

## 5.5.2 NAT

### DNAT configuration rule

DNAT is used to replace the destination address of packets accessing external network, router will replace the destination address of packet accessing external network into the user custom settings.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > NAT” to open “NAT” tab.

**Figure 5-30** NAT tab

The screenshot displays the NAT configuration interface. At the top, there are navigation tabs: Network, Applications, VPN, Forward (selected), Security, System, and Status. Under the Forward tab, there are sub-tabs: NAT (selected) and Routing. Below the sub-tabs, there is a MASQ configuration section with a dropdown menu for 'Interface' and an 'Operation' button. Underneath is a table for SNAT with columns: Protocol, Original Address, Original Port, Mapping Address, Mapping Port, and Operation. Below that is a table for DNAT with the same columns. At the bottom of the page, there are two buttons: 'Add' and 'Refresh'.

**Step 3** Click “Add” to add a new NAT rule.

**Figure 5-31** DNAT rule configuration

The screenshot shows the configuration page for a NAT rule. At the top, there are two tabs: 'NAT' and 'Routing'. Below the tabs is a 'Basic Settings' section. It contains the following fields:

- NAT Type:** Radio buttons for DNAT (selected), SNAT, and MASQ.
- Protocol:** A dropdown menu currently showing 'all'.
- Original Address Type:** A dropdown menu currently showing 'interface'.
- Interface:** A dropdown menu currently showing 'br0'.
- Original Port:** An input field with a placeholder '1-65535 or [1-65535]'.
- Mapping Address:** An input field with a placeholder '\* eg. 192.168.0.1'.
- Mapping Port:** An input field with a placeholder '1-65535 or [1-65535]'.

At the bottom of the configuration area, there are two buttons: 'Save' and 'Return'.

**Step 4** Select “DNAT” in NAT Type, to configure DNAT rule parameter.

**Table 5-19** DNAT Parameter instruction

Parameter	Details	Operation
Basic Settings		
Protocol	Supports “TCP”, “UDP”, “ICMP” or “ALL”	Select from Dropdown List
Original Address Type	The external address, the address needs to be converted	Dropdown List <ul style="list-style-type: none"> <li>• interface</li> <li>• static</li> </ul>
Interface (when the initial address type select “interface”, needs to be configured)	Indicates the external address of IP packets to an interface of the router	Dropdown List <ul style="list-style-type: none"> <li>• br0</li> <li>• modem</li> <li>• eth0</li> <li>• eth1</li> </ul>
Original Address (when the initial address type select “static”, needs to be configured)	The external address, the address needs to be converted	Manual input Format1: A.B.C.D Format2: A.B.C.D/Mask

Parameter	Details	Operation
Original port	The port of external IP, the port need to be replaced	Value area: 1~65535
Mapping address	Internal IP address	e.g. 192.168.8.1
Mapping port	The port of Internal IP address	Value area :1~65535

**Step 5** Single click “save” icon to finish.

---END

## SNAT configuration rule

SNAT is the source address translation, and its role is to translate source address of IP packets into another address.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > NAT” to open “NAT” tab.

**Step 3** NAT Type select “SNAT”, Configuration interface as shown in Figure 5-47.

**Figure 5-32** SNAT rule configuration

**Step 4** Configure SNAT rule parameter.

Parameter instruction as Table 5-22

**Table 5-20** SNAT rule instruction

Parameter	Details	Operation
Protocol	Convert some kind of protocol packets into address	<ul style="list-style-type: none"> <li>• Dropdown List</li> <li>• all</li> <li>• tcp</li> <li>• udp</li> <li>• icmp</li> </ul>
Original Address	The source address need to be replaced	Manual input Format1: A.B.C.D Format2: A.B.C.D/Mask
Original Port	The port of external IP, the port need to be replaced	Value area: 1-65535 or [1-65535], it can be a range, or a single port
Mapping Address Type	Internal IP address	<ul style="list-style-type: none"> <li>• Dropdown List</li> <li>• interface</li> <li>• static</li> </ul>
Interface	Select the interface of the router as source address after replacement	<ul style="list-style-type: none"> <li>• Dropdown List</li> <li>• br0</li> <li>• modem</li> <li>• eth0</li> <li>• eth1</li> </ul>
Mapping Port	The new port which replaces the original port of source address.	Value area: 1-65535 or [1-65535], it can be a range, or a single port

**Step 5** Single click “save” icon to finish.



When a SNAT rule is configured with port specified, selecting “all” in protocol means selecting two protocols contain "tcp", "udp"; when a SNAT rule is configured with no port specified, selecting “all” in protocol means selecting three protocols contains "tcp", "udp", "icmp".

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## MASQ rule configuration

MASQ is MASQUREADE.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > NAT” to open “NAT” tab.

**Step 3** Select “SNAT” in NAT Type. The configuration page is shown in Figure 5-48.

**Figure 5-33** MASQ configuration

**Step 4** Configure MASQ rule parameter.

**Table 5-21** MASQ rule Parameter instruction

Parameter	Details	Operation
NAT Type	To select "MASQ"	Select "MASQ"
Interface	Interface includes: <ul style="list-style-type: none"> <li>• br0: use br0 interface as commutation address between router &amp; LAN and external network</li> <li>• Modem: use modem interface as commutation address between router &amp; LAN and external network</li> <li>• eth0: use eth0 interface as commutation address between router &amp; LAN and external network</li> </ul>	Select from Dropdown List

**Step 5** Single click "save" icon to finish.



MASQ rule: the source address of all packets in the LAN need to be transferred into the specific ip address of the router, so the PC from the LAN can send packets out; If MASQ rule in the router will be deleted, the router LAN of the PC cannot communicate with external network.

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### 5.5.3 Static Routing

Static routing can forward packets according that the user configured specific forwarding path manually. Static Routing form is divided into static routing and policy routing, static routing is based on the destination address as an alternative route; while policy route is based on the source address that match with the policy to forward the packets (forwarding router detects the received packet's source address, and then forward packages according to the source which matches policy route) and policy routing priority, use numbers 3 to 252 to differentiate, the smaller number with higher priority. And there

are priorities between static routing and policy routing: policy routing higher priority than static routing.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > Routing” to open “NAT” tab, as Figure 5-49.

**Figure 5-34** Static Routing Interface

Route Type	Network	Gateway	Priority	Operation
Static Route	0.0.0.0/0	modem		Delete
Static Route	192.168.8.0/24	192.168.8.1		Delete

**Step 3** Click “Add” to add a new static route, configure interface as Figure 5-50 and Figure 5-51.

**Figure 5-35** Static Routing Interface

**Basic Settings**

Route Type:  Static Route  Policy Route

Network:  \* eg. 192.168.8.0/24

Gateway Type: static ip

Gateway:  \* eg. 192.168.8.1

Figure 5-36 Policy Routing Interface

Parameter Instruction as Table 5-24.

Table 5-22 Static Routing Parameter Instruction

Parameter	Details	Operation
Basic Setting		
Routing Type	To select "Static Route" or "Policy Route"	• Dropdown List
When Routing Type is "Static Route"		
Network	Set the destination IP address and subnet mask of static route	Manual input Format1: A.B.C.D/Mask
Gateway Type	Specify gateway type of static routing, includes: <ul style="list-style-type: none"> <li>• interface</li> <li>• static IP</li> </ul>	Dropdown List
Gateway	Set a next hop IP address of static route, IP address of the adjacent router interface	Dropdown List <ul style="list-style-type: none"> <li>• If the gateway type selects static IP, gateway need to manually input, format: A.B.C.D</li> <li>• If the gateway type select interface, the gateway needs to select from dropdown list</li> </ul>
When Routing Type is "Policy Route"		
Source Type	Set source type of policy route <ul style="list-style-type: none"> <li>• Static IP</li> <li>• Interface</li> </ul>	Dropdown List

Parameter	Details	Operation
Network	It can be configured when "static IP" is selected in source type, by adding IP address or subnet manually.	Manual input Format1: A.B.C.D/Mask
Source Interface	When source type is policy route, need to manually set source network address of policy router <ul style="list-style-type: none"> <li>• modem</li> </ul>	Dropdown List
Gateway Type	Set the next hop IP of policy route <ul style="list-style-type: none"> <li>• static ip</li> <li>• interface</li> </ul>	Dropdown List
Gateway	When the gateway type select "Static IP" to fill in the IP address, when gateway type is "interface", it will use the selected interfaces as gateway	Manual input Format1: A.B.C.D/Mask
Priority	Set policy routing priority, the priority lower the number, the higher the priority	Value area: [3,252]

**Step 4** Single click "save" icon to finish the static routing setting.



**NOTE**

Static routing will forward according to the destination address of the packet, if the router received the packet (e.g. source address is 1.1.1.1 destination address is 2.2.2.2), it will forward the packet to next hop according to the route which meets with the destination address (2.2.2.2).

It will forward the packet to next hop according to the route which meets with the destination address (2.2.2.2).

Policy routing will forward according to the source address of the packet, if the router received the packet (e.g. source address is 1.1.1.1 destination address is 2.2.2.2), it will forward the packet to next hop according to the route which meet with the source address (1.1.1.1).

Policy routing has higher priority than static routing, policy-based routing priority regardless of how much.

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## 5.5.4 QoS (Optional)

QoS (Quality of Service) quality of service, is a security mechanism for the network, is a technique to solve the network bandwidth allocation and network priority and other issues. When the network is overloaded or congested, QoS to ensure that critical traffic is not delayed or dropped, while ensuring the efficient operation of the network, our H8951-NA Cellular Wi-Fi Router supports custom QoS services.



- Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.
- Step 2** Click “Forward > QoS” to open “QoS” tab, as Figure 5-52.

**Figure 5-37** QoS interface

- Step 3** QoS configuration parameter, configuration parameter instruction as Table 5-25.

**Table 5-23** QoS parameter instruction

Parameter	Details	Option
Status	Enable or disable QoS feature	Click the button to select
Basic Setting		
Rule Name	QoS rule name	The max to 12 characters Only set when adds a new rule and the follow-up can not be modified  The rule name can not be repeated, otherwise the rule will be covered after the rule is added in front of the cover
Control Interface	The interface type of QoS, include: • br0: QoS interface is LAN • modem: QoS interface is modem	Dropdown List
Network	The network address that flow in and out via the QoS interface, is the object of speed limit.	Full in destination address and subnet mask

Parameter	Details	Option
		Manual input Format1: A.B.C.D/Mask
Port	The network interface of QoS	Value area: 1-65535 You can not configure the port, if not the configuration represents all ports
Rate	Transmission rate of the network address settings	Value area: 1~65535 Units: Kbps
Ceil Rate	In ensuring the basic rate and the spare bandwidth, the maximum bandwidth of the network address of the communication can be obtained with higher priority will be given priority redundant bandwidth	Value area: 1~65535 Units: Kbps
Priority	Set the precedence of the rules	Value area: [1,30]

**Step 4** Single click “save” icon to QoS setting.



**NOTE**

QoS is mainly used to allocate the average bandwidth for the users which access Internet through the router, or assigned specific users with more bandwidth. If the router is connected with two subnets: 192.168.8.1/24 and 192.168.9.1/24, the router QoS can control the rate of these two subnets; If the router's bandwidth is relatively well-off, the router can adjust the bandwidth based on priority and redundancy of two subnets, that is, the router meets the high priority redundancy bandwidth firstly, then meets the low priority subnet redundancy bandwidth.

