Use integrated operational management solutions and best practices to drive IT efficiency and business growth

By reading this paper, you can learn more about:

- Today's IT efficiency challenges.

- The characteristics of an operational management solution that can address those challenges

Furthermore, you can read concrete examples of using operational management to:

- Automate repetitive server management tasks.

- Monitor energy use and billing information.

- Take control of storage assets and costs.

Summary

Business success increasingly depends on IT efficiency, service delivery and innovation. And yet, industry analysts report that IT efficiency is actually decreasing. Growing IT complexity, rapid change and compliance requirements all cause organizations to dedicate more of their flat IT budgets toward operational costs. Consequently, fewer resources can be dedicated toward high-value, forward-looking initiatives that provide a competitive edge and help grow the business.

Operational management solutions can provide a basis for increasing IT efficiency and service quality, especially if they increase integration. Organizations need to integrate across traditional IT silos as well as integrate business and technology if they want to improve the operational efficiency of IT.

While an organization may pursue operational management in a number of different areas, there are three key objectives that effective operational management will address:

- Automating IT operations
- Enhancing visibility and monitoring of the infrastructure
- Managing and controlling IT assets and costs efficiently

This white paper provides detailed examples of how integrated operational management solutions and best practices can help an organization achieve these objectives to drive IT efficiency and free resources that can be used for business innovation.

Address today's IT efficiency challenges

Businesses that want to grow and outperform their competitors know they must operate efficiently, deliver services at a quality level that can differentiate the business and create innovation.

IT can be a strategic partner in each of these areas. To fully support these business goals, the IT organization must:

- Maximize efficiency.
- Deliver outstanding service to the business and its customers.
- Dedicate substantial resources toward the innovations that can help the business stand apart from the competition.

However, for many customers IT efficiency is actually decreasing. Their IT budgets have remained flat while operational IT labor costs have grown. Consequently, their resources have been diverted away from new application development or new initiatives.

Energy costs demonstrate the potential dangers of unmanaged operational efficiency. If an IT organization does not find innovative hardware and software solutions to manage and control increasing energy costs, they will take resources away from applications and technology that can grow the business.

Consequently, improving IT efficiency is the operational priority of many firms seeking to improve their competitive posture and business results. What in particular must an organization do to increase efficiency and dedicate more resources toward business innovation?

First, address growing IT complexity. Take the example of virtualization technologies. They have delivered higher server and storage utilization rates but add to the complexity and operational burden that IT staff face. IT organizations also need ways to respond quickly to a wider variety of pressures from both within and outside the enterprise, such as rapid and constant change, and tougher compliance requirements.

Increased integration and innovation help drive IT efficiency and growth

Operational management, if implemented properly, can provide a foundation for addressing these challenges, optimizing IT efficiency and delivering high-quality business services.

The key is integration, from both operational and business perspectives. Operational management strategies use standards to integrate across traditional IT silos and link disparate technologies and processes. They help an IT organization act more consistently and efficiently.

From a business perspective, the integration of business and technology is critical to efforts to reduce costs, improve service quality and customer satisfaction, and increase revenue. Nearly 80 percent of business leaders rate business and technology integration as of great importance for enabling innovation to grow their businesses and build brand value.[1] Sound operational management solutions incorporate business perspectives, priorities and policies to help align IT with the business.

Operational management strategies can focus on server, network and device management; storage management; business application management; security management; and more. No organization should tackle all of these areas at once. Instead, a successful organization defines an overall approach that will bring together its IT management and ensure that the deployed solution fits together. Then, quick implementation of a solution is done to address immediate, specific IT challenges—and later support more comprehensive service management initiatives.

Note that an organization need not integrate all of these areas to obtain the benefits of operational management. Leveraging an open standards–based, modular approach to operational management enables an organization to deploy common components that can be used in the short term to achieve greater efficiencies. Then, in the long term, the value components can be extended as they are reused for further integration efforts.

Additionally, IBM operational management solutions are designed to reduce complexities associated with managing both physical and virtual resources, helping further improve IT efficiencies.

No matter what area of operational management an organization starts with, it should seek solutions that address three key objectives:

- **Automate** IT operations to help reduce labor costs and increase speed when responding to changing conditions.
- **Enhance visibility and monitoring** of the infrastructure, from end to end, for optimal performance. By quickly identifying and resolving performance issues before they cause costly outages, an organization can effectively manage dynamic business requirements.
- **Manage and control IT assets and costs** effectively by integrating management of IT hardware and software assets. Organizations that do so help optimize staff productivity, maximize asset use and reduce compliance risks.

