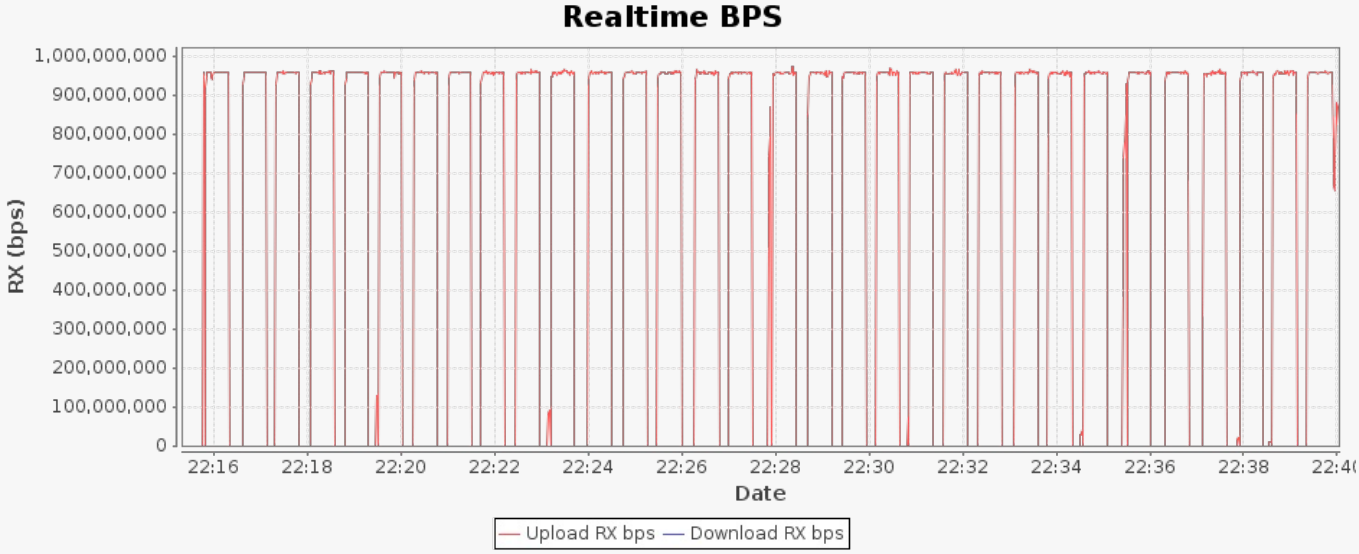
WiFi Capacity Test

Fri Jun 14 22:40:14 PDT 2019

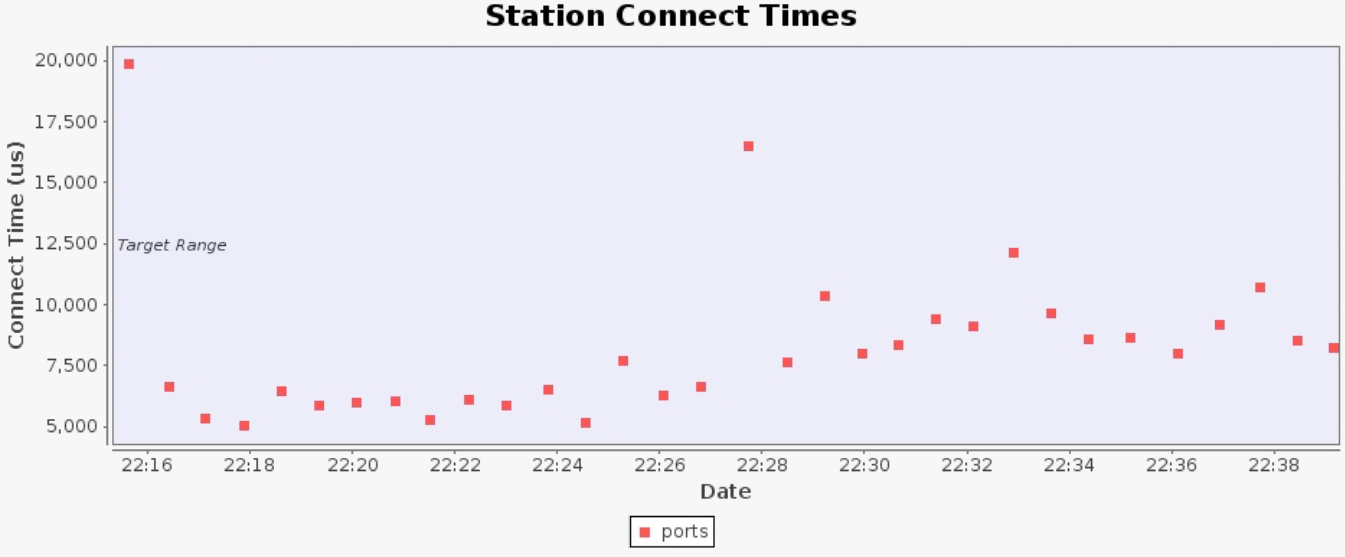
Objective

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.

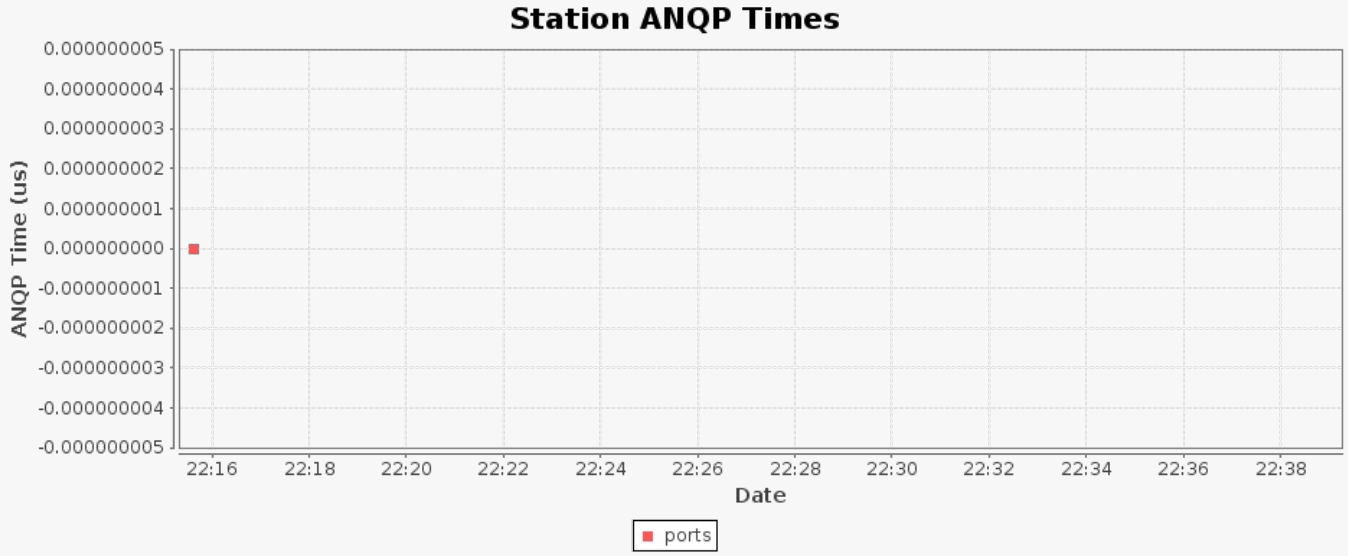
Realtime Graph shows summary download and upload RX bps of connections created by this test.



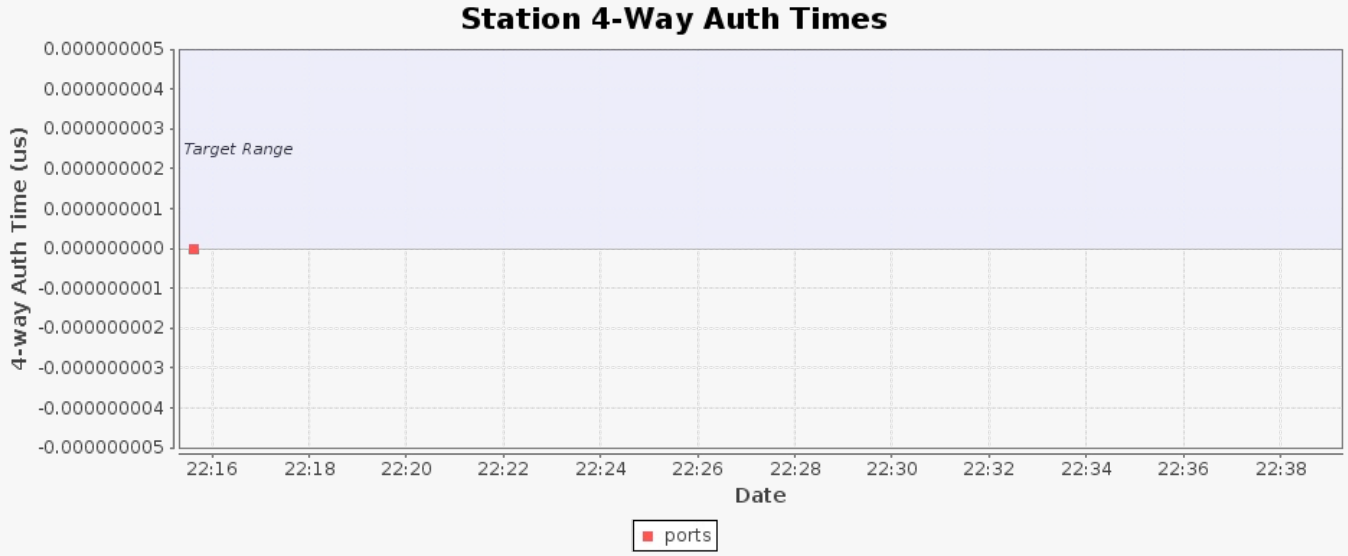
Station connect time is calculated from the initial Authenticate message through the completion of Open or RSN association/authentication.



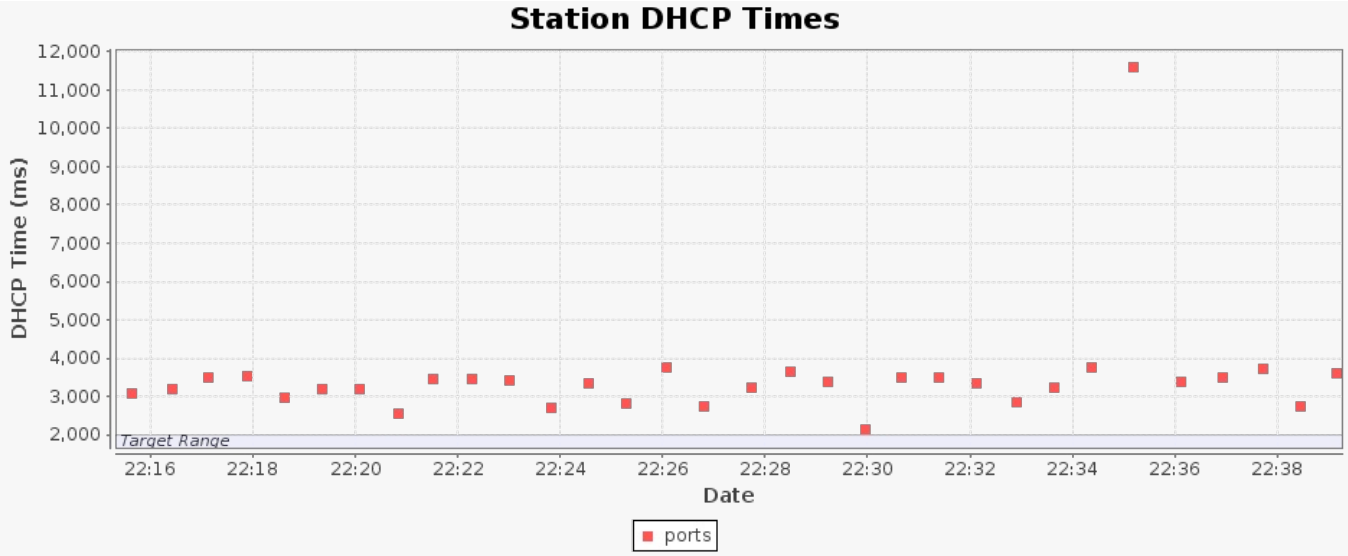
This measures the time it takes to complete the ANQP communication. This is used in Hot-Spot 2.0 (HS20) negotiation and discovery.



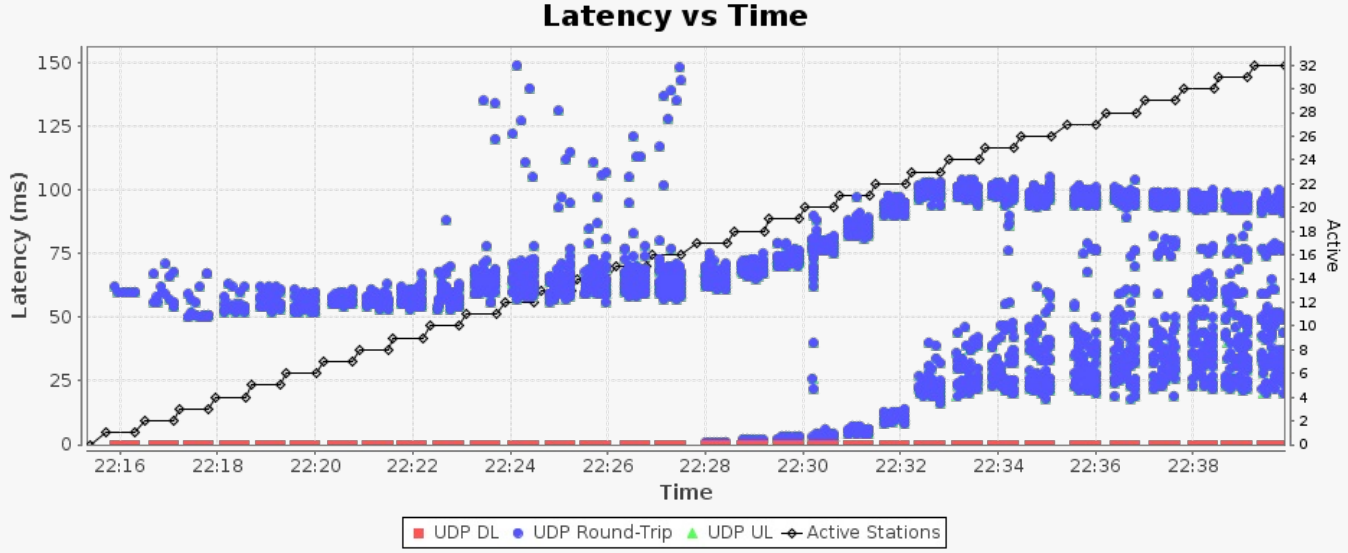
This measures the time it takes to complete the 4-way Authentication used by WPA encryption. If this increases as more stations are added, it may indicate scalability problems.



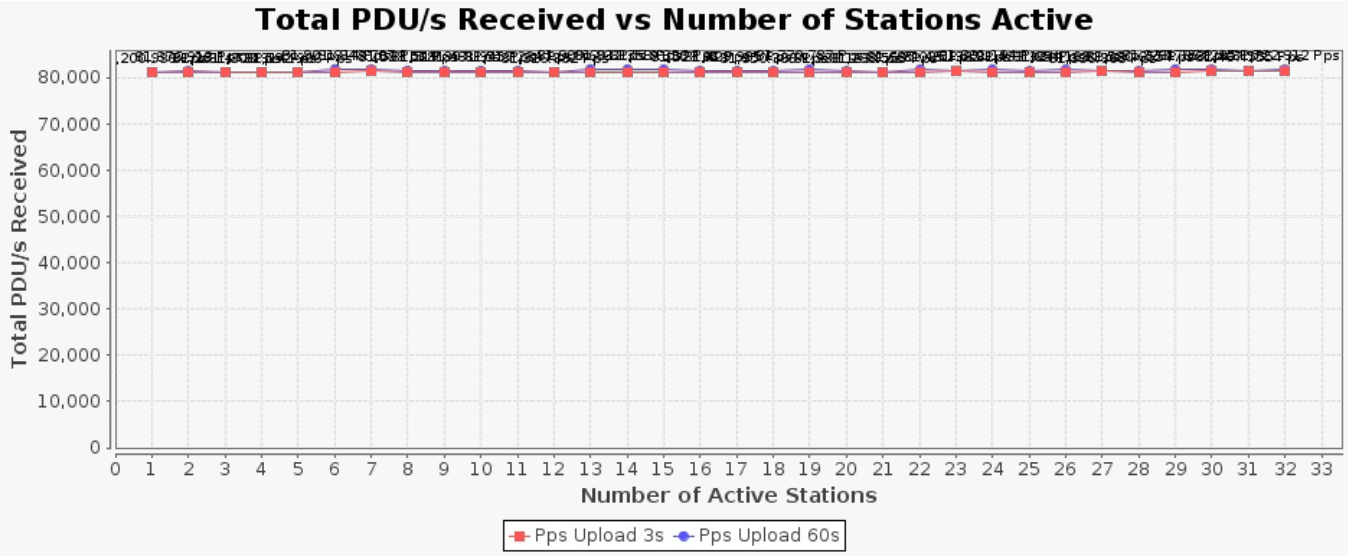
This measures the time it takes to acquire a DHCP lease. The DHCP protocol broadcasts at least one discovery message and then waits a second or two before trying to aquire a lease. So, longer times here are usually not a problem. If the time goes up as more stations associate then it may indicate scalability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



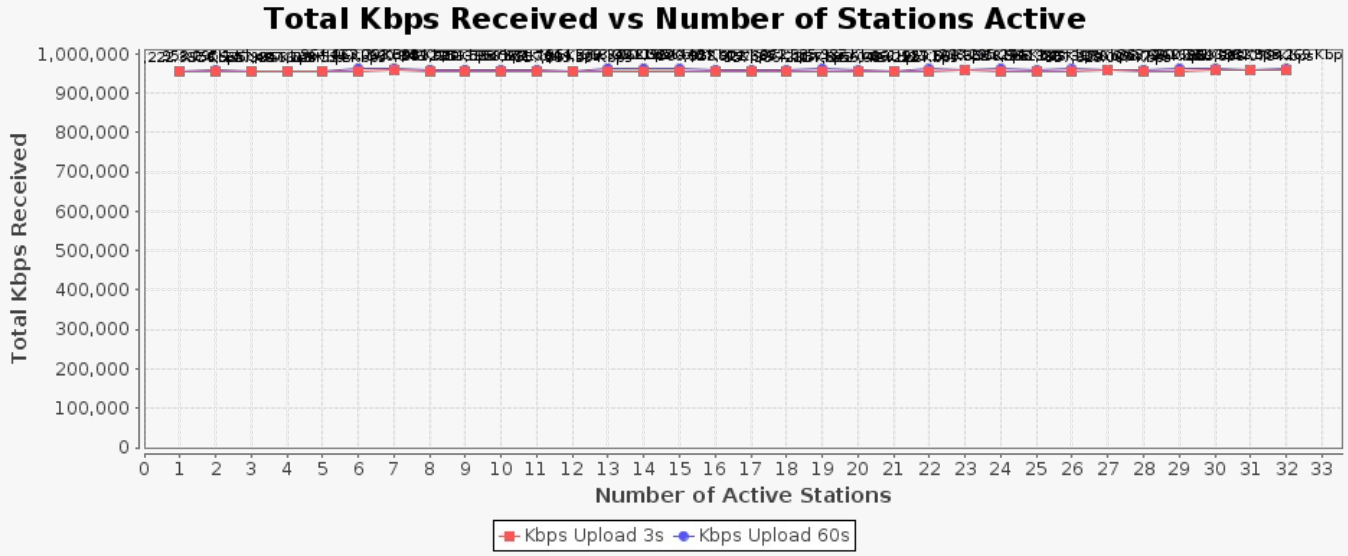
This measures the one-way latency reported by LANforge. Much of the latency will be in the LANforge itself when transmitting at maximum speeds because LANforge will have fairly large send buffers. You can force the send buffers smaller to decrease this. But, the device-under-test can also influence over-all 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.



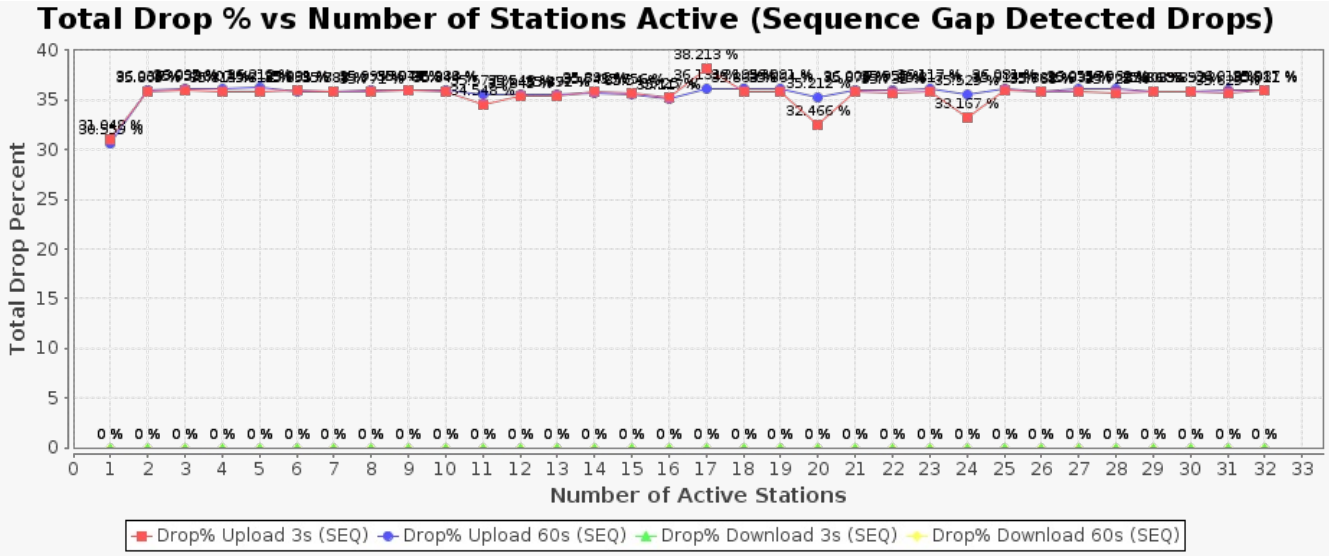
Protocol-Data-Units received. For TCP, this does not mean much, but for UDP connections, this correlates to packet size. If the PDU size is larger than what fits into a single frame, then the network stack will segment it accordingly. A well behaving system will show about the same rate as stations increase.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



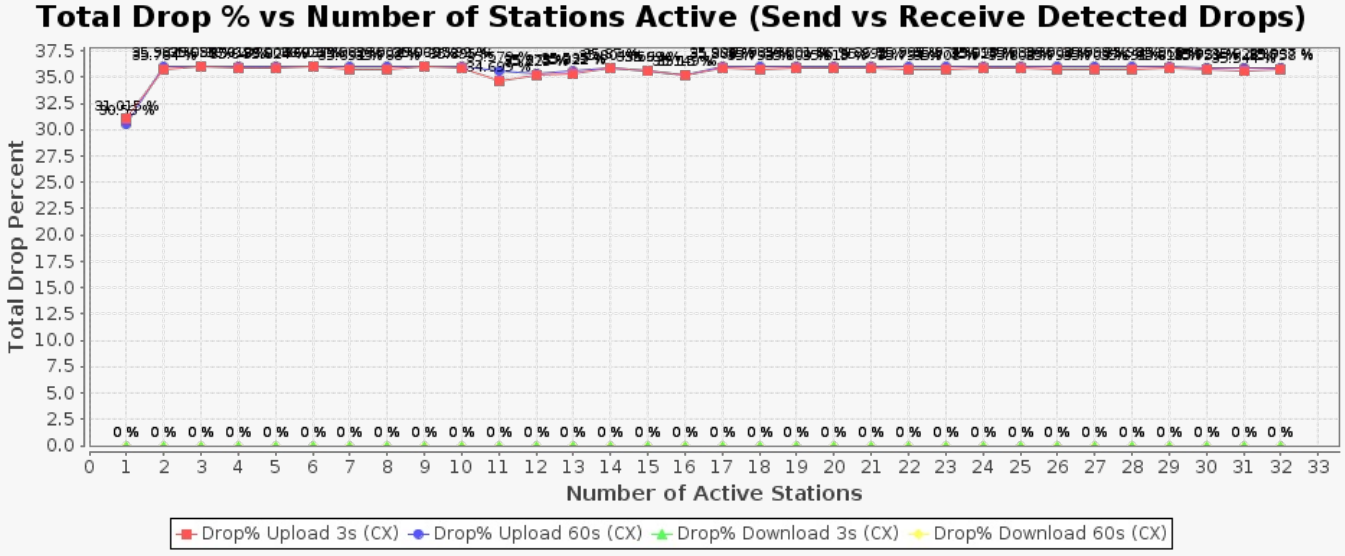
Total bits-per-second transferred. This only counts the protocol payload, so it will not count the Ethernet, IP, UDP, TCP or other header overhead. A well behaving system will show about the same rate as stations increase. If the rate decreases significantly as stations increase, then it is not scaling 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.



