Polar Thematic Exploitation Platform

Polar Data Planning Summit
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Polar TEP Overview

• A virtual research platform
• Provides polar-relevant data, tools, and processing in the cloud
• Brings users’ algorithms to the data
• A central hub in the polar data ecosystem
• Now operational
• Interested in collaborating with potential users and data providers
Polar TEP Future

• Current situation – functioning platform, engineering requirements met, limited set of capabilities in place focused on a pilot project.
• But development will not stop – focus switches to expanding the range of capabilities:
  – Additional data added to catalogue
  – New processors developed and integrated
  – Additional users
  – New capabilities, such as routine and batch processing capabilities,
  – Increase available computing resources,
  – Integration with other parallel developments (e.g. EC DIAS)
Polar TEP Canadian Instance

- Polar TEP is now available to the world.
- CCADI has submitted a proposal to CFI to create a Canadian instance of Polar TEP.
- This will demonstrate a distributed architecture.
1. Access for authorized users
2. Access all services and processors through a web portal
3. A platform catalogue providing details of accessible data and generated products
4. Virtual development environment providing user VMs
5. Execution environment
6. Interfaces based on open standards
Polar TEP Processor Publication and Execution
Processor life cycle

Processor development & deployment

Dev VM

- Dev & Testing
- Create Docker Image
- Register Docker image

Docker registry

Processor execution

P-TEP web GUI

- Processor & data selection
- Send processing task (WPS)
- Processing within Docker container
- Processing result

Execution Environment
Data Access for Processing

- **Processing**: Execution Environment (via P-TEP UI) and User VM (CLI or GUI)
- **Data discovery**: P-TEP Catalogue
- **Data access**: P-TEP File Server and External via HTTP / FTP / ..
- **P-TEP test datasets**
• Most EO data downloaded to platform on user demand – caching can be configured, i.e. store most recent Sentinel-1 data to platform and have a one week rolling archive

• OGC CSW v2.0.2 search interface via PyCSW. This has drawbacks:
  – CSW geo search limited to bounding box
  – XML encoding results in huge database – does not scale very well

• Implementation has started of OpenSearch with Geo/Time extension to address these drawbacks

• Other standards will be pursued in the future

• Polar TEP wants to work with the polar data community to establish an appropriate division of responsibilities for data storage, discovery, access and processing.
• Currently focused on polar EO data
  – ~110k Sentinel-1 records
  – ~150k Sentinel-2 records
  – ~20k Sentinel-3 records

• Science datasets
  – ~130k records for atmospheric, oceanographic model data
Polar TEP Catalogue – Outlook

- Copernicus Marine Environment Monitoring Service (CMEMS)
- Cryosat2
- ERS and ENVISAT SAR archive data integration for both polar regions
- Key polar CCI datasets

- INTAROS data catalogue
- Canadian data catalogues (Arctic Science and Technology Information System, Polar Data Catalogue, etc.)
- NSIDC data catalogue
- ... and others
For More Information

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