

Using Winroute to determine the Routing status of your Exchange organization

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Abstract

In this article I will give you some information about how to determine the Routing status of your Exchange organization with the help of the WinRoute tool.

WinRoute is a Microsoft Exchange Server 2000/2003 tool that you can use to determine the link state routing (LST) information that is known to the routing group master.

You can use this tool for troubleshooting Message Routing in Exchange 200x environments.

Let's start with some basics

Exchange 2003 primary uses SMTP to transfer user and system messages through the Exchange organization.

To reduce network traffic and to allow message flow control, Exchange uses Routing Groups. Every Routing Group has a Routing Group Master which is responsible for updating and keeping the Link State Tables up to date and then propagating it back to the other Exchange Servers.

Exchange 2003 uses the Link State Algorithm (LSA), which is similar to the Open Shortest Path First (OSPF) algorithm that IP networks use. The OSPF algorithm lets routers calculate the shortest path between nodes in a network for a message. Exchange LSA uses the same concept with some difference.

Nodes (in OSPF) are called Routing Groups (in Exchange LSA) and connections (in OSPF) are called connectors or links (in Exchange LSA). The Links State Algorithm (LSA) creates a Link State Table (LST), which contains information about Routing Groups, Connectors and something more.

Exchange uses TCP port 691 for exchanging link state informations, so keep a look at your firewalls / routers that the don't block this port.

If there are changes on the other Exchange Servers they will inform the Routing Group Master about the changes. The Routing Group Master updates it's link state table and propagate all the information to the other Exchange Servers.

The link state information (LST = Link State Table) is never written to the hard disk, it is always in RAM. The Routing Group Master in each Routing Group receive the link state information when the Routing Group Master restarts or when the routing engine is restarted.

The LST contains information about connectors, servers, Routing Groups, the organization, address spaces, the link state, the version, and costs.

For more information about how Routing works in Exchange 2003, read the following [article](#) and Markus Klein's [article](#) about Troubleshooting and Monitoring Exchange Server 2003 Message Flow.

How does Winroute works

The WinRoute tool connects to the link state port, TCP port 691, on a computer running Exchange 2003, and then extracts the link state information from your organization, in the form of an Orginfo packet. The information is a series of GUIDs that WinRoute matches to objects in the Microsoft Active Directory directory service, connectors, and bridgehead servers.

WinRoute displays the link state information in a human readable format. This format provides a tree view of your organizational topology and link state as seen by a specific Exchange 2003 host, based on the contents of the Orginfo packet. WinRoute also resolves routing object name GUIDs to a human-readable format if the tool is able to access Active Directory.

Start using Winroute

First, we need to download the Winroute tool from the following [website](#).

Copy the Winroute files after download into the \EXCHSRVR\BIN directory. Open a command prompt, and type WINROUTE.

To determine the Winroute version click **Help – About Winroute**



Figure 1: How to determine the Winroute version

To use WinRoute, you must first load a formerly saved routing table (WinRoute file (.rte)) or by specifying an Exchange 2003 server from which you want to load the routing table.

It is recommended to load the routing table from your Routing Group Master. You can find the Routing Group Master here:

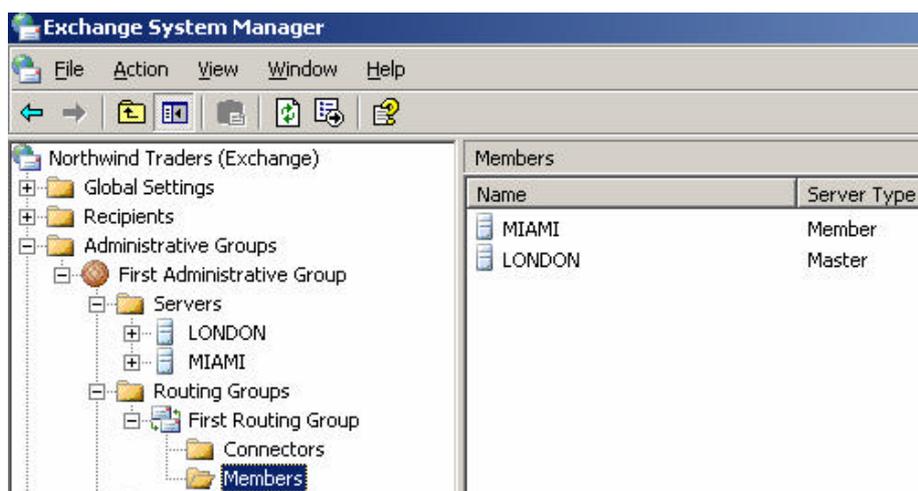


Figure 2: How to determine the Routing Group Master

After you have determined your Routing Group Master click **File – New Server Query** and enter the name of the Exchange Server:



Figure 3: Open a new query to the Routing Group Master

After entering the Server name, you see a picture like that:

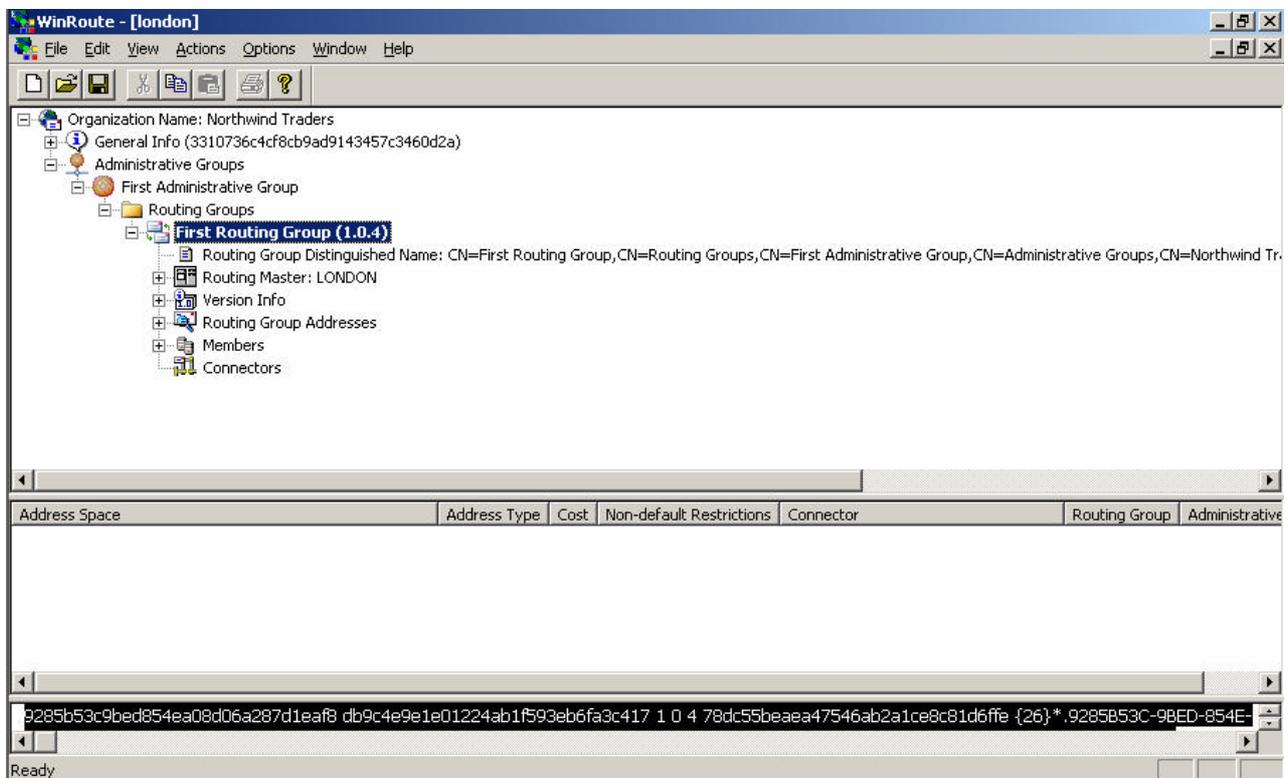


Figure 4: Routing Group overview

Understanding Winroute

The user interface in WinRoute contains three window panes.

