SGSN 3G UMTS Configuration

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SGSN 3G UMTS Configuration

This chapter outlines the basic deployment, configuration, and operation of the system to function as a Serving GPRS Support Node (SGSN) in 3G UMTS wireless data networks.

The simplest configuration that can be implemented on the system to support SGSN functionality in a 3G network requires one context but we recommend a minimum of two: one for the SGSN service (required) and another for the charging context.

The SGSN context facilitates the following:

- SGSN service configuration
- Mobile Application Part (MAP) configuration
- IuPS (Iu Packet Switched) interface configuration for communication with the RAN (Radio Access Network)
- DNS (Domain Naming System) Client configuration for resolution of APN domain names
- SGTP (SGSN GPRS Tunneling Protocol) configuration

The charging context facilitates the following:

- Configuration of connectivity to the CGF (Charging Gateway Function)

The following functionality is configured at the global system level:

- SCCP (Signalling Connection Control Part) network configuration
- SS7 (Signaling System 7) connectivity configuration
- GTT (Global Title Translation) configuration

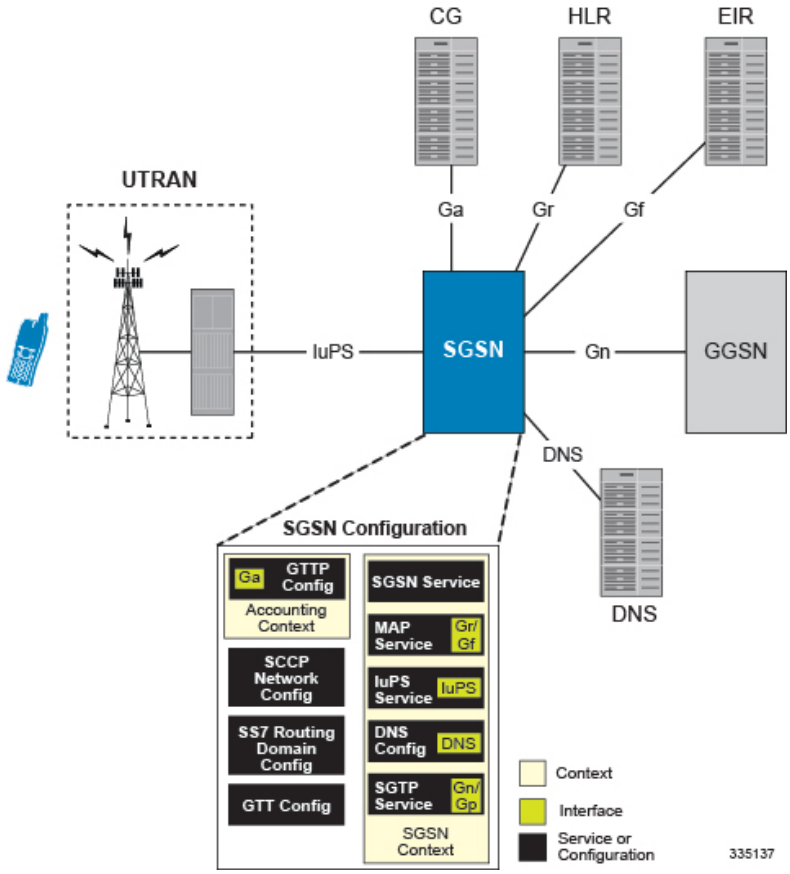
To simply configuration management, more contexts can be created and used and all context can be named as needed. The contexts listed above can be configured as illustrated in the figure on the next page.

Note With the SGSN, all configuration and created contexts, reside within the "local" or management context which is described in the *System Administration Guide*.

3G SGSN Configuration Components

In order to support 3G SGSN functionality, the system must be configured with at least one context for the SGSN (UMTS) service . In the example below, the required context has been named "SGSN_Ctx".

Figure 1: Sample 3G Network Configuration

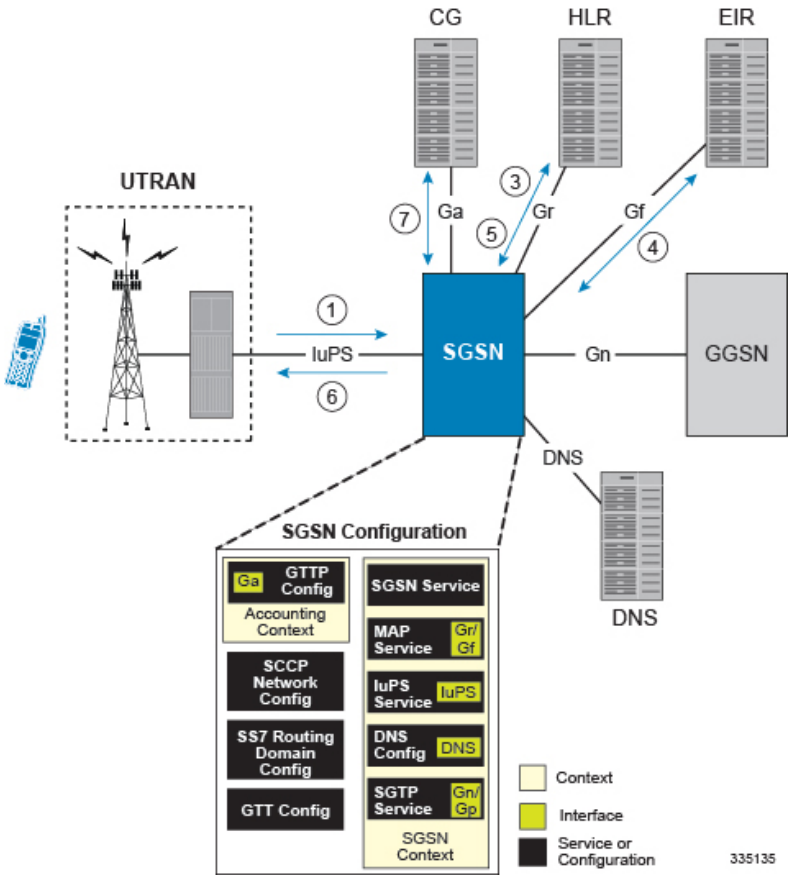


This configuration uses two contexts:

- SGSN Context containing:
  - Contains SGSN and related services
  - DNS Configuration
- Accounting Context containing:
  - GTPP configuration

For GPRS and/or IMSI Attach

Figure 2: GPRS/IMSI Attach Procedure



1. An Attach Request message is sent from the UE to the SGSN by the RNC over the IuPS interface.
2. The SGSN identifies UE and determines IMSI. Depending on whether or not the UE is already attached, this could be a simple database lookup or it could require the SGSN to communicate with an SGSN that may have been previously handling the call.
3. The SGSN communicates with the HLR to authenticate the UE.
4. Once the UE has been authenticated, the SGSN communicates with the EIR to verify that the equipment is not stolen.
5. Once equipment check is complete, the SGSN communicates with the HLR to update UE location information.
6. The SGSN then sends an Attach Complete message to UE.
7. SGSN begins sending M-CDR data to the CG.

Information Required for 3G Configuration

The following sections describe the minimum amount of information required to configure and make the SGSN operational on the network. To make the process more efficient, it is recommended that this information be available prior to configuring the system.

There are additional configuration parameters that are not described in this section. These parameters deal mostly with fine-tuning the operation of the SGSN in the network. Information on these parameters can be found in the appropriate sections of the Command Line Interface Reference.

