

Devicetree BOF

ELC 2016
San Diego, California

Frank Rowand, Sony

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Agenda

- questions, comments, issues, concerns from the crowd
 - Plumbers 2016
 - Plumbers 2015
 - Devicetree Specification: Grant Likely
 - debug tools
 - Dynamic devicetree, etc: Pantelis Antoniou
 - Odds and Ends
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What do you want to talk about?

questions

comments

issues

concerns

Plumbers 2016

Santa Fe, NM

November 2 - 4

with: Linux Kernel Summit, Oct 31 - Nov 1

Devicetree session proposed:

http://wiki.linuxplumbersconf.org/2016:device_tree

To add topics, email frowand.list@gmail.com

<https://www.linuxplumbersconf.org/2016/>

Plumbers 2015

Binding document and device tree source validation

Some momentum going into Plumbers 2015, currently stalled

dtc compiler

Overlays

Pantelis Antoniou

Probe ordering

Continues to be debated from time to time on lkml

http://elinux.org/Device_tree_future

https://etherpad.openstack.org/p/LPC2015_Device_Tree

Devicetree Specification

Grant Likely

<http://connect.linaro.org/resource/bkk16/bkk16-411/>

Debug Tools

scripts/dtc/dtx_diff

- diff .dts, .dtb, /proc/device-tree/
- In 4.6 merge window

dtc: dts source location annotation

- Provide source locations from .dts & .dtsi
- Several proof of concept versions on devicetree-compiler list
- Stalled, awaiting some of Frank's bandwidth

Debug Tools

scripts/dtc/dt_to_config

- Report drivers and kernel config needed by a device tree
- Plan to submit to mail list “any day now”

scripts/dt_conf

- Report difference between property accesses on target and properties in device tree
- Plan to submit to mail list “any day now”

Debug Tools

dt_node_info

- Provide info about device tree nodes from /proc/device-tree files
- proof of concept on elinux.org
- Stalled, awaiting some of Frank's bandwidth

source location annotation

----- short format -----

```
sdhci@f9824900 { /* qcom-apq8074-dragonboard.dts:14 */
    compatible = "qcom,sdhci-msm-v4"; /* qcom-msm8974.dtsi:240 */
    reg = <0xf9824900 0x11c 0xf9824000 0x800>; /* qcom-msm8974.dtsi:241 */
    reg-names = "hc_mem", "core_mem"; /* qcom-msm8974.dtsi:242 */
    interrupts = <0x0 0x7b 0x0 0x0 0x8a 0x0>; /* qcom-msm8974.dtsi:243 */
    interrupt-names = "hc_irq", "pwr_irq"; /* qcom-msm8974.dtsi:244 */
    clocks = <0xd 0xd8 0xd 0xd7>; /* qcom-msm8974.dtsi:245 */
    clock-names = "core", "iface"; /* qcom-msm8974.dtsi:246 */
    status = "ok"; /* qcom-apq8074-dragonboard.dts:17 */
    bus-width = <0x8>; /* qcom-apq8074-dragonboard.dts:15 */
    non-removable; /* qcom-apq8074-dragonboard.dts:16 */
}; /* qcom-apq8074-dragonboard.dts:18 */
```

source location annotation

----- long format -----

```
sdhci@f9824900 { /* qcom-apq8074-dragonboard.dts:14.3-18.5 */
    compatible = "qcom,sdhci-msm-v4"; /* qcom-msm8974.dtsi:240.4-37 */
    reg = <0xf9824900 0x11c 0xf9824000 0x800>; /* qcom-msm8974.dtsi:241.4-49 */
    reg-names = "hc_mem", "core_mem"; /* qcom-msm8974.dtsi:242.4-37 */
    interrupts = <0x0 0x7b 0x0 0x0 0x8a 0x0>; /* qcom-msm8974.dtsi:243.4-38 */
    interrupt-names = "hc_irq", "pwr_irq"; /* qcom-msm8974.dtsi:244.4-42 */
    clocks = <0xd 0xd8 0xd 0xd7>; /* qcom-msm8974.dtsi:245.4-36 */
    clock-names = "core", "iface"; /* qcom-msm8974.dtsi:246.4-34 */
    status = "ok"; /* qcom-apq8074-dragonboard.dts:17.4-18 */
    bus-width = <0x8>; /* qcom-apq8074-dragonboard.dts:15.4-20 */
    non-removable; /* qcom-apq8074-dragonboard.dts:16.4-18 */
}; /* qcom-apq8074-dragonboard.dts:14.3-18.5 */
```

