To Control and Revive P2P

The Future of Practical P2P Technology and Barriers to Growth

A Practical Perspective

Product Manager

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Ariel Networks, Inc. company Information

- About
  - A peer to peer (P2P) software vender 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

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- 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

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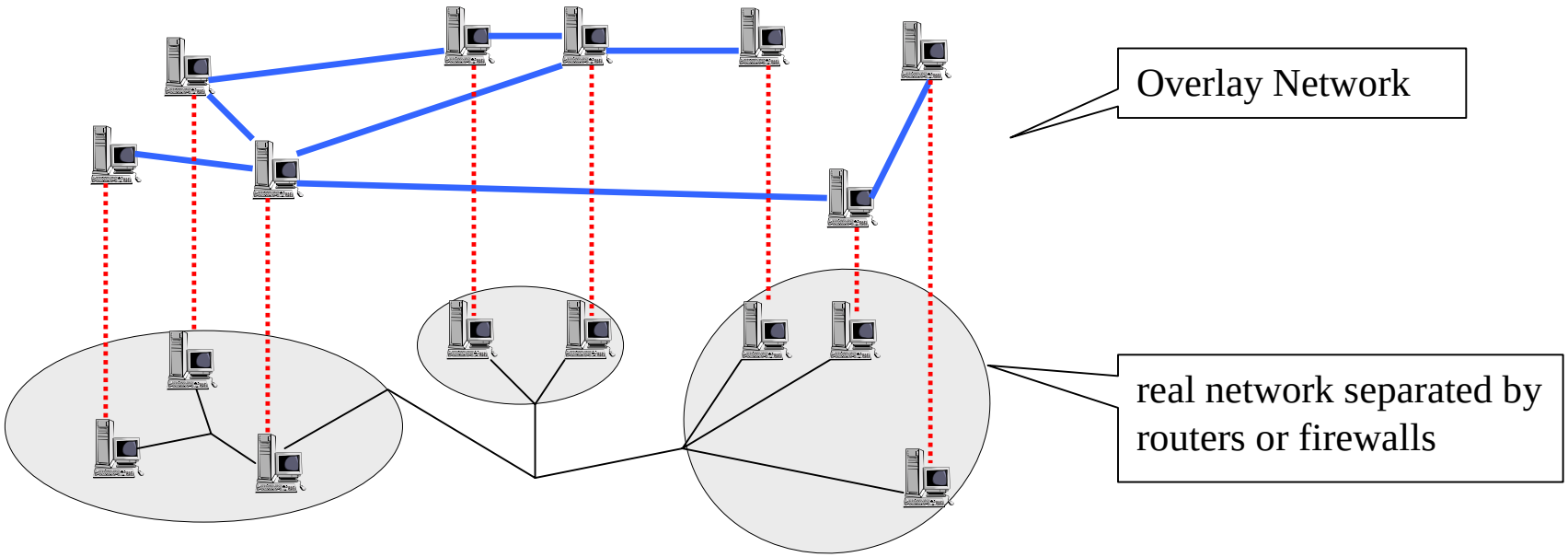
- Static Common Data
  - The data exist all over the internet unanimously. They are rarely modified.
  - Napster
  - Gnutella
- Static Local Data
  - The data generated or created by a person or a group. They are used regionally and modified.
  - Groove Virtual Office
  - Ariel ProjectA (Japanese only)
- 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”

