Broadcom Delivers Next Generation Open Switch Pipeline Specification

OpenFlow Data Path Abstraction Version 2.0 Supports Carrier Network Applications

IRVINE, Calif., Dec. 9, 2014 /PRNewswire/ -- Broadcom Corporation (NASDAQ: BRCM), a global innovation leader in semiconductor solutions for wired and wireless communications, today announced its next generation OpenFlow Data Plane Abstraction (OF-DPA) version 2.0 reference platform that includes OpenFlow software, specification and APIs, optimized for use in carrier networks and datacenter applications. With support for new networking protocols, the OF-DPA v2.0 reference platform allows datacenters and service providers to quickly deploy new applications and services. For more news, visit Broadcom's Newsroom.

The OF-DPA v2.0 reference platform enables service providers to provision, control, and instrument network switch elements through a standardized instruction set, based on the OpenFlow specification, APIs and its extensions. Designed to run on Broadcom's industry leading StrataXGS® chipset, the reference platform delivers on the flexibility and control requirements of large-scale carrier deployments.

"Broadcom's OF-DPA v2.0 supports emerging Software Defined Networking (SDN) use cases for service provider networks," said Ram Velaga, Broadcom Senior Vice President & General Manager, Network Switch. "The OF-DPA 2.0 feature set for the widely-deployed StrataXGS-based hardware, coupled with a rich software ecosystem, enables improved efficiency and operational agility for the largest carriers around the globe."

Broadcom's OF-DPA v2.0 reference platform enhances its previously released OF-DPA 1.0 reference platform with new carrier features including MPLS-TP, OAM and QoS and includes support for additional platforms optimized for carrier use cases. Carrier network operators will now have access to the same scalable infrastructure with programming abstractions that can be automated from standard controllers resulting in cost and time efficiencies. Examples of these include requirements for a Packet Transport Network (PTN) switch and the semantics of hardware packet flows.

Broadcom's OF-DPA v2.0 reference platform implements the Open Networking Foundation (ONF) OpenFlow 1.3.1 specification. OF-DPA defines and implements a hardware abstraction layer that maps the feature-rich StrataXGS switch architecture to the OpenFlow v1.3.1 switch and pipeline while providing innovative concepts on how OpenFlow can be implemented in the most efficient way. The OF-DPA specification and API are openly published and provided with turnkey reference implementation on Original Device Manufacturers (ODM) and Open Compute Project (OCP)-compliant switches to enable a community and academia-based development ecosystem.

**OF-DPA Version 2.0 Key Features**

- Support for MPLS-TP, MPLS L3 VPN, VLAN Translation, and QoS DiffServ per-hop behavior based on RFC-compliant Meter table extensions
- Leverages ONF Forwarding Abstractions Working Group Table Type Patterns (TTP)
- Scalable OpenFlow switch pipeline that efficiently utilizes ASIC resources and that supports multiple platforms
- Significantly improves latency and throughput of flows at scale using multiple tables and leveraging intrinsic ASIC capabilities such as advanced multipath support
- Enables popular SDN use cases such as virtual tenant networks, network virtualization, traffic engineering and service chaining

**Industry Quotes**

**Network Operators:**

Dr. Li Han, Vice Director, Network Technology Department, China Mobile Research Institute

*"China Mobile has pioneered the design and implementation of packet-based transport networking (PTN) and is actively leading the introduction of SDN controls in our next-generation Super-PTN network. We are looking forward to chip level solutions and the release of OF-DPA 2.0 for transport networking is an important milestone in enabling a wide array of existing switch solutions to be rapidly deployed to meet China Mobile’s Super-PTN application requirements and to unleash the full"*
potential of OpenFlow over merchant silicon."

Original Equipment Manufacturers (OEMs):

Philippe Michele, Director, Products and Networking, Hewlett Packard
"Broadcom's OF-DPA 2.0 software has enabled support for use cases such as MPLS-TP, OAM, and QoS, which is a significant step forward for software-defined networking. The combination of Broadcom software and HP's SDN solutions enables the agility and security that Service Providers need to deploy a distributed infrastructure."

Akio Iijima, Chief Product Architect, Converged Network Division, NEC Corporation
"NEC has worked with Broadcom to enable scalable OpenFlow 1.3-based Programmable Flow solutions on high performance ASICs for our next generation leadership datacenter products."

Nir Halachmi, Director, Strategic Product Management and Innovation, Telco Systems
"Telco Systems' vINOX, the first carrier SDN operating system with OpenFlow support, builds on OF-DPA 2.0 and enhances it to perfectly match service providers' specific needs. OpenFlow facilitates granular visibility and control of networks while simplifying and expediting the introduction of new services. Leveraging Telco Systems long partnership with Broadcom to embrace the SDN vision of merchant ASIC based data plane with OpenFlow as the control plane, Telco Systems' vINOX supports smooth migration from CE2.0 networks to next-generation SDN."

