



Embedded Linux on CM4 Carrier Boards, X86 and STM32 Boards with Yocto Project

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Session Overview

Session Overview

- **Challenges when creating a custom Linux System**
- **Yocto Project for Embedded Devices**
- **Yocto BSPs for Seeed SBCs**
- **Seeed SBCs Overview**
- **Building a Custom Linux Image for reTerminal**
- **reTerminal Qt5 Demo Showcase**
- **reTerminal LVGL Demo Showcase**
- **Mender Client on ODYSSEY – X6 Showcase**



Challenges when creating a custom Linux System

Challenges when creating a custom Linux System

- **Process of creating a Linux System is complicated**
- **Not easy to customize different features for the Linux System**
- **Mostly don't have product support**
- **Must go through same build process again for a different hardware platforms**



Yocto Project for Embedded Devices

Yocto Project for Embedded Devices

- Provides free templates, tools, methods and working code to create a custom Linux System
- Uses Layer Model
- Yocto BSPs provided by board manufacturers
- Easy workflow with fast build times after initial build
- Don't have to go through same build process for multiple hardware platforms



Yocto BSPs for Seeed SBCs

Yocto BSPs for Seeed SBCs

- reTerminal -
<https://github.com/Seeed-Studio/meta-seeed-reterminal>
- ODYSSEY – X86J4125 -
<https://github.com/Seeed-Studio/meta-odyssey-x86>
- ODYSSEY – STM32MP157c -
<https://github.com/Seeed-Studio/meta-st-odyssey>
- Dual Gigabit Ethernet Carrier Board for Raspberry Pi Compute Module 4 – In Progress



Seed SBCs Overview

Seeed SBCs Overview

● reTerminal

- ❖ Powered by Raspberry Pi Computer Module 4 with 4GB RAM & 32GB eMMC
- ❖ 5-Inch IPS capacitive multi-touch screen at 1280 x 720 and 293 PPI
- ❖ Wireless connectivity with dual-band 2.4GHz/5GHz Wi-Fi and Bluetooth 5.0 BLE
- ❖ Cryptographic co-processor with secure hardware-based key storage
- ❖ Gigabit Ethernet Port and Dual USB 2.0 Type-A ports



Seeed SBCs Overview

● Dual Gigabit Ethernet Carrier Board for RPi CM4

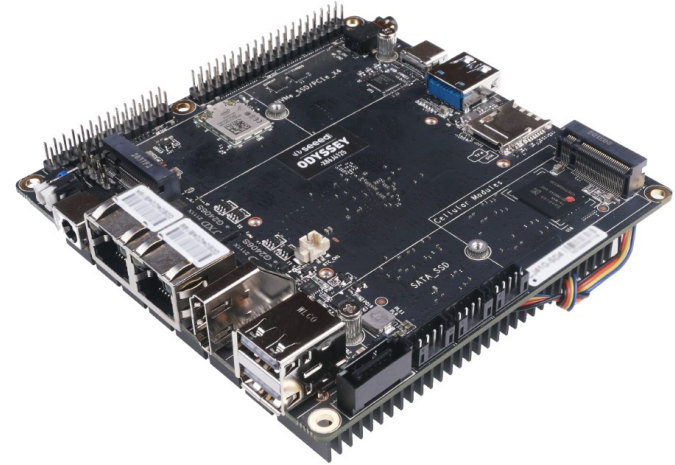
- ❖ Powered by Raspberry Pi Computer Module 4 with 4GB RAM & 32GB eMMC
- ❖ Dual Gigabit Ethernet connectors for soft router applications
- ❖ Camera/ display connectivity using MIPI CSI, MIPI DSI and micro-HI
- ❖ Onboard dual USB 3.0 with an additional USB 3.0 9-pin header for more external ports
- ❖ More Expandability via FPC Connector (I2C, SPI)



Seeed SBCs Overview

● ODYSSEY - X86J4125

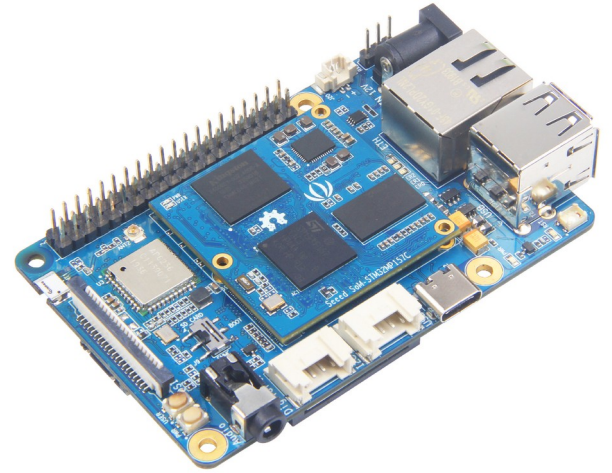
- ❖ Intel® Celeron® J4125, Quad-Core 2.0-2.7GHz
- ❖ Intel® UHD Graphics 600
- ❖ Dual-Band Frequency 2.4GHz/5GHz WiFi/ Bluetooth 5.0
- ❖ Dual Gigabit Ethernet
- ❖ Integrated Arduino Coprocessor ATSAM21 ARM® Cortex®-M0+
- ❖ 2 x M.2 PCIe (B Key and M Key)
- ❖ Support Windows 10 & Linux OS



Seeed SBCs Overview

● ODYSSEY – STM32MP157C

- ❖ Dual-core Arm-Cortex-A7 core processor with Cortex-M4
- ❖ SoM (system on module) with MPU, PMIC, RAM, eMMC.
- ❖ Raspberry Pi 40-Pin Compatible Carrier Board
- ❖ Gigabit Ethernet, WiFi 802.11 b/g/n 2.4GHz and Bluetooth 4.1 with BLE
- ❖ Camera/ display connectivity using DVP, MIPI DSI
- ❖ Grove connectors for easy prototyping
- ❖ Open-source hardware/SDK/API/BSP/OS





Building a Custom Linux Image for reTerminal



reTerminal Qt5 Demo Showcase



reTerminal LVGL Demo Showcase



Mender Client on ODYSSEY – X6 Showcase



Thank You



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PROJECT

THE
LINUX
FOUNDATION