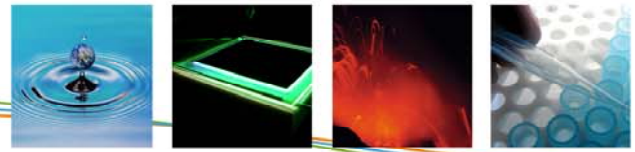
vito
vision on technology



15/12/2009

The VITO Earth Observation LTDA Facility

PV2009 – Madrid

Martine Paepen

VITO – Flemish Institute for Technological Research
Boeretang 200, B-2400 Mol, Belgium
Tel: +32 14 33.67.21
martine.paepen@vito.be

Outline

- VITO in a nutshell
- VITO Remote Sensing and Earth Observation
- CVB Archiving Facility
  - CAF - Originated by Flexsys System
  - CAF - Architectural Concepts
  - CAF - Fully Operational System
- LTDA for PROBA-V products
- Conclusions

VITO in a nutshell – Facts and Figures

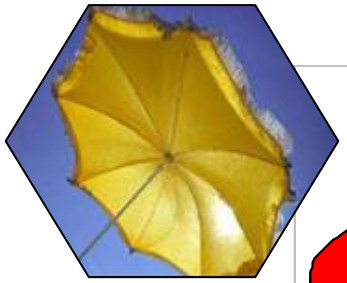
- Established in 1991 by the Flemish Government
- Autonomous public research company
  - shares 100 % owned by Flemish Government
  - 5-year framework contract (2008 - 2012)
- ENVIRONMENT – INDUSTRY – ENERGY
- 550 staff, 73 MEuro turnover (2008)
- VITO provides:
  - Technological solutions
  - For industrial applications & government policy

