

The Arista Advantage

The world is moving to the cloud to achieve better agility and economy, following the lead of the cloud titans who have redefined the economics of application delivery during the last decade. Arista's innovations in cloud networking are making this possible. New modern applications such as social media and big data, new architectures such as dense server virtualization and IP Storage and the imperative of mobile access to all applications have placed enormous demands on the network infrastructure in datacenters.

- Applications have been decomposed into multiple tiers of interoperable subsystems leveraging new standards. These applications are deployed in scalable pods or clusters that make scaling and supporting them easier.
- Traffic patterns that once centered on the use of lightly utilized links in and out of the datacenter (north-south) for mainframe and client-server applications have been supplanted by highly distributed applications that drive heavily utilized links for server-to-server and server-to-storage (east-west) traffic within the datacenter.
- Datacenters that once consisted of hundreds of servers are now built on a scale of more than 100,000 physical servers and more than one million virtual machines (VMs) or containers.
- Availability requirements for the new datacenter network are also higher -- now 24x7x365 -- with no time for maintenance windows or planned downtime.

Network architectures, and the network operating systems that make the cloud possible, need to be fundamentally different from the highly over-subscribed, hierarchical, multi-tiered and costly legacy solutions of the past.

Arista Networks was founded to deliver software-driven cloud networking solutions for these large datacenter and cloud computing environments. Arista is focused on building 10/25/50/100 Gigabit Ethernet (GbE) switches that redefine network architectures, bring extensibility to networking and dramatically change the price/performance of datacenter networks. The market that we serve is projected to grow to \$13B in 2021, and we are currently the number two and the fastest growing supplier of products to this market.¹ This market can be characterized as having three segments: the traditional enterprise where turnkey solutions are predominant and the move to the cloud is accelerating, enterprise verticals where IT delivers a competitive advantage and best of breed solutions are used, and the Cloud Titans and Service Providers where scale and control over their infrastructure are paramount.

Arista's products, based on a transformational new approach to building high-speed network switches, were first used in high frequency trading applications for their wire speed performance, ultra-low latency and high reliability. Arista's solutions were subsequently adopted by 6 of the 7 largest hyperscale cloud computing companies for their scalability, low-latency, programmability and resiliency. As enterprises have aimed at replicating the efficiency and agility of cloud architectures, and as they seek the agility and cost structure of the hyperscale cloud providers, they are also discovering the benefits of breaking from the status quo and are applying the Arista advantage to their business.

The Arista Advantage

Arista has disrupted the market for high-speed datacenter switches with two principal innovations. Our core innovation has been to build a better network operating system, Arista EOS® (Extensible Operating System), which we have built from the ground up using innovations in core technologies since our founding in 2004. We now have more than 10 million lines of code and ten thousand person-years of advanced distributed systems software engineering in our operating system. EOS is built to be open and standards-based; its modern architecture delivers better reliability and is uniquely programmable at all system levels. EOS provides an ideal platform for our customers to automate their IT workflows, while integrating with 3rd parties to achieve best-of-breed solutions in multi-vendor networks. EOS also enables our customers to gain improved visibility, faster problem isolation and correction, and greater visibility of network performance over time across their physical and virtual networks.

The other key innovation that Arista has brought to the industry is our use of merchant silicon. Legacy approaches have relied on building teams of ASIC engineers who laboriously release proprietary ASICs that are tightly coupled to proprietary software – creating vendor lock-in, increasing product cost, and limiting customer choice. Elimination of these gratuitous interdependencies and the associated vendor lock-in that they create are the roots of the movement toward software defined networking and the basis for the Universal Cloud Network architecture outlined in Arista's Software Driven Cloud Networking.

Arista has chosen to leverage an approach that uses merchant silicon and open-source software, which has delivered a more significant pace of innovation for networking gear. In addition, our merchant silicon approach delivers state-of-the-art platforms with increasing bandwidth and density and lower price points enabled by technology advances associated with Moore's Law.

In particular, Arista has championed non-blocking network performance, constant cross-sectional bandwidth availability through the use of open, standards-based network fabrics, and increases in density, power efficiency and support for new networking standards such as VXLAN without the need for wholesale replacements of network investments or commitment to a single vendor path for future purchases. Merchant silicon has enabled these new capabilities and improved price/performance to be delivered in a market that had previously been constrained and limited by legacy approaches and vendor lock-in for over two decades. Arista has built EOS so that we can support multiple families of merchant silicon – which enables rapid and comprehensive innovation to the benefit of customers across our entire datacenter portfolio of products, both today and in the future.

¹Crehan Research, Jan 2017 Data Center Switching Long Range Forecast

Arista Software Architectural Innovation

When we began to build EOS, we wanted to address two fundamental issues that exist in cloud networks: the need for non-stop availability and the need for high feature velocity coupled to high quality software. Drawing on our engineers experience in building networking products over more than 30 years, and on the state-of-the-art in open systems technology and distributed systems, Arista started from a clean sheet of paper to build an operating system suitable for the cloud era.

We built a fundamentally new architecture for the cloud, which has as its foundation a unique multi-process state-sharing architecture that separates state information and packet forwarding from protocol processing and application logic. In EOS, system state and data is stored and maintained in a highly efficient, centralized System Database (State). The data stored in State is accessed using an automated publish/subscribe/notify model. This architecturally distinct design principle supports self-healing resiliency in our software, easier software maintenance and module independence, higher software quality overall, and faster time-to-market for new features that customers require.

Arista EOS contrasts with the legacy approach to building network operating systems developed in the 1980's that relied upon embedding system state held within each independent process, extensive use of inter-process communications (IPC) mechanisms to maintain state across the system, and manual integration of subsystems without an automated structured core like State. In legacy network operating systems, as dynamic events occur in large networks or in the face of a system process failure and restart, recovery can be difficult if not impossible.

