Robust FleXGS™ packet switching architecture scales from hundreds of Gbps to multiple Tbps, enabling in-field upgrade to extend the asset life of data center, campus, and service provider networks

Trident 3

The Broadcom Trident 3 is an ethernet switch with new levels of data plane programmability

Broadcom Corporation

SAN JOSE, Calif. and SINGAPORE, June 14, 2017 (GLOBE NEWSWIRE) -- Broadcom Limited (NASDAQ:AVGO), today announced immediate availability of the first members of its breakthrough Trident 3 family of programmable switches for data center, enterprise, and service provider networks transitioning to high density 10/25/100G Ethernet. Manufactured in 16nm and building on the widely deployed StrataXGS® Trident and Tomahawk® switch products, the new StrataXGS Trident 3 switch series offers fully programmable, line-rate switching solutions ranging from hundreds of Gbps to multiple Tbps, complete with large reconfigurable on-chip databases, best-in-class load balancing, and rich embedded instrumentation for network visibility.

Key benefits of the new StrataXGS Trident 3 switch family include:

- Market-leading StrataXGS Trident switch architecture revolutionized to support fully programmable packet processing, while achieving significant cost and power efficiency advantages over alternatives

- Programmable support for new protocol parsing, processing, and editing for Service Function Chaining, Network Virtualization, and Software-Defined Forwarding

- Programmable support for new switch instrumentation capabilities such as in-band and out-of-band network telemetry

- Fully verified, feature-rich Trident 3 programming images and flexible software APIs enabling complete functional compatibility to StrataXGS Trident 2 and Trident 2+ based networks, maximizing customer investment protection and providing fastest time to network deployment

- 3.2Tbps and 2.0Tbps devices sampling now; part of complete Trident 3 portfolio extending from several Tbps down to 200Gbps of switching, leveraging a single, unified software development effort and programming flow

- Industry's broadest line of cost-and power-optimized programmable switches, providing end-to-end network feature consistency across enterprise, data center, and provider edge, as well as in-network upgradeability for maximum asset life

"The innovation in our StrataXGS Trident 3 Series is in delivering a fully programmable switching pipeline while maintaining backwards compatibility to the existing install base of StrataXGS Trident and Trident 2 based networks," said Ram Velaga, senior vice president and general manager, Switch Products at Broadcom. "Rather than a blank slate, our customers want a scalable, bulletproof network data plane that is reprogrammable to address future requirements, while continuing to aggressively drive down Ethernet cost and power. With Trident 3, we've uniquely delivered that solution. Our customers can leverage a single development to yield a complete line of programmable switching platforms, with the same rich feature set extending all the way from the service provider edge, to the data center, converged campus core, and wiring closet."

The FleXGS™ architecture in Trident 3 comprises of new programmable parsing, lookup, and editing engines with associated reconfigurable databases. The engines are dimensioned and arrayed to maximize parallelism, performance, functional capacity and area/power efficiency to best address the diverse and concurrent needs of today's evolving networks.

The pipeline can be programmed to handle software-defined network virtualization and service chaining protocols, including VXLAN, GPE, NSH, Geneve, MPLS, MPLS over GRE, MPLS over UDP, GUE, Identifier Locator Addressing (ILA) and PPPoE, among others. The architecture also supports programmable telemetry, including the insertion/processing of in-band telemetry headers (and associated packet metadata such as traffic identifiers and timestamps) as well as out-of-band network visibility (such as per-packet/per-flow attribute histograms and new ERSPAN like protocols). Programmability can be used in conjunction with Trident 3 native traffic engineering functions such as configurable ECMP and dynamic, state-based load balancing and multipathing.

"Broadcom's approach to programmable switching in the Trident 3 line distinctly enables the implementation of new and diverse packet processing use cases with a pipeline that boasts optimal silicon power and area, deterministic PPS performance, and bandwidth scalability even greater than its more purpose-built predecessor," said Bob Wheeler, principal analyst at The Linley Group. "With multiple, optimized Trident 3 products ranging from 25/100GbE data center leaf-spine to multigigabit campus distribution, network operators can deploy new software-defined visibility, overlay, and forwarding capabilities uniformly across their infrastructure in a highly responsive and efficient manner."

Broadcom's FleXGS Programmability provides the ability to introduce completely new switching and instrumentation features via field-upgrade. Network OEMs, ISVs, and operators can hence take advantage of Trident 3's programmability, while leveraging the rich and robust switching feature set developed and deployed over multiple generations of configurable StrataXGS switch devices.

FleXGS Programmable Architecture Key Features

- Fully Programmable Packet-Processing Pipelines: parsers, editors and lookup/action engines

- Support for next-generation overlay protocols, including NSH, VXLAN-GPE, VXLAN-IPv6, Geneve, MPLS-over-GRE/UDP, ILA, GUE, and more

- Programmability enables new overlay processing and instrumentation features delivered via in-network software upgrade

- Large, parallelized, and shared match-action databases for maximum table efficiency and per-packet lookup capacity

- Flexible programming models: script based programming flow for power users, in addition to fully-verified, turnkey switch program images for fastest time-to-market

- Unified software development model across devices with flexible APIs, offering quick and seamless leverage of programmable capabilities

StrataXGS Trident 3 Switch Series Key Features

- High density 1/2.5/5/10/25/40/50/100GbE port connectivity using best-in-class integrated 10/25Gbps NRZ SerDes

- Example single-chip platforms and line cards include spine and converged campus core (32x100GbE), 25/100GbE Top-of Rack (48x25GbE + 8x100GbE) and 10/100GbE Top-of-Rack (48x10GbE + 6x100GbE)

- 32MB on-chip, 100% fully shared packet buffer delivers up to 8X higher network burst absorption and congestion avoidance compared to previous generations

- Large, programmable on-chip forwarding databases for L2 switching, L3 routing, label switching, and overlay forwarding

- 3X increased ACL scale to support evolving policy/security requirements

- PCIe Gen3 x4 host CPU interface with on-chip accelerators improves control-plane update and boot performance by up to 5X

- Programmable support for enhanced network telemetry, including per-packet timestamping, Flow Tracker, microburst detection, latency/drop monitor, Active-probe-based in-band network telemetry, and in-band OAM processing; integrated with open-source BroadView v2 telemetry agent and analytics software

- Dynamic, State-Based Flow Distribution provides systematic and adaptive reduction in link congestion and traffic imbalances in large-scale Layer3/ECMP leaf-spine networks

- Adaptive Routing for dynamic traffic engineering in non-Clos topologies

- Full feature compatibility with previous generation Trident 2 and Trident 2+ devices

Availability

Broadcom is now sampling the first two members of the StrataXGS Trident 3 family: BCM56870 (3.2 Tbps) and BCM56873 (2.0 Tbps).