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A Mainframe System on a Smaller Scale — IBM's zSeries 890 and ESS 750 are Dynamic Duo

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Management Summary

In recent years, the competition for high-end servers and storage has been focused squarely on size and speed with the emphasis on more, more, and still more. Moore's law (excuse the homonym) is invoked with glee. The performance and features of high-end devices have been dragged to dramatically-greater heights of capacity, dragging the minimum capacity higher as well. But many enterprises need the features of high-end environments – both servers and storage - in more modest capacity. Much of the value of *zSeries* is in its resilience and security and highly-evolved operating environments. Much of the benefit of high-end storage lies in the data services it provides. When software pricing is capacity-based, surplus capacity can be a considerable ongoing cost. Buying the *biggest* may not be the *best* move. **These days, *right-sizing* is better than *super-sizing*.**

In the past year, IBM has switched from the imperative drumbeat of *more* to the more civilized practices of *product tailoring*. *zSeries*, in particular, made many announcements of new features and pricing flexibility that tailor the mainframe environment to better fit the needs of today's medium-to-largest enterprises. With the launch of the *zSeries 890* mainframe and the *ESS 750* storage array, both little brothers of their larger siblings, but possessing most of the same high-end genetic pool, IBM has produced an environment suited for more modest-sized – but still mission-critical – enterprise IT needs. They have tailored in flexibility and tailored out the excesses that would be merely *honkin' big* – and thus can offer an entry-level mainframe and storage that starts at as about $310,000.

Does this sound like music to your ears? For more details on this dynamic duo, read on.

z890

ESS 750

Source: IBM

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Tailoring the Data Center

Tiers of capability are common in the enterprise data center. Because of the technology buying cycle, there is always older equipment on the floor. Because of the rapid development of technology, that older equipment is often less functional in some way, and is used for applications where that particular shortcoming is not critical. During the past few years the buying cycle has stretched, so older equipment is even *older*. At the same time,

- The impact and costs of downtime have escalated,
- More applications have become mission critical, and
- The need to integrate applications with legacy back-end systems has increased, along with
- The desire to offload Java work.

The needs for high-end resilience and security are an unpleasant reality – and yet the need to tailor the acquisition to the budget of today is also paramount. The z890's and ESS 750's carefully crafted capacities and capabilities come at a good time for the beleaguered enterprise that needs higher quality, but in less than warehouse club quantities.

zSeries 890

With the *eServer zSeries Model 890 (z890)*, IBM has chosen to offer a starter-size mainframe, with the widest yet range of invokable capacity - and with the ability to offload Java applications to a separate processor called the *zSeries Application Assist Processor (zAAP)*[1]. Selectable capacity is more useful to many enterprises than surplus capacity – capacity for which they must pay, and pay, and pay. The ability to offload the processing of many Web-based applications from zOS allows smoother processing and may significantly reduce zOS's MIPS-based software licensing charges, while keeping the processing in an environment with all the mainframe qualities of availability, scalability, resiliency and security.

This smaller, less expensive zSeries may also be used by existing mainframe environments to provide another tier of mainframe processing for appropriate applications, jointly manageable by the same console. Suddenly these environments have more ways to do more with a mainframe.

With the z890, IBM has slimmed the price by coordinating the sizing. Available memory and connectivity vary with the processing capacity selected. IBM also has limited options that many customers will not need[2], while keeping all the resilience, scalability and security that makes the mainframe a top-rated environment. With z890's upper capacity being a step-up from the z800 models, and its lowest capacity being less than the z800's, you should consider the z890 as a *baby z990*, not a turbo z800.

The Model

This product is a *single machine and model*, with a single multi-chip module (MCM) – and the largest ever range of capacity settings. MIPS range from 26 (32% less than the smallest z800), to 1365 (123% bigger than the largest z800). The z890 provides this in a single frame with one- and three-phase power options and an internal battery. A raised floor environment is recommended, but not required.

The MCM has four processors, each of which can be *characterized* by the customer, as needed, as a *central processor (CP), Integrated Facility for Linux (IFL), Integrated Coupling Facility (ICF)*[3], and zAAP, the new dedicated *Java* environment. The specialty processors all perform at full capacity, while the CP is set to perform at the capacity chosen by the customer. There are some limitations. While the processors can

[1] The zAAP option is also available on the z990. For more information, see *zSeries Zips Through Java with zAAP* in **The Clipper Group Navigator** dated April 7, 2004, at http://www.clipper.com/research/TCG2004030.pdf.

[2] IBM has focused its pruning attention on infrequently used options that incur high qualification costs.

[3] These are used to connect mainframes and storage in a *Parallel Sysplex* environment..

be configured as all-IFL or all-ICF machines, any mixed-character configurations must include one central processor, and the number of zAAPs cannot exceed the number of central processors. These limitations do not limit things much, when you consider that any operating system running as a guest under VM (as Linux does in an IFL) can be set up as hundreds of virtual machines on a single processor.

z890's memory is 8 GB as a standard configuration, incrementable in 8 GB chunks to 32 GB. Up to 30 LPARs are supported, with the lowest capacity setting supporting 15.

z890 Operating System Availability	ESA/390 (31-bit)	z/Arch (64-bit)
z/OS Version 1 Release 2, 3, 4, 5 *IBM Bimodal Accommodation Offering is available for z/OS 1.2, 1.3, and 1.4. This offering will not be provided for z/OS 1.5.	No*	Yes
z/OS.e Version 1 Release 3, 4, 5	No	Yes
OS/390® Version 2 Release 10	Yes	Yes
Linux, 64-bit distribution	No	Yes
Linux, 31-bit distribution	Yes	No
z/VM Version 5	No	Yes
z/VM Version 4 Release 3, 4	Yes	Yes
z/VM Version 3 Release 1	Yes	Yes
VSE/ESA Version 2 Release 6, 7	Yes	No
z/VSE** Version 3 Release 1 **z/VSE can execute in 31-bit mode only.	Yes	No
TPF Version 4 Release 1 (ESA mode only)	Yes	No

Source: IBM

z890 supports both ESA/390, which is 31-bit, and zArchitecture, which is 64 bit. See the table at the upper right for the details on the availability of operating systems on z890.

