planets

Planning the Future with Planets

The Planets Interoperability Framework

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Outline

- ❑ Motivation
- ❑ Architecture
- ❑ Demonstration

Interoperability Framework: Motivation

Planets Software: Vision

- Planets tools available in a single downloadable software package
- This package will be simple to
  - install
  - configure
  - administer
- When this is deployed, a Planets instance is created, in which
  - an administrator can
    - create user accounts
    - deploy and browse services
    - browse registries
  - a preservation expert can
    - define service workflows (Workflow Design Tool)
    - define and evaluate preservation plans (PLATO Application)
    - define and run experiments (Testbed Application)
  - a librarian or archivist can
    - evaluate and execute preservation plans (PLATO Application)
    - define service workflows from workflow templates and execute preservation processes on a repository (Online Design Tool)

Interoperability Framework: Motivation

- There are a number of functions that all (or nearly all) software applications commonly need. These include functions such as
  - Web application infrastructure
  - Data persistence
  - User management
  - Security, Authentication and Authorization
  - Monitoring, Logging, and Messaging

- In addition, there are some non-functional requirements on the infrastructure, which should be
  - Robust
  - Scalable
  - Distributed

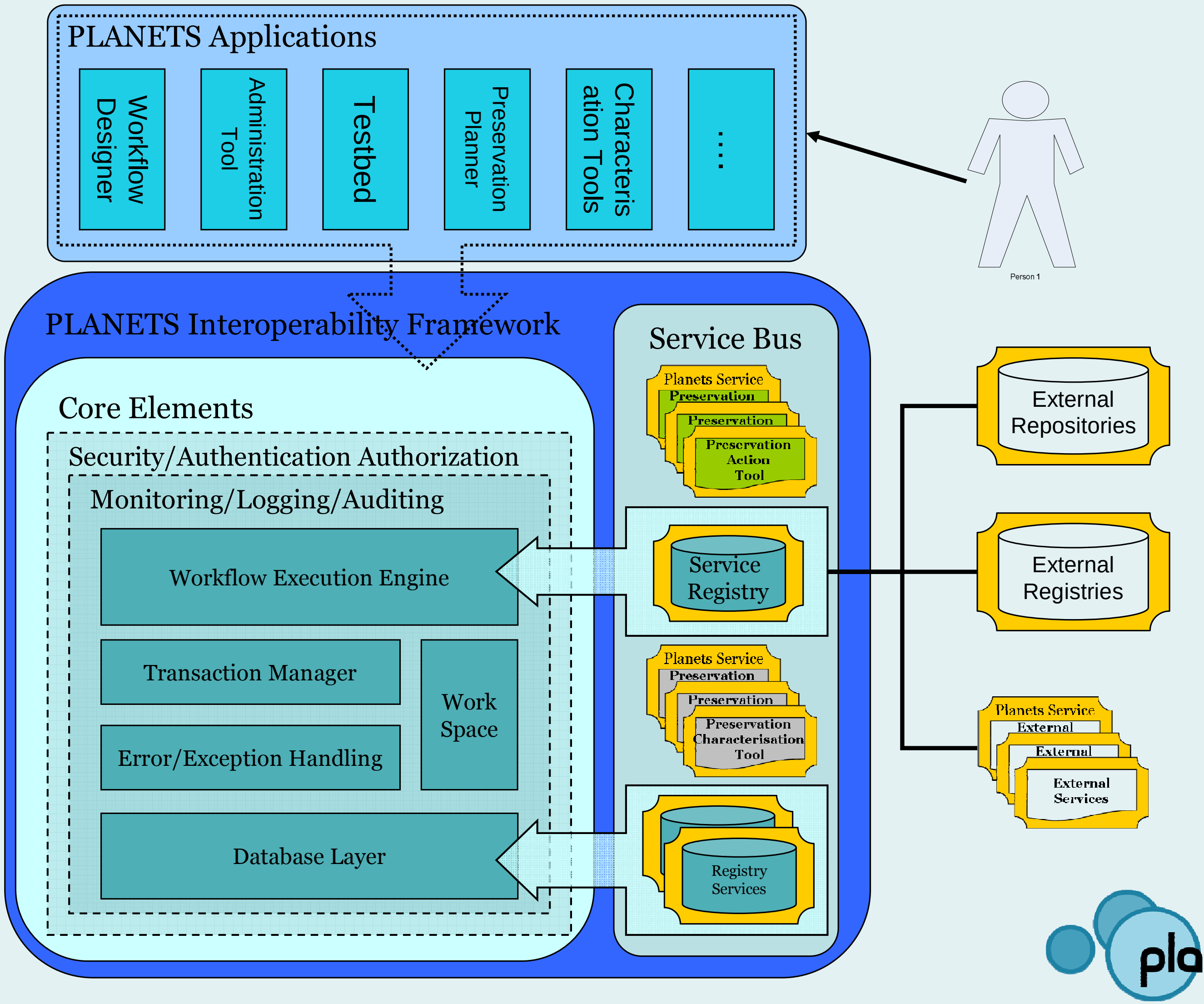
- The **Interoperability Framework (IF)** software components will provide these commonly required functions and meet these non-functional requirements.

