



Cisco APIC and Platform Insights Engine

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New and Changed Information

The following table provides an overview of the significant changes up to the current release. The table does not provide an exhaustive list of all changes or of the new features up to this release.

Table 1: New Features and Changed Information

Cisco APIC Release	Feature	Description
5.2(3)	The Platform Insights Engine (PIE) was introduced.	--

About the Platform Insights Engine

The Platform Insights Engine (PIE) is an on-switch real time root cause analysis application. To keep the service outages in a switch to a minimum, PIE gives insights about the current issues on the switch and visibility about the potential issues.

The PIE application enables you to:

- Collect data on a switch periodically or during a failure.
- Analyze the collected data.
- Find a root cause for the issue.
- Reduce the time to resolve issues.

While the data collection should happen on a switch, the analysis can happen on the switch or off the switch. The collection and analysis can happen either online or offline.

About the Platform Insights Engine Application

The Platform Insights Engine (PIE) application is implemented as an independent process. The application has an internal client that implements a set of insight engines. The actual engine logic is component-specific. The internal PIE client provides a simpler way to plug in new insight engines.

PIEs subscribe to events they can analyze. The PIEs analyze raw data and generate insights, such as root cause analysis, about the event. The insights are published back to the broker as new events, which could be used for analysis in other PIEs.

The following list describes the PIEs:

- Link flap PIE: The link flap PIE analyzes link flap events published by user space drivers (USDs) and determines the root cause for a link flap. The PIE publishes the root cause analysis insight to the broker. Link flap events are published by the USDs (PIE client) when a link flaps. The USDs collect all of the relevant data from the ASIC and USD that is required for root cause analysis and publish the data to the broker. The link flap PIE analyzes the data and arrives at the most probable root cause for the flap.
- Link down PIE: The link down PIE finds the root cause for a link not coming up. The USD collects data about an interface when the interface is configured to be up, but the interface's operating state is not up. This data is published to the PIE application. The link down PIE subscribes to these events, receives the data from the broker, and analyzes the data to find the root cause.

- **Optics PIE:** The optics PIE is a continuous monitoring engine that performs a time series analysis of the DOM data collected at regular intervals. By tracking various parameters in the DOM over a period, the PIE arrives at a metric to describe the state of optics for each optical port. The metric is an insight about the trending health of an optical transceiver.
- **SSD PIE:** The SSD PIE provides a mechanism to debug high SSD usage. This PIE provides the top 10 process usage information.
- **CPU PIE:** The CPU PIE provides a mechanism to debug high CPU usage. This PIE provides the top 10 processes that use the most CPU. The data is collected periodically to have a history of top 10 users of CPU usage.
- **Sensor PIE:** The sensor PIE provides a mechanism to debug issues with the temperature sensors by maintaining a history of temperature sensor readings for the past 30 days. The PIE enables system environment readings (PSU, fan, and sensor) to be correlated and derives an insights metric.
- **Memory PIE:** The memory PIE monitors the memory usage of the box. This PIE finds the top 10 users of memory and provides the data collection for detecting memory leaks.
- **PSU PIE:** The PSU PIE monitors the health of the PSU and predicts if the PSU will have a failure. This PIE analyzes the relationship between power, voltage, and current, and captures the hardware state periodically.
- **Fan PIE:** The fan PIE monitors the health of the fans. This PIE analyzes the relationship between pulse width modulation (PWM) and RPM, and makes it easier to find fans that have failed.

Guideline and Limitations for the Platform Insights Engine

The following guidelines and limitations are for the Platform Insights Engine (PIE):

- The PIE application does not require licensing information.
- The following hardware is not supported:
 - All modular chassis (Cisco N9K-9504, N9K-9508, N9K-9516)
 - All Cisco Nexus 3000 leaf switches
- All data that is collected in the EventDB is not written to persistent storage. Therefore, data is lost when the system is restarted, powered off, or reloaded.
- Fabric extenders (FEXes) are not supported with the PIE application.

Platform Insights Engine Information Model

The following table describes the Platform Insights Engine (PIE) information parameters:

Information Parameter	Description
Event	A piece of information exchanged by clients associated with a timestamp.
Event ID	A unique identity number to identify an event in the database.
Event Class	An event class identifies the type of event.
Client ID	Identifies a PIE client.

Information Parameter	Description
Source ID	Identifies a logical source of an event.
Event Meta Data	Consists of event ID, class ID, source ID, timestamp, and event data length. This parameter is common to all events.
Event Data	The raw data collected by the source or the insight data that is published by the PIE.