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## 5.5.5 Dynamic Routing (Optional)

### RIP configuration

RIP protocol (Routing Information Protocol) is the most widely IGP (Interior Gateway Protocol), it was designed for the same technology used in small networks, and therefore adapt to most of the campus network and used in a continuous regional networks that the rate change is not big, H8951-NA Cellular Wi-Fi Router supports RIP v2 protocol. For more complex environments, generally do not use the RIP protocol.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > RIP” to open “RIP” tab, as Figure 5-53.

Figure 5-38 RIP interface

Parameter Instruction as Table 5-26.

Table 5-24 RIP Parameter Instruction

Parameter	Details	Operation
RIP Service	Enable or disable RIP Service	Click the button to select. <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Redistribute Connected	Enable or disable Redistribute Connected	Click the button to select. <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Redistribute Static	Enable or disable Redistribute Static	Click the button to select. <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Redistribute Kernel	Enable or disable Redistribute Kernel	Click the button to select. <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>

**Step 3** Click “Add” to add a new RIP route, configuration interface as Figure 5-54.

**Figure 5-39** RIP route configuration interface

**Step 4** Configure RIP route parameter instruction, as Table 5-27.

**Table 5-25** RIP parameter instruction

Parameter	Details	Operation
Basic Setting		
Add Type	Add the type of RIP route	Click the button to select Add Type <ul style="list-style-type: none"> <li>• When it is “Network”, need to configure destination network address.</li> <li>• When it is “Neighbor”, need to configure neighbor’s IP address</li> </ul>
Network(directly connect to the router)	Add the destination network of RIP route	Add the destination network of RIP route Format: A.B.C.D/Mask
Neighbor(directly connect to the router)	Add the neighbor’s IP address of RIP route	Add the neighbor’s IP address of RIP route Format: A.B.C.D

**Step 5** Single click “save” icon to RIP route setting.

**NOTE**

RIP is an interior gateway protocol. If the communications between the two routers do not go through another router, the two routers are adjacent. The RIP protocol specifies that no information exchange between non-adjacent routers.

Routers exchanging information is all the information currently known to the router. That is its own routing table. At a fixed time to exchange routing information (such as every 30 seconds), then the router receives the routing information to update the routing table.

RIP protocol "distance" also known as "hops" (hop count), because each through a router hop count is incremented. The RIP judges a better router according to the less routing hops, as the “shorter distance”. RIP allows a path can contain up to 15 routers. Therefore, when the distance reach to 16 hops, it means the destination unreachable. RIP visible only for small Internet.

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## OSPF configuration

OSPF (Open Shortest Path First) protocol is one of the (Interior Gateway Protocol), the most widely used IGP, for a single AS (autonomous system) in the routing decisions for large networks. OSPF business can be based whether the user needs to be configured at the factory H8951-NA Cellular Wi-Fi Router.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Forward > OSPF” to open “OSPF” tab, as Figure 5-55.

**Figure 5-40** OSPF Interface

OSPF parameter instruction as Table 5-28

**Table 5-26** OSPF parameter instruction

Parameter	Details	Operation
OSPF Service	Enable or disable OSPF Service	Click the button to select <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Redistribute Connected	Enable or disable Redistribute Connected	Click the button to select <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Redistribute Static	Enable or disable Redistribute Static	Click the button to select <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>

Parameter	Details	Operation
Redistribute Kernel	Enable or disable Redistribute Kernel	Click the button to select <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>

**Step 3** Click “Add” to add a new OSPF route, configuration interface as Figure 5-56.

**Figure 5-41** OSPF route configuration interface

**Step 4** Configure RIP route parameter instruction, as Table 5-29.

**Table 5-27** OSPF route parameter instruction

Parameter	Details	Option
Add Type	Add the type of OSPF route	Click the button to select Add Type <ul style="list-style-type: none"> <li>• Network</li> <li>• Neighbor</li> <li>• Interface</li> </ul>
• When Add Type is “Network”,		
Network	Set the network address as ospf sending address	Manual input Format1: A.B.C.D/Mask
AS Number	Used to identify the network (only the routers with the same domain address can exchange routing information)	Manual input Value area:[0,65535]
When Add Type is “Neighbor”,		
Neighbor	The router can reach in the next hop	Manual input Format1: A.B.C.D/Mask
When Add Type is “Interface”,		

Interface Name	The interface of the router	<ul style="list-style-type: none"> <li>• Dropdown List</li> <li>• br0</li> <li>• modem</li> <li>• eth1</li> <li>• eth0</li> </ul>
Interface Attribute	Configure the router interface attribute, include cost and network	<ul style="list-style-type: none"> <li>• Click the button to select</li> <li>• cost</li> <li>• network</li> </ul>
Cost	Configure the cost of the router interface, used to learn routing table	Manual input Value area:1-65535
Network Type(when the interface attribute is network)	Configure the network type of the router interface	<ul style="list-style-type: none"> <li>• Dropdown List</li> <li>• broadcast</li> <li>• non-broad</li> <li>• point-to-multipoint</li> <li>• point-to-point</li> </ul>

**Step 5** Single click “save” icon to OSPF route setting.

**Step 6** Single click “save” icon to finish.



OSPF is a link-state (Link-state) routing protocol, commonly used for the same routing domain. Here, the routing domain is an autonomous system, which refers to the routers can switch routing information through a unified network switching or routing protocol routing policy in the AS, all OSPF routers maintains an identical description of the database structure AS, which is stored in the database link status information corresponding routing domain, OSPF router is through this database to calculate its OSPF routing table.

As a link-state routing protocol, OSPF link state broadcast data LSA (Link State Advertisement) sent to all routers in an area, which is different from the distance vector routing protocols. Distance vector routing protocol passed some or all routing information of the routing table to the adjacent routers.

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## 5.6 VPN configuration

### 5.6.1 Overview

H8951-NA Cellular Wi-Fi Router supports VPN (Virtual Private Network) including L2TP/PPTP/GRE/IPIP/IPSEC. What's more, it supports VPN OVER VPN, e.g. GRE over IPsec, IPsec over PPTP/L2TP/GRE/IPIP.

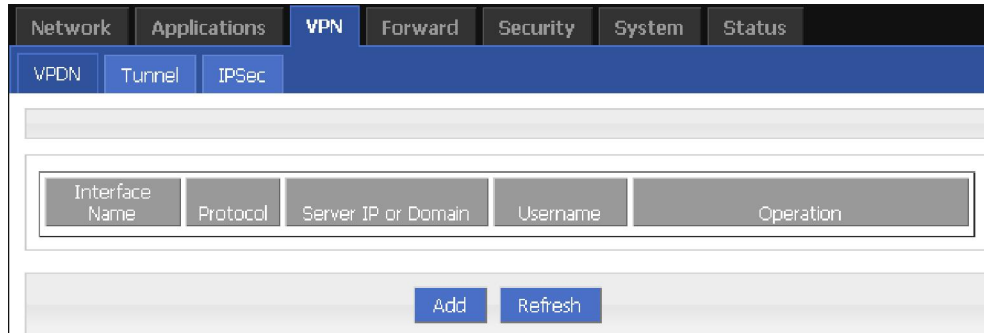
### 5.6.2 VPDN configuration

VPDN stands for Virtual Private Dial-up Networks. Now VPDN supports L2TP and PPTP

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

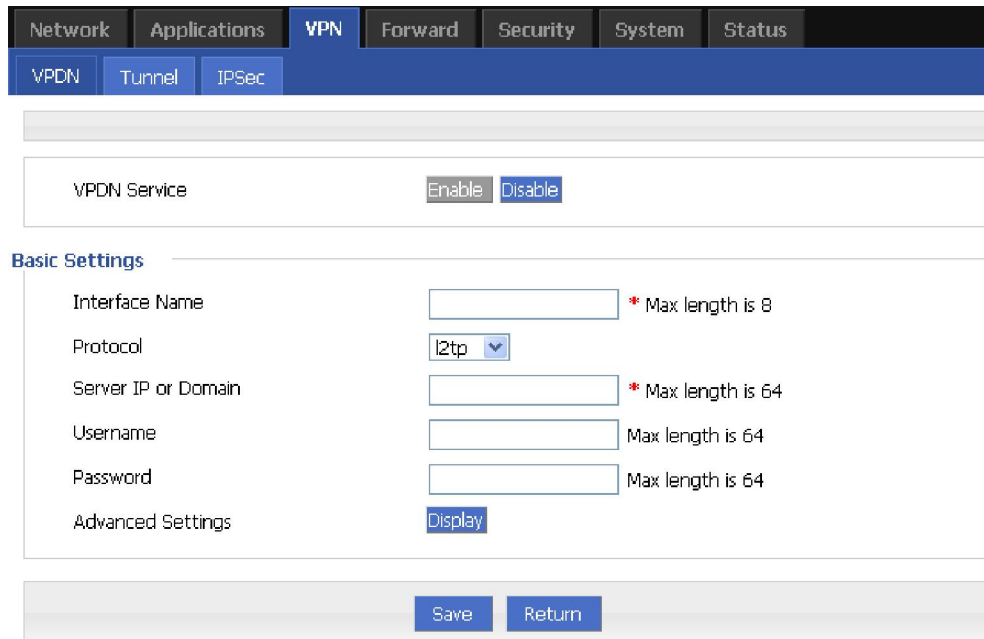
- Step 2** See “4.3.1 Login WEB GUI
- Step 3** Click “VPN > VPDN” to open “VPDN” tab.

**Figure 5-42** VPDN configuration



- Step 4** Click “Add” to add a new VPDN rule.

**Figure 5-43** VPDN rule configuration



- Step 5** Configure VPDN rule parameter.

**Table 5-28** VPDN rule parameter instruction

Parameter	Details	Operation
VPDN service	To enable or disable the VPDN rule	Click “Enable”
Basic Settings		



Parameter	Details	Operation
Interface name	Name of this VPDN rule	Cannot be modified after save.
protocol	VPDN protocol includes <ul style="list-style-type: none"> <li>• L2TP</li> <li>• PPTP</li> </ul>	Select from Dropdown List, cannot be modified after save.
Service IP or Domain	IP or domain of server to be visited	To input the IP or domain of server to be visited.
Username	Username of server to be visited	To input the username.
Password	Password of server to be visited	To input password.
Advanced settings	Advanced parameter of PPP link	Click "Display"

**Step 6** Single click "save" icon to finish.

After a VPDN rule is added, router will build VPN communication with service address automatically. To see the tunnel status, click "View" in "Tunnel" tab.

**Figure 5-44** L2TP tunnel status

Network	Applications	VPN	Forward	Security	System	Status
VPDN	Tunnel	IPSec				

Interface Name	hongdian
Status	disconnected
Protocol	l2tp
Local IP Address	
Remote IP	

Refresh	Return
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### 5.6.3 Tunnel configuration

Tunnel technology transfers data between the networks through the Internet infrastructure. In the whole process of transmission, when the encapsulated data package delivered on a public Internet, the logic path which the packet passes through is called tunnel. GRE and IPIP Tunnel configuration supports two modes.

