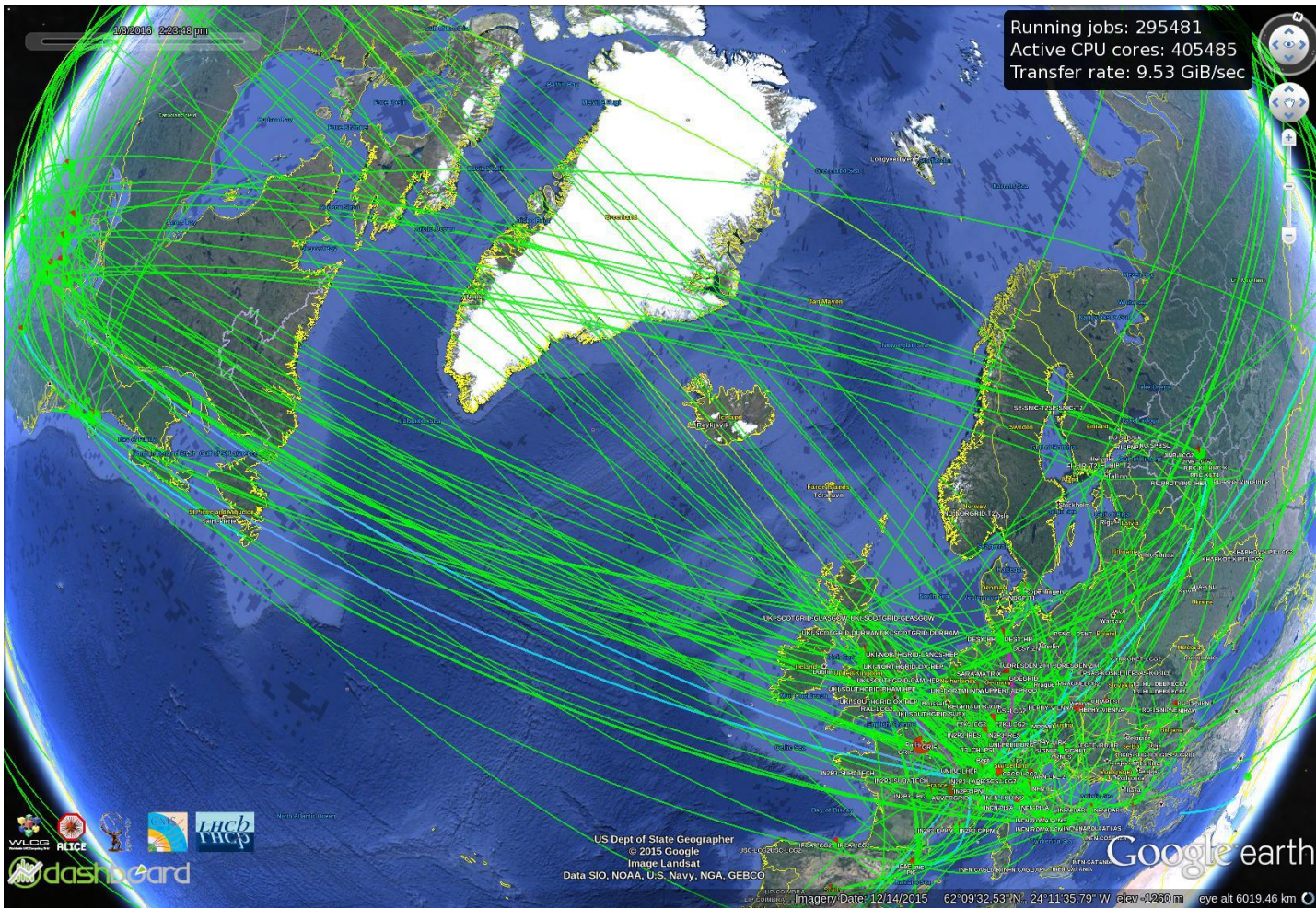




# File Transfer Service

Oliver Keeble  
On behalf of the FTS team

# Global Data Distribution



# Made for distributed computing

	TOTAL	Australia+	Austria+	Belgium+	Brazil+	Canada+	Chile+	China+	Czech-Republic+	Estonia+	Finland+	France+	Germany+	Greece+	Hungary+	India+	Israel+	Italy+	Japan+	Netherlands+	Nordic+	Pakistan+	Poland+	Portugal+	Romania+	Russia+
TOTAL-	80 %	96 %	44 %	65 %	51 %	69 %	6 %	89 %	9 %	74 %	23 %	88 %	79 %	65 %	75 %	88 %	100 %	80 %	13 %	71 %	80 %	78 %	42 %	66 %	57 %	83 %
Australia+	94 %					96 %		100 %				100 %	94 %					97 %		100 %	100 %		100 %			0 %
Austria+	92 %	70 %			50 %	95 %		91 %	100 %			100 %	94 %	100 %				93 %		100 %	100 %	100 %	80 %	100 %		100 %
Belgium+	83 %		100 %	50 %	89 %			100 %				100 %	93 %	100 %	100 %			89 %				100 %		89 %		100 %
Brazil+	75 %		100 %	100 %	50 %			100 %			0 %	100 %	55 %		0 %			97 %				100 %		75 %		71 %
Canada+	97 %	98 %				98 %	100 %	99 %	100 %			100 %	99 %	100 %			100 %	99 %	100 %	100 %	100 %		98 %		98 %	99 %
Chile+	54 %	100 %				66 %		60 %				48 %	60 %	0 %				38 %		54 %	67 %		20 %	60 %		48 %
China+	95 %	100 %	100 %		50 %	74 %						99 %	99 %	100 %				94 %		96 %	91 %	100 %	90 %	100 %		100 %
Czech-Republic+	90 %	100 %				79 %			100 %			100 %	100 %					100 %		100 %	86 %		70 %			100 %
Estonia+	84 %		100 %	0 %	14 %			67 %		0 %	0 %	100 %	85 %	100 %				90 %				0 %		100 %		100 %
Finland+	0 %		0 %	0 %	0 %			0 %		0 %	0 %	0 %	0 %	0 %	0 %			0 %				0 %		0 %		0 %
France+	94 %	99 %	57 %	60 %	20 %	93 %		99 %		100 %	0 %	97 %	96 %	100 %	38 %			96 %	33 %	98 %	98 %	80 %	78 %	64 %	50 %	97 %
Germany+	50 %	89 %	86 %	87 %	21 %	11 %	100 %	89 %	10 %	100 %	0 %	98 %	83 %	90 %	100 %	100 %		42 %	0 %	25 %	64 %	100 %	77 %	100 %	100 %	100 %
Greece+	83 %		100 %	100 %	33 %			100 %		100 %		100 %	100 %					44 %				100 %		100 %		100 %
Hungary+	80 %		100 %	50 %	5 %			100 %			0 %	100 %	32 %	100 %				73 %				100 %		100 %		57 %
