



# Command Line Interface (CLI)

# Agenda

 CLI introduction

 Shell

 OpenRG Configuration Database

 Image types

 Remote Firmware Upgrade

# CLI Introduction (1 / 3)

- 🔌 Access by telnet or serial connection
- 🔌 Linux terminal ‘ ’, installed by  
# apt-get install
- 🔌 Windows mended terminal ‘Tera Term  
Pro’ installed from
- 🔌
- 🔌 Low-level access to OpenRG’s entity  
functions
- 🔌 Commands organized in categories

# CLI Introduction (2/3)

## Help command

-  'help' - Print list of commands categories
-  'help <category>' - Print command list for a specified category
-  'help <category> <cmd>' - Print help for a specific command
-  'help -s <string>' - Search for a specific string

# CLI Introduction (3/3)

-  Networking (net)  
ifconfig, ping
-  System  
shell, ver, ps, reboot
-  Firewall  
start, stop, restart
-  Flash  
layout, load, erase

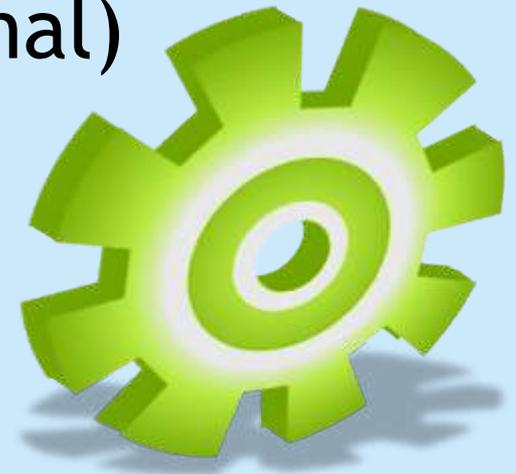
# Exercise: CLI Commands

Run the following commands from OpenRG's CLI

```
OpenRG> net ifconfig
OpenRG> net ping 192.168.1.2
OpenRG> flash layout
OpenRG> system ver
OpenRG> system ps
OpenRG> system shell
OpenRG> system reboot
```

# Flash Content

- ⚙️ Bootloader
- ⚙️ Image
- ⚙️ Configuration file
- ⚙️ Factory settings file
- ⚙️ Permanent file-system (optional)



# Flash Layout (flash layout)

```
OpenRG> flash layout
```

```
Flash layout:
```

```
Section 00 Type CONF          Range 0x00060000-0x00080000 MaxSize 0x0001FF6C  
          Size 0x00003BC7 Name 'rg_conf'  
          Checksum 0x001D841D Counter 0x000006CD Start Offset 0x00000000
```

```
Section 01 Type CONF          Range 0x00080000-0x000A0000 MaxSize 0x0001FF6C  
          Size 0x00003B80 Name 'rg_conf'  
          Checksum 0x001D8C10 Counter 0x000006C8 Start Offset 0x00000000
```

```
Section 02 Type FACTORY       Range 0x000A0000-0x000C0000 MaxSize 0x0001FF6C  
          Size 0x0000075A Name 'Image downloaded from:  
          tftp://192.168.1.10/rg_factory'  
          Checksum 0x0001DA2D Counter 0x000006CE Start Offset 0x00000000
```

```
Section 03 Type LAYOUT        Range 0x000FFC00-0x00100000 MaxSize 0x0000036C  
          Uninitialized.
```

```
Section 04 Type IMAGE         Range 0x00100000-0x02000000 MaxSize 0x01EFFF6C  
          Size 0x00AD2040 Name 'Image downloaded from:  
          tftp://192.168.1.10/openrg.img'  
          Checksum 0x4A103F90 Counter 0x000006CF Start Offset 0x00000000
```

```
Total 5 sections found.
```

# Shell

- ⚙️ OpenRG is based on an embedded Linux OS
- ⚙️ The Linux OS can be accessed using the 'shell' command
- ⚙️ Shell commands:
  - ⚙️ Processes can be viewed and controlled
  - ⚙️ Browse mounted storage device
  - ⚙️ Control kernel modules
  - ⚙️ Perform file transfer operations



# Exercise: Shell Commands (1/2)

 Telnet the board to access OpenRG CLI

 Switch to shell mode

```
OpenRG> system shell
```

 Processes

 Use 'ps' to see the running processes

 asterisk -help

 asterisk -r to debug VoIP issues

 Use 'ls -la' to view the directories

```
/ # ls -la
```

# Exercise: Shell commands (2/2)

## Mounted devices

- ☀️ Remove the disk-on-key from OpenRG
- ☀️ Navigate to the mounted file system and use 'ls' to see mounted devices

```
/ # cd /mnt/fs/  
/mnt/fs/ # ls
```

No disk is presented

- ☀️ Insert the disk-on-key

```
/ # cd /mnt/fs  
/mnt/fs/ # ls A
```

# Exercise: Using TFTP (1/2)

*Fetch a file to the board using TFTP*

- ☀ On your Windows LAN PC Start the 3Com TFTP/FTP server application (3CServer)
- ☀ Set a directory to upload files from  
Click on File → Config → TFTP Configuration → Browse Directories
- ☀ Create a text file in the directory you chose above  
In Windows Explorer, click on File → New → Text Document  
Change the file name to 'load.txt'

# Exercise: Using TFTP (2/2)

- 🔧 Use the TFTP shell command to upload the 'load.txt' file to OpenRG

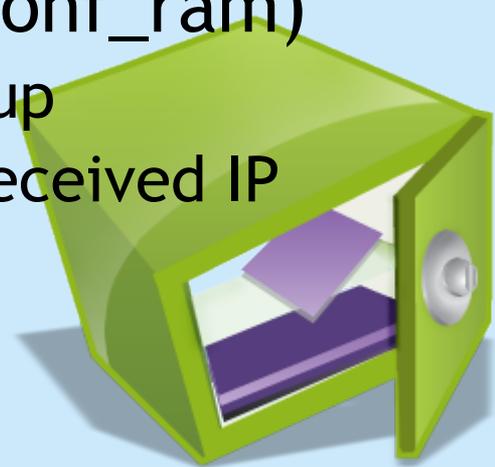
```
/ # tftp -r load.txt -g <LAN-PC-IP> -l load.txt
```

- 🔧 Use 'ls -la' to locate the file you have uploaded

```
/ # ls -la  
/ # load.txt
```

# Configuration Database (rg\_conf)

- ⚙️ Persistent configuration database (rg\_conf)
  - ⚙️ Loaded from flash to memory on start-up
  - ⚙️ Stores user configuration (connections, definitions etc.)
  - ⚙️ Stored from memory to flash after every reconf
  - ⚙️ Two instances in flash (never write over the instance we read from)
- ⚙️ Volatile configuration database (rg\_conf\_ram)
  - ⚙️ Created as an empty database on start-up
  - ⚙️ Stores non-persistent information e.g received IP address
  - ⚙️ Discarded on shutdown



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