PANACEA Tutorial

MT Summit

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Tutorial Objectives

- Become familiar with the web service paradigm and its advantages
- Become familiar with the PANACEA platform
- Learn how to search and use web services
- Learn how to chain web services to build more complex processing pipelines (workflows)
- Learn how to create and share your own web services

Tutorial outline

- Introduction to the PANACEA platform [30 min]
- Tour of the PANACEA webs [15 min]
- Find and try web services [45 min]
- Interoperability [10 min]

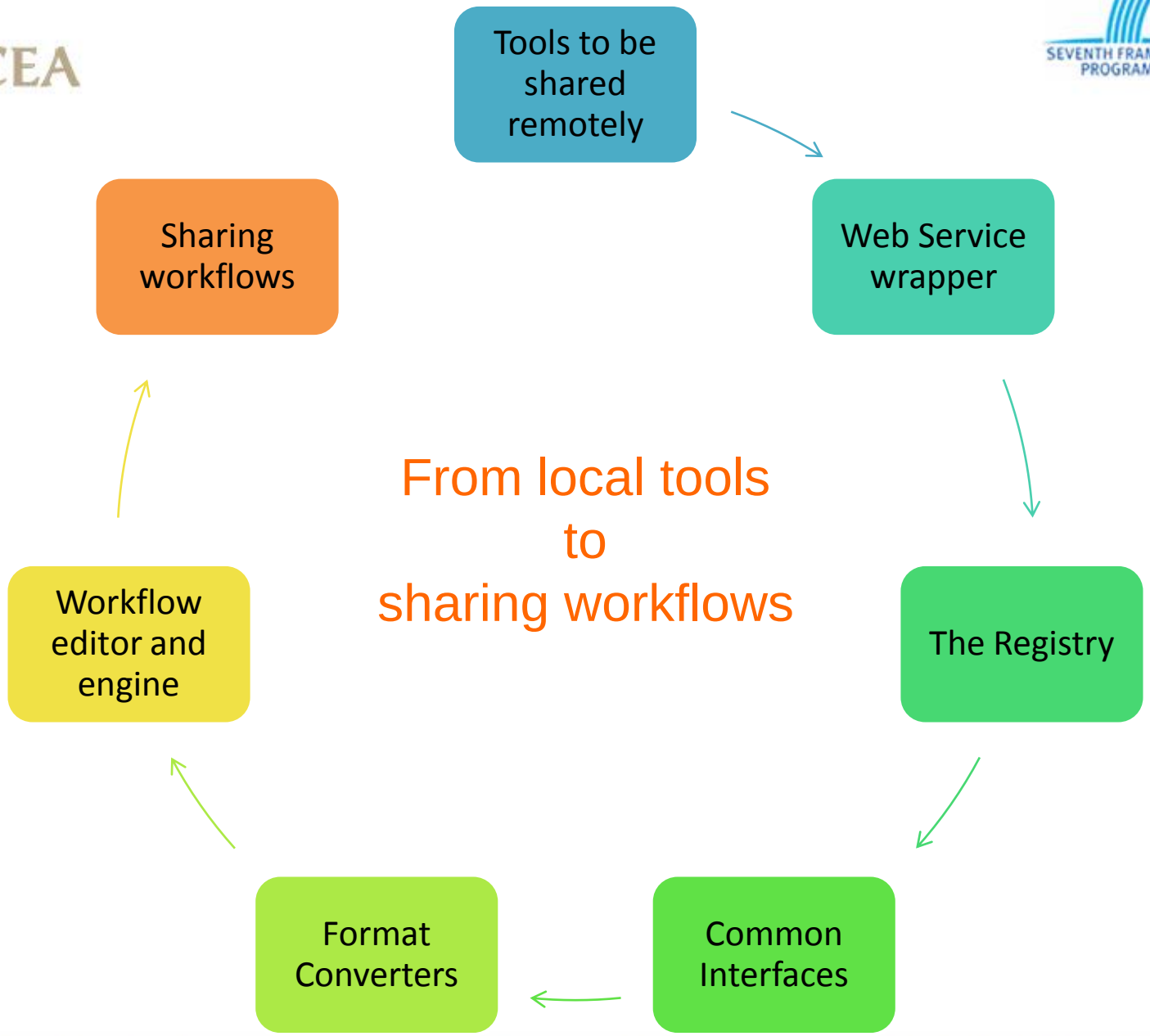
- Break [15 min]

