

Qualifying Wi-Fi 7 Devices with Automated Testing





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What we'll cover

- What is Wi-Fi 7 (& Wi-Fi 6/6E)
- CPE Testing Objectives & Strategies
 - What to test, why, and how
- CDRouter NTA3000 Platform
 - How to cover objectives/strategies
- Q&A



What is Wi-Fi 6/6E/7? (802.11ax, 6GHz, 802.11be)

What is Wi-Fi 6/6E?

- Consumer-friendly term designated to describe the features based on the IEEE amendment **802.11ax**
- Essentially branded by the Wi-Fi Alliance Certification program for access points (APs) and stations (STAs)
- Also known as HE (High Efficiency)

Wi-Fi 6/6E (802.11ax) Key Features

- Up to 8 spatial streams
- New 1024-QAM modulation
- OFDMA / Multi-User MIMO
- Operates in all 3 frequency bands (2.4, 5, and 6 GHz)
 - 6E adds 802.11ax to 6GHz (WPA3 Mandatory)

What is Wi-Fi 7?

- Consumer-friendly term designated to describe the features based on the IEEE **draft** amendment **802.11be**
- Essentially branded by the newest Wi-Fi Alliance Certification program for access points (APs) and stations (STAs) (January 2024)
- Also known as EHT (Extremely High Throughput)

Wi-Fi 7 (802.11be) Key Features

- Added 320 MHz channel width
- New 4K-QAM Modulation
- Operates in all 3 Frequency Bands (2.4, 5, and 6 GHz)
- Ability to use all 3 bands at the same time (MLO)

“Preamble Puncturing” was actually introduced in Wi-Fi 6, however it was not widely adopted by STAs (clients)

CPE Testing Objectives

What to test and why

CPE Testing Objectives

OSI Layer 3 (and above)

- WLAN Client Connectivity
 - PHY modes - legacy (a/b/g), n, ac, ax, be
 - Frequency Bands - 2.4GHz, 5GHz, 6GHz
 - Security - Open, OWE, WPA2, WPA2/3 (transitional), WPA3
- WLAN Client Functionality
 - DHCP (v4/v6)
 - DNS (v4/v6/tcp)
 - ICMP, HTTP, HTTPS

CPE Testing Objectives

(continued)

- WLAN Client Scaling
 - Single band, Across multiple bands
 - How many clients can be “connected” at the same time?
- WLAN Client Performance
 - Single client Upload/Download “Goodput”
 - Aggregate “Goodput” for multiple clients
 - “Greenfield”
 - Various Bands and PHY modes

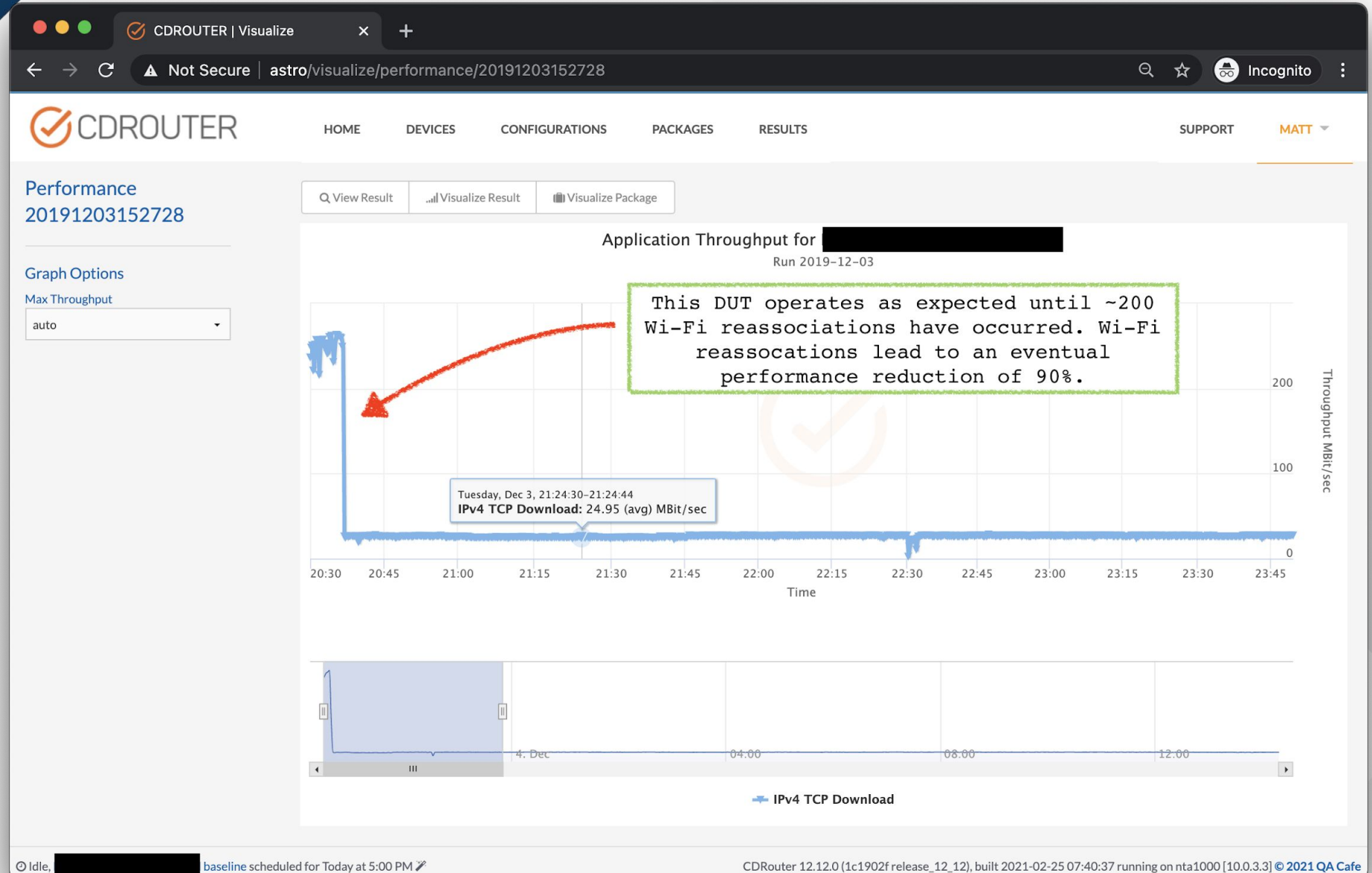
Stability testing will expose protocol interactions that lead to performance issues and vice-versa!

Stability

- ✓ Mix connectivity, functional, scaling, & performance tests
- ✓ Run for longer durations
- ✓ Look for trends over time:
 - ✓ Performance degradation
 - ✓ Functional test duration

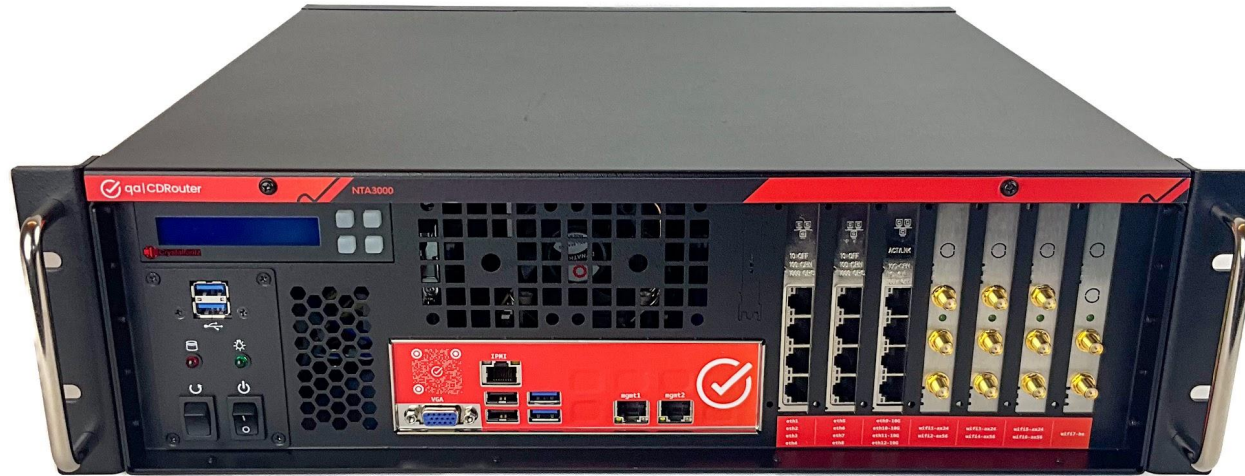


An example of what stability testing can uncover...



