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Troubleshoot Catalyst 9800 Wireless Controllers

Lakshmi Kasturi – Technical Leader
BRKEWN-3628

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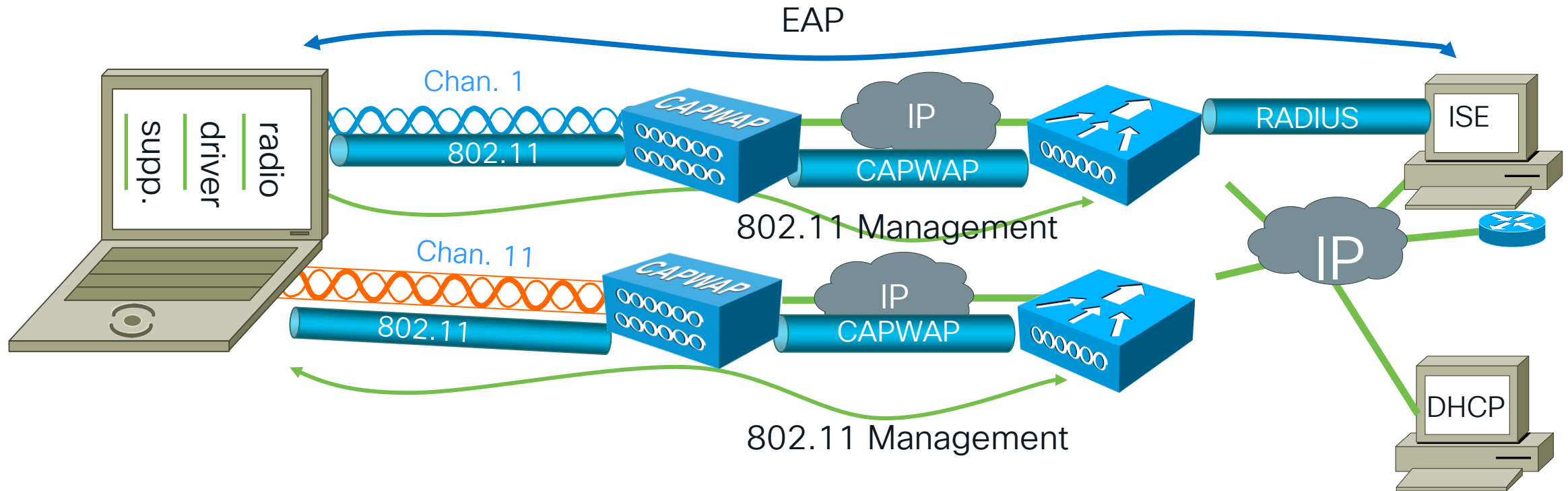
namma ♥♥♥♥
BENGALURU



Agenda

- Software Architecture
- Troubleshooting 101
- Catalyst 9800
Troubleshooting
- Access Points
Troubleshooting

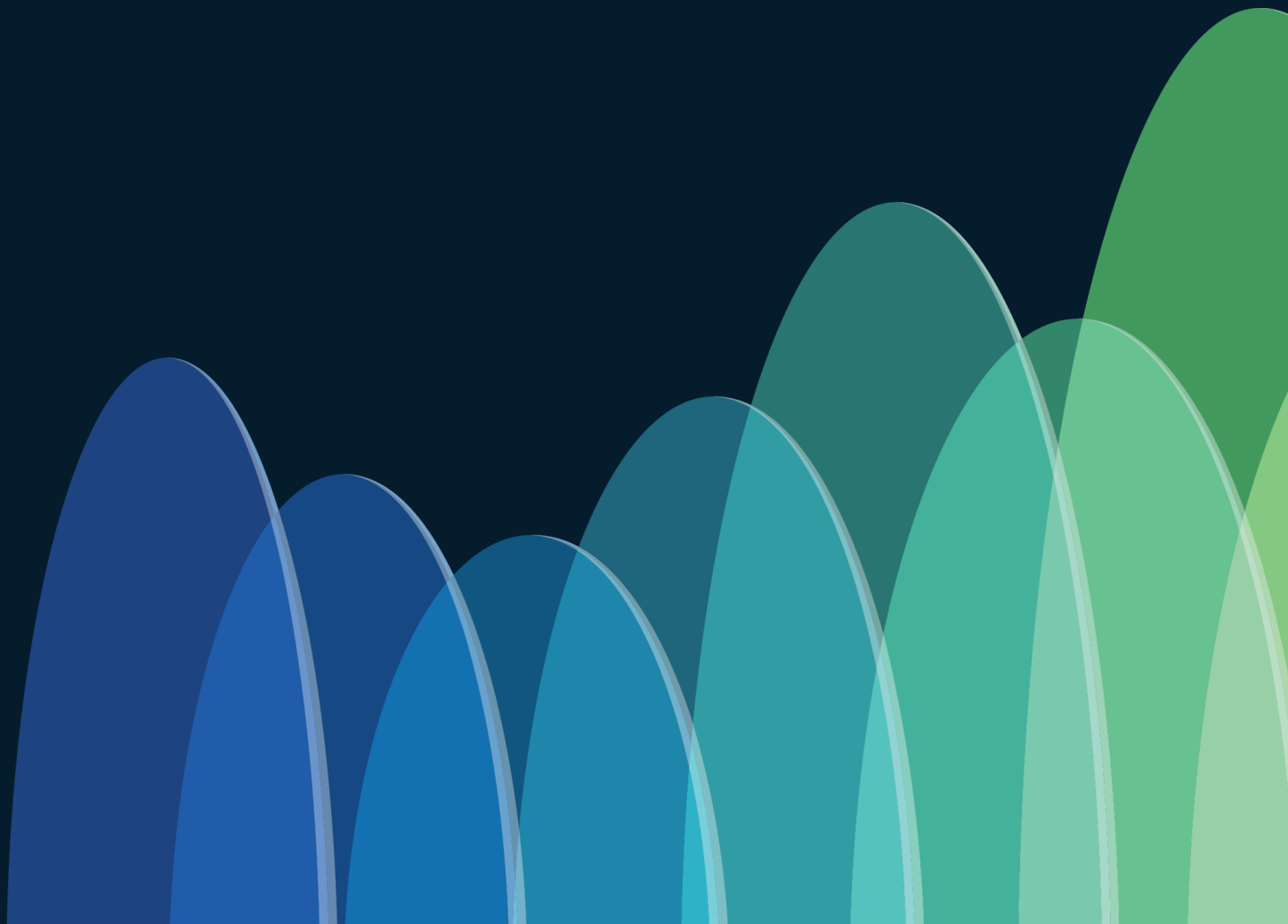
Where do we start ?



Wireless Link = Complex multi-variable equation

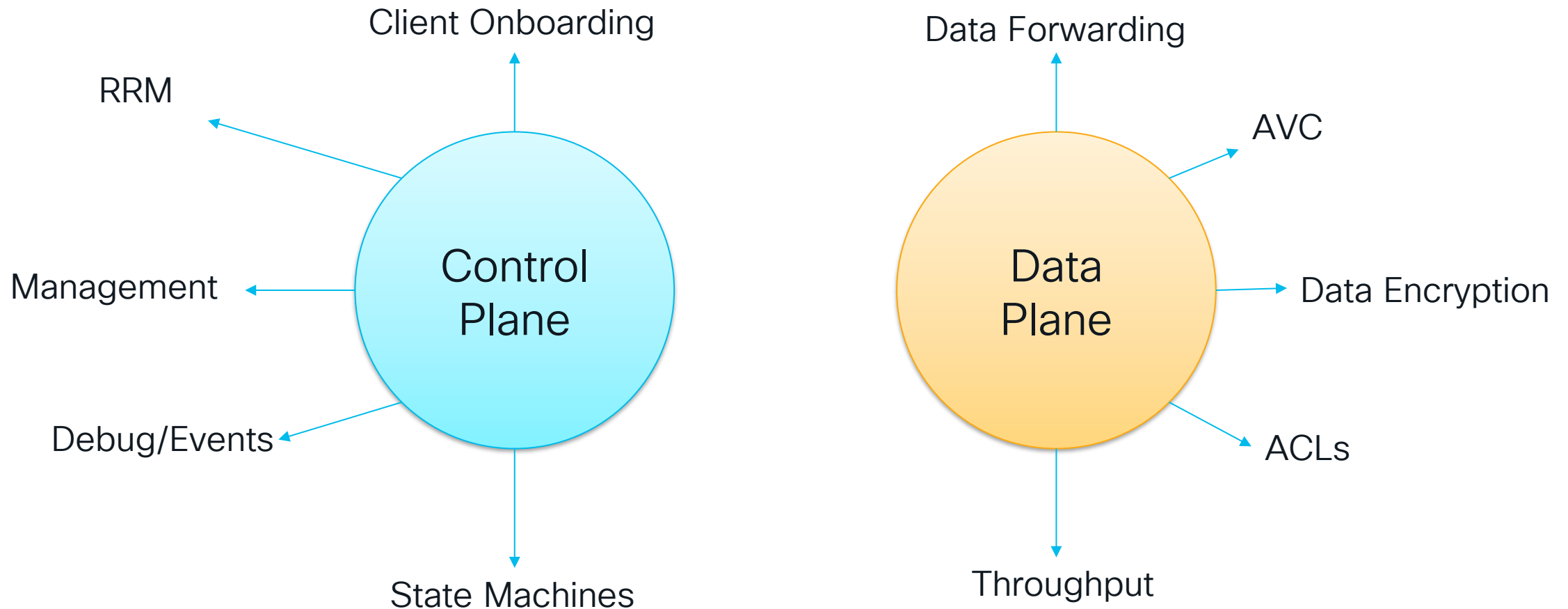
✓ Isolate and remove the variables

Software Architecture



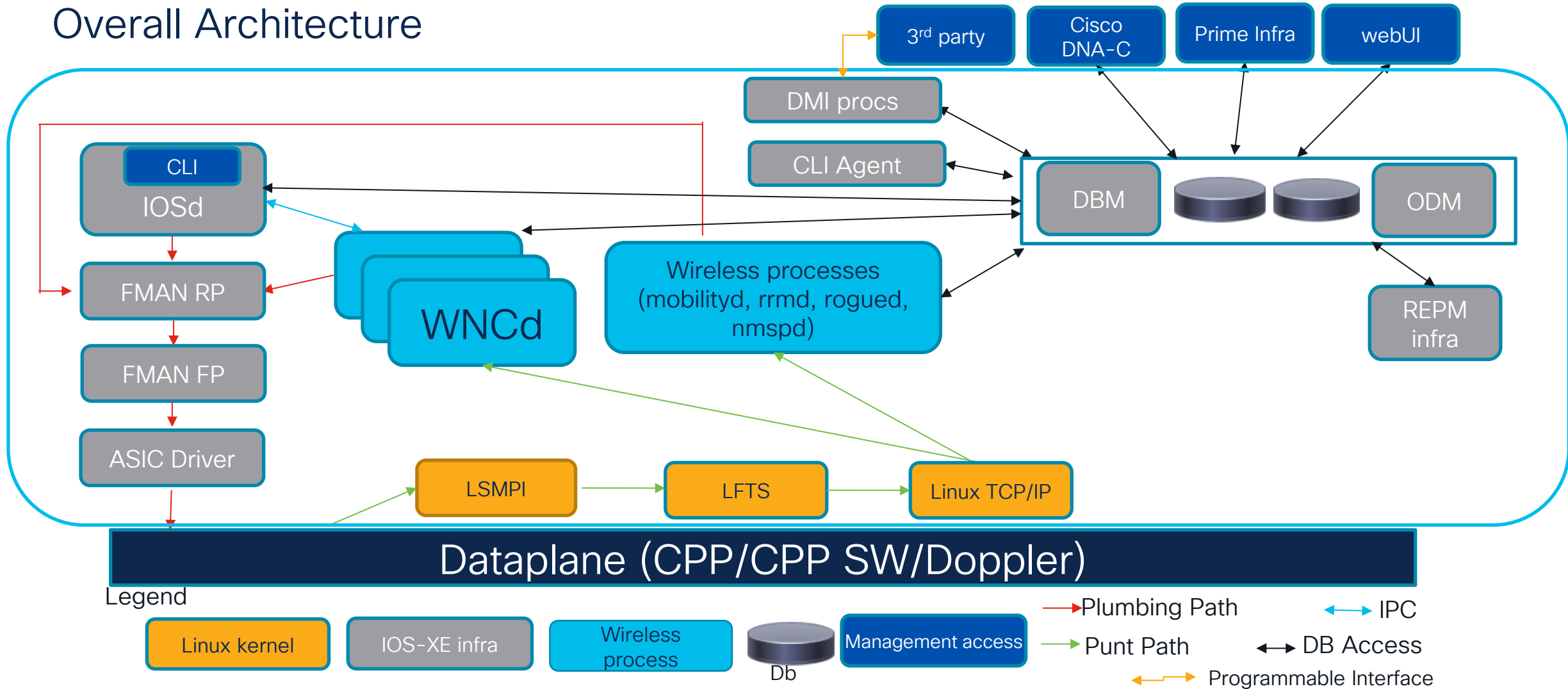
Control & Data Plane

Why do I need to care about architecture for troubleshooting ?



C9800 Software Architecture

Overall Architecture

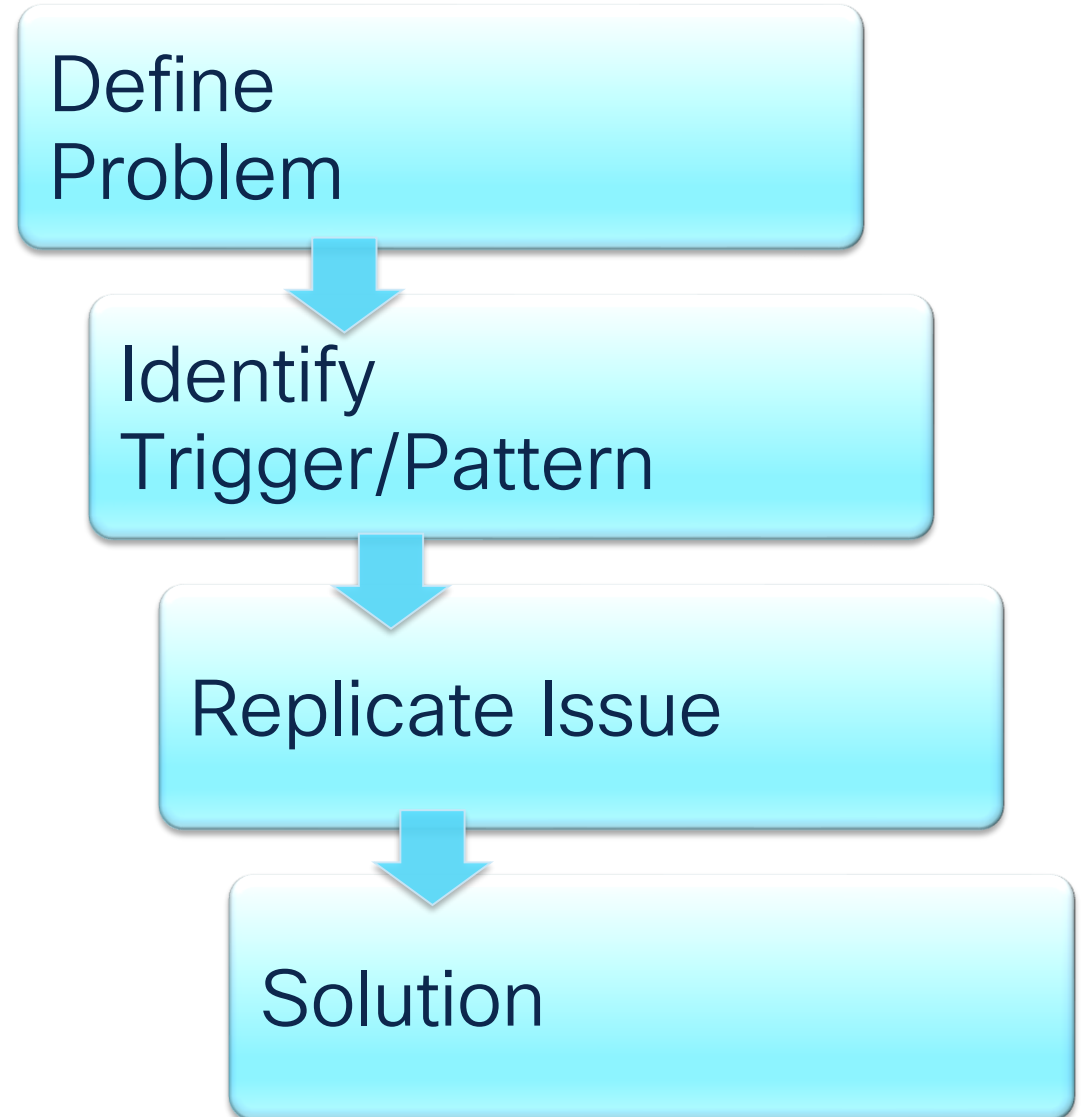


Troubleshooting 101

Troubleshooting Basics

Logical and procedural mindset

- Clearly define the problem
- Understand any possible triggers
- Reproducibility
- Never jump to conclusions !!

