Qualcomm

PCI Pwrctrl Woes

Manivannan Sadhasivam

Senior Staff Engineer, Qualcomm India Pvt Ltd

Agenda

PCI Pwrctrl Framework – Intro

Current Design

Gaps

Proposals

PCI Pwrctrl Framework – Intro

PCI Pwrctrl Framework - Intro

- Introduced in v6.11 release
  - drivers/pci/pwrctrl/

PCI Pwrctrl Framework - Intro

- Introduced in v6.11 release
  - drivers/pci/pwrctrl/
- Aimed to control the power supply to PCI devices (DT platforms)
  - Firmware has been doing the job in ACPI world
  - Couple of ways to do it on DT platforms as of now:
    - Bootloader
    - Host controller driver

PCI Pwrctrl Framework - Intro

- Introduced in v6.11 release
  - drivers/pci/pwrctrl/
- Aimed to control the power supply to PCI devices (DT platforms)
  - Firmware has been doing the job in ACPI world
  - Couple of ways to do it on DT platforms as of now:
    - Bootloader
    - Host controller driver
- Qcom WLAN/BT devices were supported initially
  - WCN7850, QCA6390

PCI Pwrctrl Framework - Intro

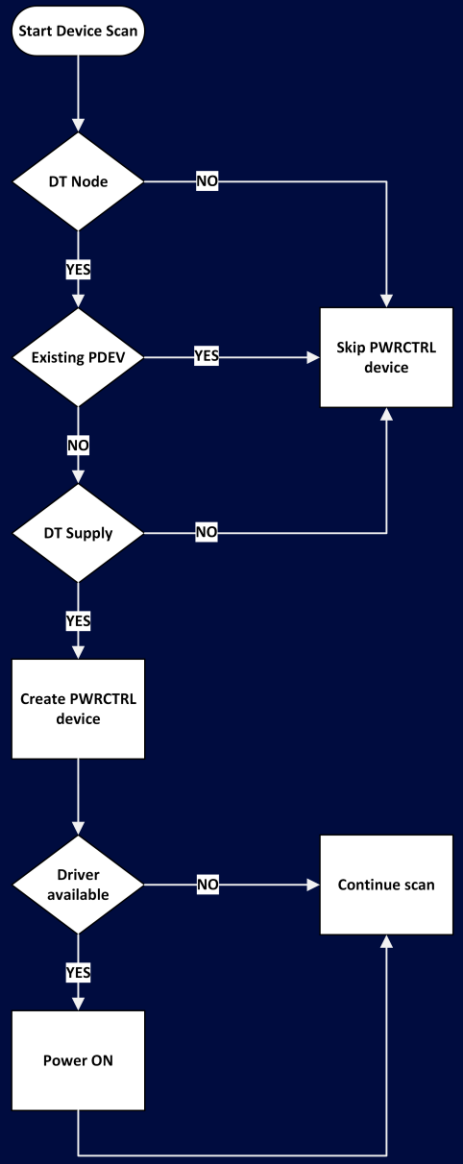
- Introduced in v6.11 release
  - drivers/pci/pwrctrl/
- Aimed to control the power supply to PCI devices (DT platforms)
  - Firmware has been doing the job in ACPI world
  - Couple of ways to do it on DT platforms as of now:
    - Bootloader
    - Host controller driver
- Qcom WLAN/BT devices were supported initially
  - WCN7850, QCA6390
- Uses PWRSEQ driver to handle complex power sequence
  - drivers/power/sequencing/

PCI Pwrctrl Framework - Intro

- Introduced in v6.11 release
  - drivers/pci/pwrctrl/
- Aimed to control the power supply to PCI devices (DT platforms)
  - Firmware has been doing the job in ACPI world
  - Couple of ways to do it on DT platforms as of now:
    - Bootloader
    - Host controller driver
- Qcom WLAN/BT devices were supported initially
  - WCN7850, QCA6390
- Uses PWRSEQ driver to handle complex power sequence
  - drivers/power/sequencing/
- Uses PWRCTRL_SLOT driver for CEM/Mini-CEM slots
  - drivers/pci/pwrctrl/slot.c

Current Design

Current Design



Gaps

Gaps

- Missing PERST# integration
  - PERST# handled autonomously by controller drivers

Gaps

- Missing PERST# integration
  - PERST# handled autonomously by controller drivers
- Resource allocation impacted if probe happens after bus scan
  - Affects PCI bridges/switches

Gaps

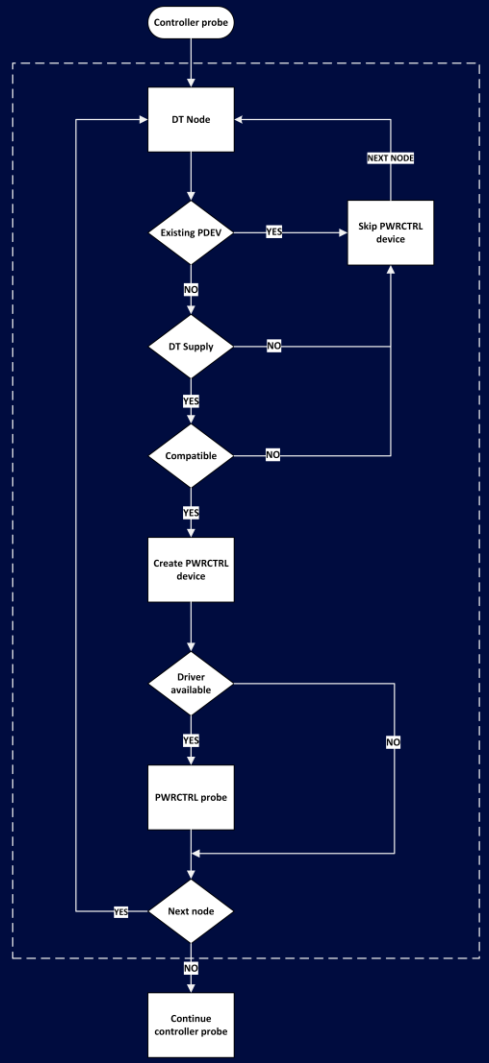
- Missing PERST# integration
  - PERST# handled autonomously by controller drivers
- Resource allocation impacted if probe happens after bus scan
  - Affects PCI bridges/switches
- Controller drivers lack full control
  - Need device power on before bus scan for PHY init

