



## **Comprehensive Network Monitoring: *The Challenges, Opportunities and Benefits***

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*Industry Leaders in Outsourced Network Monitoring*

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## **Executive Summary**

Networked communications has become a vital factor for success in almost every arena for both public and private organizations throughout the world. Ubiquitous, far-reaching networks and networked applications can boost performance, interconnect distant offices, unite coworkers into seamless teams and provide real-time integration and aggregation of mission-critical information.

In addition to improving organizational productivity across the board, the efficiencies achievable through networked communications have become a key factor for driving down costs and maintaining competitiveness. In short, most organizations simply could not meet their goals or their budgets without a heavy reliance on networked services and applications. Unfortunately, this widespread reliance on networking also means that the risks of network failures, outages or substandard performance can result in critical or even irreparable damage from lost time, idled employees, missed opportunities, loss of reputation and/or dissatisfied customers.

These escalating risks must be countered by the deployment of comprehensive Network Monitoring Systems, which adapt to the way that real-world organizations actually use their networks and proactively assure uptime, availability and performance. Just as networked applications consist of complex interrelationships between technology and human users, the network monitoring system also must include a blending of both technology and human elements. For example, it is not enough to generate an automatic alert regarding the imminent failure of a network link or application - - unless the system is also designed to assure that the right people are aware of the problem and that quick corrective action is instituted.

This white paper will provide an overview of the macro-trends that are increasing our dependence on network technologies as well as the growing risks of failures; after which it will explore the key characteristics that are needed for mission-critical monitoring and then will detail the ways in which TechTell's comprehensive network monitoring system addresses all of these issues.

## **The Escalating Risks from Network Failures or Sub-par Performance**

In today's ubiquitously connected world, most organizations are becoming virtually inseparable from their network infrastructures. Private companies across all industry segments, as well as government organizations, educational institutions, public utilities, public safety entities and many others have all leveraged the benefits of wide-ranging networks. This is especially true for multi-location organizations, where geographically dispersed facilities, such as remote sales offices, service outlets, call centers, R&D labs, assembly plants, etc. can all be seamlessly interconnected with headquarters and directly integrated into organization-wide systems and applications.

Shared databases and networked software make it possible for “virtual organizations” to take full advantage of real-time collaborative applications, such as video conferencing, Customer Relationship Management (CRM), remote Point-of-Sale (POS) systems with automatic inventory replenishment, distributed human resources & payroll processing, integrated financials, among many others. The rising trend toward Application Service Provider (ASP) offerings also provides an expanding set of options in which companies can tap into turnkey hosted applications by paying a monthly fee per user, thereby maximizing both flexibility and scalability. Users typically can access ASP services across the Internet using standard Web browsers, which means that companies can avoid many of the capital expenses and operating costs associated with deploying and supporting internally hosted applications.

In addition, the convergence of voice, data and video communications over Internet Protocol based (IP) networks allows for added flexibility and significant cost savings. Many organizations are turning to Voice over IP (VoIP) to drastically cut traditional telecommunications expenses while simultaneously adding new features such as voicemail-to-email integration. Also, the increasing use of Virtual Private Networks (VPNs) enables companies to securely “tunnel” data communications across the public Internet infrastructure, thereby eliminating many of the high costs associated with building and maintaining their own networks.

While all of these applications and technologies make possible great leaps forward in performance and efficiency, the escalating dependence on them is also putting most organizations at much greater risks from outages, slowdowns or other unanticipated network failures. For example, prior to the convergence of mission-critical services over IP-based networks, the loss of a network link might mean only a temporary interruption of non-real-time data (such as email). However, in today’s highly interconnected world, the loss of an IP network link could also bring down the facility’s voice communications as well as real-time connections to shared applications for finance, payroll, human resources, sales administration, etc. Worse yet, the inability to quickly detect such network failures can result in extended outages, idled workers and/or revenue losses that mount up rapidly if the situation is not immediately identified, diagnosed and rectified.

