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*I confirm that I understand my coursework needs to be submitted online via my second teacher platform under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.*

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## Introduction

Virtualization is a technique to merge or splitting computing resources to give one or more execution environments using technique like division of hardware and software,

machine simulation, mirroring and other (Rodríguez-Haro, et al.). It is the developing technology in the IT world. Majority of the IT company are using this technology to solidify their work load. Virtualization in computer system means creating a virtual instance of anything means it is the logical division of the resources of the system.

### i) Virtualization

A hypervisor is one of many virtualization techniques which allow multiple operating systems, termed guests, to run concurrently on a host computer (Li, 2010). An operating

system on virtual machine is called a guest OS. Virtualization enables users to run multiple virtual machines on a single machine maximizing the use of hardware. Use of

virtualization technique is actually cost effective because it reduces the extra system.

At

last virtualization is enhancing the resources effectively, flexibility, security and cost-effective.

### ii) Containerization

In alternate to virtualization we can containerization platform like Docker. It is simply operating system for different containers. Docker provides you a platform that enables software to run in its own. Docker does not need a separate OS instance for each container so it is light weight. Docker let developer to ship code faster in standardize way by improving resource utilization.

## Kali Linux:-

Kali Linux is a version of the Linux made for testing the security of systems. Before it was called Backtrack, which combined three older Linux systems: IWHAX, WHOPPIX, and Auditor. Backtrack was very popular at that time. Kali Linux officially launched on March 12, 2013, as a new and improved version. Within just five days, over 90,000 people had downloaded it (allen, et al., 2014).

## Features of Kali Linux:

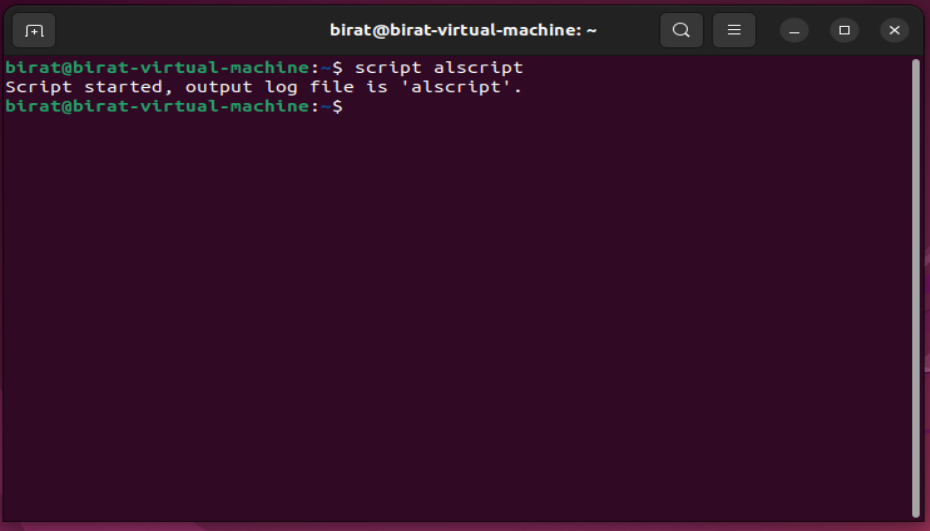
- Built on Debian: It's based on the Debian Linux system.
- Lots of Tools: It has more than 300 tools for security testing.
- Supports Wireless Devices: Works well with many wireless cards.
- Special Kernel: Includes a kernel that allows packet injection.
- Secure Software: All its software is signed for security.
- Customizable: Users can change it to fit their needs.
- Supports ARM Devices: Works on devices like Raspberry Pi.

Objective:

To learn basic Linux commands, file operations, and scripting for system interaction and management.

