Synway®

Develop robust, scalable and high-performance VAS platform based upon Synway SS7 signaling and media processing products

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Summary

This application note is intended to provide information about how the Synway SS7 signaling and media products help VAS developer build a range of cost-effective, high-performance mobile VAS services and applications. Synway tries to provide all details, including the special features and benefits which Synway SS7 Signaling and media products bring about.

Table of Contents

Introduction

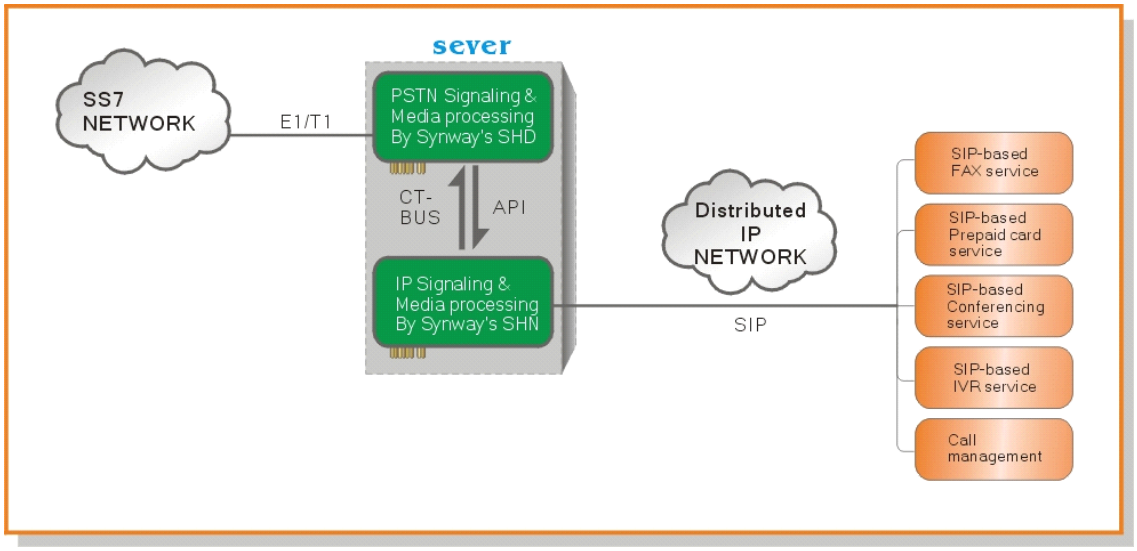
Synway PSTN architecture, SHD series combines media processing and SS7 packets (other signaling protocols available). BUILT-IN SS7 CAPABILITY, NOT INDEPENDENT SS7 SERVER, is an integrated part of Synway's proven, cost effective PSTN series, and can implement high-capacity (96 SS7 links), high-density (up to 128E1 or 3840 resource channels per system) solutions. Using together with Synway's IP media processing products, service providers and applications developers can connect SIP-based service to SS7 network, and deliver high capacity, high performance, cost effective SS7/SIP functionalities in single box.

When deployed for SS7 to SIP interconnection, Synway's hardware platform with built-in SS7 capability delivers most signaling protocol variants otherwise available only by using a separate signaling server. Synway's SS7 technology enable developers and service providers to cost effectively offer high-performance conferencing, prepaid card service, SMS, CRBT and more value-added services.

A free value-added signaling technology, on-board built-in SS7 signaling capability eliminates the need for independent SS7 server and specific SS7 components, immensely lowers ownership cost and simplifies system complexity for large-scale call center solution providers, telecom equipment provider (TEP) and carriers.

All SS7 packets, including MTP1~3, TUP, ISUP, SCCP and TCAP and IN protocols (GSM-MAP and INAP), originate from in-house development and high-performance field applications, and can be optimized for high-capacity, high performance Telco applications.

In addition, Synway's maximum value customization support can deliver customized features and embed an array of special resources, such as fax and conferencing for TEP and call center equipment providers. Synway's highly adaptive, high performance SS7 signaling technologies have been approved by operators and carriers from China, USA, India, Singapore, Pakistan, Canada and more.



