



DATASHEET

SS7 (MAP, INAP, TCAP...)





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Introduction

Synway offers Signaling System 7 (SS7) software as part of its broad range of protocols, allowing users to directly connect switching, media processing and signaling platforms to a carrier's network—via TDM-based signaling transport. The SS7 protocols are suitable for worldwide deployment using Synway's SHD series (with MAP protocols) and UMCT series Integrated Multimedia Switch Platform, bringing together DSP-based functions and PSTN connectivity on a cost-effective single platform for both IP and TDM environments.

SS7 is the protocol that defines the procedures to transport and process database queries necessary for providing today's advanced intelligent network (AIN) features and services. SS7 is increasingly being used to bridge the PSTN with next-generation Internet Protocol (IP) and 3G Wireless networks, which enables seamless convergence and inter-working of PSTN and IP protocols within a unified architecture.

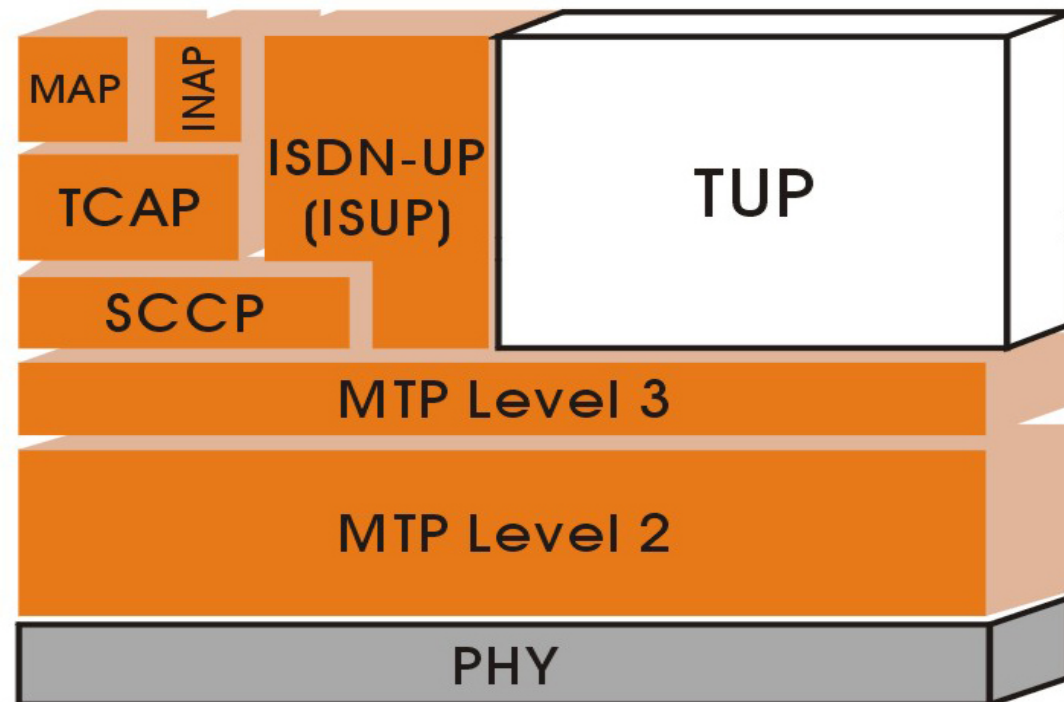
The SS7 packets combine to bring tremendous value for service providers and enterprise solution providers alike. A complete array of packets, including MTP1~3, ISUP, TCAP, SCCP, MAP and more, empower mobile solution providers to efficiently and rapidly deliver most value-added service and applications. The SS7 standard has been extended for multiple country-specific variations, such as ANSI in America and ETSI standard in Europe.