## Steps to replicate:

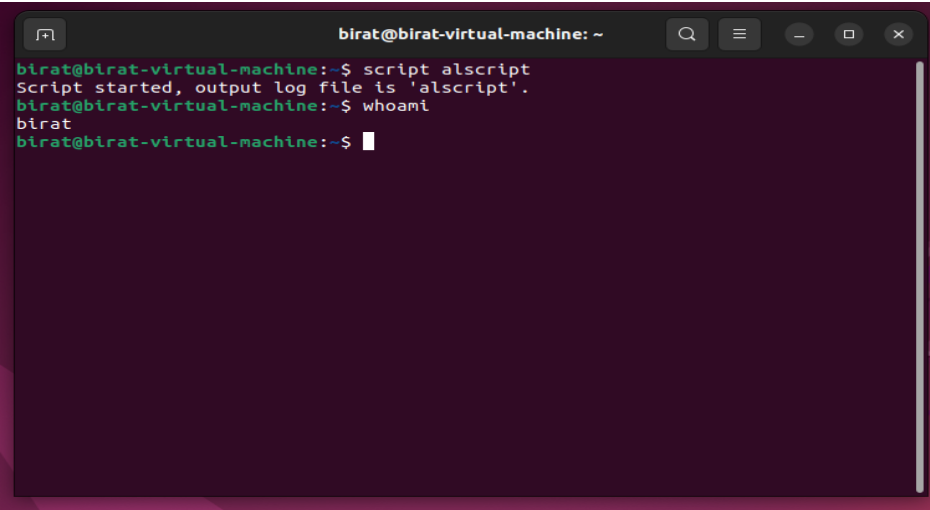
### Step 1: Starting the script

A terminal window titled 'birat@birat-virtual-machine: ~' with search, menu, and window control icons. The terminal shows the command 'script alscript' being executed, followed by the output 'Script started, output log file is 'alscript''. The prompt returns to 'birat@birat-virtual-machine:~\$'.

```
birat@birat-virtual-machine: ~  
birat@birat-virtual-machine:~$ script alscript  
Script started, output log file is 'alscript'.  
birat@birat-virtual-machine:~$
```

