



**RGOS 11.X High-end Data Center Switches
(N18000-X) Routine Maintenance and
Troubleshooting**

Contents

- Routine Maintenance Suggestions
- Handling of Common Faults
- Troubleshooting
- Obtaining Help

Routine Maintenance Suggestions

■ Importance of routine maintenance:

- Routine maintenance is a preventative action performed during normal operations of a device. This action helps to find and resolve defects or potential issues of the device in a timely manner and maintain health of the device, so that the device can securely, stably, and reliably operate in a long term.

■ Major tasks of routine maintenance:

- Hardware running status maintenance
- Smart and automatic health check and periodical maintenance using the Ruijie Networks health check tool (recommended)
- Manual check of software running status
- Periodical maintenance using the network management system (NMS)
- Checking whether a software upgrade is needed every half year or every year

Routine Maintenance Suggestions—Hardware Running Status Maintenance

■ Checking the environment

□ Cleanness:

- The chassis and floor should be clean and free of dust. Clean or replace the cabinet air filters regularly; otherwise, ventilation and heat dissipation through the cabinet door and fan trays will be affected.

□ Heat dissipation:

- When the switch runs normally, fans should run properly. If any fan is faulty, the system temperature will increase, which may cause damage to the switch. Do not place sundries at the air intake or exhaust vents of the switch. Periodically clean the dust away from the fans to prevent too much dust from accumulating on the fans.
- Run the **Ruijie#show tempr** command to check whether the operating temperature of the switch is normal.

```
N18K#show temperature
Chassis-type: RG-N18007
slot      card_type                warning(C)  shutdown(C)  current(C)
-----
1         M18000-24GT20SFP4XS-ED  56          100 |100      26|29|31|29|38|39
2         N/A                    N/A         N/A          N/A
3         N/A                    N/A         N/A          N/A
4         N/A                    N/A         N/A          N/A
5         N/A                    N/A         N/A          N/A
M1        M18007-CM II           56          100 |100      31|31|35|34|41
M2        M18007-CM II           56          100 |100      28|31|35|33|39
```

- It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Hardware Running Status Maintenance

■ Checking hardware status

- Status indicator (N18018-X as an example):

When the RG-N18000 is running normally, you can check indicators (LEDs) on its cards to monitor status of the cards.

- If the alarm LED on the primary supervisor engine is solid red, a fault has occurred in the system. In this case, log in to the system and check the logs or hardware status information to locate and rectify the fault.
- If the alarm LED on the primary supervisor engine is solid yellow, the system temperature has exceeded the alarm threshold. In this case, the system performance degrades but the system can still run. Log in to the system and check the fault information to locate and rectify the fault.
- If the status LED on a fan tray is off, the fan tray may receive no power input or is faulty. In this case, log in to the system and check the fan status.
- If the status LED of a card is off, blinking, or solid red, the card is faulty. In this case, identify the fault cause and, if necessary, perform a power-off check.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Hardware Running Status Maintenance

LED	Identification on the panel	Status	Meaning	
System LED	Status	Off	The module is NOT receiving power.	
		Solid red	The module is faulty.	
		Blinking green	Initialization is in progress. Continuous blinking indicates errors.	
		Solid green	The module is operational	
Primary/standby supervisor module LED	Primary	Off	The module acts as the standby supervisor module.	
		Solid green	The module acts as the primary supervisor module.	
Fault alarm LED	Alarm	Off	No fault	
		Solid red	The system fails, interrupting functioning of the whole system or a module; the device may be damaged if it continues operating.	
		Solid yellow	The device overheats, which will affect the system performance. The system may continue operating.	
SD card slot status LED	None	Off	SD card is not installed, or is not connected.	
		Solid green	An SD card is loaded.	
		Blinking	Data is being accessed from and written	
LED	Fan status LED	FAN	Blinking green	Initialization is in progress. Continuous blinking indicates errors.
			Solid green	The fan is operational.
			Solid yellow	The fan is NOT in the position.
			Solid red	The fan is faulty.
	Power status LED	PWR	Off	The power supply module is NOT in the position.
			Solid green	The power supply module is operational.
			Solid red	The power supply module is faulty.
	DCMI port status LED	None	Off	The DCMI port is NOT connected.
			Green	The DCMI port is connected at 1000Mbps.
			Yellow	The DCMI port is connected at 10/100Mbps.
			Blinking	The DCMI port is transmitting or receiving data.
	MGMT port status LED	None	Off	The MGMT port is NOT connected.
Green			The MGMT port is connected at 1000Mbps.	
Yellow			The MGMT port is connected at 10/100Mbps.	
		Blinking	The MGMT port is transmitting or	

