System i

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 (February 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 i™ platform.

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 access this command prompt from the following ways:

- 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 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 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

Work with RouteD Configuration command

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

To access this command prompt, use the following methods:

- Specify WRKRTDCFG 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

This scenario shows how RouteD configuration entries work in a sample network.

The routers know every route within every network, including networks X, Y, Z, A, and W.

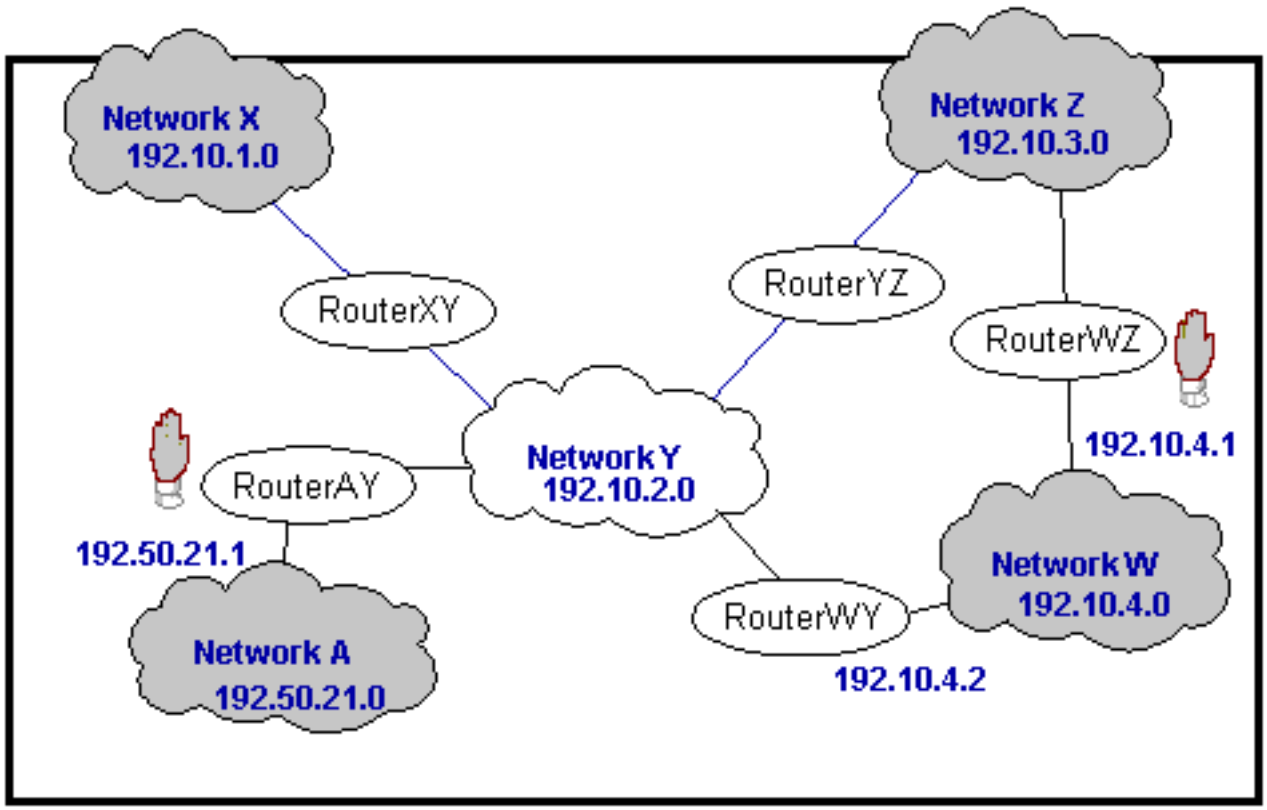

Figure 4. RouteD configuration scenario

- 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 go through router WZ to get to network W. IP packets can still reach network W 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

The RIP_INTERFACE statement enables you to define routes and create static routes for each interface.

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 using 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 – 32 bits of the IP address (counting left to right beginning from 0) 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 Add TCP/IP Interface (ADDTCPIFC) command.

Interface name
The logical interface name that identifies a Point-to-Point Protocol (PPP) interface with an IP address that is assigned dynamically when the PPP connection becomes active.

Hostname
The fully qualified 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 Router Information Protocol (RIP) traffic is handled within your network.

Use the following options for RIP_INTERFACE supply values:

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

SUPPLY RIP1
This value 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
This value 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
This value 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

The DIST_ROUTES_IN parameter 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).

Use the following values for the DIST_ROUTES_IN parameter:

***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
This value 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
This value indicates that the system does not redistribute routes that it receives from the RIP_INTERFACE network to other LIMITED interfaces. Specify this value only for some certain types 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.

The Community option 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 option is defined in RFC 1723, Section 3.1.

If you specify the Community option, 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, the system does not indicate any authentication for this interface.

Related information

RFC Editor Homepage

Additional parameters

You can use these additional RIP_INTERFACE parameters in your network, such as BLOCK and FORWARD.

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 – 32 bits of the IP address (counting left to right beginning from 0) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, a mask of 255.255.255.255 is used.

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 the private Internet. 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 – 32 bits of the IP address (counting left to right beginning from 0) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, a mask of 255.255.255.255 is used.

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 – 32 bits of the IP address (counting left to right beginning from 0) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, a mask of 255.255.255.255 is used.

NOFORWARD

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

Specify networks in one of the following 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 – 32 bits of the IP address (counting left to right beginning from 0) is the last bit of the network portion of the IP address. If the MASK and bit number are missing, a mask of 255.255.255.255 is used.

PRIVATE

The PRIVATE keyword refers to the sets of IP addresses that are designated for use by the IANA within the private Internet. 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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