

Network Intelligence Technology for 3G and 4G Traffic Management and Optimization

Bandwidth Challenges Create New Opportunities

The dramatic growth in smartphone usage, more than 300% annually, chokes networks. 3G mobile subscribers require much more bandwidth for audio and video streaming, P2P networking and the thousands of applications emerging for devices such as iPhone, Blackberry Palm and Android products, in addition to an increasing number of mobile PCs. More applications that are optimized for (all-IP) 4G networks are already on the horizon to better accommodate anywhere, anytime access at much higher data rates.

Meanwhile, telcos must operate with a finite number of radio frequencies and limited space to move data across those frequencies. Since telcos must transport a significant amount of data which they do not generate themselves, they are challenged to manage the exploding traffic volume that they, in fact, do not control. The situation has created a critical need – and business opportunity for vendors such as Network Equipment Providers (NEPs), ISVs and Systems Integrators to support their telco customers with new solutions for advanced traffic management and optimization.

Telcos' New Requirements Pose Operational and Financial Challenges for Vendors

Smartphones and mobile PCs load networks with a lot more data than regular phones, requiring substantially more bandwidth that is very expensive to provide. Subscriber expectations in terms of performance and quality are equally high on fixed and mobile broadband networks. Telcos therefore need go beyond traffic shaping and implement advanced KPIs and optimization policies with advanced bandwidth management that can parse content per subscriber to support their evolving business models.

Existing traffic optimization solutions are often too basic to support new telco requirements. Traditional Deep Packet Inspection (DPI) allows per application traffic management, but many new requirements at the per-subscriber level go unaddressed. For example, to optimize mobile video streaming, the telco must know which device is used in order to adapt content to the size of each subscriber's screen. This requires more than traditional DPI such as the ability to detect and extract the IMSI per user.

Developing technology to dig deeper into their network traffic poses significant operational and financial challenges for vendors:

- **Software development and maintenance costs:** Investments must be made to develop new Network Intelligence (NI) software to complement or replace existing DPI. Managing complex mechanisms such as tunneling or correlation of different sessions within the same application is a significant technical challenge. The capability to parse traffic at core network speed adds to the development effort. Continuously updating the technology as new protocols and versions of protocols are introduced also increases costs. For example, the Livemail protocol changed several times since 2007. Each time a new version was released, 75% of the protocol changed, which required NI software updates to detect and analyze Livemail traffic. While basic protocols such as IMAP, SMTP, POP, HTTP and others are more stable and seem easy to manage, there will always be a vast number of other protocols that are proprietary and frequently change. Moreover, the total numbers of IP users, applications and protocols will continue to increase, leading to unpredictable financial risk from ever-rising NI and DPI software development and maintenance costs.
- **Impact on product development and management methodologies:** CTOs and product managers have no control over the evolution of protocols or clear insight into the timing of protocol updates from IP applications providers. This disrupts control of product development roadmaps and is countercultural to the way most vendors need to conduct business.
- **Ability to attract and retain required expertise:** Current vendor development teams lack the specialized knowledge for a new generation of traffic intelligence solutions. Those who come from a software background have not focused on network infrastructure or the details of IP protocols. Some may be experts on mobile data protocols like WAP, but not on new mobile application protocols such as mobile Webmails (Outlook Web Access or Gmail for mobile) or correlating GTP data and GTP control to enable per subscriber optimization. Engineers with the required skill set are difficult to find and command high compensation.
- **Return on investment:** Keeping network intelligence software up to date for advanced traffic management and optimization solutions will require vendors to commit considerable resources over the long-term, impacting profit margins. The costs of continuous software redevelopment to accommodate protocol changes, new protocols and new IP applications will be difficult to pass on to customers.

Integrating Pre-Developed NI Technology Offers a Valuable Strategic Option

Vendors now have the option of working with a third-party specialist vendor that has already developed and can support the required NI technology for more advanced traffic management and optimization solutions. This enables vendors to avoid the upfront costs, time to market delay, most of the long-term maintenance expense, and associated business risks of in-house development. The strategy is to integrate proven, pre-developed NI software into existing and future network equipment solutions for mobile operators, and shift the burden of keeping the software updated to a specialist like Qosmos, who has already established the necessary expertise and tools.