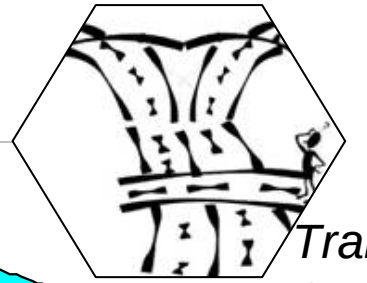
VITO in a nutshell - 8 Activity Domains

Environmental modeling

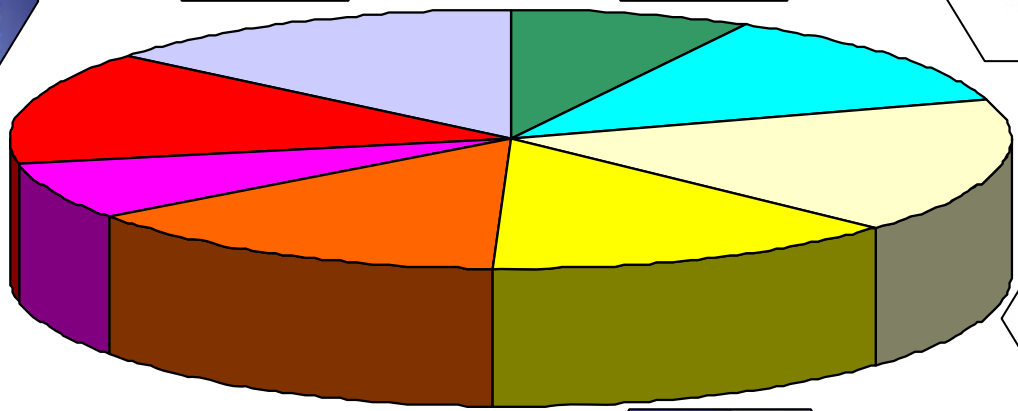
Energy technology

Environmental risk & health





Transit energy & environment



Environmental analysis & technology

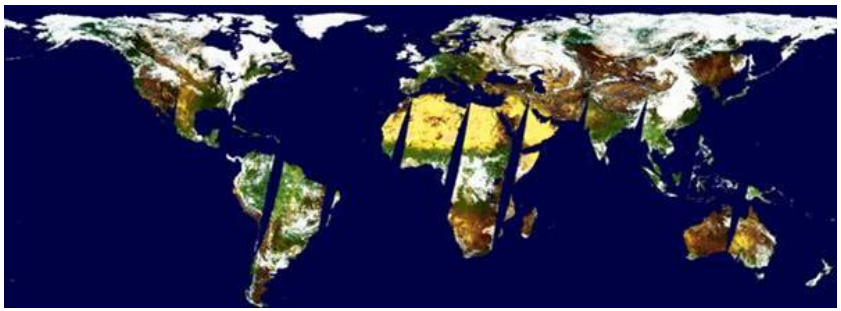
Remote sensing

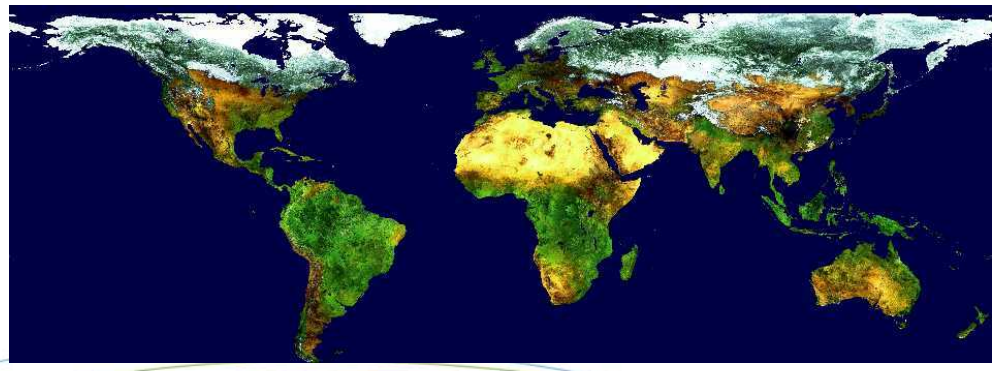
Materials technology

Separation and conversion technology

VITO Remote Sensing & Earth Observation

- CTIV: image processing, archiving and dissemination centre SPOT-VGT
  - Nearly daily earth coverage since 1998
  - Spatial resolution of 1 square kilometer
  - 4 spectralbands
  - Archive: raw images – VGT-P – VGT-S1 – VGT-S10



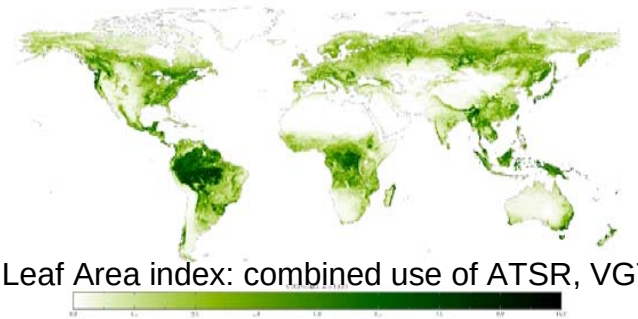


www.vgt.vito.be

vito
vision on technology

VITO Remote Sensing & Earth Observation

- Value added product / service provider
  - derived products from low resolution global instruments (e.g. burn scars, crop yield, ...)
  - from complementary satellite instruments : AVHRR, MERIS, MODIS,...



