The maturation of automation:
Taking zSeries operations to the next level

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It's no secret that business expectations have changed dramatically in the last few years.
Delivering around-the-clock, online access to a company's products and services has become an
essential part of doing business.

If your IT department is like many others, you find yourself requiring better system management
tools—tools to make changes on demand, and to integrate your own business rules into your
system. To remain competitive, you need to move toward becoming an on demand enterprise.
And to alleviate the operations burden found in heterogeneous environments, you've probably
looked into automating certain IT tasks.

Automation grows up

Of course, automation is not a new concept. It's been around for years. IBM®, in particular,
has spent over 30 years developing and continually improving automation capabilities to help
customers meet their evolving application availability requirements. As business moves further
into the on demand world, automating some basic tasks of zSeries systems has become
mandatory. To date, the most common form of automation has been in message management,
that is, reacting to bad situations and resource availability problems.

But today's on demand IT environments—responsive, agile systems with lower IT costs
and high utilization rates—require greater automation capabilities. Taking this next step,
automating the more complex aspects of an IT infrastructure, can help an organization become
more competitive—and help the IT department link more closely with overall business drivers
and demands.

To help boost productivity and flexibility, IT assets must be optimized, and best-practice business processes must be established. To accomplish this, a new phase of intelligent management of IT assets has come into play. It's called autonomic computing, and it greatly expands an organization's automation capabilities.

Autonomic computing can, for example, automatically discover system, application and/or resource failures in a cluster. It can also use sophisticated knowledge about application components and their relationships to determine corrective actions within the right context.

Managing complex environments

One area receiving a lot of attention in IT circles is reducing the complexity of data center operations. That's certainly understandable: Environments continue to become more complex, due to heterogeneous hardware and software and the multiple networks and components that connect them.

To provide higher levels of availability, these complex systems are being pushed to the limit, often overwhelming operations staff and already constrained IT budgets. Automation can help IT professionals balance these complicated and sometimes problematic issues.

Automation goes well beyond just managing complex environments, however. Organizations are applying automation techniques and solutions to a variety of business technology areas, including:

   – Improving the security of invaluable business information

   – Improving the availability and uptime of applications, systems and networks

   – Extending intranet applications without compromising security

   – Streamlining the management of both server hardware and its storage

   – Managing the automation of basic tasks and business functions

Impacting the top and bottom lines

A never-ending challenge for today's businesses is controlling bottom-line IT costs while still maintaining high availability and increasing available services. You probably recognize the typical questions that IT executives are asking:

– "How do I get more performance out of my current IT infrastructure?"

– "How do I manage this complex environment with my current IT staff?"

– "How do I better utilize the IT infrastructure already in place so that the business provides competitive products without extra cost?"

Automating both basic and complex IT tasks can provide solid answers to those questions. But automation doesn't only affect the bottom line. It can affect the top one as well. Today's businesses need to respond faster to market opportunities, competitive actions and regulations. That often requires making operational changes, which can exhaust significant manual effort and valuable time—days or even weeks.

That kind of delay is, of course, unacceptable in today's fast-paced marketplace, where lost time often means lost customers, lost market share to missed opportunities. Consider a financial institution whose ATM machines are always down, or whose at-home banking applications are non-responsive. That institution will quickly see customers move to a competitor who can offer these services without glitches.

By automating key tasks, the whole system runs more quickly, smoothly and efficiently. So when opportunity knocks, there is no lag time in responding to it.

Helping prevent operator errors… and system outages

In an e-business world, it's essential to ensure the reliability and availability of your zSeries infrastructure—especially given the alternative: system outages, which can cost customers and revenue.

Some estimates show that nearly 40 percent of computer system outages are caused by errors made by operators, who are burdened by a combination of time pressures, sheer volume of information, and the increasing complexity of today's systems and applications. It's nearly impossible for operators to be experts in all the components and relationships of an application. Modern applications are often distributed and network-based, accessing multiple subsystems across the enterprise. It makes them difficult to understand, which leads to erroneous input and responses.

This is an area where automating IT tasks can be invaluable. System automation tools have automated redundant tasks that operators once needed to perform manually in response to messaging problems, exceptions and system failures. These tools have freed operators from constantly having to watch the console. And operators have benefited, reducing reaction times, maintaining application availability, and increasing the quality of service delivered to their IT customers.

