Introduction to **Unix** Shell
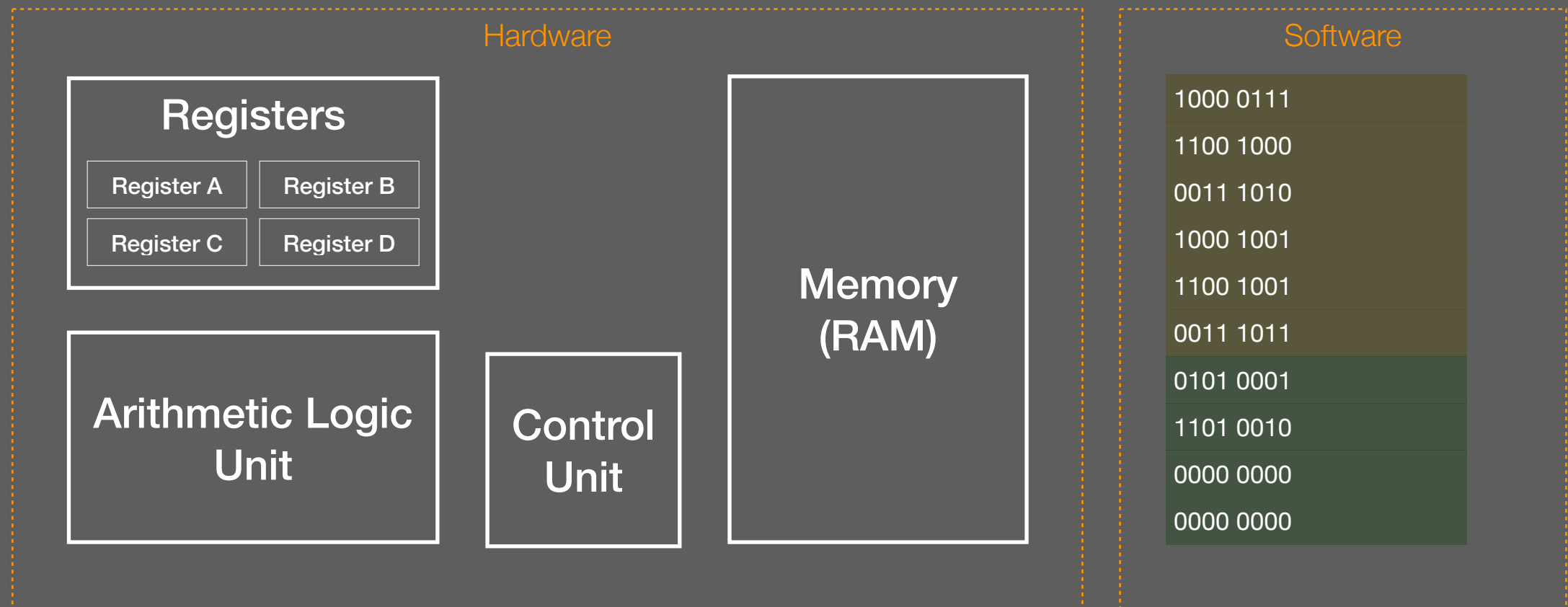
Dr Balamurugan Soundararaj

Overview

Context - Where does unix shell comes from?

Utility - For what these shells are used?

Relevance - How can I use unix shell for my purposes
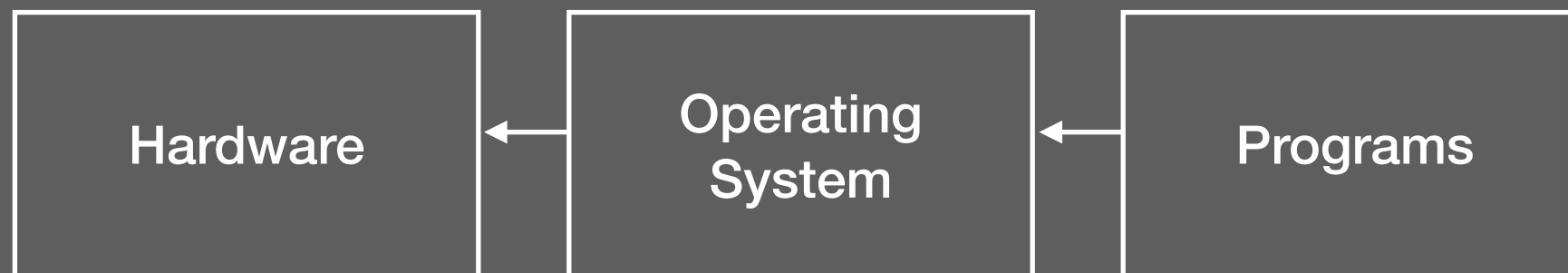
Resources - Where can I learn more?

