RG-RSR77 Series Router Routine Maintenance and Troubleshooting

Contents

Preface

Audience

Ruijie business partners and customers who are responsible for configuring and maintaining Ruijie wireless devices.

Revision History

Date	Change Contents	Reviser
2016.3	Initial publication V1.0	TAC Oversea

Note :

For more detail configuration , see configuration guide for each product . you can download configuration guide at http://www.ruijienetworks.com

For more technical enquiry , you can visit Ruijie Service portal at http://case.ruijienetworks.com . You need to sign up before submit a case.

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Routine Maintenance Suggestions

■ **Importance of Routine Maintenance**

　　□ Routine maintenance is a type of preventive maintenance. Through routine maintenance, defects or hidden risks existing on devices can be identified and eliminated in a timely manner and the health conditions of devices can be maintained during normal running of the devices. Then, the devices run securely, stably, and reliably in the long run.

■ **Contents of Routine Maintenance**

□ Environment/Indicator maintenance

□ Hardware status maintenance

□ Active/Standby supervisor election and status switching

□ Card status maintenance

□ Software version maintenance

□ CPU status maintenance

□ Memory status maintenance

□ Flow table status maintenance

□ Interface status maintenance

□ Log maintenance

□ Fault repairing

Routine Maintenance Suggestions

- **Environment/Indicator Maintenance**
  - □ Environment conditions:
    - ▪ The device shells, internal surface of the devices, dustproof filters inside the chassis, and the floors are clean and free of dust. Clean or replace dustproof filters of the cabinets in a timely manner.
    - ▪ Ensure that fans run properly during normal running of devices. Shutting down fans arbitrarily will cause temperature rise inside the devices and even damage the devices. Do not place sundries at the ventilation openings of devices, so as not to affect the ventilation and heat dissipation of cabinet doors and fan trays.
  - □ Indicators:
    - ▪ In normal cases, the PWR and SYS indicators on the supervisor are on in green. For details about indicators, see the *RG-RSR77 Series Router Datasheet.pptx* or see the *RG-RSR77 Series Router Hardware Installation and Reference Guide.pdf*.

Routine Maintenance Suggestions

- **Hardware Status Maintenance**
  - ☐ Run the **show environment** command to display the hardware running status:
    - ▪ RSR7708#show environment
      Environmental status update at 23:4:53 2013-01-16.
      Data is 5 second old, refresh in 30 second(s).
      Power Supplies: //Running condition of power modules. "on" indicates normal.
          Power supply 1 is present. Unit is on.
          Power supply 2 is present. Unit is on.
          Power supply 3 is not present. Unit is off.
      Fans working status:OK.   //Running condition of the fan module. "OK" indicates normal.
      Temperature readings: //Internal temperature of the chassis
          measured at 23 C
      Hardware:
          CPU name : Freescale MPC85xx.
          CPU Speed: 1320M
  - ☐ If an exception occurs, an alarm will be displayed.

Routine Maintenance Suggestions

- **Active/Standby Supervisor Election and Status Switching**
  - ☐ Election of active and standby supervisors:
    - ▪ After the device with dual supervisors is restarted, the M1 slot is selected as the active supervisor and the M2 slot is selected as the standby supervisor.
    - ▪ When either of the M1 or M2 slot is selected as the active supervisor, if another supervisor is hot-swapped, the active supervisor keeps unchanged and the inserted supervisor serves as the standby supervisor.
    - ▪ If the standby supervisor is removed during device running, the device will not be affected. If the active supervisor is removed during device running, the standby supervisor rapidly serves as the active supervisor.
  - ☐ Run the **show ver slot** command to check the active and standby states of supervisors:
    - ▪ RSR7708#show version slots

Dev	Slot	MaxPorts	Configured-Module	Online-Module	Status
1	M1	1	RSR7708-SRCMI	RSR7708-SRCMI	master
1	M2	1	RSR7708-SRCMI	RSR7708-SRCMI	slave

  - ☐ Switching of active and standby supervisors:
    - ▪ Run the command to switch the active and standby supervisors:

        RSR7708#redundancy forceswitch
    - ▪ You can remove and then insert the active supervisor to switch the active and standby supervisors.

