Unicast Packet Loss Report - UDP

Device Tested

WLAN Switch Model:
WLAN Switch Version:
AP Model: FS-AP1167C
AP SW Version: V200R106C60B202SP01

Overview

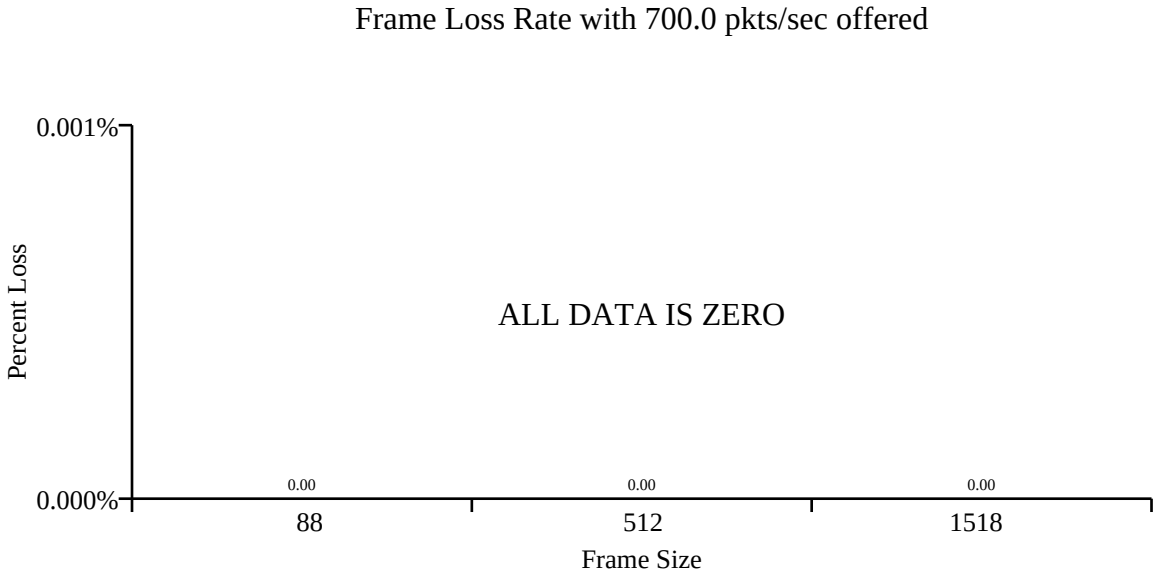
The packet loss test measures the rate at which frames are dropped, as well as the rate at which they are forwarded, by the system under test (SUT) when presented with specific traffic loads and frame sizes.

The results of this test are principally useful for characterizing the SUT behavior over a wide range of traffic, rather than for obtaining a single performance number. The test can be run using frame size and intended load sweeps to fully exercise the SUT with all combinations of traffic loads.

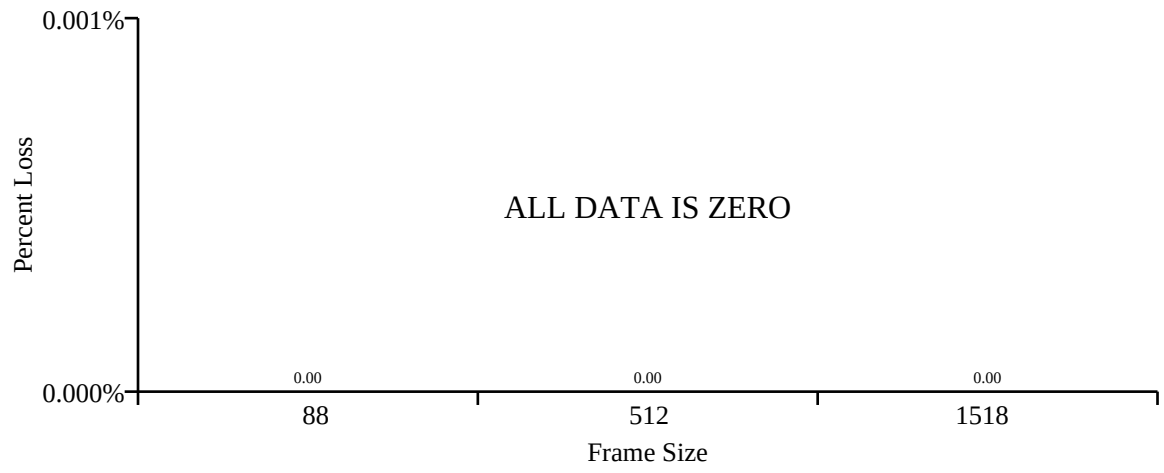
Frame Loss Rate

The following graph(s) show the percentage of frames that were dropped by the SUT for the specific combination(s) of intended load (ILOAD) in frames/sec and frame size in bytes. The values are averaged over all the trials. If there are more than 15 frame sizes the graph will represent a sample of the frame sizes only.