- Chain web services: workflows [60 min]
- Be part of the platform: creating and sharing web services [30 min]

Introduction to the PANACEA platform [30 min]

PANACEA Project Objectives

- ✓ Development of a platform (a space of interoperability defined by standardized protocols and common interfaces) for the easy integration of a variety of software components, tools and methodologies deployed as web services to configure a factory for the automation of acquisition, processing and annotation of language resources.


Tools to be shared remotely
Web Service wrapper
The Registry
Common Interfaces
Format Converters
Workflow editor and engine
Sharing workflows
From local tools to sharing workflows

Platform definition

- The PANACEA platform is an **interoperability space** based on tools, guidelines, a Common Interface definition, and a “Travelling Object” specification

Formal definition

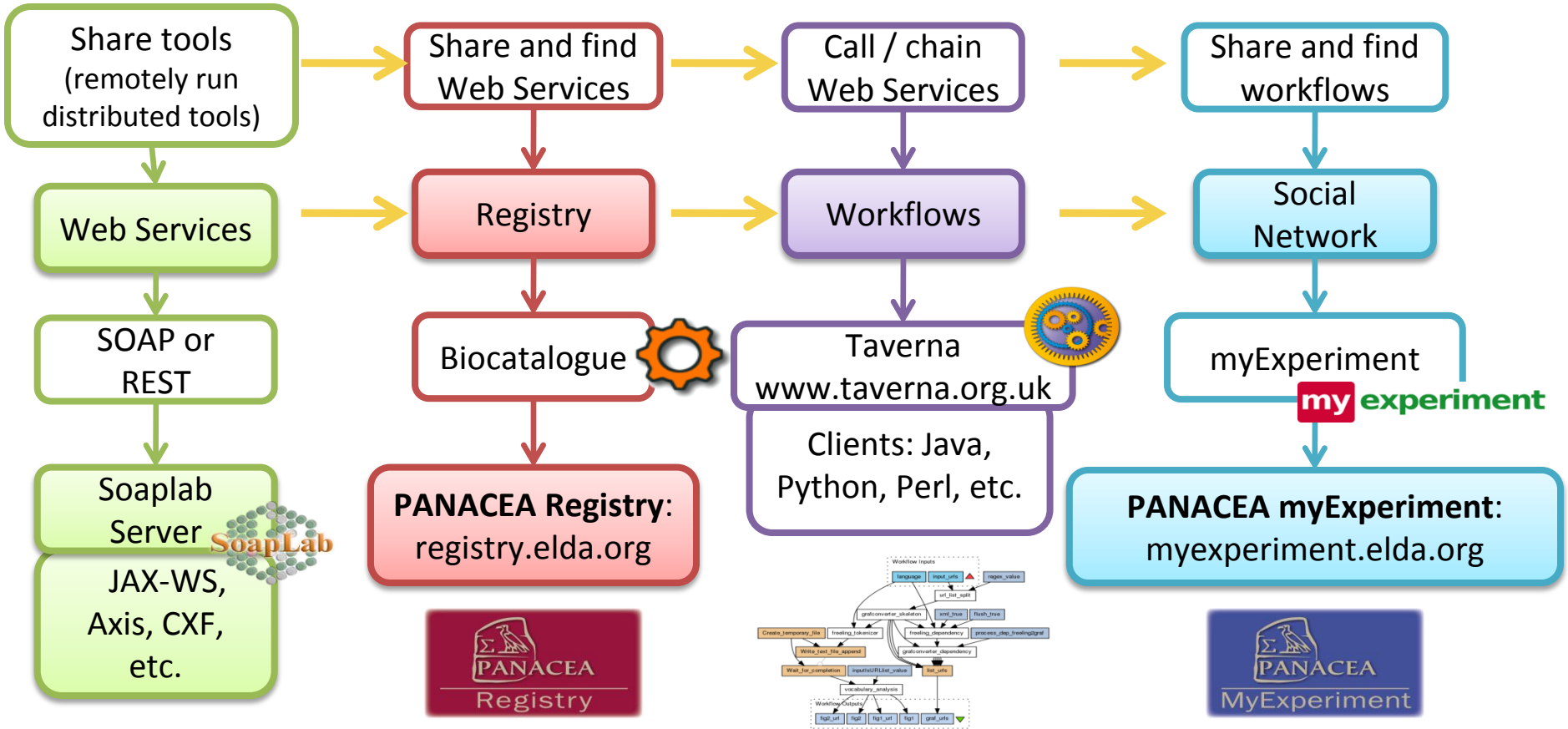
Components:

- **Tools**: Taverna, BioCatalogue, myExperiment, Soaplab, storage system
- **Common Interface**: WS interoperability
- **Travelling Object**: XCES, GrAF, CoNLL, LMF
- **Documentation**

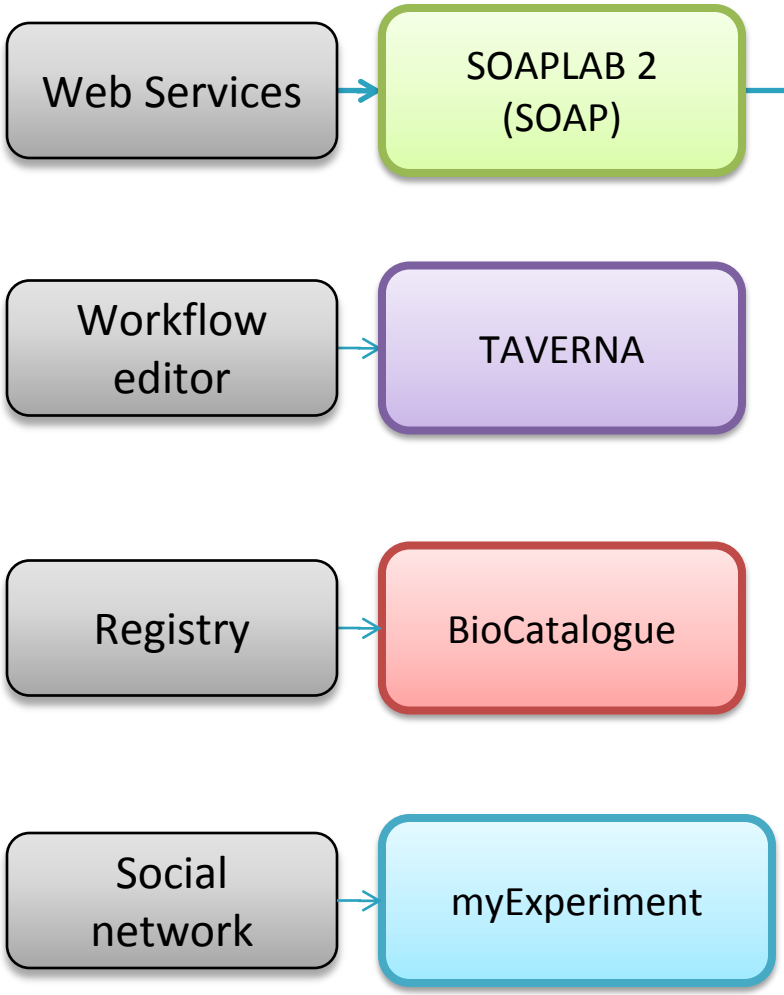
Technical Definition

Platform tools and portals

PANACEA Platform: uses, adapts and improves myGrid tools for eScience (used in biology, social science, music, astronomy, multimedia and chemistry).



