MULTIMEDIA

INFORMATION, COMMUNICATION
& TECHNOLOGY

Ch. 4 MULTIMEDIA

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What is Multimedia ?

- **Multimedia** is a computer-based interactive communications process that incorporates text, graphics, sound, animation, and video
- **Interactive**
  - Key feature of multimedia
  - User determines what content is delivered, when it is delivered and how

What is Multimedia ?

- **Non-linear**
  - 2 or more media
- **Computer multimedia**
  - Multi-sensory experience – real world
  - Multi-sensory memory imprints
  - Different learning styles benefit

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Computer-based Multimedia

Whats the different of multimedia with:

- **Hypertext** - links
- **Hypermedia** - hypermedia ware

Multimedia Advantages

- Engrossing – deep involvement
- Multi-sensory
- Creates knowledge connections
- Individualized
- Teacher and student creation

Multimedia Disadvantages

- “Lost in cyberspace”
- Lack of structure
- Non-interactive – if one-way, no feedback
- Text intensive content
- Complex to create
- Time consuming
- Cognitive overload
- Linear content

Multimedia Major Character

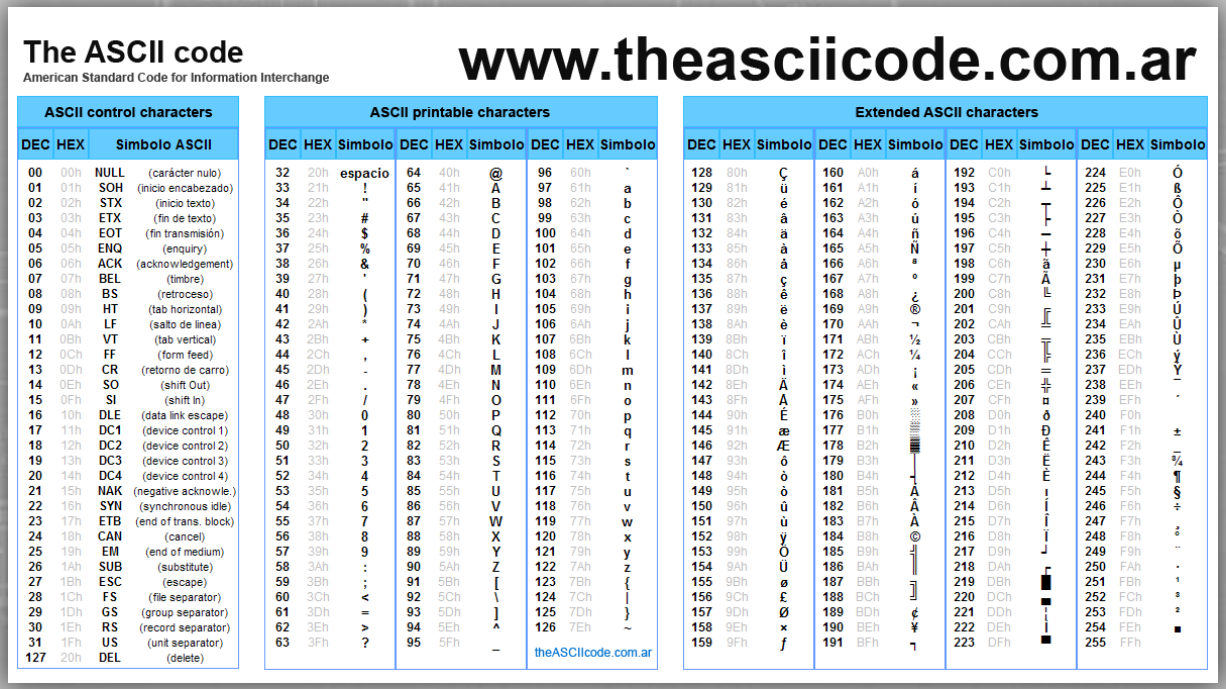
- Various function : communication, entertainment, learning, documentation, etc..
  - Multimedia Presentation
    - Viewed by person on stage, projected, transmitted, or played locally with a media player
  - Multimedia Games and Simulation
    - Used in a physical environment with special effects, with multiple users in an online network, or locally with an offline computer, game system, or simulator.

Multimedia Files

- Basic : Text, Graphic, Audio, Video

Multimedia Files

- Text
  - Standard by ASCII (American Standard Code For Information Interchange)
  - 8 bit Binary composition for define decimal code to make a control characters



The ASCII code

American Standard Code for Information Interchange

www.theasciicode.com.ar

ASCII control characters

DEC	HEX	Simbolo ASCII	
00	00h	NULL	(carácter nulo)
01	01h	SOH	(inicio encabezado)
02	02h	STX	(inicio texto)
03	03h	ETX	(fin de texto)
04	04h	EOT	(fin transmisión)
05	05h	ENQ	(enquiry)
06	06h	ACK	(acknowledgement)
07	07h	BEL	(timbre)
08	08h	BS	(retroceso)
09	09h	HT	(tab horizontal)
10	0Ah	LF	(salto de línea)
11	0Bh	VT	(tab vertical)
12	0Ch	FF	(form feed)
13	0Dh	CR	(retorno de carro)
14	0Eh	SO	(shift Out)
15	0Fh	SI	(shift In)
16	10h	DLE	(data link escape)
17	11h	DC1	(device control 1)
18	12h	DC2	(device control 2)
19	13h	DC3	(device control 3)
20	14h	DC4	(device control 4)
21	15h	NAK	(negative acknowle.)
22	16h	SYN	(synchronous idle)
23	17h	ETB	(end of trans. block)
24	18h	CAN	(cancel)
25	19h	EM	(end of medium)
26	1Ah	SUB	(substitute)
27	1Bh	ESC	(escape)
28	1Ch	FS	(file separator)
29	1Dh	GS	(group separator)
30	1Eh	RS	(record separator)
31	1Fh	US	(unit separator)
127	20h	DEL	(delete)

