StoRM configuration. "namespace.xml"

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About this talk

- Mapping concepts
- Namespace concepts
- Namespace algorithms
- Namespace in practise

Mapping concepts

Mapping The mapping functionality is the process of retrieving or building the transport URL (TURL) of a file addressed by a **Site URL (SURL)** and a **grid user credential**.

- The SURL is the **logical identifier** for a local data entity
- Data access and data transfer are made through the TURLs
- The TURL identify a **physical location** of a replica
- SRM services retrieve the TURL from a namespace database (like DPNS component in DPM) or build it through other mechanisms (like StoRM)

Mapping functionalities

In StoRM, the mapping functionality is provided by the **namespace component (NS)**.

- The Namespace component (NS) works without a database.
- The Namespace component is based on an XML configuration.
- It relies on the physical storage structure.

Namespace Component works without a database ..

The basic features of the namespace component are:

- The configuration is modular and structured (representation is based on XML)
- The loading and the parsing of the configuration file occurs:
  - **at start-up** of the back-end service
  - when configuration file **is modified**
- An efficient structure of namespace configuration lives in memory.
- No access to disk or database is performed

StoRM is different from the other solution, where typically, for every SRM request a query to the data base have to be done in order to establish the physical location of file and build the correct transfer URL.

Mapping parameters

Namespace component exposes a simple interface to the other StoRM internal components.
The namespace functions use parameters derived from the SRM requests, that are:

- the **grid user credential** (a subject or a service acting on behalf of the subject)
- the **SURLs**