CDRouter NTA3000 Platform

How it can help meet testing
objectives



CDRouter NTA3000 Layer 3 (and above) Testing Platform

Ok, really layer 2 1/2 with a few hooks into Layer 1

General availability beginning - May 2024



Test Interfaces (Wi-Fi)	(3) MediaTek MT7916AN 2.4 GHz Wi-Fi 6 radios (wifi1-ax24, wifi3-ax24, wifi5-ax24)
	(2) MediaTek MT7916AN 5 GHz Wi-Fi 6 radios (wifi2-ax56 and wifi4-ax56)
	(1) MediaTek MT7916AN 6 GHz Wi-Fi 6E radio (wifi6-ax56)
	(1) Intel BE200 Wi-Fi 7 radio (wifi7-be)
Virtual Wireless Clients	(57) Wi-Fi 6 @ 2.4 GHz (2x2, HE40, MCS11)
	(38) Wi-Fi 6 @ 5 GHz (2x2, HE160, MCS11)
	(19) Wi-Fi 6E @ 6 GHz (2x2, HE160, MCS11)
	(1) Wi-Fi 7 @ 2.4 GHz (2x2, EHT40, MCS13), 5 GHz (2x2, EHT160, MCS13), or 6 GHz (2x2, EHT320, MCS13)
	(115) total Wi-Fi clients



4 physical wireless interfaces

3 - MediaTek MT7916AN

1 - Intel BE200

(3) MediaTek -

2 single-band radios (2.4GHz and 5/6GHz) that share the same antennas.

2.4GHz radio - 2T2R with 2 spatial streams

5/6GHz radio - 2T3R with 2 spatial streams

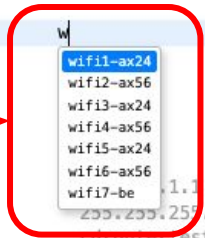
(1) Intel -

single tri-band radio (2.4/5/6GHz)

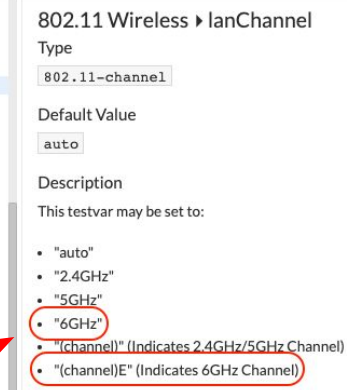
2T2R with 2 spatial streams

4 physical wireless interface cards but 7 physical wireless radios

```
1 > SECTION "About" {↔}
19
20 > SECTION "Base Configuration" {
21
22 > SECTION "WAN" {↔}
326
327 > SECTION "LAN" {
328
329 > SECTION "LAN Interface" {
330
331 testvar lanInterface
332 # testvar lanSetEthLinkSpeed
333 # testvar lanMacId
334 # testvar lanMode
335 # testvar lanClients
336 # testvar lanSecurity
337 # testvar lanIp
338 # testvar lanMask
339 # testvar lanDomainName
340 # testvar lanMtu
341 # testvar lanHostname
342 # testvar lanGuestMode
343
```

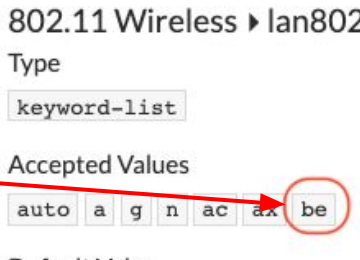


```
403
404 > SECTION "802.11 Wireless" {
405
406 # testvar lanSSID qa-net
407 # testvar lanChannel auto
408 # testvar lan80211Phy auto
409 # testvar lanBSSID auto
410 # testvar lan80211BandSteering none
411
412 > SECTION "WPA Configuration Options" {
413
414 # testvar wpaMode auto
415 # testvar wpaKey qacafe123
416 # testvar wpaSaePassword "sae secret"
417 # testvar wpaSaePweH2E auto
418 # testvar wpaKeyMgmt PSK
419 # testvar wpaCipher auto
420 # testvar wpaGroupCipher auto
421 # testvar wpaPMF auto
422
423 }
424
```



New values added to existing testvars to support 6GHz band/channels and 'BE' PHY mode

```
802.11 Wireless > lan80211Phy
Type
keyword-list
Accepted Values
auto a g n ac ax be
Default Value
```



Using CDRouter to Perform Objectives

- Connectivity
- Functionality
 - Scaling
- Performance
 - Stability

WLAN Client Connectivity

The CDRouter **start** test case provides a great deal of validation.

Example of wifi7-be connecting on the 6GHz band

```

168 12:05:31.271 SECTION(setup): Starting LAN interface 'lan' mac=b0:75:0c:fe:68:8e (wifi7-be,wireless)
169 12:05:31.273 INFO(setup): Wireless device wifi7-be capabilities:
170     key-mgmt: 802.1X,PSK,802.1X-256,PSK-256,SAE,SUITE-B,SUITE-B-192
171     cipher: CCMP-128,GCMP-128,GCMP-256,TKIP,WEP-104,WEP-40
172     phy: 802.11a,b,g,n,ac,ax,be
173 12:05:31.274 INFO(setup): Scanning for ssid="TP-Link_42C2_6G" bssid=auto freq/chan=auto phy=auto security=RSN:SAE pmf=auto h2e=auto using wifi7-be

```

Scanning

Association,
Authentication,
Key Exchange

```

179 12:05:36.231 INFO(lan): Associating to ssid="TP-Link_42C2_6G" bssid=auto freq/chan=auto phy=auto security=RSN:SAE pmf=auto h2e=auto (wifi7-be)
180 12:05:36.273 INFO(lan): SAE authentication complete (wifi7-be)
181 12:05:36.288 INFO(lan): Associated (wifi7-be)
182     ssid="TP-Link_42C2_6G" bssid=1a:52:a1:6f:42:c6 freq/chan=6295/69E signal=-33 dBm
183     privacy: 1
184     rsn: key-mgmt=SAE pairwise=CCMP-128 group=CCMP-128 mgmt-group=BIP-CMAC-128 pmkid= caps=PTKSA-RC-0,GTKSA-RC-0,MFPR,MFPC
185     wpa: none
186     phy: 802.11be
187 12:05:36.291 INFO(lan): Enabling RSN, key-mgmt=SAE pairwise=CCMP-128 group=CCMP-128 mgmt-group=BIP-CMAC-128
188 12:05:36.298 I<<<(lan):      1a:52:a1:6f:42:c6      b0:75:0c:fe:68:8e      EAPOL      EAPOL-Key
189 12:05:36.298 INFO(lan): Received RSN Pairwise-Key message 1
190 12:05:36.299 INFO(lan): Sending EAPOL-Key response
191 12:05:36.299 0>>>(lan):      b0:75:0c:fe:68:8e      1a:52:a1:6f:42:c6      EAPOL      EAPOL-Key
192 12:05:36.306 I<<<(lan):      1a:52:a1:6f:42:c6      b0:75:0c:fe:68:8e      EAPOL      EAPOL-Key
193 12:05:36.306 INFO(lan): Received RSN Pairwise-Key message 3
194 12:05:36.306 INFO(lan): Sending EAPOL-Key response
195 12:05:36.307 0>>>(lan):      b0:75:0c:fe:68:8e      1a:52:a1:6f:42:c6      EAPOL      EAPOL-Key

```

```

203 12:05:36.328 INFO(lan): WPA PSK authentication complete (wifi7-be)
204 12:05:36.334 INFO(lan): Station Connected (wifi7-be)
205     ssid="TP-Link_42C2_6G" bssid=1a:52:a1:6f:42:c6 freq/chan=6295/69E chan-width=320 MHz signal=-33 dBm noise=0 dBm

```

Connected

WLAN Client MLO Configuration



Source: <https://wifinowglobal.com/news-and-blog/multi-fold-success-with-wi-fi-7-multi-link-operation-mlo/>

CDRouter uses:

Intel BE200

- (Linux firmware, drivers, kernel)

Support for:

MLO operation (eMLSR) Enhanced Multi Link Single Radio

Puncturing capability

Multi-RU



WLAN Client Functional Tests

Selected Tests (6)