ASCII printable characters

DEC	HEX	Simbolo	DEC	HEX	Simbolo	DEC	HEX	Simbolo
32	20h	espacio	64	40h	@	96	60h	`
33	21h	!	65	41h	A	97	61h	a
34	22h	"	66	42h	B	98	62h	b
35	23h	#	67	43h	C	99	63h	c
36	24h	$	68	44h	D	100	64h	d
37	25h	%	69	45h	E	101	65h	e
38	26h	&	70	46h	F	102	66h	f
39	27h	'	71	47h	G	103	67h	g
40	28h	(	72	48h	H	104	68h	h
41	29h	)	73	49h	I	105	69h	i
42	2Ah	*	74	4Ah	J	106	6Ah	j
43	2Bh	+	75	4Bh	K	107	6Bh	k
44	2Ch	,	76	4Ch	L	108	6Ch	l
45	2Dh	-	77	4Dh	M	109	6Dh	m
46	2Eh	.	78	4Eh	N	110	6Eh	n
47	2Fh	/	79	4Fh	O	111	6Fh	o
48	30h	0	80	50h	P	112	70h	p
49	31h	1	81	51h	Q	113	71h	q
50	32h	2	82	52h	R	114	72h	r
51	33h	3	83	53h	S	115	73h	s
52	34h	4	84	54h	T	116	74h	t
53	35h	5	85	55h	U	117	75h	u
54	36h	6	86	56h	V	118	76h	v
55	37h	7	87	57h	W	119	77h	w
56	38h	8	88	58h	X	120	78h	x
57	39h	9	89	59h	Y	121	79h	y
58	3Ah	:	90	5Ah	Z	122	7Ah	z
59	3Bh	;	91	5Bh	[	123	7Bh	{
60	3Ch	<	92	5Ch	\	124	7Ch	|
61	3Dh	=	93	5Dh	]	125	7Dh	}
62	3Eh	>	94	5Eh	^	126	7Eh	~
63	3Fh	?	95	5Fh	_			