GRE (Generic Routing Encapsulation, Generic Routing protocol encapsulation) specifies how to use a network protocol to another network protocol encapsulation method. The main purpose of the GRE protocol, there are two: internal protocol encapsulation and private address encapsulation.

IPIP tunnel is a simple agreement between two routers for IP packet encapsulation, IPIP tunnel interface will be like a physical interface in the interface list, many routers including Cisco, basically support the agreement. This agreement enables multiple network distribution possible.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “VPN > Tunnel” to open “Tunnel” tab.

**Step 3** Click “Add” to add a new tunnel.

**Figure 5-45** Tunnel configuration

Configure Tunnel rule parameter

**Table 5-29** Tunnel rule parameter instruction

Parameter	Details	Operation
IP Tunnel Service	To enable or disable IP tunnel service	Click “Enable”
Basic Settings		
Tunnel name	Name of the tunnel, cannot be modified after save	Input the name of tunnel
Tunnel Mode	Tunnel mode: <ul style="list-style-type: none"> <li>• gre</li> <li>• ipip</li> </ul>	Select from Dropdown List

Parameter	Details	Operation
Local virtual IP	Virtual IP address of local tunnel	Format: interface type A.B.C.D/M.
Peer virtual IP	Virtual IP address of peer tunnel	Format: interface type A.B.C.D/M.
Interface type	To choose “interface” or “static IP”	Select from Dropdown List.
Local Extern interface	This parameter will need to be set if “interface” is selected in “interface type”. Choose any connected interface as external interface	Select from Dropdown List.
Local extern IP	This parameter need to be set if “static IP” is selected for “interface type”. It is to set IP address to external network	Format: interface type A.B.C.D/M.
Peer extern IP	External interface IP of counterpart network tunnel. Usually a public IP address, also can be a LAN IP	Format: interface type A.B.C.D/M.

**Step 4** Single click “save” icon to finish.

---END

## 5.6.4 IPSec configuration

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “VPN >IPSec” to open “IPSec” tab.

Figure 5-46 IPsec tab

Network	Applications	VPN	Forward	Security	System	Status
VPDN	Tunnel	IPSec				
<b>Phase1</b>						
Policy Name	Encrypt	Hash	Authentication	Operation		
<b>Phase2</b>						
Policy Name	Encrypt	Hash	Remote Subnet	Operation		
<b>IPSec Interface</b>						
Interface Name	Encrypt Interface	Destination IP or Domain	Operation			
				Add	Refresh	

**Step 3** Click “Add” to add a new IPsec rule.

There are 3 phases for IPsec configuration:

3. Phase 1 parameter

**Figure 5-47** IPsec phase 1 configuration

The screenshot displays the configuration page for IPsec Phase 1. The navigation tabs at the top are Network, Applications, VPN (selected), Forward, Security, System, and Status. Under the VPN tab, there are sub-tabs for VPDN, Tunnel, and IPsec. The main content area is titled 'Basic Settings' and contains the following parameters:

- Select:** Radio buttons for Phase1 (selected), Phase2, and IPsec.
- Policy Name:** Text input field with a note: \* Max length is 12.
- Initiate Mode:** Dropdown menu with 'main' selected.
- Encrypt:** Dropdown menu with 'des' selected.
- Hash:** Dropdown menu with 'md5' selected.
- Authentication:** Dropdown menu with 'psk' selected.
- Pre Share Key:** Text input field with a note: \* Max length is 24.
- Self Identify:** Text input field with a note: Max length is 64.
- Match identify:** Text input field with a note: Max length is 64.
- IKE Lifetime:** Text input field with '28800' and a note: \* 120-86400 s.
- Group Name:** Dropdown menu with 'group768' selected.
- DPD Service:** Radio buttons for Enable and Disable (selected).
- DPD Delay:** Text input field with '30' and a note: 1-512 s.
- DPD Retry Times:** Text input field with '4' and a note: 1-512 times.

At the bottom of the configuration area, there are 'Save' and 'Return' buttons.

**Table 5-30** IPsec Phase 1 Parameter instruction

Parameter	Details	Operation
Basic Settings		
Select	To select which phase of IPsec, phase 1, phase 1 or phase IPsec	Select "Phase 1"
Policy Name	Name of phase 1, mainly to match phase "IPsec"	To input the name of phase 1. Cannot be changed after save.
Initial Mode	To choose "main" or "aggr"	Select from Dropdown List, "aggr" is recommended
Encrypt	Supports 3des and aes	Select from Dropdown List
Hash	Supports md5 and sha1	Select from Dropdown List

Parameter	Details	Operation
Authentication	To select authentication	Select from Dropdown List, presently only "PSK" supported
Pre Share Key	To set pre share key	Max 24 letters
Self Identify	To set the self ID of IPSec	To input the ID, need to match the ID of other side
Match Identify	To input the match ID of IPSec	To input match ID, need to match ID of other side
IKE Lifetime	Life time of IKE key	Value area: 120~86400 Unit: second
Group Name	Select group	Select from Dropdown List
DPD Service	To enable DPD service	To click "Enable"
DPD Delay	To set DPD check interval time	Manual input Value area : 1~512 Unit: second
DPD Retry Times	Max times to continuous DPD check failure.	Manual input Value area: 1~512

Single click "save" icon to finish phase 1 configuration.

#### 4. Phase 2 parameter.



In above parameters, "Initial Mode", "Encrypt", "Hash", "Authentication" "Pre Share Key", "IKE Lifetime", "Group Name" need to match parameter of IPSec server. "Self Identify" and "Match Identify" needs to match "match Identify" and "Self Identify" of IPSec sever respectively.

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**Figure 5-48** IPsec phase 2 configuration

The screenshot shows the configuration page for IPsec phase 2. The 'Basic Settings' section contains the following parameters:

- Select:** Radio buttons for Phase1, Phase2 (selected), and Ipsec.
- Policy Name:** Text input field with a note: \* Max length is 12.
- Encryption Protocol:** Dropdown menu with 'esp' selected.
- Encrypt:** Dropdown menu with 'des' selected.
- Hash:** Dropdown menu with 'md5' selected.
- PFS:** Dropdown menu with 'open' selected.
- Group Name:** Dropdown menu with 'group768' selected.
- Lifetime:** Text input field with '3600' and a note: \* 120-86400 s.
- Transport Mode:** Dropdown menu with 'auto' selected.
- Local Subnet:** Text input field with a note: \* eg. 192.168.8.0/24.
- Remote Subnet:** Text input field with a note: \* eg. 192.168.88.0/24.

At the bottom of the configuration area are 'Save' and 'Return' buttons.

**Table 5-31** IPsec Parameter instruction

Parameter	Details	Operation
Basic Settings		
Select	To select which phase of IPsec, phase 1, phase 1 or phase IPsec	Select "Phase 2"
Policy Name	Name of phase 2, mainly to match phase "IPsec"	To input the name of phase 2. Cannot be changed after save
Encryption Protocol	Supports esp, ah, ah+esp	Select from Dropdown List
Encrypt	Supports des, 3des, aes	Select from Dropdown List
Hash	Supports md5 and sha1	Select from Dropdown List
Group Name	Need to configured when PFS is "open", to set the key length of SA initial of phase 2	Select from Dropdown List

Parameter	Details	Operation
PFS	To open or close PFS	Select from Dropdown List
Lifetime	IPSec SA key life time	Value area: 120~86400 Unit: second
Transport Mode	Supports tunnel, transport and auto.	Select from Dropdown List
Local Subnet	Set local subnet	No need to set for “transport” mode, only for “auto” and “tunnel”. Format: A.B.C.D/M
Remote Subnet	To set local subnet	No need to set for “transport” mode, only for “auto” and “tunnel”. Format: A.B.C.D/M

Single click “save” icon to finish phase 2 setting.

#### 5. “IPSec” parameter configuration

**Figure 5-49** IPSec configuration tab

The screenshot displays the configuration page for IPSec. The navigation bar includes 'Network', 'Applications', 'VPN', 'Forward', 'Security', 'System', and 'Status'. Under 'VPN', there are sub-tabs for 'VPDN', 'Tunnel', and 'IPSec'. The 'Basic Settings' section contains the following fields:

- Select:** Radio buttons for Phase1, Phase2, and Ipsec (selected).
- Interface Name:** Text input field with a note: \* Max length is 12.
- Match Phase1:** Dropdown menu.
- Match Phase2:** Dropdown menu.
- Destination IP or Domain:** Text input field with a note: \* Max length is 64.
- Encrypt Interface:** Dropdown menu with 'br0' selected.

At the bottom of the configuration area, there are 'Save' and 'Return' buttons.

To configure “IPSec” parameters, then click “Save”.

**Table 5-32** IPSec Parameter instruction

Parameter	Details	Operation
Basic Settings		



Parameter	Details	Operation
Select	To select which phase of IPsec, phase 1, phase 1 or phase IPsec	Select "IPsec"
Interface Name	Name of this phase	Input name
Match Phase1	To select a matching name of "phase1"	Select from Dropdown List.
Match Phase2	To select a matching name of "phase2"	Select from Dropdown List
Destination IP or Domain	counterpart IPsec server IP or domain	Input counterpart IPsec server IP or domain
Encryption Interface	To select binding interface of IPsec. to bind VPDN/modem/br0 as local interface of IPsec initial can support IPsec OVER VPDN. In addition, after binding, IPsec rule will change as per the charge of binding interface. Thus can resume link of IPsec dialing interface and keep IPsec linked as soon as possible	Select from Dropdown List

---END

### 5.6.5 OpenVPN Configuration

OpenVPN is the VPN achievement based on the OpenSSL library's application layer. Compared with the traditional VPN, it is simple and easy to use. OpenVPN all the communications are based on a signal IP port, and it use the UDP protocol transports default and recommended. It can also support the TCP protocol. OpenVPN connection can through most of the proxy servers and work well in the NAT environment. Its server side has the function of pushing some network configuration information (including IP address, route configuration and so on) to the client side. OpenVPN offers two types of interfaces for networking via the universal TUN/TAP driver. It can create either a layer-3 based IP tunnel (TUN), or a layer-2 based Ethernet TAP that can carry any type of Ethernet traffic. Port 1194 is the official IANA (Internet Assigned Numbers Authority) assigned port number for OpenVPN.

**Step 1** Login WEB GUI.

**Step 2** Click "VPN >OpenVPN".Enter "OpenVPN" page, as shown in Figure 2-4.

Figure 5-50 OpenVPN configuration page

**Step 3** Configure OpenVPN parameter.

The parameter instruction is shown in Table 2-1.

Table 5-33 OpenVPN parameter instruction

Parameter	Detail	Operation
OPENVPN Service	Enable OPENVPN Service.	Click button options: <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
Basic Setting		
Working Modem	Supports two working modes: Client mode: client type mode Multi mode: peer to peer working mode (peer is non-server)	Dropdown list options: Select the required working mode from dropdown list.

