HomeViews

Geambasu et al., 2007

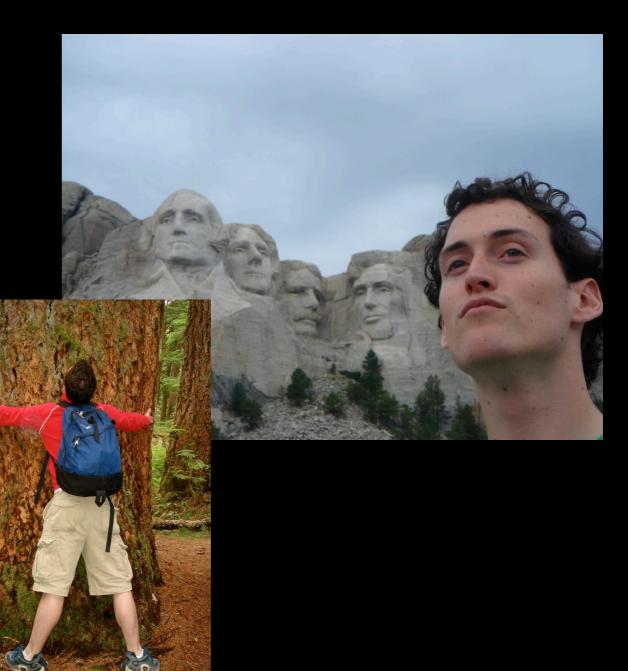
Presented by Jeremy Handcock

Motivation

- We have a lot of personal digital data
- Existing solutions for organizing and sharing aren't ideal

Typical Scenario





Existing Solutions: Sharing

- One must manually upload content to centralized repository
- Centralized repositories typically require registration for new users
- Inevitably you end up with multiple copies
- Dynamic data isn't supported

Existing Solutions: Organizing

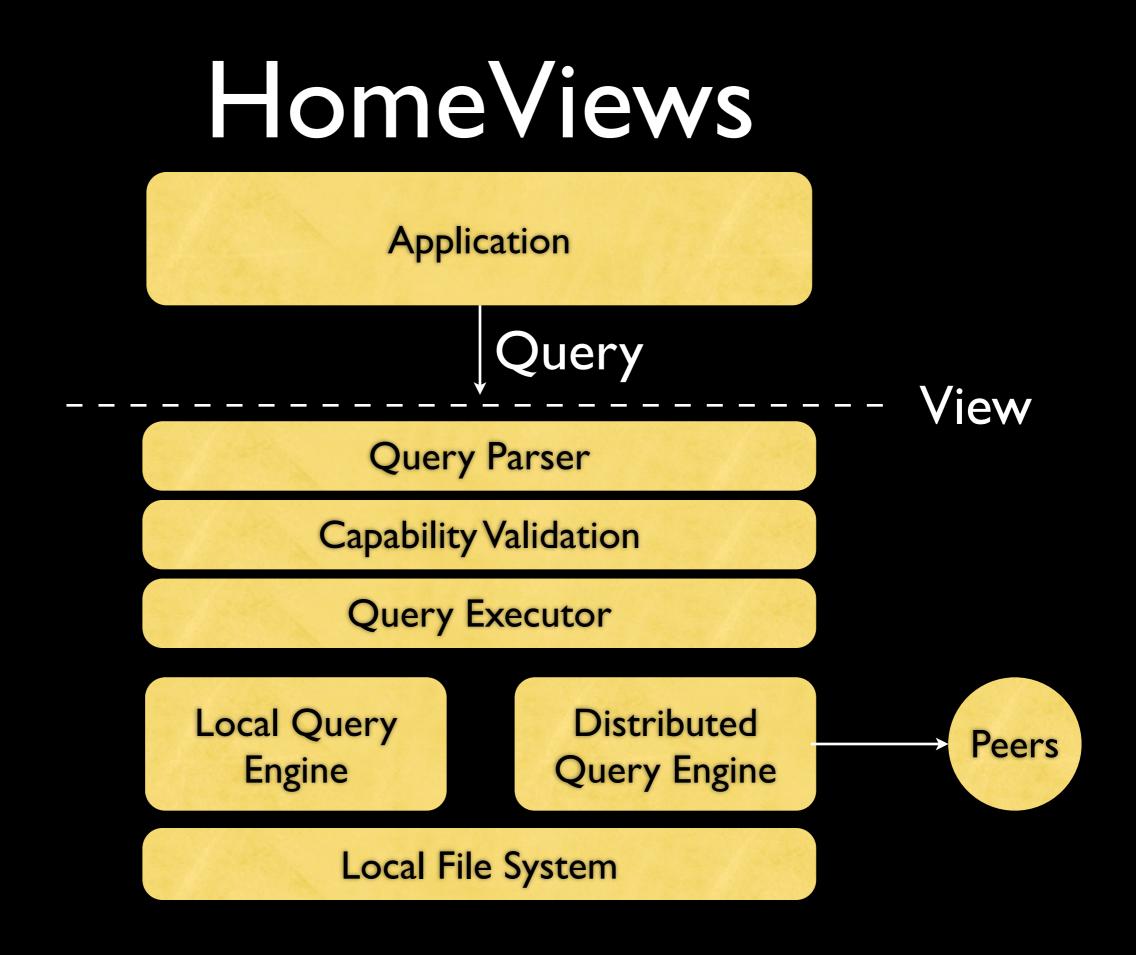
- Desktop search tools
- Create abstract data views or smart folders
- Requires metadata for non-textual objects