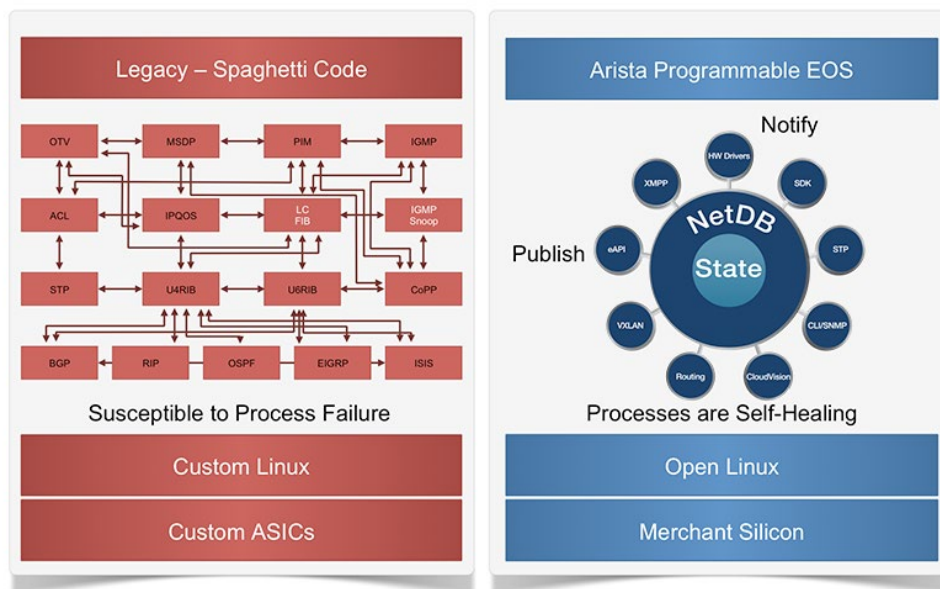


Figure 1: Arista's Cloud Scale Software Architecture

The ability to realize cloud economics and agility depends on being able to implement automation and orchestration on a network-wide basis. Arista's CloudVision® makes this possible simply and directly by extending the "State" concept per switch to an aggregated network-wide basis; NetDB. This unique architectural concept combined with the use of a portal enables turnkey workflow automation and visibility for cloud networks.

The deployment of new features and changes to production networks are a major source of network downtime. Arista has built a Smart System

Upgrade (SSU) capability, which in conjunction with Arista's Zero Touch Provisioning feature utilizes automation to create a smooth and non-disruptive software upgrade process that accomplishes this through the intelligent insertion and removal of network elements from the network topology. CloudVision extends these features on a network-wide basis and also makes it simple to rollback network-wide changes.

As well, Arista took to heart the lessons of the open source world and built EOS on top of an unmodified Linux kernel. We have also maintained full, secured access to the Linux shell and utilities. This allows EOS to preserve the security, feature development and tools of the Linux community on an ongoing basis, unlike legacy approaches where the original OS kernel is modified or based on older and less well-maintained versions of Unix. This has made it possible for EOS to natively support Docker Containers to simplify the development and deployment of applications on Arista switches. Arista EOS represents a simple but powerful architectural approach that results in a higher quality platform on which Arista is faster to deliver significant new features to customers.

Arista Enables the Cloud Powered World



Figure 2: Arista EOS – Purpose Built for the Cloud

Hyperscale cloud providers are driven by the need to cost-effectively and rapidly roll out new services and features to their customers. Microsoft, for example, stated at a Cloud “State of the Union” event in October of 2014 that they deployed 300 major new features and services on Azure in the preceding 12 months – an average of 6 per week. This level of innovation requires not only rapid new feature velocity from network infrastructure vendors, which Arista EOS provides, but also the ability to customize IT and program the infrastructure directly.

EOS Evolution from State to NetDB

While our EOS architecture is state of the art today, we are constantly investing in our core infrastructure to provide the capabilities required for building modern cloud networks. New use cases in Cloud and Service Provider networks and hybrid cloud deployments in Enterprises require on-going upgrades and extensions to our state oriented architecture. Arista has evolved EOS forward by extending State into NetDB™, enhancing scalability, visibility and control on a network-wide basis, all while staying true to our core values of reliability, open standards and programmability.

EOS Founding Principles:

- Unmodified Linux foundation
- Centralized state database
- Publish / subscribe model for scale and stability
- Proven and Open APIs across the OS (Linux, CLI, SDK, etc)

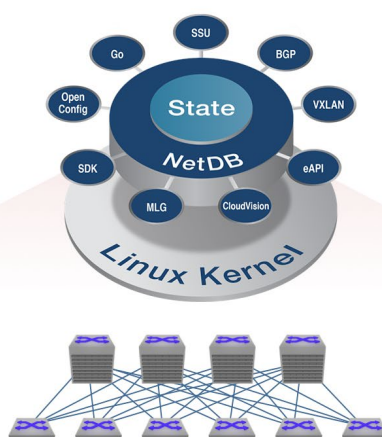


Figure 3: Ongoing investment in EOS infrastructure

NetDB Principles:

- **State:** publish-subscribe system architecture
- **Network Central** infrastructure: Optimized for Network-wide State
- **Higher Scale** – 1M+ Routes, 100K+ tunnels, Millisecond convergence
- **Network State Architecture** for real-time state streaming, filtering, coalescing, query and analytics

There are three major extensions that make up the NetDB architecture:

1. NetDB Network Central is the ability to store a large amount of data, including historical data, in a central repository such as CloudVision, HBase or other third party systems. This ability to take all of the network state and bring it to one point is crucial for scalable network analysis, debugging, monitoring, forensics and capacity planning. It simplifies workload orchestration and provides a single touch point for third party controllers. By collecting every state change on the network, Arista customers will have access to both real-time and historic telemetry views of the network in one place and at a level of granularity never before achievable.

2. NetDB NetTable is a mechanism to hold network state that allows EOS to scale to new limits. It scales the routing stack to hold more than a million routes or tunnels with millisecond convergence. This is critical, as the spine is becoming the new center of the network, the point of transition between the datacenter and the rest of the world. We are extending the spine switch to incorporate this new functionality by extending State into NetDB.
3. NetDB Replication enables an Arista switch to stream its state to other interested systems in a way that automatically tolerates failures, and adapts the rate of update propagation to match the capability of the receiver to process those updates. NetDB state streaming provides a modern and granular approach for capturing the state of each network device.

These software infrastructure enhancements extend the core State architecture. And they build on the same core principles that have been the foundation of the success of EOS: the openness, the programmability, the quality, and the way that a single build of EOS runs across all of our products. With this phase of EOS development the network has become that much more responsive and agile to the needs of hybrid clouds across Cloud Provider, Service Provider and Enterprise networks.

