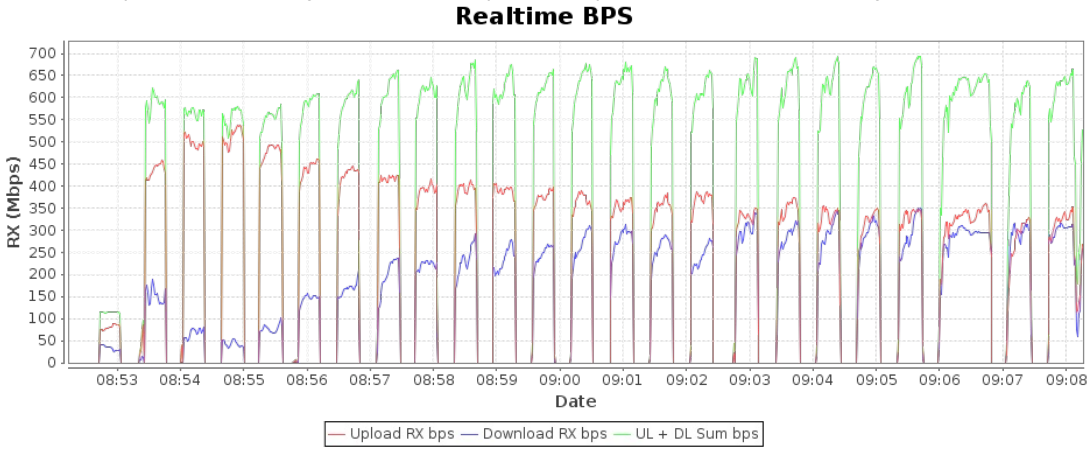
Report for: Wifi Capacity Test

Fri Jun 26 09:17:45 PDT 2020

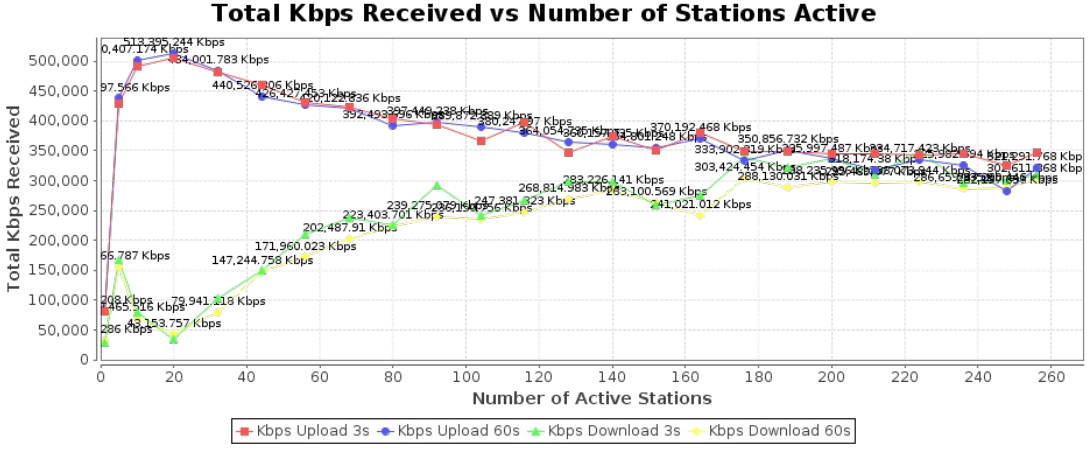
Objective

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.

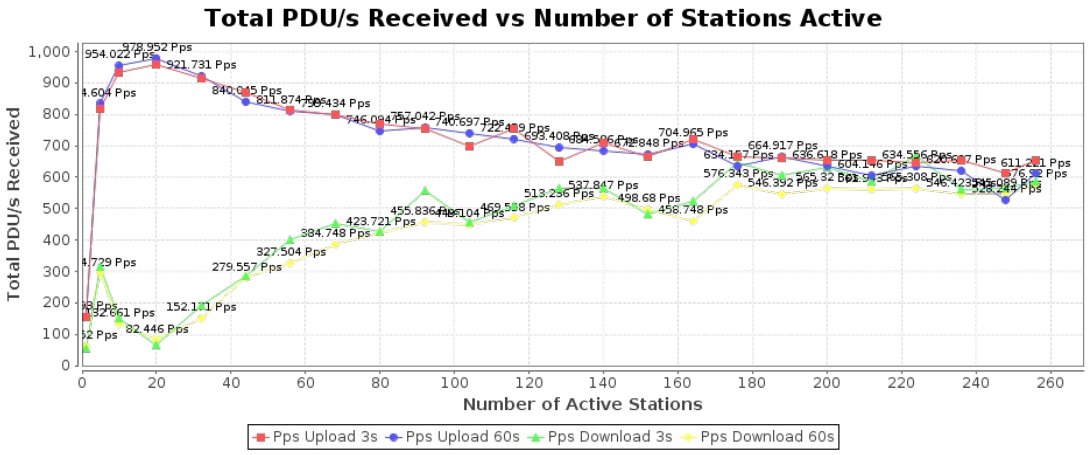
Realtime Graph shows summary download and upload RX bps of connections created by this test.



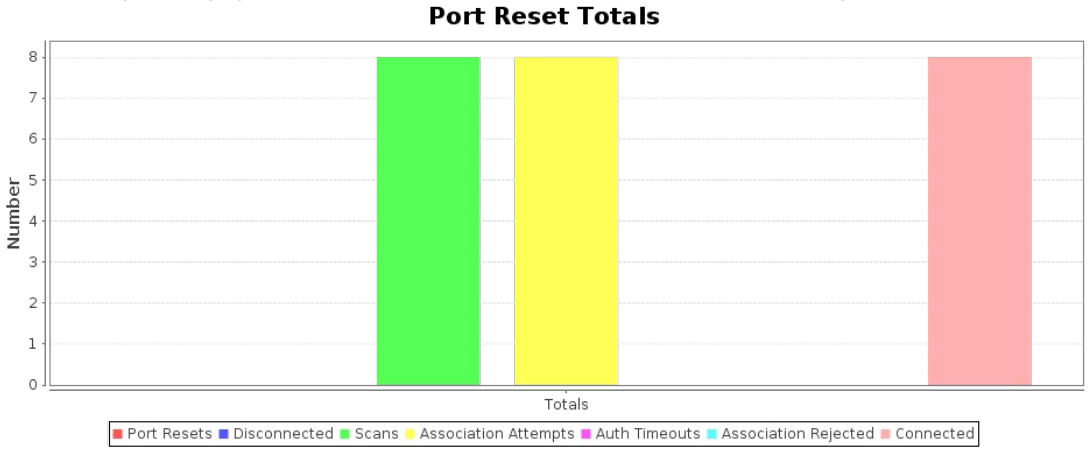
Total bits-per-second transferred. This only counts the protocol payload, so it will not count the Ethernet, IP, UDP, TCP or other header overhead. A well behaving system will show about the same rate as stations increase. If the rate decreases significantly as stations increase, then it is not scaling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



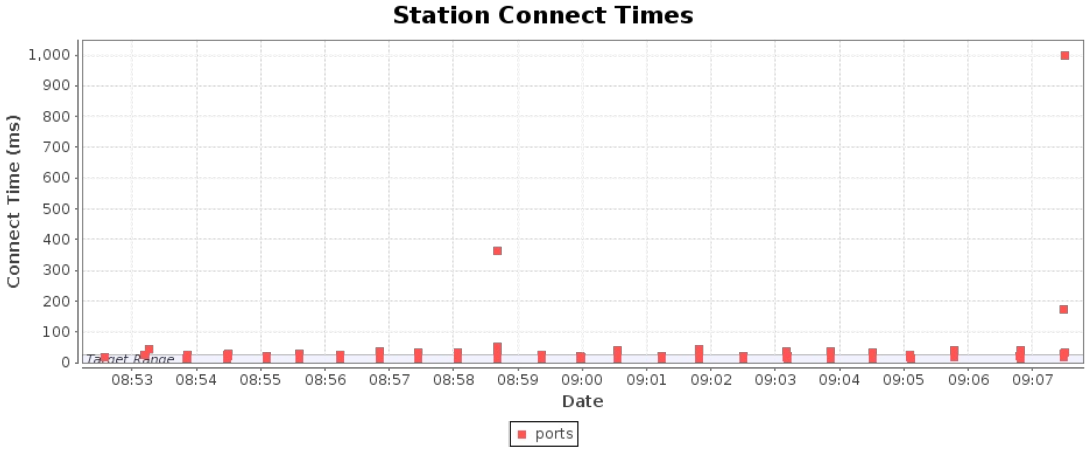
Protocol-Data-Units received. For TCP, this does not mean much, but for UDP connections, this correlates to packet size. If the PDU size is larger than what fits into a single frame, then the network stack will segment it accordingly. A well behaving system will show about the same rate as stations increase.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



Station disconnect stats. These will be only for the last iteration. If the 'Clear Reset Counters' option is selected, the stats are cleared after the initial association. Any re-connects reported indicate a potential stability issue. Can be used for long-term stability testing in cases where you bring up all stations in one iteration and then run the test for a longer duration.



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



Wifi-Capacity Test requested values	
Station Increment:	1,5,10,20,32
Loop Iterations:	Single (1)
Duration:	20 sec (20 s)
Protocol:	TCP-IPv4
Layer 4-7 Endpoint:	NONE
Payload Size:	AUTO

MSS	AUTO
Total Download Rate:	1G (1 Gbps)
Total Upload Rate:	1G (1 Gbps)
Percentage TCP Rate:	10% (10%)
Set Bursty Minimum Speed:	Burst Mode Disabled (-1)
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
Clear Reset Counters	false
CSV Reporting Dir	- not selected -
Build Date	Mon Jun 1 11:52:13 PDT 2020
Build Version	5.4.2
Git Version	e041a9abf7a5b2936c8d2109c868f04322726d02
Ports	1.1.eth2 1.1.sta00000 1.1.sta01000 1.1.sta00500 1.1.sta01500 1.1.sta00001 1.1.sta01001 1.1.sta00501 1.1.sta01501 1.1.sta00002 1.1.sta01002 1.1.sta00502 1.1.sta01502 1.1.sta00003 1.1.sta01003 1.1.sta00503 1.1.sta01503 1.1.sta00004 1.1.sta01004 1.1.sta00504 1.1.sta01504 1.1.sta00005 1.1.sta01005 1.1.sta00505 1.1.sta01505 1.1.sta00006 1.1.sta01006 1.1.sta00506 1.1.sta01506 1.1.sta00007 1.1.sta01007 1.1.sta00507 1.1.sta01507 1.1.sta00008 1.1.sta01008 1.1.sta00508 1.1.sta01508 1.1.sta00009 1.1.sta01009 1.1.sta00509 1.1.sta01509 1.1.sta00010 1.1.sta01010 1.1.sta00510 1.1.sta01510 1.1.sta00011 1.1.sta01011 1.1.sta00511 1.1.sta01511 1.1.sta00012 1.1.sta01012 1.1.sta00512 1.1.sta01512 1.1.sta00013 1.1.sta01013 1.1.sta00513 1.1.sta01513 1.1.sta00014 1.1.sta01014 1.1.sta00514 1.1.sta01514 1.1.sta00015 1.1.sta01015 1.1.sta00515 1.1.sta01515 1.1.sta00016 1.1.sta01016 1.1.sta00516 1.1.sta01516 1.1.sta00017 1.1.sta01017 1.1.sta00517 1.1.sta01517 1.1.sta00018 1.1.sta01018 1.1.sta00518 1.1.sta01518 1.1.sta00019 1.1.sta01019 1.1.sta00519 1.1.sta01519 1.1.sta00020 1.1.sta01020 1.1.sta00520 1.1.sta01520 1.1.sta00021 1.1.sta01021 1.1.sta00521 1.1.sta01521 1.1.sta00022 1.1.sta01022 1.1.sta00522 1.1.sta01522 1.1.sta00023 1.1.sta01023 1.1.sta00523 1.1.sta01523 1.1.sta00024 1.1.sta01024 1.1.sta00524 1.1.sta01524 1.1.sta00025 1.1.sta01025 1.1.sta00525 1.1.sta01525 1.1.sta00026 1.1.sta01026 1.1.sta00526 1.1.sta01526 1.1.sta00027 1.1.sta01027 1.1.sta00527 1.1.sta01527 1.1.sta00028 1.1.sta01028 1.1.sta00528 1.1.sta01528 1.1.sta00029 1.1.sta01029 1.1.sta00529 1.1.sta01529 1.1.sta00030 1.1.sta01030 1.1.sta00530 1.1.sta01530 1.1.sta00031 1.1.sta01031 1.1.sta00531 1.1.sta01531 1.1.sta00032 1.1.sta01032 1.1.sta00532 1.1.sta01532 1.1.sta00033 1.1.sta01033 1.1.sta00533 1.1.sta01533 1.1.sta00034 1.1.sta01034 1.1.sta00534 1.1.sta01534 1.1.sta00035 1.1.sta01035 1.1.sta00535 1.1.sta01535 1.1.sta00036 1.1.sta01036 1.1.sta00536 1.1.sta01536 1.1.sta00037 1.1.sta01037 1.1.sta00537 1.1.sta01537 1.1.sta00038 1.1.sta01038 1.1.sta00538

	1.1.sta01538 1.1.sta00039 1.1.sta01039 1.1.sta00539 1.1.sta01539 1.1.sta00040 1.1.sta01040 1.1.sta00540 1.1.sta01540 1.1.sta00041 1.1.sta01041 1.1.sta00541 1.1.sta01541 1.1.sta00042 1.1.sta01042 1.1.sta00542 1.1.sta01542 1.1.sta00043 1.1.sta01043 1.1.sta00543 1.1.sta01543 1.1.sta00044 1.1.sta01044 1.1.sta00544 1.1.sta01544 1.1.sta00045 1.1.sta01045 1.1.sta00545 1.1.sta01545 1.1.sta00046 1.1.sta01046 1.1.sta00546 1.1.sta01546 1.1.sta00047 1.1.sta01047 1.1.sta00547 1.1.sta01547 1.1.sta00048 1.1.sta01048 1.1.sta00548 1.1.sta01548 1.1.sta00049 1.1.sta01049 1.1.sta00549 1.1.sta01549 1.1.sta00050 1.1.sta01050 1.1.sta00550 1.1.sta01550 1.1.sta00051 1.1.sta01051 1.1.sta00551 1.1.sta01551 1.1.sta00052 1.1.sta01052 1.1.sta00552 1.1.sta01552 1.1.sta00053 1.1.sta01053 1.1.sta00553 1.1.sta01553 1.1.sta00054 1.1.sta01054 1.1.sta00554 1.1.sta01554 1.1.sta00055 1.1.sta01055 1.1.sta00555 1.1.sta01555 1.1.sta00056 1.1.sta01056 1.1.sta00556 1.1.sta01556 1.1.sta00057 1.1.sta01057 1.1.sta00557 1.1.sta01557 1.1.sta00058 1.1.sta01058 1.1.sta00558 1.1.sta01558 1.1.sta00059 1.1.sta01059 1.1.sta00559 1.1.sta01559 1.1.sta00060 1.1.sta01060 1.1.sta00560 1.1.sta01560 1.1.sta00061 1.1.sta01061 1.1.sta00561 1.1.sta01561 1.1.sta00062 1.1.sta01062 1.1.sta00562 1.1.sta01562 1.1.sta00063 1.1.sta01063 1.1.sta00563 1.1.sta01563
Firmware	10.4b-ct-9984-xtH-013-4ab470999 0x80000aef, 1.1876.0
Machines	ct523c-deca

```
Requested Parameters:
Download Rate: Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
                                              Total:    2000000000 (   2 Gbps)
Station count: 1   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  33.147 Mbps  Cx Ave:  33.147 Mbps  Cx Max:  33.147 Mbps  All Cx:  33.147 Mbps
Upload Rate:       Cx Min:  81.376 Mbps  Cx Ave:  81.376 Mbps  Cx Max:  81.376 Mbps  All Cx:  81.376 Mbps
                                                                                     Total: 114.523 Mbps
Aggregated Rate:   Min:    114.523 Mbps  Avg:    114.523 Mbps  Max:    114.523 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.
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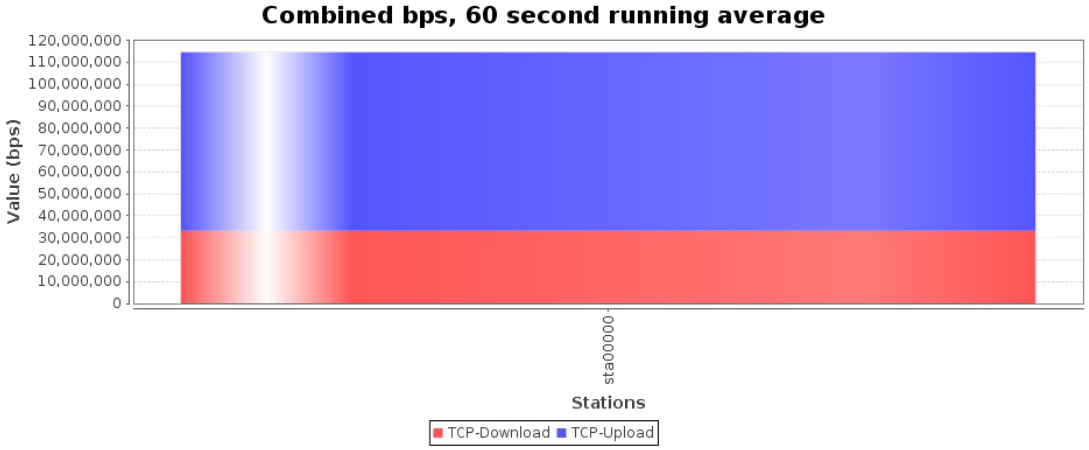


