

ICE

ICE D-20 EC506 Wireless Broadband Gateway
User Guide

Huawei Technologies Proprietary

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ICE D-20 EC506 Wireless Broadband Gateway

User Guide

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Safety Precautions

Please read the safety precautions carefully to ensure the correct and safe use of your wireless device.












-  Do not switch your wireless device on when the use of wireless devices is prohibited or when the wireless device may cause interference or danger.
-  Do not use your wireless device while driving.
-  Follow relevant rules or regulations in hospitals and health care facilities. Switch your wireless device off near medical devices.
-  Switch your wireless device off in aircraft. The radio signal from it may cause interference to control signals of the aircraft.
-  Switch your wireless device off near high-precision electronic devices. It may affect the performance of these devices.
-  Do not attempt to disassemble your wireless device or its accessories. Only qualified personnel may service or repair the wireless device.
-  Do not place your wireless device and its accessories in containers with strong electromagnetic field.
-  Do not place magnetic storage media near your wireless device. Radiation from the wireless device may erase the information stored on them.
-  Do not put your wireless device in a high-temperature place or use it in a place with flammable gas such as a gas station.
-  Keep your wireless device and its accessories away from children. Do not allow children to use your wireless device without guidance.
-  Observe any laws or regulations on the use of wireless device. Respect others' privacy and legal rights when using your wireless device.

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Chapter 1 Overview

1.1 Introduction

1.1.1 Product Description

ICE D-20 is a third generation (3G) wireless broadband gateway for household users and small office home office (SOHO) users. With D-20, your terminal device (personal computer) can access the Internet through a code division multiple access (CDMA2000) network.

D-20 provides the following interfaces:

- A high-speed CDMA2000 1x EV-DO interface to the wide area network (WAN) side: used for accessing the 3G broadband radio packet network
- Four Ethernet interfaces to the local area network (LAN): for LAN networking
- A wireless local area network (WLAN) interface (optional)

D-20 enables you to not only create a LAN easily, but also access the Internet through a wireless connection.

As a 3G network terminal, D-20 provides the following functions:

- High-speed 3G network access
- Perfect HOME/SOHO cable networking
- Receive diversity and large coverage
- Built-in DHCP server, DNS Relay and NAT
- Web-based management and configuration
- Desktop or wall-mounted installation
- AP function for WLAN networking (optional)

1.1.2 Features

D-20 functions between the user terminal devices and the network devices. It provides 3G wireless broadband access by connecting the CDMA2000 1x EV-DO interface with the packet data serving node (PDSN) on the network side. It also provides four local Ethernet interfaces and WLAN interface (optional) for wired/wireless networking. Figure 1-1 shows the position of the D-20 in a 3G network.

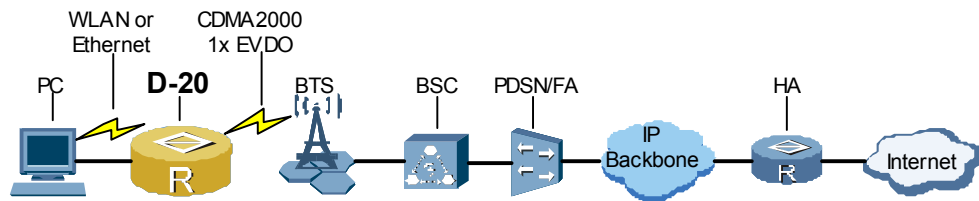


Figure 1-1 The position of D-20 in the 3G network

D-20 adopts the user-friendly WEB graphical management interface, making it ease to use. It is suitable for not only small enterprises, but also the household and SOHO users.

Table 1-1 lists the basic features of the D-20.

Table 1-1 The basic features of D-20

Item	Specification	
Standard	WAN: CDMA2000 1x Rel A CDMA2000 1x EV-DO Rel 0	
	Ethernet: IEEE 802.3 IEEE 802.3u	
	WLAN: IEEE 802.11b IEEE 802.11g	
Working frequency	450MHz frequency segment	
Data service	CDMA2000 1x Rel A	Upstream ratio: 153.6 kbit/s Downstream ratio: 153.6 kbit/s
	CDMA2000 1x EV-DO Rel 0	Upstream ratio: 153.6 kbit/s Downstream ratio: 2.4 Mbit/s
Ethernet interface	10/100 Mbit/s auto-sensing ratio	
WLAN interface (optional)	IEEE 802.11b: 11 Mbit/s, 5.5 Mbit/s, 2 Mbit/s, and 1 Mbit/s are supported IEEE 802.11g: 54 Mbit/s, 48 Mbit/s, 36 Mbit/s, 24 Mbit/s, 18 Mbit/s, 12 Mbit/s, 9 Mbit/s, and 6 Mbit/s are supported	

1.2 System Description

1.2.1 Appearance

Figure 1-2 shows the appearance of D-20.



Figure 1-2 Profile of D-20

1.2.2 Description of Hardware Specification

Table 1-2 lists the hardware specification of the D-20.

Table 1-2 Hardware specification of D-20

Item		Specification
Interface	Physical interface	Four Ethernet interfaces of 10/100base-TX One DC power interface
	Wireless interface	CDMA2000 1x EV-DO interface WLAN interface conforming to the IEEE 802.11b/g standard
The maximum power		10 W
AC/DC power module (external)		Input: 100 V to 240 V AC
		Output: 18 V DC/1.1 A, windage: < 10%
Dimension (L × W × D)		220 mm × 180 mm × 35 mm
Weight		< 500 g (excluding the power adapter)
Operating Environment temperature		-10°C to +45°C
Operating Environment relative humidity		5% to 95% non-condensing

1.2.3 Description of the Buttons and Indicators

Table 1-3 lists the buttons and indicators of the D-20.

Table 1-3 Description of the buttons and indicators

Item	Description			
Button	Power (ON/OFF)	Switch the gateway on/off.		
	Reset	Press and hold (10 seconds or more) to restore the factory settings.		
Indicator	POWER	Green	Blinking (5 Hz)	The device is self-testing.
			On	D-20 is turned on.
	WAN (3G network)	Green	Blinking (5 Hz)	The data is being transferred.
			On	The PPP connection has been created.
	WLAN (optional)	Green	Blinking (5 Hz)	The data is being transferred.
			On	WLAN is available.
	1/2/3/4 (Ethernet interface)	Green	On	The Ethernet connection has been created.
			Blinking (3 Hz)	The network is working in the 10 Mbit/s mode.
			Blinking (12 Hz)	The network is working in the 100 Mbit/s mode.
	SIGNAL STRENGTH	Green	5 CDMA network signal indicators.	

1.2.4 Interface Attributes

Table 1-4 lists the interface attributes of the D-20.

Table 1-4 The interface attributes of D-20

Interface	Quantity	Connector	Description
Ethernet Interface	4	RJ-45	10/100Base-TX 10/100 Mbit/s auto-sensing MDI/MDIX auto-sensing IEEE802.3/802.3u is compatible
WLAN	1	Wireless connection	Up to 54 Mbit/s is supported Conforming to the IEEE 802.11b/g standard (optional)
CDMA	1	Wireless connection	Max. transmission power: ≥ 25 dBm Receiving sensibility: < -104 dBm

Chapter 2 Installation and Startup of D-20

2.1 Preparation

Before using D-20, ensure that your location is covered within CDMA2000 3G network (consult your local network operator). You have to choose those network operators with the CDMA2000 3G-network coverage.

The D-20 provides four Ethernet interfaces. If more than four PCs have to be connected with D-20 by cable, prepare a hub or an Ethernet switch to expand the Ethernet interfaces.

D-20 supports wireless access. To connect a PC to a D-20 through WLAN, equip your PC with a wireless network card first.

2.1.1 Checking the Packing List

Before using D-20, ensure you have all the devices listed in the packing list. Table 2-1 lists the devices of D-20.

Table 2-1 The packing list of D-20

Item	Quantity	Description
D-20 host	1	-
Power adapter	1	18 V AC/DC power adapter
Power cable	1	3 m
Vehicle mounted power cable	1	Optional
Ethernet cable	1	3 m
Quick Start	1	Hard copy
User Manual	1	CD

 **Note:**

This is for your reference only.

2.1.2 Basic Installation Principles

The required environment:

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- Keep enough space around D-20 for the heat emission.
- When installing it on the wall, fix the D-20 and power adapter well in case of falling. Take Figure 2-1 for an example.

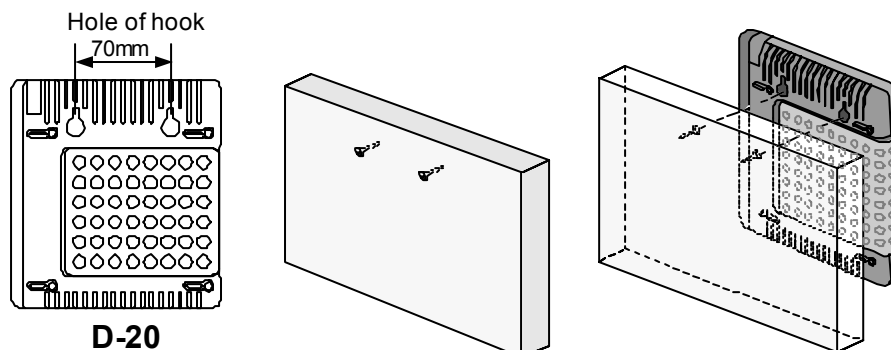


Figure 2-1 Wall-mounted installation

- To ensure the signal strength of a CDMA network, install the devices near the window.
- Keep the antenna away from metal materials. Otherwise, the receiving effect will be affected.

2.1.3 Computer Configuration Requirements

To use D-20, the following computer configurations are recommended.

- Memory: 256 MB RAM or above
- Hard disk: 50 MB free space
- Operating system: Windows XP or Windows 2000
- Internet Explorer: Microsoft Internet Explorer 6.0

Note:

If the Internet Explorer version is earlier than the recommended one, it will affect the normal configuration of D-20.

2.2 Introduction to the Install Procedure

Figure 2-2 shows the install procedures of D-20 and relative devices.

