

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.

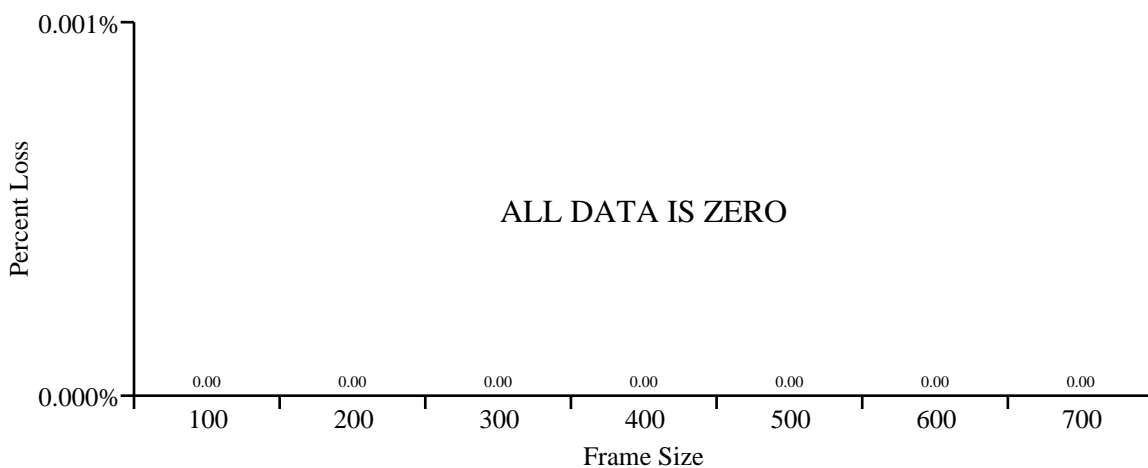
The results of this test are principally useful for characterizing the SUT behavior over a wide range of traffic, rather than for obtaining a single performance number. The test can be run using frame size and intended load sweeps to fully exercise the SUT with all combinations of traffic loads.

Frame Loss Rate

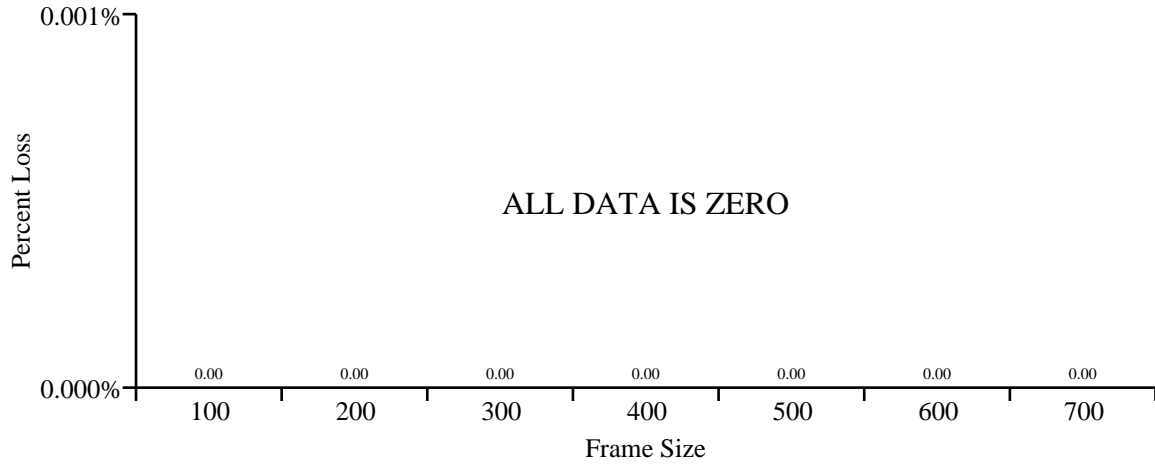
The following graph(s) show the percentage of frames that were dropped by the SUT for the specific combination(s) of intended load (ILOAD) in frames/sec and frame size in bytes. The values are averaged over all the trials. If there are more than 15 frame sizes the graph will represent a sample of the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

