Data and Movies

- A 2 hour movie as a compressed data file is about 150/200 gigabytes (one gigabyte is 10^9 bytes).

  Motion picture projector operates at 24 frames/sec.

- 2 hour movie: (1) extended color range up to 4K colors
  (2) 48 frames/sec
  (3) Uncompressed
  (4) greater than 15 terabytes (1 terabyte is 10^{12} bytes).
  (5) movies delivered to theatres on portable hard drive.

- To move a petabyte (10^{15} bytes) over a gigabit Ethernet takes 90 days!
  (1) A petabyte is 1000×10^{12} bytes or about 70 movies.
  (2) $(10^{15} \times 8)/10^9 \Rightarrow (10^6 \times 8)/(3600 \text{ sec/hour}) = 2{,}222$ hours => 90 days.

- Also, a motion picture is about 2 petabytes of data (about 500,00 DVDs in data amount) counting audio, all film masters, out takes, all filmed scenes, still photos and scripts. Seven thousand new films are produced a year.

- Digital preservation over a hundred years a problem – most studios still transfer digital movies to polyester film (blue, green, red) and store it in cold humidity-free rooms.

References:

[1] B. Beck, "Lasers Light Up the Silver Screen," IEEE Spectrum, March 2014, pp. 33-39.

[2] A. Maltz, "How Do You Store a Digital Movie for 100 Years," IEEE Spectrum, March 2014, pp. 40-44.