

RIP Routing for IP に関する資料

「Windows NT Server 4.0 Resource Kit」のファイル"RIPROUTE.WRI"より抜粋

RIP Routing for IP

Windows NT Server version 3.51 supports Routing Information Protocol (RIP) for dynamic management of Internet Protocol (IP) routing tables. RIP eliminates the need to establish static IP routing tables. This version of RIP routing does not support RIP over dial-up (switched WAN) links.

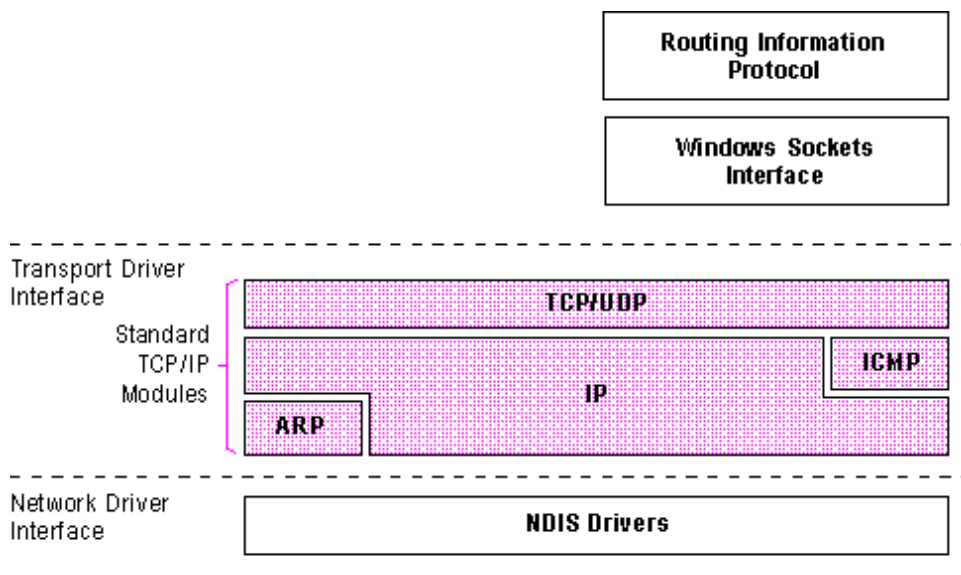
RIP for IP is installed as a Windows NT Server service through Control Panel, and is therefore configured through the Services icon in Control Panel. By default, the RIP service starts automatically when the computer starts.

Understanding the Routing Information Protocol

The Routing Information Protocol (RIP) facilitates the exchange of routing information. A RIP router is a computer or other piece of hardware that broadcasts routing information, such as network addresses, and directs data packets on IP networks.

RIP allows a router to exchange routing information with neighboring routers. As a router becomes aware of any change in the internetwork layout (for instance, a router down), this information is broadcast to any neighboring routers. Routers also send periodic RIP broadcast packets containing all routing information known to the router. These broadcasts keep all routers on the internetwork synchronized.

Using RIP for IP requires the Microsoft TCP/IP protocol family. The TCP/IP family consists of three main protocols: Internet Protocol (IP), Transmission Control Protocol (TCP), and User Datagram Protocol (UDP). The following figure illustrates the relationship between RIP and these three main protocols.



Physical Network Layer
TCP/IP and RIP architectural model

Internet Protocol

Internet Protocol (IP) is a protocol that provides packet delivery for all other protocols within the TCP/IP family. IP provides a best-effort, connectionless delivery system for computer data. That is, IP packets are not guaranteed to arrive at their destination, nor are they guaranteed to be received in the sequence in which they were sent. Internet Protocol's checksum feature confirms only the IP header's integrity. Thus, responsibility for the data contained within the IP packet (and the sequencing) is assured only by using higher-level protocols.

User Datagram Protocol

User Datagram Protocol (UDP), a TCP complement, offers a connectionless datagram service that guarantees neither delivery nor correct sequencing of delivered packets (much like IP). UDP data checksums are optional, providing a way to exchange data over highly reliable networks without unnecessarily consuming network resources or processing time. Because RIP repeatedly broadcasts information, RIP uses UDP/IP instead of TCP/IP.