On the following pages, you can see a few detailed examples of how organizations can combine integrated, innovative operational management solutions with proven best practices to achieve these three objectives. When the examples consider how various IBM solutions could be used, remember that the IBM solutions not only tightly integrate with one another to deliver greater optimization, they also rely on open standards to integrate well with non-IBM offerings. Consequently, you can use the IBM solutions described on their own or in conjunction with others to extend the value and efficiency of your existing investments.

Example 1: Automate server management tasks

Imagine a heterogeneous environment with a mix of hardware platforms and operating systems. The IT organizations could automate several key operational activities related to the servers in this environment: managing availability, workloads and provisioning.

Many organizations have different hardware- and OS-specific clustering technologies to manage system availability. But complex applications built from components that span different systems and platforms require end-to-end automation to optimize availability and operational efficiency. Connecting hardware and platform management tools with enterprise management tools gives IT staff a single point of control for availability.

This can be done in a way that extends the value of existing clustering technologies, rather than replace them. Operational management should also support applications and middleware from a variety of leading vendors for customer relationship management (CRM) software, enterprise databases, monitoring and workload scheduling solutions.

Operational management solutions that integrate these heterogeneous technologies and management tools also need to provide policy-driven ways to execute administrative tasks using industry standards. For example, planned or unplanned outages should trigger an organization's practices for stopping and restarting affected applications.

Similarly, automating end-to-end and cross-enterprise workloads supports efforts to optimize resource use, IT management costs and productivity. Consolidating batch and event-triggered workloads that span multiple applications and systems is a critical part of workload management.

So, too, is *dynamic workload brokering*—choreographing the execution of work-loads across pooled resources. When unplanned surges in workload volume and unplanned IT infrastructure incidents occur, dynamic workload brokering allows an IT organization to respond rapidly, in alignment with business priorities and without labor-intensive responses.

Provisioning is another server- and storage-related set of routine, time-consuming tasks that can productively be automated. Examples include inventory, OS provisioning, software distribution and patch management.

A single integrated solution for these tasks can help optimize the efficiency and accuracy of deployments, freeing staff from time spent performing the tasks and addressing minor inconsistencies.

IBM offers a range of hardware, software and services that deliver these availability, workload and provisioning management capabilities. The following diagram demonstrates how the IBM Systems Director family integrates with the IBM Tivoli® System Automation family, IBM Tivoli workload automation products and IBM Tivoli Provisioning Manager. These solutions also work with non-IBM applications and middleware to extend the value of existing investments and facilitate integrated operational management.

Drive efficiency by automating server management
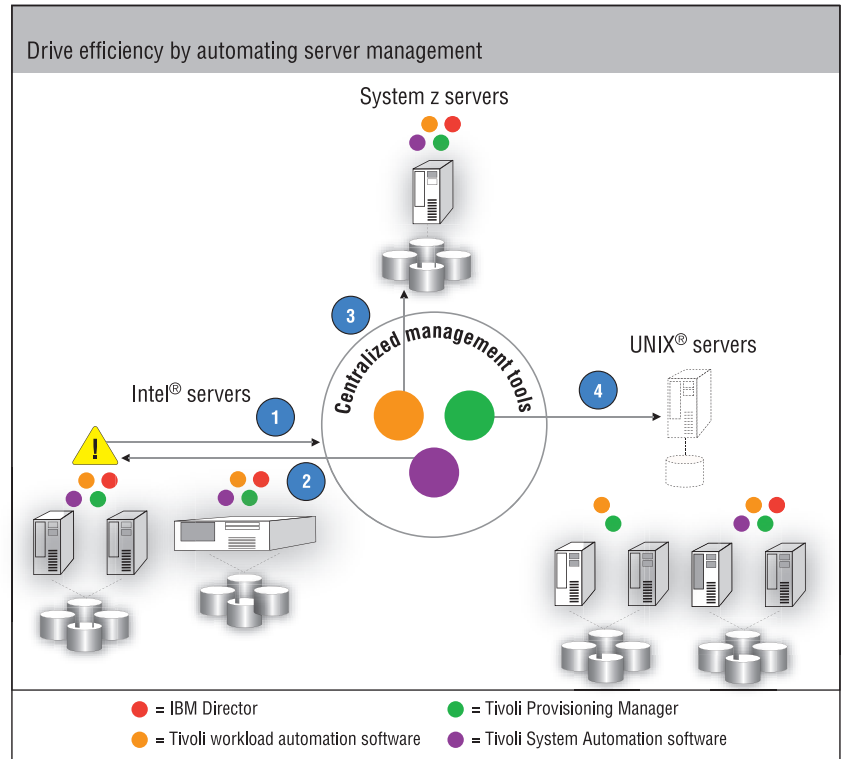
IBM Director — installed on a wide range of hardware platforms and operating systems — receives an alert about a critical server hardware failure (to the memory, disk, processor, fan, power supply and so on) or potential failure. This alert ① can be routed to a variety of centralized management tools to trigger automatic responses. Tivoli System Automation software ② can restart the applications running on a failed server. Tivoli workload automation software ③ can dynamically reschedule or reroute workloads to avoid bottlenecks. Tivoli Provisioning Manager ④ can provision a new server, blade or virtual partition onto which a high-priority workload could be moved to avoid a costly unplanned outage.