The Connectivity

The connectivity options are shown in the box to the right. It is important to note that the number of ports available goes up and down with the capacity selection. This is part of the *governing* features that keeps capacities matched with use and keeps costs within bounds. As with z990, the z890 supports *Parallel Sysplex*.

Upgradability

The z890 offers both full *Capacity-on-Demand* and temporary processor upgradeability (On-Off Capacity on Demand). This allows the z890 to be used for applications that will spike without permanently assigning them excess headroom capacity. This flexibility is most useful in an environment where the operating system will automatically take care of all the details of redeploying and balancing workloads. Many enterprises will find that the ability to upgrade transparently and the ability to transfer workloads to IFLs running Linux on the z890 will permit them to re-architect their server environments. Of

z890 Connectivity

Data Connectivity

- Up to 40 FICON channels (32 on the lowest capacity setting)
- Fibre Channel Protocol
- Up to 420 ESCON channels (240 on the lowest capacity setting)

Network Connectivity afforded by *OSA Express* adapters. Up to 40 ports available (24 on the lowest capacity setting)

- Gigabit Ethernet
- 100 Base T Ethernet
- Token Ring

Internal

- Hypersockets (16)

Parallel Sysplex

- Maximum links: 64
- ICB – 3
- ISC 3 – 1C
- ICB – 4 (2 GB/Sec.)

Integrated Console Controller (OSA-ICC) manages z990 servers as well.

course, should the need arise, some z890s can be upgraded to z990s.

Software Pricing

As well as the standard WLC pricing model, this model may be eligible for the *Entry Workload License Charge (EWLC)* tiered pricing structure. This delivers a lower cost at the smaller end of the z890's range.

Additional Security

In addition to zSeries *PCICA* for SSL transactions and the *PCIXCC* cryptography adapter, z890 offers as an option a Cryptography Function on every processor unit (*CPACF*). This will appeal to enterprises using encryption pervasively throughout the enterprise to cope with both internal and external threats – and the need for privacy.

ESS 750

With the *TotalStorage Enterprise Server Model 750 (ESS 750)*, IBM offers an entry-level version of its high-end *ESS 800 Storage Server*. IBM has limited its capacity (1.1 TB to 4.6 TB) and preset its cache (8 GB cache managed by a 2-way processor), while keeping the advanced resiliency services of *FlashCopy* and *PPRC*, and many of ESS 800's hardware features intermixable RAID (-5 and -10). Significantly, IBM offers all of this at an entry-level price. These features will appeal to customers in both mainframes and open environments. The ESS 750 will appeal strongly to mainframe customers[4], as it supports *PAV*, *Priority I/O Queueing* and *Multiple Allegiance.* And, of course, it will particularly appeal to customers of the z890, for which its sizing was targeted as a companion product.

Connectivity

The ESS 750 offers 2 GB *FICON*, Fibre Channel and *ESCON* connectivity. There is no single point of failure or repair, making it suitable for 24 x 7 operations.

[4] There are no limitations. The ESS 750 will connect to older G3, G4, G5, and G6 mainframes, as well as the z800 and z890. z900 and z990 owners can purchase this smaller ESS, if it fits their needs.

ESS 750 At a Glance

Processor	2-way, 600 MHz
Cache	8 GB
Host adapters	2 to 6
FICON	yes
Fibre Channel	yes
SCSI	no
Disk Drives	16-64, only 10K RPM
Capacity	1.1-4.6 TB
Power	three phase

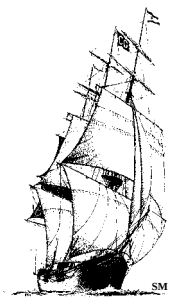
Upgradability and Software

ESS 750 supports both version 1 and version 2 of FlashCopy and PPRC. The earlier versions are less expensive and may be adequate for many enterprise situations. The two versions can work together in the same environment. Should the early version of FlashCopy or PPRC prove insufficient, it can be upgraded non-disruptively. Similarly, the entire 750 array can be upgraded non-disruptively to an ESS 800, increasing the storage capacity up to tenfold, and the cache to 64 GB.

ESS 750 is targeted at enterprises with lower workload requirements. It can also be an excellent secondary array for peer-to-peer remote copy (PPRC), and could even be a primary copy target. This right-sizing is just the first step in bringing high-end storage in line with the reality many customers face.

Conclusion

IBM is the first vendor of premium computing elements to break with the imperative of *big* and address the imperative for *best fit*. Unused capacity is expensive. With zSeries z890 and ESS 750, IBM gives its customers a way to use all they need but, more importantly, more exactly what they need – and to pay less for what they use. These two products are available separately, with attractive pricing. **For many, the two will make a right-sizeable dynamic duo, ready to address a series of serious enterprise needs.**



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