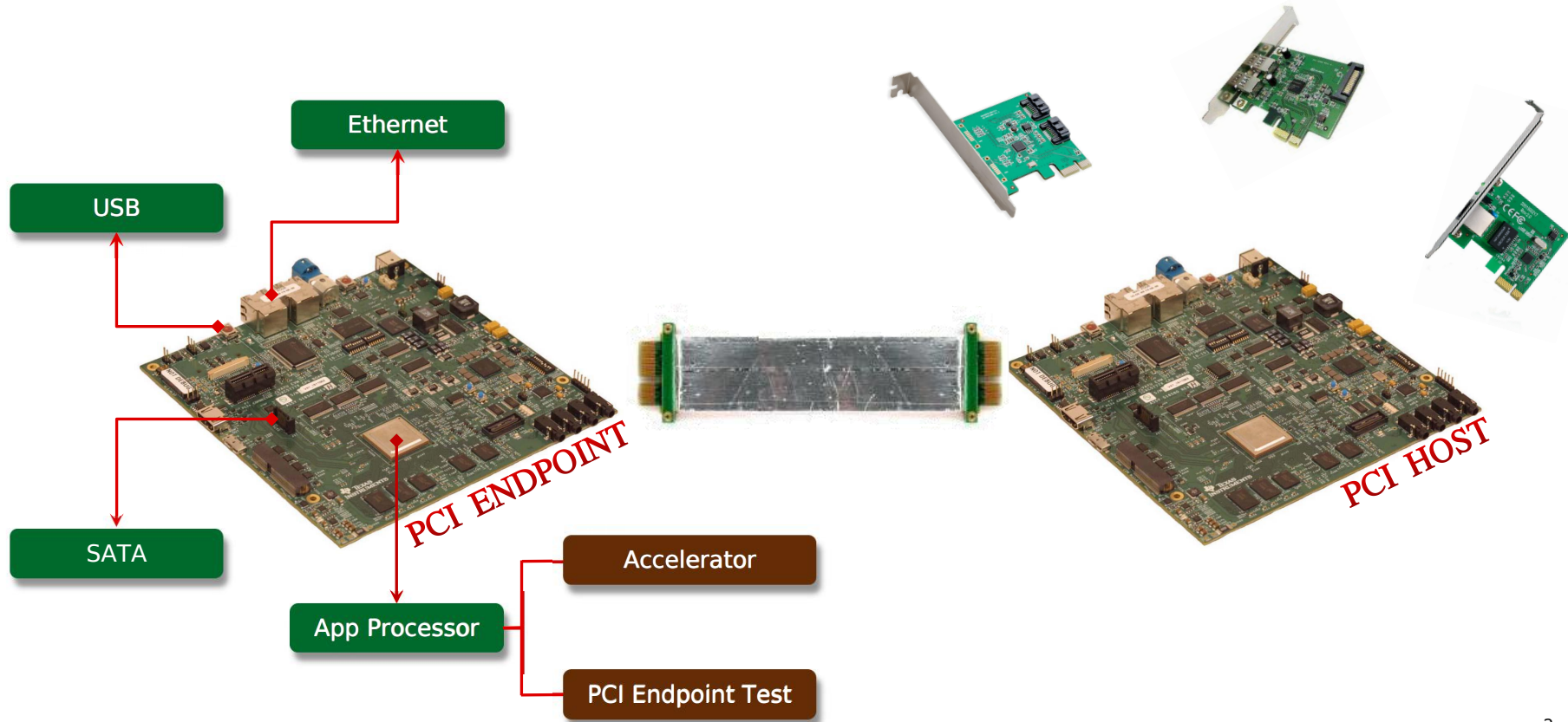


# Linux PCI EP Framework

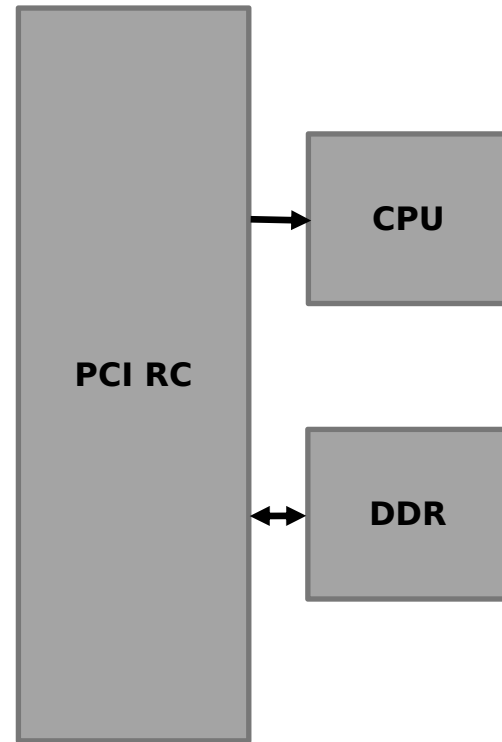