Leaf Area index: combined use of ATSR, VGT, MERIS

- Products from Airborne sensors:
  - Hyperspectral : APEX
  - High Resolution : UAV

vito
vision on technology

VITO Remote Sensing Archives

- CTIV Archive = dedicated SPOT-VGT Archive
  - Classical Role:
    - Data preservation
    - Data provision on request
      - near real time data provision
      - long time series over a specific ROI

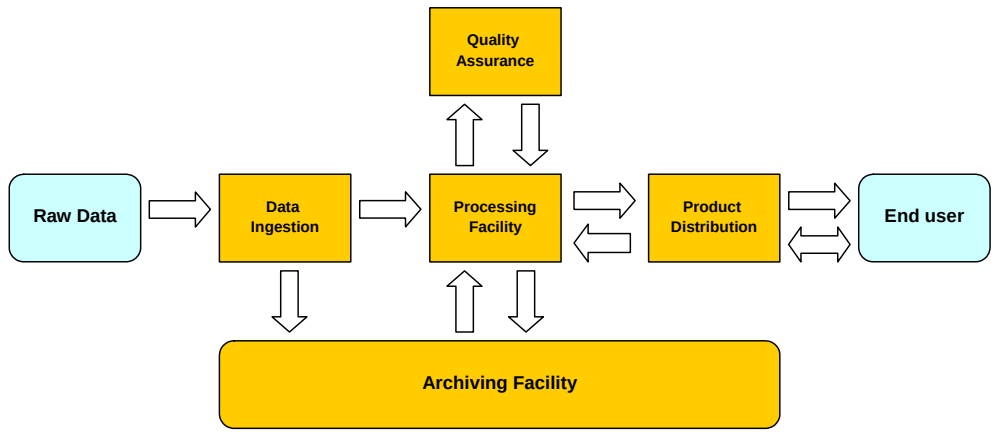
- CAF = standard based flexible multi mission Archive
  - Multi Mission (MERIS/MODIS/AATSR….. For intern VITO use)
  - Data preservation & management
  - Standard based application & interfaces

CAF - Originated by the Flexsys System (1)

- Goal:
  - Define & build new infrastructure for development & deployment of new earth observation services at VITO in a cost-effective way
  - Embed the RS archives in a modular and flexible processing and service environment for a streamlined information ingestion and retrieval

- Flexsys Concepts
  - Multi-mission
  - Harmonization
  - Interoperability
  - Modularity at all levels

- ➔ Independent Services
  - Integrated
  - Loosely coupled



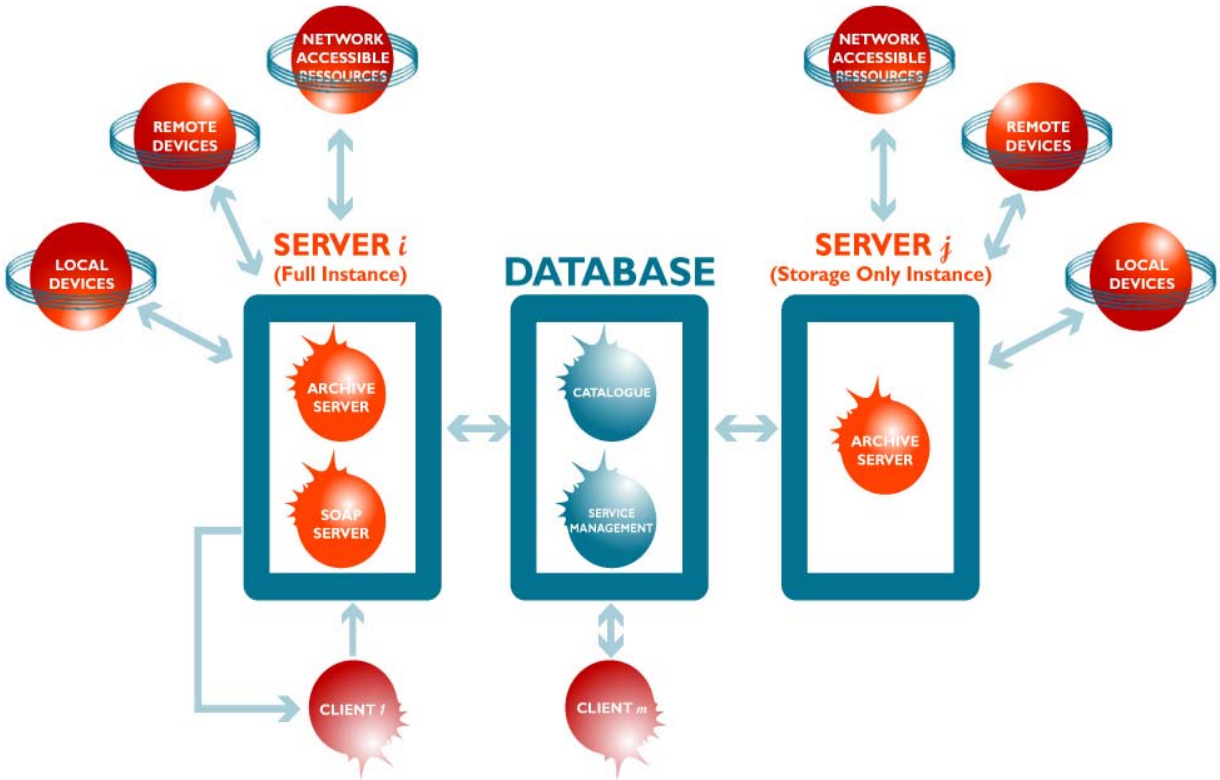
CAF - Architectural Concepts (1)