India+	80 %			83 %	100 %						100 %	81 %	89 %	100 %	100 %			80 %				0 %				68 %
Italy+	81 %		80 %	98 %	20 %			57 %		82 %	27 %	89 %	69 %	75 %	100 %	100 %		83 %		100 %		100 %		99 %		83 %
Japan+	90 %	100 %				78 %		95 %				96 %	77 %	100 %				100 %		92 %	93 %		90 %		100 %	100 %
Latin-America+	79 %												0 %					97 %		76 %						
Netherlands+	100 %											99 %						100 %								
Nordic+	72 %					100 %						67 %						50 %		50 %	67 %					50 %
Pakistan+	51 %		80 %	33 %	20 %			100 %		75 %	0 %	54 %	36 %		17 %			43 %						100 %		100 %
Poland+	83 %	90 %				69 %		60 %	77 %			96 %	88 %					91 %		91 %	85 %		25 %			93 %
Portugal+	90 %	100 %	100 %	100 %	13 %	79 %		100 %				100 %	94 %	100 %	100 %			91 %		100 %	71 %		90 %			58 %
Romania+	88 %	86 %				78 %		74 %				88 %	85 %	100 %				98 %	86 %	98 %	85 %		57 %			100 %
Russia+	92 %	0 %	100 %	0 %	17 %	100 %		100 %				100 %	100 %	100 %				97 %		100 %	100 %	100 %		100 %		100 %
Russian-Federation+	31 %		7 %	2 %	13 %	100 %		0 %		0 %		25 %	7 %	100 %	4 %			47 %		97 %	100 %	0 %		0 %		68 %
Slovakia+	92 %	63 %				82 %		93 %	100 %			100 %	100 %					100 %		96 %	92 %		65 %			100 %
South-Korea+	73 %		4 %	0 %	50 %			100 %				100 %	98 %	100 %				85 %				100 %		100 %		100 %
Spain+	91 %	100 %	100 %		13 %	88 %	100 %	100 %	100 %		100 %	99 %	94 %	100 %		87 %	100 %	76 %		91 %	94 %	100 %	82 %	100 %	100 %	99 %
Switzerland+	98 %	100 %	100 %		79 %	100 %		100 %	100 %	76 %	50 %	99 %	96 %	100 %	100 %		100 %	95 %		100 %	100 %	100 %	95 %	96 %		97 %
Taiwan+	96 %	100 %				98 %		100 %				100 %	90 %					86 %		99 %	54 %		100 %			100 %
Thailand+	92 %		100 %	100 %	100 %			50 %		100 %		100 %	55 %	100 %				100 %								0 %
Turkey+	74 %		100 %	100 %	100 %			0 %		0 %		100 %	67 %					0 %						100 %		100 %
UK+	72 %	0 %	100 %	46 %	66 %	0 %		42 %		73 %	30 %	75 %	66 %	20 %	100 %	89 %		96 %		96 %	0 %	100 %	0 %	100 %		38 %