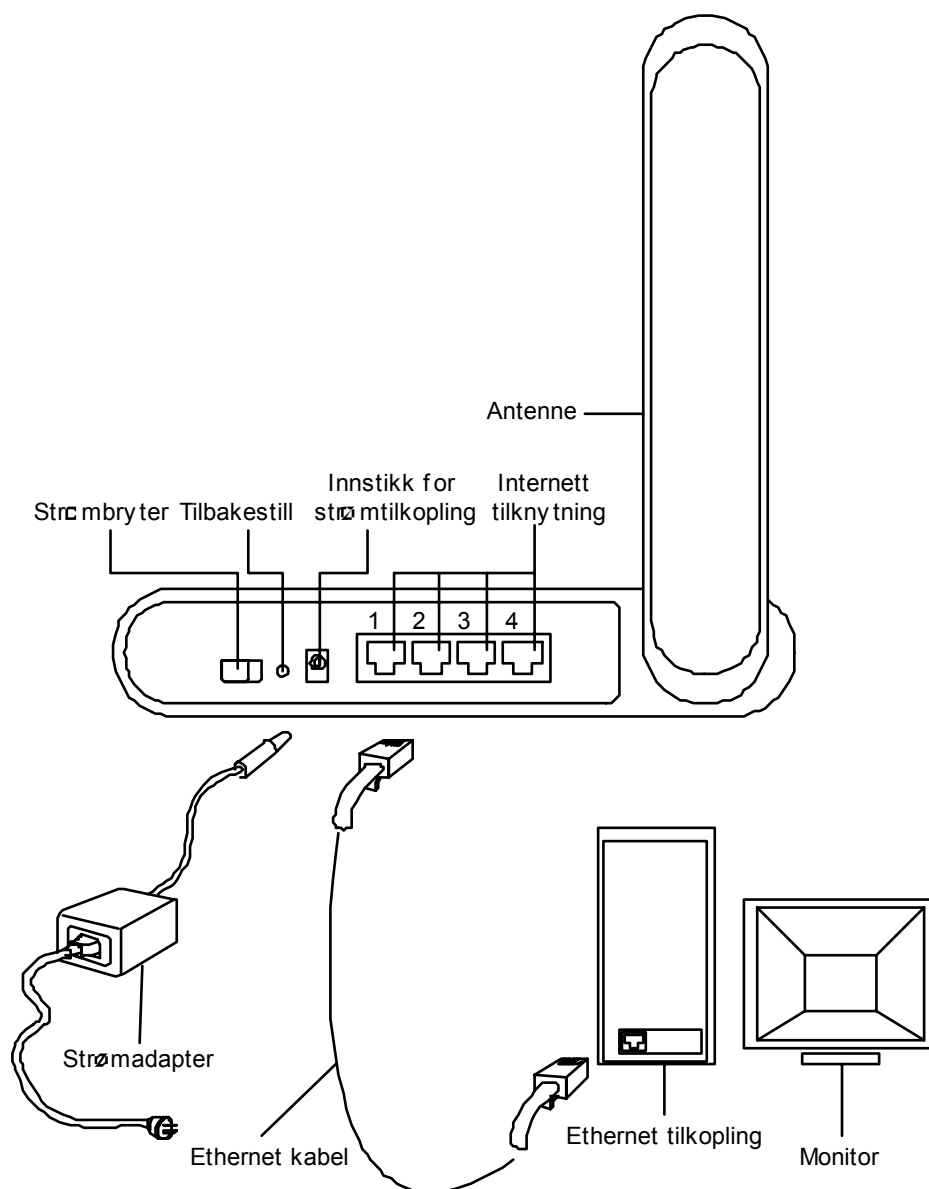


Figure 2-2 The schematic drawing of installation

2.2.1 Connecting to the Power

Connect the power adapter with the power socket and the power interface of D-20 respectively. The power input of D-20 is 18 V DC power. To ensure safe use, use the power adapter provided or approved by ICE only.

2.2.2 Connecting to PC

Connect the Ethernet interface of the PC and that of D-20 with the delivery-attached or prepared Ethernet cable preferentially. The Ethernet interface of D-20 is an adaptive

interface. Thus, crossover network cable and the standard network cable are both supported.

Note:

The length of the Ethernet cable used for connecting the PC and LAN cannot exceed 100 m.

2.3 Introduction to the Computer Configuration

The user PC configuration requirements are listed as follows.

- I. **Make sure an Ethernet network card or a wireless network card has been installed on your PC and the TCP/IP protocol has been started on the operating system.**
- II. **Install the Web browser. Microsoft Internet Explorer 6.0 or the higher version is recommended.**
- III. **Configure the PC to obtain an IP address automatically.**
 - 1) Right-click **My Network Places** and select **Properties** to display the **Local Area Connection** window. See Figure 2-3.

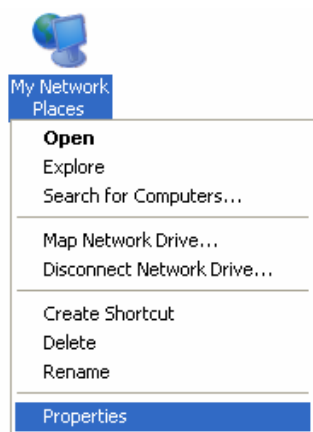


Figure 2-3 My Network Places Properties

-
- 2) Right-click **Local Area Connection** and select **Properties** from the shortcut menu. See Figure 2-4.

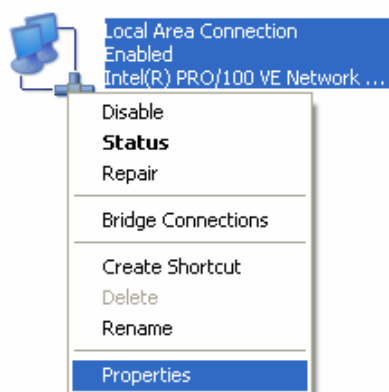


Figure 2-4 Local Area Connection

 **Caution:**

You should configure the available connections to D-20, and take **Local Area Connection** as an example.

- 3) Select **Internet Protocol (TCP/IP)** in the **This connection uses the following items** list box and then click **Properties**. See Figure 2-5.

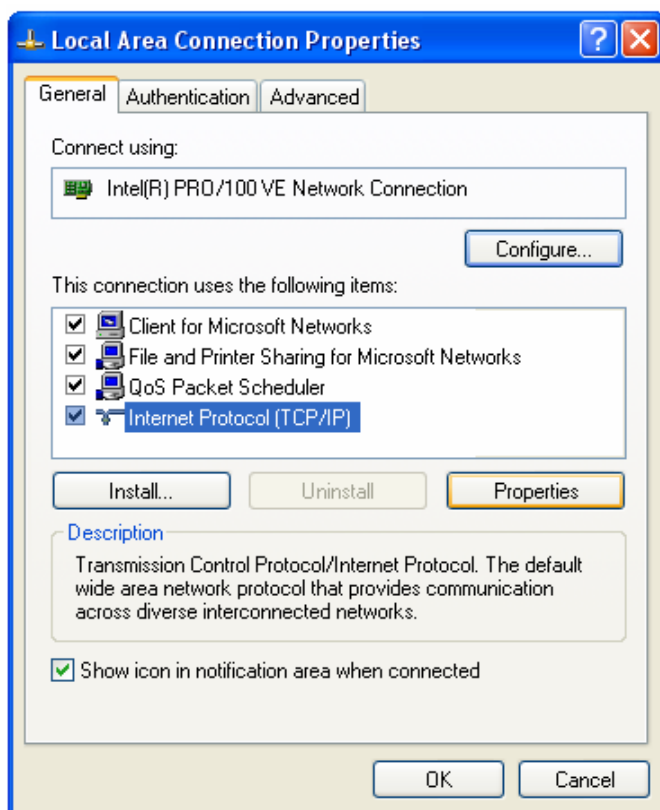


Figure 2-5 Local Area Connection Properties

- 4) Select **Obtain an IP address automatically** and **Obtain DNS server address automatically** in the **Internet Protocol (TCP/IP) Properties** dialog box, and then click **OK**. See Figure 2-6.

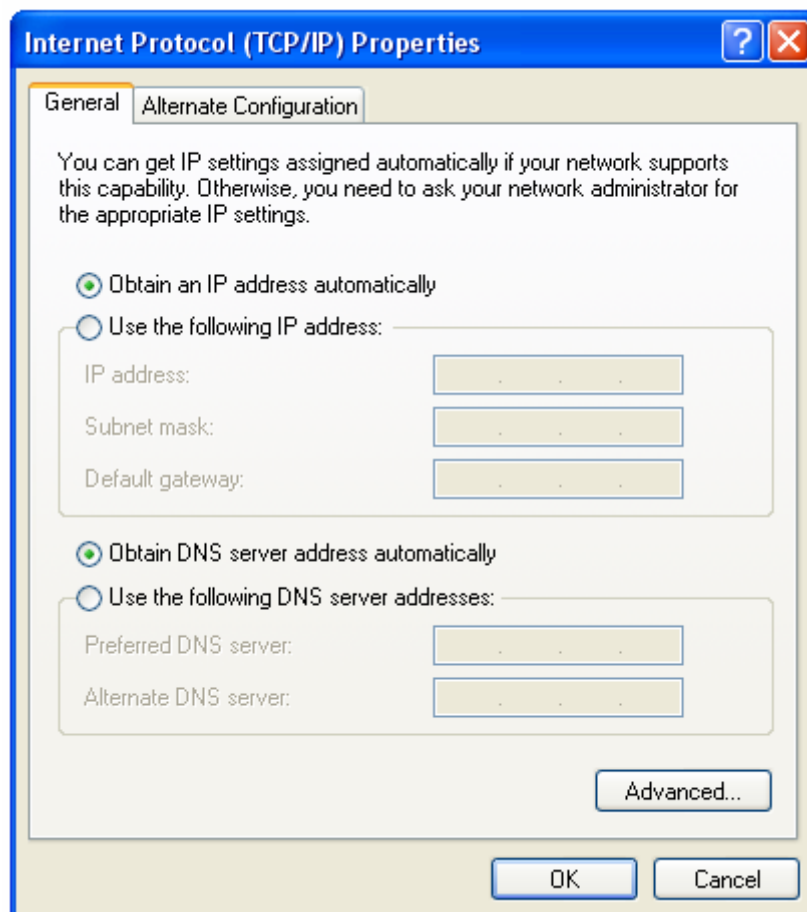


Figure 2-6 Internet Protocol (TCP/IP) Properties

⚠ Caution:

- Window XP operating system is taken for an example in the preceding descriptions. For other operating systems, the configuration interface and configuration method may be slightly different.
 - The Internet Explorer applies the default configuration. If the default configuration is changed, the configuration function of D-20 will be affected.
-

2.4 Introduction to Program Startup

2.4.1 Starting the Program

After starting D-20, open the Web browser on a PC connected to D-20. Enter <http://192.168.1.1> (the default address of D-20 wireless broadband gateway) in the address bar of the browser and then press the **Enter** key to display the **WIRELESS BROADBAND GATEWAY LOGIN** page of D-20. Users can choose different user IDs to log in. Figure 2-7 shows the login page.

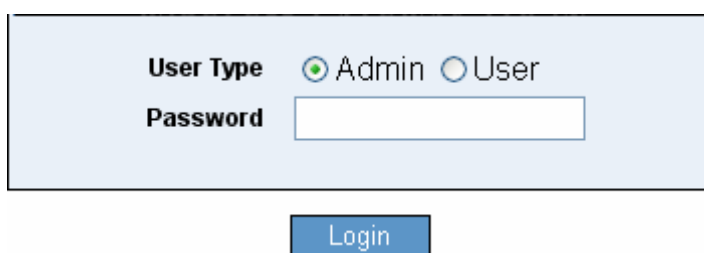


Figure 2-7 The login of the Web administrator

D-20 supports two types of users to log in.

- Admin account: The administrator can view and change the configurations.
- User account: The common users can only view the basic information.

Note:

- To avoid configurations confliction, only one host can log in to the Web configuration page of D-20 at the same time.
 - If you change the default device address 192.168.1.1 when configuring D-20, you need to enter the new device address when logging in to the gateway configuration page.
-

2.4.2 Introduction to the Configuration Page

I. The Configuration Page

After logging in as the administrator, you can see the configuration page of D-20. See Figure 2-8.

