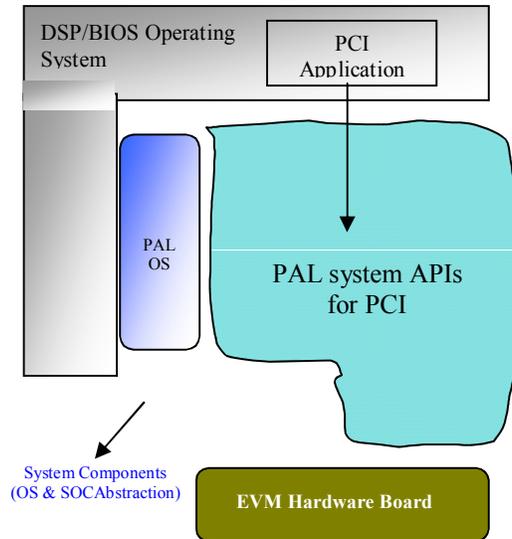• **Re-entrant safe driver**

Description

Refer system level release notes for tools and BIOS versions.

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Capabilities

The PAL SYS PCI DSP/BIOS device driver adopts a scalable architecture that eases customization/extension

- Isolates H/W and OS Accesses, Easy to maintain & re-target to new platforms
- Can stack custom-functions along control/data-path to realize "driver filters"

The driver is constituted of following sub components:

- PCI – OS Independent part of PCI Driver Core.
- System components – PALOS: BIOS Abstraction

The following table gives a quick overview of the supported API services. For help on interfaces refer to the PAL SYS PCI Driver Help File:

PAL_sysPCICreate( )	Create the instance of PCI driver.
PAL_sysPCIDelete( )	Delete the instance of PCI driver.
PAL_sysPCIOpen( )	Open the driver instance of PCI driver.
PAL_sysPCIClose( )	Close the driver instance of PCI driver.
PAL_sysPCIEnableInterrupt( )	Enables PCI interrupt/s.
PAL_sysPCIDisableInterrupt( )	Disables PCI interrupt/s.
PAL_sysPCISetMemMapReg( )	Set memory mapped register.
PAL_sysPCIGetMemMapReg( )	Get memory mapped register.
PAL_sysPCISetHookReg( )	Set Hook register
PAL_sysPCIGetHookReg( )	Get Hook register
PAL_sysPCIEnableBasePrefetch( )	API to Enable Prefetch for a base address register.
PAL_sysPCIDisableBasePrefetch( )	API to disable Prefetch for a base address register.
PAL_sysPCIProgramCacheLineSize	API to set Cache line size
PAL_sysPCIProgramLatencyTimer( )	API to set Latency timer

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Driver Performance Characteristics:

PCI DEVICE DRIVER SUB-COMPONENT	PROGRAM MEMORY (IN BYTES)	DATA MEMORY (IN BYTES)		
		MEMORY TYPE		TOTAL
		INITIALIZED	UN INITIALIZED	
<PAL SYS-PCI>	6876	19	20	6915
Total	6876	19	20	6915

- System Components Total Memory (Code & Data): **6915** Bytes

Note: The Driver Performance Characteristics can be included once testing is done on DM648/C6452 SOC.

**Performance and Profiling Characteristics for DM648/C6452:**

Driver Profiling Characteristics

API Profiled	Trial-1	Trial-2	Trial-3	Trial-4	Trial-5	Average (usec)	Maximum (usec)	Minimum (usec)
PAL_sysPCICreate	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
PAL_sysPCIOpen	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
PAL_sysPCIGetHookReg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCISetHookReg	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAL_sysPCIEnableInterrupt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIDisableInterrupt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAL_sysPCIProgramLatencyTimer	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAL_sysPCIProgramCacheLineSize	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIEnableBasePrefetch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIDisableBasePrefetch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCISetMemMapReg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIGetMemMapReg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIEnableBasePrefetch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIDisableBasePrefetch	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIClose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysPCIDelete	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Driver Performance Characteristics
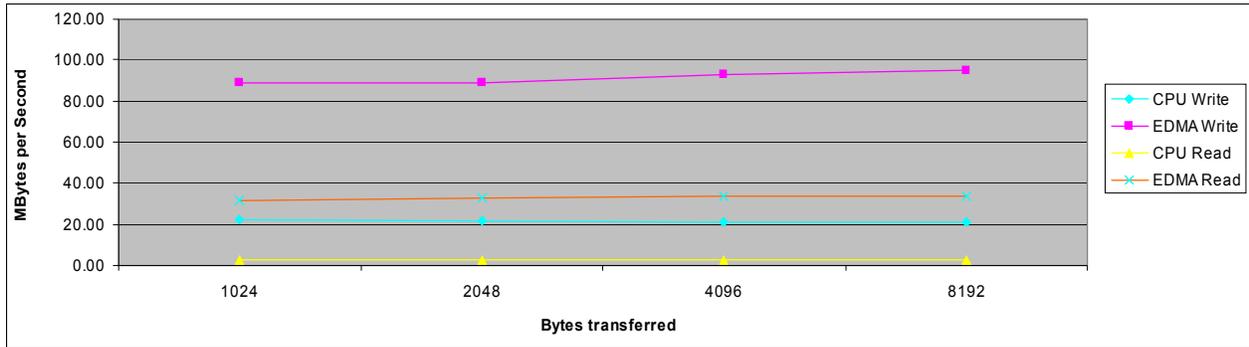
Test Setup Information	Buffer Size (Bytes)	CPU Write		EDMA Write		CPU Read		EDMA Read	
		Time (usec)	Mbytes /Sec	Time (usec)	Mbytes /Sec	Time (usec)	Mbytes /Sec	Time (usec)	MBytes/Sec
Kailash EVM inserted in PCI slot of Linux Host	1024	44.00	22.19	11	88.78	355	2.75	31	31.50
	2048	91.00	21.46	22	88.78	709	2.75	59	33.10
	4096	184.00	21.23	42	93.01	1419	2.75	117	33.39
	8192	369.00	21.17	82	95.27	2847	2.74	232	33.67

Comments:	
Frequency - 33MHz	33000000
Data Bus Width - 4 Bytes	4
Theoretical Value (Bytes/sec)	132000000
Hardware Details: Host	Dell GX260
Software : Linux Version	2.6.9
Note: The CPU and EDMA data transfer were done from DM648 board	
EDMA transfers were done in ABSYNC mode	

PRODUCT PREVIEW

References

[1] PAL SYS PCI Module Hardware Specifications

[2] BIOS Documentation from TI

[3] PAL SYS PCI Device Driver Documentation

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