**Introduction to Shell Scripting in BASH**

1. **Shell scripts are just like batch files in the Microsoft world. They are programs written in the terminal (console), which is equivalent to the DOS prompt for Microsoft.**
2. **The script programs consist of lines containing commands you can run individually at the prompt in the terminal, plus programming structures like if statements and loops.**
3. **These commands call other programs and take the output to do things to it, such as searching in text or formatting a text string.**
4. **Shell scripts in BASH (Bourne Again Shell) can also be written using different terminal programs, like ASH, DASH, and CSH. There may be different syntax requirements, but no major advantages, it is all user preference.**
5. **BASH is installed by default on almost all major Linux distributions.**

**To start, open a terminal (KDE uses konsole, Ubuntu uses gnome-terminal).**

**Within the terminal, open a text editor. Alternatively, you can just open a graphical text editing program, like Kate or gedit, but you still need a terminal window to work with.**

**Once in the editor, the first line of the script will be**

**#!/bin/bash**

**This line defines what environment the script is to run within. If you were using DASH, it would be #!/bin/dash , for example. Similarly if it were a python script, the line would be changed to reflect python.**

**Comments are started with the # sign, and lines starting with # will not be executed. This is useful for documentation, as well as for testing and troubleshooting.**

**Here is an example shell script to display the disk space in use, without showing the tmpfs and loop stuff:**

**#!/bin/bash**

**df -h | grep -v tmpfs | grep -v loop**

**free -h**

**Save this as a file, any name and any non-conflicting extension, but either no extension or .sh is often used. For example, clug1.sh**

**Make the file executable: in the terminal, type chmod +x ./clug1.sh**

**To check, you can list the file: ls -l clug1.sh**

**-rwxr-xr-x 1 bruce.adamson users 57 Jan 24 09:33 clug1.sh**

**Now to run it, type ./clug1.sh You must reference it’s location as the current directory (./) because the system is not aware this script exists for use globally. For that to happen (where you can just type clug1.sh from any directory and it run), you would need to copy or link it to /bin, /usr/bin, or other locations in your path.**

**Running this script on my system gives the following output:**

**bruce.adamson@Adamson-mgmt:~$ ./clug1.sh**

**Filesystem Size Used Avail Use% Mounted on**

**udev 7.8G 0 7.8G 0% /dev**

**/dev/sda1 19G 17G 822M 96% /**

**/dev/sda7 420G 11G 389G 3% /home**

**/dev/sda5 9.3G 28M 8.8G 1% /tmp**

**/dev/sda6 9.3G 24K 8.8G 1% /var/log/audit**

**10.227.190.19:/nfs\_b 1.8T 1.2T 561G 68% /mnt/buffer-b**

**10.227.190.19:/nfs\_a 1.8T 968G 773G 56% /mnt/buffer-a**

**total used free shared buff/cache available**

**Mem: 15Gi 5.8Gi 1.7Gi 1.2Gi 8.0Gi 8.2Gi**

**Swap: 899Mi 52Mi 846Mi**

**Without the script, just running df -h gives this:**

**Filesystem Size Used Avail Use% Mounted on**

**udev 7.8G 0 7.8G 0% /dev**

**tmpfs 1.6G 2.3M 1.6G 1% /run**

**/dev/sda1 19G 17G 822M 96% /**

**tmpfs 7.8G 17M 7.8G 1% /dev/shm**

**tmpfs 5.0M 4.0K 5.0M 1% /run/lock**

**tmpfs 7.8G 0 7.8G 0% /sys/fs/cgroup**

**/dev/loop0 128K 128K 0 100% /snap/bare/5**

**/dev/loop2 147M 147M 0 100% /snap/chromium/2254**

**/dev/loop3 117M 117M 0 100% /snap/core/14399**

**/dev/loop4 64M 64M 0 100% /snap/core20/1738**

**/dev/loop6 347M 347M 0 100% /snap/gnome-3-38-2004/119**

**/dev/loop9 56M 56M 0 100% /snap/cups/872**

**/dev/loop10 92M 92M 0 100% /snap/gtk-common-themes/1535**

**/dev/loop11 82M 82M 0 100% /snap/gtk-common-themes/1534**

**/dev/loop12 50M 50M 0 100% /snap/snapd/17883**

**/dev/loop8 347M 347M 0 100% /snap/gnome-3-38-2004/115**

**/dev/loop5 64M 64M 0 100% /snap/core20/1778**

**/dev/loop7 56M 56M 0 100% /snap/cups/836**

**/dev/sda7 420G 11G 389G 3% /home**

**/dev/sda5 9.3G 28M 8.8G 1% /tmp**

**/dev/sda6 9.3G 24K 8.8G 1% /var/log/audit**

**10.227.190.19:/nfs\_b 1.8T 1.2T 561G 68% /mnt/buffer-b**

**10.227.190.19:/nfs\_a 1.8T 968G 773G 56% /mnt/buffer-a**

**tmpfs 1.6G 16K 1.6G 1% /run/user/20005**

**tmpfs 1.6G 4.0K 1.6G 1% /run/user/30001**

**/dev/loop13 117M 117M 0 100% /snap/core/14447**

**/dev/loop14 50M 50M 0 100% /snap/snapd/17950**

**/dev/loop15 149M 149M 0 100% /snap/chromium/2271**

**If you run a series of commands frequently/repetitively, collecting the commands into a single shell script is very helpful.**

**For more detail on using variables, functions (mini-programs within a program), loops, if-statements, and more with shell scripts, please see this link:**

[**https://help.ubuntu.com/community/Beginners/BashScripting**](https://help.ubuntu.com/community/Beginners/BashScripting)