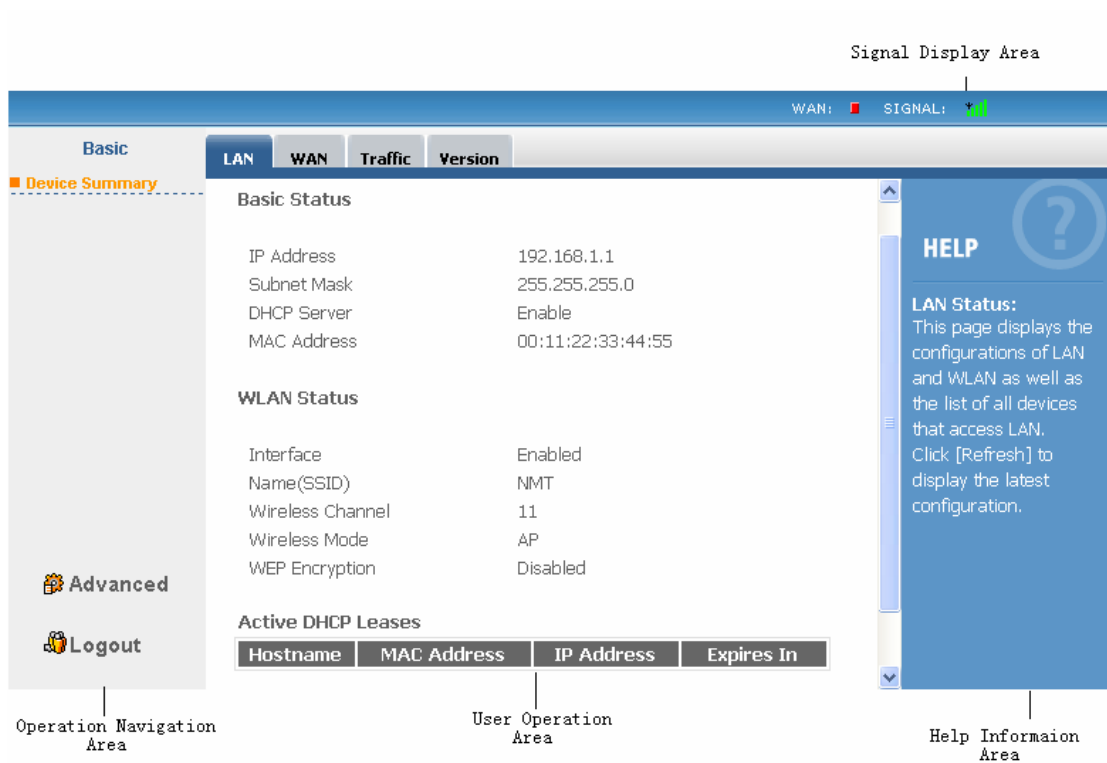



Figure 2-8 The configuration page of D-20

The window is divided into four parts.

- The operation navigation area listing three main functions: query information (**Basic**), set parameters (**Advanced**) and quit the management program (**Logout**).
- User operation area: View the gateway information and set parameters.
- Help information area: Display the help information.
- Signal display area: Display the network connection information and network signal strength. For details, see Table 2-2.

Table 2-2 Description of signal display


Signal	Description	
	Green	Red
WAN	The PPP connection is created.	The PPP connection has not been created yet.
3G	The 3G network is found.	The 3G network has not been found.
Network signal strength	The signal strength from weak to strong: 	-

II. The Operation navigation Area

There are three buttons in the operating navigating area of D-20.

- The **Basic** navigation button: To guide the user into the information querying page. By selecting different tabs in the user operation area, you can view the configuration information of LAN/WAN, the traffic statistic information and the system version information.
- The **Advanced** navigation button: To guide the user into the configuration page. You can set the parameters of LAN/WLAN and WAN, change the user password, update the software of D-20, restore the factory settings and restart D-20.
- The **Logout** button: Click this button to quit the D-20 configuration management page.

 **Caution:**

To quit the D-20 configuration management page, click **Logout**. If you click  of the browser to close this page directly, the configuration management function of D-20 will be affected.

Chapter 3 Query and Configuration of D-20

3.1 Introduction

The configuration management program of D-20 provides the functions of querying the gateway status and setting the parameters. With D-20, you can construct a network flexibly, manage the computers in the network, control the scale of the network and query the traffic information of the network.

3.2 Querying the Status

D-20 provides the function of querying the configuration of LAN/WAN, the traffic statistic and the system version information.

3.2.1 Querying the Configuration Information of LAN

After the login to D-20, follow these steps to display the LAN information querying page.

- 1) Click **Basic** in the operation navigation area.
- 2) Select the **LAN** tab in the user operation area to display the configuration information of LAN and the automatic IP address distribution information. See Figure 3-1.

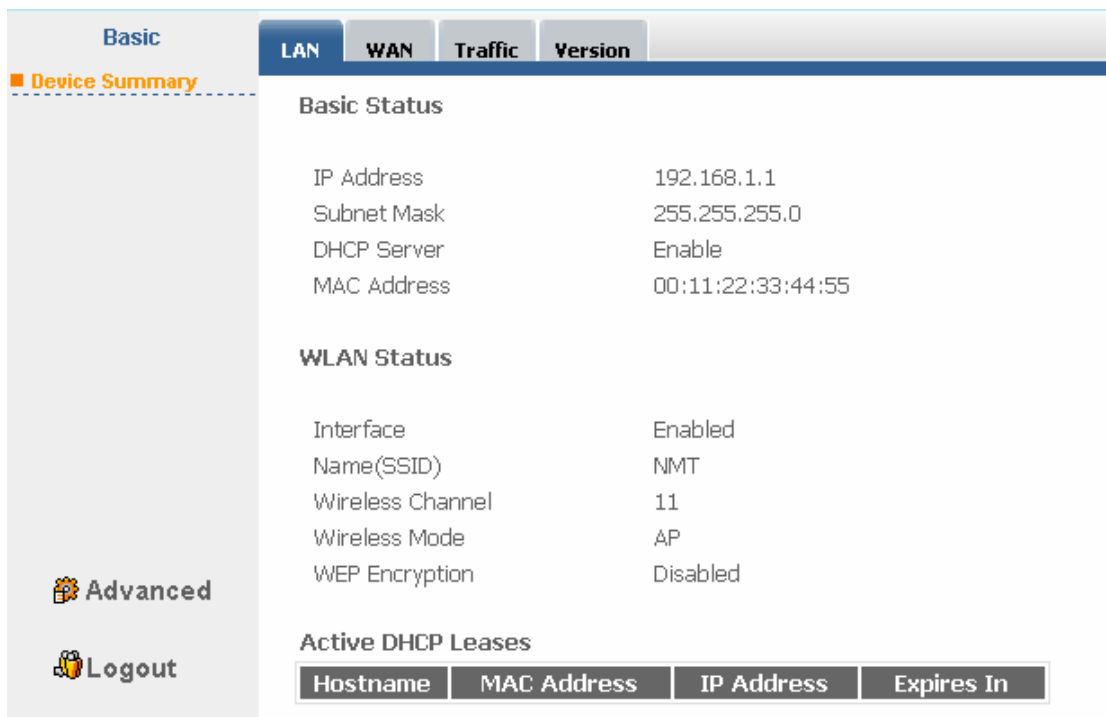


Figure 3-1 The configuration information of LAN

3.2.2 Querying the Configuration Information of WAN

After login to D-20, the steps of entering the WAN information querying page are shown as follows.

- 1) Click **Basic** in the operation navigation area.
- 2) Select the **WAN** tab in the user operation area to display the basic information of WAN. Click **Refresh** to update this page. See Figure 3-2.

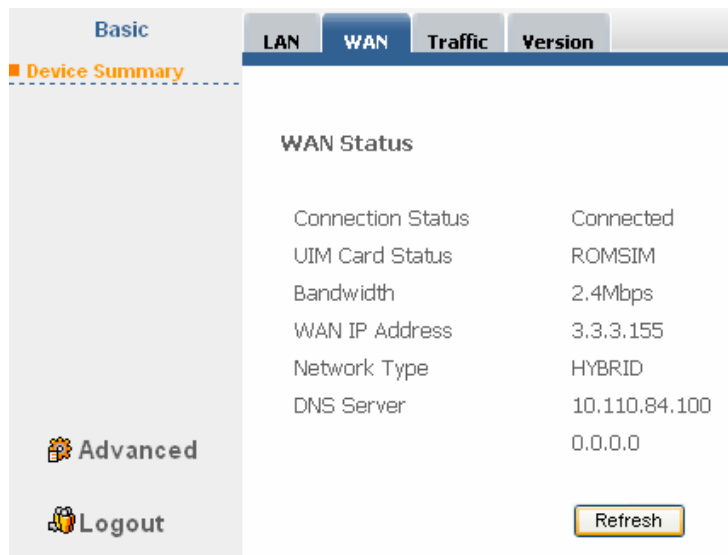


Figure 3-2 The basic information of WAN

3.2.3 Querying the Statistics Information

After login to D-20, the steps of entering the statistic information querying page are shown as follows.

- 1) Click **Basic** in the operation navigation area.
- 2) Select the **Traffic** tab in the user operation area to display the statistic information. See Figure 3-3.

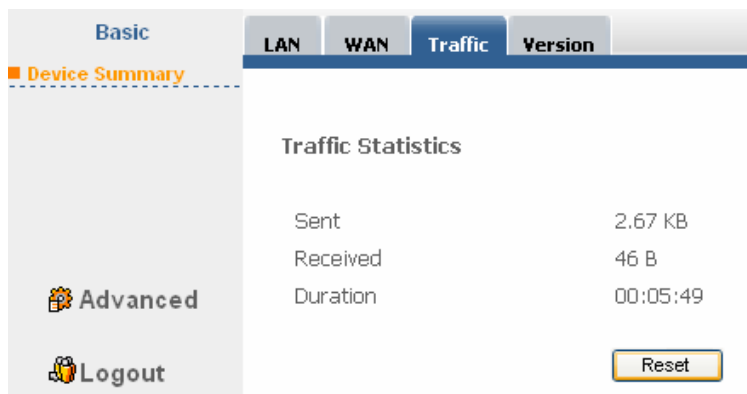


Figure 3-3 The statistics information

3.2.4 Querying the Version

After login to D-20, the steps of entering the version information querying page are shown as follows.

- 1) Click **Basic** in the operation navigation area.
- 2) Select the **Version** tab in the user operation area to display the system version information. See Figure 3-4.

