

Unicast Packet Loss Report - UDP

Device Tested

WLAN Switch Model:
WLAN Switch Version:
AP Model: FS-AP733C
AP SW Version: V200R008C60B307SP05



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.

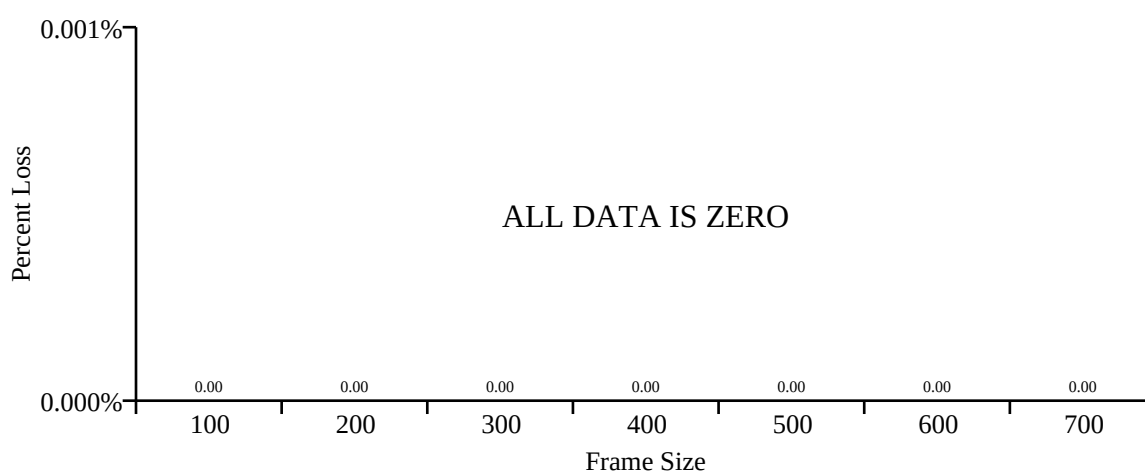
The results of this test are principally useful for characterizing the SUT behavior over a wide range of traffic, rather than for obtaining a single performance number. The test can be run using frame size and intended load sweeps to fully exercise the SUT with all combinations of traffic loads.

Frame Loss Rate

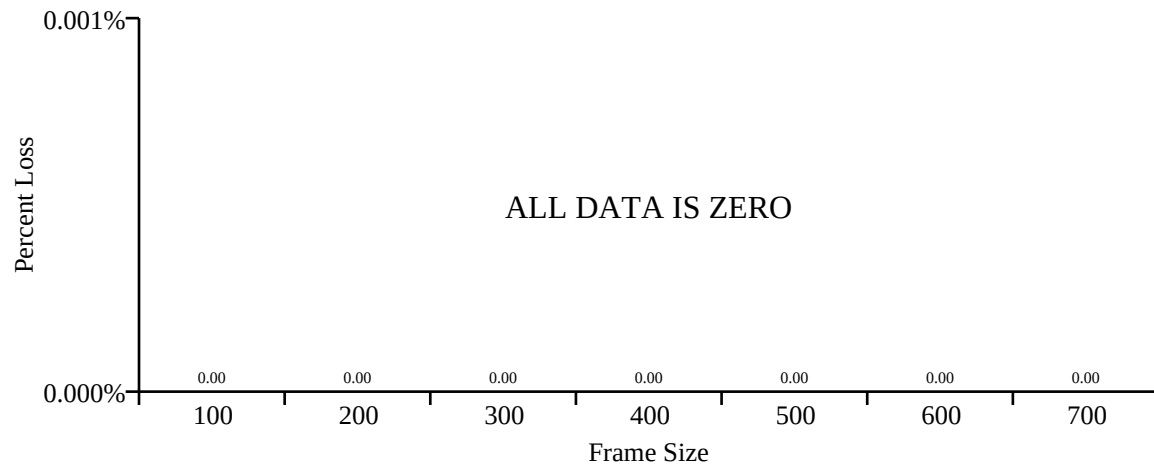
The following graph(s) show the percentage of frames that were dropped by the SUT for the specific combination(s) of intended load (ILOAD) in frames/sec and frame size in bytes. The values are averaged over all the trials. If there are more than 15 frame sizes the graph will represent a sample of the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

