

## What's New in ZoneFlex Software Release 9.0

This application note describes the new features available in Version 9.0 of the Ruckus Wireless ZoneFlex family. This document assumes familiarity with the Ruckus ZoneFlex product line and the features of earlier releases including version 8.2.

### Highlights of this Release

ZoneFlex software release 9.0 provides Enterprises, HotZone Operators and Managed Service Providers a higher performing, more reliable, and easier to deploy and use way of providing wireless access to diverse groups of users across multiple locations:

- ZoneDirector 3000 Support for 500 APs
- Streamlined AP Licensing for ZoneDirector 3000
- Smart Redundancy
- SmartCast Enhancements
  - Client Load Balancing
  - WLAN Prioritization
- Smart Mesh Enhancements
  - Hybrid Mesh
  - Mesh Management Enhancements
- Point to Multi-Point Bridging on ZoneFlex 7731
- Expanded WLAN Options
  - Time-based WLANs
  - Wi-Fi Protected Access (WPA) Auto Mode
  - Tunneled WLAN Enhancements
  - Configuration Flexibility
- Guest Access Enhancements
- Enhanced Flexibility for Authentication Servers
- RF Channel Management
  - Expanded Number of Channels for ZoneFlex 7962 Access Points in the US
  - Enhanced Dynamic RF Management
  - Smart Channel Selection for ZoneFlex 7731 Bridge
- ZoneDirector Management Enhancements
  - ZoneDirector Command Line Interface
  - Enhanced Management Control
  - Real-Time Monitoring
  - Troubleshooting Enhancements
- Product Registration Tool
- FlexMaster Enhancements
  - Super-Dashboard View
    - Widget Definition and Customization
  - Trending Reports and Customized Graphs
    - Capacity
    - Service Level Agreement
    - Troubleshooting
  - Client Trend Data
  - SpeedFlex Logging
  - Client Association Events
  - Synchronization with ZoneDirector Events



Supported Platforms

- FlexMaster version 9.0
  - ZoneDirector 1000 Smart/OS version 9.0
  - ZoneDirector 3000 Smart/OS version 9.0
  - ZoneFlex 2942 802.11g Access Point version 9.0
  - ZoneFlex 7343 802.11n Access Point version 9.0
  - ZoneFlex 7363 802.11n Dual-band Access Point version 9.0
  - ZoneFlex 7942 802.11n Access Point version 9.0
  - ZoneFlex 7962 802.11n Dual-band Access Point version 9.0
  - ZoneFlex 2741 802.11g Outdoor Access Point version 9.0
  - ZoneFlex 7762 802.11n Dual-band Outdoor Access Point version 9.0
  - ZoneFlex 7731 802.11n Outdoor Bridge version 9.0
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### 1. Support for 500 APs on ZoneDirector 3000

With this release, Ruckus ZoneDirector 3000 can be upgraded to support 500 APs. Customers with ZoneDirector 3000 can license it for 25, 50, 100, 150, 200, 250, 300, 350, 400, 450, and 500 APs. This provides even greater scalability for large campuses and growing networks.

#### ***Customer Benefits***

- Single platform manages large-scale deployments
- Investment protection
- Streamlined license upgrade process

#### ***Availability***

ZoneDirector 3000 with Smart/OS software release 9.0

### 2. Streamlined AP Licensing for ZoneDirector 3000

With this release, customers need only install a single license to increase the number of APs supported by ZoneDirector 3000. Administrators needing to increase their AP license can purchase a license from their authorized reseller. They will receive a single license key, which they install on ZoneDirector. In previous releases, the administrator may have needed to install multiple licenses to achieve their desired support level. The license upgrade process is streamlined in this release.

#### ***Customer Benefits***

- Streamlined license upgrade process

#### ***Availability***

ZoneDirector 3000 with Smart/OS software release 9.0

### 3. Smart Redundancy

With this release, administrators can deploy redundant ZoneDirectors for increased network resiliency. The wireless network can be deployed with an active and a standby ZoneDirector. The ZoneDirectors automatically synchronize network configuration and runtime information like generated guest passes, generated and activated dynamic PSKs, and authenticated captive portal clients. If the active ZoneDirector becomes unavailable, the standby ZoneDirector will become active, taking over wireless LAN management and providing network services.

