

Optimize availability and performance of your 4G network

Enable service assurance and operational efficiency in your long-term evolution network



Highlights

- Expand revenue opportunities by offering innovative services such as mobile music through increased bandwidth and network performance via LTE technology.
 - Leverage the IBM® Tivoli® Netcool® suite of products to help avoid connectivity issues, manage network performance end to end and better maintain SLAs.
 - Gain understanding and control of service health with solutions designed specifically for communications service providers.
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Communication service providers (CSPs) are experiencing an unprecedented demand for increased network capacity and performance. After a century of dominance by voice services, the market is shifting to a broader set of services—many of which rely on high-speed, data-intensive applications transmitted over the Internet. The drive toward services such as mobile broadband, online gaming and mobile television is predicted to grow exponentially in the coming years, and this trend is pushing service providers to provide ever-increasing bandwidth to accommodate the rapid speed, accessibility and service availability that subscribers expect today.

The challenge in delivering this new and expanded set of application-based services is that they are especially sensitive to network availability and quality. Their need for increased speed and availability requires a larger pipeline through which information can travel, and is the reason why many CSPs are laying the groundwork now for the move to the next generation of telecommunications technology—known as long-term evolution (LTE).

CSPs are planning and deploying LTE for good reason. The technology carries an array of benefits. In comparison to 2G/3G technology, LTE delivers both higher bandwidth and faster access to more of



today's data-heavy applications—and, consequently, a better experience for the end user. The opportunity to optimize the customer experience opens new revenue streams to CSPs.

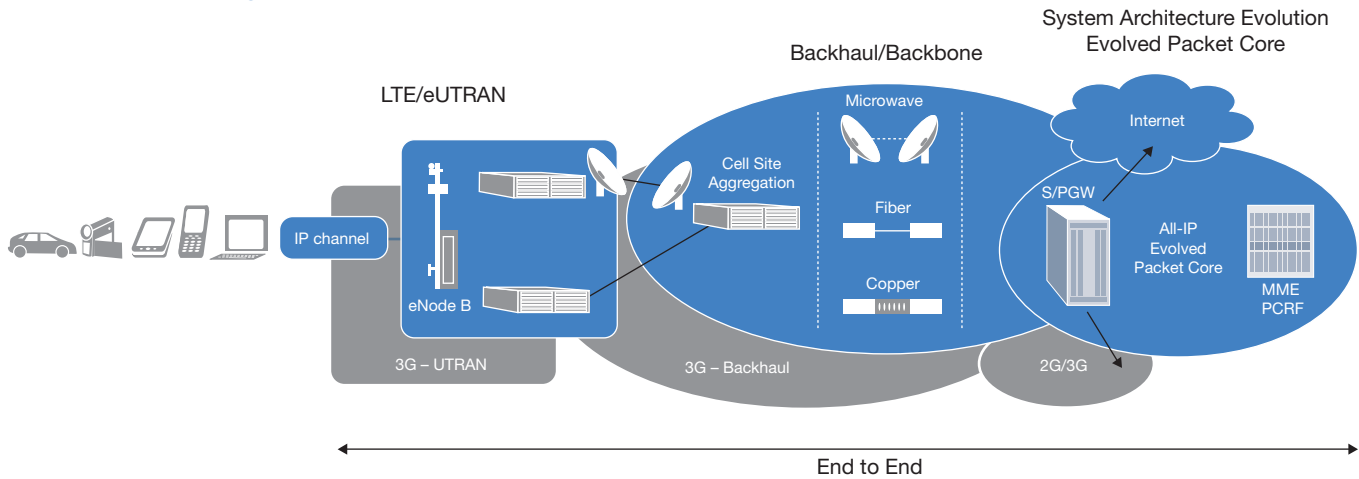
LTE is a scalable technology based on an all IP network capable of delivering information via a variety of applications, including mobile broadband, voice over IP (VoIP), mobile television and social networking over numerous devices, including handsets, smart phones, netbooks and laptops. It offers both a higher capacity and peak rate (and lower latency), enabling it to handle real-time traffic and seamless

service continuity more efficiently. In essence, it can help streamline and simplify your network while increasing scalability and the flexibility to deploy new services. Indeed, LTE is the preferred 4G technology for CSPs.

Manage performance end to end with IBM Tivoli Netcool

Because LTE requires service delivery across multiple network domains and IT, network operators need a way to manage their infrastructures end to end. The IBM Tivoli Netcool suite of products delivers this ability, offering an end-to-end

LTE/SAE Monitoring Scope



IBM Tivoli Netcool products manage the performance of the service provider communications network, including the LTE/eUTRAN, the IP backhaul/backbone, SAE/EPC and end to end.

performance management solution that provides coverage for four critical components of your communications infrastructure:

- LTE and the Evolved UMTS Terrestrial Radio Access Network (eUTRAN)
- IP backhaul/backbone
- System architecture evolution (SAE) and evolved packet core (EPC)
- The end-to-end network

As part of the broadest suite of service assurance products available today, Tivoli Netcool can help network operators ensure instant and reliable connectivity and seamless service continuity without provider finger-pointing, while reducing operating expenses. IBM can help network operators achieve a smooth transition to LTE while continuing to support the performance management needs of network operators who manage wireline and IP network services and those who manage 2G/3G networks. As you expand to an LTE environment, Tivoli Netcool products can help you:

- Extend the current breadth and depth of vendor and technology.
- Flexibly configure and manage customized key performance indicators (KPIs) for LTE via a technology pack development kit.
- Customize a state-of-the-art reporting layer (with role-based views) for network and business operations, which include service-oriented network KPIs

By leveraging Tivoli Netcool products, network operators can establish a greatly enhanced end-user experience and open the door to new revenue opportunities through increased service offerings. Tivoli Netcool products deliver:

- Coverage that spans from radio access networks (RANs) to deep within the IP core.
- Proven, carrier-grade scalability.
- Unmatched service assurance with best-of-breed, integrated products for fault management, performance management, business service management and customer experience management.

