

Multi-IP™ Mobile VPN Installation Guide Version 3.11.2

By Radio IP Software



Document Description

Multi-IP Mobile VPN 3.11.2 Installation Guide

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About the Installation Guide

Thank you for choosing Mult-IP as your mobile VPN solution. This guide contains all the information you need to deploy a full-feature Mult-IP Mobile VPN solution or single out any of its components. Despite the complexity inherent to large systems, installation of the Mult-IP mobile VPN is straightforward and requires the same steps regardless of whether you are setting up single-gateway or load balancing gateway environments. Topics discussed in this guide include:

- [Gateway Installation and Initial Setup](#) – installation of the gateway component and applying initial setup on your local network;
- [Installation of the Management Console](#) – installation and required first login into the solution's configuration and monitoring graphical user interface;
- [Installation of the Mult-IP Client software](#) – installation of the client software on a best-of-class mobile device running Windows XP, Windows 7 (x86 and x64) or Windows 8.1x64;
- [Ghosting Mobile Workstations](#) – replication of a best-of-class client image to multiple fleet devices;
- [Installing Mult-IP Analytics Software](#) – installation of the optional Analytics server and client launcher, ODBC datasource administration and binding to existing SQL database;
- [Uninstalling Mult-IP Software](#) – complete removal of Mult-IP components without impacting host.

This guide, available as a printable PDF () file, can be found in the *Documentation* folder of the Mult-IP software archive (requires Adobe® Acrobat Reader app for viewing). Please turn to the companion *Mult-IP Mobile VPN Administration Guide* for detailed configuration and administration practices. The latter comes in two formats: a printable PDF file in located in the *Documentation* folder and a topic-based searchable HTML help system can be accessed by clicking the  **Mult-IP Help** button located at the top of the management console's **Action** pane as well as in most context-sensitive menus.

Mult-IP documentation is subject to frequent revisions in order to keep pace with this fast evolving product. While updated documentation always accompanies new software releases, we do welcome your feedback on any omission or inconsistency noticed between what you read and actual software GUI or behavior

Gateway Installation and Initial Setup

In this section, you will learn how to install and enable a single gateway with minimum network settings on a dedicated Windows Server 2008 R2 or Windows Server 2012 R2 machine. Except when specified, repeat this procedure for any additional gateway (when building a load balancing system). This section discusses installation of LAN-based components only, it does not address operational tasks such as adding and configuring the communication driver(s) and deploying mobile workstations.

Note: Be aware that mobile registration does not immediately take place after gateway installation. A minimum amount of configuration is required before mobiles can register.

Note: Make sure to add Mult-IP processes to your Antivirus Exclusion list to prevent unexpected stops of Mult-IP processes: MultiIPGateway.exe, LicenseServer.exe, NdisServer.exe, RipStorage.exe. Keep in mind that the first gateway counts as a building block in a scalable solution. Paying attention to these criteria during installation will ensure seamless expansion to a load balancing solution.

- ➔ **Context Name:** A discrete network signature is defined during installation of the first gateway. The context name sent in multicast over the LAN, informs each subsequently installed gateway of the existence of an already configured environment. Basically, the context serves as a “hook” to bind all gateways to act as a single network.
- ➔ **Virtual IP Segment:** Mult-IP relies on an IP segment completely isolated from that of the corporate LAN. This segment, shared by gateways and mobile clients, is used for fleet mobile registration and internal routing. Scoped or non-scoped IP addresses and subnet masks entered during installation of the first gateway are also shared with other gateways in the same network context.
- ➔ **Master IP Address:** Physical static IP address used to route traffic from application servers to the Mult-IP virtual IP segment. It acts as a return path for packets sent back to mobile workstations.

Pre-installation checklist

	<p>Warning</p> <p>If you deploy your Mult-IP license on a virtual machine, take appropriate measures to ensure your MAC addresses and machine identification cannot change over time. Failure to do so may result in a loss of license and potential outage.</p>
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The following requirements must be met for proper operation of your Mult-IP gateway environment:

- ➔ Windows Server 2008 R2 or Windows Server 2012 R2
- ➔ .NET Framework 2.0 or later (included but disabled in Windows Server 2008 R2, .NET 4.0 Framework is enabled by default on Windows Server 2012 R2).
- ➔ MS XML v. 4.0 (included in Mult-IP gateway installer).
- ➔ Microsoft® Visual C++ 2008 redistributable (bundled with the Mult-IP gateway installer).
- ➔ Microsoft® Management Console (MMC) v. 3 (included with Windows Server 2008 R2 and Windows Server 2012 R2).

- ➔ Multiple Gigabit Ethernet Network Interface Cards (NICs) set to static IP addresses:
 - one card dedicated to fleet traffic;
 - one card hosting the Master IP (assigned to return LAN traffic (such as application data));
 - one card supporting master/slave notification between load balancing gateways.
- ➔ All network cards (NICs) updated to the latest manufacturer driver along with disabled **Checksum Offloading** to resolve network slowdowns which may lead to failures.
- ➔ Corporate firewall set to allow listening ports listed in [Appendix B: Port Assignment](#).
- ➔ In Load Balancing environments, set all gateway hosts to synchronize to the same internet clock or local NTP server. Out of sync Windows hosts cause one or several gateways to behave erratically.

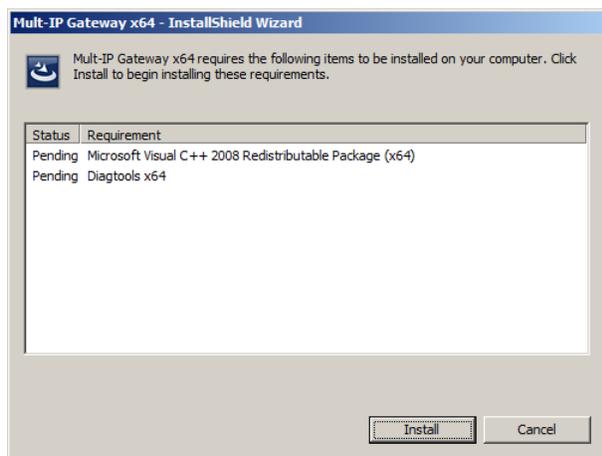
Warning: Make sure to equip gateway machines with at least three physical network adapters before launching the installer.

Step-by-Step Installation

The next procedure will guide you through the task of installing your first Multi-IP gateway. While most steps apply to all subsequent gateways you wish to add to a load balancing system, some steps are exclusive to a first-time installation and are clearly identified as such.

To install the gateway,

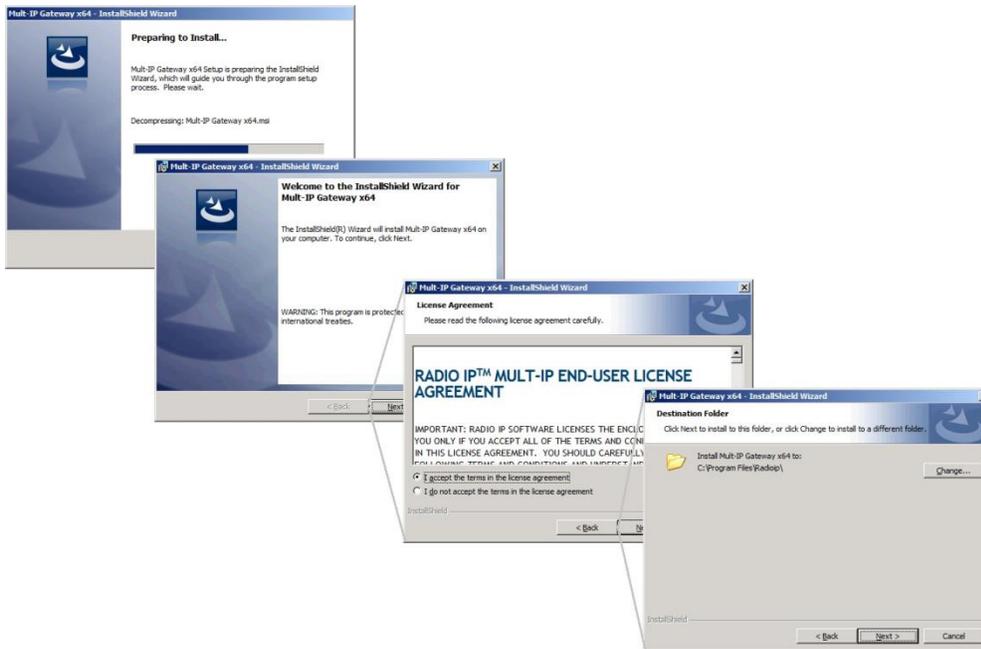
1. Run GatewaySetup64.exe. Setup should start within a few seconds.



2. The installer begins by scanning your system for missing components. Our example shows two missing prerequisites: the third-party Microsoft® Visual C++ package as well as Radio IP's own [Diagtools](#) troubleshooting utility. Click Install to install prerequisites.

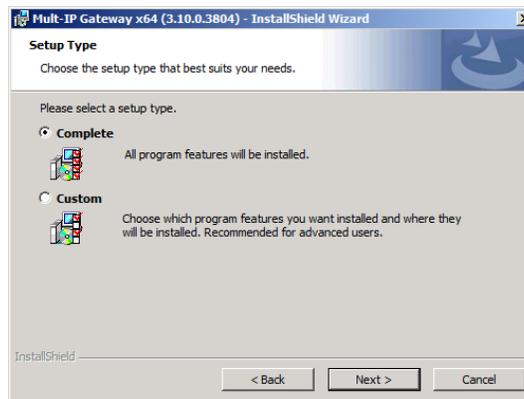
Warning: Diagtools includes a program called DTViewer used to generate traces. Turning-on all traces is CPU-intensive and will adversely impact performance of Multi-IP Gateway. Tracing should therefore be limited to planned situations and should not be left running without purpose.

