



WHY OPERATIONAL MANAGEMENT IN VIRTUALIZED DATA CENTERS IS CRITICAL TO DELIVERING SERVICE ASSURANCE

Most large enterprises' business processes require IT to function smoothly and efficiently, making a robust and predictable IT environment vital.

As underlying IT infrastructure evolves, management capabilities also must keep pace so performance and availability remain at or above promised service levels. Mitigating growing IT complexity and reducing business risk requires a management system that can provide end-to-end management and visibility for IT operations; assure accuracy and reliable remediation for configuration updates and changes; proactively deal with availability and performance problems before they impact users and service levels; and rapidly identify problem root causes and deploy the right resources to quickly restore normal operations.

This EMC Perspective highlights why IT needs to provide service assurance; the management obstacles to achieving this; what's needed in an infrastructure management solution for enabling service assurance, how EMC's Solution for Service Assurance delivers the management capabilities required to meet these needs; as well as results and value being achieved by EMC customers.

EMC PERSPECTIVE

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THE CASE FOR SERVICE ASSURANCE

Gone are the days when the end-user perceived “black magic” associated with IT operations could captivate many into believing that technology was king to the business process and business need, with technology in place, in many cases, for its own sake (because many IT budgets weren’t linked to delivering or supporting tangible business results). Now the servant has become the master: IT exists first and foremost to enable and support business operations and processes, or it won’t even be considered for funding, let alone deployment.

In fact, in its sixth annual survey¹ of business executives conducted in December of 2011, McKinsey & Co. found that “aspirations and current expectations for IT have never been higher. Executives continue to set exacting demands for IT support of business processes, and they see an even larger role for IT in a competitive environment increasingly shaken up by technology disruptions.”

In addition, the majority of business users increasingly perceive IT service delivery as a utility, much in the same way one expects electricity from an outlet when one plugs in a device; or expects clean, properly temperate water when turning on a faucet; or expects a dial tone when picking up a phone. According to IT research firm Forrester Research, “always on, always available is the new expectation,”² meaning that IT organizations need to build highly available infrastructures that can deliver continuous services to end users by leveraging technology improvements.

For business users, applications and services are paramount. They perceive IT in terms of “what” they get: for example, Internet access, e-mail, remote access, line-of-business-specific applications, human-resource systems, and information databases. The availability and performance of applications and services at promised levels is an expected function of the IT organization. The “how” of making that happen—things such as gateways, switches, firewalls, routing protocols, server clustering, and virtual machine densities—doesn’t matter to most business users. They expect IT operations to employ the resources necessary to assure the availability and performance of the IT infrastructure used to deliver the applications and services that they need to support and enable their business processes.

And the numbers of such applications and services are growing, not only as business users request more capabilities and data analysis, but also as new forces that are not easily controlled by IT push themselves to the forefront of IT spending. According to IT research firm Gartner,³ cloud computing, social media and social networking, mobility and information management (e.g., “big data”) are all evolving at a rapid pace and placing greater demands on IT. Deloitte, in its most recent annual Technology Trends report,⁴ adds real-time decision making, collaboration and connectedness, user empowerment or the consumerization of IT (i.e. the need to support personal devices and applications), and the growing need for an outside-in approach to enterprise architectures to support the use of third-party services and data sources. All of these trends represent factors that drive up demand for IT capabilities and services, and make it imperative that the IT organization be able to provide service assurance and ensure service quality.

