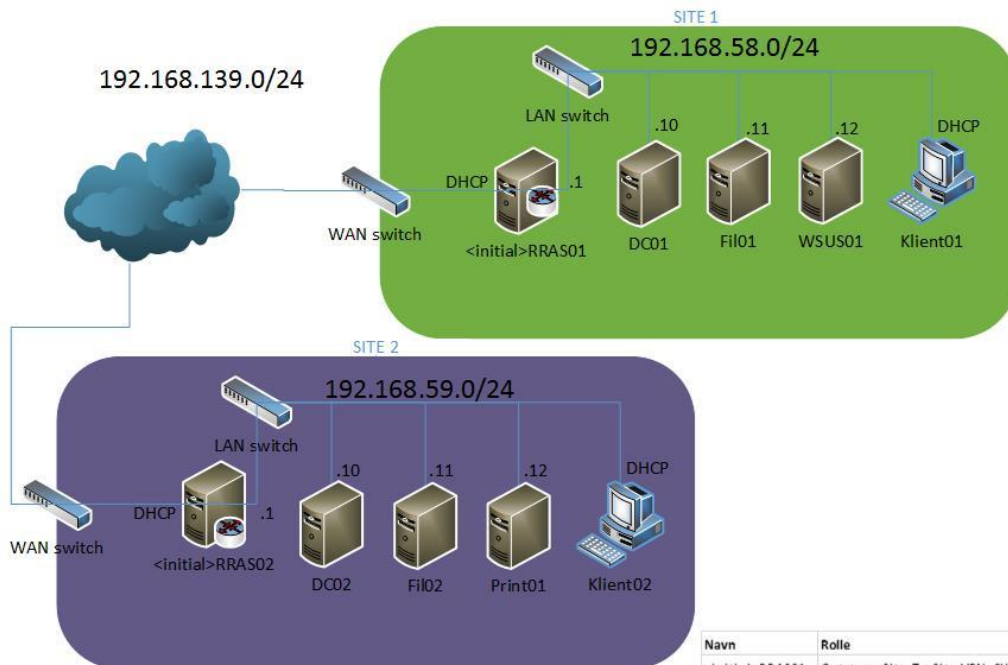


Configuring site-to-site VPN

In this guide we will create a permanent site-to-site VPN between the two sites using PPTP encryption and EAP-MS-CHAPv2 authentication.

By doing this, all servers and clients can communicate as if they were on the same LAN network. The traffic between the two RRAS servers is encrypted at the sending server, before it is sent over the internet, and decrypted at the receiving server, before it is sent to the receiving LAN network.



Navn	Rolle	Operativsystem
<initial>RRAS01	Gateway, Site-To-Site VPN, Client/server VPN	Server 2012 Standard
DC01	Domain Controller, DNS, DHCP, PKI	Server 2012 Standard
Fil01	Fileserver	Server 2012 Standard
WSUS01	Windows Server Update Services Server	Server 2012 Standard
<initial>RRAS02	Gateway, Site-To-Site VPN, Client/server VPN	Server 2012 Standard
DC02	Domain Controller, DNS, DHCP	Server 2012 Standard
Fil02	Fileserver	Server 2012 Standard
Print01	Printserver	Server 2012 Standard
Klient01	Workstation	Windows 8 Enterprise
Klient02	Workstation	Windows 8 Enterprise

Configuring RRAS01

The screenshot displays the Windows Server Manager interface for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The main dashboard area contains a 'WELCOME TO SERVER MANAGER' section with a 'QUICK START' list:

- 1 Configure this local server
- 2 Add roles and features
- 3 Add other servers to manage
- 4 Create a server group

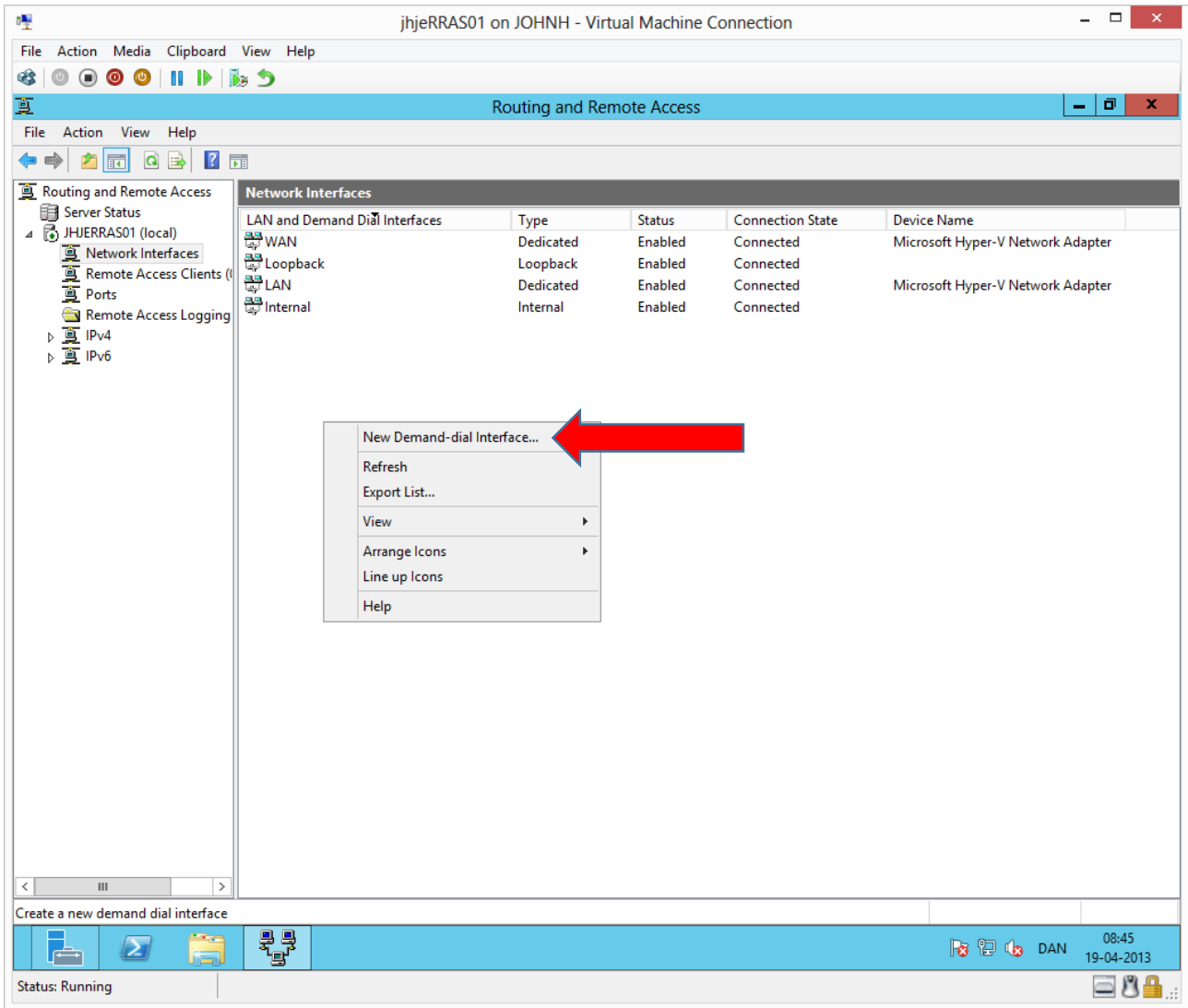
Below this, the 'ROLES AND SERVER GROUPS' section shows two installed roles:

- File and Storage Services** (1 instance)
 - Manageability
 - Events
 - Performance
 - BPA results
- IIS**
 - Manageability
 - Events
 - Services
 - Performance
 - BPA results

A right-hand pane lists various server management tools. A red arrow points to the 'Routing and Remote Access' item in this list.

- Component Services
- Computer Management
- Connection Manager Administration Kit
- Defragment and Optimize Drives
- Event Viewer
- Group Policy Management
- Internet Information Services (IIS) Manager
- iSCSI Initiator
- Local Security Policy
- Network Policy Server
- ODBC Data Sources (32-bit)
- ODBC Data Sources (64-bit)
- Performance Monitor
- Remote Access Management
- Resource Monitor
- Routing and Remote Access**
- Security Configuration Wizard
- Services
- System Configuration
- System Information
- Task Scheduler
- Windows Firewall with Advanced Security
- Windows Memory Diagnostic
- Windows PowerShell
- Windows PowerShell (x86)
- Windows PowerShell ISE
- Windows PowerShell ISE (x86)
- Windows Server Backup

The taskbar at the bottom shows the system status as 'Running', the user 'DAN', and the date '19-04-2013' at '08:44'.



Right click in the empty space.

The screenshot shows a Windows Virtual Machine window titled "jhjeRRAS01 on JOHNNH - Virtual Machine Connection". The main application is "Routing and Remote Access". On the left, a tree view shows the configuration hierarchy: "Routing and Remote Access" > "Server Status" > "JHJERRAS01 (local)" > "Network Interfaces". The main pane displays a table of network interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				
Intern...				

A "Demand-Dial Interface Wizard" dialog box is overlaid on the interface table. The dialog contains the following text:

Welcome to the Demand-Dial Interface Wizard.

This wizard helps you create a demand-dial connection to connect this router to other routers.

To continue, click Next.

At the bottom of the dialog, there are two buttons: "Next >" and "Cancel". A red arrow points to the "Next >" button.

The taskbar at the bottom shows the system tray with the time "08:46" and date "19-04-2013". The status bar at the bottom left indicates "Status: Running".

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section, which displays a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				
Intern...				

Overlaid on this is the 'Demand-Dial Interface Wizard' dialog box. The 'Interface Name' field contains the text 'Site2'. A red arrow points to the 'Next >' button at the bottom right of the wizard. The system tray at the bottom right shows the time as 08:46 on 19-04-2013, and the status bar at the bottom left indicates 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section, displaying a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter

A 'Demand-Dial Interface Wizard' dialog box is overlaid on the console. The dialog has a title bar that reads 'Demand-Dial Interface Wizard' and a close button. The main content area is titled 'Connection Type' and contains the instruction: 'Select the type of demand-dial interface you want to create.' Below this instruction are three radio button options:

- Connect using a modem, ISDN adapter, or other device
- Connect using virtual private networking (VPN)
- Connect using PPP over Ethernet (PPPoE)

At the bottom of the dialog, there is a blue hyperlink that says 'For more information'. Below the dialog, a red arrow points to the 'Next >' button. The 'Cancel' button is also visible to the right of the 'Next >' button. The taskbar at the bottom of the window shows the system tray with the time '08:46' and date '19-04-2013', and the status 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section. A 'Demand-Dial Interface Wizard' dialog box is displayed in the foreground, prompting the user to select a VPN type. The 'Point to Point Tunneling Protocol (PPTP)' option is selected. A red arrow points to the 'Next >' button. The background table lists network interfaces: WAN (Dedicated, Enabled, Connected), Loopback (Loopback, Enabled, Connected), and two LAN interfaces (Microsoft Hyper-V Network Adapter).

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				Microsoft Hyper-V Network Adapter
Intern...				