NAME	EXPANSION	MODULE
wifi_1 - Graceful wireless LAN client restart	CDRouter	wifi.tcl
wifi_2 - Restart wireless LAN client without releasing address	CDRouter	wifi.tcl
wifi_3 - Restart wireless LAN client without releasing or obtaining a new address	CDRouter	wifi.tcl
wifi_10 - Verify connectivity using all wifi modes advertised by the DUT	CDRouter	wifi.tcl
wifi_30 - WiFi association stress test	CDRouter	wifi.tcl
wifi_40 - WiFi SSID scan test	CDRouter	wifi.tcl

Selected Tests (100)

Copy Remove Move to Top Move to Bottom Undo

NAME	EXPANSION	MODULE	
<input type="checkbox"/> arp_1 - Verify DUT responds to broadcast ARP request on LAN interface	CDRouter	arp.tcl	x
<input type="checkbox"/> arp_2 - Verify DUT responds to unicast ARP request on LAN interface	CDRouter	arp.tcl	x
<input type="checkbox"/> arp_3 - Verify DUT responds to ARP Probes on the LAN interface	CDRouter	arp.tcl	x
<input type="checkbox"/> cdrouter_dhcp_server_1 - Verify DHCP server returns same IP address when client renews	CDRouter	dhcp-s.tcl	x
<input type="checkbox"/> cdrouter_dhcp_server_6 - Verify DHCP server returns same IP address when client restarts	CDRouter	dhcp-s.tcl	x
<input type="checkbox"/> cdrouter_dhcp_server_7 - Verify DHCP server returns same IP address when client releases then restarts	CDRouter	dhcp-s.tcl	x
<input type="checkbox"/> cdrouter_dhcp_server_8 - Verify DHCP server returns same IP address when client restarts using Requested IP Address option	CDRouter	dhcp-s.tcl	x
<input type="checkbox"/> cdrouter_dhcp_server_100 - Verify DHCP server accepts DHCP client packets with IPv4 length less than 576	CDRouter	dhcp-s.tcl	x

Run the 'wifi' test module, or the 'Top100', or both!