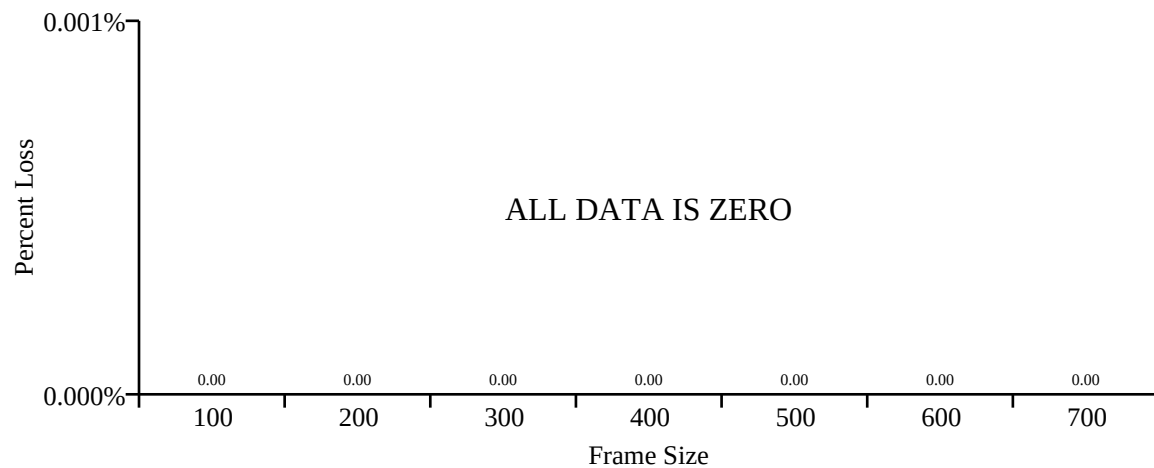
Frame Loss Rate with 700.0 pkts/sec offered



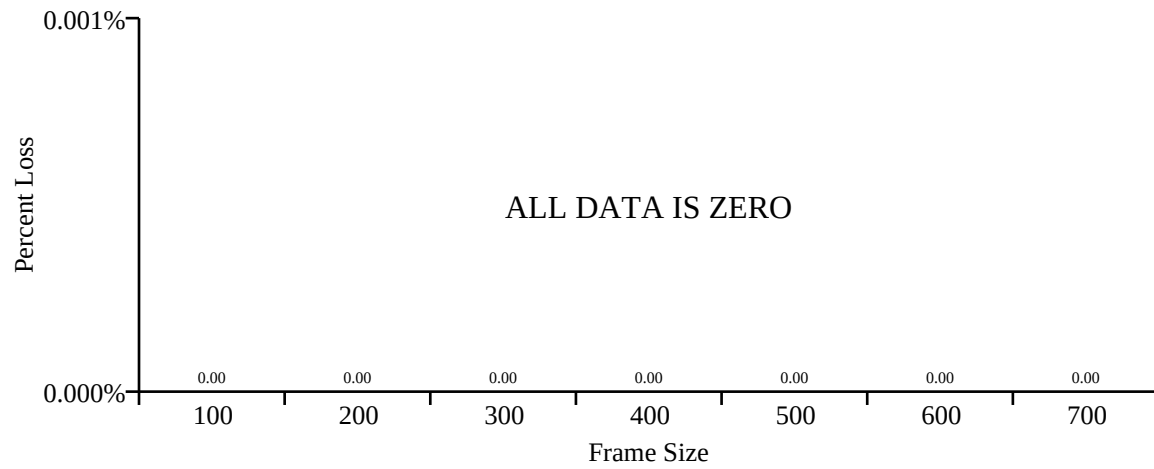
Frame Loss Rate with 600.0 pkts/sec offered



