Contents

Monitoring and maintaining processes

About monitoring and maintaining processes

The system software of the device is a full-featured, modular, and scalable network operating system based on the Linux kernel. The system software features run the following types of independent processes:

- **User process**—Runs in user space. Most system software features run user processes. Each process runs in an independent space so the failure of a process does not affect other processes. The system automatically monitors user processes. The system supports preemptive multithreading. A process can run multiple threads to support multiple activities. Whether a process supports multithreading depends on the software implementation.
- **Kernel thread**—Runs in kernel space. A kernel thread executes kernel code. It has a higher security level than a user process. If a kernel thread fails, the system breaks down. You can monitor the running status of kernel threads.

Process monitoring and maintenance tasks at a glance

To monitor and maintain processes, perform the following tasks:

- Monitoring and maintaining user processes
  - Monitoring and maintaining processes

    The commands in this section apply to both user processes and kernel threads.
  - Monitoring and maintaining user processes

    The commands in this section apply only to user processes.
- Monitoring and maintaining kernel threads
  - Monitoring and maintaining processes

    The commands in this section apply to both user processes and kernel threads.
  - Monitoring and maintaining kernel threads

    The commands in this section apply only to kernel threads.

Monitoring and maintaining processes

About monitoring and maintaining processes

The commands in this section apply to both user processes and kernel threads. You can use the commands for the following purposes:

- Display the overall memory usage.
- Display the running processes and their memory and CPU usage.
- Locate abnormal processes.

If a process consumes excessive memory or CPU resources, the system identifies the process as an abnormal process.

- If an abnormal process is a user process, troubleshoot the process as described in "Monitoring and maintaining user processes."

- If an abnormal process is a kernel thread, troubleshoot the process as described in "Monitoring and maintaining kernel threads."

Procedure

Execute the following commands in any view.

Task	Command
Display memory usage.	**display memory** [**summary**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display process state information.	**display process** [**all** | **job** *job-id* | **name** *process-name*] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display CPU usage for all processes.	**display process cpu** [**slot** *slot-number* [**cpu** *cpu-number*]]
Monitor process running state.	**monitor process** [**dumbtty**] [**iteration** *number*] [**slot** *slot-number* [**cpu** *cpu-number*]]
Monitor thread running state.	**monitor thread** [**dumbtty**] [**iteration** *number*] [**slot** *slot-number* [**cpu** *cpu-number*]]

For more information about the **display memory** command, see *Fundamentals Command Reference*.

Monitoring and maintaining user processes

About monitoring and maintaining user processes

Use this feature to monitor abnormal user processes and locate problems.

Configuring core dump

About core dump

The core dump feature enables the system to generate a core dump file each time a process crashes until the maximum number of core dump files is reached. A core dump file stores information about the process. You can send the core dump files to H3C technical support staff to troubleshoot the problems.

Restrictions and guidelines

Core dump files consume storage resources. Enable core dump only for processes that might have problems.

Procedure

Execute the following commands in user view:

1. (Optional.) Specify the directory for saving core dump files.

   exception filepath *directory*

   The default directory for saving core files is **flash:/**.

2. Enable core dump for a process and specify the maximum number of core dump files, or disable core dump for a process.

   process core { **maxcore** *value* | **off** } { **job** *job-id* | **name** *process-name* }

By default, a process generates a core dump file for the first exception and does not generate any core dump files for subsequent exceptions.

Display and maintenance commands for user processes

Execute **display** commands in any view and other commands in user view.

Task	Command
Display context information for process exceptions.	**display exception context** [**count** *value*] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display the core dump file directory.	**display exception filepath** [**slot** *slot-number* [**cpu** *cpu-number*]]
Display log information for all user processes.	**display process log** [**slot** *slot-number* [**cpu** *cpu-number*]]
Display memory usage for all user processes.	**display process memory** [**slot** *slot-number* [**cpu** *cpu-number*]]
Display heap memory usage for a user process.	**display process memory heap job** *job-id* [**verbose**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display memory content starting from a specified memory block for a user process.	**display process memory heap job** *job-id* **address** *starting-address* **length** *memory-length* [**slot** *slot-number* [**cpu** *cpu-number*]]
Display the addresses of memory blocks with a specified size used by a user process.	**display process memory heap job** *job-id* **size** *memory-size* [**offset** *offset-size*] [**slot** *slot-number* [**cpu** *cpu-number*]]
Clear context information for process exceptions.	**reset exception context** [**slot** *slot-number* [**cpu** *cpu-number*]]

Monitoring and maintaining kernel threads

Configuring kernel thread deadloop detection

About kernel thread deadloop detection

Kernel threads share resources. If a kernel thread monopolizes the CPU, other threads cannot run, resulting in a deadloop.

