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Exceeding Subscriber Expectations with Managed Wi-Fi Solutions.

For consumers Wi-Fi is the internet. As of 2016, a household of four on average has upwards of 18 connected devices according to comScore Research. Subscribers are adding connected devices at an impulsively breakneck pace and have a hard time keeping track of them all. However they still expect it all to work–seamlessly and wirelessly, and throughout their homes. The ever increasing demand for HD video and new high bandwidth, low latency applications like Virtual Reality gaming are constantly testing the limits of existing Wi-Fi networks.

Managing and exceeding these consumer expectations is as much a challenge as an opportunity for service providers. Full-home, managed Wi-Fi services – where operators control the entire subscriber experience starting from installation is the best way to keep customers happy and complaints down. It will require the best, carrier-tested CPE along with sophisticated remote management and provisioning solutions.

Industry Standards vs. Proprietary Fixes

TR-69 is a mature industry standard created to help service providers remotely manage, monitor and effectively trouble shoot broadband and home networking issues. The traditional TR-069 standard that relied on TR-098 IGD data model focused only on gateway management and lacked the tools to manage the modern digital homes with their growing web of Internet of Things (IoT) devices. So management software and CPE vendors developed proprietary work-arounds that offered limited functionality at the expense of interoperability and scalability that required extensive retooling for any upgrades. These proprietary hacks also forced service providers to settle with a single vendor for all their CPE and management software needs, thus reducing their options, limiting innovation and keeping them dependent on a single vendor for all future development.

Powerful New Generation TR-069 Standard: TR-181i2

To keep up with the evolving digital home, Broadband Forum has given a huge upgrade to the TR-069 standard with its new generation Device 2 data model specified in TR-181i2. This brings some key new capabilities to the standard:

- It generalizes the data model or data sets to cover any and all CPE devices, eliminating the need to follow separate data sets (models) for different device types like gateways, set-top boxes, VoIP bridges etc.
- It covers most features with standardized parameters to improve interoperability which was a challenge with TR-098's limitations.
- It has enriched the information that can be accessed from the broadband gateway about the home network, details on the connected devices behind the router, surrounding Wi-Fi networks and connection performance.

These new capabilities enhance the ability of TR181-equipped ACS systems to remotely diagnose and fix issues while learning more about the individual subscriber home environment.

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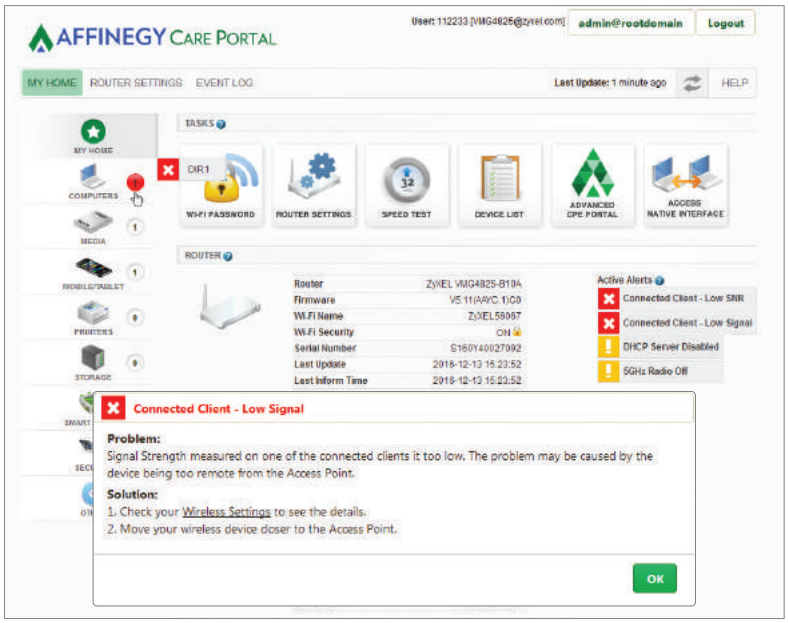
Key Use Case Examples

Here are some select use cases that have been beneficial in real-world deployments by broadband operators, with Affinegy's CHARIOT ACS and Zyxel CPEs.

Wi-Fi Diagnostics and Quick Fixes



Slow Wi-Fi Connection and Poor Video over Wi-Fi

- Wi-Fi commanded channel change
- Adjacent networks interference diagnostics and automated fix (channel change)
- Alert and recommend fix for weak Wi-Fi signal strength of connected device
- Alert and recommend fix for poor Wi-Fi link rate
- Alert and recommend fixes for Wi-Fi slow mode issues (b, g, connected client, slow security mode, etc.)
- Wi-Fi QoS voice, video priority settings
- Wi-Fi traffic reporting/diagnostics

Wi-Fi Settings and Adding New Wi-Fi Devices

- Wi-Fi settings change – SSID, passphrase, mode, channel, etc.
- Identify if Wi-Fi security is off or poor to minimize rogue usage
- Alert and fix Wi-Fi security issues (Open, WEP only, etc.)
- Dual band and multiple Wi-Fi radio settings support
- Forgotten Wi-Fi password - what's my password recovery

Wi-Fi AP and Extender Management

- Auto installation - discovery and provisioning with LAN IP reservation and automated port forwarding/NAT traversal management
- Auto configuration to match main AP Wi-Fi settings, or unique SSID settings
- Remote proactive firmware update management
- Management of all Wi-Fi configuration settings provided by the AP
- Connection status for which Wi-Fi clients are currently connected
- Auto alerts for users when a better Wi-Fi connection is available to other AP
- AP connection status and settings management to main Gateway