Basic introduction of Synway built-in SS7 protocols

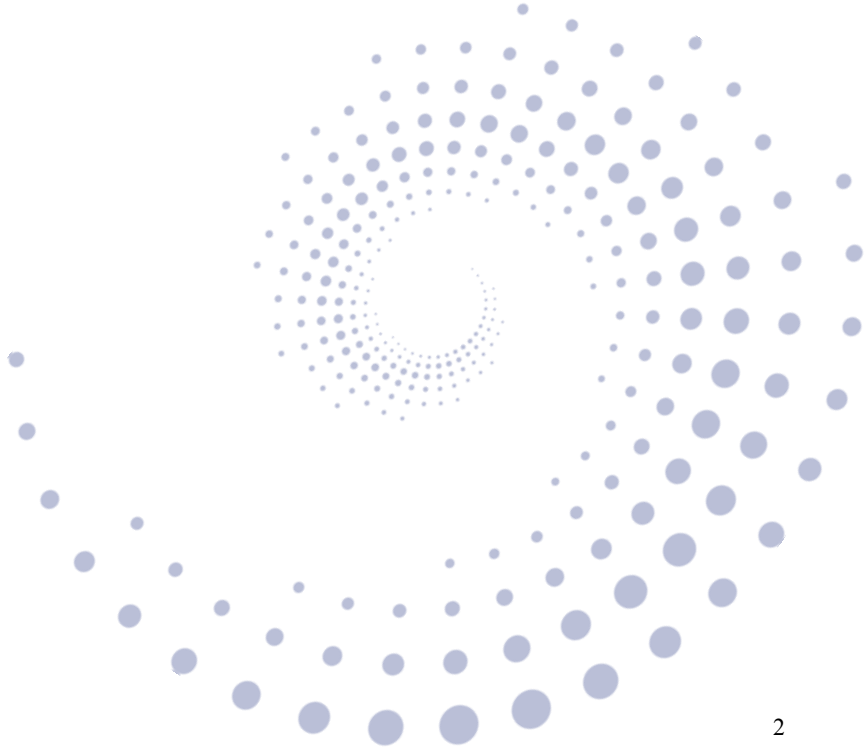
Synway offers Signaling System Number 7 (SS7) software as part of its broad range of protocols, allowing users to directly connect switching, media processing and signaling platforms to a carrier's network – via TDM-based signaling transport. The SS7 protocols are suitable for worldwide deployment using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

These choices combine to bring tremendous value for service providers and enterprise solution providers alike. Most SS7 packets, including MTP1~3, TUP, ISUP, TCAP and SCCP, are complimentary and cost free for users.

Typical applications with Synway SS7 software

The implementation of Synway SS7 signaling protocol software is intended to assist mobile VAS developers designing solutions for public telephony networks. These may range from CRBT, signaling gateways, and short messaging applications, to prepaid platforms and other added value, revenue generating services.

Many applications also require media processing resources, such as fax, conferencing, record, playback, DTMF handling and echo cancellation. These functions are available with Synway SHD series and UMCT^{TM} (multimedia switching) platforms, which can be combined with SS7 on a single board to deliver powerful, cost-effective, computer-based solutions. Together, these benefits allow operators to offer their customers new, more advanced services at competitive prices.



Primary features of Synway SS7 protocols

- Fully integrated with Synway call control API – using any Synway boards fitted with an E1/T1/J1 interface or switch platform UMCT™
- A single board TDM solution, combining SS7 signaling and media processing resources, on any form factor
- SS7 protocol support for MTP1~3, TUP, ISUP, SCCP and TCAP, with GSM-MAP API
- Built-in support for China, ITU-T, ANSI, ETSI and other variants
- Easily customized for other variants, software configurable.
- Dual resilient MTP3 for high availability and reliability.
- MSU messages can be distributed across multiple (unrestricted) platforms to share call and messaging load and for added scalability
- Management API for control of signaling links and bearer circuits

