D-Link®

Unified Services Router
User Manual

Wireless N Service Router

DSR-250NB1

DSR-150/150N/250/250N/500/500N/1000/1000N

Version 2.01 | November 17, 2014

Preface

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Manual Revisions

Revision	Date	Description
2.00	July 31, 2014	• DSR Products with firmware version 2.00
2.01	November 17, 2014	• add License Update section

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Safety Instructions

Use the following safety guidelines to ensure your own personal safety and to help protect your system from potential damage.

Safety Cautions

To reduce the risk of bodily injury, electrical shock, fire, and damage to the equipment, observe the following precautions:

- Observe and follow service markings.
    - Do not service any product except as explained in your system documentation.
    - Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock.
    - Only a trained service technician should service components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
    - The power cable, extension cable, or plug is damaged.
    - An object has fallen into the product.
    - The product has been exposed to water.
    - The product has been dropped or damaged.
    - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, see the appropriate section in your troubleshooting guide or contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- Allow the product to cool before removing covers or touching internal components.
- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.
- Also, be sure that attached devices are electrically rated to operate with the power available in your location.
- Use only approved power cable(s). If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.

- These cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a 3-wire cable with properly grounded plugs.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local/national wiring rules.
- When connecting or disconnecting power to hot-pluggable power supplies, if offered with your system, observe the following guidelines:
    - Install the power supply before connecting the power cable to the power supply.
    - Unplug the power cable before removing the power supply.
    - If the system has multiple sources of power, disconnect power from the system by unplugging all power cables from the power supplies.
- Move products with care; ensure that all casters and/or stabilizers are firmly connected to the system. Avoid sudden stops and uneven surfaces.

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of the electronic components, such as the microprocessor. You can do so by periodically touching an unpainted metal surface on the chassis.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

1. When unpacking a static-sensitive component from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the component in your system. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
2. When transporting a sensitive component, first place it in an antistatic container or package.
3. Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads, workbench pads and an antistatic grounding strap.

Power Usage

This device is an Energy Related Product (ErP) with High Network Availability (HiNA), and automatically switches to a power-saving Network Standby mode within 1 minute of no packets being transmitted. It can also be turned off through a power switch to save energy when it is not needed.

DSR-250N/DSR-250NB1

Network Standby:7.8336 watts
Switched Off: 0.1301 watts

DSR-250

Network Standby: 7.8588 watts
Switched Off: 0.1290 watts

DSR-150N

Network Standby: 8.2317 watts
Switched Off: 0.1283 watts

DSR-150

Network Standby: 6.9133 watts
Switched Off: 0.12661 watts

DSR-1000N

Network Standby: 10.969 watts
Switched Off: 0.0 watts

DSR-1000

Network Standby: 10.912 watts
Switched Off: 0.0 watts

DSR-500N

Network Standby: 11.487 watts
Switched Off: 0.0 watts

DSR-500

Network Standby: 9.744 watts
Switched Off: 0.0 watts

Table of Contents

Introduction

D-Link Services Routers offer a secure, high performance networking solution to address the growing needs of small and medium businesses. Integrated high -speed IEEE 802.11n and 3G wireless technologies offer comparable performance to traditional wired networks, but with fewer limitations. Optimal network security is provided via features such as virtual private network (VPN) tunnels, IP Security (IPsec), Point-to-Point Tunneling Protocol (PPTP), Layer 2 Tunneling Protocol (L2TP), and Secure Sockets Layer (SSL). Empower your road warriors with clientless remote access anywhere and anytime using SSL VPN tunnels.

With the D-Link Services Router you are able to experience a diverse set of benefits:

- **Comprehensive Management Capabilities**
  The DSR-500, DSR-500N, DSR-1000 and DSR-1000N include dual-WAN Gigabit Ethernet which provides policy-based service management ensuring maximum productivity for your business operations. The failover feature maintains data traffic without disconnecting when a landline connection is lost. The Outbound Load Balancing feature adjusts outgoing traffic across two WAN interfaces and optimizes the system performance resulting in high availability. The solution supports configuring a port as a dedicated DMZ port allowing you to isolate servers from your LAN.

  Note: *The DSR-150/150N/250/250N products have a single WAN interface, and thus do not support Auto Failover or Load Balancing scenarios.*

- **Superior Wireless Performance**
  Designed to deliver superior wireless performance, the DSR-500N and DSR-1000N include 802.11 a/b/g/n support, allowing for operation on either the 2.4 GHz or 5 GHz radio bands. Multiple In Multiple Out (MIMO) technology allows the DSR-500N and DSR-1000N to provide high data rates with minimal "dead spots" throughout the wireless coverage area.

  Note: *The DSR-150N, DSR-250N, and DSR-500N support the 2.4GHz radio band only.*

- **Flexible Deployment Options**
  The DSR-1000/1000N supports Third Generation (3G) Networks via an extendable USB 3G dongle. This 3G network capability offers an additional secure data connection for networks that provide critical services. The DSR-1000N can be configured to automatically switch to a 3G network whenever a physical link is lost.

- **Robust VPN features**
  A fully featured virtual private network (VPN) provides your mobile workers and branch offices with a secure link to your network. The DSR-150/150N/250/250N, DSR-500/500N and DSR-1000/1000N are capable of simultaneously managing 5, 5, 10, 20 Secure Sockets Layer (SSL) VPN tunnels respectively, empowering your mobile users by providing remote access to a central corporate database. Site-to-site VPN tunnels use IP Security (IPsec) Protocol, Point-to-Point Tunneling Protocol (PPTP), or Layer 2 Tunneling Protocol (L2TP) to facilitate branch office connectivity through encrypted virtual links. The DSR-150/150N, DSR-250/250N, DSR-500/500N, and DSR-1000/1000N support 10, 25, 35 and 75 simultaneous IPsec VPN tunnels respectively.

- **Efficient D-Link Green Technology**
  As a concerned member of the global community, D-Link is devoted to providing eco-friendly products. D-Link Green Wi-Fi and D-Link Green Ethernet save power and prevent waste. The D-Link Green WLAN scheduler reduces wireless power automatically during off-peak hours. Likewise the D-Link Green Ethernet program adjusts power usage based on the detected cable length and link status. In addition, compliance with RoHS (Restriction of Hazardous Substances) and WEEE (Waste Electrical and Electronic Equipment) directives make D-Link Green certified devices the environmentally responsible choice.

  Note: *Support for the 3G wireless WAN USB dongle is only available for the DSR-1000 and DSR-1000N.*

Installation

This section provides information and steps on how to connect your DSR router to your network.

Before you Begin

Observe the following precautions to help prevent shutdowns, equipment failures, and injuries:

- Ensure that the room in which you operate the device has adequate air circulation and that the room temperature does NOT exceed 40˚C (104˚F).
- Allow 1 meter (3 feet) of clear space to the front and back of the device.
- Do NOT place the device in an equipment rack frame that blocks the air vents on the sides of the chassis. Ensure that enclosed racks have fans and louvered sides.
- Before installation, please correct these hazardous conditions: moist or wet floors, leaks, ungrounded or frayed power cables, or missing safety grounds.

Connect to your Network

This section provides basic information about physically connecting the DSR-250 to a network.

1. Connect an Ethernet cable from the port labeled WAN to the external router or modem. The port WAN is pre-allocated to the WAN network segment.
2. Connect an Ethernet cable from one of the LAN ports to a switch or a computer in the LAN network segment.
3. Connect an RJ45-to-DB9 cable from the console port for CLI (Command Line Interface) management access (optional).

Note: *Refer to the Quick Installation Guide included with your router for more information on network connectivity, port, and LED information.*

Basic Configuration

After you install the router, perform the basic configuration instructions described in this section which includes:

#1 Log in to the Web UI

The LAN connection may be through the wired Ethernet ports available on the router, or once the initial setup is complete, the DSR may also be managed through its wireless interface. Access the router's Web user interface (Web UI) for management by using any web browser, such as Internet Explorer, Firefox, Chrome, or Safari.

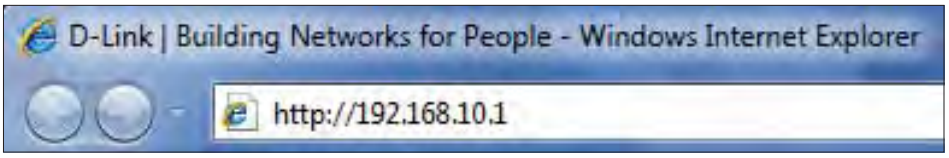
Note: *The workstation from which you manage the router must be in the same subnet as the router (192.169.10.0/24).*

To access the device with the Web UI:

1. Connect your workstation to an available LAN port on the router.
2. Ensure your workstation has DHCP enabled or is assigned a static IP address within the 192.168.10.0/24 subnet.

   Note: *Disable pop-up blocking software or add the management IP address http://192.168.10.1 to your pop-up blocker's allow list.*

3. Launch a browser, enter the IP address for the LAN interface (default = **http://192.168.10.1**), and then press **Enter**.



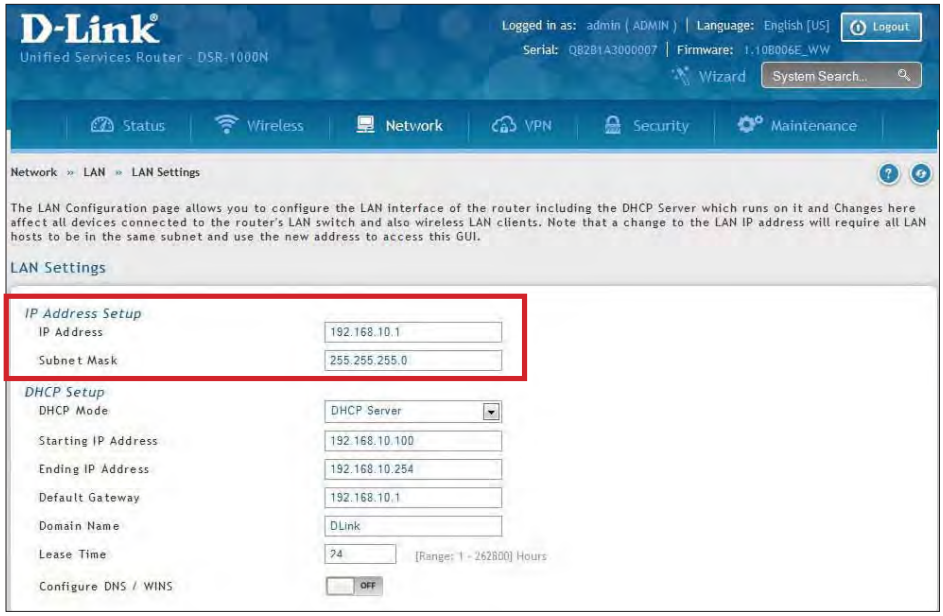
4. Enter your username (default = **admin**) and your password (default = **admin**), then click **Login**.

5. The web management interface opens with the Status > Dashboard page. This page displays general, LAN, and WLAN status information. You can return to this page at any time by clicking Status > Dashboard.

#2 Change LAN IP Address

To change the LAN IP address of the router, follow the steps below:

1. Log in to the router.
2. Click **Network** > **LAN** > **LAN Settings**. The LAN Settings page will appear.



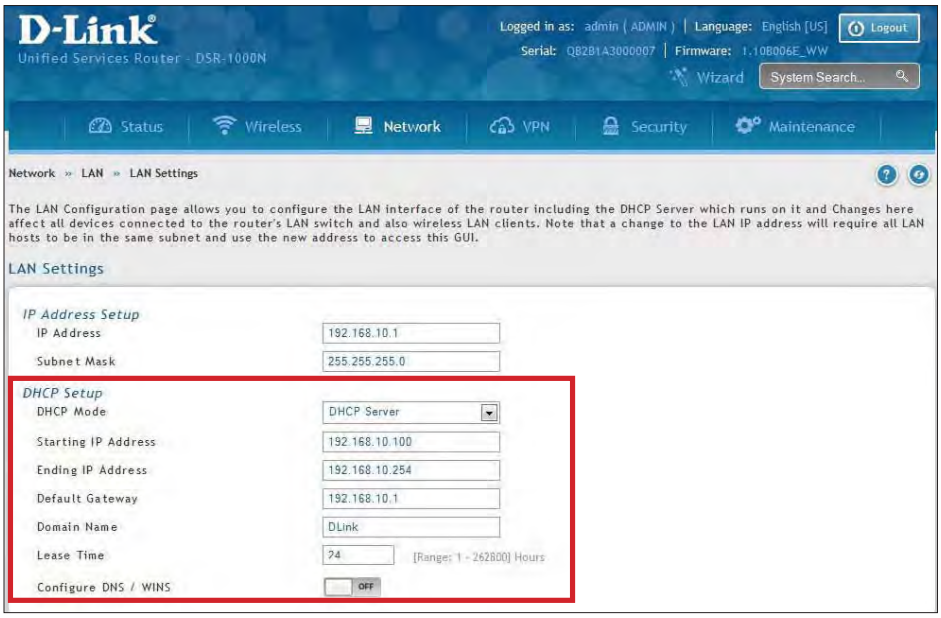
3. Under *IP Address Setup*, enter a new IP address for the router.
4. Enter a new subnet mask if needed.
5. Click **Save** at the bottom of the page.

Note: *If you change the IP address and click Save, the Web UI will not respond. Open a new connection to the new IP address and log in again. Be sure the LAN host (the machine used to manage the router) has obtained an IP address from newly assigned pool (or has a static IP address in the router's LAN subnet) before accessing the router via changed IP address.*

#3 Configure DHCP Server

To change the DHCP settings of the router, follow the steps below:

1. Log in to the router.
2. Click **Network** > **LAN** > **LAN Settings**. The LAN Settings page will appear.



3. From the *DHCP Mode* drop-down menu under *DHCP Setup*, select **None** (disable), **DHCP Server** (enable), or **DHCP Relay**.

   Note: *DHCP Relay will allow DHCP clients on the LAN to receive IP address leases and corresponding information from a DHCP server on a different subnet. When LAN clients make a DHCP request it will be passed along to the server accessible via the Relay Gateway IP address you enter.*

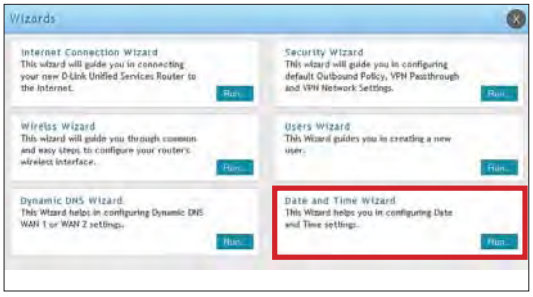
4. If enabled, fill in the following fields:

Field	Description
Starting IP Address	Enter the starting IP address in the DHCP address pool. Any new DHCP client joining the LAN is assigned an IP address within the starting and ending IP address range. Starting and ending IP addresses should be in the same IP address subnet as the wireless controller's LAN IP address.
Ending IP Address	Enter the ending IP address in the DHCP address pool.
Default Gateway	By default this setting is router's LAN IP address. It can be customized to any valid IP within the LAN subnet, in the event that the network's gateway is not this router. The DHCP server will give the configured IP address as the Default Gateway to its DHCP clients.
Domain Name	Enter a domain name.
Lease Time	Enter the time, in hours, for which IP addresses are leased to clients.
Configure DNS/WINS	Toggle to **On** and enter DNS and/or WINS server IP address(es).

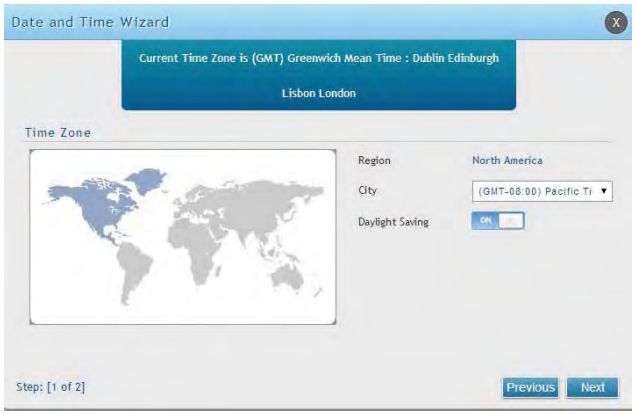
5. Click **Save** at the bottom of the page.

#4 Set Time and Date

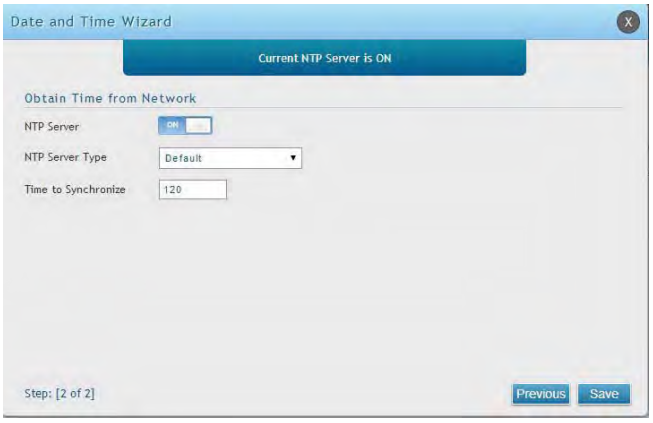
1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page. If you want to manually configure your date/time settings, refer to "Date and Time" on page 162.
3. Click **Run** in the *Date and Time Wizard* box.



4. Click the continent from the map and then next to *City*, select your time zone from the drop-down menu. Toggle Daylight Saving to **ON** if it applies to you and then click **Next**.



5. Toggle NTP server to ON to use a time server or toggle to OFF to manually enter the time and date.
6. If you selected ON, select either **Default** or **Custom** from the drop-down menu. If you selected Custom, enter a primary and secondary NTP server address.
7. Enter the time to synchronize with the NTP server and click **Save**.



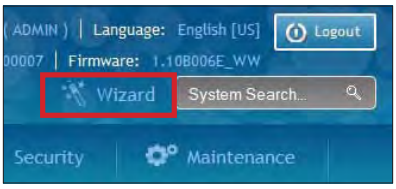
8. A summary page will appear. Verify your settings and then click **Finish**.

#5 Internet Connection Setup

This router has two WAN ports that can be used to establish a connection to the internet. It is assumed that you have arranged for internet service with your Internet Service Provider (ISP). Please contact your ISP or network administrator for the configuration information that will be required to setup the router. Supported Internet connection types include Dynamic, Static, PPPoE, PPTP, L2TP, Japanese PPPoE, and Russian PPPoE/PPTP/L2TP.

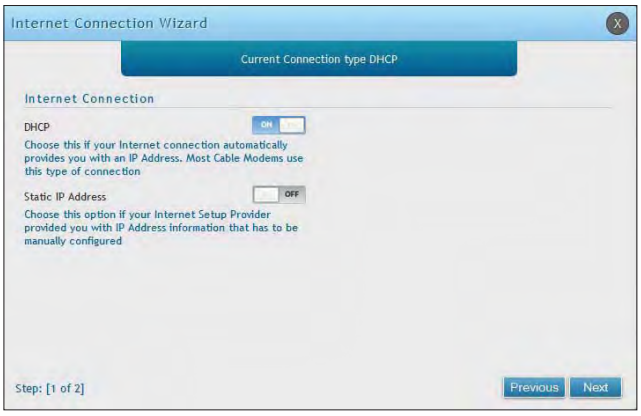
To configure your router to connect to the Internet, follow the steps below:

1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page. If you want to manually configure your Internet settings, refer to "Connect to the Internet" on page 30.

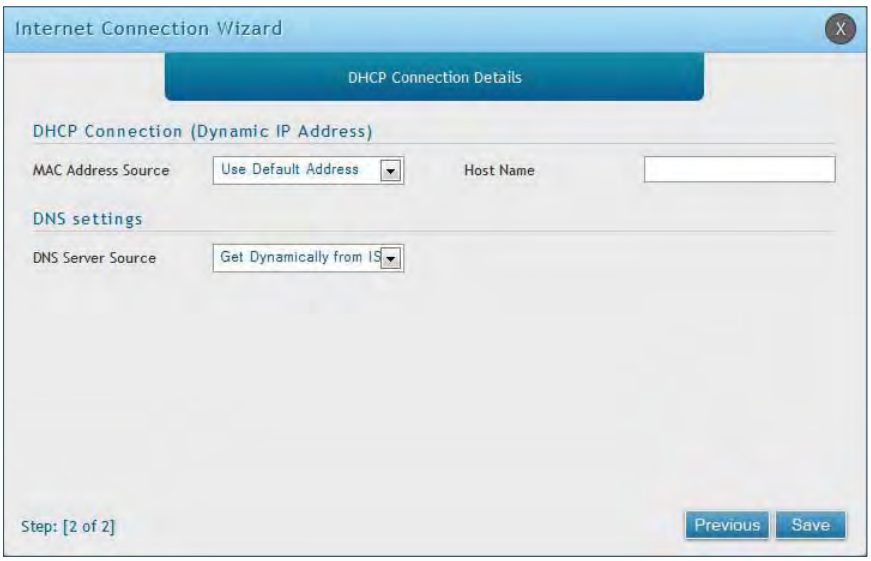


3. Click **Run** in the *Internet Connection Wizard* box.

4. Toggle **On** next to either *DHCP* or *Static IP Address* and click **Next**. If your connection type is not listed, refer to "Connect to the Internet" on page 30.



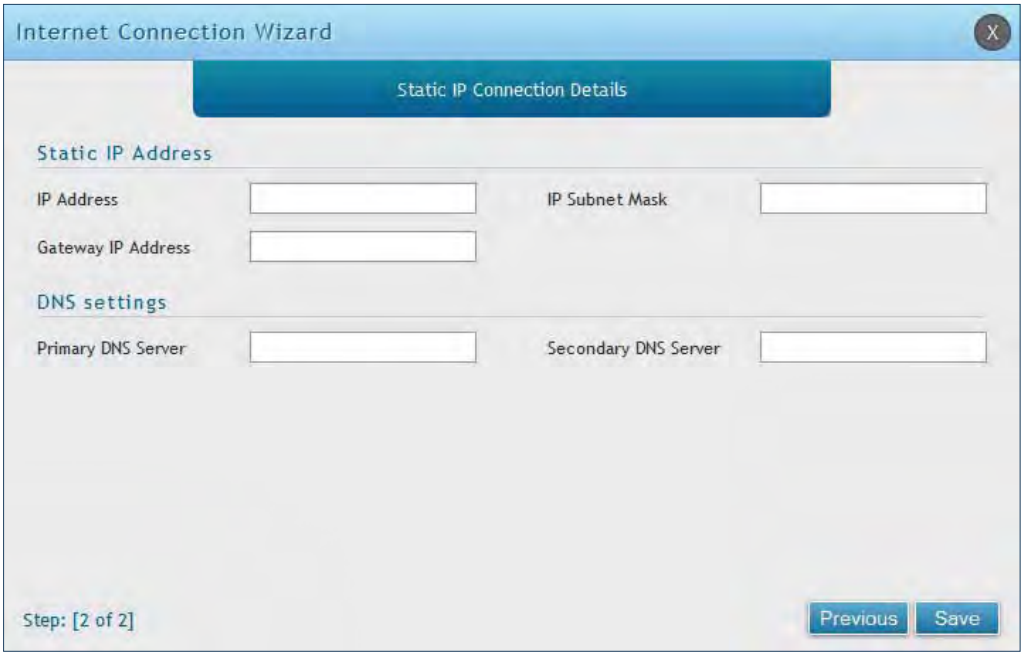
a. If you selected **DHCP**, complete the fields below:



Field	Description
MAC Address Source	This MAC address will be recognized by your ISP. Select from the following three options: • **Use Default Address** - Uses the default MAC address of the router. • **Clone your PC's MAC Address** - Select to use the MAC address of the computer you are currently connecting with. • **Use this MAC Address** - Select to manually enter a MAC address and enter the address in the box.
Host Name	Enter a host name if required by your ISP.
DNS Server Source	Select from the following two options: • **Get Dynamically from ISP** - Select to use the DNS servers assigned by your ISP. • **Use these DNS Servers** - Select to manually enter a primary and secondary DNS server address(es).

Skip to Step 5 on the bottom of the next page.

b. If you selected **Static**, complete the fields below:



Field	Description
IP Address	Enter the IP address assigned by your ISP.
Gateway IP Address	Enter the gateway IP address assigned by your ISP.
IP Subnet Mask	Enter the subnet mask assigned by your ISP.
Primary DNS Server	Enter the primary DNS server IP address assigned by your ISP.
Secondary DNS Server	Enter the secondary DNS server IP address assigned by your ISP.

5. Click **Save**. The router will reboot and attempt to connect to your ISP. Please allow one to two minutes to connect.

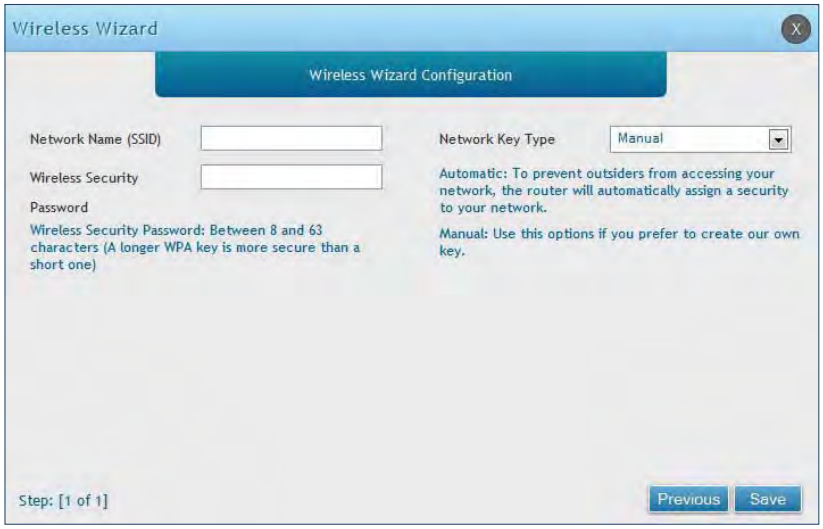
#6 Wireless Network Setup

This wizard provides a step-by-step guide to create and secure a new access point on the router. The network name (SSID) is the AP identifier that will be detected by supported clients. The Wizard uses a TKIP+AES cipher for WPA / WPA2 security; depending on support on the client side, devices associate with this AP using either WPA or WPA2 security with the same pre -shared key.

The wizard has the option to automatically generate a network key for the AP. This key is the pre-shared key for WPA or WPA2 type security. Supported clients that have been given this PSK can associate with this AP. The default (auto-assigned) PSK is "passphrase".

1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page.
3. Click **Run** in the *Wireless Wizard* box.

4. The wizard screen will appear.



5. Enter a SSID, which is the name of your wireless network.
6. Next to *Network Key Type*, select **Manual**.
7. Enter a password for the wireless network. Wireless devices connecting to this network must enter this password to connect. The password is case-sensitive.
8. Click **Save**.
9. A window will appear with a summary of your settings. Click **Finish**.

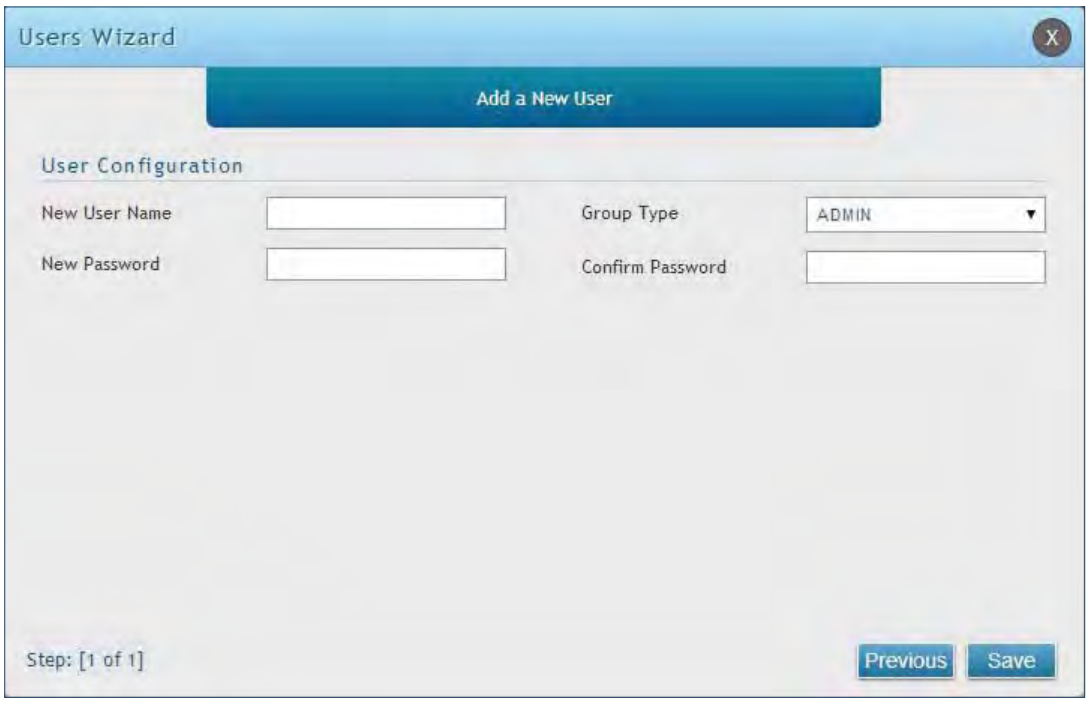
#7 Create Users

The Users Wizard allows you to create user account that you can assign to groups. Refer to "Users" on page 129 for more information. You may want to create Groups before users so you may assign them to groups as you create them. To create groups, refer to "Groups" on page 125.

To create new users, follow the steps below:

1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page.
3. Click **Run** in the *Users Wizard* box.

4. The wizard screen will appear.



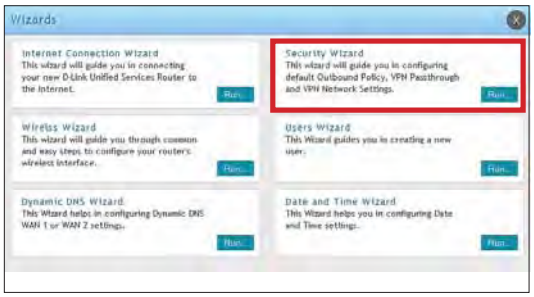
5. Enter a unique user name.
6. Select the group type from the drop-down menu. For more information on groups, refer to "Groups" on page 125.
7. Enter a password for the user.
8. Enter the password again for confirmation.
9. Click **Save**.

#8 Security/VPN Wizard

The Security Wizard allows you to enable VPN passthrough and create a VPN.

Follow the steps below:

1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page.
3. Click **Run** in the *Security Wizard* box.

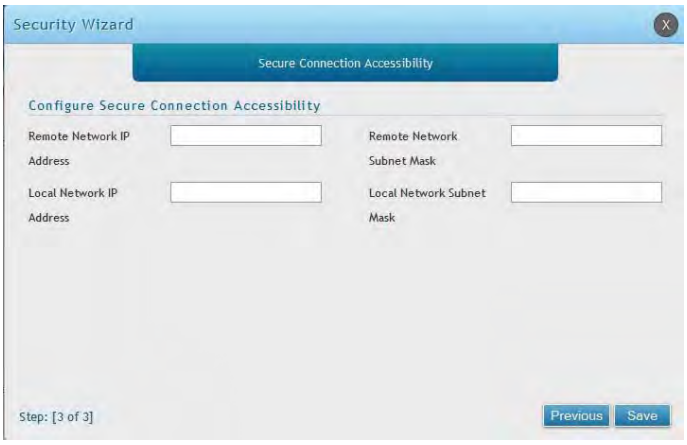


4. The wizard screen will appear.

5. Select the default outbound policy from the drop-down menu.
6. Toggle which type(s) of VPN you want allowed to pass through the router to **ON** and click **Next**.

7. You can quickly create both IKE and VPN policies. Once the IKE or VPN policy is created, you can modify it as required.

8. From the *Select VPN Type* drop-down menu, select either **Site to Site** or **Remote Access**.
9. Next to *Connection Name*, enter a name for this VPN connection.
10. Next to *IP Protocol Version*, select either **IPv4** or **IPv6**.
11. Next to *IKE Version*, select the version of IKE.
12. Next to *Pre-Shared Key*, enter the pre-shared key used.
13. Next to *Local Gateway*, select which WAN port used for the local gateway.
14. Next to *Remote Gateway Type* and *Local Gateway Type*, select either **IP Address** or **FQDN**.
15. Enter the Remote and Local WAN IP Address or FQDN and click **Next**.



16. Enter the remote network IP address and subnet mask.
17. Enter the local network IP address and subnet mask.
18. Click **Save**.

Note: *The IP address range used on the remote LAN must be different from the IP address range used on the local LAN.*

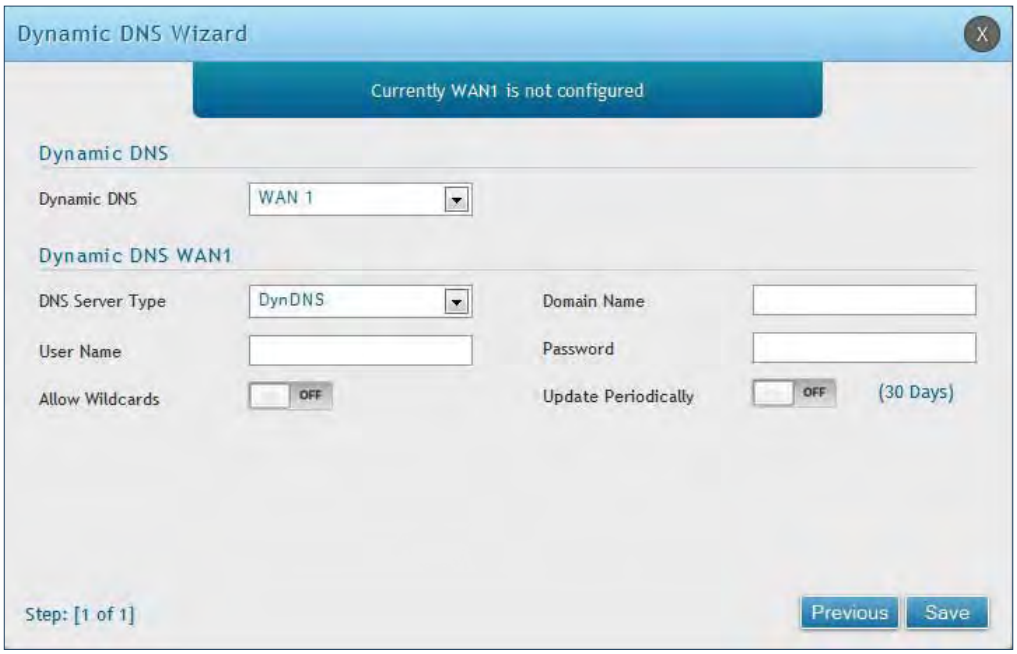
#9 Dynamic DNS Wizard

Dynamic DNS (DDNS) is an Internet service that allows routers with varying public IP addresses to be located using Internet domain names. To use DDNS, you must setup an account with a DDNS provider such as DynDNS.org, D-Link DDNS, or Oray.net. Refer to "Dynamic DNS Settings" on page 53 for more information.

Follow the steps below:

1. Log in to the router.
2. Click **Wizard** in the upper-right side of the page.
3. Click **Run** in the *Dynamic DNS Wizard* box.

4. The wizard screen will appear.



5. Next to *Dynamic DNS*, select **WAN1** or **WAN2**.
6. Select the *DNS Server Type* from the drop-down menu.
7. Depending on your service, enter your DDNS user name, password, and domain name.
8. Toggle *Allow Wildcards* to **ON** if required by your DDNS service.
9. Toggle *Update Periodically* to **ON** to auto update every 30 days.
10. Click **Save**.

LAN Configuration

By default, the router functions as a Dynamic Host Configuration Protocol (DHCP) server to the hosts on the LAN and WLAN network. With DHCP, PCs and other LAN devices can be assigned IP addresses as well as addresses for DNS servers, Windows Internet Name Service (WINS) servers, and the default gateway. With DHCP server enabled the router's IP address serves as the gateway address for LAN and WLAN clients. The PCs in the LAN are assigned IP addresses from a pool of addresses specified in this procedure. Each pool address is tested before it is assigned to avoid duplicate addresses on the LAN.

For most applications, the default DHCP and TCP/IP settings are satisfactory. If you want another PC on your network to be the DHCP server or if you are manually configuring the network settings of all of your PCs, set the DHCP mode to 'none'. DHCP relay can be used to forward DHCP lease information from another DHCP server on the network. This is particularly useful for wireless clients.

Instead of using a DNS server, you can use a Windows Internet Naming Service (WINS) server. A WINS server is the equivalent of a DNS server but uses the NetBIOS protocol to resolve host names. The router includes the WINS server IP address in the DHCP configuration when acknowledging a DHCP request from a DHCP client.

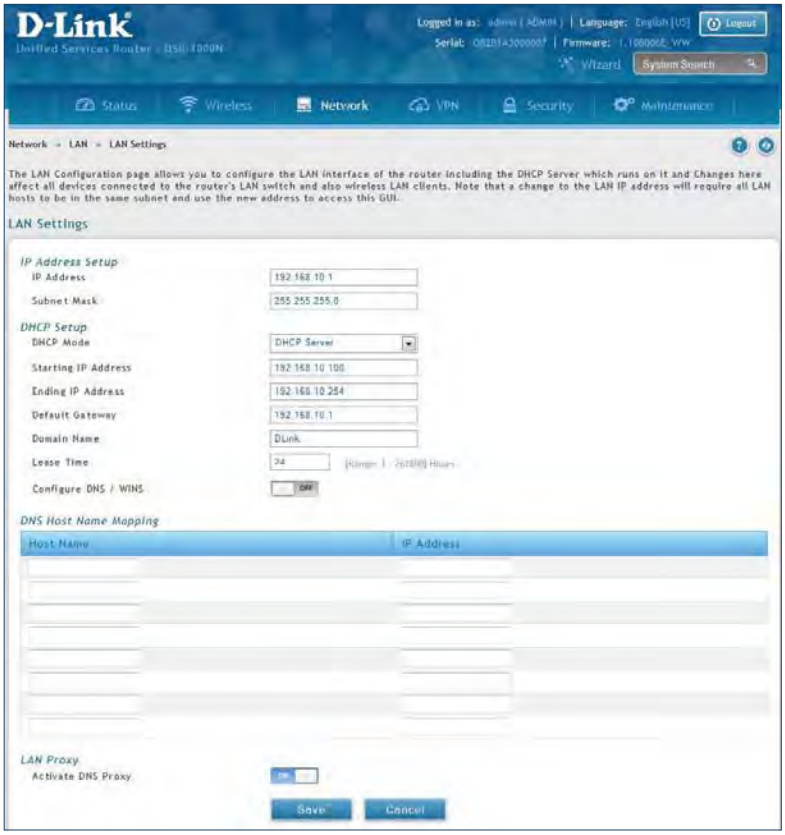
You can also enable DNS proxy for the LAN. When this is enabled the router then as a proxy for all DNS requests and communicates with the ISP's DNS servers. When disabled all DHCP clients receive the DNS IP addresses of the ISP.

LAN Settings

Path: Network > LAN > LAN Settings

To configure the LAN settings on the router:

1. Click **Network** > **LAN** > **LAN Settings**.

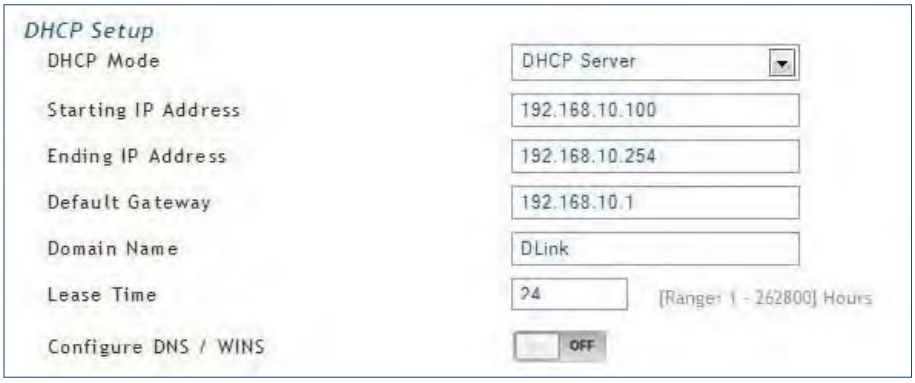


2. Complete the fields in the table below and click **Save**.

Field	Description
IP Address	Enter an new IP address for the router. Default is 192.168.10.1.
Subnet Mask	Enter the subnet mask for your network. Default is 255.255.255.0.
DHCP Mode	Select one of the following modes: • **None** - Turns off DHCP. • **DHCP Server** (default) - The router will act as the DHCP server on your network. • **DHCP Relay** - DHCP clients on your network will receive IP address leases from a DHCP server on a different subnet.

DHCP Server

1. Select **DHCP Server** from the drop-down menu.



2. Complete the fields in the table below and click **Save**.

Field	Description
DHCP Mode	Select **DHCP Server** from the drop-down menu.
Starting IP Address	Enter the starting IP address in the DHCP address pool. Any new DHCP client joining the LAN is assigned an IP address within the starting and ending IP address range. Starting and ending IP addresses must be in the same IP address subnet as the router's LAN IP address.
Ending IP Address	Enter the ending IP address in the DHCP address pool.
Default Gateway	Enter the default gateway IP address you want to assign to your DHCP clients. This IP is usually the router's LAN IP address (default is 192.168.10.1).
Domain Name	Enter a domain name.
Lease Time	Enter the time, in hours, for which IP addresses are leased to clients.
Configure DNS/WINS	Toggle to **On** to manually enter DNS and/or WINS server IP address(es). If set to **Off**, your router's LAN IP address will be assigned the DNS server to your clients and the router will get the DNS information from your ISP.
Save	Click **Save** at the bottom to save and activate your settings.

DHCP Relay

1. Select **DHCP Relay** from the drop-down menu.

2. Complete the fields in the table below and click **Save**.

Field	Description
DHCP Mode	Select **DHCP Relay** from the drop-down menu.
Domain Name	Enter the domain name of your network.
Gateway	Enter the relay gateway IP address.
Save	Click **Save** at the bottom to save and activate your settings.

DHCP Reserved IPs

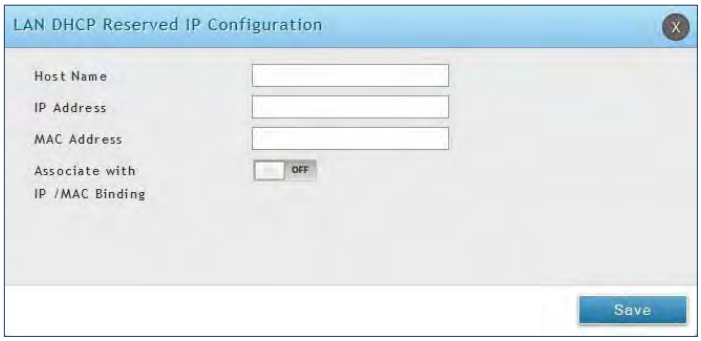
Path: Network > LAN > LAN DHCP Reserved IPs

The router's DHCP server can assign IP settings to your clients on your network by adding a client's MAC address and the IP address to be assigned. Whenever the router receives a request from a client, the MAC address of that client is compared with the MAC address list present in the database. If an IP address is already assigned to that computer or device in the database, the customized IP address is configured otherwise an IP address is assigned to the client automatically from the DHCP pool.

To create DHCP reservations:

1. Click **Network** > **LAN** > **LAN DHCP Reserved IPs**.

2. Click **Add New DHCP Reserved IP**.
3. Enter the following information and click **Save**.



Field	Description
Host Name	Enter a host name for this device. Do not use spaces.
IP Address	Enter the IP address you want to assign to this device. Note that this IP address must be in the same range as the starting/ending IP address under DHCP Settings.
MAC Address	Enter the MAC address of this device (xx:xx:xx:xx:xx:xx format). This is not case-sensitive.
Associate with IP/MAC Binding	Toggle **ON** to associate this device's information with IP/MAC binding.
Save	Click **Save** to save and activate your settings.

IGMP Setup

Path: Network > LAN > IGMP Setup

IGMP snooping (IGMP Proxy) allows the router to 'listen' in on IGMP network traffic through the router. This then allows the router to filter multicast traffic and direct it only to hosts that need this stream. This is helpful when there is a lot of multicast traffic on the network where all LAN hosts do not need to receive this multicast traffic.

To enable IGMP Proxy:

1. Click **Network** > **LAN** > **IGMP Setup**.
2. Toggle *IGMP Proxy* to **On**.
3. Click **Save**.

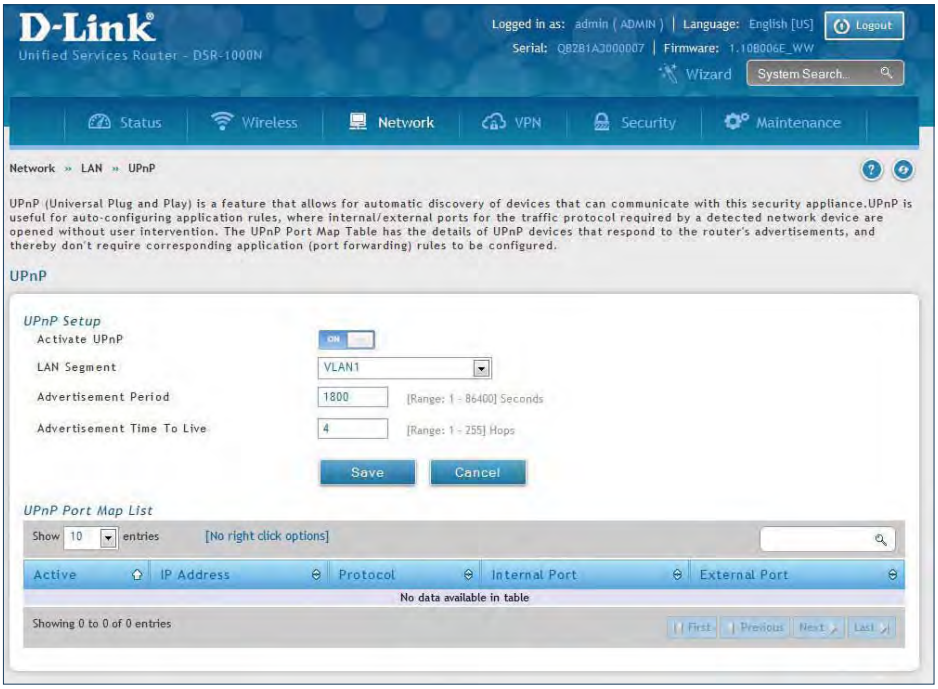
UPnP Setup

Path: Network > LAN > UPnP

Universal Plug and Play (UPnP) is a feature that allows the router to discover devices on the network that can communicate with the router and allow for auto-configuration. If a network device is detected by UPnP, the router can open internal or external ports for the traffic protocol required by that network device. If disabled, the router will not allow for automatic device configuration and you may have to manually open/forward ports to allow applications to work.

To configure the UPnP settings:

1. Click **Network** > **LAN** > **UPnP**.
2. Toggle *Activate UPnP* to **On**.
3. Select a VLAN from the *LAN Segment* drop-down menu.
4. Enter a value for *Advertisement Period*. This is the frequency that the router broadcasts UPnP information over the network. A large value will minimize network traffic but cause delays in identifying new UPnP devices to the network.
5. Enter a value for *Advertisement Time to Live*. This is the number of steps a packet is allowed to propagate before being discarded. Small values will limit the UPnP broadcast range. A default of 4 is typical for networks with a few number of switches.
6. Click **Save**.
7. Your entry will be displayed in the UPnP Port Map List. To edit or delete, right-click an entry and select the action from the menu. Repeat steps 2-6 to add multiple entries.



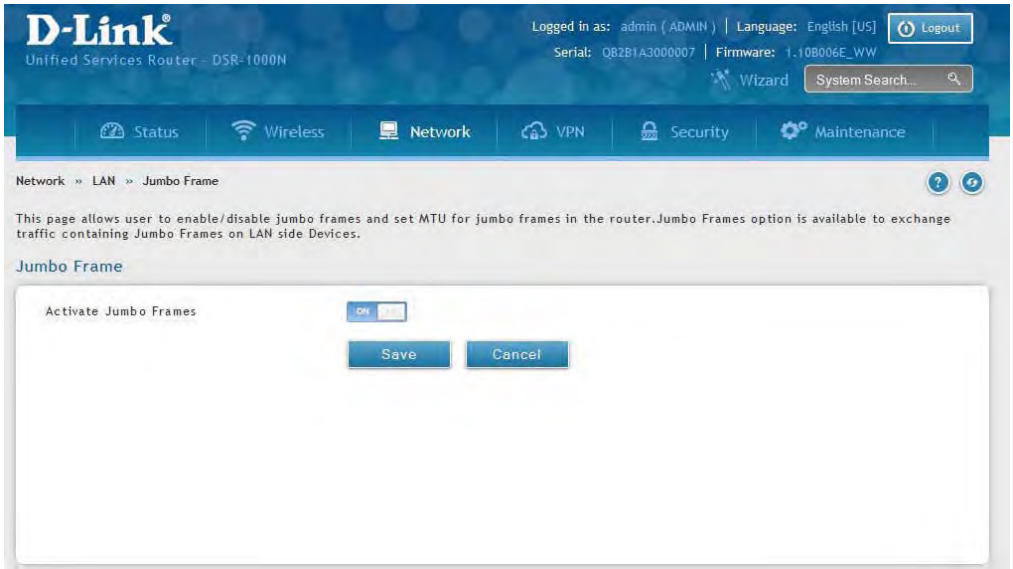
Jumbo Frames

Path: Network > LAN > Jumbo Frames

Jumbo frames are Ethernet frames with more than 1500 bytes of payload. When this option is enabled, the LAN devices can exchange information at Jumbo frames rate.

To enable jumbo frames:

1. Click **Network** > **LAN** > **Jumbo Frames**.
2. Toggle *Activate Jumbo Frames* to **On**.
3. Click **Save**.



VLAN

The router supports virtual network isolation on the LAN with the use of VLANs. LAN devices can be configured to communicate in a sub network defined by VLAN identifiers. LAN ports can be assigned unique VLAN IDs so that traffic to and from that physical port can be isolated from the general LAN.

VLAN filtering is particularly useful to limit broadcast packets of a device in a large network VLAN support is enabled by default in the router. In the VLAN Configuration page, enable VLAN support on the router and then proceed to the next section to define the virtual network.

VLAN Settings

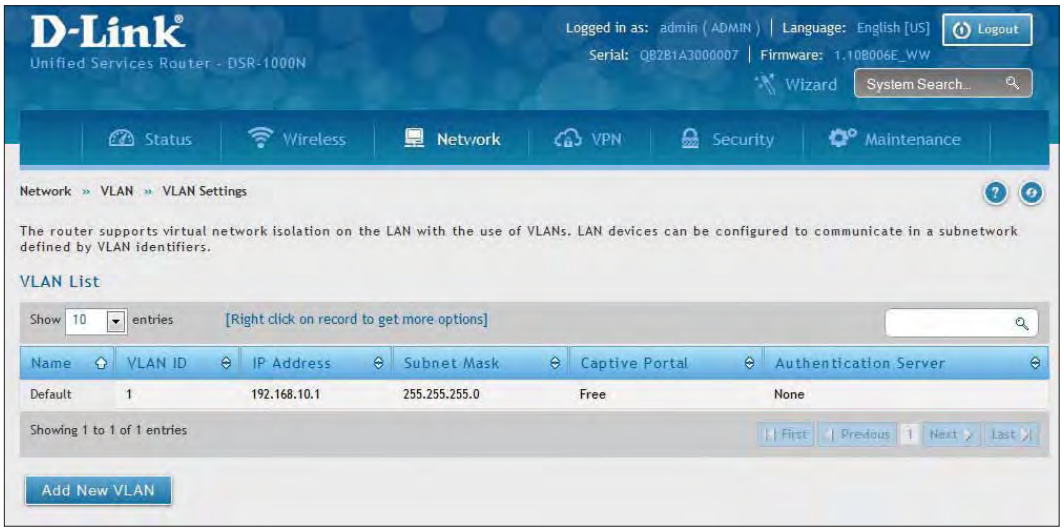
Path: Network > VLAN > VLAN Settings

The VLAN List page displays a list of configured VLANs by name and VLAN ID. A VLAN membership can be created by clicking the **Add New VLAN** button below the list.

A VLAN membership entry consists of a VLAN identifier and the numerical VLAN ID which is assigned to the VLAN membership. The VLAN ID value can be any number from 2 to 4091. VLAN ID 1 is reserved for the default VLAN, which is used for untagged frames received on the interface.

To create a new VLAN:

1. Click **Network** > **LAN** > **VLAN Settings**.
2. Click **Add New VLAN** at the bottom.
3. Enter the following required information from the table on the next page.



Field	Description
VLAN ID	Enter a number between 2 and 4053.
Name	Enter a name for your VLAN.
Captive Portal	Toggle **ON** to enable Captive Portal (refer to the next page for more information).
Activate InterVLAN Routing	Toggle **ON** to allow routing between multiple VLANs or **OFF** to deny communication between VLANs.
IP Address	Enter the IP address for the VLAN.
Subnet Mask	Enter the subnet mask for the VLAN.
DHCP Mode	Select one of the following modes: • **None** - Turns off DHCP for your VLAN. • **DHCP Server** (default) - The router will act as the DHCP server for your VLAN. • **DHCP Relay** - DHCP clients on your VLAN will receive IP address leases from a DHCP server on a different subnet.
Enable DNS Proxy	Toggle **ON** to enable the router to act as a proxy for all DNS requests and communicate with the ISP's DNS servers.
Save	Click **Save** to save and activate your settings.

Captive Portal

Note: *The DSR-150/150N/250/250N routers do not have support for the Captive Portal feature. Captive Portal is available for LAN users only and not for DMZ hosts.*

Captive Portals can be enabled on a per-VLAN basis. Hosts of a particular VLAN can be directed to authenticate via the Captive Portal, which may be a customized portal with unique instructions and branding as compared to another VLAN. The most critical aspect of this configuration page is choosing the authentication server. All users (VLAN hosts) that want to gain internet access via the selected Captive Portal will be authenticated through the selected server.

To enable Creative Portal to a specific VLAN:

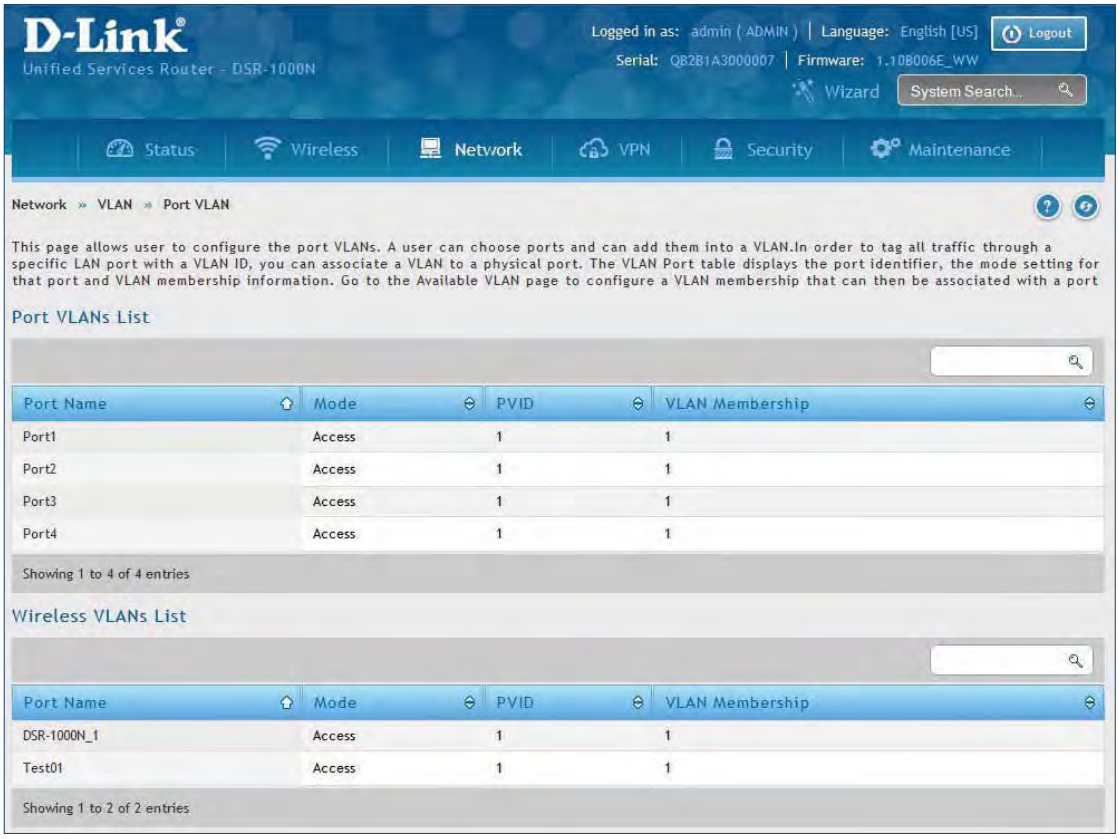
1. Click **Network** > **LAN** > **VLAN Settings**.
2. Click **Add New VLAN** at the bottom or right-click an existing VLAN and select **Edit**.
3. Toggle *Captive Portal* to **ON**.
4. Next to *Authentication Server*, select an authentication server from the drop-down menu.
5. Next to *Login Profile Name*, select a profile from the drop-down or click **Create a Profile** to create a new one.
6. Select either **HTTP** or **HTTPS** for the redirect type.
7. If you want users to enter a CAPTCHA challenge at login, toggle to **ON**.
8. If you would like communication between VLANs, toggle *Activate InterVLAN Routing* to **ON**.
9. Make any other changes/selections and click **Save**.

Port/Wireless VLAN

Path: Network > VLAN Settings > Port VLAN

In order to tag all traffic through a specific LAN port with a VLAN ID, you can associate a VLAN to a physical port and wireless segment.

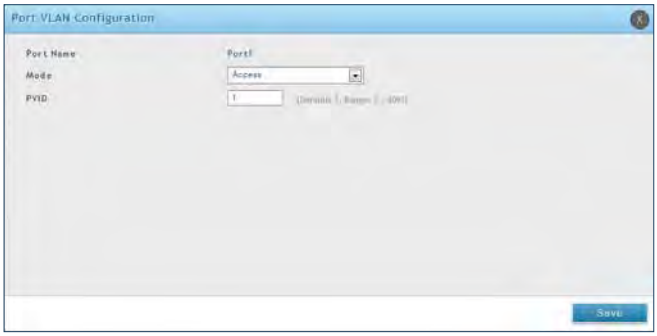
VLAN membership properties for the LAN and wireless LAN are listed on this page. The VLAN Port table displays the port identifier, the mode setting for that port and VLAN membership information. The configuration page is accessed by selecting one of the four physical ports or a configured access point and clicking **Edit**.



To edit, right-click on the port and select **Edit**. The edit page offers the following configuration options:

- Mode: The mode of this VLAN can be General, Access (default), or Trunk. Refer to the next page for more information on the different modes.
- Select PVID for the port when General mode is selected.
- Configured VLAN memberships will be displayed on the VLAN Membership Configuration for the port. By selecting one more VLAN membership options for a General or Trunk port, traffic can be routed between the selected VLAN membership IDs.

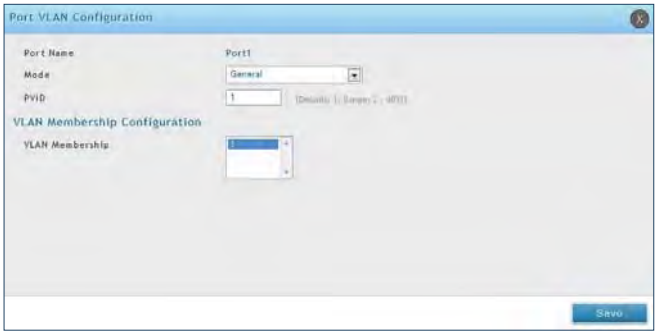
In **Access** mode the port is a member of a single VLAN (and only one). All data going into and out of the port is untagged. Traffic through a port in access mode looks like any other Ethernet frame.



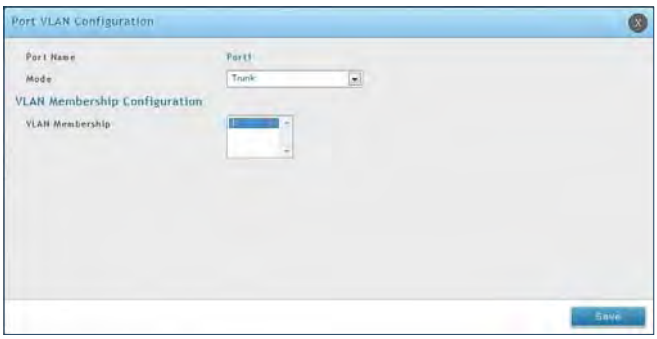
In **General** mode the port is a member of a user selectable set of VLANs. The port sends and receives data that is tagged or untagged with a VLAN ID. If the data into the port is untagged, it is assigned the defined PVID.

For example, if Port 3 is a General port with PVID 3, then the untagged data into Port 3 will be assigned PVID 3. All tagged data sent out of the port with the same PVID will be untagged. This is mode is typically used with IP Phones that have dual Ethernet ports. Data coming from phone to the switch port on the router will be tagged. Data passing through the phone from a connected device will be untagged.

Note: *The DSR-150/150N do not support General mode due to hardware limitations.*



In **Trunk** mode the port is a member of a user selectable set of VLANs. All data going into and out of the port is tagged. Untagged coming into the port is not forwarded, except for the default VLAN with PVID=1, which is untagged. Trunk ports multiplex traffic for multiple VLANs over the same physical link.



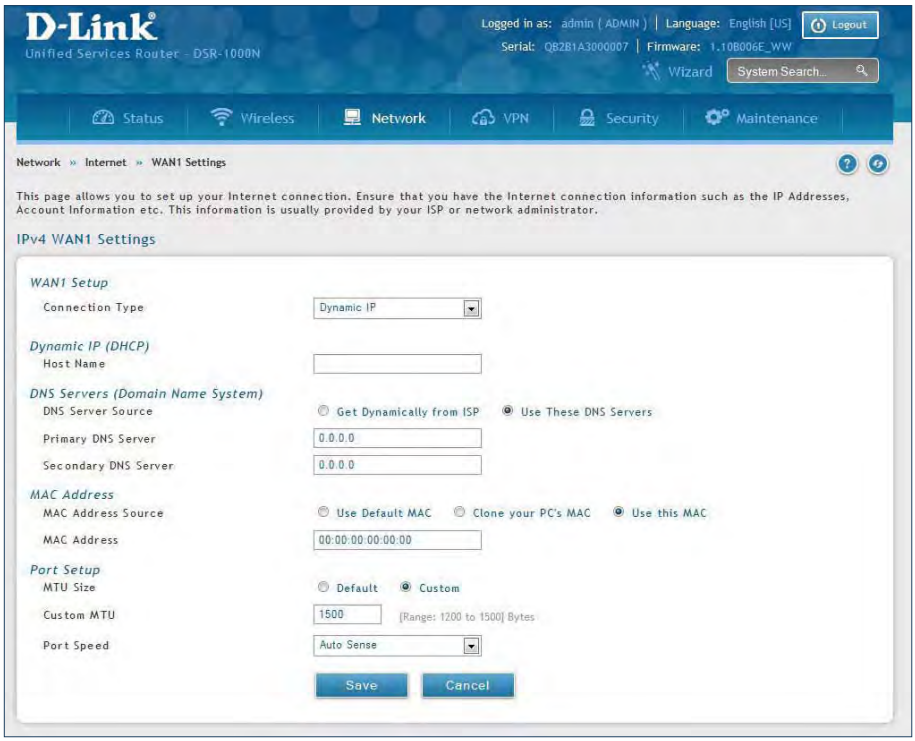
Connect to the Internet

This router has two WAN ports that can be used to establish a connection to the internet. It is assumed that you have arranged for internet service with your Internet Service Provider (ISP). Please contact your ISP or network administrator for the configuration information that will be required to setup the router.

Dynamic IP

Path: Network > Internet > WAN1 Settings

Select **Dynamic IP** (DHCP) to obtain IP address information automatically from your Internet Service Provider.

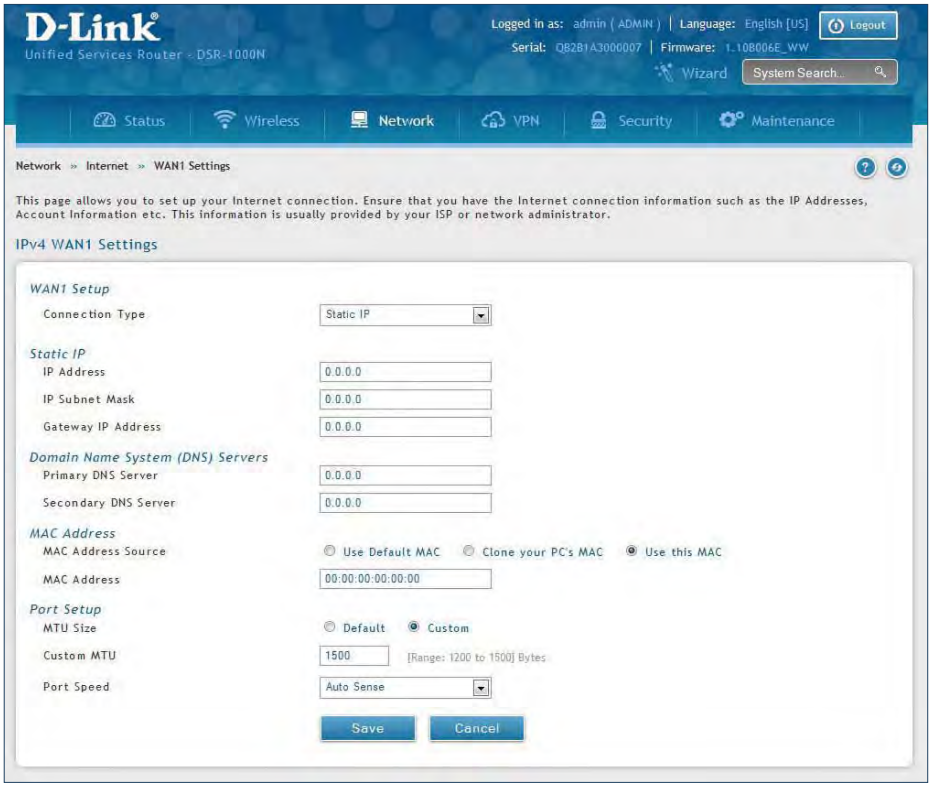


Field	Description
Host Name	Enter a host name if required by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

Static IP

Path: Network > Internet > WAN1 Settings

Select **Static IP** to manually enter the Internet settings supplied by your Internet Service Provider.

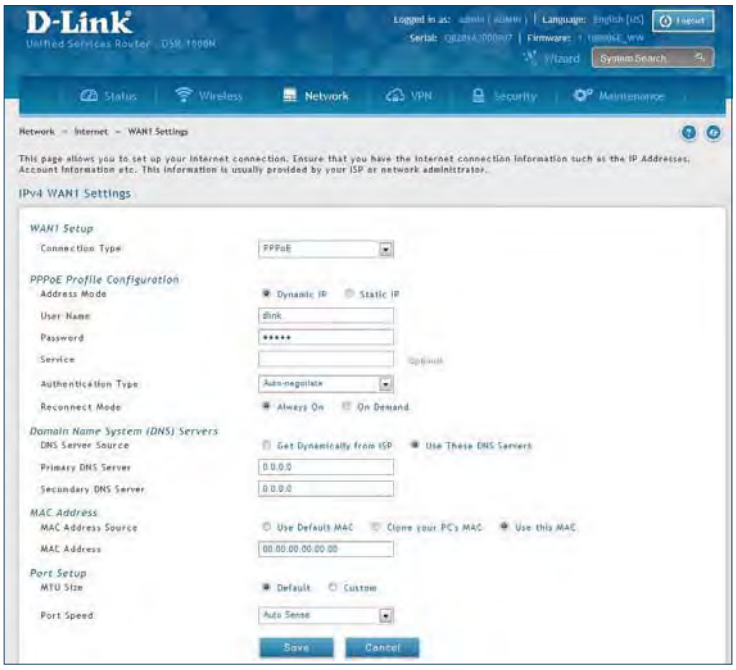


Field	Description
IP Address	Enter the IP address supplied by your ISP.
IP Subnet Mask	Enter the subnet mask supplied by your ISP.
Gateway IP Address	Enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected *Use this MAC*, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

PPPoE

Path: Network > Internet > WAN1 Settings

Select **PPPoE** to enter the PPPoE Internet settings supplied by your Internet Service Provider.



Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
User Name	Enter your PPPoE user name.
Password	Enter your PPPoE password.
Service	Enter if your ISP requires it.
Authentication Type	Select the authentication type from the drop-down menu.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

PPTP

Path: Network > Internet > WAN1 Settings

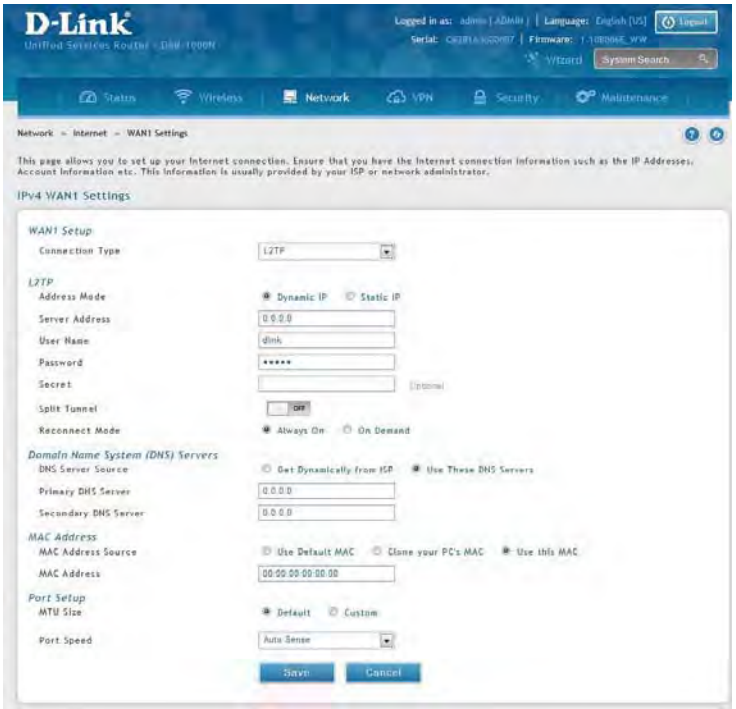
Select **PPTP** to enter the PPTP Internet settings supplied by your Internet Service Provider.

Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
Server Address	Enter your PPTP server address.
User Name	Enter your PPTP user name.
Password	Enter your PPTP password.
MPPE Encryption	Toggle to **ON** and select the level of MPPE encryption.
Split Tunnel	Toggle to **ON** to use split tunnelling. This will allow you to connect to a VPN and Internet using the same physical connection.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

L2TP

Path: Network > Internet > WAN1 Settings

Select **L2TP** to enter the L2TP Internet settings supplied by your Internet Service Provider.

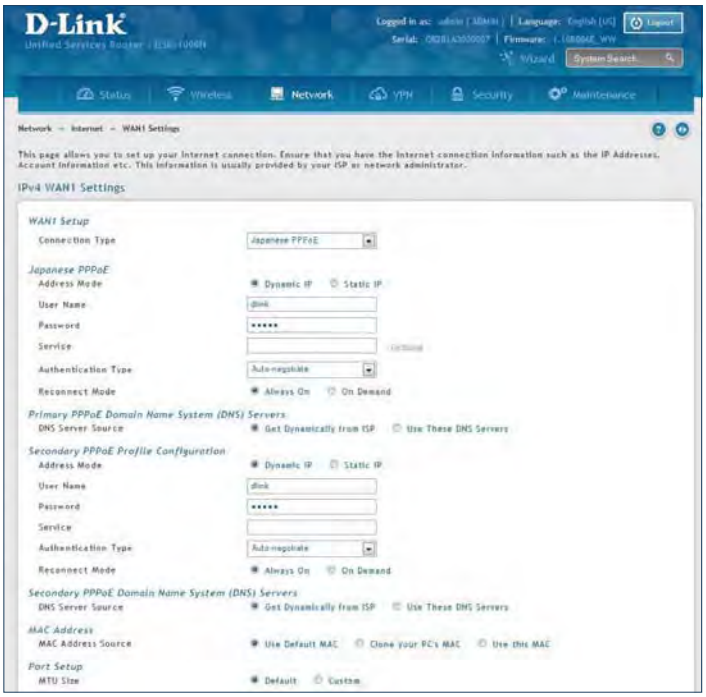


Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
Server Address	Enter your PPTP server address.
User Name	Enter your PPTP user name.
Password	Enter your PPTP password.
Secret	Enter a shared secret if required.
Split Tunnel	Toggle to **ON** to use split tunnelling. This will allow you to connect to a VPN and Internet using the same physical connection.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

Japanese PPPoE

Path: Network > Internet > WAN1 Settings

Select **Japanese PPPoE** to enter the PPPoE Internet settings supplied by your Internet Service Provider.

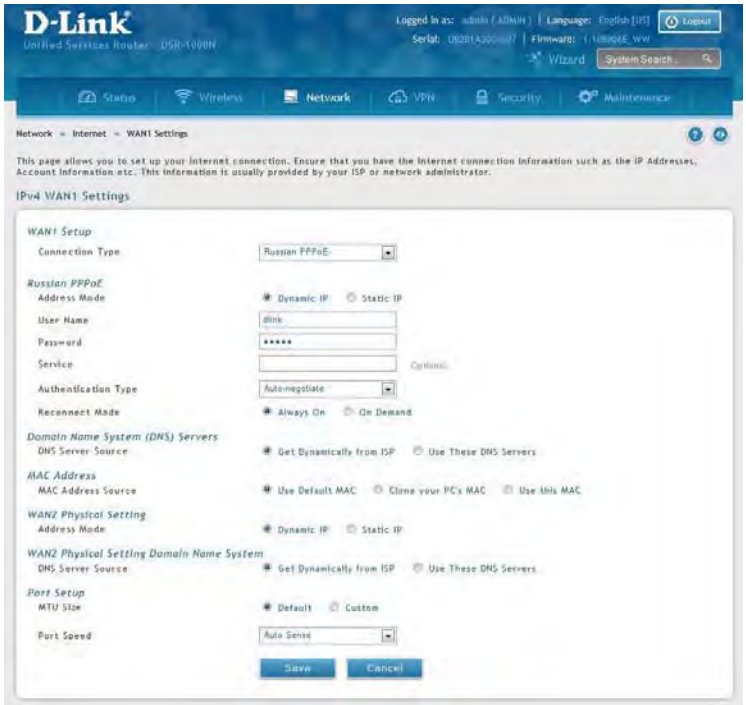


Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
User Name	Enter your PPPoE user name.
Password	Enter your PPPoE password.
Service	Enter if your ISP requires it.
Authentication Type	Select the authentication type from the drop-down menu.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
Primary PPPoE DNS Servers	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
Secondary PPPoE Profile	You may create a secondary PPPoE profile.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

Russian PPPoE

Path: Network > Internet > WAN1 Settings

Select **Russian PPPoE** to enter the PPPoE Internet settings supplied by your Internet Service Provider.

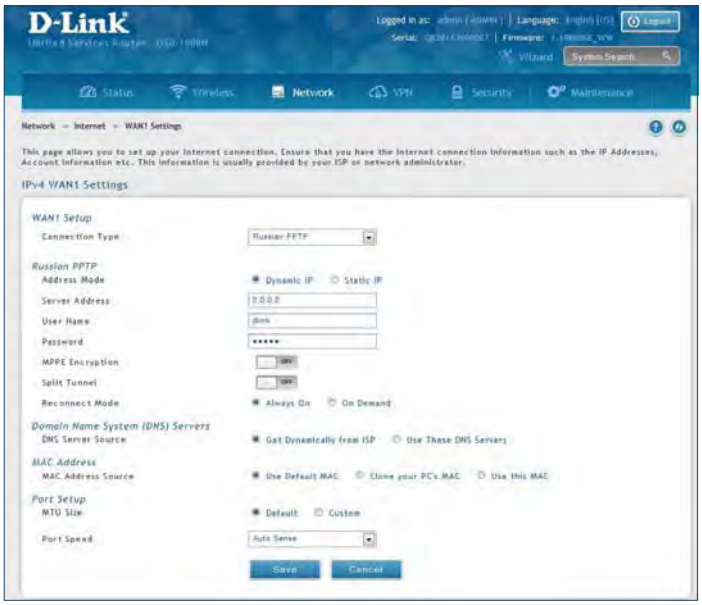


Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
User Name	Enter your PPPoE user name.
Password	Enter your PPPoE password.
Service	Enter if your ISP requires it.
Authentication Type	Select the authentication type from the drop-down menu.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
WAN2 Physical Setting	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP). If you select Static IP, enter the IP settings supplied by your ISP.
WAN2 Physical DNS	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

Russian PPTP

Path: Network > Internet > WAN1 Settings

Select **Russian PPTP** to enter the PPTP Internet settings supplied by your Internet Service Provider.

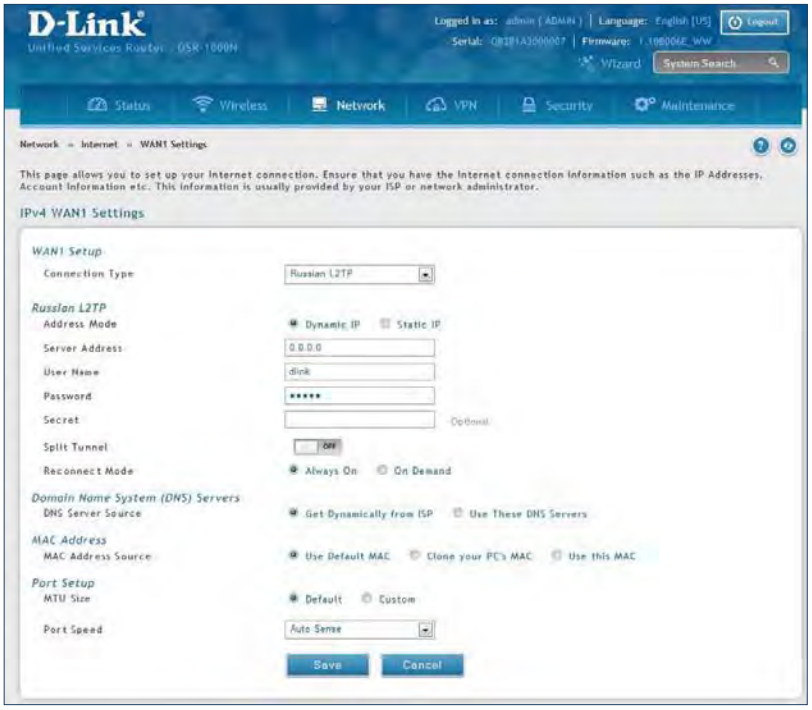


Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
Server Address	Enter your PPTP server address.
User Name	Enter your PPTP user name.
Password	Enter your PPTP password.
MPPE Encryption	Toggle to **ON** and select the level of MPPE encryption.
Split Tunnel	Toggle to **ON** to use split tunnelling. This will allow you to connect to a VPN and Internet using the same physical connection.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

Russian L2TP

Path: Network > Internet > WAN1 Settings

Select **Russian L2TP** to enter the L2TP Internet settings supplied by your Internet Service Provider.



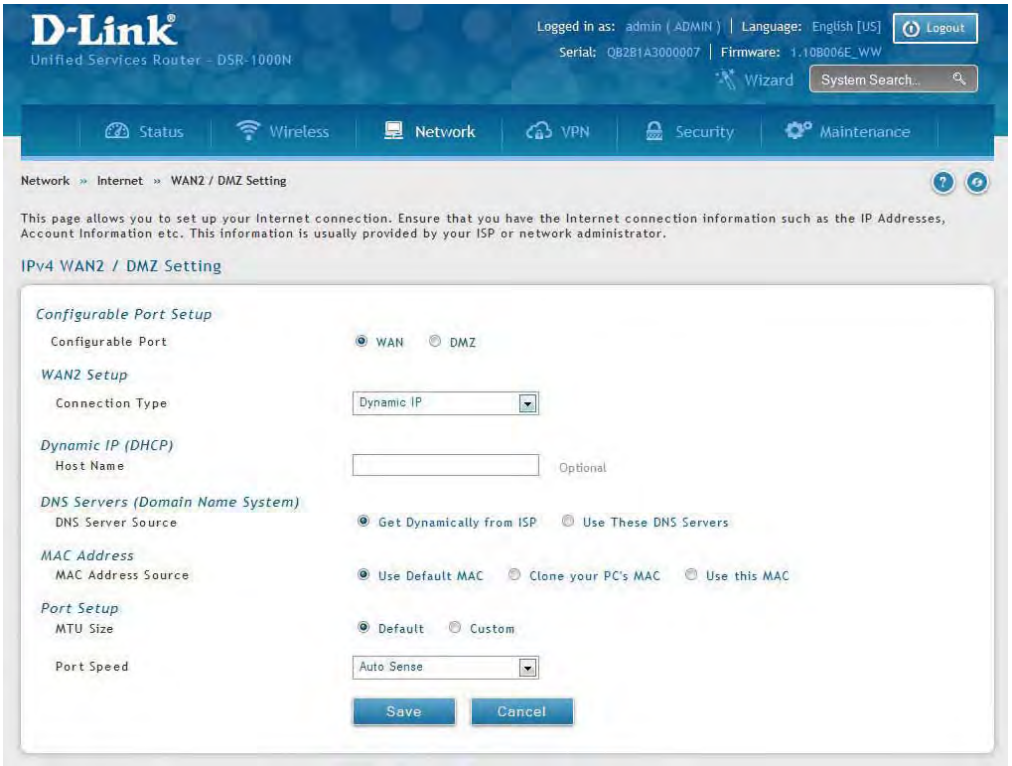
Field	Description
Address Mode	Select **Dynamic IP** or **Static IP** (IP settings supplied by your ISP).
Server Address	Enter your PPTP server address.
User Name	Enter your PPTP user name.
Password	Enter your PPTP password.
Secret	Enter a shared secret if required.
Split Tunnel	Toggle to **ON** to use split tunnelling. This will allow you to connect to a VPN and Internet using the same physical connection.
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
IP Address	If you selected Static IP, enter the IP address supplied by your ISP.
IP Subnet Mask	If you selected Static IP, enter the subnet mask supplied by your ISP.
Gateway IP Address	If you selected Static IP, enter the gateway IP address supplied by your ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MAC Address Source	Select **Use Default MAC** to use the MAC address from the WAN1 port to associate with your modem/ISP, **Clone your PC's MAC** to use the MAC address of the computer you are currently using to associate with your modem/ISP, or **Use this MAC** to manually enter a MAC address.
MAC Address	If you selected Use this MAC, enter the MAC address you want to associate with your ISP.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.
Port Speed	Select a value from the drop-down menu. The default value is **Auto-Sense**.
Save	Click **Save** to save and activate your settings.

WAN2 Settings

Path: Network > Internet > WAN2 Settings

Select **WAN** and select the Internet connection type. Please refer to the previous pages (41-49) for more information. If you want to set WAN2 port to **DMZ**, skip to the next page.

WAN



DMZ

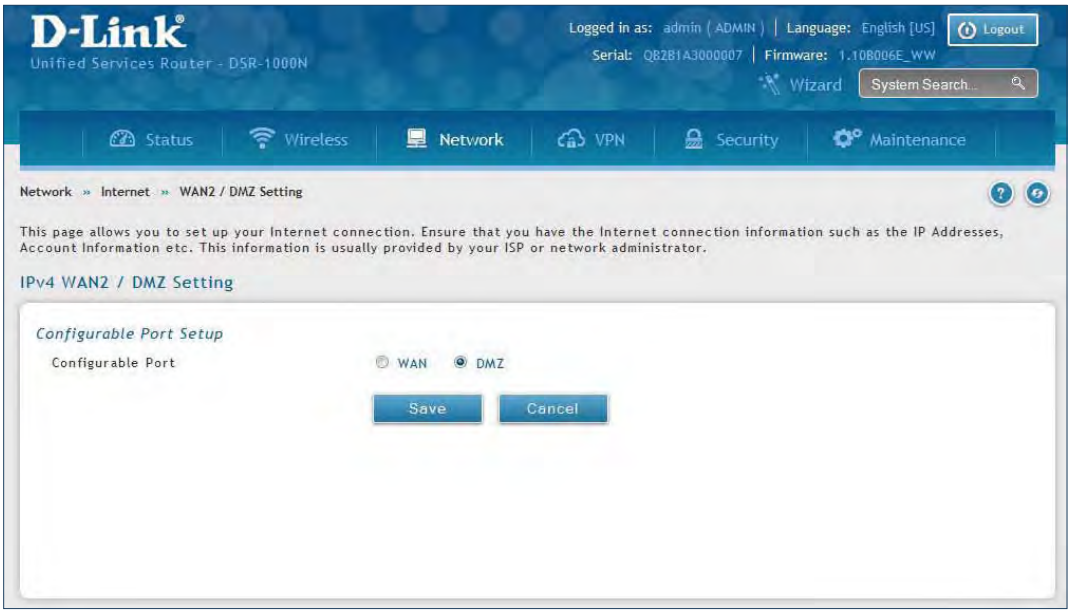
This router supports one of the physical ports to be configured as a secondary WAN Ethernet port or a dedicated DMZ port. A DMZ is a sub network that is open to the public but behind the firewall. The DMZ adds an additional layer of security to the LAN, as specific services/ports that are exposed to the internet on the DMZ do not have to be exposed on the LAN. It is recommended that hosts that must be exposed to the internet (such as web or email servers) be placed in the DMZ network.

Firewall rules can be allowed to permit access specific services/ports to the DMZ from both the LAN or WAN. In the event of an attack to any of the DMZ nodes, the LAN is not necessarily vulnerable as well.

DMZ configuration is identical to the LAN configuration. There are no restrictions on the IP address or subnet assigned to the DMZ port, other than the fact that it cannot be identical to the IP address given to the LAN interface of this gateway.

Note: *For the DSR-500N and 1000N, in order to configure a DMZ port, the router's configurable port must be set to DMZ in the* ***Network*** > ***Internet*** > ***DMZ Settings*** *page.*

1. Click **Network** > **Internet** > **WAN2 / DMZ Settings**.



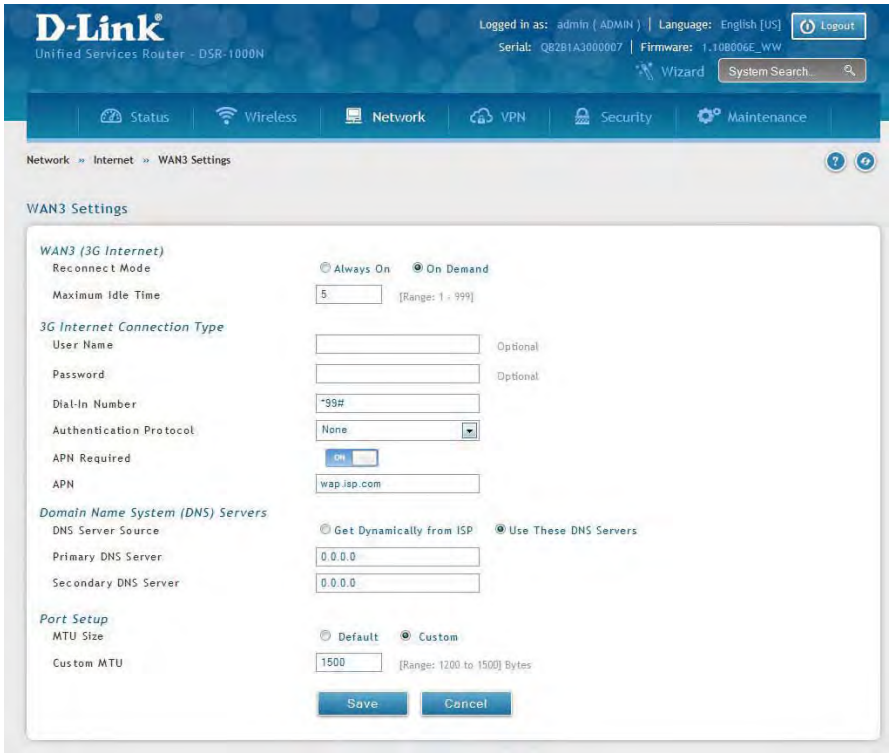
2. Select **DMZ** and click **Save**.

WAN3 (3G Internet)

Path: Network > Internet > WAN3 Settings

This router supports the use of 3G Internet access. Cellular 3G internet access is available on WAN3 via a 3G USB modem for DSR-1000 and DSR-1000N. The cellular ISP that provides the 3G data plan will provide the authentication requirements to establish a connection. The dial Number and APN are specific to the cellular carriers. Once the connection type settings are configured and saved, navigate to the WAN status page (Setup > Internet Settings > WAN3 Status) and Enable the WAN3 link to establish the 3G connection.

Note: *A 3G USB modem can be configured as the third WAN in DSR-1000 and DSR- 1000N.*



Field	Description
Reconnect Mode	Some ISPs may require you to pay for usage time. Select **On Demand** if this is the case. This will have the router connect to the Internet only when you initiate an Internet connection. Select **Always On** to have the router stay connected to the Internet.
Maximum Idle Time	Enter the idle time in minutes before the router disconnects from the Internet (On Demand only).
User Name	Enter your 3G account user name.
Password	Enter your 3G account password.
Dial-in Number	Enter the phone number to access your Internet.
Authentication Protocol	Select one of following protocols from the drop-down menu: None, PAP or CHAP.
APN Required	Toggle to ON if your ISP requires APN to connect.
APN	Enter the APN (Access Point Name) provided by the ISP.
DNS Server Source	Select either **Get Dynamically from ISP** or **Use These DNS Servers** to manually enter DNS servers.
Primary DNS Server	If you selected "Use These DNS Servers", enter the primary DNS server IP address.
Secondary DNS Server	If you selected "Use These DNS Servers", enter the secondary DNS server IP address.
MTU Size	Select to use the default MTU value (1500) or select **Custom** to enter your own value.
Custom MTU	Enter a MTU value to optimize performance with your ISP.

