4TB → 10^{40}

Size of buffer

Size_inbuf = x

$$M \approx \left(x + \frac{(x-k+1)k}{4} + 1\right) n_t$$

(in byte)

n_t ← #_thread

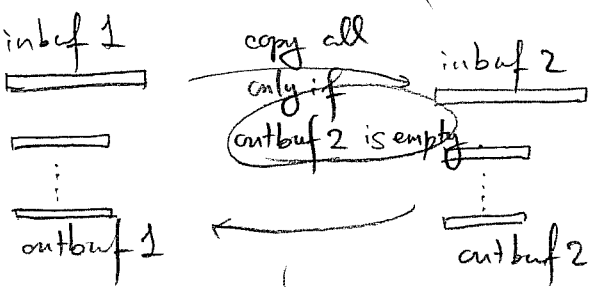
Solve it for x.

y = Size_outbuf (per partition) $= \left(\frac{(x-k+1)k}{4} + 1\right) / n_p$

$\frac{M \ll 20}{n_t}$ $\quad \frac{M \times 10^{20}}{n_t} \cdot \not{8} = x + \frac{k}{4}x - \frac{(k-1)k}{4} + 1$

$\frac{M \times 10^{20}}{n_t} - 1 + \frac{(k-1)k}{4} = \left(1 + \frac{k}{4}\right)x$

$x = \left(\quad \right) \frac{4}{4+k}$



→ where 1) outbuf 2 is full (same)

or

2) inbuf 2 is empty