The VLT Data Flow System

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High Level VLT Requirements

ESO aims to :

- maximise the scientific return of the VLT
- ensure quality and long-term usefulness of data
- ensure the performance of instruments

Therefore ESO must :

- make it possible to use the resources
  of the VLT flexibly, responsively, intelligently and easily
- calibrate, monitor and simulate the VLT instruments

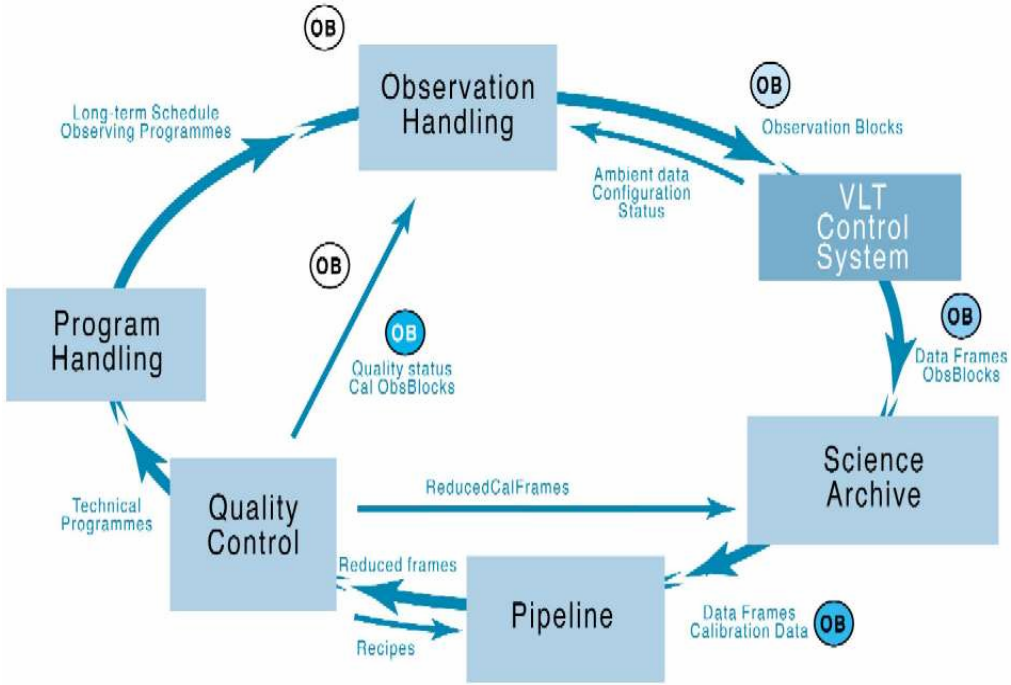
To achieve these goals the VLT must have:

- a unified, simple interface to telescope and instruments
- processing on-the-fly
- flexible scheduling
- calibration plans for all instruments
- automatic monitoring of instrument performance
- detailed instrument models

DFS Mission

- ***The Data Flow System is composed of a collection of software components for preparation and scheduling of observations, archiving of data, pipeline data reduction and quality control***

- ***Our customers are:***
  - Visiting Astronomers Section
  - User Support Department
  - Data Flow Operations Department
  - Paranal-La Silla Science Operations
  - ESO Community



DFS Front-End Tools - ETC

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Optical Spectroscopy Mode Version 2.4.1 | Description. | F.A.Q | Performance

Input Flux Distribution

Uniform (constant with wavelength)

Blackbody: T = 11000 Kelvin

Template Spectra: A0V (Pickles) Redshift Z = 0

Object Magnitude: 20. Band: V

Magnitudes are given per square arcsec for extended sources. Note that some template spectra are defined over a limited wavelength range and may not allow calculations for all instrument configurations.

Spatial Distribution: Point Source Extended Source

Sky Conditions

Days From New Moon: 0 days Airmass: 1.2 Seeing: 0.8 arcsec

The sky brightness is determined by the moon phase and the instrument efficiency according to this table.

