

The Business of P2P



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What is P2P anyway?



- P2P is different things to different people
 - It is sharing files or stealing music
 - It is sharing CPU and storage resources
 - It is distributed search and indexing
 - It is instant messaging
 - It is serverless collaborative work (and play)
 - It is Web Services
 - It is “pervasive” devices talking with one another
- What it isn't ...
 - It isn't a specific architecture or technology
 - It isn't a business model

Examples



- CPU sharing
 - Applied Metacomputing, Centrata, Datasynapse, Distributed.net, Distributed Science, Entropia, Mithral, Parabon, PlatformComputing, Porivo, ProcessTree Network, United Devices
- File sharing (Internet and Intranet)
 - Aimster, Clip2, CuteMX, Docster, FileNavigator, Free Haven, Freenet, Gnutella, Hotline Communications, Interfriendly, KaZaA, Mojo Nation, Napster, Ohaha, Opennap, Publius, Spin Friendly
 - Gigabeat, Hook R, Interfriendly, Jungle Monkey, Mango, myCIO, NextPage, Omnishift, Pointerra
- File search
 - InfraSearch (now Sun), OpenCOLA, Plebio, Thinkstream
- Collaboration
 - 24Link, Enginia, eZ, Groove, Interbind

Examples (continued)



- Instant messaging
 - AIM, ICQ, Jabber, DoCoMo, Nokia, ...
- Marketplaces
 - EPIT, LiquidNet, WorldStreet, Lightshare (a P2P eBay)
- Servers, devices and agents as peers
 - Bluetooth, Endeavors Technology, Jini, .NET, UDDI
- Messaging frameworks, application platforms & tools
 - Aimster, Biz2Peer, Elepar, Centerspan, Ikimbo, Jabber, 100x, Xdegrees
- Multitplayer gaming
 - CenterSpan, 2am, Xbox

So, how do you define P2P?



- A network of collaborating machines with at least one of the following characteristics:
 - The network relies on the active collaboration of edge-of-the-net devices (PCs, cell-phones, PDAs, game boxes, etc.). Peers benefit directly from the participation of other peers rather than just from the server.
 - Participating machines in the network act in some sense as both clients and servers.
 - Users of a P2P application are aware of each other. That is, the P2P network creates a sense of a crowd.

How is the P2P Web different?

	Client-server	P2P
Network traffic	asymmetric, e.g., cable modem, ADSL	symmetric (threatens cable & ADSL)
Intellectual property	under the control of the server	under the control of each and every peer (threatens copyright)
Intranet control	firewalls protect servers, port 80 used by Web clients	firewalls restrict peer behavior, port 80 subverted
Addressing	primarily static DNS, Network Address Translation (NAT) for clients is transparent	uses dynamic real-time registries in place of DNS, NAT can be restrictive

P2P in the Enterprise: Who's in Control?



- IT Managers want and need to keep some control
 - Many legitimate reasons -- security, protecting intellectual property, bandwidth optimization, infrastructure costs
 - ...that lead to a cultural preference for tight control
- But can they?
 - Viral marketing may bring P2P in "under the radar"
 - Firewalls -- can they cope?

Analyst Predictions for P2P



- IDC - 23.6% of large corporations will install an instant messaging system in the next year.
- Gartner - By 2002, >50% of global Internet users will regularly sign on to at least 2 P2P Internet applications
- Forrester - By 2002, 3 million households will use P2P applications to make their digital photos available to family and friends.
- Forrester - By 2004, 33% of the online population will use P2P services for storing and retrieving personal data.
- Forrester - By 2005, P2P services will come bundled in premium broadband fees and personal information-sharing applications from Adobe, Palm, and AOL.

Winners and Losers: The Power of Positive Feedback



- P2P models benefit from network effects -- each new peer makes a network of peers more valuable
- The winners will be decided by positive feedback effects
- Network effects generate a winner-take-all dynamic
- Factors that confer competitive advantage:
 - Software distribution channels
 - Real-time "presence" registries
 - Payment models

The Importance of Distribution Channels



- Voluntary download works in some cases
 - Napster found the lure of free music
 - SETI@home found the lure of a cool project
 - Instant messaging found the lure of communication
 - OpenCOLA may find many volunteers among eBay users
 - How many others will succeed by voluntary download?
- “Push” distribution will dominate in most cases
 - AOL, and other ISPs can include P2P software with their access software
 - Microsoft, Linux, and Apple can include it with the OS (or with any other ubiquitous software such as a browser)
 - Device manufacturers can include it in the device (Compaq iPAQ, cell phones, PDAs, game boxes, printers, digital cameras, mp3 players)

The Importance of the Registry

- The key issue is knowing which machines are on line and how to send messages to them (their current IP address)
- “Pure” P2P networks use fully distributed mechanisms
- Hybrid networks use a registry -- peers actively notify a registry when they join the network
- The biggest registry is the most valuable registry
 - AOL Instant Messenger has 80 - 130 million
 - Napster has nearly 60 million
 - No one else is even close
- Push distribution can “hardwire” the registry
 - Cellphones, PDAs, etc. easy to hardwire
 - Microsoft’s Windows, .NET, and/or “Hailstorm” can do likewise for PCs

The Importance of the Payment Model



- Eyeballs aren't generating as much revenue
 - Web advertising is faltering
 - P2P applications don't necessarily have a UI anyway
- Per click micropayments?
 - Micropayment systems aren't mature
 - Users haven't accepted the idea
- Monthly fees
 - Phone companies, cable companies, and ISPs already have them -- it's easy for them to add a P2P charge
 - Everyone else has to gain acceptance of another monthly bill -- a difficult task

Conclusions



- P2P is a sociological/economic phenomenon, not a new technology
- Peer-to-peer is the successor to the client-server Web
 - but...don't panic, the client-server Web isn't going away for a long time, if ever
- Peer-to-peer will continue to grow
 - there are more than 120 start up companies already
 - Next 12-18 months growth will be primarily in IM, file sharing, and collaboration
 - Will CPU sharing, search and Web services grow as rapidly?
- The winners will ride network effects. They'll probably be the ones with good distribution, viable payment models, and the biggest registries
- Today it is a PC phenomenon ... tomorrow it is a billion pervasive devices