

XRootD and FTS Workshop @ PIC (Barcelona)

Report of Contributions

Contribution ID: 1

Type: **not specified**

Benchmarking the Open Science Data Federation services - S3 plugin and cache selection

Thursday, 16 October 2025 16:40 (20 minutes)

Research has become dependent on processing power and storage, one crucial aspect being data sharing. The Open Science Data Federation (OSDF) project aims to create a scientific global data distribution network based on the Pelican Platform. OSDF does not develop new software but relies on the XrootD and Pelican projects. Nevertheless, OSDF must understand the XrootD limits under various configuration options, including transfer rate limits, proper buffer configuration, and storage type effect. This work describes the tests and results performed using National Research Platform (NRP) hosts, showing the S3 plugin and cache selection process. The tests cover various file sizes and parallel streams and use clients from various distances from the server host. We also used several standalone clients (wget, curl, pelican) and the native HTCondor file transfer mechanisms.

Author: ANDRIJAUSKAS, Fabio (Univ. of California San Diego (US))

Presenter: ANDRIJAUSKAS, Fabio (Univ. of California San Diego (US))

Session Classification: XRootD Presentations

Contribution ID: 2

Type: **not specified**

XRootD's improved support for SENSE deployments

Thursday, 16 October 2025 17:00 (20 minutes)

In this presentation we will talk about how we have been working, together with the XRootD team, towards easing the multi-subnet deployments needed by SENSE

Author: DAVILA FOYO, Diego (Univ. of California San Diego (US))

Presenter: DAVILA FOYO, Diego (Univ. of California San Diego (US))

Session Classification: XRootD Presentations

Contribution ID: 4

Type: **not specified**

Scitags: A Standardised Framework for Traffic Identification and Network Visibility

Wednesday, 15 October 2025 15:45 (30 minutes)

High-Energy Physics (HEP) experiments rely on complex and large scale networks spanning vast geographical areas and interconnecting heterogeneous sites, data centres and instruments. Managing these networks in the face of high-intensity data flows such as those intrinsic to HEP workflows poses a significant operational and administrative challenge. These conditions are expected to worsen in the HL-LHC era with its accompanying increase in data rates. The currently limited visibility into network traffic flows hinders network operators' ability to understand user behaviour across different network segments, optimise them for performance and effectively debug and troubleshoot issues.

The Scitags initiative strives to address these challenges by improving network visibility through standardised datagram marking and flow labelling techniques. Formed within the Research Networking Technical Working Group (RNTWG) in 2020, Scitags aims to develop a generic framework and standards for identifying the owner and associated scientific activity of network traffic. This framework's potential use extends that of the HEP/WLCG experiments and steps into any global community making use of Research and Education (R&E) networks.

This presentation will detail the current state of the Scitags initiative, including the evolving framework and its implementations alongside the tried and tested technologies they are built on including eBPF and IPv6 Extension Headers. The roadmap towards production deployments in both R&E networks and Storage Element implementations such as XRootD will also be discussed. By providing a larger network visibility, Scitags will empower network operators to optimise performance, troubleshoot issues more effectively and allow for a more performant use of networks in support of the needs of data-intensive scientific collaborations.

Authors: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US)); LAKE, Andy; HOEFT, Bruno Heinrich; CARDER, Dale (ESnet); ATTEBURY, Garhan (University of Nebraska-Lincoln); LETTS, James (Univ. of California San Diego (US)); MAMBRETTI, Joe (International Center for Advanced Internet Research Northwestern University); NEWELL, Karl; BABIK, Marian (CERN); LAMBERT, Michael (Pittsburgh Supercomputing Center); COLLADO SOTO, Pablo (Universidad Autonoma de Madrid (ES)); MCKEE, Shawn; CHOWN, Tim; SULLIVAN, Tristan (University of Victoria)

Presenter: COLLADO SOTO, Pablo (Universidad Autonoma de Madrid (ES))

Session Classification: XRootD Presentations

Contribution ID: 5

Type: **not specified**

Explaining Xrootd to Users by AI

Thursday, 16 October 2025 16:20 (20 minutes)

