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Customer Release Notes

ExtremeWireless™ Convergence Software

Software Version 10.11.06.0009
January 20, 2017

INTRODUCTION:

This document provides specific information for this version of software for the ExtremeWireless™ Convergence Software.

Extreme Networks recommends that you thoroughly review this document prior to installing or upgrading this product.

For the latest firmware versions, visit the download site at:
www.extremenetworks.com/support/

Firmware Specification:

Status	Version No.	Type	Release Date
Current Version	10.11.06.0009	Maintenance Release	January 20, 2017
Previous Version	10.11.05.0005	Maintenance Release	December 2, 2016
Previous Version	10.11.04.0008	Maintenance Release	October 28, 2016
Previous Version	10.11.03.0004	Maintenance Release	September 19, 2016
Previous Version	10.11.02.0032	Maintenance Release	August 15, 2016
Previous Version	10.11.01.0210	Minor Feature Release	June 29, 2016
Previous Version	10.01.05.0008	Maintenance Release	June 3, 2016
Previous Version	10.01.04.0011	Maintenance Release	April 22, 2016
Previous Version	10.01.03.0007	Maintenance Release	March 7, 2016
Previous Version	10.01.02.0038	Maintenance Release	February 2, 2016
Previous Version	10.01.01.0129	Major Feature Release	December 11, 2015

SUPPORTED CONTROLLERS AND ACCESS POINTS

This ExtremeWireless™ Convergence Software version supports the following controllers and access points:

Product	Image
ExtremeWireless Controller C4110	AC-MV-10.11.06.0009-1.gxe
ExtremeWireless Controller C5110	AC-MV-10.11.06.0009-1.txe
ExtremeWireless Controller C5210	AC-MV-10.11.06.0009-1.rue
ExtremeWireless Controller C25	AC-MV-10.11.06.0009-1.pfe
ExtremeWireless Controller C35	AC-MV-10.11.06.0009-1.cwe
ExtremeWireless Virtual Appliance V2110 VMware	AC-MV-10.11.06.0009-1.bge
ExtremeWireless Virtual Appliance V2110 MS Hyper-V	AC-MV-10.11.06.0009-1.ize
Wireless AP3935i/e_FCC/ROW	AP3935-10.11.06.0009.img
Wireless AP3965i/e_FCC/ROW	AP3935-10.11.06.0009.img
Wireless AP3801i	AP3801-10.11.06.0009.img
Wireless AP3805 & AP3805i_FCC/ROW	AP3805-10.11.06.0009.img
Wireless AP3865	AP3825-10.11.06.0009.img
Wireless AP3825	AP3825-10.11.06.0009.img
Wireless AP3715	AP3715-10.11.06.0009.img
Wireless AP3710	AP3710-10.11.06.0009.img
Wireless AP3705i	AP3705-10.11.06.0009.img
Wireless AP3765	W78XC-2-10.11.06.0009.img
Wireless AP3767	W78XC-2-10.11.06.0009.img

INSTALLATION INFORMATION

Note:

Extreme Networks strongly recommends that you create a rescue image (perform a backup operation) before upgrading your controller as described in the *Maintenance Guide*.

Installation Notes

- The minimum system software version is 09.21.01 to upgrade to this software version.
- After upgrading to V10.11.02, users with IPv4 networks will see the following changes to their IPv4/IPv6 traffic:

  a) Users with Bridged at AP deployment: Before upgrade, Bridged at AP allowed all unicast IPv6 and multicast IPv6 traffic on the network (unless the user had an explicit rule to stop the unicast IPv6). After upgrading to V10.11.02, ALL unicast IPv6 traffic will continue to be allowed, but multicast IPV6 traffic will be denied – Except multicast IPv6 Router Solicitation (RS), Neighbor Solicitation (NS), and Neighbor Advertisement (NA) will be allowed.

If the user wants to have the identical behavior as pre-V10.11.02, i.e. allow multicast IPV6 traffic, the user can add a multicast IPv6 “allow all” rule to the multicast rules.

b) Users with Bridged at Controller deployment: Before upgrade, Bridged at Controller denied all IPv6 traffic (unicast and multicast). After upgrading to V10.11.02, ALL IPv6 unicast traffic and multicast RS/NS/NA traffic will be allowed. All other multicast traffic will be denied.

If the user wants to have almost identical behaviour as pre-V10.11.02, the user can add a unicast IPv6 “deny all” rule. There is no mechanism/rule to stop multicast RS/NS/NA traffic.

- It is possible that some client devices will not handle frames properly when the L2 MAC is unicast and the L3 IP address is multicast in which case the "Multicast to Unicast Delivery" option should be disabled.
- The V2110 is supported on ESXi version 5.5 and 6.0. For best performance and lowest latency, the MMU and CPU should support hardware virtualization such as the Intel EP-T & VT-x or AMD AMD-V & RTI.
- The following advanced features are supported on vSphere 5.5:
  - vSphere High Availability (HA). Release 9.12.01 Added support for vSphere application level HA monitoring. This provides protection comparable to that offered by the hardware watchdog timer on the hardware wireless controllers.
  - vSphere vMotion. vMotion involves moving a running virtual machine (VM) from one host to another within a cluster with minimal or no service interruption.
  - vSphere Dynamic Resource Scheduling (DRS) and Dynamic Power Management (DPM). These features monitor host utilization and use vMotion to migrate VMs to different hosts based on power management and resource utilization goals.
  - Storage vMotion. Storage vMotion allows the administrator to move a VM’s disks to different host servers while the VM is running.
  - Cold migration – The V2110 supports cold migration subject to the requirement that the V2110 is migrated in a shutdown state not in a suspended state.
  - Distributed Virtual Switches (DVS). A DVS is a virtual switch that spans multiple physical hosts. VMs migrated between hosts sharing a DVS retain their network point of presence and addresses. Customers who expect to vMotion V2110s frequently should deploy DVSs if possible.
  - The V2110 has supported the virtual serial port and virtual serial port concentrator features since its first release. VMware requires that the customer purchase a license to use this feature.
  - V2110 does not support the vSphere Fault Tolerance feature. This feature is only available to VMs that require only one virtual core. This is a VMware restriction.The V2110 is supported on ESXi version 5.5 and 6.0. For best performance and lowest latency, the MMU and CPU should support hardware virtualization such as the Intel EP-T & VT-x or AMD AMD-V & RTI.
- If configuring a service that will incur topology changes after the user gets an IP address via DHCP, for example due to authentication state, it is recommended to use short lease times on the initial topology (un-auth topology) so that clients automatically re-negotiate a new address faster (typically at half-lease) . Alternatively, it may be required to manually renew the DHCP lease from the client.
- Please add filter rule "In Filter:dest, Out Filter:src, 0.0.0.0/0, port:BootP(67), Protocol:UDP, allow" in non-authenticated policy for captive portal WLAN Service if you intend to allow wireless clients to get an IP address through DHCP.
- If the filters used by controllers are managed by Policy Manager (PM), PM should include the DHCP allow rule in the policies where that is appropriate. If PM has not done this, then it will need to explicitly add the rule to policies that are pushed to the controller and that need to support DHCP.
- IP Broadcast Multicast traffic will apply catch-all role action. If users would like to allow specific multicast, broadcast, and subnet broadcast traffic with the deny-all catch-all filter rule for global default policy, they need to explicitly add specific multicast, broadcast and subnet broadcast rules one by one to allow that traffic.
- \, ', " characters are not supported in WLAN/VNS fields.

- In case of upgrade to V10.XX, if an existing VNS has WMM disabled, only legacy clients will be serviced until WMM is enabled.
- For APs with dual Ethernet ports, both interfaces need to be connected to the same subnet/VLAN for Link Aggregation.

Upgrading Virtual Appliance V2110 VMware to the Current Release

It is MANDATORY that before upgrading to v10.11.xx the setting for the "SCSI controller" for the VMware virtual controller (V2110) is set to "Paravirtual"

You only need to install the ".ova" file when you first install the V2110 VMware. The latest .ova file is V2110-10.01.02.0038.ova. All subsequent upgrades can be performed using the standard controller upgrade procedure to apply a ".bge" file to the V2110 VMware.

For more information about installing the V2110 VMware, refer to the "ExtremeWireless V2110 Virtual Appliance Installation Guide VMware platform".

