FTS and Tokens

FTS & XRootD Workshop
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Introduction : Exascale Token for FTS

- **FTS distributes majority of Data across the WLCG infrastructure. It is integrated with experiment data management frameworks as well that includes Rucio and DIRAC.**

- **The main authentication method used in the FTS ecosystem are based on X509 proxy certificates**

- **For HTTP protocol, FTS provides "unrefined" token support to enable certificate-less transfers**

- **This project aims to transition from proxy certificates to Token Authentication**

- **We are one of the first component that is attempting and aiming full support for Token Authentication at Exascale level for LHC experiment workflow**

Abstract

- **Exascale token support for long-standing operations, data archival and retrieval on cold storage and for the management of the full token lifecycle.**

- **Dedicated designing, development, test and deployment activities to natively integrate the chosen token authorization technology in FTS**

- **Regular follow up within WLCG working groups, to make sure the service will be able to provide a scalable service to the LHC experiments**

- **Identification, discussions and agreements with all involved parties (WLCG, Experiments, EGI and OSG communities) for their own distinct requirements and objectives to ensure the interoperability of the service.**

- **Identification of operational hurdles and addressal in a timely matter.**

Risks

- **This work is needed as a pre-requisite for the authentication transition from X509 certificates to Tokens of the WLCG**

- **Without this development, LHC experiments will not be able to operate at scale transfers and data archival and retrieval from cold storage**

- **Plausible impact on the WLCG Token Transition timeline and the next HL-LHC Data Challenge**

- **Convergence and agreement of all involved parties on the interoperability and scalability aspects of the different solutions to allow the FTS service to design, develop and deliver in time a coherent set of tools to meet the community decisions and the WLCG Token Transition timeline.**

Objectives

- **Assess current FTS software stack w.r.t. tokens**

- **Liaison with all stakeholders**

- **Discuss and review main workflows with all stakeholders**

- **Design and develop fully integrated token support for all supported protocols**

- **Design and develop automated token refresh mechanism**

- **Design and develop fully integrated token support for long-standing operations (cold storage)**

- **Test individual components**

- **Test service scalability**

- **Develop and deploy a functional testing framework**

- **Deploy a prototype service with full token support**

- **Validate main experiments' workflows**

- **Highlight and address shortcomings and scalability issues**

Main Stakeholders

- **WLCG**

- **LHC Experiments**

- **Storage providers**

- **Authentication and Authorization Services**

- **EGI community**

- **OSG community**

Workflow
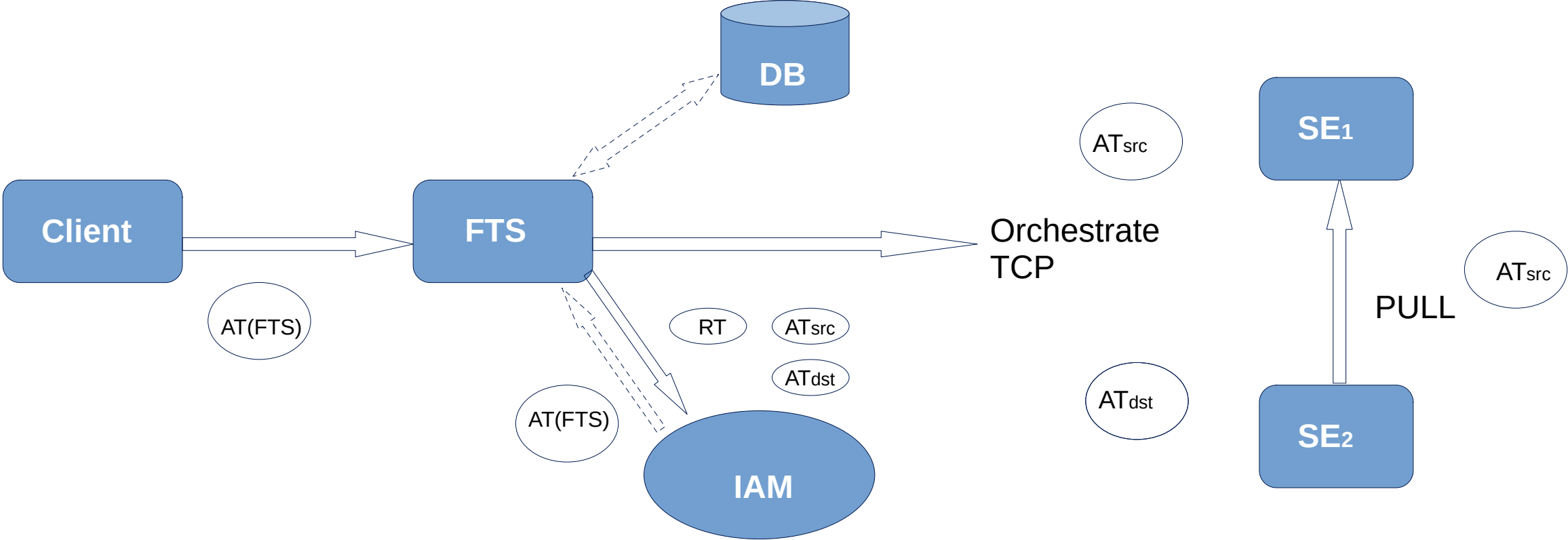
Scopes :

Read	Write	Overwrite
Scope on basepath (Optional Hint)	Scope on basepath (Optional Hint)	Scope on fullname

Workflow

1) **The client, like Rucio submits only FTS-specific token**

2) **FTS requests two tokens, one for source storage, one for destination**

   1) **The audience is always the storage**

   2) **The scope is `storage.read:<path>` or `storage.write:<path>`. When file exists, `storage.overwrite:<path>` is needed**

   3) **By default, FTS requests for `storage.read` and `storage.write` <path> = / (basepath).**

   4) **Clients may provide an optional hint for the basepath**

   5) **For `storage.overwrite` scope, <path> = always full filepath**

3) **Tokens are cached on the FTS side in order to limit number of IAM interaction**

4) **FTS constructs a client auth profile based on this initial access token. In a way, this initial token can be seen similar to today's certificates and the "delegation" process**

Questions

Thank you!

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