

SMDS Configuration Commands

Use the commands in this chapter to configure the Switched Multimegabit Data Service (SMDS), a wide-area networking service offered by some Regional Bell Operating Companies (RBOCs) and MCI.

For SMDS configuration information and examples, refer to the *Communication Server Configuration Guide*.

arp

Use the following variation of the **arp** interface configuration command to enable ARP entries for static routing over the SMDS network. Use the **no arp** command to disable this capability.

```
arp IP-address SMDS-address smds  
no arp IP-address SMDS-address smds
```

Syntax Description

| | |
|---------------------|-----------------------|
| <i>IP-address</i> | The IP address. |
| <i>SMDS-address</i> | The SMDS address. |
| smds | Enables ARP for SMDS. |

Default

None

Command Mode

Interface configuration

Example

The following example sets a static ARP entry for routing from IP network 131.108.173.28 to SMDS address C141.5797.1313 on interface serial 0:

```
interface serial 0  
arp 131.108.173.28 C141.5797.1313 smds
```

Related Command

smds enable-arp

encapsulation smds

Use the **encapsulation smds** interface configuration command to enable SMDS service on the desired interface.

encapsulation smds

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Usage Guidelines

The interface to which this command applies must be a serial interface. All subsequent SMDS configuration commands only apply to an interface with encapsulation SMDS.

Note The maximum packet size allowed in the SMDS specifications (TA-772) is 9188. This is larger than the packet size used by servers with most media. The Cisco default MTU size is 1500 bytes, to be consistent with Ethernet. If a larger MTU is used, the **mtu** command must be entered before the **encapsulation smds** command.

Keep in mind, however, that the Cisco MCI card has buffer limitations that prevent setting the MTU size higher than 2048, and the HSSI card has buffer limitations that prevent setting the MTU size higher than 4500. Configuring higher settings has caused communication server inconsistencies and performance problems.

Example

The following example shows how to configure the SMDS service on serial interface 0:

```
interface serial 0
 encapsulation smds
```

Related Command

A dagger (†) indicates that the command is documented in another chapter.

mtu†

show arp

Use the **show arp** EXEC command to display the entries in the ARP table for the communication server.

```
show arp
```

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Sample Display

The following is sample output from the **show arp** command:

```
cs# show arp

Protocol   Address                Age (min)   Hardware Addr   Type   Interface
```

Table 1-1 describes significant fields shown in the display.

Table 1-1 Show ARP Field Descriptions

| Field | Description |
|---------------|--|
| Protocol | Type of network address the entry includes. |
| Address | Network address that is mapped to the MAC address in this entry. |
| Age (min) | Interval (in minutes) since this entry was entered in the table, rather than the interval since the entry was last used. (The timeout value is 4 hours.) |
| Hardware Addr | MAC address mapped to the network address in this entry. |
| Type | Encapsulation type the communication server is using for the network address in this entry. Possible values include: <ul style="list-style-type: none">• ARPA• SNAP• ETLK (EtherTalk)• SMDS |
| Interface | Interface associated with this network address. |

show smds addresses

Use the **show smds addresses** EXEC command to display the individual addresses and the interface that they are associated with.

```
show smds addresses
```

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Sample Display

The following is sample output from the **show smds addresses** command:

```
cs# show smds addresses  
  
SMDS address - Serial0 c141.5555.1212
```

Table 1-2 describes significant fields shown in the display.

Table 1-2 Show SMDS Addresses Field Descriptions

| Field | Description |
|----------------|---|
| Serial0 | Interface to which this SMDS address has been assigned. |
| c141.5555.1212 | SMDS address that has been assigned to the interface. |

show smds map

Use the **show smds map** EXEC command to display all SMDS addresses that are mapped to higher-level protocol addresses.

show smds map

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Sample Display

The following is sample output from the **show smds map** command:

```
cs# show smds map

Serial0:  ARP maps to e180.0999.9999 multicast
Serial0:  IP maps to e180.0999.9999 150.108.42.112 255.255.255.0 multicast
Serial0:  XNS 1006.AA00.0400.0C55 maps to c141.5688.1212 static [broadcast]
```

