To Control and Revive P2P

The Future of Practical P2P Technology and Barriers to Growth

A Practical Perspective

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Ariel Networks, Inc. company Information

• About
  – A peer to peer (P2P) software vendor established in April/2001.
  – Led by former Lotus Notes engineers
  – A wholly owned subsidiary of Works Applications (JASDAQ:4329) from Jan/2005

• Products
  – Ariel Framework: P2P foundation library
  – Ariel ProjectA: Project communication tool on Ariel Framework.

• Location
  – Nakameguro3-3-2, EG Bldg.7F, Meguro-ku, Tokyo 153-0061

• URL
  – http://www.ariel-networks.com (Japanese only..)
P2P overview

• Anonymous file sharing P2P(AFS-P2P) brought impressions of bad or illegal software to P2P...
  – Uncontrollable
    – anonymous
  – Infringe a copyright
    – Music, Video, ..... 
  – Network bandwidth eater (on application layer)

• P2P is just a “technology” defining the communication between one peer and the other.
  – AFS-P2P is just one application of P2P technology.
  – P2P may supply solutions that Client/Server (C/S) cannot.
  – Stay calm down ... P2P is not magic like other technologies.
Data classifies P2P Applications

• Static Common Data
  – The data exist all over the internet unanimously. They are rarely modified.
  – Napster
  – Gnutella

• Static Local Data
  – The data generated or created by a person or a group. They are used regionally and modified.
  – Groove Virtual Office
  – Ariel ProjectA (Japanese only)

• Real-time Data
  – The data not stored to the disk.
  – Skype
Overlay network

- a.k.a. Abstraction of IP
- Built on application layer
- Controllable by software/PC, or programmable
The gap between “Anonymous File Sharing P2P” and “Business P2P”

- gap1: Management
- gap2: Reliability
- gap3: Security
gap1: Management

- **AFS-P2P hates “being managed”**.
  - no manager / do it myself
  - Management function is necessary for business use.

- **Requires for enterprise and solutions**
  - **Deployment**
    - Install / Patch / Upgrade must be applied to each and every PC in the office.
      - [solution] auto upgrade manager
  - **License Management**
    - P2P applications work on local and decentralized.
      - [solution] (PKI based) distributed authorize system
  - **Network topology**
    - AFS-P2P’s overlay network is flat.
      - [solution] sub P2P network
        - ex. P2P switching node (Ariel Networks)
        - ex. Enterprise Relay Server (Groove Networks)
gap2: Reliability

- AFS-P2P : “Lucky, if I can get the file for free!”

- Business P2P requires reliability as C/S.
  - Larger makes more stable
  - Fallback node
    - Fixed, predefined, fallback node must exists in the system.
gap3: Security

- **Private information, secret information.**
  - AFS-P2P deal only public files.
  - Inter-Company communications require higher level of security.
  - Business P2P must imply access control.
  - It’s difficult to restrict routing path. Contents itself should have ACL.
    - **[solution]** PKI based encryption and electrical signature.
    - **[solution]** Enterprise audit server (Groove)

- **Store data on local PC** (solution for “leaving notebook PC behind”)
  - Difficulty to stop distributed data a.s.a.p. (tradeoff with usability of offline use)
    - **[solution]** The use of data is restricted to online (under the authorization of server)
    - **[solution]** access right with expiration date. Expired user must access the server and request for the extension the expiration date.
Example. Ariel ProjectA Corporate Edition

- **Distributed Authorizer**
  - Issue PKI certificate
  - The certificate will expire.
  - User need to connect to the server and extend the certificate.

- **P2P Switching node**
  - A switch on P2P network
  - Separates P2P network and generates sub-P2P network.
  - Deploy each site and supply efficient connection.

- **Upgrade manager**
  - Patch, newer version
  - (option) Corporate news delivery
Challenges: P2P must overcome

1. More practical system -> Hybrid P2P is strongly recommended.
   - “Too academic” can be just a toy for end-users.
   - System environment
     - So many low-spec PCs in enterprise
       - narrow band width for uploading (not good for “edge cache”)  
       - low-spec CPU
     - 24h*7days online
     - Local installation required (<= IS loves Web application)

2. Concessions with anti-P2P
   - Copyright problem
     - Use C/S DRM (not P2P)
   - for Network manager
     - P2P Traffic Controller
     - Port forwarding / UPnP
   - for System Manager (IS division)
     - Audit function (with C/S system)
     - Install or upgrade to local PC

3. Killer Application
   - Realized or do it lower cost only by P2P.
Feature and Merit of P2P

• Decentralized network architecture
  – Anonymous routing path (example, “onion routing”)
  – Scalability
  – Redundancy

• Distribution
  – Proven by AFS-P2P.
  – Combination of C/S DRM. (P2P just distributes data.)

• Run on local PC
  – Bridge of Online and Offline
    • Add asynchronous function to Web application (Web site).
      – Download (BitTorrent), Kontiki DMS
      – Scheduled task

• Apply P2P technologies to servers
  – 24hours*7days online
  – Inter-server connectivity solution
Thank you.

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