Alcatel-Lucent 8650 Subscriber Data Manager

(GSM/UMTS, IMS AND LTE)

The Alcatel-Lucent 8650 Subscriber Data Manager (SDM) is an efficient, next-generation converged database product that consolidates Home Location Register/Authentication Center (HLR/AuC), Mobile Number Portability (MNP), Equipment Identity Register (EIR), and Home Subscriber Server (HSS) data from multiple GSM/UMTS HLRs, MNP and EIR functions, and HSSs into a single, virtual data store with centralized administration, management and reporting.

A key component of the Alcatel-Lucent Subscriber Data Management solution, the 8650 SDM features data (profile) centralization capabilities that help service providers gain a real-time, 360 degree view of their customers. The centralized subscriber data immediately becomes more relevant to the service provider and can be used to create the highly personalized services that customers now expect. Centralized subscriber data is also a key requirement for service delivery environment (SDE) and service delivery platform (SDP) strategies and for the transformation to all-IP networks and applications.

Leveraging field-proven technology, the 8650 SDM consolidates data from multiple HLRs, MNP and EIR functions, and HSSs with virtually unlimited growth because it:

- Reduces network operating expenses by leveraging high per-node capacity to simplify the network topology and replace several applications with just one
- Consolidates multiple small databases into a single, virtual data store with centralized administration, management and reporting
- Simplifies future capacity upgrades by separating the data from the applications, allowing capacity increases without major network changes
- Simplifies future network evolution, allowing application upgrades with limited impact on the subscriber data

With the 8650 SDM, applications can be tied to shared network and management resources to help avoid "dirty data" issues, and enable more flexible and agile delivery of personalized and blended services. The 8650 SDM can also help service providers monetize their networks and become more competitive by:

- Leveraging Alcatel-Lucent Bell Labs innovations to gradually increase their differentiation and business value with services that deliver convenience and enhanced quality of experience (from silos to bundled, enhanced services, and ultimately, to personalized and blended services)

- Delivering a consistently high-quality end-user experience that improves customer satisfaction and loyalty and increases willingness to pay for advanced services
- Providing maximum flexibility while still providing critical safeguards for data protection by:
  - ¬ Enabling the easy addition of new services and applications, such as EIR and MNP, as well as third-party applications, such as authentication, authorization and accounting (AAA); for example, through Lightweight Directory Access Protocol (LDAP)
  - ¬ Simplifying network expansion and evolution through HSSs and Subscriber Locator Function (SLF) for IP Multimedia Subsystem (IMS), as well as HSSs for Long Term Evolution (LTE)
  - ¬ Protecting subscriber data in a fully secured database with local and remote redundancy across two or three sites as well as automatic or manual failover and recovery capabilities
  - ¬ Ensuring data coherency through full support of Atomic, Consistency, Isolation and Durability (ACID) properties of the database at the network level
  - ¬ Supporting coherent backup and restore at the database node level

