

We would like to thank I-Hong Hou and Han Deng for catching an error in the proof of Theorem 4.

Theorem 4 is corrected. The conclusion of Theorem 4 should be “In a general multihop network topology with general arrival samples, all online algorithms are $\Omega(\log P_M)$ -competitive”, rather than “In a general multihop network topology with general arrival samples, all online algorithms are $\Omega(P_M \log P_M)$ -competitive”.

The derivation of $\sum_{j=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} F_j$ bound in page 9 is corrected as follows:

$$\begin{aligned}
& \sum_{j=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} F_j \\
= & \sum_{j=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} \frac{1}{\rho_j} \frac{P_M}{\lceil \frac{\rho_m}{\rho_M s_M} 2^{\lfloor \frac{j}{s_M^2 P_M} \rfloor} \rceil} \sum_{i=1}^j x_i \\
= & \sum_{i=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} \left(\sum_{j=i}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} \frac{1}{\rho_j} \frac{P_M}{\lceil \frac{\rho_m}{\rho_M s_M} 2^{\lfloor \frac{j}{s_M^2 P_M} \rfloor} \rceil} \right) x_i \\
\leq & \sum_{i=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} \frac{1}{\rho_i} \frac{P_M}{\lceil \frac{\rho_m}{\rho_M s_M} 2^{\lfloor \frac{i}{s_M^2 P_M} \rfloor} \rceil} \\
& \left(1 + s_M^2 P_M \frac{\rho_M}{\rho_m} \sum_{j=0}^{\log(\frac{\rho_M}{\rho_m} s_M P_M)} \frac{1}{2^j} \right) x_i \\
\leq & \sum_{i=1}^{s_M^2 P_M \log(\frac{\rho_M}{\rho_m} s_M P_M)} 2 s_M^2 P_M \frac{\rho_M}{\rho_m} x_i \frac{1}{\rho_i} \frac{P_M}{\lceil \frac{\rho_m}{\rho_M s_M} 2^{\lfloor \frac{i}{s_M^2 P_M} \rfloor} \rceil} \\
\leq & 2 \frac{\rho_M}{\rho_m} s_M^3 P_M^3,
\end{aligned}$$

And the subsequent part of Theorem 4’s proof is modified accordingly and leads to the conclusion that the optimal online algorithm is $O(\log P_M)$ -competitive.

With the above change, some sentences that claim the proposed algorithm in Section V is order-optimal online algorithm no longer hold as the byproduct of Theorem 4. Our proposed algorithm is now sub-optimal as it is $O(P_M \log P_M)$ -competitive. We have changed these sentences in the paper as well.

The whole paper with the corrections can be found in <https://ia601508.us.archive.org/27/items/HardDeadlineSchedErrata/OptimalOnlineSchedulingWithArbitraryHardDeadlinesInMultihopCommunicationNetworks.pdf>