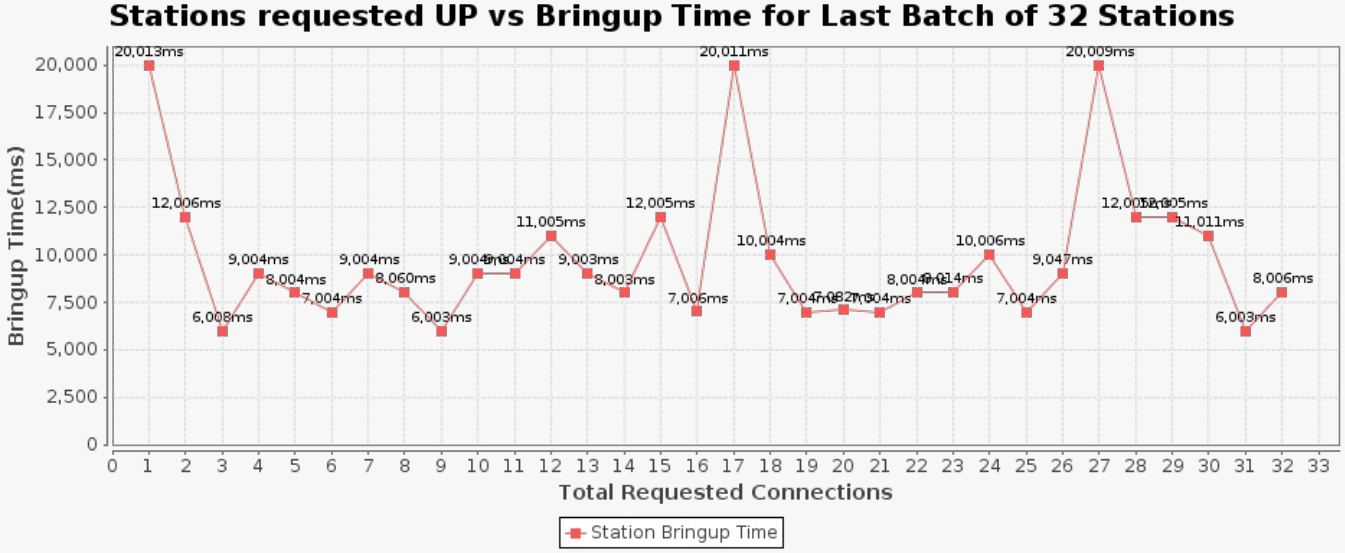
This packet loss is calculated based on the sequence-gap detected drops. If the device-under-test is reordering packets, then this value may be incorrect. Check the Layer-3 Endpoint out-of-order column if this graph is significantly different from the cx-detected-drop graph above.



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.



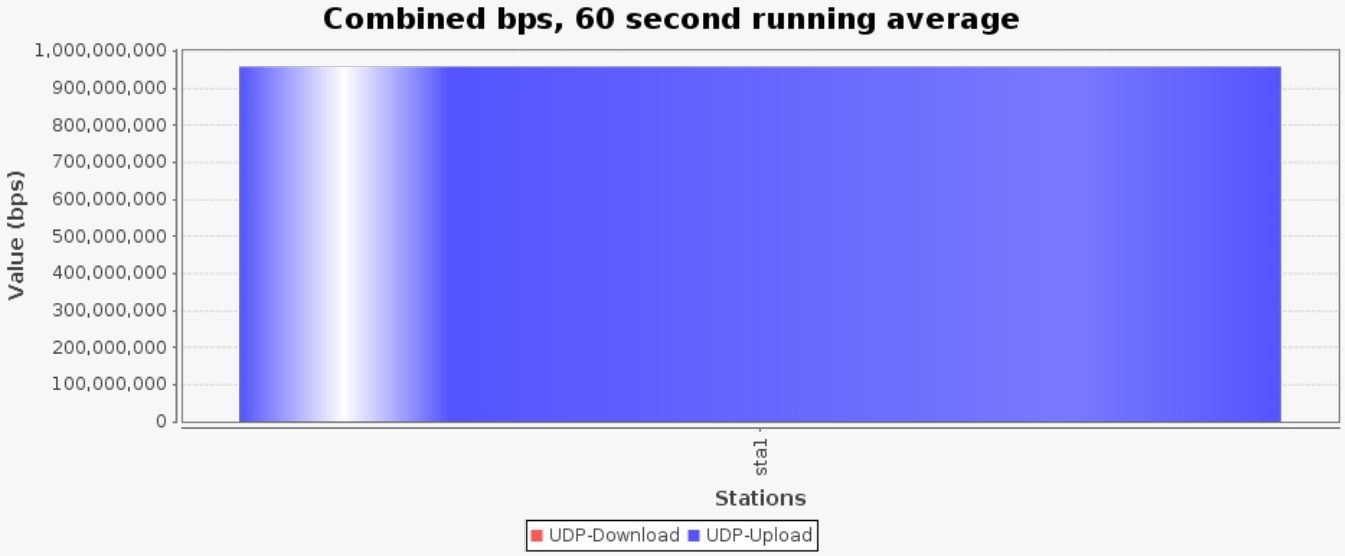
Wifi-Capacity Test requested values	
Station Increment:	1
Loop Iterations:	Single (1)
Duration:	30 sec (30 s)
Protocol:	UDP-IPv4
Layer-4 Endpoint:	NONE
Payload Size:	AUTO
MSS	AUTO
Total Download Rate:	Zero (0 bps)
Total Upload Rate:	1.5G
Percentage TCP Rate:	10% (10%)
Randomize Rates	true
Leave Ports 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: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 1500000000 (1.5 Gbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 1 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:

Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 957.35 Mbps Cx Ave: 957.35 Mbps Cx Max: 957.35 Mbps All Cx: 957.35 Mbps
Total: 957.35 Mbps
Aggregated Rate: Min: 957.35 Mbps Avg: 957.35 Mbps Max: 957.35 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: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 1500000000 (1.5 Gbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 1 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 3.393 GB Cx Ave: 3.393 GB Cx Max: 3.393 GB All Cx: 3.393 GB
Total: 3.393 GB

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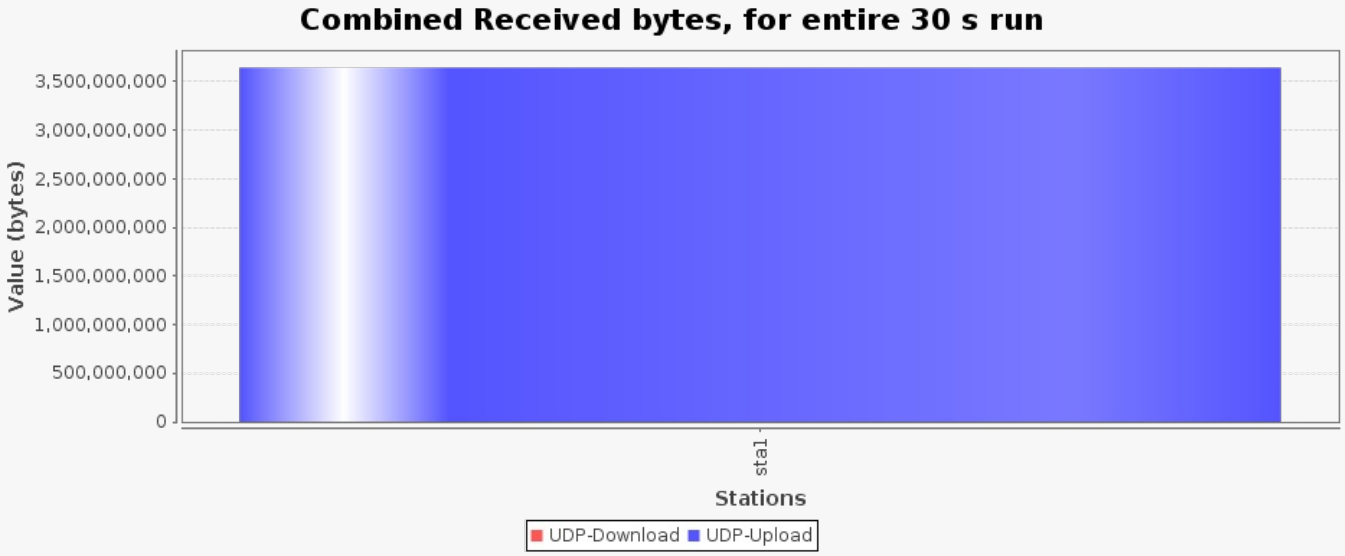

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 750000000 (750 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 2 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 478.314 Mbps Cx Ave: 478.59 Mbps Cx Max: 478.866 Mbps All Cx: 957.179 Mbps
Total: 957.179 Mbps
Aggregated Rate: Min: 478.314 Mbps Avg: 478.59 Mbps Max: 478.866 Mbps

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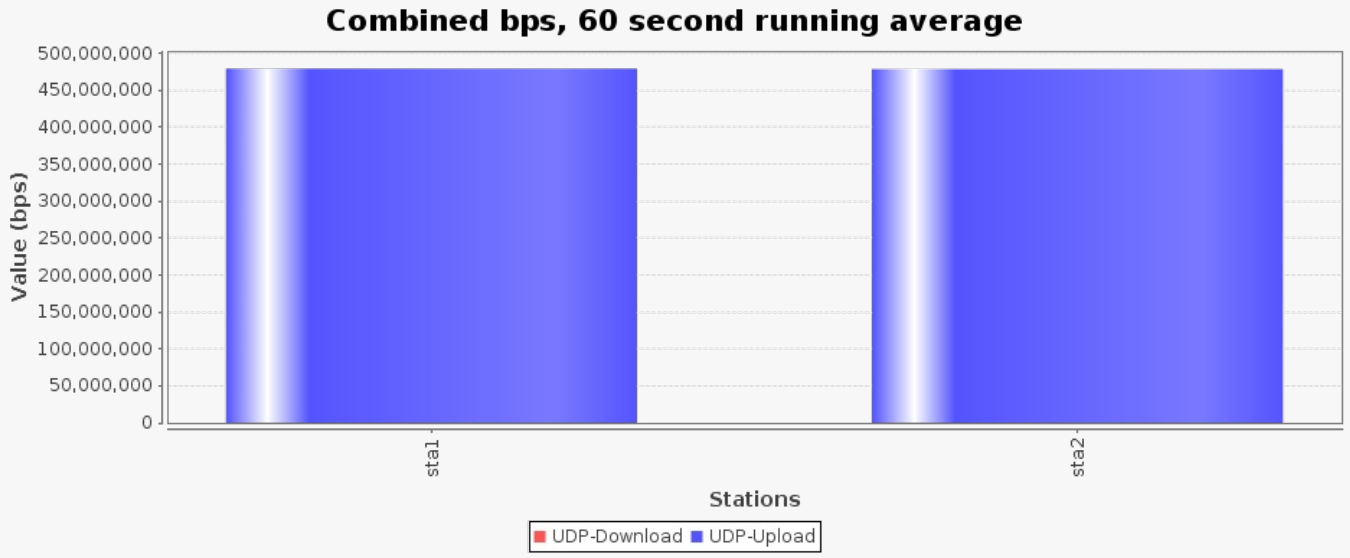

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 750000000 (750 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 2 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 1.691 GB Cx Ave: 1.7 GB Cx Max: 1.709 GB All Cx: 3.4 GB
Total: 3.4 GB

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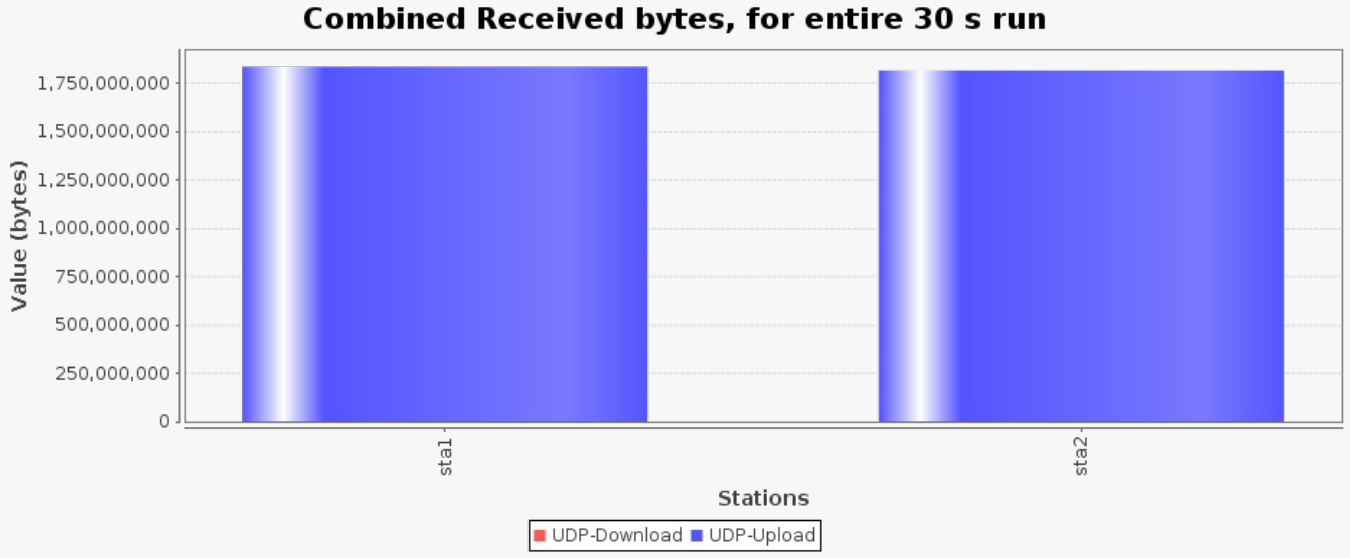

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 500000000 (500 Mbps) All: 1500000000 (1.5 Gbps)

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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 305.148 Mbps Cx Ave: 319.076 Mbps Cx Max: 328.648 Mbps All Cx: 957.229 Mbps
Total: 957.229 Mbps
Aggregated Rate: Min: 305.148 Mbps Avg: 319.076 Mbps Max: 328.648 Mbps

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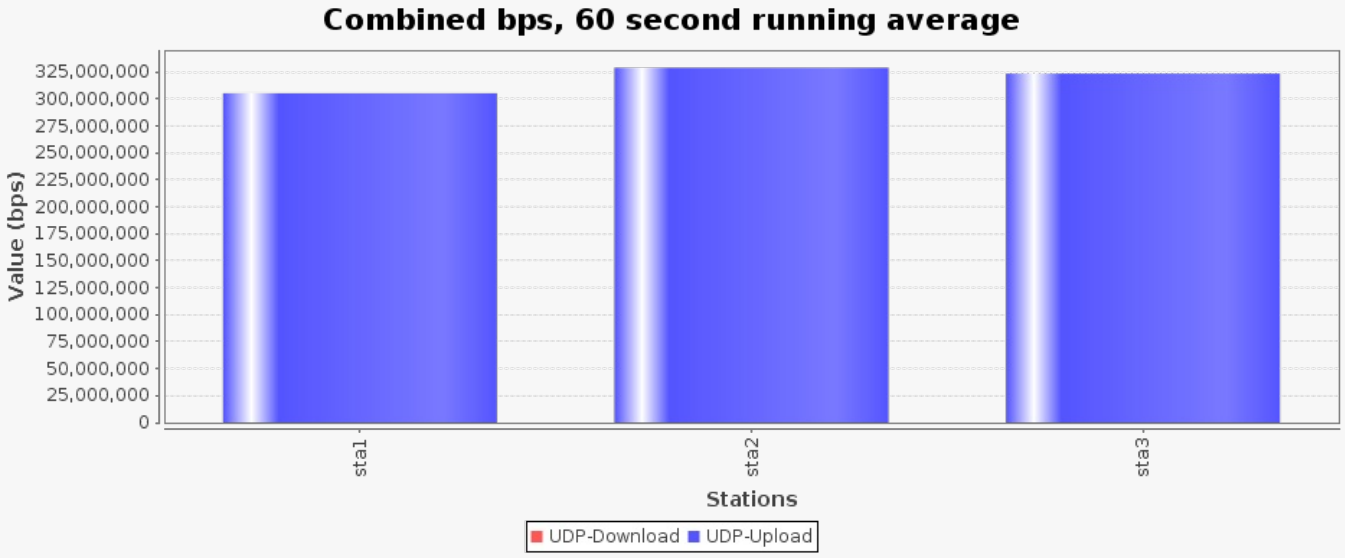

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 500000000 (500 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 3 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 1.13 GB Cx Ave: 1.133 GB Cx Max: 1.135 GB All Cx: 3.398 GB
Total: 3.398 GB

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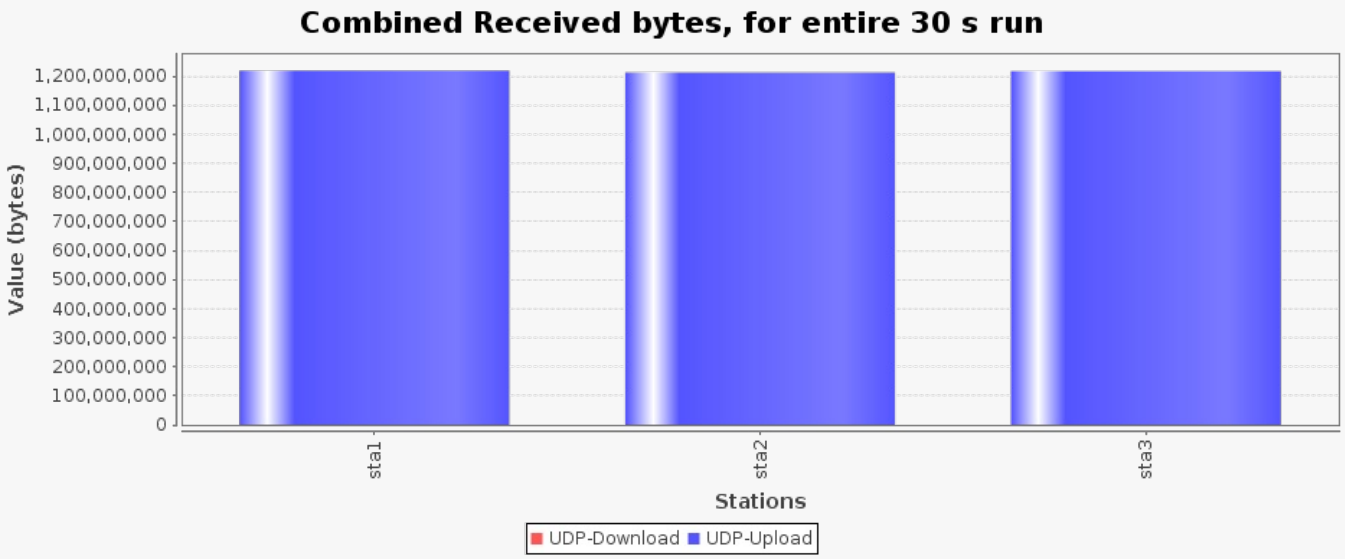

Requested Parameters:

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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 213.122 Mbps Cx Ave: 239.311 Mbps Cx Max: 252.148 Mbps All Cx: 957.242 Mbps
Total: 957.242 Mbps
Aggregated Rate: Min: 213.122 Mbps Avg: 239.311 Mbps Max: 252.148 Mbps

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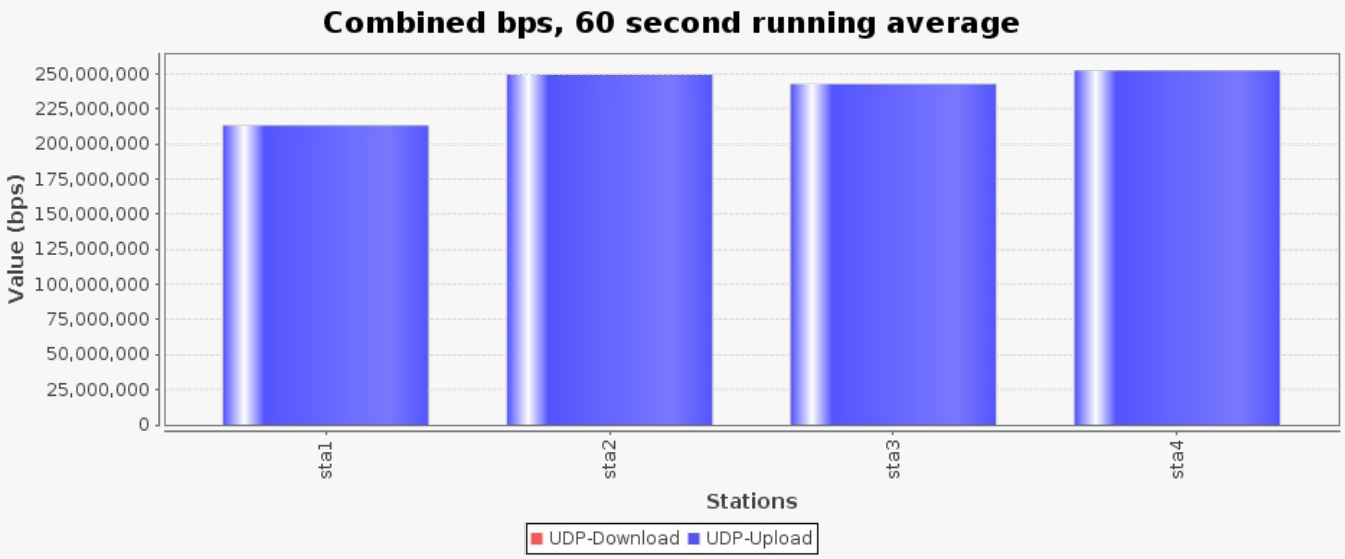

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 375000000 (375 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 4 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 849.836 MB Cx Ave: 869.858 MB Cx Max: 880.806 MB All Cx: 3.398 GB
Total: 3.398 GB

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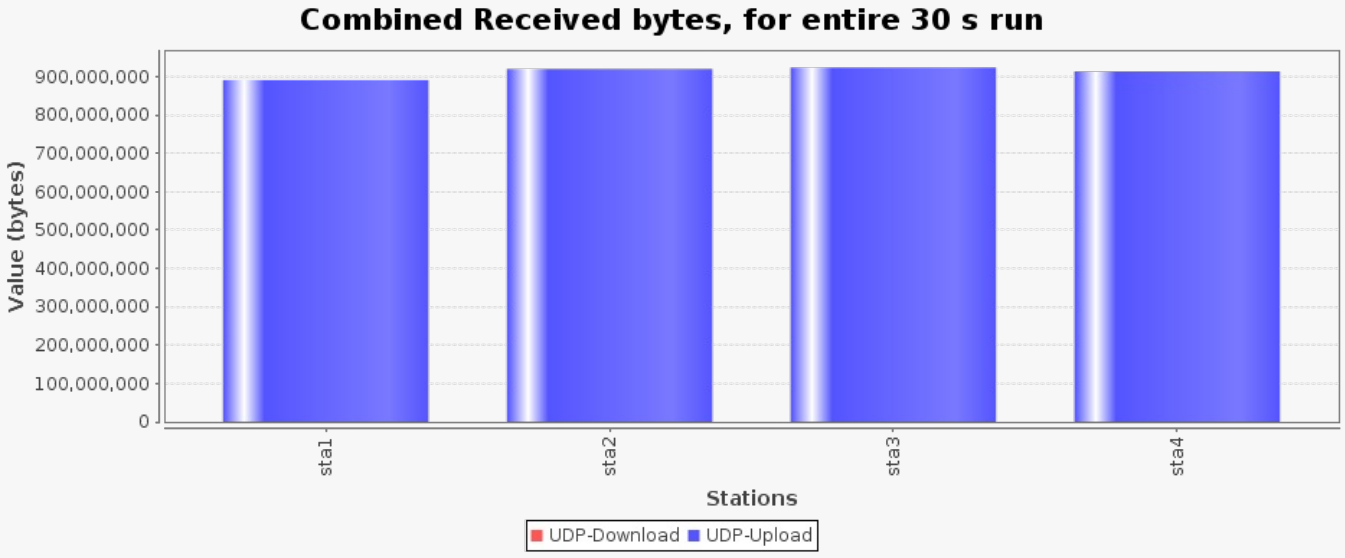

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 300000000 (300 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 5 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 188.065 Mbps Cx Ave: 191.46 Mbps Cx Max: 194.119 Mbps All Cx: 957.301 Mbps
Total: 957.301 Mbps
Aggregated Rate: Min: 188.065 Mbps Avg: 191.46 Mbps Max: 194.119 Mbps

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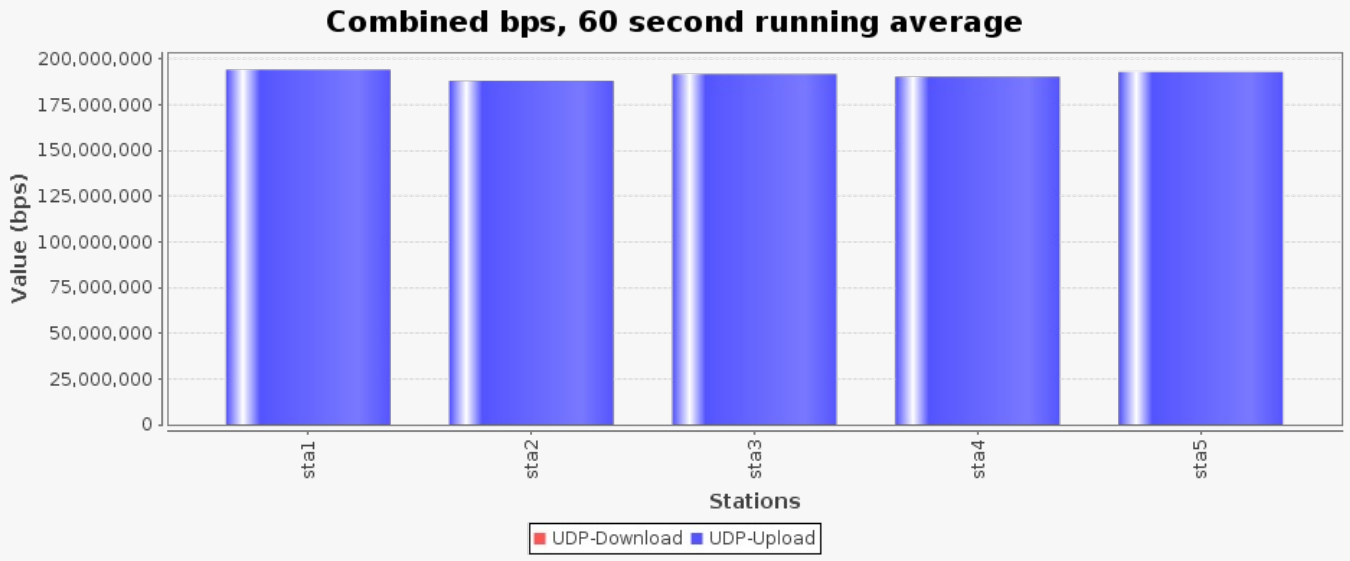