Platform Insights Engine CLI Commands

The following show commands display Platform Insights Engine (PIE)-related information:

Command	Purpose
switch# show pie eventdb all	Lists all events in the eventdb.
switch# show pie eventdb dom	Lists the transceiver digital optical monitoring (DOM) events.
switch# show pie eventdb dom_db	Lists health metrics of transceivers based on health metrics computed by the optics PIE.
switch# show pie eventdb link-down [detail]	Lists all link-down events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb link-down-rca [detail]	Lists all the link-down events with the reason for the link being down, computed by the link-down PIE. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb link-flaps [detail]	Lists all link-flap events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb link-flap-rca	Lists all the link-flap events with the reason for flaps, based on the root cause analysis by the on-switch link-flap insight engine.
switch# show pie eventdb ssd-overall	Lists all overall SSD events.
switch# show system internal bootflash-stats ? current Show SSD IO stats from bootup overall Show SSD IO overall usage summary Show SSD aggregate summary	Lists all current SSD events.
switch# show pie eventdb ssd-cur	List all current SSD events.
switch# show pie eventdb ssd-summary	List the SSD aggregate summary events.
switch# show pie interface ethernet 1/19 link-down-rca	Lists the link-down events for a specific interface.
switch# show pie eventid 26	List the details of specific event, if the eventid is known.

Command	Purpose
switch# show pie interface ethernet 1/20 link-flap-rca	Lists the link flaps for a specific interface.
switch# show pie interface ethernet 1/15 transceiver-insights	Lists the transceiver insights for a specific interface.
switch# show pie eventdb psu insights [detail]	Lists all fan insights. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie envmon psu all [detail]	Lists all fan events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb fan insights [detail]	Lists all fan insights. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie envmon fan [detail]	Lists all fan events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie envmon mem-usage [detail]	Lists all memory usage insights. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb mem-usage [detail]	Lists all memory usage events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie envmon cpu [detail]	Lists all CPU insights. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb cpu [detail]	Lists all CPU events. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie envmon sensor [detail]	Lists all sensor insights. If you specify the <code>detail</code> flag, the output includes more information.
switch# show pie eventdb sensor [detail]	Lists all sensor events. If you specify the <code>detail</code> flag, the output includes more information.

CLI Command Output Examples

The following examples show the output for some of the PIE-related commands:

```
switch# show pie eventdb link-flap-rca
2021-10-11 21:06:42 Event Id: 00008592 Ethernet1/23 Source Id: 436297728 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
2021-10-11 21:06:42 Event Id: 00008590 Ethernet1/19 Source Id: 436281344 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
2021-10-08 20:46:02 Event Id: 00001826 Ethernet1/23 Source Id: 436297728 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
2021-10-08 20:46:02 Event Id: 00001824 Ethernet1/19 Source Id: 436281344 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
2021-10-08 03:35:46 Event Id: 00000588 Ethernet1/32 Source Id: 436334592 RCA Code: 28
Reason: Link flapped due to UnderRun error on MAC

switch# show pie eventdb link-flap-rca detail
2021-10-11 21:06:42 Event Id: 00008592 Ethernet1/23 Source Id: 436297728 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
```

Link flap Reason : Link flapped/down due to Local Fault, check peer
Source Event id : 8591

***** Meta Details*****

ifindex : 0x0
port_no : 88
phy_port_no : 0
link_event_type : 0
link_status : 0
retimer_port : 0
asic_type : 0
phy_type : 0
phy_mode : 0
link_down_rca : 0
xcvr_supported : 1
is_phy_port : 0
is_copper : 0

***** SW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 20000
sw_port_fec : 0
sw_port_loopback : 0
sw_port_mtu : 9022
sw_breakout_map : 0
sw_port_ipg : 0
sw_port_prbs : 0
sw_xcvr_present : 0
sw_glct_present : 0
sw_qsa_present : 0
sw_phy_present : 0
sw_port_purged : 0
hw_port_present : 0

***** HW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 20000
sw_port_fec : 0
sw_port_loopback : 0
sw_port_mtu : 0

*****Port SM Details*****

port_sm_type : 0
port_sm_state : 0

*****MAC Layer Details*****

signal_detect : 1
num_lanes : 2
start_lane : 4
tx_enable : 0
rx_enable : 0
fault_status : 1
rx_crc_errors : 0
tx_crc_errors : 0
len_errors : 0
framing_errors : 0
tx_fifo_err : 0
rx_fifo_err : 0

*****PCS Layer Details*****

block_lock_loss : 0

```

fault : 0
phy_fifo_error : 0
decoder_trap : 0
deskew_overflow : 0
sync_loss : 0
high_ber : 0
high_ser : 0
error_blocks : 0
alignment_loss : 0
alignment_status : 0
rx_pcs_block_err : 0
rx_pcs_test_err : 0
rx_pcs_sync_err : 0
rx_pcs_bip_err : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err : 0
rx_pcs_align_marker_err : 0

