Quality Assured Image Migration

Scalable Workflow Background

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Future Formats First, Building Applications Infrastructure for Action Services
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Outline

- Setting the scene: why it's important to look at image migration workflows?
  - Collection: Digitised Newspapers
  - Collection concerns

- Outline conceptual workflow

This work was partially supported by the SCAPE Project.
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Collection: British Newspapers

- Large collection of British newspapers
  - Old newspapers are fragile
  - Digitised through various JISC funded projects for preservation and access reasons
  - >2million digitised images (TIFFs)
  - 1620-1900's
- The British Newspaper Archive
  - Partnership with brightsolid
  - ~7 million digitised scans in collection (incl. from JISC projects)
  - Up to 8000 scans per day
  - Files as large as 400MB
  - http://www.britishnewspaperarchive.co.uk

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Collection Concerns

- Need to store this collection (into the future)
  - Cost effectively
    - Large files -> more storage -> greater costs
    - Smaller files -> less storage required -> cost savings
    - Cost savings potentially leads to money to invest in…
      - … digitising more
      - … buying more storage
      - … refreshing digitisation equipment
- Need to provide efficient access to this collection also
  - At varying levels (navigation->detail)
  - Without a large increase in storage expense
    - multiple resolution images increase storage costs

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Digital Access Use Cases

a) *Navigation*: display of thumbnail images from multiple master files

b) *Reading*: display at an intermediate "reading" resolution a single master with zoom and pan (and occasionally two pages side-by-side)

c) *Detailed*: display at full resolution with pan

- *Observation*: (a) and (b) will be much more frequent than (c)

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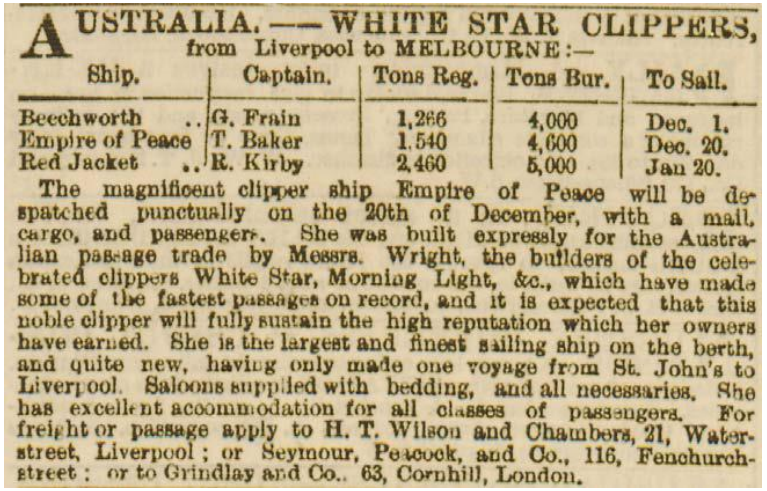
Access Use Cases

Navigation

Reading

Detailed



AUSTRALIA.—WHITE STAR CLIPPERS, from Liverpool to MELBOURNE:—

Ship.	Captain.	Tons Reg.	Tons Bur.	To Sail.
Beechworth ..	G. Frain	1,266	4,000	Dec. 1.
Empire of Peace	T. Baker	1,540	4,600	Dec. 20.
Red Jacket ..	R. Kirby	2,460	5,000	Jan 20.

The magnificent clipper ship Empire of Peace will be despatched punctually on the 20th of December, with a mail, cargo, and passengers. She was built expressly for the Australian passage trade by Messrs. Wright, the builders of the celebrated clippers White Star, Morning Light, &c., which have made some of the fastest passages on record, and it is expected that this noble clipper will fully sustain the high reputation which her owners have earned. She is the largest and finest sailing ship on the berth, and quite new, having only made one voyage from St. John's to Liverpool. Saloons supplied with bedding, and all necessaries. She has excellent accommodation for all classes of passengers. For freight or passage apply to H. T. Wilson and Chambers, 21, Water-street, Liverpool; or Seymour, Peacock, and Co., 116, Fenchurch-street; or to Grindlay and Co., 63, Cornhill, London.

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Solution: Migrate the files?

