DATA SHEET

SERVICE PROVIDER

ARUBA EDGECONNECT SD-WAN EDGE PLATFORM

Most enterprise digital transformation initiatives embrace a cloud-first strategy for hosting today’s evolving mix of applications. They must connect users securely and directly to business applications from anywhere, across any type of WAN and from any device.

For many enterprises, the ideal option is to turn to a service provider for a managed SD-WAN service. Managed SD-WAN services pave the way for service providers to compete for additional managed service opportunities outside of their footprint, provide opportunities to acquire new customers and improve customer retention with agile service delivery.

The Aruba EdgeConnect SD-WAN edge platform enables service providers to build high-performance managed SD-WAN services to drive new revenue streams, expand market reach and deliver SD-WAN services with SLAs in and out-of-region quickly and cost effectively.

ARUBA EDGECONNECT PLATFORM

Three components comprise the Aruba EdgeConnect SD-WAN platform:

- **Aruba EdgeConnect** physical or virtual appliances (supporting common hypervisors and public clouds) that support SD-WAN locations ranging from a small branch office to a large data center or campus site, deployed in branch offices to create a secure, virtual network overlay. This enables service providers to offer flexible managed SD-WAN services which can augment their MPLS services by leveraging broadband internet or 4G/LTE/5G whether site-by-site, or via a hybrid WAN approach.

- **Aruba Orchestrator** is a secure, cloud-hosted, multi-tenant management Software-as-a-Service that enables service providers to globally manage and monitor their managed SD-WAN service offering. An intuitive user interface provides unprecedented levels of visibility and control for global customer management with a unique ability to centrally configure and manage secure SD-WAN deployments that are customized per enterprise customer.

- **Aruba Orchestrator**, included with the Aruba EdgeConnect solution, Aruba Orchestrator provides full visibility, control, and management of a tenant’s enterprise-wide SD-WAN service deployment, including the unique ability to centrally assign policies based on business intent to secure and control all WAN traffic. Service providers can create value-added reports leveraging the extensive real-time and historical application visibility and reporting capabilities of Aruba Orchestrator.

- **Aruba Boost** WAN Optimization is an optional WAN optimization performance pack that combines Aruba WAN optimization technologies with Aruba EdgeConnect to create a single, unified WAN edge platform.

ARUBA EDGECONNECT KEY FEATURES

- **Zero-Touch Provisioning**: A plug-and-play deployment model enables Aruba EdgeConnect to be deployed at a branch office in seconds, automatically connecting with other Aruba instances in the data center, other branches, or in cloud Infrastructure as a Service (IaaS) such as Amazon Web Services, Microsoft Azure, Oracle Cloud Infrastructure and Google Cloud Platform.

- **Business Intent Overlays**: The Aruba EdgeConnect SD-WAN solution is built upon an application-specific virtual WAN overlay model. Multiple overlays may be defined to abstract the underlying physical transport services from the virtual overlays, each supporting different QoS, transport, failover and security policies. Groups of applications are mapped to different business intent overlays to deliver applications to users in alignment with business requirements. Business intent overlays may also be deployed to extend micro-segmentation of specific application traffic from the data center across the WAN to help maintain security compliance mandates.
• **Tunnel Bonding:** Configured from two or more physical WAN transport services, bonded tunnels form a single logical overlay connection, aggregating the performance of the underlying links. Real-time traffic steering is applied over any broadband or MPLS link, or any combination of links based on company-defined policies based upon business intent. In the event of an outage or brownout, Aruba EdgeConnect automatically continues to carry traffic on the remaining links or switches over to a secondary connection.

Network traffic traversing an Aruba EdgeConnect SD-WAN can be tuned for availability, quality, throughput and efficiency. This is accomplished on a per-application basis through the use of Business Intent Overlays. Multiple business intent policies can be created, each with its own specific bonding policy. As part of this policy definition, the service provider customers have the ability to customize the link prioritization and traffic steering policies based on multiple criteria, including physical performance characteristics, link economics, link resiliency characteristics and customer-definable attributes.

• **Path Conditioning:** This feature provides private-line-like performance over the public internet. Includes techniques to overcome the adverse effects of dropped and out-of-order packets that are common with broadband internet and MPLS connections to improve application performance.

• **Routing:** Aruba EdgeConnect supports standard Layer 2 and Layer 3 open networking protocols such as VLAN (802.1Q), LAG (802.3ad), IPv4 and IPv6 forwarding, GRE, IPsec, VRRP, WCCP, PBR, BGP (version 4), OSPF.