WLAN Multi-Client Configuration

Using **Multiport** configuration allows you to define a wide variety and combination of clients.

```

329 SECTION "LAN Interface" {
330
331     testvar lanInterface
332     # testvar lanSetEthLinkSpeed
333     # testvar lanMacId
334     # testvar lanMode
335     # testvar lanClients
336     testvar lanSecurity
337     testvar lanIp
338     # testvar lanMask
339     # testvar lanDomainName
340     # testvar lanMtu
341     # testvar lanHostname
342     # testvar lanGuestMode
343
344     SECTION "ARP Settings" {↔}
345
350 }
351
352
353 SECTION "LAN DNS" {↔}
354
355 SECTION "DHCP Client" {↔}
356
357 SECTION "802.11 Wireless" {
358
359     testvar lanSSID
360     # testvar lanChannel
361     # testvar lan80211Phy
362     # testvar lanBSSID
363     # testvar lan80211BandSteering
364
365     SECTION "WPA Configuration Options" {
366
367         testvar wpaMode
368         # testvar wpaKey
369         testvar wpaSaePassword
370         # testvar wpaSaePweH2E
371         testvar wpaKeyMgmt
372         # testvar wpaCipher
373
374         wlan7-be
375         auto
376         auto
377         DHCP
378         1
379         WPA
380         192.168.0.1
381         255.255.255.0
382         cdrouartest.com
383         mydut
384         no
385
386         SECTION "LAN Host IP" {↔}
387
388     }
389
390     SECTION "LAN DNS" {↔}
391
392     SECTION "LAN 802.1q VLAN" {↔}
393
394     SECTION "DHCP Client Configuration" {↔}
395
396     SECTION "802.11 Wireless" {
397
398         testvar lanSSID
399         testvar lanChannel
400         # testvar lan80211Phy
401         # testvar lanBSSID
402         # testvar lan80211BandSteering
403
404         SECTION "WPA Configuration Options" {
405
406             wlan6-ax56
407             auto
408             auto
409             DHCP
410             10
411             WPA
412             192.168.0.1
413             255.255.255.0
414             no
415
416             SECTION "LAN Host IP" {↔}
417
418         }
419
420         SECTION "LAN DNS" {↔}
421
422         SECTION "LAN 802.1q VLAN" {↔}
423
424         SECTION "DHCP Client Configuration" {↔}
425
426         SECTION "802.11 Wireless" {
427
428             testvar lanSSID
429             testvar lanChannel
430             # testvar lan80211Phy
431             # testvar lanBSSID
432             # testvar lan80211BandSteering
433
434             SECTION "WPA Configuration Options" {
435
436                 wlan3-ax24
437                 auto
438                 auto
439                 DHCP
440                 10
441                 WPA
442                 192.168.0.1
443                 255.255.255.0
444                 no
445
446                 SECTION "LAN Host IP" {↔}
447
448             }
449
450             SECTION "LAN DNS" {↔}
451
452             SECTION "LAN 802.1q VLAN" {↔}
453
454             SECTION "DHCP Client Configuration" {↔}
455
456             SECTION "802.11 Wireless" {
457
458                 testvar lanSSID
459                 testvar lanChannel
460                 # testvar lan80211Phy
461                 # testvar lanBSSID
462                 # testvar lan80211BandSteering
463
464                 SECTION "WPA Configuration Options" {
465
466                     wlan3-ax24
467                     auto
468                     auto
469                     DHCP
470                     10
471                     WPA
472                     192.168.0.1
473                     255.255.255.0
474                     no
475
476                     SECTION "LAN Host IP" {↔}
477
478                 }
479
480                 SECTION "LAN DNS" {↔}
481
482                 SECTION "LAN 802.1q VLAN" {↔}
483
484                 SECTION "DHCP Client Configuration" {↔}
485
486                 SECTION "802.11 Wireless" {
487
488                     testvar lanSSID
489                     testvar lanChannel
490                     # testvar lan80211Phy
491                     # testvar lanBSSID
492                     # testvar lan80211BandSteering
493
494                     SECTION "WPA Configuration Options" {
495
496                         wlan3-ax24
497                         auto
498                         auto
499                         DHCP
500                         10
501                         WPA
502                         192.168.0.1
503                         255.255.255.0
504                         no
505
506                         SECTION "LAN Host IP" {↔}
507
508                     }
509
510                     SECTION "LAN DNS" {↔}
511
512                     SECTION "LAN 802.1q VLAN" {↔}
513
514                     SECTION "DHCP Client Configuration" {↔}
515
516                     SECTION "802.11 Wireless" {
517
518                         testvar lanSSID
519                         testvar lanChannel
520                         # testvar lan80211Phy
521                         # testvar lanBSSID
522                         # testvar lan80211BandSteering
523
524                         SECTION "WPA Configuration Options" {
525
526                             wlan3-ax24
527                             auto
528                             auto
529                             DHCP
530                             10
531                             WPA
532                             192.168.0.1
533                             255.255.255.0
534                             no
535
536                             SECTION "LAN Host IP" {↔}
537
538                         }
539
540                     }
541
542                 }
543
544             }
545
546         }
547
548     }
549
550     SECTION "LAN DNS" {↔}
551
552     SECTION "LAN 802.1q VLAN" {↔}
553
554     SECTION "DHCP Client Configuration" {↔}
555
556     SECTION "802.11 Wireless" {
557
558         testvar lanSSID
559         testvar lanChannel
560         # testvar lan80211Phy
561         # testvar lanBSSID
562         # testvar lan80211BandSteering
563
564         SECTION "WPA Configuration Options" {
565
566             wlan3-ax24
567             auto
568             auto
569             DHCP
570             10
571             WPA
572             192.168.0.1
573             255.255.255.0
574             no
575
576             SECTION "LAN Host IP" {↔}
577
578         }
579
580         SECTION "LAN DNS" {↔}
581
582         SECTION "LAN 802.1q VLAN" {↔}
583
584         SECTION "DHCP Client Configuration" {↔}
585
586         SECTION "802.11 Wireless" {
587
588             testvar lanSSID
589             testvar lanChannel
590             # testvar lan80211Phy
591             # testvar lanBSSID
592             # testvar lan80211BandSteering
593
594             SECTION "WPA Configuration Options" {
595
596                 wlan3-ax24
597                 auto
598                 auto
599                 DHCP
600                 10
601                 WPA
602                 192.168.0.1
603                 255.255.255.0
604                 no
605
606                 SECTION "LAN Host IP" {↔}
607
608             }
609
610             SECTION "LAN DNS" {↔}
611
612             SECTION "LAN 802.1q VLAN" {↔}
613
614             SECTION "DHCP Client Configuration" {↔}
615
616             SECTION "802.11 Wireless" {
617
618                 testvar lanSSID
619                 testvar lanChannel
620                 # testvar lan80211Phy
621                 # testvar lanBSSID
622                 # testvar lan80211BandSteering
623
624                 SECTION "WPA Configuration Options" {
625
626                     wlan3-ax24
627                     auto
628                     auto
629                     DHCP
630                     10
631                     WPA
632                     192.168.0.1
633                     255.255.255.0
634                     no
635
636                     SECTION "LAN Host IP" {↔}
637
638                 }
639
640             }
641
642         }
643
644     }
645
646     SECTION "LAN DNS" {↔}
647
648     SECTION "LAN 802.1q VLAN" {↔}
649
650     SECTION "DHCP Client Configuration" {↔}
651
652     SECTION "802.11 Wireless" {
653
654         testvar lanSSID
655         testvar lanChannel
656         # testvar lan80211Phy
657         # testvar lanBSSID
658         # testvar lan80211BandSteering
659
660         SECTION "WPA Configuration Options" {
661
662             wlan3-ax24
663             auto
664             auto
665             DHCP
666             10
667             WPA
668             192.168.0.1
669             255.255.255.0
670             no
671
672             SECTION "LAN Host IP" {↔}
673
674         }
675
676         SECTION "LAN DNS" {↔}
677
678         SECTION "LAN 802.1q VLAN" {↔}
679
680         SECTION "DHCP Client Configuration" {↔}
681
682         SECTION "802.11 Wireless" {
683
684             testvar lanSSID
685             testvar lanChannel
686             # testvar lan80211Phy
687             # testvar lanBSSID
688             # testvar lan80211BandSteering
689
690             SECTION "WPA Configuration Options" {
691
692                 wlan3-ax24
693                 auto
694                 auto
695                 DHCP
696                 10
697                 WPA
698                 192.168.0.1
699                 255.255.255.0
700                 no
701
702                 SECTION "LAN Host IP" {↔}
703
704             }
705
706             SECTION "LAN DNS" {↔}
707
708             SECTION "LAN 802.1q VLAN" {↔}
709
710             SECTION "DHCP Client Configuration" {↔}
711
712             SECTION "802.11 Wireless" {
713
714                 testvar lanSSID
715                 testvar lanChannel
716                 # testvar lan80211Phy
717                 # testvar lanBSSID
718                 # testvar lan80211BandSteering
719
720                 SECTION "WPA Configuration Options" {
721
722                     wlan3-ax24
723                     auto
724                     auto
725                     DHCP
726                     10
727                     WPA
728                     192.168.0.1
729                     255.255.255.0
730                     no
731
732                     SECTION "LAN Host IP" {↔}
733
734                 }
735
736             }
737
738         }
739
740     }
741
742     SECTION "LAN DNS" {↔}
743