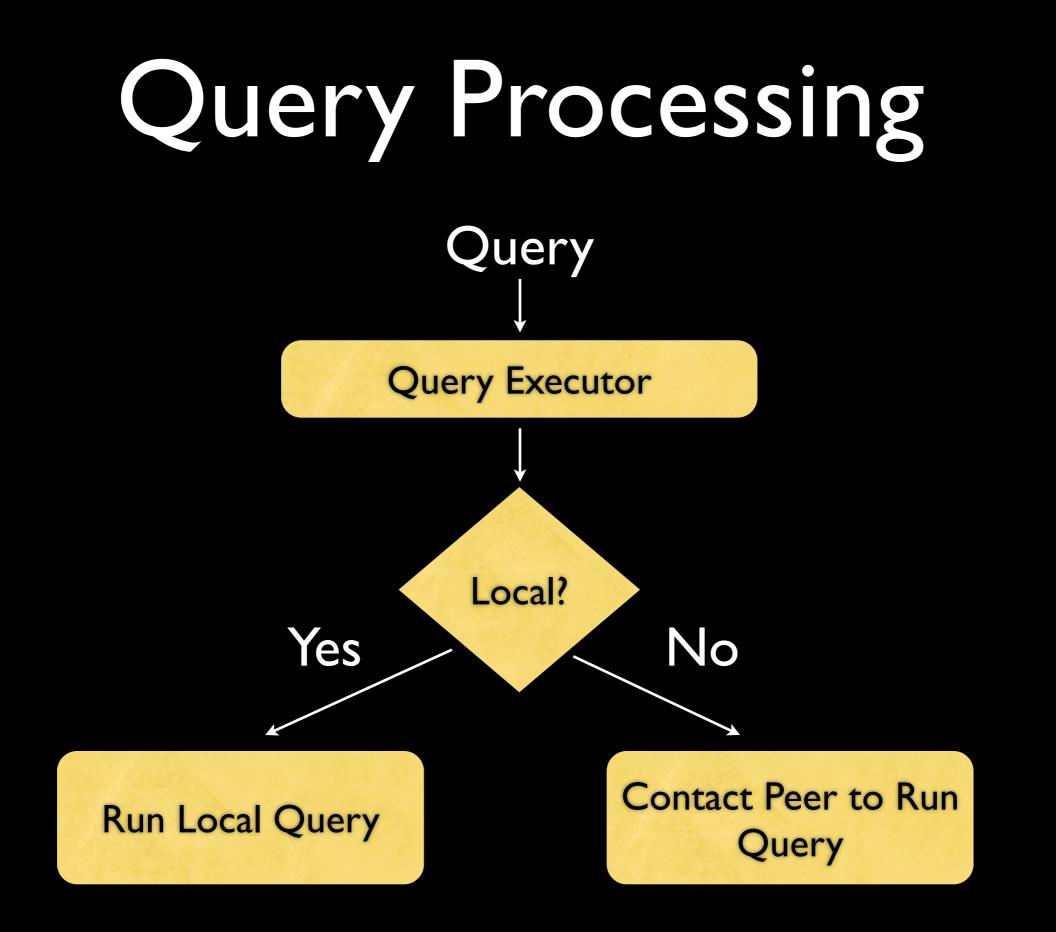
Existing Solutions: Organizing

00			\Box			
]	Q Sea	attle	8	
▶ DEVICES	Search: This	Mac "jeremy"	Contents File Name		Save +)
► SHARED	Name		Kind	 Last Op 	ened	
	c patch-	src-oix-ckp_osx.c	C Source File	January	25, 2007, 9:46 PM	1
▶ PLACES	🚞 seattle	home	Folder	26-No	v-07, 1:37 AM	-
▼ SEARCH FOR	🚞 seattle	recruiting trip	Folder	June 30	0, 2007, 2:11 AM	
🕒 Today	🖻 email.	html	HTML Document	March	1, 2006, 3:51 AM	
(L) Yesterday	🖻 format	d5.htm	HTML Document	August	: 13, 2003, 2:31 PM	
Past Week	📄 itinera	ry.html	HTML Document	16-No	v-07, 8:06 AM	
	🖻 itinera	ry.html	HTML Document	March	1, 2006, 3:51 AM	
