INDIO NETWORKS

Telecom

Carrier WiFi and Critical Infrastructure Management Solutions.

Introduction

The Telecom companies were initially aversive to the idea of pervasive WiFi because they did not see the business case in it. However, as mobile cellular networks have continued to grow, telcos are finding it increasingly difficult to manage network congestion while ensuring seamless connectivity. Network congestion is one of the key problems which telcos face today.

So, what are telcos looking at to solve this problem? Pervasive WiFi. Carrier grade, pervasive WiFi is the way telcos can dramatically reduce network congestion by offloading cellular data on to the nearest WiFi deployment that the telco has installed. Carrier grade WiFi deployments can include hundreds of thousands of Access Points.

Telcos need effective strategies & trustable solutions to target carrier WiFi deployments in order to solve their bandwidth problems. The solution needs to scale to handle nationwide deployment capable of serving millions of Internet users simultaneously. It also needs to provide multiple vendor support since telecom companies typically use multi-vendor strategy to mitigate the reliance on one vendor.

The passive infrastructure used for deploying the network gear is another important component for any telecom company. These towers are deployed all over the country in remote areas. Monitoring the health of this infrastructure is critical for maintaining the uptime and SLAs required for reliable coverage. Each cell tower site has power backup equipment like DG sets, battery banks, power rectifier, etc. Tower companies spend hundreds of millions of dollars in maintaining, upgrading and monitoring these devices. There is urgent need to automate these tasks to reduce the OPEX cost and improve the reliability of the tower site.

Critical parameter monitoring is facilitated by input sensitive IoT solutions that work on wireless communication protocols & cellular to relay the information gathered from the monitored devices to operators in real-time.

When it comes to any network management— Fault, Configuration, Accounting, Performance and Security (FCAPS), all aspects must be resolved.

Key Requirements for Carrier WiFi

- Carrier-Grade WiFi
- Highly Scalable
- Performance
- Zero Touch Configuration
- WiFi Offloading
- Seamless User Roaming
- Network Security
- Quality of Experience & Quality of Service
- Hardware Reliability and High MTBF

Telco WiFi in Depth

Let us take a detailed look at what Telecom Providers really require from WiFi.

Scalability

Mobile Network Operators (MNOs) deploy WiFi Access Points in the thousands, their network infrastructure is implemented to serve millions of users through tens of thousands of Access Points. To be able to scale and integrate all of these Access Points into a central console can be daunting. Moreover, if the Access Points are not a plug-and-play configuration, that worsens things because it is simply impractical to even think of a solution that would require Access Points of that magnitude to be configured manually on each location.

Mobility

Users are on the move while being connected at all times. This seamless connectivity can only be facilitated through solutions that provide high mobility and quick transitions over networks. The telco-grade WiFi networks need to provide seamless onboarding and mobility to the users so they can use the service from anywhere within the network without dropping the connection.

Data offloading

MNOs want to offload cellular data of their users on to MNO managed WiFi networks to free the cellular network of congestion and serve a greater number of users. In places where 4G interference is dense and hundreds of people are trying to utilize 4G, the cellular network can result in overloading and poor user experience. It is important to seamlessly offload data to the nearby WiFi hotspot to decongest the network.

Integration with LTE Core

Any telco WiFi network need to provide simple user onboarding through EAP-SIM authentication. The WiFi network should also provide Pass point 2.0 compliance for easy user provisioning and roaming. Moreover, the WiFi network should be integrated with the LTE core to handle the policy enforcement and PCRF functions.

High-Capacity Hardware

Carrier WiFi deployments usually require high capacity, high density handling of users. These deployments require robust, high concurrency, easily deployable Access Points which can work in noisy, outdoor environments.

Infrastructure monitoring

Cell Tower infrastructure consists of many hardware elements which are critical to ensure round-the-clock operations. These elements need be to monitored in real-time to ensure they are operating smoothly and efficiently. Any discrepancy in the hardware elements should be addressed immediately in order to prevent a network failure. These monitoring solutions are approached through comprehensive IoT deployments, with asset tracking to add extra levels of security.

User onboarding

Carrier WiFi deployments need to provide seamless user onboarding using EAP-SIM authentication. The guest users who are not authenticated via this method should be presented a captive portal so they can register for the service. Additionally, the authentication service should automatically assign specific quality of service to ensure that user's WiFi experience is fast and seamless.