Summary: EOS Evolution

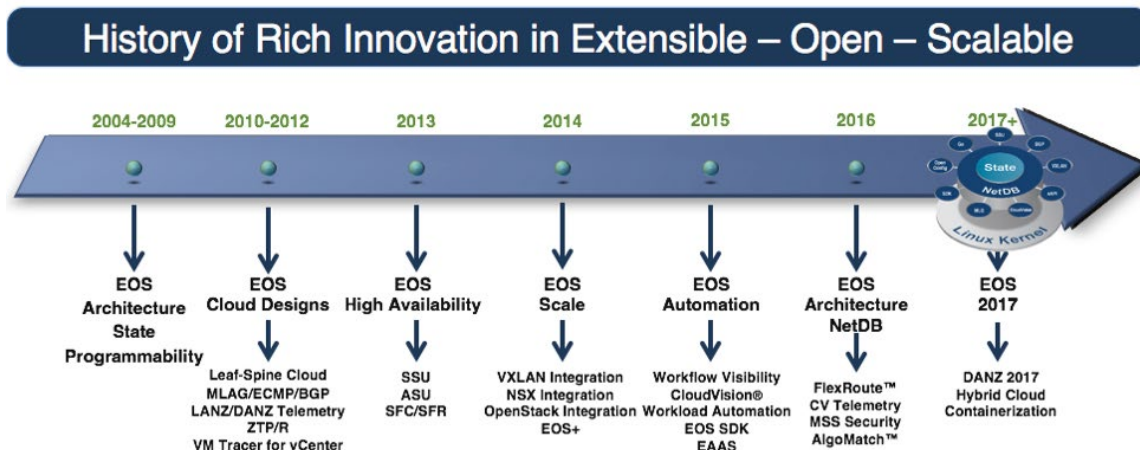


Figure 4: Ongoing software driven innovation

Programmability at Granular Levels

Arista offers six types of extensibility for EOS, as shown in the following figure:

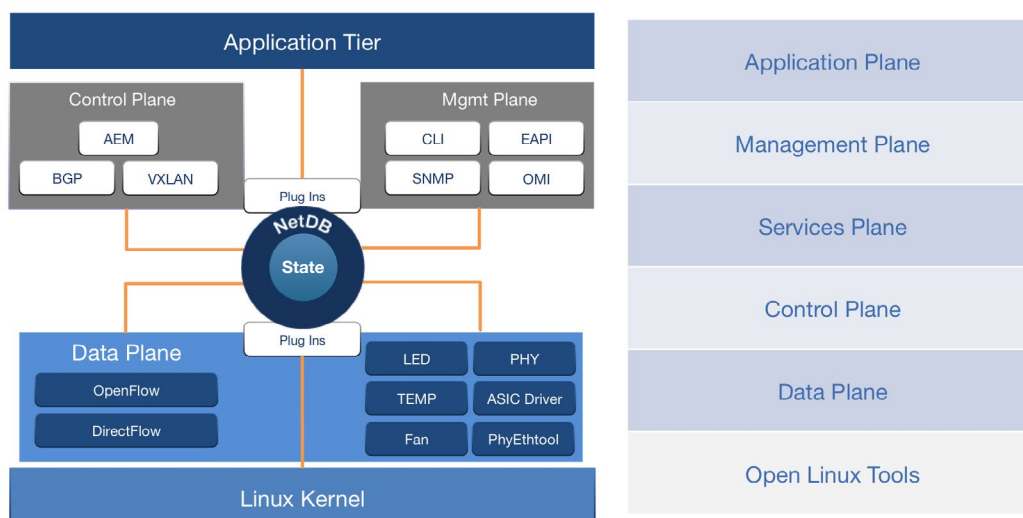


Figure 5: Extensibility at all levels

1. Management plane extensibility via APIs, such as EOS API (eAPI), OpenConfig and SNMP. Using simple, well-documented and widely used programming models such as Java-Script Object Notation (JSON), eXtensible Markup Language (XML), Python, Go, Ruby and Extensible Messaging and Presence Protocol (XMPP) to interact with the EOS management plane, Arista's APIs provide direct programmatic access to management systems such as HP OneView, EMC Smarts, VMware vCenter/vRealize, IBM Tivoli and Splunk. CloudVision provides a single integration point for partner management systems into EOS on a network-wide basis.
2. Control plane extensibility via open Linux and advanced event management (AEM), a complete event handler subsystem to allow real-time and event-driven programming of the Control plane. Interacting with EOS state-driven NetDB, Arista EOS can enable network switch actions on any state change in the system through a set of pre-defined triggers. Our customers also have direct access to the full set of Linux tools such as tcpdump through our full binary Fedora compatibility.
3. Data plane extensibility with in-line programmability. Customers looking to tune their application performance on the network can customize traffic flows by filtering and redirecting traffic using industry-standard OpenFlow or controller-less Arista DirectFlow constructs. A good example of this is Arista's Macro Segmentation Services (MSS), which can be used to provide security between physical, virtual and cloud networks by incorporating firewalls with defined policies and rules.
4. Services extensibility using Arista vEOS and Tracers for workloads, containers and big data analytics. Additionally the Arista vEOS control plane provides the ability to run the same EOS software as a VM inside any virtualized environment. This provides customers the virtual machine flexibility for lab certification efforts or for development purposes.
5. Application level extensibility for third-party development. The Arista EOS applications portal opens up Arista EOS to third-party development via SDK tool kits, scripting and APIs, making possible new types of applications as well as off-the-shelf integration with best-of-breed solutions.
6. Access to all Linux operating system facilities, including shell-level access. Arista EOS can be extended with unmodified Linux applications and a growing number of open-source management tools to meet the needs of network engineering and operations.

Organizations are attacking their OPEX costs by automating their IT workflows. This requires the ability to systematically program the network infrastructure – something that legacy approaches deliberately avoided for many years, and consequently those vendors are now attempting to band-aid limited functionality into 20+-year-old software architectures that were never designed to be fully programmable. The distributed systems concepts built into EOS and embodied in the multi-process state sharing architecture of State make it possible to program EOS at all levels needed by our customers to automate their IT workflows.

Public Cloud Providers have leveraged tools such as the Arista EOS SDK and eAPI to implement fully customized infrastructure automation solutions, while Service Providers and large enterprises have typically used Arista's EOS integration with DevOps frameworks such as Puppet, Chef and Ansible to build-in workflow automation. The Arista EOS CloudVision solution makes it possible for mainstream enterprises to deploy workflow automation and workload orchestration on a turnkey basis across the network.

The Power of EOS as a Platform

Arista has been committed to open standards and the open source community from the inception of the company. We believe that innovation within these frameworks drives customer success and permits our customers to build true multi-vendor networks. Our customers want choices and our support for open APIs, open standard protocols, and open programmability that is both accessible and secure making it possible to build best of breed multi-vendor solutions with partners.

Containerized EOS (cEOS)

To operate at cloud scale, software principles are applied to not just the applications, but to the infrastructure components as well. Server environments are built with a uniform hardware and software stack to enable the continuous development model and to orchestrate the infrastructure more efficiently. Applications reside in lightweight and efficient Linux containers to help maintain that uniformity and portability during the ongoing continuous development cycle.

