

# **Achieving ROI with Your Network Management Solutions**

*A White Paper by CCC Network Systems, Inc.*

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## ROI OVERVIEW

The title of this white paper speaks volumes. Not just for the enterprise network, corporate data centers and web hosting environments — to which this report is primarily directed — but for the IT marketplace as a whole.

Writing for [InternetWeek.com](http://InternetWeek.com) ([\*An Approach to ROI That's Worth Heeding\*](#)), author Tom Smith notes that “traditional return-on-investment metrics are back in favor as the way to justify IT spending.” Indeed.

Gone are the days when companies could throw money at any number of e-business endeavors. No longer, as Smith says, will CEOs and CFOs “break out the rubber stamp for projects promising that fuzzy ‘competitive advantage’.” Rather, each technology-based project will be scrutinized under the harsh but realistic light of expected returns. Those that show the potential to be profitable — for instance, by increasing revenue, decreasing risk, boosting operational efficiency, reducing labor costs, etc. — will be green-lighted, while other non-mission-critical projects might be delayed or halted entirely.

The current economic uncertainty makes it even more important for IT endeavors to be prioritized based on ROI. The following executives illustrate this point.

“Our CFO has reviewed and approved IT and e-business projects based on our projected return on investment,” says Continental Airlines CIO Janet Wejman in an InternetWeek article entitled, [\*E-Biz Spending Still Soaring\*](#). “If we can show profitable returns on something, the company will go ahead with it.”

Likewise, Jack Cooper, Vice President and CIO of pharmaceutical giant Bristol-Myers Squibb Co. notes that “You need to show ROI. The investment has to be tied to strong value, and there’s more pressure to show that value rapidly.”



This White Paper will delve into the issue of ROI as it pertains to investments in network management solutions (NMS) especially in large-scale network environments such as enterprise corporate data centers and the web hosting market.

*Specifically, this report is divided into four main sections:*

- I. An introduction to network management solutions (NMS)** — what they are, why we need them, and the special concerns caused by the growth of the web hosting industry.
- II. A review of challenges caused by network server failures** — potential causes, typical problem cycles, and the advantage of automated systems.
- III. The various approaches to solve server failure incidents** — diagnostic vs. corrective, in-band vs. out-of-band, and the integration of hardware and software solutions.
- IV. ROI benefits of remote server management** — areas of IT efficiencies achieved, NMS value proposition, potential cost implications of service level agreements (SLAs), and a powerful and flexible tool for assessing ROI.

## **I. SOME BACKGROUND ON NETWORK MANAGEMENT SOLUTION (NMS) TOOLS**

“In today’s marketplace of e-commerce and a ubiquitous web presence, the networked enterprise no longer confers a competitive advantage, it is a business necessity.” So says Marc Jaffrey, Ph.D., Chief Technology Officer, for Cold Day, Inc., a Pleasanton, CA consulting firm.

Investments in technology need to be made on the basis of solid data about how the technology will measurably benefit the organization. In his paper written for Predictive Systems, Inc., *Gambling the Business? Enable your technology decision-making through proven methods*, Jaffrey asserts “The days of technology for technology’s sake are over! With the future of a company hanging in the balance, today’s technology decisions can no longer afford to be made on the basis of consensus.”

Competitive advantage, he states, is achieved through the seamless delivery of applications and services. This has precipitated a change in the role of network infrastructure within the corporation, resulting in network issues becoming inexorably linked to corporate strategy and success.

Whether through delivery of mission critical applications, support of daily operations, or hosting online products, networks are the powerful engines driving today’s business successes. “With this role as an enabler of revenue,” Jaffrey notes, “there is an associated risk of failure to deliver on services which impact customers, productivity or revenue, thereby resulting in financial or reputation damage. Successful management of the relationship between financial risks and technology is therefore key to business success.”

