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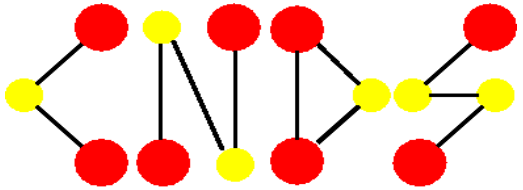

Distributed Case-based Reasoning for Fault Management

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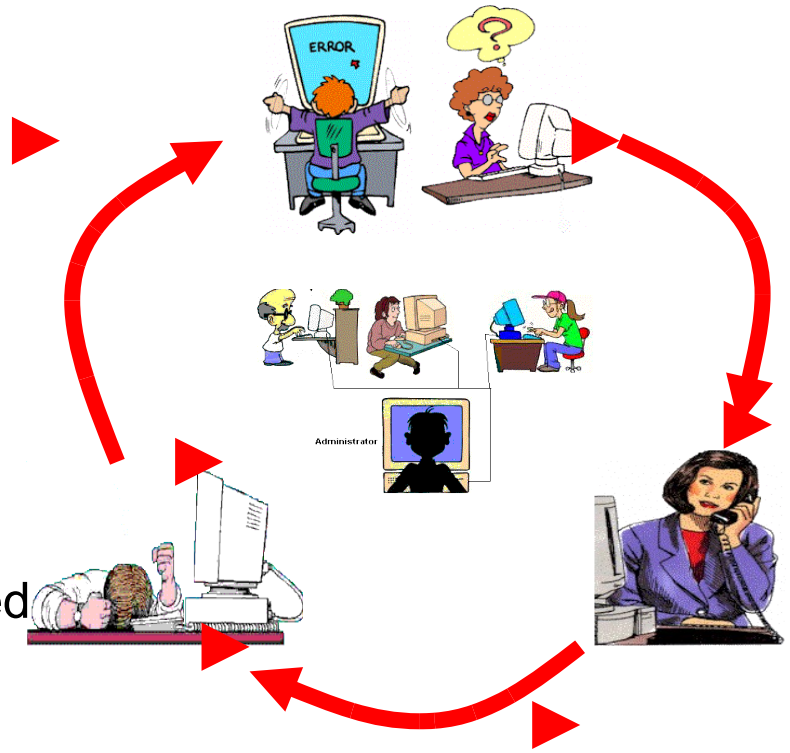
Research problem

- Fault resolution in large-scale and diverse communication systems is a challenge
  - high repair cost
  - service delay
- Fault resolution depends on operator's expertise and supporting tools
  - bug tracking systems
  - general search engines
- The demand of fault resolution is increased due to
  - Faults' complexity and difficulty
  - Software and services' dynamic change
  - Operator's limited capability



Fault management

Proposed Approach

- Research goal is to assist operators in finding solutions for faults

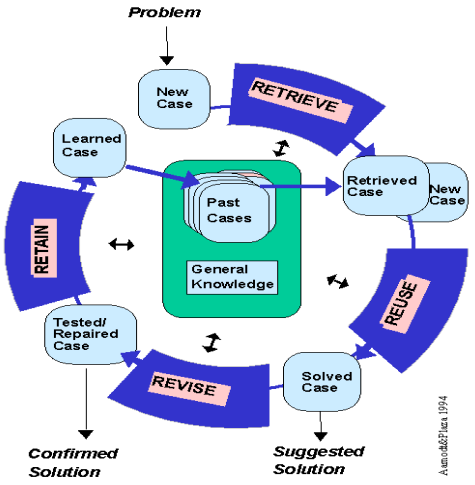
- Proposed approach focuses on a distributed case-based reasoning (CBR) which
  - explores fault knowledge sources in a decentralized environment
  - exploits problem-solving capability in case-based reasoning

Eureka!Eureka!

Difficulties

- Exploring various fault knowledge sources in a distributed environment to discover similar faults
- Representing faults to retrieve similar faults and their corresponding solutions from knowledge sources
- Reasoning on the retrieved solutions to propose new solutions adapting to the circumstances of new faults

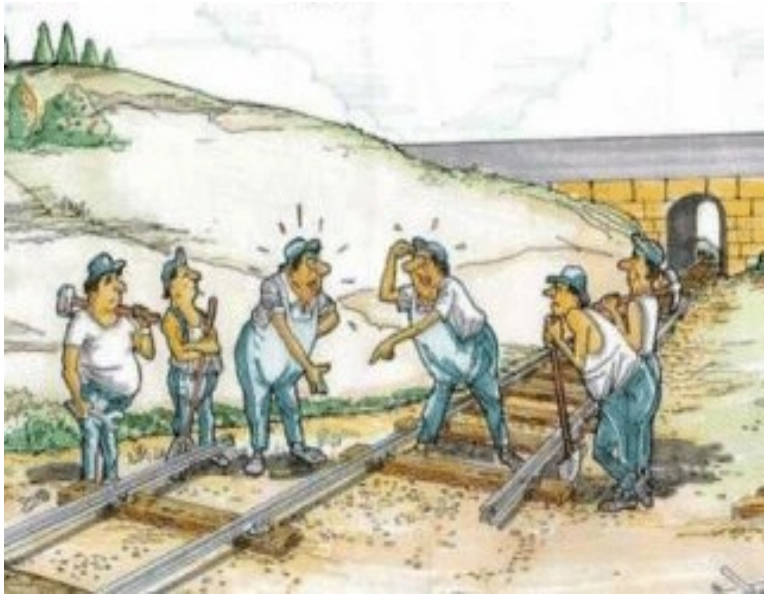
Peer-to-Peer



Case-based Reasoning

Preliminary Results

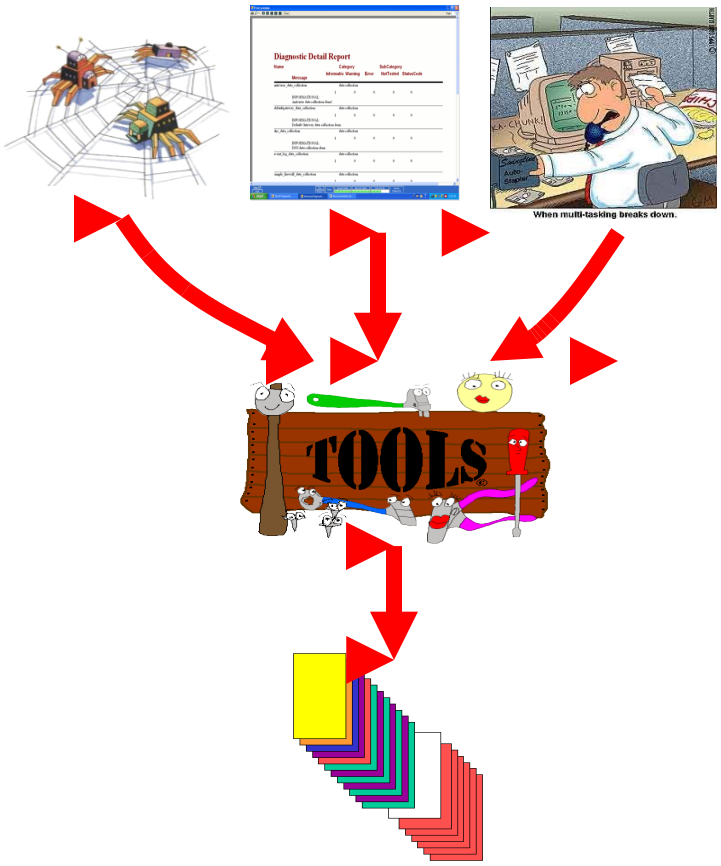
- A peer-to-peer (P2P) architecture which
  - integrates CBR engines into peers
  - allows peers to search similar faults from different sites
- A multi-vector representation which
  - exploits fault properties described in semi-structured data
- Reasoning on solutions and collecting realistic cases are work in progress



Preliminary Results

Future Work

- Build a repository of realistic fault cases
- Evaluate the proposed P2P architecture and multi-vector representation
- Study on the collaborative reasoning capability of peers
- Integrate components and evaluate the proposed system on PlanetLab



Building cases