

Telco Solves QoS and Billing Access for 3G/4G Services

Core network simplified and reliability increased

The Net Optics solution substantially reduced the complexity and risk of routing the traffic to the QoS monitoring tools and billing systems.

Director



Industry:
Telecommunications

Objective:
Provide reliable, passive access to 3G/4G wireless traffic for QoS monitoring and billing

Approach:
Tap the traffic between the SGSN and GGSN using Director data monitoring switches

Technology Improvements:

- High rack density for tapping
- Links to QoS and billing systems reduced through aggregation and regeneration
- Ability to load balance and drill down with filtering for directed monitoring and trouble-shooting

Project Outcomes:

- Core network complexity reduced
- Reliability increased
- Director to be included in 3G/4G rollout



A Wireless World

With the rollout of 3G and 4G technologies, the wireless market is booming. Cell phone usage is skyrocketing as these technologies unleash mobile devices to handle more powerful and diverse applications. Voice, video, and data are converging to provide rich new services that users enjoy and on which they have come to rely.

As one large provider of telecommunications services designed their 3G/4G infrastructure, they knew two issues would be critical to the success of the new services: maintaining a high level of quality of service (QoS) and accurately tracking and billing service usage. The challenge was to provide the QoS management tools and billing systems access to the wireless traffic in a reliable, transparent, and cost-effective manner. Since 3G and 4G wireless technology moves most of the traffic to IP, they turned to Net Optics, the leader in IP network monitoring access, for their solution.

A Monitoring Access Platform

Net Optics proposed that a Monitoring Access Platform™ (MAP) should be integrated within the core network infrastructure, implementing a monitoring access layer in the switching architecture. The monitoring access layer would give the monitoring tool layer, which included the QoS and billing equipment, 100% visibility of the 3G/4G wireless traffic—without any risk of it being negatively impacted.

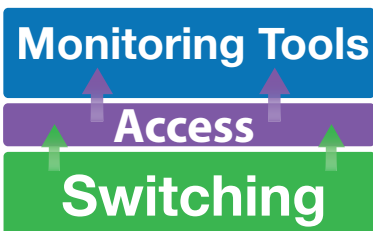
The switching architects liked the MAP approach for several reasons:

- It substantially reduced the complexity and risk of routing the traffic to the QoS monitoring tools and billing systems because it did not rely on configuring (or misconfiguring) switch Span ports that would otherwise be necessary.
- It cleanly isolated the QoS monitoring tools and billing systems from the service traffic, ensuring that they would never interfere with the customer's service.
- It was cost-effective because monitoring tap ports were much less expensive than switch ports.

Director at the Core

The company determined that the best place in the switching infrastructure to tap the wireless traffic would be at the links between the SGSNs and the GGSNs, because it was the first place that traffic from all mobile devices had been converted to IP. To implement the monitoring access layer, they selected the Net Optics Director™ data monitoring switch as the foundation of the MAP. The reasons for using Director were:

- 100% traffic visibility, including L2 errors, without impacting link traffic or losing packet timing information
- Fully passive taps that ensure link traffic continues to flow even if Director loses power
- Efficient use of rack space due to high port density, at twelve 1G taps per 1U
- Ability to aggregate traffic from multiple taps, reducing the number of connections needed to the QoS monitoring and billing systems