Recap

Registers

| Register A | Register B |
| Register C | Register D |

Arithmetic Logic Unit

Control Unit

Memory (RAM)

1000 0111
1100 1000
0011 1010
1000 1001
1100 1001
0011 1011
0101 0001
1101 0010
0000 0000
0000 0000

Recap

Hardware ← Programs

Operating System

Hardware	←	Operating System	←	Programs

Operating systems abstract away the hardware for programs.

The **way** they abstract is the key!

What is a shell

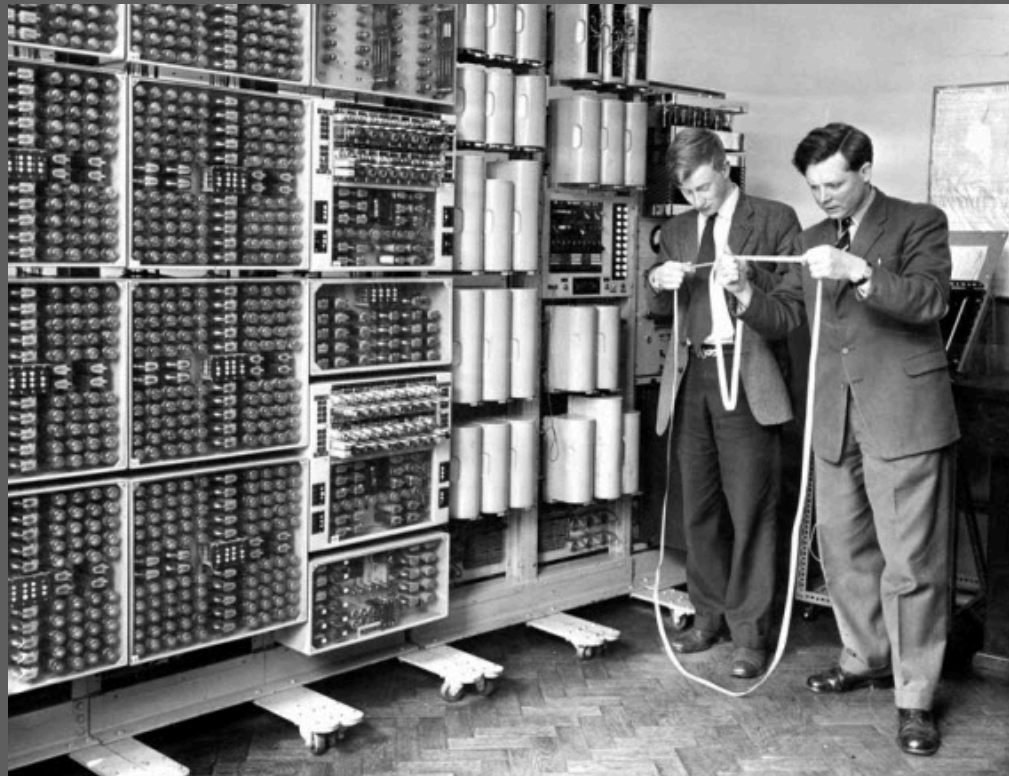| Hardware	←	Operating System	←	Programs
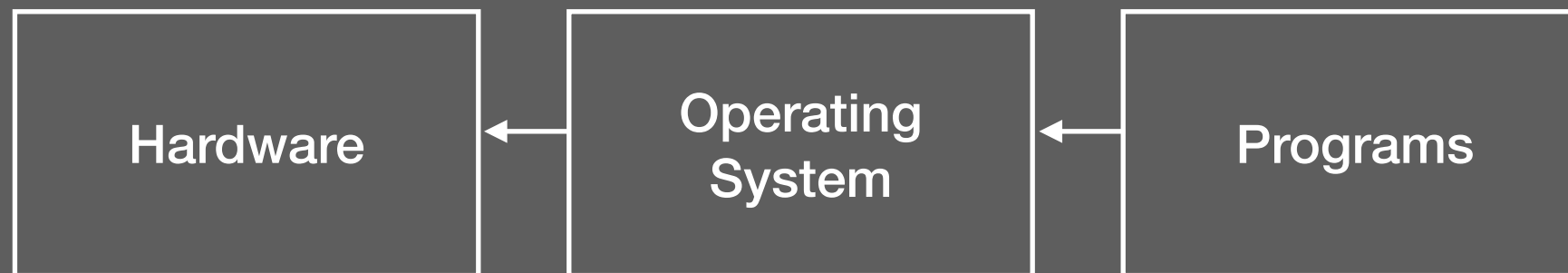
Shell is the program which the user uses to communicate to the operating system.

