

Automatic Protection Switching Controller Software

CX28299

Complete APS Solution for Linear 1+1, 1:n and UPSR

Automatic Protection Switching (APS) is a feature for SONET equipment that is used to improve the availability and reliability of transport systems by switching to a standby facility when failures occur. The Mindspeed APS Controller complies with the GR-253-CORE standards identified for two varieties of linear switching (1+1 and 1:n) as well as a ring switching topology known as SONET GR1400 Unidirectional Path Switched Rings (UPSR). This single package offers a portable solution to make implementation of Linear 1+1, 1:n and (UPSR) architectures simple and quick. The APS Controller can also be distributed to support card level protection.

APS Controller

The APS Controller is operating system (OS)- and hardware independent software with well-defined interfaces that allow easy integration with system software. The APS Controller consists of an application interface for users' applications and network management, a SONET driver interface for interacting with a SONET device, and a bridging/switching interface for switching over the standby line. The APS software works with Mindspeed's TAP driver software to provide a complete PHY solution.

KEY FEATURES

- > 1+1 and 1:n Linear Architectures
- > UPSR support
- > Distributed processor support
- > GR-253 and G.783 Annex ACompliant
- > ANSI-C Source Code
- > Works with Mindspeed TAP software drivers to provide complete solution
- > Portability across Operating Systems and hardware platforms

APS State Machine

At the heart of the APS Controller is a state machine that handles the signaling and the state transitions based on incoming APS messages. The APS message for Linear configurations consists of the combination of K1 and K2 bytes of the SONET overhead frame. The K1 and K2 are used to coordinate bridging and switching action with the far end.

For UPSR architectures, path layer indications are detected locally by the APS controller and used to switch to the ring that exhibits the best performance.

Network Management and Configuration

The APS Controller's application interface lets users employ existing network management software with the Controller to provide protection switching messages and statistic retrieval. The APS is highly configurable through the application programming interface (API).



Portability

The Mindspeed APS software has been designed to be portable across operating systems and hardware platforms. An OS abstraction layer is incorporated to ease integration of the APS Controller to a target hardware and operating system. The APS software is a modular design using service layers. The APS software operates above the TAP device driver software, and utilizes the services of the TAP driver to control the PHY according to the APS requirements.

SONET Driver Interface

A general-purpose SONET driver interface (SDI) allows the APS Controller to communicate with the TAP device driver and the underlying PHY device. This interface can integrate seamlessly with the required Mindspeed TAP device driver to support the CX28250 ATM OC-3 PHY, CX29704 Quad STS-3/STM-1 ATM/POS PHY, and the M29730 Quad OC-48/Single OC-192 Packet Over SONET Framer.

Bridging and Switching Interface

The APS Controller has a bridging and switching interface to perform these operations. The underlying device can be either a SONET device or a bridging and switching device.

Application Interface

The APS Controller features a well-defined application programming interface (API). The API allows the APS Controller to be implemented as a module that can be accessed directly by other components. It allows easy integration with higher-level application software to shorten the development cycle.

Ordering Part Numbers

- CX28299 APS Controller
- CX28250TAP Device Driver
- CX29704TAP Device Driver
- M29730TAP Device Driver

