SOLUTION BRIEF

Communications Service Providers
Universal Customer Premises Equipment (uCPE)

Aethra Telecommunications* uCPE Bridges Legacy, Future Networks

Aethra Telecommunications has distinguished its universal CPE for small and medium enterprises and branch offices by developing fully integrated devices with embedded fixed and mobile WAN interfaces. Powered by Intel Atom® SoCs, each Aethra Telecommunications solution offers a single platform for legacy WANs and today's cloud services.

Evolution of Broadband Access Services

Computing megatrends like cloud computing, increased use of mobile devices, and digital transformation are impacting small and medium businesses (SMB) and branch offices just as they are impacting large enterprises.

But the smaller organizations and sites have fewer IT resources with which to manage the transition. Thus they often turn to communications service providers (CommSPs) to provide the connectivity services—and sometimes the cloud computing resources—needed to manage in this new era.

Aethra Telecommunications* has worked with these customers in 60 countries throughout the world for more than 40 years. The company pioneered digital communications equipment in the 1970s and broadband DSL equipment in the 1990s. Now, it is evolving its expertise to network functions virtualization (NFV) and software defined networking (SDN). From the vantage point of its experience and customer base, the company has identified three telecommunications trends that are driving NFV/SDN solutions in SMB and small branch office networks. These include:

- Adoption of ultra-broadband services: Gigabit Ethernet and faster WAN services are a necessity for branch offices that are actively adopting cloud services or are utilizing more streaming video in their operations.
- New hybrid fixed-mobile networks: Branch office connections need high throughput and always-on connectivity. To ensure that, they are adopting 4G mobile services as back up to their existing IP/DSL-based services, offering super-fast download speeds on their wireless services.
- Becoming more data centric: This trend has been ongoing for a number of years as new cloud applications push data throughput higher, while telephony minutes decrease or move to voice over IP.

These trends are driving the natural technology evolution to NFV/SDN because customers are changing their services and want increased flexibility, simplified and remote management, and a reduction in the space needed for multiple dedicated network appliances. Aethra Telecommunications is responding by leveraging its technology experience to deliver platforms that bridge legacy networks to the next generation of NFV-based systems.

The Solution

Aethra Telecommunications SV6000M and XV8800 are highly scalable fully integrated universal customer premises equipment (uCPE) systems delivering a full range of WAN and cloud services for branch offices or small and medium businesses. Some of the key uses cases include:

- Software defined WAN (SD-WAN): SV6000M and XV8800 can provide a single-box solution for SD-WAN services that intelligently route sensitive data to dedicated legacy networks or to cloud services on the Internet.
- Branch office router: The uCPE device is configured as a full-fledged router with virtual network functions (VNFs) added to enable data security or other services.
- Ethernet demarcation point: Aethra Telecommunications uCPE acts as an Ethernet demarcation device (EDD) between customer and CommSP networks, delivering layer 2 IP switching into the carrier network combined with operations administration and management (OAM) features that are required to interact with the CommSP network. In this mode, the device manages WAN and Wi-Fi with vCPE or SD-WAN routing is managed by third-party VNF.
- Compute-only mode: In this mode, the Aethra Telecommunications Operating System (OS) features are utilized only to manage WAN and Wi-Fi connectivity. Third-party VNFs provide all additional services.

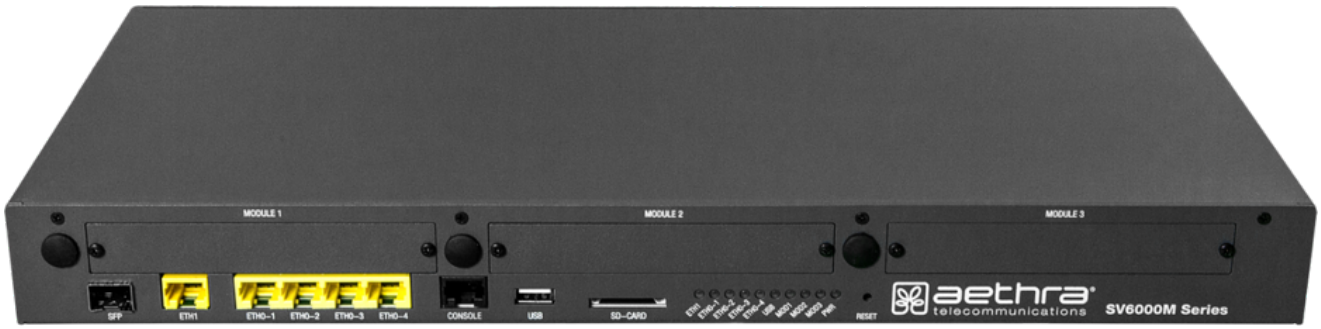

Figure 1. Aethra Telecommunications SV6000M. The three modules can support a wide range of WAN, IP, and voice connectivity options.[1]

At the heart of the SV6000M and XV8800 systems is the Aethra Telecommunications OS, a router OS that includes business-class layer 2/layer 3 networking features. Aethra Telecommunications OS supports popular network protocols (including RIP, NAT, DHCP, OSPFv2 BGP and others) along with features such as quality of service (QoS) and security features such as IPsec.

