ITS323 – Traffic and Performance Examples

1 How Much Information?

Example Information	Size (KB)
Text file with 10,000 characters	10
8 page Microsoft Word document (with images)	300
33 page PDF document (with images)	370
Simple HTML web page (text, no images)	12
Complex HTML web page (text, images—MSN.com)	740
300x300 pixel JPEG image with 24-bit colour	16
300x300 pixel uncompressed image with 24-bit colour	270
3000x2000 pixel JPEG photo	1500
4 minute song (192Kb MP3)	5760
Full audio CD (75 minutes)	700000
5 minute voice call (standard line)	2400
1 hour of high quality Internet radio station (128Kb MP3)	57600
1 hour VCD (MPEG-1)	675000
1 hour standard definition digital TV (4Mb/s)	1800000
2 hour movie on DVD (5Mb/s)	4700000
1 hour high definition digital TV (15Mb/s)	6750000
2 hour movie on Blu-Ray disc (MPEG4)	12000000

2 What Are The Performance Requirements?

- Acceptable delay for voice (recommended by ITU):

    - 0 to 150ms: acceptable for most users

    - 150 to 400ms: acceptable if users/operators are aware of quality reduction

    - Above 400ms: unacceptable for most cases

- Specific companies (ISPs, telecommunication providers) specify a maximum delay across their network (e.g. across continental US): usually about 50ms

- Web browsing: response times over 100ms are noticeable to most users

    - Estimated that 100ms delay reduces Amazon's sales by 1% (New York Times, Data Centre Overload, June 8 2009)

- Web browsing: response time of over 10 seconds usually result in user abandoning attempt to access the page