Deployment Challenges

Carrier WiFi deployments are complex. Here are a few challenges that Carrier WiFi & critical infrastructure management deployments can face:

- FCAPS management
- Capacity Planning
- RF Design
- Central management of network

- Security of the open network
- Ease of deployment and maintenance
- Gathering data for analytics

How we help the Telecom Sphere with our solutions

The solutioning approach we take is meant to serve all your requirements with a single vendor solution to manage all your core network elements.

For Critical Infrastructure Management:

Universal Modem is a device that can be used to communicate with legacy devices like power systems, factory machines, generators, telecom equipment, controllers and other instrumentation devices. It can be interfaced with multiple devices simultaneously to establish two-way communication between the device and the cloud. The Universal Modem helps in automating and monitoring the functioning of remote devices by allowing administrators to collect all the critical parameters from the remote devices periodically and process them in the cloud. Similarly, it can also send commands and instructions to these devices from the cloud thus allowing administrators to control any device remotely. Universal Modem communicates with the cloud over a 3G or 4G connection so it can be deployed in wide range of applications and in much bigger area. The Universal Modem can be used to control and monitor various equipment installed at the telecom towers, these include SPS, SMPS, DCEM and other power appliances. These equipment are manufactured by various vendors so the Universal Modem needs to implement vendor specific protocols to read and write to the equipment.

For Carrier WiFi:

WiOS is our cloud-based OSS / BSS software used for central management and control of hotspots distributed anywhere across the world, all through a single console. Our Carrier WiFi solution takes care of core network elements like AAA, DHCP, OSS / BSS, OAM, Firewall, VLAN tagging and other services that are crucial to any network deployment.

working in conjunction with UniMax Access Points, you can control and monitor your entire network, configure network, comply with local regulations, monetize the WiFi service which you provide, generate real- time user activity reports and receive real time updates. WiOS, as with UniMax, comes with a built- in AP controller which functions like a networking monitoring system.

Key Highlights of our Critical Infrastructure Management Solution:

- Tower automation
- Integrates with multiple power systems vendors
- Real time alarms
- Instant notifications
- Rich dashboard
- Fault prediction
- Improve battery health
- Reduce fuel theft
- Central inventory management
- Improve operational efficiency
- Generate actionable intelligence
- Reduce truck rolls.

Key Highlights of our Carrier WiFi Solution:

- Cloud-based hotspot monitoring
- Handling core network elements
- Real-time traffic analysis
- High density support
- Data offloading
- AP controller
- AP health monitoring
- WiFi monetization
- Captive Portal
- WiFi marketing
- Live heat maps

Implementation

For Critical Infrastructure Management:

The Universal Modem helps in automating and monitoring the functioning of remote devices by allowing administrators to collect all the critical parameters from the remote devices periodically and process them in the cloud. Similarly, it can also send commands and instructions to these devices from the cloud thus allowing administrators to control any device remotely.

Universal Modem communicates with the cloud over a 3G or 4G connection so it can be deployed in wide range of applications and in much bigger area. Universal Modem contains

various interfaces to communicate with multiple equipment's at the same time. It contains two USB, two RS-232, two RS-485 and three Ethernet ports. It can use WiFi, 4G or Ethernet for connectivity with the Internet. It also provides a provision for enabling GPS on the board.

The Universal Modem is connected with various equipment's with respective cables. It comes with tamperproof, IP-55 enclosure that can be easily installed at remote sites.

For Carrier WiFi:

WiOS, our cloud-based hotspot controller controls and monitors the entire network of UniMax Access Points. WiOS can be hosted on a public or a private cloud infrastructure. The public hosting of WiOS gives you access to an instance through which you can control and monitor your network. Using the private hosting, you can white label the software if you wish to do so.

Dual-band UniMax Access Points are intelligent and are designed to handle high concurrency of users. UniMax Access Points support up to 8 SSID configurations per AP, offering max data rates up to 1200 Mbps. UniMax Access Points can be mounted pole mounted or wall mounted, as the requirement fits.

Our Access Points can be powered using our Trinity Series Switches, these are managed switches which come in a 24P and 8P configuration with 450W and 120W power supply each.

Solution Benefits

We have worked with multiple MNOs and vendors who offer passive telecom infrastructure to MNOs for facilitating their connectivity requirements. Our solutions have been adopted by many companies over the years. Here are a few impactful ways in which we have driven growth:

For Critical Infrastructure Management:

- Real-time status of on-site equipment
- Data analyzed to identify fault and perform audits
- Operational cost of maintaining sites reduced by over 40%
- Bidirectional communication facilitated easy configuration

For Carrier WiFi:

- Easier provisioning of users
- Higher network visibility
- Facilitated data offloading
- Handling high density of CCU
- Improved subscriber experience

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