Active Preservation

Sun PA SIG, Malta 24th - 26th June 2009

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Contents

- What is “Active Preservation”?
  - History
- Nature of digital records:
  - Why is long-term preservation hard?
- Active Preservation:
  - Technical Registry
  - Characterisation
  - Preservation Planning
  - Migration
- The future

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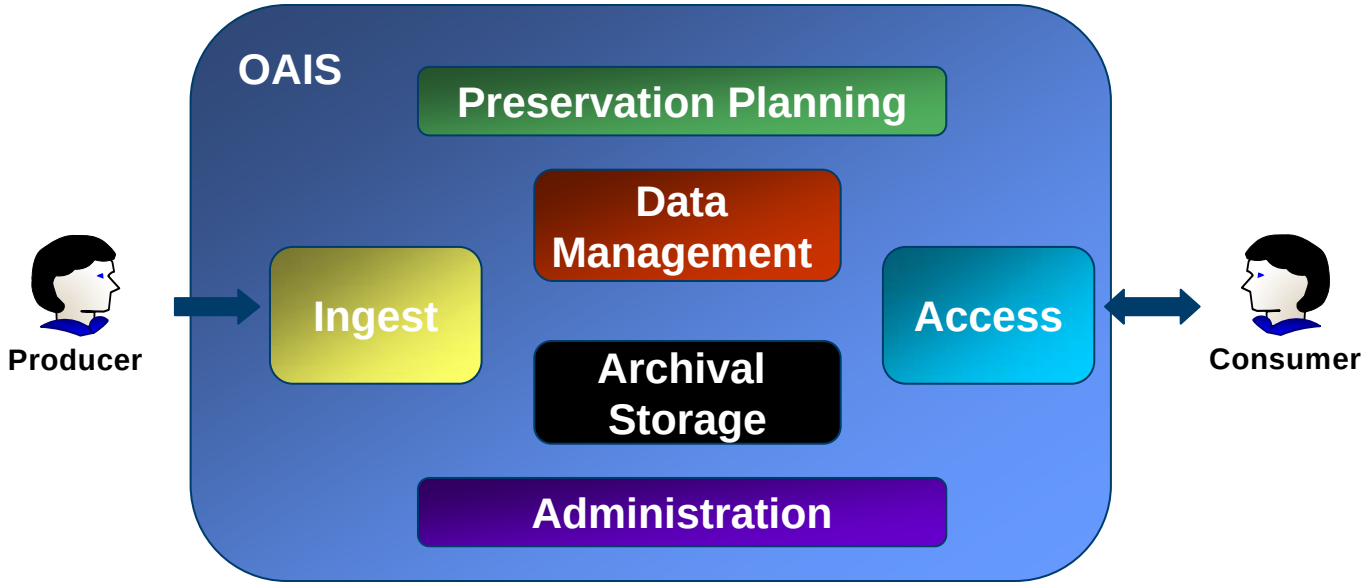
What is “Active Preservation”?

- OAIS



- Active Preservation = Preservation Planning (automated)
- BUT influences all functional entities

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History

- Tessella worked with UK National Archives:
  - PRONOM (2001+)
  - Digital Archive (2002-3)
  - DROID (2004)
  - Seamless Flow (2006+)
- Award-winning!
- Developed into Safety Deposit Box (SDB):
  - Full OAIS archiving and preservation solution
  - Incorporates TNA's technology under licence
  - Plus input from EU Planets project
- More customers…

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World Leading Digital Archive Solutions

The British Library

UK National Archives

Wellcome Trust

Rotterdam City Archive

Dutch National Archives

Swiss Federal Archives

US National Archives and Records Administration

Malaysian Archives

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Digital Preservation – Well known issue

- Can not read information objects directly :
  - Rely on file formats
  - Rely on application software
  - Rely on O/S
  - Rely on hardware.
  - Obsolescent within information object lifetime
- Preservation strategy must rely not just on preserving the original but also “lossless” transformation:
  - Migration
  - Emulation
- Active Preservation deals with this

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Digital Preservation – Less well known issue

- Break link between physical and conceptual structures:
  - e.g., Web site
- Really two structures:
  - Conceptual (information objects):
    - Understood by humans
    - Technology independent
    - Needs to be preserved
  - Physical (digital objects):
    - Understand by machines
    - Technology dependent
    - May need to be migrated / emulated
- Active Preservation deals with this too

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Active Preservation - Overview

- Step 1: Characterisation:
  - What have I got physically?
  - What have I got conceptually?
- Step 2: Preservation planning
  - Decide what is at risk?
  - What should I do about it?
- Step 3: Preservation Action
  - Perform plan
  - Include re-characterisation to validate
  - Currently just migration but will include emulation

