

Effective enterprise IT management using the Service Assurance approach

Whitepaper



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Abstract

This publication provides an overview of challenges associated with management and monitoring of complex, enterprise IT environments. IT has become a vital part of virtually any modern business and applications are at the very heart of it. When they fail, revenues and reputation are lost.

As the enterprise IT ecosystems are growing in complexity (number of applications used, virtualization, use of private clouds, etc), a business- and service- assurance approach is required.

IT Service Assurance solutions (and Verax NMS in particular) help organizations to minimize service downtimes, prevent issues before they affect the business, increase efficiency by allocation of resources to the most important tasks and increase customer satisfaction.

Intended audience

This paper is intended for CTOs, CIOs and systems management personnel running mission critical, enterprise systems and networks, especially those that are revenue-generation or revenue-protection focused and require 24/7, on-line uptimes.

1. Introduction

More and more IT departments are forced to operate on tough economic principles rather than just technical and operational criteria. They are often measured by their relationship to revenue and business productivity. As a result, they need to manage, analyze and visualize how the components in their IT environments impact business services. Their main objective is not only solving network problems and managing IT assets, but also demonstrating business value of their services. Those new conditions require effective and business-oriented tools to measure, monitor and understand the impact of operations on business processes, as well as internal and external customers. IT teams must also be able to present cost effectiveness of their actions, impact on revenues and insight to customer experience. IT Service Assurance systems such as Verax NMS (<http://www.veraxsystems.com/en/products/nms>) allow addressing the challenges in an efficient and effective manner.

2. Challenges

This section outlines a number of aspects of managing modern IT environments.

2.1. Growing complexity

During the past few years, the complexity of information systems has significantly increased. As a result, costs of maintaining and managing modern highly distributed systems have risen dramatically. The complexity of information systems comes not only from their scale, but also from their dynamics. Each of these components is complex enough by itself, the dynamic interaction among them adds another dimension of complexity.

In addition, IT departments need to deal with heterogeneous environments from multiple vendors such as CISCO, Microsoft, SAP and others running on various operating systems and platforms, very often depending on each other.

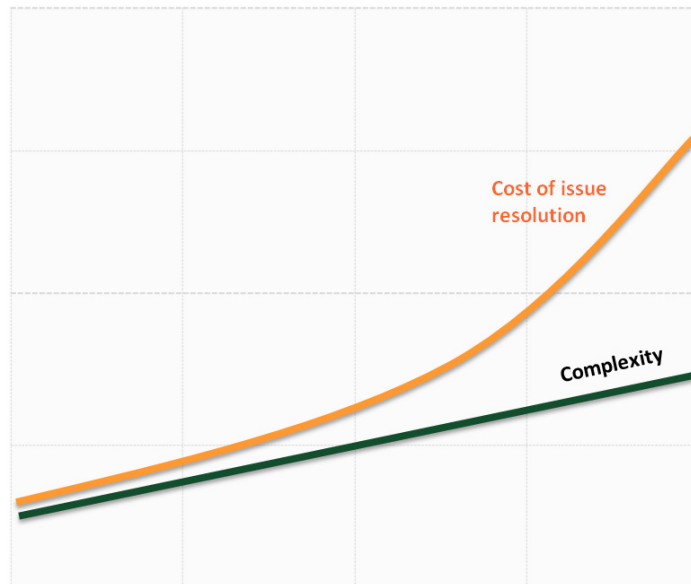


Figure 1: Cost of issue resolution vs. complexity of IT environment.

Virtualization

Virtualization contributes to the overall complexity of monitored environments. Virtual machines can be started, turned down and moved between physical servers. Virtualized environments demand proper automation and change management. Virtualization also highlights the importance of capacity analysis and planning. For example, a sudden rise in traffic to a web application may yield on-demand creation of additional VMs. Maintaining accurate views of the virtualized infrastructure may pose a significant challenge.