WAN Mode

Path: Network > Internet > WAN Mode

This router supports multiple WAN links. This allows you to take advantage of failover and load balancing features to ensure certain internet dependent services are prioritized in the event of unstable WAN connectivity on one of the ports.

To use Auto Failover or Load Balancing, WAN link failure detection must be configured. This involves accessing DNS servers on the internet or ping to an internet address (user defined). If required, you can configure the number of retry attempts when the link seems to be disconnected or the threshold of failures that determines if a WAN port is down.

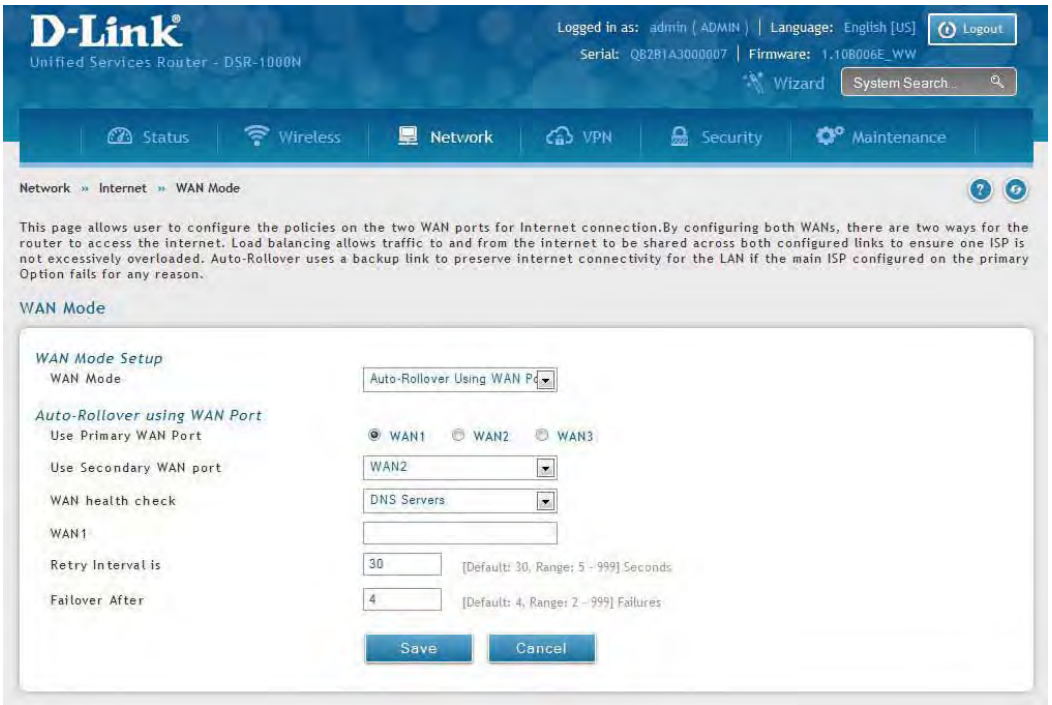
Single WAN Port

If you do not want to use Auto Failover or Load Balancing, select **Single WAN Port** from the *WAN Mode* drop-down menu and select the WAN port you want to set. Click **Save**.

Auto-Rollover using WAN IP

In this mode one of your WAN ports is assigned as the primary internet link for all internet traffic and the secondary WAN port is used for redundancy in case the primary link goes down for any reason. Both WAN ports (primary and secondary) must be configured to connect to the respective ISP's before enabling this feature. The secondary WAN port will remain unconnected until a failure is detected on the primary link (either port can be assigned as the primary). In the event of a failure on the primary port, all internet traffic will be rolled over to the backup port. When configured in Auto-Failover mode, the link status of the primary WAN port is checked at regular intervals as defined by the failure detection settings.

1. Click **Network** > **Internet** > **WAN Mode**.



2. Complete the fields from the table below and click **Save**.

Field	Description
WAN Mode	Select **Auto-Rollover Using WAN IP** from the drop-down menu.
Use Primary WAN Port	Select which WAN port is the primary.
Use Secondary WAN Port	Select which port to use if the primary port fails.
WAN Health Check	• DNS lookup using WAN DNS Servers: DNS Lookup of the DNS Servers of the primary link is used to detect primary WAN connectivity. • DNS lookup using DNS Servers: DNS Lookup of the custom DNS Servers can be specified to check the connectivity of the primary link. • Ping these IP addresses: These IP's will be pinged at regular intervals to check the connectivity of the primary link. • Retry Interval is: The number tells the router how often it should run the above configured failure detection method. • Failover after: This sets the number of retries after which failover is initiated.
WAN1/WAN2/WAN3	Enter the DNS server or IP address to ping.
Retry Interval	Enter the time in seconds to initiate the WAN health check. Default is every 30 seconds.
Failover After	Enter the number of failures before the router will enable the failover process.

Note: *The DSR-1000, DSR-1000N, DSR-500, DSR-500N, DSR-250, DSR-250N, DSR-150, and DSR-150N routers support 3G USB Modem as a failover link when the internet access is lost.*

Load Balancing

Path: Network > Internet > WAN Mode

This feature allows you to use multiple WAN links (and presumably multiple ISP's) simultaneously. After configuring more than one WAN port, the load balancing option is available to carry traffic over more than one link. Protocol bindings are used to segregate and assign services over one WAN port in order to manage internet flow. The configured failure detection method is used at regular intervals on all configured WAN ports when in Load Balancing mode.

This router currently supports three algorithms for Load Balancing:

Round Robin: This algorithm is particularly useful when the connection speed of one WAN port greatly differs from another. In this case you can define protocol bindings to route low-latency services (such as VOIP) over the higher -speed link and let low-volume background traffic (such as SMTP) go over the lower speed link. Protocol binding is explained in next section.

Spillover: If Spillover method is selected, the primary WAN acts as a dedicated link until a defined bandwidth threshold are reached. After this, the secondary WAN will be used for new connections. Inbound connections on the secondary WAN are permitted with this mode, as the spillover logic governs outbound connections moving from the primary to secondary WAN. You can configure spillover mode by using following options:

- **Load Tolerance:** It is the percentage of bandwidth after which the router switches to secondary WAN.
- **Max Bandwidth:** This sets the maximum bandwidth tolerable by the primary WAN for outbound traffic.

If the link bandwidth of outbound traffic goes above the load tolerance value of max bandwidth, the router will spillover the next connections to secondary WAN.

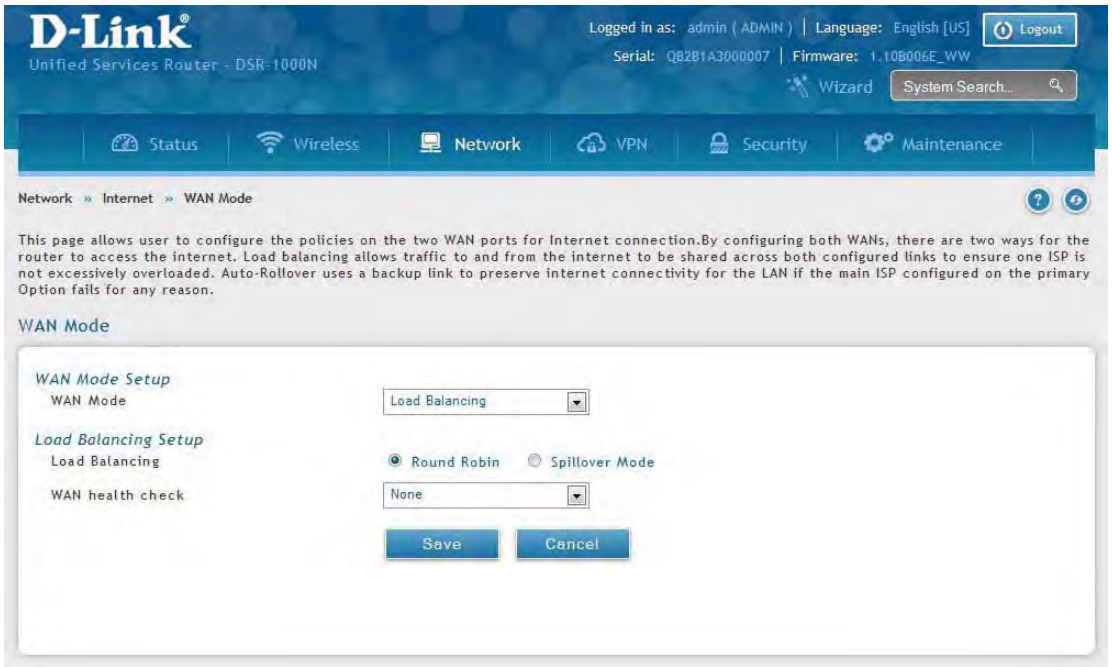
For example, if the maximum bandwidth of primary WAN is 1Kbps and the load tolerance is set to 70. Now every time a new connection is established the bandwidth increases. After a certain number of connections say bandwidth reached 70% of 1Kbps, the new outbound connections will be spilled over to secondary WAN. The maximum value of load tolerance is 80% and the minimum is 20%.

Note: *The DSR-1000, DSR-1000N, DSR-500, and DSR-500N routers support the traffic load balancing between physical WAN port and a 3G USB Modem.*

Load balancing is particularly useful when the connection speed of one WAN port greatly differs from another. In this case you can define protocol bindings to route low-latency services (such as VOIP) over the higher-speed link and let low-volume background traffic (such as SMTP) go over the lower speed link.

Round Robin

1. Click **Network** > **Internet** > **WAN Mode**.

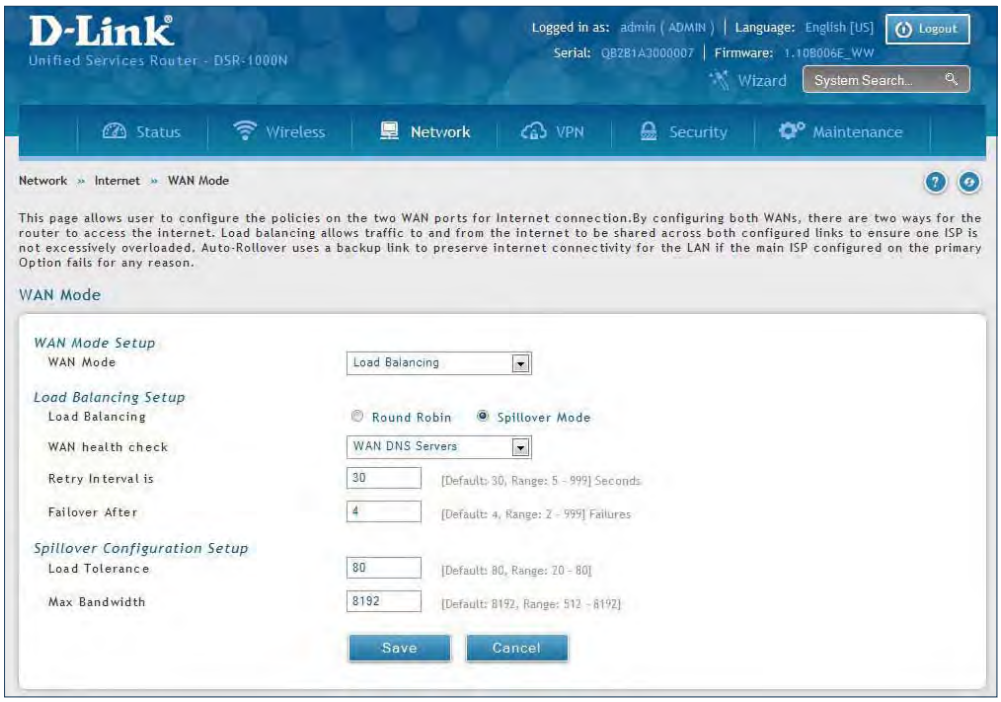


2. Complete the fields from the table below and click **Save**.

Field	Description
WAN Mode	Select **Load Balancing** from the drop-down menu.
Load Balance	Select **Round Robin**.
WAN Health Check	• DNS lookup using WAN DNS Servers: DNS Lookup of the DNS Servers of the primary link is used to detect primary WAN connectivity. • DNS lookup using DNS Servers: DNS Lookup of the custom DNS Servers can be specified to check the connectivity of the primary link. • Ping these IP addresses: These IP's will be pinged at regular intervals to check the connectivity of the primary link. • Retry Interval is: The number tells the router how often it should run the above configured failure detection method. • Failover after: This sets the number of retries after which failover is initiated.
Save	Click to save and activate your settings.

Spillover

1. Click **Network** > **Internet** > **WAN Mode**.



2. Complete the fields from the table below and click **Save**.

Field	Description
WAN Mode	Select **Load Balancing** from the drop-down menu.
Load Balance	Select **Spillover Mode**.
WAN Health Check	• DNS lookup using WAN DNS Servers: DNS Lookup of the DNS Servers of the primary link is used to detect primary WAN connectivity. • DNS lookup using DNS Servers: DNS Lookup of the custom DNS Servers can be specified to check the connectivity of the primary link. • Ping these IP addresses: These IP's will be pinged at regular intervals to check the connectivity of the primary link. • Retry Interval is: The number tells the router how often it should run the above configured failure detection method. • Failover after: This sets the number of retries after which failover is initiated.
Retry Interval is	Enter the time in seconds to initiate the WAN health check. Default is every 30 seconds.
Failover After	Enter the number of failures before the router will enable the failover process.
Load Tolerance	Enter the percentage of bandwidth after which the router switches to the secondary WAN.
Max Bandwidth	This sets the maximum bandwidth tolerable by the primary WAN for outbound traffic.
Save	Click to save and activate your settings.

Routing Mode

Routing between the LAN and WAN will impact the way this router handles traffic that is received on any of its physical interfaces. The routing mode of the gateway is core to the behavior of the traffic flow between the secure LAN and the internet.

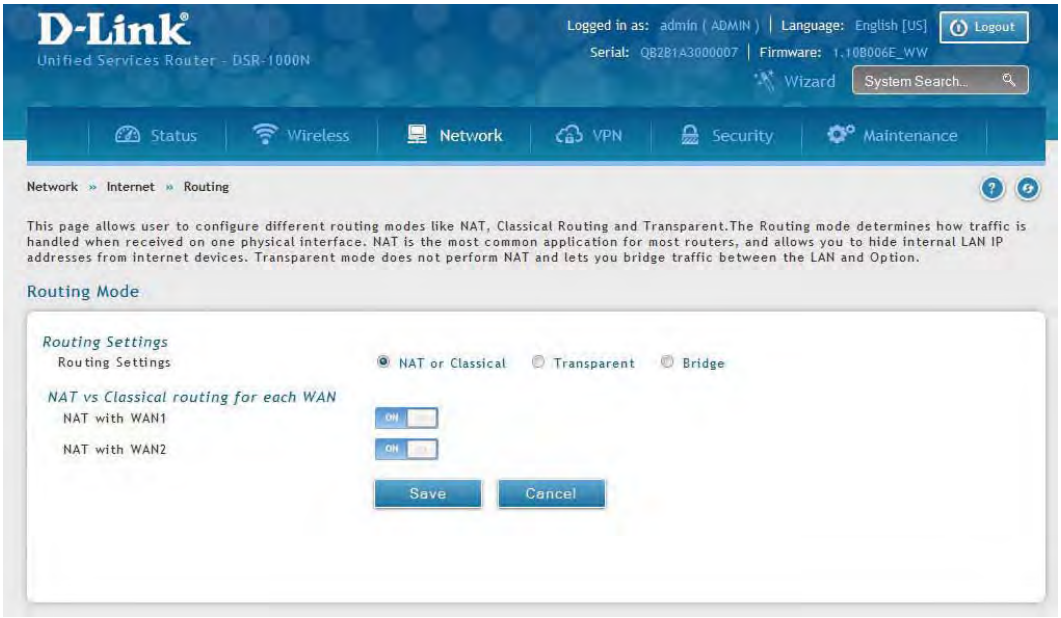
NAT or Classical

Path: Network > Internet > Routing Mode

With classical routing, devices on the LAN can be directly accessed from the internet with their public IP addresses (assuming appropriate firewall settings are configured). If your ISP has assigned an IP address for each of the computers/devices that you use, select **Classical**.

NAT is a technique which allows several computers and devices on your local network to share an Internet connection. The computers on the LAN use a "private" IP address range while the WAN port on the router is configured with a single "public" IP address. Along with connection sharing, NAT also hides internal IP addresses from the computers on the Internet. NAT is required if your ISP has assigned only one IP address to you. The computers/devices that connect through the router will need to be assigned IP addresses from a private subnet.

1. Click **Network** > **Internet** > **Routing Mode**.



2. Complete the fields from the table below and click **Save**.

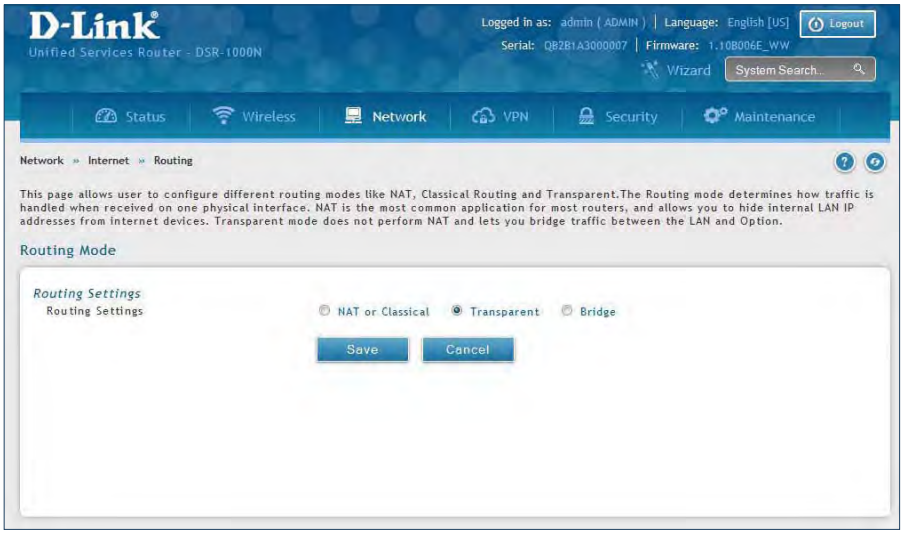
Field	Description
Routing Settings	Select **NAT or Classical**.
NAT with WAN1	Toggle to **ON** to use NAT with WAN1 or **OFF** for classical.
NAT with WAN2	Toggle to **ON** to use NAT with WAN2 or **OFF** for classical.
Save	Click to save and activate your settings.

Transparent

When Transparent Routing Mode is enabled, NAT is not performed on traffic between the LAN and WAN interfaces. Broadcast and multicast packets that arrive on the LAN interface are switched to the WAN and vice versa, if they do not get filtered by firewall or VPN policies. To maintain the LAN and WAN in the same broadcast domain select **Transparent** mode, which allows bridging of traffic from LAN to WAN and vice versa, except for router-terminated traffic and other management traffic. All DSR features (such as 3G modem support) are supported in transparent mode assuming the LAN and WAN are configured to be in the same broadcast domain.

Note: *NAT routing has a feature called "NAT Hair -pinning" that allows internal network users on the LAN and DMZ to access internal servers (e.g., an internal FTP server) using their externally-known domain name. This is also referred to as "NAT loopback" since LAN generated traffic is redirected through the firewall to reach LAN servers by their external name.*

1. Click **Network** > **Internet** > **Routing**.



2. Complete the fields from the table below and click **Save**.

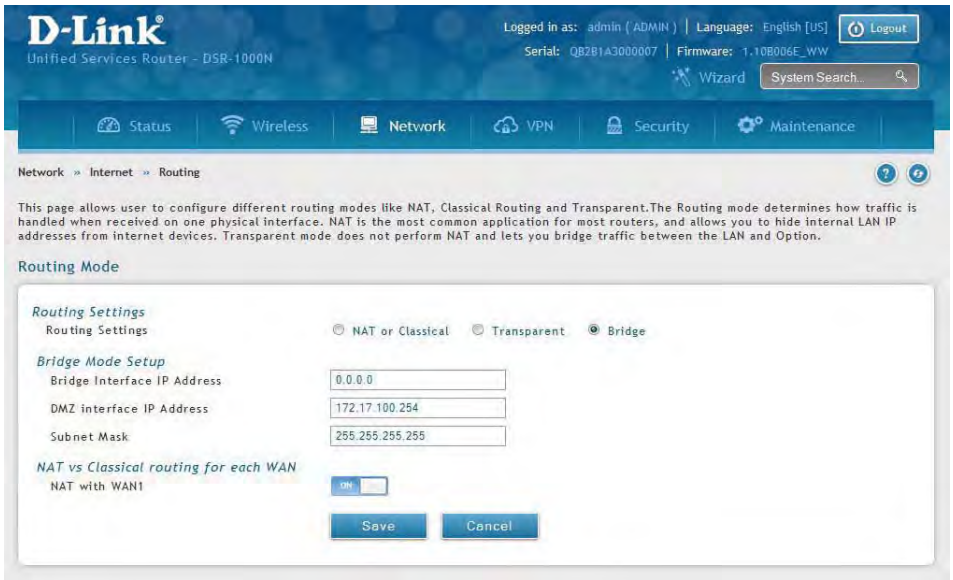
Field	Description
Routing Settings	Select **Transparent**.
Save	Click to save and activate your settings.

Bridge

When Bridge Mode routing is enabled, the first physical LAN port and secondary WAN/DMZ (port 2) interfaces are bridged together at Layer 2, creating an aggregate network. The other LAN ports and the primary WAN (WAN1) are not part of this bridge, and the router asks as a NAT device for these other ports. With Bridge mode for the LAN port 1 and WAN2/DMZ interfaces, L2 and L3 broadcast traffic as well as ARP / RARP packets are passed through. When WAN2 receives tagged traffic the tag information will be removed before the packet is forwarded to the LAN port 1 interface.

Note: *Bridge mode option is available on DSR-500 / 500N / 1000 / 1000N routers only.*

1. Click **Network** > **Internet** > **Routing**.



2. Complete the fields from the table below and click **Save**.

Field	Description
Routing Settings	Select **Bridge**.
Bridge Interface IP Address	Enter the bridge interface IP address.
DMZ Interface IP Address	Enter the DMZ interface IP address.
Subnet Mask	Enter the subnet mask.
NAT with WAN1	Toggle **ON** to turn NAT on WAN1 or **OFF** for classical.
Save	Click to save and activate your settings.

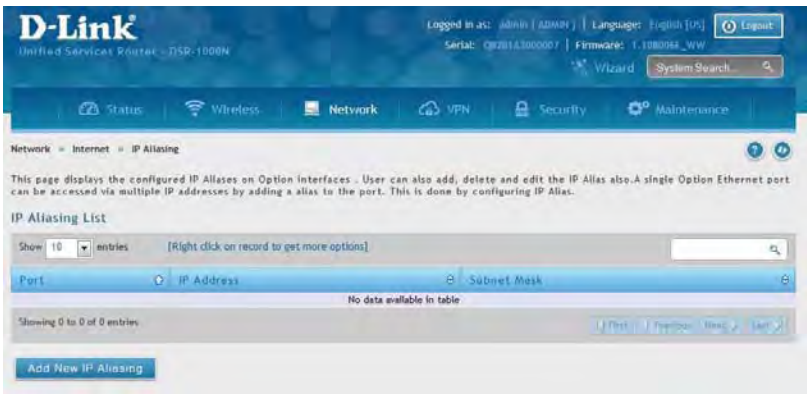
IP Aliasing

Path: Network > Internet > IP Aliasing

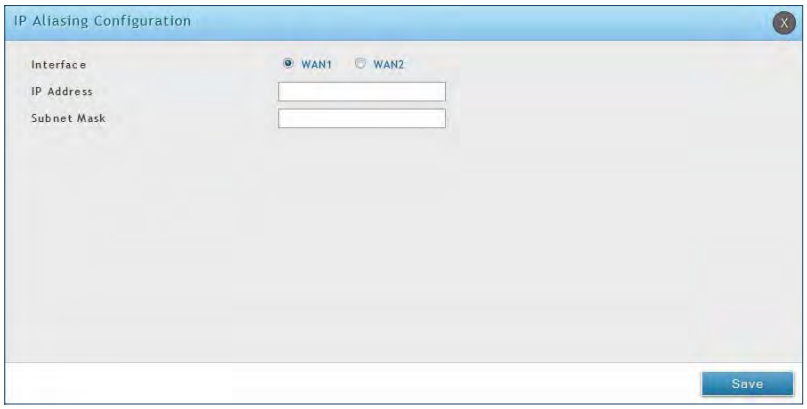
A single WAN Ethernet port can be accessed via multiple IP addresses by adding an alias to the port. This is done by configuring an IP Alias address. To edit or delete any existing aliases, right-click the alias and select either **Edit** or **Delete**.

To create a new alias:

1. Click **Network** > **Internet** > **IP Aliasing**.



2. Click **Add New IP Aliasing**.
3. Enter the following information and click **Save**.



Field	Description
Interface	Select either **WAN1** or **WAN2**.
IP Address	Enter an alias IP address for the WAN interface you selected.
Subnet Mask	Enter a subnet mask for the WAN interface you selected.
Save	Click to save and activate your settings.

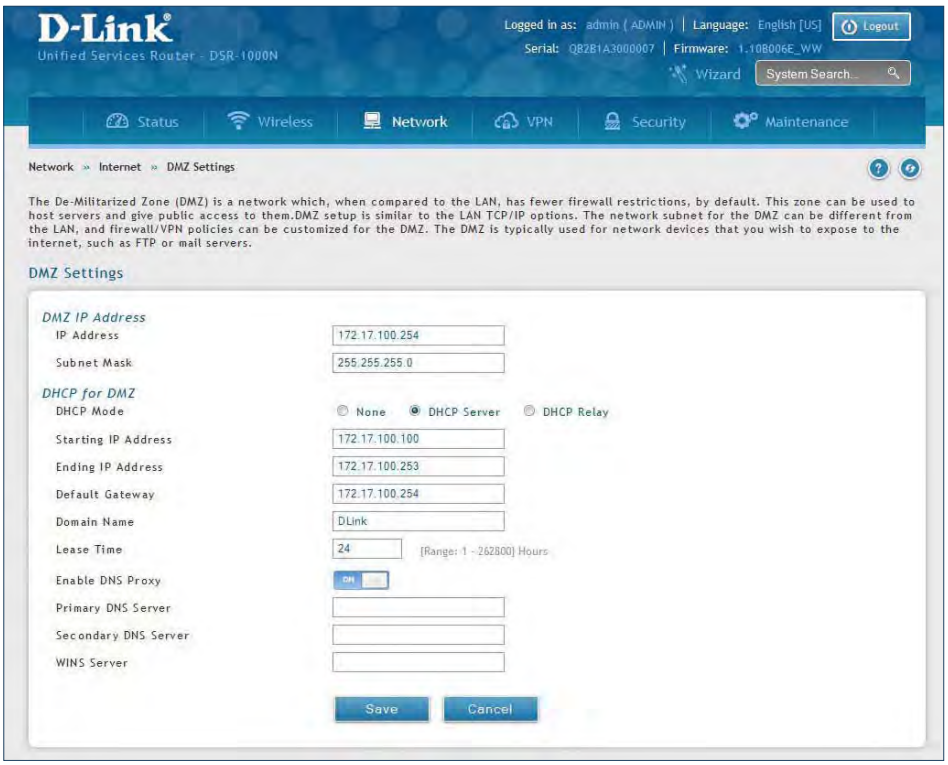
DMZ Settings

Path: Network > Internet > DMZ Settings

If you set WAN2 port to DMZ, you will need to configure the port here.

To configure the DMZ Settings:

1. Click **Network** > **Internet** > **DMZ Settings**.



2. Complete the fields from the table below and click **Save**.

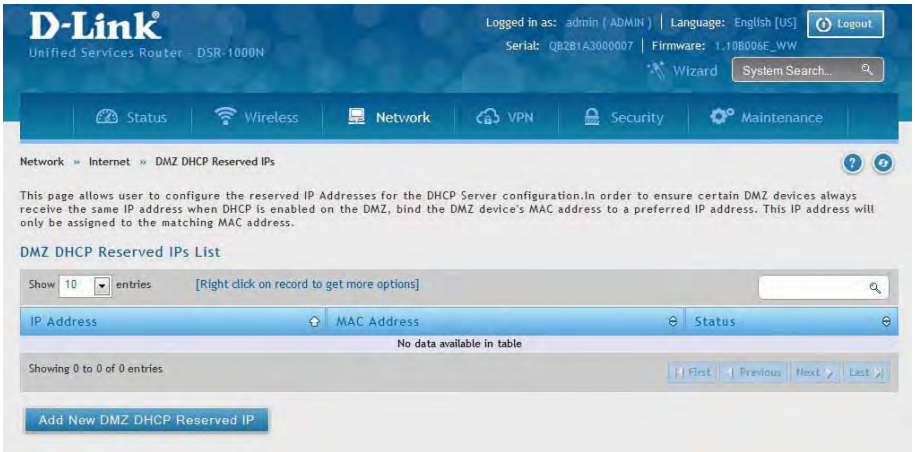
Field	Description
IP Address	Enter an IP address for the DMZ interface.
Subnet Mask	Enter the subnet mask for the DMZ interface.
DHCP Mode	Select one of the following modes: • **None** - Turns off DHCP. • **DHCP Server** (default) - The router will act as the DHCP server on your network. • **DHCP Relay** - DHCP clients on your network will receive IP address leases from a DHCP server on a different subnet.
DHCP Server	Refer to "DHCP Server" on page 19 for more information.
DHCP Relay	Refer to "DHCP Relay" on page 20 for more information.
Enable DNS Proxy	Toggle to **On** to manually enter DNS and/or WINS server IP address(es). If set to **Off**, your router's LAN IP address will be assigned the DNS server to your clients and the router will get the DNS information from your ISP.
Primary DNS Server	If DNS Proxy is set to ON, enter the primary DNS server IP address.
Secondary DNS Server	If DNS Proxy is set to ON, enter the secondary DNS server IP address.
WINS Server	If DNS Proxy is set to ON, enter the WINS server IP address.
Save	Click to save and activate your settings.

DMZ LAN DHCP Reserved IPs

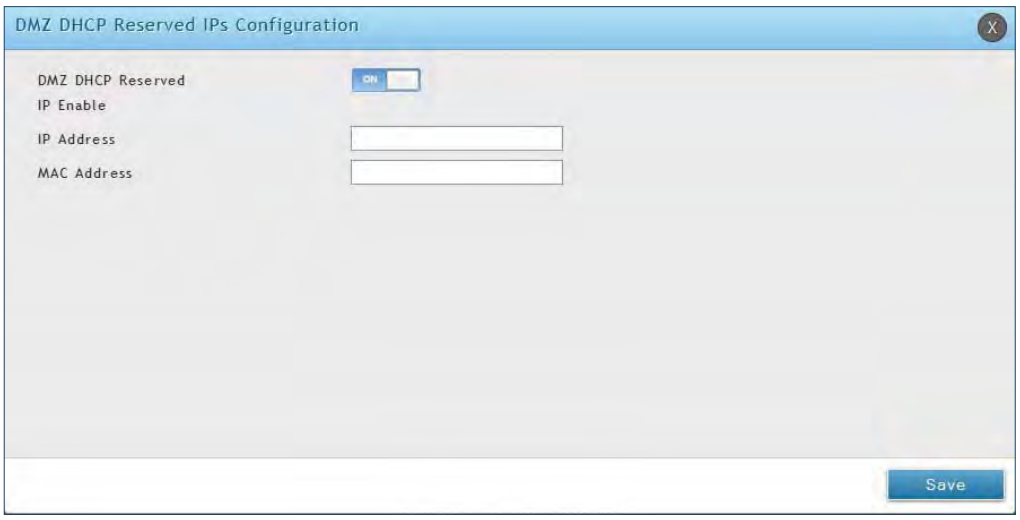
The router's DHCP server can assign IP settings to your DMZ clients on your network by adding a client's MAC address and the IP address to be assigned. Whenever the router receives a request from a client, the MAC address of that client is compared with the MAC address list present in the database. If an IP address is already assigned to that computer or device in the database, the customized IP address is configured otherwise an IP address is assigned to the client automatically from the DMZ DHCP pool.

To create DHCP reservations:

1. Click **Network** > **Internet** > **DMZ LAN DHCP Reserved IPs**.



2. Click **Add New DMZ DHCP Reserved IP**.
3. Enter the following information and click **Save**.



Field	Description
DMZ DHCP Reserved IP Enable	Toggle to **ON** to enable this reservation.
IP Address	Enter the IP address you want to assign to this device. Note that this IP address must be in the same range as the starting/ending IP address under DHCP Settings.
MAC Address	Enter the MAC address of this device (xx:xx:xx:xx:xx:xx format).
Save	Click **Save** to save your reservation.

Dynamic DNS Settings

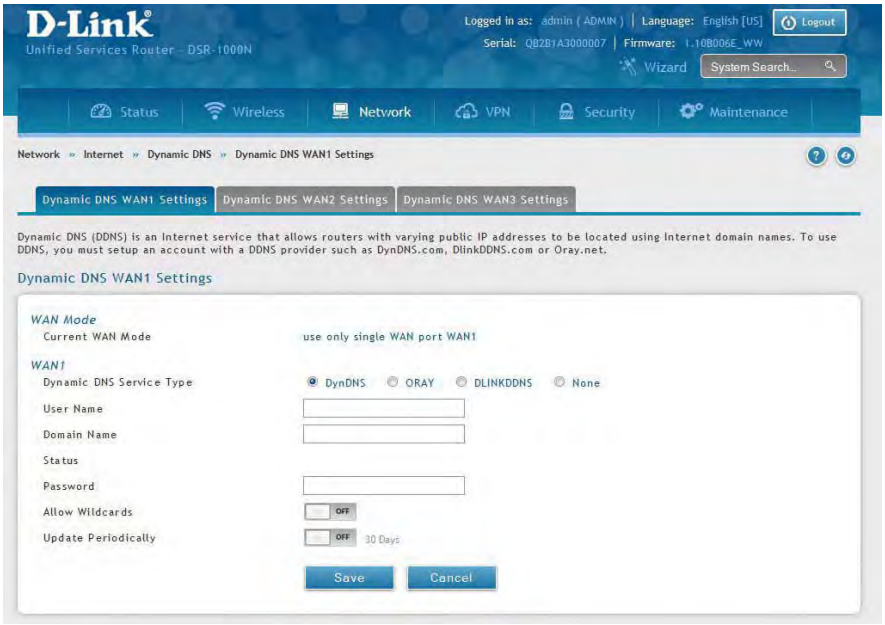
Path: Network > Internet > Dynamic DNS

Dynamic DNS (DDNS) is an Internet service that allows routers with varying public IP addresses to be located using Internet domain names. To use DDNS, you must setup an account with a DDNS provider such as DynDNS.org, D-Link DDNS, or Oray.net.

Each configured WAN can have a different DDNS service if required. Once configured, the router will update DDNS services changes in the WAN IP address so that features that are dependent on accessing the router's WAN via FQDN will be directed to the correct IP address. When you set up an account with a DDNS service, the host and domain name, username, password and wildcard support will be provided by the account provider.

To configure DDNS:

1. Click **Network** > **Internet** > **Dynamic DNS**
2. Click the tab on top to select which WAN port you want to configure DDNS to.
3. Next to *Dynamic DNS Service Type*, select your DDNS service.



4. Enter the following information and click **Save**. The information below is for DynDNS. Other services will have similar fields.

Field	Description
User Name	Enter your DDNS user name.
Domain Name	Enter the domain name.
Password	Enter your DDNS password.
Status	Displays the current connection status.
Allow Wildcards	Toggle to **ON** to allow wildcards.
Update Periodically	Toggle to **ON** to set a forced update.
Save	Click **Save** to save your reservation.

Traffic Management

Bandwidth Profiles

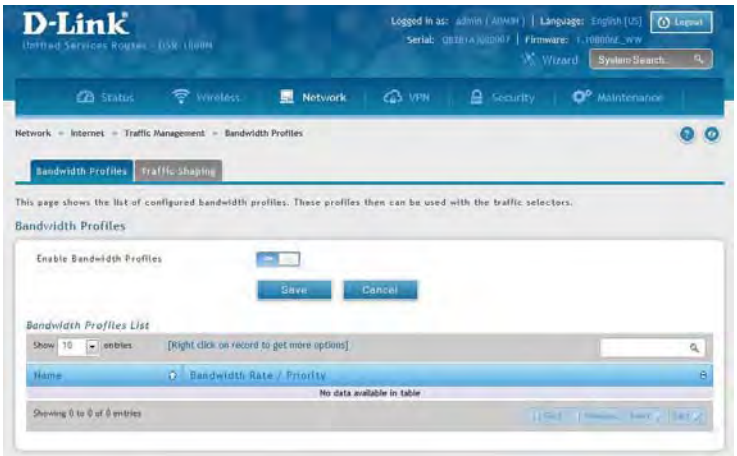
Path: Network > Internet > Traffic Management > Bandwidth Profiles

Bandwidth profiles allow you to regulate the traffic flow from the LAN to WAN 1 or WAN 2. This is useful to ensure that low priority LAN users (like guests or HTTP service) do not monopolize the available WAN's bandwidth for cost-savings or bandwidth-priority-allocation purposes.

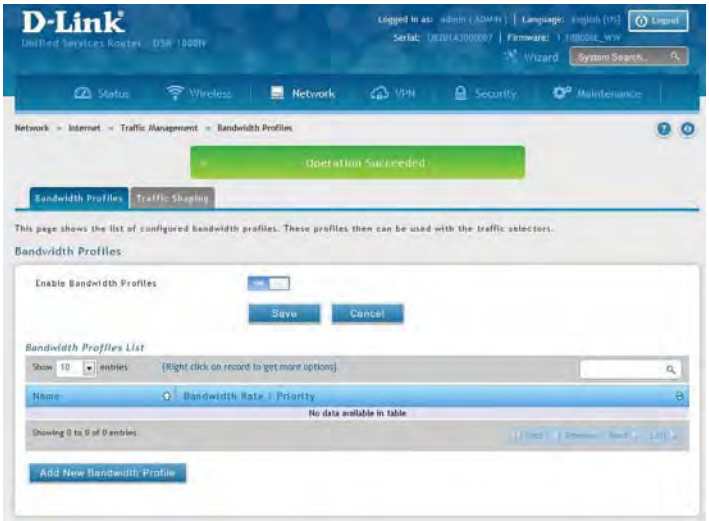
Bandwidth profiles configuration consists of enabling the bandwidth control feature from the GUI and adding a profile which defines the control parameters. The profile can then be associated with a traffic selector, so that bandwidth profile can be applied to the traffic matching the selectors. Selectors are elements like IP addresses or services that would trigger the configured bandwidth regulation.

To edit, delete, or create a new bandwidth profile:

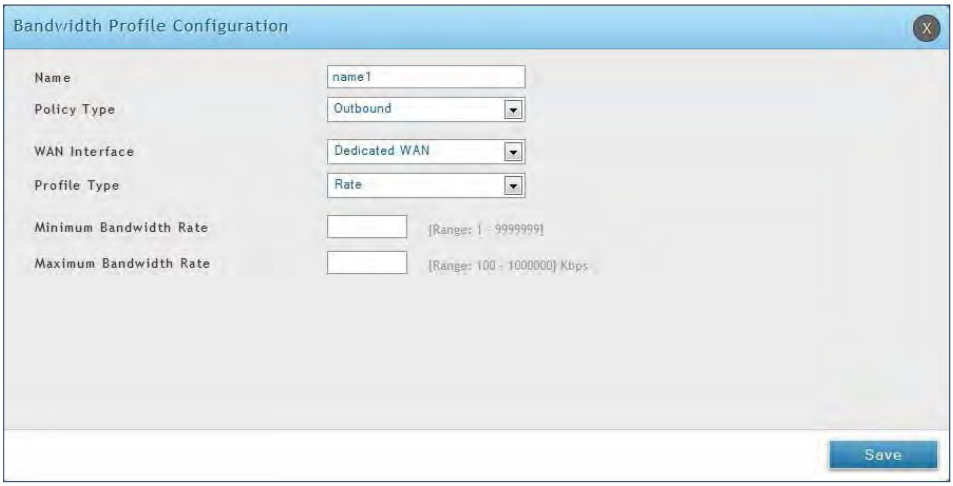
1. Click **Network** > **Internet** > **Traffic Management** > **Bandwidth Profiles**.
2. Toggle *Enable Bandwidth Profiles* to **ON** and click **Save**.



3. Click **Add New Bandwidth Profile**.



4. Enter the following information and click **Save**.



Field	Description
Name	Enter a name for your profile. This identifier is used to associate the configured profile to the traffic selector.
Policy Type	Select the policy type (**Inbound** or **Outbound**) from the drop-down menu.
WAN Interface	Select which WAN interface you want to associate this profile with.
Profile Type	Select either **Priority** or **Rate** from the drop-down menu.
Priority	If you selected *Priority*, select **Low**, **Medium**, or **High**.
Minimum Bandwidth Rate	If you selected *Rate*, enter the minimum bandwidth rate.
Maximum Bandwidth Rate	If you selected *Rate*, enter the maximum bandwidth rate.
Save	Click **Save** to save your reservation.

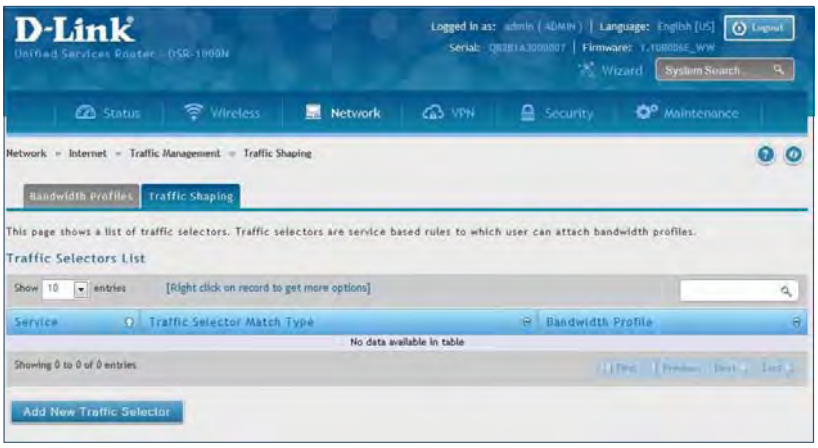
Traffic Shaping

Path: Network > Internet > Traffic Management > Traffic Shaping

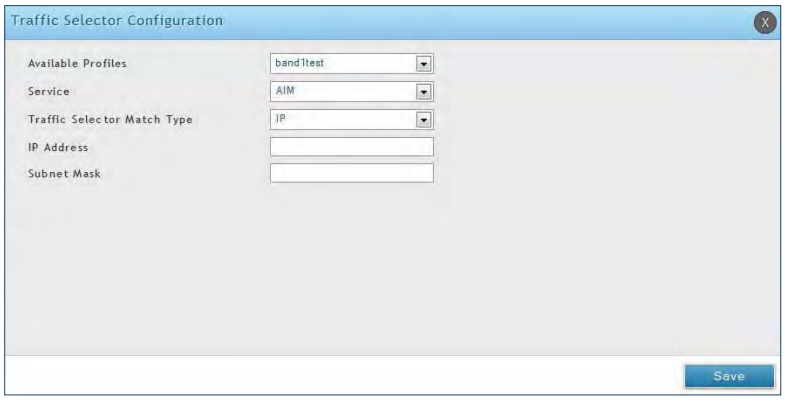
Once a profile has been created it can then be associated with a traffic flow from the LAN to WAN. Traffic selector configuration binds a bandwidth profile to a type or source of LAN traffic with the following settings.

To create a traffic selector:

1. Click **Network** > **Internet** > **Traffic Management** > **Traffic Shaping**.



2. Click **Add New Traffic Selector**.



3. Complete the fields from the table below and click **Save**.

Field	Description
Available Profiles	Select a bandwidth profile from the drop-down menu.
Service	Select a service from the drop-down menu.
Traffic Selector Match Type	Select **IP** or **MAC Address**.
IP Address	If you selected IP, enter the IP address of the source associated with this profile.
Subnet Mask	If you selected IP, enter a subnet mask.
MAC Address	If you selected MAC, enter the MAC address of the source associated with this profile.
Save	Click to save and activate your settings.

Routing

Static Routes

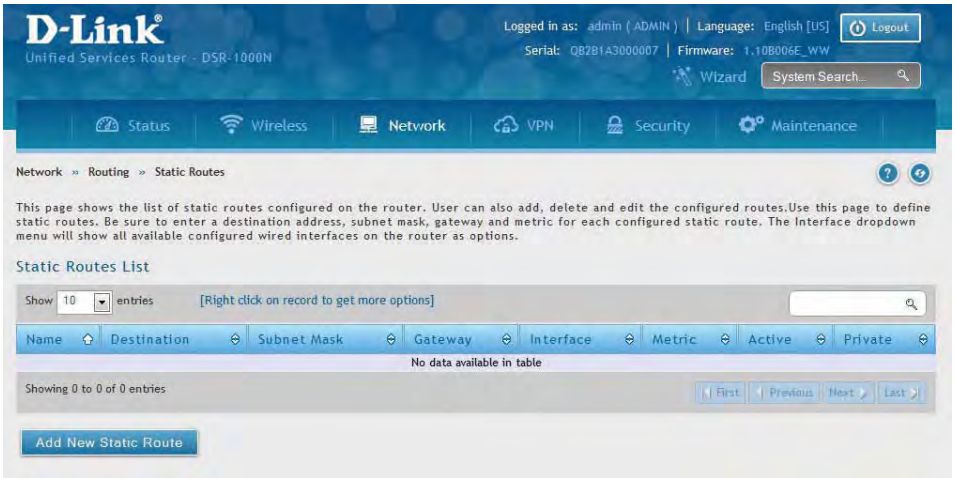
Path: Network > Routing > Static Routes

Manually adding static routes to this device allows you to define the path selection of traffic from one interface to another. There is no communication between this router and other devices to account for changes in the path; once configured the static route will be active and effective until the network changes.

