

Calo layer 2 online SW: On-call tutorial

Alessandro Thea, [Tom Williams](#)
Rutherford Appleton Laboratory

Introduction

► Online software

- ◉ Configures the electronics boards
- ◉ Monitors various status registers during runs
- ◉ ... highlights if anything goes wrong

► Quick links

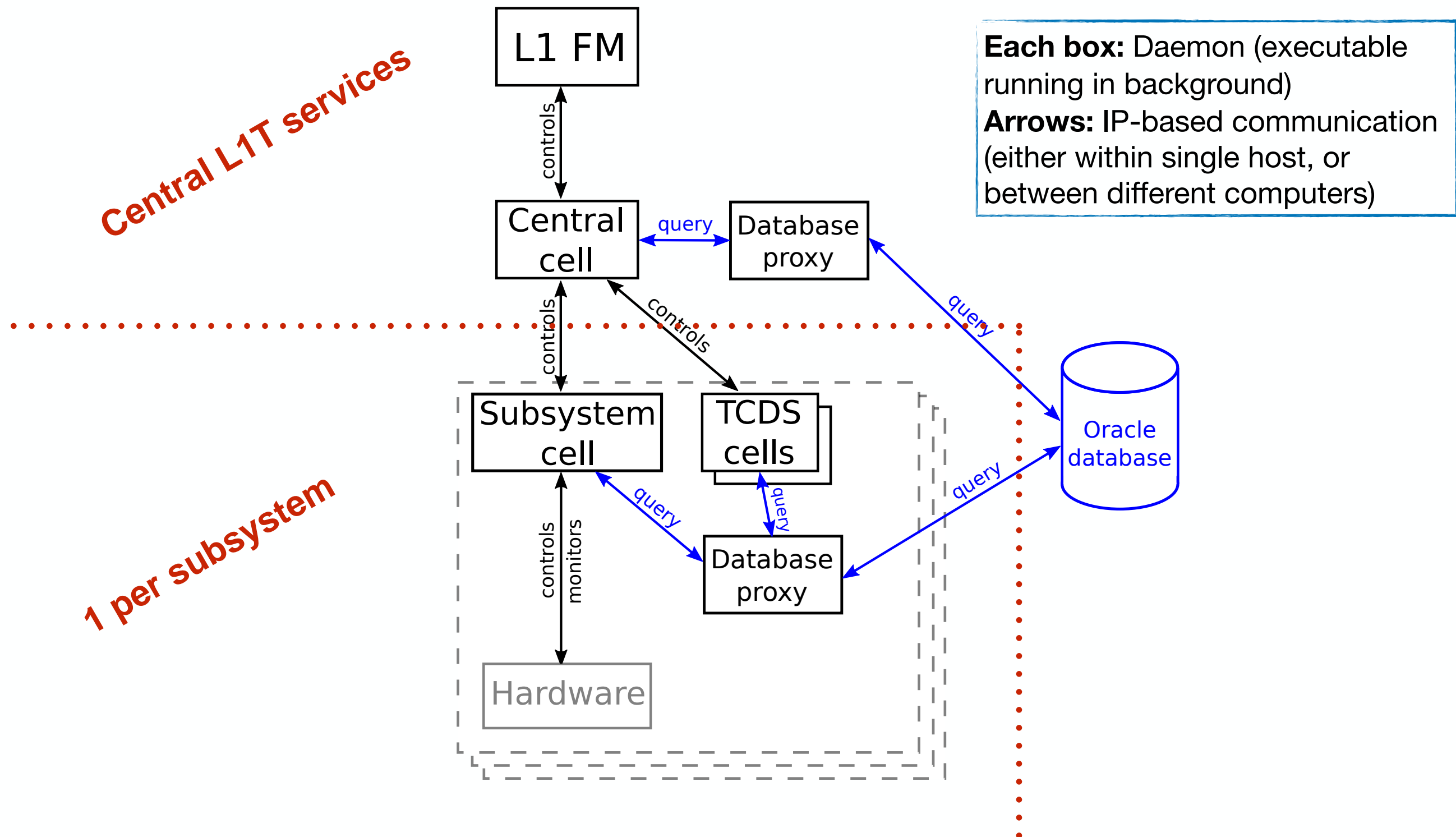
- ◉ l1page: <https://l1page.cms>
- ◉ calo layer 2 SWATCH cell: Click on **link in l1page**
 - <http://l1ts-calol2.cms:3333/urn:xdaq-application:lid=13>

► N.B. All “.cms” websites **only** accessible from within the Point 5 network — firewall'ed from general CERN network

- ◉ Instructions for setting up P5 tunnel: See [CaloLayer2OnCall twiki](#)
 - .cms account required! **Contact me & Alessandro if you don't already have one!**
- ◉ **Make sure you can access these pages** before starting on-call