Transmission Control Protocol

Although Transmission Control Protocol (TCP) guarantees the delivery of packets, proper sequencing of the data, and a checksum feature that validates both the packet header and its data for accuracy, TCP is not required for RIP. Instead, this reliability makes TCP the protocol of choice for session-based data transmission, client-server applications, and critical services, such as electronic mail.

IP Routing

IP data packets, the basic IP information units, are sent to a local LAN connection by the originating host if the destination host is on the same network. If the destination host is on a different network, the data packet is sent to a router on the local LAN, which routes it toward its destination.

If the destination host is not directly connected to the LAN that the router connects to, the router looks up the IP address of the next router that lies along the path to the ultimate destination system. The router then passes the datagram on to the next router. This continues until the ultimate destination router is reached and the data packet is sent by IP over the LAN card to the destination host.

In this implementation of RIP routing over IP, routing over dial-up (switched WAN) links is not supported. For more information on static IP routing over dial-up lines, see the topic "Installing a Simple Dial-up Router," later in this section.

Enabling IP Routing

RIP routing is enabled automatically when you install RIP for IP as described in the earlier section "Installing LAN to LAN Routing."

There are two kinds of routing you can do with IP, static and dynamic. Static routing limits you to fixed routing tables. If you have a slower WAN line (for example, ISDN) you might prefer static routing in order to reduce network traffic. With dynamic routing the routing tables are automatically updated, reducing administrative overhead, but increasing traffic over the network.

Installing RIP for IP provides dynamic routing. When you install RIP for IP, the RIP routing service is automatically enabled and the Enable IP Routing option in the Advanced TCP/IP Configuration dialog box is automatically checked. If you want static routing only, see the following section "Enabling Static Routing."

Enabling Static Routing

1. Choose the Network icon in Control Panel.
 2. In the Network Settings dialog box, remove the RIP routing service by choosing RIP for IP from the Installed Network Software list and then choosing the Remove button.
 3. From the Installed Network Software list, select TCP/IP Protocol, and then choose the Configure button.
 4. In the TCP/IP Configuration dialog box, choose the Advanced button.
 5. In the Advanced Microsoft TCP/IP Configuration dialog box, select the Enable IP Routing check box, and then choose the OK button.
- You should check this option if you have two or more network cards and you want to route between them. This option is not available if your computer has only one network adapter and one IP address.

You may need to make additional static routing entries. For information about creating static routing tables, see the topic "Managing an IP Router," later in this section.

Advanced Microsoft TCP/IP Configuration

Adapter: [1] Intel EtherExpress PRO Ethernet Adapt

IP Address:	SubnetMask:	IP Addresses	Subnet Masks
<input type="text"/>	<input type="text"/>	11.221.7.62	255.255.0.0

Default Gateway:

Windows Networking Parameters

Enable DNS for Windows Name Resolution

Enable LMHOSTS Lookup

Scope ID:

Enable WINS Proxy Agent

Enable IP Routing

Select the network adapter for which you want to configure advanced options.

For more information on the other options in the Advanced Microsoft TCP/IP Configuration dialog box, choose the Help button.

Managing an IP Router

You can use the **route** utility to configure static routing tables.

* At the command prompt, type **route** with the appropriate options.

route [-f] [-p] [*command* [*destination*] [**MASK** *netmask*] [*gateway*] [**METRIC** *metric*]]

The following options can be used:

-f

Clears the routing tables of all gateway entries. If this parameter is used in conjunction with a command, the tables are cleared prior to running the command.

-p

Enables persistent routes. This means routing table changes are carried over automatically after restarting your computer.

command

Specifies one of the following commands.

Command	Purpose
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print	Prints a route.
add	Adds a route.
delete	Deletes a route.
change	Modifies an existing route.

destination

Specifies the host or network to which you want to route.

MASK

Specifies that the next parameter be interpreted as the *netmask* parameter.

netmask

Specifies the subnet mask value to be associated with this route entry. If not present, this parameter defaults to 255.255.255.255.

gateway

Specifies the gateway to the destination.