Routine Maintenance Suggestions—Hardware Running Status Maintenance

■ Checking hardware status

□ Fans:

- Fans do not generate abnormal sound. Little dust is attached on the fans. You can run the **show fan** command to display the operating status of fans.

□ Power modules:

- Power modules function normally, with their status LEDs solid green. You can run the **show power** command to display the operating status of power modules.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Hardware Running Status Maintenance

■ Checking hardware status

```
Ruijie#show fan
Chassis-type: RG-N18010
Fan-id: 1
  Fan-type:      M10_FAN_R
  Serial Number: 9974HL20G0078
Fan-id: 2
  Fan-type:      M10_FAN_R
  Serial Number: 9974HL20G0047
Fan-id: 3
  Fan-type:      M10_FAN_R
  Serial Number: 9974HL20G0051
Fan-id: 4
  Fan-type:      M10_FAN_F
  Serial Number: 9973HL20F0025
```

fan-id	status	mode	speed-level
1	ok	normal	N/A
2	ok	normal	N/A
3	ok	normal	N/A
4	ok	normal	N/A

```
Ruijie#show fan detail
Chassis-type: RG-N18010
```

```
Ruijie#show power
Chassis-type: RG-N18010
Power-redun: no
Energy-saving: off
```

power-id	power-type	supply (W)	status	vol-in/out (V)
1	PA16001	1600	ok	233 /12
2	PA16001	1600	fail	0 /0
3	N/A	N/A	N/A	N/A /N/A
4	N/A	N/A	N/A	N/A /N/A
5	N/A	N/A	N/A	N/A /N/A
6	N/A	N/A	N/A	N/A /N/A
7	N/A	N/A	N/A	N/A /N/A
8	N/A	N/A	N/A	N/A /N/A
POE1	N/A	N/A	N/A	N/A /N/A
POE2	N/A	N/A	N/A	N/A /N/A

slot	card_type	status	require
1	M18000-24GT20SFP4XS-ED	power-on	100
2	M18000-44SFP4XS-ED	power-on	135
3	N/A	N/A	N/A
4	N/A	N/A	N/A
5	N/A	N/A	N/A
6	N/A	N/A	N/A
7	N/A	N/A	N/A
8	N/A	N/A	N/A
FE1	N/A	N/A	N/A
FE2	N/A	N/A	N/A

```
Ruijie#show fan detail
Chassis-type: RG-N18010
Fan-id: 1
  Fan-type:      M10_FAN_R
  Serial Number: 9974HL20G0078
  Status:        ok
  Mode:          normal
```

sub-fan-id	status	speed(rpm)
1	ok	2400
2	ok	2400
3	ok	2550
4	ok	2100

```
Fan-id: 2
  Fan-type:      M10_FAN_R
  Serial Number: 9974HL20G0047
  Status:        ok
  Mode:          normal
```

sub-fan-id	status	speed(rpm)
1	ok	2400
2	ok	2400
3	ok	2550
4	ok	2100

total-power (W)	redundancy (W)	available (W)	card-used (W)	fan-used (W)	free-power (W)
1600	0	1600	529	732	339



Routine Maintenance Suggestions—Manual Check of Software Running Status

Recommended check items:

Health status items:

- CPU usage: Check whether the CPU usages of line cards and supervisor engines are normal.
- CPU protection (CPP) count: Check the numbers of received and dropped packets sent to the CPU to determine whether the network environment is normal.
- Memory usage: Check whether the memory usage is normal.
- Interface status: Check whether any interface encounters CRC errors.
- Logs: Check whether any abnormal log information exists.