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 300000000 (300 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 5 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 622.871 MB Cx Ave: 695.985 MB Cx Max: 717.077 MB All Cx: 3.398 GB
Total: 3.398 GB

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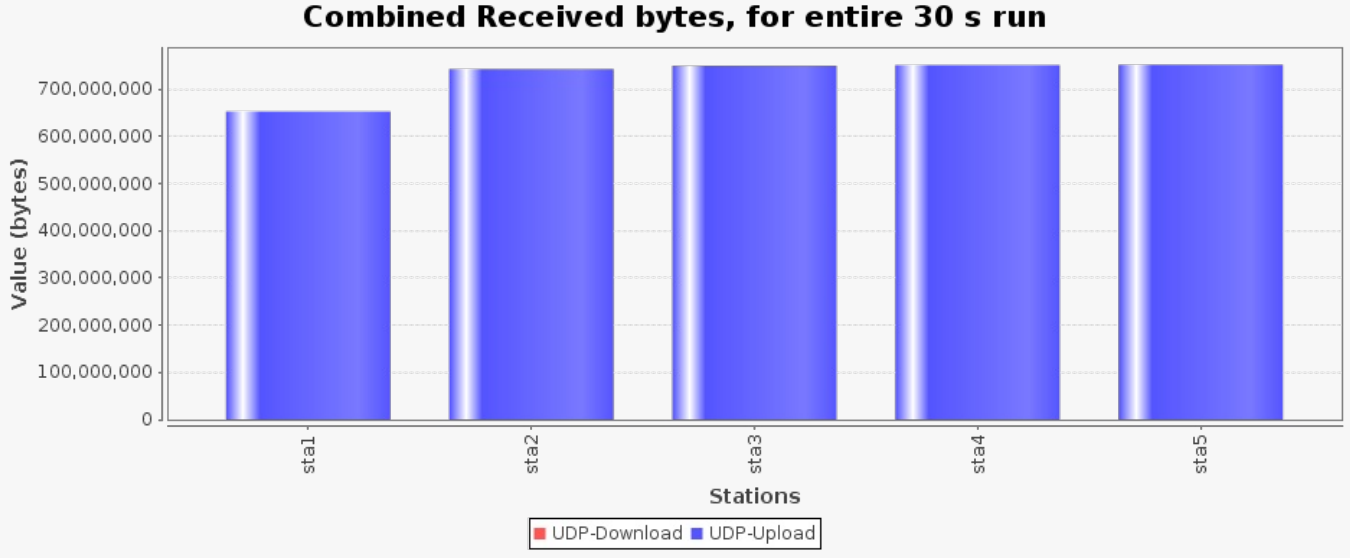

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 250000000 (250 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 6 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 138.691 Mbps Cx Ave: 159.41 Mbps Cx Max: 175.533 Mbps All Cx: 956.461 Mbps
Total: 956.461 Mbps
Aggregated Rate: Min: 138.691 Mbps Avg: 159.41 Mbps Max: 175.533 Mbps

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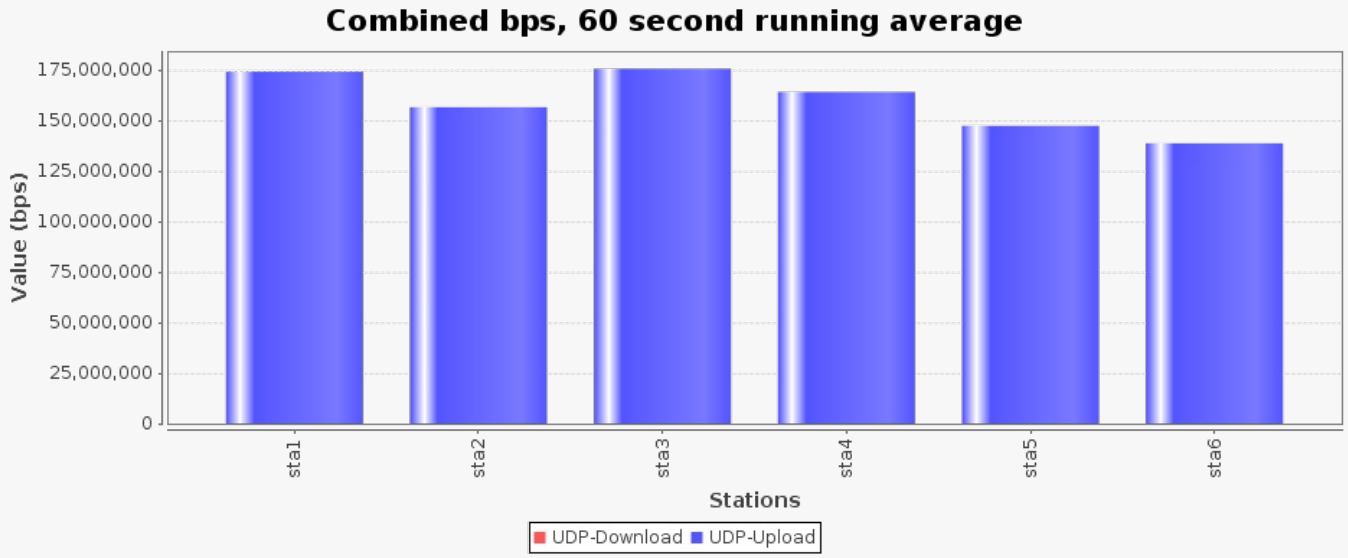

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 250000000 (250 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 6 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 543.938 MB Cx Ave: 580.032 MB Cx Max: 615.167 MB All Cx: 3.399 GB
Total: 3.399 GB

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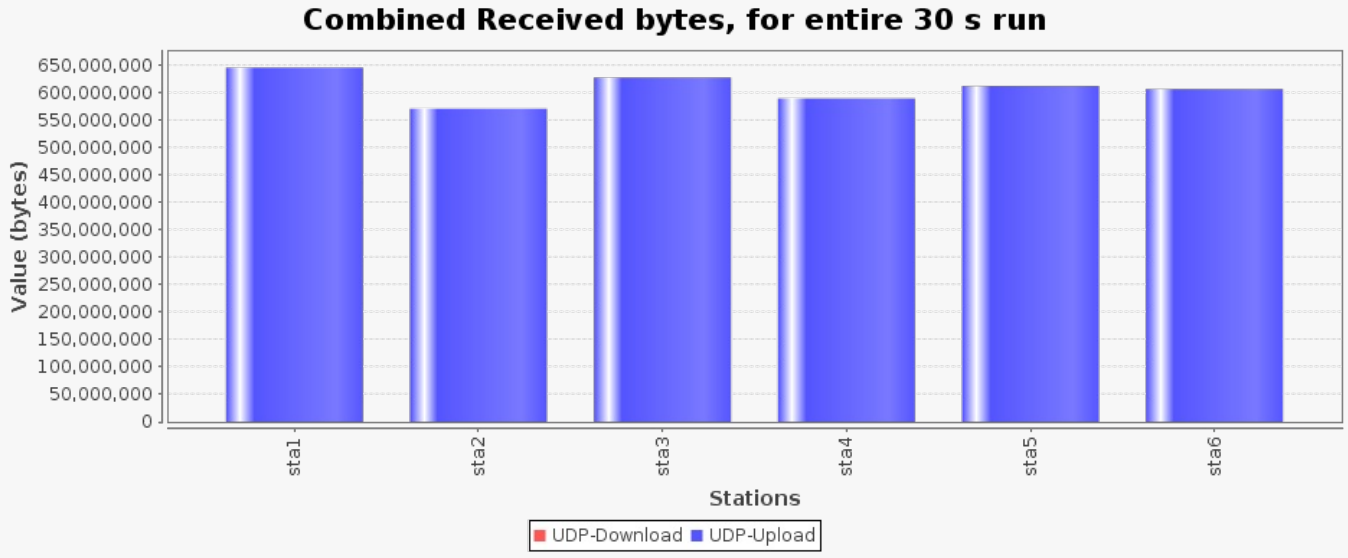

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 214285714 (214.286 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 7 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 133.467 Mbps Cx Ave: 136.941 Mbps Cx Max: 140.21 Mbps All Cx: 958.588 Mbps
Total: 958.588 Mbps
Aggregated Rate: Min: 133.467 Mbps Avg: 136.941 Mbps Max: 140.21 Mbps

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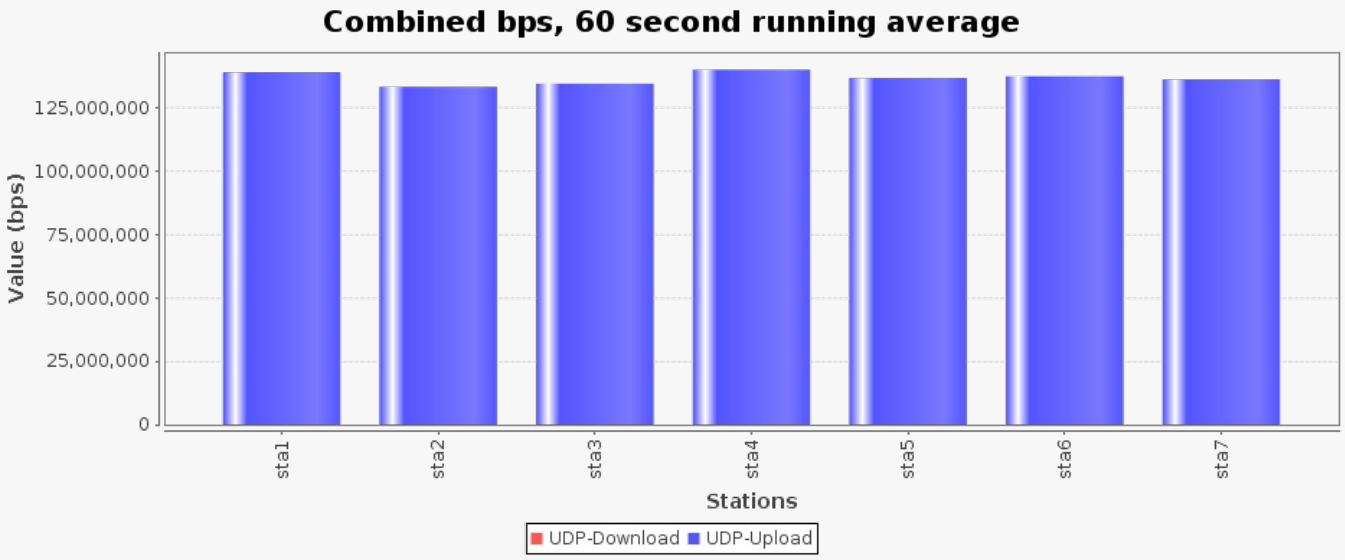

Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 214285714 (214.286 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 7 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 489.641 MB Cx Ave: 497.185 MB Cx Max: 504.815 MB All Cx: 3.399 GB
Total: 3.399 GB

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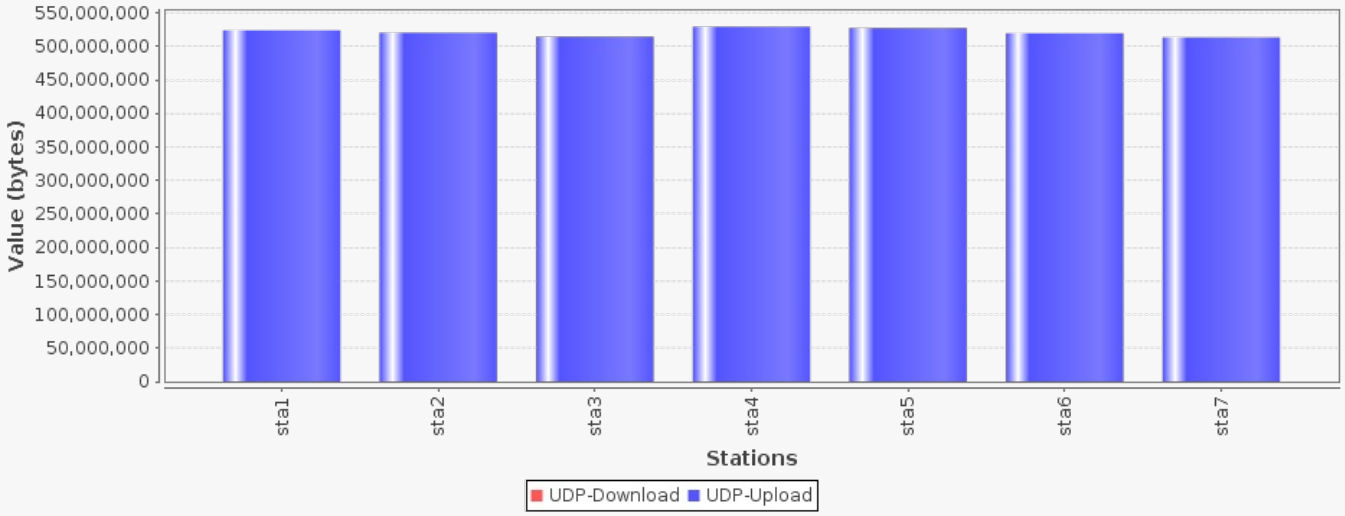
unless the device-under-test takes specific actions to ensure fairness.

Combined Received bytes, for entire 30 s run

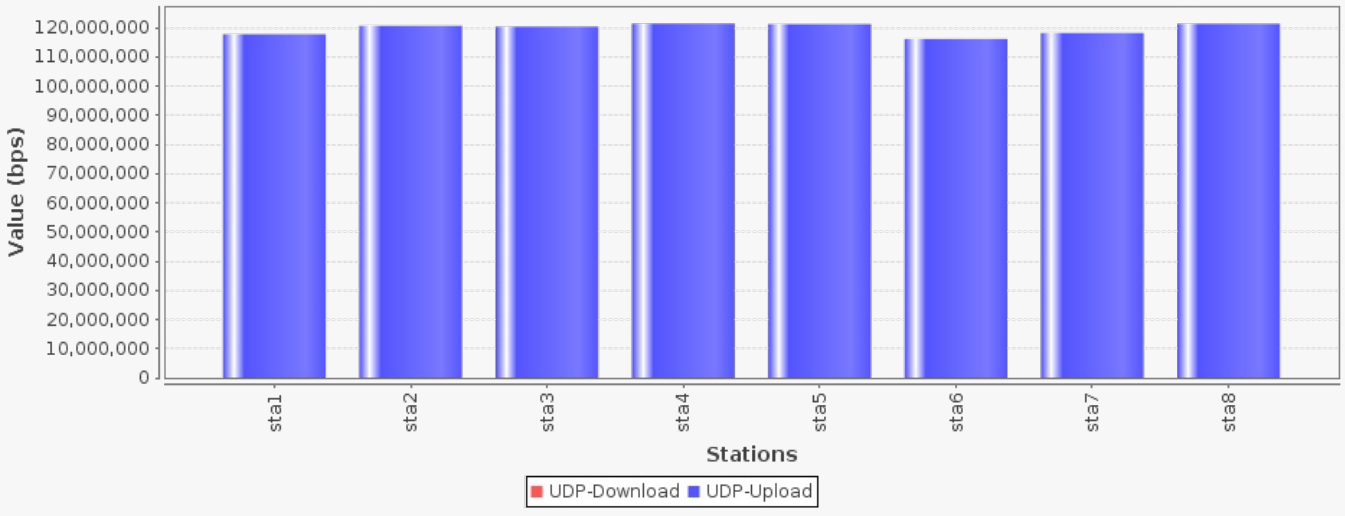


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 187500000 (187.5 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 8 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 116.118 Mbps Cx Ave: 119.604 Mbps Cx Max: 121.359 Mbps All Cx: 956.829 Mbps
Total: 956.829 Mbps
Aggregated Rate: Min: 116.118 Mbps Avg: 119.604 Mbps Max: 121.359 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.

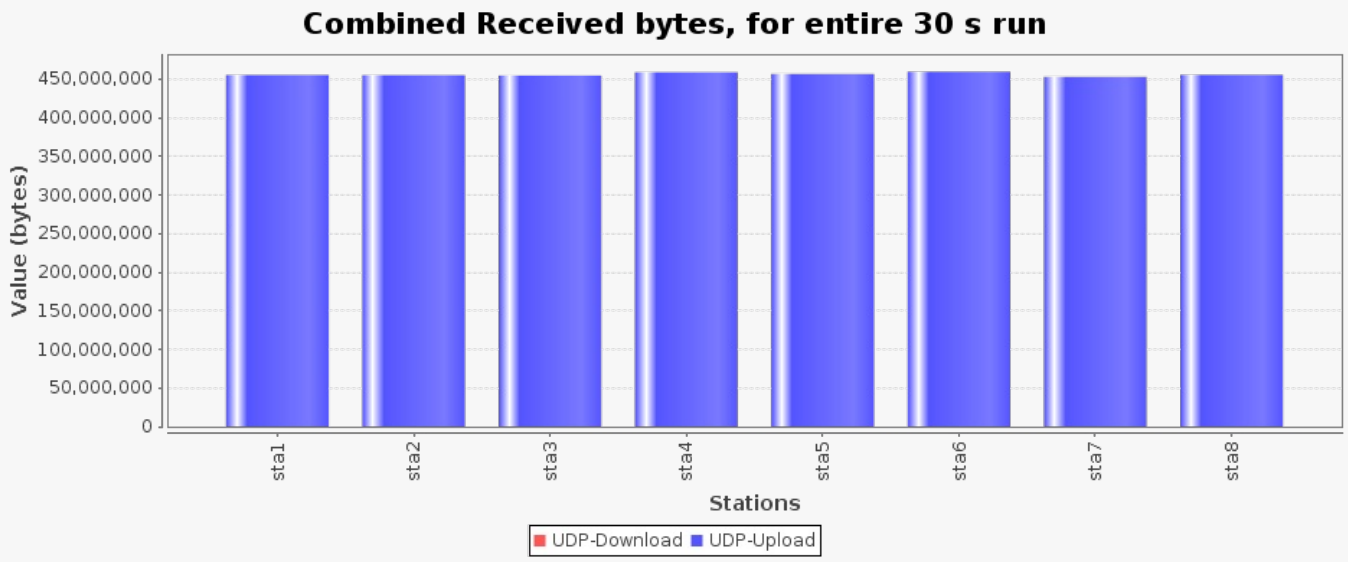
Combined bps, 60 second running average



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 431.913 MB Cx Ave: 434.907 MB Cx Max: 438.136 MB All Cx: 3.398 GB
Total: 3.398 GB

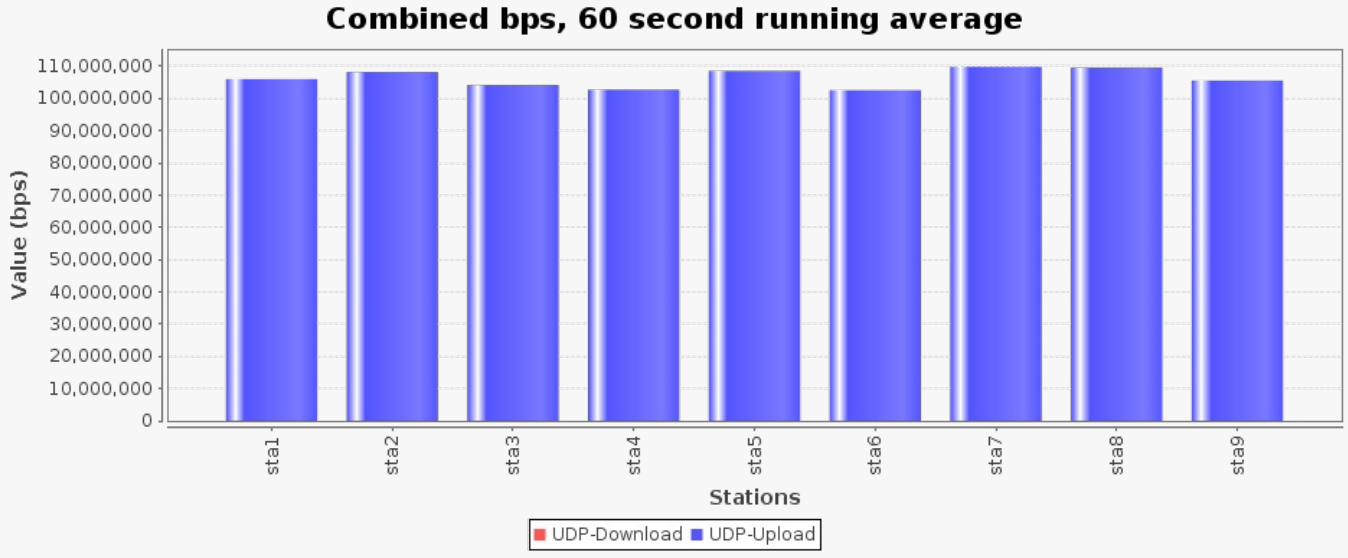
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 102.518 Mbps Cx Ave: 106.339 Mbps Cx Max: 109.85 Mbps All Cx: 957.051 Mbps
Total: 957.051 Mbps
Aggregated Rate: Min: 102.518 Mbps Avg: 106.339 Mbps Max: 109.85 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.

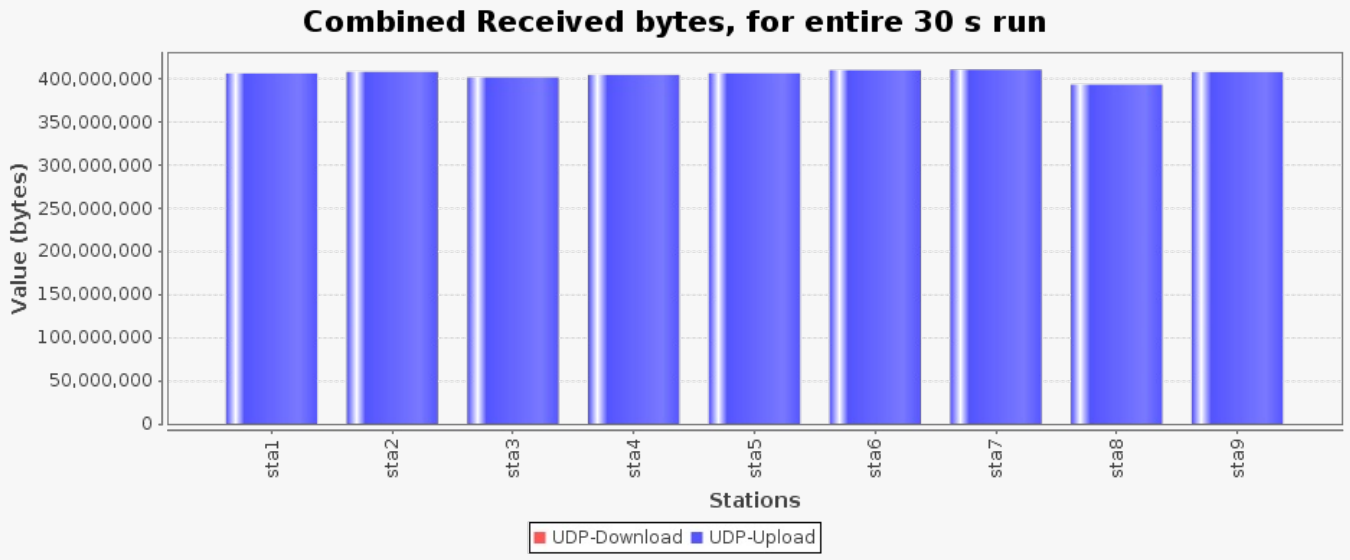


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 166666666 (166.667 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 9 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 375.047 MB Cx Ave: 386.676 MB Cx Max: 391.601 MB All Cx: 3.399 GB
Total: 3.399 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

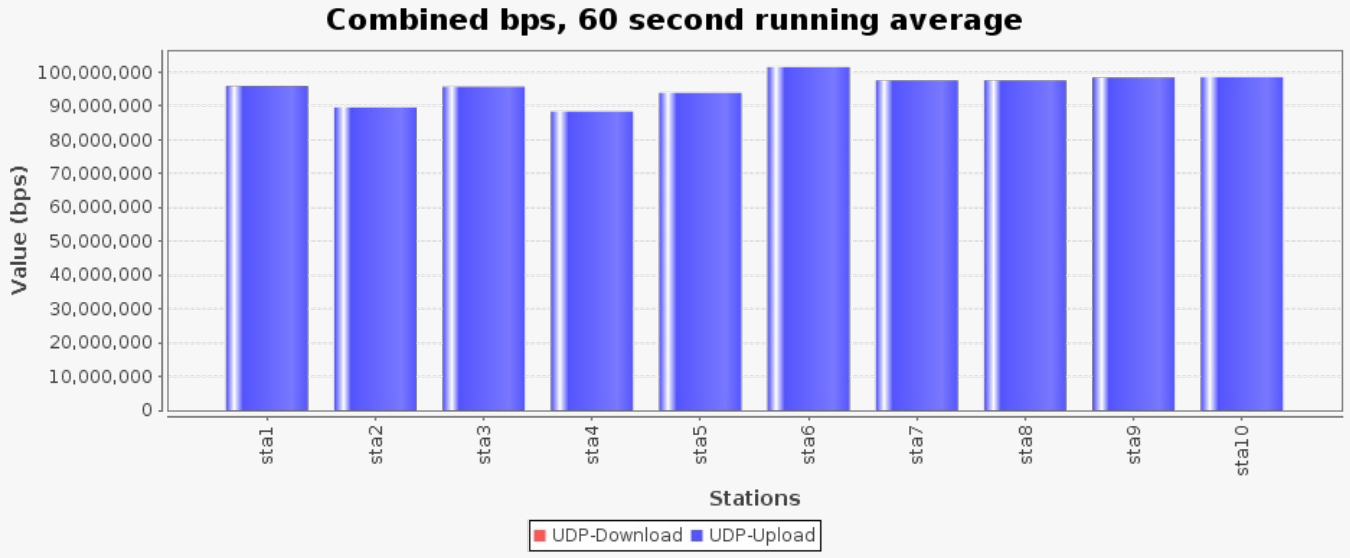
unless the device-under-test takes specific actions to ensure fairness.