The gateway wizard starts once all prerequisites are met.



3. As shown in the previous cascading screens, click **Next** to begin installation.
4. Accept the terms of the Radio IP license agreement and click **Next** to view the installation directory.
5. Click **Next** to continue with the Mult-IP Gateway installation options. Select the one that corresponds to the system component(s) you wish to deploy:

Complete installs all gateway software components at once. This option requires thorough understanding of the Mult-IP configuration process.



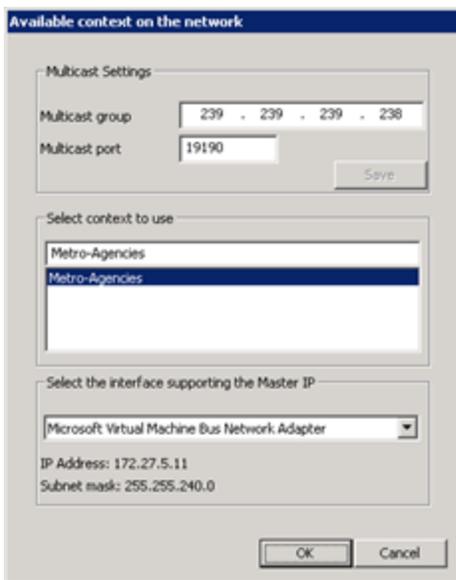
Custom: click this option only if you wish to bypass the **Mult-IP Gateway** component and install licensing software only. Such would be the case when setting up a license server on a standalone physical or virtual machine.



- Once you are satisfied with the installation option, click **Next** followed by **Install** to begin file copy. Watch for a third-party software validation prompt.



- Check **Always trust software from “Radio IP Software Inc.”** to avoid further security prompts, then click **Install**. You will then be prompted with the next context selection screen.



8. While installing the first Multi-IP gateway, set the following three parameters:
 - a. Set the multicast group and port to exchange Election information between Multi-IP gateways;
 - b. Identify a context. To do so, either select the Windows machine name on which the Multi-IP gateway software is being installed or type a custom context name in the text entry field. This name will be multicast over the corporate LAN. Context Name should be no longer than 40 characters, and should not contain spaces nor the following characters: ! * . & ' < > \ / " ;
 - c. Click the drop-down list and select the physical network adapter dedicated to support the Master IP. This network card will serve as a return path for traffic originating from network devices (namely application servers) intended for fleet clients.

9. Double-check your entries and click **OK** to register context and IP information.

Note: The context area suggests the local Windows machine name as a default network context if nothing else is found. While you may leave as is, you are encouraged to type a meaningful context name to facilitate easy tracking of this Multi-IP's network attribute in the long term.

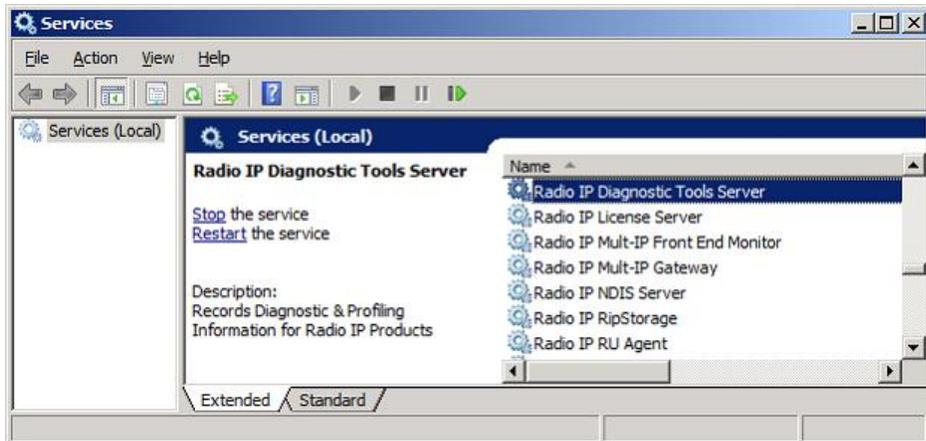
Tip: Access to the context selection screen is not restricted to the installer. In fact, you may need to access this screen to correct an erroneous context selection, to redirect an individual gateway to a new Multi-IP network or to change IP information or NIC selection for reasons such as adapter replacement. To access this feature, go to **Start > Programs > Radio IP > Scan Context**; select a new context name, then restart service.

10. Double-check your settings and click **OK** to complete gateway installation.

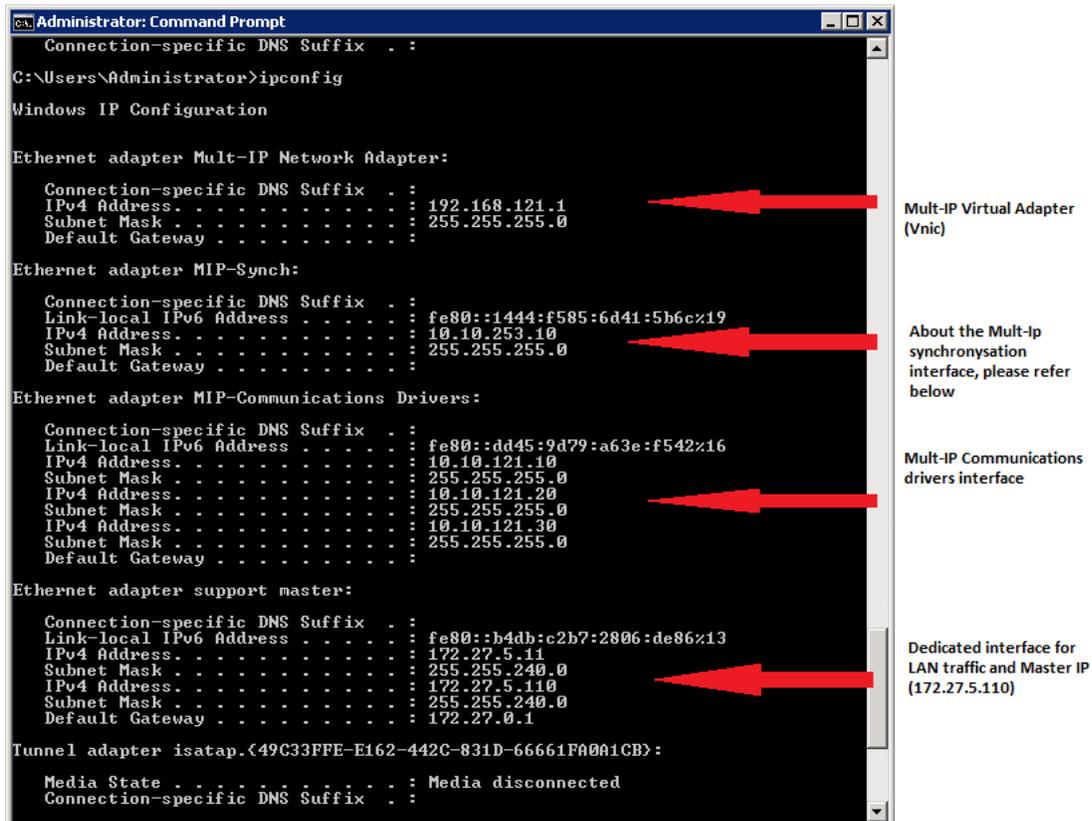


11. Click **Finish** to complete and close the installer.

12. Before going any further with installation of other Mult-IP components, bring up the Services console and verify that all Radio-IP services are running as in the following screen sample.



Note: It is good practice to open a command prompt on the gateway machine and run an `IPCONFIG` in order to ensure that all required routes are present. This next example accounts for all expected gateway host adapters and IP addresses.



Important Notice :

Disable [local Windows firewall](#) whenever possible. However, If your organization requires an active firewall on all LAN devices, make sure the Windows firewall contains inbound and outbound rules set to allow the following Multi-IP services:

- MultiIPGateway.exe
- LicenseServer.exe
- NdisServer.exe
- RipStorage.exe
- Ruagent.exe

Make sure this requirement is met to support essential function.

Enabling support for Gratuitous ARP

These steps need to be performed only on Windows 2008 R2. On Windows 2012, the gratuitous ARP packet is sent automatically when required.

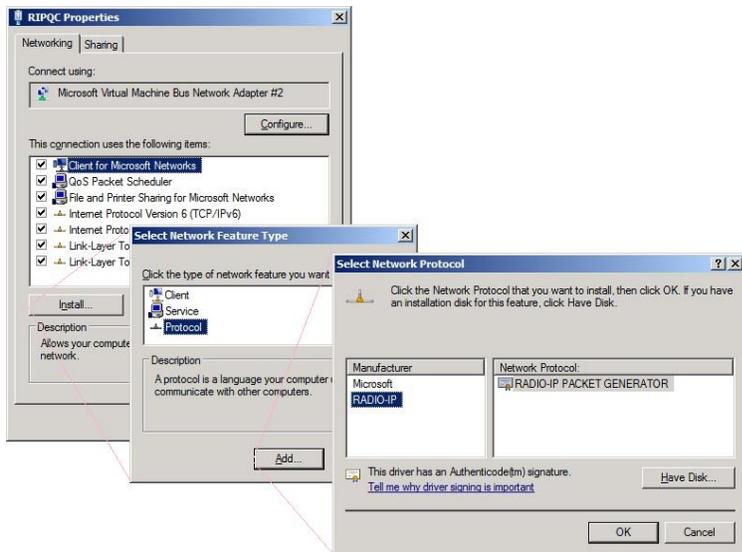
Once gateway installation has completed, you must enable gratuitous ARP announcements by binding a discrete ARP packet generator driver to the physical NIC hosting the Master IP address.

