@MyWebUniversity

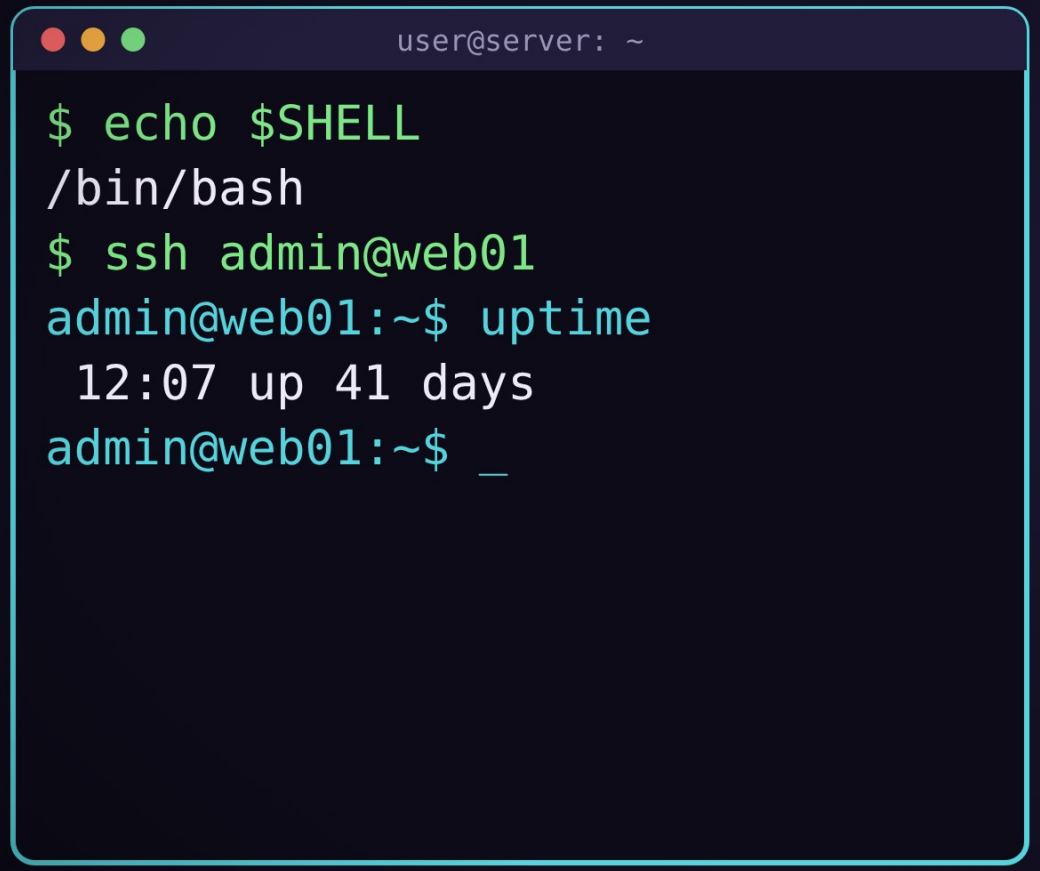
$_ ssh



sh · csh · ksh
bash · zsh · fish

the story of shells & secure logins

TELNET → SSH · 1995



A MYWEBUNIVERSITY STORY

$_ ssh

Shells and SSH

From sh to zsh, and Secure Logins

