**P3: Personal Power Plant**

**P2P Middleware for Transfer and Aggregation of PC Computational Resources**

P3 is middleware used for distributed computing that makes effective use of existing PCs. It enables engineers and scientists to harvest PC’s compute power of existing computers in their organization. It also enables outside contributors to participate in research projects that are too massive for a single organization to handle. Unlike conventional distributed computing projects, in P3 a “participant” means not only a “resource provider” but also a “resource user” because the participant both provides and uses the power.

- **PCs interacts with each other in a true P2P mode**
  - P3 utilizes JXTA, widely accepted P2P communication library. P2P concepts efficiently support P3:
    - **Discovery**: PCs dynamically discover each other and jobs without a centralized server.
    - **Peer Group**: PCs are grouped into job peer groups, where computers carry out code distribution, job control, and group communication for parallel computation.
    - **Overlay Network**: Enables end-to-end communication over NAT and firewall. It supports parallel processing in the message passing model.

**Future Plans**

- Integration of harnessed PCs into other kinds of Grid resources such as PC clusters and DBs. (in 6-18 months)
- Commercial dealings of collected resources. (in 2-5 years)

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