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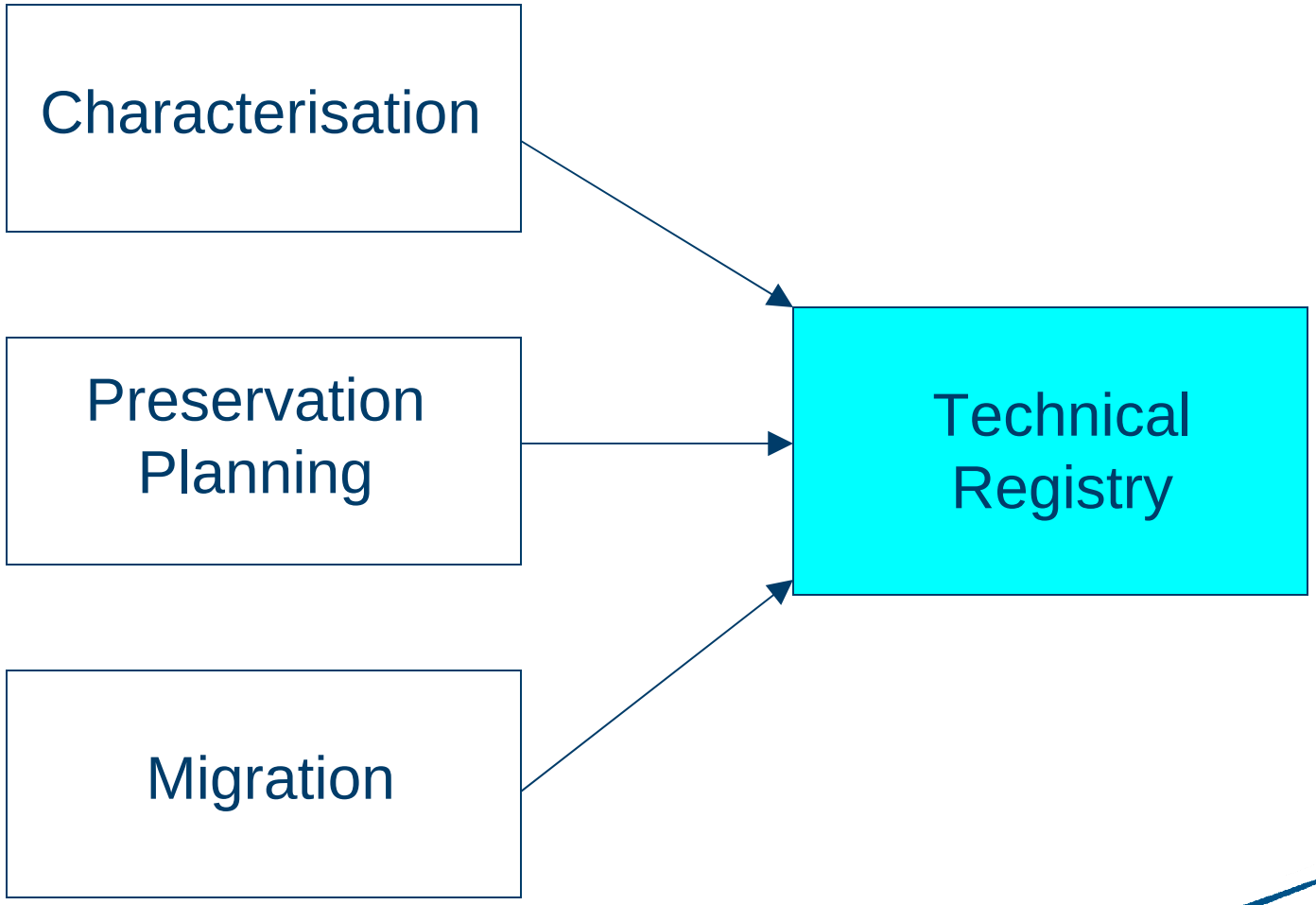
Active Preservation: Technical Registry



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Technical Registry - Overview

- All information needed to decide what active preservation to perform:
  - Factual information (formats, software, properties etc.)
  - Also policy (risk criteria, preferred pathways etc.)
- Exists with various names:
  - PRONOM (UK National Archives):
    - www.nationalarchives.gov.uk/PRONOM
  - Planets Core Registry
  - Planned to be the seed of UDFR