Interoperability Framework: Benefits

- **Efficiency**
  - If the above mentioned components are only developed once, rather than multiple times, then the Planets Sub-projects and their applications can concentrate on their specific process logic and will have more time and resources to do so.
  - Also, when packaging the Planets software, the number of components will be optimized; for example, because the IF provides a single database for all components, only one database need be installed.
- **Interoperability**
  - By providing common components, the IF can also help to assure that various applications remain interoperable.
  - By enforcing Web Service standards, the IF can support access to remote and distributed third-party characterization and migration services.

Interoperability Framework: Architecture

Interoperability Framework: Architecture



PLANETS Applications

Workflow Designer

Administration Tool

Testbed

Preservation Planner

Characterisation Tools

…

Person 1

PLANETS Interoperability Framework

Core Elements

Security/Authentication Authorization

Monitoring/Logging/Auditing

Workflow Execution Engine

Transaction Manager

Work Space

Error/Exception Handling

Database Layer

Service Bus

Planets Service

Preservation

Preservation

Preservation Action Tool

Service Registry

Planets Service

Preservation

Preservation

Preservation Characterisation Tool

Registry Services

External Repositories

External Registries

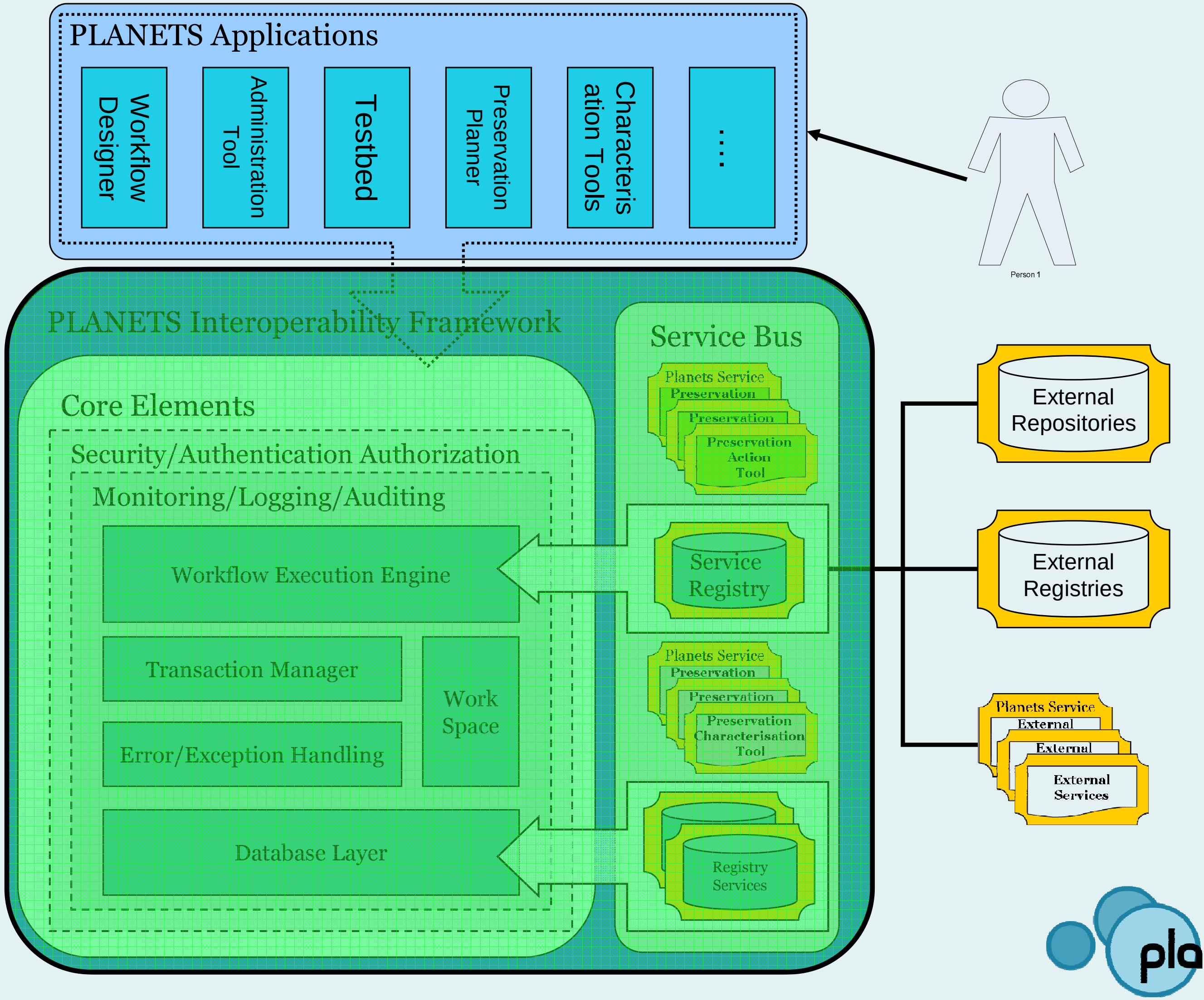