For more information about upgrading the V2110 VMware, refer to the "ExtremeWireless Maintenance Guide".

Upgrading V2110 Virtual Appliance V2110 MS Hyper-V to the Current Release

You need to install the ".zip" file when you first install the V2110 Hyper-V. All subsequent upgrades can be performed using the standard controller upgrade procedure to apply a ".ize" file to the V2110 Hyper-V.

For more information about installing the V2110 MS Hyper-V, refer to the "ExtremeWireless V2110 Virtual Appliance Installation Guide MS Hyper-V platform".

For more information about upgrading the V2110 MS Hyper-V, refer to the "ExtremeWireless Maintenance Guide".

Configuring the Shared Secret for Controller Communication

The controllers communicate amongst themselves using a secure protocol. Among other things, this protocol is used to share between controllers the data required for high availability. They also use this protocol to communicate with NetSight Wireless Manager. The protocol requires the use of a shared secret for mutual authentication of the end-points.

By default, the controllers and NetSight Wireless Manager use a well-known factory default shared secret. This makes it easy to get up and running. However, it is not as secure as some sites require.

The controllers and NetSight Wireless Manager allow the administrator to change the shared secret used by the secure protocol. In fact, the controllers and Wireless Manager can use a different shared secret for each individual end-point to which they connect with the protocol.

To configure the shared secret for a connection on the controller, open the **Secure Connections** page of the **Wireless Controller** GUI module. You can enter on this page the IP address of the other end of the secure protocol tunnel and the shared secret to use.

Be sure to configure the same-shared secret onto the devices at each end of the connection. Otherwise, the two controllers or controller and NetSight Wireless Manager will not be able to communicate. In this case, features like availability will fail.

Note that changes to secure connection share secret would come into effect only when a new connection is being established.

Please refer to the NetSight Wireless Manager *User Guide* (v5.1 or higher) for a description of how to configure the shared secret on a Wireless Manager.

NETWORK MANAGEMENT SOFTWARE SUPPORT

Network Management Suite (NMS)	Version
ExtremeManagement™	6.3 or higher
ExtremeManagement ™ Wireless Advanced Services	4.4
ExtremeControl ™	6.3 or higher

Note:

Configuration of the AP3935/AP3965 is not yet supported via ExtremeManagement™ WirelessManager.

IMPORTANT: EXTREMEWIRELESS V10 LICENSING CHANGES

Consolidated the regulatory domains to FCC, ROW, Base (for no domain specified). The FCC domain is limited to the US (and US territories), Puerto Rico, and Colombia. All other countries where an AP is certified falls under the Rest-Of-World (ROW) regulatory domain including countries previously under the NAM domain (e.g. Canada). BASE only allows management of AP3935/AP3965. Customers that have a valid maintenance contract must request a V10.01 upgrade license (available through the Extranet Licensing Site) before upgrading the appliance to V10.01.

EXTREMEWIRELESS V9 TO V10 REQUESTS FOR NEW LICENSE KEYS

A new activation license key needs to be requested whenever the Wireless Controller software is upgraded from one major version to another (e.g. version 9 to version 10). Old activation keys will not carry over in the upgrade process, but feature licenses (incremental AP licenses, Radar, etc.) are carried over on the same controller.

After an upgrade from NAM to FCC, if the AP country is not supported, then the AP radios are disabled.

After an upgrade, a customer is given a 7-day grace period. If customer does not activate an upgraded system, then customer loses the ability to manage VNS configuration and Radar scanning. Logs are recorded every15 minutes to remind the customer to install a valid 10.01 activation key.

To request a new V10 license key:

1. Log into your Extreme Networks Extranet account (https://extranet.extremenetworks.com/).
2. Select the Product Licensing link (https://extranet.extremenetworks.com/mysupport/licensing).
3. Select the **ExtremeWireless Upgrade Licenses** option from the list of tasks on the right-hand menu.
4. Fill in the simple form:

   Upgrade Version: select V10

   Contract Number: type your service contract number

   MAC Address: type the dash-delimited MAC Address of your ExtremeWireless controller
5. Click **Submit**.
6. Once the form has been submitted, it will be reviewed by Order Management to confirm the contract is valid for a version 10 upgrade.
7. Upon approval, the user is notified by email and given an Entitlement ID that must be redeemed though the user's Extranet account (follow the emailed instructions).
8. Once the Entitlement is redeemed, an activation key is emailed to the user (it can be directly copied by the user).
9. Enter the activation key into the ExtremeWireless Controller.

If you experience any issues with this process, please contact GTAC for assistance.

NEW FEATURES, SOFTWARE CHANGES, AND ENHANCEMENTS

Changes in 10.11.06.0009	
wns0014750	Adjusted client association management logic to improve buffer management for disconnecting devices.
wns0016280	Improved power save mode logic to enhance client wake-up
wns0016281	Optimized AP discovery method to account for low MTU links
wns0016897	Corrected issue with configuration of Band Preference/Load Control for Sites deployments
wns0016947	Addressed antenna port assignment logic on AP3805 for non-populated port configurations
wns0017125	Enforced inclusion of local reference address for NAS-IP-Address when doing local RADIUS authentication in Sites mode
wns0017185	Addressed AP Multi-Edit race condition for Auto-Channel Selection (ACS) configuration that could cause radio to become non-responsive
wns0017187	Corrected issued with propagation of AP tunnel state to peer Controller in High-Availability (HA)
wns0017217	Improved performance for handling of fragmented frames in Secure Data tunnel
wns0017279	Improved compatibility with Ascom Phones i62 for power management frames when aggregation enabled
wns0017179 wns0017301 wns0017318 wns0017228	Improved performance of SNMP agent to handle large volume of configuration transactions

Enhancements in 10.11.06.0009
wns0013138 Added Country Support for AP3935 for Costa Rica
wns0017271 Added Country support for Trinidad & Tobago for AP3935i-ROW
wns0017272 Added Country support for Dominican Republic for AP3935i-ROW
wns0017273 Added Country support for Trinidad & Tobago for AP3805i-ROW
wns0017274 Added Country support for Philippines for AP3805i-ROW
wns0017275 Added Country support for Costa Rica for AP3805i variants (AP3805i/e, AP3805i-ROW)
wns0017295 Added Country Support for AP3965 for Costa Rica

Changes in 10.11.05.0005	
wns0016280 wns0016353	Enhanced power save mode logic to improve client wake-up.
wns0016386	Improved stability on Controller when integrating NAC and leveraging Change-of-Authorization (CoA)
wns0016413	Improved reliability of 4-way handshake in congested environments which could affect sensitive clients
wns0016466	Relaxed restrictions on multicast/broadcast queue management and optimized algorithm to minimize drops.
wns0016498 wns0016863	Improved performance with Chromebooks on AP3700(both radios) and AP3800 (2.4GHz only) where clients entering power save mode would not receive aggregated packets
wns0016584	Improved configuration logic for deploying FFECP and 802.1x which could result in failure to redirect user
wns0016592	Corrected noise floor level reporting
wns0016777	Improved probe suppression logic for when RSS is low to release client instead of sending de-auth
wns0016906	Addressed Potential Vulnerability of AP/Controller in CVE-2016-5195
wns0016955 wns0017019	Addressed condition where small encrypted 802.11g frames could affect stability for AP3900
wns0016986	Improved SSH key management logic to regenerate keys on restart

Changes in 10.11.04.0008	
wns0014331	Addressed protection mode logic to improve compatibility with Motorola Scanner connecting to 2.4Ghz radio
wns0016159 wns0016366	Improved logic for client de-authentication that could affect stability during generation of 802.11k Neighborhood reports
wns0016175	Improved stability by adding prevention for invalid topology ID
wns0016198	Corrected issue that could cause AP to apply wrong role to client while in Site mode
wns0016226	Improved configuration import logic to prompt user to re-enter corrupted Radius Secret values instead of halting import process.
wns0016269	Improved memory management in SNMPAgent to improve stability
wns0016298	Addressed race condition in client disassociating during a failover event that could corrupt session tables.
wns0016364	Correct logic of multicast-to-unicast conversion to improve stability of AP39xx series APs when serving slow clients.
wns0016347	Improved logic for logging function to prevent log file from being flooded
wns0016390	Addressed use case for VNS Wizard when using role based redirection
wns0016450	Improved stability for look up on missing rates

