

A Forrester Consulting Thought Leadership Paper Commissioned By Cisco Systems

“Smart” Services For Network Management Will Be Critical For Business Success In A Connected World

New Business And Technology Demands On The Network Will Require A More Intelligent Approach To Network Management

September 2011

FORRESTER

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Executive Summary

“Companies run on their networks.”

Today, that statement is only partly true. Many companies have built their IT systems and business operations as archipelagos of islands that can continue to operate even if their voice and data network connections are lost. And those that do rely on networks use expensive redundancies and constant monitoring to maintain service, yet still have periodic outages. But that is changing. Large, global businesses already depend on their networks to connect their local operations to central IT systems. Large and midsize businesses rely on Internet connections and multiple devices to reach customers, suppliers, and employees on the road. In industries like education and healthcare, online learning, telemedicine, and electronic medical records are placing new demands on networks.

“Smart” services will become increasingly important to enterprises as more and more business and IT activities move into the cloud and onto the network.

Given these evolving market requirements, companies will increasingly need to shift from their current protective and reactive network management approach to a “smart” proactive approach that is more intelligent. Not all companies need smart network management now. How much they will need it will always vary by industry and size of company. But eventually, all companies that run on networks will need smart proactive services to support the new models of connected, real-time businesses that are emerging. These smart services will be built on proactive, software-enabled platforms and will use automated collection and correlation of network data to deliver actionable insight into networks.

To assess the current perceived need for and the potential future benefits of smart services, Forrester conducted in-depth interviews with 30 network administrators in a wide range of industries, geographies, and sizes of company. In these interviews, we found that companies are at different points in the transition from network indifference to network dependency. For example, many companies we interviewed have structured their business and IT operations to minimize network dependencies. Where companies we talked to do rely on high availability networks, they achieve that availability through redundancies and constant monitoring. While network administrators at both kinds of firms liked the idea of a more proactive network management, those with low current healthcare reliance on networks viewed that as a nice-to-have, not a necessity. But many reported that business partners were planning changes like the use of cloud computing, mobile workforce connectivity, online learning, and conversion from paper to electronic records that would place more demands on their networks. As those changes occur, we think network managers will place much greater value on having smart services and network management tools that are proactive and predictive, not reactive and responsive.

Key Findings

Forrester’s study yielded three key findings:

- **Business demands on the network will grow.** Most large multinational companies already rely heavily on networks to run distributed operations from central data centers and to link in real time with customers, suppliers, and partners. However, many small and midsize companies today operate with IT systems and business operations that are each autonomous and able to operate without continual access to the network. Meanwhile, new technology models like cloud computing are causing all companies to rely on external resources

delivered through the network. These new technology models as well as competitive pressure from the larger network-centric firms will trickle down to smaller firms, who will move in the same direction.

- **Current brute-force methods of maintaining network availability will become too costly.** Network managers today are generally able to provide acceptable levels of network availability, but they are doing so by heroic efforts and overinvestment in redundancy. As demands on networks grow, the cost of these efforts to maintain network availability will rise even faster.
- **Smart services that are proactive will be critical to deliver affordable network reliability.** As reliance on networks grows, companies and governments will need to shift to using proactive services if they are to deliver that reliability at reasonable costs of operation.

Proactive Versus Reactive Network Management

Today, most companies, governments, and nonprofits manage their telecommunications network on a reactive basis, responding to problems when they arise. To avoid network outages, these firms build redundancies in their telecom infrastructure that allow them to route traffic around any problems that arise. They also dedicate staff to monitor network performance in order to respond quickly to an outage. Lastly, because of lack of confidence in the reliability of their telecom network, firms may be avoiding certain revenue-generating or cost-saving initiatives that are dependent on highly reliable networks.

New smart technologies, services, and solutions are coming to the market that would allow firms to switch from reactive network management with its costs and constraints to a more proactive approach with awareness capabilities to detect potential problems before they surface and analytical capabilities to predict the damage these problems could cause and identify how to fix them. That will allow firms to take preventive action to avoid or minimize the effects of network outages or slowdowns. These technologies capture real-time data not only on the operational performance of a company's local area network (LAN), wide-area network (WAN), and its connections to the Internet, but also on the status and condition of all devices on which the LAN, WAN, and Internet interfaces run, as well as on devices that are connected to the network and could also create disruptions if they were to fail. Through continual monitoring of the network and devices connected to it, these technologies can identify stresses and potential points of failure and predict where problems could surface. In short, they allow firms to understand the usage, demands, and potential weak spots, which can be used to anticipate and prepare for future strains as new services and activities are added to the network.

To assess the value of and the challenges for implementing these smart services for proactive network management, Forrester interviewed 30 companies in a variety of industries about their network management issues. These interviews covered a) how important telecom networks were to their business; b) the costs and consequences of network outages and slowdowns; c) how they were managing their networks today and what they were doing to deliver dependable network services; d) what potential value a proactive network management solution would provide to them; and e) what the challenges they would face in implementing such a solution.

