

MINIX System Boot Process



Objective

To understand and modify the MINIX boot process by editing the kernel's source code to display a custom message during the boot phase.

This workshop demonstrates how kernel-level source changes affect the operating system startup behavior.



Tools Required

- VirtualBox
- MINIX 3 (installed and configured)
- Access to terminal and kernel source (`/usr/src/kernel`)
- Text editor (`vi` , `nano` , or equivalent)



Procedure / Implementation Steps

1. **Boot into MINIX** inside VirtualBox.

Ensure that the environment is properly configured with root privileges.

2. **Navigate to the kernel source directory:**

```
cd /usr/src/kernel
```

3. **Open the `main.c` file:**

```
vi main.c
```

4. **Locate the line** that displays the standard MINIX message:

```
printf("MINIX is open source software.\n");
```

5. **Insert your custom message** immediately after that line:

```
printf("Modified by : Kabelan G K\n");
```

6. **Save your changes** and exit the editor.

7. **Rebuild the kernel** and prepare a bootable image:

```
cd /usr/src/releasetools
make build
make hdbboot
```

8. **Reboot the system** to apply and test the modifications.

9. **Observe the boot sequence** — the new custom line should appear during startup.

Source Code Modifications

```
/* File: /usr/src/kernel/main.c */
```

```
printf("MINIX is open source software.\n");
printf("Modified by : Kabelan G K\n");
```

```
/*=====
*                                     announce                                     *
*=====*/
static void announce(void)
{
    /* Display the MINIX startup banner. */
    printf("\nMINIX %s.%s. "
#ifdef _UCS_REVISION
        "(" _UCS_REVISION ") \n"
#endif
        "Copyright 2012, Urije Universiteit, Amsterdam, The Netherlands\n",
        OS_RELEASE, OS_VERSION);

    printf("MINIX is open source software, see http://www.minix3.org\n");
    printf("MINIX modified by Kabelan G K \n");
}

/*=====
*                                     prepare_shutdown                             *
*=====*/
void prepare_shutdown(const int how)
{
    /* This function prepares to shutdown MINIX. */
    static timer_t shutdown_timer;
```

Observation / Output

During the MINIX boot process, the following lines are displayed:

MINIX is open source software....

Modified by : Kabelan G K

```
MINIX 3.2.1. (972156d)
Copyright 2012, Vrije Universiteit, Amsterdam, The Netherlands
MINIX is open source software, see http://www.minix3.org
MINIX modified by Kabelan G K
Initiating legacy i8253 timer
CPU 0 freq 3148 MHz
kernel: selecting intel syssenter ipc style
Started UFS: 8 worker thread(s)
Root device name is /dev/c0d0p0s0
/dev/c0d0p0s0: clean
/dev/c0d0p0s0 is mounted on /
none is mounted on /proc
Wed Nov  5 18:19:38 GMT 2025
/dev/c0d0p0s2: clean
/dev/c0d0p0s1: clean
size on /dev/imgrd set to 0kB
Multiuser startup in progress ...
Starting hotplugging infrastructure... done.
Starting services: random lance inet printer ipc vbox.
Starting daemons: update cron syslogd.
Starting networking: dhcpd nonamed.
Local packages (start): done.
Minix Release 3 Version 2.1 (console)

vbox.saveetha.in login:
```



Conclusion

The MINIX system boot process was successfully modified to include a custom user-defined message. This demonstrates a practical understanding of:

- The MINIX kernel source structure
- System build and boot image generation (`make build` , `make hdbboot`)
- How source-level modifications reflect in system-level behavior

Such exercises strengthen the foundational knowledge of **Operating System internals** and **kernel customization**.