Enhancements in 10.11.04.0008
wns0011752 Log recommendation for user to change AP default Password every 30 days
wns0012837 Added support for AP3825i in Uganda
wns0016453 Added country support for Taiwan for AP3805i-ROW
wns0016454 Added country support for Argentina for AP3805i-ROW
wns0016455 Added country support for Korea (ROC) for AP3805i-ROW
wns0016456 Added country support for South Africa for AP3805i-ROW
wns0016457 Added country support for Serbia for AP3825i/e

Enhancements in 10.11.03.0004
wns0015680 Added Country Support for Kazakhstan for AP3965i/e_ROW
wns0016062 Added country support for Russia for AP3965i/e-ROW
wns0016063 Added Country Support for Brazil for AP3935i/e_ROW
wns0016064 Added Country Support for Brazil for AP3965i/e_ROW
wns0016065 Added Country Support for Mexico for AP3805i_ROW
wns0016066 Added Country Support for Uruguay for AP3825i/e
wns0016067 Adjusted Power settings for Macau to leverage 200mw allowance in 2.4 GHz (B/G/N) for AP Update AP38xx and AP39xx models
wns0016073 Added country support for Brazil for AP3805i-ROW
wns0016074 Added Country Support for Nicaragua for AP3935i/e-ROW
wns0016075 Added Country Support for Nicaragua for AP3965i/e-ROW

Changes in 10.11.03.0004	
wns0015352	Adjusted parsing logic of RADIUS attributes to avoid stripping of domain name information for Captive Portal Authentication.
wns0015593	Enhanced Guest account management interface to support multi-edit for Account lifetime
wns0015807	Improved packet processing logic for core assignment to address possible instability during high-rate flows on wave2 Access points.
wns0015880	Corrected endianness conversion issue that could cause malfunction of Mac Based Authentication (MBA) for AP39xx models.
wns0015950	Corrected debug statement that could create a stack overflow by printing a value out of bounds, resulting in instability of wireless appliance (controller).
wns0015963	Corrected inclusion logic of Class attribute on Radius Accounting for 802.1x networks in 10.11.x software.

wns0015980	Improved logic in Deep Packet Inspection (DPI) Engine to address possible instability when Application Visibility enabled for a WLAN service under high traffic loads
wns0016013	Corrected issue with reporting of user statistics by Access Points, which could result in inadvertent idle timeout of registered devices

Enhancements in 10.11.02.0032
Software
Introducing IPv6 support for Bridge at Wireless Controller and Tunnel at Wireless Controller topology with IPv6 filter rules and IPv6 Proxy support.
Added support for time-based subscription licenses when integrated with ExtremeManagement.
Introducing the WS-AP3935i-IL, Indoor Wave 2 for Israel under the ROW regulatory domain.
Introducing a GUI page for AP38xx/37xx to provide support for the Dräger Certification.
Provide Warning in AP Grouping's WLAN Config quick action.
Replaced throughput pie chart with historical throughput chart from user selectable application groups.
Adding IGMP on AP37xx/AP38xx/AP39xx including support for IGMP V3 Multicast Group Registration and IGMP V2 Query/Report.
wns0013111 Added country support for Korea for the AP3935i/e-ROW.
wns0015674 Added country support for Kazakhstan for the AP3825i/e under ROW regulatory domain.
wns0015675 Added country support for Kazakhstan for the AP3805i/e under ROW regulatory domain.
wns0015676 Added country support for Kazakhstan for the AP3801i under ROW regulatory domain.
wns0015677 Added country support for Kazakhstan for the AP3865e under ROW regulatory domain.
wns0015678 Added country support for Kazakhstan for the AP3805i-ROW.
wns0015679 Added country support for Kazakhstan for the AP3935i/e-ROW.
wns0015680 Added country support for Kazakhstan for the AP3965i/e-ROW.
wns0015681 Added country support for Chile for the AP3805i-ROW.
wns0015682 Added country support for Russia for the AP3805i-ROW.
wns0015683 Added country support for Georgia for the AP3805i-ROW.
wns0014684 Added country support for Ecuador for the AP3805i-ROW.
wns0015685 Added country support for Ecuador for the AP3965i-ROW.
wns0015748 Added country support for Korea for AP3965i-ROW and AP3965e-ROW.
wns0015752 Added support for DEMO for AP3935i-IL.

Changes in 10.11.02.0032	
wns0012777	Optimized background scanning algorithm to improve stability of AP3800 series APs
wns0015281	Addressed issue with limited connectivity for Intel Clients. See known issues for other cases
wns0012074	Updated V2110 network device drivers to improve stability and host interoperability
wns0015550	Improved logic to recover from possible radio stalling during configuration.
wns0014589	Corrected user guide to correct description of CSV fields that carry user session lifetime.
wns0015121	Addressed issue with packet fragmentation logic on AP3935 which could affect Client connections over VPN
wns0015715	Corrected issue with handling of HTTPS for Captive Portal redirection
wns0014382	Updated packet buffer handler to address message corruption for secure tunnel connections
wns0015436	Adjusted radio logic handling to protect against aggressive client behavior of frequent changes in Power-Save mode for mixed client environments.

Enhancements in 10.11.01.0210
Software
Enhanced customer control over network traffic operation, by providing visibility of the Top 5 application groups per SSID and per individual user on the wireless appliance dashboard and report.
Introducing new policy definition and efforcement to support Layer7/application rules specific to control (allow, deny, QoS, rate limiting, VLAN containment) for over 3,000 fingerprints covering 2,000+ web-based applications.
Improved visibility of associating devices by providing improved fingerprinting of client device's device type and operating system. Device characteristics are represented on the device's report as well as an aggregate representation of top 5 device types and OS on a per WLAN basis.
Improved visibility and flexibility of roles defined for Captive Portal functions, by introducing an explicit REDIRECT action. This action allows user to specifically define when HTTP/HTTPS redirection should take place within the role.
Enhanced Access Points (AP38XX/39XX) to directly support redirection and Firewall Friendly External Captive Portal (FFECP) for distributed topologies.
Added support for wireless countermeasures to the AP39XX Series platforms.
Added the ability to hide the SSID for a WDS mesh for increased security.
Streamlined the AP configuration simplifying the process of provisioning of large scale AP deployments.
Upgraded the operating system to a 64bit kernel for the wireless appliances.
Enhanced Batch Location Report (BLR) to include the option to provide snapshot of full set of statistic metrics for associated Mobile Units (Mus)
Increased the number of APs that can be configured as a site to 100 and 2,000 sessions.
Enhanced the SNMP interface to include PerProtocol statistics.
wns0015080 Added country support for Ecuador to the AP3965e-ROW.

wns0015082 Added country support for Colombia to the AP3805i-FCC.	
wns0015077 Added country support for United Arab Emirates to the AP3965i/e-ROW.	
wns0015087 Updated Pakistan and Mexico to the latest regulations for all tables.	
wns0015081 Added country support for Mexico to the AP3965i/e-ROW.	
wns0015096 Added country support for India to the AP3935i/e-ROW.	
wns0015086 Added country support for Pakistan to the AP3805i/e and AP3825i/e.	
wns0015093 Added country support for Mexico to the AP3935i/e-ROW.	
wns0015079 Added country support for India to the AP3965i/e-ROW.	
wns0015085 Added country support for Argentina to the AP3805i/e and AP3865e.	
wns0014815 Added country support for Malaysia to the AP3935i/e and AP3965i/e-ROW.	
wns0015078 Added country support for Hong Kong to the AP3965i/e-ROW.	
wns0015084 Added country support for Morocco to the AP3825i	
wns0015094 Added country support for United Arab Emirates to the AP3935i/e-ROW.	
wns0015076 Added country support for Pakistan for the AP3935i/e and AP3965i/e-ROW.	
wns0015083 Added country support for Saudi Arabia to the AP3805i-ROW	
Changes in 10.11.01.0210	
wns0013712	Addressed possible exposure to OpenSSH keyboard-interactive authentication (CVE-2015-5600)
wns0014390	Improved memory allocation management for AP3705 to better handle high utilization loads.
wns0014899	Fixed timer for Inter-AP Protocol to reduce the number of multicast transmissions for Auto Channel Selection exchanges
wns0014333	Addressed possible issue with radio operational mode after removal of WLAN services. When administrator Added or removes wlans services from the radio, clients associated to other wlans on the same radio may experience temporary service interruption. Clients on the radio are disassociated and will re-associate soon after service is restarted.
wns0014488	For AP3705i, booting up is delayed until flash clean-up is finished (up to 5 minutes). Improved resilience on recovery from hard-power reset/interruption
wns0014431	Fixed password generator tool for the add guest user dialog
wns0015157	Updated configuration handler for hostname to remove leading and trailing ‘space’ characters. Space characters are not supported in Hostname definition and can cause configuration backup/restore to fail
wns0014080	Corrected issue with handling of Multicast definitions for Access Points configured in Site Mode
wns0013918	Ensure consistency of user-name reporting in radius accounting-request packets
wns0013916	Addressed Acknowledgment to NAC on policy change authentication after a Captive Portal authentication