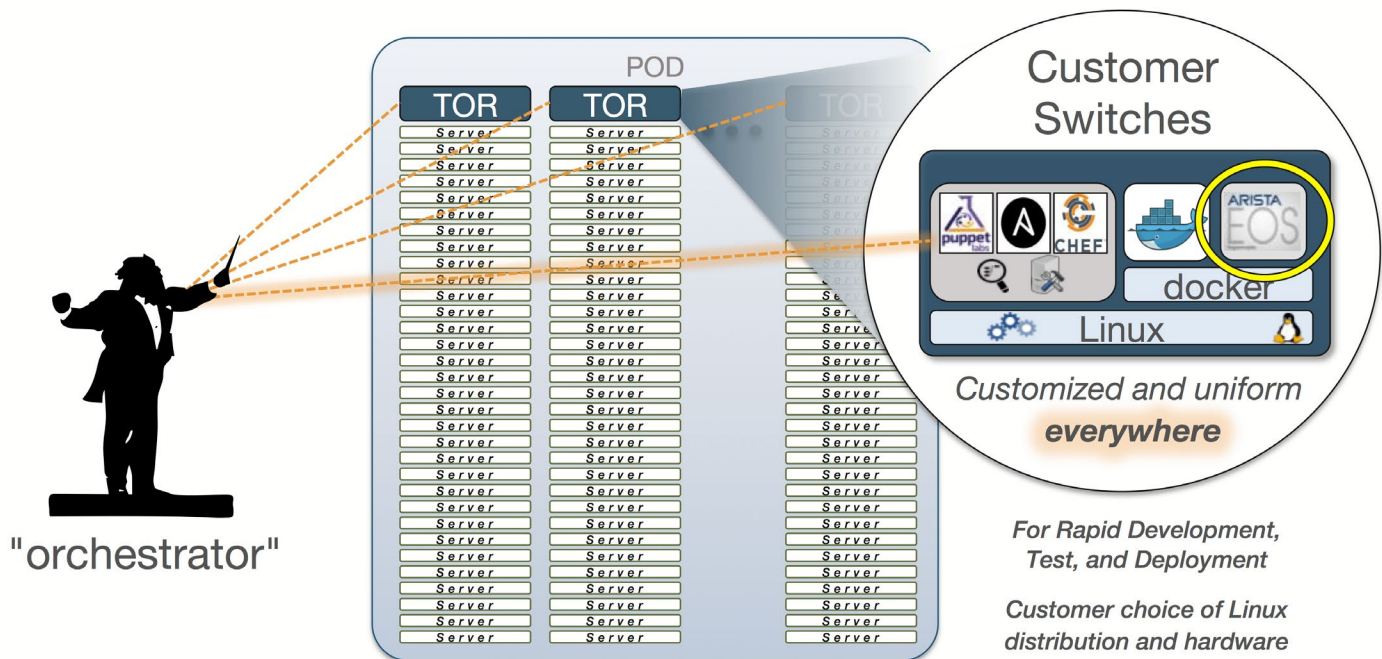


Figure 6: Cloud Networking derives scale through consistency and automation

Large scale cloud datacenters hosting hundreds of thousands of servers are interconnected by thousands of top-of-rack (ToR) switches. To gain cloud scale efficiency, the same uniform software stack running on the servers should also run on the ToR switches. Utilizing the same software stack means a common base OS (Linux) with container architecture and management infrastructure.

With cEOS, the EOS software runs in an individual container. Customer applications, like their infrastructure management agents, can run as other containers sharing the same base Linux OS. Customers can develop and test their own applications in a familiar containerized environment and then deploy on the switches, in the same common environment. This helps those customers further embrace the continuous development model and gain further software control of their infrastructure through automation.

As shown in Figure 7, cEOS is deployed as a container on a container runtime engine, such as Docker. Linux provides the native OS for the switching platform. cEOS is architected using the same state sharing mechanisms of NetDB. It retains advanced features such as state-based architecture, deep levels of programmability, a rich routing / switching feature set and telemetry tools.

cEOS supports alternate models of procuring, packaging and deploying Arista's EOS. cEOS may be deployed on Arista hardware as well as 3rd party merchant silicon based switches; also known as whitebox switches. Arista cEOS also extends the core EOS architecture to provide a lightweight module for use in network modeling, development and validation in the cloud.

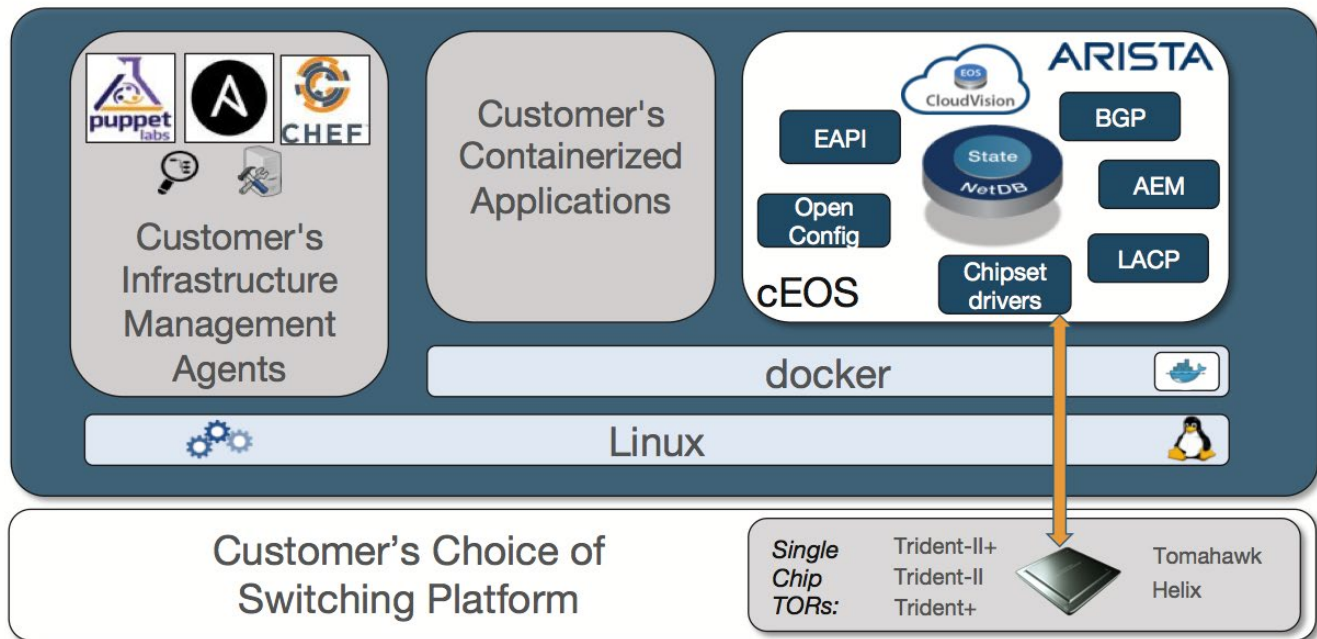


Figure 7: Arista cEOS runs as a container leveraging standard Linux and driving the silicon directly

Extending The Cloud Network Platform

Enterprises looking to build their next generation datacenter will employ cloud based architectures for their inherent advantages over proprietary legacy approaches. By adopting cloud networking and computing architectures, enterprises gain the advantages realized by the public cloud providers, including automation, scalability, always-on availability, and lower TCO. The private cloud will also be seamlessly extended to the public cloud using the same set of management and orchestration tools for simplicity and consistency. A hybrid approach offers enterprises maximum flexibility to navigate the future of cloud computing.

