Toward Cloud Based Collaboration Services

David Banks, John Erickson, Michael Rhodes
Web Services and Systems Lab, HP Labs Bristol

Agenda

- Introduction and Motivation
- Fractal Project Overview
  - A vision of cloud based collaboration
  - A content spaces and active behaviors
- Fractal Conceptual Prototype
- Discussion
  - Requirements for large scale multi-tenancy
  - Related Work
  - Further information

Introduction and Motivation

- The way that businesses work is changing…
  - Organizations are becoming more specialized
  - Increased outsourcing of IT applications to reduce costs
  - Social Web technologies are eroding organizational silos
  - Employees (users) are increasingly Internet savvy
- These trends are driving the next generation of collaboration tools…
  - Lightweight
  - Cloud-based
  - Effective within and between organizations
  - Put the user, rather than the IT dept, at the centre and in control
- The Fractal Project at HP Labs Bristol was established in May 2009 to explore this space.

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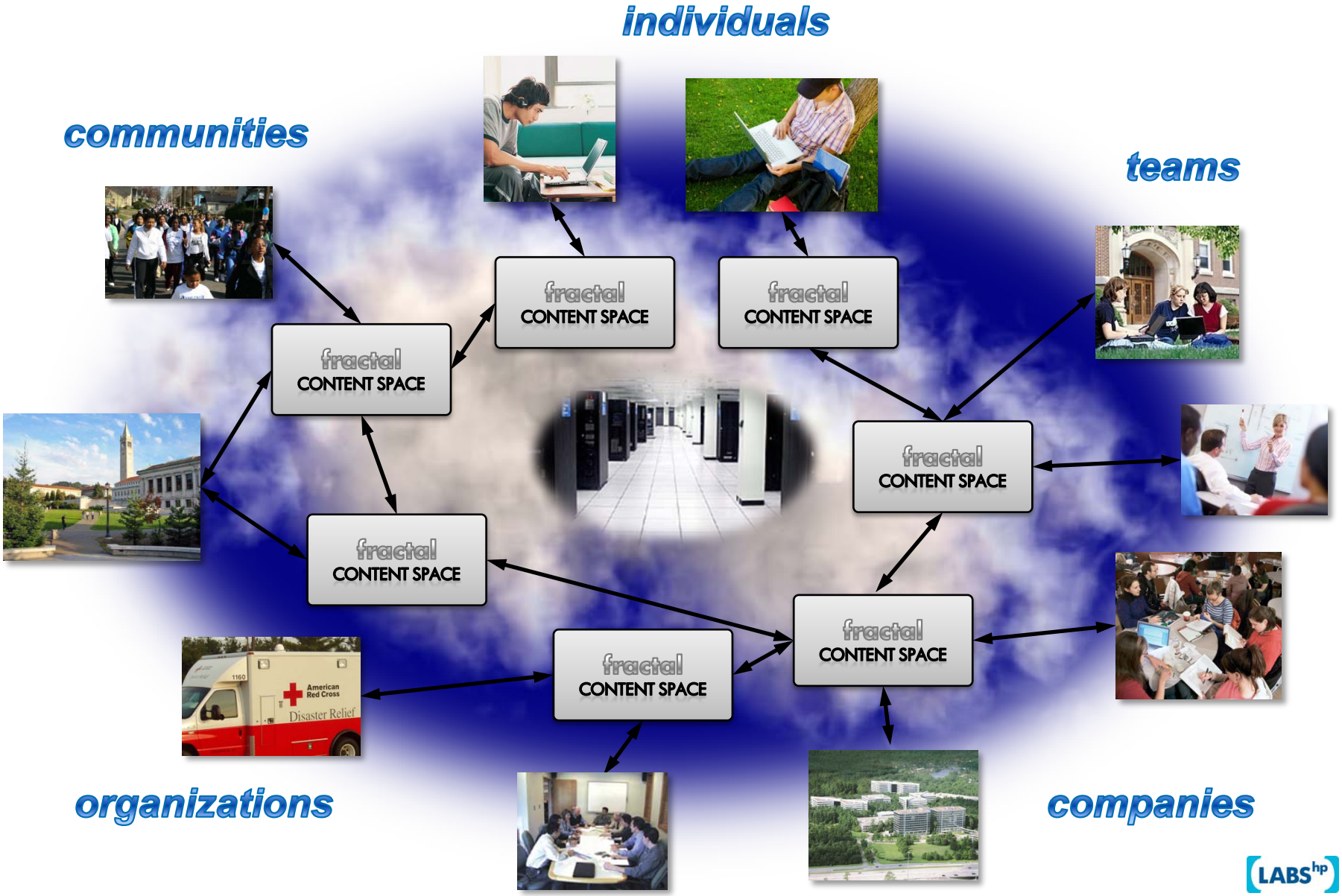
Fractal Vision: an Open Cloud-based Collaboration Platform



