

1 Range vs. Propagation delay (alone)

Table 1: Notation.

	definition
d	(Euclidean) distance d (km) b/w two reference points
$t_p(d)$	(hypothetical) propagation delay (ms) for distance d (km)
η	scale-up factor for Euclidean distance b/w two points

With an estimate of scaling factor of speed of light in fiber is 1.467, we have

$$\begin{aligned}
 t_p(d) &= \frac{d \cdot \eta}{(\text{speed of light in fiber})} \\
 &= \frac{d \cdot \eta}{300,000(\text{km/s})/1.467}.
 \end{aligned} \tag{1}$$

Examples:

$$\begin{aligned}
 t_p(500) &= 3.7(\text{ms}), \\
 t_p(1000) &= 7.4(\text{ms}), \\
 t_p(3000) &= 22.2(\text{ms}).
 \end{aligned} \tag{2}$$

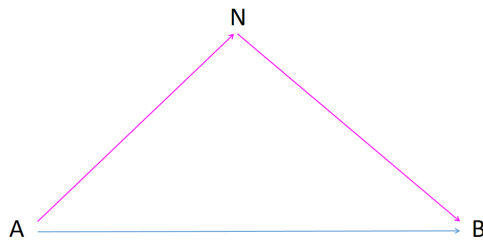


Figure 1: Scale-up factor example: Euclidean distance vs. hypothetical worst case distance