Troubleshoot ACI Switch Baseline Health Using CLI Commands

Contents

Introduction

This document describes Cisco ACI leaf and spine troubleshooting, including a triage table, switch-specific checks, and APIC-side correlation.

Overview

You can troubleshoot most ACI switch issues faster when you use an ordered command sequence instead of jumping directly into deep internal commands. Start with software and hardware baseline checks, continue with diagnostics and environmental state, and then correlate active switch issues on the APIC before moving into feature-specific commands.

- Baseline identity and software — verify image mode, version, reset reason, and uptime.
- Hardware and environment — verify modules, power supplies, fans, and temperatures.
- Diagnostics — verify online diagnostics for supervisors, line cards, and fabric modules.
- APIC correlation — verify active faults and fault history for the affected node.
- Feature-specific checks — use Layer 2, Layer 3, and policy commands only after the baseline is understood.

Quick Triage Table

Goal	Command	What to Look for	What to do Next
Confirm ACI mode and version	**show version**	ACI kick start image, expected release, sane reset reason	If the switch is not in ACI mode, stop and correct the boot image first.
Verify module health	**show module**	Modules are 'ok' and online diagnostics are 'pass'	If any active module is not 'ok' or diagnostics fail, treat it as a hardware issue first.
Verify power, fan, and thermal state	**show environment**	Operational PSUs are 'ok', fan state is 'ok', temperatures are 'normal'	If the only anomaly is a redundant PSU in 'shut' state, verify design intent before escalating.
Verify diagnostic results	**show diagnostic result module all**	Tests show '.' for pass across active modules	If any test is 'F', 'A', or 'I', correlate with module and fault output.
Check discovery and fabric baseline	**show discoveryissues**	System state, adjacency, infra VLAN, and policy download checks	If discovery checks fail, fix baseline connectivity before troubleshooting tenants or routing.
Correlate on the APIC	**show faults leaf <node-id>** or **show faults history leaf <node-id>**	Fault code, severity, and affected DN	Use the APIC view to separate active symptoms from already-cleared historical events.

Verify Configuration

Before you interpret runtime state, verify that the node is discovered, registered, and running ACI mode software. For switch onboarding and baseline discovery checks, use the built-in**show discoveryissues**command and confirm that the APIC reports the node as in-service.

Verify the Switch is in ACI Mode

<#root>

```
leaf-A#
```

show version

```
Software
  BIOS:      version 05.53
  kickstart: version 16.1(3f) [build 16.1(3f)]
  system:    version 16.1(3f) [build 16.1(3f)]
  PE:        version 6.1(3f)
  kickstart image file is: /bootflash/aci-n9000-dk9.16.1.3f.bin   <--- ACI mode indicator
  system image file is:    /bootflash/auto-s

Hardware
  cisco N9K-C93108TC-FX ("supervisor")
  Device name: leaf-A

Last reset at 241000 usecs after Wed Mar 11 17:28:38 2026 JST
  Reason: reset-requested-by-cli-command-reload
```

What good looks like: Kickstart and system lines are present, the kickstart image starts with 'aci-n9000', and the reset reason is explainable.

What bad looks like: Output shows a standalone **NXOS** image file with no ACI kickstart or system lines.

Leaf Switch Command Set

This section uses a fixed-form-factor leaf switch as the baseline. The output is based on a live ACI leaf and reflects both healthy and degraded conditions that are useful during triage.

show version

Run this command in order to verify software level, image mode, uptime, and last reset reason.

<#root>

```
leaf-A#
```

show version

```
Software
  BIOS:      version 05.53
  kickstart: version 16.1(3f) [build 16.1(3f)]
  system:    version 16.1(3f) [build 16.1(3f)]
  PE:        version 6.1(3f)
  kickstart image file is: /bootflash/aci-n9000-dk9.16.1.3f.bin
  system image file is:    /bootflash/auto-s

Hardware
  cisco N9K-C93108TC-FX ("supervisor")
  Device name: leaf-A

Kernel uptime is 29 day(s), 19 hour(s), 52 minute(s), 45 second(s)

Last reset at 241000 usecs after Wed Mar 11 17:28:38 2026 JST
  Reason: reset-requested-by-cli-command-reload
  Service: PolicyElem Ch reload
```

show module

Run this command in order to verify the line card state and the online diagnostic result at the module level.

<#root>

```
leaf-A#
```

show module

```
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    54     48x10G+6x40/100G Switch            N9K-C93108TC-FX    ok

Mod  Online Diag Status
---  ------------------
1    pass                                     <--- basic diagnostic baseline
```

What good looks like: The active module is **ok** and the online diagnostic state is **pass**.