¹ McKinsey Quarterly, “A Rising Role for IT: McKinsey Global Survey Results,” December 2011

http://www.mckinseyquarterly.com/Business_Technology/BT_Strategy/A_rising_role_for_IT_McKinsey_Global_Survey_results_2900

² Forrester Research, “The Top 10 Technology Trends EA Should Watch: 2012 To 2014,” October 2011

<http://www.forrester.com/The+Top+10+Technology+Trends+EA+Should+Watch+2012+To+2014/fulltext/-/E-RES60921?objectid=RES60921>

³ Gartner, “Gartner Predicts 2012: Four Forces Combine to Transform the IT Landscape,” December 2011

http://www.gartner.com/DisplayDocument?id=1871420&ref=g_noreg

⁴ Deloitte, “Tech Trends 2012,” http://www.deloitte.com/view/en_US/us/Services/consulting/technology-consulting/technology-2012/index.htm

Of course, within the enterprise, two of the largest IT trends, virtualization and cloud computing (or everything-as-a-service) are having a major impact on the need for automated management and service assurance capabilities. In its May 2012 whitepaper "2012 Top IT Trends,"⁵ IP Pathways emphasizes the dawn of "Virtualization 2.0" and "Data Center 2.0." In recent years, hardware capabilities have changed dramatically with the advent of multicore processors and increased RAM capacity, which, along with virtualized servers, have driven considerable data center consolidation. SAN and NAS functions are now combined in unified storage arrays and unified compute platforms, allowing multi-gigabit connectivity between servers and the switching stack, changing architecture options and best practices dramatically. They predict that 2012 will mark a move to virtualize everything including tier 1 applications, databases and desktops. Data Center 2.0 reflects a strong end-user focus, supported by sophisticated automation, that includes the building blocks for the new unified, consolidated, flexible, scalable and resilient data center. IT organizations will be able to address self-service, secure multi-tenancy and chargeback; all while embracing internal cloud strategies to attain redundancy within and across existing data centers and external cloud services for scalability and cost management. To hide the complicated integration, orchestration, and management required to make this a reality, leading CIOs will need to fulfill these capabilities in terms business users can understand – outcomes, value, assurance and service levels.

The bottom line: Users expect their IT organizations to provide high-quality services and service assurance. That in turn means IT leaders need a broad, well-balanced solution that allows their IT operations teams to efficiently and effectively manage the IT service delivery infrastructure—physical and virtual together—so that service assurance can be provided to the business.

This also creates two key priorities for CIOs and IT operations leaders:

- Ensure applications and IT services are delivered consistently and at the highest possible levels—because that's what the business and end users care most about.
- Fully understand and effectively manage the increasingly virtualized IT service delivery environment, so that service levels to the business can be met or exceeded, ongoing operational costs are minimized, and availability and performance problems—when they occur—can be resolved rapidly with minimal impact.

THREE MANAGEMENT OBSTACLES TO PROVIDING SERVICE ASSURANCE

The problem is that efficient and effective management of the service delivery infrastructure—the primary prerequisite to being able to deliver service assurance—isn't something that comes easily to most IT organizations.

Numerous operational challenges make achieving the goal of delivering service assurance difficult for IT organizations; these include:

- Mapping and monitoring service-level agreements (SLAs) and key performance indicators (KPIs) to the health of the IT service delivery infrastructure
- Needing to take a service-oriented approach to IT service delivery and infrastructure management so that the business impact of availability and performance problems is readily known and understood

⁵ IP Pathways, "2012 Top IT Trends," May 2012 http://www.ippathways.com/Resources/documents/2012%20IT%20Trends_Whitepaper.pdf

- Managing and integrating legacy, (at best) loosely federated management and monitoring systems that deliver too much raw data and not enough service-specific insight
- The integration of point tools that do one thing well but can't communicate easily with other management systems
- Having sufficient levels of automation to reduce operational costs and eliminate manual errors that impact the availability and performance of the service delivery infrastructure

To overcome these, IT organizations need capabilities that allow them to:

- Have full visibility and insight into their virtualized data centers
- Execute and manage configuration updates and changes effectively and efficiently throughout the IT service delivery infrastructure
- Find and fix quickly and easily the problems that impact delivery, availability, and performance of IT services and applications

VIRTUALIZATION MANAGEMENT AND THE SERVICE ASSURANCE CHALLENGE

Like a freight train that has built speed and momentum, trying to slow down (or reverse) the course of virtualization in the data center is near-impossible. In most enterprises, questions being asked related to the use of virtualization have changed. No longer are people questioning whether it's possible to reach their virtualization goals. Instead of "if," they're now asking "how soon?" Targets for percentage of virtualized systems rise while the time to reach that destination shrinks.