wns0013997, wns0014278	Addressed Potential Vulnerability of APs to CVE-2015-4000, CVE-2015-3197, CVE-2015-0204, CVE-2016-0800
wns0014009	Improved key management protection to address possible key corruption for 802.1x authentication
wns0014729	Addressed Radius client recovery after target Server IP configuration changes
wns0014298	Corrected handling of deny default action on B@AP for AP39xx series devices
wns0014415	Fixed channel plan pop-up when adjusting large number of APs in multi-edit
wns0014426	Addressed memory management issues when configuring MU blacklists
wns0014565	Addressed issue with possible corruption of Radius IP address configuration via SNMP
wns0014085	Corrected IPv6 address parsing for the management interface when added via the CLI
wns0015240	Adjusted validation logic for derived key maximum key length for 802.11r (Fast Transition) configuration. Misconfiguration could cause AP3800 series radio to not initialize correctly.
wns0013505	Fixed issue when controller didn't send Siemens-SSID RADIUS value for a fast-failover event
wns0014148	Addressed Potential Vulnerability of APs to CVE-2015-7547
wns0014251	Updated AP3825i/e power settings for band 1 and 4 to comply with new FCC Part 15 UNII rule with DFS, introduced new AP-ID number (-1). This is required in order to keep shipping beyond June 2016. The new rules increased power in band 1 but reduced power in band 4.
wns0015206	Addressed possible instability for AP3800 series devices in handling of client connectivity management features (Steering, Balance, Probe Suppression)

Changes in 10.01.05.0008	
wns0013289 wns0014572	Improved handling of broadcast packets for AP3900 series APs
wns0014085	Added support of topology groups in the exception filters for internal captive portal
wns0014371	Improved probe suppression logic to also block 802.11 AUTH requests
wns0014415	Fixed channel plan pop-up when adjusting large number of APs in multi-edit
wns0014426	Addressed memory management issues when configuring MU blacklists
wns0014431	Fixed password generator tool for the add guest user dialog
wns0014570	Resolved issue with APs in Guardian mode not reporting location data for 5.0 GHz radio.
wns0014777	Fixed race condition when learning new addresses with ARP proxy enabled
wns0014633	Enhanced Location logs to include X,Y coordinates for tracked devices
wns0014690	Resolved issue with possible image upgrades failures to 10.01.04 build for AP3900 series APs
wns0014729	Addressed Radius client recovery after target Server IP configuration changes
wns0014899	Fixed timer for Inter-AP Protocol to reduce the number of multicast transmissions for Auto Channel Selection exchanges

Enhancements in 10.01.05.0008
wns0013123 Added country support for Russia to the AP3935i/e
wns0014654 Added country support for Bosnia Herzegovina to AP3801i
wns0015077 Added country support for Bosnia Herzegovina to AP3805i/e
wns0014656 Added country support for Bosnia Herzegovina to AP3805i-ROW
wns0014657 Added country support for Bosnia Herzegovina to AP3825i/e
wns0014658 Added country support for Bosnia Herzegovina to AP3825i/e-1
wns0014659 Added country support for Bosnia Herzegovina to AP3865e
wns0014660 Added country support for Bosnia Herzegovina to AP3935i/e
wns0014661 Added country support for Bosnia Herzegovina to AP3965i/e
wns0014677 Added country support for Peru to AP3965i/e
wns0014679 Added channels 52-144 (DFS) for Colombia, Puerto Rico, and United States to AP3965i/e
wns0014806 Added country support for Hong Kong to the AP3805i-ROW
wns0014807 Added country support for Kuwait to the AP3805i-ROW
wns0014808 Added country support for Peru to the AP3805i-ROW
wns0014809 Added country support for Dominican Republic to the AP3805i-ROW
wns0014810 Added country support for Malaysia to the AP3805i-ROW

wns0014811 Added country support for Qatar to the AP3805i-ROW
wns0014812 Added country support for Singapore to the AP3805i-ROW
wns0014813 Added country support for China to the AP3805i-ROW
wns0014814 Added country support for Chile to the AP3935i/e and AP3965i/e
wns0014815 Added country support for Malaysia to the AP3935i/e and AP3965i/e
wns0014816 Added country support for Kuwait to the AP3965i/e
wns0014817 Added country support for Qatar to the AP3965i/e
wns0014818 Added country support for Ecuador to the AP3935i/e
wns0014765 Added country support for South Africa to the AP3935i/e
wns0014766 Added country support for South Africa to the AP3965e
wns0014488 For AP3705i, delayed booting up until flash clean-up is finished (up to 5 minutes). Improved resilience on recovery from hard-power reset/interruption

Changes in 10.01.04.0011	
wns0013847	Corrected logic for timer handling to address possible connectivity issues for APs operational for long-periods of time
wns0013916	Addressed Acknowledgment to NAC on policy change authentication after a Captive Portal authentication
wns0013918	Ensure consistency of user-name reporting in radius accounting-request packets
wns0014298	Corrected handling of deny default action on B@AP for AP39xx series devices.
wns0014358	Updated probe suppression algorithm to adhere to Qualcomm usage pattern, addressing possible resource exhaustion
wns0014371	Improved probe suppression logic to also block 802.11 AUTH requests
wns0014389	Addressed possible transmit lockup due to group rekeying operations
wns0014390	Improved memory allocation management for AP3705 to better handle high utilization loads.
wns0014416	Fixed channel plan pop-up when adjusting large number of APs in multi-edit
wns0014037	Improved More-Data indication for Power Save mode. Improved WMM (QoS) logic to ensure that AMPDU is only enabled for clients that support the function.
wns0013997	Addressed Potential Vulnerability of APs to CVE-2015-4000, CVE-2015-3197, CVE-2015-0204
wns0014148	Addressed Potential Vulnerability of APs to CVE-2015-7547

Enhancements in 10.01.04.0011
wns0013106 Add country support for Hong Kong to the AP3935i/e
wns0013124 Add country support for Saudi Arabia to the AP3935i/e

wns0013126 Add country support for Singapore to the AP3935i/e
wns0013129 Add country support for Thailand to the AP3935i/e and AP3965i/e
wns0013542 Introduce support for AP3805 FCC & ROW models
wns0013757 Add country support for Indonesia to AP3801i, AP3805i/e and AP3825i/e
wns0014239 Add country support for Peru for AP3935i and AP3935e
wns0014240 Add country support for Taiwan for AP3965i and AP3965e
wns0014241 Add country support for Singapore for AP3965i/e
wns0014242 Add country support for Channels 116-128 on AP3935i/e in Taiwan
wns0014251 Add support for AP3825i-1 and AP3825e-1 models
wns0014347 Add support WS-AO-DX10055N antenna to AP3965e
wns0014448 Add country support for China to AP3935i/e and AP3965i/e
wns0014449 Add country support for Qatar to AP3935i/e
wns0014450 Add country support for Kuwait to AP3935i/e
wns0014451 Add country support for Egypt to AP3935i/e and AP3965i/e
wns0014452 Add country support for Jordan to AP3935i/e and AP3965i/e
wns0014453 Add DFS Support (Channels 52-144) to AP3935i/e-FCC models
wns0014454 Add country support for Philippines to AP3935i/e and AP3965i/e.
wns0014455 Add country support for Indonesia to AP3935i/e and AP3965i/e
wns0014456 Add country support for Saudi Arabia to AP3965i/e
wns0014457 Add country support for Brunei to AP3805i and AP3865e.
wns0014458 Add country support for Vietnam to AP3805i, AP3825i, and AP3825i-1.
wns0014459 Add country support for Malaysia to AP3805i, AP3825e, AP3825e-1, and AP3865e.
wns0014460 Add support for WS-AI-DX10055 antenna to AP3935e