Device configurations (optional):

- Run the **show ip route** command to check whether the route table size is the same or close to the normal size.
- Run the **show arp counter** command to check whether the number of users is the same or close to the usual size.
- Run the **show run** command to check whether any configuration has changed.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Manual Check of Software Running Status

■ CPU usage:

□ Run the **show cpu** command to check the CPU running status.

- Ruijie#show cpu **New feature: The CPU usage of each line card can be displayed in RGOS 11.X.**

```
=====
CPU utilization in five seconds:12.41%
CPU utilization in one minute : 13.11%
CPU utilization in five minutes:13.08%
```

The CPU usage may increase sharply in a short time if a batch configuration is performed or a show command is executed. This is a normal symptom.

- show processes cpu history **New feature: Historical CPU usage statistics can be displayed.**
- In the healthy state, "CPU utilization in five minutes" should be lower than 30%. The CPU usage increases with the load of running services, which is a normal symptom. However, if the CPU usage exceeds 60%, call technical support for consultation or check the technical support documents on the official website of Ruijie Networks.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Manual Check of Software Running Status

- CPU usage:

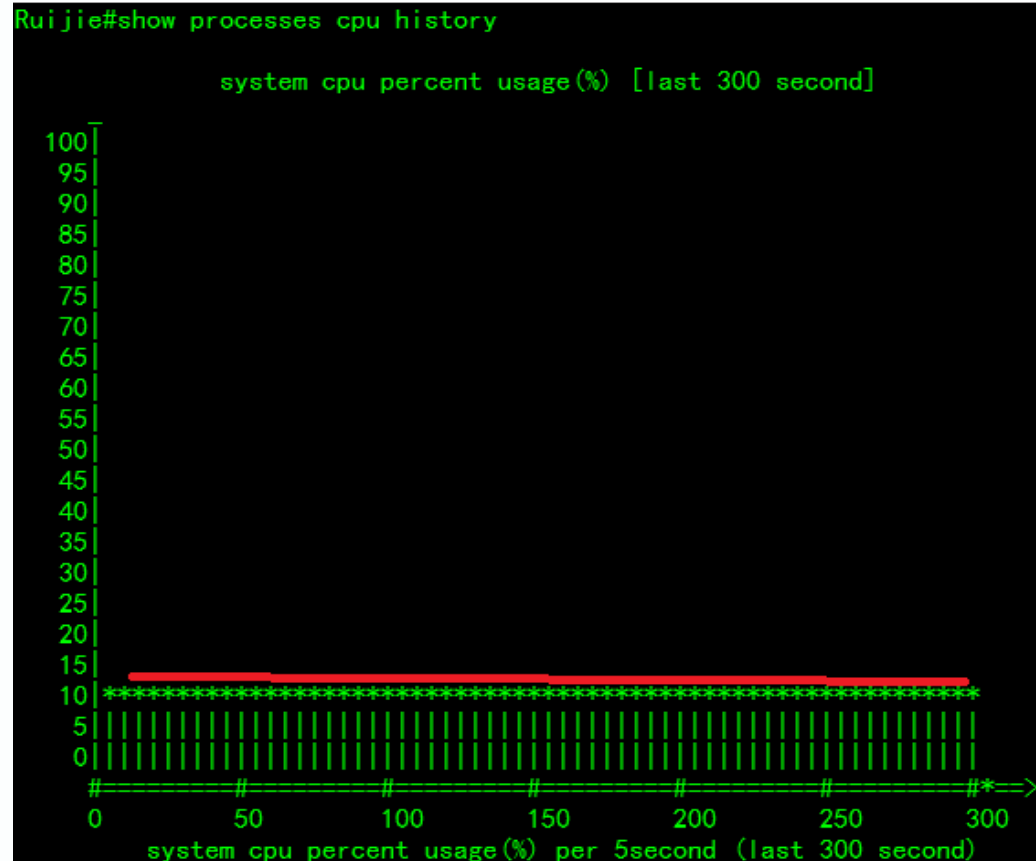
```
Ruijie#show cpu
=====
[Slot 1: M18000-24G20SFP4XS-ED, Cpu 0]
CPU Using Rate Information
CPU utilization in five seconds:7.8% line card CPU usage
CPU utilization in one minute:7.9%
CPU utilization in five minutes:7.9%

[Slot 2: M18000-44SFP4XS-ED, Cpu 0]
CPU Using Rate Information
CPU utilization in five seconds:8.6%
CPU utilization in one minute:8.5%
CPU utilization in five minutes:8.5%

[Slot FE2: M18010-FE-D 1, Cpu 0]
CPU Using Rate Information
CPU utilization in five seconds:1.9%
CPU utilization in one minute:1.8%
CPU utilization in five minutes:1.8%

[Slot FE3: M18010-FE-D 1, Cpu 0]
CPU Using Rate Information
CPU utilization in five seconds:2.0%
CPU utilization in one minute:1.8%
CPU utilization in five minutes:1.8%

=====
[Slot M1: M18010-CM] engine CPU usage
CPU Using Rate Information
CPU utilization in five seconds: 5.50%
CPU utilization in one minute: 5.30%
CPU utilization in five minutes: 5.30%
```