```

*****Fec Layer Details*****

```

FC_ECC_error : 0
RS_ECC_error : 0
RS_alignment_lost : 0
RS_uncorr_err : 0
RS_deskew_err : 0
RS_BER_over_thres_err : 0
FC_uncorr_err : 0
FC_bad_uncorr_code_word : 0

```

*****PHY Details*****

```

hrx_lanes : 0x30
htx_lanes : 0x30
lrx_lanes : 0xf
ltx_lanes : 0xf
op_mode : 2
fec_mode : 1

```

*****XCVR Details*****

```

xcvr_type : 57
xcvr_present : 1
laser_disabled : 0
diags_supported : 0
tx_los : 0
rx_los : 0
tx_fault : 0
tx_adapt_eq_fault : 0
tx_cdr_lol : 0
rx_cdr_lol : 0
temp_high_alarm : 0
temp_low_alarm : 0
temp_high_warning : 0
temp_low_warning : 0
voltage_high_alarm : 0
voltage_low_alarm : 0
voltage_high_warning : 0
voltage_low_warning : 0
rx_power_high_alarm : 0
rx_power_low_alarm : 0
rx_power_high_warning : 0
rx_power_low_warning : 0
tx_power_high_alarm : 0
tx_power_low_alarm : 0
tx_power_high_warning : 0
tx_power_low_warning : 0

```

```

bias_current_high_alarm : 0
bias_current_low_alarm : 0
bias_current_high_warning : 0
bias_current_low_warning : 0
laser_temp_high_alarm : 0
laser_temp_low_alarm : 0
laser_temp_high_warning : 0
laser_temp_low_warning : 0
tec_current_high_alarm : 0
tec_current_low_alarm : 0
tec_current_high_warning : 0
tec_current_low_warning : 0
2021-10-11 21:06:42 Event Id: 00008590 Ethernet1/19 Source Id: 436281344 RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer
Link flap Reason : Link flapped/down due to Local Fault, check peer
Source Event id : 8589
***** Meta Details*****
ifindex : 0x0
port_no : 72
phy_port_no : 0
link_event_type : 0
link_status : 0
retimer_port : 0
asic_type : 0
phy_type : 0
phy_mode : 0
link_down_rca : 0
xcvr_supported : 1
is_phy_port : 0
is_copper : 0

***** SW Admin Details*****
sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 50000
sw_port_fec : 2
sw_port_loopback : 0
sw_port_mtu : 9022
sw_breaklout_map : 0
sw_port_ipg : 0
sw_port_prbs : 0
sw_xcvr_present : 0
sw_glct_present : 0
sw_qsa_present : 0
sw_phy_present : 0
sw_port_purged : 0
hw_port_present : 0

***** HW Admin Details*****
sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 50000
sw_port_fec : 2
sw_port_loopback : 0
sw_port_mtu : 0

*****Port SM Details*****
port_sm_type : 0
port_sm_state : 0

*****MAC Layer Details*****
signal_detect : 1

```



```

num_lanes           : 2
start_lane          : 4
tx_enable           : 0
rx_enable           : 0
fault_status        : 1
rx_crc_errors       : 0
tx_crc_errors       : 0
len_errors          : 0
framing_errors      : 0
tx_fifo_err         : 0
rx_fifo_err         : 0

```

*****PCS Layer Details*****

```

block_lock_loss     : 0
fault               : 0
phy_fifo_error      : 0
decoder_trap        : 0
deskew_overflow     : 0
sync_loss           : 0
high_ber            : 0
high_ser            : 0
error_blocks        : 0
alignment_loss      : 0
alignment_status    : 0
rx_pcs_block_err    : 0
rx_pcs_test_err     : 0
rx_pcs_sync_err     : 0
rx_pcs_bip_err      : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err   : 0
rx_pcs_align_marker_err : 0

```

*****Fec Layer Details*****

```

FC_ECC_error        : 0
RS_ECC_error        : 0
RS_alignment_lost   : 0
RS_uncorr_err       : 0
RS_deskew_err       : 0
RS_BER_over_thres_err : 0
FC_uncorr_err       : 0
FC_bad_uncorr_code_word : 0

```

*****PHY Details*****

```

hrx_lanes           : 0x30
htx_lanes           : 0x30
lrx_lanes           : 0xf
ltx_lanes           : 0xf
op_mode             : 2
fec_mode            : 2

```

*****XCVR Details*****

```

xcvr_type           : 80
xcvr_present        : 1
laser_disabled      : 0
diags_supported     : 0
tx_los              : 0
rx_los              : 0
tx_fault            : 0
tx_adapt_eq_fault   : 0
tx_cdr_lol          : 0
rx_cdr_lol          : 0
temp_high_alarm     : 0
temp_low_alarm      : 0