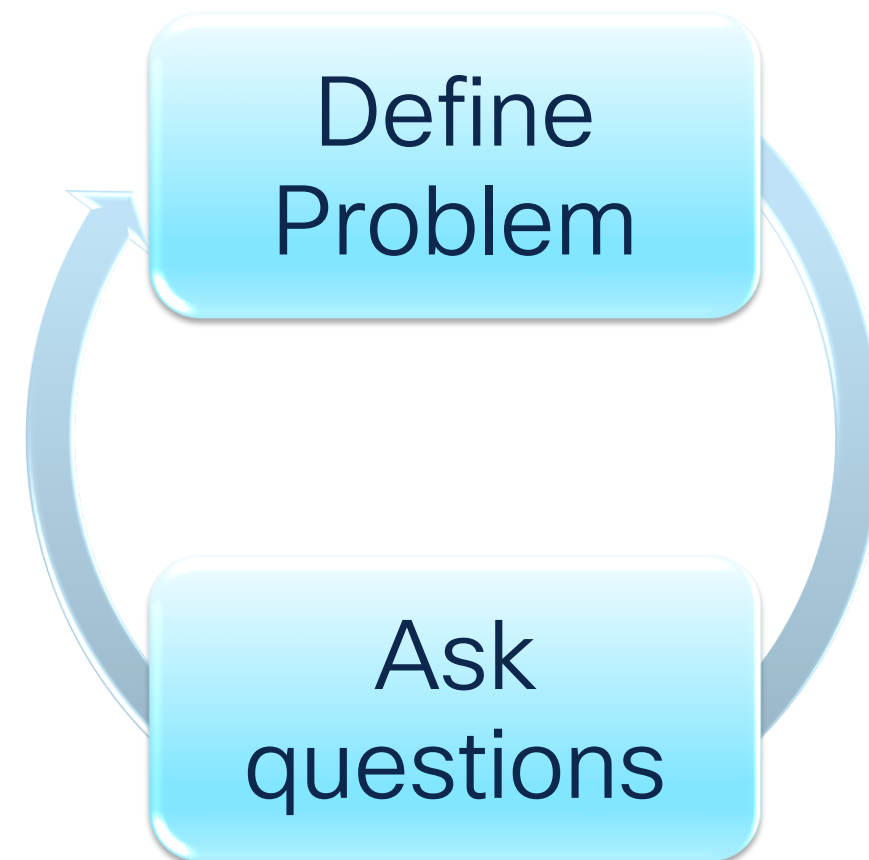




Troubleshooting Basics

Define the Problem

- Bad: “Client slow to connect”
- Good: “Client associations are rejected with Status 17 several times before they associate successfully.”
- **Characterise – Reduce Scope!**
- Isolate multiple possible problems



Troubleshooting Basics

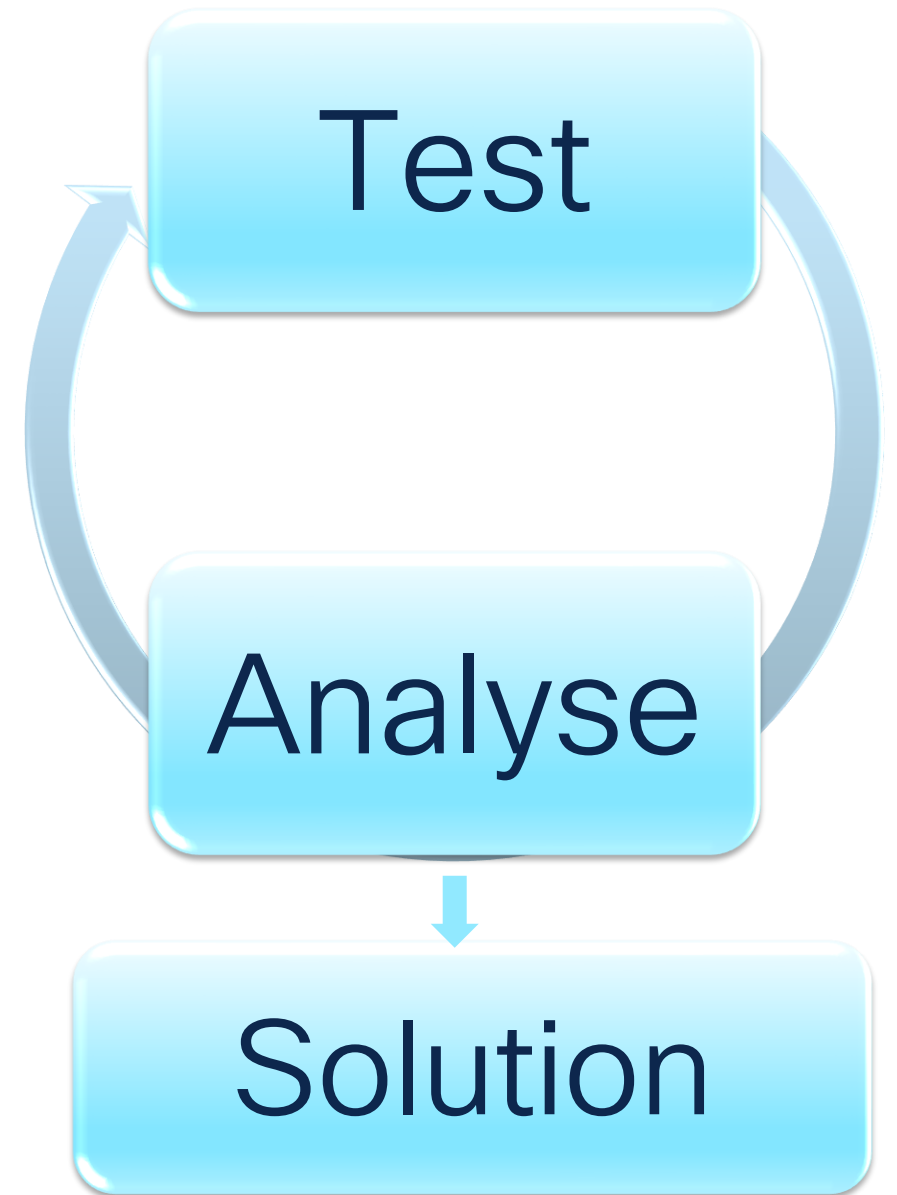
Identify Triggers / Pattern

- Did it work before?
 - Any Changes ?
 - Finding a pattern
 - Know the expected behavior
-
- Example: “One way audio between Phone A and B, because Phone A does not get an ARP Response for Phone B”

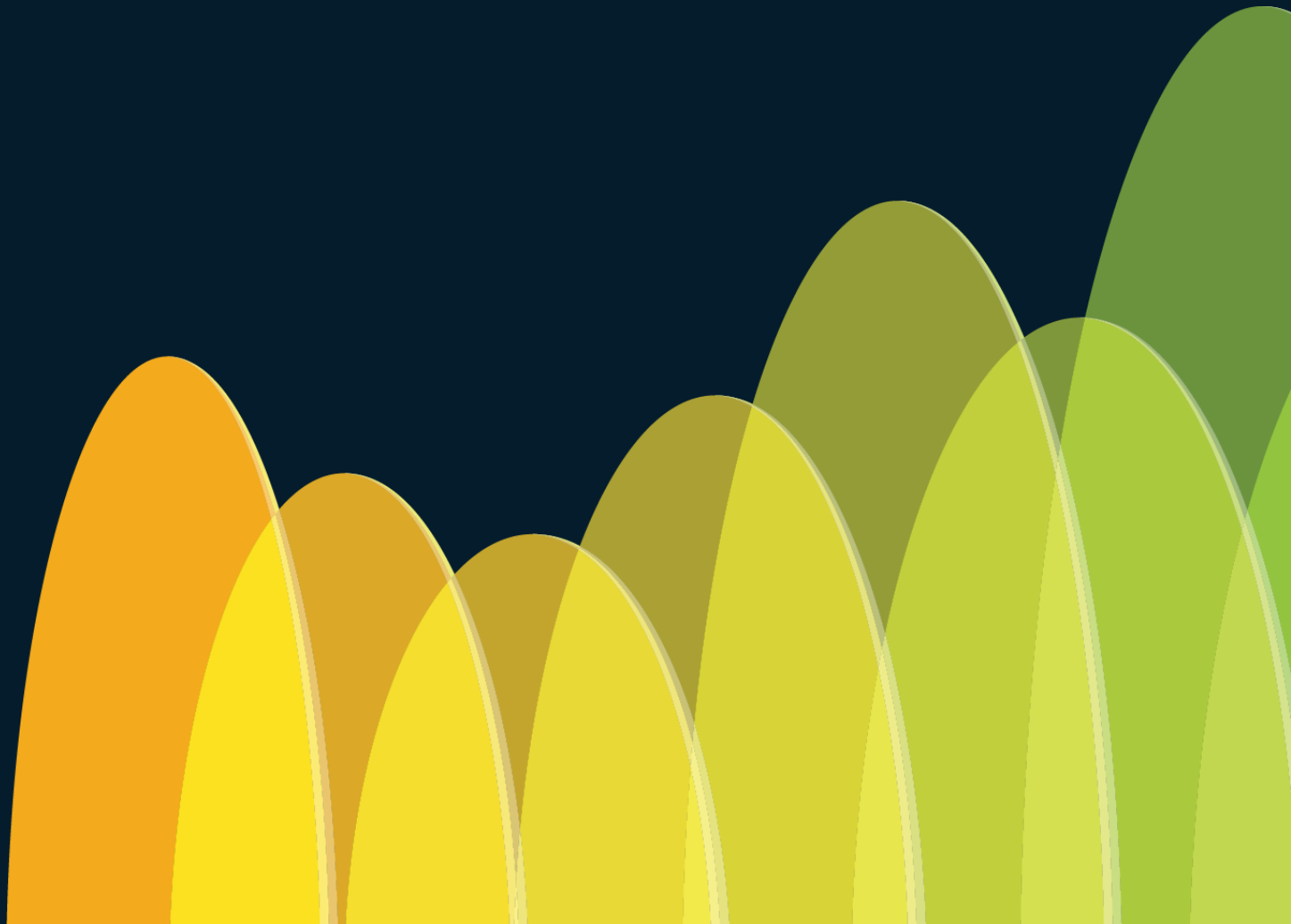
Troubleshooting Basics

Reproducibility & Solution

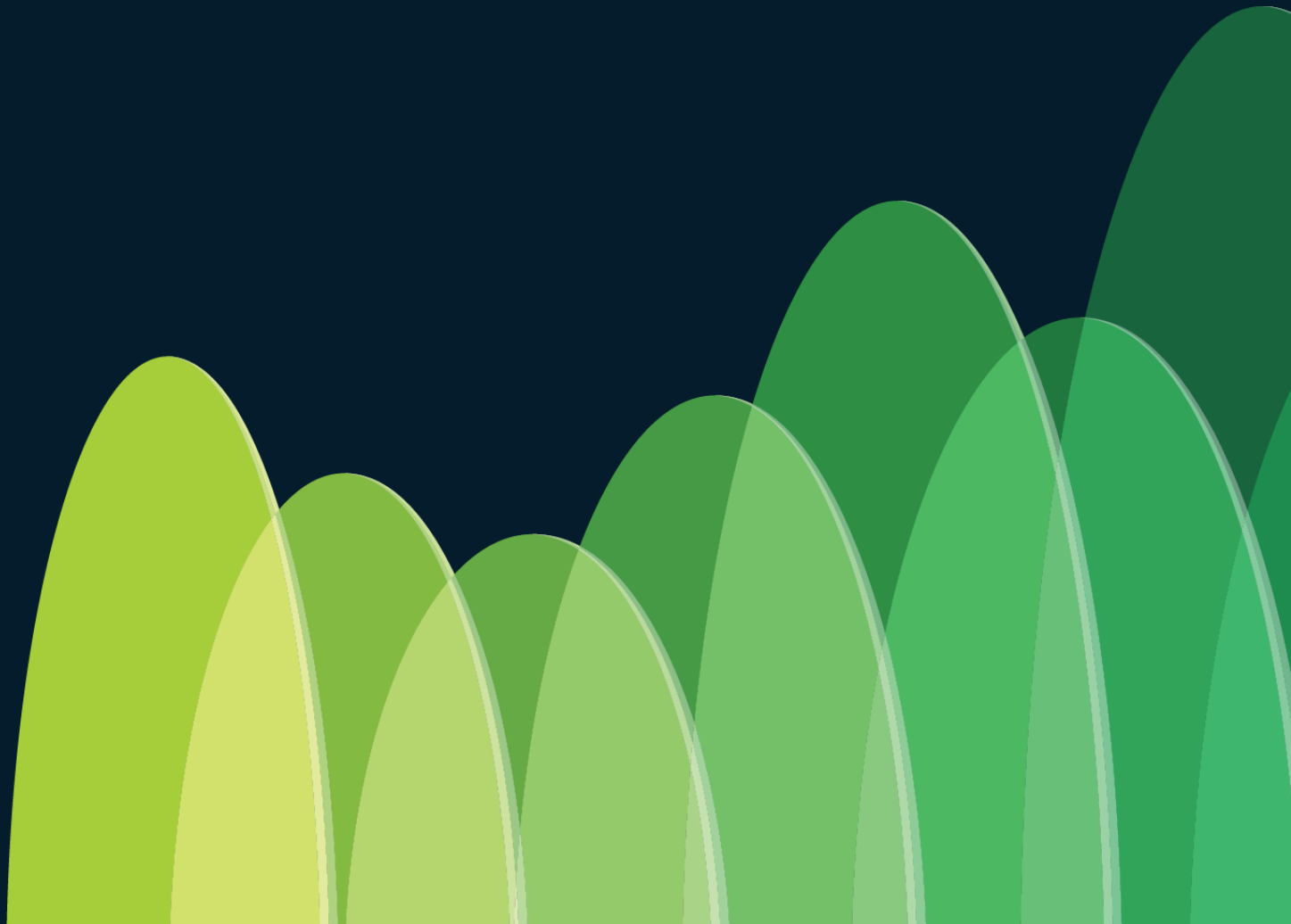
- **Reproducibility :**
 - Reproducible = Easier to fix
 - Reduce data collection dependencies
- **Solution :**
 - Validate Root Cause Analysis
 - Develop Fix
 - Test for solution, intersection



