Configuring Video Service Components with CLI

This section provides information to configure RET/FCC using the command line interface.

Topics in this section include:

Video Services Overview

There can be a maximum of eight ISA-MSs in a given system. The main entities of video configurations are:

- Video group
- Multicast information policy
  - → A video policy to configure video interface properties
  - → Multicast bundles and channels to associate bundles/channels with video groups
- Within a service, configuring a video interfaces and their associations with video groups.

Figure 51 shows various configuration elements and how they are associated by configuration.

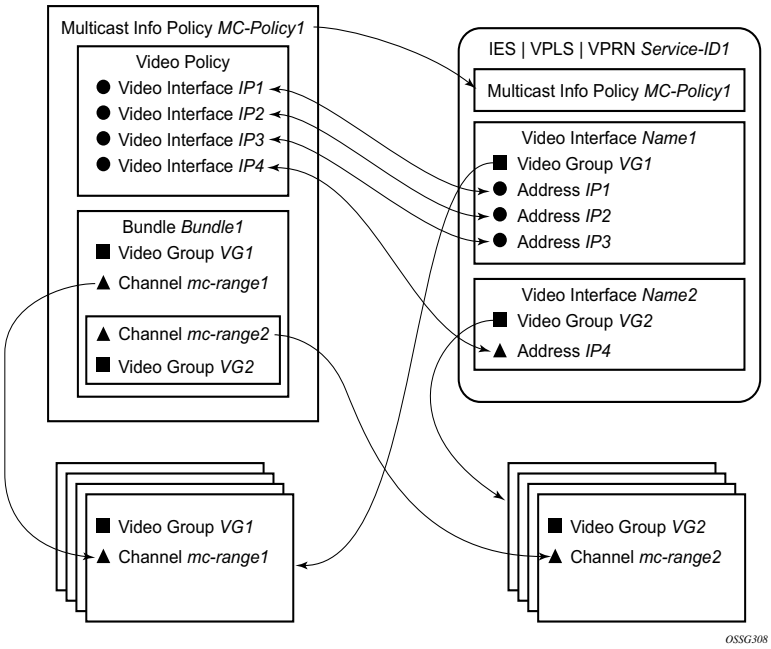

Figure 51: Video Services Configuration Elements

Note that a video interface within a service can have multiple IP address, and their association with the video interfaces within the video policy are based on IP addresses. Support for multiple video interface IP addresses for a given video interface allows video characteristics (burst rate, retransmission format, etc.) for the channels associated with the video interface to be based on the IP address on which the request is received.

Both the bundle/channel configuration and the video interface configuration within the service are associated with a specific video group. If the request is received on a video interface for a channel not serviced by the video group associated with the video interface, the request is invalid and is dropped. Figure 51 displays an example of this is a request for mc-range2 received on IP1, IP2 or IP3. A request for mc-range2 would only be valid on IP4.

As with other multicast information policies, the bundle name default is a special bundle and is reserved for setting of default values. If a video parameter is not explicitly set in a bundle/channel, the value set in the default bundle is used.

Configuring an ISA-MS Module

The ISA-MS hardware has an MDA form factor and is provisioned in the same manner as other MDAs in the **config>card>mda>mda-type** context.

Use the following commands to configure a ISA-MS module.

CLI Syntax:
```
config
    card slot-number
        mda slot-number
            mda-type isa-ms
```

The following output displays an ISA-MS configuration example:

```
*A:Dut-C>config>card# info
----------------------------------------------
        card-type iom2-20g
        mda 1
            mda-type isa-ms
        exit
        mda 2
            mda-type isa-ms
        exit
----------------------------------------------
*A:Dut-C>config>card#
```

Configuring a Video Group

When used for video services, ISA-MSes are logically grouped into video groups that pool the ISA buffering and processing resources into a single logical entity.

Use the following commands to configure a video group.

CLI Syntax:
```
config
    isa
        video-group video-group-id [create]
            description description-string
            primary mda-id
            [no] shutdown
```

The example shown below shows video-group 1 with a single ISA configured in slot 2/MDA 1.

```
*A:Dut-C>config>isa# info
----------------------------------------------------------------------------
        video-group 1 create
            description "Video Group 1"
            primary 7/2
            no shutdown
        exit
----------------------------------------------------------------------------
*A:Dut-C>config>isa#
```

Within the video group configuration, there are specific video application commands to enable features. These commands are described in the configuration examples for the application. Depending on the video application, more than one primary ISA-MS is allowed increasing the egress capacity of the video group.

Note: ISA-MS in a single video group cannot be on the same IOM. An IOM can accommodate two ISA-MS modules provided that the ISA-MS are members of different video groups.