Administrators can reach the active ZoneDirector, whichever is currently active, through a single management IP address. This simplifies management and enhances network integration since the management IP address never changes, even though which ZoneDirector is active may. Each ZoneDirector can still be reached through its own IP address. The active ZoneDirector can be managed through its individual IP address, while the standby ZoneDirector can only be monitored through its individual IP address.

Smart Redundancy can be monitored with a new widget available on the ZoneDirector Dashboard. The Smart Redundancy widget displays the status of the ZoneDirector and its peer, and allows the administrator to force a failover to the standby ZoneDirector.

#### ***Customer Benefits***

- Increased network resiliency
- Seamless failover for authenticated clients
- Seamless integration with existing infrastructure

#### ***Availability***

ZoneDirector with Smart/OS software release 9.0

#### 4. Client Load Balancing

With this release, ZoneDirector can balance client associations between ZoneFlex APs. When a client attempts to join the network where multiple ZoneFlex APs are within range, ZoneFlex APs with lighter load will associate the client. ZoneDirector assesses the relative distribution of clients across ZoneFlex APs, and directs ZoneFlex APs to respond or not to respond to new association requests.

ZoneDirector automatically determines among which ZoneFlex APs clients can be balanced between. Smart algorithms ensure that clients with strong signals associate to their closest AP, while clients with weak signals are protected from being abandoned, maximizing overall system performance and user experience. Thresholds can be fine-tuned through advanced configuration. Client load balancing can be enabled on a per-WLAN basis, providing greater control when designing WLANs for latency-sensitive traffic like voice.

##### ***Customer Benefits***

- Improved individual and system performance
- Easy to use with automatic grouping of APs
- Ideal for dense user deployments such as auditoriums and conference halls

##### ***Availability***

ZoneDirector with Smart/OS software release 9.0

#### 5. WLAN Prioritization

With this release, administrators can prioritize traffic for individual WLANs. On a per-user basis, Ruckus SmartCast QoS engine classifies and queues each packet into one of four traffic classes (Voice, Video, Data, and Background). Within each class, traffic from high priority WLANs will be delivered before traffic from low priority WLANs using a weighted Round-Robin scheduling technique across users. Traffic is then queued for transmission over the air based on traffic class.

##### ***Customer Benefits***

- Enables service level agreements (e.g. premium vs. free access, corporate vs. guest access)
- Allows differentiated services for user groups, increasing control

##### ***Availability***

ZoneDirector with Smart/OS software release 9.0

#### 6. Hybrid Mesh

With this release, a Ruckus Wireless mesh node can be connected to the Ethernet port of a Mesh AP (MAP) to extend the Smart Mesh network without expending a wireless hop. This AP, referred to as Ethernet MAP (eMAP), can be set to a different channel than the MAP it is connected to, taking advantage of spectrum reuse to provide greater system throughput. It can be installed up to 100 meters away from the MAP for minimal adjacent channel interference. Several eMAPs can be connected through a switch to a single MAP, to distribute the wireless LAN throughout a remote building connected over mesh.

ZoneFlex APs automatically determine whether they are Root APs (RAPs), MAPs or eMAPs. Mesh nodes automatically adapt to a new role if network link conditions change. ZoneDirector automatically configures radio parameters including power and channel for all mesh APs.

**Customer Benefits**

- Increased deployment flexibility
- Extends the mesh network without using a wireless hop, resulting in higher overall throughput
- Greater spatial reuse increases system throughput
- Ideal for backbone meshing between adjacent buildings

**Availability**

ZoneDirector with Smart/OS software release 9.0

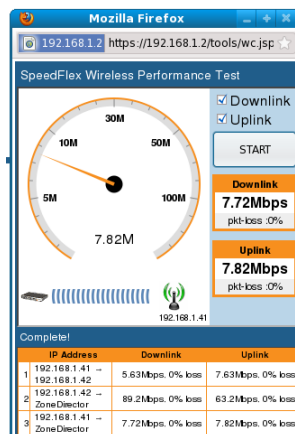
**7. Mesh Management Enhancements**

With this release, Ruckus Smart Mesh provides several management enhancements.

**7.1. SpeedFlex testing on multi-hop mesh links**

Ruckus SpeedFlex™ performance test tool can generate throughput capacity test results for each hop to a multi-hop mesh node. Administrators can now run a single test to a mesh node; ZoneDirector and FlexMaster displays the test results for each individual link as well as for the end-to-end link between ZoneDirector or FlexMaster and the mesh node.