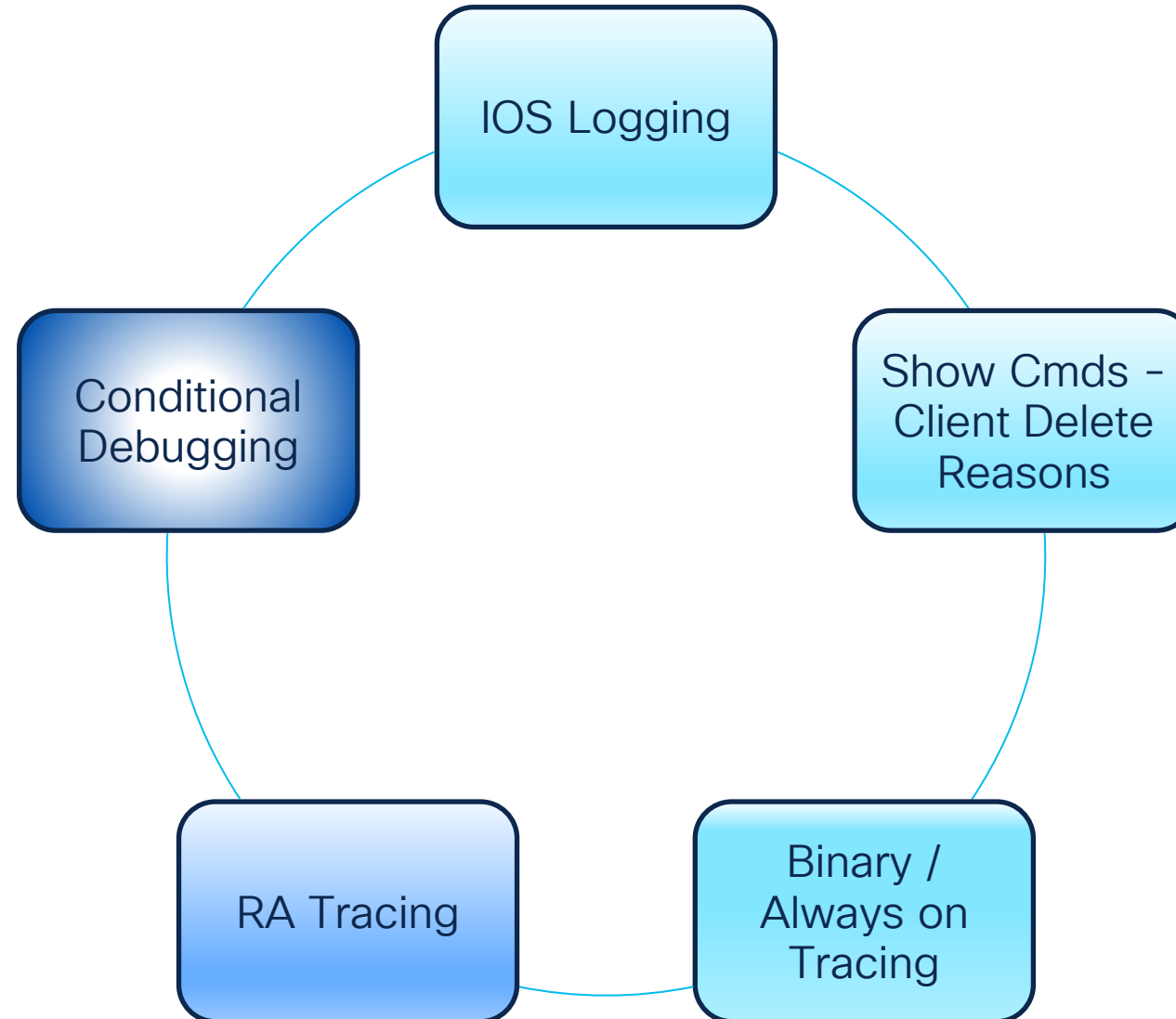
Catalyst 9800 Troubleshooting



Control Plane Troubleshooting



IOS-XE Tracing/Debugging



IOSd Logging

- Syslog – # **show logging**
 - Good Starting Point
 - System details
 - AP Join/Disjoin
 - Client delete
 - Memory / CPU
 - GUI Connections



IOSd Logging

AP Join

May 22 2023 09:34:31.249 UTC: %CAPWAPAC_SMGR_TRACE_MESSAGE-5-AP_JOIN_DISJOIN:
Chassis 1 R0/0: wncd: AP Event: AP Name: C9120_1, MAC: 0042.68a0.ee78 Joined
May 22 2023 09:36:19.548 UTC: %CAPWAPAC_SMGR_TRACE_MESSAGE-3-EWLC_GEN_ERR:
Chassis 1 R0/0: wncd: Error in Session-IP: 192.168.25.101[5264] Mac: 00a3.8ec2.da00 Heartbeat
timer expiry for AP. Close CAPWAP DTLS session

High CPU/ WNCD

Jan 26 17:31:44: %EWLC_INFRA_MESSAGE-4-EWLC_CAC_WARNING_MSG: Chassis 1 R0/2:
wncd: CPU Utilization is at 86%, applying L2 throttling

AAA Server

%RADIUS-4-RADIUS DEAD: RADIUS server <ip-address>:1812,1813 is not responding.

Client Delete Reasons



- “ALL” client delete tracked – Both AP & WLC
- Covers:
 - Normal (session timeout/idle timeout)
 - Errors/Defects (i.e. wrong bits in M2)
 - “It depends” (i.e. Key timeout)

#show wireless stats client delete reasons

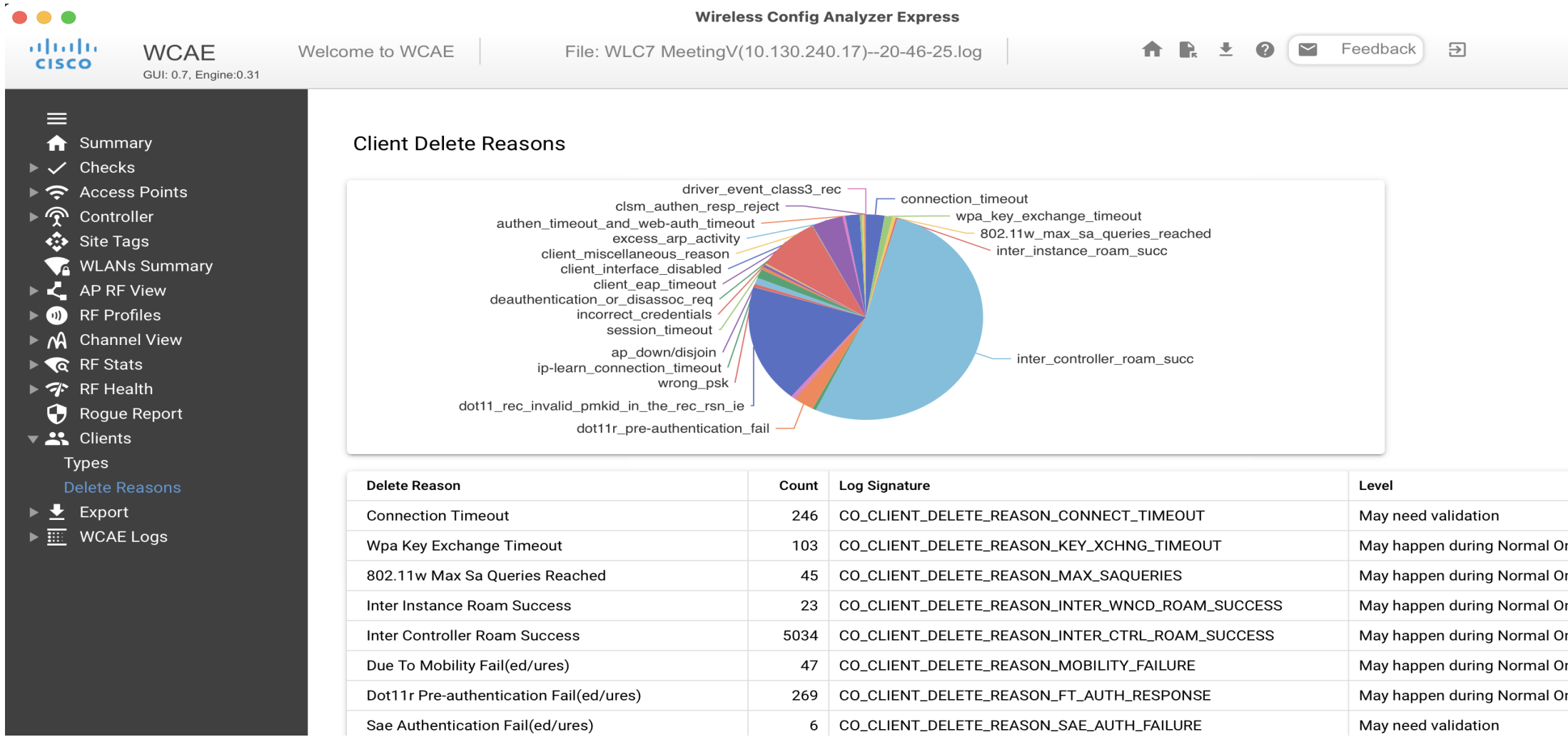
Total client delete reasons

Controller deletes

Datapath plumb	: 0
WPA key exchange timeout	: 107
802.11w MAX SA queries reached	: 0

Show tech wireless

Wireless Config Analyzer Express – WCAE



WiFi Issue !!



Yesterday we had
many users
complaining about wifi
in a given area

- Always on logs of selected clients.
- Connection last state (stuck in IP LEARN?) ?
- Were they being intentionally disconnected ?
- RADIUS / authentication issue ?

Always on Tracing CLI

- Simplified View
- Generate per process for last 10mins

```
# show logging process <process daemon> to-file <Always_on_process.txt>
# more bootflash:Always_on_process.txt
# copy bootflash:Always_on_process.txt tftp://<ServerIP>/Path or
ftp://user:password@ServerIP/Path
```

Always on Tracing CLI

Specify – MAC/IP

```
# show logging profile wireless filter {mac | ip} {client-mac | mobility-peer-ip} to-  
file < Mac Address>.txt
```

Specify – Timelines

```
# show logging profile wireless start timestamp “MM/DD/YYYY HH:MM:SS” filter  
mac <Mac Address> to-file <filename>
```

Always on : successful client connection

show log profile wireless filter mac 0040.96b9.b5c4 to-file output.txt

```
[client-orch-sm] [24632]: (note): MAC: 0040.96b9.b5c4 Association received. BSSID 0038.df25.f12f, old BSSID 0000.0000.0000, WLAN 1, Slot 1 AP 0038.df25.f120, AP0038.DF24.62A8
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_INIT ->S_CO_ASSOCIATING
[dot11] [24632]: (note): MAC: 0040.96b9.b5c4 Association success. AID 1, Roaming = 0, WGB = 0, 11r = 0, 11w = 0
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_ASSOCIATING ->S_CO_L2_AUTH_IN_PROGRESS
[client-auth] [24632]: (note): MAC: 0040.96b9.b5c4 ADD MOBILE sent. Client state flags: 0x71 BSSID: MAC: 0038.df25.f12f capwap IFID: 0xf90400004
[client-auth] [24632]: (note): MAC: 0040.96b9.b5c4 L2 Authentication initiated. method DOT1X, Policy VLAN 1,AAA override = 0
[ewlc-infra-evq] [24632]: (note): Authentication Success. Resolved Policy bitmap:11 for client 0040.96b9.b5c4
[client-auth] [24632]: (note): MAC: 0040.96b9.b5c4 L2 Authentication Key Exchange Start. EAP type: PEAP, Resolved VLAN: 16, Audit Session id: 22100A0900000000E89D69B30
[client-keymgmt] [24632]: (note): MAC: 0040.96b9.b5c4 EAP Key management successful. AKM:DOT1X Cipher:CCMP WPA2
[client-orch-sm] [24632]: (note): MAC: 0040.96b9.b5c4 Mobility discovery triggered. Client mode: Local
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_L2_AUTH_IN_PROGRESS ->S_CO_MOBILITY_DISCOVERY_IN_PROGRESS
[client-auth] [24632]: (note): MAC: 0040.96b9.b5c4 ADD MOBILE sent. Client state flags: 0x72 BSSID: MAC: 0038.df25.f12f capwap IFID: 0xf90400004
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_MOBILITY_DISCOVERY_IN_PROGRESS ->S_CO_DPATH_PLUMB_IN_PROGRESS
[dot11] [24632]: (note): MAC: 0040.96b9.b5c4 Client datapath entry params - ssid:dot1x_j,slot_id:1 bssid ifid: 0x0, radio_ifid: 0xf90400002
[dpath_svc] [24632]: (note): MAC: 0040.96b9.b5c4 Client datapath entry created for ifid 0xfa0000001
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_DPATH_PLUMB_IN_PROGRESS ->S_CO_IP_LEARN_IN_PROGRESS
[client-iplearn] [24632]: (note): MAC: 0040.96b9.b5c4 Client IP learn successful. Method: DHCP IP: 9.10.16.121
[client-orch-state] [24632]: (note): MAC: 0040.96b9.b5c4 Client state transition: S_CO_IP_LEARN_IN_PROGRESS ->S_CO_RUN
```

Periodic Issue !!



Client A is facing
some problems
everyday at some
point

- Is Always on going to help ?
- Is that sufficient ?
- How to narrow it ? – RA logs

Radioactive Tracing



Enables all debugs automatically for given MAC/IP Address

```
#debug wireless {mac | ip} {aaaa.bbbb.cccc | x.x.x.x} {monitor-time} {N-sec} internal level verbose
```

```
#no debug wireless {mac | ip} {aaaa.bbbb.cccc | x.x.x.x} → Disable & Generate logs
```

Troubleshooting > Radioactive Trace

Conditional Debug Global State: **Stopped**

Wireless Debug Analyzer

+ Add × Delete ✓ Start ■ Stop

	MAC/IP Address	Trace file
☐	1111.2222.3333	Generate

1 10 items per page 1 - 1 of 1 items

Enter time interval

Enable Internal Logs ☐

Generate logs for last ☒ 10 minutes

☐ 30 minutes

☐ 1 hour

☐ since last boot

☐ 0-4294967295 seconds

Cancel Apply to Device

RadioActive Trace – Failed Authentication

- SA - Query Timeout

```
{wncd_x_R0-0}{1}: [client-orch-sm] [15262]: (debug): MAC: 2220.08c6.05bf Delete client. Processing delete request, delete reason: 17, CO_CLIENT_DELETE_REASON_MAX_SAQUERIES  
{wncd_x_R0-0}{1}: [client-orch-sm] [15262]: (debug): MAC: 2220.08c6.05bf Client move to idle state, delete reason: CO_CLIENT_DELETE_REASON_MAX_SAQUERIES, delete reason criteria has not met  
{wncd_x_R0-0}{1}: [client-orch-sm] [15262]: (note): MAC: 2220.08c6.05bf Client delete initiated. Reason: CO_CLIENT_DELETE_REASON_MAX_SAQUERIES, details: , fsm-state transition  
00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|01|07|15|1a|1b|2c|37|46|48|4a|4c|55|64|66|87|8a|af|
```

- AAA Server Down

```
[errmsg] [17837]: (note): %DOT1X-5-FAIL: Authentication failed for client CLIENT_MAC) with reason (AAA Server Down) on Interface capwap_9000000c AuditSessionID 0B7CFB2C000002145E61348E  
[ewlc-infra-evq] [17837]: (ERR): SANET_AUTHC_FAILURE - AAA Server Down username , audit session id 0B7CFB2C000002145E61348E  
[errmsg] [17837]: (note): %SESSION_MGR-5-FAIL: Authorization failed or unapplied for client (CLIENT_MAC) on Interface capwap_9000000c AuditSessionID 0B7CFB2C000002145E61348E. Failure reason: Authc fail. Authc failure reason: AAA Server Down.  
[client-orch-sm] [17837]: (note): MAC: a86d.aa32.5271 Client delete initiated. Reason: CO_CLIENT_DELETE_REASON_AAA_SERVER_UNAVAILABLE, fsm-state transition  
00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|01|07|13|1a|23|
```

Wireless Debug Analyzer

Show Advanced Debug Insights



Select a client MAC Address and connection to see logs.