- Archival Information Packages ‘AIP’ (OAIS)
- Heterogeneous data and metadata
- Complete archive functionality
  - Ingestion, storage and retrieval
  - Management
- Two Layers
  - Abstraction layer: modular, generic and portable JAVA application
  - Physical storage layer

CAF – Architectural Concepts (2)

- Distributed Architecture
  - Instances (can) run on different computers
- Service Oriented Architecture
  - Each instance is specialised by configuration
  - Provides services
- Central Relational Database
  - Generic catalogue (metadata)
  - Service request repository
  - DB-type independent

CAF – Architectural Concepts (3)



CAF- Architectural concepts (4)

- Highly configurable lifecycle management
  - Xml configuration file
    - Projects : lifecycles
    - Instances : services & resources
- Uniform Storage Operations
  - Copy, delete, check
  - Independent of underlying infrastructure
  - Physical layer can be added or changed
  - Implemented with plugins

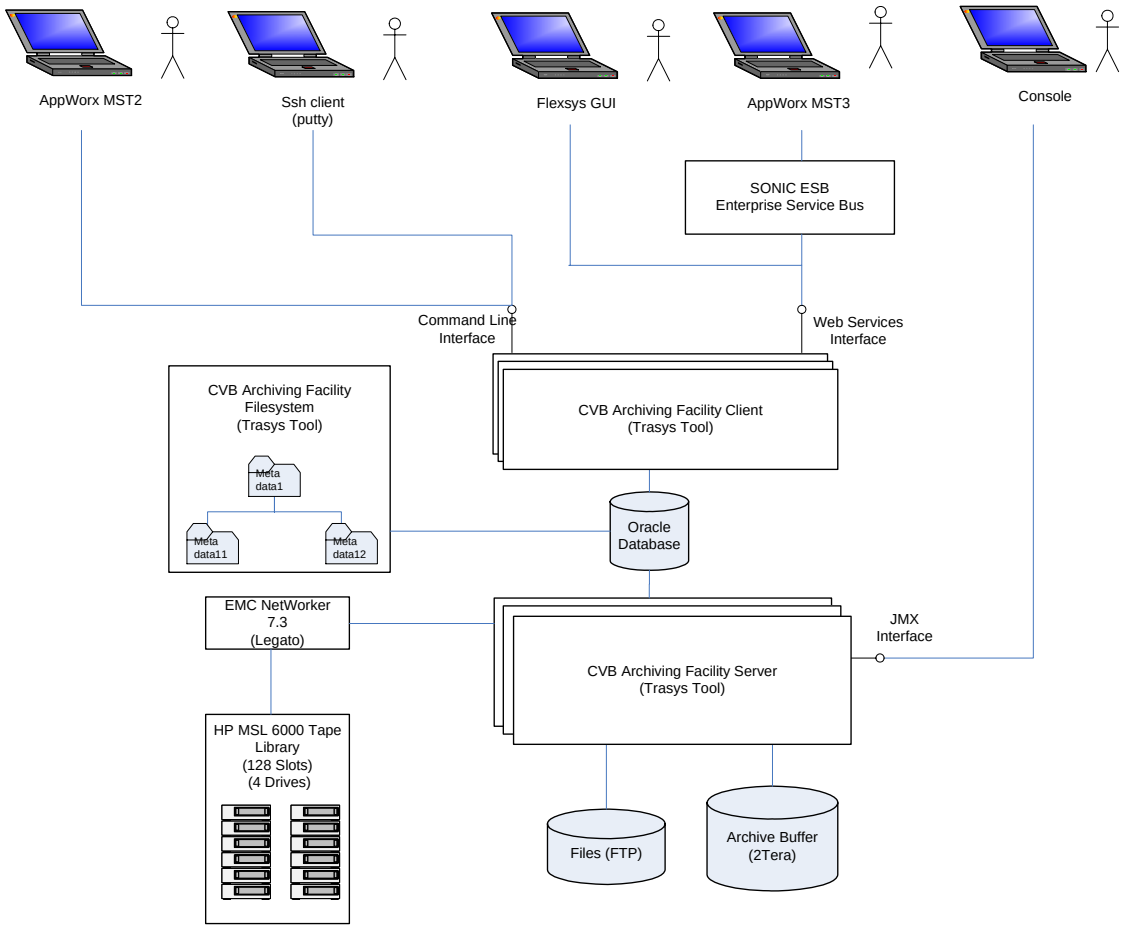
CAF – Architectural Concepts (5)

- Extensible Query Language
  - Dynamical translation into SQL request
  - Rules are stored in the central database
  - New operations can be added
- External Interfaces
  - Command Line
  - WebServices via SOAP
- File System Access
  - Virtual read-only file system
  - Customizable

CAF- Fully Operational System (1)

- Independant application
- Integrated with the CVB Processing Facility
- Seperated environments
  - Operational system (Linux)
  - Acceptance system (Linux & Windows)
- Monitored by operators

CAF – Fully Operational System (2)



CAF- Fully Operational System (3)

- Content for intern VITO use
  - Rolling archive AATSR & MERIS
  - NOAA, AVHRR (RD,S1,S10)
  - MODIS L1 & L2
- Standard approach by project
  - HMA based Metadata-file
  - 2 copies on LTO-tapes (long term Archive/Clone)
  - 1 copy on disk (short term)
- Ongoing actions
  - Activity Reporting Tool
  - Read-only access to the SPOT-VGT archive
  - Investigation performance and spatial/locator features DB-types
  - Investigation storage media (middle term / online access)

LTDA for PROBA-V products (1)

- Proba-V
  - To ensure continuation of low resolution EO products
  - New Belgian satellite (ESA authority)
  - To be launched in April 2012

- VITO – Development User Segment
  - Processing Proba-V level 0 up to level 3 products
  - Archiving received and processes data
  - Distributing products to user community
  - Assuring quality

LTDA for PROBA-V products (2)

