Simulated Self Organisation of a Peer to Peer Awareness Network

The Historical Awareness Approach

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Introduction

Historical Awareness:

The complete context of an artefact’s creation, derived from a collection of heterogenous artefacts (source code, design etc) rather than a contextless view of a single artefact’s evolution.

Therefore, certain elements of information must be presented to the user in a non-intrusive manner:

- Details of previous artefact conflicts
- “Proximity” of recent user activity
- Artefacts related to current focus
- Any relevant change information
Goals

The awareness project has the following goals:

- To provide a contextual view of artefacts’ creation
- To experiment with a reflector-free distribution model for CSCW
  - Provides robustness
  - Ease of setup (flexibility, default local broadcast discovery)
- To provide integration with an existing development environment for evaluation
- Evaluation driven implementation.
Algorithm & Rationale

An example of the self-organisation algorithm:

Peer A \overset{\text{connect}}{\rightarrow} Peer B
Peer A \overset{\text{send details of A}}{\rightarrow} Peer B
Peer B \overset{\text{send details of A}}{\rightarrow} Peer C
Peer B \overset{\text{send details of A}}{\rightarrow} Peer D
Peer B \overset{\text{reconnect D}}{\rightarrow} Peer A
Peer A \overset{\text{disconnect}}{\leftrightarrow} Peer B
Peer A \overset{\text{connect}}{\rightarrow} Peer D

- This algorithm is iterative
- It is not immune to local minima
- However, it consequently requires no global state