Configuring a Video SAP and Video Interface in a Service

Video features in a VPLS service require the creation of a video SAP and a video interface. A video SAP is similar to other SAPs in the system in that QoS and filter policies can be associated with the SAP on ingress (traffic leaving the ISA and ingressing the system) and egress (traffic leaving system and entering the ISA).

Note that the video SAP is associated with a video group. Channels are also associated with a video group which is what establishes the link between what channels can be referenced through the video SAP. The multicast information policy associated with the service is where the channel to video group association is defined.

For unicast VPLS services that have an associated multicast service that is cross connected downstream of the router, the multicast service needs to be identified by the service ID in the unicast VPLS service.

The video commands for are identical in the IES and VPRN service contexts. The basic IES and VPRN commands are similar to the video commands in the VPLS context and follow the same logic of associating the video SAP with a video group and the multicast information policy defining the channel to video group association.

Another parameter defined for a channel in the multicast information policy that is important for video services is the administrative bandwidth defined for the channel. Many video applications use the bandwidth to determine if sufficient ISA egress bandwidth exists to service or drop a service request.

The following output displays an example video interface configuration.

```
A:IPTV-SR7>config>service>ies# info
----------------------------------------------
            video-interface "video-100" create
                video-sap 4
                exit
                address 1.1.1.254/8
                address 100.100.0.254/8
                address 101.1.1.254/24
                adi
                    channel 234.4.5.228 source 195.168.9.10 channel-name "228"
                        scte35-action drop
                      zone-channel 234.4.5.228 source 100.100.100.1 adi-channel-name "228-
1"
                    exit
                    scte30
                       ad-server 10.200.14.2
                       local-address control 100.1.1.2 data 100.1.1.3
                    exit
                exit
----------------------------------------------
A:IPTV-SR7>config>service>ies#
```

Basic Multicast Information Policy Configuration

Multicast information policies are used by the video applications to define multicast channel attributes and video policies which contains application-specific configuration for a video interface IP address.

Note that it is within the multicast information policy bundles, channels and source-overrides that a video group is assigned to a channel. The video group association is inherited from the more general construct unless it is explicitly disabled.

The administrative bandwidth for channels at the bundle, channel or source-override level is also defined in the multicast information policy. Video applications use the administrative bandwidth here when a channel rate estimate is needed.

A video policy is defined within the multicast information policy for a specific video interface IP address. The IP address for the video policy is the key value that associates it with a specific video interface IP address within a service associated with overall multicast information policy.

Refer to the 7x50 OS Triple Play Guide for CLI command descriptions and syntax usage information to configure multicast info policies.

The following output displays a policy example.

```
A:IPTV-SR7>config>mcast-mgmt># info
----------------------------------------------
            multicast-info-policy "ies100" create
                bundle "5.6.140" create
                    admin-bw 8000
                    video
                        video-group 1
                        local-rt-server
                        rt-buffer-size 3000
                    exit
                    channel "234.5.6.140" "234.5.6.140" create
                    exit
                exit
                bundle "default" create
                exit
                bundle "5.6.241-5.6.243" create
                    admin-bw 12000
                    video
                        video-group 1
                        rt-buffer-size 4000
                    exit
                    channel "234.5.6.241" "234.5.6.243" create
                    exit
                exit
            exit
----------------------------------------------
A:IPTV-SR7>config>router#
```