To enable support for gratuitous GARP,

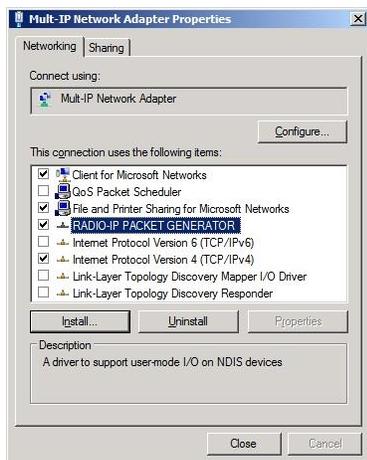
1. Go to **Start > Control Panel > Network and Sharing Center** and click **Change Adapter Setting** to view the list of installed adapters.



- As shown, right-click the physical adapter assigned to the Master IP address previewed on page 9 and select **Properties** from the context menu.



- As previewed in the above screen cascade, simply click **Install** to launch the feature installation wizard.
- Select **Protocol** in the list of available features followed by **Add**.
- Click **Radio IP > RADIO-IP PACKET GENERATOR** followed by **OK** to apply.
- Back to adapter properties, make sure the **RADIO-IP PACKET GENERATOR** feature is checked, then click **OK** to close.



	<p>Warning</p> <p>Be advised that this procedure adds the RADIO-IP PACKET GENERATOR feature to all interfaces installed on the local host. At this point, take a minute and review properties for each remaining interface, including Radio IP’s own VNIC, and make sure that they show this feature as disabled (unchecked).</p>
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Supplying Mult-IP Routes to Application Servers

Mult-IP gateway routes (segment, subnet mask) as well as the master IP address should be added to your corporate router for the benefit of application servers (CAD, FTP, and so on). Those routes serve as a return path for application packets sent out to listening mobile devices.

For example, if your Mult-IP network is set to operate on a segment of 172.20.0.0, subnet: 255.255.0.0 with a master IP address of 192.168.13.250. Add a route as follows:

1. Log on to an app server using administrative rights.
2. Go to **Start > Run** and type `cmd` to open a command prompt window.
3. Based on our example, add a route using the following command syntax:
 - a. `route add 172.20.0.0 mask 255.255.0.0 192.168.13.250 -p`
4. Repeat this syntax for each Mult-IP segment you wish to add.

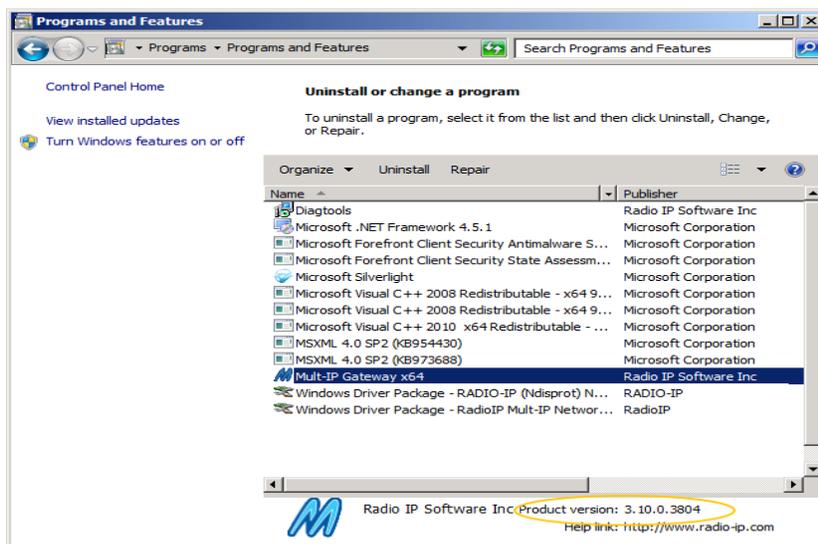
This concludes basic setup of your first Mult-IP gateway. Gateway software offers no UI and runs as background services set to start with Windows. Once you have installed the management console, you will have access to the user interface through which gateways are configured and monitored.

Retrieving Product Information

The Mult-IP gateway software runs as a service with no conventional GUI from which to retrieve product version information. Nonetheless, just as you would for any other installed Windows program, you may retrieve product information (and version number) by querying the host computer's Control Panel.

To retrieve Mult-IP gateway product information,

1. Open the Control Panel of your Windows 2008 R2 Server or Windows 2012 R2 Server OS and click **Programs and features**.
2. As shown in the next screen sample, simply scroll down and select **Mult-IP Gateway x64**. Product information can be retrieved from the bottom pane.



Installation of the Management Console

This section details installation of the management console. While you are encouraged to install and use the console on a dedicated LAN-based workstation in order to minimize resource utilization on gateway machines, it is however mandatory to install the Management Console on the Mult-IP Gateway, so that the FrontEnd service is installed and allows remote instances of other Management Consoles to get connected.

Note: Distinct installers are supplied depending on whether you are installing the console on a x86 or x64 Windows platform.

Note: Avoid running the management console installer on workstations running Mult-IP Client software. It adds an always-on Front End service designed to communicate with gateways from LAN-based computers.

Pre-installation checklist

Before launching the installer, make sure the workstation meets the following requirements:

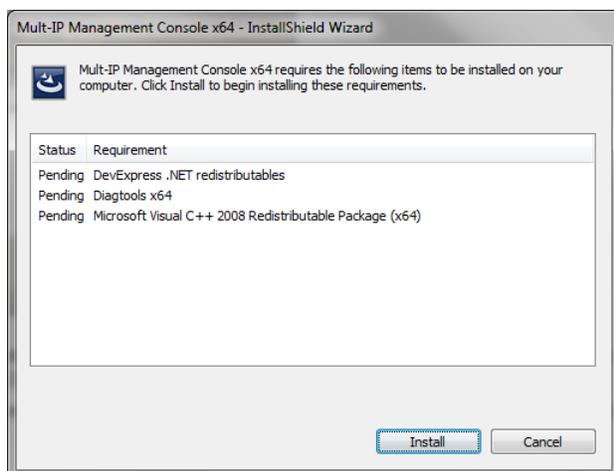
- ➔ Windows XP SP3 or higher operating system.
- ➔ Microsoft® Visual C++ 2005 redistributable (preinstalled on most modern operating systems).
- ➔ Microsoft® Management Console (MMC) v. 3 (ships with all supported Windows OS except for Windows XP SP3). Should the need arise, query the Microsoft website to download this software.

Step-by-Step Installation

The following set of instructions will guide you through the task of installing the management console. Repeat this procedure for all monitoring stations you wish to set up throughout the corporate LAN.

To install management console software,

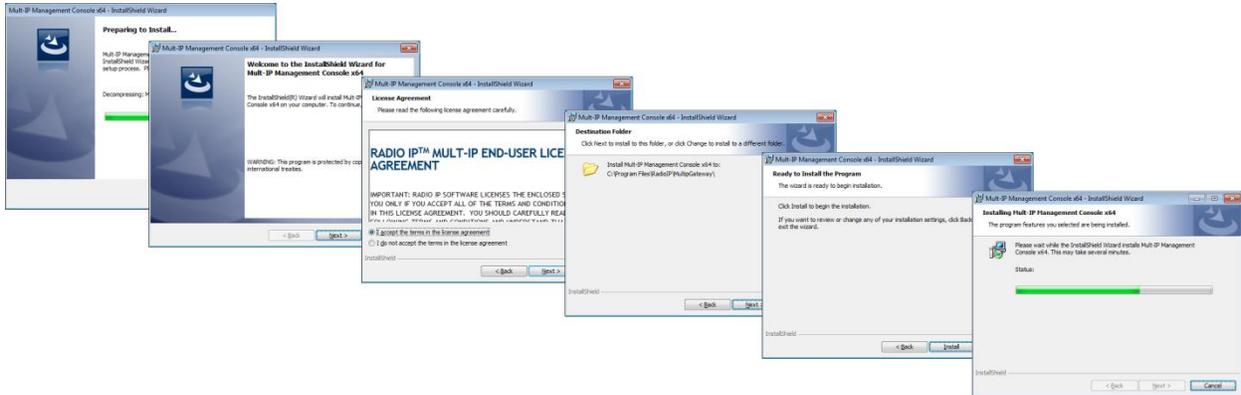
1. Run `ConsoleSetup64.exe` (or `ConsoleSetup32.exe` on x86 machines). Setup should start within a few seconds.