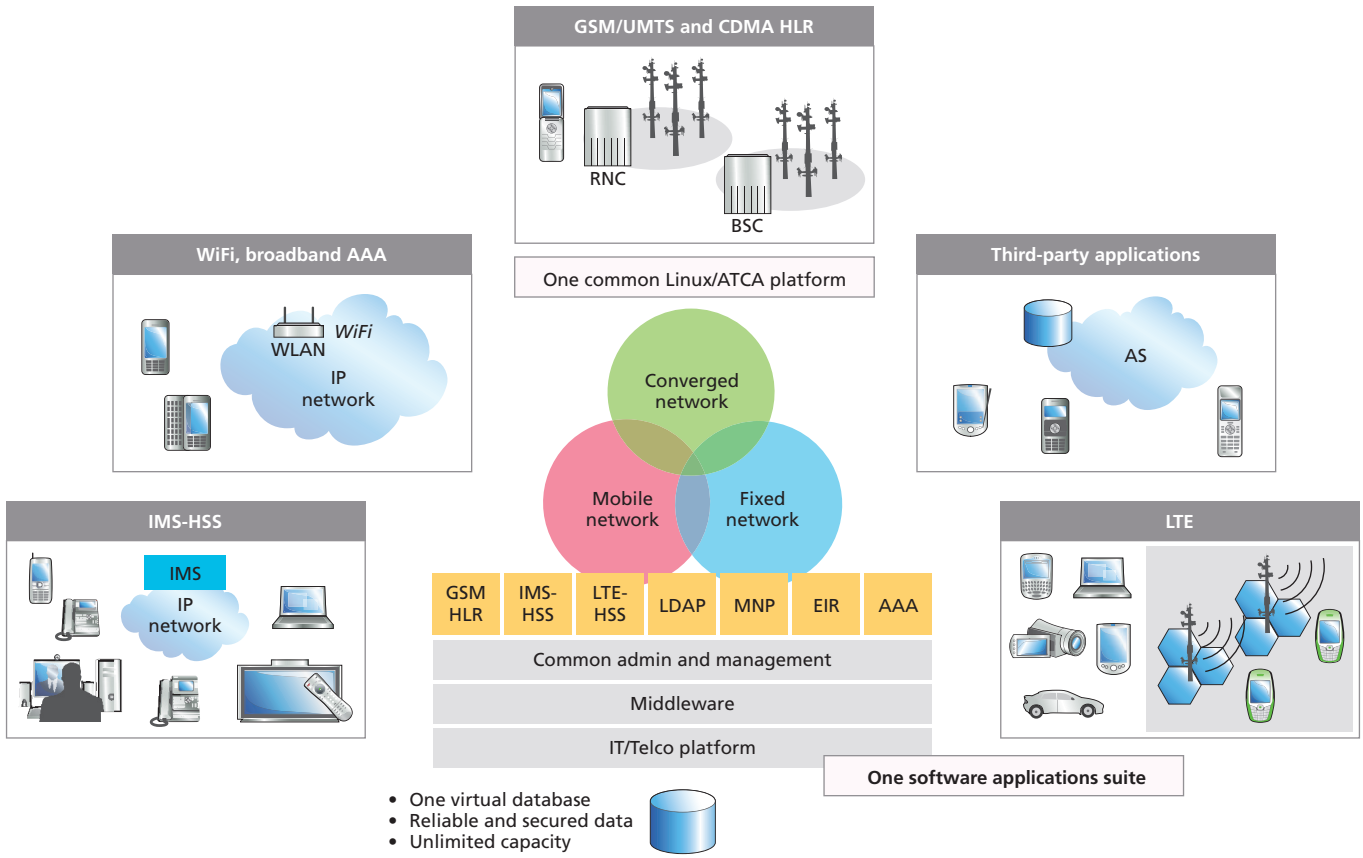
Features

The 8650 SDM is designed with a modular architecture to provide the highest levels of flexibility, performance and availability, and the broadest ranges of scalability. Its features include:

Flexibility and performance

- A multi-tier architecture provides centralized operations, administration, maintenance and provisioning (OAM&P) as well as data repository, application and signaling support with:
  - ¬ Standard Common Object Request Broker Architecture (CORBA) services, XML bulk management, Simple Network Management Protocol (SNMP) management, access control, alarm and performance management, software management services, Signaling System 7 (SS7) OA&M and operator security services

Figure 1. Alcatel-Lucent Subscriber Data Management Solution



¬ Web-based element management layer (EML) capabilities through an animated network topology map that facilitates:
  - Adding, modifying or deleting a single record
  - Updating subscriber profiles through mass provisioning
  - Easy integration with existing customer care and billing systems to administer subscriber data
  - Managing network elements both on circuit and packet domains
  - Alarm collection and centralized alarm management
  - Centralized performance data collection (observation counters and key performance indicators)
  - Centralized operators and profile management
  - Security management
  - Event and log management
  - Network element software download and backup management for the entire network
  - Interface to external Operations Support Systems (OSSs) through open interfaces
¬ Data storage and modeling that incorporates the benefits of both relational and hierarchical data structures and that enables third-party applications (for example, an AAA server)
¬ Critical safeguards to ensure proper data protection
  - Transaction and ACID properties to ensure database integrity
  - Transaction and cache management
  - High availability with transparency to the applications accessing the data
  - Database synchronization

- Support for multiple applications and networks, including critical HLR/AuC requirements for GSM/UMTS networks, such as mobility management, call tracing, translation, fraud prevention, support for multiple Public Land Mobile Networks (PLMNs), supplementary services data processing, MNP and Service Triggering
- Support for SS7 signaling, including E1, T1 and Signaling Transport (SIGTRAN) support at the HLR/AuC to support critical interfaces to multiple applications as well as full interoperability with most major core network equipment vendors in GSM/UMTS and GPRS networks
- Support for 3GPP standards-defined Diameter interface to provide interoperability with IMS core network components
- Support for 3GPP R8 standards to support LTE-HSS
- Easy extension to include MNP, EIR, IMS-HSS and LTE-HSS capabilities as well as universal view and data federation in conjunction with the Alcatel-Lucent 8660 Data Grid Suite (DGS), or deployable as standalone HLR, MNP, EIR, IMS-HSS and LTE-HSS
- Adaptable configuration options for integration in any network environment with full support for redundancy and availability requirements
- Open databases and interfaces built on Advanced Telecom Computer Architecture (ATCA) hardware

Availability and reliability

- Support for both local and geographical redundancy for high availability and improved resilience
- Data consistency checks for zero downtime

Scalability

- Virtually unlimited capacity architecture based on Bell Labs patented Index Server

Benefits

- Improves network capacity and scalability by capitalizing on major IT innovations in hardware, architecture and carrier-grade operating systems for ease of integration into the network and smooth migration of existing data
- Rationalizes and optimizes signal processes in the network through SS7 signaling with SIGTRAN (SS7/IP) at the HLR/AuC
- Enables a distributed architecture that delivers higher HLR/AuC capacity to support a virtually unlimited number of subscribers. This helps service providers maximize one-time investments in network equipment while growing their subscriber base.
- Supports multiple networks allowing service providers to replace fragmented databases with efficient, centralized and consolidated subscriber profile database management regardless of subscriber services or geographic location
- Allows the authorization and management of multiple "identities" associated with a profile of a single subscriber to facilitate personalization of supported applications and services
- Delivers scalability, density and capacity to support the smallest to the largest of networks
- Reduces operating expenses:
  ¬ A single interface for subscriber management, combined with common administration and back-office support, can save as much as 60 percent in operating expenditures
  ¬ A Tier 1 carrier in North America with approximately 35 million subscribers was able to drop from 30 HLRs to a single, virtual HLR

Technical specifications

- Voice/network integration
  - ¬ 3GPP
  - ¬ CAMEL
  - ¬ TISPAN
  - ¬ MAP
- IP data integration
  - ¬ Diameter
  - ¬ RADIUS
  - ¬ HTTP/XML
  - ¬ SOAP
  - ¬ SIGTRAN/IETF
  - ¬ IPv6-ready
- OSS/BSS integration
  - ¬ CORBA
  - ¬ SOAP/Web services
  - ¬ sFTP
  - ¬ SNMP
- Application support
  - ¬ MSC
  - ¬ GMLC
  - ¬ SMSC
  - ¬ SGSN
  - ¬ SCP
- IT-based hardware and middleware platform
  - ¬ ATCA blade technology and Linux operating system
  - ¬ MySQL
  - ¬ LDAP

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