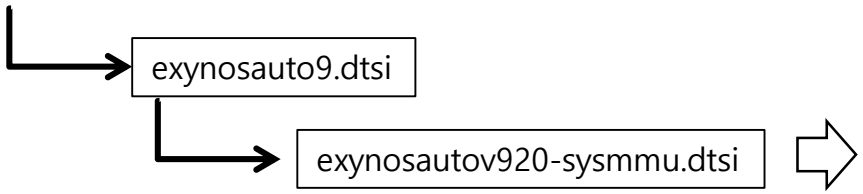
SYSMMU DT Configuration

Samsung Electronics / System LSI / SOC
April. 2022

Constructure about Device Tree

1. Location about default sysMMU DT

sources/kernel/arch/arm64/boot/dts/exynos




```
.....

sysmmu_dpum_0: sysmmu@18C80000 {
        compatible = "samsung,exynos-sysmmu";
        reg = <0x0 0x18C80000 0x10000>,
              <0x0 0x10030000 0x1000>;

        interrupts = <0 INTREQ_COMB_NONSECURE_SYSREG_PERIS
                        IRQ_TYPE_LEVEL_HIGH>,
                     <0 INTREQ_COMB_SECURE_SYSREG_PERIS
                        IRQ_TYPE_LEVEL_HIGH>;
        sysmmu,dintc_port = <37>;
        sysmmu,dintc_port_s = <36>;
        qos = <15>;

        clock-names = "aclk";
        clocks = <&clock GATE_SYSMMU_D0_DPUM_QCH_S0>;

        port-name = "GF0, G0";
        sysmmu,secure-irq;
        sysmmu,secure_base = <0x18CC0000>;
        sysmmu,default_tlb = <TLB_CFG(0x0, BL1, PREFETCH_PREDICTION)>;
        sysmmu,tlb_property =
                <1  TLB_CFG(0x0, BL1, PREFETCH_PREDICTION)
                    TLB_MATCH_CFG(0x1, DIR_READ)
                    SYSMMU_ID_MASK(0x4, 0xC07)>,
                <2  TLB_CFG(0x0, BL1, PREFETCH_PREDICTION)
                    TLB_MATCH_CFG(0x1, DIR_READ)
                    SYSMMU_ID_MASK(0x400, 0xC00)>,
                <3  TLB_CFG(0x0, BL1, PREFETCH_PREDICTION)
                    TLB_MATCH_CFG(0x1, DIR_READ)
                    SYSMMU_ID_MASK(0x800, 0xC00)>;
        #iommu-cells = <0>;
        power-domains = <&pd_dpum>;
        status = "disabled";
};

.....
```

※ All of property is optimization value.
Don't change this value in this file

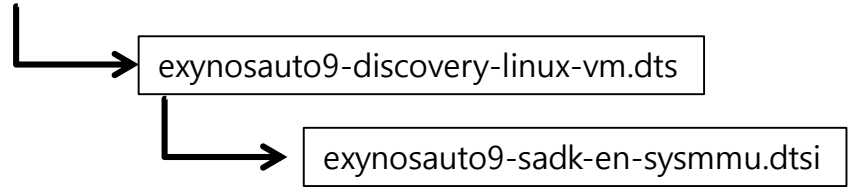
Constructure about Device Tree

2. Enable sysMMU DT each VM

1) Change status and add VMID

SYS domain(Linux)

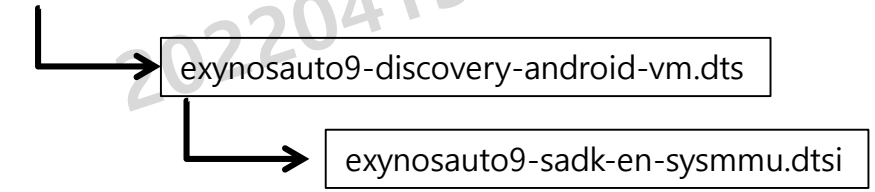
sources/linux_sys_dts-la/linux_sys




```
&sysmmu_dpus0_0 {
        status = "okay";
        vid = <2>;  // VMID about SYS domain
};
```

