NORS VALIDATION SERVER

WP8

WP8 Summary

- **Objective**

  Build a system that generates in an operational and consistent way validation reports of GAS products based on independent NORS data products.

- **Tasks**

  8.1 Definition of the validation server
  8.2 Development of the validation server system
  8.3 Validation server system tests

- **Deliverables**

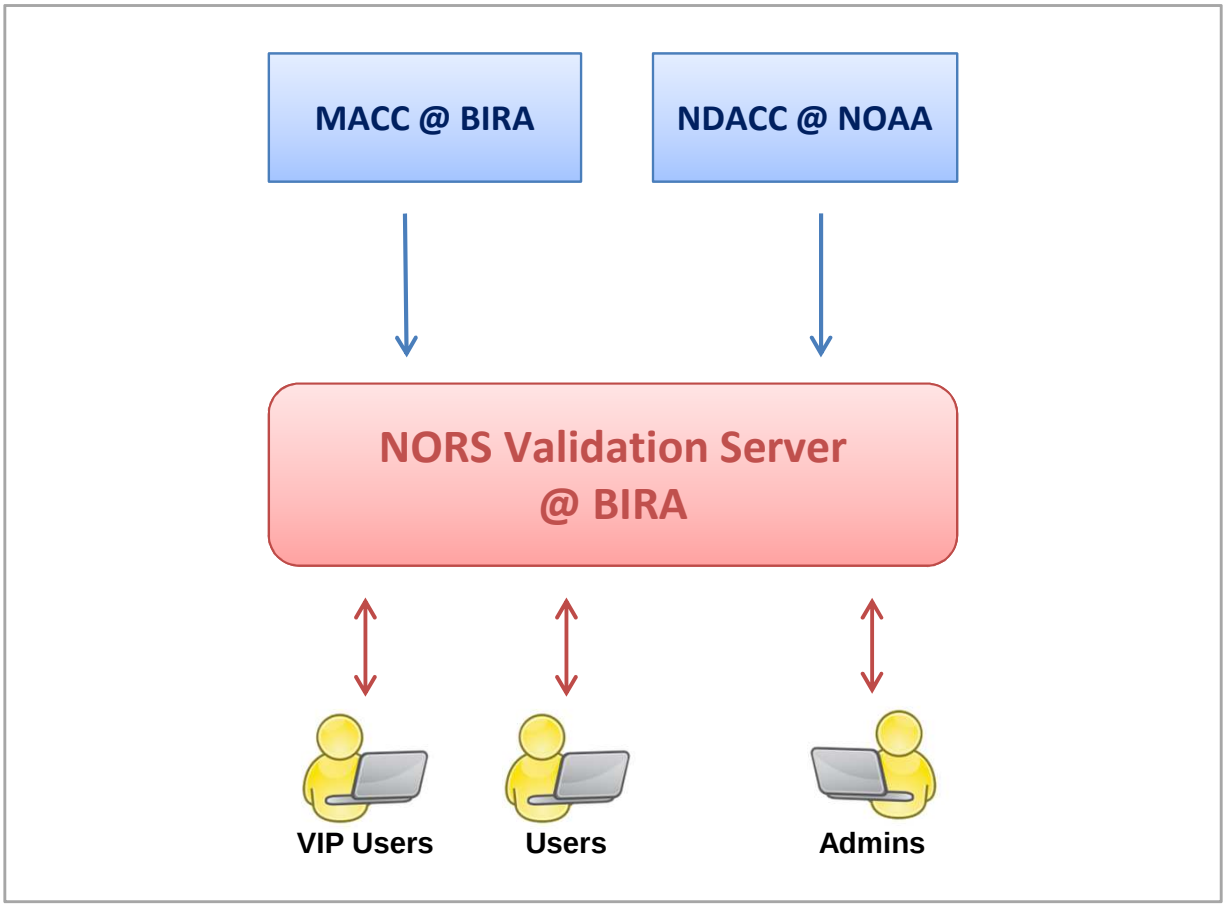
  D8.1 *Validation server User Requirements Document (URD)*
  May 14, 2012.
  D8.2 *Validation server Design Document (DD)*
  July 9, 2012.
  D8.3 *Validation server in test-phase*
  August 26, 2013.
  D8.4 *Ready-to-use Validation server*
  December 20, 2013.

