Dave Anders aka prpplague
Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI
Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI
- Partners in TinCanTools
Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI
- Partners in TinCanTools
- Open Tools for Board Bringup
Introduction

- Dave Anders aka prpplague
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- Open Tools for Board Bringup
  - Open Tools History
Introduction

- Dave Anders aka prpplague
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- Open Tools for Board Bringup
  - Open Tools History
  - Open Hardware Solutions
Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI
- Partners in TinCanTools
- Open Tools for Board Bringup
  - Open Tools History
  - Open Hardware Solutions
  - Open Software Solutions
Open Tools History

- Open Tools in Science
Open Tools History

- Open Tools in Science
  - Experiments often require special tools
Open Tools History

- Open Tools in Science
  - Experiments often require special tools
  - New tools are shared with other scientists
Open Tools History

- Open Tools in Science
  - Experiments often require special tools
  - New tools are shared with other scientists
  - Robert Bunsen - Bunsen Burner
Open Tools History

- Open Tools in Science
- Commercial Solutions
Open Tools History

- Open Tools in Science
- Commercial Solutions
Open Tools History

- Open Tools in Science
- Commercial Solutions
  - MS Windows Operating Systems
Open Tools History

- Open Tools in Science
- Commercial Solutions
  - MS Windows Operating Systems
  - Price
Open Tools History

- Open Tools in Science
- Commercial Solutions
  - MS Windows Operating Systems
  - Price
  - Features/Fixes
Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
  - Open Platform
Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
  - Open Platform
  - JTAG – Holly Gates Dongle
Open Tools History

- Open Tools in Science
- Commercial Solutions
- LART Project
  - Open Platform
  - JTAG – Holly Gates Dongle
  - Physical memory access - devmem2
Open Hardware Solutions

- Logic Analyzers
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
    - 70MHz+ sample speeds
    - 32 channels
    - 16 buffered, 5volt tolerant channels
    - USB interface, USB powered
    - USB upgradable everything
    - Make it as DIY as possible
    - $30-$40 price range
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
    - 1-Wire
    - I2C
    - SPI
    - JTAG
    - Asynchronous serial
    - 2- and 3-wire libraries with bitwise pin control
    - Scriptable binary bitbang, 1-Wire, I2C, SPI, and UART modes
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
  - AVR/Arduino
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
  - AVR/Arduino (Insert Arduino Jokes Here)
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
  - Nano-DSO
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
  - Nano-DSO
    - Based on ARM Cortex™-M3 compatible 32 bit platform
    - Unibody PCB design for better reliability
    - Portable and lightweight with 320x240 color LCD
    - Built-in Signal Generator
    - 6 triggering mode
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
  - Nano-DSO
  - AVR and Arduino (Insert More Arduino Jokes here)
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
  - Nano-DSO
  - AVR and Arduino
  - PIC Based
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG
  - FT2232
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG
  - FT2232
    - JTAG
    - I2C
    - SPI
    - UART
    - GPIO
    - Open LIBS
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG
  - FT2232
  - Generic devices
Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG
  - FT2232
  - Generic devices
  - Flyswatter
Open Software Solutions

- Platform Based
Open Software Solutions

- Platform Based
  - fb-test
## Platform Based
- fb-test
- evtest

<table>
<thead>
<tr>
<th>Input driver version is 1.0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input device ID: bus 0x3 vendor 0x47d product 0x1029 version 0x110</td>
</tr>
<tr>
<td>Input device name: &quot;Kensington USB/PS2 Wheel Mouse&quot;</td>
</tr>
</tbody>
</table>

Supported events:
- Event type 0 (Sync)
- Event type 1 (Key)
  - Event code 272 (LeftBtn)
  - Event code 273 (RightBtn)
  - Event code 274 (MiddleBtn)
  - Event code 275 (SideBtn)
  - Event code 276 (ExtraBtn)
- Event type 2 (Relative)
  - Event code 0 (X)
  - Event code 1 (Y)
  - Event code 8 (Wheel)
- Event type 4 (Misc)
  - Event code 4 (ScanCode)

Testing ... (interrupt to exit)
Platform Based

- fb-test
- evtest

ITesting ... (interrupt to exit)
Event: time 1302309754.917080, type 2 (Relative), code 0 (X), value 1
Event: time 1302309754.917087, -------------- Report Sync ------------
Event: time 1302309756.837092, type 2 (Relative), code 0 (X), value -1
Event: time 1302309756.837099, -------------- Report Sync ------------
Event: time 1302309756.845079, type 2 (Relative), code 0 (X), value -3
Event: time 1302309756.845086, -------------- Report Sync ------------
Event: time 1302309756.853079, type 2 (Relative), code 0 (X), value -4
Event: time 1302309756.853083, type 2 (Relative), code 1 (Y), value 1
Event: time 1302309756.853086, -------------- Report Sync ------------
Event: time 1302309756.861079, type 2 (Relative), code 0 (X), value -5
Event: time 1302309756.861083, type 2 (Relative), code 1 (Y), value 1
Event: time 1302309756.861086, -------------- Report Sync ------------
Event: time 1302309756.869078, type 2 (Relative), code 0 (X), value -7
Event: time 1302309756.869083, type 2 (Relative), code 1 (Y), value 1
Open Software Solutions

- Platform Based
  - fb-test
  - evtest
  - devmem2
Open Software Solutions

- Platform Based
  - fb-test
  - evtest
  - devmem2
    - Vendor variations
    - Busybox
    - Buildroot
    - OE
Open Software Solutions

- Platform Based
- Host Based
Open Software Solutions

- Platform Based
- Host Based
  - Logic Analyzer - Sigrok
Open Software Solutions

- Platform Based
- Host Based
  - Logic Analyzer – Sigrok
  - Oscilloscope - XOscillo
Open Software Solutions

- Platform Based
- Host Based
  - Logic Analyzer – Sigrok
  - Oscilloscope – XOscillo
  - JTAG - OpenOCD
Open Software Solutions

- Platform Based
- Host Based
- Desktop Utilities
Open Software Solutions

- Platform Based
- Host Based
- Desktop Utilities
  - Gerbv
Open Software Solutions

- Platform Based
- Host Based
- Desktop Utilities
  - Gerbv
  - Edanator
Open Software Solutions

- Platform Based
- Host Based
- Desktop Utilities
  - Gerbv
  - Edanator
  - GUVCView
Conclusion

- Long History of Open Tools
Conclusion

- Long History of Open Tools
- Open Hardware Tools
Conclusion

- Long History of Open Tools
- Open Hardware Tools
- Open Software Tools
Conclusion

- Long History of Open Tools
- Open Hardware Tools
- Open Software Tools
- Incentive to contribute
Conclusion

- Long History of Open Tools
- Open Hardware Tools
- Open Software Tools
- Incentive to contribute
- Transition to open tools
Conclusion

- Long History of Open Tools
- Open Hardware Tools
- Open Software Tools
- Incentive to contribute
- Transition to open tools
- Documentation
  - Http://www.elinux.org/open_tools
Questions?