RSXFIFOCommands

Cross-reference: https://github.com/AlexAltea/nucleus/blob/master/docs/technical/ps3/gpu.md

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Method fields description

What is considered as rsx fifo commands is really combination of few fields describing so called "method". Single method description is 32 bit, and contain flags, addresses, and count of parameters.

Bits	View (MSB:LSB)	Description
01:01	0X000000 00000000 00000000 00000000	Flag: Non-increment
02:02	00X00000 00000000 00000000 00000000	Flag: Jump
14:14	00000000 000000X0 00000000 00000000	Flag: Return
30:30	00000000 00000000 00000000 000000X0	Flag: Call
03:13	000XXXXX XXXXXX00 00000000 00000000	Method count, since count is left shifted by 2 you can consider count as byte count & 0x1FFC
16:29	00000000 00000000 AAABBBBB BBBBBB00	Method register (2 bits right-shifted)
03:31	000XXXXX XXXXXXXX XXXXXXXX XXXXXXXX	Jump offset
00:29	XXXXXXXX XXXXXXXX XXXXXXXX XXXXXX00	Call offset (2 bits right-shifted)

Note: It seems to be possible to write continuous registers using single write with multi param count. Eg. gcmInit write 0x00080384 to setup NV4097_SET_DEPTH_BOUNDS_MIN and NV4097_SET_DEPTH_BOUNDS_MAX using one command with two 4 bytes params.

Method subchannel identifiers

Bits	View (MSB:LSB)	Description
16:18	00000000 00000000 00000000 00000000	NV40_CURIE_PRIMITIVE (NV4097) and NV40_CHANNEL_DMA (NV406E)
16:18	00000000 00000000 00100000 00000000	NV03_MEMORY_TO_MEMORY_FORMAT (NV0039)
16:18	00000000 00000000 01000000 00000000	Unused?
16:18	00000000 00000000 01100000 00000000	NV30_CONTEXT_SURFACES_2D (NV3062)
16:18	00000000 00000000 10000000 00000000	NV30_CONTEXT_SURFACE_SWIZZLED (NV309E)
16:18	00000000 00000000 10100000 00000000	NV30_IMAGE_FROM_CPU (NV308A)
16:18	00000000 00000000 11000000 00000000	NV30_SCALED_IMAGE_FROM_MEMORY (NV3089)
16:18	00000000 00000000 11100000 00000000	SCE DRIVER These methods are executed by the LV1, not by the RSX.

Method registers

The method register field consists of two fields: A 3-bit long subchannel identifier and a 11-bit long offset in that channel. At driver user-level, the whole 14-bit field can be considered as nothing but a 2-bit-rightshifted address where data goes in, optionally triggering an event.

NV40_CHANNEL_DMA

These methods are executed by the PFIFO puller itself, instead of being forwared to an engine.

Register (whole 14 bit)	Name	Description
0x0050	NV406E_SET_REFERENCE	Modify DMA control's reference register
0x0060	NV406E_SET_CONTEXT_DMA_SEMAPHORE	DMA context object
0x0064	NV406E_SEMAPHORE_OFFSET	Offset has to be smaller than 0x1000 and 4-aligned.
0x0068	NV406E_SEMAPHORE_ACQUIRE	Make the PFIFO puller wait until offset contains the parameter.
0x006C	NV406E_SEMAPHORE_RELEASE	Write parameter to the specified offset.

