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BeagleBone 6 Part Webinar Series

with Jason Kridner

Webinar 01 -
Introduction to BeagleBone

Jason Kridner
Co-founder and board member at
BeagleBoard.org Foundation

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Webinar Series

BeagleBone Webinar Series

Date	Time (UTC)	Topic
10th May	11:00 (CT) / 17:00 (UK)	Introduction to BeagleBone
24th May	11:00 (CT) / 17:00 (UK)	BeagleBone for Linux Users
6th June	11:00 (CT) / 17:00 (UK)	BeagleBone for Embedded Developers
21th June	11:00 (CT) / 17:00 (UK)	BeagleBone for Web Developers
12th July	11:00 (CT) / 17:00 (UK)	BeagleBone Blue for Robotics
26th July	11:00 (CT) / 17:00 (UK)	BeagleBone in the Classroom

Today's Topics

- Topics
  - Who is BeagleBoard.org
  - Which products are available?
  - How are they different?
  - Introduction to Programmable Real-time Units (PRUs)
  - Overview of software platforms
  - Notable use cases and examples

- Q&A
  - Posted Questions
  - Questions from chat

Accompanying Demo

- We'll be publishing demo videos in "off" weeks
- Review *bbb.io/start-video* for this week's demo to learn
  - Day one with your BeagleBone
  - Setting up the BeagleBone connection to your computer
  - Getting to the Cloud9 IDE to create your first program
- The video is a little out-of-date and will be updated soon
- See *bbb.io/start* for the step-by-step guide

Who is BeagleBoard.org?

- A community of professionals, hobbyists and students
  - Collaborates around open source software and hardware
  - Started in 2008 and has produced over 35 books and thousands of projects
  - Over 10,000 people at *bbb.io/discuss* and *bbb.io/chat*
- BeagleBoard.org Foundation is a US-based non-profit
  - Fosters education and collaboration around open source software and hardware
  - Owns trademarks and licenses use to authorized manufacturing partners
  - Five member board with me (Jason Kridner) being the only TI employee

Which products are available?

- BeagleBoard.org BeagleBone boards
  - BeagleBone Black, BeagleBone Black Wireless, BeagleBone Blue, PocketBeagle
  - Capes for BeagleBone: Robotics, Motor, Proto, Load, Servo, Relay, Comms, Power, …
  - Capes for PocketBeagle: coming soon...
- Community
  - Compatible: Seeed BeagleBone Green, Seeed BeagleBone Green Wireless, Element14 BeagleBone Black Industrial, SanCloud BeagleBone Enhanced
  - Approved: Element14 4.3” LCD Display Cape, Linker Kit Base Cape

How are they different?

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- Perfect for controlling real-world electronic sensors and actuators
  - Built-in microcontrollers for ultra-low, predictable latency
  - Lots of I/O and peripherals including up-to-or-over 65x GPIO, ADC, PWM, QEP, 5x UART, ...
  - Simple headless development
  - Many with reliable on-board eMMC flash
- Ready for business and education
  - Open source hardware, detailed silicon documentation, catalog availability
  - Malinline Linux kernel support and 10 year board availability life-cycles

Introduction to PRUs

- Programmable Real-time Units
  - 2x 200MHz microcontrollers with single-cycle I/O and I/O subsystems
  - Shared access to memory, DMA and peripherals
- Capable of implementing UARTs, DMX controllers, stepper-motor drivers, pulse counters, PWMs, and much more
- Example uses: BeagleLogic.net, MachineKit.io, ArduPilot and LEDscape
- See *bbb.io/pru* for an introduction to programming PRUs
  - C compiler ships in the provided Debian Linux images for native use

Overview of software platforms

See *bbb.io/latest* for software releases

- U-boot and Linux – most common hardware interfaces
- Debian – most common collection of userspace software
- Cloud9 IDE – zero-install editor and command-line interface
- Bone101 – documentation and JS, Python, C examples
- /opt/scripts and /opt/source – helpful utilities for common tasks
- Node-RED – pre-installed tool for IoT development
- NI Labview and Matlab Simulink – graphical programming

Notable use cases and examples

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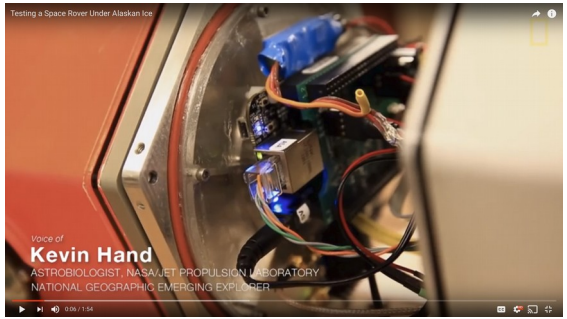
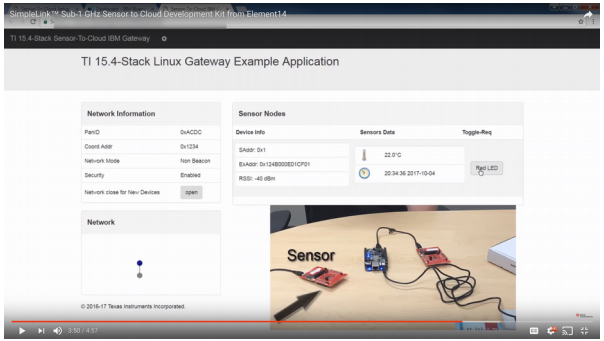
- See *bbb.io/p* for project examples



Robotics – mobile and fixed
https://youtu.be/sY5WQG3-3mo



IoT – gateways and automation
https://youtu.be/OLOqSRJowyU

See also *https://vimeo.com/151100483*

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Q&A

Questions posted on the element14.com Community

- What are the benefits of having a Linux DEV board with integrated PRUs microcontrollers?
- How does a beginner control the PRUs Microcontrollers on the BeagleBone Black?
- Does the BeagleBone require a custom version of Linux, such as Raspbian to the Raspberry Pi?
- How can I find out more?
- Where can I find the documentation?
- What is the lifecycle of a BeagleBoard?
- What are some of the more popular capes for the Beagle Bone board?
- I am doing a project with off line speech recognition using pocketsphinx...what device recommendations do you have?
- There are a number of BeagleBoards (BeagleBones?) available. Is the series going to be focusing on a specific one? As a BB newbie, which one should I be starting out with?
- “Shouldn't he change the spelling of his name to JSON?!”

Q&A

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Questions from the Webinar Chat.

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Next Webinar Dates

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Other Resources

www.beagleboard.org

www.element14.com/beagleboard

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