Routine Maintenance Suggestions

- **Card Status Maintenance**
  - □ Run the **show version slot** command to display the card running status:

```
RSR7708(config)#sho ver slot
Dev   Slot    MaxPorts   Configured-Module        Online-Module            Status
---   ----    --------   -----------------        -----------------        ------
1     M1      1          RSR7708-SRCMI            RSR7708-SRCMI            master
1     M2      1          RSR7708-SRCMI            RSR7708-SRCMI            slave
1     1/0     0          RSR77-SIP1               RSR77-SIP1              running
1     1/1     4          FNM-4GE-1                FNM-4POS-STM1           conflict
1     1/2     2          FNM-2CPOS-STM1           FNM-2CPOS-STM1         run-remove
1     2/0     0          RSR77-SIP1               RSR77-SIP1              running
1     2/1     8          DFNM-8GE                 DFNM-8GE                running
1     2/2     0                                                           none
1     3/0     2          RSR77-SIP2               RSR77-SIP2              running
1     3/1     8          DNME-8E1/CE1             DNME-8E1/CE1            running
1     3/2     0                                                           none
1     4/0     2          RSR77-SIP2               RSR77-SIP2             starting
1     4/1     1          NME-1ATM-STM1                                   installed
1     4/2     6          NME-6FE                                         installed
```

  - ▪ The **Status** column displays the current status of cards.
  - ▪ The **Configured-Module** column indicates installed cards.
  - ▪ The **Online-Module** column indicates cards that are actually online.
  - ▪ Running: Indicates the normal status. A slot with a card inserted is in the running state in normal cases.

Routine Maintenance Suggestions

- **Card Status Maintenance**
  - Description of Abnormal States of Cards and Restoration Operations
    - **Installed**: Indicates that a card is virtually loaded but is not actually inserted. This state occurs in two cases: 1) One card is installed virtually for command learning or pre-configuration. 2) A card is inserted before but is removed now.
      - Restoration operation:
        - Run the **no install** command to virtually delete the card of this slot,then insert the card, and the device automatically identifies the card.

          Ruijie(config)#no install 4/1   // 4/1 indicates the slot ID.
    - **None**: Indicates that no card is inserted and no card is manually installed. The slot is in the empty state. If a card is actually inserted but is in the **None** state, remove the card and insert it again. If the card cannot be restored to the normal state, a hardware fault may exist.

Routine Maintenance Suggestions

- **Card Status Maintenance**
  - Description of Abnormal States of Cards and Restoration Operations
    - **Conflict**: Indicates the model of an virtually installed card is inconsistent with that of a card that is actually inserted. Another card has been inserted into this slot before or manually virtually installed in this slot. As a result, the virtually installed card is inconsistent with the card that is actually inserted and the card cannot work properly.
      - Restoration operation:
        - Run the **no install** command to manually delete the card of this slot.
        - Ruijie(config)#no install 1/1   // 1/1 indicates the slot ID.
        - Run the **install** command to install the card that is actually inserted.
        - Ruijie(config)#install 1/1 FNM-4POS-STM1
    - **Run-remove**: Indicates that a card is powered off by running the **remove** command.
      - Restoration operation:
        - Run the **no remove** command to power on the card again.
        - Ruijie(config)#no remove 1/2
        - You can also hot-swap the card so that the card can be re-identified.

Routine Maintenance Suggestions

- **Software Version Maintenance**
  - ☐ Run the **show version** command to check the version:
    - RSR7708#sho version
        System description   : Ruijie Router (RSR7708) by Ruijie Networks
        System start time   : 2012-12-25 17:28:0
        System uptime   : 22:5:47:37
        System hardware version : 1.00
        System software version : RGOS 10.4(3b15) Release(144634)
        System BOOT version   : 10.4(3b15) Release(144634)
        System CTRL version   : 10.4(3b15) Release(144634)
        Module information:
          Slot-M1 : RSR7708-SRCMI
            System hardware version : 1.00
            System software version : RGOS 10.4(3b15) Release(144634)
            Flash MAIN version   : 10.4(3b15) Release(144634)
            Flash CTRL version   : 10.4(3b15) Release(144634)
            Flash BOOT version   : 10.4(3b15) Release(144634)
    - It is recommended that "System software version", "Flash MAIN version", and "Flash CTRL version" of the supervisor and all cards are consistent. If inconsistency exists, see "Software Version Upgrade" in this slide for upgrade.
    - Their "Flash BOOT version" can be different.