744     SECTION "LAN 802.1q VLAN" {↔}
745
746     SECTION "DHCP Client Configuration" {↔}
747
748     SECTION "802.11 Wireless" {
749
750         testvar lanSSID
751         testvar lanChannel
752         # testvar lan80211Phy
753         # testvar lanBSSID
754         # testvar lan80211BandSteering
755
756         SECTION "WPA Configuration Options" {
757
758             wlan3-ax24
759             auto
760             auto
761             DHCP
762             10
763             WPA
764             192.168.0.1
765             255.255.255.0
766             no
767
768             SECTION "LAN Host IP" {↔}
769
770         }
771
772         SECTION "LAN DNS" {↔}
773
774         SECTION "LAN 802.1q VLAN" {↔}
775
776         SECTION "DHCP Client Configuration" {↔}
777
778         SECTION "802.11 Wireless" {
779
780             testvar lanSSID
781             testvar lanChannel
782             # testvar lan80211Phy
783             # testvar lanBSSID
784             # testvar lan80211BandSteering
785
786             SECTION "WPA Configuration Options" {
787
788                 wlan3-ax24
789                 auto
790                 auto
791                 DHCP
792                 10
793                 WPA
794                 192.168.0.1
795                 255.255.255.0
796                 no
797
798                 SECTION "LAN Host IP" {↔}
799
800             }
801
802             SECTION "LAN DNS" {↔}
803
804             SECTION "LAN 802.1q VLAN" {↔}
805
806             SECTION "DHCP Client Configuration" {↔}
807
808             SECTION "802.11 Wireless" {
809
810                 testvar lanSSID
811                 testvar lanChannel
812                 # testvar lan80211Phy
813                 # testvar lanBSSID
814                 # testvar lan80211BandSteering
815
816                 SECTION "WPA Configuration Options" {
817
818                     wlan3-ax24
819                     auto
820                     auto
821                     DHCP
822                     10
823                     WPA
824                     192.168.0.1
825                     255.255.255.0
826                     no
827
828                     SECTION "LAN Host IP" {↔}
829
830                 }
831
832             }
833
834         }
835
836     }
837
838     SECTION "LAN DNS" {↔}
839
840     SECTION "LAN 802.1q VLAN" {↔}
841
842     SECTION "DHCP Client Configuration" {↔}
843
844     SECTION "802.11 Wireless" {
845
846         testvar lanSSID
847         testvar lanChannel
848         # testvar lan80211Phy
849         # testvar lanBSSID
850         # testvar lan80211BandSteering
851
852         SECTION "WPA Configuration Options" {
853
854             wlan3-ax24
855             auto
856             auto
857             DHCP
858             10
859             WPA
860             192.168.0.1
861             255.255.255.0
862             no
863
864             SECTION "LAN Host IP" {↔}
865
866         }
867
868         SECTION "LAN DNS" {↔}
869
870         SECTION "LAN 802.1q VLAN" {↔}
871
872         SECTION "DHCP Client Configuration" {↔}
873
874         SECTION "802.11 Wireless" {
875
876             testvar lanSSID
877             testvar lanChannel
878             # testvar lan80211Phy
879             # testvar lanBSSID
880             # testvar lan80211BandSteering
881
882             SECTION "WPA Configuration Options" {
883
884                 wlan3-ax24
885                 auto
886                 auto
887                 DHCP
888                 10
889                 WPA
890                 192.168.0.1
891                 255.255.255.0
892                 no
893
894                 SECTION "LAN Host IP" {↔}
895
896             }
897
898             SECTION "LAN DNS" {↔}
899
900             SECTION "LAN 802.1q VLAN" {↔}
901
902             SECTION "DHCP Client Configuration" {↔}
903
904             SECTION "802.11 Wireless" {
905
906                 testvar lanSSID
907                 testvar lanChannel
908                 # testvar lan80211Phy
909                 # testvar lanBSSID
910                 # testvar lan80211BandSteering
911
912                 SECTION "WPA Configuration Options" {
913
914                     wlan3-ax24
915                     auto
916                     auto
917                     DHCP
918                     10
919                     WPA
920                     192.168.0.1
921                     255.255.255.0
922                     no
923
924                     SECTION "LAN Host IP" {↔}
925
926                 }
927
928             }
929
930         }
931
932     }
933
934     SECTION "LAN DNS" {↔}
935
936     SECTION "LAN 802.1q VLAN" {↔}
937
938     SECTION "DHCP Client Configuration" {↔}
939
940     SECTION "802.11 Wireless" {
941
942         testvar lanSSID
943         testvar lanChannel
944         # testvar lan80211Phy
945         # testvar lanBSSID
946         # testvar lan80211BandSteering
947
948         SECTION "WPA Configuration Options" {
949
950             wlan3-ax24
951             auto
952             auto
953             DHCP
954             10
955             WPA
956             192.168.0.1
957             255.255.255.0
958             no
959
960             SECTION "LAN Host IP" {↔}
961
962         }
963
964         SECTION "LAN DNS" {↔}
965
966         SECTION "LAN 802.1q VLAN" {↔}
967
968         SECTION "DHCP Client Configuration" {↔}
969
970         SECTION "802.11 Wireless" {
971
972             testvar lanSSID
973             testvar lanChannel
974             # testvar lan80211Phy
975             # testvar lanBSSID
976             # testvar lan80211BandSteering
977
978             SECTION "WPA Configuration Options" {
979
980                 wlan3-ax24
981                 auto
982                 auto
983                 DHCP
984                 10
985                 WPA
986                 192.168.0.1
987                 255.255.255.0
988                 no
989
990                 SECTION "LAN Host IP" {↔}
991
992             }
993
994             SECTION "LAN DNS" {↔}
995
996             SECTION "LAN 802.1q VLAN" {↔}
997
998             SECTION "DHCP Client Configuration" {↔}
999
1000            SECTION "802.11 Wireless" {
1001
1002                testvar lanSSID
1003                testvar lanChannel
1004                # testvar lan80211Phy
1005                # testvar lanBSSID
1006                # testvar lan80211BandSteering
1007
1008                SECTION "WPA Configuration Options" {
1009
1010                    wlan3-ax24
1011                    auto
1012                    auto
1013                    DHCP
1014                    10
1015                    WPA
1016                    192.168.0.1
1017                    255.255.255.0
1018                    no
1019
1020                    SECTION "LAN Host IP" {↔}
1021
1022                }
1023
1024            }
1025
1026        }
1027
1028    }
1029
1030    SECTION "LAN DNS" {↔}
1031
1032    SECTION "LAN 802.1q VLAN" {↔}
1033
1034    SECTION "DHCP Client Configuration" {↔}
1035
1036    SECTION "802.11 Wireless" {
1037
1038        testvar lanSSID
1039        testvar lanChannel
1040        # testvar lan80211Phy
1041        # testvar lanBSSID
1042        # testvar lan80211BandSteering
1043
1044        SECTION "WPA Configuration Options" {
1045
1046            wlan3-ax24
1047            auto
1048            auto
1049            DHCP
1050            10
1051            WPA
1052            192.168.0.1
1053            255.255.255.0
1054            no
1055
1056            SECTION "LAN Host IP" {↔}
1057
1058        }
1059
1060        SECTION "LAN DNS" {↔}
1061
1062        SECTION "LAN 802.1q VLAN" {↔}
1063
1064        SECTION "DHCP Client Configuration" {↔}
1065
1066        SECTION "802.11 Wireless" {
1067
1068            testvar lanSSID
1069            testvar lanChannel
1070            # testvar lan80211Phy
1071            # testvar lanBSSID
1072            # testvar lan80211BandSteering
1073
1074            SECTION "WPA Configuration Options" {
1075
1076                wlan3-ax24
1077                auto
1078                auto
1079                DHCP
1080                10
1081                WPA
1082                192.168.0.1
1083                255.255.255.0
1084                no
1085
1086                SECTION "LAN Host IP" {↔}
1087
1088            }
1089
1090            SECTION "LAN DNS" {↔}
1091
1092            SECTION "LAN 802.1q VLAN" {↔}
1093
1094            SECTION "DHCP Client Configuration" {↔}
1095
1096            SECTION "802.11 Wireless" {
1097
1098                testvar lanSSID
1099                testvar lanChannel
1100                # testvar lan80211Phy
1101                # testvar lanBSSID
1102                # testvar lan80211BandSteering
1103
1104                SECTION "WPA Configuration Options" {
1105
1106                    wlan3-ax24
1107                    auto
1108                    auto
1109                    DHCP
1110                    10
1111                    WPA
1112                    192.168.0.1
1113                    255.255.255.0
1114                    no
1115
1116                    SECTION "LAN Host IP" {↔}
1117
1118                }
1119
1120            }
1121
1122        }
1123
1124    }
1125
1126    SECTION "LAN DNS" {↔}
1127
1128    SECTION "LAN 802.1q VLAN" {↔}
1129
1130    SECTION "DHCP Client Configuration" {↔}
1131
1132    SECTION "802.11 Wireless" {
1133
1134        testvar lanSSID
1135        testvar lanChannel
1136        # testvar lan80211Phy
1137        # testvar lanBSSID
1138        # testvar lan80211BandSteering
1139
1140        SECTION "WPA Configuration Options" {
1141
1142            wlan3-ax24
1143            auto
1144            auto
1145            DHCP
1146            10
1147            WPA
1148            192.168.0.1
1149            255.255.255.0
1150            no
1151
1152            SECTION "LAN Host IP" {↔}
1153
1154        }
1155
1156        SECTION "LAN DNS" {↔}
1157
1158        SECTION "LAN 802.1q VLAN" {↔}
1159
1160        SECTION "DHCP Client Configuration" {↔}
1161
1162        SECTION "802.11 Wireless" {
1163
1164            testvar lanSSID
1165            testvar lanChannel
1166            # testvar lan80211Phy
1167            # testvar lanBSSID
1168            # testvar lan80211BandSteering
