Embedded Linux Course Intro

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Opening Remarks

- Welcome!
- Thank you for attending!
- My promise to you…(see next slide)

My Promise to You

- Make this one of the best and most exciting courses you have ever taken!
- Provide you great presentations and demos to make your learning fast and complete
- Make sure you leave this course with solid Embedded Linux Skills!

About Myself

- Norman McEntire
- BS/MS Computer Engineering
    - USC - University of South Carolina
- 35+ Years Computer Engineering Experience
    - Hardware (chips, boards, systems) Engineering
    - Software Engineering (device drivers, systems programming, GUI apps)
- Founder of Servin Corporation
    - Since 1995, Software Development and Training.
    - Current Focus: Embedded IoT (Internet of Things)

Embedded Linux Systems Programming

- Gives you a step-by-step framework for developing an Embedded Linux System
    - Toolchain
    - Boot Loader
    - Linux Kernel
    - Linux Device Drivers
    - Root Filesystem
    - Busybox (Command-Line Interface)
    - Linux Systems Programs / Daemons

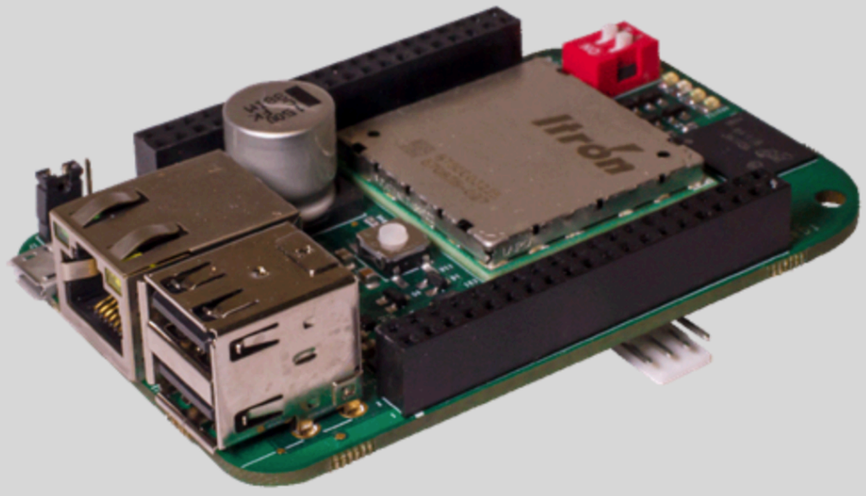
Some of my Embedded Linux Projects

Itron Riva Dev Edge

Linux Based Dev Board

Itron Riva Dev Edge Board

The Itron® Riva Dev Edge board is the processing core for the Itron Riva Dev Edge stack and includes the memory and control logic for the stack. This Linux based system can be used in a root or node configuration. In the *root* configuration, this board hosts the DHCP server. The root acts as a router for the network, supporting Ethernet, WiFi, and a Skyus 4G cellular modem. In the *node* configuration, the board relies on a root for an IP address, and can operate locally. The board requires the root and the addition of an Itron Riva Dev Edge RF board to communicate on the RF mesh network. *A fully compatible Itron Riva Dev Edge RF board can be purchased separately below*.



Board features include:

- 10/100 MBPS Ethernet Port
- 4-pin connector as a serial console for the Linux-based firmware shipped with the board
- Two USB A Host ports
- Two 40-pin expansion connectors for all major I/O types (serial, GPIO, A/D, I2C, SPI)
- iSOM module containing the TI AM335X ARM Cortex Microprocessor, FLASH, RAM, power supply control, clock and other features
- additional 4GB of eMMC Flash memory

Itron Riva Dev Mini
Linux Based Board

Itron Riva Dev Mini Board

The Itron Riva Dev Mini is a complete Linux system on a module, running a special Linux-distribution named Muse (created by Itron). While the Mini has a smaller footprint than the Edge, the Mini and the Edge boards are software compatible. The Mini provides the ability to embed Itron Riva's adaptive radio frequency communications capability (to support 870 MHz and 920 MHz bands) in a prototype product.