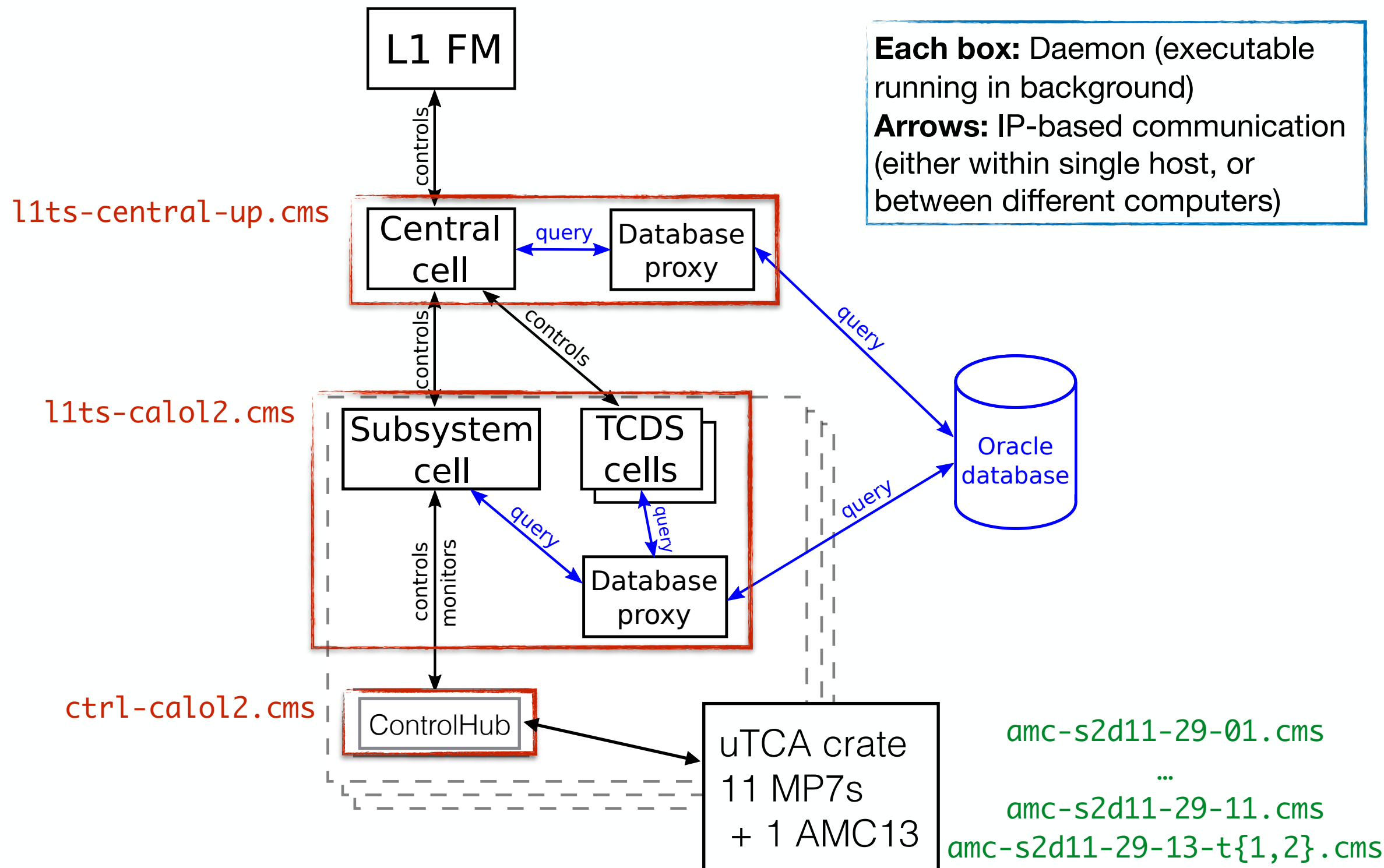
L1T control & monitoring hierarchy

- Many software daemons ...



L1T control & monitoring hierarchy

- Many software daemons, spread across several servers



Level-1 page

Level-1 page (1)

- Summarises status of whole L1T ...

L1T run control state:

- halted
- configured
- running

The screenshot displays the L1T run control interface. At the top, a blue header bar contains navigation icons, a 'Current key' field with the value 'l1_hlt_circulating2017/v6', a red checkmark icon, a 'Status' dropdown set to 'Run', and a 'Start time' field showing '#293484 for an hour'. The 'Status' dropdown is circled in red, with a red arrow pointing to it from the text 'L1T run control state:'. Below the header, the interface is divided into three main sections: 'status', 'logs', and 'suggestions'. The 'status' section on the left shows a hierarchical tree diagram of the L1T components, including Calo L2, Calo L1, μ GT, μ GMT, BMTF, OMTF, EMTF, TWINMUX, CPPF, ECAL, HCAL, DT, RPC, CSC, L1CE, L1Page, and XDAQ Services. The 'logs' section in the middle lists three error/warning messages with icons: EMTF SWATCH monitoring error components (red exclamation mark), OMTF SWATCH monitoring error components (red exclamation mark), and TWINMUX SWATCH monitoring warning components (yellow exclamation mark). The 'suggestions' section on the right contains a heart icon, a message about checking the CENTRAL - SUPERVISOR data from the TS flashlist, and a 'LOOK AT CONFIG FILE' button. At the bottom, there is a blue bar with filters for 'Type' (set to 'Any') and 'Section' (set to 'General'), a search bar, and a '+ icon. Below this bar, the text 'general type: cosmons' is visible on the left, and 'Pamela Renee Klabbers 12 days ago' is on the right.

Level-1 page (2)

- Summarises status of whole L1T ...

The screenshot displays the L1T status monitoring interface. At the top, it shows the current key 'l1_hlt_circulating2017/v6', a status indicator (a red circle with a white checkmark), and information about the run: 'Status running #293484 for an hour'. The interface is divided into three main sections: 'status', 'logs', and 'suggestions'.

The 'status' section on the left contains a subsystem diagram. The diagram shows a hierarchy of components: 'Calo L2' and 'Calo L1' are at the top, connected to 'ECAL' and 'HCAL' respectively. Below them are 'DT' and 'RPC', which connect to 'BMTF' and 'OMTF'. 'OMTF' is connected to 'TWINMUX' and 'CPPF'. 'TWINMUX' is connected to 'EMTF'. 'EMTF' is connected to 'CSC'. The diagram also shows 'L1CE', 'L1Page', and 'XDAQ Services' at the bottom. A red circle highlights the 'status' section.

The 'logs' section on the right shows three error messages:

- EMTF** EMTF SWATCH Cell::SWATCH_system_monitoring_state SWATCH monitoring Error components : numberOfBrokenInputLinks, totalNumberOfBrokenInputLinks
- OMTF** OMTF SWATCH Cell::SWATCH_system_monitoring_state SWATCH monitoring Error components : CSCports
- TWINMUX** TWINMUX SWATCH Cell::SWATCH_system_monitoring_state SWATCH monitoring Warning components : slinkXp0

The 'suggestions' section on the right provides a recommendation: 'check if CENTRAL - SUPERVISOR should receive data from the TS flashlist. Adjust config if it shouldn't'. A button labeled 'LOOK AT CONFIG FILE' is also present.

At the bottom of the interface, there is a 'general' section with a dropdown menu for 'Type' (set to 'Any'), a dropdown menu for 'Section' (set to 'General'), and a search bar. The bottom right corner shows the user 'Pamela Renee Klabbers' and the time '12 days ago'.

Subsystem diagram
Monitoring status: colours
If out of global run: Grey, text struck through
Software processes dead: Skull + crossbones

Level-1 page (3)

- Summarises status of whole L1T ...

The screenshot displays the L1T status page. At the top, it shows the current key 'l1_hlt_circulating2017/v6' and a red checkmark icon. The status is 'running #293484 for an hour'. The page is divided into three main sections: 'status', 'logs', and 'suggestions'. The 'status' section on the left contains a hierarchical diagram of the L1T system components, including Calo L2, Calo L1, μ GT, μ GMT, BMTF, OMTF, EMTF, TWINMUX, CPPF, ECAL, HCAL, DT, RPC, CSC, L1CE, L1Page, and XDAQ Services. The 'logs' section in the center, which is circled in red, lists three messages: two error messages (OMTF and EMTF) and one warning message (TWINMUX). The 'suggestions' section on the right provides a recommendation to check the CENTRAL - SUPERVISOR configuration. The bottom of the page features a search bar and a footer with the text 'general type: cosmons' and 'Pamela Renee Klabbers 12 days ago'.

connected to API

Current key
l1_hlt_circulating2017/v6

Status
running #293484 for an hour

status logs suggestions

OMTF EMTF SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Error components :
numberOfBrokenInputLinks, totalNumberOfBrokenInputLinks

OMTF OMTF SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Error components : CSCports

TWINMUX TWINMUX SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Warning components : slinkXp0

check if CENTRAL -
SUPERVISOR should
receive data from the TS
flashlist.
Adjust config if it shouldn't

LOOK AT CONFIG FILE

Warning & error messages

Type
Any

Section
General



Search



general type: cosmons


Pamela Renee Klabbers 12 days ago

Level-1 page (3)

- Summarises status of whole L1T ...

