

Technical Talk: ALBA in ExPaNDS

8th of October 2020



The ExPaNDS project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 857641.
The PaNOSC project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 823852.

Overview

- ALBA Synchrotron
- Computing
- The Computing Division
- ExPaNDS Team
- Portal Architecture Test Experience
- Facility needs for the Portal
- COVID-19 and the impact on your team



ALBA Synchrotron

- **Name:** ALBA Synchrotron
- **Location:** Cerdanyola del Vallès (Barcelona)
- **Operating since:** 2011
- **Operated by:** CELLS (Consortium)
- Currently **8 Beamlines in Operation** and **5 under construction**.
- **Experiments in 2019:** 710
- **Visitors in 2019:** 2200



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Computing

- **Data Produced in 2019:** ~190 TB
- **Data files size range:** few KB to up to 750 MB
- **Data Policy in place:** Yes (2017)
- **Embargo period:** 3 years
- **Embargo period reached on any of the datasets:** Yes
- **How data is made available:** Manual interaction
- **Data Catalogue:** ICAT in Production by the end of 2020 (expected) for one Beamline
- **How long data is kept:** Forever (for the moment)
- **Persistent Identifier service:** not yet (DOI with Datacite)
- **Remote Access to the data:** SFTP



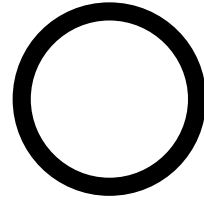
Work package title	JRA2 - Demonstrator of a Photon Science Analysis Service (DaaS)
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Task 24.4 Design and implement Remote Data Analysis as a Service portal demonstrator.

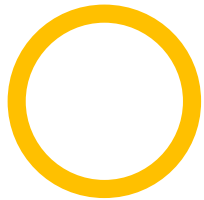
<https://www.youtube.com/watch?v=mFc4q8toXQU>



The Computing Division

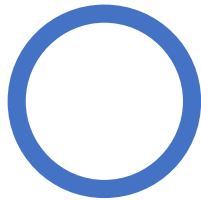


Computing & Controls



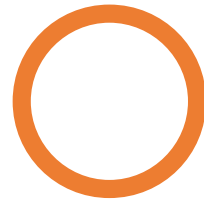
Controls & Data Acquisition

Design, develop and operate controls systems of beamlines and accelerators, and data acquisition



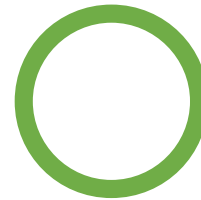
Electronics

Design, operation and support hardware of the control systems, data acquisition and electronic equipment



IT Systems

Hosting, Networking, Cloud, Beamline support, HPC, Accounting, Remote access...



MIS

Business applications, web platforms, knowledge management systems...



Scientific Data Management

Data Analysis, Data Processing... Data Management



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ExPaNDS Team



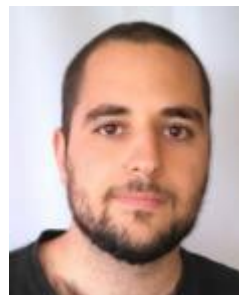
Alex Camps

Software Engineer – **Management Information Systems Section**
Expertise in web development (J2EE, Django, Javascript frameworks)
and Databases (MySQL)



Adara Carrion

IT Systems Administrator – **IT Systems Section**
Expertise in Kubernetes, CI/CD and Cloud Services (AWS)



Daniel Sanchez

Software Engineer – **Management Information Systems Section**
Expertise in web development (J2EE, Django, Javascript frameworks)
and Databases (MySQL)



Pau Carnicer

IT Systems Administrator – **IT Systems Section**
Expertise in HPC, Storage Management and DevOps



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ExPaNDS Team (II)



Matías Fisz

IT Systems Administrator– **IT Systems Section**
Expertise in Kubernetes, Docker and Storage Management



ExPaNDS Position

Software Engineer – **Management Information Systems Section**
Expertise in web development (J2EE, Django, Javascript frameworks)
and Databases (MySQL)

Gemma Rosas

IT Systems Administrator– **IT Systems Section**
Expertise in Remote Access, Data Processing Hosting, Storage and
Account Management

Toni Pérez

IT Systems Section Head
Expertise in IT Service and Project Management
Will contribute to ExPaNDS as ALBA IT Systems coordinator

Daniel Salvat

Management Information Systems Section Head
Expertise in Service, Project Management and Product Ownership (Scrum).
Will contribute to ExPaNDS as ALBA MIS coordinator



The Portal Architecture test experience

- What went well?
 - Able to deploy in test Kubernetes cluster.
 - Easy to install.
 - Support by ILL.
- What could go better?
 - Permission at cluster level required to deploy.
 - Checklist would have been handy.
- What is the gap between what's in your facility and what the Portal needs?
 - Cluster-level permissions are not recommended when shared Kubernetes.
 - No OpenStack integration as part of ALBA's roadmap.