Board features include:

- TI AM335X ARM Cortex Microprocessor
- 900 Mhz 802.15.4g radio
- 1 mini-USB connector
- 40 pin expansion to bring control and communications off the board
- iSOM module containing the processor, FLASH, RAM, power supply control, clock and other features

Resources

- Getting Started: Itron Riva Dev Mini board

Embedded Linux System We Will Use In This Course

- Raspberry Pi
  - Raspberry Pi OS
    - Provides for “hands-on” learning

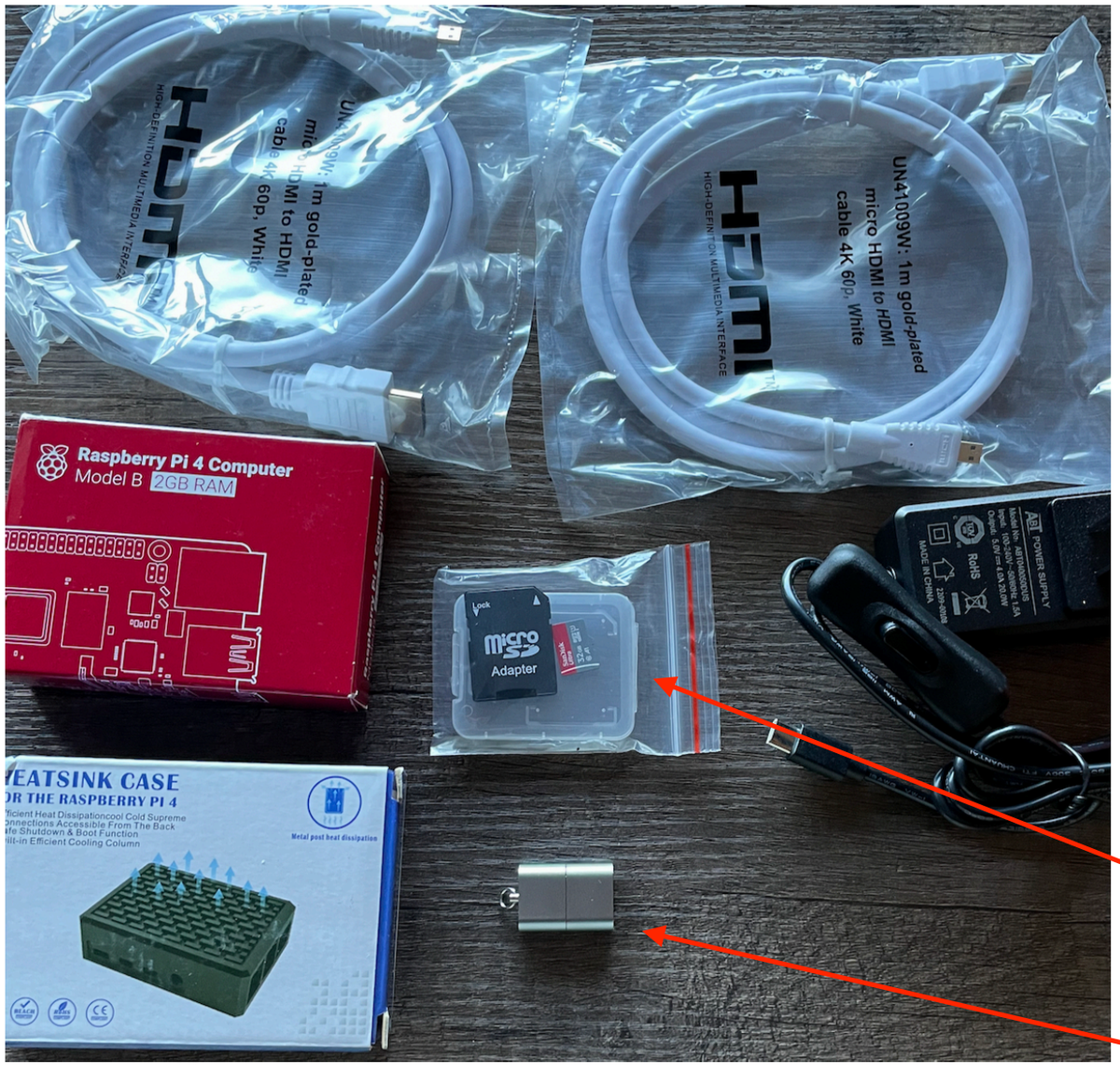
Raspberry Pi 4B Starter More Kit - Outside Box