Xrootd has lots of concepts and configuration options. Xrootd also has a set of comprehensive reference documents on its website to explain them. Yet Google's AI-based search engine seems to prefer other Xrootd-related Wiki pages and how-to documents. We would like to understand the reason, if we ever want to build an "AskXrootd" chatbot. In this work, we developed our own Retrieval Augmented Generation (RAG) system and fed the system with those documents. We learned various techniques to convert the documents to formats that are preferred by Large Language Models (LLM) and RAG systems. These techniques include format converting methods using tools or Python libraries, and format improvement using LLMs themselves. We also learned the limitations of LLM/RAG systems: they are good at providing answers by following examples, rather than answers based on a comprehensive understanding of the documents. We will share our experience and lessons learned in this exercise. Finally, we make our RAG system available to the public via a MCP (Model Context Protocol) server, and provide a simple example configuration to access the RAG/MCP server using Google's free Gemini CLI.

Authors: ERBACHER, Ian; YANG, Sarah; YANG, Wei (SLAC National Accelerator Laboratory (US))

Presenters: ERBACHER, Ian; YANG, Sarah; YANG, Wei (SLAC National Accelerator Laboratory (US))

Session Classification: XRootD Presentations

Contribution ID: 6

Type: **not specified**

Pelican and XRootD: Moving Petabytes for the broader US Science and Engineering community

Thursday, 16 October 2025 10:10 (20 minutes)

The NSF-funded Pelican project provides a software platform for data federations for the broad US's Science and Engineering community. The flagship instance of Pelican is the Open Science Data Federation (OSDF) which moves over 100PB a year and connects data from a broad set of science domains, from particle physics to earth systems.

Peeling back enough layers and you'll find an xrootd server that is actually moving the data for Pelican.

This talk provides an overview of how Pelican leverages the XRootD software and how it has served the science community in the last two years.

Author: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Presenter: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 7

Type: **not specified**

Monitoring a distributed XRootD infrastructure

Wednesday, 15 October 2025 16:15 (20 minutes)

Do you know what your XRootD-based service is doing?!

Monitoring is a key part of distributing data and information can be gathered from the network or storage layer at the client or server. Each data point provides insight into how the service is performing and where further investigation may be needed.

This talk will overview the monitoring statistics the Pelican project has found most useful in understanding our services, how we aggregate the information, and what inputs we still consider missing.

Author: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Presenter: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 8

Type: **not specified**

Building plugins for the XRootD client

Thursday, 16 October 2025 11:40 (20 minutes)

The XRootD client exports a flexible asynchronous plugin interface that allows the client to manage protocols beyond the core xroot.

This talk will review the plugins managed by the Pelican project. While the core pelican:// protocol will remain internal to the project, it is layered on top of a basic HTTPS plugin that has no dependencies beyond libcurl. The same libcurl plugin also is the basis for a s3:// protocol backend, powering connectivity between the XRootD client (or the caching file proxy) and S3-compatible endpoints.

Author: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Presenter: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 9

Type: **not specified**

Implementing functionality via the Open Storage Service (OSS) Interface

Thursday, 16 October 2025 11:00 (20 minutes)

What can your XRootD server do?

The Open Storage Service (OSS) provides a plugin interface allowing one to manage how the server interacts with the underlying storage. This allows XRootD to do more than interact with a POSIX filesystem; plugins can work with other storage (such as HTTP, S3, multiple POSIX users, or Globus) or stack on top of other plugins (filtering the visible filesystem, managing I/O load, or providing more monitoring information).

This talk will cover the available plugins in the XRootD ecosystem managed by the Pelican and OSG teams and how they can provide value to deployments.