The following is an example of SpeedFlex testing on a multi-hop mesh link:



**7.2. Mesh Branch View**

Administrators can quickly view the mesh branch for a mesh node without leaving the Access Point monitoring page. When the Mesh View icon is clicked, ZoneDirector opens up a separate, reduced-sized window that displays the parent and children for the branch of the selected node.

Both the SpeedFlex and new Mesh View icons are available in the ZoneDirector's table of Currently Managed APs.

**Customer Benefits**

- Aids mesh monitoring and troubleshooting
- Streamlines performance testing and identifies network bottlenecks

**Availability**

ZoneDirector with Smart/OS software release 9.0

FlexMaster with software release 9.0 for SpeedFlex throughput test over multi-hop mesh links

## 8. Point to Multi-Point Bridging on ZoneFlex 7731

With this release, ZoneFlex 7731 Bridges support Point to Multi-Point as well as Point to Point deployments. Root bridges can support up to four non-root bridges. ZoneFlex 7731 can be configured for either root bridge or non-root bridge role; different hardware SKUs are not required for different roles. A built in aiming tool simplifies provisioning each link.

### *Customer Benefits*

- Cost-effective high-speed backhaul extension
- Simplified backhaul distribution
- Simple upgrade path from existing Point to Point deployments
- Single hardware for root and non-root bridge for simplified stocking

### *Availability*

ZoneFlex 7731 802.11n Outdoor Bridge with software release 9.0  
FlexMaster with software release 9.0

## 9. Time-Based WLANs

With this release, administrators can control by time and day when a WLAN is available. On an easy-to-use scheduler, administrators can drag and select the days of the week and the time of day that users are allowed to access a particular WLAN, or disable the WLAN altogether for testing purposes. The WLAN will automatically be enabled or disabled based on this schedule, while ZoneDirector automatically generates an event when it changes the WLAN's operational status.

### *Customer Benefits*

- Increased control over WLAN service availability
- Enhanced security
- Ideal for schools and banks who want to restrict WLAN access outside of normal operating hours

### *Availability*

ZoneDirector with Smart/OS software release 9.0

## 10. Wi-Fi Protected Access (WPA) Mixed Mode

With this release, ZoneDirector and ZoneFlex APs support the Wi-Fi Alliance WPA Mixed mode standard. With WPA Mixed mode, a single SSID can be used for clients that support either WPA or WPA2. Administrators can define an SSID to use *WPA-Mixed* encryption, and any client supporting WPA-TKIP, WPA-AES, or WPA2-AES can be associated to this SSID.

### *Customer Benefits*

- Allows a single SSID to be advertised to clients, enabling a smoother transition from legacy to new clients
- Reduces management traffic and streamlines WLAN management

### *Availability*

ZoneFlex Access Points and ZoneDirector with Smart/OS software release 9.0

## 11. Tunneled WLAN Enhancements

With this release, administrators have increased options when configuring tunneled WLANs.

### 11.1. VLAN Override

Administrators can enable VLAN override for WLANs that are tunneled to ZoneDirector. Administrators can map a tunneled WLAN to a different VLAN for each WLAN Group, and apply different WLAN Groups to different APs. This enables the administrator to map the same WLAN to different VLANs for different APs, for instance if APs on one floor need to be mapped to different VLANs than APs on a second floor.

### 11.2. Rate Limiting

Administrators can apply rate limits to WLAN traffic tunneled to ZoneDirector. Administrators can specify the uplink and downlink limits for clients associated to the WLAN.

These features, which have been available for non-tunneled WLANs, are extended to support tunneled WLANs.

#### **Customer Benefits**

- Seamless integration into existing network architecture
- Enables tiered services

#### **Availability**

ZoneDirector with Smart/OS software release 9.0

## 12. Configuration Flexibility

With this release, several new features provide the administrator greater flexibility in managing the wireless network.

### 12.1. LEDs

Administrators can disable the LEDs on ZoneFlex 7343, 7363, and 7762 Access Points. This reduces the attention drawn to these access points when they are installed in public spaces.

### 12.2. Disabling Background Scanning on a Per-WLAN or Per-Radio Basis

Administrators can disable background scanning on a per-WLAN or per-radio basis. When background scanning is disabled for a WLAN, any AP radios that provide the WLAN service no longer go off-channel to scan the RF environment for potentially better channels or rogue APs. For latency sensitive traffic, such as voice, disabling background scanning can help improve performance.

