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OVERVIEW

QuadGen Wireless had partnered with BSNL to set up Wi-Fi hotspots in 9 states, with a focus on Southern and Western India. To address this setup QuadGen needed a customized software implementation that would work in a Carrier Network Operation Centre. And since the plan was aggressive, they wanted to work with a partner that had decades of experience in the Wi-Fi industry to ensure such a large scale deployment.

Wifi-soft being one of the leading companies in India and abroad that provides software and managed services to the global Wi-Fi industry, manages thousands of Wi-Fi hotspots across the world including those in United States, Mexico, Latin America, Canada, United Kingdom, Italy, Germany, India, Middle East, Singapore, Israel and more. Over 5 million users use Wifi-soft's services through various hotspots worldwide.

REQUIREMENT

The states where QuadGen Wireless wanted to put up hotspots in Southern and Western India include – Telangana, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Maharashtra, Gujarat, Madhya Pradesh and Chattisgarh. In these states, consumers and enterprise users were to get Internet speeds between 2 Mbps to 20 Mbps.

QuadGen Wireless would build, own, operate, manage Wi-Fi services and would also take care of subscriber acquisition, subscriber validation, Activation of service, customer support and provide centralized NOC (Network Operating Center). On the other hand, BSNL would provide Internet bandwidth to the tune of 10 Mbps – 100 Mbps to the respective hotspots.

Hotspots were to be put up at government colleges, government hospitals, bus stations, temples, parks, airports, beaches and other public places subject to permission by local authorities in respective states.

QuadGen is planned to set up 3,000 – 6,000 hotspots. Initially, focus was on setting up Wi-Fi in 100 cities as these cities had maximum Smartphone's and the Internet awareness is also high.

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SOLUTION

OSS/BSS

For its requirements QuadGen was looking out for mature OSS/BSS software. A solution that would be able to handle user management and business logic at the required scale. Besides, the solution provider making this software available would have the capability to design customized Wi-Fi Captive Portal based on the needs of different public and private places where this service would be deployed. Portals would get served through multi-vendor Wireless Access Controller (WAC). Wi-Fi service would be provided from hotspots running multi-vendor Wireless Access Points (AP) deployed at different places. The software would work with multiple SMS Gateways to provide One Time Password (OTP) for user authentication. For paid users, the software would be flexible to integrate with different online as well as offline payment options. The solution provider would have expertise to work with multi-vendor wireless controllers, access points, SMS Gateways and Payment mechanisms.

As a complete software solution provider QuadGen partnered with Wifi-soft to customize WiFiLAN, wifi-soft OSS/BSS software to realize their ambitious Wi-Fi service plans.

Deployment

There are different components of the whole system that will be discussed in detail under various sections

INFRASTRUCTURE

Network Architecture

Phase I – Network Architecture

'Figure 1.' below shows macro level architecture of network setup for a single city. This same pattern of network topology is followed in different cities where QuadGen provides Wi-Fi service. The first phase of network implementation included Ruckus vSCG as a smart cell wireless access controller and Ruckus Access Points were deployed at hotspots.

