IBM Tivoli Netcool network management solutions for VoIP

Putting service providers on the path to fulfilling the promises of VoIP

The availability of fast, cost-effective delivery of voice, data and multimedia content over IP to a range of devices—and the convergence of voice and IP networks that has resulted—has given service providers huge opportunities for business and revenue growth. But with opportunity comes industry competition and increased customer expectations. As a result, providers of Voice over IP (VoIP) services must pay more attention than ever to the quality of service they provide and the satisfaction their customers perceive.

To achieve high quality and satisfaction, service providers must pay increasing attention to their networks. They must take care to avoid performance degradations such as dropped calls, unintelligible conversations, line static and other problems that stem from the volatility of the IP environment. VoIP performance and service problems such as jitter, latency and packet loss—not to mention problems such as configuration errors, system integration and network-related regulatory compliance issues that affect any business network—mean that a provider can lose twice. Business can stop in its tracks. And customers can become dissatisfied, even to the point of resigning the service.

Highlights

- Proactively manage the VoIP infrastructure to help avoid problems and get real-time insight into customer satisfaction
- Automate management tasks to reduce IT workload and minimize the risk of errors
- Maximize infrastructure investments by leveraging an end-to-end and top-to-bottom view of VoIP services
- Gain flexibility with a software suite that integrates smoothly with existing technologies
To help VoIP providers drive the steady revenue streams that come from high service quality and low customer churn, IBM Tivoli® Netcool® network management solutions enable better control of networks, derived from automation, reliable information and a critical view into the real-time state of the tens of thousands of devices that a multisite, multivendor provider of voice services can have.

**Deploying solutions that address key network needs**

For VoIP providers—where the network does more than support the business, it provides the business’s core functions—a problem in the network can be devastating. Both internal efficiencies and customer-facing reliability are therefore critical to success. VoIP service providers require wide scalability, experience frequent changes, cannot tolerate downtime, and operate best using an integrated portfolio rather than a piecemeal approach of point solutions and tools. And they must align business and IT operations so they can address the broader issues of cost, profitability and efficiency.

Tivoli Netcool network management solutions provide critical monitoring of next-generation carrier VoIP services. The Netcool portfolio supports all layers in the network and all links across it—from the core network to equipment on the customer’s premises. The result? The provider can effectively manage VoIP services and maintain a high quality of customer experience.

By providing end-to-end visualization and management of even the most complex environments, the Tivoli Netcool portfolio can help:

- Control operations costs and accelerate service delivery—even as it helps assure quality of service.
- Meet current and future service delivery requirements.
- Leverage an integrated platform to manage services across silos.

Tivoli Netcool solutions support the complete network provisioning process—from initial element and path configuration through resource availability checks, ongoing dynamic allocation of resources, and exception handling. They support configuration and change management across the complete network life cycle. And they help ensure compliance, security and effective resource provisioning as the network evolves to support tomorrow’s VoIP offerings.

**Integrating solutions to ensure network performance**

As part of an integrated IBM portfolio, Tivoli Netcool network management solutions provide industry-leading capabilities that support and manage infrastructure operations. At the same time, Tivoli Netcool configuration management solutions provide tools to ensure that network components are deployed for optimum performance.
Configuration management solutions work with fault management, performance management and automation tools in the network management stack to ensure network performance and high quality of service.
Tivoli Netcool network management solutions consolidate configuration, performance and fault management systems so that administrators can better assess physical and logical components, understand the linkage between connected components, and collect and analyze information about operations, management and customers. Real-time monitoring and reporting solutions discover and analyze the causes of quality issues. And performance management solutions help identify and fix bottlenecks before they affect network service.

These platform-agnostic, cross-vendor solutions integrate easily across existing devices and management solutions for a unified approach that spans hardware, software and services to manage and troubleshoot a wide range of issues.

**Visualizing and managing the entire VoIP service path**

The quality of VoIP service depends on a range of devices and applications. VoIP-specific equipment such as call servers and voice gateways need to be monitored with general network equipment such as switches, routers, hubs and storage devices as part of the overall service. With the need to ensure policy-based compliance for customers in regulated industries, the task can be overwhelming in its complexity. VoIP providers need solutions that simplify management, minimize human error, speed change, ensure compliance and reduce management costs.

With the Tivoli Netcool portfolio, the VoIP provider can manage, model and visualize both the physical network and the applications and databases that are critical to next-generation services—for real-time insight into the performance of applications and their relationships to service-affecting faults.

These solutions enable network operators to see which events will impact service availability for particular services, service areas and customers—and know the exact way a service or customers are affected.

**Use dashboard reports for fast, in-depth analysis**

To make it easier to synthesize data and draw conclusions about root causes and resulting effects, the Tivoli Netcool portfolio provides side-by-side reports about different domains and key performance indicators (KPIs) over identical time spans. The Tivoli Integrated Portal integrates numerous Tivoli products into a single view with single sign-on. To help more accurately plan network capacity for cost-effective operations and improved service reliability, the VoIP provider can drill down into these reports to:

- Examine resource details using separate tabs.
- Check the results of remedial action in real time.
- Gather information that will help slash the mean time to resolution for performance issues.

