Publish/Subscribe Architectures: Attractions, Problems and Lessons

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Key Attractions of Publish/Subscribe Architectures

A natural choice for a huge variety of enterprise, consumer, government and military content-delivery applications

- Asynchronous Message Delivery
- Anonymous Message Delivery
- Multicast Message Delivery
- Expressive Filtering

Remaining Problems (I)

- **Asynchronous Message Delivery**
  - Bandwidth management and control
  - Denial of service
- **Anonymous Message Delivery**
  - Authentication
  - Trust
- **Multicast Message Delivery**
  - Inadequate deployment of multicast IP
  - Conservatism of ISPs

Remaining Problems (II)

- Expressive Filtering
  - Exploiting filters for routing and forwarding
  - Disruption to filter propagation due to mobility
- Applications
  - Reformulating "pull" applications as "push"
  - Delivering large payloads
    - Images
    - Audio
    - Video
  - Training users about appropriate/inappropriate uses

Key Lesson: Architecture Matters!

- A few years ago, *push technology* was all the rage for content delivery
  - But it never fulfilled its promise
  - Industry observers concluded "push is dead"
- Lesson: the technologies paid insufficient attention to *architectural issues*
  - Example: PointCast
    - Proprietary content source
    - Proprietary content delivery client
    - Centralized server architecture