NMS tools help enterprises to better administer their technological resources, resulting in clear and measurable ROI. According to the [Gartner Group](#) Strategic Analysis Report, *Lowering Support Costs With LAN Management Tools*:

NMS “technologies and organizational processes should be implemented for one or more of three basic reasons:

1. To reduce network, systems and applications operations costs;
2. To improve business effectiveness by increasing the availability and performance of networks, systems and applications; and/or
3. To manage risk of business loss caused by operational catastrophes (e.g., an information security breach or a natural disaster).”

### *Network management is imperative*

In recent years, network infrastructures have been transformed from the traditional server/file sharing environments into complex architectures that serve most aspects of today’s enterprises. Modern businesses rely on these systems and would suffer significant financial harm should they fail.

New products and technologies have been developed to perform the numerous tasks associated with managing and maintaining the network. Network administrators depend on these NMS tools to minimize the downtime of servers, switches and other devices and to maintain control of all network resources. Network users count on system management technology to ensure that they can access what they need when they need to and for efficient data archiving.

### *Growth of the web hosting market*

In an article entitled, [\*Immature Web Hosting Market Set To Grow To \\$46.9 Billion By 2006\*](#), the analyst and consulting company Ovum forecasts that “the global market will grow from \$10.3 billion in 2001 to \$46.9 billion in 2006, with the US and Canada currently and in the future being the biggest spenders. The most rapid growth period will occur between 2001 and 2002 when the global market value will increase by over 60%.”

In a survey of over 5,000 companies in Western Europe, North America and Asia Pacific, the researchers found that “most companies worldwide ... are not properly equipped to handle e-commerce transactions, resulting in a huge untapped market for web hosting.”

The main users of web hosting, such as large enterprises and service providers, almost always conserve time and money by hosting their sites externally. As Ovum reports, “Using web hosting permits companies to get complex web sites up and running in a matter of days. Today’s increasingly mission-critical web sites require high levels of uptime, performance, security and availability. Web hosts can guarantee these in a way that in-house provisioning often cannot.

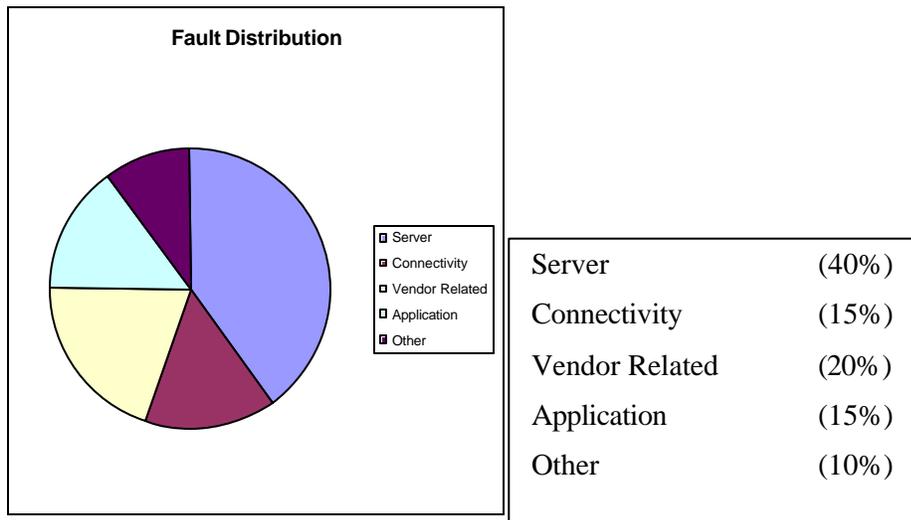
While the management of an enterprise network is a challenging enough task, hosting companies must manage the even greater complexity of multiple-enterprise environments. And as this market grows

— whether it’s external hosting facilities such as ISPs (Internet Service Providers), ASPs (Application), SSPs (Storage), or MSPs (Managed), or sophisticated internal corporate data centers — the need for NMS tools that can ensure availability (uptime), performance, security and scalability in these complex environments also soars.

## II. THE CHALLENGE OF NETWORK FAILURES

Adverse incidents may occur on a network for a variety of reasons, as shown below *[Figure 1]*.

**Figure 1: Typical Event Distribution Model**



Source: [Predictive Systems, Inc.](#)

The financial consequence of such events on corporate and web hosting entities can be severe in terms of lost business, loss of user/customer confidence, labor costs incurred to fix the problem, overhead fixed asset costs associated with technology upgrades and repairs, and punitive costs imposed by contracts (Service Level Agreements [SLA’s] with internal or external clients. *[More on this in Section IV.]*

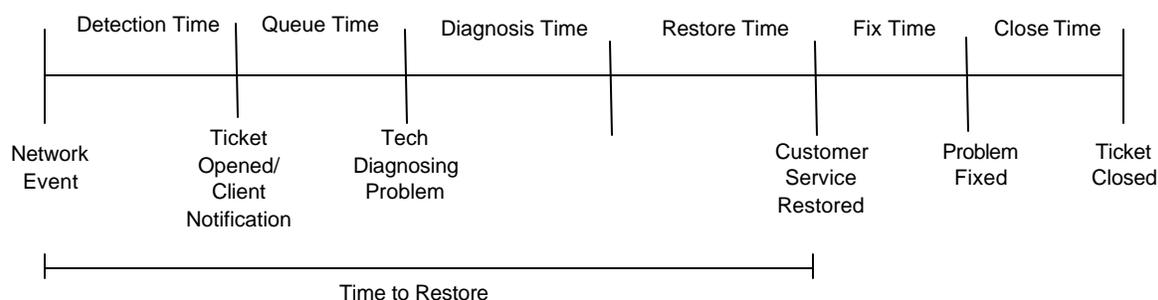
### *Lifecycle of a problem and trouble ticket*

To fully appreciate the potential impact of NMS tools on an organization, it is useful to review the typical “life cycle” of a system fault. In a fault processing analysis conducted by Predictive Systems, the following key items were identified:

- ❑ Time to detect a problem
- ❑ The queuing delay until the ticket is worked on by a technician
- ❑ Time to diagnose the problem, restore service, and fix the problem

A typical life cycle of a problem and trouble ticket follows the path described in *Figure 2*.

**Figure 2: Problem Resolution Path**



*Source: Predictive Systems, Inc.*

For example, when automated network surveillance tools detect a problem, or a phone call is made by a user or client to alert the network operations center (NOC), a ticket is opened and placed in a queue. When a technician becomes available, the problem is isolated and corrective action is taken. If the problem can be temporarily solved through an intermediate action such as by re-routing traffic or engaging a redundant device, service is restored. Once a technician is available, the root-cause of the problem is fixed and the ticket is closed upon final approval.

### ***Detection time***

Detection of network events typically comes either from monitoring performed within the company or via phone calls from clients experiencing service outages. Predictive Systems compared two fault-ticketing databases that are monitoring the same network environment — one manual and one automated with NMS tools— to uncover the time to detect a problem. They discovered the following:

- ❑ The average time between a problem’s occurrence and the time when the ticket was manually entered is 60 minutes.
- ❑ Half of the problems are reported in 30 minutes or less.
- ❑ Problems associated with outages were detected 40% faster (36 minutes more quickly) than problems associated with impaired service. (87 minutes for impaired service vs. 51 minutes for outages.)

### *Queue time*

Queue time is measured from the time a network fault is identified to the time someone begins working on the problem. Delays in queue time occur for several reasons, but primarily because the number of trouble tickets being worked on creates backlogs. Investigating the time from when a ticket was entered until it was first worked reveals that:

- The average queue time is 43 minutes
- Half of the trouble tickets sit in queue for 25 minutes or more

### *Diagnosis, restore and fix time*

Measured from the time a problem occurs until the customer has services resumed, the time to restore captures the outage time to the client. The time to restore is highly dependent on the parties involved, the ability to detect and diagnose problems, and the ability to re-route traffic within the network. Besides understanding the duration and types of outages, the time to restore is also important in understanding performance relative to service level agreements (SLAs).

Although similar to the time to restore, the fix time is slightly different. The time to fix measures how long it takes to repair, replace or reconfigure the necessary elements to restore the network to its original state. When an alternative way to restore service to the client exists, the equipment may be broken longer than the outage experienced by the client. This difference is measured by the fix time.

## **III. SOLUTIONS TO SERVER AND NETWORK DEVICE FAILURES: How NMS tools can help**

The management of a network can occur at several levels:

- The physical management of the individual hardware components of the network — e.g., servers, storage devices, switches, routers and cabling.
- The management of access privileges and software security — malicious acts can result in information being deleted; theft can result in this information falling into the hands of the competition.
- Software distribution and licensing — ensuring that all users are running the same versions of software packages, etc.
- Data management — covering backup and disaster recovery.

- ❑ Inventory and asset management — maintaining accurate records and control of what is connected to the network.

Figure 1 above (*Typical Event Distribution Model*) shows that server-related events are the largest contributors to network failure and, therefore, the greatest potential financial threat. NMS tools substantially reduce the frequency and duration of such incidents, resulting in improved ROI.

### *A variety of approaches*

NMS tools may be software-based enterprise management solutions, hardware-based routers and switches, or a combination of both. In sophisticated network environments, software solutions might include IBM's Tivoli®, Computer Associates' UnicenterTNG®, HP OpenView™, or others. Software suites such as these are extraordinary world-class tools for monitoring the functionality of devices on a network. They are designed primarily to discover faults and to alert network administrators; they are not equipped to remedy the problems they detect.

With respect to Figure 2 above (*Problem Resolution Path*), these software solutions greatly affect the detection and queue time for network incidents. However, restoration of service still depends on dispatching IT technicians directly to the device to diagnose the problem and take corrective action.

This is where hardware-based tools that offer remote device management come into play. Together with existing enterprise software, these tools form an end-to-end, wraparound solution, allowing IT personnel to diagnose, restore service and often fix device-related problems at the OS or BIOS or application level without ever having to come into direct physical contact with the actual devices.

Some of these technologies are in-band “plug ‘n play” Internet-based solutions, allowing for IP access to keyboard, video and mouse (KVM) controls, but requiring significant bandwidth to effectively function. Other tools (*as described below*) accomplish these vital tasks via out-of-band, customized solutions, specifically engineered to integrate with an enterprise's operation.

## **IV. ROI BENEFITS OF REMOTE SERVER MANAGEMENT**

NMS tools impact the total cost of ownership (TCO) for managing an entity's IT resources in several ways:

1. Increased availability/uptime
2. Better asset control
3. Enhanced security
4. Greater reliability
5. Improved IT staff productivity

### ***Uptime***

Maintaining the maximum possible uptime is a priority for both corporate IT managers and web hosting providers. Ensuring that systems are running at their optimum level in today's 24x7 business environment is a costly process and is the largest single contributor to the cost of ownership.

SLA numbers and what they mean		
Uptime guarantee	Downtime (minutes/month)	Hours/month
97%/mo	1314	21.9
98%/mo	876	14.6
98.5%/mo	657	10.95
99.0%/mo	438	7.3
99.9%/mo	43.8	0.73
99.99%/mo	4.38	0.073
99.999%/mo	0.438	0.0073
100%/mo	0	0

### ***Asset control***

In a large organization, there may be thousands of computer systems, supported by a wide variety of servers, routers, switches and other peripheral devices. All of these will be asset tagged and maintained by a team of IT support people. However, with individual systems located under user's desks, it is difficult to measure whether the system is being used in the most efficient manner or to know if items such as memory and peripheral devices have been removed or stolen.

### ***Security***

One of the most valuable assets inside an organization is the information stored within its systems. With the ability to send information anywhere, immediately, this cannot be over-emphasized. Ensuring that individuals have the correct rights to network resources is, therefore, a critical task requiring the use of both active and passive security.

### ***Reliability***

The Gartner Group estimates that the purchase price (cost of acquisition) of a computer system accounts for only 20% or less of the total cost of the system throughout its lifetime. The costs incurred supporting and maintaining the system generates the vast majority-up to 80% - of TCO.