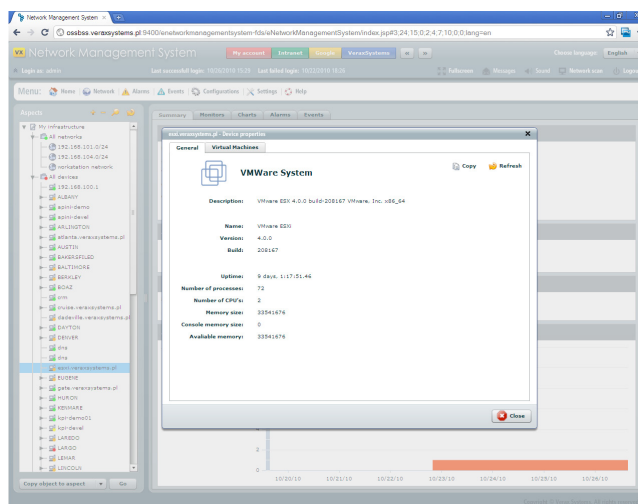


Figure 2: Verax NMS VM*Ware (ESX) management plugin.

2.2. More than infrastructure

A decade ago, IT departments were mostly focused on infrastructure and hardware, such as LANs, internet connections, telephony systems, etc. The service desk calls from users were related to PC repairs. However, as key applications become necessary for day-to-day work, more and more issues are related to user interaction with systems such as CRM, ERP, intranets and others. This shift towards applications requires not only different tools, but also different processes and skills from IT departments.

2.3. Seeing problems before they happen

Industry analyst reports say that end-users discover about 60-80% of all the service problems. In other words, they are reported as service desk calls. Reducing this number leads to decreasing revenue leaks (in case of mission-critical systems), increasing customer satisfaction and improving utilization of IT resources. Delivering of IT services requires predictability, which is based on an ability to proactively anticipate and prevent problems before they affect critical business processes.

2.4. Eliminating alarm noise and discovering root-causes

In complex IT environments, many events occur simultaneously and it is difficult to quickly determine their impact on the business. Therefore, one of the most important features of IT Service Assurance solutions is correlation and prioritization of events. Verax NMS provides an event correlation engine supporting both standard and user-defined rules, allowing for both efficient reduction of alarm noise as well as determining root-cause of a problem.

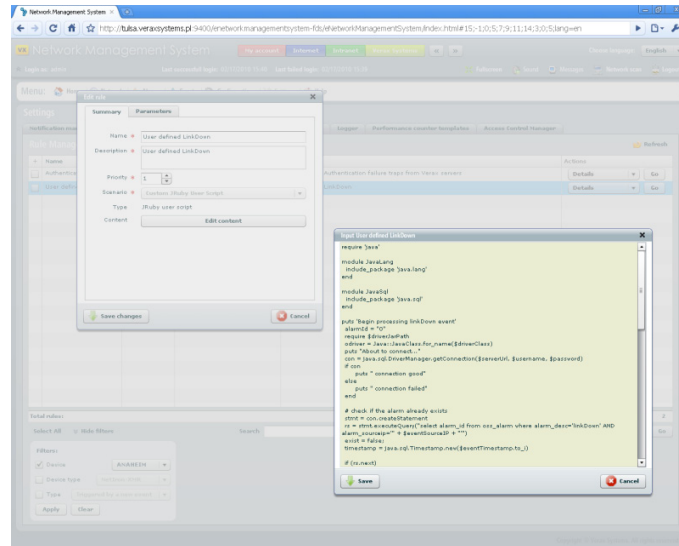


Figure 3: Correlation rules manager.

2.5. Prioritizing tasks

Determining which failures impact business the most allows for optimal prioritizing of IT team tasks. Business aspects within Verax NMS provide information on how the individual components of infrastructure are performing and what is their impact on particular business services, allowing to easily determine the incidents to be handled as top priorities.

3. Advances in IT management process

Attempts to effectively align IT with business have resulted in two main approaches to IT organization management:

- **By technology silo:** (infrastructure, servers, applications, e-mail, etc.) – the “classic” approach.
- **By business process:** (sales, manufacturing, payroll, etc.) – an approach promoted by the ITIL (IT Infrastructure Library) standard.

The IT Infrastructure Library (ITIL) and other best practice initiatives are gaining mainstream acceptance for business-aligned IT. These standards introduce measures for controlling of IT processes. The two most important Key Performance Indicators (KPIs) for IT systems include:

- **Mean Time Between Failures (MTBF)** – predicted elapsed time between inherent failures of a system during operation (<http://en.wikipedia.org/wiki/MTBF>)
- **Mean Time To Repair (MTTR)** – the average time required to repair a failed system (http://en.wikipedia.org/wiki/Mean_time_to_repair).