• **First-packet iQ application classification:** Aruba EdgeConnect First-packet iQ application classification identifies applications on the first packet to deliver trusted SaaS and web traffic directly to the internet while directing unknown or suspicious traffic to the data center firewall or IDS/IPS. Identifying applications on the first packet is especially important when branches are deployed behind Network Address Translation (NAT); the correct path must be selected based on the first packet to avoid session interruption.

• **Local Internet Breakout:** Intelligently steer trusted internet-bound application traffic from the branch directly to the internet, eliminating inefficient backhaul of all HTTP traffic to the data center. The solution eliminates the potential for wasted bandwidth and performance bottlenecks for trusted SaaS and web traffic. Trusted traffic is sent directly across the internet while unknown or suspicious traffic may be sent automatically to more robust security services in accordance with corporate security policies.

• **Cloud Intelligence:** Real-time updates on the best performing path to reach hundreds of Software-as-a-Service (SaaS) applications, ensuring users connect to those applications in the fastest, most intelligent way available. Additionally, automated daily updates of the application IP address database to Aruba EdgeConnect appliances keep pace with SaaS and web address changes.

• **WAN Hardening:** Each WAN overlay is secured edge-to-edge via 256-bit AES encrypted tunnels. No unauthorized outside traffic can enter the branch. With the option to deploy Aruba EdgeConnect directly onto the internet, WAN hardening secures branch offices without the appliance sprawl and operating costs of deploying and managing dedicated firewalls.

• **Zone-based Stateful Firewall:** Centrally visualize, define and orchestrate granular security policies and create secure end-to-end zones across any combination of users, application groups and virtual overlays, pushing configuration updates to sites in accordance with business intent. Using simple templates to create unique zones that enforce granular perimeter security policies across LAN-WAN-LAN and LAN-WAN-Data Center use cases.
• **Automated Orchestration**: Aruba EdgeConnect supports automated orchestration, using a drag-and-drop interface, to enable service providers to automate and accelerate the integration of security partners’ advanced services like Check Point, Forcepoint, McAfee, Netskope, Palo Alto Networks, Symantec, Zscaler, and secure DNS (e.g. Infoblox) utilizing private secure encrypted IPsec tunnels.

• **High Availability (HA)**: The Aruba EdgeConnect HA cluster architecture protects from hardware, software and transport failures. High Availability is achieved by providing fault tolerance on both the network side (WAN) and on the equipment side. The Aruba EdgeConnect appliances are inter-connected with a HA link that allows tunnels over each underlay to connect to both

**ARUBA ORCHESTRATOR SP KEY FEATURES**

• **Single Screen Administration**: Automates the implementation of network-wide business intent policies for each enterprise customer, eliminating manual configuration of devices at individual branch locations and enabling secure global administration of deployment assets (appliances and licenses)

• **Multi-tenant Management and Administration**: Scales to support SD-WAN deployments for hundreds to thousands of enterprise customers

• **Live View**: Monitors real-time throughput, loss, latency and jitter across SD-WAN overlays and the underlying transport services to proactively identify potential performance impacts

• **Real-Time Enterprise Customer Monitoring and Historical Reporting**: Provides specific details into application, location, and network statistics, including continuous performance monitoring of loss, latency, and packet ordering for each enterprise customers’ network paths

**INTEGRATION WITH MICROSOFT AZURE VIRTUAL WAN (VWAN) AND AWS TRANSIT GATEWAY NETWORK MANAGER (TGNM)**

By integrating the Microsoft Azure vWAN and AWS Transit Gateway Network Manager (TGNM) REST APIs, the Aruba EdgeConnect platform enables customers to quickly build a cloud on-ramp and automate network deployments, removing the manual complexity of connecting branch offices to local Azure or AWS Points of Presence (PoPs).
The API integration enables EdgeConnect to identify the locations of branches in the network and determine the closest VPN Gateway (vWAN hub or head-end gateway in AWS) to connect to. Aruba EdgeConnect automatically establishes standards-based IPsec tunnels and, configuring both of the tunnel endpoints for each branch to a VPN Gateway.

Key Features:

- Automate branch connectivity to Azure and AWS Points of Presence (PoPs)
- Simplify network expansion and troubleshooting
- Faster onboarding to applications and workloads — both to and from Azure and AWS
- Optimized routing within Azure or AWS network
- Centralized network monitoring
- Global network visibility
- Cohesive policy configuration

**DELIVERING THE HIGHEST QUALITY OF EXPERIENCE FOR MICROSOFT O365**

With the Microsoft Office 365 REST API integration, Aruba continuously learns and discovers new Office 365 end points and/or IP addresses and automatically re-configures Aruba EdgeConnect if a new, closer Office 365 end point becomes available. By doing so, users always achieve optimal Office 365 connectivity and performance by reducing the round-trip time (RTT). The Aruba EdgeConnect SD-WAN edge platform has been independently tested and certified to support the Microsoft Office 365 Connectivity Principles. As a result of the independent testing, the Aruba EdgeConnect platform has been inducted into the Microsoft Office 365 Networking Partner Program and has been given the official “Works with Office 365” designation.

