# WiFi Capacity Test

## 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.
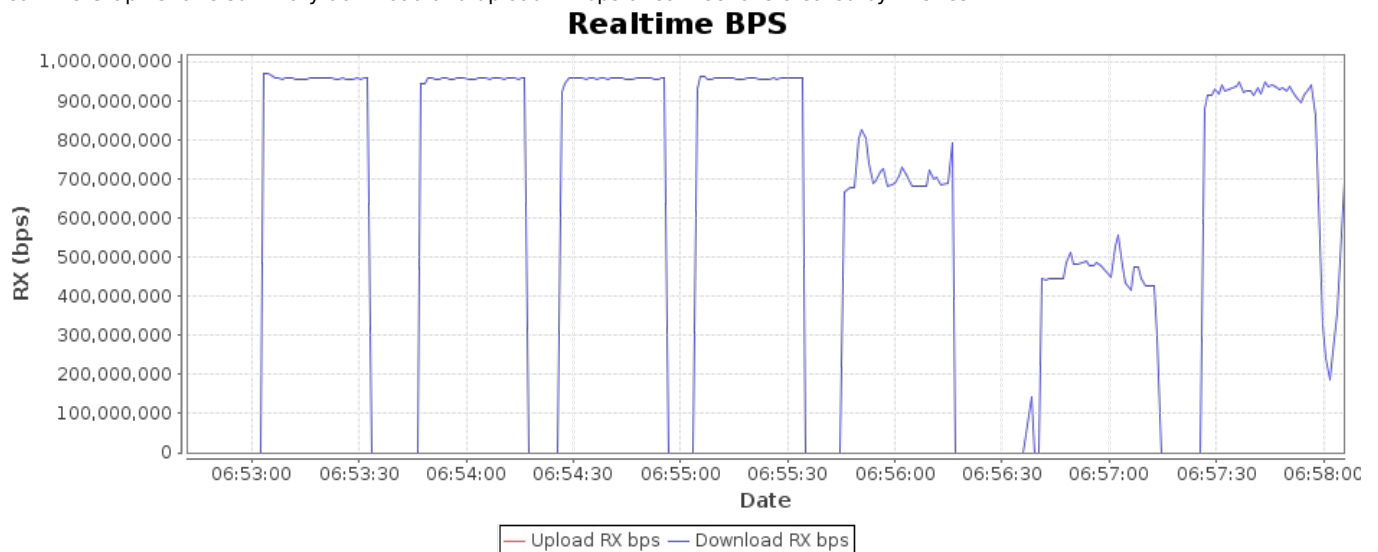


Station connect time is calculated from the initial Authenticate message through the completion of Open or RSN association/authentication.
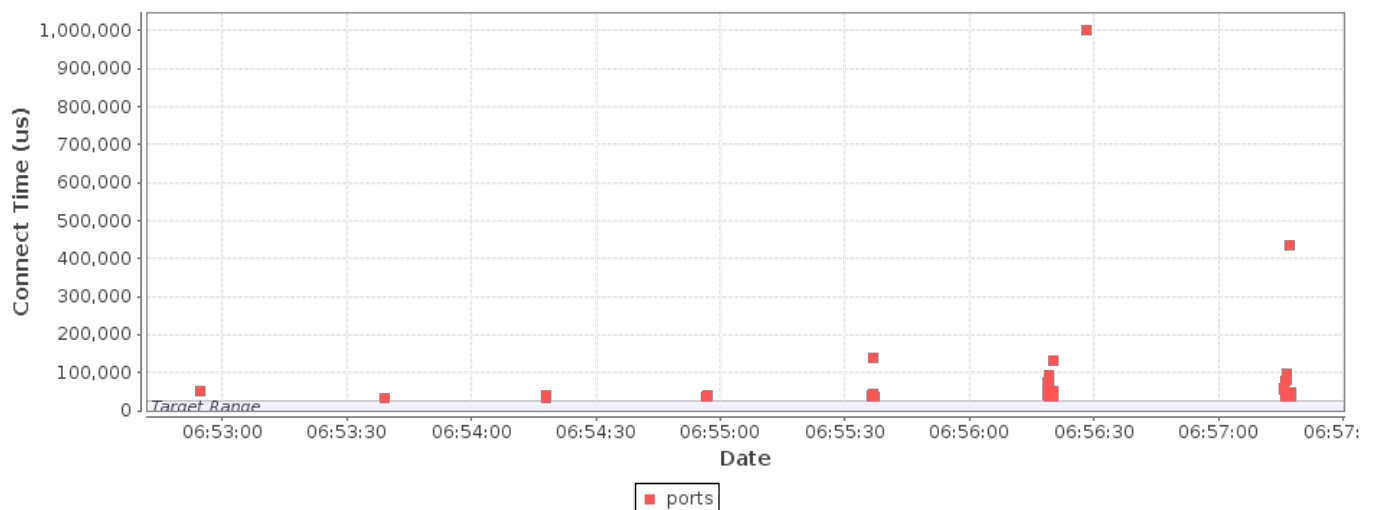
Protocol-Data-Units received. For TCP, this does not mean much, but for UDP connections, this correlates to packet size. If the PDU size is larger than what fits into a single frame, then the network stack will segment it accordingly. A well behaving system will show about the same rate as stations increase. If the rate decreases significantly as stations increase, then it is not scaling well.

## Total PDU/s Received vs Number of Stations Active
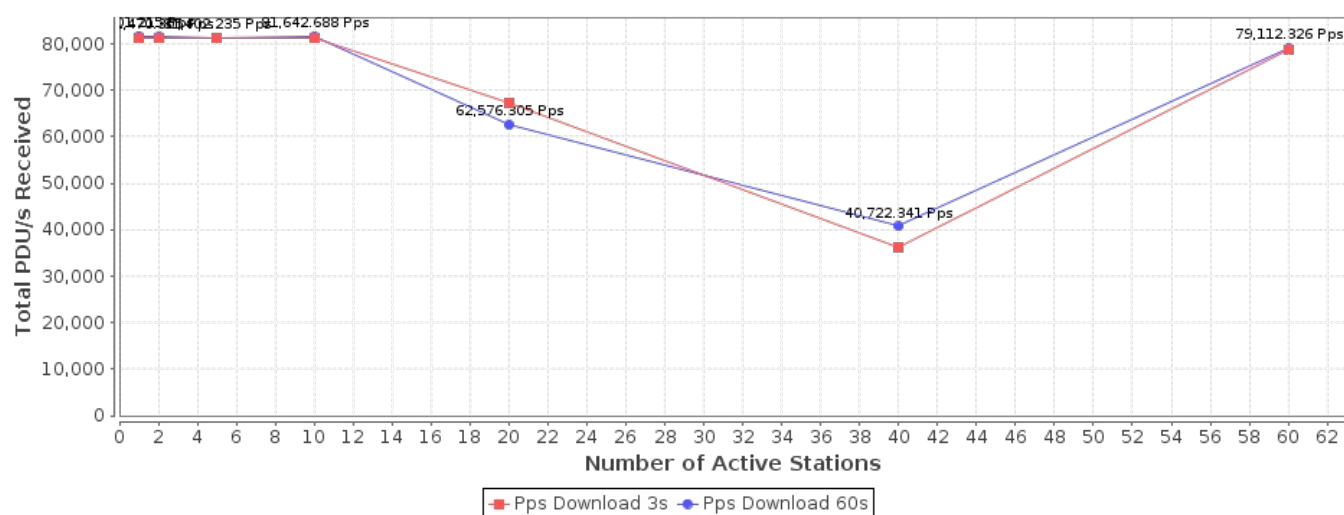


CSV Data for Graph Above

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.