Original Device Manufacturers (ODMs):

George Tchaparian, Senior Vice President of R&D and Business Development, Accton Technology Corporation
"Accton is excited to add OF-DPA 2.0 and its rich set of OpenFlow-based programmable network capabilities to our family of bare-metal and OCP-compliant datacenter switches that we develop in close collaboration with Broadcom. Accton's subsidiary, Edge-Core Networks, will deliver the enhanced programmability, openness, and services enabled by OF-DPA to enterprises, big data and service provider customers as part of Edge-Core datacenter and broadband services infrastructure solutions."

John Muller, Vice President, Sales, Advantech Networks and Communications Group
"To remain competitive, network service providers must respond to evolving traffic types and changing network demand in significantly shorter time frames than before. Broadcom's OF-DPA v2.0 reference platform brings new efficiencies to Advantech's high capacity StrataXGS-based switches enabling customers with not just a leap in performance, but an optimized OpenFlow 1.3.1 implementation for greater flexibility and control over accelerated new service provisioning."

Philippe Chevallier, Director, Product Management, Platform Architecture, Communications BU, Kontron
"As a long-standing Broadcom partner, Kontron is leveraging the OF-DPA 2.0 software package to ensure its StrataXGS-based switches provide carrier network operators the quickest and most versatile path to deploying NFV and SDN environments using the COTS-based SYMKLOUD converged cloud infrastructure platforms."

Oliver Vautrin, Head, Product Line Management, Pica8
"Pica8 is working with Broadcom to improve the capabilities and possibilities of OpenFlow-based SDN applications. A great example is Table Typing (TTP), which is a significant advancement in OpenFlow solution design and will open the door for fully capitalizing on the features of Broadcom ASICs for SDN applications."

Ecosystem Partners:

Kiyo Oishi, CEO and President, IP Infusion
"Broadcom's OF-DPA 2.0 gives users a simple and easy way to implement multiple flow tables, project the table type definitions to controller, and most importantly, to utilize the build-in pipeline of the chipset to implement services mimicking a traditional switch, but with the flexibility of OpenFlow. By making it easier to use and test APIs, our carrier network and datacenter customers will be able to benefit from faster development and test cycles to more quickly deploy new applications and services."

Andy Randall, General Manager, Networking Business Unit, Metaswitch
"Thanks to OF-DPA 2.0, companies using Metaswitch control plane technology can now use Broadcom's API to support a broad range of advanced, SDN control plane features, including MPLS-based VPNs. For example, we were able to use Broadcom's OF-DPA technology to access the full capabilities of the underlying silicon and turn a low-cost OpenFlow switch into a powerful border router — a solution that can reduce the cost and complexity of delivering highly-scaled datacenters."

Atsushi Takahara, Director, NTT Network Innovation Laboratories
"We are very excited that Broadcom's OF-DPA v2.0 will extend OpenFlow-based SDN capability and capacity for not only datacenter but also wide-area network and access network with state-of-the-art Broadcom silicon technologies for switching fabric. Collaboration with Lagopus SDN switch agent and Broadcom OF-DPA 2.0 for carrier grade use case and MPLS-based segment routing with OpenFlow technology will contribute to SDN open source community and OpenFlow extension."
Dan Pitt, Executive Director, Open Networking Foundation (ONF)
"We are excited to see strong silicon support for the OpenFlow protocol; the Open Networking Foundation has been actively cultivating such support, which brings true OpenFlow-based SDN capabilities to the high-performance forwarding plane. Network operators benefit from a choice of both hardware and software switches and overlay and underlay approaches, and OpenFlow fills the market demand for a native, standard, vendor-neutral southbound protocol."

Philip Pokorny, Chief Technology Officer, Penguin Computing
"The rapidly evolving SDN market will benefit greatly from standardization in Broadcom’s OF-DPA 2.0 reference platform. The improvements in performance, scalability, flexibility and control over provisioning of network services would enable Penguin Computing, with its leadership in Open Compute technologies, to provide a superior integrated SDN solution based on its Arctica switching product line."

Availability

Broadcom’s OF-DPA v2.0 EA0 reference platform is now available and includes a comprehensive OpenFlow 1.3.1 compliant specification. For more information on Broadcom’s OF-DPA 2.0 specification visit: http://www.broadcom.com/products/Switching/Software-Defined-Networking-Solutions/OF-DPA-Software

For ongoing Broadcom news visit our Newsroom, read our B-Connected Blog, or visit us on Facebook or Twitter. And to stay connected, subscribe to our RSS Feed.

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For the original version of this press release, visit: http://www.prnewswire.com/news-releases/broadcom-delivers-next-generation-open-switch-pipeline-specification-300006603.html

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