IBM x86 Servers in the Cloud:
“Serving the Cloud”

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Executive Summary

Midmarket companies are facing increasingly complex workloads, space constraints and tightening IT budgets, which are all driving consideration of on-premise private cloud buildouts as a solution for flexible computing capacity.

TBR believes private cloud buildouts offer a secure, cost-effective means to meet midmarket customers’ evolving requirements. Cloud offers centralized management, virtualization and energy efficiency to support enterprise productivity and a reduced IT total cost of ownership.

IBM leverages on-premise private cloud capabilities to enhance its native server hardware capabilities, such as those in its new System x M4 servers. TBR believes IBM is well positioned to meet the specific requirements of midmarket customers – including increased server performance and reduced server total cost of ownership.

Midmarket customers are migrating to the cloud to increase IT efficiency, cutting capital and operational expense requirements

Cloud provides midmarket customers with a number of benefits, namely delivering a high return on investment via increased efficiency and centralized infrastructure. Efficiency and productivity resonate with the midmarket requirement that every IT dollar invested must have a positive return in the face of tightening budgets and strained resources.

On-premise private cloud infrastructures, built on x86 servers, save customers money by increasing scalability and reducing energy and IT administrative requirements, thereby lowering IT infrastructure total cost of ownership. This increased performance also enables customers to do more with fewer machines, lowering capital and energy expenditures. Fewer machines mean that midmarket customers can save physical space, enabling more effective use of their infrastructure.

Cloud increases scalability and resource sharing between systems – saving customers’ money by enabling servers to better adjust to workload spikes and run more efficiently. Systems more finely tuned to dynamic workload demands process applications more quickly and efficiently, enabling midmarket customers to do more with less. Midmarket customers can avoid additional capital investment in excess systems to handle workload spikes.

The shared nature of cloud enables end-users to access data on multiple
technologies, from multiple locations – meeting the increasing midmarket customer expectation of access to data from anywhere. Midmarket customers can also leverage on-premise cloud infrastructure to enable access to data from on multiple devices. As a result, customers are able to extract greater value and productivity from their data and key applications, such as analytics.

On-premise private cloud buildouts enable centralized management of IT infrastructure. This allows customers facing constrained IT departments to easily, cost-effectively manage their IT environments by reducing the IT administrative burden. Centralized management also enables streamlined technical support, mitigating costs associated with a potential security breach or leak. The proximity of private clouds over public clouds has advantages for midmarket customers seeking tighter control over the design and security of IT resources. Centralizing the IT environment results in simplified support – a key midmarket requirement that grows increasingly critical as customers are working to do more with less and integrating new technology.

IBM positions its x86 servers, equipped with new Intel processors, to ensure seamless cloud adoption

IBM System x M4 servers, with Intel Xeon E5 processors, provide an efficient, secure base for midmarket on-premise private cloud environments. When integrated into private cloud buildouts, IBM’s new System x offerings support centralized, scalable IT management and heightened server automation – helping reduce costs associated with the IT environment for end-customers. IT infrastructure centralization, scalability and enhanced automation result in easier, more cost-effective and more secure system management.

IBM cultivates a multifaceted approach to increasing server return on investment in a private cloud IT environment. IBM blends server uptime, performance and input/output (I/O) flexibility with server density and cost efficiency. The System x3550 M4 and System x3650 M4 couple increased processor performance with expanded memory capacity and flexibility to deliver increased efficiency tuned according to constantly changing
workload-specific compute and power requirements. IBM reports enhanced I/O and networking capabilities also support improved efficiency by reducing network bottleneck. The System x M4 servers also integrate Feature on Demand capabilities, which can be unlocked as needed to support organizational growth – enabling midmarket customers to avoid completely ripping and replacing IT infrastructure as they grow.

Intel processors support the integration of performance and power efficiency. The processor can handle large, dynamic enterprise-caliber workloads, providing versatility in infrastructure application support.

The processor is also bandwidth-optimized to enable customers to do more with data by supporting high-performance analytics. Heightened analytics capabilities increase the value of improved access to data enabled by private cloud capabilities. In addition to accessing their data faster and more efficiently, customers can derive greater insight from their data pools with analytics.

**Incorporation into a private cloud buildout helps tune increased processor performance according to workload spikes**

Since private cloud environments maximize shared resources, the performance improvements available from the new IBM System x M4 servers can be fully utilized and adjusted to the workload they are running with more granularities. Private cloud infrastructures help customers reduce operating expense requirements associated with the IT infrastructure. Cloud enhances IBM’s workload optimization proposition, enabling IBM servers to run more efficiently. IBM leverages workload optimization to align server processing and power requirements according to the workload they are running – helping reduce midmarket customer operational expenditure requirements.