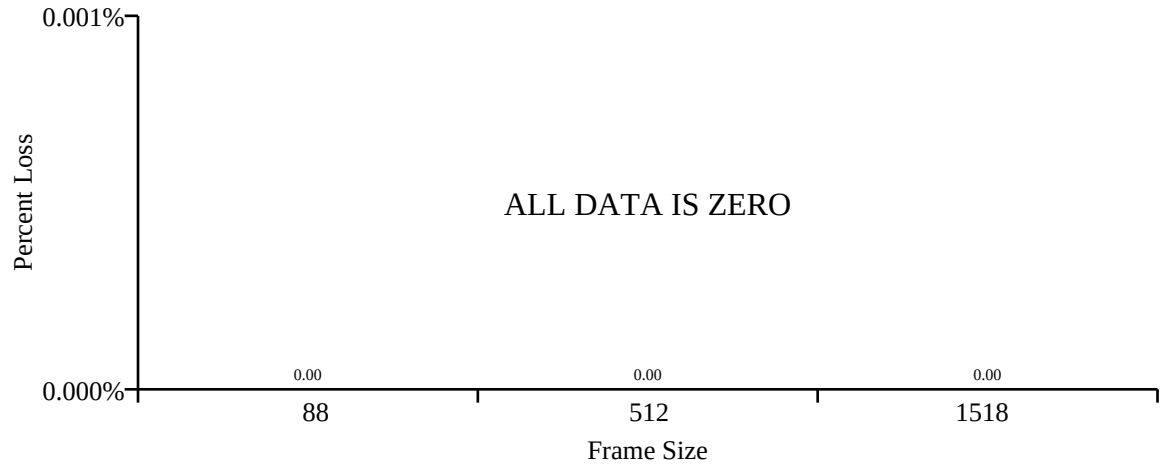
Ideally, no frames should be lost until the ILOAD exceeds the theoretical maximum. The relationship between the ILOAD and the theoretical maximum is shown in the next section (forwarding rate graphs).



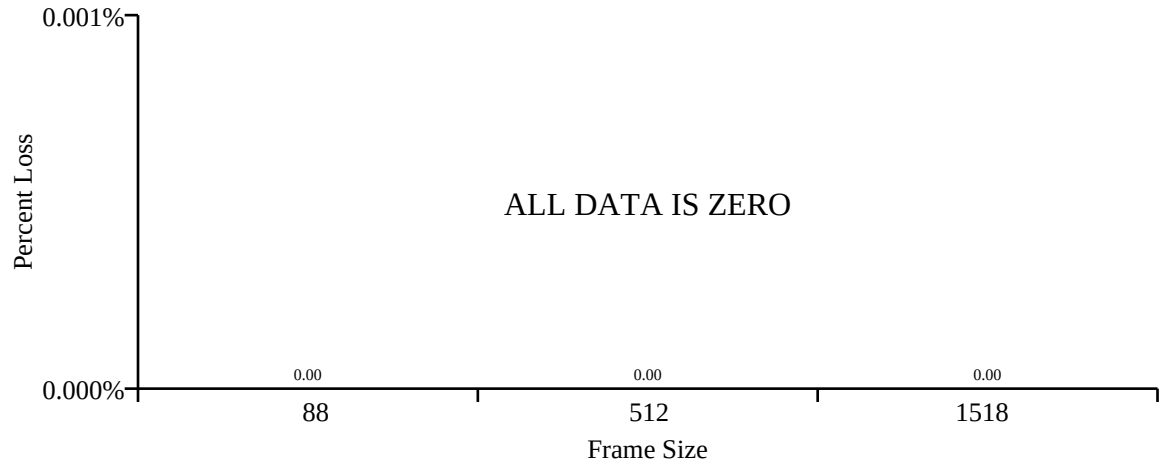
Frame Loss Rate with 600.0 pkts/sec offered



