

Quality WLAN roaming for end-users

Network services are a key success factor for the adoption of commercial WLAN services

The young Public WLAN industry is fragmented and heterogeneous. WLAN aggregators have been primarily focussing on offering the widest footprint possible at the lowest cost to service providers. Coverage and price are however just one component to the user experience. Ability to accurately communicate the location of hotspots, correctly identify the point of service in the user's bill and to support the user when he/she is calling the help line are often overlooked. WeRoam has developed a set of network services that support its WLAN roaming service.

The WLAN industry today

WLAN Roaming aggregators, such as WeRoam, broker "network usage" of national or regional Wireless Internet Service Providers (WISPs) to offer a worldwide virtual WLAN footprint to service providers that are interested in offering their subscribers new broadband wireless services.

At one end of this business chain, the WISPs own and operate the WLAN access network. They control the access to the Internet. At the other end of this chain, services providers manage the relationship with subscribers. They provide the branding, billing and customer care functions. An aggregator spans the middle of this chain and operates a roaming platform that includes Radius Proxy and signalling gateways for user authentication and accounting and billing services for WLAN usage. The aggregator thus "virtualises" multiple networks into a single footprint.

WLAN networks are cost effective and much simpler to deploy than a GSM service. The technology is younger and the deployment of WLAN services less standardised. This, combined with the split between the operation of the network and the user "facing" functions requires tighter collaboration between the different commercial actors. The flow of information is key for the user experience and the adoption of WLAN as a commercial service.

Accurate communication of hotspots

A public WLAN service is only as good as the ability of the end-user to know where the service is available. WeRoam receives from each of its WISPs a list of venues where their hotspots are located. This information contains not only addresses, but also the SSID broadcasted by the service access points, supported authentication interfaces, etc. The information delivered by the WISPs varies in format and quality and WeRoam has developed a thorough process to generate a consolidated and homogenous list of those hotspots available for WLAN roaming. Standardisation of hotspot descriptions includes the removal of doublets, enforcement of hotspot definition (e.g. aggregation of entries when each floor of a hotel is listed as a different hotspot), normalisation of country and city names for ease of database indexing and the validation of postal addresses via geocoding engines.

Identification of the points of service

Identification of the point of service is important to the operator for both the billing and customer care processes. Some service providers decide to detail each WLAN session in the subscriber's bill. A correct identification of the point of service is then important. Incorrect information can trigger inquiries about the bill, resulting in unnecessary use of customer care resources. The identification

of the point of service is also critical for any real-time support of a subscriber, for instance when a user fails to access the WLAN service at a given hotspot.

The WISPr protocol specifies a standard way for WISPs to indicate in Radius messages at which hotspot an end-user is establishing a WLAN session. Many WISPs have started to populate this information in their network. This upgrade process takes time however and the content of the data may vary. WeRoam has developed a state of the art point of service identification management system that standardises in real time the location information contained in Radius messages and correlates it with the list of hotspot venues received from the WISPs. With this system, WeRoam's customers have the guarantee that the point of service identification received follows a strict format, with indication of the country, network and venue where the service is accessed. This system is also used to detect and report eventual errors to the WISPs. This contributes to improve the accuracy of the point of service identification directly at source.

A two-pillar approach to monitoring.

