# Service Classification for vCPE Solutions: Enabling Service Function Chaining and New VAS

By integrating service classification, vendors can create vCPE solutions that support Service Function Chaining and a host of new value-added services. Qosmos ixEngine®, the market leading classification and metadata engine, is a key enabler in developing a robust service classification function for vCPE.

## Key Facts

- Qosmos ixEngine is a DPI-based application classification and metadata extraction engine

- High recognition rate: ability to identify all layers from Layer 2 to 7 in the OSI model

- 2500 protocols classified and continuously updated, 4300 application metadata extracted

- Identifies protocols and applications based on flow pattern matching, session correlation, heuristics and statistical analysis

- Users can develop their own signature plugins

- Modular architecture (flow management, regular expression engine, http parsing, etc.)

- Portable architecture (x86, Cavium)

## Benefits

- Optimizes resources for service chaining and data-center-based services

- Optimizes services delivered to premises based on subscriber and application information

- Supports reference implementations such as OpenDaylight and OpenStack

- Creates strong differentiation with other vCPE solutions

## The Challenge

Operators wish to vary the composition of network functions to offer tailored vCPE services – or, more accurately, want their customers to be able to customize their own vCPE services via a portal. In this context, the introduction of Service Function Chaining (SFC) where multiple Virtual Network Functions (VNFs) are stitched together to create a variety of service combinations, has become central to any vCPE strategy.

With traditional CPE solutions, operators used IP and Ethernet headers to steer flows to the desired networking functions. However, to enable SFC with an optimal use of bandwidth and computing resources, vCPE solutions need embedded service classification based on Layer 7 information. This is key in understanding which application is generating which flow on the network and applying the right Service Chain.

## The Solution

Qosmos ixEngine provides classification and metadata extraction, up to Layer 7, based on real-time application and subscriber information. It is readily available for integration with vCPE solutions. This information can be used to create efficient Service Function Chains or stand-alone value-added solutions such as next generation firewalling, content filtering or self-serve reporting.

Layer 7 visibility can be deployed in vSwitch, service functions or VNFs, to perform traffic classification and metadata extraction. For future proofing, Qosmos ixEngine can also be configured using reference implementations such as OpenDaylight SFC.
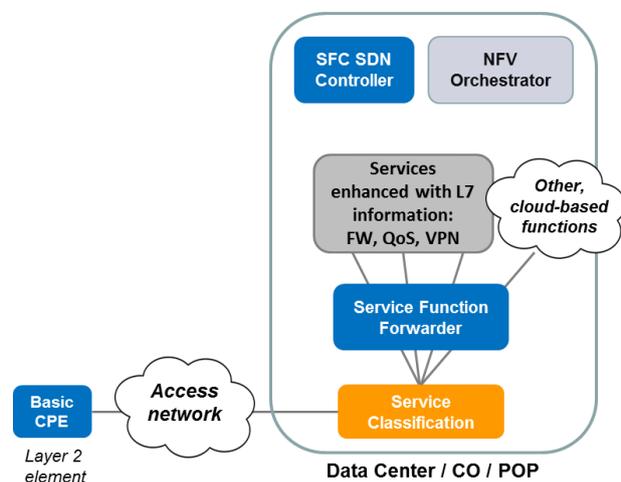
# Service classification for vCPE solutions based on Qosmos ixEngine®

## Comprehensive Network Intelligence

Qosmos ixEngine provides the broadest range of protocol and application recognition on the market, based on over a hundred man-years of expertise in the telecom, enterprise and security markets:

- Ability to identify nearly all protocols and applications behind IP flows, on mobile and wireline networks, in any geography

- Fast addition of custom plugins to meet requirements for decoding local, proprietary or legacy protocols

- Tools for users to develop customized signature plugins

## Advanced Analysis

Qosmos ixEngine can be integrated inside a service classifier VNF to provide full network application visibility. The resulting service classification function is used to optimize services delivered to premises, based on real-time application and subscriber information.

