Proactive eviction of flow entry for SDN based on hidden markov model

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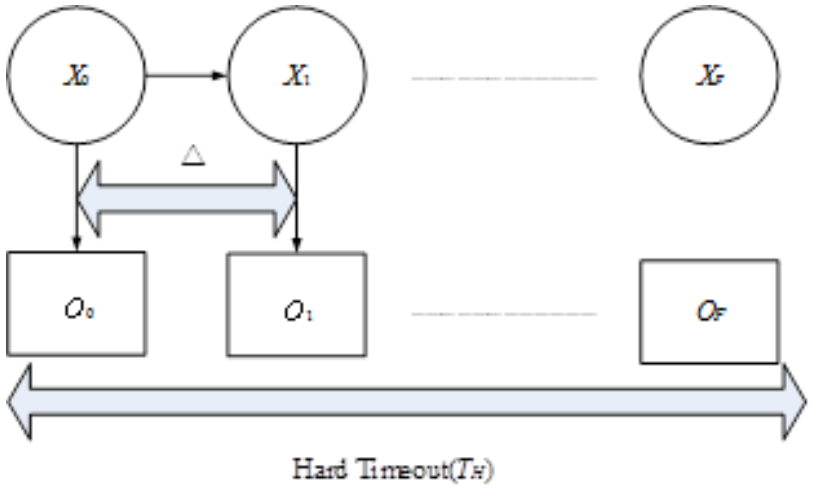
Problems & Ideas

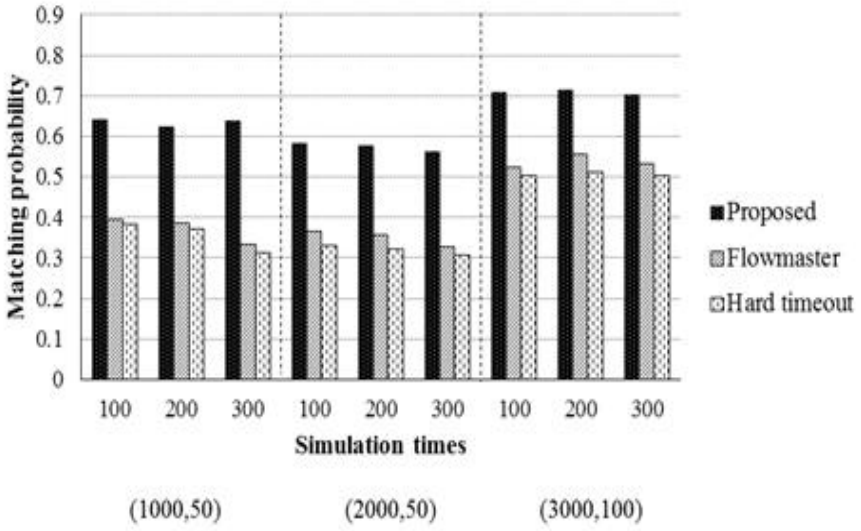
- **Problem**
  - The limitation of flow tables and the switch capacity constrains SDN.
  - A table miss incurs a large amount of overhead between the switch and controller.
- **Proposed Algorithm**
  - U_T : threshold of utilization when utilization decreases(%).
  - Hidden Markov Model (HMM) is employed to evict a flow entry which is predicted to have the lowest matching probability when the utilization of flow table exceeds U_T.
  - Use HMM to predict whether to evict towards the chosen flow entries.
  - This proposed scheme can be adopted along with the hard timeout mechanism commonly used with the SDN.



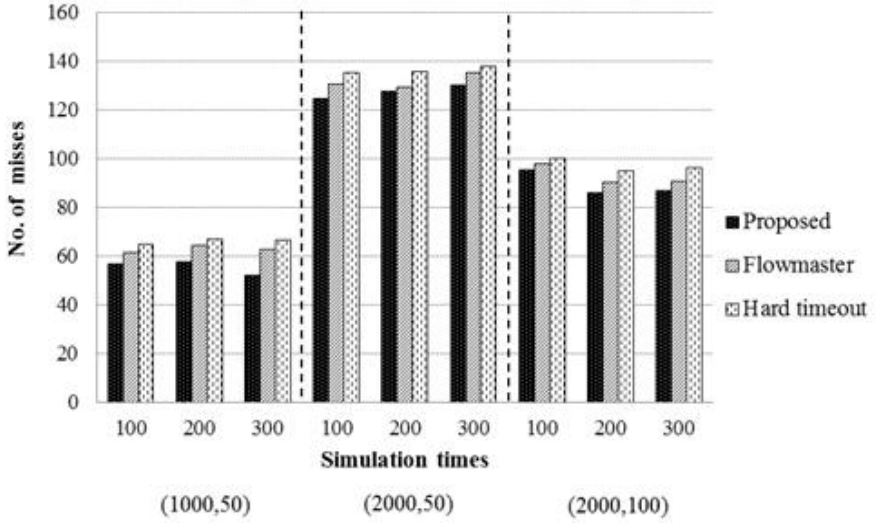
<Architecture of proposed HMM.>

Main Contributions

- Matching probability: Proposed > Flowmaster > Hard timeout
- The number of table miss: Proposed < Flowmaster < Hard timeout
- Note: n is the number of flows and m is the number of flow entries.



The comparison of matching probabilities with different (n, m) values



The comparison of the number of misses