# Augment Your MNO Business with Alepo WiFi Offload

Introduction

By 2019, forecasts say there will be an estimated 2.08 billion smartphone users.[1] Increased smartphone usage will mean a surge in data consumption. Wireless spectrum, an invisible, finite infrastructure over which all wireless transmissions travel, is already experiencing a spectrum crunch. With an expected 800-percent increase in mobile data traffic over the next five years[2], demand for high data speeds and better signalling traffic will be overwhelming for mobile network operators (MNOs).

Catering to such demand requires larger network coverage that is expensive, and has its own set of physical limitations. However, there is a solution.

WiFi, with its game-changing, cheaper offerings, is gaining ground. MNOs can now offload data and its associated signalling traffic onto a WiFi network, commonly referred to as WiFi offload. It easily and securely supplements network capacity, helping operators alleviate spectrum congestion and utilize their networks more efficiently.

Benefits of WiFi Offload
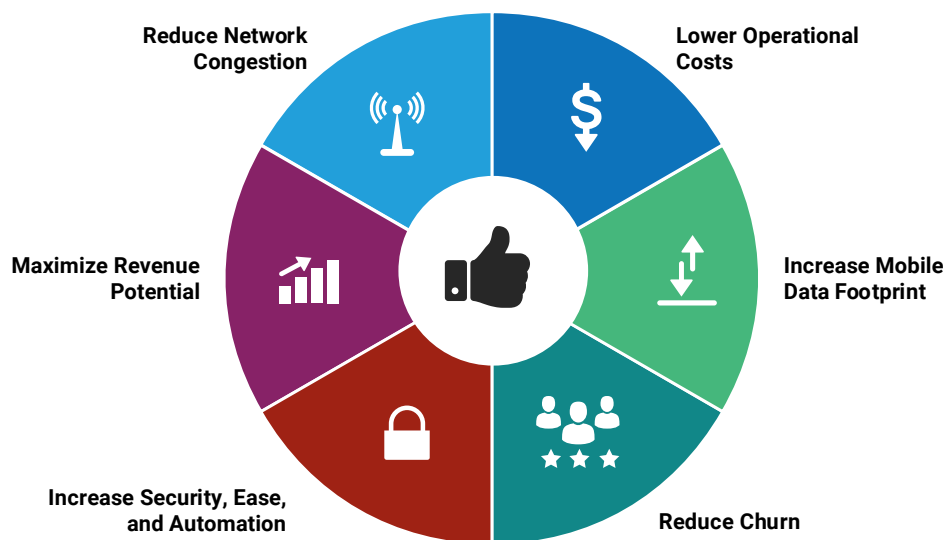
In a carrier-grade WiFi network, users expect more accessibility, service and performance than is provided by public WiFi. They expect the network to be secure and anticipate no difference between their MNO and WiFi data. To meet these expectations, operators need to support automatic network discovery, strong authentication methods, and mobility when moving from access point to access point.

Finally, the network must be properly managed, thereby ensuring that user experience and quality of service are consistent, the network is not overloaded, user information is secure, and automated troubleshooting and network optimization are included.

Alepo WiFi Offload Solution

WiFi offload can be a win-win solution for MNOs and subscribers. By offloading mobile data traffic from an MNO network to a WiFi hotspot network, carriers can optimize available MNO network resources and increase overall capacity, thereby reducing operational costs, and maximizing revenue potential.

Reduce Network Congestion

As data usage on mobile devices skyrockets, MNO networks are becoming overloaded with high traffic, causing congestion on the network – a huge frustration for users. MNOs are beginning to see great potential in leveraging WiFi to reduce congestion on their networks. By alleviating congestion caused by heavy smartphone data usage, MNOs can better allocate their network resources for voice calls and other services. Customers are happier with better delivery of data to their devices and MNOs are happy to give some relief to their networks.

Lower Operational Costs

The greatest benefit of an offload strategy is being able to deliver the same high-quality data services to subscribers at a lower cost-per-byte. WiFi is far less expensive than mobile data. With growing data use, the ability to deliver more data at a lower cost will be a necessity for MNOs. Adopting WiFi is economically viable and helps MNOs continue delivering mobile data services while lowering operational costs.
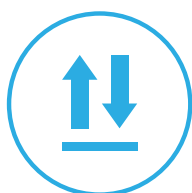
Increase the Mobile Data Footprint

MNOs, who are looking for ways to supplement their existing data services, can expand their overall data footprint by delivering consistent, high-speed data services over a mix of different network types. Through the addition of their own WiFi infrastructure, or through agreements with other MNOs and wireless ISPs, WiFi offers a cheaper, quicker, and easier way to expand network coverage and readily offload mobile data traffic, without sacrificing quality of service.

