The BCC is case-sensitive. Enter all commands using lowercase letters.

To recall any command from the history list, press the up arrow (or Control-p) or down arrow (or Control-n).

To display online Help, enter the **help** commands after either the `bcc>` prompt (indicating operations mode) or the `box#` prompt (indicating configuration mode), as Table 1 shows.

Table 1. Displaying BCC Help

Task	Command
List the online Help features.	**help**
List all system commands.	**help commands**
List all system commands with terse descriptions.	**help commands -more**
Display help for a specific command.	**help** *<command>*

Configuring the Versalar 15000

When you enter configuration commands, they immediately modify the configuration.

The Versalar™ 15000 uses a hierarchical tree configuration model similar to the DOS hierarchy of directories and files. The configuration tree for the Versalar 15000 contains:

- ***Objects:*** An Ethernet interface or a protocol is an object (a physical or logical entity you can configure).
- ***Parameters:*** Characteristics of an object; **slot** and **connector** are parameters of the object **mct3**. Parameters have *values*; for example, **slot 4** is a parameter-value pair.

Starting at the root level, you build a BCC™ configuration by adding objects to the tree. Every object occupies a specific level, or *context*, within the tree. Figure 1 shows the BCC commands you enter to create a sample portion of the tree.

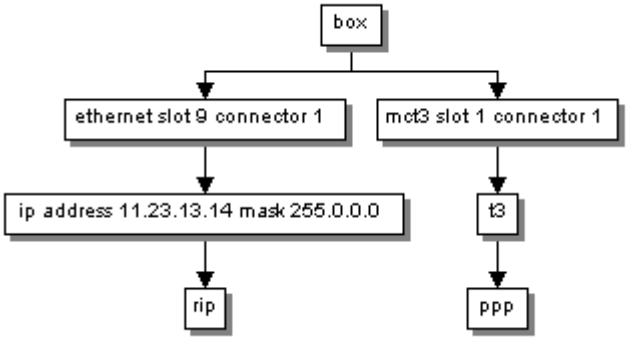

Figure 1. Using BCC Commands to Create a Configuration

The `mct3` object stands for *multichannel T3*. (Figure 1 does not show the configurable objects under the `ppp` object.)

The following example shows how to configure these services:

```
box# ethernet slot 9 connector 1
ethernet/9/1# ip 11.23.13.14/8
ip/11.23.13.14/255.0.0.0# rip
rip/11.23.13.14# box
box# mct3 slot 1 connector 1
mct3/1/1# t3
t3/1/1# ppp
ppp/1/1#
```

The BCC creates a *unique identifier* for each object that you add to the tree. The ID consists typically of the object name plus any parameter values required for configuration, such as in the example above, `ethernet/9/1`. The slash (/) characters are part of the ID.

When the BCC is in configuration mode, you can go to any configured object by entering its unique ID after any prompt, regardless of your current position in the configuration tree. For example, enter **ip/11.23.13.14/255.0.0.0** to go to the IP interface configured on `ethernet/9/1`.

As you navigate between levels of the tree, the BCC prompt changes to show the unique ID of the object configured at your current location. (Refer to the previous configuration example to see how the prompt changes.)

The **lso** command displays the unique identifiers of branch objects configured immediately below your current location in the tree. If you do not know the unique ID of an object, enter **lso -r** after the `box#` prompt to display the configuration object IDs recursively.

When you add IP to an interface, the BCC accepts the subnet mask value in either dotted-decimal notation (for example, 255.255.255.0) or in standard decimal notation (for example, 24, representing the number of contiguous bits reserved for the network portion of the IP interface address). For example, enter any of the following commands to create an object with the unique ID `ip/11.23.13.14/255.0.0.0`:

ip address 11.23.13.14 mask 255.0.0.0
ip address 11.23.13.14 mask 8
ip 11.23.13.14/255.0.0.0
ip 11.23.13.14/8

When you use BCC to create a configuration, the BCC prompts you for parameter values that it cannot automatically assign. To change a parameter value, you enter the name of the parameter, a space, and the new value.

Table 2 shows each help configuration task, the associated command, and examples.

Table 2. Displaying Configuration Help

Task	Command	Examples
Display Help for an object or parameter.	**help** *<item>*	**help snmp** **help bofl**
Show all objects configurable from your current location in the tree.	**help tree**	**help tree**
Show the entire tree of configurable objects.	**help tree -all**	**help tree -all**
List the names of all objects, parameters, and commands that you can enter at this level. (The BCC immediately displays output upon detecting the **?** character, which it does not display.)	**?**	**?**
Show the configuration syntax and list the parameters of an object that you can configure from your current location in the tree.	*<object>* **?**	**ip ?**
Display the supported values for this parameter of the current object.	*<parameter>* **?**	**bofl ?**
List the values assigned to parameters of the current object.	**info**	**info**

Table 3 shows how to enter configuration mode, display your current context and the contexts of other objects, and change your current context.

Table 3. Navigating the Configuration Tree

Task	Command	Examples
Enter configuration mode from the system prompt.	**config**	**config**
Show the full context, starting from the root level.	**pwc**	**pwc**
Show objects configured at the next (branch) level.	**lso**	**lso**
Show objects configured at all branch levels descending from the current object, and the paths to those objects. If at the box# prompt, show all objects in the configuration and the paths to those objects.	**lso -r**	**lso -r**
List only the configured objects that match the specified pattern.	**lso** [-r | *<pattern>*]	**lso *o*** **lso “ip/1.2.?.?/*”**
Show the total device configuration in BCC syntax.	**show config** [**-all**]	**show config -all**
Go back one level.	**back**	**back**
Return to the root level of the router configuration.	**box**	**box**
Go to a configured object from any location in the tree.	*<unique_id>*	**bgp** **ethernet/9/1** **ip/1.2.3.4/255.0.0.0**

Table 4 shows each basic configuration task, the associated command, and examples.

Table 4. Entering Configuration Commands

Task	Command	Examples
Configure a physical interface.	Go to the box# prompt, and enter either of the following: *<interface_type>* **slot** *<slot>* **connector** *<connector>* *<interface_type> <slot>***/***<connector>*	**mct3 slot 2 connector 1** **mc 3/1**
Configure a protocol with default values.	*<protocol> <required_parameter> <value> ...*	**ip address 1.2.3.4 mask 255.0.0.0** **ip 1.2.3.4/255.0.0.0** **ip address 1.2.3.4 mask 8** **ip 1.2.3.4/8**
Modify parameter values.	*<parameter> <new_value> ...*	**cache-size 64**
Disable, enable, or delete the current object.	{**disable** | **enable** | **delete**}	**disable** **enable** **delete**
Disable enable, or delete an object anywhere in the configuration tree.	{**disable** | **enable** | **delete**} *<object_id>*	**disable t1/3/4/15** **enable t1/3/4/15** **delete t1/3/4/15**
Save the total device configuration to a file on the default volume.	**show config -all -file** *<filename>*	**show config -all -file regular.cfg**