**EXTEND WAN FABRIC TO THE CLOUD**

Deploy virtual Aruba EdgeConnect appliances in a public cloud such as AWS, Azure, Google Cloud Platform, or Oracle Cloud to optimize connections between branch locations and the cloud using all the SD-WAN benefits. If a brownout or blackout occurs, the remaining link(s) continue to carry traffic so that users don’t notice any disruption to voice calls, audio and video conferences, or any other application. Ruggedized first mile between the branch and the public cloud delivers better network performance, reliability, and quality.
**ADVANCED SEGMENTATION WITH VIRTUAL ROUTING AND FORWARDING (VRF)**

Network managers can now configure and manage separate addressing, routing and security policies consistently with the Aruba EdgeConnect SD-WAN edge platform across end-to-end segments and micro-segments for traffic traversing large-scale multinational enterprises and federations of independent companies. Advanced segmentation eliminates the arduous task of manually stitching together VRF, firewall and NAT policies in a consistent manner, dramatically simplifying the management of diverse scenarios and providing unprecedented flexibility when contending with overlapping IP address spaces.

**EFFICIENT DNS QUERY RESOLUTION**

A critical step in the DNS proxy is to resolve the DNS query quickly. With Aruba EdgeConnect, customers can reach DNS servers in close proximity to branch sites eliminating backhaul of the DNS request to the remote data centers where enterprise DNS servers are hosted. From the branch location itself, DNS requests can be made directly to Global DNS servers, which reduces the impact of latency in establishing a SaaS application session, thereby improving SaaS application performance.

**SUPPORT FOR CUSTOM USER-DEFINED APPLICATIONS**

Many organizations continue to support applications customized for or internal to the company that are hosted in the corporate data center. Such custom applications are critical for the enterprise and with the Aruba EdgeConnect SD-WAN, customers can ensure optimal performance of these applications. From Aruba Orchestrator, IT can easily configure a custom application definition that enables Aruba EdgeConnect to identify it on the first packet.

**INTELLIGENT INTERNET BREAKOUT**

Often customers provision two or more WAN internet links from the remote branch site to increase network and application availability and performance. To optimize utilization of the provisioned WAN internet links, Aruba EdgeConnect monitors the performance of all WAN internet links by continuously measuring packet loss, jitter, latency and mean opinion score (MOS) in real-time. Aruba EdgeConnect uses statistical learning to determine the optimal forwarding link, ensuring maximum application performance.

**ACCELERATE MANAGED SD-WAN DEPLOYMENTS**

Service providers face unprecedented demand for managed SD-WAN services and choosing an SD-WAN management platform that is intuitive and flexible can accelerate service deployments.

Aruba Orchestrator generates unique customer Aruba Orchestrator tenants to ensure flexibility in tailoring deployments to individual customer requirements. It securely isolates each customer’s SD-WAN configuration and performance statistics to assure robust security. Each tenant Aruba Orchestrator enables secure zero-touch provisioning of Aruba EdgeConnect appliances in each customer’s branch sites, providing full visibility, control and management of the entire SD-WAN service deployment. Aruba Orchestrator automates the assignment of business intent policies for applications groups to accelerate connectivity across multiple branches, eliminating the configuration drift that can result from manually updating rules and access control lists (ACLs) on a site-by-site basis.

When branch offices are deployed as part of an SD-WAN or hybrid WAN, some applications may require higher performance levels, like accelerating replication data over distance for disaster recovery.
GAIN CONTROL OVER THE CLOUD
Gain an accurate picture of how Infrastructure-as-a-Service (IaaS) and Software-as-a-Service (SaaS) are being used within your organization.

• Name-based identification and reporting of all cloud applications.
• Tracking of SaaS provider network traffic.
• Cloud Intelligence provides internet mapping of optimal egress to SaaS services.

STRENGTHENING WAN SECURITY
Advanced capabilities provide cloud-first service providers with the control to centralize and automate security policy governance and safely connect users directly to applications.

The optional Aruba Boost WAN optimization performance pack enables service providers to create tiered WAN service offerings that can be offered as a value-added software service on any Aruba EdgeConnect appliance. With a single mouse click in the Aruba Orchestrator GUI, service providers can enable enterprise customers to utilize Aruba Boost to accelerate application performance where and when it is needed.