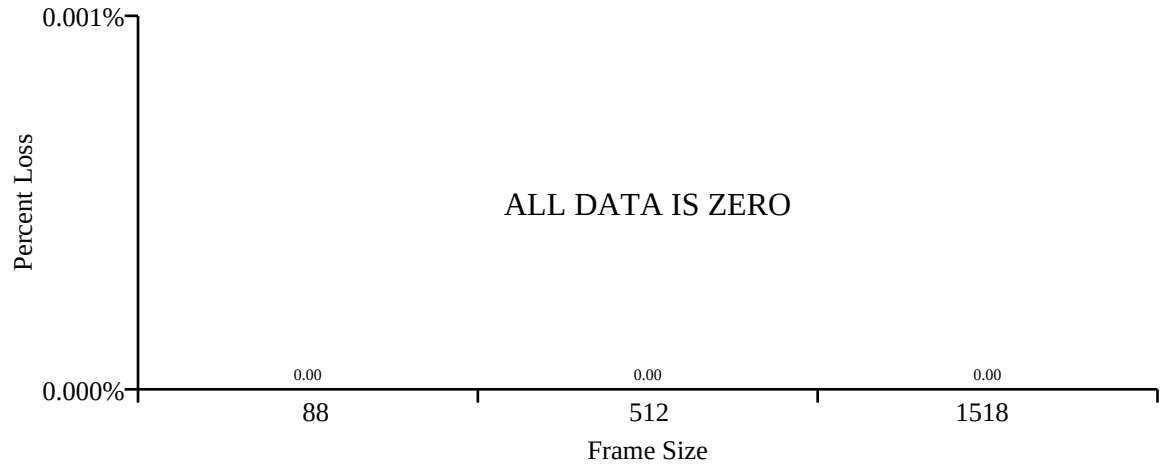
Frame Loss Rate with 500.0 pkts/sec offered



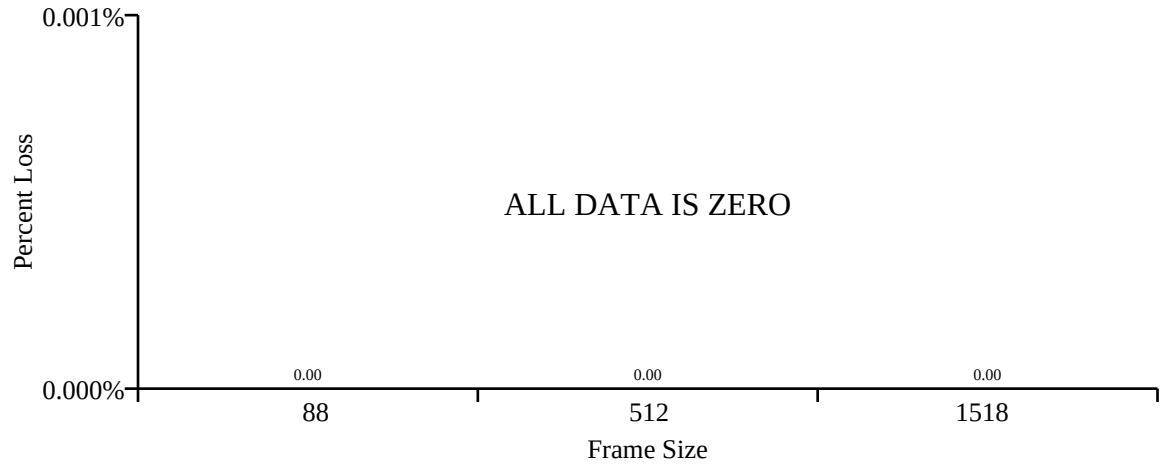
Frame Loss Rate with 400.0 pkts/sec offered



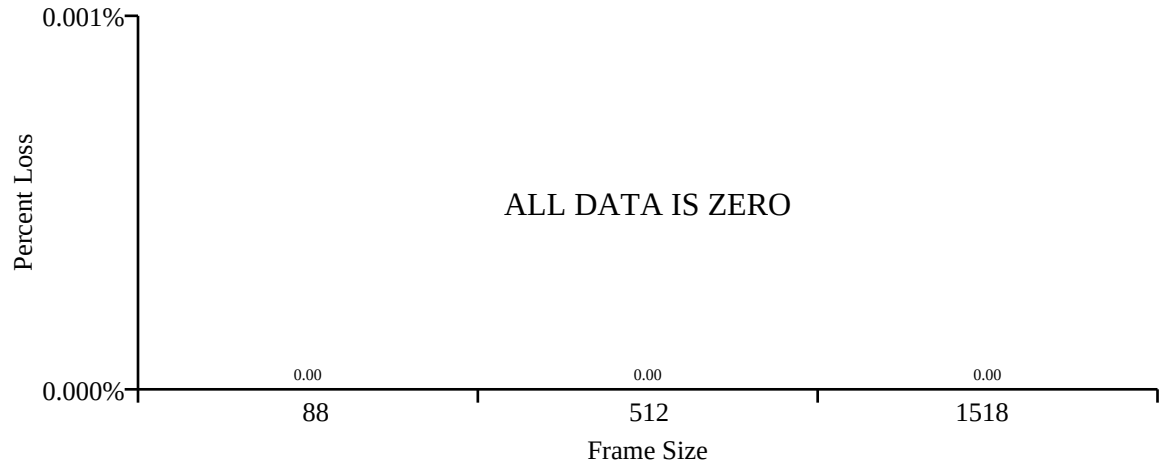
Frame Loss Rate with 300.0 pkts/sec offered