Increase Customer Satisfaction and Reduce Churn

According to a 2015 study by The Boston Consulting Group[3] latency is the key to mobile customer satisfaction. While speed is often pushed by providers as distinguishing their service, the study's results actually found that customers are much more concerned with latency issues than sheer speed and the biggest determining factor in service latency is network congestion. While adding cells is a central strategy, it is expensive and not always practical. WiFi offload, if handled properly, offers high-level service at a much lower upfront cost, and with no difference in service to the customer. While customers on other networks might attempt public WiFi in congested areas to access faster data speeds, this is sure to provide an experience that requires manual authentication, all while being slower and less secure. With the proper platform, providers can offer seamless hand-off to wireless networks that are fast and offer high-quality service.

Secure, Easy, and Automatic

In a public WiFi network, the end user must initiate the connection, manually select the network, and enter a security key or login credentials. Conversely, WiFi offload can make the process of moving from an MNO network to a WiFi network automatic and transparent to the customer, with no disruption to the subscriber experience. In addition, compared to unsecured public WiFi, an MNO's own WiFi reduces security risks, such as exposing login credentials during the authentication process. Service also remains consistent, allowing the MNO to ensure that subscribers are receiving the same level of service across all network types.

Maximize Revenue Potential

Operators are beginning to see great potential in leveraging WiFi to capitalize on new revenue channels. Even if the MNO's main driver for a WiFi hotspot network is to increase mobile network capacity by offloading existing mobile subscribers, that network can be extended to new and non-mobile subscribers as well. By integrating with Alepo's charging system, or using their existing charging system, operators can expand their reach to new and casual users, roaming users, partners, and affiliates, as well as their existing mobile subscribers, using secondary, WiFi-only devices. Through the creation of new WiFi business models, like WiFi roaming and location-aware advertising, MNOs can drive up revenue, market share, and ARPU of data services. Learn more: Alepo WiFi Monetization.

Solution Components

Along with components from an MNO's core network, carrier-grade WiFi offload requires wireless network hardware components like base stations, access controllers, and access points. With this hardware, software components are needed to monetize the WiFi network and offload users.

Alepo's robust, carrier-grade WiFi offload solution helps alleviate network congestion and enables MNOs to fulfil demands for mobile data offload. It is highly stable and built around a flexible architecture that is easily interoperable.

Alepo's solution is designed to be vendor-agnostic. Simplifying integration and allowing service providers to build a best-of-breed stack, not just now but also as the business evolves. The solution is field-tested and has been integrated with all major WiFi access network providers and is interoperable with various access networks.

Alepo WiFi To Mobile Authentication Gateway (AAA)

Alepo's 3GPP AAA server provides authentication, authorization, and policy control for 3GPP WiFi access. It supports both RADIUS and Diameter interfaces necessary for network element integration.

Alepo's carrier-grade AAA infrastructure enables secure and automatic offload from cellular to WiFi networks. The AAA interacts directly with the HSS or HLR in the existing mobile core network to authenticate mobile subscribers to the WiFi network, without the end user's intervention. Alepo leverages EAP-SIM and EAP-AKA authentication methods, enabling a secure and smooth offload process.

Achieving an automatic and transparent offload process is not easy. EAP compliance, however, makes it possible for MNOs to securely authenticate any EAP-SIM/AKA-compliant user device and shift mobile data traffic to a WiFi network, thus reducing network congestion. Non-SIM devices can be authenticated by the Alepo-developed Mobile Connection Manager application.

Alepo AAA EMS Portal

Alepo's AAA features a web-based user interface from which system administrators can fully manage network users. The Alepo AAA EMS supports hierarchical role-based access to the portal. Each system user is assigned a role, and the roles define access permissions for each page, including field-level permissions. The system can be configured in different languages, making it easily deployed worldwide.

The Alepo AAA EMS Portal enables system administrators to:

- Manage AAA subscribers (create, update, delete)
- View online RADIUS sessions and event detail records (EDRs)
- Manage and configure the Alepo AAA
- Create groups, services, and messages
- Configure the NAS
- Configure role-based permissions

Alepo Mobile Connection Manager

The Alepo Mobile Connection Manager app facilitates offload for non-SIM devices that cannot be authenticated based on SIM credentials. The app works in a device's background to facilitate a secure and transparent WiFi offload by utilizing EAP-TLS or WISPr authentication. If a subscriber comes in the range of an offload-enabled WiFi hotspot, and their credentials match, they will automatically be connected to the WiFi. The user is not required to open the app or enter any additional validation or security details. In addition, the app can show a map of all the available, offload-enabled hotspot locations. The user has control over the following settings within the application:

- Enable/disable automatic WiFi offload
- Enable/disable notifications
- Vibrate/ring when connected to WiFi offload

Map Gateway

If an operator's HLR/HSS does not support the SWx interface, Alepo offers a MAP WiFi to Mobile Authentication Gateway. This gateway functions over SS7/SIGTRAN to enable offload. If the HLR is Diameter compliant, the MAP gateway is not needed.