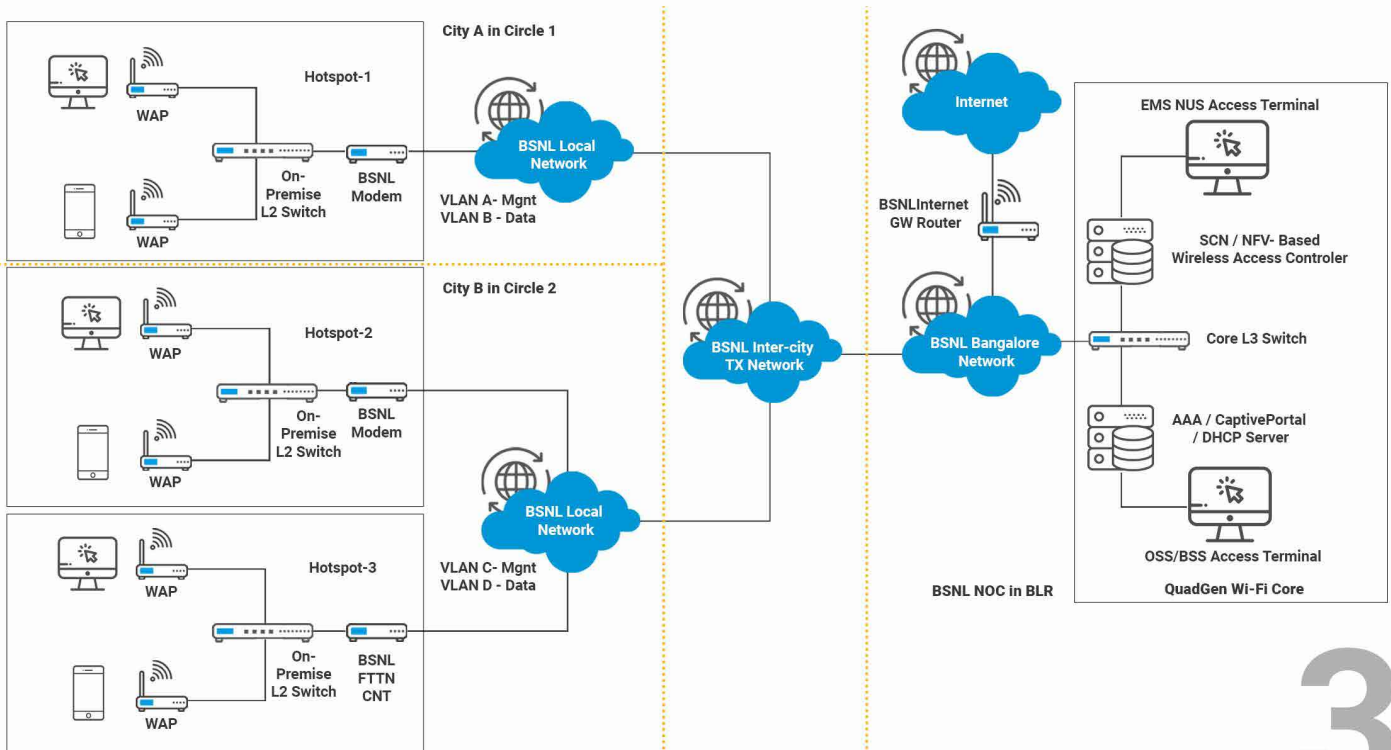


Figure 1. Macro Level Architecture with Ruckus Access Points

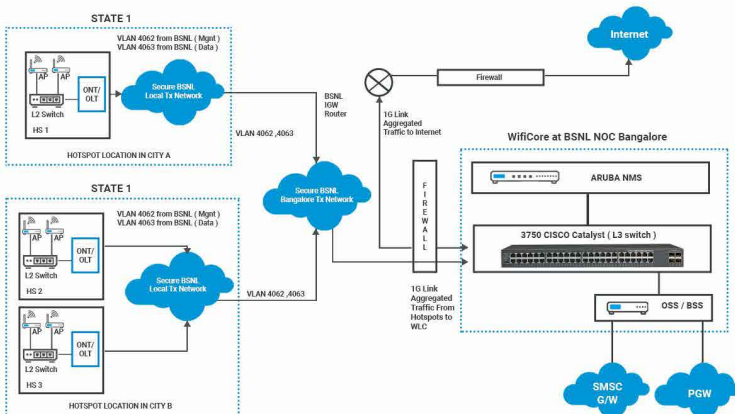
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Phase II – Network Architecture

Besides the existing phase one setup the second phase made use of Aruba hardware controller with Aruba IAP access points.

Connectivity Diagram from Aruba AP Location to Centralized NOC



'Figure 2' below shows the network architecture with Aruba IAP access points and Aruba controller.

Wifi-soft OSS/BSS Software

The OSS/BSS software application from Wifi-soft provides many features to manage the dynamics of a large Wi-Fi network service and acts as the control center to manage the whole setup. This is a crucial piece of software in this entire Wi-Fi service ecosystem.

This application provides facility to manage user authentication, authorization and accounting. There is a captive portal, which is a special web page that is shown before the accessing the Internet made available through Wi-Fi service. This portal is often used to present a login page to the user so that this can authenticate with the Wi-Fi service before they are taken on the Internet.

QuadGen hotspots would be put up at government colleges, government hospitals, bus stations, temples, parks, airports, beaches and other public places subject to permission by local authorities in respective states. All these places at a certain point in time might need to have different captive portal pages customized to address the users in their specific place. Wifi-soft has built different captive portals for various customers based on their needs. We also have a set of standard portals that can be quickly adopted without spending too much time in portal design. We engage with the customer to understand the specific needs of the captive portal they have for the users and propose a solution based on our vast experience in the field.

Content Filtering

During their initial engagement with Wifi-soft QuadGen team shared details of different types of users they saw making use of its Wi-Fi service. The user types identified were:

a. Free Wi-Fi user

QuadGen wanted to offer free Wi-Fi service to users to tap into Wi-Fi user base. This free service will be time restricted to 30 minutes. Also, a user will get 3 attempts to avail 30 minutes of service within a month. These 30 minutes can be consumed at different point in time, in a given day.

b. Paid Wi-Fi user

The free Wi-Fi service is a bait to lure customer to try service. For those interested in going beyond the limits of free Wi-Fi usage the service is expected to provide paid plans addressing the needs of different user segments. These are revenue-generating users that are willing to go online in exchange of a fee. These users make use of online payments.

c. Paid Voucher Users

These too are paid users. however these users purchase a paid voucher against cash. A voucher code printed on the voucher is then used during user authentication for obtaining Wi-Fi service.

