WORLD TELECOM LABS

Changing the Way the World Communicates

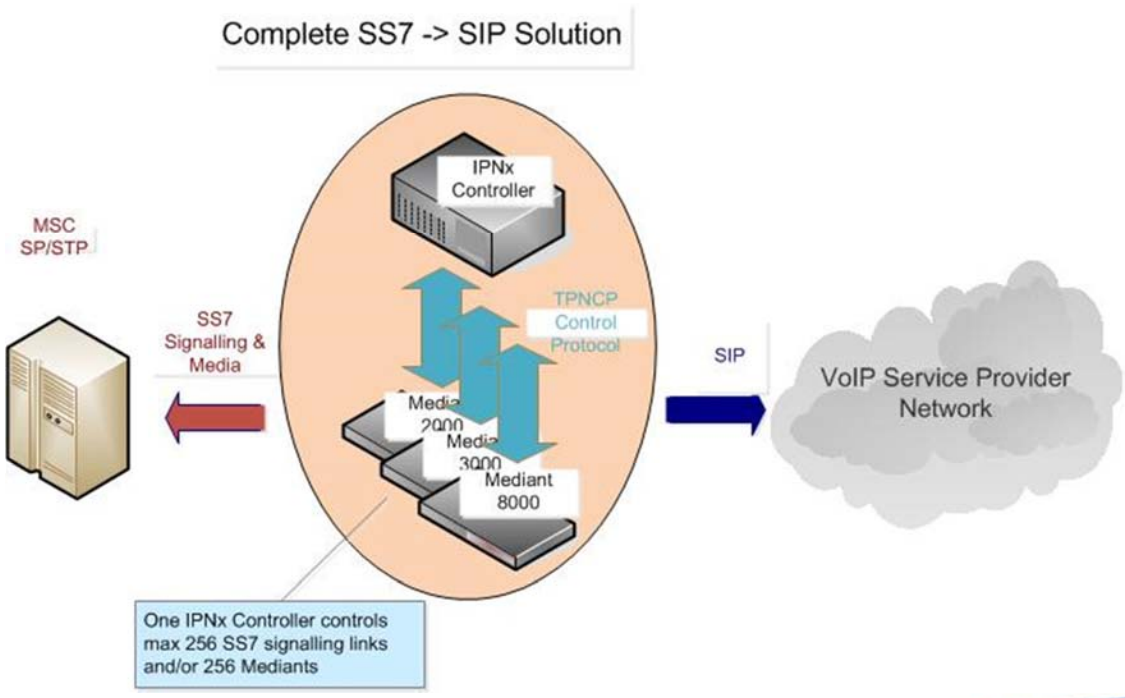
IPNx STM-1 Gateway & Switch: High Capacity, Highest Performance

The WTL IPNx Controller is a Media Gateway Controller (MGC) capable of switching many 1000s of calls from multiple STM-1 optical interfaces. It is also a Signalling Gateway translating SS7 ISUP signalling to SIP.
The architecture consists of a single or redundant pair of IPNx Controller servers acting as a SS7 to SS7 TDM switch and/or SS7 to SIP signaling converter and MGC for one or many Mediant media gateways (MG). The MG handles the physical connections to the E1 or STM-1 links and converts from TDM to VoIP. In this design, the Mediant is totally under the control of the IPNx Controller for all configuration, routing, authentication and other functions.
The MG interfaces with legacy TDM equipment over E1s or STM-1 passing any SS7 signalling messages received to the IPNx. The IPNx interprets this signalling and uses it to control PCM and RTP media on one or more MGs. This also allows the IPNx to act as a signalling gateway for external application servers supporting Sigtran M3UA.

The IPNx + MG solution complements SIP-based NGN solutions and seamlessly integrates with any SS7 network.

WTL STM-1 Switching Architecture

The IPNx Controller is a 2U rack mounted device. One box can support SS7 signalling translation for up to 256 SS7 Signalling Link Sets on up to 8 Media Gateways.



The IPNx runs WTL's robust, powerful signalling and switching software and uses the Solaris Operating System. It supports many SS7 ISUP variants and network topologies and has been approved by many leading national operators for use in their networks. For mobile applications MAP signalling is available as is an integrated SMSC. Multiple routing rules can be configured to support various fallback features.
The IPNx + MG operates as follows: SS7 up to MTP2 layer is terminated on the MG which acts as the signaling gateway, and sends all MTP3 payload to IPNx over Sigtran M2UA. IPNx acts as MGC processing all MTP3 messages and converting ISUP messages to SIP call control messages. IPNx controls media using the AudioCodes TPNCP protocol.
Numerous useful extra features are included in the IPNx: LNP (Local Number Portability), Emergency Number support, load balancing, ratio-based routing, RADIUS AAA and many others.