The "prove-it" time for server virtualization is over. Benefits abound, are well-documented, and include:

- Server consolidation
- Physical data-center space reductions
- Lower maintenance costs
- Power savings
- Less risk of "cross contamination" of applications during upgrades and changes
- Faster deployment of new services
- Redeployment of resources that have run their course
- Improved and more cost-effective disaster recovery
- Higher availability

Virtualization got its "tryout" by significantly increasing server-resource utilization, which in turn dramatically lowered capital expenditures. Increased operational flexibility and resource management gave virtualization its "long-term contract." In short, virtualization as a data center technology is now considered the norm. IDC research validates this: In mid-2011, virtualized systems became the majority; i.e., more than 50 percent of all systems were virtualized.

Although virtualization represents a mainstream technology and delivers numerous valuable benefits, it also creates considerable operational management challenges. Like a freight train, these challenges can get out of control quickly: So much so that IT leaders decide to literally put on the breaks, and shun further virtualization or rollout of advanced virtualization features related to power management, recovery,

and consolidation, until operational visibility and management efficiency improve to acceptable levels — a phenomenon commonly referred to as “VM stall.”

WHAT MAKES SERVICE ASSURANCE FOR VIRTUALIZED ENVIRONMENTS SO DIFFICULT?

Several factors combine to make service assurance a more complex and thorny issue in virtualized environments, including:

- The dynamic nature of virtualized data center (VMs can be created, destroyed, modified, moved, powered up and powered down at any time, and with high frequency)
- The impact of automation
- The rapid pace of IT change
- A lack of visibility and insight to applications and services that migrate between virtual machines
- Ineffective problem management

Most organizations with sizeable investments in information technology have already invested in virtualization to benefit from server consolidation as well as reduced power and cooling costs. They have completed the experimentation phase and now trust that virtualization can deliver IT services reliably. Virtualization has become the standard when implementing new applications, and many are now migrating more important business applications to virtualized environments. However, mission-critical applications remain a concern. Although virtualization of these “tier 1” applications may be possible, the concern is whether sufficient management capabilities are in place to be able to guarantee expected service levels.

In virtualized environments, applications no longer run on dedicated physical infrastructure. Compute and storage resources are pooled and shared. Networking for hypervisor environments are software-based logical constructs, not physical devices. In most cases, fixed mapping between an application and its supporting infrastructure components doesn’t exist like it used to before virtualization. Consequently, it’s no longer sufficient to track physical connectivity when evaluating availability or performance issues. Management systems must be intimately familiar with the underlying physical infrastructure but must fully understand the virtual environment to be able to properly monitor virtualized applications and services to proactively identify issues and automatically implement pre-planned responses.

Management of a virtualized environment is at least an order of magnitude more complex than any pre-virtualization system. Maintaining SLAs requires a thorough understanding of and complete visibility into the virtualized environment, the careful planning and orchestration of downtime for maintenance and upgrades, and the ability to quickly diagnose and enable timely repairs whenever issues arise. Without automation, the speed with which issues can be diagnosed and remediated slows as the level of complexity increases, and the ability of IT Operations to guarantee service levels becomes questionable.

Most large IT organizations use a range of existing management systems, primarily covering the physical components of their environment. However unless tightly integrated, in a virtualized environment they can sometimes add to the confusion when issues arise. For example, knowing that a component may have failed and that a physical back-up solution has kicked in, does not guarantee the continued availability of adequate resources to virtualized applications which, in the meantime, have migrated to alternate servers. In this case, a performance issue might well arise in a complex or multi-tier application because of response time or resource

availability issues and users will start to call for assistance. However, neither management systems nor physical domain experts will have the necessary visibility to be able to easily diagnose the problem.