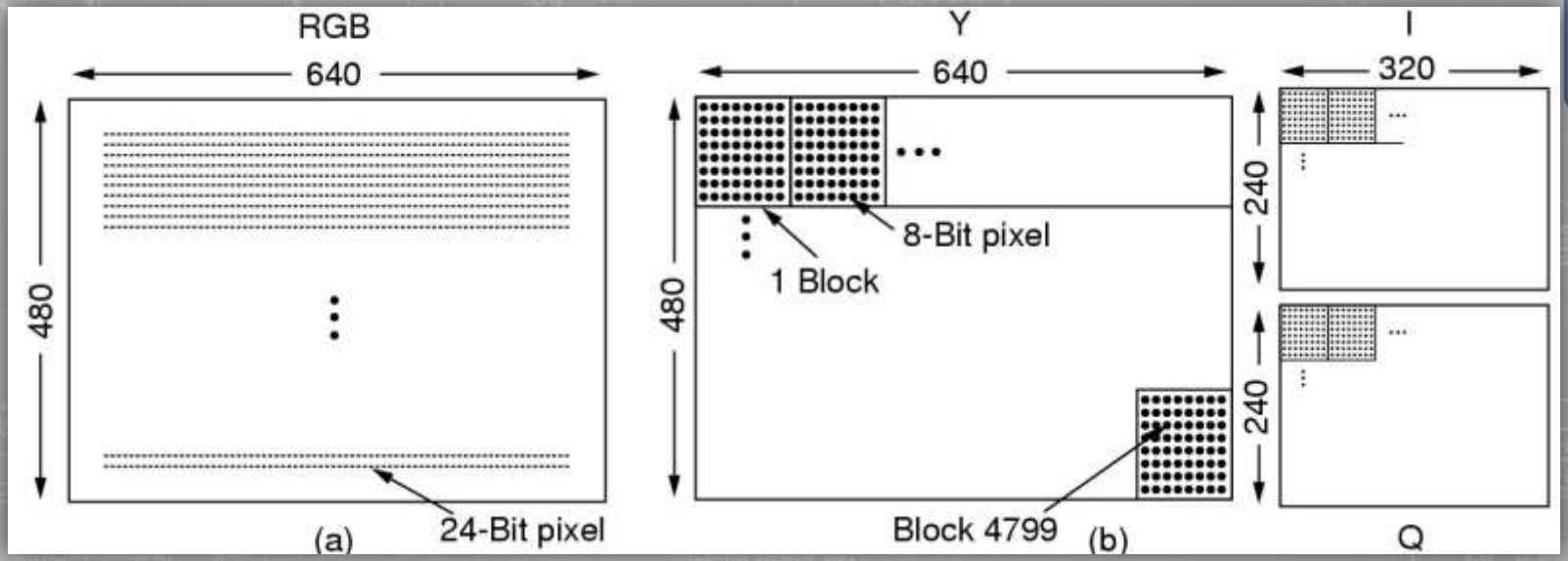
theASCIIcode.com.ar

Extended ASCII characters

DEC	HEX	Simbolo	DEC	HEX	Simbolo	DEC	HEX	Simbolo	DEC	HEX	Simbolo
128	80h	Ç	160	A0h	á	192	C0h	└	224	E0h	Ó
129	81h	ü	161	A1h	í	193	C1h	┴	225	E1h	ß
130	82h	é	162	A2h	ó	194	C2h	┬	226	E2h	Ô
131	83h	â	163	A3h	ú	195	C3h	├	227	E3h	Ò
132	84h	ä	164	A4h	ñ	196	C4h	─	228	E4h	õ
133	85h	à	165	A5h	Ñ	197	C5h	┼	229	E5h	Õ
134	86h	å	166	A6h	ª	198	C6h	ã	230	E6h	µ
135	87h	ç	167	A7h	º	199	C7h	Ã	231	E7h	þ
136	88h	ê	168	A8h	¿	200	C8h	╚	232	E8h	Þ
137	89h	ë	169	A9h	®	201	C9h	╔	233	E9h	Ú
138	8Ah	è	170	AAh	¬	202	CAh	╩	234	EAh	Û
139	8Bh	ï	171	ABh	½	203	CBh	╦	235	EBh	Ù
140	8Ch	î	172	ACh	¼	204	CCh	╠	236	ECh	ý
141	8Dh	ì	173	ADh	¡	205	CDh	═	237	EDh	Ý
142	8Eh	Ä	174	AEh	«	206	CEh	╬	238	EEh	¯
143	8Fh	Å	175	AFh	»	207	CFh	¤	239	EFh	´
144	90h	É	176	B0h	░	208	D0h	ð	240	F0h	
145	91h	æ	177	B1h	▒	209	D1h	Ð	241	F1h	±
146	92h	Æ	178	B2h	▓	210	D2h	Ê	242	F2h	‗
147	93h	ô	179	B3h	│	211	D3h	Ë	243	F3h	¾
148	94h	ö	180	B4h	┤	212	D4h	È	244	F4h	¶
149	95h	ò	181	B5h	Á	213	D5h	ı	245	F5h	§
150	96h	û	182	B6h	Â	214	D6h	Í	246	F6h	÷
151	97h	ù	183	B7h	À	215	D7h	Î	247	F7h	¸
152	98h	ÿ	184	B8h	©	216	D8h	Ï	248	F8h	°
153	99h	Ö	185	B9h	╣	217	D9h	┘	249	F9h	¨
154	9Ah	Ü	186	BAh	║	218	DAh	┌	250	FAh	·
155	9Bh	ø	187	BBh	╗	219	DBh	▉	251	FBh	¹
156	9Ch	£	188	BCh	╝	220	DCh	▄	252	FCh	³
157	9Dh	Ø	189	BDh	¢	221	DDh	¦	253	FDh	²
158	9Eh	×	190	BEh	¥	222	DEh	▌	254	FEh	■
159	9Fh	ƒ	191	BFh	┐	223	DFh	▀	255	FFh	

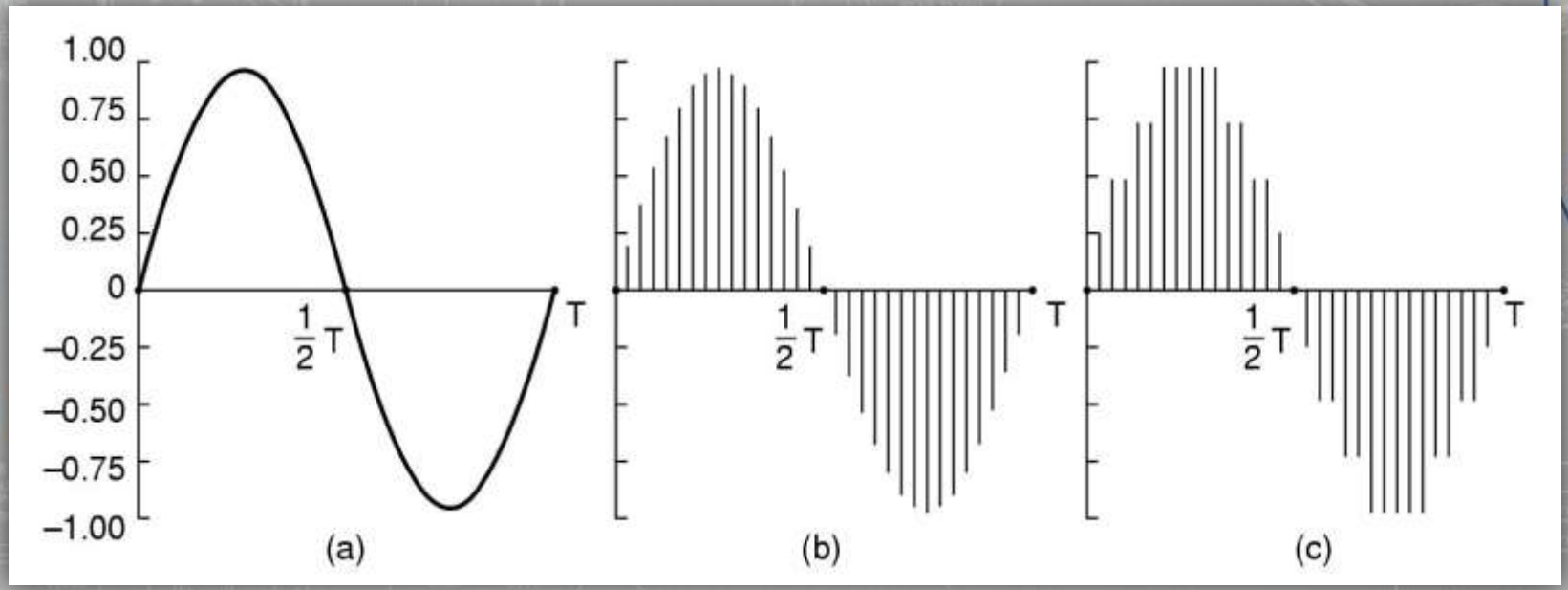
Multimedia Files

- Graphic
  - **JPEG** Compression : **Joint Photographic Experts Group**, the name of the committee that created the JPEG standard and also other still picture coding standards



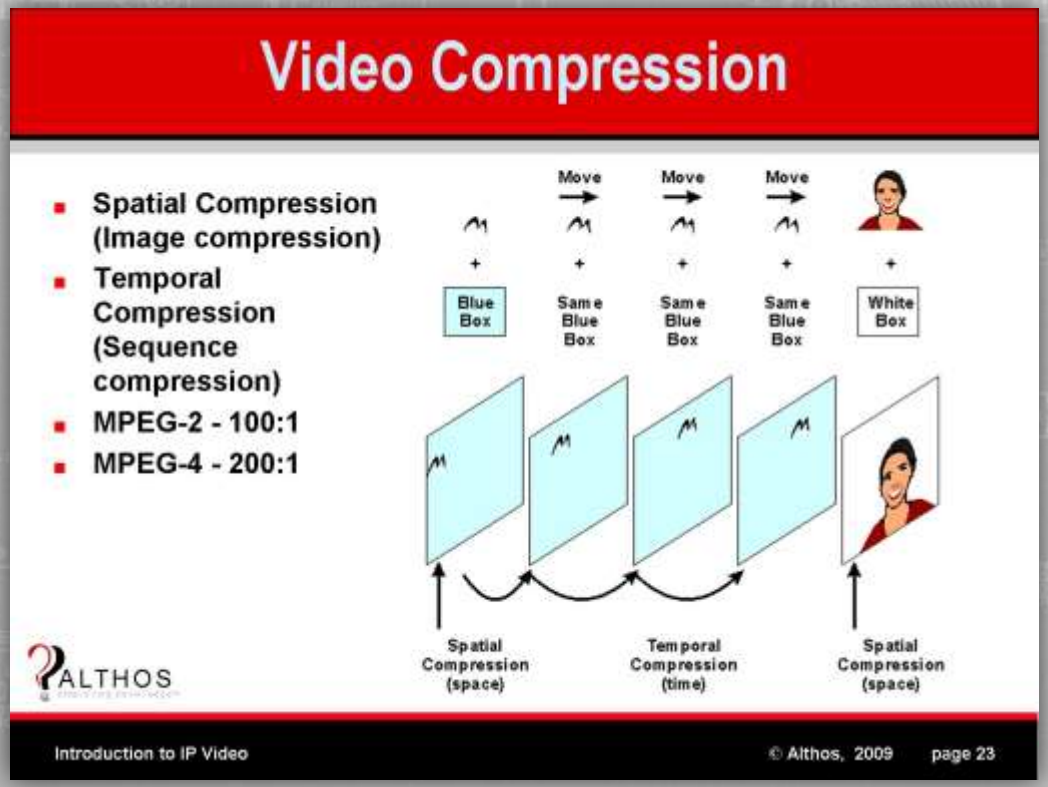
Multimedia Files

- Audio File : is a file format for storing digital audio data on a computer system
- Audio waves convert to digital



Multimedia File

- Video : is an electronic medium for the recording, copying and broadcasting of motion pictures. Videography is the recording of video, as on videotape or videodisc



Multimedia Usage

- Creative industries
- Commercial uses
- Entertainment and fine arts
- Education
- Journalism
- Engineering
- Industry
- Mathematical and scientific research
- Medicine
- Document imaging
- Disabilities

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Multimedia Usage

- Creative industries
  - use multimedia for a variety of purposes ranging from fine arts, to entertainment, to commercial art, to journalism, to media and software services provided for any of the industries listed below

AKB48 live concert at Tokyo Dome 2012

Multimedia Usage

- Commercial uses
  - Much of the electronic old and new media used by commercial artists is multimedia. Exciting presentations are used to grab and keep attention in advertising.

Multimedia Usage

- Entertainment and fine arts
  - multimedia is heavily used in the entertainment industry, especially to develop special effects in movies and animations

Multimedia Usage

- Education
  - In Education, multimedia is used to produce computer-based training courses (popularly called CBTs) and reference books like encyclopedia

Multimedia Usage

- Journalism
  - Newspaper companies all over are also trying to embrace the new phenomenon by implementing its practices in their work

Multimedia Usage

- Engineering
  - Software engineers may use multimedia in Computer Simulations for anything from entertainment to training such as military or industrial training

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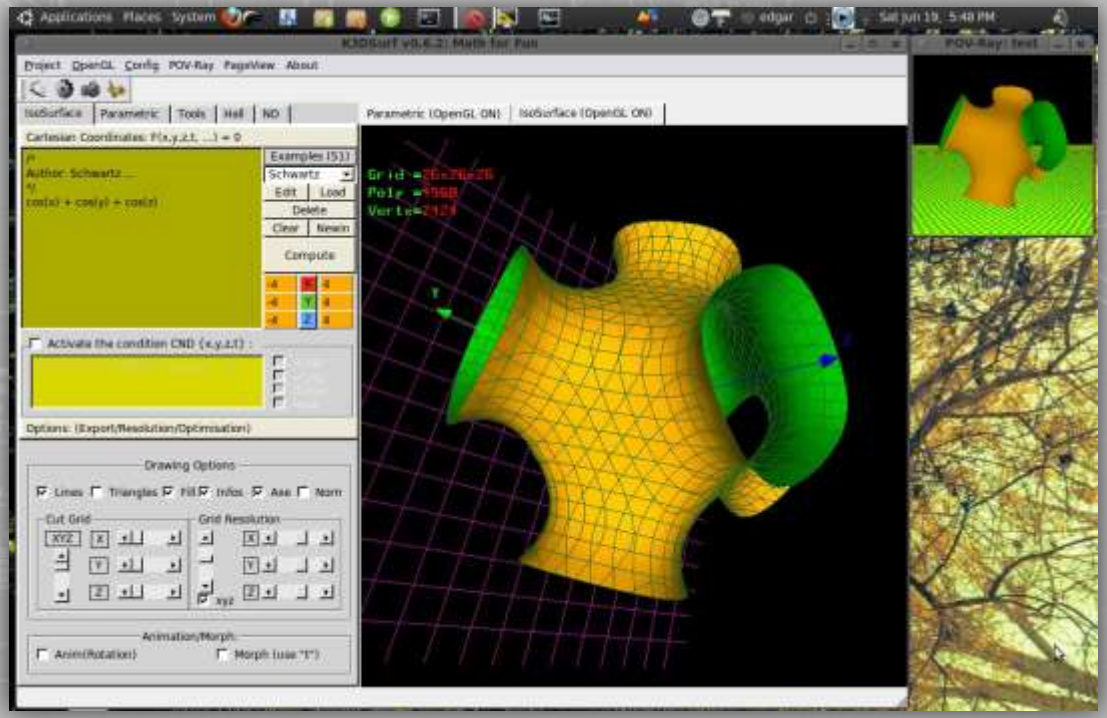
Multimedia Usage