1169
1170            SECTION "WPA Configuration Options" {
1171
1172                wlan3-ax24
1173                auto
1174                auto
1175                DHCP
1176                10
1177                WPA
1178                192.168.0.1
1179                255.255.255.0
1180                no
1181
1182                SECTION "LAN Host IP" {↔}
1183
1184            }
1185
1186            SECTION "LAN DNS" {↔}
1187
1188            SECTION "LAN 802.1q VLAN" {↔}
1189
1190            SECTION "DHCP Client Configuration" {↔}
1191
1192            SECTION "802.11 Wireless" {
1193
1194                testvar lanSSID
1195                testvar lanChannel
1196                # testvar lan80211Phy
1197                # testvar lanBSSID
1198                # testvar lan80211BandSteering
1199
1200                SECTION "WPA Configuration Options" {
1201
1202                    wlan3-ax24
1203                    auto
1204                    auto
1205                    DHCP
1206                    10
1207                    WPA
1208                    192.168.0.1
1209                    255.255.255.0
1210                    no
1211
1212                    SECTION "LAN Host IP" {↔}
1213
1214                }
1215
1216            }
1217
1218        }
1219
1220    }
1221
1222    SECTION "LAN DNS" {↔}
1223
1224    SECTION "LAN 802.1q VLAN" {↔}
1225
1226    SECTION "DHCP Client Configuration" {↔}
1227
1228    SECTION "802.11 Wireless" {
1229
1230        testvar lanSSID
1231        testvar lanChannel
1232        # testvar lan80211Phy
1233        # testvar lanBSSID
1234        # testvar lan80211BandSteering
1235
1236        SECTION "WPA Configuration Options" {
1237
1238            wlan3-ax24
1239            auto
1240            auto
1241            DHCP
1242            10
1243            WPA
1244            192.168.0.1
1245            255.255.255.0
1246            no
1247
1248            SECTION "LAN Host IP" {↔}
1249
1250        }
1251
1252        SECTION "LAN DNS" {↔}
1253
1254        SECTION "LAN 802.1q VLAN" {↔}
1255
1256        SECTION "DHCP Client Configuration" {↔}
1257
1258        SECTION "802.11 Wireless" {
1259
1260            testvar lanSSID
1261            testvar lanChannel
1262            # testvar lan80211Phy
1263            # testvar lanBSSID
1264            # testvar lan80211BandSteering
1265
1266            SECTION "WPA Configuration Options" {
1267
1268                wlan3-ax24
1269                auto
1270                auto
1271                DHCP
1272                10
1273                WPA
1274                192.168.0.1
1275                255.255.255.0
1276                no
1277
1278                SECTION "LAN Host IP" {↔}
1279
1280            }
1281
1282            SECTION "LAN DNS" {↔}
1283
1284            SECTION "LAN 802.1q VLAN" {↔}
1285
1286            SECTION "DHCP Client Configuration" {↔}
1287
1288            SECTION "802.11 Wireless" {
1289
1290                testvar lanSSID
1291                testvar lanChannel
1292                # testvar lan80211Phy
1293                # testvar lanBSSID
1294                # testvar lan80211BandSteering
1295
1296                SECTION "WPA Configuration Options" {
1297
1298                    wlan3-ax24
1299                    auto
1300                    auto
1301                    DHCP
1302                    10
1303                    WPA
1304                    192.168.0.1
1305                    255.255.255.0
1306                    no
1307
1308                    SECTION "LAN Host IP" {↔}
1309
1310                }
1311
1312            }
1313
1314        }
1315
1316    }
1317
1318    SECTION "LAN DNS" {↔}
1319
1320    SECTION "LAN 802.1q VLAN" {↔}
1321
1322    SECTION "DHCP Client Configuration" {↔}
1323
1324    SECTION "802.11 Wireless" {
1325
1326        testvar lanSSID
1327        testvar lanChannel
1328        # testvar lan80211Phy
1329        # testvar lanBSSID
1330        # testvar lan80211BandSteering
1331
1332        SECTION "WPA Configuration Options" {
1333
1334            wlan3-ax24
1335            auto
1336            auto
1337            DHCP
1338            10
1339            WPA
1340            192.168.0.1
1341            255.255.255.0
1342            no
1343
1344            SECTION "LAN Host IP" {↔}
1345
1346        }
1347
1348        SECTION "LAN DNS" {↔}
1349
1350        SECTION "LAN 802.1q VLAN" {↔}
1351
1352        SECTION "DHCP Client Configuration" {↔}
1353
1354        SECTION "802.11 Wireless" {
1355
1356            testvar lanSSID
1357            testvar lanChannel
1358            # testvar lan80211Phy
1359            # testvar lanBSSID
1360            # testvar lan80211BandSteering
1361
1362            SECTION "WPA Configuration Options" {
1363
1364                wlan3-ax24
1365                auto
1366                auto
1367                DHCP
1368                10
1369                WPA
1370                192.168.0.1
1371                255.255.255.0
1372                no
1373
1374                SECTION "LAN Host IP" {↔}
1375
1376            }
1377
1378            SECTION "LAN DNS" {↔}
1379
1380            SECTION "LAN 802.1q VLAN" {↔}
1381
1382            SECTION "DHCP Client Configuration" {↔}
1383
1384            SECTION "802.11 Wireless" {
1385
1386                testvar lanSSID
1387                testvar lanChannel
1388                # testvar lan80211Phy
1389                # testvar lanBSSID
1390                # testvar lan80211BandSteering
1391
1392                SECTION "WPA Configuration Options" {
1393
1394                    wlan3-ax24
1395                    auto
1396                    auto
1397                    DHCP
1398                    10
1399                    WPA
1400                    192.168.0.1
1401                    255.255.255.0
1402                    no
1403
1404                    SECTION "LAN Host IP" {↔}
1405
1406                }
1407
1408            }
1409
1410        }
1411
1412    }
1413
1414    SECTION "LAN DNS" {↔}
1415
1416    SECTION "LAN 802.1q VLAN" {↔}
1417
1418    SECTION "DHCP Client Configuration" {↔}
1419
1420    SECTION "802.11 Wireless" {
1421
1422        testvar lanSSID
1423        testvar lanChannel
1424        # testvar lan80211Phy
1425        # testvar lanBSSID
1426        # testvar lan80211BandSteering
1427
1428        SECTION "WPA Configuration Options" {
1429
1430            wlan3-ax24
1431            auto
1432            auto
1433            DHCP
1434            10
1435            WPA
1436            192.168.0.1
1437            255.255.255.0
1438            no
1439
1440            SECTION "LAN Host IP" {↔}
1441
1442        }
1443
1444        SECTION "LAN DNS" {↔}
1445
1446        SECTION "LAN 802.1q VLAN" {↔}
1447
1448        SECTION "DHCP Client Configuration" {↔}
1449
1450        SECTION "802.11 Wireless" {
1451
1452            testvar lanSSID
1453            testvar lanChannel
1454            # testvar lan80211Phy
1455            # testvar lanBSSID
1456            # testvar lan80211BandSteering
1457
1458            SECTION "WPA Configuration Options" {
1459
1460                wlan3-ax24
1461                auto
1462                auto
1463                DHCP
1464                10
1465                WPA
1466                192.168.0.1
1467                255.255.255.0
1468                no
1469
1470                SECTION "LAN Host IP" {↔}
1471
1472            }
1473
1474            SECTION "LAN DNS" {↔}
1475
1476            SECTION "LAN 802.1q VLAN" {↔}
1477
1478            SECTION "DHCP Client Configuration" {↔}
1479
1480            SECTION "802.11 Wireless" {
1481
1482                testvar lanSSID
1483                testvar lanChannel
1484                # testvar lan80211Phy
1485                # testvar lanBSSID
1486                # testvar lan80211BandSteering
1487
1488                SECTION "WPA Configuration Options" {
1489
1490                    wlan3-ax24
1491                    auto
1492                    auto
1493                    DHCP
1494                    10
1495                    WPA
1496                    192.168.0.1
1497                    255.255.255.0
1498                    no
1499
1500                    SECTION "LAN Host IP" {↔}
1501
1502                }
1503
1504            }
1505
1506        }
1507
1508    }
1509
1510    SECTION "LAN DNS" {↔}
1511
1512    SECTION "LAN 802.1q VLAN" {↔}
1513
1514    SECTION "DHCP Client Configuration" {↔}
1515
1516    SECTION "802.11 Wireless" {
1517
1518        testvar lanSSID
1519        testvar lanChannel
1520        # testvar lan80211Phy
1521        # testvar lanBSSID
1522        # testvar lan80211BandSteering
1523
1524        SECTION "WPA Configuration Options" {
1525
1526            wlan3-ax24
1527            auto
1528            auto
1529            DHCP
1530            10
1531            WPA
1532            192.168.0.1
1533            255.255.255.0
1534            no
1535
1536            SECTION "LAN Host IP" {↔}
1537
1538        }
1539
1540        SECTION "LAN DNS" {↔}
1541
1542        SECTION "LAN 802.1q VLAN" {↔}
1543
1544        SECTION "DHCP Client Configuration" {↔}
1545
1546        SECTION "802.11 Wireless" {
1547
1548            testvar lanSSID
1549            testvar lanChannel
1550            # testvar lan80211Phy
1551            # testvar lanBSSID
1552            # testvar lan80211BandSteering
1553
1554            SECTION "WPA Configuration Options" {
1555
1556                wlan3-ax24
1557                auto
1558                auto
1559                DHCP
1560                10
1561                WPA
1562                192.168.0.1
1563                255.255.255.0
1564                no
1565
1566                SECTION "LAN Host IP" {↔}
1567
1568            }
1569
1570            SECTION "LAN DNS" {↔}
1571
1572            SECTION "LAN 802.1q VLAN" {↔}
1573
1574            SECTION "DHCP Client Configuration" {↔}
1575
1576            SECTION "802.11 Wireless" {
1577
1578                testvar lanSSID
1579                testvar lanChannel
1580                # testvar lan80211Phy
1581                # testvar lanBSSID
1582                # testvar lan80211BandSteering
1583
1584                SECTION "WPA Configuration Options" {
1585
1586                    wlan3-ax24
1587                    auto