Without appropriate and capable management tools, the cost of providing non-server related infrastructure elements can multiply, "finger pointing" among various support functions can increase, SLAs are placed in jeopardy and time needed to restore impacted services and applications can spiral out of control. In short, there's a stronger risk of compromising the business when management systems and processes are inadequate to the task.

Thus despite the benefits, today's virtualized IT environments make service assurance anything but easy. Network management and operations professionals are expected to understand and monitor these highly flexible and dynamic infrastructures and to make proactive plans for mitigation and recovery in the event of system failure or performance degradation. To do this they need to answer critical management questions, such as:

- How can I ensure applications and IT services are delivered consistently and at the highest possible levels?
- How can I proactively avert the business impact of growing performance problems?
- How do I understand risk conditions and business impact so I can prioritize the team's actions?
- How can I better understand the business impact of virtual and physical IT infrastructure problems?
- How do I monitor, isolate, prioritize, and resolve availability and performance problems more effectively, efficiently, and quickly?

With the rapid and pervasive increase in server virtualization, finding the answers becomes more important and challenging without the right management solution.

WHAT TO EXPECT FROM AN INFRASTRUCTURE MANAGEMENT SOLUTION FOR ENABLING SERVICE ASSURANCE

For most large enterprises, having a robust and predictable IT environment is absolutely vital. Without it, communications fail, business cannot be conducted, required compliance cannot be maintained, deadlines cannot be met, revenue cannot be recognized, productivity declines....and so on. Modern businesses processes require IT to function smoothly and efficiently.

As underlying IT infrastructure evolves, management capabilities also must keep pace so performance and availability remain at or above promised service levels. Mitigating growing complexity and reducing business risk by adopting standards, developing processes, and leveraging automation becomes important. As IT complexity increases, so should the management system capabilities, which need to:

- Provide end-to-end management and visibility for IT operations
- Assure accuracy and reliable remediation for configuration updates and changes
- Proactively deal with availability and performance problems before they impact service levels and end users
- Rapidly identify problem root-causes and deploy appropriate resources to quickly resolve the issue and restore normal operations

UNDERSTANDING BUSINESS IMPACT

As virtualization has become pervasive, it has accelerated another related trend within IT—the move to service-orientation; that is, the IT organization managing first and aligned with the applications and services being delivered to support and enable business processes. It recognizes that, from a business perspective, users of the infrastructure don't need to know, nor do they care about the underlying technology. Of paramount importance to the business is service availability and service performance. Availability ensures that they can have access to their applications whenever they need them to support and enable business operations. Performance enables competitive advantage, agility and business efficiency. And by taking a service-oriented approach, IT can prioritize service availability and performance management response times based on business impact, not on other factors, such as processing a queue on a “first-in, first-out” (FIFO) basis, or solving more but “easier” problems before tackling more challenging ones.

THE NEED FOR AUTOMATION

Another key concern for IT organizations is how to get the most out of the IT budget. The level of IT spending is not as important as its distribution: According to IDC, almost three-quarters of IT spending goes to maintaining existing systems, both infrastructure and applications, i.e., to “keeping the lights on”. That means only about one-quarter of the IT budget is available for spending on helping using IT to propel the company to become more intimate with their customers, retain a competitive advantage, and to help save costs and be more efficient.

CIOs want to spend more than roughly 25% on IT innovation to deliver additional value to the business. An important way to move in this direction is to reduce ongoing management and maintenance costs through increased use of automation to significantly reduce the need for human intervention as well as positively impact productivity. Yet automation requires investments, not only in automation capabilities but also in process improvements, training and organizational changes. And while great strides have been made (for example, in adoption of process frameworks such as ITIL and CoBIT), more is needed to get to the next level. The net is a continuing need for IT organizations to find ways to automate the operation and maintenance of their data centers and networks so that they can more efficiently and effectively deliver applications and services to their business customers with the required levels of assurance.