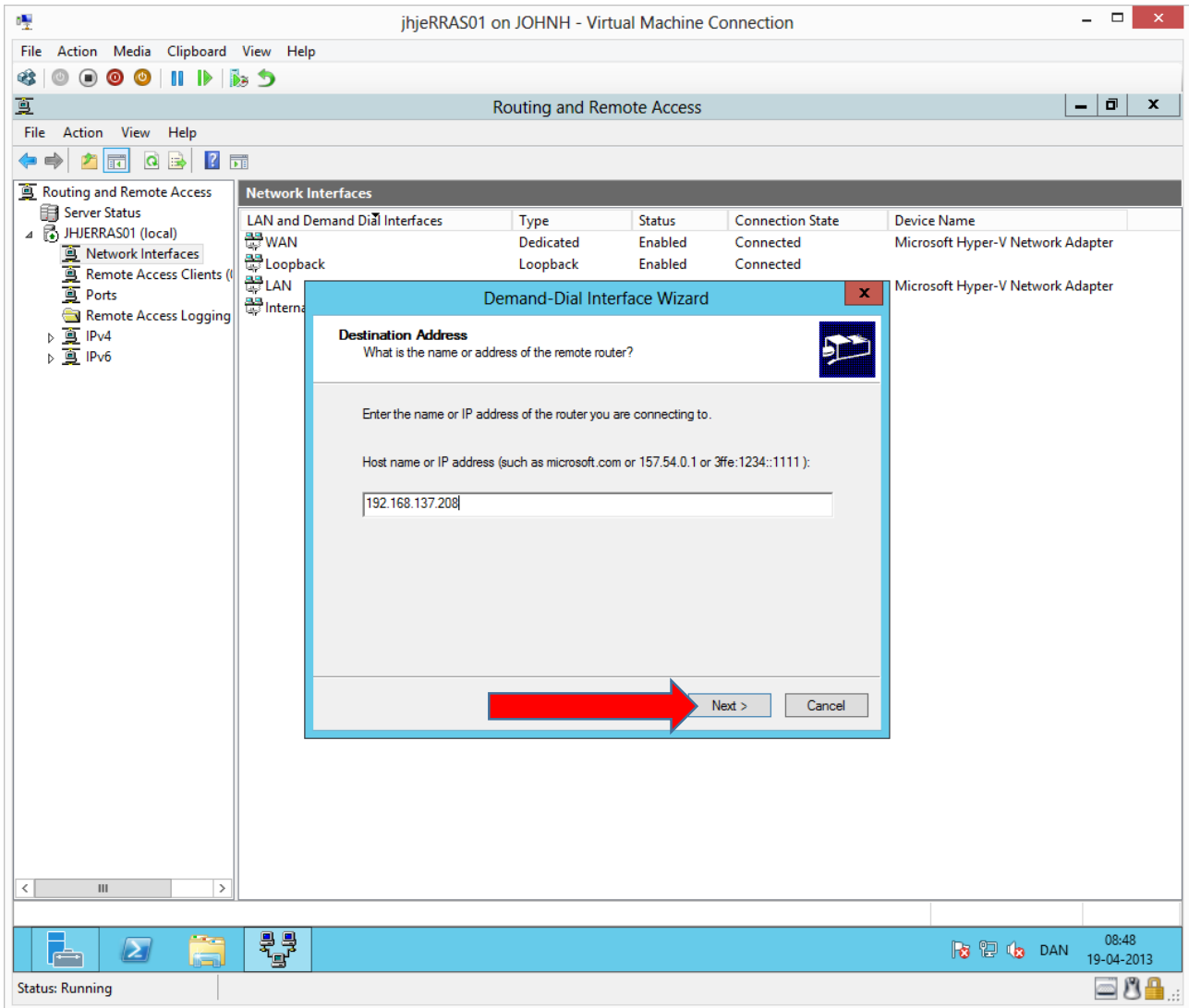
Demand-Dial Interface Wizard

VPN Type
Select the type of VPN connection you want to create.

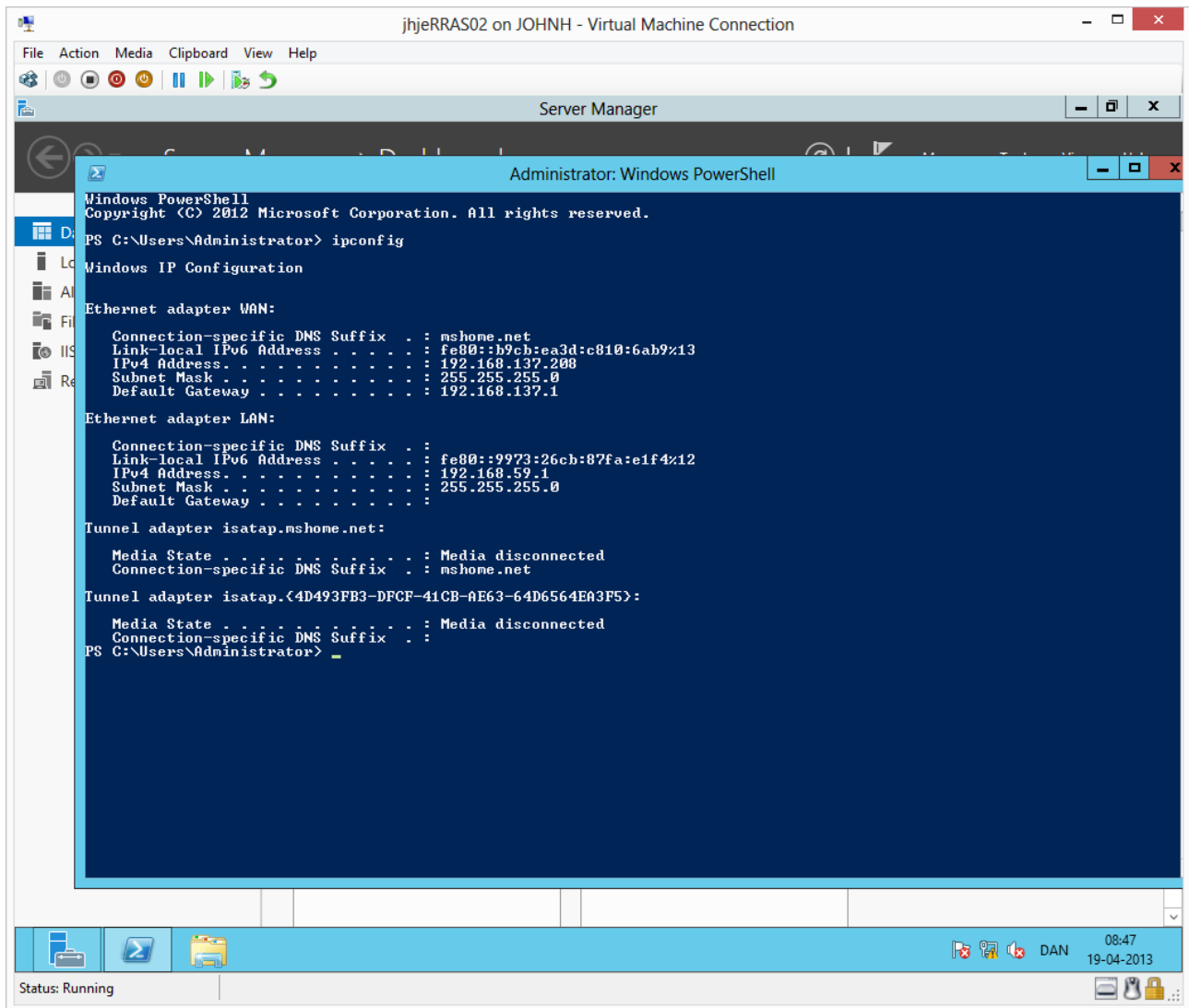
- Automatic selection
- Point to Point Tunneling Protocol (PPTP)
- Layer 2 Tunneling Protocol (L2TP)
- IKEv2

[For more information.](#)

Next > **Cancel**



Type in the opposite RRAS server **external** IP address.



At RRAS02, the external IP address can be found easily with the ipconfig command.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section. A 'Demand-Dial Interface Wizard' dialog box is displayed, showing the 'Protocols and Security' step. The wizard prompts the user to select transports and security options for the connection. The 'Next >' button is highlighted with a red arrow.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				
Intern...				

Demand-Dial Interface Wizard

Protocols and Security
Select transports and security options for this connection.

Select all that apply:

- Route IP packets on this interface.
- Add a user account so a remote router can dial in
- Send a plain-text password if that is the only way to connect
- Use scripting to complete the connection with the remote router

[For more information](#)

Next > **Cancel**

Status: Running | 08:49 19-04-2013

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section, which displays a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter

A 'Demand-Dial Interface Wizard' dialog box is overlaid on the console. The wizard is titled 'Demand-Dial Interface Wizard' and has a sub-section 'Static Routes for Remote Networks'. Below the title, it states: 'A static route is a manually defined, permanent route between two networks.' The main text reads: 'To activate this demand-dial connection, you must add a static route to the network. Specify the IP address of the remote networks this network will communicate with.' Below this text is a table for 'Static Routes':

Destination	Network Mask/Prefix length	Metric
-------------	----------------------------	--------

At the bottom of the wizard, there are three buttons: '< Back', 'Next >', and 'Cancel'. A red arrow points to the 'Add' button, which is located below the 'Static Routes' table.

The taskbar at the bottom of the window shows the system tray with the time '08:49' and date '19-04-2013'. The status bar at the bottom left indicates 'Status: Running'.

The screenshot displays the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'Network Interfaces' section, which shows a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter

A 'Demand-Dial Interface Wizard' dialog box is open, showing the 'Static Route' step. The 'Remote Network Support using IPv4' option is selected. The fields are filled with the following values:

- Destination: 192 . 168 . 59 . 0
- Network Mask: 255 . 255 . 255 . 0
- Metric: 10

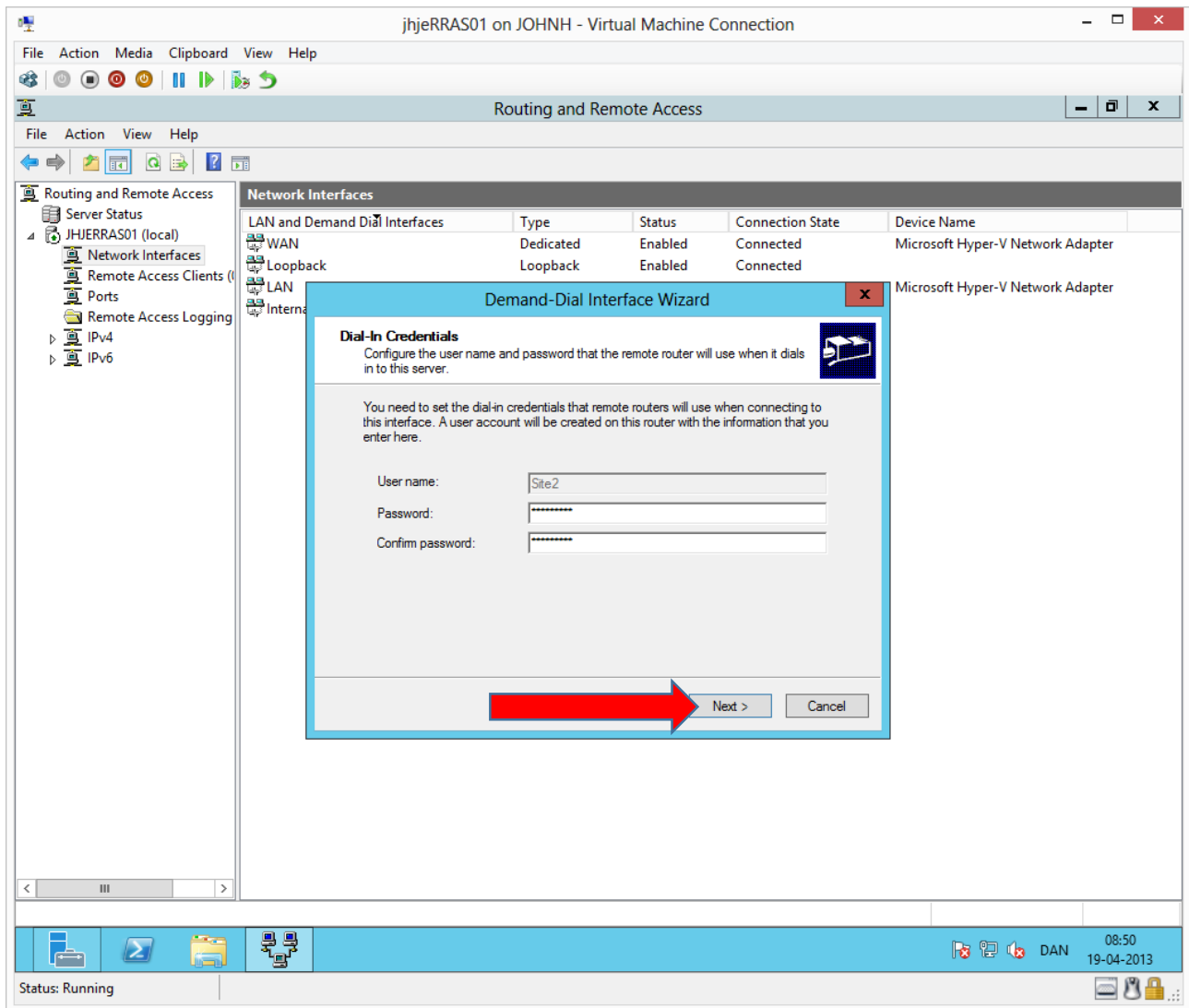
The 'OK' button is highlighted with a red arrow. Below the dialog, there are navigation buttons: '< Back', 'Next >', and 'Cancel'. The taskbar at the bottom shows the system tray with the time '09:41' and date '19-04-2013', and the status 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is displaying the 'Demand-Dial Interface Wizard' with the 'Static Routes for Remote Networks' step selected. The wizard explains that a static route is a manually defined, permanent route between two networks and instructs the user to specify the IP address of the remote networks. A table lists the static routes, with one entry: Destination 192.168.59.0, Network Mask/Prefix length 255.255.255.0, and Metric 10. A red arrow points to the 'Next >' button.

