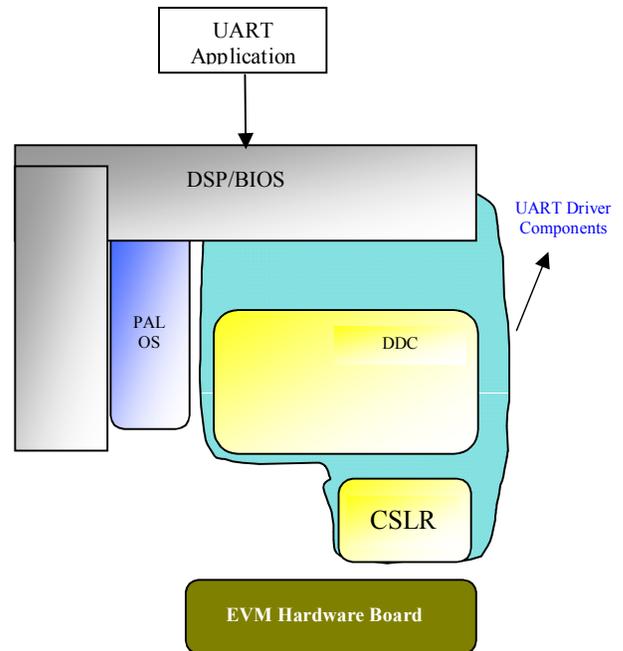- **Multi-instantiable and re-entrant safe driver**
- **Supports H/W Flow Control**
- **Provides Synch mode of operation.**
- **Operates in Polled and Interrupts**

Description

For hardware, software & S/W components used refer to the release notes in the root of the installation directory.

Capabilities

The UART 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"
- Supports Multiple Instances

The DSP/BIOS driver APIs supported follow the general call sequence depicted in figure below

For easy and quick reconfiguration of driver, all its statically configurable parameters have been isolated into a single file -- <uart/src/ddc_uart.c>.

The driver is constituted of following sub components:

- UART IOM – Application facing, OS Specific Adaptation of UART Device Driver

- UART DDC – OS Independent part of UART Driver Core

- System components – PALOS: DSP/BIOS Abstraction, CSLR: Non-UART low-level h/w register overlays such as INTC, DMA, CHIP and generic macros.

The following table gives a quick overview of the supported API services.

uart_mdBindDev	Create (and initialize) a given Uart driver (instance)
uart_mdCreateChan	Create a particular channel for the instance of the driver
uart_mdSubmitChan	For data transaction (for both read/write)(Supports only one transaction at a time) as well as supports the abort and flush .Abort cancels all the io of the instance of the port whereas Flush cancels the io of the read channel of the particular instance.

uart_mdControlChan	Ioctl interface. Ioctls Supported are:
	
	`PSP_UART_IOCTL_SET_BAUD,`
	`PSP_UART_IOCTL_SET_STOPBITS,`
	`PSP_UART_IOCTL_SET_DATABITS,`
	`PSP_UART_IOCTL_SET_PARITY,`
	`PSP_UART_IOCTL_SET_FLOWCONTROL,`
	`PSP_UART_IOCTL_SET_TRIGGER_LEVEL,`
	`PSP_UART_IOCTL_RESET_RX_FIFO,`
	`PSP_UART_IOCTL_RESET_TX_FIFO,`
	`PSP_UART_IOCTL_CANCEL_CURRENT_IO,`
	`PSP_UART_IOCTL_GET_STATS,`
	`PSP_UART_IOCTL_CLEAR_STATS,`
	`PSP_UART_IOCTL_MAX_IOCTL`

uart_mddeleteChan	Delete a particular channel for the instance of the driver
uart_mdBindDev	Delete (and de-initialize) a given Uart driver (instance)

Driver Performance Characteristics

For DM648/C6452 UART driver

UART DEVICE DRIVER SUB-COMPONENT	PROGRAM MEMORY (IN BYTES)	DATA MEMORY (IN BYTES)		TOTAL (CODE+DATA)
		MEMORY TYPE		
		INITIALIZED	UN INITIALIZED	
<uart/dda>	2016	338	248	2602
<uart/ddc>	8216	92	4064	12372
Total	10232	430	4312	14974

