W3Objects
Flexible Open Caching for the Web

Steve Caughey
Research Associate, Arjuna Project
Department of Computing Science, Newcastle University, U.K.
Email: s.j.caughey@ncl.ac.uk
URL: http://www.cs.ncl.ac.uk/~s.j.caughey/

Contents

- W3Objects Overview
- Caching requirements
- Caching with W3Objects
- Conclusion
HTTP review

- Stateless protocol
- No session semantics
- but these are required for q.o.s. guarantees
- We can support session semantics on top of transport
  - Cookies
  - Java

W3Objects

- Encapsulate Web resources
  - well-defined interfaces, including an http interface for all objects
- Uses object-stub technology
- API supports highly dynamic systems
- Operates in parallel to existing Web
W3Objects and the Web

HTTP
Standard Servers
RPC
W3Object Servers

Current Caching Mechanisms
Caching Requirements

- Improve performance / Reduce bandwidth
- Requirements are Client-driven
- Fine-grained control
  - i.e. object-based
- Support for a wide range of consistency models are needed

Flexible Caching

- Clients can create proxies and use them as caches
- Clients can create hierarchical caches
- Clients can create cache servers
- Caching is object-based!
- Caching is orthogonal to existing caching mechanisms
Open Caching

- Caching messages -
  - object: give me copy
  - object: writeback copy
  - proxy: invalidate cached copy
  - object: increment version
  - proxy: set acceptable age
  - object: register callback

Multi-level caching
Conclusions

- W3Objects offer flexible caching
  - cooperating clients may create multi-level caches which are orthogonal to existing caching schemes
- W3Objects offer open caching
  - clients may choose their own consistency models and either create their own caching mechanisms (or choose them off the shelf)

Current Status

- W3Objects have access to the full set of Shadows functionality
- Caching is fully implemented within Shadows (except for server callback)
- Developing hotlist servers
Future Work

- Complete hotlist servers
- Implement server callback
  - Develop proxy server
  - Informed Traveler

W3Objects
http://arjuna.ncl.ac.uk/w3objects/

Steve Caughey
Research Associate, Arjuna Project
Department of Computing Science, Newcastle University, U.K.
Email: s.j.caughey@ncl.ac.uk
URL: http://www.cs.ncl.ac.uk/~s.j.caughey/

This work has been partially funded by: