

SPECIAL REPORT

Optimizing Your
**NETWORK
MANAGEMENT
STRATEGY**
for Today's Economy

A REPORT PREPARED FOR NWW/SOLARWINDS

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Introduction

The challenges that network managers face as a part of their larger IT organization may seem insurmountable just given the logic of the overall situation facing network operations.

For instance:

The current economic environment is one in which IT investments will need to show value and budgets will be targeted carefully at priorities and in some cases actually be frozen or cut. Yet the availability of appropriately skilled technical personnel is in short supply.

At the same time, the importance of IT services is all the more critical to business competitiveness and organizational success. Businesses depend on IT services for productivity, for interfacing with partners and supply chains, and increasingly for revenue-generating services. IT services are also helping businesses reshape themselves into new business models, or to reshape their current business model into a more competitive posture.

- Moreover, the importance of the network as a delivery system to IT services is growing as more businesses depend on remote branch offices and other locations, and application designs are becoming more multi-tiered and network dependent. EMA research from 2007 shows, for instance, that more than 34% of businesses of all sizes have more than 100 branch offices or remote locations.
- VoIP initiatives are challenging designs. Web-based applications are often multi-tiered and hence networked by design. Web 2 is exacerbating this. And the rise of virtualized environments and service-oriented architecture will change your life – much for the worst if you're not prepared.
- Security and compliance concerns have risen dramatically over the last several years, adding yet another set of burdens on IT.
- Making this more difficult is the fact that both network and systems devices have become orders of magnitude more complex in part to support a wider array of services, and on the systems side in part to support requirements for virtualization and grid computing.
- The frequency of changes to the infrastructure and the applications are similarly exacerbating the challenges of managing all of the above.

But don't give up. There are strategies, tools and approaches that can help you to stay ahead of this seemingly impossibly steep curve of change and demands. This report is designed to provide you with some guidelines for getting quick time to value out of your network management investments and strategies, as well as a few process and metrics recommendations to help you make those technology investments count.

Processes and best practices

The first thing to keep in mind is that technology can't do the job by itself. Management solutions need to be adopted to support better processes across network operations and IT as a whole. In other words, as one of EMA's IT clients once said, "Management software isn't a commodity; it's about a way of life." How you optimize your management investments depends on your ability to directly relate them to work processes and problem solving beyond professionals doing their jobs in isolation. This leads to more effective data sharing and collaboration, and minimizing, or maybe even eliminating, finger pointing.

Here are some pointers for going forward from a process perspective:

- **Initial strategic aligning and planning:** Don't give short shrift to understanding how your IT organization can better align to business goals. Healthy, ongoing interaction with your customers (internal and external) can do wonders to improve your relevance and effectiveness.
- **Organizational and process audit:** Take the time to make sure that organizational issues and poor processes won't get in the way of an effective management strategy.
- **Seek out best practice recommendations such as those from the IT Infrastructure Library (ITIL):** EMA has a lot to say here, but don't write off ITIL just because of its help desk roots. ITIL is evolving to become more Operations savvy and it is becoming more prevalent within IT organizations for good reason. It provides a common lexicon for different silos within IT to communicate effectively with each other, while reinforcing the importance of a service vs. component-centric mindset in orchestrating IT operations. Even trends such as the Configuration Management Database (CMDB) or Configuration Management System (CMS) as per ITIL v3 have strong potential value to network operations, where understanding interdependencies between services and the infrastructure has arguably a longer history than anywhere else in IT.
- **Governance, audits, compliance:** These are becoming more and more a part of IT requirements and clearly linked to policies and best practices, just as they ultimately depend on good technology investments that can support some level of process automation. Viewing this as purely overhead, vs. integrated processes; in the day-to-day working of IT will ultimately lead to inefficiencies, or worse, severe compliance breaches. So once again, look for technologies that can assimilate and automate these kinds of process requirements, but first think ahead to define cohesive, efficient policies vs. top-down, legislated policies that don't fit in well with the reality of day-to-day operations.
- **Grassroots best practices also count:** EMA is seeing a growth in cross-domain collaboration often driven from the network operations center. These efforts have little to do directly with some of the more well-established best practices initiatives, such as ITIL, but they ultimately support the same ends for more effective service management. Two examples stand out. Network engineers and managers are increasingly driving teams to help resolve application service performance problems, including application managers and data center experts such as database professionals and systems experts. And why is this? It's because the network often gets blamed erroneously for application service issues. Another example is Application Network Review (ANR) teams designed to support application development and Q/A test with insight into real network performance requirements prior to when applications are actually deployed. Both of these groups are trendsetters and pioneers who deserve more recognition than they're currently getting in the industry. These teams go well beyond mere self defense. They are proactive innovators that help to place network operations in the forefront of strategic problem solving for all of IT.