Gaps

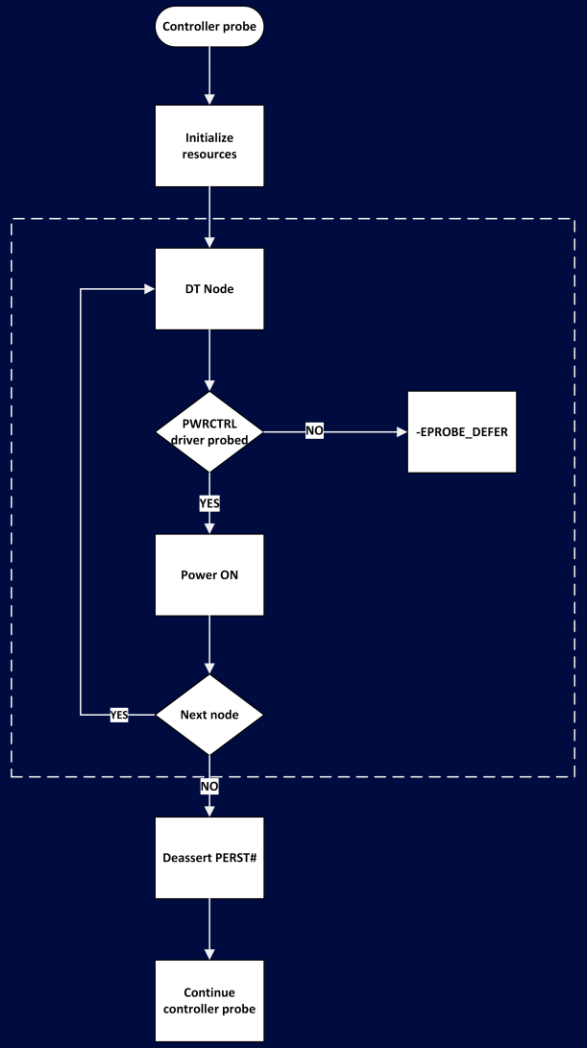
- Missing PERST# integration
  - PERST# handled autonomously by controller drivers
- Resource allocation impacted if probe happens after bus scan
  - Affects PCI bridges/switches
- Controller drivers lack full control
  - Need device power on before bus scan for PHY init
- D3Cold support

Proposals

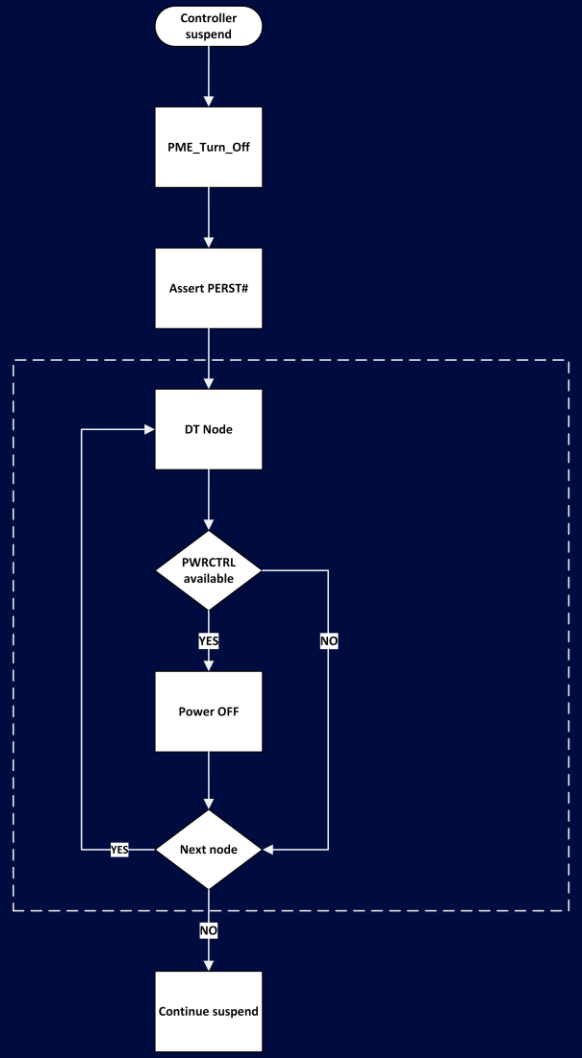
Proposal – pci_pwrctrl_create_devices()



Proposal – pci_pwrctrl_power_on_devices()



Proposal – pci_pwrctrl_power_off_devices()



Thank you

Follow us on:

For more information, visit us at qualcomm.com & qualcomm.com/blog