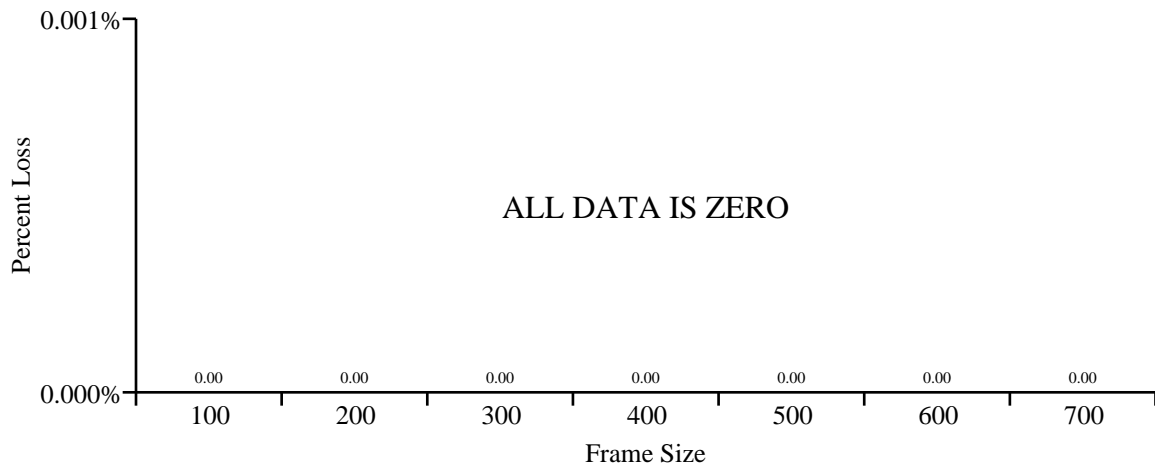
Frame Loss Rate with 700.0 pkts/sec offered



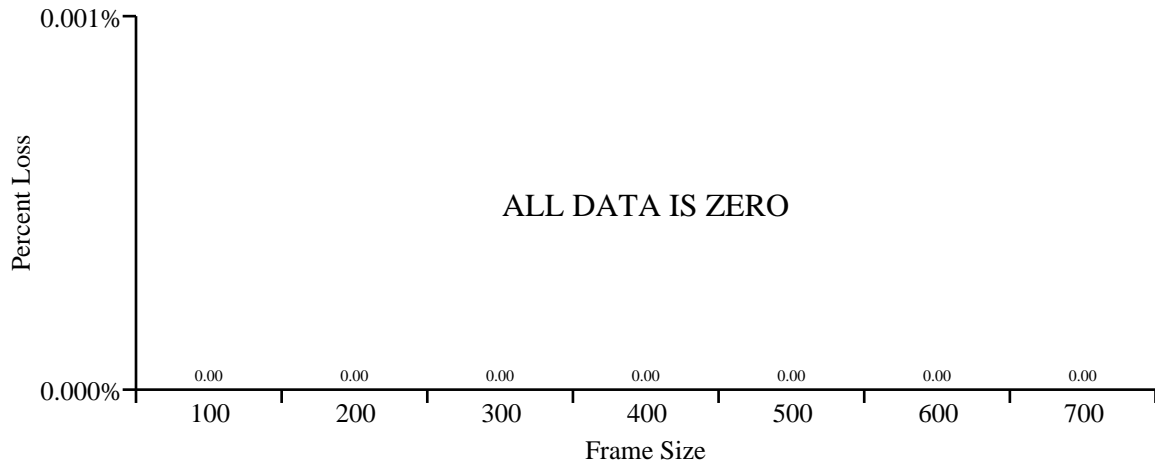
Frame Loss Rate with 600.0 pkts/sec offered



