APS: M2PA

adax
Legacy to LTE

MTP-2 Peer-to-Peer Adaptation Layer for SS7 over IP

Overview

M2PA is one of the many products in the Adax Protocol Software (APS) SIGTRAN suite that has been designed for Convergence, Wireless and Intelligent Networks. M2PA is designed to transport SS7 MTP-3 signaling messages over IP using the services of Stream Control Transmission Protocol (SCTP) to build next generation SS7 networks over IP. The immediate benefits of this is that current upper layer SS7 applications can run on new high-speed IP signaling networks without software change, maximizing performance of the solution without increasing costs and protecting the investment in the application.

Traditionally SS7 traffic is carried over MTP-2 64kbps links and is a worldwide standard for reliability in PSTN signaling but in the continual search for cost savings operators are looking to move from circuit switched to packet based networks and an IP infrastructure. Using Adax M2PA enables higher densities and efficiencies of SS7 transmission, while still preserving reliability and compatibility.

M2PA has many applications, and together with the other SIGTRAN protocols, can be used as a building block in a Softswitch, Signaling Gateway or Media Gateway Controller in the VoIP domain.

Quality and Reliability of Service

The future of Intelligent Networks is IP and SIGTRAN combined with SS7. As most operators face increased signaling demand, M2PA coupled with SCTP can meet the required demands while preserving the investments in SS7 upper layer applications. M2PA delivers optimum utilization of high-bandwidth data links and is backward compatible with legacy MTP-3 software running over the Adax SS7 board and driver.

The Adax M2PA module creates high-speed links for SS7 when it is used with the Adax ATM and HDC series of boards. It does this by supporting both SIGTRAN and SS7 signaling over IP at T1/E1, Ethernet and OC3/STM1 data rates, providing a highly reliable transmission service to the signaling layer above it.

MTP-2 is only defined for 56/64 kbps signaling links, however M2PA is compatible with MTP-B, the broadband definition for SS7. The immediate result of this is that current upper layer SS7 applications can run on new high speed IP signaling networks without software change, maximizing performance of the solution without increasing costs and protecting the investment in the application.

Using Adax M2PA enables higher densities and efficiencies of SS7 transmission, while still preserving reliability and compatibility.

Performance Benefits

M2PA provides complete level 2 data communication control for transmission on T1/E1, Ethernet or ATM based SS7 conforming to the ITU and ANSI broadband SS7 standards including:

- Signal unit formatting into ATM cells (AAL5), Ethernet, HDLC or T1/E1;

- Enhanced and efficient error recovery as provided by SCTP/T;

- Selective re-transmission of rejected Protocol Data Units;

- Error monitoring;

- Sequence number control (uses very large sequence numbers);

- Link status control;

- Monitoring of the underlying ATM or IP link.

M2PA and SCTP are independent parts of the SIGTRAN suite. SCTP provides the signaling transport mechanism and M2PA is an adaptation sub-layer that supports specific primitives such as management indications, required by a particular signaling application protocol. Together they form the equivalent of the MTP-2 layer protocol in an ATM, Ethernet, HDLC or IP environment. M2PA supports a common interface like the User Network Interface (Q.703). For users and developers, this means that the M2PA interfaces to MTP-3, the management and control functions, and the Intelligent Network applications all conform to current industry standards.

Adax M2PA is designed to be modular and interoperate with other SIGTRAN solutions for MTP-2 tunneling, M2UA and M3UA. This means that you can build a server from a single card up to a multi-port rack for the most demanding telecommunications applications, running combinations of Frame Relay, X.25, SS7/MTP-2 and SS7/ATM simultaneously. M2PA, MTP-3, MTP-2 tunneling and media gateway solutions can be combined in the same system to produce a seamless solution for SS7 and VoIP with advanced data services.

Application Areas

M2PA is used between SS7 Signaling Points employing the MTP-3 protocol and uses an IP network to connect the two SS7 points. This type of SS7 node equipped with an IP network connection is called an IP Signaling Point or IPSP. The IPSP functions as a traditional SS7 node, using the IP Network instead of SS7 links. SS7 Signaling Points may also employ standard SS7 links using the SS7 MTP-2 to provide transport of MTP-3 signaling messages.

Typical application areas for M2PA include:

SS7 offload

Communication between two Signaling End Points (SEP) nodes can be set up via two Signaling Gateways (SG). The SEPs are connected to two different SGs via SS7 interface. The SGs are connected to each other via SIGTRAN (M2PA + SCTP) and act as Signaling Transfer Points (STP) nodes. Signaling messages from the two SEP's are passed via the two SG's. This type of application is termed as SS7 offload – SS7 traffic is off-loaded over an IP network in this case the Signaling Gateways using M2PA.

IP based Signaling Points

In this case Signaling Points are connected to each other using an IP network. These IP based signaling points (IPSP) use M2PA links instead of MTP-2 links. These IPSPs can also connect to signaling points in SS7 networks, via an M2PA based signaling gateway.

Signaling Gateways

The Signaling Gateway (SG) is an IPSP equipped with both traditional SS7 and IP network connections. In effect, the SG acts as a Signaling Transfer Point (STP). The M2PA/SCTP/IP stack can be used in place of an SS7 MTP-2/MTP1 stack.

API

M2PA supports a comprehensive API based on standard MTP-2 and SSCF/SSCOP (broadband SS7) commands as defined in Q.2140/Q.2110 and Q.703 of ITU for layer 2 SS7.

- The user API for M2PA is implemented within the standard Unix DLPI.

- The user API for M2PA is similar to, and consistent with, the Adax API for traditional SS7 signaling offerings.

- The API is common to all User Adaptation (UA) interfaces such as M3UA and M2UA.

Standards

- IETF RFC4165 - SS7 MTP-2-User Peer-to-Peer Adaptation Layer - 6-13

Operating System Support and Adax Protocol Controllers

M2PA is available for Linux and Solaris Operating Systems. Other OS support on request.

All Adax products are available for PCI, PCIe, Low Profile PCIe (LPe), PCIe EM, PMC and AMC architectures.

Adax Software

M2PA is just one of the many products in the Adax Protocol Software (APS) SIGTRAN suite that has been designed for Convergence, Wireless and Intelligent Networks.

Other Adax SIGTRAN products include M3UA, M2UA, SCTP, and Signaling Gateways. Adax Protocol Software (APS) is designed to provide the customer with the greatest benefit to their application and from each Adax hardware product.

The Adax software provides the user with a set of common APIs that enables integration of business applications and upper layers with Adax signaling infrastructure.

Fastest Time to Market

Adax provides extremely fast time to market through simplicity of design and a modular product range. The common software interface ensures a simple migration path and provides a flexible and portable solution. The API's between products remain the same preserving the investment in the higher layer software and applications. This compatibility enables quick upgrades to next generation requirements and easy field upgrades to expand the capabilities of installed systems.

Adax is an industry leader in high performance packet processing, security and network infrastructure for Legacy to LTE networks. Modular, scalable and flexible, the Adax LTE-EPC solutions, SIGTRAN and SS7 Signaling platforms, as well as the DPI, IPsec Security, and GTP acceleration products enable customers to build the solutions they need, creating a smarter network infrastructure for all.

adax
Legacy to LTE