*Figure 1:starting the script*

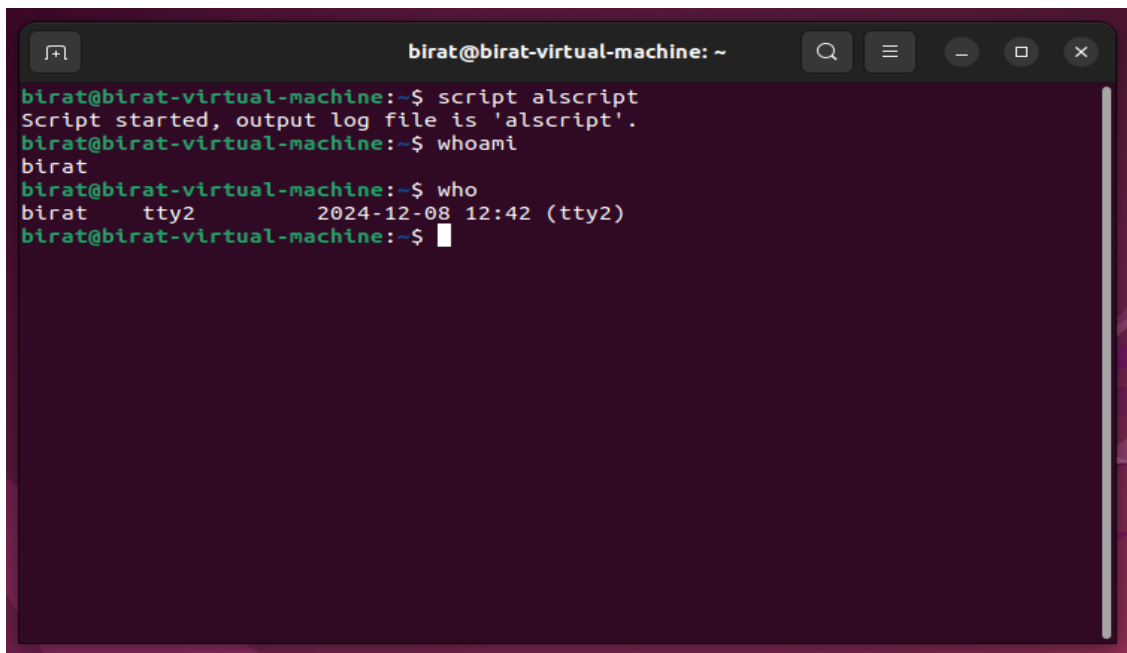
### Step 2: Identifying user

A terminal window titled 'birat@birat-virtual-machine: ~' with search, menu, and window control icons. The terminal shows the command 'script alscript' being executed, followed by the output 'Script started, output log file is 'alscript''. Then, the command 'whoami' is executed, and the output 'birat' is displayed. The prompt returns to 'birat@birat-virtual-machine:~\$'.

```
birat@birat-virtual-machine:~$ script alscript  
Script started, output log file is 'alscript'.  
birat@birat-virtual-machine:~$ whoami  
birat  
birat@birat-virtual-machine:~$
```

*Figure 2:identifying user*

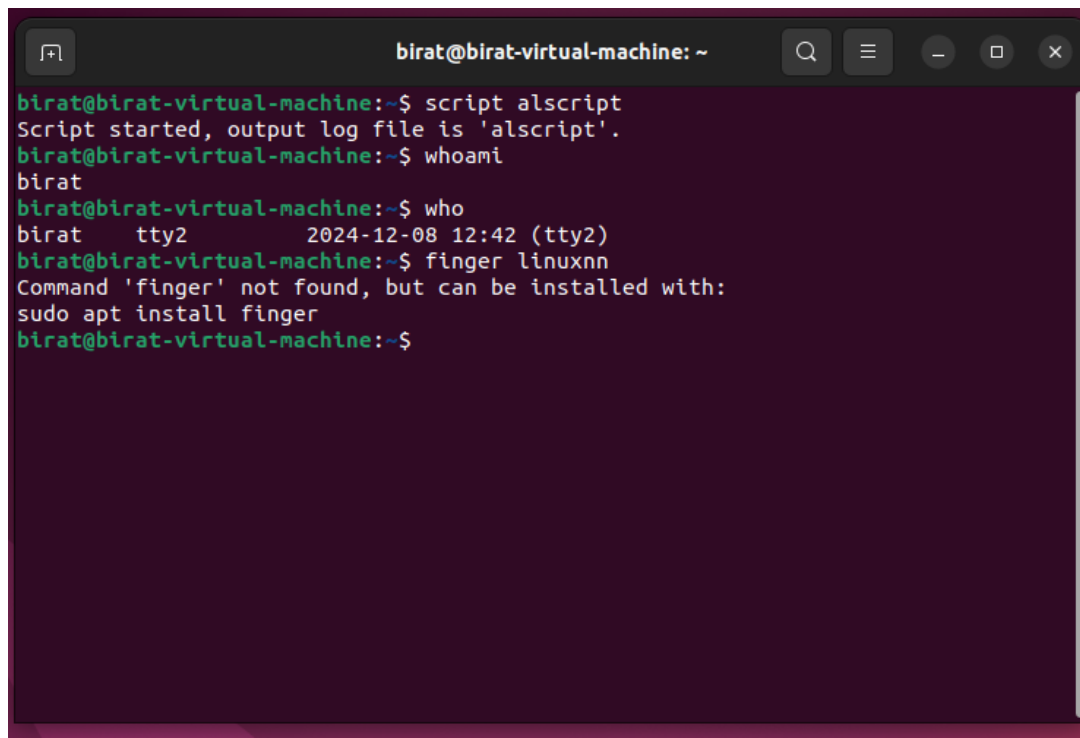
### Step 3: Users Overview



```
birat@birat-virtual-machine: ~  
birat@birat-virtual-machine:~$ script alscript  
Script started, output log file is 'alscript'.  
birat@birat-virtual-machine:~$ whoami  
birat  
birat@birat-virtual-machine:~$ who  
birat    tty2          2024-12-08 12:42 (tty2)  
birat@birat-virtual-machine:~$
```

