

DATA SHEET

Virtual WiFi Access Gateway

Today, end-users have high expectations when it comes to WiFi availability, performance, and Quality of Experience (QoE). In response, WiFi networks have become more sophisticated in their handling of subscriber management, control, and security.

To address these needs in a simple, unified, and consistent manner across WiFi networks, service providers use a WiFi Access Gateway (WAG). A WAG enables the use of cost-effective WiFi Access Points (APs) and supports multi-vendor WiFi networks without compromising functionality.

WAGs assist with user authentication and assignment of IP addresses, and dynamically apply per-user policies for bandwidth, Quality of Service (QoS), traffic routing, and security.

Ciena’s virtual WiFi Access Gateway (vWAG) is a scalable, carrier-grade solution capable of addressing the high performance demands of several use cases, including public/community WiFi, smart cities, venue WiFi, and others.

Ciena’s vWAG solution is particularly useful for:

- Distributed WiFi networks in multiple physical locations
- Networks requiring enhanced security
- Automated administration and enforcement of subscriber policies
- Multi-vendor WiFi networks

Today, Ciena’s vWAG serves millions of subscribers and is deployed by some of the largest service providers in the world. A common network deployment is shown in Figure 1.

Features and benefits

Manage bandwidth

- Flexible traffic intelligence
- Consistent per-application, per-user, and per-group performance

Improve security

- Network micro-segmentation
- Guest-portal and walled-garden protections
- Policies for connected but unauthorized users
- Denial-of-service prevention
- Firewall and content filtering
- Malware and phishing protection

Enhance guest user experience

- Flexible authentication and authorization schemes
- Seamless mobility across access points, fast and at scale

Reduce costs

- Consolidate subscriber gateway, DHCP, router, and firewall functions
- Simplified and centralized policy enforcement

Avoid proprietary lock-in

- Runs on commercial servers
- Standards-based open interfaces

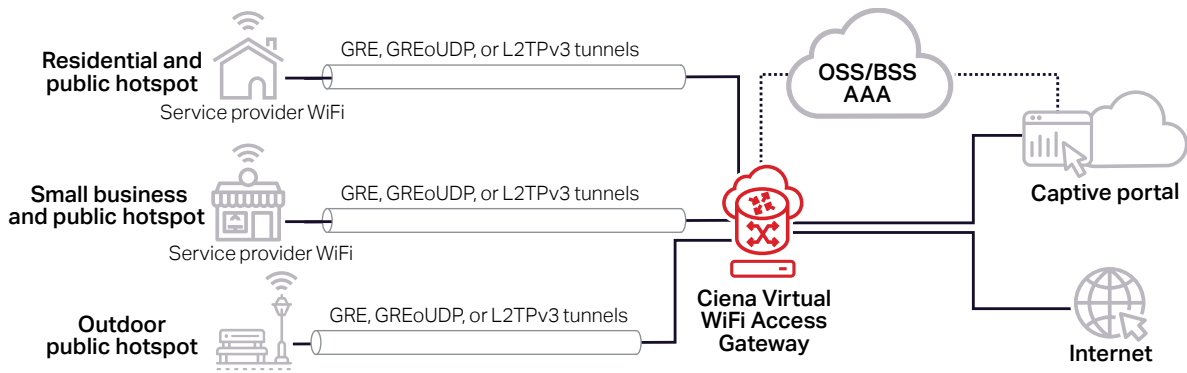


Figure 1. Ciena vWAG network architecture

Ciena’s vWAG provides a rich feature set that complements WiFi network functionality while simplifying overall management:

- Multi-vendor WiFi aggregation via Generic Routing Encapsulation (GRE), L2TPv3, or Virtual LANs (VLANs) from the Customer Premise Equipment (CPE)/WiFi access points
- Authentication, Authorization, and Accounting (AAA) proxy and load balancing
- Policy enforcement per access point, per VLAN, or per subscriber
- Access controls and advanced QoS
- Best-in-class mobility across WiFi APs as well as different WiFi networks
- Application and service steering
- Scalable routing
- Carrier-grade Network Address Translation (CGNAT) and stateful firewall
- High-scale Dynamic Host Configuration Protocol (DHCP) server
- Full IPv6 support and dual IPv4/IPv6 support
- Content filtering and malware/phishing protection
- Lawful intercept support

Deployment options and use cases

Within the WAG family of products, Ciena has affordable options based on network scale and desired entry point. Our virtual Business Access Gateway (vBAG) is a low-scale version of the vWAG. It is primarily for gateways up to 14 Gb/s bandwidth and 1,000 tunnels, but licensing does allow for higher capacities.