Table 1-3 describes significant fields shown in the output

Table 1-3 Show SMDS Map Field Descriptions

| Field | Description |
|----------------|--|
| Serial0 | Name of interface on which SMDS has been enabled. |
| ARP maps to | Higher-level protocol address that maps to this particular SMDS address. |
| e180.0999.9999 | SMDS address. Includes all SMDS addresses entered with either the smds static-map command (static) and smds multicast command (multicast). |
| 150.108.21.112 | IP address. |
| 255.255.255.0 | Subnet mask for the IP address. |

Note Trailing Fs are implied in displays showing the SMDS addresses.

show smds traffic

Use the **show smds traffic** EXEC command to display statistics on bad SMDS packets the communication server has received.

show smds traffic

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Sample Display

The following is sample output from the **show smds traffic** command:

```
communication server# show smds traffic
624363 Input packets
759695 Output packets
2 DXI heartbeat sent
0 DXI heartbeat received
0 DXI DSU polls received
0 DXI DSU polls sent
0 DXI invalid test frames
0 Bad BA size errors
0 Bad Header extension errors
65 Invalid address errors
1 Bad tag errors
```

Table 1-4 describes significant fields shown in the output.

Table 1-4 Show SMDS Traffic Field Descriptions

| Field | Description |
|-------------------------------|---|
| 0 Input packets | Number of input packets. |
| 0 Output packets | Number of output packets. |
| 0 DXI heartbeat sent | Number of DXI heartbeat polls transmitted. |
| 0 DXI heartbeat received | Number of DXI heartbeat polls received. |
| 0 DXI DSU polls sent | Number of DXI DSU polls sent. |
| 0 DXI DSU polls received | Number of DXI DSU polls received. |
| 0 DXI invalid test frames | Number of invalid test frames seen. |
| 0 Bad BA size errors | Number of packets that have a size less than 32 bytes or greater than 9188 bytes. |
| 0 Bad Header extension errors | Number of extended SIP L3 header errors. |
| 65 BadInvalid address errors | Number of address errors |
| 0 Bad tag errors | Status indicating the number of errors that occur when there is a mismatch between the BeTag values in the header and trailer of a SMDS frame. This usually indicates that there is a misconfiguration (that is, a DXI is connected to a non-DXI) or that the SDSU is scrambling the L2 PDUs. |

smds address

Use the **smds address** interface configuration command to specify the SMDS individual address for a particular interface. Use the **no smds address** command to remove the address from the configuration file.

```
smds address SMDS-address  
no smds address SMDS-address
```

Syntax Description

SMDS-address An individual address provided by the SMDS service provider. This address is protocol independent. See the “Usage Guidelines” section for more information.

Default

None

Command Mode

Interface configuration

Usage Guidelines

All addresses for SMDS service are assigned by the service provider, and can be assigned to individuals and groups.

A multicast address is entered in the Cisco SMDS configuration software using the standard E prefixes. The E1 prefix specifies North American addresses; the E0 prefix specifies European addresses. A unicast address is entered in the Cisco SMDS configuration software using the standard C prefixes. The C1 prefix specifies North American addresses; the C0 prefix specifies European addresses.

The Cisco software expects the addresses to be entered in a slightly modified E.164 format. E.164 format is 64 bits. The first 4 bits are type code followed by 4 bits of country code, followed by 10 BCD digits with the final 16 bits all ones. The full E.164 address is not required. The trailing FFFFs are not needed. They are not displayed and it is not necessary to type them when entering an address.

Example

The following example shows how to specify an individual address in Ethernet-style notation:

```
interface serial 0  
smds address c141.5797.1313
```


smds dxi

Use the **smds dxi** interface configuration command to reenble the DXI 3.2 support. Use the **no smds dxi** command to turn the DXI 3.2 support off.

smds dxi
no smds dxi

Syntax Description

This command has no arguments or keywords.

Default

On

Command Mode

Interface configuration

Usage Guidelines

Adding this command to the configuration enables the Data Exchange Interface (DXI) Version 3.2 mechanism and encapsulates SMDS packets in a DXI frame before they are transmitted. DXI3.2 adds an additional four bytes to the SMDS packet header to communicate with the SDSU. These bytes specify the frame type. The interface will expect all packets to arrive with DXI encapsulation.