Parameter	Detail	Operation
Dev	Dev represents the network interface type, and supports two types: Tun(OSI Layer 3):Simulates network layer device to operate the third layer data packets, such as IP packets Tap(OSI Layer 2):Equates to an Ethernet device to operate the second layer data packets, such as Ethernet data frame.	Dropdown list options: Select the required working mode from dropdown list. Demand consistent with peer.
Protocol	Data transfer protocol type settings: • TCP protocol: A kind of connection oriented reliable transmission protocol, which is suitable for the occasions where the reliability requirement is high and the communication efficiency is not high. • UDP protocol: A kind of non - connection unreliable transmission protocol, which is suitable for the scene with relatively high efficiency and relatively low reliability.	Dropdown list options: Select the required working mode from dropdown list. Demand consistent with peer.
Destination address or domain	Specifies connected server address	WORD type, max 32 bytes. Demand consistent with peer.
Port	Specifies connected server port	Value range: 1~65535 • Default: 1194 Demand consistent with peer. •
Compress	Compression protocol: configure whether VPN connection compression is opened. If the server is open, the client must open.	Click button options: • Enable • Disable
Nobind	Configure whether to bind to the specific local port.	Click button options: • Enable • Disable

Parameter	Detail	Operation
Authentication	Configuring the VPN data transfer mode:  SSL: encrypt the network connection in transport layer, high safety factor.  Text: transport with text form during transmission, low safety factor	Dropdown list options: Select the required data transfer type from dropdown list.
Ca	Specifies the file path for the client CA certificate	WORD type, max 32 bytes.
Key	Specifies the private key path for the current client	WORD type, max 32 bytes.
Cert	Specifies the certificate file path for the current client	WORD type, max 32 bytes.”。
Tls	Open TLS, if the server is open, the client must also open.  TLS: secure transport layer protocol (TLS) to provide confidentiality and data integrity between two communication applications. The protocol consists of two layers: the TLS record protocol (TLS Record) and the TLS handshake protocol (TLS Handshake)	WORD type, max 32 bytes.
Cipher	SSL's encryption algorithm system.	Drop box options: <ul style="list-style-type: none"> <li>• NONE</li> <li>• BF-CBC</li> <li>• DES-CBC</li> <li>• DES-EDE-CBC</li> <li>• DES-EDE3-CBC</li> <li>• DESX-CBC</li> <li>• RC2-40-CBC</li> <li>• CAST5-CBC</li> <li>• RC2-64-CBC</li> <li>• AES-128-CBC</li> <li>• AES-192-CBC</li> <li>• AES-256-CBC</li> <li>• SEED-CBC</li> </ul>

**Step 4** Click “Save” to finish OpenVPN configuration.

---END

## 5.7 System configuration

### 5.7.1 Overview

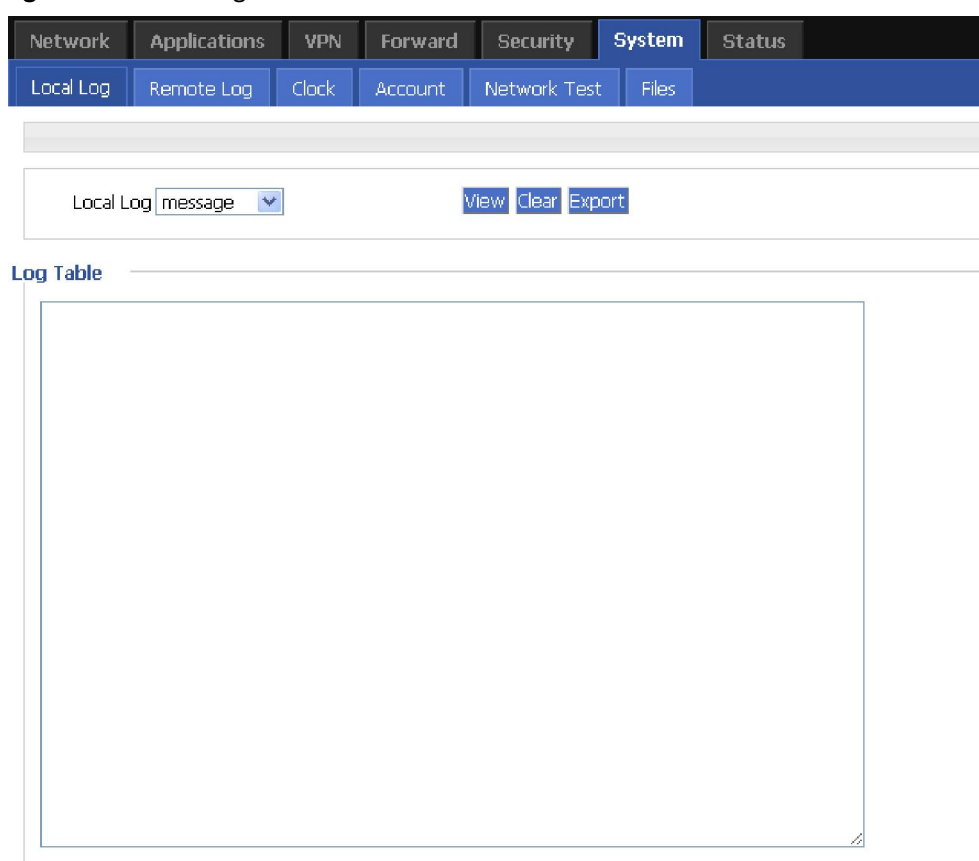
“System” can let you know the status of router, firmware upgrading and other maintenance.

### 5.7.2 Local Log

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “System > Local Log” to open “Local Log” tab.

**Figure 5-51** Local Log tab



**Step 3** Select type of “Local Log” and then click “View” to see log.

Click “Clear” to clear the log info in the “Log Table”, and click “Export” to export log in your local PC.

There are 3 types log:

- Message: system log, to record the running log of router, usually for most of users.
- Application: application program log, to record the Open or close of some application programs.
- Kernel: kernel log of router, usually for R&D engineers.



To see “local log”, “remote log” must be enabled.

---END

### 5.7.3 Remote Log

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “System > Remote Log” to open “Local Log” tab.

**Figure 5-52** Remote Log tab

**Step 3** Configure “Remote Log” parameter.

**Table 5-34** Remote log parameter instruction

Parameter	Details	Operation
Log Status	To enable or disable remote log	Click “Enable”
Remote IP or Domain	IP address or Domain of remote log server	To input the IP address or domain to receive log
Remote Port	Port of remote log serve	Default port: 514

**Step 4** Single click “save” icon to finish “Remote Log” parameter configuration.



The software tool Syslog is use to receive remote log in server. Syslog can be downloaded from the Internet by searching “MT\_Syslog.exe”.

---END

## 5.7.4 Clock

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “System > Clock” to open “Clock” tab.

**Figure 5-53** “NTP” Time Synch.

The screenshot shows the 'Clock' configuration page in the router's web interface. The 'System' menu is open, and the 'Clock' sub-menu is selected. The 'Status' is currently 'Enable'. Under 'Time Synch. Type', 'NTP' is selected. The 'NTP Server IP or Domain' is set to 'ntp.sjtu.edu.cn'. The 'NTP Server BackUp' field is empty, with a note 'Max length is 64'. The 'NTP Synch. Interval' is set to '1-65535 s'. The 'Time Zone' is set to 'abu-dhabi/muscat'. At the bottom, there are 'Save' and 'Refresh' buttons.

**Figure 5-54** Manual Time Synch. Type

The screenshot shows the 'Clock' configuration page in the router's web interface, specifically the 'Manual' time synchronization type. The 'System' menu is open, and the 'Clock' sub-menu is selected. The 'Status' is currently 'Disable'. Under 'Time Synch. Type', 'Manual' is selected. The 'Set Date' field is empty, with an example 'eg. 1970-01-01'. The 'Set Time' field is empty, with an example 'eg. 07:01:01'. At the bottom, there are 'Save' and 'Refresh' buttons.

**Step 3** Set “clock” parameters.

**Table 5-35** Clock Parameter instruction

Parameter	Details	Operation
Status	To enable to disable Time Synchronization service	<ul style="list-style-type: none"> <li>To click “Enable” or “Disable”</li> </ul>

Time Synch. Type	Type to synchronize system time	• Select “NTP” or “Manual”
When select “NTP” in “Time Synch. Type”		
NTP Server IP or Domain	IP or domain of NTP server	Select from Dropdown List
NTP Server Backup	Backup NTP server	Manual input server domain or IP address
NTP Synch. Interval	Interval for NTP client to check time with NTP Server. E.g. every 10 minutes	Value area: 1~65535 Unit: second Default: 600 s
Time Zone	Time Zone	Select from Dropdown List
Time Zone Number	For “Custom” option in “Time Zone”. E.g. +8 or -4	WORD type
When select “Manual” in “Time Synch. Type”		
Set Date	To set date	YYYY-MM-DD e.g. 1970-01-01
Set Time	To set time	HH:MM:mm E.g. 07:01:01

**Step 4** Single click “save” icon to finish.

---END

## 5.7.5 Account

“Account” is to change username/password, change web port and forbid other users to visiting the router.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “System > Account” to open “Account” tab.



Figure 5-55 Account tab

The screenshot shows the 'Account' configuration page. The navigation tabs at the top are Network, Applications, VPN, Forward, Security, System (selected), and Status. Below these are sub-tabs: Local Log, Remote Log, Clock, Account (selected), Network Test, and Files. The main form area contains the following fields:

- Account Type: WEB (dropdown)
- Account Level: admin (dropdown)
- Current Username: admin (text input)
- Old Password: (text input) \* Max length is 64
- New Username: (text input)
- New Password: (text input)
- New Password Again: (text input)
- Port: (text input) 1-65535

A 'Save' button is located at the bottom right of the form area.

**Step 3** Set account parameters.

Table 5-36 Account parameter instruction

Parameter	Details	Operation
Account Type	Visit the router on web	• Select from Dropdown List
Account Level	Level of account to login router	Select from Dropdown List • Admin: can view and change the parameter. • Guest: can view parameter and export log and use "Network Test".
Current Username	Current username	Showing user name
Old password	Current password	To input current PW
New Username	New username	Manual input, max 64 word type.
New Password	New password	Manual input, max 64 word type.
New password again	To confirm the new password	Manual input, max 64 word type.
Port	Web port to login router	Manual input Value area 1~65535

Parameter	Details	Operation
		Default: 80

**Step 4** Click “Save” to finish configuration. After saving, user needs to login again.

---END

## 5.7.6 Network Test

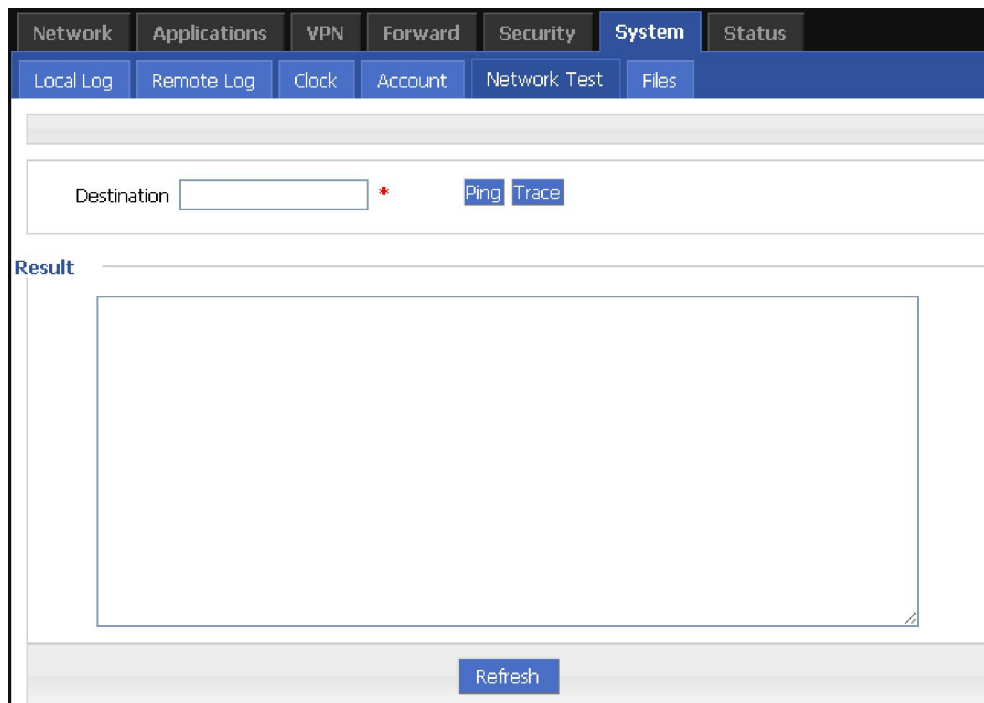
### Network Test

This function includes Ping function and Trace router function.

