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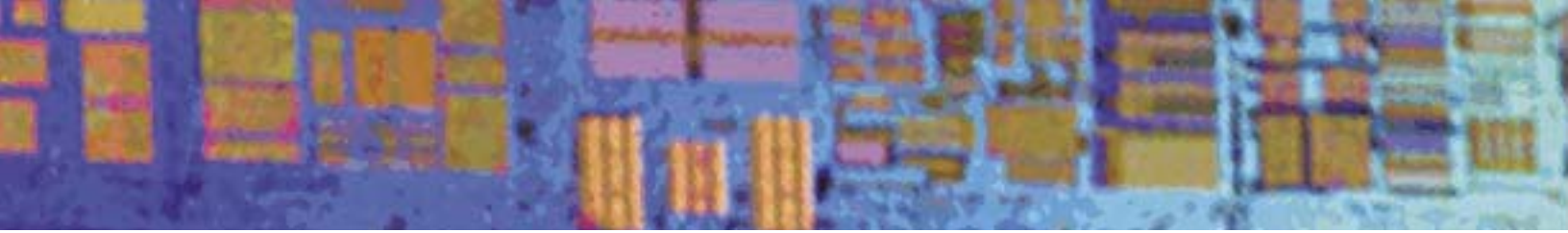
zAAP Cost and Complexity Out of Your Infrastructure with the IBM System z9 and eServer zSeries Application Assist Processors

Delivering a specialized z/OS Java execution environment with the integration advantages and traditional strengths of the mainframe platform

On demand is business is everywhere. Customer expectations continue to grow and business requirements are changing more rapidly than ever.

As the Web becomes the tool of choice for commerce, and as the Java™ language continues to take the programming world by storm, organizations that want to remain competitive and responsive to their customers, partners, employees and stakeholders must develop and deploy new strategic business applications more quickly, efficiently and cost effectively than ever before. In order to develop, maintain and enhance these applications on a regular basis, sophisticated tools and a strategic approach are required.
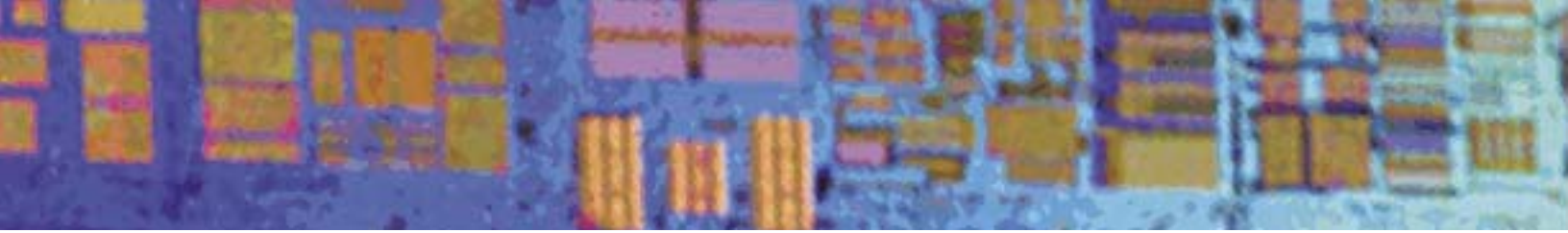
Enter the On Demand Business Era

We have now entered the On Demand Business era. Companies that want to succeed need to ensure that their IT infrastructures support their core business strategies and meet the changing demands of customers, partners, suppliers and employees by being more responsive, more flexible, and more resilient than ever before.

The supporting IT infrastructure is now one of the most tangible manifestations of a brand image. It is the way a company can allow for the privacy of confidential information and the security of the system itself. It is the vehicle that enables a business to respond far more dynamically to the demands of an always-on marketplace and economy.

An On Demand Business is one where business processes are integrated end-to-end across a company and out to key partners, suppliers, and customers. In today's competitive marketplace, companies, governments, and nonprofit organizations must be able to sense and respond quickly to changing customer demands, market opportunities and external threats.

In order to become an On Demand Business, a company must have the proper IT infrastructure in place to meet these new demands — one that can seamlessly integrate computing elements — hardware, software and the related integration services — with vital business applications.

Turning Challenges into Opportunities

In the On Demand Business era, the only constant is change. As a result, business requirements are changing faster than ever. New strategic Web applications are being developed and deployed much more frequently in an effort to remain current and competitive in the face of today's constantly evolving business environment. Java adoption and application development continues to accelerate in the marketplace as an open, highly strategic and productive programming model. Its design and richness of function make it the tool of choice for programmers to write robust, bug-free code that can run on almost any platform.