KEY VIRTUALIZED-ENVIRONMENT SERVICE ASSURANCE CAPABILITIES

The introduction of virtualization in any IT environment or data center operation fundamentally changes the nature of service assurance. Prior to virtualization, while often complex, the static relationship between physical and logical functions made it far easier to determine which assets were used for what services, how hardware, software or configuration issues could affect those services, and where to affect remedies when problems were discovered. With virtualization, the number of permutations of logical to physical mappings grows significantly. Assumptions about the physical location of applications and services may no longer be valid and the potential for service degradation can increase unless capable management strategies and solutions are adopted. Solutions must have a view across the environment and into both its physical and virtual elements. They must be able to assimilate and parse the information needed to identify and rapidly resolve issues from the many streams of management data. They must also be able to develop a performance-focused view for applications and services in order to:

- Provide better IT service levels to the business functions and their end users
- Establish performance norms, deviations from which can be used to identify issues and remedies before they impact the business

And finally, they must be able to undertake these actions automatically and dynamically, adjusting to the environment as the virtualized environment adjusts to provide the highest utilization and performance levels.

Taken together these automated capabilities translate into the three vital functions that IT managers need to deliver service assurance:

- Insight and operational understanding of the virtual data center
- Fully automated management of configurations
- Enhanced incident and problem management

INSIGHT AND OPERATIONAL UNDERSTANDING OF THE VIRTUAL DATA CENTER

The dynamic nature of a virtualized data center and its rapid pace of change create a need for clear line of sight into the entire IT service delivery infrastructure—physical and virtual. Management of physical and virtual IT environments needs to:

- Be unified, combining physical and virtual management capabilities in one system
- Use and leverage automated discovery to keep pace with dynamic changes in the virtualized environment
- Update the locations of physical network, storage, and server elements, virtual machines, virtualized networks and storage, their interconnections, as well as the applications and services running on them, in real time
- Integrate performance measurements
- Aggregate multiple streams of management data into a coherent picture

With this, operations teams would have a cross-domain, detailed view of their IT environment, including both new and legacy technologies, with unparalleled line-of-sight from the application and VM level, all the way to the underlying physical infrastructure.

FULLY AUTOMATED MANAGEMENT OF CONFIGURATIONS

All of the major IT analyst firms—Gartner, Forrester, IDC, and EMA—agree: The vast majority of service-affecting problems in data centers—from 65 percent to 85 percent—are the result of an improper configuration or change.

For those in IT operations responsible for delivering service assurance—who are also the ones making changes and updating configurations—the implication is staggering: Most problems impacting application and service delivery are the direct result of actions caused by the IT organization. In other words, for service assurance, an IT organization often is its own worst enemy.

From a service assurance perspective, automating configuration management, across domains, will yield tremendous benefits:

- IT operations can significantly reduce, if not eliminate, configuration-related problems at their source
- Business risk consequently decreases proportionally
- Application and service availability and performance improve dramatically as well

- Increased operational efficiency and reduced operational costs

Key configuration management features to consider include:

- Automatic change tracking and update handling
- Policy-based management to ensure desired states and standards are automatically maintained
- Standardized, consistent representation of configuration data
- Multivendor hardware support

ENHANCED INCIDENT AND PROBLEM MANAGEMENT

Any data center will have elements that will, at some point, degrade and break down. Delivering service assurance requires IT operations to have the resources and capabilities necessary to efficiently and effectively manage and handle incidents and problems related to degradations and failures. That way, when trouble arises in the IT service delivery infrastructure, impacted applications and services can quickly be restored to a normal operational state.

All too often, when trying to troubleshoot problems and resolve incidents, IT operations teams are data “fat” information “lean.” The numerous events automatically issued by IT systems easily overload operational teams, and usually come from “symptoms” not related to the true source of the problem. In short, the events created by these symptoms create so much background “noise,” it’s extremely difficult for IT operations to “hear” the soft voice in this crowd that is the true source of the problem.

