



IBM Virtualization Engine™
Self-Managing Capabilities:
*Optimizing infrastructure management for
increased efficiency.*

Contents

This white paper provides an overview of the self-managing autonomous features within IBM Virtualization Engine™ solutions and how they contribute to helping companies build an adaptable and flexible infrastructure poised for change.

Speed. Agility. Efficiency. These are critical factors for success in today’s marketplace. Yet, the complexity of IT infrastructures has created a significant barrier in building an organization that’s primed for change and optimized for efficiency. In fact, the complexity is so great that operational costs now far exceed the budgets for new hardware – by more than 2.5 times the compound annual growth rate.¹

It’s not surprising.

Each time you add new systems, it becomes harder to manage all the individual components. Harder to find and fix problems. Harder to allocate processing power to respond to spikes in demand without maintaining a room full of servers that are hardly used. And harder to link infrastructure performance to business goals.

Imagine how much easier life would be if all your IT systems looked and performed as one.

Simplification helps improve productivity, optimize resource utilization

IBM Virtualization Engine solutions can help you manage and use IT resources as a cohesive, holistic unit – one that can adjust and respond with changes in the business environment. As a result, you can manage and monitor resources based on business priority in real time, helping ensure that you have what you need and are utilizing what you have.

Helping make this possible is IBM Self-Managing Autonomous Technology™ – an essential component of any virtualization effort.

Why?

Autonomic technology helps enable systems to manage themselves and dynamically adapt to change in accordance with business policies and objectives. This can include:

- *Dynamically configuring themselves on the fly, so the IT environment can adapt immediately to the deployment of new components or changes.*

- *Detecting improper operations and then initiating corrective action without disrupting system applications.*
- *Efficiently managing resource allocation and utilization.*
- *Detecting hostile or intrusive behavior as it occurs and taking autonomous actions to make systems less vulnerable.*

And it's all accomplished autonomically – with minimal human intervention – so you can maintain higher levels of service at a low cost and high efficiency.

Self-managing autonomic capabilities of the IBM Virtualization Engine platform

By selecting IBM Virtualization Engine solutions, you gain a virtualization platform for heterogeneous, cross-platform management and integration – one that incorporates self-managing autonomic capabilities on almost every level.

Here are a few examples:

Virtual resources

Across IBM hardware and storage systems, you'll find self-managing autonomic capabilities that enable the products to tune themselves based on their environments. Automatically correct infrastructure problems. Adjust to fluctuating demand. Help protect against potential security breaches. For example, IBM **@server**[®] products incorporate a variety of advanced autonomic capabilities such as the ability to:

- *Configure and re-configure autonomously both at boot time and during run time.*
- *Concurrently add or remove hardware resources in response to commands from administrators, service personnel, or hardware resource management software.*
- *Detect hardware and firmware faults instantly, then contain the effects of the faults within defined boundaries so that systems can recover with minimal or no impact on the execution of operating system and user-level workloads.*
- *Autonomously measure the performance or usage of resources and then tune the configuration of hardware resources to deliver improved performance.*
- *Protect against internal and external threats to the integrity and privacy of applications and data.*

Likewise, consider IBM TotalStorage® San Volume Controller, which pools storage volumes from IBM and non-IBM devices. This solution features self-managing autonomic capabilities that can oversee how storage resources are used, viewed and managed to help optimize storage utilization and improve productivity. For example, it includes advanced self-managing migration capabilities that can move data from one storage device to another without disrupting services. Additionally, its policy-based features help control storage growth by freeing up disk space on higher value storage for critical active data while moving inactive data to lower cost devices.

Virtual access

The IBM Virtualization Engine Console is based on IBM Integrated Solutions Console technology, a strategic IBM autonomic component that provides a consolidated view for managing virtualized enterprise resources. With this technology, the IBM Virtualization Engine Console delivers a common look, feel and technology for administering heterogeneous systems. As a result, IT staff can rapidly determine when a system is running at a less-than-optimal level, and locate and fix the problem.