## Total Kbps Received vs Number of Stations Active
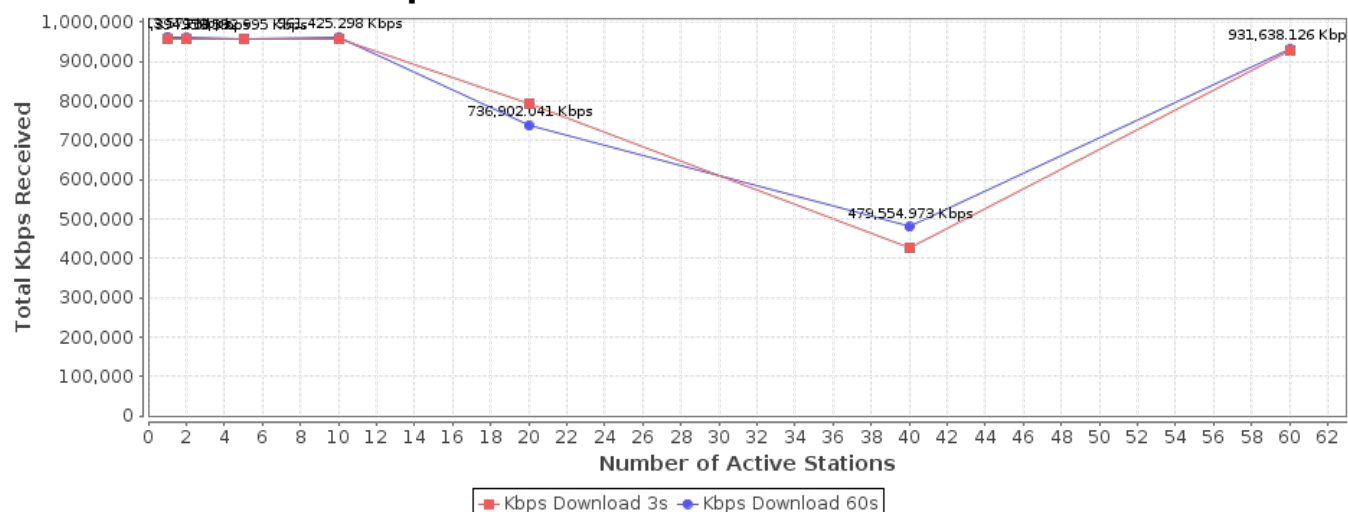


CSV Data for Graph Above

| Wifi-Capacity Test requested values | |
|---|---|
| Station Increment: | 1,2,5,10,20,40,60 |
| Loop Iterations: | Single (1) |
| Duration: | 30 sec (30 s) |
| Protocol: | UDP-IPv4 |
| Layer-4 Endpoint: | NONE |
| Payload Size: | AUTO |
| MSS | AUTO |

| | |
|---|---|
| Total Download Rate: | 1G (1 Gbps) |
| Total Upload Rate: | Zero (0 bps) |
| Percentage TCP Rate: | 10% (10%) |
| Randomize Rates | true |
| Leave Ports Up | false |
| Socket buffer size: | OS Default |
| Settle Time: | 5 sec (5 s) |
| Rpt Timer: | fast (1 s) |
| IP ToS: | Best Effort (0) |
| Multi-Conn: | AUTO |
| Show-Per-Iteration-Charts | true |
| Show-Per-Loop-Totals | true |
| Hunt-Lower-Rates | false |
| Show Events | true |
| CSV Reporting Dir | - not selected - |
| Build Date | Fri May 31 21:34:23 PDT 2019 |
| Build Version | 5.3.9 |
| Ports | 1.1.eth1 1.1.sta0000 1.1.sta0001 1.1.sta0002 1.1.sta0003 1.1.sta0004 1.1.sta0005 1.1.sta0006 1.1.sta0007 1.1.sta0008 1.1.sta0009 1.1.sta0010 1.1.sta0011 1.1.sta0012 1.1.sta0013 1.1.sta0014 1.1.sta0015 1.1.sta0016 1.1.sta0017 1.1.sta0018 1.1.sta0019 1.1.sta0020 1.1.sta0021 1.1.sta0022 1.1.sta0023 1.1.sta0024 1.1.sta0025 1.1.sta0026 1.1.sta0027 1.1.sta0028 1.1.sta0029 1.1.sta0030 1.1.sta0031 1.1.sta0032 1.1.sta0033 1.1.sta0034 1.1.sta0035 1.1.sta0036 1.1.sta0037 1.1.sta0038 1.1.sta0039 1.1.sta0040 1.1.sta0041 1.1.sta0042 1.1.sta0043 1.1.sta0044 1.1.sta0045 1.1.sta0046 1.1.sta0047 1.1.sta0048 1.1.sta0049 1.1.sta0050 1.1.sta0051 1.1.sta0052 1.1.sta0053 1.1.sta0054 1.1.sta0055 1.1.sta0056 1.1.sta0057 1.1.sta0058 1.1.sta0059 |
| Firmware | 0. 6-1 10.4b-ct-9984-xtH-012-f6434814c |
| Machines | MobileStations |

```
Requested Parameters:
Download Rate: Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:          0 (    0 bps)  All:            0 (    0 bps)
                                                    Total:   1000000000 (   1 Gbps)
Station count: 1   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:       Cx Min: 962.114 Mbps  Cx Ave: 962.114 Mbps  Cx Max: 962.114 Mbps  All Cx: 962.114 Mbps
Upload Rate:         Cx Min:      0 bps Cx Ave:      0 bps Cx Max:      0 bps  All Cx:      0 bps
                                                                              Total: 962.114 Mbps
Aggregated Rate:   Min:    962.114 Mbps  Avg:    962.114 Mbps  Max:    962.114 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



CSV Data for Graph Above

Requested Parameters:
```
Download Rate: Per station: 1000000000 (   1 Gbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:           0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 1   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:     3.399 GB  Cx Ave:     3.399 GB  Cx Max:     3.399 GB  All Cx:     3.399 GB
Upload Amount:     Cx Min:         0 B  Cx Ave:         0 B  Cx Max:         0 B  All Cx:         0 B
                                                                               Total:     3.399 GB
```
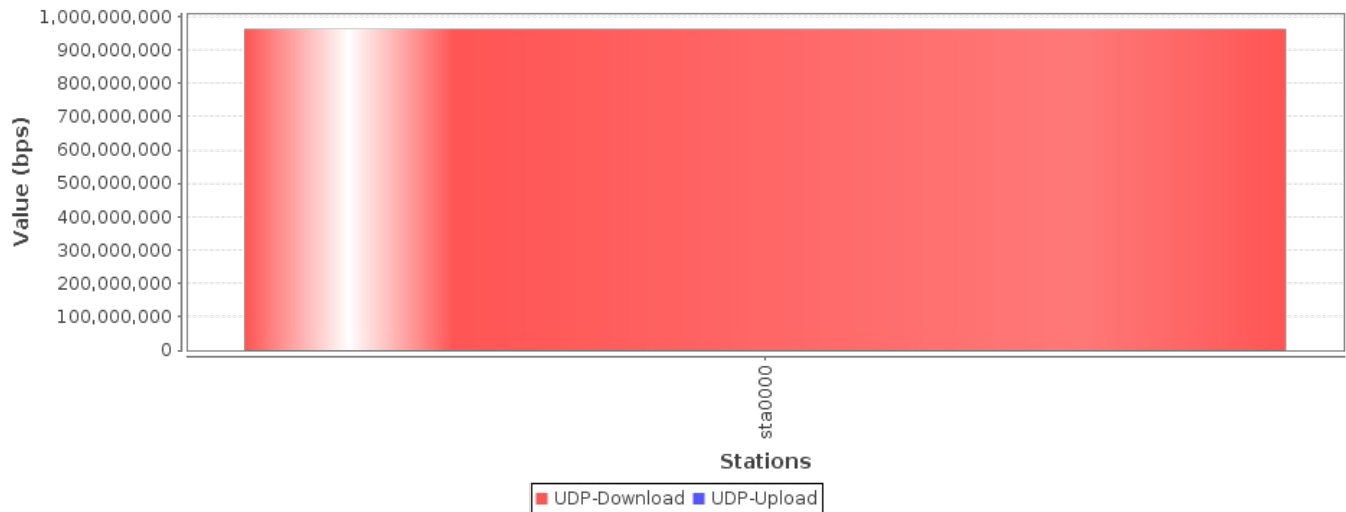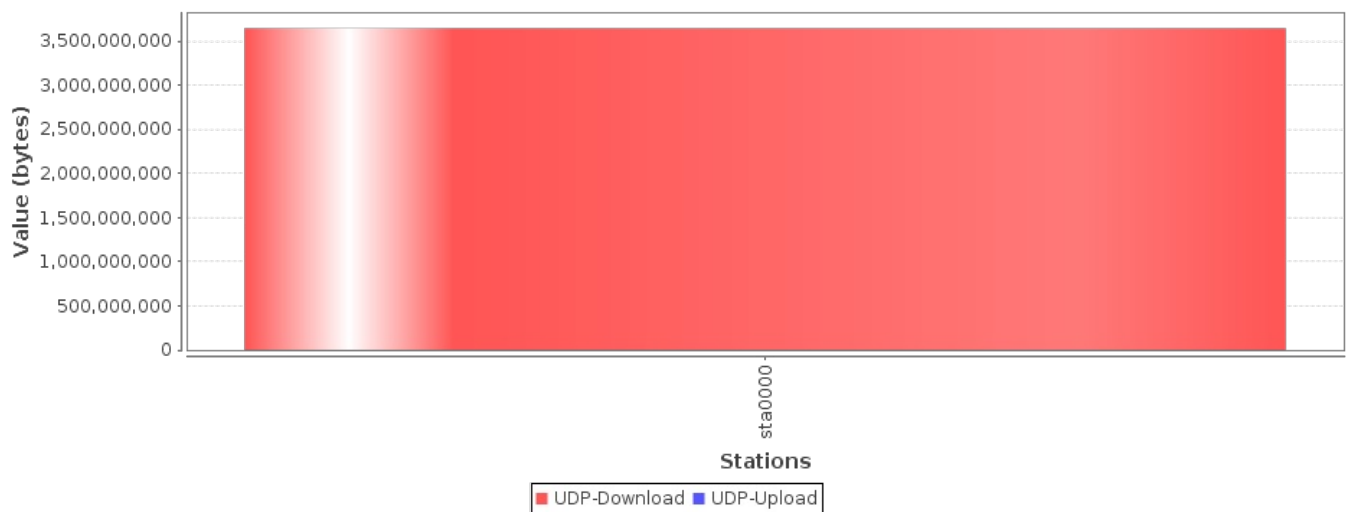
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

## Combined Received bytes, for entire 30 s run



CSV Data for Graph Above

Requested Parameters:
```
Download Rate: Per station: 500000000 ( 500 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:           0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 2   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 479.472 Mbps  Cx Ave: 479.697 Mbps  Cx Max: 479.923 Mbps  All Cx: 959.395 Mbps
Upload Rate:       Cx Min:       0 bps  Cx Ave:       0 bps  Cx Max:       0 bps  All Cx:       0 bps
```

