APS Networks® launches three TIP OpenBNG programmable switches to boost the disaggregated telco broadband market.

Operators gain further product alternatives right down to the chip level, supporting multi-sourcing strategies for Broadband Network Gateway (BNG) and hybrid use case requirements. The APS Networks® OpenBNG devices are based on Intel Tofino P4-programmable Ethernet switch ASICs, Stratix 10 MX FPGAs and Intel Xeon D Scalable processors.

Stuttgart, Germany – June 16th, 2021 – APS Networks® launches three BNG switches which aim to comply with the Telecom Infra Project's (TIP) OpenBNG requirements, enabling customers to choose between the TIP standard configurations (SC) SC-1, SC-2 and SC-3 leaf designs that best address end user demands. This provides operators flexible deployment options covering full-functionality deployments and service-only BNG deployments and leaf-spine configuration alternatives.

TIP OpenBNG is an initiative within the Open Optical & Packet Transport (OOPT) Project Group's Disaggregated Open Routers (DOR) sub-group. The participating operators in the Project Group are currently preparing a joint Request for Information (RFI) for OpenBNG, leading to test and validation activities and the awarding of TIP badges later in the year for compliant solutions. The OpenBNG initiative is backed by leading operators such as BT, Deutsche Telekom, Telecom Italia, Telefónica and Vodafone Group.

Disaggregated and open BNGs allow operators a choice of different hardware platforms and types of network operating system (NOS) and control plane applications they want to use. This agility results in a lower total cost of ownership, ultimately leading to a lower cost per broadband subscriber and reduces dependencies on individual monolithic suppliers. Disaggregation provides any user with more flexibility in services offerings and enhanced experiences, allowing organizations to easily adapt to ever-changing business requirements.

APS Networks® is a member of Broadband Forum, the leading open standards organization, that is increasing the scalability of operators' networks by creating a simplified and more agile architecture to address the increased bandwidth demands being placed on BNGs due to the growth of broadband demand and video consumption across devices. Broadband Forum's 'Control and User Plane Separation for a Disaggregated BNG' (TR-459) outlines the challenges in control plane and user plane scaling. This architecture reduces time to market for new services and simplifies network operation by reducing the number of management points.

APS Networks® is launching the following three BNG switch designs: The Hyperion APS2172Q, supporting 64x1/10/25G BNG user ports & 8x100G spine ports (SC-1), the Jupiter APS6120Q with 16x100G BNG ports & 4x1/10/25G ports (SC-2) and the Hyperion APS2140D with 32x1/10/25G BNG user ports & 8x100G spine ports (SC-3 leaf). The APS2172Q and APS6120Q support up to 32,000 broadband subscribers and the APS2140D up to 20,000 broadband subscribers.

The announced Advanced Programmable Switches (APS®) by APS Networks® make use of the Intel Tofino P4-programmable Ethernet switch ASICs, Intel Stratix 10 MX FPGAs with High-Bandwidth Memory (HBM), and MoSys® Blazar high-speed memories to allow for up to 7 layers of Hierarchical Quality of Service (HQoS) and buffer capabilities. The units feature Intel Xeon D processors, which provide high-speed connectivity between the compute board and switch board and include innovative hardware-enhanced security features.

All models can be equipped with a versatile Precision Time Protocol IEEE 1588v2 compliant add-on module, which enables the switches to operate as PTP boundary clocks. The PTP module has been designed by Oregano Systems, a MEINBERG® company, and supports a wide range of PTP profiles and features. It integrates a dedicated high-performance PTP hardware-processor and a high-quality OCXO into the new APS Networks® OpenBNG product line, allowing to build a highly interoperable and powerful synchronization infrastructure for a multitude of applications and use-cases. The PTP module will deliver end2end accuracies of less than 10ns.

Expanding upon the need for greater data and privacy protections, special attention was given to the overall security of the devices, strictly following the principles of 'Security by Design' with focus on a secure supply chain from design to production and enhanced security features on both hardware and software. Telco networks typically form part of a country's Critical National Infrastructure (CNI), making enhanced security mandatory.

The entirely new switch range comes with core software, including the lightweight and secure Yocto-based core OS mion, which falls under the Network Grade Linux Project by the Linux Foundation. The switches support OpenBMC and Redfish, boosted with further security features and use the Open Networking Foundation's (ONF) Stratum project to standardize north-bound APIs, making it easy for NOS vendors to port to the devices by using open standards.