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Fractal Content Spaces

organizations
communities
companies
individuals
teams
annotate
organize
archive
browse
preserve
vizualize
tag
customize
collaborate
search
discuss

Google Calendar
snapfish
a service of hp
twitter
Technorati
Who's saying what. Right now.

peer services

fractal CONTENT SPACE
fractal CONTENT SPACE
fractal CONTENT SPACE

peer content spaces

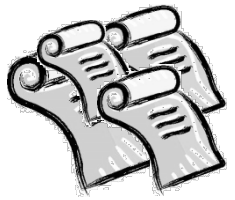
Human Interaction Tools

Integration

fractal
CONTENT SPACE

Behavior

Content and Metadata



policies

active behaviors

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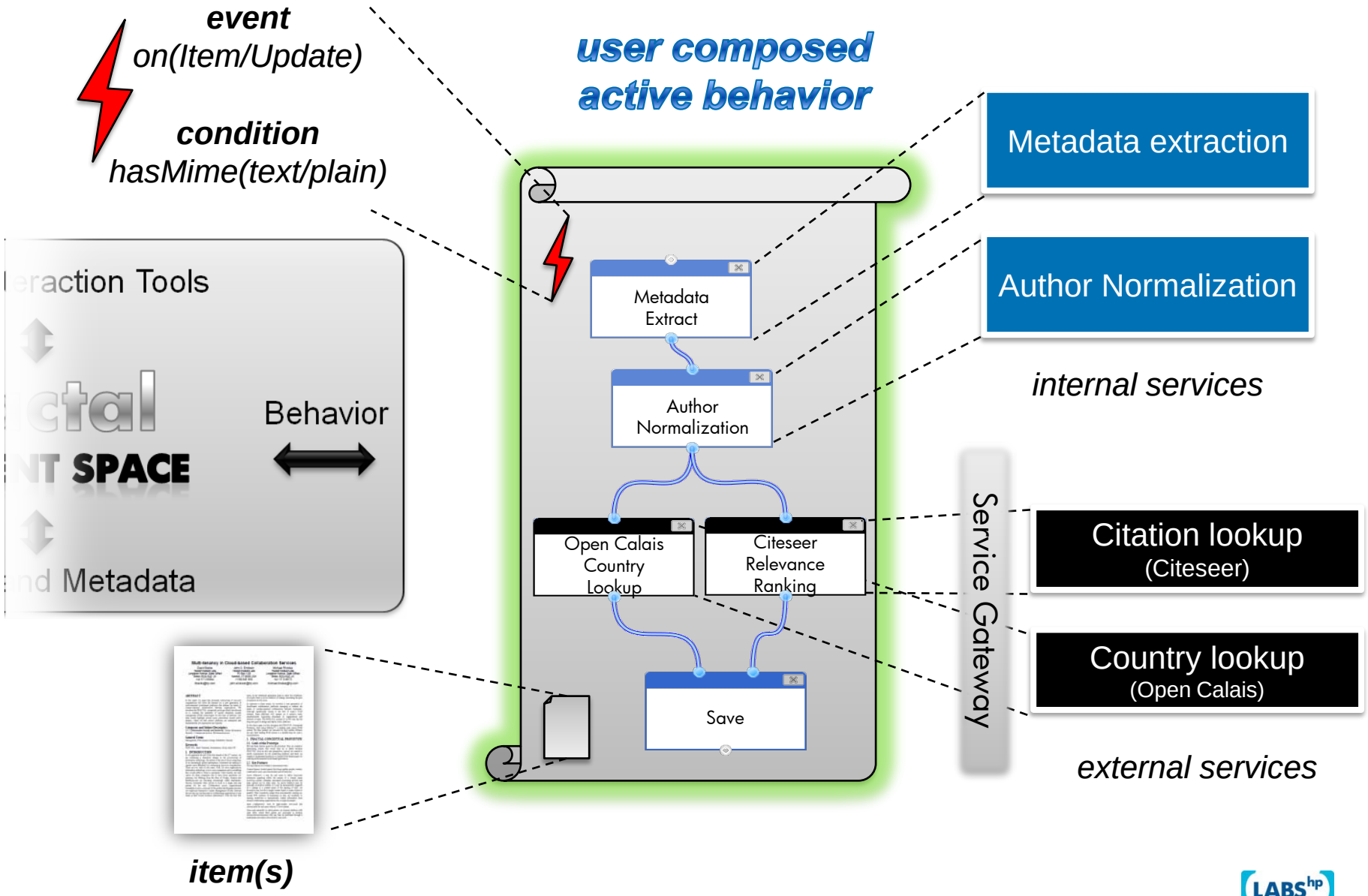
Fractal Active Behaviors



