

Timing Lightning Talk

Ryan McClanahan

Overview

Role

Filling in for Carolina while on maternity leave

All TPRs

PyDM troubleshooting display

BSA Ready flag

State notation language

Engines Display

PyDM troubleshooting display

Courtesy of Chris Myers

BSA Verification

Python diagnostic tool

Please hold questions

If enough interest will follow up with another presentation

Role While Carolina is Away

- Ryan
 - Fill in as first contact for Carolina while she is away Sept 19 – Nov 15
 - In case of timing issues assign new CATERs to Ryan;
 - On call for ACR Timing issues
 - For timing questions email timing-support@slac.stanford.edu
 - Upcoming plan to fix some SC BSA edge issues happening when fault buffers are running
 - Future presentations about BSAS and then BLD
 - Continue to work with TID and organize meetings as needed to make the needed progress while Carolina is out
- Alex
 - Alex Ng is developing further the TPGGUI tools
 - Alex and I will continue to work together to fulfill OPS requirements for the timing patterns.

BSA Ready Flag

The screenshot shows the 'bsaBufferDef - PyDM (on lcls-srv01)' interface. The main title is 'SC BSA Acquisition' with a timestamp of '09/13/2023 14:29:30' and 'PRODUCTION' mode. The 'BSA#' is 23. The 'Acquisition' section shows 'BSA data: Ready' and 'Percent complete: 100.0 %', both highlighted with a red box. The 'Destination Selection' table is as follows:

Destination	Current Rate	Facility Mode
LASER	0 Hz	
SC_DIAG0	0 Hz	
SC_BSYD	100 Hz	
SC_HXR	0 Hz	NC
SC_SXR	1000 Hz	SC
SC_DASEL	0 Hz	

At the bottom, the 'Number to Average per Measurement' is 1, 'Total to Acquire' is 24, 'Number of Measurements' is 0, and 'Total Acquired so far' is 24. Buttons for 'View Data', 'Reset', and 'Release Buffer' are visible.

Needed as data can take a long time to be ready after the acquisition

Percent Complete also added

Expert Timing Displays

Dialog - PyDM (on lcls-srv01)

File View History Tools

SC Timing Expert Display

2023/09/13 14:43:42 545798424

	Manual Fault	BCS Fault	MPS Fault	Tag	MPS Tag	Status	
FLT Buf0	0	0	1	4080	10021		Clear
FLT Buf1	0	0	1	4079	10013		Clear
FLT Buf2	0	0	1	4081	10026		Clear
FLT Buf3	0	0	1	4082	10031		Clear