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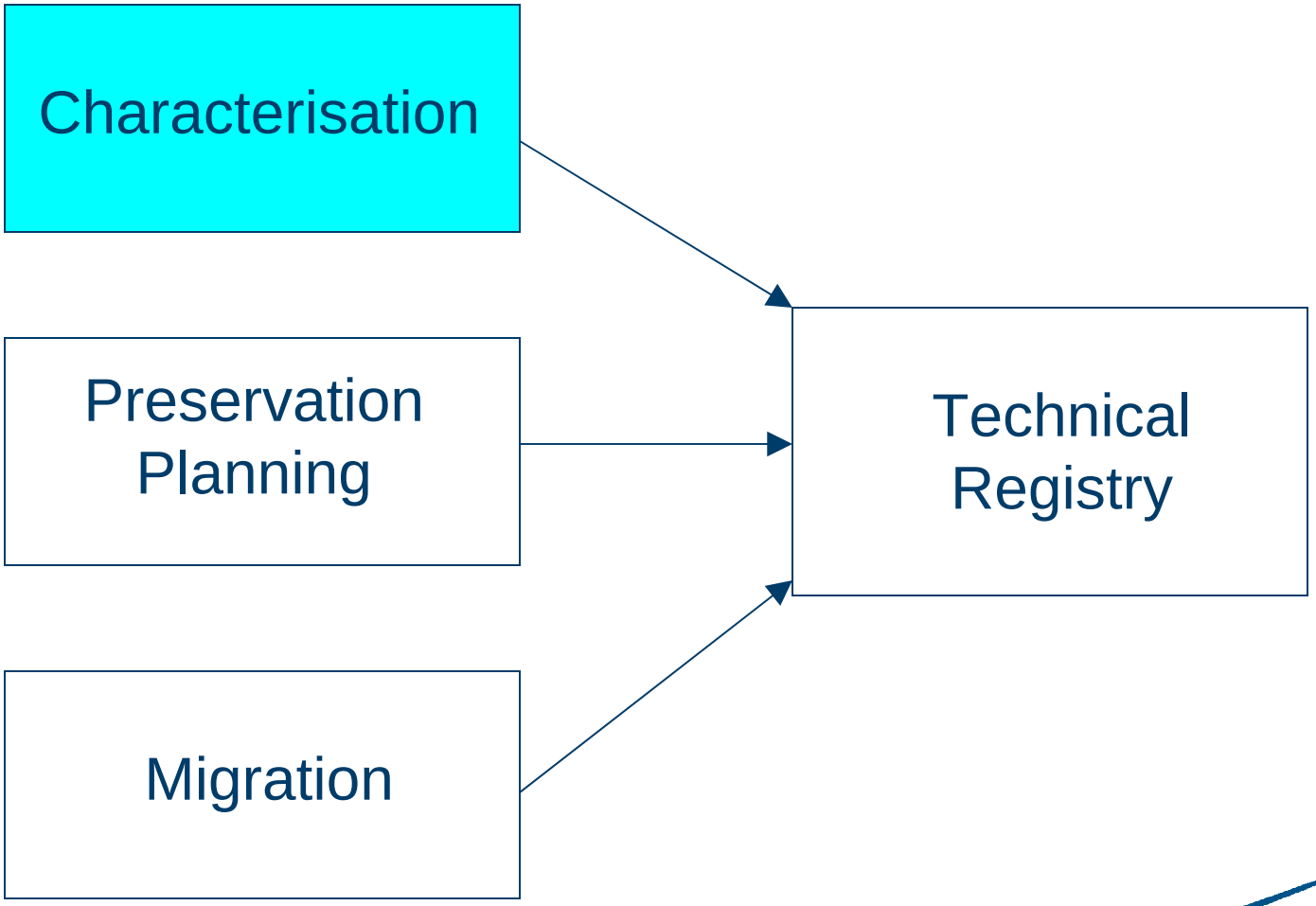
Active Preservation: Characterisation



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Characterisation - Overview

- What have I got physically (file level)?
  - Format, properties that might indicate obsolescence etc.
  - Technology dependent
- What have I got conceptually (information object level)?
  - Conceptual Structure
  - “Essential characteristics”
  - Technology independent

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File Characterisation

- Identification:
  - Single tool: e.g., DROID
- Validation:
  - Tool depends on format: e.g, Jhove
- Property extraction:
  - Tool depends on format, e.g, Jhove
  - Properties to measure depends on format/tool combination
- Detect embedded objects:
  - Tool depends on format, e.g, ZIP
- All automatic, controlled by policy in the Registry

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Conceptual Characterisation

- Conceptual vs. physical structures
- Receive physical:
  - In today's technology
- Identify conceptual:
  - Including links / dependencies
  - Measure "essential characteristics"
- Retain conceptual structure:
  - Accept change in physical structure

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Conceptual Characterisation - Example