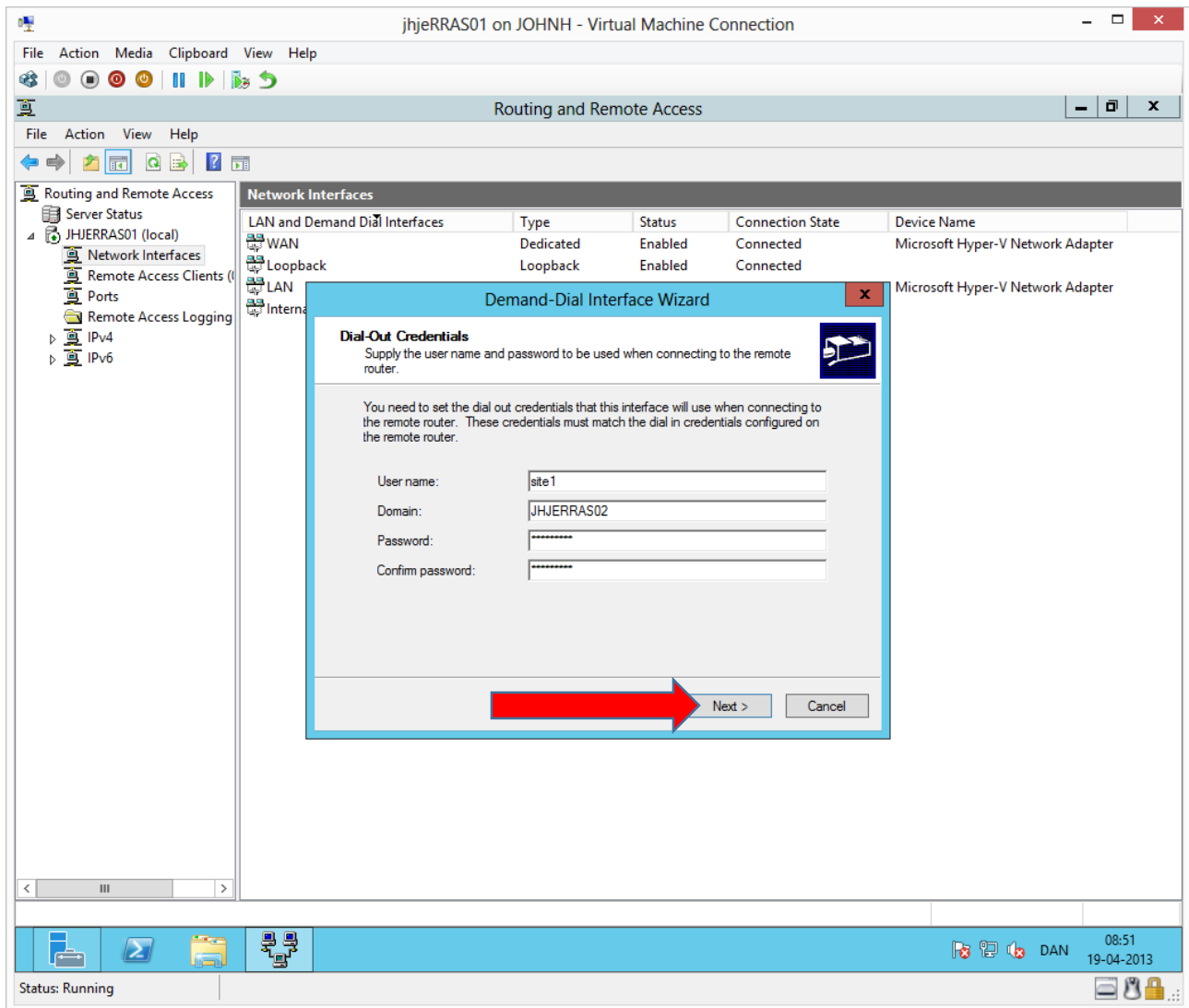
Destination	Network Mask/Prefix length	Metric
192.168.59.0	255.255.255.0	10

Buttons: Add, Remove, Next >, Cancel

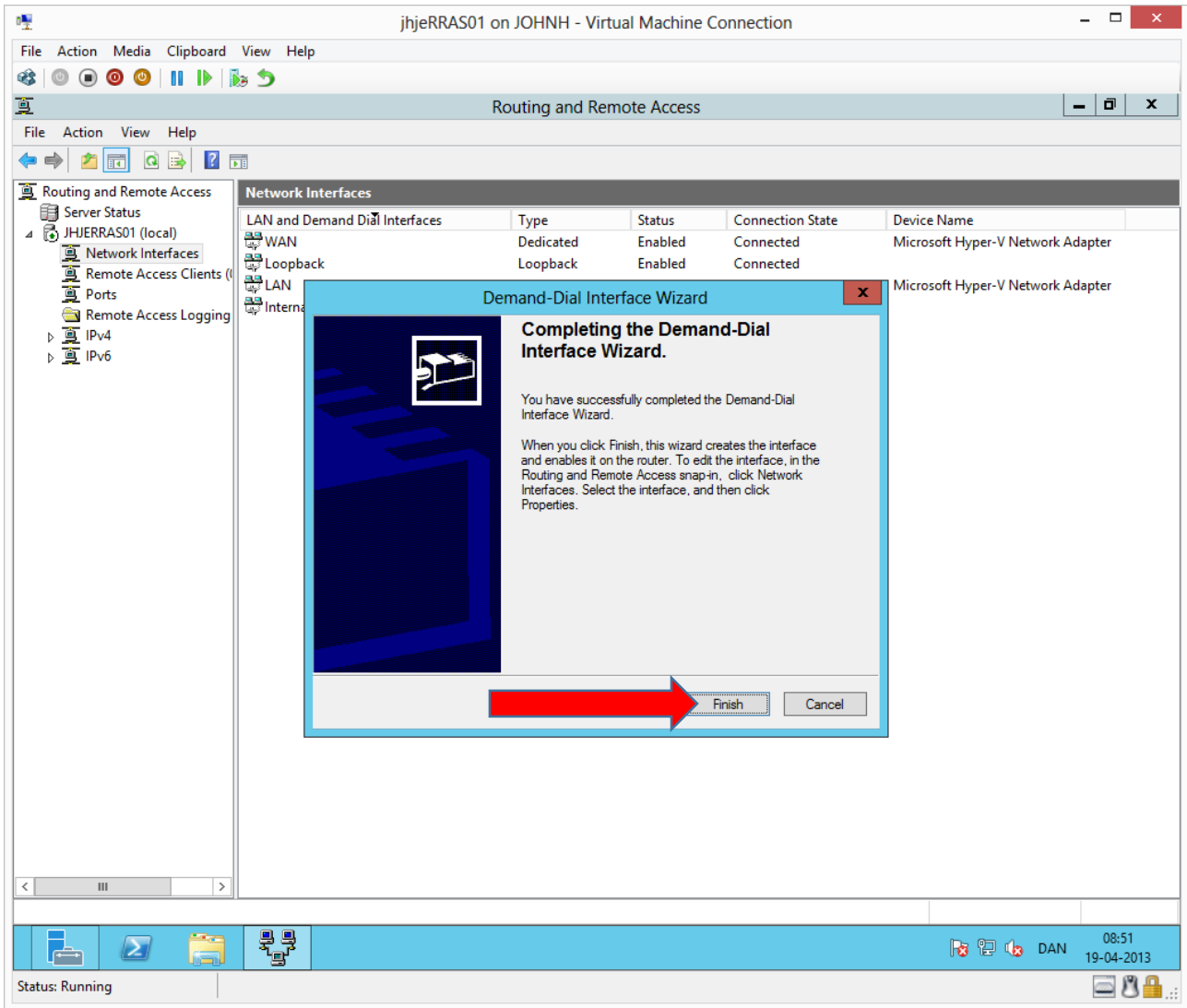
Taskbar: Status: Running, 08:50, 19-04-2013

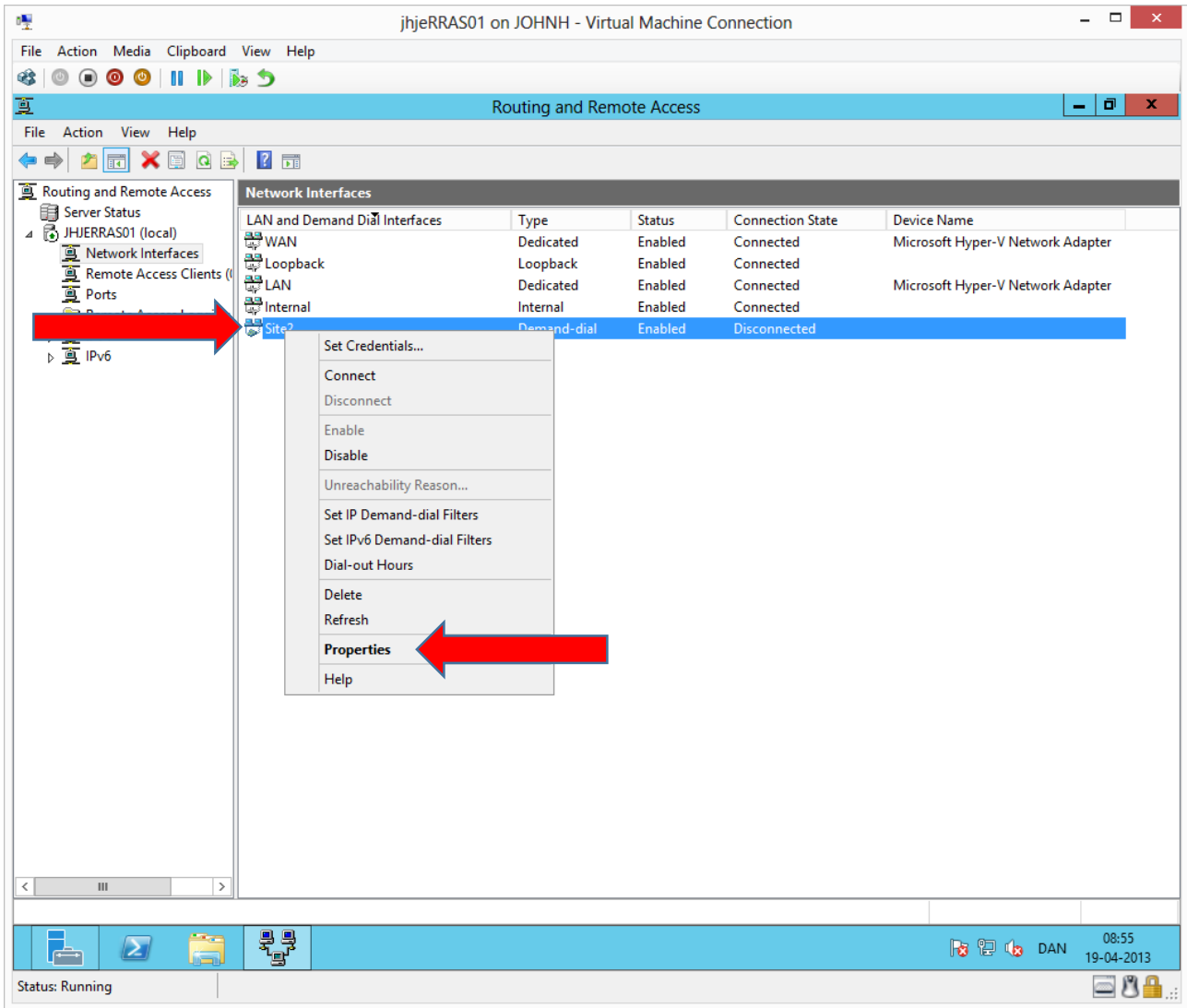


We are creating a user account, which RRAS02 must use when dialing site 1 (this server). The test password **Password1** can be used.