Our key findings are as follows:

- **The value of proactive network management depends on the importance of a network to business operations.** Most businesses have three kinds of networks: 1) the local area network (LAN) that is used for internal data exchange and voice within a business facility; 2) the wide-area network (WAN) that is used for data exchange, voice services, and increasingly, videoconferencing between multiple business facilities; and 3) the network connections with third-party telecommunications networks used for voice and data interchange with external customers, suppliers, and partners. Proactive network management is most important when a firm uses all three kinds of networks — is using the LAN and WAN for exchanging critical business data between systems that are shared by different parts of the organization and is using external networks not only for voice communication and data interchange with partners, but also for accessing applications and data in the cloud. Proactive network management is less important when a company has decentralized operations and systems that can operate autonomously, uses few if any software-as-a-service applications, and has intermittent and non-time-sensitive interactions with customers and suppliers.
- **Different industries have greater or lesser reliance on networks, so greater or lesser interest in smart proactive network management services.** We talked with companies in two dozen different industries.
 - We found the greatest interest in proactive network management in telecom network service providers and companies that provided network-managed telecom services because their business depends on highly reliable networks. Not only do they lose revenues if network outages cause violations of service-level agreements, but such outages also damage their brands and their ability to attract and retain customers.
 - Large banks and securities firms depend on their networks to connect their internal transaction, trading, and risk management systems across different offices and countries in which they do business, as well as with counterparties involved in their financial transactions. If their networks go down, everything from consumer cash withdrawals at ATMs to million dollar bond trades would come to a halt, with all the attendant loss in revenues and customer confidence that would follow. However, we found that smaller regional banks are less vulnerable to a network outage and could easily tolerate outages of up to six hours.
 - Healthcare providers have traditionally not been too dependent on networks and have structured their operations to be able to function through even multihour outages. But that is starting to change, for example as electronic medical records gain adoption and telemedicine for doctors to interact remotely with patients starts to take off. When paper medical records still dominate, doctors, nurses, technicians, and administrators can still perform their duties, keeping paper records of diagnoses, treatments, or care provided. But when medical records become electronic, an outage in the LAN means that healthcare providers are literally in the dark. When telemedicine becomes more common, a patient expecting a diagnosis through a video conference will be left untreated. So reliable networks will become critical for healthcare providers.
 - Retailers and manufacturers relatively have low needs, which are starting to rise. Large global retail chains and diversified manufacturers need reliable networks to coordinate their sales with their

supply chains and manage the flow of goods from suppliers to warehouses to stores or through factories to distribution centers. Midsize retailers and manufacturers are not at this point yet. Their different locations often have the ability to operate autonomously for up to a day or more if their network connection is lost. But the competitive pressure from larger retailers or manufacturers will push them toward more tightly integrated and centralized IT systems, and their dependence on their LANs and WANs will increase as this happens.

- For most universities and colleges, the most important network need has been to keep students happy with their ability to download music, games, and social media from the Internet. But some of the universities we interviewed are not only moving administrative functions like class enrollment and grading online, but they are also putting class materials and even library content online. As this happens, their dependence on reliable networks will also grow. Students may still be able to attend their traditional classes if the network goes down, but they won't be able to complete their assignments, and their professors won't be able to grade their work.
- **New demands on the network like video and cloud computing are starting to hit network managers.** Regardless of industry, the people we interviewed talked about the growing importance of cloud computing. "It is very important to be proactive as we go forward in the cloud environment where a lot of the new stuff is focused," one network manager told us. Several people also mentioned the growing use of video within their business. A network manager for a commercial real estate firm said, "We use videoconferencing all the time, several times a day, and use it for management sharing, knowledge transfer, and training." The representatives of educational institutions and healthcare providers also cited the increased use of video for education and interactions between professionals and clients.
- **In most cases, network reliability (or lack thereof) has not been a constraint on how firms use networks.** Very few of the people we talked to could identify new business initiatives that their firm would undertake if their network was more reliable. Instead, business leaders in companies have assumed that their networks will be reliable. That's because network managers in most companies have been working overtime to make sure that the LANs, WANs, and Internet connections are available 24x7. When businesses launch a new initiative like electronic medical records in healthcare, online education at universities, RFID tracking systems for manufacturers, or smart meters for utilities, they spend a lot of time on the software they will need for these services and may even consider the hardware implications, but they almost never think of what the resulting demand on the network will be.
- **As a result, network managers have to react to business and IT decisions made without their input.** Network administrators are left to catch these hot potatoes and figure out ways of making sure the networks continue to function reliably despite the heavier demands and loads. Their response has typically been to then throw resources at the problem — more network capacity, more redundant systems to maintain service when something breaks, and more monitoring of network activity to be able to respond quickly when an outage occurs. This is the brute force solution to a problem, and it is expensive.

