Managing Dataset DOIs and Versions in a Changing Archive

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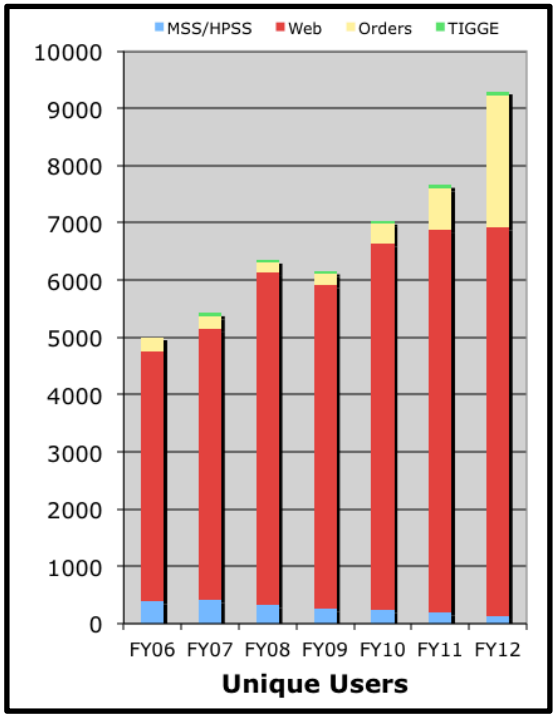
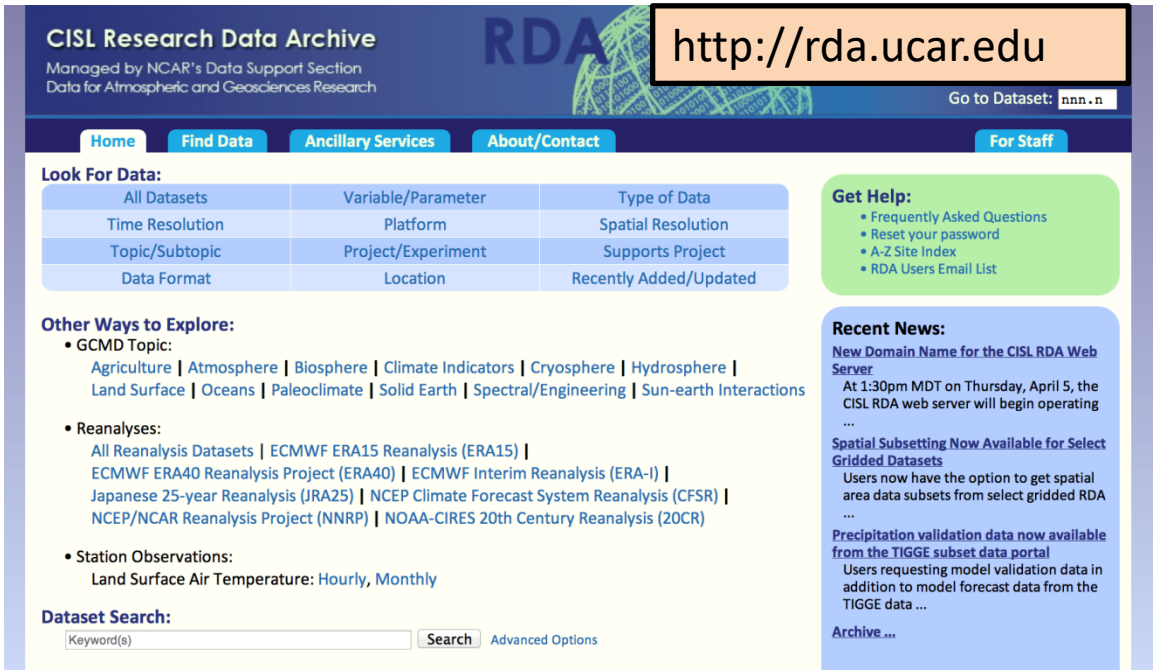
Topics

