Testbed – a walk-through

Digital Preservation Planning: Principles, Examples and the Future with Planets, July 2008

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Definition

"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 perservation 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
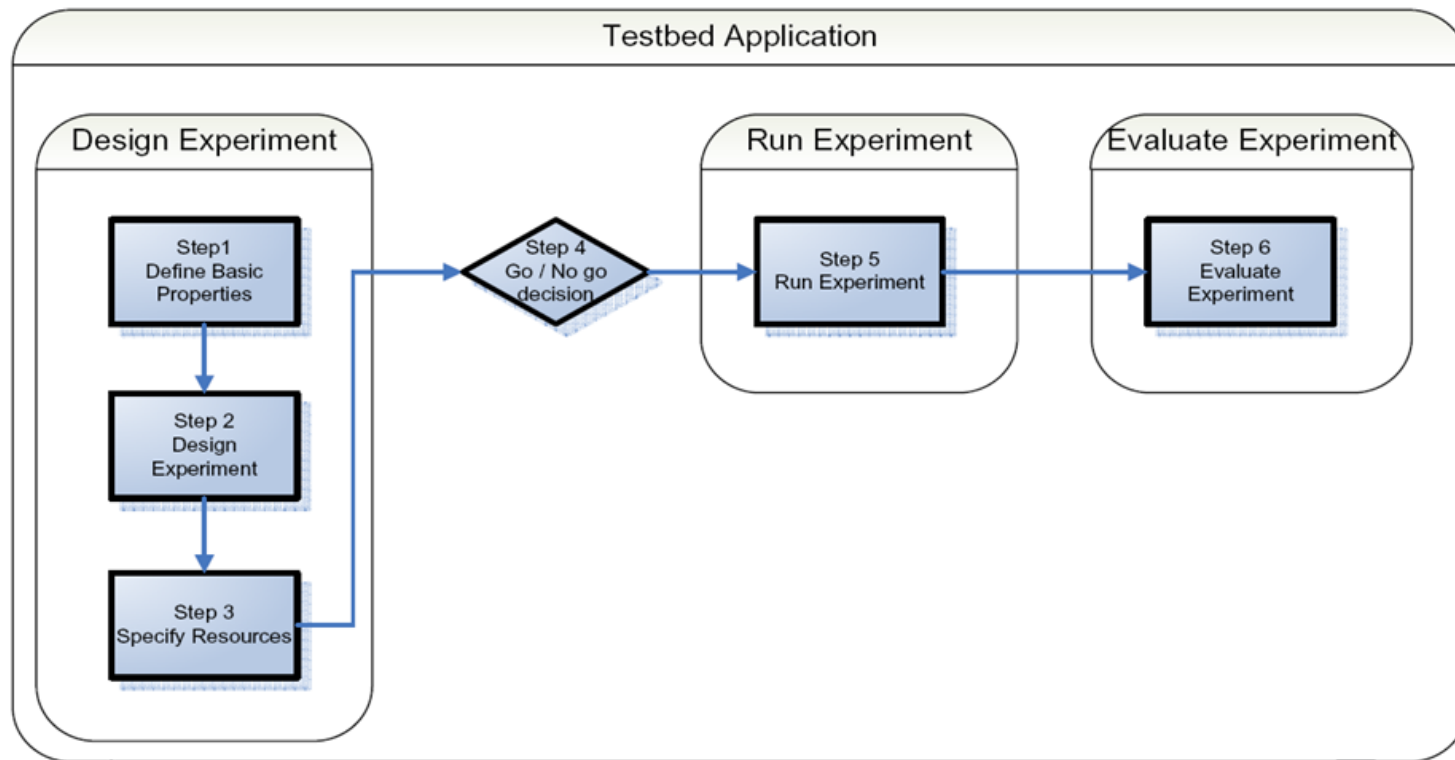- Various updates to the GUI

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

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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