Deploying with Alepo

A Zero-Impact Solution

Making system-wide changes in a complex network environment can cause service disruption, and require significant time and investment, delaying time to market. Alepo's WiFi offload solution allows rapid and cost-effective deployment by employing an existing WiFi infrastructure. With the full support of EAP technology, it requires minimum network element upgrades. In addition, Alepo's "Replace Nothing" deployment mode ensures seamless integration with an MNO's network elements. By delivering only the necessary components to bridge the gap, this approach reduces network complexity and unnecessary changes to the existing network environment, speeding up deployment time.

Ongoing 24/7/365 Support

Alepo's Global Technical Assistance Center (GTAC) is an internationally renowned technical support services department, offering convenient, multi-channel, 24/7/365 support in a host of languages. The department operates in-house, ensuring quality checks at every level. The team comprises skilled, experienced support professionals and engineers, who provide immediate response, technical assistance, and implementation services to clients. All Alepo clients can subscribe to GTAC on an annual or multi-year basis.

A Best-Fit Solution

Alepo takes the time to learn about each customer's unique business goals, both short-term and long-term, to understand priorities. Because we have a modular and flexible architecture, our components can be configured in any number of ways so that we ultimately find the best match for each customer. A customer solution is then constructed as per our core design principles of automation, compliance to standards, scalability, feature-richness, flexibility, and future-readiness. The solution is measured against a rigorous set of key performance indicators. On every project, Alepo carefully designs, builds, and delivers solutions that:

- Grow with the business and readily adapt to market changes
- Heighten the user experience for end customers and system users alike
- Reduce time, costs, and risks associated with deployment and network integration
- Maximize return on investment (ROI)

End-To-End Solution Partners

To provide an end-to-end solution for MNOs, Alepo often collaborates with WiFi hardware vendors. A few of the vendors we have worked with are listed here.

Solution Use Case Examples

Seamless EAP-SIM/AKA Offload

A user with a smartphone can be seamlessly offloaded onto a WiFi network from a mobile network. A provider's network uses SIM credentials to authenticate the user's presence in its HLR/HSS.

Seamless EAP-TLS/WISPr Alepo App Offload

A user with a non-EAP device (no SIM) can be seamlessly offloaded onto a WiFi network from a mobile network. The user has the Alepo mobile app, which facilitates a secure and transparent WiFi offload.

Service Convergence (Bundling)

Users can be charged for their WiFi and cellular data usage from a common bundle, sharing billing information seamlessly between WiFi and traditional data networks.

Promotional Offers

Service providers can promote WiFi use to alleviate MNO network congestion by offering free or discounted rates on WiFi usage.

Offload Partner Networks 3G/LTE Customers (Roaming)

MNOs can have partnerships with other service providers (domestic and international) to offload their customers onto the MNO's WiFi network. Revenue sharing and leasing can be arranged accordingly.

Sources:

1. https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/
2. http://www.fiercewireless.com/wireless/cisco-mobile-data-traffic-to-increase-800-within-5-years
3. https://www.bcg.com/publications/2015/telecommunications-customer-insight-uncovering-real-mobile-data-usage-drivers-customer-satisfaction.aspx

About Alepo

At Alepo, we turn next-generation data opportunities into reality. Our software and services power operations and billing for digital service providers, enabling them to accelerate revenue growth, market share, and business success.

Through a lean and agile approach to digital transformation, we empower businesses to:

- Welcome disruptive technologies
- Orchestrate a unique customer experience
- Grow, adapt, and evolve with confidence in the network's performance, reliability, and security

Our award-winning technology has helped make Alepo the go-to partner for all things data at leading national service providers like Orange, Saudi Telecom, Digicel. We provide cutting-edge monetization models with business-focused user experiences that allow service providers to tap new markets and revenue sources, while delivering more value to their customers.

Our mature and proven solutions include advanced policy and charging control, convergent charging and billing, customer relationship management, device management, WiFi monetization, WiFi offload, AAA, and more. We offer expert professional services: consulting and design, managed services, training, and support – our solution integration team has a success record that is the envy of our peers.

Headquartered in Austin, Texas, Alepo has a presence in all regions of the world, including offices and representatives in Latin America, North America, Asia Pacific, Africa, the Middle East, and India.

For more information, please visit www.alepo.com

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