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “System > Network Test” to open “Network Test” tab.

**Figure 5-56** Network Test Tab



**Step 3** Input IP address or domain to be tested in “Destination”, click “Ping, to check whether the router can be linked with destination.

**Table 5-37** Network Test Parameter instruction

Parameter	Details	Operation
Destination	To input IP address or domain to be	Input IP address or

Parameter	Details	Operation
	tested	domain to be tested
Ping	To use Ping to test link	Click "Ping"
Trace	To use Trace command to test hops from the router to destination	Click "Trace"
Result	Test result	

---END

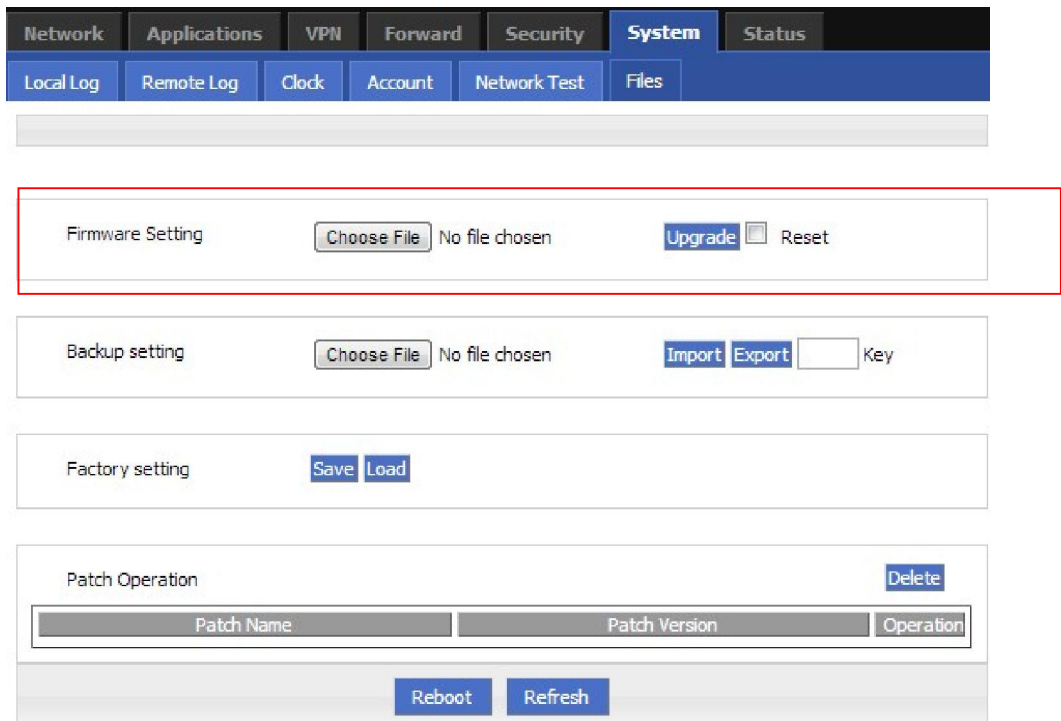
## 5.7.7 Files

### Firmware Setting

H8951-NA Cellular Wi-Fi Router supports upgrade firmware locally.

- Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.  
**Step 2** Click "System > Files" to open "Files" tab.

**Figure 5-57** Files tab



#### NOTE

If "reset" is selected, all parameters will be reset to factory setting.

In upgrading, don't close the page.

Upgrading files is suggested not to exceed 6MB. If larger than 6MB please use "CFE MINI WEB update".

**Step 3** Click “Browse” to select upgrading file and then click “Upgrade”.

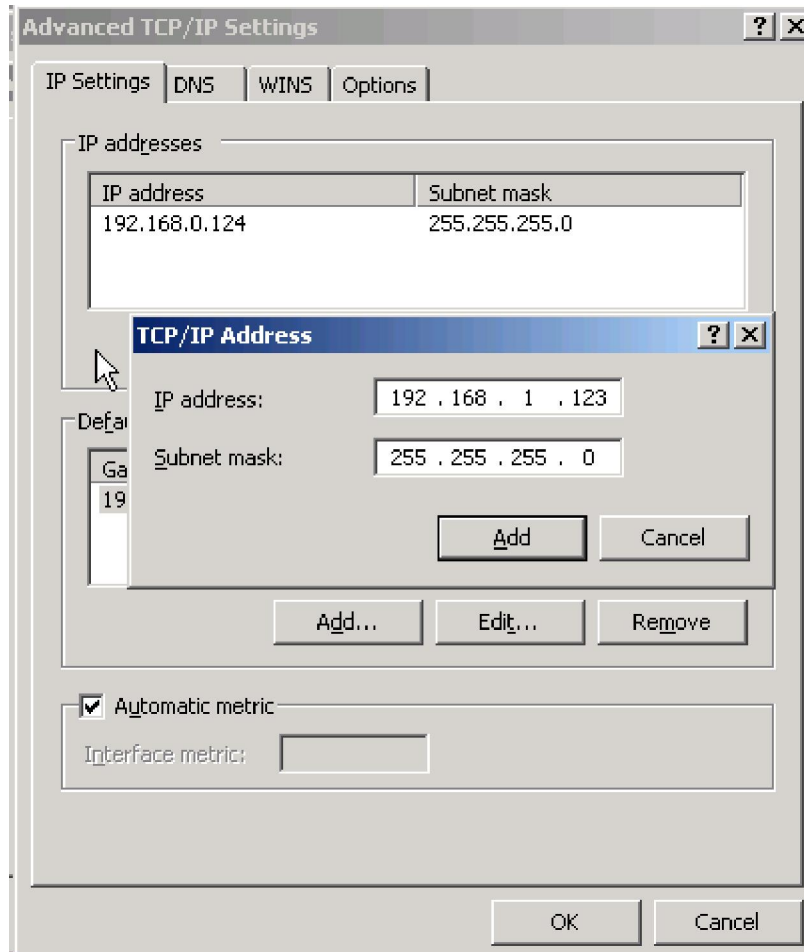
---END

## CFE mode upgrading

If upgrading file is larger than 6MB, CFE mode upgrading shall be used to upgrade.

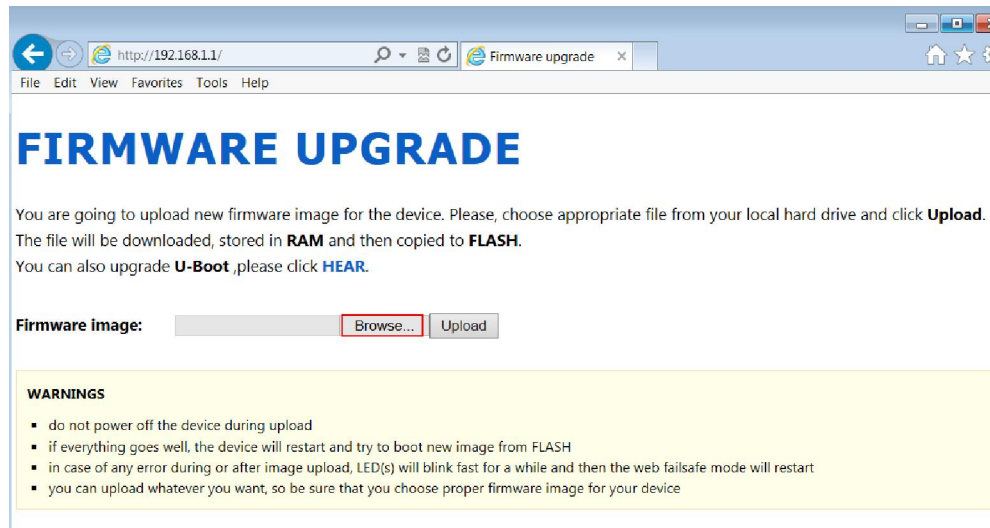
**Step 1** Add an IP address 192.168.1.

**Figure 5-58** Add an IP address

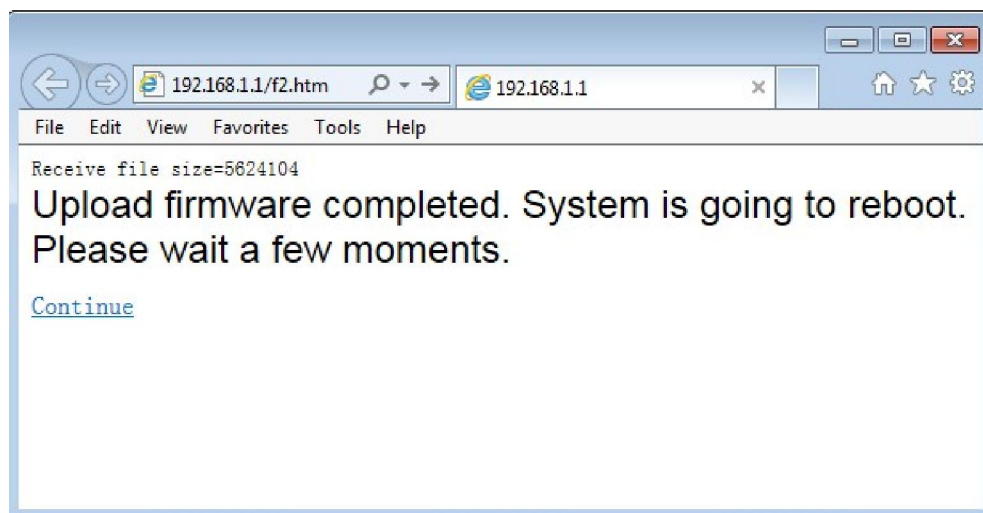


**Step 2** Press the RESET/DEF interface. Do not release it. Hold it, meanwhile power on router, till 30 seconds, and connection to PC is built properly. Then release RESET/DEF interface.

**Step 3** Input 192.168.1.1 in your browser, click “enter” you will see following page. If not, start over again from step 1.

