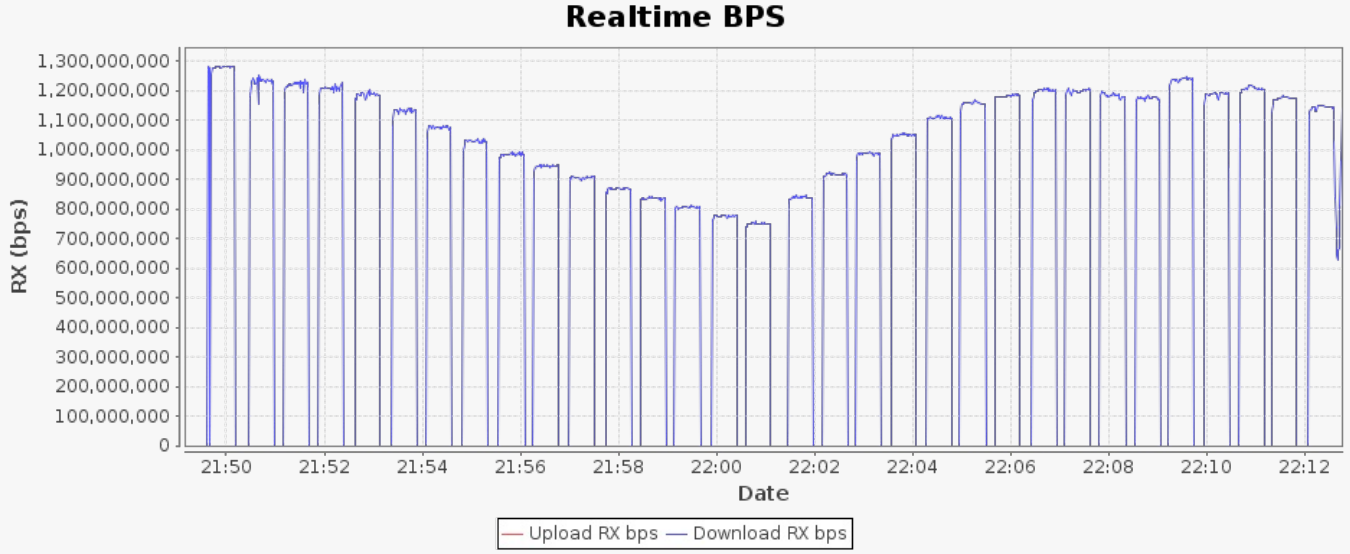
WiFi Capacity Test

Fri Jun 14 22:12:57 PDT 2019

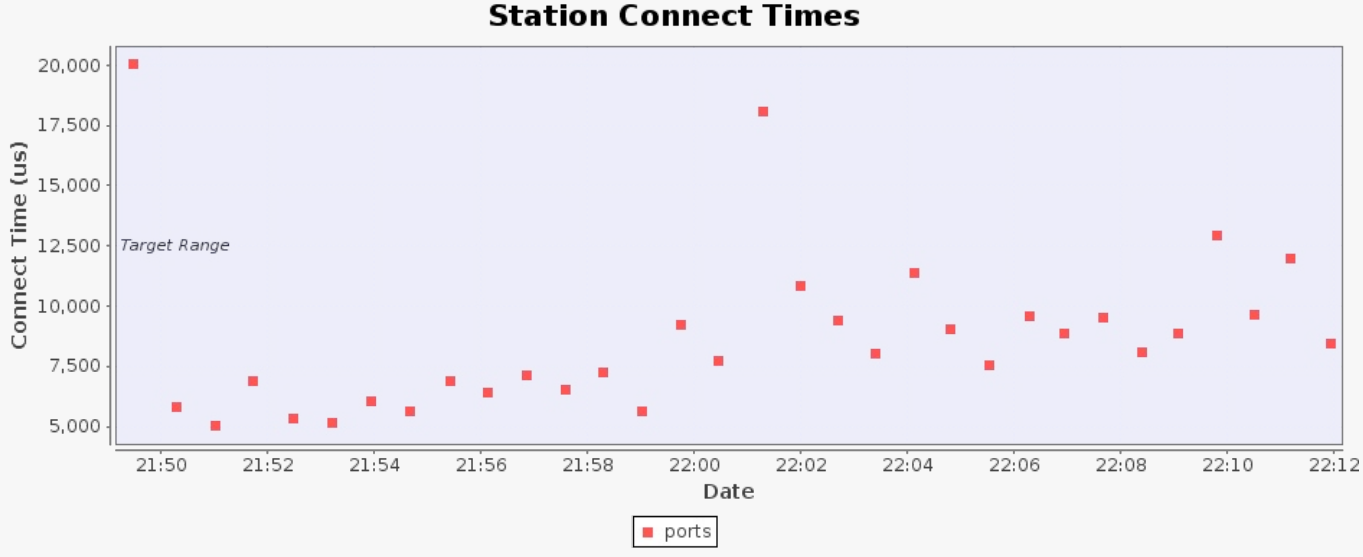
Objective

The Candela WiFi Capacity test is designed to measure performance of an Access Point when handling different amounts of WiFi Stations. The test allows the user to increase the number of stations in user defined steps for each test iteration and measure the per station and the overall throughput for each trial. Along with throughput other measurements made are client connection times, Fairness, % packet loss, DHCP times and more. The expected behavior is for the AP to be able to handle several stations(within the limitations of the AP specs) and make sure all stations get a fair amount of airtime both in the upstream and downstream. An AP that scales well will not show a significant over-all throughput decrease as more stations are added.

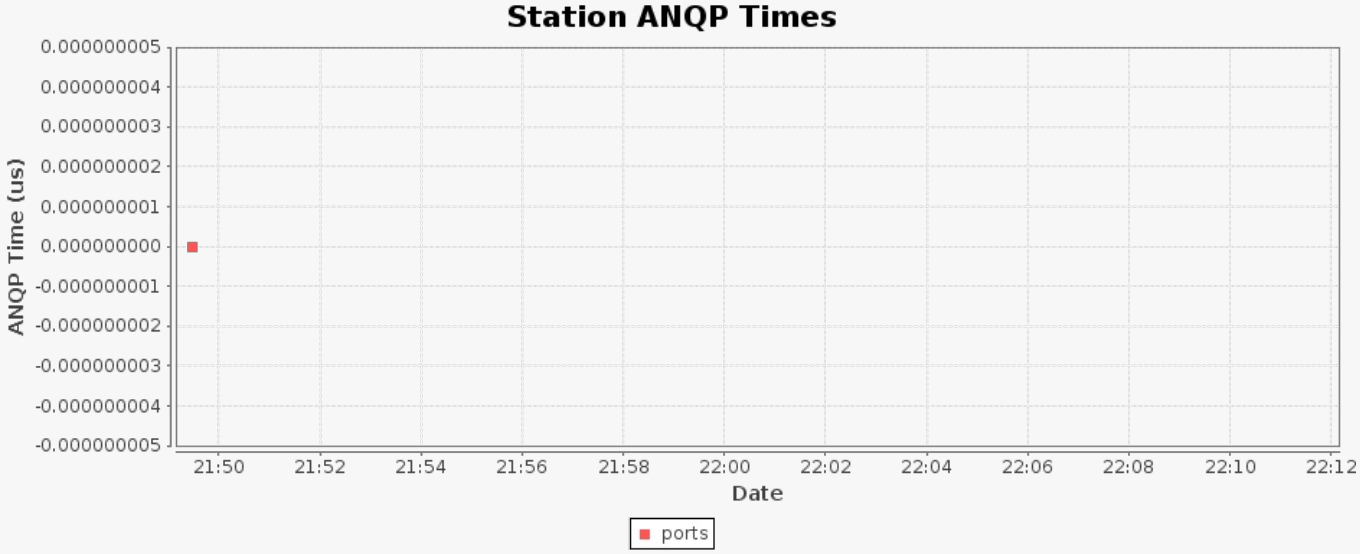
Realtime Graph shows summary download and upload RX bps of connections created by this test.



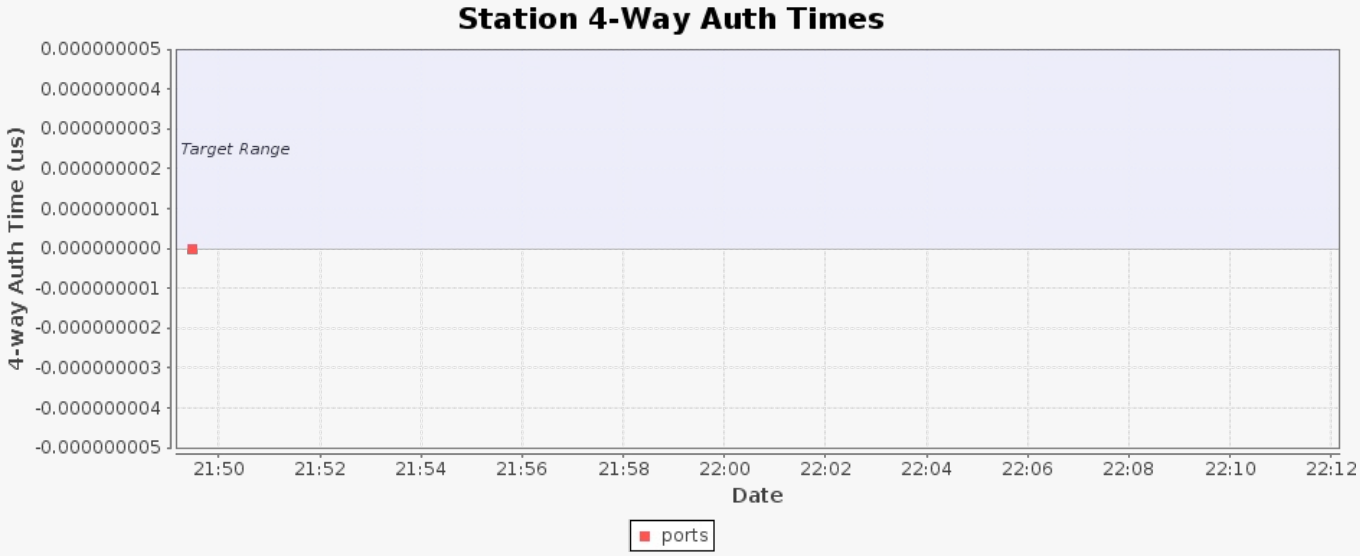
Station connect time is calculated from the initial Authenticate message through the completion of Open or RSN association/authentication.



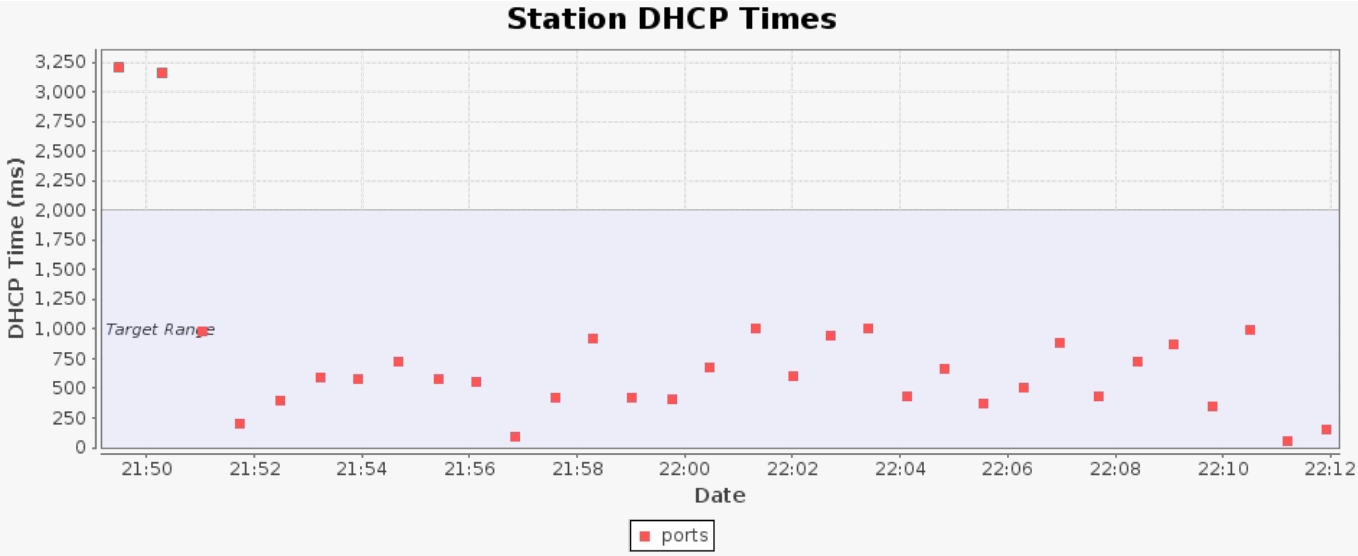
This measures the time it takes to complete the ANQP communication. This is used in Hot-Spot 2.0 (HS20) negotiation and discovery.



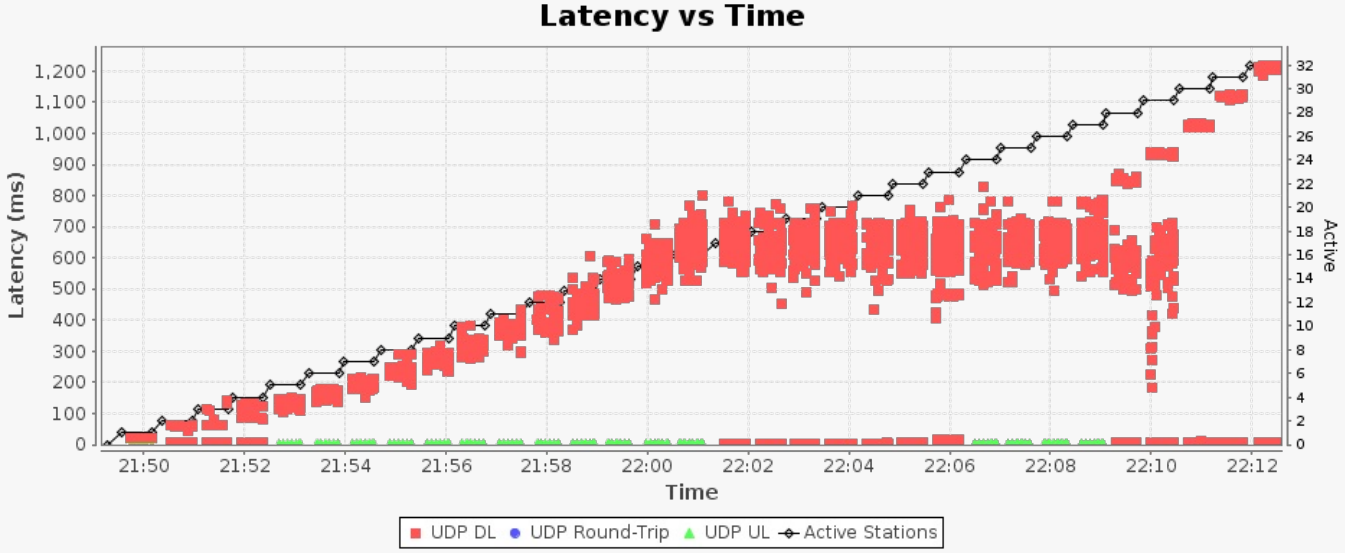
This measures the time it takes to complete the 4-way Authentication used by WPA encryption. If this increases as more stations are added, it may indicate scalability problems.



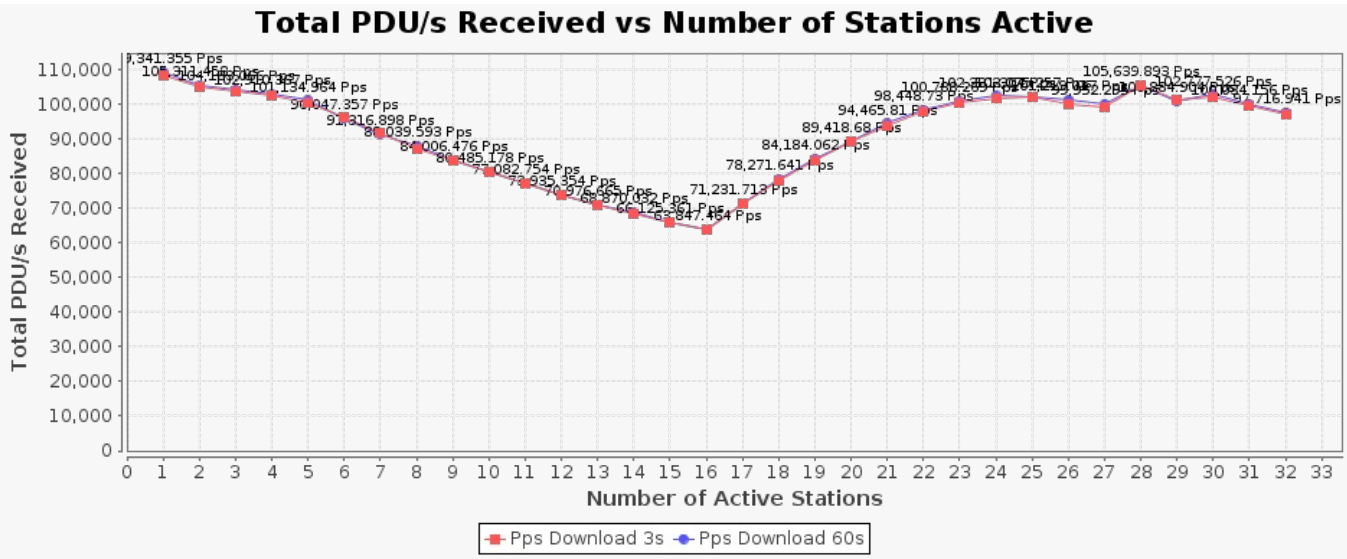
This measures the time it takes to acquire a DHCP lease. The DHCP protocol broadcasts at least one discovery message and then waits a second or two before trying to aquire a lease. So, longer times here are usually not a problem. If the time goes up as more stations associate then it may indicate scalability issues, and it may also mean that the DHCP server has run out of leases.



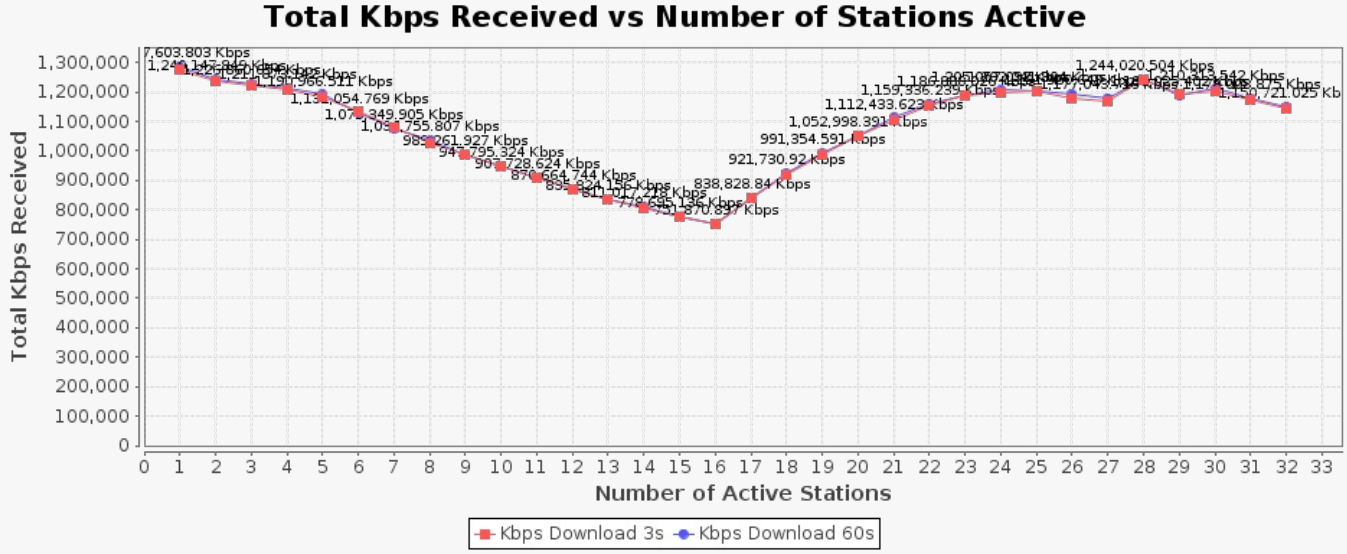
This measures the one-way latency reported by LANforge. Much of the latency will be in the LANforge itself when transmitting at maximum speeds because LANforge will have fairly large send buffers. You can force the send buffers smaller to decrease this. But, the device-under-test can also influence over-all latency. We often see multiple seconds of latency in our testing, but in a perfect world you would want the latency to not increase much as more stations are added.



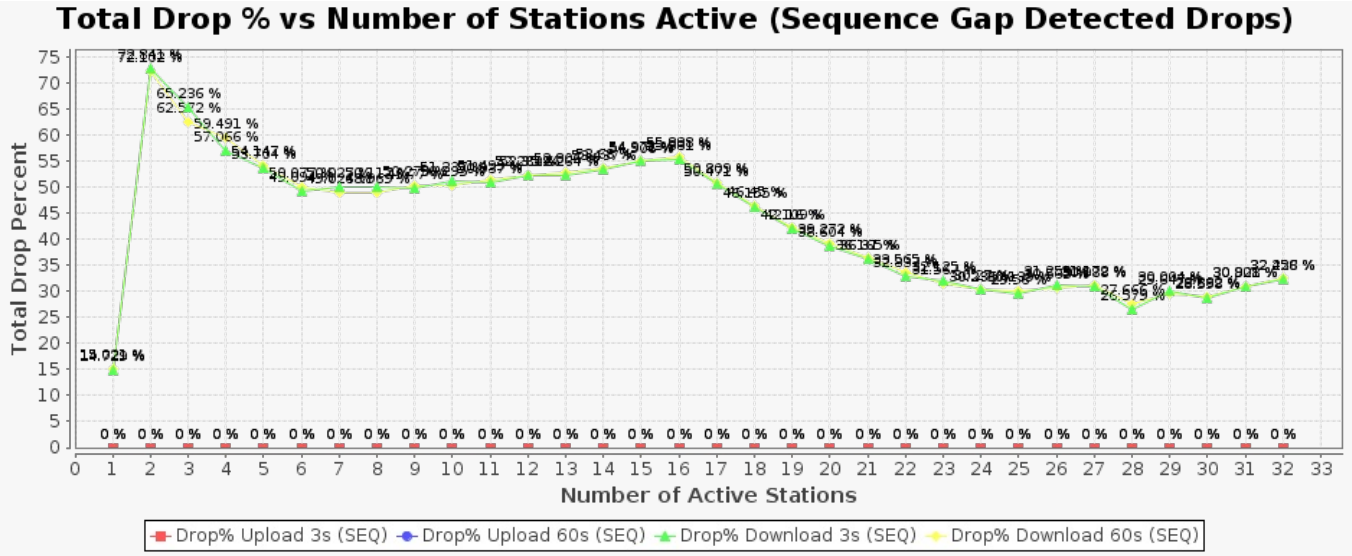
Protocol-Data-Units received. For TCP, this does not mean much, but for UDP connections, this correlates to packet size. If the PDU size is larger than what fits into a single frame, then the network stack will segment it accordingly. A well behaving system will show about the same rate as stations increase. If the rate decreases significantly as stations increase, then it is not scaling well.



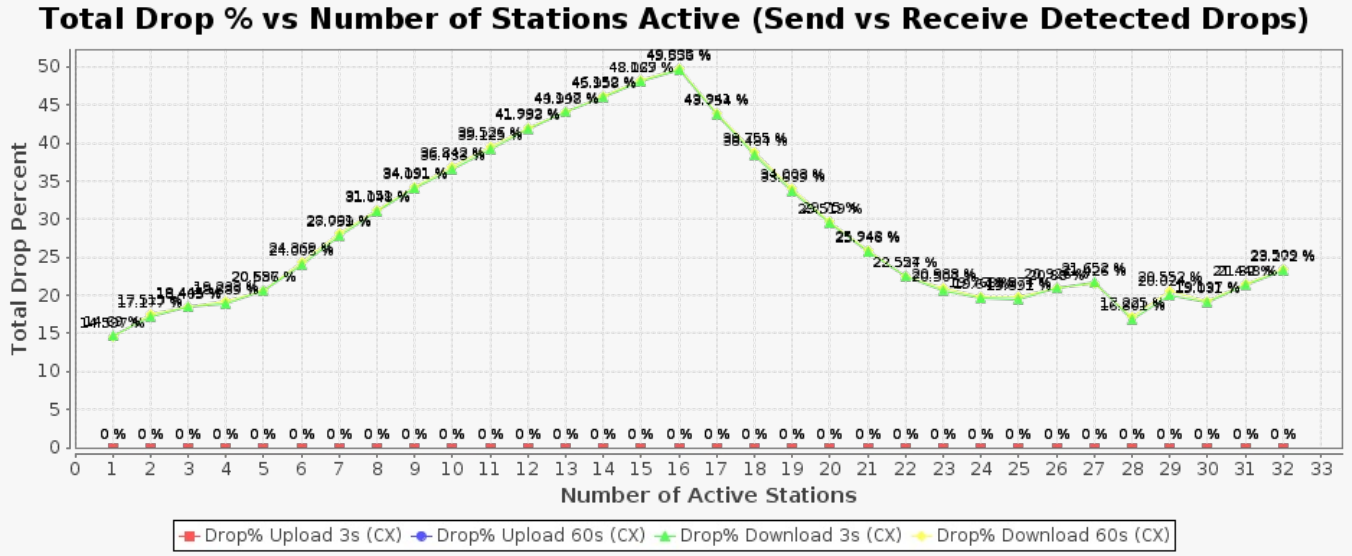
Total bits-per-second transferred. This only counts the protocol payload, so it will not count the Ethernet, IP, UDP, TCP or other header overhead. A well behaving system will show about the same rate as stations increase. If the rate decreases significantly as stations increase, then it is not scaling well.
If selected, the Golden AP comparison graphs will be added. These tests were done in an isolation chamber, Open encryption, conductive connection, with LANforge CT525 wave-1 3x3 NIC as the stations.