Fault Counts 5005644

PLL Change Counter 1

186MHz Counter 736009581

Sync Error Counter 1

Interval Counter 181999999

Base Rate Trig Counter 910000

TX Clock Counter 782478829

Delta TxClk 23494889

Tx Clock Rate(M Counts/sec) 100

Counter Reset Clear

MPS Link Diagnostics

Physical Link Rx Ready

Physical Link Tx Ready

Local Link Ready

Remote Link Ready

Rx Clock Frequency 250000200

Tx Clock Frequency 250000200

Rx Frame Error Count 65535

Rx Frame Count 960884163

IP Address IP address not applicable

Firmware Version 0

Allow Engines 16

Beam Engines 16

Expr Engines 68

BSA Arrays 44

Seq AddrWidth 11

FIFO AddrWidth 0

HOLDOFF Fault Buffer 10000

INHIBIT Fault Buffer 900000000

RefClock Lock Cnt 0

RefClock Lost Cnt 0

RefClock Lost Present

SC Timing Verification Tool Open

Pattern Programmer status 216498

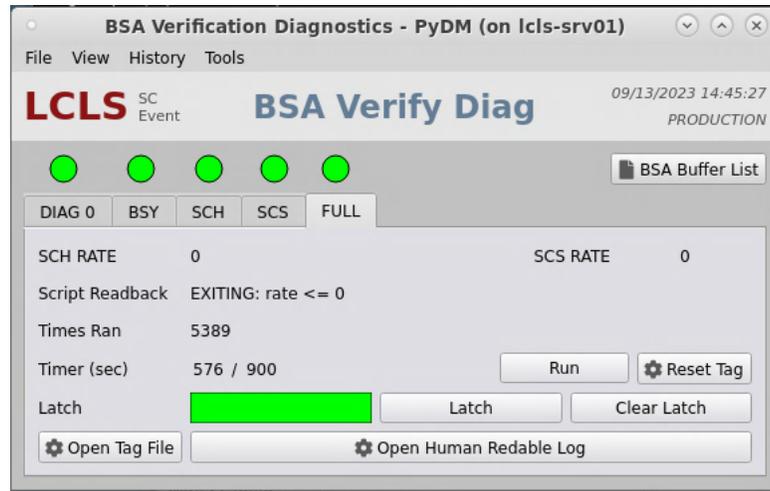
Pattern Programmer Start Stop

Active Fanout status 1201487

Active Fanout comp script Start Stop

Engines All TPRs BSA Verification Fanout Controls

BSA Verification



Pair down eget tag so users are 😊 and not ☹️

- This makes BSA Ready flag faster (take 3-10s rather than 60s timeout)

Help identify which PVs are not participating in BSA

Help identify issues with BSA

Script for each destination

Only runs diag if there is rate

TPR Display

All Tprs - PyDM (on lcls-srv01)

LCLS SC 09/13/2023 14:54:19 PRODUCTION

EVENT

Previous BSY0 Next

EVR	IOC Location	Type	Pattern	Fiducial	RX Link:			RESET	Expert Display
					Status	Last 2 sec	Count		
IOC:BSY0:BP01	B136-2522	BPM	Pattern	360.0	ON	0	386	RESET	EVR BP01
IOC:BSY0:IM01	B136-2546	Toroid	Pattern	360.0	ON	0	2	RESET	EVR IM01
IOC:BSY0:MP01	8005-Rm112-404-19	MPS	Pattern	360.0	ON	0	0	RESET	EVR MP01
IOC:MCC0:BC01	8005-208	Wire Scanner	Pattern	360.0	ON	0	24	RESET	EVR BC01
IOC:SYS0:BD01	8005-2030		Pattern	360.0	ON	0	20	RESET	EVR BD01
IOC:SYS0:BD02	8005-2930		Pattern	360.0	ON	0	21	RESET	EVR BD02
SIOC:BSY0:TR01	cpu-sys0-fb01		Pattern	360.0	ON	0	0	RESET	EVR TR01
SIOC:BSY0:TR02	cpu-sys0-fb02		Pattern	360.0	ON	0	0	RESET	EVR TR02
SIOC:SYS0:GN01	cpu-sys0-fb02		Pattern	360.0	ON	0	0	RESET	EVR GN01
SIOC:SYS0:LG01	cpu-sys0-fb02		Pattern	360.0	ON	0	0	RESET	EVR LG01
SIOC:SYS0:LG02	SIOC:SYS0:LG02:LOC		Pattern	:-FIDUCIALRATE	YS0:LG0	NKERR	RRCNT	RESET	EVR LG02