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 88.348 Mbps Cx Ave: 95.724 Mbps Cx Max: 101.526 Mbps All Cx: 957.24 Mbps
Total: 957.24 Mbps
Aggregated Rate: Min: 88.348 Mbps Avg: 95.724 Mbps Max: 101.526 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.

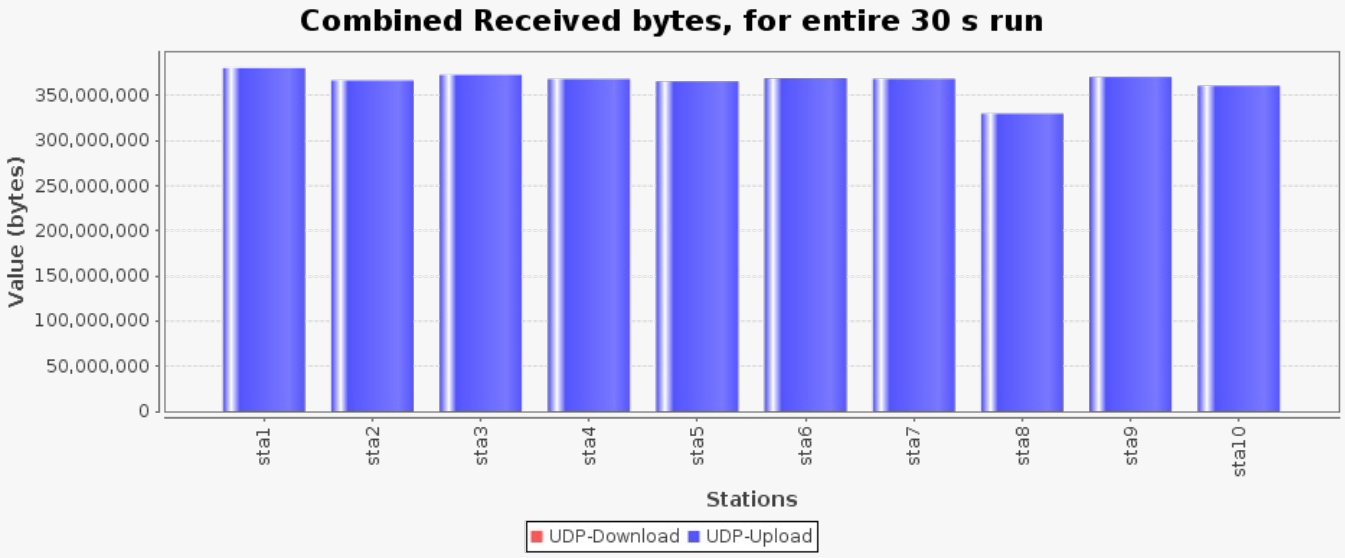


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 150000000 (150 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 10 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 314.289 MB Cx Ave: 347.971 MB Cx Max: 362.409 MB All Cx: 3.398 GB
Total: 3.398 GB

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

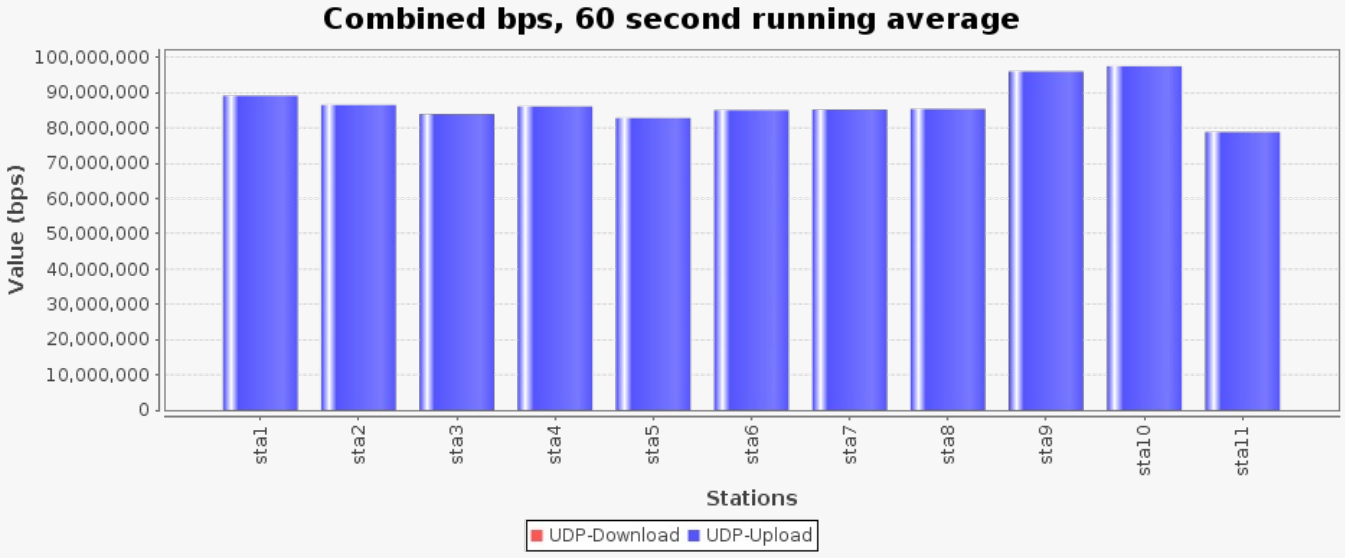
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 78.883 Mbps Cx Ave: 86.986 Mbps Cx Max: 97.552 Mbps All Cx: 956.844 Mbps
Total: 956.844 Mbps
Aggregated Rate: Min: 78.883 Mbps Avg: 86.986 Mbps Max: 97.552 Mbps

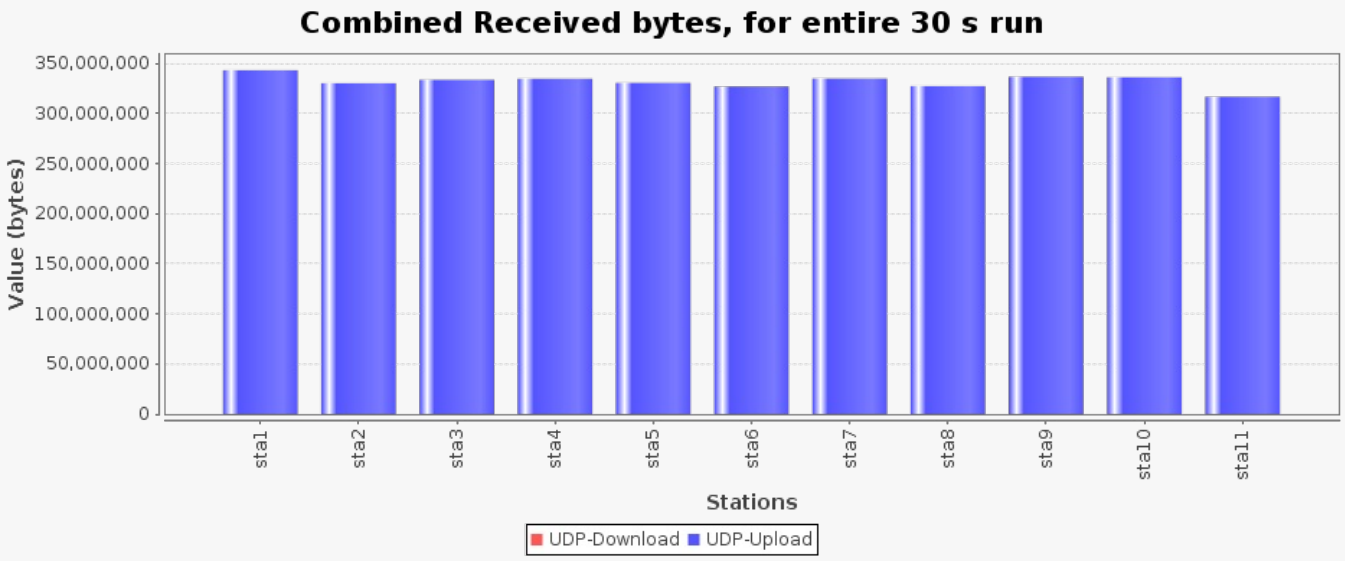
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 301.914 MB Cx Ave: 316.389 MB Cx Max: 327.072 MB All Cx: 3.399 GB
Total: 3.399 GB

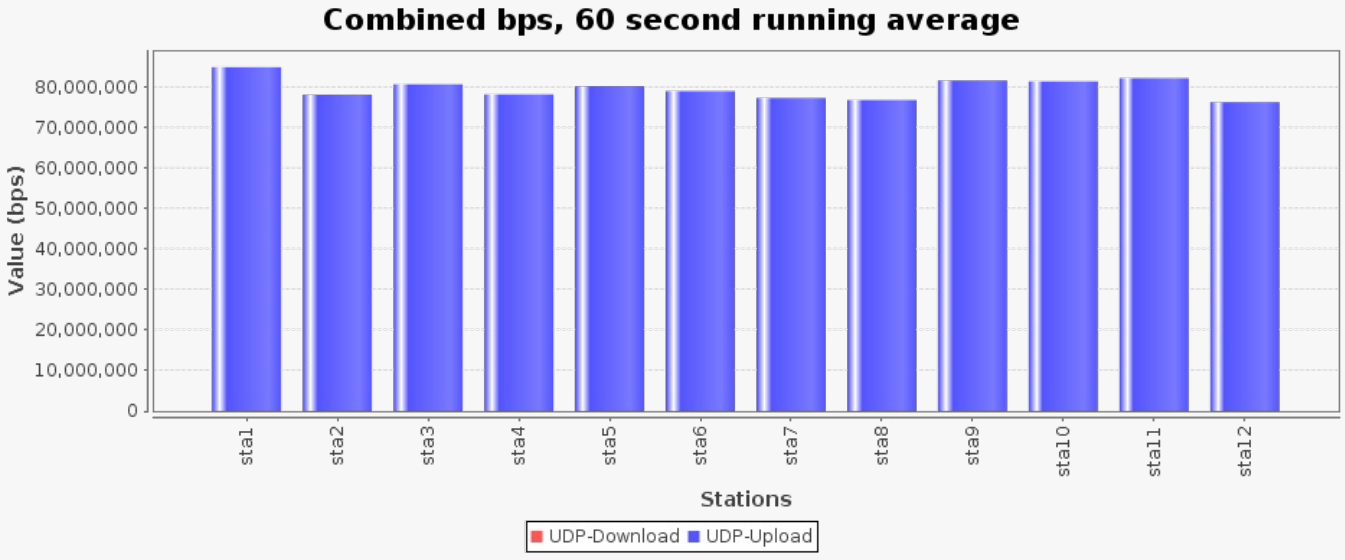
This graph shows fairness. On a fair system, each station should get about the same throughput. In the download direction, it is mostly the device-under-test that is responsible for this behavior, but in the upload direction, LANforge itself would be the source of most fairness issues unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 76.294 Mbps Cx Ave: 79.771 Mbps Cx Max: 84.957 Mbps All Cx: 957.254 Mbps
Total: 957.254 Mbps
Aggregated Rate: Min: 76.294 Mbps Avg: 79.771 Mbps Max: 84.957 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.

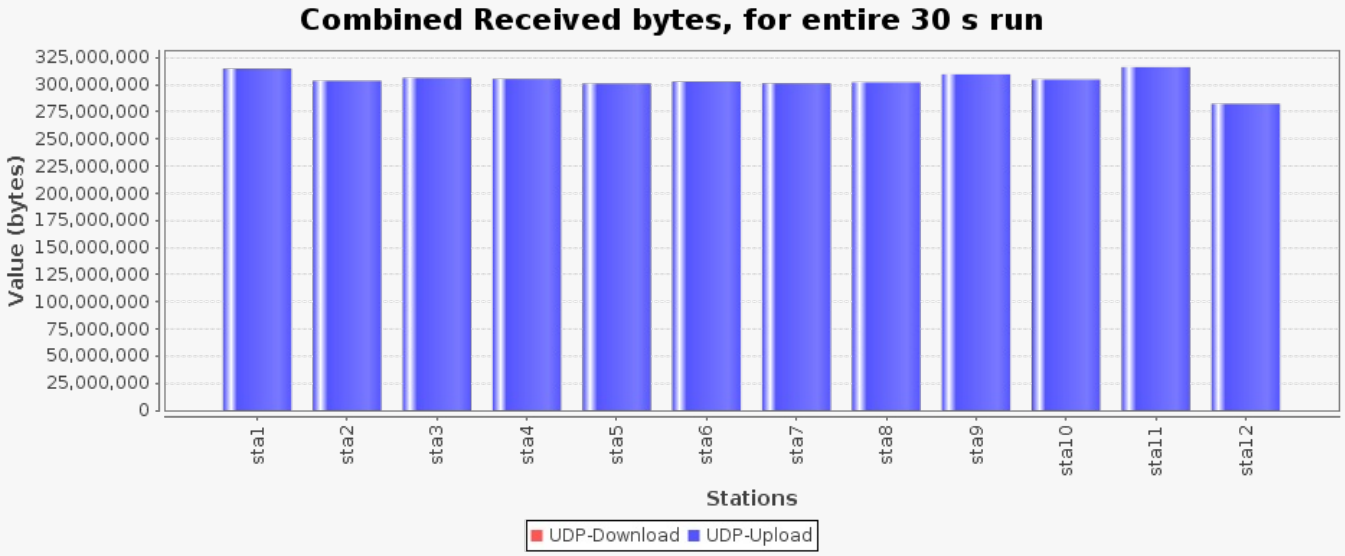


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 125000000 (125 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 12 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B

Upload Amount: Cx Min: 269.236 MB Cx Ave: 290.041 MB Cx Max: 301.492 MB All Cx: 3.399 GB
Total: 3.399 GB

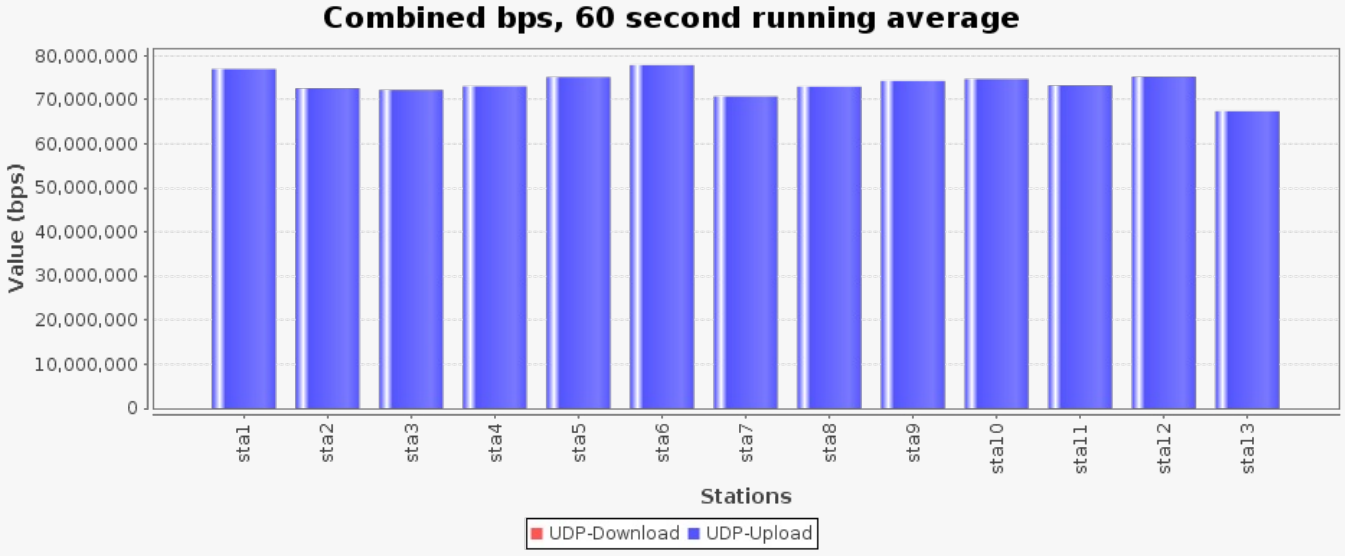
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 67.396 Mbps Cx Ave: 73.578 Mbps Cx Max: 77.865 Mbps All Cx: 956.508 Mbps
Total: 956.508 Mbps
Aggregated Rate: Min: 67.396 Mbps Avg: 73.578 Mbps Max: 77.865 Mbps

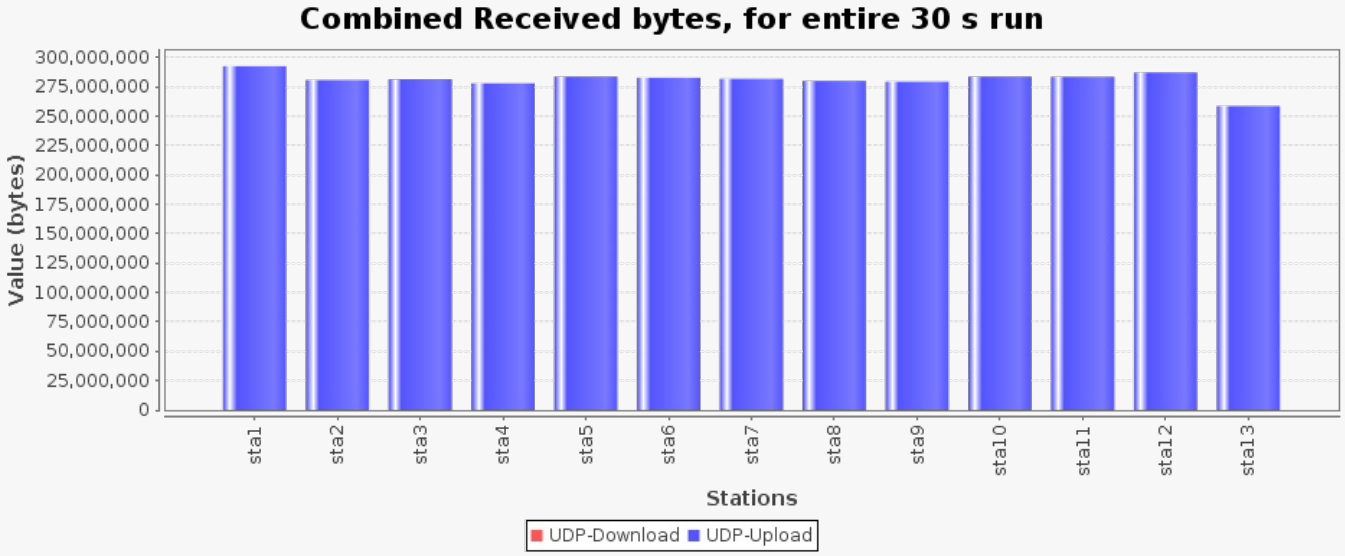
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 246.462 MB Cx Ave: 267.803 MB Cx Max: 278.781 MB All Cx: 3.4 GB
Total: 3.4 GB

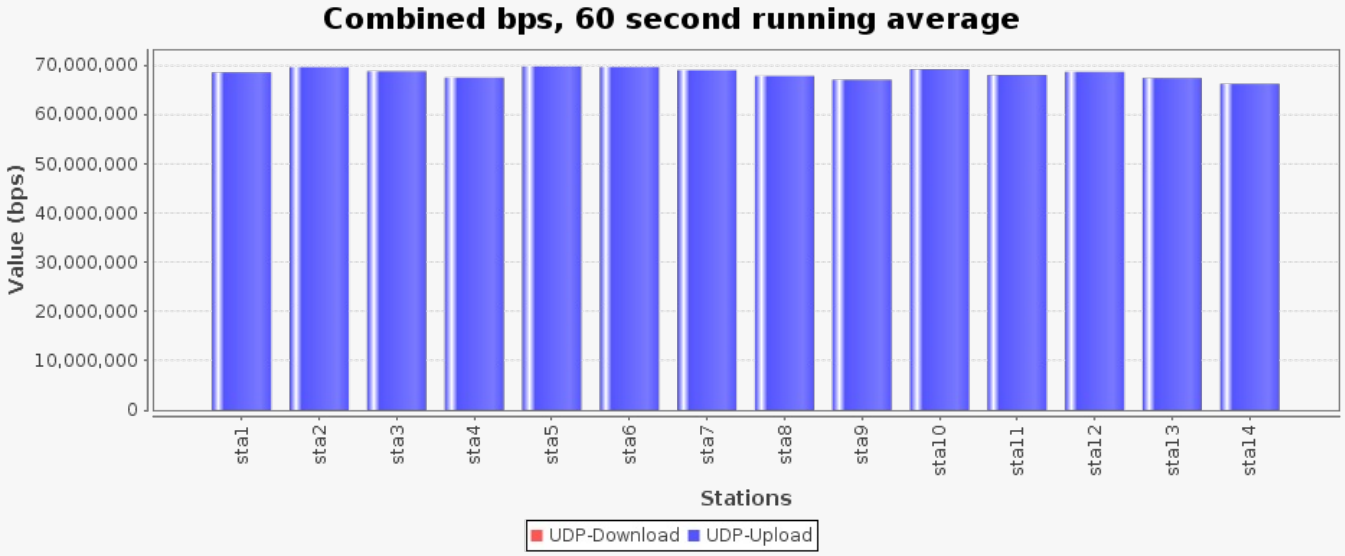
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 66.193 Mbps Cx Ave: 68.349 Mbps Cx Max: 69.767 Mbps All Cx: 956.886 Mbps
Total: 956.886 Mbps
Aggregated Rate: Min: 66.193 Mbps Avg: 68.349 Mbps Max: 69.767 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.

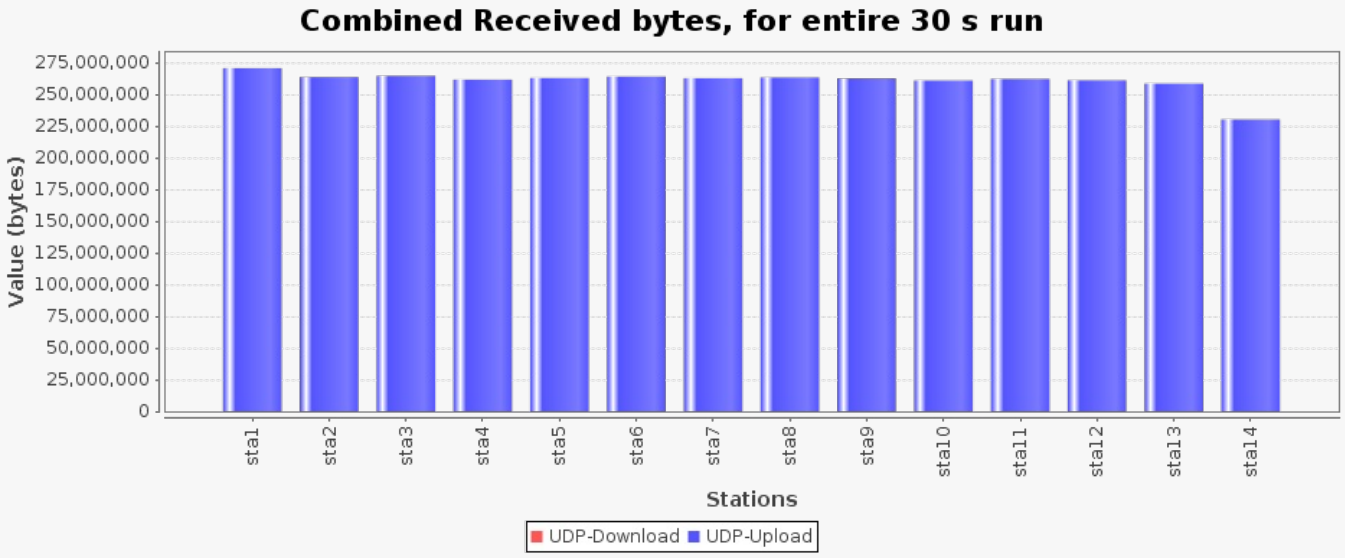


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 107142857 (107.143 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)

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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 219.599 MB Cx Ave: 248.574 MB Cx Max: 258.156 MB All Cx: 3.398 GB
Total: 3.398 GB

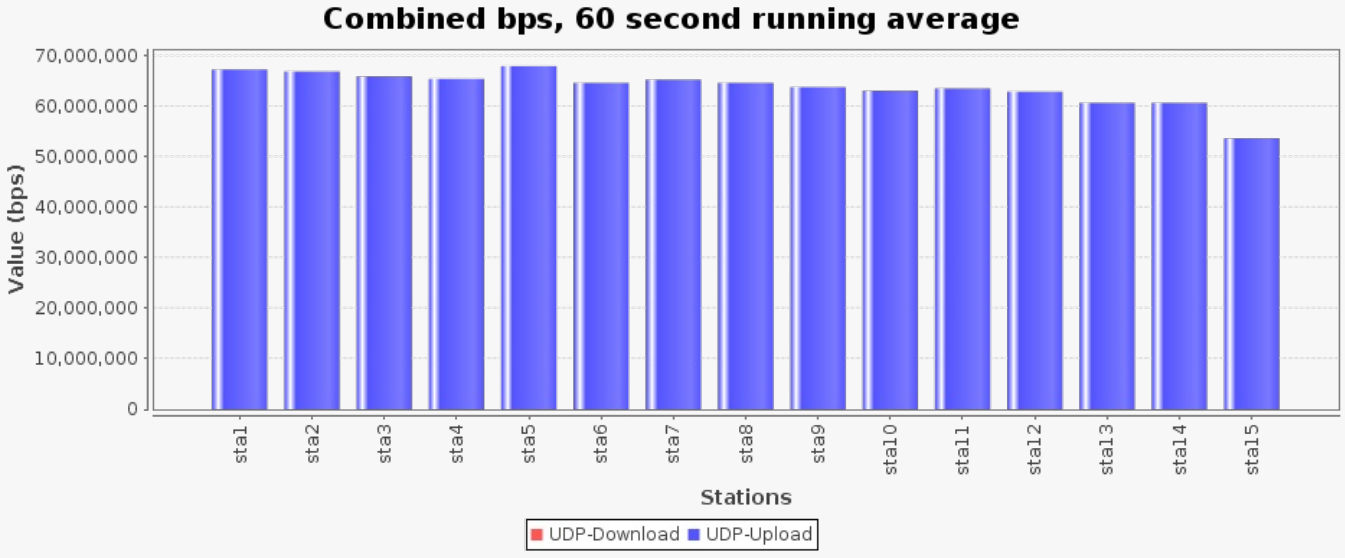
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 53.66 Mbps Cx Ave: 63.772 Mbps Cx Max: 67.966 Mbps All Cx: 956.584 Mbps
Total: 956.584 Mbps
Aggregated Rate: Min: 53.66 Mbps Avg: 63.772 Mbps Max: 67.966 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.