```
                                                          Total: 959.395 Mbps
Aggregated Rate:   Min:    479.472 Mbps  Avg:     479.697 Mbps  Max:    479.923 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.
```
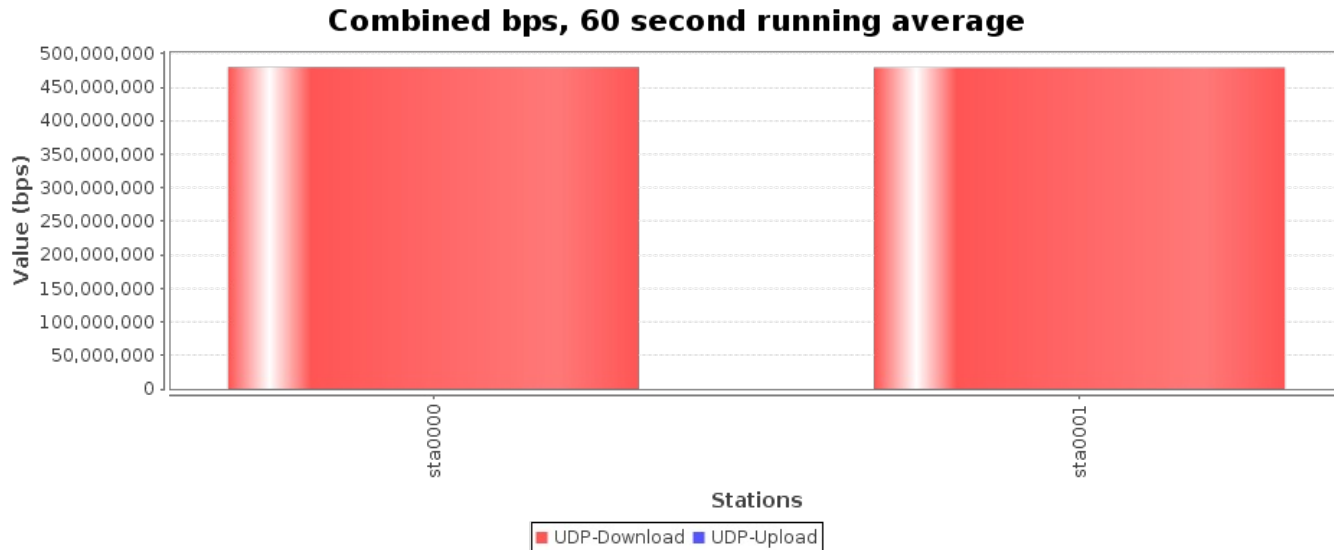
## Combined bps, 60 second running average

CSV Data for Graph Above

```
Requested Parameters:
Download Rate: Per station: 500000000 ( 500 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (   0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 2   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:    1.699 GB  Cx Ave:      1.7 GB  Cx Max:    1.701 GB  All Cx:      3.4 GB
Upload Amount:     Cx Min:       0 B  Cx Ave:       0 B  Cx Max:       0 B  All Cx:       0 B
                                                   Total:      3.4 GB

This graph shows fairness.  On a fair system, each station should get about the same throughput.
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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.
```
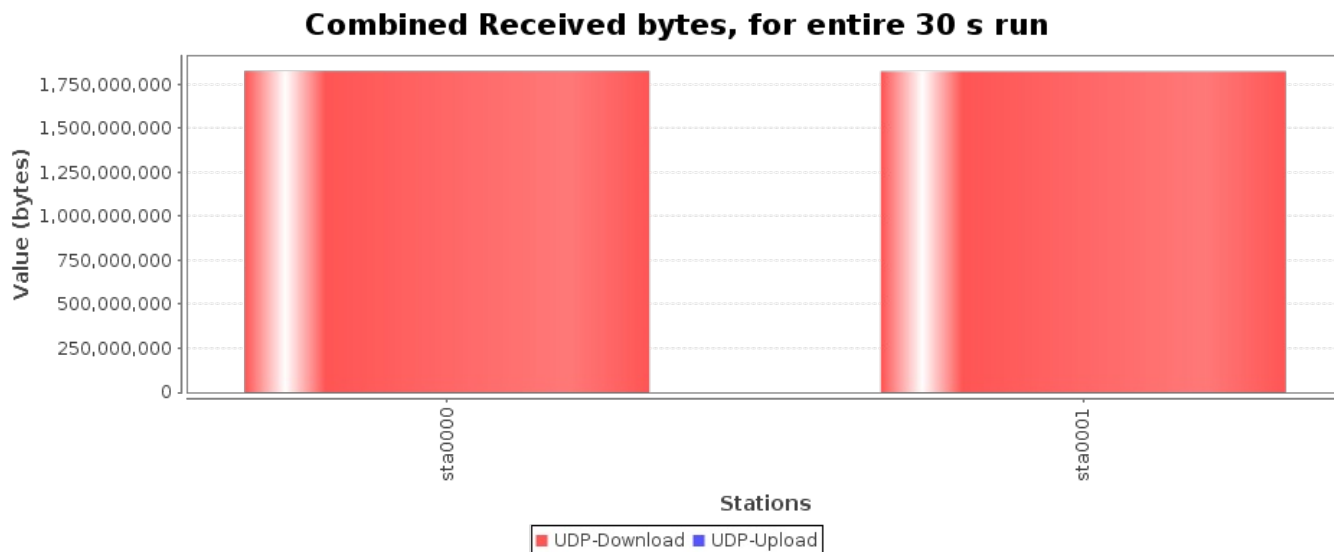
## Combined Received bytes, for entire 30 s run

CSV Data for Graph Above

```
Requested Parameters:
Download Rate: Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 5   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)