The **tree view pane** contains graphical information about the Exchange routing table.

The **address space pane** contains all the address spaces known by this server and the cost, restrictions, connector, source routing group, and administrative group.

The **raw routing data table pane** contains the routing information that Exchange uses.

These informations are only for informational purpose and Admins who understand the Exchange routing internals.

Tree View Pane in detail

The tree view pane contains data how Winroute interpreted the data which it gets from Active Directory where the Exchange configuration is stored (configuration container).

General Info Node in detail

The following information is also displayed under the General Info node:

Routing Engine Version= Shows build version for routing binaries.

Digest = A Digest is used to determine if two or more Exchange servers are synchronized. The Digest increments when a change in the routing topology occurs.

Organization DN = Shows the distinguished name (DN) of the Exchange organization.

Routing Group Node in detail

Winroute displays every Routing Group as a node in the GUI.

Each routing group is represented as a node in the user interface. Expand the node to view the designated Routing Group Master.

Version Info

Major Version:

Shows that changes were made in the connections container; for example, add/delete/change connector. A Zero indicates that it is an isolated Exchange 200x Routing Group or a routing group of exclusively Exchange 5.5 servers.

Minor Version:

Shows that a change to the state of a connector was made.

User Version:

Shows changes to the routing group object. Every time when a server is added or removed from the Routing Group, the user version increments.

A change from WinMgmt (Windows Management Instrumentarium) can increment the User Version.

RG Addresses

RG (Routing Group) Addresses contains the Routing Group addresses that are used internally by Exchange. Winroute should display a SMTP, X.400, and X.500 address.

RG Members

RG (Routing Group) Members shows the following information for routing group members:

Member Server DN:

Displays the distinguished name of the member server.

Connected to Master?:

Connected to Master shows if the routing services has opened a connection to the RGM (Routing Group Master). „NO“ indicates problems with the routing service, except for legacy servers (Exchange 5.5).

Server Version:

This number is incremented when a server is moved to another routing group. Zero indicates an Exchange 5.5 server.

Build Version:

Shows the version number of Exchange 200x.

User Data:

Shows information used by WinMgmt to monitor a connector.

„Connectors“ shows the different types of connectors configured. This includes:

- ? SMTP connectors
- ? Routing Group connectors
- ? X.400 connectors
- ? Connectors from third-party mail systems, such as Lotus Notes connector and Novell Groupwise

Under the Connectors node, the following information is displayed:

Source BH Address:

BH stands for BridgeHead and is used for legacy connectors (to Exchange 5.5). This is the name of the bridgehead MTA server. For SMTP and Routing Group connectors, this is the GUID of the connector object in the directory.

Destination BH Address:

For legacy connectors, this is the name of the target bridgehead MTA server. For routing group connectors, this is the GUID of the connector object in the directory. For SMTP connectors, this value is either blank (DNS) or the smart host.

Restrictions:

This contains information about the connector configuration. Some examples:

- ? Connector scope
- ? Allowed message priorities
- ? Allowed message types
- ? Oversized message size
- ? Maximum message size

and many more.

Address Spaces

Address Spaces define the cost and type of address space. Both values are very important, because Address space costs define the way the message follows to their destination and the Address space is used to determine which way messages will follow depending on their addresses.

Source Bridgehead

The bridgehead server for the connector. Beneath this node, you can find additional information like...

DN of the bridgehead server

Bridgehead server status

FQDN of the virtual server (if the connector is an SMTP or Routing Group connector)

Target Bridgehead

The destination bridgehead for the connector. The only connectors that display target bridgeheads are routing group connectors and site connectors.