- Receive physical:
  - Home.html
  - Style.css
  - Logo.gif
  - Page1/Page1.html
  - Page1/Image.jpg
  - Page2/Page2.html
  - Page2/Image.png
  - Page3/Page3.html
  - Page3/Document.pdf

Conceptual Characterisation - Example

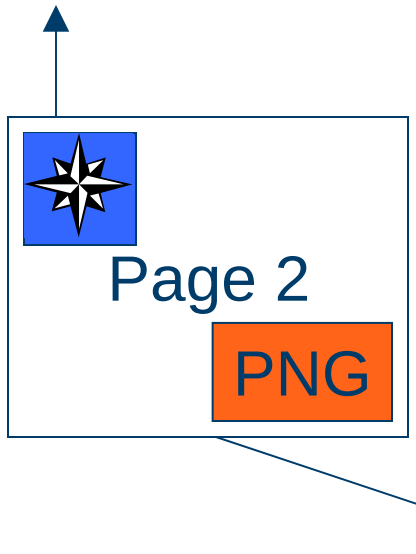
- Identify components:

Physical

Page2/Page2.html

Uses Style.css
Embeds Logo.gif
Embeds Page2/Image.png
+ Link to Home
+ Link to Page 3

Conceptual



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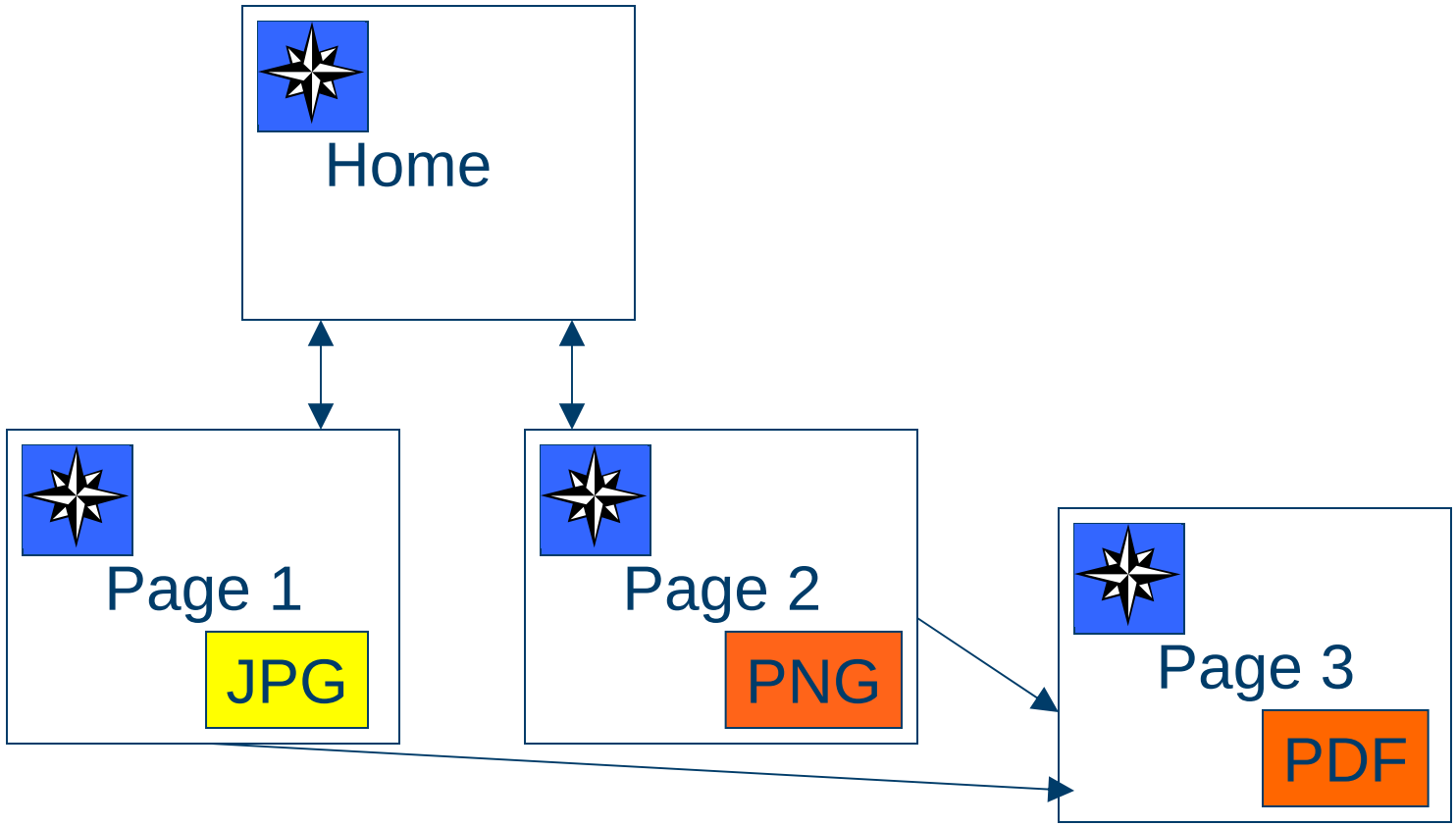
Conceptual Characterisation - Example