Technological option: Web Services



- Easy deployment of command line tools as WS. (Java, Python, C++, **UIMA**, etc.)
- Clients: Java, Python, Perl, Taverna, etc.
- No coding needed! Only metadata
- "Polling" techniques for long lasting tasks
- Web form to run the web services
- URL input / output ready
- PANACEA improvement for SOAP messaging (network usage and memory)
- PANACEA limit multiple users

Technological option: Registry and myExperiment

Web Services → SOAPLAB 2 (SOAP)

Workflow editor → TAVERNA

Registry → BioCatalogue

Social network → myExperiment

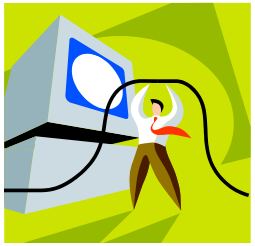
- User friendly GUI
- Free, open source, Continuously maintained
- Search function
- Users rating (users feedback)
- Service annotations and Language Categorization (PANACEA)
- Monitoring system (web service status and data results)

Technological option: Taverna

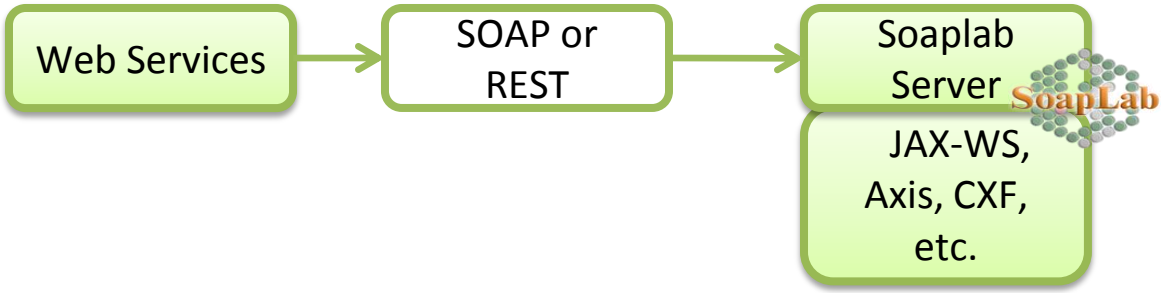
- Web Services → SOAPLAB 2 (SOAP)
- Workflow editor → TAVERNA
- Registry → BioCatalogue
- Social network → myExperiment

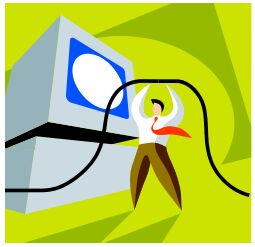
- User friendly GUI
- Free and open source
- Continuously maintained (v. 2.4)
- SOAP and REST web services
- Credentials manger (passwords, certificates, etc.)
- Multiple files processing ("lists")
- PANACEA Workflows, best practises, videos, etc. :
  - Parallelization, Error recovery: "retries", Polling
- PANACEA collaboration: bug fixing and pre-release tests

Service providers

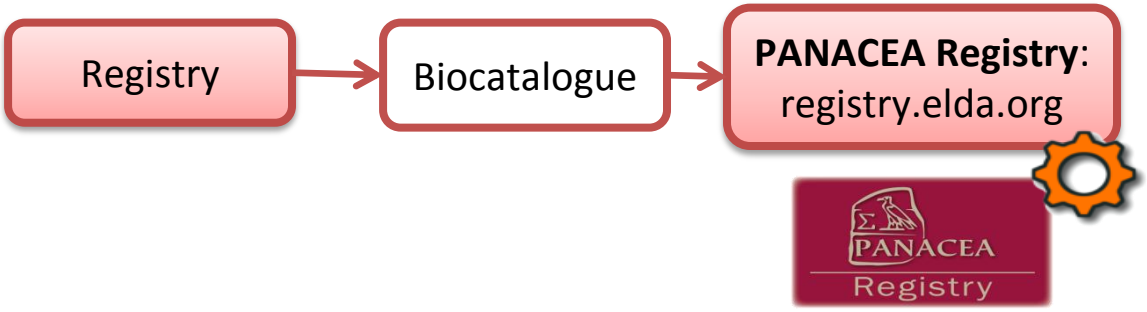


How can I share the tools on my server?





Where can I make my Web Services public?



