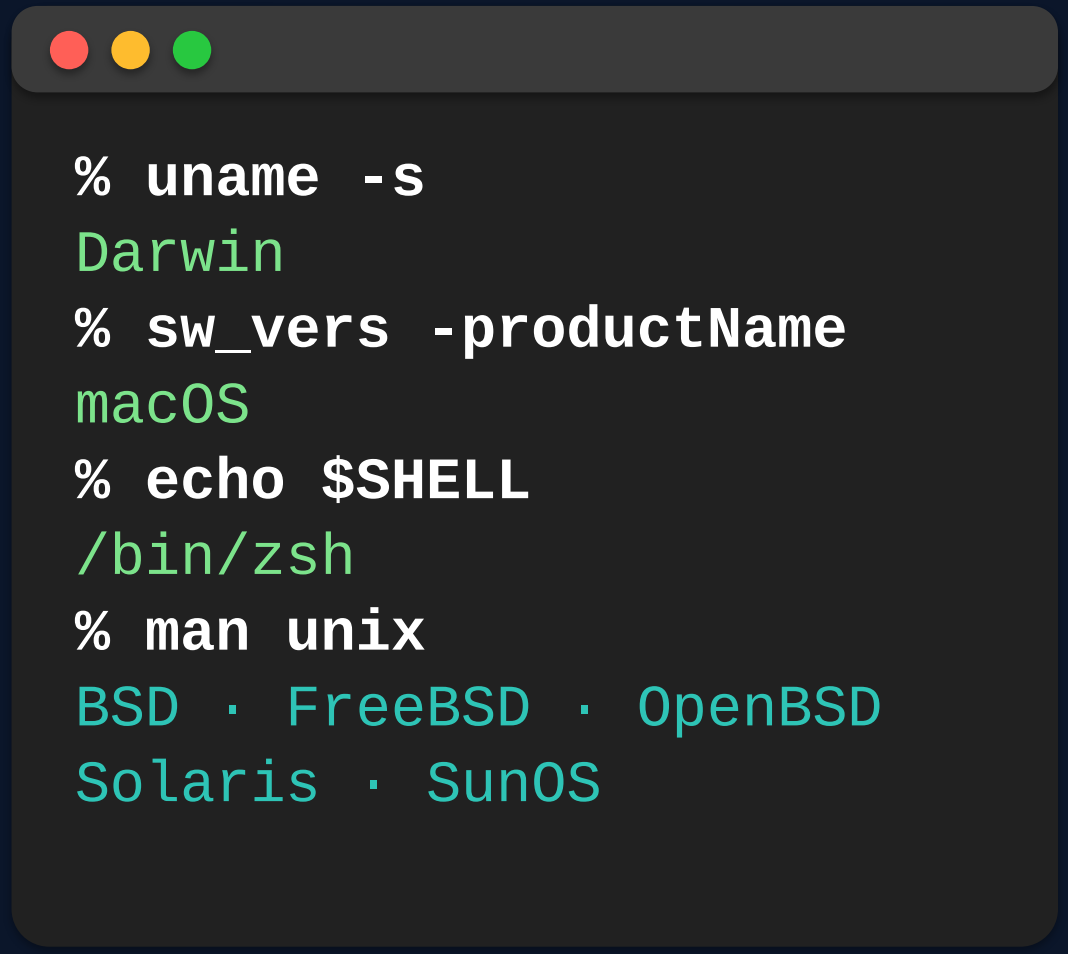


LESSON 2 OF 12

macOS UNIX

Darwin & BSD

Installing, Upgrading & Recovering macOS

Full Course · macOS 27 Golden Gate

What You Will Learn in Lesson 2

- Prepare: compatibility, disk space and a backup first
- Start an Apple silicon Mac in macOS Recovery
- Recovery tools: reinstall, restore, Disk Utility, Terminal
- Clean install, Erase All Content and Settings, bootable USB installer
- Setup Assistant: the first account and security choices
- Updates vs upgrades in the GUI and with softwareupdate
- Rollback plans, and how FreeBSD, OpenBSD and Solaris do it

Before You Install or Upgrade

- macOS 27 Golden Gate runs on Apple silicon Macs only
- Check your model in Apple menu → About This Mac
- Free disk space: plan for 30–40 GB for a major upgrade
- Back up first: Time Machine, or clone/snapshot your VM
- Know your passwords: Apple Account, admin, FileVault recovery key
- Check important apps support the new version

Starting macOS Recovery

Mac	How to start Recovery
Apple silicon	Shut down → press and hold the power button until "Loading startup options" → Options → Continue
Apple silicon (fallback)	Shut down, then press-release-press-and-hold the power button
Intel (older Macs)	Hold Command (⌘) + R at startup; Option + ⌘ + R = Internet Recovery
UTM virtual machine	Right-click the VM → "Boot into Recovery Mode" (or hold power in the VM)