Figure 3:view all users

### Step 4: Account details

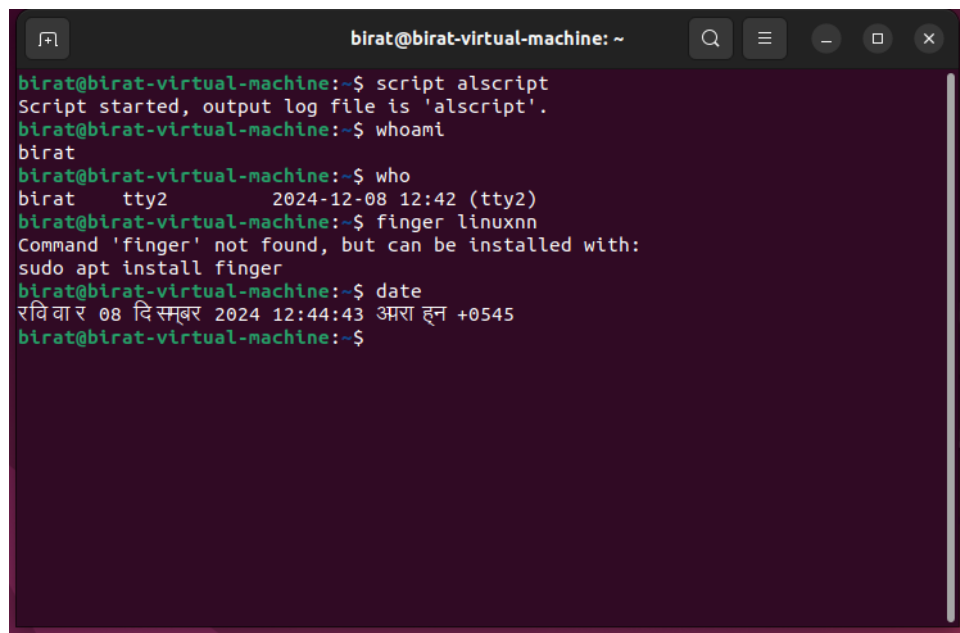


```
birat@birat-virtual-machine: ~  
birat@birat-virtual-machine:~$ script alscript  
Script started, output log file is 'alscript'.  
birat@birat-virtual-machine:~$ whoami  
birat  
birat@birat-virtual-machine:~$ who  
birat    tty2          2024-12-08 12:42 (tty2)  
birat@birat-virtual-machine:~$ finger linuxnn  
Command 'finger' not found, but can be installed with:  
sudo apt install finger  
birat@birat-virtual-machine:~$
```