sh · csh · ksh · bash · zsh · fish

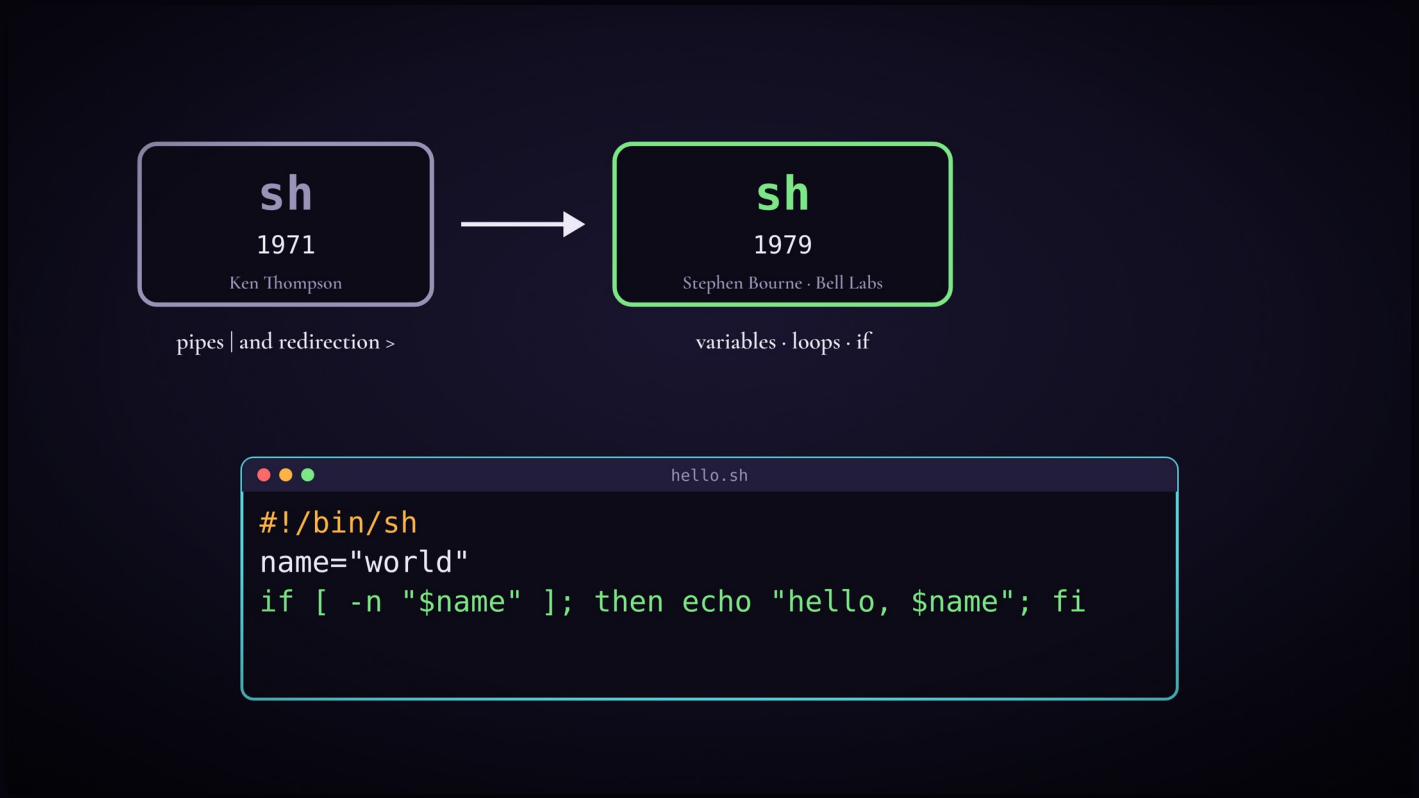
What Is a Shell?



- Kernel = core · shell = the layer you talk to
- Command interpreter + programming language
- Shell scripts automate repeated work