  **Useful links & phone numbers**

connected to API  

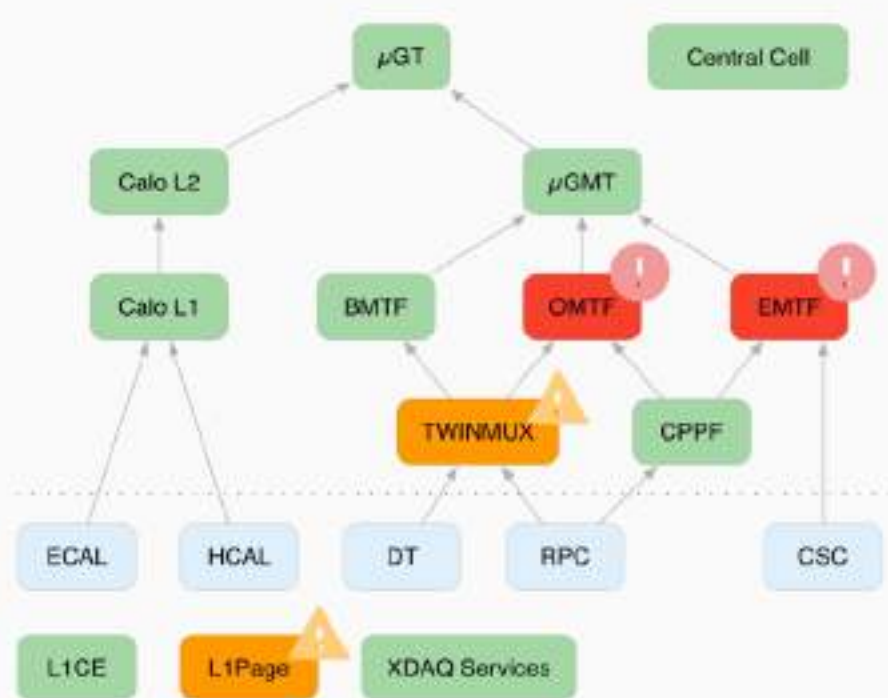
Current key `l1_hlt_circulating2017/v6` 

Status: running #293484 for an hour

Run

Start time

status logs suggestions



EMTF EMTF SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Error components :
numberOfBrokenInputLinks, totalNumberOfBrokenInputLinks

OMTF OMTF SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Error components : CSCports

TWINMUX TWINMUX SWATCH Cell::SWATCH_system_monitoring_state
SWATCH monitoring Warning components : slinkXp0

check if CENTRAL - SUPERVISOR should receive data from the TS flashlist.
Adjust config if it shouldn't

[LOOK AT CONFIG FILE](#)

Type: Any

Section: General

Search

general type: cosmits

Pamela Renee Klabbers 12 days ago

Calo layer-2 details (1)

- After clicking on calo layer-2 box ...

The screenshot displays the CALOL2 interface. At the top, it shows 'Current key cospics2018/v51' and a 'Status error' indicator. Below this, a blue header bar contains the text 'CALOL2' and several status buttons: 'in run', 'all applications online', '1 alarm', and '3 operations'. A green button labeled 'GO TO APPLICATION' is circled in red, with a red arrow pointing to it from the text 'Link to SWATCH cell'. Below the header, there are four columns representing different applications: 'CALOL2 SWATCH Cell', 'CALOL2 TCDS ICI Cell', 'CALOL2 TCDS PI Cell', and 'TSTORE'. Each column shows a 'mandatory application' status, a 'healthy' checkmark, and a 'Run Control halted no message' warning. At the bottom, a blue bar labeled 'Process Control' contains buttons for 'STATUS', 'START', 'STOP', and 'RESTART'. A 'CLOSE' button is located in the bottom right corner.

connected to API

Current key
cospics2018/v51

Status
error

status logs suggestions

CALOL2 in run all applications online 1 alarm 3 operations **GO TO APPLICATION** Link to SWATCH cell

CALOL2 SWATCH Cell

⚡ mandatory application
✓ healthy: system responds to HTTP request

Run Control halted
no message

CALOL2 SWATCH Cell SWATCH_sy
SWATCH monitoring NoLimit

CALOL2 TCDS ICI Cell

⚡ mandatory application
✓ healthy: system responds to H

Run Control halted
no message

CALOL2 TCDS PI Cell

⚡ mandatory application
✓ healthy: system responds to H

Run Control halted
no message

TSTORE

⚡ mandatory application
✓ healthy: system gives valid TStc

Process Control

STATUS START STOP RESTART

CLOSE

Calo layer-2 details (2)

- After clicking on calo layer-2 box ...

The screenshot displays the CALOL2 monitoring interface. At the top, it shows 'Current key: cosmos2018/v51' and a 'Status error' indicator. Below this, a blue header bar contains the text 'CALOL2' and several status buttons: 'in run', 'all applications online', '1 alarm', '3 operations', and a green 'GO TO APPLICATION' button. The main content area is divided into four columns, each representing a different application: 'CALOL2 SWATCH Cell', 'CALOL2 TCDS ICI Cell', 'CALOL2 TCDS PI Cell', and 'TSTORE'. Each column shows the application's status (e.g., 'mandatory application', 'healthy: system responds to HTTP request') and a 'Run Control' section with a 'halted no message' status. At the bottom, a blue 'Process Control' bar contains four buttons: 'STATUS', 'START', 'STOP', and 'RESTART'. A red circle highlights these four buttons. To the right of the buttons, red text reads: 'HERE BE DRAGONS! These buttons stop / restart the layer 2 daemons DO NOT TOUCH THESE DURING A RUN!'. Below this, further red text states: 'As on-call, only use if processes are dead, or not responding to central cell Over past year, only used for layer 2 after installing new SW'. A 'CLOSE' button is visible in the bottom right corner.

HERE BE DRAGONS!
These buttons stop / restart the layer 2 daemons
DO NOT TOUCH THESE DURING A RUN!