```
Requested Parameters:
Download Rate: Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
                                              Total:    2000000000 (   2 Gbps)
Station count: 1   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:    80.501 MB  Cx Ave:    80.501 MB  Cx Max:    80.501 MB  All Cx:    80.501 MB
Upload Amount:     Cx Min:   197.425 MB  Cx Ave:   197.425 MB  Cx Max:   197.425 MB  All Cx:   197.425 MB
                                                                                     Total:    277.926 MB

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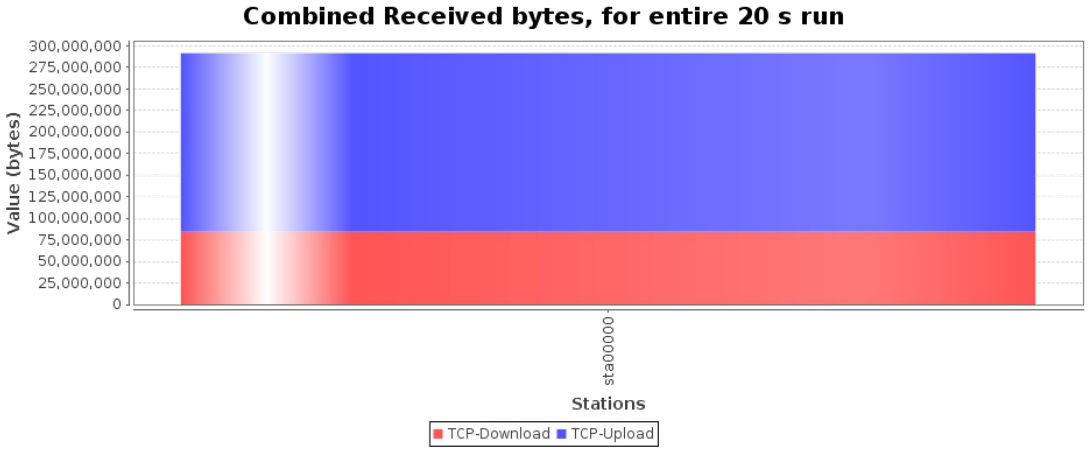


```
Requested Parameters:
Download Rate: Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 5   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:    4.02 Mbps  Cx Ave:  30.933 Mbps  Cx Max:  80.801 Mbps  All Cx: 154.667 Mbps
Upload Rate:       Cx Min:  12.258 Mbps  Cx Ave:  85.868 Mbps  Cx Max: 169.986 Mbps  All Cx: 429.342 Mbps
                                                                                     Total: 584.008 Mbps
Aggregated Rate:   Min:     16.277 Mbps  Avg:    116.802 Mbps  Max:    250.787 Mbps

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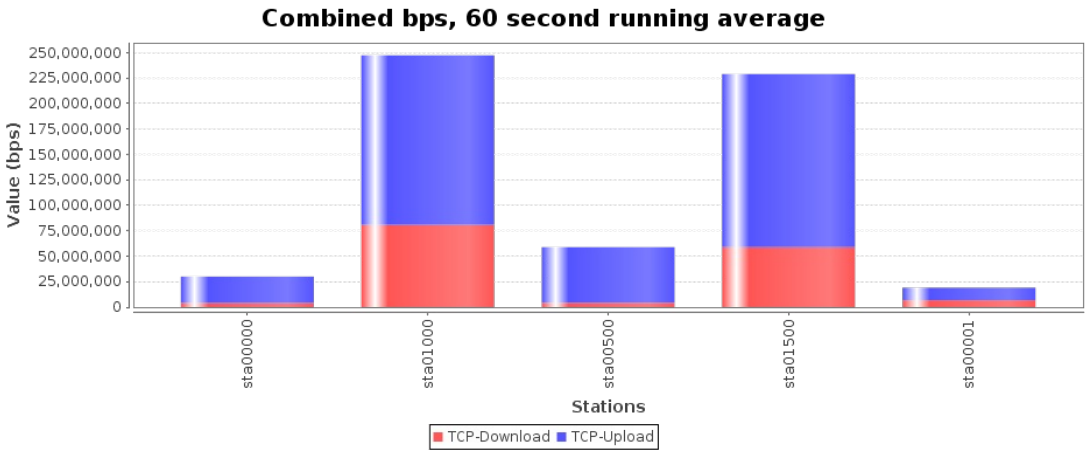


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Requested Parameters:
Download Rate: Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 5   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:     9.775 MB  Cx Ave:    75.231 MB  Cx Max:     196.5 MB  All Cx:   376.153 MB
Upload Amount:     Cx Min:    31.321 MB  Cx Ave:   212.898 MB  Cx Max:   424.536 MB  All Cx:      1.04 GB
                                                                                     Total:      1.407 GB

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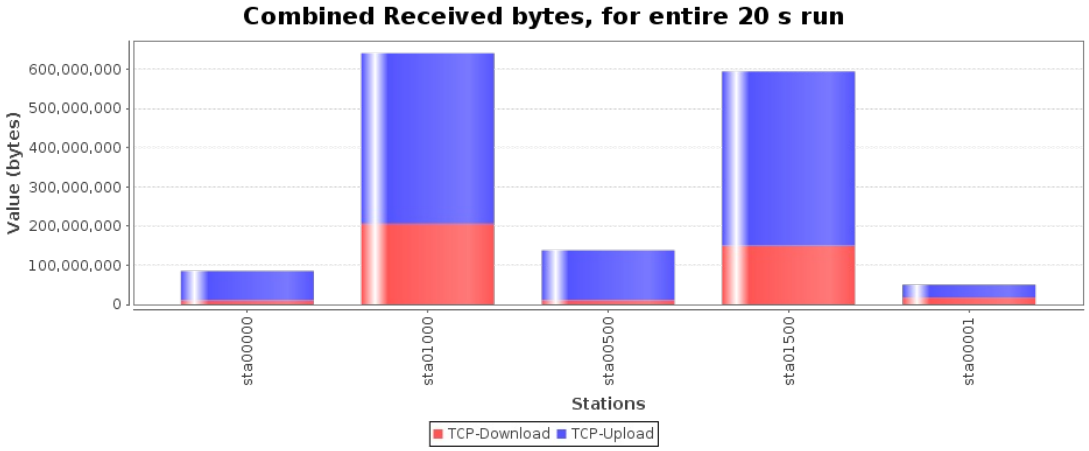


```
Requested Parameters:
Download Rate: Per station: 100000000 ( 100 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 100000000 ( 100 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 10   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:   1.725 Mbps  Cx Ave:   6.947 Mbps  Cx Max:  25.053 Mbps  All Cx:  69.466 Mbps
Upload Rate:       Cx Min:  10.184 Mbps  Cx Ave:  49.087 Mbps  Cx Max:  98.787 Mbps  All Cx: 490.874 Mbps
                                                                                     Total: 560.339 Mbps
Aggregated Rate:   Min:     11.909 Mbps  Avg:     56.034 Mbps  Max:     123.84 Mbps

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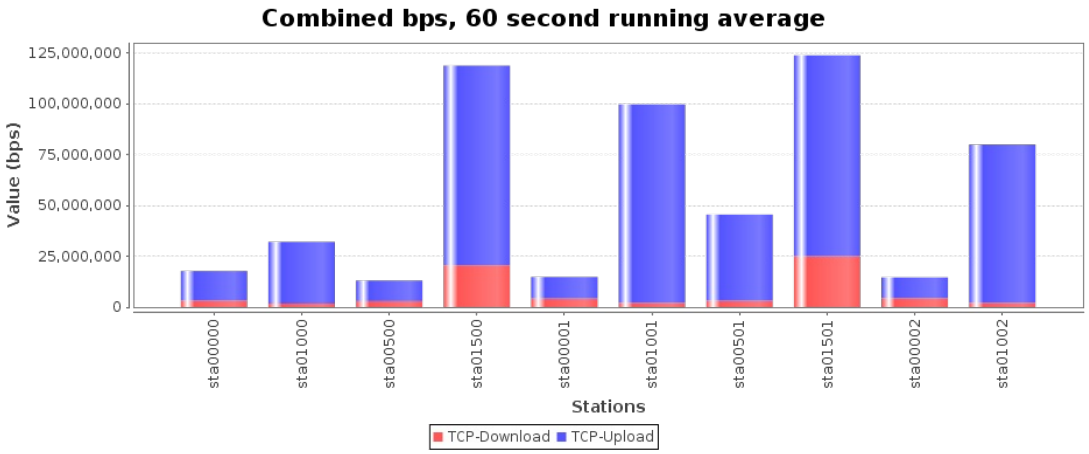


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Requested Parameters:
Download Rate: Per station: 100000000 ( 100 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station: 100000000 ( 100 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 10   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:       4.2 MB  Cx Ave:    16.918 MB  Cx Max:    61.018 MB  All Cx:   169.184 MB
Upload Amount:     Cx Min:    18.647 MB  Cx Ave:   121.872 MB  Cx Max:   246.261 MB  All Cx:      1.19 GB
                                                                                     Total:      1.355 GB

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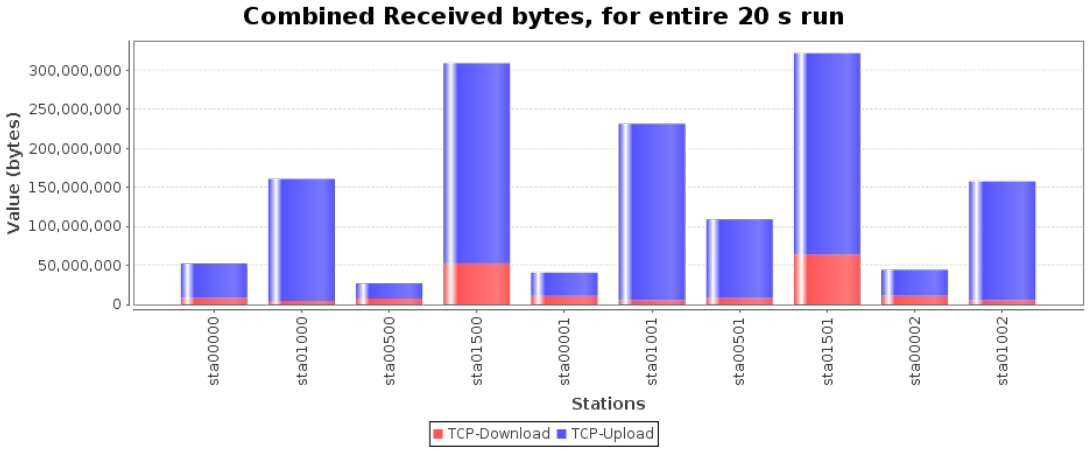


```
Requested Parameters:
Download Rate: Per station:  50000000 (  50 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  50000000 (  50 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 20   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 468.068 Kbps  Cx Ave:   2.158 Mbps  Cx Max:   6.646 Mbps  All Cx:  43.154 Mbps
Upload Rate:       Cx Min:    2.44 Mbps  Cx Ave:  25.244 Mbps  Cx Max:  47.816 Mbps  All Cx: 504.882 Mbps
                                                                                     Total: 548.036 Mbps
Aggregated Rate:   Min:      2.908 Mbps  Avg:     27.402 Mbps  Max:     54.463 Mbps

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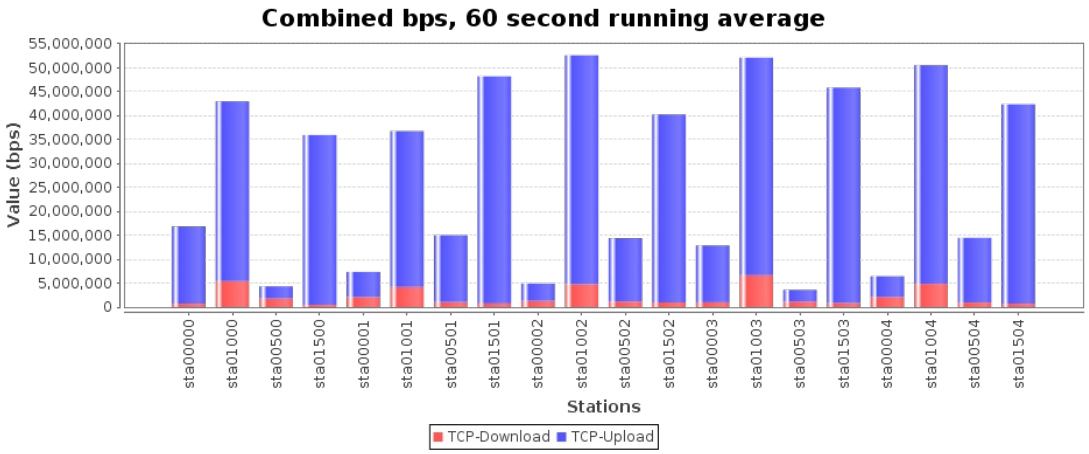


```
Requested Parameters:
Download Rate: Per station:  50000000 (  50 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  50000000 (  50 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 20   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:     1.138 MB  Cx Ave:     5.243 MB  Cx Max:    16.151 MB  All Cx:   104.866 MB
Upload Amount:     Cx Min:     8.502 MB  Cx Ave:    62.379 MB  Cx Max:    121.76 MB  All Cx:     1.218 GB
                                                                                     Total:      1.321 GB