Today, Benefits Of Smart Networks Are Better Reliability At Lower Costs

One would like to think that the availability of new technologies and services that enable smart networks would open the minds of business executives to new business opportunities. That may be true for technologies that business leaders can touch and see, such as new client devices like iPads or smartphones, or new software products. But business leaders, however much they realize the importance of their network, also take network technologies for granted. Instead, they are attracted to new business opportunities that use mobile technologies, social media, electronic data and real time analysis, and cloud computing. While these will inevitably increase reliance and demands on voice and data networks, our interviews consistently showed that business is not waiting for the arrival of more reliable networks before moving ahead. Instead, they are assuming that their network managers will be able to provide the reliability, as they have done in the past when demands were simpler.

As a result, the main benefits of smart networks today will accrue to the operators of the networks that business relies on, and will appear in the form of lower cost provisioning for and delivery of network reliability. In the future, as business comes to understand how much their business success depends on their networks, they may view smart services as strategic investments that provide competitive advantage.

For now, network managers can expect the following benefits.

- **Better insight on current network stresses, so more focused investment to address new demands.** Capturing real-time data on the status and condition of the network, network devices, and devices connected to the network provides companies with a map of where stresses will arise when a business launches new initiatives that require network capacity. Network managers can then focus their investments to add capacity and provide redundancy on the specific points of stress rather than blindly investing more across the whole network. As an executive at a company that provides network-managed network services commented, “To be able to identify issues, workloads, peaks, and valleys proactively rather than waiting for something to happen gives us a better uptime and gives our customers better service.”
- **Outage avoidance, with a more efficient deployment of repair workforces.** Better detection of potential network problems allows the scheduling of repair or replacement before a problem occurs, avoiding an outage altogether. “[If] we would have better insights into our network, especially during off hours,” one network manager said, “then we would be able to get up and get going before users come to work.”
- **Reduced business disruption and internal customer support costs.** If the network or other systems need to be shut down for preventive repair, they can be scheduled at off-peak times when employee or business disruption can be minimized. Alerts of these planned outages can give business users time to plan their activities to avoid disruption. Network managers can also devote their time to fixing the problem instead of dealing with calls from employees asking why the network is down. “We have a much easier time if we can tell our employees when the network will be unavailable,” one of the network managers we talked to said.
- **Reduced monitoring staff costs.** Better information on network and device performance reduces the need for the continuous human monitoring of network activity. Many of the network managers either had dedicated staff (at larger firms) to monitor network conditions for outages or spend much of their own time (at smaller firms) doing so. Proactive network management means that this task can be turned over to the system to provide alerts

as needed. As a result, network managers at large firms can redeploy staff to more important activities, while network managers at small firms will have more time for planning and anticipating business needs.

- **Faster and more cost-efficient responses to outages that do occur.** Even with the best information, outages will still occur. But proactive services will help network managers identify the causes of the outage quickly, thereby allowing more focused problem solving. As one network manager said, “Anytime we can detect faults and keep an eye on them, that’s something we want to have ahead of time.”
- **The potential for reducing redundant network resources as network services become more reliable.** Many of the network managers we interviewed mentioned the investments they had made in redundant equipment and service providers in order to assure network uptime. Many of these redundancies will still be prudent whether or not a firm is using proactive services. After all, the proverbial backhoe that cuts the fiber optic line coming into your building cannot be anticipated, but having different lines coming at different points will minimize the potential damage. Still, network managers thought they could reduce some of their redundant systems if they had better insight into their network status and conditions.

Implementation Challenges For Smart Networks Are Manageable

The companies that we interviewed assumed that implementation of a proactive solution would not be too difficult. They assumed that most of the data about network operations and performance was already available, and the various network or network-connected devices to be monitored were already on the network and generating data about their status and condition. The major missing piece was the analytics to interpret this existing data and generate predictions about where potential problems would arise, and that would be provided by the proactive solution.

Based on our interviews, the implementation issues and challenges are the following:

- **Firms expected the biggest challenges would be employee training and retraining.** Today, network management professionals spend most of their time watching out for and fixing network problems as they occur. With proactive smart services, much of this work will be handled. Instead, network managers will need to become more familiar with predictive analytics, more skilled at planning and anticipating potential problems, and more involved in upfront business decisions with network implications. That will be a significant shift in skills, which at a minimum will require the retraining of existing personnel and could entail their replacement with new employees with the right skill set.
- **Companies are divided about getting proactive network management from a telco provider or an end vendor.** Many of the companies we talked to expected to turn to their network provider for a proactive network management solution, especially if this network provider was also serving as a network management service provider (MSP) with responsibility for all network operations. However, a majority of the companies we surveyed liked to deal directly with the vendor that had developed and supported the proactive solution.