- Industry
  - In the Industrial sector, multimedia is used as a way to help present information to shareholders, superiors and coworkers

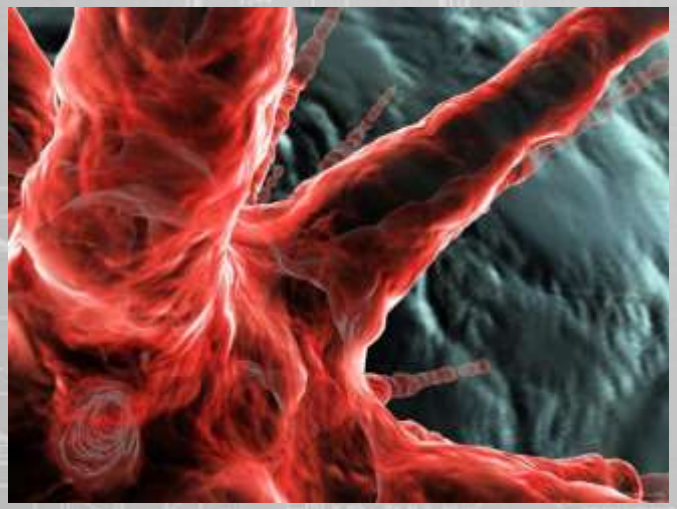
Multimedia Usage

- Mathematical and scientific research
  - In mathematical and scientific research, multimedia is mainly used for modeling and simulation



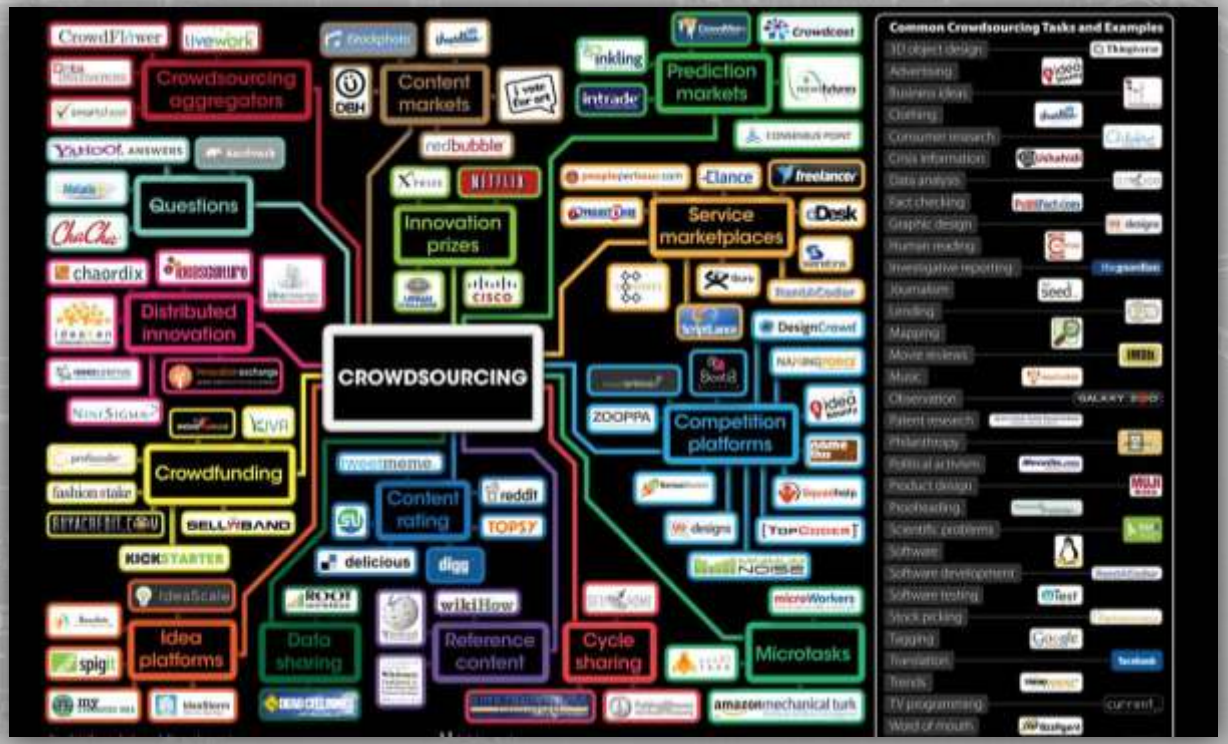
Multimedia Usage

- Medicine
  - In Medicine, doctors can get trained by looking at a virtual surgery or they can simulate how the human body is affected by diseases spread by viruses and bacteria and then develop techniques to prevent it