**Generate operational reports to speed time to resolution**

Regardless of the number of resources involved or the length of time covered, Tivoli Netcool solutions can generate on-demand reports—providing critical data that can draw attention to potential performance degradation issues before they affect the customer experience. Tivoli Netcool network management solutions collect both raw and aggregated data in real time and store the information in its database. From this central location, the data does not require additional manipulation, so it is immediately available for reports.
With detailed, up-to-date information in hand, the VoIP provider can take remedial action, reallocate resources, change thresholds, create new traps or adjust throughput—all while keeping problems transparent to subscribers. The provider can protect service availability while driving customer satisfaction.

Ensuring service quality from the infrastructure to the application layer

To deliver on the full capabilities of the provider’s infrastructure—from transport layer to application layer and across resources such as Metro Ethernet, multiprotocol label switching links and element management solutions—Tivoli Netcool solutions provide clear, end-to-end visibility at the service level.

This visibility enables quick identification of VoIP trunking issues that affect service by providing insight into:

- Call signaling and voice services.
- Traffic across the IP backbone.

Call signaling and voice services

Using the Tivoli Netcool portfolio, the VoIP provider can track call signaling and voice quality using call detail records for up to millions of elements. Evidence of poor voice quality can help the provider remedy problems elsewhere, whether from the core IP network, a media gateway or an end point. Conversely, poor performance indicators in the lower domains can alert the provider to voice quality vulnerability.

To round out call seizure ratio information, the provider can utilize statistics on call attempts, failures by error type, short calls and dropped calls. Detailed call usage and geographic distribution data such as Top N clusters and extensions then become KPIs that operations and business units can use with key quality indicators (KQIs) to assist with capacity planning, resource allocation and voice services trending.
### Monitoring in real time for KPIs and KQIs

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**Traffic across the IP backbone**

Tivoli Netcool solutions enable providers to spot areas of congestion and thwart degradation that threatens services by comparing volume and throughput data in relation to bandwidth sufficiency. This information is monitored over time to include all per-day and per-hour traffic conditions.

By tracking real-time and historical data from IP domains, providers can identify root-cause problems and their effects. With a jump start on remedial reallocation of resources, the service provider can dramatically reduce rates of mean time to resolution and boost proactive troubleshooting. Through the use of holistic performance tuning to avoid problems, network domains run more efficiently and subscribers get better service.

Leveraging Tivoli Common Reporting technology, customers can now integrate these solutions with reporting from tools such as IBM Cognos® software, using the performance data captured by the Tivoli Netcool solutions to create historical business intelligence reports.

**Enhancing support functions that are key to business needs**

Tivoli Netcool management solutions give VoIP providers the insights and control necessary to launch new services quickly with the stability necessary to deliver the high levels of service that customers demand. The ability to integrate Netcool solutions with applications for discovery, provisioning, trouble management and testing—and the power to effectively automate key operations, even across heterogeneous environments—provides support capabilities that are critical to the provider’s business success.
Ensure device settings are correct
IBM Tivoli Netcool configuration management solutions use repeatable processes and an innovative policy compliance engine that validates those settings against corporate policies to ensure that network settings are consistently and correctly configured across the network. These configuration management solutions back up device configurations and track device configuration changes—even changes made out of band—to record who made them, when they were made, what the changes were and whether or not they comply with corporate and network policies. Configuration changes and policy violations are flagged and alerts are sent to the Tivoli Netcool fault management solution where correlation policies can be applied to compare with network events. Erroneous configurations can be rolled back, without the need for a device reboot.

Support policy-based compliance
A reusable policy framework provides the visibility the organization needs in order to understand its network compliance readiness at any time. Tivoli Netcool solutions automate the network compliance life cycle to define policies, validate devices against policies, resolve violations and report results in a continuous and closed-loop manner—providing IT staff with greater control of network resources and facilitating audit-readiness.

Improve discovery, visualization and modeling
Automated discovery at the device level provides visibility into the configuration of all devices and reveals underutilized assets to help reduce unnecessary duplication and costs due to overbuilding. Patented modeling capabilities simplify the complexities of disparate configuration languages by translating device information—regardless of vendor, type, model or operating system—into an XML-based representation containing configuration demands, allowed parameter ranges, inter-relationships and intelligence necessary to configure devices. These Tivoli Netcool tools help the provider better understand the network, the impact of problems on services, and priorities for policies. The knowledge that discovery, visualization and modeling provide is key in optimizing operational efficiency in the VoIP network.

For more information
To learn more about IBM Tivoli Netcool network management solutions and how they can enhance customer satisfaction by giving you tools to comprehensively manage all aspects of your VoIP services, contact your IBM representative or IBM Business Partner, or visit ibm.com/tivoli/solutions/network

Tivoli Netcool Products
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- Tivoli Netcool/Impact
- Tivoli Netcool Configuration Manager
- Tivoli Netcool Performance Manager
- Tivoli Netcool Service Quality Management Center
- Tivoli Network Manager
About Tivoli software from IBM

Tivoli software offers a service management platform for organizations to deliver quality service by providing visibility, control and automation—visibility to see and understand the workings of their business; control to effectively manage their business, help minimize risk and protect their brand; and automation to help optimize their business, reduce the cost of operations and deliver new services more rapidly. Unlike IT-centric service management, Tivoli software delivers a common foundation for managing, integrating and aligning both business and technology requirements. Tivoli software is designed to quickly address an organization’s most pressing service management needs and help proactively respond to changing business demands. The Tivoli portfolio is backed by world-class IBM Services, IBM Support and an active ecosystem of IBM Business Partners. Tivoli clients and Business Partners can also leverage each other’s best practices by participating in independently run IBM Tivoli User Groups around the world—visit www.tivoli-ug.org

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