ENEA

Qosmos ixEngine®: DPI-Based Classification & Metadata Extraction

More than 70% of networking and security vendors who have decided to source DPI software have selected Qosmos ixEngine to embed Layer 2 to Layer 7 flow classification & metadata extraction into their products.

Key Facts

▸ C libraries designed to be embedded into applications

▸ 2,700+ protocol plugins, continuously supported and updated

▸ 4,500 application metadata extracted

▸ Classification of networking protocols and applications based on flow pattern matching, bi-directional flow correlation, heuristics and statistical analysis

▸ High recognition rate: ability to identify Layers 2 to 7 in the OSI model

▸ Optional modules for additional processing of classification data and metadata
- Deep File Inspection
- Rule Engine
- Custom Signatures
- Transactional DPI
- Automated DPI

▸ Frequent protocol plugin releases that support In-Service Software Upgrade (ISSU) to keep up with the fast changing nature of IP traffic

▸ Supports multiple instances of DPI engine

▸ Modular architecture for application development flexibility (separate flow management, DPI framework, protocol plugins and optional modules)

▸ Up to 10 Gbps* per core on latest x86 architecture

Qosmos ixEngine is a DPI library for software developers who wish to embed detailed, real-time visibility into their networking or security products.

While some technologies are limited to identifying the application behind an IP flow, Qosmos ixEngine goes further to also extract protocol and application metadata. This enables developers to inject application-level insight into their solutions for complete visibility into network traffic in real time and a detailed understanding of network transactions and user behavior.

A series of optional modules are also available to shorten development cycles. These modules, such as a Rule Engine or a Deep File Inspection function, use the output data from classification and metadata extraction and apply further processing that would otherwise have to be built within the final application.

Designed with developers in mind, Qosmos ixEngine accelerates product development cycles. Ready-to-use software libraries and modules reduce costs and risks associated with developing and maintaining a highly complex technology internally.
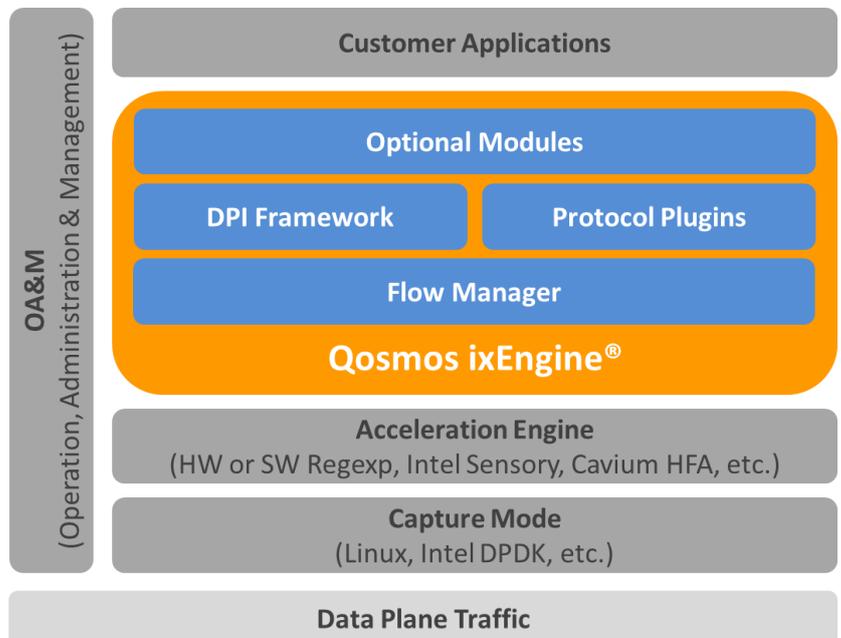
*Performance may vary significantly with traffic patterns and networking environment. Please contact your local representative to get details of each scenario.