Configuration Tree

The following figures show the complete hierarchy of objects that you can configure on a Versalar 15000:

- Miscellaneous Configuration Objects (Figure 2)
- Ethernet Configuration Objects (Figure 3)
- Global IP Configuration Objects (Figure 4)
- Global BGP Configuration Objects (Figure 5)
- Global OSPF Configuration Objects (Figure 6)
- Global Multicast Configuration Objects (Figure 7)
- Global RIP Configuration Objects (Figure 8)
- ATM Configuration Objects (Figure 9)
- MCOC3 Configuration Objects (Figure 10)
- MCT3 Configuration Objects (Figure 11)

- STM1 Configuration Objects (Figure 12)
- PPP Configuration Objects (Figure 13)
- Frame Relay Objects in an MCOC3 Configuration (Figure 14)
- Frame Relay Objects in an MCT3 Configuration (Figure 15)
- Frame Relay Objects in an STM1/E1 Configuration (Figure 16)

Note: To fit all the objects on a single page, some figures show the objects from left to right while other figures show them from top to bottom.

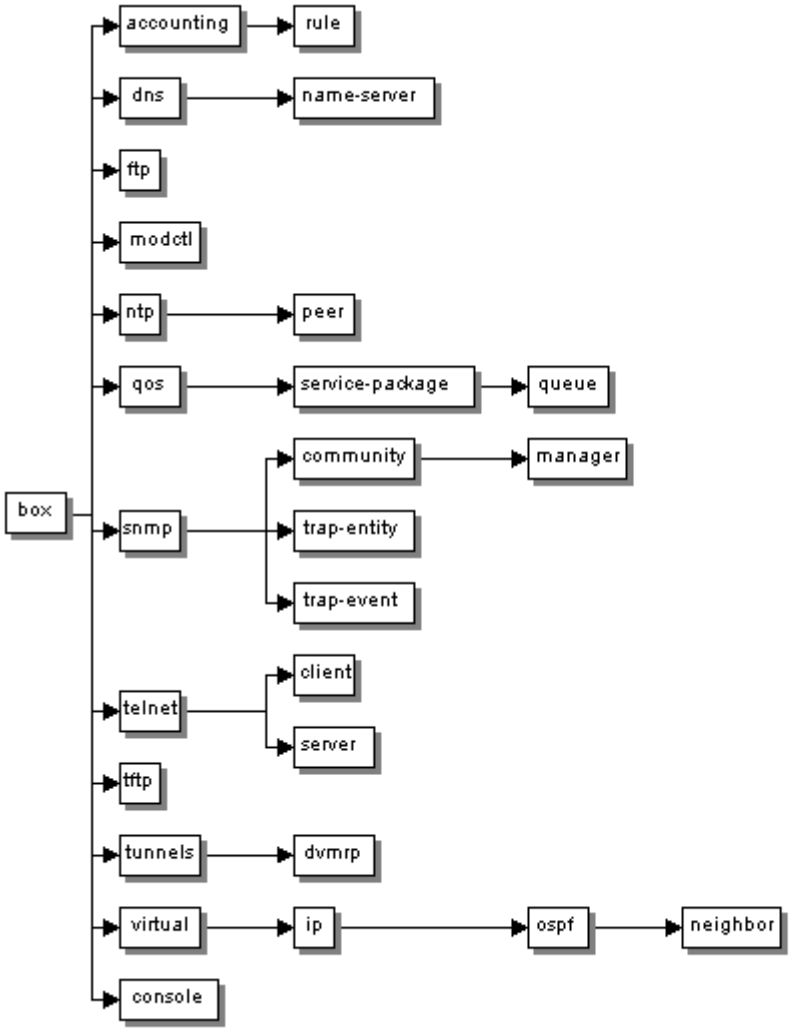

Figure 2. Miscellaneous Configuration Objects

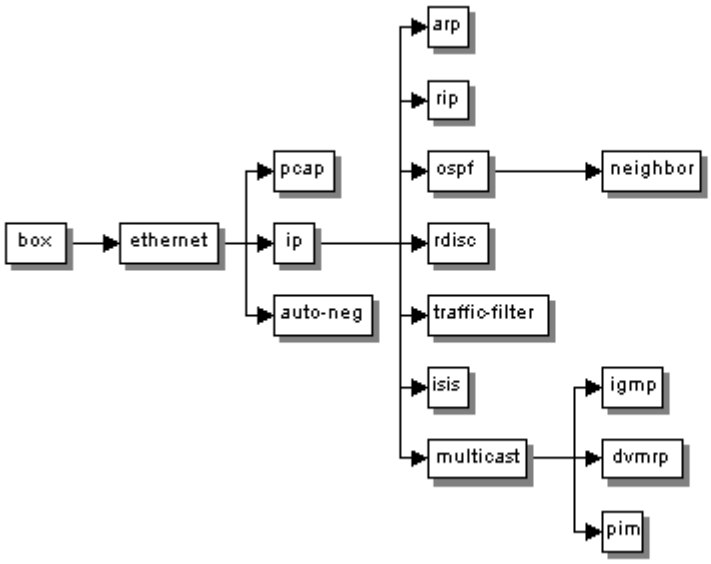

Figure 3. Ethernet Configuration Objects

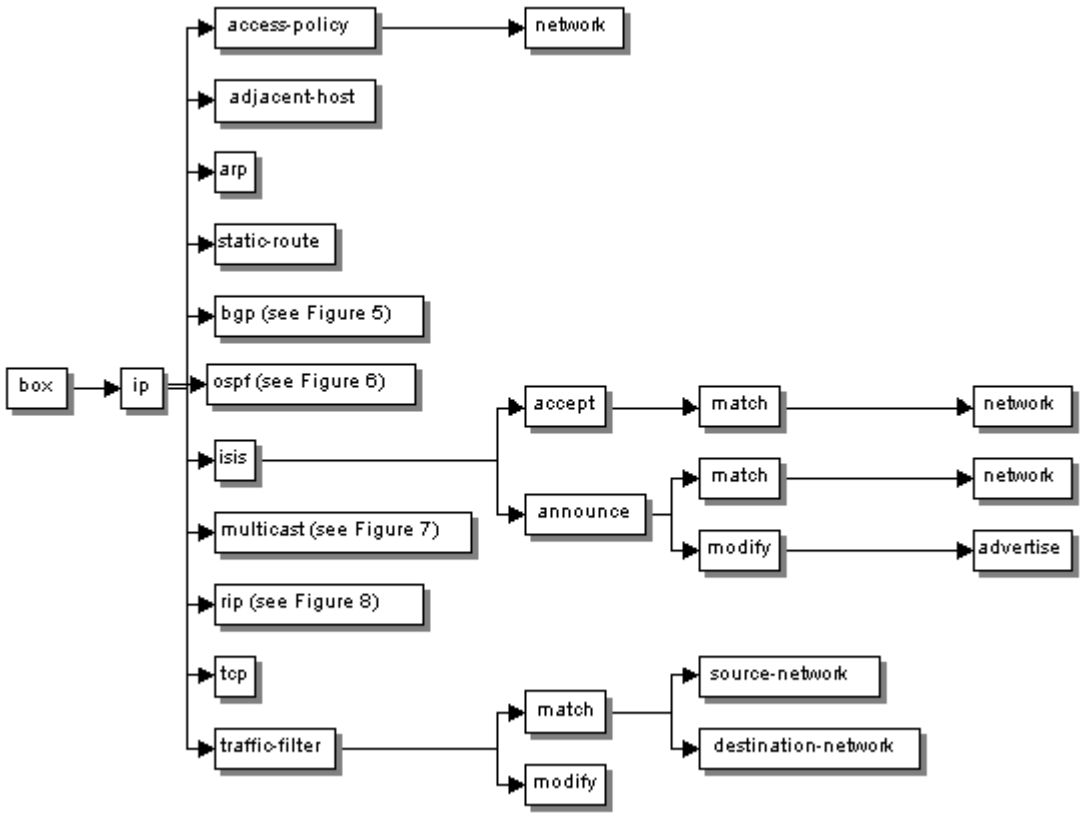

Figure 4. Global IP Configuration Objects

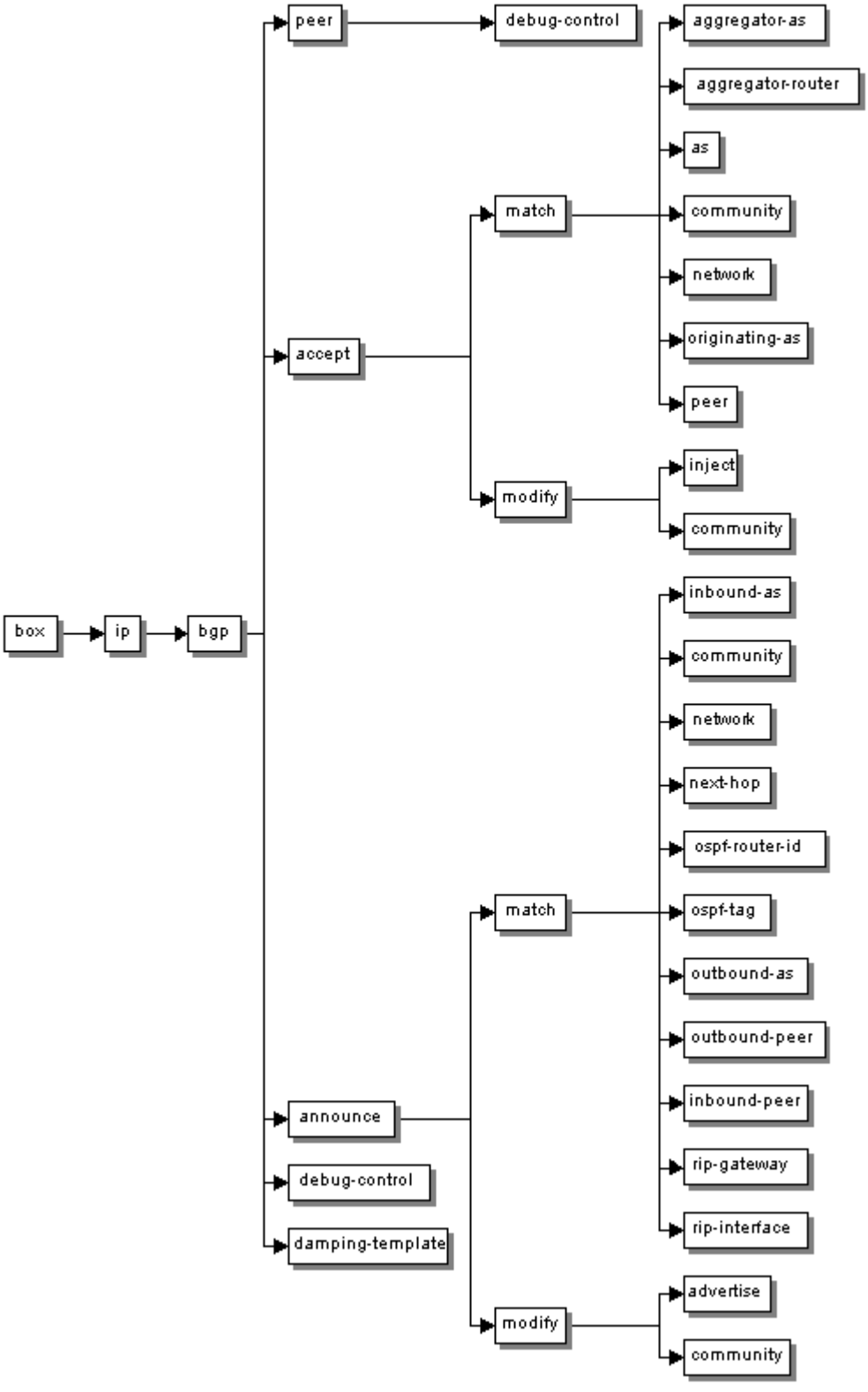

Figure 5. Global BGP Configuration Objects

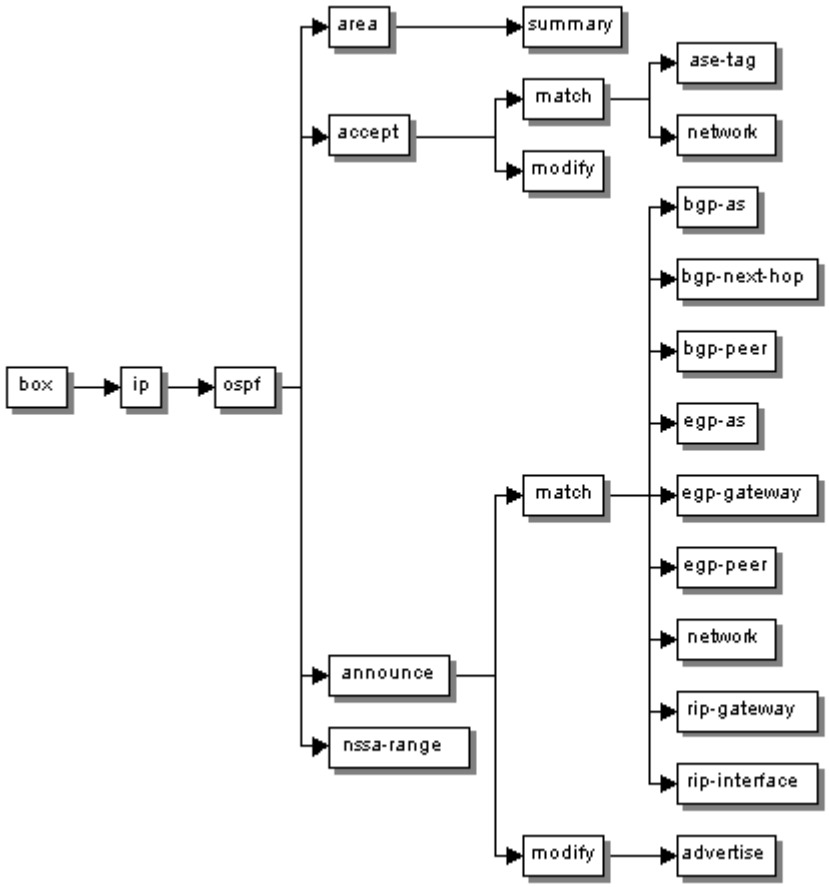

Figure 6. Global OSPF Configuration Objects