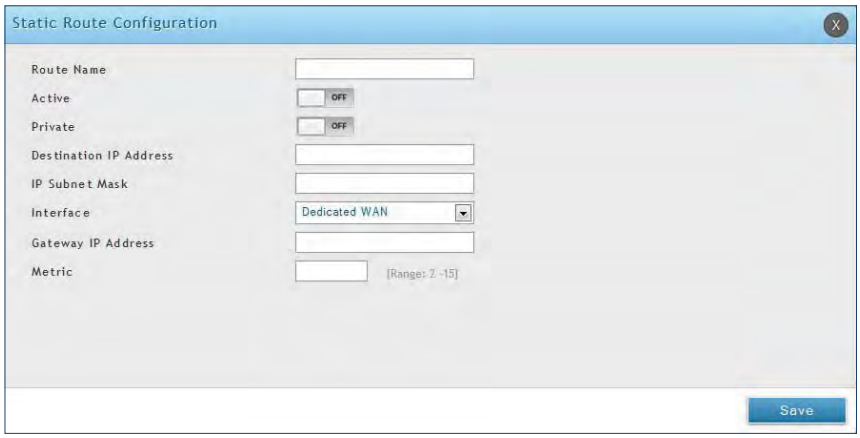
The List of Static Routes displays all routes that have been added manually by an administrator and allows several operations on the static routes.

To create a new static route:

1. Click **Network** > **Routing** > **Static Routes**.



2. Click **Add New Static Route**.
3. Complete the fields in the table on the next page and click **Save**.



Field	Description
Route Name	Enter a name for your route.
Active	Toggle to **ON** to activate this route or to **OFF** to deactivate.
Private	Toggle to **ON** to make this route private. If the route is made private, then the route will not be shared in a RIP broadcast or multicast.
Destination IP Address	Enter the IP address of the static route's destination.
IP Subnet Mask	Enter the subnet mask of the static route.
Interface	The physical network interface (WAN1, WAN2, WAN3, DMZ or LAN), through which this route is accessible.
Gateway IP Address	IP address of the gateway through which the destination host or network can be reached.
Metric	Determines the priority of the route. If multiple routes to the same destination exist, the route with the lowest metric is chosen.
Save	Click **Save** to save your route.

RIP

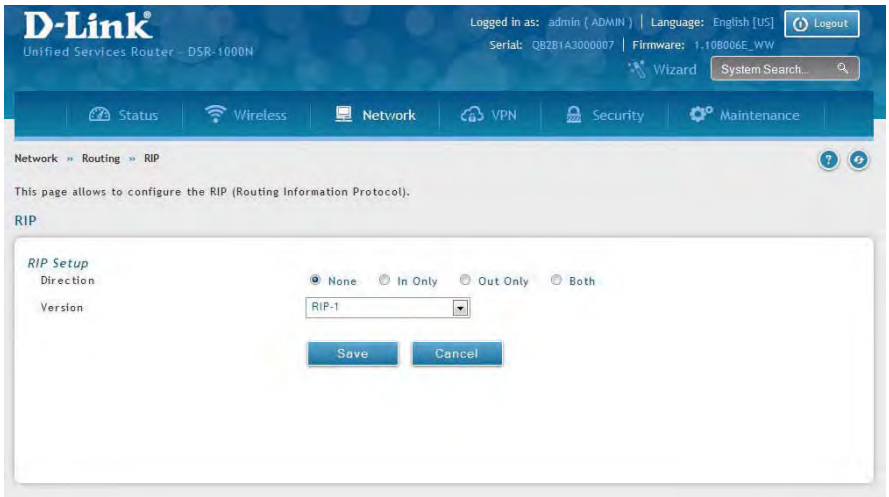
Path: Network > Routing > RIP

Dynamic routing using the Routing Information Protocol (RIP) is an Interior Gateway Protocol (IGP) that is common in LANs. With RIP this router can exchange routing information with other supported routers in the LAN and allow for dynamic adjustment of routing tables in order to adapt to modifications in the LAN without interrupting traffic flow.

Note: *The DSR-150/150N/250/250N routers do not support RIP.*

To configure RIP:

1. Click **Network** > **Routing** > **RIP**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Direction	The RIP direction will define how this router sends and receives RIP packets. Select one of the following: • **Both:** The router both broadcasts its routing table and also processes RIP information received from other routers. This is the recommended setting in order to fully utilize RIP capabilities. • **Out Only:** The router broadcasts its routing table periodically but does not accept RIP information from other routers. • **In Only:** The router accepts RIP information from other routers, but does not broadcast its routing table. • **None:** The router neither broadcasts its route table nor does it accept any RIP packets from other routers. This effectively disables RIP.
Version	The RIP version is dependent on the RIP support of other routing devices in the LAN. • **Disabled:** This is the setting when RIP is disabled. • **RIP-1:** A class-based routing version that does not include subnet information. This is the most commonly supported version. • **RIP-2:** Includes all the functionality of RIPv1 plus it supports subnet information. Though the data is sent in RIP-2 format for both RIP-2B and RIP-2M, the mode in which packets are sent is different. RIP-2B broadcasts data in the entire subnet while RIP-2M sends data to multicast addresses. Note: If RIP-2B or RIP-2M is the selected version, authentication between this router and other routers (configured with the same RIP version) is required. MD5 authentication is used in a first/second key exchange process. The authentication key validity lifetimes are configurable to ensure that the routing information exchange is with current and supported routers detected on the LAN.
Save	Click **Save** to save your settings.

OSPF

Path: Network > Routing > OSPF

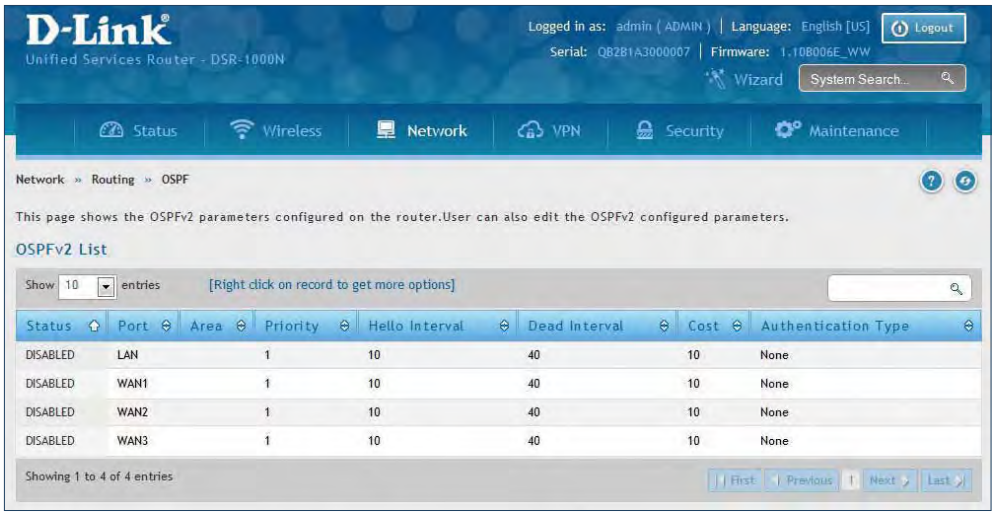
OSPF is an interior gateway protocol that routes Internet Protocol (IP) packets solely within a single routing domain. It gathers link state information from available routers and constructs a topology map of the network.

OSPF version 2 is a routing protocol which described in RFC2328 - OSPF Version 2. OSPF is IGP (Interior Gateway Protocols). OSPF is widely used in large networks such as ISP backbone and enterprise networks.

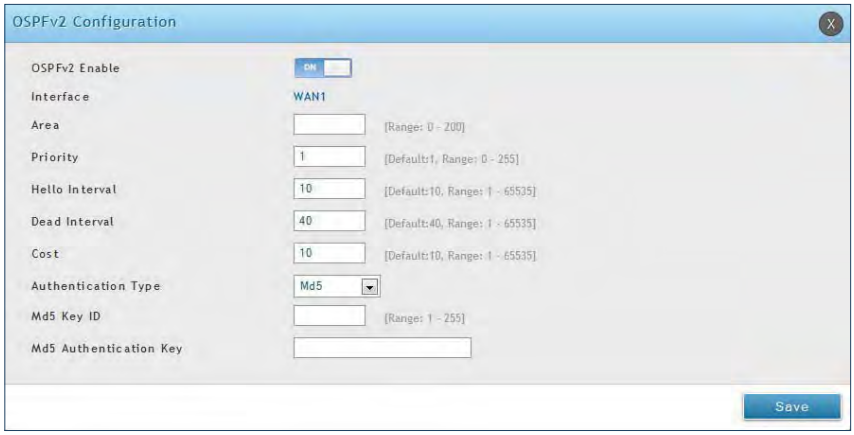
Note: *The DSR-150/150N/250/250N routers do not support OSPFv2.*

To configure OSPF:

1. Click **Network** > **Routing** > **OSPF**.



2. Right-click the port you want to edit (LAN/WAN1/WAN2/WAN3) and select **Edit**.
3. Complete the fields in the table on the next page and click **Save**.



Field	Description
OSPFv2 Enable	Toggle **ON** to enable OSPF.
Interface	Displays the physical network interface on which OSPFv2 is Enabled/Disabled.
Area	Enter the area to which the interface belongs. Two routers having a common segment; their interfaces have to belong to the same area on that segment. The interfaces should belong to the same subnet and have similar mask.
Priority	Helps to determine the OSPFv2 designated router for a network. The router with the highest priority will be more eligible to become Designated Router. Setting the value to 0 makes the router ineligible to become Designated Router. The default value is 1. Lower the value means higher the priority.
Hello Interval	The number of seconds for Hello Interval timer value. Enter the number in seconds that the Hello packet will be sent. This value must be the same for all routers attached to a common network. The default value is 10 seconds.
Dead Interval	The number of seconds that a device's hello packets must not have been seen before its neighbors declare the OSPF router down. This value must be the same for all routers attached to a common network. The default value is 40 seconds. OSPF requires these intervals to be exactly the same between two neighbors. If any of these intervals are different, these routers will not become neighbors on a particular segment.
Cost	Enter the cost of sending a packet on an OSPFv2 interface.
Authentication Type	Select one of the following authentication types: • **None:** The interface does not authenticate OSPF packets. • **Simple:** OSPF packets are authenticated using simple text key. • **MD5:** The interface authenticates OSPF packets with MD5 authentication.
Md5 Key ID	If MD5 authentication is selected, enter the MD5 key ID.
Md5 Authentication Key	If MD5 authentication is selected, enter the MD5 authentication key.
Save	Click **Save** to save your settings.

Protocol Binding

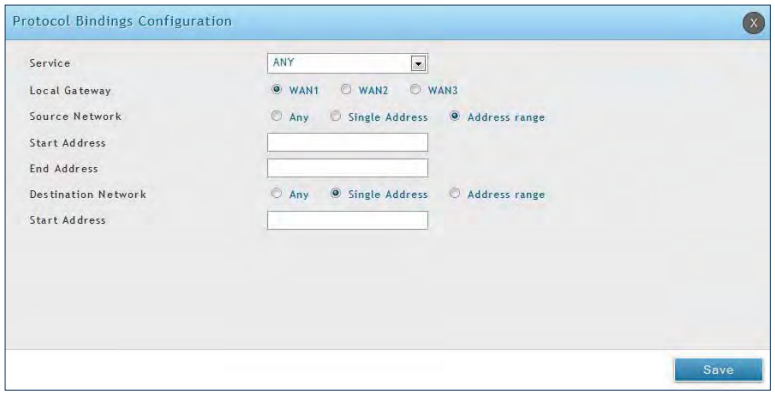
Path: Network > Routing > Protocol Binding

Protocol bindings are useful when the Load Balancing feature is in use. Selecting from a list of configured services or any of the user-defined services, the type of traffic can be assigned to go over only one of the available WAN ports. For increased flexibility the source network or machines can be specified as well as the destination network or machines. For example, the VOIP traffic for a set of LAN IP addresses can be assigned to one WAN and any VOIP traffic from the remaining IP addresses can be assigned to the other WAN link. Protocol bindings are only applicable when load balancing mode is enabled and more than one WAN is configured.

To add, edit, or delete a protocol binding entry:

1. Click **Network** > **Routing** > **Protocol Binding**.

2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Protocol Binding**.
3. Complete the fields in the table below and click **Save**.



Field	Description
Service	Select a service from the drop-down menu.
Local Gateway	Select a WAN interface.
Source Network	Select the source network: **Any**, **Single Address**, or **Address Range**. If Single Address or Address Range is selected, enter the IP address or IP range.
Destination Network	Select the destination network: **Any**, **Single Address**, or **Address Range**. If Single Address or Address Range is selected, enter the IP address or IP range.
Save	Click **Save** to save your settings.

IPv6

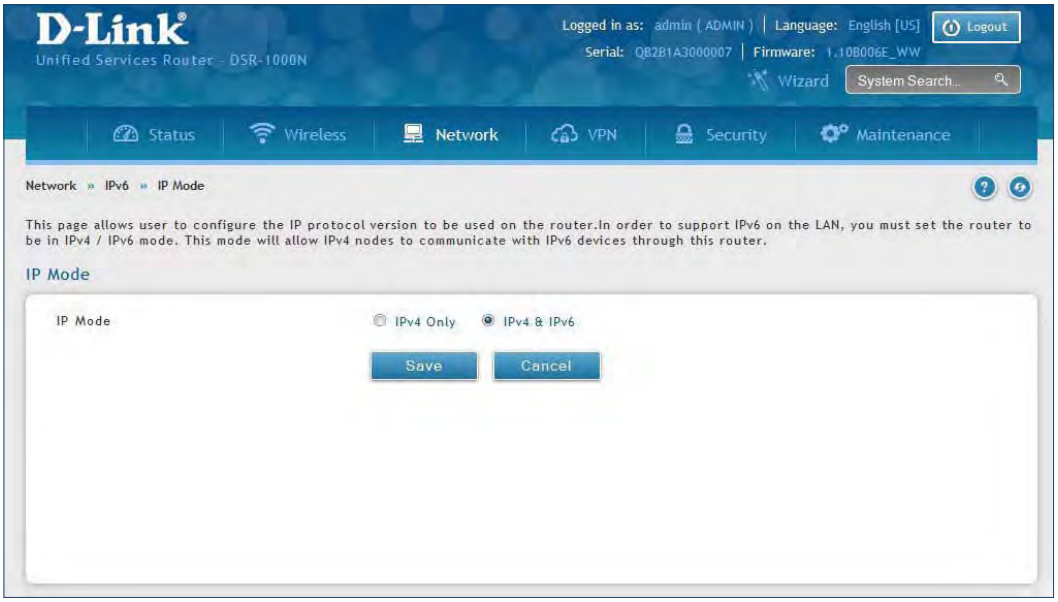
IP Mode

Path: Network > IPv6 > IP Mode

This page allows you to configure the IP protocol version to be used on the router. In order to support IPv6 on your local network (LAN), you must set the router to be in IPv4 / IPv6 mode. This mode will allow IPv4 nodes to communicate with IPv6 devices through this router.

To enable IPv6 on the router:

1. Click **Network** > **IPv6** > **IP Mode**.



2. Select **IPv4 & IPv6**.
3. Click **Save**.

WAN Settings

Path: Network > IPv6 > WAN1 Settings

For IPv6 WAN connections, this router can have a static IPv6 address or receive connection information when configured as a DHCPv6 client. In the case where the ISP assigns you a fixed address to access the internet, the static configuration settings must be completed. In addition to the IPv6 address assigned to your router, the IPv6 prefix length defined by the ISP is needed. The default IPv6 Gateway address is the server at the ISP that this router will connect to for accessing the internet. The primary and secondary DNS servers on the ISP's IPv6 network are used for resolving internet addresses, and these are provided along with the static IP address and prefix length from the ISP.

When the ISP allows you to obtain the WAN IP settings via DHCP, you need to provide details for the DHCPv6 client configuration. The DHCPv6 client on the gateway can be either stateless or stateful. If a stateful client is selected the gateway will connect to the ISP's DHCPv6 server for a leased address. For stateless DHCP there need not be a DHCPv6 server available at the ISP, rather ICMPv6 discover messages will originate from this gateway and will be used for auto configuration.

A third option to specify the IP address and prefix length of a preferred DHCPv6 server is available as well.

Dynamic IP

To configure a dynamic (DHCP) IPv6 Internet connection:

1. Click **Network** > **IPv6** > **WAN1 Settings**.

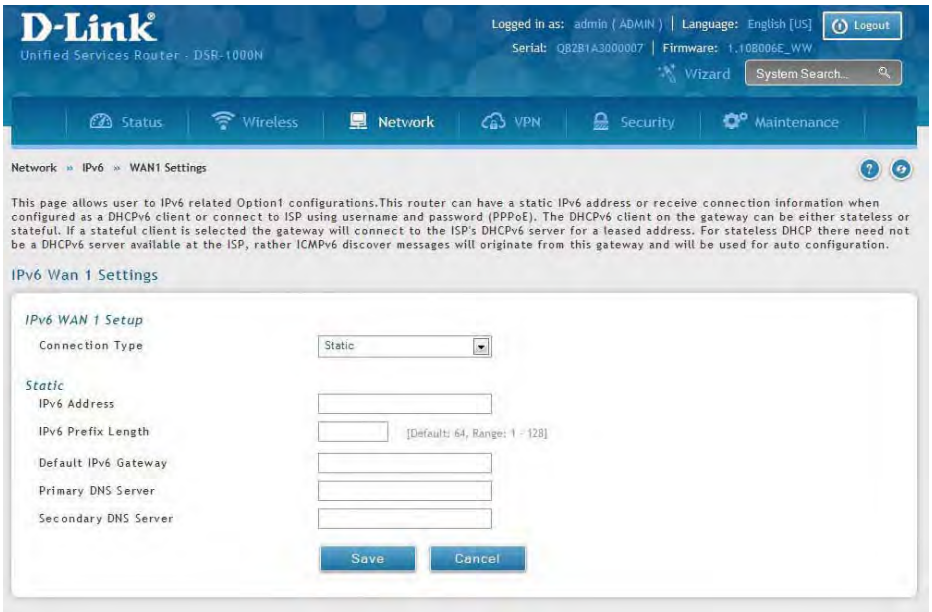
2. Complete the fields in the table below and click **Save**.

Field	Description
Connection Type	Select **DHCPv6** from the drop-down menu.
DHCPv6 Auto Configuration	Select either **Stateless Address** or **Stateful Address**.
Prefix Delegation	Select this option to request router advertisement prefix from any available DHCPv6 servers available on the ISP, the obtained prefix is updated to the advertised prefixes on the LAN side. This option can be selected only in Stateless Address Auto Configuration mode of DHCPv6 Client.
Save	Click **Save** to save your settings.

Static IP

To configure a static IPv6 Internet connection:

1. Click **Network** > **IPv6** > **WAN1 Settings**.



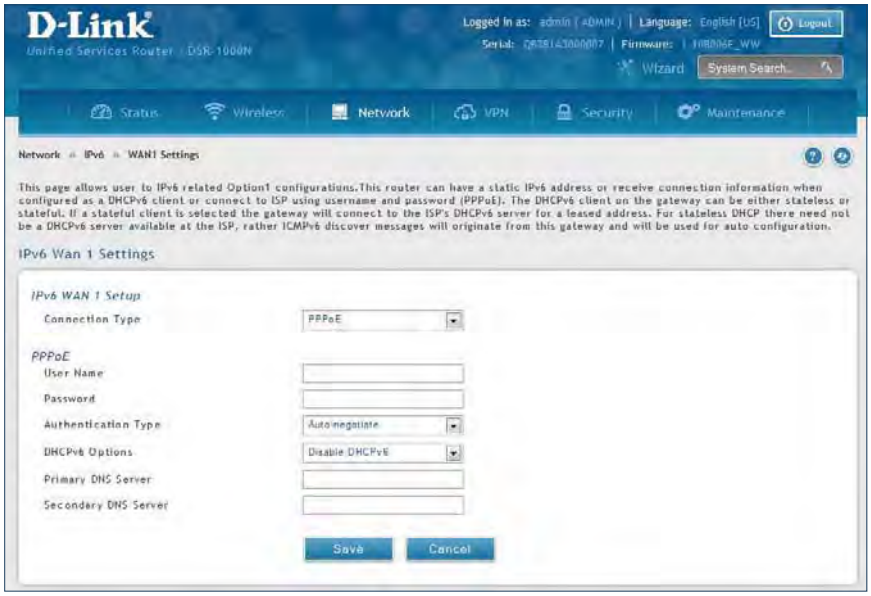
2. Complete the fields in the table below and click **Save**.

Field	Description
Connection Type	Select **Static**.
IPv6 Address	Enter the IP address supplied by your ISP.
IPv6 Prefix Length	Enter the IPv6 prefix length supplied by your ISP.
Default IPv6 Gateway	Enter the IPv6 gateway address supplied by your ISP.
Primary DNS Server	Enter the primary DNS server IP address.
Secondary DNS Server	Enter the secondary DNS server IP address.
Save	Click **Save** to save and activate your settings.

PPPoE

To configure a dynamic (DHCP) IPv6 Internet connection:

1. Click **Network** > **IPv6** > **WAN1 Settings**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Connection Type	Select **PPPoE**.
User Name	Enter your PPPoE user name.
Password	Enter your PPPoE password.
Authentication Type	Select the authentication type from the drop-down menu (Auto-negotiate/PAP/CHAP/MS-CHAP/MS-CHAPv2).
DHCPv6 Options	Select the mode of DHCPv6 client that will start in this mode (Disable dhcpv6/Stateless dhcpv6/Stateful dhcpv6/Stateless dhcpv6 with prefix delegation.
Primary DNS Server	Enter the primary DNS server IP address.
Secondary DNS Server	Enter the secondary DNS server IP address.
Save	Click **Save** to save and activate your settings.

Static Routing

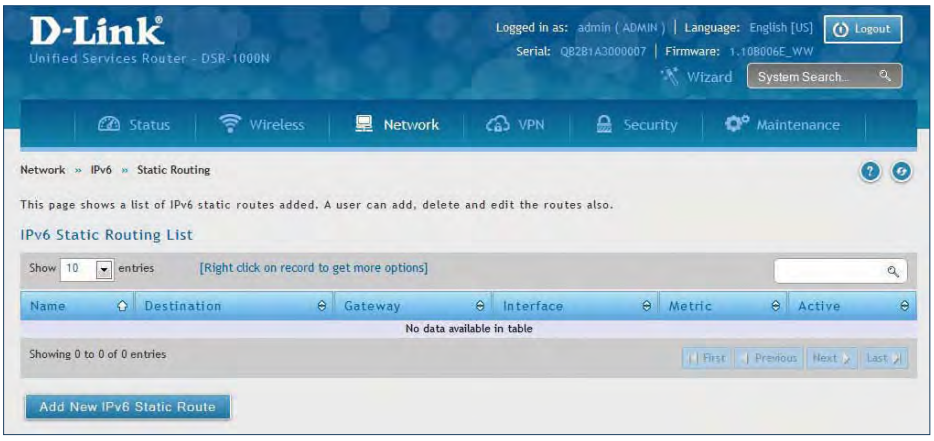
Path: Network > IPv6 > Static Routing

Manually adding static routes to this device allows you to define the path selection of traffic from one interface to another. There is no communication between this router and other devices to account for changes in the path; once configured the static route will be active and effective until the network changes.

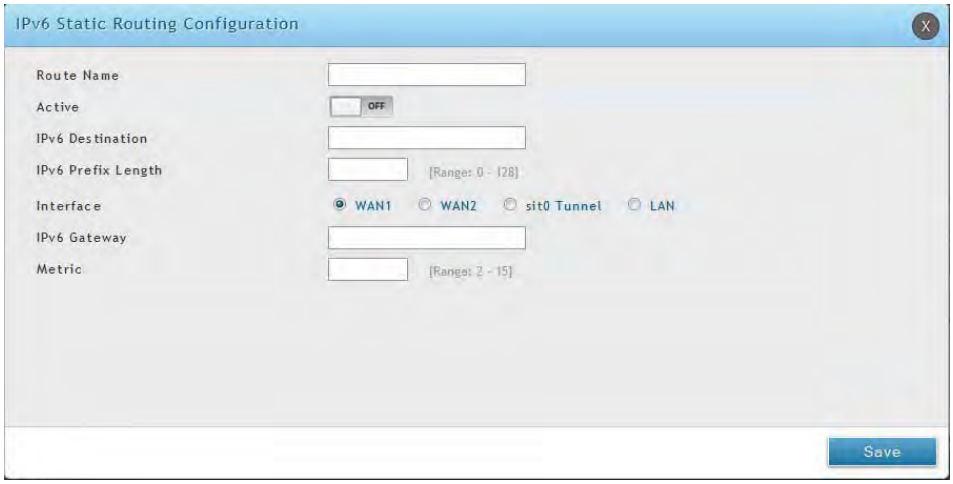
The List of Static Routes displays all routes that have been added manually by an administrator and allows several operations on the static routes.

To create a new static route:

1. Click **Network** > **IPv6** > **Static Routing**.



2. Click **Add New IPv6 Static Route**.
3. Complete the fields in the table on the next page and click **Save**.



Field	Description
Route Name	Enter a name for your route.
Active	Toggle to **ON** to activate this route or to **OFF** to deactivate.
IPv6 Destination	Enter the IP address of the static route's destination.
IPv6 Prefix Length	Enter the prefix length of the static route.
Interface	The physical network interface (WAN1, WAN2, WAN3, DMZ or LAN), through which this route is accessible.
IPv6 Gateway	IPv6 address of the gateway through which the destination host or network can be reached.
Metric	Determines the priority of the route. If multiple routes to the same destination exist, the route with the lowest metric is chosen.
Save	Click **Save** to save your route.

OSPFv3

Path: Network > IPv6 > OSPFv3

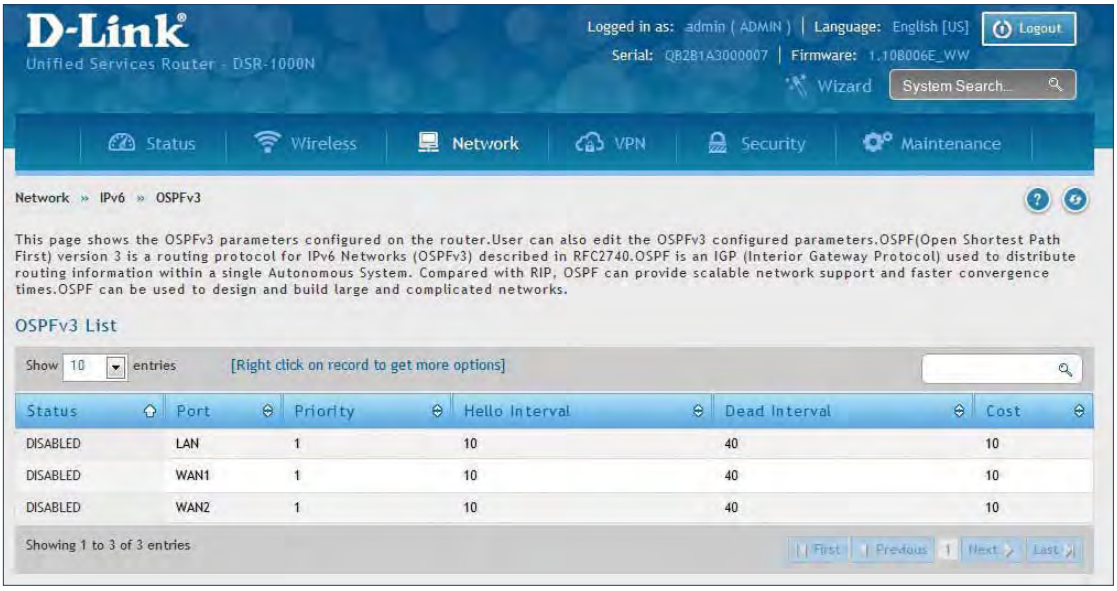
OSPF is an interior gateway protocol that routes Internet Protocol (IP) packets solely within a single routing domain. It gathers link state information from available routers and constructs a topology map of the network.

Open Shortest Path First version 3 (OSPFv3) supports IPv6. To enable an OSPFv3 process on a router, you need to enable the OSPFv3 process globally, assign the OSPFv3 process a router ID, and enable the OSPFv3 process on related interfaces.

Note: *The DSR-150/150N/250/250N routers do not support OSPFv3.*

To configure OSPF:

1. Click **Network** > **IPv6** > **OSPFv3**.



2. Right-click the port you want to edit (LAN/WAN1/WAN2) and select **Edit**.
3. Complete the fields in the table on the next page and click **Save**.

Field	Description
OSPFv3 Enable	Toggle **ON** to enable OSPFv3.
Interface	Displays the physical network interface on which OSPFv3 is Enabled/Disabled.
Priority	Helps to determine the OSPFv3 designated router for a network. The router with the highest priority will be more eligible to become Designated Router. Setting the value to 0 makes the router ineligible to become Designated Router. The default value is 1. Lower the value means higher the priority.
Hello Interval	The number of seconds for Hello Interval timer value. Enter the number in seconds that the Hello packet will be sent. This value must be the same for all routers attached to a common network. The default value is 10 seconds.
Dead Interval	The number of seconds that a device's hello packets must not have been seen before its neighbors declare the OSPF router down. This value must be the same for all routers attached to a common network. The default value is 40 seconds. OSPF requires these intervals to be exactly the same between two neighbors. If any of these intervals are different, these routers will not become neighbors on a particular segment.
Cost	Enter the cost of sending a packet on an OSPFv3 interface.
Save	Click **Save** to save your settings.

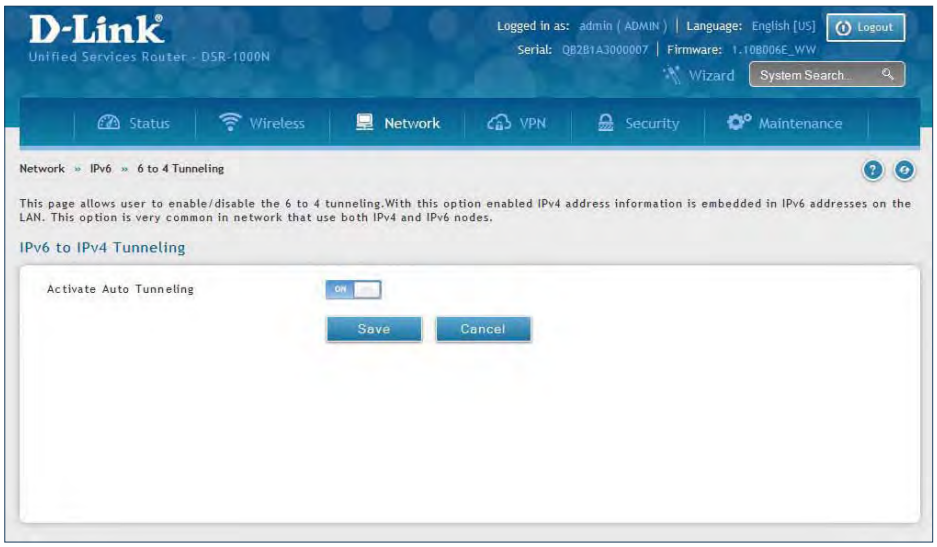
6 to 4 Tunneling

Path: Network > IPv6 > 6 to 4 Tunneling

6to4 is an Internet transition mechanism for migrating from IPv4 to IPv6, a system that allows IPv6 packets to be transmitted over an IPv4 network. Select the check box to Enable Automatic Tunneling and allow traffic from an IPv6 LAN to be sent over an IPv4 Option to reach a remote IPv6 network.

To enable 6 to 4 tunneling:

1. Click **Network** > **IPv6** > **6 to 4 Tunneling**.



2. Toggle *Activate Auto Tunneling* to **ON**.
3. Click **Save**.

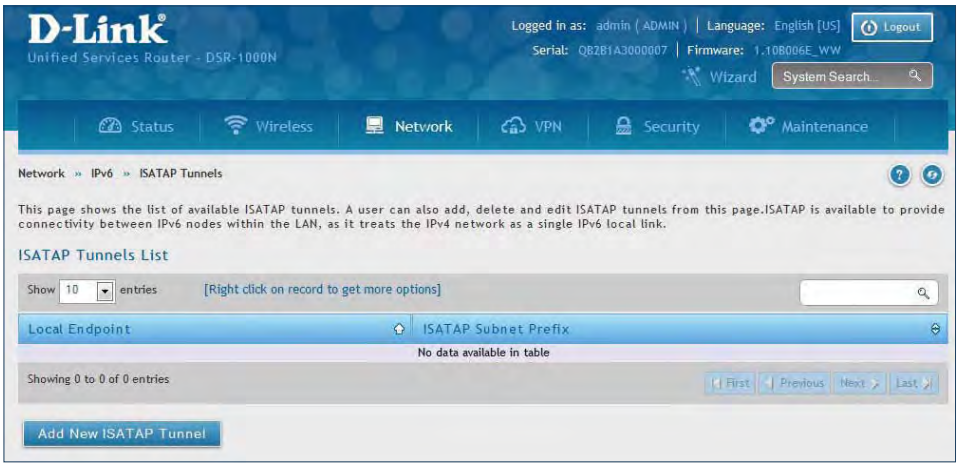
ISATAP

Path: Network > IPv6 > 6 to 4 Tunneling

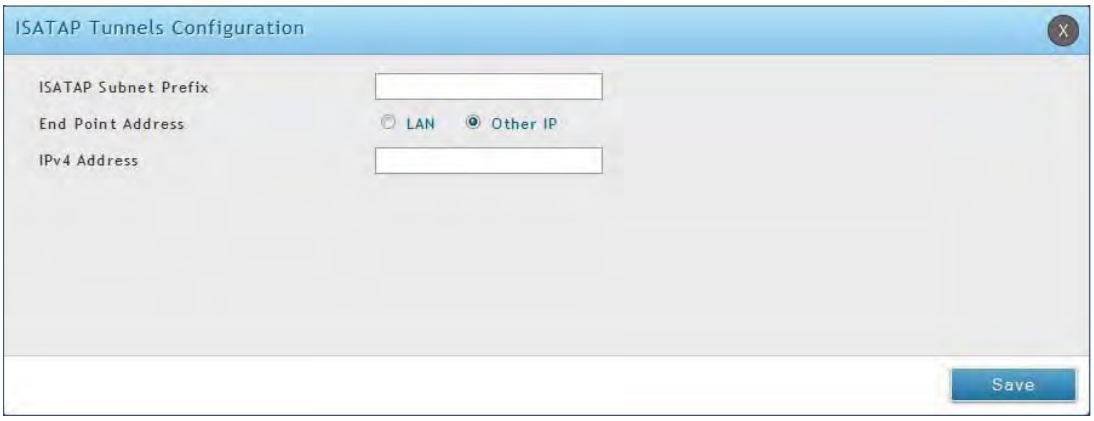
ISATAP (Intra-Site Automatic Tunnel Addressing Protocol) is an IPv6 transition mechanism meant to transmit IPv6 packets between dual-stack nodes on top of an IPv4 network. ISATAP specifies an IPv6-IPv4 compatibility address format as well as a means for site border router discovery. ISATAP also specifies the operation of IPv6 over a specific link layer - that being IPv4 used as a link layer for IPv6.

To add, edit, or delete a ISATAP entry:

1. Click **Network** > **IPv6** > **ISATAP**.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New ISATAP Tunnel**.
3. Complete the fields in the table below and click **Save**.



Field	Description
ISATAP Subnet Prefix	This is the 64-bit subnet prefix that is assigned to the logical ISATAP subnet for this intranet. This can be obtained from your ISP or internet registry, or derived from RFC 4193.
End Point Address	This is the endpoint address for the tunnel that starts with this router. The endpoint can be the LAN interface (assuming the LAN is an IPv4 network), or a specific LAN IPv4 address.
IPv4 Address	The end point address if not the entire LAN.
Save	Click **Save** to save your settings.

LAN Settings

DHCPv6 Server

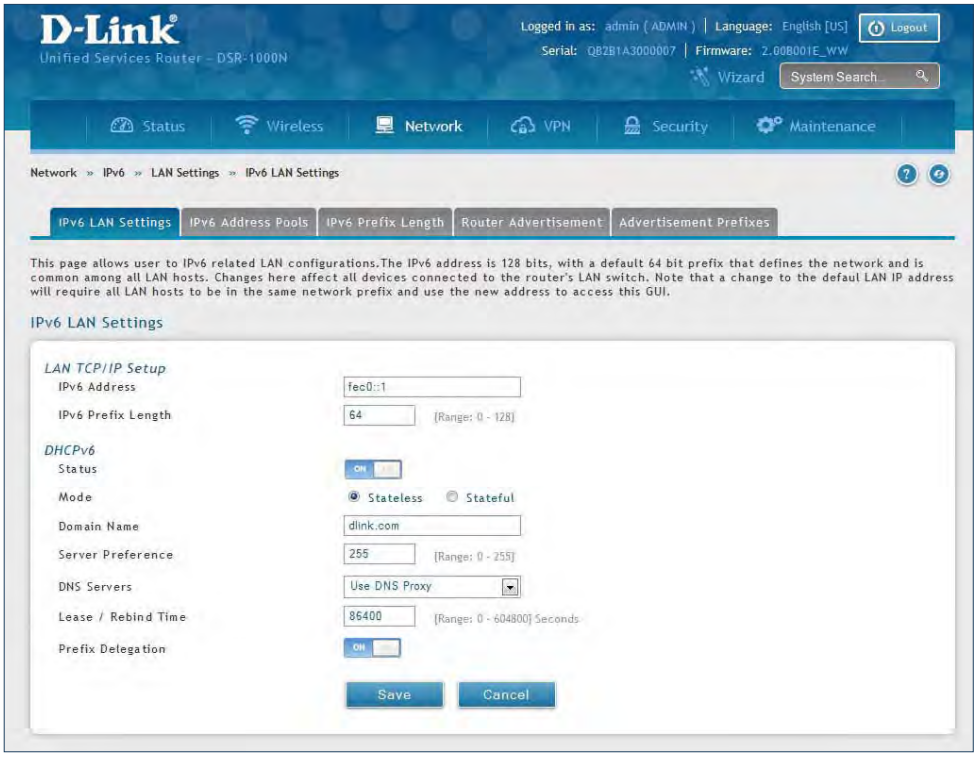
Path: Network > IPv6 > LAN Settings > IPv6 LAN Settings

In IPv6 mode, the LAN DHCP server is disabled by default (similar to IPv4 mode). The DHCPv6 server will serve IPv6 addresses from configured address pools with the IPv6 Prefix Length assigned to the LAN.

The default IPv6 LAN address for the router is fec0::1. You can change this 128-bit IPv6 address based on your network requirements. The other field that defines the LAN settings for the router is the prefix length. The IPv6 network (subnet) is identified by the initial bits of the address called the prefix. By default this is 64 bits long. All hosts in the network have common initial bits for their IPv6 address; the number of common initial bits in the network's addresses is set by the prefix length field.

To configure IPv6 LAN settings on the router:

1. Click **Network** > **IPv6** > **LAN Settings** > **IPv6 LAN Settings**.



2. Complete the fields in the table on the next page and click **Save**.

Field	Description
IPv6 Address	Enter the IPv6 LAN address for the router.
IPv6 Prefix Length	Enter the prefix length.
Status	Toggle to **ON** to enable DHCPv6.
Mode	The IPv6 DHCP server is either stateless or stateful. If stateless is selected an external IPv6 DHCP server is not required as the IPv6 LAN hosts are auto-configured by this router. In this case the router advertisement daemon (RADVD) must be configured on this device and ICMPv6 router discovery messages are used by the host for auto-configuration. There are no managed addresses to serve the LAN nodes. If stateful is selected the IPv6 LAN host will rely on an external DHCPv6 server to provide required configuration settings.
Domain Name	Enter a domain name (optional).
Server Preference	Server Preference is used to indicate the preference level of this DHCP server. DHCP advertise messages with the highest server preference value to a LAN host are preferred over other DHCP server advertise messages. The default is 255.
DNS Servers	The DNS server details can be manually entered here (primary/secondary options. An alternative is to allow the LAN DHCP client to receive the DNS server details from the ISP directly. By selecting Use DNS proxy, this router acts as a proxy for all DNS requests and communicates with the ISP's DNS servers (a WAN configuration parameter).
Lease / Rebind Time	Enter the duration of the DHCPv6 lease from this router to the LAN client.
Prefix Delegation	Toggle to **ON** to enable prefix delegation in DHCPv6 server. This option can be selected only in Stateless Address Auto Configuration mode of DHCPv6 server.
Save	Click **Save** at the bottom to save and activate your settings.

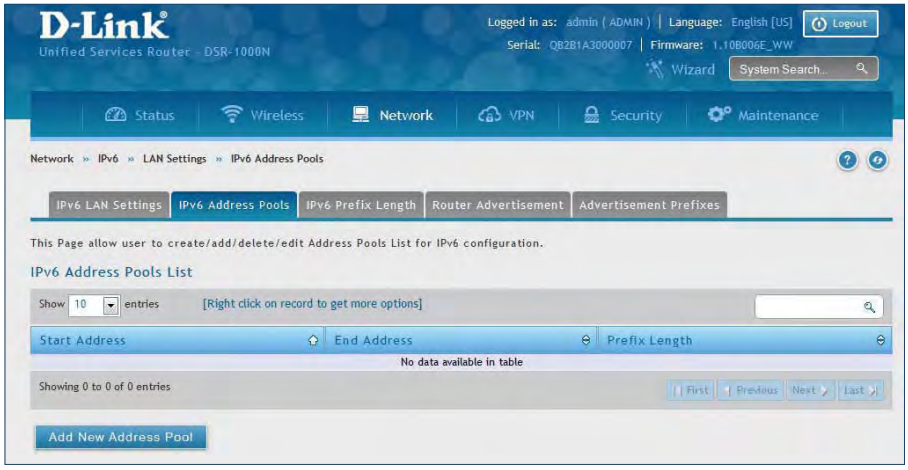
IPv6 Address Pools

Path: Network > IPv6 > LAN Settings > IPv6 Address Pools

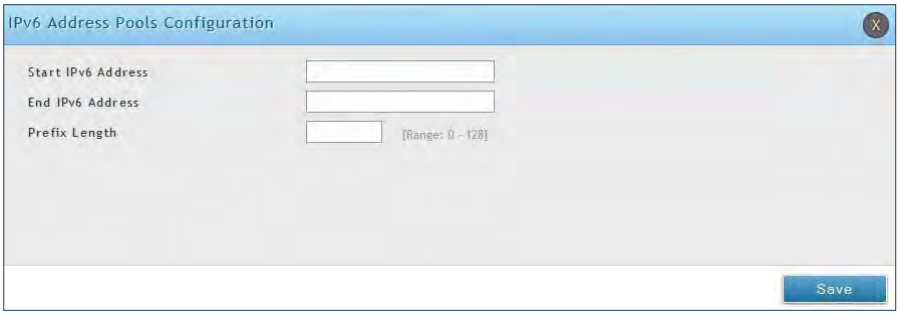
This feature allows you to define the IPv6 delegation prefix for a range of IP addresses to be served by the router's DHCPv6 server. Using a delegation prefix you can automate the process of informing other networking equipment on the LAN of DHCP information specific for the assigned prefix.

To add, edit, or delete a IPv6 address pool entry:

1. Click **Network** > **IPv6** > **LAN Settings** > **IPv6 Address Pools** tab.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Address Pool**.
3. Complete the fields in the table below and click **Save**.



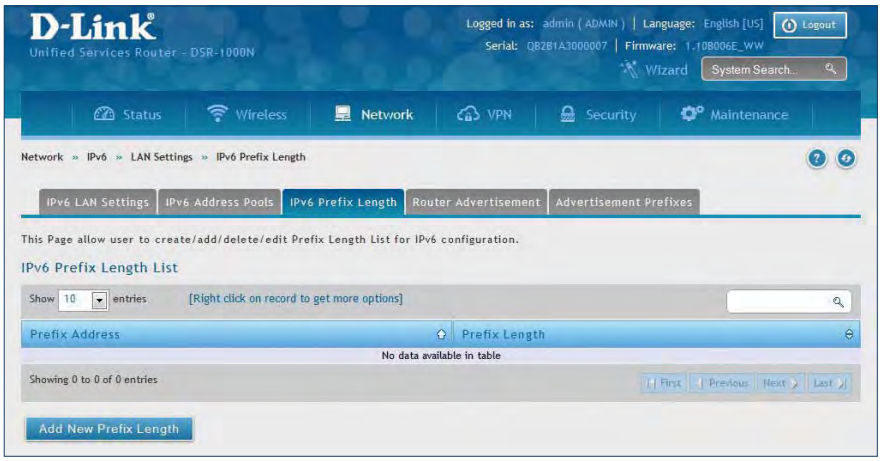
Field	Description
Start IPv6 Address	Enter the starting IPv6 LAN address.
End IPv6 Address	Enter the ending IPv6 LAN address.
Prefix Length	Enter the prefix length.
Save	Click **Save** at the bottom to save and activate your settings.