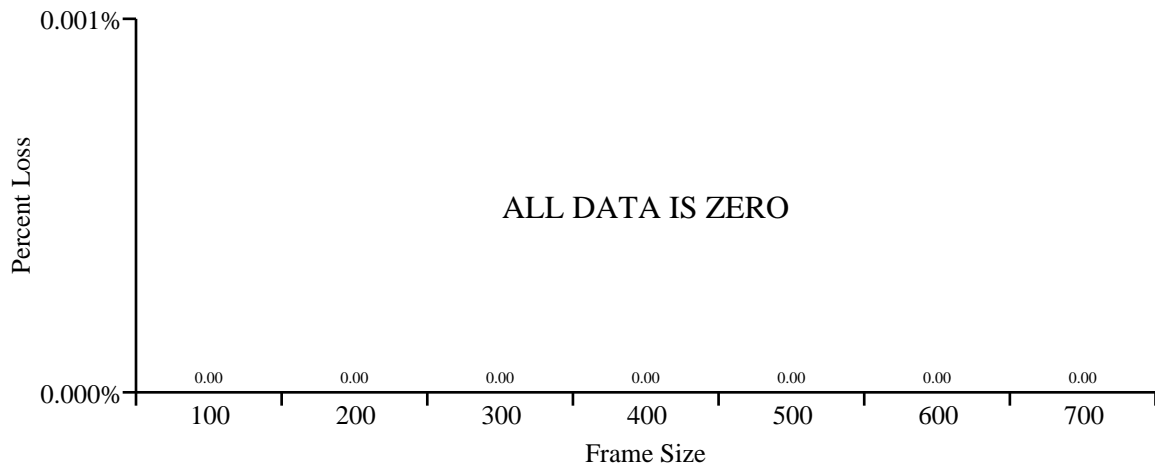
Frame Loss Rate with 500.0 pkts/sec offered



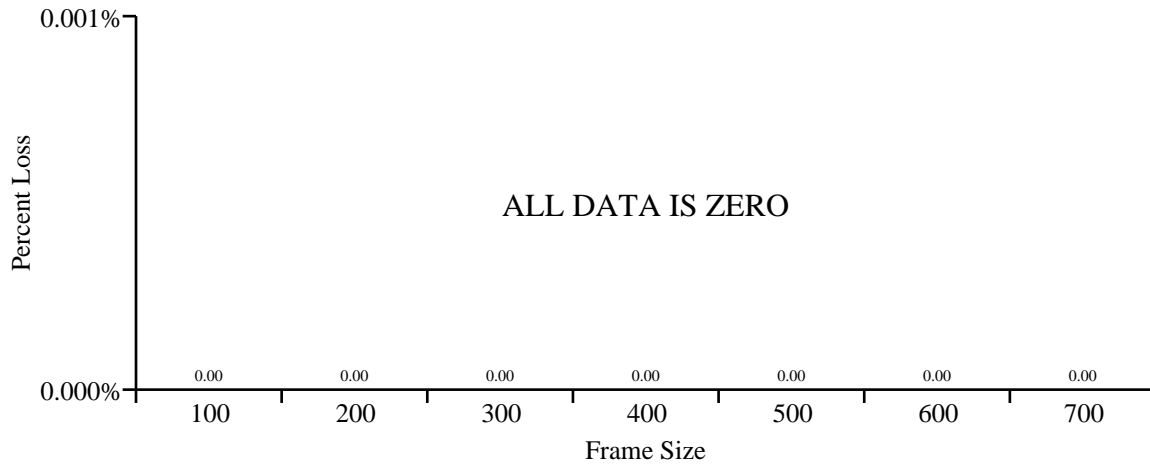
Frame Loss Rate with 400.0 pkts/sec offered



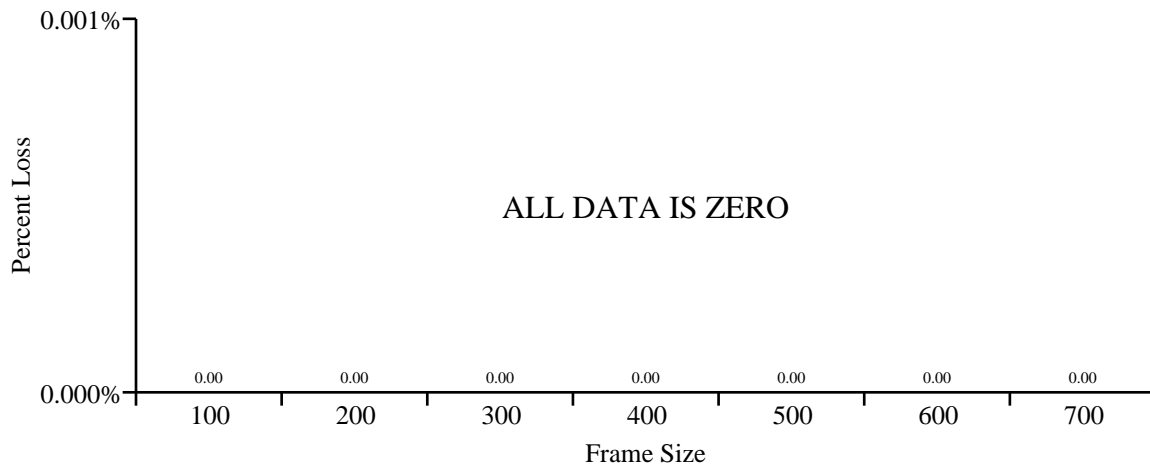
Frame Loss Rate with 300.0 pkts/sec offered