What bad looks like: Module state is not **ok** or the diagnostic state is not **pass**.

show environment

Run this command in order to verify PSU, fan, and thermal state.

<#root>

```
leaf-A#
```

show environment

```
Power Supply:
Supply    Model              Output   Capacity   Status
1         NXA-PAC-500W-PE      0 W      500 W   shut       <--- redundant PSU not in use
2         NXA-PAC-500W-PE    219 W      500 W   ok

Fan:
Fan1(sys_fan1)  NXA-FAN-30CFM-F  Status: ok
Fan2(sys_fan2)  NXA-FAN-30CFM-F  Status: ok
Fan3(sys_fan3)  NXA-FAN-30CFM-F  Status: ok
Fan4(sys_fan4)  NXA-FAN-30CFM-F  Status: ok

Temperature:
1  Inlet(1)          37  normal
1  outlet(2)         38  normal
1  x86 processor(3)  71  normal
1  Homewood(4)       56  normal
```

What good looks like: The active PSU is **ok**, fans are **ok**, and temperatures are **normal**.

What bad looks like: An operational PSU is failed, fan status is not **ok**, or any thermal sensor is not **normal**.

show diagnostic result module all

Run this command in order to validate the actual online diagnostic tests, not just the summary field in **show module**.

<#root>

```
leaf-A#
```

```
show diagnostic result module all
```

```
Current bootup diagnostic level: bypass
Module 1: 48x10G  (Active)

Test results: (. = Pass, F = Fail, I = Incomplete,
U = Untested, A = Abort, E = Error disabled)

 1) bios-mem----------------------->  .
 2) mgmtp-lb----------------------->  .
22) cpu-cache--------------------->  .
23) mem-health-------------------->  .
24) ssd-acc----------------------->  .
33) fpga-reg-chk------------------->  .
43) tahoe-mem--------------------->  .
```

What good looks like: All required tests show '**.**'.

What bad looks like: Any **F**, **I**, or **A** result for active hardware.

show discoveryissues

Run this command in order to validate onboarding, adjacency, infra VLAN, and controller reachability. This is one of the most useful first-pass commands for leaf switches.

<#root>

```
leaf-A#
```

show discoveryissues

```
Check 3 HW Modules Check
Test01 Fans status check                                                    PASSED
Test02 Power Supply status check                                            FAILED
      [Warn] Operational state of sys/ch/psuslot-1/psu is: shut
      [Info] Ignore this if it is a redundant power supply

Check 5 System State
Test01 Check System State                                                   PASSED
      [Info] TopSystem State is : in-service

Check 8 Infra VLAN Check
Test01 Check if infra VLAN is received                                      PASSED
      [Info] Infra VLAN received is : 4093

Check 10 IS-IS Adj Info
Test01 check IS-IS adjacencies                                              PASSED
      [Info] IS-IS adjacencies found on interfaces:
      [Info] eth1/54.30
      [Info] eth1/51.31
      [Info] eth1/53.32

Check 11 Reachability to APIC
Test01 Ping check to APIC                                                   FAILED
      [Error] Ping to APIC IP 198.51.100.1 from 198.51.100.64 with MTU 1450 failed.
```

This example is useful because it shows a realistic mixed result - the node is in service and has fabric adjacencies, but controller reachability still fails while one redundant PSU is shut. You must interpret each failure in context instead of treating every failed line as equally severe.

Modular Spine Command Set

This section uses a modular spine switch. The structure of the output is different from a fixed leaf because you must evaluate line cards, fabric modules, supervisors, and system controllers separately.

show version

<#root>

```
spine-A#
```

```
show version
```

```
Software
  BIOS:      version 05.53
  kickstart: version 16.1(3f) [build 16.1(3f)]
  system:    version 16.1(3f) [build 16.1(3f)]
  PE:        version 6.1(3f)
  kickstart image file is: /bootflash/aci-n9000-dk9.16.1.3f-cs_64.bin   <--- modular spine image
  system image file is:    /bootflash/auto-s

Hardware
  cisco N9K-SUP-A+ ("supervisor")
  Device name: spine-A

Last reset at 983000 usecs after Wed Mar 11 17:31:09 2026 JST
  Reason: reset-requested-by-cli-command-reload
```

show module

Run this command in order to verify every hardware plane in the chassis.