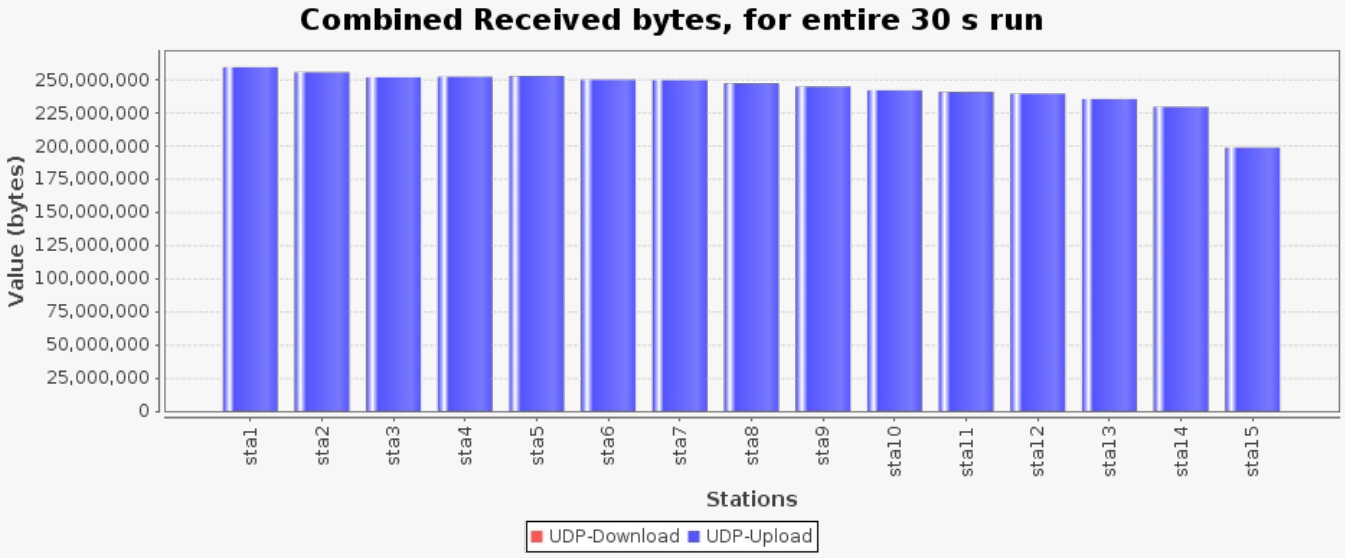


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)

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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 189.541 MB Cx Ave: 232.009 MB Cx Max: 247.322 MB All Cx: 3.399 GB
Total: 3.399 GB

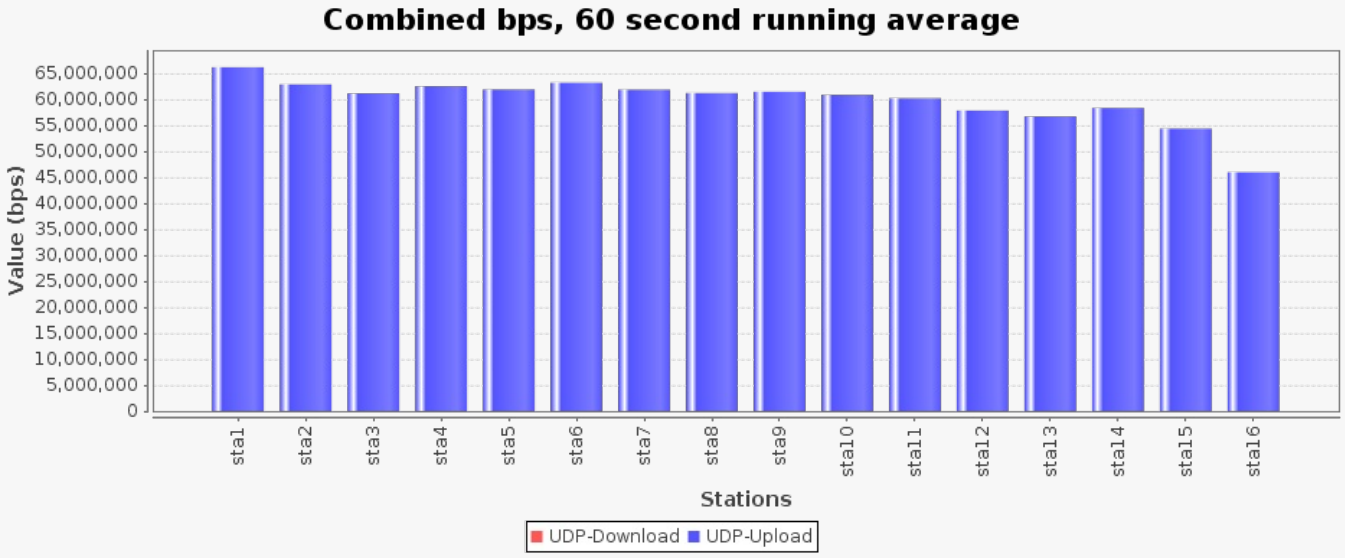
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 45.997 Mbps Cx Ave: 59.846 Mbps Cx Max: 66.231 Mbps All Cx: 957.536 Mbps
Total: 957.536 Mbps
Aggregated Rate: Min: 45.997 Mbps Avg: 59.846 Mbps Max: 66.231 Mbps

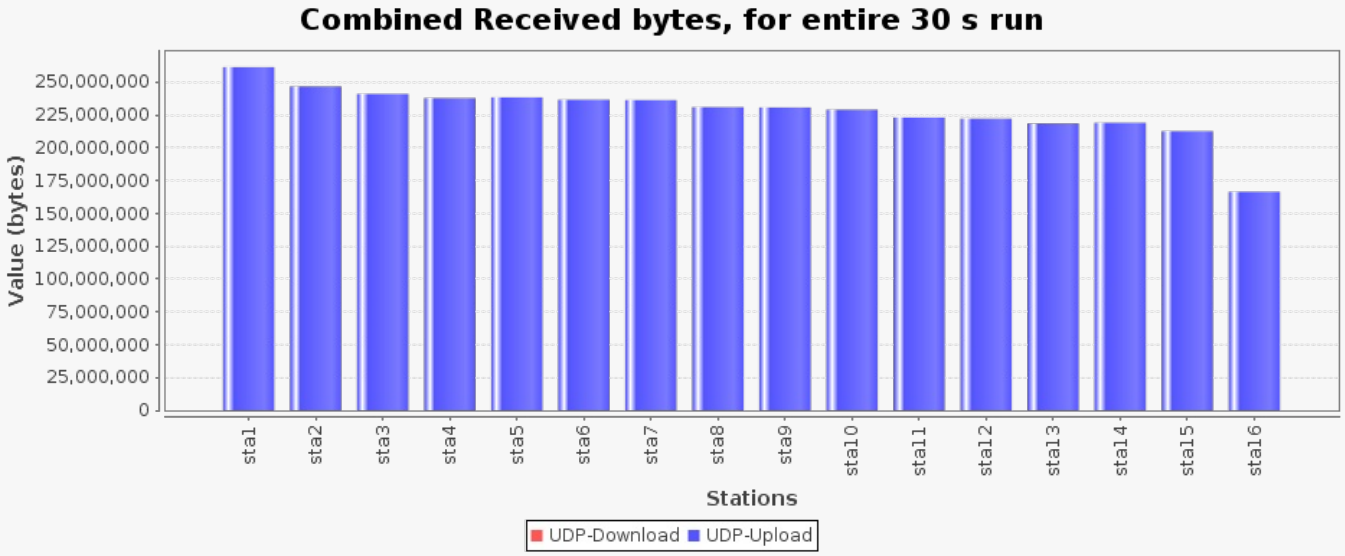
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 158.715 MB Cx Ave: 217.553 MB Cx Max: 249.255 MB All Cx: 3.399 GB
Total: 3.399 GB

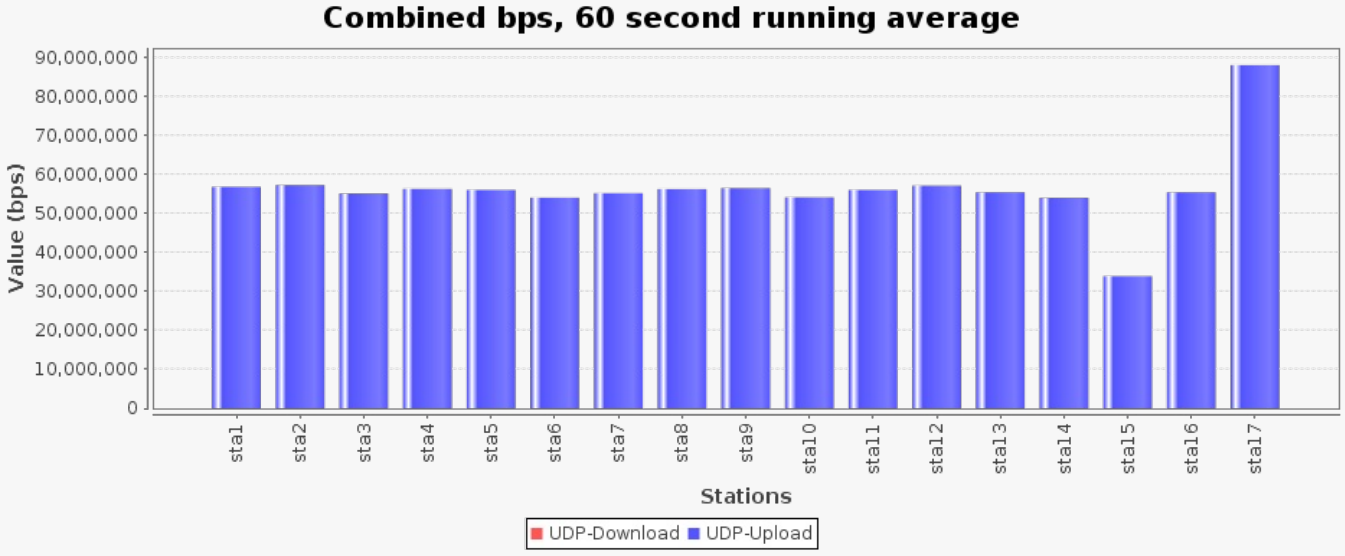
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 33.876 Mbps Cx Ave: 56.294 Mbps Cx Max: 87.999 Mbps All Cx: 956.994 Mbps
Total: 956.994 Mbps
Aggregated Rate: Min: 33.876 Mbps Avg: 56.294 Mbps Max: 87.999 Mbps

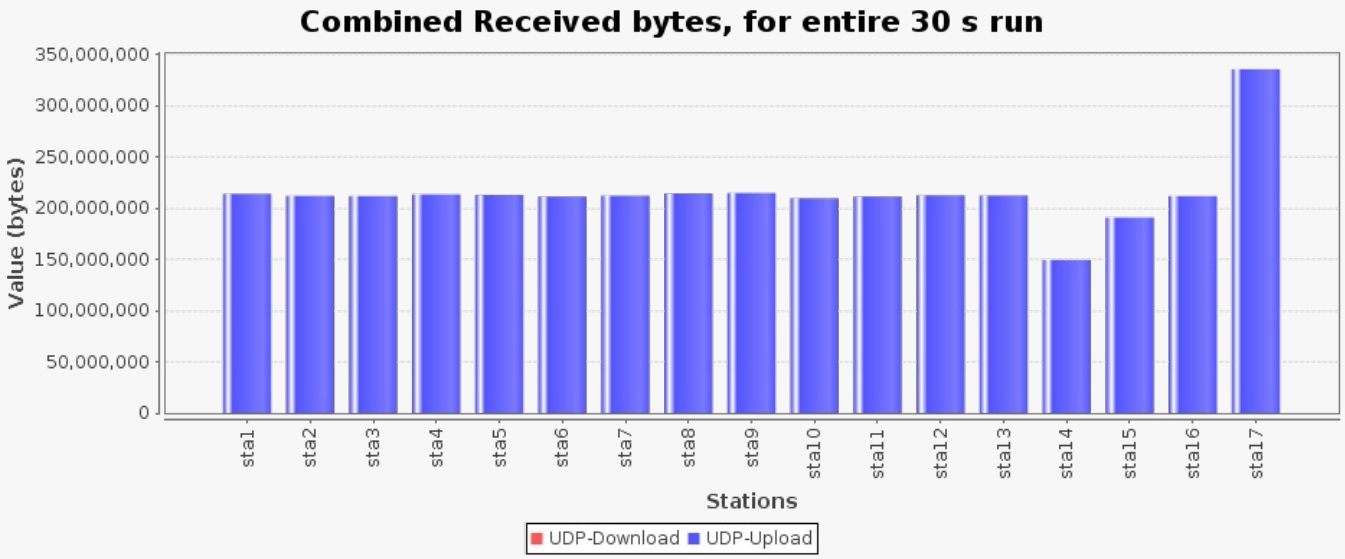
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 142.634 MB Cx Ave: 204.731 MB Cx Max: 320.025 MB All Cx: 3.399 GB
Total: 3.399 GB

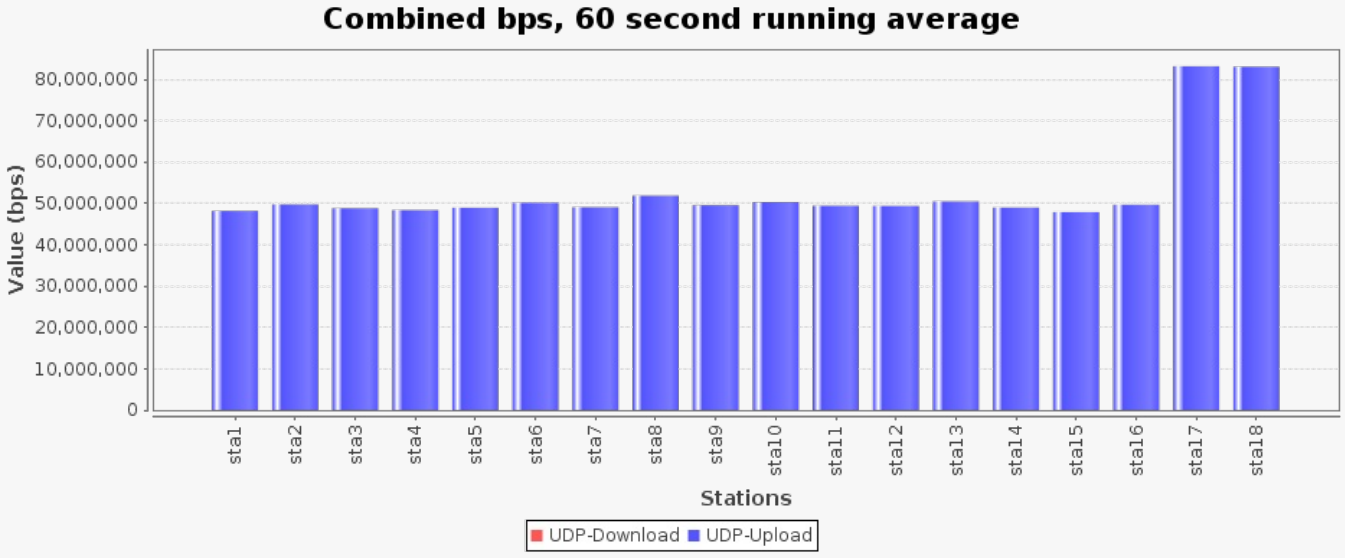
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 47.927 Mbps Cx Ave: 53.194 Mbps Cx Max: 83.199 Mbps All Cx: 957.493 Mbps
Total: 957.493 Mbps
Aggregated Rate: Min: 47.927 Mbps Avg: 53.194 Mbps Max: 83.199 Mbps

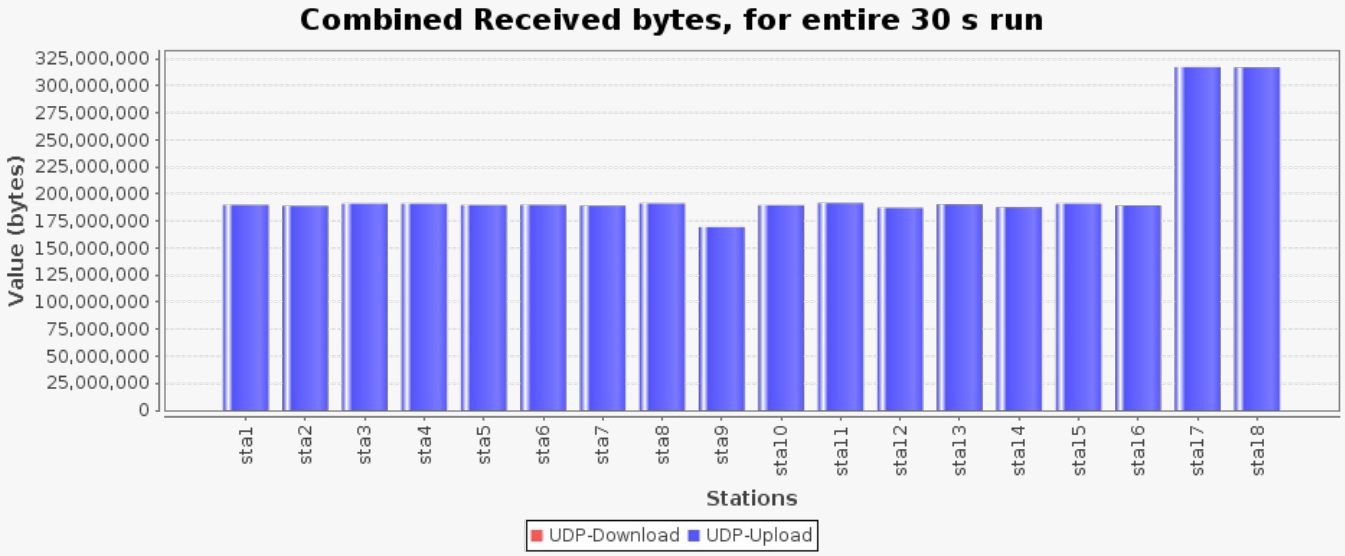
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 161.543 MB Cx Ave: 193.434 MB Cx Max: 302.571 MB All Cx: 3.4 GB
Total: 3.4 GB

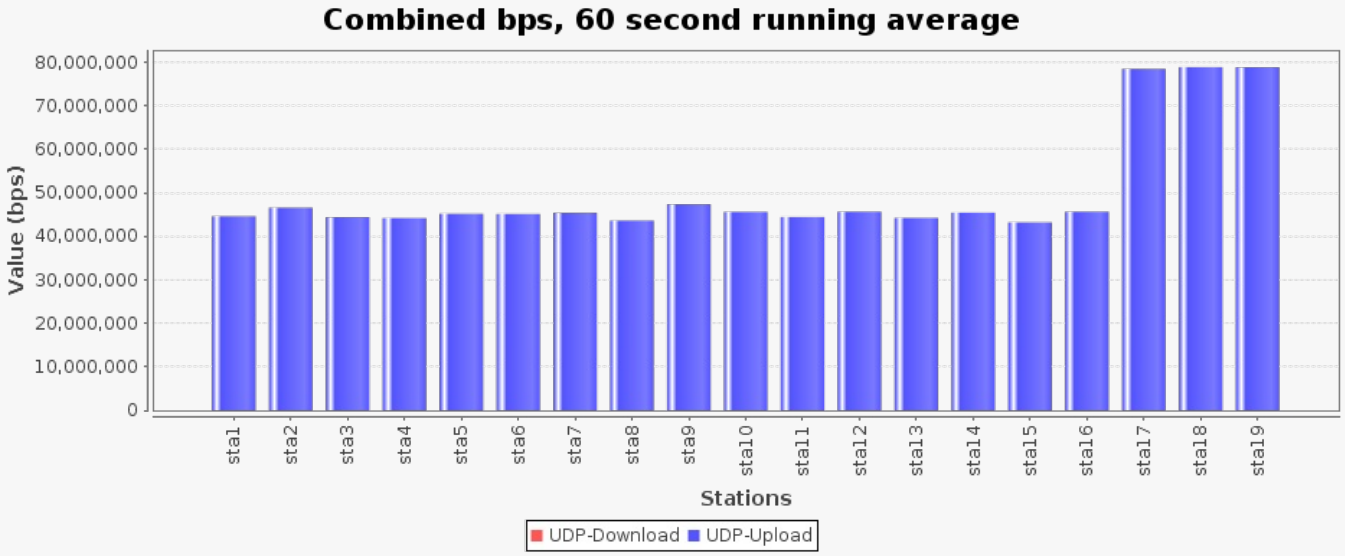
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 43.208 Mbps Cx Ave: 50.375 Mbps Cx Max: 78.895 Mbps All Cx: 957.127 Mbps
Total: 957.127 Mbps
Aggregated Rate: Min: 43.208 Mbps Avg: 50.375 Mbps Max: 78.895 Mbps

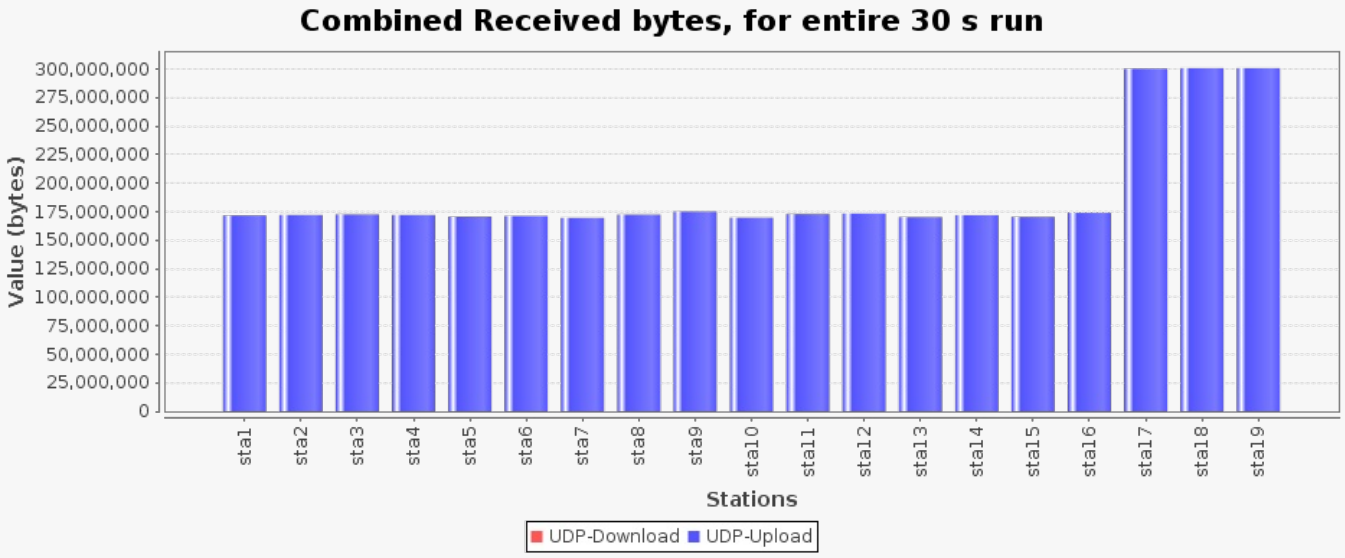
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 161.799 MB Cx Ave: 183.321 MB Cx Max: 286.864 MB All Cx: 3.401 GB
Total: 3.401 GB