In fact, a recent study showed that nearly three quarters of respondents are using Java today with approximately 11 percent more expected within the next 12 months*.
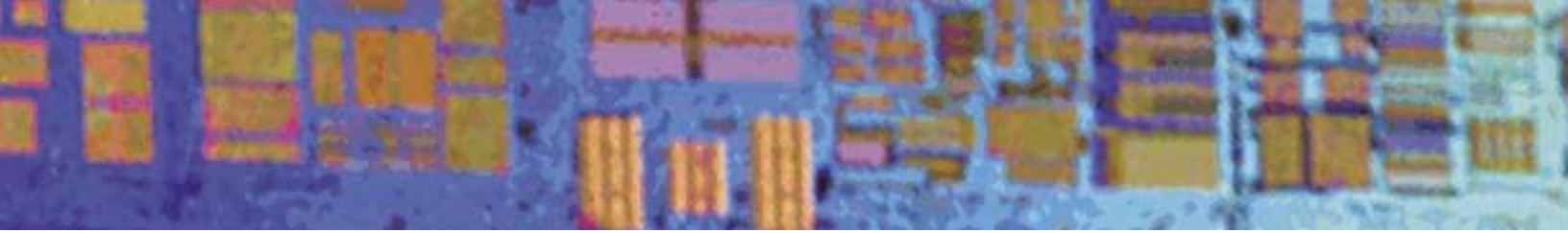
Applications developed using Java, however, can be fairly unpredictable and typically require significantly more processing and memory resources (often 2-3x more) than traditional applications. This is due to Java's platform-independent architecture characteristics, which generate applications with high levels of abstraction, code generation and reuse that result in longer path lengths, larger memory footprints and other potential inefficiencies.

IT budgets, unfortunately, are not growing exponentially and customers continue to seek more strategic, efficient, productive and cost-effective ways of deploying these new strategic Java technology-based applications.

The IBM mainframe platform is a proven industry leader in safety, security, availability, scalability, and reliability for critical databases. By delivering the IBM System z9™ and zSeries® Application Assist Processor (zAAP), IBM provides its customers with compelling strategic, performance, security and economic reasons to place their key Java applications there as well.

The is an ideal platformsto provide the security, flexibility, scalability, resiliency and integration needed to respond to the demands of this dynamic marketplace. zAAPs provide a specialized, z/OS® Java Language execution environment, giving you the opportunity to harness the power and integration advantages of the IBM System z9 and eServer™ zSeries environments at an optimized price point to meet these challenges.

Maximizing your IT investment with zAAP

Companies in every industry are looking for ways to enhance their existing technology investments and reduce costs. As a result, strategic IT investments often end up taking a back seat to aggressive cost cutting. The zAAP, however, enables you to exploit the integration capabilities and core strengths of your System z9 or zSeries platform— allowing strategic z/OS Java technology-based applications to run alongside core business applications and data on the same server platform at an extremely cost-effective price point. Leveraging the zAAP could be the smartest move your company could make. Why?

- *zAAPs allow you to integrate and run Java workloads on the same server as your database, helping to simplify and reduce the infrastructure required for Web applications*
- *zAAPs can be exploited in the security-rich IT operating environment that only z/OS can provide*
- *zAAPs may help to increase system productivity by reducing the demands on general purpose processors, making capacity available for reallocation to other workloads.*
  - *zAAPs allow you to run Java workloads, such as WebSphere® for z/OS for a significantly lower total cost of ownership than previously possible*
  - *Java workload is transparently exe cuted on the zAAP processors. You don't have to change your applications at all.*
  - *zAAPs are priced attractively at only $125,000 USD per zAAP.*
  - *IBM does not impose software charges on zAAP capacity.*
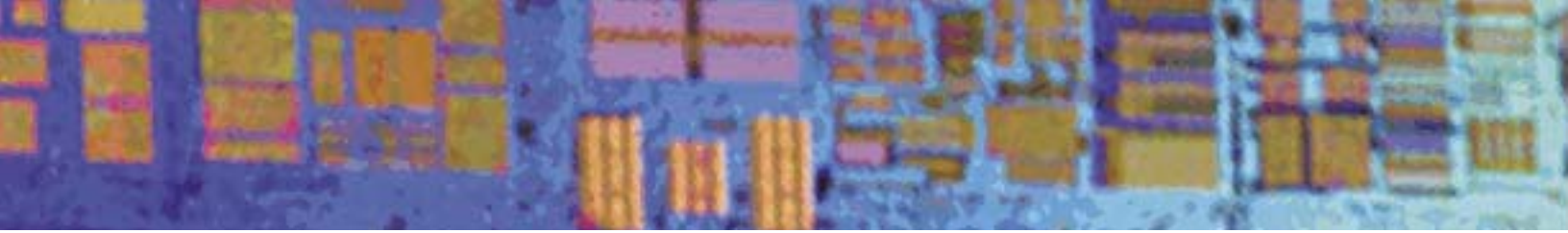
What is the zAAP?

