DPI & Network Intelligence Technology for Policy Control & Charging Solutions

3rd generation Deep Packet Inspection for smarter core network equipment

Overview
Telecom Equipment Manufacturers (TEMs) need to go beyond traditional Deep Packet Inspection (DPI) to enable personalized policy control. Qosmos 3rd generation DPI Engine can be embedded into core network elements such as GSSNs, Mobile Gateways or standalone DPI boxes. Only Qosmos technology provides real-time application awareness for over 97% of the traffic flows and extraction of detailed application metadata.

This allows TEMs to develop products perfectly suited for their customers' new requirements for managing the exponential growth of mobile data, providing differentiated services and enhancing user experience and quality of service.

Why Qosmos

**Requirement:**
Integrate a DPI engine compatible with carrier grade standards for high accuracy and reliability.

Qosmos provides TEMs with:
- The most reliable DPI engine providing both the highest application identification rate and the fastest technology updates when applications and protocols are constantly changing.
- Advanced failsafe mechanisms such as sandboxing and session state recovery.

**Requirement:**
Analyze 10 Gb/s and 40 Gb/s interfaces in real-time.

Qosmos provides:
- The fastest DPI engine on the market.
- Support for all leading processor environments with optimized code.
- Expertise in integrating a DPI engine with multicore processors and high-performance data plane software.

**Requirement:**
Deliver a 1 box form factor pooling all traffic policy functions and DPI into a single device.

Qosmos enables TEMs to:
- Add DPI software libraries into their existing product design (e.g. a GGSN) providing the combined features and benefits of a core network equipment and a standalone DPI box in a single system.

What We Offer

**Product:**
- Qosmos ixEngine is a 3rd generation DPI engine designed to be embedded in new or existing core network equipment.
- The product is delivered in the form of a software library written in C code, ready to be embedded into the network equipment software.
- Only Qosmos provides real-time technology that identifies 97% of all traffic flows, delivers more than 4,500 application metadata and updates the protocol and application signatures with minimum reaction time.

**Expertise:**
- Qosmos is one of the world’s leading DPI experts. We have an extensive track record in developing, integrating and optimizing flow inspection technology in telecom applications to enable TEMs to deliver products that leverage the most granular application visibility.
- Qosmos has a strong relationship with multicore processor vendors (Intel, Cavium, Netlogic, etc.) and packet processing software vendors (Intel DPDK, 6Wind etc.). This means that our technology is optimized for these environments, and our experts will assist your R&D team in designing the best architecture for maximum performance.
- Qosmos is your DPI/Network Intelligence partner, not only providing technology, but also supporting your teams in integrating, optimizing and marketing your product.

Devices and Functions that Require a DPI Engine

<table>
<thead>
<tr>
<th>Devices</th>
<th>Functions</th>
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</thead>
<tbody>
<tr>
<td>UTRAN eNodeB</td>
<td>Offline Charging (OFCs)</td>
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<tr>
<td></td>
<td>Online Charging (OCS)</td>
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<tr>
<td></td>
<td>GGSN Serving-GW</td>
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<td></td>
<td>GGSN PDN Gateway</td>
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<tr>
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<td>PCRF</td>
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<td>Traffic Detection Function (QOSMOS)</td>
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Qosmos Product: ixEngine DPI & metadata engine
Target Products: GGSN-GW, Mobile Service Gateways, Standalone DPI box
Applications: Policy Management, QoS, Charging, Subscriber Analytics and more

Qosmos Expertise: Flow analysis/DPI, Integration with multicore network processors, data plane software (6Wind, Intel DPDK) and ATCA architectures
Users: Developers working for TEMs, System Integrators
This tier1 Telecom Equipment Manufacturer has always been at the forefront of technology innovation. With the emergence of smartphones and mobile devices consuming large amounts of bandwidth, it was key to develop products that would allow mobile carriers to implement advanced policies to optimize bandwidth and quality of service and generate additional ARPU with differentiated services.

Key Requirements for the GGSN Vendor

- Enable precise policy management for MNOs.
- Give the ability to monetize usage rather than bandwidth to increase ARPU while implementing smart traffic management.

Technical Requirements

- Rich protocol recognition.
- Integration on dedicated blade powered by 2 Network Processors.
- 10 Gb/s throughput/blade.
- Ability to tune accuracy vs. throughput.

Qosmos Advantage

- IP application protocol libraries constantly updated in line with changing market.
- Specific development for additional protocols/applications with aggressive timing.
- Continuous optimization strategy to leverage highly efficient processor architecture.
- Stringent SLAs to meet Telco grade requirements - 24/7/365 worldwide.

Leadership

- Integrated DPI engine vs. 2-box solution lowers total cost and simplifies administration.
- Gives MNO agility towards protocol/application updates and increasing bandwidth demand.
- Additional features to enable new revenue generating services (QoS, Analytics, etc.).

The Challenge

- Classification and analysis of L7 applications in wireless networks.
- Drastically reduce price per Gb/s to improve cost-efficiency.
- Correlation of flow, session, application and service at the user/subscriber level.
- Portable solution to adapt to present and future processor architectures.

How it was Accomplished

- Partnership between Qosmos and the customer’s R&D team to integrate the Qosmos ixEngine into the GGSN.
- A dedicated Qosmos engineer was allocated to support the customer.
- Combined architecture design work to optimize the design of the target application software embedding the Qosmos ixEngine.
- Development of specific application plugins to answer the customer requirement to identify regional applications (e.g. Chinese Instant Messaging).

The Solution

- Integration of Qosmos 3rd generation DPI engine (ixEngine) into the customer GGSN. The engine provides application identification and metadata to the GGSN functions such as:
  - QoS Control and Traffic Policing/Shaping
  - Charging
  - Subscriber analytics

The Technical Environment

- ATCA Chassis
- 10 Gb/s cards
- 6Wind Gate data plane software

At a Glance

Customer
Tier 1 GGSN vendor

Industry
Telecoms

Deployment Country
Deployments across all continents

Network Intelligence Delivered
- Application identification for more than 1,000 applications.
- Extraction of metadata for HTTP, audio and video streams.

Lessons Learned

- Partnership between the TEM and Qosmos was important to enable optimal performance for the GGSN with the selected hardware.
- Architecture tuning between the DPI engine and the packet transport layer (data plane) was crucial for high performance.
- Modular approach to DPI was key to enable the TEM to sell additional value to his carrier customer. Starting with basic flow classification and upgrade to more advanced services based on application metadata extraction.