IBM Systems - iSeries™

Networking
RouteD

Version 5 Release 4

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Note

Before using this information and the product it supports, read the information in “Notices,” on page 9.

Fifth Edition (Februray 2006)

This edition applies to version 5, release 4, modification 0 of IBM i5/OS (5722–SS1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

Contents

RouteD

@ The Route Daemon (RouteD) provides support for the Routing Information Protocol (RIP) on the system.

@ RIP is the most widely used routing protocol today. It is an Interior Gateway Protocol (IGP) that assists
@ TCP/IP in the routing of IP data packets within an autonomous domain. Dynamic routing protocols
@ allow you to handle networks with multiple routers or to switch automatically to redundant routes.

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RouteD configuration commands

You can configure a new RouteD server on your system by using the RouteD configuration commands.

Use the Configure TCP/IP RouteD (CFGTCPRTD) command to configure the RouteD server. You can use the following two different ways to access this command prompt:

- Specify CFGTCPRTD (Configure TCP/IP RouteD) command from the command line.
- Specify CFGTCPAPP (Configure TCP/IP Applications) command from the command line. Select option **2** (Configure RouteD).

After you specify the command, you see the following display:

```
                          Configure TCP/IP RouteD
                                                 System:    SYSNAM01

Select one of the following:

     1. Change RouteD attributes
     2. Work with RouteD configuration
```

Figure 1. Configure TCP/IP RouteD

The following two commands control the RouteD server:

- The Change RouteD Attributes (CHGRTDA) command allows an administrator to set the configurable attributes for the RouteD server.
- The Work with RouteD Configuration (WRKRTDCFG) command allows an administrator to work with the RouteD configuration.

RouteD attribute commands

You can change configuration attributes of your RouteD server by using the Change RouteD Attributes (CHGRTDA) command.

You can use the following two different ways to access this command prompt:

- Specify the CHGRTDA (Change RouteD Attributes) command from the command line.
- Select option **1** on the Configure TCP/IP RouteD (CFGTCPRTD) display.

Note: You must have *IOSYSCFG special authority to make changes to the RouteD attributes with the CHGRTDA command.

```
                      Change RouteD Attributes (CHGRTDA)

Type choices, press type.

Autostart  . . . . . .  . .   *No          *SAME, *YES, *NO
Supply . . . . . .  . . . .   *No          *SAME, *YES, *NO
```

Figure 2. Change RouteD Attributes (CHGRTDA) command

RouteD work with configuration command

You can use the RouteD Configuration (WRKRTDCFG) command to work with the RouteD configuration.

Use the Work with RouteD Configuration (WRKRTDCFG) command to change the RouteD configuration. The following are two different ways to access this command prompt:

- Specify WRKRTDCFG (Work with RouteD Configuration) from the command line.
- Select option **2** on the Configure TCP/IP RouteD (CFGTCPRTD) display.

Note: You must have *IOSYSCFG special authority to make changes to the RouteD configuration with the WRKRTDCFG command.

```
                      Work with RouteD Configuration
                                                              System:   SYSNAM01
Type options, press Enter.
  1=Add   2=Change   3=Copy   4=Remove   5=Display   13=Insert

      Sequence
Opt    Number    Entry

_____   00010    # * * * * * * * * * * * * * * * * * * * * * * * * * * * *   >
_____   00020    # RTD DEFAULT CONFIGURATION                                  >
_____   00030    # * * * * * * * * * * * * * * * * * * * * * * * * * * * *   >
_____   00040    #                                                           >
_____   00050    # RouteD Interface Definitions
_____   00060    # ---------------------------
_____   00070    # TCP/IP will learn about a route to network 9.0.0.0 th   >
_____   00080    # means external to RouteD, therefore do not allow Rout   >
_____   00090    # route to this network.
_____   00100    #
_____   00110    # RIP_INTERFACE * SUPPLY RIP1 METRIC 1 BLOCK 9.0.0.0 MA   >
_____   00120    #
_____   00130    #
                                                                      More...
F3=Exit   F5=Refresh   F6=Print List   F12=Cancel   F17=Top   F18=Bottom
```

Figure 3. Work with RouteD Configuration command

Scenario: RouteD configuration

@ You can use this scenario, which shows how RouteD configuration entries work in a sample network, as @ an example for your own RouteD configuration.

@ The following figure shows how the RouteD configuration entries work in a sample network. The routers @ know every route within every network, including networks X, Y, Z, A, and W.

