

Routing Through Teranode Networks with Topology Aggregation

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Abstract

The future global teranode networks will consist of many subnetworks called domains. For reasons of both scalability and security, domains will not release details of their internal structure to nodes outside of the domain. Rather, they will release a summary, or aggregation, of the internal structure, e.g., as required by the ATM PNNI standard.

This work compares by simulation the effect of different aggregation schemes on the network throughput, and on the network control measured in the number of crank-backs per realized connection. It shows, that using stars for aggregation results in bad performance when compared with other simple methods.

keyword: PNNI, topology aggregation, routing, teranode networks, hierarchical network structure

Areas of interest: internetworking, network signaling and control

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exceptions allowed by PNNI [tc96, section 3.3.8]. An algorithm for a tree-based construction within the PNNI aggregation framework (using bypass exception) is described and analyzed by Awerbuch and Shavitt [AS97]. We intend to simulate it in our future work.

This paper shows that performing re-aggregation using our logarithmic update policy reduces the number of aggregations drastically, yet the performance is not compromised. We also show that exponential cost metric results in better performance than min-hop as theory suggests.

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