Huawei VRP Basics

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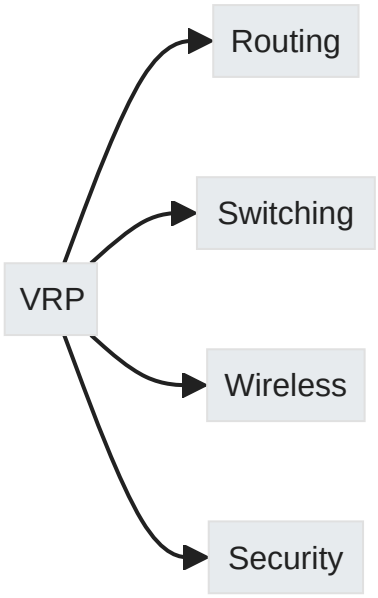
1.1 VRP Overview



- The **Versatile Routing Platform (VRP)**: is Huawei's universal OS for datacom products.
- It adopts a component-based architecture and supports IP-based functions.

> designed with modular components that can be combined like building blocks, and it allows for the use of internet protocols to manage network traffic and functions.

- **VRP provides the following functions:**

- Provides a unified user interface and a unified management interface.
- VRP handles network decision-making and sets rules for data routing. (control plane & forwarding plane)
- VRP manages the interaction between the network device's data-handling component and its decision-making component.(control plane & forwarding plane)

1.1.1 Development Stages

Period	Version	Description
1998-2001	VRP1	Centralized design for low to mid-range devices. Low performance.
1999-2000	VRP2	Distributed design used in AR series routers.
2000-2004	VRP3	Distributed platform supporting core routers' features.
2004-Now	VRP5	Component-based design with high performance for various Huawei products. (AR router ,S Switches)
2009-Now	VRP8	Multi-process, component-based architecture optimized for multi-CPU and multi-chassis systems (NE router , CE switches)

1.1.2 File System & Storage Media

1.1.2.1 Common File Types

- **System Software (.cc)**: Essential for device operation.
- **Patch File (.pat)**: Fixes system software bugs.
- **Configuration File (.cfg/zip/dat)**: Contains command configurations.
- **PAF File (.bin)**: Controls product features and resources.

1.1.2.2 Storage Media Types

SDRAM: Stores system running info (like computer memory).
NVRAM: Nonvolatile; stores log buffer files (moved to flash after timer/buffer full).
Flash Memory: Nonvolatile; stores system software/config files.
SD Card: Nonvolatile; large storage capacity used for system files/logs.
USB: Interface for connecting large-capacity storage mediums.

1.1.3 Device Initialization Process

🔌 **After power-on:**

1. BootROM initializes hardware.
2. System software loads from default storage path.
3. Reads configuration file for initialization procedures.

1.1.4 Device management

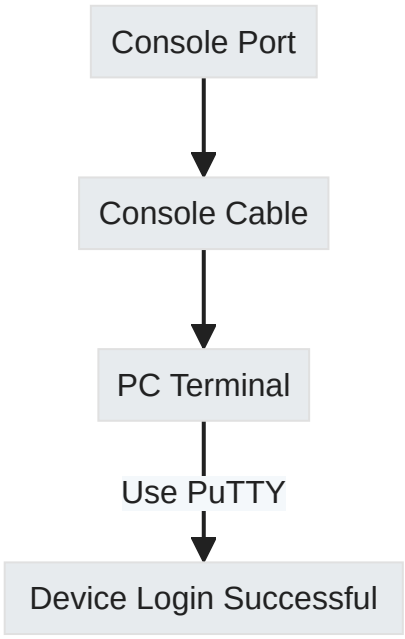
Device management can be done through a user-friendly graphical interface on the web (Web System) or by typing specific commands into a text-based interface (CLI).

1.1.5 Command Line Basics

1.1.5.1 Command Line Overview

1.1.5.1.1 Login Methods

1.1.5.1.1.1 Local Login (Console Port)



> **Tip**
>
> Use console port when configuring a device for the first time.
> set Connection type to **Serial**.
> Set Speed to **9600**.

1.1.5.1.1.2 Remote Login (Telnet/SSH)

SSH default port: `22`
Telnet default port: `23`

> Use PuTTY or similar terminal emulator to initiate connection.