SS7

• Introduction



SS7 Stack Diagram

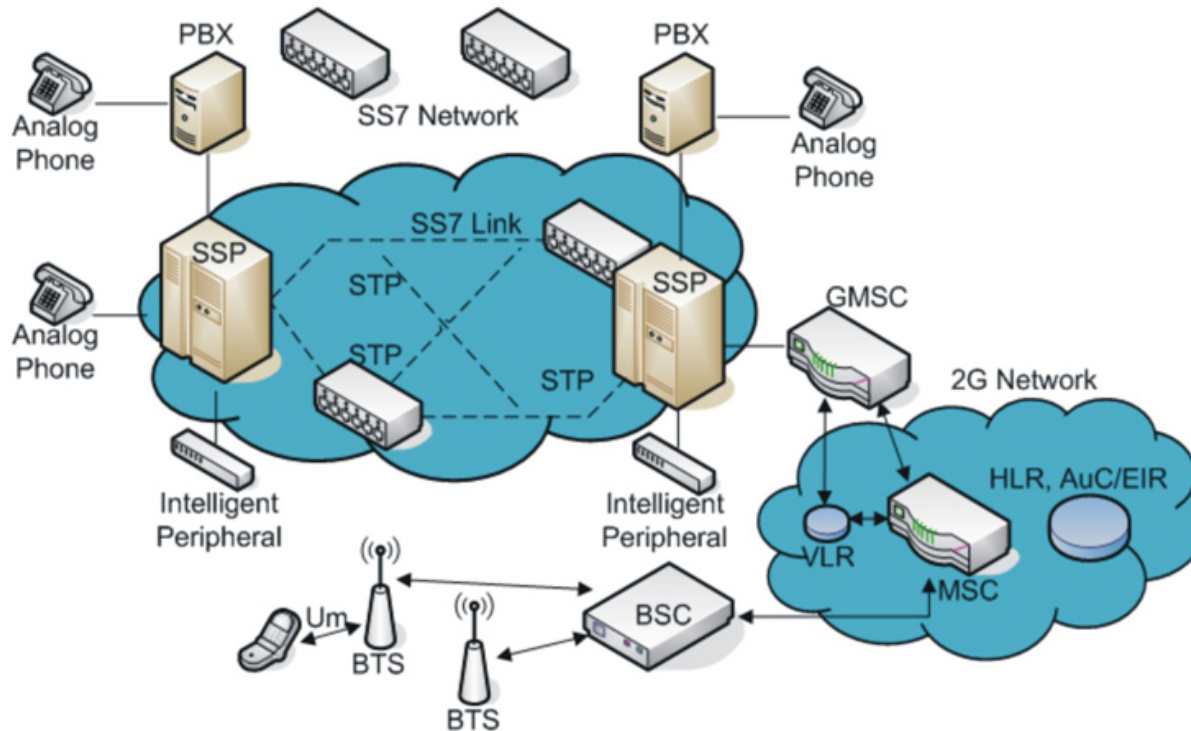


SS7

• Stack Diagram



SS7 Network Architecture



SS7

• Network Architecture

Synway SS7 Protocols

SS7 product line includes the following protocol layers:



Mobile Application Part (MAP)

- ❗ Used by the Mobile Switching Center (MSC), Serving GPRS Support Node (SGSN), and Gateway GPRS Support Node (GGSN) in wireless networks to query the Home Location Register (HLR) or Visitor Location Register (VLR) to determine and/or verify subscriber services



Intelligent Network Application Protocol (INAP) (Available while requested)

- ❗ Capability Set 1 (CS1), as defined by the ITU, ETSI, and the Generic Requirement (GR) standards of the Telcordia Advanced Intelligent Network (AIN)
- ❗ The interaction between the SSF, SCF, Specialized Resource Function (SRF), and the Service Data Function (SDF)



ISDN User Part (ISUP)

- ❗ The signaling protocol to establish, maintain and release circuit-switched network connections across an SS7 network; can act as originating, destination or intermediate exchange
- ❗ ITU-T, Telcordia (formally Bellcore), ANSI, Singapore, Q.767, ETSI, FTZ, Russia, Italy, NTT (Japan), and other variants

SS7

• Synway SS7 Protocols

Synway SS7 Protocols

SS7 product line includes the following protocol layers: (Continued)



MTP1

- ! Defines the physical and functional characteristics of the digital signaling link



MTP2

- ! Reliable transfer of signaling messages over signaling links
- ! ITU-T, ANSI, TTC (Japan), NTT (Japan), China, and other variants



MTP3

- ! Broadband and narrowband signaling traffic management, signaling link and route management
- ! Functionality as an SSP or STP
- ! ITU-T, ANSI, TTC (Japan), NTT (Japan), Singapore, China, B-ICI, and other variants

SS7

• Synway SS7 Protocols

Synway SS7 Protocols

SS7 product line includes the following protocol layers: (Continued)



Signaling Connection Control Part (SCCP)

- ❗ Connection-oriented and/or connection-less services (Class 0, 1, 2, and 3) for transferring data across an SS7 network
- ❗ ITU-T, ANSI, and China variants



Transaction Capabilities Application Part (TCAP)

- ❗ End-to-end, connectionless network service protocol between transaction capability users across an SS7 network
- ❗ An ASN.1 encoding/decoding engine to encode/decode all operation codes and dialog parameters
- ❗ ITU-T, ANSI, ETSI, and TTC (Japan) variants



Telephone User Part (TUP)

- ❗ Establishing, maintaining and releasing circuit-switched network connections across an SS7 network; can act as the originating, destination, or intermediate exchange
- ❗ ITU-T and China variants

SS7

• Synway SS7 Protocols



About MAP - GSM, GPRS, UMTS, 3G

The Global System or 3G for Mobile Communications (GSM) is a globally accepted standard for digital cellular communications. Mobile Application Part (MAP) – GSM/3G supports interactive mobile applications (e.g., cellular, paging, voice messaging) between the network entities in a GSM/3G system. These functional entities include Home Location Registers (HLRs), Visitor Location Registers (VLRs), Mobile Switching Centers (MSCs), SGSN Serving GPRS Support Node (SGSN) and so on.