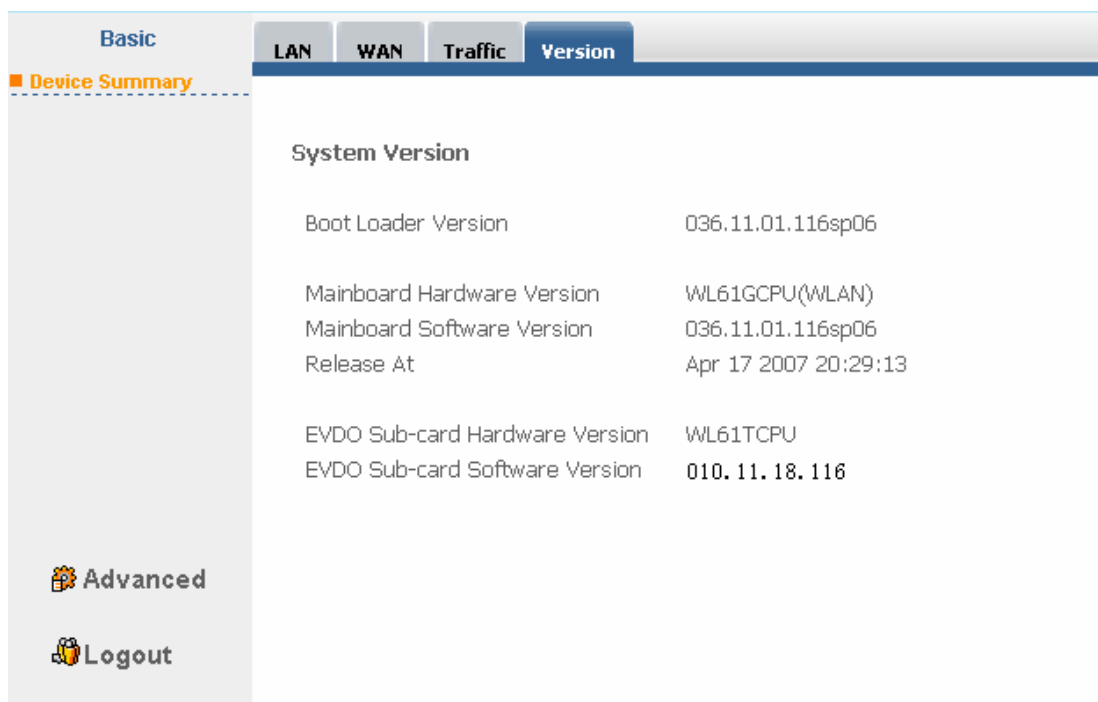


Figure 3-4 Version information

3.3 Configuring Parameters

3.3.1 Configuring LAN

I. Entering the configuration page of LAN

After login to D-20, the steps of entering the configuration page of LAN are shown as follows.

- 1) Click **Advanced** in the operation navigation area.
- 2) Enter the **LAN/Basic** page.

In the user operation area, you can configure the following parameters including the LAN interface IP address of D-20, subnet mask, and the relative configuration item of DHCP. Click **Apply** and then D-20 auto restarts to validate the configurations. Figure 3-5 shows the configuring page.

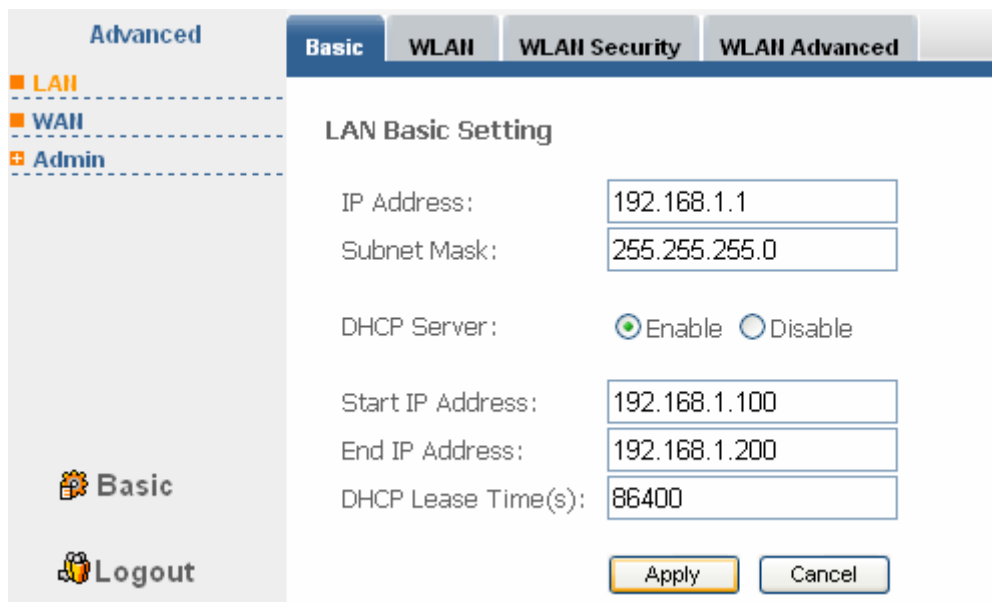


Figure 3-5 Configuring the basic parameters of LAN

II. Description of LAN parameters

- **IP Address:** The LAN address of D-20, by default, it is 192.168.1.1.
- **Subnet Mask:** To divide the subnet with its IP address, by default, it is 255.255.255.0.
- **Dynamic Host Configuration Protocol (DHCP) Server:** To realize the automatic IP address distribution. If **Enable** is selected, the DHCP Server auto distributes IP address. By default, it is **Enable**.
- **Start IP Address and End IP Address:** To delimit the random range for the automatic distribution of IP address. For example, in the subnet of 192.168.1.0/24, when the default address for D-20 is 192.168.1.1, the maximum range for the host IP is 192.168.1.2 – 192.168.1.254; the minimum is the single IP address.
- **DHCP Lease Time:** The valid period for the IP address of the hosts in LAN. By default, it is 86400s.

Note:

- **Start IP Address** must be no larger than **End IP Address**.
 - If the **DHCP Server** is enabled, you can configure the **Start IP Address**, **End IP Address** and **DHCP Lease Time**. Otherwise, you cannot configure parameters.
-

3.3.2 Configuring WLAN

I. Entering the WLAN Setting page

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The steps to enter WLAN setting page are shown as follows.

- 1) In the operation navigation area, click **Advanced**.
- 2) In the user operation area, select the **WLAN** tab.

In the WLAN setting page, you can set the service set identity (SSID), network type and channel. The setting page is as shown in Figure 3-6.

The screenshot shows the 'WLAN Setting' configuration page. On the left, there is a navigation menu with 'Advanced' selected, and sub-items for 'LAN', 'WAN', and 'Admin'. Below this are icons for 'Basic' and 'Logout'. The main content area has tabs for 'Basic', 'WLAN', 'WLAN Security', and 'WLAN Advanced', with 'WLAN' being the active tab. The 'WLAN Setting' form contains the following fields:

- Wireless Interface: NMT (00:11:22:33:44:55)
- Network Name(SSID): NMT
- Network Type: Open
- AP Isolation: Off
- Country: SWEDEN (Current: SE)
- Interface: Enabled
- 54g™ Mode: 54g Auto
- Channel: 11 (Current: 11)
- Rate: Auto

At the bottom of the form are 'Apply' and 'Cancel' buttons.

Figure 3-6 Setting WLAN basic parameters

II. Description of WLAN basic parameters

- **Wireless Interface:** The SSID and MAC address of D-20, which is used for identifying D-20. You do not need to fill it in manually, for the system will fill it in automatically.
- **Network Name (SSID):** Used for identifying a WLAN. When SSID of the wireless terminal (such as PC) is the same with that of D-20, they can put up data communication with each other. For the security of WLAN, do not use the default SSID. Use other string instead, such as "My home".
- **Network Type:** Network type of WLAN. When it is set to **Open**, WLAN is an open network and D-20 broadcasts the SSID of this WLAN. This type of network is convenient for users to access, but it is also easy for unauthorized access to WLAN. When it is set to **Closed**, WLAN is a closed network and D-20 does not broadcast the SSID of this WLAN. Under this network type, configure the SSID at the wireless terminal first before accessing the WLAN to guarantee the security.

- **AP Isolation:** Used for setting the two working modes for D-20. When it is set to **On**, multiple terminals can be connected to D-20, but wireless terminals cannot visit each other.
- **Country:** To identify different countries, for different countries adopt different channel standards and each country defines a set of common channels in their own country.
- **Interface:** Used for enabling or disabling WLAN. When it is set to **Disabled**, WLAN is unavailable. By default, it is **Enabled**.
- **Channel:** The channel that D-20 works on. In the IEEE802.11 standard, the working frequency of WLAN adopting direct sequence spread spectrum ranges from 2.4 GHz to 2.4835 GHz. Each channel occupies a frequency band with a bandwidth of about 22 MHz. The available channel varies with the selected country.
- **Rate:** To set the transmitting rate of D-20 WLAN. By default, it is set to **Auto** and the supported rate is up to 54 Mbit/s.
- **54g™ Mode:** Four modes are available.

Table 3-1 54g™ Mode

Mode	Description
54g Auto	With this mode, the compatibility of the WLAN is the best.
54g Performance	With this mode, the performance of the WLAN is the best.
54g LRS	When failed to communicate with the devices conforming to the IEEE 802.11b standard, select this mode.
802.11b Only	D-20 can only work in the mode of the IEEE 802.11b standard.

3.3.3 Configuring WLAN Security

I. Entering the WLAN Security Setting page

The steps to enter the WLAN security setting page are shown as follows.

- In the operation navigation area, click **Advanced**.
- In the user operation area, select the **WLAN Security** tab.

In the **WLAN Security Setting** page, you can set the encryption mode and the encryption key. Figure 3-7 show the configuration page.

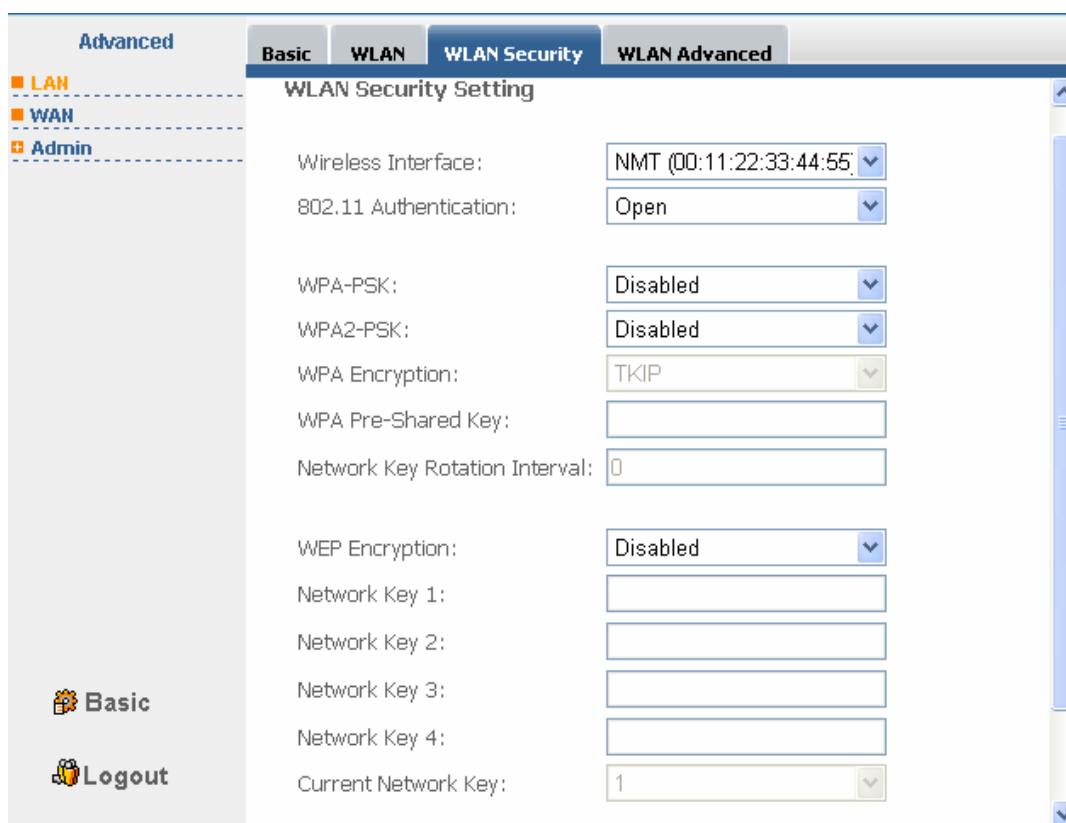


Figure 3-7 WLAN Security Setting

II. WLAN Security Parameter Description

- **Wireless Interface:** The SSID and MAC address of D-20, which is used for identifying D-20. It is not necessary for the user to enter the parameter manually and the system fills it in automatically.
- **802.11 Authentication:** Two options are available, **Open** and **Shared**, which are corresponding to two types of authentication for user's visit defined in the IEEE 802.11 standard. By default it is **Open**.
- **WPA-PSK:** To enable or disable the management function of the WPA pre-shared key.
- **WPA2-PSK:** To enable or disable the management function of the WPA2 pre-shared key.
- **WPA Encryption:** To set WPA encryption mode. Three modes are available: **TKIP**, **AES**, and **TKIP+AES**.
- **WPA Pre-Shared Key:** To set WPA pre-shared key.
- **Network Key Rotation Interval:** To set the interval of the dynamic change of the key. By default, it is **0 s**. By setting to 0 or vacant, you can disable this function.
- **WEP Encryption:** To enable or disable WEP data encryption. Two conditions are required: **Enabled** is selected and an available key is set.