Frame Loss Rate with 200.0 pkts/sec offered



Frame Loss Rate with 100.0 pkts/sec offered

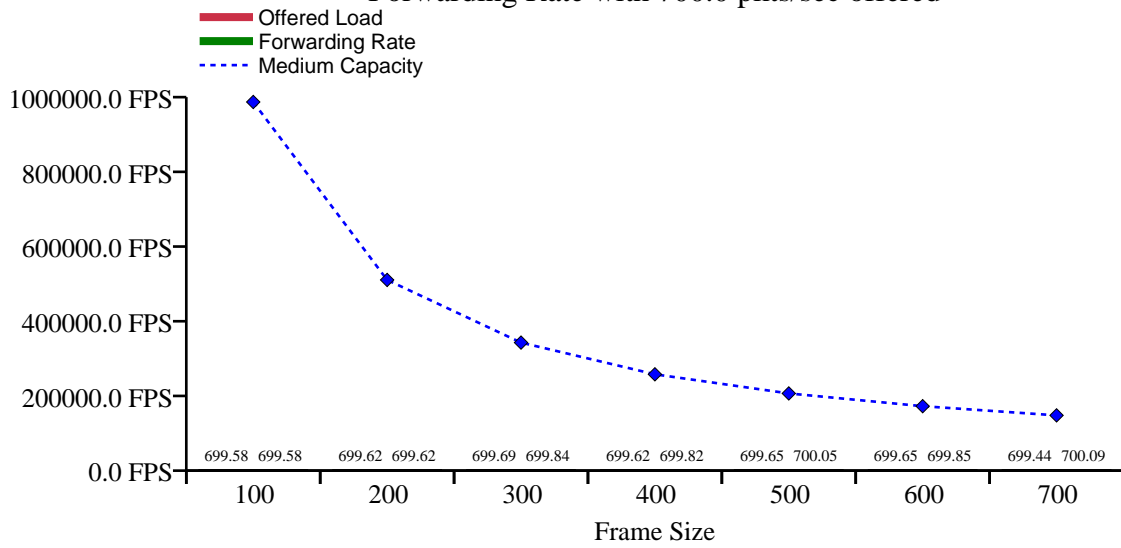


Forwarding Rate

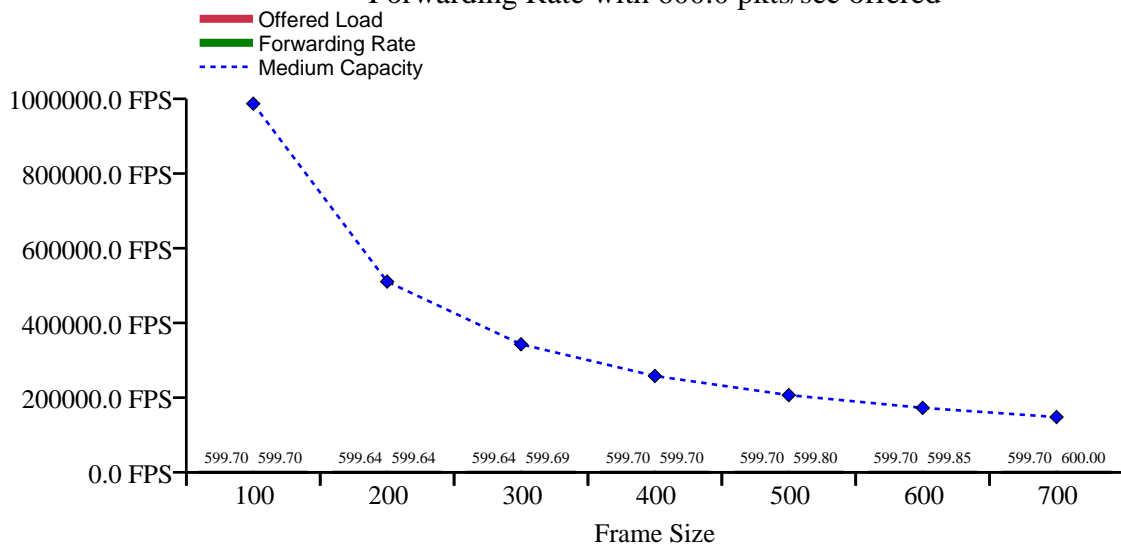
The following graph(s) compares the ILOAD presented to the SUT, versus the rate at which the SUT was able to successfully forward the traffic. The dashed line indicates the theoretical maximum ILOAD, as determined by the physical media. All traffic values are in frames/sec for specific frame sizes in 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.