Changes in 10.01.03.0007	
wns0013859	Resolved issue where AP could get stuck in scanning mode until it is rebooted
wns0013942	Corrected ipv6 address parsing when added via the CLI
wns0014009	Resolved 802.1X authentication client connection issues
wns0014075	Fixed controller configuration check routine for overlapping subnets on different interfaces, this use case is not supported
wns0014080	Fixed site mode B@AP multicast filter configuration updates AP properly
wns0014153	Improved handling of Fast Transition state for 802.11r
wns0014185	Fixed duplicate L2 updates when new client associated to AP which caused invalid MAC addresses on the AP switch port

Enhancements in 10.01.02.0038
Hardware
Introduces support for the ExtremeWireless AP3965i/e, a fully featured outdoor 4x4:4 dual radio 802.11ac Wave 2 AP, providing up to 2.5 Gbps over-the-air performance, multi-user MIMO, built-in wired load balancing for high-density and mission critical deployments.
Software
Added support for wireless countermeasures to the AP39XX Series platforms.
Added country support for the Philippines to the AP3825i/e under the ROW domain.
Extended the AP3935/3965 functionality to support higher power request levels via LLDP.
For AP3935 and AP3965, a manual overwrite configuration function through the Controller interface was provided to allow the administrator to overwrite the power mode, setting the AP explicit into full power mode (equivalent to 802.3at operation for full 4x4:4 operation).
For AP3935 and AP3965, the per-radio user capacity was increased to at least 240 devices.

Changes in 10.01.02.0038	
wns0011674	Corrected a problem when the controller was no longer reachable via SMTPv3 if the user set a password with special characters.
wns0012997	Restricted transmission of Ethernet pause frames on the AP3805i.
wns0012007	Bypass filtering functions if no filter rules defined.
wns0013502	Corrected Radius accounting state machine relevant start messages when the interval was set to 0.
wns0013505	Corrected a problem whereby the controller didn't send Siemens-SSID RADIUS value for a fast-failover event.
wns0013712	Addressed a possible exposure to the OpenSSH keyboard-interactive authentication vulnerability (CVE-2015-5600).
wns0013620	Resolved iStat device not staying connected with WPA2-PSK authentication.
wns0013761	Updated the AP3865e power settings to comply with the latest Industry Canada (IC) Regulations. Removed band 1 for all antennas with the exception of the WS-ANT-5DIPN; changed band 1 channels 36-48 power to meet 50mW limit and indoor Only for WS-ANT-5DIPN.

Enhancements in 10.01.01.0129
Hardware
Introduces support for the ExtremeWireless AP3935i/e, a fully featured 4x4:4 dual radio 802.11ac Wave2 AP, providing up to 2.5 Gbps over-the-air performance, multi-user MIMO, built-in wired load balancing and transparent PoE failover for high-density and mission critical deployments.
Added support for new quad and eight-feed MIMO antennas to optimize the RF advantages of 4x4:4 in high-density deployments.
Software

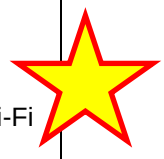
Enhancements in 10.01.01.0129
Enhanced the discovery mechanism of the management plane on the AP39XX Series enabling secure discovery over SSL of the management service through the public cloud. The on-premise discovery mechanism and secured control channel for on-premise controllers remains unchanged from previous releases.
Added support for Hotspot 2.0 functionality, enabling transparent mobility between cellular data networks and hotspot Wi-Fi networks. New services include support for 802.11u, enabling pre-authentication network selection.
Enhancements doubles the maximum user/device capacity of the C5210 wireless appliance from 8,000 to 16,000 users/devices per appliance and a total of 32,000 users in high-availability mode.
Increased the map size for location tracking and added enhancements to track and report location of un-associated devices.
Licensing modifications to support moving regulatory enforcement to the AP39xx Series APs, enabling flexibility for global deployments by eliminating controller regulatory restrictions; a single wireless appliance installation can support both FCC and ROW deployments.
Provide administrative control over guest password generation algorithm so as to generate simpler and more localized passwords for Guest Login.
Include Area/Location information elements in 802.1x requests when Area Notification for MBA enabled (wns0012660)
Resolved limitation on V2110-Small to provide N-Packet mirroring for Application Visibility integration. N-Packet Mirroring supported on all capacity variants of V2110 (wns0012749)
Validated support for V2110 installations on VMWare ESXi 6.0.
Enhanced Batch Location reporting interface to support definition of header authentication credentials.
Introduced administrative method for configuring the level of security protocol used in inter-controller and controller / NetSight communications.
Enhanced export of AP inventory report to include the BSSID information for configured services per AP.
Added support to automatically bind the inter-controller communications channel to user installed (CA signed) certificate.
Extended information elements of Location Batch Report to include Area, AP SN and Authentication state identifiers.
Enforce definition of AP password on controller install through CLI and GUI install wizards.
Static routing entries can now refer to next hops reachable through B@AC (L3) topologies.
Added option to customize format of CallingStation-ID field in 802.1x requests by allowing binding to format definition of Mac-Based-Authntication (MBA)
Introducing the new ExtremeWireless™ branding.

KNOWN RESTRICTIONS AND LIMITATIONS:

Known Restriction or Limitation	I.D.
It is MANDATORY that before performing the upgrade to release 10.11.xx the setting for the “SCSI controller” for a VMware virtual controller (V2110) is set to “Paravirtual” (note that the default value is “BusLogic Parallel”). See also the KB: https://gtacknowledge.extremenetworks.com/articles/Solution/V2110-large-upgrade-to-v10	Wns0015953 - Info
The following cipher-suites have been obsoleted in release 10.01 as compared with the 9.21 release: DES-CBC3-MD5 RC2-CBC-MD5 DES-CBC-MD5 EXP-EDH-RSA-DES-CBC-SHA EXP-EDH-DSS-DES-CBC-SHA EXP-DES-CBC-SHA EXP-RC2-CBC-MD5 EXP-RC4-MD5 If any of the above cipher-suites was being used to configure the "message-bus-ciphers" under the CLI "secureconnection" context in a 9.21 EWC release, then after upgrading the EWC to the 10.01 release, then the "message-bus-ciphers" is automatically set to "none" which maps to the default "RC4-MD5" cipher-suite setting.	wns0013172 - Info
The client of the Intel AC7260 wireless chipset with the latest drivers 18.32.x or 18.33.x may become un-responsive when client roams outside of Wi-Fi Coverage area and comes back. The Symptom is a Yellow Exclamation mark within the Wi-Fi icon in the task bar. The current work around is to manually refresh the Wi-Fi connection or troubleshoot the Wi-Fi connection. This issue is fixed in Intel drivers 18.33.3.1 or 18.33.3.2 and above.	Info
AP3900 Series need to be configured as part of a Radar “In-service” scanning group in order for location information to be consistently reported. Otherwise, there could be periodic interruptions in location reporting	wns0014954 – Fixed in V10.02
Rule Based Redirection (RBR) provides users better visibility and control on how and when Captive Portal redirection works. Administrators can now explicitly define where in the Role the redirection will take place. However, if opting to use this funcition, be aware that the rule order for the REDIRECT action is critical to the proper functionality. The REDIRECT action rules for ports 80, 8080 and 443 must be added below the rules that define allowed access to the intended External Captive Portal server and any other allowed (Walled Garden) destinations. The rule must also be positioned above the 'Deny All' Default action.	wns0014608 - Info
The Deep Packet Inspection mechanism employed for Layer 7/Application rule enforcement requires several frames of a flow in order to make a decisive fingerprint. This operaiton is therefore incompatible with Rule Based Redirection (RBR) [aka, REDIRECT action], as that function triggers directly off the first frame (SYN) in the flow. Therefore, Layer 7/Application rules cannot be combined in the same role with redirection operations, whether implicit redirection (traditional redirection triggered from	wns0014726 - Info