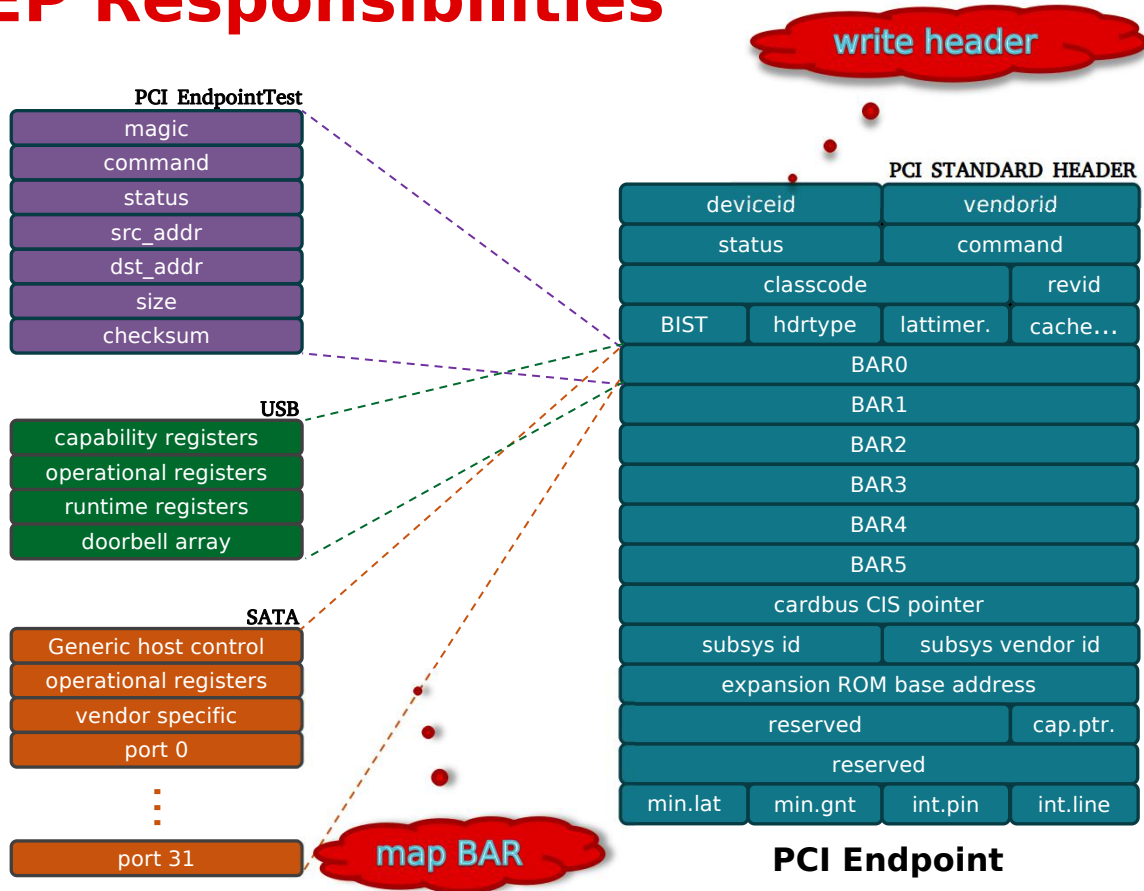
*Support for Configurable PCI Endpoint in Linux*