- RDA Background
- Use Cases
- User DOI Services

Research Data Archive (RDA) at NCAR

1. 600+ distinct datasets for climate and weather research, 8M Files
2. Collections: ocean & atmosphere observations, analyses, reanalyses, operational NWP outputs
3. Free and open access



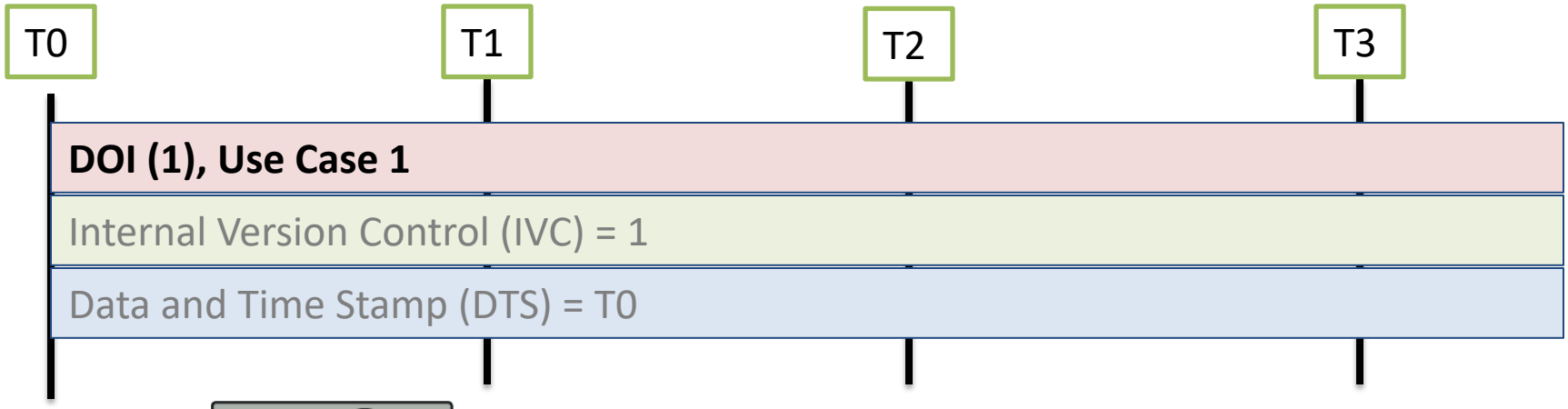


Technical Approach – MySQL DB

- DB records for each file
  - DOI
  - Internal Version Control (IVC) setting
  - Date and Time Stamp (DTS) of file activities
- Other features
  - Maintain file to dataset relationship
  - Maintain history of file activities
  - Tracks user access via registration and login