Instrumental Setup

Mirrors (2 aluminium coated mirrors): 80% at 670 nm

Resolution: Standard High

Detector read mode: slow

Grism: GRIS_600B Disp 5.0 nm/mm

Slit: From list: 0.40 arcsec

Polarimetry Mode: No polarimetry Linear or circular polarisation

Results

Exposure Time (s): Value 100 Plotting range 50 %

On submission the model can generate the following graphs:

- Object Spectrum
- Sky Spectrum
- Input spectrum in physical units
- Signal-to-noise
- Total Efficiency and Wavelength Range

◇ Slit : 0.40 arcsec width
◇ Detector CCD#901 in slow read mode

▪ Results
◇ Exposure Time of 100(s) with Range 50(%)

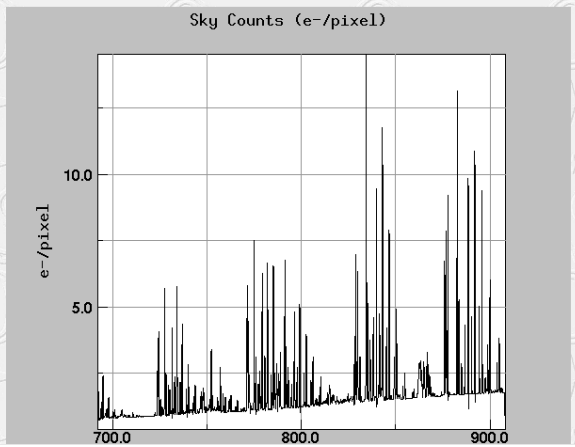
Spatial distribution	:	Seeing limited
Wavelength Range	:	691.892 - 907.981 nm
Central Wavelength	:	799.937 nm
Dispersion	:	0.106 nm/pixel
Plate scale	:	0.200 "/pixel
Probability of realisation of seeing	:	65.600 %
FWHM of the seeing spatial profile	:	4.000 pixels
Efficiency at central wavelength	:	7.851 %
Total object counts at central wavelength	:	10.056 e-
Sky background level at central wavelength	:	1.227 e-/pixel
Max. intensity at central wavelength (object+sky)	:	3.555 e-
AD converter saturation	:	120000 e-
Detector read-out noise level	:	4.700 e-/pixel
Detector dark current	:	5.000 e-/pixel/hour
PSF extension	:	8 pixels
Signal to Noise (*) at central wavelength	:	0.716

(*) The signal to noise is calculated over 1 pixel along the dispersion and the nearest integer of 2*seeing/plate_scale = 8 pixels along the slit.

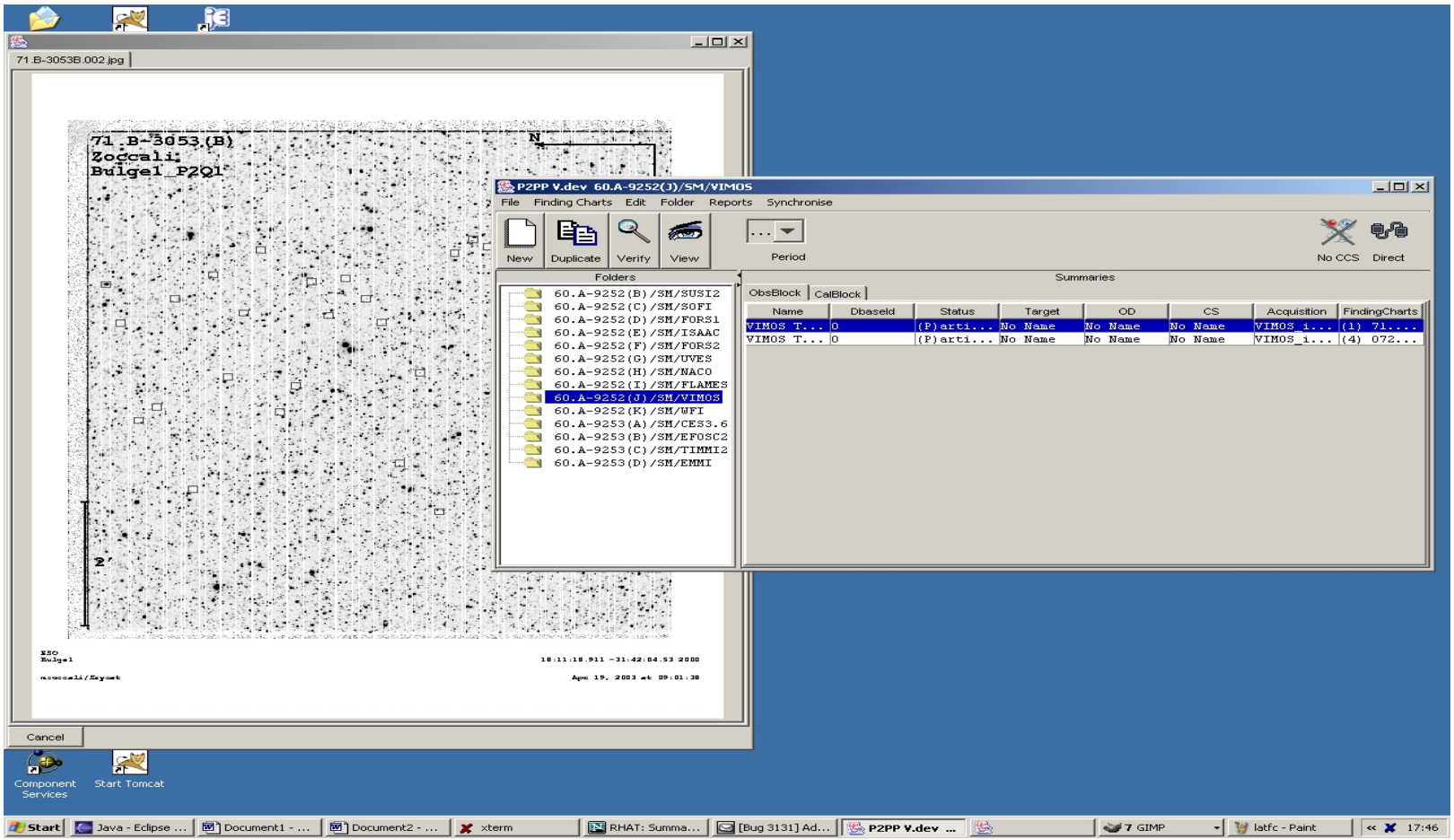
The following graphs are Java applets. Click here for more details.