METRIC

Specifies that the next parameter be interpreted as the *metric* parameter.

metric

Associates a cost/hop count for the destination specified by the route entry. Generally, this specifies the distance in number of hops from the destination. If not specified, the metric is set to 1 by default.

The **route** utility does not accept a subnet mask value of 255.255.255.255 on the command line. To specify a subnet mask with this value, you must accept the default.

On a multihomed computer on which a network is available from more than one adapter card, all remote network traffic is passed over the first gateway defined. If you add a second gateway to the same network, the entry is added to the route table, and is used if it is a default gateway and dead gateway detection is activated.

The **route** utility uses the NETWORKS file to convert destination names to addresses. For the **route** utility to work correctly, the network numbers in the NETWORKS file must specify all four octets in dotted decimal notation. For example, a network number of 284.122.107 must be specified in the NETWORKS file as 284.122.107.0, with trailing zeroes appended.

The gateway must be on the network that your computer is on. Otherwise, the route will not be added.

Registry Parameters for IP RIP

This section presents configuration parameters that affect the behavior of RIP routing for IP and that can be modified only through Registry Editor.

To make changes using Registry Editor

1. Start the Registry Editor by running the REGEDT32.EXE file from File Manager or Program Manager.
– Or –

At the command prompt, type the **start regedt32** command, and then press ENTER.

When the Registry Editor window appears, you can press F1 to get Help on how to make changes in Registry Editor.

2. In Registry Editor, click the window titled HKEY_LOCAL_MACHINE On Local Machine, and then click the icons for the SYSTEM subtree until you reach the appropriate subkey, as described later in this section.

The Registry parameters for IP RIP are specified under the following key:

```
..SYSTEM\CurrentControlSet\Services\Iprip\Parameters
```

AcceptDefaultRoutes

Data type = REG_DWORD

Range = 0 or 1

Default = 0

If set to 1, default routes in received RIP announcements are accepted. By default, they are ignored.

AcceptHostRoutes

Data type = REG_DWORD

Range = 0 or 1

Default = 0

If set to 1, host routes in received RIP announcements are accepted. By default, they are ignored.

AnnounceDefaultRoutes

Data type = REG_DWORD

Range = 0 or 1

Default = 0

If set to 1, default routes are included in RIP announcements.

AnnounceHostRoutes

Data type = REG_DWORD

Range = 0 or 1

Default = 0

If set to 1, host routes are included in RIP announcements.

EnablePoisonedReverse

Data type = REG_DWORD

Range = 0 or 1

Default = 1

By default, if a RIP announcement contains a route that was previously advertised by that route, then that route is announced on the network with a metric of 16.

EnableSplitHorizon

Data type = REG_DWORD

Range = 0 or 1

Default = 1

By default, routes learned on a network are suppressed in updates sent on that network. If the parameter is set to 0, routes learned on a network are announced on the same network, as well.

EnableTriggeredUpdates

Data type = REG_DWORD

Range = 0 or 1

Default = 1

By default, new routes and metric changes trigger an immediate update which includes only the changes.

The time between updates depends on the value of MaxTriggeredUpdateFrequency.

GarbageTimeout

Data type = REG_DWORD

Range = 15 seconds - 259200 seconds (72 hours)

Default = 120 seconds

The number of seconds to wait before removing a route marked for garbage collection.

LoggingLevel

Data type = REG_DWORD

Range = 0 - 3

Default = 1

The minimum level of information for entries being made to the system log; 0 = no logging, 1 = errors, 2 = warnings, 3 = information.

MaxTriggeredUpdateFrequency

Data type = REG_DWORD

Range = 1 second - 884400 seconds (24 hours)

Default = 5 seconds

The minimum number of seconds that must elapse between triggered updates.

RouteTimeout

Data type = REG_DWORD

Range = 15 seconds - 259200 seconds (72 hours)

Default = 180 seconds

The number of seconds to wait before marking a route for garbage collection.

SilentRip

Data type = REG_DWORD

Range = 0 or 1

Default = 0

If set to 1, suppresses periodic RIP announcements.

UpdateFrequency

Data type = REG_DWORD

Range = 15 seconds - 884400 seconds (24 hours)

Default = 30 seconds

The number of seconds between periodic updates which contain the entire routing table.