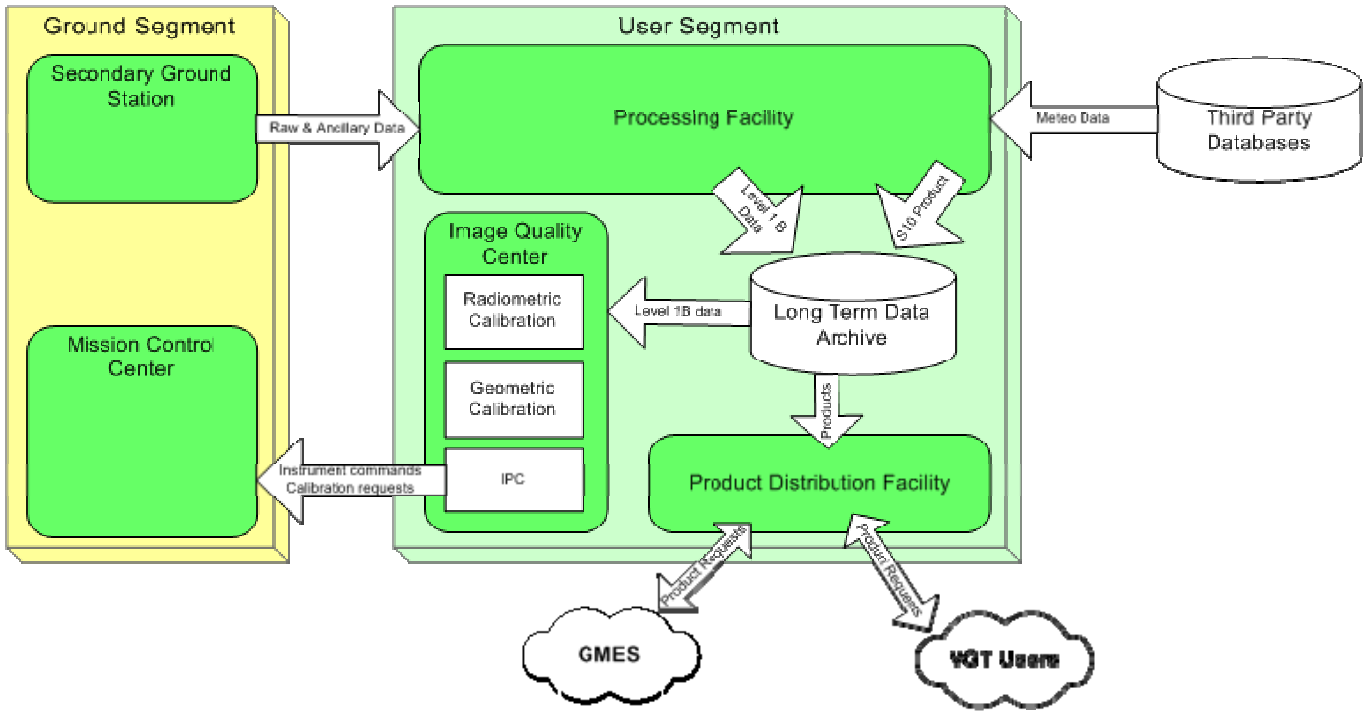


Figure: PROBA-V User Segment Blocks and Interfaces

Re-use Archiving Facility and integrate in the Product Distribution Facility to make the archived data discoverable and accessible by WebServices

Conclusions

- CAF = flexible and independent archiving facility
  - Ingestion, storage, retrieval and management
  - Heterogeneous data and metadata
  - Multi mission EO sensors
  - HW independent
- Integrated in the CVB Processing Facility
- Integration in Product Distribution Facility
- Future re-use to implement LTDA for PROBA-V products
- Historical archive of CTIV
  - More standard and up-to-date way to access and distribute the SPOT-VGT products

vito
vision on technology

Thank you for your attention

Any questions ?

Join us at the international conference integrating:

- Sustainable Production;
- Sustainable Chemistry;
- Sustainable Energy;
- Materials for Sustainable Production;
- Carbon capture and storage (CCS)
- In Vitro Methods replacing Animal Testing (CARDAM).

i-SUP 2010

Innovation for Sustainable Production

April | 18 - 21 | 2010
Bruges (Belgium)

www.i-sup2010.org

We are looking forward to welcoming you at the i-SUP2010 conference!

vito
vision on technology

mip
Supporting the green economy