Frame Loss Rate with 200.0 pkts/sec offered



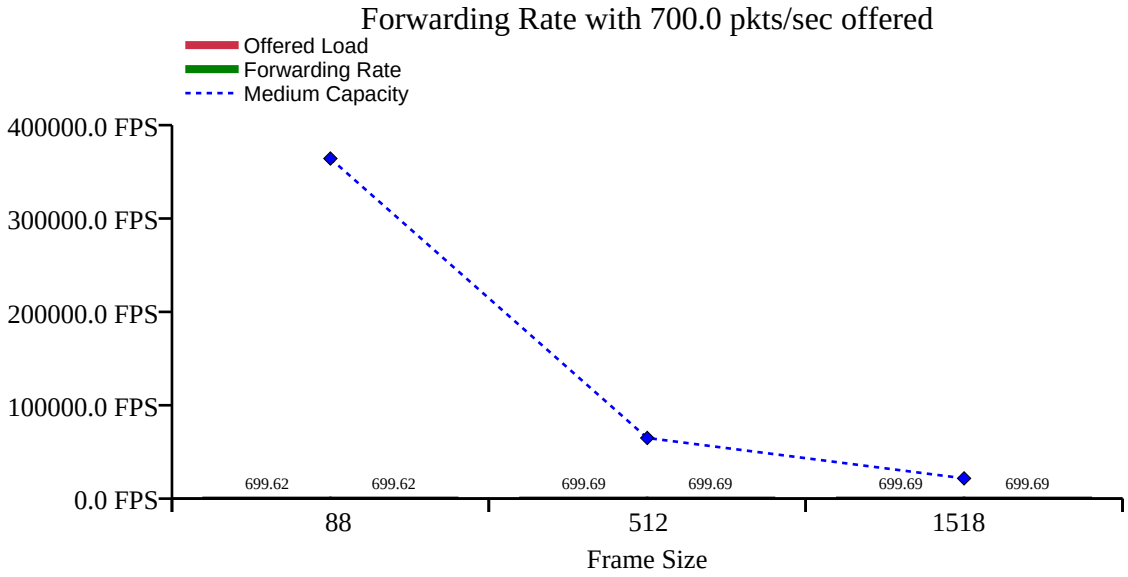
Frame Loss Rate with 100.0 pkts/sec offered