## **Fundamental Requirements for Comprehensive, Centralized Network Monitoring**

The implementation of a comprehensive network monitoring strategy is the only way to assure required levels of uptime needed to support today’s networked applications. The network monitoring function must be designed with the following primary goals:

- **Aggregation** – centralized 24x7 monitoring of critical elements throughout the entire network
- **Isolation** – the ability to quickly and accurately identify specific network issues as they arise and to pin-point fault locations anywhere across the network
- **Resolution** – direct integration with existing organizational structures and support staff to ensure timely notification, targeted response and follow-up.

In order to accomplish these core goals, it is critical that the network monitoring architecture incorporate the following fundamental characteristics:

- Robust centralized monitoring facilities with 24x7 staffing and built-in redundancy with automatic fail-over
- Distributed monitoring points that can be flexibly deployed throughout the network (regionally, nationally and globally)
- Software and hardware flexibility to adapt for monitoring any specific set of application requirements
- Knowledge of the organization structure and operations in order to allow appropriately targeted monitoring of network elements as well as optimal routing of alerts, alarms and other system notifications
- Flexible notification mechanisms (email, wireless, pagers, etc.) that conform to specific organizational requirements and can reach responsible staff quickly.
- A comprehensive user-interface to enable easy monitoring of the entire network as a single entity from the centralized location.
- Extensibility for smoothly adapting to new monitoring requirements as the network and applications grow and change.

As can be seen, the above characteristics combine to form an approach that is firmly grounded in both the technologies needed for monitoring network elements and the “human elements” needed for successful network monitoring.

For most organizations, implementing all of these requirements and maintaining a high level of monitoring discipline on a 24x7 on-going basis can be a daunting proposition, which must compete for already scarce resources and limited management bandwidth. However, that doesn't make it any less important.

Fortunately, there are now viable outsourcing alternatives for comprehensive, centralized turnkey network monitoring services, allowing customers to side-step all the challenges of designing and implementing their own systems. Instead of trying to cobble together a comprehensive solution using a variety of disparate software packages that address only pieces of the overall challenge, organizations can leverage outsourcing to get complete monitoring services while minimizing their upfront investments and tapping into robust dedicated network monitoring structures.

## **Key Attributes of the TechTell Outsourced Network Monitoring System**

TechTell Inc. offers a unique approach to outsourced network monitoring by bringing together all of the technological and human elements that are needed to tailor the process to fit any organization and to ensure that the network monitoring intelligence is actually put to use for rapid problem resolution and/or proactive problem avoidance.

## Comprehensive Approach – Tailored to Specific Customer Requirements & Organizational Structures

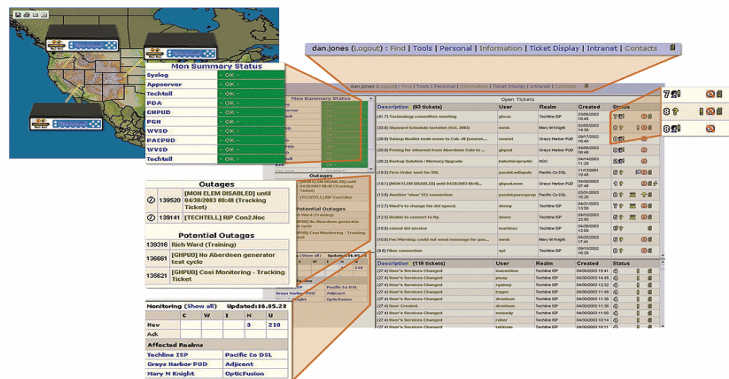
TechTell's comprehensive approach is designed to flexibly adapt to any network configuration and to interface smoothly with associated organizational structures. Using a combination of distributed hardware monitoring points, specialized software "probes" and a state-of-the-art 24x7 Network Monitoring Center (NMC), the TechTell solution can be mapped on to virtually any network infrastructure. This enables all network resources to be seen as a unified "single-login monitored entity" by system administrators and allows the aggregation of network status information to be intelligently mapped back into the customer organization for effective action.