NV40_CURIE_PRIMITIVE

Register (whole 14 bit)	Name	Description
0x0000	NV4097_SET_OBJECT	
0x0100	NV4097_NO_OPERATION	
0x0104	NV4097_NOTIFY	
0x0110	NV4097_WAIT_FOR_IDLE	
0x0140	NV4097_PM_TRIGGER	
0x0180	NV4097_SET_CONTEXT_DMA_NOTIFIES	
0x0184	NV4097_SET_CONTEXT_DMA_A	
0x0188	NV4097_SET_CONTEXT_DMA_B	
0x018C	NV4097_SET_CONTEXT_DMA_COLOR_B	
0x0190	NV4097_SET_CONTEXT_DMA_STATE	
0x0194	NV4097_SET_CONTEXT_DMA_COLOR_A	
0x0198	NV4097_SET_CONTEXT_DMA_ZETA	
0x019C	NV4097_SET_CONTEXT_DMA_VERTEX_A	
0x01A0	NV4097_SET_CONTEXT_DMA_VERTEX_B	
0x01A4	NV4097_SET_CONTEXT_DMA_SEMAPHORE	
0x01A8	NV4097_SET_CONTEXT_DMA_REPORT	
0x01AC	NV4097_SET_CONTEXT_DMA_CLIP_ID	
0x01B0	NV4097_SET_CONTEXT_DMA_CULL_DATA	
0x01B4	NV4097_SET_CONTEXT_DMA_COLOR_C	
0x01B8	NV4097_SET_CONTEXT_DMA_COLOR_D	
0x0200	NV4097_SET_SURFACE_CLIP_HORIZONTAL	
0x0204	NV4097_SET_SURFACE_CLIP_VERTICAL	
0x0208	NV4097_SET_SURFACE_FORMAT	
0x020C	NV4097_SET_SURFACE_PITCH_A	
0x0210	NV4097_SET_SURFACE_COLOR_AOFFSET	
0x0214	NV4097_SET_SURFACE_ZETA_OFFSET	
0x0218	NV4097_SET_SURFACE_COLOR_BOFFSET	
0x021C	NV4097_SET_SURFACE_PITCH_B	
0x0220	NV4097_SET_SURFACE_COLOR_TARGET	
0x022C	NV4097_SET_SURFACE_PITCH_Z	
0x0234	NV4097_INVALIDATE_ZCULL	
0x0238	NV4097_SET_CYLINDRICAL_WRAP	

0x023C	NV4097_SET_CYLINDRICAL_WRAP1	
0x0280	NV4097_SET_SURFACE_PITCH_C	
0x0284	NV4097_SET_SURFACE_PITCH_D	
0x0288	NV4097_SET_SURFACE_COLOR_COFFSET	
0x028C	NV4097_SET_SURFACE_COLOR_DOFFSET	
0x02B8	NV4097_SET_WINDOW_OFFSET	
0x02BC	NV4097_SET_WINDOW_CLIP_TYPE	
0x02C0	NV4097_SET_WINDOW_CLIP_HORIZONTAL	
0x02C4	NV4097_SET_WINDOW_CLIP_VERTICAL	
0x0300	NV4097_SET_DITHER_ENABLE	
0x0304	NV4097_SET_ALPHA_TEST_ENABLE	
0x0308	NV4097_SET_ALPHA_FUNC	
0x030C	NV4097_SET_ALPHA_REF	
0x0310	NV4097_SET_BLEND_ENABLE	
0x0314	NV4097_SET_BLEND_FUNC_SFACTOR	
0x0318	NV4097_SET_BLEND_FUNC_DFACTOR	
0x031C	NV4097_SET_BLEND_COLOR	
0x0320	NV4097_SET_BLEND_EQUATION	
0x0324	NV4097_SET_COLOR_MASK	
0x0328	NV4097_SET_STENCIL_TEST_ENABLE	
0x032C	NV4097_SET_STENCIL_MASK	
0x0330	NV4097_SET_STENCIL_FUNC	
0x0334	NV4097_SET_STENCIL_FUNC_REF	
0x0338	NV4097_SET_STENCIL_FUNC_MASK	
0x033C	NV4097_SET_STENCIL_OP_FAIL	
0x0340	NV4097_SET_STENCIL_OP_ZFAIL	
0x0344	NV4097_SET_STENCIL_OP_ZPASS	
0x0348	NV4097_SET_TWO_SIDED_STENCIL_TEST_ENABLE	
0x034C	NV4097_SET_BACK_STENCIL_MASK	
0x0350	NV4097_SET_BACK_STENCIL_FUNC	
0x0354	NV4097_SET_BACK_STENCIL_FUNC_REF	
0x0358	NV4097_SET_BACK_STENCIL_FUNC_MASK	
0x035C	NV4097_SET_BACK_STENCIL_OP_FAIL	
0x0360	NV4097_SET_BACK_STENCIL_OP_ZFAIL	
0x0364	NV4097_SET_BACK_STENCIL_OP_ZPASS	