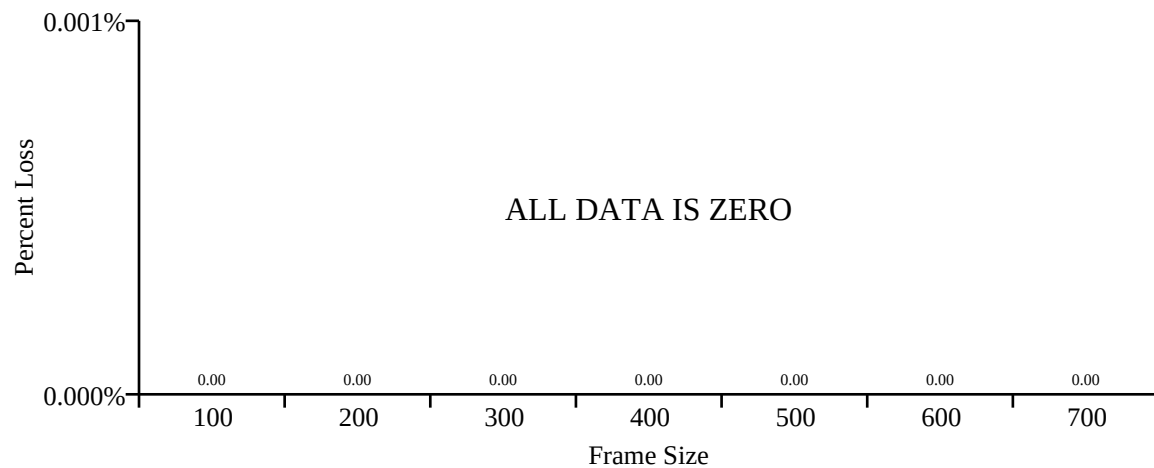
Frame Loss Rate with 500.0 pkts/sec offered



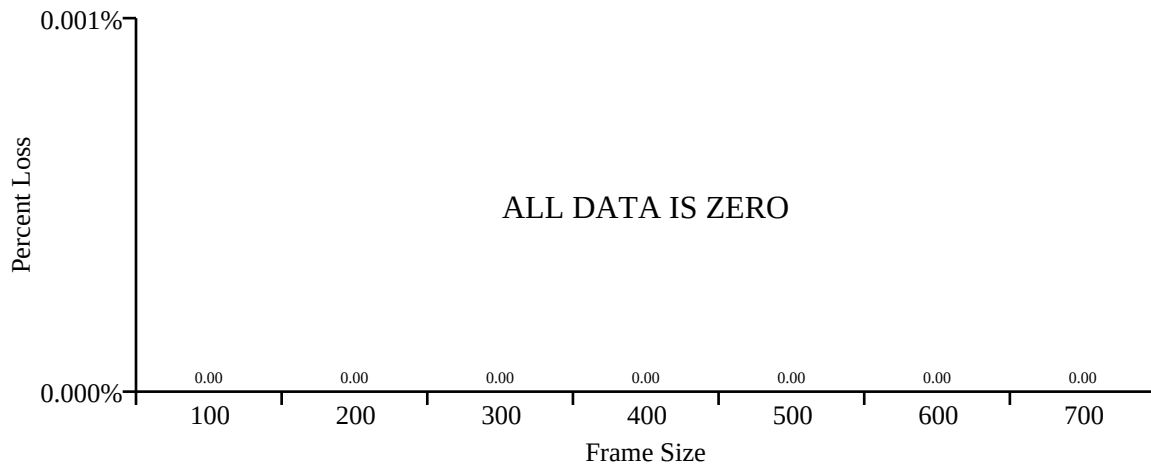
Frame Loss Rate with 400.0 pkts/sec offered



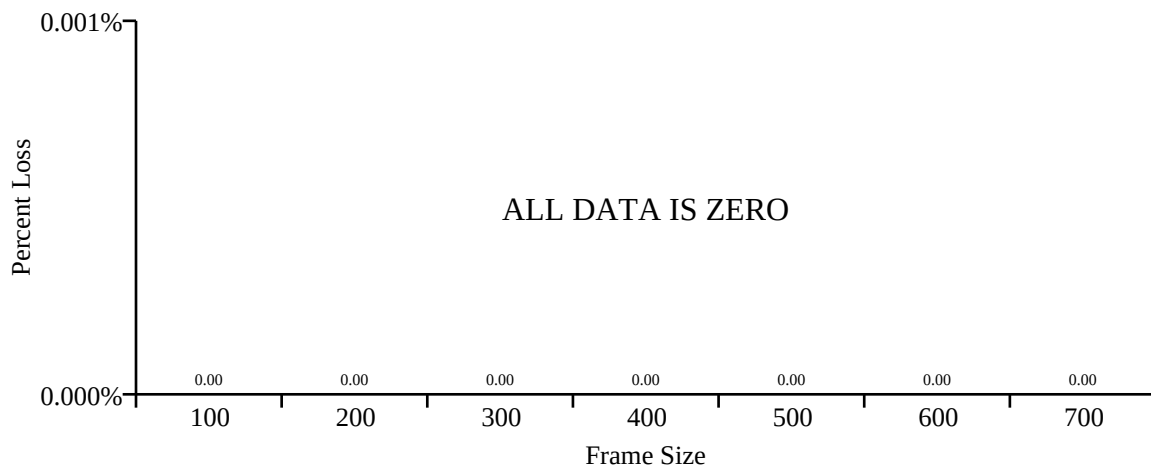
Frame Loss Rate with 300.0 pkts/sec offered