```

```

temp_high_warning      : 0
temp_low_warning       : 0
voltage_high_alarm    : 0
voltage_low_alarm     : 0
voltage_high_warning  : 0
voltage_low_warning   : 0
rx_power_high_alarm   : 0
rx_power_low_alarm    : 0
rx_power_high_warning : 0
rx_power_low_warning  : 0
tx_power_high_alarm   : 0
tx_power_low_alarm    : 0
tx_power_high_warning : 0
tx_power_low_warning  : 0
bias_current_high_alarm : 0
bias_current_low_alarm : 0
bias_current_high_warning : 0
bias_current_low_warning : 0
laser_temp_high_alarm : 0
laser_temp_low_alarm  : 0
laser_temp_high_warning : 0
laser_temp_low_warning : 0
tec_current_high_alarm : 0
tec_current_low_alarm  : 0
tec_current_high_warning : 0
tec_current_low_warning : 0

```

switch# **show pie eventdb link-down-rca**

```

2021-10-11 21:23:38 Event Id: 00008624 Ethernet1/1 Source Id: 436207616 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer
2021-10-11 21:23:23 Event Id: 00008622 Ethernet1/1 Source Id: 436207616 RCA Code: 1
Reason: No Signal from peer is detected .Please check peer configuration.
2021-10-11 21:17:13 Event Id: 00008616 Ethernet1/23 Source Id: 436297728 RCA Code: 1
Reason: No Signal from peer is detected .Please check peer configuration.
2021-10-11 21:16:28 Event Id: 00008614 Ethernet1/23 Source Id: 436297728 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer
2021-10-11 21:16:22 Event Id: 00008612 Ethernet1/1 Source Id: 436207616 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer
2021-10-11 21:07:13 Event Id: 00008598 Ethernet1/23 Source Id: 436297728 RCA Code: 1
Reason: No Signal from peer is detected .Please check peer configuration.
2021-10-11 21:07:12 Event Id: 00008596 Ethernet1/19 Source Id: 436281344 RCA Code: 1
Reason: No Signal from peer is detected .Please check peer configuration.
2021-10-11 21:07:07 Event Id: 00008594 Ethernet1/1 Source Id: 436207616 RCA Code: 1
Reason: No Signal from peer is detected .Please check peer configuration.

```

switch# **show pie eventdb link-down-rca detail**

```

2021-10-11 21:23:38 Event Id: 00008624 Ethernet1/1 Source Id: 436207616 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer
Link Down Reason :No PCS alignment detected. Please check Fec, speed, Autoneg configurations
with peer
Link Down Event id :8623
Source Event id :8623

```

***** Meta Details*****

```

ifindex      : 0x1a000000
port_no     : 0
phy_port_no  : 0
link_event_type : 0
link_status  : 0
retimer_port : 0
asic_type   : 0
phy_type    : 0
phy_mode    : 0
link_down_rca : 0

```

```

xcvr_supported      : 1
is_phy_port        : 0
is_copper          : 0

***** SW Admin Details*****
sw_port_admin_state : 1
sw_port_oper_state  : 2
sw_port_autoneg     : 1
sw_port_speed       : 50000
sw_port_fec         : 2
sw_port_loopback    : 0
sw_port_mtu         : 9022
sw_breakout_map     : 0
sw_port_ipg         : 0
sw_port_prbs        : 0
sw_xcvr_present     : 0
sw_glct_present     : 0
sw_qsa_present      : 0
sw_phy_present      : 0
sw_port_purged      : 0
hw_port_present     : 0

***** HW Admin Details*****
sw_port_admin_state : 1
sw_port_oper_state  : 2
sw_port_autoneg     : 1
sw_port_speed       : 50000
sw_port_fec         : 2
sw_port_loopback    : 0
sw_port_mtu         : 0

*****Port SM Details*****
port_sm_type        : 0
port_sm_state       : 0

*****MAC Layer Details*****
signal_detect       : 1
num_lanes           : 2
start_lane          : 0
tx_enable           : 0
rx_enable           : 0
fault_status        : 0
rx_crc_errors       : 0
tx_crc_errors       : 0
len_errors          : 0
framing_errors      : 0
tx_fifo_err         : 0
rx_fifo_err         : 0

*****PCS Layer Details*****
block_lock_loss     : 0
fault               : 0
phy_fifo_error      : 0
decoder_trap        : 0
deskew_overflow     : 0
sync_loss           : 0
high_ber            : 0
high_ser            : 0
error_blocks        : 0
alignment_loss      : 0
alignment_status    : 0
rx_pcs_block_err    : 0
rx_pcs_test_err     : 0
rx_pcs_sync_err     : 0

```

```
rx_pcs_bip_err      : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err   : 0
rx_pcs_align_marker_err : 0
```