Product benefits of Synway SS7 signaling

- Flexibility to meet diverse requirements through choosing and mixing the best platforms and most suitable form factors for optimum price performance and time to market
- Flexibility to meet worldwide signaling requirements over TDM or hybrid TDM/IP transport environments as needed
- Cost-effective, high performance signaling protocol software providing essential redundancy, load sharing and high availability features
- Development investment protection – the same API regardless of underlying transport method
- Proven deployments – Synway SS7 signaling software has been deployed in more than 20 countries, 30plus carriers' networks
- No dependence on expensive 3rd party APIs and toolkits for e.g. GSM-MAP or INAP
- Scalable, high density intercept, monitoring and call recording solutions can be readily developed for many application scenarios

SS7 Protocol support

Synway SS7 software supports, MTP1, MTP2, MTP3, TUP, ISUP protocol procedures. SCCP, TCAP, MAP and INAP protocols are licensed available.

SS7 Signaling capacities

Connection to a TDM network is supported by any SHD board fitted with an optional primary rate trunk interface, which carries user-defined 64kbit/s or 2Mbit/s timeslots for signaling links. Timeslots that are not used for signaling are available as voice/data bearer circuits, thereby leading to maximum cost efficiency. SHD signaling board variants using PMXC modules can support up to 96 signaling links, which can be freely allocated over the trunks on the SHD board or UMCT™ multimedia switch.

Signaling scalability and resilience

Signaling links can operate in fully associated signaling mode (F-links) or quasi-associated mode and form one or more link sets. Signaling links within the same link set can reside on more than one Synway board within a system, ensuring that a single board level failure does not cause a loss of signaling connectivity to the SS7 network. Because of this, the product can be connected to one or more service switching points (SSPs) or one or more signal transfer points (STPs) in the network and resilience is achieved. Different SPs, appear as a single network or local nodes. As well, a single link set can be split. The dual redundant architecture applies equally to M3UA configurations, with signaling associations established via SCTP to adjacent network nodes from each host. The dual M3UA hosts provide the same high level of resilience expected of traditional SS7 network connections with the advantages of greater bandwidth and reduced transport costs.

Configuration options

The SS7 signaling monitor software can be used with any Synway SHD series boards and UMCT™ multimedia switch platform. Configurations are available to enable the dynamic capture and monitoring of signaling information in up to 64 bi-directional links, carried within up to 16 software selectable E1/T1/J1 trunks, per board, and 128 software selectable E1/T1/J1 ports per switch platform. Usefully, protocol variants (e.g., ITU-T, ANSI, China) are configurable on a per link basis, and traffic from multiple signaling links can be merged into a single TCP/IP connection to an application. Multiple boards can be used for distributed, scalable, high density traffic monitoring, filtering, analysis and recording systems.

Capture and decode

Three capture modes are provided; the non-invasive mode requires a high impedance line tap for passive interception of signaling traffic on E1/T1/J1 trunks, the active pass through mode provides a cost effective alternative, and a local traffic mode allows the capture of data from a co-existing signaling application. Three decode levels are also presented and the developer has the option of adding user defined decoders. Choosing raw HDLC presents Level 2 MSU data directly to an application with no MTP3 or user part decode. An auto-decode buffers the MTP3 payload, and can be set for all traffic, or for explicit decode of selected messages. And the ISUP decoder presents ISUP message data to the application, either automatically, or via API control. A powerful search and filter capability can be used to specify which messages an application needs to capture from within each monitored traffic stream.

Multi-threaded applications

The Synway API includes supporting software that enables easy construction of multithreaded applications, with mechanisms that automatically manage thread pools and route protocol traffic to individual threads for processing. In addition, many of the system facilities required for a multi-threaded application that are normally operating system specific, such as threads libraries, are presented in an operating system independent interface. This makes for easier portability of applications between platforms.

Protocol standards (upgraded)

Synway is continually expanding its coverage of SS7 protocol standards and country-specific variants. In addition to general market requirements, a request for change process is used to manage customer priorities for modifications to functionality. Contact Synway for more information about protocol development plans and individual feature requests.