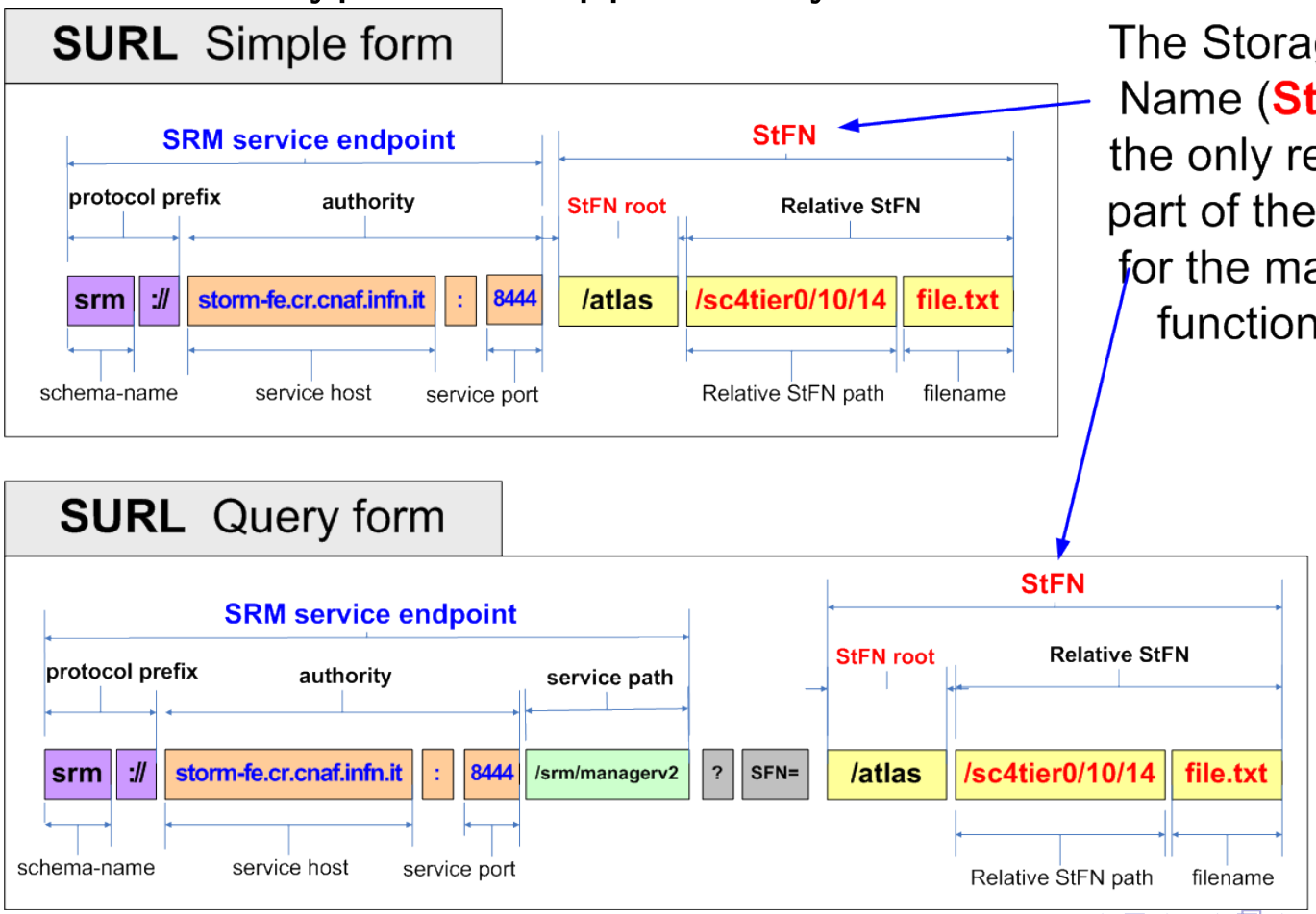
Grid identity credentials

Two credential types are supported and managed by Namespace Component:

- **X.509 Distinguished Name (DN)**
  - Country Name (C), State (ST), Organization Name (O), Organizational Unit Name (OU), Locality Name (L), Common Name (CN)
  - "*/C=IT/O=INFN/OU=Personal Certificate/L=CNAF/CN=Riccardo Zappi/*"
- **VOMS Fully Qualified Attribute Name**
  - "*/VO/group*" and "*Role*"
  - currently the NS ignore capability and other VOMS attributes.

Simple form and Query form

Two SURL types are supported by StoRM:



The Storage File Name (**StFN**) is the only relevant part of the SURL for the mapping functionality

Namespace Component Model

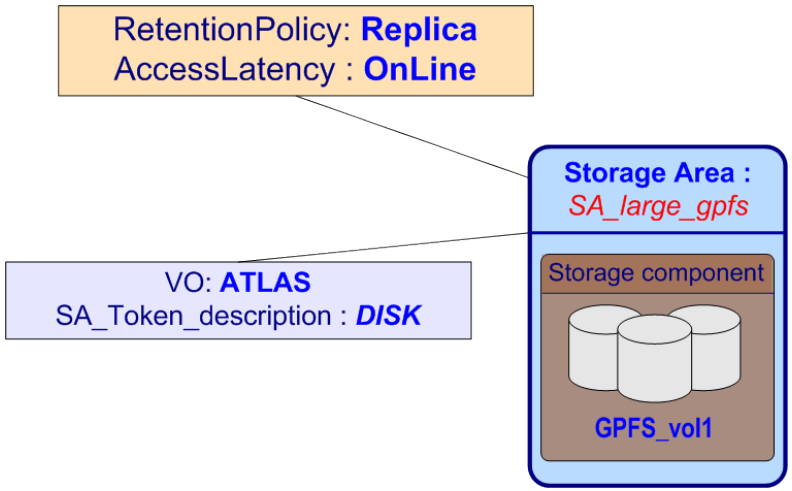
The Namespace Component is based on three main concepts:

1. **NS-File system**: is the representation of a Storage Area
2. **Mapping rule**: represents the basic rule for the mapping functionalities
3. **Approachable rule**: represents the coarse grain access control to the Storage Area.