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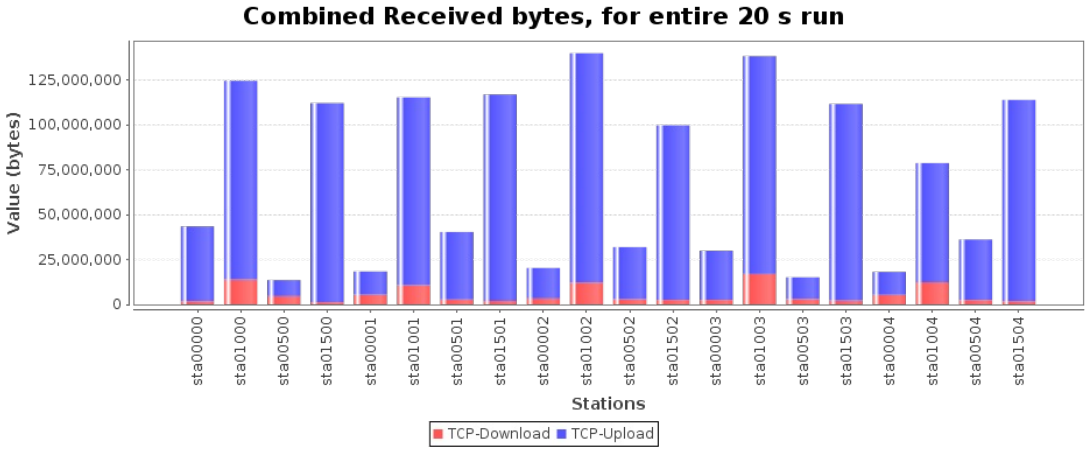


```
Requested Parameters:
Download Rate: Per station:  31250000 (31.25 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  31250000 (31.25 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 32   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 324.683 Kbps  Cx Ave:   2.498 Mbps  Cx Max:   9.031 Mbps  All Cx:  79.941 Mbps
Upload Rate:       Cx Min:   1.237 Mbps  Cx Ave:  15.065 Mbps  Cx Max:  32.991 Mbps  All Cx:  482.08 Mbps
                                                                                     Total: 562.021 Mbps
Aggregated Rate:   Min:      1.562 Mbps  Avg:     17.563 Mbps  Max:     42.022 Mbps

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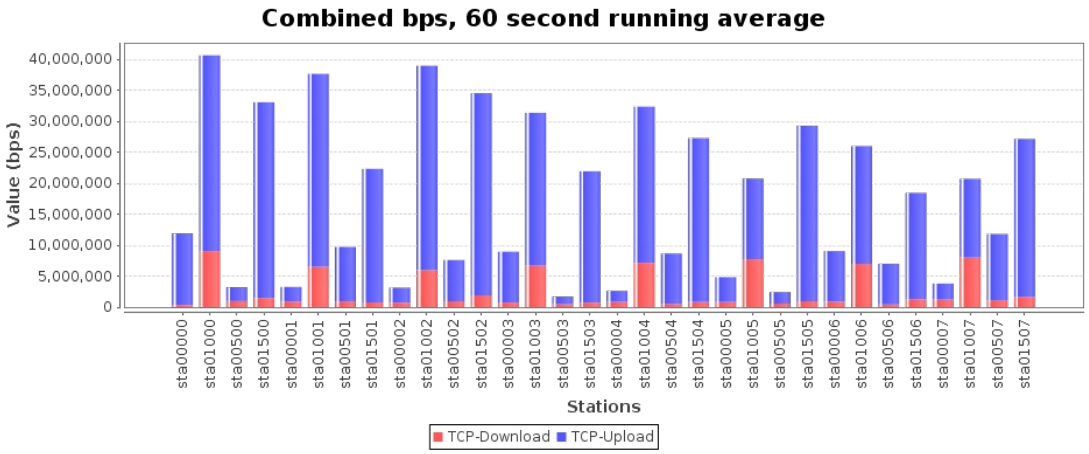


```
Requested Parameters:
Download Rate: Per station:  31250000 (31.25 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  31250000 (31.25 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 32   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   809.344 KB  Cx Ave:     6.082 MB  Cx Max:    21.983 MB  All Cx:   194.638 MB
Upload Amount:     Cx Min:     4.642 MB  Cx Ave:    36.827 MB  Cx Max:     76.97 MB  All Cx:     1.151 GB
                                                                                     Total:      1.341 GB

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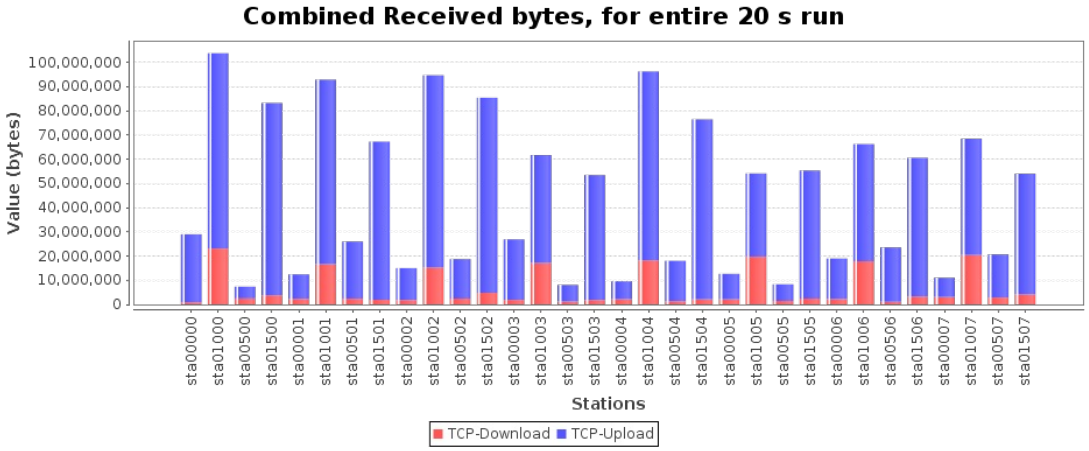
```




```
Requested Parameters:
Download Rate: Per station:  22727272 (22.727 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  22727272 (22.727 Mbps)  All:   1000000000 (   1 Gbps)
                                                Total:    2000000000 (   2 Gbps)
Station count: 44   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 350.268 Kbps  Cx Ave:   3.346 Mbps  Cx Max:  10.918 Mbps  All Cx: 147.245 Mbps
Upload Rate:       Cx Min:   1.129 Mbps  Cx Ave:  10.432 Mbps  Cx Max:  24.473 Mbps  All Cx: 459.024 Mbps
                                                                                     Total: 606.268 Mbps
Aggregated Rate:   Min:      1.479 Mbps  Avg:     13.779 Mbps  Max:     35.391 Mbps

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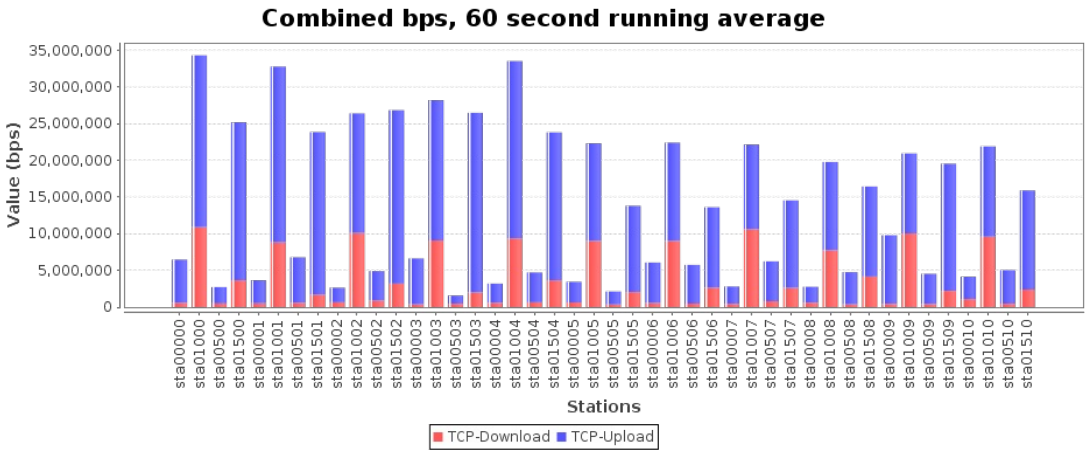
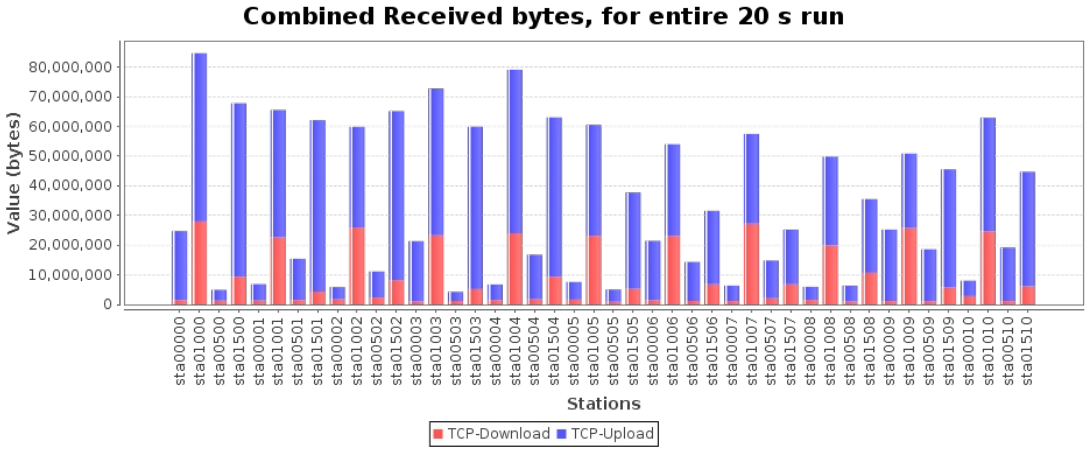
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.
```




```
Requested Parameters:
Download Rate: Per station:  22727272 (22.727 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  22727272 (22.727 Mbps)  All:   1000000000 (   1 Gbps)
                                                Total:    2000000000 (   2 Gbps)
Station count: 44   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   876.984 KB  Cx Ave:     8.182 MB  Cx Max:    26.695 MB  All Cx:   360.003 MB
Upload Amount:     Cx Min:     2.923 MB  Cx Ave:    24.477 MB  Cx Max:     55.79 MB  All Cx:     1.052 GB
                                                                                     Total:      1.403 GB

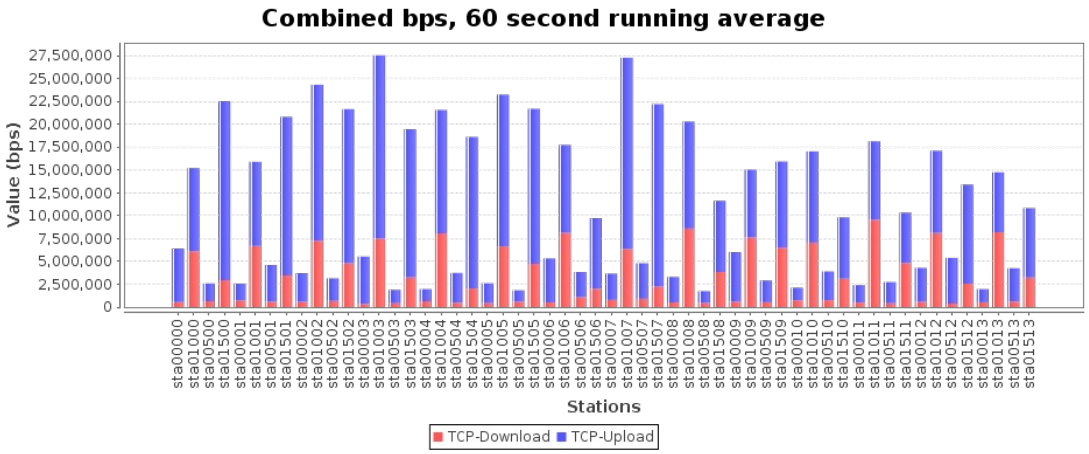
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  17857142 (17.857 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  17857142 (17.857 Mbps)  All:   1000000000 (   1 Gbps)
                                                     Total:    2000000000 (   2 Gbps)
Station count: 56   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  337.23 Kbps  Cx Ave:   3.071 Mbps  Cx Max:   9.563 Mbps  All Cx:  171.96 Mbps
Upload Rate:       Cx Min:    1.26 Mbps  Cx Ave:   7.706 Mbps  Cx Max:  20.959 Mbps  All Cx: 431.528 Mbps
                                                                                     Total: 603.488 Mbps
Aggregated Rate:   Min:      1.597 Mbps  Avg:     10.777 Mbps  Max:     30.522 Mbps

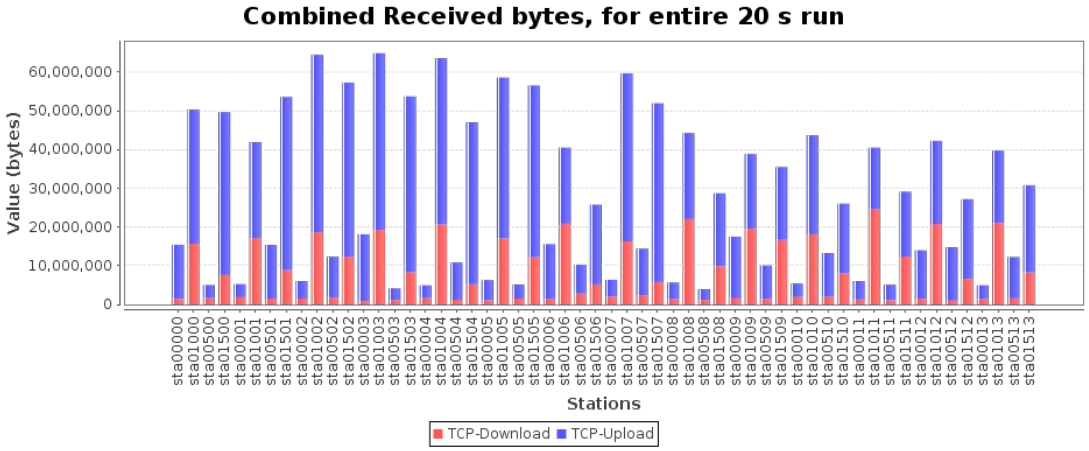
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  17857142 (17.857 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  17857142 (17.857 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 56   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   843.832 KB  Cx Ave:     7.505 MB  Cx Max:    23.374 MB  All Cx:   420.284 MB
Upload Amount:     Cx Min:     2.644 MB  Cx Ave:    18.612 MB  Cx Max:    44.032 MB  All Cx:     1.018 GB
                                                                                    Total:      1.428 GB

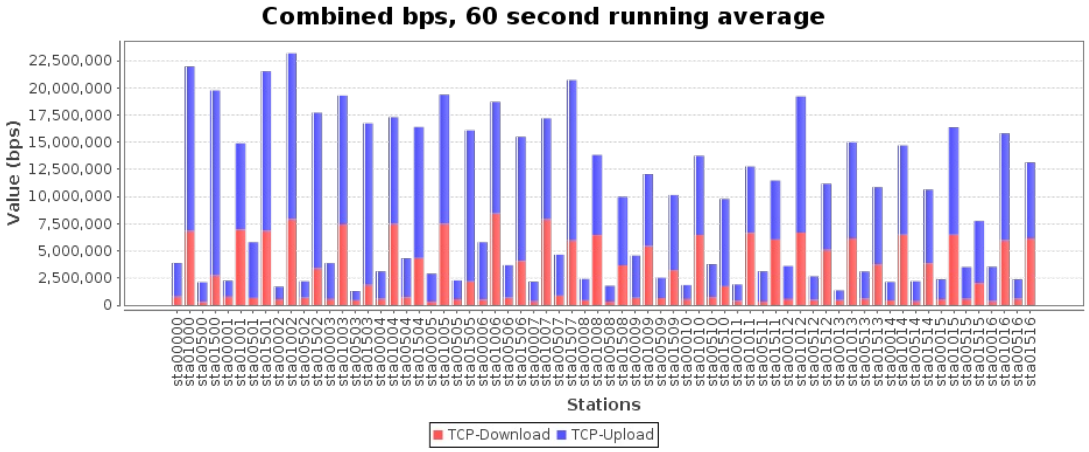
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



Requested Parameters:
Download Rate: Per station: 14705882 (14.706 Mbps) All: 1000000000 (1 Gbps)
Upload Rate: Per station: 14705882 (14.706 Mbps) All: 1000000000 (1 Gbps)
Total: 2000000000 (2 Gbps)
Station count: 68 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate: Cx Min: 301.886 Kbps Cx Ave: 2.978 Mbps Cx Max: 8.448 Mbps All Cx: 202.488 Mbps
Upload Rate: Cx Min: 843.677 Kbps Cx Ave: 6.222 Mbps Cx Max: 17.038 Mbps All Cx: 423.077 Mbps
Total: 625.565 Mbps
Aggregated Rate: Min: 1.146 Mbps Avg: 9.199 Mbps Max: 25.486 Mbps

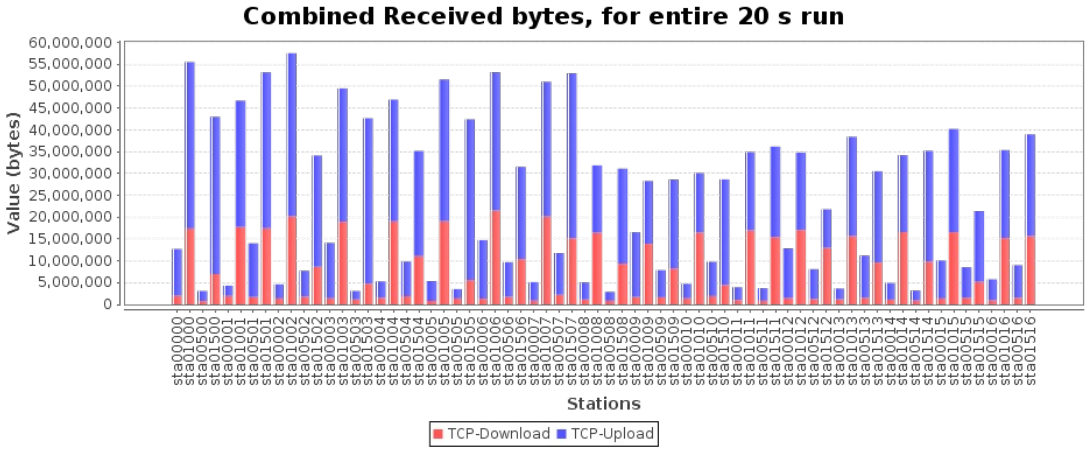
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