TPR	IOC Location	Mode	Type	Fiducial	Version	RX Link:			TimingCore ERROR Counts:		Expert Display
						Status	Latch	RESET	Decoding	Disparity	
TPR:BSYH:BP01:0	cpu-sph-sp06	NC	BPM	0.0	No Error	●	●	RESET	10614186	24768192	TPR:BSYH:BP01:0
TPR:BSYH:BP02:0	cpu-bsyh-sp01	NC	BPM	0.0	No Error	●	●	RESET	-1	-1	TPR:BSYH:BP02:0
TPR:BSYH:BP03:0	cpu-bsyh-sp01	NC	BPM	0.0	No Error	●	●	RESET	-390728473	-1757359622	TPR:BSYH:BP03:0
TPR:BSYH:MP01:0	cpu-bsyh-sp01	NC	MPS	0.0	No Error	●	---	---	-1597622945	-1836548762	TPR:BSYH:MP01:0
TPR:BSYH:MP02:0	cpu-bsyh-sp01	NC	MPS	358.0	No Error	●	---	---	-1	-1	TPR:BSYH:MP02:0
TPR:BSYH:MP03:0	cpu-bsyh-sp02	NC	MPS	361.0	No Error	●	---	---	-1	-1	TPR:BSYH:MP03:0
TPR:BSYS:BP01:0	cpu-bsys-sp01	SC	BPM	0.0	No Error	●	●	RESET	51055113	38250965	TPR:BSYS:BP01:0
TPR:BSYS:MP01:0	cpu-bsys-sp01	SC	MPS	930717.0	No Error	●	---	---	-1246097753	-1516501682	TPR:BSYS:MP01:0
TPR:BSYS:MP02:0	cpu-bsys-sp01	SC	MPS	930847.5	No Error	●	---	---	-1	-1	TPR:BSYS:MP02:0
TPR:BSYS:MP03:0	cpu-bsys-sp01	SC	MPS	931723.0	No Error	●	---	---	-1	-1	TPR:BSYS:MP03:0
TPR:BSYS:MP04:0	cpu-bsys-sp02	SC	MPS	930831.5	No Error	●	---	---	147732	170580	TPR:BSYS:MP04:0
TPR:CLTS:BP01:0	cpu-sps-sp05	NC	BPM	0.0	No Error	●	●	RESET	22485719	182678185	TPR:CLTS:BP01:0
TPR:CLTS:BP02:0	cpu-sps-sp05	NC	BPM	0.0	No Error	●	●	RESET	25463320	184216086	TPR:CLTS:BP02:0
TPR:CLTS:BP03:0	cpu-sps-sp05	NC	BPM	0.0	No Error	●	●	RESET	26860594	186597712	TPR:CLTS:BP03:0

all egets completed successfully Refresh Egnet

Easy way to view all TPRs and EVRs

Helpful for troubleshooting

Navigate by area

SC and NC mode

Engine Display

DST00
Engine Number: 16
Engine Description: LASER ONLY
Subsequence Description: 100 Hz
Subsequence Index to Remove: 2
Instruction Counter: 0
Sub-Sequence Index: 3, -1, -1, -1, -1, -1, -1, -1, -1, -1
Last Index: 3
Request Rate: 100
Require Mask: 1
Destination (bit): 0
Subsequence Index to Run: 3
Jump Address: 0
Sync: 0
SchedReset: SchedReset

ALW00
Engine Number: 0
Engine Description: 0 Hz
Subsequence Description: 0 Hz
Subsequence Index to Remove: 3
Instruction Counter: 0
Sub-Sequence Index: 2, -1, -1, -1, -1, -1, -1, -1, -1, -1
Last Index: 2
Request Rate: 0
Subsequence Index to Run: 0
Jump Address: 0
Sync: 0
SchedReset: SchedReset

ALW00 Engine Number 0
Description of the Engine:
Latched State: 0
Current State: 13
Set State: 13
Sub-Sequence Index Start Address Power Class
MPS00 2 0 0
MPS01 2 0 0
MPS02 2 0 0
MPS03 2 0 0
MPS04 2 0 0
MPS05 2 0 0
MPS06 2 0 0
MPS07 2 0 0
MPS08 2 0 0
MPS09 2 0 0
MPS10 2 0 0
MPS11 2 0 0
MPS12 2 0 0
MPS13 2 0 0
MPS14 0 0 0
MPS15 0 0 0

Courtesy of new team member Chris Myers

View paired DST/ALW engines and ALW table easier

Reduced visual clutter using scroll areas