- UART Components Total Memory for DM648/C6452 (Code & Data): **14974** Bytes

For DM6437/C6424 UART driver

UART DEVICE DRIVER SUB-COMPONENT	PROGRAM MEMORY (IN BYTES)	DATA MEMORY (IN BYTES)		TOTAL (CODE+DATA)
		MEMORY TYPE		
		INITIALIZED	UN INITIALIZED	
<uart/dda>	2016	338	332	2686
<uart/ddc>	8216	92	5948	14256
Total	10232	430	4312	16942

- UART Components Total Memory for DM6437/C6424 (Code & Data): **16942** Bytes

Driver Profiling Characteristics

Polled Mode								
API Profiled	Trial-1	Trial-2	Trial-3	Trial-4	Trial-5	Average (uSecs)	MAX (uSecs)	MIN (uSecs)
DEV_createDevice	120.00	95.00	95.00	95.00	95.00	100.00	120.00	95.00
GIO_create	15.00	10.00	10.00	10.00	10.00	11.00	15.00	10.00
GIO_write	346.00	389	428.00	467.00	509.00	427.80	509.00	346.00
GIO_control	53175.00	51150.00	51165.00	52166.00	53203.00	52171.80	53203.00	51150.00
GIO_delete	7.00	5.00	5.00	5.00	5.00	5.40	7.00	5.00
DEV_deleteDevice	2.00	1.00	1.00	1.00	1.00	1.20	2.00	1.00
Interrupt Mode								
API Profiled	Trial-1	Trial-2	Trial-3	Trial-4	Trial-5	Average (uSecs)	MAX (uSecs)	MIN (uSecs)
DEV_createDevice	98.00	96.00	96.00	96.00	96.00	96.40	98.00	96.00
GIO_create	11.00	10.00	11.00	11.00	10.00	10.60	11.00	10.00
GIO_write	6.00	3.00	3.00	3.00	3.00	3.60	6.00	3.00
GIO_control	49516.00	55146.00	53175.00	54174.00	51168.00	52635.80	55146.00	49516.00
GIO_delete	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
DEV_deleteDevice	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

GIO_read in not profiled because it depends on user input to tera-term

Driver Performance Characteristics
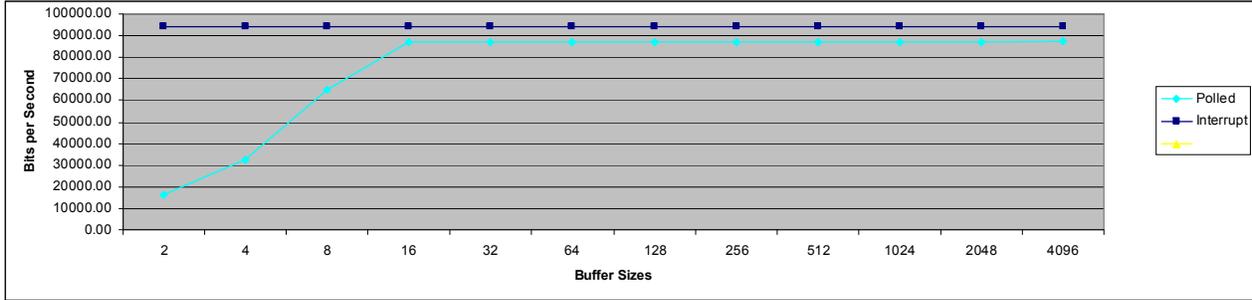
Test Setup Information	Packet Size (in bytes)	Polled			Interrupt		
		Bits/Sec	**Pkts**	**Duration**	**Bits/Sec**	**Pkts**	**Duration**
	2	16266.67	61000	60	94334.13	353753	60
	4	32533.87	61001	60	94363.73	176932	60
API Interface : GIO_Write	8	65067.73	61001	60	94349.87	88453	60
	16	86756.27	40667	60	94350.93	44227	60
	32	86758.40	20334	60	94344.53	22112	60
	64	86758.40	10167	60	94344.53	11056	60
	128	86766.93	5084	60	94344.53	5528	60
	256	86766.93	2542	60	94344.53	2764	60
	512	86766.93	1271	60	94344.53	1382	60
	1024	86835.20	636	60	94344.53	691	60
	2048	86835.20	318	60	94481.07	346	60
	4096	87381.33	160	60	94481.07	173	60

Comments:
Baud rate is configured to be 115200
System is configured as cache enabled
FIFO is enabled. Tx trigger level is 14 bytes.
Stop bit is configured to be 1.
Parity is disabled.
Flow control is disabled.
UART_TPOLL_MSECS is defined as 1

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