Avoid connectivity issues

More than any other challenge, communications providers have made it clear that avoiding connectivity issues is their biggest priority in preventing customer churn, lost revenues and a damaged reputation. With features like trend analysis, root cause analysis (RCA), retainability, accessibility and connector monitoring to better understand connection failure conditions, the Tivoli Netcool suite of products helps CSPs maintain instant and reliable connectivity.

Maintain maximum throughput for every user

As networks diversify and consumers increasingly move toward data-intensive, Web-based applications, the possible points of failure become more numerous. Maintaining a high peak rate and low latency is essential in reducing service

drops and delays. To accomplish this, network operators must be able to manage network performance end to end. For example, Tivoli Netcool products can help you manage end-to-end quality of service to ensure that minimum latency and maximum throughput are applied to every user, helping to increase customer satisfaction. In addition, you can use the solution to monitor for bottlenecks at each node and run capacity planning reports to enable you to adjust network capacity as needed, helping you to better maintain service level agreements (SLAs).

Gain seamless mobility between heritage and LTE technologies

Just as important as high network performance for LTE technology is the ability to ensure a transparent user experience across 2G/3G technologies and LTE. Inter Radio Access Technology (IRAT) will be a key part of LTE rollout to ensure success for service providers in this key area. The Tivoli Netcool suite of products helps CSPs to optimize network coverage, capacity and quality by providing seamless mobility and interdomain performance validation to manage service performance and the customer experience across the service infrastructure, to assure that all systems are operating as expected.

Reduce operating expenses via a self-organizing network

Because they use bandwidth more efficiently, self-organizing networks (SONs) are viewed as one of the greatest economic benefits of moving to LTE technology. In addition, a SON helps carriers to reduce operations expenses for evolved

NodeB (eNodeB) deployment by automating the manual steps needed to efficiently operate networks and services. The Tivoli Netcool suite of products support SON performance management features, including RAN optimization reporting, to help accommodate bandwidth demands without a substantial increase in backhaul and transport costs.

Manage performance of third-party LTE nodes

In a diverse communications network, performance degradations may originate within third-party nodes. The Tivoli Netcool suite of products helps network operators ensure they are meeting SLAs, produce reports on third-party nodes and use eNodeB sharing to optimize network capacity and performance.

Ensure node health

Consistent, reliable network performance is critical in reducing customer churn. The Tivoli Netcool suite of products enables you to monitor node metrics and even drill down to understand how each node is affecting network performance, helping to speed problem determination and resolution.

Deliver advanced validation of key performance indicators

Understanding and monitoring key performance indicators (KPIs) is critical as service providers continually strive to meet internal and external service-level commitments and goals. Yet the challenge here is to ensure overall network health and quality in a multivendor and multitechnology

environment. The Tivoli Netcool suite of products delivers the ability to track vendor-specific KPIs, so network operators can more easily pinpoint—and more quickly repair—the source of service performance issues.

Leverage IBM expertise to ensure service performance in LTE

To remain successful in today's marketplace, communication service providers must maintain service performance while anticipating the next generation of communications technology. Through an all IP network, LTE enables you to leverage better capacity and performance, faster deployment of service offerings and scalability to enable a world of opportunities for increased revenues. CSPs that are in early trials and testing for LTE technology can look to IBM for the broadest suite of service assurance products available—Tivoli Netcool—and for depth of experience based on thousands of customer engagements around the globe. LTE can open the door to increased performance, additional revenue streams and a foothold in the highly competitive and ever-evolving communications landscape. Today, more than 1,000 service providers rely on Tivoli Netcool to ensure their most critical services are performing to the highest standards. In fact, IBM is the worldwide leader in the telecommunications software market,

and owns the majority of market share in fault and event management, as well as performance monitoring.¹ For all of these reasons, IBM is singularly positioned to help you speed the smooth transition to 4G today and to support high network performance and availability well into the future.

The Tivoli Netcool suite of service assurance products is the leading software for the monitoring and management of critical services, application and network-based systems, enabling you to leverage:

- End-to-end service management, problem isolation and automation.
 - Accelerated time to market for new services and the ability to quickly adapt to meet future market requirements.
 - More than 350 integrations to elements, trouble ticketing systems, inventory and performance to achieve operational workflow.
 - Simplified network management through process automation and service process integration.
 - Improved service reliability and quality across the network.
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For more information

For more information about how IBM supports service assurance for CSPs migrating to LTE technology, contact your IBM representative or IBM Business Partner, or visit

ibm.com/tivoli

About Tivoli Netcool software from IBM

Tivoli Netcool software offers CSPs and large enterprises a service management platform that enables the delivery of quality service by providing visibility, control and automation—visibility to see and understand the workings of their business; control to effectively manage their business, minimize risk and protect their brand; and automation to optimize their business, reduce the cost of operations and deliver new services more rapidly. Tivoli Netcool has been selected by more than 1,000 CSPs globally. 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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Software Group
Route 100
Somers, NY 10589 U.S.A.

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¹ Analyst firm OSS Observer, an Analysys Mason company, OSS Observer's June 2009 Server Assurance Market Review



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