RDK Exclusive Command Usage

1. hrut_boardid

The **hrut_boardid** command is used to retrieve the ID of the current development board (different development boards have different IDs).

> ⚠ The board ID affects hardware initialization during boot—please configure it with caution.

- ### Grammar explanation

```
root@ubuntu:~# hrut_boardid
0x6A84
```

- ### Output explanation:

```
0x   6A          8             4
     ^^          ^             ^
     ||          |             |
  Chip ID   Board Power Design   Board Design Version
```

2. hrut_ps

The **hrut_ps** command prints process status information not supported by BusyBox's `ps` command, including process ID, parent process ID, priority, memory usage, virtual memory, and more.

- ### Grammar explanation

```
hrut_ps
```

- ## Supported Information

  - **pid**: Process ID. Each process in the operating system has a unique identifier called the process ID (pid), which is used to uniquely identify and reference a process within the system.
  - **ppid**: Parent Process ID. This indicates the parent process that created the current process.
  - state: Process state.
    - `I`: Idle.
    - `R`: Running.
    - `S`: Sleeping.
    - `D`: Disk sleeping (uninterruptible sleep).
    - `T`: Stopped.
    - `X`: Dead.
    - `Z`: Zombie.
    - `t`: Tracing stop.
    - `P`: Parked.
  - **prio**: Priority. Represents the scheduling priority of the process, usually expressed as a numeric value. A higher number typically indicates higher priority, making the process more likely to receive CPU time slices.
  - **nice**: Nice value. Represents the scheduling priority as an integer. A lower nice value indicates higher priority, allowing the process to obtain CPU time more frequently.
  - **rt_prio**: Real-time priority. Indicates the priority of real-time processes; a lower value signifies higher real-time priority.
  - **policy**: Scheduling policy. Specifies the scheduling policy used for the process, typically a scheduling algorithm such as First-In-First-Out (FIFO), Round Robin (RR), etc.
  - **vsize**: Virtual memory size. Represents the size of the virtual memory address space accessible to the process.
  - **rss**: Resident Set Size (physical memory usage). Indicates the amount of physical RAM currently allocated and used by the process.
  - **comm**: Command name. Contains the name of the command or executable file associated with the process, used to identify the process type or purpose.

3. hrut_somstatus

The **hrut_somstatus** command retrieves temperature sensor readings, CPU/BPU operating frequencies, and BPU load.

- ## Grammar explanation

```
sudo hrut_somstatus
```

- **Common Usage**

```
sunrise@ubuntu:~$ sudo hrut_somstatus
====================1====================
temperature-->
        pvt_cmn_pvtc1_t1 : 38.565 (C)
        pvt_cmn_pvtc1_t2 : 40.219 (C)
        pvt_mcu_pvtc1_t1 : 37.829 (C)
        pvt_mcu_pvtc1_t2 : 38.013 (C)
        pvt_bpu_pvtc1_t1 : 38.932 (C)
voltage-->
        FAKE     : 100.0 (mV)
        VDDQ_DDR2 : 498.0 (mV)
        VDD_MCU  : 749.0 (mV)
        VDDIO_PVT_MCU : 1794.0 (mV)
        VDDIO_TOP4_1V8 : 1794.0 (mV)
        VDDQ_DDR0 : 504.0 (mV)
        VDD2H_DDR0 : 1042.0 (mV)
        VAA_DDR0 : 1794.0 (mV)
        VDD_DDR0 : 743.0 (mV)
        VDDQ_DDR1 : 504.0 (mV)
        VDD2H_DDR1 : 1042.0 (mV)
        VAA_DDR1 : 1794.0 (mV)
        VDD_DDR1 : 743.0 (mV)
        VDDIO_SD_SDIO_T : 1788.0 (mV)
        VDD_CPU  : 776.0 (mV)
        VAA_DDR2 : 1780.0 (mV)
        VDD2H_DDR2 : 1030.0 (mV)
        VDD_DDR2 : 737.0 (mV)
        VDDIO_TOP2_1V8 : 1780.0 (mV)
        VDD_BPU  : 737.0 (mV)
        VDDIO_TOP0_1V8 : 1780.0 (mV)
        PLL_TOP0_VDDHV : 1768.0 (mV)
        VDDIO_SD_33_MCU : 3304.0 (mV)
        VDDIO_ADC_MCU : 1800.0 (mV)
        VDDIO_MCU_1V8 : 1800.0 (mV)
        PLL_MCU_VDDHV : 1800.0 (mV)
        PLL_MCU_VDDPOST : 746.0 (mV)
        PLL_MCU_VDDREF : 751.0 (mV)
        VDD_TOP  : 757.0 (mV)
        VDD_AON  : 751.0 (mV)
        VDDIO_SD_AON_CA : 1662.0 (mV)
        VDDIO_PVT_1V8 : 1800.0 (mV)
cpu frequency-->
                  min   cur     max
        policy0: 1125000        1500000 1500000
        policy4: 1125000        1500000 1500000
bpu status information---->
               ratio
        bpu0:   0
```

  - temperature:
    - **pvt_cmn_pvtc1_t1/2**: CPU temperature, in degrees Celsius (°C).
    - **pvt_mcu_pvtc1_t1/2**: MCU temperature, in degrees Celsius (°C).
    - **pvt_bpu_pvtc1_t1**: BPU temperature, in degrees Celsius (°C).
  - **cpu frequency**:

        - `min`: Minimum operating frequency of the CPU.
        - `cur`: Current operating frequency of the CPU.
        - `max`: Maximum operating frequency of the CPU.
        - This information shows the frequency range (minimum, current, and maximum) for each CPU cluster.
    - **bpu status information:**
        - `ratio`: BPU load ratio during operation.
        - This information indicates the BPU load.

