

APPLICATION NOTE

Integrating HSSI applications with Packet-over-SONET/SDH routers.

- Easy migration from HSSI-based IP networks to SONET/SDH
- Interconnect PDH IP infrastructure to developing Optical core networks
- Flexibility in Satellite IP distribution via SONET/SDH terrestrial networks
- Increase your choice of core networking routers

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Overview

High-speed core router networks are moving rapidly into the SDH/SONET speed stack to meet the huge demands of IP networking. Core routers are now designed to operate most efficiently over fibre, from OC-3/STM-1 (155Mbit/s) through to OC-192/STM-64 (10Gbit/s). As products, they are technically removed from the current and earlier lower-speed applications aimed primarily at HSSI and PDH Networking. As the world migrates to IP traffic, data is increasingly being transported using HDLC frames, e.g. PPP, and POS(Packet-over-Sonet/SDH).

IP networks have developed using Frame Relay as a transport technology via E3/DS3 lines, with HSSI as a higher speed router interface.

Solutions are required to integrate these 'legacy' IP networking structures into the emerging very high speed Packet over SONET/SDH cores, efficiently and economically.

The Metrodata PA1000 is a Packet-over-SONET to HSSI adaptor that offers several powerful application features.

The needs

To economically connect SDH/SONET routers to HSSI networks

To ease the migration of router technologies, e.g. from Cisco to Juniper.

To allow Service Providers to interconnect PDH/HSSI-based networks to SDH/SONET router applications.

To offer greater choice of technology in high-speed backbone routers.

To migrate existing sub-optical Frame Relay and E3/DS3 speed router networks into SDH/SONET

To introduce maximum flexibility in terrestrial and asymmetric-speed satellite IP networking.

To extend the distances over which HSSI networks can integrate with SDH/SONET.

Metrodata Solutions



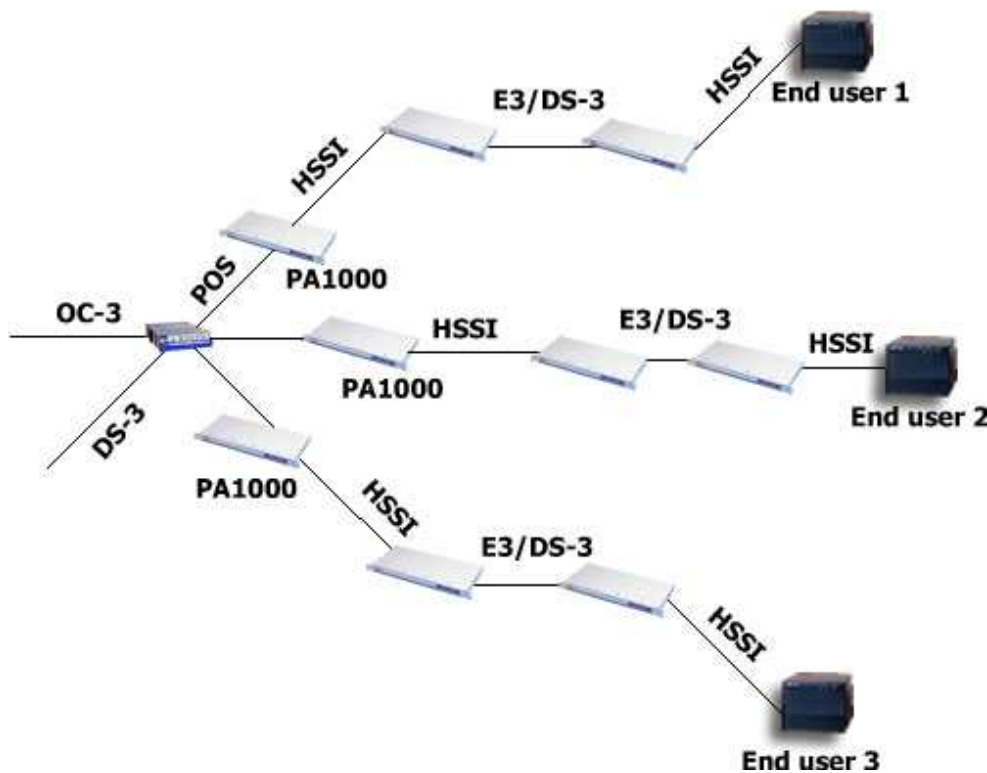
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The Metrodata PA1000 is a HSSI to Packet over SONET adaptor. It is designed to fulfill the needs above when integrated with PDH/HSSI-based routing products, the new high-powered SONET/SDH routers and other Metrodata Connectivity products, when necessary.

Most core IP networks have developed upon Cisco or Nortel (or equivalent) platforms. Such networks are based upon HSSI delivery for higher speed routers, with upgrades to OC3/STM-1 being very expensive, if at all possible. Emerging products in the CPE arena may not offer HSSI, but higher speed Interfaces based upon Sonet/SDH speeds.

To be able to offer the connectivity for OC3/STM-1 interfaced routers to your HSSI-based network allows the user more flexibility in his choice of router supplier. The Metrodata PA1000 offers Packet-over-Sonet to HSSI conversion which will allow, for example, Juniper routers with their standard 155Mbit/s POS interfaces to connect to a HSSI-based network. The user thereby gains a migration path - to use the router on <=52Mbit/s initially, and later upgrade his access speed to full STM-1 155Mbit/s later, without any hardware change to the router.

Global Networking



Many Carriers/service Providers have developed their data infrastructures on Nortel Passport or Cisco equipment. The newer Juniper-based(for example) networks are designed to meet the explosive growth in bandwidth and speed, by utilising SONET or SDH Fibre Transmission medium.