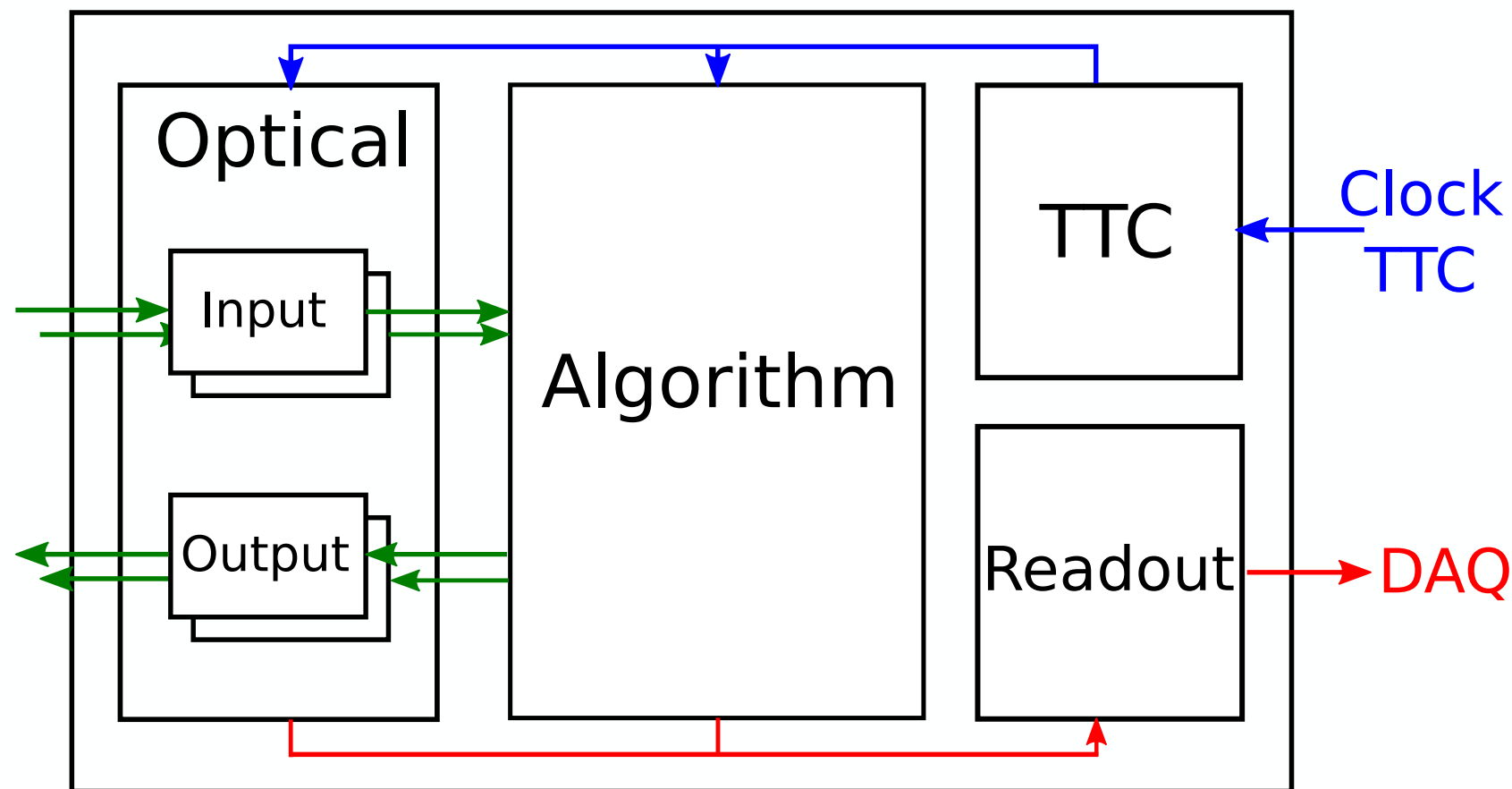
As on-call, **only use if processes are dead, or not responding to central cell**
Over past year, only used for layer 2 after installing new SW

SWATCH

**Software for Automating the control of Common Hardware
= common framework for controlling & monitoring
electronics in L1T Phase-1 upgrade**

SWATCH: Common processor model

- Covers the main data processing nodes — commonalities ...
 - ⦿ **all AMCs** following MicroTCA specification
 - ⦿ transmit/receive the trigger data on **high-speed serial optical links**
 - ⦿ implement the processing logic in an **FPGA** (mainly Virtex 7)

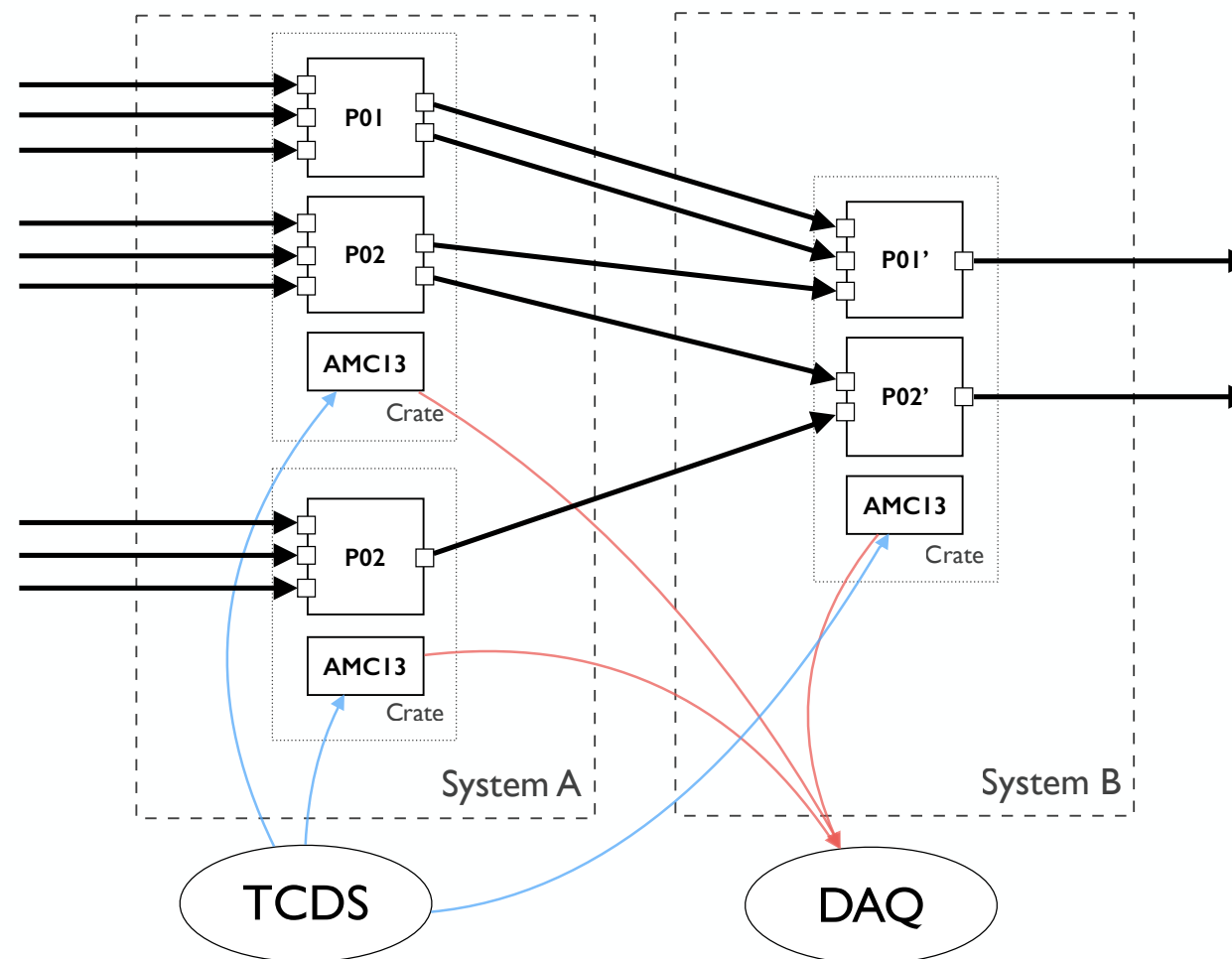


- ⦿ Monitoring data organised under these blocks in SWATCH cell

SWATCH: Common system model

► Each subsystem

- One or more processor boards, in MicroTCA crates
- One “**AMC13**” board in each crate
 - Common CMS board; provides **clock, timing & DAQ services** via backplane