Status contains one of two values:

STATE UP = The connector is available

STATE DOWN = The connector is unavailable

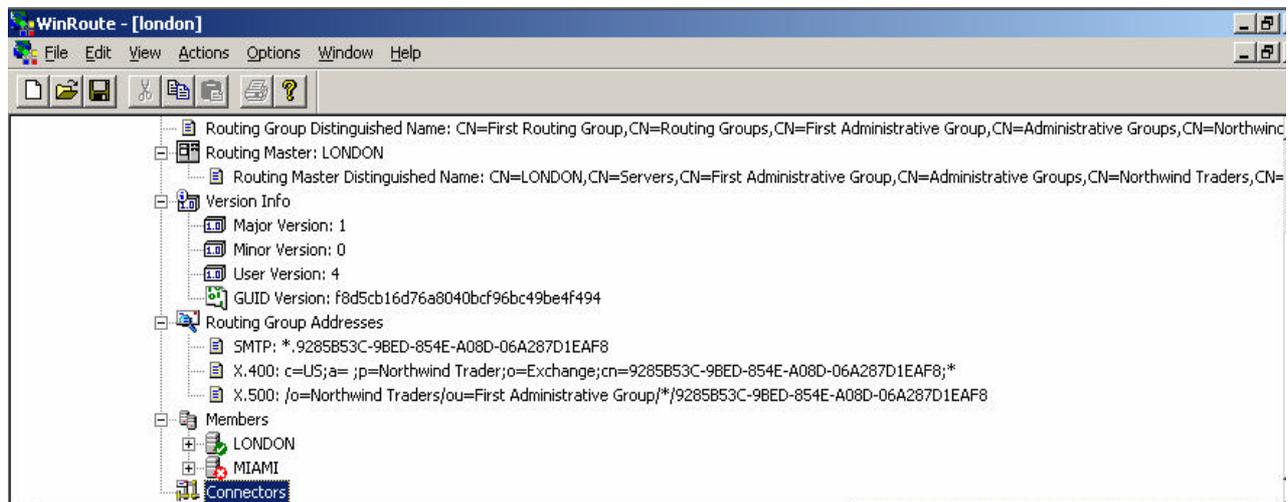


Figure 5: Detailed Winroute information

How many Servers and connector are in my Exchange organization

Winroute is a nice tool to determine the the number of Routing Groups, Servers, Connectors and many more. Simply click **Actions – Get Statistics**



Figure 6: How many Routing Groups and Servers are in your Organization

Refresh Winroute information from Active Directory

Because Exchange 2003 uses Active Directory for its data repository, it is sometimes recommended to refresh information from Active Directory.

To refresh the information from Active Directory click **Refresh Information in Active Directory** on the Actions menu.

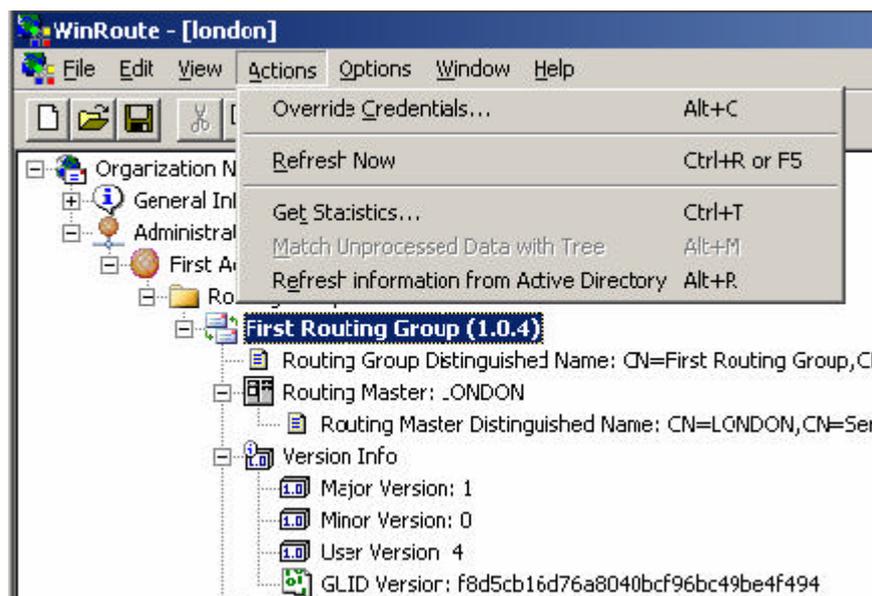


Figure 7: Refresh information from Active Directory

How to determine the size of the Link State Table

To determine the size of the link state information, open Winroute.exe and then save this data to a text file. The size of the text file is the same size as the link state information.

