A Tool for Frequent Items Discovery in Large-Scale P2P Networks

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Introduction

For large scale distributed systems, designing energy efficient protocols and services has become significant while considering conventional performance criteria like **scalability**, **reliability**, f**ault-tolerance** and s**ecurity**.

Due to its extensive applicability in diverse areas, we consider frequent item set discovery problem in this context.

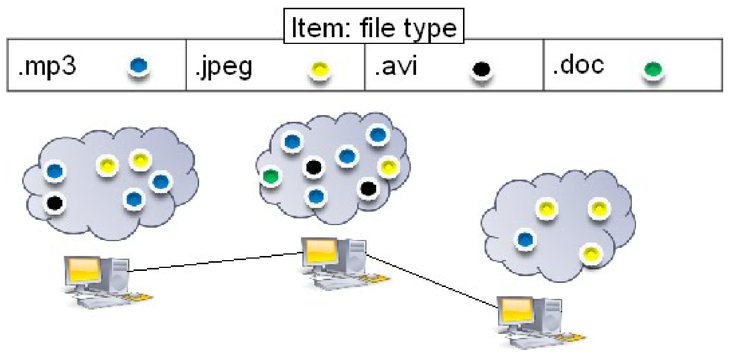
A **simulation model** is developed for ProFID protocol, which is a distributed protocol is developed to find frequent item set discovery in unstructured networks on Peersim.

Objectives

• Providing users to analyze the effects of the protocol and network parameters on different network topologies such as Barabasi-Albert, Erdos-Renyi etc.

• Providing users to do experiments and analysis on different algorithms:
ProFID, adaptive ProFID, hierarchical ProFID and Push-Sum.

ProFID: Protocol for Frequent Item Set Discovery



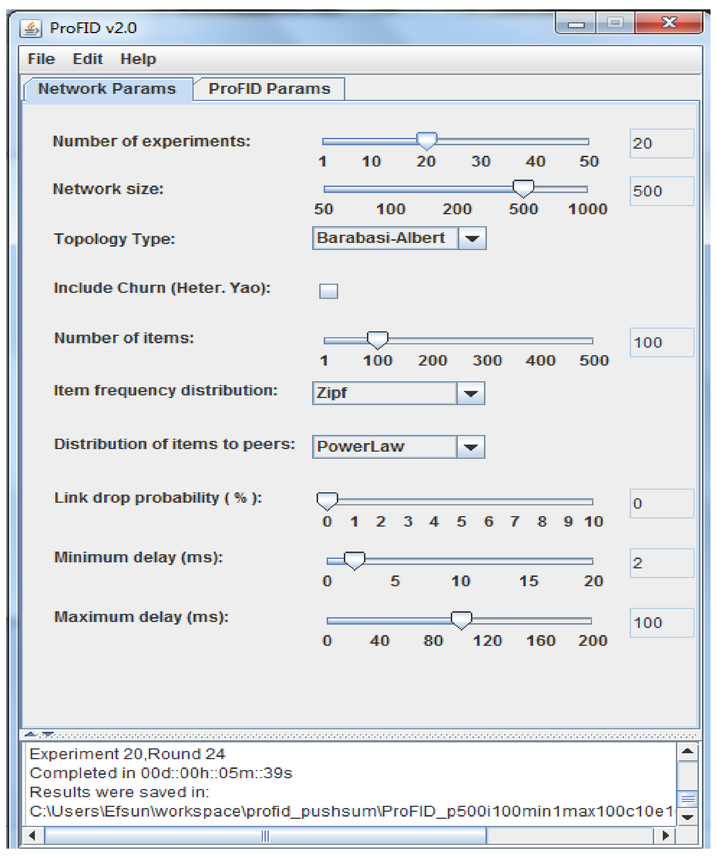
Which file types are frequent?

• Items with global frequencies above a threshold is detected.

• Supports various distributed applications such as cache management, military attack detection, worm detection, DDoS attack detection and topology optimization.