Multimedia Usage

- Document Imaging
  - Document imaging is a technique that takes hard copy of an image/document and converts it into a digital format (for example, scanners)



Multimedia Usage

- Disabilities
  - Ability Media allows those with disabilities to gain qualifications in the multimedia field so they can pursue careers that give them access to a wide array of powerful communication forms

Streaming Multimedia

- Streaming Stored audio, video
  - Properties : Prerecorded
  - Youtube, vimeo, metacafe, coundclud, netflix, etc
- Conversational voice/video over IP
  - Properties : real-time communication
  - Skype, GoogleTalk, P2P, etc
- Streaming Live audio, video
  - Properties : On-the-fly compression, broadcast
  - IPTV Apps (mivo, bagan, groovia), Ustream, YoutubeLive, Livestream, HelloOnline, etc

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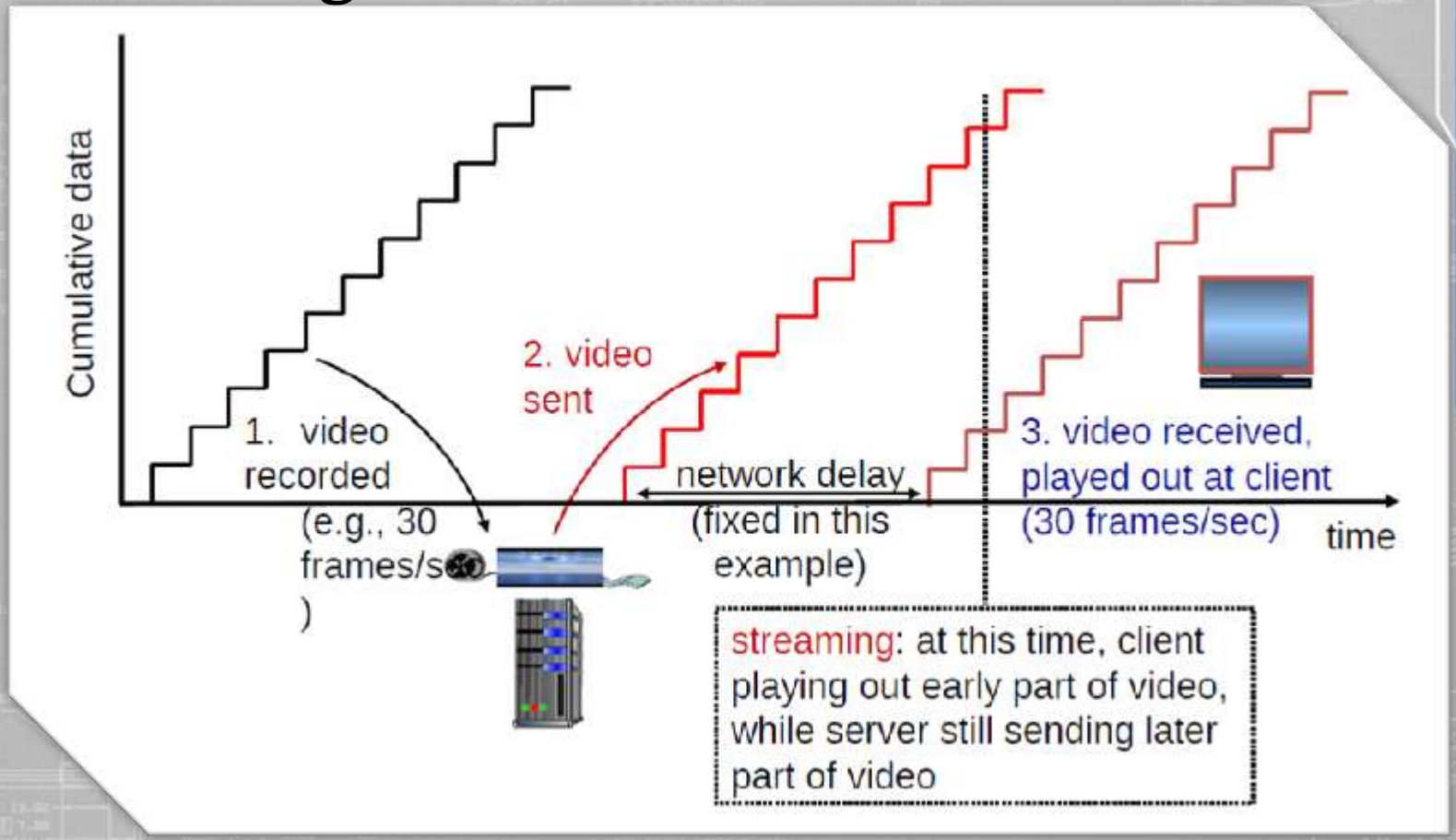
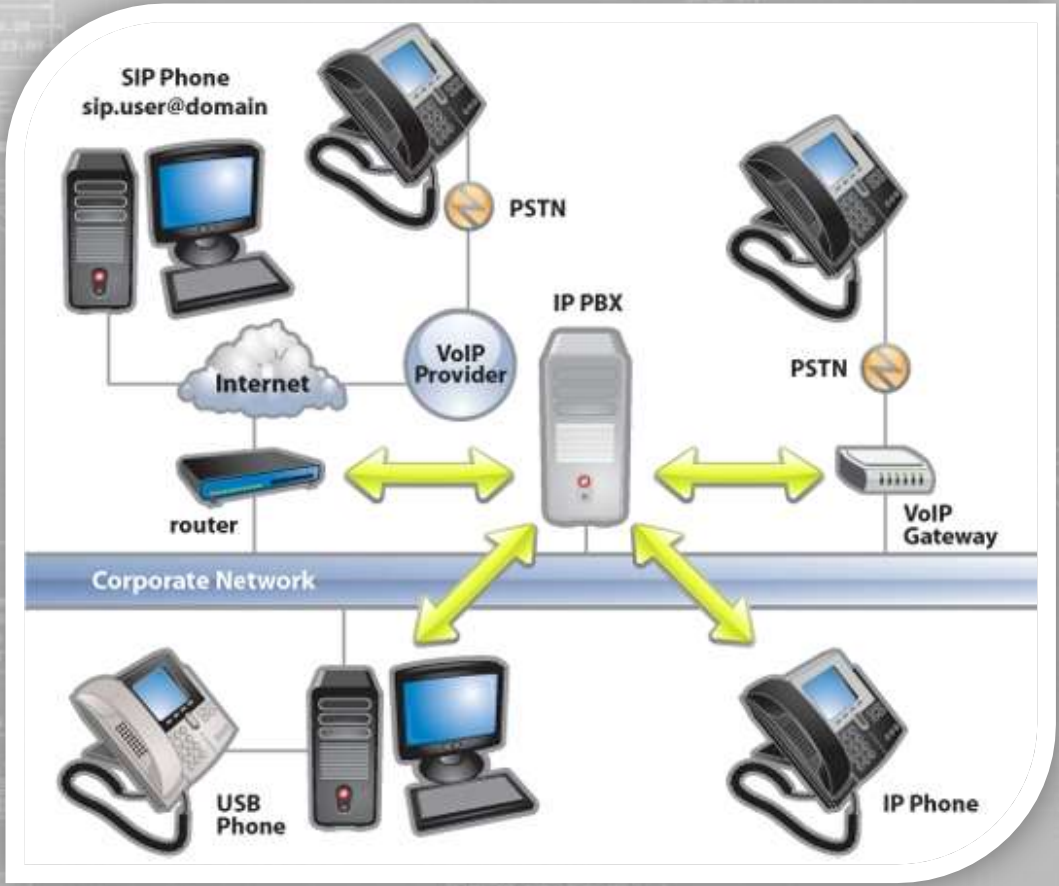
Streaming Multimedia