The DXI 3.2 support also includes the heartbeat process as specified in the SIG-TS-001/1991 standard, revision 3.2. The heartbeat (active process) is enabled when both DXI and keepalives are enabled on the interface. The echo (passive process) is enabled when DXI is enabled on the interface. The heartbeat mechanism automatically generates a heartbeat poll frame every 10 seconds. This default value can be changed with the **keepalive** command. The Interim Local Management Interface (ILMI) is not supported.

Note Switching in or out of DXI mode causes the IP cache to be cleared. This is necessary to remove all cached IP entries for the serial line being used. Stale entries must be removed to allow the new MAC header with or without DXI framing to be installed in the cache. This is not frequently done and is not considered to be a major performance penalty.

Example

The following example shows how to enable DXI 3.2 on interface HSSI 0:

```
interface hssi 0
 encapsulation smds
 smds dxi-mode
 smds address C120.1111.2222
 ip address 131.108.1.30 255.255.255.0
 smds multicast ip E180.0999.9999
 smds enable-arp
```

Related Command

A dagger (†) indicates that the command is documented in another chapter.

keepalive†

smds enable-arp

Use the **smds enable-arp** interface configuration command to enable the Address Resolution Protocol (ARP). The multicast address for ARP must be set before this command is issued. Once ARP has been enabled, use the **no smds enable-arp** command to return the interface to the default state.

```
smds enable-arp  
no smds enable-arp
```

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Interface configuration

Example

The following example illustrates how to enable the dynamic ARP routing table:

```
interface serial 0  
ip address 131.108.1.30 255.255.255.0  
smds multicast IP E180.0999.9999  
smds enable-arp
```

Related Command

arp

smds multicast

Use the **smds multicast** interface configuration command to map an SMDS group address to a broadcast or multicast address used by higher-level protocols. Use the **no smds multicast** command with the appropriate address to remove a multicast address.

smds multicast *protocol-type* *SMDS-address*
no smds multicast *protocol-type* *SMDS-address*

Syntax Description

| | |
|----------------------|--|
| <i>protocol-type</i> | The protocol type; see Table 1-5 for a list of supported protocols and their keywords. |
| <i>SMDS-address</i> | The SMDS address. Since SMDS does not incorporate broadcast addressing, a group address for a particular protocol must be defined to serve the broadcast function. |

Table 1-5 Supported Protocols

| Keyword | Protocol |
|---------------|------------|
| ip | IP |
| arp | ARP |
| novell | Novell IPX |

Default

None

Command Mode

Interface configuration

Example

The following example shows how to map the IP broadcast address to the SMDS group address E180.0999.9999:

```
interface serial 0
smds multicast IP E180.0999.9999
```

smds multicast arp

Use the **smds multicast arp** interface configuration command to map the SMDS address to a multicast address. Use the **no smds multicast arp** command to disable this feature.

```
smds multicast arp SMDS-address [IP-address mask]  
no smds multicast arp SMDS-address [IP-address mask]
```

Syntax Description

| | |
|---------------------|---|
| <i>SMDS-address</i> | SMDS address in E.164 format. |
| <i>IP-address</i> | (Optional.) IP address. |
| <i>mask</i> | (Optional.) Subnet mask for the IP address. |

Default

None

Command Mode

Interface configuration

Usage Guidelines

This command is only used when an ARP server is present on a network. When broadcast ARPs are sent, SMDS first attempts to send the packet to all multicast ARP SMDS addresses. If none exist in the configuration, they are sent to all multicast IP SMDS multicast addresses. If the optional ARP multicast address is missing, each entered IP multicast command will be used for broadcasting.

Example

The following example illustrates how to configure broadcast ARP messages:

```
interface serial 0  
smds multicast arp E180.0999.9999
```

Related Command

smds multicast ip

smds multicast ip

Use the **smds multicast ip** interface configuration command to map an SMDS group address to a secondary IP address. Use the **no smds multicast ip** command to remove the address map.

```
smds multicast ip SMDS-address [IP-address mask]  
no smds multicast ip SMDS-address [IP-address mask]
```

Syntax Description

| | |
|---------------------|---|
| <i>SMDS-address</i> | SMDS address in E.164 format. |
| <i>IP-address</i> | (Optional.) IP address. |
| <i>mask</i> | (Optional.) Subnet mask for the IP address. |

Default

The IP address and mask will default to the primary address of the interface if they are left out of the configuration.