This user must be used when RRAS01 (this server) is dialing site 2 (RRAS02). The user account has not been created yet, but is created when we follow these same steps on RRAS02 afterwards. We can use the same password **Password1**

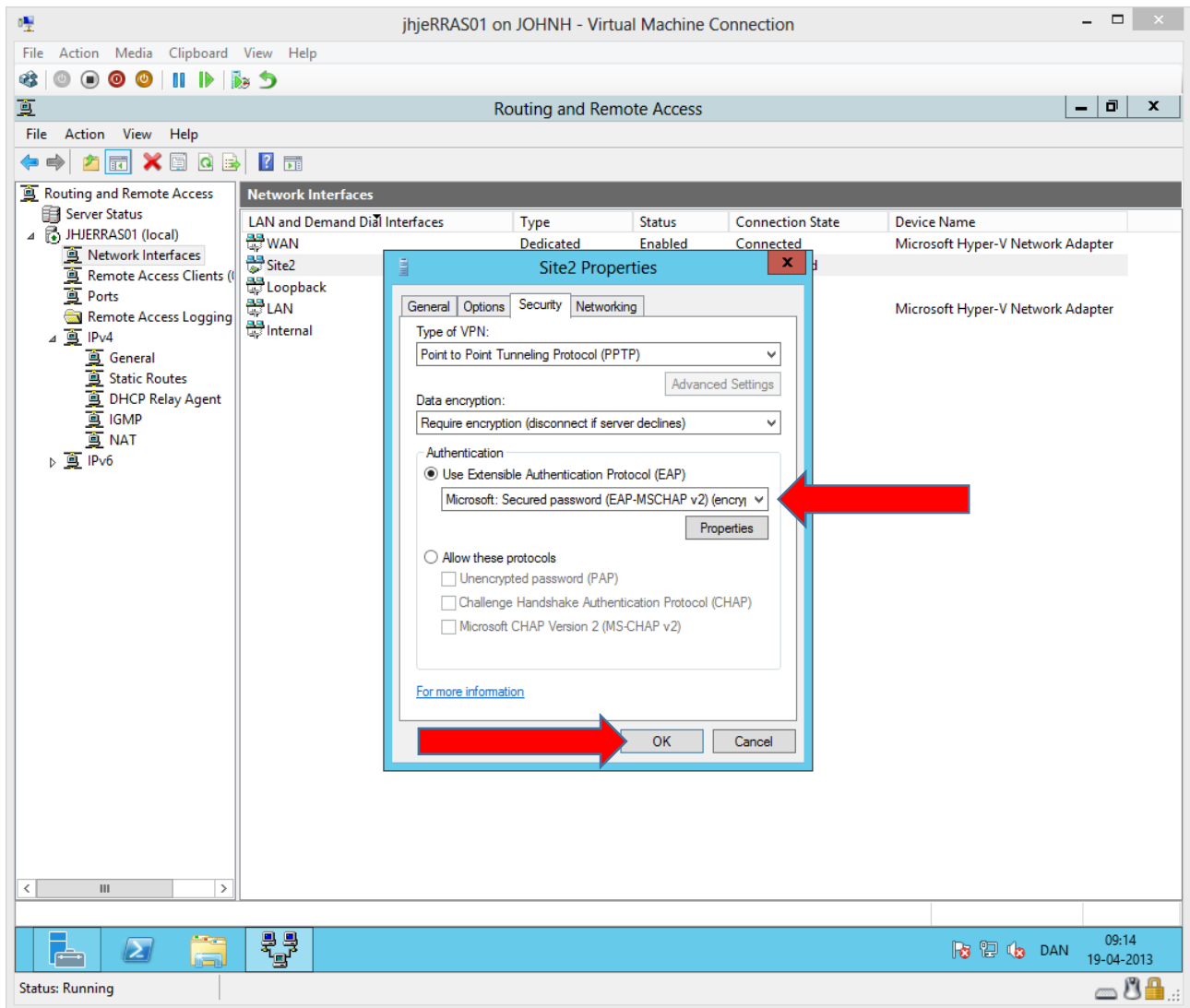




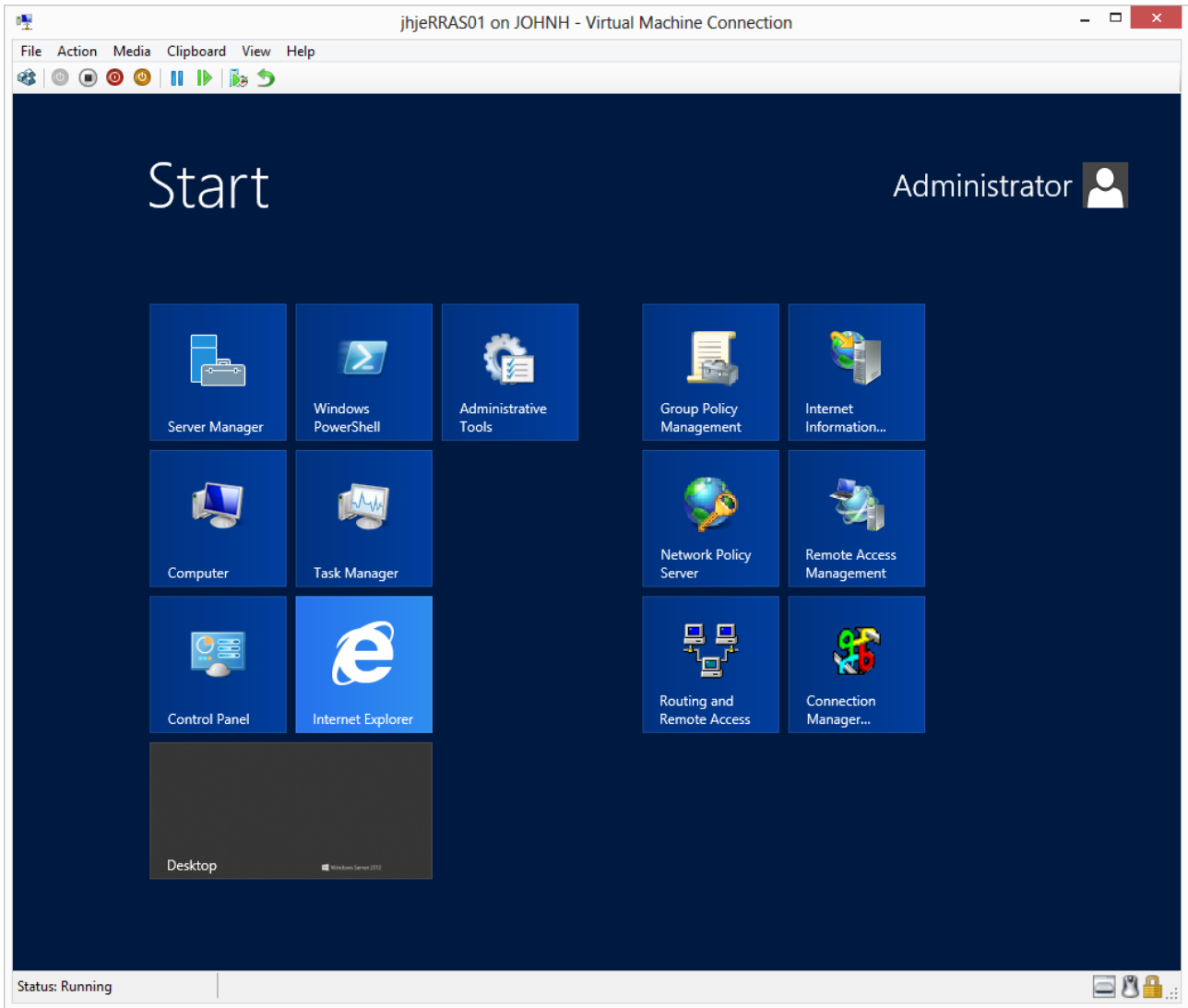
Right click site 2 and choose **Properties**

The screenshot displays the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console window has a menu bar with 'File', 'Action', 'Media', 'Clipboard', 'View', and 'Help'. Below the menu bar is a toolbar with various icons. The main area is divided into a left-hand tree view and a right-hand main pane. The tree view shows a hierarchy: 'Routing and Remote Access' > 'Server Status' > 'JHJERRAS01 (local)' > 'Network Interfaces'. The main pane shows a table of 'Network Interfaces' with columns for 'Type', 'Status', 'Connection State', and 'Device Name'. The table lists 'WAN' (Dedicated, Enabled, Connected) and 'Site2' (Dedicated, Enabled, Connected), both using 'Microsoft Hyper-V Network Adapter' devices. A 'Site2 Properties' dialog box is open over the 'Site2' interface. The dialog has tabs for 'General', 'Options', 'Security', and 'Networking'. The 'General' tab is active, showing 'Connection type' with 'Persistent connection' selected (indicated by a red arrow). Other settings include 'Idle time before hanging up: never', 'Dialing policy' with 'Redial attempts: 0' and 'Average redial intervals: 1 minute'. Buttons for 'Callback', 'PPP Settings...', 'OK', and 'Cancel' are visible at the bottom of the dialog. The Windows taskbar at the bottom shows the system tray with the time '08:56' and date '19-04-2013', and the name 'DAN'. The status bar at the very bottom indicates 'Status: Running'.

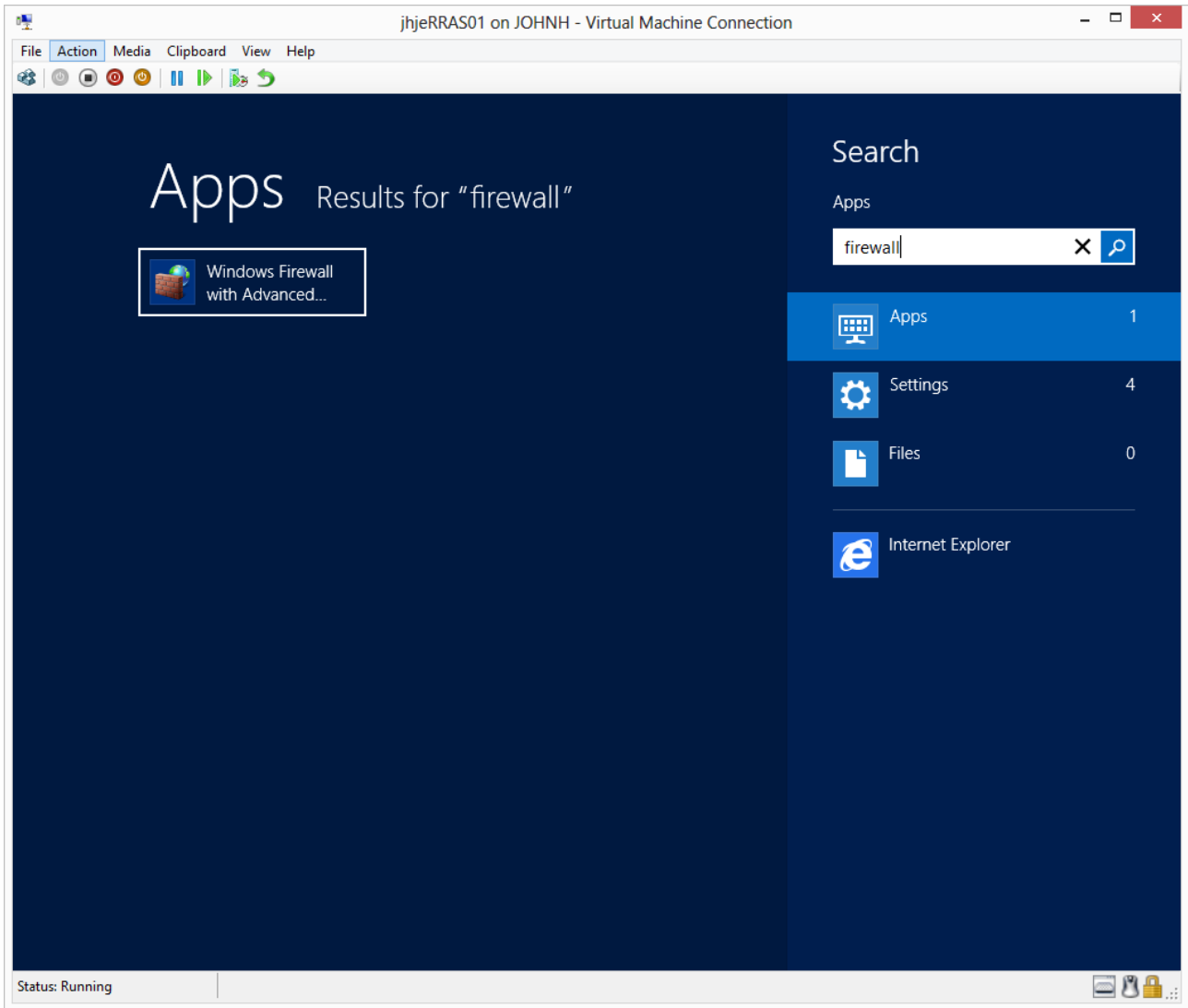
LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback				
LAN				
Internal				
Site2	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter



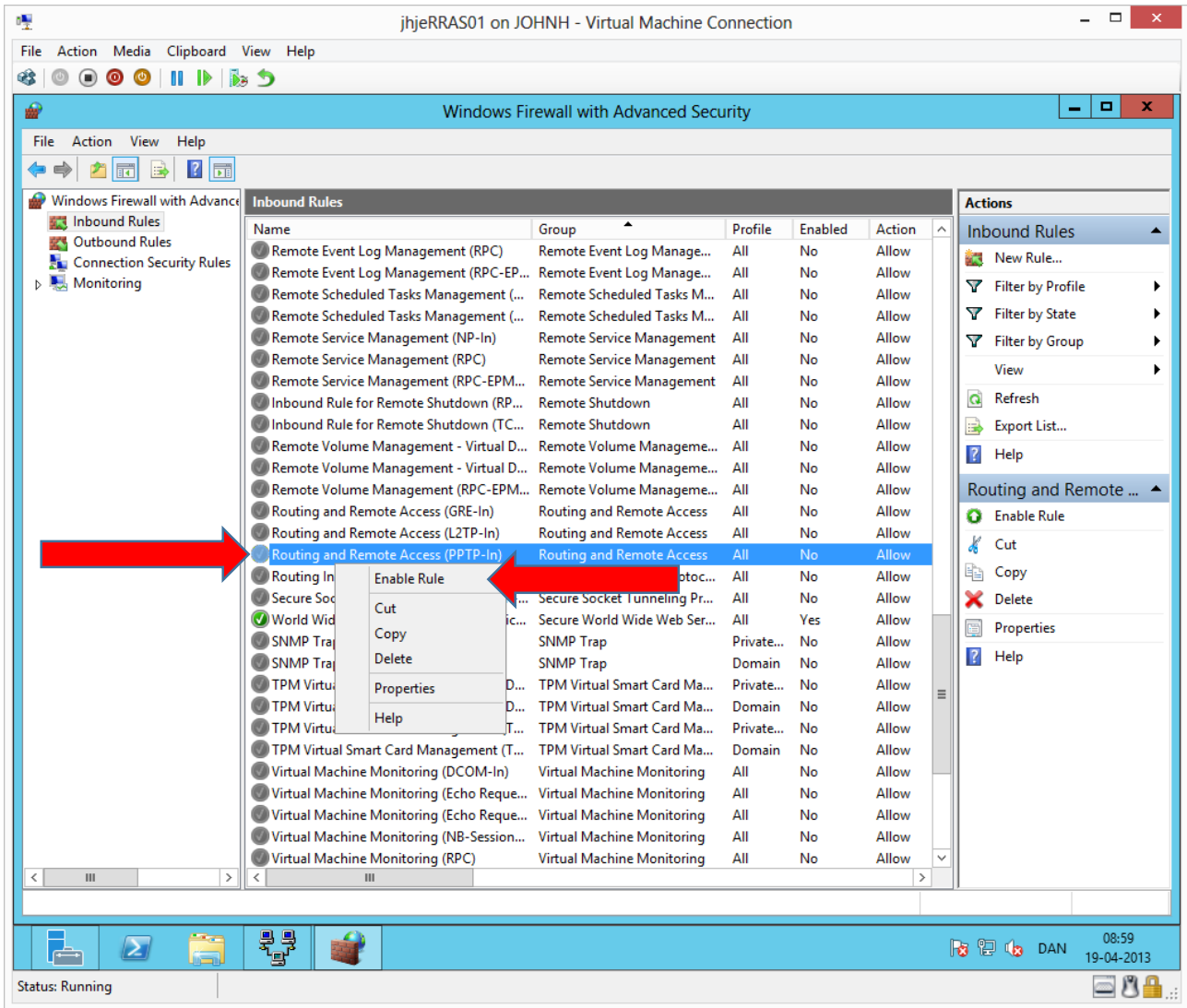
The older MS-CHAP v2 is no longer secure in combination with PPTP. Therefore we will use the later EAP-MSCHAPv2



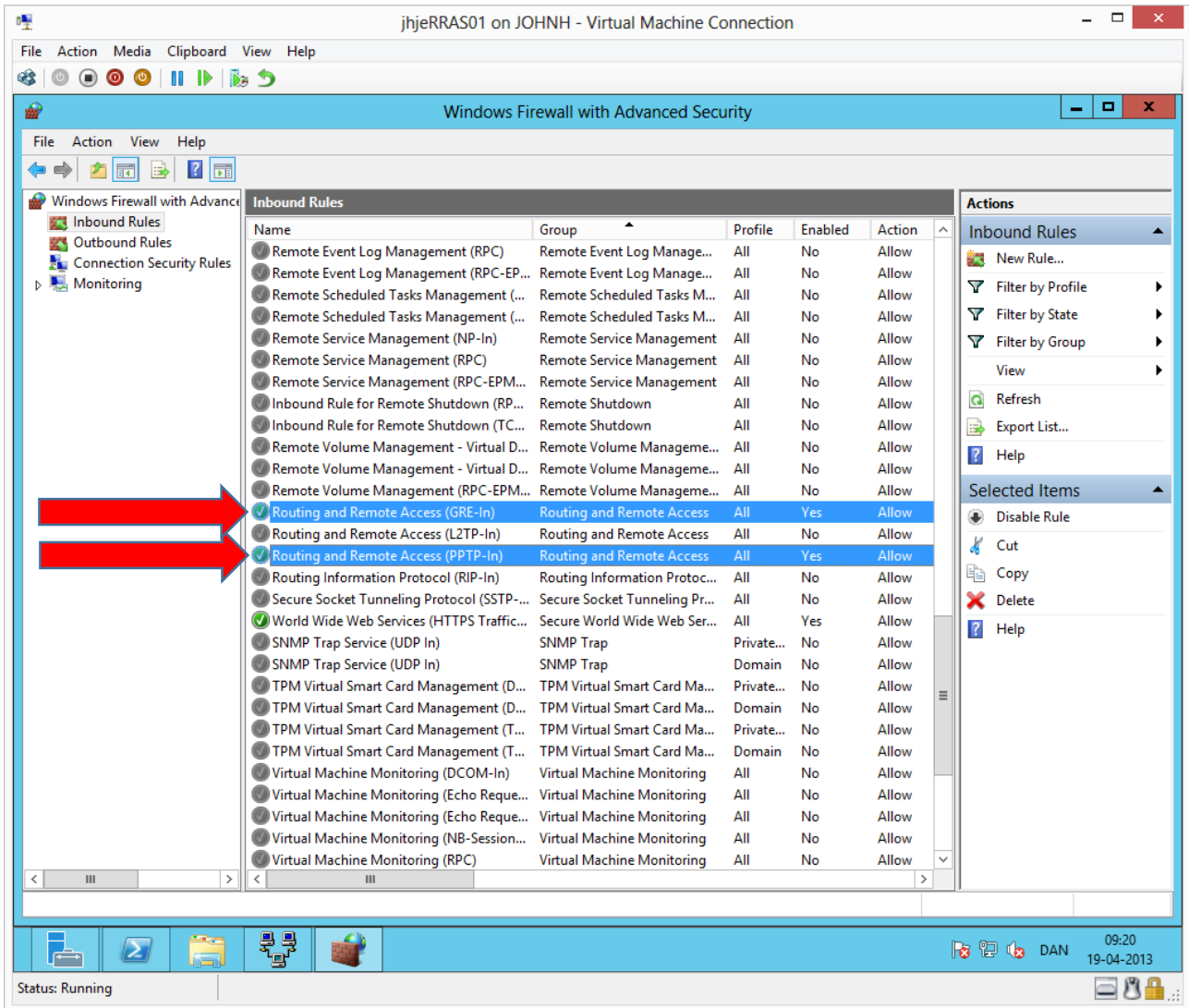
Press the Windows key on the keyboard.



Type **firewall** and press enter.

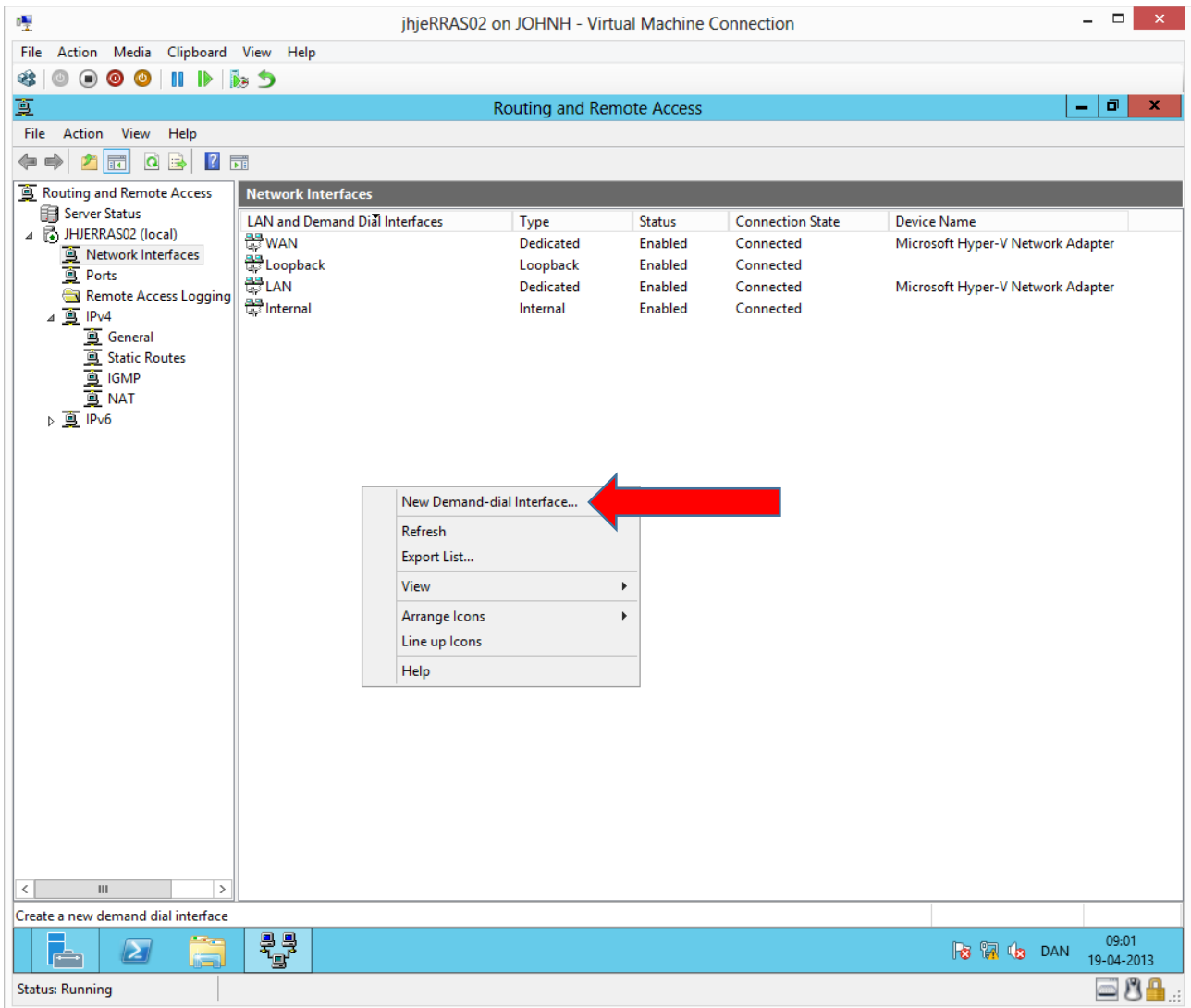


We will open the firewall to our VPN.



We must open both PPTP and GRE inbound.

Configuring RRAS02



We will now complete the same steps on RRAS02 in reverse direction.

The screenshot shows a Windows Virtual Machine window titled "jhjeRRAS02 on JOHNNH - Virtual Machine Connection". The main application is the "Routing and Remote Access" console. On the left, a tree view shows the configuration hierarchy: "Server Status", "JHJERRAS02 (local)", "Network Interfaces", "Ports", "Remote Access Logging", "IPv4" (with sub-items: General, Static Routes, IGMP, NAT), and "IPv6".

The main pane displays the "Network Interfaces" table:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				Microsoft Hyper-V Network Adapter
Intern...				

A "Demand-Dial Interface Wizard" dialog box is overlaid on the console. The dialog has a blue title bar and contains the following text:

Welcome to the Demand-Dial Interface Wizard.

This wizard helps you create a demand-dial connection to connect this router to other routers.

To continue, click Next.

At the bottom of the dialog, there are two buttons: "Next >" and "Cancel". A red arrow points to the "Next >" button.

The taskbar at the bottom shows the system tray with the date and time "09:03 19-04-2013" and the name "DAN". The status bar at the very bottom indicates "Status: Running".

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is displaying the 'Network Interfaces' section, which contains a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				Microsoft Hyper-V Network Adapter
Intern...				

Overlaid on this is the 'Demand-Dial Interface Wizard' dialog box. The 'Interface Name' step is active, with the instruction: 'You can type a friendly name for this connection.' Below this, a text box contains 'site1'. At the bottom of the dialog, a red arrow points to the 'Next >' button.

The taskbar at the bottom shows the system tray with the date '19-04-2013' and time '09:04'. The status bar indicates 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section, displaying a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				Microsoft Hyper-V Network Adapter
Intern...				

A 'Demand-Dial Interface Wizard' dialog box is overlaid on the console. The dialog has a title bar with a close button (X). The main content area is titled 'Connection Type' and contains the instruction: 'Select the type of demand-dial interface you want to create.' Below this, there are three radio button options:

- Connect using a modem, ISDN adapter, or other device
- Connect using virtual private networking (VPN)
- Connect using PPP over Ethernet (PPPoE)

At the bottom of the dialog, there is a blue hyperlink that says 'For more information.' and two buttons: 'Next >' and 'Cancel'. A large red arrow points directly to the 'Next >' button.