DENY traffic) or explicit REDIRECT rule action. When defining a role to be used in support of HTTP/HTTPS redirection, the role can only contain Layer 2-4 rule sets.	
For Policy/Roles mapped to centralized topologies, references to layer 7 application group 'Streaming' (Allow or Deny actions) cause mobile YouTube Applications to not show content. Issue not observed with YouTube access via browser. Issue is being investigated and will be addressed in a future release	wns0014846 - Info
When configured to 100% Airtime, the Flexible Client Access (FCA) [aka, Airtime Fairness] feature is limited to 50 simultaneouly transmitting clients per radio on AP3900 series models.	wns0015037 - Info
ExtremeWireless Virtual Appliance V2110 MS Hyper-V – Info It was noticed that Hyper-V controllers with ports mapped to virtual ports of their server do not have the best performance, hence it is recommended to map controller's ports to physical ports. Clustering Hyper-V is not supported and should not be configured.	
For deployments with AP39xx, ARP Proxy function for Bridged@AP topologies must be disabled, otherwise it can trigger instability. Fix is under investigation.	wns0014780 – Info – Fixed on V10.11.02
When changing SNMPv3 user credentials, or deleting a user and adding a new one with the same name and credentials, a controller reboot is required, or restart the SNMP Trap Agent process in the CLI using the "restart snmp trap agent" command. When switching between SNMPv3 and SNMPv1/2, a controller reboot is required, along with rediscovery of the controller on the SNMP tool.	wns0013972 – Info – Fixed in V10.11.02
When upgrading from V9.21 (or earlier) to V10.01.02, SNMP tools (such as NetSight MIB Tools) will need to rediscover the controller with an updated Engine ID (even if using the same SNMP user & credentials) as the prefix used in the Engine ID has been changed from Siemens to Extreme Networks.	wns0013973 – Info
A limitation was found for clients that will not connect in ac-strict radio mode. The list includes Nexus 9, Galaxy S4, iPad Air, Intel7260.	wns0013397– Info
Due to changes to the SNMP agent in V10.01.02, "counter64" type OIDs are no longer supported. To support this type OID, use SNMP V2c or V3.	wns0013536– Info
Some versions of Apple Mac Books might exhibit low throughput performance when Management Frame Protection (PMF) is enabled.	wns0012889– Info
In order to capture NULL and QOS_NULL packets with WireShark, do not set a Capture Filter and disable "Do not capture own RPCAP traffic" under Remote Settings. In WireShark v1.12.3, select Capture --> Option --> Double Click Interface Row --> Remote Settings.	wns0012862– Info
The Access Point Name field can be up to 23 characters and must start with alpha characters, not numeric.	wns0012722 – Info
When enabling Sites Mode, the Controller's topology capacity is capped at 128 topologies. Currently, APs are unable to process more than 128 topologies. In site configuration, all topologies get pushed to all APs, which effectively limits the maximum per-controller topologies to 128.	wns0012793 – Info
Countermeasures for honeypot AP threat may be less effective for the iPhone (with version 8.3) client device than other device types	wns0012678 – Info
We recommend that you do not enable 802.11k along with the Quiet IE option for installations with Ascom i62 phones.	wns0012567– Info

Rogue AP Detection applies only ‘Open” hostspots. Countermeasures can be enforced against other link-protected hotspots if designated as a threat.	wns0012296– Info
Instability issues observed on the network with Intel AC-7260 based clients. Workaround: Update the Intel AC-7260 driver and disable the Throughput Boost setting in the client driver Advanced options. This issue is not present if the client driver is running18.20.0.9 or above.	wns0011519 – Info
AP38XX supports TKIP with the following restrictions due to new Wi-Fi Alliance certification requirements: Only available for Legacy rates; not supported with 11n nor 11ac rates Mix configuration of AES and TKIP on one radio is not supported; for example, configuring multiple VNS with mixed types of TKIP and AES on one AP radio is not allowed.	wns0011589 – Info
RADIUS attribute-value pair limits the location data size to 251 characters. When the location data size is more than 251 characters, the data is sent to the RADIUS server truncated to 251 characters.	wns0011467– Info
The Location Batch Report file contains two timestamp attributes that are currently in local time. However, the time zone indicator is missing. These fields should be reported as UTC time with the time zone is set to 'Z'.	wns0011008– Info
The Chrome auto-complete function fills in fields incorrectly. Disable password saving and password field auto completion in a Chrome configuration.	wns0010642– Info
APs advertising the SSIDs of administratively disabled WLAN Services are not detected as internal honeypots until the WLAN Service is enabled.	wns0008740 – Info
For "g/n" mode operation of the AP with wireless clients based on Intel 6300N chipset with driver 15.x/14.3.x, we recommended disabling the "11g protection" setting. Set AP/Radio2/Advanced --> 11g Settings / Protection mode --> None.	wns0008979 - Info
When the AP is used in a WDS or Mesh service, the AP name must be under 32 characters.	wns0008035 - Info
On C5210, status on interface without physical transceivers plugged reported Up and Down.	wns0008023 - Info
Topology groups – Info Topology groups are not supported for Site deployments. Configuration of Services referencing Topology Groups should result in a “incompatible’ policy resolution at the site, but this may not always be the case, and could result in an incorrect topology assignment. We recommend that you do not configure Topology groups if Site deployments are in use.	
Info MacBook Air running SW prior to 10.8.4 can experience random disconnections (mostly noticeable during video streaming). The issue is caused by a bug in the Apple WiFi driver, and it is corrected in SW 10.8.4.	
Info The client of the Intel AC7260 wireless chipset with the latest drivers 18.32.x or 18.33.x may become un-responsive when client roams outside of Wi-Fi Coverage area and comes back. The Symptom is a Yellow Exclamation mark within the Wi-Fi icon in the task bar. The current work around is to manually refresh the Wi-Fi connection or troubleshoot the Wi-Fi connection. This issue is fixed in Intel drivers 18.33.3.1 or 18.33.3.2 and above.	



How to use Real Capture Tool

- Click Start to start real capture server on the AP. This feature can be enabled for each AP individually. Default capture server timeout is set to 300 seconds and the maximum configurable timeout is 1 hour. While the capture session is active the AP interface operates in promiscuous mode.
- From Wireshark GUI set the capture interface to the selected AP's IP address and select null authentication. Once Wireshark connects to the AP, the AP's interfaces will be listed as available to capture traffic. eth0 is the wired interface, wlan0 is the 5Ghz interface, and wlan1 is the 2.4Ghz interface.
- You have the option to capture bidirectional traffic on eth0, wifi0, and wifi1. The capture on wifi0 and wifi1 will not include internally generated hardware packets by the capturing AP. The capturing AP does not report its own Beacons, Retransmission, Ack, and 11n Block Ack. If this information is needed, then perform the real capture from a close-by second AP. Change the second AP's wireless channel to match the AP that is being troubleshot. Let the second AP broadcast an SSID to activate the radios, but do not broadcast the same SSID you are troubleshooting, so that you can prevent the clients from connecting to your second capturing AP

Note: For AP3935/AP3965 some frames generated by the AP's radio, such as Beacons, ACK, RTS/CTS are not captured.

SUPPORTED WEB BROWSERS

For EWC management GUI, the following Web browsers were tested for interoperability:

- MS IE 8.0, IE9, IE10, IE11, Edge
- Firefox 38.0
- Google Chrome 43.0

The Wireless Clients (Captive Portal, AAA):

Browsers	Version	OS
Chrome	46.0.2490.71 dev-m	Windows server 2012
Chrome	47.0.2526.80 m	Windows 7
Chrome	38.0.2125.111m	Windows server 2012
Firefox	41.0.1	Windows server 2012
Firefox	38.0.5	Windows XP
IE 11	11.0.9600.18059	Windows 7
IE 9	9.0.8112.16421	Windows 7
IE 8	8.0.6001.18702	Windows XP
Opera beta	34.0.2036.24	Windows 7
Safari	preinstalled with iOS9.1	iOS9.1

PORT LIST

The following list of ports may need to remain open so that the controllers/APs will function properly on a network that includes protection equipment like a firewall.