Sky Counts

ASCII data GIF plot



DFS Front-End Tools -P2PP



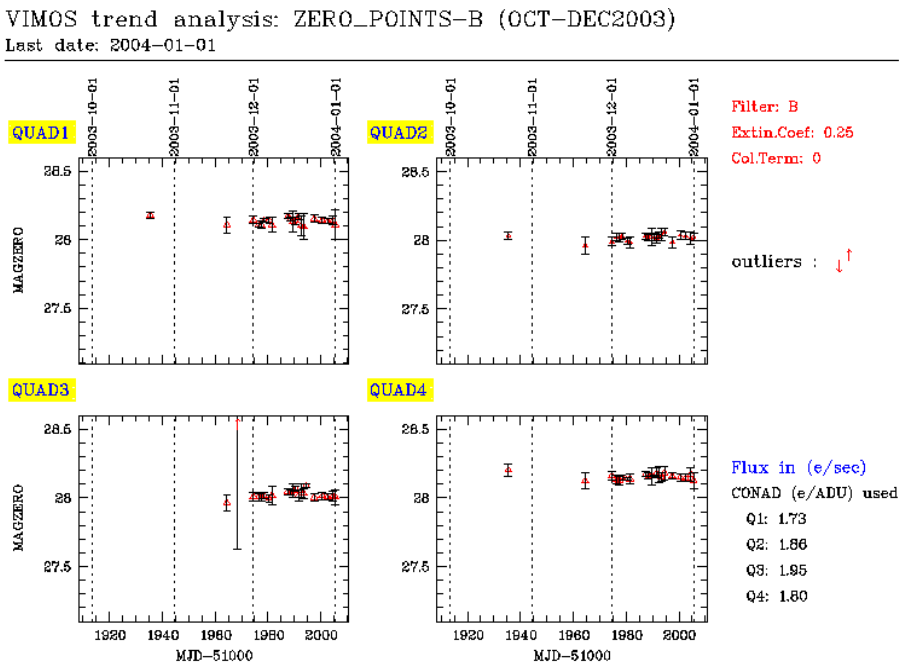
VLT/VLTI Instrument Pipelines

The main missions of the instrument pipelines are:

- Process raw calibration frames into master calibration
- Produce QC parameters for monitoring telescope, instrument and detector performance
- Process raw science frames into science data products