The taskbar at the bottom of the window shows the system tray with the date '19-04-2013' and time '09:04'. The status bar at the very bottom indicates 'Status: Running'.

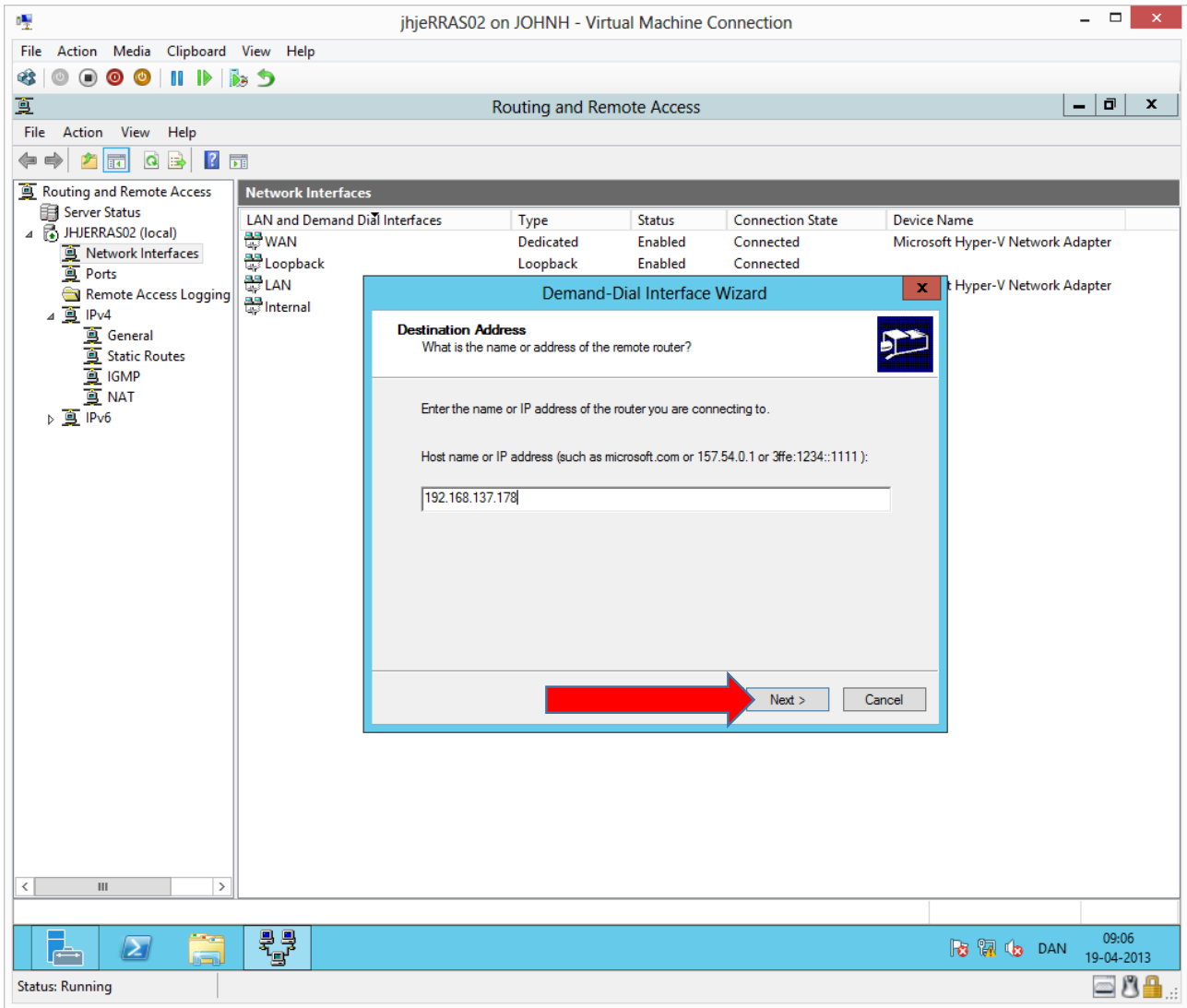
The screenshot shows a Windows Virtual Machine (VM) window titled "jhjeRRAS02 on JOHNNH - Virtual Machine Connection". The main window displays the "Routing and Remote Access" console. On the left, a tree view shows the configuration hierarchy: "Server Status", "JHJERRAS02 (local)", "Network Interfaces", "Ports", "Remote Access Logging", "IPv4" (with sub-items: General, Static Routes, IGMP, NAT), and "IPv6". The main pane shows a table of "Network Interfaces":

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				Microsoft Hyper-V Network Adapter
Intern...				

Overlaid on this is the "Demand-Dial Interface Wizard" dialog box. The "VPN Type" section asks to "Select the type of VPN connection you want to create." with the following options:

- Automatic selection
- Point to Point Tunneling Protocol (PPTP)
- Layer 2 Tunneling Protocol (L2TP)
- IKEv2

At the bottom of the wizard, there is a "Next >" button and a "Cancel" button. A red arrow points to the "Next >" button. A link for "For more information" is also visible. The taskbar at the bottom shows the system tray with the time "09:04" and date "19-04-2013". The status bar at the very bottom indicates "Status: Running".



External IP of the opposite RRAS server.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS01 on JOHNNH'. The console is open to the 'General' tab, displaying a table of network interfaces. A red arrow points to the 'Incoming bytes' column for the 'WAN' interface, which shows a value of 328. The table lists several interfaces: WAN (Dedicated, 192.168.137.178), Site2 (Demand-dial, Not available), Loopback (Loopback, 127.0.0.1), LAN (Dedicated, 192.168.58.1), and Internal (Internal, Not available). The console also shows a tree view on the left with categories like Server Status, Network Interfaces, and Remote Access Clients. The system tray at the bottom indicates the status is 'Running' and shows the date and time as 09:05 on 19-04-2013.

Interface	Type	IP Address	Incoming bytes	Outgoing bytes	Static Filters	Adr
WAN	Dedicated	192.168.137.178	328	0	Disabled	Up
Site2	Demand-dial	Not available	0	0	Disabled	Up
Loopback	Loopback	127.0.0.1	0	0	Disabled	Up
LAN	Dedicated	192.168.58.1	2,157,751	18,783,532	Disabled	Up
Internal	Internal	Not available	-	-	Disabled	Unk

RRAS01's external IP can also be found from the Routing and Remote Access snap in on RRAS01.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section. A 'Demand-Dial Interface Wizard' dialog box is displayed, showing the 'Protocols and Security' step. The dialog box contains the following text and options:

Demand-Dial Interface Wizard

Protocols and Security
Select transports and security options for this connection.

Select all that apply:

- Route IP packets on this interface.
- Add a user account so a remote router can dial in
- Send a plain-text password if that is the only way to connect
- Use scripting to complete the connection with the remote router

[For more information](#)

Next > Cancel

The dialog box is overlaid on a table of network interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				
Internal				

The taskbar at the bottom shows the system tray with the date and time: 09:06 19-04-2013. The status bar at the bottom left indicates 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section, displaying a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				
Internal				

A 'Demand-Dial Interface Wizard' dialog box is open, titled 'Static Routes for Remote Networks'. It contains the following text: 'A static route is a manually defined, permanent route between two networks.' Below this, it states: 'To activate this demand-dial connection, you must add a static route to the network. Specify the IP address of the remote networks this network will communicate with.' There is a table for 'Static Routes' with columns for 'Destination', 'Network Mask/Prefix length', and 'Metric'. At the bottom of the dialog, there are 'Add' and 'Remove' buttons, and 'Back', 'Next', and 'Cancel' buttons at the very bottom. A red arrow points to the 'Add' button.

The taskbar at the bottom shows the system tray with the date '19-04-2013' and time '09:07'. The status bar at the bottom left indicates 'Status: Running'.

The screenshot shows a Windows Virtual Machine window titled "jhjeRRAS02 on JOHNNH - Virtual Machine Connection". The main application is "Routing and Remote Access". The left-hand tree view shows the following structure:

- Routing and Remote Access
 - Server Status
 - JHJERRAS02 (local)
 - Network Interfaces
 - Ports
 - Remote Access Logging
 - IPv4
 - General
 - Static Routes
 - IGMP
 - NAT
 - IPv6

The main pane displays the "Network Interfaces" table:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				Microsoft Hyper-V Network Adapter
Internal				

A "Demand-Dial Interface Wizard" dialog box is open, showing the "Static Route" step. The "Remote Network Support using IPv4" radio button is selected. The fields are filled with:

- Destination: 192 . 168 . 58 . 0
- Network Mask: 255 . 255 . 255 . 0
- Metric: 10

The "Remote Network Support using IPv6" section is disabled. A red arrow points to the "OK" button. At the bottom of the wizard, there are "< Back", "Next >", and "Cancel" buttons.

The taskbar at the bottom shows the system tray with the date "19-04-2013" and time "09:07". The status bar at the bottom left indicates "Status: Running".

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section, which displays a table of interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				
Internal				

A 'Demand-Dial Interface Wizard' dialog box is overlaid on the console. The wizard is at the 'Static Routes for Remote Networks' step. The text in the dialog reads: 'To activate this demand-dial connection, you must add a static route to the network. Specify the IP address of the remote networks this network will communicate with.' Below this text is a table of static routes:

Destination	Network Mask/Prefix length	Metric
192.168.58.0	255.255.255.0	10

Buttons for 'Add' and 'Remove' are located below the table. At the bottom of the dialog, a red arrow points to the 'Next >' button, with a 'Cancel' button to its right. The taskbar at the bottom shows the system tray with the date '19-04-2013' and time '09:07', and the user name 'DAN'. The status bar at the bottom left indicates 'Status: Running'.

The screenshot shows a Windows Virtual Machine connection window titled "jhjeRRAS02 on JOHNNH - Virtual Machine Connection". The main window displays the "Routing and Remote Access" console. In the left-hand tree view, the "Network Interfaces" folder is expanded, showing "WAN", "Loopback", "LAN", and "Internal" interfaces. The main pane shows a table of "LAN and Demand Dial Interfaces":

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				
Internal				

Overlaid on this is the "Demand-Dial Interface Wizard" dialog box, specifically the "Dial-In Credentials" step. The text in the dialog reads: "Configure the user name and password that the remote router will use when it dials in to this server." Below this, it states: "You need to set the dial-in credentials that remote routers will use when connecting to this interface. A user account will be created on this router with the information that you enter here." There are three input fields: "User name:" with the value "site 1", "Password:" with masked characters, and "Confirm password:" with masked characters. At the bottom, there are "Next >" and "Cancel" buttons. A large red arrow points to the "Next >" button.

The taskbar at the bottom shows the system tray with the date and time "09:08 19-04-2013" and the name "DAN". The status bar at the very bottom indicates "Status: Running".

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section. A 'Demand-Dial Interface Wizard' dialog box is displayed, showing the 'Dial-Out Credentials' step. The wizard prompts for a user name, domain, password, and confirm password. A red arrow points to the 'Next >' button.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN				
Internal				

Demand-Dial Interface Wizard

Dial-Out Credentials
Supply the user name and password to be used when connecting to the remote router.

You need to set the dial out credentials that this interface will use when connecting to the remote router. These credentials must match the dial in credentials configured on the remote router.

User name:

Domain:

Password:

Confirm password:

Next > **Cancel**

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section. A 'Demand-Dial Interface Wizard' dialog box is displayed in the foreground, indicating that the wizard has been successfully completed. The dialog box contains the following text:

Completing the Demand-Dial Interface Wizard.

You have successfully completed the Demand-Dial Interface Wizard.

When you click Finish, this wizard creates the interface and enables it on the router. To edit the interface, in the Routing and Remote Access snap-in, click Network Interfaces. Select the interface, and then click Properties.

A red arrow points to the 'Finish' button in the dialog box. The background console shows a tree view on the left with 'Network Interfaces' selected, and a table of interfaces on the right:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN				
Internal				

The taskbar at the bottom shows the system tray with the date and time '09:09 19-04-2013' and the name 'DAN'. The status bar at the bottom left indicates 'Status: Running'.

The screenshot shows the Windows Routing and Remote Access console. The left pane displays a tree view with 'Network Interfaces' selected. The right pane shows a table of network interfaces. A context menu is open over the 'site1' interface, with 'Properties' highlighted. A red arrow points to 'Properties' in the context menu, and another red arrow points to 'site1' in the table.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Internal	Internal	Enabled	Connected	
site1	Demand-dial	Enabled	Disconnected	

Context Menu for 'site1':

- Set Credentials...
- Connect
- Disconnect
- Enable
- Disable
- Unreachability Reason...
- Set IP Demand-dial Filters
- Set IPv6 Demand-dial Filters
- Dial-out Hours
- Delete
- Refresh
- Properties**
- Help

Status: Running

09:09 19-04-2013

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section. A table lists the interfaces:

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback				
LAN				
Internal				
site1				Microsoft Hyper-V Network Adapter

The 'site1 Properties' dialog box is open, showing the 'General' tab. The 'Connection type' section has 'Persistent connection' selected. The 'Dialing policy' section shows 'Redial attempts' set to 0 and 'Average redial intervals' set to 1 minute. A red arrow points to the 'Persistent connection' radio button.