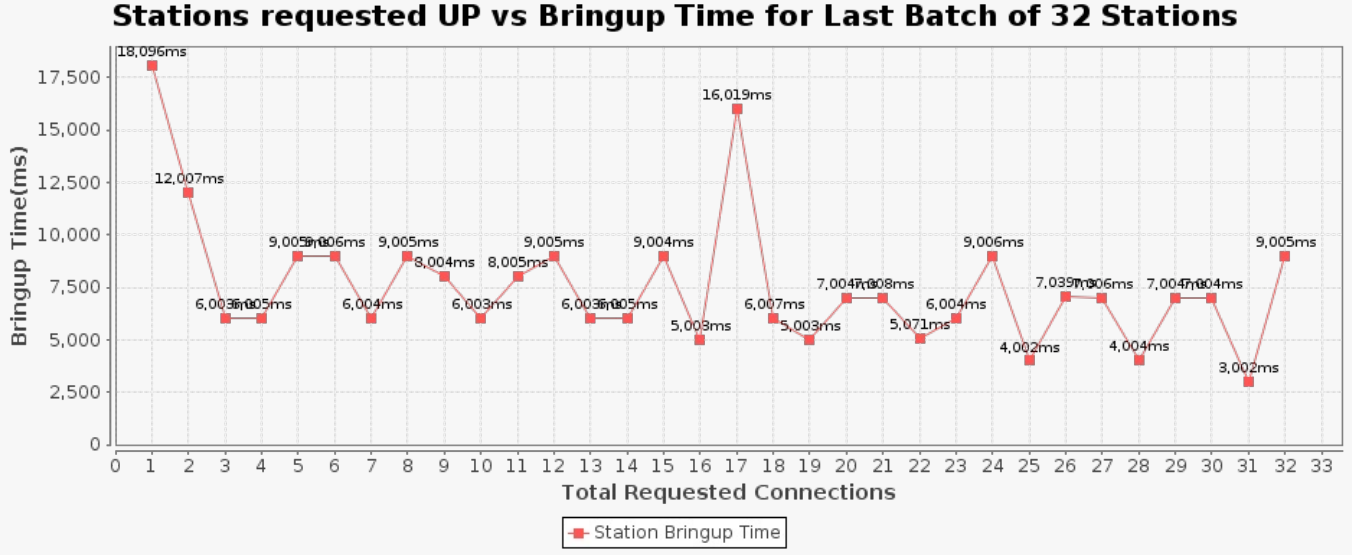
This packet loss is calculated based on the sequence-gap detected drops. If the device-under-test is reordering packets, then this value may be incorrect. Check the Layer-3 Endpoint out-of-order column if this graph is significantly different from the cx-detected-drop graph above.



This packet loss is calculated based on the number of PDUs sent by one side versus the number received on the other. Please note that TCP does not actually drop packets, but it will instead just run slower and retransmit frames. UDP will give more accurate packet-loss statistics.



This charts the total time it takes the stations to associate and acquire a DHCP lease (if DHCP is being used). If the system is scaling well, this time should not increase much as more stations are brought up.



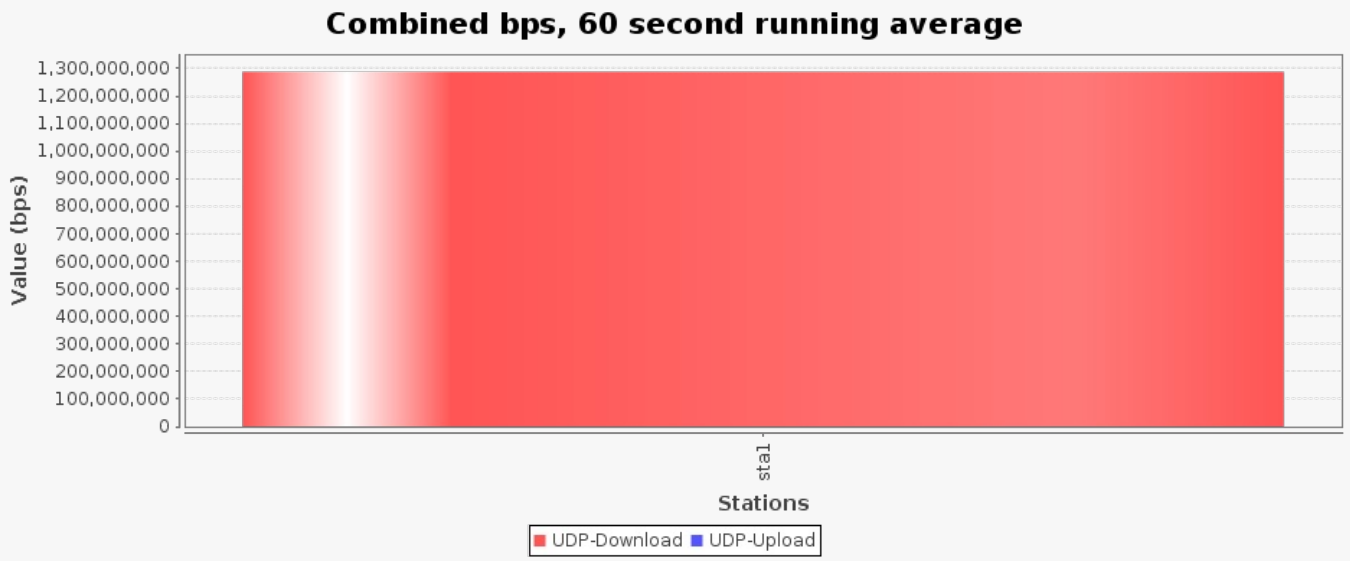
Wifi-Capacity Test requested values	
Station Increment:	1
Loop Iterations:	Single (1)
Duration:	30 sec (30 s)
Protocol:	UDP-IPv4
Layer-4 Endpoint:	NONE
Payload Size:	AUTO
MSS	AUTO
Total Download Rate:	1.5G
Total Upload Rate:	Zero (0 bps)
Percentage TCP Rate:	10% (10%)
Randomize Rates	true
Leave Ports Up	false
Socket buffer size:	OS Default
Settle Time:	5 sec (5 s)
Rpt Timer:	fast (1 s)
IP ToS:	Best Effort (0)
Multi-Conn:	AUTO
Show-Per-Iteration-Charts	true
Show-Per-Loop-Totals	true
Hunt-Lower-Rates	false
Show Events	true
CSV Reporting Dir	- not selected -
Build Date	Thu Jun 13 15:04:03 PDT 2019
Build Version	5.3.9
Ports	1.1.bond0 1.1.sta1 1.1.sta2 1.1.sta3 1.1.sta4 1.1.sta5 1.1.sta6 1.1.sta7 1.1.sta8 1.1.sta9 1.1.sta10 1.1.sta11 1.1.sta12 1.1.sta13 1.1.sta14 1.1.sta15 1.1.sta16 1.1.sta17 1.1.sta18 1.1.sta19 1.1.sta20 1.1.sta21 1.1.sta22 1.1.sta23 1.1.sta24 1.1.sta25 1.1.sta26 1.1.sta27 1.1.sta28 1.1.sta29 1.1.sta30 1.1.sta31 1.1.sta32
Firmware	2 10.4b-ct-9984-xtH-012-e80202737
Machines	ct525-is16100005

Requested Parameters:
Download Rate: Per station: 1500000000 (1.5 Gbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 1 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:

Download Rate: Cx Min: 1.288 Gbps Cx Ave: 1.288 Gbps Cx Max: 1.288 Gbps All Cx: 1.288 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.288 Gbps
Aggregated Rate: Min: 1.288 Gbps Avg: 1.288 Gbps Max: 1.288 Gbps

This graph shows fairness. On a fair system, each station should get about the same throughput. In the download direction, it is mostly the device-under-test that is responsible for this behavior, but in the upload direction, LANforge itself would be the source of most fairness issues unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 1500000000 (1.5 Gbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 1 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 4.542 GB Cx Ave: 4.542 GB Cx Max: 4.542 GB All Cx: 4.542 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.542 GB

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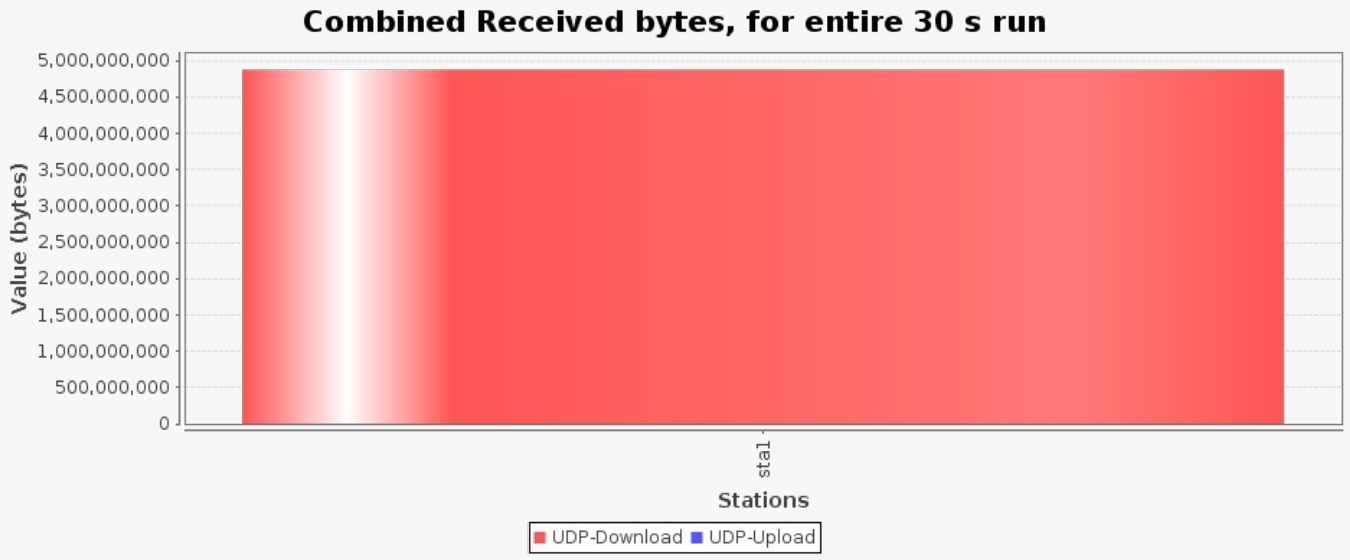

Requested Parameters:
Download Rate: Per station: 750000000 (750 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 2 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 594.739 Mbps Cx Ave: 620.074 Mbps Cx Max: 645.409 Mbps All Cx: 1.24 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.24 Gbps
Aggregated Rate: Min: 594.739 Mbps Avg: 620.074 Mbps Max: 645.409 Mbps

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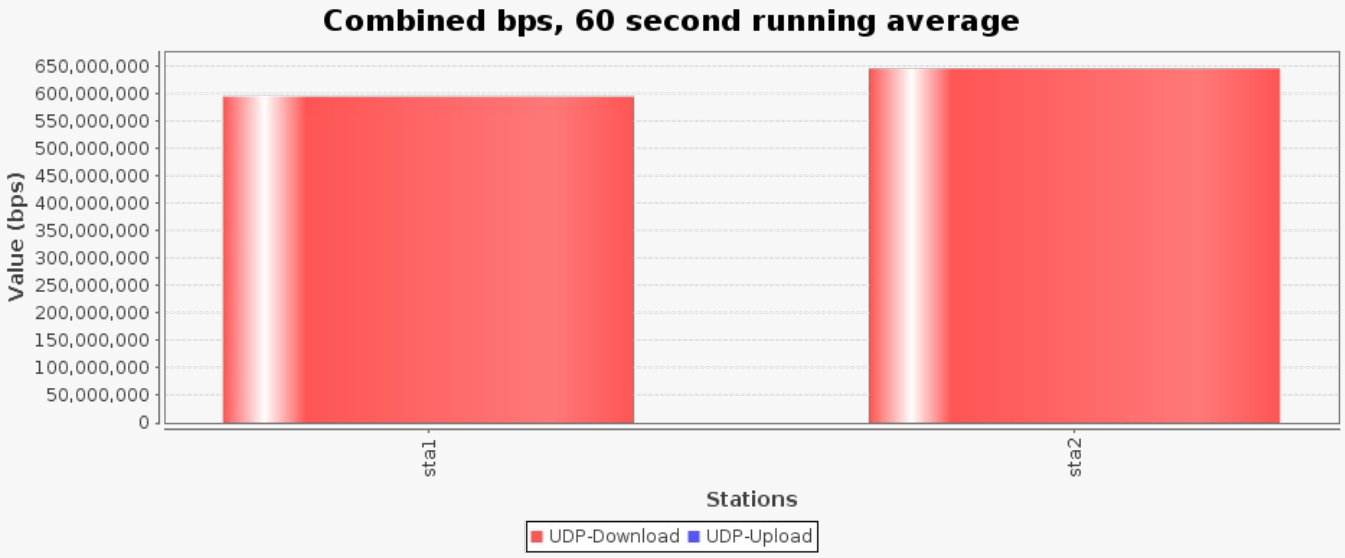

Requested Parameters:
Download Rate: Per station: 750000000 (750 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 2 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 2.099 GB Cx Ave: 2.189 GB Cx Max: 2.279 GB All Cx: 4.379 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.379 GB

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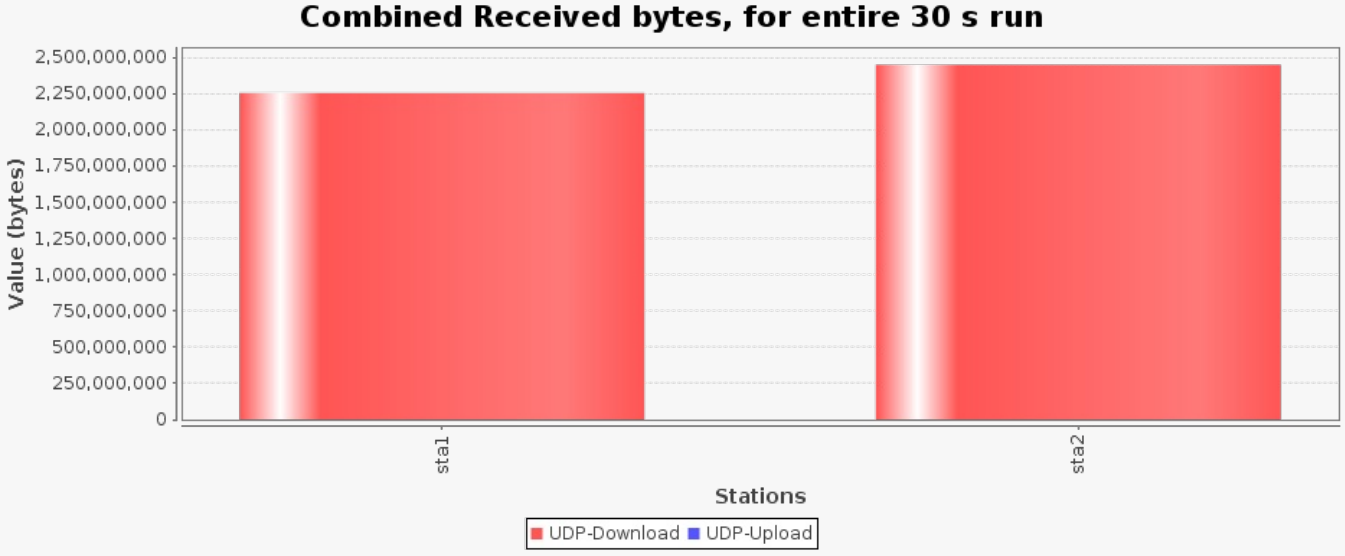

Requested Parameters:
Download Rate: Per station: 500000000 (500 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)

Total: 1500000000 (1.5 Gbps)
Station count: 3 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 351.558 Mbps Cx Ave: 408.954 Mbps Cx Max: 500.934 Mbps All Cx: 1.227 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.227 Gbps
Aggregated Rate: Min: 351.558 Mbps Avg: 408.954 Mbps Max: 500.934 Mbps

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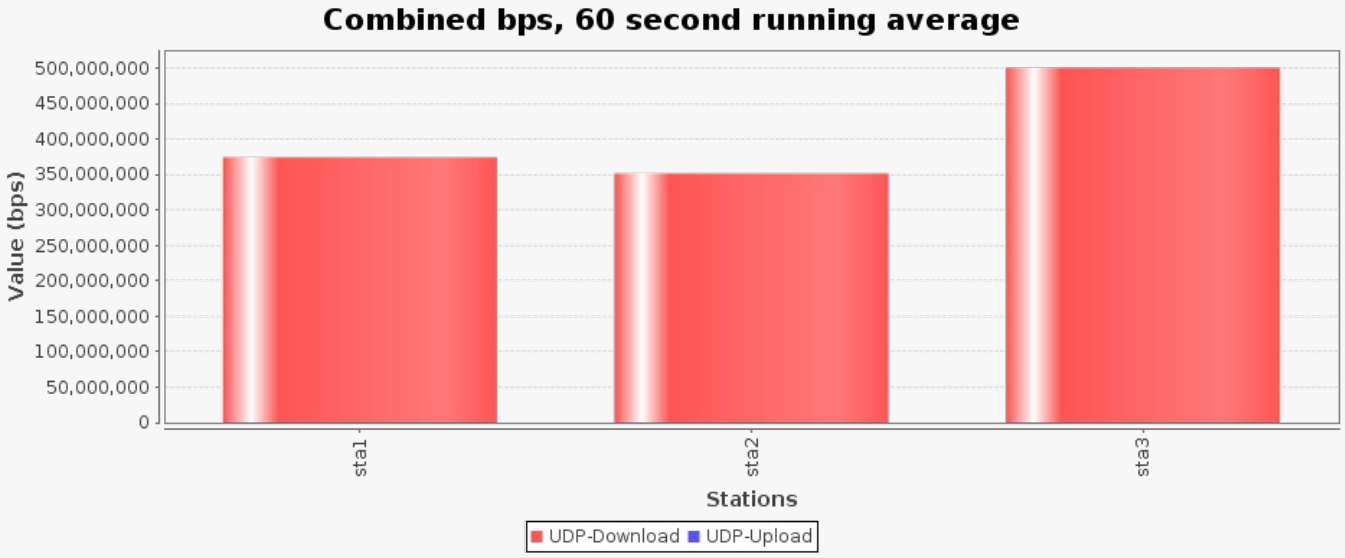

Requested Parameters:
Download Rate: Per station: 500000000 (500 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 3 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 1.241 GB Cx Ave: 1.445 GB Cx Max: 1.771 GB All Cx: 4.335 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.335 GB

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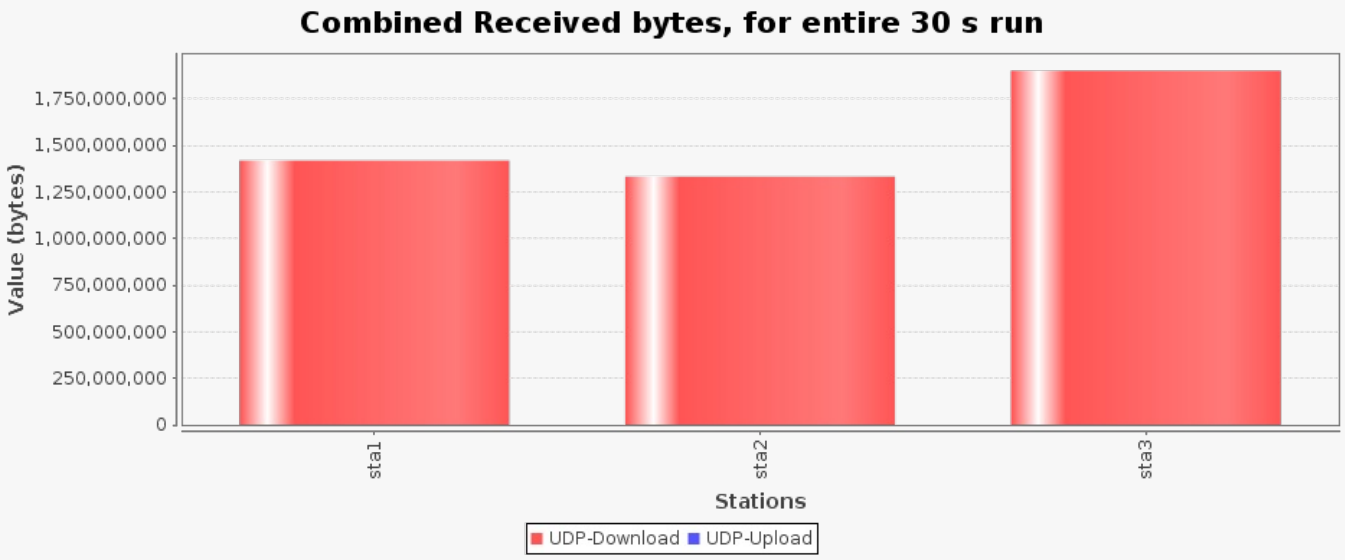

Requested Parameters:

Download Rate: Per station: 375000000 (375 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 4 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 250.257 Mbps Cx Ave: 302.968 Mbps Cx Max: 375.291 Mbps All Cx: 1.212 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.212 Gbps
Aggregated Rate: Min: 250.257 Mbps Avg: 302.968 Mbps Max: 375.291 Mbps

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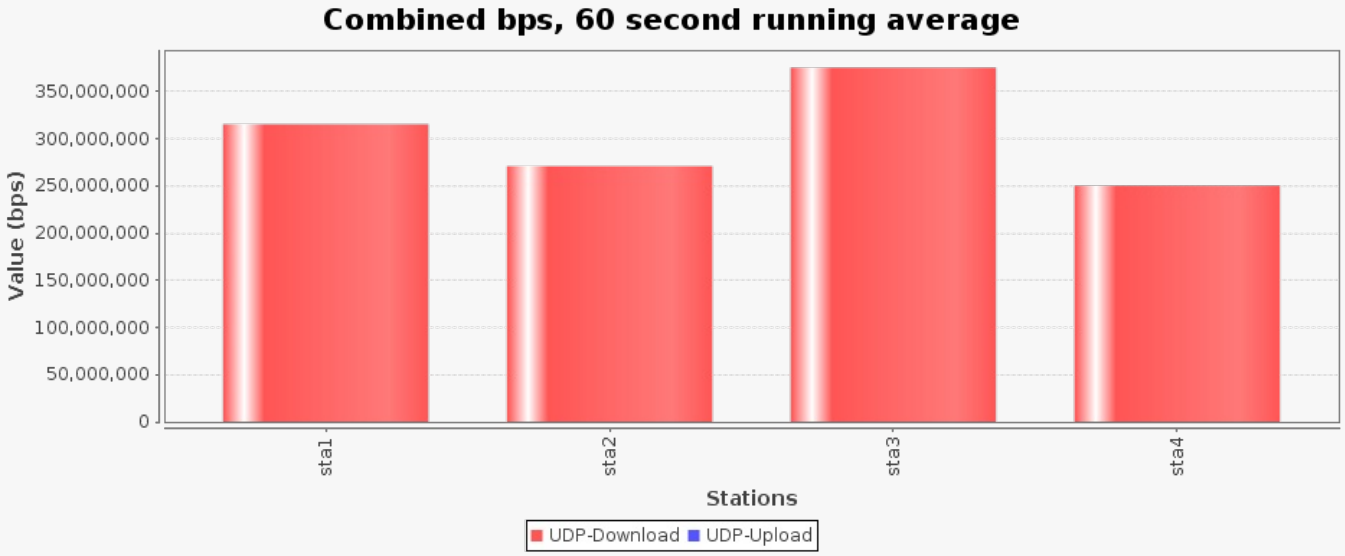

Requested Parameters:
Download Rate: Per station: 375000000 (375 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 4 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 906.693 MB Cx Ave: 1.071 GB Cx Max: 1.328 GB All Cx: 4.285 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.285 GB

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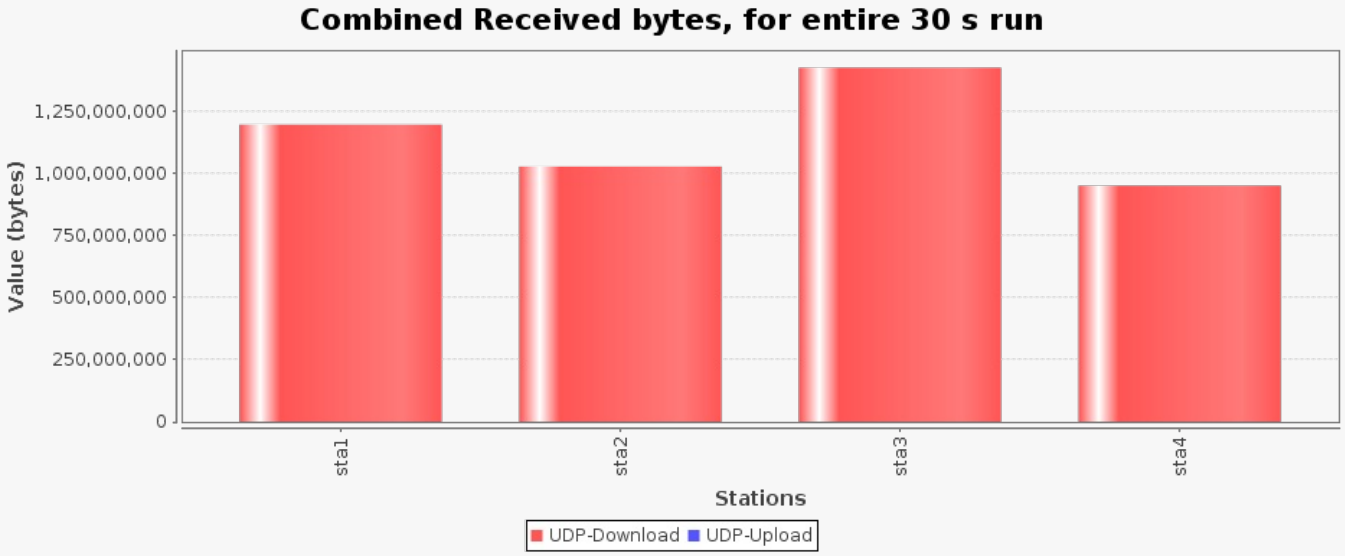

Requested Parameters:
Download Rate: Per station: 300000000 (300 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 5 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 233.642 Mbps Cx Ave: 238.193 Mbps Cx Max: 243.007 Mbps All Cx: 1.191 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.191 Gbps
Aggregated Rate: Min: 233.642 Mbps Avg: 238.193 Mbps Max: 243.007 Mbps

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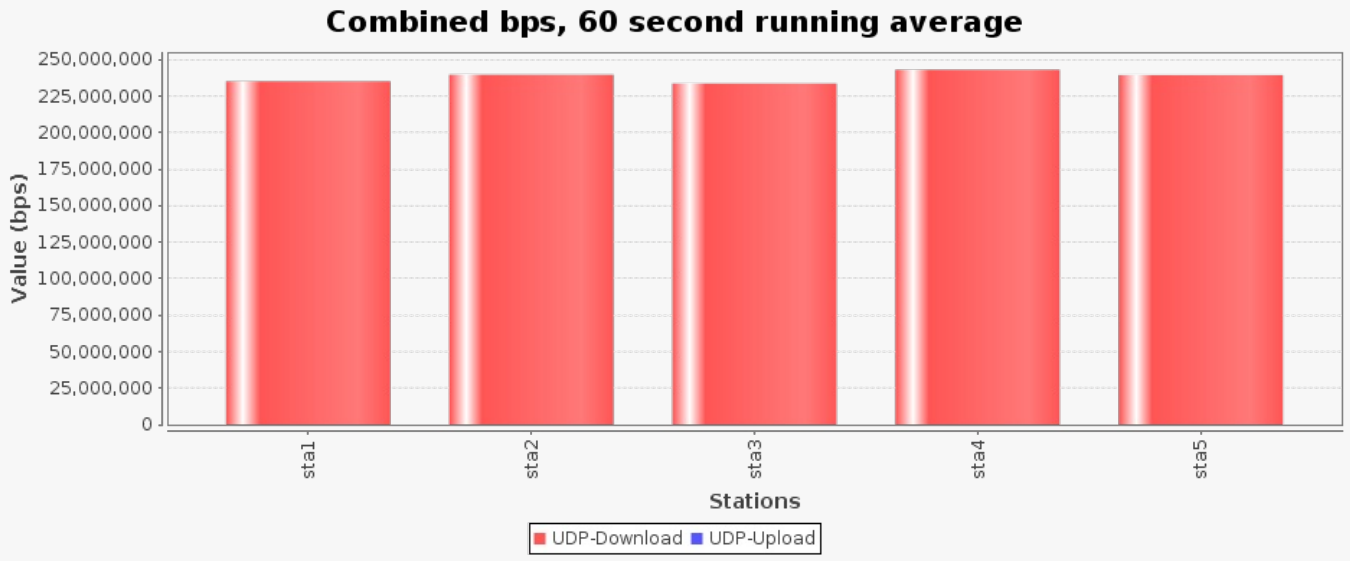

