Interface between kernel and boot loaders on Exynos boards

Author: Krzysztof Kozlowski

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The document tries to describe currently used interface between Linux kernel and boot loaders on Samsung Exynos based boards. This is not a definition of interface but rather a description of existing state, a reference for information purpose only.

In the document "boot loader" means any of following: U-boot, proprietary SBOOT or any other firmware for ARMv7 and ARMv8 initializing the board before executing kernel.

1. Non-Secure mode

Address: sysram_ns_base_addr

Offset	Value	Purpose
0x08	exynos_cpu_resume_ns, mcpm_entry_point	System suspend
0x0c	0x00000bad (Magic cookie)	System suspend
0x1c	exynos4_secondary_startup	Secondary CPU boot
0x1c + 4*cpu	exynos4_secondary_startup (Exynos4412)	Secondary CPU boot
0x20	0xfcba0d10 (Magic cookie)	AFTR
0x24	exynos_cpu_resume_ns	AFTR
0x28 + 4*cpu	0x8 (Magic cookie, Exynos3250)	AFTR
0x28	0x0 or last value during resume (Exynos542x)	System suspend

2. Secure mode

Address: sysram_base_addr

Offset	Value	Purpose
0x00	exynos4_secondary_startup	Secondary CPU boot
0x04	exynos4_secondary_startup (Exynos542x)	Secondary CPU boot
4*cpu	exynos4_secondary_startup (Exynos4412)	Secondary CPU boot
0x20	exynos_cpu_resume (Exynos4210 r1.0)	AFTR
0x24	0xfcba0d10 (Magic cookie, Exynos4210 r1.0)	AFTR

Address: pmu_base_addr

Offset	Value	Purpose
0x0800	exynos_cpu_resume	AFTR, suspend
0x0800	mcpm_entry_point (Exynos542x with MCPM)	AFTR, suspend
0x0804	0xfcba0d10 (Magic cookie)	AFTR
0x0804	0x00000bad (Magic cookie)	System suspend
0x0814	exynos4_secondary_startup (Exynos4210 r1.1)	Secondary CPU boot
0x0818	0xfcba0d10 (Magic cookie, Exynos4210 r1.1)	AFTR
0x081C	exynos_cpu_resume (Exynos4210 r1.1)	AFTR

3. Other (regardless of secure/non-secure mode)

Address: pmu_base_addr

Offset	Value	Purpose
0x0908	Non-zero	Secondary CPU boot up indicator on Exynos3250 and Exynos542x

4. Glossary

AFTR - ARM Off Top Running, a low power mode, Cortex cores and many other modules are power gated, except the TOP modules MCPM - Multi-Cluster Power Management