025c.90af.914d

Download CSV

Lines 1-50 of 110

1 2 3

☒ Show Time ☒ Show Task ☒ Show Translated ☐ Show Original ☐ Show Prior First Connection ☒ Show All

Time	Task
Connection attempt #1	
Connection attempt #2	
2024/09/16 15:29:32.340	client-orch-sm Client made a new Association to an AP/E default-site-tag, Policy tag default-policy
2024/09/16 15:29:32.341	dot11 Association success for client, assigned /
2024/09/16 15:29:32.450	client-keymgmt Negotiated the following encryption mecl
2024/09/16 15:29:32.450	client-auth Client successfully completed Pre-sharec
2024/09/16 15:29:32.450	client-orch-sm Policy profile is configured for local switc
2024/09/16 15:29:32.450	client-orch-state Starting Mobility Anchor discovery for cli
2024/09/16 15:29:32.452	client-orch-state Entering IP learn state

Advanced Debug Insights

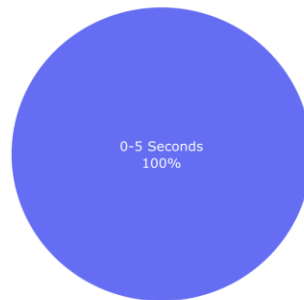
9800 WLC Advanced Debug Insights (Help)

Client MAC Address	Success Sessions	Failed Sessions	Start Time	End Time
025c.90af.914d	3	6	September 16, 2024 1...	September 16, 2024 15:...

DASHBOARD

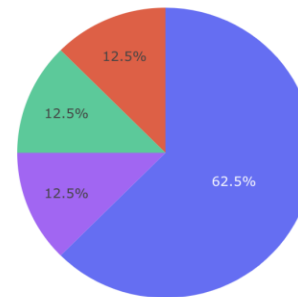
Client Onboarding Time

0-5 Seconds 5-10 Seconds > 10 Seconds



Delete Reasons

KEY_XCHNG_TIMEOUT
CLIENT_INTERFACE_DISABLED
MAX_SAQUERIES
CLIENT_USER_TRIGGERED_DISASSOC

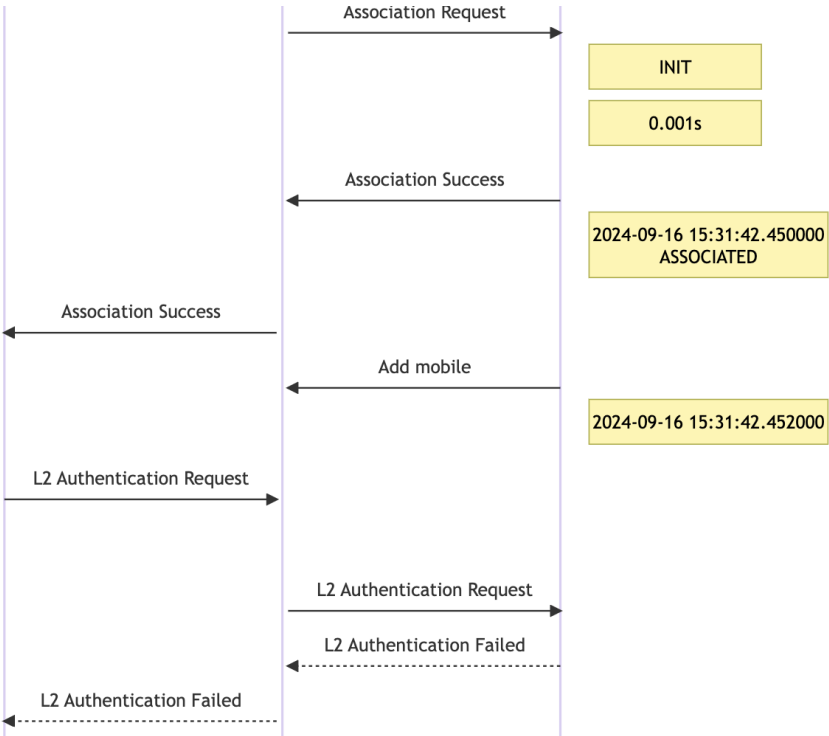


Wireless Debug Analyzer



Client MAC: 025c.90af.914d

Session	State	Auth Method	AP	WLAN	Mobility Role	IP Address	Onboarding Time	Start/Run Time	Delete Reason	Delete Time
1	RUN	PSK	7411.b2d3.5b60	WPA3-PSK-SAE	Local-None	192.168.0.253	851 ms	15:29:32:340 / 15:29:33:191	CLIENT_INTERFACE_DISABLED	15:31:00:000
2	L2AUTH	PSK	7411.b2d3.5b60	WPA3-PSK-SAE	NONE-NONE		0 ms	15:31:42:449 /	KEY_XCHNG_TIMEOUT	15:31:45:000
3	L2AUTH	PSK	7411.b2d3.5b60	WPA3-PSK-SAE	NONE-NONE		0 ms	15:31:49:401 /	KEY_XCHNG_TIMEOUT	15:31:52:000
4	L2AUTH	PSK	7411.b2d3.5b60	WPA3-PSK-SAE	NONE-NONE		0 ms	15:31:54:157 /	KEY_XCHNG_TIMEOUT	15:31:57:000



← → Transaction seen in the log file
↔ Transaction not seen in log file.(Doesn't mean this is expected or needed always)



Conditional Debugging

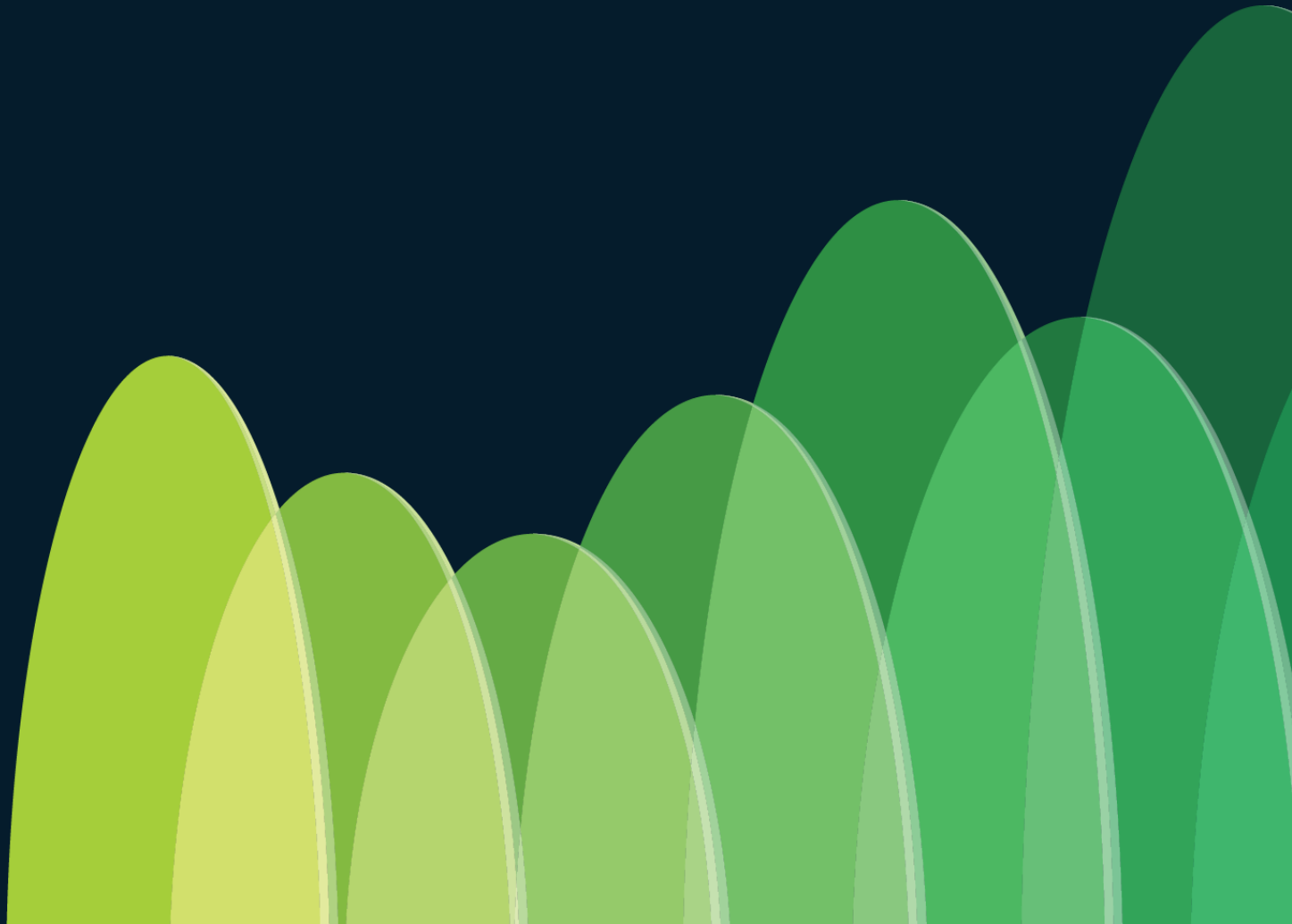
Further Complicate

- Specific Process
- Specific Use Cases

```
# set platform software trace {Process Name} wireless chassis active R0 {Modules |  
all-modules } {level}  
# show platform software trace level {Process Name} chassis active R0  
# show logging process {Process Name} to-file bootflash:Process_Logs.txt
```

E.g. set platform software trace **wncd 4** wireless chassis active R0 **sisf verbose**

System Troubleshooting



Memory Utilisation



show platform resources

**State Acronym: H - Healthy, W - Warning, C - Critical

Resource	Usage	Max	Warning	Critical	State
<hr/>					
RP0 (ok,active)					H
Control Processor	5.00%	100%	80%	90%	H
DRAM	4425MB(28%)	15567MB	88%	93%	H
ESP0(ok, active)					H
QFP					H
DRAM	244364KB(13%)	1835008KB	85%	95%	H
IRAM	414KB(20%)	2048KB	85%	95%	H
CPU Utilization	0.00%	100%	90%	95%	H



Memory Utilisation

show process memory platform sorted

System memory: 64397992K total, 31547488K used, 32850504K free,
Lowest: 31092292K

Pid	Text	Data	Stack	Dynamic	RSS	Name
16845	188	5596376	3956	48664	5596376	wncmgrd
21500	556	5355180	136	54044	5355180	dbm
18200	594	5229624	136	80832	5229624	nmspd
14133	59	4996032	136	12432	4996032	paed
20039	667	4964168	136	57192	4964168	odm_0
16533	72	4878772	136	3060	4878772	wstatsd
18808	159	4862324	136	413132	4862324	sessmgrd

Memory Utilisation

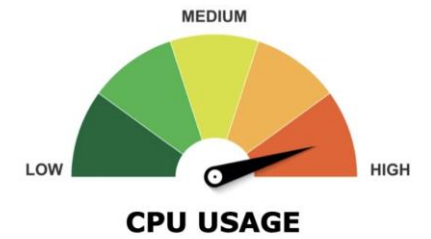
Deeper Dive



```
show logging process <Process Name> wireless chassis active R0  
start last <X> <Days/Hours> to-file bootflash:<Filename>
```

```
service internal  
request platform software process core <Process Name> chassis  
active R0  
no service internal
```

High CPU !!



CPU Utilization

Wireless Interface

Management Summary

Redundancy

IOS Daemon CPU Usage(Top 5 Process)

[IOSD CPU Dump](#)

Process	5Sec	1Min	5Min
HTTP CORE	0.00%	1.82%	0.83%
SEP_webui_wsma_h	0.00%	0.45%	0.18%
Check heaps	0.00%	0.03%	0.05%
SASRcvWQWrk2	0.00%	0.08%	0.04%
Crimson config p	0.07%	0.03%	0.02%

Datapath Utilization

[Datapath Utilization Dump](#)

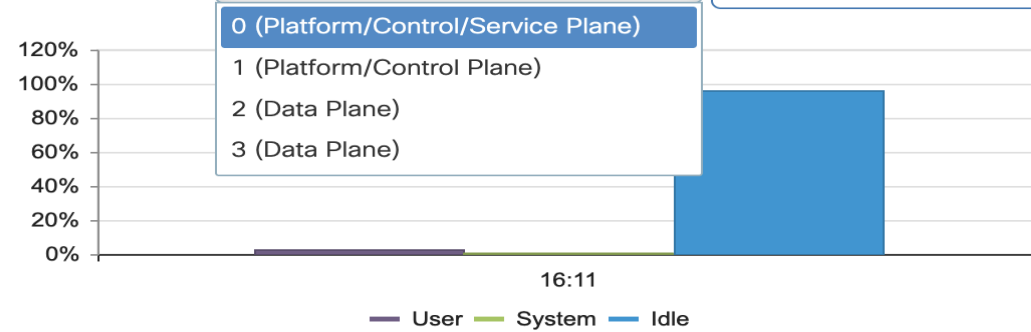
Data Plane	Core 2	Core 3
PP (%)	0.43	0.00
RX (%)	0.00	0.03
TM (%)	0.00	1.40
IDLE (%)	99.57	98.57

CPU trend
(CPU (%) vs Device Time)

Slot: Active CPU:

0 (Platform/Control/Service Plane) ▼

[Control Plane Data](#)



High CPU

- Per process CPU Utilization

```
#show processes cpu platform sorted / ex 0% 0% 0%
```

CPU utilization for five seconds: 69%, one minute: 71%, five minutes: 65%

Core 0: CPU utilization for five seconds: 26%, one minute: 37%, five minutes: 28%

Core 1: CPU utilization for five seconds: 29%, one minute: 42%, five minutes: 23%

Core 2: CPU utilization for five seconds: 27%, one minute: 38%, five minutes: 26%

Core 3: CPU utilization for five seconds: 30%, one minute: 37%, five minutes: 25%

Core 4: CPU utilization for five seconds: 95%, one minute: 96%, five minutes: 97%

Core 5: CPU utilization for five seconds: 93%, one minute: 94%, five minutes: 95%

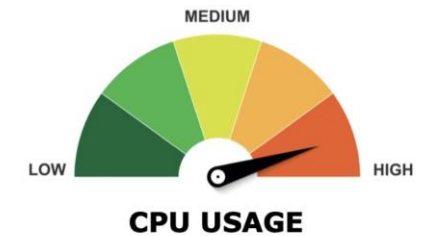
Core 6: CPU utilization for five seconds: 94%, one minute: 94%, five minutes: 95%

Core 7: CPU utilization for five seconds: 93%, one minute: 94%, five minutes: 95%

Core 8: CPU utilization for five seconds: 99%, one minute: 99%, five minutes: 99%

Pid	PPid	5Sec	1Min	5Min	Status	Size	Name
897	9122	50%	60%	39%	R	1407376	linux_iosd-imag
25985	25423	29%	22%	15%	R	281152	ucode_pkt_PPE0
16812	16418	14%	14%	15%	S	912112	wncd_0
21295	20937	12%	12%	13%	S	647732	odm_0
30661	30305	11%	13%	12%	R	803760	pubd
17290 1	6864	11%	11%	11%	S	879732	wncd_2

High CPU !!



- CPU utilization within IOSd :

show process cpu sorted

CPU utilization for **five seconds: 30%/1%; one minute: 37%; five minutes: 36%**

PID	Runtime(ms)	Invoked	uSecs	5Sec	1Min	5Min	TTY	Process
694	73575634	62240082	1182	18.63%	18.10%	18.14%	0	SNMP ENGINE
528	37526513	4014938	9346	4.87%	9.08%	9.39%	0	SNMP LA Cache pr
84	16672132	223797251	74	2.79%	3.91%	3.98%	0	IOSD ipc task
561	1422242	49040030	29	0.47%	0.35%	0.37%	0	PM Callback
562	1038304	43348515	23	0.39%	0.24%	0.24%	0	IP SNMP

WNCD x is high !!

One of my WNCD
utilisation is high
!!



Show tech wireless | redirect bootflash:<Filename>

WNCD x is high !!