Users

Can I run tools without installing them? → Web Services

Where can I find Web Services? → Registry → PANACEA Registry

How can I run Web Services? → PANACEA Registry

-Java, Python, perl clients, etc.
- Web clients: Soaplab Spinet

How can I chain WS? → -Java, Python, perl clients, etc.
- Taverna workflows → Workflows

Tour of the PANACEA webs [15 min]

http://panacea-lr.eu

http://registry.elda.org

http://myexperiment.elda.org

http://panacea-lr.eu/en/tutorials

http://panacea-lr.eu/en/info-for-professionals/documents/

The PANACEA web

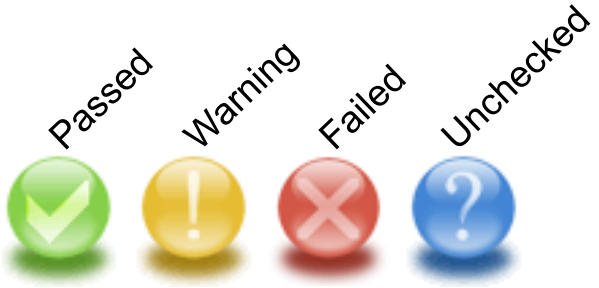
- Main Page
- Link Buttons (Registry, myExperiment, tutorials and documentation)
- Tutorials Page / Videos
- Documentation
- Deliverables

http://panacea-lr.eu

The Registry

http://registry.elda.org

- The PANACEA Registry is a BioCatalogue instance (the source code has been used to deploy the registry on a server)
- Features:
  - Annotation capabilities and categorization
  - Search function
  - Automatic status check system for web services



myExperiment

- The PANACEA myExperiment is a myExperiment instance (the source code has been used to deploy it on a server)

- Features:
  - Annotation capabilities
  - Search function
  - “Services tab beta” added to PANACEA myExperiment. Users can list web services from the Registry and see in which workflows have been used. ✓

Find and try web services [45 min]

Registry tutorial

- http://registry.elda.org

- Global view of the Registry
- Search engine
- Categorization System
- Metadata and documentation
- Monitoring System
- http://vimeo.com/24790416

Calling Web Services

- Spinet web client (Soaplab web services)
- Taverna
- SOAP, WSDL. Examples (perl, python)
  - http://ws02.iula.upf.edu/panacea/examples/soaplab-clients/soaplab_clients.zip
- Soaplab command-line client

```
sh $SOAPLAB_FOLDER/build/run/run-cmdline-client
-protocol axis1
-e http://srv-cngl.computing.dcu.ie/panacea-soaplab2-axis/services/panacea.europarl_lowercase
-w -r input_direct_data "ASDA"
```

Spinet Tutorial

- Spinet is the Soaplab web client used to test and run WS deployed on a Soaplab Server.
- Every Service provider has (at least) a Soaplab Server

- the Demo...
- Access Spinet directly from the Registry

  "*Test Form Location (Spinet Web Client):*"
- Configure mandatory parameters and RUN the WS

- *10 minutes to try to find and run some web services.*

You can start from http://registry.elda.org

Exercise

Twitter NLP + Registry

(3rd party tool) ✓

- This web service is based on the Twitter NLP tool developed by Noah's ARK group.
- Noah's ARK group is Noah Smith's research group at the Language Technologies Institute, School of Computer Science, **Carnegie Mellon University**.

1. Search the WS in the Registry
2. Check monitoring system
3. Use web client with example data

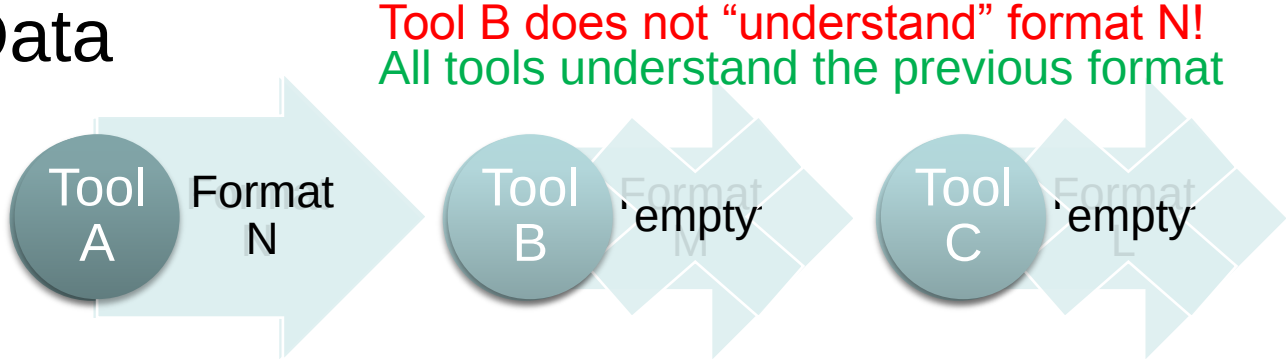
WS advantages (for users)