Figure 4:account details



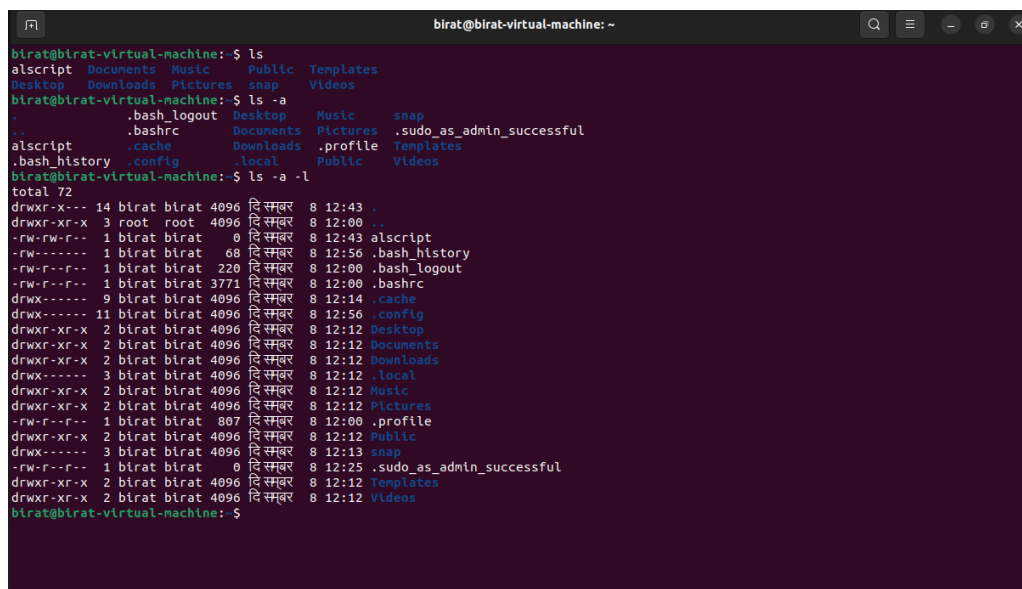
## Step 5: Date and time

A terminal window titled 'birat@birat-virtual-machine: ~' with standard window controls. It shows a series of commands and their outputs: 'script alscript' (output: 'Script started, output log file is 'alscript''), 'whoami' (output: 'birat'), 'who' (output: 'birat tty2 2024-12-08 12:42 (tty2)'), 'finger linuxnn' (output: 'Command 'finger' not found, but can be installed with: sudo apt install finger'), and 'date' (output: 'रवि वार 08 दिस्म्बर 2024 12:44:43 अपरा ह्न +0545').

```
birat@birat-virtual-machine:~$ script alscript
Script started, output log file is 'alscript'.
birat@birat-virtual-machine:~$ whoami
birat
birat@birat-virtual-machine:~$ who
birat    tty2      2024-12-08 12:42 (tty2)
birat@birat-virtual-machine:~$ finger linuxnn
Command 'finger' not found, but can be installed with:
sudo apt install finger
birat@birat-virtual-machine:~$ date
रवि वार 08 दिस्म्बर 2024 12:44:43 अपरा ह्न +0545
birat@birat-virtual-machine:~$
```

Figure 5: date and time

## Step 6: Listing files

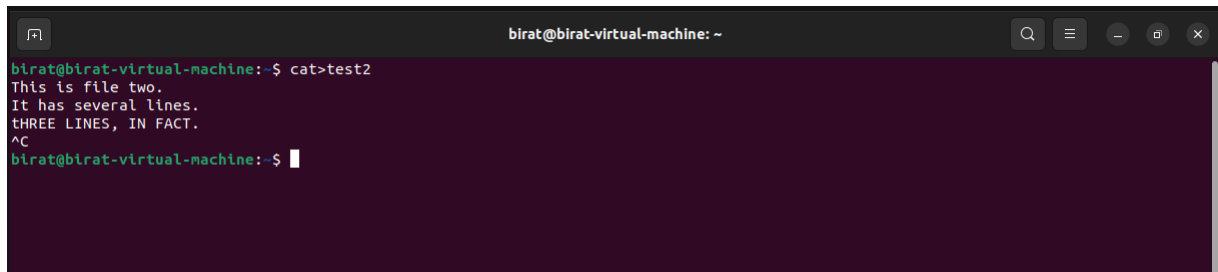
A terminal window titled 'birat@birat-virtual-machine: ~' with standard window controls. It shows the execution of 'ls' and 'ls -la' commands. The 'ls' command lists directories: 'alscript', 'Documents', 'Music', 'Public', 'Templates', 'Desktop', 'Downloads', 'Pictures', 'snap', and 'Videos'. The 'ls -la' command provides a detailed listing of all files and directories, including permissions, owner, group, size, and timestamps in Hindi.

```
birat@birat-virtual-machine:~$ ls
alscript  Documents  Music      Public    Templates
Desktop   Downloads  Pictures   snap      Videos

birat@birat-virtual-machine:~$ ls -la
total 72
drwxr-x--- 14 birat birat 4096 दिस्म्बर 8 12:43 .
drwxr-xr-x  3 root  root  4096 दिस्म्बर 8 12:00 ..
-rw-rw-r--  1 birat birat   0 दिस्म्बर 8 12:43 alscript
-rw-----  1 birat birat   68 दिस्म्बर 8 12:56 .bash_history
-rw-r--r--  1 birat birat  220 दिस्म्बर 8 12:00 .bash_logout
-rw-r--r--  1 birat birat 3771 दिस्म्बर 8 12:00 .bashrc
drwx-----  9 birat birat 4096 दिस्म्बर 8 12:14 .cache
drwx----- 11 birat birat 4096 दिस्म्बर 8 12:56 .config
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Desktop
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Documents
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Downloads
drwx-----  3 birat birat 4096 दिस्म्बर 8 12:12 .local
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Music
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Pictures
-rw-r--r--  1 birat birat  807 दिस्म्बर 8 12:00 .profile
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Public
drwx-----  3 birat birat 4096 दिस्म्बर 8 12:13 snap
-rw-r--r--  1 birat birat   0 दिस्म्बर 8 12:25 .sudo_as_admin_successful
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Templates
drwxr-xr-x  2 birat birat 4096 दिस्म्बर 8 12:12 Videos
birat@birat-virtual-machine:~$
```