1.1.6 User Levels & Commands Accessible

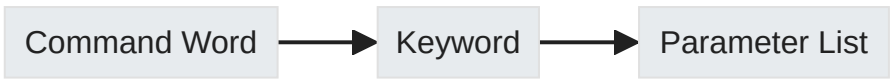
User Level	Accessible Commands
0	Visit level (e.g., ping)
1 - 2	Monitoring level commands
3	Configuration level
>3	Management level

1.2 Command Line Basics

1.2.1 Command Line Overview

1.2.1.1 Basic Command Structure

- CLI commands follow a unified structure: `Command Word` ➜ `Keyword` ➜ `Parameter List`
  - **Command Word**: Specifies the operation to be executed (e.g., `display`, `reboot`, `ip`).
  - **Keyword**: Further restricts a command, used to express command logic.
  - **Parameter List**: Composed of names and values to further restrict command function.



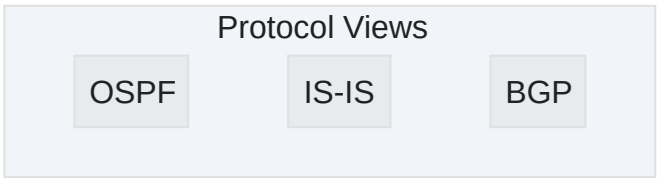
Example

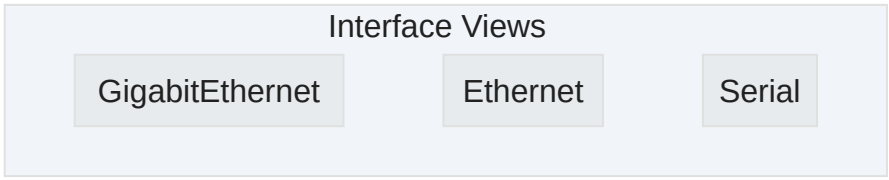
- **Command**: `display ip interface GE0/0/0`
- **Word**: `display`
- **Keyword**: `ip`
- **Parameter Name**: `interface`

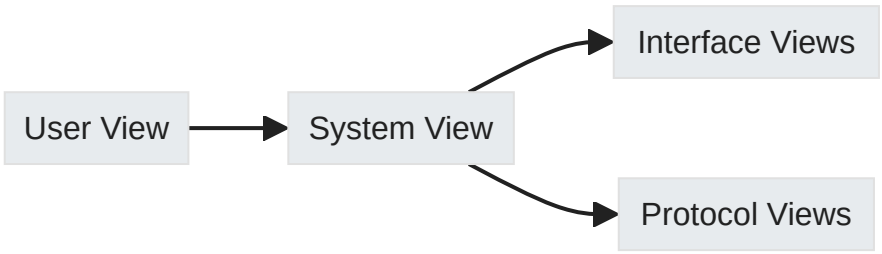
- **Value**: `GE0/0/0`

1.2.1.2 Command Views

Views help categorize commands by function. Common views include:







- **User View** (`<Huawei>`): Check running status; only query and tool commands.
- **System View** (`[Huawei]`): Set system parameters; access other configuration views.
- **Interface/Protocol Views** (e.g., `[Huawei-GigabitEthernet0/0/1]` , `[Huawei-ospf-1]`): Set specific interface or protocol parameters.

> Example:

Markdown

```
<Huawei>system-view     # Enter system view from user view.\
```

```Markdown
[Huawei]interface GigabitEthernet 0/0/1  # Enter interface view from system view.
```

1.2.1.3 Editing Commands

Function Key	Description
Backspace	Deletes character before cursor.
← or Ctrl+B	Moves cursor left.
→ or Ctrl+F	Moves cursor right.

1.2.1.3.1 Incomplete Keyword Input

- The CLI allows entering partial keywords if they're unique enough for recognition.

```Markdown
<Huawei>d cu              # Correct for 'display current-configuration'
<Huawei>d c               # Error: Ambiguous command found at '^' position.
```

1.2.1.3.2 Using Tab Key

- Auto-complete keywords with Tab.