What is a shell
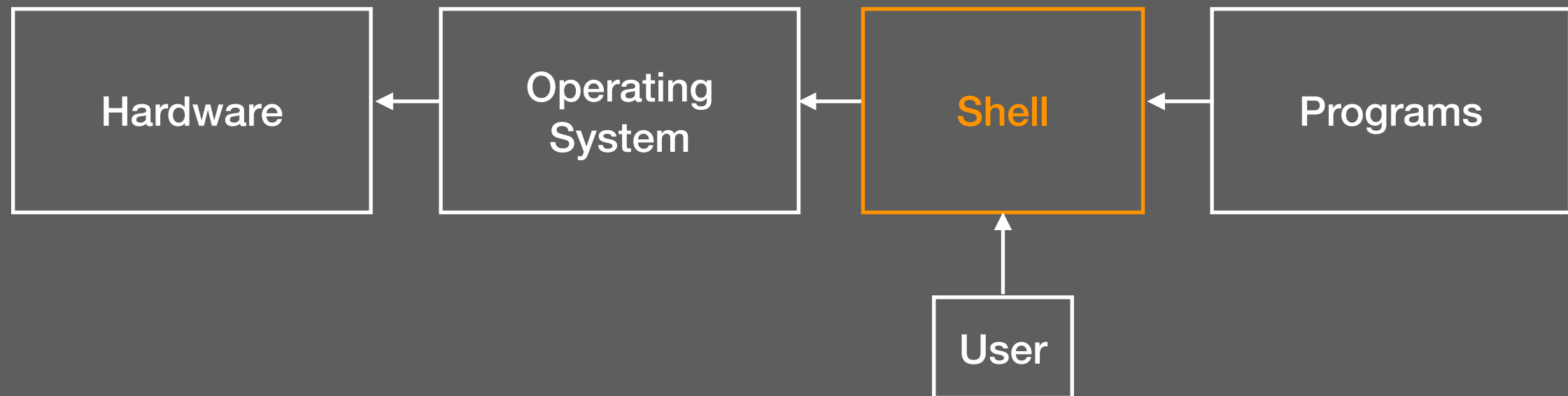
Shell is the program which the user uses to communicate to the operating system.

How do they Abstract?

Central mainframe

↓

Command line
(unix)