Requested Parameters:
Download Rate: Per station: 300000000 (300 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 5 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 846.95 MB Cx Ave: 862.881 MB Cx Max: 880.914 MB All Cx: 4.213 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.213 GB

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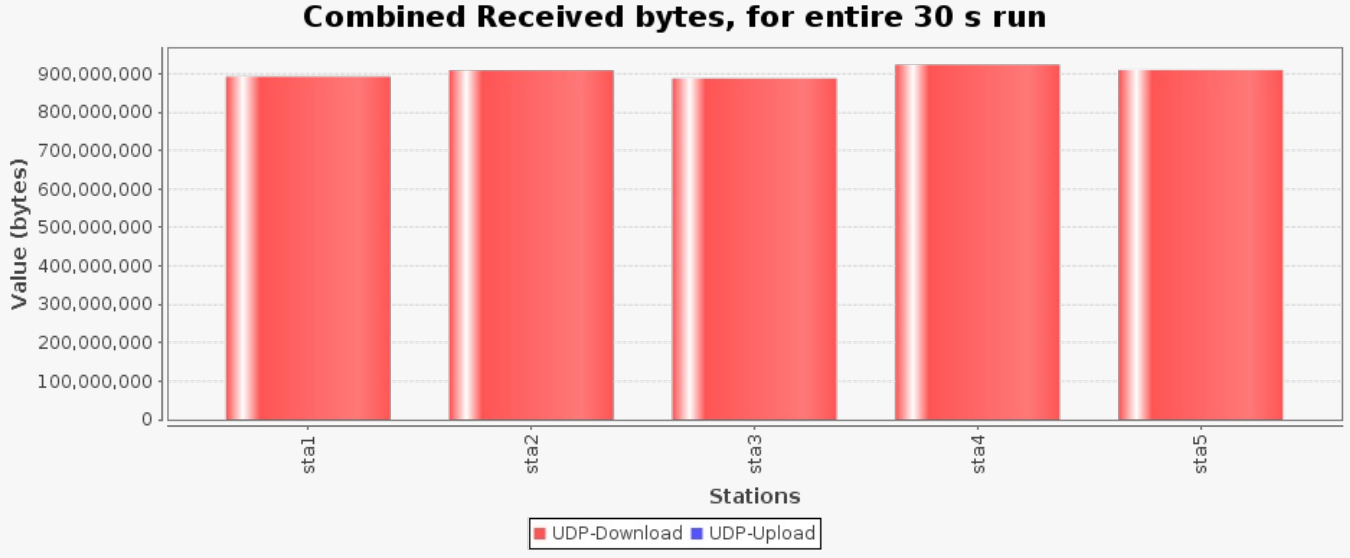

Requested Parameters:
Download Rate: Per station: 250000000 (250 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 6 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 184.321 Mbps Cx Ave: 188.509 Mbps Cx Max: 191.308 Mbps All Cx: 1.131 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.131 Gbps
Aggregated Rate: Min: 184.321 Mbps Avg: 188.509 Mbps Max: 191.308 Mbps

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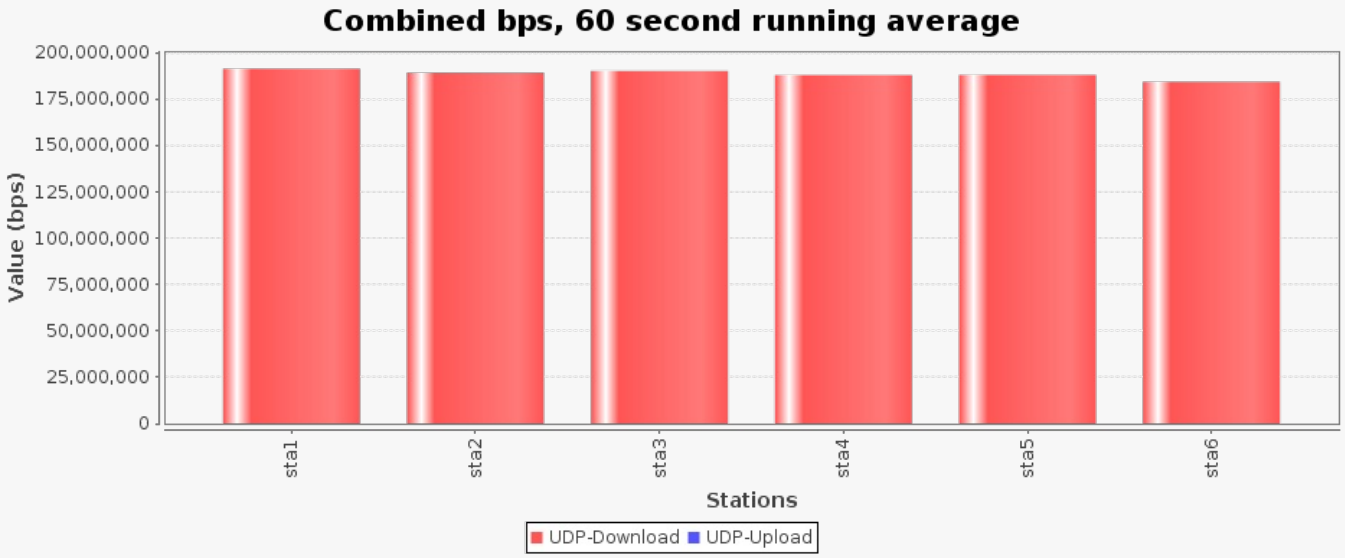

Requested Parameters:
Download Rate: Per station: 250000000 (250 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 6 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 671.196 MB Cx Ave: 685.508 MB Cx Max: 694.759 MB All Cx: 4.017 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.017 GB

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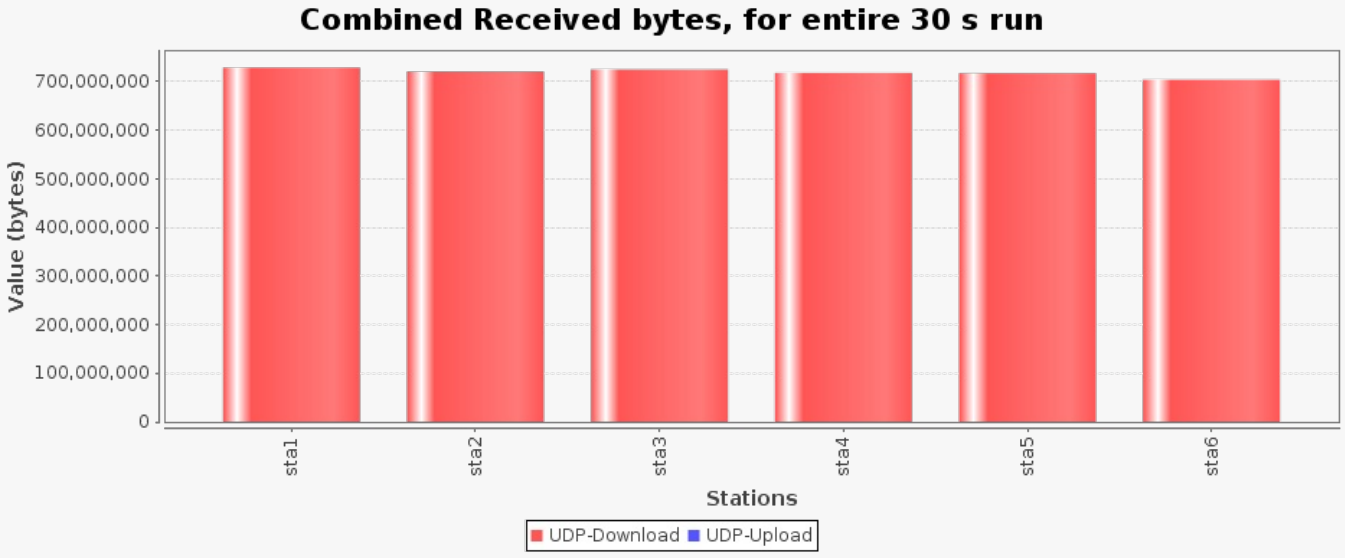

Requested Parameters:
Download Rate: Per station: 214285714 (214.286 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 7 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 150.121 Mbps Cx Ave: 153.621 Mbps Cx Max: 158.83 Mbps All Cx: 1.075 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.075 Gbps
Aggregated Rate: Min: 150.121 Mbps Avg: 153.621 Mbps Max: 158.83 Mbps

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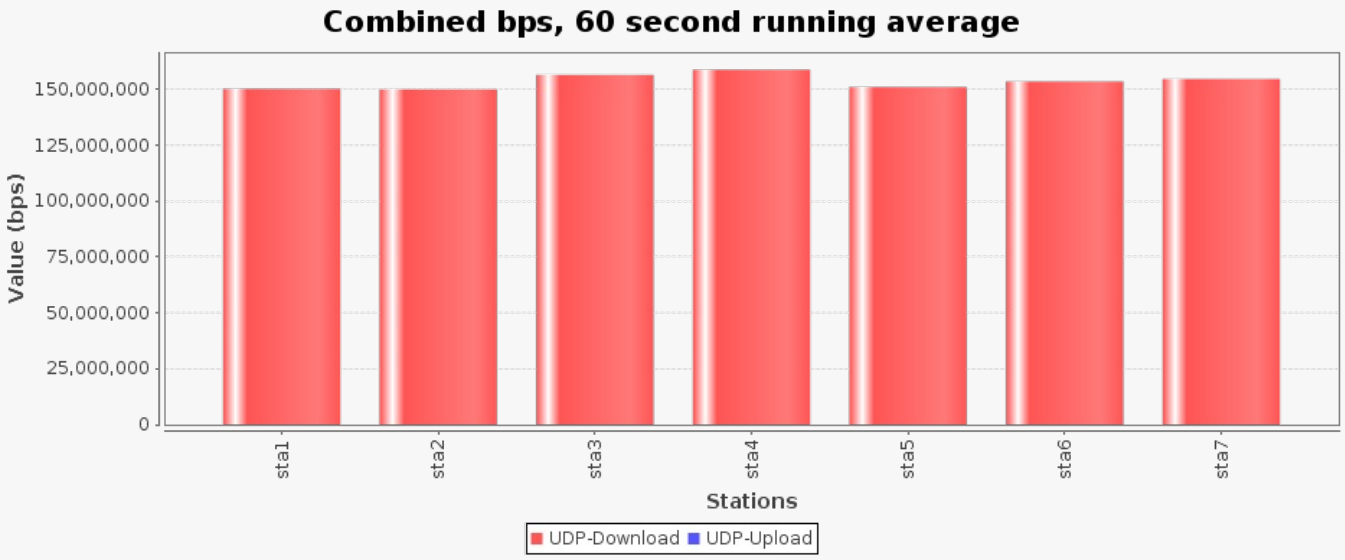

Requested Parameters:
Download Rate: Per station: 214285714 (214.286 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 7 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 545.548 MB Cx Ave: 558.917 MB Cx Max: 577.982 MB All Cx: 3.821 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.821 GB

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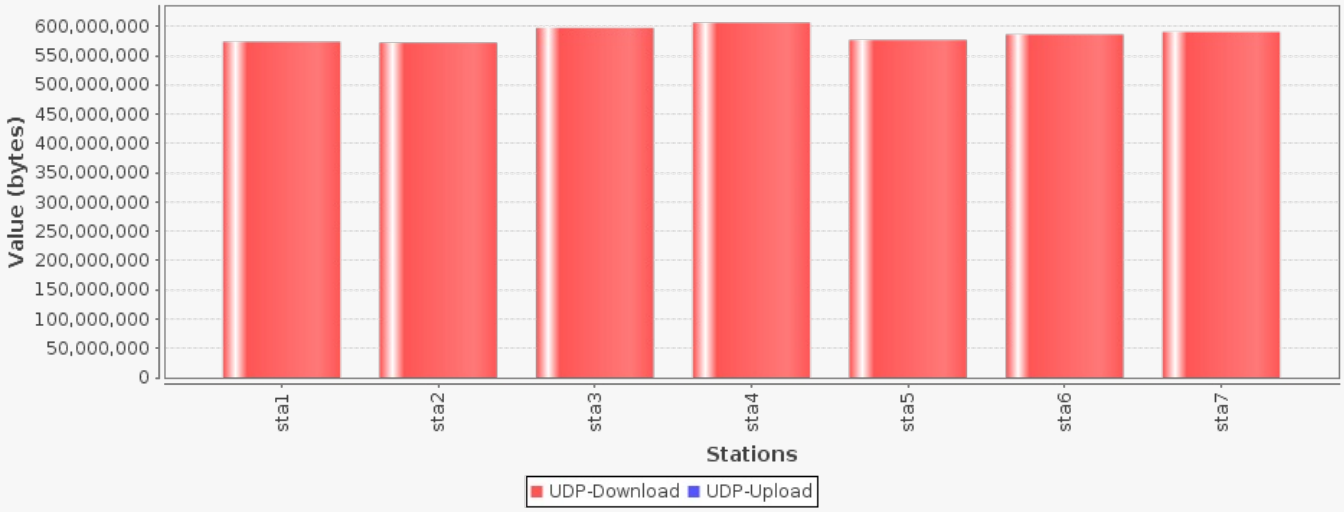
unless the device-under-test takes specific actions to ensure fairness.

Combined Received bytes, for entire 30 s run

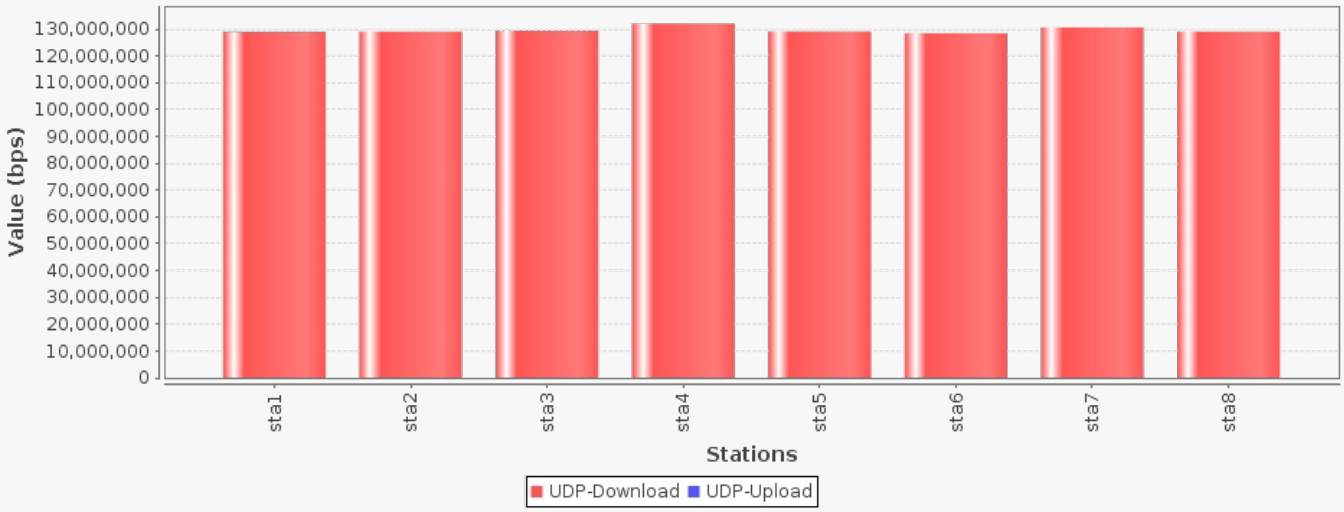


Requested Parameters:
Download Rate: Per station: 187500000 (187.5 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 8 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 128.477 Mbps Cx Ave: 129.594 Mbps Cx Max: 131.997 Mbps All Cx: 1.037 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.037 Gbps
Aggregated Rate: Min: 128.477 Mbps Avg: 129.594 Mbps Max: 131.997 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

Combined bps, 60 second running average

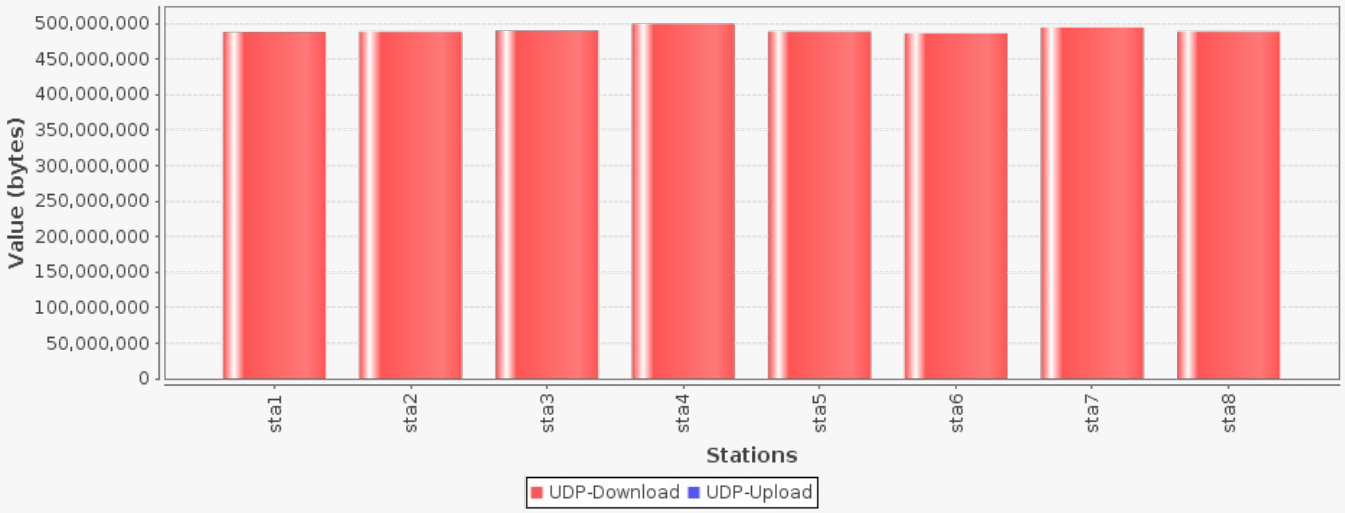


Requested Parameters:
Download Rate: Per station: 187500000 (187.5 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 8 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 463.928 MB Cx Ave: 467.951 MB Cx Max: 476.614 MB All Cx: 3.656 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.656 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

Combined Received bytes, for entire 30 s run

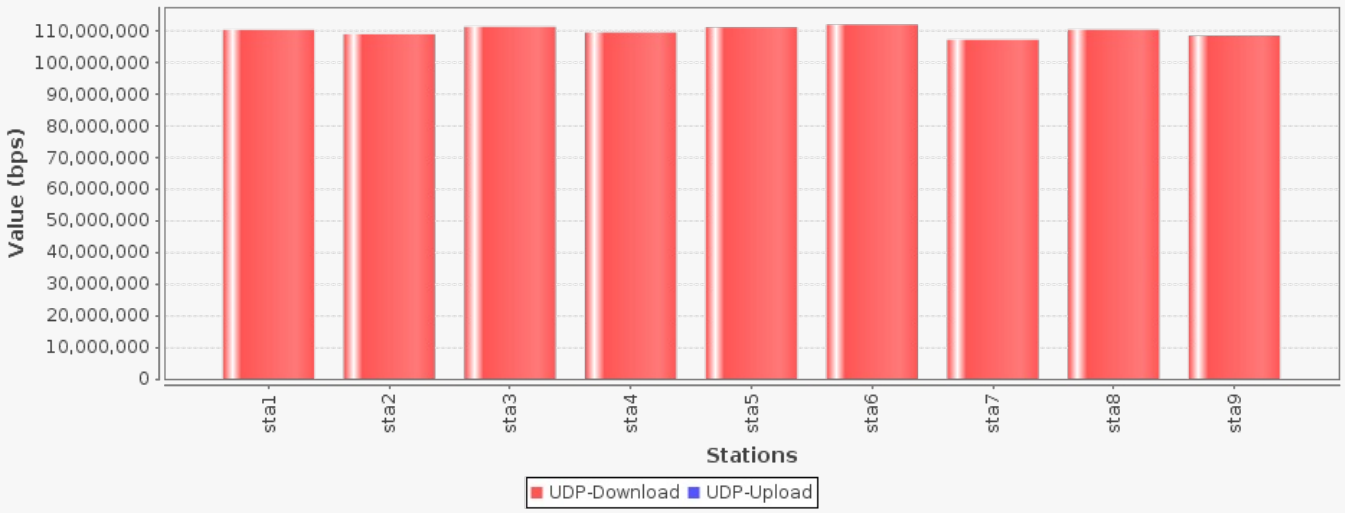


Requested Parameters:
Download Rate: Per station: 166666666 (166.667 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 9 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 107.204 Mbps Cx Ave: 109.918 Mbps Cx Max: 111.967 Mbps All Cx: 989.262 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 989.262 Mbps
Aggregated Rate: Min: 107.204 Mbps Avg: 109.918 Mbps Max: 111.967 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

Combined bps, 60 second running average

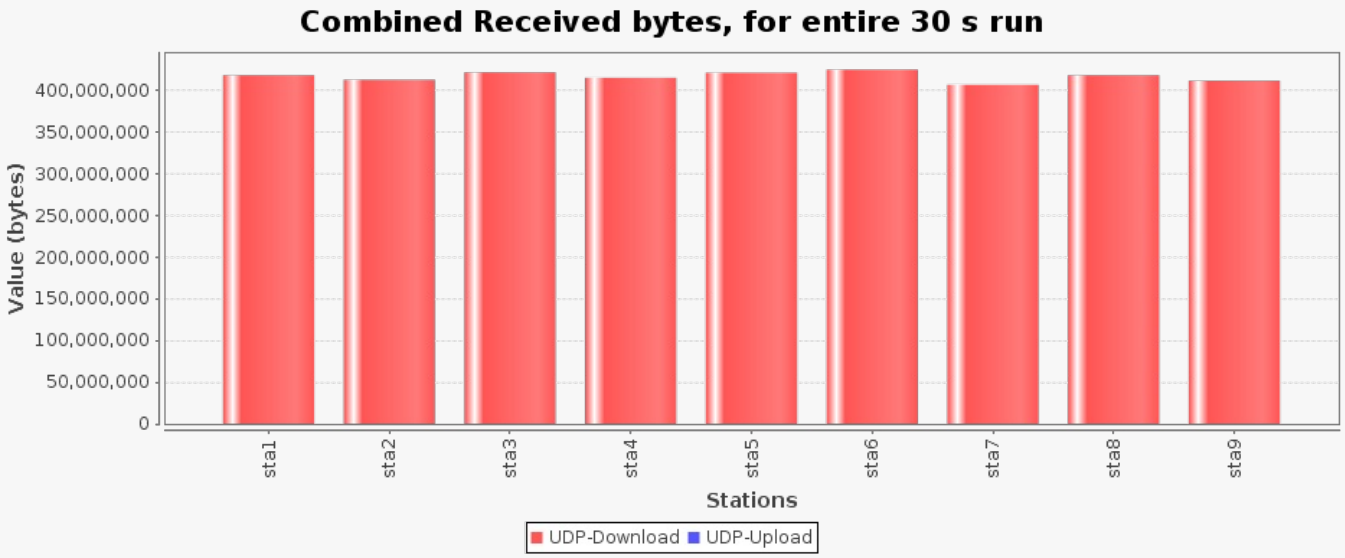


Requested Parameters:
Download Rate: Per station: 166666666 (166.667 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 9 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 388.371 MB Cx Ave: 397.848 MB Cx Max: 405.626 MB All Cx: 3.497 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.497 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues

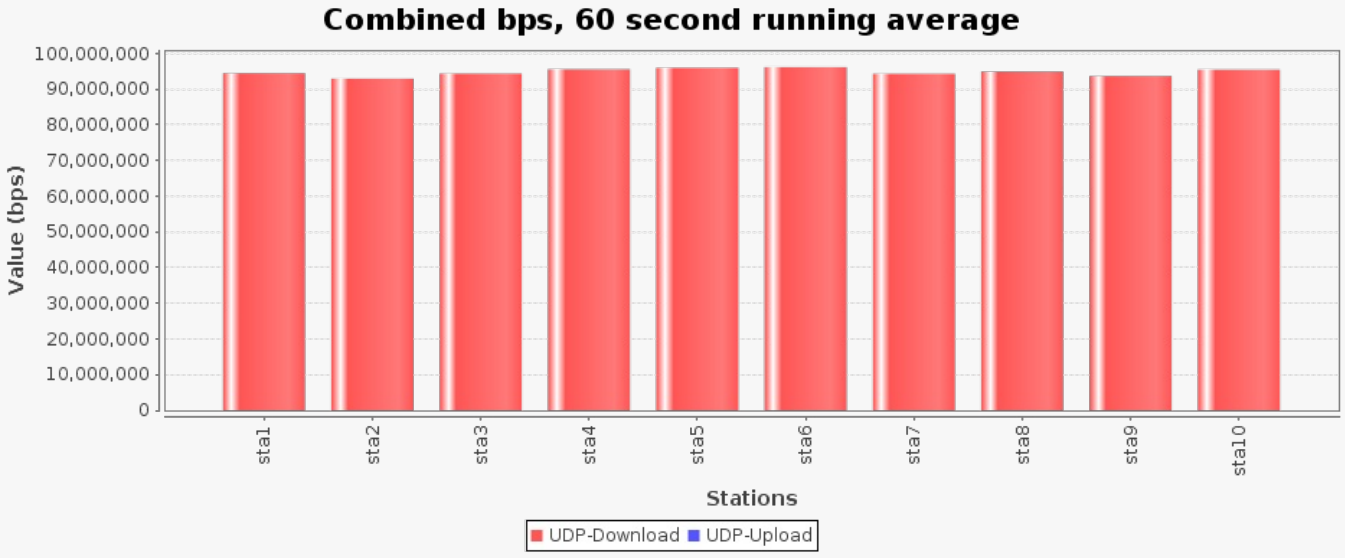
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 150000000 (150 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 10 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 92.961 Mbps Cx Ave: 94.78 Mbps Cx Max: 96.16 Mbps All Cx: 947.795 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 947.795 Mbps
Aggregated Rate: Min: 92.961 Mbps Avg: 94.78 Mbps Max: 96.16 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

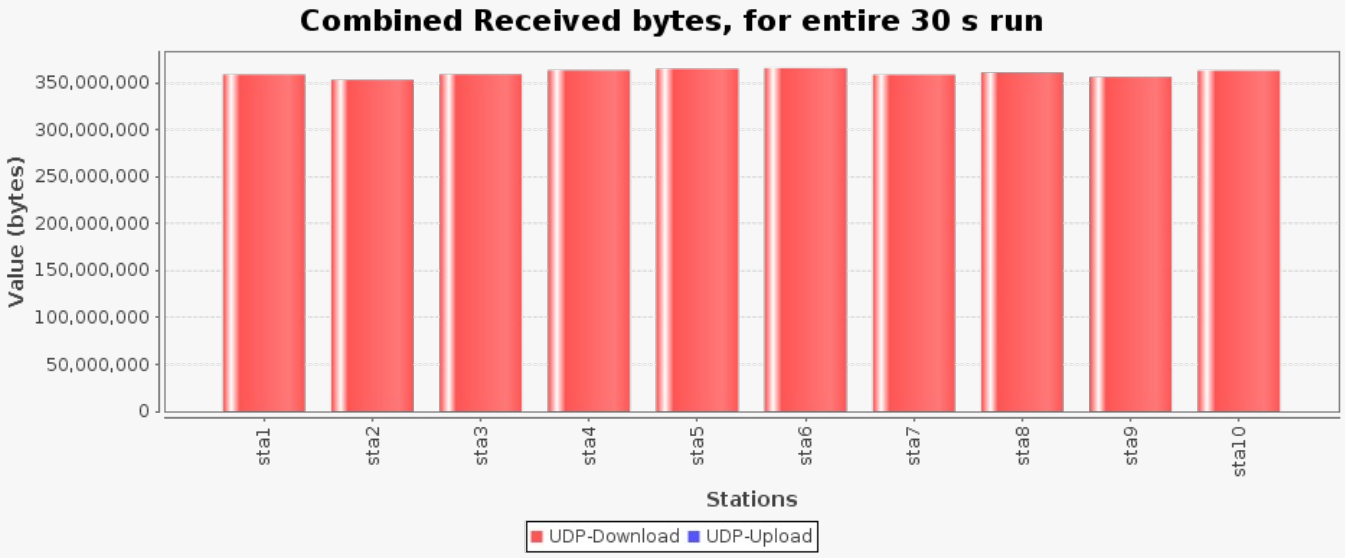


Requested Parameters:
Download Rate: Per station: 150000000 (150 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 10 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 336.552 MB Cx Ave: 343.51 MB Cx Max: 348.615 MB All Cx: 3.355 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.355 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.