Routine Maintenance Suggestions—Manual Check of Software Running Status

■ CPU protection (CPP) status:

The system performs queuing and rate limiting on packets sent to the CPU based on priorities of packets, thus protecting its own CPU.

- Run the **show cpu-protect** command to check information about protocol packets received by the CPU.
 - In the healthy state, the rate of protocol packets does not exceed the preset threshold. If the rate of a certain type of protocol packets continuously exceeds the threshold, and the number of dropped packets keeps increasing, you need to identify the source of these packets on the network and handle the problem accordingly. (You can run the **show cpu-protect** command for two or three times to verify that the problem occurs.)

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Manual Check of Software Running Status

- CPU protection (CPP) status:

```
Ruijie#show cpu-protect mboard
%cpu port bandwidth: 100000 (pps)
Traffic-class  Bandwidth(pps)  Rate(pps)  Drop(pps)
-----
0 20000 0 0
1 20000 0 0
2 20000 0 0
3 20000 0 0
4 20000 0 0
5 20000 0 0
6 20000 0 0
7 20000 0 0

Packet Type      Traffic-class  Bandwidth(pps)  Rate(pps)  Drop(pps)  Total  Total Drop
-----
bpdv             6             128             0           0           0       0
arp              1            10000           0           0           0       0
tpp              6             128             0           0           0       0
dot1x           2            1500            0           0           0       0
gvrp            5             128             0           0           0       0
rldp            5             128             0           0           0       0
lacp            5             256             0           0           0       0
rerp            5             128             0           0           0       0
reup            5             128             0           0           0       0
lldp            5             768             0           0           0       0
cdp             5             768             0           0           0       0
```

Routine Maintenance Suggestions—Manual Check of Software Running Status

■ Memory usage:

Run the **show memory** command to check the memory running status. (New features: You can run the **show memory sorted total** command to sort processes based on their memory usages, or the **show memory history** command to display the historical peak memory usage and related process information.)

```
Ruijie#show memory
System Memory: 4194304KB total, 2078688KB used, 2115616KB free, 49.5% used rate
Used detail: 647592KB active, 60700KB inactive, 60976KB mapped, 1182304KB slab, 174672KB core

PID      Vsd      Text     Rss      Data     Stack    Total    Process
23331    0         100      1976     17852    84       22704    rl-con/0
3491     0         100      2192     34184    84       40292    rl-con/1458
2591     0         220      2984     79960    84       88044    tty_secu_enable
2356     0         24       1816     8484     84       12864    sntp.elf
2348     0         108      21196    17136    84       40760    span.elf
2336     0         16       1448     428      84       3452     rg-mtdoops-cli
2305     0         552      30696    74264    84       103780   snooping.elf
2267     0         928      848      852      84       4704     sh
2265     0         24       388      164      84       2072     run_proxy-io2ne
2263     0         24       288      32       84       1940     demo_proxy-io2n
2262     0         928      772      788      84       4640     sh_app
2237     0         384      21996    62096    84       86076    ofdatapath
2236     0         280      2132     20824    84       26196    ofprotocol
```

In the healthy state, the total memory usage should be lower than 60%. The memory usage increases with the load of running services, which is a normal symptom. However, if the memory usage exceeds 80%, call technical support for consultation or check the technical support documents on the official website of Ruijie Networks.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Manual Check of Software Running Status

- Interface status:
 - Run the **show interface** command to display the interface status and check:
 - Whether the traffic on an interface is normal. If the traffic rate approaches or reaches the bandwidth, check whether the bandwidth meets the current application requirements. Or, if network attacks exist and exhaust the bandwidth, pay close attention to the bandwidth occupied by the multicast or broadcast packets and the increase rate of bandwidth consumption in a short term.
 - Whether the number of CRC errors and the number of dropped packets on an interface are large and continuously increase. If so, the cable on the interface may not be securely connector or has aged, or the duplex mode or rate of the local interface does not match that of the remote interface.
 - Run the **show interface tras dia** command to display the Tx/Rx optical power of optical transceivers and check whether any alarm is generated.
 - Perform this check to prevent packet loss caused by link or transceiver failures, and eliminate potential risks.

Routine Maintenance Suggestions—Manual Check of Software Running Status

■ Interface status:

- Run the **show interface** command to display the interface status and check:

```
Ruijie#show interface counters

Interface : GigabitEthernet 1/1
 10 seconds input rate :0 bits/sec, 0 packets/sec      FCSErrors : 0
 10 seconds output rate :0 bits/sec, 0 packets/sec    dropped packet events (due to lack of resources): 0
Rxload : 0%                                           packets received of length (in octets):
InOctets : 0                                           64 : 0
InPkts : 0 (Unicast: 0%, Multicast: 0%, Broadca     65-127 : 0
InUcastPkts : 0                                         128-255 : 0
InMulticastPkts : 0                                       256-511 : 0
InBroadcastPkts : 0                                       512-1023 : 0
Txload : 0%                                           1024-1518 : 0
OutOctets : 0                                           Packet increment in last sampling interval (5 seconds):
OutPkts : 0 (Unicast: 0%, Multicast: 0%, BroadcaInPkts : 0 (Unicast: 0%, Multicast: 0%, Broadcast: 0%)
OutUcastPkts : 0                                         InUcastPkts : 0
OutMulticastPkts : 0                                       InMulticastPkts : 0
OutBroadcastPkts : 0                                       InBroadcastPkts : 0
Undersize packets : 0                                       OutOctets : 0
Oversize packets : 0                                       OutPkts : 0 (Unicast: 0%, Multicast: 0%, Broadcast: 0%)
collisions : 0                                           OutUcastPkts : 0
Fragments : 0                                           OutMulticastPkts : 0
Jabbers : 0                                           OutBroadcastPkts : 0
CRC alignment errors : 0
AlignmentErrors : 0
FCSErrors : 0
dropped packet events (due to lack of resources): 0
packets received of length (in octets):
 64 : 0
```


Routine Maintenance Suggestions—Manual Check of Software Running Status

■ Logs:

- Run the **show log** command to check whether any abnormal logs exist.

```
*Jul 21 17:24:20: %LOCAL_DP-5-LC_PROB: Probing card in slot 1 of local chassis.  
*Jul 21 17:24:20: %LOCAL_DP-5-LC_PROB: Probing card in slot 2 of local chassis.  
*Jul 21 17:24:20: %LOCAL_DP-5-LC_PROB: Probing card in slot FE2 of local chassis.  
*Jul 21 17:24:20: %LOCAL_DP-5-LC_PROB: Probing card in slot FE3 of local chassis.  
*Jul 21 17:24:25: %LOCAL_DP-5-LC_PROB: Board information in this chassis has been collected.  
*Jul 21 17:24:25: %SWITCH-6-INSTALL: Install chassis RG-N18010 on switch 1  
*Jul 21 17:24:25: %DP-6-MASTER: Module in slot M1 has translated to master.  
*Jul 21 17:24:25: %DP-5-LC_PROB: Probing card in slot 1.
```

- Run the **show log** command to check whether abnormal information exists in the logs, for example, frequent up/down state transitions of interfaces or OSPF neighbors. Check for alarms with severity of 2 or above or find the related logs based on the actual symptoms of faults.

It is recommended that a routine inspection be performed on a monthly basis.

Routine Maintenance Suggestions—Automatic Maintenance Using the NMS

- Ruijie Networks NMS products, such as SNC and RIIL, can be used to monitor the real-time CPU usage, memory usage, interface traffic, MAC table, ARP table, and routing table of a device. In addition, the NMS can receive logs and traps from the device periodically, based on which automatic routine maintenance can be implemented.
- If the third-party NMS software needs to obtain certain MIB objects from the switch, call technical support to obtain the MIB reference for the specific product version and search for the specific OIDs in the document.

Contents

- Routine Maintenance Suggestions
- **Handling of Common Faults**
- Troubleshooting
- Obtaining Help

Handling of Common Faults

■ Symptom:

After the switch is powered on, the Console port does not have any output, or outputs garbled characters.

■ Possible Causes:

- ① The switch is not properly powered on.
- ② The baud rate or other communication parameter settings on the Console port are not consistent with those on the PC. Or, the COM port selected on the HyperTerminal is incorrect.
- ③ The console cable is damaged, or its wire sequence is not standard.
- ④ The console cable is not connected to the primary supervisor engine.

■ Solution:

- ① Check whether power cables of the switch are correctly connected, whether the switch receives power input from the power source normally, and whether the status LED on the front panel of the switch is solid green.
- ② Change the baud rate of the PC to 9600, and confirm that other COM port parameters (select **Restore Defaults** on the HyperTerminal) and the COM port ID are correct.
- ③ Replace the console cable with the one delivered with the switch, and configure data again.
- ④ Check the primary LED to confirm that the console cable is connected to the primary supervisor engine.

Handling of Common Faults

■ Symptom:

After an Ethernet interface is connected with an Ethernet cable or optical fiber, its link LED does not turn on, and the interface cannot change to the up state.

■ Possible Causes:

- ① The Ethernet cable or optical fiber does not function normally.
- ② The optical transceiver does not match the interface.
- ③ The duplex modes and rates of the Ethernet interfaces at two ends of the link do not match. (Currently, N18000, S86E, and S78E ED line cards do not support the half-duplex mode.)
- ④ The Tx and Rx ends of the optical fiber are connected incorrectly.

■ Solution:

- ① Run the **show interface tran dia** command to diagnose the optical signals, and replace the Ethernet cable or optical fiber with a new one for the test.
- ② Replace the optical transceiver with a new one of the same specifications (single-mode/multimode and transmission distance) for the test.
- ③ Set the same duplex mode and rate on two ends of the link.
- ④ Swap the Tx and Rx ends of the optical fiber.

Handling of Common Faults

■ Symptom:

The status LED is solid red.

■ Possible Causes:

- ① Fan alarm
- ② Temperature alarm
- ③ Power alarm

■ Solution:

- ① Check whether the fans are blocked or damaged. Run the **show fan** command to verify the fan running status.
- ② Run the **show temper** command to verify the temperature. If the switch has stopped normal service switching, check the operating environment of the switch, clean the dust on the switch, and improve the cooling effect.
- ③ Check whether the two power modules are working properly. Run the **show power** command to verify the status of the power modules.

