- General tree properties:
  - n/k levels, one per spine
  - Branching factor 2^k (per choice of k-bit message chunk)

- Let s'_t be the tth spine value associated with all messages that share s'_t

- We find cost of a particular message by summing costs on path from root to leaf

$$\left| y_{1,1} - x_{1,1}\left(s'_1 = 0 \right) \right|^2$$

$$\left| y_{1,1} - x_{1,1}\left(s'_1 = 1 \right) \right|^2$$