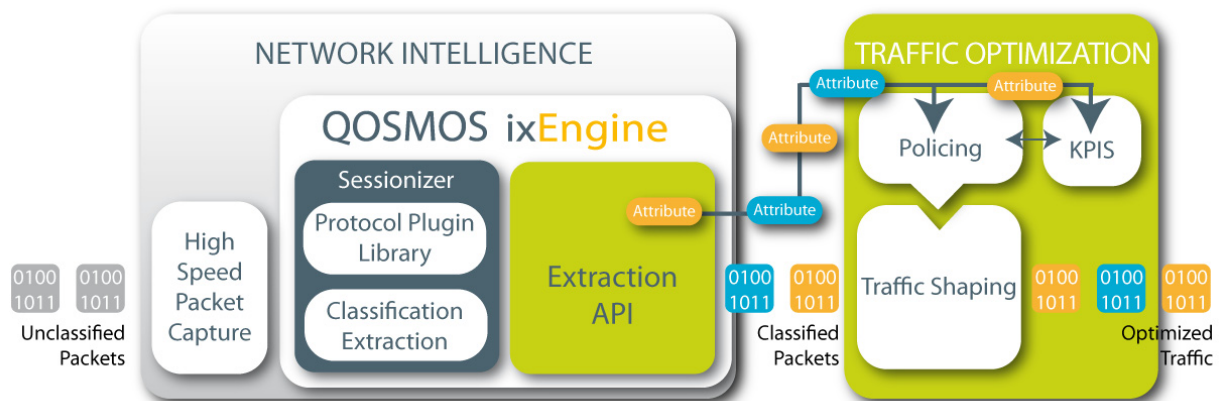
Qosmos ixEngine

Qosmos provides the NI capability for vendors to more easily and cost-effectively deliver advanced traffic management and optimization solutions to customers. The Qosmos ixEngine is a Network Intelligence Software Development Kit (SDK) that gives vendors access to the technology, development support and professional services.

Using a “building block” approach, vendors can incorporate basic to sophisticated NI capabilities into their traffic management solutions according to business goals, product roadmap and evolving needs. A vendor can start small, using ixEngine only to quickly classify traffic flows, and later upgrade to more advanced features such as per application and per subscriber traffic metadata extraction and advanced querying.

The NI software runs on all popular computing platforms, supports advanced SMP (symmetric multiprocessing) and can be deployed to complement or replace existing DPI. Code is optimized for a vendor’s specific computing platforms to maximize computing capacity.

Qosmos ixEngine is available today on leading network processors from companies such as Tileria Corporation, Cavium Networks and RMI Corporation.



Functional architecture

Qosmos NI technology expands network and IP application protocol recognition, and provides deep visibility into traffic content, context and patterns at per-subscriber levels.

Using Qosmos ixEngine, vendors gain capabilities such as:

- Network and application protocol recognition of more than 300 different protocols and their latest variants
- Real-time Layer 7 analysis to classify flows and extract over 4,000 attributes types
- Detection and parsing of tunneling protocols for the information they encapsulate
- Advanced data filtering capabilities
- Visibility at the flow, session, IP application and end-user levels
- User metrics for highly granular visibility into network usage by user identity (IMSI, MSISDN, IP address), applications group (PC or mobile) and specific IP applications
- A powerful solution to monitor what devices (PC or mobile) and what applications (web, streaming, P2P) are consuming bandwidth capacity in order to implement and enforce more effective network governance rules.

Key Business Benefits

- More efficient use of R&D resources and focus on core business of developing optimization solutions
- Enables stronger solutions for advanced traffic management and optimization
- Reduced time to market and faster revenue capture as your telco customers pursue 3G and future 4G business models
- Minimized risk associated with developing and maintaining specialized complex network protocol technology
- Lower product development and life cycle support costs (predictable CAPEX and OPEX)
- Predictable product roadmaps and product launch timing

Key Technical Benefits

- Integrate proven, leading-edge NI technology instead of developing from scratch
- Use with choice of hardware platforms (available for standard Intel x86 architecture and optimized code for leading high-capacity network processors such as Tiler, Cavium, etc.)
- Scalability from protocol detection and classification to real-time extraction of traffic metadata and advanced querying capabilities
- 100 Mbps to 80 Gbps data rate scalability
- Protocol and protocol evolution support (ixEngine protocol plug-in library, API for custom protocols, "Protocol Watch" service and quarterly protocol updates)
- Qosmos support for ixEngine applications in traffic management/optimization solutions

About Qosmos

Qosmos develops network intelligence technology, providing real-time visibility into data as it crosses networks. The company's software development kit and hardware platforms are used by systems integrators, solution developers and network equipment suppliers to make their applications more secure, efficient and profitable. Qosmos network intelligence technology enhances solutions for lawful interception, cyber security, traffic optimization, QoS management, content billing, market research and more. Qosmos customers gain unparalleled ability to understand and analyze data in transit, while they maintain control and flexibility.

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