The quality of the products is limited by :

- Quality of input data (raw +calibration)
- Set of standard parameters (on-line)
- Quality of the algorithms



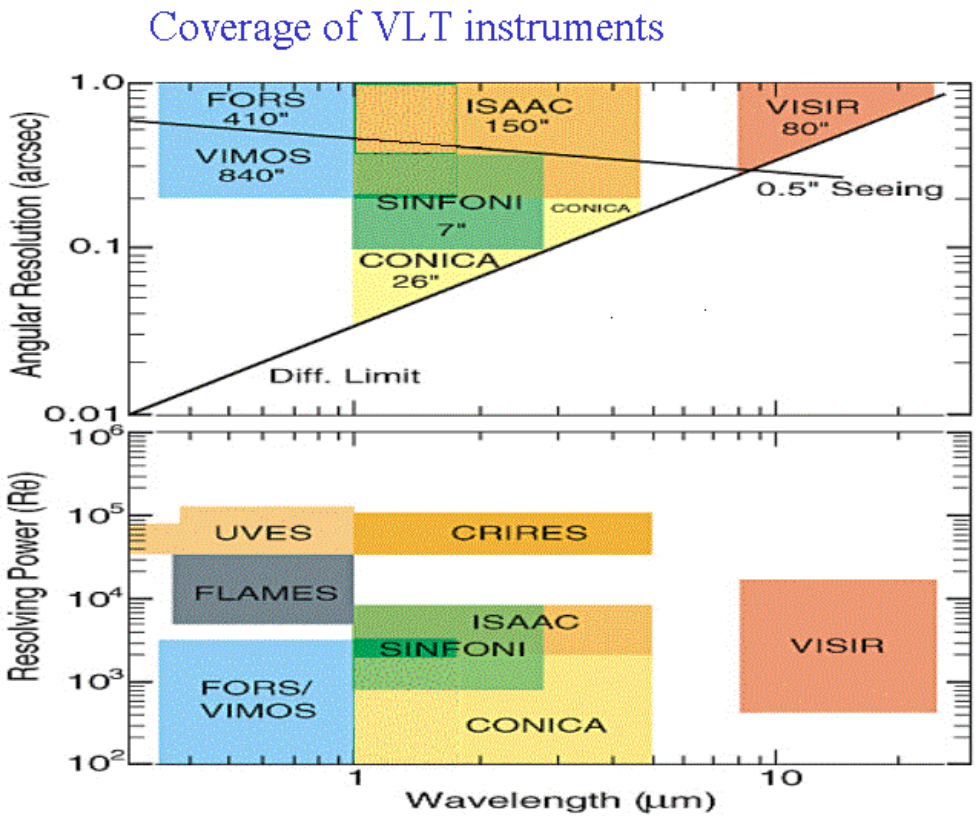
VLT/VLTI Instrument Pipelines

An instrument pipeline is:

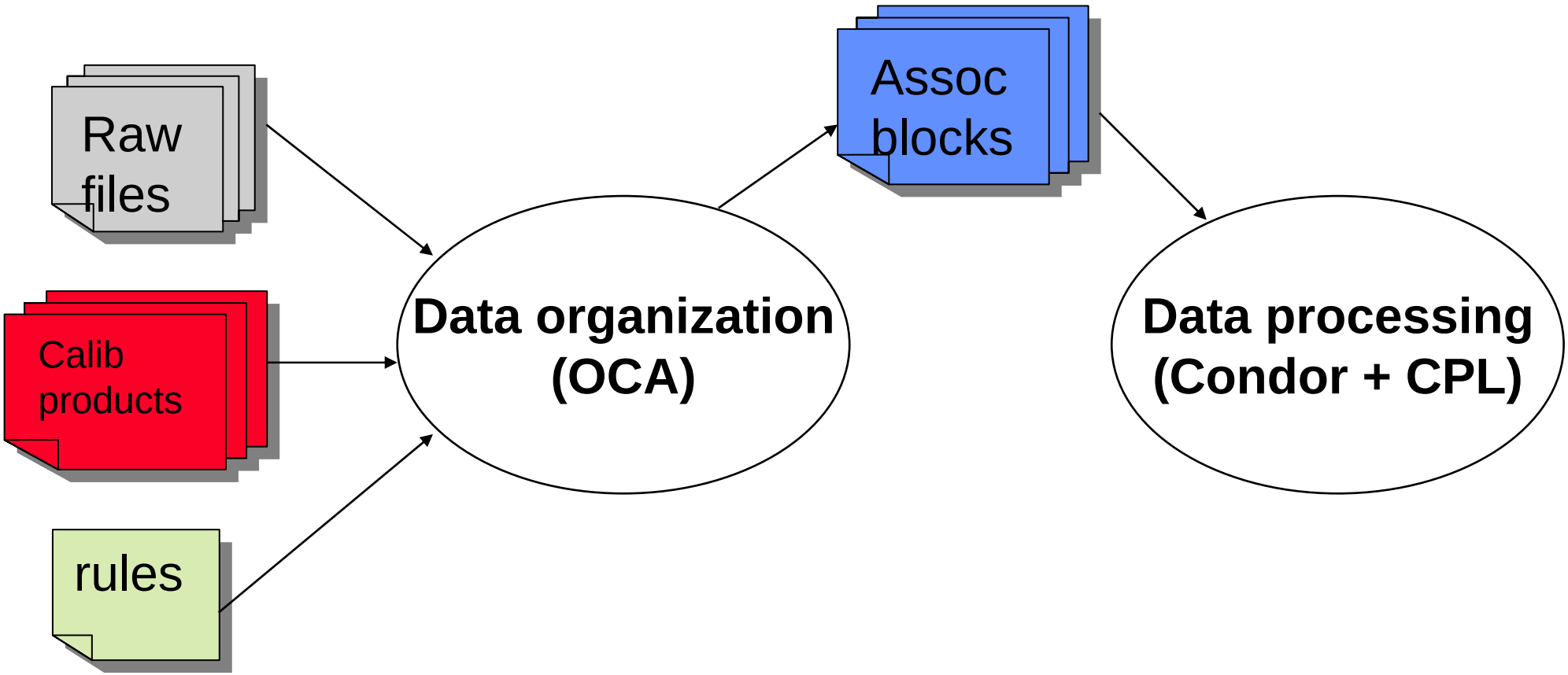
- Set of data processing executables called Pipeline Recipes built on top of the Common Pipeline Library

An Instrument pipeline runs in the following environments:

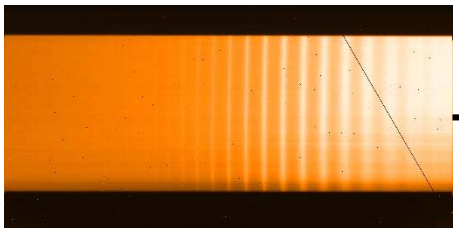
- On-line (Paranal), in an automatic manner with default settings
- Off-line (Data Flow Operations), in an automatic manner
- On the Desktop, interactively

