



IBM System z: Platform Star for Linux and Open Source Software

We've made no secret of our respect for and interest in the mainframe. Nor, have we been reluctant to identify where we consider it a rising star for use in a number of new and emerging segments of the IT market. We've even been known to offer commentary and advice about its problems. However, we strongly believe the mainframe possesses inherent architectural and management advantages for dynamic, highly adaptive, secure, highly demanding operational environments whether considered for the appropriateness of application or architecture. The investment by multiple systems management vendors (BMC, CA) added to IBM's continued investment testifies to the mainframe's ability to drive, and derive, a respectable revenue stream. Recently, IBM took the stage to discuss the growing popularity of the mainframe in the Linux and open source software communities. IBM shows that the demand for mainframe MIPs is in transition from a mild (2%/year) to respectable (7%/year) growth range. Let's examine what's behind this growth.



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Mainframe Attributes Meet Open Source Needs

IBM provided a range of data to illustrate the ability of the mainframe to meet the requirements for improved efficiency, escalated levels of and capabilities for security, and improved economics that drive demand in today's computing environment. IBM presented studies showing that in terms of power demands and cooling, a mainframe can be configured that requires only 1/12th of the power as a distributed server farm configured to offer equivalent processor compute capability. A new, more space efficient configuration allows today's mainframe to provide up to 4 times the compute performance with the same footprint as earlier models.

To meet security requirements, the System z9 alone has the highest certified security rating (EAL 5) existing on the planet today for partitioned server environments. The System z9 provides enhanced encryption functionality that integrates with recently announced tape encryption to maintain the traditional security touchstone of the mainframe architecture. These capabilities complement built-in high availability capabilities for risk management to meet the strictest requirements of governance and business continuity.

The economics of the mainframe with built-in virtualization, server optimization techniques, and specialty engines (for pooling processor resources – ICF engine, Java applications –zAAP engine, Data management – zIIP engine, and Linux – IFL engine) translate directly to savings in hardware costs through more efficient utilization of available resources, and lower software costs through available licensing options. For example, the price of the Integrated Linux Facility, built specifically to support Linux workloads has not increased in price since 2001 despite a 300% increase in processing capacity. The recently introduced z9 BC (Business Class) machine is priced at \$95,000. This is 24% less than the general purpose System z servers.

An indication of Linux user response to the mainframe is that over 1000 purchased System z Linux systems for development or application deployment. Currently, approximately 20% of IBM’s revenues and 30% of MIPS come from Linux customers. Some 28% of zSeries customers currently run Linux. The demand for

ICF – Integrated Coupling Facility
IFL – Integrated Facility for Linux
zAAP – z Application Assist Processor
zIIP – z9 Integrated Information Processor

Linux IFL’s grew by 63% from 2004 to 2005. There are over 800 System z-based Linux projects currently underway at IBM customer sites. In its Q3 numbers, IBM shows a leap to 25% year-to-year growth in mainframe revenue (from 7% in Q2) while gaining 2 points of market segment share for servers costing over \$100K. Market share growth runs 2 to 3 points per quarter.

The distribution of customers installs runs across market segments (see Figure 1). The highest (over 20% each) occur in the Financial, Public, and SMB segments. The balance of the systems are spread over (running between 3% and 7% each) in Communications, Computer Services, Distribution, and Industrial markets.