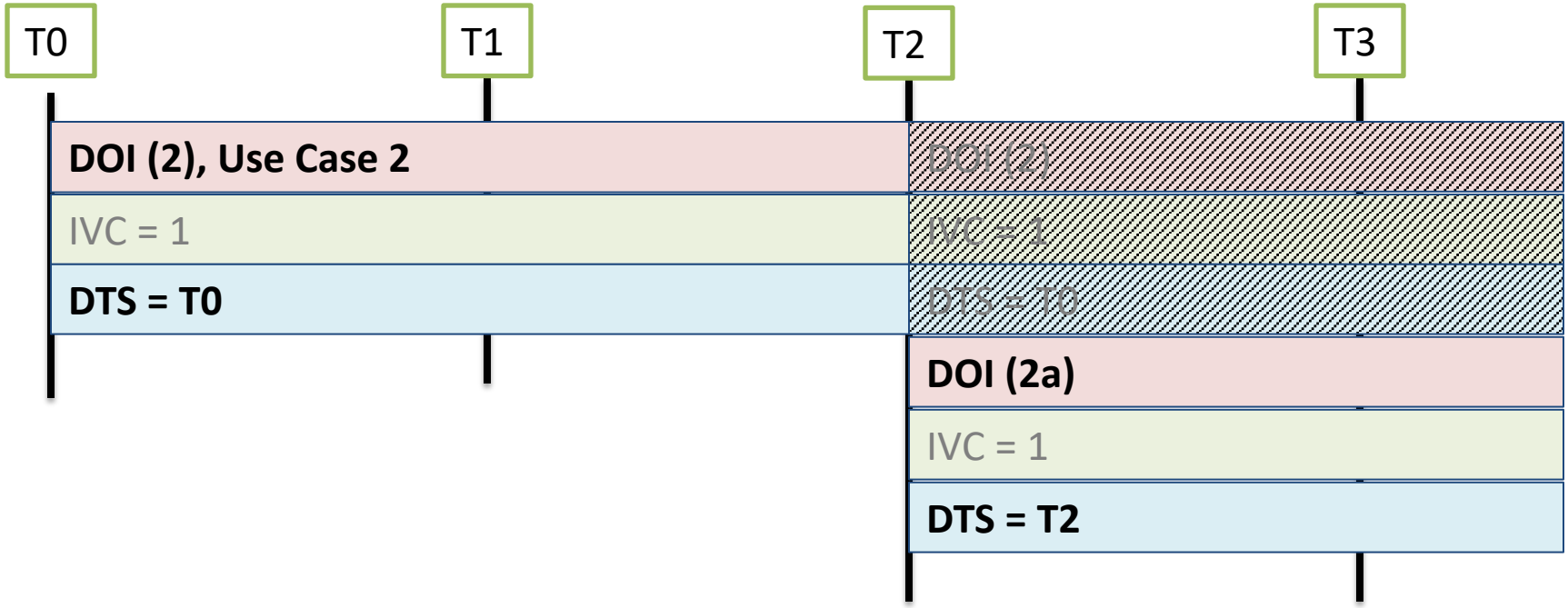
Use Case 1 – Create a new DOI dataset

- All files one-to-one match on tape (offline) and online storage
  - Exceptions: permit Endian byte swap, standard file packaging (tar, gzip, htar, etc.)
- Mint a new DOI through DataCite



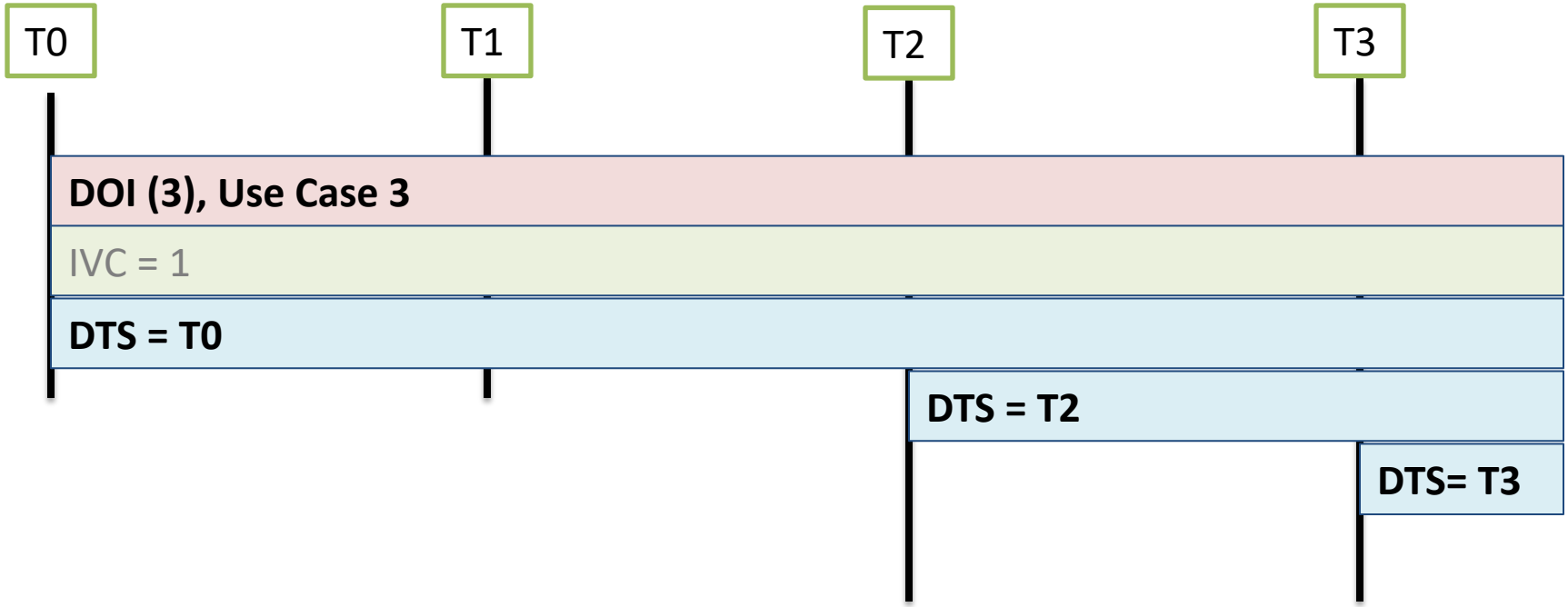
Use Case 2 – Complete dataset replacement (e.g. new data from the provider)

