PROTEI

PROTEI DPI

Deep Packet Inspection Platrorm

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DPI platform as standalone 3GPP PCEF/TDF unlocks a variety of the data traffic management tools enabling Operator to deploy range of services related with ultimately flexible traffic charging, bandwidth management etc. The DPI is equipped with signature constructor which allows creating new traffic signatures in order to be capable of detecting flows of newly developed Internet applications.

The solution is capable of detection of obfuscated protocols using statistical analysis techniques and allows flexible creation of new services and protocols using regularly updated signature base. The platform supports bit rate control with regard to service priority, supports traffic prioritization and ToS/DSCP remapping.

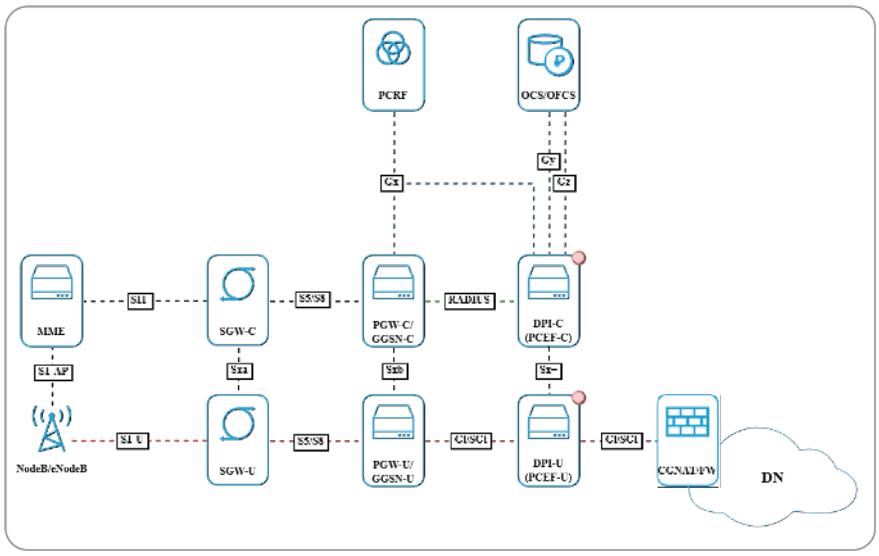


Figure 1, 2G-4G deployment

The system follows Control User Plane Separation (CUPS) according industry standards and allow Carriers to scale planes independently according network needs as well as provide edge computing for User Plane.

In order to simplify signaling network when network growth DPI can be delivered as Virtual Network Function (VNF) to existing NVFI or NVF-MANO platform or simply launched on bare metal or existing hypervisor for medium-size networks.

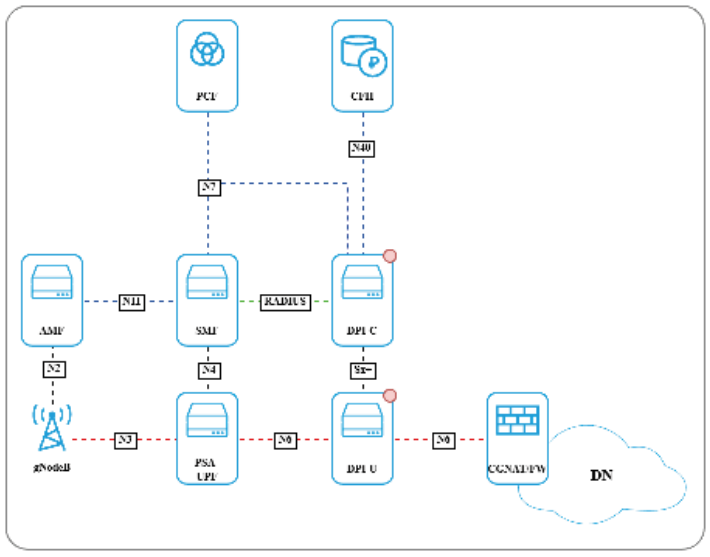


Figure 2, 5G deployment

Key benefits:

- User Plane DPDK interfaces: 10GE/25GE/40GE/100GE
- Control Plane interfaces: 1GE/10GE/25GE
- Hardware, virtualization and cloud independency: COTS x86 equipment (bare metal) with support of VMWare, KVM hypervisors and private, public or hybrid clouds
- Optional internal and external bypass – save client experience in case of failures without system redundancy
- Control and User Plane Separation (CUPS)
- Virtual Network Function (VNF) form-factor
- Powerful CLI and UI to control VNF instance configuration in a single place
- Access network technology independency: mobile (from 2G to 5G) or fixed broadband access, Wi-Fi, satellites or mixed access networks
- Hierarchical and distributed QoS
- Overload control for remote systems and system itself
- IP network quality measurement: RTT, QoE, payload delays
- Efficient real-time policy and charging management with Policy and Charging (PCC) framework based on 3GPP interfaces: Diameter Gx, Diameter Gy, SFTP Gz
- Online and offline charging support for prepaid, postpaid or mixed charging models
- Functionality extension by Value-Added Services (VAS) systems
- Several DPI engines support
- Performance up to 100Gbps per CPU
- Statistical information about each served IP flow
- Cluster up to 2Tbps and 16M subscribers' sessions with N: N+1 redundancy
- Customizable software solution