4. rdkos_info

The **rdkos_info command** is used to collect, in one go, software and hardware versions of the `RDK` system, a list of loaded drivers, installed RDK software packages, and the latest system logs, enabling users to quickly obtain the current system status information.

- ## Grammar explanation

```
sudo rdkos_info [options]
```

- ## Options

  All options are optional. If run without any options, `rdkos_info` defaults to the concise output mode.

  - `-b`: Basic output mode; system logs will not be collected.
  - `-s`: Concise output mode (default); outputs the latest 30 lines of system logs.
  - `-d`: Detailed output mode; outputs the latest 300 lines of system logs.
  - `-v`: Display version information.
  - `-h`: Display help information.

- ## Common Usage

  Default usage:

```
sudo rdkos_info
```

  Partial output is shown below:

```
sunrise@ubuntu:/root$ sudo rdkos_info
================ RDK System Information Collection ================

[Hardware Model]:
        D-Robotics RDK S100(P) V0P5 (Board Id = 0x6A84)

[CPU And BPU Status]:
        ====================1====================
        temperature-->
                pvt_cmn_pvtc1_t1 : 38.932 (C)
                pvt_cmn_pvtc1_t2 : 40.587 (C)
                pvt_mcu_pvtc1_t1 : 38.013 (C)
                pvt_mcu_pvtc1_t2 : 38.381 (C)
                pvt_bpu_pvtc1_t1 : 39.300 (C)
```

```
        voltage-->
                FAKE     : 100.0 (mV)
                VDDQ_DDR2 : 504.0 (mV)
                VDD_MCU  : 749.0 (mV)
                VDDIO_PVT_MCU : 1794.0 (mV)
                VDDIO_TOP4_1V8 : 1794.0 (mV)
                VDDQ_DDR0 : 498.0 (mV)
                VDD2H_DDR0 : 1042.0 (mV)
                VAA_DDR0 : 1794.0 (mV)
                VDD_DDR0 : 743.0 (mV)
                VDDQ_DDR1 : 498.0 (mV)
                VDD2H_DDR1 : 1052.0 (mV)
                VAA_DDR1 : 1794.0 (mV)
                VDD_DDR1 : 743.0 (mV)
                VDDIO_SD_SDIO_T : 1788.0 (mV)
                VDD_CPU  : 776.0 (mV)
                VAA_DDR2 : 1780.0 (mV)
                VDD2H_DDR2 : 1042.0 (mV)
                VDD_DDR2 : 737.0 (mV)
                VDDIO_TOP2_1V8 : 1780.0 (mV)
                VDD_BPU  : 737.0 (mV)
                VDDIO_TOP0_1V8 : 1780.0 (mV)
                PLL_TOP0_VDDHV : 1768.0 (mV)
                VDDIO_SD_33_MCU : 3304.0 (mV)
                VDDIO_ADC_MCU : 1800.0 (mV)
                VDDIO_MCU_1V8 : 1800.0 (mV)
                PLL_MCU_VDDHV : 1800.0 (mV)
                PLL_MCU_VDDPOST : 751.0 (mV)
                PLL_MCU_VDDREF : 751.0 (mV)
                VDD_TOP  : 757.0 (mV)
                VDD_AON  : 751.0 (mV)
                VDDIO_SD_AON_CA : 1662.0 (mV)
                VDDIO_PVT_1V8 : 1800.0 (mV)
        cpu frequency-->
                          min   cur     max
                policy0: 1125000        1500000 1500000
                policy4: 1125000        1500000 1500000
        bpu status information---->
                        ratio
                bpu0:   0

[Total Memory]:         4.7Gi
[Used Memory]:          1.6Gi
[Free Memory]:          1.5Gi


[RDK OS Version]:
        4.0.2-Beta

[RDK Kernel Version]:
        Linux ubuntu 6.1.112-rt43-DR-4.0.2-2506091317-g08c4b8-g2e7d75 #80
SMP PREEMPT_RT Mon Jun  9 13:18:49 CST 2025 aarch64 aarch64 aarch64
GNU/Linux

[RDK Miniboot Version]:
        4.0.2-20250605231718
```

5.hrut_socuid

The **hrut_socuid** command prints the UID (Unique Identifier) of the current SoC chip.

- ## Grammar explanation

```
hrut_socuid
```

- ## Common Usage

```
sunrise@ubuntu:~$ hrut_socuid
060c0b0d3090694108255c4c00001079
```

6.devmem

`devmem` is a command in BusyBox. It can read from and write to hardware registers by using the `mmap` function to map device memory into user space via the `mmap` method of the `/dev/mem` driver, thereby enabling read/write operations on physical addresses.

- ## Grammar explanation

```
devmem ADDRESS [WIDTH [VALUE]]

Read/write from physical address

      ADDRESS Address to act upon
      WIDTH   Width (8/16/...)
      VALUE   Data to be written
```

  - **ADDRESS:** The physical address on which to perform the operation. This is a required parameter specifying the address to read from or write to.
  - **WIDTH:** An optional parameter indicating the data width. It can be specified as 8, 16, or 32, defining the bit-width of the data to read or write. If omitted, it defaults to 32 bits.
  - **VALUE:** An optional parameter representing the data value to write. If `WIDTH` is provided, `VALUE` must match the specified width. If `VALUE` is omitted, the command performs a read operation.

- ## Common Commands

  - Reading registers

```
Read 32-bit: devmem 0xa600307c 32
Read 16-bit: devmem 0xa600307c 16
Read 8-bit:  devmem 0xa600307c 8
```

  - Writing registers

```
Write 32-bit: devmem 0xa6003078 32 0x1000100
Write 16-bit: devmem 0xa6003078 16 0x1234
Write 8-bit:  devmem 0xa6003078 8 0x12
```