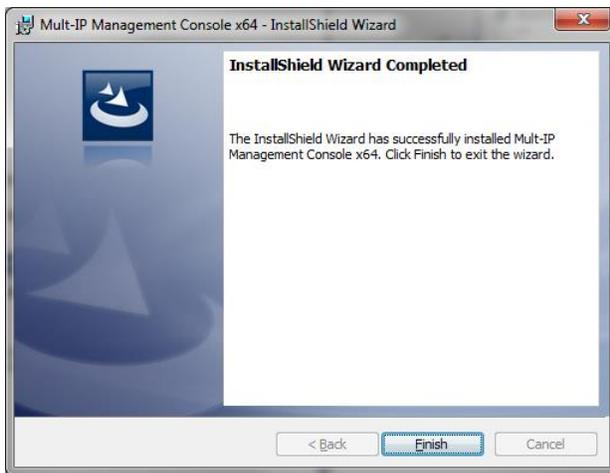
The installer begins by scanning your system for missing components. In this instance, you are required to install Diagtools, which is a companion troubleshooting software provided by all Radio IP software.

2. Click **Install** to fetch and install components.

3. Watch for onscreen prompts to assist third-party component installation.
The Mult-IP wizard starts once all components are installed.



The following screen appears once installation is complete.



4. Click **Finish** to complete installation.

Installation of the management console is now complete.

Note: for an installation of the console on a different machine than the Mult-IP gateway, jump to [Connecting to an alternate Front End](#) on page 17 to learn how to connect a remote management console to a gateway.

Before going any further, please review [Secure Login](#) on page 16 to learn how to change the master password in order to preserve system security.

Secure Login

System integrity and security should be your prime concern from the earliest stages of deployment.

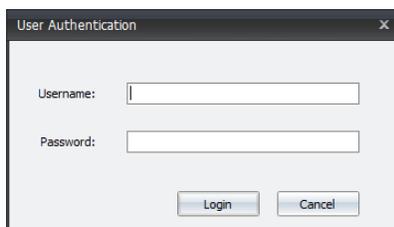
Mult-IP comes preloaded with the *Super User* role matched with the *admin* user. These are supplied for administrative purposes and cannot be edited or deleted. As the system administrator, you are encouraged to login to the management console soon after the first copy is installed in order to update access credentials. This will help secure subsequent accesses to the console and its configurable areas.

Make sure that at least one gateway is running before initial login to the management console. User credentials are centrally managed.

To secure login,

Review [Connecting to an alternate Front End Service](#) if you are performing this task on the x86 version of the management console which is not designed to automatically connect at launch.

1. Double-click the  desktop icon to launch the management console and wait for the login prompt. Keep in mind that this prompt is an indication that you have successfully connected to a gateway.

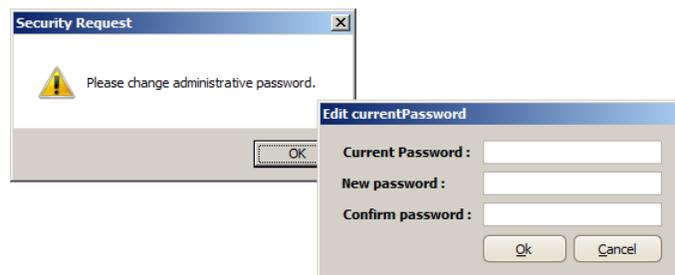


2. Type the following default login credentials.

User: *admin*

Password: *admin*

Upon successful login, you will be prompted to change password as shown next.



3. As instructed, type the current "admin" password. Then type a new password twice. Keep in mind that the *admin* username tied to this administrative user profile cannot be changed.
4. Click **OK** twice to register using the new personal password. Administrative login is now secured.

Note: Failure to perform the login and change password steps within a few minutes of console startup will lock you out of the system. Simply quit the application and reload to repeat steps.

Connecting to an alternate Front End Service

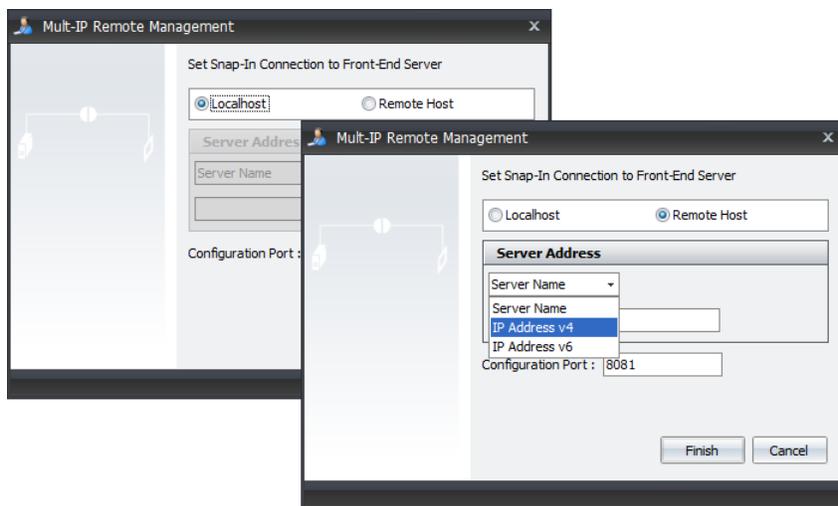
Connecting the management console to the Multi-IP gateway network is handled differently depending on whether you have installed the x86 or x64 version of the Multi-IP management console snap-in software. Consider the three supported scenarios:

- ➔ **Preferred method:** A user installs the management console on a remote machine, the user will have to invoke the one-time **Connect to an alternate Front End** command described next, after launch of the console.
- ➔ A user installs the x64 version of the management console on the x64 gateway machine. This is the simplest path in which both console and gateway are on the same machine, which poses no connection issues. However, this option is not recommended because the Multi-IP gateways should be running on a secure, dedicated machine in order to maximize traffic handling performance.

Follow the next procedure to connect a management console installed on an x86 Windows workstation.

To connect to an Alternate Front End,

1. Launch the management console. Expect a “System Connection Error” error message.
2. Click **Connect to an alternate Front End** in the **Actions** pane



3. As shown, point to **Remote Host**, then select **IP Address IPV4** from the drop-down list.
4. Type the [master IP address](#) supplied earlier then click **Finish** to connect.
5. Wait for the User Authentication dialog as an indication that you have successfully connected to a Multi-IP gateway. Proceed to log on as usual.

Note: You will only need to do this once. This procedure usually comes handy in organizations running two or more independent Multi-IP VPN networks, where all networks are managed and monitored from the same workstation.

Installing License server software

This section describes the installation of a Multi-IP License server stand-alone installation. Single license server may be installed on a dedicated Windows Server 2008 R2. To be able to join adequately the dedicated context, this stand-alone installation should occur after the first gateway installation.

Note: Make sure to add Radio IP License server process (LicenseServer.exe) to your antivirus exclusion list to prevent unexpected stops.



Warning

If you deploy your Multi-IP license on a virtual machine, take appropriate measures to ensure that your MAC addresses and machine identification cannot change over time. Failure to do so may result in a loss of license and potential outage.

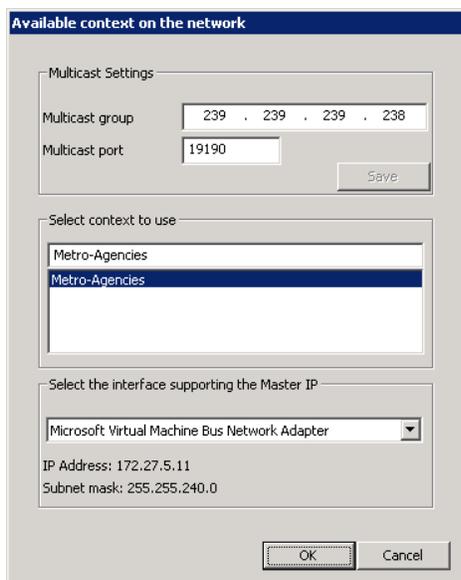
The following requirements must be met for proper License server environment operation:

- Windows Server 2008 R2, Windows Server 2012 R2,;
- .NET Framework 2.0 or later (included but disabled in Windows Server 2008 R2, .NET 4.0 Framework is enabled by default on Windows Server 2012 R2);
- MS XML v. 4.0 (included in Multi-IP gateway installer);
- Microsoft® Visual C++ 2008 redistributable (bundled with the Multi-IP gateway installer);
- Microsoft® Management Console (MMC) v. 3 (included with Windows Server 2008 R2);
- One Gigabit Ethernet Network Interface Cards (NICs) set to static IP addresses.

Step-by-Step Installation

To install the License server,

1. Run GatewaySetup64.exe. Navigate to the Setup Type window.
2. Select Custom type and enable the License server component only.
3. Click **Next** followed by **Install** to begin copying the file. You will be prompted with the next context selection screen.



4. While installing the License server, configure the following three parameters:
 - a. Set the multicast group and port to exchange Election information between Mult-IP gateways;
 - b. Identify a context. To do so, either select the Windows machine name on which the Mult-IP gateway software is being installed or type a custom context name in the text entry field. This name will be multicast over the corporate LAN. Context Name should be no longer than 40 characters, and should not contain spaces nor the following characters: ! * . & ' < > \ / " ;
 - c. Click the drop-down list and select the physical network adapter dedicated to support the Master IP. This network card will serve as a return path for traffic originating from network devices (namely application servers) intended for fleet clients.
5. Click **Finish** to complete and close the installer.

Installing Client Software

This section describes installation of the Mult-IP client software on Windows XP SP3 (x86) and Windows 7 (x86, x64) or Windows 8.1x64 machines as well as the mandatory “dry run” registration to the Mult-IP gateway.

Important notice: Install client software only once gateways are set up and ready to receive connections from mobile devices.