Observed Rate:
Download Rate:     Cx Min: 186.248 Mbps  Cx Ave: 191.719 Mbps  Cx Max: 199.712 Mbps  All Cx: 958.593 Mbps
Upload Rate:       Cx Min:         0 bps  Cx Ave:         0 bps  Cx Max:         0 bps  All Cx:         0 bps
                                                                 Total: 958.593 Mbps

Aggregated Rate:   Min:    186.248 Mbps  Avg:    191.719 Mbps  Max:    199.712 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.
```
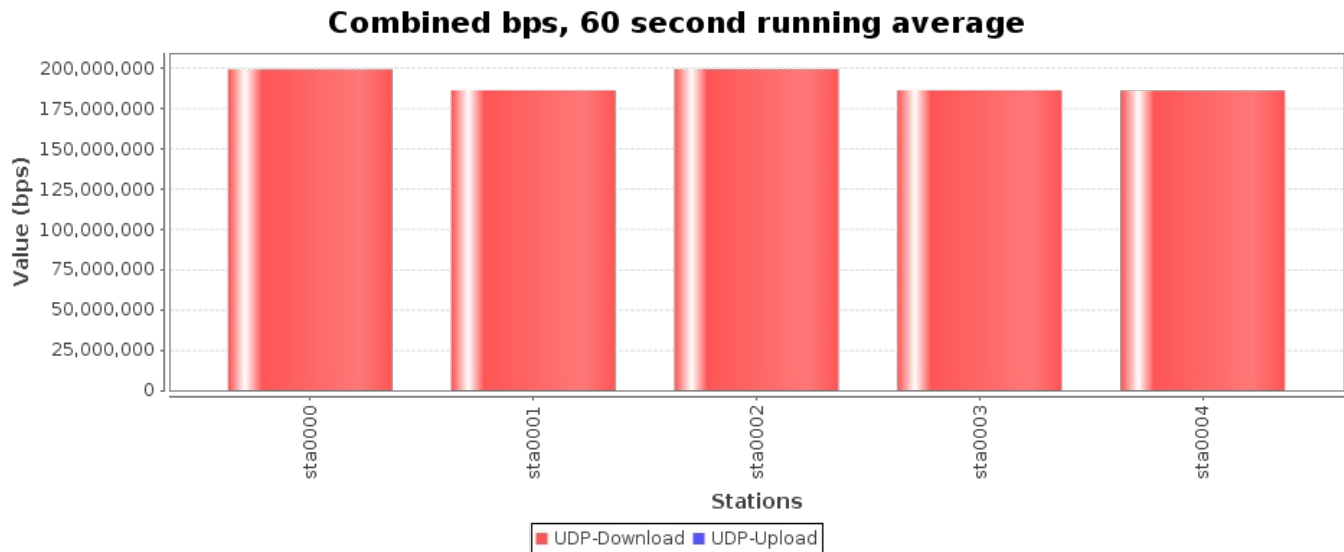
## Combined bps, 60 second running average



[CSV Data for Graph Above](#)

```
Requested Parameters:
Download Rate: Per station: 200000000 ( 200 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 5   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)


Observed Amount:
Download Amount:   Cx Min:   676.683 MB  Cx Ave:   695.972 MB  Cx Max:   724.809 MB  All Cx:     3.398 GB
Upload Amount:     Cx Min:         0 B  Cx Ave:         0 B  Cx Max:         0 B  All Cx:         0 B
                                                                 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.
```
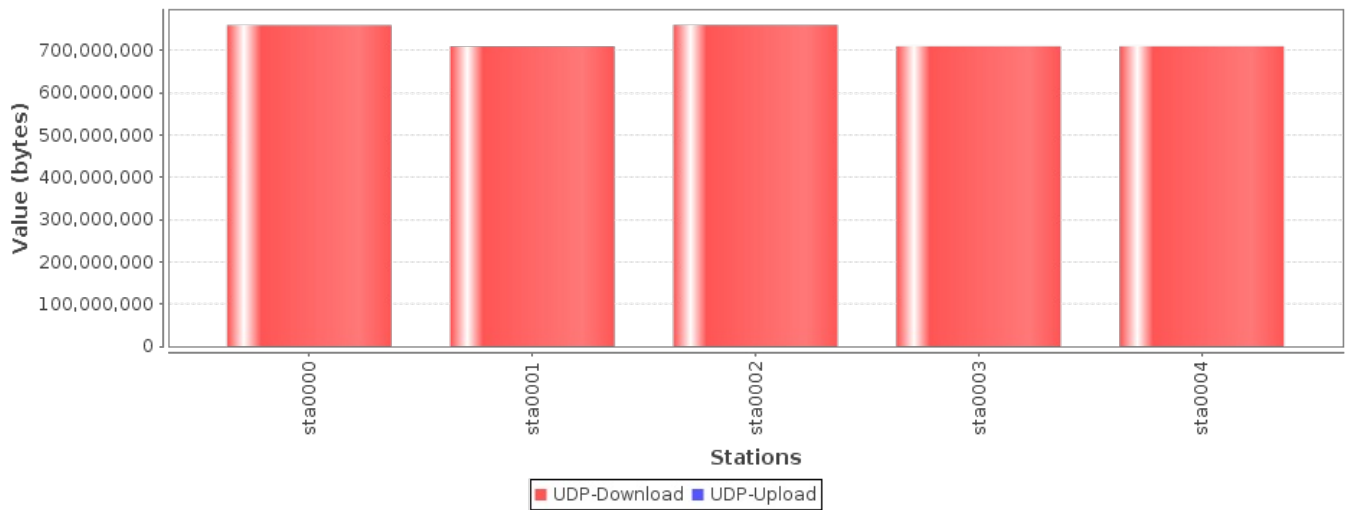
## Combined Received bytes, for entire 30 s run



[CSV Data for Graph Above](#)

```
Requested Parameters:
Download Rate: Per station: 100000000 ( 100 Mbps)  All:   1000000000 (    1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (    1 Gbps)
Station count: 10   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:      Cx Min:  93.417 Mbps  Cx Ave:  96.143 Mbps  Cx Max: 100.294 Mbps  All Cx: 961.425 Mbps
Upload Rate:       Cx Min:      0 bps  Cx Ave:       0 bps  Cx Max:       0 bps  All Cx:       0 bps
                                                                                Total: 961.425 Mbps
Aggregated Rate:   Min:    93.417 Mbps  Avg:     96.143 Mbps  Max:    100.294 Mbps
```
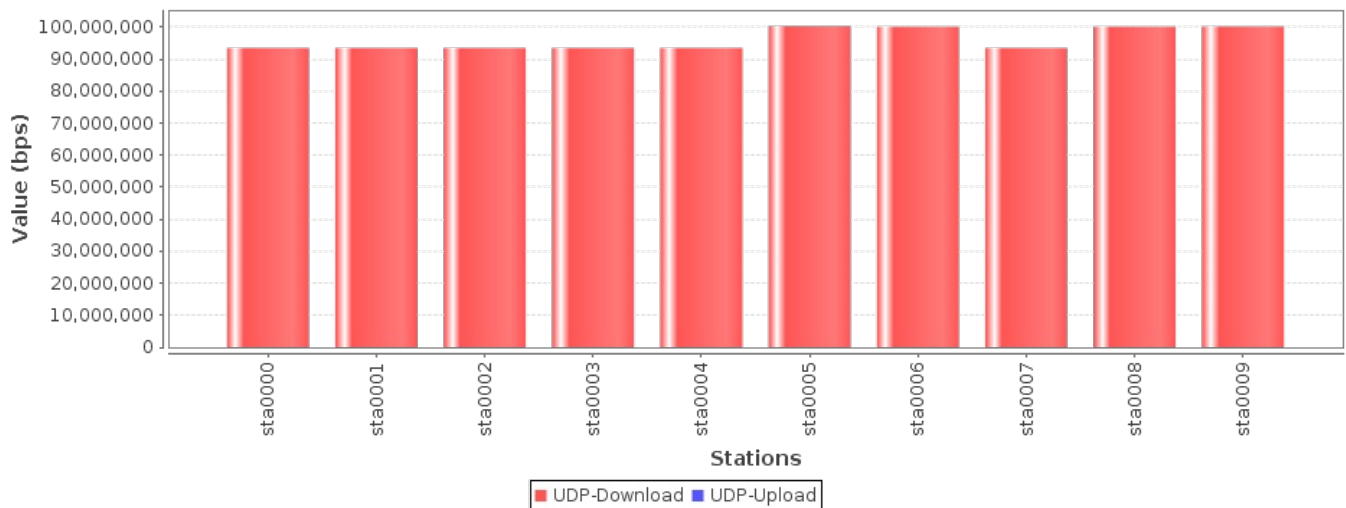
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

## Combined bps, 60 second running average



[CSV Data for Graph Above](#)

```
Requested Parameters:
Download Rate: Per station: 100000000 ( 100 Mbps)  All:   1000000000 (    1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (    1 Gbps)
Station count: 10   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:  338.123 MB  Cx Ave:    348.09 MB  Cx Max:  363.273 MB  All Cx:     3.399 GB
```

```
Upload Amount:     Cx Min:        0 B  Cx Ave:        0 B  Cx Max:        0 B  All Cx:        0 B
                                                                          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.