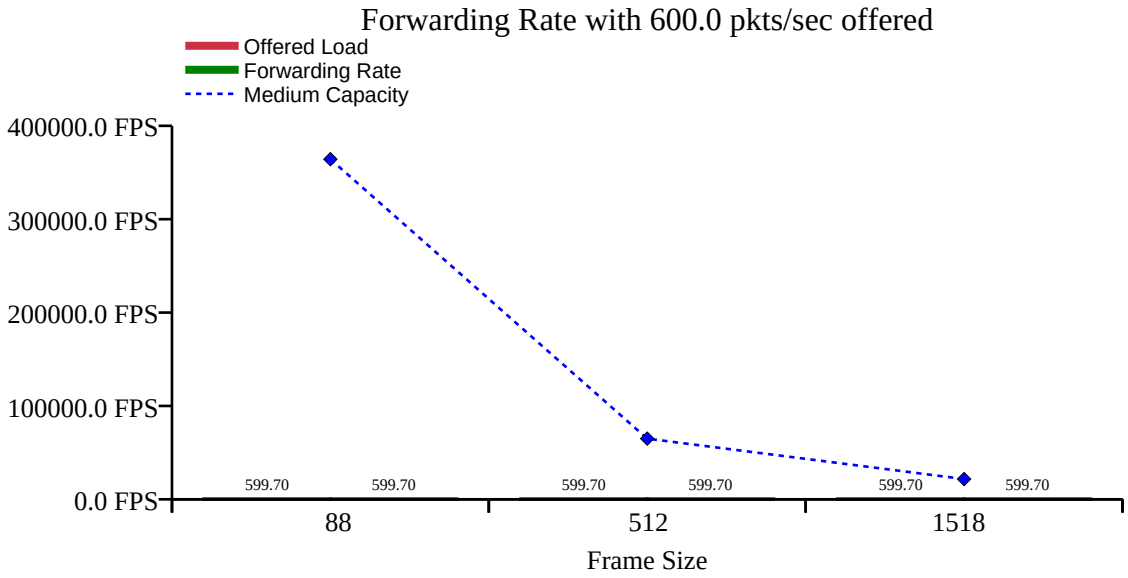


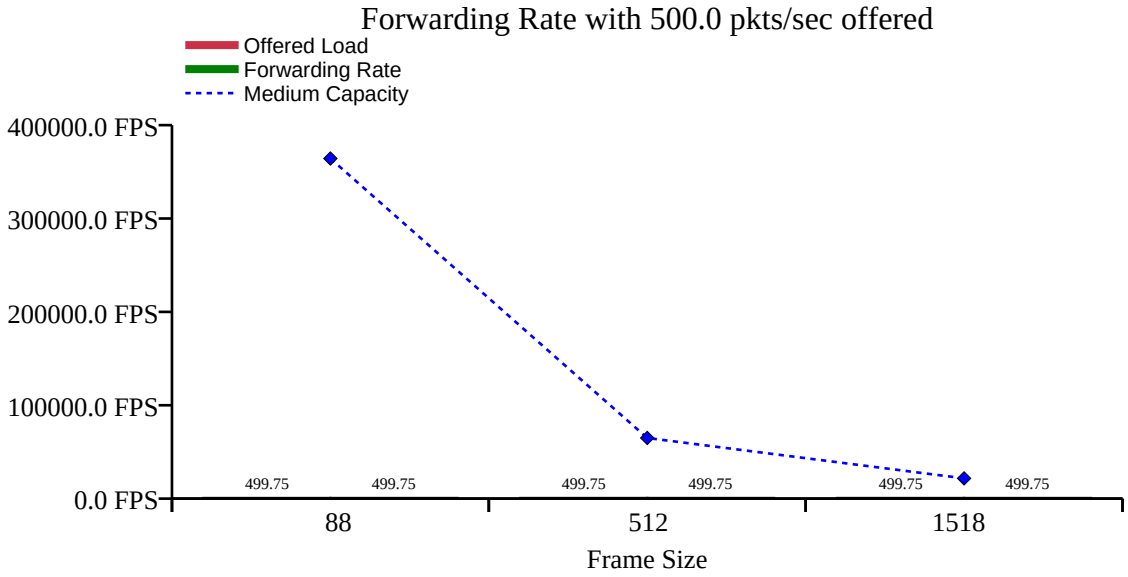
Forwarding Rate

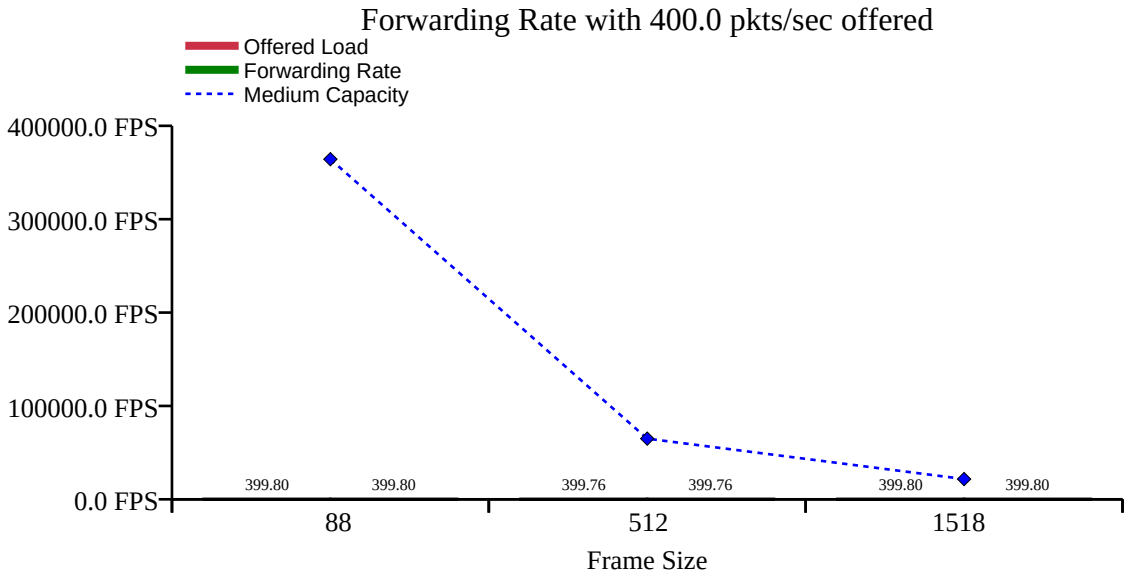
The following graph(s) compares the ILOAD presented to the SUT, versus the rate at which the SUT was able to successfully forward the traffic. The dashed line indicates the theoretical maximum ILOAD, as determined by the physical media. All traffic values are in frames/sec for specific frame sizes in bytes. The values are averaged over all the trial(s). If there are more than 15 frame sizes the graph will represent a sample of the frame sizes only.