All Images	📄 itinera	ry2.html	HTML Document	March	1, 2006, 3:51 AM	
All Movies	🖻 Old-St	yle ASCII Property Lists	HTML document	August	31, 2007, 7:15 PM	
All Documents	🖻 Search	ing an Address Book	HTML document	August	: 31, 2007, 7:12 PM	
	n expension	se report candidate.xls	Microsoft Excel Documer	nt March	1, 2006, 3:51 AM	
	n expension	se report candidate.xls	Microsoft Excel workbool	k 10-No	v-07, 10:23 AM	
	📄 Presen	tation.ppt	Microsoft Pot Documer	nt March	1, 2006, 3:20 AM	Ă
	m MyDoo	ument.m	Objective-C Source File	1-Dec-	-07, 7:27 PM	۳
		*******		*****) + +	

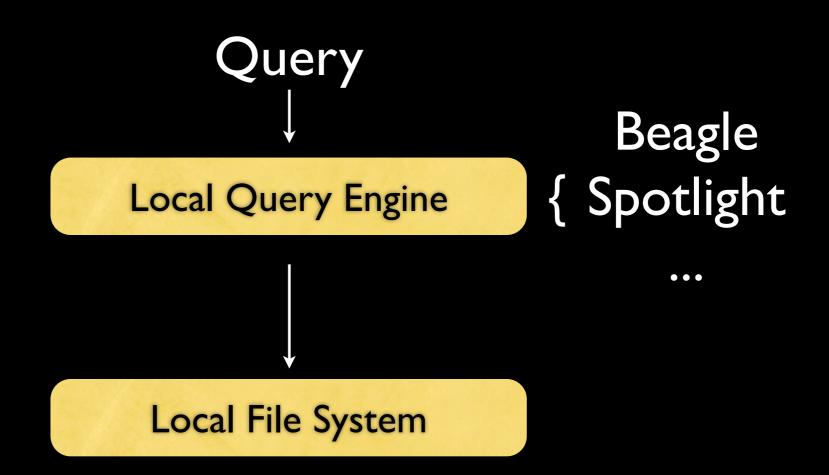
Idea!