Those two system characteristics can help to quantify the suitability of a system for a potential application. In common sense terms, **MTTR is all about fixing things faster**, which requires improving repair processes. It is a measure of the maintainability of a system and predicts the average amount of time required to get the system to work again in case of a system failure. MTTR is a vital parameter that indicates how soon things will get back to normal, which has a great bearing on the overall stability of the system.

MTBF represents a statistical approximation of how long a set of components should last before failure. It is all about how long equipment continues to function properly. MTBF is properly used only for components that can be repaired and returned to service.

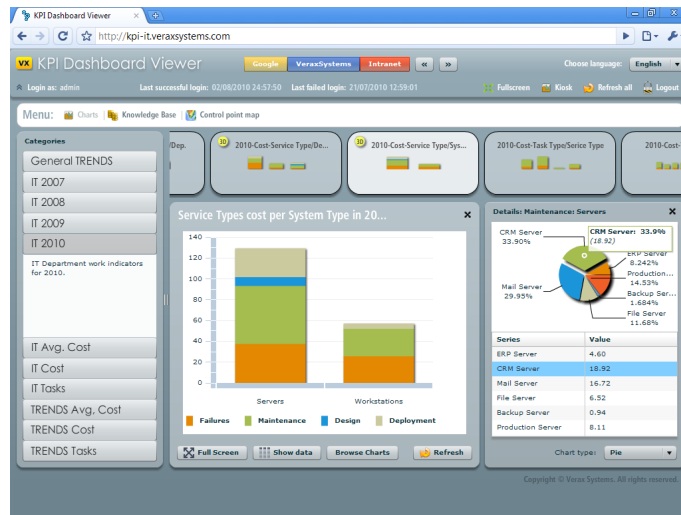


Figure 4: Verax Systems KPI Dashboard with IT performance indicators.

Both MTTR and MTBF, as well as many other IT KPIs can be visualized using the Verax KPI Dashboard, presented above.

4. The Service Assurance approach

Ever-increasing complexity of modern IT requires a new set of tools and applications to encompass network managers and systems administrators on their duty. The Service Assurance approach is focused on delivering a **business-oriented, end-to-end view of IT infrastructure**. Such an approach is required in order to ensure complete visibility and control of all on-going operations and services. Network teams have to be provided with an ability to see the **entire business flow** across various components participating in delivering services. Business flows might become very complex and involve for instance:

- Dispatching user requests from web server cluster
- Processing in application servers
- Serving content from static content servers
- Accessing back office applications through database, web services or middleware
- Interacting with transaction services.

In order to address these challenges, IT Service Assurance tools must be able to promptly discover every service component and its importance to the service. This pertains not only to hardware (network and computers), but also applications across the silos (CRM, ERP, e-commerce, websites, databases, directory services and others).

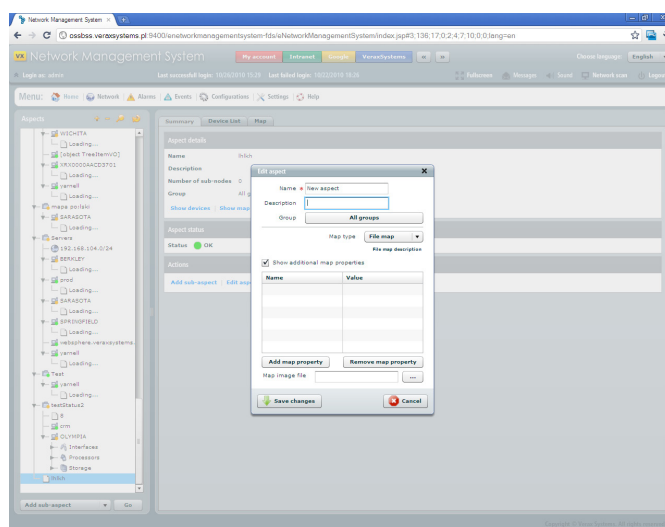


Figure 5: Business aspect definition.

