Decentralized Trust Management Based on the Reputation of Information Sources

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The problem

- Trust an identity (authentication) vs. trust a piece of information (integrity)
- Quantify the trust
- Trust management in a distributed system

Existing solutions

- Public key systems can binds credentials to identities, e.g., PKI, PGP, etc.
- Rating credits of identities, e.g., credits histories.

Our contributions

- ▶ Assign different integrity levels to agencies and their information
- ▶ Use mathematical model to integrate information from different sources
- ▶ Protocols to exchange information and evaluate credit of agencies
- ▶ Performance evaluation
- ▶ Integrity level analysis along the information path

Protocols

- ▶ Information without feedback
- ▶ Information with feedback
- ▶ Query for the quality of information
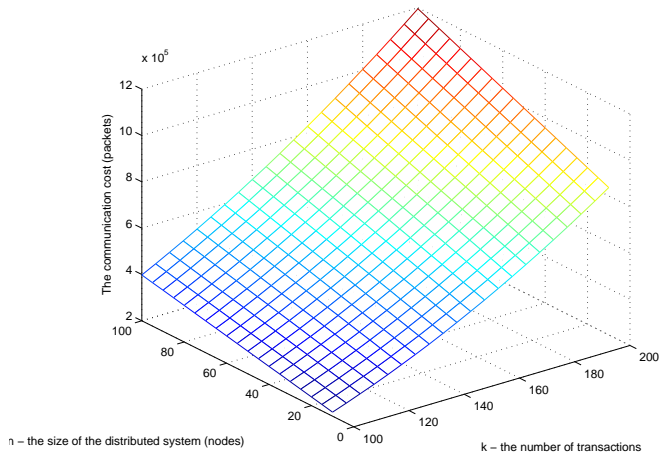- ▶ Ask for the reference periodically to give ratings to agents
- ▶ Collect information

Coalitions

- Set up a threshold m
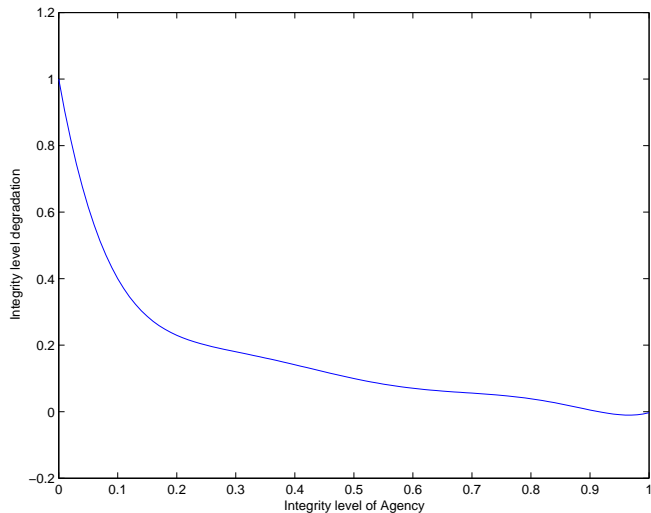- Get at least m good feedback from references to trust an agency

Communication costs to establish trust in a distributed system with $m = 4$
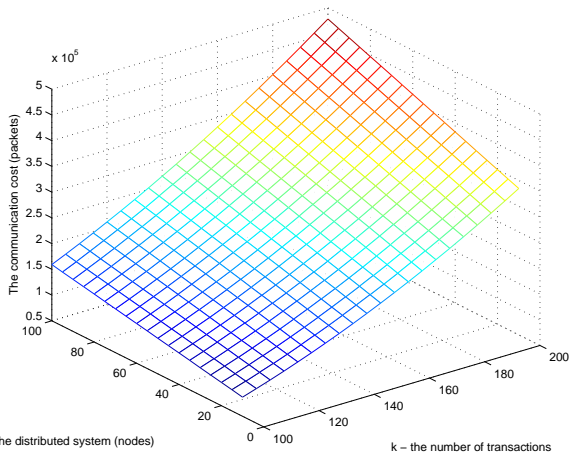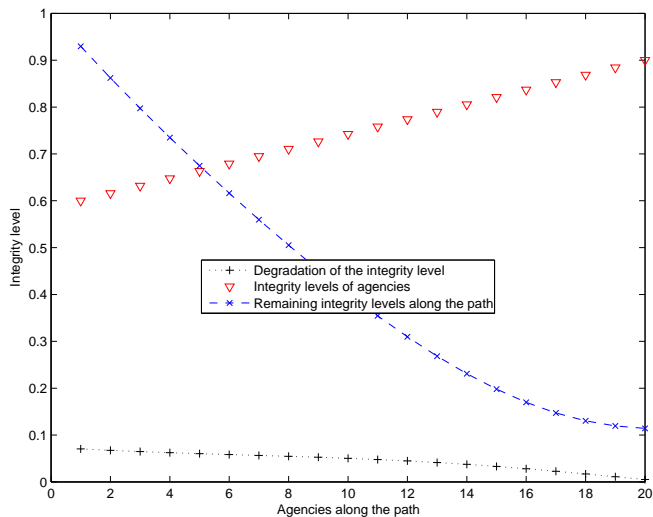
Communication costs to establish trust in a distributed system with $m = 10$

An example function of the degradation of integrity levels

An example of the degradation of integrity levels

Thanks!

Thanks and questions?