## ***IT productivity***

Having distributed computer resources located throughout an organization often necessitates a large, highly skilled, and often difficult to recruit and retain support staff — and associated labor costs — to provide technical support. To achieve the lowest possible TCO, it is crucial that an enterprise achieve savings in manpower.

System management tools that centralize network access and control effectively address each of the above issues by increasing IT staff productivity and reducing costs.

## ***NMS value proposition***

The financial affect of NMS tools within complex network environments (and especially web-hosting environments) is significant. According to Marc Jaffrey of Predictive Systems, there are four primary areas of business impact where financial return might be realized. These are divided into two categories — reduction in fixed and potential costs, and increased revenue:

### **❑ Cost reductions:**

1. Potential returns generated from reduction in overhead cost associated with **fixed assets**
2. Potential returns associated with operational **labor savings**
3. Potential returns associated with reductions in **service level agreement (SLA) payouts**

### **❑ Revenue enhancement:**

4. Potential revenue generated from **increased operating capacity**

*These four items are specifically addressed below, and are highlighted in a robust ROI tool, also reviewed below.*

## ***Introducing CCC's FreeVision®***

The benefits of network system management are realized with FreeVision, a product suite created by CCC Network Systems. FreeVision is a collection of enterprise-class hardware, software and remote management technologies that allow scalable and highly secure, real-time management of network devices.

FreeVision is an out-of-band network management solution that provides remote access to and control of connected servers, routers, switches, UPS's and telephony equipment, enabling centralized management of globally dispersed enterprise networks and data centers. By allowing console access remotely through out-of-band connectivity, FreeVision provides network operation center technicians and system administrators with complete control of virtually all network devices from their desktop ... or laptop.

Here's how FreeVision addresses the four ROI issues identified above:

### ***Cost reduction: fixed assets***

In a FreeVision-instrumented network, keyboards, video monitors and mice are removed from individual racks and replaced with links into the FreeVision system. All console access functions are then managed through FreeVision. The removal of keyboards, video monitors and mice leads to an ROI benefit in a reduction of fixed-assets costs as clients can redistribute these tools to their desktop environment. At an average industry cost of \$300 dollars per rack for KVM assets, the reduced fixed-asset costs are substantial, particularly for large server farms.

### ***Cost reduction: labor savings***

With centralized control over servers through desktops computers, FreeVision allows systems administrators to more efficiently manage individual devices, thus increasing the number of servers/routers managed by each administrator. This conclusion is based on the reduction in time required for administrators to physically travel to servers to manage them. At the low end, this gain has been estimated at 10% improvement, which translates into a reduction in labor costs associated with system administrators. At the high end, Microsoft has reported that, at one site, one administrator can manage as many as 100 devices, more than doubling the productivity of that administrator.

Additional labor savings are gained in the reduction in time spent by hardware technicians to build new server racks, perform scheduled maintenance and deal with contention delays. Predictive Systems has estimated the overall improvement at a 17% reduction in time, translating into an equivalent reduction in labor cost for hardware technicians. Vince Conroy, Vice President of Product Development for [NACIO Systems](#), a managed hosting, connectivity and outsourcing solutions provider, estimates that the FreeVision product suite has reduced the amount of time it takes to deploy and support dedicated managed servers for their customers by at least 40%, resulting in significant cost savings and increased customer retention

Lastly, network operation center technicians benefit from the reduction in time to manage server problems through improved diagnostic and fault resolution capabilities. The timesavings technicians achieve in managing network faults translate directly into labor cost savings.

### ***Cost reduction: service level agreement (SLA) payouts***

FreeVision's most significant impact is its reduction in risk to network availability. Network availability and, more directly, server availability, is the business of web hosting companies and enterprise network managers alike.