The paradigm of systems management is shifting from management of network devices to a more **holistic approach**. The focus is on analyzing the business impact of the services delivered to help increase quality of service across the infrastructure and improve customer experience. In the Service Assurance paradigm, the most important issues include:

- **Business-oriented perspective across silos** (i.e. what does a problem mean to my business?). For instance, a server down (a serious problem in classic network management approach) may not affect business seriously (it is only one of twenty servers in a farm).
- **Service orientation** (i.e. what does a problem mean to a particular business service and which services are affected?). For instance, when a DNS server is down, it may affect a number of services such as e-mail, production, sales, etc.
- **Focus on both applications and infrastructure** rather than infrastructure alone, as it is applications which are business-critical, rather than the supporting infrastructure.
- **IT automation**: the ability to automate and execute tasks without involvement of IT personnel. Examples of IT automation may include actions such as automatically extending rollback segments, reconfiguring routing in case of outage, purging temporary files, etc.

The relation between traditional monitoring and IT Service Assurance is provided in the figure below:

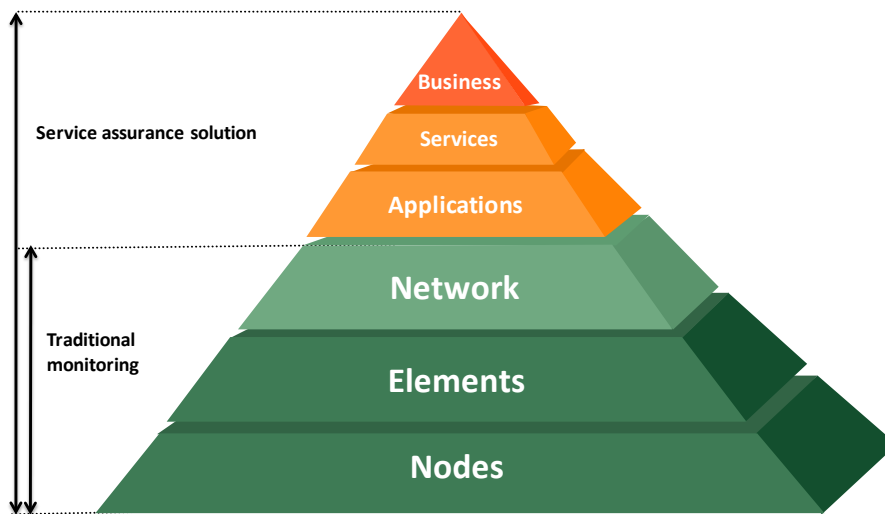


Figure 6: Service assurance as a superset of traditional network monitoring.

4.1. Application monitoring and diagnostics

Supervising business applications requires a different approach than traditional network monitoring. In the traditional approach, applications are treated as another set of IT infrastructure components. Any dependencies (e.g. an Active Directory servers requires a working DNS server, a SAP system requires a healthy Oracle database, etc.) are ignored. To make dependency-tracking even more complex, today's modern applications are highly modular and can be distributed across a number of hosts.

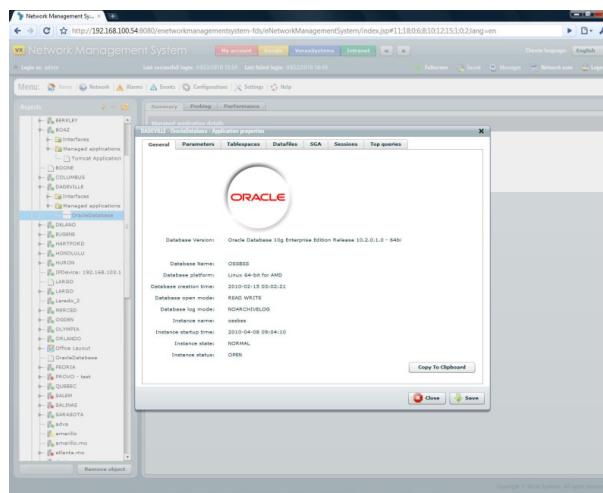


Figure 7: Verax NMS Oracle management plugin.

The architecture of today's modern enterprise Java (J2EE) and .NET-based applications is multi-tier and usually distributed (see figure below). Applications consist of multiple network-connected components, such as load web servers (including load balancers and firewalls), application servers, transaction monitors, databases and others. Therefore, the application itself is a highly componentized entity.