ExtremeWireless TCP/UDP Port Assignment Reference

Comp. Source	Comp. Dest	Protocol (TCP/UDP)	Src Port	Dest Port	Service	Remark	Open Firewall Req'd
Ports for AP/Controller Communication							
Controller	Access Point	UDP	Any	13910	WASSP	Management and Data Tunnel between AP and Controller	Yes
Access Point	Controller	UDP	Any	13910	WASSP	Management and Data Tunnel between AP and Controller	Yes
Controller	Access Point	UDP	4500	Any	Secured WASSP	Management Tunnel between AP and Controller	Optional
Access Point	Controller	UDP	Any	4500	Secured WASSP	Management Tunnel between AP and Controller	Optional
Access Point	Controller	UDP	Any	13907	WASSP	AP Registration to Controller	Yes
Access Point	Controller	UDP	Any	67	DHCP Server	If Controller is DHCP Server for AP	Optional

Comp. Source	Comp. Dest	Protocol (TCP/UDP)	Src Port	Dest Port	Service	Remark	Open Firewall Req'd
Access Point	Controller	UDP	Any	427	SLP	AP Registration to Controller	Optional
Controller	Access Point	TCP/UDP	Any	69	TFTP	AP image transfer	Yes[1]
Access Point	Controller	TCP/UDP	Any	69	TFTP	AP image transfer	Yes[2]
Controller	Access Point	TCP/UDP	Any	22	SCP	AP traces	Yes
Any	Access Point	TCP	Any	2002, 2003	RCAPD	AP Real Capture (if enabled)	Optional
Any	Access Point	TCP/UDP	Any	22	SSH	Remote AP login (if enabled)	Optional
Ports for Controller Management							
Any	Controller	TCP/UDP	Any	22	SSH	Controller CLI access	Yes
Any	Controller	TCP/UDP	Any	5825	HTTPS	Controller GUI access	Yes
Any	Controller	TCP/UDP	Any	161	SNMP	Controller SNMP access	Yes
Any	Controller	TCP/UDP	Any	162	SNMP Trap	Controller SNMP access	Yes
Ports for Inter Controller Mobility and Availability							
Controller	Controller	UDP	Any	13911	WASSP	Mobility and Availability Tunnel	Yes
Controller	Controller	TCP	Any	427	SLP	SLP Directory	Yes
Controller	Controller	TCP	Any	20506	Langley	Remote Langley Secure	Yes
Controller	Controller	TCP	Any	60606	Mobility	VN MGR	Yes
Controller	Controller	TCP	Any	123	NTP	Availability time sync	Yes
Controller	DHCP Server	UDP	Any	67	SLP	Asking DHCP Server for SLP DA	Yes
DHCP Server	Controller	UDP	Any	68	SLP	Response from DHCP Server for SLP DA request	Yes
Core Back-End Communication							
Controller	DNS Server	UDP	Any	53	DNS	If using DNS	Optional
Controller	Syslog Server	UDP	Any	514	Syslog	If Controller logs to external syslog server	Optional

[1] TFTP uses port 69 only when the secure control tunnel is NOT enabled between the AP and controller. If the secure control tunnel is enabled TFTP exchanges take place within the secure tunnel and port 69 is not used.
[2] TFTP uses port 69 only when the secure control tunnel is NOT enabled between the AP and controller. If the secure control tunnel is enabled TFTP exchanges take place within the secure tunnel and port 69 is not used.

Comp. Source	Comp. Dest	Protocol (TCP/UDP)	Src Port	Dest Port	Service	Remark	Open Firewall Req'd
Controller	RADIUS Server	UDP	Any	1812	RADIUS Authentication and Authorization	If using RADIUS AAA	Optional
Controller	RADIUS Server	UDP	Any	1813	RADIUS Accounting	If enabled RADIUS accounting	Optional
Dynamic Authorization Client (typically NAC)	Controller	UDP	Any	3799	Dynamic Authorization Server (DAS)	Request from Dynamic Authorization Client to disconnect a specific client	Optional
Controller	AeroScout Server	UDP	1144	12092	Location-Based Service Proxy (lbs)	Stanley Healthcare/ AeroScout Location-Based Service	Optional
AeroScout Server	Controller	UDP	12092	1144	Location-Based Service Proxy (lbs)	AeroScout Location-Based Service	Optional
Controller	Check Point	UDP	Any	18187	Checkpoint	Logging to Check Point Server	Optional

IETF STANDARDS MIB SUPPORT:

RFC No.	Title	Groups Supported
Draft version of 802.11	IEEE802dot11-MIB	
1213	RFC1213-MIB	Most of the objects supported
1573	IF-MIB	ifTable and interface scalar supported
1907	SNMPv2-MIB	System scalars supported
1493	BRIDGE-MIB	EWC supports relevant subset of the MIB
2674	P-BRIDGE-MIB	EWC supports relevant subset of the MIB
2674	Q-BRIDGE-MIB	EWC supports relevant subset of the MIB

EXTREME NETWORKS PRIVATE ENTERPRISE MIB SUPPORT

Extreme Networks Private Enterprise MIBs are available in ASN.1 format from the Extreme Networks website at: http://www.extremenetworks.com/support/policies/mibs . Indexed MIB documentation is also available.

Proprietary MIBs

Title	Description
enterasys-configuration-management-mib.txt	Used to perform configuration backup and restore
ENTERASYS-CLASS-OF-SERVICE-MIB	Used for configuration/monitoring CoS and rate control
ENTERASYS-POLICY-PROFILE-MIB	Used for configuration/monitoring policy and rules assignments
ENTERASYS-RADIUS-AUTH-CLIENT-MIB	Used for configuration of RADIUS Authentication servers
ENTERASYS-RADIUS-ACCT-CLIENT-EXT-MIB	Used for configuration of RADIUS Accounting servers
ENTERASYS-IEEE8023-LAG-MIB-EXT-MIB	Used for configuration/monitoring LAG port

Standard MIBs

Title	Description
IEEE802dot11-MIB	Standard MIB for wireless devices
RFC1213-MIB.my	Standard MIB for system information
IF-MIB	Interface MIB
SNMPv2-MIB	Standard MIB for system information
BRIDGE-MIB	VLAN configuration information that pertains to EWC
P-BRIDGE-MIB	VLAN configuration information that pertains to EWC
Q-BRIDGE-MIB	VLAN configuration information that pertains to EWC
IEEE8023-LAG-MIB	LAG configuration information. Set is permitted for LAG L2 port configuration only.

Siemens Proprietary MIB

Title	Description
HIPATH-WIRELESS-HWC-MIB.my	Configuration and statistics related to EWC and associated objects
HIPATH-WIRELESS-PRODUCTS-MIB.my	Defines product classes
HIPATH-WIRELESS-DOT11-EXTNS-MIB.my	Extension to IEEE802dot11-MIB that complements standard MIB
HIPATH-WIRELESS-SMI.my	Root for Chantry/Siemens MIB

802.11AC AND 802.11N CLIENTS

The following 802.11ac and 80211n clients are known to work with V10.01 software release:

Windows 10

Device	Model	Driver	Radio
Intel	AC-7260	18.21.0.2	a/b/g/n/ac
Microsoft Lumia	950 xl dual sim	10.0.10586.11	a/b/g/n/ac

11ac MU-MIMO

Device	Model	Driver	1x Support	Radio	11ac Strict	MU-MIMO
Google Nexus	Nexus 5x	Android 6.0	Yes	abgn+ac	Yes	2x2 MU-MIMO
Microsoft Lumia	Lumia 950	Windows 10 Mobile	Yes	abgn+ac	No	2x2 MU-MIMO
Microsoft Lumia	Lumia 950XL	Windows 10 Mobile	Yes	abgn+ac	No	2x2 MU-MIMO
Dell Alienware	Dell Alienware with Killer Wireless- 1535	Windows 10	Yes	abgn+ac	No	2x2 MU-MIMO
Linksys	USB AC600		Yes	abgn+ac	No	1x1 MU-MIMO
Acer PC	Acer Aspire E5 with Qualcomm Atheros QCA9377	Windows 10	Yes	abgn+ac	No	1x1 MU-MIMO
Acer PC	Acer Aspire E15 with Qualcomm Atheros QCA9377	Windows 10	Yes	abgn+ac	No	1x1 MU-MIMO

Due to limited availability of the real clients, most of the feature testing was done with IxVeriWave tool.