The Arista advantage for a hybrid solution incorporates the following five 'A' principles:

1. **Available Architecture:** Delivering a self-healing architecture of quality and aperture of data-collection across a highly available leaf-spine network with link, path, device and network wide redundancy.
2. **Agile Work-X:** Legacy networks are typically unaware of micro-services such as workloads, work-streams, or workflows. Arista has spent a decade building a universal cloud network foundation that can handle agile work-X focusing on key cloud principles.
3. **Automation:** Workload mobility across the cloud network, and the emerging container infrastructures for rapid and agile provisioning in minutes instead of hours or days.
4. **Analytics:** Tracing the workflow information across the different domains to quickly pin-point problems through telemetry tracers that abstract the actionable meta-data state for dynamic correlation.
5. **Any API Cloud:** Whereby the state of the network (via Arista NetDB™) and open APIs offer in Private and Hybrid Cloud deployments and auto-learning predictive methods with partners in Arista eco system such as Splunk, F5, PANW, Checkpoint, VMware, Docker, Service Now and DevOps tools.

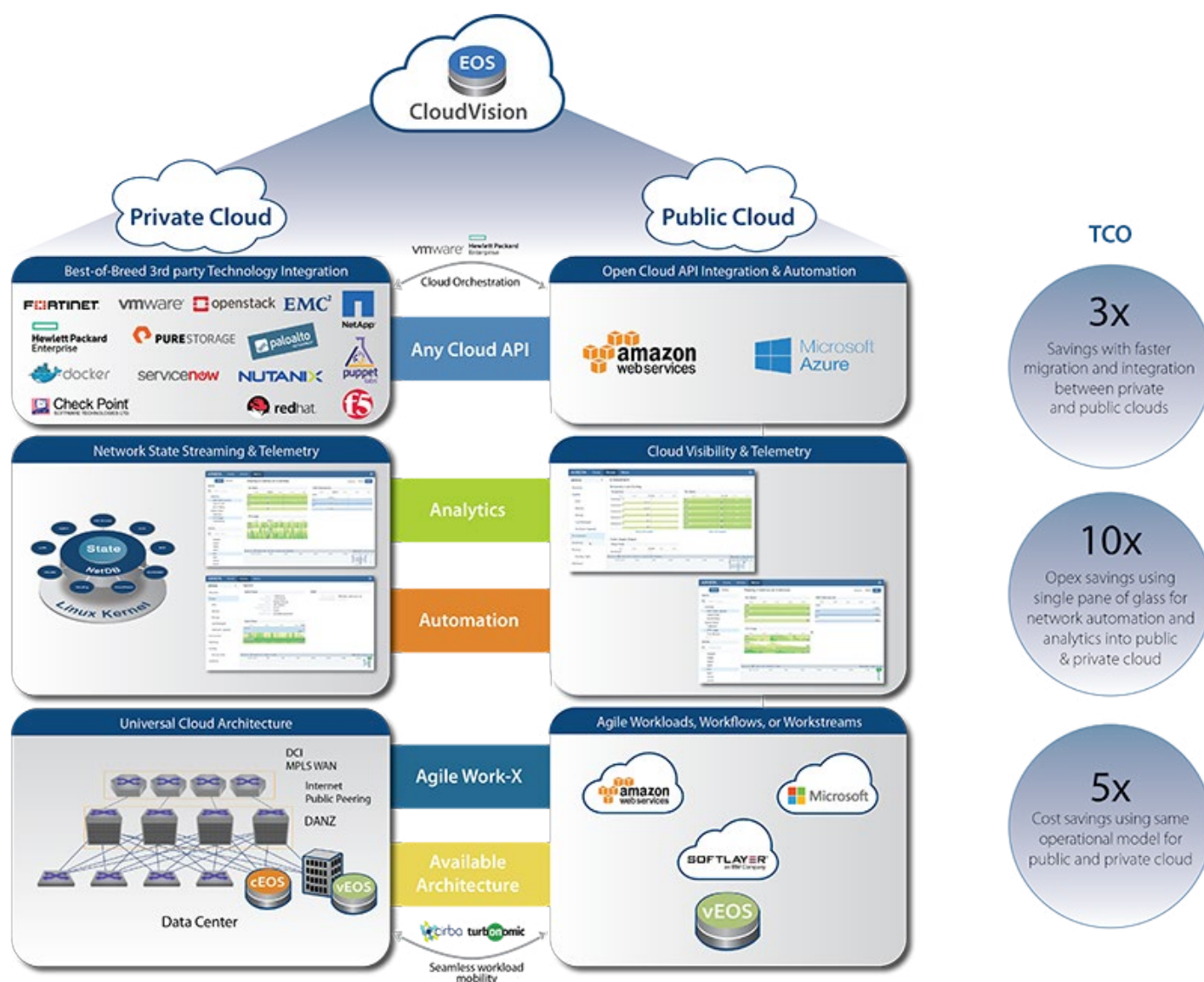


Figure 8: Arista's '5 A' Architecture

SDN and Network Orchestration

SDN has had many definitions since its original conception. Originally described as a way to separate the network control and data planes, it has increasingly come to represent a framework for network automation that encompasses both the virtual and physical network, often referred to as the network overlay and network underlay, respectively. The network overlay and underlay are then orchestrated by an SDN system or controller such as VMware's NSX, an OpenStack-based controller, an OpenFlow-based controller, or another orchestration solution. There are many options available, and Arista's approach is to support all open, standards-based controllers in order to preserve customer choices. This means that customers can deploy their physical network today with confidence, knowing that they can change their network overlay as needed in the future – we preserve their ability to choose without single vendor lock-in, unlike legacy vendor approaches.

Analytics for Triggered Workflows

Arista EOS provides unprecedented, cost-effective visibility for rapidly identifying and troubleshooting application and performance problems with a suite of tools and features designed to optimize network performance and reliability without the addition of proprietary out-of-band monitoring infrastructure or backhaul networks. The key components of Arista's workflow telemetry and analytics suite are summarized in Figure 9.