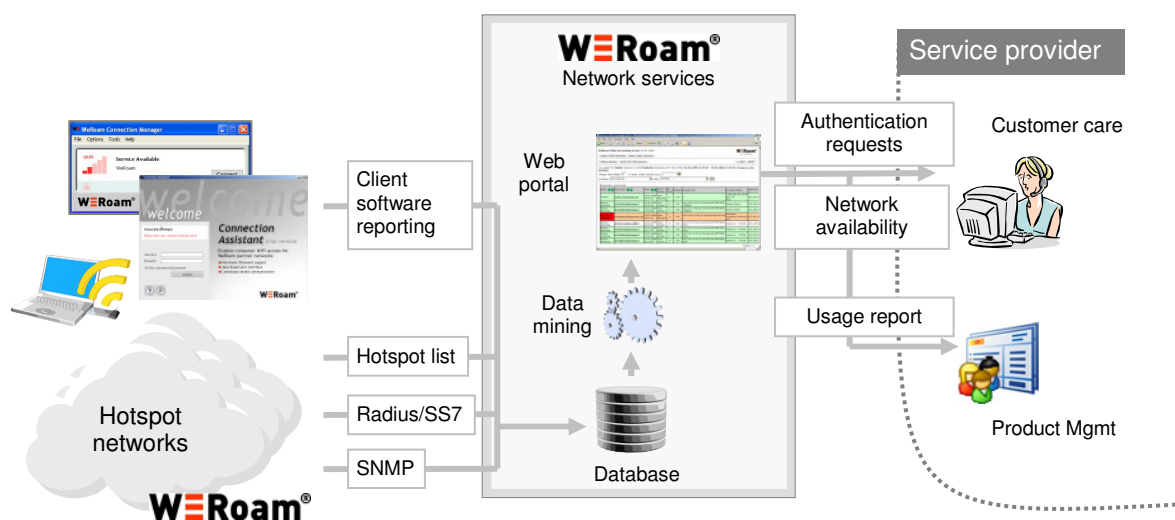
Service providers must offer customer care to their subscribers but are often blind on the availability of the public WLAN network. This

situation is same in the GSM world as an MNO has usually no visibility on the cells availability of another MNO. In GSM however, 15 years of operations have resulted in a rise of the service quality of the GSM industry as a whole and users are now accustomed to be able to roam everywhere. Service providers may therefore face a gap between the expectations from their users and the best effort quality offered by the public WLAN industry.

To support customer care organisations, WeRoam is working on a two pillar strategy that offers better visibility on the status of its public WLAN roaming service.

Monitoring of hotspots availability

The first pillar lies on standard network management solution using the Simple Network Management Protocol (SNMP). Read access and traps are used to monitor the network elements of the WISPs and WeRoam's infrastructure. The status information about the network infrastructure is processed and made available to the customer care departments of service providers through a Web portal. Information is filtered to reflect the actual footprint available to a customer. Customer care departments have access to a nearly real-time status of the availability of WLAN networks.



WeRoam's comprehensive vision of network services

Monitoring the user experience

The second pillar focuses on the end-user experience and reports information about the service availability and quality observed at a hotspot. A software probe is integrated into the software connection managers. This probe logs all failed login attempts and the quality experienced during a WLAN session (e.g. latency, bandwidth). This information is automatically conveyed back to a central server by the reporting probe. A regular post-processing on the server analyses the information and determines any recurrent point where the service is unavailable or of poor quality. This information is communicated to the WISPs to help them improve their infrastructure. Monitoring the user experience also gives valuable information on attempts to use the service at points where there is no coverage, on connecting to the wrong SSID, etc. This information helps service providers to tune their communication of the WLAN service to their subscribers.

Real-time access and traffic reporting

WeRoam is developing a Web based tool to monitor WLAN sessions in almost real-time. This

tool not only produces summary of the traffic with different views, but also provides detailed information about the status of individual WLAN sessions. This platform will be a powerful tool for the customer care departments of service providers to identify in real-time the cause of an authentication failure and for example, correct the provisioning of the subscriber or report an outage to the WLAN operator.

Summary

Service providers are increasingly looking to add public WLAN to their portfolio of services. While service coverage and pricing is important, the end-user experience is the key success factor for public WLAN services adoption. When designing their wireless broadband data offering, service providers must therefore take into consideration all the network services that enhance the user experience. WeRoam has been relentlessly focusing on this aspect and offers network services that help operators differentiate themselves with the quality of the service delivered.

WeRoam is a trademark of Swiss company Comfone AG. Comfone provides roaming services to over 300 operators in 125 countries worldwide. Its services portfolio includes signalling, data, clearing, hubbing and convergence services.

WeRoam's patented open roaming platform connects to nearly 60 WISPs and offers an aggregated footprint of more than 23.000 hotspots. Key solutions found in GSM technology have been adopted to make up the WeRoam service. This positions WeRoam as the only open roaming platform supporting username/password and SIM based authentication for WLAN Roaming. All solutions easily integrate with existing products of Internet, Enterprise, GSM and VoIP service providers.

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