- Decentralize data using P2P
- Share data using location-independent abstract views
- Provide lightweight access control
- Put it all in a middleware framework

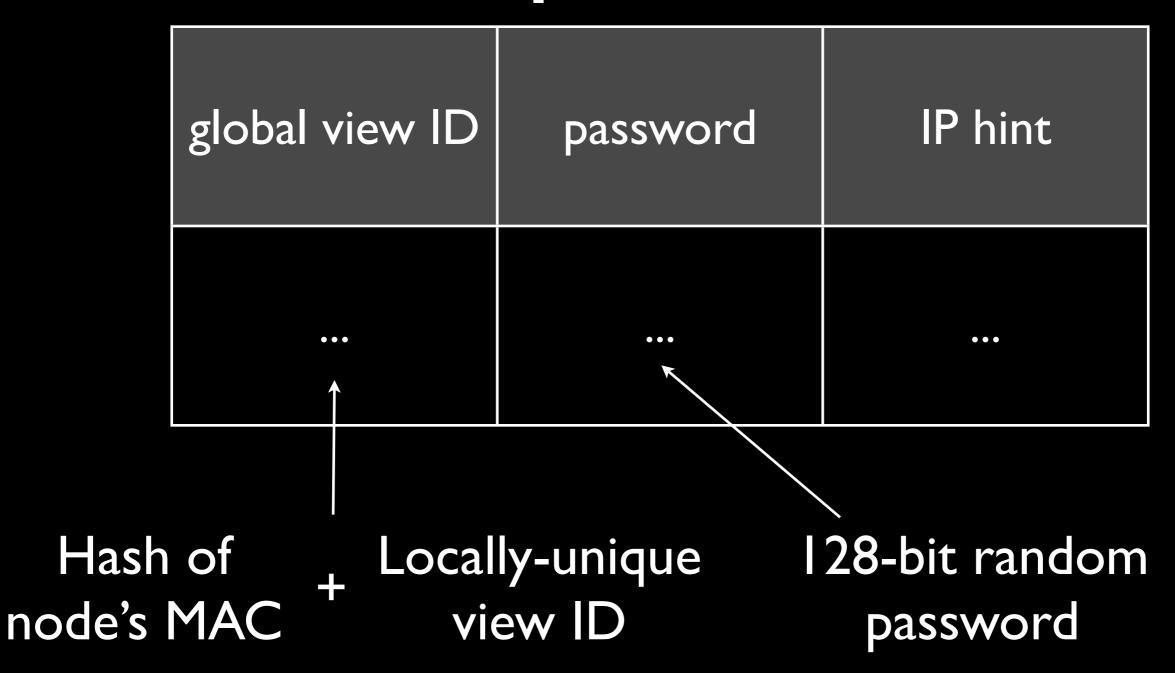




Query Processing



- Associated with a view
- Self-authenticating unit of permission
- Capabilities unforgeable with high probability
- Used in global naming and routing



- Capability provides location information
- IP hint hopefully points to node where capability is defined
- When IP Hint fails, use a DHT (Chord) to locate the content

- Capability could be represented as a simple "token"
- Distributing capabilities is annoying, but relatively easy
- Revocation is easy

- Is this an appropriate model for sharing personal digital data?
- Do capabilities provide sufficient security?

Queries

- Extension of SQL
- Fundamental difference: relations replaced with capabilities
- Define a capability by creating a view
- Base capability provides access to all files

Queries:Views

CREATE VIEW MyFiles2007 AS SELECT * FROM BaseCapability WHERE createDate > '2007-01-01' AND createDate < '2008-<u>01-01</u>'

New capability: Jeremy2007

Queries: Restrictions

RESTRICT Jeremy2007 RIGHTS SELECT

→ **New capability:** Jeremy2007_RO

Queries: Selections

SELECT * FROM Jeremy2007_RO
WHERE fileType = 'image'

Queries: Complex Views

CREATE VIEW MyFriendMovies2007 AS

SELECT * FROM Jeremy2007_RO WHERE fileType = 'movie' UNION

SELECT * FROM Rob2007_RO
WHERE fileType = 'movie'