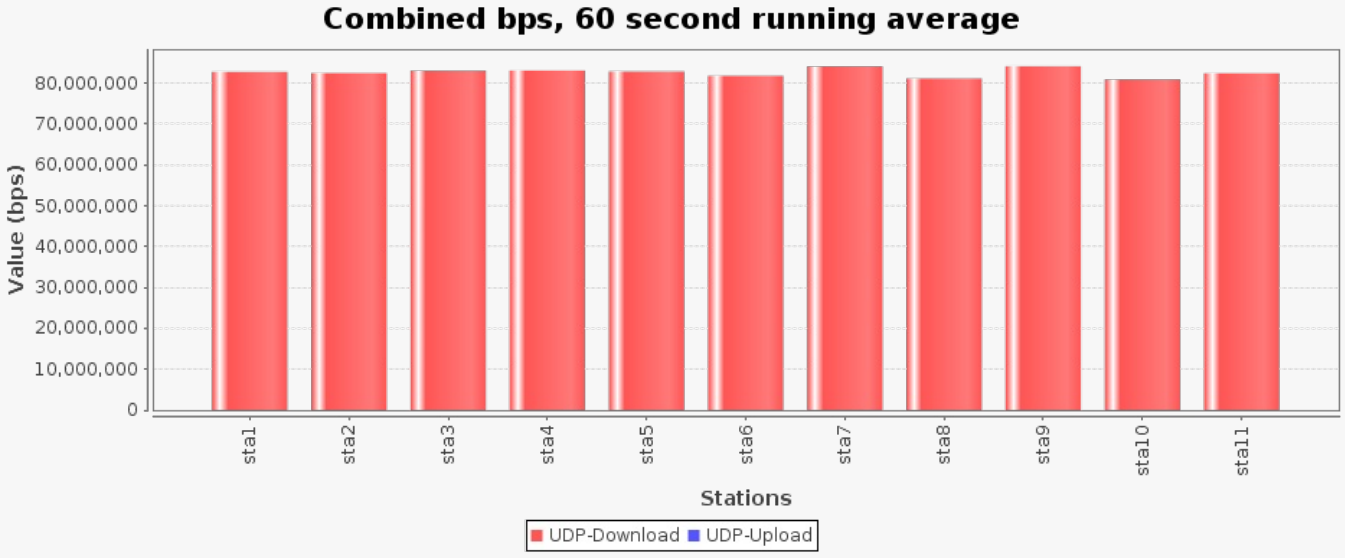
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 136363636 (136.364 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 11 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 80.836 Mbps Cx Ave: 82.521 Mbps Cx Max: 84.044 Mbps All Cx: 907.729 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 907.729 Mbps
Aggregated Rate: Min: 80.836 Mbps Avg: 82.521 Mbps Max: 84.044 Mbps

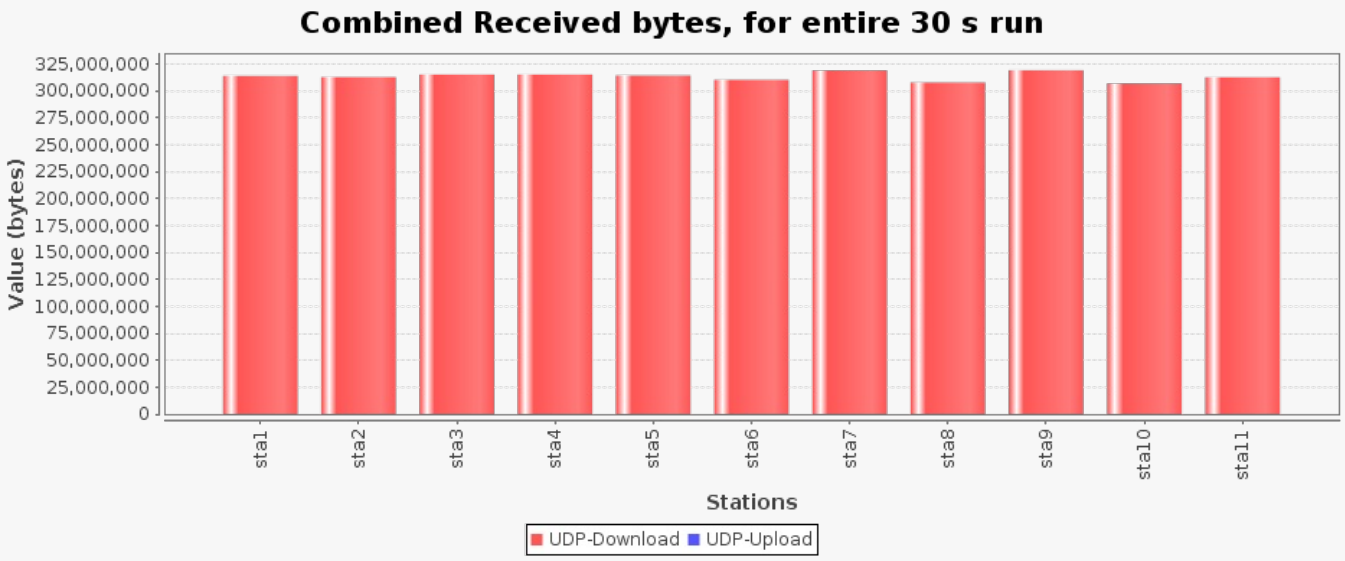
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 136363636 (136.364 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 11 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 292.877 MB Cx Ave: 298.999 MB Cx Max: 304.503 MB All Cx: 3.212 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.212 GB

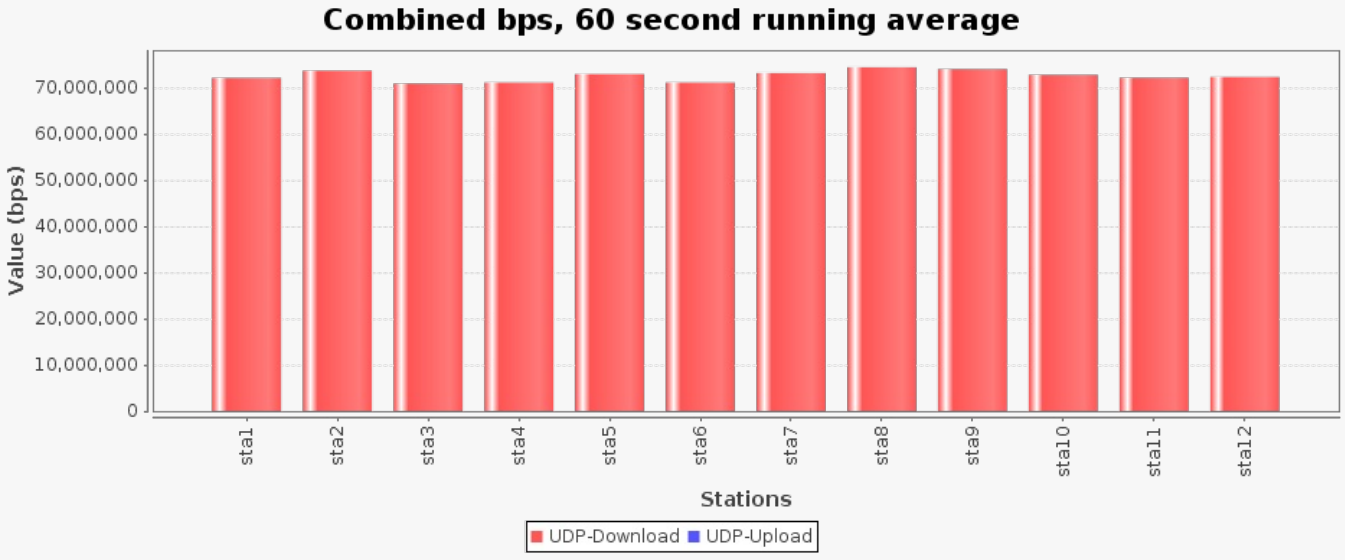
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 125000000 (125 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 12 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 70.898 Mbps Cx Ave: 72.555 Mbps Cx Max: 74.409 Mbps All Cx: 870.665 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 870.665 Mbps
Aggregated Rate: Min: 70.898 Mbps Avg: 72.555 Mbps Max: 74.409 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

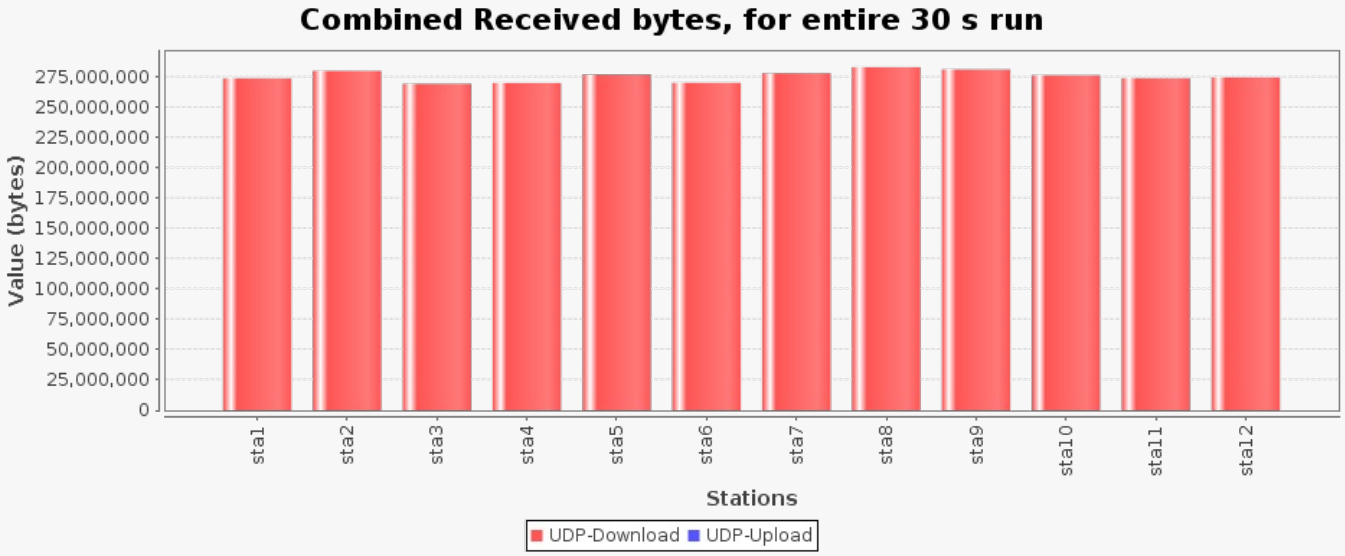


Requested Parameters:
Download Rate: Per station: 125000000 (125 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 12 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 257.105 MB Cx Ave: 263.139 MB Cx Max: 270.19 MB All Cx: 3.084 GB

Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.084 GB

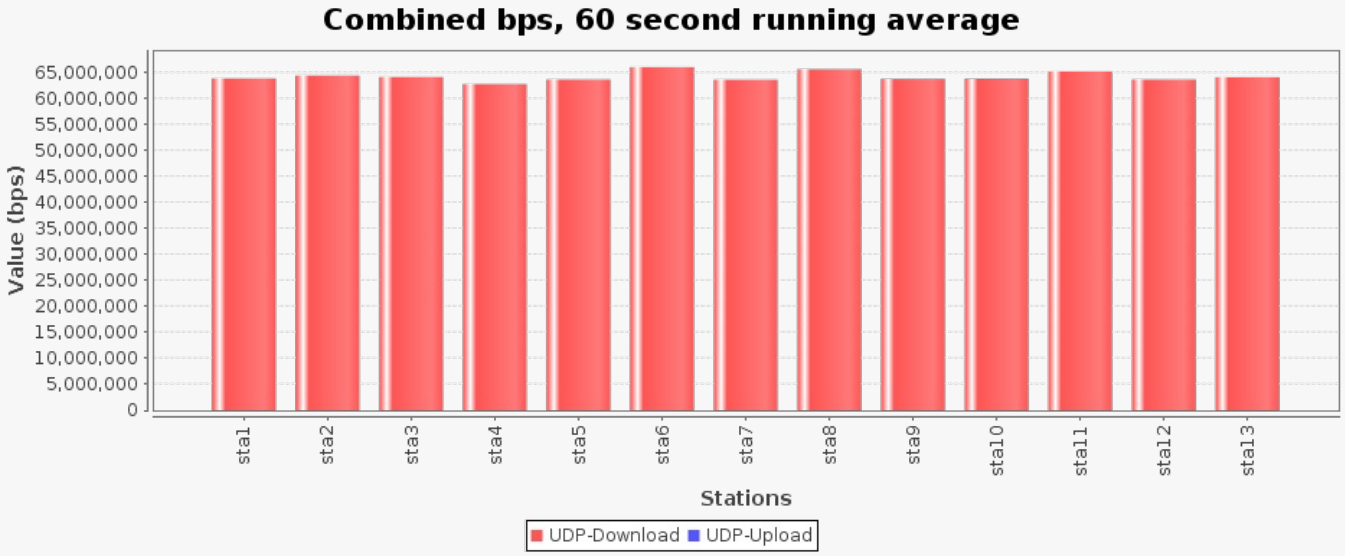
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 115384615 (115.385 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 13 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 62.875 Mbps Cx Ave: 64.294 Mbps Cx Max: 66.131 Mbps All Cx: 835.824 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 835.824 Mbps
Aggregated Rate: Min: 62.875 Mbps Avg: 64.294 Mbps Max: 66.131 Mbps

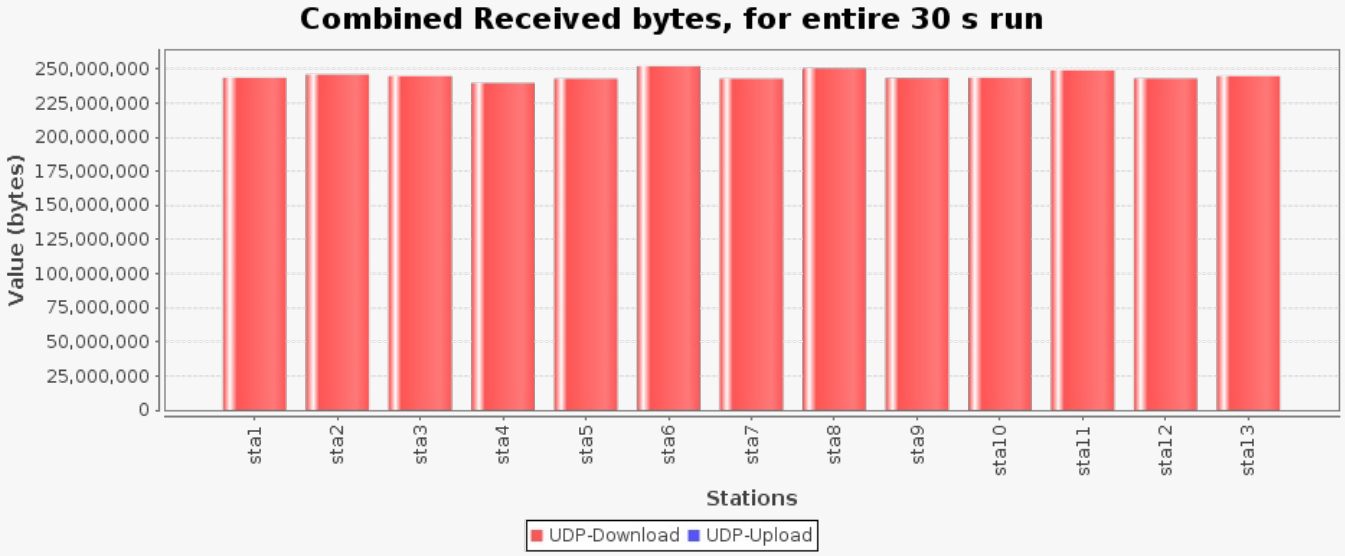
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 115384615 (115.385 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 13 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 228.665 MB Cx Ave: 233.792 MB Cx Max: 240.394 MB All Cx: 2.968 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 2.968 GB

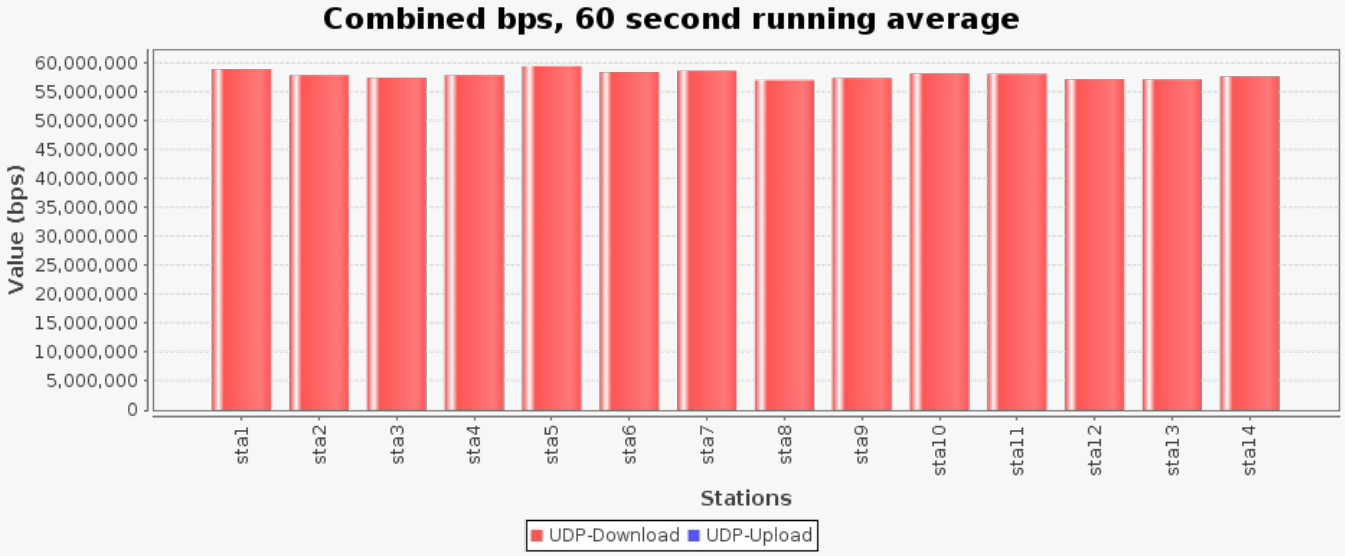
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 107142857 (107.143 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 14 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 56.991 Mbps Cx Ave: 57.93 Mbps Cx Max: 59.425 Mbps All Cx: 811.017 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 811.017 Mbps
Aggregated Rate: Min: 56.991 Mbps Avg: 57.93 Mbps Max: 59.425 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

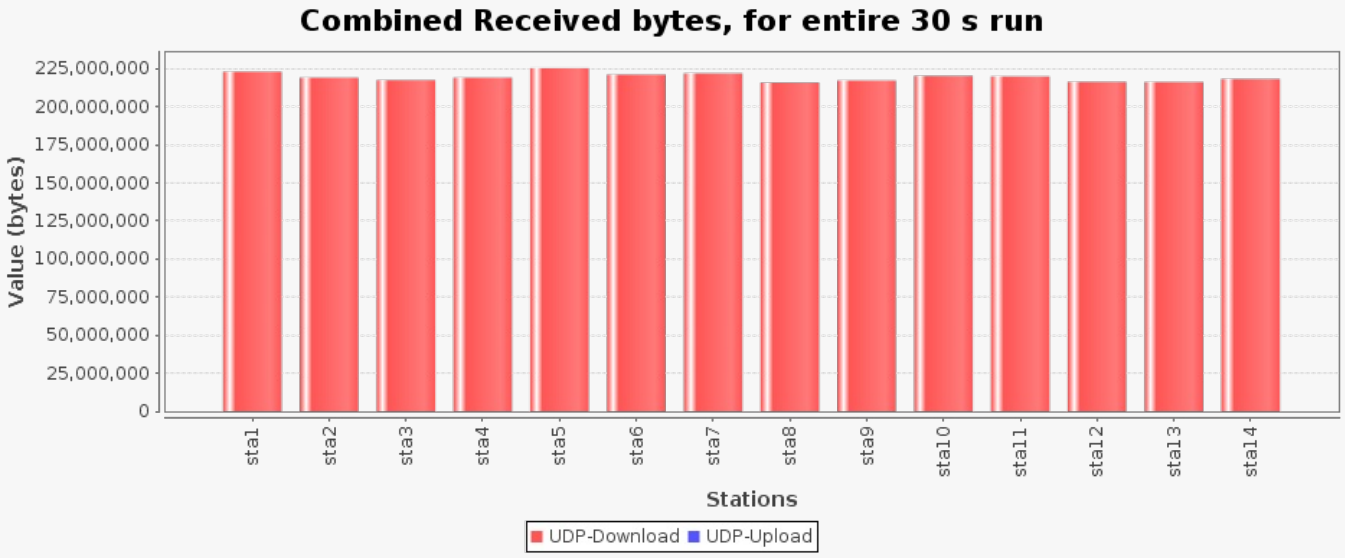


Requested Parameters:
Download Rate: Per station: 107142857 (107.143 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)

Station count: 14 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 205.781 MB Cx Ave: 209.185 MB Cx Max: 214.868 MB All Cx: 2.86 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 2.86 GB

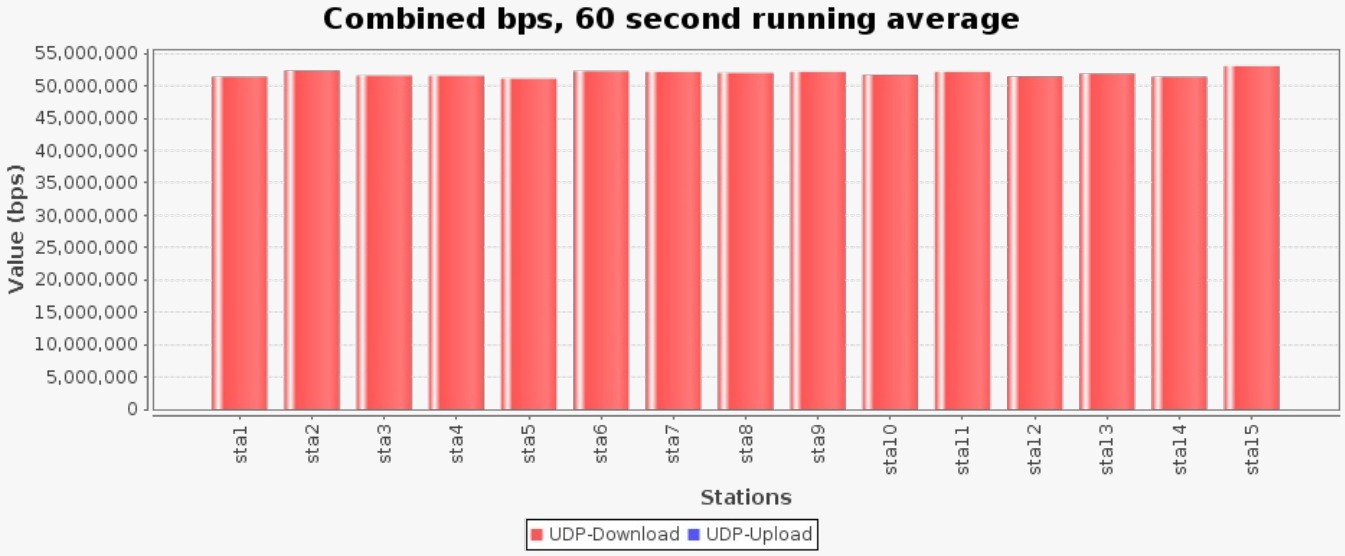
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 100000000 (100 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 15 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 51.129 Mbps Cx Ave: 51.913 Mbps Cx Max: 53.075 Mbps All Cx: 778.695 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 778.695 Mbps
Aggregated Rate: Min: 51.129 Mbps Avg: 51.913 Mbps Max: 53.075 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

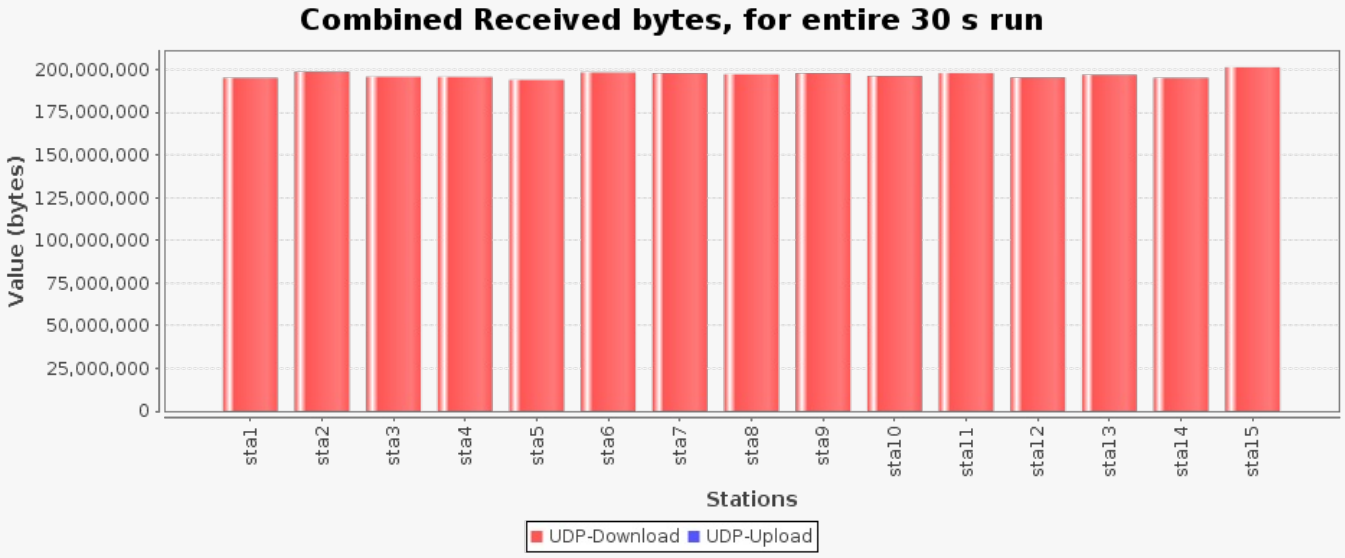


Requested Parameters:
Download Rate: Per station: 100000000 (100 Mbps) All: 1500000000 (1.5 Gbps)

Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 15 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 185.203 MB Cx Ave: 188.007 MB Cx Max: 192.242 MB All Cx: 2.754 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 2.754 GB

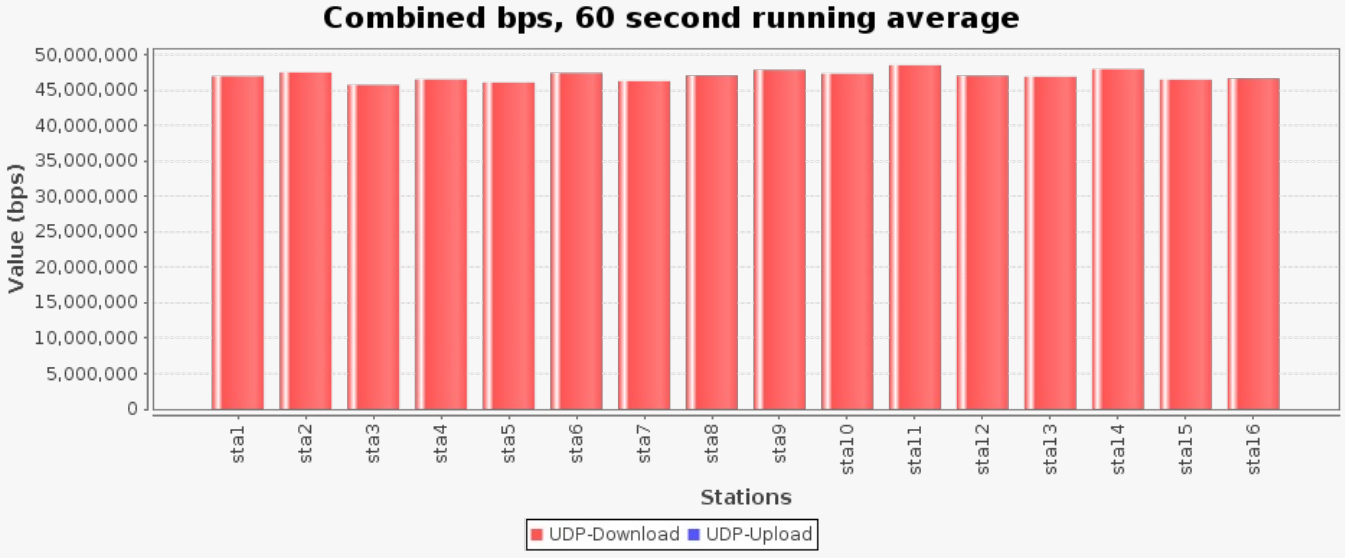
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 93750000 (93.75 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 16 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.71 Mbps Cx Ave: 46.992 Mbps Cx Max: 48.484 Mbps All Cx: 751.871 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 751.871 Mbps
Aggregated Rate: Min: 45.71 Mbps Avg: 46.992 Mbps Max: 48.484 Mbps

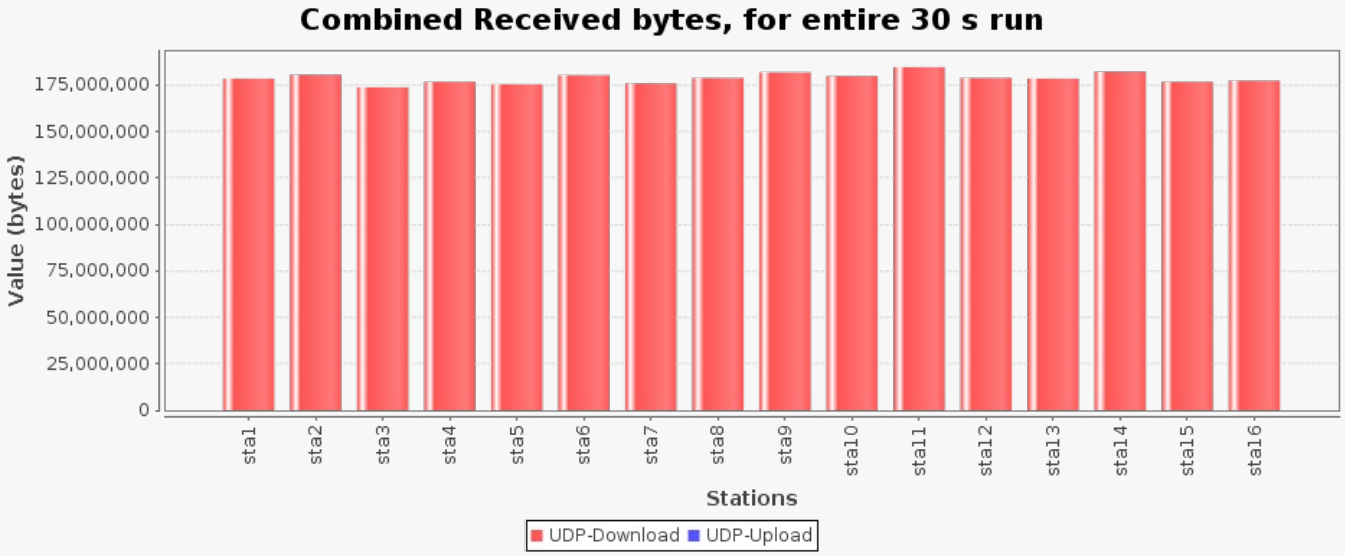
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 93750000 (93.75 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 16 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 165.743 MB Cx Ave: 170.466 MB Cx Max: 176.08 MB All Cx: 2.664 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 2.664 GB

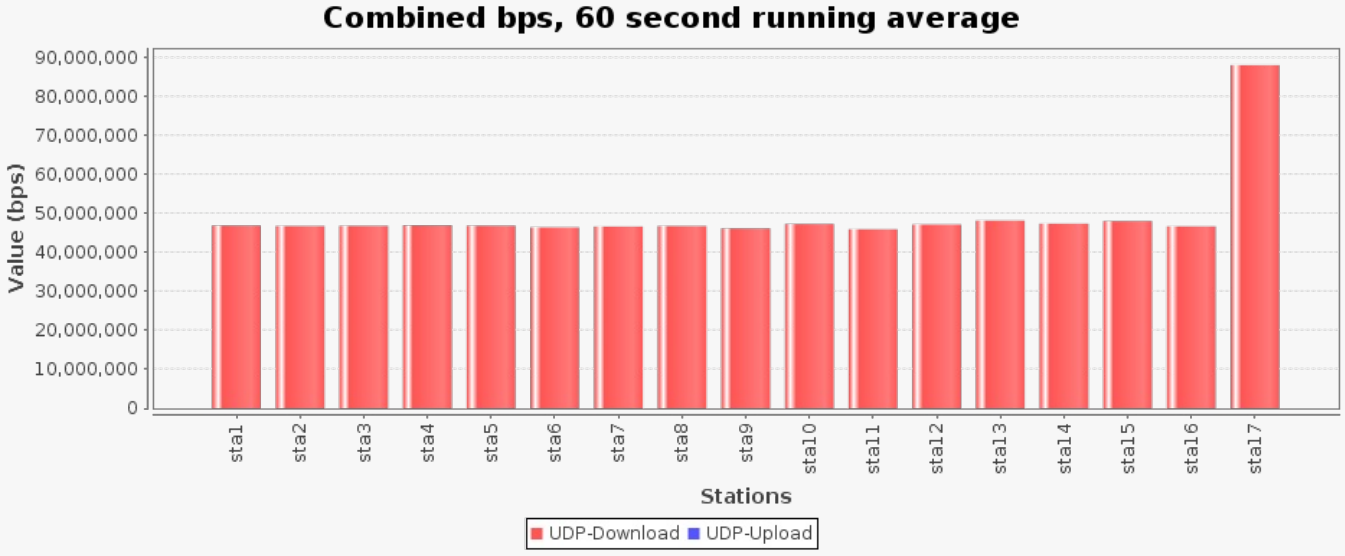
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 88235294 (88.235 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 17 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.956 Mbps Cx Ave: 49.343 Mbps Cx Max: 88.025 Mbps All Cx: 838.829 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 838.829 Mbps
Aggregated Rate: Min: 45.956 Mbps Avg: 49.343 Mbps Max: 88.025 Mbps

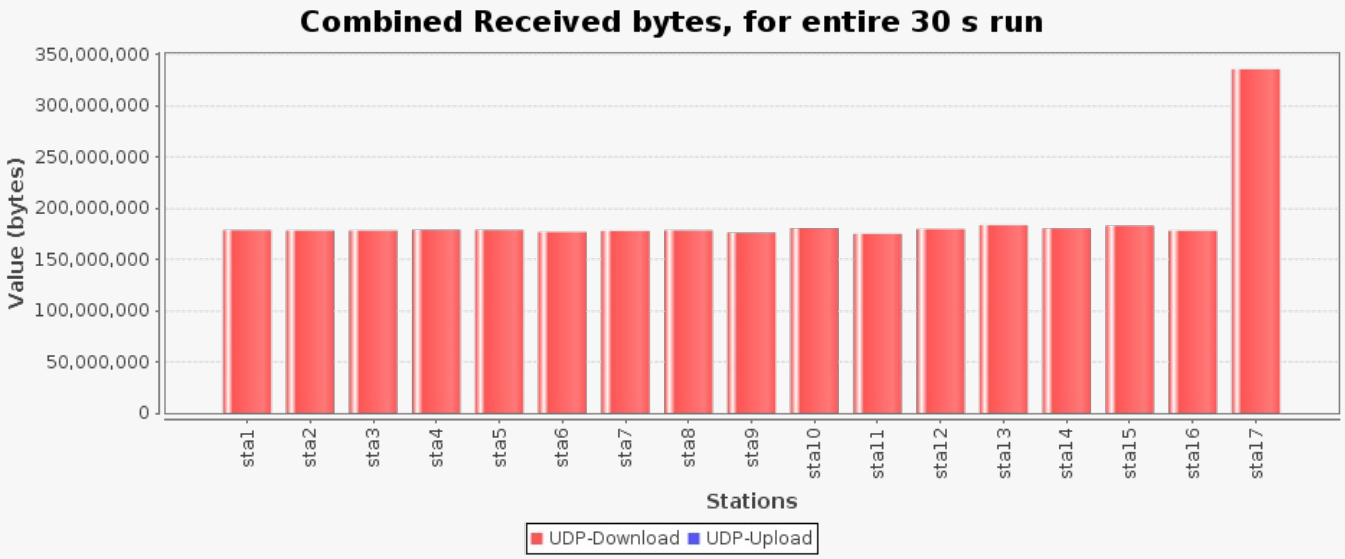
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 88235294 (88.235 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 17 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 166.879 MB Cx Ave: 179.305 MB Cx Max: 320.07 MB All Cx: 2.977 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 2.977 GB

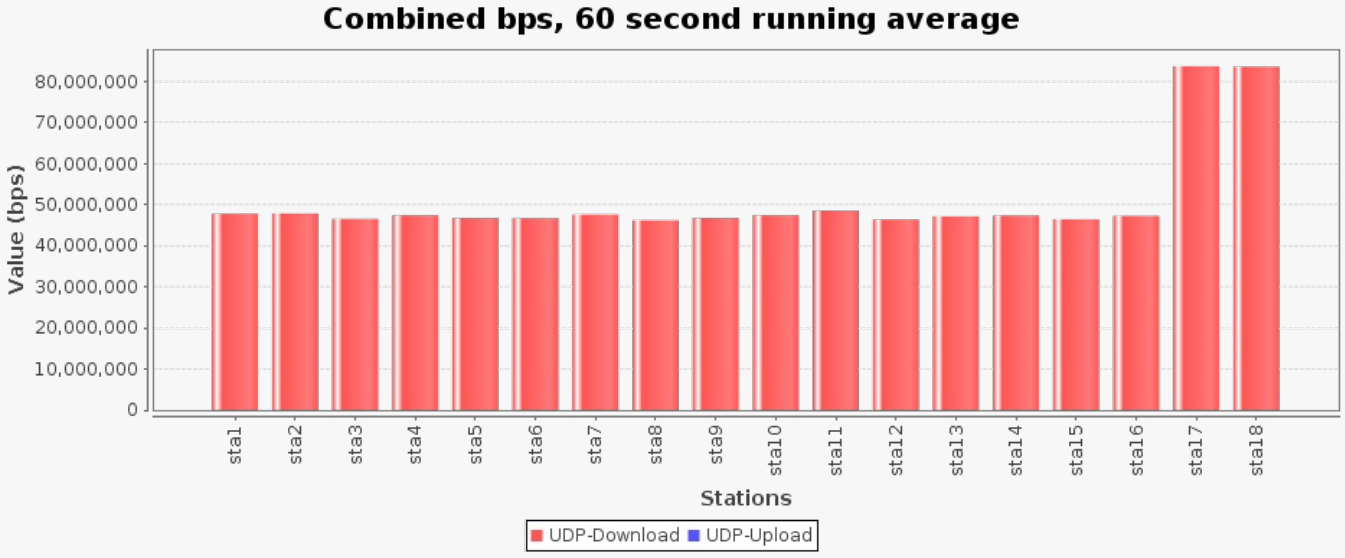
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 83333333 (83.333 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 18 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 46.218 Mbps Cx Ave: 51.207 Mbps Cx Max: 83.732 Mbps All Cx: 921.731 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 921.731 Mbps
Aggregated Rate: Min: 46.218 Mbps Avg: 51.207 Mbps Max: 83.732 Mbps

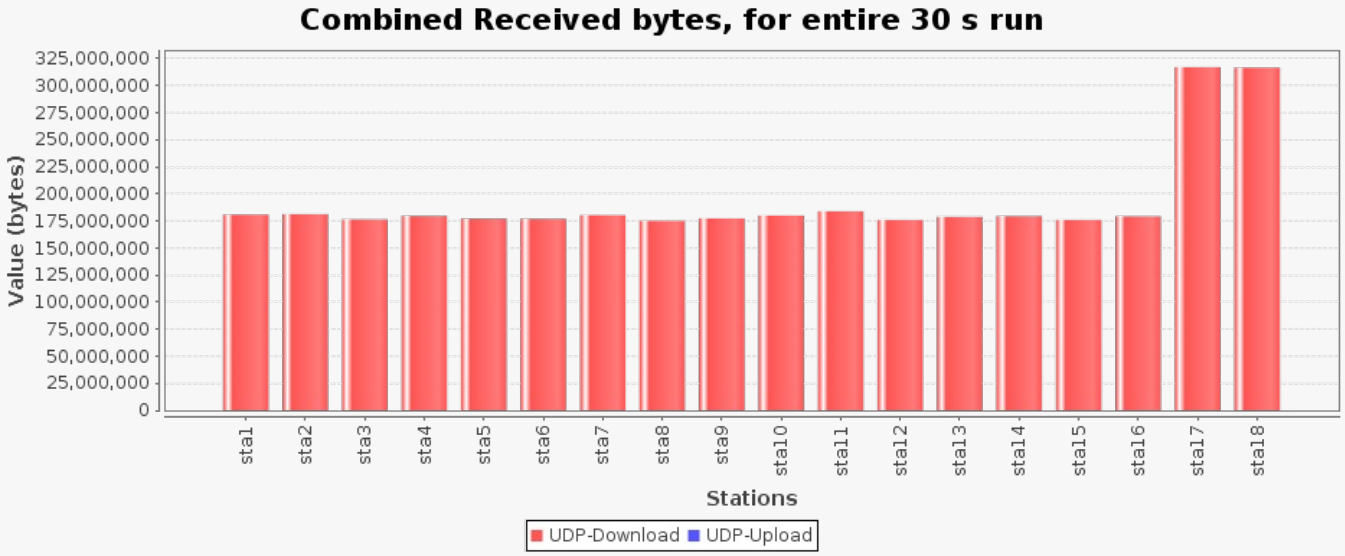
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 83333333 (83.333 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 18 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 166.954 MB Cx Ave: 185.038 MB Cx Max: 302.425 MB All Cx: 3.253 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.253 GB

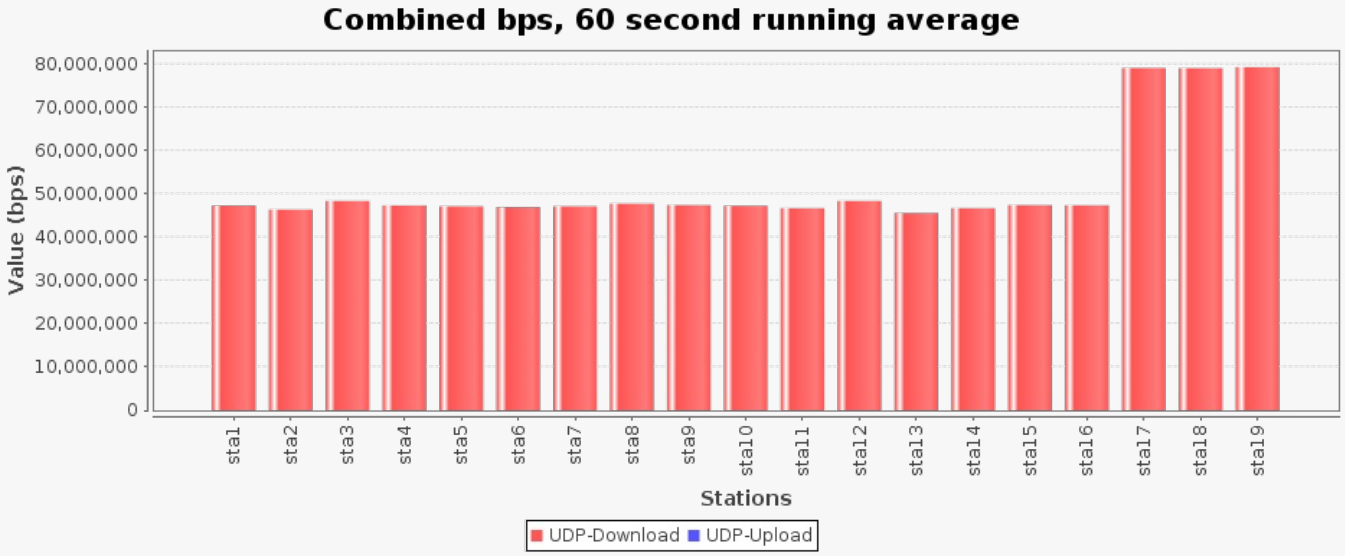
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 78947368 (78.947 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 19 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.522 Mbps Cx Ave: 52.177 Mbps Cx Max: 79.196 Mbps All Cx: 991.355 Mbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 991.355 Mbps
Aggregated Rate: Min: 45.522 Mbps Avg: 52.177 Mbps Max: 79.196 Mbps

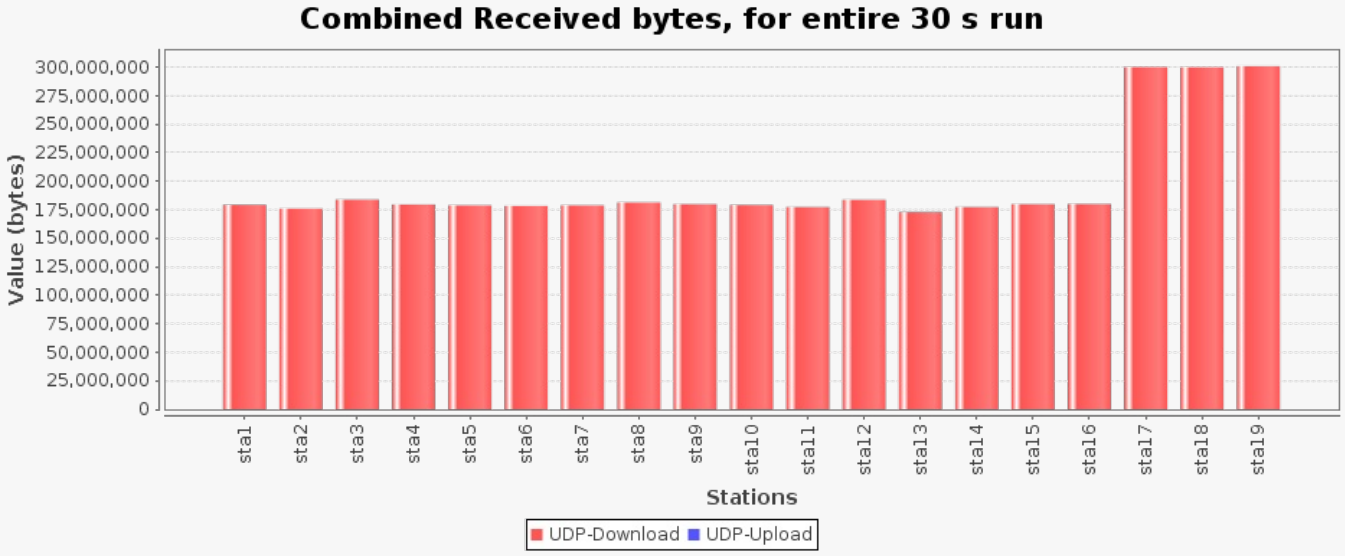
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 78947368 (78.947 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 19 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 164.91 MB Cx Ave: 189.109 MB Cx Max: 286.926 MB All Cx: 3.509 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.509 GB

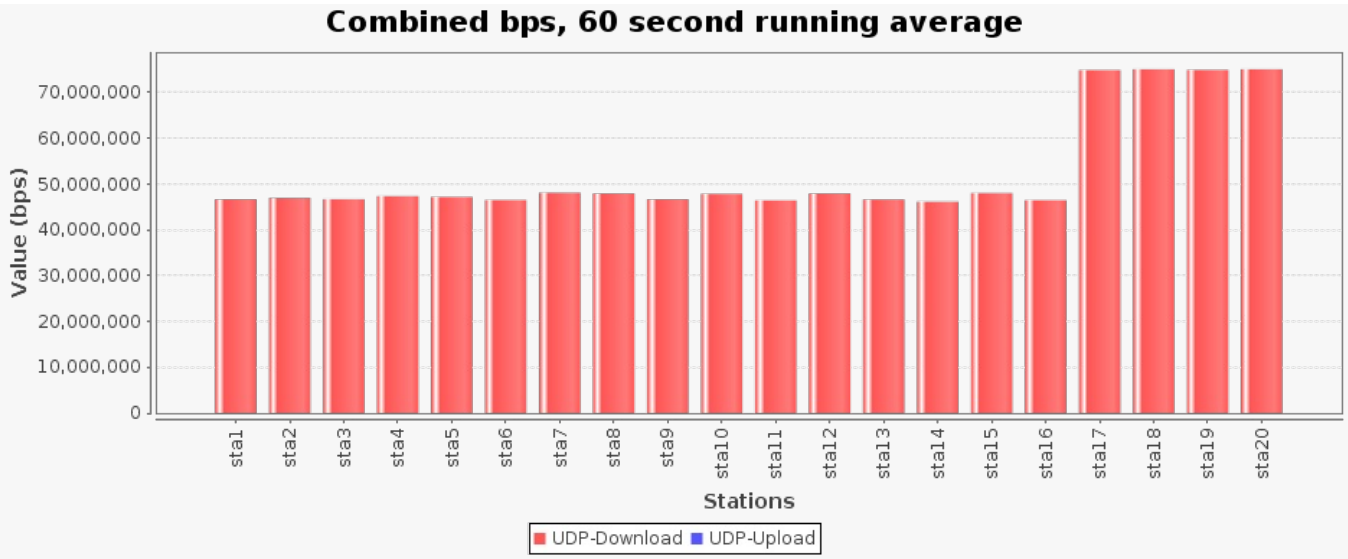
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 75000000 (75 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 20 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 46.133 Mbps Cx Ave: 52.65 Mbps Cx Max: 75.036 Mbps All Cx: 1.053 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.053 Gbps
Aggregated Rate: Min: 46.133 Mbps Avg: 52.65 Mbps Max: 75.036 Mbps

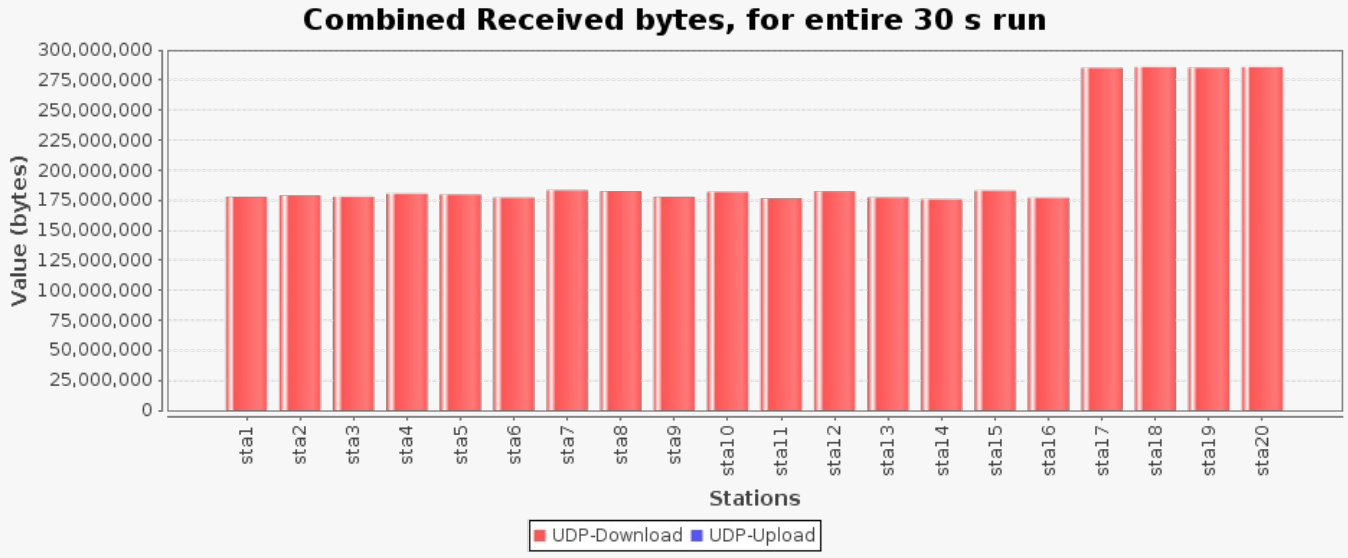
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 75000000 (75 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 20 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 167.535 MB Cx Ave: 191.161 MB Cx Max: 272.503 MB All Cx: 3.734 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.734 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

