Access Circuit Redundancy Support for Inverse Multiplexing over ATM

The Access Circuit Redundancy Support for Inverse Multiplexing over ATM feature provides a converged IP or Multiprotocol Label Switching (MPLS) access network for its mobile users that use Radio Access Network (RAN) aggregation.

Inverse Multiplexing over ATM (IMA) breaks up the ATM cell stream and distributes the cells over the multiple physical links of an IMA group and then recombines the cells into a single stream at the other end of the connection. In IP RAN 3G networks, ATM cells received on the access side are transported using Layer 2 Transport over an IP or MPLS cloud using MPLS pseudowires (PWs). SONET-APS is used to provide redundancy at the access side that connects the Base Transceiver Station (BTS) and the Circuit Emulation over Packet (CEoP) card in the aggregation router. The convergence time upon failure in this framework is in seconds. ACR provides ACR for SONET-based clients in a Single Router Automatic Protect Switching (SR APS) environment that ensures data traffic downtime of less than 500 milliseconds in case of switchover.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "Feature Information for Access Circuit Redundancy Support for Inverse Multiplexing over ATM" section on page 16.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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Prerequisites for Access Circuit Redundancy Support for Inverse Multiplexing over ATM

The Access Circuit Redundancy Support for Inverse Multiplexing over ATM feature is supported only on Cisco 7600 routers with Session Initiation Protocol (SIP) 400 line cards and Black Russian (BR) Shared Point Adapters (SPA) (SPA-1CHOC3-CE-ATM).

Restrictions for Access Circuit Redundancy Support for Inverse Multiplexing over ATM

- ACR configuration is an extension of APS and works only with an APS configuration.
- ACR support is available only for SR APS.
- There is no provision for migration from the existing physical interface-based configuration, because the entire configuration is on a virtual interface.
- The maximum number of ACR groups is restricted to the maximum number of SONET controllers or BR SPAs supported on a Cisco 7600 router.
- There are only 11 slots of SIP 400 (2 for rendezvous point (RP)) available.
- The absence of dedicated primary and secondary line cards results in port-level redundancy. Each port has to be identified as a primary or secondary.
- ACR can be configured only after all the previous configurations are removed from the physical interface.
- Once a member controller of an ACR group is removed during the online insertion and removal (OIR) process, and replaced with another controller, it cannot be reinserted into the ACR group.

Information About Access Circuit Redundancy Support for Inverse Multiplexing over ATM

The aggregation of multiple low-speed links (T1/E1) into one or more IMA groups provides IMA support. The ATM IMA interface appears as one logical ATM interface.
How to Configure Access Circuit Redundancy Support for Inverse Multiplexing over ATM

- Configuring ACR, page 3 (required)
- Configuring IMA Groups on a Virtual Controller, page 4 (required)
- Configuring an ATM PVC on an IMA ACR Interface or an ATM ACR Group, page 6 (required)
- Configuring an ATM PVP on an IMA ACR Interface or an ATM ACR Group, page 7 (required)

Configuring ACR

Support for ACR has been provided using the `aps` command on the SONET controller. Perform the following steps to configure ACR:

**SUMMARY STEPS**

1. `enable`
2. `configure terminal`
3. `controller SONET slot/p-adapter/port`
4. `aps group acr acr-group-number`
5. `aps working channel`
6. `exit`
7. `controller SONET slot/p-adapter/port`
8. `aps group acr acr-group-number`
9. `aps protect circuit-number loopback ip-address`
10. `end`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td>Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong> <code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> <code>controller SONET slot/p-adapter/port</code></td>
<td>Selects and configures a SONET controller and enters controller configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config)# controller SONET 4/1/0</td>
<td></td>
</tr>
</tbody>
</table>
### Configuring IMA Groups on a Virtual Controller

To configure the IMA group on a virtual controller, use the following commands:

**SUMMARY STEPS**

1. *enable*
2. *configure terminal*
3. *controller SONET-ACR slot/p-adapter/port*
4. *framing sonet*
5. *sts-1 id-number*
6. *mode mode-name*
7. *vtg number interface interface-number ima-group group-number*

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 4**  ```enable``` | Configures the APS group for a SONET controller and enables the ACR functionality on top of an APS.  
- **The acr-number** range is from 0 to 255.  