*****Fec Layer Details*****

```
FC_ECC_error       : 0
RS_ECC_error       : 0
RS_alignment_lost  : 0
RS_uncorr_err      : 0
RS_deskew_err      : 0
RS_BER_over_thres_err : 0
FC_uncorr_err      : 0
FC_bad_uncorr_code_word : 0
```

*****PHY Details*****

```
hrx_lanes          : 0xc0
htx_lanes          : 0xc0
lrx_lanes          : 0xf0
ltx_lanes          : 0xf0
op_mode            : 2
fec_mode           : 2
```

*****XCVR Details*****

```
xcvr_type          : 80
xcvr_present       : 1
laser_disabled     : 0
diags_supported    : 0
tx_los             : 240
rx_los             : 0
tx_fault           : 0
tx_adapt_eq_fault  : 0
tx_cdr_lol         : 0
rx_cdr_lol         : 0
temp_high_alarm    : 0
temp_low_alarm     : 0
temp_high_warning  : 0
temp_low_warning   : 0
voltage_high_alarm : 0
voltage_low_alarm  : 0
voltage_high_warning : 0
voltage_low_warning : 0
rx_power_high_alarm : 0
rx_power_low_alarm : 0
rx_power_high_warning : 0
rx_power_low_warning : 0
tx_power_high_alarm : 0
tx_power_low_alarm : 0
tx_power_high_warning : 0
tx_power_low_warning : 0
bias_current_high_alarm : 0
bias_current_low_alarm : 0
bias_current_high_warning : 0
bias_current_low_warning : 0
laser_temp_high_alarm : 0
laser_temp_low_alarm : 0
laser_temp_high_warning : 0
laser_temp_low_warning : 0
tec_current_high_alarm : 0
tec_current_low_alarm : 0
tec_current_high_warning : 0
tec_current_low_warning : 0
```

Reason: No Signal from peer is detected .Please check peer configuration.
Link Down Reason :No Signal from peer is detected .Please check peer configuration.
Link Down Event id :8621
Source Event id :8621

***** Meta Details*****

ifindex : 0x1a000000
port_no : 0
phy_port_no : 0
link_event_type : 0
link_status : 0
retimer_port : 0
asic_type : 0
phy_type : 0
phy_mode : 0
link_down_rca : 0
xcvr_supported : 1
is_phy_port : 0
is_copper : 0

***** SW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 50000
sw_port_fec : 2
sw_port_loopback : 0
sw_port_mtu : 9022
sw_breaklout_map : 0
sw_port_ipg : 0
sw_port_prbs : 0
sw_xcvr_present : 0
sw_glct_present : 0
sw_qsa_present : 0
sw_phy_present : 0
sw_port_purged : 0
hw_port_present : 0

***** HW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 50000
sw_port_fec : 2
sw_port_loopback : 0
sw_port_mtu : 0

*****Port SM Details*****

port_sm_type : 0
port_sm_state : 0

*****MAC Layer Details*****

signal_detect : 0
num_lanes : 2
start_lane : 0
tx_enable : 0
rx_enable : 0
fault_status : 0
rx_crc_errors : 0
tx_crc_errors : 0
len_errors : 0
framing_errors : 0
tx_fifo_err : 0
rx_fifo_err : 0

*****PCS Layer Details*****

```
block_lock_loss      : 0
fault                : 0
phy_fifo_error       : 0
decoder_trap         : 0
deskew_overflow      : 0
sync_loss            : 0
high_ber              : 0
high_ser              : 0
error_blocks         : 0
alignment_loss       : 0
alignment_status     : 0
rx_pcs_block_err     : 0
rx_pcs_test_err      : 0
rx_pcs_sync_err      : 0
rx_pcs_bip_err       : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err    : 0
rx_pcs_align_marker_err : 0
```

*****Fec Layer Details*****

```
FC_ECC_error         : 0
RS_ECC_error         : 0
RS_alignment_lost    : 0
RS_uncorr_err        : 0
RS_deskew_err        : 0
RS_BER_over_thres_err : 0
FC_uncorr_err        : 0
FC_bad_uncorr_code_word : 0
```

*****PHY Details*****

```
hrx_lanes            : 0xc0
htx_lanes             : 0xc0
lrx_lanes             : 0xf0
ltx_lanes             : 0xf0
op_mode               : 2
fec_mode              : 2
```

