

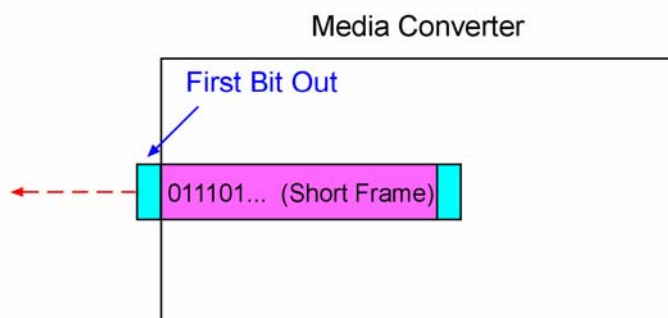
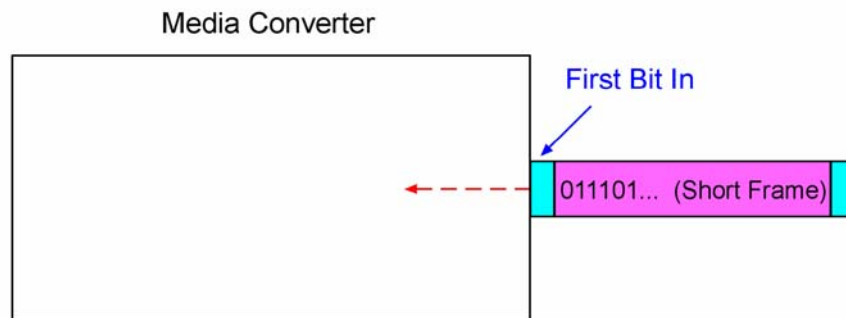
Application Note
Latency Test for KGC-300
2010/07/02

Device: KGC-300 Gigabit Ethernet Media Converter
Standard: Definition specified in **RFC2544** and **RFC1242**.

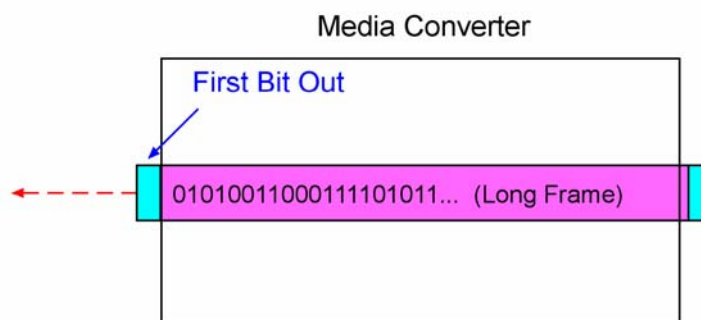
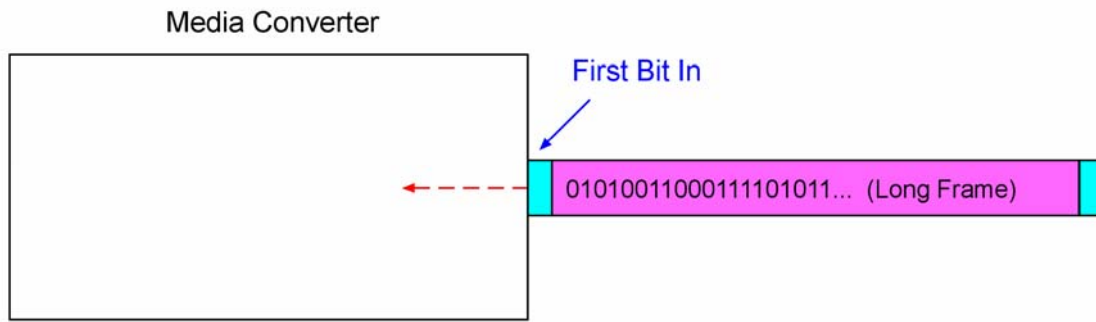
1. Cut-Through (Bit-Forwarding) Latency

1.1 Definition: The time interval starting when the end of the first bit of the input frame reaches the input port and ending when the start of the first bit of the output frame is seen on the output port. **(First Bit In, First Bit Out)**

1.2 Latency of the **Short Frame** forwarding



1.3 Latency of the **Long Frame** forwarding



1.4 KGC-300 Cut-Through Latency Tested with IXIA tool.

The result shows a constant cut-through latency in forwarding any size of frames.

Copper port to fiber port: 1120ns

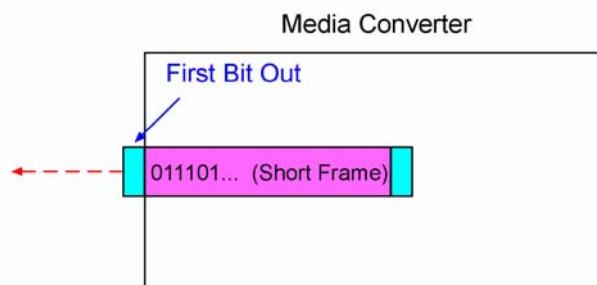
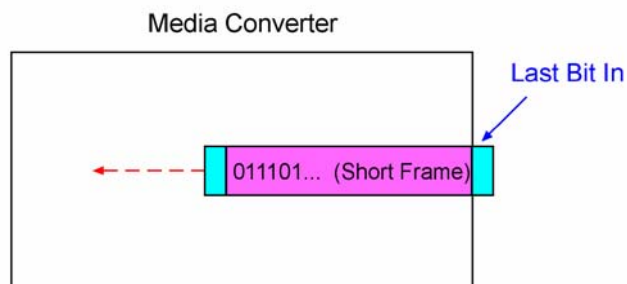
Fiber port to copper port: 1040ns