General WP8 Approach

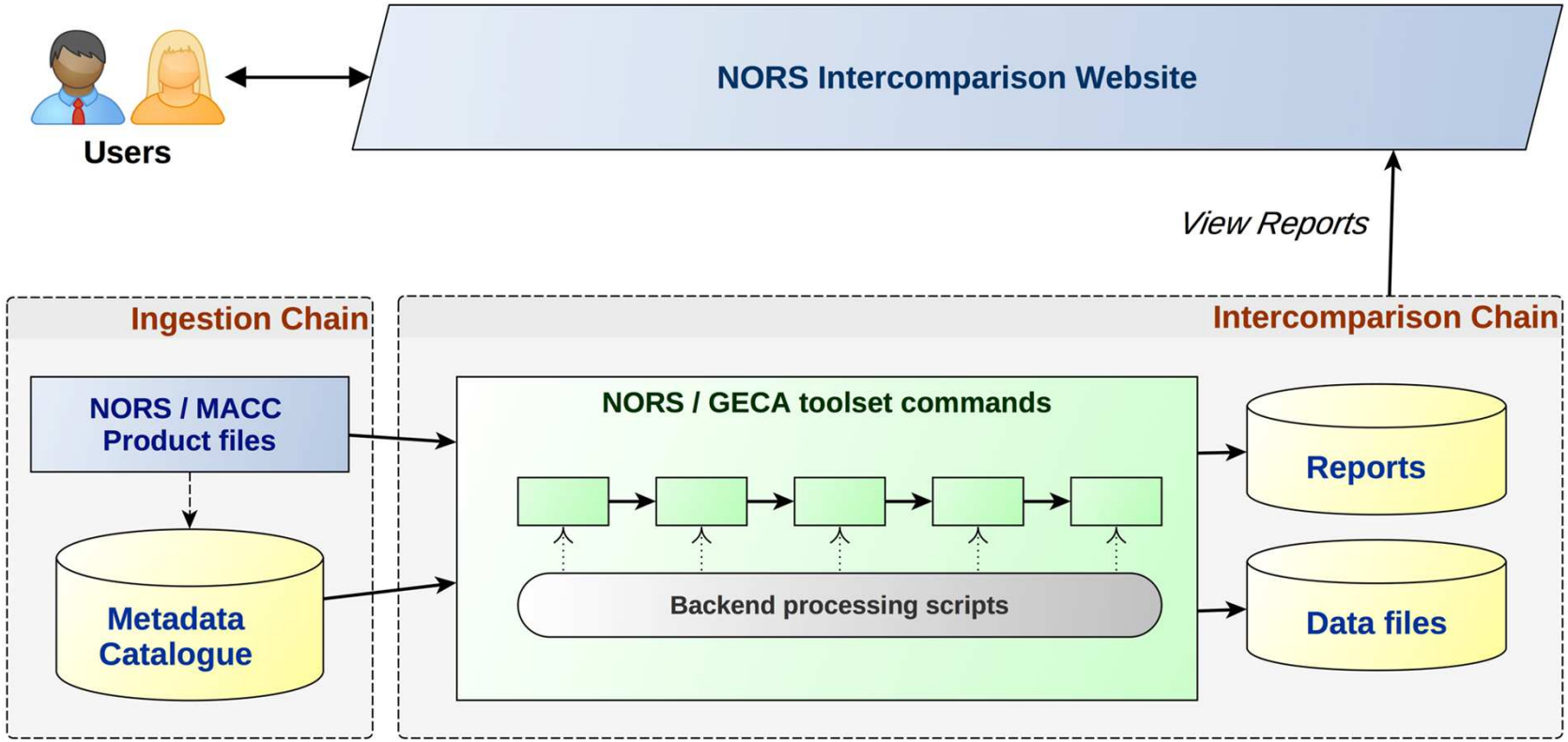
Division of labour:

- **User Requirements documented in User Requirements Document URD (BIRA)**
- **System Architecture documented in Design Document DD (S&T)**
- **Algorithm definitions document and prototype Python scripts (BIRA)**
- **Backend Toolchain and Webserver (S&T)**
- **Testing, validation, feedback, fixes (All project partners)**