To solve this challenge, operations teams need to look to leverage automation and management intelligence. And that doesn’t just mean simple event suppression and de-duplication. That will not address the heart of the matter, which is needing to quickly and easily pinpoint the root cause of service-impacting problems.

The former—root-cause analysis—requires the combination of sophisticated analytics and extensive automation to enable IT operations to rapidly identify the source of risk conditions and performance degradations. The latter—service-impacting—requires that this same system have the ability to create, understand, and maintain critical relationships and connections between virtual data center elements, and the applications and services that rely on them for their delivery to the business.

EMC'S SOLUTION FOR SERVICE ASSURANCE

The previous section of this report outlined three key capabilities necessary for allowing IT operations teams to deliver Service Assurance to the business:

- Insight and operational understanding of the virtual data center
- Fully automated management of configurations
- Enhanced incident and problem management

EMC’s Solution for Service Assurance delivers the management capabilities needed to meet these critical needs, allowing customers to identify the source of problems 80 percent faster, resolve problems 60 percent faster, and double their IT operational efficiency.

EMC classifies its Service Assurance management capabilities in three ways:

- Virtual Data Center Visibility
- Configuration Management
- Identify and Act

VIRTUAL DATA CENTER VISIBILITY

EMC's Virtual Data Center Visibility provides much-needed visibility, insight, and understanding into the availability, performance, and connectivity of virtual and physical infrastructures:

- Obtain unparalleled line-of-sight—From the application and virtual machine (VM) level, through the virtual network, to the underlying physical storage, network, and server infrastructure
- Receive real-time updates—Dynamic tracking of VM movement and other critical VM-related events
- Understand virtualization details—Including virtual switches, vMotion activity, VMs impacted by problems, VM-to-storage relationships VM and ESX performance, composite vApps, and availability and performance for all VMware-attached storage

The result is streamlined, unified management that eliminates virtualization complexity and its associated inefficiencies, reduces operational costs, and enables IT operations to quickly solve complex availability and performance problems, and restore impacted virtualized IT services faster, by having the insight and understanding they need to provide service assurance.

CONFIGURATION MANAGEMENT

EMC provides the configuration management capabilities needed to automate critical configuration tracking and remediation across your IT infrastructure:

- Instantly informed—See all changes and deviations from approved configurations, and know exactly what changes are needed to restore the configuration to standard
- Policy-based remediation—Make corrections and updates faster, easily and in large scale by leveraging policies and automation
- Automated updates—Speed every configuration update and eliminate human error, with just one touch and complete accuracy

This significantly reduces, at its source, what's likely a major contributor to service-impacting IT problems, which in turn goes a long way toward enabling IT operations to provide Service Assurance to the business.

IDENTIFY AND ACT

EMC provides the automation and advanced analytics required to identify the root cause of risk conditions and performance degradations, and act in a way that aligns with business priorities and enables service assurance:

- Identify the root cause—Quickly separate symptoms from problems
- Determine risk conditions—See performance degradations before business impact occurs
- Manage key cloud-enabling technologies—Monitor for availability and performance throughout the VDC, including VMware-attached storage, protocol management, MPLS, optical, multicast, VoIP, wireless, and Vblock infrastructure platforms

By creating, automatically maintaining, and leveraging a single, unique management model of the physical and virtual IT environment, EMC's solution can rapidly identify root causes, which allows IT operations to:

- Quickly and reliably resolve issues prioritized by business impact

- Proactively avert the end-user and business impact of escalating performance problems
- Shrink the time needed to identify the source of service-impacting issues (often from hours to minutes)

CASE STUDY: COMPUCOM SYSTEMS

CompuCom Systems, a leading IT outsourcing company providing infrastructure management and IT services for Fortune 500 companies, began processing applications in real time and over wide-area networks and started to experience network latency and slow performance. CompuCom's existing management solution did not provide the real-time monitoring and rapid fault detection and resolution these more rigorous environments demanded.