NS-File system as Storage Area representation

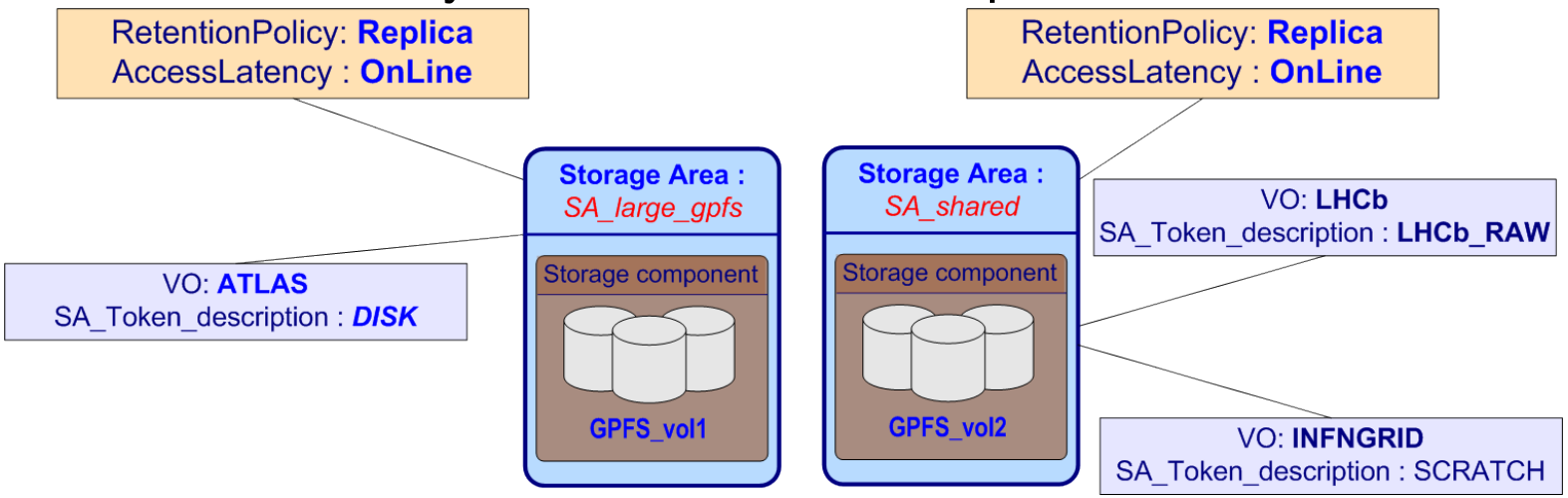
The storage area is a logical portion of storage assigned to a VO. In StoRM the SA is defined with "NS-file system". The NS-File system contains:

- **SA attributes**: SSToken Description, Online Size, Retention Policy, ...
- **NS-File System specific attributes**: Driver class, FS-Type, Authz-source, ...