Aruba Orchestrator enables granular visibility into thousands of customer branch deployments for both data center and cloud-enabled applications. It provides the unique ability to centrally configure and manage secure SD-WAN deployments for each individual customer, while providing customized, segregated views and reporting.

Each Aruba Orchestrator tenant provides specific details of the WAN performance for each individual enterprise customer including:

• Detailed reporting on application, location, and network statistics
• Continuous performance monitoring of throughput, loss, latency, jitter and packet ordering for all network paths
• Identification of all application traffic by name and location
• Alarms and alerts allow for faster resolution of network related issues
• Bandwidth cost savings report that documents the cost savings of migrating to broadband
They enable service providers to centrally segment distributed enterprises’ users, applications and WAN services into secure zones and automate application traffic steering across the LAN and WAN in compliance with predefined security policies, regulatory mandates and business intent. To support enterprises with multivendor security architectures, Aruba Orchestrator offers service providers a seamless drag and drop service chaining to next-generation security infrastructure and service.

**BOOST APPLICATION PERFORMANCE AS NEEDED**

Aruba Boost WAN Optimization is an optional WAN optimization performance module that includes:

- **Latency Mitigation**: TCP and other protocol acceleration techniques are applied to all traffic, minimizing the effects of latency on application performance and significantly improving application response times across the WAN.
- **Data Reduction**: Data compression and deduplication eliminates the repetitive transmission of duplicate data. Aruba software inspects WAN traffic at the byte-level and stores content in local data stores. Advanced fingerprinting techniques recognize repetitive patterns for local delivery. Data Reduction can be applied to all IP-based protocols, including TCP and UDP.

**WHY ADD ARUBA BOOST?**

Aruba Boost enables service providers to create tiered WAN service offering for SD-WAN that includes an optional WAN optimization service that can be offered as a value-added software service on the Aruba EdgeConnect appliance.

Aruba Boost enables customers to add application performance as needed.

Aruba EdgeConnect appliances alone provide enhanced application performance for broadband or hybrid WAN deployments, utilizing the included packet-based tunnel bonding, Dynamic Path Control (DPC) for real-time traffic steering over multiple WAN links, and Path Conditioning for overcoming the adverse effects of dropped and out-of-order packets that are common with internet connections.

However, sometimes additional performance is needed for specific applications or locations. As distance between locations increases over the WAN, application performance degrades.

This has less to do with the available bandwidth, and is more about the time it takes to send and receive data packets over distance, and the number of times data must be re-sent.

**ARUBA BOOST USE CASE EXAMPLES**

- Customers replicating to a disaster recovery (DR) site thousands-of-miles away might want to add Aruba Boost to ensure recovery point objectives (RPOs) are not compromised.
- Enterprises with remote sites located in rural areas, or with sites that are exceptionally farther away from the company’s data center, might want to add Aruba Boost to overcome the effects of high latency.

With Aruba Boost, customers gain the flexibility to enable enhanced WAN optimization capabilities where and when it is needed in a fully integrated solution.

**OVERCOME EFFECTS OF LATENCY**

The time it takes for information to go from sender to receiver and back is referred to as network latency. Since the speed of light is constant, WAN latency is directly proportional to the distance traveled between the two network endpoints. Aruba offers a variety of TCP acceleration...
ARUBA EDGECONNECT HARDWARE PLATFORMS