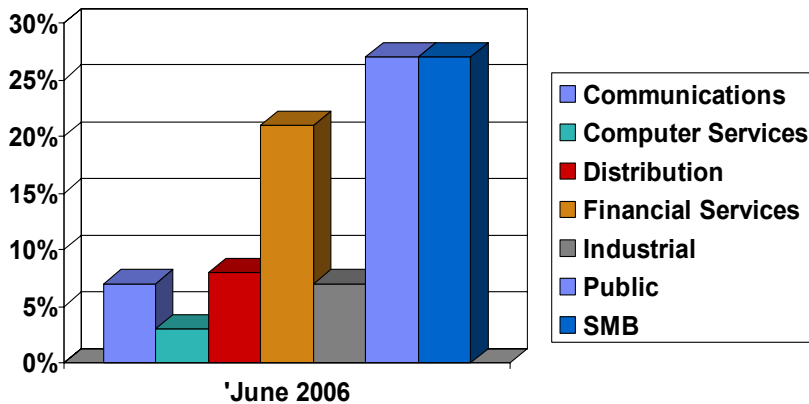


Figure1 IFL Customers by Market Segment

Finally, an IBM effort to foster and create a comprehensive ecosystem of support for Linux on all platforms is paying off. The number of ISV and application development partners supporting Linux on System z has grown to over 800 developer partners and over 300 ISV's. These partners and customers are supported by an expanded Linux and Open Source ecosystem that includes technical support located in 32 competence centers worldwide. The three newest centers are located in Sao Paulo, Moscow, and India.

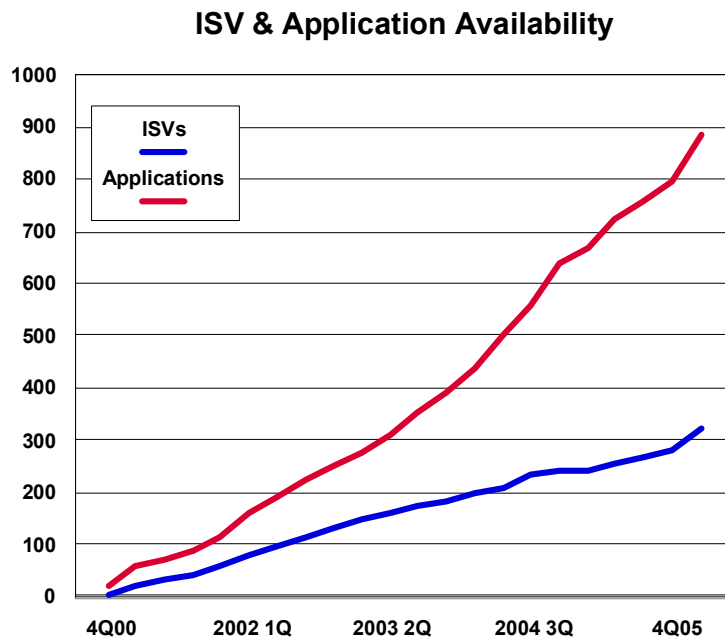


Figure 2 Linux support in IBM ISVs and Application Developers

The IBM services organization has delivered over 15,000 Linux client engagements. Currently, there are over 6,000 IBM employees in the Linux practice community who write about, use and support Linux within the IBM environment. A dedicated website at www.ibm.com/linux provides on-line inquiry and support. Every IBM's processor platform supports Linux from the BlueGene supercomputer to microprocessors (Power and Cell) to the desktop, and including storage platforms like the DS 6000.

Clearly, IBM has committed significant resources to the success of Linux and the Open Source software community with the mainframe positioned as a major development and production platform. Open Source software is positioned at the heart of the future of the IT market in the European community. Because of its support for Linux, J2EE, Eclipse, and Apache, IBM is well positioned for an active role in fostering Europe's open source market growth.

What Customers are saying

IBM provided specific examples of customer using Linux in mission critical situations. These include Nationwide Insurance where every day over 100,000 active users access 12 mission critical applications. The solution deployed in 4 months and is expected to save the company more than \$15M over 3 years in a combination of direct savings and cost avoidance.

The First National Bank of Omaha implemented a server consolidation project based on Linux on System z to realize an immediate cost savings of \$450,000. At the same time, they proved their experiencing better RAS (reliability, availability, and security) while freeing two-thirds of the support staff to do other tasks. Particularly attractive to this user was the fact that with IBM they could easily move their application onto other platforms if their processing needs change.