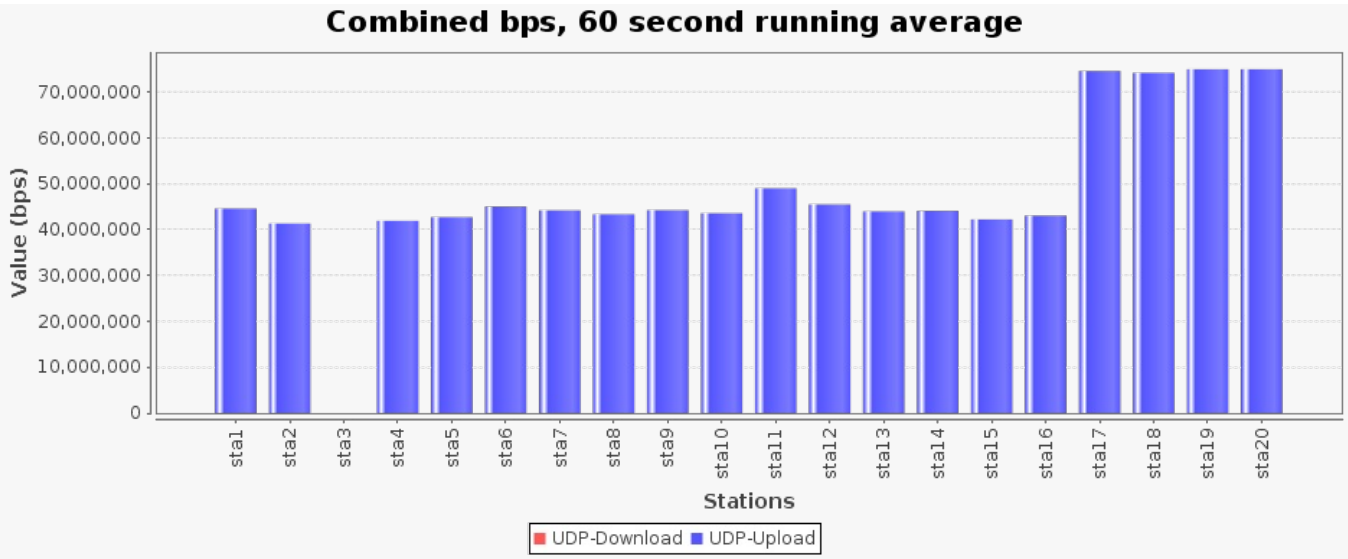
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 0 bps Cx Ave: 47.857 Mbps Cx Max: 74.946 Mbps All Cx: 957.145 Mbps
Total: 957.145 Mbps
Aggregated Rate: Min: 0 bps Avg: 47.857 Mbps Max: 74.946 Mbps

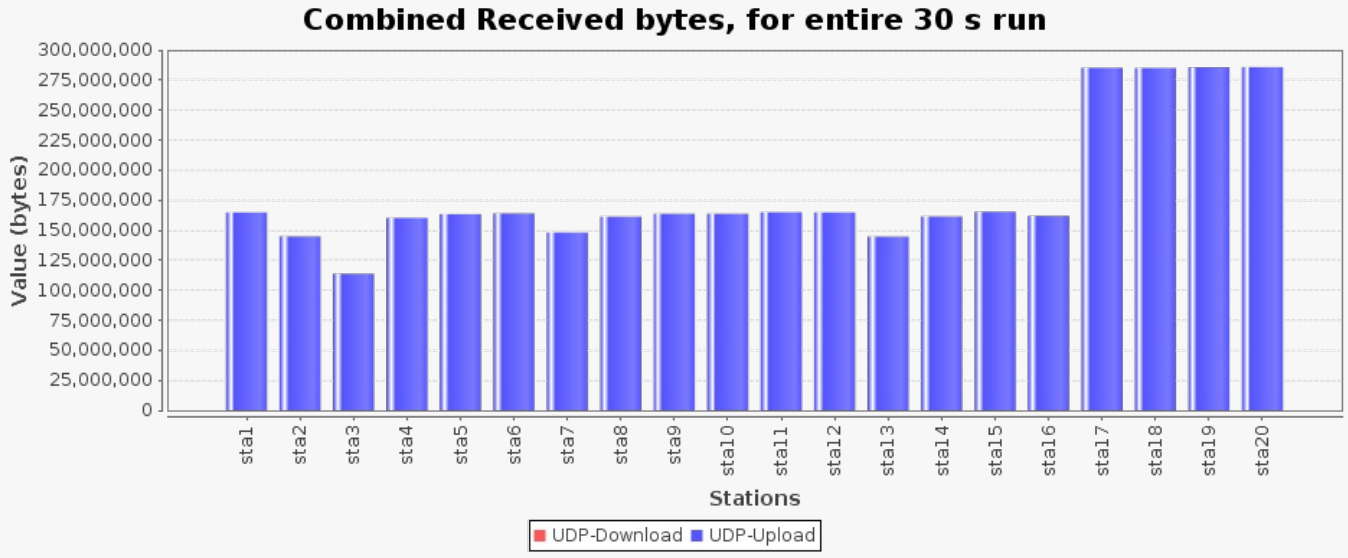
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 108.478 MB Cx Ave: 174.133 MB Cx Max: 272.483 MB All Cx: 3.401 GB
Total: 3.401 GB

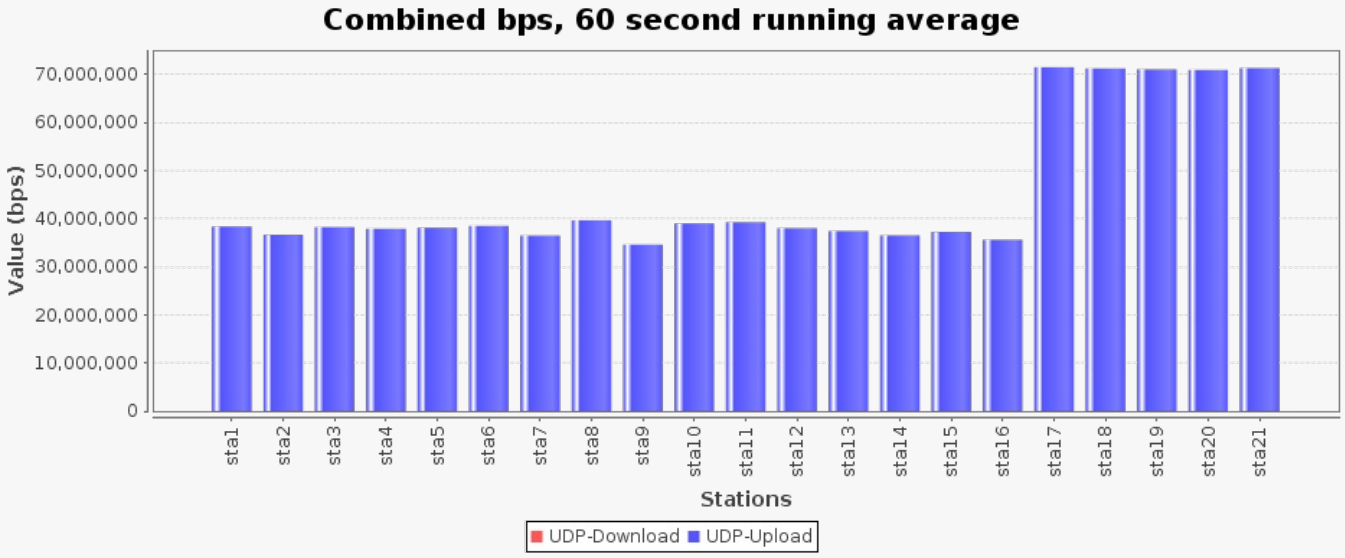
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 34.591 Mbps Cx Ave: 45.58 Mbps Cx Max: 71.461 Mbps All Cx: 957.179 Mbps
Total: 957.179 Mbps
Aggregated Rate: Min: 34.591 Mbps Avg: 45.58 Mbps Max: 71.461 Mbps

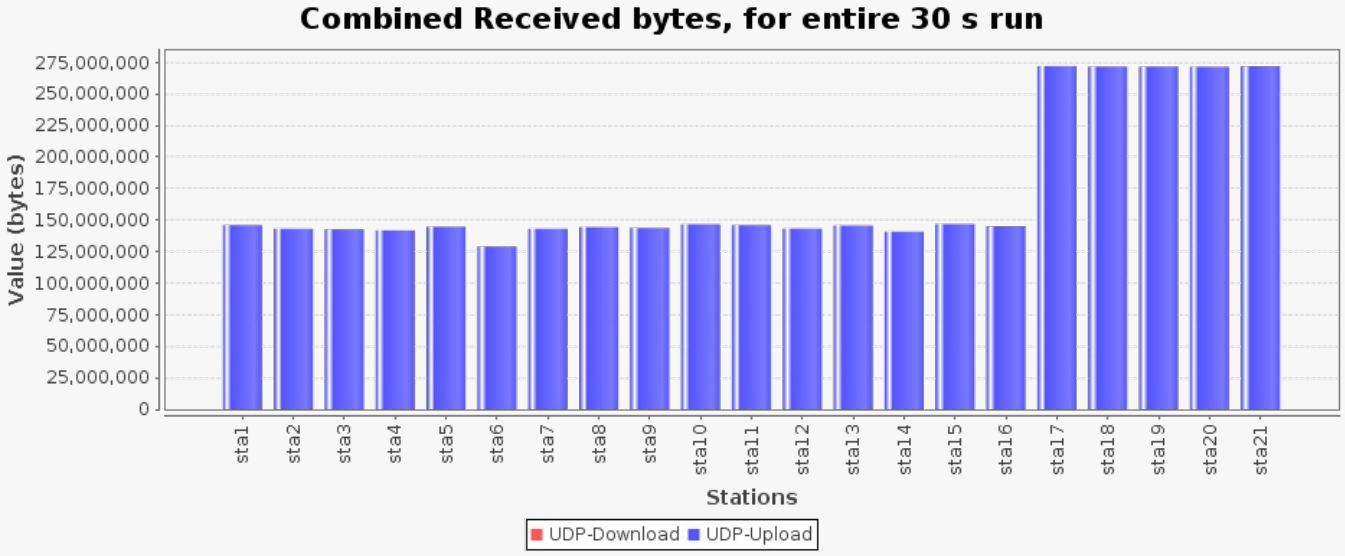
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 122.974 MB Cx Ave: 165.877 MB Cx Max: 259.497 MB All Cx: 3.402 GB
Total: 3.402 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.

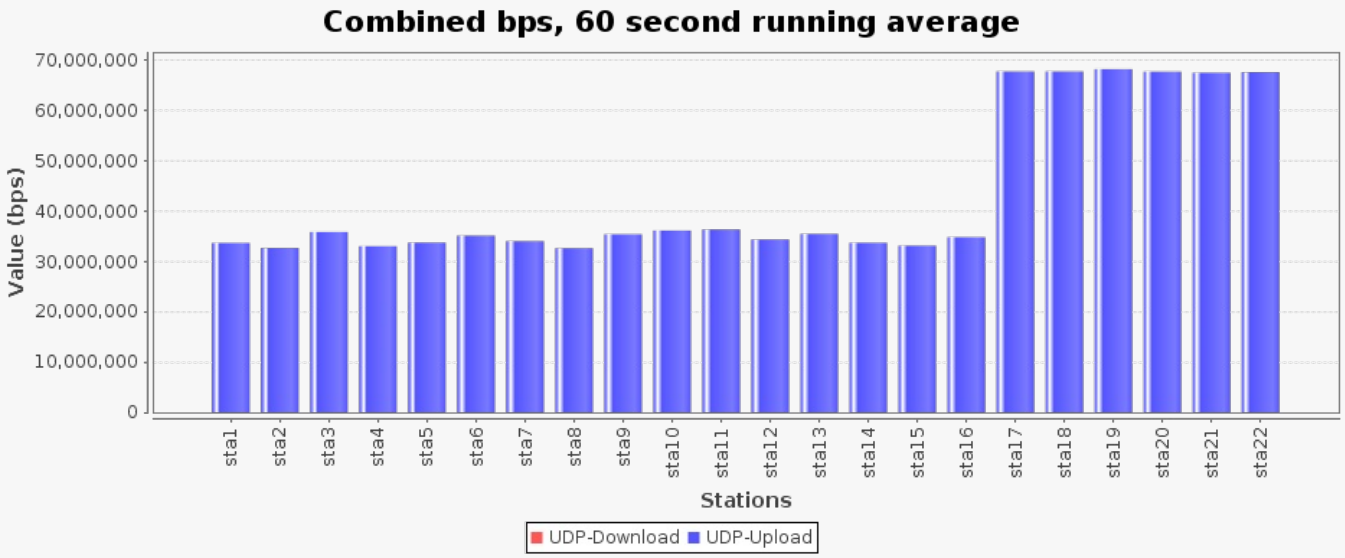


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 68181818 (68.182 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 22 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 32.636 Mbps Cx Ave: 43.509 Mbps Cx Max: 68.253 Mbps All Cx: 957.201 Mbps
Total: 957.201 Mbps
Aggregated Rate: Min: 32.636 Mbps Avg: 43.509 Mbps Max: 68.253 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

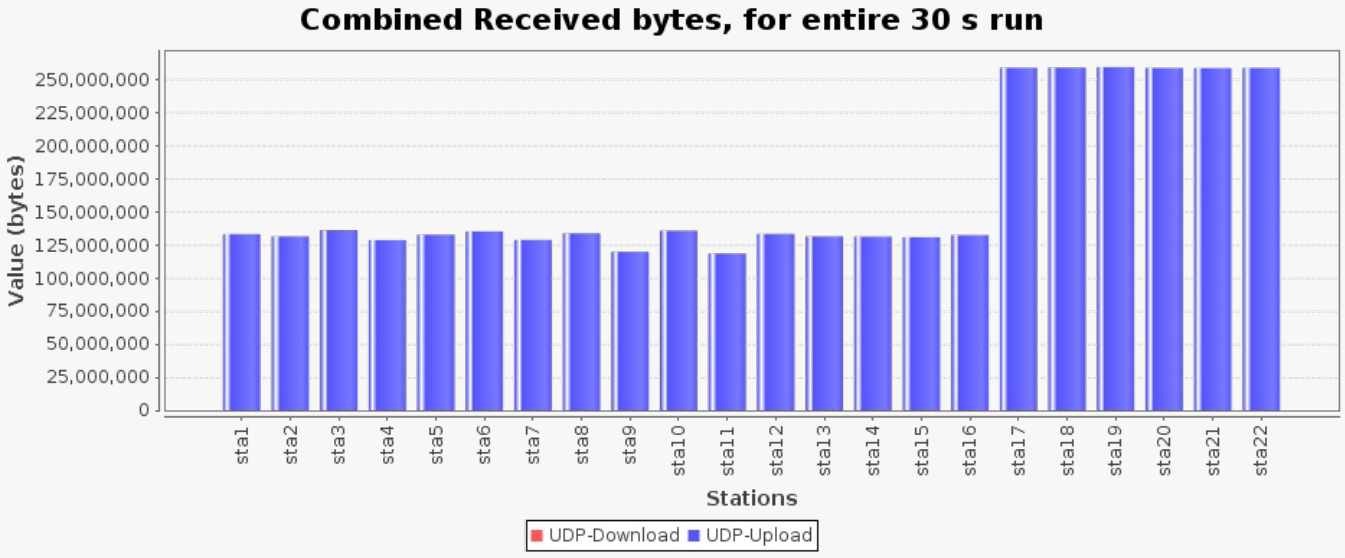
unless the device-under-test takes specific actions to ensure fairness.



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 113.185 MB Cx Ave: 158.341 MB Cx Max: 247.792 MB All Cx: 3.402 GB
Total: 3.402 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.

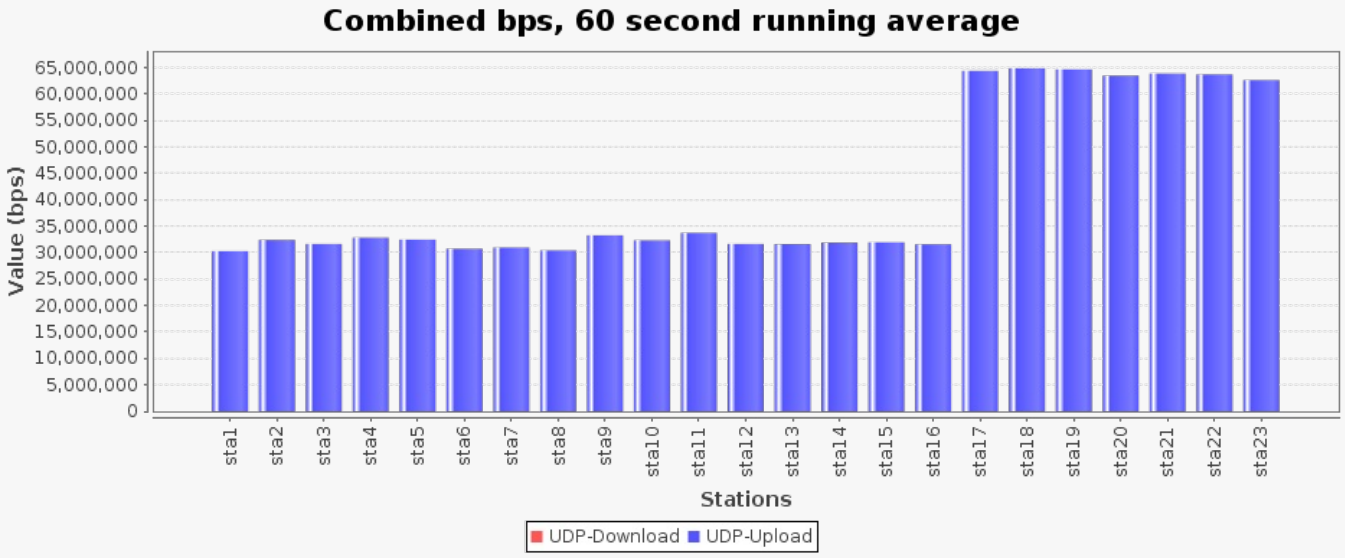


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 65217391 (65.217 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 23 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 30.318 Mbps Cx Ave: 41.651 Mbps Cx Max: 64.931 Mbps All Cx: 957.964 Mbps
Total: 957.964 Mbps
Aggregated Rate: Min: 30.318 Mbps Avg: 41.651 Mbps Max: 64.931 Mbps

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

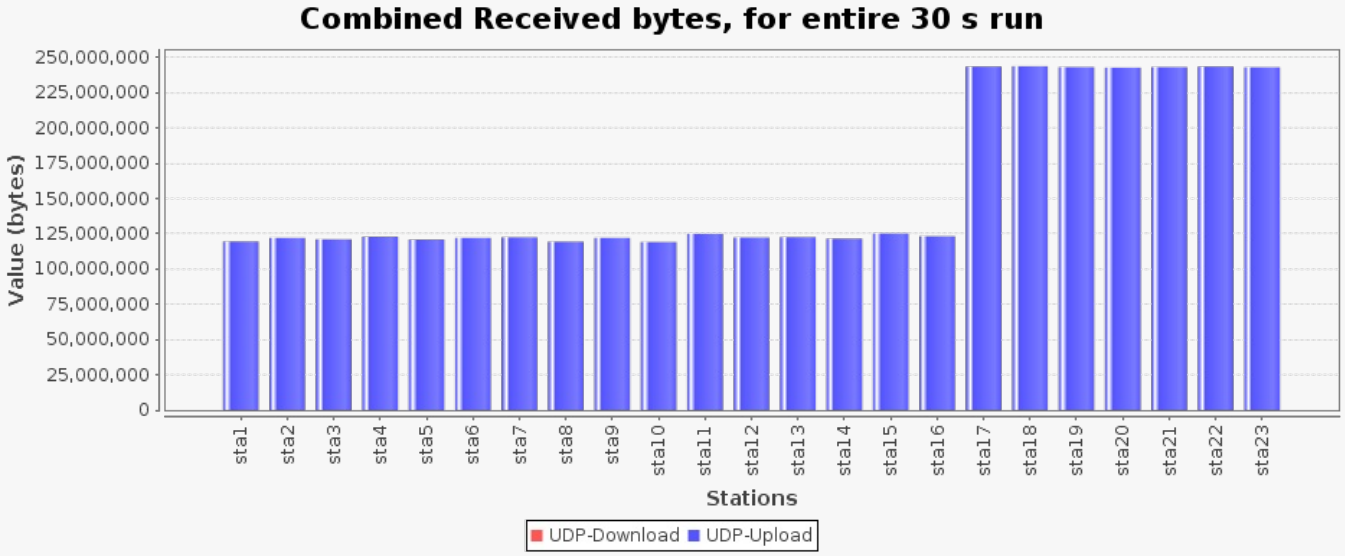
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 113.529 MB Cx Ave: 151.488 MB Cx Max: 232.395 MB All Cx: 3.403 GB
Total: 3.403 GB

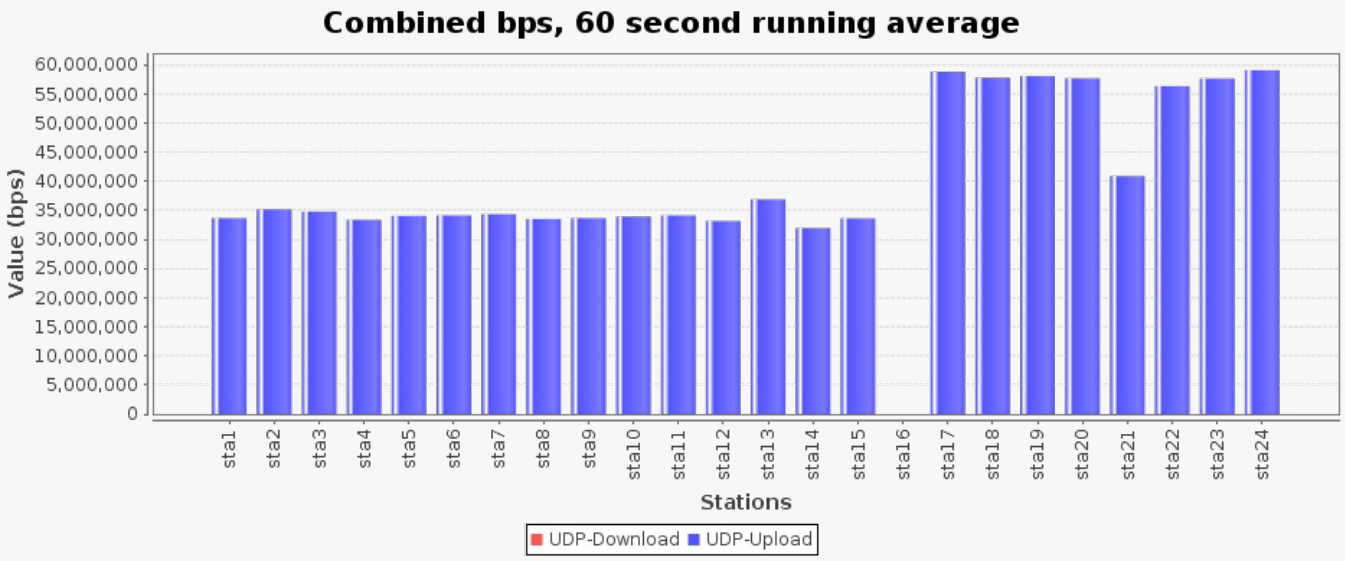
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 0 bps Cx Ave: 39.873 Mbps Cx Max: 59.094 Mbps All Cx: 956.941 Mbps
Total: 956.941 Mbps
Aggregated Rate: Min: 0 bps Avg: 39.873 Mbps Max: 59.094 Mbps

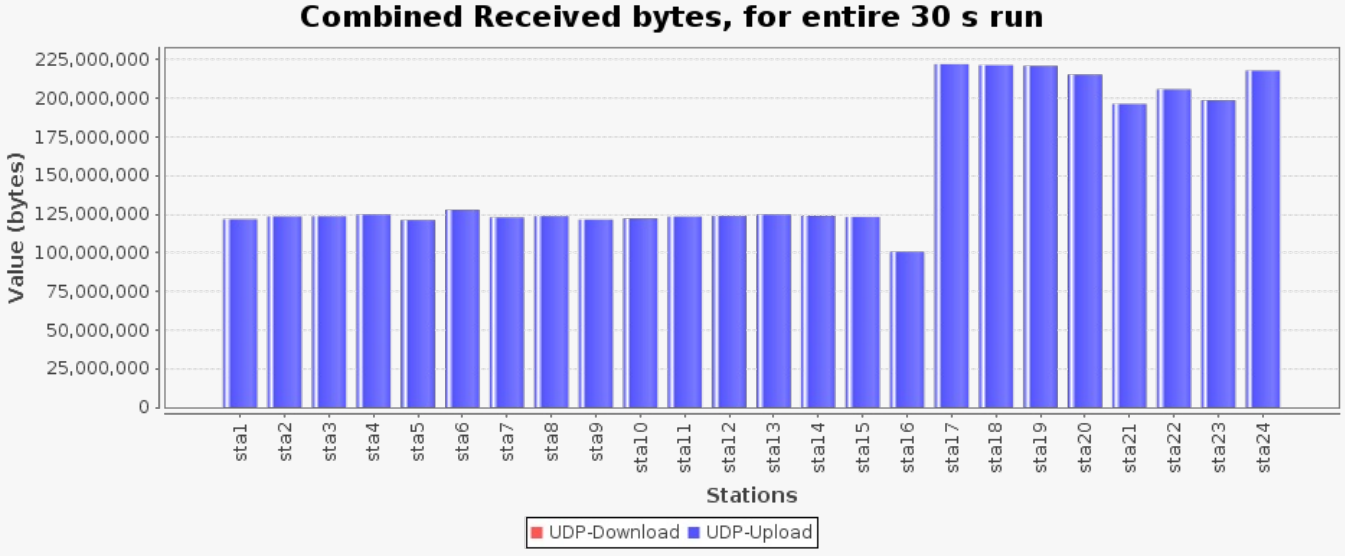
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 95.966 MB Cx Ave: 145.189 MB Cx Max: 211.926 MB All Cx: 3.403 GB
Total: 3.403 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.