## Unification of Both Technological and Human Elements

Each TechTell network monitoring project begins with an emphasis on understanding the target organizational structure, mission and objectives. Using TechTell's unique T'aira software, any organization's network structure can be easily mapped into an end-to-end monitoring process that provides web-based visibility of all network elements and services, allowing the monitoring process to mesh efficiently into existing operations and procedures. Because the TechTell system adapts to the organization instead of the other way around, outsourced network monitoring services can be efficiently tailored to meet real-world applications management needs and can grow dynamically with changing organizational requirements.

## Adaptable & Extensible Software

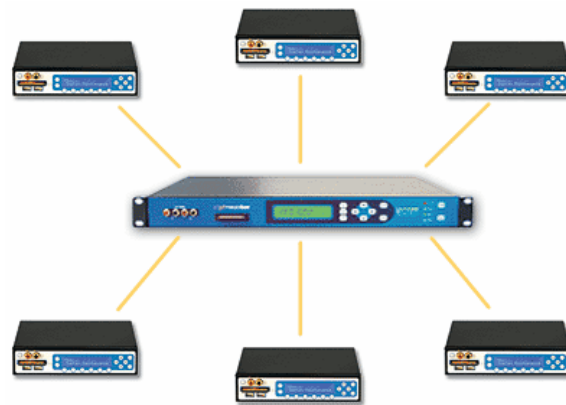
T'aira enables all network functions to be tracked and monitored from a single location. In addition, T'aira's Trouble Ticket Management Module provides a centralized repository for historical information on trouble tickets, problem resolution, statistics, and network element performance.



TechTell's network monitoring architecture also includes the use of specialized software "probes" that can be deployed to the distributed hardware monitoring points (described in the next section) in order to collect specific information on network elements and applications anywhere within the network. Standard software probes include functions such as SNMP, SMTP, ICMP, TCP/UDP, etc. and custom probes can be quickly created to target and track virtually any network protocol or application. The combination of T'aira centralized management and distributed software probes provides seamless integration of live real-time monitoring for rapid problem response and resolution as well as historical trend analysis to drive on-going improvement processes.

## ***Easily Deployable Hardware Monitoring Points***

The TechTell approach also makes use of cost-effective distributed hardware monitoring devices, which allow for rapid deployment of real-time tracking functions anywhere in the network. The use of advanced “M” Series hardware devices enables TechTell to seamlessly plug into key network monitoring points, while avoiding any alterations to current network infrastructures or performance penalties that can result from installing monitoring software on the hardware that is used for network operations.



The “M” Series family (M2500, M5500, M8500) includes central monitoring devices, data aggregation devices and stand-alone monitoring devices, which enables seamless deployment at key points throughout any customer network. In addition, the built-in flexibility and programmability of the “M” Series allows for cost-effective field changes, such as remote downloading of updated software probes to monitor new applications as the customer network grows and changes.

## ***State-of-the-art 24/7 Network Monitoring & Operations Center***

All of TechTell’s network monitoring services are built around and benefit from our state-of-the-art Network Monitoring Center, which operates in conjunction with a number of nationwide strategically located data aggregation points.

The TechTell Network Monitoring & Operations Center is located in Western Washington in the Satsop Development Park, within a secure facility that is rated for Magnitude 9 Earthquake Resilience. Originally constructed to support a nuclear power generation facility, TechTell’s monitoring center infrastructure includes network redundancy (both in-band and out-of-band), telecommunications redundancy and power redundancy (UPS and diesel generators).

The Network Monitoring & Operations Center is staffed on a 24x7 basis by a full team of professionals, who continuously monitor all customer networks via the T’aira software interface. Whenever the monitoring system’s automatic alert mechanisms require human follow-ups, on-duty technicians are available to assure that emergent issues never fall between the cracks. This gives TechTell customers all of the advantages of having their own fully-staffed 24x7 monitoring center, without having to incur the huge capital investment, operating expenses and personnel costs associated with actually creating one.

