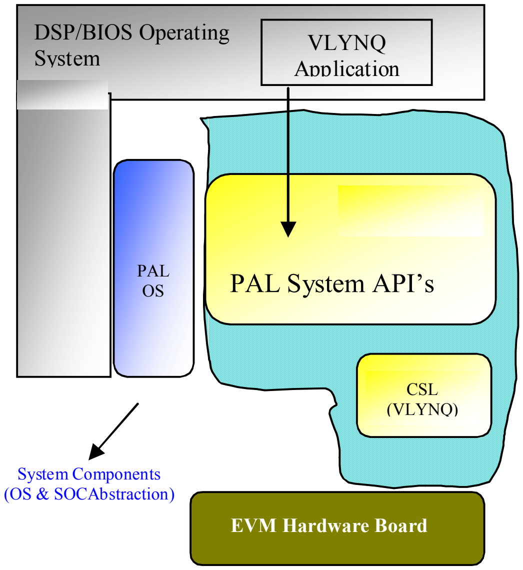
- **Re-entrant safe driver**



Description

Refer system level release notes for tools and BIOS versions.

PRODUCT PREVIEW

Capabilities

The PAL SYS VLYNQ 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:

- VLYNQ – OS Independent part of VLYNQ Driver Core. This also includes CSL.
- 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 VLYNQ Driver Help File:

PAL_sysVlynqInit( )	Initialize the VLYNQ control module.
PAL_sysVlynqInitSoc	Initialize the VLYNQ control module.
PAL_sysVlynqCleanUp( )	Un-Initialize the VLYNQ control module.
PAL_sysVlynqDevCreate( )	Creates a device reference.
PAL_sysVlynqDevDestroy( )	Destroys the device reference.
PAL_sysVlynqMapRegion( )	Map the memory regions of the device.
PAL_sysVlynqMappedRegion( )	Return the Mapped Region configuration for Local/Peer.
PAL_sysVlynqUnMapRegion( )	Unmap the memory regions of the De vice.
PAL_sysVlynqMapIrq( )	Maps the IRQ hardware line onto the VLYNQ.
PAL_sysVlynqUnMapIrq( )	Unmap the IRQ hardware line.
PAL_sysVlynqChainAppend( )	Append to the VLYNQ chain.
PAL_sysVlynqAddDevice( )	Add the device reference into VLYNQ.
PAL_sysVlynqRemoveDevice( )	Removes the device reference from VLYNQ.
PAL_sysVlynqChainUnAppend( )	Remove (the tail) from the VLYNQ chain.
PAL_sysVlynqRootIsr( )	The Root ISR; register it with the system.
PAL_sysVlynqDevFind( )	Get the handle for the device.
PAL_sysVlynqDevGetVlynq( )	Get the VLYNQ for this device.
PAL_sysVlynqGetDevBase( )	Get the physical base address of the device.
PAL_sysVlynqDevFindIrq( )	Get the mapped interrupts of the device.
PAL_sysVlynqAddIsr( )	Install the ISR for the device.
PAL_sysVlynqDevGetResetBit( )	Get the reset bit of the device.
PAL_sysVlynqDevCbRegister( )	Register for the callbacks.
PAL_sysVlynqDevCbUnregister( )	Unregisters the callbacks.
PAL_sysVlynqIoctl( )	Read/Write register of the VLYNQ module.

PRODUCT PREVIEW

PAL_sysVlynqClockConfig( )	Configures the Clock for the VLYNQ bridge.
PAL_sysVlynqGetForIrq( )	Get the VLYNQ for the IRQ.
PAL_sysVlynqSetIrqPol( )	Set the polarity of the hardware IRQ line.
PAL_sysVlynqSetIrqType( )	Set the type of the hardware IRQ line.
PAL_sysVlynqGetIrqPol ( )	Get the polarity of the hardware IRQ line.
PAL_sysVlynqGetIrqType( )	Get the type of the hardware IRQ type.
PAL_sysVlynqGetIrqCount( )	Get the number of times this IRQ occurred.
PAL_sysVlynqDisableIrq( )	Disable the IRQ.
PAL_sysVlynqEnableIrq( )	Enable the IRQ.
PAL_sysVlynqGetLinkStatus( )	Get the status of the of the VLYNQ module.
PAL_sysVlynqGetNumRoot( )	Get the number of the root VLYNQ(s)
PAL_sysVlynqGetRoot( )	Get the handle to the specified root VLYNQ.
PAL_sysVlynqGetRootVLYNQ( )	Get root for the given VLYNQ.
PAL_sysVlynqGetRootAtBase( )	Get the root VLYNQ at the base address.
PAL_sysVlynqGetBaseAddr( )	Returns the base address of the VLYNQ.
PAL_sysVlynqGetNext( )	Get the next VLYNQ module in the chain.
PAL_sysVlynqIsLast( )	Is this VLYNQ module the last one in the chain.
PAL_sysVlynqGetChainLength( )	Get the length of the VLYNQ chain.
PAL_sysVlynqDump( )	Dumps vital VLYNQ information into the buffer.