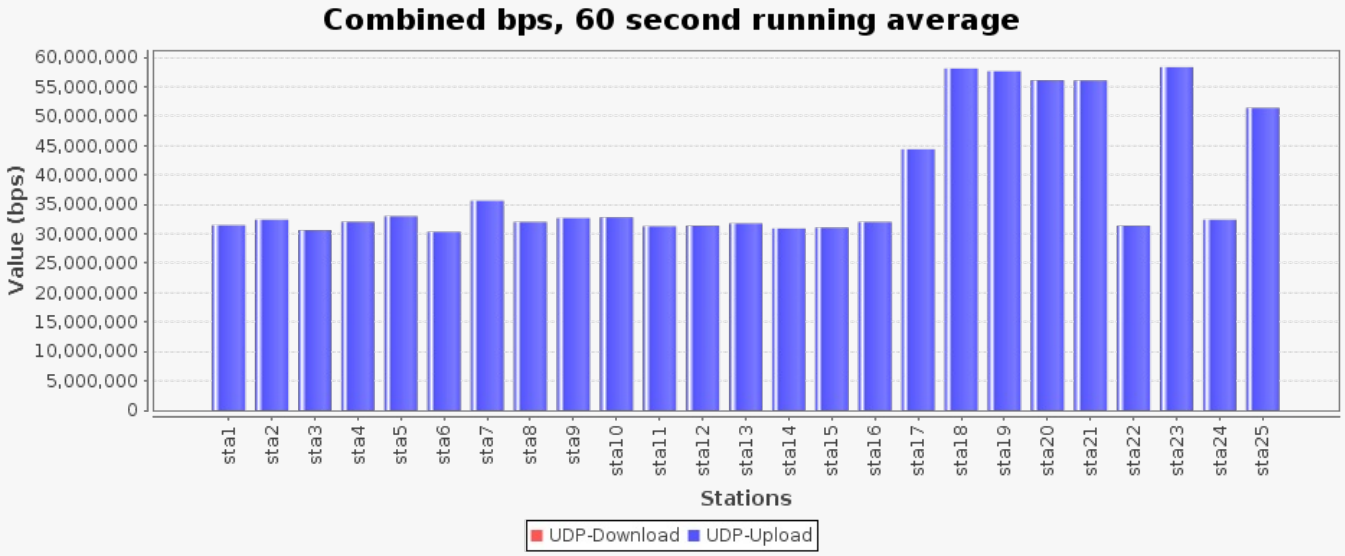


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 60000000 (60 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 25 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 30.339 Mbps Cx Ave: 38.291 Mbps Cx Max: 58.346 Mbps All Cx: 957.263 Mbps

Total: 957.263 Mbps
Aggregated Rate: Min: 30.339 Mbps Avg: 38.291 Mbps Max: 58.346 Mbps

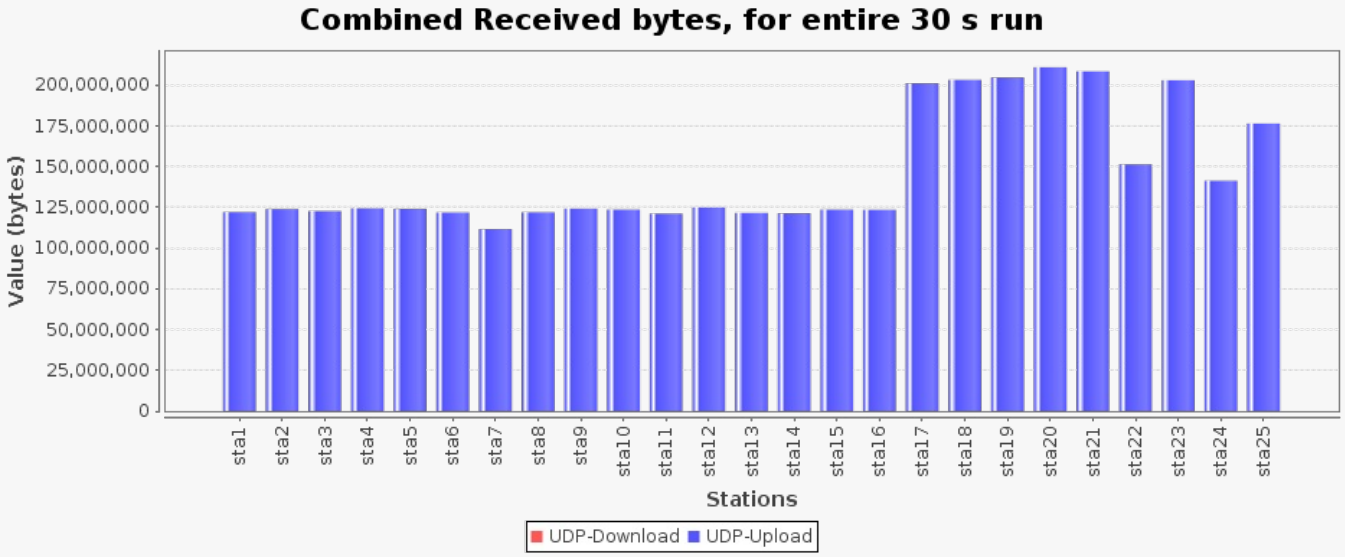
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 106.402 MB Cx Ave: 139.503 MB Cx Max: 201.157 MB All Cx: 3.406 GB
Total: 3.406 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.

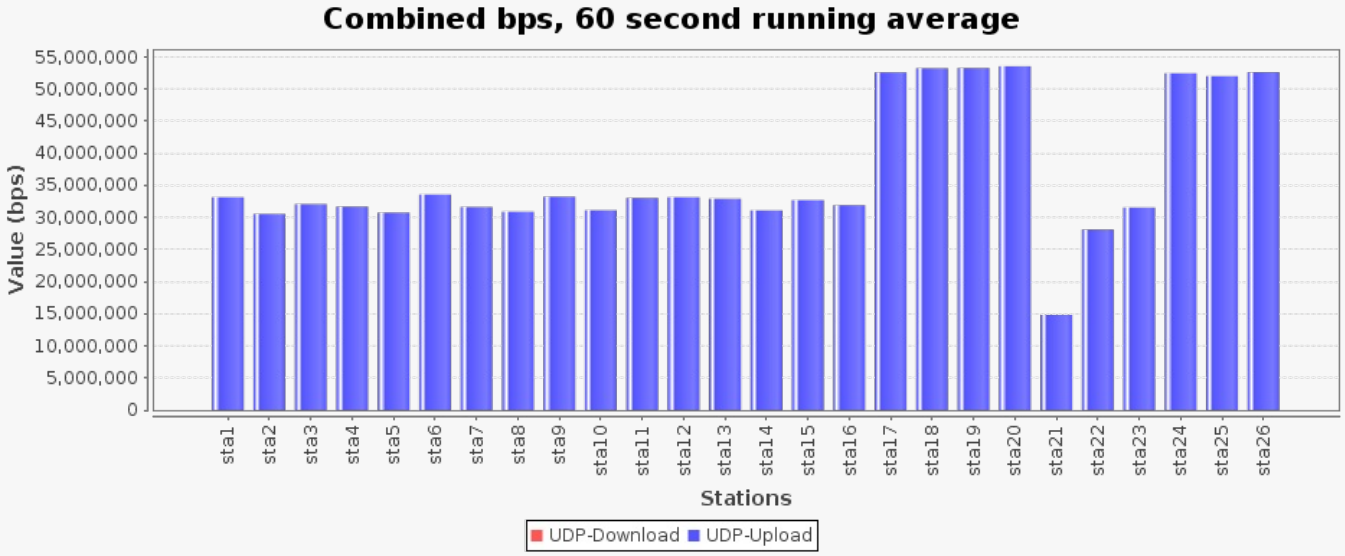


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 57692307 (57.692 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 26 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:

Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 14.843 Mbps Cx Ave: 36.818 Mbps Cx Max: 53.527 Mbps All Cx: 957.279 Mbps
Total: 957.279 Mbps
Aggregated Rate: Min: 14.843 Mbps Avg: 36.818 Mbps Max: 53.527 Mbps

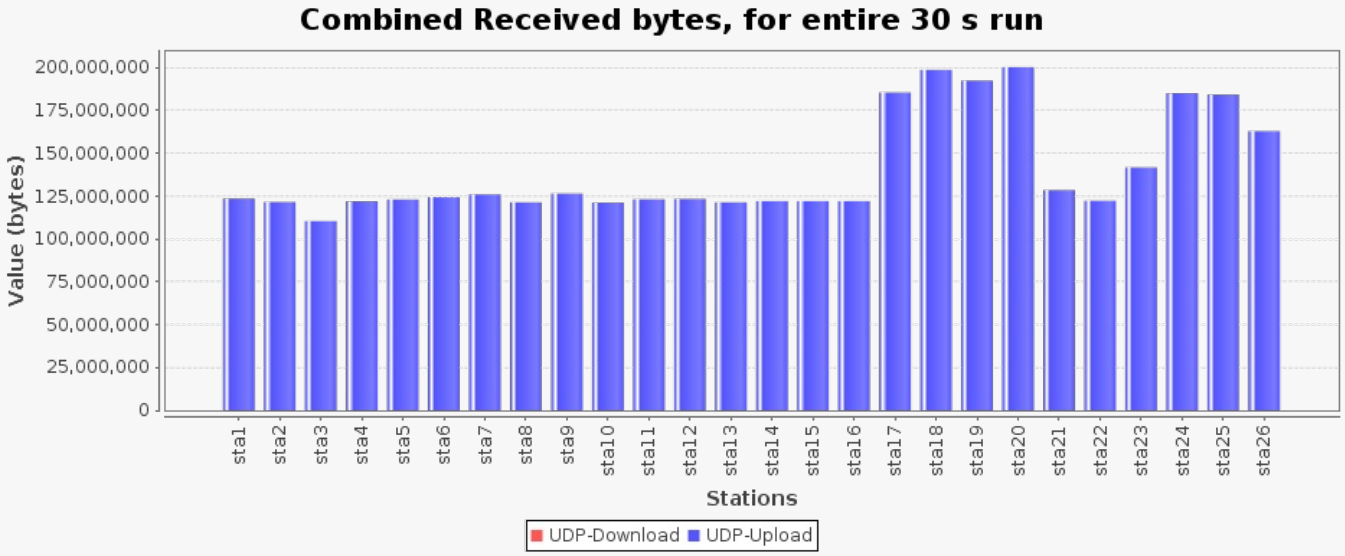
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 105.269 MB Cx Ave: 134.101 MB Cx Max: 191.036 MB All Cx: 3.405 GB
Total: 3.405 GB

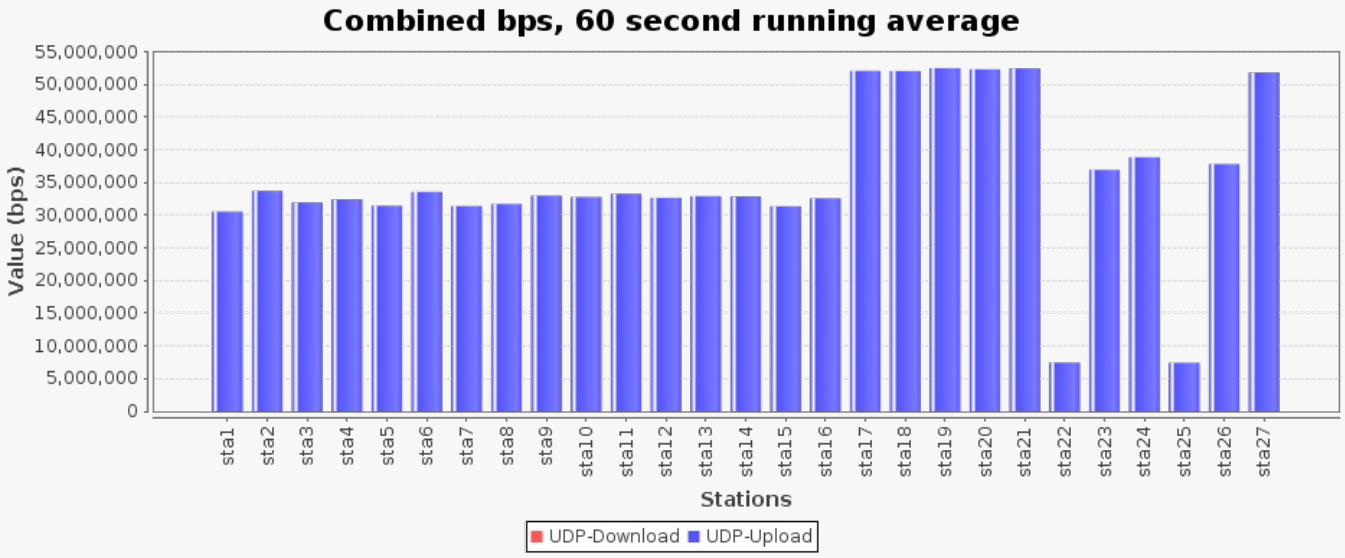
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.421 Mbps Cx Ave: 35.518 Mbps Cx Max: 52.457 Mbps All Cx: 958.999 Mbps
Total: 958.999 Mbps
Aggregated Rate: Min: 7.421 Mbps Avg: 35.518 Mbps Max: 52.457 Mbps

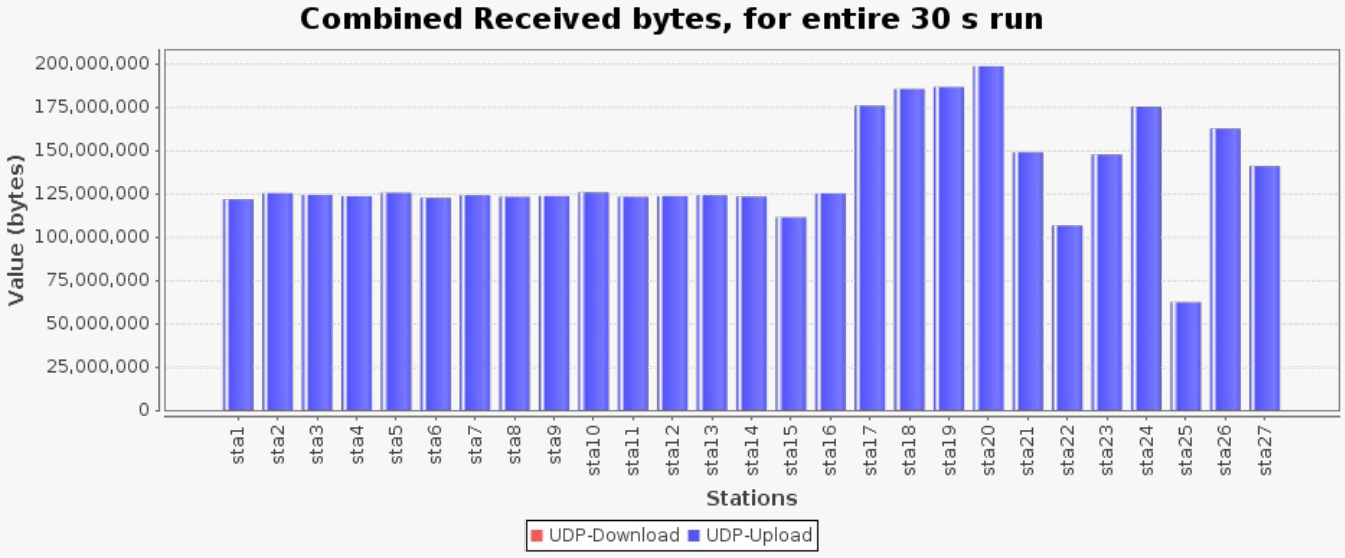
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 59.347 MB Cx Ave: 129.242 MB Cx Max: 189.311 MB All Cx: 3.408 GB
Total: 3.408 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.

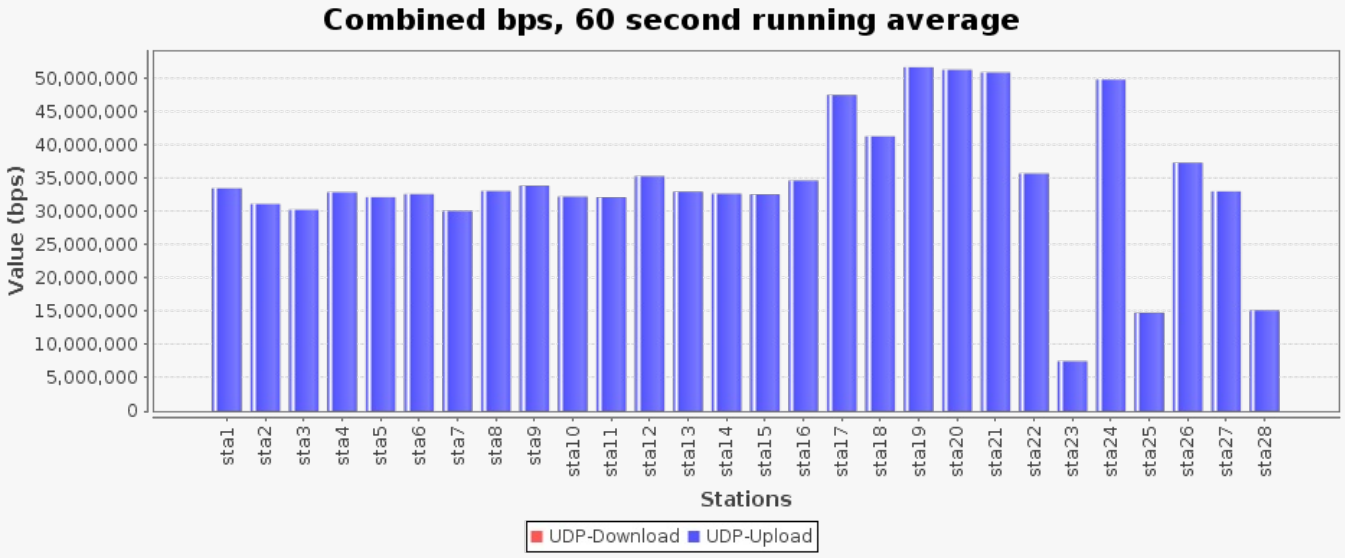


Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 53571428 (53.571 Mbps) All: 1500000000 (1.5 Gbps)

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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.489 Mbps Cx Ave: 34.198 Mbps Cx Max: 51.658 Mbps All Cx: 957.546 Mbps
Total: 957.546 Mbps
Aggregated Rate: Min: 7.489 Mbps Avg: 34.198 Mbps Max: 51.658 Mbps

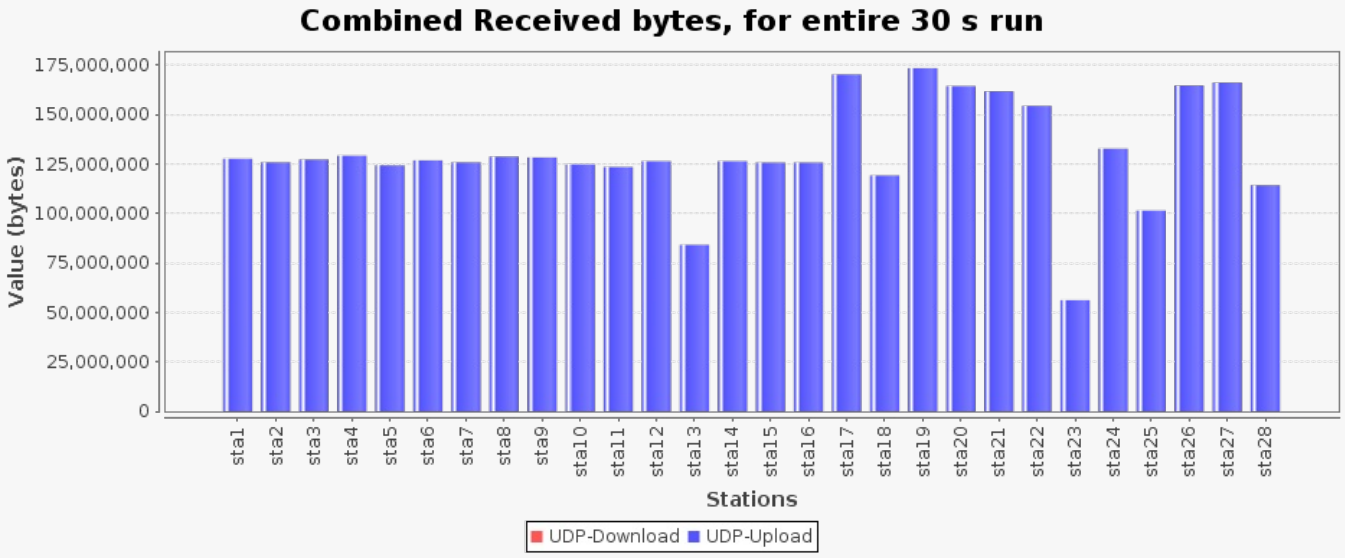
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 53.572 MB Cx Ave: 124.686 MB Cx Max: 165.47 MB All Cx: 3.409 GB
Total: 3.409 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.

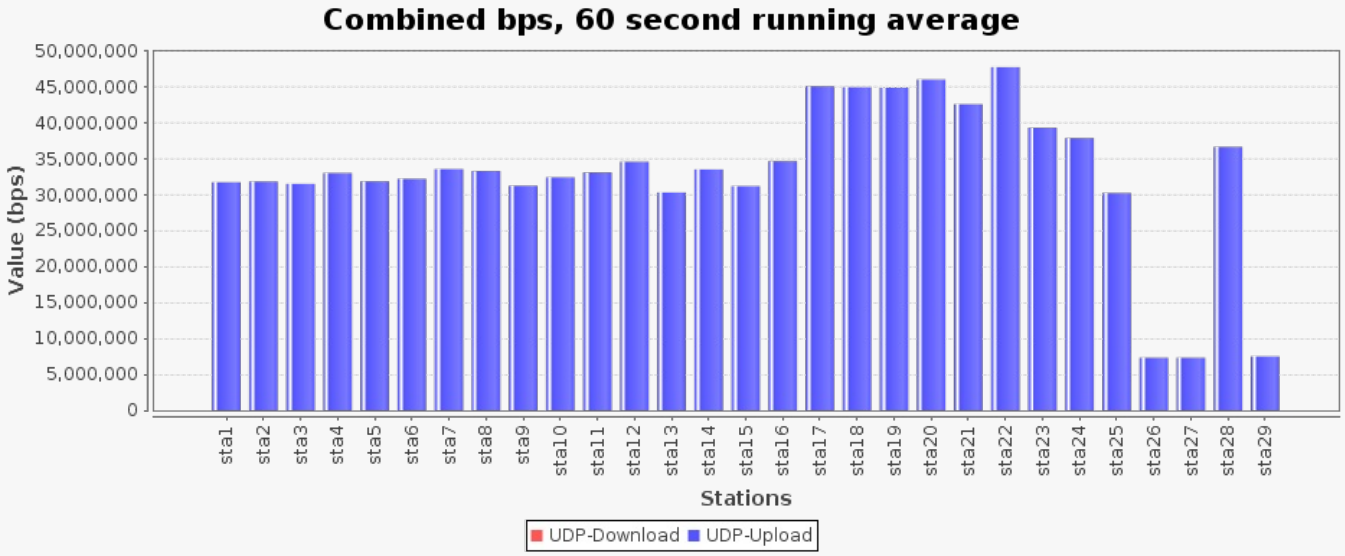


Requested Parameters:

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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.322 Mbps Cx Ave: 33.014 Mbps Cx Max: 47.742 Mbps All Cx: 957.419 Mbps
Total: 957.419 Mbps
Aggregated Rate: Min: 7.322 Mbps Avg: 33.014 Mbps Max: 47.742 Mbps

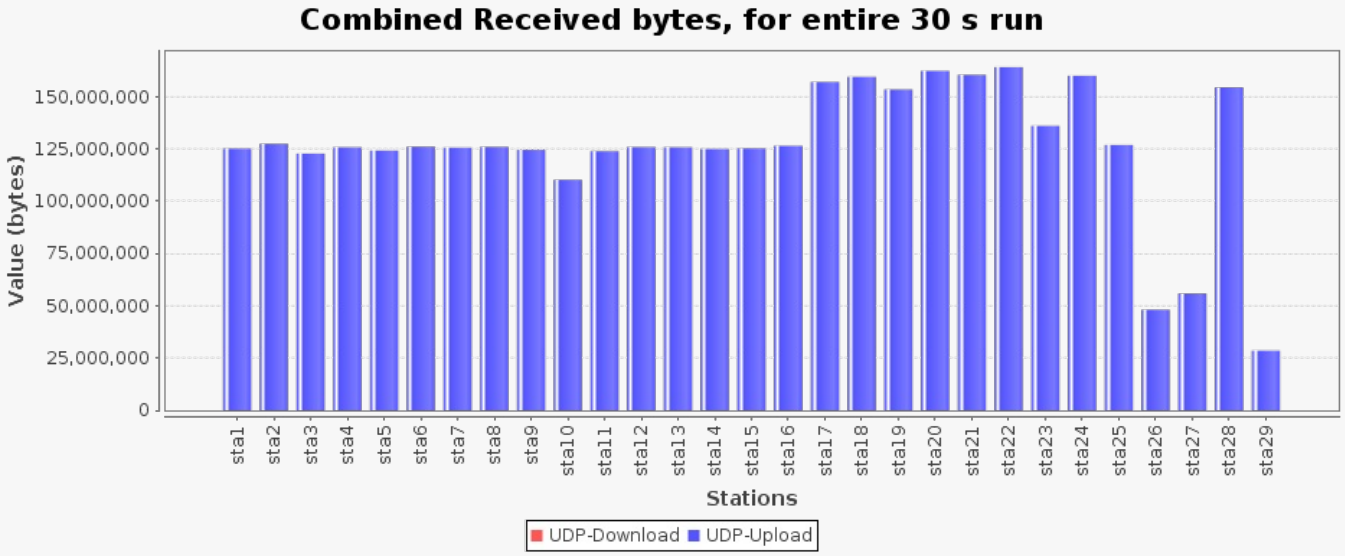
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 27.192 MB Cx Ave: 120.313 MB Cx Max: 156.579 MB All Cx: 3.407 GB
Total: 3.407 GB

