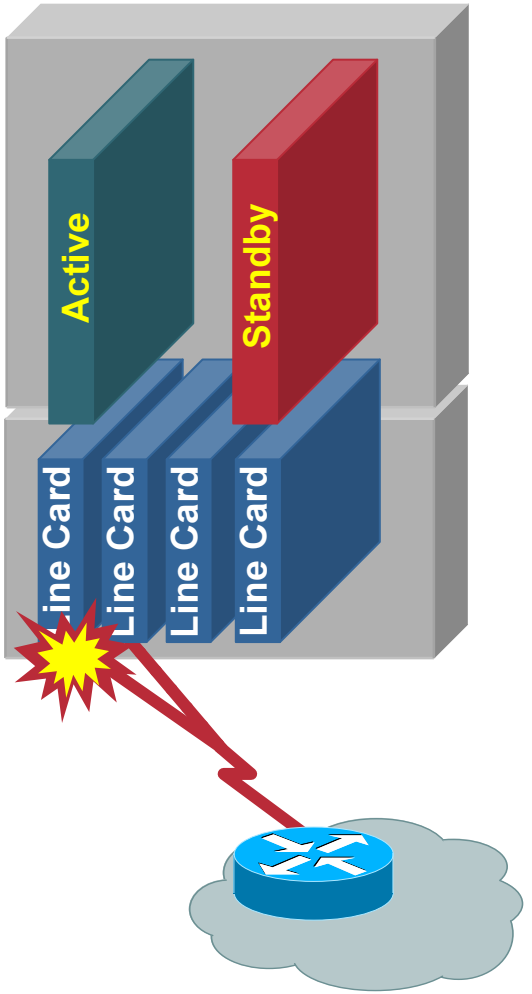
Line Card Redundancy with Y-Cables

Technical Overview

Line Card Redundancy with Y-Cables

Seamless Line Card Failover Solution for Line Card Hardware or Software Failures

- **Leverages hardware Y-cable support on new C10000 half-height 4xCT3 line card**
- **Minimizes service disruptions**
  - **Typical line card failure downtime reduced from a few hours to less than a few seconds**
  - **Peer doesn't see a link failure and control plane protocols/application are not disrupted**
- **Delivers incremental revenue opportunities via improve SLAs**
- **Reduces operational costs**
  - **Minimizes emergency dispatches and repair operations for line card failures**

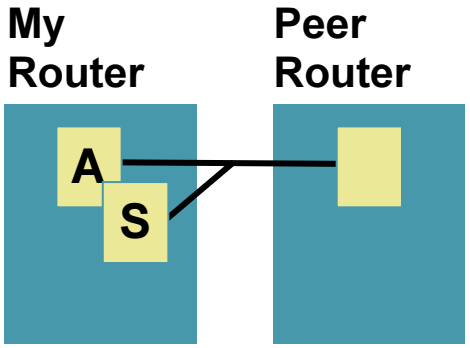


Available in Cisco IOS Release 12.2(28)SB

C10000 4 Port CT3 Line Card

- **Half-height line card**
  - **Increases density from 6 ports to 8 ports per slot**
  - **Lower initial cost for CT3 interfaces**
- **New features**
  - **Diagnostics—BERT/Loopback**
  - **High availability—Y-cable support**
  - **Linerate throughput and higher channel density**
  - **BITS timing support (w/ PRE3 BITS kit)**

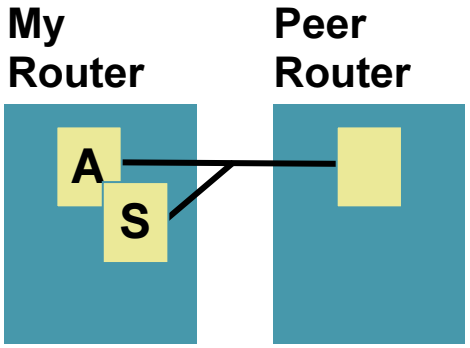
Y-Cable LC Redundancy Overview



- **Y-cable, for 1:1 hot redundancy**
  - Redundancy without APS (no protocol, no peer config, no dual line), or external switch
- **Two line cards are used in a redundant pair**
  - "Active" linecard is connected to cabling
  - "Standby" linecard is isolated via relays
  - Tx/Rx enabled only on Active LC; Tx/Rx on Standby LC is shut off
  - Redundant pair occupies two halves of one full slot
- **Software will switch to hot standby line card in response to failures in the active line card**
- **All ports switch over together**
  - Typical failure detection time range between 15ms—1.5 second
  - Typical switchover completion times range between 40–120 ms

