A PROOFS

A.1 Proof of Proposition 2.10

PROOF.

$$c_1 = \frac{n}{m-\kappa}(m+d-\kappa)$$

$$c_2 = \frac{n}{m-\kappa}(1-\rho(\kappa))d + \frac{n}{m-\kappa}\rho(\kappa)(m+d-\kappa)$$

$$\pi(\kappa) = \frac{c_1+c_2}{n} = 1 + \rho(\kappa) + \frac{2d}{m-\kappa}$$

□

A.2 Proof of Proposition 3.3

PROOF. Since there is the deferred area with size κ to cache the out-of-order data points, the points that delay less than κ wouldn't trigger disorders and then overlap. Therefore, It is easy to derive the overlap ratio based on the Equation 7 to increase the beginning of the summary from 1 to κ. Obviously, the overlap ratio gets lower.

□

A.3 Proof of Proposition 3.6

PROOF.

$$\Delta\pi(\kappa) = \pi(0) - \pi(\kappa)$$

$$= \rho(0) - \rho(\kappa) + \frac{2d}{m} - \frac{2d}{m-\kappa}$$

$$= \Delta\rho(\kappa) - \frac{2\kappa d}{m(m-\kappa)}$$

$$= -\prod_{t=1}^{m} F_{\Delta\tau}(t) + \prod_{t=\kappa}^{m} F_{\Delta\tau}(t) - \frac{2\kappa d}{m(m-\kappa)}$$

□