Trigger Control & Distribution System
clock & fixed-latency commands

Data AcQuisition network
sink for readout data

SWATCH cell: Configuration

SWATCH cell: Run control

Hides left-hand menu

Click to expand

Configuration parameters sent by central cell

Commands

Default

Operations

Run Control

Control Panels

Monitoring

Peers

DB

MON

Configuration Key (string)
calol2_commissioning2017/v12

FED Map (string)
1200&11%1201&11%1202&11%1203&11%1204&11%1205&11%1206&11%1207&11%1208&11%1209&11%1212&11%1213&11%1214&11%1215&11%1216&11%1217&11%1218&11%1219&11%1220&11%1221&11%

Run Number (unsigned long)
293474

Run Settings Key (string)
calol2_rs_tmtMode10/v4

TTC Map (string)
{HO=3, FPIXP=3, LTC_TRG=0, LPM_RPC=0, EE+=3, DTUP=0, FPIXM=3, EE-=3, CALSTAGE1=0, CALTRIGUP=3, MUTFUP=3, LPM_HCAL=0, CTPPS=0, TIBTID=0, DT+=3, LPM_CSC=0, DT-=3,

RUNNING

PAUSE STOP RESET

Successfully completed system FSM transition 'start!'

SWATCH cell: Run control

≡ CALOL2 SWATCH Cell > Operations > Run Control

Commands

> Default

Operations

Run Control

Control Panels

Monitoring

Peers

DB

MON

Configuration Key (string)
calol2_commissioning2017/v12

FED Map (string)
1200&11%1201&11%1202&11%1203&11%1204&11%
1205&11%1206&11%1207&11%1208&11%1209&11%
1212&11%1213&11%1214&11%1215&11%1216&11%
1217&11%1218&11%1219&11%1220&11%1221&11%

Run Number (unsigned long)
293474

Run Settings Key (string)
calol2_rs_tmtMode10/v4

TTC Map (string)
{HO=3, FPIXP=3, LTC_TRG=0, LPM_RPC=0, EE+=3,
DTUP=0, FPIXM=3, EE-=3, CALSTAGE1=0,
CALTRIGUP=3, MUTFUP=3, LPM_HCAL=0,
CTPPS=0, TIBTID=0, DT+=3, LPM_CSC=0, DT-=3,

RUNNING

PAUSE STOP RESET

↻

Successfully completed system FSM transition 'start'!

Calo layer 2 keys
Config + “run settings”
Specifies exact config. of layer 2
(e.g. FW loaded on boards,
all values written to FW)

SWATCH cell: Run control

≡ CALOL2 SWATCH Cell > Operations > Run Control



- Commands
 - Default
- Operations
 - Run Control**
- Control Panels
- Monitoring
- Peers
 - DB
 - MON

Configuration Key (string)
calol2_commissioning2017/v12

FED Map (string)
1200&11%1201&11%1202&11%1203&11%1204&11%
1205&11%1206&11%1207&11%1208&11%1209&11%
1212&11%1213&11%1214&11%1215&11%1216&11%
1217&11%1218&11%1219&11%1220&11%1221&11%

Run Number (unsigned long)
293474

Run Settings Key (string)
calol2_rs_tmtMode10/v4

TTC Map (string)
{HO=3, FPIXP=3, LTC_TRG=0, LPM_RPC=0, EE+=3,
DTUP=0, FPIXM=3, EE-=3, CALSTAGE1=0,
CALTRIGUP=3, MUTFUP=3, LPM_HCAL=0,
CTPPS=0, TIBTID=0, DT+=3, LPM_CSC=0, DT-=3,

RUNNING

PAUSE

STOP

RESET



Successfully completed system FSM transition 'start'!

Cell's current state

Cell-level FSM controls:
Do NOT touch if in global

Summary message
for last transition

Debugging configuration errors (1)

- *Scenario:* L1 DOC calls you to say that there was an error in calo layer 2 during configuration ...
 - ⦿ E.g. Disruption of LHC clock, but L1T not re-configured, only 'stop-start'ed

The screenshot displays the 'CALOL2 SWATCH Cell > Operations > Run Control' interface. On the left, a sidebar contains navigation links: Commands, Default, Operations, Control Panels, Monitoring, and Peers. The main area is divided into two panels. The left panel shows configuration details: Configuration Key (string) 'calol2_commissioning2017/v12', FED Map (string) '1200&11%1201&11%1202&11%1203&11%1204&11%1205&11%1206&11%1207&11%1208&11%1209&11%1212&11%1213&11%1214&11%1215&11%1216&11%1217&11%1218&11%1219&11%1220&11%1221&11%', Run Number (unsigned long) '293475', Run Settings Key (string) 'calol2_rs_tmtMode10/v4', and TTC Map (string) '{HO=3, FPIXP=3, LTC_TRG=0, LPM_RPC=0, EE+=3, DTUP=0, FPIXM=3, EE-=3, CALSTAGE1=0, CALTRIGUP=3, MUTFUP=3, LPM_HCAL=0, CTPPS=0, TIBTID=0, DT+=3, LPM_CSC=0, DT-=3}'. The right panel, titled 'CONFIGURED', features 'ALIGN' and 'RESET' buttons. Below them, a circular arrow icon is present. A red error message states: 'no results yet... An error occurred in 9 single-object transitions, during step 1 of system transition 'align'. Details of commands causing the error: Transition 'calol2.MP0.runControl.Configured.align', 'calol2.MP0.tmtAlignMGts' (command 2 out of 2) Progress = 0, last status message: Alignment failed on input ports: Rx00, Rx01, Rx02, Rx03, Rx04, Rx05, Rx06, Rx07, Rx08, Rx09, Rx10, Rx11, Rx12, Rx13, Rx14, Rx15, Rx16, Rx17, Rx18, Rx19, Rx20, Rx21, Rx22, Rx23, Rx24, Rx25, Rx26, Rx27, Rx28, Rx29, Rx30, Rx31, Rx32, Rx33, Rx34, Rx35, Rx36, Rx37, Rx38, Rx39, Rx40, Rx41, Rx42, Rx43, Rx44, Rx45, Rx46, Rx47, Rx48, Rx49, Rx50, Rx51, Rx52, Rx53, Rx54, Rx55, Rx56, Rx57, Rx58, Rx59, Rx60, Rx61, Rx62, Rx63, Rx64, Rx65, Rx66, Rx67, Rx68, Rx69, Rx70, Rx71. Transition 'calol2.MP1.runControl.Configured.align', 'calol2.MP1.tmtAlignMGts' (command 2 out of 2) Progress = 0, last status message: Alignment failed on input ports: Rx00, Rx01, Rx02, Rx03, Rx04, Rx05, Rx06, Rx07, Rx08, Rx09, Rx10, Rx11, Rx12, Rx13, Rx14, Rx15, Rx16, Rx17, Rx18, Rx19, Rx20, Rx21, Rx22, Rx23, Rx24, Rx25, Rx26, Rx27, Rx28, Rx29, Rx30, Rx31, Rx32, Rx33, Rx34, Rx35, Rx36, Rx37, Rx38, Rx39, Rx40, Rx41, Rx42, Rx43, Rx44, Rx45, Rx46, Rx47, Rx48, Rx49, Rx50, Rx51, Rx52, Rx53, Rx54, Rx55, Rx56, Rx57, Rx58, Rx59, Rx60, Rx61, Rx62, Rx63, Rx64, Rx65, Rx66, Rx67, Rx68, Rx69, Rx70, Rx71'.