**KISHON VIJAY ABRAHAM I**

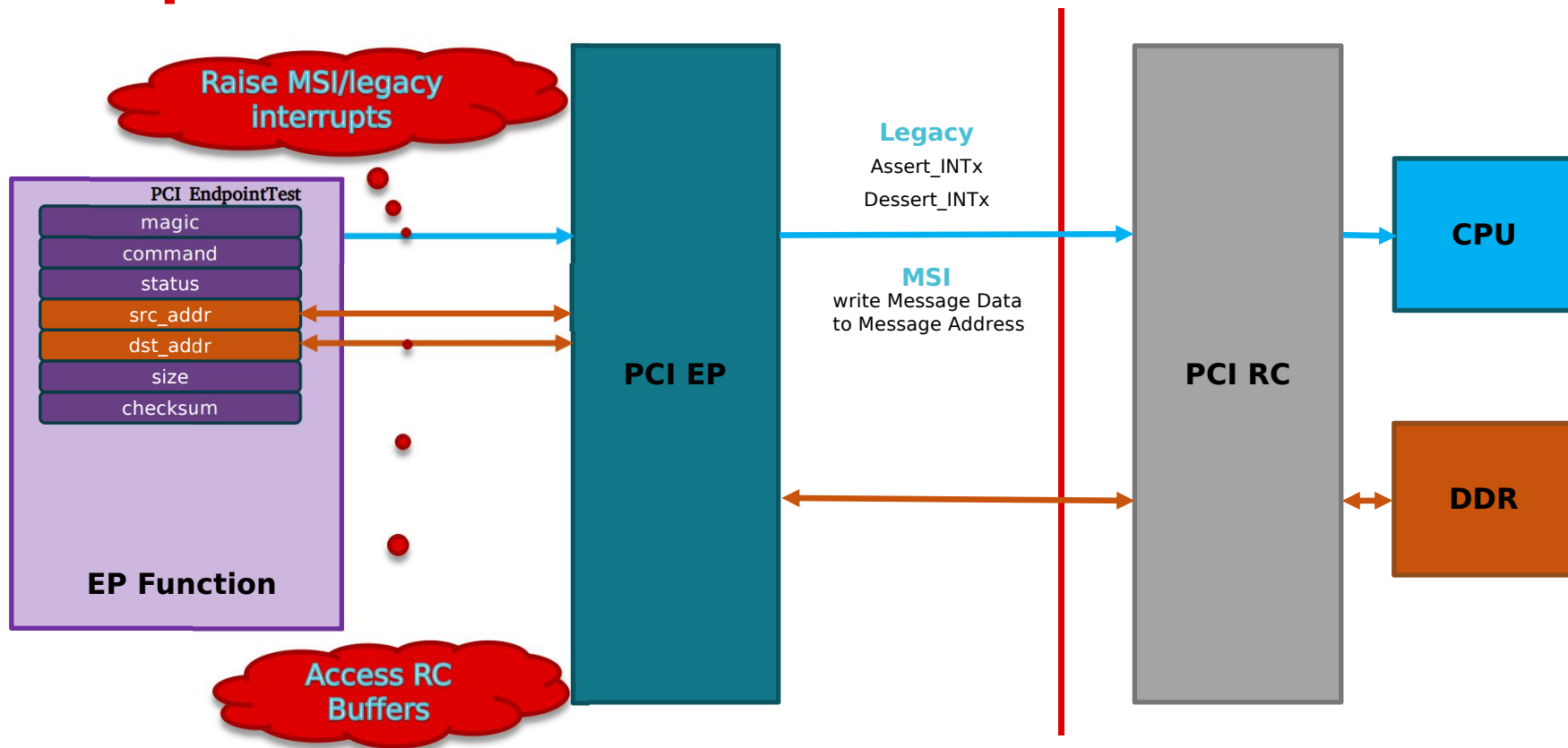
# Introduction



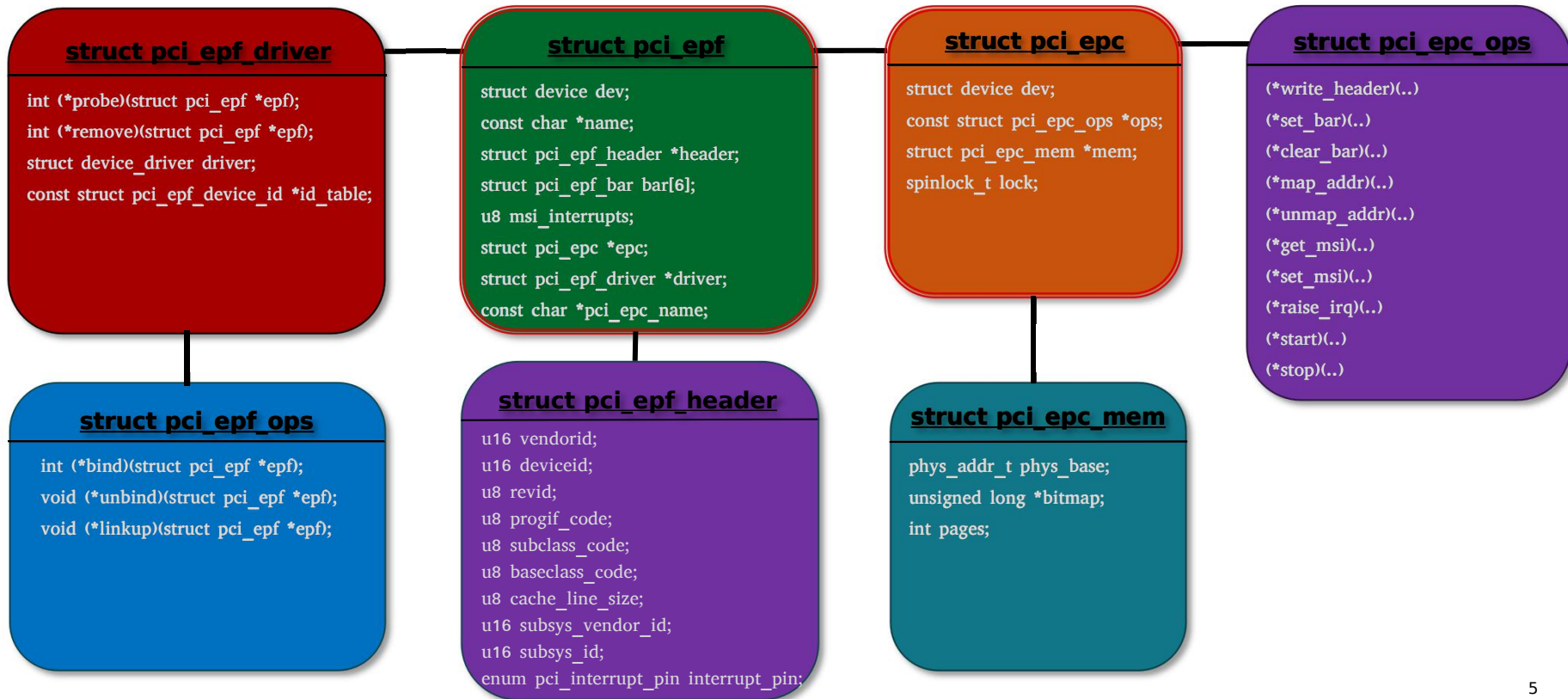
# EP Responsibilities



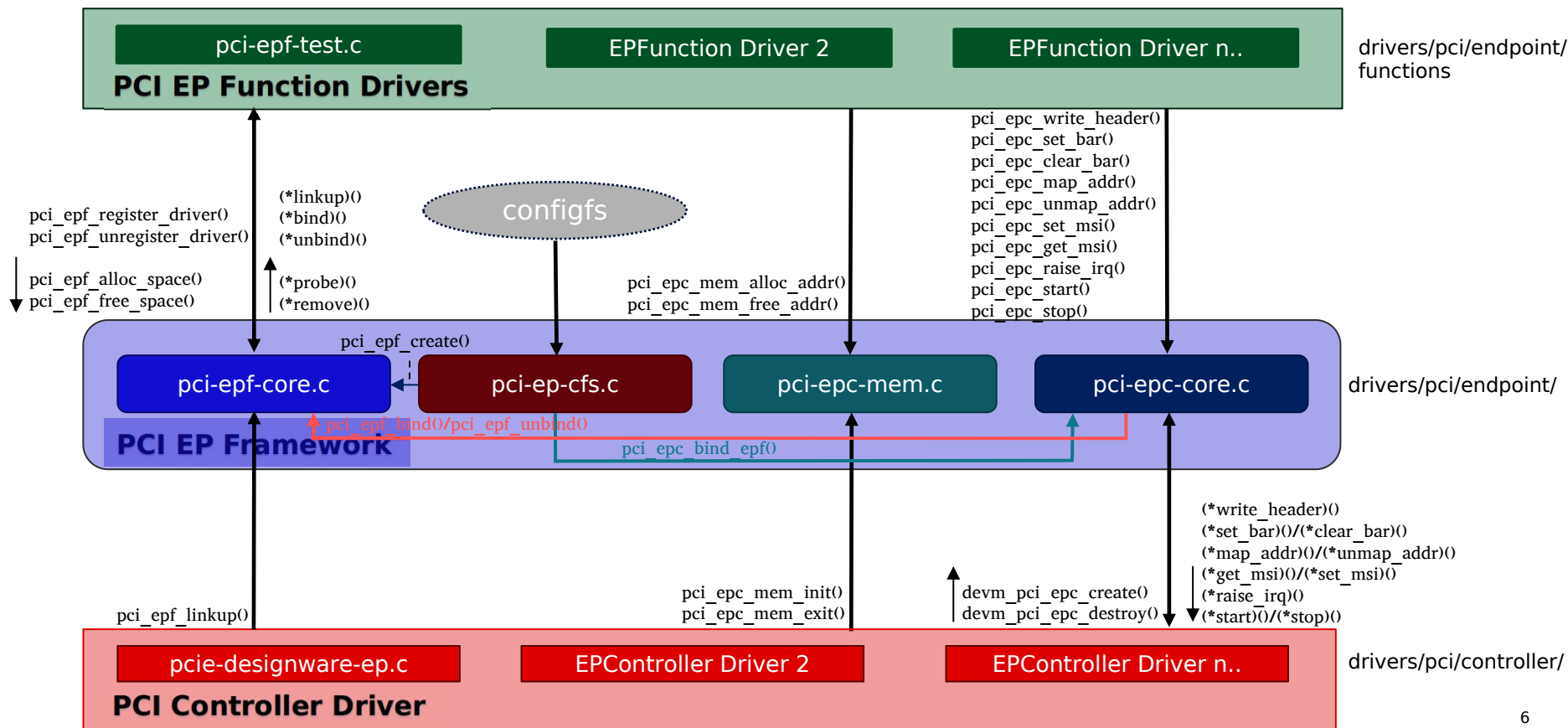
# EP Responsibilities



# EP Framework



# EP Framework



# devicetree node

```
pcie1_rc: pcie_rc@51000000 {  
    compatible = "ti,dra7-pcie";  
    reg = <0x51000000 0x1000>, <0x51002000 0x14c>, <0x1000 0x2000>;  
    reg-names = "rc_dbics", "ti_conf", "config";  
    interrupts = <0 232 0x4>, <0 233 0x4>;  
    ti,hwmods = "pcie1";  
    phys = <&pcie1_phy>;  
    phy-names = "pcie-phy0";  
    num-lanes = <1>;  
    #address-cells = <3>;  
    #size-cells = <2>;  
    device_type = "pci";  
    ranges = <0x81000000 0 0 0x03000 0 0x00010000  
            0x82000000 0 0x20013000 0x13000 0 0xffed000>;  
    #interrupt-cells = <1>;  
    linux,pci-domain = <0>;  
    interrupt-map-mask = <0 0 0 7>;  
    interrupt-map = <0 0 0 1 &pcie1_intc 1>,  
    ....  
};
```