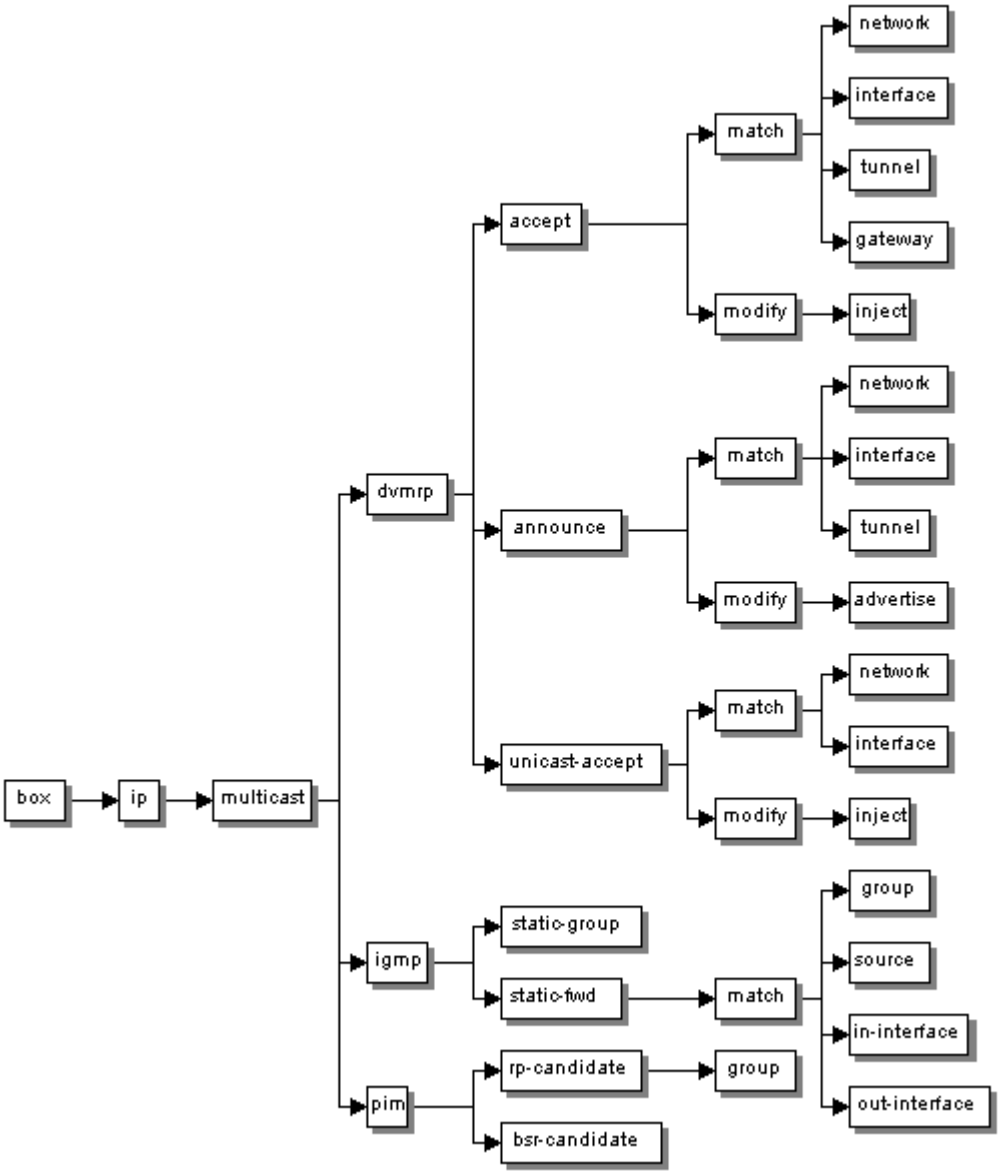

Figure 7. Global Multicast Configuration Objects

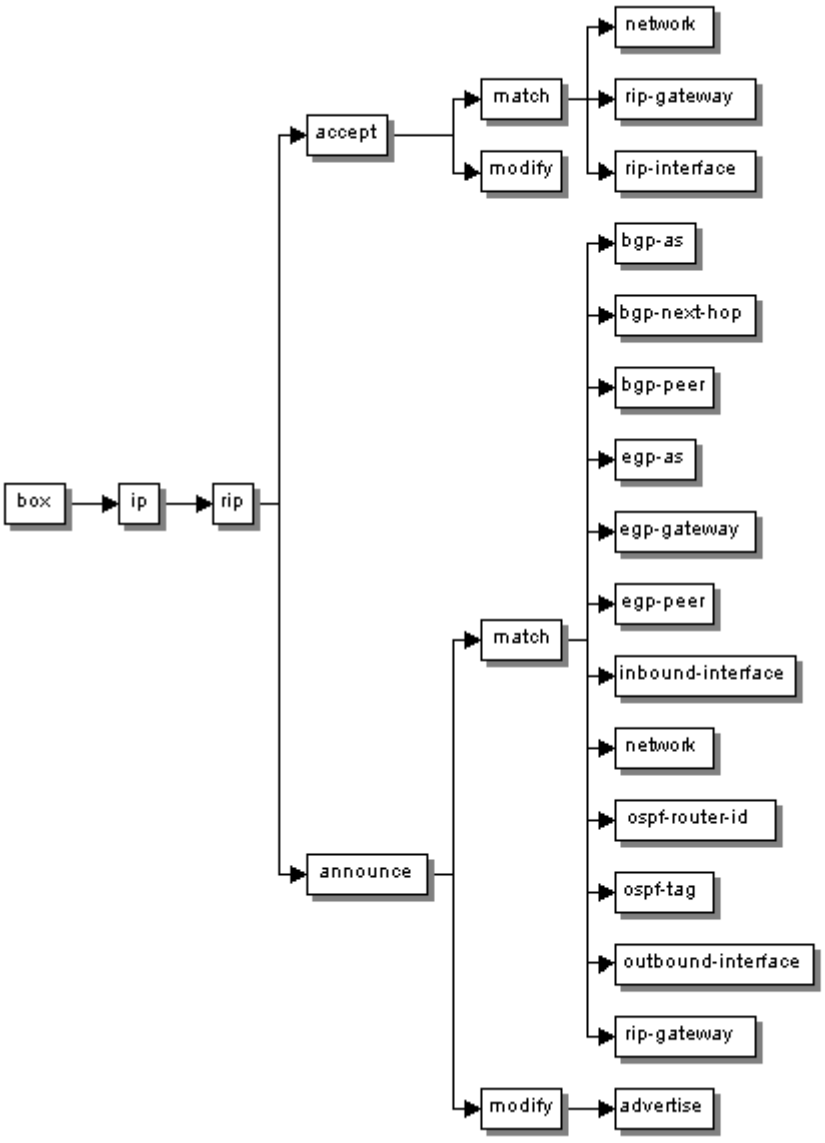

Figure 8. Global RIP Configuration Objects

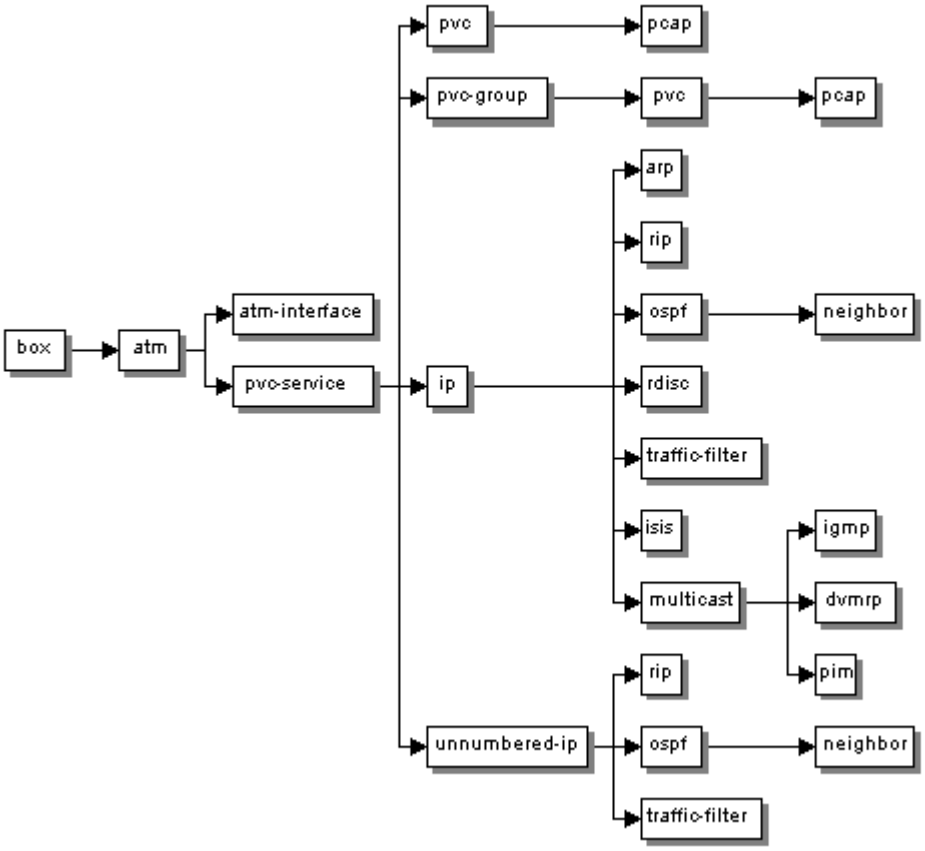

Figure 9. ATM Configuration Objects

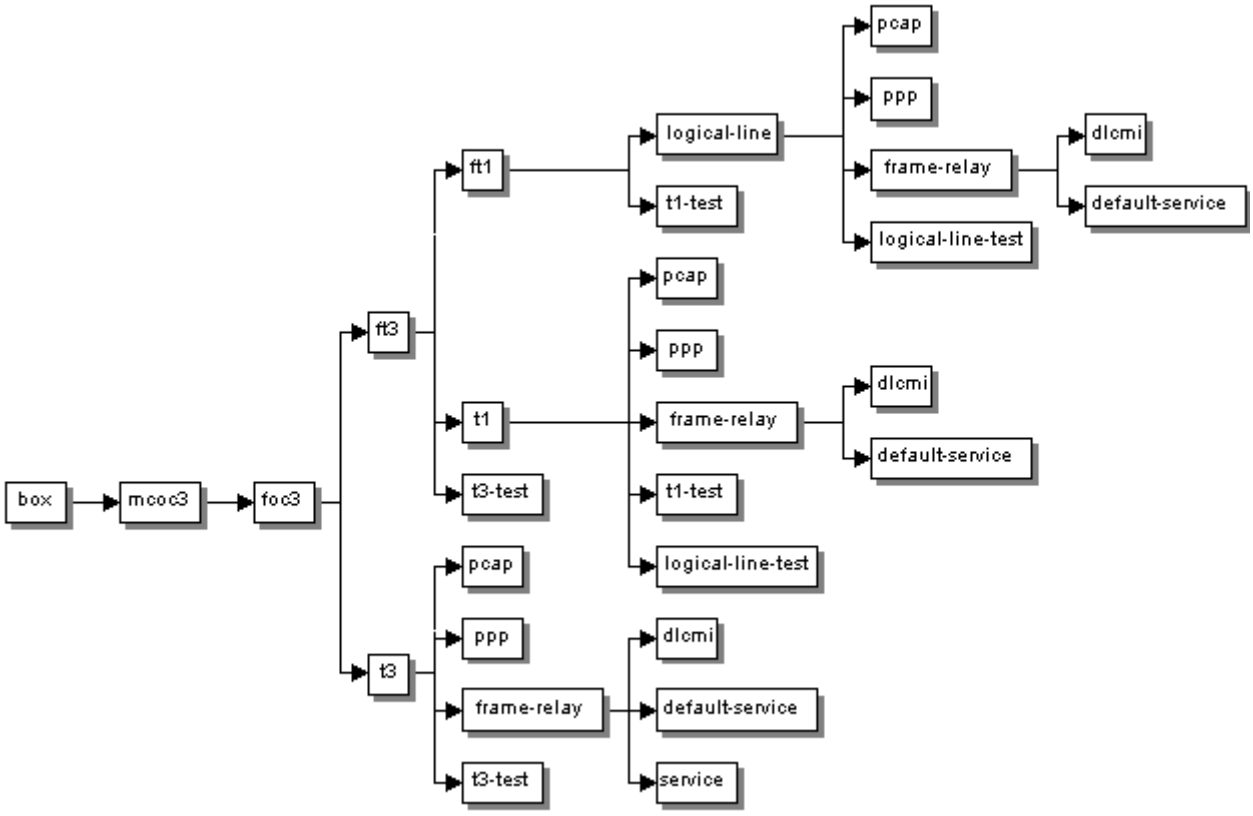

Figure 10. MCOC3 Configuration Objects

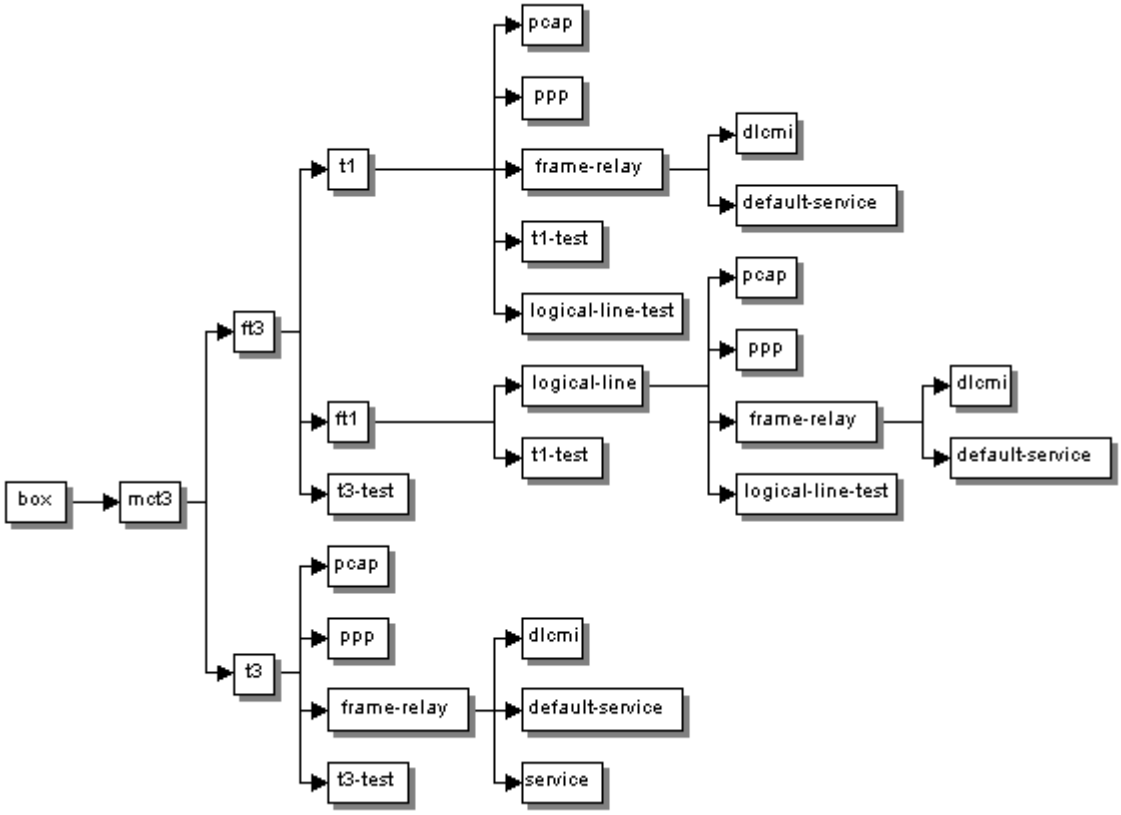

Figure 11. MCT3 Configuration Objects

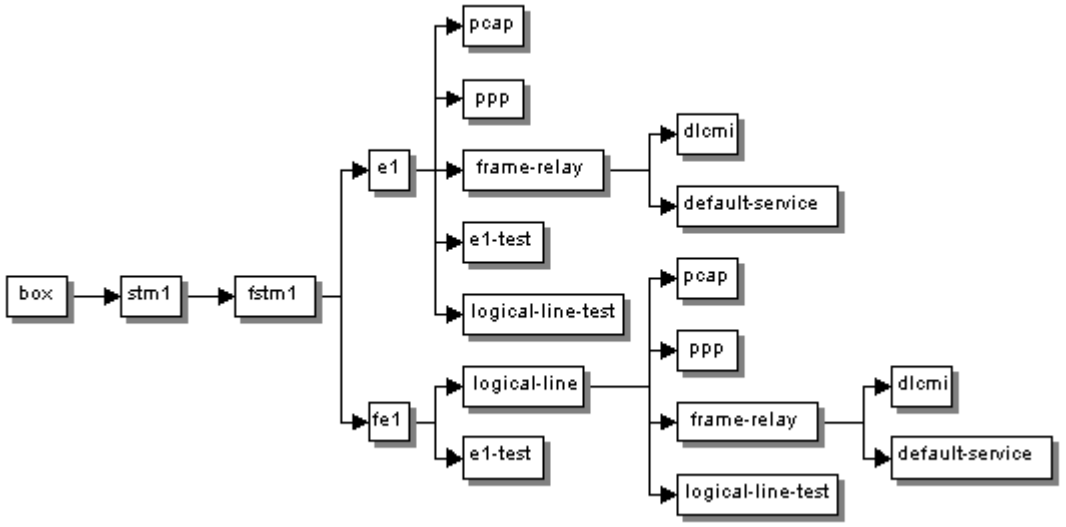

Figure 12. STM1 Configuration Objects