0x0368	NV4097_SET_SHADE_MODE	
0x036C	NV4097_SET_BLEND_ENABLE_MRT	
0x0370	NV4097_SET_COLOR_MASK_MRT	
0x0374	NV4097_SET_LOGIC_OP_ENABLE	
0x0378	NV4097_SET_LOGIC_OP	
0x037C	NV4097_SET_BLEND_COLOR2	
0x0380	NV4097_SET_DEPTH_BOUNDS_TEST_ENABLE	
0x0384	NV4097_SET_DEPTH_BOUNDS_MIN	When writing 2 params, second param will be used to setup NV4097_SET_DEPTH_BOUNDS_MAX
0x0388	NV4097_SET_DEPTH_BOUNDS_MAX	
0x0394	NV4097_SET_CLIP_MIN	
0x0398	NV4097_SET_CLIP_MAX	
0x03B0	NV4097_SET_CONTROL0	
0x03B8	NV4097_SET_LINE_WIDTH	
0x03BC	NV4097_SET_LINE_SMOOTH_ENABLE	
0x03C0	NV4097_SET_ANISO_SPREAD	
0x08C0	NV4097_SET_SCISSOR_HORIZONTAL	
0x08C4	NV4097_SET_SCISSOR_VERTICAL	
0x08CC	NV4097_SET_FOG_MODE	
0x08D0	NV4097_SET_FOG_PARAMS	
0x08E4	NV4097_SET_SHADER_PROGRAM	
0x0900	NV4097_SET_VERTEX_TEXTURE_OFFSET	
0x0904	NV4097_SET_VERTEX_TEXTURE_FORMAT	
0x0908	NV4097_SET_VERTEX_TEXTURE_ADDRESS	
0x090C	NV4097_SET_VERTEX_TEXTURE_CONTROL0	
0x0910	NV4097_SET_VERTEX_TEXTURE_CONTROL3	
0x0914	NV4097_SET_VERTEX_TEXTURE_FILTER	
0x0918	NV4097_SET_VERTEX_TEXTURE_IMAGE_RECT	
0x091C	NV4097_SET_VERTEX_TEXTURE_BORDER_COLOR	
0x0A00	NV4097_SET_VIEWPORT_HORIZONTAL	
0x0A04	NV4097_SET_VIEWPORT_VERTICAL	
0x0A0C	NV4097_SET_POINT_CENTER_MODE	
0x0A1C	NV4097_ZCULL_SYNC	
0x0A20	NV4097_SET_VIEWPORT_OFFSET	
0x0A30	NV4097_SET_VIEWPORT_SCALE	

0x0A60	NV4097_SET_POLY_OFFSET_POINT_ENABLE	
0x0A64	NV4097_SET_POLY_OFFSET_LINE_ENABLE	
0x0A68	NV4097_SET_POLY_OFFSET_FILL_ENABLE	
0x0A6C	NV4097_SET_DEPTH_FUNC	
0x0A70	NV4097_SET_DEPTH_MASK	
0x0A74	NV4097_SET_DEPTH_TEST_ENABLE	
0x0A78	NV4097_SET_POLYGON_OFFSET_SCALE_FACTOR	
0x0A7C	NV4097_SET_POLYGON_OFFSET_BIAS	
0x0A80	NV4097_SET_VERTEX_DATA_SCALED4S_M	
0x0B00	NV4097_SET_TEXTURE_CONTROL2	
0x0B40	NV4097_SET_TEX_COORD_CONTROL	
0x0B80	NV4097_SET_TRANSFORM_PROGRAM	Copy 128-bit data to PGRAPH's VPE instruction buffer at the LOAD offset by collecting 32-bit chunks.
0x1428	NV4097_SET_SPECULAR_ENABLE	
0x142C	NV4097_SET_TWO_SIDE_LIGHT_EN	
0x1438	NV4097_CLEAR_ZCULL_SURFACE	
0x1450	NV4097_SET_PERFORMANCE_PARAMS	
0x1454	NV4097_SET_FLAT_SHADE_OP	
0x145C	NV4097_SET_EDGE_FLAG	
0x1478	NV4097_SET_USER_CLIP_PLANE_CONTROL	
0x147C	NV4097_SET_POLYGON_STIPPLE	
0x1480	NV4097_SET_POLYGON_STIPPLE_PATTERN	
0x1500	NV4097_SET_VERTEX_DATA3F_M	
0x1680	NV4097_SET_VERTEX_DATA_ARRAY_OFFSET	
0x1710	NV4097_INVALIDATE_VERTEX_CACHE_FILE	
0x1714	NV4097_INVALIDATE_VERTEX_FILE	
0x1718	NV4097_PIPE_NOP	
0x1738	NV4097_SET_VERTEX_DATA_BASE_OFFSET	
0x173C	NV4097_SET_VERTEX_DATA_BASE_INDEX	
0x1740	NV4097_SET_VERTEX_DATA_ARRAY_FORMAT	
0x17C8	NV4097_CLEAR_REPORT_VALUE	
0x17CC	NV4097_SET_ZPASS_PIXEL_COUNT_ENABLE	
0x1800	NV4097_GET_REPORT	
0x1804	NV4097_SET_ZCULL_STATS_ENABLE	