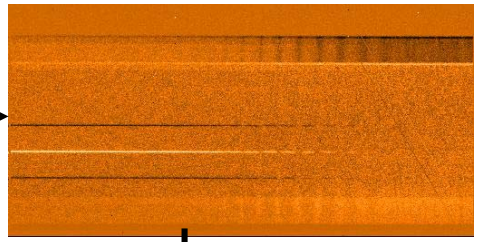


On-Line-DFO Environment

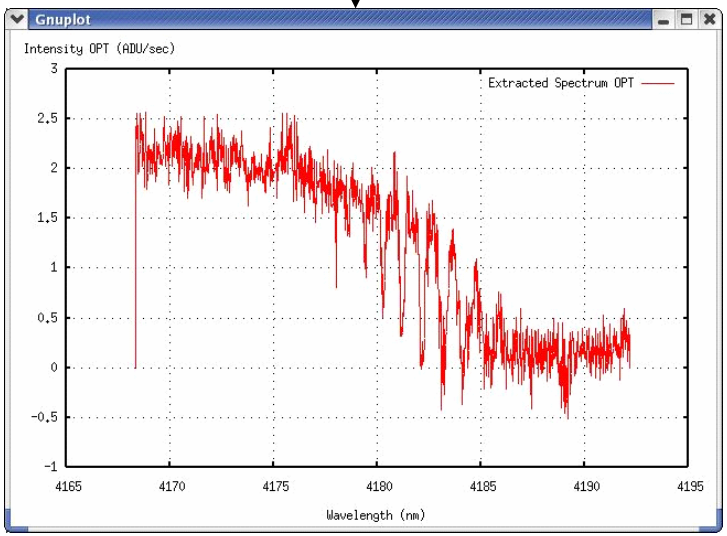


Pipeline Desktop environments-EsoRex





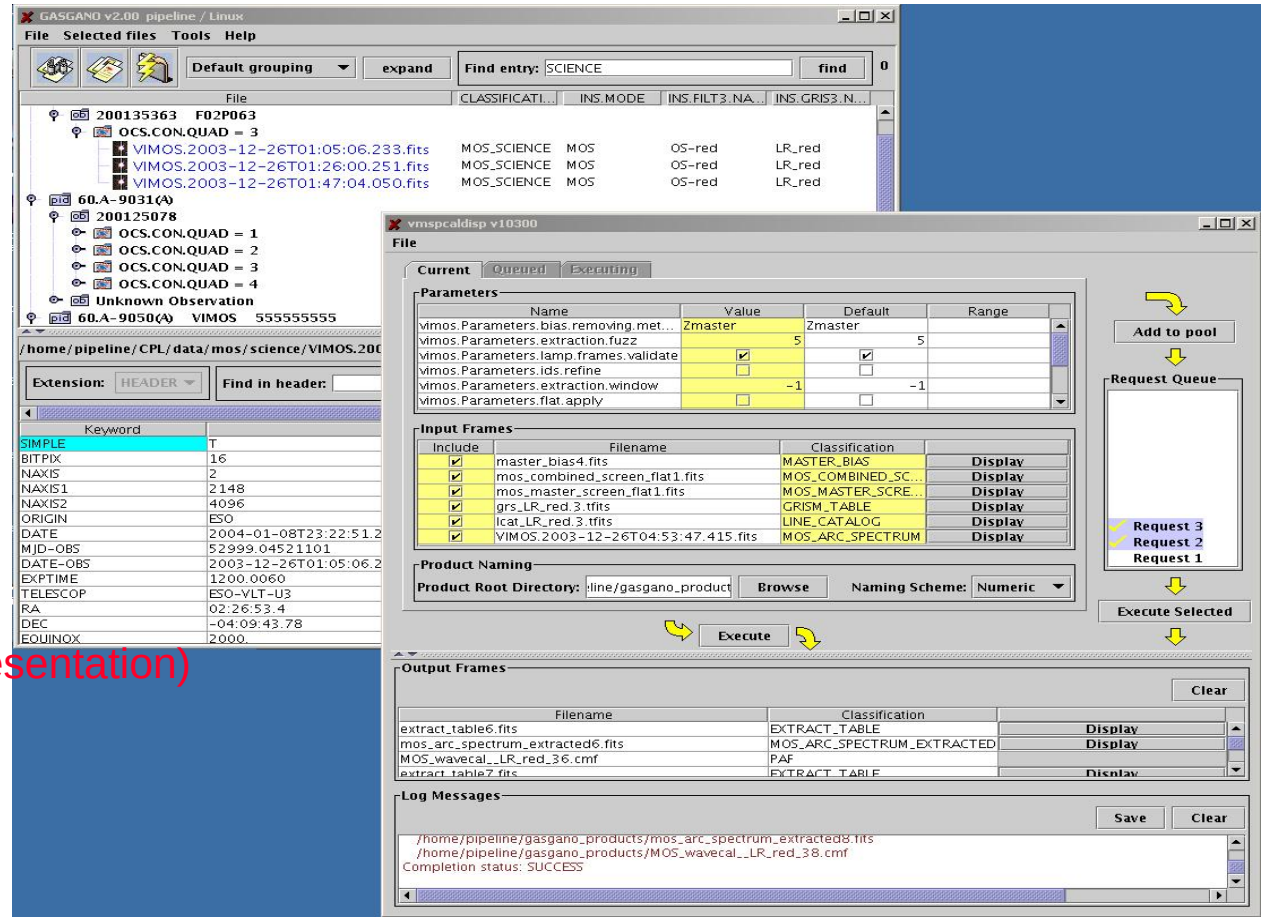
CRIRES Pipeline



- EsoRex supports the execution of pipeline recipes from the command line.
- Recipe name, input files and parameters must be provided on the command line
- Pipelines and tools can be downloaded:
  www.eso.org/pipelines