- **Network Key 1:** To enter 5-digit ASCII characters or 10-digit hexadecimal numbers generates a 64-digit key. Or to enter 13-digit ASCII characters or 26-digit hexadecimal numbers generates a 128-digit key.
- **Network Key 2:** To enter 5-digit ASCII characters or 10-digit hexadecimal numbers generates a 64-digit key. Or to enter 13-digit ASCII characters or 26-digit hexadecimal numbers generates a 128-digit key.
- **Network Key 3:** To enter 5-digit ASCII characters or 10-digit hexadecimal numbers generates a 64-digit key. Or to enter 13-digit ASCII characters or 26-digit hexadecimal numbers generates a 128-digit key.
- **Network Key 4:** To enter 5-digit ASCII characters or 10-digit hexadecimal numbers generates a 64-digit key. Or to enter 13-digit ASCII characters or 26-digit hexadecimal numbers generates a 128-digit key.
- **Current Network Key:** To choose one key from **1**, **2**, **3**, and **4** as data encryption or authentication.

3.3.4 Advanced Configuration of WLAN

I. Entering the WLAN Advanced Setting page

The steps to enter WLAN advanced setting page are shown as follows.

- In the operation navigation area, click **Advanced**.
- In the user operation area, select the **WLAN Advanced** tab.

In the **WLAN Advanced Setting** page, you can set the working mode, MAC address filter, and bridge function of D-20. The setting page is shown in Figure 3-8 and Figure 3-9.

Advanced	Basic	WLAN	WLAN Security	WLAN Advanced
LAN	WLAN Advanced Setting			
WAN	Wireless Interface:	NMT (00:11:22:33:44:55)		
Admin	Preamble Type:	Long		
	Max Associations Limit:	128		
	Mode:	Access Point		
	Bridge Restriction:	Enabled		
	Bridges:	Peer MAC Address	Link Status	
	MAC Restrict Mode:	Disabled		

Figure 3-8 WLAN advanced setting page 1

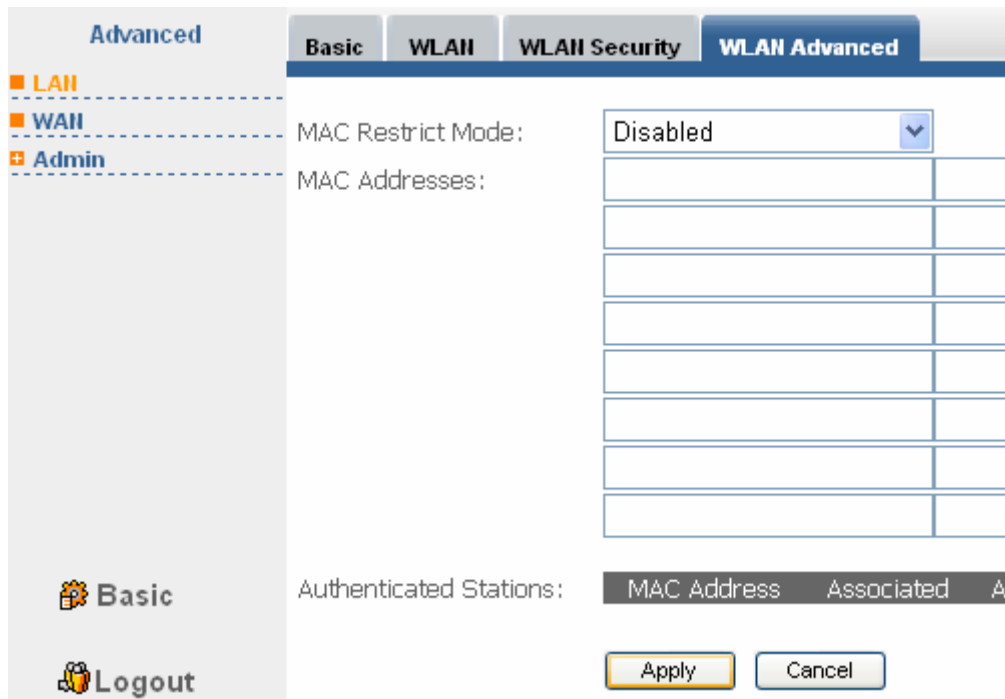


Figure 3-9 WLAN advanced setting page 2

II. WLAN Advanced Setting Parameter Description

- **Wireless Interface:** The SSID and MAC address of D-20, which is used for identifying D-20. It is not necessary for the user to enter the parameter manually and the system fills it in automatically.
- **Preamble Type:** Two parameters are available, **Long** and **Short**. If it is supported by terminal, to select **Short** will enhance the performance of WLAN.
- **Max Associations Limit:** To set the up limit on the number of the terminal connecting to D-20 at one time. D-20 supports up to 128 wireless terminals theoretically to access the Internet through a wireless connection.
- **Mode:** Two working modes, listed in Table 3-2. By default, it is **Access Point**.

Table 3-2 Working mode of D-20

Mode	Description
Wireless bridge	Bridge mode, used for bridging between two or more APs.
Access point (AP)	Access mode, in which AP and WIRELESS TERMINAL satisfying the IEEE 802.11b/g can access D-20.

- **Bridge Restriction:** Select **Disabled** to disable wireless bridge restriction. Any wireless bridge will be granted access. Select **Enabled** to enable wireless bridge restriction. Only those bridges listed in Remote Bridges will be granted access.

- **Bridges:** The physical address of the remote peer bridge. D-20 supports P-to-P bridge mode. One D-20 can connect with four remote peer bridges.
- **Peer MAC Address:** The physical address list of the remote peer bridges. Up to four physical addresses can be filled in.
- **Link Status:** Two statuses are available, up and down. **up** means bridging is successful and **down** means bridging is unsuccessful.
- **MAC Restrict Mode:** Three options are listed in Table 3-3. By default, it is **Disabled**.

Table 3-3 MAC restrict mode parameter description

Parameter	Description
Disabled	MAC address filter function is disabled.
Allow	The wireless terminals corresponding to the MAC addresses in the MAC addresses list are allowed to access D-20 through WLAN.
Deny	The wireless terminals corresponding to the MAC addresses in the MAC addresses list are forbidden to access D-20 through WLAN.

- **MAC Addresses:** MAC addresses list. D-20 controls the access to the clients whose addresses are listed in the MAC address list. Up to 16 MAC addresses can be saved in the list.
- **Authenticated Stations:** The information of wireless terminals that logs in to D-20 through authentication.

3.3.5 Configuring WAN

I. Configuring the parameters of WAN connection

The steps of entering WAN configuration page are shown as follows.

- 1) Click **Advanced** in the operation navigation area.
- 2) Click **WAN** in the unfolded navigation tree to display the parameter configuration page of WAN. In this page, you can set the PPP parameters and parameters for connecting the CDMA network. Click **Apply** to save your settings. Figure 3-10 shows the configuration page.

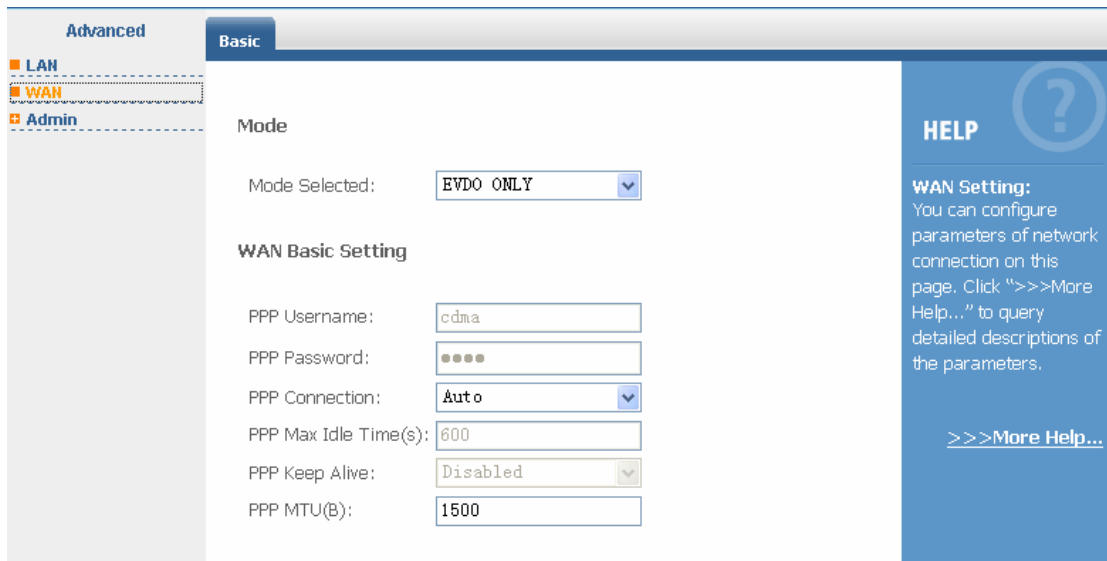


Figure 3-10 Configuring the parameters of WAN

II. Parameter Description of WAN

- **Mode:** Network mode. Table 3-4 lists the network modes.

Table 3-4 Network modes

Network mode	Description	
	Performance	Remark
CDMA 1X ONLY	The maximum downlink rate: 153.6 kbit/s	D-20 runs only under the CDMA2000 1x network mode.
EVDO ONLY	The maximum downlink rate: 2.4 Mbit/s	D-20 runs only under the CDMA20001x EV-DO network mode.
HYBRID	The maximum downlink rate: 2.4 Mbit/s	D-20 auto selects the CDMA2000 1x or the CDMA 2000 1x EV-DO network mode and the CDMA2000 1x EV-DO mode is preferential.