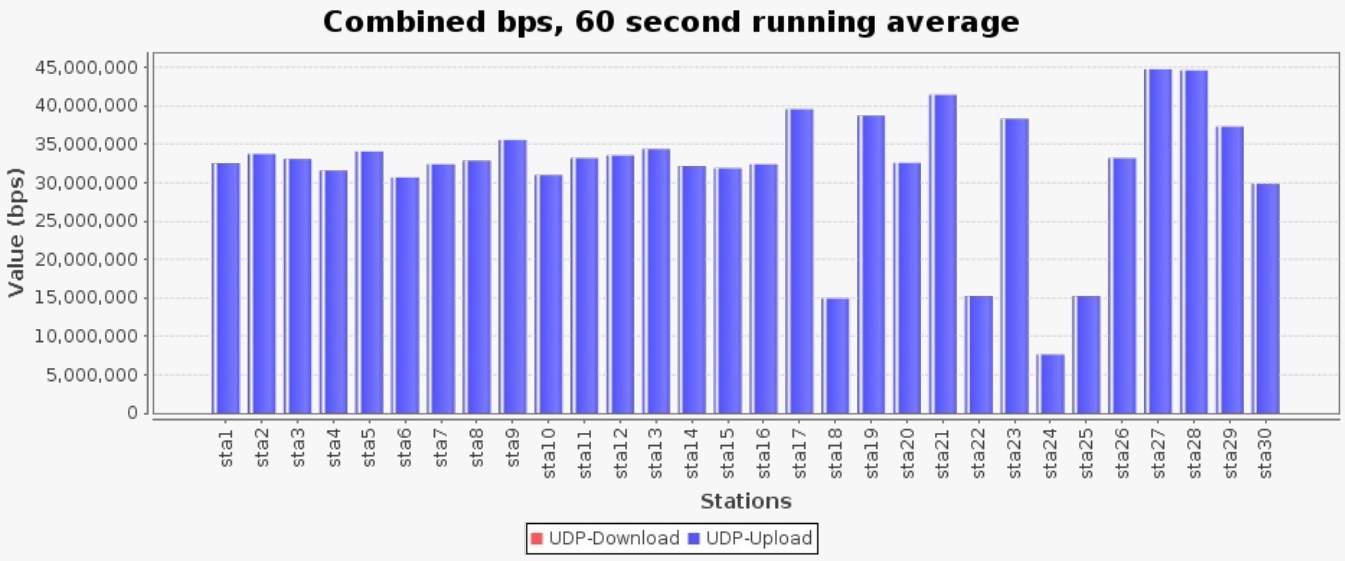
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.609 Mbps Cx Ave: 31.938 Mbps Cx Max: 44.767 Mbps All Cx: 958.151 Mbps
Total: 958.151 Mbps
Aggregated Rate: Min: 7.609 Mbps Avg: 31.938 Mbps Max: 44.767 Mbps

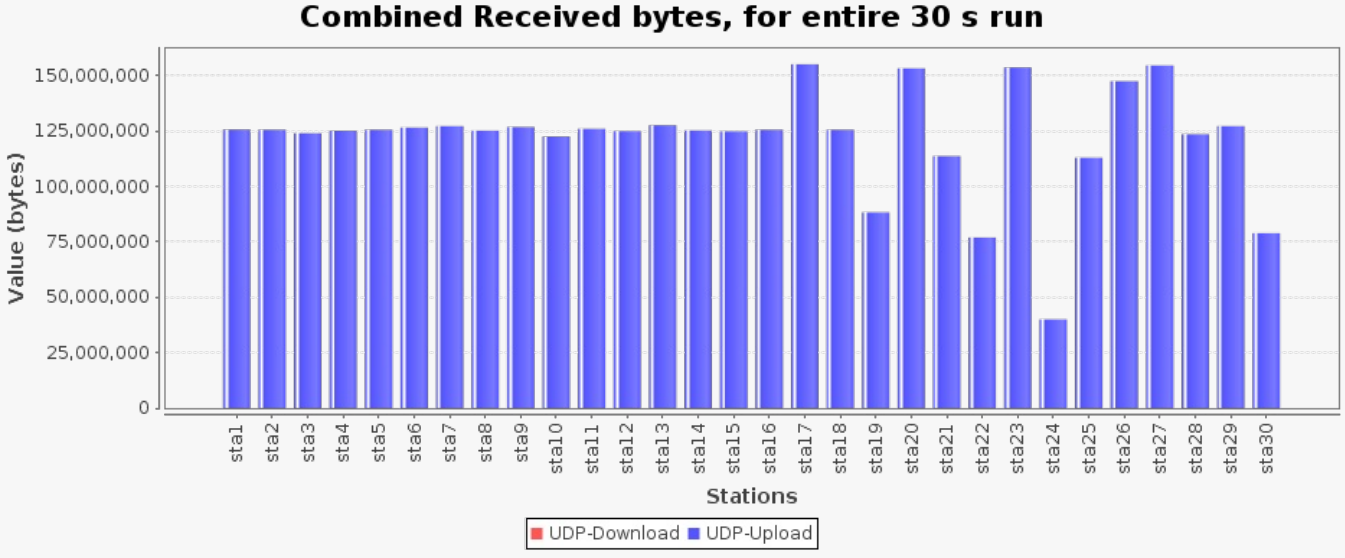
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 38.088 MB Cx Ave: 116.3 MB Cx Max: 147.893 MB All Cx: 3.407 GB
Total: 3.407 GB

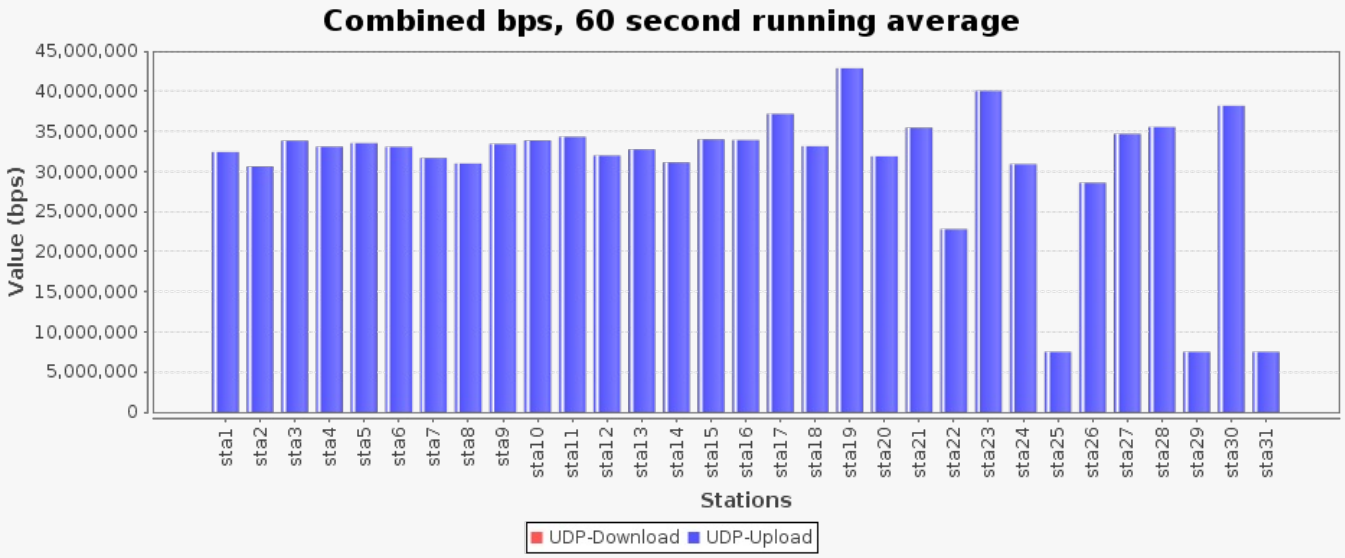
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.494 Mbps Cx Ave: 30.912 Mbps Cx Max: 42.867 Mbps All Cx: 958.274 Mbps
Total: 958.274 Mbps
Aggregated Rate: Min: 7.494 Mbps Avg: 30.912 Mbps Max: 42.867 Mbps

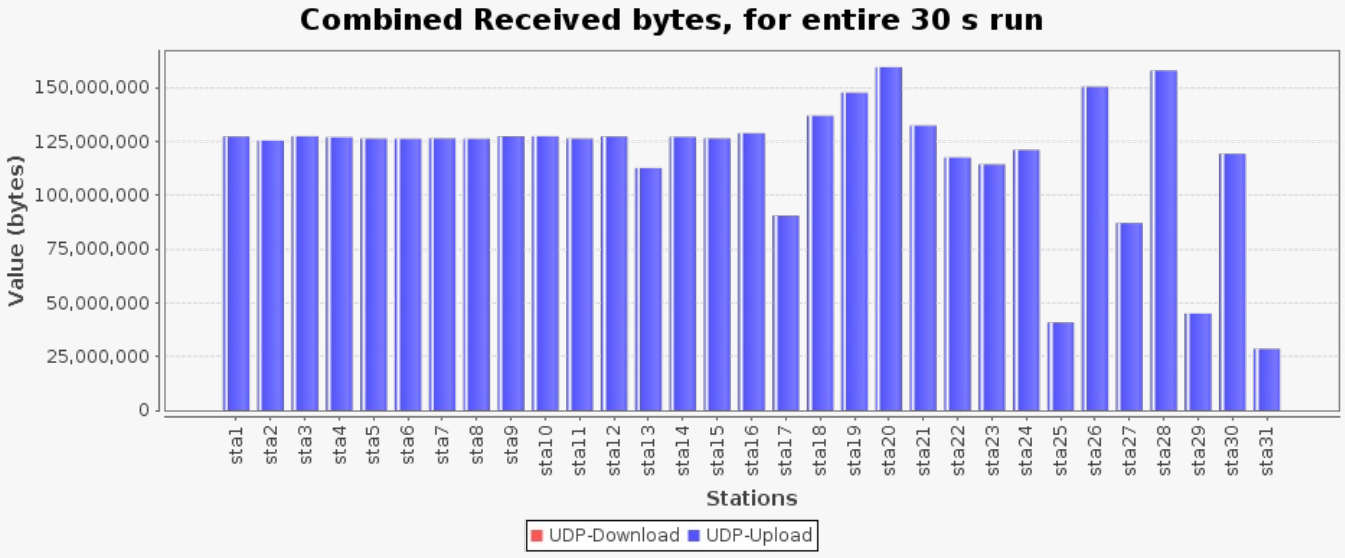
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 27.24 MB Cx Ave: 112.699 MB Cx Max: 152.127 MB All Cx: 3.412 GB
Total: 3.412 GB

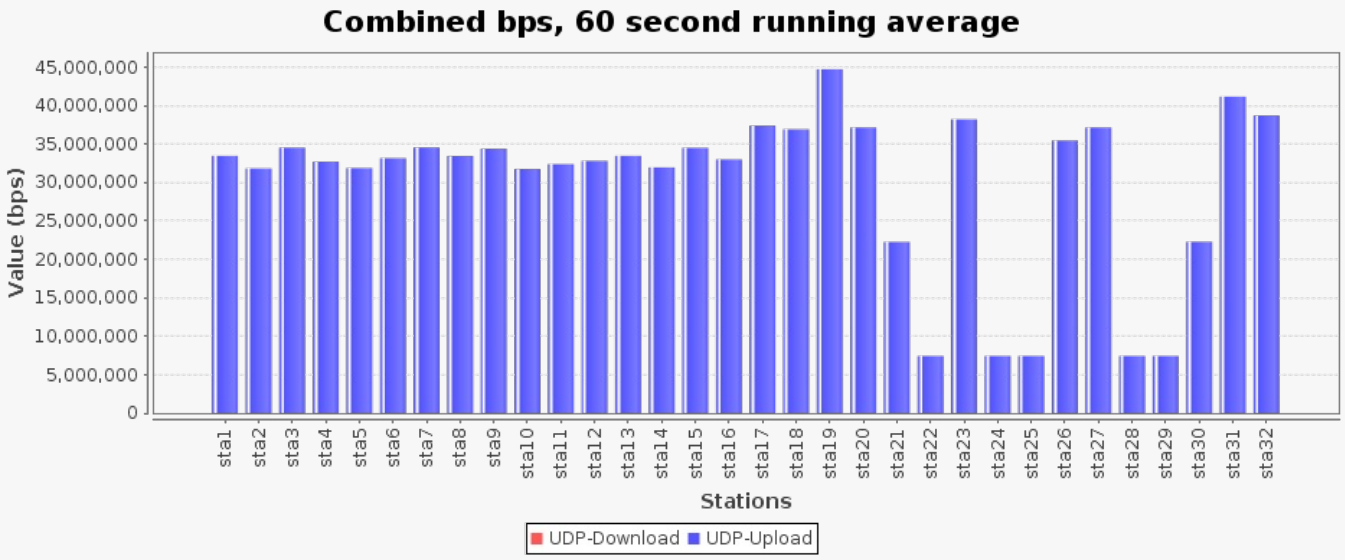
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



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

Observed Rate:
Download Rate: Cx Min: 0 bps Cx Ave: 0 bps Cx Max: 0 bps All Cx: 0 bps
Upload Rate: Cx Min: 7.421 Mbps Cx Ave: 29.949 Mbps Cx Max: 44.736 Mbps All Cx: 958.383 Mbps
Total: 958.383 Mbps
Aggregated Rate: Min: 7.421 Mbps Avg: 29.949 Mbps Max: 44.736 Mbps

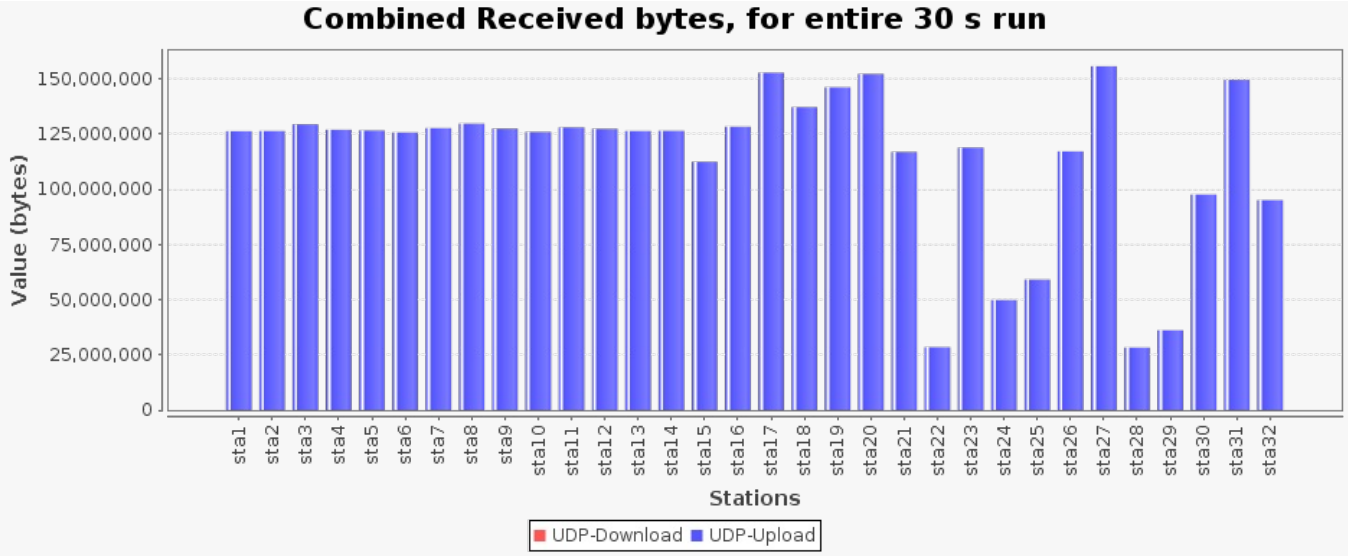
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



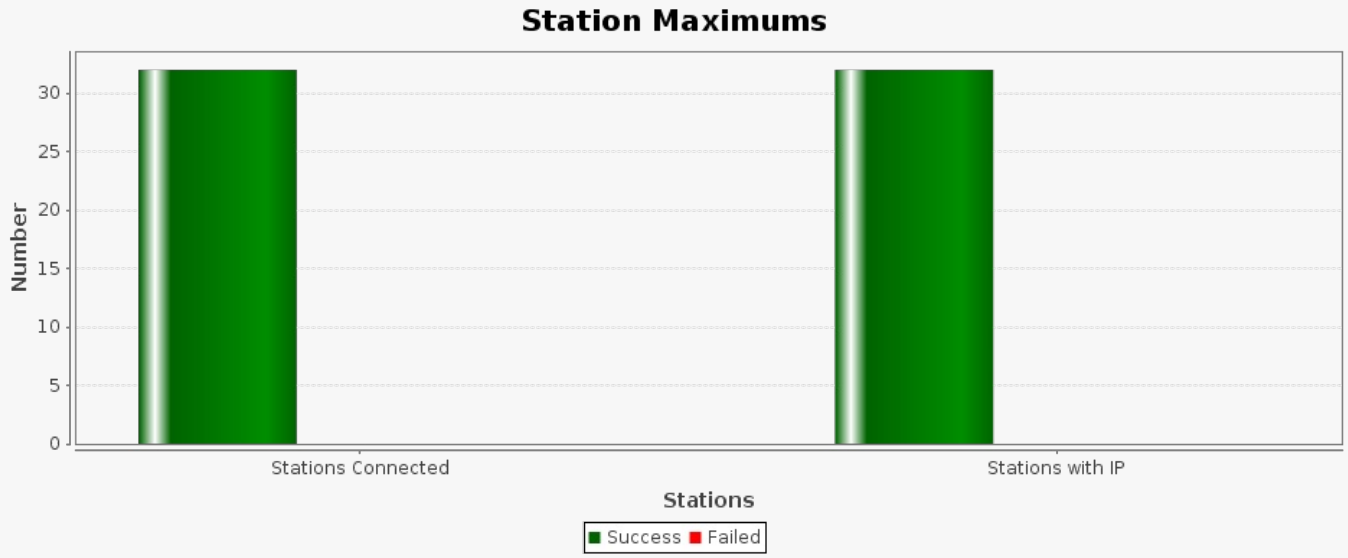
Requested Parameters:
Download Rate: Per station: 0 (0 bps) All: 0 (0 bps)
Upload Rate: Per station: 46875000 (46.875 Mbps) All: 1500000000 (1.5 Gbps)
Total: 1500000000 (1.5 Gbps)
Station count: 32 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 0 B Cx Ave: 0 B Cx Max: 0 B All Cx: 0 B
Upload Amount: Cx Min: 27.026 MB Cx Ave: 109.213 MB Cx Max: 148.582 MB All Cx: 3.413 GB
Total: 3.413 GB

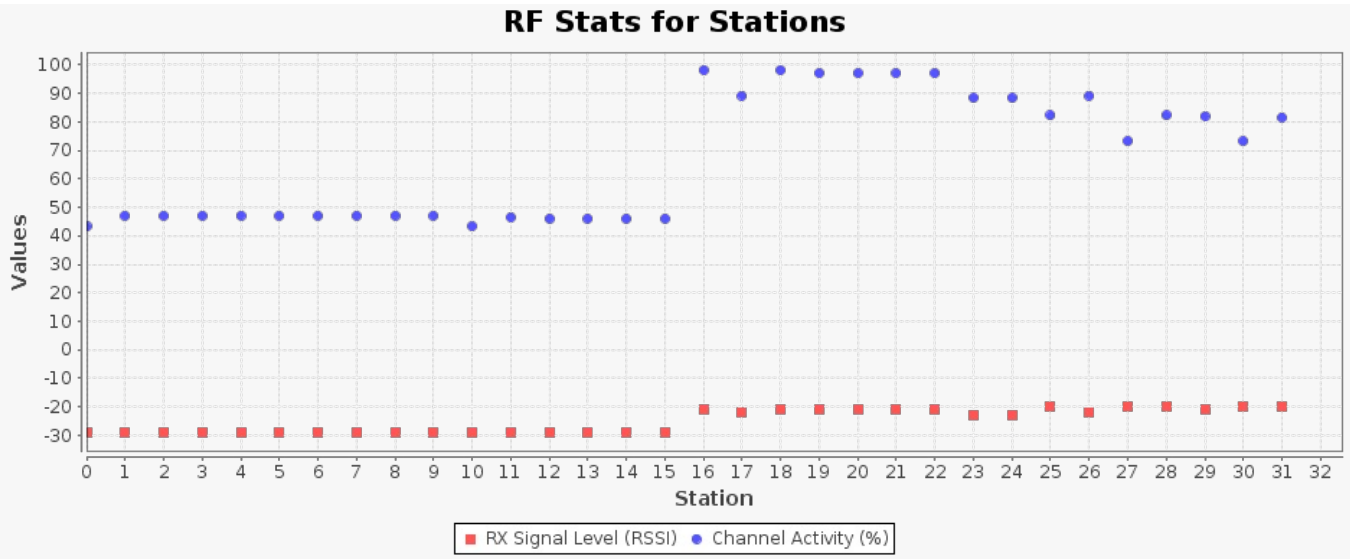
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



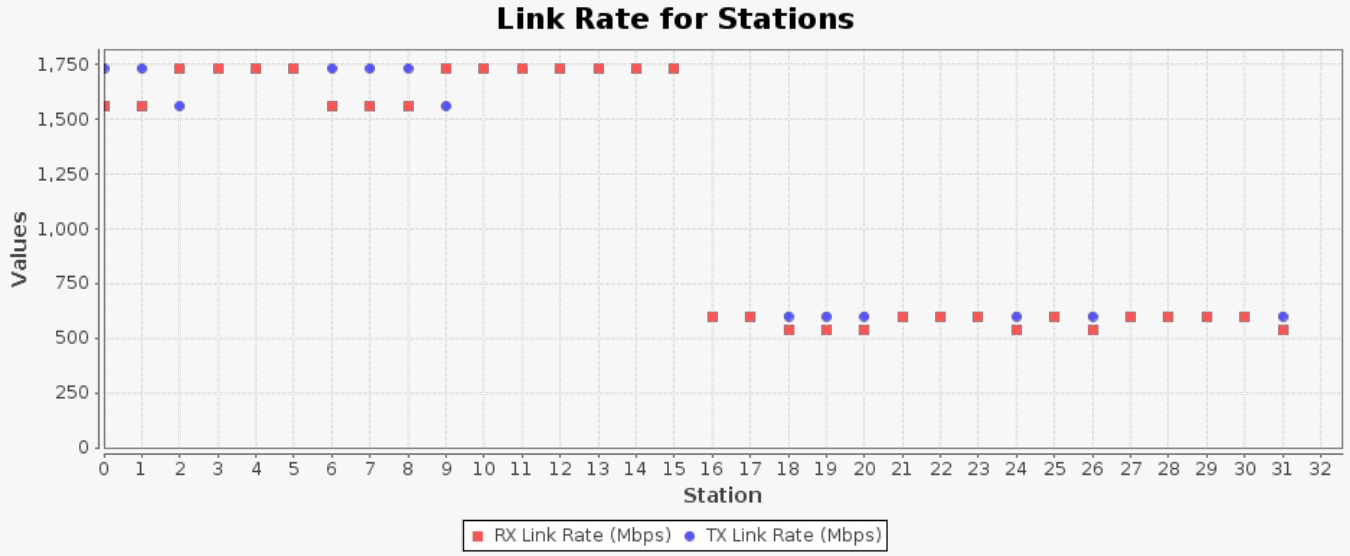
Maximum Stations Connected: 32
Stations NOT connected at this time: 0
Maximum Stations with IP Address: 32
Stations without IP at this time: 0



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 used in this test.

BSS f8:32:e4:53:af:a4(on sta1) -- associated
        TSF: 3346480954 usec (0d, 00:55:46)
        freq: 5745
        beacon interval: 100 TUs
        capability: ESS (0x0001)
        signal: -30.00 dBm
        last seen: 41 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: 85/255
                * 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: 3342320328 usec (0d, 00:55:42)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS ShortSlotTime (0x0401)
        signal: -20.00 dBm
        last seen: 148 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: 221/255
                 * 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


Scan Results for SSIDs NOT used in this test.

BSS f8:32:e4:53:af:a5(on sta1)
        TSF: 3346482276 usec (0d, 00:55:46)
        freq: 5745
        beacon interval: 100 TUs
        capability: ESS Privacy (0x0011)
        signal: -30.00 dBm
        last seen: 402 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: 85/255
                 * 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: 3342324968 usec (0d, 00:55:42)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS Privacy ShortSlotTime (0x0411)
        signal: -20.00 dBm
        last seen: 866 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: 221/255
                 * 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
```