0x1808	NV4097_SET_BEGIN_END	Locks or unlocks PGRAPH state while submitting vertex/index/inlined data to draw
0x180C	NV4097_ARRAY_ELEMENT16	
0x1810	NV4097_ARRAY_ELEMENT32	
0x1814	NV4097_DRAW_ARRAYS	
0x1818	NV4097_INLINE_ARRAY	
0x181C	NV4097_SET_INDEX_ARRAY_ADDRESS	
0x1820	NV4097_SET_INDEX_ARRAY_DMA	
0x1824	NV4097_DRAW_INDEX_ARRAY	
0x1828	NV4097_SET_FRONT_POLYGON_MODE	
0x182C	NV4097_SET_BACK_POLYGON_MODE	
0x1830	NV4097_SET_CULL_FACE	
0x1834	NV4097_SET_FRONT_FACE	
0x1838	NV4097_SET_POLY_SMOOTH_ENABLE	
0x183C	NV4097_SET_CULL_FACE_ENABLE	
0x1840	NV4097_SET_TEXTURE_CONTROL3	
0x1880	NV4097_SET_VERTEX_DATA2F_M	
0x1900	NV4097_SET_VERTEX_DATA2S_M	
0x1940	NV4097_SET_VERTEX_DATA4UB_M	
0x1980	NV4097_SET_VERTEX_DATA4S_M	
0x1A00	NV4097_SET_TEXTURE_OFFSET	
0x1A04	NV4097_SET_TEXTURE_FORMAT	
0x1A08	NV4097_SET_TEXTURE_ADDRESS	
0x1A0C	NV4097_SET_TEXTURE_CONTROL0	
0x1A10	NV4097_SET_TEXTURE_CONTROL1	
0x1A14	NV4097_SET_TEXTURE_FILTER	
0x1A18	NV4097_SET_TEXTURE_IMAGE_RECT	
0x1A1C	NV4097_SET_TEXTURE_BORDER_COLOR	
0x1C00	NV4097_SET_VERTEX_DATA4F_M	
0x1D00	NV4097_SET_COLOR_KEY_COLOR	
0x1D60	NV4097_SET_SHADER_CONTROL	
0x1D64	NV4097_SET_INDEXED_CONSTANT_READ_LIMITS	
0x1D6C	NV4097_SET_SEMAPHORE_OFFSET	
0x1D70	NV4097_BACK_END_WRITE_SEMAPHORE_RELEASE	
0x1D74	NV4097_TEXTURE_READ_SEMAPHORE_RELEASE	

0x1D78	NV4097_SET_ZMIN_MAX_CONTROL	
0x1D7C	NV4097_SET_ANTI_ALIASING_CONTROL	
0x1D80	NV4097_SET_SURFACE_COMPRESSION	
0x1D84	NV4097_SET_ZCULL_EN	
0x1D88	NV4097_SET_SHADER_WINDOW	
0x1D8C	NV4097_SET_ZSTENCIL_CLEAR_VALUE	
0x1D90	NV4097_SET_COLOR_CLEAR_VALUE	
0x1D94	NV4097_CLEAR_SURFACE	
0x1D98	NV4097_SET_CLEAR_RECT_HORIZONTAL	
0x1D9C	NV4097_SET_CLEAR_RECT_VERTICAL	
0x1DA4	NV4097_SET_CLIP_ID_TEST_ENABLE	
0x1DAC	NV4097_SET_RESTART_INDEX_ENABLE	
0x1DB0	NV4097_SET_RESTART_INDEX	
0x1DB4	NV4097_SET_LINE_STIPPLE	
0x1DB8	NV4097_SET_LINE_STIPPLE_PATTERN	
0x1E40	NV4097_SET_VERTEX_DATA1F_M	
0x1E94	NV4097_SET_TRANSFORM_EXECUTION_MODE	
0x1E98	NV4097_SET_RENDER_ENABLE	
0x1E9C	NV4097_SET_TRANSFORM_PROGRAM_LOAD	Set PGRAPH's VPE LOAD register, which specifies the offset where new instructions are copied.
0x1EA0	NV4097_SET_TRANSFORM_PROGRAM_START	Set PGRAPH's VPE START register.
0x1EA4	NV4097_SET_ZCULL_CONTROL0	
0x1EA8	NV4097_SET_ZCULL_CONTROL1	
0x1EAC	NV4097_SET_SCULL_CONTROL	
0x1EE0	NV4097_SET_POINT_SIZE	
0x1EE4	NV4097_SET_POINT_PARAMS_ENABLE	
0x1EE8	NV4097_SET_POINT_SPRITE_CONTROL	
0x1EF8	NV4097_SET_TRANSFORM_TIMEOUT	
0x1EFC	NV4097_SET_TRANSFORM_CONSTANT_LOAD	
0x1F00	NV4097_SET_TRANSFORM_CONSTANT	
0x1FC0	NV4097_SET_FREQUENCY_DIVIDER_OPERATION	
0x1FC4	NV4097_SET_ATTRIB_COLOR	
0x1FC8	NV4097_SET_ATTRIB_TEX_COORD	
0x1FCC	NV4097_SET_ATTRIB_TEX_COORD_EX	
0x1FD0	NV4097_SET_ATTRIB_UCLIP0	