# FTS

- Low level data mover
  - “Move file F from A to B”
    - Efficiently, reliably
- Highly scalable
  - ~25PB per month
  - 1-2 million files per day
- “Zero config”
- Adaptive optimisation
  - Get the most out of your storage and network
- Modular protocol support
  - GridFTP, HTTP, S3, [SRM, xrootd, ...]
- Open Source

# Programmatic interface

- As used by the LHC experiments
- Suitable for integration into data management frameworks
- Placement logic (eg sync) can be built on top

## POST /jobs

Submits a new job

### Returns

```
{"job_id": }
```

### Notes

It returns the information about the new submitted job. To know the format for the submission, </api-docs/schema/submit> gives the expected format encoded as a [JSON](#)-schema.

It can be used to validate (i.e in Python, `jsonschema.validate`)

### Expected request body

Submission description (SubmitSchema)

### Responses

Code	Description
419	The credentials need to be re-delegated
403	The user doesn't have enough permissions to submit
400	The submission request could not be understood

# http://webfts.cern.ch

You are authenticated as **Oliver Keeble** Your current proxy is valid for 11 hours for the VO dteam ▾

WebFTS *Simplifying power*

[Home](#) [My jobs](#) [Submit a transfer](#)

**Dropbox**  
Dropbox

/ Load

Create Folder  Delete  Rename

Select All Files None Refresh Show filters Revoke

Name	Mode	Date	Size
Getting Started.pd...	-	29 Jan 13:16	240.2 kB
Photos	-	29 Jan 13:18	0
Public	-	29 Jan 13:18	0
services	-	26 Jan 10:58	19.1 kB

0 File(s) Selected

**Grid SE**  
Grid Storage Element

https://dpmhead-trunk.cern.ch/dpm/cern.ch/home/dteam/dynafe Load

Create Folder  Delete  Rename

Select All Files None Refresh Show filters

Name	Mode	Date	Size
..			
everywhere-README...	-rw-rw-r--	26 Jun 11:20	728 B
everywhere	drwxrwxr-x	26 Jun 12:48	-
interleaved-README...	-rw-rw-r--	26 Jun 11:20	466 B
interleaved	drwxrwxr-x	26 Jun 13:15	-