The next advancement in this area is to bring automation to the application level—that is, automating individual messages and exceptions by putting them in the context of a specific application. IBM's Tivoli® System Automation software, for example, supports basic automation functions such as starting, stopping and moving failed applications. But it also has the intelligence to restart a failed application on a different system—or the same system it was running on, in the same context as it was running.

Case in point: Bullet-proof availability on an SAP server

Here's an example of the above scenario: Let's say you have a highly available SAP application server installed in a cluster of three systems. A new built-in SAP replication server allows replication of all enqueue server requests, so that if the enqueue server fails, it can be recovered quickly without losing data.

However, to ensure that the entire system meets the high availability you demand, you still need the capabilities of a product like Tivoli System Automation. All key SAP solution components—

enqueue server, message server and virtual IP address (VIPA)—must be available on the same system in the cluster. The SAP policy used by Tivoli System Automation specifies a group with the following mandatory and collocated members: enqueue server, message server and virtual IP address all must run on "System A."

Also contained in the SAP policy is the replication server. Since it cannot be on the same system as the enqueue server, the SAP policy instructs Tivoli System Automation to start the replication server automatically on "System B." Systems A and B are anti-collocated, so transactions can be replicated from A to B.

The next important element of the policy defines what should occur in the event of a failure. If System A fails, the policy directs the enqueue server, message server and virtual IP address to be restarted on System B (where the replicated data sits) to continue processing the data. These simple rules provide bullet-proof high availability, are highly adaptable to changing environments, and eliminate the need to write and maintain copious code.

The final element verifies that the replication server terminates on this system. Tivoli System Automation then starts the replication server on "System C." The replication process can start again, and the application configuration is ready.

Taking it step by step

Moving to an on demand infrastructure need not require a rip-and-replace IT overhaul. Rather, the evolution can be progressive, modular and cost-effective. Here are some automation capabilities that can be deployed according to your evolving business needs.

Availability ensures the health and appropriate functioning of an IT environment. Recent IBM studies identified availability as the most important area of automation, driven by the visibility and up-time needs of mission critical applications. Consider your environment: Are you confident your systems will not fail? Can you automate actions to lessen the impact of a failure?

Security helps ensure that information assets, confidentiality and data integrity are protected. Using identity management ensures the right people automatically have the right access to the right resources. The importance of security is determined not only by the need to manage identities across the enterprise, but also by compliance with regulatory pressures to maintain privacy of information. Is your business IT infrastructure sufficiently protected from threats?

Optimization makes sure that your IT infrastructure is being utilized productively. For example, workloads between resources must be automatically balanced for optimal throughput and performance. Optimization is critically important to IT professionals looking to get the most of their existing resources. Are you using the resources you have in the best, most efficient way possible?

Provisioning makes the right resources available to the proper processes and people—for example, when high resource utilization is detected and additional capacity is automatically allocated to meet response time targets. It can be difficult to determine the impact of growth or the implementation of new initiatives. The ability to quickly reallocate or de-allocate resources from application to application, and system to system, is of vital importance. Can you allocate resources in response to your changing business demands?

Orchestration uses defined policies and priorities to proactively allocate IT resources to workloads. Some business policies trigger changes in the IT infrastructure using industry standards-based XML workflows, based on company best practices. Many organizations regard orchestration as a critical part of the overall blueprint. The customizability and ease of working with XML workflows will allow them to capture their own best practices for managing the IT environment. Does your environment provision technology based on business policies and service level requirements?

Business Service Management links IT and resources to business processes, making it possible to view your IT resources in a business context. By clearly setting priorities to ensure the right processes get attention first when problems arise, you can better manage service levels. Are your business service objectives being delivered in a way that satisfies your customers?

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All these capabilities are built on software and hardware with built-in intelligence—including autonomic capabilities of self-healing, self-configuring, self-protecting, and self-optimizing.

Beyond a piecemeal approach

As businesses have grown, their IT infrastructures have grown largely in a piecemeal fashion. And over the years, these complex, heterogeneous environments have become a true challenge for most businesses to maintain and keep running efficiently.

But run efficiently they must. According to a recent IBM study, 55 percent of large organizations must meet service levels to support their internal customers; 42 percent must meet service levels for external customers.

Automating complex IT tasks can help businesses achieve these expected service levels, maintaining availability and flexibility at low cost.

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