- Streaming Stored audio, video



Streaming Multimedia

- Conversational voice/video over IP



Streaming Multimedia

- Streaming Live audio, video
- Live, broadcast-like
  - multiple receivers receive the same audio/video at the same time.
  - Multicasting is the natural approach of this type apps
  - cannot skip forward
  - same client buffering approach of streaming stored to deal with delay and jitter
  - In practice, a 10–15 second startup delay is usually adequate

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Multimedia issues online

- People need high performance, Up-to-date fast respons, good quality, more cheap

Today Solution

- H.265
  - **High Efficiency Video Coding (HEVC)** is a video compression standard, a successor to H.264/MPEG-4 AVC (Advanced Video Coding). HEVC is said to improve video quality, double the data compression ratio compared to H.264/MPEG-4 AVC, and can support 8K UHD and resolutions up to 8192×4320

Comparison of video coding standards based on equal PSNR[57]

Video coding standard	Average bit rate reduction compared to			
	H.264/MPEG-4 AVC HP	MPEG-4 ASP	H.263 HLP	H.262/MPEG-2 MP
HEVC MP	35.4%	63.7%	65.1%	70.8%
H.264/MPEG-4 AVC HP	-	44.5%	46.6%	55.4%
MPEG-4 ASP	-	-	3.9%	19.7%
H.263 HLP	-	-	-	16.2%