Sample Configurations

The following output displays configurations of VQM with packet selection.

```
*A:SR-7/Dut-C>config>mcast-mgmt># info
----------------------------------------------
            multicast-info-policy "vqm" create
                bundle "ixia" create
                    channel "235.5.5.6" "235.5.5.7" create
                        admin-bw 20000
                        video
                            video-group 4
                            rt-buffer-size 1000
                            analyzer
                                alarms
                                    cc-error
                                    pat-repetition tnc 400 qos 600 poa 700
                                    pat-syntax
                                    pid-pmt-unref
                                    pmt-repetition tnc 2300 qos 2500 poa 2700
                                    pmt-syntax
                                    vid-pid-absent 5000
                                    non-vid-pid-absent 5000
                                    pcr-repetition tnc 400 qos 600 poa 700
                                    scte-35
                                    tei-set
                                    ts-sync-loss
                                exit
                            exit
                            stream-selection source1 192.168.2.1 intf1 "ineo-ingress1"
source2 192.168.2.1 intf2 "ineo-ingress2"
                        exit
                        source-override "192.168.2.1" create
                        exit
                    exit
                exit
                bundle "default" create
                exit
            exit
----------------------------------------------
*A:SR-7/Dut-C>config>service# info
----------------------------------------------
        customer 1 create
            description "Default customer"
        exit
        ies 300 customer 1 vpn 300 create
            description "Default Ies description for service id 300"
            video-interface "video-300" create
                video-sap 4
                exit
                address 20.20.255.254/16
                channel 235.5.5.6 source 192.168.2.1 channel-name "Ineoquest-1"
                  zone-channel 235.5.5.6 source 20.20.0.1 adi-channel-name "Ineoquest-1-1"
                exit
                adi
                exit
                no shutdown
```

```
            exit
            service-name "XYZ Ies 300"
            no shutdown
        exit
-------------------------------------------
*A:SR-7/Dut-C>config>service#

*A:SR-7/Dut-C>config>router# info
-------------------------------------------
#--------------------------------------------------
echo "IP Configuration"
#--------------------------------------------------
        interface "ineo-ingress1"
            address 10.200.16.1/24
            port 3/2/12
            ingress
                filter ip 100
            exit
        exit
        interface "ineo-ingress2"
            address 10.200.17.1/24
            port 5/1/1
            ingress
                filter ip 200
            exit
        exit
        interface "ixia-egress"
            address 10.200.15.1/24
            port 3/2/15
        exit
        interface "system"
            address 10.20.3.1/32
        exit
        ecmp 2
        multicast-info-policy "vqm"
        static-route 192.168.2.1/32 next-hop 10.200.16.2 mcast-ipv4
        static-route 192.168.2.1/32 next-hop 10.200.17.2 mcast-ipv4
#--------------------------------------------------
echo "IGMP Configuration"
#--------------------------------------------------
        igmp
            interface "video-300-D"
                static
                    group 235.5.5.6
                        source 192.168.2.1
                    exit
                exit
            exit
            interface "video-300-D2"
                static
                    group 235.5.5.6
                        source 192.168.2.1
                    exit
                exit
            exit
            interface "ixia-egress"
                static
                    group 235.5.5.6
                        source 20.20.0.1
```

```
                    exit
                exit
            exit
        exit
#--------------------------------------------------
echo "PIM Configuration"
#--------------------------------------------------
        pim
            rpf-table rtable-m
            interface "video-300"
            exit
            interface "ineo-ingress1"
                multicast-senders always
            exit
            interface "ineo-ingress2"
                multicast-senders always
            exit
            rp
                static
                exit
                bsr-candidate
                    shutdown
                exit
                rp-candidate
                    shutdown
                exit
            exit
        exit
-------------------------------------------------
*A:SR-7/Dut-C>config>router#
*A:SR-7/Dut-C>config>isa# info
-------------------------------------------------
        video-group 4 create
            analyzer
            stream-selection
            primary 3/1
            no shutdown
        exit
-------------------------------------------------
*A:SR-7/Dut-C>config>isa#
```

The following output displays configurations of VQM without packet selection.

```
------------------------------------------
*A:SR-7/Dut-C>config>service# info
------------------------------------------
        customer 1 create
            description "Default customer"
        exit
        ies 300 customer 1 vpn 300 create
            description "Default Ies description for service id 300"
            interface "linux-ingress"  create
                address 10.10.33.228/24
                sap 3/2/17 create
                    description "sap-300-10.10.33.228"
                exit
            exit
            interface "linux-egress"  create
                address 10.10.34.228/24
                sap 3/2/7 create
                    description "sap-300-10.10.34.228"
                exit
            exit
            video-interface "video-300" create
                video-sap 2
                exit
                address 20.20.13.1/24
                channel 235.5.5.6 source 192.168.2.1 channel-name "A2-SP3"
                    zone-channel 235.5.5.6 source 20.20.13.2 adi-channel-name "A2-SP3-1"
                exit
                adi
                exit
                no shutdown
            exit
            service-name "XYZ Ies 300"
            no shutdown
        exit
------------------------------------------
*A:SR-7/Dut-C>config>service# /configure router
*A:SR-7/Dut-C>config>router# info
------------------------------------------
#------------------------------------------------
echo "IP Configuration"
#------------------------------------------------
        interface "system"
            address 10.20.1.1/32
        exit
        multicast-info-policy "A-server"
#------------------------------------------------
echo "Static Route Configuration"
#------------------------------------------------
        static-route 128.251.33.0/24 next-hop 10.10.33.229
        static-route 192.168.2.0/24 next-hop 10.10.33.229
#------------------------------------------------
echo "IGMP Configuration"
#------------------------------------------------
        igmp
            interface "video-300-D"
                static
```

```
                    group 235.5.5.6
                        source 192.168.2.1
                    exit
                exit
            exit
            interface "linux-egress"
                static
                    group 235.5.5.6
                        source 20.20.13.2
                    exit
                exit
            exit
        exit
#--------------------------------------------------
echo "PIM Configuration"
#--------------------------------------------------
        pim
            interface "linux-ingress"
                hello-interval 0
                multicast-senders always
            exit
            interface "linux-egress"
                hello-interval 0
            exit
            apply-to all
            rp
                static
                exit
                bsr-candidate
                    shutdown
                exit
                rp-candidate
                    shutdown
                exit
            exit
        exit
-------------------------------------------------
*A:SR-7/Dut-C>config>router# /configure isa
*A:SR-7/Dut-C>config>isa# info
-------------------------------------------------
        video-group 2 create
            analyzer
            primary 2/1
            no shutdown
        exit
-------------------------------------------------
*A:SR-7/Dut-C>config>isa# /configure mcast-management
*A:SR-7/Dut-C>config>mcast-mgmt># info
-------------------------------------------------
            multicast-info-policy "A-server" create
                bundle "LiveTv" create
                    channel "234.5.6.243" "234.5.6.243" create
                        admin-bw 3000
                        video
                            video-group 2
                            rt-buffer-size 1000
                        exit
                    exit
                    channel "235.5.5.6" "235.5.5.6" create
```

```
                        admin-bw 5000
                        video
                            video-group 2
                            rt-buffer-size 1000
                            analyzer
                                alarms
                                    cc-error
                                    pat-repetition tnc 200 qos 400 poa 600
                                    pat-syntax
                                    pid-pmt-unref
                                    pmt-repetition
                                    pmt-syntax
                                    vid-pid-absent 1000
                                    non-vid-pid-absent 1000
                                    pcr-repetition tnc 200 qos 400 poa 600
                                    scte-35
                                    tei-set
                                    ts-sync-loss
                                    report-alarm severity tnc
                                exit
                            exit
                        exit
                        source-override "128.251.33.37" create
                        exit
                    exit
                exit
                bundle "default" create
                exit
                bundle "mp2ts-ads" create
                    channel "234.4.5.1" "234.4.5.254" create
                        admin-bw 5000
                        video
                            video-group 2
                            rt-buffer-size 1000
                        exit
                    exit
                exit
            exit
-------------------------------------------
*A:SR-7/Dut-C>config>mcast-mgmt>#
```

Configuring RET/FCC Video Components with CLI

This section provides information to configure RET/FCC using the command line interface.

Topics in this section include:

Configuring RET/FCC Video Features in the CLI

The following sections provide configuration examples for the RET client, RET server and FCC server.

Configuring the RET Client

This section provides an example configuration for the RET client. The configuration example has the following assumptions:

- A single ISA-MS in slot 2/1 in video group 1
- A single channel 234.0.0.1 within multicast bundle “b1” with an administrative bandwidth of 2700 Kbps defined in **multicast-info-policy** *multicastinfopolicyname*.
- The upstream RET server for the channel is 4.4.4.4 on UDP port 4096
- A single video interface named “v1” in the service with IP address 3.3.3.3/24
- A RET client address of 3.3.3.4 for a VPLS and 3.3.3.3 for IES and VPRN case.

The first step in the configuration is to configure video group 1 and the ISA-MS hardware.

CLI Syntax:
```
config>isa
          video-group video-group-id [create]
             primary mda-id
             no shutdown
```

```
*A:ALA-48config>isa# info
----------------------------------------------
        video-group 1 create
            primary 2/1
            no shutdown
        exit
----------------------------------------------
*A:ALA-48config>isa#
```

CLI Syntax:
```
config# card slot-number
          mda mda-slot
                mda-type mda-type
```

```
*A:ALA-48config>card>mda#  info
----------------------------------------------
            mda-type isa-ms
----------------------------------------------
*A:ALA-48config>card>mda#
```

The channel parameters for 234.0.0.1 are configured in **multicast-info-policy** *multicastinfopolicyname*. The channel configuration includes the administrative bandwidth, the channel's association with video group 1 and the upstream RET server configuration for the channel (4.4.4.4 UDP port 4096). The following output displays the configuration. Refer to the CLI tree for a complete list of CLI commands.

```
*A:ALA-48config>mcast-mgmt>mcast-info-plcy# info
----------------------------------------------
            bundle "b1" create
                admin-bw 2700
                video
                    video-group 1
                    rt-server 4.4.4.4 port 4096
                exit
                channel "234.0.0.1" "234.0.0.1" create
                exit
            exit
            bundle "default" create
            exit
            video-policy
                video-interface 3.3.3.3 create
                exit
            exit
----------------------------------------------
*A:ALA-48configmcast-mgmtmcast-info-plcy#
```

Note that the channel parameters are actually defined for the channel bundle "b1" and the channel inherits those values based on the multicast information policy inheritance rules.