0x1FD4	NV4097_SET_ATTRIB_UCLIP1	
0x1FD8	NV4097_INVALIDATE_L2	
0x1FE0	NV4097_SET_REDUCE_DST_COLOR	
0x1FE8	NV4097_SET_NO_PARANOID_TEXTURE_FETCHES	
0x1FEC	NV4097_SET_SHADER_PACKER	
0x1FF0	NV4097_SET_VERTEX_ATTRIB_INPUT_MASK	
0x1FF4	NV4097_SET_VERTEX_ATTRIB_OUTPUT_MASK	
0x1FF8	NV4097_SET_TRANSFORM_BRANCH_BITS	

NV03_MEMORY_TO_MEMORY_FORMAT

Register (whole 14 bit)	Name	Description
0x2000	NV0039_SET_OBJECT	
0x2180	NV0039_SET_CONTEXT_DMA_NOTIFIES	
0x2184	NV0039_SET_CONTEXT_DMA_BUFFER_IN	
0x2188	NV0039_SET_CONTEXT_DMA_BUFFER_OUT	
0x230C	NV0039_OFFSET_IN	
0x2310	NV0039_OFFSET_OUT	
0x2314	NV0039_PITCH_IN	
0x2318	NV0039_PITCH_OUT	
0x231C	NV0039_LINE_LENGTH_IN	
0x2320	NV0039_LINE_COUNT	
0x2324	NV0039_FORMAT	
0x2328	NV0039_BUFFER_NOTIFY	

NV30_CONTEXT_SURFACES_2D (NV3062)

Register (whole 14 bit)	Name	Description
0x6000	NV3062_SET_OBJECT	
0x6180	NV3062_SET_CONTEXT_DMA_NOTIFIES	
0x6184	NV3062_SET_CONTEXT_DMA_IMAGE_SOURCE	
0x6188	NV3062_SET_CONTEXT_DMA_IMAGE_DESTIN	
0x6300	NV3062_SET_COLOR_FORMAT	
0x6304	NV3062_SET_PITCH	
0x6308	NV3062_SET_OFFSET_SOURCE	
0x630C	NV3062_SET_OFFSET_DESTIN	

NV30_CONTEXT_SURFACE_SWIZZLED

Register (whole 14 bit)	Name	Description
0x8000	NV309E_SET_OBJECT	
0x8180	NV309E_SET_CONTEXT_DMA_NOTIFIES	
0x8184	NV309E_SET_CONTEXT_DMA_IMAGE	
0x8300	NV309E_SET_FORMAT	
0x8304	NV309E_SET_OFFSET	

NV30_IMAGE_FROM_CPU (NV308A)

Register (whole 14 bit)	Name	Description
0xA000	NV308A_SET_OBJECT	
0xA180	NV308A_SET_CONTEXT_DMA_NOTIFIES	
0xA184	NV308A_SET_CONTEXT_COLOR_KEY	
0xA188	NV308A_SET_CONTEXT_CLIP_RECTANGLE	
0xA18C	NV308A_SET_CONTEXT_PATTERN	
0xA190	NV308A_SET_CONTEXT_ROP	
0xA194	NV308A_SET_CONTEXT_BETA1	
0xA198	NV308A_SET_CONTEXT_BETA4	
0xA19C	NV308A_SET_CONTEXT_SURFACE	
0xA2F8	NV308A_SET_COLOR_CONVERSION	
0xA2FC	NV308A_SET_OPERATION	
0xA300	NV308A_SET_COLOR_FORMAT	
0xA304	NV308A_POINT	
0xA308	NV308A_SIZE_OUT	
0xA30C	NV308A_SIZE_IN	
0xA400	NV308A_COLOR	

NV30_SCALED_IMAGE_FROM_MEMORY

Register (whole 14 bit)	Name	Description
0xC000	NV3089_SET_OBJECT	
0xC180	NV3089_SET_CONTEXT_DMA_NOTIFIES	
0xC184	NV3089_SET_CONTEXT_DMA_IMAGE	
0xC188	NV3089_SET_CONTEXT_PATTERN	
0xC18C	NV3089_SET_CONTEXT_ROP	
0xC190	NV3089_SET_CONTEXT_BETA1	
0xC194	NV3089_SET_CONTEXT_BETA4	
0xC198	NV3089_SET_CONTEXT_SURFACE	
0xC2FC	NV3089_SET_COLOR_CONVERSION	
0xC300	NV3089_SET_COLOR_FORMAT	
0xC304	NV3089_SET_OPERATION	
0xC308	NV3089_CLIP_POINT	
0xC30C	NV3089_CLIP_SIZE	
0xC310	NV3089_IMAGE_OUT_POINT	
0xC314	NV3089_IMAGE_OUT_SIZE	
0xC318	NV3089_DS_DX	
0xC31C	NV3089_DT_DY	
0xC400	NV3089_IMAGE_IN_SIZE	
0xC404	NV3089_IMAGE_IN_FORMAT	
0xC408	NV3089_IMAGE_IN_OFFSET	
0xC40C	NV3089_IMAGE_IN	

SCE DRIVER

These methods are executed by the LV1, not by the RSX.

Register (whole 14 bit)	Name	Description
0xE000	SCE_DRIVER_SET_OBJECT	
0xE920	SCE_DRIVER_FLIP	Head is specified by the 2 possible indices [0xE920:0E924]
0xE940	SCE_DRIVER_QUEUE	Head is specified by the 8 possible indices [0xE940:0E95C]
0xEB00	SCE_DRIVER_INTERRUPT	

Commands

NOP (0x00000100)

- Nop

```
0x00000100
```

CALL (0x00000002)

- Calls a function at the specified offset.
- Command size is **0**.
- The parameter is offset in FIFO buffer.

```
<offset> | 0x00000002
```

RET (0x00020000)

- Returns from a function.
- Command size is **0**.

```
0x00020000
```

JMP (0x20000000)

- Jumps to the specified offset.
- Command size is **0**.
- The parameter is offset in FIFO buffer.

```
0x20000000 | <offset>
```

COLOR MASK (0x00040324)

- Sets color mask.
- Command size is **1**.
- The parameter is color mask.

```
0x00040324
<color mask>
```

COLOR MASK MRT (0x00040370)

```
0x00040370
<color mask>
```

CLEAR COLOR (0x00041D90)

```
0x00041D90
<value>
```

FRONT POLYGON MODE (0x00041828)

- Sets front polygon mode.
- Command size is **1**.
- The parameter is front polygon mode.

```
0x00041828
<front polygon mode>
```

SET REF (0x00040050)

- Sets value of REF control register

```
0x00040050
<value>
```

SEMAPHORE DMA CONTEXT (0x00040060)

- Sets semaphore DMA context

```
0x00040060
<value>
```

SEMAPHORE OFFSET (0x00040064)

- Sets semaphore offset

```
0x00040064
<value>
```

SEMAPHORE ACQUIRE (0x00040068)

- Acquires semaphore

```
0x00040068
<value>
```

SEMAPHORE RELEASE (0x0004006C)

- Releases semaphore

```
0x0004006C
<value>
```

libgcm Functions

cellGcmGetControlRegister

- Returns EA of FIFO registers: PUT, GET and REF

cellGcmFlush

- Kicks FIFO command processing by moving PUT register

cellGcmFinish

- This function adds FIFO command for setting REF register to value 0xFFFFFFFF, kicks FIFO and then loops and checks REF register until it is set to value 0xFFFFFFFF.
- It just waits until all FIFO commands are processed by GPU.