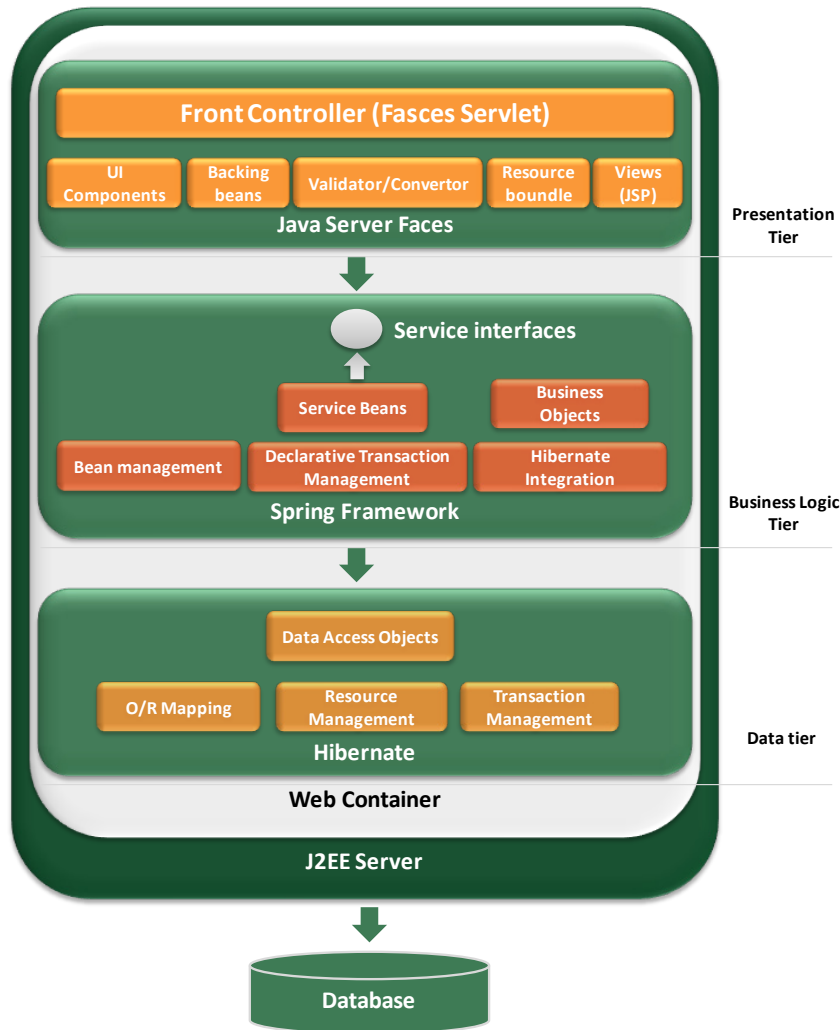


Figure 8: An example of complex application architecture.

Verax NMS utilizes **business aspects and application plugins** in order to provide means of effective application monitoring.

Business aspects are logical entities with their own status and events that can be used as containers for application elements (e.g. database, app server, etc.). A business aspect may contain various sensors and counters, as well as own business rules to determine the state of a multi-component, distributed application.

Application plugins are specialized entities to communicate with, monitor and perform management actions on applications.

4.2. Business service orientation

When a user executes an action against an IT system, for instance issuing a money transfer in Internet banking, many systems get involved. If the resulting performance (and thus the user experience) is low, the question which element is to blame arises. Was the problem related to the network? Or maybe the database? Or insufficient number of web server sessions?

Verax NMS utilizes business aspects to assemble transaction elements into single, logical entities that can be monitored. This allows business services (such as Internet banking in the case above) to be effectively monitored, and IT teams alarmed in case of any service degradations.

4.3. IT automation

Network monitoring and service desk/trouble ticketing systems have become standard for fault management in enterprise IT organizations. However, in a majority of cases, these systems do not provide any automation capabilities. To overcome this, organizations typically build their own automation scripts and tools using shell scripting or programming languages such as Expect or Perl. Such in-house solutions are costly to develop and maintain, are usually not consistently used and cause security problems.

On the other hand, Verax NMS provides a consistent, reliable and secure framework for automating IT tasks. Verax NMS contains an embedded jRuby scripting engine, allowing users to provide automaton scripts. These scripts can be triggered by predefined schedules or by various events in the system. They utilize application or device plugins to initiate actions (such as “extend connection pool” or “reset”) against objects. Altogether, it allows systems administrators to create a wide range of automated scenarios for repeatable tasks. It also allows to shift from reactive to proactive mode and actually prevent problems before they happen.

