

An Overview of LifeWatch distributed ICT e-Infrastructure construction operations and on-going initiatives 5th LW e-Infrastructure Construction Operational Meeting Malaga, 26-27th February



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Overview

Progress since Crete meeting (July 2014), following Granada conclusions (February 2014)

- SoA (Service Oriented Architecture) on top of CLOUD (EGI FedCloud)
- EGI-Engage LifeWatch Competence Center
- Progress on ICT-core e-Infrastructure
 - Adaptation and improvement of the e-Infrastructure ICTS-EBD
- Pilots and H2020 initiatives

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ICT-Core Starting Tasks

ICT CORE	Start-up activities	
Keep Reference Model up to date	Mechanism will be developed. Currently	
	expansion done by ENVRI and EUDAT.	
Analysis of requirements	Need requirements from distributed initiatives.	
ICT-core technical unit project plan	Proposal will follow with lean organization with	
	coordination and outsourcing capabilities.	
Technical framework user portal	Priority for e-science users' portal. Cloud/Grid	
	experiences will assist in drafting proposals.	
IT release plan and annual work plans	Will follow (after tasks 26 and 27)	
Core basic Application Services	Priorities of core basic application services for	
	the initial years to be proposed.	
Organize distributed	A management tool will come into place to keep	
construction/operations	track of distributed activities and relations	
	related to the distributed e-Infrastructure	
	construction/operations.	
	A technical body will be created.	
Contribute to arrangements with data	Test cases to be addressed ((in cooperation with	
resources	EUDAT, ENVRI, EUBON, LTER and GBIF).	
Contribute to enabling data generation	Sensor enabled data generation is being	
	addressed.	

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Solution for HETEROGENEITY: An SOA approach





How to explore the LW Core-ICT Implementation As presented at Interministerial in Seville (July 2013)

A SUGGESTED PATH:

Revise Key Components and Actors

- Learn from Preparatory Phase and from on-going projects
- Learn from other Research Infrastructures
- Interact with all partners in LW
 - Learn, collaborate, build relationships
- **IN ORDER TO CONTRIBUTE TO A REVISED TASK LIST**



A pilot project to understand the global framewo Adaptation and improvement of the e-Infrastructure ICTS-EBD (Estacion Biologica de Doñana)

- **Funded by MINECO (CSIC to be commisioned to execute it starting in 2013)**
 - Setup an operational framework supporting from basic services to advanced data processing and collaborative work
 - Improve the sensor monitoring network at Doñana
 - MATCH & INTEGRATE ICT Services CAPABILITIES IN ANDALUCIA

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Progress with LW Core-ICT Implementation

- A pilot project to understand the global framework: Adaptation and improvement of the e-Infrastructure ICTS-EBD
 - Funded by MINECO (CSIC to be commissioned to execute it)
 - Setup an operational framework supporting from basic services to advanced data processing and collaborative work
 - Improve the sensor monitoring network at Doñana
 - MATCH & INTEGRATE ICT Services
- Four actions:
 - ICT e-Infrastructure
 - servers (cloud oriented + HTC/HPC), storage (300TB), 10GB network

in progress!

before end of 2014

- methodology for services design
- Implementing services
- Integration of the network of sensors
- Conditioning for in-situ data process at RBD (Natural Reserve)
- New sensors and observational setups

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Status of the action

- A1= e-Infraestructura TIC
 - Hardware
 - Basic Middleware
 - Data and Remote sensors Integration
 - Collaborative Platform
 - Services, Quality Assurance, Sustainibility
- Initial steps
 - Technical Collaboration IFCA/EBD:
 - Visits to EBD (JM, March, June, August, October, November, March)
 - Visita to IFCA (JCS y AGC April, DF, FS, LT, January)
 - Advance
 - INITIAL TENDERS FOR HARDWARE (CATALOGO DE PATRIMONIO)
 - COMPUTING ROOMS READY
 - IMPROVED NETWORK (dark fiber at EBD y RJB)

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Equipment

- Two clusters: DELL, y HP
 - 18 nodes Xeon E5V2 + 21 nodes Xeon E5-V3
 - Large memory (192 GB RAM)
 - Blade type, compact and efficient
- Storage (EMC)
 - 300 TB + 300 TB, + cache
- Network (CISCO)
 - Backbone 10GB
- FLEXIBLE !
- ESTIMATED TOTAL: 1M







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Services

- Much more complex from admin point of view
- ollo de Sistemas Started: "Catálogo de patrimonio, 26, De in work! (Fujitsu) Información"
- SERVICES being tendered:
 - laaS a la FedCloud -n-
 - Ready for tender Collaborative Platform (supporting web services)
 - **Distributed Control Platform**
 - Resources Management
 - Users Management
 - Preservation
 - External data integration
 - Remote data integration
- Assistance:
 - **Project Office**
 - **Quality Assurance**
 - Support for installation and operation

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Sensor Networks and Virtual Labs