**Figure 5-59** CFE mode upgrading

**Step 4** Click “Browse” to select upgrading file, and then click “Upload” to begin upgrading.

**Figure 5-60** CFE upgrading page

Upgrading will need 4-6 minutes, if RUN light is on, upgrading is OK.



**TIP**

You can also PING br0 address on your PC (**ping 192.168.8.1 -t**). If Ping ok, upgrading is OK.

---END

## Backup setting

H8951-NA Cellular Wi-Fi Router supports to backup and to recover configuration file.

- Click “Browse” to select a configuration file to be imported. And then click “Import” to resume the configuration as the configuration file.
- Click “Export” to export configuration file and save it in local PC.

Figure 5-61 Backup setting page



After import, router will reboot automatically.

“Key”: if key is input when export configuration file, this key need to be input in import. Not more than 8 digits for key.

## Factory setting

H8951-NA Cellular Wi-Fi Router has function to resume factory configuration. Users can set the configuration to factory mode, and also can set the current configuration into default configuration and generate a default factory configuration file in router. To resume this default factory setting, users can click “Load” in “factory setting”. If the default factory configuration file is deleted, the router will be resumed back to initial factory setting.

Figure 5-62 Factory setting page

The screenshot displays the 'Factory setting page' within the router's web interface. The navigation menu at the top includes 'Network', 'Applications', 'VPN', 'Forward', 'Security', 'System', and 'Status'. The 'System' tab is active, showing sub-tabs for 'Local Log', 'Remote Log', 'Clock', 'Account', 'Network Test', and 'Files'. The main content area is divided into several sections:

- Firmware Setting:** Includes a 'Choose File' button, the text 'No file chosen', an 'Upgrade' button, and a 'Reset' button.
- Backup setting:** Includes a 'Choose File' button, the text 'No file chosen', 'Import' and 'Export' buttons, and a 'Key' input field.
- Factory setting:** This section is highlighted with a red box and contains 'Save' and 'Load' buttons.
- Patch Operation:** Includes a 'Delete' button and a table with the following structure:
 

Patch Name	Patch Version	Operation

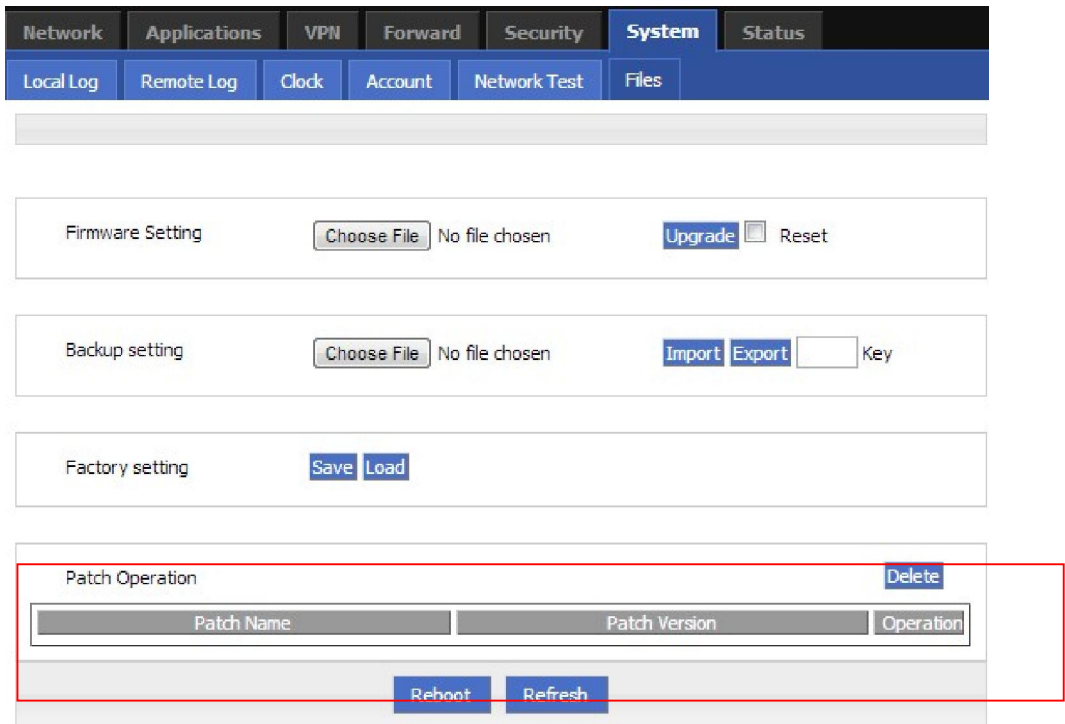
At the bottom of the page, there are 'Reboot' and 'Refresh' buttons.

- Save: to save the current setting as default factory configuration setting.
- Load: to resume default factory setting.

### Patch operation function

H8951-NA Cellular Wi-Fi Router supports to delete patch.

**Figure 5-63** Patch operation



Delete: to delete patch.

## Reboot

Click "Reboot" to restart the router.



Figure 5-64 Reboot

The screenshot shows the 'System' tab selected in the top navigation bar. Below it, the 'Files' sub-tab is active. The main content area contains several sections:

- Firmware Setting:** Includes a 'Choose File' button, the text 'No file chosen', an 'Upgrade' button with a checkbox, and a 'Reset' button.
- Backup setting:** Includes a 'Choose File' button, the text 'No file chosen', 'Import' and 'Export' buttons, and a 'Key' input field.
- Factory setting:** Includes 'Save' and 'Load' buttons.
- Patch Operation:** Includes a 'Delete' button and a table with columns 'Patch Name', 'Patch Version', and 'Operation'.

At the bottom of the page, there are 'Reboot' and 'Refresh' buttons. A red rectangular box highlights the 'Reboot' button.

--END

## 5.8 Status

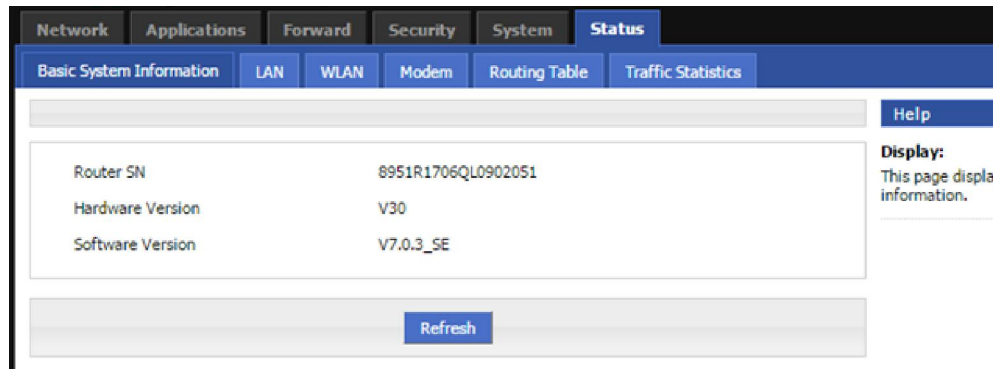
### 5.8.1 Overview

Status provides the basic info, network status info, router info of H8951-NA Cellular Wi-Fi Router.

### 5.8.2 Base Information

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Status > Base information” to open “Base Information” tab.

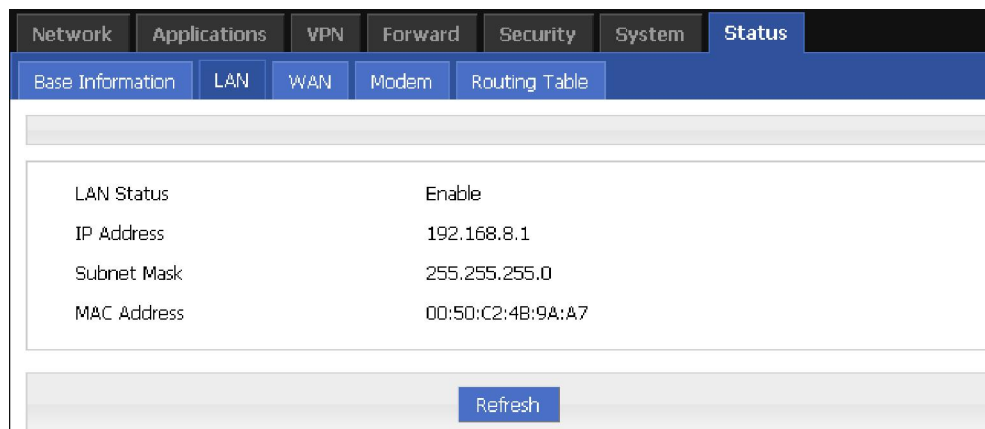
**Figure 5-65** Base Information tab**Table 5-38** Base information Parameter instruction

Parameter	Details	Operation
Router Model	Router model info	
Router SN	Router Serial No info	
Hardware version	Router hardware version info	
Software version	OS and application software info.	

### 5.8.3 LAN

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Status > LAN” to open “LAN” tab.

**Figure 5-66** “LAN” info

**Table 5-39** LAN Parameter instruction

Parameter	Details	Operation
LAN status	To show current LAN interfaces status.	
IP address	To show the LAN IP address.	
Subnet Mask	Subnet mask of LAN interface.	
MAC address	To show the MAC address of the router.	

## 5.8.4 WAN

- Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.
- Step 2** Click “Status > WAN” to open “WAN” tab. There are three types of WAN status: static IP/DHCP/PPPOE.

**Figure 5-67** Static IP WAN status

Network		Applications		VPN		Forward		Security		System		Status	
Base Information		LAN		WAN		Modem		Routing Table					
WAN Status				Enable									
Wan Type				static IP									
Local IP Address				192.168.10.1									
Mask				255.255.255.0									
MAC Address				00:50:C2:4B:9A:A9									
												Refresh	

**Figure 5-68** DHCP WAN status

Network	Applications	VPN	Forward	Security	System	Status										
Base Information	LAN	WAN	Modem	Routing Table												
<table border="1"> <tr> <td>WAN Status</td> <td>Enable</td> </tr> <tr> <td>Wan Type</td> <td>dhcp</td> </tr> <tr> <td>Local IP Address</td> <td>192.168.10.1</td> </tr> <tr> <td>Mask</td> <td>255.255.255.0</td> </tr> <tr> <td>MAC Address</td> <td>00:50:C2:4B:9A:A9</td> </tr> </table>							WAN Status	Enable	Wan Type	dhcp	Local IP Address	192.168.10.1	Mask	255.255.255.0	MAC Address	00:50:C2:4B:9A:A9
WAN Status	Enable															
Wan Type	dhcp															
Local IP Address	192.168.10.1															
Mask	255.255.255.0															
MAC Address	00:50:C2:4B:9A:A9															
Refresh																

**Figure 5-69** PPPoE WAN status

Network	Applications	VPN	Forward	Security	System	Status				
Base Information	LAN	WAN	Modem	Routing Table						
<table border="1"> <tr> <td>WAN Status</td> <td>Enable</td> </tr> <tr> <td>Wan Type</td> <td>static IP pppoe connected 192.168.100.247 192.168.100.1</td> </tr> </table>							WAN Status	Enable	Wan Type	static IP pppoe connected 192.168.100.247 192.168.100.1
WAN Status	Enable									
Wan Type	static IP pppoe connected 192.168.100.247 192.168.100.1									
Refresh										

**Table 5-40** WAN Parameter instruction

Parameter	Details	Operation
WAN status	To show the current WAN is used or not	
WAN Type	To show the current WAN type	
Local IP	To show the local IP of WAN interface	
Subnet mask	To show the subnet mask	
MAC address	To show the MAC address of the router	
PPPoE for WAN type		

Parameter	Details	Operation
Status	To show the link status of WAN interface PPPoE	
Local IP	To show the router IP distributed by PPPoE	
Remote IP	To show IP of PPPoE server	

## 5.8.5 Modem

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click “Status > Modem” to open “Modem” tab.