For the RET client in a VPLS, the following commands within the service instance perform the following tasks to complete the RET client configuration:

- Associate the VPLS with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi”.
- Create video SAP and associate it with video group 1.
- Assigns a RET client address and gateway.
- Create a static IGMP join on SAP 3/2/13:21 for the channel 234.0.0.1.

  Note that SAP 3/2/13:21 is a dummy SAP with the only purpose of attracting multicast traffic to the node to enable the caching. No subscribers are connected to it.

```
*A:ALA-48config>service>vpls# info
----------------------------------------------
            igmp-snooping
                no shutdown
            exit
            video-interface "vi" create
                video-sap 1
                exit
                address 3.3.3.3/24
                gateway-ip 3.3.3.253
                rt-client-src-address 3.3.3.4
                no shutdown
            exit
----------------------------------------------
*A:ALA-48config>service>vpls#



*A:ALA-48config>router# info
----------------------------------------------
...
            multicast-info-policy multicastinfopolicyname
            sap 3/2/13:21 create
                igmp-snooping
                    static
                        group 234.0.0.1
                            starg
                        exit
                    exit
                exit
            exit
...
----------------------------------------------
*A:ALA-48config>router#
```

Note that the RET client address is 3.3.3.4 which must be within the IP subnet assigned to the video interface (3.3.3.3/24).

For the RET client in an IES or VPRN, the following commands within the service instance perform these tasks to complete the RET client configuration:

- Associate the service with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi” and assign IP address 3.3.3.3.
- Create video SAP and associate it with video group 1.
- Creates a static IGMP join on the video interface for the channel 234.0.0.1. (7750 only)

```
*A:ALA-48config>service>ies# info
----------------------------------------------
            video-interface "vi" create
                video-sap 1
                exit
                address 3.3.3.3/32
                no shutdown
            exit
...
----------------------------------------------
*A:ALA-48config>service>ies#


*A:ALA-48config>router# info
----------------------------------------------
...
    multicast-info-policy multicastinfopolicyname
    pim (7750 only)
        interface "vi"
        exit
    exit
    igmp (7750 only)
        interface "vi"
            static
                group 234.0.0.1
                    starg
                exit
            exit
        exit
----------------------------------------------
*A:ALA-48config>router#
```

The RET client address is 3.3.3.3 which is the address assigned to the video interface in the video policy portion of the multicast information policy.

Configuring the RET Server

This section provides an example configuration for the RET server. The configuration example has the following assumptions:

- A single ISA-MS in slot 2/1 in video group 1
- A single channel 234.0.0.1 within multicast bundle “b1” with an administrative bandwidth of 2700 Kbps defined in **multicast-info-policy** *multicastinfopolicyname.*
- A retransmission buffer for the channel set to 300 milliseconds.
- The RET rate is 5% of nominal.
- Local RET server address is 3.3.3.3 with destination port is UDP 4096.

The first step in the configuration is to configure video group 1 enabling the RET server and the ISA-MS hardware.

CLI Syntax:
```
config>isa
          video-group video-group-id [create]
             local-rt-server
             no shutdown
```

```
*A:ALA-48config>isa# info
----------------------------------------------
        video-group 1 create
            local-rt-server
            primary 2/1
            no shutdown
        exit
----------------------------------------------
*A:ALA-48config>isa#
```

```
*A:ALA-48config>card 2>mda 1# info
----------------------------------------------
            mda-type isa-ms
----------------------------------------------
*A:ALA-48config>card>mda#
```

Note the **local-rt-server** command in the above output enables the local RET server on the video group.

The channel parameters for 234.0.0.1 are configured in **multicast-info-policy** *multicastinfopolicyname.* The channel configuration includes the administrative bandwidth and the channel's association with video group 1.

```
*A:ALA-48config>mcast-mgmt>mcast-info-plcy# info
----------------------------------------------
            bundle "default" create
                local-rt-port 4096
            exit
            bundle "b1" create
                admin-bw 2700
                video
                    video-group 1
                    local-rt-server
                    rt-buffer-size 300
                exit
                channel "234.0.0.1" "234.0.0.1" create
                exit
            exit
            video-policy
                video-interface 3.3.3.3 create
                    rt-rate 5
                    hd
                        local-rt-server
                    exit
                    sd
                        local-rt-server
                    exit
                    pip
                        local-rt-server
                    exit
                exit
            exit
----------------------------------------------
*A:ALA-48config>mcast-mgmt>mcast-info-plcy#
```

Note the **local-rt-port** command in the bundle "default" defines the destination UDP port used to reach the local RET server on the service where the multicast information policy is applied. The RET server port can only be defined in the bundle "default" and applies for all bundles in the policy. If no value is specified, the default is used.