New capability: FriendMovies2007

Evaluation: Applications

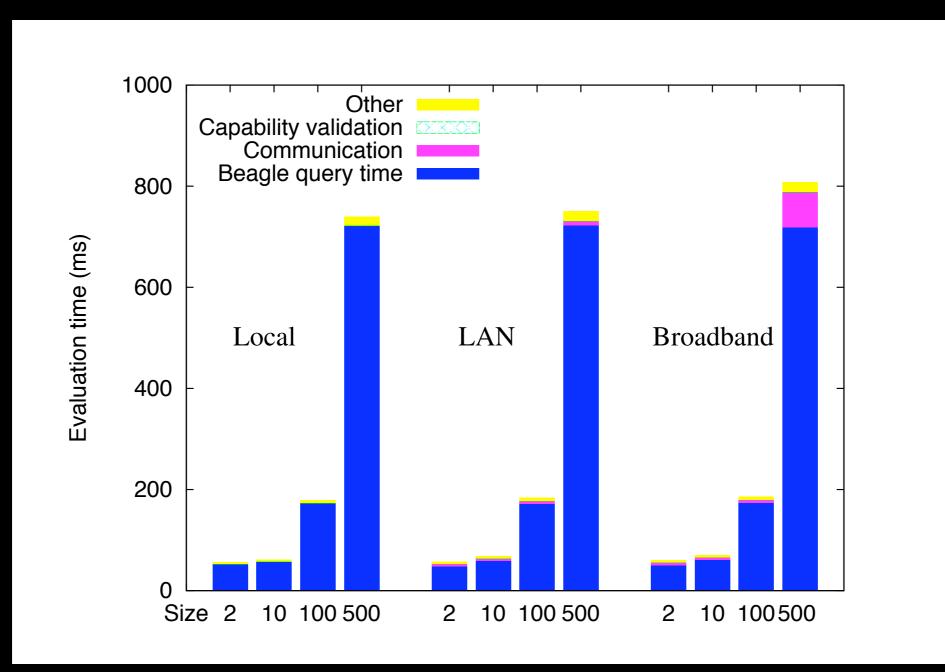
- Simple read-only filesystem
- Photo gallery

Evaluation: Applications

0

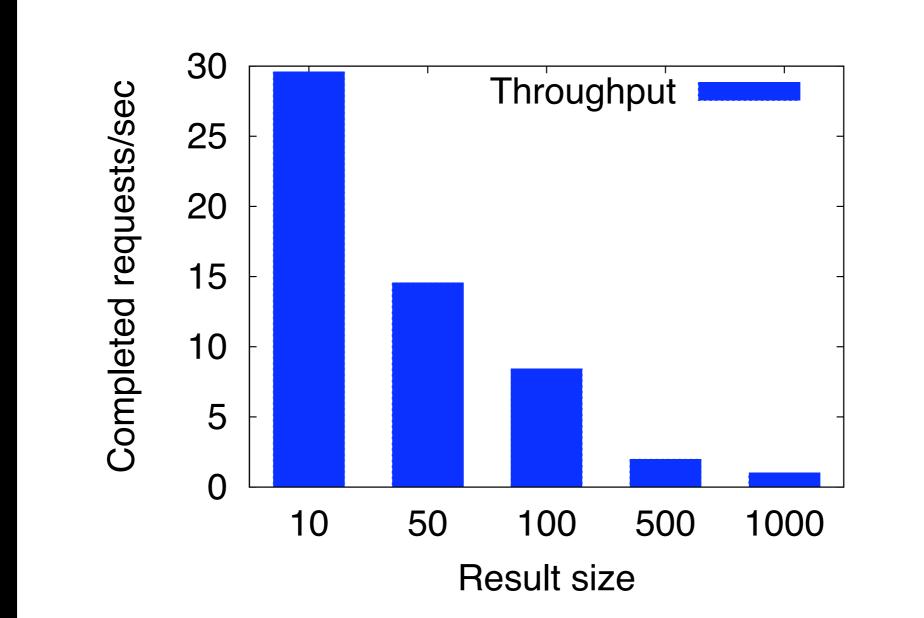
0		Photos		0
Photos			Photos	
2007				
	Track Star Party 12 Images		Back in Toronto 9 Images	
	Seattle to Toronto Road Trip 23 Images		Olympic Peninsula 52 Images	
	Summer in BC 22 Images		Lazy Seattle Weekend 11 Images	

Evaluation: Numbers



Result Size

Evaluation: Numbers



Applicability to OSNs

- Middleware platform for OSN applications to share data between users: ie.
 PeerSpective, Facebook
- Capability management could be hidden

Applicability to OSNs

Danger: lack of explicit sharing action and dynamic data

Conclusions

- P2P not always appropriate model for sharing personal digital data
- Complex views offer opportunities for poor performance
- We still don't have an ideal solution