Automation can be simplified and enhanced with services from IBM, such as:

- The IBM IT Management Consulting Services – business of IT executive workshop helps define an organization's IT strategy and identify where automation can provide the greatest benefit to the business.

- IBM IT Transformation and Optimization Consulting Services help develop a roadmap and technical architecture for achieving automation goals.

- IBM middleware services help implement, manage and optimize the solution.

Example 2: Monitor energy use and billing across the infrastructure

As mentioned earlier, energy costs are an increasingly pressing concern for IT organizations. To proactively take control of energy costs, an IT organization needs to integrate information from across the infrastructure, including hardware, applications, end-user response and transaction throughput data. Synthesizing information from a heterogeneous, multivendor environment is critical.
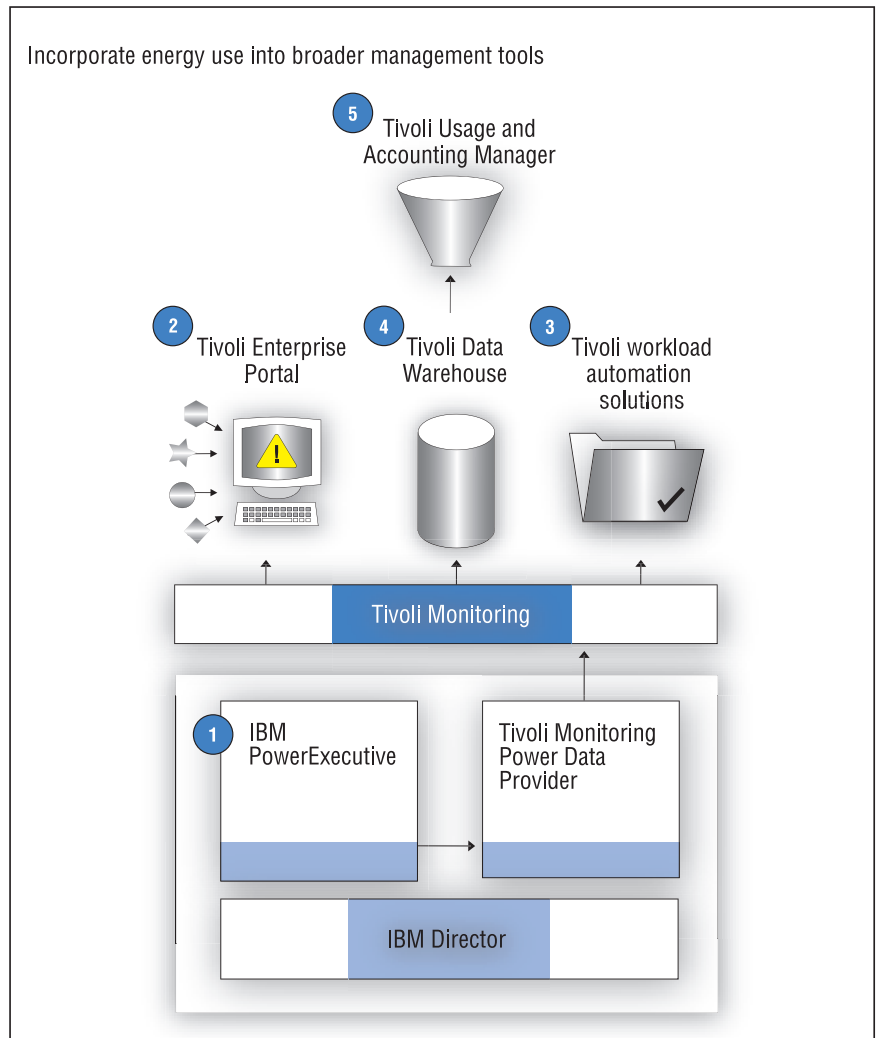
For example, operational management solutions correlate energy data with workload-throughput, response-time and capacity-use information. Consequently, an IT organization can deploy and manage its applications to avoid potential energy problems just as it would to avoid bottlenecks.