0 File(s) Selected

Overwrite Files

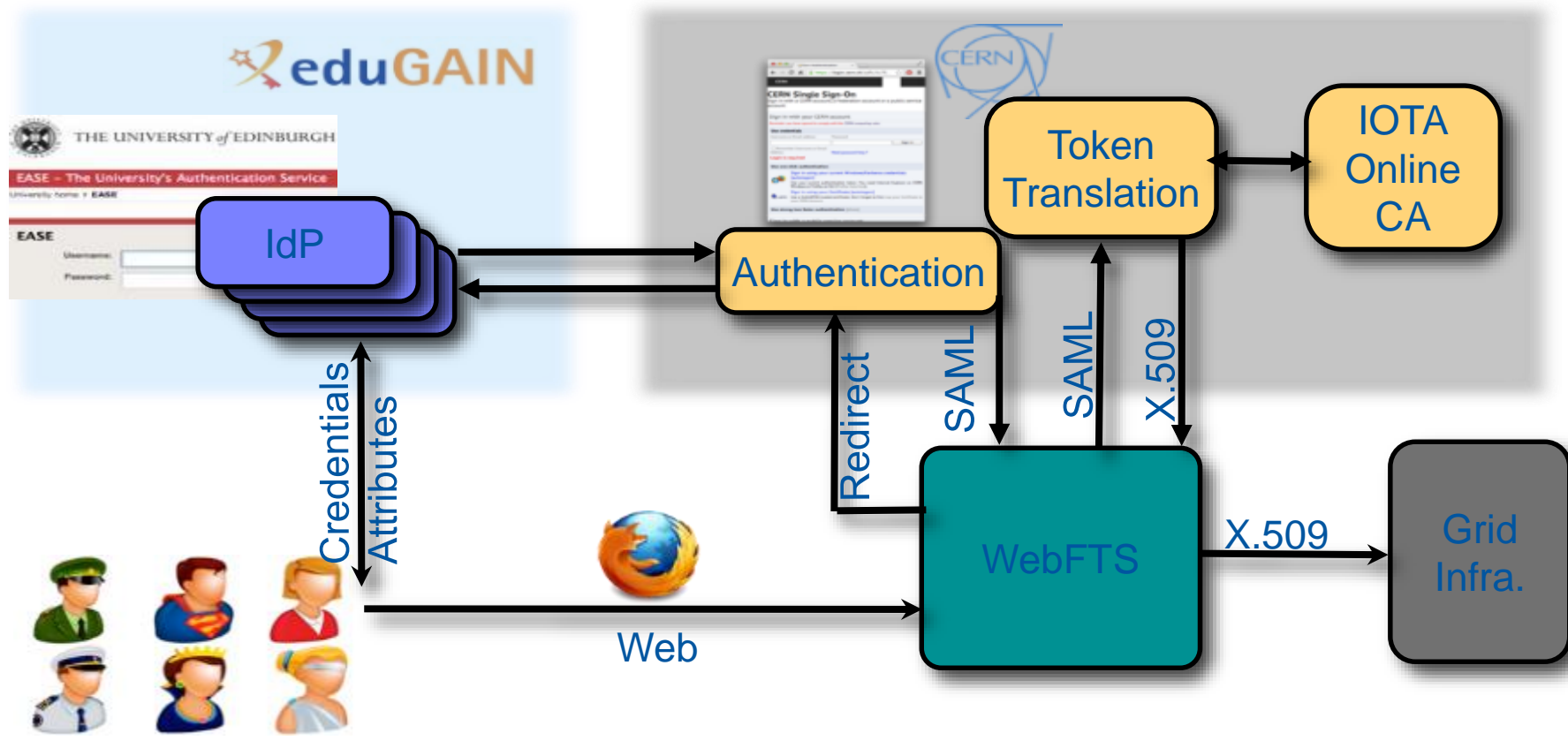
Compare Checksums

LFC Registration

lfc://

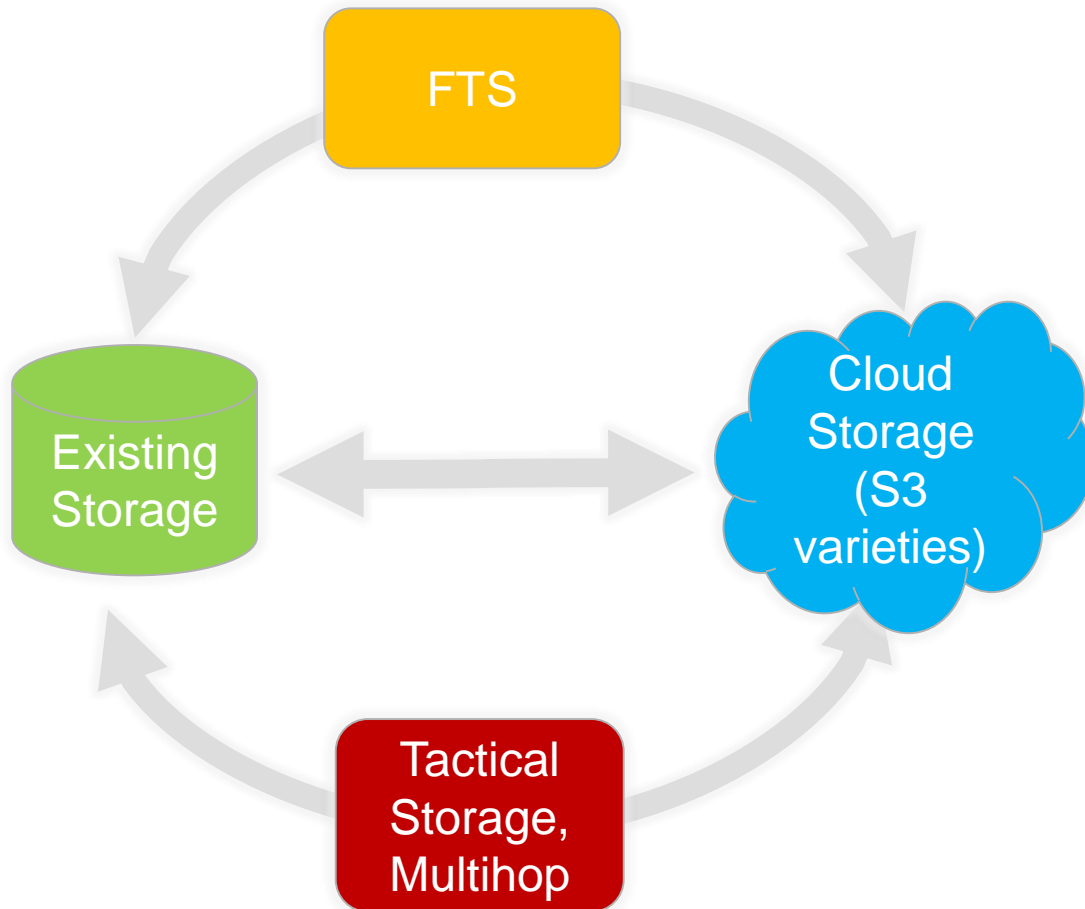
# Federated Identity

X509-free access to WebFTS using eduGAIN credentials





# Cloud Support



- Solutions for import to and export from clouds
  - Several S3 variants supported
- Various architectures possible
  - FTS gateway
  - 3<sup>rd</sup> party transfer
  - Multi-hop with tactical storage

# Summary

- Overview
  - Proven file movement technology operated at scale
  - Comprehensive support for cloud storage
  - Accessible to large frameworks and to small projects
- References
  - <http://webfts.cern.ch>
  - <http://fts3-service.web.cern.ch/>
  - [fts-support@cern.ch](mailto:fts-support@cern.ch)