*****XCVR Details*****

```
xcvr_type            : 80
xcvr_present         : 1
laser_disabled       : 0
diags_supported      : 0
tx_los               : 240
rx_los               : 15
tx_fault             : 0
tx_adapt_eq_fault    : 0
tx_cdr_lol           : 0
rx_cdr_lol           : 0
temp_high_alarm      : 0
temp_low_alarm       : 0
temp_high_warning    : 0
temp_low_warning     : 0
voltage_high_alarm   : 0
voltage_low_alarm    : 0
voltage_high_warning : 0
voltage_low_warning  : 0
rx_power_high_alarm  : 0
rx_power_low_alarm   : 0
rx_power_high_warning : 0
rx_power_low_warning : 0
tx_power_high_alarm  : 0
```

```

tx_power_low_alarm      : 0
tx_power_high_warning   : 0
tx_power_low_warning    : 0
bias_current_high_alarm : 0
bias_current_low_alarm  : 0
bias_current_high_warning : 0
bias_current_low_warning : 0
laser_temp_high_alarm   : 0
laser_temp_low_alarm    : 0
laser_temp_high_warning : 0
laser_temp_low_warning  : 0
tec_current_high_alarm  : 0
tec_current_low_alarm   : 0
tec_current_high_warning : 0
tec_current_low_warning  : 0

```

switch# **show pie interface ethernet 1/1 link-down-rca**

```

2021-10-11 21:23:38 Event Id: 00008624 Ethernet1/1 Source Id: 436207616 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer

```

switch# **show pie interface ethernet 1/1 link-down-rca detail**

```

2021-10-11 21:23:38 Event Id: 00008624 Ethernet1/1 Source Id: 436207616 RCA Code: 16
Reason: No PCS alignment detected. Please check Fec, speed, Autoneg configurations with peer
Link Down Reason :No PCS alignment detected. Please check Fec, speed, Autoneg configurations
with peer
Link Down Event id :8623
Source Event id :8623

```

***** Meta Details*****

```

ifindex      : 0x1a000000
port_no      : 0
phy_port_no  : 0
link_event_type : 0
link_status  : 0
retimer_port : 0
asic_type    : 0
phy_type     : 0
phy_mode     : 0
link_down_rca : 0
xcvr_supported : 1
is_phy_port  : 0
is_copper    : 0

```

***** SW Admin Details*****

```

sw_port_admin_state : 1
sw_port_oper_state  : 2
sw_port_autoneg     : 1
sw_port_speed       : 50000
sw_port_fec         : 2
sw_port_loopback    : 0
sw_port_mtu         : 9022
sw_breaklout_map    : 0
sw_port_ipg         : 0
sw_port_prbs        : 0
sw_xcvr_present     : 0
sw_glct_present     : 0
sw_qsa_present      : 0
sw_phy_present      : 0
sw_port_purged      : 0
hw_port_present     : 0

```

***** HW Admin Details*****

```

sw_port_admin_state : 1
sw_port_oper_state  : 2

```

```

sw_port_autoneg      : 1
sw_port_speed       : 50000
sw_port_fec         : 2
sw_port_loopback    : 0
sw_port_mtu         : 0

*****Port SM Details*****
port_sm_type        : 0
port_sm_state       : 0

*****MAC Layer Details*****
signal_detect       : 1
num_lanes           : 2
start_lane          : 0
tx_enable           : 0
rx_enable           : 0
fault_status        : 0
rx_crc_errors       : 0
tx_crc_errors       : 0
len_errors          : 0
framing_errors      : 0
tx_fifo_err         : 0
rx_fifo_err         : 0

*****PCS Layer Details*****
block_lock_loss     : 0
fault               : 0
phy_fifo_error      : 0
decoder_trap        : 0
deskew_overflow     : 0
sync_loss           : 0
high_ber            : 0
high_ser            : 0
error_blocks        : 0
alignment_loss      : 0
alignment_status    : 0
rx_pcs_block_err    : 0
rx_pcs_test_err     : 0
rx_pcs_sync_err     : 0
rx_pcs_bip_err      : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err   : 0
rx_pcs_align_marker_err : 0

*****Fec Layer Details*****
FC_ECC_error        : 0
RS_ECC_error        : 0
RS_alignment_lost   : 0
RS_uncorr_err       : 0
RS_deskew_err       : 0
RS_BER_over_thres_err : 0
FC_uncorr_err       : 0
FC_bad_uncorr_code_word : 0

*****PHY Details*****
hrx_lanes           : 0xc0
htx_lanes           : 0xc0
lrx_lanes           : 0xf0
ltx_lanes           : 0xf0
op_mode             : 2
fec_mode            : 2

*****XCVR Details*****