<#root>

```
spine-A#
```

```
show module
```

```
Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    32     32p 40/100G Ethernet Module        N9K-X9732C-EX      ok
2    32     32p 40/100G Ethernet Module        N9K-X9732C-EX      ok
3    36     36p 40/100G Ethernet Module        N9K-X9736C-FX      ok
22   0      Fabric Module                      N9K-C9504-FM-E     ok
23   0      Fabric Module                      N9K-C9504-FM-E     ok
24   0      Fabric Module                      N9K-C9504-FM-E     ok
26   0      Fabric Module                      N9K-C9504-FM-E     ok
27   0      Supervisor Module                  N9K-SUP-A+         active
28   0      Supervisor Module                  N9K-SUP-A+         standby
29   0      System Controller                  N9K-SC-A           standby
30   0      System Controller                  N9K-SC-A           active

Mod  Online Diag Status
---  ------------------
1    pass
2    pass
3    pass
22   pass
23   pass
24   pass
26   pass
27   pass
28   pass
29   pass
30   pass
```

What good looks like: Line cards, fabric modules, supervisors, and system controllers are all present and diagnostics are **pass**.

What bad looks like: Missing or **non-ok** fabric modules, supervisor failover anomalies, or any failed module diagnostics.

show environment

<#root>

```
spine-A#
```

```
show environment
```

```
Power Supply:
Supply    Model           Output   Capacity   Status
1         N9K-PAC-3000W-B 1031 W    3000 W    ok
2         N9K-PAC-3000W-B    0 W    3000 W    shut
3         N9K-PAC-3000W-B  992 W    3000 W    ok
4         ------------      N/A W      0 W    Absent

Power Usage Summary:
Power Supply redundancy mode (operational)              Non-Redundant(combined)
Total Power Output (actual draw)                              1523 W
Total Power Available for additional modules                  1793 W

Fan:
Fan1(sys_fan1)  N9K-C9504-FAN  Status: ok
Fan2(sys_fan2)  N9K-C9504-FAN  Status: ok
Fan3(sys_fan3)  N9K-C9504-FAN  Status: ok
Fan4(sys_fan4)  N9K-C9504-FAN  Status: ok
Fan5(sys_fan5)  N9K-C9504-FAN  Status: ok
Fan6(sys_fan6)  N9K-C9504-FAN  Status: ok

Temperature:
1   ATOM processor(1)          32  normal
3   Homewood instance 2(3)     78  normal
22  LAC instance 1(2)          70  normal
27  x86 processor(4)           36  normal
```

This output is a good example of a chassis that is healthy even though one PSU is **shut** and another slot is **Absent**. The configured redundancy mode explains why the chassis is still operational.

show diagnostic result module all

<#root>

```
spine-A#
```

```
show diagnostic result module all
```

```
Current bootup diagnostic level: bypass
Module 1: 32p 40/100G Ethernet Module
 1) bios-mem----------------------->  .
 9) mvl4p-eobc-snake--------------->  .
39) lcfc-conn---------------------->  .
43) tahoe-mem---------------------->  .

Module 22: Fabric Module
10) mvl10p-snake------------------->  .
42) fclc-conn---------------------->  .
43) tahoe-mem---------------------->  .

Module 27: Supervisor Module  (Active)
24) ssd-acc------------------------>  .
32) nvram-cksum-------------------->  .
35) eobc-mon----------------------->  .

Module 30: System Controller
11) bcm28p-snake------------------->  .
41) pcie-bus----------------------->  .
```

On a modular spine, the main value of this command is breadth. You can confirm that line cards, fabric modules, and supervisors all pass diagnostics in a single view.

APIC Companion Section

After you validate the switch CLI baseline, move to the APIC in order to correlate the node with active and historical fault objects. This is the fastest way to determine whether the switch issue is isolated, policy-related, environmental, or already cleared.

show version

<#root>

```
apic-A#
```

show version

```
Role        Pod  Node  Name       Version
----------  ---  ----  ---------  -----------
controller  1    1     apic-A     6.1(3f)
controller  1    2     apic-B     6.1(3f)
controller  1    3     apic-C     6.1(3f)
leaf        1    101   leaf-A     n9000-16.1(3f)
spine       1    201   spine-A    n9000-16.1(3f)
```

Use this command in order to verify release alignment between controllers and switches before you assume a software mismatch.