### 12.3. Disabling WLAN Service on a per-AP, per-Radio basis

With this release, administrator can disable WLAN services on individual AP radios. Any radio that is disabled will not advertise any WLAN service beacons. This will allow an administrator to disable the 2.4 GHz radio for selected APs in high density environments like auditoriums which may already be served by several APs.

#### **Customer Benefits**

- Enables deployment in unsecured public spaces such as hotel rooms
- Improved performance for latency-sensitive traffic like voice
- Control over WLAN service availability on a per-AP, per-radio basis

#### **Availability**

ZoneDirector with Smart/OS software release 9.0

### 13. Guest Access Enhancements

With this release, ZoneDirector provides several new enhancements when creating guest passes

#### 13.1. *Multiple-user guest-passes on a per-pass basis*

Administrators or authorized users (e.g. receptionists) can specify whether a particular guest-pass is sharable by multiple users or can only be used by a single user. This allows customers to apply multi-use policies on a pass by pass basis.

#### 13.2. *Per-user session duration on multiple-user guest-passes*

Authorized users can specify how long each individual using a multiple-user guest-pass can use the pass before they must re-authenticate. This allows customers to limit sessions per user for a shared guest-pass.

##### **Customer Benefits**

- Enhanced control for guest-pass usage

##### **Availability**

ZoneDirector with Smart/OS software release 9.0

### 14. Enhanced Flexibility for Authentication Servers

With this release, ZoneDirector provides more options when configuring authentication services.

#### 14.1. *Hierarchical Directory Servers*

ZoneDirector can support user authentication to directory servers where the users are organized in multiple domains or in a hierarchical structure. Administrators can enable ZoneDirector to search throughout multiple Organizational Units (OU) under an LDAP server's Base DN or throughout multiple domains in a tree or forest within an Active Directory Global Catalog. LDAP servers supported include OpenLDAP, Apple Open Directory, and Novell eDirectory.

#### 14.2. *Backup RADIUS Server*

ZoneDirector supports backup RADIUS authentication and accounting servers. If a primary RADIUS server is unavailable, ZoneDirector will query or report to the secondary RADIUS server. ZoneDirector will resume communications with the primary server once it becomes available again.

##### **Customer Benefits**

- Seamless integration with existing network infrastructure
- Streamlines WLAN configuration and management
- Enhances network resiliency and security

##### **Availability**

ZoneDirector with Smart/OS software release 9.0

### 15. Expanded Number of Channels for ZoneFlex 7962 Access Points in the US

ZoneFlex 7962 Access Points are now certified by the FCC to operate on those channels that require Dynamic Frequency Selection (DFS). With this release, ZoneFlex APs can operate in the United States in following bands, on the listed channels:

- 5.15 - 5.25 GHz: 36, 40, 44, 48
- 5.25 - 5.35 GHz: 52, 56, 60, 64
- 5.47 - 5.725 GHz: 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140
- 5.725 - 5.85 GHz: 149, 153, 157, 161, 165

This expands the number of channels available by 15 for a total of 24 channels.

#### ***Customer Benefits***

- Greater channel distribution reduces interference and increases network capacity

#### ***Availability***

ZoneFlex 7962 Access Point and ZoneDirector with Smart/OS software release 9.0

### 16. Enhanced Dynamic RF Management

The 2.4 GHz and 5 GHz band are unlicensed bands available for use by a multitude of popular technologies such as Wi-Fi, Bluetooth, microwave ovens, and military and weather radar. Nearby use of products based on these technologies can degrade performance of 802.11 Wi-Fi networks when used on the same channel. With this release, ZoneFlex APs now detect RF interference from sources other than 802.11-based devices, in addition to 802.11-based sources. ZoneFlex APs and ZoneDirector use this information as input when selecting the optimal channel for the access point.

#### ***Customer Benefits***

- Improved avoidance of channels with RF interference
- Increased system performance

#### ***Availability***

ZoneFlex Access Points and ZoneDirector with Smart/OS software release 9.0

### 17. Smart Channel Selection for ZoneFlex 7731 Bridge

With this release, ZoneFlex 7731 Bridges support channel selection based on real-life throughput test results. Based on Ruckus SpeedFlex, Smart Channel Selection runs uplink and downlink tests on all available channels, and automatically configures the bridge to the one with the best performance. The WebUI returns the throughput test results and selected channel, while the complete test results are logged for analysis or reference. Ruckus Smart Channel Selection can be manually initiated, or set to run automatically on a periodic basis.

