

Compression Ratio Rules of Thumb

- **Compression ratios to maintain excellent quality:**
 - 10:1 for general images using JPEG
 - 30:1 for general video using H.263 and MPEG-2
 - 50:1 for general video using H.264 / MPEG-4 AVC
- **Emerging standards offer further improvements (e.g., JPEG2000 at 40:1 generally looks much better than JPEG at 40:1, and H.264 / MPEG-4 AVC produces excellent quality at 60:1 for some types of video content)**
- **Application-specific conditions can enable much higher compression ratios (e.g., 1000's:1 when nothing is moving)**
- **Event-based methods that selectively identify certain important images to keep while discarding others**

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Network Bit Rate vs. Compression Ratio

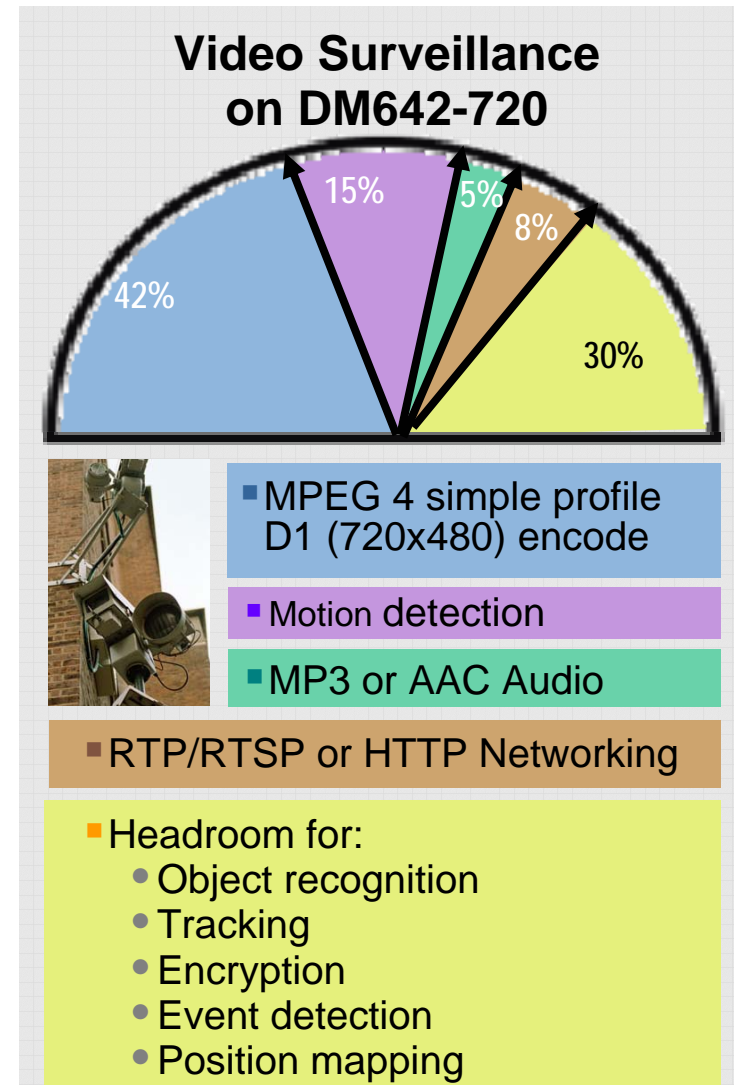
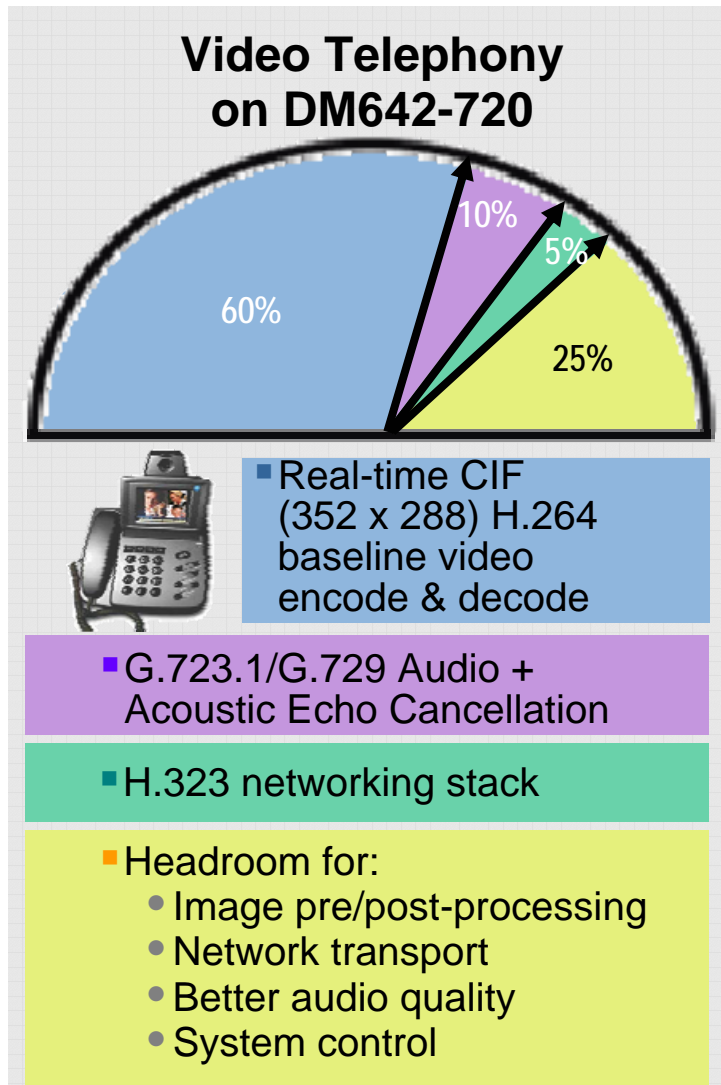
<i>Frame Rates</i>		<i>Image Compression</i>		<i>Video Compression</i>		<i>Adv. Video Compression</i>	
<i>Network</i>	<i>Kbps</i>	Compressed 10:1		Compressed 30:1		Compressed 60:1	
		<i>Frames/Second</i>	<i>Frames/Second</i>	<i>Frames/Second</i>	<i>Frames/Second</i>	<i>Frames/Second</i>	<i>Frames/Second</i>
GSM Digital Cellular	14	1	7	1	2	1	1
56K Modem (PSTN)	56	1	2	2	1	4	1
DSL or Cable Up-Link	128	1	1	4	1	8	1
Cellphone TV	300	3	1	9	1	18	1
DSL Down-Link	768	8	1	23	1	45	1
Wireless LAN (802.11)	11,000	109	1	326	1	652	1