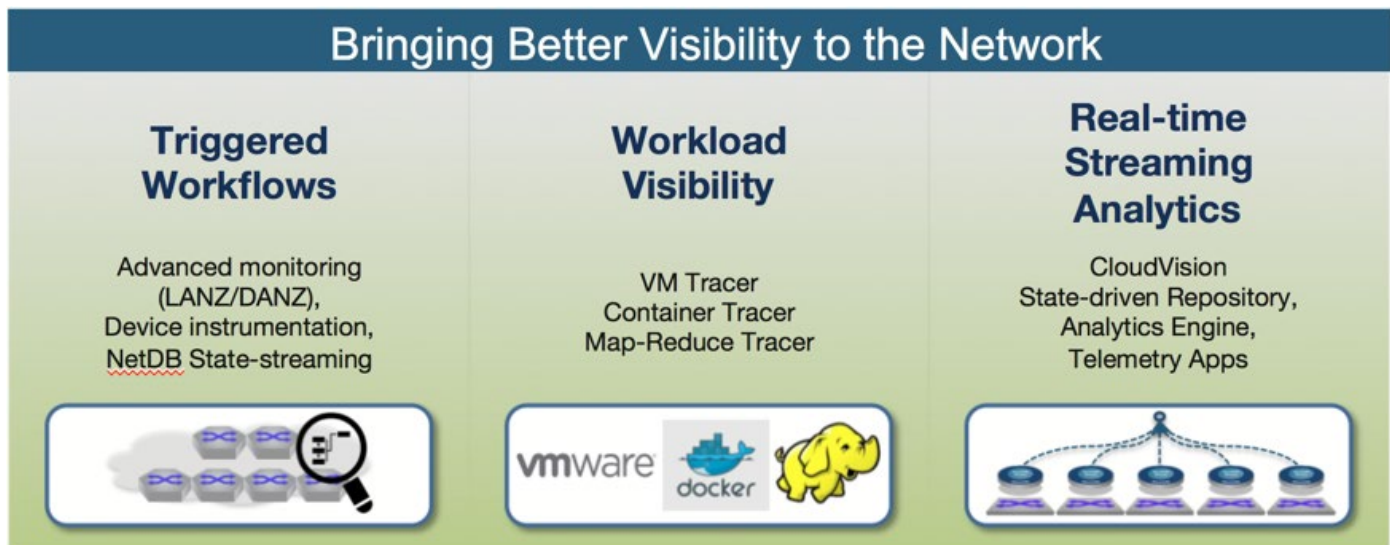


Figure 9: Next generation network visibility

Arista's EOS offers an advanced set of tools for proactive monitoring and device instrumentation that provides deeper insight into network operations.

- With Arista DANZ, organizations that have requirements to perform critical analytical and monitoring functions with increasingly higher data volumes and higher network bandwidths can maintain security, compliance and reporting for all traffic.
- Arista Latency Analyzer (LANZ) tracks sources of congestion and latency with real time reporting in microseconds. LANZ enables the application layer to make intelligent traffic routing decisions by giving unique visibility into the network layer.
- Health Tracer: EOS Health Tracer enables infrastructure resiliency at the hardware and software layer to increase overall service availability across all EOS platforms.
- Path Tracer: EOS Path Tracer is a network monitoring and analysis tool that monitors all paths in the active-active Layer 2 as well as ECMP networks.
- Network Telemetry provides a linkage between the network infrastructure and applications. Streaming Telemetry is a modern approach that streams all network state data off of EOS devices for further analytics, including to Arista CloudVision or other cloud management suites

Arista's Telemetry Tracers bring deeper workload-level visibility by integrating with distributed applications like big data, cloud, container and virtualized environments. The tracers provide visibility into the following workloads:

- VM Tracer: EOS VM Tracer allows the network engineer to have visibility into the virtual infrastructure associated with the physical switch.
- Container Tracer: EOS Container Tracer delivers advanced placement and monitoring capabilities for container-based applications and their associated switches.
- MapReduce Tracer: EOS MapReduce Tracer tracks and interacts with Hadoop workloads directly connected to Arista switches in a cluster, ensuring faster rebalancing and recovery in case of a node failure or congested link.

CloudVision Brings Real Time Controls

Arista EOS and CloudVision bring a modern approach to network telemetry and a replacement for legacy polling mechanisms. CloudVision Apps take full advantage of the state streaming infrastructure of EOS and NetDB to give Arista customers an unprecedented level of visibility into their network operations. The CloudVision platform includes a built-in storage infrastructure to serve as the state repository for the entire network. On top of this storage infrastructure, CloudVision also now includes an Analytics Engine for processing the raw streamed data into actionable information. This analytics engine digs through the captured state data to track trends, correlate data across devices and layers, and detect anomalies. The Analytics Engine also includes easy access to the streamed state via open, RESTful APIs, as a point for integration into a variety of partner solutions and customer-specific infrastructure.

Legacy network visibility approaches have been based on inefficient polling mechanisms, which only provide insight into a limited subset of what is actually going on with the network. Infrequent polling intervals completely miss many network events that take place on a sub-second basis. Inconsistent and inflexible MIBs gather only a limited amount of actual network state. The net effect is that network operators have essentially been left in the dark. With NetDB, EOS-based devices are able to stream every state change from every device into an aggregated network-wide view.

The CloudVision Portal provides simplified visualization of network-wide state for faster time to resolution. With access to every statistic across the network in both a real-time and a historic view, the Analytics Viewer provides the network operator the ability to correlate events, devices, metrics and other views with a network-wide perspective. CloudVision also provides an extensible infrastructure for building customer-specific visibility apps directly into the portal. Monitoring and troubleshooting are dramatically simplified, reducing costs and service times.

Universal Cloud Networks for Agile and Available Micro-Services

Arista has pioneered building cost-effective networks that scale with simple, repeatable designs to over 100,000 physical servers and more than one million VMs and a new class of native cloud applications. Scalability begins with the network design, where Arista has innovated with two-tier Leaf-Spine concepts for horizontal scale-out with significantly less cost and lower latency than legacy multi-tier architectures, and then with Spline designs that handle the needs of mid-size datacenters with a single network tier. With NetDB state driven enhancements, EOS now supports greater scale in excess of one million routes and 100,000 tunnels for increased cloud scale.

Open standards play a critical role in building scalable networks that preserve customer's choice of vendors. Arista supports standards-based technologies to build scalable Layer 2 and Layer 3 networks, such as Multi-Chassis Link Aggregation (MLAG) at Layer 2 and 128-way ECMP at Layer 3. Arista is a leader in delivering VXLAN, which extends Layer 2 domains across Layer 3 boundaries, while supporting up to 16 million virtual networks.

CloudVision uses open, standards-based protocols for integration, including OVSD, the OpenStack ML2 plug-in and eAPI. The CloudVision architecture enables a central integration point for all controllers, which makes for a more scalable solution with up to a 10 times performance improvement for controller-based actions across workloads, workflows and workstreams such as re-convergence, as it does not require the controller to communicate with every single network device.