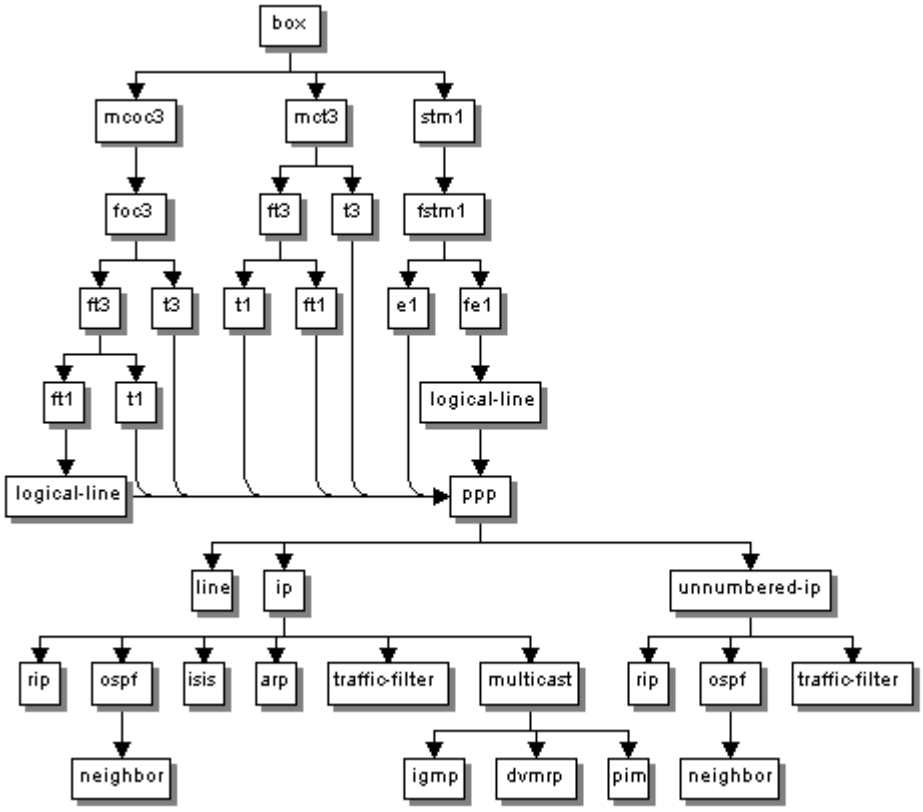

Figure 13. PPP Configuration Objects

As Figure 13 shows, each hierarchy is the same under each instance of the t1, t3, ft1, and e1 objects. However, the properties of each ppp object are unique for each instance of its parent object. For example, for each logical line, T1 line, T3 line, FT1 line, and E1 line carrying PPP traffic, you create a separate `frame-relay` object containing unique properties for that line.