- RDA dataset landing page (URL) is unchanged
  - Metadata (discovery, file content) updated
- Assign **new** DOI
- Old version
  - Files offline – tape archive
  - File-set permanently frozen
  - Create new landing page (URL) for old DOI
    - Inform user of options
      - Go to new DOI
      - Initiate recovery of old DOI file-set
  - Update the URL in DataCite metadata


T0
T1
T2
T3
DOI (2), Use Case 2
IVC = 1
DTS = T0
DOI (2)
IVC = 1
DTS = T0
DOI (2a)
IVC = 1
DTS = T2

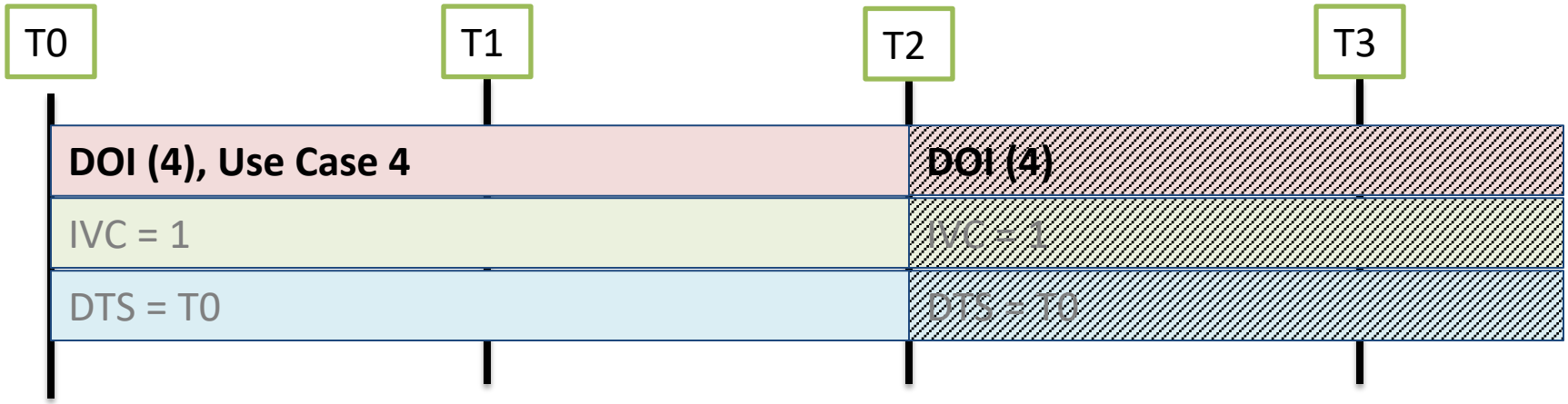
Use Case 3 – Routine dataset extension in time