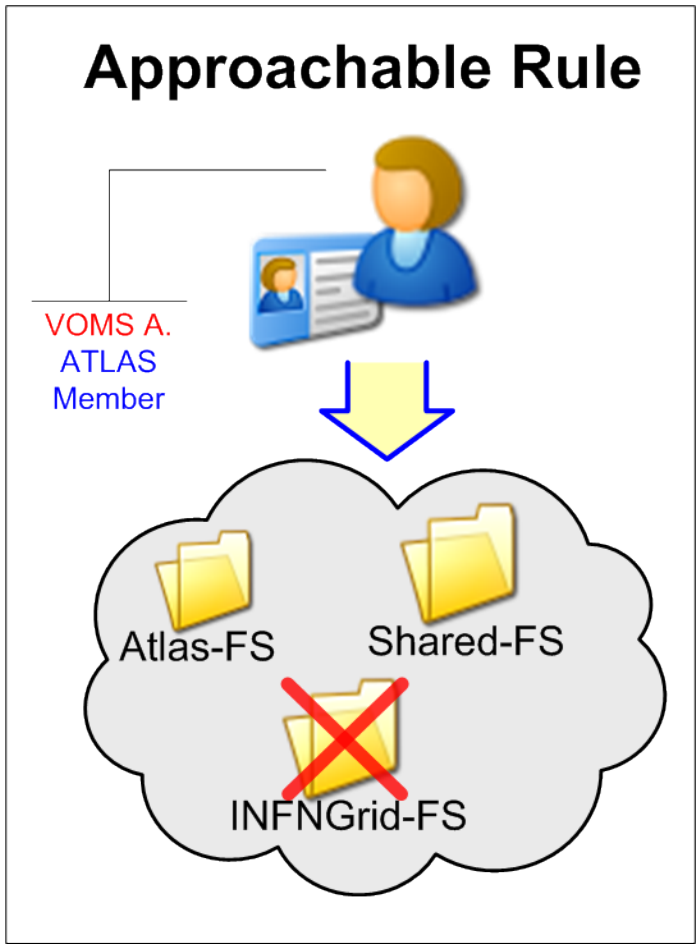


File system as Storage Area representation

Storage Area could be shared by different VO.
In the StoRM namespace model, this situation is represented with different NS-file system definition, one per VO.



Approachable rules



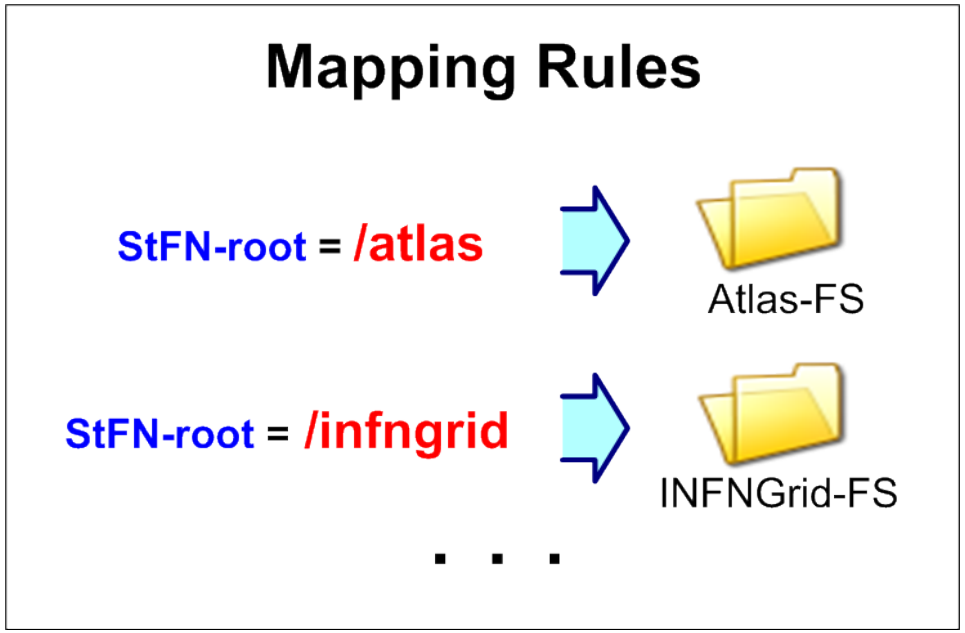
- Defines, in terms of user credential, which file systems can be approached.
- Access rules are expressed as regular expression by user DN and FQAN.