Planets Service

External

External

External Services

Interoperability Framework: Application Server



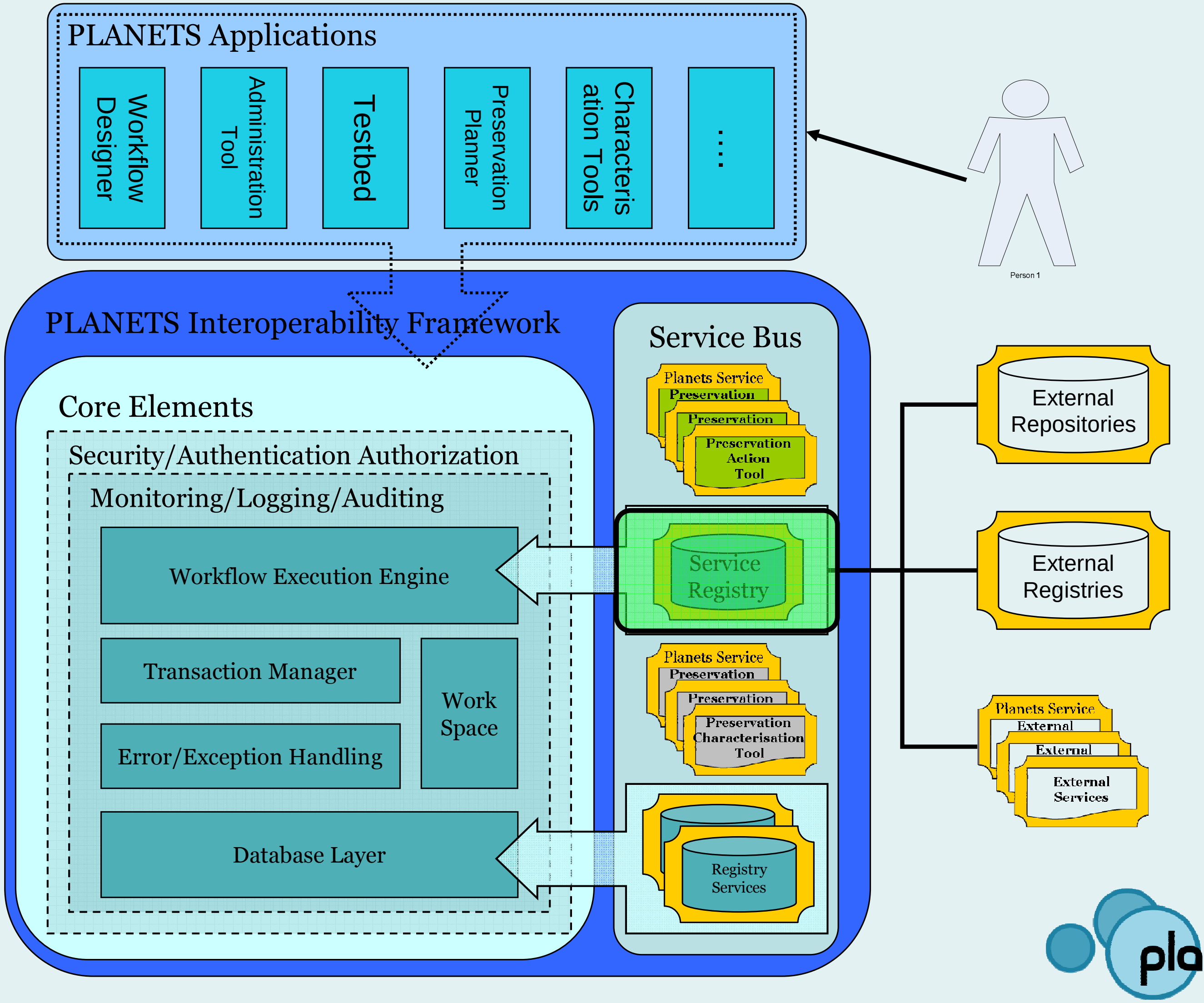
Interoperability Framework: Application Server

- ❑ An Application Server is a software engine that delivers applications to client computers or devices, and is necessary in order to host dynamic web applications.

- ❑ Advanced application servers provide a number of additional important features, such as Web Service support, thread pooling, and persistence management.

- ❑ We have selected the **JBoss** application server as the most robust, open-source java-based implementation, certified for the Java 2 Enterprise Edition (J2EE) 1.4 standard and supporting Enterprise Java Beans (EJB) 3.0.