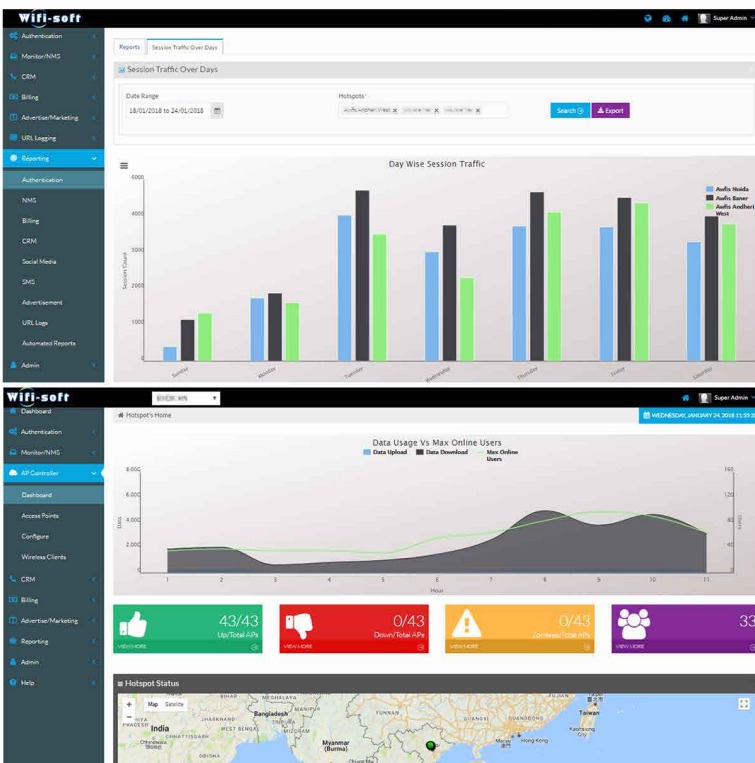
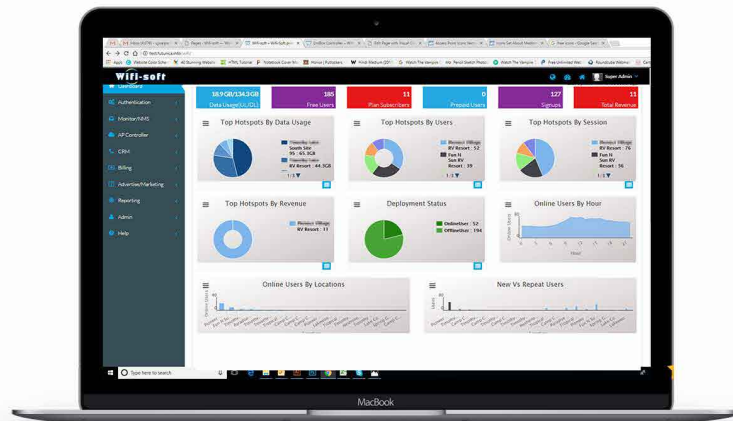
Wifi-soft customized its software to accommodate the three types of users mentioned above. Besides these users post deployment QuadGen was faced with newer requirements from the Chief Minister's office wherein they needed free Wi-Fi access to be give to some key people therein. Also since these were high profile users with limited time at their disposal they wanted to skip the captive portal authentication mechanism and wanted their devices to be remembered by the system for quicker authentication. We had a feature called auto-login readily accessible that could maintain a list of MAC addresses of user devices that can be authenticated using a layer 2 network interactions and thus this requirement got fulfilled.

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Wifi-soft had another requirement post deployment to support Bulk Wi-Fi. This requirement came mainly from government Village free Wi-Fi initiative wherein some individual or business entities adopts the entire village and pay upfront for bulk Wi-Fi to be made available in to to them. We successfully made this possible by providing a different captive portal for the region.

- o Reporting
- o Customization
- o CDR Reports
- o Dashboard
- o Customization
- o Autologin - Chief Ministers Office
- o Portal - Bulk Wi-Fi
- o SMS Gateway Integration
- o Payment Gateway Integration
- o System Configuration
- o Redundancy and Failover



Wifi-soft LLC
 815-A Brazos St, Suite 326
 Austin, Texas - 78701 U.S.A
 +91 (20) 3018 5500
 sales@wifi-soft.com

Wifisoft Global FZE
 P.O.Box - 120360,
 Sharjah, UAE
 +971 555310434
 sales@wifi-soft.com

Wifi-soft Solutions Pvt. Ltd.
 C-410, Teerth Technospace
 IT Park, Baner, Pune - 411045,
 +91 (20) 3018 5577
 sales@wifi-soft.com