Network availability for clients of web hosting companies is guaranteed by service level agreements (SLAs). The level of network availability guaranteed on a monthly basis is determined within

SLA contracts. Web hosting companies can incur substantial financial penalties for failing to meet required monthly network availability as guaranteed in SLAs. Enterprise IT organizations are being asked more frequently to provide SLAs to their internal departmental clients. And failure to achieve agreed upon service levels affects compensation, headcount and future budgets.

The risk to not meeting required monthly network availability and thus having to payout on SLAs stems from a range of sources — from management issues to technology issues. Mitigation of this risk is achieved through improvement in network operations and management, which either reduce the duration of network outages or reduce the frequency of service outage events occurring monthly. FreeVision helps mitigate risk to monthly network availability — thereby decreasing the likelihood of SLA payouts — by reducing the time to process server availability disruptions.

According to Conroy of Nacio Systems, the FreeVision product suite has also allowed them to offer very aggressive Service Level Agreements to their customers. “Our SLA’s include a guaranteed availability for our dedicated managed servers, ranging from 99.9 to 99.99 percent, and our customers expect us to meet it. The FreeVision system has allowed us to do that and keep SLA payouts to a minimum.”

*The threat of SLA payouts is going to skyrocket across the industry, he predicts, due to the recent introduction of user-friendly monitoring tools that enable clients to easily track their hosting facilities’ compliance with SLAs. “There’s no doubt that this will encourage clients to enforce existing agreements. Every hosting facility needs to take measures to ensure that they are meeting or exceeding their SLA commitments. Aside from protecting ourselves, it’s simply a matter of delivering on a promise. CCC’s FreeVision is the route that we chose and we’re glad that we did.”*

#### ***Revenue enhancement: increased operating capacity***

The removal of all keyboards, video monitors and mice from server racks also results in additional rack space for servers. This translates to an increase in server capacity for a given environment. With all things being equal, there is minimum 12.5% improvement in the number of servers a server farm can hold. The additional server capacity can be used to support more clients and thus translates directly into potential revenue gains. As new server packaging such as 1U and ‘blade’ server design drives server density up, this improvement will yield even greater returns.

Dividing a client’s current revenue by the current number of servers provides an estimate of the potential revenue per server. Thus the potential revenue gain is equal to the additional number of servers allowed by the installation of FreeVision times the average revenue generated per server.

## Easy-to-use ROI tool

Cold Day, LLP, the Pleasanton, California consulting organization, has developed a robust interactive ROI tool in network management that helps quickly view the potential return on investment from employing an NMS solution such as FreeVision. The tool specifically addresses the four financial impact areas noted earlier: 1) reductions in overhead fixed asset costs, 2) decreased labor costs, 3) potential revenue generated from increased operating availability (Figure 3), and 4) savings from SLA payouts (figure 4).