IPv6 Prefix Length

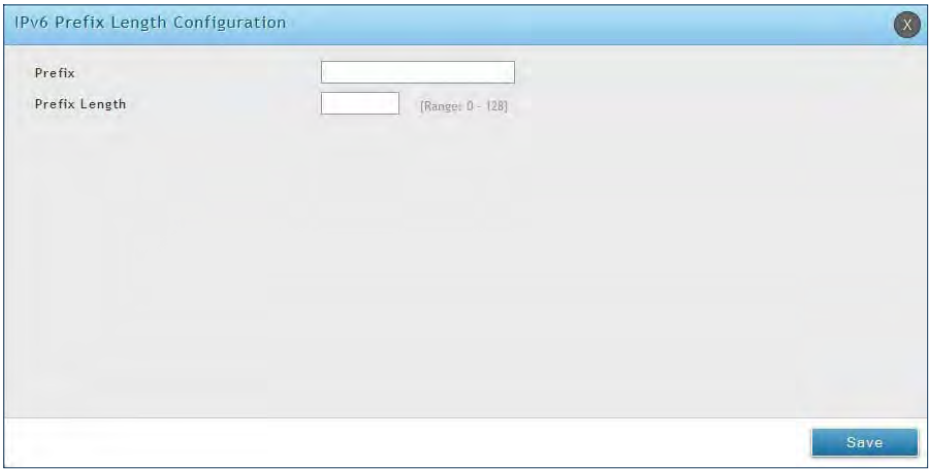
Path: Network > IPv6 > LAN Settings > IPv6 Prefix Length

To add, edit, or delete a IPv6 prefix length entry:

1. Click **Network** > **IPv6** > **LAN Settings** > **IPv6 Prefix Length** tab.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Prefix Length**.
3. Complete the fields in the table below and click **Save**.



Field	Description
Profile	Enter a name for this profile.
Prefix Length	Enter the prefix length.
Save	Click **Save** at the bottom to save and activate your settings.

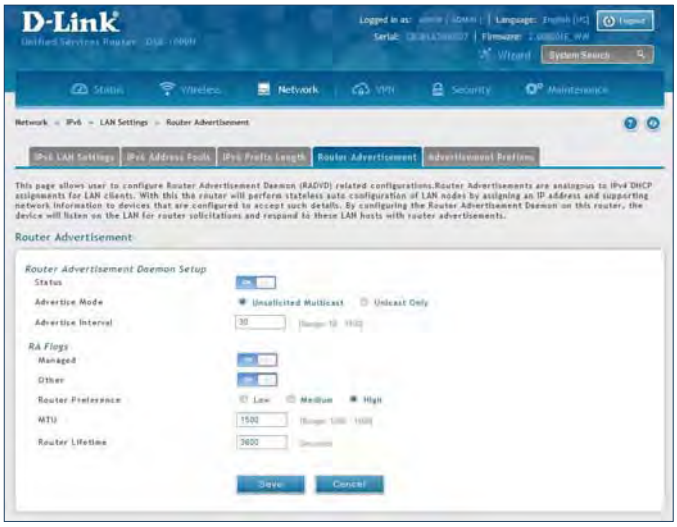
Router Advertisement

Path: Network > IPv6 > LAN Settings > Router Advertisement

Router Advertisements are analogous to IPv4 DHCP assignments for LAN clients, in that the router will assign an IP address and supporting network information to devices that are configured to accept such details. Router Advertisement is required in an IPv6 network is required for stateless auto configuration of the IPv6 LAN. By configuring the Router Advertisement Daemon on this router, the router will listen on the LAN for router solicitations and respond to these LAN hosts with router advisements.

To configure router advertisement settings:

1. Click **Network** > **IPv6** > **LAN Settings** > **Router Advertisement** tab.



2. Complete the fields in the table on the next page and click **Save**.

Field	Description
Status	Toggle to **ON** to enable this feature.
Advertise Mode	Select **Unsolicited Multicast** to send router advertisements (RA's) to all interfaces in the multicast group. To restrict RA's to well-known IPv6 addresses on the LAN, and thereby reduce overall network traffic, select **Unicast only**.
Advertise Interval	When advertisements are unsolicited multicast packets, this interval sets the maximum time between advertisements from the interface. The actual duration between advertisements is a random value between one third of this field and this field. The default is 30 seconds.
Managed	Toggle to **ON** to use the administered/stateful protocol for address auto-configuration. If set to **OFF**, the host uses administered/stateful protocol for non-address auto configuration.
Other	Toggle to **ON** to use administered/stateful protocol of other (i.e., non-address) information auto configuration.
Router Preference	This parameter (low/medium/high) determines the preference associated with the RADVD process of the router. This is useful if there are other RADVD-enabled devices on the LAN as it helps avoid conflicts for IPv6 clients.
MTU	The router advertisement will set this maximum transmission unit (MTU) value for all nodes in the LAN that are auto-configured by the router. The default is 1500.
Router Lifetime	This value is present in RAs and indicates the usefulness of this router as a default router for the interface. The default is 3600 seconds. Upon expiration of this value, a new RADVD exchange must take place between the host and this router.
Save	Click **Save** at the bottom to save and activate your settings.

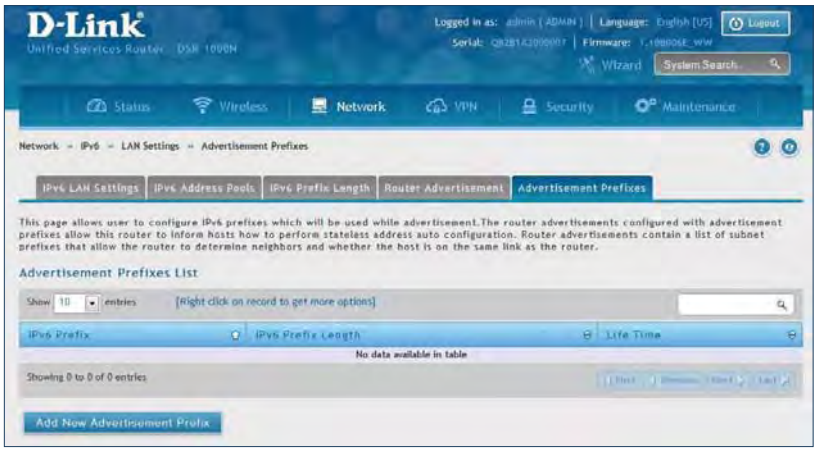
Advertisement Prefixes

Path: Network > IPv6 > LAN Settings > Advertisement Prefixes

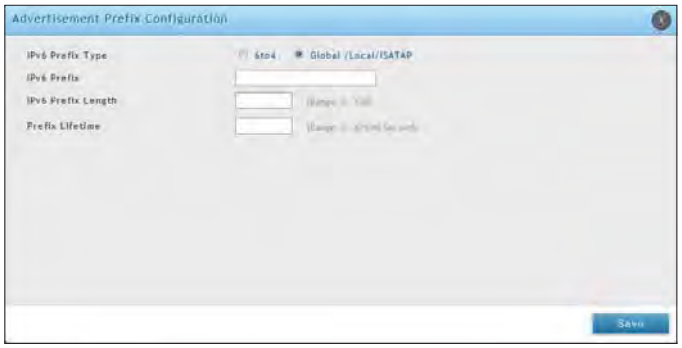
Router advertisements configured with advertisement prefixes allow this router to inform hosts how to perform stateless address auto configuration. Router advertisements contain a list of subnet prefixes that allow the router to determine neighbors and whether the host is on the same link as the router.

To add, edit, or delete an advertisement prefix entry:

1. Click **Network** > **IPv6** > **LAN Settings** > **Advertisement Prefixes** tab.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Advertisement Length**.
3. Complete the fields in the table below and click **Save**.

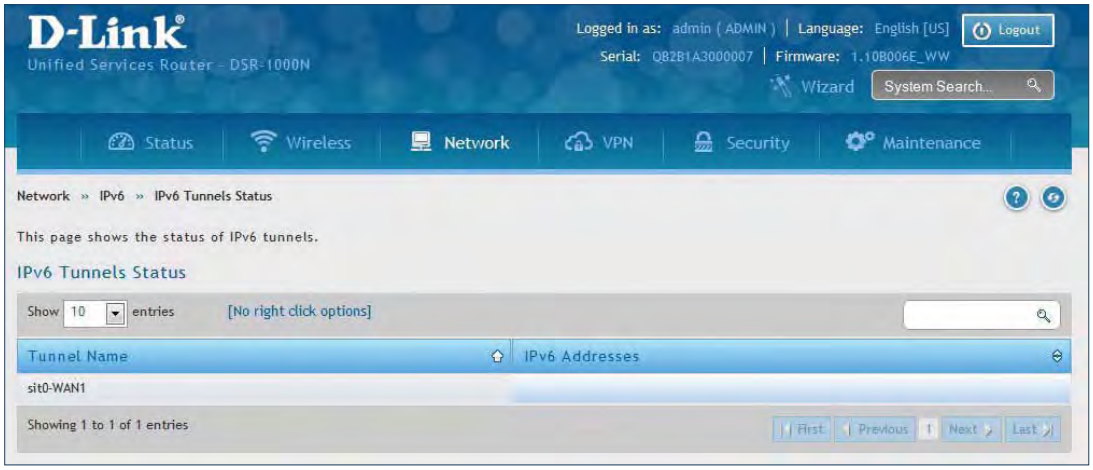


Field	Description
IPv6 Prefix Type	To ensure hosts support IPv6 to IPv4 tunnel select the **6to4** prefix type. Selecting **Global/Local/ISATAP** will allow the nodes to support all other IPv6 routing options.
SLA ID	The SLA ID (Site-Level Aggregation Identifier) is available when 6to4 Prefixes are selected. This should be the interface ID of the router's LAN interface used for router advertisements.
IPv6 Prefix	When using Global/Local/ISATAP prefixes, this field is used to define the IPv6 network advertised by this router.
IPv6 Prefix Length	This value indicates the number contiguous, higher order bits of the IPv6 address that define up the network portion of the address. Typically this is 64.
Prefix Lifetime	This defines the duration (in seconds) that the requesting node is allowed to use the advertised prefix. It is analogous to DHCP lease time in an IPv4 network.
Save	Click **Save** at the bottom to save and activate your settings.

IPv6 Tunnels Status

Path: Network > IPv6 > IPv6 Tunnels Status

This page displays the current status of IPv6 Tunnels.



Wireless Settings

The Wireless Network Setup Wizard is available for users new to wireless networking. By going through a few configuration pages you can enable a Wi-Fi™ network on your LAN and allow supported 802.11 clients to connect to the configured Access Point. To run the wizard, refer to "#6 Wireless Network Setup" on page 12.

Access Points

Path: Wireless > General > Access Points

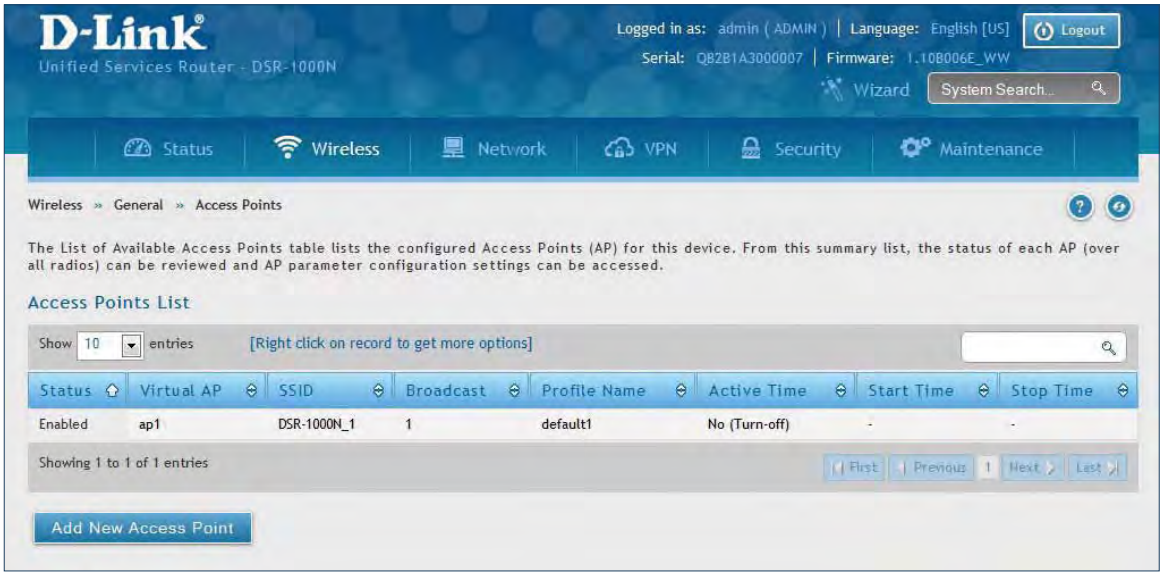
This router has an integrated 802.11n radio that allows you to create an access point for wireless LAN clients. The security/encryption/authentication options are grouped in a wireless Profile, and each configured profile will be available for selection in the AP configuration menu. The profile defines various parameters for the AP, including the security between the wireless client and the AP, and can be shared between multiple APs instances on the same device when needed.

Up to four unique wireless networks can be created by configuring multiple "virtual" APs . Each such virtual AP appears as an independent AP (unique SSID) to supported clients in the environment, but is actually running on the same physical radio integrated with this router.

Note: *Profiles may be thought of as a grouping of AP parameters that can then be applied to not just one but multiple AP instances (SSIDs), thus avoiding duplication if the same parameters are to be used on multiple AP instances or SSIDs.*

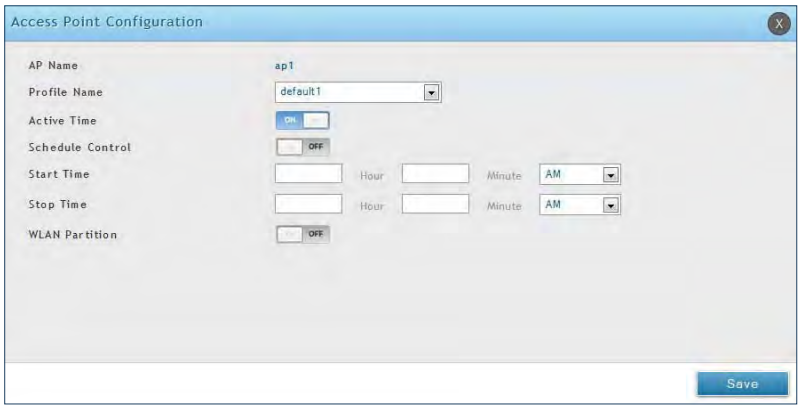
To add, edit, or delete an access point entry:

1. Click **Wireless** > **General** > **Access Points**.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Access Point**.

3. Complete the fields in the table below and click **Save**.



Field	Description
AP Name	Enter a name for your virtual access point.
Profile Name	Select a profile from the drop-down menu to associate this access point with. If you do not want to use the default profile, create a profile (refer to the next page) and then create an access point.
Active Time	Toggle to **ON** to "turn on" this access point.
Schedule Control	Toggle to **ON** if you want to specify a time to have this access point turned on.
Start/Stop Time	Enter a start and stop time.
WLAN Partition	Toggle to **ON** to prevent associated wireless clients from communicating with each other.
Save	Click **Save** at the bottom to save and activate your settings.

Profiles

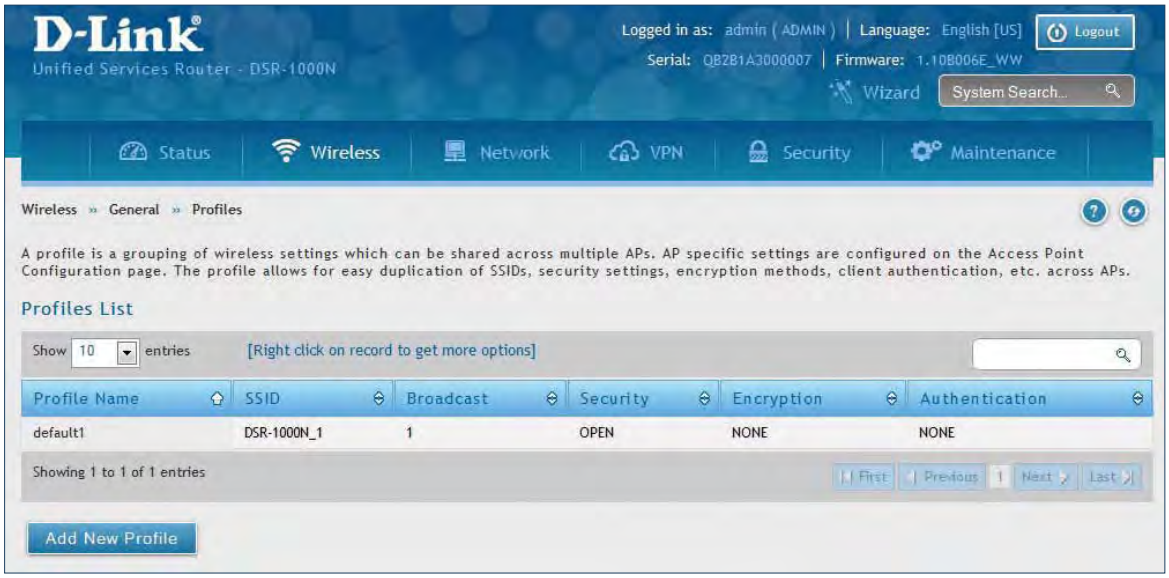
Path: Wireless > General > Profiles

Creating a profile allows you to assign the security type, encryption and authentication to use when connecting the AP to a wireless client. The default mode is "open", i.e., no security. This mode is insecure as it allows any compatible wireless clients to connect to an AP configured with this security profile.

To create a new profile, use a unique profile name to identify the combination of settings. Configure a unique SSID that will be the identifier used by the clients to communicate to the AP using this profile. By choosing to broadcast the SSID, compatible wireless clients within range of the AP can detect this profile's availability. The AP offers all advanced 802.11 security modes, including WEP, WPA, and WPA2.

To add, edit, or delete a profile:

1. Click **Wireless** > **General** > **Profiles**.



2. Right-click a current entry and select **Edit** or **Delete**. To add a new entry, click **Add New Access Point**.
3. Complete the fields in the table on the next page and click **Save**.

Field	Description
Profile Name	Enter a name for your profile.
SSID	Enter a name for your wireless network (SSID).
Broadcast SSID	Toggle to **ON** if you want your SSID broadcast openly or toggle to **OFF** to hide it. Clients will have to know the SSID to connect.
Security	Select what kind of wireless security you want to use: • **Open:** Select this option to create a public "open" network to allow unauthenticated devices to access this wireless gateway. • **WEP (Wired Equivalent Privacy):** This option requires a static (pre -shared) key to be shared between the AP and wireless client . Note that WEP does not support 802.11n data rates; is it appropriate for legacy 802.11 connections. • **WPA (Wi-Fi Protected Access):** For stronger wireless security than WEP, choose this option. The encryption for WPA will use TKIP and also CCMP if required. The authentication can be a preshared key (PSK), Enterprise mode with RADIUS server, or both. Note that WPA does not support 802.11n data rates; is it appropriate for legacy 802.11 connections. • **WPA2:** This security type uses CCMP encryption (and the option to add TKIP encryption) on either PSK (pre-shared key) or Enterprise (RADIUS Server) authentication. • **WPA + WPA2:** This uses both encryption algorithms, TKIP and CCMP. WPA clients will use TKIP and WPA2 clients will use CCMP encryption algorithms.
Encryption	Select the encryption type: • WEP - Select **Open** or **Shared**. • WPA - Select **TKIP** or **TKIP+CCMP**. • WPA2 - Select **CCMP** or **TKIP+CCMP**. • WPA+WPA2 - **TKIP+CCMP** will be the only option.
Authentication	Select the authentication type: • WEP - Select **64-bit** or **128-bit**. • WPA/WPA2/WPA+WPA2 - Select **PSK** (passphrase), **RADIUS** (RADIUS server), or **PSK+RADIUS** (both).
WEP Passphrase/Key (1-4)	If you selected WEP, enter a passphrase or up to four hexadecimal keys (a-f, 0-9, A-F).
WPA Password	If you selected WPA, WPA2, or WPA+WPA2, enter a WPA password.
Save	Click **Save** at the bottom to save and activate your settings.

The AP configuration page allows you to create a new AP and link to it one of the available profiles. This router supports multiple AP's referred to as virtual access points (VAPs). Each virtual AP that has a unique SSIDs appears as an independent access point to clients. This valuable feature allows the router's radio to be configured in a way to optimize security and throughput for a group of clients as required by the user. To create a VAP, refer to "Access Points" on page 80. After setting the AP name, the profile drop-down menu is used to select one of the configured profiles.

Radio Settings

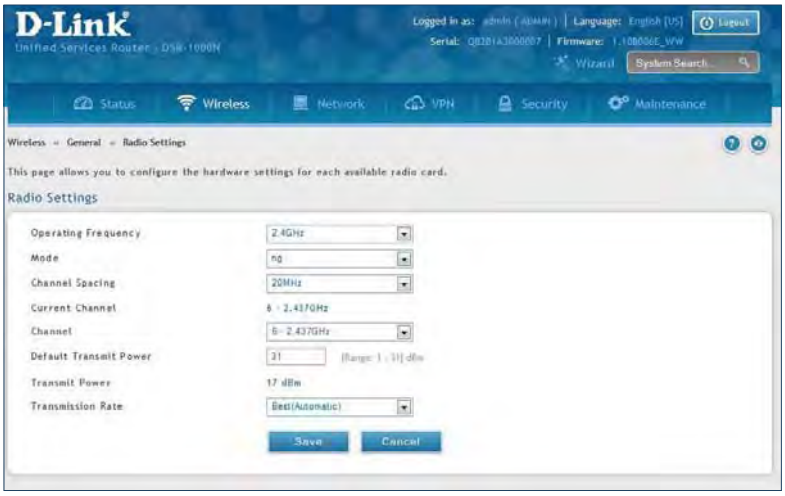
Path: Wireless > General > Radio Settings

You may configure the channels and power levels available for the AP's enabled on the router. The router has a dual band 802.11n radio, meaning either 2.4 GHz or 5 GHz frequency of operation can be selected (not concurrently though). Based on the selected operating frequency, the mode selection will let you define whether legacy connections or only 802.11n connections (or both) are accepted on configured APs.

The ratified 802.11n support on this radio requires selecting the appropriate broadcast mode, and then defining the channel spacing and control side band for 802.11n traffic. The default settings are appropriate for most networks. For example, changing the channel spacing to 40MHz can improve bandwidth at the expense of supporting earlier 802.11n clients. The available transmission channels are governed by regulatory constraints based on the region setting of the router.

To configure the radio settings:

1. Click **Wireless** > **General** > **Radio Settings**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Operating Frequency	Select **2.4GHz** or **5GHz**.
Mode	Select the 802.11 mode: • 2.4GHz - **g and b**, **g only**, **n and g**, or **n only**. • 5GHz - **a only**, **n and a**, or **n only**.
Channel Spacing	Select the Channel Width: **Auto 20/40** - This is the default setting. Select if you are using both 802.11n and non-802.11n wireless devices. **20MHz** - Select if you are not using any 802.11n wireless clients.
Control Side Band	Select **Upper** or **Lower**. Available for 802.11n only.
Current Channel	Displays the current channel.
Channel	Select the channel you want to use.
Default Transmit Power	Enter the default transmit power (0-31).
Transmit Power	Displays the current transmit power.
Transmission Rate	Select a transmission rate from the drop-down menu. This will lock the transmission rate of your wireless connection. It is strongly recommended to use **Best (Automatic)**.
Save	Click **Save** at the bottom to save and activate your settings.

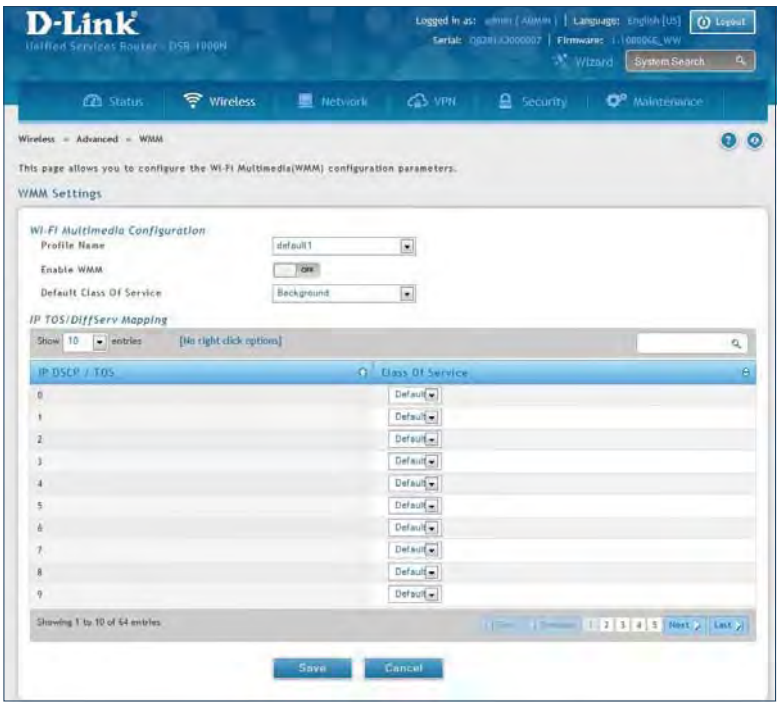
WMM Settings

Path: Wireless > Advanced > WMM

Wi-Fi Multimedia (WMM) provides basic Quality of Service (QoS) features to IEEE 802.11 networks. WMM prioritizes traffic according to four Access Categories (AC) - voice, video, best effort, and background.

To configure the radio settings:

1. Click **Wireless** > **Advanced** > **WMM**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Profile Name	Select the profile to associate this configuration to from the drop-down menu.
Enable WMM	Toggle to **ON** to enable WMM.
Default Class of Service	Select an available access category (voice, video, best effort, or background) to assign as "default".
IP DSCP / TOS	Under Class of Service, select a service and map it to the IP DSCP / TOS value.
Save	Click **Save** at the bottom to save and activate your settings.

WDS

Path: Wireless > Advanced > WDS

Wireless Distribution System (WDS) is a system enabling the wireless interconnection of access points in a network. This feature is only guaranteed to work between devices of the same type (i.e., using the same chipset/driver).

When you enable WDS, use the same security configuration as the default access point. The WDS links do not have true WPA/WPA2 support, as in there is no WPA key handshake performed. Instead the Session Key to be used with a WDS Peer is computed using a hashing function (similar to the one used for computing a WPA PMK). The inputs to this function are a PSK (configurable by an administrator from the WDS page) and an internal "magic" string (non-configurable).

In effect the WDS links use TKIP/AES encryption, depending on the encryption configured for the default AP. In case the default AP uses mixed encryption (TKIP + AES). The WDS link will use the AES encryption scheme.

Note: *For a WDS link to function properly the Radio settings on the WDS peers have to be the same.*

To configure the radio settings:

1. Click **Wireless** > **Advanced** > **WDS**.

2. Complete the fields in the table below and click **Save**.

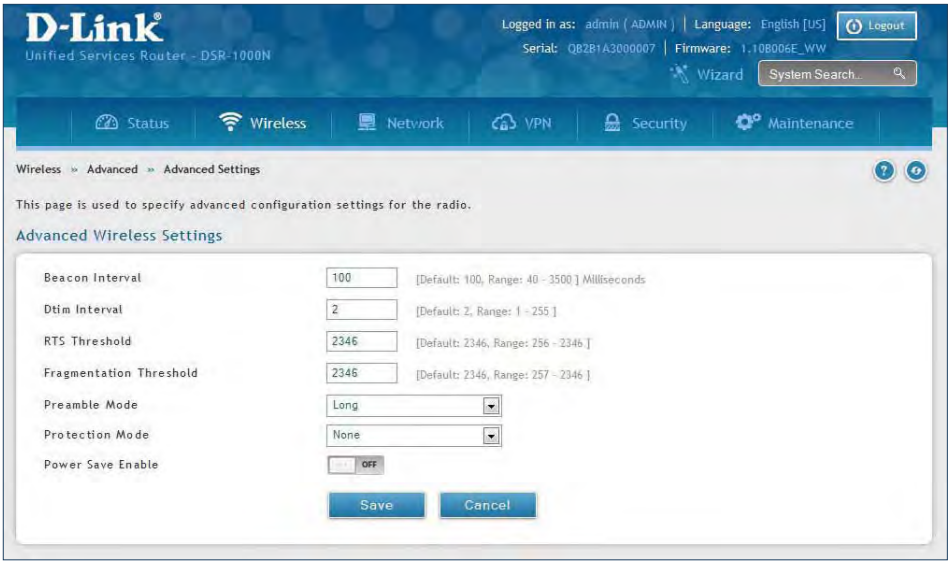
Field	Description
WDS Enable	Toggle to **ON** to enable WDS and click **Save**.
WDS Encryption	Displays the current wireless encryption used.
WDS Security	Displays the current security type.
WDS Authentication	Displays the current authentication type.
WDS Passphrase	Enter the WDS passphrase (if WEP, WPA, WPA2, or WPA+WPA2 is enabled).
System MAC Address	Displays the system MAC address.
Add New WDS	Once you enabled WDS (and clicked Save), click Add New WDS and enter the MAC address of a WDS peer. You can add up to four WDS peers.
Save	Click **Save** at the bottom to save and activate your settings.

Advanced Settings

Path: Wireless > Advanced > Advanced Settings

You can modify the 802.11 communication parameters in this page. Generally, the default settings are appropriate for most networks.

1. Click **Wireless** > **Advanced** > **Advanced Settings**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Beacon Interval	Beacons are packets sent by an Access Point to synchronize a wireless network. The default value is 100.
DTIM Interval	(Delivery Traffic Indication Message) 3 is the default setting. A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.
RTS Threshold	This value should remain at its default setting of 2432. If inconsistent data flow is a problem, only a minor modification should be made.
Fragmentation Threshold	The fragmentation threshold, which is specified in bytes, determines whether packets will be fragmented. Packets exceeding the 2346 byte setting will be fragmented before transmission. 2346 is the default setting.
Preamble Mode	Select either **Long** or **Short**. The Preamble Type defines the length of the CRC (Cyclic Redundancy Check) block for communication between the Access Point and roaming wireless adapters. High network traffic areas should use Short preamble type.
Protection Mode	Select either **None** or **CTS-to-Self Protection**. Select the CTS-to-Self Protection to enable CTS-to-Self protection mechanism, which is used to minimize collisions among stations in a mixed 802.11b & g environment. The default selection is **None**.
Power Save Enable	Toggle to **ON** to enable the Unscheduled Automatic Power Save Delivery (also referred to as WMM Power Save) feature that allows the radio to conserve power.
Save	Click **Save** at the bottom to save and activate your settings.

WPS

Path: Wireless > Advanced > WPS

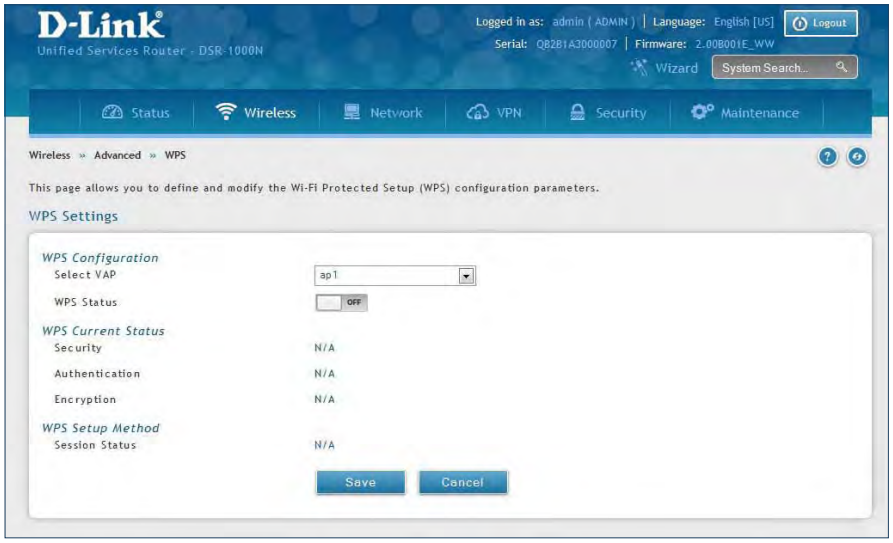
WPS is a simplified method to add supporting wireless clients to the network. WPS is only applicable for APs that employ WPA or WPA2 security. To use WPS, select the eligible VAPs from the drop-down menu of APs that have been configured with this security and enable WPS status for this AP.

The WPS Current Status section outlines the security, authentication, and encryption settings of the selected AP. These are consistent with the AP's profile. There are two setup options:

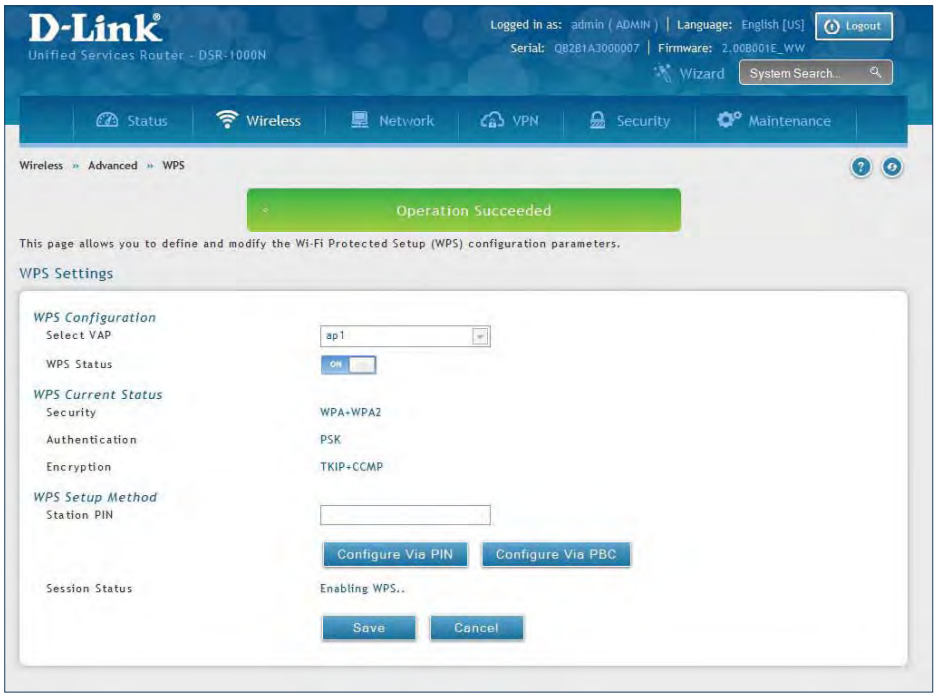
- **Personal Identification Number (PIN):** The wireless device that supports WPS may have an alphanumeric PIN, if it does add the PIN in this field. The router will connect within 60 seconds of clicking the "Configure via PIN" button immediately below the PIN field. There is no LED indication that a client has connected.
- **Push Button Configuration (PBC):** For wireless devices that support PBC, press and hold the WPS button for two seconds, and then press the WPS button (or initiate WPS via GUI) on your wireless client within two minutes. The AP will detect the wireless device and establish a secure link to the client.

To enable and connect clients using WPS:

1. Click **Wireless** > **Advanced** > **WPS**.
2. Select which VAP you want to perform the WPS process from the drop-down menu.
3. Toggle *WPS Status* to **ON** and click **Save**.



4. Once enabled the following screen will appear.



5. Under *WPS Setup Method*, decide to either use PIN or PBC (Push Button).
6. If you want to use PIN method, enter the PIN next to *Station PIN* and click **Configure Via PIN**. You will need to enter the PIN on your wireless client and start the WPS process within one minute.
7. If you want to use push button method, click **Configure Via PBC**. This will initiate the WPS session. You will need to press the WPS button (or initiate through an interface) on your client within one minute.
8. Allow up to two minutes to connect. Check the Session Status to see if it successfully connected.

VPN

A VPN provides a secure communication channel (“tunnel”) between two gateway routers or a remote PC client. The following types of tunnels can be created:

- Gateway-to-gateway VPN: To connect two or more routers to secure traffic between remote sites.
- Remote Client (client-to-gateway VPN tunnel): A remote client initiates a VPN tunnel as the IP address of the remote PC client is not known in advance. The gateway in this case acts as a responder.
- Remote client behind a NAT router: The client has a dynamic IP address and is behind a NAT Router. The remote PC client at the NAT router initiates a VPN tunnel as the IP address of the remote NAT router is not known in advance. The gateway WAN port acts as responder.
- PPTP server for LAN / WAN PPTP client connections.
- L2TP server for LAN / WAN L2TP client connections.

IPSec VPN

Policies

Path: VPN > IPSec VPN > Policies

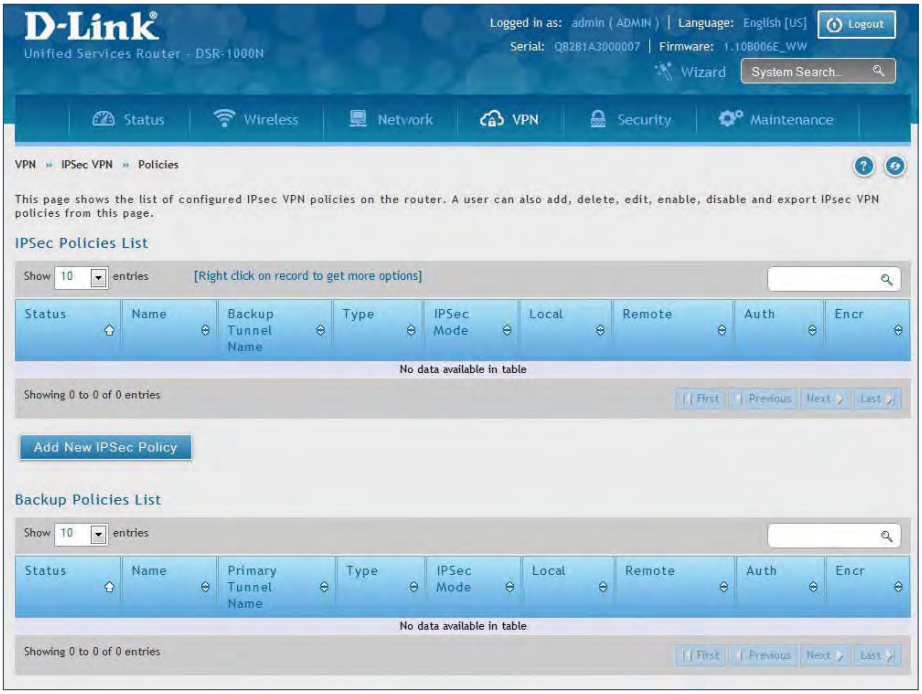
An IPsec policy is between this router and another gateway or this router and an IPsec client on a remote host. The IPsec mode can be either tunnel or transport depending on the network being traversed between the two policy endpoints.

- **Transport:** This is used for end-to-end communication between this router and the tunnel endpoint, either another IPsec gateway or an IPsec VPN client on a host. Only the data payload is encrypted and the IP header is not modified or encrypted.
- **Tunnel:** This mode is used for network-to-network IPsec tunnels where this gateway is one endpoint of the tunnel. In this mode the entire IP packet including the header is encrypted and/or authenticated.

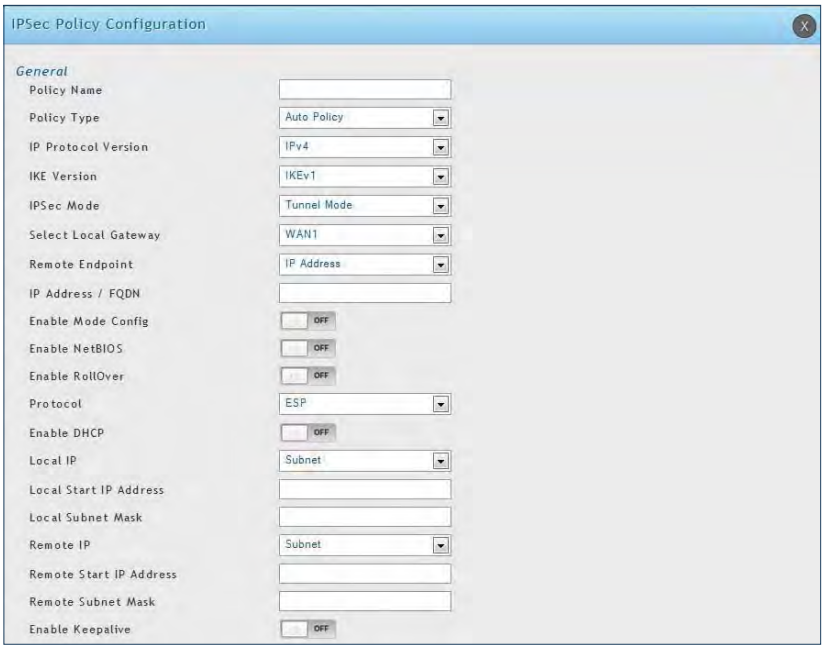
When tunnel mode is selected, you can enable NetBIOS and DHCP over IPsec. DHCP over IPsec allows this router to serve IP leases to hosts on the remote LAN. As well in this mode you can define the single IP address, range of IPs, or subnet on both the local and remote private networks that can communicate over the tunnel.

To configure the radio settings:

1. Click **VPN** > **IPSec VPN** > **Policies**.



2. Click **Add new IPSec Policy**. Fill out the General section which you will name the VPN, select policy type, define the tunnel type, and define endpoints.

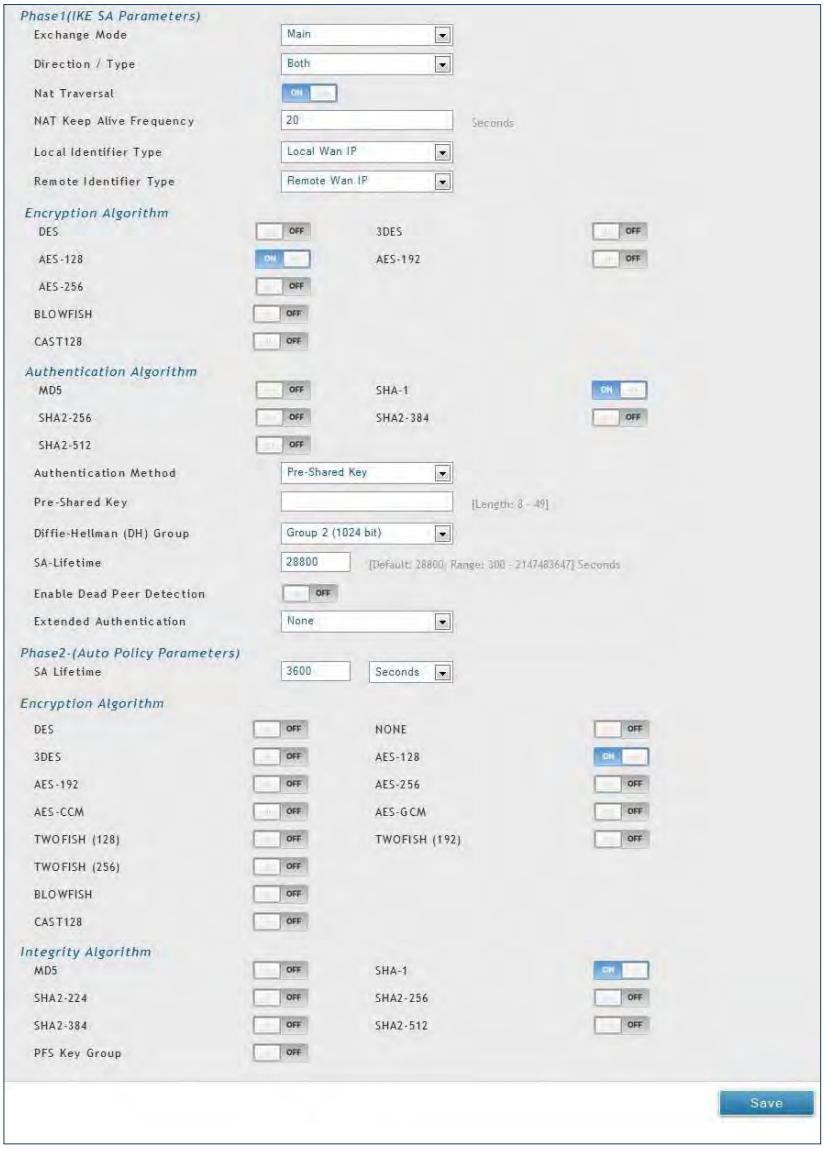


Field	Description
Policy Name	Enter a unique name for the VPN Policy. This name is not an identifier for the remote WAN/client.
Policy Type	Select either **Manual** or **Auto**. • Manual: All settings (including the keys) for the VPN tunnel are manually input for each end point. No third-party server or organization is involved. • Auto: Some parameters for the VPN tunnel are generated automatically. This requires using the IKE (Internet Key Exchange) protocol to perform negotiations between the two VPN Endpoints.
IP Protocol Version	Select either **IPv4** or **IPv6**.
IKE Version	Select the version of IKE.
IPSec Mode	Select either **Tunnel** or **Transport**. IPsec tunnel mode is useful for protecting traffic between different networks, when traffic must pass through an intermediate, untrusted network. Tunnel mode is primarily used for interoperability with gateways, or end-systems that do not support L2TP/IPsec or PPTP connections. Transport mode is the default mode for IPsec, and it is used for end-to-end communications (for example, for communications between a client and a server).
Select Local Gateway	In the event that two WAN ports are configured to connect to your ISP, select the gateway that will be used as the local endpoint for this IPsec tunnel.
Remote Endpoint	Select the type of identifier that you want to provide for the router at the remote endpoint (either **IP Address** or **FQDN** [Fully Qualified Domain Name])
IP Address/FQDN	Enter the identifier for the router.
Enable Mode Config	Toggle to **ON** to enable. Mode Config is similar to DHCP and is used to assign IP addresses to the remote VPN clients.
Enable NetBIOS	Toggle to **ON** to allow NetBIOS broadcasts to travel over the VPN tunnel
Enable RollOver	Toggle to **ON** to enable VPN rollover. You must have the WAN Mode set to Rollover.
Protocol	Select a protocol from the drop-down menu.
Enable DHCP	Toggle to **ON** to allow VPN clients that are connected to your router over IPsec to receive an assigned IP using DHCP.
Local IP/Remote IP	Select the type of identifier that you want to provide for the endpoint: • **Any:** Specifies that the policy is for traffic from the given end point (local or remote). Note that selecting Any for both local and remote end points is not valid. • **Single:** Limits the policy to one host. Enter the IP address of the host that will be part of the VPN. • **Range:** Allows computers within an IP address range to connect to the VPN. Enter the Start IP Address and End IP Address in the provided fields. • **Subnet:** Allows an entire subnet to connect to the VPN. Enter the network address and subnet mask in the provided fields.
Enable Keepalive	Toggle to **ON** to periodically send ping packets to the host on the peer side of the network to keep the tunnel alive.