**Example:**

```
Router(config-controller)# aps group acr 1
```

<table>
<thead>
<tr>
<th><strong>Step 5</strong>  <code>aps working channel</code></th>
<th>Configures a Packet over SONET (POS) interface as a working interface.</th>
</tr>
</thead>
</table>
| **Example:**

```
Router(config-controller)# aps working 1
```

<table>
<thead>
<tr>
<th><strong>Step 6</strong>  <code>exit</code></th>
<th>Exits controller configuration mode and returns to global configuration mode.</th>
</tr>
</thead>
</table>
| **Example:**

```
Router(config-controller)# exit
```

<table>
<thead>
<tr>
<th><strong>Step 7</strong>  <code>controller SONET slot/p-adapter/port</code></th>
<th>Selects and configures a SONET controller and enters controller configuration mode.</th>
</tr>
</thead>
</table>
| **Example:**

```
Router(config)# controller SONET 4/1/0
```

| **Step 8**  ```aps group acr acr-number``` | Configures the APS group for a SONET controller and enables the ACR functionality on top of an APS.  
- **The acr-number** range is from 0 to 255.  

**Example:**

```
Router(config-controller)# aps group acr 1
```

<table>
<thead>
<tr>
<th><strong>Step 9</strong>  <code>aps protect circuit-number loopback ip-address</code></th>
<th>Enables a POS interface as a protect interface.</th>
</tr>
</thead>
</table>
| **Example:**

```
Router(config-controller)# aps protect 1 loopback 10.7.7.7
```

<table>
<thead>
<tr>
<th><strong>Step 10</strong>  <code>end</code></th>
<th>Exits controller configuration mode and returns to privileged EXEC mode.</th>
</tr>
</thead>
</table>
| **Example:**

```
Router(config-controller)# end
```
8.  `exit`
9.  `exit`
10. `interface IMA-ACR group-number ima ima-group-id`
11. `pvc vpi/vci l2transport`
12. `xconnect peer-id vc-id encapsulation mpls`
13. `end`

## Detailed Steps

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example: Router&gt; enable</td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> controller SONET-ACR slot/p-adapter/port</td>
<td>Selects and configures a SONET ACR controller and enters controller configuration mode.</td>
</tr>
<tr>
<td>Example: Router(config)# controller SONET-ACR 4/1/0</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> framing sonet</td>
<td>Specifies SONET framing.</td>
</tr>
<tr>
<td>Example: Router(config-controller)# framing sonet</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> sts-1 id-number</td>
<td>Specifies the Synchronous Transport Signal (STS) identifier and enters STS controller configuration mode.</td>
</tr>
<tr>
<td>Example: Router(config-controller)# sts-1 1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 6</strong> mode mode-name</td>
<td>Configures the STS-1 mode of operation.</td>
</tr>
<tr>
<td>Example: Router(config-ctrlr-sts1)# mode vt-15</td>
<td></td>
</tr>
<tr>
<td><strong>Step 7</strong> vtg number interface interface-number ima-group group-number</td>
<td>Configures the interface to run in IMA mode and assigns the interface to an IMA group.</td>
</tr>
<tr>
<td>Example: Router(config-ctrlr-sts1)# vtg 1 t1 1 ima-group 1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 8</strong> exit</td>
<td>Exits STS controller configuration mode and returns to controller configuration mode.</td>
</tr>
<tr>
<td>Example: Router(config-ctrlr-sts1)# exit</td>
<td></td>
</tr>
</tbody>
</table>
### Command or Action | Purpose
--- | ---
**Step 9** | `exit`
**Example:**
Router(config-controller)# exit
Exit controller configuration mode and returns to global configuration mode.

