Chapter 9
Multiple Routing Information Bases (RIBs)

9.1 Multiple RIBs Overview

GateD keeps multiple Routing Information Bases (RIBs) with active routes. Currently, two RIBs per address family are available: unicast and multicast. Routes in the unicast RIB get installed in the kernel forwarding information base (FIB) (because the UNIX kernel supports only unicast routes in the FIB). The multicast RIB is used by multicast routing protocols to construct multicast trees. Multicast routes are then installed in the kernel's multicast forwarding cache. Each route may be active in one or more RIBs simultaneously.

9.2 Direct (Interface) Routes

The direct route(s) for each multicast-capable interface apply to (are eligible to become active in) the multicast RIB. The direct route(s) for each unicast-capable interface apply to the unicast RIB. No additional configuration is needed to achieve this.

9.3 Static Routes

Static routes can be tagged with one or more RIB names. By default, a static route applies only to the unicast RIB. (See "Chapter 19 Static Routes" on page 101 for more information about static routes.)

Example:

```
static {
    10.0.0.0 masklen 24 interface le1;
    10.0.1.0 masklen 24 interface le1 unicast;
    10.0.2.0 masklen 24 interface le1 multicast;
    10.0.3.0 masklen 24 interface le1 unicast multicast;
};
```

The first two static routes apply only to the unicast RIB. The third applies only to the multicast RIB, and the last applies to both.

9.4 Aggregate Routes

RIBs need not be specified for aggregate routes. (See "Chapter 33 Route Aggregation and Generation" on page 155 for more information about aggregate routes.) By default, an aggregate applies to all RIBs to which any contributing route applies. For example, an aggregate applies to the unicast RIB if and only if any contributing route applies to the unicast RIB.

Example:

```
aggregate 10.0.0.0 masklen 8 {
    proto static {
        10.0.0.0 masklen 8 refines;
    };
};
```

If any static route in the unicast RIB matches the route filter (which three of the four static routes in the previous example do), the aggregate will exist in the unicast RIB. Likewise, for the multicast RIB.

RIB limits may, however, be specified. By default, the limit is all RIBs (for example, all RIBs to which any contributing route applies). This default can be overridden with a more specific limit, as in the example below.

```
aggregate 10.0.0.0 masklen 8 unicast {
    proto static {
        10.0.0.0 masklen 8 refines;
    };
};
```

The above aggregate applies only to the unicast RIB and only if a contributing route is in the unicast RIB. Contributing routes in other RIBs are ignored.

9.5 Importing Routes

Normally, routes from unicast routing protocols are imported only into the unicast RIB. (See "Chapter 31 Route Importation" on page 137 for more information.) Routes from multicast routing protocols (for example, DVMRP) are imported only into the multicast RIB. However, some multicast routing protocols do not maintain their own routing table. Instead, they rely on the unicast routing protocol. To support these protocols, unicast routes must be imported into the multicast RIB. If this is not done, only interface routes and properly configured static or aggregate routes will be available to these multicast protocols.

Because BGP is able to tag routes as to which RIBs they apply, no additional configuration is required for BGP routes. The RIP and Redirect protocols, however, do not do this. Hence, GateD must be configured to import RIP or Redirect routes into the multicast RIB.

One or more RIB names can be specified as follows (where **multicast** and **unicast** appear below):

```
import proto ( rip | redirect )
    [ ( interface interface_list ) | ( gateway gateway_list ) ]
        [ preference preference ] [ multicast ][ unicast ] {
            {route_filter [ restrict | ( preference preference ) ]
            [ multicast ] [ unicast ];
};
```

If no RIBs are specified, the unicast RIB (only) is assumed.

Example 1

Example 1 keeps the normal behavior of allowing all RIP routes in the unicast RIB, but also imports all routes falling under 198/8 into the multicast RIB.

```
import proto rip  {
    0.0.0.0 masklen 0 refines;
    198.0.0.0 masklen 8 refines multicast unicast;
};
```

Example 2

Example 2 imports all RIP routes (except default) into the multicast RIB (as well as the usual unicast RIB).

```
import proto rip  {
    0.0.0.0 masklen 0 refines multicast unicast;
};
```

To import OSPF routes into the multicast RIB, you currently must import all OSPF routes as follows:

```
ospf yes {
    defaults {
      ribs unicast multicast;
      ...
    };
    ...
};
```

You cannot import OSPF routes into only the multicast RIB. Attempting to do so will be flagged as a configuration error.

9.6 gii

In gii, the `show ip walkup` and `show ip walkdown` commands have been expanded to allow a RIB name as an additional optional argument. If no RIB is specified, the output covers all RIBs combined. Also, another column has been added to their output to show to which RIBs a route applies ("u" for unicast, "m" for multicast).

Example 1

```
GateD> sh ip walkdown 10.0.0.0/8
100 um Agg   10/8  ---     IGP (Id 1)
100 u  Sta   10/24 192.168.10.89 IGP (Id 1)
100 u  Sta   10.0.1/24 192.168.10.89 IGP (Id 1)
100 m  Sta   10.0.2/24 192.168.10.89 IGP (Id 1)
100 um Sta   10.0.3/24 192.168.10.89 IGP (Id 1)
GateD> sh ip walkdown 10.0.0.0/8 unicast
100 u  Agg   10/8  ---  IGP (Id 1)
100 u  Sta   10/24 192.168.10.89  IGP (Id 1)
100 u  Sta   10.0.1/24 192.168.10.89  IGP (Id 1)
100 u  Sta   10.0.3/24 192.168.10.89  IGP (Id 1)
```

```
GateD> sh ip walkdown 10.0.0.0/8 m
100 m  Agg   10/8 ---        IGP (Id 1)
100 m  Sta   10.0.2/24 192.168.10.89  IGP (Id 1)
100 m  Sta   10.0.3/24 192.168.10.89  IGP (Id 1)
GateD>
```

See Chapter 7 of *Operating GateD* for more information about gii, the GateD Interactive Interface.