Platform Innovation with Universal Leaf and Spine Designs

Arista's EOS platform is uniquely suited to supporting multiple families of merchant silicon to optimize switch family price/performance and feature innovation – all with a single, binary software image that runs across all of Arista's products. This is possible because of the layer of abstraction that Arista has built between EOS and the drivers for the merchant silicon families that we use.

This contrasts with the legacy approach of tightly coupling software to proprietary ASICs, resulting in multiple software images across families of switches. The Arista single image advantage results in simplified datacenter operations and an order of magnitude faster software release qualification. It also delivers higher quality software with a consistent feature set across the datacenter.

Arista's Switching Portfolio



Figure 10: Cloud-Class Platform Portfolio

Arista has been a leader in developing 25/50GbE as a founding member of the 25 Gigabit Ethernet consortium to enable the cost-efficient scaling of network bandwidth delivered to server and storage endpoints in next-generation cloud infrastructure, where workloads are expected to surpass the capacity of existing 10 or 40GbE connections.

Arista has also led in providing investment protection to customers with our award-winning modular platforms that have had three interoperable generations of industry leading performance and density over the past six years in the same system. A similar focus is evident in our approach to optics, which protect customer investments in optical cabling infrastructure while supporting industry standards.

Product environmentals also play a critical role in keeping a green earth and lowering operating costs. Arista continues to lead with innovations in the areas of power efficiency, space utilization, port density and reversible airflow for our switches, with true front-rear cooling. Our commitment to efficient datacenter operations and protecting our environment is unwavering.

Extending to Routing and Data Center Interconnect (DCI)

Arista's Universal Spine platforms, the 7500R Series of products, are uniquely positioned to meet the needs of datacenters where Spine Switching and Core Routing are converging. With the introduction of the R-Series, the underlying merchant silicon has

become even more capable of not only higher speed and higher density but also larger hardware table sizes, giving the R-Series the ability to address internet peering scale supporting in excess of 1 million routes.

Additional routing use cases are enabled with the ability to address Data Center Interconnect (DCI) requirements. Local datacenters can be interconnected through dark fiber with integrated DWDM optics and MACsec encryption. Arista supports the extension of the Spine layer of the datacenter to metro or regional build-outs that can span up to 3000+km of amplified reach. Additional protocols addressing Inter-DC WAN requirements include MPLS and Segment Routing using the FLX feature set.

The Arista Universal Leaf platforms, the 7280R Series of products, are designed for next generation IP storage, Routing and Digital Media use cases. These switches combine dynamic and deep buffering for lossless forwarding with high density, internet scale table sizes and comprehensive L2 and L3 features.

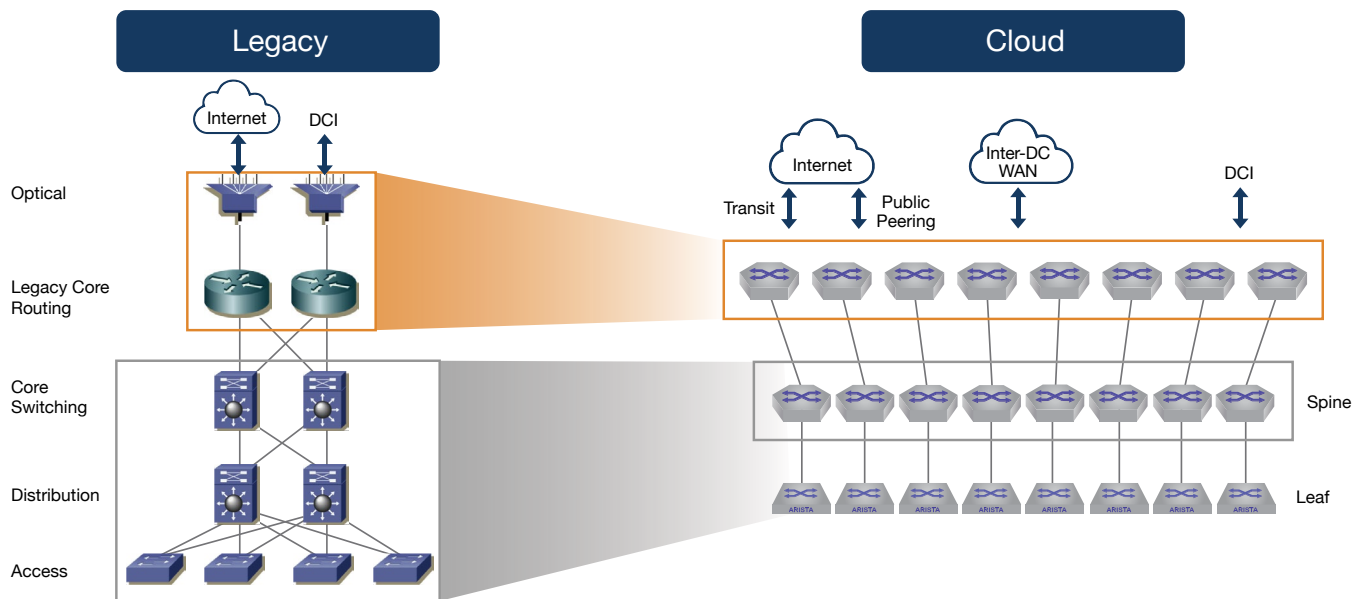


Figure 11: Evolution of Cloud Architectures with the Arista Universal Spine

Total Cost of Ownership

Arista's innovations mean real savings in total cost of ownership (TCO) for our customers, who are trying to achieve cloud scale economics. The Arista product line offers dramatically lower datacenter capex compared to prior generation equipment. Leveraging merchant silicon, Arista switches offer high 10 GbE port density and power efficiency, with up to 96 ports per RU at under 2.5W per port. The two-tier, leaf-spine network architectures that Arista brought to market eliminate the cost and complexity of traditional three-tier designs. Reducing the footprint and power utilization of network switches means that every rack can support more servers and more storage.

The Arista EOS advantage of a modern architecture, better network visibility and open programmability on a network-wide basis makes it possible to simplify datacenter network operations. The single EOS image across the product line means that new release certification in typical networks can be reduced from several man-years down to two months. Most datacenter network vendors have a unique image per switch model; for three-tier networks, this can easily result in six images or more to certify per release cycle.

The programmability of EOS makes it possible to automate provisioning and upgrades. Automation takes the legacy requirement of multi-hour processes per switch and reduces it to minutes and even seconds. With Arista's network rollback capability, it is simple to restore a previous configuration or software version across the network, when needed. The visibility toolset of EOS accelerates the time to resolution for network issues such as performance troubleshooting, virtual machine misconfigurations and cluster

management for big data. Additionally, with the turnkey approach of CloudVision, customers can more easily and rapidly realize the gains from automation of their workflows and orchestration of their workloads for migration between private and public clouds facilitating hybrid cloud solutions.