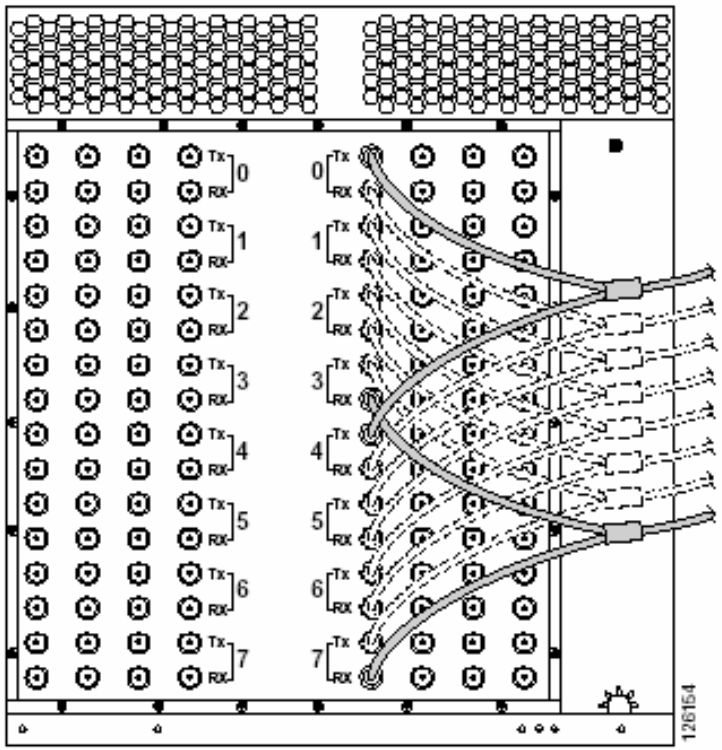
Y-Cable LC Redundancy Overview (Cont.)

- **Common IOS Infrastructure to support LC redundancy**
  - **Shall be leveraged for future Y-cable/APS redundancy feature development**
- **Common, platform independent CLI for LC redundancy**
- **Fully integrated with SSO and ISSU infrastructure**



