

Disk Usage Warning Script – Test and Verification Guide

Field	Value
Project	Disk Usage Monitoring Script (fs_usage_warning.sh)
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Environment	Ubuntu 22.04 (VirtualBox)
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📄 Script Functionality Specification

The `fs_usage_warning.sh` script monitors ext2/ext4 file systems and sends email alerts when disk usage exceeds a specified threshold.

Core Features

- **Threshold-Based Alerts** Sends warnings when usage exceeds a user-defined percentage (e.g., 80%). Sends critical alerts when usage is $\geq 90\%$.
- **Filesystem Filtering** Only monitors ext2/ext4 file systems using `df -T -P`.
- **Email Delivery** Sends alerts via mailx with formatted subject and body. In `--test` mode, prints output instead of sending emails.
- **Special Handling**
 - Displays a disk usage snapshot (ext2/ext4 only) in normal mode.
 - Suppresses snapshot in `--test` mode to avoid duplication during automated testing.
- **No Temporary Files Used**

🔍 Verification Steps

Step 1: Preparation

Ensure both the main script and the test suite are in the same directory:

```
chmod +x fs_usage_warning.sh
```

```
chmod +x test_suite_fs_usage.sh
```

Step 2: Automated Validation

Run the full test suite:

```
./test_suite_fs_usage.sh
```

Test Suite Results (10 Tests)

Test ID	Test Focus	Status
T1–T8	Live Threshold Tests (10% to 80%)	Passed
T9–T10	Mock Critical Alerts ($\geq 90\%$ simulated)	Passed

Manual Sanity Check

Command	Expected Output	Status
<code>./fs_usage_warning.sh --test -c 80 sanjeet8.23@gmail.com</code>	Warning: the file system / is above 80 % used Filesystem snapshot included	Verified
<code>./fs_usage_warning.sh --test -c 100 sanjeet8.23@gmail.com</code>	No output if usage < 100% (correct behaviour)	Verified
<code>./fs_usage_warning.sh -c 80 sanjeet8.23@gmail.com</code>	Sends real email alert if usage $\geq 80\%$	Verified

Final Test Result Summary (Ubuntu Linux)

- **Total Tests Run:** 10
- **Passed:** All tests passed
- **Manual Checks:** Verified
- **Environment:** Ubuntu 22.04 (VirtualBox)

```
sanjeet@sanjeet-VirtualBox: ~/LinuxProgramming/scripting/disk_warning_system$ ./test_suite_fs_usage_warning.sh ./fs_usage_warning.sh
Current ext2/ext4 Disk Usage Snapshot:
Filesystem      Type      Size      Used      Avail     Use%      Mounted on
/dev/sda3        ext4      40453376  31659444  6706816    6706816    83% /
Note: ext2 is not supported on this system.

-----
[TEST] Trigger warning at 10%
[PASS] Trigger warning at 10%
-----
[TEST] Trigger warning at 20%
[PASS] Trigger warning at 20%
-----
[TEST] Trigger warning at 30%
[PASS] Trigger warning at 30%
-----
[TEST] Trigger warning at 40%
[PASS] Trigger warning at 40%
-----
[TEST] Trigger warning at 50%
[PASS] Trigger warning at 50%
-----
[TEST] Trigger warning at 60%
[PASS] Trigger warning at 60%
-----
[TEST] Trigger warning at 70%
[PASS] Trigger warning at 70%
-----
[TEST] Trigger warning at 80%
[PASS] Trigger warning at 80%
-----
[TEST] Mock critical at 90%
[PASS] Mock critical at 90%
-----
[TEST] Mock critical at 100%
[PASS] Mock critical at 100%
-----
Test Suite Summary
Total Tests: 10
Passed: 10
Failed: 0
sanjeet@sanjeet-VirtualBox: ~/LinuxProgramming/scripting/disk_warning_system$
```

Email(gmail) alerts:

Compose

Inbox2,492

Starred

Snoozed

Important

Sent

Drafts19

Trash

Purchases249

Social29

Updates10,621

Forums

Promotions762

Search mail

1-100 of 51,595

<input type="checkbox"/>			me	Warning: the file system / is above 80 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Critical Warning: the file system / is greater than or equal to 90% capacity - File...	8:55 PM
<input type="checkbox"/>			me	Critical Warning: the file system / is greater than or equal to 90% capacity - File...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 70 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 60 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 30 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 40 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 50 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 20 % used - Filesystem Type Size Used Avail Us...	8:55 PM
<input type="checkbox"/>			me	Warning: the file system / is above 10 % used - Filesystem Type Size Used Avail Us...	8:55 PM