Arista customers today are realizing operational savings of tens of thousands of man-hours annually. 10,000+ man-hours of savings for 10,000 servers translates to yearly OPEX savings of \$300 per server. The key cost savings from Arista's innovations are shown in Table 1.

Table 1: Total Cost of Ownership Advantages

Cost Factor	Arista Advantage	Cost Impact
Large scale datacenter design	Two-Tier Leaf and Spine network designs, combined with Arista's port density, reduces the number of devices, cabling interconnections, and rack space.	Reduces cost for switches, cabling and rack hardware. Reduces the cost for software licenses and maintenance contracts. OPEX costs decrease with fewer devices to manage, power and cool.
Power efficiency	Arista switches feature the latest in energy-efficient technology, i.e., the Arista 7500 modular switch family uses less than 10W/10GbE wire speed port.	OPEX costs decrease with lower power devices and fewer devices to power and cool.
Software release certification	Arista uses a single image of EOS for all products. Customers only have to test and qualify once compared to legacy vendors with multiple OS images and disjointed software releases.	Reduces the time needed to qualify software prior to the network being installed or upgraded.
APIs	APIs are consistent across Arista's switch product line and are compatible from release to release.	Preserves the customer and partner's investment made in programming APIs as new products are added and new software is released.
Advanced System Engineering support	Reduction in architectural complexity and a comprehensive visibility toolset results in reduced support requirements.	Reduces the number of engineers required by a customer to support the network.
Provisioning new switches	Network automation via CloudVision, including initial provisioning and ongoing change controls. Also integration with Chef, Puppet, CFEngine, Ansible.	Reduces the number of engineers required by a customer to support the network.
Network upgrades	Automated, zero downtime upgrades through Smart System Upgrade (SSU), automated network snapshots and rollback through CloudVision.	Reduces the downtime from multiple hours per switch for manual upgrade from a legacy vendor to seconds for Arista.
Problem resolution	Visibility into device state (realtime state streaming) compute workloads (VM, container tracers), Hadoop environments (MapReduce Tracer), network infrastructure and applications (LANZ, DANZ, Path Tracer, AEM).	Reduces the downtime from multiple hours per switch for manual upgrade from a legacy vendor to seconds for Arista.

*Based on customer data

Conclusion

Arista provides superior and differentiated products for sophisticated customers. We build products for engineers that contain the most advanced technologies available that support the broadest tool sets for engineering highly available, scalable, manageable and cost-effective networks for our customers. We invest significantly in R&D to continue the pace of innovation to sustain our ability to meet our customer's business requirements as they increasingly cloudify their IT infrastructure, a mandate for 21st century CIOs.

For traditional enterprises, we partner with compute, storage and security companies to deliver Arista Cloud Converged infrastructure solutions. Our CloudVision product makes the automation of their network operations turnkey across the hybrid cloud environments.

For enterprises that consider IT a competitive advantage, Arista delivers Cloud Class platforms based on industry leading merchant silicon architectures, all running a single image of EOS, which enables our customers to have visibility and programmability across their physical and virtual network, offering the most reliable and automated operation.

Arista Cloud Scale is used by Cloud Titans to deeply control their infrastructure and automate their IT workflows. Arista provides platforms that deliver the resilience, scale and control required for the most demanding environments. The Arista advantage has resulted in a fast-growing company that has emerged to become one of the leading players in the high-speed 10/25/40/50/100GbE switching market in the datacenter. Arista has achieved this by focusing solely on building the best products for the needs of high performance cloud datacenters, and by building an organizational strategy and supporting structure that enables our customers to interact directly with our engineering team to explore and develop new products and features. We have a deep pool of executive talent that has successfully built innovative organizations and products across the industry over the past several decades, and who have brought innovation and dynamism back to the stagnant networking of prior decades.

For further reading:

Data Center Scaling

- Facebook Blog - Introducing data center fabric, the next-generation FB data center network <http://arsta.co/2oFPi3y>
- Arista, Cloud Scale Architecture <http://arsta.co/2nWNTsg>
- Arista 7500 Series Scalable Cloud Network <http://arsta.co/2pbut30>

Big Data

- Arista's Solutions for Big Data <http://arsta.co/2pbA9KE>

Workload Mobility and Virtualization

- Arista & VMware Network Virtualization Guide <http://arsta.co/2pl8UCO>

Arista's EOS

- EOS General <http://arsta.co/2oGqU3l>
- EOS White Paper <http://arsta.co/2onOHSi>
- EOS Resiliency <http://arsta.co/2oQ6dCQ>
- EOS CloudVision <http://arsta.co/2oFE92X>
- EOS General <http://arsta.co/2oGqU3l>
- Containerized EOS <http://arsta.co/2oiRVHA>

EOS Extensibility and Programmability

- Open and Programmable <http://arista.co/2oQ6tli>
- EOS+ <http://arista.co/2oiHRhH>

Software Defined Cloud Networking Provisioning, Automation and Partner Integration

- SDCN <http://arista.co/2oQntYC>
- Automation/Partner Integration <http://arista.co/2pvqZp1>
- Arista DANZ for TAP Aggregation <http://arista.co/2pbqKmb>
- Network Telemetry and Analytics <http://arista.co/2oiXu8Y>

Santa Clara—Corporate Headquarters

5453 Great America Parkway,
Santa Clara, CA 95054

Phone: +1-408-547-5500

Fax: +1-408-538-8920

Email: info@arista.com

Ireland—International Headquarters

3130 Atlantic Avenue
Westpark Business Campus
Shannon, Co. Clare
Ireland

Vancouver—R&D Office

9200 Glenlyon Pkwy, Unit 300
Burnaby, British Columbia
Canada V5J 5J8

San Francisco—R&D and Sales Office

1390 Market Street, Suite 800
San Francisco, CA 94102

India—R&D Office

Global Tech Park, Tower A & B, 11th Floor
Marathahalli Outer Ring Road
Devarabeesanahalli Village, Varthur Hobli
Bangalore, India 560103

Singapore—APAC Administrative Office

9 Temasek Boulevard
#29-01, Suntec Tower Two
Singapore 038989

Nashua—R&D Office

10 Tara Boulevard
Nashua, NH 03062



Copyright © 2017 Arista Networks, Inc. All rights reserved. CloudVision, and EOS are registered trademarks and Arista Networks is a trademark of Arista Networks, Inc. All other company names are trademarks of their respective holders. Information in this document is subject to change without notice. Certain features may not yet be available. Arista Networks, Inc. assumes no responsibility for any errors that may appear in this document. May 2, 2017 02-0018-02