Figure 3: Fixed Asset, Labor and Additional revenue Model

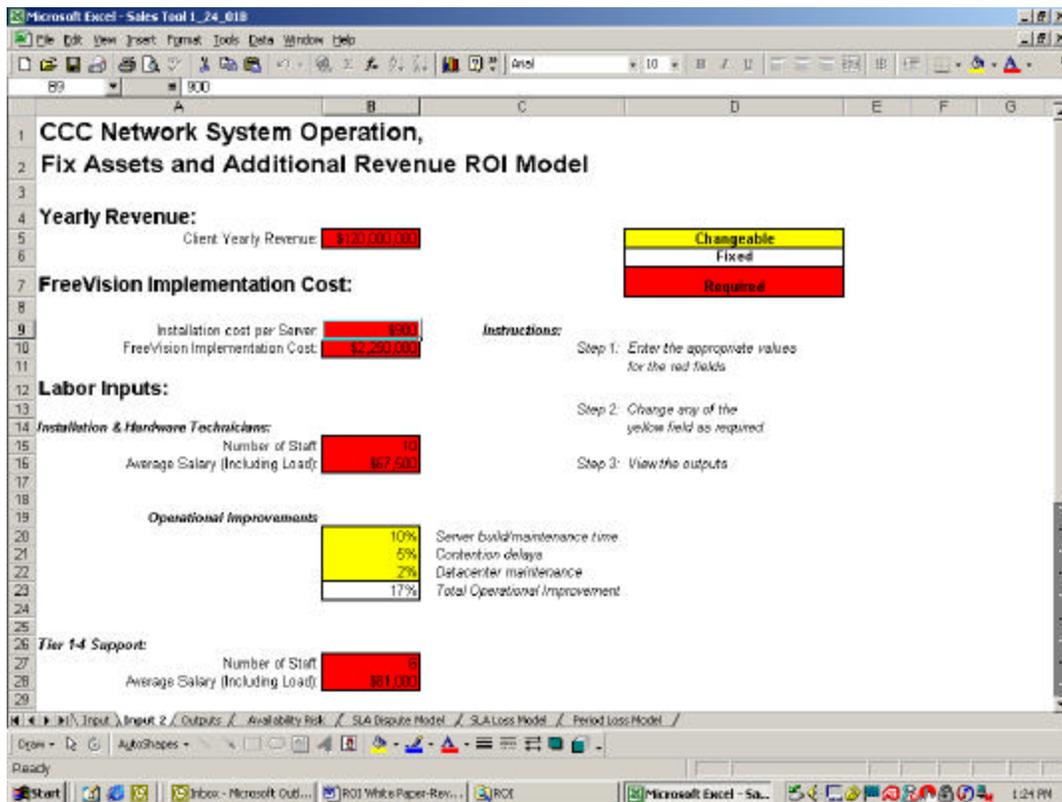
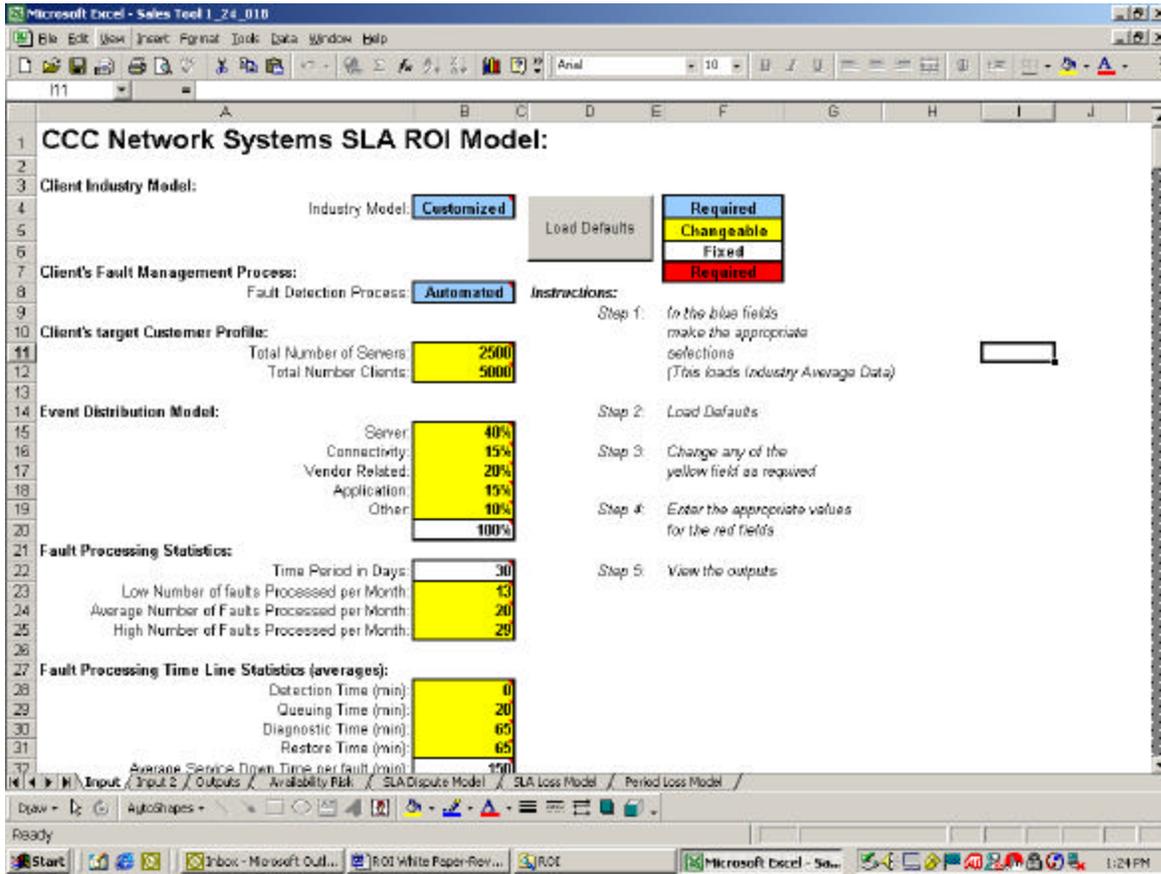