(e.g., JPEG) (e.g., MPEG-4) (e.g., H.264)

Maximum theoretical frame rates for transmitting generic VHS-quality digital video data (352x240 frames) using various networks and compression techniques

Format	Description	Common Usage
PCM	Uncompressed Audio	Audio CD, uncompressed computer audio
WAV	PC Audio Format (usually uncompressed audio)	PC audio files
AIFF	Apple Audio Format (usually uncompressed audio)	Mac's audio files
MLP	Meridian Lossless Packing	DVD-Audio
DSD	Direct Stream Digital	Super Audio CD (SACD)
Apple Lossless	Lossless Audio Compression	iTunes
Monkey's Audio	Lossless Compression	WinAmp compatible
DTS	Digital Theater System	Multi-channel CD & DVD
DD (also AC3)	Dolby Digital	Primary audio for DVD's and HDTV
Dolby Pro-Logic	Analog Multi-Channel Format	Laserdisk, VHS, Broadcast TV
MP3	MPEG-1 – Layer 3	2-channel compressed format for computers and portable applications
WMA	Windows Audio	2-channel compressed format for computers and portable applications
Ogg Vorbis	Open Source	Open source competition to MP3 & WMA
AAC	Audio format from MPEG-4	Similar to MP3, but better quality at low bitrates and supports DRM features

OEMs Innovate with Additional System Headroom for Video Performance and Features



Benchmarks

System Careabouts	C6205 (200MHz)	C6415/C6416 (720MHz)***	DM642 (600MHz)	DM641 (500MHz)***	DM640 (400MHz)***
MPEG-4 SP Decode	Multi CIF	Multi D1	Multi D1	Multi D1	Dual D1
MPEG-4 SP Encode	CIF***	Dual D1	D1	D1	-
MPEG-4 ASP Decode	CIF***	Dual D1	Dual D1	D1	D1
MPEG-4 ASP Encode	-	D1	D1	-	-
MPEG-2 Decode	Dual CIF	Multi D1	Multi D1	Dual D1	Dual D1
MPEG-2 Encode	-	D1	D1	D1	-
H.263 (Baseline) Dec	Multi CIF	Multi D1	Multi D1	Multi D1	Dual D1
H.263 (Baseline) Enc	CIF	Dual D1	D1	D1	D1
H.264 (Baseline) Dec	-	Dual D1	Dual D1	D1	D1
H.264 (Baseline) Enc	-	D1	CIF	-	-
Microsoft WMV9 Dec	CIF	Dual D1	Dual D1	D1	D1
Microsoft WMV9 Enc	-	D1	D1	-	-
RealVideo 8 Dec	CIF	D1	D1	D1	D1***
RealVideo 8 Enc					
G.726 Enc	4%	1%	1%	1%	1%
Capture/Display			3 – 20bit video ports	2 – 8bit video ports	1 – 8bit video ports
JPEG	D1-86% / CIF-28%	D1-% / CIF-%	D1-22% / CIF-7%		
TCP Receive			95.2Mb/s (28.6%)		
TCP Transmit			88.4Mb/s (34.9%)		
Connectivity	TCPIP stack	TCPIP stack	On-chip EMAC	On-chip EMAC	On-chip EMAC
DSP Careabouts					
Performance (MIPs)	1600	5760	4800	4000	3200
On-chip memory	128K	1032KB/More	256KB	128KB	128KB
Peripheral integration	PCI	PCI/Utopia2	3 Video ports, EMAC, PCI, HPI	2 Video ports, EMAC, HPI	1 Video port, EMAC
Price (2004 10kU)	\$9.23	\$80-90/ More	\$40-50	\$32/\$37	\$19.95

NOTE: Data is for algorithm only and does not include networking stacks or additional frameworks/software necessary to run the algorithm.

NOTE: Multi is 3 or more simultaneous channels

For more Information please contact your local Product Information Center

All performance data is for 30fps unless otherwise noted

Resolution Information: D1(720x480) / CIF (352x288)

****ESTIMATED; All Data for C6415/6416 (720MHz), DM641, and DM640 are Estimated*

+ Not able to perform at 30fps