

Distributed Algorithm on AHCv2: Waves: Tarry's Traversal and Tree, Release V1.0.0

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May 12, 2024

Outline

- 1 Introduction
- 2 Implementation and Methodology
- 3 Results
- 4 Discussion
- 5 Conclusion

Introduction

Context: Introduction to the challenges and importance of efficient traversal algorithms in distributed systems.

- Importance of Tarjan's Algorithm and Tree Algorithm in network exploration and rapid network setup.
- Discussion on their theoretical implications and expected behaviors in different network topologies.

Problem Statement:

- In distributed systems, effective network traversal and spanning tree construction are crucial.
- The primary challenge is to design protocols that minimize communication overhead and ensure completion.

Significance and Necessity:

- These algorithms provide mechanisms for efficient data dissemination and network reconfiguration.
- Solving this problem enables efficient resource management

Implementation and Methodology

Simulation Setup:

- Description of the AHCv2 simulation environment.
- Network topologies used: linear, tree, and random graphs.
- Metrics captured: message count, traversal time, overhead.

Methodological Approach:

- Nodes initialized with either Tarry's or the Tree Algorithm.
- Simulations to measure efficiency and coverage across network topologies.

Results

Theoretical Results:

- Tarry's Algorithm is expected to use about $2E$ messages for complete traversal.
- Tree Algorithm is designed for quick spanning tree formation but may incur higher message overhead.

Expected Outcomes:

- Comprehensive coverage by Tarry's Algorithm.
- Rapid spanning tree formation by the Tree Algorithm.

Discussion

Discuss the implications of the findings:

- Suitability of Tarry's Algorithm for comprehensive network exploration.
- Tree Algorithm's application in scenarios requiring rapid deployment.

Practical Recommendations:

- Tarry's Algorithm for detailed network exploration.
- Tree Algorithm for rapid setup in structured networks.

Conclusion

Summarize the theoretical insights and their practical implications:

- Both algorithms serve critical but distinct roles in distributed systems.
- Future research directions, such as reducing overhead and adapting to dynamic network conditions.

Final Thoughts:

- Theoretical exploration highlights the need for empirical validation.
- Importance of ongoing research in efficient traversal algorithms.

References

Questions

Thank you!
Questions?