Requested Parameters:
Download Rate: Per station: 14705882 (14.706 Mbps) All: 1000000000 (1 Gbps)
Upload Rate: Per station: 14705882 (14.706 Mbps) All: 1000000000 (1 Gbps)
Total: 2000000000 (2 Gbps)
Station count: 68 Connections per station: 1 Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount: Cx Min: 751.609 KB Cx Ave: 7.241 MB Cx Max: 20.538 MB All Cx: 492.374 MB
Upload Amount: Cx Min: 1.834 MB Cx Ave: 15.028 MB Cx Max: 36.324 MB All Cx: 1,021.924 MB
Total: 1.479 GB

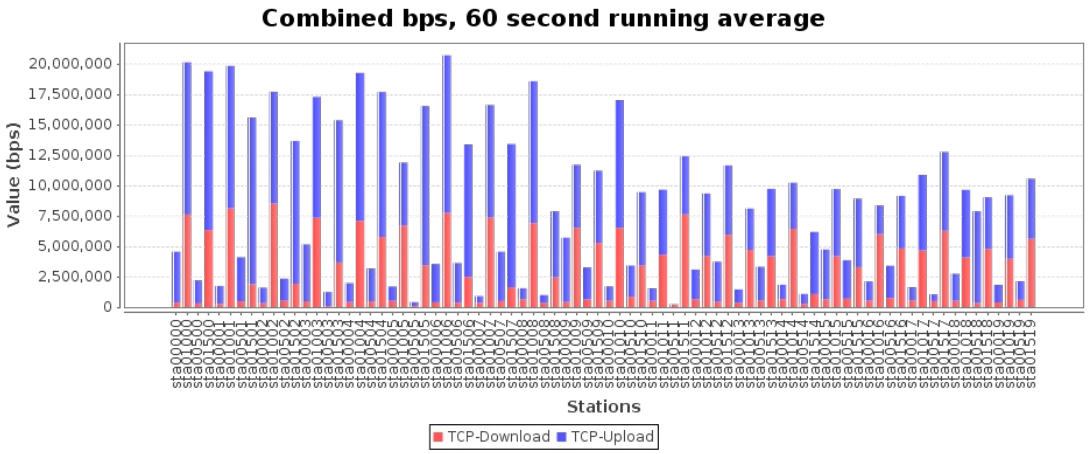
This graph shows fairness. On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  12500000 (12.5 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  12500000 (12.5 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 80   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  81.254 Kbps  Cx Ave:   2.793 Mbps  Cx Max:   8.524 Mbps  All Cx: 223.404 Mbps
Upload Rate:       Cx Min:  22.944 Kbps  Cx Ave:   5.043 Mbps  Cx Max:  13.699 Mbps  All Cx: 403.465 Mbps
                                                                                     Total: 626.869 Mbps
Aggregated Rate:   Min:    104.198 Kbps  Avg:      7.836 Mbps  Max:     22.223 Mbps

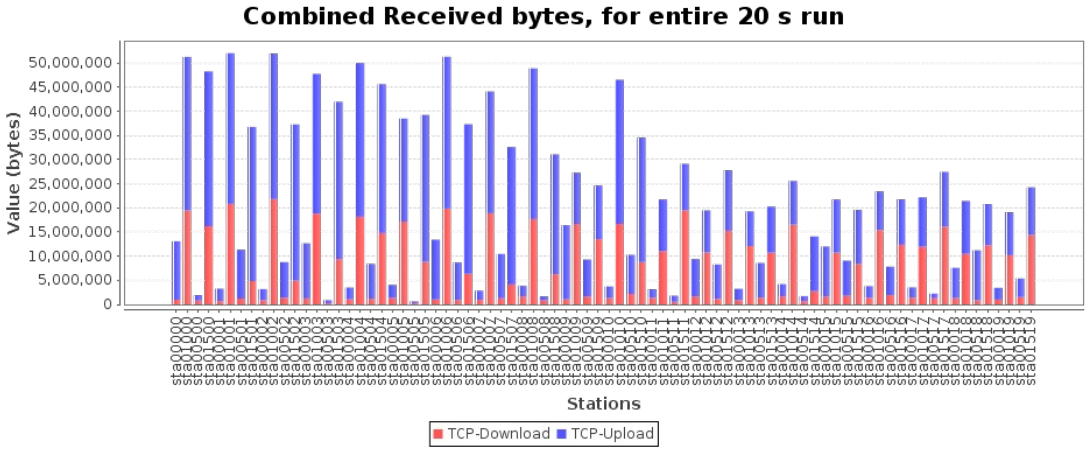
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  12500000 (12.5 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  12500000 (12.5 Mbps)  All:   1000000000 (   1 Gbps)
                                                   Total:    2000000000 (   2 Gbps)
Station count: 80   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   203.238 KB  Cx Ave:     6.825 MB  Cx Max:    20.814 MB  All Cx:   545.963 MB
Upload Amount:     Cx Min:   405.699 KB  Cx Ave:    11.982 MB  Cx Max:    31.101 MB  All Cx:   958.544 MB
                                                                                     Total:      1.469 GB

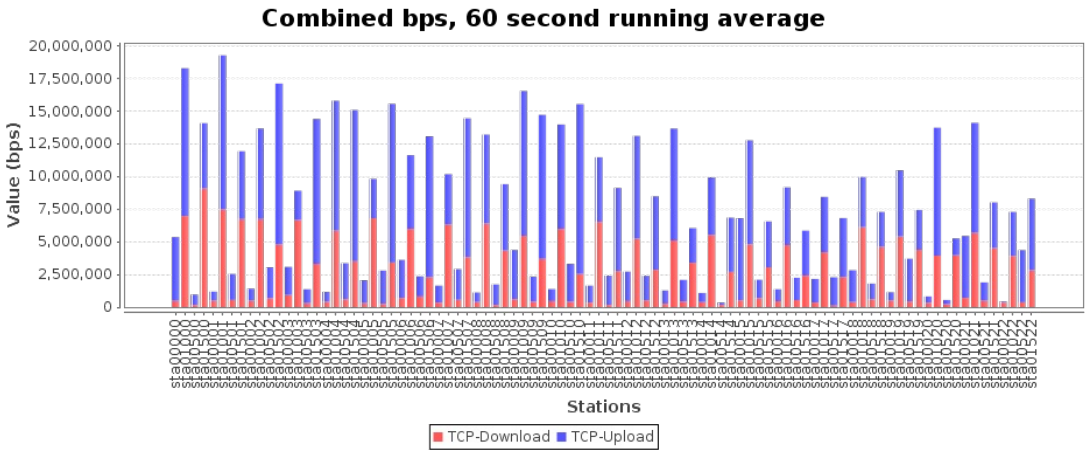
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  10869565 (10.87 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  10869565 (10.87 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 92   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 112.878 Kbps  Cx Ave:   2.601 Mbps  Cx Max:   9.071 Mbps  All Cx: 239.275 Mbps
Upload Rate:       Cx Min:  81.768 Kbps  Cx Ave:   4.285 Mbps  Cx Max:  12.984 Mbps  All Cx:  394.21 Mbps
                                                                                     Total: 633.485 Mbps
Aggregated Rate:   Min:    194.646 Kbps  Avg:      6.886 Mbps  Max:     22.056 Mbps

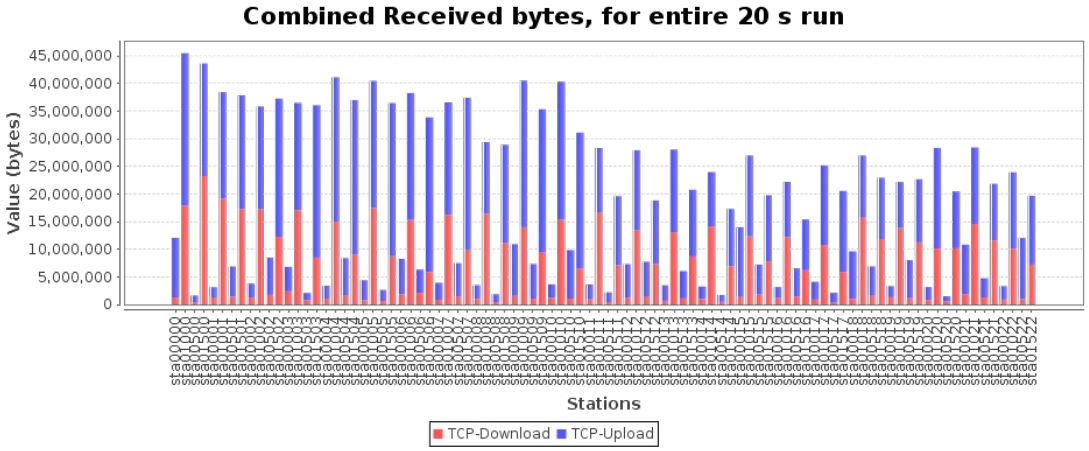
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:  10869565 (10.87 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:  10869565 (10.87 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 92   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   282.762 KB  Cx Ave:     6.361 MB  Cx Max:    22.178 MB  All Cx:   585.184 MB
Upload Amount:     Cx Min:    868.82 KB  Cx Ave:    10.567 MB  Cx Max:    26.735 MB  All Cx:   972.154 MB
                                                                                     Total:      1.521 GB

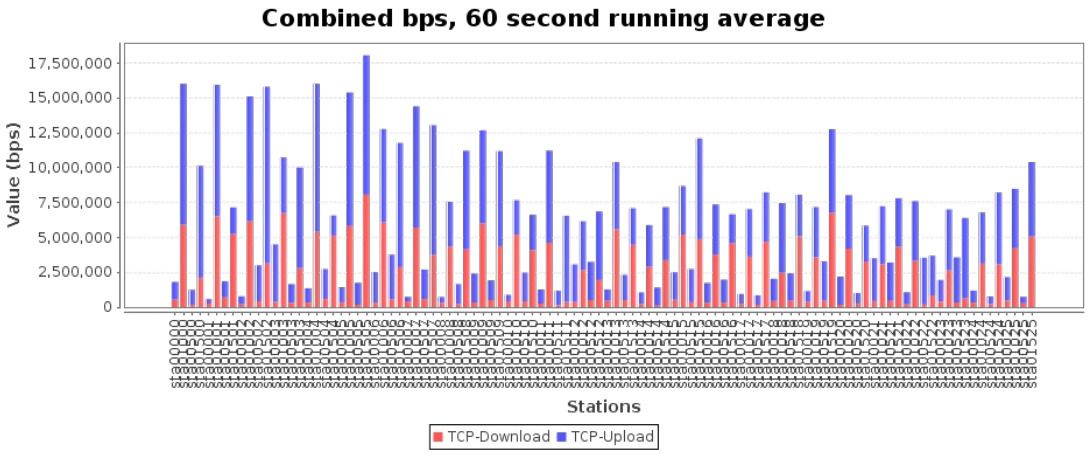
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   9615384 (9.615 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   9615384 (9.615 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 104   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 106.982 Kbps  Cx Ave:   2.271 Mbps  Cx Max:   8.069 Mbps  All Cx: 236.151 Mbps
Upload Rate:       Cx Min: 320.661 Kbps  Cx Ave:   3.518 Mbps  Cx Max:  12.675 Mbps  All Cx: 365.871 Mbps
                                                                                     Total: 602.022 Mbps
Aggregated Rate:   Min:    427.643 Kbps  Avg:      5.789 Mbps  Max:     20.744 Mbps

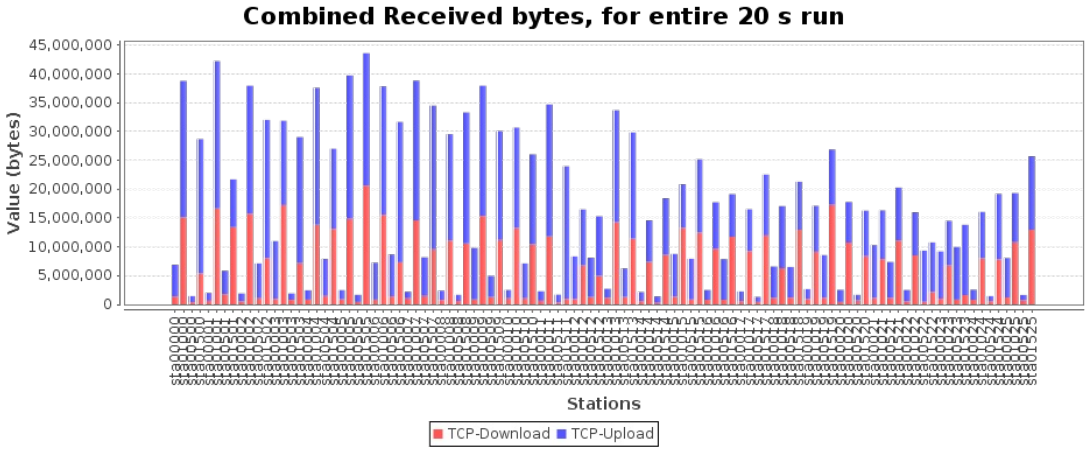
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   9615384 (9.615 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   9615384 (9.615 Mbps)  All:   1000000000 (   1 Gbps)
                                                  Total:    2000000000 (   2 Gbps)
Station count: 104   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   267.078 KB  Cx Ave:     5.537 MB  Cx Max:    19.672 MB  All Cx:   575.808 MB
Upload Amount:     Cx Min:   843.406 KB  Cx Ave:      9.14 MB  Cx Max:    24.396 MB  All Cx:   950.532 MB
                                                                                     Total:      1.491 GB

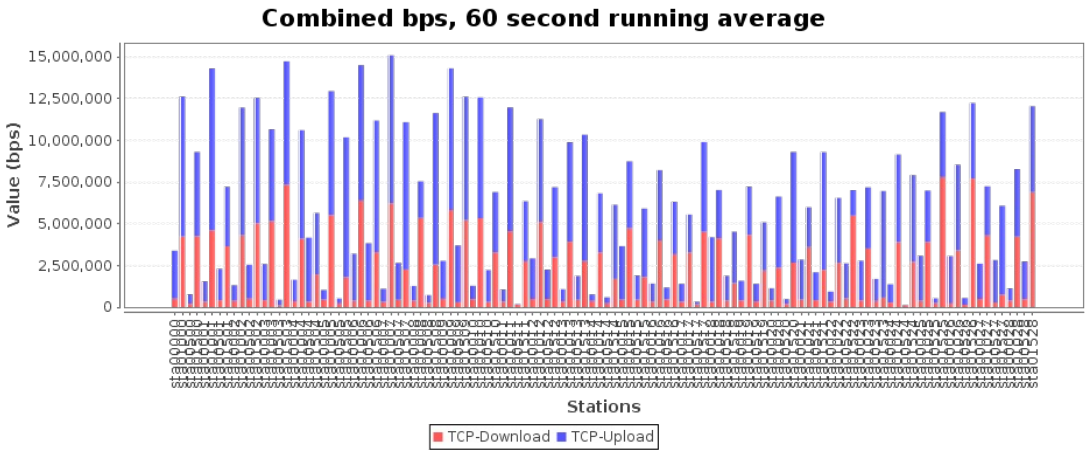
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   8620689 (8.621 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   8620689 (8.621 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 116   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  94.598 Kbps  Cx Ave:   2.133 Mbps  Cx Max:   7.798 Mbps  All Cx: 247.381 Mbps
Upload Rate:       Cx Min:  11.496 Kbps  Cx Ave:   3.427 Mbps  Cx Max:    9.71 Mbps  All Cx: 397.565 Mbps
                                                                                     Total: 644.947 Mbps
Aggregated Rate:   Min:    106.094 Kbps  Avg:       5.56 Mbps  Max:     17.508 Mbps

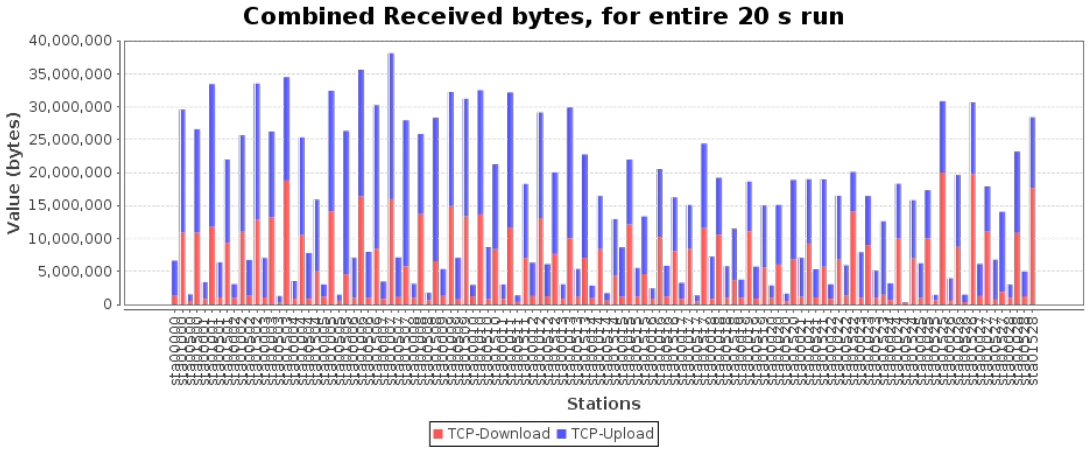
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   8620689 (8.621 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   8620689 (8.621 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 116   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   236.766 KB  Cx Ave:     5.214 MB  Cx Max:    19.092 MB  All Cx:     604.8 MB
Upload Amount:     Cx Min:    58.445 KB  Cx Ave:     8.012 MB  Cx Max:    21.133 MB  All Cx:   929.441 MB
                                                                                     Total:      1.498 GB

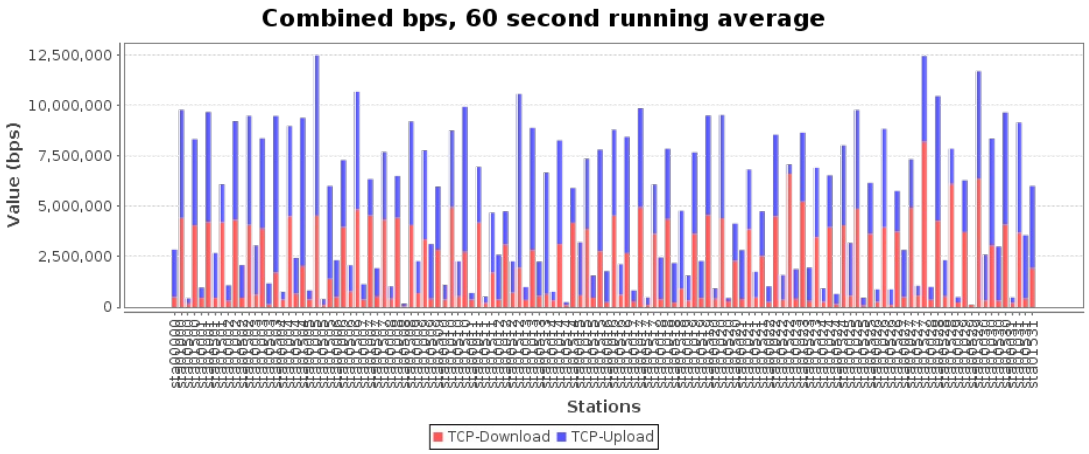
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   7812500 (7.812 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   7812500 (7.812 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 128   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  45.485 Kbps  Cx Ave:     2.1 Mbps  Cx Max:   8.197 Mbps  All Cx: 268.815 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   2.703 Mbps  Cx Max:   8.616 Mbps  All Cx: 346.032 Mbps
                                                                                     Total: 614.847 Mbps
Aggregated Rate:   Min:     45.485 Kbps  Avg:      4.803 Mbps  Max:     16.813 Mbps

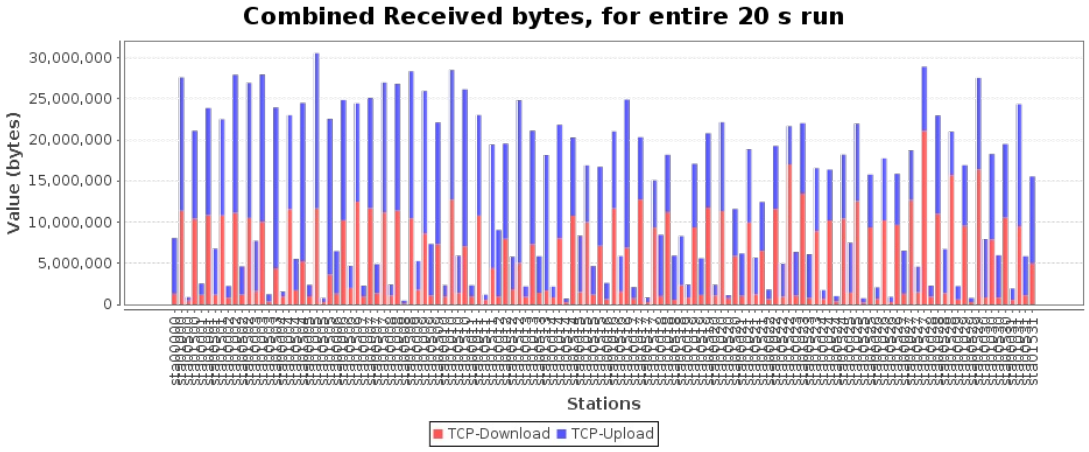
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   7812500 (7.812 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   7812500 (7.812 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 128   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   114.398 KB  Cx Ave:     5.158 MB  Cx Max:    20.129 MB  All Cx:   660.176 MB
Upload Amount:     Cx Min:   344.383 KB  Cx Ave:     6.986 MB  Cx Max:    18.879 MB  All Cx:   894.144 MB
                                                                                     Total:      1.518 GB

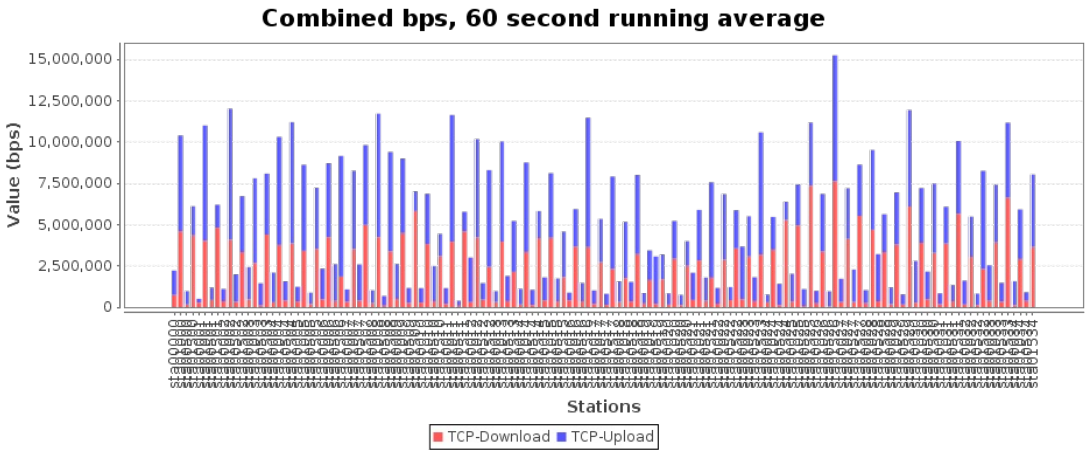
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   7142857 (7.143 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   7142857 (7.143 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 140   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  42.915 Kbps  Cx Ave:   2.023 Mbps  Cx Max:   7.625 Mbps  All Cx: 283.226 Mbps
Upload Rate:       Cx Min: 234.277 Kbps  Cx Ave:   2.672 Mbps  Cx Max:   7.939 Mbps  All Cx:   374.1 Mbps
                                                                                     Total: 657.326 Mbps
Aggregated Rate:   Min:    277.192 Kbps  Avg:      4.695 Mbps  Max:     15.564 Mbps

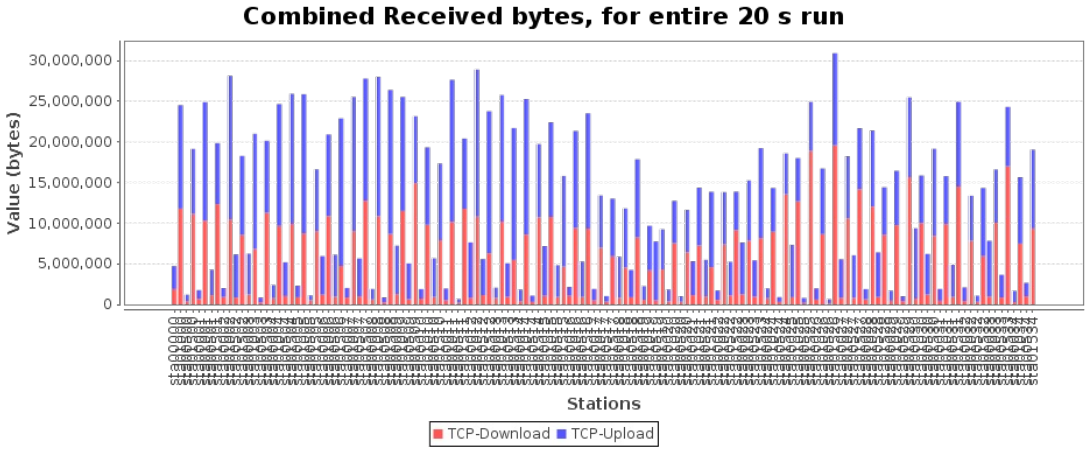
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   7142857 (7.143 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   7142857 (7.143 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 140   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   107.672 KB  Cx Ave:     4.954 MB  Cx Max:    18.681 MB  All Cx:   693.592 MB
Upload Amount:     Cx Min:   444.348 KB  Cx Ave:       6.3 MB  Cx Max:    17.302 MB  All Cx:   881.948 MB
                                                                                     Total:      1.539 GB

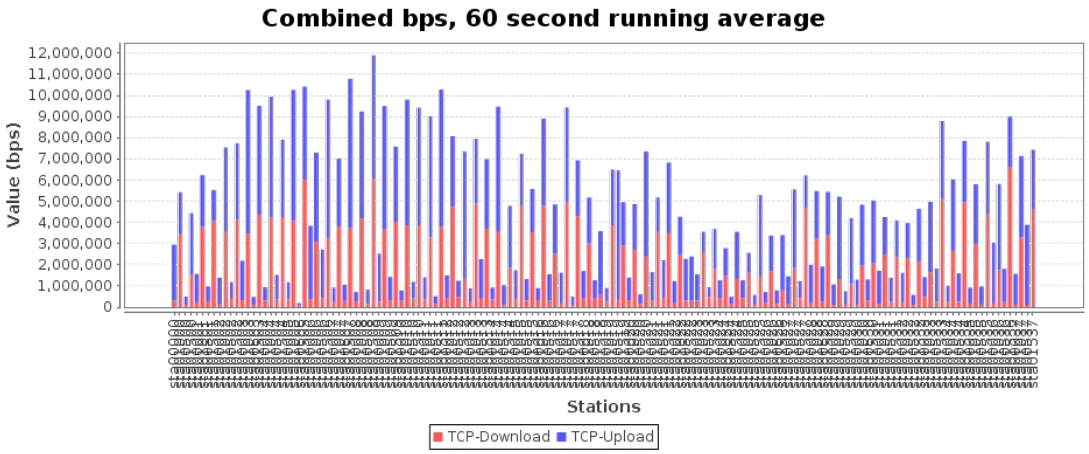
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   6578947 (6.579 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   6578947 (6.579 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 152   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  71.031 Kbps  Cx Ave:   1.731 Mbps  Cx Max:   6.592 Mbps  All Cx: 263.101 Mbps
Upload Rate:       Cx Min:  99.456 Kbps  Cx Ave:   2.303 Mbps  Cx Max:   7.044 Mbps  All Cx: 350.068 Mbps
                                                                                     Total: 613.169 Mbps
Aggregated Rate:   Min:    170.487 Kbps  Avg:      4.034 Mbps  Max:     13.636 Mbps

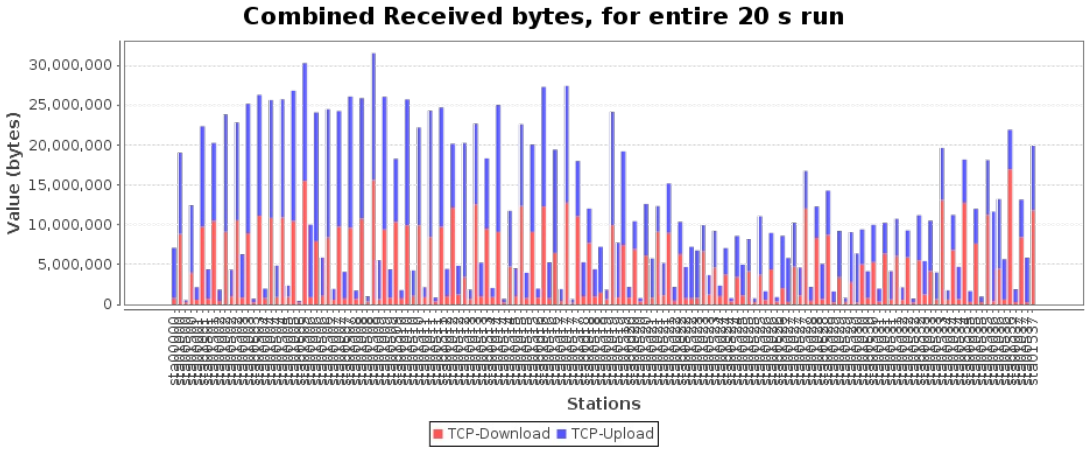
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   6578947 (6.579 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   6578947 (6.579 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 152   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   178.172 KB  Cx Ave:      4.24 MB  Cx Max:    16.156 MB  All Cx:   644.524 MB
Upload Amount:     Cx Min:   211.105 KB  Cx Ave:     5.718 MB  Cx Max:    16.061 MB  All Cx:   869.196 MB
                                                                                     Total:      1.478 GB

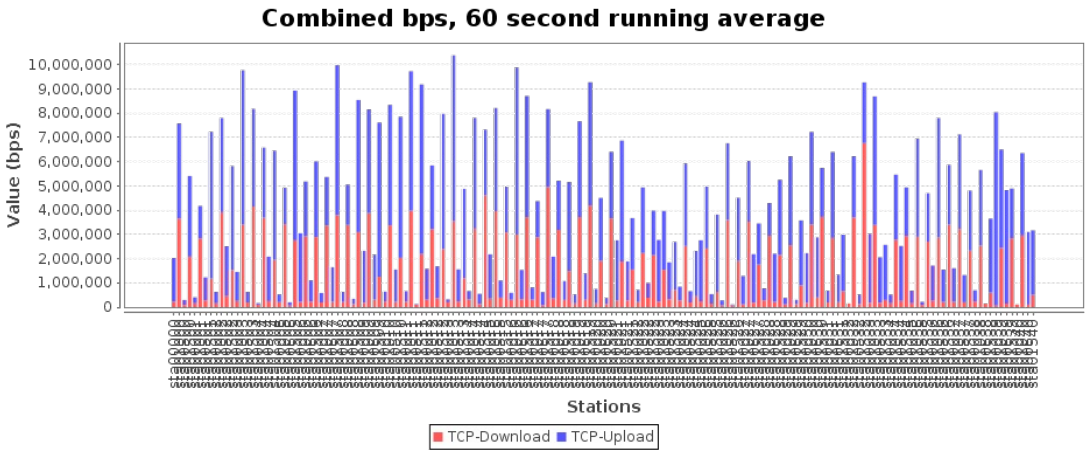
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   6097560 (6.098 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   6097560 (6.098 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 164   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  60.319 Kbps  Cx Ave:    1.47 Mbps  Cx Max:    6.77 Mbps  All Cx: 241.021 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   2.314 Mbps  Cx Max:   7.982 Mbps  All Cx: 379.569 Mbps
                                                                                     Total:  620.59 Mbps
Aggregated Rate:   Min:     60.319 Kbps  Avg:      3.784 Mbps  Max:     14.753 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.
```

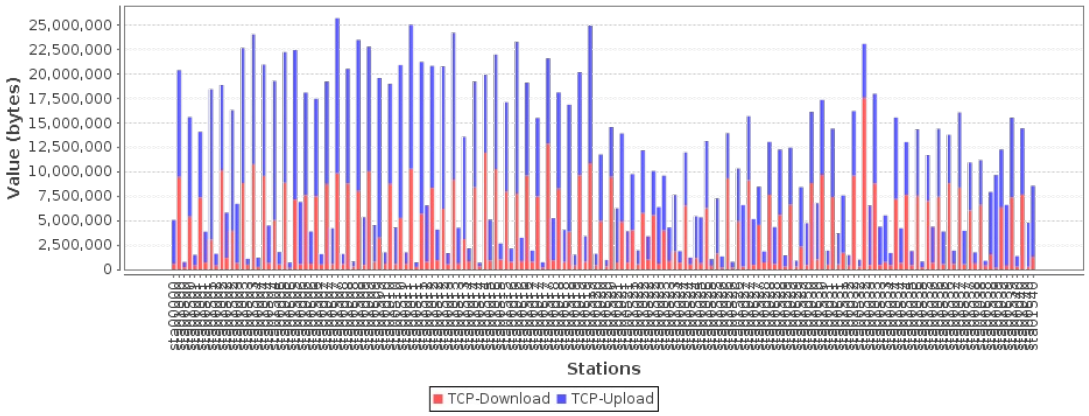