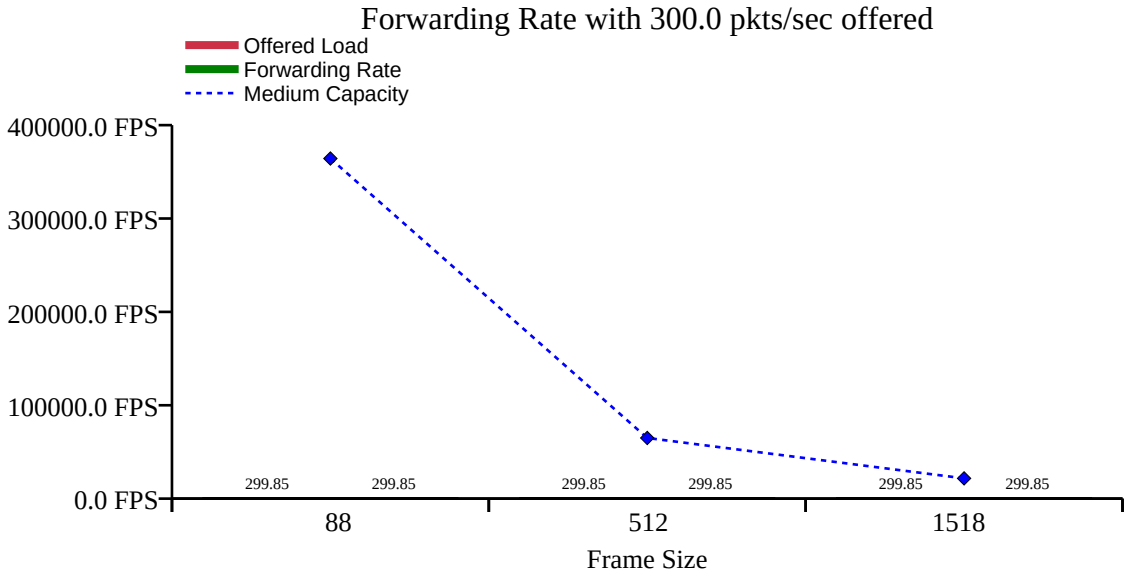
Ideally, the forwarding rate should equal the ILOAD whenever the latter is less than or equal to the theoretical maximum. NOTE: For 11n clients the theoretical maximum assumes the Best Effort AC, AIFSn of 2, and ECWMin of 4.

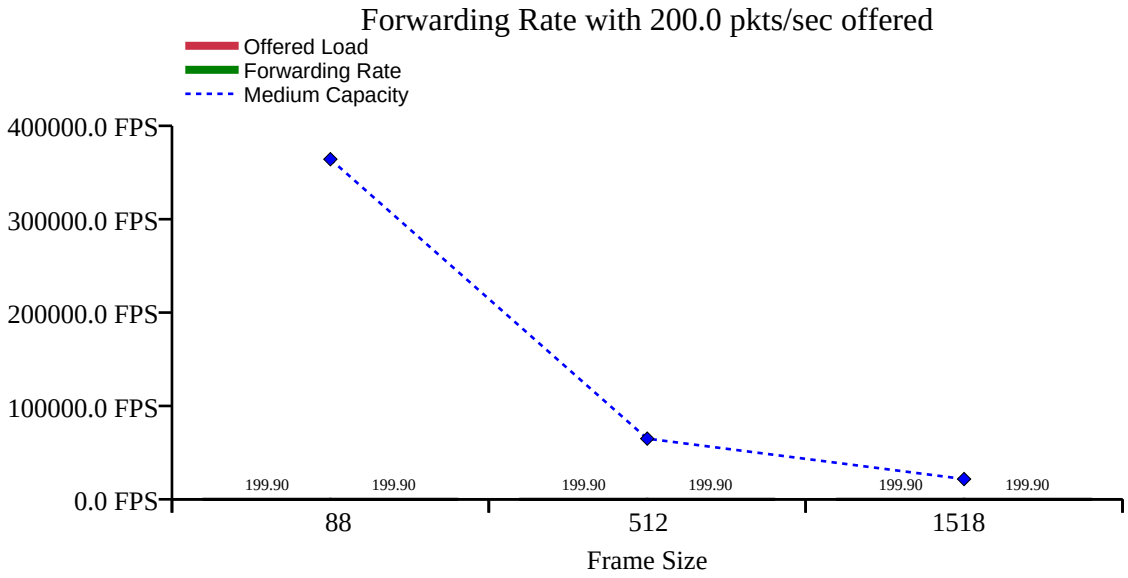

Forwarding Rate with 700.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
699.62
699.62
699.69
699.69
699.69
699.69
88
512
1518
Frame Size

