



*Nordic Testbed for Wide Area Computing  
And Data Handling*

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## THE NORDUGRID “SMART” STORAGE ELEMENT

*Description and Administrator’s Manual\**

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## 1 Introduction

A "Smart " Storage Element (SSE) is supposed to be autonomous service implementing at least most important data management functions without user's intervention. It should be also capable of resolving failure situation in safest way. It is part of HTTPSD server[1]. So please read it's manual first.

The SSE is developed by NorduGrid project[2] as part of ARC software.

This manual contains only most important things to know about SSE. More things will be most probably added into it later.

## 2 Configuration

The SSE is part of HTTPSD server and is configured in corresponding section of server's configuration file. It supports following service-specific configuration commands:

- *acl\_create group\_name[ group\_name[ ...]]* - list of groups of users allowed to create new files.
- *acl\_read group\_name[ group\_name[ ...]]* - list of groups of users which are always allowed to retrieve content and information about stored files.
- *acl\_replicate group\_name[ group\_name[ ...]]* - list of groups of users allowed to initiate replication (this operation is not implemented yet).
- *storage directory\_path* - place to store data. *directory\_path* specifies directory used to store content of data and associated metadata.
- *url URL* - defines URL used to create URL for file access. File with logical name LFN will be reported as accessible under URL/LFN.
- *registration [option[,option[,...]]* - defines how and when registration of new data unit happens. Options are
  - *immediate* or *delayed* - determines if SSE should try to register incoming data before it allows to store it (*immediate*) or accept new data without that and do registration later periodically (*delayed*).
  - *retry* or *noretry* - defines if failed *immediate* registration should cause error passed to client (*noretry*) or it should fallback to *delayed* behavior (*retry*).
- *ns configuration\_string* - defines Indexing Service to use for data registration. *configuration\_string* determines type of service. For RC and RLS it contains URL of indexing service.

## 3 How it works

This section is not written yet.

## 4 Registration of files

The SSE can register stored files at Globus Replica Catalog (RC) and Replica Location System (RLS)[3] name indexing services (NS). The type of NS is determined from URL following configuration command *ns*. These URLs are supported:

- *rc://hostname[:port]/logical\_collection\_distinguished\_name* - for RC.

- *rls://hostname[:port]* - for experimental registration to RLI part of RLS. This way is not fully compatible with RLS infrastructure and should be used only for testing and future development.
- *lrc://hostname[:port]* - for registering to LRC part of RLS. Because RLS does not support storing information about Storage Elements, the SSE registers itself under special name “*\_\_storage\_service\_\_*”. Client utilities can use it to find place to store data files.

## 5 Clients

Client part of the SSE is integrated into utilities provided as part of NorduGrid Grid Manager. For more information about usage and supported options please read “The NorduGrid Grid Manager and GridFTP Server”[4]. Currently the SSE is supported by *ngls*, *ngcopy* and *ngacl* utilities. To access SSE directly following URL must be used

*se://hostname[:port]/service\_path[?filename]*

This URL corresponds to service accessible at *http://hostname[:port]/service\_path*. And *filename* corresponds to LFN to be used while registering file to indexing service.

To store new file at SSE one could use command

*ngcopy file:///somefile\_path\_to\_file se://host:port/service?lfn .*

This will store file at SSE and make it register in indexing service.

But it is much better to use index service to choose SSE. Hence advisable way to store file is

*ngcopy file:///some\_path\_to\_file rls://index\_host:port/lfn .*

Here RLS URL *rls://index\_host:port* is one of NS used by our SSE to register files.

## 6 Setup

Both HTTPSD and SSE are in development state. As result it’s setup can be a bit cumbersome. After instalaltion following files must be present in instalaltion root:

- *sbin/httpsd*
- *sbin/httpsd.sh*
- *etc/httpsd.conf* or *share/doc/grid-manager/httpsd.conf*

Edit *etc/httpsd.conf* as described in [1] and Section 2. Or use central configuration file */etc/nordugrid.conf* if You start server using SysV startup script installed during aototools build.

Make sure You have valid host certificate and key at */etc/grid-security/*.

Start HTTPSD by using SysV startup script (*/etc/init.d/httpsd start*) or by simplified startupt script *sbin/httpsd.sh* or directly (*\$NORDUGRID\_LOCATION/sbin/httpsd*).

Look at */var/log/httpsd.log* (default log file if started by script) for possible errors.

## References

[1] The HTTP(S,G) and SOAP Server/Framework. <http://www.nordugrid.org/documents/>

[2] NorduGrid project. <http://www.nordugrid.org>

[3] **Replica Location Service.** <http://www.globus.org/rls/>

[4] **The NorduGrid Grid Manager And GridFTP Server: Description and Administrator's Manual.** <http://www.nordugrid.org/documents/>