

## UNLOCK THE HIDDEN VALUE OF MOBILE NETWORK DATA

Location Services cover those services using the positional (geographical) location of mobile user's equipment to offer a range of value added services. With the Arcanum GMLC / SMLC we support location services that require this type of standard architecture to deliver a competitive price option that is independent of the Network Equipment provider or Switch vendor.

The location of a user's mobile is defined in terms of latitude and longitude co-ordinates. The accuracy depends on the particular technique used to locate the mobile. Within many networks several mobile (GSM) industry variants are currently deployed. The method for 'requesting' a user's mobile location and the resultant network generated messages are standardised for GSM regardless of the location technique in use.

## ENABLE RICH VALUE ADDED SERVICES

GMLC / SMLC captures mobile network data that enables a rich seam of applications such as:

- Location Based Services (LBS)
- Find Me Services
- Friend Finder Services
- Child Minder
- Local Information Services
- Emergency Alert Services
- Proximity Advertising
- Mobile Push and Contextual Services
- Emergency Assistance

### BENEFITS

- Cost effective solution
- Scalable platform solution
- Meets 3GPP standards
- OPEX reduction
- Reduced CAPEX
- Vendor independent
- Fast deployment
- Standard hardware options
- Future-proof NGN / LTE migration

### KEY FEATURES

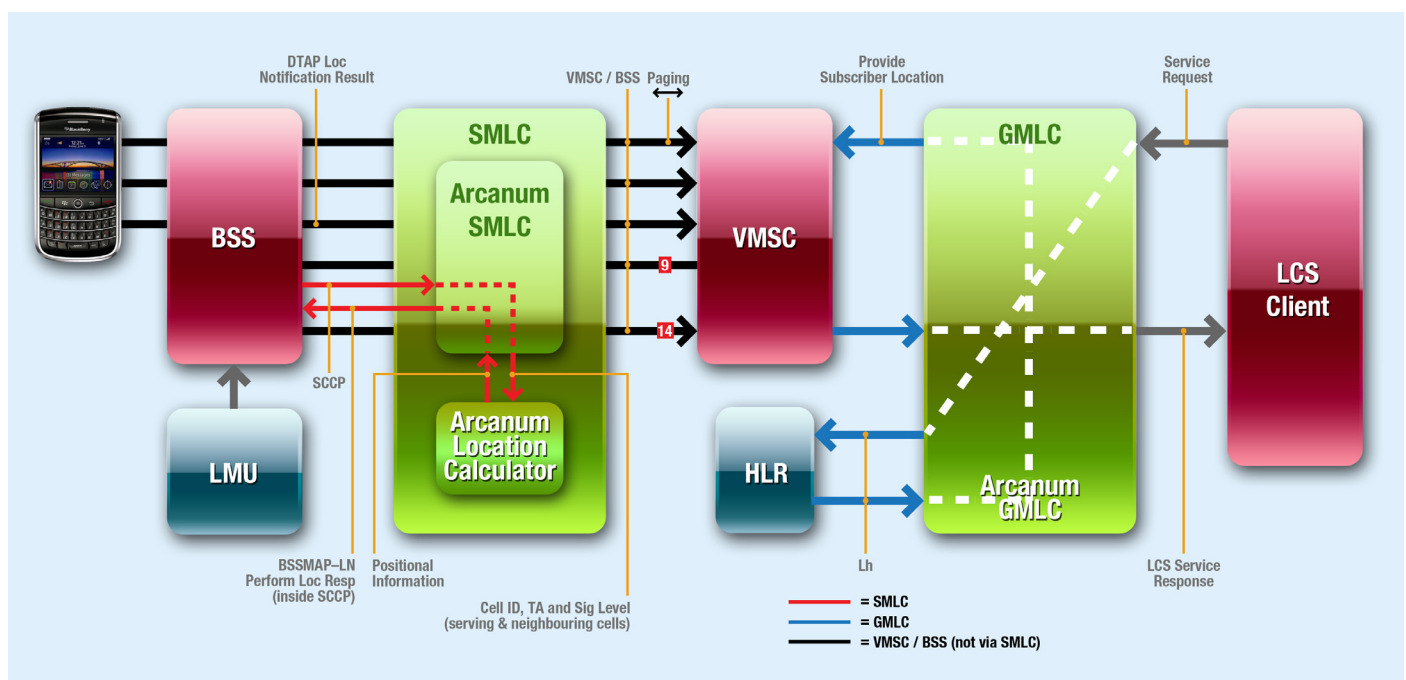
- SS7 Signalling data collection
- Proven technology
- High throughput
- NSS / BSS based options
- MTP version
- Resiliency options
- 'Push mode'
- Camel option
- Advanced positioning methods
- LMU support
- Report and stats package
- Full user documentation

## MOBILE NETWORK: Location Services

The ability of a mobile network to establish the location of a user mobile is essential to ensure incoming calls are 'directed' to the appropriate cluster or group of cells. Such clusters or groups are defined/known as Location Areas.

To maintain this situation mobiles continually assess and measure the radio parameters from surrounding/neighbouring cells and detect when moving from one cell area (LAC) to another. Using this information it is possible to 'triangulate' the geographic position of a user mobile. This information may include the serving cell (Cell ID), relative signal strengths of neighbouring cells and timing advance settings.

To externalise this information and control the management of authorised requests say from external VAS applications requires the network provision of two additional nodes named the Gateway Mobile Location Centre (GMLC) and the Serving Mobile Location Centre (SMLC).



## STANDARDS

The Arcanum GMLC and SMLC (including the Arcanum Location Calculator) have been developed to run on telecoms standard servers running Unix or Linux. A third entity GMLC 'Arcanum Front End' is also provided to support the communications interface to the LCS Client service. We comply with the 3GPP standardised network infrastructure for Location Services detailed in 3GPP TS 23.271 Sections 9.1.1 to 9.1.4.

The interfaces comply with the requirements for supporting mobile terminated location information as detailed in OMA MLP 3.1 and 3.2. The precise functions supported shall be as agreed with each client. The system will require signalling servers to extract the SS7 layer messages (SIGTRAN) which we can supply from our partners. The software code used for the GMLC and SMLC is Objective C.

## GMLC

The Arcanum GMLC function is provided as a licence and works with the necessary protocol stacks which are available with the Signalling Server. Our software is built using Objective 'C' code which is easy to maintain and adjust for different configurations. The GMLC code used in generating the necessary location specific messages shall be hosted on a dedicated server interfaced to the signalling server. The signalling server will support communications to existing network nodes.

The GMLC server will additionally host a copy of the 'Arcanum Location Calculator' to support location services for the required BSS or NSS infrastructure. This type of arrangement will also support location services for other Network derived location information from an existing SMLC until such time a new SMLC is installed and operational.

## SMLC

Two types of SMLC Licence are possible:

1. NSS based SMLC: supporting the Ls interface.
2. BSS based SMLC: supporting the Lb interface.

The Arcanum SMLC is designed to serve multiple BSCs for the purpose of obtaining radio interface measurements to assist in locating the target UE. Signalling between the BSS based SMLC is transferred via the BSC using the Lb interface. The SMLC and GMLC functionality can be hosted on separate dedicated servers interfaced to a single signalling server for support of network communications. This arrangement can be duplicated such that each 'system' shall be capable of supporting the full load in the event a problem occurs making one or other 'system' unavailable.

## HARDWARE

The GMLC and SMLC functions shall run on dedicated telecoms standard entry level servers as does the GMLC 'Arcanum Front End' function, which supports XML access to the LCS Client services. Typically hardware such as the Dialogic G31 and Sun Netra servers (with 2 or more processors) are suitable.