The APS Networks® OpenBNG products support a range of commercial NOS options and an open source-based options making use of the ONF's Tassen, SD-BNG and Aether projects.

Availability: The APS2140D and APS6120Q are scheduled to be available from Q4 2021 as early access and the APS2172Q from Q1 2022. APS Networks® is taking orders from customers and partners interested in being part of our Early Access Program.

Webinars:

APS Networks® will host a webinar with further details on the OpenBNG switches on June 24th, 2021, at 07:00 AM PST / 16:00 CET. Please register under: bit.ly/APSN-OpenBNG-webinar

The Telecom Infra Project (TIP) is providing an update on OpenBNG on June 23rd, 2021, at 06:00 PST / 15:00 CET. The participating operators will provide updates on the project and insights into the required solutions. Please register under: https://hopin.com/events/openbng-webinar .

Quotes:

650 Group:

"Programmable switch ASICs and the move towards disaggregation opens up the market towards new applications and use cases such as APS Networks OpenBNG switch," said Alan Weckel, Technology Analyst at 650 Group. "5G and 6G will stress BNGs to the max and having an open, disaggregated and programmable BNG is key to delivering value to customers. We project that programmable and accelerated switches will outgrow the overall market through 2025 as operators unlock the value of these systems."

APS Networks:

"After years of conceptional work, we are proud to offer our service provider customers a choice for their disaggregated BNG strategies right down to the chip level based on innovative Intel technology," says Alexander Jeffries, Chief Executive Officer for APS Networks. "These products will allow customers the highest degree of flexibility and security, whilst keeping their total cost of ownership per subscriber under control. This was only possible with Intel as a strategic partner, and we are thankful for their support."

"The APS Networks range of OpenBNG switches accelerate the possibilities for access edge solutions. Combining these low latency products of Intel Tofino P4-programmable switch ASICs and Intel Stratix

10 MX FPGAs, with world-class PTP capabilities and Intel Xeon D processors, APS Networks have designed and developed a unique range of network switches for the wireline broadband market. The versatility of FPGAs enables multigigabit user port technology with High Bandwidth Memory (HBM) for multi-layer Hierarchical Quality of Service (HQoS), which is combined with programmable protocol stacks to create powerful Broadband Network Gateway (BNG) access switches. APS Networks have developed a series of network switches that live up to future requirements today, for the wireline and wireless markets." – Andy Heal, Chief Technology Officer for APS Networks

Broadband Form (BBF):

"The industry continues to recognize the need for flexible scalability. This is achieved through an agile architecture constructed to meet service provider needs and a Disaggregated BNG ensures that operators no longer have to resort to simply adding more BNGs into the network," said Broadband Forum Managing Director Ken Ko. "Disaggregated BNG user plane deployments can be easily scaled to match subscribers' broadband demand and be managed by a single control plane function in a centralized location and can result in a reduced operational expenditure (OPEX) for operators. TR-459 specifically is a reference architecture with standardized interfaces and protocols that ensures our members such as APS Networks can seamlessly offer flexible deployment options for operators."

Intel:

"It is great to see APS Networks deliver a range of BNG use case switching solutions based on the TIP Open BNG specifications," says Guido Appenzeller, Chief Technology Officer for Intel's Data Platforms Group. "By harnessing the capabilities of our Intel Tofino P4-programmable switch ASICs, Intel Stratix 10 MX FPGAs with additional memory options and Intel Xeon D processors with enhanced security features, APS Networks is delivering a range of powerful options to customers for BNG, and hybrid use cases."

Kaloom:

"Having developed our distributed Edge Networking software solution based on Intel Tofino P4-programmable switch ASICs and Intel Xeon processors, we welcome the opportunity to leverage APS Networks' switches that bring together the best of P4 programmability and additional buffer capability opening up many new possible services/applications. Having NGL, Stratum, OpenBMC and Redfish support also make these switches more accessible and manageable." – Per Anderson, Chief Architect, Kaloom

LightCounting:

"After a successful Q1 2021 which saw disaggregated cell site router units grow exponentially, +356% vs. Q1 2020, it is clear the disaggregated router market is evolving and ready for diversification. As the adoption of standards like open broadband network gateway (BNG) and open radio access network (RAN) endure, telecom operators are exploring different device options to meet their specific needs. Key parts of an operator's network deployment strategy include ensuring they are operating at the lowest cost per subscriber, meeting stringent security regulations, and have access to a variety of hardware and software equipment choices in an effort to avoid potential vendor lock-in. Therefor new vendor entries into the open BNG market are a welcome sight for the entire ecosystem." – Devan Adams, Principal Analyst at LightCounting

Linux Foundation (LF):

"Network Grade Linux is poised to dramatically reduce maintenance and support requirements for major network manufacturers and providers," said Trishan de Lanerolle, technical program manager & community architect, at the Linux Foundation. "It is no surprise that it's being rapidly adopted by ecosystem participants to accelerate innovation in networking, especially with the rollout of 5G. That said, it's great to see organizations like APS Networks responding collaboratively to market needs via flexible and scalable solutions."

Meinberg:

"The new product line of APS Networks comes with some impressive features and opens up a universe of possibilities for the Open Network community – and beyond. We were very happy to be able to contribute to this feature set by designing a PTP module for the three new switch models and are looking forward to finding out how our mutual customers are going to utilize the incredible firepower of the switches in combination with our flexible and powerful sync technology." – Heiko Gerstung, CEO, MEINBERG® Funkuhren GmbH & Co. KG

MoSys:

"Innovative companies like APS Networks understand how to extract the utmost performance and functionality obtainable from combining our MoSys Blazar Bandwidth Engine® ultra-highspeed memories with the latest Intel Stratix 10 FPGAs and Intel Tofino P4-programmable Ethernet switch ASICs," says Daniel Lewis, MoSys CEO. "We are pleased to be working with APS Networks, as they bring these new switches to the telco market."

Togán Labs:

"Togán Labs are proud to have worked closely with APS Networks to bring Network Grade Linux and mion to launch. NGL fills the market need for a secure open source core OS for network devices, and has a stable community of contributors behind it." said Beth Flanagan, CEO of Togán Labs and Linux Foundation Yocto Project Ambassador. "NGL mion is built on the Yocto project, with long term supported branches ensuring ongoing security needs are met. The Yocto base also means that the footprint of mion is very small in comparison with alternative implementations."

Open Networking Foundation (ONF):

"ONF is pleased to see APS expanding the universe of P4 powered networking devices. With APS shipping these systems natively running the Stratum thin switch OS, we expect these new platforms to work seamlessly with ONF's SD-Fabric full-stack solution. We expect this will offer developers and operators exciting new options with P4 networking devices that can support greater numbers of subscribers and more sophisticated traffic processing." – Timon Sloane, VP Marketing & Ecosystem, ONF

Telecom Infra Project (TIP):

"Our operator members participants believe that open and disaggregated BNGs are a vital part of the telecoms ecosystem," said David Hutton, Chief Engineer of TIP. "The availability of secure, flexible and cost-effective solutions from suppliers such as APS Networks, responding to operators' requirements, is crucial to the success of this initiative, and we are excited to see this new generation of products come to market."

Further information is available under:

[Products – APS Networks (aps-networks.com)](aps-networks.com)

[Open Optical & Packet Transport - Telecom Infra Project](#)

[Intel Tofino Series Programmable Ethernet Switch ASIC](#)

[Intel Stratix 10 MX FPGA Overview - High Performance Stratix FPGA](#)

[Home - Network Grade Linux](#)

[Stratum - Open Networking Foundation](#)

About:

APS Networks® is a networking product company that specializes in programmable network devices in combination with open source-based networking software. Established in 2020, the

company has a large focus on overall network security and follows the 'Security by Design' and secure supply chain principles. The company is committed to developing supported and trusted hardware and software products, which have been inspired by and are based on open source community frameworks and projects, enabling these as commercial, secure and fully supported solutions. APS Networks® serves the telecommunications, broadcasting, cyber security, academic and other market verticals, where programmable network devices offer key strategic value and allow for features which typically could not be addressed by traditional fixed function network devices. APS Networks® is an Intel® Network Builder Program Solution Partner and is a member of the Open Networking Foundation (ONF), the Open Compute Project (OCP), the Telecom Infra Project (TIP), the Broadband Forum (BBF) and the P4 Language Consortium.

All mentioned product features, part codes and names are forward thinking and subject to change.

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