

“Online Training on Linux Kernel Internals” by Pradeep Tewani

+ Session 1: BBB Set up & Introduction to Linux Driver

- Ready to go BBB for Linux Kernel Internals
- Linux Driver Ecosystem
- Kernel Source Organization

+ Session 2: Linux Kernel Module

- Kernel Module & related commands
- Writing the First Linux Driver

+ Session 3: Character Driver Part - I

- W's of Character Driver
- Major & Minor Number
- Registering a Character Driver
- Writing the First Character Driver

+ Session 4: Character Driver Part - II

- Device File Creation
- Controlling the GPIOs
- W's of IOCTL

+ Session 5: Waiting / Blocking a Process

- Waiting in a Process
- Sleeping & Waking up

+ Session 6: Kernel Timing Management

- Timing Architecture
- Ticking in Jiffies
- Kernel Timers

+ Session 7: Top & Bottom Halves

- Hardware Interrupts & Registrations
- Bottom Halves (Tasklets & Work Queues)

+ Session 8: Wrap Up

- Conclusion
- What Next?

Caution: All sessions are highly interactive & hands-on with Beagle Bone Black.

Hands-On Details

+ **BBB Set up**

- BBB Setup – Hardware & Software
- Booting up with pre-built images

+ **Linux Kernel Module**

- Writing the first kernel driver
- Preparing a kernel for building the modules
- Testing a module on Embedded System

+ **Character Drivers**

- Writing a character driver
- Playing around with memory based character driver
- Controlling the GPIO with character driver
- Using the IOCTL to manage the GPIO

+ **Waiting / Blocking a Process**

- Basic mechanism to block a process
- Using wait queues

+ **Kernel Timing Management**

- Delaying the process
- Usage of kernel timers

+ **Top & Bottom Halves**

- Getting an interrupt from the GPIOs
- Using the Tasklets & Work Queues