3. Once the tunnel type and endpoints of the tunnel are defined you can determine the Phase 1/ Phase 2 negotiation to use for the tunnel. This is covered in the IPsec mode setting, as the policy can be Manual or Auto. For Auto policies, the Internet Key Exchange (IKE) protocol dynamically exchanges keys between two IPsec hosts. The Phase 1 IKE parameters are used to define the tunnel's security association details.

   The Phase 2 Auto policy parameters cover the security association lifetime and encryption/authentication details of the phase 2 key negotiation.

   The VPN policy is one half of the IKE/VPN policy pair required to establish an Auto IPsec VPN tunnel. The IP addresses of the machine or machines on the two VPN endpoints are configured here, along with the policy parameters required to secure the tunnel.



A Manual policy does not use IKE and instead relies on manual keying to exchange authentication parameters between the two IPsec hosts. The incoming and outgoing security parameter index (SPI) values must be mirrored on the remote tunnel endpoint. As well the encryption and integrity algorithms and keys must match on the remote IPsec host exactly in order for the tunnel to establish successfully. Note that using Auto policies with IKE are preferred as in some IPsec implementations the SPI (security parameter index) values require conversion at each endpoint.

DSR routers supports VPN roll-over feature. This means that policies configured on the primary WAN will rollover to the secondary WAN in case of a link failure. This feature can be used only if your WAN is configured in Auto-Rollover mode.

Note: Once you have created an IPSec policy, you may right-click the policy and select Export to save as a file. You can then upload this to another DSR router or keep as a backup. To upload a saved policy, refer to "Easy VPN Setup" on page 101.

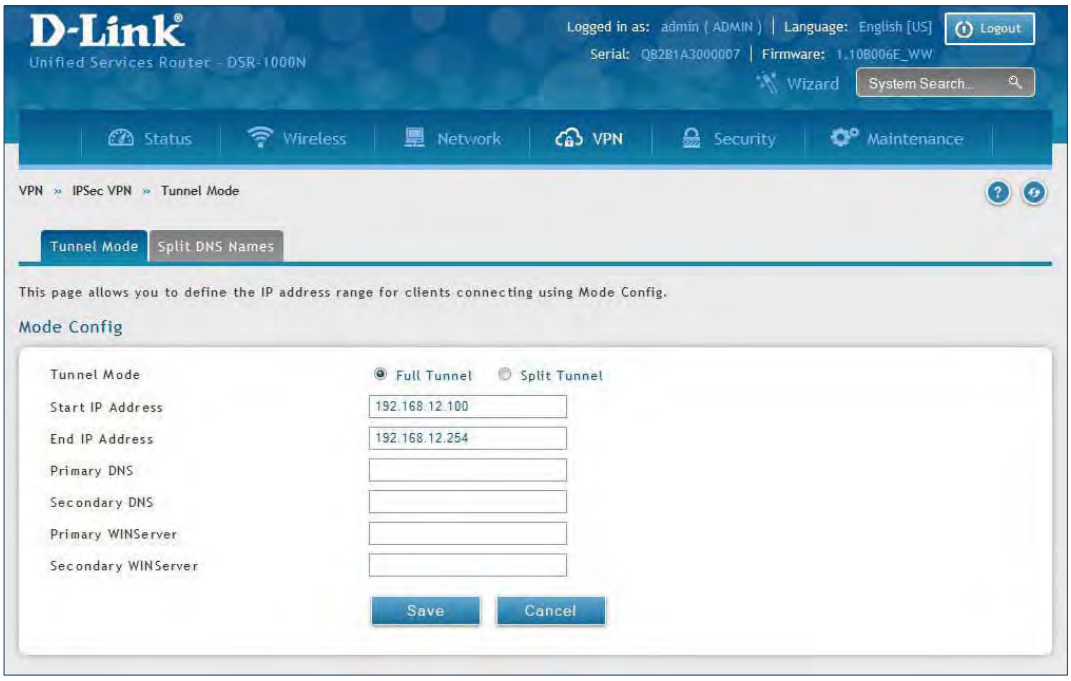
Tunnel Mode

Path: VPN > IPSec VPN > Tunnel Mode

When tunnel mode is selected, you can enable NetBIOS and DHCP over IPSec. DHCP over IPSec allows this router to serve IP leases to hosts on the remote LAN. You can also define a single IP address, a range of IPs, or a subnet on both the local and remote private networks that can communicate over the tunnel.

The router allows full tunnel and split tunnel support. Full tunnel mode just sends all traffic from the client across the VPN tunnel to the router. Split tunnel mode only sends traffic to the private LAN based on pre-specified client routes. These client routes give the client access to specific private networks, thereby allowing access control over specific LAN services.

1. Click **VPN** > **IPSec VPN** > **Tunnel Mode**.



2. Complete the fields in the table below and click **Save**.

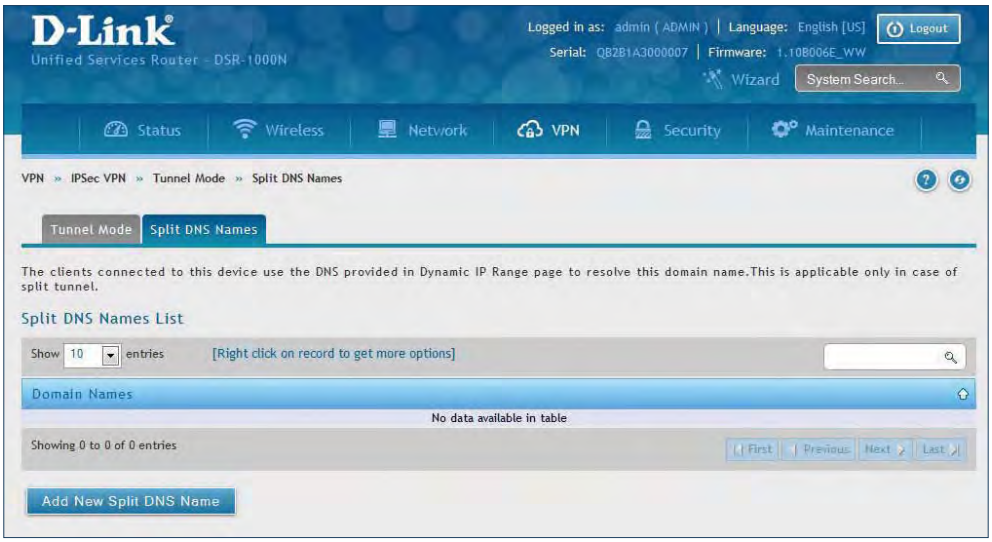
Field	Description
Tunnel Mode	Select either **Full Tunnel** or **Split Tunnel**.
Start/End IP Address	Enter the starting and ending IP addresses.
Primary/Secondary DNS	Enter the primary and secondary DNS server addresses.
Primary/Secondary WINS	Enter the primary and secondary WINS server addresses.
Save	Click **Save** to save and activate your settings.

Split DNS Names

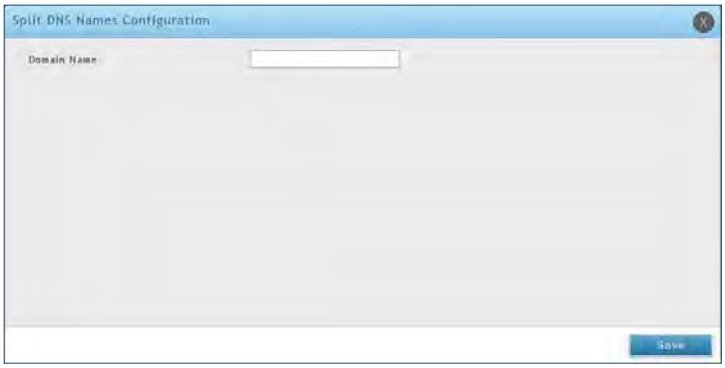
In a split DNS infrastructure, you create two zones for the same domain, one to be used by the internal network, the other used by the external network. Split DNS directs internal hosts to an internal domain name server for name resolution and external hosts are directed to an external domain name server for name resolution.

To add a DNS name:

1. Click **VPN** > **IPSec VPN** > **Tunnel Mode** > **Split DNS Names** tab.



2. Click **Add New Split DNS name**. You can right-click any created entries to edit or delete.



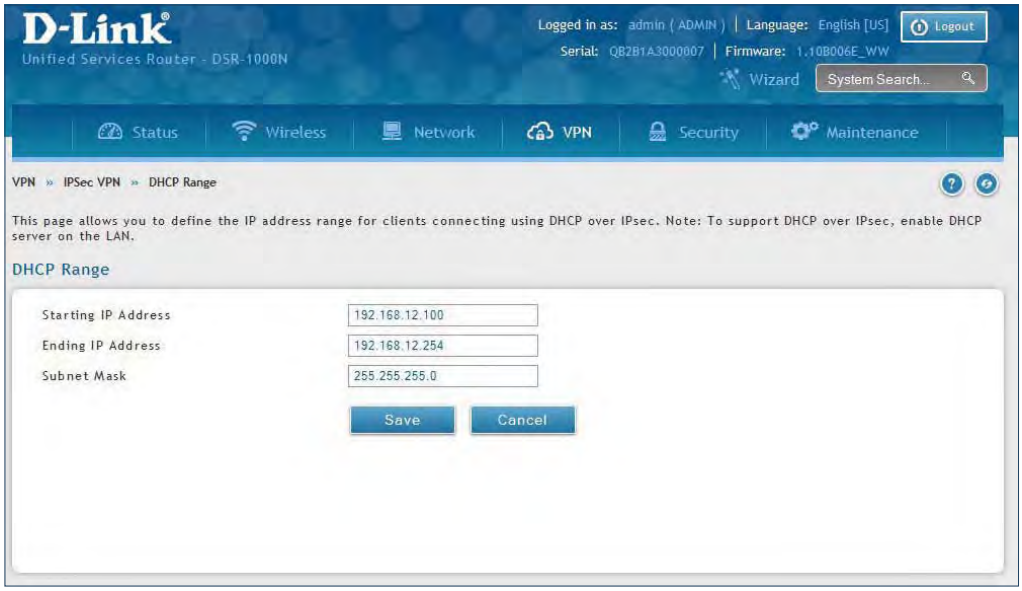
3. Enter a domain name and click **Save**.

DHCP Range

This page displays the IP range to be assigned to clients connecting using DHCP over IPsec. By default the range is in 192.168.12.0 subnet.

To configure the *DHCP over IPSec* DHCP server settings:

1. Click **VPN** > **IPSec VPN** > **DHCP Range**.



2. Complete the fields in the table below and click **Save**.

Field	Description
Starting IP Address	Enter the starting IP address to issue your clients connecting using DHCP over IPSec.
Ending IP Address	Enter the ending IP address.
Subnet Mask	Enter the subnet mask.
Save	Click **Save** to save and activate your settings.

Certificates

This router uses digital certificates for IPsec VPN authentication. You can obtain a digital certificate from a well-known Certificate Authority (CA) such as VeriSign, or generate and sign your own certificate using functionality available on this gateway.

The router comes with a self-signed certificate, and this can be replaced by one signed by a CA as per your networking requirements. A CA certificate provides strong assurance of the server's identity and is a requirement for most corporate network VPN solutions.

Trusted Certificates

The certificates menu allows you to view a list of certificates (both from a CA and self-signed) currently loaded on the router. The following certificate data is displayed in the list of Trusted (CA) certificates:

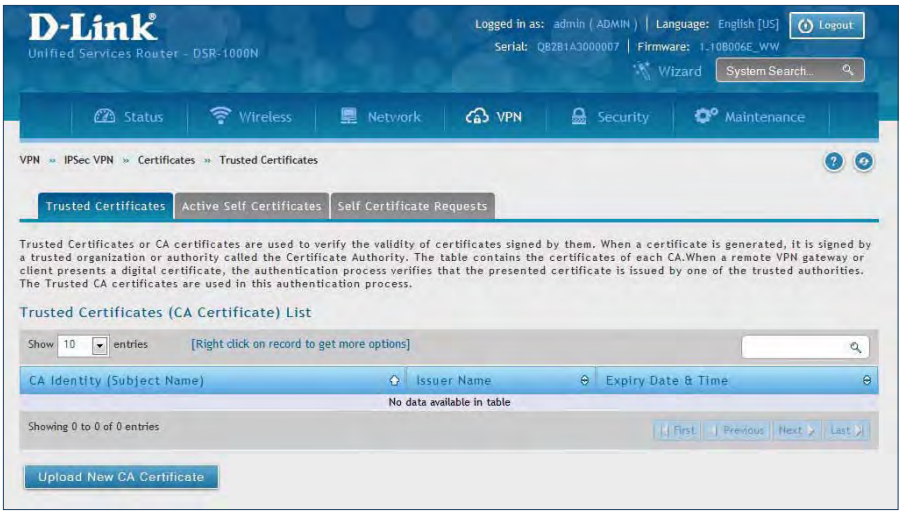
CA Identity (Subject Name): The certificate is issued to this person or organization

Issuer Name: This is the CA name that issued this certificate

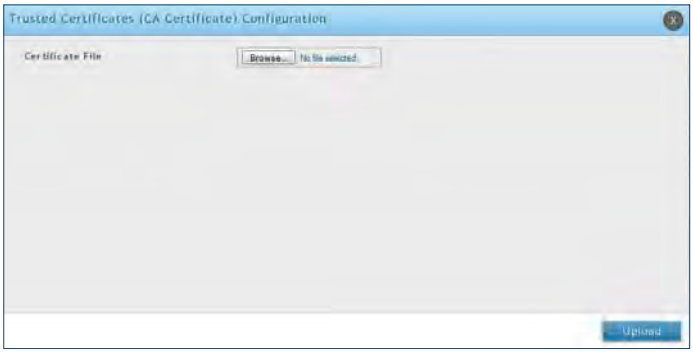
Expiry Time: The date after which this Trusted certificate becomes invalid

To upload a certificate:

1. Click **VPN** > **IPSec VPN** > **Certificate** > **Trusted Certificates** tab.



2. Click the **Browse** button. Locate your certificate and click **Open**.
3. Click **Upload**.



Active Self Certificates

A self certificate is a certificate issued by a CA identifying your device (or self-signed if you don't want the identity protection of a CA). The Active Self Certificate table lists the self certificates currently loaded on the router. The following information is displayed for each uploaded self certificate:

Name: The name you use to identify this certificate, it is not displayed to IPsec VPN peers.

Subject Name: This is the name that will be displayed as the owner of this certificate. This should be your official registered or company name, as IPsec or SSL VPN peers are shown this field.

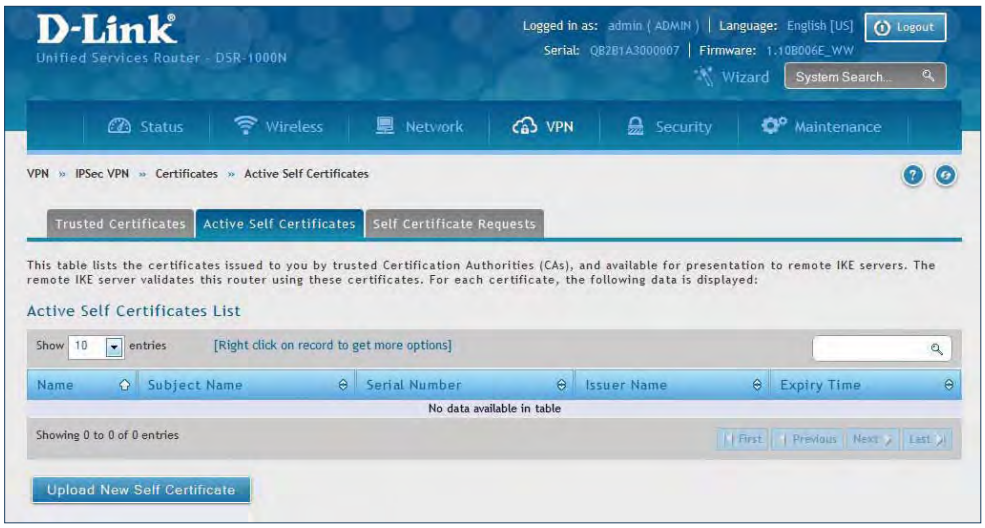
Serial Number: The serial number is maintained by the CA and used to identify this signed certificate.

Issuer Name: This is the CA name that issued (signed) this certificate

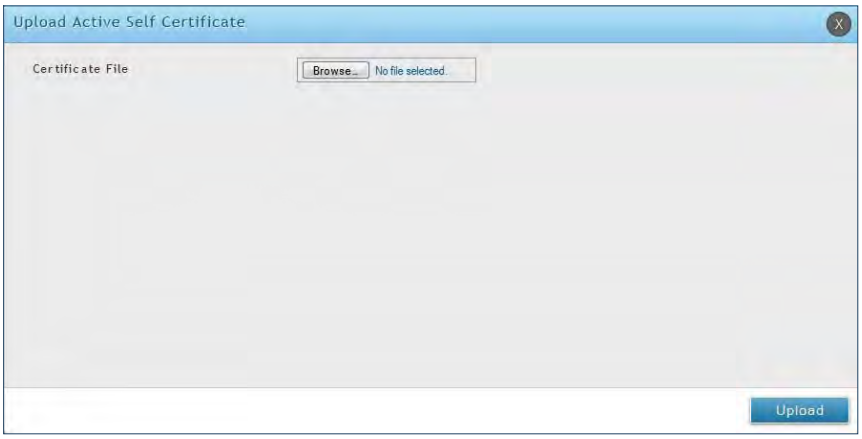
Expiry Time: The date after which this signed certificate becomes invalid. You should renew the certificate before it expires.

To upload a certificate:

1. Click **VPN** > **IPSec VPN** > **Certificate** > **Active Self Certificates** tab.



2. Click the **Browse** button. Locate your certificate and click **Open**.
3. Click **Upload**.

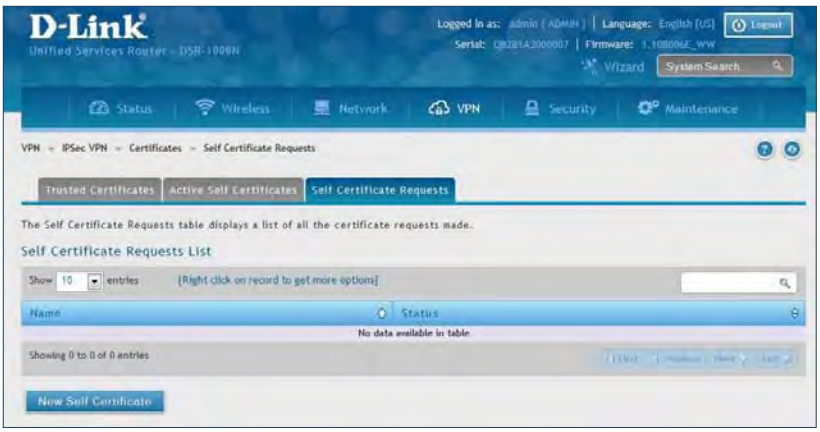


Self Certificate Requests

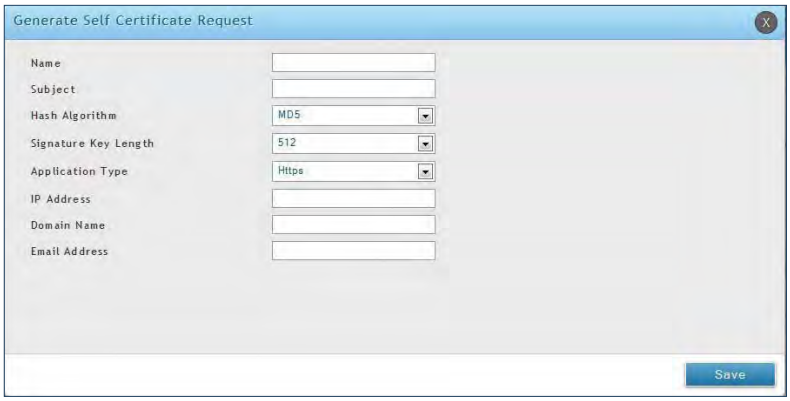
To request a self certificate to be signed by a CA, you can generate a Certificate Signing Request from the router by entering identification parameters and passing it along to the CA for signing. Once signed, the CA's Trusted Certificate and signed certificate from the CA are uploaded to activate the self -certificate validating the identity of this gateway. The self certificate is then used in IPsec and SSL connections with peers to validate the gateway's authenticity.

To generate a certificate signing request:

1. Click **VPN** > **IPSec VPN** > **Certificates** > **Self Certificate Requests**.



2. Click **New Self Certificate**.
3. Complete the fields in the table below and click **Save**.

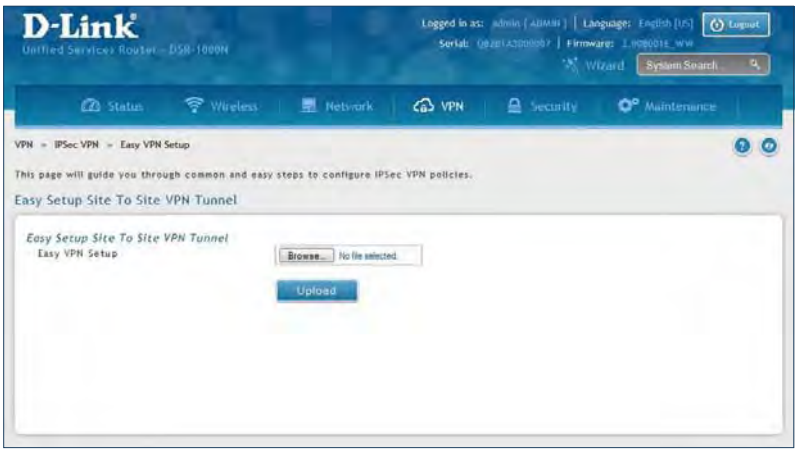


Field	Description
Name	Enter a name (identifier) for the certificate.
Subject	This field will populate the CN (Common Name) entry of the generated certificate. Subject names are usually defined in the following format: CN=<device name>, OU=<department>, O=<organization>, L=<city>, ST=<state>, C=<country>. For example: CN=router1, OU=my_company, O=mydept, L=SFO, C=US.
Hash Algorithm	Select the algorithm from the drop-down menu. Select either **MD5** or **SHA-1**.
Signature Key Length	Select the signature key length from the drop-down menu. Select either **512**, **1024**, or **2048**
Application Type	Select the application type from the drop-down menu. Select either **HTTPS** or **IPSec**.
IP Address	Enter an IP address (optional).
Domain Name	Enter a domain name (optional).
Email Address	Enter your email address.
Save	Click **Save** to save and activate your settings.

Easy VPN Setup

To upload an exported IPSec VPN policy:

1. Click **VPN** > **IPSec VPN** > **Easy VPN Setup**.
2. Click **Browse** and navigate to the policy file you want to upload. Select it and click **Open**.
3. Click Upload.



4. Once uploaded, go to **VPN** > **IPSec VPN** > **Policies** and the loaded VPN will be listed. Right-click it to edit or delete.

PPTP VPN
Server

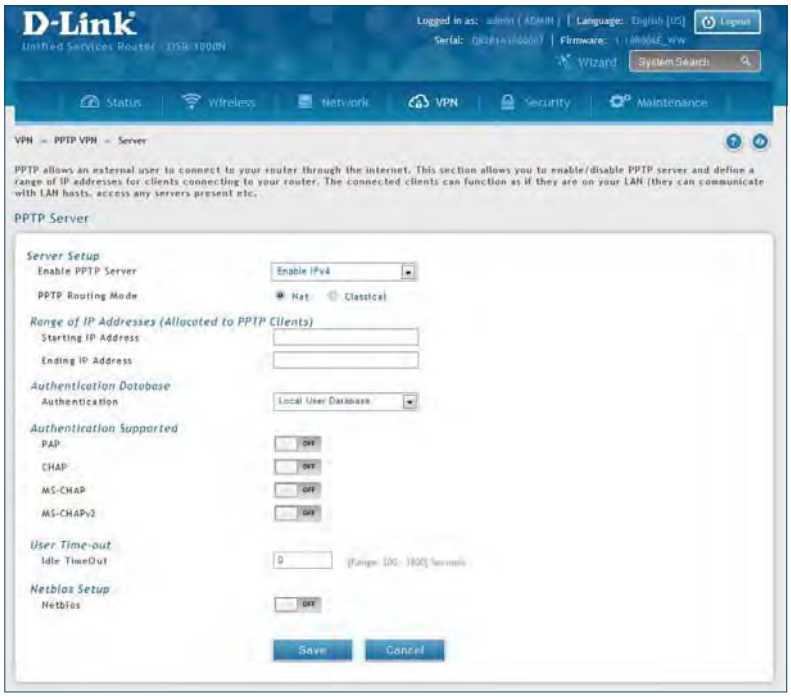
Path: VPN > PPTP VPN > Server

A PPTP VPN can be established through this router. Once enabled a PPTP server is available on the router for LAN and WAN PPTP client users to access. Once the PPTP server is enabled, PPTP clients that are within the range of configured IP addresses of allowed clients can reach the router's PPTP server. Once authenticated by the PPTP server (the tunnel endpoint), PPTP clients have access to the network managed by the router.

The range of IP addresses allocated to PPTP clients can coincide with the LAN subnet. As well the PPTP server will default to local PPTP user authentication, but can be configured to employ an external authentication server should one be configured.

To create a PPTP VPN server:

1. Click **VPN** > **PPTP VPN** > **Server**.
2. Complete the fields in the table below and click **Save**.



Field	Description
Enable PPTP Server	Select either **IPv4** or **IPv6**.
PPTP Routing Mode	Select either **NAT** or **Classical**.
Starting/Ending IP Address	Enter the IP address range to assign your PPTP clients.
IPv6 Prefix	If you selected IPv6, enter the IPv6 prefix.
IPv6 Prefix Length	If you selected IPv6, enter the IPv6 prefix length.
Authentication	Select the authentication type from the drop-down menu.
Authentication Supported	Toggle which type of authentication you want to enable to **ON**.
Idle TimeOut	Enter the amount of time in seconds that the connection will disconnect when idle.
NetBIOS	Toggle to **ON** to allow NetBIOS broadcasts to travel over the VPN tunnel.
Save	Click to save your settings.

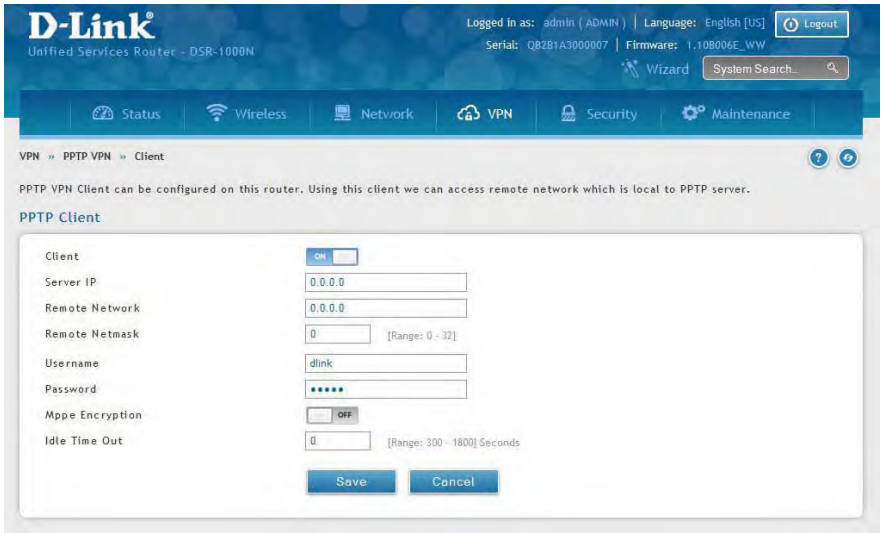
Client

Path: VPN > PPTP VPN > Client

PPTP VPN Client can be configured on this router. Using this client you can access remote network which is local to PPTP server. Once client is enabled, the user can access Status > Active VPNs page and establish PPTP VPN tunnel clicking Connect.

To configure the router as a PPTP VPN client:

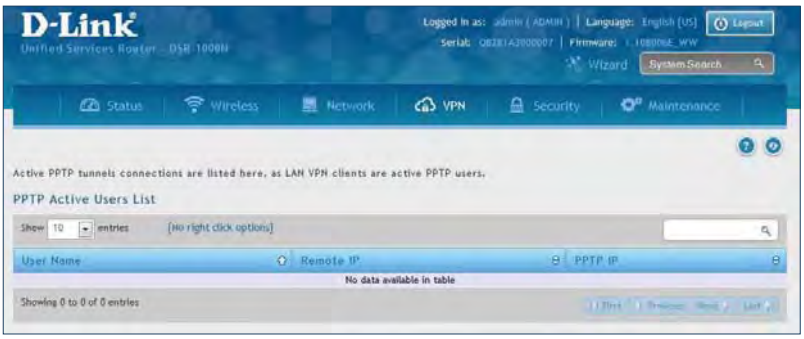
1. Click **VPN** > **PPTP VPN** > **Client** tab.
2. Toggle *Client* to **ON** and complete the fields in the table below.



Field	Description
Client	Toggle to **ON** to enable PPTP client.
Server IP	Enter the IP address of the PPTP server you want to connect to.
Remote Network	Enter the remote network address. This address is local for the PPTP Server.
Remote Netmask	Enter the remote network subnet mask.
Username	Enter your PPTP user name.
Password	Enter your PPTP password.
MPPE Encryption	Toggle to ON to enable Microsoft Point-to-Point Encryption (MPPE).
Idle Time Out	Enter the amount of time (in seconds) that you will disconnect from the PPTP server when idle.
Save	Click **Save** to save and activate your settings.

PPTP Active Users List

A list of PPTP connections will be displayed on this page. Right-click the connection to connect and disconnect.



L2TP VPN
Server

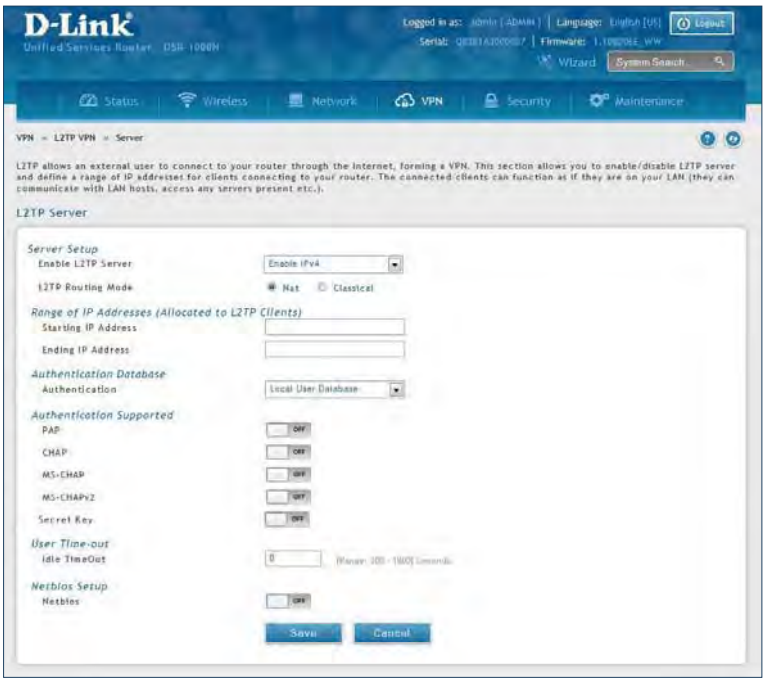
Path: VPN > L2TP VPN > Server

A L2TP VPN can be established through this router. Once enabled a L2TP server is available on the router for LAN and WAN L2TP client users to access. Once the L2TP server is enabled, PPTP clients that are within the range of configured IP addresses of allowed clients can reach the router's L2TP server. Once authenticated by the L2TP server (the tunnel endpoint), L2TP clients have access to the network managed by the router.

The range of IP addresses allocated to L2TP clients can coincide with the LAN subnet. As well the L2TP server will default to local L2TP user authentication, but can be configured to employ an external authentication server should one be configured.

To create a L2TP VPN server:

1. Click **VPN** >**L2TP VPN** > **Server**.
2. Complete the fields in the table below and click **Save**.



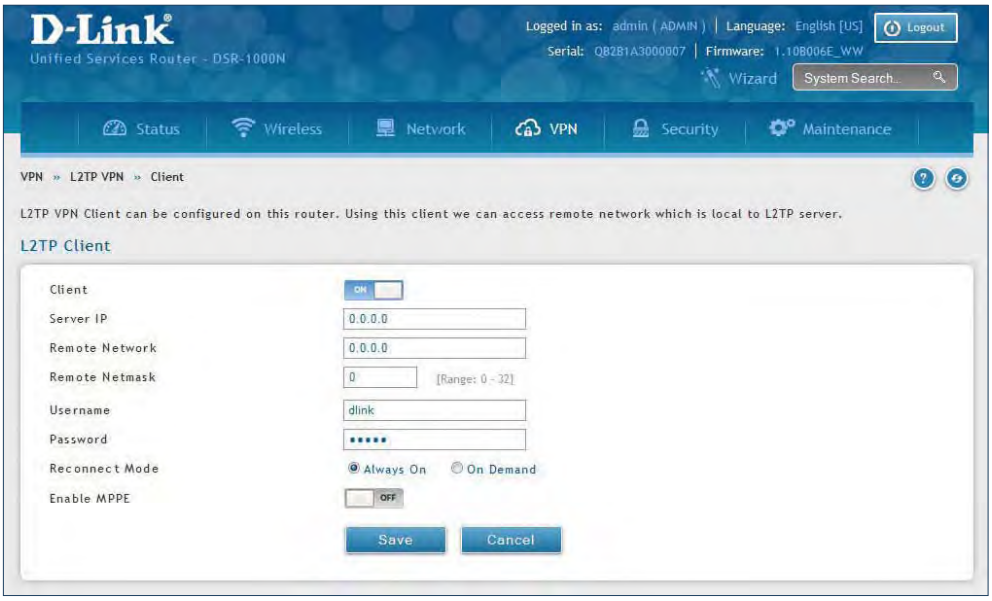
Field	Description
Enable L2TP Server	Select either **IPv4** or **IPv6**.
L2TP Routing Mode	Select either **NAT** or **Classical**.
Starting/Ending IP Address	Enter the IP address range to assign your L2TP clients.
IPv6 Prefix	If you selected IPv6, enter the IPv6 prefix.
IPv6 Prefix Length	If you selected IPv6, enter the IPv6 prefix length.
Authentication	Select the authentication type from the drop-down menu.
Authentication Supported	Toggle which type of authentication you want to enable to **ON**.
Idle TimeOut	Enter the amount of time in seconds that the connection will disconnect when idle.
NetBIOS	Toggle to **ON** to allow NetBIOS broadcasts to travel over the VPN tunnel.
Save	Click to save your settings.

Client

L2TP VPN Client can be configured on this router. Using this client we can access remote network which is local to L2TP server. Once client is enabled, the user can access Status > Active VPNs page and establish L2TP VPN tunnel clicking Connect.

To configure the router as a L2TP VPN client:

1. Click **VPN** > **L2TP VPN** > **Client** tab.
2. Toggle *Client* to **ON** and complete the fields in the table below.



Field	Description
Client	Toggle to **ON** to enable L2TP client.
Server IP	Enter the IP address of the L2TP server you want to connect to.
Remote Network	Enter the remote network address. This address is local for the L2TP Server.
Remote Netmask	Enter the remote network subnet mask.
Username	Enter your L2TP user name.
Password	Enter your L2TP password.
Reconnect Mode	Select **Always On** or **On Demand**.
MPPE Encryption	Toggle to **ON** to enable Microsoft Point-to-Point Encryption (MPPE).
Save	Click **Save** to save and activate your settings.

L2TP Active Users List

A list of L2TP connections will be displayed on this page. Right-click the connection to connect and disconnect.

SSL VPN

Server Policies

SSL VPN Policies can be created on a Global, Group, or User level. User level policies take precedence over Group level policies and Group level policies take precedence over Global policies. These policies can be applied to a specific network resource, IP address, or IP ranges on the LAN, or to different SSL VPN services supported by the router. The *List of Available Policies* can be filtered based on whether it applies to a user, group, or all users (global).

To add a SSL VPN policy, you must first assign it to a user, group, or make it global (i.e., applicable to all SSL VPN users). If the policy is for a group, the available configured groups are shown in a drop-down menu and one must be selected. Similarly, for a user-defined policy, a SSL VPN user must be chosen from the available list of configured users.

The next step is to define the policy details. The policy name is a unique identifier for this rule. The policy can be assigned to a specific Network Resource (details follow in the subsequent section), IP address, IP network, or all devices on the LAN of the router. Based on the selection of one of these four options, the appropriate configuration fields are required (i.e., choosing the network resources from a list of defined resources, or defining the IP addresses). For applying the policy to addresses the port range/port number can be defined.

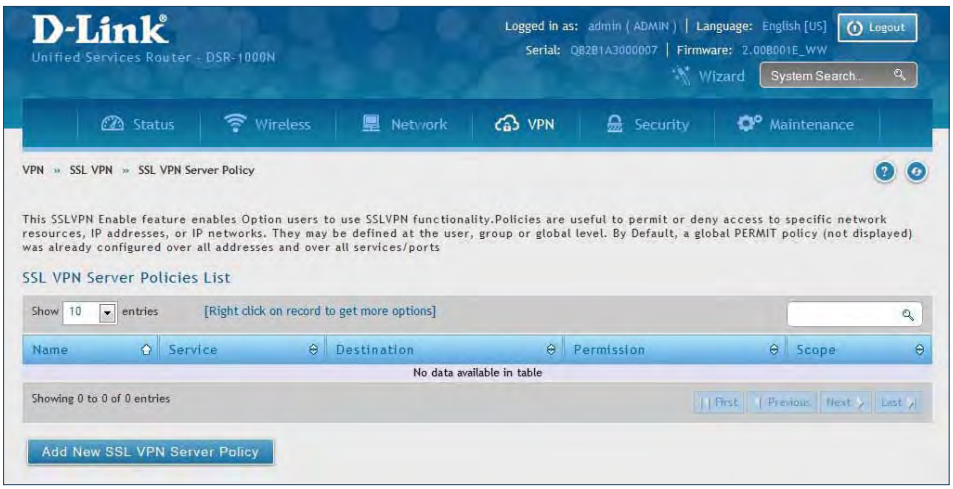
The final steps require the policy permission to be set to either permit or deny access to the selected addresses or network resources. As well the policy can be specified for one or all of the supported SSL VPN services (i.e. VPN tunnel).

Once defined, the policy goes into effect immediately. The policy name, SSL service it applies to, destination (network resource or IP addresses), and permission (deny/permit) is outlined in a list of configured policies for the router.

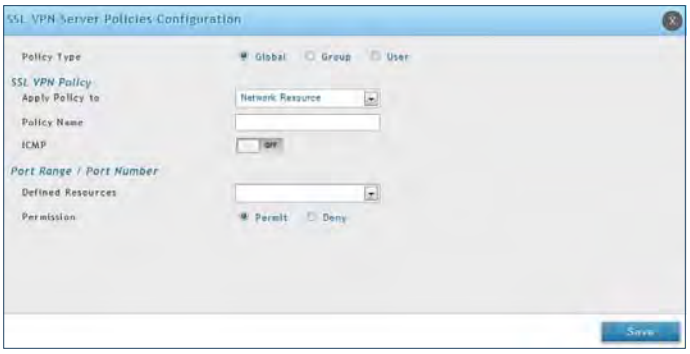
Note: You must enable Remote Management. Refer to "Remote Management" on page 172.

To create a new SSL VPN policy:

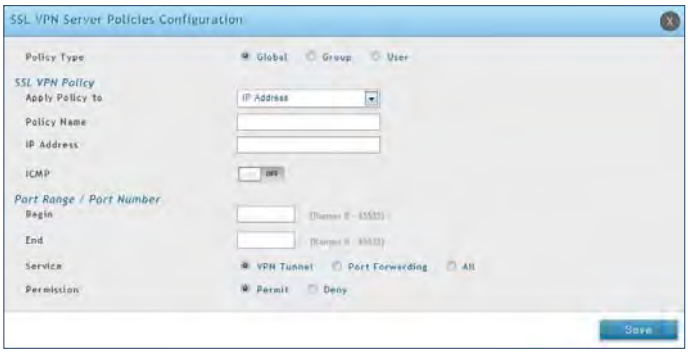
1. Make sure you have enabled remote management and have created user(s) and group(s) to assign to this policy.
2. Click **VPN** > **SSL VPN** > **SSL VPN Server Policy**.
3. Click **Add New SSL VPN Server Policy**.



4. Complete the fields from the table below and click **Save**.



Network Resource



IP Address

Field	Description
Policy Type	Select **Global**, **Group**, or **User**.
Available Groups/Users	If you selected Group, select a group from the drop-down menu. If you selected User, select a user from the drop-down menu.
Apply Policy To	Select **Network Resource**, **IP Address**, **IP Network**, or **All Addresses**.
Policy Name	Enter a unique name for this policy.
IP Address	If you selected **IP Address** or **IP Network**, enter the IP address.
Mask Length	If you selected **IP Network**, enter the mask length (0-32).
ICMP	Toggle to **ON** to include ICMP traffic.
Begin/End	Enter a port range or leave blank to include all TCP and UDP ports. These fields are not available when selecting Network Resource.
Defined Resources	If you selected Network Resource, select the resource for the *Defined Resource* drop-down menu. If you have not created a resource, refer to "Resources" on page 112 to create a defined resource.
Service	Select either **VPN Tunnel**, **Port Forwarding**, or **All**. This field is not available when selecting Network Resource.
Permission	Select either **Permit** or **Deny**.
Save	Click to save your settings.

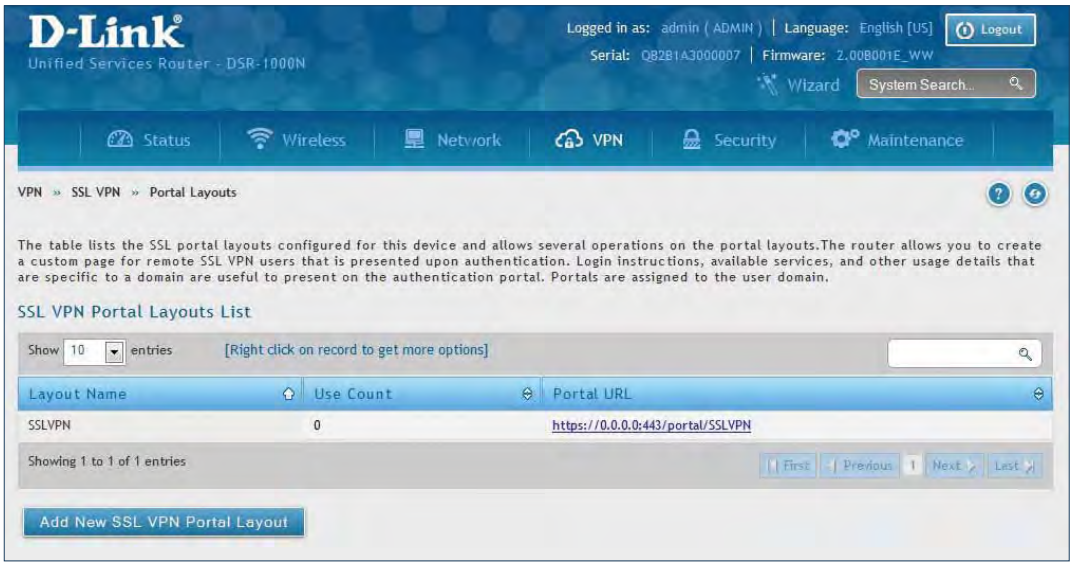
Portal Layouts

Path: VPN > SSL VPN > Portal Layouts

You may create a custom page for remote VPN users that is viewed during authentication. You may include login instructions, services, and other details. Note that the default portal LAN IP address is https://192.168.10.1/scgi-bin/userPortal/portal. This is the same page that opens when the "User Portal" link is clicked on the SSL VPN menu of the router web UI.