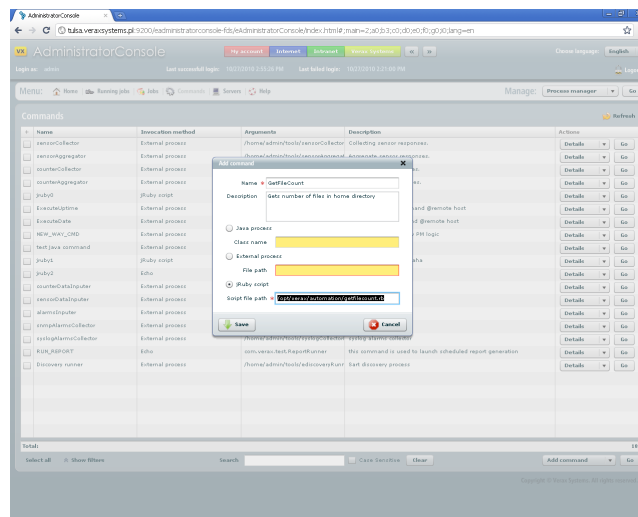


Figure 9: Verax NMS rules script editor.

5. Measuring benefits

Introduction of an IT Service Assurance solution brings measurable benefits in the following areas:

- **Business** – reduction of issue resolution costs, increased revenues and lower customer churn.
- **Customer** – higher QoS (quality of service) and QoE (quality of experience) levels experienced by customers.
- **Operational** – reduction of downtime costs, increased utilization of existing assets, automation of repeatable tasks and MTTR reduction.

All of these are presented in the figure below.

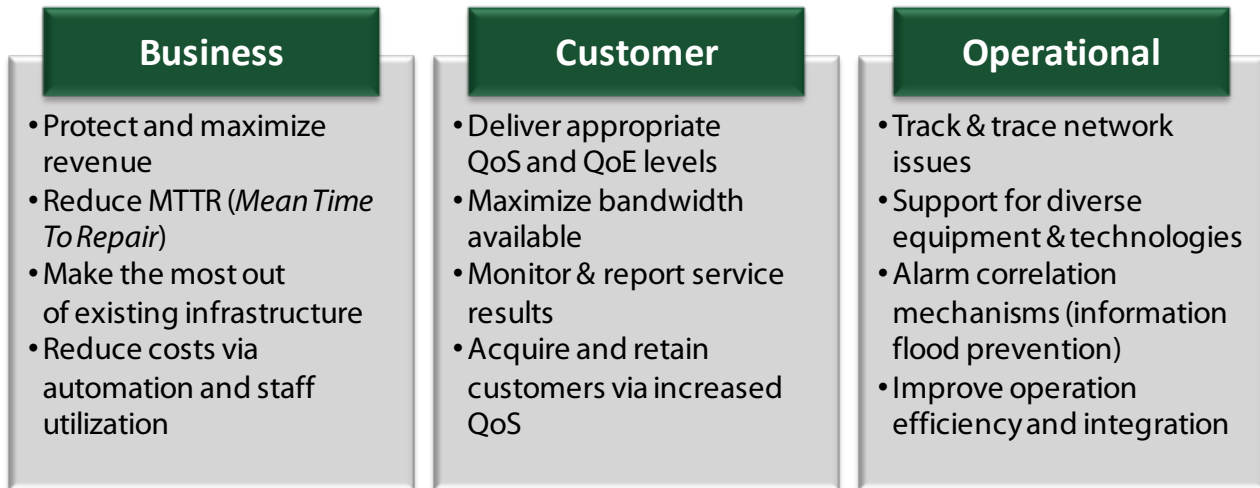


Figure 10: Three aspects of Service Assurance effectiveness.

6. Summary

The IT Service Assurance approach to network and application monitoring and management enables IT teams to effectively maintain overall health of their systems and keep their clients satisfied. As availability of IT services quality becomes more and more important to the business, the Service Assurance approach allows **rapid resolution of problems affecting business services** and provides full **360° view of the entire IT ecosystem**.

Verax NMS is the first Service Assurance solution designed for high user experience and developed in the Rich Internet Application (RIA) technology. Verax NMS is an ITIL-compliant solution with strong visualization capabilities providing essential **IT service metrics** in a clear, comprehensive way.

For more information about the Verax NMS, please visit us at:
www.veraxsystems.com/en/products/nms