Pre-installation checklist

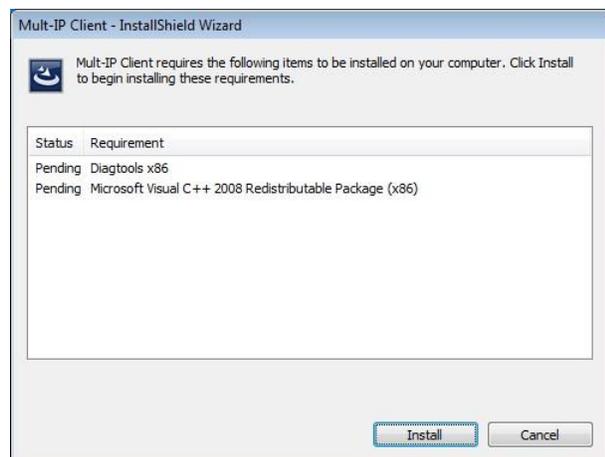
Before launching the Mult-IP Client installer, make sure the mobile workstation meets the following requirements:

- ➔ Windows XP SP3, Windows 7 (x86 and x64) or Windows 8.1x64.
- ➔ .NET Framework 2.0 or later.
- ➔ All network adapters (NICs) updated to the latest manufacturer firmware along with disabled **Checksum Offloading** to prevent network slowdowns which lead to failures.
- ➔ Disabled local Windows firewall whenever possible. However, if your organization requires that a firewall remains active on all devices at all times, enter Windows firewall properties and create inbound and outbound rules set to allow **multip.exe**.

To install Mult-IP Client software,

1. Review (or temporarily disable) antivirus software on the mobile device to allow system changes during the installation process.
2. Apply one of the following installation options:
 - Run `ClientSetup64.exe` on x64 systems (or `ClientSetup32.exe` on x86 systems) to perform a fresh install of the current Mult-IP Client baseline version on mobile devices available locally. Note that the steps described in this section follows this installation process.
 - Push `mult-ip.msi` through Remote Update to remotely upgrade mobile devices to the latest Mult-IP Client. Note that the same file naming convention applies to both x86 and x64 folders.

Keep reading if you are performing a fresh install, otherwise review *Applying Updates through Remote Update* in your *Mult-IP Mobile VPN Administration Guide*. To the end user, remote updates are silent except for the required machine reboot upon update completion.

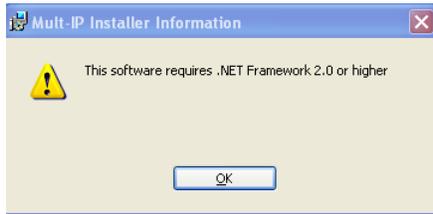


The Mult-IP Client baseline installer begins by scanning your system for missing components. In this instance, you are required to install Diagtools, which is a companion software used by all Radio IP for troubleshooting purposes.

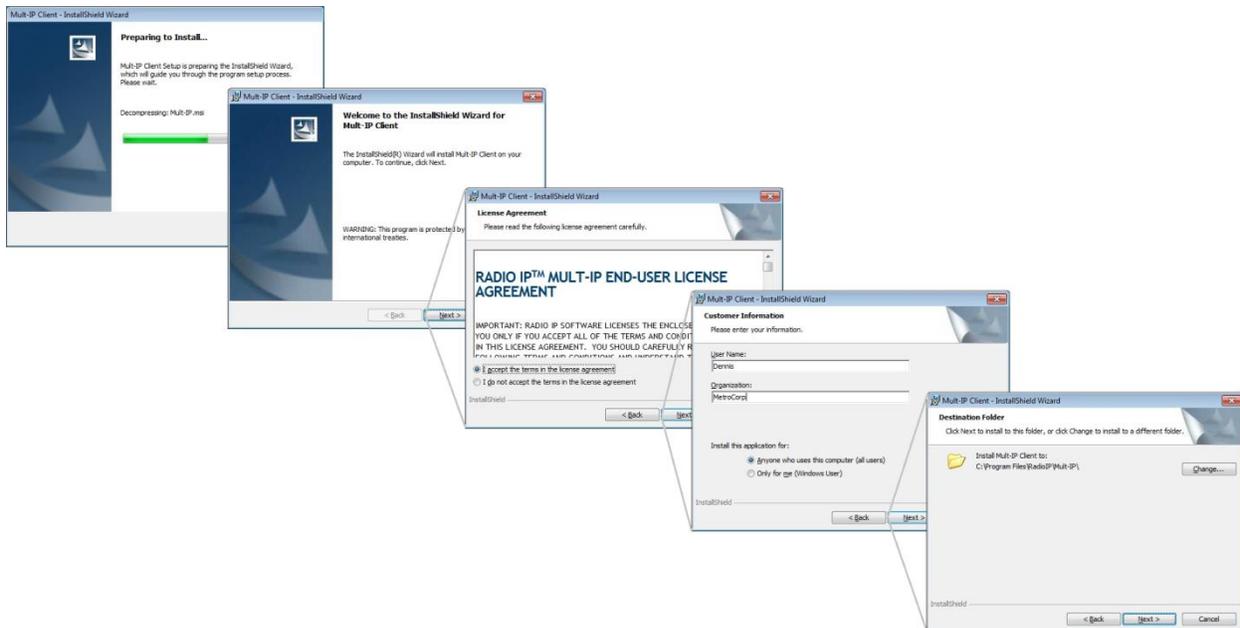
Warning: Diagtools includes a program called DTViewer used to generate traces. Turning-on all traces is CPU-intensive and will adversely impact performance of Mult-IP Client. Tracing should therefore be limited to planned situations and should not be left running without purpose.

3. Click **Install** to copy required add-ons.

Note: The following warning will inform you that the Microsoft® .NET Framework Redistributables v. 2.0 or higher component cannot be found on your mobile workstation. This package is not part of the Mult-IP client installation but can easily be obtained by querying the Microsoft website.



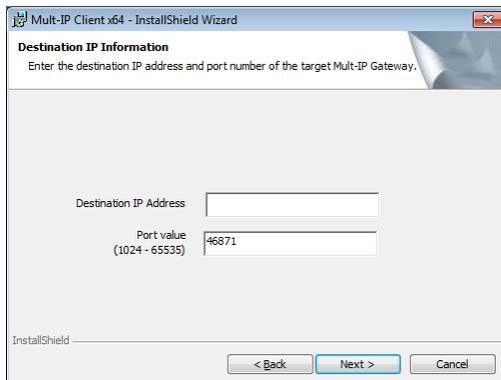
4. Click **OK** to proceed. The Mult-IP client installer will resume with the following screens once all third-party components are installed.



5. As shown in the previous cascading screens, accept the license agreement then click **Next**.

6. Fill in user information and leave radio button set to **Anyone who uses this computer (All users)**, then click **Next**.

- Review installation directory and click **Next** again to display the following dialog.



- As requested, type the destination IP address of the registration gateway.

Note: The destination IP address entered here is a route for client registration. It corresponds to the **External Address Access** value assigned to the corresponding Generic IP driver for one of the gateways in the same context (i.e. farm). Keep in mind that the static IP address entered above will be saved as a default route and will be recalled whenever you perform a **Reset Factory Defaults** on Mult-IP Client.

Note: Do not confuse the Destination IP Address with the IP address assigned to a gateway on the Mult-IP virtual IP segment.

- Enter the **Port value** reserved for communication with the registration gateway (between 1024 and 65535). The installer suggests a default port value of 46871 also assigned to the Generic IP driver onboard Mult-IP gateways. Review Gateway Communication Driver parameters in the *Mult-IP Mobile VPN Administration Guide* should you decide to change this parameter.
- With the IP address typed in, click **Next > Install** to begin filecopy. Watch for a certificate warning.

11. The warning comes as Windows detects the pending creation of Radio IP's Virtual Network Interface Card (VNIC). As shown above, click **Install** to continue with the VNIC's Internet Protocol (TCP/IP) Properties screen.

The following screen appears shortly after, marking the end of the installation process.



12. Once files are copied, click **Finish**. Then as shown, click **Yes** when prompted to restart the mobile device. Mult-IP Client will automatically start with Windows upon reboot as evidenced by the deskband showing in the system tray area.

Installation of the Mult-IP Client software is now complete. If you are planning fleet deployment through the method of imaging a “best of class” mobile workstation, please review recommended practices described in [Ghosting Mobile Workstations](#).

Ghosting Mobile Clients

The following procedure applies to organizations planning fleet deployment by replicating a best-of-class configuration obtained from a mobile workstation running Mult-IP Client.

Ghosting is a time-saving process which allows large organizations to quickly deploy 100s of similarly-configured mobile devices. Instead of having to manually install applications and test configurations on individual machines, a typical scenario would have IT personnel perform this task once and simply use ghost software to provision remaining mobile workstations.

Important Notice - Avoid ghosting a machine that has been previously registered to a Mult-IP gateway so as to prevent duplicate entries in the Mult-IP client list. A sound practice would be to test (or rehearse) installation and registration on a sample mobile workstation, revert workstation to a virgin state, then reapply installation prior to the actual ghosting process.

