

## Meeting the Mobile Data Explosion Challenge using WiFi

### Enabling seamless & automatic mobile data traffic offload to WLAN broadband networks

Smart phones have irreversibly changed the future of the mobile Internet. Mobile Service Providers worldwide are seeing a surge in data traffic volumes. The surge although not entirely unexpected, poses serious challenges both technical & commercial.

WLAN or WiFi as it is better known could be part of the solution to de-congest and offload the surge in data traffic. All smart phones without exception have WLAN as a standard feature and most support SIM based authentication, a crucial feature for enabling seamless mobile-to-WLAN offload..

Inventum's UNIFY Service Management Platform combined with MSC Multi Service & Session Controllers provide a comprehensive solution allowing mobile operators to offload their traffic to captive or third party WiFi hotspots.

### The Standards

There are two major approaches to enabling data offload, both of which are supported by Inventum.

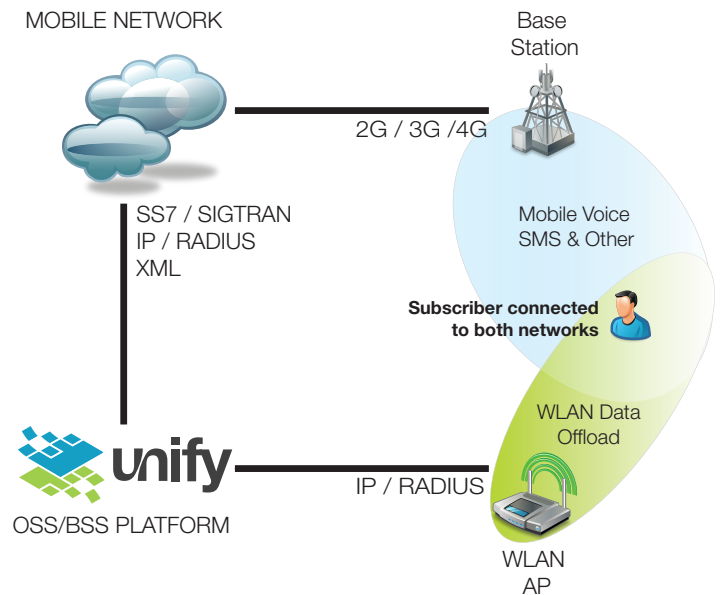
- **3GPP iWLAN** - advocates the secure tunneling of authentication & WLAN traffic to the mobile core. iWLAN client or compatible mobile devices are required.
- **EAPSIM with Local Breakout** - provides for secure SIM authentication using 802.1x standards followed by local transit of traffic to the Internet and only accounting & charging being handled over a secure 3GPP AAA inside the mobile core.

Both standards are supported by Inventum, each offering its own unique benefits.

### Challenges

The challenges of hopping between a Mobile & WLAN network are significant and include the following:

- Securely acquiring & authenticating the mobile phone session over WLAN using SIM credentials
- Provisioning services on associated WLAN infrastructure that may not be owned by the mobile operator
- Metering off-loaded session traffic over WLAN which is not hauled back to the GGSN.
- Managing IP transition from Mobile Data to WLAN network and vice-versa
- Real-time charging as well as presenting CDR for post pay billing system



### Solutions

Inventum's UNIFY SMP & MSC Service Controllers address all network & IT challenges for mobile data offload. Where appropriate, Inventum also works with leading partners for mobile terminal connection managers, iWLAN clients & TTG vendors.

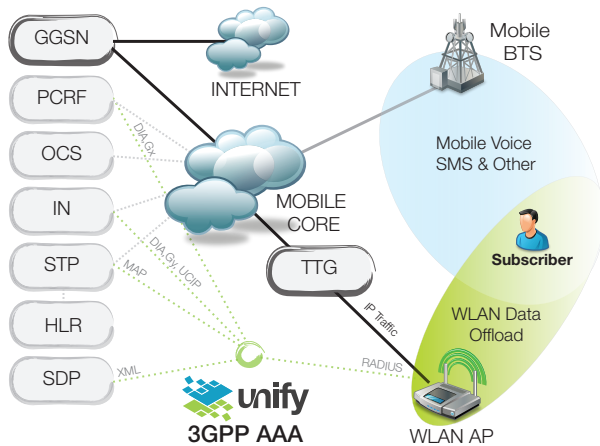
- 3GPP AAA server that interfaces both the mobile network (MAP/SIGTRAN) and the IP network (RADIUS/Diameter)
- Native MAP v2/v3 calls to mobile core for authentication of SIM, MSISDN lookup & policy.
- IN charging using Diameter calls
- XML or custom calls to ESB, SDP or other enterprise systems for deriving policy, terminal or subscriber information
- Edge policy enforcement (PCEF) in EAPSIM with Local Breakout model of offload.