Check the balancing of APs across WNCD processes



#show wireless loadbalance tag affinity wncd 0

Tag	Tag type	No of AP's Joined

Site1	SITE TAG	200
Site2	SITE TAG	200

Leverage WCAE for WNCD analysis

[Back to Content Tab](#)

WNCD ID	Tags Count	Tags Assigned	AP Count	Client Count	CPU load	Percentage Aps	Percentage Clients
0	2	(Click on + sign to expand)	141	1250	22	9.00	7.28
1	1	(Click on + sign to expand)	227	2497	43	14.50	14.54
2	1	(Click on + sign to expand)	227	2035	34	14.50	11.85
3	1	(Click on + sign to expand)	226	3025	51	14.43	17.62
4	1	(Click on + sign to expand)	226	2092	43	14.43	12.18
5	1	(Click on + sign to expand)	226	2639	47	14.43	15.37
6	2	(Click on + sign to expand)	154	2275	34	9.83	13.25
7	2	(Click on + sign to expand)	139	1356	22	8.88	7.90
Totals:			1566	17169			

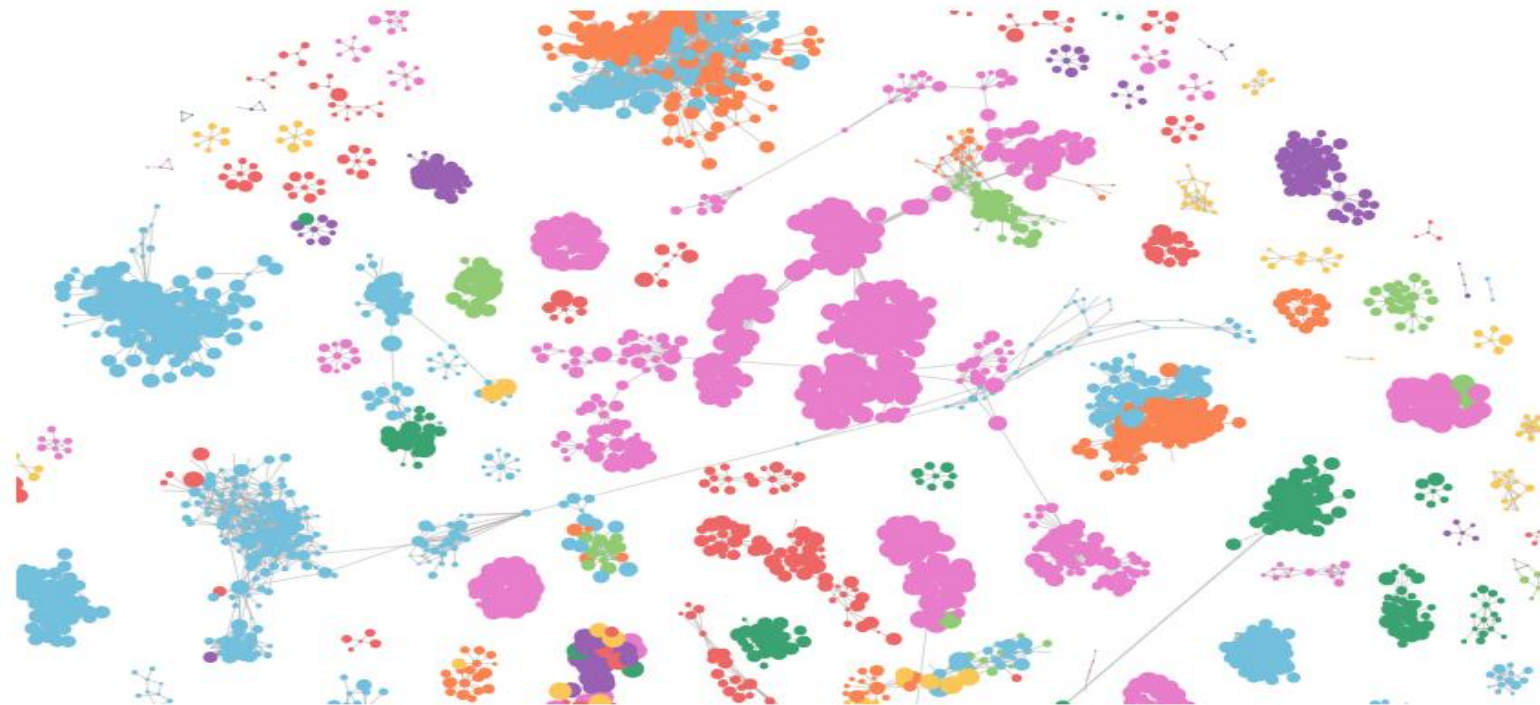
WNCD x is high !!

Alternate WCAE View – Via RF Graph



RF View - Band: 5 GHz

AP Classified per : WNCD. NDP RSSI: -85



Radio Count: 3498

Link Count: 14740

WNCD	AP Count	Client Count
wncd0	278	1262
wncd1	700	1843
wncd2	119	1800
wncd3	194	2210
wncd4	682	11152
wncd5	241	461
wncd6	270	1132
wncd7	481	1576

☐ Show Legend

View Type: WNCD | Link RSSI Filter: -85

WNCD x is high !!

Possible Prevention ?

- Balance Site tag across WNCD
 - Based on Load
 - RF based

RF Based :

wireless load-balance ap method rf
ap neighborhood load balance apply

17.12
Onwards

Configuration > Tags & Profiles > Tags

Policy Site RF AP

+ Add

× Delete

Clone

Reset APs

Site Tag Name



Flex_site



Local_site



default-site-tag



1



10

Edit Site Tag

Name*

Local_site

Description

Enter Description

AP Join Profile

default-ap-profile

Fabric Control Plane Name

Enable Local Site



Load* ⓘ

20

Load Based

Crashes & System reports

- **Process** impacted, **timestamp**

9800-40/80 – Harddisk
9800-L/CL – Bootflash

```
#dir harddisk:/core/ | i core/system-report
```

Directory of harddisk:/core/

```
3661831 -rw-      11260562  Mar 25 2024 22:07:12 +01:00
```

```
Gladius1_1_RP_0_wncd_16574_20240325-220708-CET.core.gz
```

```
3661830 -rw-      48528      Mar 25 2024 21:57:20 +01:00 Gladius1_1_RP_0-system-  
report_20240325-215658-CET-info.txt
```

```
3661829 -rw-     126548098  Mar 25 2024 21:57:10 +01:00 Gladius1_1_RP_0-system-  
report_20240325-215658-CET.tar.gz
```

HA Concern

- Basic HA status

#show redundancy / i uptime/Location/Current Software state/Switchovers

Available system uptime = 2 weeks, 1 day, 2 hours, 48 minutes

Switchovers system experienced = 1

Active Location = slot 1

Current Software state = ACTIVE

Uptime in current state = 7 hours, 10 minutes

Standby Location = slot 2

Current Software state = STANDBY HOT

Uptime in current state = 7 hours, 4 minutes

- Per Chassis and stack status
- Switchover count

HA Concern

#show redundancy switchover history

Index	Previous active	Current active	Switchover reason	Switchover time
8	2	1	active unit removed	14:06:05 CEST Wed Mar 29 2023
9	1	2	active unit removed	14:25:29 CEST Wed Mar 29 2023
10	2	1	Active RMI port down	11:00:22 CEST Thu Mar 30 2023
11	1	2	active unit removed	11:08:53 CEST Thu Mar 30 2023
12	2	1	active unit removed	11:18:47 CEST Thu Mar 30 2023
13	1	2	active unit removed	11:34:32 CEST Thu Mar 30 2023
14	2	1	active unit removed	11:51:34 CEST Thu Mar 30 2023
15	1	2	user forced	12:01:51 CEST Thu Mar 30 2023
16	2	1	active unit removed	12:08:46 CEST Thu Mar 30 2023
17	1	2	user forced	09:40:40 CEST Tue May 9 2023

HA Checklist

Show tech wireless redundancy

Show chassis detail

show platform software stack-mgr chassis active R0 sdp-counters

show platform software stack-mgr chassis standby R0 sdp-counters

show platform software stack-mgr chassis active R0 peer-timeout

show platform software stack-mgr chassis standby R0 peer-timeout

show logging process stack_mgr last <X> <Days/Hours> to-file

bootflash:<Stack_Mgr.txt>

show logging process rif_mgr last <X> <Days/Hours> to-file

bootflash:<RifMgr.txt>

Troubleshooting – HA SSO



My WLC HA
Switchover
regularly due to
Gateway
reachability !!

HA Checklist

- Issue is frequent or there is a pattern !! – Gateway is becoming Unreachable

show chassis detail

show redundancy switchover history

debug ewlc-rmi gateway

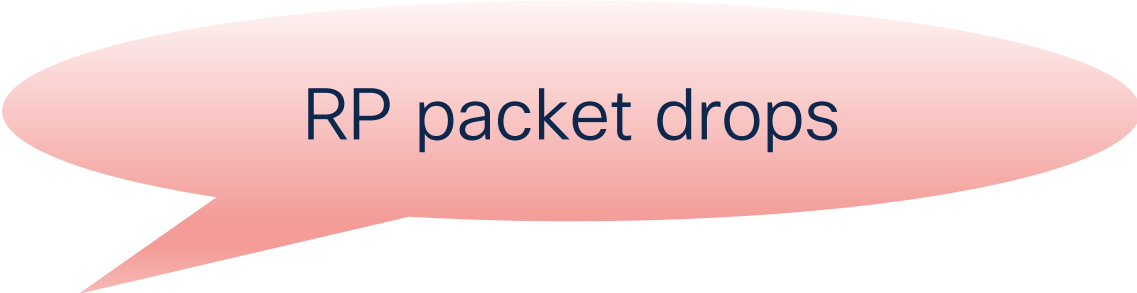
debug ewlc-rmi error

request platform software trace archive last <X> <Days> to-file

bootflash:<Filename>

HA – RP Port Captures

- Useful to troubleshoot RP
- Capture all traffic in port



RP packet drops

```
test wireless redundancy packetdump start  
test wireless redundancy packetdump stop
```

```
#dir
```

```
Directory of bootflash:/
```

25	-rw-	237568	May 10 2024	11:51:30 +02:00	haIntCaptureLo.pcap
1087409	drwx	90112	May 10 2024	11:50:59 +02:00	tracelogs

```
test wireless redundancy rpings
```

SMU – Installation Failing ?



SMU installation
is failing with
errors

SMU/APSP – Install Failed !!

SMU failure during commit

```
# install add file bootflash:C9800-L-  
universalk9_wlc.17.12.04.CSCwi78109.SPA.smu.bin activate commit  
install_add_activate_commit: START Tue Oct 15 14:30:49 IST 2024  
install_add: START Tue Oct 15 14:30:49 IST 2024  
install_add: Adding IMG  
[1] Chassis 1/R0 FAILED: Invalid installation package. SMU conflict with C9800-L-  
universalk9_wlc.17.12.04.CSCwi78109.SPA.smu.bin of ver  
17.12.04.0.4826.1721753583 SMU_ID 6  
FAILED: add_activate_commit /bootflash/C9800-L-  
universalk9_wlc.17.12.04.CSCwi78109.SPA.smu.bin Tue Oct 15 14:30:49 IST 2024
```

SMU / APSP

#show install summary

Type St Filename/Version

IMG C 17.12.04.0.4826

APSP I bootflash:C9800-CL-universalk9.17.12.04.CSCwm71871.SPA.apsp.bin



#show install summary

Type St Filename/Version

IMG C 17.12.04.0.4826

SMU C bootflash:C9800-CL-universalk9.17.12.04.CSCwi78109.SPA.smu.bin

APSP C bootflash:C9800-CL-universalk9.17.12.04.CSCwm71871.SPA.apsp.bin

SMU/APSP - Install Failed !!

```
INSTALL ADD OPERATION:

--- Analyzing file C9800-CL-universalk9.17.12.04.CSCwi78109.SPA.smu.bin ---
Package Type is SMU
Initiating INSTALL_ADD operation for the package C9800-CL-universalk9.17.12.04.CSCwi78109.SPA.smu.bin
install_add: START Wed Nov  6 09:29:53 UTC 2024
install_add: Adding SMU
install_add: Checking whether new add is allowed ....

--- Starting initial file syncing ---
Info: Finished copying bootflash:C9800-CL-universalk9.17.12.04.CSCwi78109.SPA.smu.bin to the selected chassis
Finished initial file syncing

--- Starting SMU Add operation ---
Performing SMU_ADD on all members
[1] SMU_ADD package(s) on chassis 1/R0
    FAILED: install_add /bootflash/C9800-CL-universalk9.17.12.04.CSCwi78109.SPA.smu.bin: Improper State./bootflash/C9800-CL-universalk9.2022-10-31_04.42_saurasi3.0.CSCwd03847.SSA.smu.bin not present. Please restore file for stability.
[1] Finished SMU_ADD on chassis 1/R0
Checking status of SMU_ADD on [1/R0]
SMU_ADD: Passed on []. Failed on [1/R0]
Finished SMU Add operation

FAILED: install_add  exit(1) Wed Nov  6 09:30:01 UTC 2024
```

show install logs

clear install state

clear_install_state: START Wed Nov 6 09:38:48 UTC 2024

This command will remove all the provisioned SMUs, and rollback points. Use this command with caution.

A reload is required for this process. Press y to continue [y/n]y

--- Starting clear_install_state ---

Performing clear_install_state on all members

[1] clear_install_state package(s) on chassis 1/R0

[1] Finished clear_install_state on chassis 1/R0

Checking status of clear_install_state on [1/R0]

clear_install_state: Passed on [1/R0]

Finished clear_install_state

Send model notification for before reload

Install will reload the system now!

SMU – Installation Success

#show install log

```
[8|install_commit(CONSOLE, )]: Committing SMU
[8|install_commit(INFO, )]: Executing .install_pre_smu_activation.sh from /bootflash/C9800-CL-
universalk9.17.09.03.CSCwf67455.SPA.apsp.bin
[8|install_commit(INFO, )]: SUCCESS: Prescript execution done
[8|install_commit(INFO, )]: Executing .install_pre_smu_activation.sh from /bootflash/C9800-CL-
universalk9.17.09.03.CSCwf67455.SPA.apsp.bin done.
[8|install_commit(CONSOLE, )]:
[8|install_commit(INFO, )]: [1]: Performing verify_smu SUCCESS: verify_smu finished
[remote|install_commit]: END SUCCESS
Wed Sep 27 00:21:47 UTC 2023
[remote|install_commit(INFO, )]: cleanup_trap remote_invocation 1 operation install_commit .. 0 .. 0
[8|install_commit(INFO, )]: [1]: Performing SMU_COMMIT
SUCCESS: SMU_COMMIT finished
[8|install_commit(INFO, )]: Remote output from chassis 1/R0
[8|install_commit(INFO, )]:
[8|install_commit]: END SUCCESS /bootflash/C9800-CL-universalk9.17.09.03.CSCwf67455.SPA.apsp.bin
```

RRM – Is there a problem ?