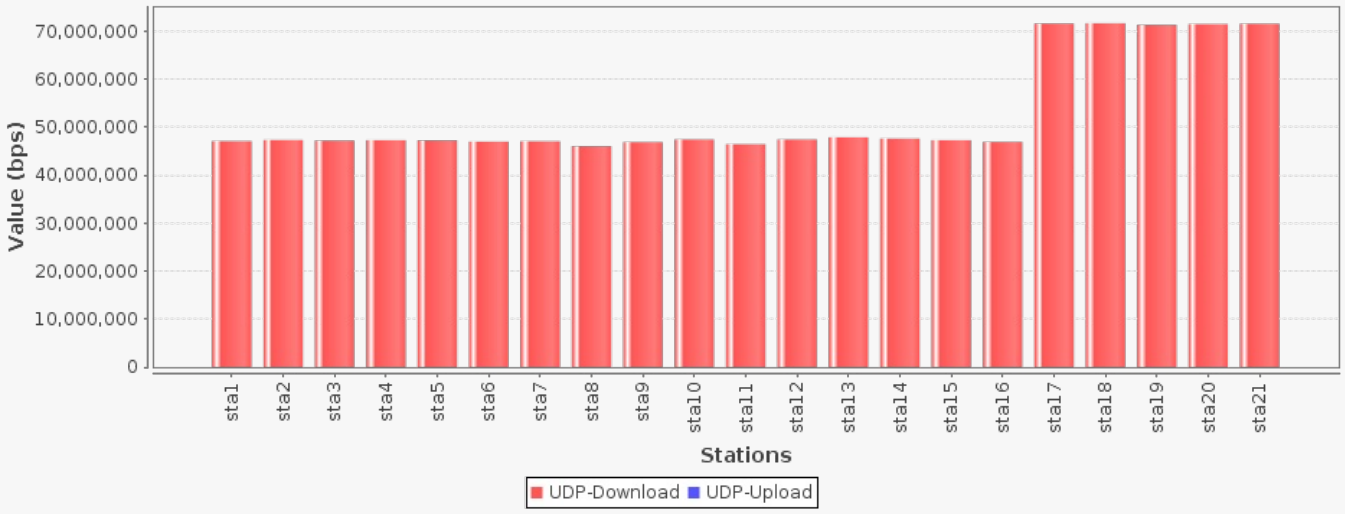


Requested Parameters:
Download Rate: Per station: 71428571 (71.429 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 21 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 46.08 Mbps Cx Ave: 52.973 Mbps Cx Max: 71.699 Mbps All Cx: 1.112 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.112 Gbps
Aggregated Rate: Min: 46.08 Mbps Avg: 52.973 Mbps Max: 71.699 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

Combined bps, 60 second running average

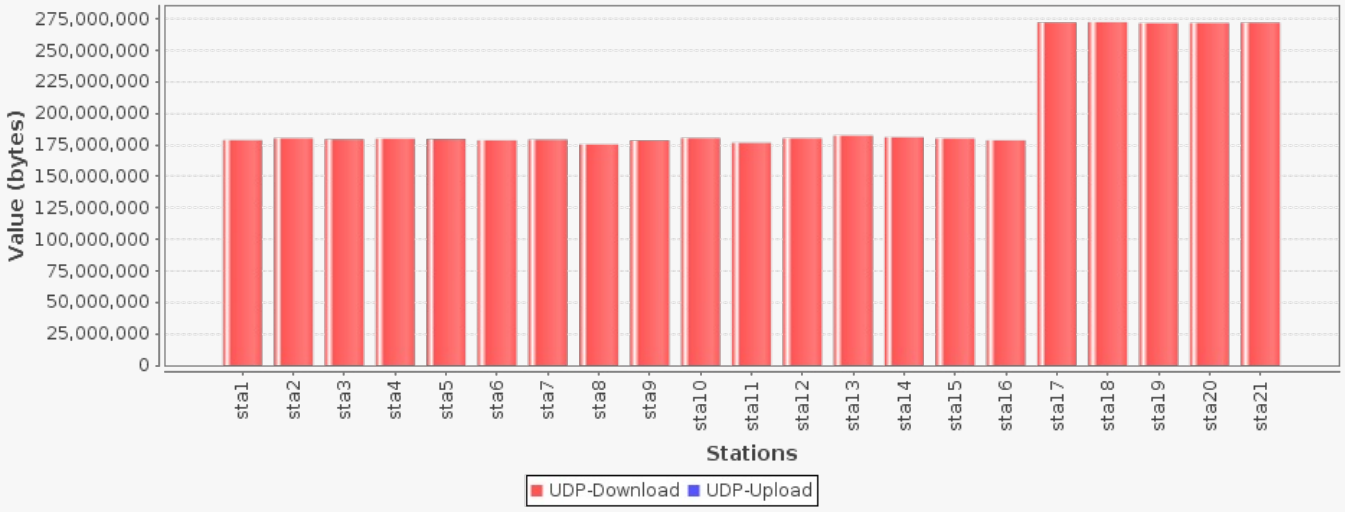


Requested Parameters:
Download Rate: Per station: 71428571 (71.429 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 21 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 167.171 MB Cx Ave: 192.005 MB Cx Max: 259.75 MB All Cx: 3.938 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 3.938 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

Combined Received bytes, for entire 30 s run

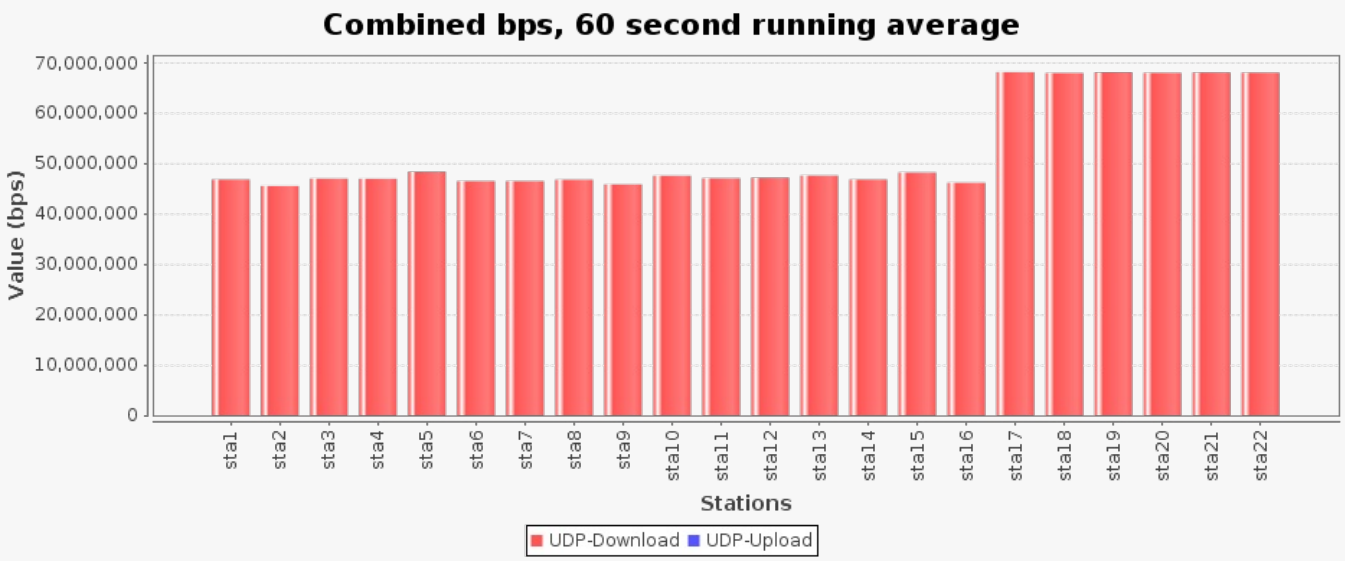


Requested Parameters:
Download Rate: Per station: 68181818 (68.182 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 22 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.535 Mbps Cx Ave: 52.697 Mbps Cx Max: 68.137 Mbps All Cx: 1.159 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.159 Gbps
Aggregated Rate: Min: 45.535 Mbps Avg: 52.697 Mbps Max: 68.137 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues

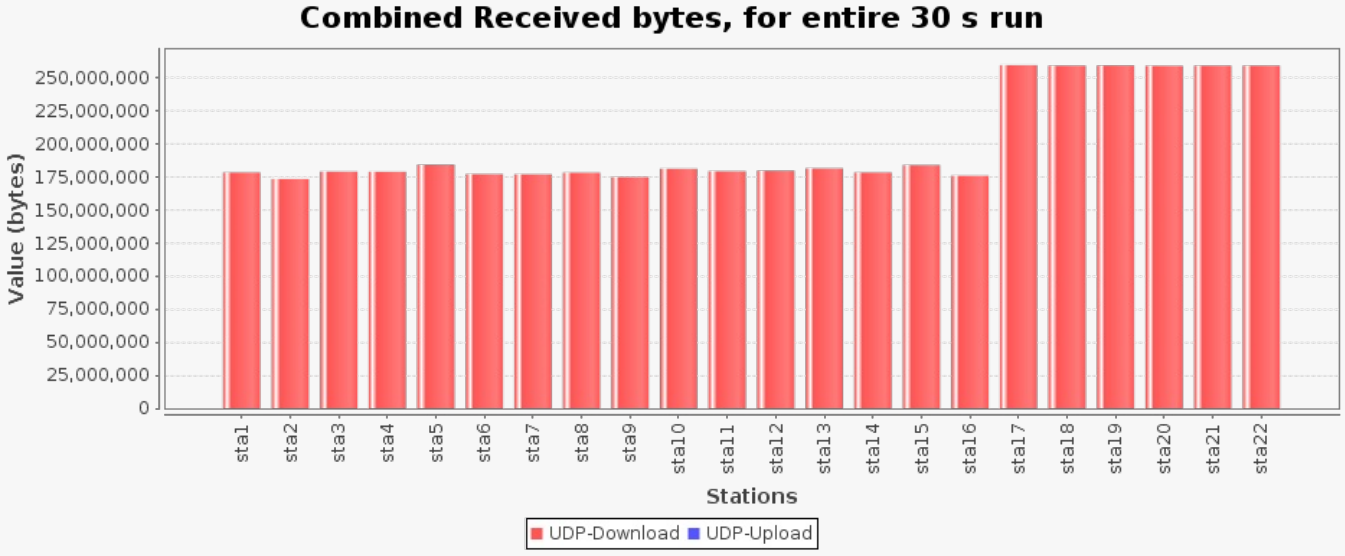
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 68181818 (68.182 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 22 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 165.402 MB Cx Ave: 191.5 MB Cx Max: 247.581 MB All Cx: 4.114 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.114 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

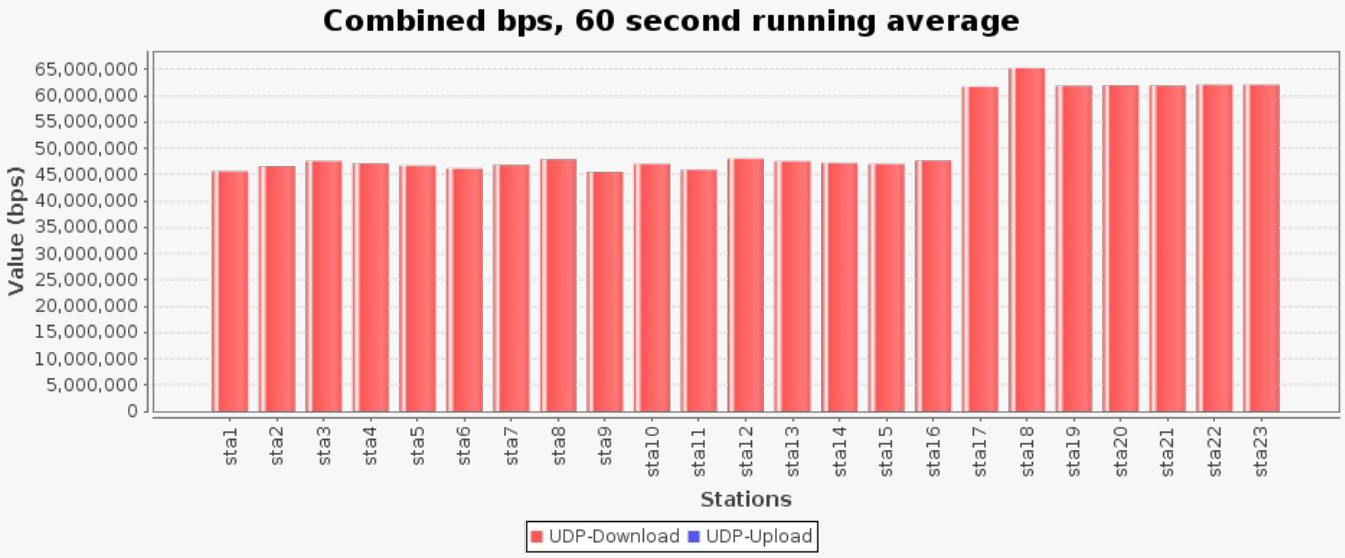


Requested Parameters:
Download Rate: Per station: 65217391 (65.217 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 23 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.481 Mbps Cx Ave: 51.604 Mbps Cx Max: 65.239 Mbps All Cx: 1.187 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.187 Gbps
Aggregated Rate: Min: 45.481 Mbps Avg: 51.604 Mbps Max: 65.239 Mbps

This graph shows fairness. On a fair system, each station should get about the same throughput.

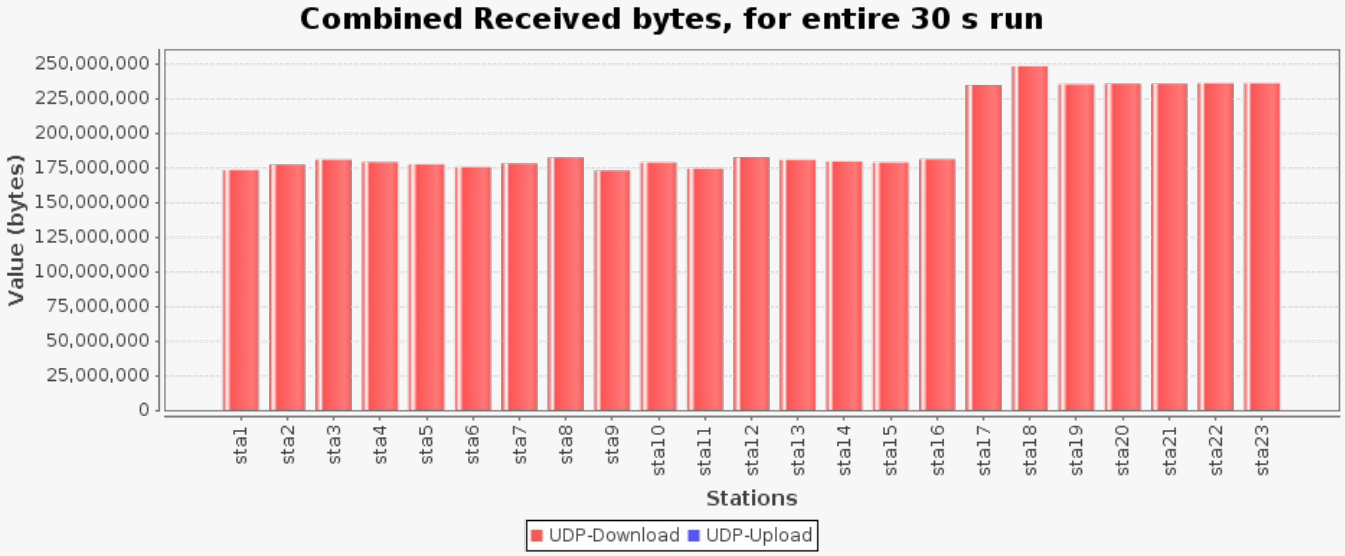
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 65217391 (65.217 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 23 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 164.782 MB Cx Ave: 186.998 MB Cx Max: 236.622 MB All Cx: 4.2 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.2 GB

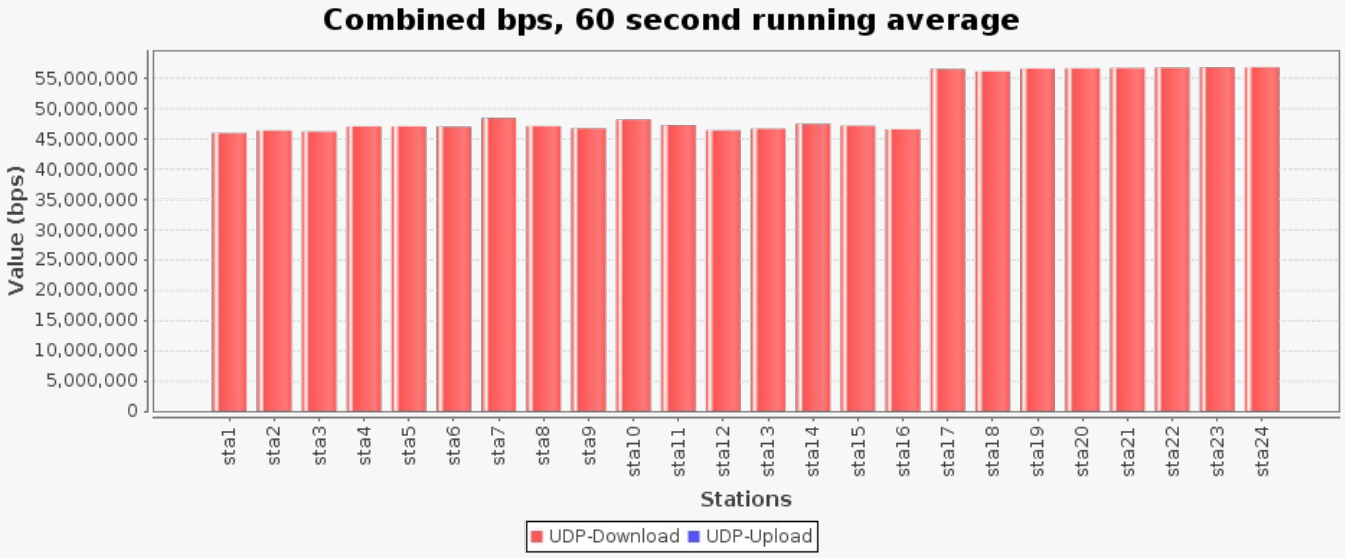
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 62500000 (62.5 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 24 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 45.964 Mbps Cx Ave: 50.211 Mbps Cx Max: 56.855 Mbps All Cx: 1.205 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.205 Gbps
Aggregated Rate: Min: 45.964 Mbps Avg: 50.211 Mbps Max: 56.855 Mbps

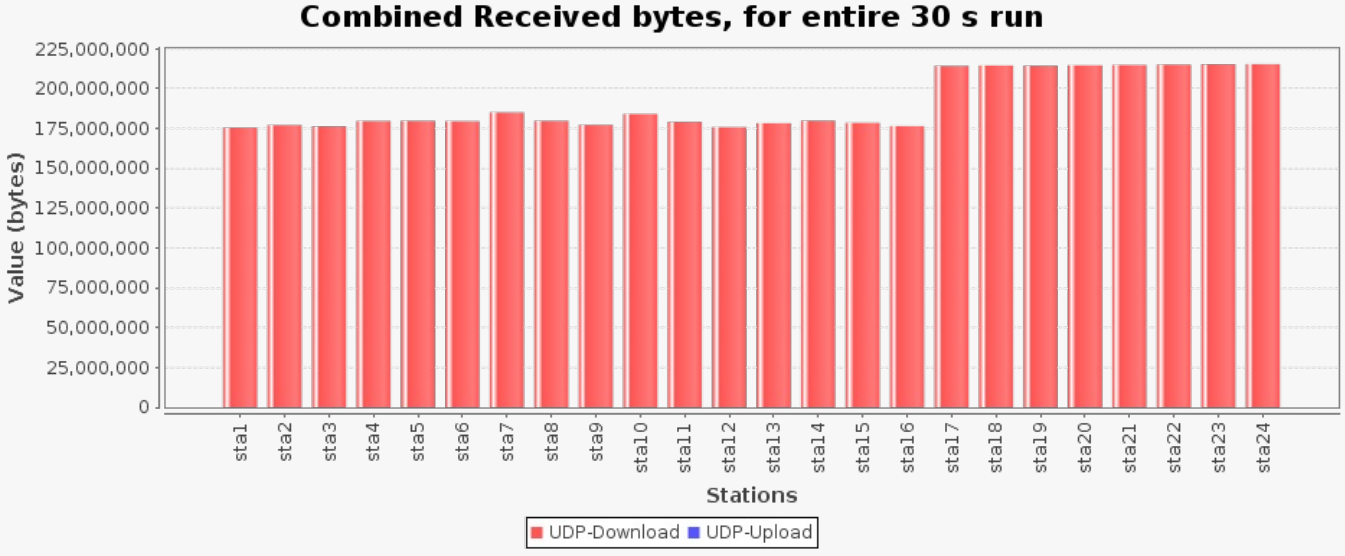
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 62500000 (62.5 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 24 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 167.399 MB Cx Ave: 182.104 MB Cx Max: 205.485 MB All Cx: 4.268 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.268 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

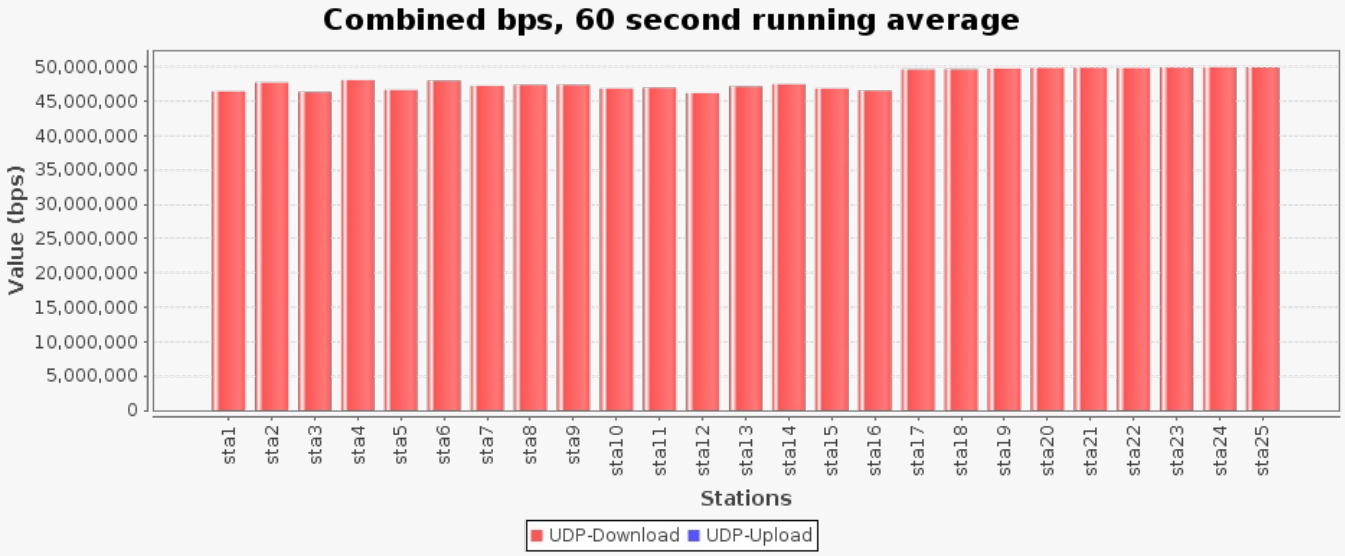


Requested Parameters:
Download Rate: Per station: 60000000 (60 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 25 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 46.211 Mbps Cx Ave: 48.082 Mbps Cx Max: 49.976 Mbps All Cx: 1.202 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps

Total: 1.202 Gbps
Aggregated Rate: Min: 46.211 Mbps Avg: 48.082 Mbps Max: 49.976 Mbps

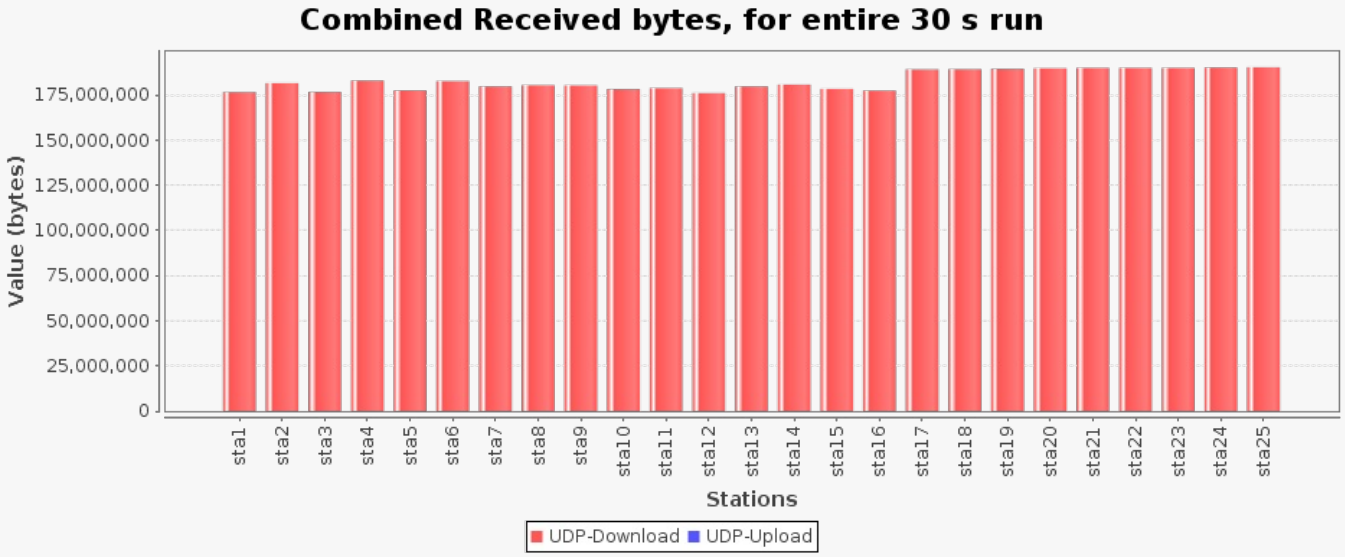
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 60000000 (60 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 25 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 167.961 MB Cx Ave: 174.578 MB Cx Max: 181.545 MB All Cx: 4.262 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.262 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

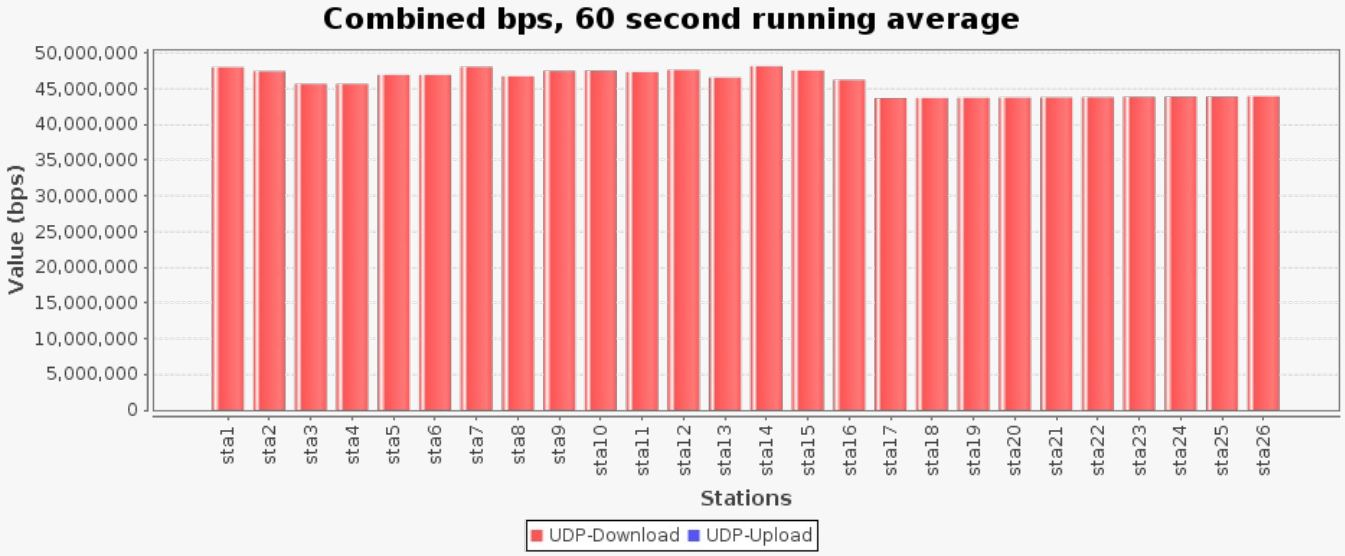


Requested Parameters:
Download Rate: Per station: 57692307 (57.692 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 26 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:

Download Rate: Cx Min: 43.684 Mbps Cx Ave: 45.845 Mbps Cx Max: 48.148 Mbps All Cx: 1.192 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.192 Gbps
Aggregated Rate: Min: 43.684 Mbps Avg: 45.845 Mbps Max: 48.148 Mbps

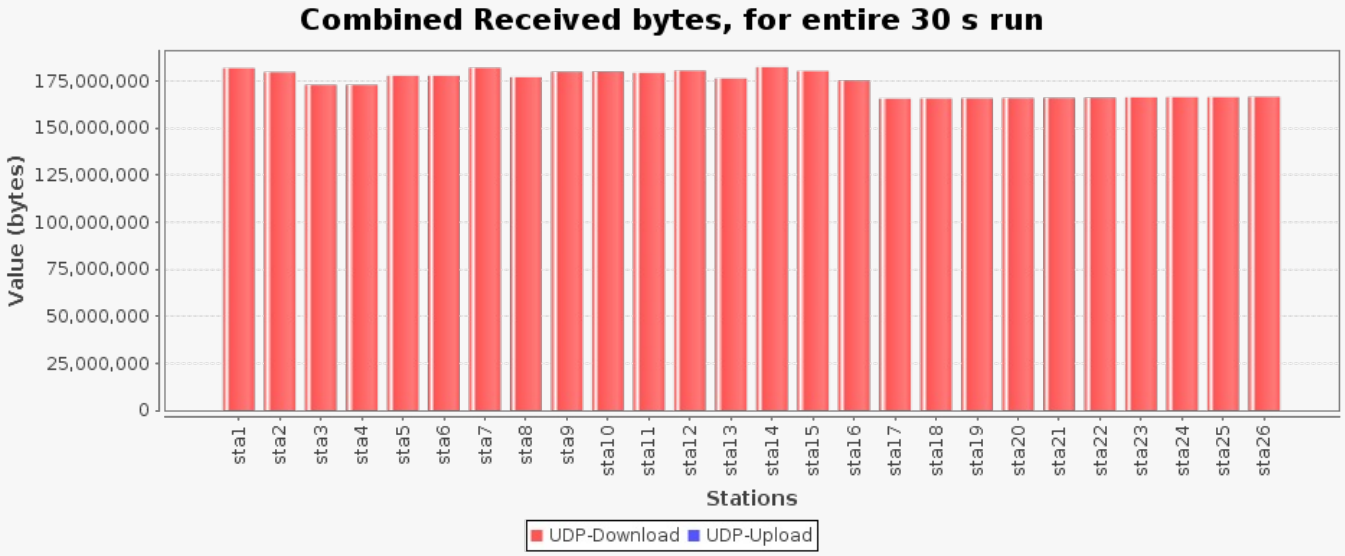
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 57692307 (57.692 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 26 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 158.09 MB Cx Ave: 165.813 MB Cx Max: 174.061 MB All Cx: 4.21 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.21 GB

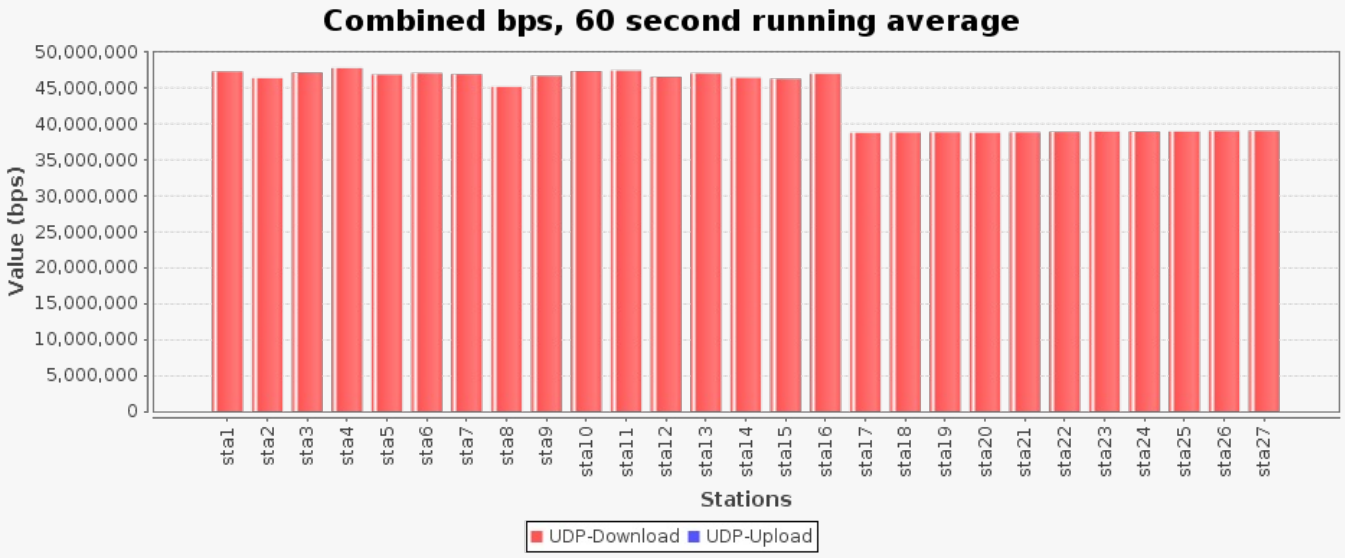
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 55555555 (55.556 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 27 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 38.775 Mbps Cx Ave: 43.594 Mbps Cx Max: 47.76 Mbps All Cx: 1.177 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.177 Gbps
Aggregated Rate: Min: 38.775 Mbps Avg: 43.594 Mbps Max: 47.76 Mbps

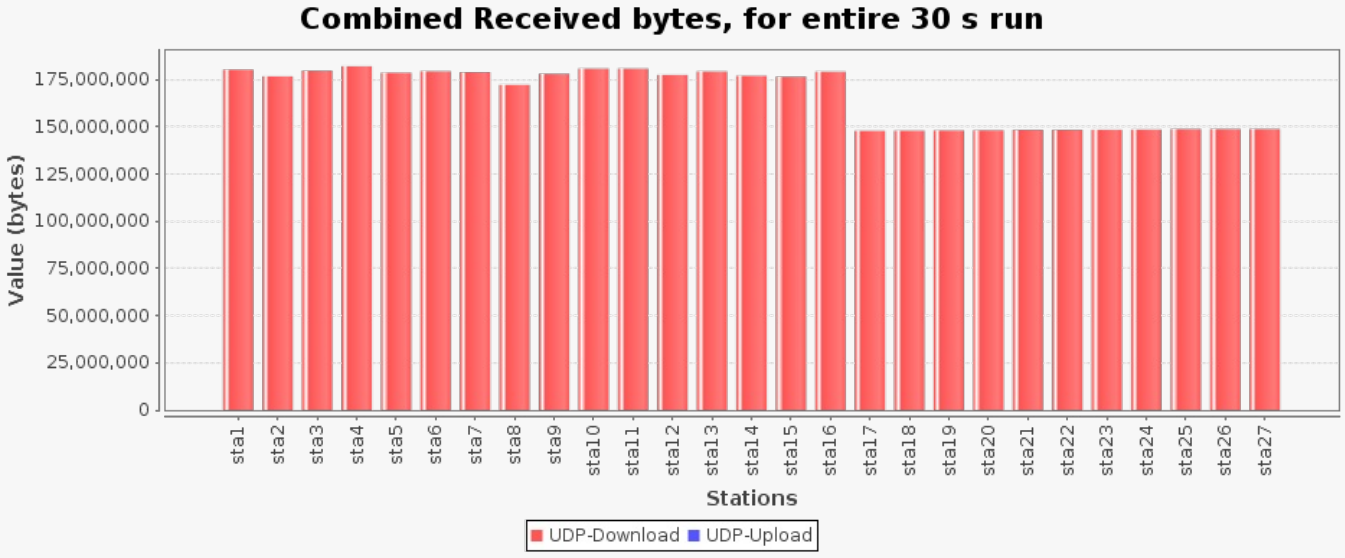
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 55555555 (55.556 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 27 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 141.028 MB Cx Ave: 158.59 MB Cx Max: 173.657 MB All Cx: 4.182 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.182 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

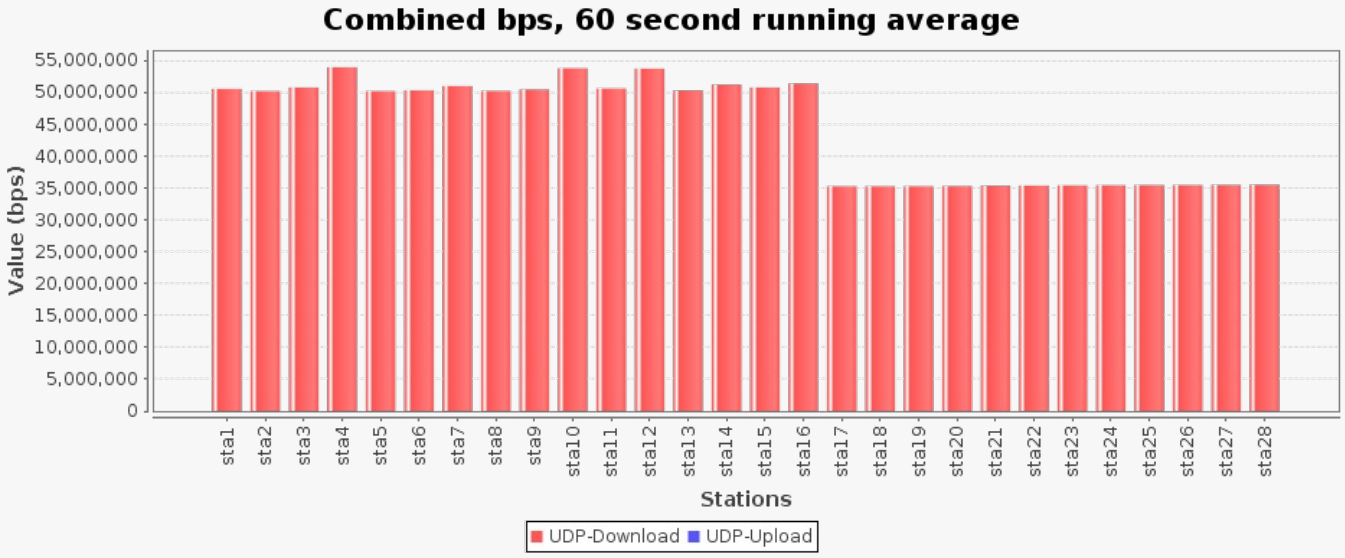


Requested Parameters:
Download Rate: Per station: 53571428 (53.571 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)

Total: 1500000000 (1.5 Gbps)
Station count: 28 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 35.25 Mbps Cx Ave: 44.429 Mbps Cx Max: 53.946 Mbps All Cx: 1.244 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.244 Gbps
Aggregated Rate: Min: 35.25 Mbps Avg: 44.429 Mbps Max: 53.946 Mbps

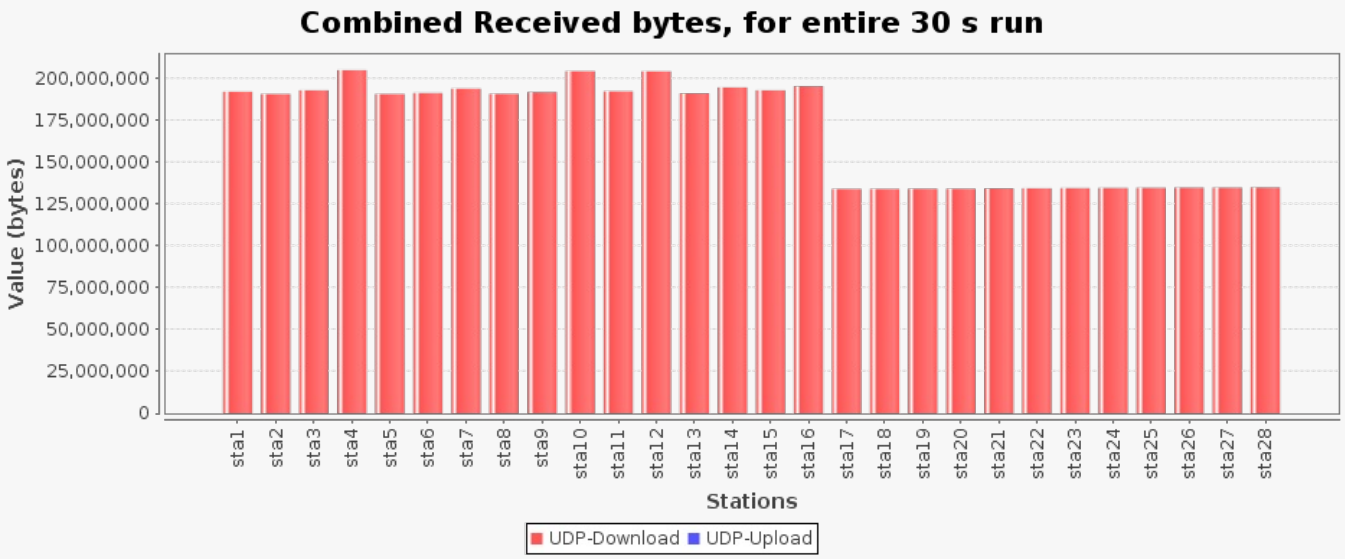
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 53571428 (53.571 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 28 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 127.779 MB Cx Ave: 161.071 MB Cx Max: 195.529 MB All Cx: 4.404 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.404 GB

This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

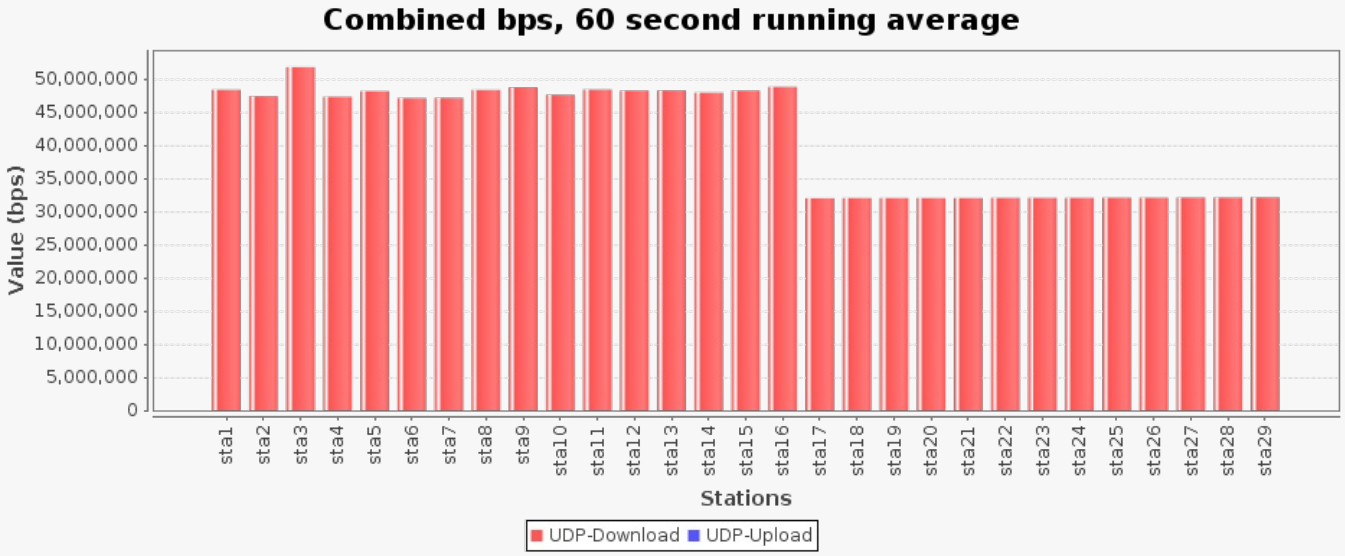


Requested Parameters:

Download Rate: Per station: 51724137 (51.724 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 29 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 31.998 Mbps Cx Ave: 40.966 Mbps Cx Max: 51.764 Mbps All Cx: 1.188 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.188 Gbps
Aggregated Rate: Min: 31.998 Mbps Avg: 40.966 Mbps Max: 51.764 Mbps

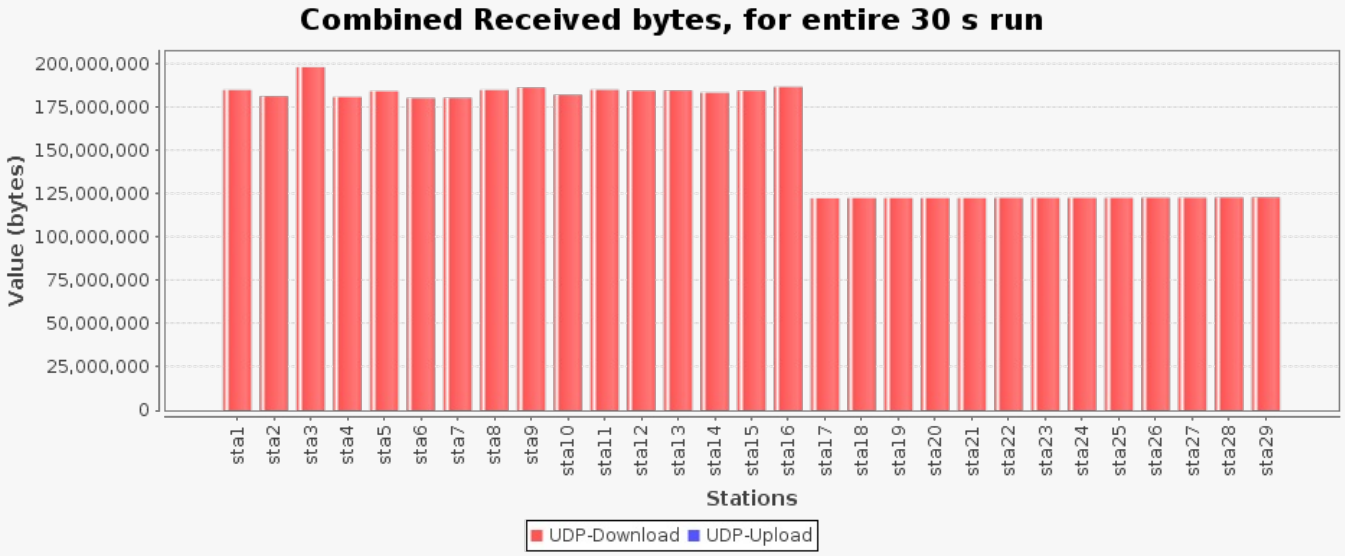
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 51724137 (51.724 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 29 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 116.734 MB Cx Ave: 149.457 MB Cx Max: 188.877 MB All Cx: 4.233 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.233 GB

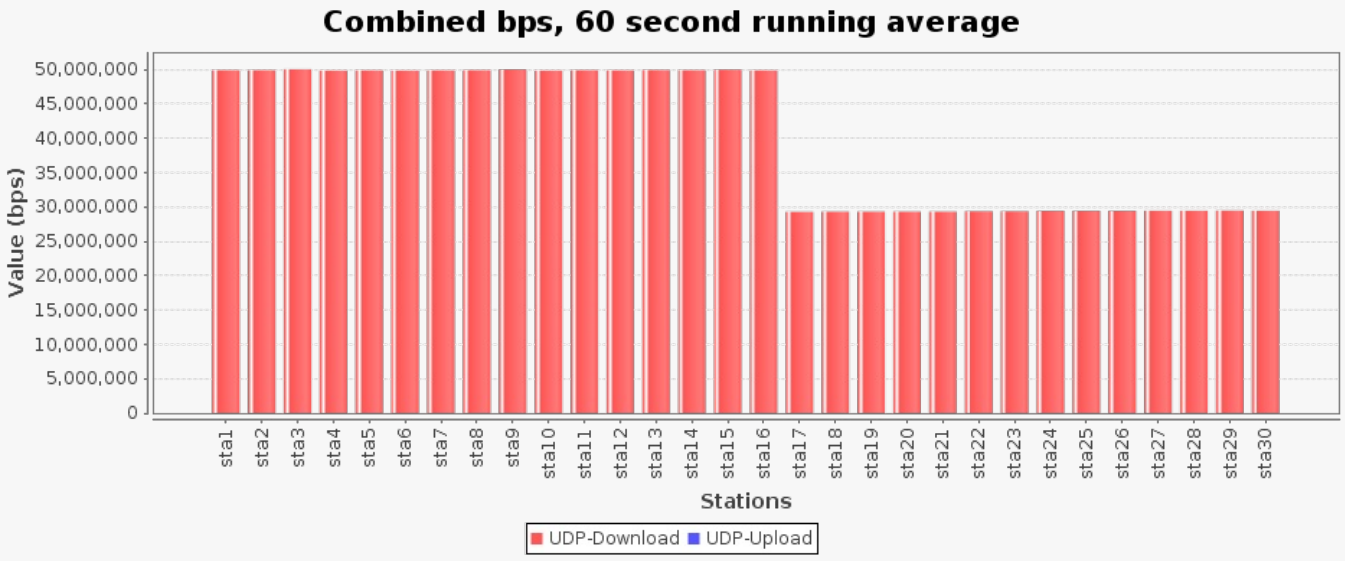
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 50000000 (50 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 30 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 29.292 Mbps Cx Ave: 40.344 Mbps Cx Max: 50.049 Mbps All Cx: 1.21 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.21 Gbps
Aggregated Rate: Min: 29.292 Mbps Avg: 40.344 Mbps Max: 50.049 Mbps

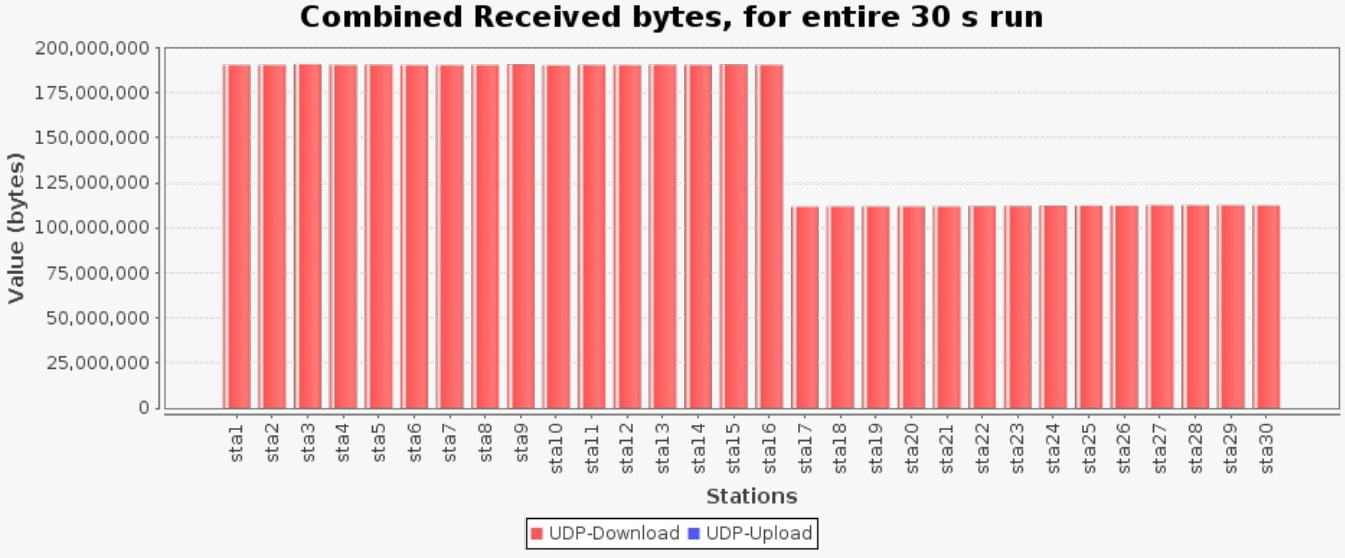
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 50000000 (50 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 30 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 106.543 MB Cx Ave: 146.792 MB Cx Max: 182.052 MB All Cx: 4.301 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.301 GB

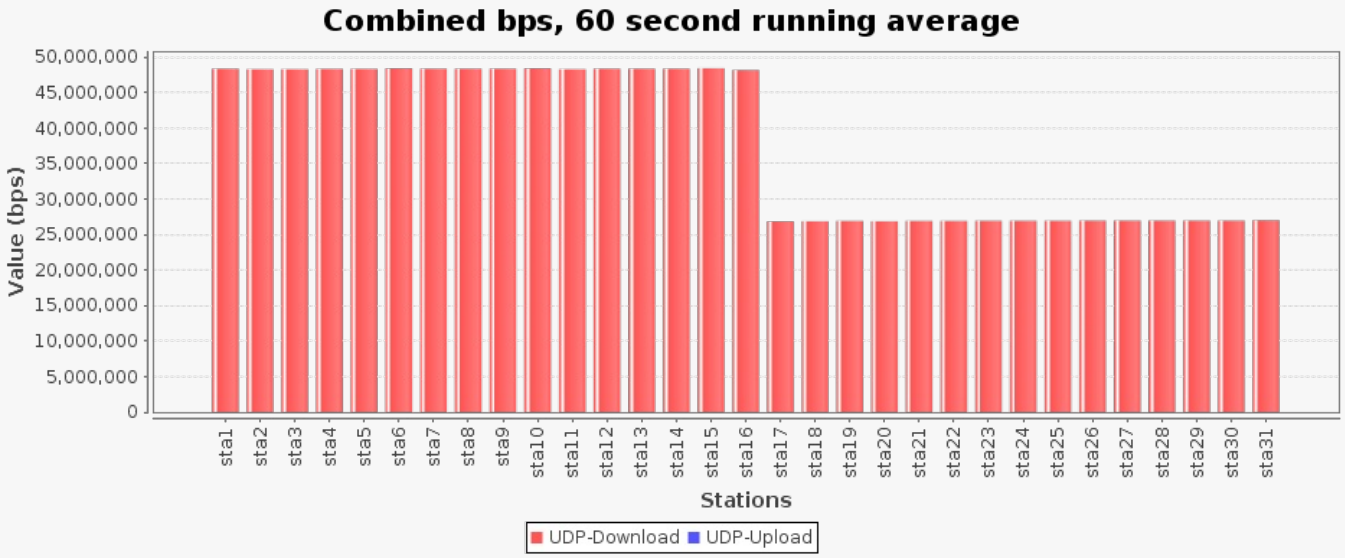
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 48387096 (48.387 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 31 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 26.865 Mbps Cx Ave: 38 Mbps Cx Max: 48.446 Mbps All Cx: 1.178 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.178 Gbps
Aggregated Rate: Min: 26.865 Mbps Avg: 38 Mbps Max: 48.446 Mbps