Debugging configuration errors (2)

- ▶ Extremely rarely, error may not appear in calo layer-2 cell — e.g. if central cell is having problems talking to it
 - ⦿ Look in central cell — <http://l1ts-central.cms:3333/urn:xdaq-application:lid=13>

The screenshot displays the L1 Run Control web interface. The top navigation bar shows the path: Upgrade Central Cell > Operations > Run Control. The left sidebar contains a tree view with sections: Commands (CALOL1, DT, Default, Expert, Information), Operations (Run Control), Control Panels (About), Monitoring, and Peers (BMTF, CALOL1, CALOL1_TCDS_ICI, CALOL1_TCDS_PI, CALOL2). The main content area is divided into two panels. The left panel lists configuration keys and their values: AutoMode (checked), Use Primary TCDS (checked), Configuration Key (l1_trg_circulating2017/v6), DCS LHC Flags (ES_HV_ON&true%TK_HV_ON&N/A%PIX_HV_ON&N/A%LHC_RAMPING&>false%PHYSICS_DECLARED&false%), FED Map (a list of 21 detector IDs), Run Number (293480), Run Settings Key (l1_trg_rs_circulating2017/v4), and TTC Map (a list of detector IDs). The right panel, titled 'RUNNING', features buttons for PAUSE, STOP, and RESET, along with a refresh icon. Below these buttons, it shows three log entries for the 'align' transition, each with a timestamp and elapsed time: CALOL1.align (4512 msec), CALOL2.align (2427 msec), and BMTF.align (928 msec). The final log entry shows EMTF.align (134 msec).

Upgrade Central Cell > Operations > Run Control

Commands

- CALOL1
- DT
- Default
- Expert
- Information

Operations

Run Control

Control Panels

About

Monitoring

Peers

- BMTF
- CALOL1
- CALOL1_TCDS_ICI
- CALOL1_TCDS_PI
- CALOL2

☒ AutoMode

☒ Use Primary TCDS

Configuration Key (string)

l1_trg_circulating2017/v6

DCS LHC Flags (string)

ES_HV_ON&true%TK_HV_ON&N/A%PIX_HV_ON&N/A%LHC_RAMPING&>false%PHYSICS_DECLARED&false%

FED Map (string)

1200&11%1201&11%1202&11%1203&11%1204&11%1205&11%1206&11%1207&11%1208&11%1209&11%1212&11%1213&11%1214&11%1215&11%1216&11%1217&11%1218&11%1219&11%1220&11%1221&11%

Run Number (unsigned long)

293480

Run Settings Key (string)

l1_trg_rs_circulating2017/v4

TTC Map (string)

{H0=3, FPIX=3, ITC, TRG=0, LPM, RPC=0, FF+=3,

RUNNING

PAUSE STOP RESET

*** Collecting Run Control:align" replies...
@CALOL1.align : Successfully completed system FSM transition 'align'!
Elapsed time: 4512 msec

*** Collecting Run Control:align" replies...
@CALOL2.align : Successfully completed system FSM transition 'align'!
Elapsed time: 2427 msec

*** Collecting Run Control:align" replies...
@BMTF.align : Successfully completed system FSM transition 'align'!
Elapsed time: 928 msec

*** Collecting Run Control:align" replies...
@EMTF.align : Successfully completed system FSM transition 'align'!
Elapsed time: 134 msec

SWATCH cell: Monitoring

Reading various registers & comparing values with error/warning conditions (after at least some configuration has taken place)

System overview (1)

Hides left-hand menu

Click to expand

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

Default

Operations

Control Panels

1. Summary

2. Logging

3. System setup

4. Masking

5. Monitoring

6. Commands

7. Sequences

8. State machines

9. System state machines

About

Monitoring

Peers

DB

MON

calol2 **Status: Warning** State machine: runControl::Aligned

System Processors Object Details Ports

S2D11_29 fed-id: 1360

1 2 3 4 5 6 7 8 9 10 11 12 13

calol2 ▼

Processors S2D11_29 ▼

Monitoring: Enabled

T = 5000ms last: 1s ago

System overview (2)

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

1. Summary

2. Logging

3. System setup

4. Masking

5. Monitoring

6. Commands

7. Sequences

8. State machines

9. System state machines

About

Monitoring

Peers

DB

MON

calol2 Status: Warning State machine: runControl::Aligned

System Processors

S2D11_29 fed-id: 1360

1 2 3 4 5 6 7 8 9 10 11 12 13

Current 'run control' FSM state "Running" during a global run

CaloL2 crate: MP7s & AMC13

Monitoring: Enabled

Processors S2D11_29

System overview (3)

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines

About

Monitoring

Peers

- DB
- MON

calol2 **Status: Warning** State machine: runControl::Aligned

System Processors Object Details Ports >

S2D11_29 fed-id: 1360

MPs

AMC13

Redundant MP

Demux

calol2 ▼

Monitoring: Enabled

Processors S2D11_29 ▼

T = 5000ms last: 1s ago

System overview (4)

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines
- About

Monitoring

Peers

- DB
- MON

calol2 **Status: Warning** State machine: runControl::Aligned

System Processors Object Details Ports >

S2D11_29 fed-id: 1360

algo
readout
ttc
input ports
output ports
overall status

BOARD / COMPONENT NAMES
SHOWN HERE when hover
mouse over above boxes

1 2 3 4 5 6 7 8 9 10 11 12 13

calol2 ▼

Monitoring: Enabled

Processors S2D11_29 ▼

T = 5000ms last: 1s ago

System overview (5)

☰ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

1. Summary

2. Logging

3. System setup

4. Masking

5. Monitoring

6. Commands

7. Sequences

8. State machines

9. System state machines

About

Monitoring

Peers

DB

MON

1 2 3 4 5 6 7 8 9 10 11 12 13

calol2

▼

Monitoring: Enabled

Processors S2D11_29

▼

Processor ID	Slot	Status	algo	readout	ttc	inputPorts	outputPorts
MP0	1	Good	NoLimit	Good	Good	NoLimit	Good
MP1	2	Good	NoLimit	Good	Good	NoLimit	Good
MP2	3	Good	NoLimit	Good	Good	NoLimit	Good
MP3	4	Good	NoLimit	Good	Good	NoLimit	Good
MP4	5	Good	NoLimit	Good	Good	NoLimit	Good
MP5	6	Good	NoLimit	Good	Good	NoLimit	Good
MP6	7	Good	NoLimit	Good	Good	NoLimit	Good

Click to expand

Processors (MPs and demux) status table

TOM WILLIAMS (RAL)

— ONLINE SW INTRO —

CALO LAYER 2 ON-CALL TUTORIAL (02/03/2018)

26

System overview (6)

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines

About

Monitoring

Peers

DB

MON

1 2 3 4 5 6 7 8 9 10 11 12 13

calol2 Monitoring: Enabled

Processors S2D11_29

TTC / DAQ

AMC13 status table

AMC13 ID	Crate	Status	evb	slinkXp0	ttc	amcports
AMC13	S2D11_29	Warning	Warning	Good	Good	Good