- **PPP:** Point-to-Point protocol is widely applied on the WAN. It supports the synchronous mechanism and the asynchronous mechanism, and forms a set of safety solutions to ensure safe transmission. D-20 adopts this protocol in the data transmission on WAN.
- **PPP Username:** The user name used in the communication when the PPP protocol is adopted, provided by the Internet service provider (ISP).
- **PPP Password:** The password used in the communication when the PPP protocol is adopted, provided by the Internet service provider.

- **PPP Connection:** The connection mode of PPP. When **Auto** is selected, the PPP connection holds on even though there is no data transmission; when **On Demand** is selected, the PPP connection will be cut off automatically when there is no data transmission for the PPP Max Idle Time duration.
- **PPP Max Idle Time:** The duration of PPP connection in the idle mode. If there is no data transmission within this duration, PPP connection will be cut off automatically. By default, it is 600s.
- **PPP Keep Alive:** The parameter of PPP connection for restoring. When set to **Enable**, the system will auto restore to connecting state when the PPP connection is cut off.
- **PPP MTU:** The maximum unit of data transmission when PPP protocol is adopted. By default, it is 1500B.

 **Caution:**

Only when **PPP Connection** is set to **On Demand** can the configuration **PPP Max Idle Time** be valid.

3.3.6 Managing the System

I. Managing the User and Password

This function is used to configure the login password and prevent the invalid users from logging in to the configuration management page. D-20 provides two kinds of users, **Admin** and **User**.

- **Admin** is the administrator, who can view and change the configurations. By default, the password is “admin”.
- **User** is the common user, who can only view the basic information. By default, the password is “user”.

 **Note:**

- **Admin** user can change only the administrator password but cannot change the user password.
 - **User** user does not have the right of changing password.
 - Upper case and lower case letters, numeric, and the common symbols on the keyboard all can be used as password. Special symbols are not allowed by the system.
-

Admin user can change the password in the **User & Password** configuration page. The operation steps are shown as follows.

- 1) Select **Advanced > Admin > User & Password** in the operation navigation area to display the **User & Password** page.
- 2) Enter the current password in the **Current Password** text box.
- 3) Enter the new password in the **New Password** text box.
- 4) Enter the new password again in the **Confirm Password** text box.
- 5) Click **Apply** to finish or click **Cancel** to cancel the changes.

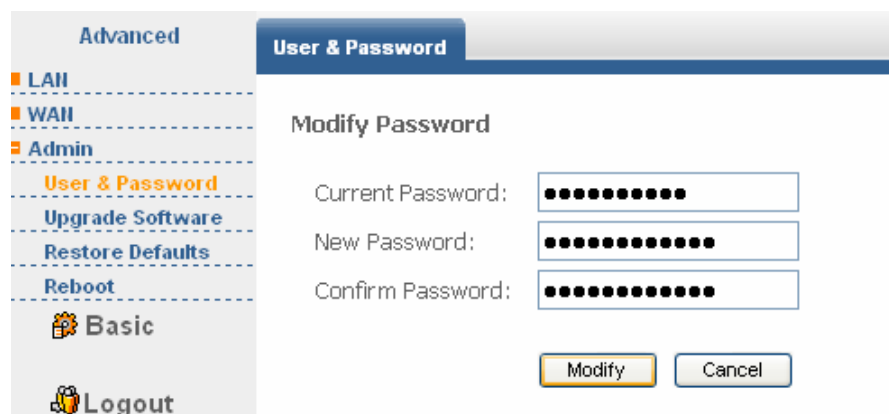


Figure 3-11 The management page of User & Password

II. Upgrading the Software

This function is used for upgrading the software of D-20. The steps of entering the software upgrading page are shown as follows.

- 1) Select **Advanced** in the operation navigation area.
- 2) Select **Admin** in the operation navigation area.
- 3) Select **Upgrade Software** in the operation navigation area to enter the **Upgrade** page. See Figure 3-12.

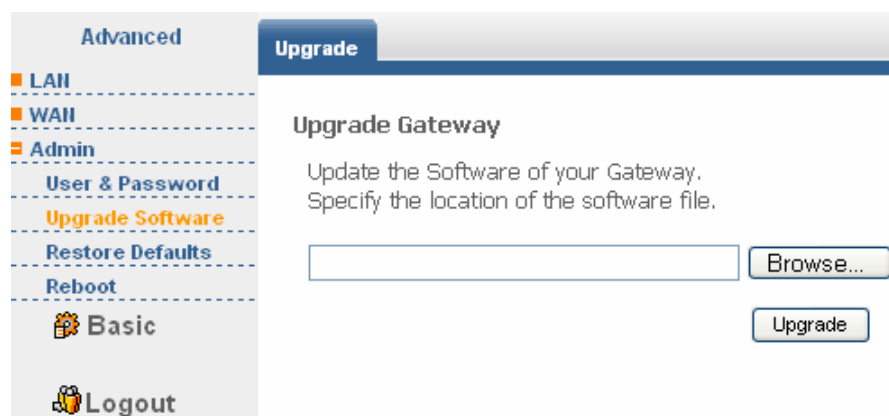


Figure 3-12 The software upgrading page

 **Caution:**

- After the upgrade of software, D-20 will restart. The process will take two minutes approximately.
- Download the software for upgrading only from the official website of ICE or other network operator.

To upgrade the software of D-20, follow these steps.

- 1) Click **Browse** in the **Upgrade** page and select the software file. Take **WL6GCPU11004_update.app** for an example.
- 2) Click **Upgrade** in the **Upgrade** page.
- 3) After upgrading, **Upgrade Successfully! The gateway is rebooting...** will be prompted in the user operation area. Click **Continue** to reboot the devices to finish the upgrade.

Figure 3-13 and Figure 3-14 show the upgrading process.

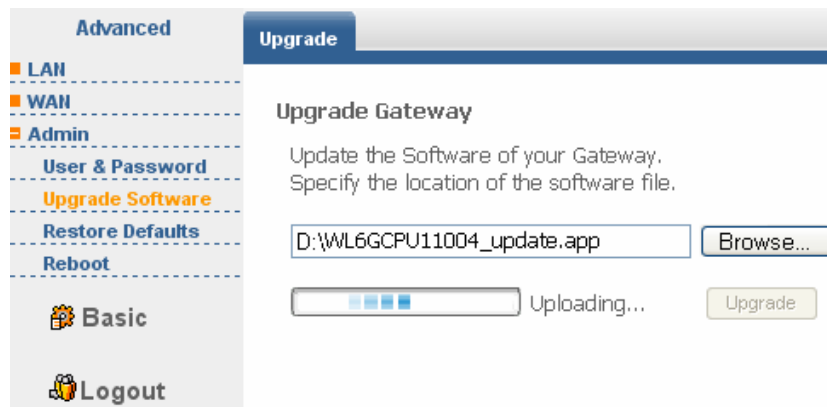


Figure 3-13 The software upgrading process

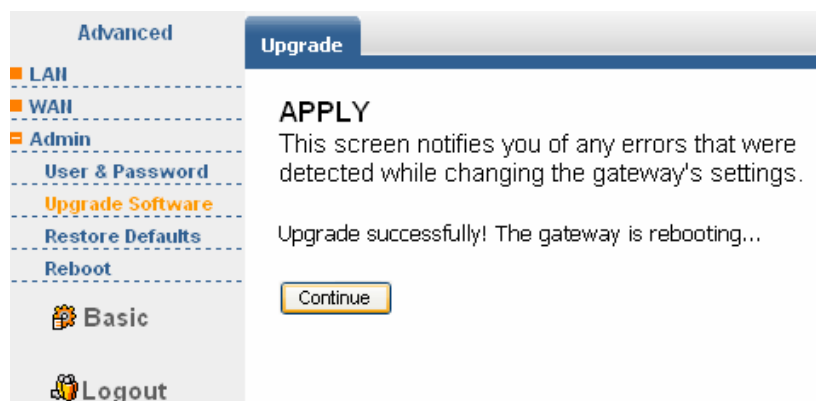


Figure 3-14 Upgrade successfully

III. Restoring the Default Settings

The steps of restoring the factory setting are shown as follows.

- 1) Select **Advanced** in the operation navigation area.
- 2) Select **Admin** in the operation navigation area.
- 3) Select **Restore defaults** in the operation navigation area and then click **Restore** to restore the default settings. See Figure 3-15.

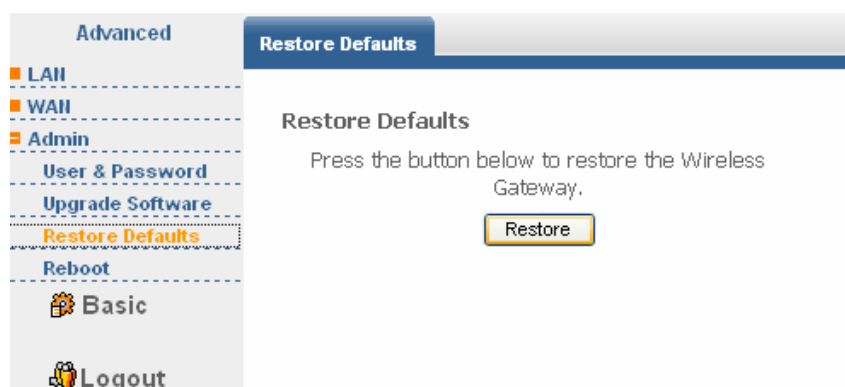


Figure 3-15 Restoring the default settings

Note:

After setting D-20 to default settings, you need to re-set the parameters of D-20.

IV. Rebooting D-20

The steps of rebooting D-20 are shown as follows.

- 1) Select **Advanced** in the operation navigation area.
- 2) Select **Admin** in the operation navigation area.
- 3) Select **Reboot** in the operation navigation area and then click **Reboot** to reboot D-20. See Figure 3-16.

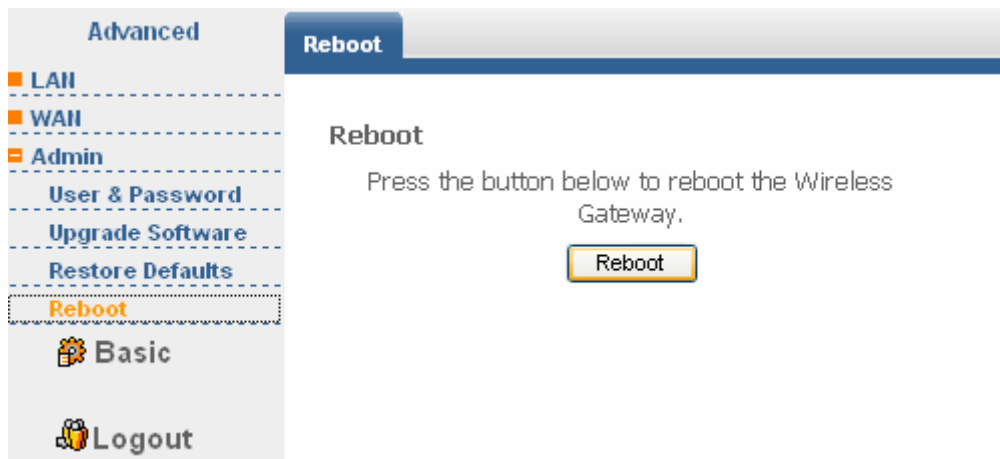


Figure 3-16 Rebooting D-20

3.4 Networking Example

3.4.1 Demand Analysis

Four PCs connect to D-20 through wired or wireless connection, which constitutes a small network. The LAN logs in to the Internet through D-20. Figure 3-17 shows the networking structure.

