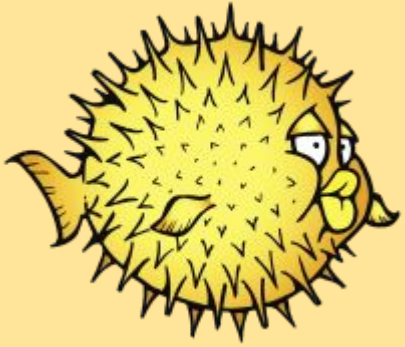

Kernel Panics, DDB and Snapshots

COMP3301 - Applied Class 2.5

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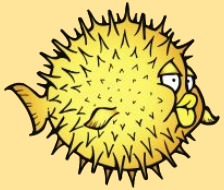
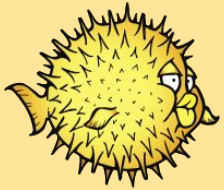


OpenBSD Kernel Panics

Kernel Panics (“Crashes”)

- When a fault happens in your kernel it “panics”
  - Invalid memory accesses, etc. etc.
  - Used to catch errors and prevent really bad things from happening (e.g. file system corruption)
  - Often used to prevent the kernel from entering undefined or unexpected states preventing undefined or bad behaviour
  - Can also be used to debug the kernel - e.g. force the kernel to go into DDB to trace the registers in the current context when something goes wrong. (panic(), KASSERT())



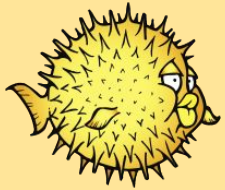
DDB and Non-Maskable Interrupts

DDB - interactive kernel debugger

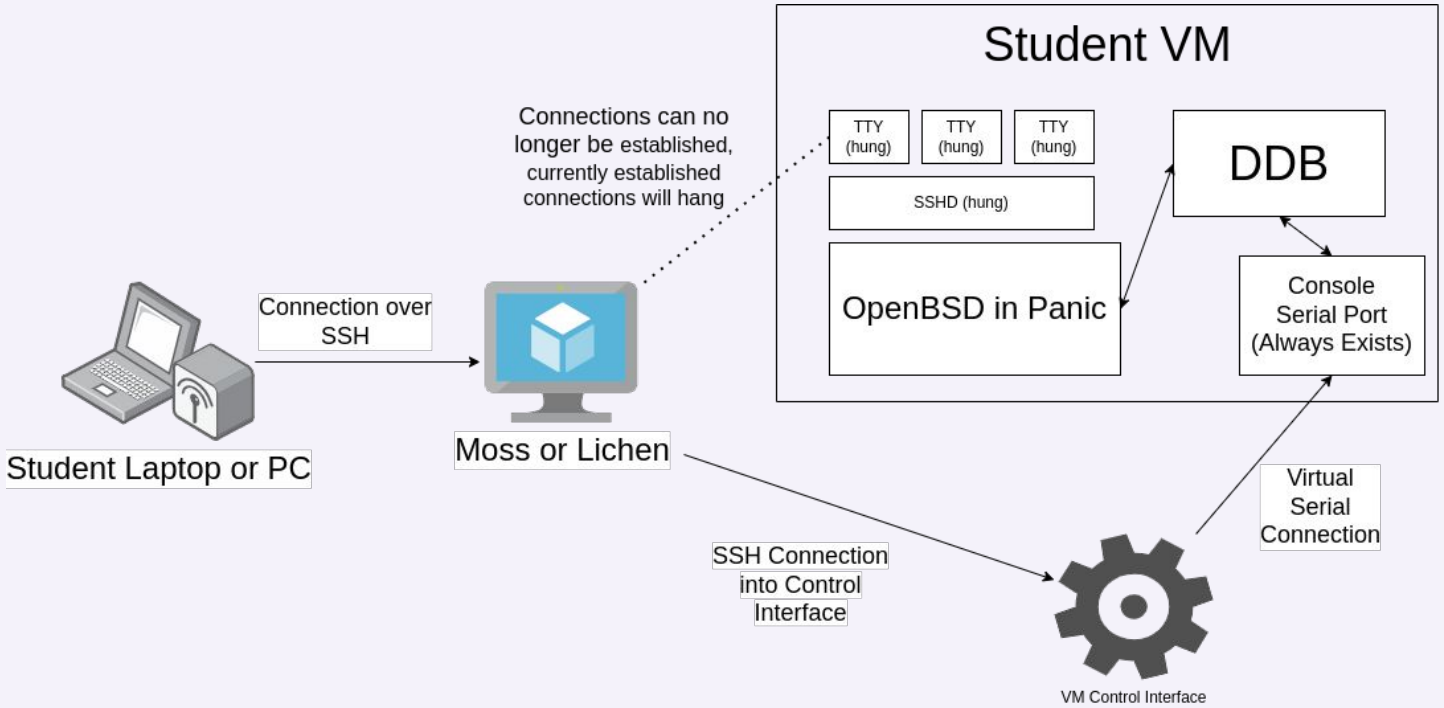
- When the kernel panics DDB will run
- Runs on the kernel
- Can only be viewed from the console
- We might cover usage about this later – but for now focus on the current content.