To ghost a source workstation,

1. Install Mult-IP Client on a source mobile workstation deprived of network connectivity.
2. Type the destination IP address pointing to a registration Mult-IP gateway.
3. Upon installation completion, click **Cancel** when prompted to restart the mobile workstation.
4. Navigate to the Services console and stop the RadiolIP Mult-IP service (which should not have had time to start), then set startup type to **Manual**.
5. Navigate to `C:\Program Files\RadioIP\Data\Backup` and copy the `MultIP.xml` file up one level to the `Data` folder. When prompted, agree to replace the existing file.
6. Open Registry Editor and erase `HKEY_LOCAL_MACHINE\SOFTWARE\RadioIP\MultIP\Registration` (this key may not be present).
7. Reboot the workstation. This step is needed to ensure that all binaries and services are properly registered with the OS.
8. Ghost the mobile workstation using popular imaging software like *Symantec Ghost™*.

To deploy a fleet of mobile workstations,

1. Apply the ghost image on mobile clients.
2. Make sure to change computer name on each workstation after a first reboot (unless this step is accomplished through ghosting processes such as (New SID, Sysprep, and others).
3. Enable the network interface which will connect through the Generic IP driver using the supplied destination IP address and port (which is set by default to UDP port 46871).
4. Launch the services console and set the RadiolIP Mult-IP service to **Automatic** and start service.
5. Locate the Mult-IP deskband and validate that the only displayed Generic IP Driver is not showing a yellow exclamation mark and that it is operational as illustrated in the next screen sample:



6. Log on to the management console and navigate to the **Clients** node. From there, notice that all clients are held in the **Quarantine** group (or custom default group).
7. Acknowledge each mobile client at your earliest convenience by assigning them to their respective functional group.

Installing Mult-IP Analytics Software

To take advantage of the Mult-IP Analytics reporting feature, you must first complete the following installation and configuration tasks:

1. Installation of the Mult-IP Analytics server and association with an existing SQL database;
2. Binding of the Analytics server to your Mult-IP gateways;
3. Definition of an ODBC data source;
4. Installation of the Mult-IP Analytics Launcher.

Note: The Mult-IP Analytics software targeted by this procedure cannot be used to upgrade previous versions. Make sure to always run server and launcher installers on fresh systems.

Installing Mult-IP Analytics Server

Make sure the following requirements are met before running Mult-IP Analytics server installer:

- ➔ a Windows XP SP3 minimum physical or virtual machine for a small fleet;
- ➔ a Windows 2008 R2 x64 physical or virtual machine for a large fleet of 500 clients and up;
- ➔ Microsoft® .NET 3.0 Framework or higher installed (if you are installing on a Windows 2008 R2 machine, add the .NET Framework 3.5.1 feature.
- ➔ Microsoft® SQL server 2005 or later with TCP/IP network support;
- ➔ SQL server local or named instance along with administrator credentials.

To install the Mult-IP Analytics Server,

1. Copy both setup.exe and Mult-IP Analytics Server Installer.msi to a common location on the host machine.
2. Launch setup.exe and click Next to move forward through the straightforward installer. Pay attention to the following dialog displayed during file copy.



3. Click the **SQL Server** field and type the local or named instance. This property is not case sensitive but adheres to the following naming convention (with no spaces allowed):

`machinename\instancename`

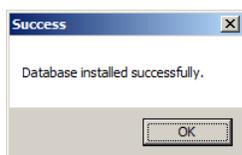
In our example, the Mult-IP Analytics server database connects to the Microsoft® SQL Server Express engine which would require you to overtype field contents with

`machinename\sqlexpress.`

Note: Mult-IP Analytics can use the same SQL instance previously assigned to other programs accessing the SQL Server.

Note: You may need to retrieve instance name from the SQL administrative console if you do not have this information handy. Username and password are supplied once during installation of the SQL server and cannot be retrieved otherwise.

4. Enter **Username** and **Password** credentials, then click **Install(...)**. Allow up to a minute for the following confirmation.



5. Click **OK** to continue with product registration.



6. Paste the grayed-out **Install Code** to a text file for later use, then click **Activate Later** to close the installer. This will suspend the Analytics server until a proper activated code is supplied.

Note: Click **Activate Later** for a 30-day trial of the product. To activate product at any time during the trial period, go to **Start > All Programs > RadiolP > Mult-IP Analytics > Mult-IP Analytics Admin** And click **License**.

7. Email Radio IP at support@radio-ip.com using subject line "Analytics Registration" and supply the following information:
 - **Customer Name** (for example, Metro Corp)
 - **Number of mobile clients allowed per Mult-IP context**, where one context identifies a gateway farm which usually covers to your entire corporate deployment. (refer to your Mult-IP license)
 - **Install code** (retrieved from previous step)

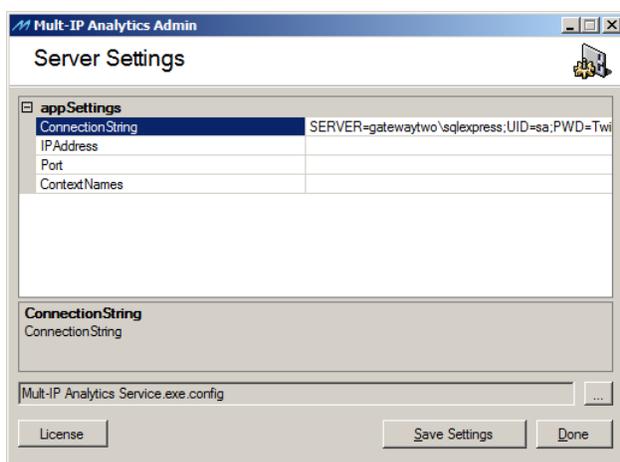
8. Upon receiving the Activation Code, run the following command to return to the product activation screen and complete the process:
 - x86 systems, run: C:\Program Files\Genesis\Multi-IP Analytics\Multi-IP Analytics Admin.exe
 - x64 systems, run: C:\Program Files (x86)\Genesis\Multi-IP Analytics\Multi-IP Analytics Admin.exe

Binding the Analytics Server to Multi-IP Gateways

Once installation of the Analytics server is complete, you must specify the originator of the statistical information, in this case Multi-IP gateways.

To bind the Analytics Server to Multi-IP Gateways,

1. Go to **Start > All Programs > RadiolP > Multi-IP Analytics > Multi-IP Analytics Admin**. Wait for the following settings window to appear.



2. If the Multi-IP Analytics is running on a standalone computer, type the host static **IPAddress** and **Port** assigned to the external SQL Server. Leave empty if both components are running on the same Windows host.
3. Click the **ContextName** text field and type the mandatory [context name](#) of your Multi-IP environment set earlier on page 9. This parameter will allow the Syslog data generated by Multi-IP to be copied to the SQL database.

Note: The **ContextName** parameter is not limited to a single context as some organizations might support multiple Multi-IP VPN environments for distinct agencies. Use the following syntax to register as many contexts as are required to funnel all status data from all gateway farms into a unified SQL storage solution:

```
ContextA;ContextB;ContextC
```

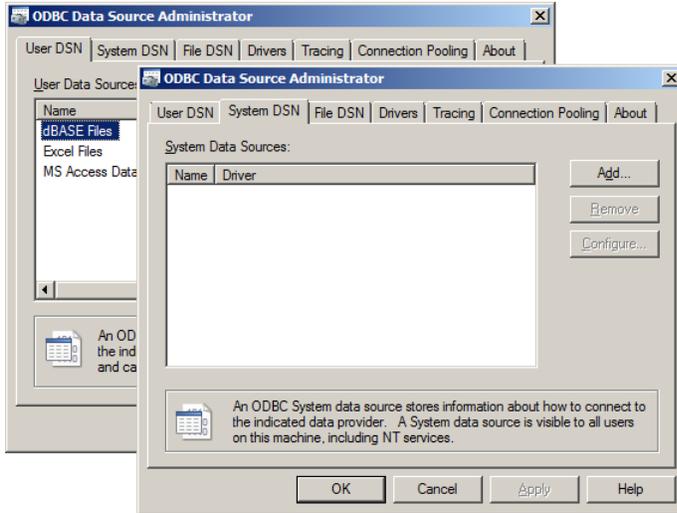
Note: Hover your mouse over the **ConnectionString** text area should you need to recover useful information about the Multi-IP-specific SQL instance (such as username, password and target database name).

Creating an ODBC Data Source

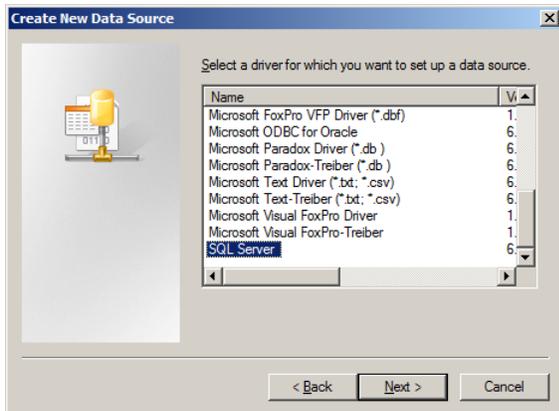
Follow the next steps to create the ODBC data source which binds the Analytics report launcher (installed later) with an active SQL Server instance.

To create the ODBC data source,

1. Launch the ODBC Data Source Administrator on the machine hosting the management console. Keep in mind that access to this tool varies slightly from one Windows version to the next.
2. Select the **System DSN** tab.