The Tools Inside macOS Recovery

Tool	Use it to
Restore from Time Machine	Bring back the whole system from a backup
Reinstall macOS	Install a fresh copy of macOS (keeps your data if you don't erase)
Safari	Read Apple support articles while the Mac is broken
Disk Utility	First Aid, erase and format disks (APFS)
Utilities → Terminal	Run commands such as csrutil, diskutil, resetpassword
Utilities → Startup Security Utility	Set Full or Reduced Security for the startup disk

Three Ways to Do a Clean Install

- 1. Recovery: Disk Utility → erase the internal disk (APFS) → Reinstall macOS
- 2. System Settings → General → Transfer or Reset → Erase All Content and Settings
- 3. A bootable USB installer (next slide): best for many Macs or slow internet
- Apple silicon also supports a full restore from an IPSW file with Apple Configurator
- In the lab: UTM installs from an IPSW automatically

Create a Bootable USB Installer

```
% softwareupdate --list-full-installers        # which full installers exist
% softwareupdate --fetch-full-installer \
      --full-installer-version 27.2.1           # downloads to /Applications

# Erase a 32 GB+ USB drive as Mac OS Extended, named MyUSB, then:
% sudo /Applications/Install\ macOS*.app/Contents/Resources/createinstallmedia \
      --volume /Volumes/MyUSB

# Boot from it: hold the power button → choose the installer
```

Replace 27.2.1 with a version shown by --list-full-installers.

Setup Assistant: First Boot Choices

- Country, language, accessibility and network
- Migration Assistant: move data from another Mac or a backup
- Apple Account: optional; you can skip it in a lab
- Create the computer account: the FIRST account is an administrator
- FileVault disk encryption: keep the recovery key safe
- Location, analytics, Screen Time, Siri, Touch ID, appearance

Updates vs Upgrades

	Update	Upgrade
Example	27.2 → 27.2.1	26 Tahoe → 27 Golden Gate
Contains	Security and bug fixes	New features, new APIs, changed tools
Risk	Low	Medium: test apps and scripts first
Where (GUI)	System Settings → General → Software Update	Same place: "Upgrade Now"
Tip	Install promptly	Wait for x.1, back up, test in a VM

softwareupdate: Updates From the Command Line

```
% softwareupdate --list                          # what is available
% sudo softwareupdate --install --all            # install everything
% sudo softwareupdate -i -a --restart            # install and restart if needed
% softwareupdate --history                       # what was installed, and when
% sudo softwareupdate --install-rosetta --agree-to-license

% sw_vers                                        # confirm the new version
% tail -f /var/log/install.log                   # watch the installer log
```

App Compatibility and Rosetta 2

- Native apps are built for Apple silicon (arm64)
- Rosetta 2 translates Intel (x86_64) apps
- Apple has said Rosetta 2 stays broadly available through macOS 27
- Check an app: Get Info in Finder, or the Kind column in Activity Monitor
- Command line: file /Applications/App.app/Contents/MacOS/App
- Plan now to replace Intel-only apps

Your Rollback Plan

- macOS cannot simply 'uninstall' an upgrade
- Going back = erase + install the older version + restore your data
- Real Mac: Time Machine backup made BEFORE the upgrade
- Lab: duplicate the VM in UTM before every risky change
- Keep the older full installer or IPSW you may need
- Test the plan once, before you need it

Updating Other UNIX Systems

System	Security fixes	Major upgrade	Packages
macOS	softwareupdate -i -a	softwareupdate / installer app	brew upgrade (Lesson 5)
FreeBSD	freebsd-update fetch install	freebsd-update upgrade -r <ver>	pkg upgrade
OpenBSD	syspatch	sysupgrade	pkg_add -u
Solaris 11.4	pkg update	pkg update (new boot environment)	pkg update

Lab: Practice Updates in Your VM

```
# 1. In UTM: right-click the VM → Clone (your rollback copy)
# 2. In the VM, open Terminal:
% sw_vers
% softwareupdate --list
% softwareupdate --history
% softwareupdate --list-full-installers | head
# 3. Start the VM in Recovery Mode and open Utilities → Terminal:
-bash-3.2# csrutil status
-bash-3.2# reboot
```

Keep the clone until you finish Lesson 3.

Summary & Homework

- Prepare: compatibility, space, backup, passwords
- Recovery: hold the power button → Options
- Clean install: Recovery, Erase All Content and Settings, USB, IPSW
- softwareupdate --list / --install --all / --history
- Homework: clone the VM, run the lab, boot into Recovery once
- Next: Lesson 3 — The macOS GUI, Applications & Utilities

Thank You! 🙏

Free videos & PDFs: www.MyWebUniversity.com

Slides for this lesson: MyWebUniversity.com/presentations

YouTube: @MyWebUniversity · @MyWebUniversity-Dari

Wahidullah Lutfy — Founder and Director of IT of MyWebUniversity, and CS teacher

Book: The Direct Path to Linux Ubuntu (Amazon · Barnes & Noble)

Learn it, then pass it on.