SimpleOS User Manual & Documentation

Overview

SimpleOS is a custom, educational operating system developed to provide an understanding of key operating system concepts such as memory management, interrupt handling, and command processing. It's designed primarily for academic purposes, offering a simplified environment where users can execute basic commands, manage processes, and understand system operations.

System Requirements

SimpleOS is lightweight and can be run on most hardware capable of booting a custom operating system. It is typically tested on x86 architecture via emulators such as QEMU. Minimal system requirements include:

- x86 Processor
- At least 512 MB of RAM
- Basic VGA display or equivalent
- Standard 101/102-key or natural PS/2 keyboard

Installation Guide

1. Setting up the Environment:
   - Download the SimpleOS image from the provided source.
   - Prepare a bootable device or configure a virtual machine (VM).

2. Booting SimpleOS:
   - Insert the bootable USB drive into your device and reboot, or start your configured VM.
   - Set the boot device to USB or virtual hard disk in BIOS settings or VM settings respectively.
   - Save the changes and exit. Your machine should boot into SimpleOS.

Features

- Command Line Interface (CLI): SimpleOS features a simple CLI for interacting with the operating system. Basic commands include:
  - `hello`: Displays a welcome message.
  - `help`: Lists available commands.
  - `tree`: Displays a simple tree structure.
  - `uptime`: Shows the system uptime since the last boot.
  - `echo`: Echoes text back to the display.
  - `add [num1] [num2]`: Adds two numbers and displays the result.

- `multiply [num1] [num2]`: Multiplies two numbers and displays the result.

- Memory Management:
  - SimpleOS includes basic memory management functionalities for allocating and deallocating memory dynamically during runtime.

- Interrupt Handling:
  - The system handles basic interrupts, primarily for managing system timer and keyboard inputs.

Running Commands

To execute a command in SimpleOS:
1. At the command prompt, type the command and press `Enter`.
2. For commands requiring arguments, ensure you provide valid input. For example, to add two numbers:

```
add 5 10
```

Advanced Configuration (For Developers)

- **Kernel Development:**
  - The kernel source files are located under the `kernel/` directory. Kernel modifications can be made here.
  - Rebuild the kernel after changes using the provided Makefile:

```
make build
```

- **Adding New Commands**:
  - To add new commands, edit the `bash.c` file in the `bin/` directory.
  - Implement the command function and update the command dispatcher to recognize your new command.

Troubleshooting

- **System Does Not Boot:**
  - Check if the bootable media is correctly created and configured.
  - Ensure your BIOS/UEFI settings are set to boot from the correct device.

- **Command Not Recognized:**
  - Verify that the command is typed correctly.
  - Use the `help` command to list all available commands.

- **Memory Errors:**
  - Ensure there is no overuse of memory allocation commands without corresponding deallocations.

Documentation and Support

- **Documentation**:
  - This user manual provides basic guidelines. For development details, refer to the `README.md` in the root directory of the source code *(https://github.com/jakhongirodilov/SimpleOS)*.

This documentation aims to help both users and developers in efficiently working with and enhancing SimpleOS, fostering a deeper understanding of operating system mechanics through practical involvement.