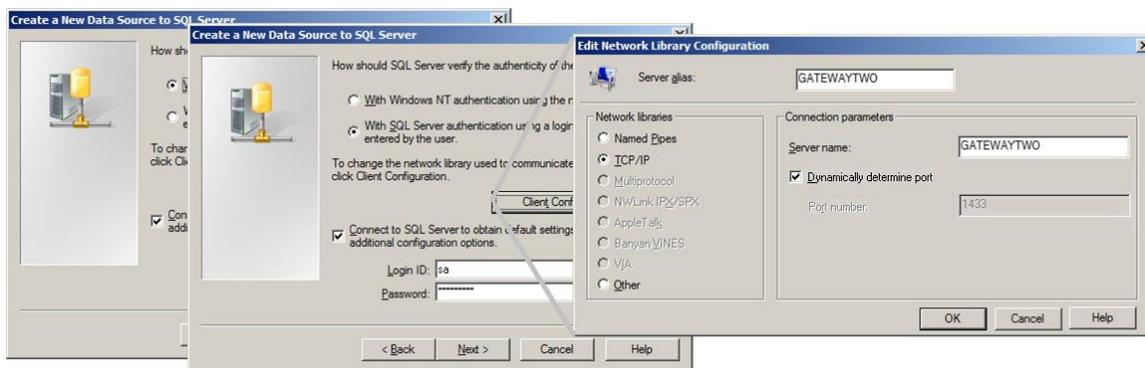
3. Click **Add** to add a data source. As shown next, scroll the list of available application drivers and select **SQL Server**.



- Click **Next > Finish** to launch the SQL server data source creation utility. As shown in the following screen cascade, type a **Name** such as `Radio_IP`, then click the **Server** drop-down list and select the hostname of the active SQL server instance you want to bind to. You may also type the hostname if it is not showing or else, type the machine's static IP address.

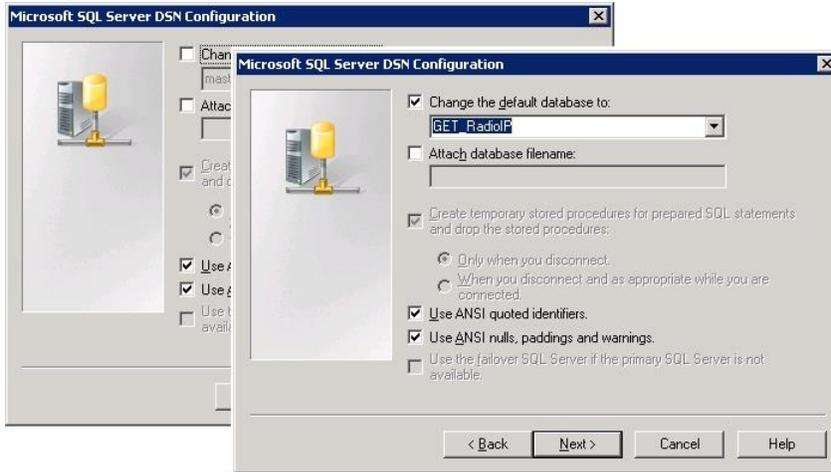


- Click **Next** to continue.
- Set ODBC client access attributes exactly as shown in the next set of cascading screens.



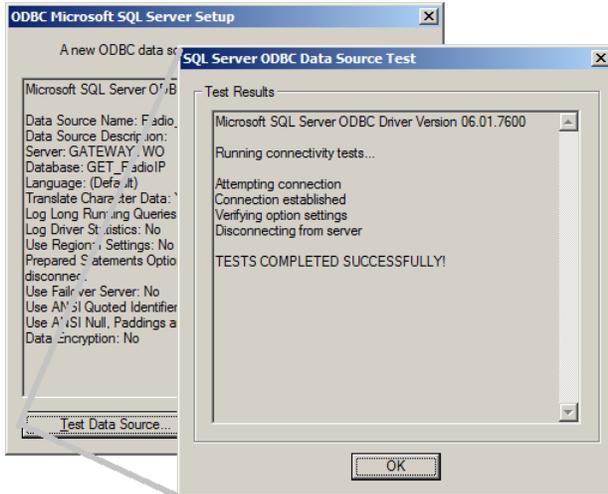
- Click the **With SQL Server...** radio button to determine the login ID authentication method.
- Click **Connect to SQL Server...** and type the SQL server cap-sensitive credentials.
- Click **Client Configuration** (see rightmost in the previous screen sequence). Make sure that both **Server alias** and **Server name** are set to the SQL server's machine name. Then, if you configured the SQL server to receive queries over an assigned port (set via the SQL server administration tool), uncheck **Dynamically determine port** and supply port value.
- Click **OK**.

11. As shown below, check the top box, then switch from **master** to **GET_RadioIP** SQL database. Do not change any of the remaining options.



12. Click **Next** and **Finish** to complete the data source creation wizard.

13. This step is not mandatory. However, to avoid troubleshooting down the line, you are advised to click **Test Data Source**. As shown below, expect a successful connection report.



14. Click **OK** to close the connection report.

This concludes the data source creation process and one-time connection to the Mult-IP Analytics server database. Keep in mind that you should not have to repeat this procedure unless one of the following conditions occur:

- ➔ The SQL server is moved to a new machine (causing a new machine name to be applied).
- ➔ The SQL instance name has changed

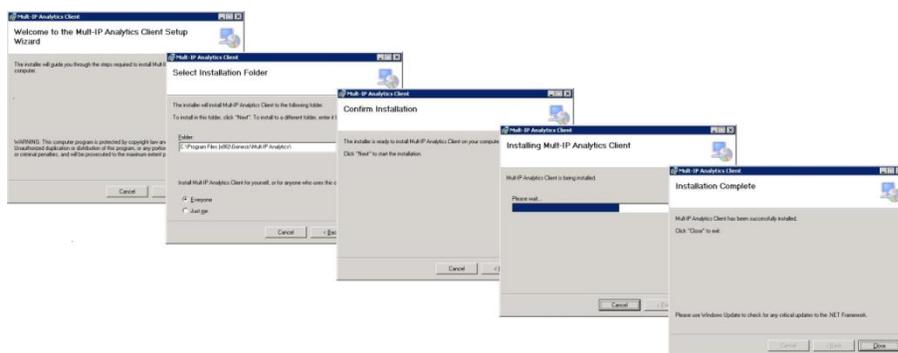
Installing the Mult-IP Analytics Client

Make sure the following requirements are met before running the Mult-IP Analytics client installer:

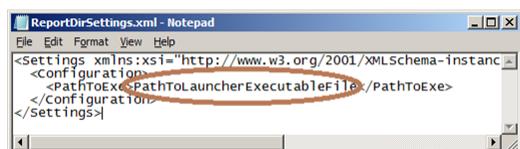
- ➔ a Windows XP SP3 or higher machine with Mult-IP management console installed;
- ➔ Microsoft® .NET 3.5 SP1 Framework or higher (for Windows 2008 R2, add the .NET Framework 3.5.1 feature);
- ➔ Microsoft® Excel 2003 or higher installed and set to allow macros.

To install Mult-IP Analytics client software,

1. Copy both `setup.exe` and `Mult-IP Analytics Client Installer.msi` to a common location on the machine hosting the Mult-IP management console.
2. Run `setup.exe`.



3. As shown, simply click **Next** to complete the straightforward installation wizard. Make sure not to change the default installation directory.
4. Once the Mult-IP Analytics client software is installed, navigate to:
C:\Program Files\RadioIP\MultipGateway\Console\Views\
5. Open `ReportDirSettings.xml` in Notepad.



6. Edit the file by replacing the following xml string: `PathToLauncherExecutableFile` with a path pointing to the Mult-IP Analytics client executable.
 - For x86 systems, type:
C:\Program Files\Genesis\Mult-IP Analytics\Mult-IP Analytics Client.exe
 - For x64 systems, type:
C:\Program Files (x86)\Genesis\Mult-IP Analytics\Mult-IP Analytics Client.exe

Installation of the Mult-IP Analytics Client consisting of the report launcher. To make use of the Analytics functionality, you must configure Mult-IP for event forwarding to a remote SQL server and generate reports through the management console GUI. Those aspects and more are further discussed in the *Mult-IP Mobile VPN Administration Guide*.

Uninstalling Mult-IP Software

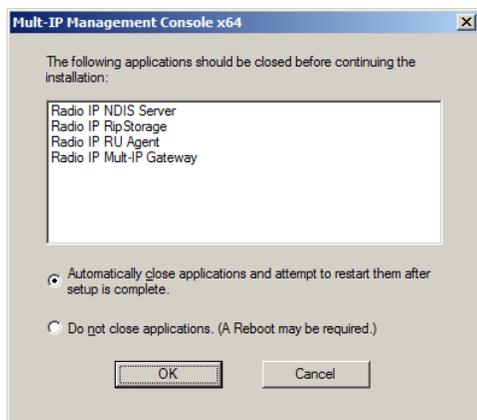
IMPORTANT: This section contains information about modifying the Windows registry. Before you modify the registry, make sure to back it up and make sure that you understand how to restore the registry if a problem occurs. For more on backing up, restoring, and editing the registry, consult article [256986](#) in the Microsoft Knowledge Base.

Apply the following procedure to remove Mult-IP from your Windows hosts. This document offers a software removal path that will free machine from any “bread crumbs” that would otherwise require restoration of the OS to a state prior to the time Mult-IP components were installed. Consider the scenario that best applies to you and follow the steps in the exact order shown.

This document assumes that the uninstallation processes are taking place on Windows 7/Windows 8/Windows 2008/Windows 2012 machines which both exhibit Microsoft’s latest operating system menu structure. Windows XP users will be alerted in instances where access to such items as control panel items shows variations.