Frame Loss Rate with 200.0 pkts/sec offered



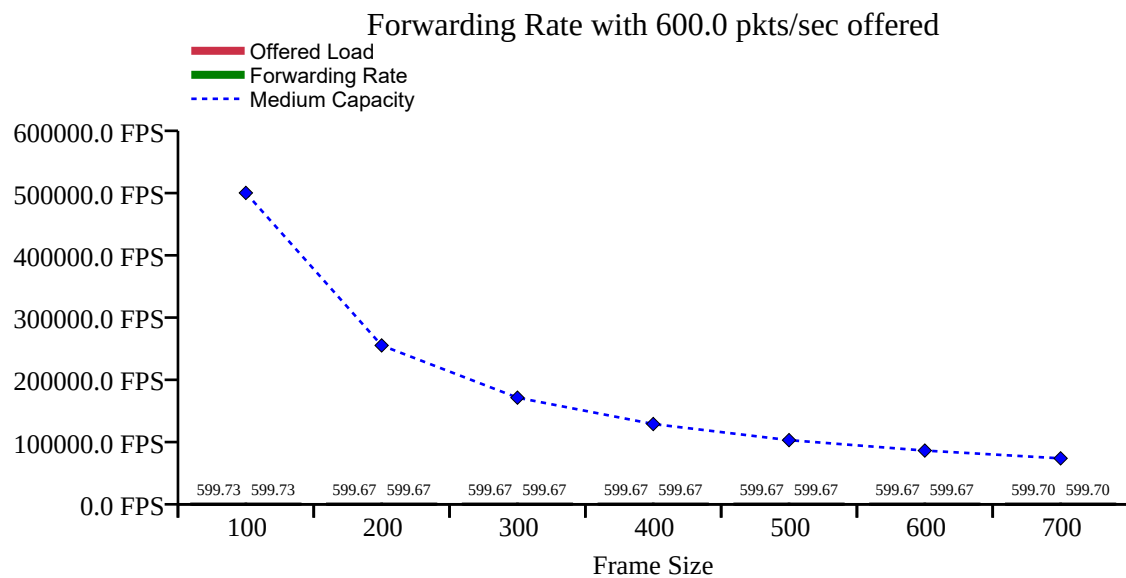
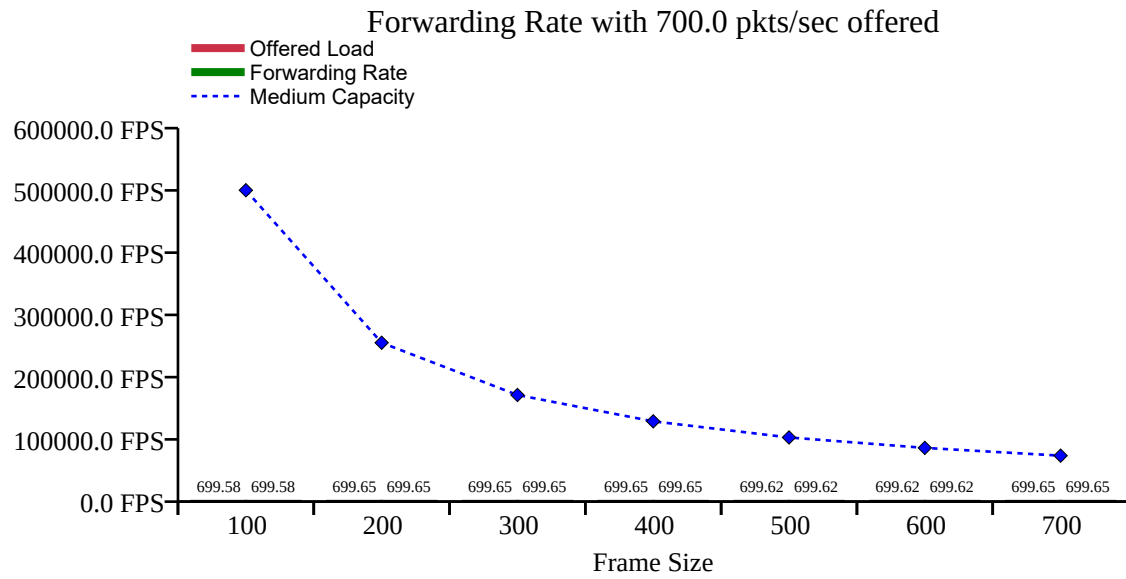
Frame Loss Rate with 100.0 pkts/sec offered