**In addition to supporting increased performance, Intel CPUs help drive down server total cost of ownership**

IBM leverages its partnership with Intel to augment the workload optimization proposition, increasing processor performance and supporting enterprise productivity. At a base level, Intel Xeon E5 processors provide the efficient engine for the on-premise private cloud by leveraging increased processor cores, expanded memory and bandwidth capacity and tighter I/O integration.

Furthermore, integration with Intel TurboBoost Technology 2.0 enables IBM’s new System x offerings to rapidly meet workload spikes to return the server to a lower power state – reducing system power consumption and operational costs. TurboBoost Technology 2.0 maximizes CPU performance when processing single and multi-threaded applications, including technical, financial, scientific and content creation applications.
In addition to providing base-layer support for core compute applications, this support helps align IBM’s System x M4 servers with vertical-specific applications.

TurboBoost 2.0 Technology manages CPU power and thermal headroom to maximize time spent in Turbo mode, boosting processor performance. TurboBoost Technology 2.0 can detect when memory and I/O are the bottlenecks, so as to not engage the processor in Turbo to maximize power consumption efficiency.

**Enhanced memory and storage deliver increased scalability and reduce server TCO**

IBM System x M4 servers support both scalability and virtualization in a midmarket private cloud environment, keeping the server total cost of ownership low by increasing memory capacity with its System x M4 servers. Increased memory capacity also enables the server to process applications faster, saving end-customers money.

**IBM System x3650 M4**

As the criticality of data and demand for access increase, IBM integrates expanded, diverse memory options into its System x M4 servers. Enhanced memory capabilities deliver increased flexibility help to align the system with customer-specific needs, which supports productivity and efficiency.

Disk storage is designed to be flexible and deliver increased capacity, also supporting both scalability and productivity in the cloud. A key lever IBM’s M4 servers integrate to boost storage scalability and productivity is improved RAID control options, which enable more efficient distribution of data across the servers’ storage systems and enhance server virtualization capabilities.

The System x3650 also offers optional eXFlash storage. eXFlash increases internal storage capacity and performance to boost overall server efficiency. IBM reports the technology delivers 40% greater solution density and reduces server power requirements to 1% of spinning disk power requirements to drive total storage costs down 97%.

**Expanded networking and I/O capabilities are key levers in enabling rapid data transfer across the private cloud**
Demand for access is creating new strains on midmarket networks. As a result, IBM’s System x M4 servers have new features that meet evolving networking requirements. IBM’s servers utilize Intel I/O integration to boost data processing efficiency throughout the organization’s private cloud. Intel integrates the I/O controller and connections directly on the processor to reduce latency and add bandwidth—streamlining network traffic. I/O integration helps mitigate network bottlenecks, enabling data to be accessed more quickly in addition to reducing power requirements. IBM’s System x M4 servers leverage two additional x16 I/O slots and increased PCIe lanes to afford customers greater flexibility in which peripheral devices are connected to the processor.

**Features on Demand enable IBM System x servers to easily, cost-effectively grow in tandem with midmarket customers**

IBM leverages Features on Demand, add-on server features customers pay to utilize, to deliver incremental server improvements and upgrades as the midmarket company grows. Features on Demand enable customers to purchase the near-term capabilities they need and avoid costly ripping and replacing of existing infrastructure.

Features on Demand are enhanced System x capabilities integrated into the server’s firmware and software. This integration reduces the cost of upgrades by enabling customers to avoid ripping and replacing architectures, and enables upgrades to be conducted in the field. IBM positions upgrades as secure and easy to implement and end-user- and business partner-friendly, enabling business partners to reduce their inventory levels and enable evolving end-user requirements to be addressed more rapidly.

**The value of IBM System x cloud capabilities for customers and partners**

IBM is aligning its portfolio with the needs of midmarket customers migrating to the cloud, making it easy for end-customers to build on-
premise private cloud infrastructure. Customers will gain assurance by knowing IBM servers will perform reliably, while delivering secure access to data. IBM business partners can also play a key role, as some customers will require assistance from their IT suppliers in setting up and supporting on-premise private cloud infrastructure. TBR believes business partners can benefit from IBM’s standing as a trusted IT advisor, leveraging IBM’s expansive services business to better support their midmarket end-customers.

Conclusion

As midmarket companies face increasing compute requirements and stagnant or shrinking IT budgets, on-premise private cloud buildouts emerge as a suitable and reliable solution to evolving midmarket customer requirements.

IBM leverages private cloud capabilities to augment its core server hardware capabilities, boosting IT environment efficiency and reducing the IT administrative burden to meet the needs of midmarket end-customers. This also better enables IBM’s business partners to support end-customer adoption of on-premise cloud infrastructure.
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