6WIND
Virtualized Networking Software

Accelerated Data Plane Solution For EPC and vEPC

For 4G networks, 3GPP has specified a flat IP-based network architecture called SAE (System Architecture Evolution) with the goal of efficiently supporting massive IP service use. As a consequence, the evolved network architecture becomes much simpler than existing architectures such as 3G. However, as all the services (data, voice, video…) use IP packets, processing these packets efficiently becomes critical to ensure LTE system performance.

The main component of SAE is the EPC (Evolved Packet Core). EPC equipment has to manage a large number of subscribers via a Mobility Management Entity (MME) and process the aggregated traffic for 4G users via a Serving Gateway (SGW) and PDN Gateway (PGW). Compared to the previous generation of mobile networks, the combination of an increasing number of mobile users and per-user bandwidth led to critical performance and scalability challenges for LTE EPC.

NFV (Network Functions Virtualization) is a major trend in the Telecom industry that can be applied to mobile core infrastructures. Instead of developing dedicated EPC equipment, vEPC relies on a generic virtualized platform that embeds an EPC function as a software appliance running in a Virtual Machine (VM). Significant CAPEX and OPEX savings areexpected.

Since the first shipment of its 6WINDGate™ packet processing software in 2007, 6WIND has been selected by major 4G Network Equipment Providers for their EPC equipment to unlock hidden infrastructure performance for commercial off-theshelf (COTS) hardware.

Data Plane Acceleration For EPC

6WINDGate is high performance Layer 2 – 4 packet processing software optimized for generic multicore platforms. Based on its fast path architecture, 6WINDGate transparently accelerates Linux to provide more than 10x network performance improvements for more than 50 protocols compared to standard software architectures. To achieve maximum performance, 6WINDGate's fast path scales linearly over a large number of cores on one or more processors, either on the same board or on separate boards.

6WINDGate is delivered in source code for Telecom Equipment Manufacturers to customize the fast path and maximize product differentiation.

Beyond data plane protocols, 6WIND also provides control plane protocols including routing, virtual routing, security, VRRP and high availability capabilities. All these protocols are pre-integrated with 6WINDGate's high performance fast path architecture to reduce time-to-market.

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6WINDGate's fast path is completely transparent for applications as it reuses standard APIs between the Linux kernel and applications. In-house or third-party control plane protocols running on a standard Linux networking stack can therefore be easily integrated on top of 6WINDGate's accelerated data plane.

6WINDGate is available for market-leading processor platforms including Cavium, Intel and Mellanox. 6WINDGate software is mostly generic code. Portability over the different platforms is ensured by a thin layer (FPN-SDK) on top of the processor vendor's SDK. For Intel platforms, 6WINDGate uses its own DPDK (Data Plane Development Kit).

The combination of performance, portability, transparency and wide feature set makes 6WINDGate the ideal networking software platform for quickly developing high performance EPC equipment based on generic hardware platforms.

6WINDGate Provides A Transparent Path For EPC Virtualization

Virtualizing telecoms architectures adds many software processing layers between the network interface and the application workload running in a VM that cause significant networking performance penalties. It will be an increasing challenge for vEPC workloads that have to individually process a very large amount of traffic. NFV Infrastructure (NFVI) is a critical software component to provide vEPC workloads with the required bandwidth.

6WINDGate provides an open and high-performance NFVI solution designed around a software switch. Based on its fast path architecture, 6WINDGate transparently accelerates the selected software switch to provide extreme bandwidth and low-latency to Virtual Networking Functions (VNFs). As an example, 6WINDGate Open vSwitch (OVS) acceleration processes 20 Gbps per core on an Intel platform without any modification to OVS or its management.

6WIND's software solution isolates vEPC workloads from real hardware, thus eliminating hardware dependency in workloads' operating systems. This isolation also allows network hardware changes in either connection speed or supplier without workload changes. It also allows for live and scheduled migration of workloads from one platform to the other without any hardware NIC adaptations.

Inter-VNF communications with high capacity and low latency are key differences between traditional Cloud and Telecom Operator environments. 6WINDGate supports low latency with several hundreds of Gbps throughput of inter-VNF traffic. It does this without consuming external ports, impacting available bandwidth on the existing ports, or incurring PCI Express contention and latency. This highperformance communication capability enables the integration of vEPC functions with other added-value functions such as Application Delivery Controllers (ADCs) and the Policy and Charging Enforcement Function (PCEF).

The 6WINDGate extensions for virtualized environments provide a transparent and progressive path for future NFV-based architectures.

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