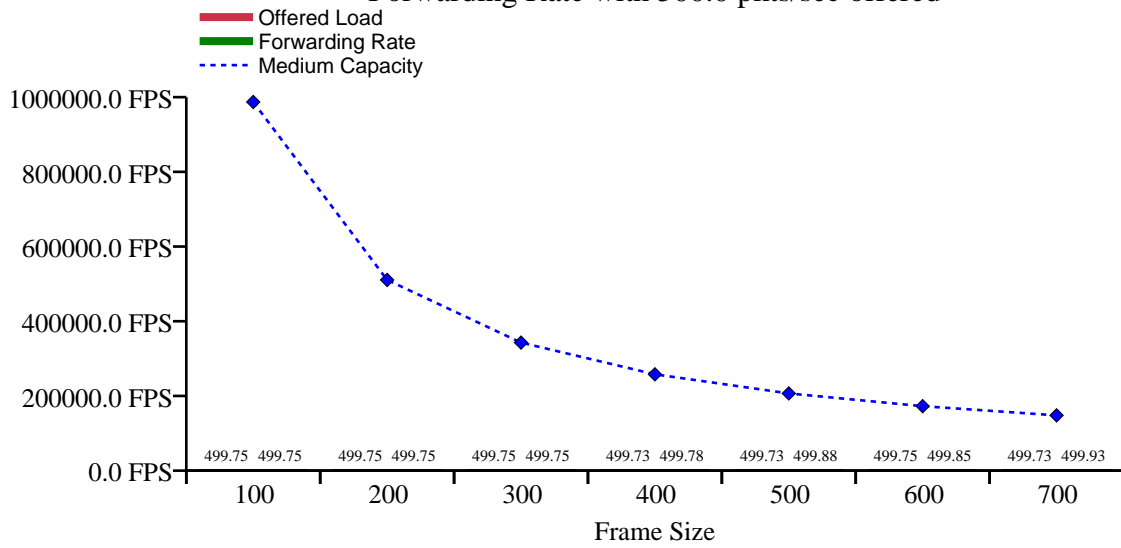
Forwarding Rate with 700.0 pkts/sec offered