## Combined Received bytes, for entire 30 s run



CSV Data for Graph Above

```
Requested Parameters:
Download Rate: Per station:  50000000 (  50 Mbps) All:  1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (   0 bps) All:           0 (   0 bps)
                                          Total:    1000000000 (   1 Gbps)
Station count: 20   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min: 27.797 Mbps  Cx Ave: 36.845 Mbps  Cx Max: 41.677 Mbps  All Cx: 736.902 Mbps
Upload Rate:       Cx Min:      0 bps  Cx Ave:      0 bps  Cx Max:      0 bps  All Cx:       0 bps
                                                                          Total: 736.902 Mbps
Aggregated Rate:   Min:    27.797 Mbps  Avg:     36.845 Mbps  Max:    41.677 Mbps
```
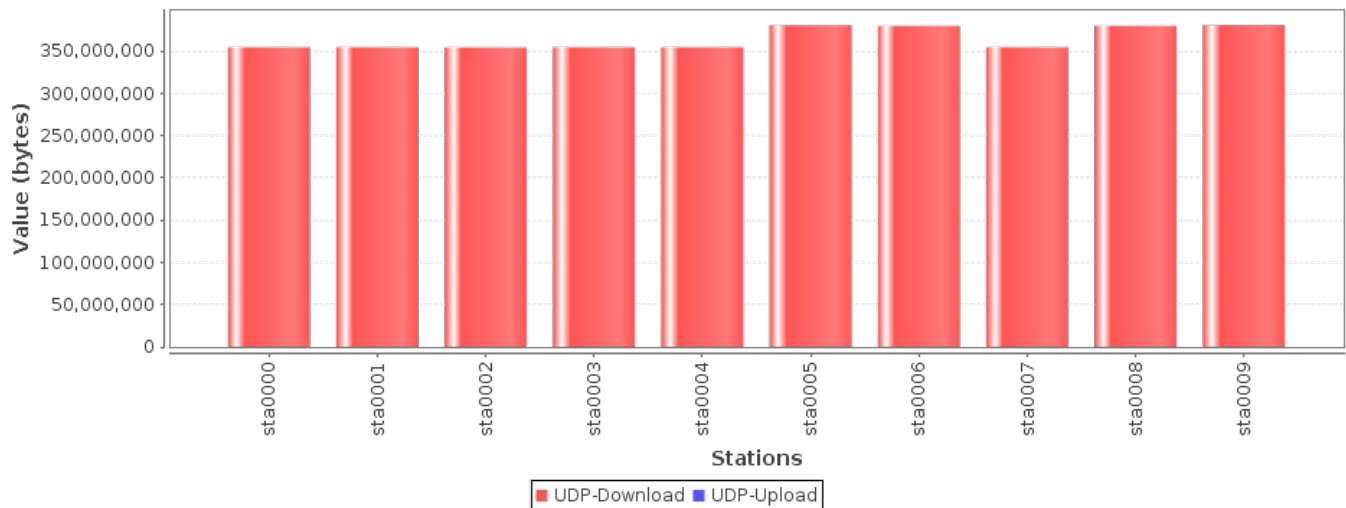
This graph shows fairness.  On a fair system, each station should get about the same throughput.
In the download direction, it is mostly the device-under-test that is responsible for this behavior,
but in the upload direction, LANforge itself would be the source of most fairness issues
unless the device-under-test takes specific actions to ensure fairness.

## Combined bps, 60 second running average



CSV Data for Graph Above

```
Requested Parameters:
Download Rate: Per station:  50000000 (  50 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 20   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:   104.801 MB  Cx Ave:   138.426 MB  Cx Max:   157.093 MB  All Cx:    2.704 GB
Upload Amount:     Cx Min:        0 B   Cx Ave:        0 B    Cx Max:        0 B    All Cx:        0 B
                                                                                   Total:     2.704 GB

This graph shows fairness.  On a fair system, each station should get about the same throughput.
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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.
```
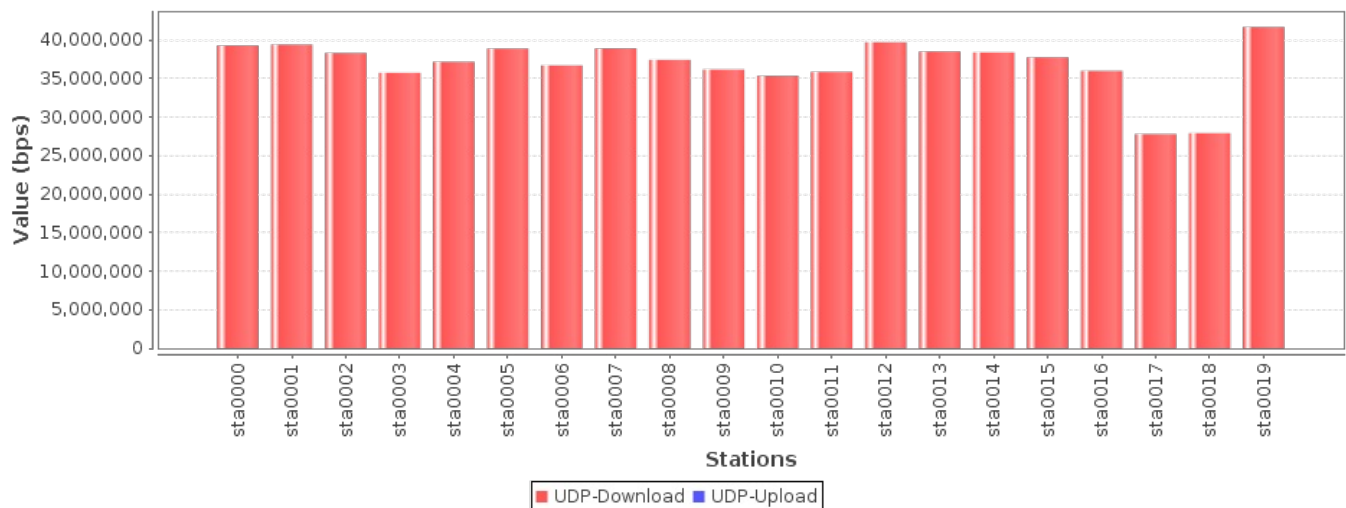
## Combined Received bytes, for entire 30 s run