Full-Home Network Visibility and Management

LAN Devices Identification, Status and Ease of Use Features

- Dashboard showing all connected LAN devices connection status and history (connected, not connected)
- Show connection type (Ethernet, Wi-Fi)
- Automatically identify device, hostname, vendor, type, MAC address, IP address
- Easy Local/Remote Access to web GUI of any connected device (printers, cameras, etc)
- Check speed and data usage by device in the LAN

Port Forward Support – Enable peer to peer gaming and secure remote access

- Port settings through easy drop down list of applications in the router firewall
- Enable/Disable UPnP for router

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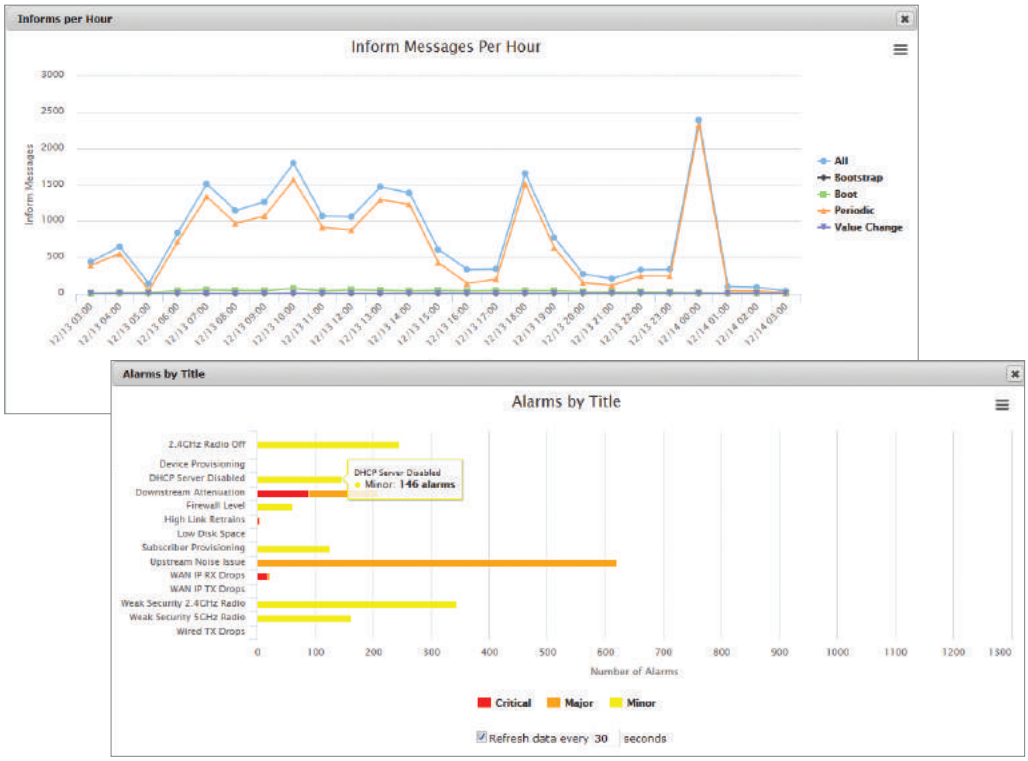
Internet (WAN) Speed and Quality of Experience

- WAN QoS Parameters (SNR, attenuation, retrains, error rates, etc)
- Reboot gateway on command or in repair scripts
- Improper registration, non-authorized equipment identification and disable
- Launch the speed test tool from the connected device to the Internet
- WAN port speed test (not limited by Wi-Fi speed)

Analytics and Statistics: Insights into subscriber's network



- Alert events history and type by household, equipment, history, current active - analyze what issues matter most for corrective action planning
- Which subscribers have a certain model number device that needs update
- Which subscribers don't have Wi-Fi security enabled
- What the number of devices a subscriber has connected (upsell higher speed tier)
- What types of devices are connected (marketing demographics)
- Type of Wi-Fi connection by device (B, G, N, AC, 2.4, 5, Open, WEP, WPA, WPA2, etc)
- Traffic usage (WAN port, LAN ethernet, LAN Wi-Fi)
- Traffic usage by LAN device

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Solutions Available Today

Zyxel partners with many industry leading developers of TR-69 compliant remote management systems for service providers, giving our customers flexibility and choice. Affinegy offers an advance and innovative TR-69 ACS server with TR-181i2 standard support. Zyxel and Affinegy have committed resources for rigorous interoperability testing to pre-certify latest Zyxel gateways with Affinegy's ACS platform. The result is a quick and effortless deployment for service provider's managed Wi-Fi offering. The solution includes:

- Affinegy's CHARIOT platform is a powerful remote management and support system with advanced management, diagnostics and easily accessible user interface
- Zyxel TR-181 equipped CPE include:
  - › AC2050 Wi-Fi, Bonded VDSL2 Residential Gateway - Zyxel VMG4825
  - › AC1600 Wi-Fi, Single Line VDSL2 Residential Gateway – Zyxel VMG3925
  - › AC2200 High-Power Wi-Fi, Managed Ethernet Gateway for FTTH – Zyxel EMG3425

You can have the advanced remote management and diagnostics power that you need for today's advanced services without being locked into proprietary platforms. By choosing Zyxel CPE with Affinegy's CHARIOT software you can deliver robust, high quality services for your subscribers while retaining the flexibility and cost benefits of a standards based solution. These solutions are available today, contact us for more information at one of the following ways.

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