The IBM System z9 and zSeries Application Assist Processor is an attractively priced specialized processing unit that provides a highly strategic z/OS Java execution environment for organizations who desire the traditional Qualities of Service and the powerful integration advantages of the mainframe platform.

When configured with general purpose processors within logical partitions running z/OS, zAAPs can help customers strategically integrate new Web applications with mission-critical data, increase system productivity, and lower the overall cost of computing for running Java technology-based applications on the platform.

zAAPs are designed to operate asynchronously with the general purpose processors to execute Java programming under control of the IBM Java Virtual Machine (JVM). This can help reduce the demands and capacity requirements on general purpose processors, which may then be available for reallocation to other mainframe workloads.

The IBM JVM processing cycles can be executed on the configured zAAPS with no anticipated modifications to the Java application(s). Execution of the JVM processing cycles on a zAAP is a function of the IBM Software Developer's Kit (SDK) for z/OS Java 2 Technology Edition, z/OS 1.6 (or z/OS.e 1.6) and the Processor Resource/Systems Manager™ (PR/SM™).

The amount of general purpose processor savings will vary based on the amount of Java application code executed by zAAP(s). This is dependent upon the amount of Java cycles used by the relevant application(s) and on the zAAP execution mode selected by the client.

Execution of the Java applications on zAAPs, within the same z/OS LPAR as their associated database subsystems, can also help simplify the server infrastructures and improve operational efficiencies.

For example, the use of zAAPs to strategically integrate Java Web applications with backend databases could reduce the number of TCP/IP programming stacks, firewalls, and physical interconnections (and their associated processing latencies) that might otherwise be required when the application, applications servers and their database servers are deployed on separate physical server platforms.

zAAPs allow customers to purchase additional processing power exclusively for Java application execution without affecting the total MSU rating or machine model designation. Conceptually, zAAPs are very similar to a System Assist Processor (SAP); they cannot execute an Initial Program Load and can only assist the general purpose Central Processors (CPs) for the execution of Java programming under control of the IBM JVM.
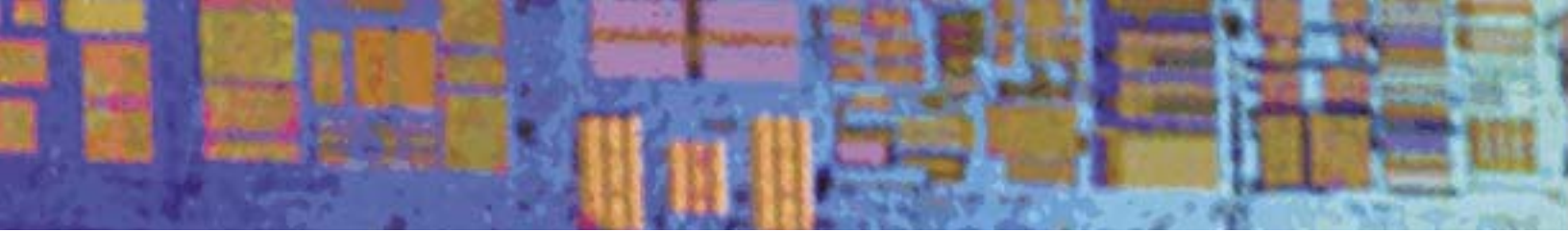
However, unlike standard CPs, ICFs and IFLS, zAAPs can do nothing on their own. For this reason, IBM does not impose software charges on zAAP capacity. Additional IBM software charges apply only when additional general purpose CP capacity is used. Customers are encouraged to contact their specific ISVs/USVs directly to determine if their charges will be affected.

Self-Managing, self-healing features for agility and resilience

The zAAP allows you to take advantage of innovative self-healing features built into the mainframe platform for your On Demand Business environment. These features are designed to manage and heal themselves and dynamically adapt to changes. That means helping to keep your system running at peak performance, reducing administration costs and letting you focus on running your business rather than managing your IT infrastructure.

The concept of servers that take care of themselves is modeled after the autonomic function of the human nervous system. Just as the human body automatically breathes, digests and fends off viruses, The mainframe is designed to manage, repair and protect itself. Because they incorporate IBM technologies that have been developed over decades of research and fine-tuning, System z9 and zSeries platforms are leaders in autonomic computing abilities.

