Biography of a Peer-to-Peer system: P-Grid

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Idea

- Self-organizing trie-based structured overlay network
- Exact queries, range queries, structured queries, etc.
- Local interactions and knowledge
- Load balancing and fault-tolerance
- Improving Data Access in P2P Systems,
  *IEEE Internet Computing Journal, Jan/Feb 2002*

Implementation

- Java, open-source (SourceForge)
- XML-based protocol with ZLIB compression
- Layered software architecture with APIs
- Gridella - file-sharing application with GUI
- Range queries in trie-structured overlays,
  *IEEE International Conference on Peer-to-Peer Computing, 2005*

Evaluation

- PlanetLab, a global-scale test bed
- Evaluation with different load distributions of:
  - Overlay construction algorithm
  - Exact and range queries
  - Robustness under network churn
- Measured properties: bandwidth consumption, messages, latency, success rates, load distribution, etc.
- Indexing data-oriented overlay networks,
  *International Conference on Very Large Databases, 2005*

Applications

- EU projects: discovery component and peer-to-peer search engine
- GridVine: a semantic overlay network for peer-to-peer data management
- Resource discovery in Grid computing environments
- Storing of probabilistically correlated data (e.g., Bayesian networks)
- An overlay network for resource discovery in Grids,
  *International Workshop on Grid and Peer-to-Peer Computing Impacts on Large Scale Heterogeneous Distributed Database Systems, 2005*

http://www.p-grid.org/