Global Configuration

Table 1: Required Information for Global Configuration

Required Information	Description
SS7 Routing Domain to Support IP SS7 Signaling for SIGTRAN for the IuPS Interface	
SS7 Routing Domain ID	A unique ID number from 1 through 12 to identify the SS7 Routing Domain.
SS7 Routing Domain Variant	The network variant for the SS7 Routing Domain.
Sub Service Field	The Sub Service Field selector that this SS7 Routing Domain should use.
ASP Instance ID	A unique ID number from 1 through 4 to use for the M3UA ASP instance.
ASP Instance Endpoint	The IP address and port (if needed) of an interface that will be used as this ASP instance end point.
ASP Instance Endpoint Context	The name of the context in which the interface associated with this routing domain is configured
Peer Server ID	A unique ID number from 1 through 49 to use for the M3UA peer server configuration.
Peer Server Name	A name for the Peer Server configuration. Usually this is the name of the SS7 network entity that this instance is configured to communicate with. HLR, VLR, or EIR for example.
Peer Server Mode	The mode of operation for the peer server.
Routing Context ID	The ID of the M3UA routing context used to reach this peer server.
Self Point Code	The point code that the peer server will be routed to for its destination.
Peer Server Process (PSP) ID	A unique number from 1 through 4 used to identify each PSP process for the current peer server.
PSP Mode	Specify whether this peer server process will be used to communicate with the peer server in client or server mode.
Exchange Mode	Specify whether this peer server process will use double or single-ended mode for exchanges with the peer server.

Required Information	Description
SCTP End Point Address	A local SCTP end point address configured in an ASP instance that this peer server process will use. For the IuPS service, this is the address of the RNC.
ASP Association	The ID of a configured ASP instance that this peer server process will be associated with.
SS7 Routing Domain to Support IP SS7 Signaling for SIGTRAN for the Gr Interface	
SS7 Routing Domain ID	A unique ID number from 1 through 12 to identify the SS7 Routing Domain.
SS7 Routing Domain Variant	The network variant for the SS7 Routing Domain.
Sub Service Field	The Sub Service Field selector that this SS7 Routing Domain should use.
ASP Instance ID	A unique ID number from 1 through 4 to use for the M3UA ASP instance.
ASP Instance Endpoint	The IP address and Port (if needed) of an interface that will be used as this ASP instance end point.
ASP Instance Endpoint Context	The name of the context in which the interface associated with this routing domain is configured
Peer Server ID	A unique ID number from 1 through 49 to use for the M3UA peer server configuration.
Peer Server Name	A name for the Peer Server configuration. Usually this is the name of the SS7 network entity that this instance is configured to communicate with. HLR, VLR, or EIR for example.
Peer Server Mode	The mode of operation for the peer server.
Routing Context ID	The ID of the M3UA routing context used to reach this peer server.
Self Point Code	The point code that the peer server will be routed to for its destination.
Peer Server Process ID	A unique number from 1 through 4 used to identify each PSP process for the current peer server.
PSP Mode	Specify whether this peer server process will be used to communicate with the peer server in client or server mode.
Exchange Mode	Specify whether this peer server process will use double or single-ended mode for exchanges with the peer server.
SCTP End Point Address	A local SCTP end point address configured in an ASP instance that this peer server process will use. For the IuPS service, this is the address of the HLR.

Required Information	Description
ASP Association	The ID of a configured ASP instance that this peer server process will be associated with.
SCCP Network for the IuPS Interface	
SCCP Network ID	A unique number from 1 through 12 with which to identify the SCCP configuration.
SCCP Variant	The network variant for the SCCP network configuration.
Self Point Code	The point code that the system will use to identify itself when using this SCCP configuration.
SS7 Routing Domain Association	The ID number of the SS7 routing Domain with which to associate this SCCP network configuration.
SCCP Destination Point Code	The point code for the SCCP destination entity. For the IuPS interface, this is the RNC's point code
SCCP Destination Name	The name by which the SCCP destination will be known by the system
SCCP Destination Version	The SCCP variant.
SCCP Destination Subsystem Number	The subsystem number (SSN) of the SCCP destination.
SCCP Network for the Gr Interface	
SCCP Network ID	A unique number from 1 through 12 with which to identify the SCCP configuration.
SCCP Variant	The network variant for the SCCP network configuration.
Self Point Code	The point code that the system will use to identify itself when using this SCCP configuration.
SS7 Routing Domain Association	The ID number of the SS7 routing Domain with which to associate this SCCP network configuration.
SCCP Destination Point Code	The point code for the SCCP destination entity. For the IuPS interface, this is the RNC's point code
SCCP Destination Name	The name by which the SCCP destination will be known by the system
SCCP Destination Version	The SCCP variant.
SCCP Destination Subsystem Number	The subsystem number (SSN) of the SCCP destination.
Port Configuration	
Bind-to Interface Name	The name of the logical interface to bind the port to.
Bind-to Interface Context Name	The name of the context in which the logical interface is configured.