- No installation
- No maintenance
- No machine resources
- Easily found on the Registry
- Usability
- Can be combined in workflows (share experiments)

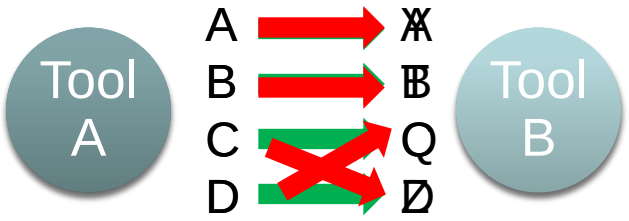
Interoperability [10 min]

Interoperability

- Three levels of interoperability:
  - Communication protocols: SOAP, REST
  - Data

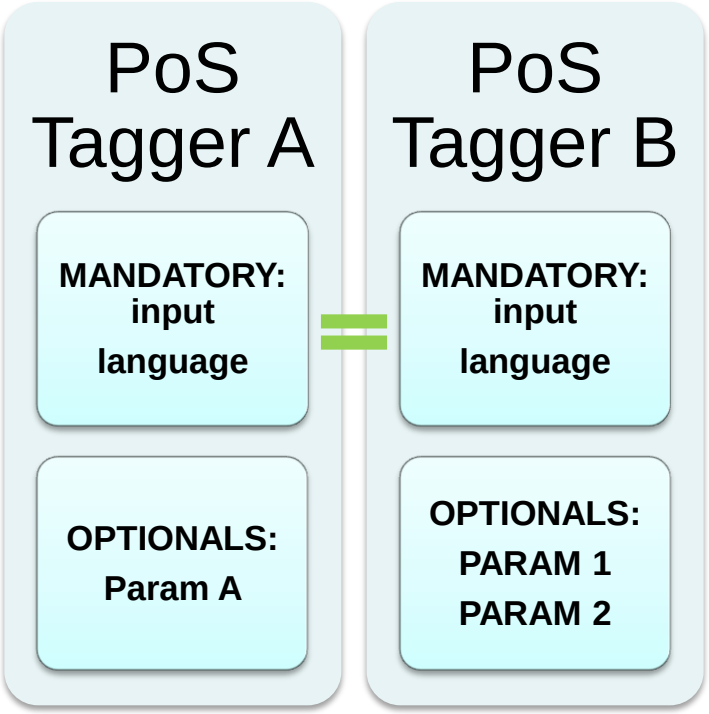


  - Parameters



Common Interface

- A Common Interface (CI) defines the mandatory parameters for every functionality, e.g. PoS tagging:



http://panacea-lr.eu/en/info-for-professionals/documents/

http://registry.elda.org

Travelling Object

- Travelling Object (TO): common data and metadata format used in PANACEA to make components interoperable

- TO1: minimal common vertical in-line format used by deployed tools (based on the **XCES** standard)
- TO2: stand-off format. Based on the **GrAF** standard, the XML serialization of LAF (ISO 24612, 2009)
- LMF: for lexical resources
- CONLL: for parsers
- **Converters and adapted WS outputs**