```
Requested Parameters:
Download Rate: Per station:   6097560 (6.098 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   6097560 (6.098 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 164   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   152.719 KB  Cx Ave:     3.636 MB  Cx Max:    16.755 MB  All Cx:    596.23 MB
Upload Amount:     Cx Min:   336.332 KB  Cx Ave:     5.584 MB  Cx Max:    15.577 MB  All Cx:   915.776 MB
                                                                                     Total:      1.477 GB

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

Combined Received bytes, for entire 20 s run

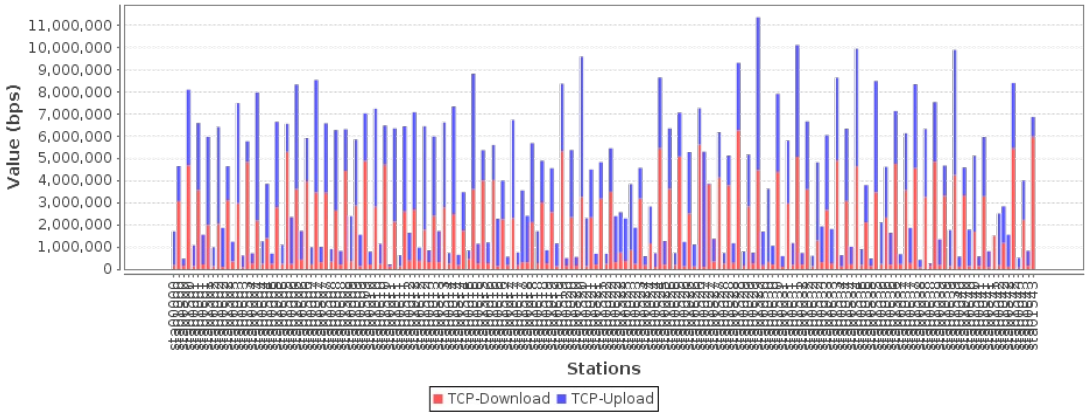



```
Requested Parameters:
Download Rate: Per station:   5681818 (5.682 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5681818 (5.682 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 176   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  65.898 Kbps  Cx Ave:   1.724 Mbps  Cx Max:   6.263 Mbps  All Cx: 303.424 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.979 Mbps  Cx Max:   6.894 Mbps  All Cx: 348.278 Mbps
                                                                                     Total: 651.703 Mbps
Aggregated Rate:   Min:     65.898 Kbps  Avg:      3.703 Mbps  Max:     13.157 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

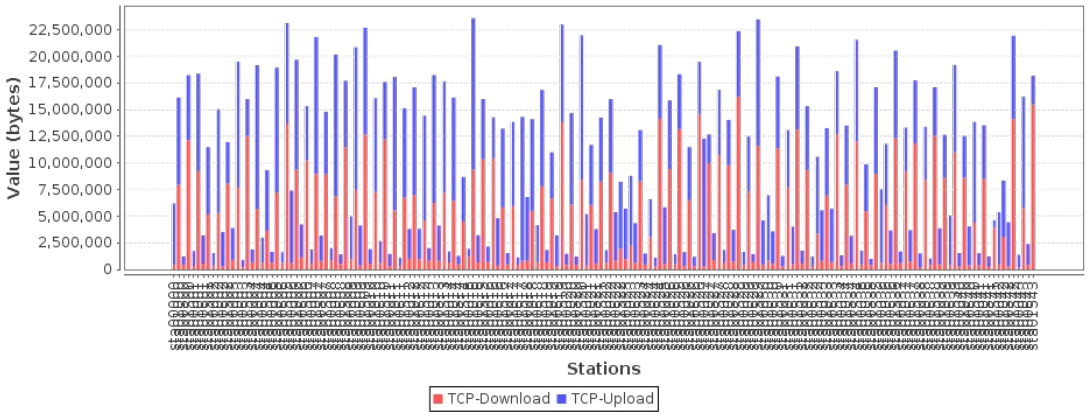



```
Requested Parameters:
Download Rate: Per station:   5681818 (5.682 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5681818 (5.682 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 176   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   166.812 KB  Cx Ave:      4.26 MB  Cx Max:    15.479 MB  All Cx:   749.805 MB
Upload Amount:     Cx Min:   582.207 KB  Cx Ave:     4.689 MB  Cx Max:    13.567 MB  All Cx:   825.346 MB
                                                                                     Total:      1.538 GB

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

Combined Received bytes, for entire 20 s run

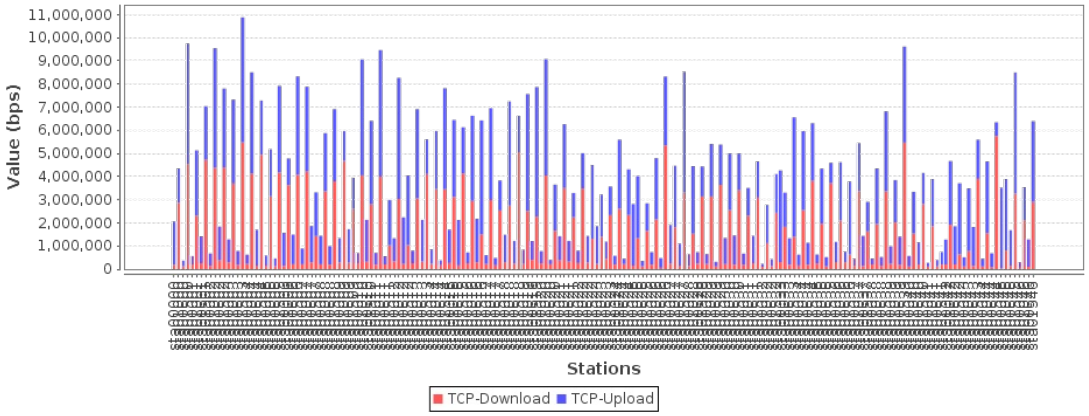



```
Requested Parameters:
Download Rate: Per station:   5319148 (5.319 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5319148 (5.319 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 188   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  35.656 Kbps  Cx Ave:   1.533 Mbps  Cx Max:   5.751 Mbps  All Cx:  288.13 Mbps
Upload Rate:       Cx Min: 123.872 Kbps  Cx Ave:   1.853 Mbps  Cx Max:   5.603 Mbps  All Cx: 348.433 Mbps
                                                                                     Total: 636.563 Mbps
Aggregated Rate:   Min:    159.528 Kbps  Avg:      3.386 Mbps  Max:     11.354 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.
```

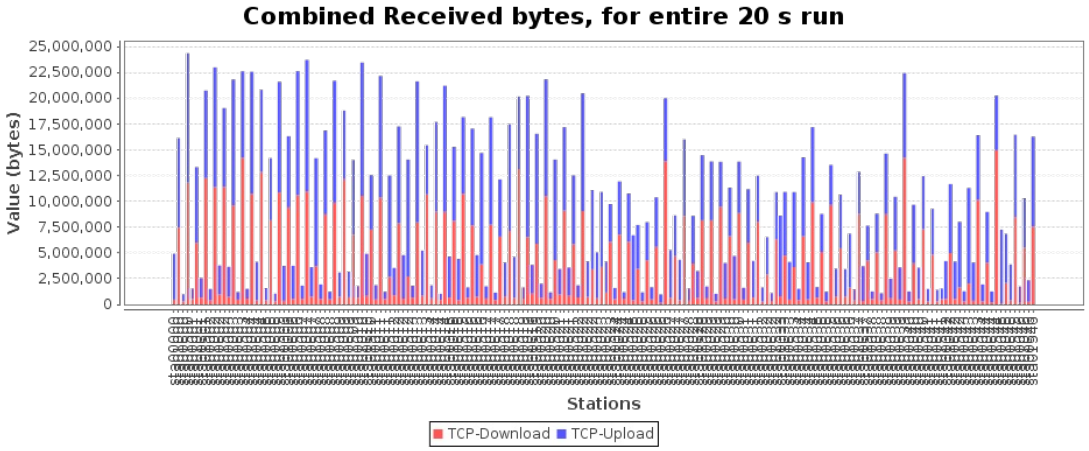
Combined bps, 60 second running average




```
Requested Parameters:
Download Rate: Per station:   5319148 (5.319 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5319148 (5.319 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 188   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:      90.5 KB  Cx Ave:     3.797 MB  Cx Max:    14.255 MB  All Cx:    713.82 MB
Upload Amount:     Cx Min:   592.473 KB  Cx Ave:     4.623 MB  Cx Max:    13.051 MB  All Cx:   869.152 MB
                                                                                     Total:     1.546 GB

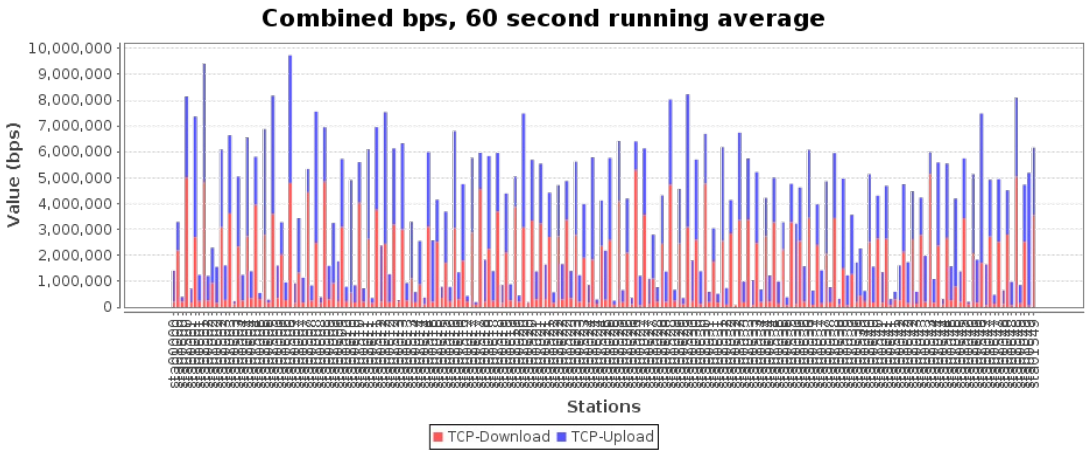
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   5000000 (   5 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5000000 (   5 Mbps)  All:   1000000000 (   1 Gbps)
                                                 Total:    2000000000 (   2 Gbps)
Station count: 200   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  56.433 Kbps  Cx Ave:   1.491 Mbps  Cx Max:   5.297 Mbps  All Cx: 298.236 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.721 Mbps  Cx Max:   5.764 Mbps  All Cx: 344.137 Mbps
                                                                                     Total: 642.373 Mbps
Aggregated Rate:   Min:     56.433 Kbps  Avg:      3.212 Mbps  Max:     11.062 Mbps

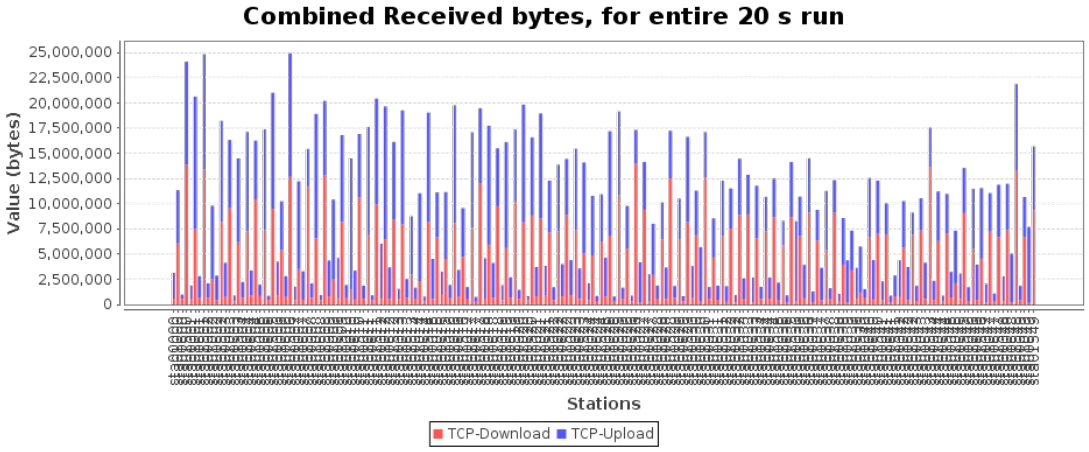
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   5000000 (   5 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   5000000 (   5 Mbps)  All:   1000000000 (   1 Gbps)
                                                 Total:    2000000000 (   2 Gbps)
Station count: 200   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   145.629 KB  Cx Ave:      3.76 MB  Cx Max:    13.328 MB  All Cx:   752.054 MB
Upload Amount:     Cx Min:   384.727 KB  Cx Ave:     4.227 MB  Cx Max:    12.582 MB  All Cx:   845.441 MB
                                                                                     Total:       1.56 GB

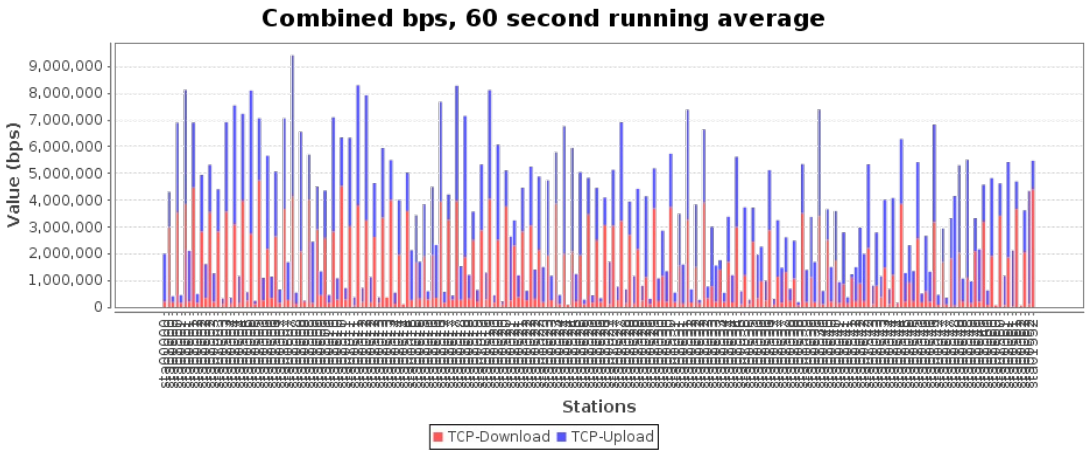
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   4716981 (4.717 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4716981 (4.717 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 212   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  40.978 Kbps  Cx Ave:   1.394 Mbps  Cx Max:   4.745 Mbps  All Cx: 295.489 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:    1.63 Mbps  Cx Max:   5.351 Mbps  All Cx: 345.477 Mbps
                                                                                     Total: 640.967 Mbps
Aggregated Rate:   Min:     40.978 Kbps  Avg:      3.023 Mbps  Max:     10.096 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.
```