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Conceptual Prototype: Goals

- Refine our **vision** for Fractal, using a scenario based on a collaborative pharmaceutical research project involving several organizations
- Evaluate several **current technologies** as possible starting points for Fractal
- Explore the feasibility of **end-user created active behaviors** with current technologies
- Explore how such extensions might by published through an **extensions marketplace**
- Derive key **platform requirements**

Technology Evaluation

- Technologies:
  - Alfresco – Enterprise Content Management
  - Drupal/Joomla – Content driven web applications
  - Liferay – Enterprise Portal
  - TikiWiki – Collaboration / Groupware
- Criteria:
  - strong document management features
  - embedded workflow engine
  - social capabilities (blogs, wikis, tagging)
  - user interface features matching our ideas for Fractal
- Conclusion: Alfresco Share was the best option

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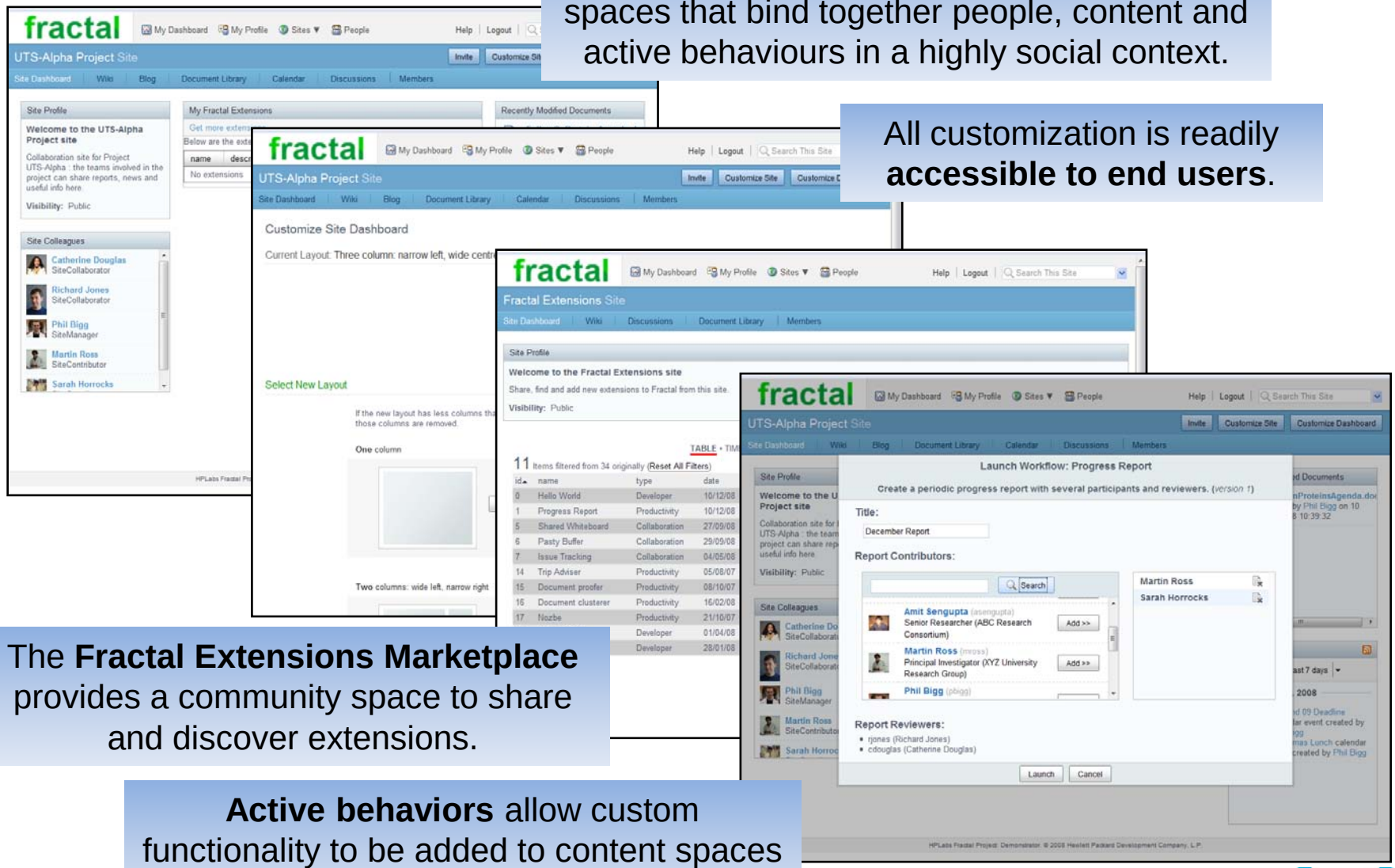
Prototype Walk Through

Content Spaces are hosted collaborative spaces that bind together people, content and active behaviours in a highly social context.

