



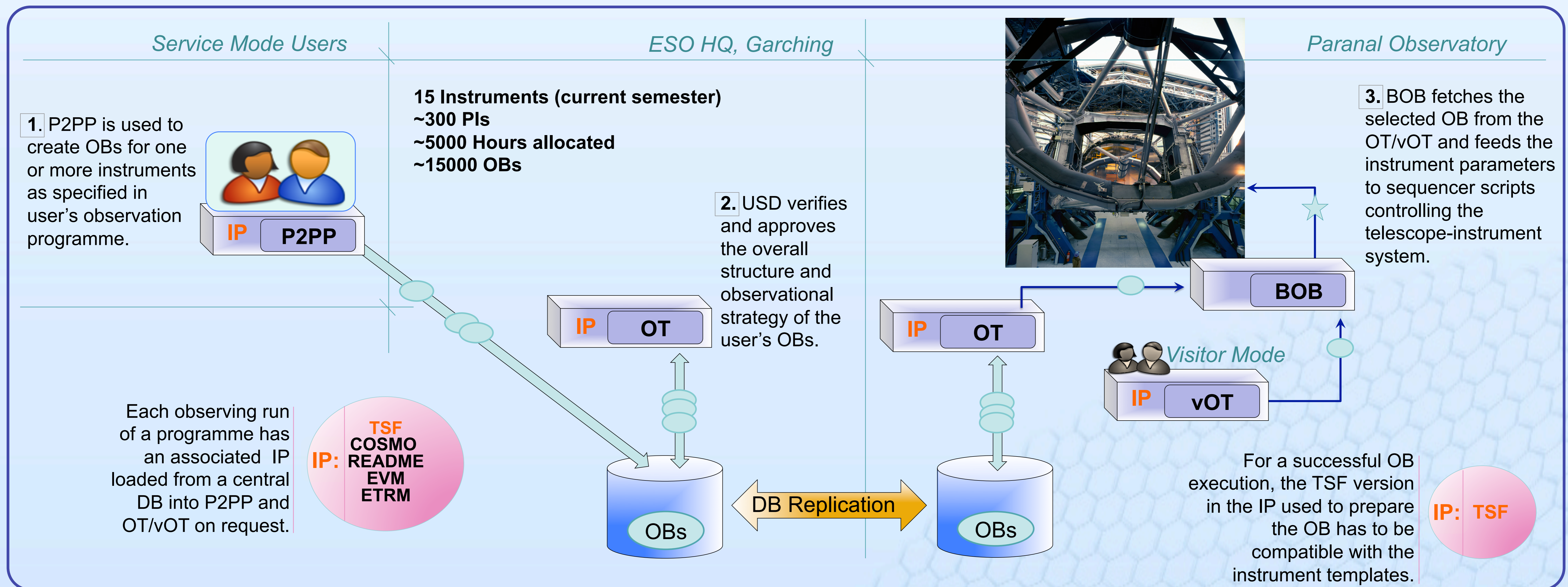
# Instrument Packages

## Seamlessly presenting the instrument to the User

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**Abstract** Instrument Packages (IPs) support a common framework for the preparation, verification, and execution of observations across all ESO instruments. IPs greatly simplify access to a vast array of instrument parameters for the user and ensure that the observations prepared by the user are mostly error-free and are executed efficiently at ESO's telescopes. IPs are an integral part of the interface for our observation-oriented tools like P2PP (Phase 2 Proposal Preparation) and OT (Observing Tool). We describe here the central role that IPs play in the observation process - from preparation to execution - while serving the user in a transparent manner.

**What are Instrument Packages?** Instrument setup and exposure parameters are specified in the form of pre-defined templates. Templates and all other specifications necessary to carry out an uninterrupted sequence of related exposures by the instrument-telescope system are collected in a representational entity called Observation Block (OB). An IP is an instrument-specific bundle of Template Signature Files (TSF), XML configuration files for specifying observational constraints, and Tcl scripts that constitute the External Verification Module (EVM) and the Execution Time Reporting Module (ETRM).



### Benefits of Instrument Packages

**For the User, Instrument Packages:**

- provide a standardized schema across instruments to enable easier OB preparation
- facilitate OB preparation for multiple instruments using the same tools
- hide the complexity of the instruments from the user as P2PP is designed to convey instrument parameters directly to the user via the IPs
- give confidence in the validity of OBs made possible through complex checks performed by the EVM
- allow for the calculations of execution time estimates via the ETRM and help maintain compliance with the allocated telescope time

**For ESO Operations, IPs are beneficial in the following ways:**

- IPs allow ESO to enforce OB structure and observing strategy.
- EVM ensures that SM OBs read at the telescope are error-free to a large extent thus notably reducing the time spent on faulty OBs.
- IPs provide a stable framework to convert instrument information from OBs into execution commands for the telescope and instrument through the Broker for Observation Blocks (BOB).
- Help maintainability from Period to Period by releasing versioned IPs that are easily identifiable.
- Make updating rules/observation strategy straightforward which involves EVM and ETRM modifications.
- Conveying changes to parameters due to instrument upgrade is straightforward and involves modification of the TSF files.
- Bringing new instruments into operation is fast since all instruments share the same IP schema.
- Upgrades to instruments and commissioning of new instruments requires only a new release of the IP while the tools (P2PP, OT, BOB) remain unchanged.

### Collaborators

**Instrument Scientists (IS)** – define TSF content, observational constraints, OB verification rules, and Execution Time formulae.

**Instrument Software Responsible** – provide TSFs.

**Data Flow Infrastructure (DFI)** – department responsible for the development and maintenance of software tools, supporting infrastructure, and API.

**User Support Department (USD)** – provides OB verification rules, responsible for the development of EVM / ETRM, and for packaging, testing, and the deployment of the IPs released to the user community.

### Tools

**BOB** – Broker for Observation Blocks: High-level GUI to the instrument used by the instrument operator to execute individual OBs selected from the OT or vOT.

**P2PP** – Phase 2 Proposal Preparation: A client-server model based application where the Java GUI client is installed locally by users and is used to prepare OBs.

**OT** – Observing Tool: Java application used to execute SM OBs via BOB; also used by USD primarily for OB verification and approval.

**vOT** – visitor OT: Java application used by visiting astronomers at the observatory to prepare and execute OBs via BOB.

### Acronyms

**API** – Application Programming Interface

**COSMO** – Constraint Set Module

**DB** – Database

**EVM** – External Verification Module

**ETRM** – Execution Time Reporting Module

**GUI** – Graphical User Interface

**IP** – Instrument Package

**OB** – Observation Block

**PI** – Principal Investigator

**SM / VM** – Service Mode / Visitor Mode

**TSF** – Template Signature File