Figure 4: SLA ROI Model



Cold Day's Marc Jaffrey explains that:

“Employing our Network Availability Risk Analysis and using our proprietary fault event database, we developed an industry model for the risk to monthly network availability for [different types of] companies.”

The Cold Day tool has distinct measurements for a wide and customized range of data inputs and generates a rapid calculation including internal or external SLA payouts.

“We analyzed the mitigation impact of FreeVision on monthly network availability risk,” Jaffrey. “This was done through our proprietary Fault Processing Analysis. By analyzing the improvement in monthly network availability risk from the implementation of FreeVision, we then quantified the corresponding improvement in the likelihood of SLAs being met and the reduction in potential financial loss from the failure to meet monthly SLAs.

## V. CONCLUSION

In a letter to the editor ([\*IT Adopts Back-To-Basics ROI Model\*](#)) published on [InternetWeek.com](#), Izhar Shay, President/CEO of [Business Layers, Inc.](#), writes that “Demonstrating and measuring ROI — and how it relates to technology spending — is an essential part of the New Economy. CEOs and CFOs need tangible justification as to why spending money on technology is a value-add.”

Indeed, he continues, “IT spending decisions are no longer solely about innovative technologies, but about the long-term business proposition. Companies must align all aspects of their IT infrastructure with their business goals. To maximize growth potential through technology, IT spending has to be justified by careful business arguments that can tie together cost savings, increased efficiencies and improved productivity.”

The argument for utilizing NMS technologies was made succinctly in a Gartner Group report entitled, [\*Total Cost of Ownership: The Impact of System Management Tools\*](#). The authors state “Gartner Group has consistently recommended that enterprises should invest in labor-reducing products and implement sound business practices to reduce the labor-related expense of operating distributed systems. The industry has now reached a point whereby:

- Most enterprises cannot delay taking steps any longer
- Vendors are releasing products specifically aimed at reducing technical support, administration and end-user operating costs

The time to begin investing in distributed system management technology is now. The payback on such investments are rapid and a manageable environment is on the critical path to moving forward in using the PC/LAN infrastructure for critical applications.”

In InternetWeek’s piece, [\*E-Biz Spending Still Soaring\*](#), Gartner analyst Kurt Potter sums up the IT challenges and opportunities that exist in today’s uncertain economy. “Some are going to take a more cautious approach and under fund initiatives,” he says. “But companies should look at this as an opportunity to increase spending and leap ahead of their competitors. IT has changed from something used to cut costs to something that produces revenue, and very few companies will say, ‘Let’s forgo new revenue.’”

## VI. REFERENCES

### *Electronic-Based Sources Used in This Report:*

These are embedded within the document.

### *Paper-Based Sources Used in This Report:*

#### *Lowering Support Costs with LAN Management Tools*

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By D. Cappuccio, B. Keyworth, W. Kirwin

Gartner Group, Inc.

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#### *Gambling the Business?:*

##### *Enable your technology decision-making through proven methods*

By Marc Jaffrey, Ph.D., Senior Consultant, Qualitative Business Analysis

Predictive Systems, Inc.

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