Special API support

With Synway consistent approach to APIs, on a per call/transaction basis, the user has access to and control of many of the MTP1, MTP2, MTP3, TUP, ISUP or TCAP protocol parameters. The ISUP API also provides a lower level of access to message parameters. For power users requiring more complex control, direct access to raw data ISUP parameters, through ‘flexible ISUP' extensions to the generic call control API, is provided.

SS7 Signaling monitor API

The SS7 signaling monitor API can be used to produce sophisticated monitoring and data capture applications for use in SS7 networks. The API provides developers with a powerful means of creating a variety of critical applications to increase ARPU, improve customer satisfaction and meet lawful intercept obligations.

SS7 signaling can be monitored to detect call placement and/or service or feature interaction, and to determine parameters such as caller ID (CLI/ANI), circuit identification code (CIC), dialed number, point code (DPC/OPC), redirection number, and time stamp information. This is particularly important for mobile calls, which are substantially more difficult to tap into than fixed networks, because usage could be anywhere where the home operator and its roaming partners provide service. The SS7 signaling monitor also assists in call surveillance, and results in decoded and filtered message data being extracted by an application to trigger local recording (fully associated signaling) or remote recording (quasi-associated/mobile calls) of calls when filtering criteria has been met. The media processing resources on Synway SHD series and UMCT™ multimedia switch can be used to record such calls. Importantly, this enables lawful intercept requirements for capture of both signaling data and call content to be met.

Maintenance API

An SS7 maintenance API provides user functions for the activation and deactivation of any configured link and the maintenance block/unblock of configured circuits, in addition to retrieval of essential state information from all configured hosts.

Evaluate now

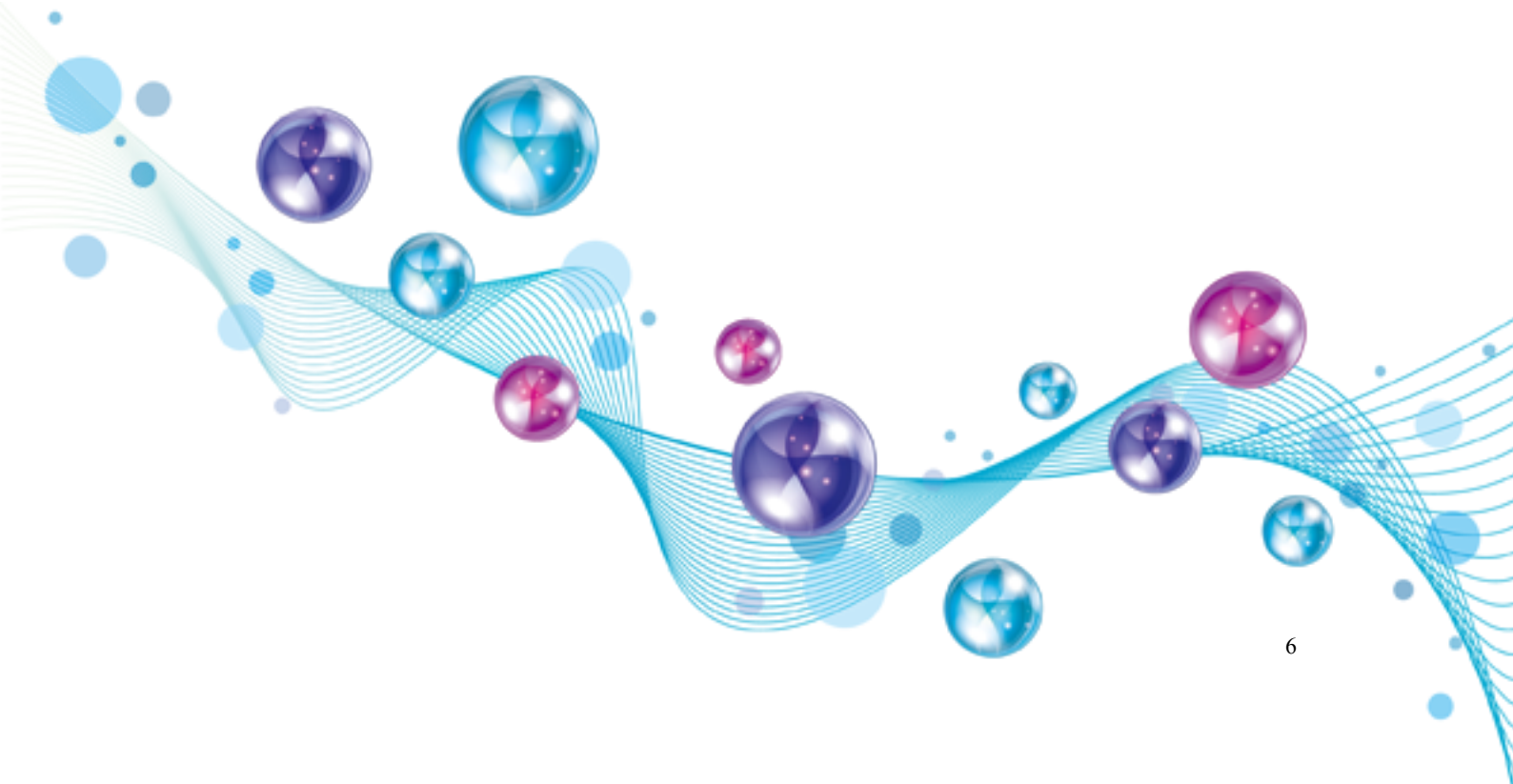
All SS7 related user and API guides are freely available to download from Synway website at any time. All documentation, including a useful SS7 developer's guide, can be viewed from the technical documents pages. For obtain more details, please contact Synway technical support engineers.