Additionally, IBM Self-Managing Autonomic Capabilities are driving significant advances in solution deployment and serviceability in the IBM Virtualization Engine Console. For example, Virtualization Engine Serviceability technology helps staffs quickly discover and download available fixes for their Virtualization Engine environments.

Once the fixes are downloaded, IBM Autonomic Deployment Engine – another IBM Self-Managing Autonomic Technology – can package and deploy the fixes for rapid, reliable installation. With this technology, systems can scan themselves for all prerequisites and other software dependencies needed for deploying a fix, then install the fix as necessary.

If additional software is required, the Deployment Engine can automatically flag the necessary dependencies to IT staff. This capability also comes into play in the provisioning of new resources to help ensure all dependencies are met.

The result: smooth successful deployment of both fixes and new resources with less staff intervention.

The IBM TotalStorage Productivity Center manages the storage, devices and SAN fabric to aid in storage planning, capacity utilization, performance, and storage and application availability of a distributed, cross-platform environment. Within this offering, IBM Self-Managing Autonomic Capabilities enable:

- *Policy-based storage management provisioning; transparent data movement between volumes and storage pools.*
- *Transparent addition, deletion and redeployment of storage.*
- *Automatic failover and failback of virtualization nodes.*

Virtual management

IBM Enterprise Workload Manager (EWLM) technology allows administrators to coordinate the activities of a large number of cross-platform servers to help optimize performance and meet overall business goals. Through its self-managing autonomic capabilities, IBM EWLM can automatically divert the flow of job dispatch from systems that are down to available systems, redirect work from systems with a heavy load to ones with a lighter load, and send work to systems that are running jobs of lesser importance as determined by business policies.

IBM Director also contains IBM Self-Managing Autonomic Capabilities that can provide remote management, automated problem determination, and self-monitoring capabilities to help increase the availability of managed servers and reduce management time. For example, IBM Director can automatically discover all the hardware available in the environment, its configuration and its status through automated scanning of each managed system. Automated problem determination capabilities point out problems with hardware, such as faulty power supplies, fans, voltage regulator modules, and network interfaces. It can even launch custom action plans based on business policies.

IBM Resource Dependency Service helps companies gain a view into their IT resources and can be used to define and discover relationships between users, resources, applications and networks. Self-managing autonomic capabilities enable the technology to automatically discover IBM and non-IBM resources and correlate that information to identify dependencies and relationships.

Autonomic virtualization in action

How can these solutions help your organization? Consider the following scenario:

It's Monday morning and a newspaper article appears that generates immediate demand for your product or service. Maybe interest rates are expected to rise and homeowners run to lock in mortgage rates. Maybe gas prices are forecast to jump and consumers begin booking airfares quickly before ticket prices increase as a result. Whatever the external stimulus, customers begin to flood your Web site. With IBM solutions, your infrastructure can respond automatically.

By leveraging IBM Virtualization Engine solutions, your IT staff has a centralized console to define business priorities and monitor business-critical applications. As demand for your product or service increases, the software can automatically detect the change in workload and, based on your business policy, allocate additional CPU resources to maintain availability and performance of your sales application. At the same time, the software can also help ensure that storage resources are appropriately allocated so your highest priority applications have access to the storage devices with the best quality of service. As a result, you can continue to provide your customers the same quality of service with minimal staff intervention.

Summary

IT complexity. It's a serious challenge for organizations today. One that can significantly affect operational costs, staff productivity and business growth.

Through the delivery of IBM Virtualization Engine solutions with self-managing autonomic capabilities, IBM is helping companies profoundly simplify their IT infrastructures. You can pool resources as needed to quickly accommodate

changes in demand. Manage disparate systems through a common console. Leverage policy-based autonomic services to adjust resources based on business requirements.

With IBM Virtualization Engine solutions, imagine how much easier life would be.

For more information

Please contact your IBM sales representative or IBM Business Partner.

Visit us at: ibm.com/autonomic, or ibm.com/servers/eserver/about/virtualization




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Software Group
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¹ IDC, On-Demand Enterprises and Utility Computing: A Current Market Assessment and Outlook, IDC #31513, July 2004.