01

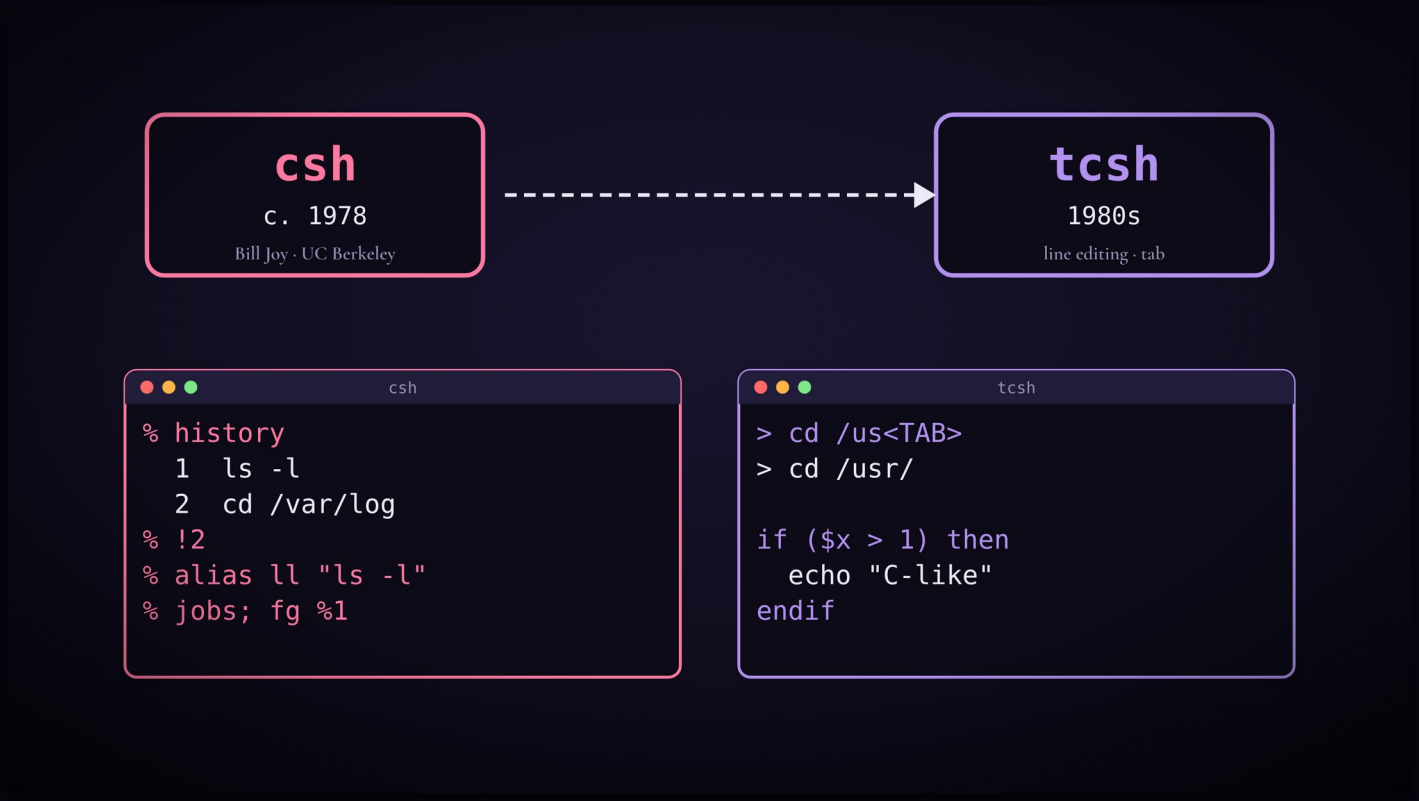
Thompson Shell to Bourne Shell



- 1971: Thompson shell: pipes and redirection
- 1979: Bourne shell (sh), Stephen Bourne
- #!/bin/sh: variables, loops, if

02

The C Shell and tcsh



- c. 1978: C shell (csh), Bill Joy, Berkeley
- History, aliases, job control
- tcsh: line editing, tab completion

03

The Korn Shell



- 1983: Korn shell (ksh), David Korn, Bell Labs
- Bourne-compatible + C shell ideas + arrays
- Standard on AIX/Solaris; shaped POSIX sh

04

Bash: the Bourne Again Shell



- 1989: bash, Brian Fox, GNU project
- “Bourne Again SHell” · maintained by Chet Ramey
- Default on most Linux distributions

05

zsh and fish



- 1990: zsh (Paul Falstad) · macOS default since 2019
- 2005: fish, the friendly interactive shell
- Type in any shell; script in sh/bash

06

The Danger of Telnet



- telnet · rlogin · rsh sent passwords in plain text
- 1995: password-sniffing attack in Helsinki
- Tatu Ylönen sets out to fix it

07

SSH: the Secure Shell



- SSH: encryption, server identity, key login
- 1999: OpenSSH (OpenBSD project)
- sshd on port 22 · scp · sftp (internal sftp server)

08

Securing SSH

your laptop

```
$ ssh-keygen -t ed25519
Your public key: ~/.ssh/id_ed25519.pub
$ ssh-copy-id admin@web01
$ ssh admin@web01   # no password
```