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

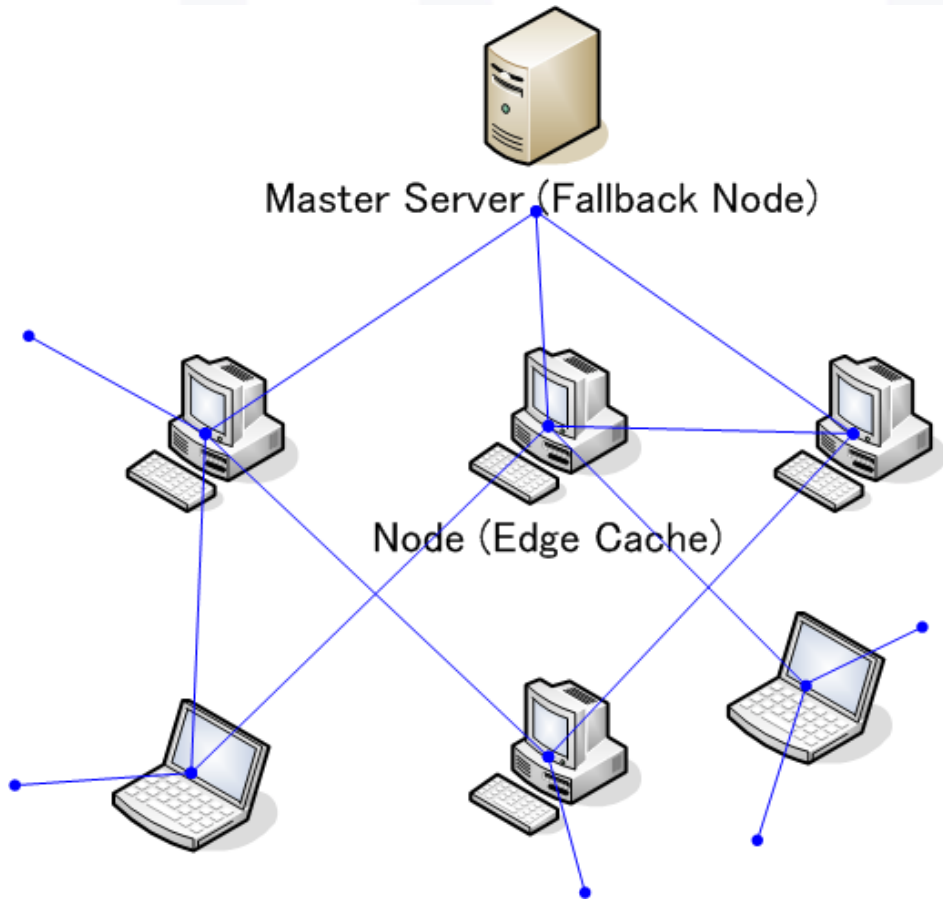
gap1: Management

- **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.

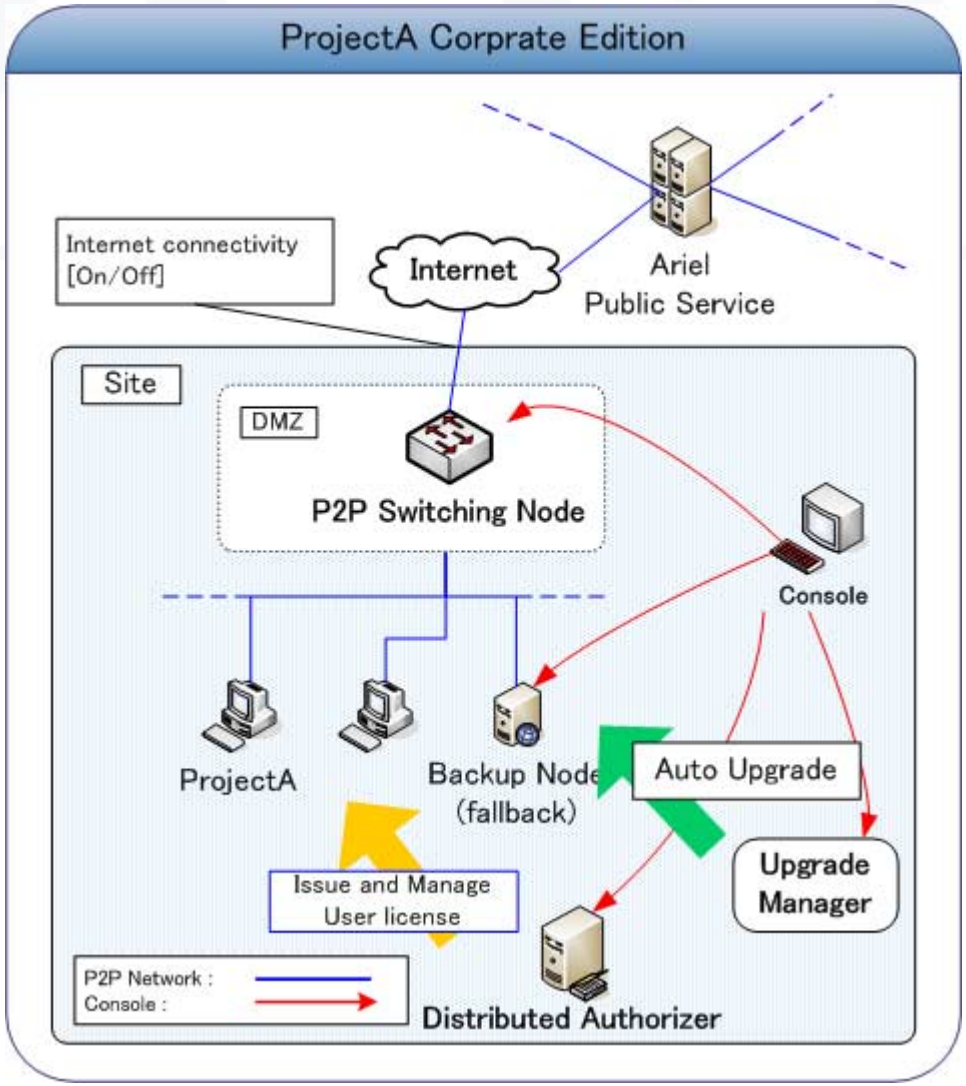


gap3: Security

- **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

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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

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- 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

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Thank you.

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