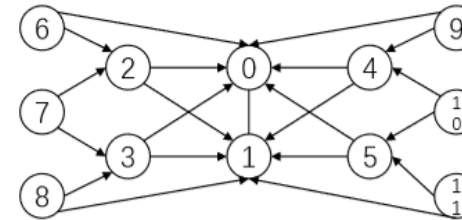
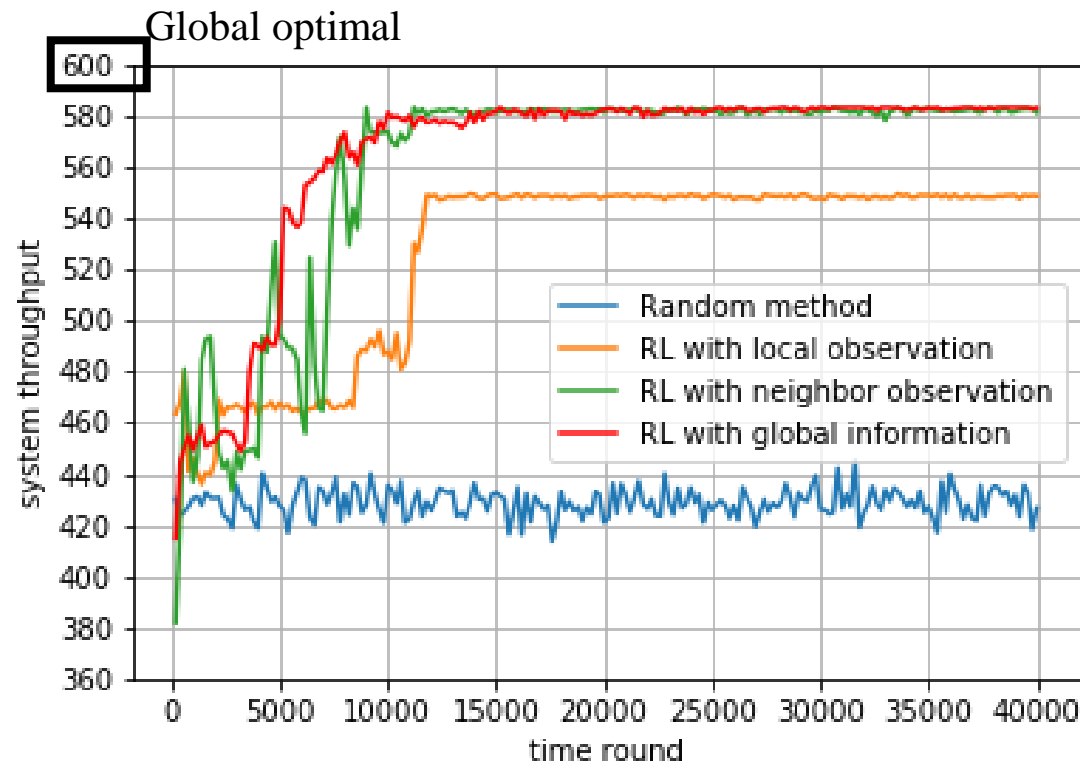


Enlarge Topology with Neighbor Information

2018 3.7

Previous Network with Neighboring Information

- Network with 12 nodes, 21 edges, 10 flows.



RL with global information reaches a state with system throughput value 583.3
Improvement 35.6%

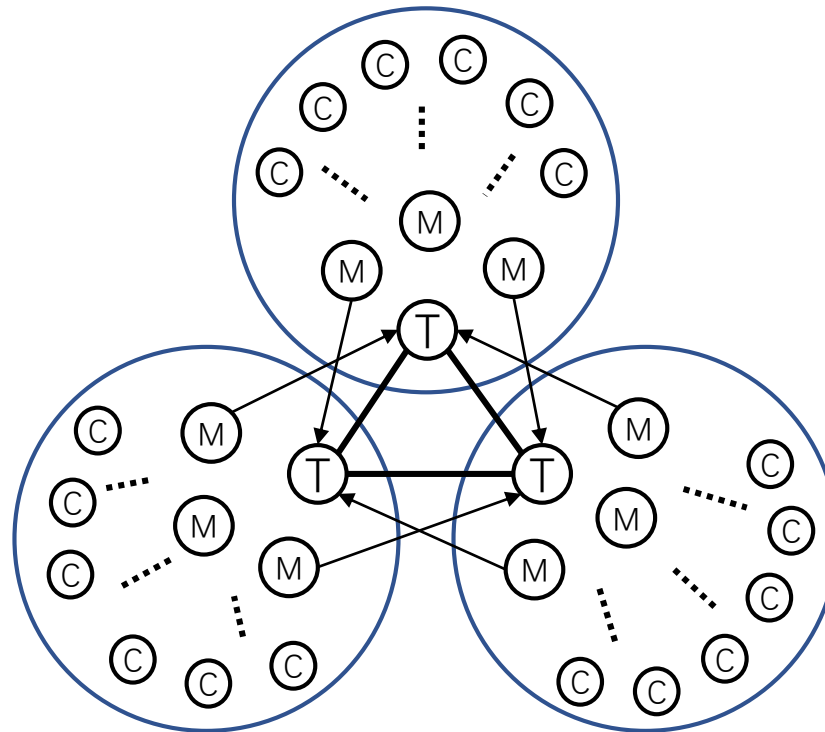
RL with neighbor information reaches a state with system throughput value 583.3
Improvement 35.6%

