presented by

Innovation at the CORE

Debug Methodology Under UEFI

UEFI Fall Plugfest – October 24-27, 2011

Presented by Jack Wang

Phoenix Technologies

Agenda

- Comparing Debug Options
  - UEFI vs Legacy BIOS Debug
- Problems to Solve
- Design Considerations
- Typical Design
- Example Solution
- Q & A

Comparing Debug Options

	Software Solution	Hardware Solution (ICE)
Interface	Simple	Complicated
Capability	Limited	Strong
Availability	Platform Independent	Platform Dependent
Cost	Low	Extremely High
Connection	Universal	Limited

UEFI vs Legacy BIOS Debug

	Nowadays (UEFI)	Prior Art (Legacy BIOS)
Language	C Base	Assembly Base
Debugging	Source Level	Symbolic
Status Output	Message Driven	POST Code Driven
Status Interface	ReportStatusCode Device (e.g. Port 80+81)	Port 80
Debug Interface	USB/I2C/SPI/Wireless	Serial/Parallel/PCI Slot

Problems to Solve

- Legacy Debug Interfaces Are Going Away
  - Serial Port, Parallel Port, PCI Slot, etc.
- Board Design Issues
  - Lack of J-TAG/XDP/USB 2.0 Debug Port
- Reliability
  - Complicated Data Communication
- Confliction
  - Debug Interface Not Always Available

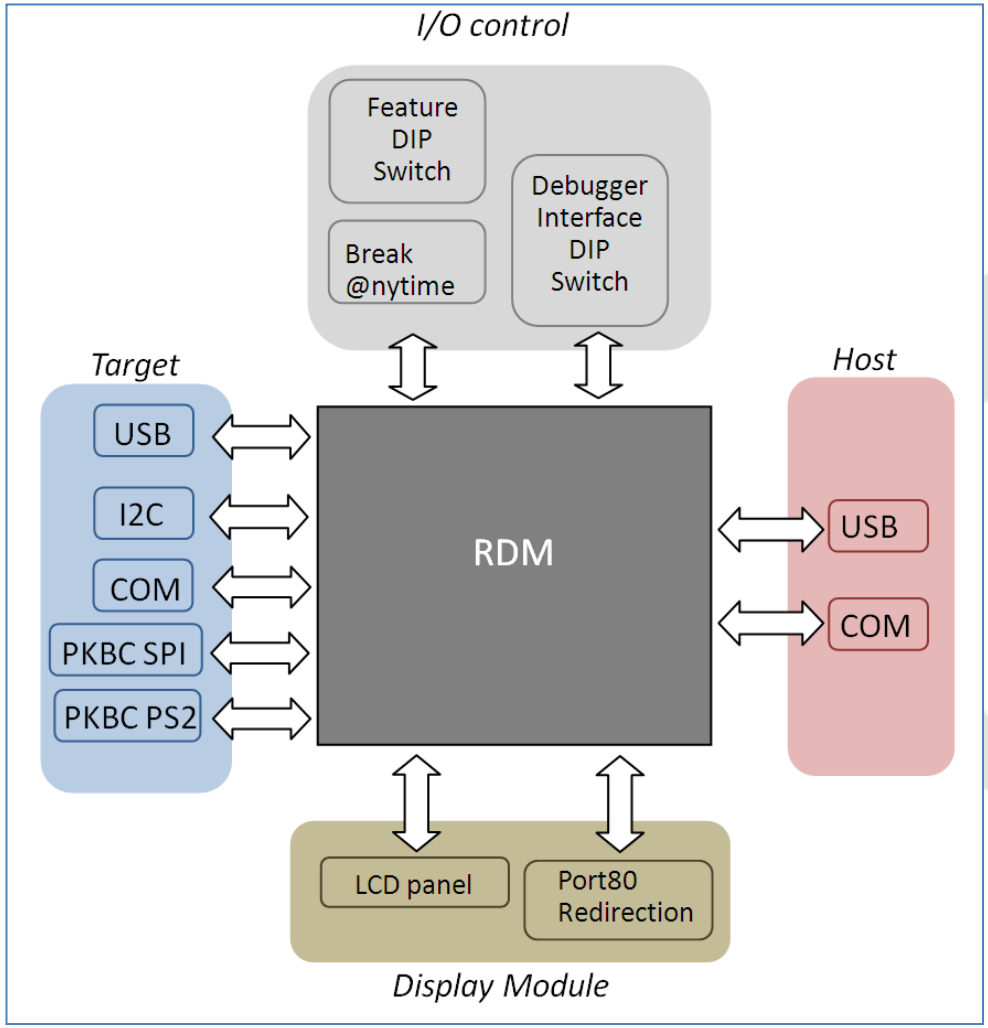
Device Considerations

- Cross-Platform (Intel/AMD/ARM…)
- Multiple Connection Methods
- Usability
  - POST Time & Runtime
  - Use in R&D or After Market
  - Use on CRB or Production Hardware
- Status Reporting
  - I/O Port 80/81 (Checkpoints)
  - Debug Messages (Log)