- Work out conceptual structure:



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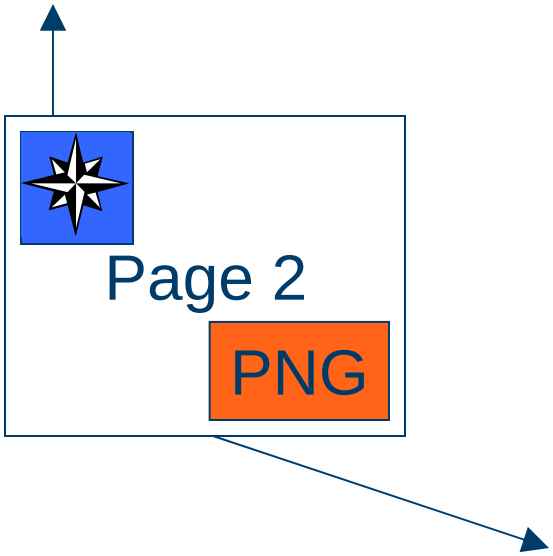
Conceptual Characterisation - Example

- Identify characteristics:



- Title
- Link to home page
- Link to Page 3
- Contains image:
  - Height
  - Width
- Contains image:
  - Height
  - Width

- Characteristics **not** linked to technology

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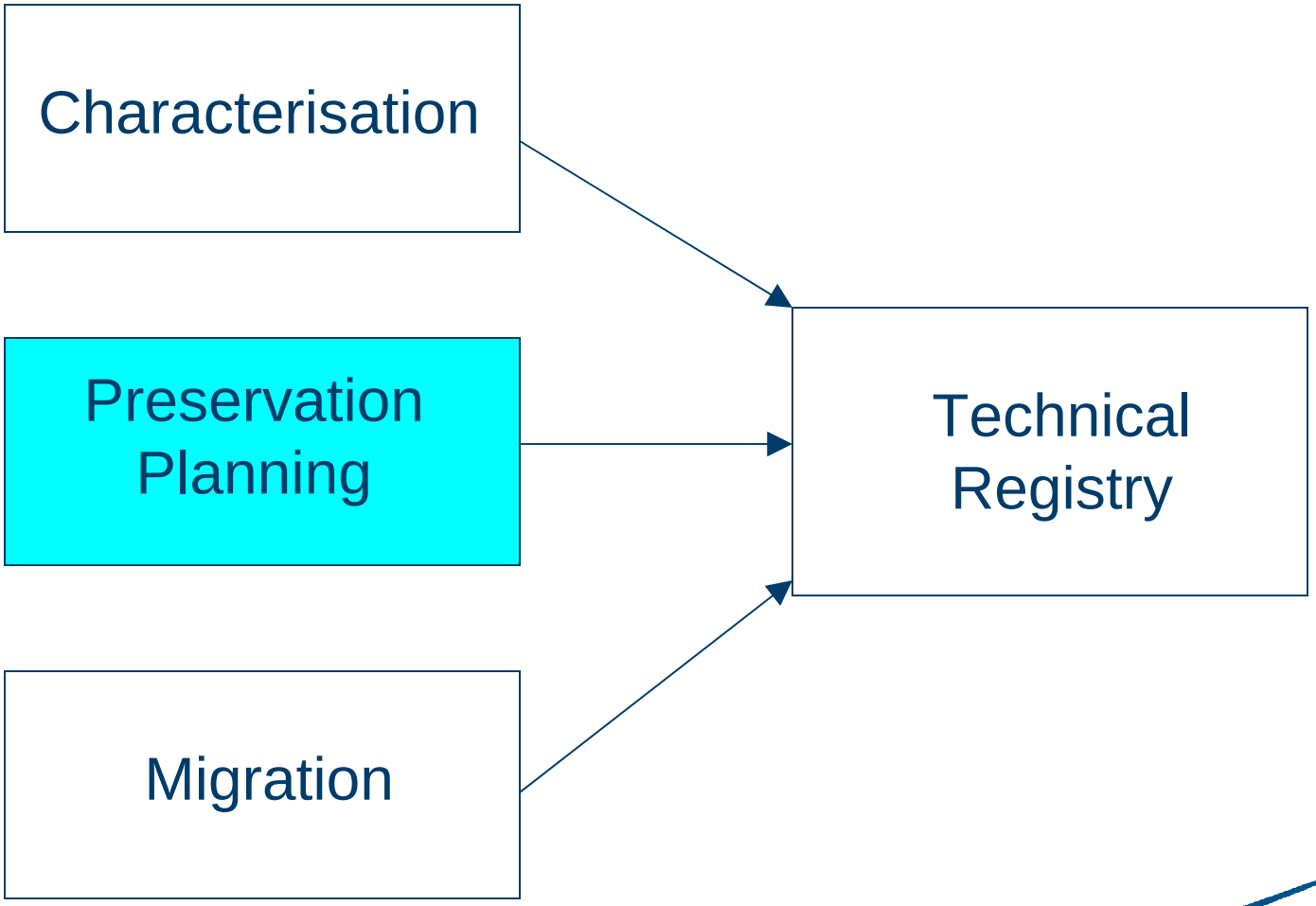