- Add new files
  - Inherit existing DOI and IVC
  - Log DTS into DB
  - Allow adding data to the newest file
    - E.G. Adding monthly data to an annual file
    - Update DTS
  - Data replacement is not permitted
- Regularly update temporal coverage in DataCite metadata
  - Frequency: monthly or weekly (TBD)



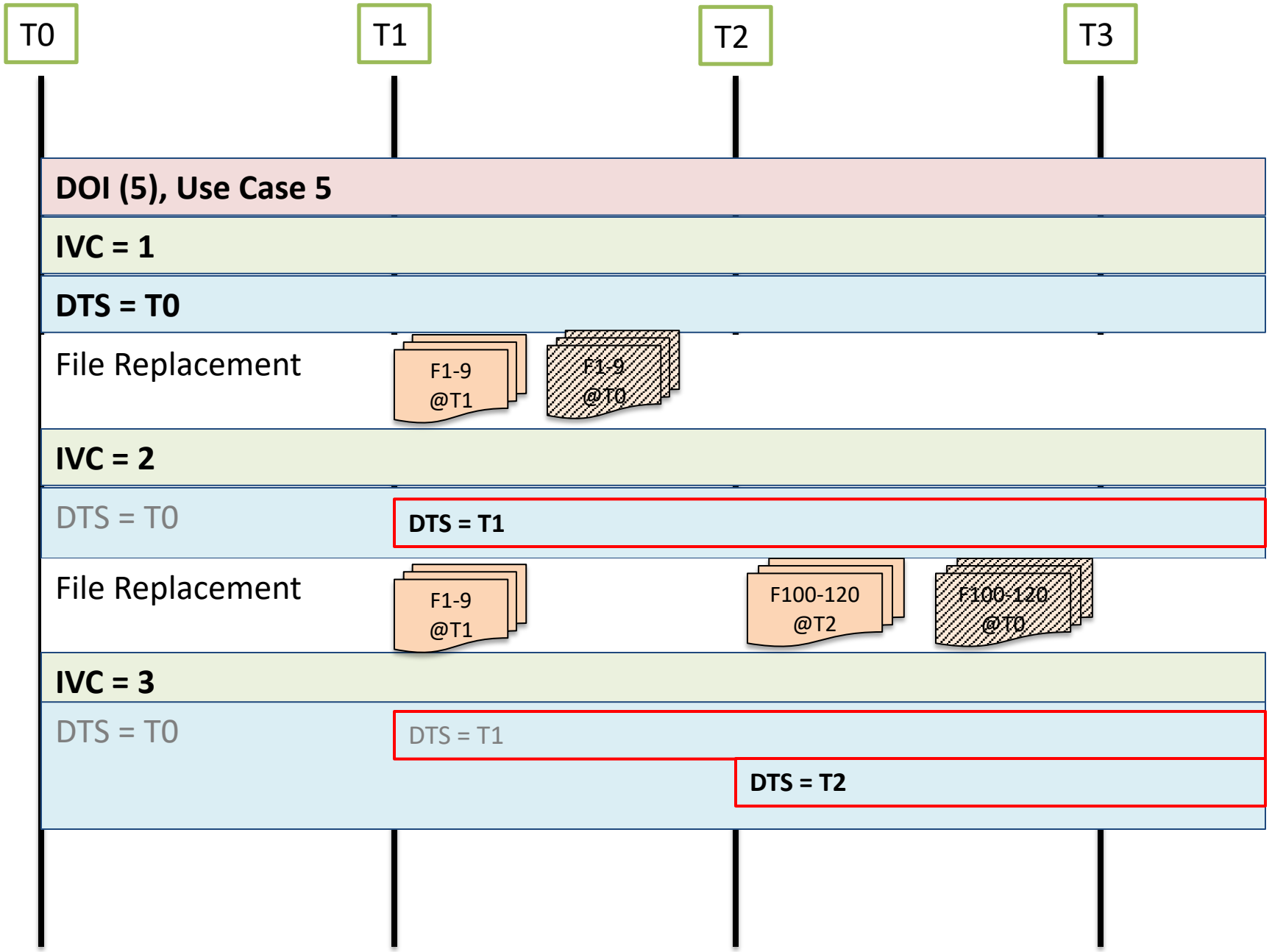
Use Case 4 – Removal of a DOI dataset

- Update DataCite metadata so DOI resolves to a special “dead” dataset landing page (URL)
- Landing page explains status and options
  1. File set is preserved and can be restaged
     - Use Case 2, recover from tape (offline) archive
  2. File set has been deleted from the system
     - Explanation required



Use Case 5 – Small scale replacement (fixes) within a dataset

- Erroneous files are removed from the file-set
  - Files permanently preserved
  - IVC and DTS are saved as history in DB
- Actions to replace a file
  - Incremented IVC, nn ➔ nn+1
  - Re-assign IVC across complete file set
  - Add IVC notation to replacement file base-name
    - » noaa_CFR_hourly_1988_2mTemp_IVC2.grb
- DOI remains unchanged


T0
T1
T2
T3
DOI (5), Use Case 5
IVC = 1
DTS = T0
File Replacement
F1-9 @T1
F1-9 @T0
IVC = 2
DTS = T0
DTS = T1
File Replacement
F1-9 @T1
F100-120 @T2
F100-120 @T0
IVC = 3
DTS = T0
DTS = T1
DTS = T2

User DOI services

Citation design – ESIP Guidelines

Compo, G. P., et al. 2010. *International Surface Pressure Databank (ISPDv2) 1768 to 2010. Research Data Archive at the National Center for Atmospheric Research, Computational and Information Systems Laboratory.* http://dx.doi.org/10.5065/D6SQ8XDW. Accessed§ dd mmm yyyy.