Feature Consideration

- Multiple Phase Support
  - PEI/DXE/SMM/CSM/Runtime
  - Selectable Debug Phase (PEI/DXE/SMM/CSM)
- Pre-RAM Debugging
- Convenience
  - Automatic Source Level Detection
  - Debug Mode Auto-Enabling
  - Debug Interface Auto-Detection
  - Debug Driver Auto-Download
  - Debug/Release Build Override
- Target-Defined Debug Features

Typical Design (Phoenix PDD)



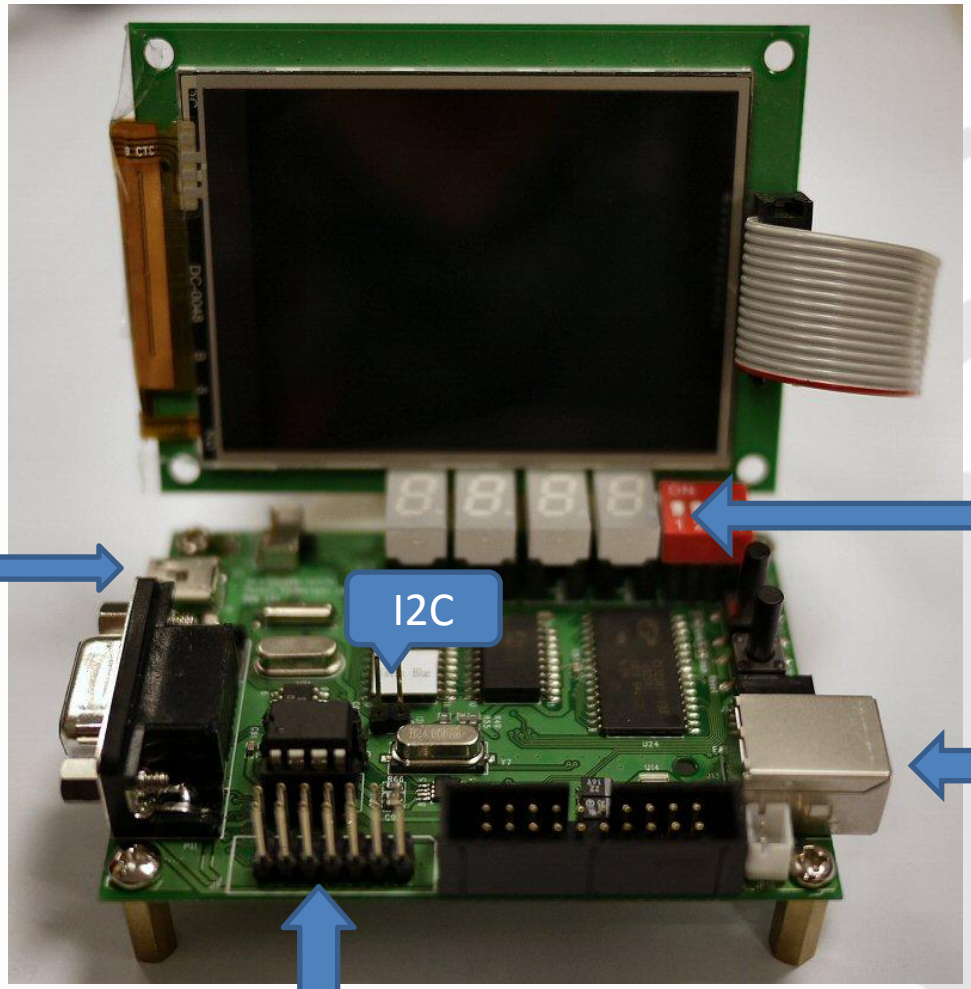
Multiple Interfaces

- Platform End
  - ✓ USB
  - ✓ I2C (DDR2/3), GPIO
  - ✓ Serial
  - ✓ SPI
  - ✓ PS2
- Host End
  - ✓ USB
  - ✓ Serial

Standalone (Host Free)