Approachable rules sample

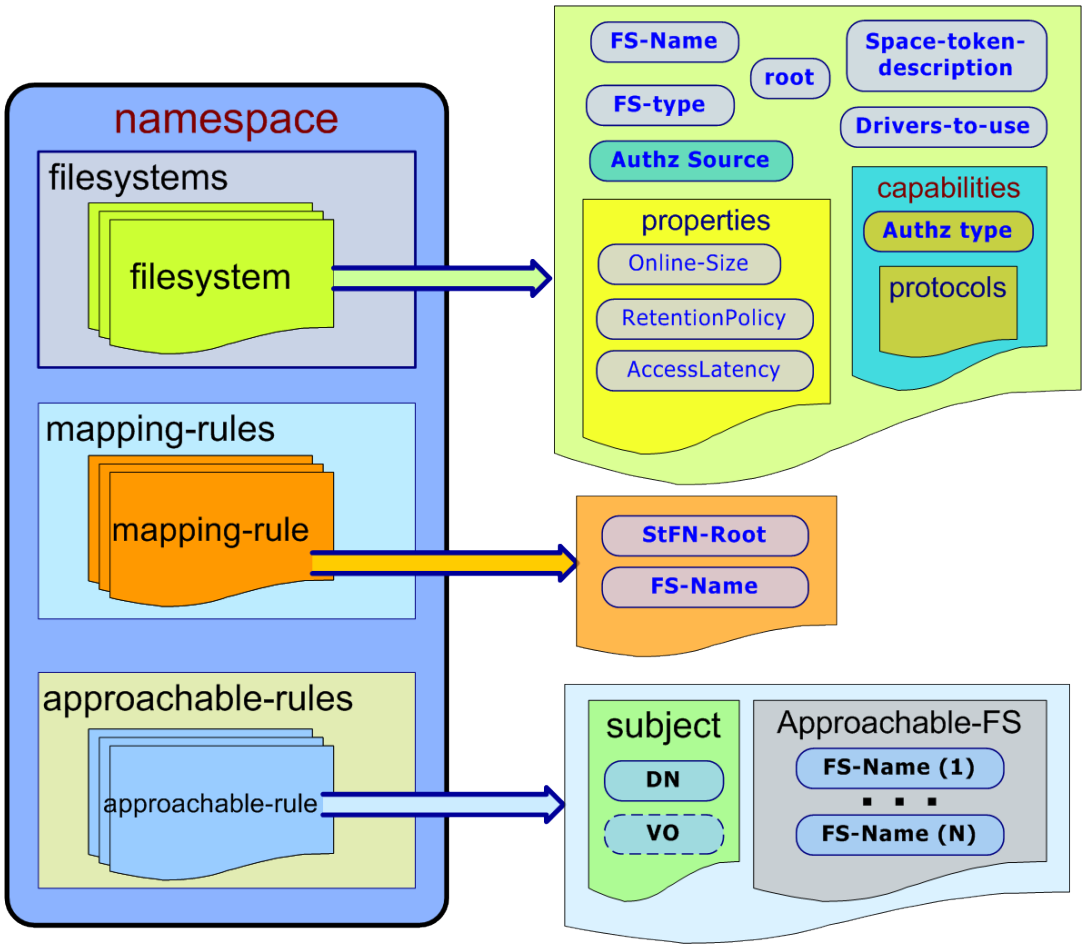
- **All users**: $< dn > * < /dn >$
- **All user with VOMS credentials)**: $< dn > * < /dn >$
  $< vo - name > * < vo - name >$
- **DN rules** (all user named John):
  $< dn > CN = John < /dn >$
- **VO rules** (all users belonging to *infngrid*): $< dn > * < /dn >$
  $< vo - name > infngrid < /vo - name >$

Mapping Rule

The Mapping rule represents the relation between the "*StFN-Root*" part of the "*StFN*" and the NS-File system (addressed by FS-name attribute).