Synway MAP – GSM/3G software enables telecom equipment manufacturers of soft switches, signaling gateways, signal transfer points, service control points, media gateway controllers or other products to:

- Accelerate time to market
- Reduce development costs
- Reduce project risk of internally developed MAP – GSM applications

Product deliverables consist of C source software, documentation, training, a warranty and technical support.

SS7

• MAP-GSM, GPRS, UMTS, 3G

Features & Benefits

- Supports ASN.1 Encoding/Decoding of all the standard operations-related messages exchanged in the MAP interfaces, like C, D, and E, and so on. These MAP messages are exchanged to provide CAMEL services, GPRS network services and 3G network services.
- Enables dialogue establishment and release procedures.
- Provides remote operation invocation procedures.
- Securely transports MAP messages as defined by the MAP security protocol (MAPSec).
- Supports SCCP release for the ITU/ANSI 96 specifications.
- Runs over SS7 or TCP/IP by using either the Synway SS7 stack or TCAP over TCP/IP (SR-3389) software.
- Segmentation mechanism, as explained, in the MAP protocol machine (PM) for user-specific operation responses.
- Audit of dialogues. In systems where there is a possibility of the MAP-GSM application and the MAP-GSM protocol going out of synch, the stack manager can issue a control request MAP-GSM asking it to delete the dialogues and invokes older than the specified time period.
- Operate in a distributed fault tolerance environment. Note, MAP-GSM can only operate as a Fault Tolerant layer.
- Rolling Upgrade compliance, which support the Rolling Upgrade feature.

SS7

- Features & Benefits



APPLICATIONS & SERVICES SUPPORTED

- Location management services
- Handover management services
- Authentication management services
- Subscriber management services
- Short Message Service (SMS) management services
- Network-requested PDP context activation services
- Location service management services
- IMEI (International Mobile Equipment Identities) management services
- Fault recovery management services
- Operation and maintenance services
- Call handling services
- Supplementary services



PRODUCT INTERWORKING

The MAP– GSM/3G product can be used with Synway TCAP, TCAP over TCP/IP, MTSS – Windows NT and MTSS – Solaris software products. For American networks, the MAP – GSM product can be used in hybrid stacks with the ITU-TCAP and ANSI-SCCP software products.



Synway MAP–GSM/3G software conforms to:

- GSM 29.002, Phase 2+ Specification, for 3G networks (Release-7)
- GSM 29.002, Phase 2+ Specification, for 3G networks (Release-6)
- GSM 29.002 Phase 2+ Specification for 3G networks (Release-5)
- GSM 29.002 Phase 2+ Specification for 3G networks (Release-4)
- GSM 29.002 Phase 2+ Specification for 3G networks (Release-99)
- GSM 09.02 Phase 2+ Specification for 2G networks (Release-98)
- GSM 09.02 Phase 2+ Specification for 2G networks (Release-97)
- GSM 09.02 Phase 1 and 2 Specifications
- GSM 33.200 for Network Domain Security (Release-6)
- GSM 33.200 for Network Domain Security (Release-5)
- GSM 33.200 for Network Domain Security (Release-4)

Refer to the Mobile Application Part – GSM Functional Specification for a implementation.

SS7

- Applications & Services
- Product Interworking
- Conformance



About Synway

Synway specializes in providing superior Media Processing & Signaling Technologies, Telephony Hardware and Integrated Multimedia Switch in use for convergence (voice/data/video) communications. Since 1995, over 1000 software developers and system integrators have integrated Synway's offerings to deliver a broad range of TDM and VoIP-based applications, including unified communications, call center, mobile VAS, media gateway, fax, conferencing, call recording, Asterisk-based open source applications for operators and enterprises worldwide.

Having continued to optimize and expand its product portfolios to cater to various needs, Synway has consolidated its position as a leading vendor in international market for its widest range of portfolios: IP&TDM board & new-generation integrated multimedia switch platform for SP developers, Asterisk-based hardware & appliances for IP-PBX and gateway applications, and the most diverse hardware options for passive call recording (logging) applications in IP and TDM network. With 200 teammates, Synway makes all efforts to deliver quality support and service to help clients deliver a variety of customizable, high-performance and cost effective solutions.

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