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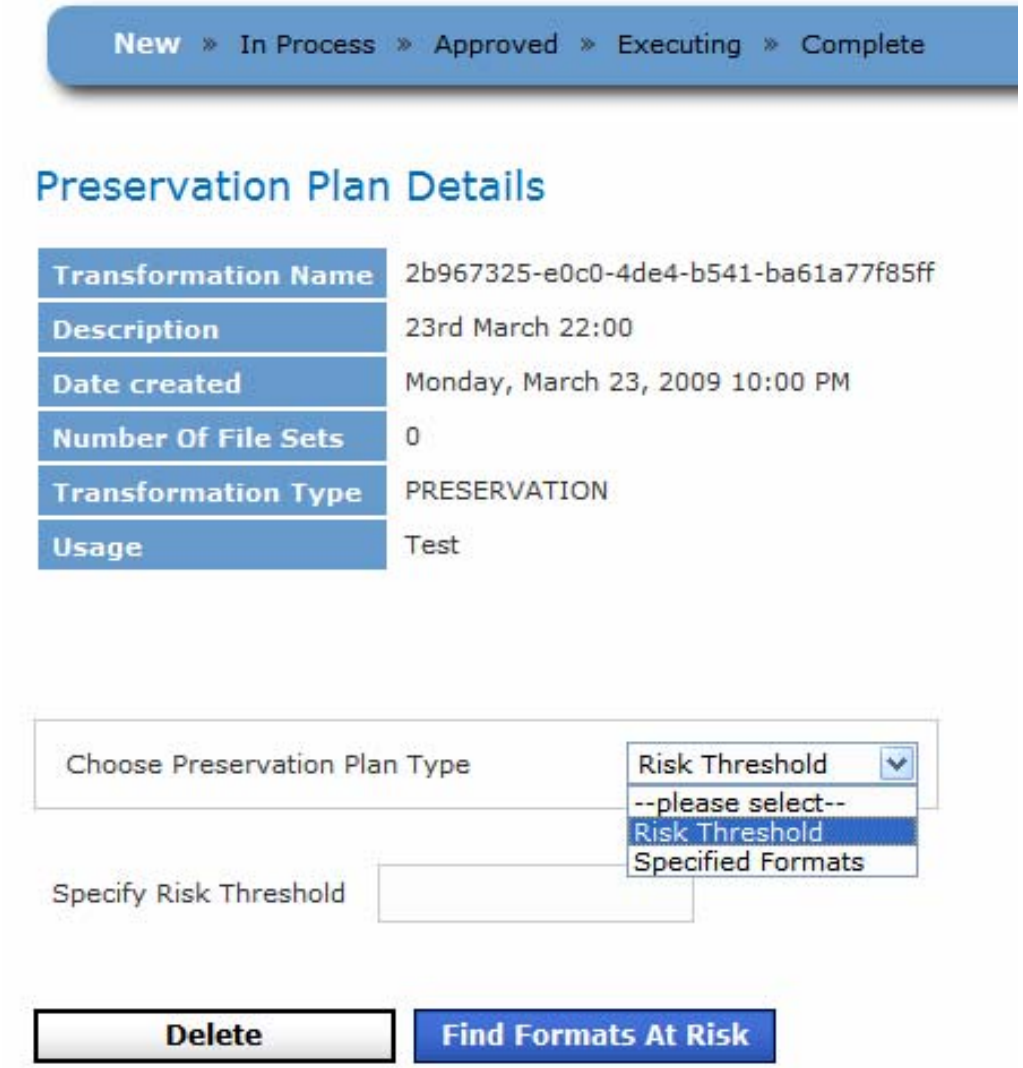
Preservation Planning– Select formats



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Preservation Planning – Risk Threshold 1/2

The following formats are considered risky at this risk threshold.