RRM - Checks

DCA & TPC

#show ap dot11 5ghz summary

* global assignment

AP Name	Mac Address	Slot	Admin State	Oper State	Width	Txpwr	Channel	Mode
9166_2	10a8.29b9.0040	1	Enabled	Up	40	8/8 (2 dBm)	(44,48)	REAP
2802_1	7cad.4f13.16e0	1	Enabled	Down	40	1/7 (18 dBm)	(104,100)*	Bridge
9130_3	d4e8.8019.fee0	1	Enabled	Up	40	*1/8 (18 dBm)	(120,116)*	Local

show ap auto-rf dot11 5ghz | i Channel change|AP Name

AP Name : Lakshmi-9130-2

Channel changes due to radar : 0

AP Name : Lakshmi_9166_1

Channel changes due to radar : 0

Channel Change Count : 0

RRM – Checks

Debugging

- Per AP

```
# set platform software trace wireless chassis active r0 rrm all info  
# debug wireless mac <AP MAC> internal level verbose
```

- Across – Multiple APs

```
# set platform software trace wireless chassis active r0 rrm all info  
# set platform software trace wncd chassis active r0 radio-history-txpower info  
# set platform software trace wncd chassis active r0 radio-history-channel info  
# set platform software trace wncd chassis active r0 radio-history-reset info  
# set platform software trace wncd chassis active r0 radio-history-dfs info  
  
# show logging profile wireless internal start last <X> <Days/Hours> to-file  
bootflash:<Filename>
```

RRM – Checks

Debugging

- Expected – Working

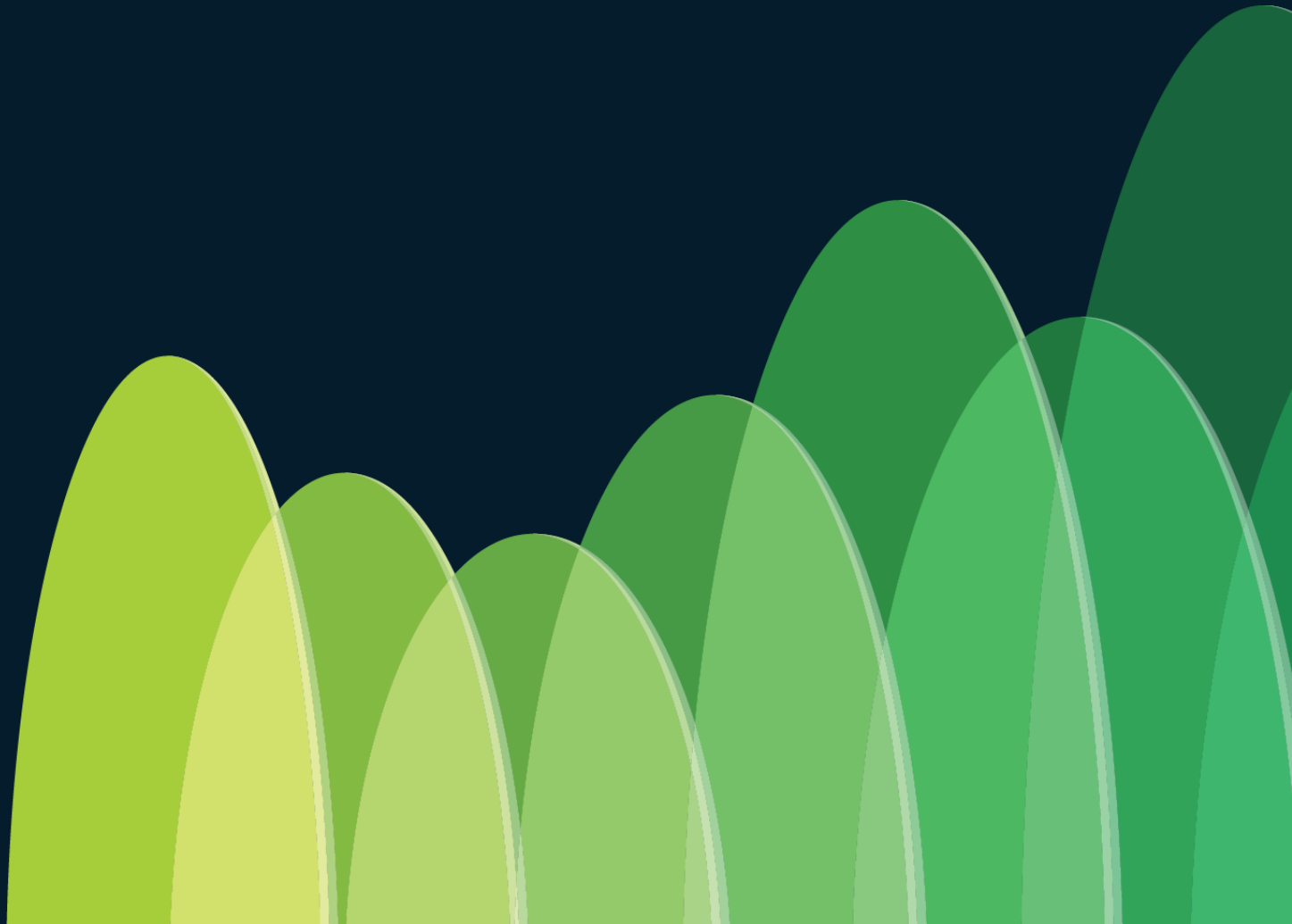
```
{wncd_x_R0-3}{1}: [radio-history-channel] [19978]: (note): Channel change for AP aaaa.bbbb.cccc slot: 1, band 802.11a, new channel 52, new channel width 40, old Channel 64, old channel width 40, new channel energy -80, old channel energy -75, new interference metric -84 dBm, old interference metric -79 dBm, new noise metric -86 dBm, old noise metric -86 dBm, channel load 0% reason: DCA: (Controller), Contribution: INTERFERENCE
```

- Non –working

```
{wncd_x_R0-3}{1}: [rrm-client] [19978]: (ERR): aaaa.bbbb.cccc exec-cli: Set Channel width failed, Failed to process radio slot Channel change for Slot id 1, err 15  
{wncd_x_R0-3}{1}: [errmsg] [19978]: (ERR): %RRM_CLIENT-3-EWLC_EXEC_ERR: R0/3: wncd: % Error: AP 9166-new2 MAC: aaaa.bbbb.cccc Slot-id 1 - Static channel needs to be set before changing channel width
```

Other Device Connectivity

- ✓ Mobility
- ✓ Telemetry



Connectivity – Mobility

#show wireless mobility summary

Wireless Management VLAN: 25

Wireless Management IP Address: 192.168.25.25

Mobility Control Message DSCP Value: 48

Mobility Keepalive Interval/Count: 10/3

Mobility Group Name: eWLC3

Mobility Multicast Ipv4 address: 0.0.0.0

Mobility MAC Address: 001e.f62a.46ff

Mobility Domain Identifier: 0x2e47

Controllers configured in the Mobility Domain:

IP	Public Ip	MAC Address	Group Name	Multicast IPv4	Multicast IPv6	Status	PMTU

192.168.25.25	N/A	001e.f62a.46ff	eWLC3	0.0.0.0	::	N/A	N/A
192.168.5.35	192.168.5.35	00b0.e1f2.f480	9800-2	0.0.0.0	::	Up	1385
192.168.25.23	192.168.25.23	706d.1535.6b0b	Vewlc	0.0.0.0	::	Control And Data Path Down	
192.168.25.33	192.168.25.33	f4bd.9e57.ff6b	8500	0.0.0.0	::	Up	1005

Connectivity – Mobility

#show wireless mobility peer ip 9.12.88.55

Ip Address : 9.12.88.55
Public Ip Address : 9.12.88.55
MAC Address : 706d.1535.eeab
Group Name : default
Total Number of Clients on Peer : 0
Local Clients Exported to Peer : 0
Locally Anchored Peer Clients : 0
Data Link Encryption Status : Disabled
Keepalive Data Link Status : UP
Keepalive Control Link Status : UP
Number of Data Path Flaps : 0
Last Data Path Flap : Never
Number of Data Packet Failure : 2
Number of Control Path Flaps : 0
Last Control Path Flap : Never
Number of Control Packet Failure : 2

Mobility event statistics

Roam stats

L2 roam count : 0
L3 roam count : 0

Handoff Status Received

Success : 0
Group mismatch : 0
Client unknown : 0
Client blacklisted : 0
SSID mismatch : 0
Denied : 0

Handoff Status Sent

Success : 0
Group mismatch : 0
Client unknown : 0
Client blacklisted : 0
SSID mismatch : 0
Denied : 0

Connectivity – Mobility

Complex Issue

```
# debug wireless mac <Client MAC> internal level verbose
```

```
# debug wireless ip <IP Address> internal level verbose
```

```
# set platform software trace mobilityd chassis active r0 all-modules  
verbose
```

```
# show logging process mobilityd internal start last <X> <Days/Hours> to-  
file bootflash:<Filename>
```

Connectivity - Telemetry

State = Connected
Connection flaps = 0

Vewlc#show telemetry connection all
Telemetry connections

Index	Peer Address	Port	VRF	Source Address	State	State Description
84	192.168.0.105	25103	0	192.168.40.10	Active	Connection up

Vewlc #show telemetry internal connection 84 detail
Telemetry protocol manager stats:

Con str : 192.168.0.1Te05:25103:0:192.168.40.10
Sockfd : 103
Protocol : tls-native
State : **CNDP_STATE_CONNECTED**
..
Version : TLSv1.2
..
Msgs Received : 0
Creation time: : Wed Oct 14 18:19:43:761

Last connected time: : Wed Oct 14 18:19:43:910
Last disconnect time: :
Last error: :
Connection flaps: : 0
Last flap Reason: :
Keep Alive Timeouts: : 0
Last Transport Error : No Error

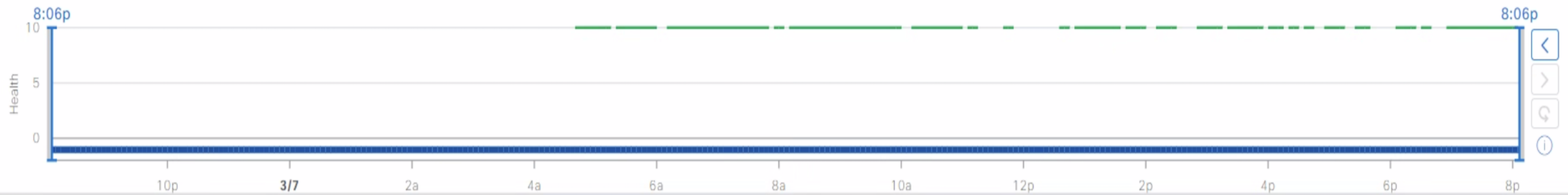
Telemetry Up – But Intermittent

Telemetry data
is intermittent



🕒 24 Hours ▾

Run Commands



Telemetry – Checks

#show telemetry internal protocol tls-native connector counters queue

Telemetry protocol connector queue counters:

Protocol	: tls-native
Queue max len	: 256000000
Packets count	: 63331
High watermark	: 255999999

#show telemetry internal protocol tls-native connector counters drop

Telemetry protocol connector drop counters:

Protocol	: tls-native
CNDP_CON_LOST_DROP	: 10164
CNDP_TAIL_DROP	: 11162233
CNDP_MSG_BUILD_ERR	: 0
CNDP_MSG_MARSHAL_ERR	: 0
CNDP_MSG_PAYLOAD_TOO_BIG	: 0
CNDP_BIPC_BUFFER_PKT_ERR	: 0
CNDP_DNAC_FILTER_DROP	: 0

Telemetry – Checks

#show telemetry internal subscription all stats

Telemetry subscription stats:

Subscription ID	Msgs Sent	Msgs Drop	Bytes Sent	Connection Info
9992	3650771	0	4134178746	10.10.10.10:25103:0:20.20.20.20
9991	408605	0	970448093	10.10.10.10:25103:0:20.20.20.20
9994	1	0	430	10.10.10.10:25103:0:20.20.20.20
9993	34723	0	42220224	10.10.10.10:25103:0:20.20.20.20

show telemetry ietf subscription all detail

telemetry ietf subscription 9992

encoding encode-ttl

filter tdl-uri /services;serviceName=rogue_oper/rogue_data

receiver-type protocol

source-address 10.141.248.229

stream native

update-policy on-change

Telemetry – Checks

Buffer overflow – Packet drops ?

- Suspect – Rogue Subscription
 - Show wireless wps rogue stats

AP Reports

Packets : 3878601

Packets/s: 123

Updates : 28173942 (3299363 NO-OPs)

Updates/s: 839

Client Reports

Packets : 873141

Packets/s: 20

Updates : 3320980 (0 NO-OPs)

Updates/s: 51

- High – Rogue & Updates per second
- Rogue Notification setting – Possible culprit ?

Telemetry – Best Practices

Current Configuration

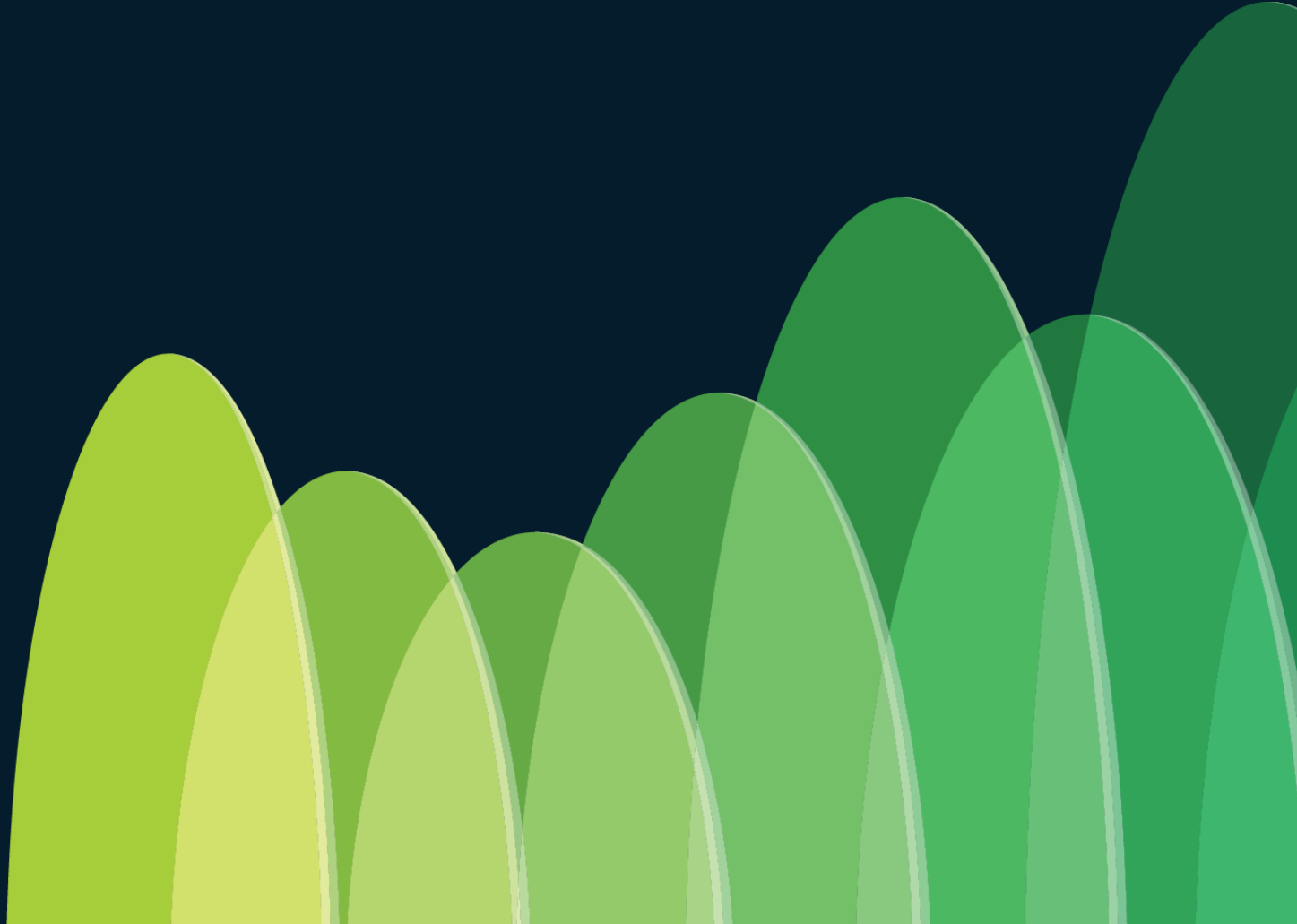
```
wireless wps rogue ap aaa polling-interval 3600
wireless wps rogue ap init-timer 180
wireless wps rogue ap notify-min-rssi -128
wireless wps rogue ap notify-rssi-deviation 0
wireless wps rogue ap rldp retries 1
wireless wps rogue ap timeout 1200
wireless wps rogue auto-contain level 1
wireless wps rogue client client-threshold 0
wireless wps rogue client notify-min-rssi -128
wireless wps rogue client notify-rssi-deviation 0
wireless wps rogue network-assurance enable
```

Best Practice

- Default Rogue Values – Aggressive
- Notification Default values – 0 dbm
- Recommended Interval – 5 or Higher

```
wireless wps rogue ap notify-rssi-deviation 5
wireless wps rogue client notify-rssi-deviation 5
```

Data Plane Troubleshooting



Dataplane Utilization

- Exception : 9800-CL & 9800-L
- Both have dedicated CPU cores DP

QuantumFlow Processor Datapath Utilization

 QFP datapath utilization

Type	5 sec	1 min	5 min	60 min
Output (bps)	84768	62616	61864	63032
Input (bps)	192	8680	8720	8840
Processing Load (%)	0	0	0	0