Figure 6: list all files

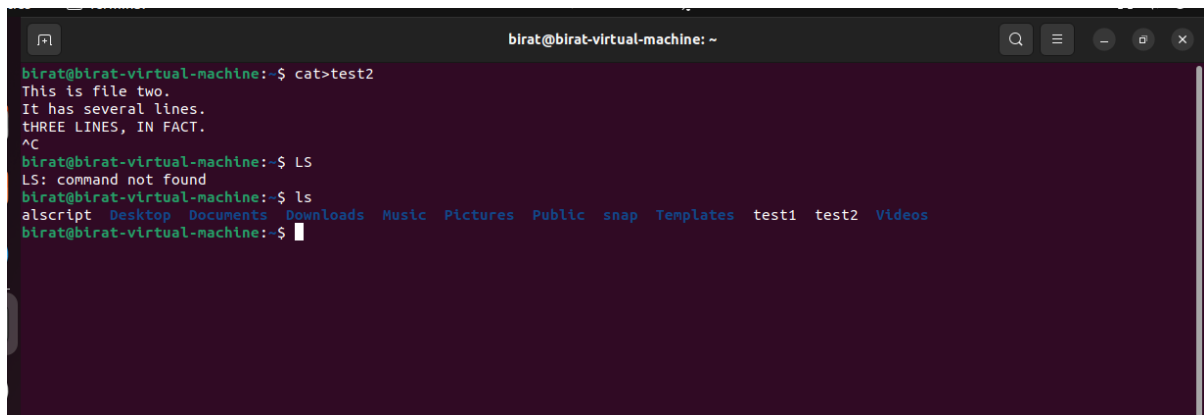
## Step 7: Exploring Files

A terminal window titled 'birat@birat-virtual-machine: ~' with search, menu, and window control icons in the title bar. The terminal shows the command 'cat>test2' being executed, which outputs three lines of text: 'This is file two.', 'It has several lines.', and 'THREE LINES, IN FACT.'. The prompt returns to 'birat@birat-virtual-machine:~\$' after a carriage return is entered.

```
birat@birat-virtual-machine:~$ cat>test2
This is file two.
It has several lines.
THREE LINES, IN FACT.
^C
birat@birat-virtual-machine:~$
```

*Figure 7:how to explore the files*

## Step 8: File contents

A terminal window titled 'birat@birat-virtual-machine: ~' with search, menu, and window control icons in the title bar. The terminal shows the command 'cat>test2' being executed, which outputs three lines of text: 'This is file two.', 'It has several lines.', and 'THREE LINES, IN FACT.'. The prompt returns to 'birat@birat-virtual-machine:~\$' after a carriage return is entered. Then, the command 'LS' is entered, resulting in the error 'LS: command not found'. Finally, the command 'ls' is entered, which lists the contents of the current directory: 'alscript Desktop Documents Downloads Music Pictures Public snap Templates test1 test2 Videos'. The prompt returns to 'birat@birat-virtual-machine:~\$' after a carriage return is entered.

```
birat@birat-virtual-machine:~$ cat>test2
This is file two.
It has several lines.
THREE LINES, IN FACT.
^C
birat@birat-virtual-machine:~$ LS
LS: command not found
birat@birat-virtual-machine:~$ ls
alscript Desktop Documents Downloads Music Pictures Public snap Templates test1 test2 Videos
birat@birat-virtual-machine:~$
```

*Figure 8: merge the files*

## References

Rodríguez-Haro, F., Freitag, F., Navarro, L., Hernández-sánchez, E., Farías-Mendoza,

N., Guerrero-Ibáñez, J.A. and González-Potes, A., 2012. A summary of virtualization techniques. *Procedia Technology*, 3, pp.267-272.

Allen, L., Heriyanto, T. and Ali, S., 2014. *Kali Linux—Assuring security by penetration testing*. Packt Publishing Ltd.