### Comprehensive Modular System

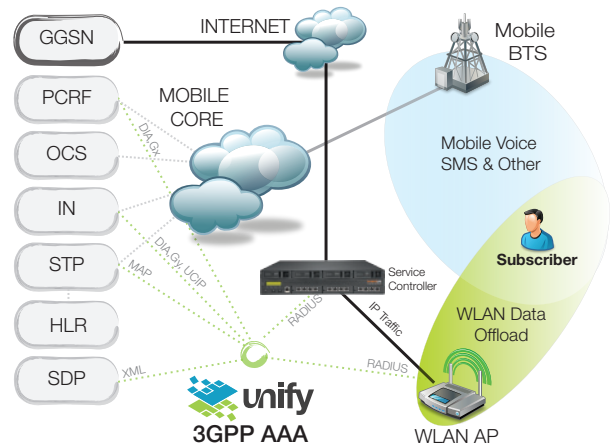
Service providers start with the base UNIFY software platform and add suitable modules as required. Key modules are:

- **3GPP AAA** : RFC compliant RADIUS server with native MAP calls to authenticate & retrieve policy data from mobile core. Act as bridge between WLAN RADIUS & mobile core.
- **Policy Server** : Store WLAN specific policies or integrate with PCRF to build complex business models.
- **VMS with SMS Gateway** : Voucher or One-Time-Password management system with integrated SMS delivery for enabling non SIM based devices & visitor subscribers.
- **Subscriber Management System** : Tackle visiting subscribers who do not have an account in mobile OSS/BSS.

## iWLAN Deployment



## EAPSIM with Local Breakout



Feature	Description	Benefit
<b>Acquiring WLAN Subscribers</b>	<ul style="list-style-type: none"> <li>Mobile operator can choose to deploy their own WiFi hotspot network where the UNIFY will provide complete OSS/BSS function</li> <li>Mobile operator can also purchase capacity over smaller third party hotspot networks that may not be connected to IP network of mobile operator at all e.g. hotels, airports, small ISP, infrastructure sharing providers</li> </ul>	<ul style="list-style-type: none"> <li>Single platform pre-integrated with mobile network for rolling out WiFi hotspots immediately in large numbers</li> <li>Cherry pick locations and partners and integrate easily into mobile eco-system</li> </ul>
<b>Subscriber Management</b>	<ul style="list-style-type: none"> <li>UNIFY provides comprehensive subscriber &amp; service management to overcome limitations of existing mobile BSS systems</li> </ul>	<ul style="list-style-type: none"> <li>Cater for business models that cannot be handled in primary system. E.g. third party hotspot or non home network subscribers.</li> </ul>
<b>3GPP AAA Services</b>	<ul style="list-style-type: none"> <li>Deeply integrated RADIUS &amp; LDAP services directly within the UNIFY SMP with support for MAP v2/3, SS7, SIGTRAN</li> <li>Interface any device or IT system with UNIFY over AAA, LDAP or XML.</li> </ul>	<ul style="list-style-type: none"> <li>No separate investment in AAA required, works out of the box, needs virtually no configuration</li> <li>Integrate legacy and future systems with UNIFY using 3GPP standards.</li> </ul>
<b>Metering &amp; Charging</b>	<ul style="list-style-type: none"> <li>UNIFY offers optional modules for complete pre &amp; post pay rating &amp; charging of data services off-loaded from mobile network</li> <li>Use Inventum's MSC Service Controllers to meter each byte off-loaded without having to modify any existing IP-mobile gateways</li> </ul>	<ul style="list-style-type: none"> <li>Present raw or rated CDR of data usage for easy integration into mobile bill. UNIFY can also query mobile BSS policy data.</li> <li>Off-loading is great, but being able to meter the off-loaded data traffic for volume limited plans is also critical. MSC solves this problem</li> </ul>
<b>High Availability</b>	<ul style="list-style-type: none"> <li>Multi server, clustered 99.999% uptime system architecture</li> <li>Modular approach with on-the-fly upgrades</li> <li>Support horizontal and vertical scaling using industry standard solutions</li> </ul>	<ul style="list-style-type: none"> <li>Available on both Enterprise Linux and Solaris systems, HA is key in any telecom network</li> <li>Upgrade with least downtime</li> <li>Start small and grow to millions of subscribers with the same solution</li> </ul>

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