PUID Format	Format Name	Version	Risk Threshold	Options
fmt/1	Broadcast WAVE	0	Get Risk	Remove
fmt/2	Broadcast WAVE	1	Get Risk	Remove
fmt/3	Graphics Interchange Format	1987a	Get Risk	Remove
fmt/4	Graphics Interchange Format	1989a	Get Risk	Remove
fmt/5	Audio/Video Interleaved Format		Get Risk	Remove
fmt/6	Waveform Audio		Get Risk	Remove
fmt/7	Tagged Image File Format	3	Get Risk	Remove
fmt/8	Tagged Image File Format	4	Get Risk	Remove

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Preservation Planning – Risk Threshold 2/2

The following formats do not have any available migration pathways and have been removed from the transformation.

PUID Format	Format Name	Version
fmt/1	Broadcast WAVE	0
fmt/2	Broadcast WAVE	1
fmt/5	Audio/Video Interleaved Format	
fmt/6	Waveform Audio	
fmt/11	Portable Network Graphics	1.0
fmt/12	Portable Network Graphics	1.1
fmt/13	Portable Network Graphics	1.2
fmt/21	AutoCAD Drawing	1.0
fmt/22	AutoCAD Drawing	1.2
fmt/23	AutoCAD Drawing	1.3
fmt/24	AutoCAD Drawing	1.4
fmt/25	AutoCAD Drawing	2.0
fmt/26	AutoCAD Drawing	2.1
fmt/27	AutoCAD Drawing	2.2

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Preservation Planning – Determine Information Objects at risk…

Select the File Sets for Transformation

Select	Ingested File Set Ref	Catalogue Ref	Number of Files	Files at Risk	Size
☑	a5ec6914-f89c-4152-9ce6-f23277ea3285	Phones 1	97	32	1.43 MB
☑	4990ddba-2957-4729-9eb8-21bb114bb4b1	test0001	20	4	408.86 kB
☑	f0458fce-d1cf-42c3-9da1-a1c91bbc02fd	HP4	99	4	16.09 kB
☑	c6a04eb5-127b-4b3a-a965-3b8d8b7a4935	COLL CODE	96	90	687.17 MB
Totals	4		312	130	689.02 MB

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Preservation Planning – Select pathways

Select Transformation Pathways

Original Format	Resulting Format
JPEG File Interchange Format 1.02 (fmt/44)	Portable Network Graphics 1.0 (fmt/11) - Stellent Image Export
JPEG File Interchange Format 1.01 (fmt/43)	Tagged Image File Format 4 (fmt/8) - Image Magick
Tagged Image File Format 5 (fmt/9)	Portable Network Graphics 1.0 (fmt/11) - Stellent Image Export
Microsoft Word for Windows Document 97-2003 (fmt/40)	Portable Document Format 1.4 (fmt/18) - Stellent PDF Export
Tagged Image File Format 6 (fmt/10)	Portable Network Graphics 1.0 (fmt/11) - Stellent Image Export
Portable Document Format 1.2 (fmt/16)	Extensible Markup Language 1.0 (fmt/101) - xmlExportWrapper
Graphics Interchange Format 1989a (fmt/4)	Portable Network Graphics 1.0 (fmt/11) - Stellent Image Export