Routine Maintenance Suggestions

■ **CPU Status Maintenance**

  □ Run the **show cpu** command to display the CPU running status:

  ▪ RSR7708#sho cpu

    ==
    CPU Using Rate Information
    CPU utilization in five seconds: 0.21%
    CPU utilization in one minute : 0.21%
    CPU utilization in five minutes: 0.22%

  ▪ The CPU utilization becomes a bit high in a short period of time when the device is configured or a show command is executed, which is normal.

  ▪ CPU utilization in five minutes should be maintained below 30% when the device is in the healthy state.

  ▪ The more services are carried by the device, the higher the CPU is, which is normal. Pay attention to the device when the value is larger than 60%. If the value is larger than 60% for a long time, get in touch with Ruijie Post Sales.

Routine Maintenance Suggestions

- **Memory Status Maintenance**
  - ☐ Run the **show memory** command to display the memory running status:
    - RSR7708#sho memory
      System Memory Statistic:
        Free pages: 373700
          watermarks : min 3555, lower 5319, low 7083, high 8847
        System Total Memory : 2048MB, Current Free Memory : 1497708KB
        Used Rate : 29%
    - The memory utilization should be maintained below 60% when the device is in the healthy state.
    - The more services are carried by the device, the higher the memory utilization is. Pay attention to the device when the memory utilization is larger than 80%. If the memory utilization is larger than 80% for a long time, get in touch with Ruijie Post Sales.

Routine Maintenance Suggestions

■ **Flow Table Status Maintenance**

    □   Run the **show ip fpm statistics** command to display the flow table utilization status:

        ▪ RSR7708#sho ip fpm statistics

            Flow table capacity: 32767
            Flow number: 2
            Nat-flow number: 0
            User number: 2
            Defragment context number: 0
            Defragment packet number: 0
            Event count: 20134

            Slot-1/1 : FNM-4POS-STM1
            Flow table capacity: 2097151 //Flow table capacity
            Flow number: 0 //Number of entries in the current flow table
            Nat-flow number: 0 //Number of entries in the NAT flow table
            User number: 0
            Defragment context number: 0 //Number of fragmented IP packets to be combined
            Defragment packet number: 0 //Number of fragmented packets to be combined
            Event count: 19552

        ▪ The supervisor and cards have their own flow tables. The flow table has a capacity of 2 million entries. If the number of entries in a flow table is close to the flow table capacity (the RSR77 is a distributed system, with each card having an independent flow table capacity), network attacks maybe exist and the attack source needs to be located.

Routine Maintenance Suggestions

Interface Status Maintenance

□ Run the **show interface** command to display the interface status. Pay attention to the following:

- Whether the interface traffic is normal. If the interface traffic is close to or equal to the bandwidth, check whether the bandwidth can meet existing application requirement or whether attacks exist on the network and deplete the bandwidth.
- Whether there are a large number of CRC errors and dropped packets and the quantities increase continuously. If yes, the fault may be relevant to the poor cable quality, cable aging, or mismatched duplex rate.

```
RSR7708#sho interfaces
======================== Serial 1/2/0.1/1/1/1:0 ========================
Index(dec):52 (hex):34
Serial 1/2/0.1/1/1/1:0 is UP  , line protocol is DOWN
Hardware is  Serial
Interface address is: 1.1.1.1/24
  MTU 1500 bytes, BW 2000 Kbit
  Encapsulation protocol is PPP, loopback not set
  Keepalive interval is 10 sec ,retries 10.
  Carrier delay is 2 sec
  Rxload is 1/255, Txload is 1/255
  LCP Listen
  Queueing strategy: FIFO
    Output queue 0/40, 0 drops;
    Input queue 0/75, 0 drops
  5 minutes input rate 0 bits/sec, 0 packets/sec
  5 minutes output rate 31 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer, 0 dropped
    Received 0 broadcasts, 0 runts, 0 giants
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 abort
    27434 packets output, 493812 bytes, 0 underruns , 0 dropped
    0 output errors, 0 collisions, 2493 interface resets
======================== Serial 1/2/1.1/1/1/1:0 ========================
```

