On the Generation of SLR Output Files at Mt Stromlo

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Abstract

- *As part of the re-establishment and improvement of the Mt Stromlo SLR station, much of the software systems have been redeveloped, including new post-processing software. With the advent of the new CRD format this has provided an opportunity to consider new approaches to the generation of data products. This presentation provides a description of the approach adopted, using XML and XSLT technologies.*
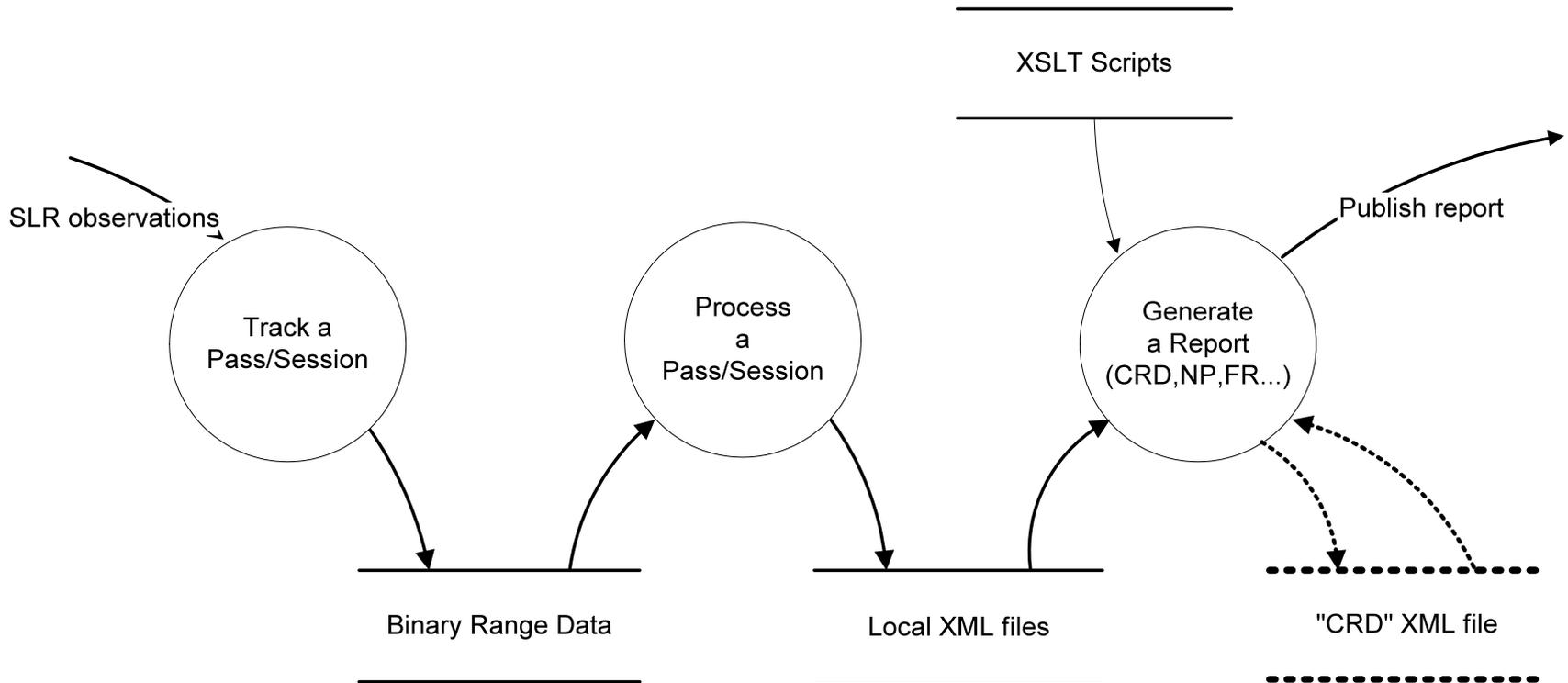
Background

- Redevelopment of post processing facilities.
- Support for automated data processing and publication.
- Adoption of XML to capture all data fields.
  - *Process a pass raw data once to extract and store all useful data in one file.*
  - *Data then accessible to different users/platforms/locations.*
  - *Data subsets can be extracted for all report generations.*
  - *System changes have minimum impact on existing software.*
  - *Object oriented software allows addition of modules/data with minimal impact on existing code.*
- Applications using XML files unaffected by subsequent format changes.
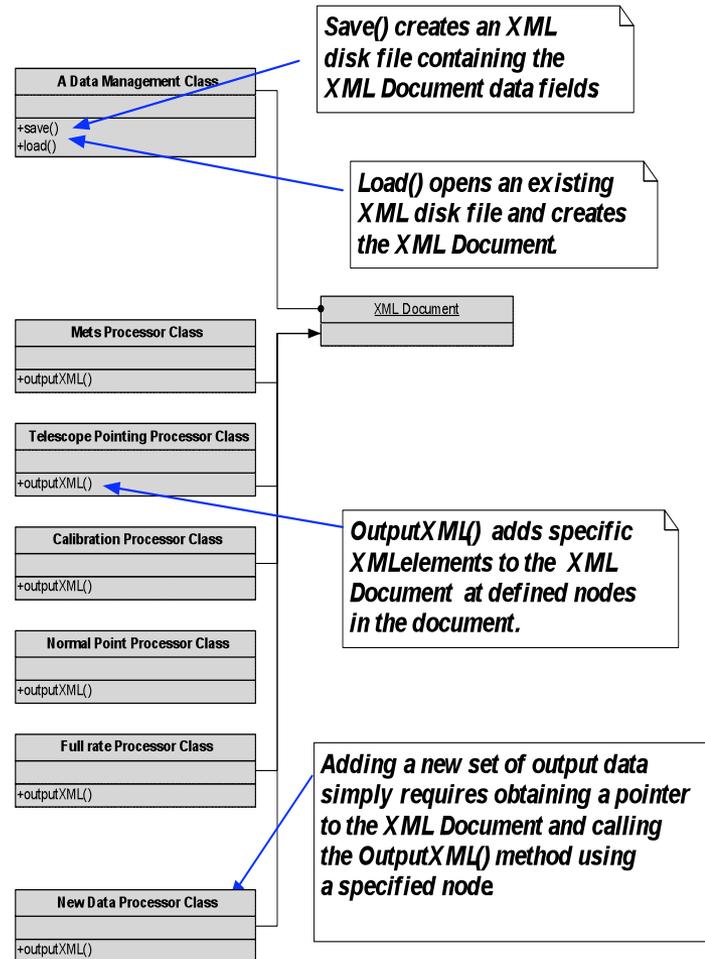- Report generation using XSLT transformations.