At the bottom of the console, the status is 'Running'. The taskbar shows the time as 09:09 on 19-04-2013, and the user name is DAN.

The screenshot displays the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section, where a 'site1' interface is selected. A 'site1 Properties' dialog box is open, showing the 'Security' tab. The 'Type of VPN' is set to 'Point to Point Tunneling Protocol (PPTP)'. Under 'Data encryption', 'Require encryption (disconnect if server declines)' is selected. In the 'Authentication' section, 'Use Extensible Authentication Protocol (EAP)' is selected, and the dropdown menu is set to 'Microsoft: Secured password (EAP-MSCHAP v2) (encript)'. Two red arrows point to the 'Microsoft: Secured password (EAP-MSCHAP v2) (encript)' dropdown and the 'OK' button. The background shows a tree view of network settings including Server Status, Network Interfaces, Ports, Remote Access Logging, IPv4 (General, Static Routes, IGMP, NAT), and IPv6. The taskbar at the bottom shows the system tray with the time 09:10 on 19-04-2013 and the name DAN.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback				
LAN				
Internal				
site1				Microsoft Hyper-V Network Adapter

The screenshot shows the Windows Firewall with Advanced Security console. The 'Inbound Rules' list is displayed with the following columns: Name, Group, Profile, Enabled, and Action. Three red arrows point to the following rules:

Name	Group	Profile	Enabled	Action
Remote Desktop - User Mode (TCP-In)	Remote Desktop	All	No	Allow
Remote Desktop - User Mode (UDP-In)	Remote Desktop	All	No	Allow
Remote Event Log Management (NP-In)	Remote Event Log Manage...	All	No	Allow
Remote Event Log Management (RPC)	Remote Event Log Manage...	All	No	Allow
Remote Event Log Management (RPC-EP...	Remote Event Log Manage...	All	No	Allow
Remote Scheduled Tasks Management (...)	Remote Scheduled Tasks M...	All	No	Allow
Remote Scheduled Tasks Management (...)	Remote Scheduled Tasks M...	All	No	Allow
Remote Service Management (NP-In)	Remote Service Management	All	No	Allow
Remote Service Management (RPC)	Remote Service Management	All	No	Allow
Remote Service Management (RPC-EPM...	Remote Service Management	All	No	Allow
Inbound Rule for Remote Shutdown (RP...	Remote Shutdown	All	No	Allow
Inbound Rule for Remote Shutdown (TC...	Remote Shutdown	All	No	Allow
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow
Remote Volume Management - Virtual D...	Remote Volume Manageme...	All	No	Allow
Remote Volume Management (RPC-EPM...	Remote Volume Manageme...	All	No	Allow
Routing and Remote Access (GRE-In)	Routing and Remote Access	All	Yes	Allow
Routing and Remote Access (L2TP-In)	Routing and Remote Access	All	No	Allow
Routing and Remote Access (PPTP-In)	Routing and Remote Access	All	Yes	Allow
Routing Information Protocol (RIP-In)	Routing Information Protoc...	All	No	Allow
Secure Socket Tunneling Protocol (SSTP-...	Secure Socket Tunneling Pr...	All	No	Allow
World Wide Web Services (HTTPS Traffic...	Secure World Wide Web Ser...	All	Yes	Allow
SNMP Trap Service (UDP In)	SNMP Trap	Private...	No	Allow
SNMP Trap Service (UDP In)	SNMP Trap	Domain	No	Allow
TPM Virtual Smart Card Management (D...	TPM Virtual Smart Card Ma...	Private...	No	Allow
TPM Virtual Smart Card Management (D...	TPM Virtual Smart Card Ma...	Domain	No	Allow
TPM Virtual Smart Card Management (T...	TPM Virtual Smart Card Ma...	Private...	No	Allow
TPM Virtual Smart Card Management (T...	TPM Virtual Smart Card Ma...	Domain	No	Allow
Virtual Machine Monitoring (DCOM-In)	Virtual Machine Monitoring	All	No	Allow
Virtual Machine Monitoring (Echo Reque...	Virtual Machine Monitoring	All	No	Allow

The system tray at the bottom shows the status as 'Running', the user as 'DAN', and the date and time as '19-04-2013 09:19'.

The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' view. A tree view on the left shows the hierarchy: Routing and Remote Access > JHJERRAS02 (local) > Network Interfaces. The main pane displays a table of network interfaces. The 'site1' interface is selected, and a context menu is open over it. Two red arrows highlight the 'site1' interface in the table and the 'Connect' option in the context menu.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	Microsoft Hyper-V Network Adapter
LAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Internal	Internal	Enabled	Connected	Microsoft Hyper-V Network Adapter
site1	Demand-dial	Enabled	Disconnected	

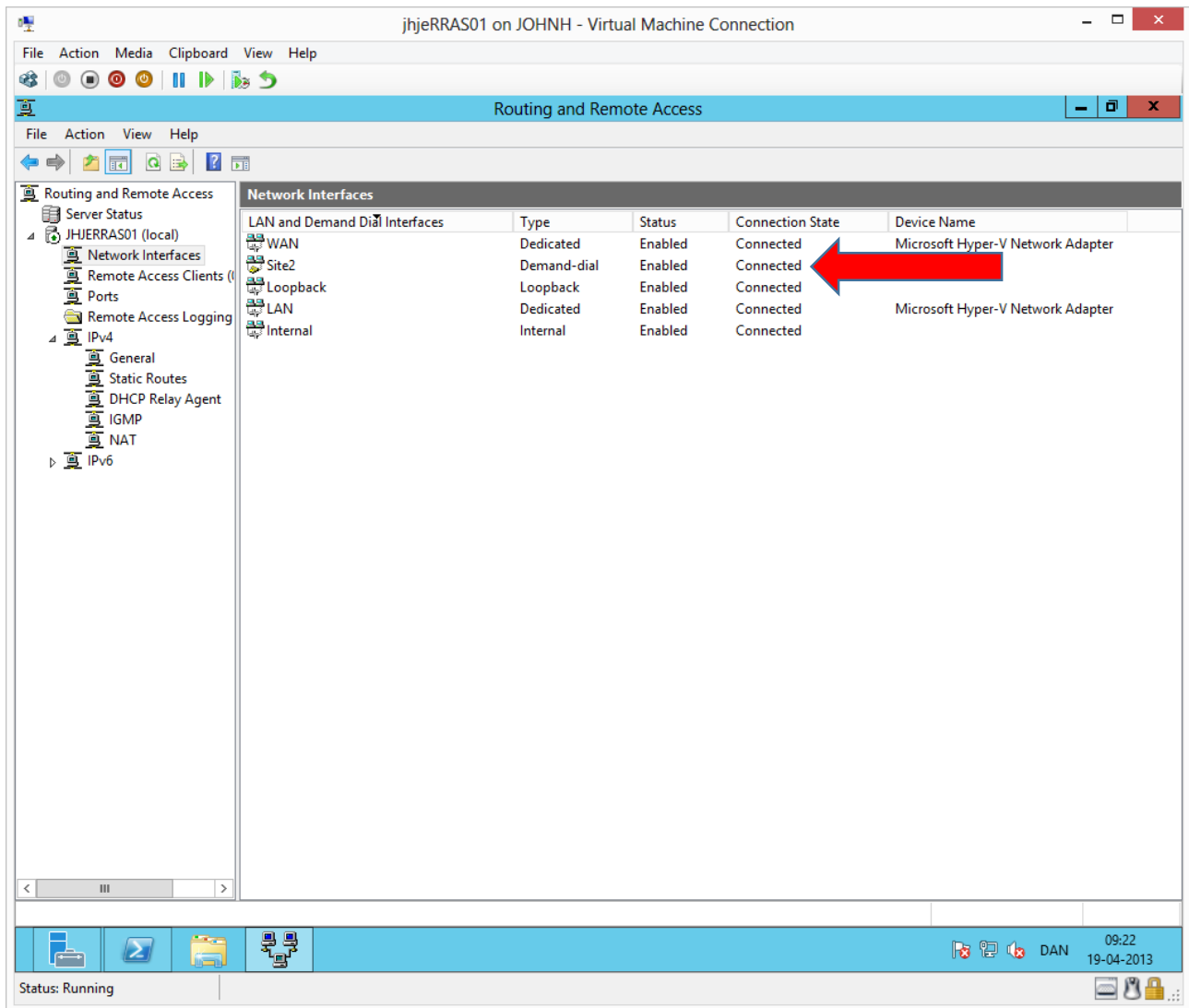
Context Menu for 'site1':

- Set Credentials...
- Connect
- Disconnect
- Enable
- Disable
- Unreachability Reason...
- Set IP Demand-dial Filters
- Set IPv6 Demand-dial Filters
- Dial-out Hours
- Delete
- Refresh
- Properties
- Help

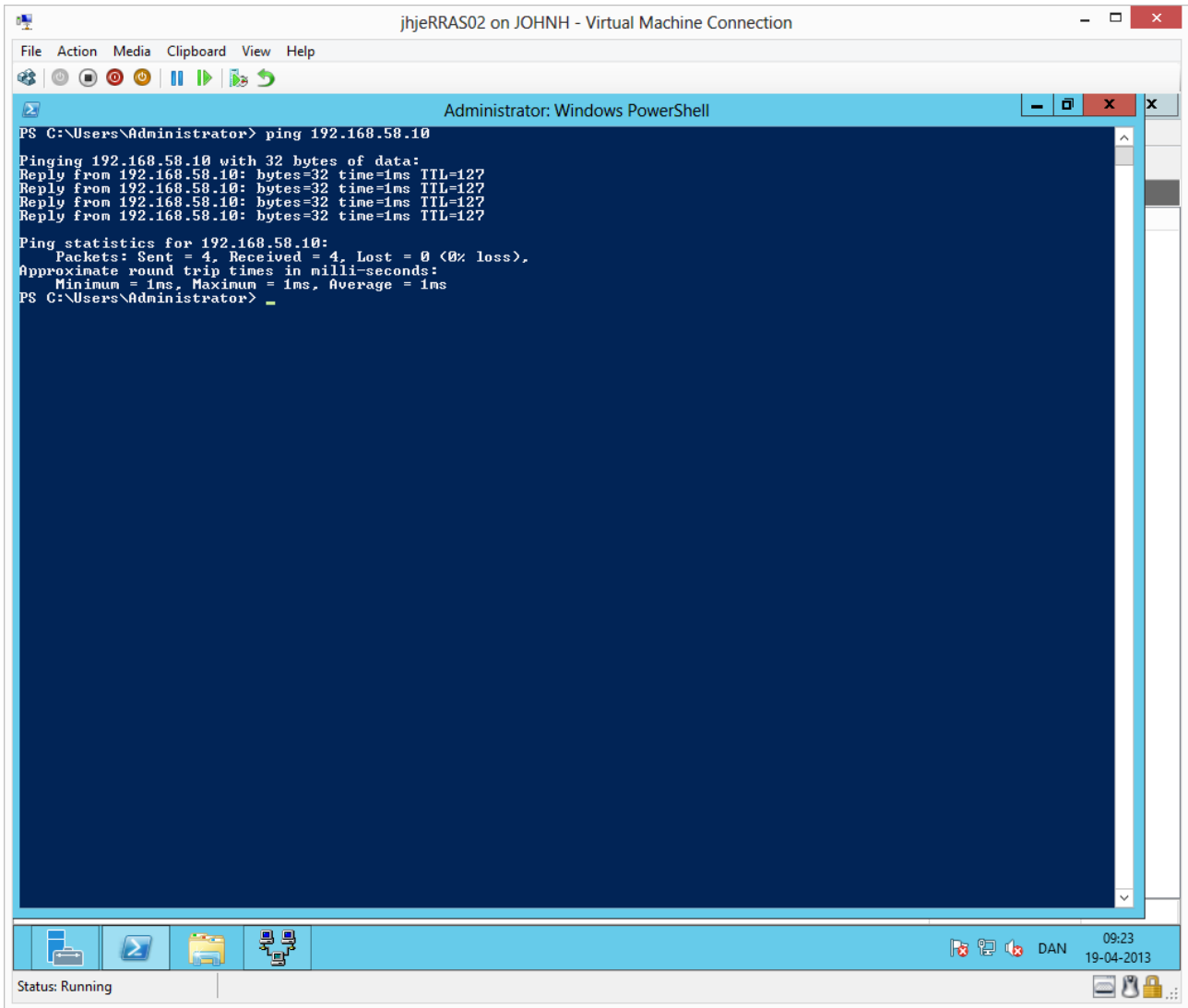
The screenshot shows the Windows Routing and Remote Access console for a virtual machine named 'jhjeRRAS02 on JOHNNH'. The console is open to the 'Network Interfaces' section. A table lists the configured interfaces, with the 'site1' interface highlighted in blue and a red arrow pointing to its 'Connected' status.

