

# MINIX System Boot Process

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## Objective

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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

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

## Procedure / Implementation Steps

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### 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 hdboot
```

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

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```
/* 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 _VCS_REVISION  
        (" _VCS_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

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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 sysenter ipc style
Started VFS: 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: dhcpcd 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 hdboot` )
- How source-level modifications reflect in system-level behavior

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