Format Converters

31 Format converters on the PANACEA Registry

• Freeling to **TO**. CNR	http://registry.elda.org/services/207
• **KAF** to TO. CNR	http://registry.elda.org/services/208
• Basic **Xces** to txt. CNR	http://registry.elda.org/services/209
• PoS tag. (**Freeling treetagger**) to **GrAF**. UPF	http://registry.elda.org/services/142
• Dependency parsing (Freeling) to GrAF. UPF	http://registry.elda.org/services/197
• Dependency **CoNLL** to GrAF. CNR	http://registry.elda.org/services/254
• **Word** doc to **txt**. UPF	http://registry.elda.org/services/112
• **In-house mwe** to **LMF.** CNR	http://registry.elda.org/services/296
• **Pdf** to text. UPF	http://registry.elda.org/services/116
• Multi. **encodings** converter (ISO, UTF, etc.). UPF	http://registry.elda.org/services/114
• **Aligner** to TO. DCU	http://registry.elda.org/services/69
• Sentence alignment to **TMX**. DCU	http://registry.elda.org/services/219
• **Treetagger** to **MOSES** (factored models). DCU	http://registry.elda.org/services/275
• **UIMA** to GrAF. ILSP	http://registry.elda.org/services/182

Providers are encouraged to provide converters for the formats they are interested on

3rd party tools integration

- PANACEA WS wrapper (Soaplab) and the CI make it easy for WS Providers to integrate 3rd party tools.

• ILSP tools are **UIMA** tools	UIMA
• **Freeling**	UPC
• **Treetagger**	University of Stuttgart
• **Twitter NLP**	Carnegie Mellon University
• **MALT Parser**	Uppsala University
• **DeSR**	Università di Pisa
• **MOSES, GIZA++, other aligners**	Edinburgh, etc.
• **DELiC4MT**, MT evaluation	DCU
• **Berckeley** tagger, parser, aligner	Berkeley University

Chain web services: workflows [60 min]

Workflows

- Once we can run WS...
- …it's time to chain them

- Workflows are process chains that combine multiple WS and/or processors.

- We use Taverna 2.4 http://www.taverna.org.uk

- Documentation:
  http://dev.mygrid.org.uk/wiki/display/taverna/Documentation+and+Videos

Quick start guide, videos, etc.

Workflow tutorial

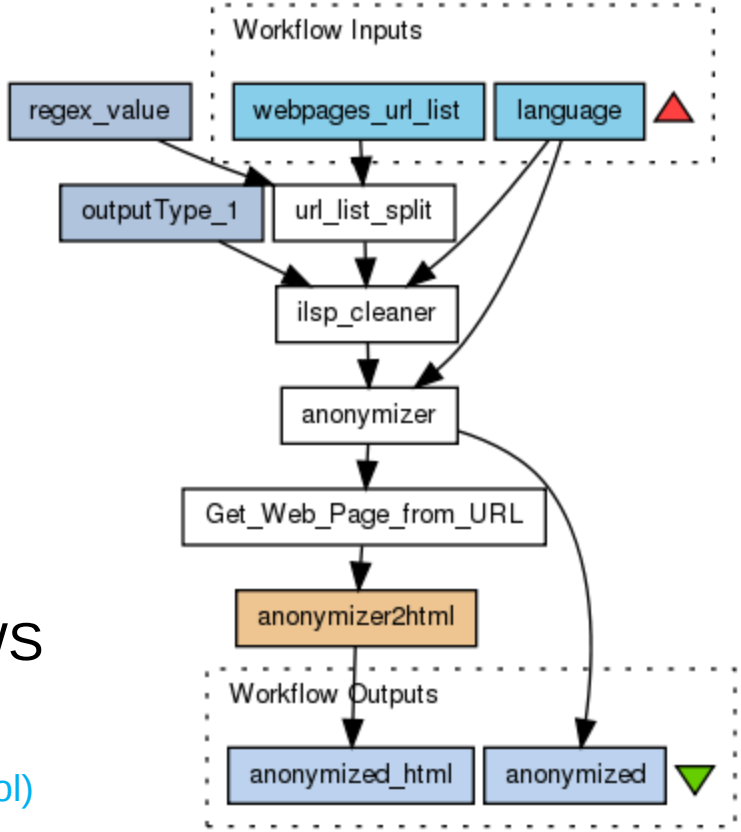
- Find and run a workflow
- http://vimeo.com/28449833