Interoperability Framework: Service Registry



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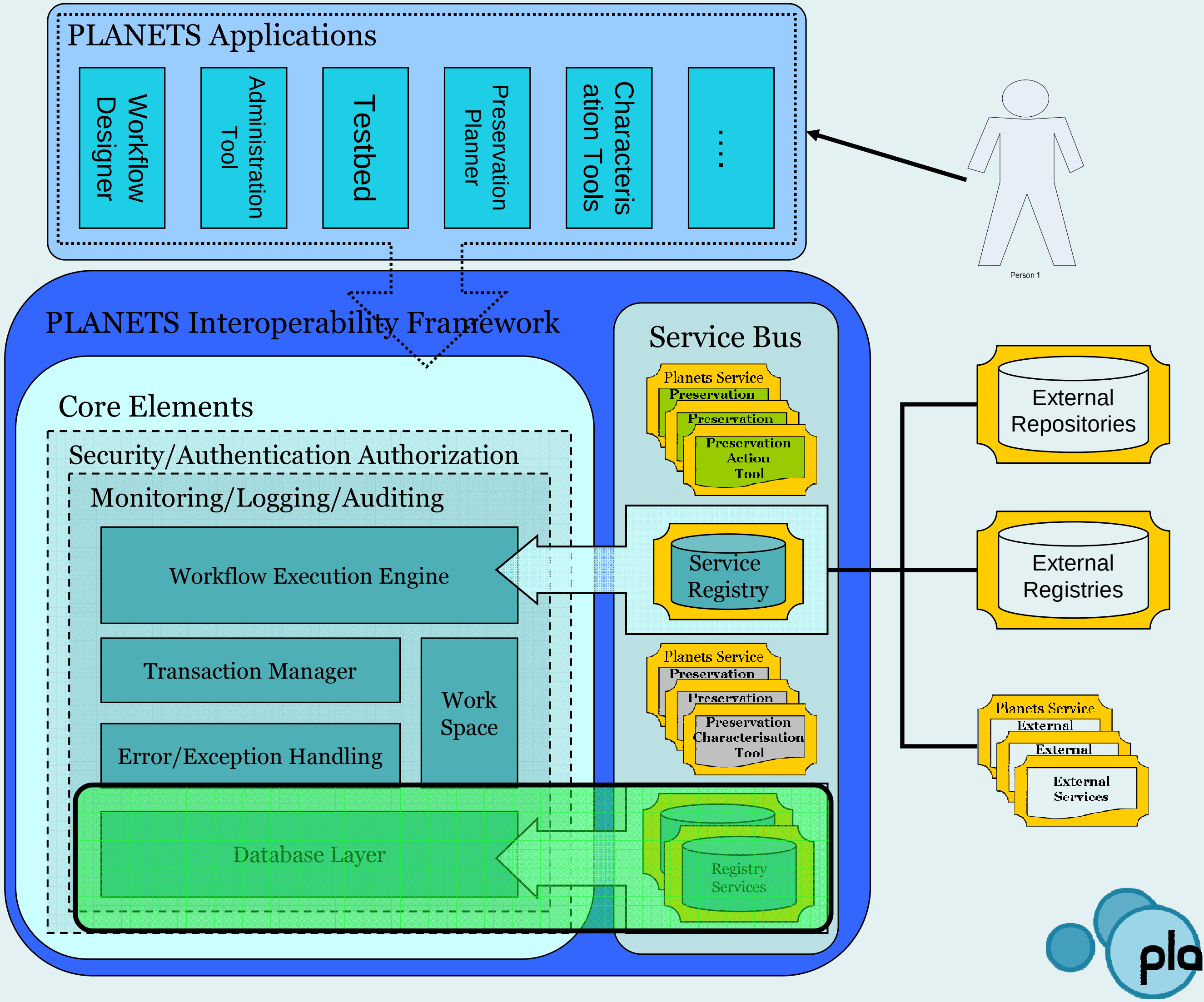
Interoperability Framework: Service Registry

- The Planets Service Registry is developed on top of **jUDDI**, an open-source, Java-based implementation of the Universal Description, Discovery and Integration (UDDI) standard.

- On top of the UDDI standard, we intend to add **semantic service descriptions**. This will enhance the search for humans, but also support automatic service composition by machines.

- The Service Registry is the central discovery point for internal and external web services, for both users and applications.