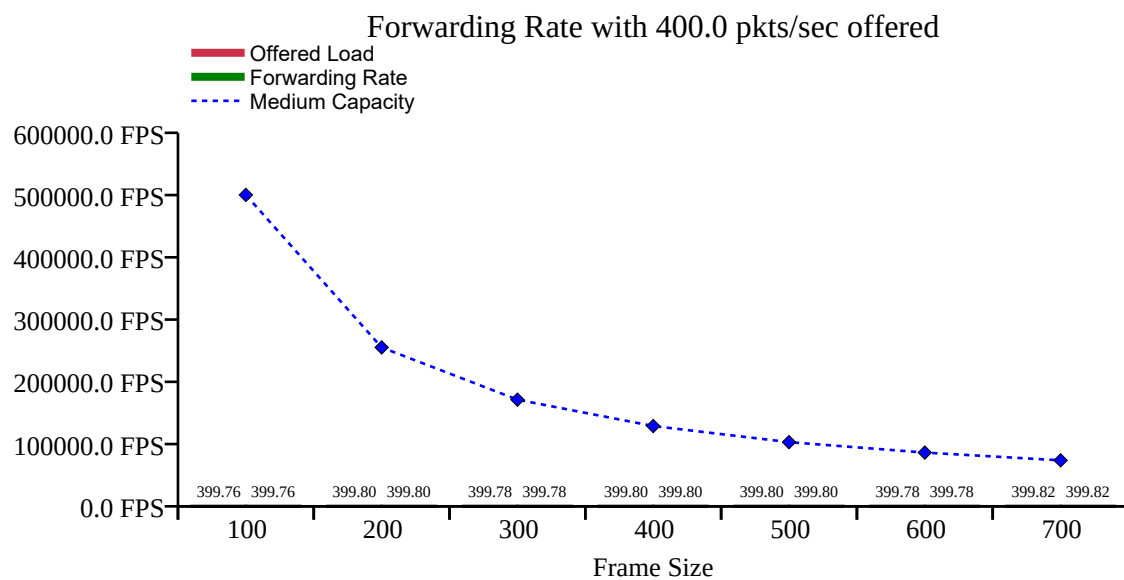
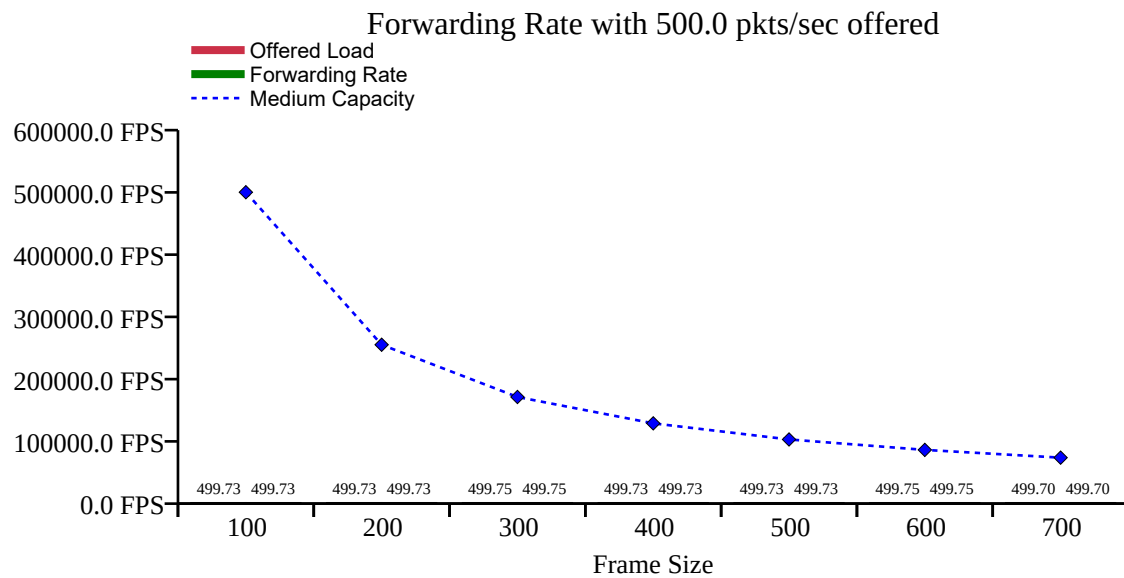