## RC Devicetree Node

```
pcie1_ep: pcie_ep@51000000 {  
    compatible = "ti,dra7-pcie-ep";  
    reg = <0x51000000 0x1000>, <0x51002000 0x14c>,  
        <0x51001000 0x80>, <0x1000 0xFFFF000>;  
    reg-names = "ep_dbics", "ti_conf", "ep_dbics2", "addr_space";  
    interrupts = <0 232 0x4>;  
    ti,hwmods = "pcie1";  
    phys = <&pcie1_phy>;  
    phy-names = "pcie-phy0";  
    num-lanes = <1>;  
    num-ib-windows = <4>;  
    num-ob-windows = <16>;  
    syscon-legacy-mode = <&scm_conf1 0x14 2>;  
};`
```

## EP Devicetree Node

# Configuring PCI Endpoint Function

```
# ls /sys/class/pci_epc/
```

```
51000000.pcie_ep
```

**list of PCI Endpoint Controllers**

```
# ls /sys/bus/pci-epf/drivers
```

```
pci_epf_test
```

**list of PCI Endpoint Function Drivers**

```
# mount -t configfs none /sys/kernel/config
```

```
# cd /sys/kernel/config/pci_ep/
```

```
# mkdir pci_epf_test.0
```

```
# cd pci_epf_test.0
```

```
# ls
```

<i>baseclass_code</i>	<i>function</i>	<i>revid</i>	<i>vendorid</i>
<i>cache_line_size</i>	<i>interrupt_pin</i>	<i>subclass_code</i>	
<i>deviceid</i>	<i>peripheral</i>	<i>subsys_id</i>	
<i>epc</i>	<i>progif_code</i>	<i>subsys_vendor_id</i>	

```
# cat vendorid
```

```
0xffff
```

```
# cat interrupt_pin
```

```
0x0001
```

**Creating Endpoint Function Device**

```
# echo 0x104c > vendorid
```

```
# echo 16 > msi_interrupts
```

**Configuring Endpoint Function Device**

```
# echo "51000000.pcie_ep" > epc
```

**Binding Endpoint Function with Endpoint Controller**



The background of the slide features a light blue gradient with a complex, white circuit board pattern. The pattern consists of numerous interconnected lines, nodes, and loops, resembling a microchip or a network diagram. The lines are of varying thicknesses, and the nodes are small circles or squares. The overall effect is a technical, digital aesthetic.

# Happy Hacking!

**Feedback:**

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