Interoperability Framework: Data Registry



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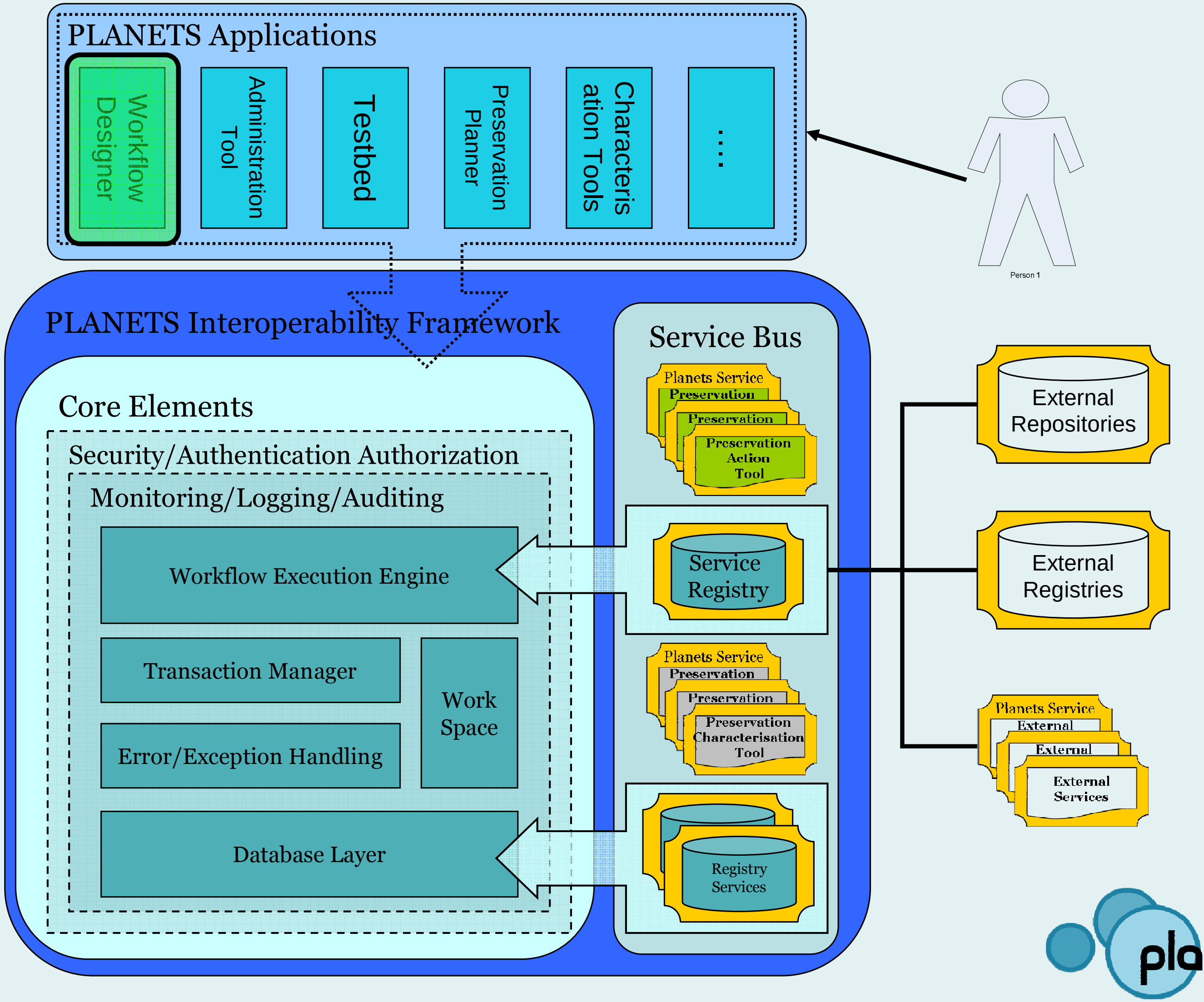
Interoperability Framework: Data Registry

- The Planets Data Registry implements the *Java Content Repository* (JCR) specification, and is built on top of the open-source implementation **Jackrabbit**.

- A JCR implementation has the following features:
  - a standardized approach to content repositories
  - automatic versioning support
  - dynamic definition of complex content models and metadata schema
  - queries using XPATH and XQUERY
  - queries using SQL

- The Data Registry is built on top of a relational database, in our case the open-source Apache **Derby** database management system.