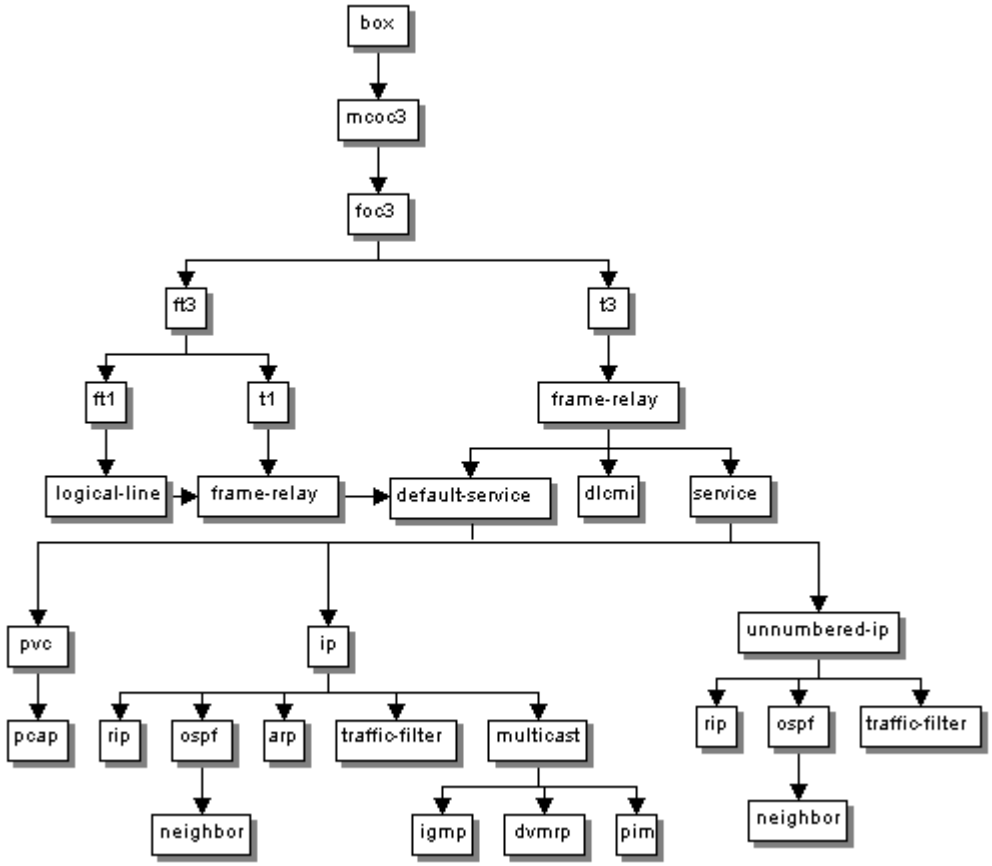

Figure 14. Frame Relay Objects in an MCOC3 Configuration

As Figure 14 shows, each hierarchy is the same under each instance of the default-service and service objects. However, the properties of each of these objects are unique for each instance of its parent object. For example, for each logical line and T1 line, you create a separate `frame-relay` object containing unique properties for that line.

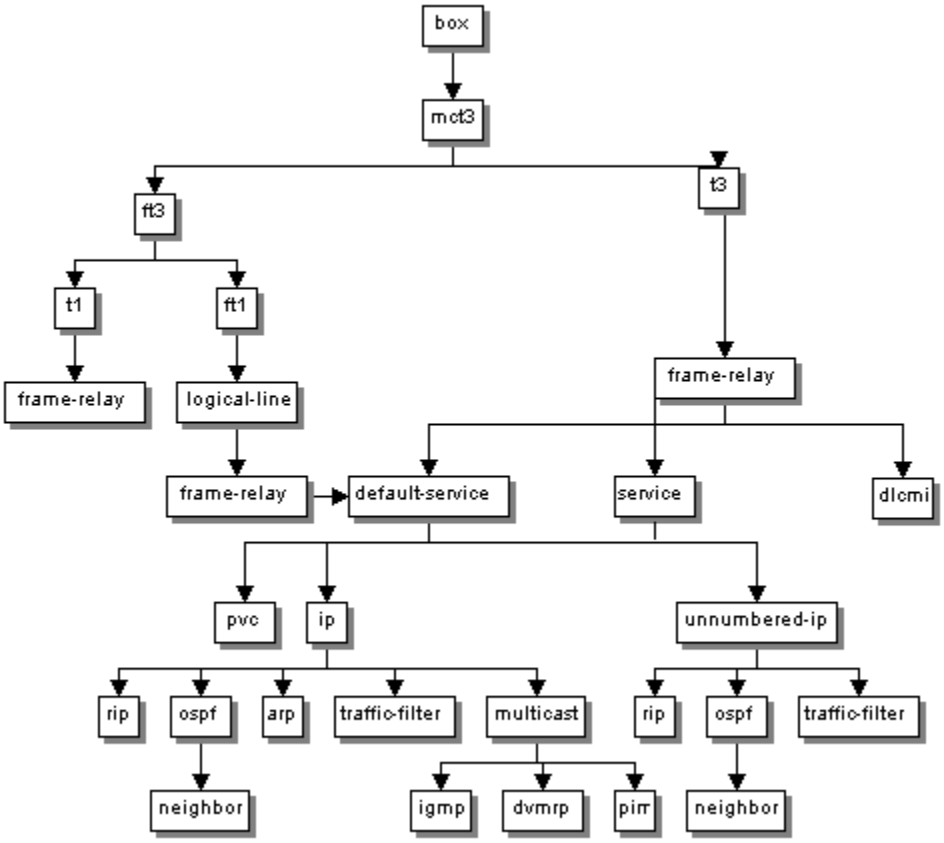

Figure 15. Frame Relay Objects in an MCT3 Configuration

As Figure 15 shows, each hierarchy is the same under each instance of the default-service and service objects. However, the properties of each of these objects are unique for each instance of its parent object. For example, for each logical line and T1 line, you create a separate `frame-relay` object containing unique properties for that line.