With the exception of MAP/TCAP/SCCP, which is licensed, all protocols, including any other SS7 packets, are readily available from Synway driver. Developers can simply collect the protocol firmware, free of charge, when they need it, gaining a distinct advantage in terms of system cost and value per channel.

Synway products with SS7 capacity

Synway's SHD series is the flexible TDM boards, available from single port to 16ports per slot, E1/T1/J1 software selectable. And hybrid protocol processing is available when multiple signaling applications are required in single board, any of CAS, ISDN, SS7, R2MF or mixed protocols (simultaneously optional). For details, please refer to link: http://www.synway.net/Products/index_xx.aspx?id=63

Synway UMCT™ integrated multimedia switch platforms are open programmable platforms with integrated multimedia processing and signaling capabilities. In addition to rich media resources, the switch platforms help bridge existing wired and wireless networks with IP networks, and integrate for IP (SIP)/TDM (SS7/ISDN/CAS)/mobility protocols with IVR, fax, conferencing, compression, echo cancellation and other media processing resources. The applications which can be deployed with UMCT™ include call center, IVR, unified messaging, fax, conferencing, SMS, CRBT, video in enterprise and service provider networks. Each can scale up to 1920(from 120) voice processing channels(TDM), or 120 1080(from 120) IP voice channels. For details, please refer to link: http://www.synway.net/Products/class.aspx?tid=30



About Synway

Synway specializes in providing superior media processing & signaling technologies as well as high-performance CTI components in use for convergence (voice/data/video) communications for CTI software developers and system integrators worldwide. With decades of expertise in voice communications, Synway's offerings, including its robust, versatile CTI hardware and platforms, are applied to design a broad range of TDM or VoIP-based applications and services, such as unified communications, call center, Telco value-added services(SMS/CRBT/DIALING), media gateway, signaling, fax, conferencing, passive call recording, open source applications and more.

For two decades, Synway has consolidated its position as a leading hardware and platform vendor in international market. Having been working with thousands of partners over time across the world, Synway has achieved the robust portfolios for passive call recording applications in call center and financial institutes: the most diverse product ranges, greatest scalability, greatest compliance with multi-protocols and multi-networks and the most installations worldwide. For Asterisk open-source applications, Synway leverages its patent-owned DSP expertise for data processing, echo cancellation and transcoding, helping solution providers create high-scalability, cost effective, flexible, user-friendly systems.

For more information, please visit us at http://www.synway.net or contact us.

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