Driver Performance Characteristics:

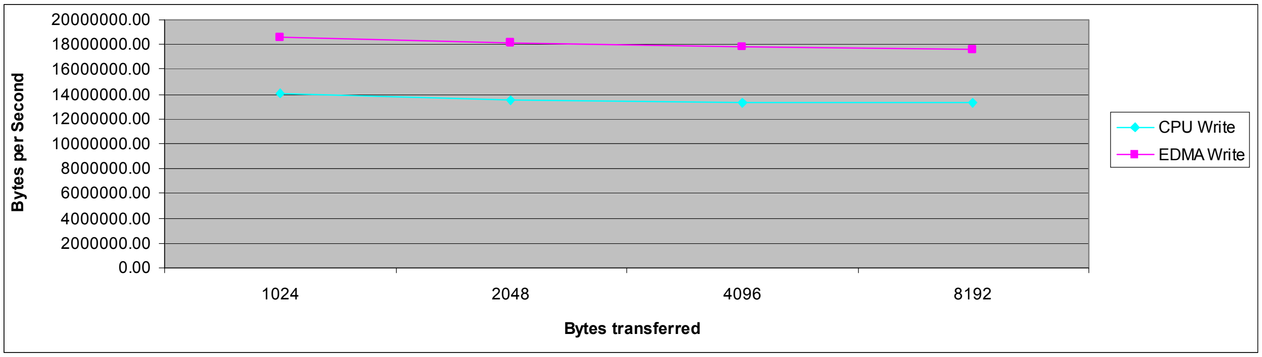
VLYNQ DEVICE DRIVER SUB-COMPONENT	PROGRAM MEMORY (IN BYTES)	DATA MEMORY (IN BYTES)		
		MEMORY TYPE		TOTAL
		INITIALIZED	UN INITIALIZED	
<TOTAL>	25408	2871	3180	**31459**
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

- System Components Total Memory (Code & Data): **31834** Bytes

Driver Profiling characteristics

API Profiled	**Trial-1**	Trial-2	**Trial-3**	**Trial-4**	**Trial-5**	**Average (usec)**	**Maximum (usec)**	**Minimum (usec)**
PAL_sysVlynqInitSoc	23472.00	23472.00	23472.00	23472.00	23472.00	23472.00	23472.00	23472.00
PAL_sysVlynqDevCreate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqAddDevice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqMapRegion	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PAL_sysVlynqMappedRegion	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PAL_sysVlynqIoctl	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
PAL_sysVlynqDump	147.00	146.00	147.00	145.00	147.00	146.00	147.00	145.00
PAL_sysVlynqDevGetVlynq	35.00	34.00	35.00	33.00	35.00	34.00	35.00	33.00
PAL_sysVlynqGetDevBase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqGetLinkStatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqGetNumRoot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqGetRoot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqGetBaseAddr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqGetRootVlynq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqDevGetResetBit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqUnMapRegion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqRemoveDevice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqDevDestroy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAL_sysVlynqCleanUp	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00

Driver Performance Characteistics



Test Setup Information	Buffer Size (Bytes)	CPU Write		EDMA Write	
		Time(usec)	Bytes/Sec	Time (usec)	Bytes/Sec
Kailash EVM inserted in PCI slot of Linux Host	1024	73.00	14027397.26	55	18618181.82
	2048	151.00	13562913.91	113	18123893.81
	4096	307.00	13342019.54	230	17808695.65
	8192	618.00	13255663.43	465	17617204.30

Comments:

Input clock to Vlynq Module = 891/6 (PLL1/6) = 148.5MHZ
Clk divisor value = 3 (Set in Testcode)
Vlynq Clock = 148.5/3 = 49.5MHz
Number of lines connected - 4 TX and 4 RX
Number of bits transmitted \ clock = 4 bits
Write Theoretical Data rate = 4 bits * 49.5 MHZ = 198 Mbits/sec

References

[1] PAL SYS VLYNQ Module Hardware Specifications

[2] BIOS Documentation from TI

[3] PAL SYS VLYNQ Device Driver Documentation

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