#### ***Customer Benefits***

- Increased capacity and optimal performance made simple

#### ***Availability***

ZoneFlex 7731 802.11n Outdoor Bridge with software release 9.0

FlexMaster with software release 9.0

## 18. ZoneDirector Command Line Interface (CLI)

With this release, administrators can manage ZoneDirector through a Command Line Interface. Administrators can use the CLI to execute commands and run scripts to configure the WLAN system and APs, or to extract network system and status information. The ZoneDirector CLI is available through console, Telnet, and SSH.

### *Customer Benefits*

- Enables batch configuration through scripts and automated management by external management systems

### *Availability*

ZoneDirector with Smart/OS software release 9.0

## 19. Enhanced ZoneDirector Management Control

With this release, administrators have additional control for managing ZoneDirector.

### *19.1. Management-only Interface*

Administrators can create a second interface on ZoneDirector. This interface is used for management only, and separates management traffic from traffic between ZoneDirector and ZoneFlex APs.

### *19.2. Management Access Control*

Administrators can restrict access to manage ZoneDirector to specified IP address(es). Only hosts with a permitted IP address can manage ZoneDirector with WebUI, SSH, telnet, and SNMP. The administrator can define permitted IP addresses as a single address, a range of addresses, or a subnet of addresses.

This allows controlled management by remote management systems such as FlexMaster or other 3<sup>rd</sup> party management devices without having to open up a hole in the firewall.

### *Customer Benefits*

- Enhanced security
- Seamless integration with existing infrastructure

### *Availability*

ZoneDirector with Smart/OS software release 9.0

## 20. Real Time Monitoring

With this release, administrators can monitor ZoneDirector's CPU and memory utilization, as well as the number of packets and bytes transmitted and received for all WLANs in real-time. Information is charted over time, where the period over which this information is displayed can be adjusted for the last 5 minutes, 1 hour, or 1 day as needed for increased or decreased granularity. These charts help the administrator assess the network load

Additionally, administrators can monitor in real-time the number of client devices connected to the WLAN and the number of APs connected to ZoneDirector. These charts help the administrator look for connectivity and usage trends and help in troubleshooting and capacity planning.

### *Customer Benefits*

- Enhanced visibility to system resource use and historical trends

### *Availability*

ZoneDirector with Smart/OS software release 9.0

## 21. Troubleshooting Enhancements

With this release, several new tools are available to assist administrators in troubleshooting the network.

### 21.1. Ping and Traceroute

Administrators can initiate a ping or traceroute test from ZoneDirector to any network device. This helps them quickly verify connectivity and route to APs, clients, and servers. The connectivity test tool can be opened from any page in ZoneDirector's WebUI, and opens as a separate window, preserving the administrator's current monitoring or configuring activity view.

### 21.2. AP Activities Widget

Administrators can monitor all AP and mesh logs from the ZoneDirector Dashboard. The Dashboard is the administrator's main portal for ongoing monitoring of the WLAN. The AP Activities widget displays AP-specific events, such as AP or mesh joins or disconnects, interference detection and channel changes, and helps the administrator assess the health of the network.

### 21.3. Radio Frequency (RF) Statistics

ZoneFlex APs collect physical layer statistics for packets transmitted over the air. These results, which can be requested from the CLI of ZoneDirector, provide RF information for the AP or for an individual client. Information provided includes utilization, packet counters, retry counters, phy rate, and link RSSI.

#### **Customer Benefits**

- Aids network setup, monitoring and troubleshooting
- Streamlines network monitoring

#### **Availability**

ZoneDirector with Smart/OS software release 9.0

## 22. Product Registration Tool

With this release, administrators can register their ZoneDirector and ZoneFlex APs directly from ZoneDirector. On a new Product Registration page, administrators simply enter their contact information and click a button to generate a .csv file with product registration information for ZoneDirector and all connected ZoneFlex APs. They then email this file to [support@ruckuswireless.com](mailto:support@ruckuswireless.com) to register their products for support.

The Product Registration page, under the Administer tab, is also available through a link on the Dashboard Support widget.