Device	Model	OS	1x Support	Radio	11ac Strict	MU-MIMO
Google Nexus	Nexus 5x	Android 6.0	yes	a/b/g/n/ac	yes	2x2 Mu-MIMO

The following clients passed the 11ac strict mode test.

Client	Driver Version	Test Case	Build	Result
AC 1200 D-Link	1027.4.630.2015	11ac Strict mode		Pass

Broadcom 802.11 ac	6.30.223.102	11ac Strict mode		Pass
AirPort Extreme (0x14E4, 0x117)	Broadcom BCM43xx 1.0 (6.30.223.74.22)	11ac Strict mode		Pass
Cisco AE6000	AE6000_v5.0.7.0_Driver_Win7	11ac Strict mode		Pass
iPhone 6 - iOS 9.1	Modem firmware 2.23.03	11ac Strict mode		Pass
ASUS PCE-68ac	6.30.223.75	11ac Strict mode		Pass
MacBook Air	Broadcom BCM43xx 1.0 (6.30.223.154.65)	11ac Strict mode		Pass
iPhone 6 - iOS 9.1	Modem firmware 4.32.00	11ac Strict mode		Pass
Nexus 5X	Kernel Version 3.10.73-g60cf314	11ac Strict mode		Pass

Other 11ac and 11n devices:

Device	Model	OS	Radio
Apple	A1396	iPad OS	11abgn
Apple	iPad	IOS 7.1.2	
Apple	iPad (4th generation)	iOS9.1	a/b/g/n
Apple	iPad 3	iOS 8.4.1	a/b/g/n
Apple	iPad Air 2	IOS9.1	a/b/g/n
Apple	iPad Mini	iOS 8.4.1	
Apple	iPhone 5	iOS 9.1	a/b/g/n/
Apple	iPhone 5	iOS	11abgn
Apple	iPhone 5 S	IOS 6.1.4	a/b/g/n
Apple	iPhone 6	iOS 9.1	a/b/g/n/ac
Apple	iPhone 6 GSM	iOS8.4.1	a/b/g/n/ac
Ascom	902202		
Asus	2 in 1	Windows 8.1	abgn
Blackberry	Bold 9000 Smartphone	Blackberry OS 4.6.0.282	
Chromebook	503C32-K01	Chrome OS	11abgn
Chromebook	Asus C200	Chrome 46.0.2490.82	abgn
Galaxy S4	Galaxy S4	Android	
Google Nexus	Nexus 5x	Android 6.0	a/b/g/n/ac
Laptop PC	Intel AC-7260	Win10 (all builds)	11 abgnac
Nexus 9	Nexus 9	Android	a/b/g/n/ac
Nokia 830		Win8.1 Win 10	802.11abgnac
Polycom Spectralink	8440		
Samsung	Galaxy Note4	Android v5.0.1	a/b/g/n/ac
Surface 3 Pro		Win 8.1 / Win 10	Marvel Avastar 802.11 ac
Surface 4 Pro		Win 10	Marvel Avastar 802.11 ac

RADIUS SERVERS AND SUPPLICANTS

RADIUS Servers used during testing

Vendor	Model OS	Version
FreeRADIUS45	1.1.6	FreeRADIUS
FreeRADIUS21	1.0.1	FreeRADIUS
IAS	5.2.3790.3959	Microsoft Server 2003 IAS
SBR50	6.1.6	SBR Enterprise edition
NPS	6.0.6002.18005	Microsoft Server 2008 NPS

802.1x Supplicants Supported

Vendor	Model OS	Version
Juniper Networks® / Funk	Odyssey client	Version 5.10.14353.0
		Version 5.00.12709.0
		Version 4.60.49335.0
Microsoft®	Wireless Zero Configuration	Version Windows XP-4K-891859-Beta1
	Wireless Network Connection Configuration	Version Microsoft Window Server 2003, Enterprise Edition R2 SP2
	Wi-Fi Protected Access 2 (WPA2)/Wireless Provisioning Services Information Element (WPS IE) update for Windows XP with Service Pack 2	Version WindowsXP-KB893357-v2-x86-ENU.exe
Intel®	Intel PRO Set/Wireless	Version 13.0.0.x (with Windows® Intel® driver version 13.0.0.x)
Wireless Zero	Windows 7, 8, 8.1 Pro, 10 Pro Windows Phone 8.1, Windows Mobile 10	provided with Windows®

LAN SWITCHES

Vendor	Model OS	Version	Tested with
Cisco	Catalyst 3550	12.1(19)EA1c	AP 802.1x
Extreme	G3	01.00.02.0001	For PoE
	G3	06.11.01.0040	
	C20N1	Version 12.1(19)EA1c	No PoE
	B3G124-48P	06.61.03.0004	for AP 802.1x, PoE
	B3	01.02.01.0004	10480068225P
	C5	06.42.06.0008	11511205225K
	B3G124-48P	06.61.03.0004	for AP 802.1x, POE
	X460-24P	12.5.4.5	for AP 802.1x, POE
	B3	06.61.08.0013	Lab switch - sn 10480062225P
	B3	06.61.08.0013	Veriwave switch - sn 10480075225P
	X-460-G2		802.3at interoperability with AP3935
Extreme	Summit 300-24	7.6e.4.4	
	Summit 300-24	System Serial Number: 800138-00-03 0443G-01236 CP: 04	for AP 802.1x, POE
	Summit 300-48	7.6e1.4	AP 802.1x, PoE
	Summit 300-48	7.6e1.4	
	Summit 300	Software Version 7.4e.2.6	Lab switch
H3C	H3C S5600 26C	Bootrom Version is 405	for PoE
HP	ProCurve 4104GL	#G.07.22	Lab switch

CERTIFICATION AUTHORITY

Server Vendor	Model OS	Version
Microsoft CA	Windows Server 2003 Enterprise Edition	5.2.3790.1830
Microsoft CA	Windows Server 2008 Enterprise Edition	6.0
OpenSSL	Linux	0.9.8e

RADIUS ATTRIBUTES SUPPORT

RADIUS Authentication and Authorization Attributes

Attribute	RFC Source
Called-Station-Id	RFC 2865, RFC 3580
Calling-Station-Id	RFC 2865, RFC 3580
Class	RFC 2865
EAP-Message	RFC 3579
Event-Timestamp	RFC 2869
Filter-Id	RFC 2865, RFC 3580
Framed-IPv6-Pool	RFC 3162
Framed-MTU	RFC 2865, RFC 3580
Framed-Pool	RFC 2869
Idle-Timeout	RFC 2865, RFC 3580
Message-Authenticator	RFC 3579
NAS-Identifier	RFC 2865, RFC 3580
NAS-IP-Address	RFC 2865, RFC 3580
NAS-IPv6-Address	RFC 3162
NAS-Port	RFC 2865, RFC 3580
NAS-Port-Id	RFC 2865, RFC 3580
NAS-Port-Type	RFC 2865, RFC 3580
Password-Retry	RFC 2869
Service-Type	RFC 2865, RFC 3580
Session-Timeout	RFC 2865
State	RFC 2865
Termination-Action	RFC 2865, RFC 3580
Tunnel Attributes	RFC 2867, RFC 2868, RFC 3580
User-Name	RFC 2865, RFC 3580
Vendor-Specific	RFC 2865

RADIUS Accounting Attributes

Attribute	RFC Source
Acct-Authentic	RFC 2866
Acct-Delay-Time	RFC 2866
Acct-Input-Octets	RFC 2866
Acct-Input-Packets	RFC 2866
Acct-Interim-Interval	RFC 2869
Acct-Output-Octets	RFC 2866
Acct-Output-Packets	RFC 2866
Acct-Session-Id	RFC 2866
Acct-Session-Time	RFC 2866
Acct-Status-Type	RFC 2866
Acct-Terminate-Cause	RFC 2866

GLOBAL SUPPORT:

By Phone: +1 800-998-2408 (toll-free in U.S. and Canada)

For the toll-free support number in your country:
www.extremenetworks.com/support/

By Email: support@extremenetworks.com

By Web: www.extremenetworks.com/support/

By Mail: Extreme Networks, Inc.
6480 Via Del Oro
San Jose, CA 95119

For information regarding the latest software available, recent release note revisions, or if you require additional assistance, please visit the Extreme Networks Support website.