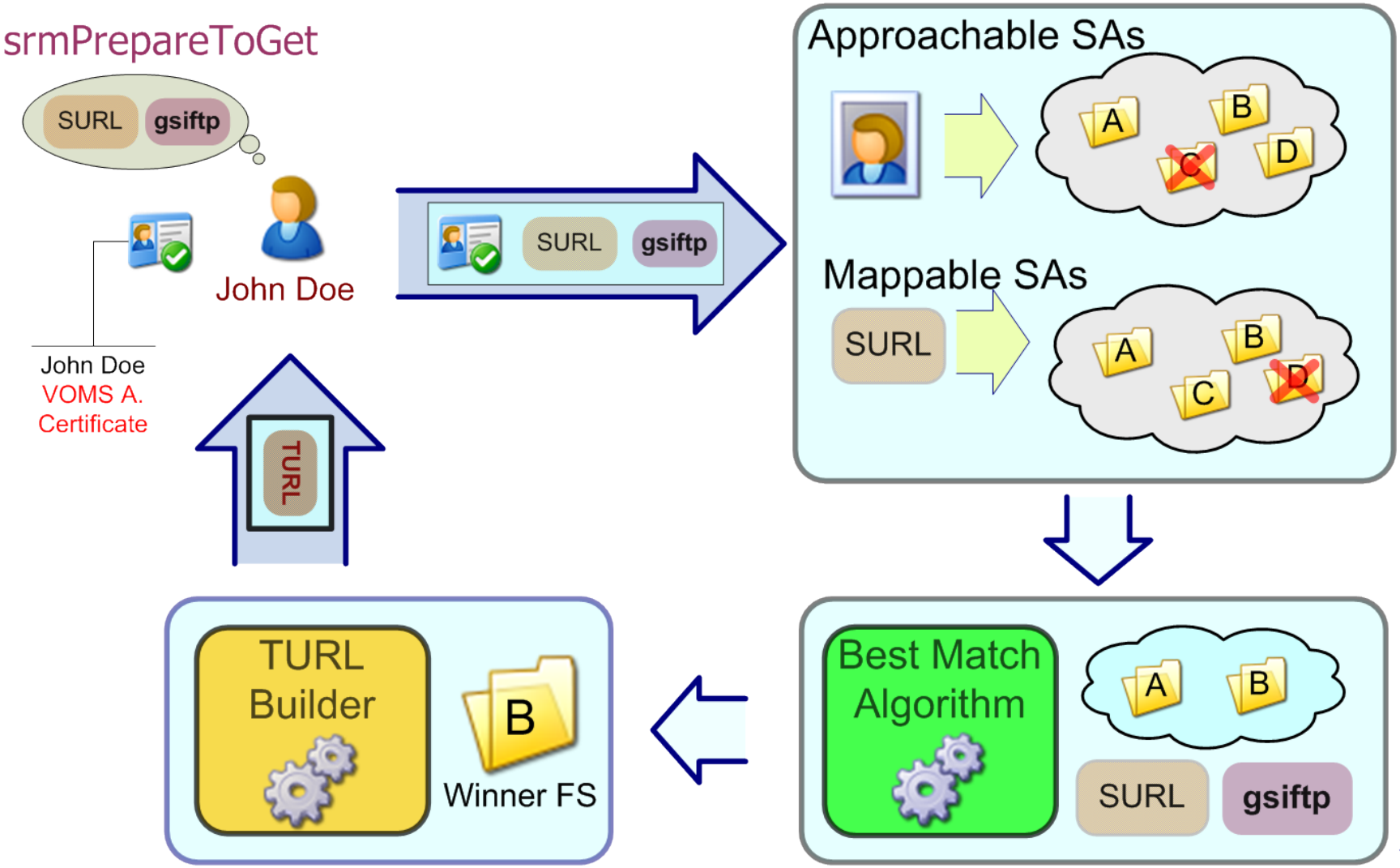
Namespace configuration elements



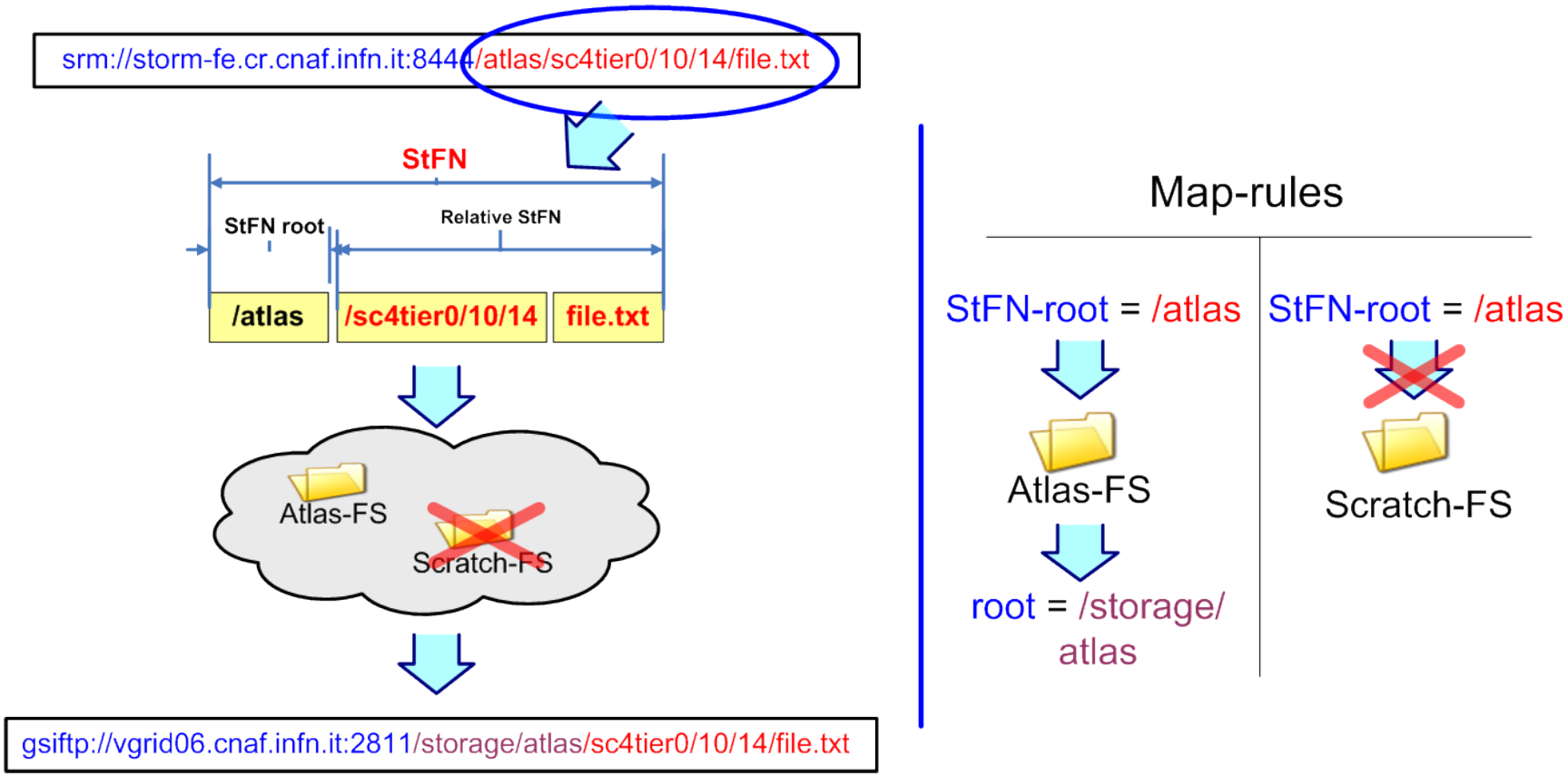
High view of the namespace main elements.

1. File system
2. Mapping rule
3. Approachable rule

Namespace mapping algorithm



A mapping example



StoRM specific variables in YAIM

The Namespace Component configuration file is the "**namespace.xml**".
During the YAIM configuration a basic "namespace.xml" is created. It reflects the storage configuration as specified by StoRM specific variables.
To further details, please, wait the next session "Hand-On" where we will have a practical sample.

Adding a SA for a VO

Site admin can modify the file *namespace.xml* created by YAIM for tuning and customization purposes.
As generic rule, when you add a new support for a SA you have to add:

1. A NS-file system
2. The corresponding mapping rule, and
3. The corresponding approachable rule.

Anyway, during the next session "Hands-On" we will see a practical example.

StoRM team

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