Author: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Presenter: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 12

Type: **not specified**

XCache – recent developments

Thursday, 16 October 2025 09:30 (20 minutes)

20 Minute talk

Author: MRAK TADEL, Alja (UCSD)

Presenter: MRAK TADEL, Alja (UCSD)

Session Classification: XRootD Presentations

Contribution ID: 13

Type: **not specified**

XCache: plans, suggestions/feedback and Q&A

Thursday, 16 October 2025 09:50 (20 minutes)

20 Minutes

Author: TADEL, Matevz (Univ. of California San Diego (US))

Presenter: TADEL, Matevz (Univ. of California San Diego (US))

Session Classification: XRootD Presentations

Contribution ID: 14

Type: **not specified**

OU XRootD Site Report anf Plans

Thursday, 16 October 2025 14:55 (20 minutes)

20 Minute talk

Author: SEVERINI, Horst (University of Oklahoma (US))

Presenter: SEVERINI, Horst (University of Oklahoma (US))

Session Classification: XRootD Presentations

Contribution ID: 15

Type: **not specified**

XRootD Admin Dashboard

Thursday, 16 October 2025 16:00 (20 minutes)

An admin dashboard for automating bulk operations and monitoring over an XRootD server cluster

Author: THOMAS, Jyothish (STFC)

Presenter: THOMAS, Jyothish (STFC)

Session Classification: XRootD Presentations

Contribution ID: 16

Type: **not specified**

XrdCeph Streamed Checksums

Thursday, 16 October 2025 12:15 (15 minutes)

An update on streamed checksum for XrdCeph

Author: THOMAS, Jyothish (STFC)

Presenter: THOMAS, Jyothish (STFC)

Session Classification: XRootD Presentations

Contribution ID: 17

Type: **not specified**

Introduction

Tuesday, 14 October 2025 14:00 (10 minutes)

Presenters: DI GIROLAMO, Alessandro (CERN); LETTS, James (Univ. of California San Diego (US))

Session Classification: WLCG Open Technical Forum #7

Contribution ID: **18**

Type: **not specified**

FTS - status and plans

Tuesday, 14 October 2025 14:10 (15 minutes)

Major plans for the coming years,
gaps identified in the current situation,
concrete milestones along the way to solving the major problems observed

Presenter: MURRAY, Steven (CERN)

Session Classification: WLCG Open Technical Forum #7

Contribution ID: **19**

Type: **not specified**

XRootD - status and plans

Tuesday, 14 October 2025 14:40 (20 minutes)

Major plans for the coming years,
gaps identified in the current situation,
concrete milestones along the way to solving the major problems observed.

Presenter: HANUSHEVSKY, Andrew (Stanford University/SLAC)

Session Classification: WLCG Open Technical Forum #7

Contribution ID: **20**

Type: **not specified**

XRootD Monitoring

Session Classification: WLCG Open Technical Forum #7

Contribution ID: 21

Type: **not specified**

Evolution of Grid Data Management clients

Presenter: MASCETTI, Luca (CERN)

Session Classification: WLCG Open Technical Forum #7

Contribution ID: 22

Type: **not specified**

Site update on FTS at RAL

Tuesday, 14 October 2025 10:10 (20 minutes)

General overview of the current status of the FTS service being run at RAL and plans for it moving forward.

Author: COOPER, Rose

Presenter: COOPER, Rose

Session Classification: FTS Presentations

Contribution ID: 23

Type: **not specified**

EOSCTA tape integration with WLCG tokens

Wednesday, 15 October 2025 09:30 (20 minutes)

As we move towards managing tape staging operations with WLCG tokens, EOSCTA has to be adapted for this new reality.

This presentation will cover the latest WLCG token developments on EOSCTA, as well as the plans towards full adoption of tokens on EOSCTA tape workflows.

Author: AFONSO, Joao (CERN)

Presenter: AFONSO, Joao (CERN)

Session Classification: FTS Presentations

Contribution ID: 24

Type: **not specified**

CMS community talk

Tuesday, 14 October 2025 11:20 (20 minutes)

A description of CMS Data Management with particular emphasis on FTS. This will include the latest updates and changes since the last workshop.