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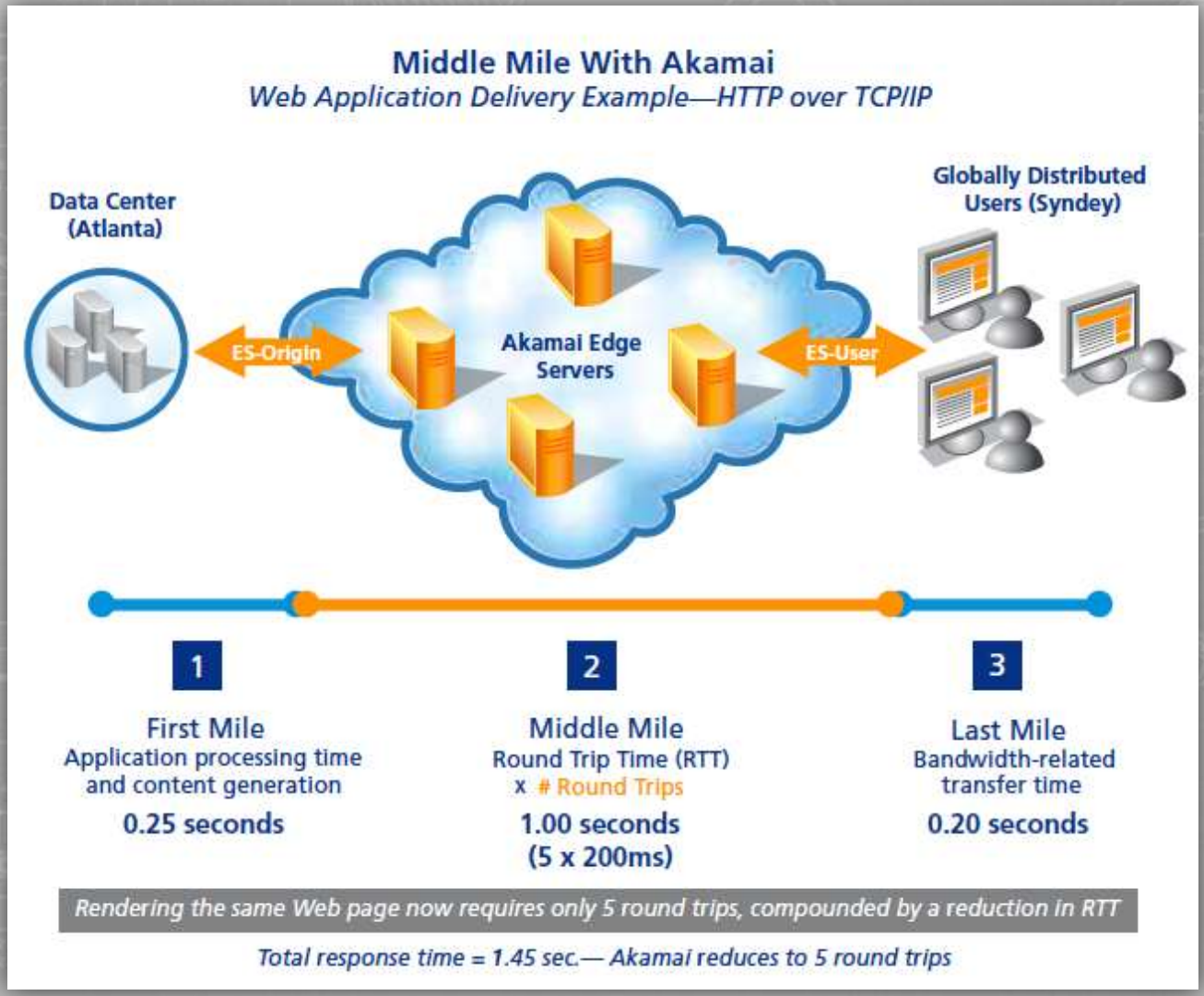
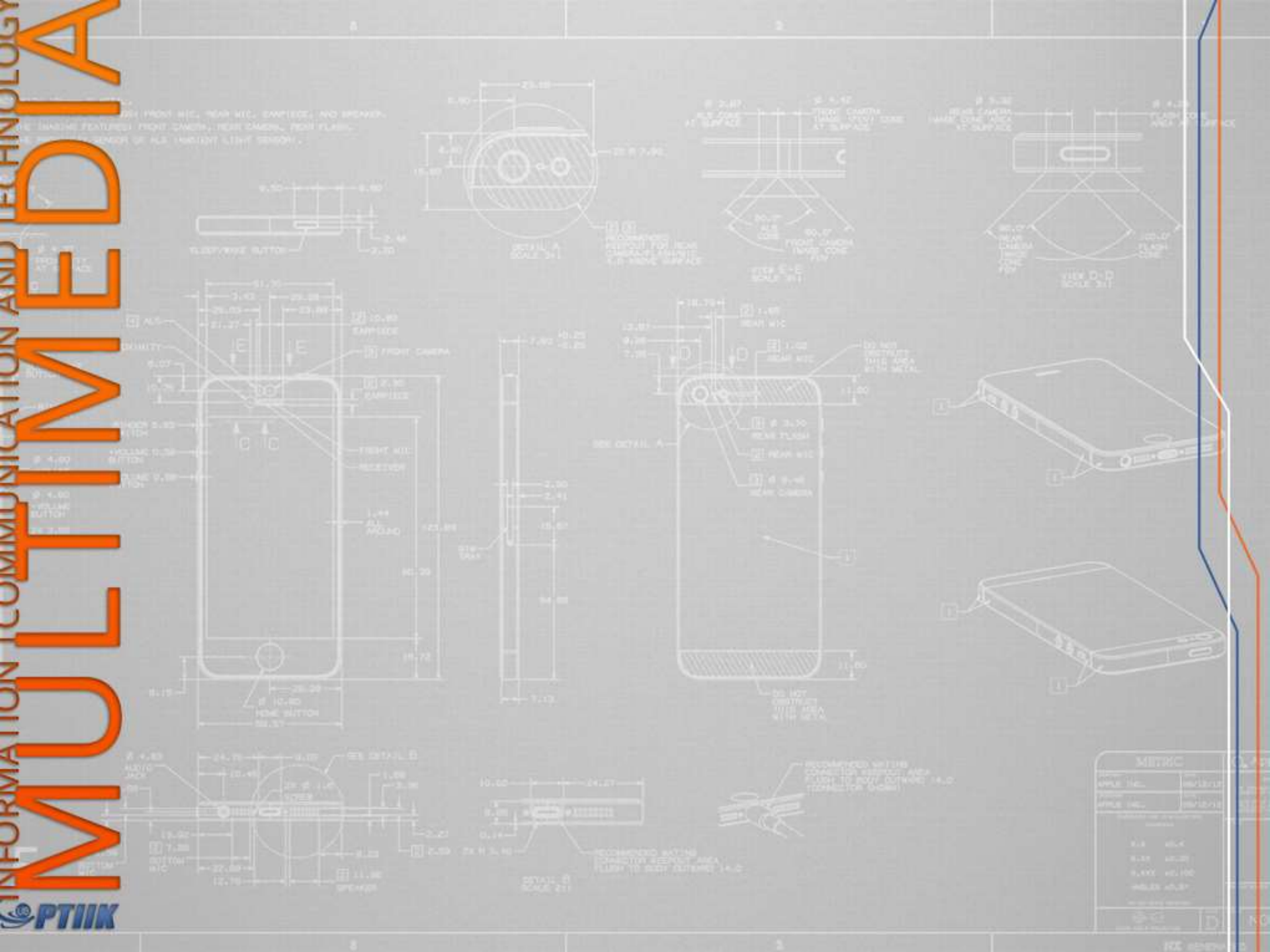
Today Solution

- CDN (Content Delivery Network)
  - is a large distributed system of servers deployed in multiple data centers in the Internet. The goal of a CDN is to serve content to end-users with high availability and high performance
  - And the largest : **Akamai**

Today Solution

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