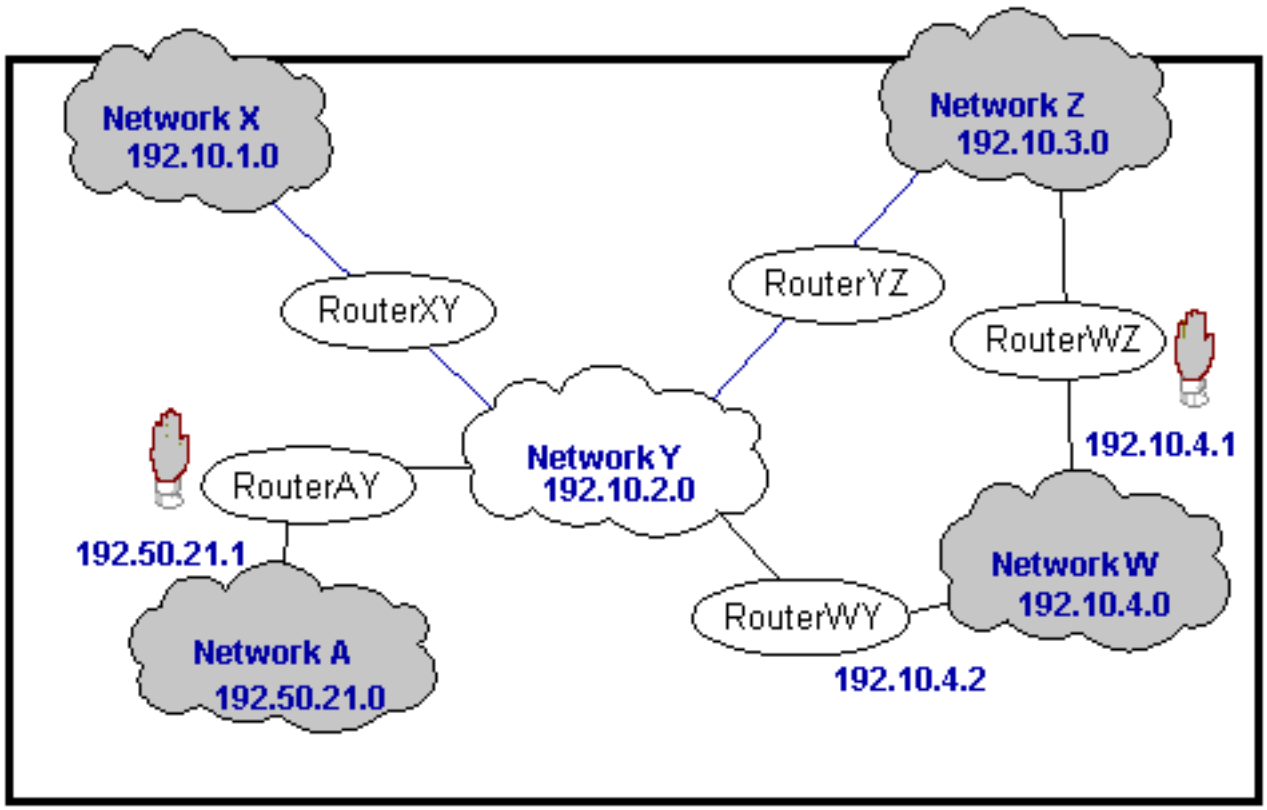

Figure 4. RouteD configuration scenario

- **Case 1** – If router AY has an interface of 192.10.2.1, a metric of 1, and a NOFORWARD parameter of 192.50.21.0, then none of the hosts in the networks reach network A.
- **Case 2** – If router WZ has an interface of 192.10.3.1, a metric of 1, and a NOFORWARD parameter of 192.10.4.0, then none of the IP packets goes through router WZ to get to network W. IP packets can still reach network W, however, because router WY provides a route to that network.

  Note: If you set the parameter option of any interface to Passive, then no routing takes place across the interface.

RIP_INTERFACE statement

RIP_INTERFACE statement allows you to specify all of the routing options that you configure on a per-interface basis.

@ The RIP_INTERFACE statement contains the functionality for defining routes and creating static routes.
@ In releases before OS/400® V4R2, this functionality existed in the NET statement and HOST statement.

@ You can specify multiple interface options on a single entry in the configuration file. You can use the
@ following options:
@ • BLOCK
@ • FORWARD
@ • FORWARD.COND
@ • NOFORWARD

You can specify interfaces on the system by the following methods:

Network
@ Network of the system, which is specified as an IP address and either a mask or a bit number. The
@ bit number *n* indicates which bit in the 0 – *n* bits of the IP address (counting left to right) is the last
@ bit of the IP address' network portion. If the MASK and bit number are missing, the system calculates
@ a network by using the subnet mask of the interface specified through the Add TCP/IP Interface
@ (ADDTCPIFC) command.

Interface name
Logical Interface name that identifies a PPP interface with an IP address that is assigned dynamically when the PPP connection becomes active.

Hostname
@ The host name of the system, which is resolvable through the Domain Name System (DNS).

@ * This character refers to all of the interfaces on the system and is useful for setting default values that
@ apply to all interfaces. You can override these defaults by providing a RIP_INTERFACE statement for
@ a specific interface with different values for selected parameters.

Supply values

You can use RIP_INTERFACE supply values to specify how RIP traffic is handled within your network.

You can use the following values for RIP_INTERFACE supply values:

PASSIVE
The system does not receive or generate any RIP traffic on the specified interface.

SUPPLY RIP1
Indicates which version of the RIP protocol the system uses to send and receive routing information to and from neighboring routers. For SUPPLY RIP1, the system processes only RIPv1 packets.