```

WLAN Client Scaling

```

start 20240321141442
Show comments | Test result: pass (00:48)
This log has filters applied to it. You can clear them or Ctrl+Cmd+C

161 14:14:59.112 + SECTION(setup): Starting LAN interface 'lan' mac=b0:75:0c:26:47:63 (wifi7-be,wireless)
162 14:14:59.114 INFO(setup): Wireless device wifi7-be capabilities:
166 14:14:59.115 INFO(setup): Scanning for ssid="TP-Link_42C2_ML0" bssid=auto freq/chan=auto phy=auto security=RSN:SAE pmf=auto h2e=auto using wifi7-be
195 14:15:01.935 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan
245 14:15:05.085 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.81/255.255.255.0 on lan
248 14:15:05.085 + SECTION(setup): Starting LAN interface 'lan2.1' mac=b0:75:0c:95:e0:0c (wifi6-ax56,wireless)
249 14:15:05.086 INFO(setup): Wireless device wifi6-ax56 capabilities:
253 14:15:05.087 INFO(setup): Scanning for ssid="TP-Link_42C2_6G" bssid=auto freq/chan=6GHz phy=auto security=RSN:SAE pmf=yes h2e=auto using wifi6-ax56
331 14:15:13.061 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.1
365 14:15:16.234 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.18/255.255.255.0 on lan2.1
368 14:15:16.235 + SECTION(setup): Starting LAN interface 'lan2.2' mac=b0:75:0c:d1:aa:7d (wifi6-ax56,wireless)
369 14:15:16.236 INFO(setup): Wireless device wifi6-ax56 capabilities:
403 14:15:16.307 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.2
446 14:15:19.477 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.55/255.255.255.0 on lan2.2
449 14:15:19.477 + SECTION(setup): Starting LAN interface 'lan2.3' mac=b0:75:0c:0d:05:7a (wifi6-ax56,wireless)
450 14:15:19.479 INFO(setup): Wireless device wifi6-ax56 capabilities:
484 14:15:19.551 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.3
523 14:15:22.725 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.45/255.255.255.0 on lan2.3
526 14:15:22.725 + SECTION(setup): Starting LAN interface 'lan2.4' mac=b0:75:0c:7b:8d:6d (wifi6-ax56,wireless)
527 14:15:22.727 INFO(setup): Wireless device wifi6-ax56 capabilities:
561 14:15:22.793 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.4
601 14:15:25.949 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.14/255.255.255.0 on lan2.4
604 14:15:25.950 + SECTION(setup): Starting LAN interface 'lan2.5' mac=b0:75:0c:b6:a7:1d (wifi6-ax56,wireless)
605 14:15:25.951 INFO(setup): Wireless device wifi6-ax56 capabilities:
638 14:15:26.026 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.5
685 14:15:29.195 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.35/255.255.255.0 on lan2.5
688 14:15:29.196 + SECTION(setup): Starting LAN interface 'lan2.6' mac=b0:75:0c:26:e3:8e (wifi6-ax56,wireless)
689 14:15:29.197 INFO(setup): Wireless device wifi6-ax56 capabilities:
723 14:15:29.268 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.6
751 14:15:29.429 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.100/255.255.255.0 on lan2.6
754 14:15:29.429 + SECTION(setup): Starting LAN interface 'lan2.7' mac=b0:75:0c:c9:62:96 (wifi6-ax56,wireless)
755 14:15:29.431 INFO(setup): Wireless device wifi6-ax56 capabilities:
789 14:15:29.499 + SECTION(setup): Enabling IPv4 DHCP client on LAN interface lan2.7
816 14:15:29.672 NOTICE(setup): Obtained IPv4 DHCP address 192.168.0.60/255.255.255.0 on lan2.7
819 14:15:29.672 + SECTION(setup): Starting LAN interface 'lan2.8' mac=b0:75:0c:cb:d5:41 (wifi6-ax56,wireless)

```

Defining the additional clients in your configuration allows all of them to get connected during the **start** test.

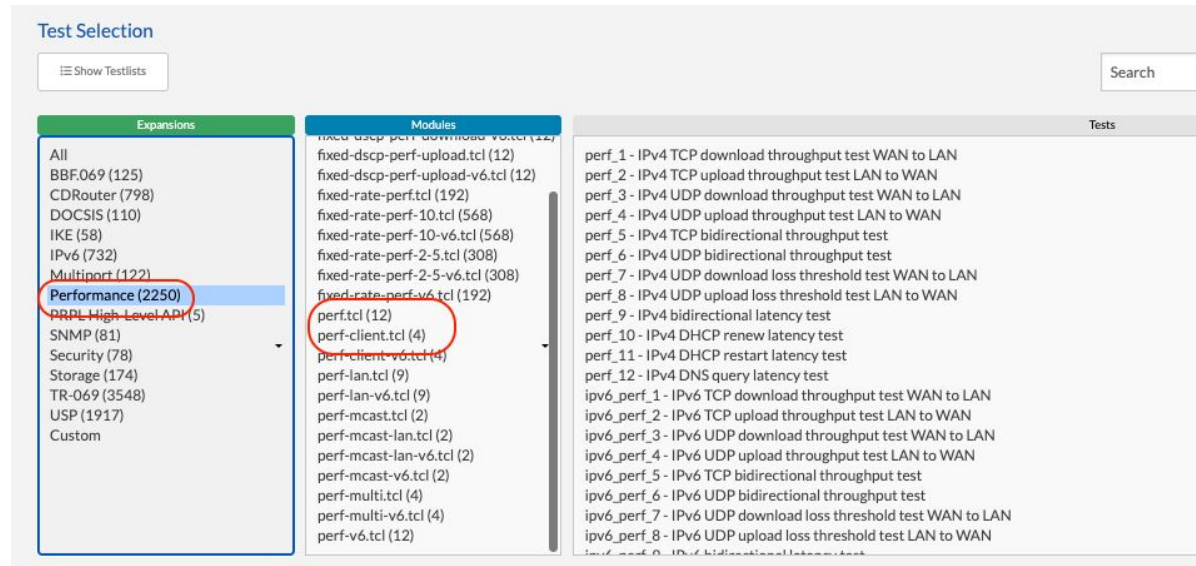
This allows the tests within the package to rotate through all the clients.

*NOTE: You could also define a single client on each interface and use the **cdrouter** scaling tests*

WLAN Client Performance

Create multiple scenarios to measure upload and download 'goodput' (LAN <-> WAN)

- single client scenarios
- multiple client scenarios (uniform traffic generation, aggregate measurement)
- perf_client test cases (variable traffic generation, multiple measurement criteria)



The screenshot shows the 'Test Selection' interface with three columns: Expansions, Modules, and Tests. In the Expansions column, 'Performance (2250)' is highlighted with a red circle. In the Modules column, 'perf_client.tcl (4)' is highlighted with a red circle. The Tests column lists various performance tests such as 'perf_1 - IPv4 TCP download throughput test WAN to LAN' and 'perf_client.tcl (12)'.

```

1763 v
1764
1765 v
1947
1948 v
1971
1972 v
1996
1997 v
1998
1999 v
2007
2008 v
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025 v
2036
2037 v
2048

testvar_group lan2 {
    SECTION "IPv4 LAN" {↔}
    SECTION "IPv6 LAN" {↔}
    SECTION "Parental Controls" {↔}
    SECTION "CDRouter Performance Expansion" {
        SECTION "Basic Configuration" {↔}
        SECTION "Performance Settings" {
            # testvar perfDuration 10
            # testvar perfDownloadBandwidth 0.0
            # testvar perfInterval auto
            # testvar perfIncrement 5
            # testvar perfStreams 1
            # testvar perfStreamIncr 0
            # testvar perfUpdLen auto
            # testvar perfUploadBandwidth 0.0
            # testvar perfLantoLanBandwidth 0.0
            # testvar perfOmit 0
            # testvar perfDSCP 0
            # testvar perfFairness no
        }
        SECTION "WAN Download Thresholds" {↔}
        SECTION "WAN Upload Thresholds" {↔}
    }
}

```

perf-client Example

```
62 15:43:17.049 INFO(lan): Connect to performance server at 202.254.1.4:19750 using the following:
63     direction: download ( source 202.254.1.4:19750 -> destination 192.168.0.151 )
64     bandwidth: 500.0M (0=unlimited)
65     duration: 30
```

```
117 15:43:20.102 INFO(lan2.1): Connect to performance server at 202.254.1.4:19751 using the following:
118     direction: download ( source 202.254.1.4:19751 -> destination 192.168.0.123 )
119     bandwidth: 100.0M (0=unlimited)
120     duration: 20
121     report interval: auto
```

```
171 15:43:26.183 INFO(lan2.3): Connect to performance server at 202.254.1.4:19753 using the following:
172     direction: download ( source 202.254.1.4:19753 -> destination 192.168.0.199 )
173     bandwidth: 100.0M (0=unlimited)
174     duration: 20
175     report interval: auto
```

```
20 15:43:32.262 INFO(lan3.1): Connect to performance server at 202.254.1.4:19755 using the following:
21     direction: download ( source 202.254.1.4:19755 -> destination 192.168.0.6 )
22     bandwidth: 20.0M (0=unlimited)
23     duration: 10
24     report interval: auto
25     protocol: TCP
26     DSCP: 0 (0x00)
27     clients: 1
28     streams: 1
29     length: auto
```