1.2.1.4 Command Line Online Help

Use '?' for help:

```
<Huawei> ?              # Full help: Shows all commands in the view.
<Huawei> d?             # Partial help: Shows commands starting with 'd'.
```

1.2.1.5 Undoing Commands

Undo actions with the keyword 'undo':

```
[Huawei]interface g0/0/1                    # Set IP address on interface g0/0/1.
[Huawei-GigabitEthernet0/0/1]undo ip address       # Undo set IP address.
```

1.2.1.6 Shortcut Keys

You can use system shortcut keys for faster operations:

- CTRL+A/Z/X/C/V: Navigation & editing shortcuts within the CLI environment.

1.2.2 Basic Configuration Commands

1.2.2.1 Navigating Directories

- `pwd` - Print Working Directory (Current Directory).
- `cd directory` - Change Directory.

- `mkdir directory` - Make Directory.
- `rmdir directory` - Remove Directory (must be empty).

1.2.2.2 Managing Files

- `dir` - Display files/directories info.
- `more filename` - Display information text about file content.
- `copy source destination` - Copy files.
- `move source destination` - Move files.
- `rename old-name new-name` - Rename file/directory.
- `delete filename` - Delete a file.

1.2.2.3 Recycle Bin Operations

- `undelete` - Restore a deleted file.
- `reset recycle-bin` - Empty recycle bin.

> **Note**
>
> Use `/force` to bypass confirmation prompts when deleting, and `/unreserved` to permanently delete without sending to recycle bin.

1.2.3 Basic Configuration Commands

1.2.3.1 Device Identification and Time Management

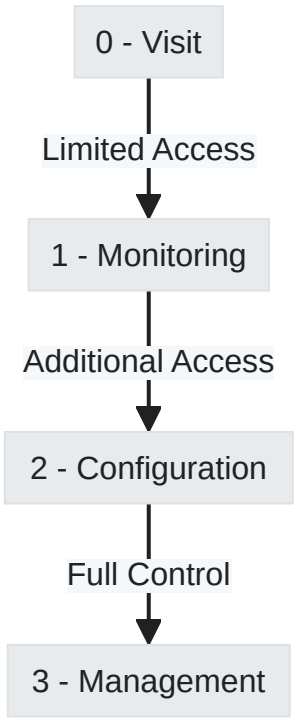
- **System Name**: `[Huawei] sysname name`

> Set unique device identifier.

Command	Description
`clock timezone name {add|minus} offset`	Set local time zone.
`clock datetime [utc] HH:MM:SS YYYY-MM-DD`	Set system or UTC time.(current time)
`clock daylight-saving-time`	Configure DST(daylight saving time) settings.

1.2.3.2 Command Level Configuration

- Configure a command level to restrict access to certain commands based on user privilege levels.



- `command-privilege level <level> view <view-name> <command-key>`

1.2.3.3 Password-based Login Mode

- Set up password authentication for remote logins via VTY (Virtual Terminal Line).
- a maximum of 15 users can log in to a device through VTY at the same time.
- Enter VTY interface: `user-interface vty 0 4`
- Set password: `set authentication password cipher <password>`

1.2.3.4 User Connection Timeout

- Configure the timeout period for inactive user connections.
- Command: `idle-timeout <minutes> [seconds]`
- Default: 10 minutes

1.2.3.5 Interface IP Address Configuration

- Assign an IP address to a device's physical or logical interface.
- Enter interface configuration mode: `interface <interface-number>`
- Set IP address: `ip address <ip-address> {<subnet-mask>|<mask-length>}`

1.2.3.6 Viewing and Saving Configurations

1.2.3.6.1 Display Current Configurations

- View the currently active configuration settings on the device.
- `display current-configuration`

1.2.3.6.2 Save Configurations

- Persist the current configurations to memory.
- `save`

1.2.3.6.3 Check Saved Configurations

- Review the saved configuration file in memory.
- `display saved-configuration`

1.2.4 Clear Saved Configurations

- Remove all saved configurations from memory.
- `reset saved-configuration`

1.2.5 System Startup Parameters

- Check parameters that determine system behavior on startup.
- `display startup`

1.2.6 Configure Startup File

- Set which configuration file to use on next system startup.
- `startup saved-configuration <configuration-file>`

1.2.7 Restart Device

- Restart the device with or without saving changes first.
- `reboot`