Click **File – Save as** and specify a name for the file.

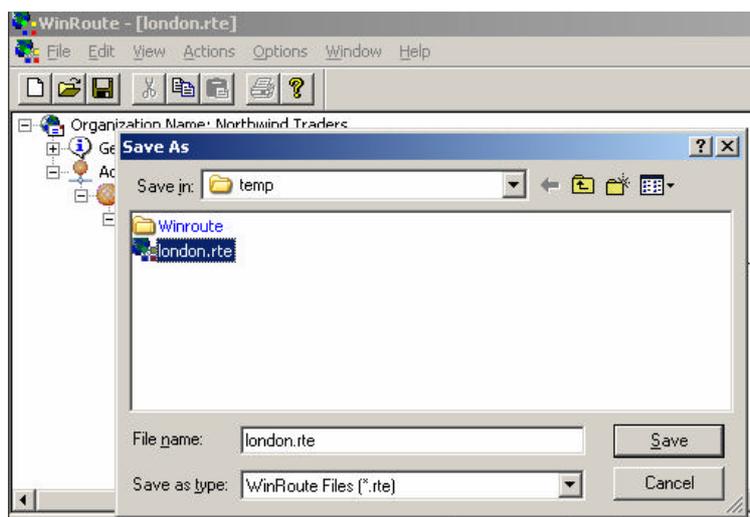


Figure 8: Export the configuration into a text file

Sample output of the .RTE file with Notepad

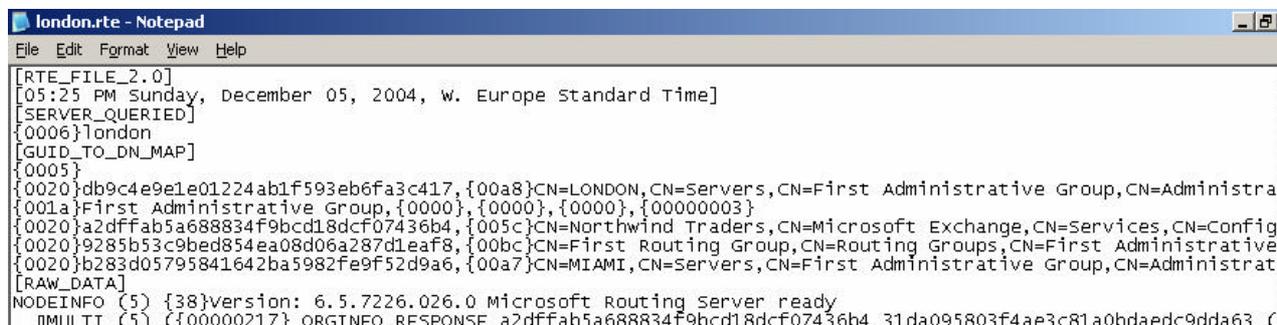


Figure 9: Content of the Export file

Conclusion

Winroute is a great tool to display information about Exchange's Routing topology and a first Step for troubleshooting Exchange routing problems.

Related Links

Exchange Server Winroute Download

<http://www.microsoft.com/downloads/details.aspx?FamilyID=C5A8AFBF-A4DA-45E0-ADEA-6D44EB6C257B&displaylang=en>

How to use the Winroute tool

<http://support.microsoft.com/default.aspx?scid=kb;en-us;281382>

Link state issues and routing issues in Exchange 2000 Server and in Exchange Server 2003

<http://support.microsoft.com/default.aspx?scid=kb:en-us:832281>

Troubleshooting and Monitoring Exchange Server 2003 Message Flow

http://www.msexchange.org/tutorials/Exchange_Server_2003_Message_Flow.html

Exchange Server 2003 Transport and Routing Guide

<http://www.microsoft.com/technet/prodtechnol/exchange/2003/library/extransrout.mspx>