Contents

- Routine Maintenance Suggestions
- Handling of Common Faults
- **Troubleshooting**
- Obtaining Help

Troubleshooting

■ Fault classification:

- ❑ Faults that occur on a device are generally classified into hardware faults, software faults (further divided into the common function or protocol failures, and bottom-layer software failures), and environment problems (non-device faults).
- ❑ Hardware faults: The symptom of a hardware fault is generally easy to identify. For example, a card cannot start or a fan alarm is generated. A hardware fault can be rectified by means of hardware replacement.
- ❑ Common function or protocol failures: For example, addresses cannot be obtained through DHCP, or an SNMP error is reported. The troubleshooting methods for these faults are the same as those of the RGOS 10.X products, such as the S86 and S12000.
- ❑ Bottom-layer software failures: The information collection methods are relatively complex and must be provided by Ruijie Networks engineers.

■ New features for troubleshooting the RGOS 11.X products: **one-click information collection**, which helps to collect complete fault information, simplifies user/engineer operations, and improves the fault location efficiency.

- ❑ For common troubleshooting procedures and methods, see the *Ruijie Networks Switch Troubleshooting Guide*. You can also call the technical support for help.

Troubleshooting

■ One-click information collection:

This function allows users to collect basic information about all functional modules and the switch at a time, avoiding repeated information collection.

- Run the **Ruijie#debug support** command to enter the one-click information collection mode. (You are advised to use the **tech-support package** function to package and save fault information to a USB flash drive.)

[tech-support console](#)

[tech-support package](#)

[tech-support package slot { all | m1 | m2 | slot-id }](#)

[@@@f](#)

```
----- slot info -----
....
Tech-support package success, the package file is /tmp/vsd/0/tech_support_20140730170941.tar.gz
----- tech-support package end -----
Ruijie(support)#
Ruijie(support)#
Ruijie(support)#exit
Ruijie#dir
Directory of tmp:/
 1 drwx      760  Wed Jul 30 17:09:43 2014  .
 2 drwx       60  Mon Jul 21 17:23:47 2014  ..
 3 -rw-    332493  Wed Jul 30 17:09:43 2014  tech_support_20140730170941.tar.gz
 4 -rw-    246486  Fri Jul 25 11:03:15 2014  tech_support_20140725110313.tar.gz
```

Suggestion: For common protocol problems, you are advised to locate the fault using basic troubleshooting methods.

Use the one-click information collection function only when the troubleshooting time is tight or no explicit troubleshooting method is available.

Troubleshooting

- Common troubleshooting method: If a fault cannot be located in time, you are advised to collect the following basic information and then call the customer service hotline for technical support:

Ruijie#show version detail information.	////Display the software and hardware version information.
Ruijie#show run	//Display the current system configurations.
Ruijie#show cpu	//Display the CPU usage.
Ruijie#show cpu-protect	//Display detailed statistics about packets received by the CPU. The command should be executed for two consecutive times.
Ruijie#show memory	//Display the memory usage.
Ruijie#show interface	//(If the problem is related to traffic or packet loss, run the show command for three to five consecutive times.)
Ruijie#show interface counters	//Display statistics about packets received and sent on the problematic interface.
Ruijie#show ip int brief	//Display the interface status information.
Ruijie#show ip route	//Display the routing table.
Ruijie#show ip ospf database	//Display the OSPF routing database.
Ruijie#show arp	//Display detailed ARP information.
Ruijie#show arp counter	//Display ARP statistics.
Ruijie#show mac-address-table	//Display detailed information about MAC addresses.
Ruijie#show clock	//Display the system time.
Ruijie#show log	//Display logs.
Ruijie#ping x.x.x.x	//Conduct a ping test on the device.
Ruijie#traceroute x.x.x.x	//Conduct a traceroute test on the device.