[CSV Data for Graph Above](#)

```
Requested Parameters:
Download Rate: Per station:  25000000 (  25 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:            0 (    0 bps)
                                                   Total:   1000000000 (   1 Gbps)
Station count: 40   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Rate:
Download Rate:     Cx Min:   9.492 Mbps  Cx Ave:  11.989 Mbps  Cx Max:  14.406 Mbps  All Cx: 479.555 Mbps
Upload Rate:       Cx Min:       0 bps  Cx Ave:       0 bps   Cx Max:       0 bps   All Cx:       0 bps
                                                                                   Total: 479.555 Mbps
Aggregated Rate:   Min:      9.492 Mbps  Avg:     11.989 Mbps  Max:     14.406 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.
```
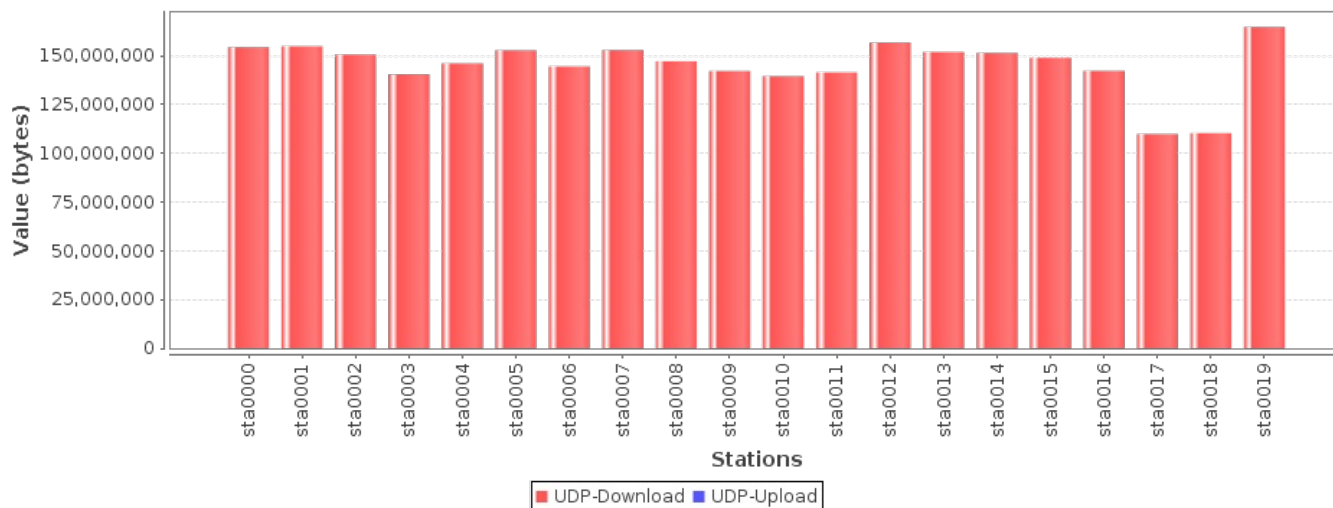
## Combined bps, 60 second running average



CSV Data for Graph Above

Requested Parameters:
Download Rate: Per station:  25000000 (  25 Mbps)  All:  1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:           0 (   0 bps)
                                                   Total:   1000000000 (   1 Gbps)
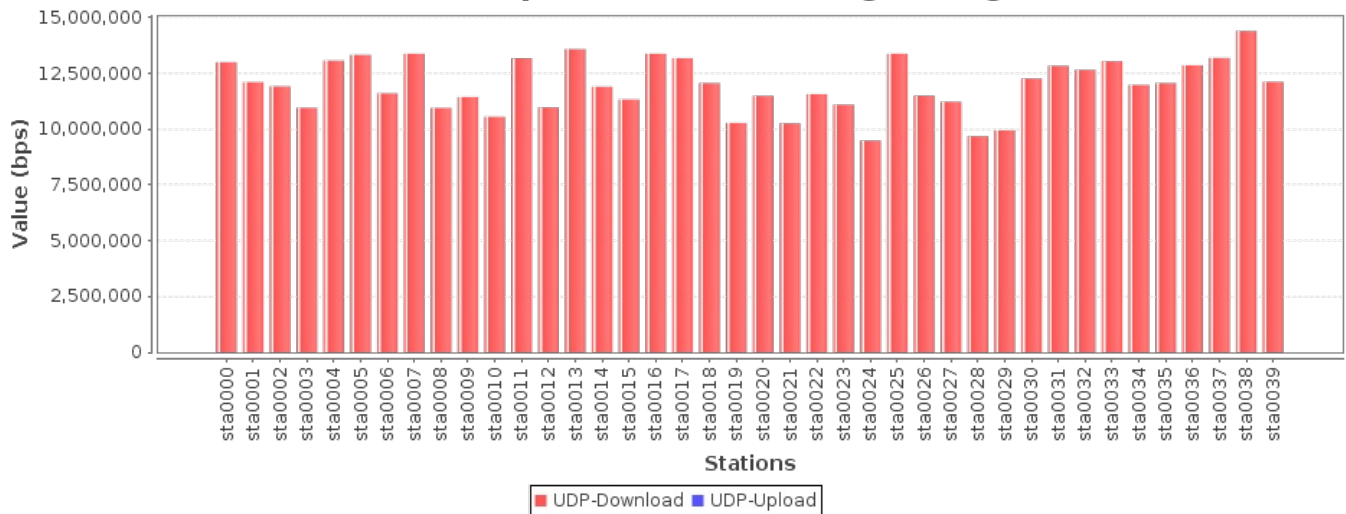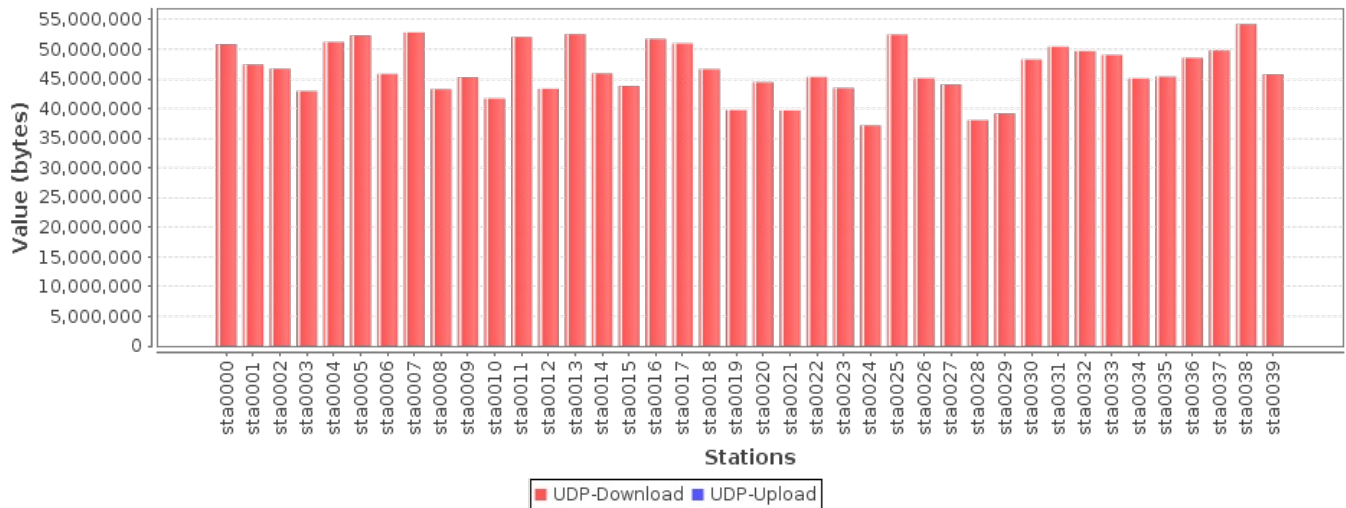Station count: 40   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:    35.439 MB  Cx Ave:    44.403 MB  Cx Max:    51.721 MB  All Cx:    1.734 GB
Upload Amount:     Cx Min:         0 B  Cx Ave:         0 B  Cx Max:         0 B  All Cx:         0 B
                                                                                   Total:     1.734 GB