Functionality

- 3300+ signature-based and statistical-based recognition of L3-L7 protocols and applications
- 5000+ protocols and applications attributes extraction
- 60+ WEB categories with daily updates
- Application based Fair Usage Policy (FUP)
- Traffic filtering by lists of allowed or restricted IP/HTTP URL/SSL SNI/WEB categories
- Integration with external registry of restricted resources via customizable interface
- Tethering detection (line sharing)
- HTTP and HTTPS header enrichment
- TCP enrichment
- HTTP traffic redirection
- DNS steering
- Fraud detection and prevention: ICMP, HTTP, DNS, SSL
- Subscribers' information extraction from Radius flow from access gateways such as GGSN/PGW/SMF/BRAS/BNG
- Radius carbon-copy
- Service group definition based on Radius flow data with unique policy and charging settings
- Policy and charging control (PCC) rules via Diameter Gx enhanced for ADC/HTTP N7 with on-the-fly rule set change without service interruption
- Dynamic policy enforcement by bit rate limitation and priority control on a per-subscriber per-flow basis according different conditions such as date and time, location, terminal type, scoring model, traffic usage, network congestion and others
- Online charging via Diameter Gy/HTTP N40: flow or event based
- Multiple Diameter over TCP/SCTP links
- Diameter DRA integration
- Diameter routing based on service groups
- Flexible Diameter failure handling configuration (CCFH)
- Diameter sessions failover support
- Offline charging via SFTP Gz in PULL or PUSH modes
- Traffic diverting to VAS platforms: VLAN and NSH modes
- CLI- and WEB- based configuration and statistical reporting interface
- JSON/AVRO IP data records with native Clickhouse or Kafka integration for BigData
- ASN.1 Charging Data Records (CDR)

PROTEI DPI enforces policy and charging control rules on a per-subscriber basis. Every subscriber is assigned with a policy containing rules that defines subscriber's services with assigned QoS and priority in order to grant necessary resources for important traffic or margin subscribers in case of network congestion. As a result, subscribers of privileged plans suffer less from QoS degradation during periods of overload than subscribers' of economy plans.

Policy is usually defined on the PCRF, but also can be predefined locally without quota control and management.

To create specific bandwidth limiters per group of subscribers, base stations, regions and others subscriber session's context attributes can be used.

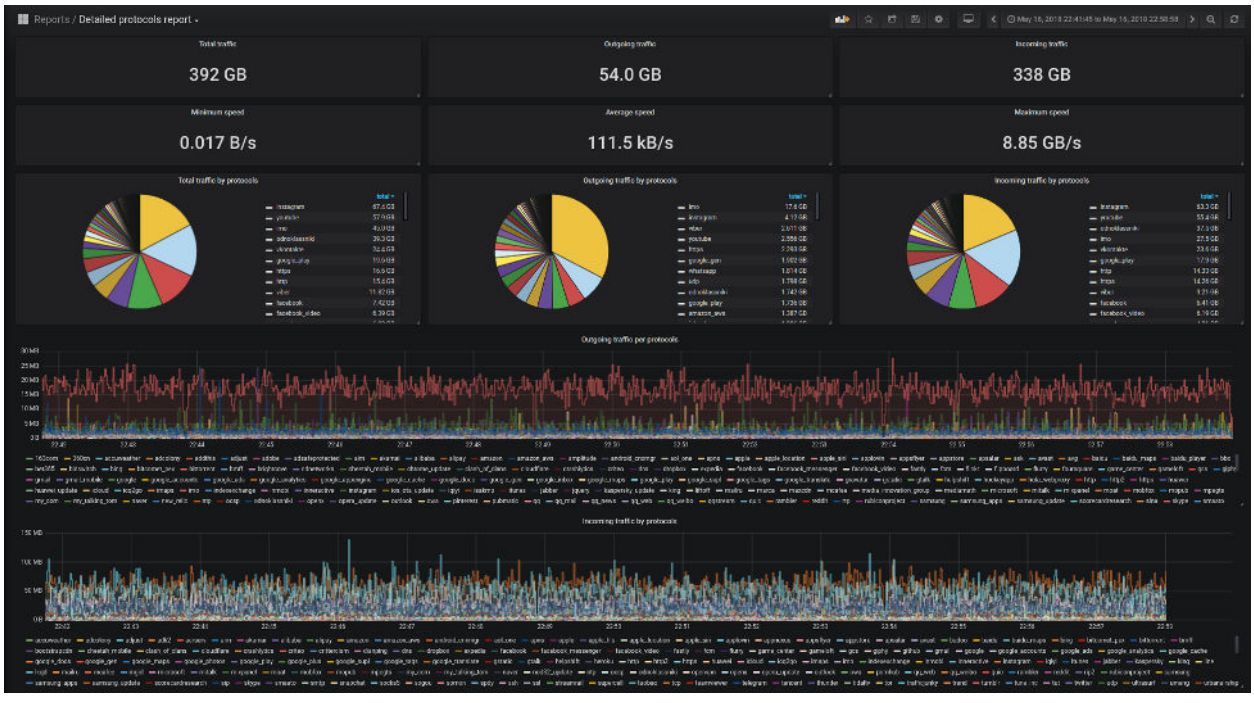
Traffic charging is executed on a per-flow per-subscriber basis as well. PROTEI DPI provides the following types of charging:

- By volume, by time, by time and volume with Credit Pool support in addition to charging, by events over Diameter Gy/HTTP N40/xFTP Gz interfaces
- Without charging with usage monitoring control over Diameter Gx/HTTP N7 interface

PROTEI DPI is not only a utility for charging and regulating bandwidth consumption but also a value-added service platform.

PROTEI DPI allows to:

- Divert traffic to external VAS or partners' systems;
- Collect statistical data about subscriber's preferences to make advertising campaign more efficient and track provided quality of services;
- Perform access limitation to restricted content and categorize traffic using internal source with daily updates.



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