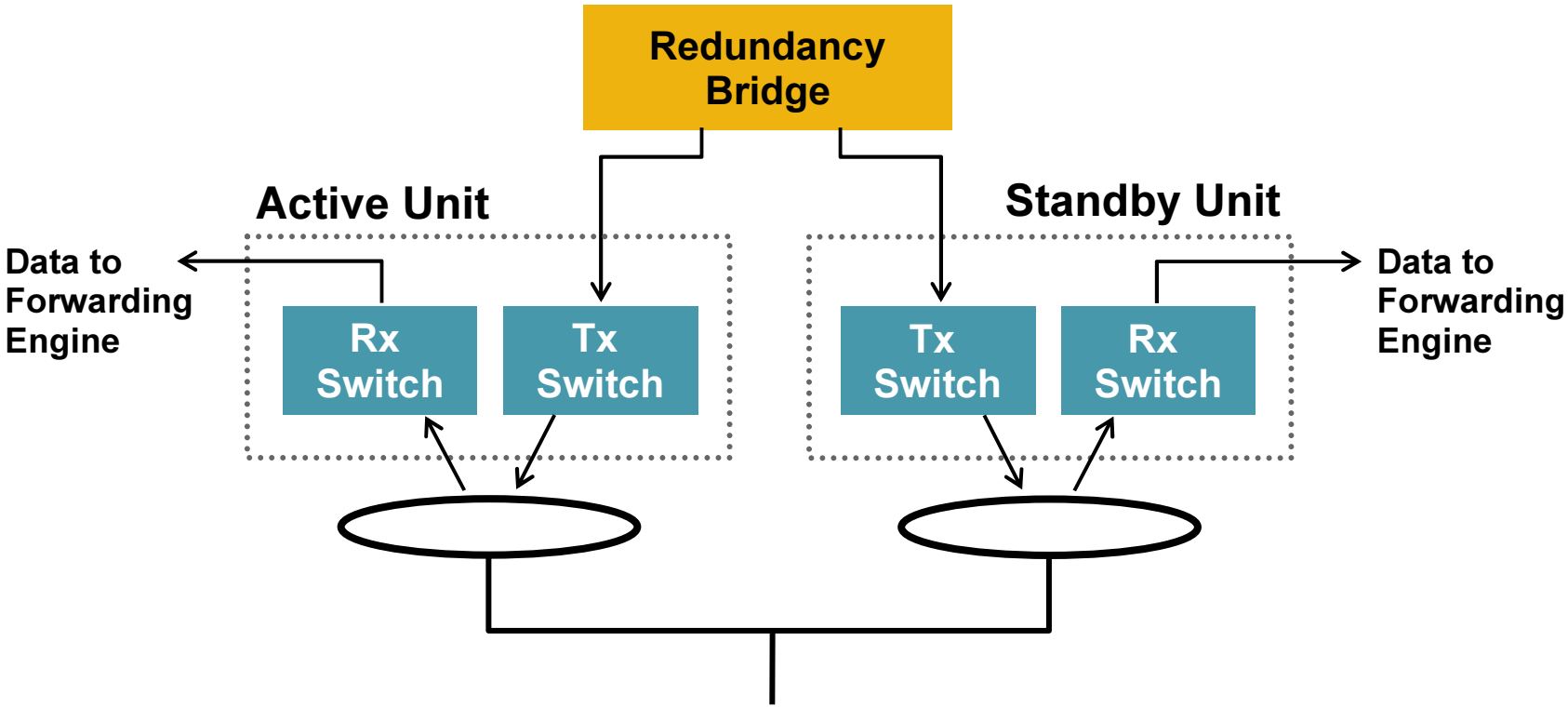
Y-Cable Hardware Details

- **8 Y-cables needed per redundant pair**
  - **Must connect all four ports**
  - **Each port requires 2 cables, Tx and Rx**
- **New cable with 7 inch "Y legs" is available**
  - **CAB-BNC-7INY =**



Forwarding Model: Redundancy Bridge

Redundancy Bridge Is Implemented on C10K Using Hardware-Supported Packet Duplication



Line Card Redundancy Uses a Virtual IDB Model

- **Higher level applications only see a single "virtual" IDB**
- **Configuration for most applications is only allowed on the virtual interface; but common configuration is downloaded to both line cards**
- **Configuring redundant LCs creates a virtual i/f for each port pair**

Line Card Redundancy CLI: Config Commands

- Router(config)#**redundancy**
- Router(config-red)# **linecard-group** *linecard-groupId* **y-cable**
- Router(config-red-lc)# **description** *description string*
- Router(config-red-lc)# **member subslot** *slot/subslot* **primary**
- Router(config-red-lc)# **member subslot** *slot/subslot* **secondary**
- Router# **redundancy linecard-group switchover from subslot** *slot/subslot*

Line Card Redundancy CLI: Show Commands

- **show redundancy linecard all** Displays the redundancy state of all line card slots
- **show redundancy linecard subslot** Displays the redundancy state of the line card in a subslot
- **show redundancy linecard group** Displays the redundancy state of line cards in a line card group
- **show redundancy linecard history** Displays recent activity in line card redundancy
- **show redundancy linecard sub-block** Displays troubleshooting information

Summary of Common LC Redundancy CLI

- **To configure LC redundancy (example):**

```
(config-red)#linecard-group 1 y-cable
(config-red-lc)#member subslot 2/1 primary
(config-red-lc)#member subslot 2/0 secondary
```

- **To do exec-level switchover (example):**

```
#redundancy linecard-group switchover from subslot 2/1
```

Q and A