- Initial investigations indicated that migrating TIFFs to JPEG2000 could:
  - Reduce storage size/costs
  - Facilitate enhanced user access
- However, cost savings can only be realised through deleting original TIFFs
  - Must ensure the quality and validity of the migration
    - Avoiding (or at least detecting) corrupted migrated images
- Secondly, we have a lot of files to process
  - How to do this in an efficient and scalable way?

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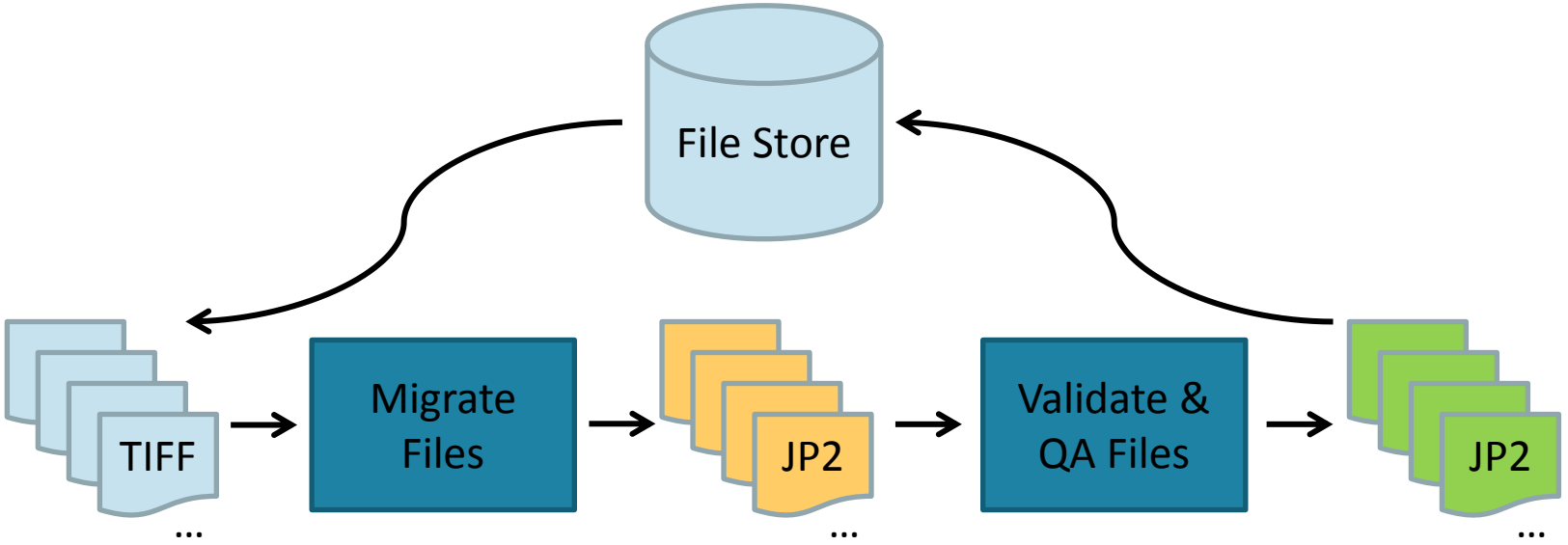
Conceptual Migration Workflow