**Figure 5-70** Modem Status page

The screenshot displays the Modem Status page in the router's web GUI. The page is organized into a navigation menu at the top, followed by a sub-menu for the Modem tab. Below this, there are two sections for modem1 and modem2, each showing a list of status parameters and their values. A Refresh button is located at the bottom of the page.

Modem	Parameter	Value
modem1	Modem Select	0
	Up Time	101 seconds
	Modem Status	connected
	Network Type	wcdma
	Signal	(31)
	IP Address	172.29.138.98
	DNS	210.21.196.6
	SIM Status	ready
modem2	Modem Select	2
	Up Time	60 seconds
	Modem Status	connected
	Network Type	td-scdma
	Signal	(23)
	IP Address	10.90.14.215
	DNS	120.196.165.7
	SIM Status	ready

**Table 5-41** Modem Parameter instruction

Parameter	Details	Operation
Modem Select	To show the current modem name	
Up tome	To show the current on line time of the modem Unit: second	
Modem Status	To show the Router's status to link to the mobile network	
Network type	Current network type of the SIM in use	
signal	Signal of mobile network Value area: 1-31	
IP Address	To show the external network IP address which the router links	
DNS	To show which DNS router is using	
SIM Status	Status of current SIM	

## 5.8.6 Routing Table

**Step 1** Log-on WEB GUI of H8951-NA Cellular Wi-Fi Router.

**Step 2** Click "Status > Routing Table" to open "Routing Table" tab.

**Figure 5-71** Routing table page

Network	Subnet Mask	Gateway	Interface	Metric
127.0.0.0	255.255.255.0	0.0.0.0	lo	0
192.168.10.0	255.255.255.0	0.0.0.0	eth0	0
192.168.8.0	255.255.255.0	0.0.0.0	br0	0

**Table 5-42** Routing table Parameter instruction

Parameter	Details	Operation
Static route		
Network	IP address the router can reach	
Subnet Mask	IP network the router can reach. It is used together with "Network"	
Gateway	Next hop IP address which the router will reach	
interface	Interface from router to gateway	
metric	Route No which the router reaches destination IP	
Policy route		
Priority	Priority the router select route	

---END

## 5.9 RESET button function

"RESET" button is on the rear panel and next to power interface. This button can be used when the router is in use or when the router is turned on. There are 3 functions to press "RESET" button when the router is in use:

- Press "RESET" for about 2 seconds, router will reboot.
- Press "RESET" 5-10 seconds, the router will reboot, meanwhile, the router will be resumed to default factory setting configuration.
- Press "RESET" over 20 seconds, the router will reboot, and get into CFE upgrading. The router is resumed to default factory setting configuration.
- Press button when the router is turned on:
- Press "RESET" button and turn on the router, and keep pressing "RESET" for 2 seconds. The router will get into CFE upgrading mode.

---END

# 6 Typical application

## About this chapter

Chapter	Content
6.1 Overview	Summary some typical application of H8951-NA Cellular Wi-Fi Router
6.2 Awake function	How to awake H8951-NA Cellular Wi-Fi Router if not auto-dial
6.3 Parameter select	Parameter switch to achieve SIM backup function
6.4 VPN	H8951-NA Cellular Wi-Fi Router VPN setting
6.5 Timing Task	Set Timing task on H8951-NA Cellular Wi-Fi Router

## 6.1 Overview

H8951-NA Cellular Wi-Fi Router commonly used function includes wake up, parameter switch, VPN, etc.

## 6.2 Awake function

### Typical case

H8951-NA Cellular Wi-Fi Router support wake up function, means router will not auto-dial after power on, but dial triggered by data or call or SMS. Then router auto in offline by idle or timeout. This function could save your data traffic fee.

For example, after setting phone trigger number, a call to router by that number could trigger the router dial online; one phone number could control the modem.



## parameter setting

Let us check an example:

**Figure 6-1** Wake up/trigger setting example

Wake Up Service

**Basic Settings**

Wake Up Method

Offline Method

Online Time  \* 0-86400 s

Data Trigger

**Add Phone Number**

Phone Number  \* Max length is 32

Task Type

Phone Number	Task Type	Operation
861888888888	modem2-up	<input type="button" value="Del"/>
861222222222	modem-down	<input type="button" value="Del"/>
861222222222	modem2-down	<input type="button" value="Del"/>
861888888888	modem-up	<input type="button" value="Del"/>

## Effect

By this setting, after router power on, if there are data trigger or you could call/SMS SIM1 or SIM2 number from 861888888888 to trigger corresponding SIM online, modem will dial online, After 3600s, router will offline. Or you could use 861222222222 to call SIM, make the router offline. Please notice, to enable this function, the SIM must support phone and/or SMS function.

## 6.3 Parameter select

### Typical case

H8951-NA Cellular Wi-Fi Router provides the parameter switching function, or temporarily stop working links can be replaced. For example: When L2TP link is working for some reason does not work, you can switch to an alternate PPTP or IPsec link. H8951-NA Cellular Wi-Fi Router configured parameters based on switching rules, multi-link switching and good communication ensures the reliability of the network.

### Parameter Select

Let us check an example:



Please set the "Parameter select" of vpdn1 and vpdn2 separately

Set rules as below

**Figure 6-2** Rules setting

Network																													
LAN	WAN	Modem	Parameter Select	Connection Type	Link Backup	DHCP Server																							
<table border="1"> <thead> <tr> <th>Rule Name</th> <th>Interval</th> <th>Retry Times</th> <th>Running Timeout</th> <th colspan="3">Operation</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>60</td> <td>3</td> <td>----</td> <td>Mod</td> <td>Del</td> <td>En</td> <td>Dis</td> </tr> <tr> <td>1</td> <td>60</td> <td>3</td> <td>----</td> <td>Mod</td> <td>Del</td> <td>En</td> <td>Dis</td> </tr> </tbody> </table>							Rule Name	Interval	Retry Times	Running Timeout	Operation			2	60	3	----	Mod	Del	En	Dis	1	60	3	----	Mod	Del	En	Dis
Rule Name	Interval	Retry Times	Running Timeout	Operation																									
2	60	3	----	Mod	Del	En	Dis																						
1	60	3	----	Mod	Del	En	Dis																						
				Add	Refresh																								

Figure 6-3 Parameter select setting 1

Rule Name	Name	Check Method	Operation
-----------	------	--------------	-----------

Status

**Basic Settings**

Rule Name  \* 0-9

Interval  \* 1-512 s

Retry Times  \* 1-512

Running Timeout  1-65535 s

**select an interface to check**

Interface Name  ▼

Check Method  ▼

Destination IP  \* eg. 192.168.8.1

Figure 6-4 Parameter select setting 2

Rule Name	Name	Check Method	Operation
Status	<input type="button" value="Enable"/> <input type="button" value="Disable"/>		
<b>Basic Settings</b>			
Rule Name	<input type="text" value="2"/>	* 0-9	
Interval	<input type="text" value="60"/>	* 1-512 s	
Retry Times	<input type="text" value="3"/>	* 1-512	
Running Timeout	<input type="text"/>	1-65535 s	
<input type="button" value="Save"/>			
<b>select an interface to check</b>			
Interface Name	<input type="text" value="vpdn2"/>		
Check Method	<input type="text" value="icmp"/>		
Destination IP	<input type="text" value="192.168.110.1"/>	* eg. 192.168.8.1	
<input type="button" value="Add"/>			
<input type="button" value="Refresh"/> <input type="button" value="Return"/>			

When L2TP link is working for some reason disconnected from the server, the router will perform parameter switching in Command "check icmp", through IP ping to detect whether router interrupt with network operators; after 3 IP ping fails, the router will switch to the PPTP link, connecting to maintain the server, continue to work.

## Effect

Initially using L2TP link, then set L2TP connection is disconnected manually, the router after 3 ping 192.168.100.1, after the link failed, the link will switch to the L2TP and maintaining connection to the server.

## 6.4 VPN

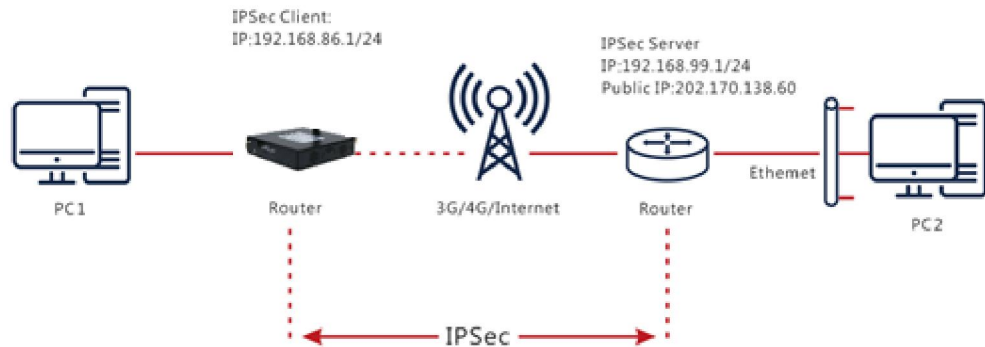
### Introduction

VPN, virtual private network, a technology based on Internet, now H8951-NA Cellular Wi-Fi Router supports L2TP/PPTP/GRE/IPIP/IPSec/OpenVPN of VPN.

L2TP used to build a virtual private network, after H8951-NA Cellular Wi-Fi Router connect to company NAS server, PC under H8951-NA could visit company network like visiting the local area network.

Let us check a setting example:

Figure 6-5 Build IPsec



PC1 connect H8951-NA then build IPSEC link by VPN function of H8951-NA with company router. I assume using IPsec tunnel mode, H8951-NA end local network 192.168.86.1/24, company server end 192.168.99.1/24, by IPSEC, two LAN could communicate.