Authors: OZTURK, Hasan (CERN); ELLIS, Katy (Science and Technology Facilities Council STFC (GB)); PAPARRIGOPOULOS, Panos (CERN)

Presenter: PAPARRIGOPOULOS, Panos (CERN)

Session Classification: FTS Presentations

Contribution ID: 25

Type: **not specified**

What happened since the last workshop

Wednesday, 15 October 2025 14:00 (20 minutes)

Past developments.

Author: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Presenter: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Session Classification: XRootD Presentations

Contribution ID: 26

Type: **not specified**

Plans for XRootD 6.0 and Other News

Wednesday, 15 October 2025 14:20 (20 minutes)

What we are looking to and when.

Author: AMADIO, Guilherme (CERN)

Presenter: AMADIO, Guilherme (CERN)

Session Classification: XRootD Presentations

Contribution ID: 27

Type: **not specified**

XRootD Evolution Discussion

Wednesday, 15 October 2025 14:40 (20 minutes)

Where to find it and how to drive it.

Authors: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US)); AMA-DIO, Guilherme (CERN)

Presenters: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US)); AMA-DIO, Guilherme (CERN)

Session Classification: XRootD Presentations

Contribution ID: 28

Type: **not specified**

OssArc - Rucio aware backup plug-in

Thursday, 16 October 2025 11:20 (20 minutes)

Oss overlay plug-in to provide Rucio dataset backups

Author: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Presenter: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Session Classification: XRootD Presentations

Contribution ID: 29

Type: **not specified**

XRootD developments at RAL

Thursday, 16 October 2025 14:20 (20 minutes)

A round-up of recent XRootD-related work at RAL

Author: ELLIS, Katy (Science and Technology Facilities Council STFC (GB))

Presenter: ELLIS, Katy (Science and Technology Facilities Council STFC (GB))

Session Classification: XRootD Presentations

Contribution ID: **30**

Type: **not specified**

Evolution of Summary Monitoring

Wednesday, 15 October 2025 16:35 (20 minutes)

New format, directives etc but with a migration plan

Author: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Presenter: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Session Classification: XRootD Presentations

Contribution ID: 31

Type: **not specified**

How the ALICE experiment uses Xrootd

*Thursday, 16 October 2025 14:00 (20 minutes)***Authors:**

Costin Grigoras, Adrian Sevcenco

In the ALICE experiment Xrootd is the foundational protocol for all data interactions. It is the sole method for engaging with the 52 storage endpoints and the Xrootd client library and the command line utilities are integral to a wide range of tasks. These tasks include operations carried out by job agents, ROOT-based applications, user shells, and data transfer agents. Xrootd-based server implementations are providing access to 97% of the distributed storage volume, which today consists of more than 400PB of disk space and 375PB of tape archives.

This presentation will show how the distributed data storage is federated with the help of a central file catalogue and centrally issued access tokens, how the different clients are used by the experiment middleware and processing framework and how we monitor the storage infrastructure.

Author: GRIGORAS, Costin (CERN)**Co-author:** Dr SEVCENCO, Adrian (Institute of Space Science subsidiary of INFLPR (RO))**Presenter:** GRIGORAS, Costin (CERN)**Session Classification:** XRootD Presentations

Contribution ID: **32**

Type: **not specified**

FTS4: Plans and Developments

Monday, 13 October 2025 14:30 (40 minutes)

An overview of what's new in the FTS4 world, ending with the short, medium and long-term plans

Author: MURRAY, Steven (CERN)

Co-authors: LOPES, Joao Pedro; REGNIER, Louis; PATRASCOIU, Mihai (CERN); PACE, Nicola

Presenter: MURRAY, Steven (CERN)

Session Classification: FTS Presentations

Contribution ID: 33

Type: **not specified**

FTS4: The Reinvented Scheduler

Monday, 13 October 2025 15:10 (20 minutes)

An overview of the new FTS4 scheduler

Author: PACE, Nicola

Co-authors: LOPES, Joao Pedro; MURRAY, Steven (CERN)

Presenter: PACE, Nicola

Session Classification: FTS Presentations

Contribution ID: 34

Type: **not specified**

FTS4: The New File API

Monday, 13 October 2025 16:00 (20 minutes)

An overview of the new File API, which will replace the usage of the Gfal2 library

Author: REGNIER, Louis

Co-author: PATRASCOIU, Mihai (CERN)

Presenter: REGNIER, Louis

Session Classification: FTS Presentations

Contribution ID: 35

Type: **not specified**

FTS3: State of stable affairs

Tuesday, 14 October 2025 09:10 (40 minutes)

An overview of the FTS3 service deployment @ CERN, together with latest changes to the software in order to keep operations smooth.

Author: PATRASCOIU, Mihai (CERN)

Presenter: PATRASCOIU, Mihai (CERN)

Session Classification: FTS Presentations

Contribution ID: **36**

Type: **not specified**

FTS, Tape & Tokens: Making First Contact

Wednesday, 15 October 2025 09:00 (30 minutes)

An overview of the Tape & Tokens proposal and how it was implemented in the FTS4 software

Author: PATRASCOIU, Mihai (CERN)

Presenter: PATRASCOIU, Mihai (CERN)

Session Classification: FTS Presentations

Contribution ID: 37

Type: **not specified**

Welcome to PIC and UAB

Monday, 13 October 2025 14:00 (20 minutes)

Presenter: MERINO, Gonzalo (IFAE - Institute for High Energy Physics)

Session Classification: Welcome & Logistics

Contribution ID: **38**

Type: **not specified**

Workshop logistics

Monday, 13 October 2025 14:20 (10 minutes)

Presenter: FLIX MOLINA, Jose (CIEMAT - Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

Session Classification: Welcome & Logistics

Contribution ID: **39**

Type: **not specified**

FTS4: November test planning

Tuesday, 14 October 2025 12:00 (30 minutes)

Session Classification: FTS Presentations

Contribution ID: 44

Type: **not specified**

Tape & Tokens: Discussion

Wednesday, 15 October 2025 09:50 (40 minutes)

Session Classification: FTS Presentations

Contribution ID: 45

Type: **not specified**

FTS Open Discussion

Wednesday, 15 October 2025 11:00 (1 hour)

Session Classification: FTS Presentations

Contribution ID: 46

Type: **not specified**

Refactoring HTTP-TPC

Thursday, 16 October 2025 15:15 (15 minutes)

This talk will present the refactoring of the HTTP-TPC subsystem in XRootD aimed at improving efficiency and maintainability. The update addresses overhead from creating and destroying libcurl contexts for every transfer by introducing a persistent worker-pool model that reuses connections and manages transfer queues. This talk will outline the motivation behind this change, the key architectural decisions, early observations, and how this work lays the foundation for future improvements in error handling and monitoring.

Author: CHAUHAN, Rahul (University of Wisconsin Madison (US))

Co-author: BOCKELMAN, Brian Paul (University of Wisconsin Madison (US))

Presenter: CHAUHAN, Rahul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 47

Type: **not specified**

WebDAV Error Improvement Initiative

Thursday, 16 October 2025 17:20 (15 minutes)

This session will discuss ongoing efforts to improve the clarity and consistency of WebDAV error reporting in XRootD. The initiative focuses on standardising and defining numeric codes within HTTP error messages, as recommended by WLCG, so that clients can better interpret and act on them, especially given the limited range of HTTP status codes. The talk will present examples of current inconsistencies, outline proposed mappings and validation strategies, and invite discussion on adoption, testing, and integration with existing monitoring tools.

Author: CHAUHAN, Rahul (University of Wisconsin Madison (US))

Presenter: CHAUHAN, Rahul (University of Wisconsin Madison (US))

Session Classification: XRootD Presentations

Contribution ID: 48

Type: **not specified**

Experiences for Early SKA Data Movement

Thursday, 16 October 2025 14:40 (15 minutes)

Recent development at SKA

Author: WALDER, James William (Science and Technology Facilities Council STFC (GB))

Presenter: WALDER, James William (Science and Technology Facilities Council STFC (GB))

Session Classification: XRootD Presentations

Contribution ID: 49

Type: **not specified**

XRootD Monitoring

Tuesday, 14 October 2025 15:45 (20 minutes)