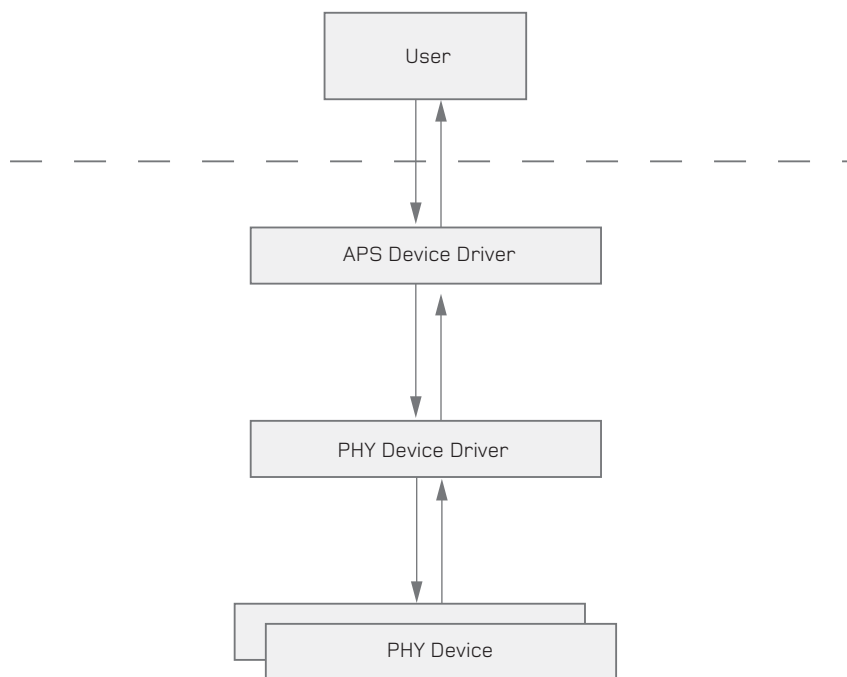


Figure 1 APS Design

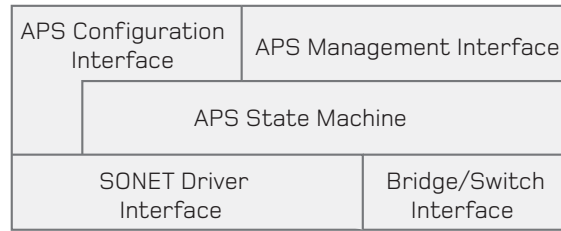


Figure 2 APS Structure

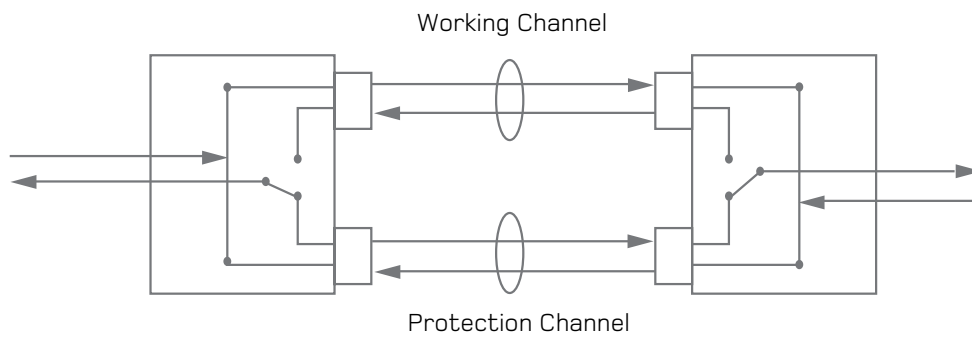


Figure 3 1+1 Architecture

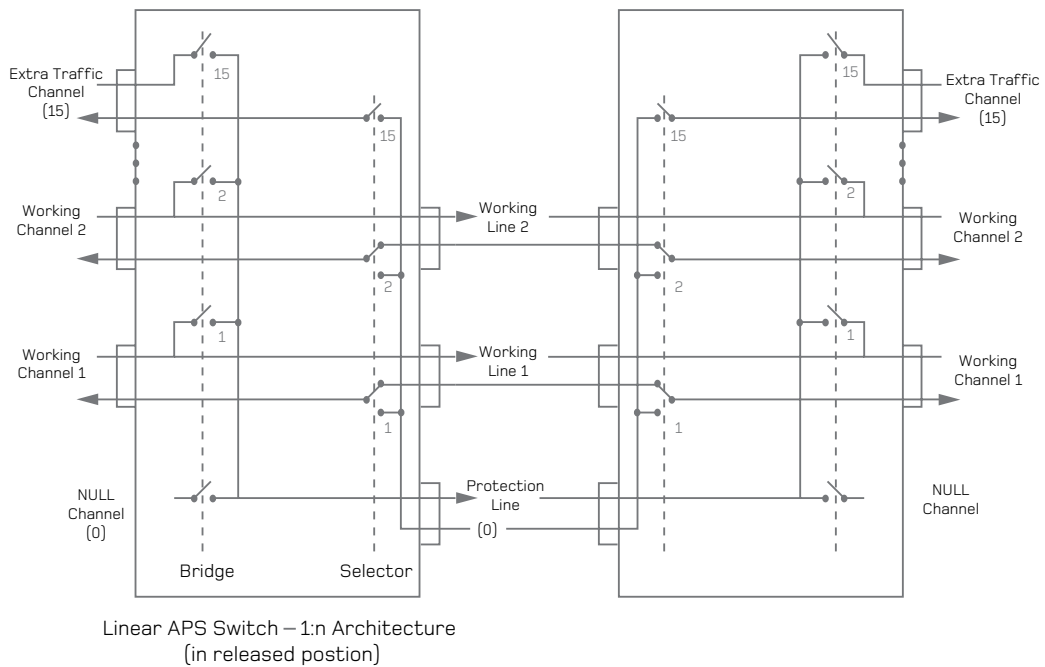


Figure 4 1:n Architecture



Basic UPSR Operation

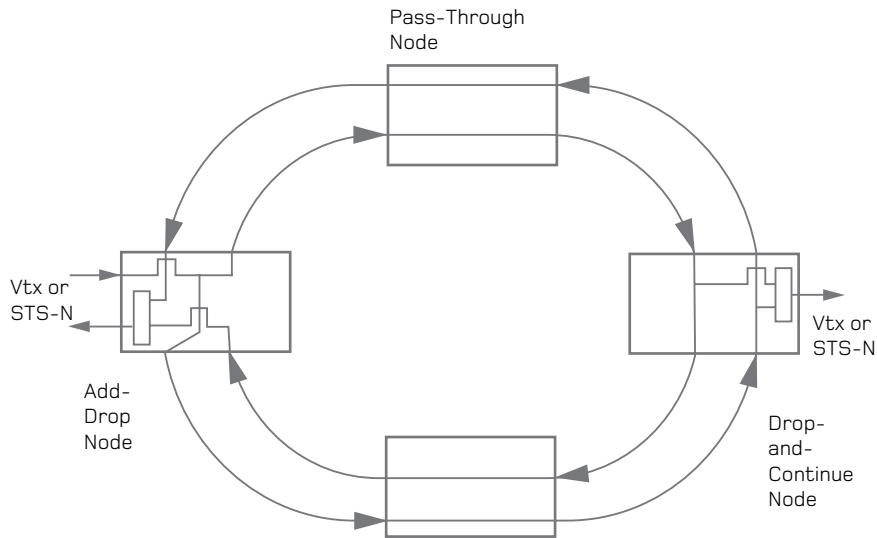


Figure 5 Basic UPSR Architecture

Product Features

- **APS Architectures Supported**
 - Linear 1+1
 - Linear 1:n
 - UPSR
- **Distributed Processing**
- **Telcordia GR-253-CORE**
- **G.783 Annex A Compliant**
- **Flexible system design**
 - SONET driver interface
 - Bridging and switching interface
 - Application interface
- **Network management and configuration**
 - Manually initiated APS switch requests
 - Statistic retrieval
 - Configure APS Controller
- **Integrate seamlessly with required TAP Device Drivers**
 - CX28250TAP
 - CX29704TAP
 - CX29730TAP
- **Portability**
 - ANSI-C source code
 - Extensible to other embedded kernel
 - VxWorks sample port
 - QNX
 - Solaris

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