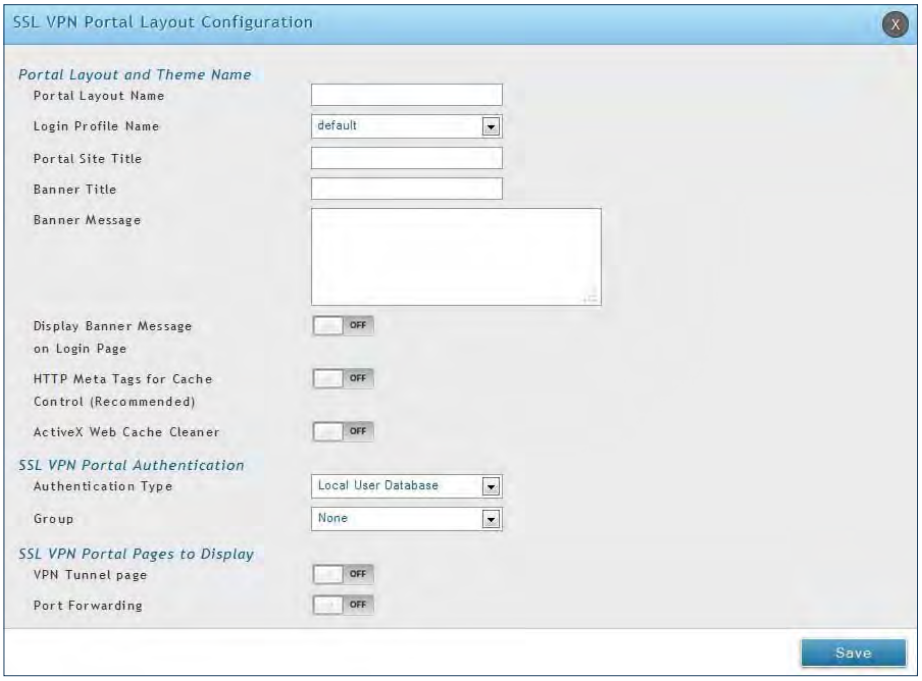
To create a new portal layout:

1. Click **VPN** > **SSL VPN** > **Portal Layouts**.
2. Click **Add New SSL VPN Portal Layout**.



Note: *You may right-click a layout from the list and edit or delete a layout.*

3. Complete the fields from the table on the next page and click **Save**.



Field	Description
Portal Layout Name	Enter a name for this portal. This name will be used as part of the path for the SSL portal URL. Only alphanumeric characters are allowed for this field.
Login Profile View	Select a login profile from the drop-down menu.
Portal Site Title	Enter the portal web browser window title that appears when the client accesses this portal. This field is optional.
Banner Title	The banner title that is displayed to SSL VPN clients prior to login. This field is optional.
Banner Message	Enter a message you want to display.
Display Banner Message on Login Page	Toggle to **ON** to display the banner title and message or **OFF** to hide the banner title and message.
HTTP Meta Tags for Cache Control	Toggle to **ON** or **OFF**. This security feature prevents expired web pages and data from being stored in the client's web browser cache. It is recommended to toggle to ON.
Active X Web Cache Cleaner	Toggle to **ON** or **Off**. An ActiveX cache control web cleaner can be pushed from the gateway to the client browser whenever users login to this SSL VPN portal.
Authentication Type	Select the type of authentication from the drop-down menu.
Group	Select what group to include from the drop-down menu.
VPN Tunnel Page	Toggle to **ON** to allow remote users to view this page.
Port Forwarding	Toggle to **ON** to allow remote users to view this page.
Save	Click to save your settings.

Resources

Path: VPN > SSL VPN > Resources

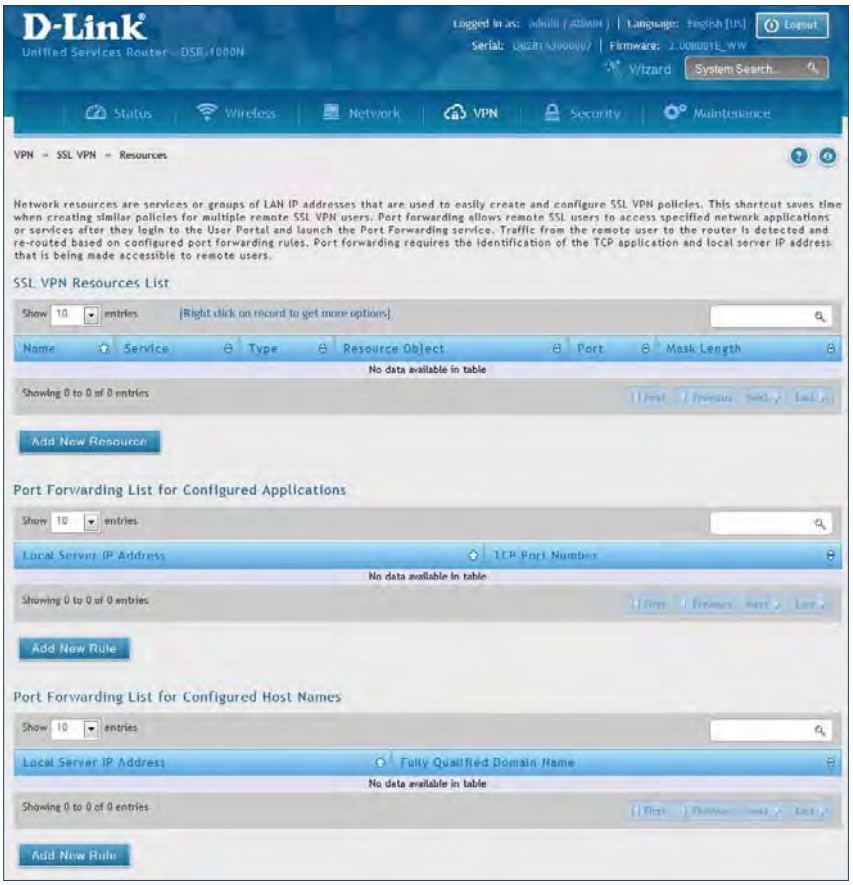
Network resources are services or groups of LAN IP addresses that are used to easily create and configure SSL VPN policies. This shortcut saves time when creating similar policies for multiple remote SSL VPN users.

Adding a Network Resource involves creating a unique name to identify the resource and assigning it to one or all of the supported SSL services. Once this is done, editing one of the created network resources allows you to configure the object type (either IP address or IP range) associated with the service. The Network Address, Mask Length, and Port Range/Port Number can all be defined for this resource as required.

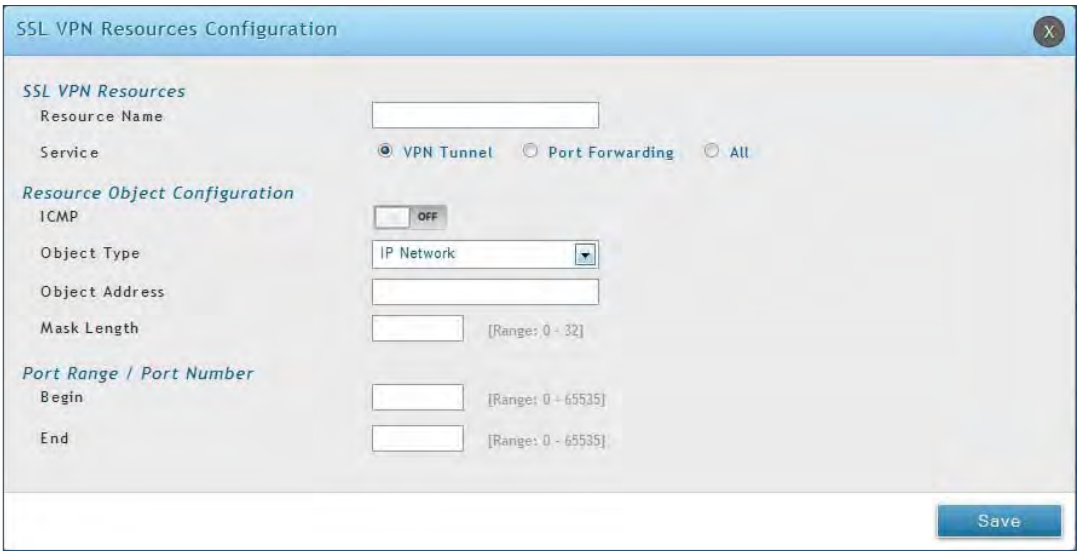
Add New Resource

To add a new resource:

1. Click **VPN** > **SSL VPN** > **Resources**.
2. Click **Add New Resource**.



3. Complete the fields from the table on the next page and click **Save**.



Field	Description
Resource Name	Enter a unique name for this resource.
Service	Select **VPN Tunnel**, **Port Forwarding**, or **All**.
ICMP	Toggle to **ON** to include ICMP traffic.
Object Type	Select **Single IP Address** or **IP Network**.
Object Address	Enter the IP address.
Mask Length	If you selected IP Network, enter the mask length (0-32).
Begin/End	Enter a port range for the object.
Save	Click to save your settings.

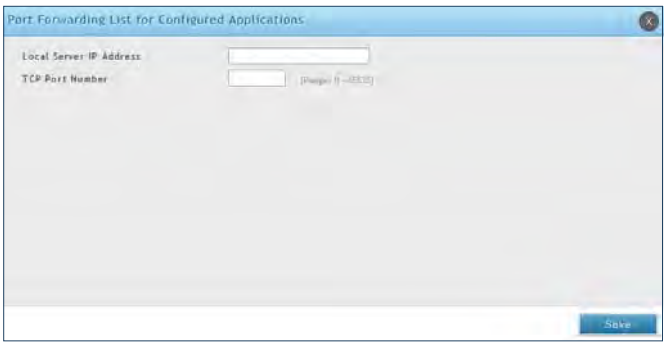
Port Forwarding

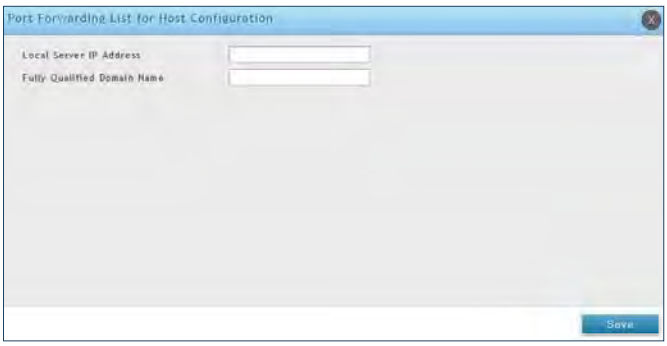
Port forwarding allows remote SSL users to access specified network applications or services after they login to the User Portal and launch the Port Forwarding service. Traffic from the remote user to the router is detected and re-routed based on configured port forwarding rules.

Internal host servers or TCP applications must be specified as being made accessible to remote users. Allowing access to a LAN server requires entering the local server IP address and TCP port number of the application to be tunnelled.

To add a port forwarding rule:

1. Click **VPN** > **SSL VPN** > **Resources**.
2. Click **Add New Rule** under either *Port Forwarding List for Configured Applications* (TCP Port) or under *Port Forwarding List for Configured Host Names* (FQDN).
3. Enter the IP address of the local server.
4. Next enter either the TCP port number or the domain name (FQDN).
5. Click **Save**.





Client

Path: VPN > SSL VPN > SSL VPN Client

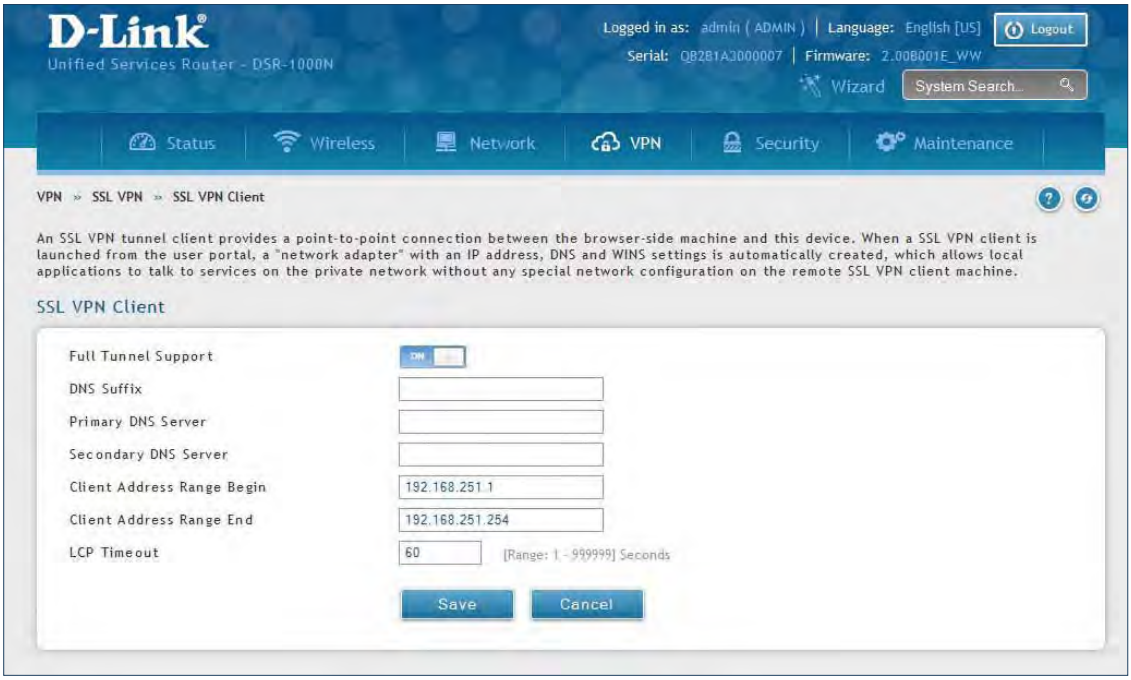
An SSL VPN tunnel client provides a point-to-point connection between the browser-side machine and this router. When a SSL VPN client is launched from the user portal, a "network adapter" with an IP address from the corporate subnet, DNS and WINS settings is automatically created. This allows local applications to access services on the private network without any special network configuration on the remote SSL VPN client machine.

It is important to ensure that the virtual (PPP) interface address of the VPN tunnel client does not conflict with physical devices on the LAN. The IP address range for the SSL VPN virtual network adapter should be either in a different subnet or non-overlapping range as the corporate LAN.

The router allows full tunnel and split tunnel support. Full tunnel mode just sends all traffic from the client across the VPN tunnel to the router. Split tunnel mode only sends traffic to the private LAN based on pre-specified client routes. These client routes give the SSL client access to specific private networks, thereby allowing access control over specific LAN services.

To configure client mode:

1. Click **VPN** > **SSL VPN** > **SSL VPN Client**.



2. Toggle *Full Tunnel Support* to **ON** to support full tunnel or **OFF** to enable split tunnel.
3. Enter a DNS suffix to assign to this client (optional).
3. Enter a primary and secondary DNS server addresses (optional).
4. Enter the range of IP addresses clients will be assigned (DHCP).
5. Next to *LCP Timeout*, set the value for LCP echo interval (in seconds).
6. Click **Save**.

Client Routes

Path: VPN > SSL VPN > SSL VPN Client

If the SSL VPN client is assigned an IP address in a different subnet than the corporate network, a client route must be added to allow access to the private LAN through the VPN tunnel. As well a static route on the private LAN's firewall (typically this router) is needed to forward private traffic through the VPN Firewall to the remote SSL VPN client.

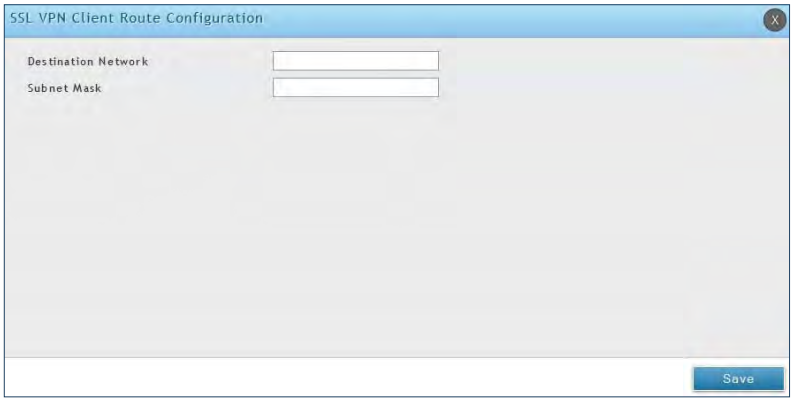
When split tunnel mode is enabled, the user is required to configure routes for VPN tunnel clients:

- Destination network: The network address of the LAN or the subnet information of the destination network from the VPN tunnel clients' perspective is set here.
- Subnet mask: The subnet information of the destination network is set here.

To configure a client route:

1. Click **VPN** > **SSL VPN** > **Client Routes**.
2. Click **Add New Client Route**.

3. Enter the destination network and subnet mask.
4. Click **Save**.



Open VPN
Settings

VPN > OpenVPN > Settings

OpenVPN allows peers to authenticate each other using a pre-shared secret key, certificates, or username/ password. When used in a multiclient-server configuration, it allows the server to release an authentication certificate for every client, using signature and Certificate authority. An OpenVPN can be established through this router.

You can select server mode, client mode, or access server client mode. In access server client mode, the user has to download the auto login profile from the OpenVPN Access Server and upload the same to connect.

Server

To configure the router as an OpenVPN Server:

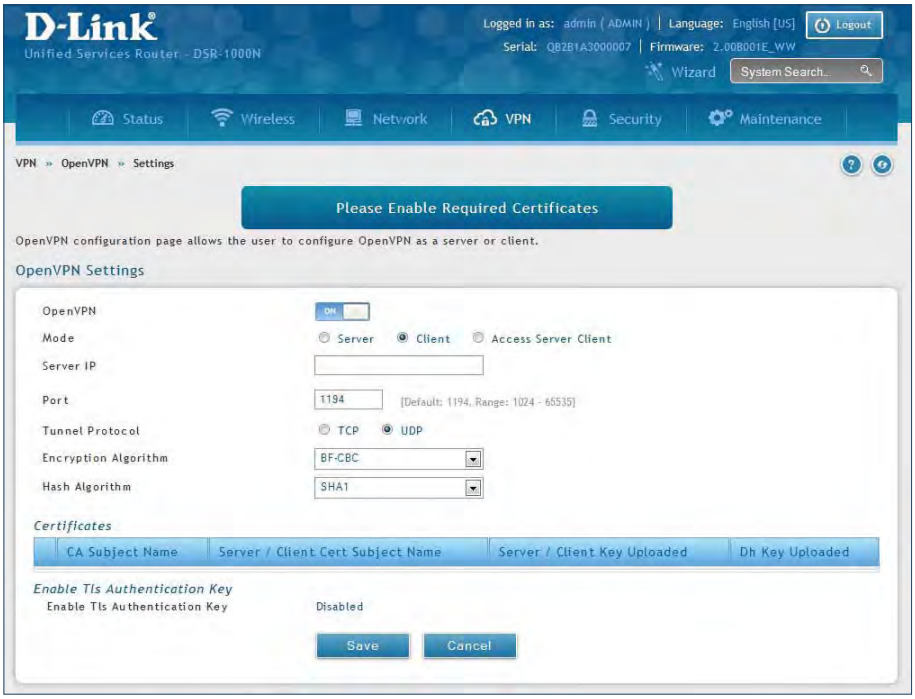
1. Click **VPN** > **OpenVPN** > **Settings**.
2. Toggle *OpenVPN* to **ON** and complete the fields in the table below.

Field	Description
Mode	Select **Server**.
VPN Network	Enter the IP network for the VPN.
VPN Netmask	Enter the netmask.
Port	Enter what port to use. The default port is 1194.
Tunnel Protocol	Select either **TCP** or **UDP**.
Encryption Algorithm	Select the encryption algorithm from the drop-down menu.
Hash Algorithm	Select the hash algorithm from the drop-down menu.
Tunnel Type	Select either **Full Tunnel** or **Split Tunnel**. Full Tunnel mode just sends all traffic from the client across the VPN tunnel to the router. Split Tunnel mode only sends traffic to the private LAN based on pre-specified client routes. If you select Split Tunnel, refer to "Local Networks" on page 120 to create local networks.
Save	Click **Save** to save and activate your settings.

Client

To configure the router as an OpenVPN client:

1. Click **VPN** > **OpenVPN** > **Settings**.
2. Toggle *OpenVPN* to **ON** and complete the fields in the table below.

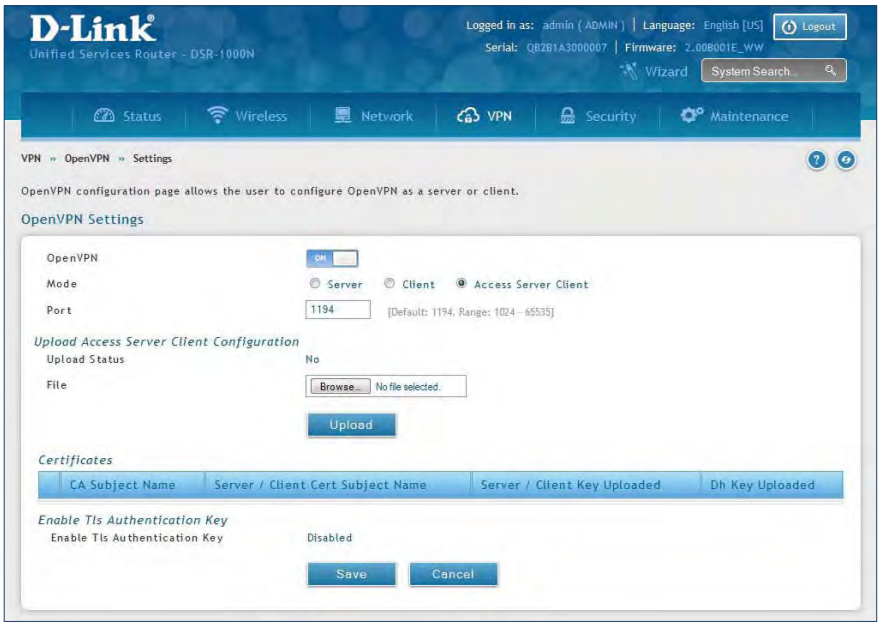


Field	Description
Mode	Select **Client**.
Server IP	Enter the IP address of the OpenVPN server.
Port	Enter what port to use. The default port is 1194.
Tunnel Protocol	Select either **TCP** or **UDP**.
Encryption Algorithm	Select the encryption algorithm from the drop-down menu.
Hash Algorithm	Select the hash algorithm from the drop-down menu.
Save	Click **Save** to save and activate your settings.

Access Server Client

To configure the router as an OpenVPN access server client:

1. Click **VPN** > **OpenVPN** > **Settings**.
2. Toggle *OpenVPN* to **ON** and complete the fields in the table below.



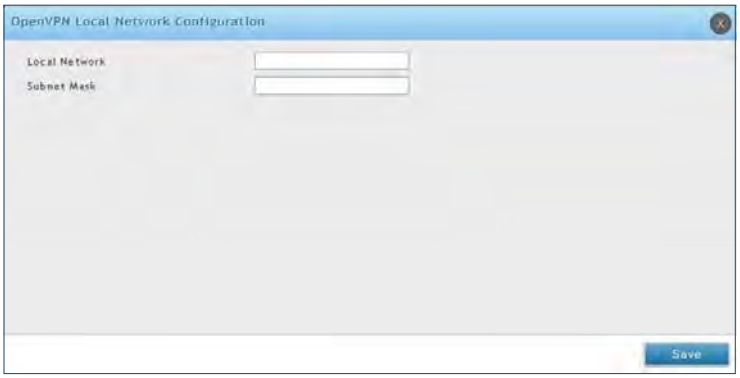
Field	Description
Mode	Select **Access Server Client**.
Port	Enter what port to use. The default port is 1194.
Upload Status	Displays if a configuration file has been uploaded.
File	Click **Browse** and locate the configuration file. Click **Open** and then click **Upload**.
Save	Click **Save** to save and activate your settings.

Local Networks

If you selected Split Tunnel (from OpenVPN Server), you can create a local network by following the steps below:

1. Click **VPN** > **OpenVPN** > **Local Networks**.
2. Click **Add New OpenVPN Local Network**.

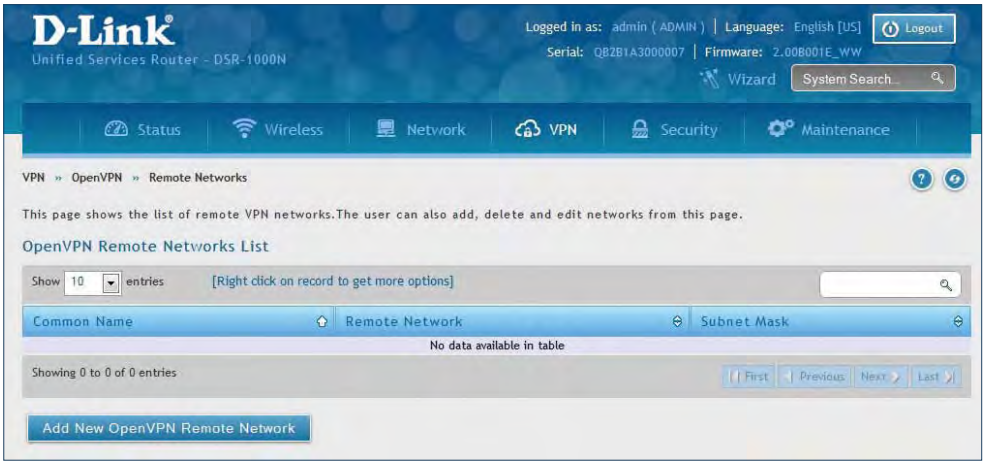
3. Enter a local IP network.
4. Enter the subnet mask.
5. Click **Save**.



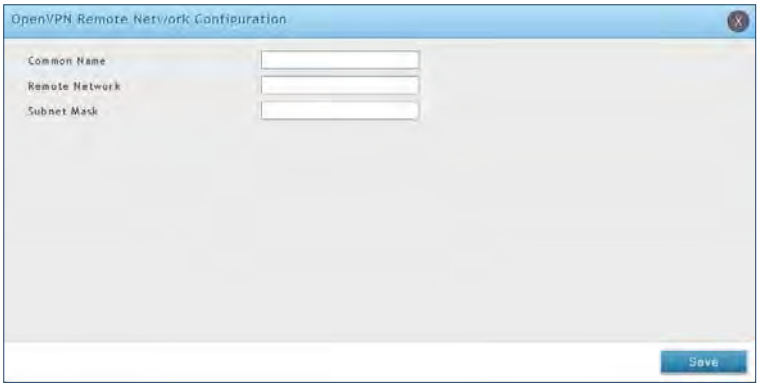
Remote Networks

To create remote networks:

1. Click **VPN** > **OpenVPN** > **Remote Networks**.
2. Click **Add New OpenVPN Remote Network**.

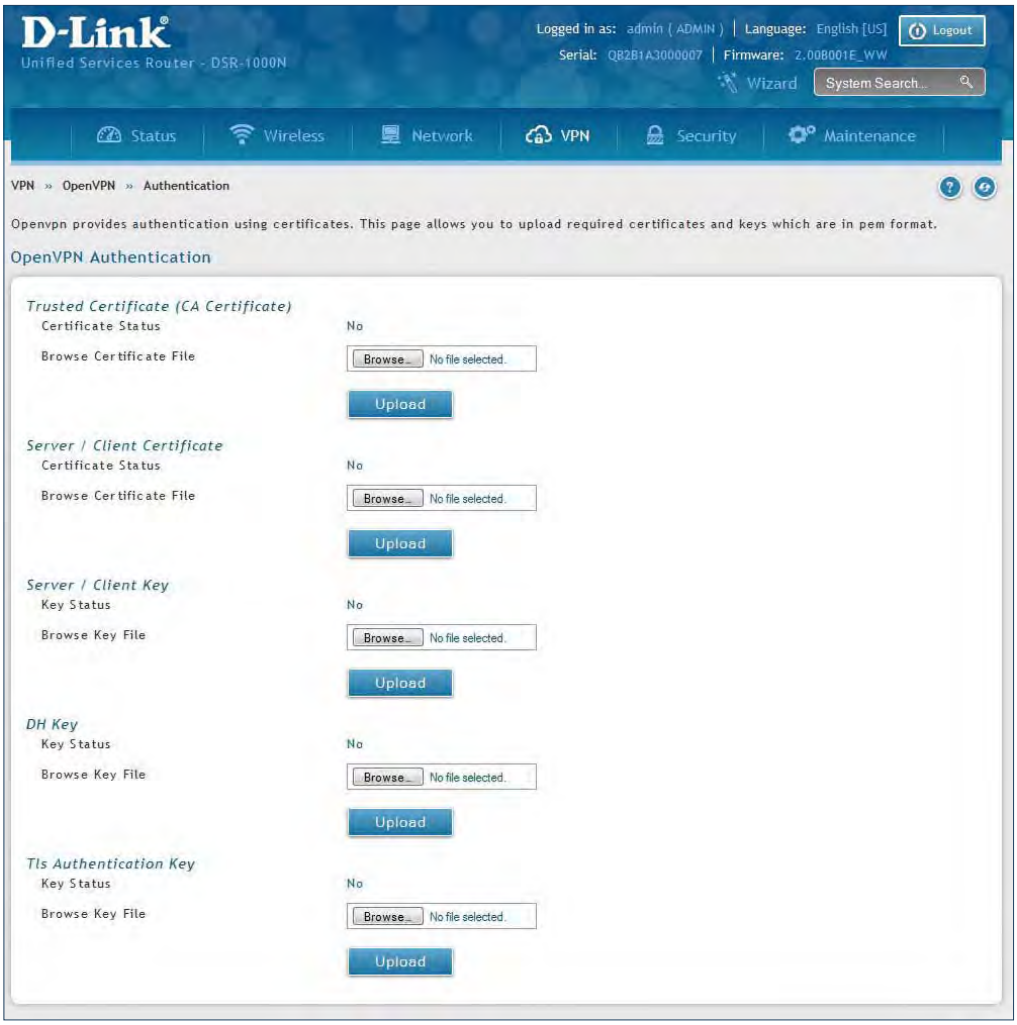


3. Enter a name of the remote network.
4. Enter a local IP network.
5. Enter the subnet mask.
6. Click **Save**.



Authentication

This page will allow you to upload certificates and keys. Click **Browse** and select the file you want to upload. Click **Open** and then click **Upload**.



GRE

VPN > VPN Settings > GRE

GRE tunnels allow for broadcast traffic on the LAN of the router to be passed over the internet and received by remote LAN hosts. This is primarily useful in the D-Link Discovery Protocol (DDP) application where broadcast traffic from one LAN host is to be received by all LAN hosts in the local subnets of the GRE endpoints.

Note the following limits for the number of supported GRE tunnels per product:

- DSR-150/150N: 5
- DSR-250/250N: 10
- DSR-500/500N: 15
- DSR-1000/1000N: 20

There are two simple steps involved in establishing a GRE tunnel on the router:

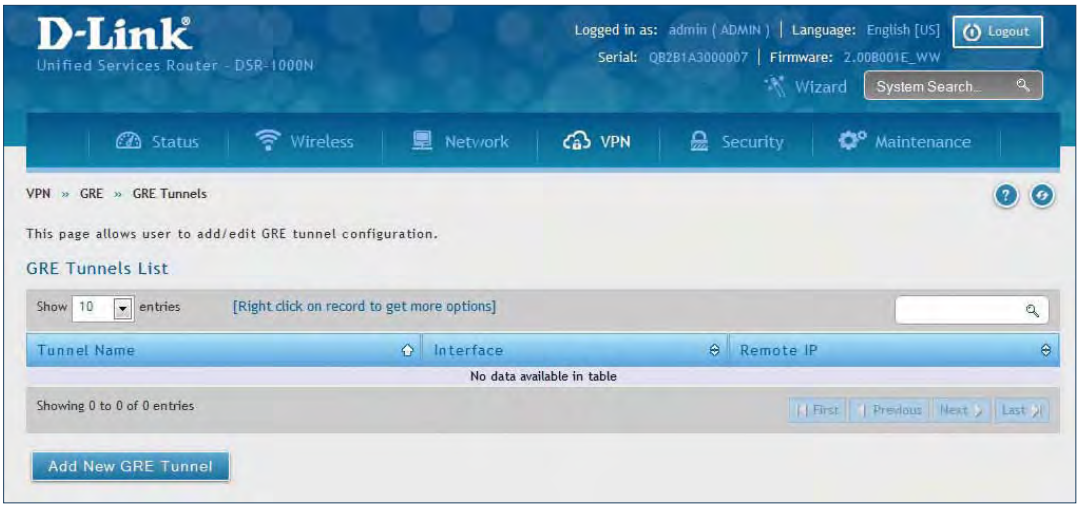
1. Create a GRE tunnel from the GUI
2. Setup a static route for the remote local networks using the GRE tunnel

When creating the GRE tunnel, the IP Address should be a unique address that identifies that GRE tunnel endpoint. It will be referenced in the other router's static route as the Gateway IP address. The Remote End Address in the GRE tunnel configuration page is the WAN IP address of the other endpoint router.

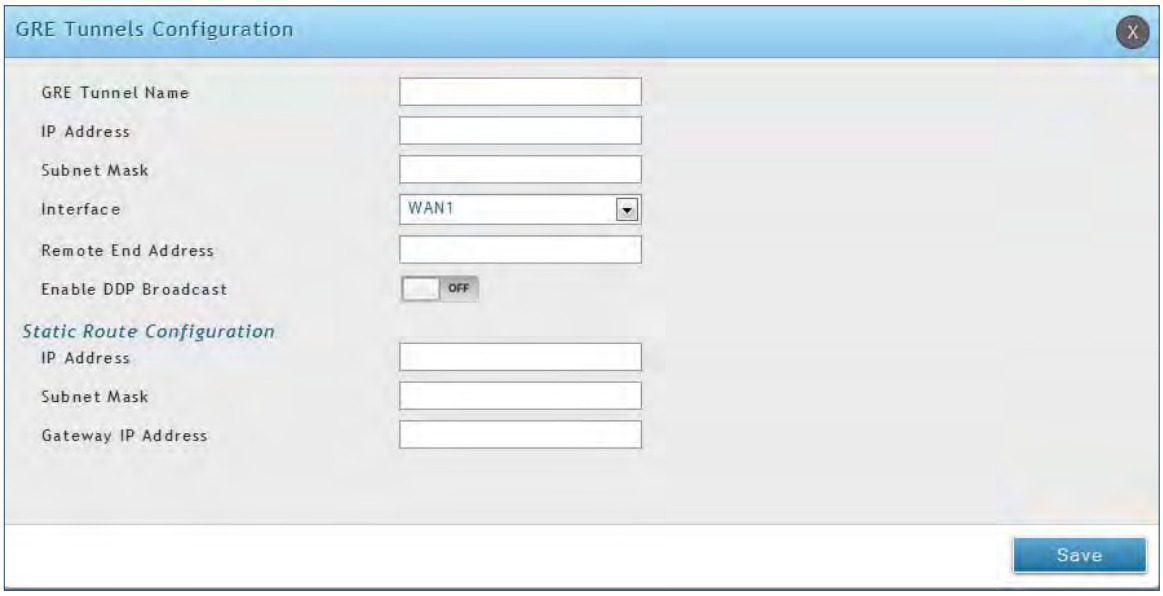
Once the tunnel is established, a static route on the router can be made using the interface set to the configured GRE tunnel name. The destination IP address of the static route is the remote LAN subnet, and the route's gateway IP address will be the GRE tunnel IP of the terminating router (the same router that manages the remote LAN subnet). Once these two steps are completed, all DDP broadcast traffic can flow between remote LAN subnets via the GRE Tunnel.

To create a GRE tunnel:

1. Click **VPN** > **GRE** > **GRE Tunnels**.
2. Click **Add New GRE Tunnel**.



3. Complete the fields in the table below and then click **Save**.



Field	Description
GRE Tunnel Name	Enter a name for the tunnel.
IP Address	Enter the IP address of this endpoint. It will be referenced in the other router's static route as the Gateway IP address.
Subnet Mask	Enter the subnet mask.
Interface	Select the interface to create this tunnel with from the drop-down menu.
Remote End Address	Enter the WAN IP address of the endpoint router.
Enable DDP Broadcast	Toggle to **ON** to enable DDP broadcasting.
IP Address	Enter the destination IP address of the static route from the remote LAN subnet.
Subnet Mask	Enter the subnet mask.
Gateway IP Address	Enter the IP address of the termination router.
Save	Click **Save** to save and activate your settings.

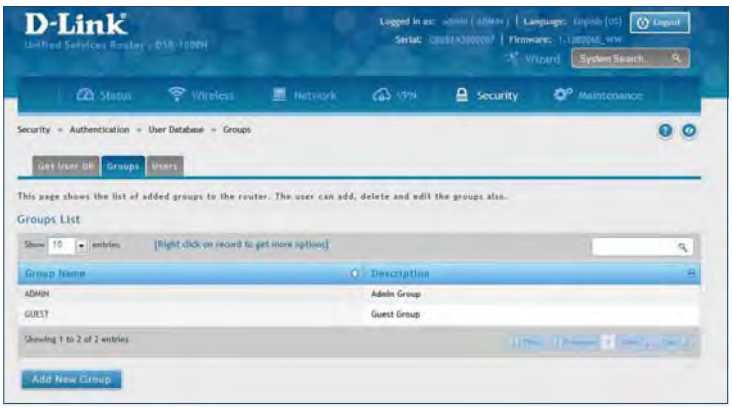
Security
Groups

Path: Security > Authentication > User Database > Groups

The group page allows creating, editing, and deleting groups. The groups are associated to set of user types.

To edit/delete an existing group, or add a new group:

1. Click **Security** > **Authentication** > **User Database** > **Groups** tab.



2. Right-click a group entry and select either **Edit** or **Delete**. To add a new group, click **Add New Group**.
3. Complete the fields in the table below and click **Save**.

Admin User Type

Network User Type

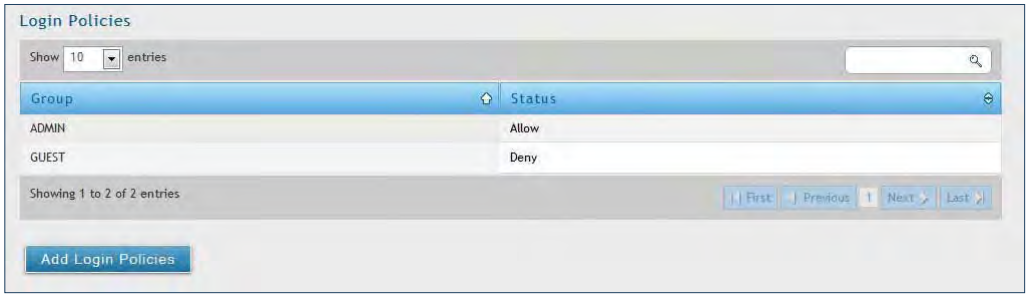
Field	Description
Group Name	Enter a name for the group.
Description	Enter a description for the group.
User Type	Select the user type: • Admin - Grants all users in this group super-user privileges. By default, there is one admin user. • Network - Grants the next level of privileges. • Front Desk - Grants permissions to create temporary users who can Internet/network access (Hotspot). • Guest - Guest users will only have read access. Network and Admin users can toggle **ON** PPTP, L2TP, Xauth (Network only), SSLVPN, and Captive Portal.
Idle Timeout	Enter the number of minutes of inactivity that must occur before the users in this user group are logged out of their web management session automatically. Entering an Idle Timeout value of 0 (zero) means never log out.
Save	Click **Save** at the bottom to save and activate your settings.

Login Policies

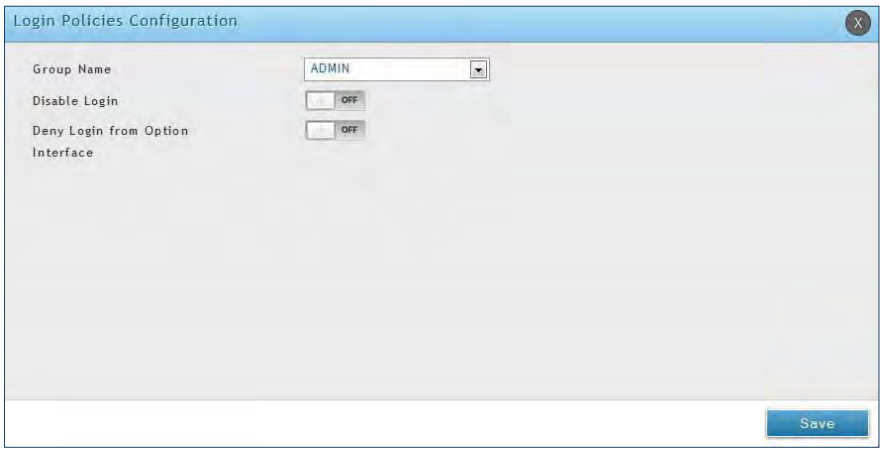
Path: Security > Authentication > Internal User Database > Groups

Using the following procedure, you can grant or deny a user group login access to the web management interface.

1. Click **Security** > **Authentication** > **Internal User Database** > **Groups** tab.



2. Click **Add Login Policies**.



3. Complete the fields from the table below and click **Save**.

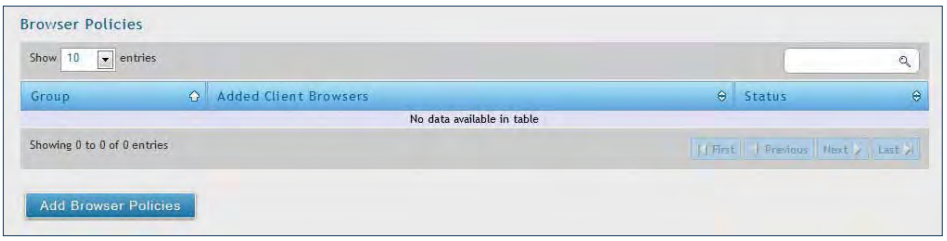
Field	Description
Group Name	Select the group you want to configure.
Disable Login	Toggle **ON** to deny login access to the web management interface for all users in this user group. Toggle **OFF** will allow users to log in.
Deny Login from Option Interface	Toggle **ON** to deny login access to the web management interface from the WAN2/DMZ Port for all users in this user group. Toggle **OFF** will allow users.
Save	Click **Save** at the bottom to save and activate your settings.

Browser Policies

Path: Security > Authentication > Internal User Database > Groups

Use this feature to allow or deny users in a selected group from using a particular web browser to log in to the router's web management interface.

1. Click **Security** > **Authentication** > **Internal User Database** > **Groups** tab.



2. Click **Add Browser Policies**.

3. Complete the fields from the table below and click **Save**.

Field	Description
Group Name	Select the group you want to configure from the drop-down menu.
Client Browser	Select a web browser from the drop-down menu.
Save	Click **Save** at the bottom to save and activate your settings.

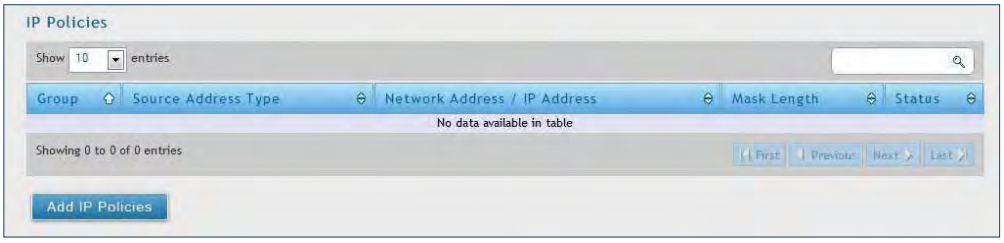
4. Your policy will now be in the browser policies list. By default the status will be set to deny. If you want to set the status to allow, right-click the policy and select **Allow**.

IP Policies

Path: Security > Authentication > Internal User Database > Groups

Use this feature to allow or deny users in a user group to log in to the router's web management interface from a particular network or IP address.

1. Click **Security** > **Authentication** > **Internal User Database** > **Groups** tab.



2. Click **Add IP Policies**.

3. Complete the fields from the table below and click **Save**.

Field	Description
Group Name	Select the group you want to configure from the drop-down menu.
Source Address Type	Select either **Network** to specify a IP network or **IP Address** to specify a specific IP address.
Network Address/IP Address	Enter the network address or IP address.
Mask Length	If you selected *Network*, enter the mask length.
Save	Click **Save** at the bottom to save and activate your settings.