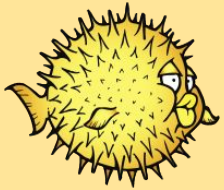
NMI - non-maskable interrupt

- Will force DDB to run
- can use the nmi command in the control interface

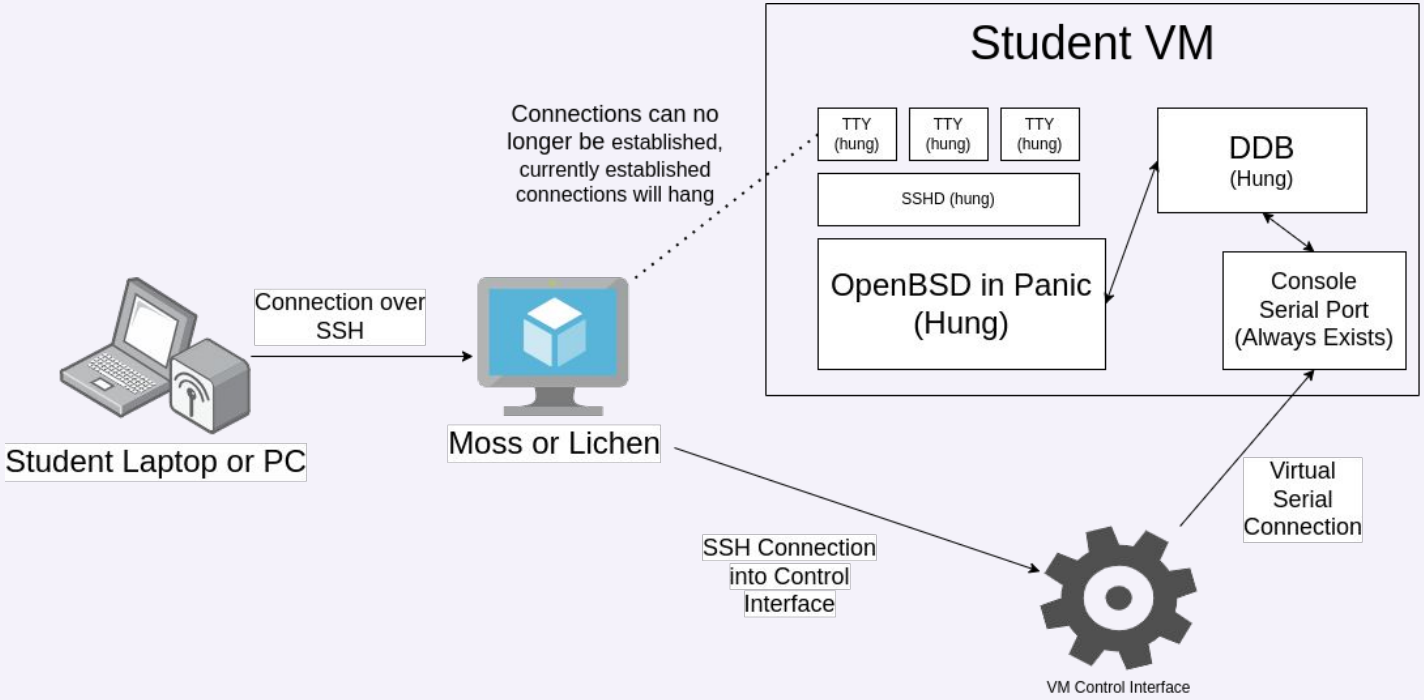


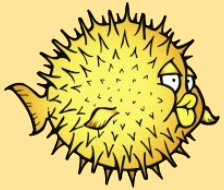
COMP3301 Virtual Machine with DDB running





COMP3301 Virtual Machine HARD FAULT!





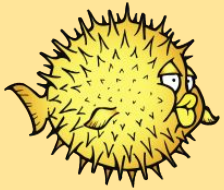
When Kernel Panics go Wrong – Snapshots!

Kernel Panics maybe be extremely useful, however things can also go very wrong (particularly when hard faults occur):

- File system corruption!
- Things just not working anymore?

Take snapshots!

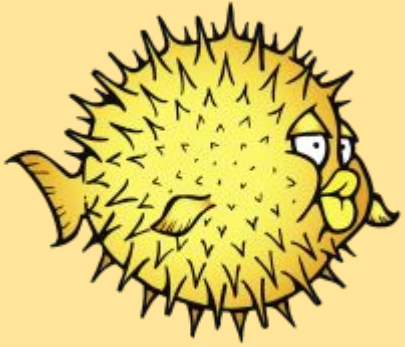
- From control interface you can create snapshots
  - These are sequential
  - Each snapshot builds off the last
  - Perfect when you just want to step back to a working version
  - You can only roll back to the most recent snapshot
  - If you force rollback (with -f) then it will delete the newer snapshots
- **REMEMBER TO COMMIT TO GIT OFTEN!!!**



Snapshots Commands from control Interface

- snapshot <NAME>
  - Create a snapshot called <NAME>
- snapshots
  - List snapshots
- snapshot-delete <NAME>
  - Delete snapshot <NAME>
  - Deleting earlier snapshots will merge it with newer ones
- rollback <NAME> [-f]
  - Rollback to snapshot <NAME>
  - Make sure to turn off your vm before rolling back
  - Rolling back to earlier snapshots will fail
  - Forcing it will delete the ones taken after it
  - Don’t force rollback when your vm isn’t disabled

Again, remember snapshots are sequential!!



HAPPY DEVVING!!!

Thanks for Coming

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