cellGcmGetFlipStatus

- Returns flip status.
- **Checks bit 31 in word at offset 0x10C0 + 0x1 * 0x40 of reports area returned by lv1_gpu_context_allocate.**
- Flip status = ((word at 0x10C0 + 0x1 * 0x40) >> 31) ^ 0x1.
- Flip status: 0 - flip done, 1 - flip waiting

cellGcmResetFlipStatus

- Resets flip status.
- Sets flip status to **flip waiting**.
- Sets bit 31 to 0 in word at offset 0x10C0 + 0x1 * 0x40 of reports area returned by lv1_gpu_context_allocate.

Equivalent to:

```
lv1_gpu_context_attribute(context handle, 0x10a, 0x1 /* id */, 0x7fffffff /* mask */, 0x0 /* value */,
0x0)
```

libgcm Commands

SetNopCommand

```
0x00000000
```

SetReferenceCommand

```
0x00040050
<param>
```

SetJumpCommand

```
0x20000000 | <param>
```

SetCallCommand

```
0x00000002 | <param>
```

SetReturnCommand

```
0x00002000
```

SetLogicOp

- Sets pixel logical operation

```
0x00040378
<param>
```

SetLogicOpEnable

- Enables/Disables pixel logical operation

```
0x00040374
<param>
```

SetColorMask

```
0x00040324
<param>
```

SetColorMaskMrt

```
0x00040370
<param>
```

SetClearColor

```
0x00041D90
```

```
<param>
```

SetClearDepthStencil

```
0x00041D8C
<param>
```

SetClearSurface

```
0x00041D94
<param>
0x00040100
<param>
```

SetFrontPolygonMode

```
0x00041828
<param>
```

SetFrontFace

```
0x00041834
<param>
```

SetAlphaTestEnable

```
0x00040304
<param>
```

SetAlphaFunc

```
0x00080308
<param1>
<param2>
```

SetDepthTestEnable

```
0x00040A74
<param>
```

SetDepthFunc

```
0x00040A6C
<param>
```

SetDepthBounds

```
0x00080384
<param1>
<param2>
```

SetBlendEnable

```
0x00040310
<param>
```

SetBlendFunc

```
0x00080314
<param1>
<param2>
```

SetBlendColor

```
0x0004031C
<param>
0x0004037C
<param>
```

SetBlendEquation

```
0x00040320
<param>
```

SetClipMinMax

- Sets Z clipping values

```
0x00080394
<param1>
<param2>
```

SetZcullEnable

- Enables/Disables Zcull/Scull

```
0x00041D84
<param>
```

SetPointSize

```
0x00041EE0
<param>
```

SetWriteCommandLabel

- Releases semaphore.

```
0x00040064
<param>
0x0004006C
<param>
```

SetWaitLabel

- Acquires semaphore.

```
0x00040064
<param>
0x00040068
<param>
```

SetWriteBackEndLabel

```
0x00041D6C
<param>
0x00041D70
<param>
```

SetWriteBackEndLabelForConditional

```
0x00041D6C
<param>
0x00041D70
<param>
0x00040110
0x00000000
```

SetWaitForIdle

```
0x00040110
0x00000000
```

SetWaitFlip

- SetWaitFlip is nothing more than acquiring semaphore.
- This command is equal to SetWaitLabel with **index=0x00000001** and **value=0x00000000**.

```
0x00040064
0x00000010       # semaphore offset = index * 16
0x00040068
0x00000000
```

SetReportLocation

```
0x000401A8
<param>
```

SetReport

```
0x00041800
<param>
```

SetTimeStamp

```
0x00041800
<param>
```

SetClearReport

```
0x000417c8
<param>
```

SetCullFace

- Specifies culling face (front or back)

```
0x00041830
<param>
```

SetCullFaceEnable

- Enables/Disables face culling

```
0x0004183C
<param>
```

SetViewport

```
0x00080A00
<param1>
<param2>
0x00080394
<param1>
<param2>
0x200A20
<param1>
```

```
<param2>
<param3>
<param4>
<param5>
<param6>
<param7>
<param8>
0x200A20
<param1>
<param2>
<param3>
<param4>
<param5>
<param6>
<param7>
<param8>
```