This feature enables the device to detect deadloops. If a thread occupies the CPU for a specific interval, the device considers that a deadloop has occurred. It generates a deadloop message and reboots to remove the deadloop.

Restrictions and guidelines

Change kernel thread deadloop detection settings only under the guidance of H3C technical support staff. Inappropriate configuration can cause system breakdown.

Procedure

1. Enter system view.

   system-view

2. Enable kernel thread deadloop detection.

   monitor kernel deadloop enable [**slot** *slot-number* [**cpu** *cpu-number* [**core** *core-number*&<1-64>]]]

   By default, kernel thread deadloop detection is enabled.

3. (Optional.) Set the interval for identifying a kernel thread deadloop.

   monitor kernel deadloop time *time* [**slot** *slot-number* [**cpu** *cpu-number*]]

   The default is 20 seconds.

4. (Optional.) Disable kernel thread deadloop detection for a kernel thread.

   monitor kernel deadloop exclude-thread *tid* [**slot** *slot-number* [**cpu** *cpu-number*]]

   When enabled, kernel thread deadloop detection monitors all kernel threads by default.

5. (Optional.) Specify the action to be taken in response to a kernel thread deadloop.

   monitor kernel deadloop action { **reboot** | **record-only** } [**slot** *slot-number* [**cpu** *cpu-number*]]

   The default action is **reboot**.

Configuring kernel thread starvation detection

About kernel thread starvation detection

Starvation occurs when a thread is unable to access shared resources.

Kernel thread starvation detection enables the system to detect and report thread starvation. If a thread is not executed within a specific interval, the system determines that a starvation has occurred and generates a starvation message.

Thread starvation does not impact system operation. A starved thread can automatically run when certain conditions are met.

Restrictions and guidelines

Configure kernel thread starvation detection only under the guidance of H3C technical support staff. Inappropriate configuration can cause system breakdown.

Procedure

1. Enter system view.

   system-view

2. Enable kernel thread starvation detection.

   monitor kernel starvation enable [**slot** *slot-number* [**cpu** *cpu-number*]]

   By default, kernel thread starvation detection is disabled.

3. (Optional.) Set the interval for identifying a kernel thread starvation.

   monitor kernel starvation time *time* [**slot** *slot-number* [**cpu** *cpu-number*]]

   The default is 120 seconds.

4. (Optional.) Disable kernel thread starvation detection for a kernel thread.

   monitor kernel starvation exclude-thread *tid* [**slot** *slot-number* [**cpu** *cpu-number*]]

When enabled, kernel thread starvation detection monitors all kernel threads by default.

Display and maintenance commands for kernel threads

Execute **display** commands in any view and **reset** commands in user view.

Task	Command
Display kernel thread deadloop detection configuration.	**display kernel deadloop configuration** [**slot** *slot-number* [**cpu** *cpu-number*]]
Display kernel thread deadloop information.	**display kernel deadloop** *show-number* [*offset*] [**verbose**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display kernel thread exception information.	**display kernel exception** *show-number* [*offset*] [**verbose**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display kernel thread reboot information.	**display kernel reboot** *show-number* [*offset*] [**verbose**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Display kernel thread starvation detection configuration.	**display kernel starvation configuration** [**slot** *slot-number* [**cpu** *cpu-number*]]
Display kernel thread starvation information.	**display kernel starvation** *show-number* [*offset*] [**verbose**] [**slot** *slot-number* [**cpu** *cpu-number*]]
Clear kernel thread deadloop information.	**reset kernel deadloop** [**slot** *slot-number* [**cpu** *cpu-number*]]
Clear kernel thread exception information.	**reset kernel exception** [**slot** *slot-number* [**cpu** *cpu-number*]]
Clear kernel thread reboot information.	**reset kernel reboot** [**slot** *slot-number* [**cpu** *cpu-number*]]
Clear kernel thread starvation information.	**reset kernel starvation** [**slot** *slot-number* [**cpu** *cpu-number*]]