In the bundle "b1" the **local-rt-server** command enables the RET server for all channels in the bundle, and the **rt-buffer-size** *rt-buffer-size* command sets the retransmission buffer for all channels in the bundle to 300 milliseconds.

In the video policy above, the **local-rt-server** commands for the video interface 3.3.3.3 enables the RET server on that interface for all channel types "hd" (High Definition), "sd" (Standard Definition) and "pip" (Picture-in-Picture). The **rt-rate** *rt-burst-percentage* command in the policy indicates that the retransmission rate will be 5% of the nominal rate for all channel types; individual rates can be defined if desired.

For the RET server in a VPLS, these commands within the service instance perform the following tasks to complete the RET server configuration:

- Associate the VPLS with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi”.
- Create video SAP and associate it with video group 1.
- Assigns an IP address 3.3.3.3 to the video interface.
- Create a static IGMP join on SAP 3/2/13:21 for the channel 234.0.0.1.

  Note that SAP 3/2/13:21 is a dummy SAP with the only purpose of attracting multicast traffic to the node to enable the caching. No subscribers are connected to it.

```
*A:ALA-48config>service>vpls# info
----------------------------------------------
            igmp-snooping
                no shutdown
            exit
            video-interface "vi" create
                video-sap 1
                exit
                address 3.3.3.3/32
                no shutdown
            exit
            multicast-info-policy multicastinfopolicyname
            sap 3/2/13:21 create
                igmp-snooping
                    static
                        group 234.0.0.1
                            starg
                        exit
                    exit
                exit
            exit
----------------------------------------------
*A:ALA-48config>service>vpls#
```

The services available on the video interface address 3.3.3.3 are defined in the video policy in which the RET server was enabled.

For the RET server in an IES or VPRN, these commands within the service instance perform the following tasks to complete the RET server configuration:

- Associate the service with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi” and assign IP address 3.3.3.3.
- Create video SAP and associate it with video group 1.
- Creates a static IGMP join on video-interface “vi” for the channel 234.0.0.1.

```
*A:ALA-48config>service>ies# info
----------------------------------------------
            video-interface "vi" create
                video-sap 1
                exit
                address 3.3.3.3/32
                no shutdown
            exit
    multicast-info-policy multicastinfopolicyname
    pim
        interface "vi"
        exit
    exit
    igmp
        interface "vi"
            static
                group 234.0.0.1
                    starg
                exit
            exit
        exit
----------------------------------------------
*A:ALA-48config>service>ies#
```

The services available on the video interface address 3.3.3.3 are defined in the video policy in which the RET server was enabled.

Configuring the FCC Server

This section provides an example configuration for the FCC server. The configuration example has the following assumptions:

- A single ISA-MS in slot 2/1 in video group 1.
- A single channel 234.0.0.1 within multicast bundle “b1” with an administrative bandwidth of 8000 Kbps defined in **multicast-info-policy** *multicastinfopolicyname*.
- The FCC mode is burst with a rate 130% of nominal for HD, 200% for SD, and disabled for PIP.
- Local FCC server address is 3.3.3.3 with destination port is UDP 4098.

CLI Syntax:
```
config>isa
        video-group video-group-id [create]
           fcc-server
           no shutdown
```

The first step in the configuration is to configure video group 1 enabling the RET server and the ISA-MS hardware.

```
*A:ALA-48config>isa# info
----------------------------------------------
        video-group 1 create
            fcc-server
            primary 2/1
            no shutdown
        exit
----------------------------------------------
*A:ALA-48config>isa#


*A:ALA-48config>card>mda# info
----------------------------------------------
            mda-type isa-ms
----------------------------------------------
*A:ALA-48config>card>mda#
```

Note the **fcc-server** command in the above output enables the FCC server on the video group.

The channel parameters for 234.0.0.1 are configured in **multicast-info-policy** *multicastinfopolicyname.* The channel configuration includes the administrative bandwidth and the channel's association with video group 1.

```
*A:ALA-48configmcast-mgmtmcast-info-plcy# info
----------------------------------------------
            bundle "default" create
                local-fcc-port 4098
            exit
            bundle "b1" create
                admin-bw 8000
                video
                    video-group 1
                    fcc-server
                    fcc-channel-type hd
                exit
                channel "234.0.0.1" "234.0.0.1" create
                exit
            exit
            video-policy
                video-interface 3.3.3.3 create
                    rt-rate 5
                    hd
                        fcc-server mode burst
                        fcc-burst 30
                    exit
                    sd
                        fcc-server mode burst
                        fcc-burst 100
                    exit
                    pip
                        no fcc-server
                    exit
                exit
            exit
----------------------------------------------
*A:ALA-48configmcast-mgmtmcast-info-plcy#
```

Note the **local-fcc-port** command in the bundle "default" defines the destination UDP port used to reach the FCC server on the service where the multicast information policy is applied. The FCC server port can only be defined in the bundle "default" and applies for all bundles in the policy. If no value is specified, the default is used.