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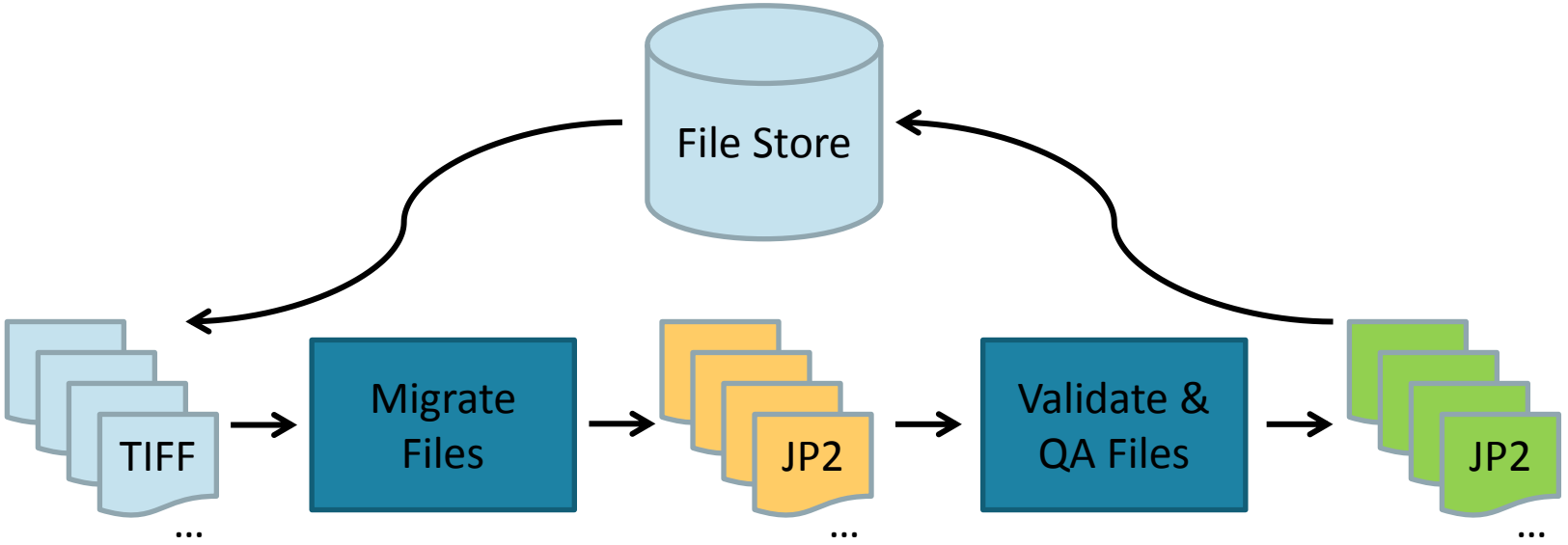
Conceptual Migration Workflow - Tools



Migration Codecs:

- Kakadu
- OpenJPEG
- …

QA/Validation tools:

- Jpylyzer
- Matchbox (image feature analysis)
- Exiftool (metadata extraction)

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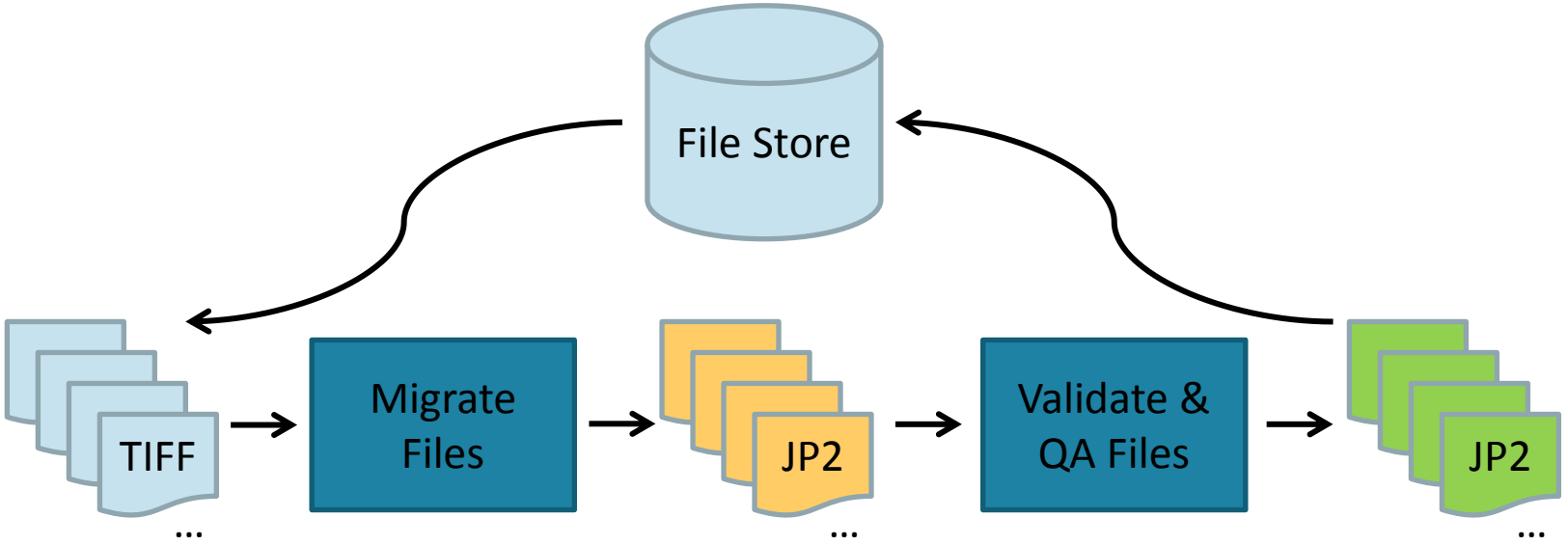
Conceptual Migration Workflow - Validation