KEY RECOMMENDATIONS

Forrester's in-depth interviews/surveys with 30 network managers about the value of smart services and proactive network management solutions yielded several important observations:

- **Project forward your firm's dependence on reliable LAN, WAN, and Internet connections.** The value of proactive solutions is proportionate to a firm's network dependency. As businesses, governments, and non profits increase their reliance on their networks to support more efficient and effective business operations, the value of proactive solutions will rise.
- **Design your networks for the future, not just the present.** Cloud computing in its various permutations of software-as-a-service, platform-as-a-service, and infrastructure-as-a-service will place new demands on networks as firms take advantage of these computing models. New awareness technologies like smart meters in utilities and electronic medical records in healthcare are other sources of demand on network resources. Network managers may not see these demands today. But they should expect them to arise in the future.
- **Understand the true of cost providing reliable network service today and in the future.** The main value of proactive network management lies in reducing the cost of having reliable networks. That cost will include the staff that monitors network operations to be able to respond when problems occur as well as investments in and contracts for redundancy that you have incurred to make sure the network can still function when a problem happens. But the cost also is the opportunity cost of not being able to anticipate and influence business demands because you are spending all your time putting out fires.
- **Look for a vendor that both knows your business and is a leader in providing smart network services.** If your telco provider has been reliable, understands your needs, and has a partnership with the right vendor of smart network services, you, like many of those we interviewed, will find their network provider the right place to look for a solution. But it's more important to get the right solution, so go directly to the source if you have doubts about whether or not your network providers can provide these services.

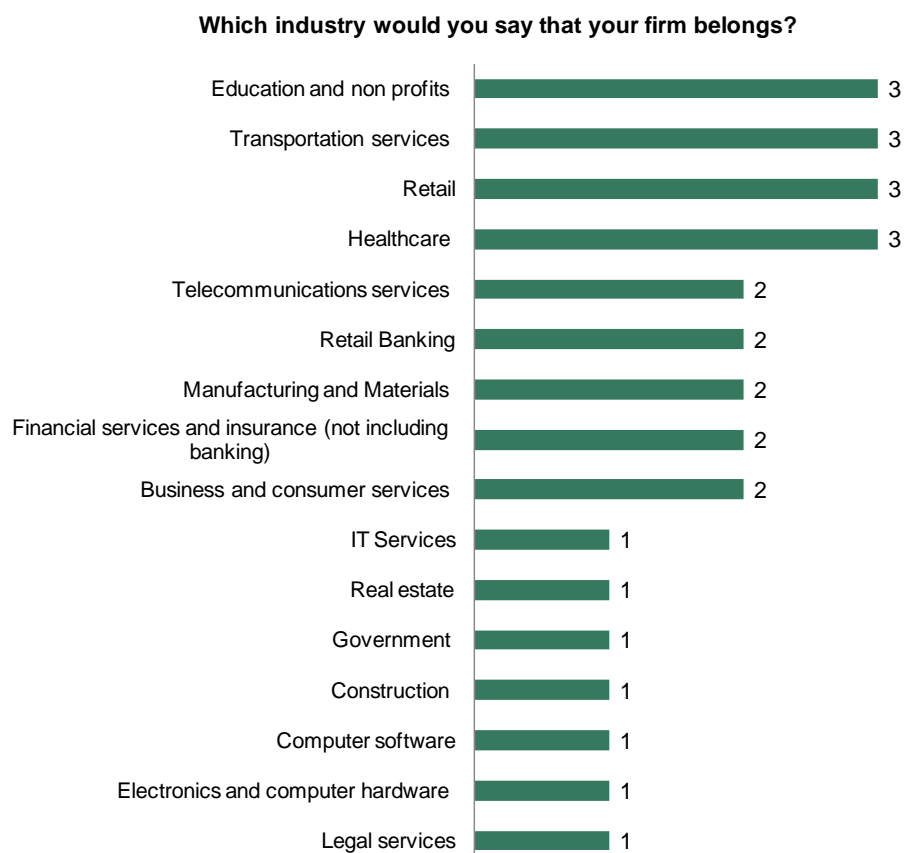
Appendix A: Methodology In This Study

In this study, Forrester interviewed 30 organizations in North America and Western Europe to evaluate their perspectives on telecom network reliability, network management issues, and types of services used. Survey participants included network managers and CIOs or other heads of IT departments with responsibility for network operations. Questions provided to the participants asked about business benefits, challenges, and the values and capabilities of a delivery partner. Respondents were offered a summary of our findings as a thank you for the time spent on the survey. The study began in May 2011 and was completed in July 2011.

Appendix B: Demographics/Data

Figure 1

Industry Of Respondents



Base: 30 senior-level IT decision-makers

Source: A commissioned study conducted by Forrester Consulting on behalf of Cisco Systems, July 2011