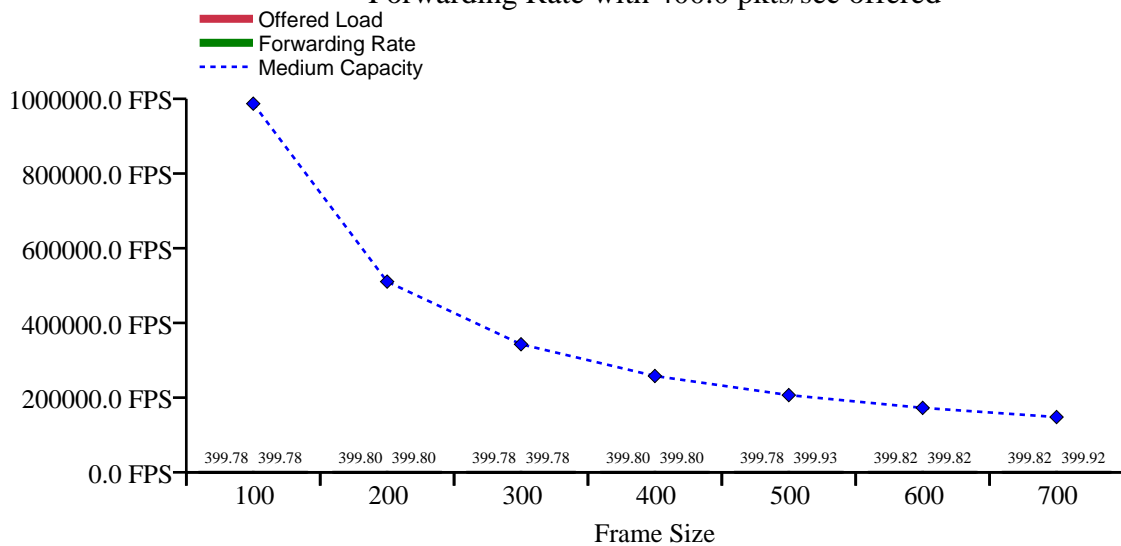
Forwarding Rate with 600.0 pkts/sec offered



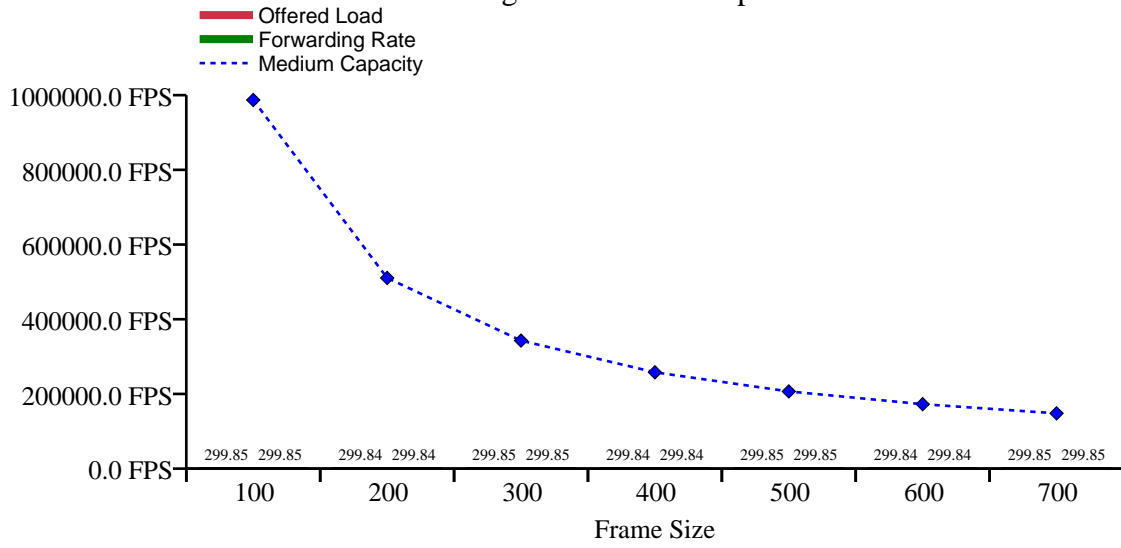
Forwarding Rate with 500.0 pkts/sec offered