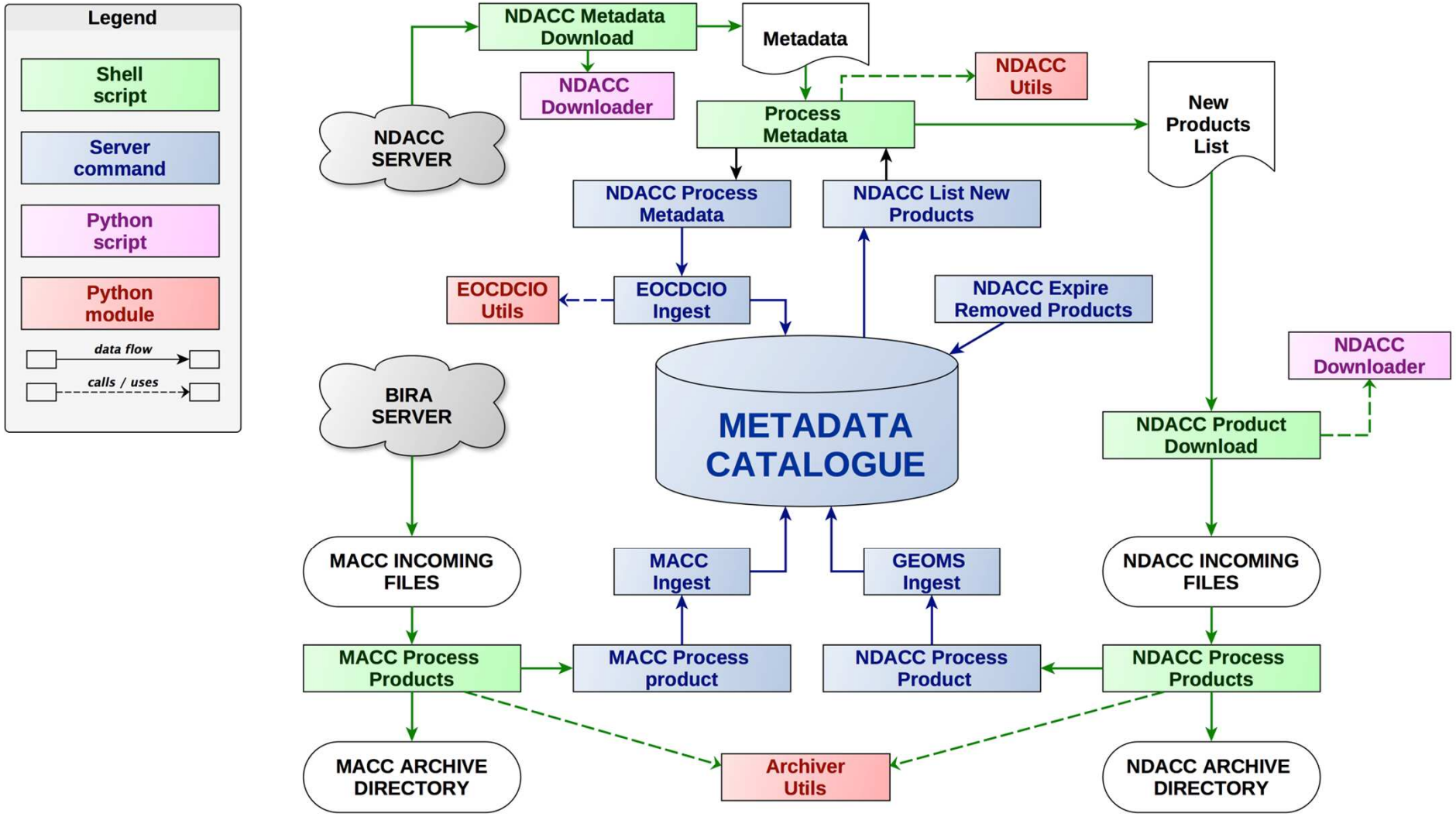
Global Architecture



Server Architecture



Ingestion Chain Architecture



Intercomparison Design

- **Intercomparison is defined by** PARAMETER**,** MODEL TYPE **and** INSTRUMENT TYPE
  - **Special value** [ALL] **for MODEL TYPE**
- **Each intercomparison yields many different reports**
  - **Reports are split by** LOCATION**,** AFFILIATION **and** TIME PERIOD
  - **Special case** [ALL] **for LOCATION and AFFILIATION**
- **Each report is a separate run of the toolchain in the backend (starting from original HDF and GRIB data)**
  - **Resulting HTML report can be viewed in website or downloaded as PDF**
  - **Output datafiles of toolchain can be downloaded as zip archive**

Toolchain Functionality

- Time and location based collocation
- Effective airmass location calculation
  - Implemented for FTIR (same 'slant' profile is also extracted from MACC!)
- MACC profile extraction (including zsurf)
- Vertical grid resampling (only point-based)
- Vertical smoothing
- 1DF partial grid (per measurement)
- Total/partial column creation from concentrations
- Reporting using different quantities and grids (including Taylor diagrams and cross-model comparisons)

Toolchain Architecture

Implementation in toolchain does not always exactly match that of algorithm document and/or prototype code

Toolchain uses chains of 'steps':

- **Sequence of command line tool executions**
- **Sequence of core library function calls within a tool**
  - **Core functions do not always map 1:1 to dedicated tailored algorithms as defined in Algorithm Document**

Toolchain uses concept of *file* → *file*:

- **This poses restrictions on what 'state' can be kept in between steps:**
  - **different grids = different files = additional states**
  - **report can be based on set of states**

Validation Server

- **Automated operation:**
  - **ingestion of NDACC data (conforming files picked up automatically, also from non-NORS stations)**
  - **ingestion of MACC data (including the new *MACC_osuite*)**
  - **generation of intercomparison reports**
- **Browsing of reports (easy and efficient navigation)**
- **Inspection/download of individual reports**
- **Downloading of all result and data files**
- **User account management (VIP/Admin users)**
- **Metadata catalogue browsing & download (VIP)**
- **Definition of intercomparisons and reports almost fully by means of configuration files (i.e. no code update needed)**
  - **Additional non-NORS intercomparisons (H_20, FTIR-NO_2, etc.)**

Validation Server Demo