Additional examples of Linux on z customers include: 1) the PGA Tour – using Linux virtual services to host their internet offerings, cost-effectively handled wide swings in demand fluctuation; 2) the Regione Lazio (a regional Italian government) providing e-government on demand with improved convenience for citizens while lowering the total cost of ownership; and 3) Nexxar – a service provider creating an IT infrastructure architecture to support very high (24x7) availability while responding economically and efficiently to high growth in service demands as the expanded through acquisition. Nexxar is particularly interesting as it consolidated more than 80 x 86 servers onto a single IBM System z9 BC server.

Unfortunately, IBM was not able to provide details on the per cent of customers using the Linux environment exclusively for development versus those using it as a production deployment platform. IBM did, however, provide a significant number of customer examples running critical applications on Linux mainframes. While our research across multiple different vendors' platforms showed that as recently as the latter half of 2005, a significant majority of distributed Linux systems were used purely in development or internal environments with relatively few production deployments. Without exact numbers, we can only say we sense that the mainframe market appears more willing to use Linux in production environments.

While we like to see harder numbers, we tend to agree as IBM stated, that the growth in Linux is coming from a combination of new customers and new workloads not simply replacement of out-grown Linux or overly expensive UNIX systems. As the price point and footprint of the mainframe drops while the processing power increases, it becomes more difficult to justify the additional costs incurred in support, maintenance, networking, power, and space required by racks of servers.

One might create a synthesis of the mainframe with various server farms, but today we cannot equal the mainframe's particular advantages in multi-tasking at high volume and hence the lower per unit costs of mainframe computing power.

The mainframe is technology matched to the scale and demands of an e-infrastructure for a knowledge-based society. There is little expectation or danger of blades and distributed systems being driven from the market. However, it continues to become more interesting to contemplate and assess the mainframe against these smaller, individually cheaper alternatives. The difference becomes especially striking when considered in terms of the emerging advantages in the areas of reduced environmental impacts (power, heat generation, space savings, etc.) inherent in a centralized and specialized mainframe.

The Final Word

In our opinion, for far too long mainframe demand and success in that market has been treated as a unique, almost sideshow, event. Its growth always appeared to be somehow viewed as something unique and unexpected. As IBM pointed out, the arguments are demonstrably in favor of the mainframe from the unique attributes of its consistently self-centered, self-aware, and self-controlled architecture and operating environment to its consistent delivery of additional value at reduced cost. The mainframe is not and will not be the right solution in every case, but it alone can and will meet the needs of a significant portion of the IT market that demands unrelenting and unmatched reliability, security, and control.

The explosion in both interest and demand for environmentally friendly, 'green' IT hardware infrastructure will only add fuel to the mainframe demand. Legislated mandates for more efficient utilization of resources, lowered power consumption, and reduced environmental impact all add to the allure of a more efficient, lower-priced, and smaller footprint mainframe.

But does this argue for the replacement of small, individually cheap, separate processors in swarms - be they in server farms, clusters or arrays? Such large server farms which often form our Internet portals, as the front-ends to handle perhaps millions of 'hits' on a website will no doubt continue to be the preferred architectural style. However, what happens beyond the portal in serving the customer and returning the service is often another story. Highly accessible computing in small units at low cost has reshaped our society by providing access - but it has its limits when delivering services. The story of IBM's mainframe experience is still being written and it looks to be a story of impressive rebirth, renewal, and return.

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Richard Ptak has extensive experience working closely with Fortune 500 companies in developing product direction and strategies at a global level. Rich has held positions as senior vice president at Hurwitz Group and D.H. Brown Associates. He has held engineering and marketing management positions with Western Electric's Electronic Switch Manufacturing Division and Digital Equipment Corporation. He is frequently quoted in major business and trade press such as The Wall Street Journal, New York Times, AP, Business Week, eWeek, InformationWeek, and Computer World. He is author of "Manager's Guide to Distributed Environments," (John Wiley & Sons, 1998). In addition, Ptak was technical editor of "Cisco Internet Architecture Essentials Study Guide: Cisco Internet Solutions Specialist" by Recore, Laurenson, and Herrmann (Cisco Press, 2002). Rich earned his MBA from the University of Chicago, and his MS in engineering from Kansas State University.

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