/etc/ssh/sshd_config

```
PasswordAuthentication no
PermitRootLogin no
AllowUsers admin deploy
$ sudo systemctl reload sshd
```

Keep OpenSSH updated

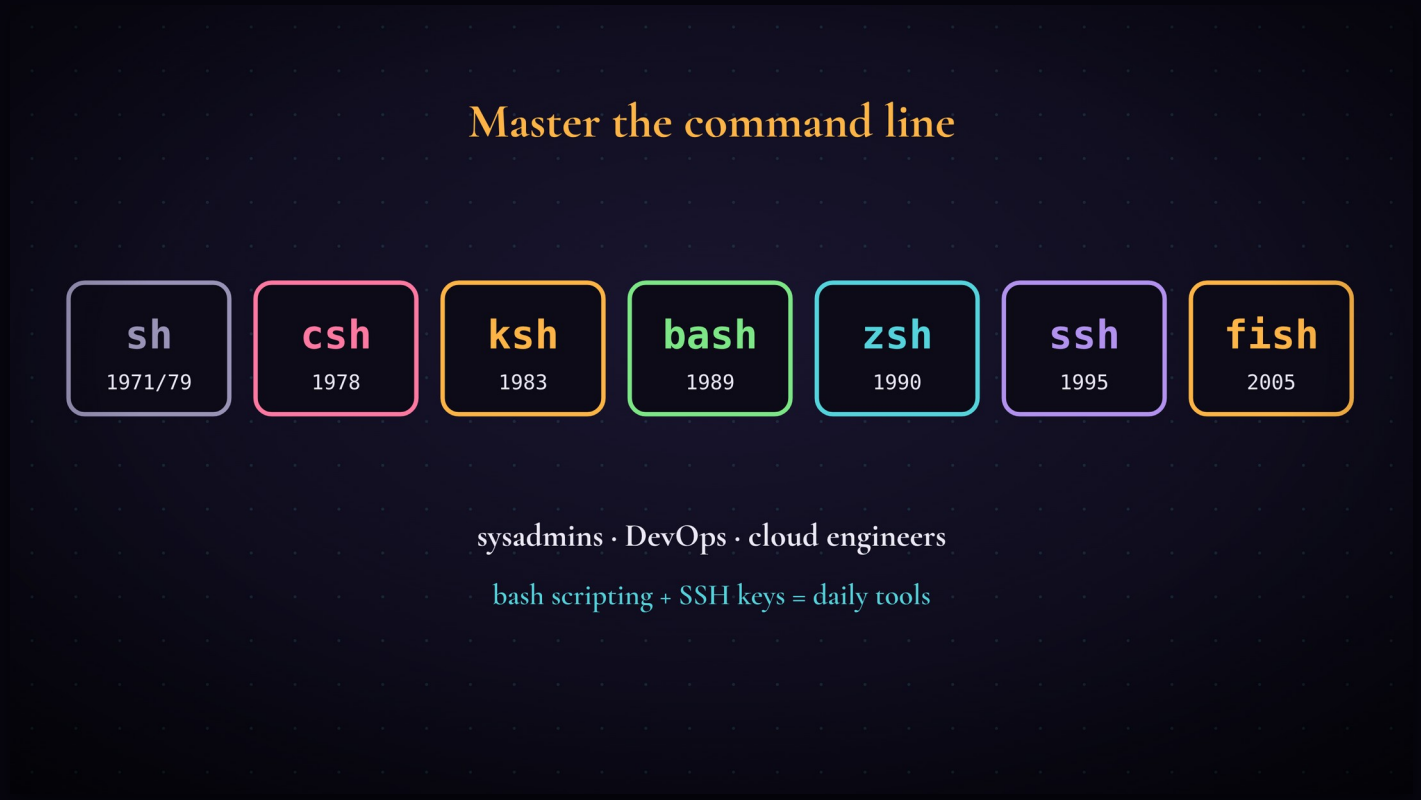
2024: regreSSHion (CVE-2024-6387) in sshd

```
$ sudo apt update && sudo apt upgrade openssh-server
```

