Testbed – a walk-through


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“A controlled environment for experimentation and evaluation, with metrics and benchmark content that allow comparison of tools and strategies”
Why do we need a Testbed for Digital Preservation?

- Perform scientific research in digital preservation
- Evaluate preservation approaches in diverse “real life” settings
- Avoid duplication of work
- Maximise use of invested resources

→ Need for a dedicated research environment
  - Systematic execution of experiments by different institutions with
    - automated evaluation
    - reproducibility
    - documentation and accessibility
Contribution of the Testbed to Planets

• To preserve digital objects, we need:
  – Preservation tools:
    • Characterisation tools
    • Preservation action tools (migration / emulation)
  – A preservation plan

• The Planets Testbed will give us:
  – Information on the usability of preservation tools and services in various conditions / on various types of data, e.g.:
    • Degree of preservation of certain characteristics of data
    • Speed of tool
  – Institution independent results (focusing on tools and data only)
  – (Aggregated) information will feed into the Planets Tools Registry
  – Information can be used in a preservation plan
The Planets Testbed

• Foundation for objective evaluation of preservation tools and strategies:
  – Load content
  – Perform experiments: select data and tools, run the experiment, evaluate results, compare outcomes
  – Provide support for validation of preservation strategies
  – Benchmark tools and services

• Consists of:
  – Data storage, hardware, Planets software, Testbed application
  – Benchmark content
Achievements so far

- First Testbed prototype release in September 2007
- Planets-wide first release of Testbed in March 2008
- Release to be used by Planets partners for digital preservation experiments in July 2008
- Planning for corpora established
- Planning for participation of external institutions established
First Prototype (Sept. 2007)

- Mainly intended for internal feedback on user interface
- No integration with Planets Interoperability Framework (e.g. single sign-on, user management, data registry)
- Main focus on the experiment design and the experimenter user type
- Execution still a mock-up
First Release (March 2008)

- Experiments can be fully executed
- Custom versions of certain Interoperability Framework elements, such as the Service and Data Registries
- Integration of the IF single sign-on service
- Limited number of Services available
- Services can be registered through the Service Registration Wizard
- Arbitrary migration services can be registered and used in an experiment
New in current release  
(V.0.6, July 2008)

- Expanded experiment search functionality
- Experiment approval and scheduling system
- Data browser for browsing and selecting experiment data
- Planets FTP area for supplying sample experiment data
- WebDAV interface for uploading and managing data available
- Significant increase in the number of available services
- Various updates to the GUI
Services currently available

- PNG to TIFF Converter
- JPG To TIFF Converter
- JPG to PNG Converter
- TIFF to PNG Converter
- Xena DOC to ODF and ODF to PDF
- PS to PDF Basic Migration
- OpenXML Migration
- Simple Characterisation
- Image Identification Service
The Testbed Experiment Process

Design Experiment:
1. Define Basic Properties
2. Design Experiment
3. Specify Resources

Run Experiment:
4. Go / No go decision
5. Run Experiment

Evaluate Experiment:
6. Evaluate Experiment
Experiment Evaluation

- For each digital object type the Testbed contains a list of characteristics, or properties, which may be of interest to the experimenter
- These properties can then be used to assess the functional performance of the characterisation, migration and emulation services
- Results can be aggregated to give average information about the performance of tools on various types of digital objects
- eXtensible Characterisation Definition Language (XCDL) and eXtensible Characterisation Extraction Language (XCEL) used to automatically extract and evaluate characteristics
Experiment methodology

• Built on work undertaken by the Dutch Digital Preservation Testbed and DELOS Testbed, but
  – Integration with Planets Interoperability Framework
  – Focus on workflow design and on automation
• Experiment Process: based on that of the Dutch and DELOS testbeds, but
  – different end-user typology → simplification (from 12 steps to 6)
The Testbed Central Instance and the Testbed software

• The Testbed Central Instance is hosted by HATII at the University of Glasgow
  – Available to all Planets partners at http://testbed.hatii.arts.gla.ac.uk:8080/testbed/
  – Experimenters are encouraged to use this central instance to ensure the seamless aggregation of experiment results

• A downloadable instance of the Testbed software is available for local installation at http://gforge.planets-project.eu/gf/project/ptb
Testbed Architecture: Key Principles

1. Designed to be platform independent, robust and scalable
   - Java Enterprise Edition

2. Designed to execute experiments on a wide array of preservation tools and services
   - Web Service approach: tools wrapped as web services can be accessed by the Testbed application by means of a platform-independent URI

3. Designed to be a part of the overall Planets software suite
   - Sharing of common components across the entire project
   - Testbed development can focus primarily on the components that are unique to the TB
Web Service Approach

- All preservation tools required for Testbed experiments are deployed and accessed as Web Services
- All tools must be wrapped as WSI-compliant web services so that
  - Services can be registered with the testbed
  - Service templates can be created
  - Experimenters can then access these templates to simulate the specific usage of a tool
  - The Testbed is **extensible**. Any WSI tool can be made available
- Steps involved in registering and configuring a service are handled by the Testbed administrator
Next steps

• Next releases
• Planning for corpora
• Planning of experiments
• Opening to external institutions
Planning for Corpora

- Digital preservation corpus: annotated collection of digital objects
  - Annotations should contain the criteria against which given algorithms will be evaluated

- By October 2008 a detailed plan for the building of the corpora will be in place

- Corpora will ensure that a sufficient knowledge base is available for each experiment
  → will avoid the duplication of effort for experimenters
Planning of Experiments

Next steps (summer 2008):

1. Decide on good evaluation criteria
   – Make use of PLATO case studies

2. Decide on test strategy
   – (in depth testing of small sets / broad testing / tools for most common object types / tests on as many different object types as possible / etc.)

3. Set up a test schema
   – Get partners involved & monitor progress

4. Evaluate and continue
   – Use evaluation information to reconsider steps and continue
   – Broaden the automated evaluation concepts
Opening to external institutions

• Current areas of work:
  – Work out Testbed benefits for external organisations
  – Define criteria for filtering organisations
  – Establish key contacts in the organisations
  – Devise concrete testing tasks the organisations to be involved in
  – Assign timescales and resources for testing

• Agreement with external institutions in place by November 2008

• Opening of Testbed for external experiments by April 2009
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Thanks!

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