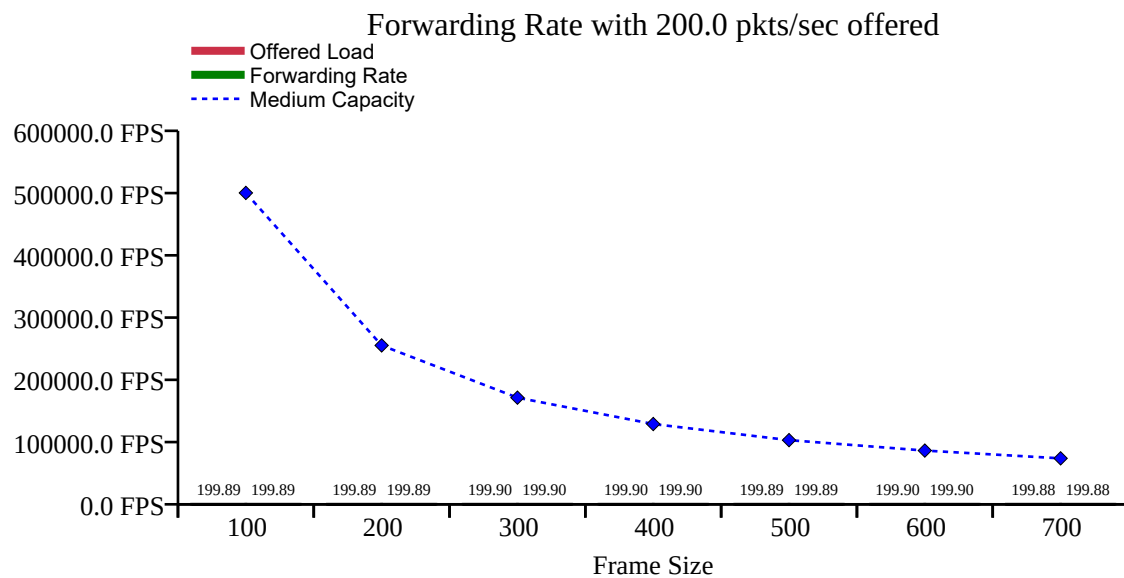
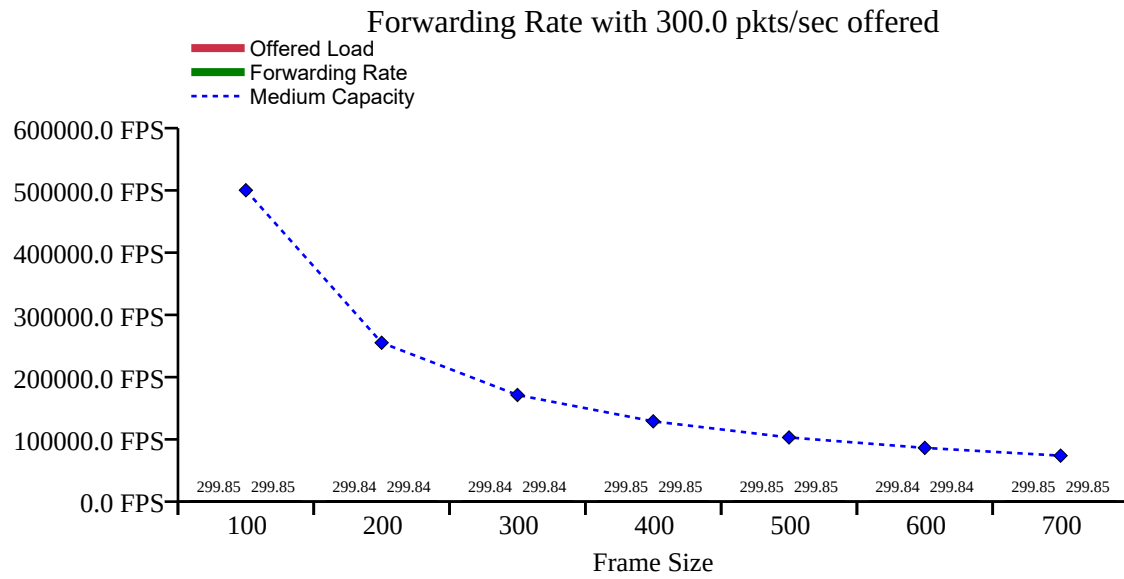
Forwarding Rate

