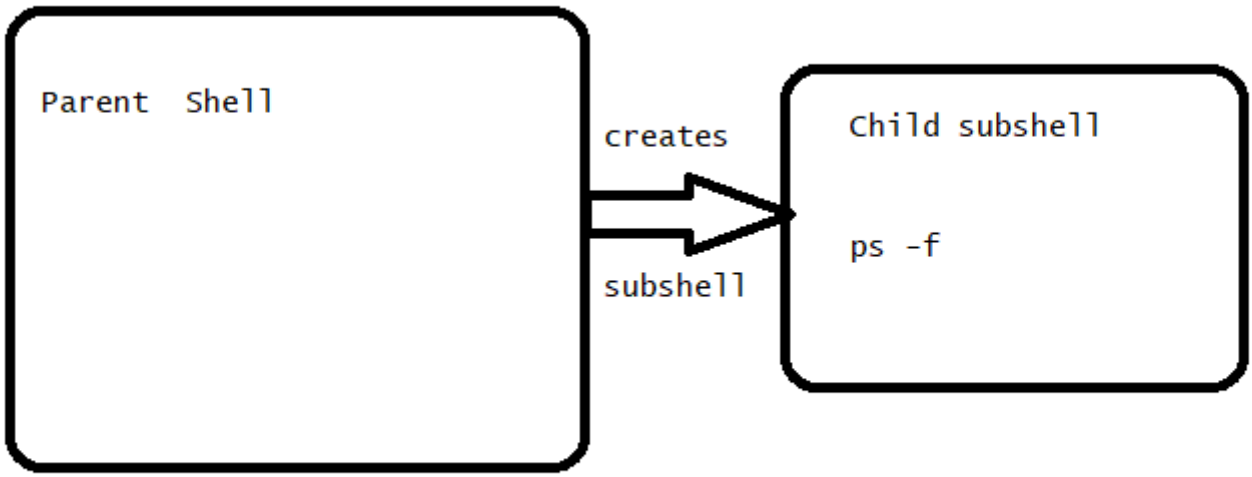
Error Checking and Handling

- The following topics
  - Error checking
  - Error handling
  - Error Prevention
- The exit status (exit codes or return codes) is the way Bash communicates the successful or unsuccessful termination of a process to its parent.
- Linux command execution process



- Lets use mktemp command

```
mktemp --help
```

- Lets write a script with exit codes for success & failure

```
#!/bin/bash

# Run a command with will always work
mktemp
# storing the exit code of mktemp
mktemp_ec=$?

# Run a command which always fails
mkdir /home/ubuntu
mkdir_ec=$?
```

```
echo "mktemp returned success exit code which
${mktemp_ec}"

echo "mkdir returned failure exit code which
${mkdir_ec}"
```

- now execute this script

```
ubuntu@ip-172-31-2-166:~/scripts$ vi returncodedemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ chmod +x returncodedemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ export PATH=$PATH:/home/ubuntu/script
ubuntu@ip-172-31-2-166:~/scripts$ returncodedemo.sh
/tmp/tmp.MMO9NGSLRW
mkdir: cannot create directory '/home/ubuntu': File exists
mktemp returned success exit code which 0
mkdir returned failure exit code which 1
ubuntu@ip-172-31-2-166:~/scripts$
```

- Return code of 0 is success any other return code is failure
- For the standard exit codes and their meanings **refer here**

Test Shorthand

- We use *test* command in lot of scripts. Lets explore test
- Directory checking

```
# full command
test -d <dirpath>

# short hand
[ -d <dirpath> ]
```

```
ubuntu@ip-172-31-2-166:~/scripts$ test -d /home/ubuntu
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
ubuntu@ip-172-31-2-166:~/scripts$ [ -d /home/ubuntu/ ]
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
```

- Using test we can do comparisons using *-gt, -ne, -eq, -lt*

```
ubuntu@ip-172-31-2-166:~$ test 5 -gt 2 && echo "Yes" || echo "No"
Yes
ubuntu@ip-172-31-2-166:~$ test 5 -gt 2
ubuntu@ip-172-31-2-166:~$ echo $?
0
ubuntu@ip-172-31-2-166:~$ test 5 -gt 22 && echo "Yes" || echo "No
No
ubuntu@ip-172-31-2-166:~$ [ 5 -gt 2 ]
ubuntu@ip-172-31-2-166:~$ echo $?
0
ubuntu@ip-172-31-2-166:~$ [ 5 -gt 2 ] && echo "Yes" || echo "No"
Yes
ubuntu@ip-172-31-2-166:~$
```

- To check the file existence use *test -f*

```
ubuntu@ip-172-31-2-166:~/scripts$ test -f /home/ubuntu/scripts/returncodedemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
ubuntu@ip-172-31-2-166:~/scripts$ [ -f ~/scripts/returncodedemo.sh ]
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
ubuntu@ip-172-31-2-166:~/scripts$ test -f /home/ubuntu/scripts/returncodedemo1.sh
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
1
ubuntu@ip-172-31-2-166:~/scripts$ [ -f ~/scripts/returncodedemo1.sh ]
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
1
ubuntu@ip-172-31-2-166:~/scripts$ [ -f ~/scripts/returncodedemo1.sh ] && echo "File exists" || e
le doesnot exists"
File doesnot exists
ubuntu@ip-172-31-2-166:~/scripts$ [ -f ~/scripts/returncodedemo.sh ] && echo "File exists" || ec
e doesnot exists"
File exists
ubuntu@ip-172-31-2-166:~/scripts$
```

- So far we looked at how to check for directories, files and conditions which can act as error checks. if we combine this checks with conditional statements we can avoid errors.
- For handling errors also we need a conditional statements

if-then-exit

- The basic idea is to test for a condition (IF), and if that condition is true, we do something (THEN) and if condition is false we return failure exit codes (exit)
- We want to write a script which prints content of file
- lets write a basic if condition

```
if <condition> then
   statements
```

```
fi
```

- Using this lets write the script as shown below

```
#!/bin/bash

FILE=/tmp/random.txt

# Check if the file exits

if [[ -f ${FILE} ]]; then
   cat ${FILE}
   exit 0
fi

exit 1
```

- Now execute the script for negative test (/tmp/random.txt doesnot exist)

```
ubuntu@ip-172-31-2-166:~$ cd scripts/
ubuntu@ip-172-31-2-166:~/scripts$ vi ifthenexitdemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ chmod +x ifthenexitdemo
ubuntu@ip-172-31-2-166:~/scripts$ ./ifthenexitdemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
1
ubuntu@ip-172-31-2-166:~/scripts$ touch /tmp/random.txt
ubuntu@ip-172-31-2-166:~/scripts$ ./ifthenexitdemo.sh
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
ubuntu@ip-172-31-2-166:~/scripts$ vi /tmp/random.txt
ubuntu@ip-172-31-2-166:~/scripts$ ./ifthenexitdemo.sh
Hello
This is sample
we are learning
ubuntu@ip-172-31-2-166:~/scripts$ echo $?
0
ubuntu@ip-172-31-2-166:~/scripts$
```