- Building a workflow from scratch
- http://vimeo.com/28450024

Workflow Demos I

Web cleaner and anonymizer

http://myexperiment.elda.org/workflows/98



- Input: a list of URLs to process
  - Example: a web article from www.fifa.com

1. ILSP Web cleaner and text extractor WS
2. UPF Anonymizer WS
   - Internally calls Freeling NER WS (3rd party tool)
     Interoperability ✓

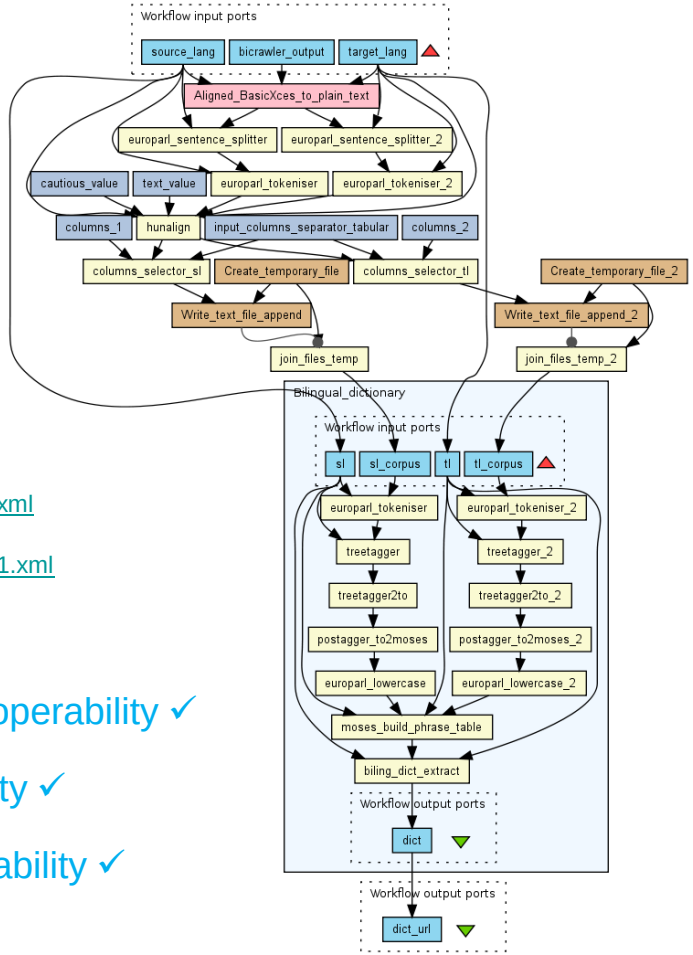
Video: http://ws02.iula.upf.edu/panacea/examples/videos/Panacea_web_cleaner_and_anonymization_v01.mp4

Workflow Demos II

Creation of a bilingual dictionary (only FR-EN)

– http://myexperiment.elda.org/workflows/93

– Input: Pairs of Basic Xces Documents
  - English: http://nlp.ilsp.gr/panacea/Bilingual/data/20101222/LAB_EN_FR/www.ilo.org/1.xml
  - French: http://nlp.ilsp.gr/panacea/Bilingual/data/20101222/LAB_EN_FR/www.ilo.org/191.xml



1. Sentence alignment: Hunalign (3rd party tool) Interoperability ✓
2. PoS tagging: Treetagger (3rd party tool) Interoperability ✓
3. Build phrase tables: Moses (3rd party tool) Interoperability ✓
4. Bilingual dictionary extractor

Video: http://ws02.iula.upf.edu/panacea/examples/videos/Panacea_bilingual_dictionary_extraction_v01.mp4

Be part of the platform: creating and sharing web services [30 min]

Deploy your tools as WS

- There are multiple solutions:
  - Soaplab, CLAM, Apache Axis2, Apache CXF, Spring

http://soaplab.sourceforge.net/soaplab2

- PANACEA can provide tips on setting up a Soaplab2 server

Share your WS in the Registry

- Provide your web services publically:

gain visibility, make your work useful for others

- http://panacea-lr.eu/en/tutorials

- How to register WS
- http://panacea-lr.eu/system/tutorials/How%20to%20Register%20services%20in%20Panacea-v4.pdf

Thank you

Questions?