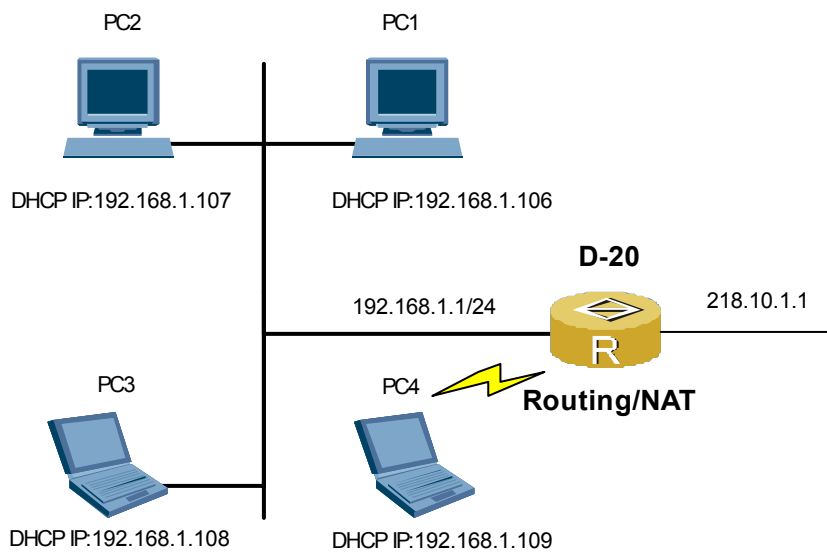


Figure 3-17 Networking example

3.4.2 Installing Hardware

For the requirement of installing hardware, see “2.2 Introduction to the Install Procedure”.

3.4.3 Configuring Device

For the requirement of configuring software, see “2.3 Introduction to the Computer Configuration” and “3.3.5 Configuring WAN”. Set the PC to **Obtain an IP address automatically**. **PPP Username** and **PPP Password** are mandatory, and other parameters can be set to the default value.

Chapter 4 Troubleshooting

4.1 Troubleshooting

4.1.1 The Host in the LAN Cannot Access the Internet

I. Symptom

The host in the wired LAN connected with D-20 cannot access the Internet.

II. Causes

- From the aspect of the host: the network configuration of the host and the network card of the host
- From the aspect of D-20: the connection to the power and the configuration of D-20
- From the aspect of network: the connection of Ethernet and the CDMA network

III. Troubleshooting

You can locate the problems as follow.

- 1) If the power indicator of D-20 is on, it means the power connection is normal; if it is off, check the power connection of D-20.
- 2) There are five green indicators of signal strength on the panel of D-20. If none of the signal strength indicator is on, make sure the CDMA network covers your location area.
- 3) If there is CDMA network coverage, check the network mode. For the primary users, the HYBRID network mode is recommended.
- 4) The "1", "2", "3" and "4" indicators of D-20 represent the Ethernet interfaces. If the indicator is off, check the physical connection of the corresponding Ethernet interface.
- 5) Make sure that **PPP Username** and **PPP Password** are correctly configured. For details, see 3.3.5 I. "Configuring the parameters of WAN".
- 6) If DHCP service is disabled, and the host still adopts the automatic mode, the host cannot access the Internet. You can set the IP address of the host manually. For details, see Figure 4-1.

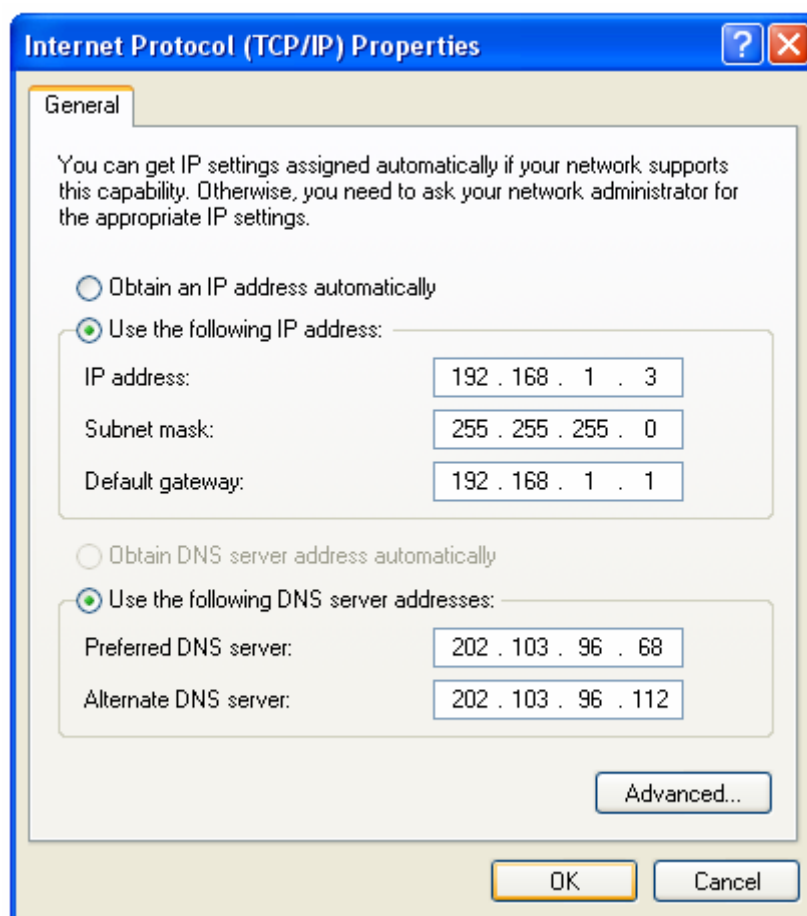


Figure 4-1 Internet Protocol (TCP/IP) Properties

- **IP address:** The IP address of the host cannot be identical to that of other computer in the same LAN and that of D-20; but it should be in the same subnet with D-20. For example, if the IP address of D-20 is 192.168.1.1 and the subnet mask is 255.255.255.0, the IP address of the host ranges from 192.168.1.2 to 192.168.1.254.
 - **Subnet mask:** The code that is necessary to divide subnet. Apply the bit-wise-and operation on the IP address and the mask to make up the corresponding network address. By default, it is 255.255.255.0.
 - **Default Gateway:** The IP address of D-20, by default, it is 192.168.1.1.
 - **Preferred DNS server:** provided by the network provider.
 - **Alternate DNS server:** provided by the network provider.
- 7) Make sure the driver of network adapter is well installed.
 - 8) Restore the factory settings of D-20.
- If the previous methods are all in vain, you can restore D-20 to the factory settings by pressing and holding **Reset** (on the back panel) for more than 10 seconds.

 **Caution:**

- After restoring D-20 to factory settings, make sure the host adopts the mode of **Obtain an IP address automatically**.
 - After restoring D-20 to factory settings, you need to re-set the parameters of D-20.
-

4.1.2 The Host in the WLAN Cannot Access D-20

I. Symptom

One host is configured with a wireless network card and is to access the WLAN, but it cannot set up the connection to D-20.

II. Causes

This failure is mainly because the wireless channel signal is weak or the parameters of the wireless network card and that of D-20 are not the same.

III. Troubleshooting

- 1) If the signal is weak, make sure there is no interference source or shield near D-20. If there is any, put D-20 at another place.
- 2) Make sure that the **Interface** of WLAN is enabled.
- 3) Make sure that the following parameters on D-20 and the wireless network card are consistent: SSID, channel, WEP type, and key. Otherwise, you need to modify the information of the wireless network card. The SSID of the wireless network card should be ANY.

4.2 FAQ

I. What to do if you forget the administrator password

If you forget the administrator password, you can restore D-20 to the factory settings. The default administrator account in factory settings is:

User name: Admin

Password: admin

Then you can change the administrator password of D-20.

II. What to do if you forget the IP address of the LAN interface

If you forget the IP address of the LAN interface of D-20, you can reset D-20 to the factory settings. By default, it is 192.168.1.1.

III. What to do if bridging between two D-20s is unsuccessful

First, make sure that the two D-20s work on the same channel. For details, see "3.3.2 Configuring WLAN".

Second, make sure that the MAC address of one D-20 is in the peer MAC address list of another D-20. For details, see "3.3.4 Advanced Configuration of WLAN".

IV. When the signal strength is normal, what to do if the downloading rate is much lower than 2.4Mbit/s?

In this case, you may need to set the DWORD value in registry of TcpWindowSize and DefaultRcvWindow to 65536 at:

\\KEY_LOCAL_MACHINE\\SYSTEM\\CurrentControlSet\\Services\\Tcpip\\Parameters. If TcpWindowSize or DefaultRcvWindow does not exist, you need to create a new DWORD entry for them and then set the DWORD value to 65536.

To create a DWORD entry, see the following steps.

- 1) Click **start** and then select **Run**. See Figure 4-2.

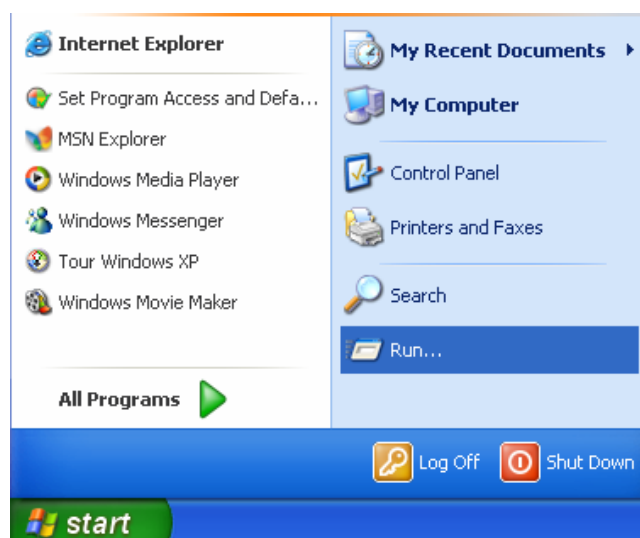


Figure 4-2 Select Run

- 2) Type "regedit" in the **Open** text box and then click **OK**. See Figure 4-3.

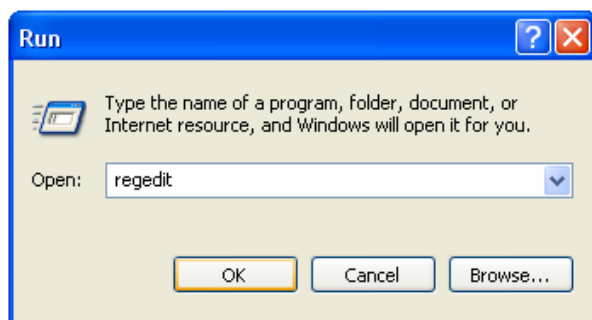


Figure 4-3 Run regedit

- 3) Select **Parameters** under the following directory:
\\HKEY_LOCAL_MACHINE\\SYSTEM\\CurrentControlSet\\Services\\Tcpip. See Figure 4-4.