```



```

xcvr_type           :      80
xcvr_present        :      1
laser_disabled      :      0
diags_supported     :      0
tx_los              :     240
rx_los              :      0
tx_fault            :      0
tx_adapt_eq_fault   :      0
tx_cdr_lol          :      0
rx_cdr_lol          :      0
temp_high_alarm     :      0
temp_low_alarm      :      0
temp_high_warning   :      0
temp_low_warning    :      0
voltage_high_alarm  :      0
voltage_low_alarm   :      0
voltage_high_warning :      0
voltage_low_warning :      0
rx_power_high_alarm :      0
rx_power_low_alarm  :      0
rx_power_high_warning :      0
rx_power_low_warning :      0
tx_power_high_alarm :      0
tx_power_low_alarm  :      0
tx_power_high_warning :      0
tx_power_low_warning :      0
bias_current_high_alarm :      0
bias_current_low_alarm :      0
bias_current_high_warning :      0
bias_current_low_warning :      0
laser_temp_high_alarm :      0
laser_temp_low_alarm :      0
laser_temp_high_warning :      0
laser_temp_low_warning :      0
tec_current_high_alarm :      0
tec_current_low_alarm :      0
tec_current_high_warning :      0
tec_current_low_warning :      0

```

switch# **show pie interface ethernet 1/23 link-flap-rca**

```

2021-10-11 21:06:42  Event Id: 00008592      Ethernet1/23      Source Id: 436297728      RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer

```

```

2021-10-08 20:46:02  Event Id: 00001826      Ethernet1/23      Source Id: 436297728      RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer

```

switch# **show pie interface ethernet 1/23 link-flap-rca detail**

```

2021-10-11 21:06:42  Event Id: 00008592      Ethernet1/23      Source Id: 436297728      RCA Code: 41
Reason: Link flapped/down due to Local Fault, check peer

```

Link flap Reason : Link flapped/down due to Local Fault, check peer

Source Event id : 8591

***** Meta Details*****

```

ifindex            :      0x0
port_no            :      88
phy_port_no        :      0
link_event_type    :      0
link_status        :      0
retimer_port       :      0
asic_type          :      0
phy_type           :      0
phy_mode           :      0

```

```

link_down_rca           : 0
xcvr_supported          : 1
is_phy_port             : 0
is_copper               : 0

***** SW Admin Details*****
sw_port_admin_state     : 1
sw_port_oper_state      : 2
sw_port_autoneg         : 1
sw_port_speed           : 20000
sw_port_fec             : 0
sw_port_loopback        : 0
sw_port_mtu             : 9022
sw_breaklout_map        : 0
sw_port_ipg             : 0
sw_port_prbs            : 0
sw_xcvr_present         : 0
sw_glct_present         : 0
sw_qsa_present          : 0
sw_phy_present          : 0
sw_port_purged          : 0
hw_port_present         : 0

***** HW Admin Details*****
sw_port_admin_state     : 1
sw_port_oper_state      : 2
sw_port_autoneg         : 1
sw_port_speed           : 20000
sw_port_fec             : 0
sw_port_loopback        : 0
sw_port_mtu             : 0

*****Port SM Details*****
port_sm_type            : 0
port_sm_state           : 0

*****MAC Layer Details*****
signal_detect           : 1
num_lanes               : 2
start_lane              : 4
tx_enable               : 0
rx_enable               : 0
fault_status           : 1
rx_crc_errors           : 0
tx_crc_errors           : 0
len_errors              : 0
framing_errors          : 0
tx_fifo_err             : 0
rx_fifo_err             : 0

*****PCS Layer Details*****
block_lock_loss         : 0
fault                   : 0
phy_fifo_error          : 0
decoder_trap            : 0
deskew_overflow         : 0
sync_loss               : 0
high_ber                : 0
high_ser                : 0
error_blocks            : 0
alignment_loss          : 0
alignment_status        : 0
rx_pcs_block_err        : 0
rx_pcs_test_err         : 0

```

```
rx_pcs_sync_err      : 0
rx_pcs_bip_err       : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err    : 0
rx_pcs_align_marker_err : 0
```

*****Fec Layer Details*****

```
FC_ECC_error         : 0
RS_ECC_error         : 0
RS_alignment_lost    : 0
RS_uncorr_err        : 0
RS_deskew_err        : 0
RS_BER_over_thres_err : 0
FC_uncorr_err        : 0
FC_bad_uncorr_code_word : 0
```

*****PHY Details*****

```
hrx_lanes           : 0x30
htx_lanes           : 0x30
lrx_lanes           : 0xf
ltx_lanes           : 0xf
op_mode             : 2
fec_mode            : 1
```

*****XCVR Details*****

```
xcvr_type           : 57
xcvr_present        : 1
laser_disabled      : 0
diags_supported     : 0
tx_los              : 0
rx_los              : 0
tx_fault            : 0
tx_adapt_eq_fault   : 0
tx_cdr_lol          : 0
rx_cdr_lol          : 0
temp_high_alarm     : 0
temp_low_alarm      : 0
temp_high_warning   : 0
temp_low_warning    : 0
voltage_high_alarm  : 0
voltage_low_alarm   : 0
voltage_high_warning : 0
voltage_low_warning : 0
rx_power_high_alarm : 0
rx_power_low_alarm  : 0
rx_power_high_warning : 0
rx_power_low_warning : 0
tx_power_high_alarm : 0
tx_power_low_alarm  : 0
tx_power_high_warning : 0
tx_power_low_warning : 0
bias_current_high_alarm : 0
bias_current_low_alarm : 0
bias_current_high_warning : 0
bias_current_low_warning : 0
laser_temp_high_alarm : 0
laser_temp_low_alarm : 0
laser_temp_high_warning : 0
laser_temp_low_warning : 0
tec_current_high_alarm : 0
tec_current_low_alarm : 0
tec_current_high_warning : 0
tec_current_low_warning : 0
```