Check validity of migrated files against format specification and institutional profile (Jpylyzer)

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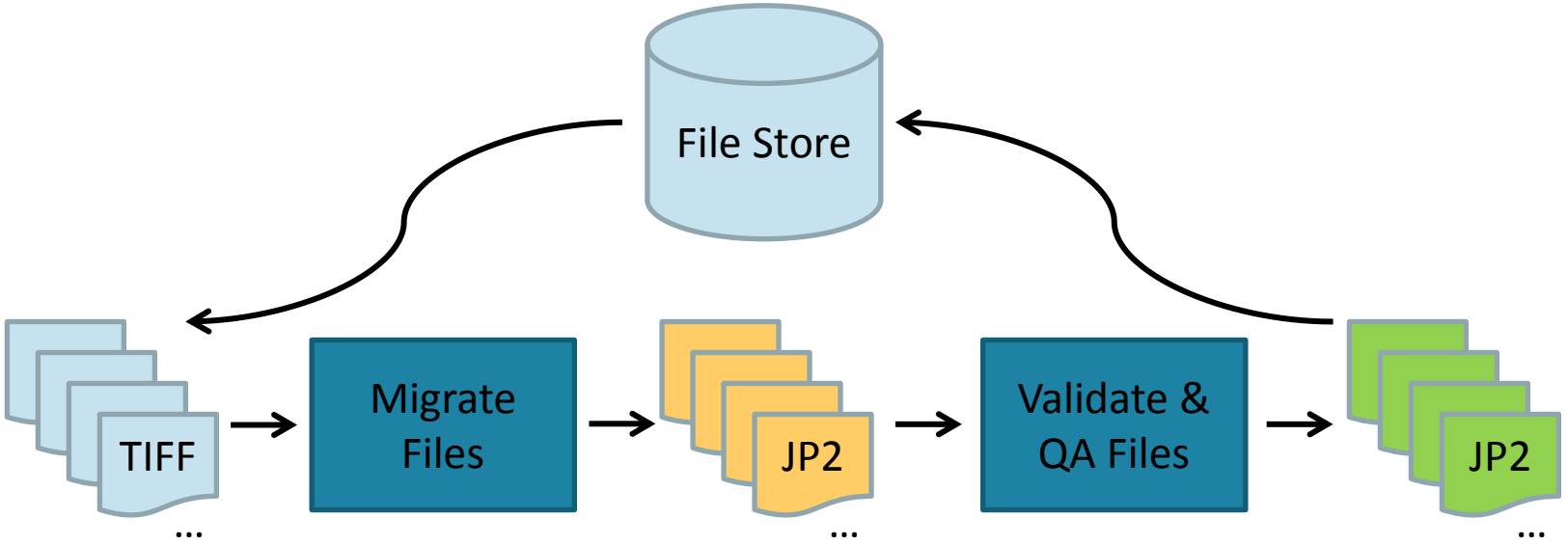
Conceptual Migration Workflow - QA



Extract from originals:

- Technical Metadata (ExifTool)
- Image Features (Matchbox)

Compare for equality

Extract from migrated:

- Technical Metadata (ExifTool)
- Image Features (Matchbox)