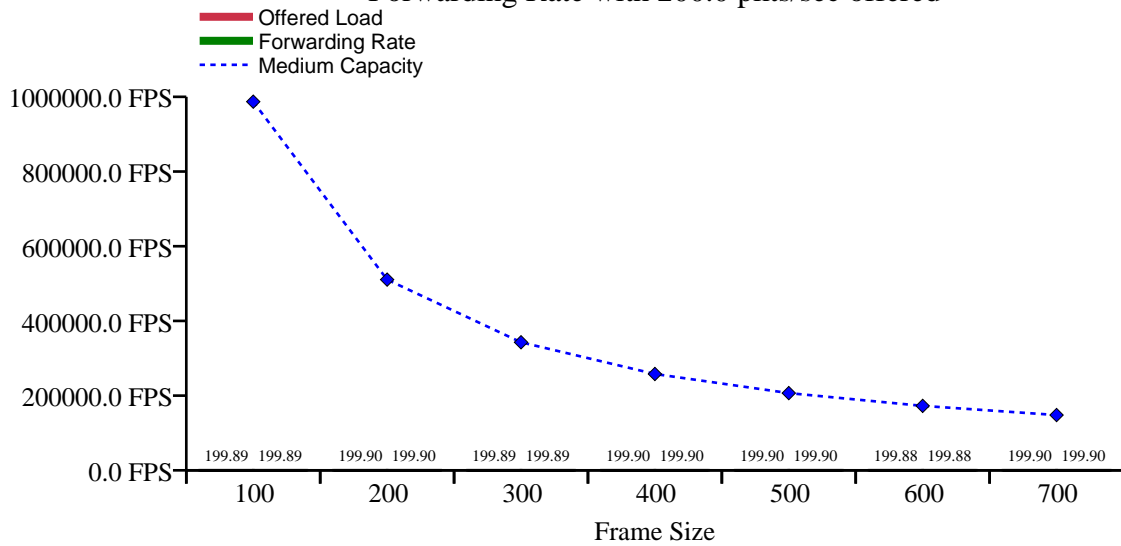
Forwarding Rate with 400.0 pkts/sec offered

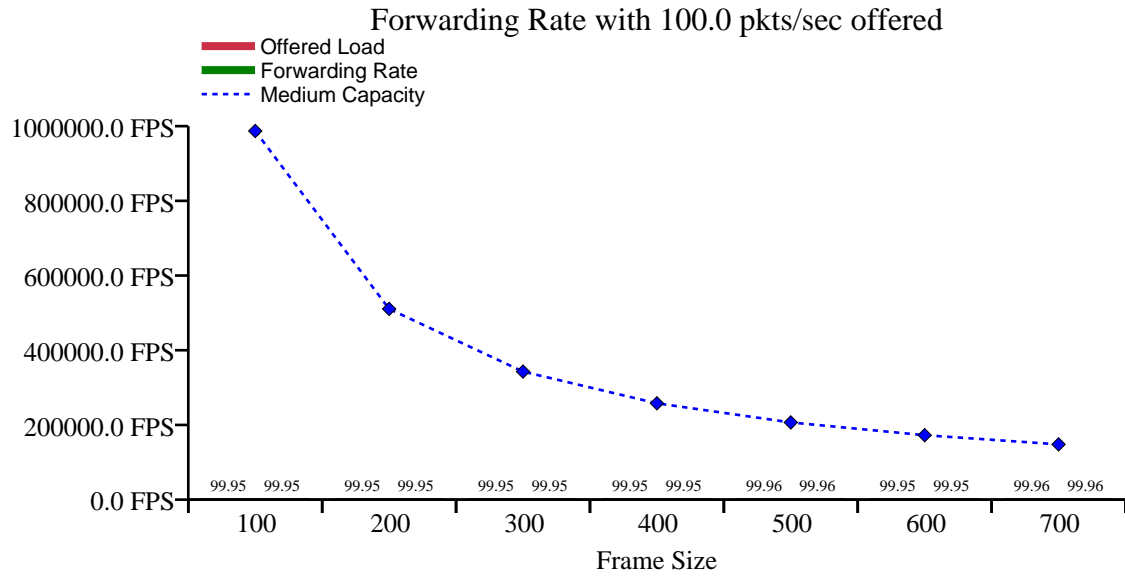


Forwarding Rate with 300.0 pkts/sec offered



Forwarding Rate with 200.0 pkts/sec offered





Test Conditions

Parameter	Value	Description
Frame Sizes	[100, 200, 300, 400, 500, 600, 700]	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	9	9	54.0	866.7	Disabled	192.168.1.111_card2_port1	Off
Group_002	N/A	N/A	N/A	1000	Disabled	192.168.1.111_card1_port1	N/A

"Rx Data MCS Index" found in WML file will be ignored if "Adopt Tx Data MCS Index" is enabled. In this case, "Rx Data MCS Index" will be set equal to "Tx Data MCS Index".