§ Please fill in the "Accessed" date with the day, month and year (e.g. – 5 Aug 2011) you last accessed the data from the RDA.

Also offer AMS, AGU, DataCite styles as an option.

RIS

Download standard metadata for citation management software, e.g Endnote, Zotero, etc.

User DOI services

Three ways to get a citation

1. Generic dataset citation, from RDA portal
2. Download service (scripts, subsetting): Provide complete dataset citation, including "Accessed on" date.
3. Generate citations on demand at a later time:
   - Display user specific access activities
     - Utilize registration information
   - Allow activity selection
   - Create the complete citation

Some Outstanding Challenges

- No limit on data sharing after extraction from the RDA
  - Could lose ability to provide accurate citations
- Have not designed a way to tag an access event with the software ID used to enable it
  - E.g. format conversion, regridding, server-side computations
- Have not designed a systematic way to couple DOIs from the RDA with nearly identical or related datasets
  - Could be managed with metadata enhancements

Conclusions

- Managing DOIs for a dynamic archive has complications
  - Full dataset replacements
  - Dataset retirements
  - Routine dataset extension
  - Stewardship improvements – data fixes, patches, etc
- Implementation – keep records for each file, including:
  - DOI
  - Internal Version Control
  - Date and Time Stamp
- Provide users options to create citations, base on ESIP recommendations

Questions?

RDA: http://rda.ucar.edu

DataCite: http://www.datacite.org

ESIP:
http://wiki.esipfed.org/index.php/Interagency_Data_Stewardship/Citations

(Federation of Earth Science Information Partners)