

SGA-EIR

Equipment Identity Register

Core Network Essentials

SGA-EIR is AITIA's implementation of the EIR, an essential part of the GSM/UMTS architectures. It is a database mainly used for checking the IMEI (International Mobile Equipment Identity) of mobile equipment against various service requests. The unique identifier of each handset can statically or dynamically be classified by the operator into white, black and grey lists, and before specific service initiations the EIR is interrogated via SS7 or SIGTRAN to reveal the status of the particular handset.



Save and Protect

"The standard EIR functionality is to store information about the identity of mobile equipment to prevent calls from stolen, unauthorized or defective mobile stations." Moreover, SGA-EIR not only protects the network and its subscribers, but it also saves resources and money for the operator due to its minimal requirements of server room space as well as its customizable expenditure (CAPEX-OPEX) structure.

The EIR Functionality



SGA-EIR has various lists to maintain mobile equipment status. These follow the concept of black, gray and white lists. When the mobile handset activates, the MSC (or the SGSN) sends a Check IMEI request to the EIR, which screens its lists and reveals the handset's status (e.g., BlackListed), in turn. Beside this basic functionality, SGA-EIR is equipped with the common capabilities of a regular node in the GSM/UMTS core network.



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SGA-EIR provides full EIR functionality implemented in a highly reliable hardware and software architecture.

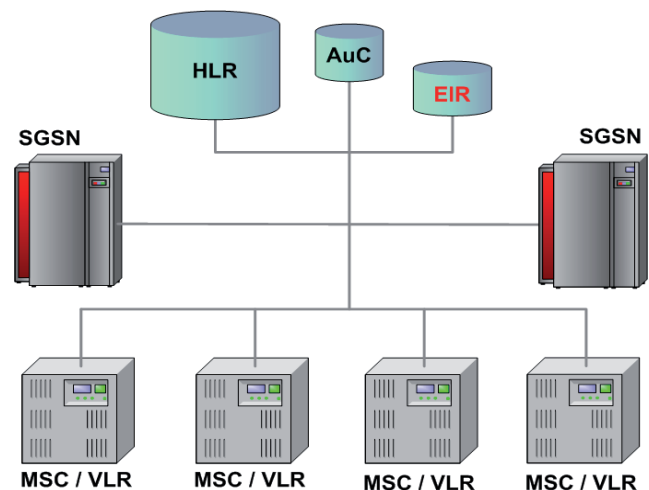
Main Features

- Various black/white/grey lists can be configured for different service purposes
- Lists can contain standalone IMEIs as well as IMEI ranges
- Standalone IMEI number and/or range can be deleted/inserted from/into a certain list
- Both 14- and 15-digit IMEIs are handled
- Full handling of Check IMEI functionality
- Configurable triggers for alarms
- Functionality-related and transaction-related logging and archiving
- Periodic IMEI Database backup
- Periodic reporting of transaction statistics. Separate statistics for hitting black, white and grey lists
- IMSI-dependent rules for screening the lists. Rules can be defined for IMSI-prefixes to determine the sequence for searching IMEIs in lists. A default rule could be the screening of a (certain) black list first, then a white list, and if the IMEI is listed nowhere, providing the result "unknown"
- For security and traceability purposes all subsystem communications and direct database / list interventions are checked and logged
- Custom-database is applied for 10x faster access than commercial DBs
- Central provisioning of clusters with load-sharing.

Capacity Considerations

- Ten different IMEI lists - including black, grey, white and "unknown"
- Altogether 50 million possible entries (IMEI ranges or standalone items) in the 10 IMEI lists

- 100 IMSI prefix rules to describe "IMSI prefix – IMEI" combinations
- Traffic capacity, SS7 on E1:
 - two bidirectional signaling links per card
 - each link handling 32 transactions/sec (calculating with 40% effective usage of a 64 kbps channel)
 - one signaling card: 64 transactions/sec altogether
- Maximum 4 cards in one machine (PC); scalable
- The SS7 limitations do not apply for SIGTRAN. There is no practical transaction speed-limit for the application itself.



Hardware and Software Configuration

A fully duplicated system requires two 19" industrial grade PCs, containing:

- redundant HDD (e.g., 160 GB SATA)
- redundant power supply
- passive motherboard with 6-10 slots to fit several SGA-47 cards
- active processor board
- processor: Intel Core2 Duo – or similar
- memory: 4 GB

For SS7 connections SGA-47 interface cards are required; SIGTRAN connections can be handled by any industrial grade Ethernet cards.



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