Dynamic resource allocation helps to allow for maximum transaction processing,so your customers, suppliers and employees can count on reliable service. Self-diagnosing service processors are designed to perform routine preventive maintenance on all aspects of the system to help keep critical applications running without interruption. Predefined business priorities allow the system to dynamically direct resources to top-priority work so your most important applications can have the power and bandwidth they need at the right time.
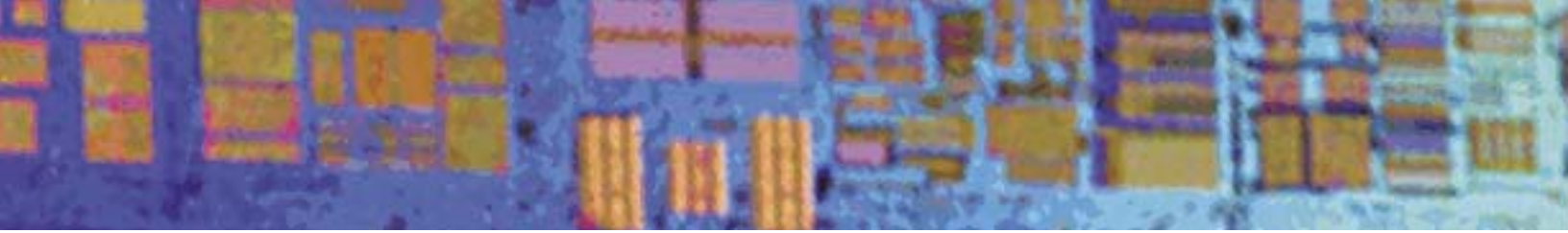
Mainframe reliability, scalability and availability enable flexibility for growth

The zAAPs' attractive price and infrastructure simplification advantages, combined with mainframe virtualization, application availability and autonomic management capabilities make the System z9 and zSeries platforms the ideal environment for On Demand Business computing. In addition, the traditional mainframe benefits that System z9 and zSeries platforms also offer — legendary performance, reliability, security and scalability — can help support on demand operations.

The industry already recognizes the IBM mainframe as being among the safest, most secure, most available, most scalable, and most reliable platforms to keep mission-critical workloads and databases on. Now there are compelling economic, performance and security reasons to place key Java Applications here as well, which are also quickly becoming mission-critical in nature.

Imagine that you are a banker trying to decide where to place your growing on-line checking and account management applications. You could lose million of dollars if your customers' accounts were hacked into. Wouldn't you want a security-rich platform available if the cost were affordable and competitive?

Both the System z9 and zSeries CPs and zAAPs can take advantage of capacity on demand. During spikes in demand, this ability to scale up and out quickly can be the difference between flawless execution and slow response times or even system crashes. A System z9 or a zSeries server can scale up to millions of transactions per day or scale out to manage tens to hundreds of virtual Linux® systems.

System z9 and zSeries platforms are among the most secure on the market, with mean time between failure measured in decades, not weeks or days. In fact, the mainframe environment is designed for up to 99.999 percent availability with Parallel Sysplex® clustering. System z9 and zSeries platforms are designed to provide superior qualities of service to help support high-volume, transaction-driven applications and other critical processes, supplying tremendous power and throughput for information-intensive On Demand Business computing requirements.
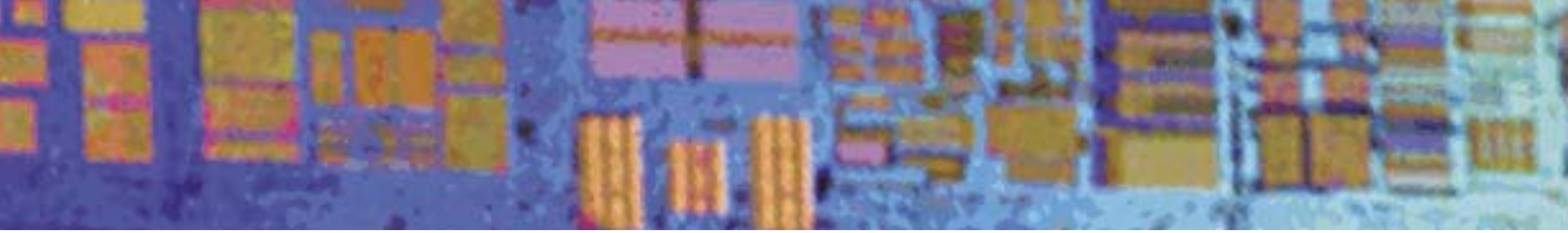
zAAP Pre-Requisites

System z9 and zSeries Application Assist Processors may be purchased and installed on IBM System z9 (z9-109), or eServer zSeries 990 (z990), and eServer zseries 890 (z890) servers and future follow-on models only.

zAAPs are designed to operate in conjunction with the general CPs to execute Java programming under control of the IBM Java Virtual Machine (JVM).

