

# Carrier WiFi Services: Meeting the Needs of the Mobile User

While cable services have traditionally only been available in the home, today's mobile consumers are now demanding anywhere, anytime, any device access to stay connected to their favorite services. As a result, cable operators are extending their networks through carrier WiFi services which allow their customers to stay connected, thus reducing churn and growing the subscriber base by addressing the needs of the mobile user.

By leveraging the ubiquity of the installed cable plant, easy access to cable power, and free, unlicensed spectrum to provide WiFi service, cable operators are extending video, data, and voice services to subscribers and opening up new off-load revenue opportunities from wireless carriers.

Rolling out a successful and profitable carrier WiFi infrastructure requires service insight and network intelligence. With the nGeniusONE™ Performance Management platform, operators can maximize their WiFi investment and assure the highest quality user experience.

## The Challenge of Deploying a Successful Carrier WiFi Network – User Authentication

Unlike other users, the on-the-go user has a number of options for service, and poor or unreliable service tends to lead to customer churn instead of complaints.

A common driver of churn amongst mobile users is slow or failed WiFi authentication. With a WiFi access network, every user requires automatic authentication and authorization. For roaming users, authentication has the added complexity of needing an authentication, authorization, and accounting (AAA) query and approval from the partner's network to authenticate the identity and rights of the user.

For carriers, subscriber and roamer connectivity requires a complex process of user authentication and authorization, which involves several service delivery elements and potentially up to 30 steps to authenticate each user – each step representing potential source of congestion or failure.

Resolving authentication issues requires coordination across multiple service elements and can be difficult and complex to diagnose. With the proper service assurance infrastructure, operators can quickly pinpoint the issues for root-cause analysis and report Quality of Experience (QoE) metrics for users on the WiFi network.

## A Robust Service Assurance Strategy

NetScout provides operators a robust, carrier-grade service assurance solution that provides proactive visibility into the data and control plane traffic from the access point to the service controller and throughout the network (Figure 1), thus assuring that the service delivery elements are functioning properly. This insight is extremely important for delivering a consistent experience and maximizing the WiFi infrastructure investment.

### Network

At the network level, the nGeniusONE platform provides visibility into network performance such as link congestion, capacity issues, load balancing errors, bandwidth spikes, network configuration problems, firewall issues and other IP transport problems.

### Service Enablers

At the service enabler level, the nGeniusONE platform monitors and detects issues associated by authentication, authorization, IP address resolution, IP address assignment and billing mediation platforms by monitoring protocols such as RADIUS, Lightweight Directory Access Protocol (LDAP), Dynamic Host Configuration Protocol (DHCP), Domain Name Server (DNS) and Address Resolution

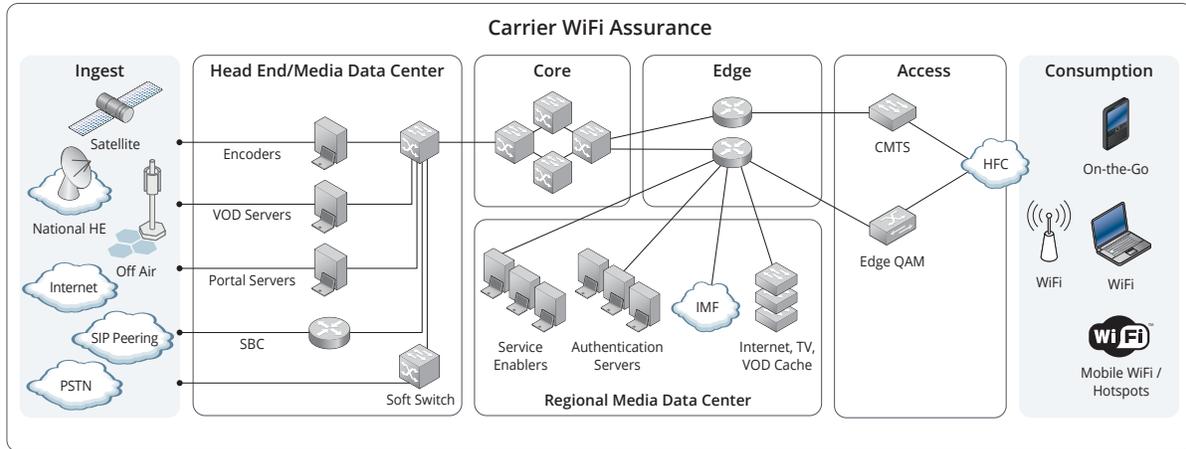


Figure 1: End-to-end data and control plane view of services.

Protocol (ARP). By monitoring the DHCP, DNS and AAA servers, the nGeniusONE platform provides insight to authentication issues associated with partner subscribers.

### Application

At the application level, the nGeniusONE platform provides application visibility into the WiFi Authentication Web Server and proactively alerts on violations against a baseline of usual user traffic, supports Control And Provisioning of Wireless Access Points (CAPWAP) and Proxy Mobile IPv6 (PMIP) for visibility into the user plane for tunneled WiFi traffic, and by monitoring the portal server, the solution is able to provide detailed response-time analysis by detecting anomalous server behavior.

### The nGeniusONE Platform for Carrier WiFi

The nGeniusONE platform provides cable operators proactive network monitoring of their WiFi network, real-time WiFi network performance information on a per-location basis, validation of new WiFi devices on the cable infrastructure, and the ability to generate executive-level usage reports.

With the nGeniusONE platform, cable operators can confidently roll out WiFi services across multiple regions and manage operations while protecting the user experience, thus assuring that cable operators are able to optimize operation of their WiFi service delivery infrastructure and simplify operations with seamless visibility across resources.

### The nGeniusONE Platform for Unified Service Delivery Management

The nGeniusONE platform is a highly scalable, unified performance management platform that combines real-time situational awareness, historical analysis, and multi-layered analysis capabilities to enable effective and efficient service delivery management in complex, converged services networks. The nGeniusONE platform converges network, service enabler and application performance management to deliver holistic service visibility across application tiers, end-to-end networks, and diverse user devices. The service-oriented workflows of the nGeniusONE platform enable seamless, contextual transitioning across multiple layers of analysis, facilitating efficient hand off of incident response tasks across the different Network Operations groups.

The nGeniusONE platform streamlines service delivery management by providing layers that support data, voice and video services with multidimensional reporting and data analytics.

- Real-time Service Dashboard provides service visualization with Intelligent Early Warning for proactive service delivery management
- Network and service performance analysis provides correlated views of key performance metrics of the signaling bearer and enabler components from access, core and service networks

- Session analysis enables session-level subscriber analysis with hop-by-hop transaction analysis
- Deep-dive packet analysis enables protocol-level analysis and forensic evidence collection

Leveraging an advanced, highly scalable architecture, the nGeniusONE platform delivers powerful capabilities, including:

- Single performance management platform supporting multi-technology, multi-service networks for data, voice and video services
- Real-time correlated data plane and control plane monitoring and analysis for voice, video and data traffic
- Modern, service-oriented workflows support proactive and reactive management activities to quickly identify, triage and resolve performance incidents

### The NetScout Advantage

The nGeniusONE platform unifies multiple analysis views into a single pane of glass providing an integrated analysis architecture that simplifies and streamline performance management activities. More than 165 Service Providers in 48 countries rely on the nGenius® solution to gain greater insight to assure the performance, availability and quality of their network and services.



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