2021-10-08 20:46:02 Event Id: 00001826 Ethernet1/23 Source Id: 436297728 RCA Code: 41

Reason: Link flapped/down due to Local Fault, check peer
Link flap Reason : Link flapped/down due to Local Fault, check peer
Source Event id : 1825

***** Meta Details*****

ifindex : 0x0
port_no : 88
phy_port_no : 0
link_event_type : 0
link_status : 0
retimer_port : 0
asic_type : 0
phy_type : 0
phy_mode : 0
link_down_rca : 0
xcvr_supported : 1
is_phy_port : 0
is_copper : 0

***** SW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 20000
sw_port_fec : 0
sw_port_loopback : 0
sw_port_mtu : 9022
sw_breaklout_map : 0
sw_port_ipg : 0
sw_port_prbs : 0
sw_xcvr_present : 0
sw_glct_present : 0
sw_qsa_present : 0
sw_phy_present : 0
sw_port_purged : 0
hw_port_present : 0

***** HW Admin Details*****

sw_port_admin_state : 1
sw_port_oper_state : 2
sw_port_autoneg : 1
sw_port_speed : 20000
sw_port_fec : 0
sw_port_loopback : 0
sw_port_mtu : 0

*****Port SM Details*****

port_sm_type : 0
port_sm_state : 0

*****MAC Layer Details*****

signal_detect : 1
num_lanes : 2
start_lane : 4
tx_enable : 0
rx_enable : 0
fault_status : 1
rx_crc_errors : 0
tx_crc_errors : 0
len_errors : 0
framing_errors : 0
tx_fifo_err : 0
rx_fifo_err : 0

*****PCS Layer Details*****

```

block_lock_loss      : 0
fault                : 0
phy_fifo_error       : 0
decoder_trap         : 0
deskew_overflow      : 0
sync_loss            : 0
high_ber             : 0
high_ser             : 0
error_blocks         : 0
alignment_loss       : 0
alignment_status     : 0
rx_pcs_block_err     : 0
rx_pcs_test_err      : 0
rx_pcs_sync_err      : 0
rx_pcs_bip_err       : 0
rx_pcs_align_map_err : 0
rx_pcs_align_skew_err : 0
rx_pcs_fec_cw_err    : 0
rx_pcs_align_marker_err : 0

```

*****Fec Layer Details*****

```

FC_ECC_error         : 0
RS_ECC_error         : 0
RS_alignment_lost    : 0
RS_uncorr_err        : 0
RS_deskew_err        : 0
RS_BER_over_thres_err : 0
FC_uncorr_err        : 0
FC_bad_uncorr_code_word : 0

```

*****PHY Details*****

```

hrx_lanes            : 0x30
htx_lanes            : 0x30
lrx_lanes            : 0xf
ltx_lanes            : 0xf
op_mode              : 2
fec_mode             : 1

```

*****XCVR Details*****

```

xcvr_type            : 57
xcvr_present         : 1
laser_disabled       : 0
diags_supported      : 0
tx_los               : 0
rx_los               : 0
tx_fault             : 0
tx_adapt_eq_fault    : 0
tx_cdr_lol           : 0
rx_cdr_lol           : 0
temp_high_alarm      : 0
temp_low_alarm       : 0
temp_high_warning    : 0
temp_low_warning     : 0
voltage_high_alarm   : 0
voltage_low_alarm    : 0
voltage_high_warning : 0
voltage_low_warning  : 0
rx_power_high_alarm  : 0
rx_power_low_alarm   : 0
rx_power_high_warning : 0
rx_power_low_warning : 0
tx_power_high_alarm  : 0
tx_power_low_alarm   : 0

```

```
tx_power_high_warning      : 0
tx_power_low_warning       : 0
bias_current_high_alarm    : 0
bias_current_low_alarm     : 0
bias_current_high_warning  : 0
bias_current_low_warning   : 0
laser_temp_high_alarm      : 0
laser_temp_low_alarm       : 0
laser_temp_high_warning   : 0
laser_temp_low_warning     : 0
tec_current_high_alarm     : 0
tec_current_low_alarm      : 0
tec_current_high_warning   : 0
tec_current_low_warning    : 0
```

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