Empowering the network Edge with Cisco and Arm

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The Edge Takes Center Stage

As part of the ongoing digital transformation across multiple industries, we are witnessing essential changes at the network edge. Today, the enterprise edge is increasingly software-driven, as well as functionally less well-defined. Its evolving role is ushering in a dynamic innovation cycle.

Gartner recently spotlighted the importance of the edge in "Top 10 Strategic Technology Trends for 2018:"

"Connectivity and latency challenges, bandwidth constraints and greater functionality embedded at the edge favors distributed models. Enterprises should begin using edge design patterns in their infrastructure architectures — particularly for those with significant IoT elements." [1]

The widely anticipated rollout of 5G is also driving new expectations, mandating an increasing need to handle data and extract intelligence at the edge. The rise of 5G coincides with an explosion of connected devices and systems associated with the Internet of Things (IoT).

"No matter what the setup looks like, the influx of additional data — which will need to be processed in real-time—will drive the need for edge computing. It allows for faster processing of data, reducing latency and improving customer experiences." [2]

This solution brief discusses how the Cisco ISR1000 Series – a scalable, feature-rich services-based routing platform utilizing efficient compute technology from Arm – helps enterprises and Mobile Network Operators (MNOs) extend and enhance the capabilities of today's networks, while simultaneously laying the groundwork for a 5G-ready edge.

Enabling a Heterogeneous Edge

As 5G and other innovative technologies emerge, business outcomes will be more closely tied to mobility. Computing habits are changing, and the mobile office is emerging as the dominant model across industries. People are using mobile devices more than desktops and workstations not just for entertainment, but increasingly for performing most of their work functions as well. We're seeing the shift reflected in escalating investment in leading mobile platforms, such as Android and iOS.

Today's hardware manufacturers are pursuing design and development for mobile application environments as a high priority. Microsoft's partnership with Qualcomm to launch Windows on Arm as part of its "Always Connected Devices" strategy is positioned to take advantage of connectivity that is increasingly reliant on highly-available cellular networks instead of Wi-Fi. Arm is the only viable technology that can deliver the performance efficiency required to meet increased demands of endpoints combined with the network's access layers.

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1 www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2018/

2 www.networkworld.com/article/3255426/lan-wan/why-5g-is-bringing-edge-computing-and-automation-front-and-center.html

"With its Cisco-based solution, Verizon is simplifying its current configuration for better control of upfront and ongoing management costs."

In the case of wireline networks, data center operators and enterprise network OEMs are developing and deploying platforms that have built-in cloud connectivity, through virtualized software runtimes optimized for the edge.

Such platforms that are being deployed downstream on the network edge are expected to do more, securely. An effective edge device should offer functionality beyond fast, efficient routing, and be capable of hosting application services such as SD-WAN. Today's expensive, power-hungry compute solutions simply cannot address requirements for a scaled-out enterprise edge.

A Partnership of Two Industry Leaders

To deliver the power and performance that service providers and enterprise organizations require at the edge, Cisco and the Arm partner ecosystem have collaborated to deliver a highly capable services platform, the Cisco ISR 1000 Series.

Cisco® 1000 Series Integrated Services Routers (ISRs) with Cisco IOS® XE Software combine Internet access, comprehensive security, and wireless services (LTE Advanced 3.0 wireless WAN and 802.11ac wireless LAN) in a single, high-performance device. The routers are easy to deploy and manage with cutting-edge, scalable, multicore data and control plane capabilities.

Cisco 1000 Series ISRs are powered by multiple 64-bit Arm processors with separate cores allocated for the data plane, the data plane scheduler, and the control plane. Their high performance allows organizations to take advantage of broadband and LTE network speeds while running secure, concurrent data, voice, video, and wireless services.

The ability of the Cisco ISR 1000 Series to host virtual services makes it ideal for deployment as Customer Premises Equipment (CPE) that will usher in a new era of a Software-Defined Branch. Their Arm processor's powerful combination of performance and efficiency enables full-feature support for Cisco's industry-standard IOS-XE network operating system to be deployed at the enterprise and service provider edge. Furthermore, this architecture provides a robust platform for extending the Software-Defined WAN into some of the smallest remote sites.

A World-Class Connectivity Solution for Verizon Retail

To ensure a consistently reliable experience online and at its 1,700 stores, Verizon deployed a solution based on the ISR 1000. This advanced LTE solution provides up to twice the throughput that was available previously. Working with the Verizon Wireless Private Network, the combination provides the solution the retailer needed, along with encrypted VPN traffic for strong security.

With its Cisco-based solution, Verizon is simplifying its current configuration for better control of upfront and ongoing management costs.

"Watch for continued innovation in this space as these leaders continue collaborative efforts to build solutions that power tomorrow's network edge."

The Latest Evolution in a Broad Portfolio

With the groundbreaking combination of the Arm architecture with Cisco IOS-XE software, customers can now choose from a wide range of Cisco routers to match whatever their network demands. With software and features that are consistent with the ISR 4000 Series and ASR 1000 Series, the ISR 1000 Series provides a reliable, feature-rich platform, and a strong foundation for delivering a Software Defined WAN (SD-WAN). The platform's subscription-based model provides tremendous flexibility for highly distributed organizations.

Building on top of IOS-XE routing platforms, Cisco SD-WAN provides an easy-to-deploy solution of rich network services that don't require multiple degrees and certifications to deploy and manage. Security is a given with encrypted links by default.

The solution also gives organizations the ability to match application requirements to the most appropriate WAN circuit, recapturing the idle bandwidth in expensive backup circuits. The result is unmatched integrity, reliability, and application quality-of-experience. Enabled by the compelling performance and value delivered by Arm technology, efficient platforms such as the ISR 1000 Series offer a strong foundation for SD-WAN deployments.

Extending the Edge with Cisco and Arm

Cisco began developing the latest offering in its ISR Series as part of its initiative to drive its Linux-based Network Operating System (IOS-XE) deeper into its enterprise routing portfolio. The solution would require multi-core CPUs that would provide the right balance between performance and power efficiency to create "fan-less" systems deployed at the enterprise and the Mobile Network Operator edge.

SoCs based on Arm technology were found to be a perfect fit, as it enabled power-efficient designs offering unprecedented throughput and scalability—while maintaining or improving on the system price points needed and wanted by the market.

The flexible technology supports a broad choice of hardware and platform ecosystems, including the Marvell® ARMADA® 7000 and 8000 Series.

Conclusion

Cisco, Arm, and its partner ecosystem have collaborated to enrich and extend the service provider and enterprise edge, thus helping organizations stay ahead of the ongoing digital transformation. Watch for continued innovation in this space, as these leaders continue collaborative efforts to build solutions that power tomorrow's network edge.