Some technology considerations to help you become more effective

The management technologies you choose are, of course, important. They are always only enablers, but they can also be catalysts for improved service quality, reduced cost and improved organizational effectiveness. The technology criteria described below are not meant to be a complete list, but they are a good departure point for getting on top of the problem of more efficient network management.

Planning for Adoption

There are some basic steps to planning for the successful adoption of new technologies, which follow as an extension to process considerations as discussed above.

- **Audit what you've got:** Make sure that you really know what management tools you're using, and who's using them and why. Identify redundancies and seek out areas that are under-addressed.
- **Create a phased plan:** Develop a set of phased objectives and measurements for your management strategy that fits your particular needs and goals.
- **Product selection and integration:** Once you've done this homework, you're ready to set criteria for, and select, the right management tools.
- **First phase checkpoint:** Stay with your phased plan. Honor the first checkpoint and recalibrate as need be based on what you've learned so far.

Issues of investment: Time to value

Network management investments typically have two central drivers: infrastructure expansion and change, and support for new business services – the great preponderance being Web-based applications. In this economy, the importance of support for new business services will rise in priority over basic infrastructure expansion unless that's linked to clear business benefit. But management investments can also empower you to do more with less and become more effective and efficient. While this is not a dominant statistical reason for making IT management investments, it does occur with increasing frequency, often linked to best practices initiatives and/or simply more

enlightened IT leadership. In EMA's perspective, it is the best reason even if it is not the most frequent reason.

But having said that, IT management investments can become their own quagmires. Many in IT complain: "If a product is strategic, it's hard to deploy, administer and use. If it's tactical, it doesn't meet my needs but it's easy to use – how do you beat that problem?" The truth is that there are innovators in the marketplace keenly focused on time to value, although they may not be the most obvious or well-recognized choices. Look for them, and leverage the old vs. new perspectives listed below as you do so:

Old approaches

- While point tools still might serve a purpose, they tend to be adopted in an ad hoc manner and stimulate siloed processes rather than the effective management of the infrastructure as a whole in support of service delivery.
- Siloed tools managing individual device types create another form of overhead, as each typically requires knowledge of a specific command lexicon.
- Most strategic management products, on the other hand, are drastically underutilized because of product complexity combined with poor training.
- In both the strategic and tactical area, management tools output a lot of data but are short on useful, pre-processed management information.

New approaches

- **Look for tools that are easy to deploy, use and maintain:** Seek out design points that minimize routine tasks such as data aggregation, purging or even backup – otherwise product complexity quickly can become part of the problem rather than the solution. Maintenance of the product itself should ideally require no more than an hour a week.
- **The product must be flexibly configurable:** Management products should support the need for unique functional requirements without forcing IT to purchase unexpected, additional tools. On the other hand, superfluous functionality in excess of what's needed can create problems of deployment and use.

- **Tools must be functionally expandable:** Too often a major “forklift” of the initial toolset is required as the IT environment changes, or as operational tasks become more sophisticated. Ideally new functions required in the IT environment should be modular, with the potential of adding in new capabilities that integrate well with an established functional base.
- **Simple pricing structure:** The pricing structure of these tools must be simple enough to offer easy comparisons to other products or services for initial purchase and future functional expansion.

Five standout technology features to look for

Below is a partial list of what EMA believes are some of the standout features to look for to support more effective network management.

- **Discovery, inventory and topology:** Visibility into what you’ve got is a foundation not only for problem resolution but can also be leveraged for asset management and planning. Assessing effective discovery capabilities in network management has been a point of prominent debate within network management for years. The idea to keep in mind is that whether it’s Layers 3 or 2, or whether it’s a more asset-oriented type of discovery directed at device inventory, or even application dependency mapping systems to dynamically define application ecosystems over the full IT infrastructure — discovery itself is only an enabler. Less may turn out to be more based on your needs, maturity and readiness.
- **Configuration management for operational efficiencies:** Network change and configuration has fortunately been one of the most innovative areas in the IT management marketplace. Values in operational savings can often be dramatic — sometimes as much as 1,000 to one or even more – in terms of configuring large, networked environments. These operational investments also can result in strong values in terms of security, governance and compliance,

by providing a cohesive approach to support policy-based process automation.