Command Mode

Interface configuration

Usage Guidelines

This command allows a single SMDS interface to be treated as multiple logical IP subnets (MultiLIS). If taking advantage of the MultiLIS support in SMDS, you can use more than one multicast address on the SMDS interface, that is, multiple commands can be entered. However, each **smds multicast ip** command entry must be associated with a different IP address on the SMDS interface.

Broadcasts can be sent on the SMDS interface using the multicast address. By sending broadcasts in this manner, the communication server is not required or replicate broadcasts messages to every remote host.

In addition, the higher-level protocols such as OSPF can use the multicast capability by sending one update packet or routing packet to the multicast address.

If the optional IP address and mask arguments are not present, the SMDS address and multicast address are associated with the primary IP address of the interface. This allows the command to be backward compatible with earlier versions of the software.

If an ARP multicast address is missing, each entered IP multicast command will be used for broadcasting. The ARP multicast command has the same format as the IP multicast command and is typically used only when an ARP server is present in the network.

Note All communication servers at the other end of the SMDS cloud must have the MultiLIS capability enabled. A receiving communication server must have the primary IP network address of the transmitter configured as a secondary IP network. This is required in order for replies to return. IP discards all packets with a destination address not equal to the primary network address on the SMDS interface.

Example

The following example configures an interface that supports two different subnets with different multicast addresses to each network. The first multicast configuration command associates the multicast address with the primary IP address and mask of the interface.

```
interface hssi 0
encapsulation smds
smds address C120.1111.2222
ip address 131.108.1.30 255.255.255.0
ip address 131.108.5.30 255.255.255.0 secondary
smds multicast ip E180.0999.9999
smds multicast ip E180.0333.3333 131.108.5.0 255.255.255.0
smds enable-arp
```

Related Command

smds multicast arp

smds static-map

Use the **smds static-map** interface configuration command to configure a static map between an individual SMDS address and a higher-level protocol address. Use the **no smds static-map** command with the appropriate arguments to remove the map.

```
smds static-map protocol-type protocol-address SMDS-address [broadcast]  
no smds static-map protocol-type protocol-address SMDS-address [broadcast]
```

Syntax Description

| | |
|-------------------------|---|
| <i>protocol-type</i> | Supported protocol type: ip or novell . |
| <i>protocol-address</i> | Address of the higher-level protocol. |
| <i>SMDS-address</i> | SMDS address, to complete the mapping. |
| broadcast | (Optional.) Marks the specified protocol address as a candidate for broadcast packets. All broadcast requests will be sent to the unicast SMDS address. |

Default

None

Command Mode

Interface configuration

Usage Guidelines

This command provides pseudobroadcasting by allowing the use of broadcasts on those hosts that cannot support SMDS multicast addresses. Using pseudo-broadcasts can degrade performance.

Examples

The following example illustrates how to enable pseudobroadcasting. In addition to broadcasting IP and ARP requests to E180.0999.9999, the device at address C120.4444.9999 will also receive a copy of the broadcast request. The host at address 131.108.1.15 is incapable of receiving multicast packets. The multicasting is simulated with this feature.

```
interface hssi 0  
encapsulation smds  
smds address C120.1111.2222  
ip address 131.108.1.30 255.255.255.0  
smds static-map ip 131.108.1.15 C120.4444.9999 broadcast  
smds enable-arp
```


The following example illustrates how to enable multicasting. In addition to IP and ARP requests to E180.0999.9999, the device at address C120.4444.9999 will also receive a copy of the multicast request. The host at address 131.108.1.15 is incapable of receiving broadcast packets.

```
interface hssi 0
encapsulation smds
smds address C120.1111.2222
ip address 131.108.1.30 255.255.255.0
smds multicast ip E100.0999.999
smds static-map ip 131.108.1.15 C120.4444.9999
smds enable-arp
```