ProFID Toolkit

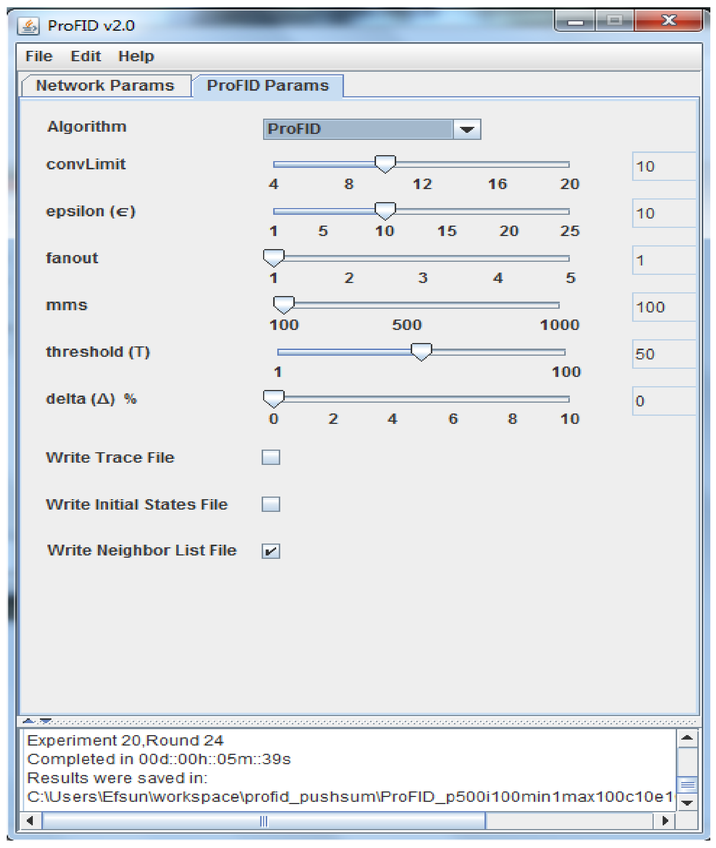
Network Parameters



• Network parameters and protocol parameters can be easily set from the interface.

• Experiments , completion time and destination folder is shown in the console.

Protocol Parameters



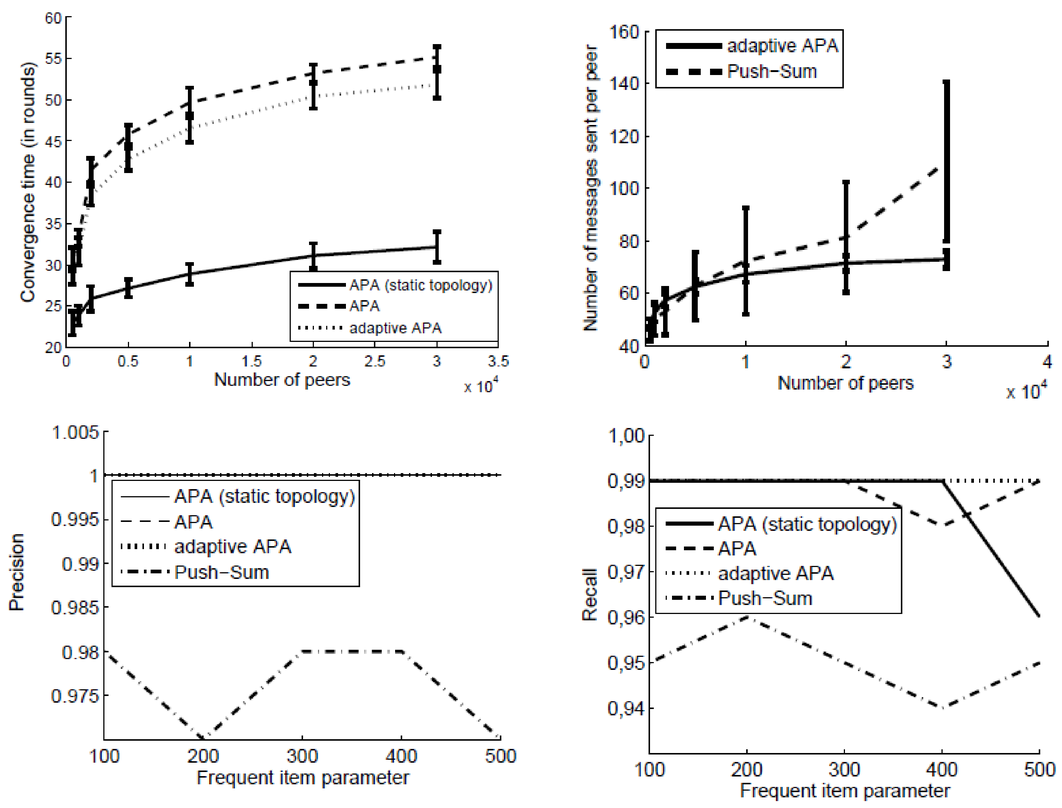
We focus on **performance metrics** :

Convergence time: measures how fast the algorithm converges

Number of messages sent per peer: measures the energy efficency of the algorithm

Precision / Recall: measures how accurate the actual and estimated frequent items based on true positives, false positives and false negatives.

Experimental Results



Conclusions

• Provide a toolkit for extensive analysis on large scale P2P networks for different type of frequent item discovery (FID) algorithms.

•Propose a distributed hierarchical gossip-based approach using dominating set algorithm

References

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