### Parameter Setting

Figure 6-6 IPsec Phase 1

**Basic Settings**

Select  Phase1  Phase2  Ipsec

Policy Name  \* Max length is 12

Initiate Mode

Encrypt

Hash

Authentication

Pre Share Key  \* Max length is 24

Self Identify  Max length is 64

Match identify  Max length is 64

IKE Lifetime  \* 120-86400 s

Group Name

DPD Service  Enable  Disable

DPD Delay  1-512 s

DPD Retry Times  1-512 times

Figure 6-7 IPsec Phase 2

Basic Settings	
Select	<input type="radio"/> Phase1 <input checked="" type="radio"/> Phase2 <input type="radio"/> Ipsec
Policy Name	<input type="text" value="1"/> * Max length is 12
Encryption Protocol	<input type="text" value="esp"/>
Encrypt	<input type="text" value="des"/>
Hash	<input type="text" value="md5"/>
PFS	<input type="text" value="open"/>
Group Name	<input type="text" value="group1024"/>
Lifetime	<input type="text" value="3600"/> * 120-86400 s
Transport Mode	<input type="text" value="auto"/>
Local Subnet	<input type="text" value="192.168.86.0/24"/> * eg. 192.168.8.0/24
Remote Subnet	<input type="text" value="192.168.99.0/24"/> * eg. 192.168.88.0/24

Figure 6-8 IPsec

Basic Settings	
Select	<input type="radio"/> Phase1 <input type="radio"/> Phase2 <input checked="" type="radio"/> Ipsec
Interface Name	<input type="text" value="1"/> * Max length is 12
Match Phase1	<input type="text" value="1"/>
Match Phase2	<input type="text" value="1"/>
Destination IP or Domain	<input type="text" value="202.170.138.60"/> * Max length is 64
Encrypt Interface	<input type="text" value="modem"/>

Company router server should have same setting but the identity and subnet setting for the company router server should be the opposite of those for H8951-NA Cellular Wi-Fi Router.

## Result

After setting H8951-NA Cellular Wi-Fi Router and company router parameter, they can connect each other by IPSEC, and ping peer subnet, you could check status by click "view" button.

**Figure 6-9** IPsec status

Interface Name	1
Status	connected
Local Subnet	192.168.86.0/24
Remote Subnet	192.168.99.0/24

```

~ # ping 192.168.99.1 -i 192.168.86.1
PING 192.168.99.1 (192.168.99.1) from 192.168.86.1: 56 data bytes
64 bytes from 192.168.99.1: seq=0 ttl=255 time=1569.360 ms
64 bytes from 192.168.99.1: seq=1 ttl=255 time=769.937 ms

--- 192.168.99.1 ping statistics ---
2 packets transmitted, 2 packets received, 0% packet loss
round-trip min/avg/max = 769.937/1169.648/1569.360 ms

```

## 6.5 Timing Task

### Typical Application

H8951-NA Cellular Wi-Fi Router support timing task, by setting timing task, at certain time, router will operate reboot, online command. Etc. Easier the customer operation. I assume set the router online at certain time and keep a moment, then reboot every 24 hours. You could set like below.

**Figure 6-10** Timing

Task Name	Operating Time	Task Type	Operation			
2	interval:1440	reboot	Mod	Del	En	Dis
1	date:1005-1008	modem-online	Mod	Del	En	Dis

### Result

Router will be online at 10:05 AM and keep online until 10:08, then offline at 10:09. And router will reboot every 24 hours count began last reboot.

**Figure 6-11 Router online**

```

10:04:57 time[912]: ntpclient -h clock.via.net -s return 1{time.c->109}
10:04:57 time[912]: open the file(/tmp/ntp_first.mark) success!{time.c->254}
10:04:57 time[912]: NTP failed!{time.c->274}
10:04:59 pppd[345]: sent [LCP EchoReq id=0xf magic=0x5511fa91]
10:05:00 pppd[345]: rcvd [LCP EchoRep id=0xf magic=0xc1caf26e]
10:05:05 modem[969]: got SIG_TERM signal{modem.c->605}
10:05:05 modem[969]: argument error{hp_chat.c->533}
10:05:05 modem[1019]: modem_parameter_init :: boot!{modem.c->702}
10:05:05 modem[1019]: modem name is (0, 0){modem.c->294}
10:05:05 modem[1020]: find the modem(ZTE-AD3812:10){modemcheck.c->185}
10:05:06 modem_mg[229]: search usb device{modem_mg.c->1489}
10:05:06 modem[1020]: open the device(/dev/ttyUSB2) succeed{hp_chat.c->326}

```

**Figure 6-12 Router off line**

```

10:09:02 pppd[1067]: Terminating on signal 15
10:09:02 pppd[1067]: Connect time 3.0 minutes
10:09:02 pppd[1067]: Sent 445 bytes, received 2660 bytes.
10:09:03 netdown[1336]: ppp interface modem down{netdown.c->37}
10:09:03 netdown[1336]: killall -SIGUSR2 modem{netdown.c->47}
10:09:03 pppd[1067]: Script /usr/sbin/pppdown-run started (pid 1335)
10:09:03 pppd[1067]: sent [LCP TermReq id=0x2 "User request"]
10:09:03 pppd[1067]: rcvd [LCP TermAck id=0x2]
10:09:03 pppd[1067]: Connection terminated.

```

**Figure 6-13 Router reboot**

```

10:12:01 timing[1484]: timing: Reboot the system{hp_misc.c->984}

```



# 7

## FAQ

### About this chapter

Chapter	Content
7.1 Hardware failure	Possible hardware failure during using H8951-NA Cellular Wi-Fi Router and how to handle them
7.2 Dial online problem	Possible problem during dialing and how to handle them
7.3 VPN	Possible problem when connecting VPN
7.4 Web configuration	Possible WEB configuration problem and how to handle them

## 7.1 Hardware Failure

### 7.1.1 All LED dark

#### Phenomenon

Router LED all dark

#### Possible Reason

- Power supply does not match, it should be 9-36VDC
- No power supply

#### Solution

- Make sure the power supply is 9~36VDC
- Check the power adapter and cable connection

## 7.1.2 SIM Slot

### Phenomenon

Cannot insert SIM card

### Possible Reason

- SIM slot damaged
- SIM card wrong direction

### Solution

- SIM slot damaged, please contact us to repair
- Check the SIM card direction, please make sure the SIM card is inserted correctly

## 7.1.3 Ethernet Connection

### Phenomenon

LAN LED dark, cannot visit router WEB GUI

### Possible Reason

- Ethernet cable connection problem
- Ethernet cable damage
- PC end network card abnormal

### Solution

- Re-connect Ethernet cable
- Change a Ethernet cable
- Check network card setting on PC end

## 7.1.4 Antenna Connection

### Phenomenon

Cannot connect antenna

### Possible Reason

- Antenna type do not match
- Wrong connection

### Solution

- Please check antenna interface, should be SMA-J
- Please check antenna type, there are 3G/4G and WIFI, GPS antenna, do not mix them

## 7.2 Dial Online Problem

### 7.2.1 Dial discontinue

#### Phenomenon

H8951-NA Cellular Wi-Fi Router discontinue during dialing, dial failure

#### Possible Reason

- SIM card network type do not match
- SIM charges owed
- Power supply do not match
- Modem setting wrong

#### Solution

- Change to a suitable SIM card
- Recharge SIM card
- Change to suitable power supply
- Change Modem setting, please check related chapter

### 7.2.2 No Signal

#### Phenomenon

H8951-NA Cellular Wi-Fi Router modem status show no signal

#### Possible Reason

- Antenna connect wrong
- Modem cannot online
- Modem offline

#### Solution

- Connect suitable antenna
- Modem cannot online, check SIM and modem setting
- Modem offline, check router setting, like wake up setting, ICMP setting, check if there are any setting make router offline

### 7.2.3 Cannot find SIM/UIM card

#### Phenomenon

H8951-NA Cellular Wi-Fi Router cannot find SIM/UIM card

#### Possible Reason

- SIM card damage
- SIM bad contact

## Solution

- Replace SIM card
- Re-install SIM card

## 7.2.4 Poor Signal

### Phenomenon

H8951-NA Cellular Wi-Fi Router no signal or poor signal

### Possible Reason

- Antenna connect wrong
- Area signal weak

### Solution

- Check the antenna and re-connect it.
- Contact Telecom Operator to confirm signal problem
- Change to high-gain antenna

## 7.2.5 Compress Protocol not match

### Phenomenon

H8951-NA Cellular Wi-Fi Router dial failure, log shows compress protocol not match

### Possible Reason

Modem compress protocol do not match with server end

### Solution

Change compress protocol setting

## 7.3 VPN Problem

### 7.3.1 VPDN cannot connect

#### Phenomenon

VPDN cannot connect

#### Possible Reason

- VPDN port work abnormal
- VPDN parameter wrong
- VPDN peer server abnormal

## Solution

- Make sure Modem is online
- Set the correct port to VPDN
- VPDN parameter wrong
- Check VPDN peer server

## 7.3.2 VPN cannot communicate

### Phenomenon

VPN already connect, but cannot communicate

### Possible Reason

- Router table is configured wrong
- VPN peer server is configured wrong

### Solution

- Add related Router table
- Check VPN peer server setting

## 7.3.3 Router can communicate but subnet cannot

### Phenomenon

Router can communicate but subnet can not communicate

### Possible Reason

- VPN peer server is configured wrong
- Local Router has no MASQ
- Wrong local route table

### Solution

- Check VPN peer server setting
- Local Router has no MASQ, please manual add VPN port MASQ
- Wrong local route table, set right route table

## 7.4 WEB configuration

### 7.4.1 Updating firmware failure

#### Phenomenon

Updating firmware failure

#### Possible Reason

- Auto reboot during updating H8951-NA Cellular Wi-Fi Router

- Power supply problem
- Wrong firmware
- Power off during updating router

### Solution

- Check setting, disable the function which may cause reboot
- Change to a suitable power supply
- Ask technical support for suitable firmware
- Power off during updating router, please make sure power supply normal

## 7.4.2 Backup setting problem

### Phenomenon

Router import backup setting failure

### Possible Reason

- Backup setting file format wrong
- No reboot after backup setting

### Solution

- Choose a right file to import
- Must reboot after import setting, then parameters available

## 7.4.3 Updating patch failure

### Phenomenon

Updating fix patch failure, after updating, view fix patch and found no fix patch

### Possible Reason

- Patch format wrong
- Patch name too complicated

### Solution

- Check patch format, change to a right one
- Change the patch name to a simple one

## 7.4.4 CFE Updating failure

### Phenomenon

CFE updating failure, firmware edition no change

### Possible Reason

- Power supply do not match
- Firmware version or format do not match
- Power off during updating process

## Solution

- If power supply does not match, please change then update again
- If firmware version, format do not match, please change then update again
- If power off during updating, please update again

## 7.4.5 Update failure in WEB GUI

### Phenomenon

Updating by WEB GUI, failed and cannot visit WEB GUI again

### Possible Reason

Firmware oversize cause updating failure

### Solution

Using CFE mode to update again, and router will restore to factory mode. If after CFE updating, still cannot visit WEB GUI, please contact us for repairing

## 7.4.6 Forget Router Password

### Phenomenon

Forget router login password

### Possible Reason

User has changed the password

### Solution

After router power on, push and hold RESET button over 10 seconds then release, then re-power on router, router will back to factory mode (Username/Password both admin), but patch will reserve



When router is power on, press and hold RESET button around 1s, router will reboot and kept all setting.

---

## FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## RF Exposure Information

To comply with FCC RF exposure compliance requirements, this grant is applicable to only mobile configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

## IC Statement

- English:

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES - 3 (B)/NMB - 3(B).

- French:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## IC RF Exposure Information

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS -

102 of the IC radio frequency (RF) Exposure rules. This equipment has very low levels of RF energy that are deemed to comply without testing of specific absorption ratio (SAR).

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour

un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF)

CNR - 102 de l'IC. Cet équipement émet une énergie RF très faible qui est considérée conforme sans évaluation du débit d'absorption spécifique (DAS).







*ConnectingThings*

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