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

## Combined Received bytes, for entire 30 s run



CSV Data for Graph Above

Requested Parameters:
Download Rate: Per station:  16666666 (16.667 Mbps)  All:  1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps)  All:           0 (   0 bps)
                                                     Total:   1000000000 (   1 Gbps)
Station count: 60   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)
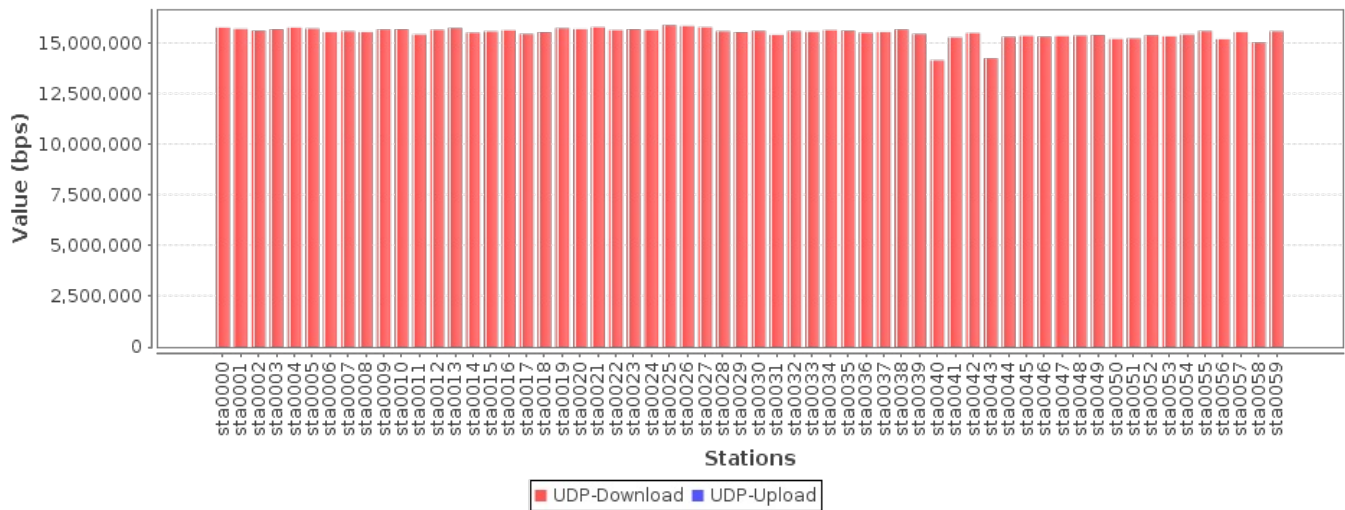
Observed Rate:
Download Rate:     Cx Min:  14.176 Mbps  Cx Ave:  15.527 Mbps  Cx Max:  15.914 Mbps  All Cx: 931.638 Mbps
Upload Rate:       Cx Min:       0 bps  Cx Ave:       0 bps  Cx Max:       0 bps  All Cx:       0 bps

Total: 931.638 Mbps

Aggregated Rate:    Min:      14.176 Mbps  Avg:      15.527 Mbps  Max:      15.914 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



CSV Data for Graph Above

Requested Parameters:
Download Rate: Per station:  16666666 (16.667 Mbps)  All:   1000000000 (   1 Gbps)
Upload Rate:   Per station:         0 (    0 bps) All:            0 (   0 bps)
                                                   Total:    1000000000 (   1 Gbps)
Station count: 60   Connections per station: 1   Payload (PDU) sizes: AUTO (AUTO)

Observed Amount:
Download Amount:   Cx Min:     51.427 MB  Cx Ave:      56.299 MB  Cx Max:      57.681 MB  All Cx:     3.299 GB
Upload Amount:     Cx Min:          0 B  Cx Ave:           0 B  Cx Max:          0 B  All Cx:          0 B
                                                                                       Total:      3.299 GB

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

## Combined Received bytes, for entire 30 s run



CSV Data for Graph Above
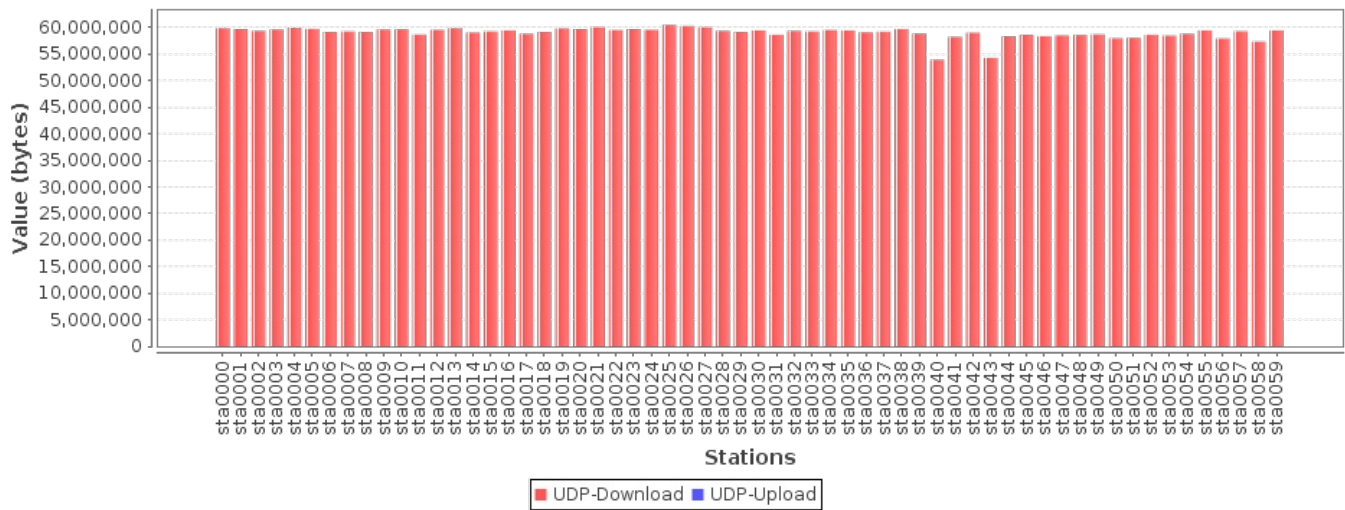
Maximum Stations Connected: 60

```
Stations NOT connected at this time: 0
Maximum Stations with IP Address: 60
Stations without IP at this time: 0
```

## Station Maximums
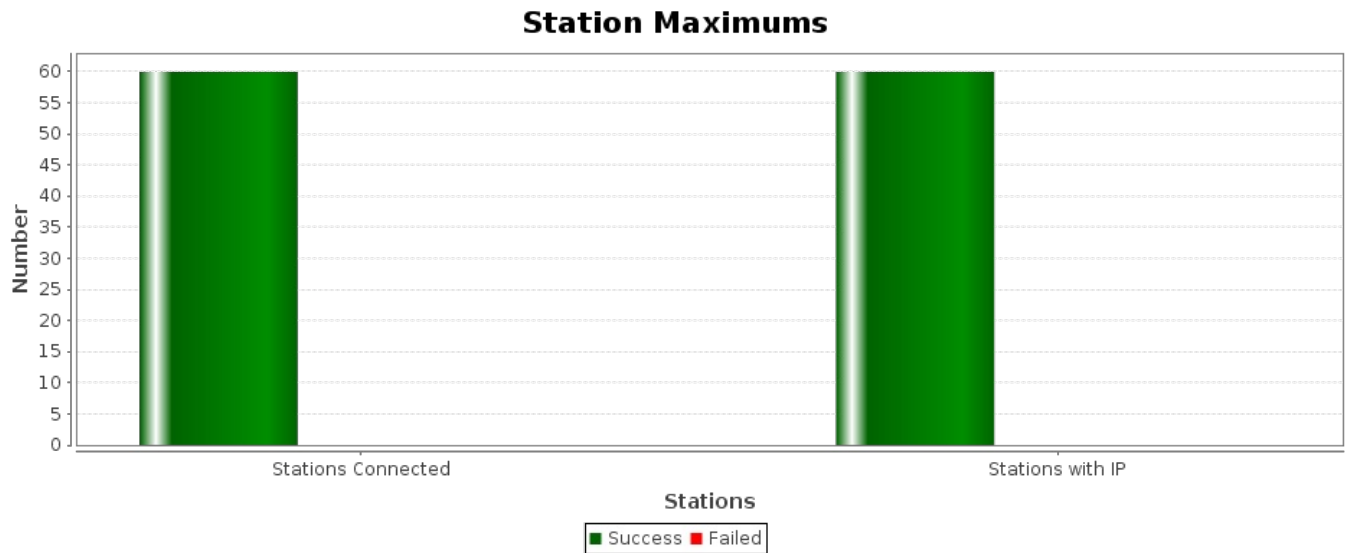


RF stats give an indication of how well how congested is the RF environment. Channel activity is what the wifi radio reports as the busy-time for the RF environment. It is expected that this be near 100% when LANforge is running at max speed, but at lower speeds, this should be a lower percentage unless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