#### **Customer Benefits**

- Streamlines support process and customer care

#### **Availability**

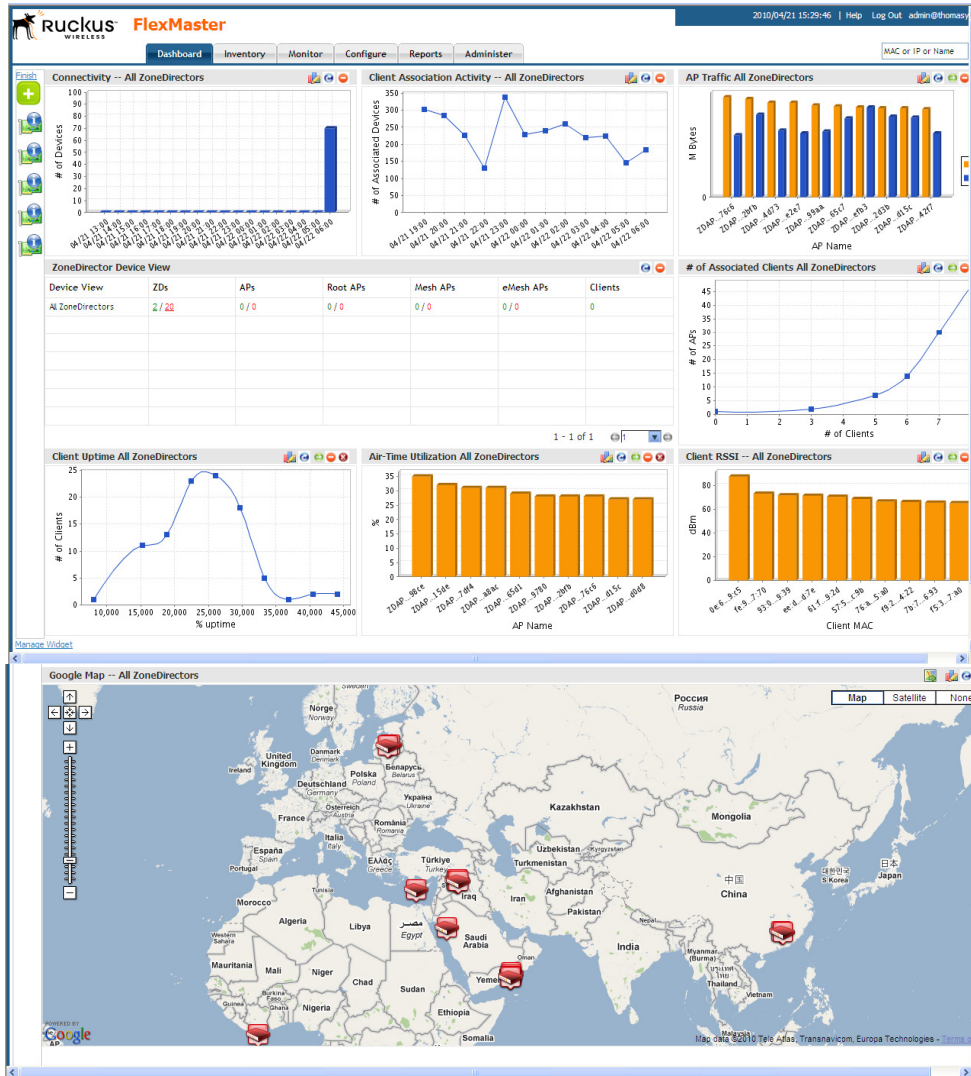
ZoneDirector with Smart/OS software release 9.0

### 23. FlexMaster Super Dashboard View

With this release, the FlexMaster Dashboard is redesigned to enhance overall usability as well as to better accommodate networks where administration responsibilities are delegated to different users. The Super Dashboard provides the capability to:

- Customize which graphs and reports are displayed and how they are laid out along with Google maps
- Define the details of the graphs and reports
- Customize Dashboard View settings on a per-administrator basis

The following is an example of the new Super Dashboard View:



#### Customer Benefits

- Comprehensive information in both detailed and at-a-glance views
- Increased effectiveness and efficiency for network troubleshooting
- Helps administrators quickly identify network issues or potential trouble areas
- Provides high-level executive view of network status