- ssh-keygen -t ed25519 · ssh-copy-id
- PasswordAuthentication no · PermitRootLogin no
- Patch OpenSSH (e.g. regreSSHion, CVE-2024-6387)

09

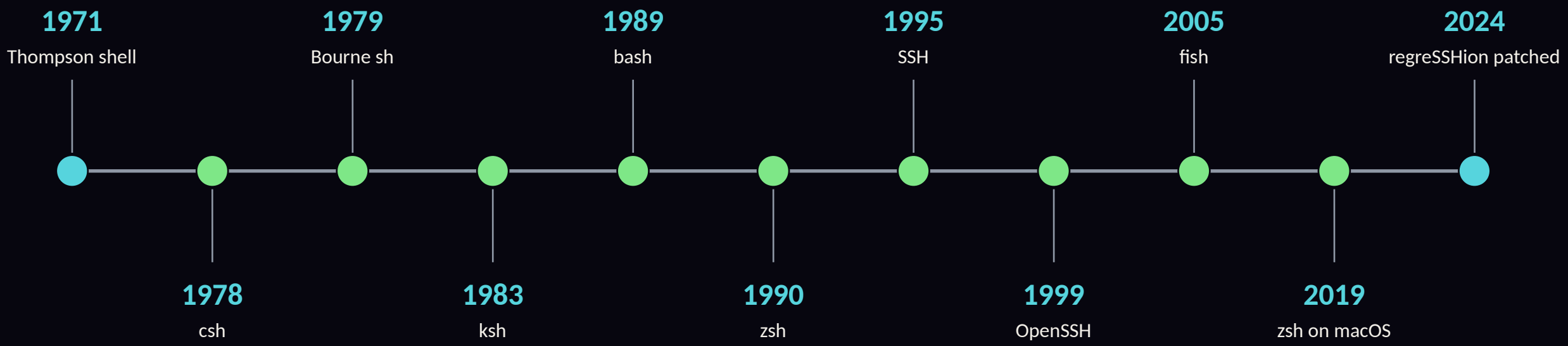
Master the Command Line



- The shell: fastest way to control a computer
- SSH: how professionals reach servers
- Daily tools for sysadmins, DevOps and cloud

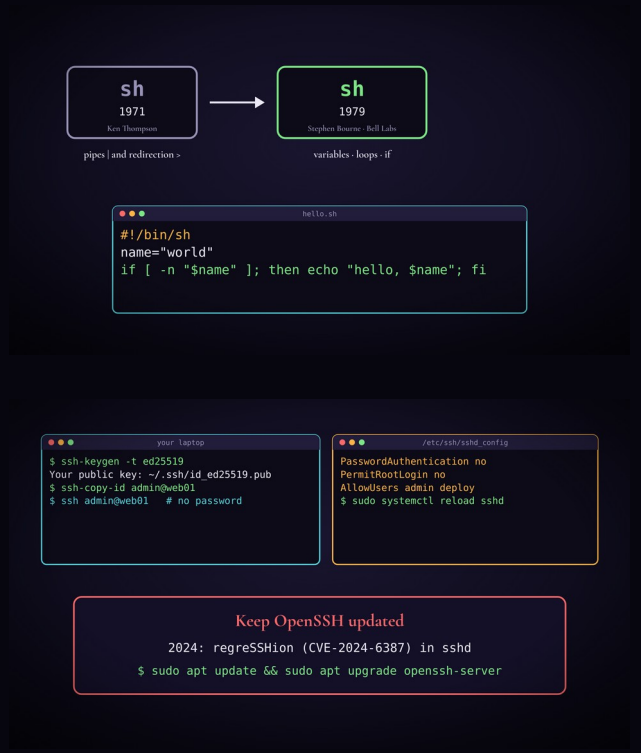
10

Timeline: 1971 to 2024



Sources and Further Reading

1. Stephen Bourne, “An Introduction to the UNIX Shell” (Bell Labs, 1978)
2. GNU Bash Reference Manual — gnu.org/software/bash
3. Tatu Ylönen, SSH history — ssh.com/academy/ssh/history
4. OpenSSH project — openssh.com · Qualys, regreSSHion (CVE-2024-6387), July 2024
5. Apple, “Use zsh as the default shell on your Mac” — support.apple.com



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