

Voice Bandwidth Calculations

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G7.11	10ms Sampling	20ms Sampling	30ms Sampling	
Packet byte size	80	160	240	
G.729	10ms Sampling	20ms Sampling	30ms Sampling	
Packet Byte Size	10	20	30	

Bytes_Per_Sample=(Sample_Size*Codec_Bandwidth)/8

BPS=(.020*64000)/8 = 160bytes per sample of audio G.711

BPS=(.020*8000)/8 = 20 bytes per sample of audio G.729

G.711 – 20ms Sampling	G.729 – 20ms Sampling
160 bytes <u>x 8</u> (8 bits in a byte) 1280 bits <u>x 50</u> (samples/sec) 64000 bps (64K)	20 bytes <u>x 8</u> (8 bits in a byte) 160 bits <u>x 50</u> (samples/sec) 8000 bps (8K)

20ms Sampling	30ms Sampling
<ul style="list-style-type: none"> voice is sampled every 20ms 1ms is 1/1000 20/1000 = 1/50 50 pps – packets per second 	<ul style="list-style-type: none"> voice is sampled every 30ms 1ms is 1/1000 30/1000 = 1/33 33 pps – packets per second

20ms Sampling L3+ Over Head	30ms Sampling L3+ Over Head
+ 20 (IP Header) + 8 (UDP Header) + 12 (RTP Header) 40 bytes L3+ Over Head <u>x 8</u> (8 bits in a byte) 320 bits <u>x 50</u> pps (packets per second) 16,000 bps (16K) L3+ Over Head	+ 20 (IP Header) + 8 (UDP Header) + 12 (RTP Header) 40 bytes L3+ Over Head <u>x 8</u> (8 bits in a byte) 320 bits <u>x 33</u> pps (packets per second) 10,560 bps (11K) L3+ Over Head

- 30ms sampling = lower BW but bigger PDU – chance of more Jitter and gaps

20ms Sampling PPP L2 Over Head	30ms Sampling PPP L2 Over Head
6 byte (ppp header) <u>x 8</u> (8 bits in a byte) 48 bits <u>x 50</u> pps (packets per second) 2400 bps (2.4 kbps L2 PPP Over Head)	6 byte (ppp header) <u>x 8</u> (8 bits in a byte) 48 bits <u>x 33</u> pps (packets per second) 1584 bps (1.5 kbps L2 PPP Over Head)

G.711 PPP Call 20ms Sampling Bandwidth	G.711 PPP Call 30ms Sampling Bandwidth
64 kbps + 16 kbps L3+ Overhead 80 kbps w/o L2 + 2.4 kbps L2 PPP OH 82.4 kbps	64 kbps + 11 kbps L3+ Overhead 72 kbps w/o L2 + 1.5 kbps L2 PPP OH 73.5 kbps

G.729 PPP Call 20ms Sampling Bandwidth	G.729 PPP Call 30ms Sampling Bandwidth
8 kbps + 16 kbps L3+ Overhead 24 kbps w/o L2 + 2.4 kbps L2 PPP OH 26.4 kbps	8 kbps + 11 kbps L3+ Overhead 19 kbps w/o L2 + 1.5 kbps L2 PPP OH 20.5 kbps