- **Configuration management for diagnosing service performance issues:** Well over 60% of performance and availability problems are caused by configuration changes, most of which are the result of human error. Integrated capabilities to audit configuration changes as they impact infrastructure and service performance are key to your success. For instance, creating a reflexive system for understanding how changes made may have impacted service performance can be invaluable – improving service availability while saving you lots of operational overhead.
- **Application performance – QoE:** QoE is how the user experiences the service. As such it parallels the original history in MOS, or Mean Opinion Score, for VoIP — and in both cases, “experience” is recognized as being subjective. Nevertheless, two sets of objective metrics stand out for getting at one of the most common and easily metricized issues impacting QoE — degraded application response. These include synthetic transactions and observed transactional performance capabilities to approximate, or in some instances actually capture, user experience at the end-station.



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- **Application performance – diagnostics and triage:**

Your job in network operations is in part to leverage the network to help isolate points of failure in critical application delivery — and you will find this role becoming increasingly important. As an extension of this, you will want to focus the diagnostic effort away from you and your team if the problem is not the network. This is best facilitated by helping to assess who should own the problem if it's not the network, or else it may well come back to you anyway. End-to-end performance metrics — to test the infrastructure for latency — are the right place to start with diagnostics. And these tie back to QoE as approximations of the actual user experience. Understanding specific application traffic in terms of volumes and usage over the network is also key in assessing network readiness as well as in helping to diagnose critical problems. And finally, drilling into infrastructure components for root cause makes up the next logical step. Hence integrated flow and event data can be invaluable. And by the way, don't forget to look for problems due to configuration and change. A system that can combine all of the above can be invaluable.

Assessing your progress

One of the single biggest reasons that strategic planning for network management and other management initiatives fails is a lack of clear and sufficiently detailed objectives

to help assess progress and communicate direction and value. Finding appropriate metrics to show progress isn't just a political requirement; it can help to keep you honest with your deployments and help to inform you on how to tune what you're doing to improved success. This doesn't mean that you should categorically prioritize those metrics that indicate the highest ROI — that's one of the first ways to derail an otherwise well thought out project. What does work best is a combination of objectives that combine pragmatic project guidelines with some clear, well-chosen external benefits.

Below is a very incomplete list of metrics that you might want to consider for showing objective value and measuring progress in your network management initiatives.

1. **Reduction in MTTR:** Reduction in Mean-Time-to-Repair is a standard metric and often a service-level agreement associated with outsourced services. It actually includes many processes within it, such as improved diagnostics, improved collaboration between operations and the help desk, and across domains within operations, among others. So MTTR is often a starting point for a set of other more detailed metrics. One of the most useful in large companies is MTTF — or Mean-Time-to-Find-Someone, meaning locating the owner of a service problem from Level 1 support, or sometimes within an operations team.
2. **Reduction in Mean-Time-Between-Failure (MTBF):** MTBF is a good indicator of uptime, or minimal downtime. Whereas MTTR is more operational in nature, MTBF is more directly targeted at business impact.
3. **Reduction in the number of trouble tickets that are network-related:** This is more a test for how you are managing changes to the network infrastructure than anything else, including capacity planning and configuration changes.
4. **Reduction in the number of repeat failures:** These are reoccurring failures that are not effectively resolved the first time because of incomplete or incorrect diagnostics.



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5. **Reduction in unapproved change:** This is a valuable operational metric as you begin to enforce effective policy and review criteria for making changes to the networked infrastructure.
6. **Reduction in the number of unsuccessful changes:** In other words, how many changes need to be redone in contrast to those “successful” changes that do not result in service disruptions or non-compliance issues.
7. **Capex savings across the infrastructure:** EMA has documented some significant dollar savings including those made by mid-tier and even small businesses as superior discovery, inventory and in some cases CMDB deployments have exposed unneeded or underutilized infrastructure components.
8. **Time savings in introducing and retiring assets:** The effective reduction in operational time and overhead associated with introducing and/or retiring new network devices can not only produce solid operational savings, but also is a good indication that your organization is becoming more mature and more efficient overall in the way you work.
9. **Reduced time to perform audits:** Audits for security and/or compliance initiatives have already become a major source of overhead and sometimes consulting costs across IT, including network operations. Your ability to automate some of these procedures through better processes combined with better technology is a sign of better operational efficiency overall.
10. **Superior quality/accuracy of audits:** Not every audit is effective, and EMA has seen breaches occur within a single day after an audit was completed. Audits are worthless if they're not accurate, leaving

you exposed to the same security and compliance issues as before.

11. **Reductions in costs associated with maintaining management investments:** Many strategic network management investments require full-time, dedicated administrators, with lengthy time to make updates that extend the time required to incorporate new devices, and often results in questionable levels of accuracy and efficiency in performing management tasks. So while this metric directly shows value in reducing operational overhead, its indirect benefits may be even greater in terms of your overall effectiveness in managing business services.