Internal Links

Click to expand

Processor details (1)

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines
- About

Monitoring

Peers

- DB
- MON

calol2 **Status: Warning** State machine: runControl::Aligned

1. Click here

System Processors **Object Details** Ports

Selected object **MP0**

2. Select the board

Component Status: Good

Monitoring: Enabled

Input Ports

Output Ports

Monitorables

- algo
- readout
- ttc
- inputPorts
- outputPorts

State machine

- runControl::Aligned


Stub Info


Path	calol2.MP0
Hardware type	MP7-XE
Role	MainProcessor
Creator	calol2::MainProcessor
URI	chtcp-2.0://bridge-calol2:10203?target=amc-s2d11-29-01:50001
Address table	file:///opt/cactus/etc/calol2/addrtab/mp_v75/mp7xe_infra.xml
Crate	S2D11_29
Slot	1

T = 5000ms last: 3s ago


Processor details (2)


- Scrolling down the “Object details” page ...

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary ? 


 **Commands**


> Default

 **Operations**

 **Control Panels**










- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines
- About

 **Monitoring**

 **Peers**

- DB
- MON

readout ▼ Monitoring: Enabled


Metric ID 	Value	Error Condition	Warning Condition	Last updated (UTC)
 amcCoreReady	true	== 0	N/A	2018-03-02 12:04:51
 busyTime	8.04113	N/A	N/A	2018-03-02 12:04:51
 eventCounter	0	N/A	N/A	2018-03-02 12:04:51
 oosTime	0	N/A	N/A	2018-03-02 12:04:51
 readyTime	1318.82	N/A	N/A	2018-03-02 12:04:51
 tts	Ready (0x8)	== Error (0xc)	!= Ready (0x8)	2018-03-02 12:04:51
 upTime	1326.86	N/A	N/A	2018-03-02 12:04:51
 warnTime	0	N/A	N/A	2018-03-02 12:04:51


tts ▼ Monitoring: Enabled

inputPorts ▼ Monitoring: Enabled


Processor details (3)


- Scrolling down the “Object details” page ...

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary ? 


 **Commands**


> Default

 **Operations**

 **Control Panels**

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines
- About
















 **Monitoring**

 **Peers**

- DB
- MON

Monitoring: Enabled

ttc ▼

Metric ID 	Value	Error Condition	Warning Condition	Last updated (UTC)
 bc0Counter	16004923	N/A	N/A	2018-03-02 12:06:31
 bunchCounter	2779	N/A	N/A	2018-03-02 12:06:31
 doubleBitErrors	0	> 0	N/A	2018-03-02 12:06:31
 ec0Counter	0	N/A	N/A	2018-03-02 12:06:31
 hardResetCounter	0	N/A	N/A	2018-03-02 12:06:31
 hasClock40Stopped	false	== 1	N/A	2018-03-02 12:06:31
 isBC0Locked	true	== 0	N/A	2018-03-02 12:06:31
 isClock40Locked	true	== 0	N/A	2018-03-02 12:06:31
 l1aCounter	0	N/A	N/A	2018-03-02 12:06:31
 oc0Counter	0	N/A	N/A	2018-03-02 12:06:31
 orbitCounter	16016271	N/A	N/A	2018-03-02 12:06:31
 resyncCounter	0	N/A	N/A	2018-03-02 12:06:31
 singleBitErrors	0	> 0	N/A	2018-03-02 12:06:31
 startCounter	0	N/A	N/A	2018-03-02 12:06:31

Processor details (4)

- Scroll down the “Object details” page ...

The screenshot shows the 'CALOL2 SWATCH Cell > Control Panels > 1. Summary' page. The left sidebar contains navigation links: Commands, Default, Operations, Control Panels (1. Summary, 2. Logging, 3. System setup, 4. Masking, 5. Monitoring, 6. Commands, 7. Sequences, 8. State machines, 9. System state machines, About), Monitoring, and Peers (DB, MON). The main content area displays the 'inputPorts' section, which is circled in red. Below it, three rows of object details are shown, each with a dropdown menu and status indicators. The 'Rx02' row is also circled in red. Below the object details, a table lists various metrics.

Metric ID	Value	Last updated (UTC)	Monitoring	Error Condition	Warning Condition
alignBx	3495	2017-05-07 16:20:14	Enabled	N/A	== 4095
alignCycle	0	2017-05-07 16:20:14	Enabled	N/A	== 7
alignErrors	0	2017-05-07 16:20:14	Enabled	!= 0	N/A
crcErrors	0	2017-05-07 16:20:14	Enabled	== 255	> 0
isAligned	true	2017-05-07 16:20:14	Enabled	== 0	N/A
isLocked	true	2017-05-07 16:20:14	Enabled	== 0	N/A
packetCounter	255	2017-05-07 16:20:14	Enabled	N/A	== 0

AMC13 details (1)

☰ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines

About

Monitoring

Peers

- DB
- MON

calol2 Status: Warning State machine: runControl::Aligned

System

Processors

Object Details

Ports

Selected object
AMC13

Component Status: Warning

Monitoring: Enabled

T = 5000ms last: 4s ago

AMC13
AMC ports

evb

slinkXp0

ttc

amcports

State machine

runControl::Configured

Stub Info

Path	calol2.AMC13
FedId	1360
Role	daqtc
Creator	swatch::amc13::AMC13Manager
URI_T1	chtcp-2.0://bridge-calol2:10203?target=amc-s2d11-29-13-t1:50001
URI_T2	chtcp-2.0://bridge-calol2:10203?target=amc-s2d11-29-13-t2:50001
T1 address table	file:///opt/cactus/etc/amc13/AMC13XG_T1.xml
T2 address table	file:///opt/cactus/etc/amc13/AMC13XG_T2.xml
Crate	S2D11_29

AMC13 details (2)

- Scrolling down the page ...

≡ CALOL2 SWATCH Cell > Control Panels > 1. Summary

Commands

> Default

Operations

Control Panels

- 1. Summary
- 2. Logging
- 3. System setup
- 4. Masking
- 5. Monitoring
- 6. Commands
- 7. Sequences
- 8. State machines
- 9. System state machines
- About

Monitoring

Peers

- DB
- MON

evb Monitoring: Enabled

slinkXp0 Monitoring: Enabled

ttc Monitoring: Enabled

Metric ID	Value	Error Condition	Warning Condition	Last updated (UTC)
bc0Counter	35263	N/A	N/A	2018-03-02 12:15:12
bc0Errors	0	N/A	N/A	2018-03-02 12:15:12
clkFreq	4.0079e+07	< 3.99e+07 or > 4.01e+07	N/A	2018-03-02 12:15:12
resyncCount	1811939336	N/A	N/A	2018-03-02 12:15:12
ttcDoubleBitErrors	0	> 0	N/A	2018-03-02 12:15:12
ttcSingleBitErrors	0	> 0	N/A	2018-03-02 12:15:12

amcports Monitoring: Enabled

Port summary (1)

The screenshot displays the 'CALOL2 SWATCH Cell' monitoring interface. The top navigation bar shows the path 'Control Panels > SWATCH Monitoring'. The left sidebar contains sections for 'Commands', 'Operations', 'Control Panels', 'Monitoring', and 'Peers'. The main content area is titled 'calol2' with a 'Status: Good' indicator and a 'State machine: runControl::Running' label. Below this, there are tabs for 'System', 'Processors', 'Object Details', and 'Ports', with 'Ports' being the active tab and circled in red. A refresh button and a timeline slider (T = 5000ms, last: 4s ago) are positioned above the port data. The port data is organized into six panels, each representing a Machine Processor (MP0 to MP5). Each panel shows 'Input Ports' and 'Output Ports' as green squares. MP0, MP1, and MP2 each have 10 input ports and 5 output ports. MP3, MP4, and MP5 each have 10 input ports and 10 output ports.