Execution of the JVM processing cycles on a zAAP is a function of: IBM SDK for z/OS, Java 2 Technology Edition V1.4 with the PTF (or later) for APAR PQ86689, z/OS (or z/OS.e) 1.6, and the Processor Resource/Systems Manager (PR/SM). For WebSphere-based Java workload exploitation on zAAP, WebSphere Version 5.1 or above is required.

Understanding the Potential and Getting Started

In order to assist you in assessing the appropriateness of zAAP for your environment, IBM provides tools for analyzing and assessing the percentage of your workloads that can take advantage of zAAP.

The zAAP Projection Tool for Java 2 Technology Edition, SDK 1.3.1, will allow customers who are considering zAAPs to learn the potential for Java execution on zAAPs inherent in their existing applications. This tool will gather usage information about how much CPU time is spent executing Java code which could potentially execute on zAAPs. By running a Java workload that is representative of the production system operations, it will report, via the Java log, how much of that workload could be eligible for execution on zAAPs. This information will also be useful in predicting the number of zAAPs that might be necessary in order to provide an optimum zAAP configuration.
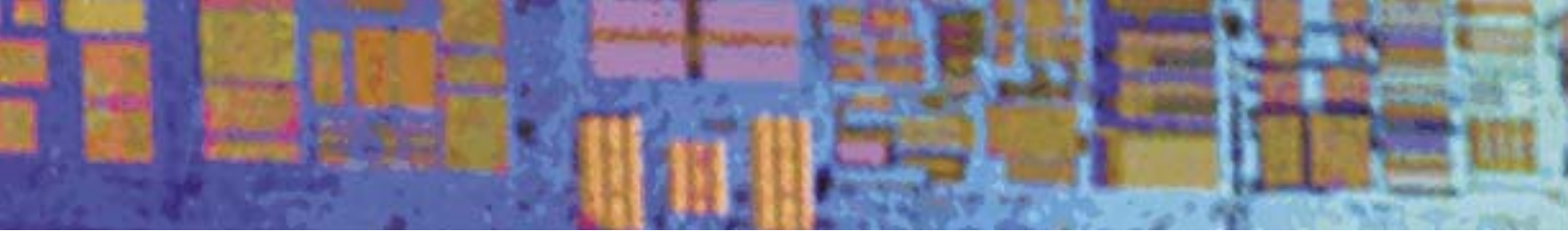
The right partner for your On Demand Business

Ultimately, the ability to meet growing expectations for response time, availability, and security in handling transactions will be the critical factor for ongoing success. In addition, it will be imperative to balance providing the best possible service at the least possible cost.

When carried out correctly, On Demand Business integration can be a powerful, business-enabling strategy. It's important for companies adopting on demand strategies to team up with a trusted, experienced partner to help pave the way to success.

By helping companies create adaptive systems free of unnecessary redundancies, optimized solutions from IBM can help speed the move toward On Demand Business — helping to create a competitive advantage in a difficult business environment.

By selecting IBM, businesses can take advantage of the power of the world's largest information technology company and its Business Partner network. IBM has the comprehensive portfolio of resources ranging from servers, storage and software solutions to financing, consulting, implementation and learning services that can support a successful on demand initiative.

This "one-stop shopping" approach differentiates IBM from the majority of IT vendors in the market today. IBM can deliver customized, complete solutions — from start to finish — enabling an IT infrastructure that is ready to capitalize on the new era of On Demand Business.

The Bottom Line

The System z9 and zSeries Application Assist Processor, available on z9-109, z990, and z890 servers, delivers a specialized z/OS Java execution environment and allows you to extend the value of your existing IT investments by strategically integrating new Java technology-based workloads alongside your core-business applications and data on the mainframe.

Attractively priced at $125,000 per processor, zAAPs can allow your enterprise to further leverage the flexibility of the J2EE open programming model, along with unique virtualization technologies to help simplify IT infrastructure complexities, increase overall system productivity, and lower the overall cost of computing for Java applications on the System z9 and zSeries platforms.

For more information

To learn more about zAAPs, the Java Predictor Tool, or the System z9 and zSeries platforms, please contact your local IBM Sales Representative, IBM Business Partner or visit: **ibm.com**/zseries/zaap