Dataplane Statistics

#show platform hardware chassis active qfp statistics drop all / inc
Global/Wls

Global Drop Stats	Packets	Octets
PuntGlobalPolicerDrops	0	0
SdwanGlobalDrop	0	0
WlsCapwapError	1471733	327309563
WlsCapwapFragmentationErr	0	0
WlsCapwapNoUldb	0	0
WlsCapwapReassAllocErr	0	0
WlsCapwapReassFragConsume	242814618	37954342616
WlsCapwapReassFragDrop	0	0
WlsClientError	212513426	62965772923
WlsClientFNFV9Err	0	0
WlsClientFNFV9Report	0	0
WlsDtlsProcessingError	0	0

Dataplane Statistics

show platform hardware chassis active qfp feature wireless punt statistics / ex 0

CPP Wireless Punt stats:

App Tag	Packet Count
-----	-----
CAPWAP_PKT_TYPE_DOT11_PROBE_REQ	13114
CAPWAP_PKT_TYPE_DOT11_IAPP	13773496
CAPWAP_PKT_TYPE_CAPWAP_DATA_PAT	193
SISF_PKT_TYPE_DHCP6	4219
SISF_PKT_TYPE_DATA_GLEAN	88
SISF_PKT_TYPE_DATA_GLEAN_V6	555

Dataplane Statistics

#show wireless stats punt detail

Punt statistics for process : wncd_0

App Tag	Packets count ms	Max-latency 101-500ms	Packet read latency		
			501-1000ms count	exceeds 1000ms count	count
Dot11 Probe	1	28	0	0	0
Dot11 Mgmt	3	1	0	0	0
Dot11 IAPP	1409786	13	0	0	0
Dot11 RFID	0	0	0	0	0
Dot11 RRM	0	0	0	0	0
Dot11 Dot1x	0	0	0	0	0
Capwap Data Keepalive	31899	4	0	0	0
Mobility Data Keepalive	0	0	0	0	0
Capwap Control	232012	15	0	0	0
Capwap Data	0	0	0	0	0
Mobility Control	0	0	0	0	0
Mobility Data	0	0	0	0	0

Punt statistics for process : wncmgrd

Embedded Packet Capture

Search Menu Items

- Dashboard
- Monitoring >
- Configuration >
- Administration >
- Licensing
- Troubleshooting**

Troubleshooting > Packet Capture

+ Add

× Delete

Create Packet Capture

Capture Name* Uplink

Filter* any

Monitor Control Plane ⓘ



Inner Filter Protocol ☐ DHCP

Inner Filter MAC

Buffer Size (MB)* 100

Limit by*

Duration

3600

secs ~= 1.00 hour

Available (6)

Search



- GigabitEthernet2 →
- GigabitEthernet3 →
- Vlan1 →
- Vlan88 →

Selected (1)

GigabitEthernet1 ←

Cancel

Apply to Device

Embedded Packet Capture

Search Menu Items

Dashboard

Monitoring

Configuration

Administration

Troubleshooting

Troubleshooting : Packet Capture

[← Back to Troubleshooting Menu](#)

+ Add

✕ Delete

	Capture Name	Interface	Monitor Control Plane	Buffer Size	Filter by	Limit	Status	Action
☐	uplink	TenGigabitEthernet0/0/0	Yes	0%	any	0 secs	Inactive	<div>▶ Start</div>

◀ 1 ▶

10 items per page

1 - 1 of 1 items

Embedded Packet Capture



- Circular Buffer
- Increase in file size to 500Mb

monitor capture <name> buffer file <2-5> <fsize 1-500Mb> [circular]

- Older version - Use Guestshell with EEM Script

```
event manager applet Continuous_packet_capture
event timer watchdog name timer time 120
action 0.5 cli command "enable"
action 1.0 cli command "guestshell run python3 /bootflash//guest-
share/Continuous_packet_capture.py"
```

Client Debug Bundle



- Client RA + Client Tech Support

```
# debug wireless bundle client <Client mac 1 .... Client mac 5>  
# no debug wireless bundle client <Client mac 1 .... Client mac 5>
```

- With EPC Capture

```
# debug wireless bundle start epc monitor-time <seconds>  
# debug wireless bundle client stop-all collect-all
```

Note : Client mac should be in xxxx.xxxx.xxxx format
Bundle name is highlighted by wlc, when 'no debug' is run

Archive Logs



17.15
Onwards

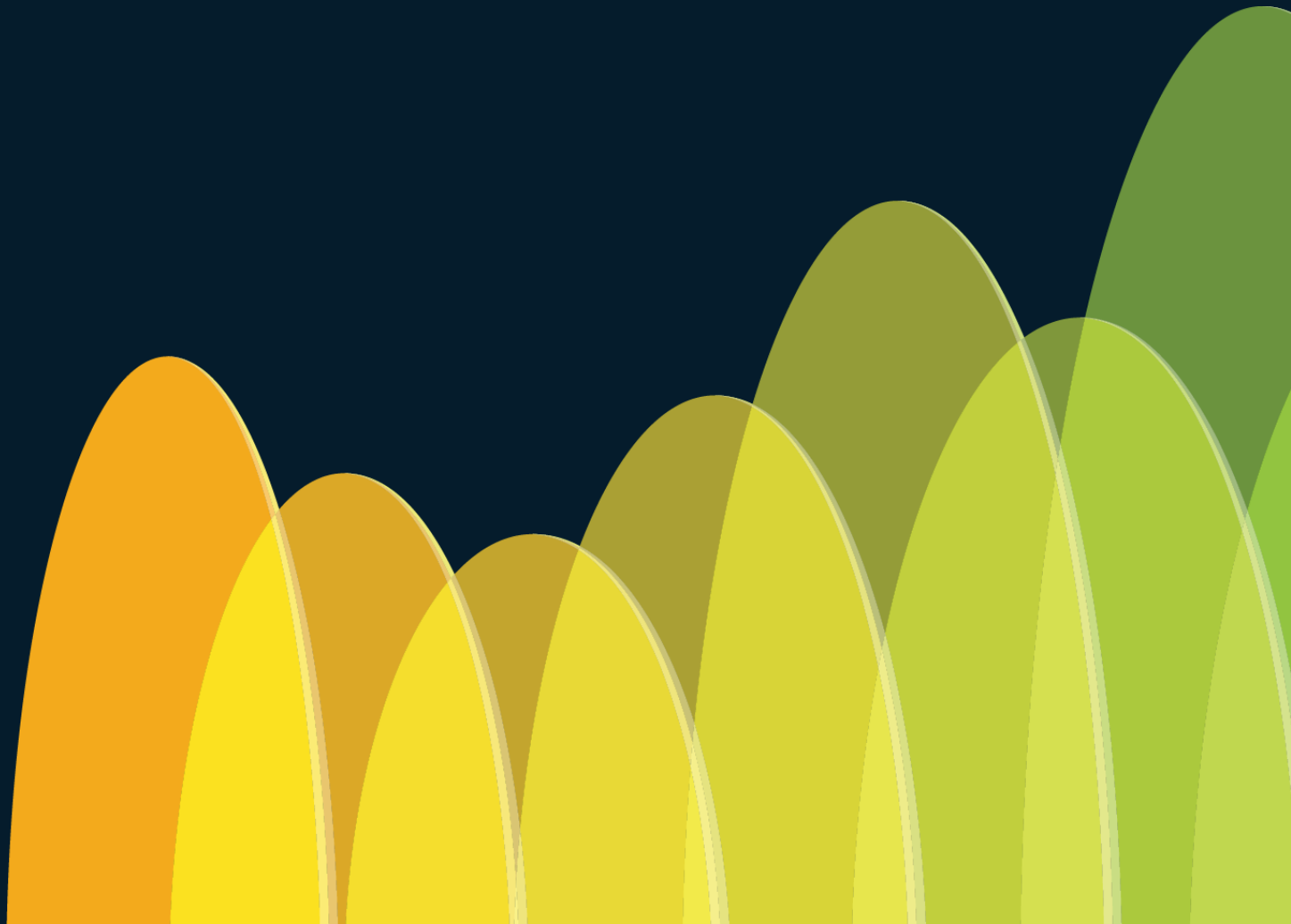
- Earlier

request platform software trace archive last <X> <Days> to-file bootflash:<Filename>

- After 17.15.1

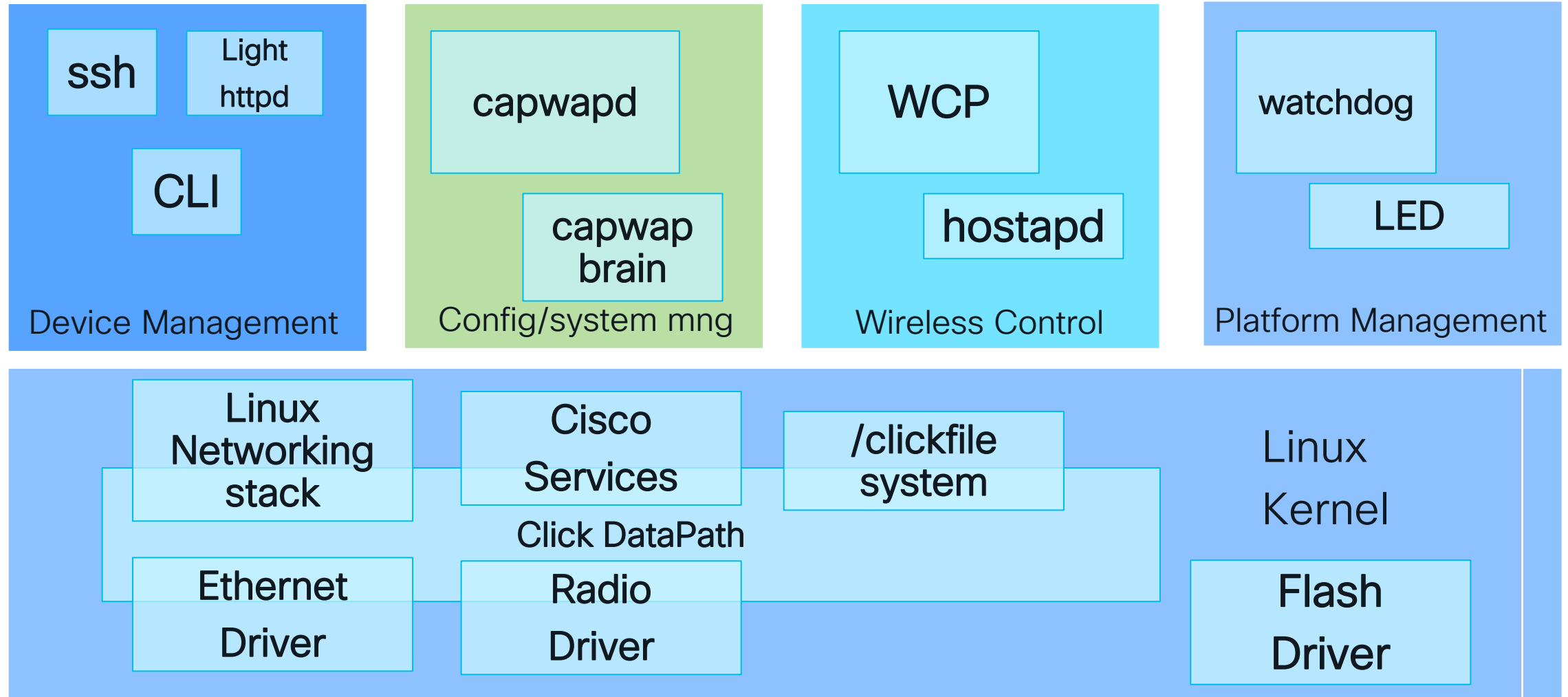
request platform software trace archive last <X> <Hours/Mins/Seconds/Days> to-file bootflash:<Filename>

Access Points Troubleshooting



Architecture

Simplified View



Control Plane

- Show logging !!

May 27 04:01:48 kernel: [*05/27/2023 04:01:48.5450] **Re-Tx** Count=1, Max Re-Tx Value=5, SendSeqNum=238, NumofPendingMsgs=4

May 27 04:01:54 kernel: [*05/27/2023 11:59:54.6813] **Re-Tx Count=2**, Max Re-Tx Value=5, SendSeqNum=243, **NumofPendingMsgs=3**

#*show flash syslog*

Directory of /storage/syslogs/
total 1848K

-rw-r--r--	1	root	root	36722	Oct 29	2024	19
-rw-r--r--	1	root	root	40916	Oct 29	2024	19.0
-rw-r--r--	1	root	root	36722	Oct 27	2024	18

AP Syslogs

Historic data possible ?

#show flash cores

Directory of /storage/cores/
total 13128K

```
-rw-rw-rw-  1 root  root   1974149 Jan 12 15:02 ap9136-3__27149-core-wcpd.17.9.4.212.2024-01-12.tgz
-rw-r--r--  1 root  root    799797 Feb  7  2024 AP9166-2__8176-core-capwapd.17.14.0.47.2024-02-07-10-52-07.tgz
```

#show flash crash

No AP crash file found

```
-----
Filesystem      Size  Used Available Use% Mounted on
/dev/ubivol/part2 519.4M 69.7M  445.0M  14% /part2
```

Client Connectivity – Issues

Traditional Method

```
#config ap client-trace filter mac <MAC>
#config ap client-trace filter all enable
#config ap client-trace filter start
#config ap client-trace filter stop

# debug client <MAC>

#show ap client-trace status
# show ap client-trace events mac <MAC>
```

Client debug bundle

Why not on AP ?



```
#debug client-bundle start debug 22:0F:23:B1:82:EC
```

```
#show client-bundle status
```

Client Bundle Status : Started

Client Bundle Starting Addresses : 22:0F:23:B1:82:EC

Client Bundle Upload Status : None

Client Bundle Upload File : None

```
#debug client-bundle stop debug 22:0F:23:B1:82:EC
```

```
#debug client-bundle upload scp admin@192.168.1.133:/bootflash  
22:0F:23:B1:82:EC
```

Troubleshooting Clients on the AP side

Make sense of client debugs

17.12
Onwards

```
[*10/03/2024 12:26:47.1319] [1727958407:133567] [9120-2] [aa:aa:aa:bb:bb:bb] < apr1v4> [U:W] ARP_QUERY : Sender
10.10.10.2 Targlp 172.17.95.254
[*10/03/2024 12:26:47.1319] [1727958407:133671] [9120-2] [aa:aa:aa:bb:bb:bb] < apr1v4> [U:C] ARP_QUERY : Sender
10.10.10.2 Targlp 172.17.95.254
[*10/03/2024 12:26:47.1329] chatter: ethertype_arp who-has 172.17.95.254 tell 10.10.10.2
[*10/03/2024 12:26:47.1329] [1727958407:133671] [9120-2] [aa:aa:aa:bb:bb:bb] < apr1v4> [U:C] ARP_QUERY : Sender
10.10.10.2 Targlp 172.17.95.254
[*10/03/2024 12:26:47.1339] [1727958407:135627] [9120-2] [aa:aa:aa:bb:bb:bb] < wired0> [D:C] ARP_REPLY : Sender
172.17.95.254 HwAddr 00:00:0c:07:ac:65
[*10/03/2024 12:26:47.1339] [1727958407:135627] [9120-2] [aa:aa:aa:bb:bb:bb] < wired0> [D:C] ARP_REPLY : Sender
172.17.95.254 HwAddr 00:00:0c:07:ac:65
[*10/03/2024 12:26:47.1339] [1727958407:135627] [9120-2] [aa:aa:aa:bb:bb:bb] < apr1v4> [D:W] ARP_REPLY : Sender
172.17.95.254 HwAddr 00:00:0c:07:ac:65
[*10/03/2024 12:26:47.1359] [1727958407:136812] [9120-2] [aa:aa:aa:bb:bb:bb] < apr1v4> [D:A] ARP_REPLY : Sender
172.17.95.254 HwAddr 00:00:0c:07:ac:65 [Tx Success]
```