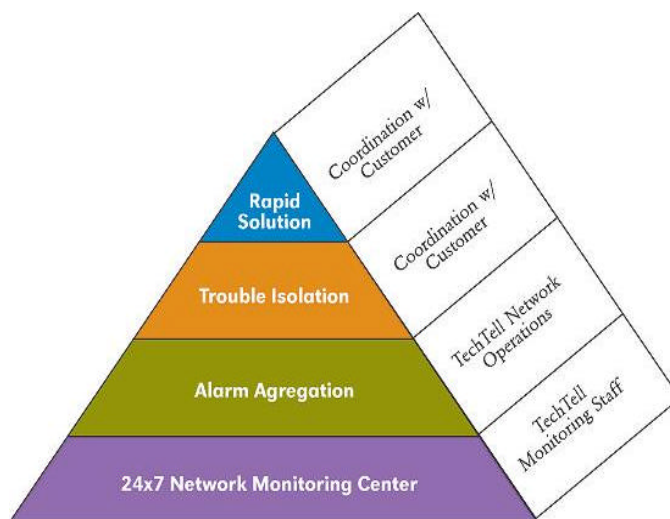


## ***Flexible Options for Timely Alerts & Persistent Follow-up***

The TechTell system is designed to mesh seamlessly with whatever notification mechanisms are most appropriate for each customer organization. Typical alternatives include email notifications, pager alerts or phone messages with real-time follow-ups. TechTell maintains an extensive and regularly updated database of individual contacts and associated contact methods for every customer organization.

Using pre-established methods for alarm aggregation, trouble isolation and coordination with designated customer staff, TechTell provides for disciplined movement from the initial problem alert all the way through a complete solution.

By combining always-up-to-date organizational contact information with Tiara's flexible ticket tracking mechanisms, TechTell uses structured escalation procedures that guarantee timely attention to emerging issues and persistent follow through to assure rapid problem resolution.



## ***TechTell's Maturity Model – Fits Smoothly with Any Existing Network Monitoring Methodologies***

TechTell's network monitoring architecture is designed from the ground up with the inherent flexibility and modularity to mesh with virtually any set of requirements and also to fit within pre-existing network monitoring measures that the customer may already have purchased and/or deployed. In a number of cases, where the customer was attempting to monitor their network through a variety of prepackaged software solutions, TechTell outsourced monitoring services have been able to provide the unifying factor that pulls everything together. In some other instances, organizations have focused mainly on the benefits of the Tiara software to manage their contact databases and ticket tracking, without an immediate requirement for TechTell's full monitoring services.

One of the major benefits of the TechTell approach is the fact that it is always guided by an adherence to "Best Practices" in network monitoring. Regardless of the client organization's current maturity level regarding network management and monitoring processes, TechTell's flexible monitoring services can be tailored to fill the gaps, enhance network performance, improve applications uptime and lay a new foundation for future growth of the network.

## The Bottom Line

Ultimately, the true test of any network monitoring solution is in the ability to provide a high return on investment by giving the customer greater control over their network operations and protecting them against unplanned network failures and/or extended applications downtime.

TechTell's outsourced approach to turnkey network element monitoring combines maximum deployment flexibility and distributed data collection with a robust centralized monitoring capability, which allows both the costs and the benefits to be tailored specifically to the customers' requirements - - thereby optimizing ROI for each situation.

By leveraging TechTell's outsourcing model, organizations such as cities, counties, public utilities, public safety, school districts, and a wide range of private enterprises, including health care and financial institutions, have been able to maximize their network monitoring programs while minimizing both capital investment and operations costs. The combination of a relatively small front-end capital investment and highly predictable on-going monitoring costs makes the TechTell service ideal for private enterprises and public entities that must live within tight budgets but can't afford to ignore the importance of network monitoring.

In addition, communications carriers, Internet Service Providers (ISPs) and independent Value-Added Resellers of network software/hardware also can leverage TechTell's flexible deployment architecture to cost-effectively integrate network monitoring into their own offerings, resulting in both incremental revenue streams for monitoring and improved subscriber loyalty.

For all of TechTell's customers and value-added partners, the major bottom line benefits of the outsourced network element monitoring services include:

- Consistent availability of network systems and resources
- Improved uptime and performance for networked applications
- Enhanced awareness of performance trends and latent or emerging problems
- Tangible return on investments for network monitoring services
- Highly leveraged results from finite in-house IT resources
- Improved organizational performance and productivity