

Multicore Software Development Kit (MCSDK) Training

PCIE Boot Demo

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Agenda

- Overview
- PCIe initialization
- PCIe boot example
- Linux Host Loader
- Demo

PCIE Initialization

- Functions:
 - Initialize the PLL
 - Enable PCIE module
 - Configure PCIE registers
 - Monitor the magic address (0x87FFFC) for secondary boot.
- Need to run on DSP first
- Check the successful enumeration

```
— local-ubuntu:~$ lspci -n
— 00:00.0 0600: 8086:2774
— 00:1b.0 0403: 8086:27d8 (rev 01)
— ....
— 00:1f.3 0c05: 8086:27da (rev 01)
— 01:00.0 0480: 104c:8888 (rev 01)
— 03:00.0 0200: 14e4:1677 (rev 01)
```

PCIE boot example

- “Hello world” example under MCSDK
- Convert the ELF out file into header file (data array) to be loaded by Linux host into DSP
- View the results via UART (minicom on Linux)

PCIE Linux Host Loader Code

- Mapping between PC memory and DSP memory
- Configure the PCIE inbound address translation
- Provide DSP memory read/write API:
 - `Uint32 ReadDSPMemory(Uint32 coreNum, Uint32 DSPMemAddr, Uint32 *buffer, Uint32 length)`
 - `Uint32 WriteDSPMemory(Uint32 coreNum, Uint32 DSPMemAddr, Uint32 *buffer, Uint32 length)`
- Parse the boot example header array to load data into DSP
- Write the boot entry address into the magic address on core 0 to jump start

Set-up and demo

- An AMC adaptor card, a TMS320C6678L EVM card, a Linux PC and a UART cable
- Write the PCIE init code into NOR, set NOR boot
- Compile the Linux host loader code and insert the module into kernel
- Expected results:

```
File Edit View Terminal Help
Compiled on Jan 25 2010, 06:49:09.
Port /dev/ttyS0

Press CTRL-A Z for help on special keys

PCIE Boot Hello World Example Version 01.00.00.01
Booting Hello World image on Core 0 from PCIE ...
Booting Hello World image on Core 1 from Core 0 ...
Booting Hello World image on Core 2 from Core 0 ...
Booting Hello World image on Core 3 from Core 0 ...
Booting Hello World image on Core 4 from Core 0 ...
Booting Hello World image on Core 5 from Core 0 ...
Booting Hello World image on Core 6 from Core 0 ...
Booting Hello World image on Core 7 from Core 0 ...
```