Scenario 1: to uninstall Radio IP software on the gateway machine

1. Go to Start > Control Panel > Programs and features.
2. Right-click and uninstall components in the reverse order in which they were installed. For instance, if you installed Diagttools, Mult-IP gateway and Mult-IP management console snap-in on the same machine, simply uninstall components in the following order: **Mult-IP Management Console x64**, **Mult-IP Gateway x64**, followed by **Diagttools**. Wait for the following services shutdown dialogue.



3. Make sure the top radio button is selected and click **OK** to let the uninstall utility to stop gateway services.

Note: While uninstalling the Mult-IP Management Console you might be prompted with the error message 1001. Simply acknowledge the message and the uninstall process will be resumed.



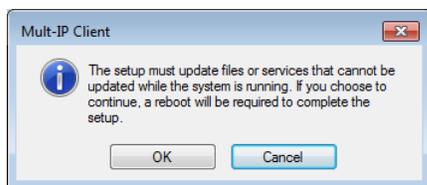
4. Once all items have been uninstalled, go to **C:\Program Files** and delete the **Radio IP** installation folder.
5. Go to **Start > Run** and type `Regedit` to launch the Windows registry editor. Delete the following registry hive using elevated rights:
 - **HKEY_LOCAL_MACHINE\SOFTWARE\RadioIP**
 - **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\multip** (if present, remove it also from the others CurrentControlSet sub hives - 001, 00n)
6. Restart the computer. This will complete removal of all Radio IP software components, including the license monitor.

Scenario 2: to uninstall Radio IP software on the standalone management console machine

1. Go to **Start > Control Panel > Programs and features**
2. Right-click and uninstall **Multi-IP Management Console (x86 or x64)**, then uninstall **Diagtools** if you are not planning to use other Radio IP software on this workstation.
3. Delete the **RadiolIP** installation folder found in either **C:\Program Files** or **C:\Program Files x86**, depending on whether you had installed the x64 or x86 version of the software.
4. Launch the Windows registry editor with elevated rights and delete the following: **HKEY_LOCAL_MACHINE/SOFTWARE/RadiolIP**.
5. Restart the computer to complete the process.

Scenario 3: to uninstall Multi-IP Client software

1. Go to **Start > Control Panel > Programs and features**. (for Windows 7 operating system), or go to **Start > Control Panel > Add or Remove Programs** (for Windows XP operating system)
2. Right-click **Multi-IP Client** and click **Uninstall** to start the uninstallation utility. Wait for the following prompt.



3. Click **OK** to acknowledge and continue. The purpose of this dialogue is to inform you that some components, such as the deskband, will only be removed after a machine restart.
4. Uninstall **Diagtools** if you are not planning on using other Radio IP software on this workstation.
5. Delete the **RadiolIP** installation folder (**C:\Program Files** or **C:\Program Files x86**) if not already removed by the uninstall wizard. If other RadiolIP components are still present on the workstation (like Diagnostic Tools, Shadoport Client) delete only the **Multi-IP** and **Data** folders.
6. Launch the Windows registry editor and delete the following, if found:
 - a. **HKEY_LOCAL_MACHINE/SOFTWARE/RadiolIP**. If other RadiolIP components are still present on the workstation (like Diagnostic Tools, Shadoport Client) delete only the keys **Data** and **MultiIP**.



Appendix A – Common Configuration Notes

About Packet Size

The packet size parameter is present in the configurations of nearly all communication drivers. A few words ought to be mentioned about it.

The packet size setting is the maximum length of the data payload (including protocol overhead) to use on the Mult-IP communication network. The value results from a balance between efficiency and safety. The higher the number, the more efficient the communication becomes as proportionally less overhead is used per data payload. However, the longer a packet is, the more susceptible it is to being corrupted by a transient RF emission, like radio interference, a starting engine, etc. Corruption leads to retransmissions, and efficiency is lost.

On many private networks, the maximum packet size is also determined by the network provider or by the modem manufacturer. Changing the values proposed by the driver installer should be made upon request by Radio IP or by your network provider.

About IP Routing

Both Mult-IP gateway and client installers supply their respective host computer with a virtual network interface card (VNIC). The VNIC has an IP address which is made available to the gateway so it may be used as a normal network interface in the Windows OS IP Routing Table. Since many options are given to the systems integrator by the client installer, this section will discuss the details of the IP routing table, and the various options offered to the user.

The IP Routing Table

An IP Route table is present in all computers with the IP stack installed. It allows the computer to determine where to forward an IP datagram when one is sent by a program. Here is what a routing table looks like. You can get this output on a Windows computer by typing “route print” from the command line.

```
Z:\>route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...00 04 75 f5 82 e1 ..... 3Com EtherLink XL 10/100 PCI For Complete PC Man
agement NIC (3C905C-TX) - Packet Scheduler Miniport
=====
Active Routes:
Network Destination      Netmask          Gateway          Interface      Metric
    0.0.0.0                0.0.0.0            192.168.1.1        192.168.1.95     20
    127.0.0.0              255.0.0.0          127.0.0.1          127.0.0.1        1
    192.168.1.0            255.255.255.0      192.168.1.95       192.168.1.95     20
    192.168.1.95          255.255.255.255    127.0.0.1          127.0.0.1        20
    192.168.1.255         255.255.255.255    192.168.1.95       192.168.1.95     20
    224.0.0.0              240.0.0.0          192.168.1.95       192.168.1.95     20
    255.255.255.255       255.255.255.255    192.168.1.95       192.168.1.95     1
Default Gateway:          192.168.1.1
Persistent Routes:
None
```

Below is a short description of its structure and how it is used.

Network destination: This is a set of IP addresses or IP subnet that your computer can handle by itself. IP datagrams generated by the local computer are addressed. The target address is matched (up to some extent, as explained below) to one of these “Network Destinations”, and the best match made determines a line in the table, and the line determines a local interface (the interface column), and a gateway (the gateway column).

Netmask: This is a masking bit field. When comparing the target IP address in the datagram and the IP address in the network destination column, the comparison takes place inside the zone where the netmask bits are raised (set to 1). The more 1s you have in the netmask, the more determinative the match can be, and the better the match, the more precisely the routing can be determined. As a consequence, you can see in the table that no “Network Destination” is determined outside the bounds of the “Netmask”; it would be useless to do so. However, for a line to code the route it is intended for, the “Network Destination” must be determined entirely at least within the scope of the “Netmask”. As you can see in the above table, there is a line reading 0.0.0.0, which means that if no other line gives a match at all, at least this line will produce a 0-match. If a frame is sent to an address that matches no network destination in this table, then this line will be selected as giving a 0-match (poor, albeit a working default). The interface address on this line should be that of the **Default Gateway**.

Gateway: When a line is selected for routing, this field yields the IP address of the gateway (or router) where datagrams are forwarded for further routing.

Interface: This an IP address bound to a local network interface card. When a line is selected for routing, this field determines the network card that should be used to send the frame. This structure allows a computer to host many network cards connected to entirely different networks.

Metric: The metric indicates the cost of using a route, which is typically the number of hops to the IP destination. Anything on the local subnet is one hop, and each router crossed after that is an additional hop. If there are multiple routes to the same destination with different metrics, the route with the lowest metric is selected.

Default Gateway: This line is considered the last resort routing solution, and will be associated to the default gateway, whose address you see at the bottom of the table, and a default interface. The default gateway (and the default interface) is where IP sends its traffic when the routing table does not provide any more appropriate information.

Appendix B – Port Assignment

This section identifies outgoing or listening ports that you need to open on corporate firewalls to permit communication between various components of the Mult-IP VPN.

Location	Port Value or Range	Description
Local gateway host firewall	19190 (UDP)	Default multicast communication port for Mult-IP systems
Local gateway host firewall	46871 (UDP)	Listening port reservation for the Generic IP driver. Used for client connection lifeline. Please do not change.
Local gateway host firewall	1024 to 65535 (TCP or UDP)	One listening port reservation for use by each additional communication driver.
Corporate firewall	46871 (UDP)	External port access reservation for the Generic IP driver. Used for client connection lifeline. Please do not change.
Corporate firewall	1024 to 65535 (TCP or UDP)	One external port access reservation for use by each additional communication driver.

Note: Make sure to add Mult-IP processes to your Antivirus Exclusion list to prevent unexpected Mult-IP stops.

Appendix C - Post installation tuning

This section describes steps to fine-tune the server to prevent issues that may occur after you enable the Receive Window Auto-Tuning feature for HTTP traffic.

When the Receive Window Auto-Tuning feature is enabled for HTTP traffic, older routers, older firewalls, and older operating systems that are incompatible with the Receive Window Auto-Tuning feature may sometimes cause slow data transfer or connectivity loss. This may result in slow performance or even an application crash.

If the incompatible devices or applications are outside your organization and it is impossible to replace the devices, this issue will persist and it might be necessary to disable the Receive Window Auto-Tuning feature for HTTP traffic.

Windows 7 and Windows 8.1x64:

1. disable the selective ACK (SACK) and the heuristic option:
 - a. open a console window with administrative privileges,
 - b. at the prompt, type:
 - i) netsh interface tcp set global autotuninglevel=restricted;
 - ii) netsh int tcp set heuristics disabled.

Windows 8.1x64 only:

1. **Start > Run** and type gpedit.msc to open Local Group Policy Editor;
2. Navigate to Computer\Configuration\Administrative Templates\Network\Windows Connection Manager;
3. Select “Minimize the number of simultaneous connections to the internet or Windows Domain” and disable it.