x86 systems and blades. Here are four reasons why organizations should now think differently about the mainframe:

1. zEnterprise breaks the boundaries of the mainframe cabinet—able to reach beyond the box to UNIX/AIX on POWER7 and x86 blade systems and integrate them closely with the z196, allowing end-to-end management of the extended platforms. Exactly how much management control the administrator actually has is not clear, but whatever it is it will be far more than before. If IBM carries through and makes the Unified Resource Manager into a true virtual cross-platform resource manager it will have achieved a valuable breakthrough for its z196 customers.
2. Potential to change the cost per workload—the more workloads you run on a shared system, the lower the cost of each workload and, ultimately the greater the overall ROI (assuming each workload delivers a positive ROI). With the z196 and the zBX you can now run z/OS, Linux on z, AIX, and x86 Linux workloads through the z196. The combination of z/OS, Linux, and AIX workloads gives the organization more choice and the possibility of many more workloads over which to spread the cost.
3. Extension of z/OS management—the Unified Resource Manager extends the span of control of the z196 administrator to workloads on the POWER7 and x86 virtualized blade platforms, enabling organizations to reduce cost of ownership with fewer people managing more systems. The POWER7 and x86 blade workloads

also should benefit from the higher levels of reliability, availability, security, and manageability inherent in the z196 platform.

4. Alternative cloud platform—to date the cloud has been considered primarily a commodity x86 virtual server play despite IBM's isolated System z forays into the cloud. The z196 and zBX combine to present a viable alternative to commodity x86 cloud platforms. It should be of particular interest to organizations considering private clouds.

These four new ways to think about the mainframe seem viable based on what is known about the newly introduced machine at this point. To what extent IBM is able to build out the potential in the zEnterprise design and to what extent IBM competitively prices the z196 will greatly impact how viable any of the ways noted above becomes. But the potential is there.

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Independent Assessment analysis

There are reasons to get excited about the zEnterprise System. The z196 certainly is not just a z11, which was widely expected to be the next rev of the z10. It is based on a dramatically different design, which brings the potential to do things differently. That certainly is what mainframe-based enterprise computing needs.

IBM referred to the zEnterprise initially as a hybrid mainframe and with support for POWER7 and x86 blades that appears to be true. Unclear at this point, however, is how its hybrid nature plays out in the real world of enterprise computing. Certainly there is more we need to know about the z196, its performance, its capabilities, and its costs. Independent Assessment will continue to research all aspects of the zEnterprise System and z196, seek out early adopters, and report on whatever turns up. Right now the machine has all the markings of a winner. But we will withhold judgment and give the machine 6-12 months to begin demonstrating what it really can do.

About Independent Assessment

Independent Assessment is the IT and business assessment, analysis, and writing service of Alan Radding, an independent business and IT analyst/writer for over 20 years. It provides independent ROI and TCO analysis, competitive assessment and positioning reports, case studies, white papers, and Web content.

Independent Assessment publishes *DancingDinosaur*, the independent blog covering the System z.