Facility needs for the Portal

- Name the features you would prioritize/what does the portal needs in order to run in your facility?
 - Slurm module for HPC.
 - Singularity compatibility might also be of interest.
 - Containers standardization? Common repos for Docker images?
 - CentOS or Debian.
 - Compatibility with other existing services (Citrix,...)
- Non-technical needs:
 - Training platforms on the Portal.
 - Involving instrument scientists and user communities to hands-on workshops (feedback from the final users are needed).



COVID-19 and the impact on your team

- Upgrades on in-place systems for Business and Cloud support:
 - Upgraded firewall/remote access VPN infrastructure & capacity
 - Enabled user physical desktops for efficient Windows & Linux remote work (RDPproxy, NX, Thin Clients, CAD)
 - Acquired and provided equipment needed by users on-site or home
 - Adoption of Zoom teleworking tool for chat, remote meetings and seminars
 - Upgrade of remote terminal ssh and upload server “bastion”
- IT Experiment support:
 - Remote Operation and
 - Remote Support (desktop connection and chat)
- Additional constraints:
 - **Future Project:** Sample Tracking system project, involving the whole organization, due to mail-in procedures (Instrument scientists, Safety, Logistics, external carrier,...)
 - Hiring delays (finally solved!).



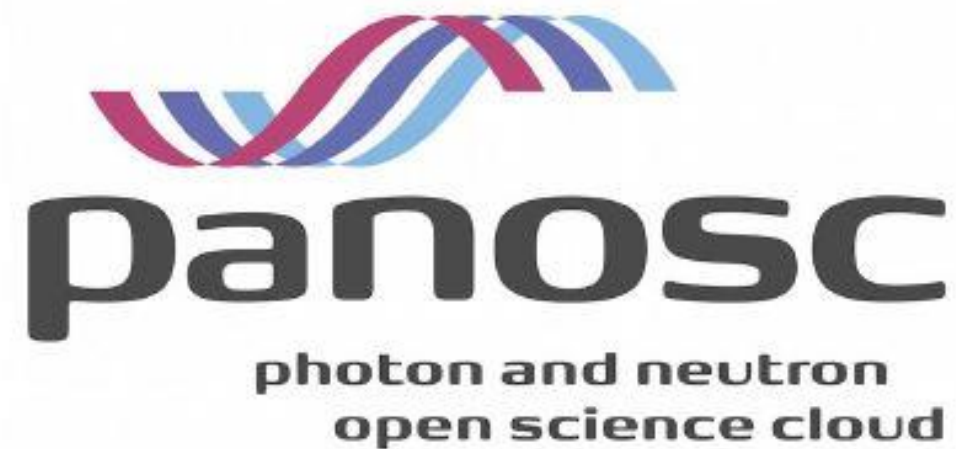
Comparison table of the capacities and capabilities increase

Connection method	Capacity pre-COVID	NEW capacity COVID	Top users usage pre-COVID	Top users usage COVID	Capacity increase permanency
RDP (Remote Desktop) Proxy connections via Citrix ADC (Netscaler)	25 Mbps	200 Mbps	20 Mbps 0	70 Mbps 45 (77 unique)	Temporal BW increase subscription due to COVID Avoids consuming + Citrix licenses
Pulse Secure VPN	35 users	35 users	28	29	Upgrade to 50 pending installation
Citrix <ul style="list-style-type: none"> To windows: Mostly RDP To Linux: MobaXterm (12), X2go (2) 	78 users	123 users	25	35	
<ul style="list-style-type: none"> Engineering Remote PC CAD + VDI CAD 			18	30	
Linux: SSH Proxy: a few users (no numbers yet, around 5-10)	No limit	No limit	5	5	Infrastructure upgraded due to COVID
NoMachine (Licensed)	10 hosts	70 hosts			Infrastructure upgraded due to COVID <ul style="list-style-type: none"> 23/70 host licenses reserved for growth & new BLs remote Workstations tests 16 New NX clients installed to support sample Mail-in operation
<ul style="list-style-type: none"> NoMachineNX Staff 	2 hosts	40 hosts	0	21	
<ul style="list-style-type: none"> NoMachineNX Beamlines remote user operation NoMachineNX Beamlines remote staff access 	1 host	30 hosts	1 (XALOC 2016)	17	
TOTAL usage				193 (Staff) +12 (BLs)	

We are hiring!!

- 9 Positions open in October:
 - 2 Software Engineers for MIS (including 1 for ExPaNDS – 2 years).
 - 3 Controls Engineers.
 - 2 Electronics Engineers.
 - 2 IT Systems Technical Support Agents.
- More information: <https://public.cells.es/jobs>





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