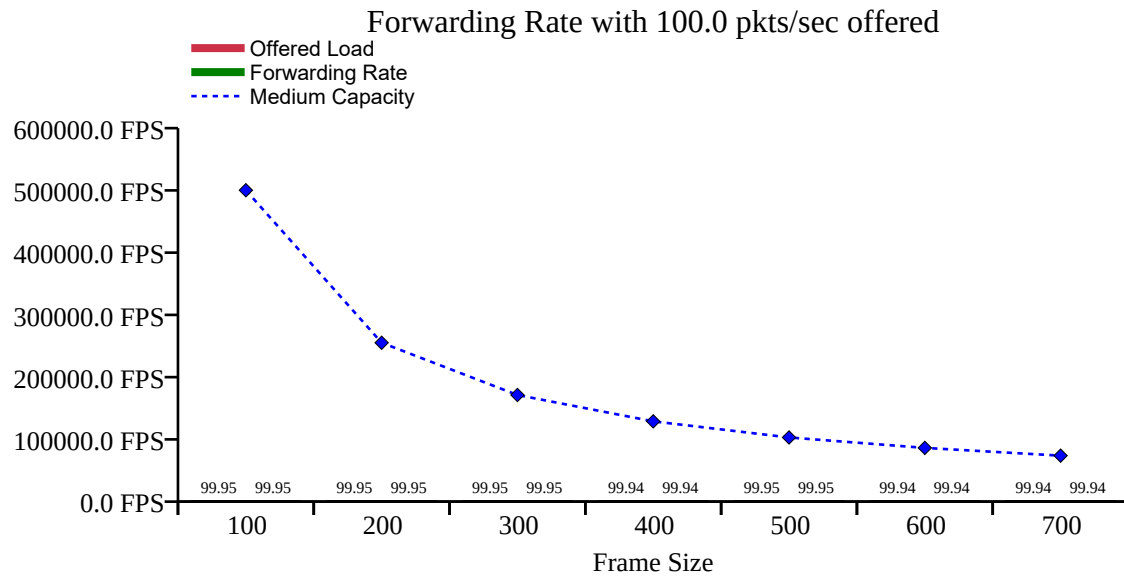
The following graph(s) compares the ILOAD presented to the SUT, versus the rate at which the SUT was able to successfully forward the traffic. The dashed line indicates the theoretical maximum ILOAD, as determined by the physical media. All traffic values are in frames/sec for specific frame sizes in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









Test Conditions

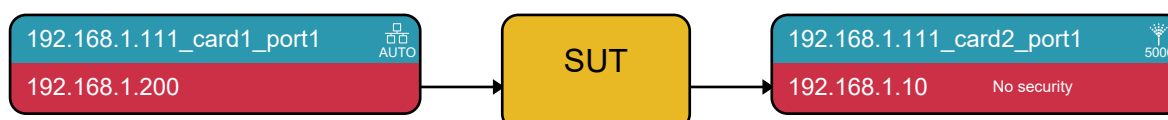
Parameter	Value	Description
Frame Sizes	[100, 200, 300, 400, 500, 600, 700]	Frame sizes in bytes
ILOAD	[700, 600, 500, 400, 300, 200, 100]	Traffic load, frames/sec