#### Availability

FlexMaster with software release 9.0

## 24. FlexMaster Trending Reports and Customized Graphs

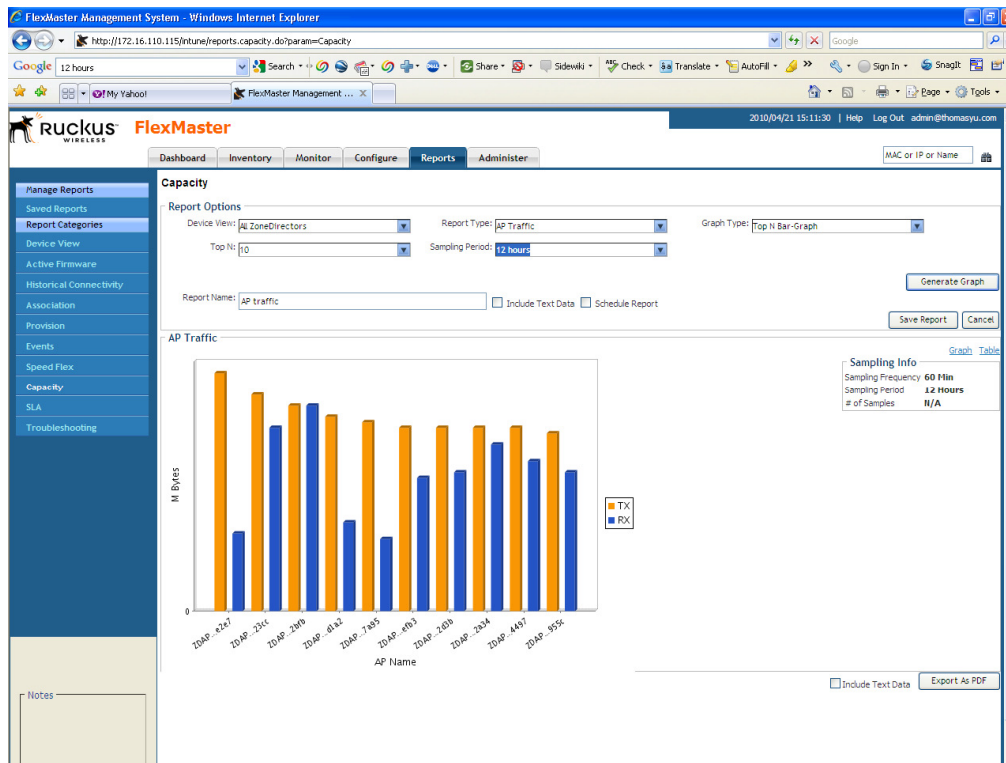
With this release, FlexMaster provides a comprehensive list of graphs, reports, and tables:

- Capacity graphs and reports assist administrators in network planning. Information available includes packets sent and received by the busiest APs, AP airtime utilization, and APs with the most number of associated clients.
- Service Level Agreement (SLA) graphs and reports help service providers monitor and identify committed service levels. Information available includes percentage uptime for a group of AP's, percentage uptime for a specific number of clients, backhaul uptime, and client potential throughput.
- Troubleshooting graphs and reports help administrators monitor and identify problem nodes or clients. Information available includes Mesh APs with the lowest RSSI, Mesh APs with the most number of hops, and clients with the lowest RSSI.

Each of the graphs can display:

- Top-N - identifies the top N number of devices in that specific category
- Histogram - sorts the number of data points into different frequency bins
- X-Y - graphs the results versus time

The following is an example of one of the new graphs:



### Customer Benefits

- More visual effects of the network status enhances capacity planning and troubleshooting
- Provides quick, at-a-glance view of network, managed nodes, and client statuses
- Provides both executive-level and detailed troubleshooting reports to facilitate understanding of the network condition