Typical Workspace

↓

Graphical User Interface
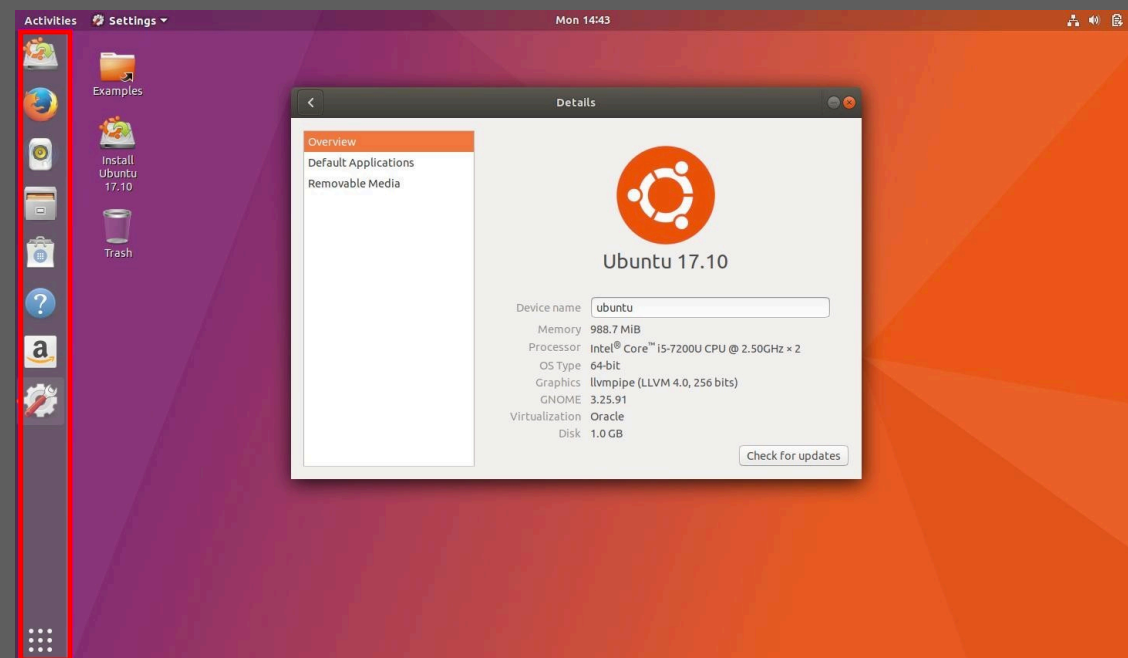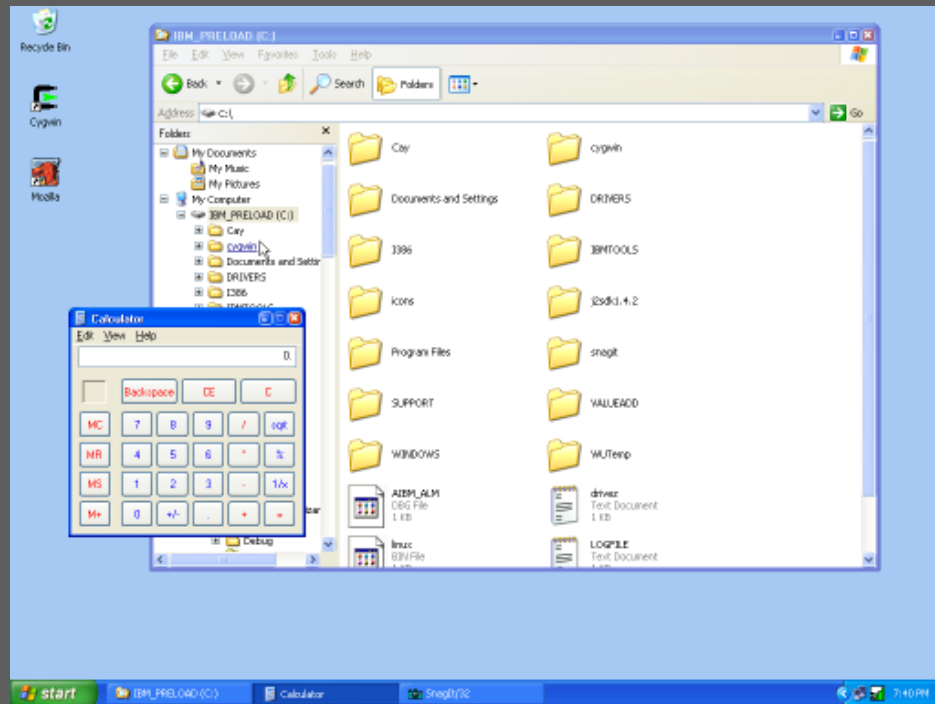(apple, windows)