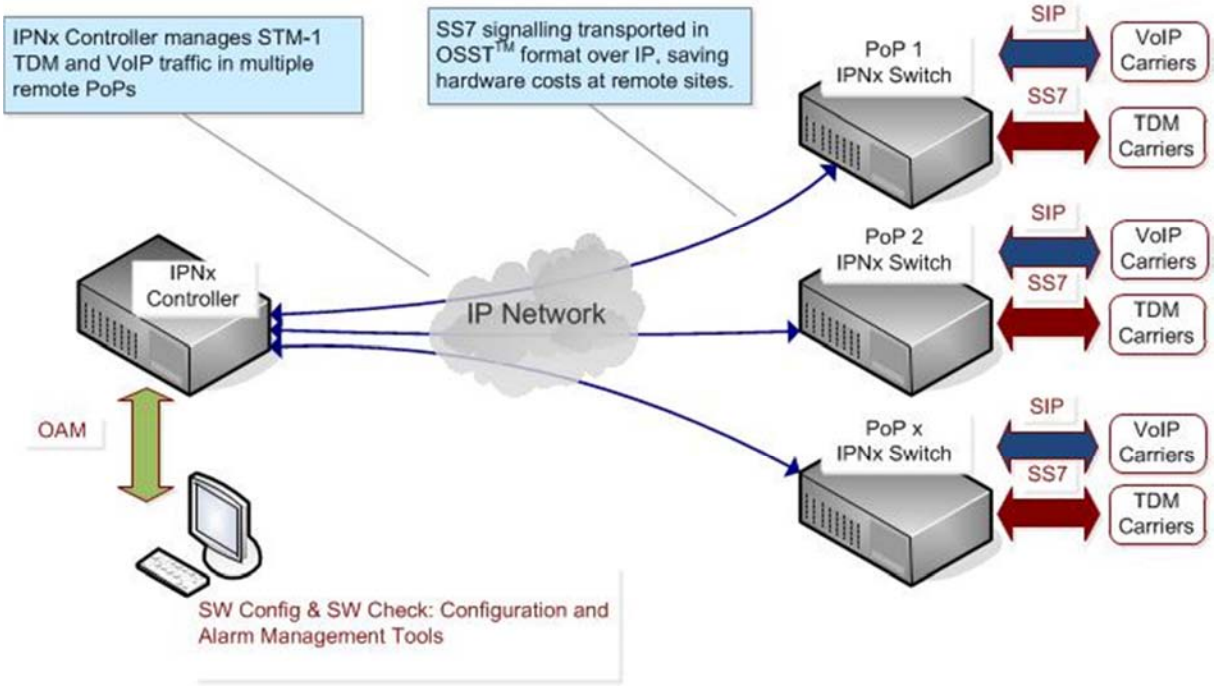


Figure 2: Distributed, Optimised, Multi-Protocol Switch

Carrier Grade Reliability & Performance

The huge amount of traffic that may be carried by the IPNx STM-1 gateways means that there is a need for redundancy to be included in the network design.

Both elements of the solution; the MGC and the MG can be offered in a High Availability (HA) mode.

High Availability (HA) operation means that 2 MGCs can work in an active/passive configuration where the standby MGC is available to take over the control of the remote gateway in case of failure. The HA feature is based on the well-known Linux "Heartbeat" framework. Heartbeat is based upon a

robust ping mechanism that detects failures and, based on the results of this, decides which server should be active. It then stops and starts resources on the servers accordingly. Heartbeat guarantees that no resource will be running on both servers at the same time and strictly manages the start and stop actions of each resource.

Key Features:

MEDIA GATEWAY CONTROLLER

- ✓ VoIP Protocols: SIP, SIP-I, H323
- ✓ Configurable mapping of ISUP Cause codes to SIP return codes
- ✓ Class 4 routing
- ✓ Multiple national SS7/ISUP support
- ✓ Origin, prefix and time based routing
- ✓ Powerful route selection policies

MANIPULATION SCRIPTS

- ✓ SS7 ISUP message manipulation
- ✓ Modify information elements in SS7 messages
- ✓ Number manipulation for incoming (pre-routing) and outgoing (post-routing) trunks

CARRIER GRADE PLATFORM

- ✓ High availability architecture - 99.99% availability
- ✓ Billing
- ✓ CDR generation or RADIUS interface support
- ✓ Total Remote Management
- ✓ SS7 Redundancy at multiple levels
- ✓ IP separation (by media, control protocol, and OAM)
- ✓ CDRs generated for successful and unsuccessful calls
- ✓ Web based EMS

DESIGNED FOR HEAVY TRAFFIC:

- ✓ CPS (calls per second): 200 per IPNx
- ✓ BHCA: 720,000 per IPNx
- ✓ MSUs (Message Signal Units) per sec: 8,000
- ✓ Maximum Timeslots: 6048 / 3 STM-1 per IPNx
- ✓ SS7 link sets per STM1: Up to 32
- ✓ SS7 link sets per IPNx: Up to 256
- ✓ DPC (Destination Point Codes): 32
- ✓ LPC (Local Point Codes): 2