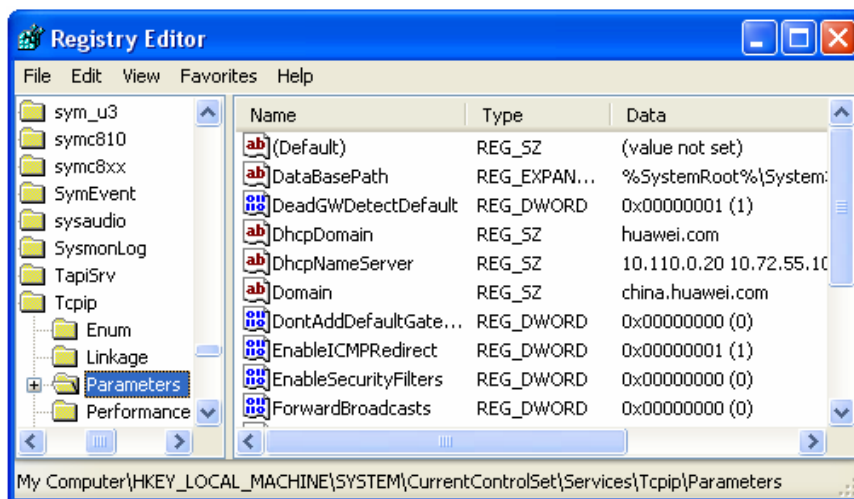


Figure 4-4 Select Parameters

- 4) Select **Edit > New > DWORD Value**. See Figure 4-5.

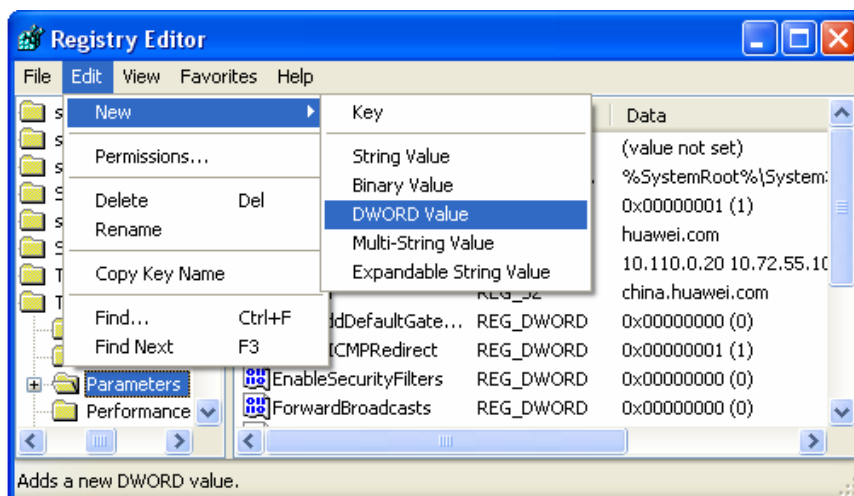


Figure 4-5 New DWORD Value

- 5) Rename "New Value #1" as "TcpWindowSize". See Figure 4-6.

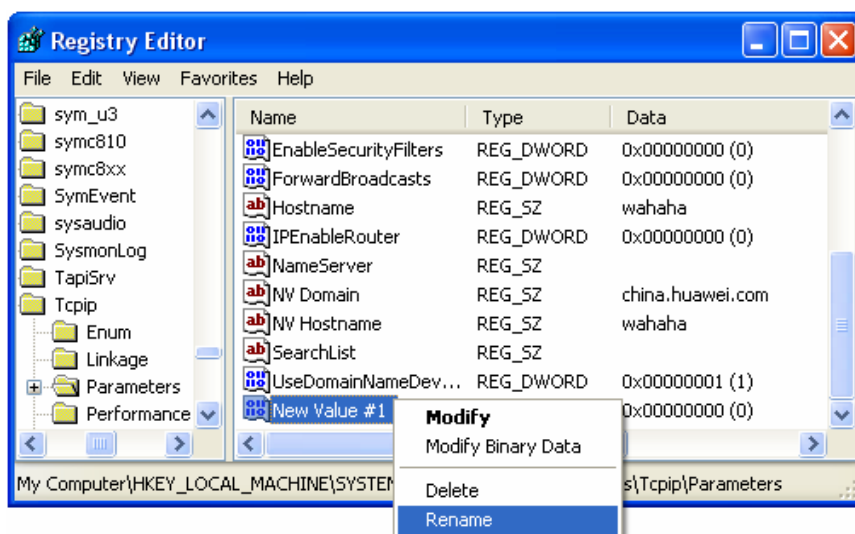


Figure 4-6 Rename

- 6) Right-click "TcpWindowSize" and then select **Modify** in the shortcut menu. See Figure 4-7.

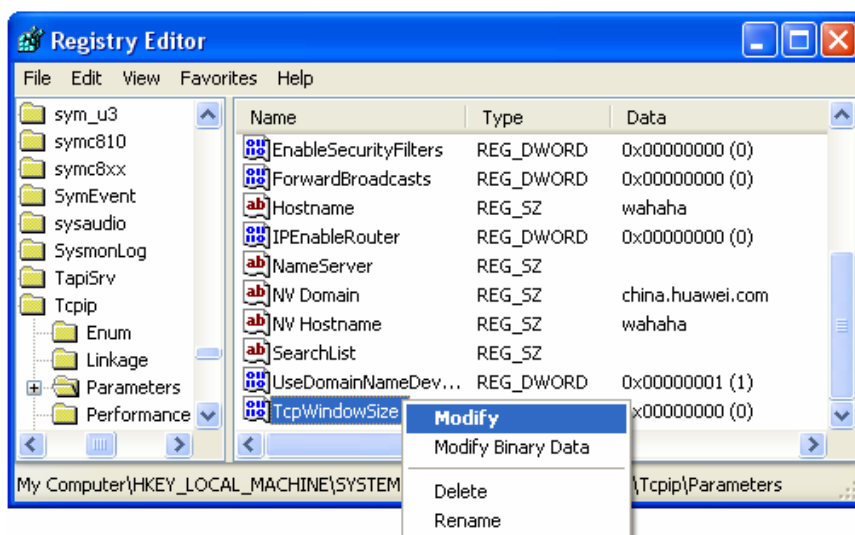


Figure 4-7 Modify value

- 7) Select **Decimal** and enter "65536" in the **Value data** text box, and then click **OK**. See Figure 4-8.

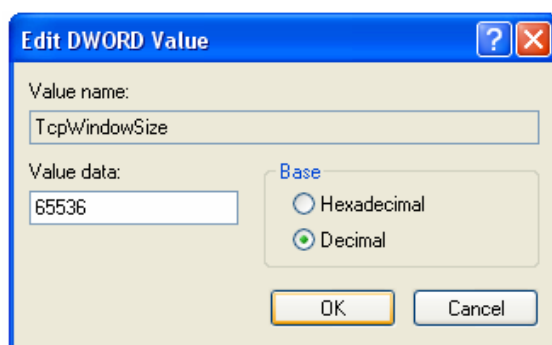


Figure 4-8 Edit DWORD Value of TcpWindowSize

For the DWORD value of DefaultRcvWindow, do the same operations as that of TcpWindowSize. See Figure 4-9.

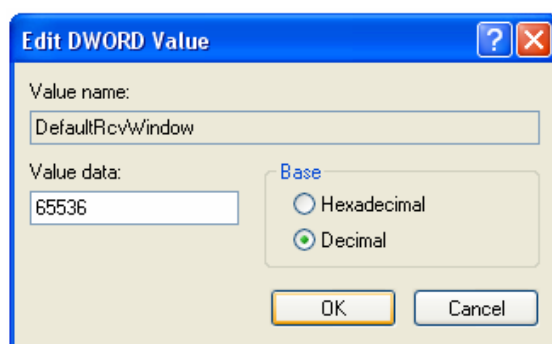


Figure 4-9 Edit DWORD Value of DefaultRcvWindow

 **Caution:**

Window XP operating system is taken for an example in the preceding descriptions. For other operating systems, the configuration method may be slightly different.

V. What to do if software update failed

If the failure is caused by sudden power-off, you can employ the emergency update method. Enter the IP address of D-20 (by default, it is 192.168.1.1) in the browser, and then press **Enter** to display the emergency update page. Then follow the instructions in the emergency update page to update the software. See Figure 4-10.

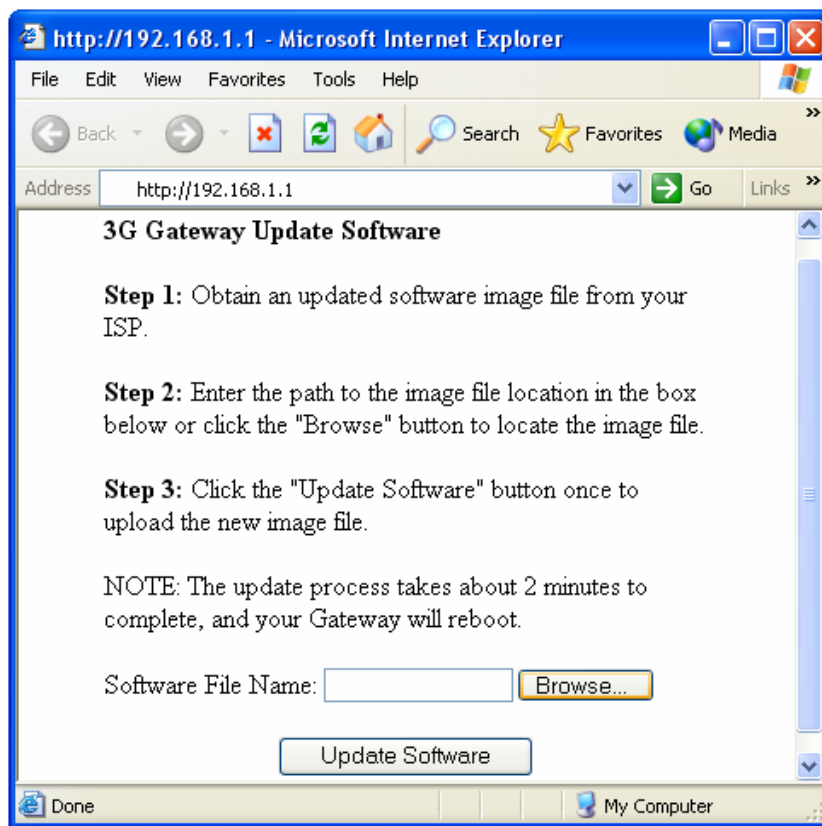


Figure 4-10 Updating when in emergency

Chapter 5 Acronyms and Abbreviations

3G	The Third Generation
A	
AES	Advanced Encryption Standard
AP	Access Point
B	
BSC	Base Station Controller
BTS	Base Transceiver Station
C	
CDMA2000	Code Division Multiple Access 2000
D	
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
E	
EV-DO	Evolution Data Optimization
F	
FA	Foreign Agent
H	
HA	Home Agent
I	
IP	Internet Protocol
L	
LAN	Local Area Network
M	
MTU	Maximum Transmission Unit
N	
NAT	Network Address Translation
P	
PC	Personal Computer
PDSN	Packet Data Serving Node
PPP	Point-to-Point Protocol

R

RAN Radio Access Network

S

SOHO Small Office Home Office

SSID Service Set Identity

STA Station

T

TKIP Temporal Key Integrity Protocol

W

WAN Wide Area Network

WAP Wireless Application Protocol

WEP Wired Equivalent Privacy

WLAN Wireless Local Area Network

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