In the bundle "b1", the **fcc-server** command enables the FCC server for all channels in the bundle, and the **fcc-channel-type hd** command sets the channel type for all channels in the bundle to "hd" (High Definition).

In the video policy context above, the **fcc-server** commands for the video interface 3.3.3.3 enables the FCC server on that interface for all channel types "hd" (High Definition), "sd" (Standard Definition) whereas the **no fcc-server** command disables the FCC for "pip" (Picture-in-Picture) channels on the video interface. The **fcc-burst** command in the policy indicates that the burst rate over the nominal rate for the channel type; HD at 130% (30% over nominal) and SD at 200% (100% over nominal).

For the FCC server in a VPLS, the following commands within the service instance perform the following tasks to complete the FCC server configuration:

- Associate the VPLS with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi”.
- Create video SAP and associate it with video group 1.
- Assigns an IP address 3.3.3.3 to the video interface.
- Create a static IGMP join on SAP 3/2/13:21 for the channel 234.0.0.1.

  Note that SAP 3/2/13:21 is a dummy SAP with the only purpose of attracting multicast traffic to the node to enable the caching. No subscribers are connected to it.

```
*A:ALA-48configservicevpls# info
----------------------------------------------
            igmp-snooping
                no shutdown
            exit
            video-interface "vi" create
                video-sap 1
                exit
                address 3.3.3.3/32
                no shutdown
            exit
            multicast-info-policy multicastinfopolicyname
            sap 3/2/13:21 create
                igmp-snooping
                    static
                        group 234.0.0.1
                            starg
                        exit
                    exit
                exit
            exit
----------------------------------------------
*A:ALA-48configservicevpls#
```

The services available on the video interface address 3.3.3.3 are defined in the video policy in which the FCC server was enabled.

For the FCC server in an IES or VPRN, the following commands within the service instance perform the following tasks to complete the FCC server configuration:

- Associate the service with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface “vi” and assign IP address 3.3.3.3.
- Create video SAP and associate it with video group 1.
- Creates a static IGMP join on video-interface “vi” for the channel 234.0.0.1.

```
*A:ALA-49configserviceies# info
----------------------------------------------
            video-interface "vi" create
                video-sap 1
                exit
                address 4.4.4.4/32
                no shutdown
            exit
----------------------------------------------
*A:ALA-49configserviceies#


*A:ALA-48configrouter# info
----------------------------------------------
...
    multicast-info-policy multicastinfopolicyname
    pim
        interface "vi"
        exit
    exit
    igmp
        interface "vi"
            static
                group 234.0.0.1
                    starg
                exit
            exit
        exit
----------------------------------------------
*A:ALA-48configrouter#
```

The services available on the video interface address 3.3.3.3 are defined in the video policy in which the FCC server was enabled.

Logging and Accounting Collection for Video Statistics

The following output displays a configuration example used in logging and accounting for video.

```
*A:SR-7/Dut-C>config>log# info
----------------------------------------------
        file-id 1
            location cf3:
        exit
        accounting-policy 1
            shutdown
            record video
            collection-interval 5
            to file 1
        exit
...
----------------------------------------------
*A:SR-7/Dut-C>config>log#
```

Use the following CLI to enable logging and accounting to a service to collect stats for that particular service.

Example:

```
*A:SR-7/Dut-C>config>service>ies# video-interface "vi" accounting-policy 1
*A:SR-7/Dut-C>config>service>ies# info
  video-interface "vi" create
        accounting-policy "1"
  exit
```

Start ing stats collection can be enabled by executing a **no shutdown** command on the accounting policy. This starts the recording of stats and the stats will be written in an act-collect directory and a **shutdown** command on the accounting policy will move the recorded file to act directory.

Configuring ADI Components with CLI

This section provides information to configure ADI using the command line interface.

