An explanation of the Automatic Metric feature for IPv4 routes

Applies to: Windows Web Server 2008, Windows Server 2008 Datacenter, Windows Server 2008 Enterprise, **More**

Summary

This article describes the Automatic Metric feature that is used in Windows for Internet Protocol IPv4 routes.

More Information

A metric is a value that is assigned to an IP route for a particular network interface that identifies the cost that is associated with using that route. For example, the metric can be valued in terms of link speed, hop count, or time delay. Automatic Metric is a new feature in Windows that automatically configures the metric for the local routes that are based on link speed. The Automatic Metric feature is enabled by default, and it can also be manually configured to assign a specific metric.

The Automatic Metric feature can be useful when the routing table contains multiple routes for the same destination. For example, if you have a computer with a 10 megabit (Mb) network interface and a 100 Mb network interface, and the computer has a default gateway that is configured on both network interfaces, the Automatic Metric feature assigns a higher metric to the slower network interface. This feature can force all of the traffic that is destined for the Internet, for example, to use the fastest network interface that is available.

NOTE: Typically, Microsoft does not recommend that you add default gateways across disjoint networks. For example, edge servers, such as, Network Address Translation (NAT) and proxy servers, are typically configured to connect two or more disjoint networks: The public Internet and one or more private intranets. In this situation, you should not assign the default gateways on the private interfaces, as doing so may result in improper routing on your network.

The following table outlines the criteria that is used by Windows to assign metrics for routes that are bound to network interfaces of various speeds.

Link Speed	Metric
Greater than or equal to 2 GB	5
Greater than 200 Mb	10
Greater than 20 Mb, and less than or equal to 200 Mb	20
Greater than 4 Mb, and less than or equal to 20 Mb	30
Greater than 500 kilobits (Kb), and less than or equal to 4 Mb	40
Less than or equal to 500 Kb	50

The following table lists the link speeds and assigned metrics for computers that run Windows XP Service Pack 2 and newer versions of Windows operating systems.

Link Speed	Metric

Greater than or equal to 2 GB	5
Greater than 200 Mb	10
Greater than 80 Mb, and less than or equal to 200 Mb	20
Greater than 20 Mb, and less than or equal to 80 Mb	25
Greater than 4 Mb, and less than or equal to 20 Mb	30
Greater than 500 Kb, and less than or equal to 4 Mb	40
Less than or equal to 500 Kb	50

The following table lists the link speeds and assigned metrics for computers that run Windows 10 and newer versions of Windows operating systems:

For interfaces with physical medium types NdisPhysicalMediumWirelessLan, NdisPhysicalMediumWirelessWan, NdisPhysicalMediumNative802_11:

Link Speed	Metric
Greater than or equal to 2 GB	25
Greater than or equal to 500 Mb and less than 2 Gb	30
Greater than or equal to 200 Mb and less than 500 Mb	35
Greater than or equal to 150 Mb and less than 200 Mb	40
Greater than or equal to 80 Mb and less than 150 Mb	45
Greater than or equal to 50 Mb and less 80 Mb	50
Greater than or equal to 20 Mb and less than 50 Mb	55
Greater than or equal to 10 Mb and less than 20 Mb	60
Greater than or equal to 4 Mb and less than 10 Mb	65
Greater than or equal to 2 Mb and less than 4 Mb	70
Greater than or equal to 500 Kb and less than 2 Mb	75
Greater than or equal to 200 Kb and less than 500 Kb	80
Less than 200 Kb	85

For other interfaces types:

Link Speed	Metric
Greater than or equal to 100 Gb	5
Greater than or equal to 40 Gb and less than 100 Gb	10
Greater than or equal to 10 Gb and less than 40 Gb	15
Greater than or equal to 2 Gb and less than 10 Gb	20
Greater than or equal to 200 Mb and less than 2 Gb	25

Greater than or equal to 80 Mb and less than 200 Mb	35
Greater than or equal to 20 Mb and less 80 Mb	45
Greater than or equal to 4 Mb and less than 20 Mb	55
Greater than or equal to 500 Kb and less than 4 Mb	65
Less than 500 Kb	75

The Automatic Metric feature is configured independently for each network interface in the network. This feature is useful in situations where you have more than one network interface of the same speed, for example, when each network interface has been assigned a default gateway. In this situation, you may want to manually configure the metric on one network interface, and enable the Automatic Metric feature to configure the metric of the other network interface. This setup can enable you to control the network interface that is used first in the routing of IP traffic.

In addition, the metric that is assigned to specific default gateways can be configured independently for each gateway. This setup enables a further level of control over the metric that is used for the local routes. For example, it is possible to enable the Automatic Metric feature to configure the routes that are assigned to the network interface, and at the same time to manually configure the metric that is assigned to the default gateways.

NOTE: If a metric is specified at the network interface level, but a gateway is added and configured for the Automatic Metric feature, the gateway can inherit the metric that is assigned to the network interface. For example, if you assign a metric of five at the network interface level, and then you add a gateway and leave the Automatic Metric feature checked for the gateway, the gateway is also assigned a metric of five. For half-duplex interfaces, such as wireless, the effective speed is half of the advertised speed.

The Automatic Metric feature is different from the Dead Gateway Detection feature that can force the network to switch the default gateways that are based on Transmission Control Protocol (TCP) retransmissions. Also, the Routing and Remote Access feature does not activate the Dead Gateway Detection feature. This activation is performed by the TCP/IP stack on the computer that initiates the TCP session.

For additional information, click the article number below to view the article in the Microsoft Knowledge Base:

205027 Dead Gateway Detection with RRAS and Demand Dial Connections

To configure the Automatic Metric feature:

1. In Control Panel, double-click Network Connections.

2. Right-click a network interface, and then click Properties.

3. Click Internet Protocol (TCP/IP), and then click Properties.

4. On the General tab, click Advanced.

5. To specify a metric, on the IP Settings tab, click to clear the Automatic metric check box, and then enter the metric that you want in the Interface Metric field.

Last Updated: Oct 2, 2018

What's new	Store & Support	Education	Enterprise	Developer	Company
NEW Surface Pro 6	Account profile	Microsoft in education	Microsoft Azure	Microsoft Visual Studio	Careers
NEW Surface Laptop 2		Office for students	Enterprise	Windows Dev Center	About Microsoft

NEW Surface Go

Xbox One X

Xbox One S

VR & mixed reality

Windows 10 apps

Office apps

Download Center

Sales & support

Returns

Order tracking

Store locations

Support

Buy online, pick up in store

Office 365 for schools

Deals for students & parents

Microsoft Azure in education

Data platform

Find a solution provider

Microsoft partner resources

Microsoft AppSource

Manufacturing & resources

Financial services

Developer Network

TechNet

Microsoft developer program

Channel 9

Office Dev Center

Microsoft Garage

Company news

Privacy at Microsoft

Investors

Diversity and inclusion

Accessibility

Security

English (United States)

Contact us   Terms of use   Privacy and cookies   Trademarks   Safety & eco   © Microsoft 2019