U = upstream (from client)
D = downstream (to client)
A = Antenna
W - Wireless driver
E - Ethernet driver
C - Click driver

Client Debugs

Fails in 4-way
Handshake

```
[*09/16/2024 14:32:22.4269] CLSM[02:5C:90:AF:91:4D]: DS Assoc Resp(10) IF 18 slot 1 vap 2 state AUTH, generated by AP
[*09/16/2024 14:32:22.4278] CLSM[02:5C:90:AF:91:4D]: Driver send mgmt frame success Radio 1 Vap 2
[*09/16/2024 14:32:22.4278] CLSM[02:5C:90:AF:91:4D]: client moved from AUTH to ASSOC
[*09/16/2024 14:32:22.4281] hostapd:hostapd_common_drv_send_client_cp_tc_auth_event_to_wcp
[*09/16/2024 14:32:22.4282] hostapd:ap_free_sta: cancel ap_handle_timer for 02:5c:90:af:91:4d
[*09/16/2024 14:32:22.4535] CLSM[02:5C:90:AF:91:4D]: Not populating DEO IE: Device export (0) client type (0)
[*09/16/2024 14:32:22.4536] CLSM[02:5C:90:AF:91:4D]: DS Assoc Resp(10) IF 18 slot 1 vap 2 state ASSOC, generated by WLC
[*09/16/2024 14:32:22.4536] CLSM[02:5C:90:AF:91:4D]: Ignoring DS Assoc Resp generated by WLC in flexconnect mode
[*09/16/2024 14:32:22.4567] CLSM[02:5C:90:AF:91:4D]: ADD_MOBILE AID 2
[*09/16/2024 14:32:22.457] [REDACTED] 91:4D]: client moved from ASSOC to 8021X
[*09/16/2024 14:32:22.457] [REDACTED] 91:4D]: Send ext cache, pmk len (32) pmkid len (16)
[*09/16/2024 14:32:22.4579] CLSM[02:5C:90:AF:91:4D]: Added to WCP client table AID 2 Radio 1 Vap 2 Enc 1
[*09/16/2024 14:32:22.4914] chatter: eap_to_cli: 135 | 025c90af 914d7411 b2d35b6d 888e0203 00750200 88001000
00000000 000000ce
[*09/16/2024 14:32:22.4914] [REDACTED] receive: src=02:5c:90:af:91:4d len=156
[*09/16/2024 14:32:22.4914] [REDACTED] receive: l2=0xbe3ad310 ctx=0x55be3ad210 sock=10
[*09/16/2024 14:32:22.4941] hostapd:EAPOL Pkt handling: no local cache for client=02:5c:90:af:91:4d, send to controller
[*09/16/2024 14:32:22.4942] chatter: eap_from_cli: 156 | 7411b2d3 5b6d025c 90af914d 888e0203 008a0201 08001000
00000000 00000064
[*09/16/2024 14:32:22.5166] chatter: eap_to_cli: 217 | 025c90af 914d7411 b2d35b6d 888e0203 00c70213 c8001000
00000000 000001ce
```

EAP M1

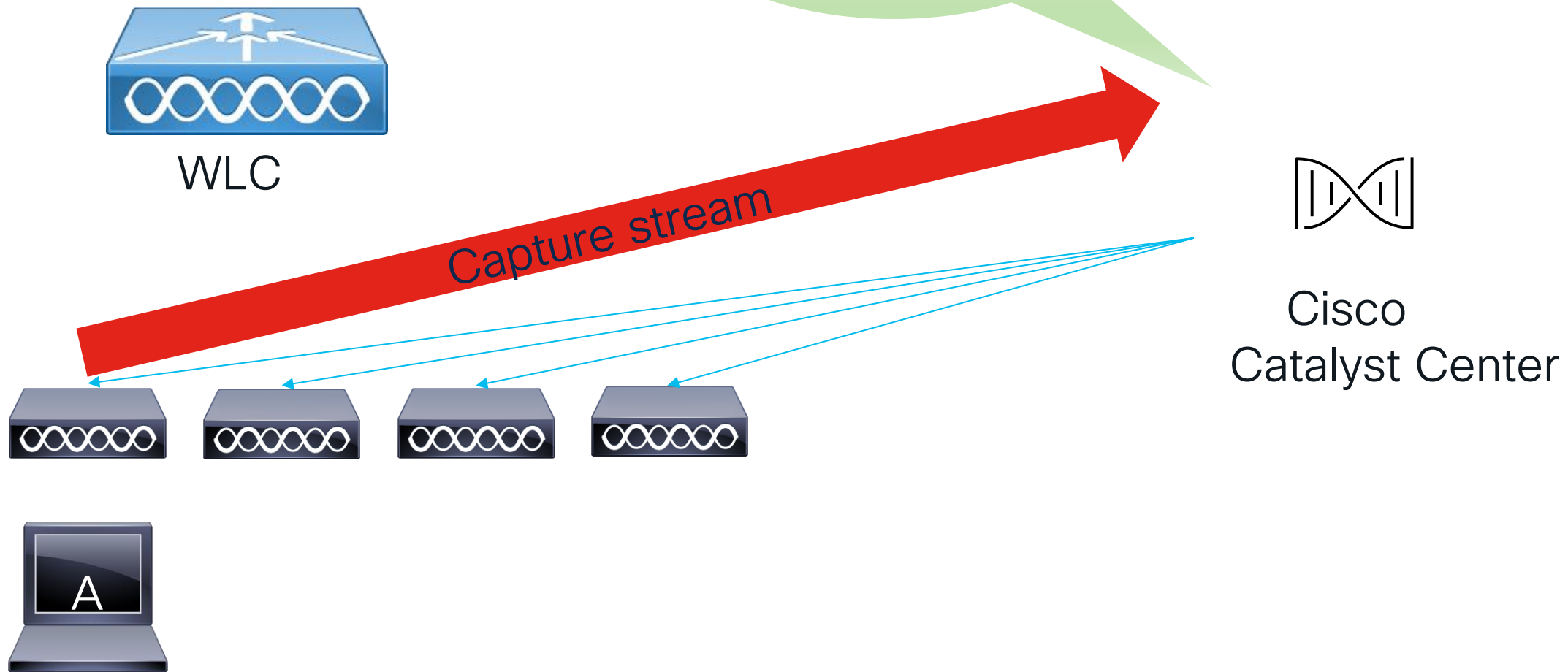
EAP M2 – From client

EAP M3

*No Response for M3 – Deleted due to
KeyExchange timeout*

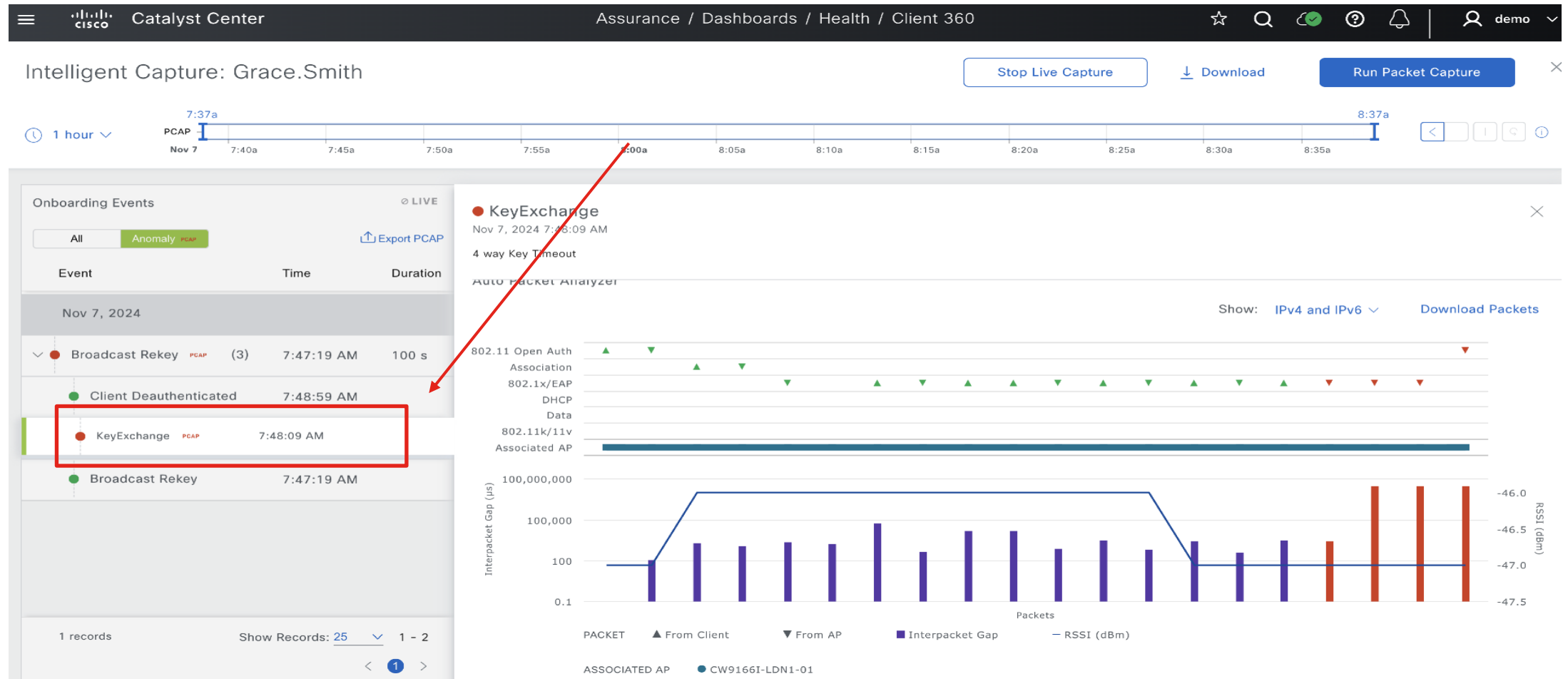
Catalyst Center

Intelligent capture



Intelligent Capture

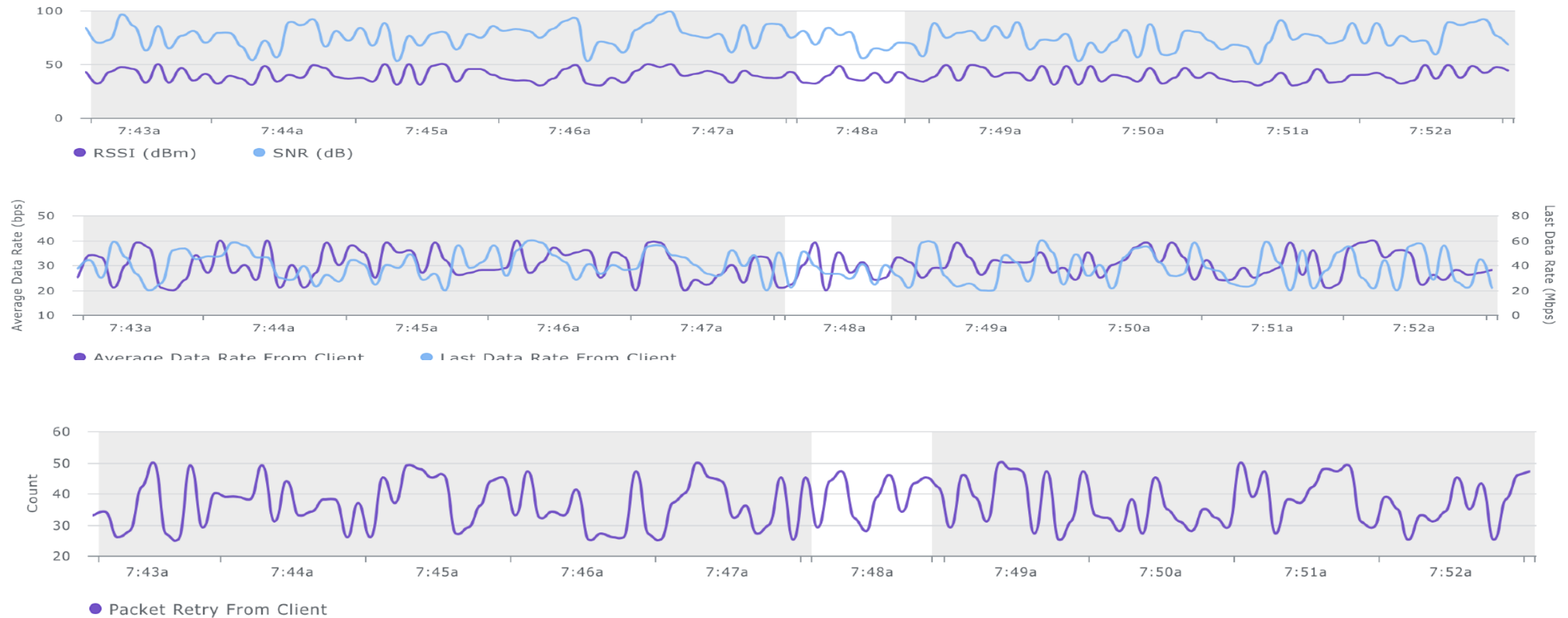
Anomaly capture



Intelligent Capture

Anomaly capture

RF Statistics



Possible Rx/Tx Issue ?

Radio Rx/Tx stats

#show controllers dot11Radio 1

QBSS Load: cca_load: 0x30(48%), rx_load: 0x0(0%), tx_load: 0xb(11%)

radio stats:

=====

ML_TYPE: NON_ML DOT11 Statistics (Cumulative Total/Last 5 Seconds):

RECEIVER

Host Rx K Bytes: 372/0

Unicasts Rx: 1478/0

Broadcasts Rx: 212/0

Beacons Rx: 1184806/1724

Probes Rx: 441151/714

Multicasts Rx: 1123/0

Mgmt Packets Rx: 176/0

Ctrl Frames Rx: 614/0

RTS received: 0/0

Duplicate frames: 0/0

MIC errors: 0/0

FCS errors: 0/0

Key Index errors: 0/0

TRANSMITTER

Host Tx K Bytes: 124/0

Unicasts Tx: 878/0

Broadcasts Tx: 0/0

Beacons Tx: 227299/340

Probes Tx: 186907/301

Multicasts Tx: 2732/0

Mgmt Packets Tx: 9/0

Ctrl Frames Tx: 0/0

RTS transmitted: 0/0

CTS not received: 0/0

WEP errors: 1/0

Retries: 201/0

Tx Failures: 0/0

Tx Drops: 0/0

AP Radio Health

Radio Resets ?

#show controllers dot11Radio 1

Radio RC stats:

=====

Last radio RC(65): Total 9 Start 4

Normal:

Code	Count	State	When
30	1	START	Tue Nov 5 02:25:42 2024 UTC
43	1	STOP	Tue Nov 5 02:25:41 2024 UTC
54	1	START	Tue Nov 5 02:25:42 2024 UTC
55	1	STOP	Tue Nov 5 02:25:42 2024 UTC
65	1	START	Tue Nov 5 02:27:52 2024 UTC
66	1	STOP	Tue Nov 5 02:27:52 2024 UTC
70	1	STOP	Tue Nov 5 02:25:41 2024 UTC

Failure:

Code	Count	State	When
2	2	START	Tue Nov 5 02:25:50 2024 UTC

AP SSH Blocked !! Any Alternative ?

Troubleshoot from WLC !!

```
#ap name 9120_1 remote enable
```

```
#term mon
```

```
#ap name 9120_1 remote command "show clock"
```

```
Jan  4 18:59:25 CET: %AP_LOG-6-9120_1 : Chassis 1 *17:59:25 UTC Wed Jan  4  
2024
```

```
#
```

```
#ap name 9120_1 remote disable
```

Key Takeaway

- Architecture – 9800 & AP
- Troubleshooting Techniques
 - Always on tracing
 - RA & Conditional Debugging
 - Control & Data Plane Debugging
- Analysis Tools
 - WCAE
 - Wireless Debug Analyzer
- Troubleshooting on AP
 - Local & Remote debugging
- Catalyst Centre
 - Client 360
 - Intelligent Capture

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Thank you

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