rhc2544 - Latency - Per Port Statistics									
Trial	Frame Size	Tx Port	Rx Port	Tx Count (frames)	Rx Count (frames)	Tx Frame Rate (fps)	Frame Loss (%)	Latency (ns)	
1	64	1.5.1	1.5.2	89285700	89285700	1488095	0.00	1120	
1	64	1.5.2	1.5.1	89285700	89285700	1488095	0.00	1040	
1	128	1.5.1	1.5.2	50675700	50675700	844595	0.00	1100	
1	128	1.5.2	1.5.1	50675700	50675700	844595	0.00	1020	
1	256	1.5.1	1.5.2	27173940	27173940	452899	0.00	1120	
1	256	1.5.2	1.5.1	27173940	27173940	452899	0.00	1040	
1	512	1.5.1	1.5.2	14097720	14097720	234962	0.00	1120	
1	512	1.5.2	1.5.1	14097720	14097720	234962	0.00	1040	
1	1024	1.5.1	1.5.2	7183920	7183920	119732	0.00	1120	
1	1024	1.5.2	1.5.1	7183920	7183920	119732	0.00	1060	
1	1280	1.5.1	1.5.2	5769240	5769240	96154	0.00	1140	
1	1280	1.5.2	1.5.1	5769240	5769240	96154	0.00	1040	
1	1518	1.5.1	1.5.2	4876440	4876440	81274	0.00	1140	
1	1518	1.5.2	1.5.1	4876440	4876440	81274	0.00	1040	

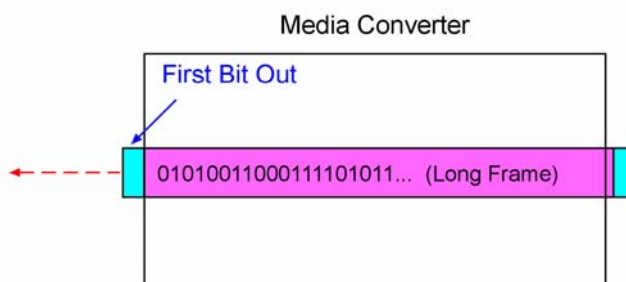
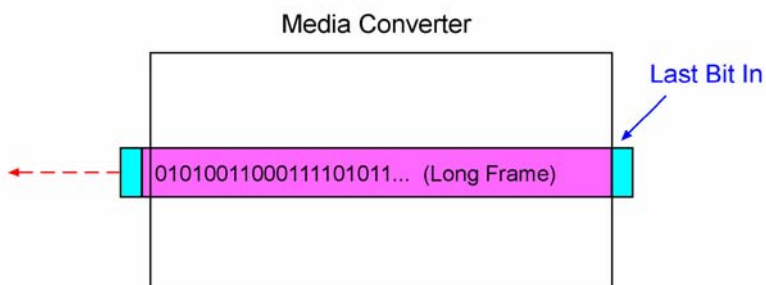
2. Store-and-Forward Latency

2.1 Definition: The time interval starting when the last bit of the input frame reaches the input port and ending when the first bit of the output frame is seen on the output port. **(Last Bit In First Bit Out)**

2.2 Latency of the **Short Frame** forwarding



2.3 Latency of the **Long Frame** forwarding



2.4 KGC-300 Store-and-forward Latency Tested with IXIA tool.

The result shows that there is some store-and-forward latency with shorter frames and no store-and-forward latency with long frames.

rfc2544 - Latency - Per Port Statistics								
Trial	Frame Size	Tx Port	Rx Port	Tx Count (frames)	Rx Count (frames)	Tx Frame Rate (fps)	Frame Loss (%)	Latency (ns)
1	64	1.5.1	1.5.2	89285700	89285700	1488095	0.00	608
1	64	1.5.2	1.5.1	89285700	89285700	1488095	0.00	508
1	128	1.5.1	1.5.2	50675700	50675700	844595	0.00	76
1	128	1.5.2	1.5.1	50675700	50675700	844595	0.00	16
1	256	1.5.1	1.5.2	27173940	27173940	452899	0.00	0
1	256	1.5.2	1.5.1	27173940	27173940	452899	0.00	0
1	512	1.5.1	1.5.2	14097720	14097720	234962	0.00	0
1	512	1.5.2	1.5.1	14097720	14097720	234962	0.00	0
1	1024	1.5.1	1.5.2	7183920	7183920	119732	0.00	0
1	1024	1.5.2	1.5.1	7183920	7183920	119732	0.00	0
1	1280	1.5.1	1.5.2	5769240	5769240	96154	0.00	0
1	1280	1.5.2	1.5.1	5769240	5769240	96154	0.00	0
1	1518	1.5.1	1.5.2	4876440	4876440	81274	0.00	0
1	1518	1.5.2	1.5.1	4876440	4876440	81274	0.00	0

* Since KGC-300 is a converter designed with bit-forwarding technology instead of store-and-forward. The first bit has gone away from the output port even the last bit has not reached the input port for those frames come with size more than 256 bytes. This is why zero data is measured in the report for frame sizes larger than 256 bytes.

3. Summary

KGC-300 is an excellent Gigabit Ethernet media converter which has the shortest cut-through latency and the best store-and-forward latency comparing to the media converters available in the market.