Bringing the PDH and HSSI-based networks together with Packet-over SONET/SDH is made possible with the PA1000 from Metrodata. The existing end-user local

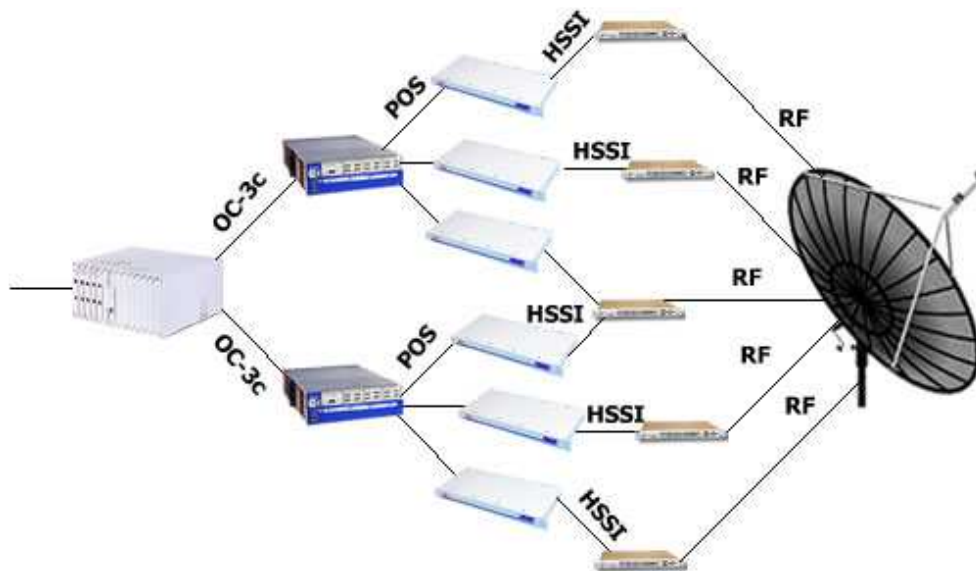
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distribution can be maintained (via E3 and HSSI in this example), and be integrated into the Juniper-based Fibre IP network, at standard SONET interfaces.

Future growth of the core network is thus possible without any forklift changes to the (probably) huge end-user distribution.

Satellite Internet Distribution



The Distribution of worldwide Internet services frequently employs asymmetric speed satellite uplinks to gain access to terrestrial networks.

Satellite modems can offer HSSI standard data interfaces. As the bandwidth and capacity demands of the terrestrial network grow – satellite links increasingly operate at up to 155Mbit/s – SONET/SDH is being employed with associated high capacity routers.

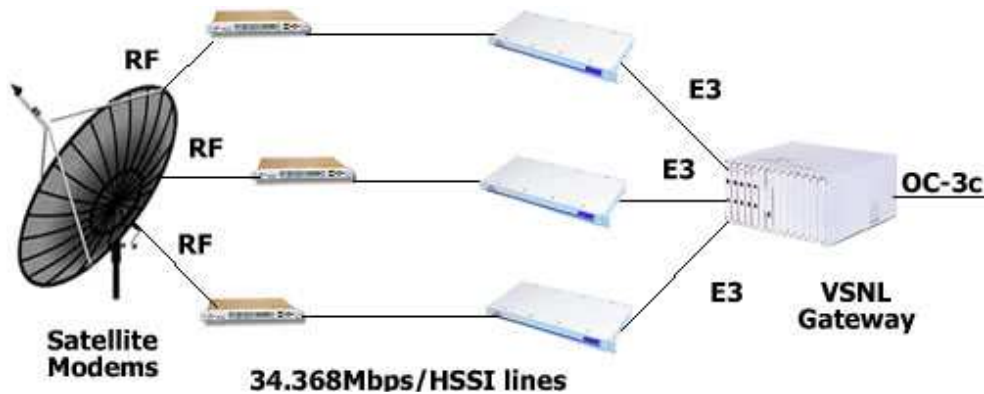
The PA1000 economically allows the higher-order routers to maintain connectivity with the standard HSSI Satellite modem interfaces.

HSSI router interfaces normally only operate up to 51.84Mbit/s – the PA1000 extends the speed capability in this application to **90Mbit/s**, dramatically increasing the flexibility and longevity of the satellite uplink bandwidth – that's 80% more throughput, and/or a major deferral of the need to launch new satellites for additional capacity - \$m's savings.

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Satellite Tail Circuits



Upgrading a core router network to SDH/SONET can even be simplified where HSSI tail circuit feeds need supporting. Although primarily featured to SDH/SONET standards, the higher range routers will support E3 direct. So, with the new Metrodata DC 3445 HSSI to E3 Interface converter, each HSSI tail circuit can be integrated, with no (expensive) changes to the Satellite Earth Station.

Metrodata Overview – a technically excellent British communications company

You think you have an issue connecting communications equipment and network services together? – not any more - Metrodata will have developed the solution to your current need, and we are already developing the solutions for your future needs!

The communications world is full of techno-terminology and mystique. Convergence, fibre, SDH, STM1, ATM, integration, copper, interface conversion, interface extension, coaxial, dsu, satellite, broadband, connectivity, access, standards and so on.

Carriers and Service Providers are coming under increasing pressure from the market to provide more than just leased lines. End to end management of their services, fast service provision, flexible bandwidth and tariffing, remote management and diagnostic tools are some examples.

Be assured, the **Metrodata Carrier Division** is working closely with users and SP's to create innovative solutions and services. **Metrodata are the experts to guide you to your network solution.**

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