When heavier loads began hitting their clients' infrastructures, it took four to five hours to generate network maps and between 10 and 15 minutes to poll devices—times that are unacceptable in today's business world.

By implementing the EMC Solution for Service Assurance, CompuCom now provides remote monitoring, root-cause analysis, and event resolution for its clients' virtual and physical servers, storage, and network infrastructures. CompuCom utilizes the solution to enable automated network change and configuration management, and facilitate compliance with key industry requirements such as Payment Card Industry (PCI) DSS and SAS 70 auditing standards. The EMC solution has enabled CompuCom to identify and resolve network issues dramatically faster and more efficiently. CompuCom can now:

- Detect, diagnose, and correct clients' systems and network problems in real time
- Poll tens of thousands of devices in two to three minutes, compared with the 10 to 15 minutes it took before the EMC solution was installed
- Perform root-cause analysis in an hour or less, compared to four to five hours previously
- Monitor twice as many devices per systems administrator

In the first year, EMC saved CompuCom more than \$550,000, and the company expects higher annual savings as it expands its use of EMC data center management technology and its business continues to grow at a fast pace.

The EMC solution has also improved customer satisfaction levels among CompuCom's customers. One large, nationwide clothing retailing client reported significant improvements when its data centers were managed by the EMC Solution for Service Assurance. The retailer's monthly number of trouble tickets dropped from nearly 2,200 to around 500. In addition, the retailer's device availability increased from 98.2 percent to 99.3 percent, and network availability improved from 98.3 percent to 99.5 percent—differences that looks small in percentage points, but were considered highly significant and beneficial to the customer.

RESULTS AND VALUE FROM THE EMC SOLUTION FOR SERVICE ASSURANCE

CompuCom isn't alone in these kinds of results from using the EMC Solution for Service Assurance.

There are literally hundreds of other EMC customers—across industries as diverse as telecommunications, managed services, financial services, retail, healthcare, higher education, utilities, transportation, manufacturing, and government—that confidently provide service assurance to the business thanks to the management capabilities delivered in the EMC Solution for Service Assurance.

Many EMC customers—including BT, Verizon Business, Swisscom, Colt, Radianz, HL Komm, Reliance Globalcom, and Hol, and whose case studies are public and available—have leveraged the EMC Solution for Service Assurance to tremendously improve how they meet or exceed promised service levels to the business, significantly reduce ongoing operational costs and increase operating efficiency, and quickly identify and properly act on problems, with minimal impact to the business. For example:

- Improve efficiency and reduce costs—By deploying an automated solution and by significantly reducing the time it takes to identify and resolve problems, the number of staff assigned to manage the IT environment can often be reduced. For example, after deploying the EMC Solution for Service Assurance, Verizon Business was able to reassign 75 percent of their network operations center staff to other projects and functions.
- Increase effectiveness—Automation and rapid problem identification also allow the existing IT organization to simultaneously manage many more devices than in the past. HL Komm and CompuCom, for example, found that they could manage twice as many devices per administrator, with the same staffing levels.

Enhance service levels and end-user satisfaction—By proactively managing potential issues before they impact users, reducing problem resolution times, being able to get the right expert to address problems quickly, and by understanding how to prioritize based on business impact, service availability and performance levels increase along with user satisfaction. CompuCom was able to reduce the amount of time needed to identify a root cause by 80 percent, cutting the time it took identify complex root causes from between four and five hours to less than an hour. Verizon found being able to identify the root cause of problems also helped them reduce the time needed to fully resolve problems and restore normal operations by up to 60 percent.

CONTACT US

To learn more about how the EMC Solution for Service Assurance can help solve your business and IT challenges and deliver value to your organization, [contact](#) your local representative or authorized reseller—or visit us at www.EMC.com/SA.

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