**Step 10** | `interface IMA-ACR group-number/ima ima-group-id`
**Example:**
Router(config)# interface IMA-ACR1/ima0
Configures an IMA ACR group and enters interface configuration mode.
- The **IMA-ACR** keyword specifies the virtual IMA interface.
- The **group-number** argument specifies the ACR group ID.
- The **ima-group-id** specifies the IMA group.

**Step 11** | `pvc vpi/vci l2transport`
**Example:**
Router(config-if)# pvc 1/100 l2transport
Assigns a name to an ATM permanent virtual circuit (PVC), specifies the encapsulation type on an ATM PVC, and enters interface ATM L2 transport PVC configuration mode.

**Step 12** | `xconnect peer-id vc-id encapsulation mpls`
**Example:**
Router(config-if-atm-l2trans-pvc)# xconnect 10.1.1.1 1234 encapsulation mpls
Binds an attachment circuit to a pseudowire, configures an Any Transport over MPLS (AToM) static pseudowire and enters interface ATM L2 transport PVC xconnect configuration mode.

**Step 13** | `end`
**Example:**
Router(config-if-atm-l2trans-pvc-xconn)# end
Exits interface ATM L2 transport PVC xconnect mode and returns to privileged EXEC mode.

---

### Configuring an ATM PVC on an IMA ACR Interface or an ATM ACR Group

To create a virtual ATM ACR group or an IMA ACR interface and configure an ATM PVC, use the following commands:

**SUMMARY STEPS**

1. `enable`
2. `configure terminal`
3. `interface IMA-ACR group-number/ima ima-group-id`
4. `pvc vpi/vci l2transport`
5. `xconnect peer-id vc-id encapsulation mpls`
6. `end`
How to Configure Access Circuit Redundancy Support for Inverse Multiplexing over ATM

DETAILLED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| Step 1 enable     | Enables privileged EXEC mode.  
|                   | • Enter your password if prompted. |
| Example:          |         |
| Router> enable    |         |
| Step 2 configure terminal | Enters global configuration mode. |
| Example:          |         |
| Router# configure terminal |         |
| Step 3 interface IMA-ACR group-number/ima ima-group-id | Configures an IMA ACR group and enters interface configuration mode.  
|                   | • The IMA-ACR keyword specifies the virtual IMA interface.  
|                   | • The group-number argument specifies the ACR group ID.  
|                   | • The ima-group-id specifies the IMA group. |
| Example:          |         |
| Router(config)# interface IMA-ACR 1/ima 0 |         |
| Step 4 pvc vpi/vci l2transport | Assigns a name to an ATM permanent virtual circuit (PVC), specifies the encapsulation type on an ATM PVC, and enters interface ATM L2 transport PVC configuration mode. |
| Example:          |         |
| Router(config-if)# pvc 1/100 l2transport |         |
| Step 5 xconnect peer-id vc-id encapsulation mpls | Binds an attachment circuit to a pseudowire, configures an AToM static pseudowire and enters interface ATM L2 transport PVC xconnect configuration mode. |
| Example:          |         |
| Router(config-if-atm-l2trans-pvc)# xconnect 10.1.1.1 1234 encapsulation mpls |         |
| Step 6 end | Exits interface ATM L2 transport PVC xconnect mode and returns to privileged EXEC mode. |
| Example:          |         |
| Router(config-if-atm-l2trans-pvc-xconn)# end |         |

Configuring an ATM PVP on an IMA ACR Interface or an ATM ACR Group

To create a virtual ATM ACR group or an IMA ACR interface and configure an ATM PVP, use the following commands:

SUMMARY STEPS

1. enable
2. configure terminal
3. interface IMA_ACR group-number/ima ima-group-id
4. atm pvp vpi l2transport
5. xconnect peer-id vc-id encapsulation mpls
6. end
**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1** enable | Enables privileged EXEC mode.  
  • Enter your password if prompted. |
| **Example:** Router> enable | |
| **Step 2** configure terminal | Enters global configuration mode. |
| **Example:** Router# configure terminal | |
| **Step 3** interface IMA_ACR group-number/ima ima-group-id | Configures an IMA ACR group and enters interface configuration mode.  
  • The **IMA-ACR** keyword specifies the virtual IMA interface.  
  • The **group-number** argument specifies the ACR group ID.  
  • The **ima-group-id** specifies the IMA group. |
| **Example:** Router(config)# interface IMA-ACR 1/ima 0 | |
| **Step 4** atm pvp vpi l2transport | Assigns a name to an ATM permanent virtual path (PVP), specifies the encapsulation type on an ATM PVP, and enters interface ATM L2 transport PVP configuration mode. |
| **Example:** Router(config-if)# atm pvp 100 l2transport | |
| **Step 5** xconnect peer-id vc-id encapsulation mpls | Binds an attachment circuit to a pseudowire, configures an AToM static pseudowire and enters interface ATM L2 transport PVP xconnect configuration mode. |
| **Example:** Router(config-if-atm-l2trans-pvp)# xconnect 10.1.1.1 1234 encapsulation mpls | |
| **Step 6** end | Exits interface ATM L2 transport PVP xconnect mode and returns to privileged EXEC mode. |
| **Example:** Router(config-if-atm-l2trans-pvp-xconn)# end | |

**Configuration Examples for Access Circuit Redundancy Support for Inverse Multiplexing over ATM**

- Example: Configuring ACR and IMA Groups, page 8
- Example: Configuring an IMA ACR Interface on an ATM PVP, page 9
- Example: ACR show Command Output, page 11

**Example: Configuring ACR and IMA Groups**

The following example shows how ACR and IMA groups are configured:
Working ACR Member
controller SONET 4/1/0
framing sonet
clock source line
! sts-1 1
mode vt-15
!
sts-1 2
mode vt-15
!
sts-1 3
mode vt-15
aps group acr 1
aps working 1

Protect ACR Member
controller SONET 4/3/0
framing sonet
clock source line
! sts-1 1
mode vt-15
!
sts-1 2
mode vt-15
!
sts-1 3
mode vt-15
aps group acr 1
aps protect 1 10.2.2.2
controller SONET-ACR 1
framing sonet
! sts-1 1
mode vt-15
!
sts-1 2
mode vt-15
!
sts-1 3
mode vt-15
vtg 1 t1 1 ima-group 0

interface IMA-ACR 1/ima 0
no ip address
pvc 2/34 12transport
xconnect 10.3.3.3 1234 encapsulation mpls
!
end

Example: Configuring an IMA ACR Interface on an ATM PVP

The following example shows how an IMA ACR interface on ATM PVP is configured:

interface ATM 1/0/0
aps group acr 1
aps working 1
!
interface ATM 1/0/1
aps group acr 1
aps protect 1 10.2.2.2

interface Loopback 1
ip address 10.1.1.1 255.255.255.0

interface ATM-ACR 1
no ip address
atm pvp 10 l2transport
    xconnect 10.2.2.2 1234 encapsulation mpls
Example: ACR show Command Output

The **show acr group** command lists the status of all active ACR groups:

```
Router# show acr group

ACR Group Working I/f Protect I/f Currently Active Status
---------------------------------------------------------------
1 SONET 4/1/0 SONET 4/3/0 SONET 4/1/0
```

The **show acr group acr-group-number** command lists the status of a specific ACR group:

```
Router# show acr group 1

ACR Group Working I/f Protect I/f Currently Active Status
---------------------------------------------------------------
1 SONET 4/1/0 SONET 4/3/0 SONET 4/1/0
```

The **show acr group acr-group-number detail** command lists the status and details of a specific ACR group:

```
Router# show acr group 1 detail ima

ACR Group Working I/f Protect I/f Currently Active Status
---------------------------------------------------------------
IM1/ima0 ATM4/1/ima0 ATM4/3/ima0 ATM4/1/ima0

ATM PVC Detail
VPI VCI State on Working State on Protect
2 34 Provision Success Unknown
```