Topics in this section include:

Configuring ADI in CLI

Configuring the RET Client

This section provides an example configuration for the ADI splicer. The configuration example makes the following assumptions:

- A single ISA-MS is configured in slot 2/1 in video group 1.
- The NTP server for the router is 192.168.15.221.
- A single channel main 234.5.6.140 within multicast bundle “b1” is defined in the **multicast-info-policy** *multicastinfopolicyname* context.
- IES service 100 is a Layer 3 service in which ADI will be performed.
- The video interface in IES 100 is 100.100.0.254/8
- The ad server address is 10.200.14.2
- The splicer’s local addresses used to communicate with the ad server are 100.1.1.2 for control traffic and 100.1.1.3 for data traffic.
- For the SCTE 30 communication in the example, the main channel is named 228 with (S,G) = (195.168.9.10,234.4.5.228) and the zone channel is named 228-1with (S,G) = (100.100.100.1,234.4.5.228).
- Must have an IGMP static entry for the network channel (S,G) on the video-interface to attract the network traffic to the video interface.
- Must have the video-interface enabled in PIM.

Configuring a Video Group

The first step in the configuration is to configure a video group (*video-group-id* = 1) and enabling ad insertion and the ISA-MS hardware. Note the **ad-insert** command enables the ADI splicer on the video group.

```
A:ALA-49>config>isa# info
----------------------------------------------
...
        video-group 1 create
            description "Video Group 1"
            ad-insert
            primary 7/2
            no shutdown
        exit
...
----------------------------------------------
A:ALA-49>config>isa#
```

The following output shows the card and MDA configuration.

```
A:ALA-49>config>card# info
----------------------------------------------
        card-type iom2-20g
        mda 1
            shutdown
            mda-type isa-ms
        exit
        mda 2
            mda-type isa-ms
        exit
----------------------------------------------
A:ALA-49>config>card#
```

Configuring NTP

NTP is required on the splicer to ensure that time is synchronized between it and the ad server.

```
A:ALA-49>config>system>time# info
----------------------------------------------
            ntp
                no authentication-check
                ntp-server
                server 192.168.15.221
                no shutdown
            exit
...
----------------------------------------------
A:ALA-49>config>system>time#
```

Configuring Channel Parameters

The channel parameters for 234.4.5.228 are configured in the **multicast-info-policy** *multicastinfopolicyname* context. For ADI, the channel configuration required is the channel's association with video group 1.

```
*A:ALA-49>config>mcast-mgmt# info
----------------------------------------------
...
            multicast-info-policy "multicastinfopolicyname" create
                bundle "b1" create
                    video
                        video-group 1
                    exit
                    channel "234.4.5.228" "234.4.5.228" create
                    exit
                exit
                bundle "default" create
                exit
            exit
...
----------------------------------------------
*A:ALA-49>config>mcast-mgmt#
```

Configuring Service Entities

In addition to the commands needed to configure a service, the following commands within the service instance are used to perform the following ADI configuration steps. This example uses an IES service context.

- Associate IES 100 with **multicast-info-policy** *multicastinfopolicyname.*
- Create the video interface video-100.
- Create a video SAP and associate it with video group 1.
- Assigns an IP address 100.100.0.254 to the video interface and subnet 100.0.0.0/8.
- Name the main channel (S,G) = (195.168.9.10,234.4.5.228) “228” and the zone channel (S,G) = (100.100.100.1,234.4.5.228) “228-1”.
- Configure the ad server (address = 10.200.14.2) and create IP addresses within the video interface subnet for SCTE 30 control traffic (100.1.1.2) and data traffic (100.1.1.3).
- The control and data addresses must be in the video interface subnet.

```
*A:ALA-49>config>service>ies# info
----------------------------------------------
...
            video-interface "video-100" create
                video-sap 1
                exit
                address 100.100.0.254/8
                adi
                    channel 234.4.5.228 source 195.168.9.10 channel-name "228"
                        scte35-action drop
                      zone-channel 234.4.5.228 source 100.100.100.1 adi-channel-name "228-
1"
                    exit
                    scte30
                        ad-server 10.200.14.2
                        local-address control 100.1.1.2 data 100.1.1.3
                    exit
                exit
                no shutdown
            exit
            no shutdown
----------------------------------------------
*A:ALA-49>config>service>ies#
```

Note that the source address (100.100.100.1) for the zone channel (S,G) and the local addresses (100.1.1.2 and 100.1.1.3) used for SCTE 30 communication must all be within the video interface subnet (100.0.0.0/8).

Connections are accepted from multiple ad-servers. This can be used for ad server redundancy.

If the main channel were a (*,G), the source address of 0.0.0.0 would have been specified.

Additional zone channels with distinct names could be configured within the service instance. In a practical configuration, the G for the main channel (234.4.5.228) will be the same for G in the zone channel (S,G) because the STBs will join the (*,G) at the A-server and D-server.

Configuring ADI for a VPRN service instance uses the same commands within the VPRN service context.