LAN and Demand Dial Interfaces	Type	Status	Connection State	Device Name
WAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
site1	Demand-dial	Enabled	Connected	Microsoft Hyper-V Network Adapter
Loopback	Loopback	Enabled	Connected	
LAN	Dedicated	Enabled	Connected	Microsoft Hyper-V Network Adapter
Internal	Internal	Enabled	Connected	

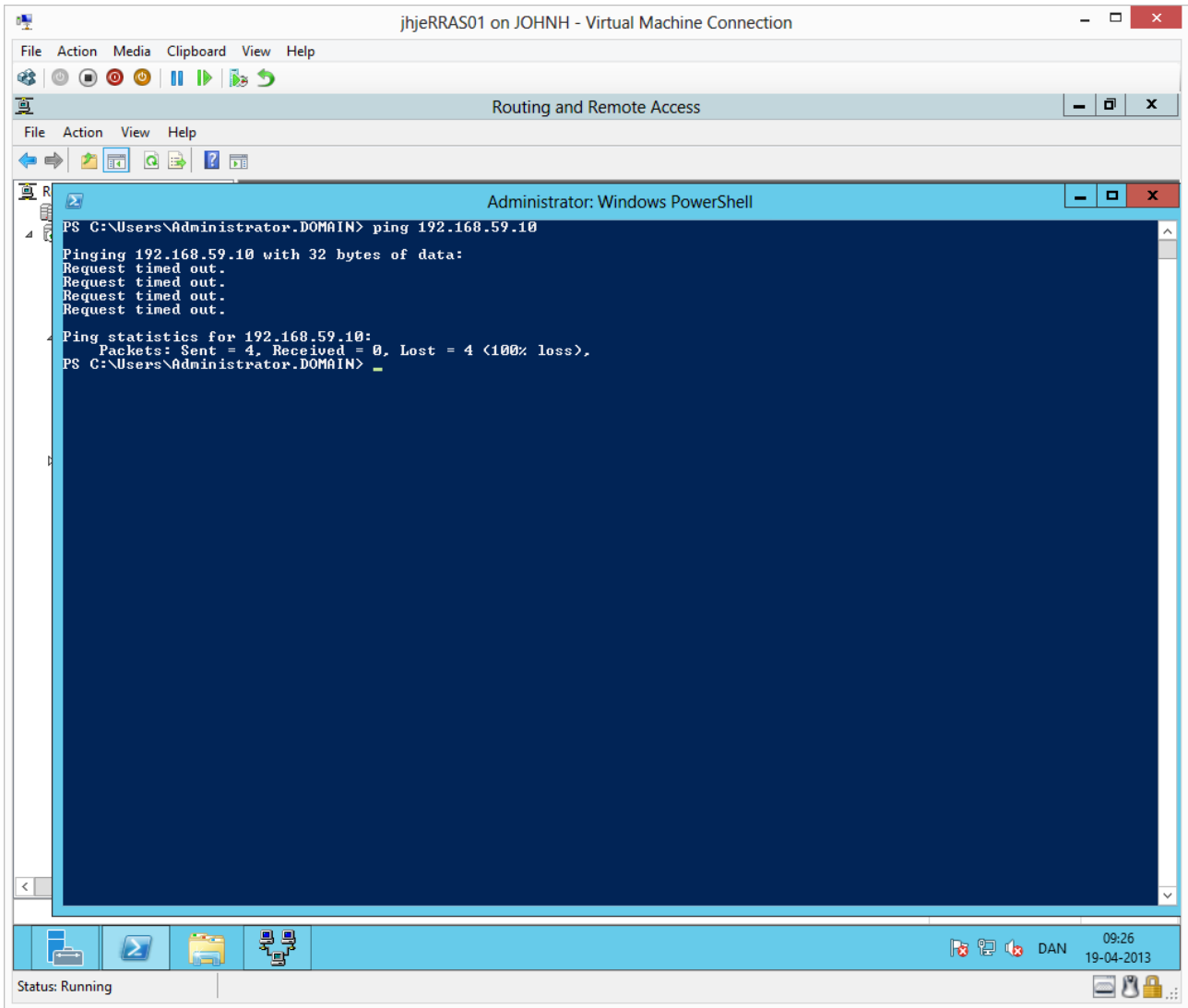
The console also shows a tree view on the left with 'Network Interfaces' selected. The taskbar at the bottom shows the system tray with the time 09:22 on 19-04-2013 and the user name DAN. The status bar at the bottom left indicates 'Status: Running'.



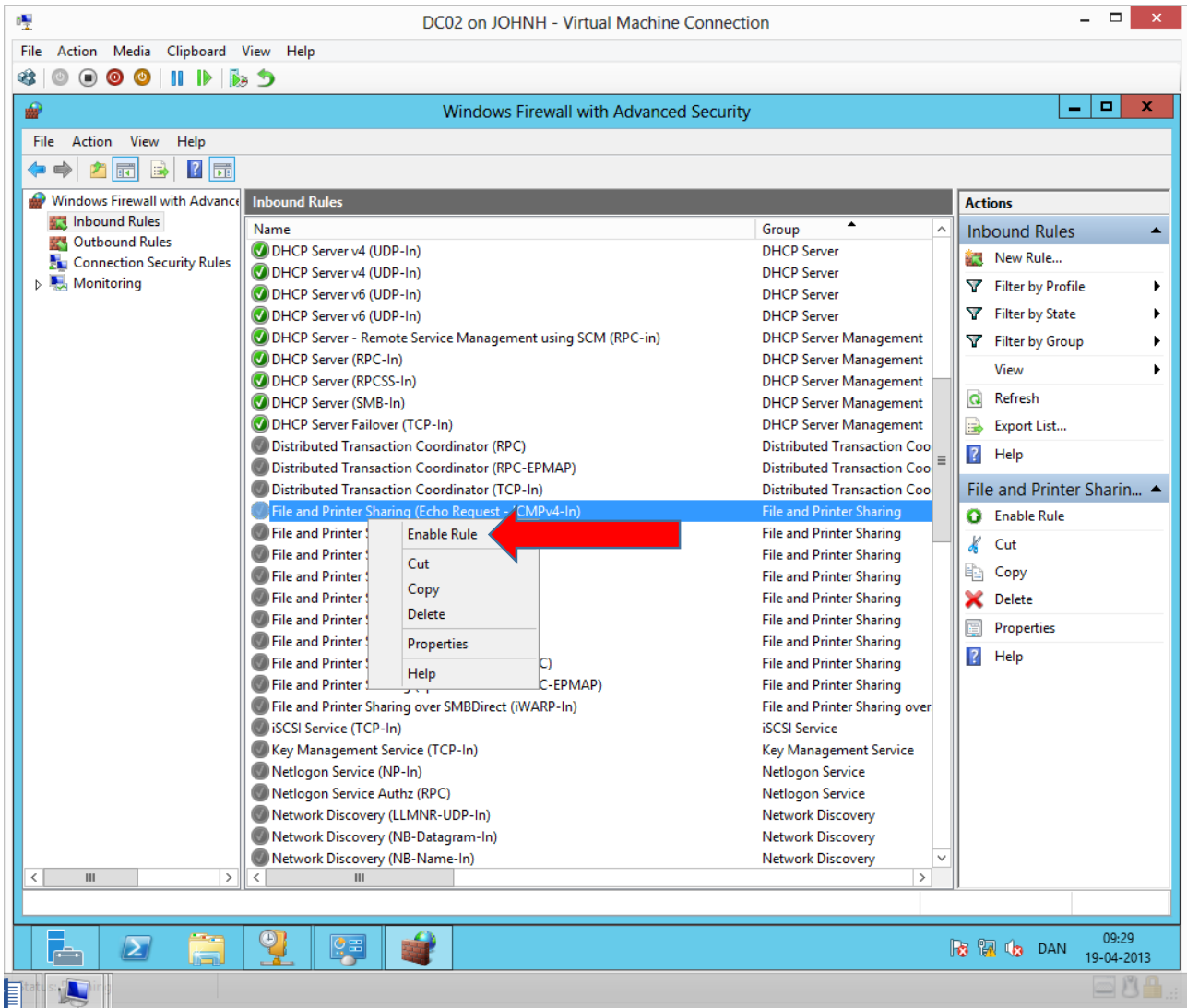
On RRAS01 the site-to-site connection will automatically connect when RRAS02 has established the connection. It may be necessary to do a refresh to see this. (Routing and Remote Access windows must be active and press F5)



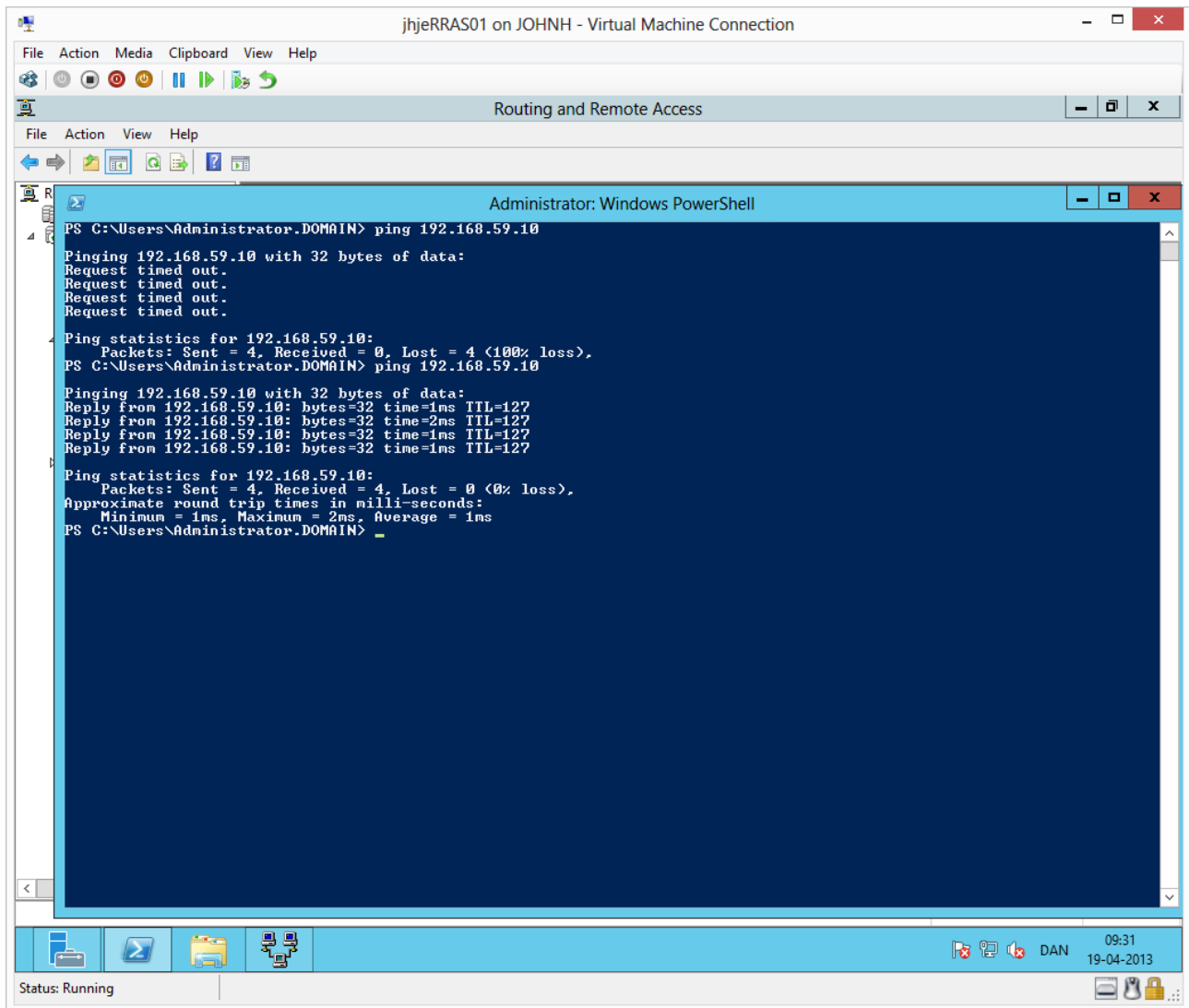
We are testing the connection by pinging from RRAS02 to DC01 in the opposite site.



Here we are pinging from RRAS01 to DC02 in site 2, but the firewall on DC02 is blocking the ICMP packets.



We can manually allow ping traffic (above). Otherwise, the firewall rule will automatically enable when DC02 later is configured as a Domain Controller.



We have manually opened the firewall and the ping packets are now allowed through to DC02.