- Sensor Networks deployments at Doñana's National Park
- Cloud-based sensor data storage, presentation and access
- Virtual Lab integration in the ICT-Core
 - Real Time monitoring
 - Historical data management
 - Assessing data quality
- Testing Lab development
 - Maintain, calibrate, and troubleshooting instrumentation
 - Install instruments using commonlyaccepted best practices



Sensor Networks and Virtual Labs

- Biological Data Modelling for
 - Automated data from Sensor Networks
 - Manual tracking data
- Data Extractor tool
 - 7.036.418 observations since 2010
 - 89 sensors and 31 dataloggers
 - Historical and real time extractions
- Use Case: Eddy Covariance towers
 - Wetlands are monitored with high accuracy
 - 3 flux towers based on
 - CO_2/H_2O flux
 - Sonic anemometers
- Francisco M Sánchez is working at Estación Biológica de Doñana (Seville, Spain)



Reflection on our context

- LW "global" funding is limited
 - Focus on coordination + selected global services
- 1- National initiatives/results must be integrated
- 2- Coordinate with EU/Global initiatives with resources:
 - E-Infrastructures: EGI, EUDAT, PRACE
 - Data: GBIF, LTER
 - OTHER ESFRI Initiatives
- 3- Exploit previous/ongoing results from EU projects
- 4- Consider new H2020 opportunities
- 5- Can we engage SMEs/Industry?
- 6- What about Public Managers?
- 7- Can we support Citizen Science?

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in progress!

EGI services for LW:

in progress!

- MODEL: LW brings users & resources together!
 - LW core-ICT (Spain) will operate an e-infrastructure in 2014 - **†** 1
 - in progress! LW core-ICT could/will integrate grid/cloud infrastructure
 - LW VOMS will be supported by LW core-ICT
 - LW core-ICT will rely on IberGrid for this integration in EGI
 - LW national initiatives will be integrated
 - LW core-ICT will support integration at different levels (NGI role?)
 - **LW** will explore successful examples in EGI FedCloud:
 - EUBrazilOpenBio Ecological Niche Modeling Service
 - FUBrazilCloudConnect
 - New challenge for phenology with LTER/Univ.Granada
- So, LW will use existing EGI services

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Use case: Research Vessel Simon Stevin





- Marine, Fluvial, Estuaries, Flooding, Phenology/Pollen
- **"**Support" to LifeWatch from management authorities
 - Confederacion Hidrografica Guadalquivir
 - Autoridad Portuaria Seville
 - SMHI

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Can we address a challenge?

- Grand Challenge: Predictive Modeling pf Biosphere
 - Global Carbon cycle

Learning! In COOPEUS

COOP+ proposa

- Essential Biodiversity Variables (EBV) for IPBES
 - IPBES=Intergovernmental Platform on Biodiversity & Ecosystem Services (cf. IPCC)
 - EBV= a measurement required for study, reporting, and management of biodiversity change.
- **E** Examples of candidate EBV:
 - Species populations: Abundances and distributions (inc. invasive alien)

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EBV class	EBV examples	Measurement and scalability	Temporal sensitivity	Feasibility	Relevance for CBD targets and indicators (1,9)	
Genetic composition	Allelic diversity	Genotypes of selected species (e.g., endangered, domesticated) at representative locations.	Generation time	Data available for many species and for several locations, but little global systematic sampling.	Targets: 12, 13. Indicators: Trends in genetic diversity of selected species and of domesticated animals and cultivated plants; RU.	
Species populations	Abundances and distributions	Counts or presence surveys for groups of species easy to monitor or important for ES, over an extensive network of sites, complemented with incidental data.	1 to >10 years	Standardized counts under way for some taxa but geographically restricted. Presence data collected for more taxa. Ongoing data integration efforts (Global Biodiversity Information Facility, Map of Life).	Targets: 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15. Indicators: LPI; WBI; RLI; population and extinction risk trends of target species, forest specialists in forests under restoration, and species that provide ES; trends in invasive alien species; trends in climatic impacts on populations.	Pereir et al., Scienc 2013
Species traits	Phenology	Timing of leaf coloration by RS, with in situ validation.	1 year	Several ongoing initiatives (Phenological Eyes Network, PhenoCam, etc.)	Targets: 10, 15. Indicators: Trends in extent and rate of shifts of boundaries of vulnerable ecosystems.	2010
Community	Taxonomic	Consistent multitaxa surveys and	5 to >10	Ongoing at intensive monitoring sites	Targets: 8, 10, 14.	leeting

JOINT RESEARCH UNIT LIFEWATCH SPAIN (JRU LW.ES) GOVERNANCE SCHEME





Our next, and key, step:

Engage LifeWatch distributed nodes

WE NEED YOUR COLLABORATION
 Let's setup the ICT-core related mailing list?

WE APPRECIATE YOUR SUPPORT (AND PATIENCE)

Many thanks!

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