Presenter: PAPARRIGOPOULOS, Panos (CERN)

Session Classification: WLCG Open Technical Forum #7

Contribution ID: 50

Type: **not specified**

Evolution of Grid Data Management clients

Tuesday, 14 October 2025 16:20 (20 minutes)

Presenter: MASCETTI, Luca (CERN)

Session Classification: WLCG Open Technical Forum #7

Contribution ID: 51

Type: **not specified**

LHCb <3 FTS

Tuesday, 14 October 2025 11:40 (20 minutes)

I promise to make a better abstract very soon!

Author: HAEN, Christophe (CERN)

Presenter: HAEN, Christophe (CERN)

Session Classification: FTS Presentations

Contribution ID: 52

Type: **not specified**

Tracking file integrity with an XRootD plugin

Thursday, 16 October 2025 12:00 (15 minutes)

15 minutes

Author: SMITH, David (CERN)

Presenter: SMITH, David (CERN)

Session Classification: XRootD Presentations

Contribution ID: 53

Type: **not specified**

Introducing file cloning in XRootD R6

Wednesday, 15 October 2025 15:30 (15 minutes)

15 min

Author: SMITH, David (CERN)

Presenter: SMITH, David (CERN)

Session Classification: XRootD Presentations

Contribution ID: 54

Type: **not specified**

XRootD Collaboration Meeting

Friday, 17 October 2025 09:00 (30 minutes)

Presenter: HANUSHEVSKY, Andrew Bohdan (SLAC National Accelerator Laboratory (US))

Session Classification: XRootD Presentations

Contribution ID: 55

Type: **not specified**

XRootD Continuous Integration Infrastructure

Friday, 17 October 2025 09:45 (45 minutes)

In this contribution, we will present the current continuous integration infrastructure for XRootD on GitHub, which uses GitHub Actions. We will also show how to perform several of the tasks required during development, such as running the test suite locally and on GitHub Actions, enabling the CI on a fork repository, running CI builds on demand, and some auxiliary tools which we currently use, but have not yet been integrated into the CI system (e.g. ABI compliance checker and Coverity Static Analysis).

Presenter: AMADIO, Guilherme (CERN)

Session Classification: XRootD Presentations

Contribution ID: 56

Type: **not specified**

XRootD Release Management

Friday, 17 October 2025 09:30 (15 minutes)

In this contribution, we will discuss changes to the release management and release cycle of XRootD, as well updates to the development model.

Presenter: AMADIO, Guilherme (CERN)

Session Classification: XRootD Presentations

Contribution ID: 57

Type: **not specified**

FTS & Rucio

Monday, 13 October 2025 16:20 (20 minutes)

FTS is the de facto transfer tool for Rucio communities to orchestrate site-to-site transfers. This talk will cover a variety of topics regarding the interaction between Rucio and FTS.

Author: CHRISTIDIS, Dimitrios (CERN)

Presenter: CHRISTIDIS, Dimitrios (CERN)

Session Classification: FTS Presentations

Contribution ID: 58

Type: **not specified**

ATLAS Community Talk

Tuesday, 14 October 2025 11:00 (20 minutes)

FTS manages the transfer of millions of files every day for the ATLAS experiment. This talk aims to offer some insights into our use of FTS and outline our hopes for FTS4.

Author: CHRISTIDIS, Dimitrios (CERN)

Presenter: CHRISTIDIS, Dimitrios (CERN)

Session Classification: FTS Presentations

Contribution ID: 59

Type: **not specified**

FTS@PIC

Tuesday, 14 October 2025 09:50 (20 minutes)

Description and usage of the PIC FTS instance.

Author: NEISSNER, Christian (PIC)

Co-authors: ACOSTA SILVA, Carles (PIC); TORRADEFLOT, Francesc; NOT SUPPLIED, Jordi Delgado; FLIX MOLINA, Jose (CIEMAT - Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

Presenter: NEISSNER, Christian (PIC)

Session Classification: FTS Presentations