Aethra Telecommunications OS provides this complete networking capability utilizing two CPU cores, which leaves between four or eight cores available for other services. Examples of VNFs include firewall and unified threat management (UTM) applications or SD-WAN, as well as industrial internet of things (IIoT) VNFs.

The virtualization infrastructure is based on KVM* hypervisor with optional OpenStack* support for the compute node. This use of open source software makes the systems compatible with a wide range of third-party VNFs. The system also utilizes the open source Data Plane Development Kit for fast packet processing performance. Aethra Telecommunications works with all of its carrier partners to integrate and test VNFs to maximize performance.

Integrated Voice and Legacy WAN Support
The systems have an integrated voice gateway with integrated services digital network basic rate interfaces and primary rate interfaces and foreign exchange subscriber (FXS) ports to support voice applications and handset connectivity. With a PBX VNF installed, the system becomes a complete small office PBX.

Another differentiator is the flexibility to support both gigabit Ethernet and legacy WAN (FTTx, MPLS, xDSL) networks so that when an SD-WAN VNF is utilized, the uCPE can act as a bridge between legacy WAN connections and IP-based services. A 3G and 4G/LTE wireless capability is also available to serve as a wireless backup connection to the network in the event of an outage on the wired connection.

Powered by Intel® Processors
To get the right balance of performance and price, Aethra Telecommunications servers are powered by Intel® processors, including Intel Atom® processors C3000 and Intel Atom processors C2000.

Intel Atom processors C3000 and Intel Atom processors C2000 are low power systems on chips (SoCs) that deliver new options for cost and infrastructure optimization by bringing the efficient performance and intelligence of the Intel Atom processor into a dense SoC. The Intel Atom processor C3000 is Intel's third-generation SoC-based CPU manufactured on Intel's optimized 14 nm process technology. It can be deployed for a variety of light scaled-out workloads that require very low power, high density, and high I/O integration including network routers, switches, storage, security appliances, dynamic web serving, and more.

The Intel Atom processors C3000 feature Intel virtualization technologies, including single root input/output virtualization (SR-IOV) and Intel® Virtualization Technology for Directed I/O (Intel® VT-d). For encryption performance, the Intel Atom processors C3000 features Intel® Advanced Encryption

Standard New Instructions (Intel® AES-NI), and Intel® QuickAssist Technology (Intel® QAT). Combined, these technologies give the device the features and throughput for virtual CPE, universal CPE, SD-WAN, and software-defined security applications.

Conclusion

Faster networks, cloud services and more mobile devices are changing the networking needs of small offices and small businesses. uCPEs are a great fit for the needs of this customer segment because they feature flexible service deployment and a single platform for lower cost. Aethra Telecommunications' uCPE platforms leverage the company's extensive experience in WAN and voice network interfaces combined with the power of the Intel Atom SoCs to provide the connectivity and compute power that CommSPs need to support these customers.

About Aethra Telecommunications

Aethra Telecommunications built its foundations in the early years of digital communications in the 1970s and grew exponentially in the 1980s and 1990s with several millions of ISDN NTs installed in more than 60 countries worldwide.

At the dawn of the 21st century, Aethra Telecommunications launched its first integrated access device embedding DSL connectivity into a voice-over-IP gateway. Today, with over 40 years of experience in telecommunications and hundreds of thousands of DSL customers served worldwide, Aethra Telecommunications are fully committed to the network virtualization revolution of NFV and SDN.

About Intel® Network Builders

Intel® Network Builders is an ecosystem of infrastructure, software, and technology vendors coming together with communications service providers and end users to accelerate the adoption of solutions based on network functions virtualization (NFV) and software defined networking (SDN) in telecommunications and data center networks. The Network Edge Ecosystem is a new initiative gathering ecosystem partners with a focus on accelerating network edge solutions. As an integral part of the broader Intel Network Builders program, this initiative aims to facilitate partners' access to tested and optimized solutions for network edge and cloud environments. Learn more at http://networkbuilders.intel.com.

[1] Figure courtesy of Aethra Telecommunications.

0518/DO/H09/PDF ♻ Please Recycle 337631-001US