Experience and Evaluation of the Distributed Node Consensus Protocol
draft-jin-homenet-dncp-experience-00

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Introduction

• Objective:
  Evaluate the performances of DNCP in different scenarios.

• ns-3
  A discrete-event network simulator.

• Libdncp implementation

• Integration of libdncp into ns-3
Metrics

• **Convergence time:**
The time it took for the network to converge.

• **Average traffic sent per node until convergence:**
The overall traffic sent until convergence divided by the number of nodes.
Topologies

- Single link topology
- String topology
- Full mesh topology
- Tree topology
- Double tree topology
Simulation description

• Network size: 5, 10, 15, 20, ......, 80
• 10 experiments for each scenario
• Used HNCP profile
• Data rate of simulated net device: 1 Gbps (Virtually infinite throughput for DNCP)
• All DNCP instances start simultaneously and struggle to converge from a null state.
Convergence time

- 3 incidents were observed in link and mesh topology
- Slope inconsistency in mesh topology at around 50 nodes.
- Convergence time linear in string topology
Convergence time(2)

- Convergence is quick
- Convergence time is sub-linear
Traffic

- Significant traffic in link and mesh topology
- Support For Dense Broadcast Links proposed in draft-ietf-homenet-dncp-07.
Traffic(2)

- Traffic per node sub-linear
- Light overhead in these two topologies.

Network throughput within 100 seconds

- Once converged, very small traffic is used to keep-alive
Conclusion

• DNCP can converge in different topologies of different sizes.
• Quick convergence.
• Trickle makes DNCP verbose in reaction to frequent change (expected to behave better in a less extreme situation).
• DNCP implementation status
  --libdncp implementation (separated from HNCP implementation)
  --libdncp2 Implementation
  --shncpd Implementation
Next steps?

- Test newer implementation: libdncp2
- Measure convergence time in a less extreme situation (with only part of the nodes publishing new data).
- Different topologies: input from topology generators
- Test with lossy links and moving nodes.
- Interesting work to be continued in the WG?
Thank you, questions?