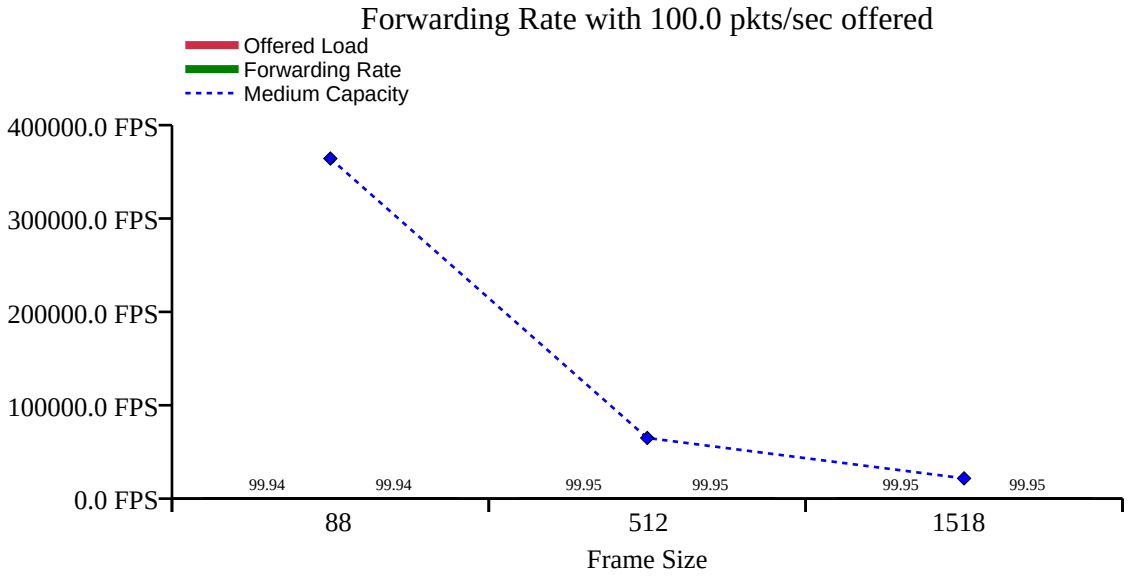

Forwarding Rate with 600.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
599.70
599.70
599.70
599.70
599.70
599.70
88
512
1518
Frame Size


Forwarding Rate with 500.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
499.75
499.75
499.75
499.75
499.75
499.75
88
512
1518
Frame Size


Forwarding Rate with 400.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
399.80
399.80
399.76
399.76
399.80
399.80
88
512
1518
Frame Size


Forwarding Rate with 300.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
299.85
299.85
299.85
299.85
299.85
299.85
88
512
1518
Frame Size


Forwarding Rate with 200.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
199.90
199.90
199.90
199.90
199.90
199.90
88
512
1518
Frame Size


Forwarding Rate with 100.0 pkts/sec offered
Offered Load
Forwarding Rate
Medium Capacity
400000.0 FPS
300000.0 FPS
200000.0 FPS
100000.0 FPS
0.0 FPS
99.94
99.94
99.95
99.95
99.95
99.95
88
512
1518
Frame Size

Test Conditions

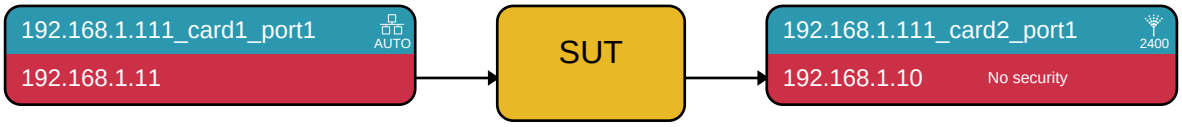
Parameter	Value	Description
Frame Sizes	[88, 512, 1518]	Frame sizes in bytes
ILOAD	[700, 600, 500, 400, 300, 200, 100]	Traffic load, frames/sec

Test Configuration

Parameter	Value	Description
Learning Time	2 sec	Transmission time (seconds) for initial learning packets, to allow the SUT to set up forwarding tables
Transmit Time	20 sec	Trial duration (seconds) - i.e., duration of test traffic
Number of Trials	1	Number of times measurements are repeated for averaging
Settle Time	2 sec	Idle time after test traffic transmission completes
Prefer IPv6 addressing	False	If this flag is enabled and clients has an IPv6 address configured, then generated traffic will use IPv6 addresses. If there is no IPv6 address configured on clients then generated traffic will use IPv4 addresses.

Test Topology

The test topology is shown below. Traffic is transmitted in the direction of the arrows. The test client port identifiers and IP addresses are indicated in the boxes, together with the security mode and channel ID for WLAN clients.



A total of 2 ports were used in this test.