show faults leaf <node-id>

<#root>

```
apic-A#
```

```
show faults leaf 101
```

```
Code            : F0532
Severity        : critical
Lifecycle       : raised
DN              : topology/pod-1/node-101/sys/phys-[eth1/11]/phys/fault-F0532
Description     : Port is down, reason being Link Not Connected(Connected),
                  used by EPG on node 101 with hostname leaf-A

Code            : F1451
Severity        : minor
Lifecycle       : raised
DN              : topology/pod-1/node-101/sys/ch/psuslot-1/psu/fault-F1451
Description     : Power supply shutdown.

Code            : F1699
Severity        : warning
Lifecycle       : raised
DN              : topology/pod-1/node-101/sys/time/prov-198.51.100.10/status/fault-F1699
Description     : NTP configuration on Leaf leaf-A is not synced to NTP server
```

This output is useful because it immediately separates three domains - access ports used by EPGs, PSU state, and time synchronization.

show faults history leaf <node-id>

<#root>

```
apic-A#
```

```
show faults history leaf 101
```

```
ID                    : 8589940065
Description           : Port is down, reason:Link Not Connected(Connected), used by:Fabric
Severity              : minor
Code                  : F1394
Action                : modification
Life Cycle            : raised

ID                    : 8589940026
Description           : TCA: ingress drop packets rate value 233 raised above threshold 200
Severity              : warning
Code                  : F112128
Action                : creation

ID                    : 8589939383
Description           : BGP peer is not established, current state Idle
```

```
Severity              : cleared
Code                  : F0299
Action                : deletion
```

Use the history view in order to distinguish active problems from transient events that have already recovered.

moquery for Node Correlation

<#root>

```
apic-A#
```

moquery -c topSystem -f 'top.System.name=="spine-A"'

```
# top.System
dn            : topology/pod-1/node-201/sys
name          : spine-A
role          : spine
state         : in-service
oobMgmtAddr   : 198.51.100.201
version       : n9000-16.1(3f)
```

Use this query in order to confirm that the APIC view of the node matches the switch you are troubleshooting.

Troubleshooting Workflow

1. Run **show version** on the switch in order to verify ACI mode, release, uptime, and reset reason.
2. Run **show module** in order to verify module presence, state, and summary diagnostics.
3. Run **show environment** in order to verify PSU, fan, and temperature status.
4. Run **show diagnostic result module all** in order to validate actual online diagnostics.
5. On leaf switches, run **show discoveryissues** in order to validate controller reachability and fabric adjacencies.
6. On the APIC, run **show faults leaf <node-id>** or **show faults spine <node-id>** in order to correlate the node with active fault objects.
7. Only after the baseline is understood you can move to feature-specific commands such as **show lldp neighbors**, **show ip route vrf all**, **show ip ospf neighbor vrf all**, **show interface ethx/y trunk**, or **show vpc brief**.

Common Scenarios

Scenario: Redundant Power Supply Appears Failed in Baseline Output

Problem: **show environment** or **show discoveryissues** reports a PSU in shut state.

Operational Check: Compare PSU state with the configured and operational redundancy mode in the same output.

Root Cause: In many lab and non-redundant deployments, one PSU is intentionally unused.

Solution: Treat the output as informational unless the active PSU is degraded or the redundancy mode does not match design intent.

Scenario: Leaf Is In-Service but Still Fails APIC Reachability Checks

Problem: **show discoveryissues** shows the node as in-service but APIC ping checks fail.

Configuration Check: Verify management and infra reachability design, including the APIC-facing path used by the test.

Operational Check: Confirm IS-IS adjacencies, infra VLAN deployment, and active APIC-side faults for the node.

Root Cause: The node can have enough baseline fabric state to join while still exposing controller reachability or policy download edge cases.

Solution: Use the APIC fault view and node management configuration to isolate whether the failure is management path related, tunnel related, or policy related.

Escalation Criteria

Collect techsupport and escalate when one or more of these conditions exist:

- An active module is not **ok** or any online diagnostic test fails.
- Environmental state is abnormal for an in-use PSU, fan tray, or thermal sensor.
- **show discoveryissues** shows persistent APIC reachability or policy download failures after connectivity has been validated.
- APIC fault history shows recurring fabric, tunnel, BFD, or BGP failures without a clear external cause.

Note: Validate intrusive recovery actions such as reloads, clean operations, and hardware reseat procedures during a maintenance window and in a non-production environment first.

Related Information

- Troubleshoot ACI Fabric Discovery - Initial Fabric Setup
- Troubleshoot ACI Fabric Discovery - Device Replacement
- Cisco APIC Faults, Events, and System Messages Management Guide
- Troubleshoot Address ACI Fault Code F0467: invalid-vlan, invalid-path, encap-already-in-use
- Configuring Route Peering
- Cisco Technical Support & Downloads