SGSN Context Configuration

Table 2: Required Information for SGSN Context Configuration

Required Information	Description
SGSN context name	An identification string from 1 to 79 characters (alpha and/or numeric) by which the SGSN context will be recognized by the system.
Logical Interface Name	The name by which the logical interface will be known by the system.
Logical Interface Addresses	IP addresses and subnets are assigned to the logical interface(s) which are then associated with physical ports.
MAP service Configuration	
MAP Service name	A unique name with which to identify an individual MAP service.
SCCP Network ID	The ID of the SCCP network configuration to use for SS7 connectivity for SCCP applications.
HLR IMSI Mapping	The IMSI prefixes for the HLR associated with this service.
HLR Point Code	The point code of the HLR to map to the IMSIs
Iu-PS Service	
IuPS Service Name	A unique name to identify the IuPS service.
SCCP Network ID	The ID of the SCCP network configuration to use for SS7 connectivity for SCCP applications.
GTPU Address	The address of an IP interface defined in the current context to use for GTPU connections to the RNC.
RNC ID	A unique ID number from 0 through 4095 for this RNC configuration and the MCC and MNC associated with the RNC.
RNC MCC	The mobile country code (MCC) associated with the RNC.
RNC MNC	The mobile network code (MNC) associated with RNC.
RNC Point Code	The SS7 point code for the specified RNC.
LAC ID	The location area code (LAC) ID associated with the RNC.
RAC ID	The routing area code (RAC) ID associated with the RNC.
SGTP Service	

Required Information	Description
SGTP Service Name	A unique alpha and /or numeric name for the SGTP service configuration.
GTP-C Address	An IP address that is associated with an interface in the current context. This is used for GTP-C over the Gn and/or Gp interface.
GTP-U Address	An IP address that is associated with an interface in the current context. This is used for GTP-U over the Gn and/or Gp interface.
SGSN Service	
SGSN Service Name	a unique name to identify this SGSN service.
Core Network ID	The core Network ID for this SGSN service to use to identify itself on the core network.
SGSN Number	The E.164 number to use to identify this SGSN.
MAP Service Name	The name of a MAP service that this SGSN service will use for MAP.
MAP Service Context	The context in which the MAP service is configured.
Maximum PDP Contexts	The maximum number of contexts each UE can establish at one time.
IuPS Service Name	The name of a configured IuPS service to use with the SGSN configuration. If the IuPS service is not in the same context, the context name of the IuPS service must also be specified.
IuPS Service Context	The context in which the IuPS service is configured.
SGTP Service Name	The name of the SGTP service that this SGSN service will use to for GTP.
SGTP Service Context	The context in which the SGTP service is configured.
Accounting Context Name	By default, the SGSN service looks for the GTPP accounting configuration in the same context as the SGSN service. If GTPP accounting is configured in a different context the context name must be specified.
DNS Client Configuration	
Name Server Addresses	The IP addresses of Domain Name Service (DNS) servers in the network.
DNS CLient Name	A unique name for the DNS client configured on the system.
DNS Client Address	The IP address of an Interface in the current context that the DNS is bound to.
DNS Client Port	The UDP port to use for DNS communications.

Accounting Context Configuration

Table 3: Required Information for Accounting Context Configuration

Required Information	Description
Accounting Context Name	An identification string from 1 to 79 characters (alpha and/or numeric) by which the context will be recognized by the system.
Ga Interface Name	The name by which the logical interface used as the Ga interface will be known by the system.
Ga Interface Address	The IP address and subnet for the Ga interface.
GTPP Charging	
GTTP Group Name	If you are going to configure GTTP accounting Server groups, you will need to name them.
Charging Agent Address	The IP address of an interface in the current context that to use for the Ga interface to communicate with the CGFs.
GTTP Server	The IP address and priority to use to contact the GTTP server.
GTTP Dictionary Name	The name of the GTTP dictionary to use.