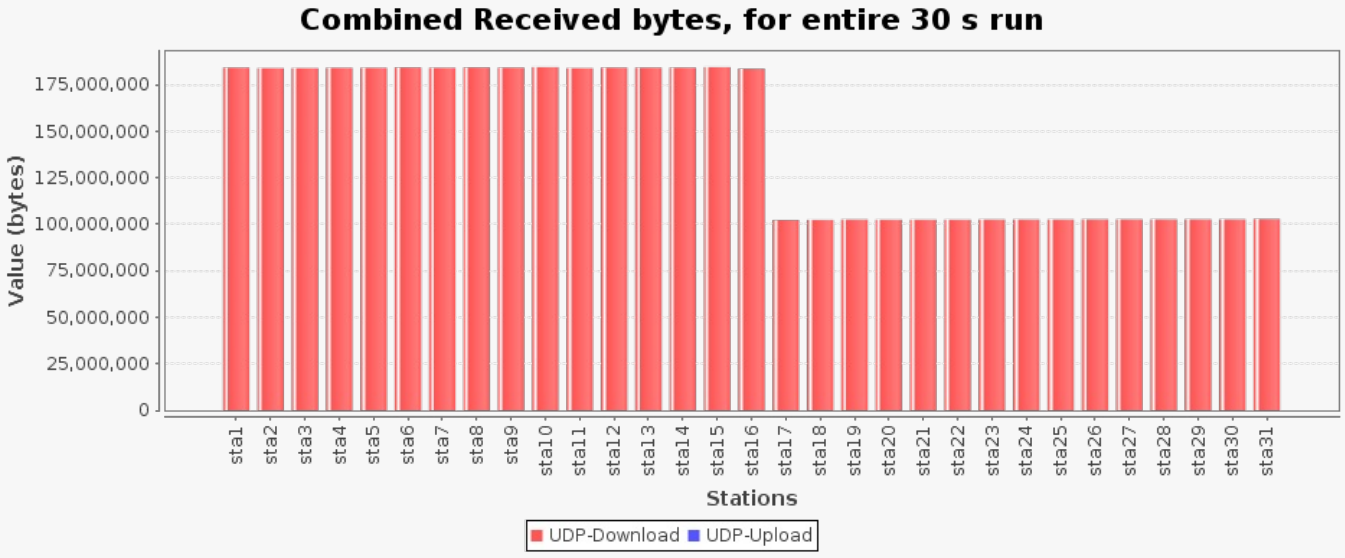
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 48387096 (48.387 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 31 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 97.572 MB Cx Ave: 137.982 MB Cx Max: 175.952 MB All Cx: 4.177 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.177 GB

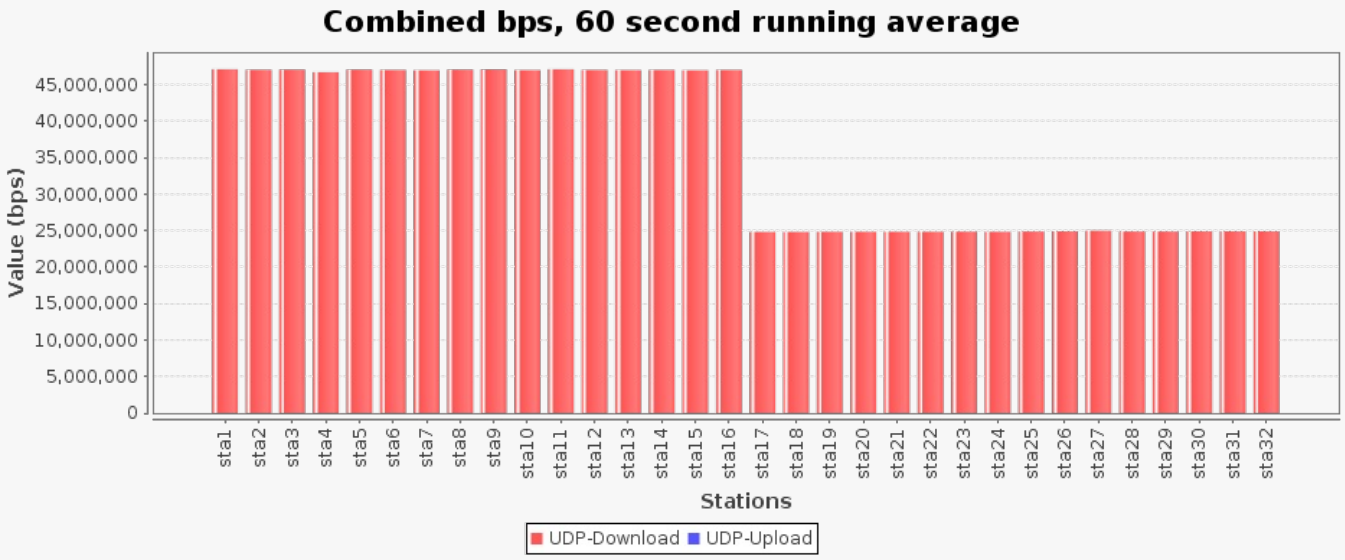
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



Requested Parameters:
Download Rate: Per station: 46875000 (46.875 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 32 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 24.834 Mbps Cx Ave: 35.96 Mbps Cx Max: 47.118 Mbps All Cx: 1.151 Gbps
Upload Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Total: 1.151 Gbps
Aggregated Rate: Min: 24.834 Mbps Avg: 35.96 Mbps Max: 47.118 Mbps

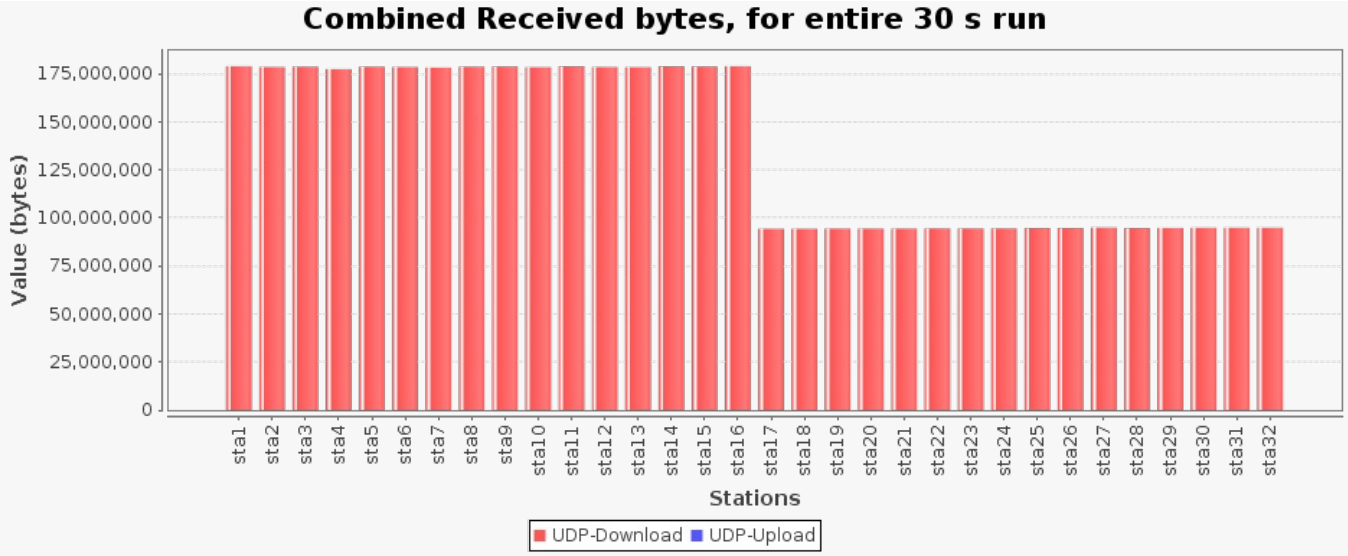
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



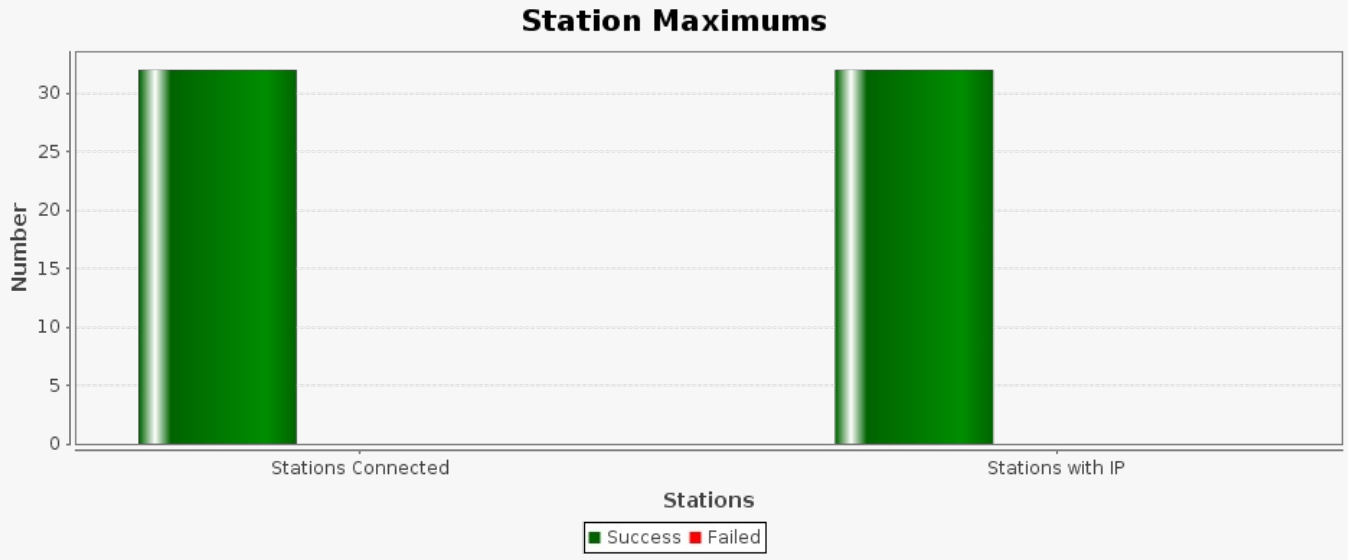
Requested Parameters:
Download Rate: Per station: 46875000 (46.875 Mbps) All: 1500000000 (1.5 Gbps)
Upload Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Total: 1500000000 (1.5 Gbps)
Station count: 32 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 90.002 MB Cx Ave: 130.312 MB Cx Max: 170.703 MB All Cx: 4.072 GB
Upload Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Total: 4.072 GB

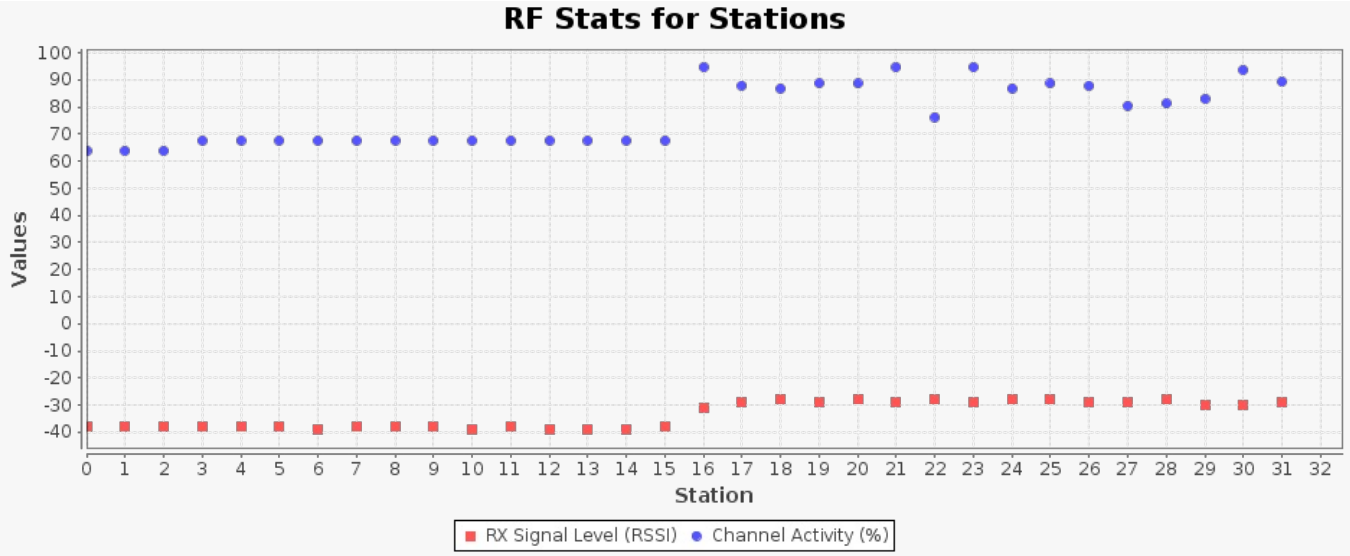
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



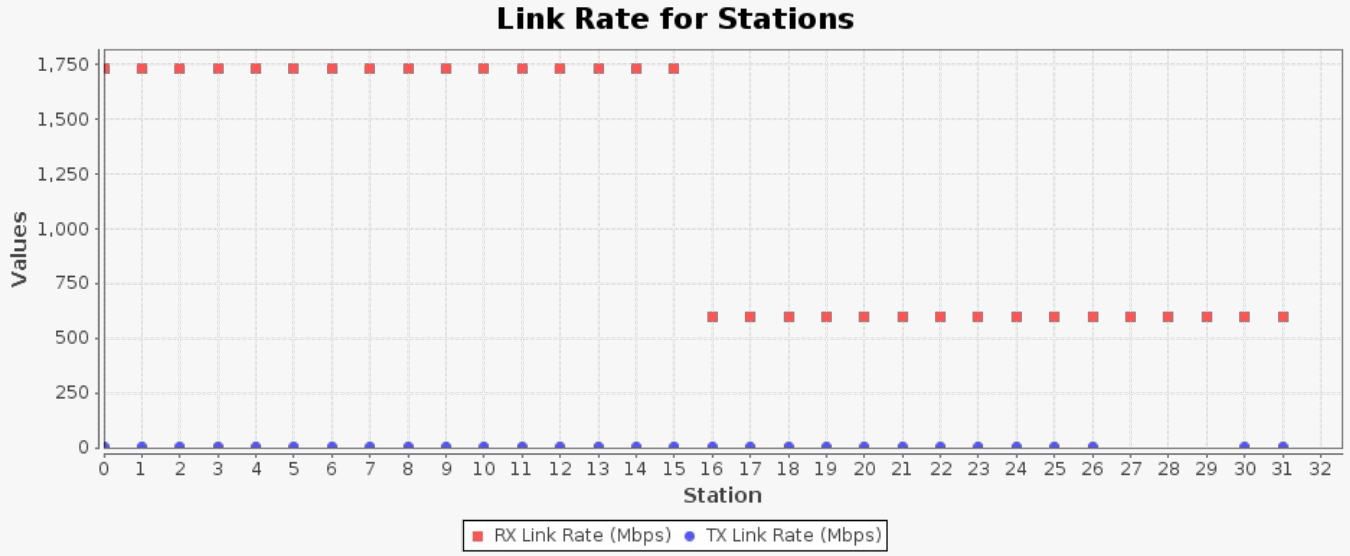
Maximum Stations Connected: 32
Stations NOT connected at this time: 0
Maximum Stations with IP Address: 32
Stations without IP at this time: 0



RF stats give an indication of how well how congested is the RF environment. Channel activity is what the wifi radio reports as the busy-time for the RF environment. It is expected that this be near 100% when LANforge is running at max speed, but at lower speeds, this should be a lower percentage unless the RF environment is busy with other systems.



Link rate stats give an indication of how well the rate-control is working. For rate-control, the 'RX' link rate corresponds to what the device-under-test is transmitting. If all of the stations are on the same radio, then the TX and RX encoding rates should be similar for all stations. If there is a definite pattern where some stations do not get good RX rate, then probably the device-under-test has rate-control problems. The TX rate is what LANforge is transmitting at.



Scan Results for SSIDs used in this test.

```
BSS f8:32:e4:53:af:a4(on sta1) -- associated
        TSF: 1709308139 usec (0d, 00:28:29)
        freq: 5745
        beacon interval: 100 TUs
        capability: ESS (0x0001)
        signal: -30.00 dBm
        last seen: 37 ms ago
        Information elements from Probe Response frame:
        SSID: ASUS_5G
        Supported rates: 6.0* 9.0 12.0* 18.0 24.0* 36.0 48.0 54.0
        BSS Load:
                 * station count: 16
                 * channel utilisation: 99/255
                 * available admission capacity: 0 [*32us]
        HT capabilities:
                Capabilities: 0x1ef
                        RX LDPC
                        HT20/HT40
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
                        TX STBC
                        RX STBC 1-stream
                        Max AMSDU length: 3839 bytes
                        No DSSS/CCK HT40
                Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
                Minimum RX AMPDU time spacing: 4 usec (0x05)
```

```
                HT RX MCS rate indexes supported: 0-31
                HT TX MCS rate indexes are undefined
        HT operation:
                 * primary channel: 149
                 * secondary channel offset: above
                 * STA channel width: any
                 * RIFS: 1
                 * HT protection: no
                 * non-GF present: 1
                 * OBSS non-GF present: 0
                 * dual beacon: 0
                 * dual CTS protection: 0
                 * STBC beacon: 0
                 * L-SIG TXOP Prot: 0
                 * PCO active: 0
                 * PCO phase: 0
        Extended capabilities:
                 * Extended Channel Switching
                 * BSS Transition
                 * Operating Mode Notification
                 * Max Number Of MSDUs In A-MSDU is unlimited
        VHT capabilities:
                VHT Capabilities (0x0f8b79b2):
                        Max MPDU length: 11454
                        Supported Channel Width: neither 160 nor 80+80
                        RX LDPC
                        short GI (80 MHz)
                        TX STBC
                        SU Beamformer
                        SU Beamformee
                        MU Beamformer
                VHT RX MCS set:
                        1 streams: MCS 0-9
                        2 streams: MCS 0-9
                        3 streams: MCS 0-9
                        4 streams: MCS 0-9
                        5 streams: not supported
                        6 streams: not supported
                        7 streams: not supported
                        8 streams: not supported
                VHT RX highest supported: 0 Mbps
                VHT TX MCS set:
                        1 streams: MCS 0-9
                        2 streams: MCS 0-9
                        3 streams: MCS 0-9
                        4 streams: MCS 0-9
                        5 streams: not supported
                        6 streams: not supported
                        7 streams: not supported
                        8 streams: not supported
                VHT TX highest supported: 0 Mbps
        VHT operation:
                 * channel width: 1 (80 MHz)
                 * center freq segment 1: 155
                 * center freq segment 2: 0
                 * VHT basic MCS set: 0x0000
        WMM:     * Parameter version 1
                 * u-APSD
                 * BE: CW 15-1023, AIFSN 3
                 * BK: CW 15-1023, AIFSN 7
                 * VI: CW 7-15, AIFSN 2, TXOP 3008 usec
                 * VO: CW 3-7, AIFSN 2, TXOP 1504 usec


BSS f8:32:e4:53:af:a0(on sta17) -- associated
        TSF: 1705350954 usec (0d, 00:28:25)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS ShortSlotTime (0x0401)
        signal: -22.00 dBm
        last seen: 59 ms ago
        Information elements from Probe Response frame:
        SSID: ASUS
        Supported rates: 1.0* 2.0* 5.5* 11.0* 18.0 24.0 36.0 54.0
        DS Parameter set: channel 6
        ERP:
        Extended supported rates: 6.0 9.0 12.0 48.0
        BSS Load:
                 * station count: 16
                 * channel utilisation: 233/255
                 * available admission capacity: 0 [*32us]
        HT capabilities:
                Capabilities: 0x11ef
                        RX LDPC
                        HT20/HT40
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
                        TX STBC
                        RX STBC 1-stream
                        Max AMSDU length: 3839 bytes
                        DSSS/CCK HT40
                Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
                Minimum RX AMPDU time spacing: 4 usec (0x05)
                HT RX MCS rate indexes supported: 0-32
                HT TX MCS rate indexes are undefined
        HT operation:
                 * primary channel: 6
                 * secondary channel offset: above
                 * STA channel width: any
                 * RIFS: 1
                 * HT protection: no
```

```
                * non-GF present: 1
                * OBSS non-GF present: 0
                * dual beacon: 0
                * dual CTS protection: 0
                * STBC beacon: 0
                * L-SIG TXOP Prot: 0
                * PCO active: 0
                * PCO phase: 0
        Extended capabilities:
                * Extended Channel Switching
                * BSS Transition
                * Operating Mode Notification
        WPS:    * Version: 1.0
                * Wi-Fi Protected Setup State: 2 (Configured)
                * Response Type: 3 (AP)
                * UUID: f9b59eba-d4d9-9978-ff31-b0bd515df2ca
                * Manufacturer: ASUSTeK Computer Inc.
                * Model: Wi-Fi Protected Setup Router
                * Model Number: RT-AC3100
                * Serial Number:
                * Primary Device Type: 6-0050f204-1
                * Device name: RT-AC3100
                * Config methods: Display
                * RF Bands: 0x1
                * Unknown TLV (0x1049, 6 bytes): 00 37 2a 00 01 20
        WMM:    * Parameter version 1
                * u-APSD
                * BE: CW 15-1023, AIFSN 3
                * BK: CW 15-1023, AIFSN 7
                * VI: CW 7-15, AIFSN 2, TXOP 3008 usec
                * VO: CW 3-7, AIFSN 2, TXOP 1504 usec




Scan Results for SSIDs NOT used in this test.

BSS f8:32:e4:53:af:a5(on sta1)
        TSF: 1709308556 usec (0d, 00:28:29)
        freq: 5745
        beacon interval: 100 TUs
        capability: ESS Privacy (0x0011)
        signal: -31.00 dBm
        last seen: 1320 ms ago
        Information elements from Probe Response frame:
        SSID: ASUS_5G_Guest1
        Supported rates: 6.0* 9.0 12.0* 18.0 24.0* 36.0 48.0 54.0
        RSN:    * Version: 1
                * Group cipher: CCMP
                * Pairwise ciphers: CCMP
                * Authentication suites: PSK
                * Capabilities: 16-PTKSA-RC 1-GTKSA-RC (0x000c)
        BSS Load:
                * station count: 0
                * channel utilisation: 99/255
                * available admission capacity: 0 [*32us]
        HT capabilities:
                Capabilities: 0x1ef
                        RX LDPC
                        HT20/HT40
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
                        TX STBC
                        RX STBC 1-stream
                        Max AMSDU length: 3839 bytes
                        No DSSS/CCK HT40
                Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
                Minimum RX AMPDU time spacing: 4 usec (0x05)
                HT RX MCS rate indexes supported: 0-31
                HT TX MCS rate indexes are undefined
        HT operation:
                * primary channel: 149
                * secondary channel offset: above
                * STA channel width: any
                * RIFS: 1
                * HT protection: no
                * non-GF present: 1
                * OBSS non-GF present: 0
                * dual beacon: 0
                * dual CTS protection: 0
                * STBC beacon: 0
                * L-SIG TXOP Prot: 0
                * PCO active: 0
                * PCO phase: 0
        Extended capabilities:
                * Extended Channel Switching
                * BSS Transition
                * Max Number Of MSDUs In A-MSDU is unlimited
        VHT capabilities:
                VHT Capabilities (0x0f8b79b2):
                        Max MPDU length: 11454
                        Supported Channel Width: neither 160 nor 80+80
                        RX LDPC
                        short GI (80 MHz)
                        TX STBC
                        SU Beamformer
                        SU Beamformee
```

```
                MU Beamformer
            VHT RX MCS set:
                1 streams: MCS 0-9
                2 streams: MCS 0-9
                3 streams: MCS 0-9
                4 streams: MCS 0-9
                5 streams: not supported
                6 streams: not supported
                7 streams: not supported
                8 streams: not supported
            VHT RX highest supported: 0 Mbps
            VHT TX MCS set:
                1 streams: MCS 0-9
                2 streams: MCS 0-9
                3 streams: MCS 0-9
                4 streams: MCS 0-9
                5 streams: not supported
                6 streams: not supported
                7 streams: not supported
                8 streams: not supported
            VHT TX highest supported: 0 Mbps
        VHT operation:
             * channel width: 1 (80 MHz)
             * center freq segment 1: 155
             * center freq segment 2: 0
             * VHT basic MCS set: 0x0000
        WMM:     * Parameter version 1
             * u-APSD
             * BE: CW 15-1023, AIFSN 3
             * BK: CW 15-1023, AIFSN 7
             * VI: CW 7-15, AIFSN 2, TXOP 3008 usec
             * VO: CW 3-7, AIFSN 2, TXOP 1504 usec


BSS f8:32:e4:53:af:a1(on sta17)
        TSF: 1705354593 usec (0d, 00:28:25)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS Privacy ShortSlotTime (0x0411)
        signal: -20.00 dBm
        last seen: 877 ms ago
        Information elements from Probe Response frame:
        SSID: ASUS_Guest1
        Supported rates: 1.0* 2.0* 5.5* 11.0* 18.0 24.0 36.0 54.0
        DS Parameter set: channel 6
        ERP:
        Extended supported rates: 6.0 9.0 12.0 48.0
        RSN:     * Version: 1
             * Group cipher: CCMP
             * Pairwise ciphers: CCMP
             * Authentication suites: PSK
             * Capabilities: 16-PTKSA-RC 1-GTKSA-RC (0x000c)
        BSS Load:
             * station count: 0
             * channel utilisation: 233/255
             * available admission capacity: 0 [*32us]
        HT capabilities:
            Capabilities: 0x11ef
                RX LDPC
                HT20/HT40
                SM Power Save disabled
                RX HT20 SGI
                RX HT40 SGI
                TX STBC
                RX STBC 1-stream
                Max AMSDU length: 3839 bytes
                DSSS/CCK HT40
            Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
            Minimum RX AMPDU time spacing: 4 usec (0x05)
            HT RX MCS rate indexes supported: 0-32
            HT TX MCS rate indexes are undefined
        HT operation:
             * primary channel: 6
             * secondary channel offset: above
             * STA channel width: any
             * RIFS: 1
             * HT protection: no
             * non-GF present: 1
             * OBSS non-GF present: 0
             * dual beacon: 0
             * dual CTS protection: 0
             * STBC beacon: 0
             * L-SIG TXOP Prot: 0
             * PCO active: 0
             * PCO phase: 0
        Extended capabilities:
             * Extended Channel Switching
             * BSS Transition
        WMM:     * Parameter version 1
             * u-APSD
             * BE: CW 15-1023, AIFSN 3
             * BK: CW 15-1023, AIFSN 7
             * VI: CW 7-15, AIFSN 2, TXOP 3008 usec
             * VO: CW 3-7, AIFSN 2, TXOP 1504 usec
```