dt_to_config example snippet

```
$ dt_to_config --include-suspect --config=.config arch/arm/boot/dts/qcom-apq8074-dragonboard.dts
```

```
-dDc-----y : smem : qcom,smem : drivers/soc/qcom/smem.c : CONFIG_QCOM_SMEM : y
```

```
-dDc-----N-- : smem : qcom,smem : drivers/soc/qcom/smp2p.c : CONFIG_QCOM_SMP2P : none
```

```
Md-c-----y : power-controller@f9089000 : qcom,msm8974-saw2-v2.1-cpu : drivers/soc/qcom/spm.c : CONFIG_QCOM_PM : y
```

```
M-----N-- : power-controller@f9089000 : qcom,saw2 : no_driver : no_config : none
```

```
-d-c-----y : coincell@2800 : qcom,pm8941-coincell : drivers/misc/qcom-coincell.c : CONFIG_QCOM_COINCELL : y
```

```
-dDc-----y : timer : arm,armv7-timer : arch/arm/kernel/vdso.c : CONFIG_VDSO : y
```

```
-dDc-----y : timer : arm,armv7-timer : drivers/clocksource/arm_arch_timer.c : CONFIG_ARM_ARCH_TIMER : y
```

dt_prop example snippets

```
$ dt_prop --td dmesg_4.5-rc5_160307_2100 qcom-apq8074-dragonboard.dts
```

```
# --- dmesg_4.5-rc5_160307_2100  
# +++ qcom-apq8074-dragonboard.dts  
/dts-v1/;
```

```
/ {  
-     #address-cells;  
-     #interrupt-cells;  
-     #size-cells;  
-     compatible;  
-     dma-coherent;  
-     dma-ranges;  
-     interrupt-parent;  
+     model;  
-     serial-number;  
  
-     aliases {  
+         compatible;  
+         serial0;  
+         usid0;  
+         usid4;  
};
```

dt_prop example snippets

```
$ dt_prop --td dmesg_4.5-rc5_160307_2100 qcom-apq8074-dragonboard.dts
```

```
# --- dmesg_4.5-rc5_160307_2100  
# +++ qcom-apq8074-dragonboard.dts  
/dts-v1/;
```

```
                // ***** i2c@f9964000 disabled *****  
i2c@f9964000 {  
+               #address-cells;  
+               #size-cells;  
+               clock-names;  
+               clocks;  
+               compatible;  
+               interrupts;  
+               reg;  
+               status;  
};
```

dt_node_info example 1

```
$ dt_node_info coincell
```

```
==== devices
```

```
==== nodes
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

```
==== nodes bound to a driver
```

```
==== nodes with a device
```

```
==== nodes not bound to a driver
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

```
==== nodes without a device
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

dt_node_info example 2

```
$ dt_node_info coincell
```

```
==== devices
```

```
/sys/devices/platform/soc/fc4cf000.spmi/spmi-0/0-00/
```

```
==== nodes
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

```
==== nodes bound to a driver
```

```
==== nodes with a device
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

```
==== nodes not bound to a driver
```

```
/soc/spmi@fc4cf000/pm8941@0/qcom,coincell@2800 qcom,
```

```
==== nodes without a device
```


Dynamic devicetree, etc

Pantelis Antoniou

Odds and Ends

- dtc warnings
- dtc changes for overlays
- for_all_nodes vs for_all_nodes_available
- locking issues
- hw description vs configuration vs policy

THE END

Thank you for your attention...

Questions?

How to get a copy of the slides

- 1) leave a business card with me
- 2) frank.rowand@am.sony.com
frowand.list@gmail.com
- 3) http://elinux.org/Device_Tree
- 4) <http://events.linuxfoundation.org>