The **show controllers SONET-ACR slot/p-adapter/port** command lists the details of the active controllers:

```
Router# show controllers sonet 4/1/0

SONET 4/1/0 is up.
Hardware is SPA-1CHOC3-CE-ATM

Applique type is Channelized Sonet/SDH
Clock Source is Line
Medium info:
  Type: Sonet, Line Coding: NRZ,
  SECTION:
    LOS = 0          LOF = 0                           BIP(B1) = 13

SONET/SDH Section Tables
  INTERVAL     CV  ES  SES  SEFS
  06:13-06:28   0   0   0   0
  05:58-06:13   0   0   0   0
  05:43-05:58   0   0   0   0

  23:43-23:58   0   0   0   0
  23:28-23:43   0   0   0   0
  06:13-06:28   0   0   0   0

Total of Data in Current and Previous Intervals
  06:13-06:28   0   0   0   0
```
LINE:
   AIS = 0        RDI = 0        REI = 351390     BIP(B2) = 23
Active Defects: None
Active Alarms: None
Alarm reporting enabled for: SLOS SLOF
Defect reporting enabled for: SF B1-TCA B2-TCA
BER thresholds:  SF = 10e-3  SD = 10e-6
TCA thresholds:  B1 = 10e-6  B2 = 10e-6

SONET/SDH Line Tables

<table>
<thead>
<tr>
<th>INTERVAL</th>
<th>CV</th>
<th>ES</th>
<th>SES</th>
<th>UAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>06:13-06:28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>05:58-06:13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>05:43-05:58</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Total of Data in Current and Previous Intervals
06:13-06:28  0  0  0  0

High Order Path:

PATH 1:
   AIS = 0        RDI = 1        REI = 2302655982 BIP(B3) = 3659922183
   LOP = 0        PSE = 32       NSE = 0        NEWPTR = 0
   LOM = 0        PLM = 0        UNEQ = 0
Active Alarms: None
Active Defects: PRDI B3-TCA
Alarm/Defect reporting enabled for: PLOP LOM B3-TCA
TCA threshold:  B3 = 10e-6
Rx: S1S0 = 02, C2 = 02
   K1 = 00,   K2 = 00
   J0 = 01
Tx: S1S0 = 00, C2 = 02
   K1 = 00,   K2 = 00
   J0 = 01
PATH TRACE BUFFER: STABLE

45 32 20 32 2F 33 2F 30 2E 31 00 00 00 00 E6 50 E2 2/3/0.1.....P
45 32 20 32 2F 33 2F 30 2E 31 00 00 00 00 E6 50 E2 2/3/0.1.....P
45 32 20 32 2F 33 2F 30 2E 31 00 00 00 00 E6 50 E2 2/3/0.1.....P
45 32 20 32 2F 33 2F 30 2E 31 00 00 00 00 E6 50 E2 2/3/0.1.....P

SONET/SDH Path Tables

The **show ima** command lists the details of IMA activation on the active interfaces:

```
Router# show ima

ATM4/1/ima0 is up, ACTIVATION COMPLETE
Slot 4 Slot Unit 64 unit 256, CTRL VC 256, Vir -1, VC 4097
IMA Configured BW 1523, Active BW 1523
IMA version 1.1, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
ImaGroupState: NearEnd = operational, FarEnd = operational
ImaGroupFailureStatus = noFailure
IMA Group Current Configuration:
ImaGroupMinNumTxLinks = 1 ImaGroupMinNumRxLinks = 1
ImaGroupDiffDelayMax = 25 ImaGroupNeTxClkMode = common(ctc)
ImaGroupFrameLength = 128 ImaTestProcStatus = disabled
```
IMA Group Test Link = None ImaGroupTestPattern = 0x0
IMA Group Config Link = 1 ImaGroupActiveLink = 1

IMA Link Information:
ID Link Link State - Ctrlr/Chan/Prot Test Status
--- ------------------------------ ---------------
0 VT1.5 3/1/1 Up Up Up Up disabled