Planets Application: Workflow Design

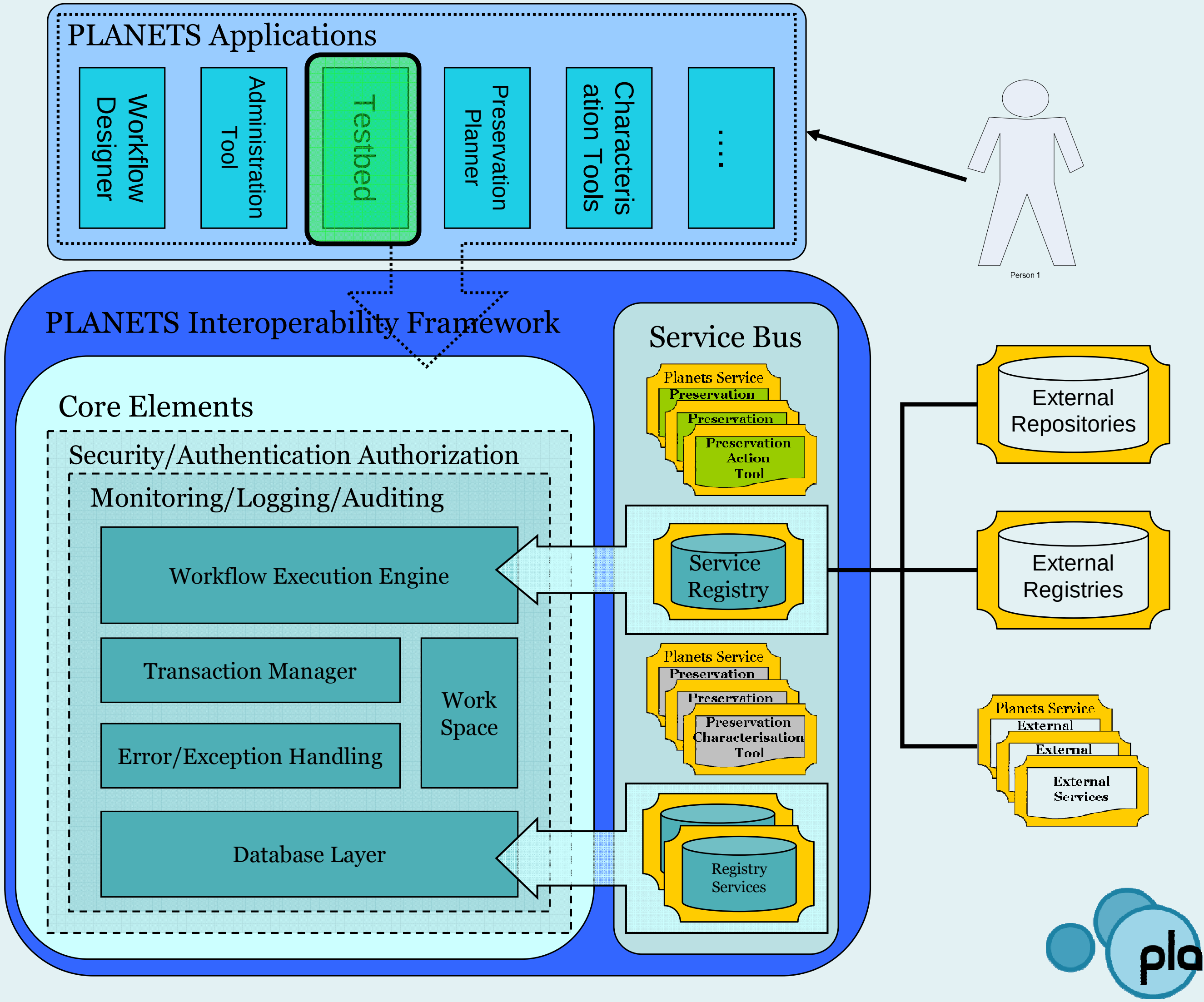


Interoperability Framework: Workflow Design

- **Expert Workflow Design Tool**
  - Planets Workflows are expressed using the *Business Process Execution Language*, or **BPEL**.
    - Why BPEL? The main argument is standardization
      - which means, Planets workflows can be created with any BPEL tool and run on any BPEL compliant engine - that is, they are not tied to the Interoperability Framework
  - The expert workflow design tool is a client application based on the Eclipse BPEL Plugin.
- **Online Workflow Design Tool**
  - A simplified web-based workflow tool requiring no knowledge of BPEL
  - Based on *workflow templates*
    - pre-defined workflow fragments that must be completed by the user by specifying Web service endpoints.

Interoperability Framework: Demonstration

Planets Application: Testbed



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Thank you for your attention!

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