

$$f(n) = 2f\left(\frac{n}{16}\right) + O(n^4)$$

node size	No. of node	Work per node	total work
n	1	Cn^4	Cn^4
$\frac{n}{16}$	2	$C\left(\frac{n}{16}\right)^4$	$C \cdot 2 \left(\frac{n}{16}\right)^4$
$\left(\frac{1}{16}\right)^2 n$	2^2	$C \left[\left(\frac{1}{16}\right)^2 n\right]^4$	$C 2^2 \left[\left(\frac{1}{16}\right)^2 n\right]^4$
$\left(\frac{1}{16}\right)^3 n$	2^3	$C \left[\left(\frac{1}{16}\right)^3 n\right]^4$	$C 2^3 \left[\left(\frac{1}{16}\right)^3 n\right]^4$
\vdots	\vdots	\vdots	\vdots
1	2^k	C	$C 2^k \left[\left(\frac{1}{16}\right)^k n\right]^4$

$$k = \log_{16} n$$

$$T(n) = Cn^4 \left[1 + 2\left(\frac{1}{16}\right)^4 + 2^2 \left[\left(\frac{1}{16}\right)^2\right]^4 + \dots + 2^k \left[\left(\frac{1}{16}\right)^k\right]^4 \right]$$

$$= Cn^4 \left[1 + 2^{-15} + 2^{-30} + 2^{-45} + \dots + 2^{-15 \cdot k} \right]$$

$$= Cn^4 \left[\frac{1 - 2^{-15k}}{1 - 2^{-15}} \right]$$

$$= Cn^4 \left[\frac{1 - 2^{-15 \log_{16} n}}{1 - 2^{-15}} \right] \rightarrow = 0?$$

$$\in O(n^4)$$