ATM4/3/ima0 is up, ACTIVATION COMPLETE
Slot 4 Slot Unit 192 unit 256, CTRL VC 256, Vir -1, VC 4097
IMA Configured BW 1523, Active BW 1523
IMA version 1.1, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
ImaGroupState: NearEnd = startup, FarEnd = groupStateUnknown
ImaGroupFailureStatus = startup
IMA Group Current Configuration:
ImaGroupMinNumTxLinks = 1 ImaGroupMinNumRxLinks = 1
ImaGroupDiffDelayMax = 25 ImaGroupNetTxClkMode = common(ctc)
ImaGroupFrameLength = 128 ImaTestProcStatus = disabled
ImaGroupTestLink = None ImaGroupTestPattern = 0x0
ImaGroupConfigLink = 1 ImaGroupActiveLink = 0

IMA Link Information:
ID Link Link State - Ctrlr/Chan/Prot Test Status
--- ------------------------------ ---------------
0 VT1.5 3/1/1 Up Up Up Up disabled

IMA-ACR1/ima0 is up, CONFIG COMPLETE
Slot 14 Slot Unit 1 unit 256, CTRL VC 256, Vir -1, VC 4097
IMA Configured BW 1523, Active BW 1523
IMA version 1.1, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
ImaGroupState: NearEnd = operational, FarEnd = operational
ImaGroupFailureStatus = noFailure
IMA Group Current Configuration:
ImaGroupMinNumTxLinks = 1 ImaGroupMinNumRxLinks = 1
ImaGroupDiffDelayMax = 25 ImaGroupNetTxClkMode = common(ctc)
ImaGroupFrameLength = 128 ImaTestProcStatus = disabled
ImaGroupTestLink = None ImaGroupTestPattern = 0x0
ImaGroupConfigLink = 1 ImaGroupActiveLink = 1

IMA-ACR1/ima0 is up, CONFIG COMPLETE
Slot 14 Slot Unit 1 unit 256, CTRL VC 256, Vir -1, VC 4097
IMA Configured BW 1523, Active BW 1523
IMA version 1.1, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
ImaGroupState: NearEnd = operational, FarEnd = operational
ImaGroupFailureStatus = noFailure
IMA Group Current Configuration:
ImaGroupMinNumTxLinks = 1 ImaGroupMinNumRxLinks = 1
ImaGroupDiffDelayMax = 25 ImaGroupNetTxClkMode = common(ctc)
ImaGroupFrameLength = 128 ImaTestProcStatus = disabled
ImaGroupTestLink = None ImaGroupTestPattern = 0x0
ImaGroupConfigLink = 1 ImaGroupActiveLink = 1

The show ima interface interface-name IMA-ACR command lists the details of IMA-ACR activation on a specific interface:

Router# show ima interface IMA-ACR 1/ima 0
IMA-ACR1/ima0 is up, CONFIG COMPLETE
Slot 14 Slot Unit 1 unit 256, CTRL VC 256, Vir -1, VC 4097
IMA Configured BW 1523, Active BW 1523
IMA version 1.1, Frame length 128
Link Test: Disabled
Auto-Restart: Disabled
ImaGroupState: NearEnd = operational, FarEnd = operational
ImaGroupFailureStatus = noFailure
IMA Group Current Configuration:
ImaGroupMinNumTxLinks = 1 ImaGroupMinNumRxLinks = 1
ImaGroupDiffDelayMax = 25 ImaGroupNetTxClkMode = common(ctc)
Additional References

Related Documents

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<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Commands List, All Releases</td>
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<tr>
<td>ATM commands</td>
<td>Cisco IOS Asynchronous Transfer Mode Command Reference</td>
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Standards

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MIBs

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RFCs

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## Technical Assistance

<table>
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<tr>
<th>Description</th>
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<td>The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.</td>
<td><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></td>
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</table>
Feature Information for Access Circuit Redundancy Support for Inverse Multiplexing over ATM

Table 1 lists the features in this module and provides links to specific configuration information.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

<table>
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<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
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<td>Access Circuit Redundancy Support for Inverse Multiplexing over ATM</td>
<td>15.1(1)S</td>
<td>The Access Circuit Redundancy Support for IMA over ATM feature provides a converged IP or MPLS access network for its mobile users that use RAN aggregation.</td>
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