Beyond IP Traffic Classification: Metadata Extraction

Qosmos ixEngine® extracts 6 main categories of network-based application metadata and computed metadata:

- Volume: e.g. the volume of traffic per application and per user, size of a web page including all its components

- Application usage: e.g. HTTP URL or name of video played in YouTube. Qosmos delivers 4,500 application metadata to enable smarter decisions based on full understanding of user behavior

- Service identification (audio, video, chat, file transfer) for most popular VoIP and IM applications

- Application performance: e.g. delay and jitter / application / user. Qosmos ixEngine also provides computed metadata like VoIP MOS and RFactor

- Identifiers: e.g. email sender / receiver addresses or any other ID that can be used to implement strong security rules

- Content: e.g. attached file within an email, which can be directed to specific processing like anti-virus or content inspection

- File metadata like codec and bit rate used in a Flash video. These can be used for customer experience management, network security, etc.

Up-to-date Protocol Plugins and Metadata

Applications and their protocols change constantly and without notice. Qosmos ixEngine provides the more secure path to reliable, always up-to-date DPI technology. Experts at Qosmos Labs continuously receive information about changes in protocols and applications and update the plugins accordingly. Updates are deployable on-the-fly, without service interruption.

Extensions for Aggregated and Computed Metadata

Qosmos ixEngine features a number of extensions designed to facilitate operations through extraction of application metadata. The extensions can correlate flows for inheritance (signaling and user plane consolidation), and compute KPIs (e.g. MOS for VoIP flows).

Optional Modules

Complementary modules are available to provide additional processing of classification data and metadata:

- Custom Signature Module, to complement Qosmos Signatures with user-defined signatures for proprietary protocols or extensions

- Deep File Inspection for detection of file type, consistency check between MIME type and file extension, file hash computation, and extraction of metadata

- Rule Engine for execution of customer-defined rules at run-time (e.g. correlations, aggregations, etc.)

- Transactional DPI to obtain user transactions within specific applications as metadata (e.g. picture download on Facebook)

- Automated DPI to classify previously unknown traffic using embedded machine-learning algorithms

* Measurements based on real traffic inputs

High-Performance & Throughput

Qosmos ixEngine has built-in multi-core support capabilities. The software typically handles up to 10 Gbps* of traffic per core on Intel architecture.

- Optimized multi-thread support for scalability up to 96 cores

- High performance under heavy metadata extraction load

- Optimized code for the industry's highest performance multicore processors

- Leveraging of hardware acceleration

Architecture & Integration Scheme

Qosmos ixEngine provides the easiest path to L2-L7 flow analysis for embedded software developers. Qosmos ixEngine ready-to-use libraries reduce development cycles, costs and risks, and let developers focus on building complete solutions, relying on the Qosmos division of Enea for its domain expertise in protocols, applications and metadata extraction:

- Optimized integration with packet processing middleware (e.g. Intel DPDK)

- Acceleration and offloading configuration options for optimal integration with custom flow manager, external regular expression engine (Intel Sensory, Cavium HFA), etc.

- Independent core-decoding framework and protocol plugin library, which translates into fast flow signature updates while preserving engine stability. Protocol plugins are hot-swappable

- Switchable IP and TCP flow reassembly process for packet reordering

- Customizable early packet discard mechanism

- Optional packet pre-filtering: depending on application requirements, all packets or only a subset of packets are parsed by the Qosmos ixEngine

- A unique Flow Manager architecture to ensure continuity of classification and no loss of flow data in handover or failure situations

- Supports multiple instances of DPI engine for maximum implementation flexibility

To accelerate integration and ensure that you leverage all the capabilities of our technology, Enea offers professional services and provides access to a network of expert developers.

Supported OS and Chipset
- Intel x86 (Linux, Solaris, FreeBSD, MacOS, Windows)
- Cavium Octeon (SE, Linux, HFA)
- Broadcom XLP (Linux)
- PowerPC (Linux)
- Tilera Gx (Linux)
- ARM (Linux)

Find out more on the Qosmos website!

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Qosmos, a division of Enea, is the leader in IP traffic classification and network intelligence technology used in physical, SDN and NFV architectures. Qosmos ixEngine software development kit and components are embedded by vendors and integrators into their products sold to telcos, cloud service providers and enterprises. For more information: www.qosmos.com