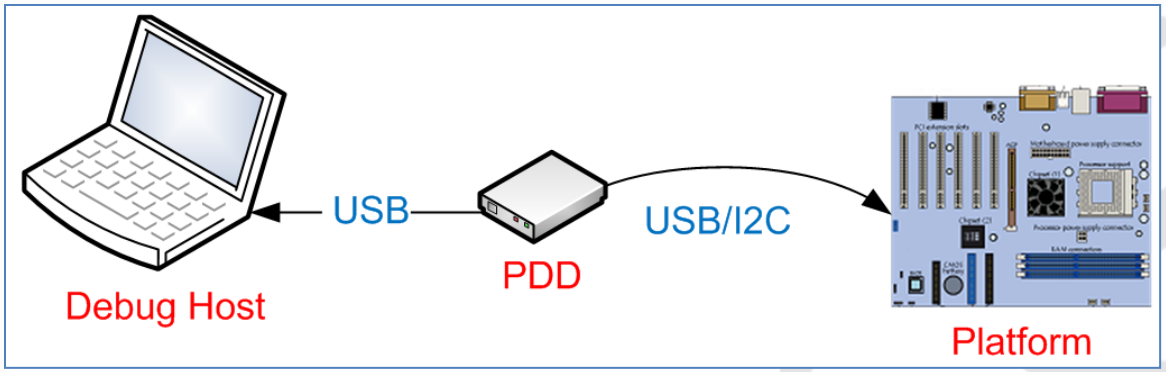
- Port 80 Redirection
- LCD Message Panel (Optional)
- Wireless Module (Optional)

Example Solution

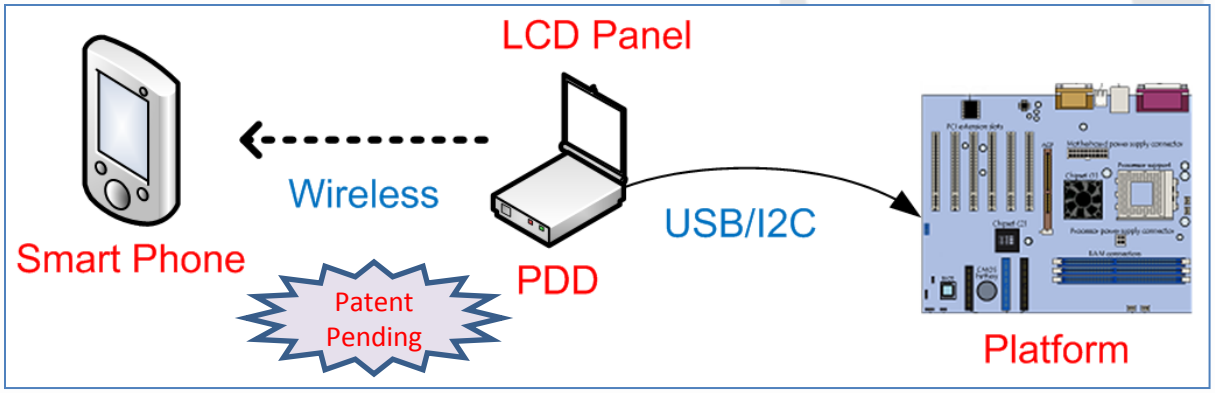


Usage Scenarios

- Remote Debugging (Host <-> Target)



- Standalone Debugging (Host Free)



Agenda

- Comparing Debug Options
  - UEFI vs Legacy BIOS Debug
- Problems to Solve
- Design Considerations
- Typical Design
- Example Solution
- Q & A

Thanks for attending the UEFI Fall Plugfest 2011

For more information on the Unified EFI Forum and UEFI Specifications, visit http://www.uefi.org

presented by

phoenix technologies

Innovation at the CORE

And that's all for now …

T

~~**Welcoming Remarks** – Aven Chuang, Insyde Software~~
~~**UEFI Forum Updates** – Dong Wei, VP of the UEFI Forum~~

T

~~**Tip… EFI Driver Compatibility** – American Megatrends, Inc.~~
~~**…derstanding …latform Requirements for UEFI HII** – Brian …Richardson, Intel Corporation~~

W

~~**UEFI Se… …ncements** – … Davis, Insyde Software~~
~~**How to Prote… …OS Environment with UEFI** – Tony Mangefeste, Micros…~~

Th

~~**Pre-OS Display Switching using …** – … Huang, …~~
~~**Debug Methodology Under UEFI** – Jas… …Phoenix Technologies~~

Download Presentations From www.uefi.org

Download presentations after the plugfest at www.uefi.org