GUI vs Command line

Capturing complex instruction with language is much easier than with skeuomorphism.
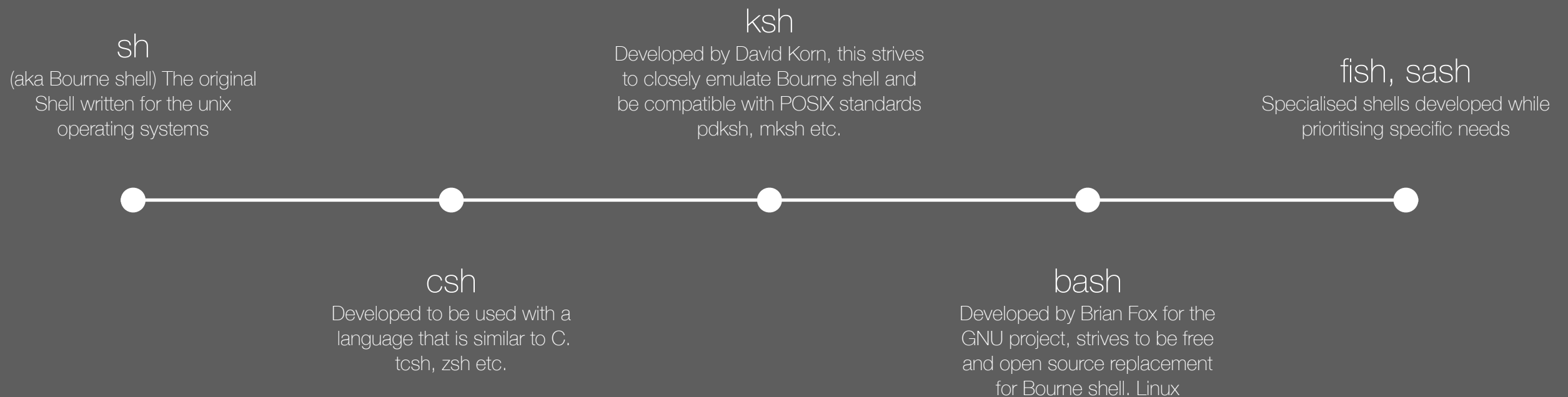
Bandwidth is much smaller between user and shell.

Repeating stuff is easy.

Much harder learning curve.

GUI Shells

History of Unix Shell

ksh
Developed by David Korn, this strives
to closely emulate Bourne shell and
be compatible with POSIX standards
pdksh, mksh etc.

fish, sash
Specialised shells developed while
prioritising specific needs

sh
(aka Bourne shell) The original
Shell written for the unix
operating systems

csh
Developed to be used with a
language that is similar to C.
tcsh, zsh etc.

bash
Developed by Brian Fox for the
GNU project, strives to be free
and open source replacement
for Bourne shell. Linux

Though there is a lot of history and evolution all of them remained
backward compatible and POSIX compliant

bash is synonymous with a command line shell for unix and unix-like
(linux) systems.

https://developer.ibm.com/tutorials/l-linux-shells/

Major functions of Shell

Managing Input and Output

Managing Filesystem

Executing Programs

Demo!

Demo

Advanced file system management

Search and find files in file systems

Building data pipelines

Parallelising data pipelines

Remote access

ssh - **s**ecure **sh**ell

Purpose	Geography servers
Gateway Servers	archibald.geog.ucl.ac.uk roundabout.geog.ucl.ac.uk squarepeg.geog.ucl.ac.uk triangleting.geog.ucl.ac.uk
General Purpose	ankara.geog.ucl.ac.uk bangkok.geog.ucl.ac.uk caracas.geog.ucl.ac.uk dakar.geog.ucl.ac.uk edinburgh.geog.ucl.ac.uk freetown.geog.ucl.ac.uk gaborone.geog.ucl.ac.uk hanoi.geog.ucl.ac.uk islamabad.geog.ucl.ac.uk khartoum.geog.ucl.ac.uk lima.geog.ucl.ac.uk muscat.geog.ucl.ac.uk nassau.geog.ucl.ac.uk ottawa.geog.ucl.ac.uk pyongyang.geog.ucl.ac.uk quito.geog.ucl.ac.uk rabat.geog.ucl.ac.uk seoul.geog.ucl.ac.uk tirana.geog.ucl.ac.uk ulanbator.geog.ucl.ac.uk valletta.geog.ucl.ac.uk washington.geog.ucl.ac.uk

Purpose	CDRC servers
Database	cdrc-db.geog.ucl.ac.uk
High Memory (1TB of RAM)	cdrc-highmem.geog.ucl.ac.uk cdrc-footfall.geog.ucl.ac.uk
Storage	cdrc-archive.geog.ucl.ac.uk
Computing	cdrc-node01.geog.ucl.ac.uk cdrc-node02.geog.ucl.ac.uk cdrc-node03.geog.ucl.ac.uk cdrc-node04.geog.ucl.ac.uk cdrc-node05.geog.ucl.ac.uk cdrc-node06.geog.ucl.ac.uk cdrc-node07.geog.ucl.ac.uk cdrc-node08.geog.ucl.ac.uk

Purpose	UCL Server
General HPC	Legion
Parallel Proc.	Grace
Storage	Myriad