Client Configuration

Client Group	Rx Data MCS	Tx Data MCS	Tx Mgmt. PHY Rate (Mbps)	PHY Rate (Mbps)	IPv6	Port	Adopt Tx Data MCS
Group_001	15	N/A	24.0	300.0	Disabled	192.168.1.111_card2_port1	N/A
Group_002	N/A	N/A	N/A	1000	Disabled	192.168.1.111_card1_port1	N/A

Client MAC Configuration

Client Group	PHY Type	A-MPDU	RX A-MSDU	TX A-MSDU (Max, Target)	LDPC	Channel Bandwidth	Guard Interval	Channel Model	Dynamic Bandwidth
Group_001	11n	On	On	On (Auto)	Off	40	short	Bypass	N/A

Client MIMO Configuration

Client Group	MIMO	MU/SU-MIMO
Group_001	2x2	N/A

Client 802.11k Configuration

Client Group	802.11k	Measurements Enabled	Periodicity	Max. Frames
Group_001	Off	None	N/A	N/A

Methodology

The test is performed by associating test clients with the SUT ports, performing any desired learning transmissions, and then generating unidirectional test traffic between the test clients. The test then calculates frame loss rate as defined in RFC 2544, and forwarding rate according to RFC 2285. Proprietary signatures and tags are inserted into the test traffic to ensure accurate measurement results.

The test is repeated for each combination of test conditions (i.e., frame size and ILOAD), and the required number of trials. The results are recorded separately for each trial, as well as being averaged into the graphs shown above.

Detailed Results

Frame Size	ILOAD	Trial	Theoretical Rate pkts/sec	Theoretical Rate kbits/sec	OLOAD	Forwarding Rate pkts/sec	Forwarding Rate kbits/sec	Frame Loss Rate
88	700.0	1	364246	256430	699.6	699.6	493	0.0
88	600.0	1	364246	256430	599.7	599.7	422	0.0
88	500.0	1	364246	256430	499.8	499.8	352	0.0
88	400.0	1	364246	256430	399.8	399.8	281	0.0
88	300.0	1	364246	256430	299.9	299.9	211	0.0
88	200.0	1	364246	256430	199.9	199.9	141	0.0
88	100.0	1	364246	256430	99.9	99.9	70	0.0
512	700.0	1	64978	266152	699.7	699.7	2866	0.0
512	600.0	1	64978	266152	599.7	599.7	2456	0.0
512	500.0	1	64978	266152	499.8	499.8	2047	0.0
512	400.0	1	64978	266152	399.8	399.8	1637	0.0
512	300.0	1	64978	266152	299.9	299.9	1228	0.0
512	200.0	1	64978	266152	199.9	199.9	819	0.0
512	100.0	1	64978	266152	100.0	100.0	409	0.0
1518	700.0	1	21699	263523	699.7	699.7	8497	0.0
1518	600.0	1	21699	263523	599.7	599.7	7283	0.0
1518	500.0	1	21699	263523	499.8	499.8	6069	0.0
1518	400.0	1	21699	263523	399.8	399.8	4855	0.0
1518	300.0	1	21699	263523	299.9	299.9	3641	0.0
1518	200.0	1	21699	263523	199.9	199.9	2428	0.0
1518	100.0	1	21699	263523	100.0	100.0	1214	0.0

Access Point Information

The following table shows the SUT details. The received signal strength indication (RSSI) from the SUT is sampled on each port at the start of each trial and averaged over all of the trials.

Port Name	Type	RxAtt*	Chan	BSSID	SSID	RSSI (dBm) A,B,C,D
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -18, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -18, N/A, N/A

Port Name	Type	RxAtt*	Chan	BSSID	SSID	RSSI (dBm) A,B,C,D
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, N/A, -15, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, N/A, -14, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A
192.168.1.111_card2_port1	80211ac	off	1	7C:DD:76:00:DC:86	A2-T	N/A, -19, N/A, N/A

The RSSI is measured at the WaveBlade SMA connector. RSSI values should be between -25 dBm and -35 dBm for port types of 80211 and 80211n ports when the RX attenuation (RxAtt*) option is 'off'. For 80211n port types with attenuation 'on' the RSSI values at the port should be between -5 dBm and -15 dBm. If the RSSI is not in this range, modify the external attenuation to bring it into this range.

Port Configuration

The following table shows the port configuration details like Bandwidth, Channel, Band, CenterFrequency.

PortName	Port Type	Channel	Band	Channel Bandwidth	Center Frequency
192.168.1.111_card2_port1	80211ac	1	2.4 GHz	40 MHz	N/A MHz

Other Information

Results Directory	C:\Users\Dell\VeriWave\WaveApps\Results\20201124-141602
WaveApps Version	7.6, 2019.04.02.18-ixia
WaveTest Version	7.6-124-ixi, 2019.04.02.17

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