Conclusion

Network management, far from being a mature and static discipline, is once again at the forefront of many areas of innovation within the industry. These range from application management to virtualization, to support for remote offices, to more real-time approaches to integrating and sharing critical information across IT. Optimizing for costs in this chaotic and demanding environment may seem like an unachievable goal. But if you approach this problem from both a process and technology perspective with well-defined metrics, your chances of succeeding are much higher. And the good news is that many of the more innovative approaches to management from both a process and technology perspective can produce significant operational savings as well as meaningful improvements in service quality.

PRODUCT SPOTLIGHT

Vendor Spotlight: SolarWinds

SolarWinds develops affordable, easy-to-use, network management software targeted at a wide range of users and user environments. SolarWinds' offerings range from desktop solutions designed for individual professional users to server-based software products designed to support multiple roles across network operations. EMA has seen strong uptake in not only small businesses and mid-tier businesses of SolarWinds solutions, but also a growing instance of enterprise use. Here SolarWinds' offerings are popular in combining support for strategic requirements with easily deployable design points featuring intuitive and customizable user interfaces and built-in workflows.

SolarWinds also makes its solutions available from the Web so that they can be installed and configured by users. SolarWinds has also evolved an active, online community of more than 16,000 users (www.thwack.com), for knowledge sharing and collaboration.

SolarWinds Solutions:

SolarWinds offers multiple network management solutions including fault and performance management products, configuration and compliance products and a range of software tools (including several FREE tools) for network diagnostics and discovery.

More specifically, these offerings are:

Orion Network Performance Monitor – starts at \$2475

Comprehensive fault and network performance management platform that:

- Monitors and analyzes real-time, in-depth network performance metrics for routers, switches, servers, and any other SNMP-enabled devices.
- Provides a customizable Web interface that supports multiple views by user and department, as well as map views of your global network.

- Enables advanced alerting for correlated events, sustained conditions and complex combinations of device states.
- Scales to accommodate growth and management needs with a hot standby engine, multiple polling engines and additional Web servers.
- Provides Customizable Web views.
- Extends management capabilities to NetFlow traffic analysis and monitoring of VoIP performance, wireless devices, applications and servers.

ipMonitor – starts at \$1495

Network Monitoring for small businesses that provides IT administrators with a real-time view of what's happening across their applications, servers and devices.

ipMonitor provides:

- A built-in database and Web server, so installation is fast, affordable and easy.
- Out-of-the-box monitoring of Active Directory®, DNS, Microsoft® Exchange, FTP, Web, IMAP, MS SQL Server™, SMTP and so forth.
- Quick discovery of IP-based network devices and automatic recommendations (SmartMonitor settings) for each device — no manual configuration is required.
- User experience monitoring with synthetic transactions.
- Customizable network maps that enable you to visually monitor network data and to drill down to take immediate corrective actions.
- A user interface and dashboard that enable a clear view of the health of the network and application infrastructure.

SolarWinds Engineer's Toolset – \$1390

49 network troubleshooting tools providing engineer-level diagnostics to help discover, configure and monitor networks. The toolset also helps with identifying and remediation of network failures.

Some of the tools include:

- **NetFlow realtime tool:** Performs real-time capture and analysis of Flow data, providing visibility into bandwidth utilization.
- **Switch port mapper:** Remotely discovers the devices connected to each port or switch or hub.
- **IP address management:** Determines which IP addresses are not in use and how long it has been since the last use.
- **IP network browser:** Provides a detailed discovery on one device or scan a range of subnets
- **DNS audit:** Inventories an IP address and validates the correct forward and reverse resolution of domain names.

Cirrus Configuration Manager – starts at \$1245

Performs network change and configuration management for network devices across multi-vendor environments allowing engineers to:

- Schedule device configuration backups.
- Implement configuration changes in bulk (IOS and firmware updates).
- Generate detailed configuration reports for inventory, change and policy management.
- Receive notification of device configuration changes.

- Identify configuration violations through out-of-the-box policy management reporting.
- View detailed change history and side-by-side comparison of configurations.
- Perform detailed device inventory for each managed device.

SolarWinds LANSurveyor – starts at \$1995

Automated network mapping providing easy-to-view network diagrams that integrate Layer 2 and Layer 3 topology data.

- Automatically discover and diagram network topology.
- Generate network maps in Microsoft Office® Visio®.
- Automatically detect new devices and changes to network topology.
- Perform inventory management for hardware and software assets.
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