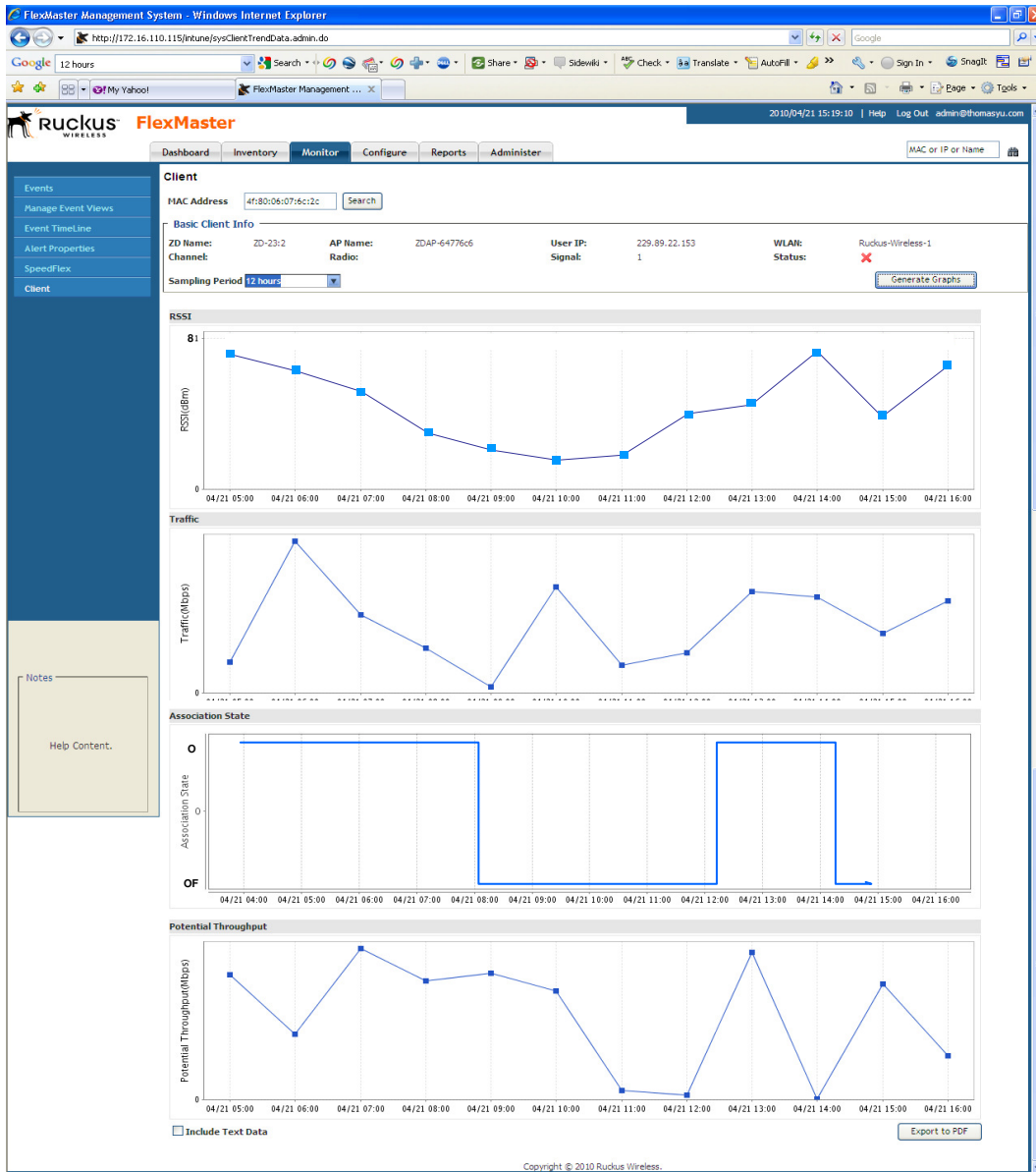
### Availability

FlexMaster with software release 9.0

## 25. FlexMaster Client Trend Data

With this release, administrators and network operators can search for a specific client and retrieve useful information including throughput, connectivity status, signal quality, and traffic sent and received. Administrators can specify over what period information is displayed (for example, the last 1 hour, the last 24 hours, or the last 7 days).

The following is an example of the Client Trend Data graph:



### Customer Benefits

- Enables troubleshooting down to the client level
- Allows network operators to proactively ensure SLAs are met for each client
- Minimizes need to send support personnel on site for troubleshooting, reducing support costs per subscriber

### Availability

FlexMaster with software release 9.0

## 26. SpeedFlex Logging in FlexMaster

With this release, FlexMaster can store Ruckus SpeedFlex performance test results for reporting purposes. Administrators can schedule SpeedFlex to run immediately or at a future time, and can review the stored results and compare them to other tests.

### *Customer Benefits*

- Enables archiving for future detailed analysis of the changing environment of the network

### *Availability*

FlexMaster with software release 9.0

## 27. FlexMaster Client Association Events

With this release, when clients associate or dissociate to and from ZoneFlex APs, FlexMaster records this event. The event information includes client MAC, client IP address, time of event, associated AP and ZoneDirector (if applicable).

### *Customer Benefits*

- Enables real-time client troubleshooting through FlexMaster
- Increased information enables location-based or fee-based services

### *Availability*

FlexMaster with software release 9.0

## 28. Event Filtering in FlexMaster

With this release, administrators can filter out what types of events are reported by ZoneDirector to FlexMaster. This allows the administrator to more effectively control the events they see in FlexMaster.

### *Customer Benefits*

- Increased control and improved visibility for monitoring a particular activity
- Reduced network traffic

### *Availability*

FlexMaster with software release 9.0