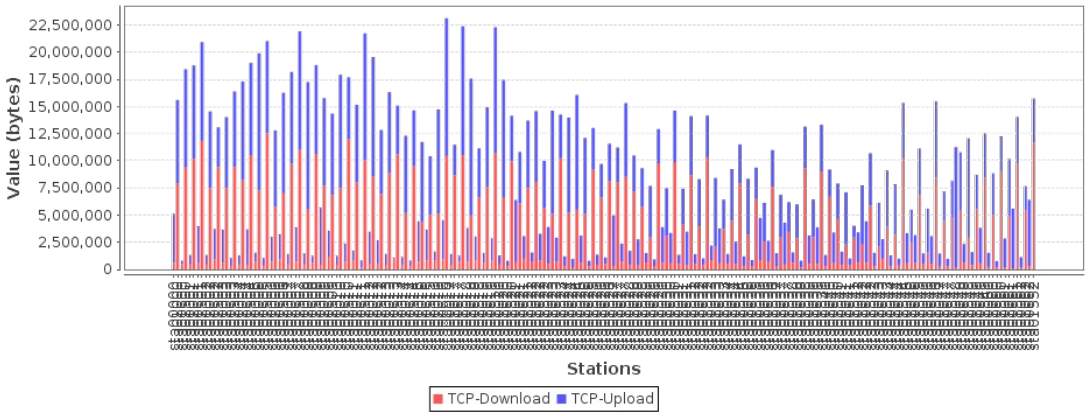



```
Requested Parameters:
Download Rate: Per station:   4716981 (4.717 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4716981 (4.717 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 212   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   106.035 KB  Cx Ave:      3.52 MB  Cx Max:    11.974 MB  All Cx:   746.339 MB
Upload Amount:     Cx Min:   111.543 KB  Cx Ave:     3.791 MB  Cx Max:    12.106 MB  All Cx:   803.774 MB
                                                                                     Total:      1.514 GB

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

Combined Received bytes, for entire 20 s run

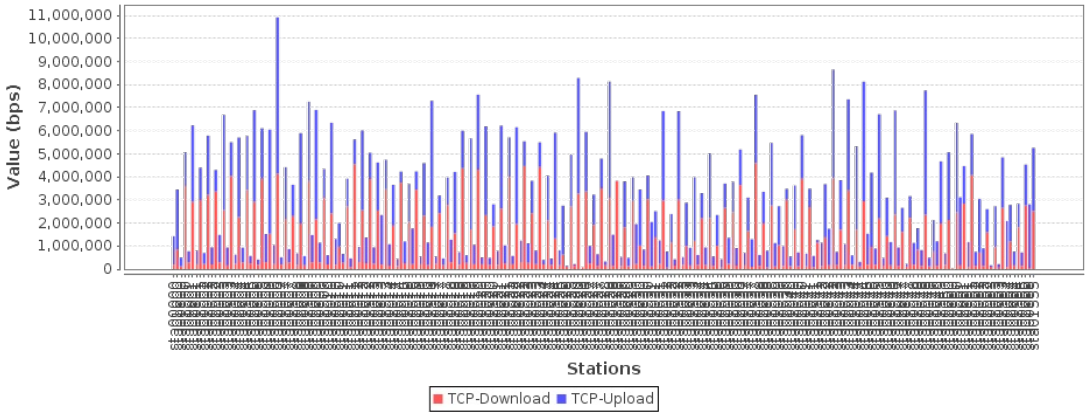



```
Requested Parameters:
Download Rate: Per station:   4464285 (4.464 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4464285 (4.464 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 224   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:  32.672 Kbps  Cx Ave:   1.331 Mbps  Cx Max:     4.6 Mbps  All Cx: 298.074 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.528 Mbps  Cx Max:   6.783 Mbps  All Cx: 342.378 Mbps
                                                                                     Total: 640.452 Mbps
Aggregated Rate:   Min:     32.672 Kbps  Avg:      2.859 Mbps  Max:     11.383 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.
```

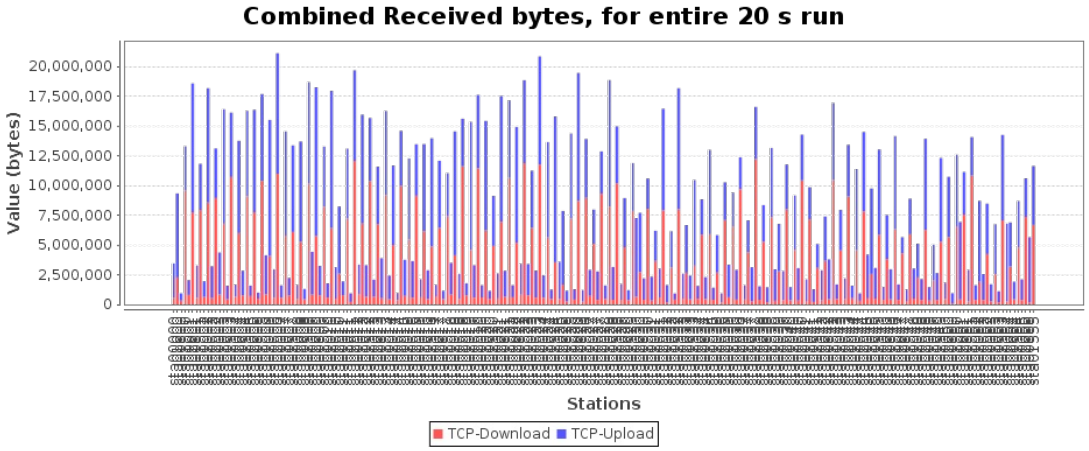
Combined bps, 60 second running average




```
Requested Parameters:
Download Rate: Per station:   4464285 (4.464 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4464285 (4.464 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 224   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:    84.844 KB  Cx Ave:     3.378 MB  Cx Max:    11.665 MB  All Cx:   756.737 MB
Upload Amount:     Cx Min:   495.855 KB  Cx Ave:     3.806 MB  Cx Max:    11.908 MB  All Cx:   852.513 MB
                                                                                     Total:      1.572 GB

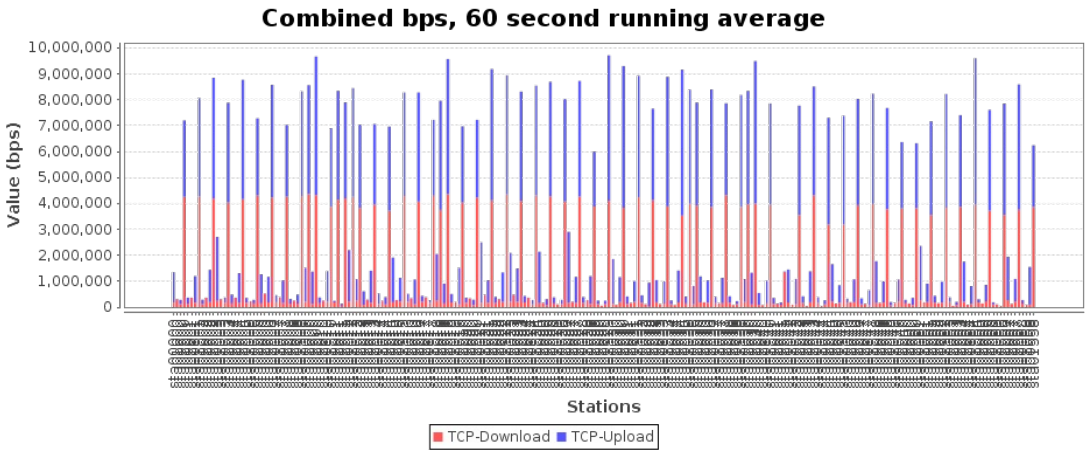
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   4237288 (4.237 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4237288 (4.237 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 236   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:   37.97 Kbps  Cx Ave:   1.215 Mbps  Cx Max:   4.361 Mbps  All Cx: 286.659 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.463 Mbps  Cx Max:   5.658 Mbps  All Cx: 345.375 Mbps
                                                                                     Total: 632.034 Mbps
Aggregated Rate:   Min:      37.97 Kbps  Avg:      2.678 Mbps  Max:     10.019 Mbps

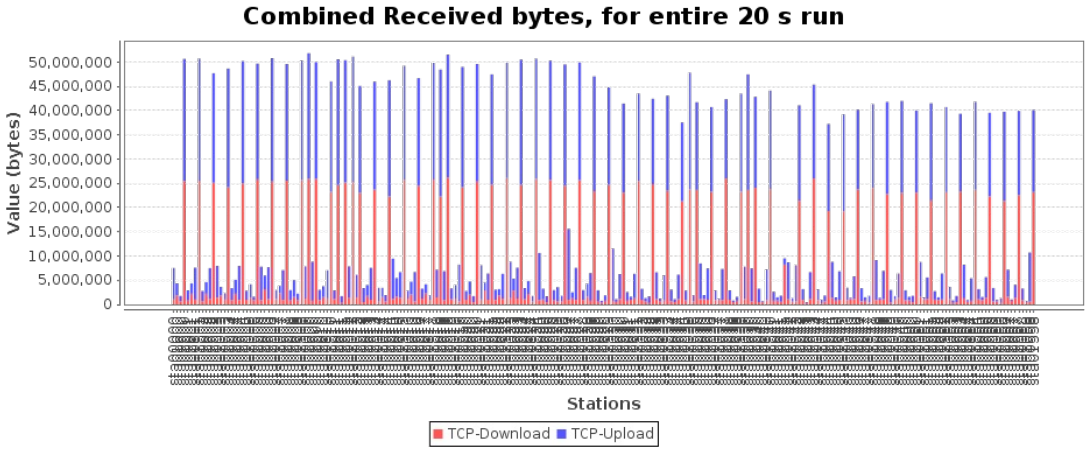
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   4237288 (4.237 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4237288 (4.237 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 236   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   221.473 KB  Cx Ave:     6.952 MB  Cx Max:    24.984 MB  All Cx:     1.602 GB
Upload Amount:     Cx Min:   199.199 KB  Cx Ave:     7.882 MB  Cx Max:    24.974 MB  All Cx:     1.817 GB
                                                                                     Total:      3.419 GB

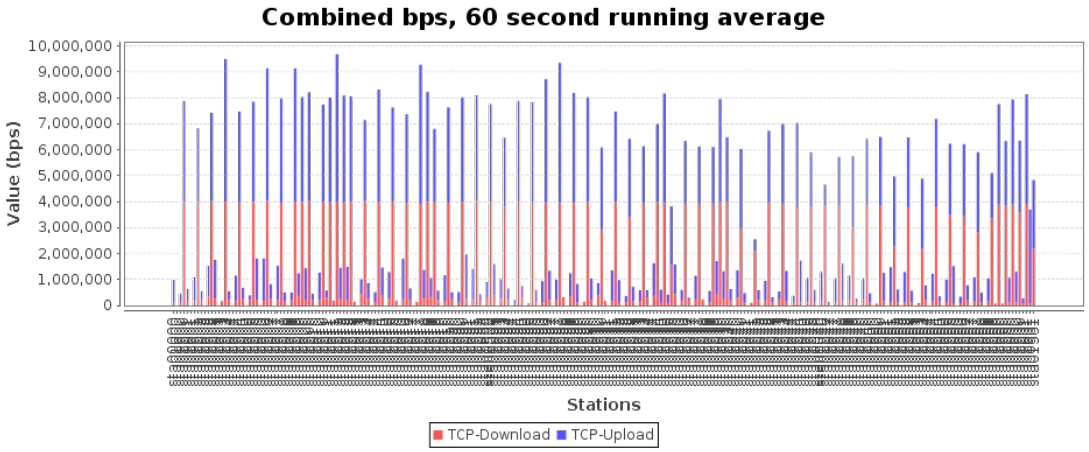
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   4032258 (4.032 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4032258 (4.032 Mbps)  All:   1000000000 (   1 Gbps)
                                                Total:    2000000000 (   2 Gbps)
Station count: 248   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:        0 bps  Cx Ave:   1.158 Mbps  Cx Max:   4.027 Mbps  All Cx:  287.29 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.308 Mbps  Cx Max:   5.676 Mbps  All Cx: 324.427 Mbps
                                                                                     Total: 611.718 Mbps
Aggregated Rate:   Min:           0 bps  Avg:      2.467 Mbps  Max:      9.703 Mbps
Non-Transmitting endpoints: (53)  tcp--1.eth2-01.sta01000-A tcp--1.eth2-01.sta01001-A tcp--1.eth2-01.sta01002-A tcp--1.eth2-01.sta01003-A tcp--1.eth2-01.sta01(

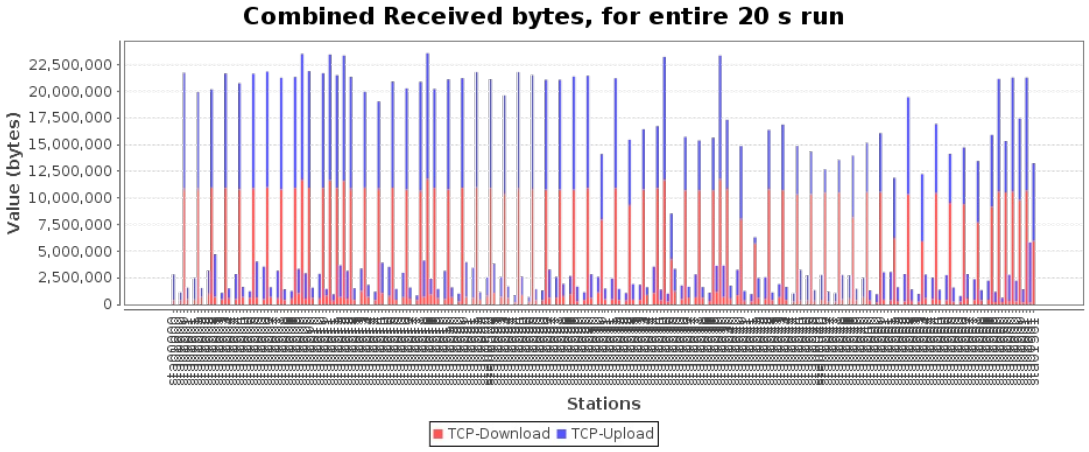
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   4032258 (4.032 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   4032258 (4.032 Mbps)  All:   1000000000 (   1 Gbps)
                                                Total:    2000000000 (   2 Gbps)
Station count: 248   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:          0 B  Cx Ave:     3.053 MB  Cx Max:    11.237 MB  All Cx:   757.241 MB
Upload Amount:     Cx Min:          0 B  Cx Ave:     3.026 MB  Cx Max:     11.25 MB  All Cx:   750.426 MB
                                                                                     Total:      1.472 GB
Non-Transmitting endpoints: (53)  tcp--1.eth2-01.sta01000-A tcp--1.eth2-01.sta01001-A tcp--1.eth2-01.sta01002-A tcp--1.eth2-01.sta01003-A tcp--1.eth2-01.sta01(