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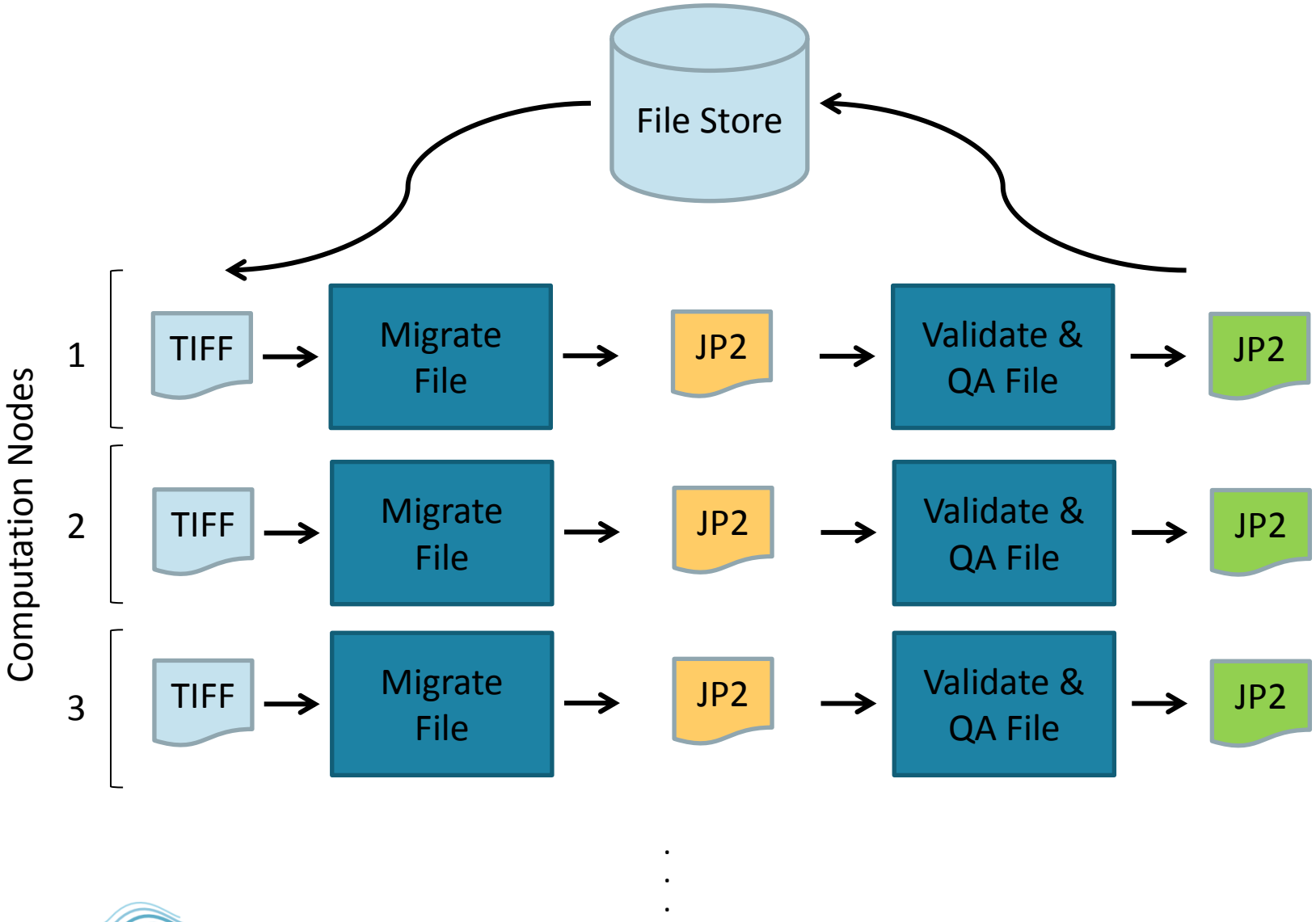
Conceptual Migration Workflow - Scalability



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Concluding remarks

- Important to investigate migration workflows
  - Realise and validate the outcomes from initial investigations
  - Understand the pros/cons of the infrastructure technology (Hadoop, Taverna)
  - Investigate and understand the pros/cons of the tools
    - Migration codecs, validation tools, QA tools
- Even if this image migration workflow is not used to generate preservation masters
  - Still valid as workflow for generating access copies
- TIFF to JPEG2000 migration is one possibility
  - What if there's a problem with JP2's or the migration software is found to have a bug
    - JP2->TIFF migration may be needed to reverse the process

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