Back | Filter By Catalogue Ref | Approve

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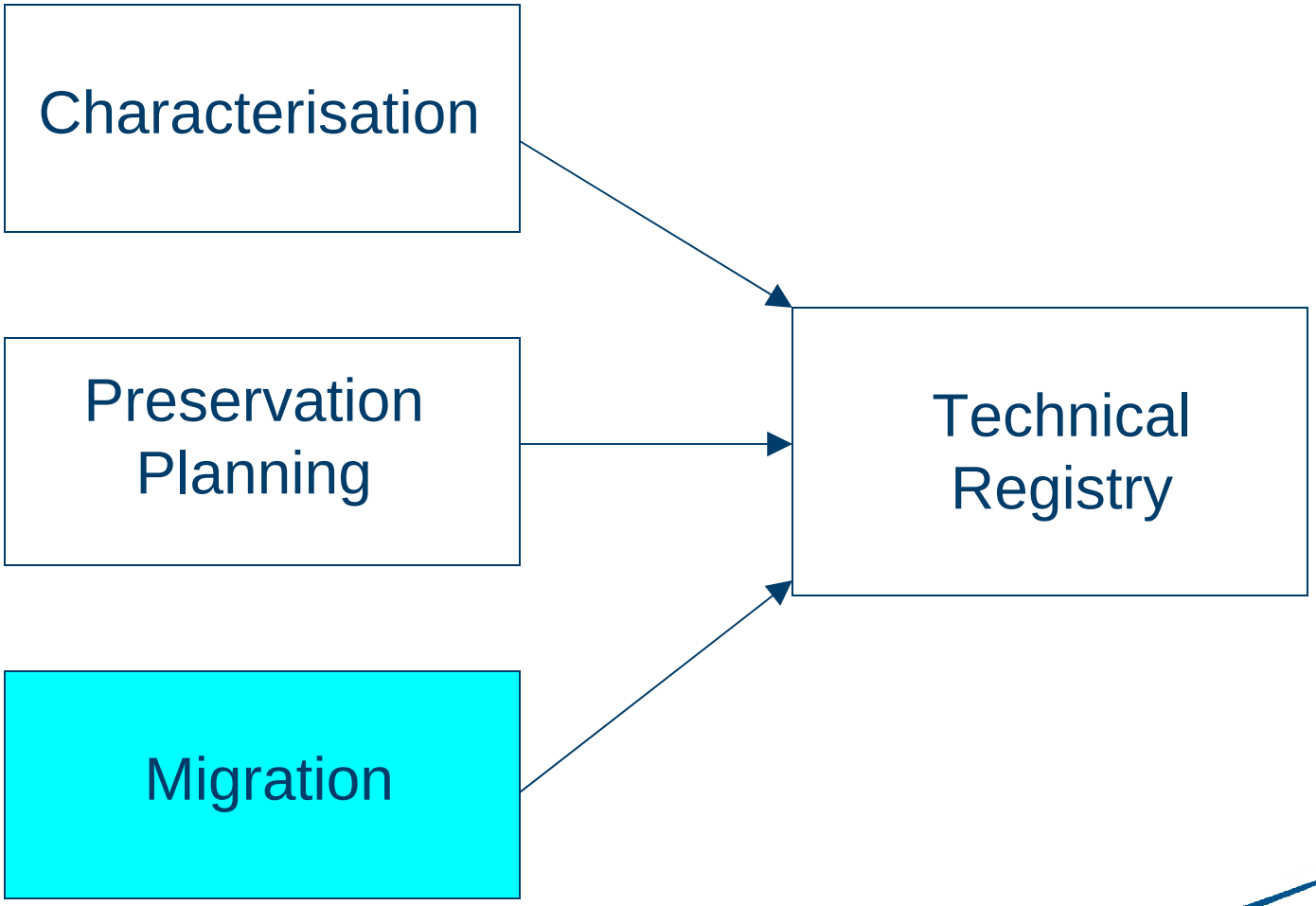

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Migration – Waiting…

New » In Process » Approved » **Executing** » Complete

Preservation Plan Details

Transformation Name	20cb5260-6b26-42ca-b817-b4ece740c21a
Description	23rd March 21:55
Date created	Monday, March 23, 2009 9:55 PM
Number Of File Sets	1
Transformation Type	PRESERVATION
Usage	Production

Transformation in Progress. Start Date: 23.03.09 21:57:37

Ingested File Set Ref	Number of Files	Size	Status
4990ddba-2957-4729-9eb8-21bb114bb4b1	20	399 KB	Copying Files from storage

Stop Transformation

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Migration – Done

New » In Process » Approved » Executing » **Complete**

Preservation Plan Details

Transformation Name	20cb5260-6b26-42ca-b817-b4ece740c21a
Description	23rd March 21:55
Date created	Monday, March 23, 2009 9:55 PM
Number Of File Sets	1
Transformation Type	PRESERVATION
Usage	Production

The transformation has completed successfully.

Accession Ref	Ingested File Set Ref	New Ingested File Set Ref
7f5c5e7c-5807-4594-b609-10f919919993	4990ddba-2957-4729-9eb8-21bb114bb4b1	013e97ec-fece-4996-bfcc-be5c323fba42

Home Page

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Migration

- Perform plan
  - Conceptual component is atomic level of migration:
    - Consume a set of files
    - Create a set of files
    - Not necessarily 1-to-1.
  - Aggregate new component manifestations to get new information object manifestation
- Verification:
  - Characterise new files
  - Re-characterise new manifestation of information object
  - Check component structure not changed
  - Compare essential characteristics before and after
  - Can also run specific tool, e.g., image comparison tool
- If passes, ingest new manifestation

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Active Preservation: Summary

- Framework
  - Have tools for common formats
- Integral part of SDB
- Future:
  - Develop best practice
  - Wrap more tools: Planets, Xena, NLNZ etc.
  - Plan to be integrated to other repository systems (e.g., Fedora)

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