Processes

- Track and capture satellite ranging data.
- Post-process pass data to extract signal and form normal points.
- Save full rate and normal point data in "local" XML files.
- Apply "CRD XML" XSLT transformation to create temporary "CRD-like" XML file.
- Apply selected XSLT transformation to the "CRD" XML file to generate required report (eg NP, merit 2, CRD etc.)
- Publish required report(s).

Data Flow

Processing Software

Save() creates an XML disk file containing the XML Document data fields

A Data Management Class

+save()
+load()

Load() opens an existing XML disk file and creates the XML Document.

XML Document

Mets Processor Class

+outputXML()

Telescope Pointing Processor Class

+outputXML()

OutputXML() adds specific XMLelements to the XML Document at defined nodes in the document.

Calibration Processor Class

+outputXML()

Normal Point Processor Class

+outputXML()

Full rate Processor Class

+outputXML()

Adding a new set of output data simply requires obtaining a pointer to the XML Document and calling the OutputXML() method using a specified node

New Data Processor Class

+outputXML()

Processing Software

Minimize Software Development Effort and Maximize Robustness

- *Object oriented design allows addition of modules/data with minimal impact on existing code base.*

- *Reduced coupling - independent data managed by independent classes.*

- *Additional classes only need a pointer to the XML Document.*

- *Tree structure is maintained by node metadata.*

- *Use existing and stable XML/XSLT libraries.*

- *e.g. MSXML or Xerces/Xalan.*

XML Outputs
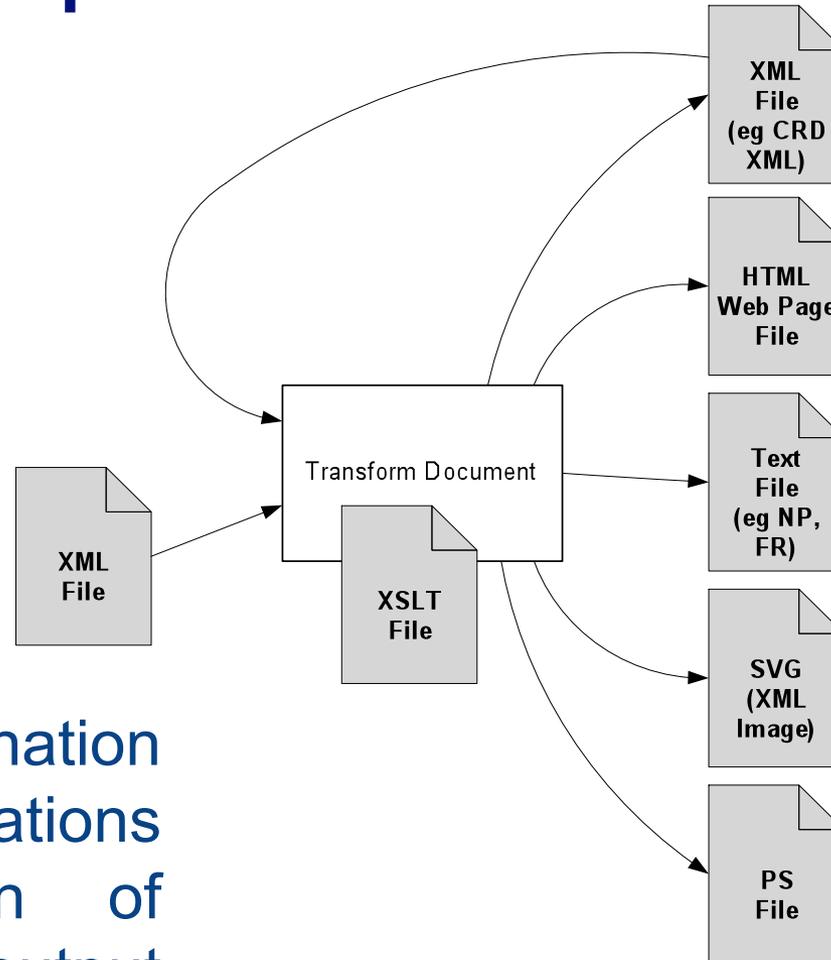
XML files in combination with XSLT transformations supports generation of various types of output files.

Poster

- Sample of a Local XML Output file
- Sample of a "CRD-like" XML File
- XSLT Transform to Create "CRD-like" XML file
- XSLT Transform to Create Combined CRD File
- XSLT Transform to Create CRD Normal Point File.
- XSLT Transform to Create CRD Full Rate File
- XSLT Transform to Create ILRS NP file
- XSLT Transform to Create ILRS FR file