Use case	Description	Benefits
Public/community WiFi	Service providers offer a WiFi hotspot network across existing home, business, and/or outdoor WiFi networks	<ul style="list-style-type: none"> • Builds brand: Users see operator’s SSID everywhere • Increases subscriber retention: Subscribers benefit from easy and free out-of-home WiFi access, and can allow premium services to ‘follow’ them wherever they connect • Market and upsell other network services: LTE backup, business guest networks, and more
Smart cities	Cities use WiFi to support Internet of Things (IoT) monitoring and automation related to utility billing, traffic, parking, public transport, public safety, and street lighting	<ul style="list-style-type: none"> • Reduces operational costs while increasing automation • Improves constituent satisfaction: More efficient delivery of city services • Green: Reduces waste in transportation costs
Venue WiFi	Venues provide critical amenity for convention centers, stadiums, shopping malls, airports, and train stations	<ul style="list-style-type: none"> • Improves customer satisfaction • Reduces operations costs through IoT automation (control of lights, heat, etc.) • Revenue opportunities: Enable commerce opportunities, location-based services, and sponsored WiFi opportunities

Table 1. Ciena vWAG use cases

Both the vWAG and vBAG can be deployed in Virtual Machine (VM) environments or as a bare metal appliance. In both cases, x86 Commercial Off the Shelf (COTS) servers are used for the hardware.

Feature summary

Gateway support

- Business Access Gateway (BAG)
- WiFi Access Gateway (WAG)

Tunnel connectivity

- Soft GRE, GRE over UDP
- L2TPv3, L2TPv3 over IP, L2TPv3 over UDP
- GRE over IPSec and IKEv2
- VLAN as a tunnel (subscriber VLANs)

Authentication, Authorization, and Accounting (AAA)

- RADIUS AAA client support
- RADIUS accounting
- 802.1x with EAP authentication
- RADIUS AAA server groups
- RADIUS AAA load balancing or primary/secondary scheduling
- RADIUS custom dictionaries and VSAs

Management

- CLI, Telnet, SSH
- SNMPv1, v2c, v3; 400+ MIBs

- FTP, TFTP, SFTP, FTP client/server
- PING, traceroute, MTU settings
- Management ACLs
- NTP
- Syslog
- TACACS+

High availability

- N+1 active/active, active/standby
- VRRP (for Layer 2 networks)
- BGP Anycast (for Layer 3 networks)
- 802.1ad link aggregation
- Link Aggregation Group (LAG)
- VLAN over LAG

QoS and bandwidth management

- Rate limiting (subscriber/device, VLAN, tunnel)
- DSCP classification and marking

IP addressing and IP features

- DHCP v4/v6 server
- IPv4, IPv6, and dual stack

The flexibility in design and pricing enables Ciena's vWAG to be used in several deployment use cases (see Table 1).

- IPv4/v6 block fragmented packets
- DNS v4/v6 client/resolver
- DNS server v4/v6 options
- DNS bridge

L2/L3 routing

- Static
- BGP
- OSPFv4
- IS-IS
- BFD
- Equal Cost Multi Path (ECMP)
- Route maps
- 1 million IPv4 routes
- ARP
- IP v4/v6 fragmentation handling
- Static IP on CPE (B2B static IP)
- L3VPN with B2B static IP

Security

- VLANs
- Standard and extended ACLs, IPv4/v6
- ACLs per port, per subscriber, per tunnel, per tunnel VLAN
- IPv4 firewall

- Carrier-Grade NAT (CGNAT)
- CGNAT port block
- In-use Syslog/SNMP alarm threshold
- FQDN DNS ACLs
- Wildcard DNS ACLs
- Tunnel broadcast prevention
- Parental controls
- Content filtering
- Malware and phishing protection
- Lawful intercept
- Subscriber mirroring
- WiFi AP mirroring

Guest user services

- Captive portal redirect
- HTTP enrichment
- Splash page—one time redirection
- Walled-garden services
- Guest user mobility
- Unauthorized and authorized user policies

Analytics

- SNMP MIB stats
- Port and VLAN utilization metrics

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No

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