Similarly, the organization can respond to alerts about power surges, wasted energy and overheating as it would to other potential causes of costly downtime.

Furthermore, operational management tools related to energy use can incorporate a business perspective. If the monitoring solutions that collect information from across the enterprise link with solutions that track business priorities and policies, the IT organization can make decisions that properly balance energy management goals and service level objectives.

Energy use information can be fed into chargeback applications so that business units accurately understand and cover the costs of their IT use. Historical and aggregated energy data can also be used for planning purposes.

IBM hardware, software and services enable organizations to integrate energy-use information into cross-infrastructure monitoring solutions to obtain greater visibility and control over resource use. In the following diagram, IBM PowerExecutive™ collects power and temperature data at the hardware level and makes the information available to cross-enterprise Tivoli solutions for operations and business service management. These Tivoli offerings integrate additional information from IBM and non-IBM discovery, monitoring, event management and other solutions into a single view of the complete IT infrastructure, which enables more effective management. The information from IBM PowerExecutive can trigger a wide range of automated responses, including those described previously.

Incorporate energy use into broader management tools

5 Tivoli Usage and
Accounting Manager

2 Tivoli Enterprise
Portal

4 Tivoli Data
Warehouse

3 Tivoli workload
automation
solutions

Tivoli Monitoring

1 IBM
PowerExecutive

Tivoli Monitoring
Power Data
Provider

IBM Director

IBM PowerExecutive ① controls power consumption on servers and monitors power use. Through
Tivoli Monitoring, this data is ② made available to Tivoli Enterprise™ Portal, which puts the informa-
tion into a broader monitoring context and can alert administrators about potential problems.
Workloads can be shifted in response to power alerts or policies using Tivoli workload automation
solutions ③. Historical aggregated energy use data can also be ④ stored in Tivoli Data Warehouse
and later ⑤ used by Tivoli Usage and Accounting Manager for chargeback purposes.

IBM services that help enhance infrastructure visibility and monitoring include:

- IBM Infrastructure Optimization Services test a current infrastructure for efficiency and determine its capacity for change and responsiveness. These services help speed implementation and time to value while reducing risk.

- The IBM IT Lifecycle Management and Governance Services – business of IT dashboard integrates assessment, software and deployment services from IBM to rapidly deliver value from a targeted solution. It leverages IBM and existing third-party software and technology.

Example 3: Manage storage assets and costs

A typical enterprise storage infrastructure includes a variety of multivendor server systems and storage systems built on storage area network (SAN) fabric infrastructures. Managing that diversity requires specialized skills and tools. Coordinating across that heterogeneous infrastructure to optimize use and avoid buying excess capacity is nearly impossible and extremely time-consuming without integrated operational management.

By centralizing management, based on open standards, an organization can take control of IT assets and their associated costs. Centralized monitoring helps an organization identify storage assets and pinpoint storage use. Storage applications can automate the processes of backing up, archiving and deleting files based on business policies. And organizations can automate storage provisioning using the same management workflow tools used for server provisioning.

Just as servers can be virtualized to allow more flexibility in utilizing the underlying hardware, storage from multiple vendors can be virtualized. An organization can arrange mixed storage capabilities into tiers: for example, it might use Serial Advanced Technology Attachment (SATA) drives for lower-end needs and enterprise-class storage for critical business applications to use.

Sound operational management solutions provide a single administration console to ease management of these mixed environments and administration of storage hardware. They also enable organizations to migrate data from one storage array to another without impacting the applications using the storage. This capability provides greater operational flexibility.

By automatically collecting and reporting on storage use information across the infrastructure, an IT organization can bill departments according to how much they use storage. An organization should be able to collect information from anything related to storage that can be metered: storage devices, network devices and even transactions. IT organizations with this level of information can better plan future capacity. They also can demonstrate the value of IT to the business in line-of-business and financial terms.

In the diagram that follows, IBM TotalStorage® Productivity Center identifies storage use on each storage system it monitors and provides a common management interface for physical and virtual resources, including storage systems, SAN infrastructure and replication services. It also manages IBM System Storage™ SAN Volume Controller, which virtualizes and pools storage to make storage available for management through a common interface and thereby help improve administrator productivity and storage utilization. TotalStorage Productivity Center works in conjunction with IBM Tivoli Storage Manager to capture files as required by the business, make necessary data available for use, and delete or archive inactive files. Tivoli Storage Manager helps maximize data protection and minimize storage administration costs by coordinating repetitive storage management tasks. IBM Usage and Accounting Manager collects use and billing information from across the storage infrastructure. Like all the solutions described here, it works with both IBM and non-IBM storage systems.