SetLineWidth

```
0x000403B8
<param>
```

SetLineSmoothEnable

```
0x000403BC
<param>
```

SetTextureAddress

```
0x00041A08 + (param1 << 5)
<param2>
```

SetTextureControl

```
0x00041A0C + (param1 << 5)
<param2>
```

SetTextureFilter

```
0x00041A14 + (param1 << 5)
<param2>
```

SetFogMode

```
0x000408CC
<param>
```

SetNotifyIndex

```
0x00040180
```

```
0x6660420F - <param>
```

SetNotify

```
0x00040104
0x00000000
0x00040100
0x00000000
```

SetTransferDataMode

```
0x00082184
<source>            # 0xFEED0000 - local memory, 0xFEED0001 - system memory
<destination>       # 0xFEED0000 - local memory, 0xFEED0001 - system memory
```

SetTransferDataOffset

```
0x0004230C
<source address>

0x00042310
<destination address>

0x00042328
0x00000000
```

SetTransferDataFormat

```
0x00142314
<source pitch>
<destination pitch>
<line length>
<line count>
<destination increment> << 8 | <source increment>
```

SetTransferLocation

```
0x00046188
<destination>            # 0xFEED0000 - local memory, 0xFEED0001 - system memory
```

SetTransferData

```
0x00082184
<source>                 # 0xFEED0000 - local memory, 0xFEED0001 - system memory
<destination>            # 0xFEED0000 - local memory, 0xFEED0001 - system memory

for (each row)
{
    0x0020230C
    <source address>
    <destination address>
    0x00000000
    0x00000000
    <number of bytes to transfer>    # max 0x3FFFFF bytes
```

```
    0x00000001
    0x00000101
    0x00000000
}
```

SetSurfaceWindow

```
0x00040194
<param>
0x0004018C
<param>
0x000801B4
<param1>
<param2>
0x00040198
<param>

TODO
```

SetVertexTextureAddress

```
0x00040900 + (index * 0x20)
(wrapt << 8) | wraps
```

SetVertexDataArray

```
0x00041740 + (index * 0x4)
param
0x00041680 + (index * 0x4)
param
```

libgcm System Semaphores

Offset	Value	Description
0x00000010	0x00000000	Flip done semaphore (used by cellGcmWaitFlip)

Semaphores

Small Test

Here is a FIFO program i executed on Linux:

```
0x00040060     # set semaphore DMA context method
0x66616661     # DMA object handle
0x00040064     # set semaphore offset method
0x00000400     # semaphore offset
0x0004006C     # semaphore release method
0xf00dbeef     # semaphore value
```

And here is dump of reports area:

```
000003f8: 0x1337beef
000003fc: 0x1337f001
00000400: 0xf00dbeef   # semaphore value
00000404: 0x1337babe
00000408: 0x1337beef
0000040c: 0x1337f001
```

- As you see releasing semaphore writes 0xf00dbeef to reports area at offset 0x400.

Reports Area

- PS3:HvReverseEngineering:RSXFIFOCommands:ReportsAreaDump

v · e (https://www.psdevwiki.com/ps3/edit/Template:Development) **Development**

SDK	Cell Programming IBM · PSL1GHT · PSDK3v2 · SCEI PS3 SDK
VSH	VSH Exports · VSH Imports · DIVXDRM Exports · PAF WEB Exports
IDs + labels	Category ID · Category ID Label · Chassis ID · Console ID · Client ID · Client Secret · Content ID · Entitlement ID · Entitlement Label · IDPS · NID · NP Communication ID · NP Communication Signature · NP OnlineID · NP Passphrase · NP Service Label · NP Title ID · NP Title Secret · OpenPSID · Platform ID · Product Code · Product Sub Code · Product ID · Product Label · Service Entitlement ID · Service Entitlement Label · Publisher ID · Service ID · SKU ID · SKU Label · Slot ID · TITLE_ID · Serial Database
Reference	Program Authority ID · Program Vender Id · Dev Tools · DeviceID · Devices · HV Syscall Reference · HV Syscalls · Iso module · Loaders · LV2 Functions and Syscalls · LV2 Handling · PS3 Payload Development · RSXFIFOCommands · Synergistic Processing Unit (SPU) · Documented SPU Channels · Undocumented SPU Channels · Gitbrew · Gitorious · OpenCLit · PS3-Documents
Others	Multimedia Formats and Tools · Game Engines · Game Modding · Unreal Development Kit 3 · Codenames



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