≡ CALOL2 SWATCH Cell > Control Panels > SWATCH Monitoring

Commands

> Default

Operations

Control Panels

- About
- SWATCH Cmd Sequences
- SWATCH Commands
- SWATCH Log Inspector
- SWATCH Masked and Disabled
- SWATCH Metrics
- SWATCH Monitoring
- SWATCH Setup
- SWATCH State machines
- SWATCH System state machines

Monitoring

Peers

- DB
- MON

calol2 **Status: Good** State machine: runControl::Running

System Processors Object Details **Ports**

Refresh T = 5000ms last: 4s ago

MP0
Input Ports
Output Ports

MP1
Input Ports
Output Ports

MP2
Input Ports
Output Ports

MP3
Input Ports
Output Ports

MP4
Input Ports
Output Ports

MP5
Input Ports
Output Ports

Port summary (2)

Expected: Redundant MP (Dark grey = disabled)

- Hover mouse over port reveals ID
- Clicking on the port takes you to detailed info in table

Port summary (3)

- Scrolling down the page ...

≡ CALOL2 SWATCH Cell > Control Panels > SWATCH Monitoring

Commands

Default

Operations

Control Panels

- About
- SWATCH Cmd Sequences
- SWATCH Commands
- SWATCH Log Inspector
- SWATCH Masked and Disabled
- SWATCH Metrics
- SWATCH Monitoring
- SWATCH Setup
- SWATCH State machines
- SWATCH System state machines

Monitoring

Peers

- DB
- MON

Input Port Details

MP0 Monitoring: Enabled

MP1 Monitoring: Enabled

Port ID	Status	Monitoring	Masked	alignCycle	alignErrors	alignBx	packetCounter	crcErrors	isAligned	isLocked
Rx00	Good	Enabled	False	0	0	3496	255	0	true	true
Rx01	Good	Enabled	False	0	0	3496	255	0	true	true
Rx02	Good	Enabled	False	0	0	3496	255	0	true	true
Rx03	Good	Enabled	False	0	0	3496	255	0	true	true
Rx04	Good	Enabled	False	0	0	3496	255	0	true	true
Rx05	Good	Enabled	False	0	0	3496	255	0	true	true
Rx06	Good	Enabled	False	0	0	3496	255	0	true	true
Rx07	Good	Enabled	False	0	0	3496	255	0	true	true
Rx08	Good	Enabled	False	0	0	3496	255	0	true	true
Rx09	Good	Enabled	False	0	0	3496	255	0	true	true
Rx10	Good	Enabled	False	0	0	3496	255	0	true	true

Port summary (4)

- Scrolling down the page ...

CALOL2 SWATCH Cell > Control Panels > SWATCH Monitoring

Commands

> Default

Operations

Control Panels

- About
- SWATCH Cmd Sequences
- SWATCH Commands
- SWATCH Log Inspector
- SWATCH Masked and Disabled
- SWATCH Metrics
- SWATCH Monitoring
- SWATCH Setup
- SWATCH State machines
- SWATCH System state machines

Monitoring

Peers

- DB
- MON

Hx/1 NOLimit Disabled True Unknown Unknown Unknown Unknown Unknown Unknown Unknown

Output Port Details

MP0 Monitoring: Enabled

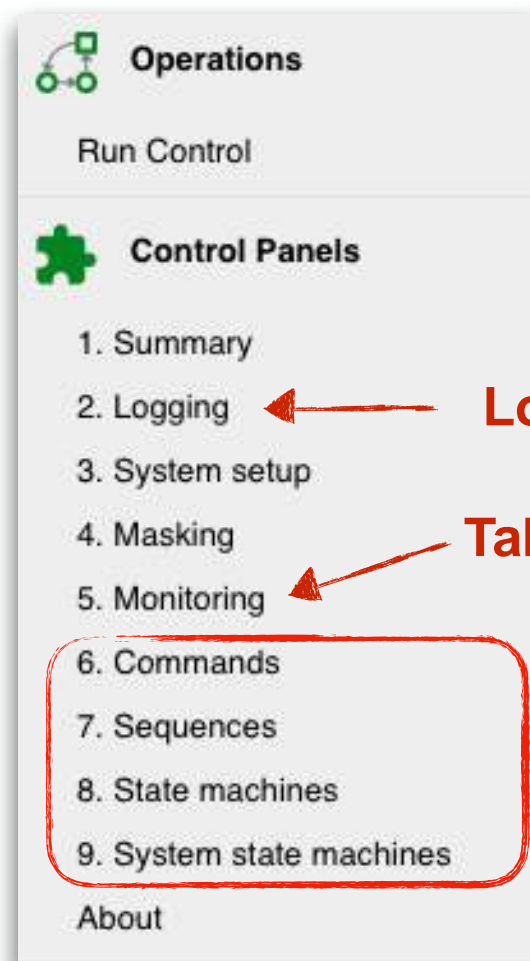
MP1 Monitoring: Enabled

Port ID	Status	Monitoring	isOperating
Tx60	Good	Enabled	● true
Tx61	Good	Enabled	● true
Tx62	Good	Enabled	● true
Tx63	Good	Enabled	● true
Tx64	Good	Enabled	● true
Tx65	Good	Enabled	● true

MP2 Monitoring: Enabled

SWATCH cell: Anything else?

- ▶ As on-call, you should only need to look at ...
 - ◎ “Run control” FSM page
 - Operations -> “Run control”
 - ◎ Monitoring summary page
 - Control panels -> “1. Summary”
- ▶ ... the other SWATCH panels provide more expert tools



Logs

Tables / Graphs of individual metrics

Configuration GUIs — HERE BE DRAGONS!

*Don't touch buttons here if
calo layer 2 in global run*

Summary

- ▶ Online software
 - ⦿ Configures the electronics boards
 - ⦿ Monitors various status registers during runs
 - ⦿ ... highlights if anything goes wrong
- ▶ Main interfaces for calo layer-2 on-call
 - ⦿ l1page: <https://l1page.cms>
 - ⦿ calo layer 2 SWATCH cell: Click on **link in l1page**
 - “Run control” FSM page
 - Monitoring summary page
- ▶ **Check that you can access these websites before starting on-call**
 - ⦿ Instructions for setting up P5 tunnel: See [*CaloLayer2OnCall twiki*](#)