SUPPLY RIP2
Indicates which version of the RIP protocol the system uses to send and receive routing information to and from neighboring routers. For SUPPLY RIP2, the system uses the multicast address 224.0.0.9 to process only RIPv2 packets, as specified in the RFC1723 sect.3.5.

SUPPLY OFF
Indicates that the system receives both RIPv1 and RIPv2 on the specified interface. However, the system does not send RIP packets.

Note: The default supply value for interfaces that you do not specify is SUPPLY RIP1. The system does not support RIP Version 1 Compatibility mode.

DIST_ROUTES_IN

@ DIST_ROUTES_IN controls how RouteD redistributes routes that it receives from this RIP_INTERFACE
@ network to wide area networks (WANs). This parameter does not affect redistribution of routes to local
@ area networks (LANs).

@ You can use the following values for DIST_ROUTES_IN:

***CALC**
RouteD determines a value of FULL or LIMITED by whether the RIP_INTERFACE network is a LAN or a WAN. If the specified interface is broadcast-capable, it is assumed local, and a value of FULL is given. Otherwise, the system uses a value of LIMITED.

FULL
Indicates that RouteD redistributes routes that it receives from the specified interface to all of the other interfaces that use normal RIP algorithm. Specify this value only for local networks.

LIMITED
Indicates that the server is not to redistribute routes that it receives from the RIP_INTERFACE network to other LIMITED interfaces. Specify this value only for some type of WAN. You cannot set this value for a LAN.

Metric

@ You can use the Metric parameter to specify the metric that the system uses to add routes that it receives @ through a specified interface. Possible values are 1 through 15.

Community

@ You can specify the community name that is used by the specified interface for authentication.

Community is valid for interfaces with a SUPPLY value of RIP2. The rip_community_name is a character string of 1 to 16 characters in length.

Note: The community parameter is defined in RFC 1723, Section 3.1.

If you specify the community option, then the system indicates that this interface needs authentication. The community name that is specified with the community option must match the community name sent in all RIP2 message blocks for this interface. If you do not specify the community option, then the system does not indicate any authentication for this interface.

Related information

RFC Editor Homepage

Additional parameters

You can also encounter additional RIP_INTERFACE parameters in your network.

BLOCK

The BLOCK parameter prevents the network route received on the specified interface from being included in the RouteD routes table.

Consequently, the network is unknown and not forwarded to any other routers. Specify networks that you want to block by one of the following methods:

Network
A network that is specified as an IP address and a mask or as an IP address and a bit number. The bit number n indicates which bit in the 0 – n bits of the IP address (counting left to right) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, the system calculates a network by using the subnet mask of the interface specified through the ADDTCPIFC CL command.

PRIVATE
The PRIVATE keyword refers to the sets of IP addresses that are designated for use by the Internet Assigned Number Authority (IANA) only within private internets. For more information, see RFC 1918, section 3.

- 10.0.0.0 to 10.255.255.255 (10/8 prefix) – 1 class A network.
- 172.16.0.0 to 172.31.255.255 (172.16/12 prefix) – 16 contiguous class B networks.
- 192.168.0.0 to 192.168.255.255 (192.168/16 prefix) – 256 contiguous class C networks.

When the RouteD server tries to send a route, it processes multiple forward parameters in the supplied order. The first forward parameter that allows the system to send the route over the specified interface ends the processing. The default is to forward.

FORWARD

You can use the FORWARD parameter to forward the specified network route exclusively over a specified interface.

If the specified interface is inactive, RouteD takes no special action to forward this network.

Specify a network as both an IP address and a mask or as both an IP address and a bit number. The bit number n indicates which bit in the 0 – n bits of the IP address (counting left to right) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, the system calculates a network by using the subnet mask of the interface specified through the ADDTCPIFC CL command.

FORWARD.COND

You can use the FORWARD.COND parameter to forward the specified network route exclusively over a specified interface.

If the specified interface is inactive, RouteD forwards the network over all of the other interfaces.

Specify a network as both an IP address and a mask or as both an IP address and a bit number. The bit number n indicates which bit in the 0 – n bits of the IP address (counting left to right) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, the system calculates a network by using the subnet mask of the interface specified through the ADDTCPIFC CL command.

NOFORWARD

When you use the NOFORWARD parameter, the system does not send out RIP information about the specified network to the specified interface.

Specify networks in one of the following two methods:

Network

Specify a network as both an IP address and a mask or as both an IP address and a bit number. The bit number n indicates which bit in the 0 – n bits of the IP address (counting left to right) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, the system calculates a network by using the subnet mask of the interface specified through the ADDTCPIFC CL command.

PRIVATE

The PRIVATE keyword refers to the sets of IP addresses that are designated for use by the IANA within private internets. For more information, see RFC 1918, section 3.

- 10.0.0.0 to 10.255.255.255 (10/8 prefix) – 1 class A network.
- 172.16.0.0 to 172.31.255.255 (172.16/12 prefix) – 16 contiguous class B networks.
- 192.168.0.0 to 192.168.255.255 (192.168/16 prefix) – 256 contiguous class C networks.

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