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	8	54.0	433.3	Disabled	192.168.1.111_card2_port1	Off
Group_002	N/A	N/A	N/A	100	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	1x1	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	500257	400206	699.6	699.6	560	0.0
100	600.0	1	500257	400206	599.7	599.7	480	0.0
100	500.0	1	500257	400206	499.7	499.7	400	0.0
100	400.0	1	500257	400206	399.8	399.8	320	0.0
100	300.0	1	500257	400206	299.9	299.9	240	0.0
100	200.0	1	500257	400206	199.9	199.9	160	0.0
100	100.0	1	500257	400206	100.0	100.0	80	0.0
200	700.0	1	255251	408403	699.7	699.7	1119	0.0
200	600.0	1	255251	408403	599.7	599.7	959	0.0
200	500.0	1	255251	408403	499.7	499.7	800	0.0
200	400.0	1	255251	408403	399.8	399.8	640	0.0
200	300.0	1	255251	408403	299.8	299.8	480	0.0
200	200.0	1	255251	408403	199.9	199.9	320	0.0
200	100.0	1	255251	408403	99.9	99.9	160	0.0
300	700.0	1	171335	411206	699.7	699.7	1679	0.0
300	600.0	1	171335	411206	599.7	599.7	1439	0.0
300	500.0	1	171335	411206	499.8	499.8	1199	0.0
300	400.0	1	171335	411206	399.8	399.8	959	0.0
300	300.0	1	171335	411206	299.8	299.8	720	0.0
300	200.0	1	171335	411206	199.9	199.9	480	0.0
300	100.0	1	171335	411206	99.9	99.9	240	0.0
400	700.0	1	128972	412713	699.7	699.7	2239	0.0
400	600.0	1	128972	412713	599.7	599.7	1919	0.0
400	500.0	1	128972	412713	499.7	499.7	1599	0.0
400	400.0	1	128972	412713	399.8	399.8	1279	0.0
400	300.0	1	128972	412713	299.9	299.9	960	0.0
400	200.0	1	128972	412713	199.9	199.9	640	0.0
400	100.0	1	128972	412713	99.9	99.9	320	0.0
500	700.0	1	103101	412408	699.6	699.6	2798	0.0
500	600.0	1	103101	412408	599.7	599.7	2399	0.0
500	500.0	1	103101	412408	499.7	499.7	1999	0.0
500	400.0	1	103101	412408	399.8	399.8	1599	0.0
500	300.0	1	103101	412408	299.9	299.9	1199	0.0
500	200.0	1	103101	412408	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	103101	412408	99.9	99.9	400	0.0
600	700.0	1	86337	414418	699.6	699.6	3358	0.0
600	600.0	1	86337	414418	599.7	599.7	2878	0.0
600	500.0	1	86337	414418	499.8	499.8	2399	0.0
600	400.0	1	86337	414418	399.8	399.8	1919	0.0
600	300.0	1	86337	414418	299.8	299.8	1439	0.0
600	200.0	1	86337	414418	199.9	199.9	960	0.0
600	100.0	1	86337	414418	99.9	99.9	480	0.0
700	700.0	1	73854	413585	699.7	699.7	3918	0.0
700	600.0	1	73854	413585	599.7	599.7	3358	0.0
700	500.0	1	73854	413585	499.7	499.7	2798	0.0
700	400.0	1	73854	413585	399.8	399.8	2239	0.0
700	300.0	1	73854	413585	299.9	299.9	1679	0.0
700	200.0	1	73854	413585	199.9	199.9	1119	0.0
700	100.0	1	73854	413585	99.9	99.9	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	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A
192.168.1.111_card2_port1	80211ac	off	149	7C:DD:76:00:DC:84	A1-T	-45, -40, -31, N/A

[illegible]



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\20201123-144103
WaveApps Version 7.6, 2019.04.02.18-ixia
WaveTest Version 7.6-124-ixi, 2019.04.02.17

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