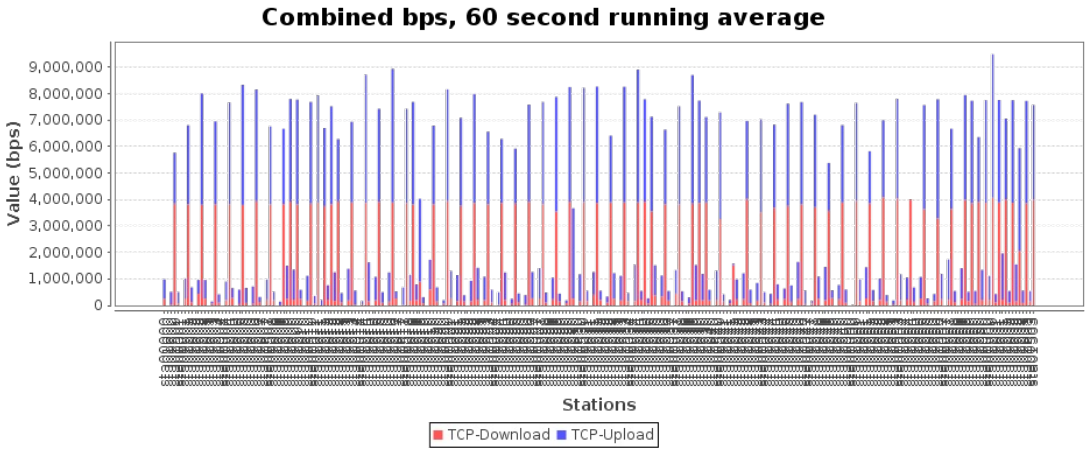
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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




```
Requested Parameters:
Download Rate: Per station:   3906250 (3.906 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   3906250 (3.906 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 256   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:        0 bps  Cx Ave:   1.182 Mbps  Cx Max:   4.092 Mbps  All Cx: 302.612 Mbps
Upload Rate:       Cx Min:        0 bps  Cx Ave:   1.356 Mbps  Cx Max:   5.421 Mbps  All Cx: 347.032 Mbps
                                                                                     Total: 649.644 Mbps
Aggregated Rate:   Min:           0 bps  Avg:      2.538 Mbps  Max:      9.513 Mbps
Non-Transmitting endpoints: (53)  tcp--1.eth2-01.sta01000-A tcp--1.eth2-01.sta01001-A tcp--1.eth2-01.sta01002-A tcp--1.eth2-01.sta01003-A tcp--1.eth2-01.sta01(

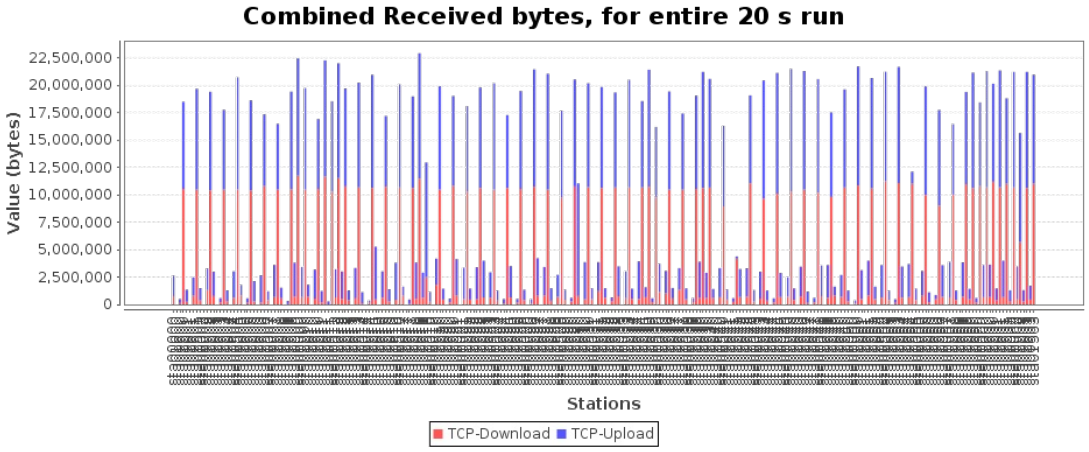
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



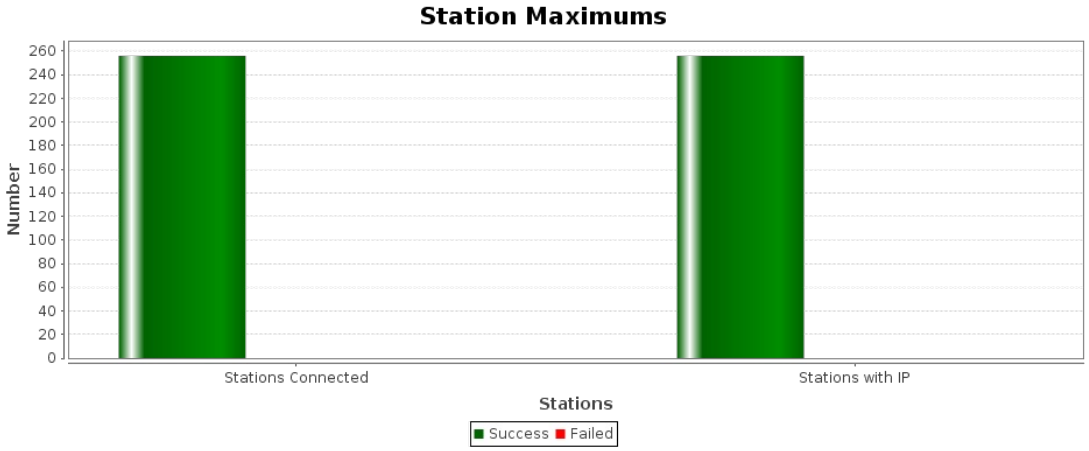

```
Requested Parameters:
Download Rate: Per station:   3906250 (3.906 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:   3906250 (3.906 Mbps)  All:   1000000000 (   1 Gbps)
                                                    Total:    2000000000 (   2 Gbps)
Station count: 256   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:          0 B  Cx Ave:     3.127 MB  Cx Max:    11.199 MB  All Cx:   800.471 MB
Upload Amount:     Cx Min:          0 B  Cx Ave:     3.351 MB  Cx Max:    10.938 MB  All Cx:   857.892 MB
                                                                                     Total:      1.619 GB
Non-Transmitting endpoints: (53)  tcp--1.eth2-01.sta01000-A tcp--1.eth2-01.sta01001-A tcp--1.eth2-01.sta01002-A tcp--1.eth2-01.sta01003-A tcp--1.eth2-01.sta01(

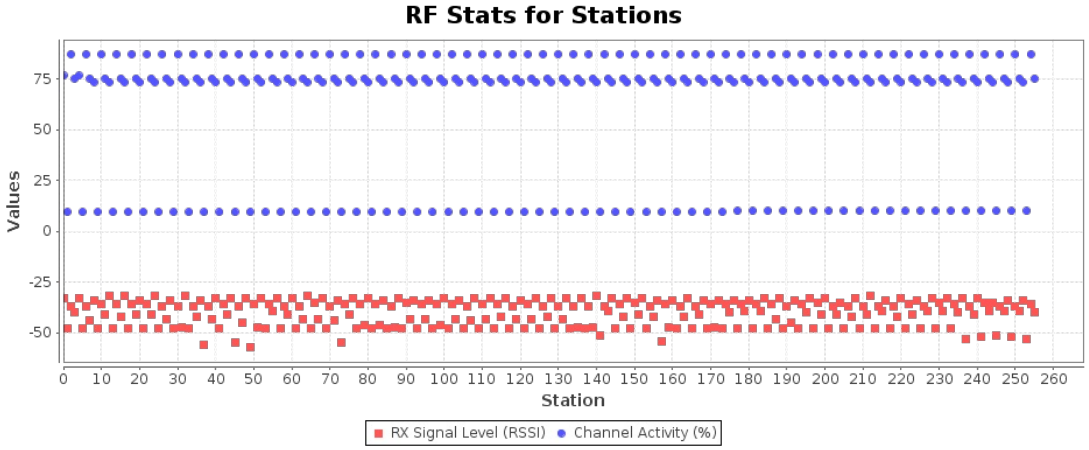
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test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



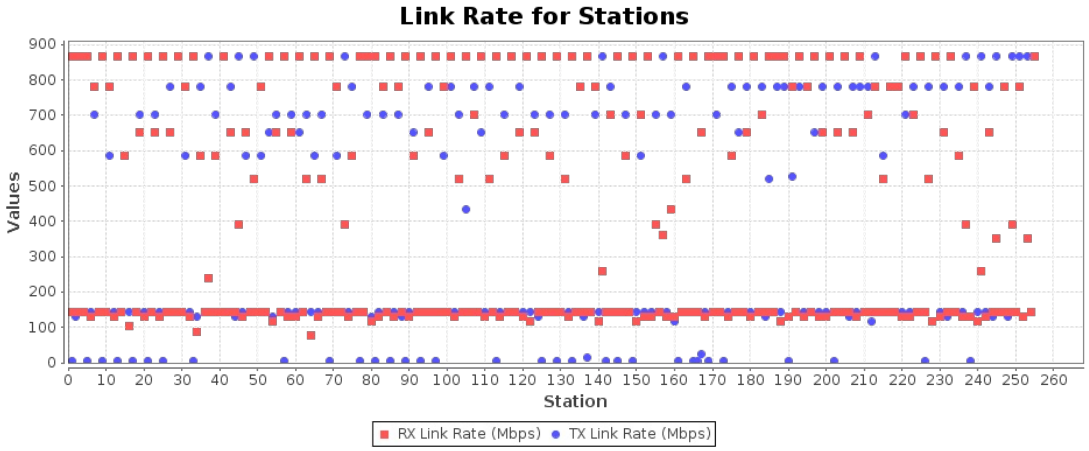

```
Maximum Stations Connected: 256
Stations NOT connected at this time: 0
Maximum Stations with IP Address: 256
Stations without IP at this time: 0
```



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.



Key Performance Indicators CSV

```
Scan Results for SSIDs used in this test.

BSS 24:f5:a2:08:21:6c(on sta00000) -- associated
        TSF: 0 usec (0d, 00:00:00)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS Privacy ShortPreamble ShortSlotTime (0x0431)
        signal: -33.00 dBm
        last seen: 29 ms ago
        Information elements from Probe Response frame:
        SSID: Default-SSID-2g
        Supported rates: 1.0* 2.0* 5.5* 11.0* 6.0 9.0 12.0 18.0
        DS Parameter set: channel 6
        ERP: <no flags>
        Extended supported rates: 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: 128
                 * channel utilisation: 240/255
                 * available admission capacity: 0 [*32us]
        Supported operating classes:
                 * current operating class: 81
        HT capabilities:
                Capabilities: 0x19ed
                        RX LDPC
                        HT20
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
                        TX STBC
                        RX STBC 1-stream
                        Max AMSDU length: 7935 bytes
                        DSSS/CCK HT40
                Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
                Minimum RX AMPDU time spacing: 8 usec (0x06)
                HT TX/RX MCS rate indexes supported: 0-15
        HT operation:
                 * primary channel: 6
                 * secondary channel offset: no secondary
                 * STA channel width: 20 MHz
                 * RIFS: 0
                 * 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
                 * UTF-8 SSID
                 * Operating Mode Notification
        WPA:     * Version: 1
                 * Group cipher: CCMP
                 * Pairwise ciphers: CCMP
                 * Authentication suites: PSK
        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 24:f5:a2:08:21:6d(on sta01000) -- associated
```

```
TSF: 0 usec (0d, 00:00:00)
freq: 5180
beacon interval: 100 TUs
capability: ESS Privacy (0x0011)
signal: -44.00 dBm
last seen: 154 ms ago
Information elements from Probe Response frame:
SSID: Default-SSID-5gl
Supported rates: 6.0* 9.0 12.0* 18.0 24.0* 36.0 48.0 54.0
DS Parameter set: channel 36
RSN:     * Version: 1
         * Group cipher: CCMP
         * Pairwise ciphers: CCMP
         * Authentication suites: PSK
         * Capabilities: 16-PTKSA-RC 1-GTKSA-RC (0x000c)
BSS Load:
         * station count: 64
         * channel utilisation: 47/255
         * available admission capacity: 0 [*32us]
Supported operating classes:
         * current operating class: 128
HT capabilities:
        Capabilities: 0x9ef
                RX LDPC
                HT20/HT40
                SM Power Save disabled
                RX HT20 SGI
                RX HT40 SGI
                TX STBC
                RX STBC 1-stream
                Max AMSDU length: 7935 bytes
                No DSSS/CCK HT40
        Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
        Minimum RX AMPDU time spacing: 8 usec (0x06)
        HT TX/RX MCS rate indexes supported: 0-15
HT operation:
         * primary channel: 36
         * secondary channel offset: above
         * STA channel width: any
         * RIFS: 0
         * 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
         * UTF-8 SSID
         * Operating Mode Notification
         * Max Number Of MSDUs In A-MSDU is unlimited
VHT capabilities:
        VHT Capabilities (0x338819b2):
                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
                RX antenna pattern consistency
                TX antenna pattern consistency
        VHT RX MCS set:
                1 streams: MCS 0-9
                2 streams: MCS 0-9
                3 streams: not supported
                4 streams: not supported
                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: not supported
                4 streams: not supported
                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: 42
         * center freq segment 2: 0
         * VHT basic MCS set: 0xfffc
Transmit Power Envelope:
         * Local Maximum Transmit Power For 20 MHz: 23 dBm
         * Local Maximum Transmit Power For 40 MHz: 23 dBm
         * Local Maximum Transmit Power For 80 MHz: 23 dBm
WPA:     * Version: 1
         * Group cipher: CCMP
         * Pairwise ciphers: CCMP
         * Authentication suites: PSK
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 24:f5:a2:08:21:6c(on sta00500) -- associated
        TSF: 0 usec (0d, 00:00:00)
        freq: 2437
        beacon interval: 100 TUs
        capability: ESS Privacy ShortPreamble ShortSlotTime (0x0431)
        signal: -38.00 dBm
        last seen: 27 ms ago
        Information elements from Probe Response frame:
        SSID: Default-SSID-2g
        Supported rates: 1.0* 2.0* 5.5* 11.0* 6.0 9.0 12.0 18.0
        DS Parameter set: channel 6
        ERP: <no flags>
        Extended supported rates: 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: 128
                 * channel utilisation: 240/255
                 * available admission capacity: 0 [*32us]
        Supported operating classes:
                 * current operating class: 81
        HT capabilities:
                Capabilities: 0x19ed
                        RX LDPC
                        HT20
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
                        TX STBC
                        RX STBC 1-stream
                        Max AMSDU length: 7935 bytes
                        DSSS/CCK HT40
                Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
                Minimum RX AMPDU time spacing: 8 usec (0x06)
                HT TX/RX MCS rate indexes supported: 0-15
        HT operation:
                 * primary channel: 6
                 * secondary channel offset: no secondary
                 * STA channel width: 20 MHz
                 * RIFS: 0
                 * 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
                 * UTF-8 SSID
                 * Operating Mode Notification
        WPA:     * Version: 1
                 * Group cipher: CCMP
                 * Pairwise ciphers: CCMP
                 * Authentication suites: PSK
        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 26:f5:a2:08:21:6e(on sta01500) -- associated
        TSF: 0 usec (0d, 00:00:00)
        freq: 5745
        beacon interval: 100 TUs
        capability: ESS Privacy (0x0011)
        signal: -36.00 dBm
        last seen: 30 ms ago
        Information elements from Probe Response frame:
        SSID: Default-SSID-5gu
        Supported rates: 6.0* 9.0 12.0* 18.0 24.0* 36.0 48.0 54.0
        DS Parameter set: channel 149
        RSN:     * Version: 1
                 * Group cipher: CCMP
                 * Pairwise ciphers: CCMP
                 * Authentication suites: PSK
                 * Capabilities: 16-PTKSA-RC 1-GTKSA-RC (0x000c)
        BSS Load:
                 * station count: 64
                 * channel utilisation: 193/255
                 * available admission capacity: 0 [*32us]
        Supported operating classes:
                 * current operating class: 128
        HT capabilities:
                Capabilities: 0x9ef
                        RX LDPC
                        HT20/HT40
                        SM Power Save disabled
                        RX HT20 SGI
                        RX HT40 SGI
```

```
                TX STBC
                RX STBC 1-stream
                Max AMSDU length: 7935 bytes
                No DSSS/CCK HT40
        Maximum RX AMPDU length 65535 bytes (exponent: 0x003)
        Minimum RX AMPDU time spacing: 8 usec (0x06)
        HT TX/RX MCS rate indexes supported: 0-15
HT operation:
         * primary channel: 149
         * secondary channel offset: above
         * STA channel width: any
         * RIFS: 0
         * 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
         * UTF-8 SSID
         * Operating Mode Notification
         * Max Number Of MSDUs In A-MSDU is unlimited
VHT capabilities:
        VHT Capabilities (0x338819b2):
                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
                RX antenna pattern consistency
                TX antenna pattern consistency
        VHT RX MCS set:
                1 streams: MCS 0-9
                2 streams: MCS 0-9
                3 streams: not supported
                4 streams: not supported
                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: not supported
                4 streams: not supported
                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: 0xfffc
Transmit Power Envelope:
         * Local Maximum Transmit Power For 20 MHz: 30 dBm
         * Local Maximum Transmit Power For 40 MHz: 30 dBm
         * Local Maximum Transmit Power For 80 MHz: 30 dBm
WPA:     * Version: 1
         * Group cipher: CCMP
         * Pairwise ciphers: CCMP
         * Authentication suites: PSK
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
```