RL with local observation reaches a state with system throughput value 550.0
Improvement 27.9%

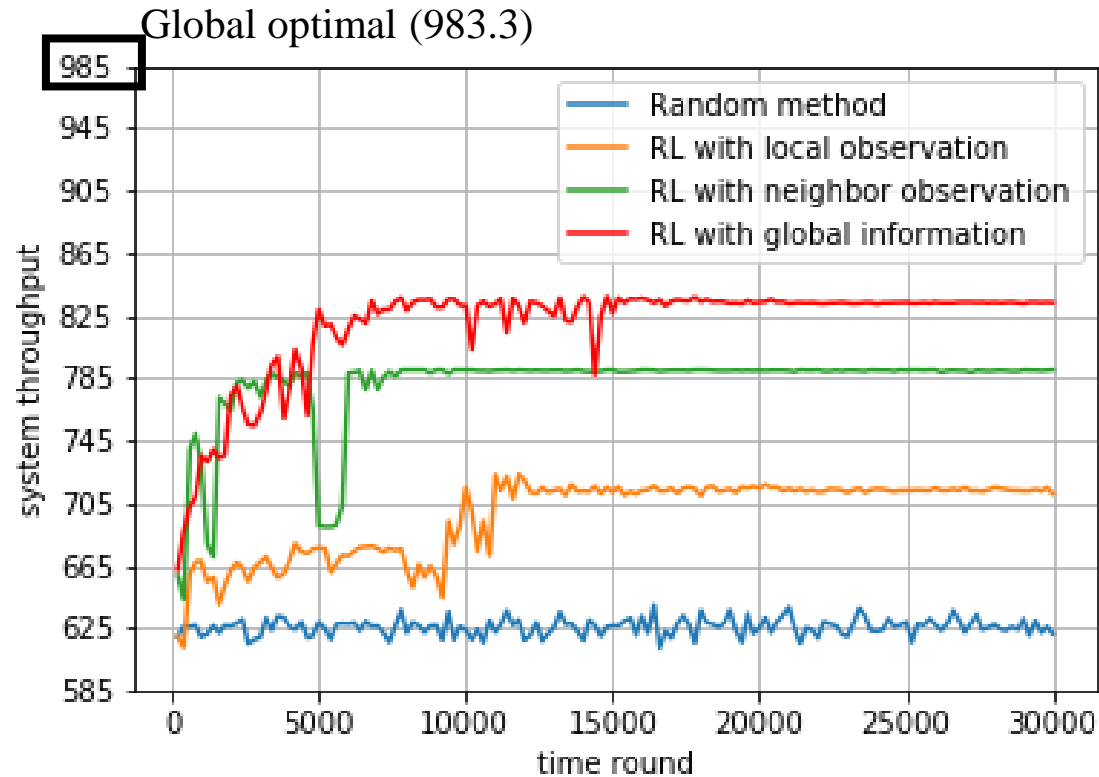
- Simple network environment neighboring information may be enough to show the global situations.

Enlarge Network

- Network with 30 nodes, 51 links (9 peer links, 42 customer-provider links), and 15 flows across three regions.
- Ensure that every node has at least 2 neighbors as potential next hops.



Experiment Results



RL with global information reaches a state with system throughput value **833.3**
Improvement 33.3%

RL with neighbor observation reaches a state with system throughput value **790.0**
Improvement 26.4%

RL with local observation reaches a state with system throughput value **714.0**
Improvement 14.3%

- When network becomes larger and more flows are injected, it becomes harder to get experiences with high system throughput.

e.g. Only a few joint actions in 50000 rounds using Random can reach system throughput above 900