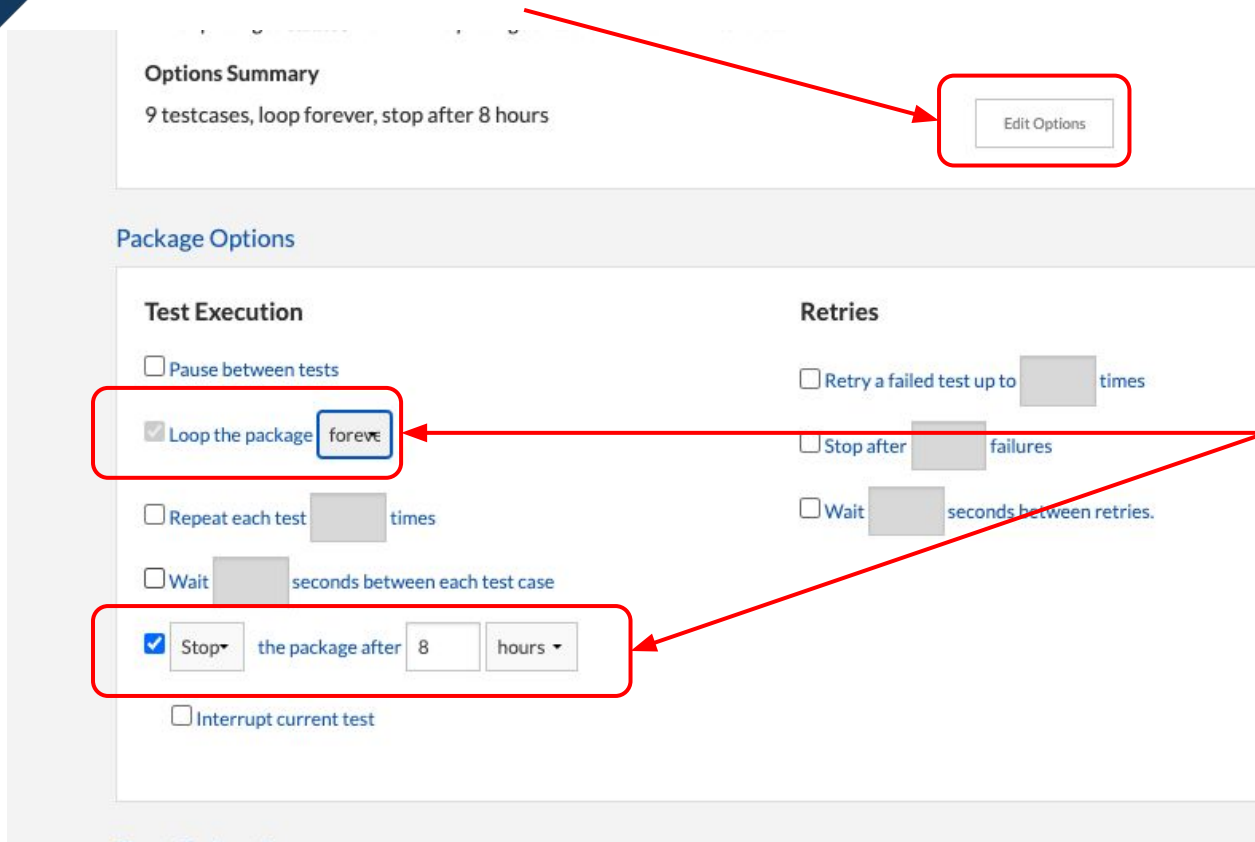
1723 15:44:07.163 SECTION(cdrouter-5550): Perf Results Summary

	performance	performance	performance	performance	performance	performance	performance
	lan	lan2.1	lan2.2	lan2.3	lan2.4	lan3.1	lan3.2
1724 15:44:07.163 INFO(cdrouter-5550): trafficType	performance	performance	performance	performance	performance	performance	performance
1725 15:44:07.163 INFO(cdrouter-5550): stackName	lan	lan2.1	lan2.2	lan2.3	lan2.4	lan3.1	lan3.2
1726 15:44:07.163 INFO(cdrouter-5550): iface	error	error	error	error	error	error	error
1727 15:44:07.163 INFO(cdrouter-5550): transProto	TCP	TCP	TCP	TCP	TCP	TCP	TCP
1728 15:44:07.163 INFO(cdrouter-5550): dscp_name	BestEffort	BestEffort	BestEffort	BestEffort	BestEffort	BestEffort	BestEffort
1729 15:44:07.163 INFO(cdrouter-5550): dscp	0	0	0	0	0	0	0
1730 15:44:07.163 INFO(cdrouter-5550): thresholdPctPrint	100%	100%	100%	100%	100%	100%	100%
1731 15:44:07.163 INFO(cdrouter-5550): duration	30	20	20	20	20	10	10
1732 15:44:07.163 INFO(cdrouter-5550): bandwidth	500.0M	100.0M	100.0M	100.0M	100.0M	20.0M	20.0M
1733 15:44:07.163 INFO(cdrouter-5550): streams	1	1	1	1	1	1	1
1734 15:44:07.163 INFO(cdrouter-5550): threshold	auto	auto	auto	auto	auto	auto	auto
1735 15:44:07.163 INFO(cdrouter-5550): calc_threshold	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1736 15:44:07.163 INFO(cdrouter-5550): rateUnits	499 Mbits/sec	100 Mbits/sec	99.6 Mbits/sec	100 Mbits/sec	15.0 Mbits/sec	20.0 Mbits/sec	19.9 Mbits/sec
1737 15:44:07.163 INFO(cdrouter-5550): lossP	0%	0%	0%	0%	0%	0%	0%
1738 15:44:07.163 INFO(cdrouter-5550): retr	0	0	0	0	0	0	0
1739							

WLAN Client Stability

The simplest method is to combine **connectivity**, **functional**, **scaling** and **performance** into a single package.

Edit your test package options



The screenshot shows a web interface for editing test package options. At the top, under 'Options Summary', it says '9 testcases, loop forever, stop after 8 hours'. A red box highlights the 'Edit Options' button. Below, the 'Package Options' section is divided into 'Test Execution' and 'Retries'. In 'Test Execution', the 'Loop the package' checkbox is checked and set to 'forever', and the 'Stop the package after' option is checked and set to '8 hours'. Red arrows point from the 'Edit Options' button to these two settings.

Options Summary
9 testcases, loop forever, stop after 8 hours

Edit Options

Package Options

Test Execution

- Pause between tests
- Loop the package **forever**
- Repeat each test [] times
- Wait [] seconds between each test case
- Stop the package after 8 hours
- Interrupt current test

Retries

- Retry a failed test up to [] times
- Stop after [] failures
- Wait [] seconds between retries.

Loop (repeat) your package many times or...

select **forever** and set a timer for **8 hours** for an overnight test run

WLAN Client Stability



20240325142054

Filter Tests

Status
All Tests

Search
Enter test name

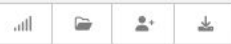
Loop
7



Test Navigation

Jump to
Enter test name

← Prev Failure Next Failure →



✓ Test Results

Security Alerts

RUNNING 7

Follow current test [perf_1]

75

PASS

0

FAIL

17:05

TIME

■ Stop

|| Pause

Package

11 testcases, loop forever, stop after 8 hours

Configuration File

[Redacted]

Interfaces

eth11-10G mgmt1 wif7-be

Started

2024-03-25 at 2:20 PM

Device

Edit device

N/A

Tags

Edit tags

N/A

Notes

Edit notes

N/A

✓	🛡️	TIME	🚩	TEST NAME	DESCRIPTION	■ Skip reasons	LOG	SEQ ^
✓		00:01	○	wifi_3	Restart wireless LAN client without releasing or obtaining a new address		log	7 68
✓		00:19	○	perf_client_1	IPv4 TCP download throughput test WAN to LAN		log	7 69
✓		00:29	○	wifi_30	WiFi association stress test		log	7 70
✓		00:19	○	perf_client_2	IPv4 TCP upload throughput test LAN to WAN		log	7 71
✓		00:01	○	cdrouter_http_200	Verify HTTP/1.1 GET connections		log	7 72
✓		00:20	○	perf_client_3	IPv4 UDP download throughput test WAN to LAN		log	7 73
✓		00:00	○	cdrouter_connectivity_4	Execute simple connectivity check only		log	7 74
✓		00:21	○	perf_client_4	IPv4 UDP upload throughput test LAN to WAN		log	7 75
✓		00:00	○	cdrouter_dhcp_server_1	Verify DHCP server returns same IP address when client renews		log	7 76
🔄		00:17	○	perf_1	IPv4 TCP download throughput test WAN to LAN		log	7 77
		00:00	○	perf_2	IPv4 TCP upload throughput test LAN to WAN			7 78

- [Beyond the PHY - testing fully featured Wi-Fi products](#)
- [How to use virtual LAN clients to test broadband and Wi-Fi CPE](#)
- [How to build an automated test strategy](#)
- Stability testing series with Matt Langlois
- Upgrade to NTA3000: sales@qacafe.com