Routine Maintenance Suggestions

- **Log Maintenance**
  - ☐ Run the **show log** command to check whether there is exception information in logs, for example, frequent interface up/down, dynamic protocol down, and alarm prompts. Find out logs according to the problem that you come across.
  - ☐ Record logs in the flash memory. The buffer for storing logs is not large and the logs are lost after the device is restarted. It is recommended that logs be recorded in the flash memory. Querying historical logs is very useful when a fault occurs.
    - RSR7708(config)#logging file flash:/log   2000000 7 //Record logs in the flash memory.
    - RSR7708# more flash:/log.txt   //Display log files recorded in the flash memory.

- **Clock Maintenance**
  - ☐ Run the **show clock** command to check the current time:
    - Ruijie#sho clock
         02:24:23 UTC Thu, Jan 17, 2013
  - ☐ The time accuracy ensures the accuracy of log recording time, thereby facilitating fault locating. Applications such as the CA certificate also have high time requirements.

Routine Maintenance Suggestions

- **Fault Information Collection**
    - If a fault cannot be located in a timely manner, collect the following basic

      information and get in touch with Ruijie Post Sales to seek technical support:
        - Ruijie#Show version   //Display the version.
        - Ruijie#Show version slot   //Display the installation status of a card.
        - Ruijie#Show run   //Display the device configuration.
        - Ruijie#Show cpu   //Display the device CPU status.
        - Ruijie#Show memory   //Display the device memory status.
        - Ruijie#Show interface (Run the **show** command multiple times if a traffic-relevant problem or packet loss problem occurs.)
                               //Display the interface status.
        - Ruijie#Show ip int brief   //Display the interface status brief.
        - Ruijie#Show ip fpm sta   //Display the flow table status.
        - Ruijie#Show ip route   //Display the routing table.
        - Ruijie#Show clock   //Display the current time of the device.
        - Ruijie#Show log   //Display device logs in buffer.
        - Ruijie#more flash:/log.txt   //Display logs recorded in the flash memory.

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Common Problem Handling

- **Problem Symptom**
  - A device cannot enter the config mode through the console and an error is

    prompted:
    - Ruijie>en
    - Ruijie#conf t
    - % Can't execute this command in redundancy slave.

- **Problem Cause**
  - The console cable is inserted into the standby supervisor. The standby

    supervisor cannot enter the config mode.

- **Solution**
  - Plug in the console cable into the active supervisor.

Common Problem Handling

- **Problem Symptom**
  - After a device is started, the system is unable to launch firmware correctly and it prompts "send download request".

- **Problem Cause**
  - The device firmware is lost.

- **Solution**
  - Download correct RGOS firmware.
  - Reinstall the firmware via TFTP server (for detail steps, see "Upgrading the Software Version at the Bottom Layer" in latter section .

Common Problem Handling

- **Problem Symptom**
  - In an MPLS-VPN network, the routing connectivity is normal (the ping operation is successful), but accessing web pages or some OA systems is very slow or they cannot be accessed.

- **Problem Cause**
  - Interface MTU settings are incorrect. Packets of web pages and OA systems are large in size, and the MPLS labels are added to these packets when they pass through the MPLS-VPN network. The packet size is beyond the interface MTU and data packets are discarded. As a result, web pages cannot be loaded.

- **Solution**
  - Run the following command to configure the MTU for all MPLS-enabled interfaces on devices throughout the network: mtu 1530
    - Example:
      ```
      R2(config)#interface gigabitEthernet 2/1/0
      R2(config-if-GigabitEthernet 2/1/0)#mtu 1530
      ```

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Factory Default Restoration of Devices

- **Restoring Factory Defaults in the Main Program (in MAIN Mode)**
  - ① Back up the configuration file as required.
    - Ruijie#dir
      ```
      Directory of flash:/
        Mode Link    Size                  MTime Name
      -------- ---- -------- ---------------- ----------------
      1           2363            2013-01-15 10:07:19 config.text
          ...........
              1     15107168         2013-01-15 09:47:59 rgos.bin
      ---------------------------------------------------------------
      ```
    - Ruijie#copy flash:/config.text flash:/config.bak   //Back up the configuration file as config.bak.
  - ② Delete the configuration file.
    - Ruijie#delete config.text   //Delete the configuration file.
    - Are you sure you want to delete "config.text"?[No/yes]yes //Confirm the deletion.
  - ③ Restart the device.
    - Ruijie#reload   //Restart the device.
    - Proceed with reload? [no]y   //Confirm the restart.