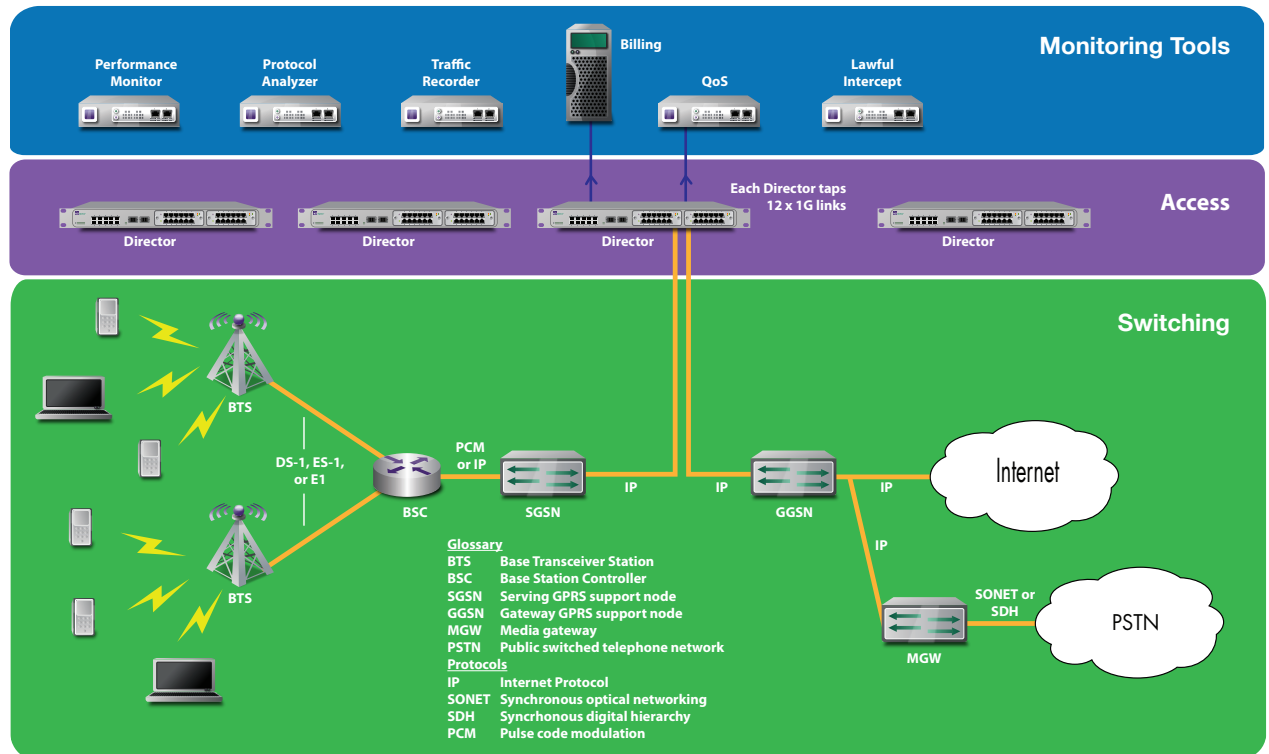


- Ability to regenerate identical copies of traffic on multiple ports, enabling a variety of systems (QoS, billing, performance monitoring, protocol analysis, traffic recording, and lawful intercept) to view the same traffic simultaneously

Two other capabilities provided by Director would be useful for special trouble-shooting and monitoring situations, but not be used in normal production operation. (1) Director's filtering capability would be useful for pre-filtering traffic to prevent oversubscribing monitoring tools and for drilling down on issues during trouble-shooting. (2) Director's static load balancing capability would enable splitting the load to multiple tools when a single tool's capacity was exceeded. For example, if it was necessary to record all of the link traffic for a forensic investigation, the traffic could be split between two or more traffic recorders to increase recording bandwidth.

Compared to competitive devices, the company found that Director had the highest tap density per rack unit and the lowest price per tap. Director's Web-browser based graphical user interface was also richer and easier to use than the GUIs from competing vendors.

As an overall system, testing showed that the design objectives were achieved: all traffic was successfully routed to the QoS monitoring tools and billing systems, the tools and billing systems were isolated from the service traffic, and the solution was cost-effective. By using Director to isolate QoS and billing from the rest of the SSGN's functionality, the architects felt they simplified the system and made it more reliable — the risk of losing data due to switch failure, overload, or misconfiguration was eliminated. In addition, the overall cost of the solution was less because of the lower price per port of Director compared to switch-based solutions, and the savings in power and rack space due to Director's port density. As a result, when this company rolls out its 3G/4G services, Director will be at the heart of its core network.



3G/4G Wireless switching infrastructure with Director data monitoring switch for monitoring access

Another feature that was available only on Director would be important for system continuity: If Director itself needed to be removed for repair or upgrade, the Director Network Modules (DNMs) could slide out of the main chassis and operate on their own, without power, and without ever taking the attached links down. This unique feature would improve uptime and lower MTTR, for substantial cost savings.

Director Delivers

The switching system architects evaluated Director as a component and then in their test switching system. They found Director to be reliable and capable of handling full bandwidth on all ports without blocking. No packets were dropped or lost on their way to the QoS and billing systems, and link traffic was unaffected no matter how they configured or misconfigured Director—or even when they removed power from Director's two redundant power inputs.

To learn more, visit www.netoptics.com

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