## RF Stats for Stations
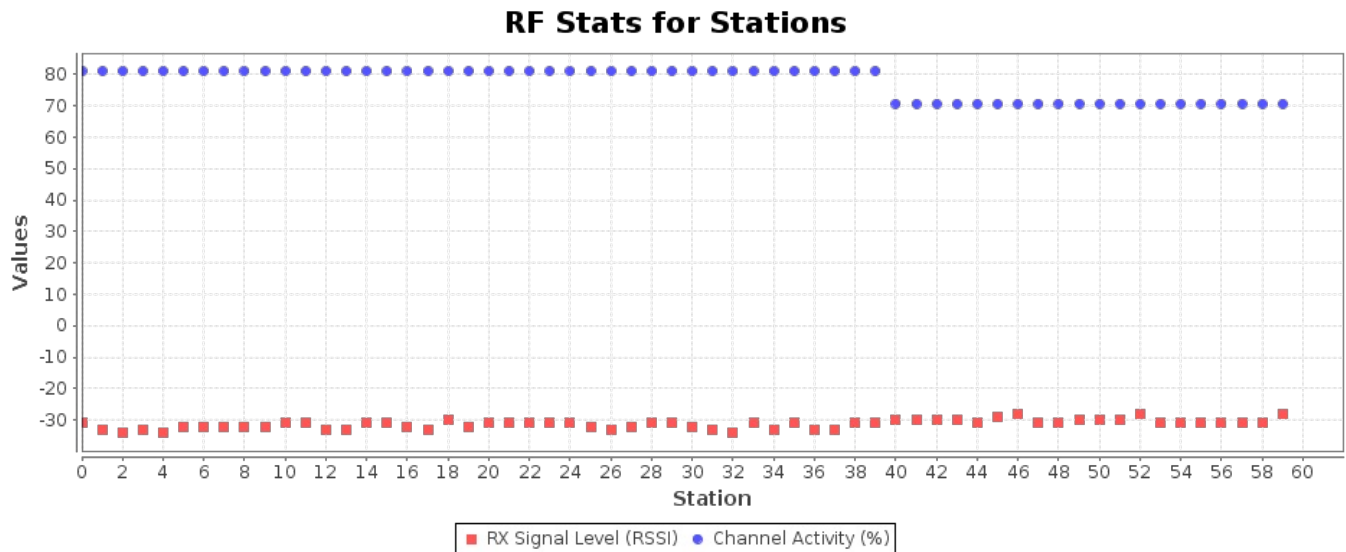


CSV Data for Graph Above

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.

# Link Rate for Stations



RX Link Rate (Mbps)  ●  TX Link Rate (Mbps)
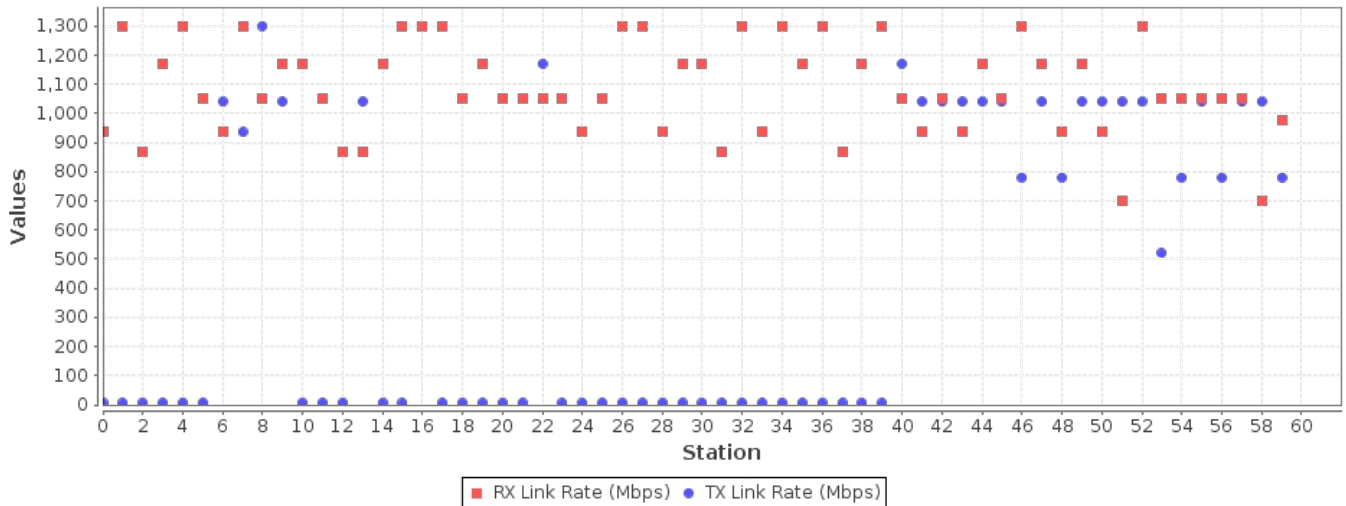
[CSV Data for Graph Above](#)

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

BSS 78:d2:94:bf:16:43(on sta0000) -- associated
        TSF: 149156932634 usec (1d, 17:25:56)
        freq: 5785
        beacon interval: 100 TUs
        capability: ESS Privacy SpectrumMgmt ShortSlotTime RadioMeasure (0x1511)
        signal: -27.00 dBm
        last seen: 24 ms ago
        Information elements from Probe Response frame:
        SSID: labap
        Supported rates: 6.0* 9.0 12.0* 18.0 24.0* 36.0 48.0 54.0
        DS Parameter set: channel 157
        Country: US     Environment: Indoor/Outdoor
                Channels [36 - 36] @ 23 dBm
                Channels [40 - 40] @ 23 dBm
                Channels [44 - 44] @ 23 dBm
                Channels [48 - 48] @ 23 dBm
                Channels [52 - 52] @ 17 dBm
                Channels [56 - 56] @ 17 dBm
                Channels [60 - 60] @ 17 dBm
                Channels [64 - 64] @ 17 dBm
                Channels [100 - 100] @ 17 dBm
                Channels [104 - 104] @ 17 dBm
                Channels [108 - 108] @ 17 dBm
                Channels [112 - 112] @ 17 dBm
                Channels [116 - 116] @ 17 dBm
                Channels [120 - 120] @ 17 dBm
                Channels [124 - 124] @ 17 dBm
                Channels [128 - 128] @ 17 dBm
                Channels [132 - 132] @ 17 dBm
                Channels [136 - 136] @ 17 dBm
                Channels [140 - 140] @ 17 dBm
                Channels [149 - 149] @ 23 dBm
                Channels [153 - 153] @ 23 dBm
                Channels [157 - 157] @ 23 dBm
                Channels [161 - 161] @ 23 dBm
                Channels [165 - 165] @ 23 dBm
        Power constraint: 3 dB
        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: No restriction (0x00)
                HT TX/RX MCS rate indexes supported: 0-31
        HT operation:
                * primary channel: 157
                * 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:
                    * TFS
                    * WNM-Sleep Mode
                    * TIM Broadcast
                    * BSS Transition
                    * SSID List
                    * Operating Mode Notification
                    * Max Number Of MSDUs In A-MSDU is unlimited
        VHT capabilities:
                VHT Capabilities (0x338b79f2):
                        Max MPDU length: 11454
                        Supported Channel Width: neither 160 nor 80+80
                        RX LDPC
                        short GI (80 MHz)
                        short GI (160/80+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: 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: 0xfffc
        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
        RSN:        * Version: 1
                    * Group cipher: CCMP
                    * Pairwise ciphers: CCMP
                    * Authentication suites: PSK
                    * Capabilities: 1-PTKSA-RC 1-GTKSA-RC (0x0000)
        WPS:        * Version: 1.0
                    * Wi-Fi Protected Setup State: 2 (Configured)
                    * Response Type: 3 (AP)
                    * UUID: 87654321-9abc-def0-1234-78d294bf1641
                    * Manufacturer: NTGR
                    * Model: R7800
                    * Model Number: R7800
                    * Serial Number: 78d294bf1641
                    * Primary Device Type: 6-0050f204-1
                    * Device name: R7800(Wireless AP)
                    * Config methods: Display
                    * Unknown TLV (0x1049, 6 bytes): 00 37 2a 00 01 20




        Scan Results for SSIDs NOT used in this test.
```