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	11ac	On	On	On (Auto)	Off	80	short	Bypass	Off

Client MIMO Configuration

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

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
100	700.0	1	987011	789609	699.6	699.6	560	0.0
100	600.0	1	987011	789609	599.7	599.7	480	0.0
100	500.0	1	987011	789609	499.8	499.8	400	0.0
100	400.0	1	987011	789609	399.8	399.8	320	0.0
100	300.0	1	987011	789609	299.9	299.9	240	0.0
100	200.0	1	987011	789609	199.9	199.9	160	0.0
100	100.0	1	987011	789609	99.9	99.9	80	0.0
200	700.0	1	510587	816940	699.6	699.6	1119	0.0
200	600.0	1	510587	816940	599.6	599.6	959	0.0
200	500.0	1	510587	816940	499.8	499.8	800	0.0
200	400.0	1	510587	816940	399.8	399.8	640	0.0
200	300.0	1	510587	816940	299.8	299.8	480	0.0
200	200.0	1	510587	816940	199.9	199.9	320	0.0
200	100.0	1	510587	816940	99.9	99.9	160	0.0
300	700.0	1	342825	822781	699.7	699.8	1680	-0.02
300	600.0	1	342825	822781	599.6	599.7	1439	-0.008
300	500.0	1	342825	822781	499.8	499.8	1199	0.0
300	400.0	1	342825	822781	399.8	399.8	959	0.0
300	300.0	1	342825	822781	299.9	299.9	720	0.0
300	200.0	1	342825	822781	199.9	199.9	480	0.0
300	100.0	1	342825	822781	99.9	99.9	240	0.0
400	700.0	1	257901	825285	699.6	699.8	2239	-0.03
400	600.0	1	257901	825285	599.7	599.7	1919	0.0
400	500.0	1	257901	825285	499.7	499.8	1599	-0.01
400	400.0	1	257901	825285	399.8	399.8	1279	0.0
400	300.0	1	257901	825285	299.8	299.8	959	0.0
400	200.0	1	257901	825285	199.9	199.9	640	0.0
400	100.0	1	257901	825285	100.0	100.0	320	0.0
500	700.0	1	206718	826873	699.7	700.0	2800	-0.06
500	600.0	1	206718	826873	599.7	599.8	2399	-0.02
500	500.0	1	206718	826873	499.7	499.9	2000	-0.03
500	400.0	1	206718	826873	399.8	399.9	1600	-0.04
500	300.0	1	206718	826873	299.9	299.9	1199	0.0
500	200.0	1	206718	826873	199.9	199.9	800	0.0

Frame Size	ILOAD	Trial	Theoretical Rate pkts/sec	Theoretical Rate kbits/sec	OLOAD	Forwarding Rate pkts/sec	Forwarding Rate kbits/sec	Frame Loss Rate
500	100.0	1	206718	826873	100.0	100.0	400	0.0
600	700.0	1	172551	828247	699.7	699.9	3359	-0.03
600	600.0	1	172551	828247	599.7	599.9	2879	-0.03
600	500.0	1	172551	828247	499.8	499.9	2399	-0.02
600	400.0	1	172551	828247	399.8	399.8	1919	0.0
600	300.0	1	172551	828247	299.8	299.8	1439	0.0
600	200.0	1	172551	828247	199.9	199.9	959	0.0
600	100.0	1	172551	828247	99.9	99.9	480	0.0
700	700.0	1	147982	828700	699.4	700.1	3921	-0.09
700	600.0	1	147982	828700	599.7	600.0	3360	-0.05
700	500.0	1	147982	828700	499.7	499.9	2800	-0.04
700	400.0	1	147982	828700	399.8	399.9	2240	-0.03
700	300.0	1	147982	828700	299.9	299.9	1679	0.0
700	200.0	1	147982	828700	199.9	199.9	1119	0.0
700	100.0	1	147982	828700	100.0	100.0	560	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	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -14, N/A
192.168.1.111_card2_port1	80211ac	off	149	02:DD:76:00:DC:87	A2-T-5G	-24, -11, -13, 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	149	5 GHz	80 MHz	5775 MHz

Other Information

Results Directory C:\Users\Dell\VeriWave\WaveApps\Results\20201124-120853
WaveApps Version 7.6, 2019.04.02.18-ixia
WaveTest Version 7.6-124-ixi, 2019.04.02.17

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