IVI domain (Android)

sources/Android-kernel/and_ivi_dts-la/and_ivi

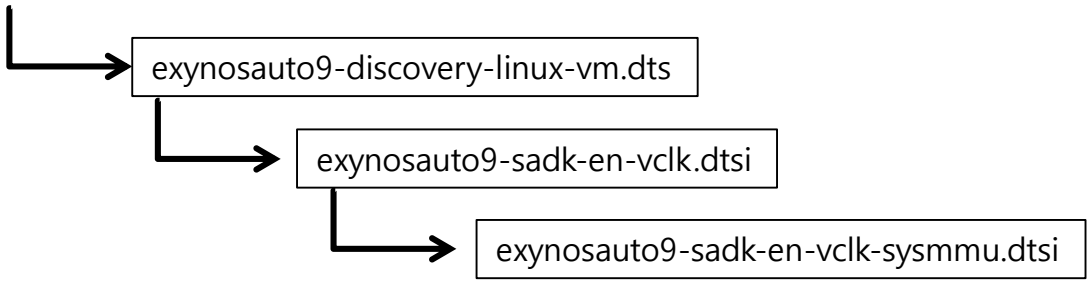



```
&sysmmu_dpum_0 {
        power-domains = <>;
        vid = <3>; // VMID about  IVI domain
        status = "okay";
};
```

Constructure about Device Tree

3. Allow clock-ref to IVI domain

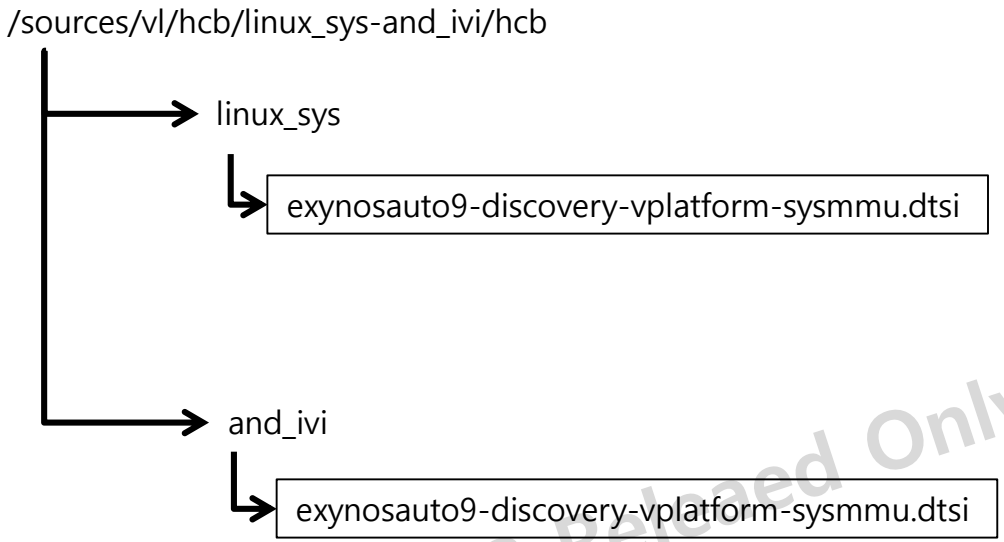
sources/linux_sys_dts-la/linux_sys




```
&vclk_be_3 {

        // Clock reference about sysmmu used on IVI domain
        clk@sysmmu_dpum_0 {
                vl,clock-ref = <&sysmmu_dpum_0>;
        };

        clk@sysmmu_dpum_1 {
                vl,clock-ref = <&sysmmu_dpum_1>;
        };

        ......
}
```

Constructure about Device Tree

4. Allow VM HW resources in vPlatform DT




```
...
// Allow sysmmu HW resource
ENABLE_VPLAT_MEM(sysmmu_dpus0_0);
ENABLE_VPLAT_MEM(sysmmu_dpus0_1);
ENABLE_VPLAT_MEM(sysmmu_dpus0_2);
ENABLE_VPLAT_MEM(sysmmu_dpus0_3);
...

&dintc_PERIS {

    vl,master;

    vl,interrupt-domain-addr = <0x0 0x10030000>;

    dintc_PERIS_interrupts {

        interrupt-parent = <&dintc_PERIS>;

        // Allow sysmmu interrupt for each domain
        vl,dintc_PERIS@sysmmu_dpus0_0 {
                compatible = "vl,interrupts-mapper";
                interrupts = <13>;
                #vl,interrupts-count = <1>;
        };
```

Thank you