- Full application decoding: classification, metadata extraction, content extraction, reconstruction of communications (e.g. Instant Messaging)

- High accuracy rate: advanced techniques like double checking and CRC checking ensure 100% accuracy with no false positives

- Full protocol behavior analysis: for example full http decoding to handle http proxying

- Support of complex networking behavior such as GTP encapsulation, VXLAN and tunnels (GRE, L2TP, etc.)

- Leverages hardware acceleration

## Architecture & Integration Scheme

Qosmos provides the easiest path to L2-L7 flow analysis for embedded software developers. This reduces development cycles, costs and risks, and lets developers focus on building complete solutions, relying on Qosmos for its domain expertise in protocol, application and metadata extraction:

- Integration with Open Virtual Switch version 2.4 or higher

- Qosmos works with leading switch vendors and the open source community to extend support for additional switches

- Different configuration options enable developers to optimize integration. Qosmos ixEngine is modular and can work, for example, with an external regular expression engine

- Independent core decoding framework and protocol plugin library enable fast protocol updates while preserving software stability. The protocol plugins are hot-swappable

- Switchable IP and TCP flow reassembly process for packet reordering

- Traffic offloading mechanism

## Supported Environments

- Open Virtual Switch 2.4 or higher
- Cavium LiquidIO virtual switch
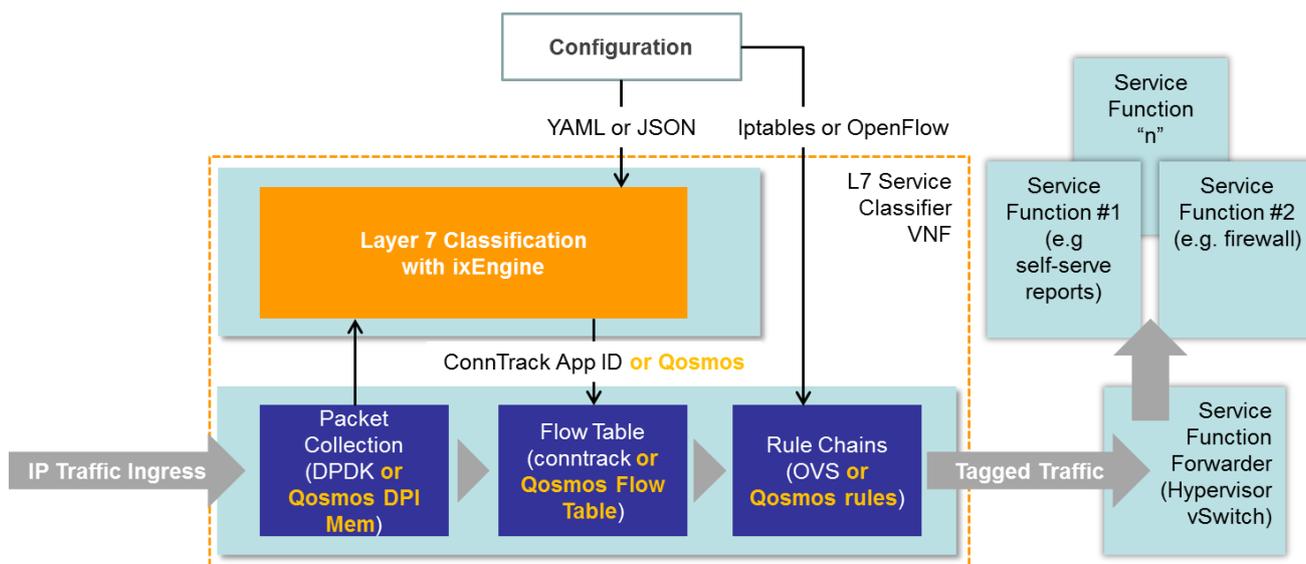


*Reference architecture for L7-based Service Chaining built on Qosmos ixEngine*

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