All customization is readily **accessible to end users**.



The **Fractal Extensions Marketplace** provides a community space to share and discover extensions.

Active behaviors allow custom functionality to be added to content spaces to adapt them to the task at hand.

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Requirements for Large Scale Multi-Tenancy
What is a tenant?

- Multi-tenancy refers to the ability to support multiple independent customers on a single software instance
- Multi-tenancy is usually defined along organizational boundaries:
  - a tenant is typically a company, or an organization
  - however, this impedes collaboration between companies, because there are no "shared spaces"
- To better support collaboration between organizations, it's necessary to define a tenant differently
  - a tenant simply becomes a collaborative context
  - users need to be visible globally, but still valuable to manage them locally within "organizations"

Requirements for Large Scale Multi-Tenancy
Providing Isolation between Tenants

- Isolation at the Data level
  - each tenant's data should be managed securely and independently from other tenants
  - for some tenants, logical isolation may be sufficient
  - for others, isolation might be needed all the way down to the storage level
- Isolation at the Application level
  - one tenant's use of particular extensions should not in any way pollute (or put at risk) other tenants
- Isolation at the Performance level
  - one tenant's heavy use of the service should not impact the quality of service provided to other tenants

Requirements for Large Scale Multi-Tenancy
Maintaining levels of service

- Provide multiple levels of service
  - different tenants will have different requirements, and different abilities to pay
  - many aspects of the service (capacity, bandwidth, processing, consistency, replication, versioning) should be configurable on a per-tenant basis
- Resource usage tracking has several benefits:
  - allows usage based pricing models
  - allows excessively heavy usage to be throttled
  - allows poorly written applications to be detected
  - in general, acts as a form of demand management

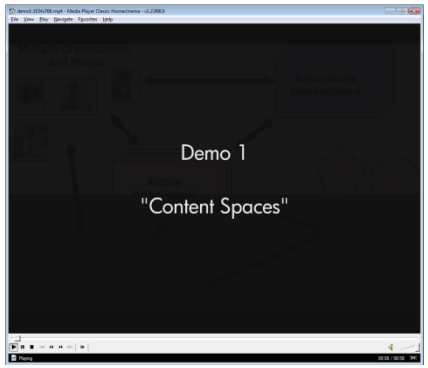
Related Work

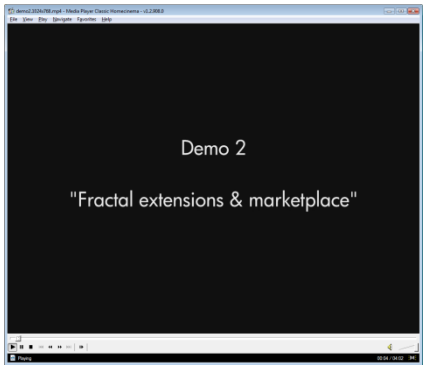
- Ning
  - custom social networks
  - excellent example of "End-user configurability"
- myExperiment
  - a social environment for scientific workflows
- Google Wave
  - online communication and collaboration tool
  - just announced at Google IO, looks awesome
- zoho.com
  - comprehensive suite of web based apps for SMBs
- salesforce.com
  - an open/extensible cloud platform focussed on CRM
- Google App Engine, Microsoft Azure
  - general purpose platform for cloud based apps

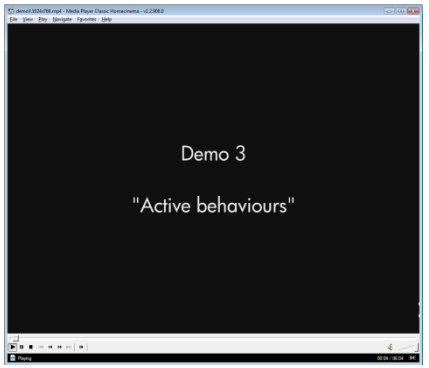
Further information:

"Fractal Conceptual Prototype Videos"

- Content Spaces, narrator Ed Simpson, duration 9 mins
- http://library.hp.com/techpubs/2009/HPL-2009-64.html
- Extensions Marketplace, narrator Guillaume Belrose, duration 4 mins
- http://library.hp.com/techpubs/2009/HPL-2009-65.html
- Active Behaviors, narrator Guillaume Belrose, duration 6 mins
- http://library.hp.com/techpubs/2009/HPL-2009-66.html







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