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<thead>
<tr>
<th></th>
<th>Ultra-Small</th>
<th>Extra-Small</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Extra-Large</th>
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<tbody>
<tr>
<td>Part Identifier</td>
<td>EC-US</td>
<td>EC-XS</td>
<td>EC-S-P</td>
<td>EC-M</td>
<td>EC-L</td>
<td>EC-XL</td>
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<tr>
<td>Typical Deployment</td>
<td>Small branch/ home office</td>
<td>Small branch</td>
<td>Large branch</td>
<td>Head office small hub</td>
<td>Data center large hub</td>
<td>Data center large hub</td>
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<tr>
<td>Typical WAN Bandwidth</td>
<td>1-100 Mbps</td>
<td>2 - 500 Mbps</td>
<td>10 - 1000 Mbps</td>
<td>50 - 2000 Mbps</td>
<td>1 - 5 Gbps</td>
<td>2 - 10 Gbps</td>
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<tr>
<td>Recommend Aruba Boost up to</td>
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<td>500 Mbps</td>
<td>500 Mbps</td>
<td>1 Gbps</td>
<td>5 Gbps</td>
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<tr>
<td>Redundancy / FRUs</td>
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<td>Power (optional) and SSD</td>
<td>Power and SSD</td>
<td>Power and SSD</td>
<td>Power and SSD</td>
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<tr>
<td>Datapath Interfaces</td>
<td>3 x RJ45 10/100/1000 Mbps</td>
<td>4 x RJ45 10/100/1000 Mbps</td>
<td>8 x RJ45 10/100/1000 Mbps plus 4 x 1/10Gbps SFP+ (pluggable)</td>
<td>EC-M-B: 4 x RJ45 10/100/1000 Mbps plus 2 x 1/10 Gbps fiber; fail-to-glass (bypass)</td>
<td>EC-L-B/EC-L-B-NM*: 4 x RJ45 10/100/1000 Mbps plus 2 x 1/10 Gbps fiber; fail-to-glass (bypass)</td>
<td>EC-XL-B/EC-XL-B-NM*: 4 x RJ45 10/100/1000 Mbps plus 2 x 1/10 Gbps fiber; fail-to-glass (bypass)</td>
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<td>EC-M-P: 4 x RJ45 10/100/1000 Mbps plus 2 x 1/10Gbps SFP+ (pluggable)</td>
<td>EC-L-P/EC-L-P-NM*: 4 x RJ45 10/100/1000 Mbps plus 2 x 1/10Gbps SFP+ (pluggable)</td>
<td>EC-L-P/EC-L-P-NM*: 4 x RJ45 10/100/25 Gbps SFP28 (pluggable)</td>
<td>EC-XL-P/EC-XL-P-NM*: 6 x 1/10 Gbps fiber; fail-to-glass (bypass)</td>
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*Models with suffix “-NM” are recommended for applications employing the Aruba Boost WAN Optimization performance pack

techniques to mitigate WAN latency, including window scaling, selective acknowledgment, round-trip measurement and high-speed TCP.

Windows and other applications that rely on the common internet file system (CIFS) often take longer to perform common file operations over distance, such as retrieving and sharing files. Aruba Boost helps these applications not only by improving the underlying TCP transport, but also by accelerating CIFS through CIFS read-ahead, CIFS write-behind, and CIFS metadata optimizations.

**INCREASE THROUGHPUT**

As packets flow through Aruba EdgeConnect appliances, Aruba Boost inspects WAN traffic at the byte-level and stores content in local data stores. As new packets arrive, Aruba computes fingerprints of the data contained within the packets and checks to see whether these fingerprints match data that is stored locally.

If the remote appliance contains the information, there is no need to resend it over the WAN. Instead, specific start-stop instructions are sent to deliver the data locally.
ARUBA EDGECONNECT SD-WAN EDGE PLATFORM SPECIFICATION SHEETS

Ultra-Small  Extra-Small  Small
Medium  Large  Extra-Large

ARUBA EDGECONNECT TECHNICAL SUPPORT

<table>
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<th>Term</th>
<th>Description</th>
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| Support is included as part of the Aruba EdgeConnect subscription license | Web-based Support Portal
| Unlimited access 24 / 7 / 365 includes software downloads, technical documentation, and online knowledge base | Software Updates
| Major and minor features releases; maintenance releases | Technical Support
| 24 / 7 / 365 Phone / E-mail / Web | Response Time
| 30 minutes for high priority (P1) — critical | HW Warranty and Maintenance
| Refer to the Aruba EdgeConnect Warranty and Maintenance Policies Data Sheet for further information. |

FLEXIBLE DEPLOYMENT MODELS

Aruba EdgeConnect Virtual (EC-V) – Download and install Aruba EdgeConnect from anywhere in the world. The software runs on all common hypervisors, including VMware ESXi, Microsoft Hyper-V, Citrix XenServer, and KVM. Aruba customers who have an IaaS presence in AWS, Microsoft Azure, Oracle Cloud Infrastructure or Google Cloud Platform can deploy Aruba EdgeConnect within their hosted cloud environment.

Aruba EdgeConnect Physical (EC) – For enterprises that are not virtualized in the branch, choose one of the Aruba EdgeConnect hardware appliance models for plug-and-play deployment.

ARUBA EDGECONNECT SUBSCRIPTION LICENSING

Aruba offers a metered licensing (ML) model. It provides service providers with a flexible pay-as-you-go licensing model that is based on how much bandwidth is consumed per appliance for each month, based on provisioned aggregate WAN bandwidth, and viewed in arrears. Aruba Orchestrator SP supports both on-prem and cloud-hosted tenant orchestration instances, and the metered pricing model applies to the cloud-hosted tenants.

Aruba Boost WAN optimization is an optional WAN optimization software that is priced on a per Mbps basis and that may be ordered and deployed flexibly to sites that require application acceleration.