Pipeline Desktop environments-Gasgano

- VLT interactive data organisation tool
  - FITS file browsing
  - Grouping
  - Classification
- Interactive front-end
  - Interface to CPL plugins
  - Interface to vizualisation tools
- Next Generation tool : Reflex (next presentation)

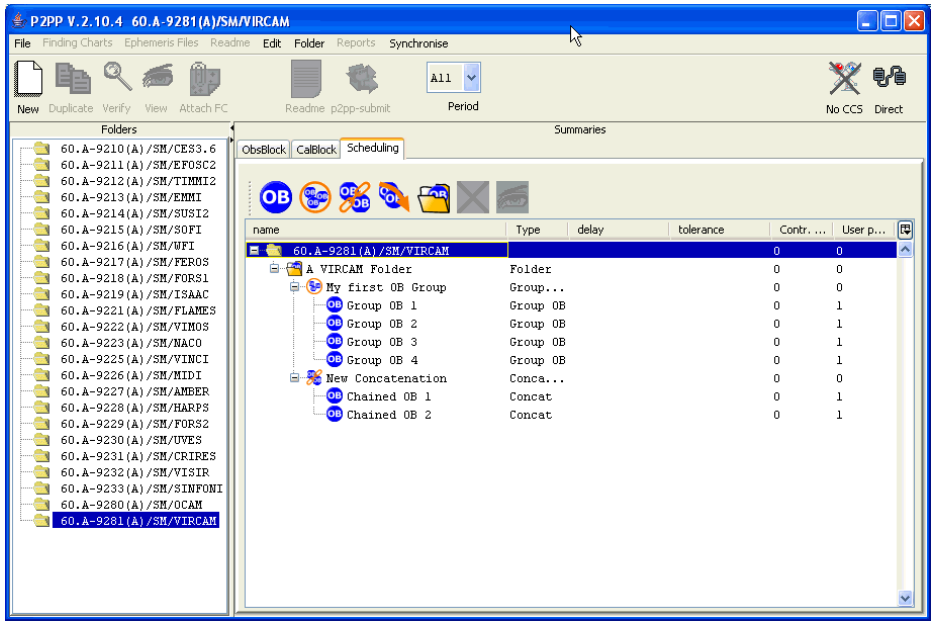


Observation Preparation Tools - Support for surveys

- Surveys will involve many OBs per run (~1,000 per semester?)
- They will require observations of large fields (many pointings)
- They will require repeated observations over a time span, with a given frequency
- They will require sets of observations to be performed over a short interval (near-simultaneity)
- They will require a sequencing of the observations so as to maximize the scientific value of intermediate release products

Support of new structures in P2PP

- Groups contain internal scores driving the scheduling of their components
- Time links and concatenations are defined in a straightforward way
- Grouping in containers facilitates the overall view and organization of the survey
- The implementation of containers will also be valuable for operations at VLT, VLTI, La Silla



User Portal - Background

Read the Call for Proposals

Submit an observing proposal

Find out the status of the OPC review

Prepare and submit OBs (SM only)

Specify where the resulting data are to be sent (SM only)

Request (supporting) data from the Archive

Phase 1/2 Interactions

USD-based applications, OPC-related applications, ESO-internal applications

User Portal - Current Situation

Proposal to Receipt of Data

Download the ESOFORM package.

Find web page, and download.

Upload the finished proposal.

Find WASP web page and upload.

Review the webletter report.

Find another web page, and login (ID?).

(If successful) use P2PP to prepare OBs, Finding Charts, and README file.

Download P2PP (where?), login (ID?), and receive notice of submission.

(If OBs are executed) receive the SM data.

But I'm on sabbatical, …

User Portal - Current Situation

Archive Data Request

Look through the Archive for the data

Use the new Archive web search interface

Login (authenticate).

Username? Password? Not the P2PP …

Receive the data.

But I'm on sabbatical!

Wouldn't it be bette[r] if…

- links for the whole fl… were in one plac…
- each pers… h… co… ever… i… yn… … d p…ss…
- usern… s… f… 1/… ar…
  Ar…
- each … eir …a i… …ent… …s like
  th… … h… …-lin…

ESO User Portal

User Portal - Account Manager