Manage costs by optimizing the IT storage environment
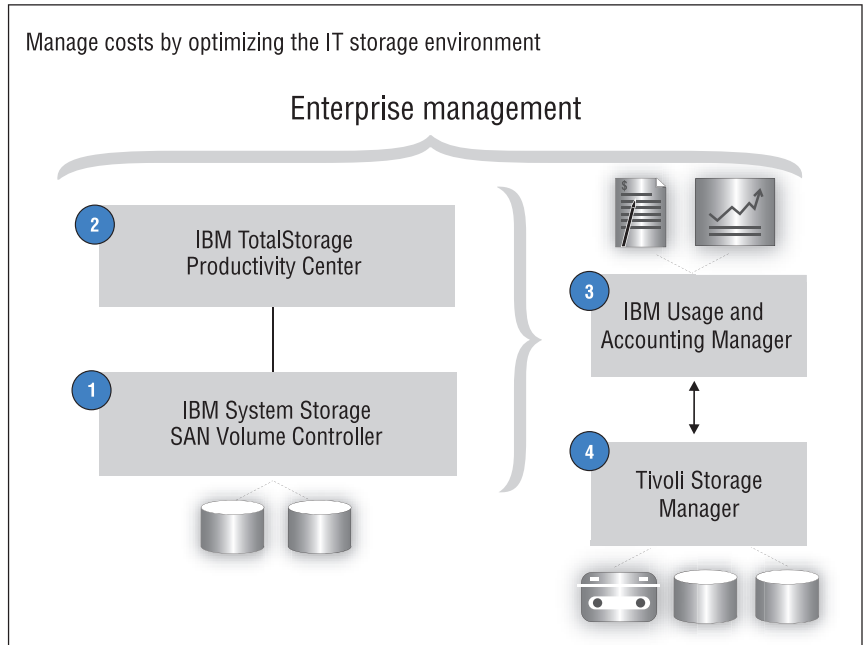
IBM System Storage SAN Volume Controller ① virtualizes storage from various disks to enable dynamic storage utilization. IBM TotalStorage Productivity Center ② centralizes a variety of storage management tasks, including asset capacity reporting, provisioning, performance management and replication management. It also delivers information to IBM Usage and Accounting Manager ③, which measures storage use to enable chargeback and help improve utilization. IBM TotalStorage Productivity Center also works with Tivoli Storage Manager ④, which manages the full data life cycle with hierarchical backup and archive capabilities that work with disk, archive and tape storage. All these IBM storage management tools support process management, automation and business impact analysis to enhance enterprise management.

IBM services for IT asset and cost management include:

- IBM Device Management Services help track, monitor, control and support IT assets from acquisition to disposal. The organization can make sure assets are available when and where they are needed.

- IBM platform integration and deployment services help accelerate planning, deployment, recovery and upgrades of end-user devices by using consistent, worldwide processes.

- IBM Software Platform Management Services help streamline the designing, building and maintenance of software platforms for end-user devices—all tailored to the needs of the business.

- IBM Operational Support Services – End User Support provides quick answers to end users' problems as they arise to help free IT staff and enhance productivity.

Conclusion

IBM understands the importance of an integrated operational management toolset and offers the full breadth of capabilities needed for today's constrained IT organizations. Drawing on open standards, IBM operational management solutions work closely with leading technologies and management solutions from IBM and non-IBM vendors. Consequently, IBM operational management solutions can help an organization take the integrated approach that is critical to driving IT efficiency and service delivery—and to freeing resources to pursue high-value innovation.

The IBM offerings described in this white paper represent just a small fraction of IBM operational management solutions. These solutions help organizations automate, enhance monitoring and optimize IT asset and cost management in areas such as server, network and device management; storage management; business application management; security management; and more. They also are part of the broader set of IBM IT Optimization solutions that help organizations reduce costs, improve IT service delivery and enable a more flexible IT environment.

For more information

To learn more about how IBM IT Optimization solutions can help you deploy integrated, innovative operational management in your environment—as well as to read detailed case studies and customer references—contact your IBM representative or IBM Business Partner, or visit **ibm.com**/systems/optimizeit/operational_mgmt

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[1] IBM Global CEO Study 2006, March 2006.

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