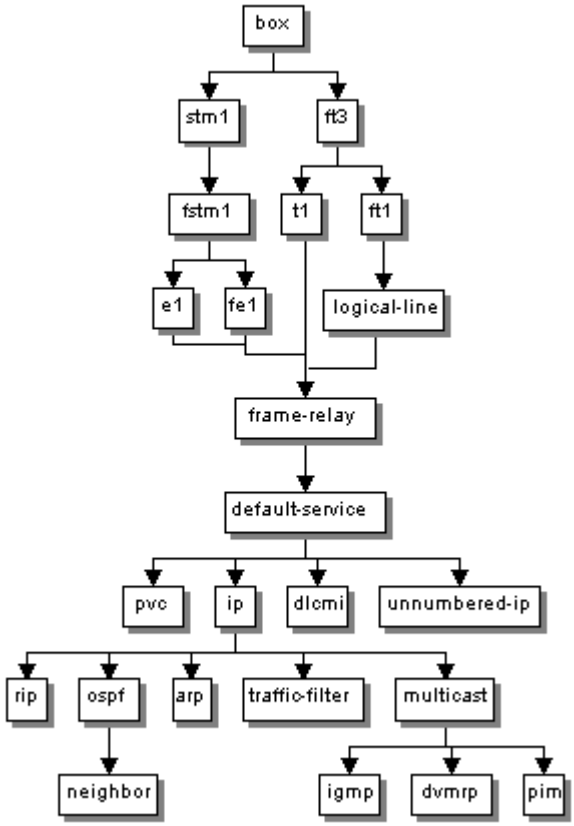

Figure 16. Frame Relay Objects in an STM1/E1 Configuration

As Figure 16 shows, each hierarchy is the same under each instance of the e1, fe1, t1, and logical-line objects. However, the properties of each object are unique for each instance of its parent object. For example, for each E1 line, FE1 line, T1 line, and logical line carrying frame relay traffic, you create a separate `frame-relay` object containing unique properties for that line.

Show Commands

The following show commands display statistics and configuration information. Type [space] and **?** after a command and press [Return] to display its syntax. For example, to display the syntax of the **show atm line stats** command, type **show atm line stats ?** after the BCC prompt and press [Return].

show accounting interfaces stats
show accounting interfaces summary
show accounting rules
show accounting summary

show arp

show atm interface
show atm line errors
show atm line phy errors
show atm line phy state
show atm line sample
show atm line state
show atm line stats
show atm map
show atm pvc-groups
show atm services
show atm stats line
show atm stats vcs
show atm traffic
show atm vc
show atm vp

show bgp damped-routes
show bgp debug
show bgp errors
show bgp peers
show bgp routes
show bgp stats
show bgp summary
show bgp timers

show buffers

show config

show console config
show console stats

show controllers atm
show controllers t3

show dns server
show dns stats

show dvmrp cache
show dvmrp interfaces
show dvmrp neighbors
show dvmrp routes detail
show dvmrp routes main
show dvmrp stats interfaces
show dvmrp stats tunnels
show dvmrp summary
show dvmrp tunnels

show e1 ds1 ansi errors
show e1 ds1 interval current
show e1 ds1 interval history
show e1 ds1 state
show e1 ds1 summary
show e1 errors
show e1 qos stats
show e1 qos summary
show e1 sample
show e1 summary
show e1 vc qos stats
show e1 vc stats

show ethernet all
show ethernet auto-neg
show ethernet errors
show ethernet flow-control
show ethernet qos stats
show ethernet qos summary
show ethernet sample
show ethernet stats
show ethernet summary

show frame-relay services
show frame-relay stats
show frame-relay stats dlcmi
show frame-relay stats errors
show frame-relay summary
show frame-relay vcs

show ftp

show hardware
show hardware config-file
show hardware daughter-card
show hardware image
show hardware memory
show hardware prom

show ifp buffers
show ifp errors
show ifp input-ports
show ifp interrupts
show ifp queues trunk
show ifp queues access
show ifp queues multicast
show ifp queues ssp
show ifp stats
show ifp summary

show igmp groups
show igmp interfaces state
show igmp interfaces timers
show igmp stats
show igmp summary

show ip adjacent-hosts
show ip alerts
show ip arp
show ip disabled
show ip enabled
show ip filter interface
show ip icmp client
show ip icmp in
show ip icmp misc
show ip icmp out
show ip icmp server
show ip interface
show ip ospf
show ip ospf ase
show ip ospf interface
show ip ospf io
show ip ospf lsdb
show ip ospf neighbors
show ip ospf nssa-range
show ip rip alerts
show ip rip auth
show ip rip disabled
show ip rip enabled
show ip rip summary
show ip rip timers
show ip routes
show ip static
show ip stats datagrams
show ip stats fragments
show ip stats interface
show ip summary
show ip traffic

show isis interfaces
show isis l2lspdb
show isis l2stats
show isis lspdetail
show isis neighbors
show isis summary

show logical-line bert-stats
show logical-line errors
show logical-line qos stats
show logical-line qos summary
show logical-line sample mcoc3
show logical-line sample mct3
show logical-line sample stm1
show logical-line stats
show logical-line summary
show logical-line timeslots
show logical-line vc qos stats
show logical-line vc stats

show modctl

show multicast stats control-packets
show multicast stats data-packets
show multicast stats source-group

show ntp access
show ntp base
show ntp peers
show ntp stats

show oc3 partition connector
show oc3 partition path
show oc3 partition virtual-container
show oc3 partition virtual-tributary
show oc3 state
show oc3 summary

show pcap config
show pcap state

show ppp alerts
show ppp bad-packets
show ppp disabled
show ppp enabled
show ppp interfaces
show ppp ip
show ppp line config
show ppp line params

show processes buffers detail
show processes buffers total
show processes [cpu]
show processes list
show processes memory

show qos service-package queues
show qos service-package summary

show sdh current
show sdh errors
show sdh history

show snmp community
show snmp stats
show snmp trap-entity
show snmp trap-event

show sonet current
show sonet errors
show sonet history

show stm1 partition connector
show stm1 partition virtual-container
show stm1 state
show stm1 summary

show system information
show system memory
show system protocols
show system tasks

show t1 bert-stats
show t1 ds1 ansi errors
show t1 ds1 ansi prm
show t1 ds1 interval current
show t1 ds1 interval history
show t1 ds1 state
show t1 ds1 summary
show t1 errors
show t1 qos stats
show t1 qos summary
show t1 sample
show t1 stats
show t1 summary
show t1 vc qos stats
show t1 vc stats

show t3 ds3 interval current
show t3 ds3 interval history
show t3 ds3 state
show t3 ds3 summary
show t3 errors
show t3 qos stats
show t3 qos summary
show t3 sample
show t3 stats
show t3 summary
show t3 vc qos stats
show t3 vc stats

show tcp connections
show tcp stats

show telnet

show tftp

show version