Users

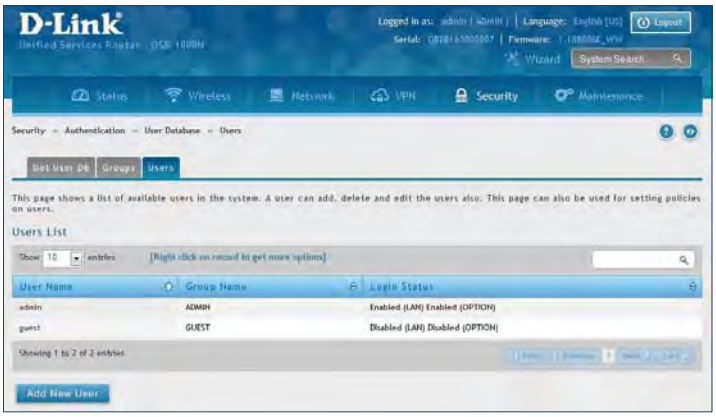
User Management

Path: Security > Authentication > Internal User Database > Users

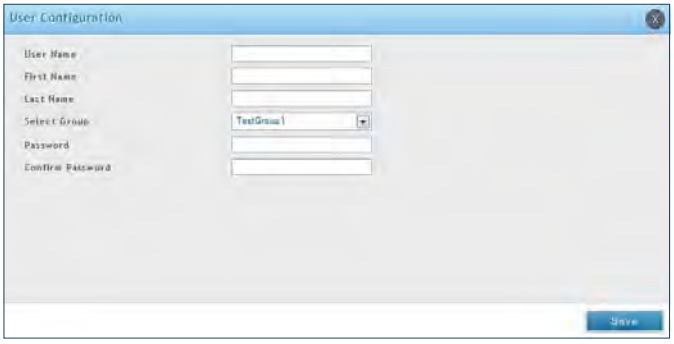
After you add user groups, you can add users to the user groups. Users can be added individually, or they can be imported from a comma-separated-value (CSV) formatted file. After you add users, you can edit them when changes are required or delete users when you no longer need them.

To edit/delete existing users, or add a new user:

1. Click **Security** > **Authentication** > **Internal User Database** > **Users** tab.



2. Right-click a group entry and select either **Edit** or **Delete**. To add a new group, click **Add New User**.



3. Complete the fields from the table below and click **Save**.

Field	Description
User Name	Enter the user name for this user. This name is a unique identifier
First Name	Enter the user's first name.
Last Name	Enter the user's last name.
Select Group	Select the group you want to assign this user to from the drop-down menu.
Password	Enter a case-sensitive login password that the user must specify at the login prompt to access the web management interface. For security, each typed password character is masked with a dot (•).
Confirm Password	Enter the password to confirm.
Save	Click **Save** at the bottom to save and activate your settings.

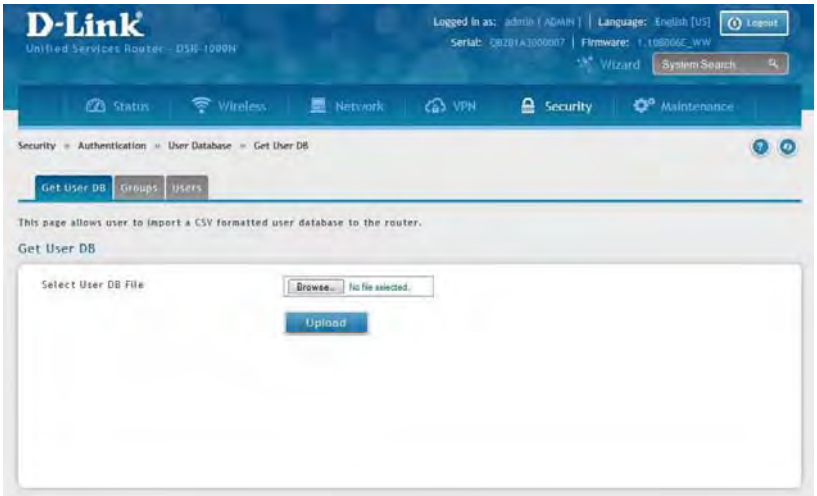
Import User Database

Path: Security > Authentication > Internal User Database > Get User DB

The DSR administrator can add users to the local built-in database directly via an appropriately-formatted comma separated value (CSV) file. The advantage of this feature is to allow for a large number of users to be added to the system with one operation, and the same file can be uploaded to multiple DSR devices as needed. Once uploaded the specific users in the local user database can be modified via the GUI as needed.

To import a user database:

1. Click **Security** > **Authentication** > **Internal User Database** > **Get User DB** tab.



2. Click **Browse** and locate the file you want to upload. Select it and click **Open**.
3. Click **Upload**.
4. Once completed, go to **Security** > **Authentication** > **User Database** > **Users** and your imported users will be displayed in the Users List.
5. From the list you can right-click the user to edit or delete.

Create a User Database (CSV File)

The following parameters must be used to define the User database CSV file.

1. Create an empty text file with a .csv extension.
2. Each line in the file corresponds to a single user entry. Every line should end with carriage return equivalent of CRLF. Do not add comments or other text in this file.
3. Formatting rules:
   a) All the fields must be enclosed within double quotes.
   b) Consecutive fields are separated by commas.
   c) There should be no leading or trailing spaces in a line.
   d) There should be no spaces between fields.

   Each line in the CSV user database file should follow the following format:

   "UserName","FirstName","LastName","GroupName","MultiLogin","Password"

   The above sample has fields that can assume the following values:

   - Username (text field): Name of the user and identifier in the DSR's database, and so it must be unique in the local user database.
   - FirstName (text field): This is a user detail and need not be unique.
   - LastName (text field): This is a user detail and need not be unique.
   - GroupName (text field): The group that is associated with this user.
   - MultiLogSup (Boolean value): With this enabled ("1"), then multiple users can share a single username and password.
   - Password (text field): password to assign for this username
   - The Group for a corresponding user ("GroupName" in the CSV) must be created via the GUI in advance of the User Database CSV upload action.
   - None of the above fields can be left empty or NULL in the User Database CSV.

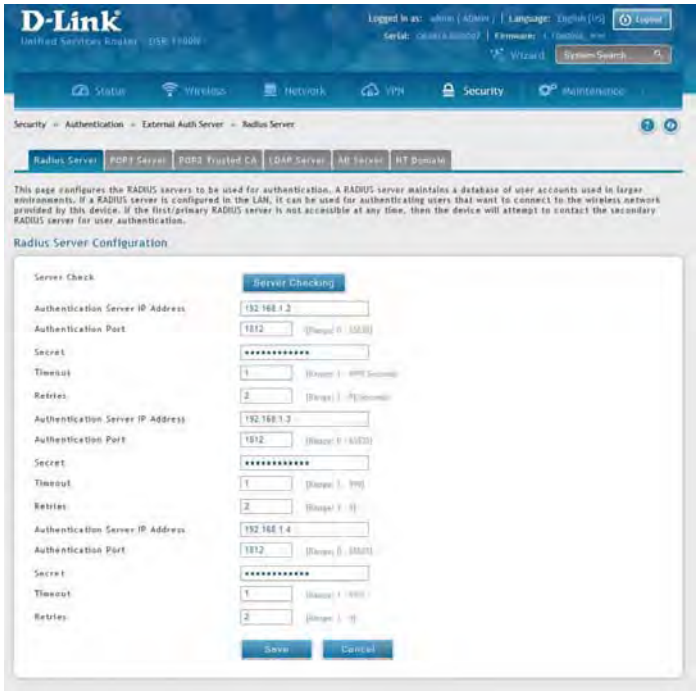
External Authentication Servers
RADIUS Server

Path: Security > Authentication > External Auth Server > RADIUS Server

A RADIUS server can be configured and accessible by the router to authenticate client connections.

To configure the router to connect to your RADIUS server:

1. Click **Security** > **Authentication** > **External Auth Server** > **RADIUS Server** tab.



2. Complete the RADIUS server information from the table below and click **Save**. You can configure up to three servers.

Field	Description
Authentication Server IP Address	Enter the IP address of your RADIUS server.
Authentication Port	Enter the RADIUS authentication server port.
Secret	Enter the secret key that allows the device to log into the configured RADIUS server. It must match the secret on RADIUS server.
Timeout	Set the amount of time in seconds that the router should wait for a response from the RADIUS server.
Retries	This determines the number of tries the controller will make to the RADIUS server before giving up.
Save	Click **Save** at the bottom to save and activate your settings.
Server Check	Click to test the connection(s) to your RADIUS Server(s).

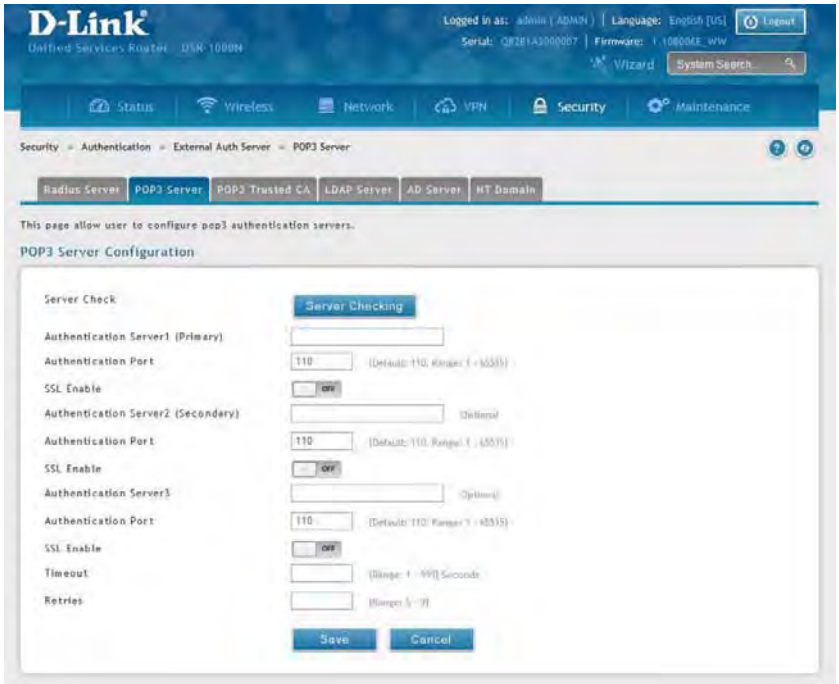
POP3 Server

Path: Security > Authentication > External Auth Server > POP3 Server

POP3 is an application layer protocol most commonly used for e-mail over a TCP/IP connection. The authentication server can be used with SSL encryption over port 995 to send encrypted traffic to the POP3 server. The POP3 server's certificate is verified by a user-uploaded CA certificate. If SSL encryption is not used, port 110 will be used for the POP3 authentication traffic.

To configure the router to connect to your POP3 server:

1. Click **Security** > **Authentication** > **External Auth Server** > **POP3 Server** tab.



2. Complete the POP3 server information from the table below and click **Save**. You can configure up to three servers.

Field	Description
Authentication Server IP Address	Enter the IP address of your POP3 server.
Authentication Port	Enter the POP3 authentication server port.
SSL Enable	Toggle to **ON** to enable SSL support for POP3. If this option is enabled, it is mandatory to select a certificate authority for it.
CA File	Certificate Authority to verify POP3 server's certificate.
Timeout	Set the amount of time in seconds that the router should wait for a response from the POP3 server.
Retries	This determines the number of tries the controller will make to the POP3 server before giving up.
Save	Click **Save** at the bottom to save and activate your settings.
Server Check	Click to test the connection(s) to your POP3 Server(s).

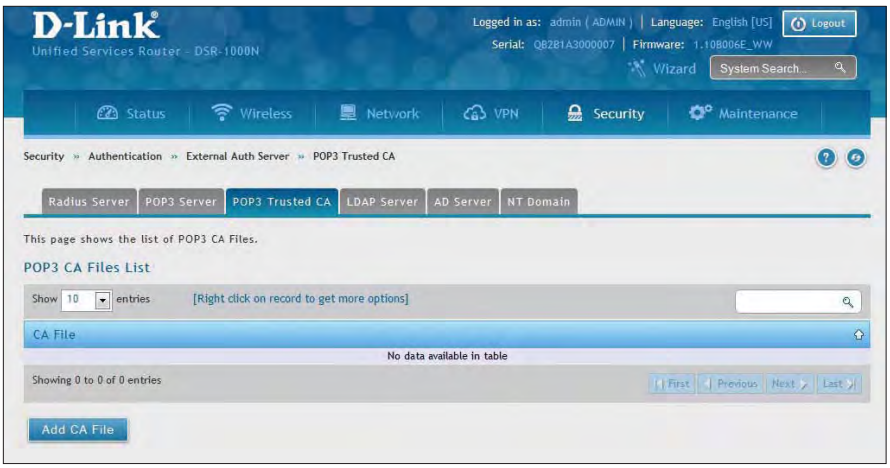
POP3 Trusted Server

Path: Security > Authentication > External Auth Server > POP3 Trusted CA

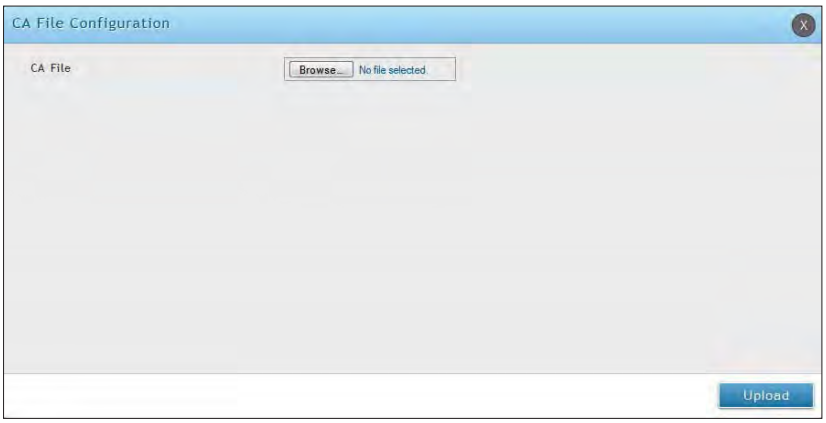
A CA file is used as part of the POP3 negotiation to verify the configured authentication server identity. Each of the three configured servers can have a unique CA used for authentication.

To configure:

1. Click **Security** > **Authentication** > **External Auth Server** > **POP3 Trusted CA** tab.



2. Click **Add CA File**.



3. Click **Browse** and select a CA file. Click **Open** and then click **Upload**.

LDAP Server

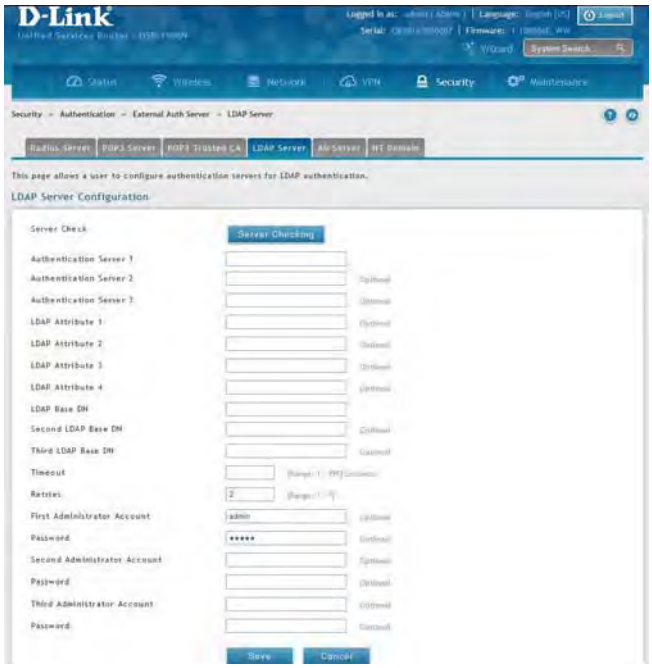
Path: Security > Authentication > External Auth Server > LDAP Server

The LDAP authentication method uses LDAP to exchange authentication credentials between the router and an external server. The LDAP server maintains a large database of users in a directory structure, so users with the same user name but belonging to different groups can be authenticated since the user information is stored in a hierarchal manner. Also of note is that configuring a LDAP server on Windows or Linux servers is considerably less complex than setting up NT Domain or Active Directory servers for user authentication.

The details configured on the controller will be passed for authenticating the router and its hosts. The LDAP attributes, domain name (DN), and in some cases the administrator account & password are key fields in allowing the LDAP server to authenticate the controller.

To configure the router to connect to your LDAP server:

1. Click **Security** > **Authentication** > **External Auth Server** > **LDAP Server** tab.



2. Complete the LDAP server information from the table below and click **Save**. You can configure up to three servers.

Field	Description
Authentication Server (1-3)	Enter the IP address of your primary LDAP server.
LDAP Attribute (1-4)	These are attributes related to LDAP users configured in LDAP server. These may include attributes like SAM account name, associated domain name etc. These can be used to distinguish between different users having same user name.
LDAP Base DN	Enter the base domain name.
Timeout	Set the amount of time in seconds that the router should wait for a response from the LDAP server.
Retries	This determines the number of tries the controller will make to the LDAP server before giving up.
Save	Click **Save** at the bottom to save and activate your settings.
Administrator Account	Enter the admin account information that will be used when LDAP authentication is required for PPTP/L2TP connection.
Server Check	Click to test the connection(s) to your LDAP Server(s).

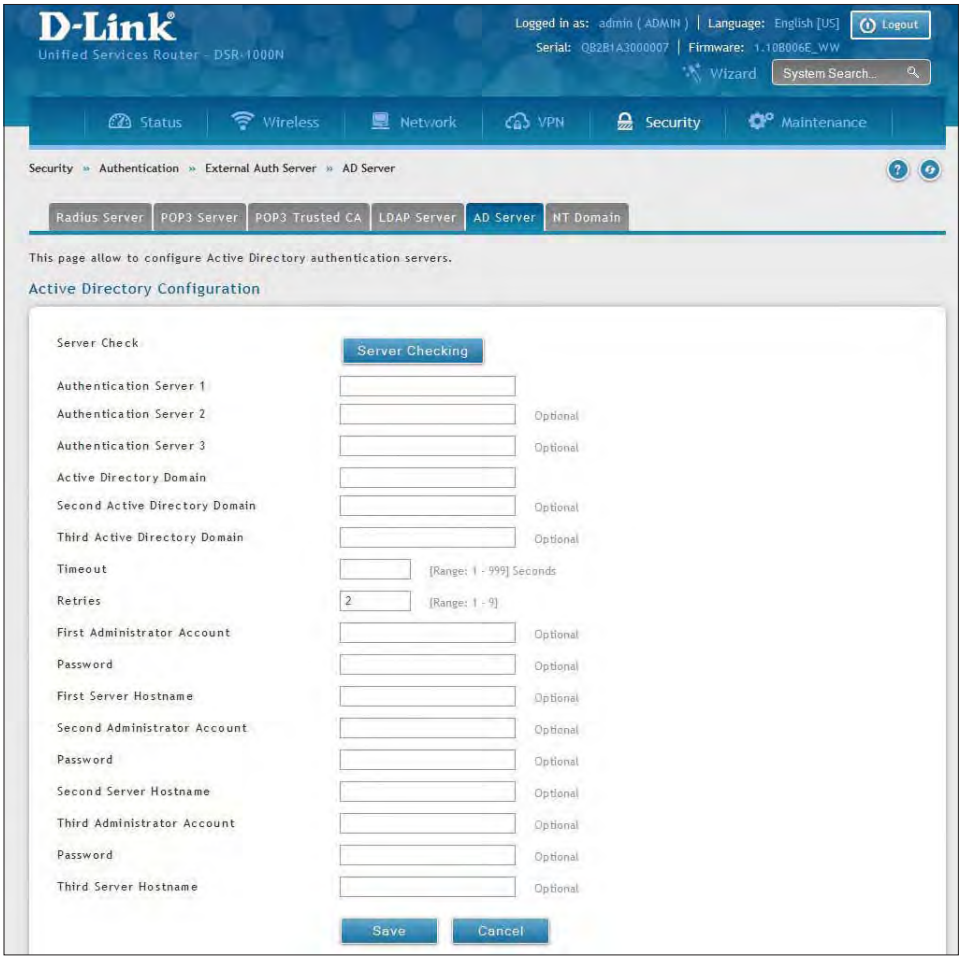
AD Server

Path: Security > Authentication > External Auth Server > AD Server

Active Directory authentication is an enhanced version of NT Domain authentication. The Kerberos protocol is leveraged for authentication of users, who are grouped in Organizational Units (OUs). In particular the Active Directory server can support more than a million users given is structure while the NT Domain server is limited to thousands. The configured Authentication Servers and Active Directory domain(s) are used to validate the user with the directory of users on the external Windows based server. This authentication option is common for SSL VPN client users and is also useful for IPsec / PPTP / L2TP client authentication.

To configure the router to connect to your AD server:

1. Click **Security** > **Authentication** > **External Auth Server** > **AD Server** tab.



2. Complete the AD server information from the table on the next page and click **Save**. You can configure up to three servers.

Field	Description
Authentication Server (1-3)	Enter the IP address of your AD server(s).
Active Directory Domain (1-3)	Enter the active directory domain name(s).
Timeout	Set the amount of time in seconds that the router should wait for a response from the AD server.
Retries	This determines the number of tries the controller will make to the AD server before giving up.
Administrator Account	Enter the admin account information that will be used when authentication is required for PPTP/L2TP connection.
Save	Click **Save** at the bottom to save and activate your settings.
Server Check	Click to test the connection(s) to your AD Server(s).

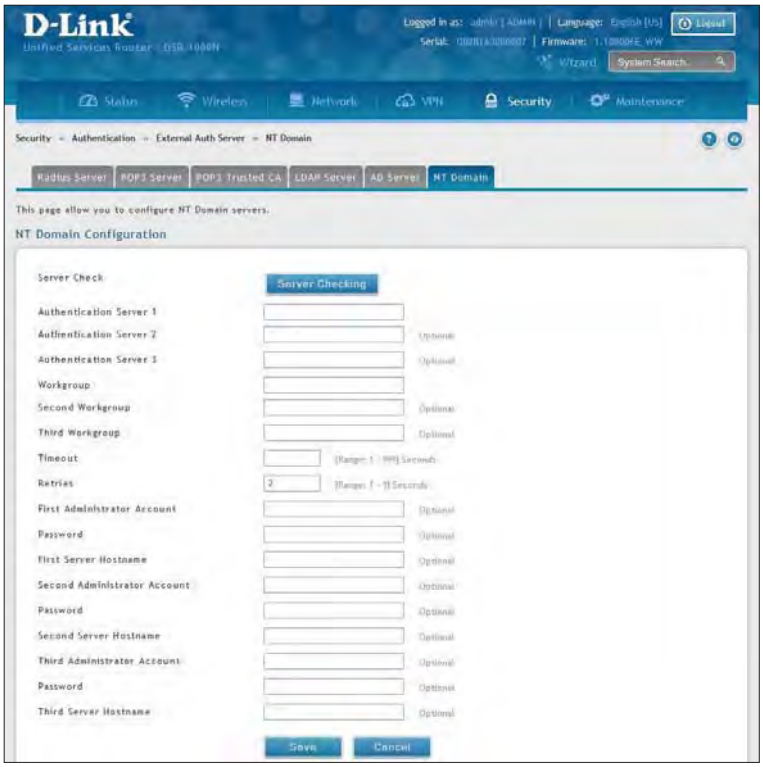
NT Domain Server

Path: Security > Authentication > External Auth Server > NT Domain

The NT Domain server allows users and hosts to authenticate themselves via a pre-configured Workgroup field. Typically Windows or Samba servers are used to manage the domain of authentication for the centralized directory of authorized users.

To configure the router to connect to your NT domain server:

1. Click **Security** > **Authentication** > **External Auth Server** > **NT Domain** tab.



2. Complete the NT server information from the table below and click **Save**. You can configure up to three servers.

Field	Description
Authentication Server (1-3)	Enter the IP address of your NT server(s).
Workgroup (1-3)	Enter the NT workgroup name(s).
Timeout	Set the amount of time in seconds that the router should wait for a response from the AD server.
Retries	This determines the number of tries the controller will make to the AD server before giving up.
Administrator Account	Enter the admin account information that will be used when authentication is required for PPTP/L2TP connection.
Save	Click **Save** at the bottom to save and activate your settings.
Server Check	Click to test the connection(s) to your AD Server(s).

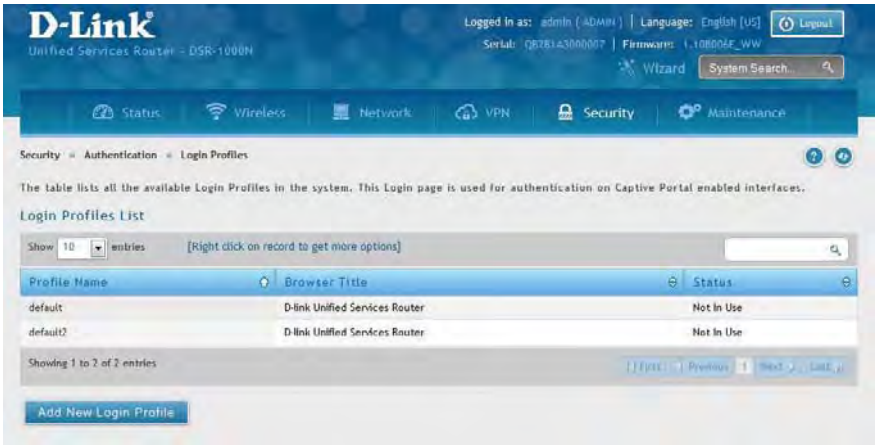
Login Profiles

Path: Security > Authentication > Login Profiles

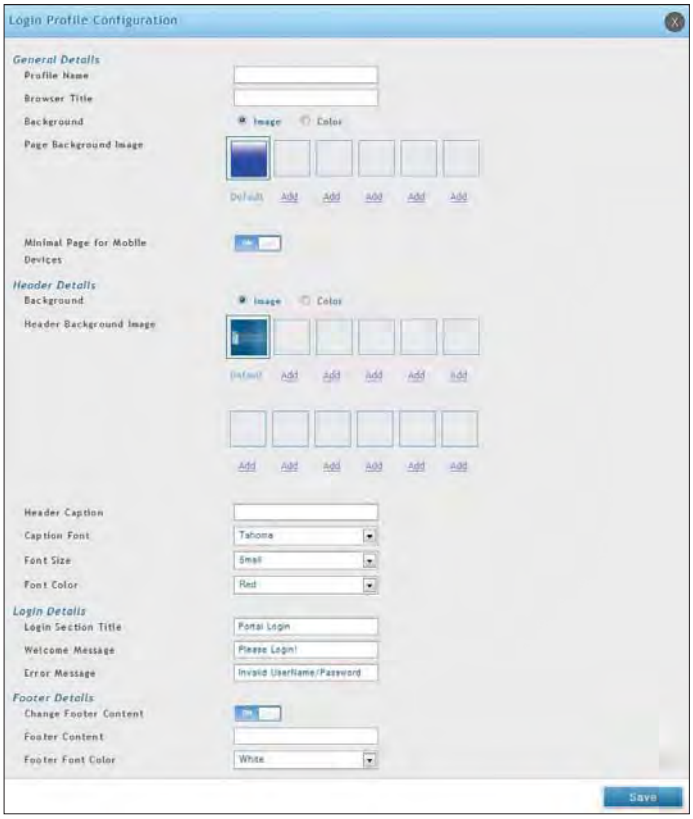
When a wireless client connects to the SSIDs or VLANs, the user sees a login page. The Login Profile and SLA page allows you to customize the appearance of that page with specific text and images. The wireless router supports multiple login and SLA pages. Associate login page or SLAs on SSIDs or VLANs separately.

To add, delete, or edit login profiles:

1. Click **Security** > **Authentication** > **Login Profiles** tab.



2. Right-click an entry and select either **Edit** or **Delete**. To add a new group, click **Add New Login Profile**.



3. Complete the fields from the table on the next page and click **Save**.

Field	Description
General Details	
Profile Name	Enter a name for this captive portal profile. The name should allow you to differentiate this captive profile from others you may set up.
Browser Title	Enter the text that will appear in the title of the browser during the captive portal session.
Background	Select whether the login page displayed during the captive portal session will show an image or color. Choices are: • Image: Displays an image as the background on the page. Use the Page Background Image field to select a background image. • Color: Sets the background color on the page. Select the color from the drop-down menu
Page Background Image	If you set *Background* to **Image**, upload the image file by clicking **Add** > **Browse**. Select an image, click **Open** and then click the **Upload** button. The maximum size of the image is 100 kb.
Page Background Upload	Choose the file you want to upload.
Page Background Color	If you set *Background* to **Color**, select the background color of the page that will appear during the captive portal session from the drop-down menu.
Custom Color	If you choose Custom on Page Background Color, enter the HTML color code.
Minimal Page for Mobile Devices	Toggle to **ON** to allow the web page to be properly viewed from a mobile device.
Header Details	
Background	Select whether the login page displayed during the captive portal session will show an image or color. Choices are: • Image: Show image on the page. Use the Header Background Color field to select a background color. The maximum size of the image is 100 kb. • Color: Show background color on the page. Use the radio buttons to select an image.
Header Background Image	If you set *Background* to **Image**, upload the image file by clicking **Add** > **Browse**. Select an image, click **Open** and then click the **Upload** button. The maximum size of the image is 100 kb.
Header Background Upload	Choose the file you want to upload.
Header Background Color	If you set *Background* to **Color**, select the header color from the drop-down menu.
Custom Color	If you choose Custom on Page Background Color, you can choose particular color by filling in the HTML color code.
Header Caption	Enter the text that appears in the header of the login page during the captive portal session.
Caption Font	Select the font for the header text.
Font Size	Select the font size for the header text.
Font Color	Select the font color for the header text.

Login Details	
Login Section Title	Enter the text that appears in the title of the login box when the user logs in to the captive portal session. This field is optional.
Welcome Message	Enter the welcome message that appears when users log in to the captive session successfully. This field is optional.
Error Message	Enter the error message that appears when users fail to log in to the captive session successfully. This field is optional.
Footer Details	
Change Footer Content	Enables or disables changes to the footer content on the login page.
Footer Content	If Change Footer Content is checked, enter the text that appears in the footer.
Footer Font Color	If Change Footer Content is checked, select the color of the text that appears in the footer.

External Payment Gateway	
Enable External Payment Gateway	Enables or disables external payment gateway and online wireless service purchasing from on the login page.
Session Title 1	Enter the text that appears in the title of the online purchasing login box when the user logs in to the captive portal session.
Message	Enter the text appears in the online purchasing login box when the user logs in to the captive portal session.
Session Title 2	Enter the text that appears in the title of the message box while online purchasing is complete.
Success Message	Enter the text that appears in the message box while online purchasing is complete.
Session Title 3	Enter the text that appears in the title of the message box while online purchasing is fail.
Failure Message	Enter the text that appears in the message box while online purchasing is fail.
Enable Billing Profile	Select the billing profile which will be shown on the login page. The table only listed the billing profiles which are set Unit Price. Enable the billing profile by switch ON on STATUS.
Service Disclaimer Text	Enter the service disclaimer text which is shown before user select and purchase wireless service.
Payment Server	Select the payment received account and its payment agent.

Web Content Filtering

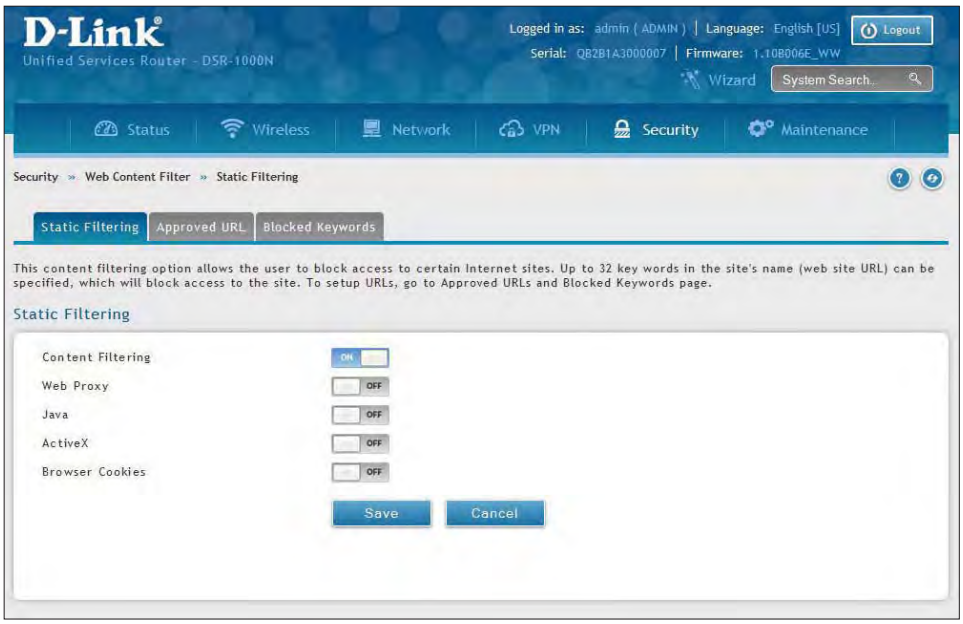
Static Filtering

Path: Security > Authentication > Static Filtering

You may block access to certain Internet services.

To block or allow a service:

1. Click **Security** > **Web Content Filter** > **Static Filtering** tab.



2. Toggle Content Filtering to **ON**.
3. Toggle the service to **ON** to block. Toggle to **OFF** to allow.
4. Click **Save**.

Approved URLs

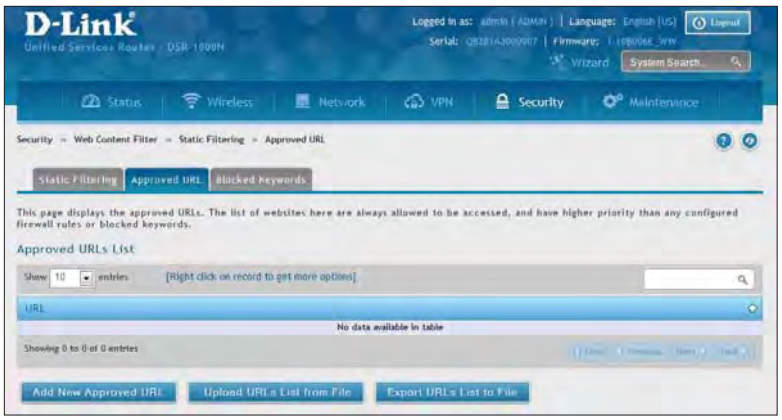
Path: Security > Web Content Filter > Static Filtering > Approved URL

The approved URL list is an acceptance list for all URL domain names. Domains added to this list are allowed in any form. For example, if the domain "dlink" is added to this list then all of the following URL's are permitted access from the LAN: www.dlink.com, support.dlink.com, etc.

Importing/exporting from a text or CSV file is also supported.

To add/import/export URLs to the approved list:

1. Click **Security** > **Web Content Filter** > **Static Filtering** > **Approved URL** tab.



2. To import a list from a text/CSV file, click **Upload URLs List from File**. If you want to export the current list, click **Export URLs List to File**. To add a new URL, click **Add New Approved URL**.

3. Enter a URL and click **Save**.

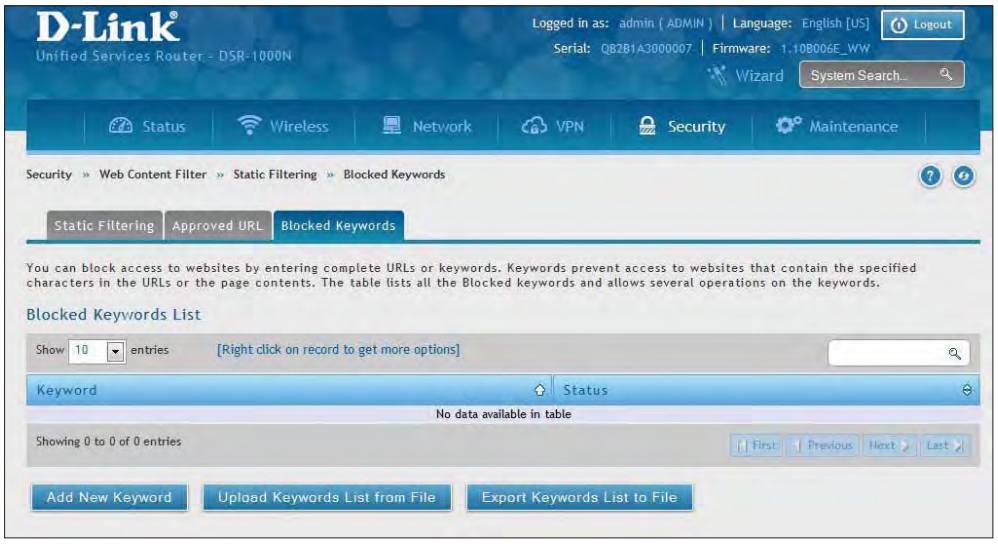
Blocked Keywords

Path: Security > Web Content Filter > Static Filtering > Blocked Keywords

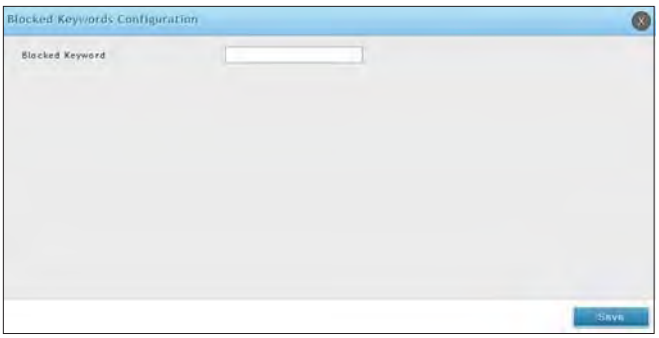
Keyword blocking allows you to block all website URL's or site content that contains the keywords in the configured list. This is lower priority than the Approved URL List; i.e. if a blocked keyword is present in a site allowed by a trusted domain in the Approved URL List, then access to that site will be allowed. Import/export from a text or CSV file is also supported.

To add/import/export URLs to the approved list:

1. Click **Security** > **Web Content Filter** > **Static Filtering** > **Blocked Keywords** tab.



2. To import a list from a text/CSV file, click **Upload Keywords List from File**. If you want to export the current list, click **Export Keywords List to File**. To add a new URL, click **Add New Keyword**.



3. Enter a keyword and click **Save**.

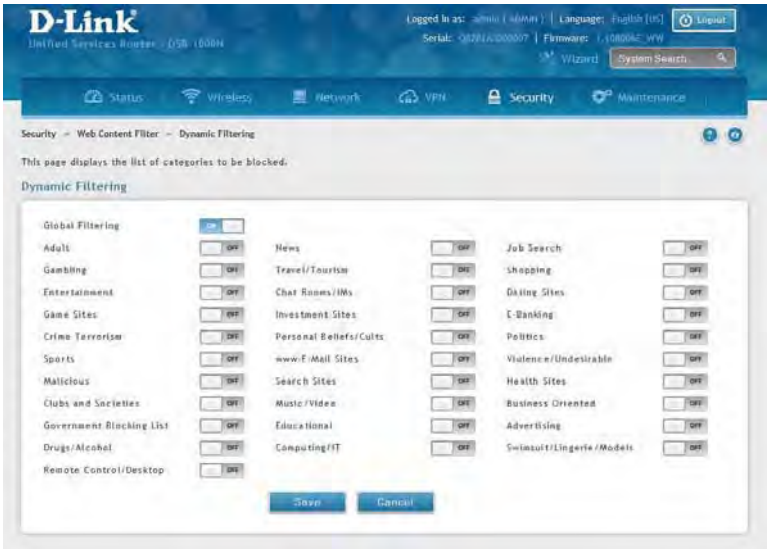
Dynamic Filtering

Path: Security > Web Content Filter > Dynamic Filtering

Dynamic Filtering will allow you to filter content from a list of categories. The router must be upgraded with the WCF license and then the Content Filtering option, which allows the user to filter out internet sites, needs to be enabled. When enabled, access to a website belonging to one of these configured categories will be blocked with an error page.

To add/import/export URLs to the approved list:

1. Click **Security** > **Web Content Filter** > **Dynamic Filtering**.



2. Toggle Global Filtering to **ON** to enable dynamic filtering.
3. Toggle any of the listed categories to **ON** to block. Toggle to **OFF** to allow.
4. Click **Save**.

Firewall
Firewall Rules

Path: Security > Firewall > Firewall Rules > IPv4 Firewall Rules or IPv6 Firewall Rules

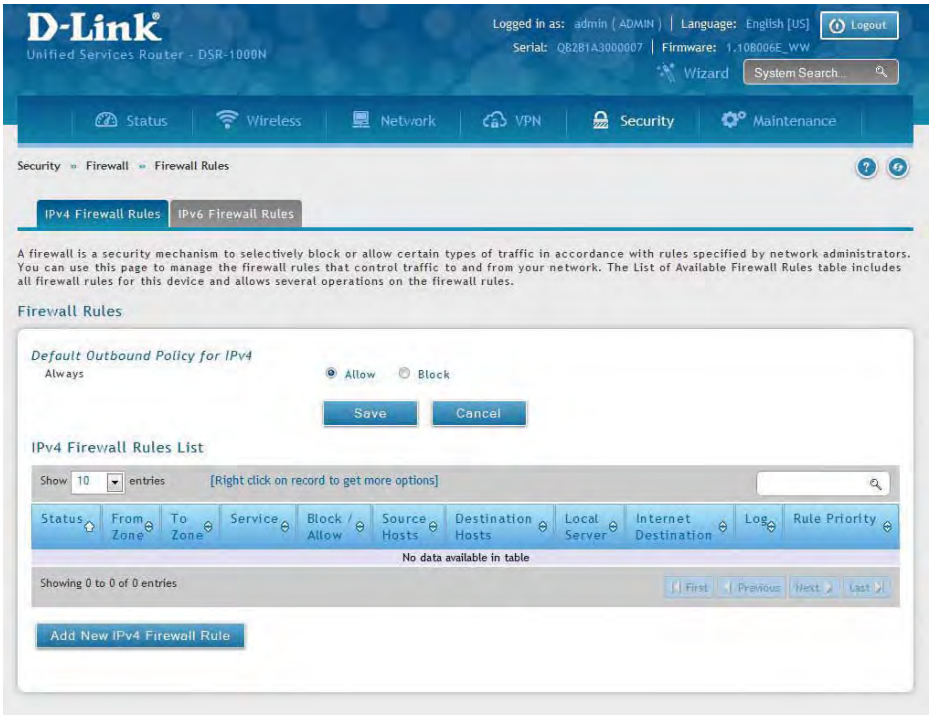
Inbound (WAN to LAN/DMZ) rules restrict access to traffic entering your network, selectively allowing only specific outside users to access specific local resources. By default all access from the insecure WAN side are blocked from accessing the secure LAN, except in response to requests from the LAN or DMZ. To allow outside devices to access services on the secure LAN, you must create an inbound firewall rule for each service.

If you want to allow incoming traffic, you must make the router's WAN port IP address known to the public. This is called "exposing your host." How you make your address known depends on how the WAN ports are configured; for this router you may use the IP address if a static address is assigned to the WAN port, or if your WAN address is dynamic a DDNS (Dynamic DNS) name can be used.

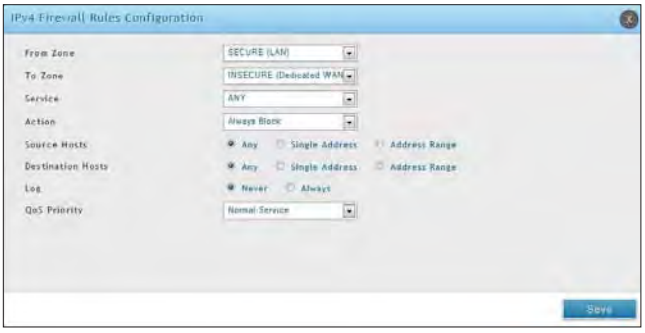
Outbound (LAN/DMZ to WAN) rules restrict access to traffic leaving your network, selectively allowing only specific local users to access specific outside resources. The default outbound rule is to allow access from the secure zone (LAN) to either the public DMZ or insecure WAN. On other hand the default outbound rule is to deny access from DMZ to insecure WAN. You can change this default behavior in the Firewall Settings > Default Outbound Policy page. When the default outbound policy is allow always, you can to block hosts on the LAN from accessing internet services by creating an outbound firewall rule for each service.

To create a new firewall rule:

1. Click **Security** > **Firewall** > **IPv4 Firewall Rules** tab or **IPv6 Firewall Rules** tab.



2. Right-click an entry and select either **Edit** or **Delete**. To add a new group, click **Add New IPv4/IPv6 Firewall Rule**.



3. Complete the fields from the table below and click **Save**.

Field	Description
From Zone	Select the source of originating traffic: either secure LAN, public DMZ, or insecure WAN. For an inbound rule WAN should be selected.
To Zone	Select the destination of traffic covered by this rule. If the From Zone is the WAN, the To Zone can be the public DMZ or secure LAN. Similarly if the From Zone is the LAN, then the To Zone can be the public DMZ or insecure WAN.
Service	Select a service from the drop-down menu. ANY means all traffic is affected by this rule.
Action	Select an action from the drop-down menu.
Source Hosts	Select a source host. If you select Single Address or Address Range, you will need to enter the IP address or IP range.
Destination Hosts	Select a Destination host. If you select Single Address or Address Range, you will need to enter the IP address or IP range.
Log	Select whether to log firewall traffic or not.
QoS Priority (IPv4 only)	Outbound rules (where To Zone = insecure WAN only) can have the traffic marked with a QoS priority tag. Select a priority level: • Normal-Service: ToS=0 (lowest QoS) • Minimize-Cost: ToS=1 • Maximize-Reliability: ToS=2 • Maximize-Throughput: ToS=4 • Minimize-Delay: ToS=16