Raspberry Pi 4B Starter More Kit - Items Inside Box

2X HDMI Cables →

Raspberry Pi 4B W/ 2GB RAM →

Heatsink →

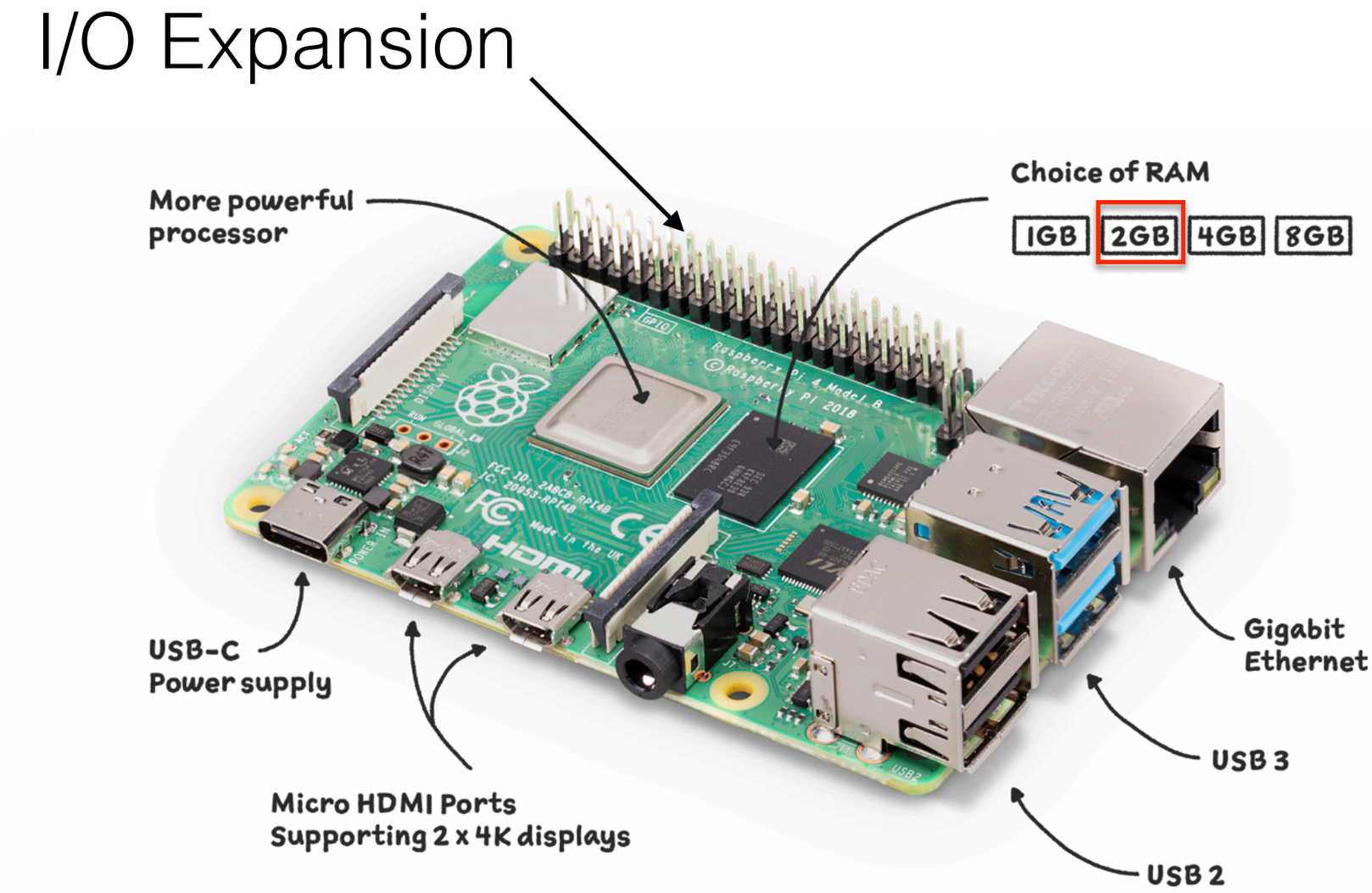


← Power Supply W/On/Off Switch

Micro SD Car For Booting

USB Storage

Raspberry Pi 4B



For Every Lesson

- Content on Canvas
    - Videos
    - Slides
        - No textbook for course - use slides and links provided in slides
- Discussion Group for Questions/Answers
- Assignments
    - Online Quiz
    - Submit PDF of Lesson Project
        - Your PDF will show screenshots of your tests of taking each lesson

Questions At Any Time Are Great!

- Post Questions on the Discussion Board
- Other students can answer the question
  - No need to wait for me to answer!

Let’s Get Started!