Factory Default Restoration of Devices

- **Restoring Factory Defaults at the Bottom Layer (in CTRL Mode)**
  - □ When the device login password is forgotten or the device cannot launch firmware correctly or enter the main mode, factory defaults need to be restored at the bottom layer.
  - ① Connect to the console port of the device and enter CLI by using a console cable.
  - ② Restart the device. When system prompts "Press Ctrl+C to enter Ctrl…", press **Ctrl+C** to suspend the startup process and enter the CTRL mode.
  - ③ Back up the configuration file as required.
    - Ctrl>rename config.text config.bak   //Back up the configuration file as **config.bak**.
    - If the configuration file does not need to be backed up, run the following command to directly delete it:
    - Ctrl>delete config.text   //Delete the configuration file.
  - ④ Start the device.
    - Ctrl>load   //Restart the device.

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Software Version Upgrade

- **Upgrading the Software Version in the Main Program (in MAIN Mode)**
  - ① Run the **show ver slot** command to check that all cards are installed correctly.
  - ② Back up the configuration and software:
    - Ruijie# copy flash:/config.text flash:/config.back
    - Ruijie#rename flash:/rgos.bin flash:/rgos.back
  - ③ Transfer firmware to the router via TFTP server , overwrite the old firmware.
    - Ruijie#copy tftp://192.168.0.1/rgos.bin flash:/rgos.bin
  - ④ Check that the version is transmitted successfully : The prompt "SUCCESS: UPGRADING OK." is displayed.
  - ⑤ Synchronize the software version to the standby supervisor and cards to ensure the version synchronization of the device:
    - Ruijie#upgrade system   //This process needs several minutes. Do not power off the device. Wait patiently.
  - ⑥ Restart the device and do not power off the device during the restart:
    - Ruijie#reload
  - ⑦ After the system upgrade is complete, access the main program and run the **show version** command to check that all cards are upgraded successfully.

Software Version Upgrade

- **Upgrading the Software Version at the Bottom Layer (in CTRL Mode)**
  ① Connect to the console port of the device and enter CLI by using a console cable.
  ② Restart the device. When the system prompts "Press Ctrl+C to enter Ctrl…", press **Ctrl+C** to suspend the startup process and enter the CTRL mode
  ③ Transfer firmware to the router via TFTP server. Connect the TFTP server to the MGMT port of the active supervisor.
  - Ctrl>tftp 192.168.1.1 192.168.1.2 rgos.bin –main //192.168.1.1 is the IP address temporarily allocated to the router. It must be in the same network segment as the IP address of the TFTP server.192.168.1.2 is the IP address of the TFTP server.
  ④ Check that the firmware is transmitted successfully : The prompt "SUCCESS: UPGRADING OK." is displayed.
  ⑤ Synchronize the software version to the standby supervisor and cards to ensure the version synchronization of the device:
  - Ctrl>upgrade -slot all –type ctrl –force   //Deliver the ctrl program.
  - Ctrl>upgrade -slot all -type main –force //Deliver the main program.
    This process needs several minutes. Do not power off the device. Wait patiently.
  ⑥ Restart the device and do not power off the device during the restart:
  - Ctrl>reload
  ⑦ After the system upgrade is complete, access the main program and run the **show version** command to check that all cards are upgraded successfully.

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Obtaining Help

Self-service

- Official website of Ruijie Networks: www.ruijienetworks.com

- Downloading of software and documents: www.ruijienetworks.com/service.aspx

  ftp: //partnetportal.ruijienetworks.com

Remote technical support

- Fault submission: case.ruijienetworks.com

- Live Chat(Skype): service_rj@ruijienetworks.com