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DESHL v3.0

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1. Introduction

1.1 Executive Summary

The DESHL (**DEISA Services for the Heterogeneous management Layer**) has been developed by the DEISA Joint Research Activity JRA7 [1]. It provides standards-based access for users and their applications to manage jobs and transfer files in the DEISA heterogeneous supercomputing infrastructure.

This document, “DESHL v3.0”, is deliverable D-JRA7-3.10 from Task T3.9 “Implementation of DESHL release 3.0” in Work Package 3 of the DEISA JRA7. This document reports on the release version 3.0 of the DESHL. This release contains the functionality for data staging and job management, designed using a standards-based layered stack with the UNICORE ARCON client as its base. This release has been successfully tested against DEISA production platforms at EPCC and FZJ.

1.2 Document Structure

Section 1 of this document contains the executive summary, references, table of acronyms, etc. Section 2 indicates where background information on DESHL v3.0 can be obtained, with Sections 3 briefly describing the contents of DESHL v3.0. Section 4 indicates where the DESHL software can be obtained from and finally section 5 outlines the known issues with DESHL v2.0.

1.3 References and Applicable Documents

- [1] DEISA Annex I – “Description of Work”, November 5th 2003.
- [2] “JRA7 Quality Plan v2.0”, DEISA JRA7 Report, Deliverable ID DEISA-JRA7-1.2, May 3rd 2005.
- [3] “Functional scope for DESHL v3.0”, DEISA JRA7 Report, Deliverable ID D-JRA7-3.9, November 30th 2005.
- [4] “Final Design for DESHL v2.0”, DEISA JRA7 Report, Deliverable ID D-JRA7-3.7, November 2005.
- [5] UNICORE, <http://unicore.sourceforge.net>
- [6] SAGA GGF, <https://forge.gridforum.org/projects/saga-rg/>
- [7] UniGrids, <http://www.unigrids.org/>

1.4 Document Amendment Procedure

The document procedure is covered in the Quality Plan [2].

1.5 List of Acronyms and Abbreviations

API	Application Programming Interface
CLT	Command Line Tool
DEISA	Distributed European Infrastructure for Supercomputing Applications

DESHL	DEISA Services for the Heterogeneous management Layer
GGF	Global Grid Forum
HPC	High Performance Computing
JRA	DEISA Joint Research Activity
JSDL2AJO	Job Submission Description Language to Abstract Job Object
JRA7	Seventh Joint Research Activity
NJS	Network Job Supervisor
SAGA	Simple API for Grid Applications
UNICORE	Uniform Interface to Computing Resources
UniGrids	Uniform Interface to Grid Services

2. Background

The functional scope for DESHL v3.0 can be found in the DEISA JRA7 deliverable D-JRA7-3.9 “Functional scope for DESHL v3.0” [3]. The design is presented in DEISA JRA7 deliverable “Final Design for DESHL v2.0” [4]. (The v3.0 design document is included in the v3.0 release bundle.)

3. DESHL v3.0 Overview

DESHL aims to provide standards-based access to DEISA resources. In the extended heterogeneous DEISA infrastructure, sites have different HPC resources but all sites provide access to those resources via UNICORE [5].

DESHL release v3.0 contains the DESHL client, that is implemented as a layered stack with a SAGA-inspired API [6] at its top and the UNICORE ARCON client at its base. The DESHL client can be used for data staging operations to, from and within the DEISA environment, and to submit, monitor and terminate jobs running on DEISA resources. Issuing a certificate for access to a DEISA site is the task of the certificate authority associated with the user’s national location. These certificates are then held locally, and the DESHL client is configured via a single configuration file to allow seamless access to all such configured sites.

For more detailed information on the DESHL v3.0 architecture and the functionality available in this release please refer to the DESHL v3.0 Design document included in the release.

4. Major Changes in v3.0

The following major changes have been made since the release of DESHL v2.0:

- modification of the JSDL2AJO converter from the UniGrids [7] project to ensure that parallel jobs could run in the DEISA environment
- added functionality for listing all available storages at a DEISA site
- inclusion of user-defined shortcuts for UNICORE NJS names
- the addition of masked pass phrase at the command line
- testing of all functionality against DEISA production environments

5. Availability of DESHL v3.0

DESHL v3.0 is a public release and is available from the DEISA JRA7 NeSCForge development site at <http://forge.nesc.ac.uk/projects/deisa-jra7/>.

The release is contained in a tar archive file that contains the following:

- `deshl30.tar.gz` – The DESHL v3.0 command line tool application and supporting libraries
- `DESHL-V3-Design.doc` – Current design of this release.
- `D-JRA7-ExtensionOfUserTools_Deshl_v3.0.doc` – installation and user guide.
- `README` – brief outline of the release contents
- `D-JRA7-3.10-DESHL-V3.doc` – this document.

6. DESHL v3.0 Deployment

Having obtained and unpacked the DESHL v3.0 release bundle refer to `D-JRA7-ExtensionOfUserTools_Deshl_v3.0.doc` for installation and usage instructions. For further details on how DESHL works, please refer to the DESHL v3.0 design document, `DESHL-V3-Design.doc`, included in this release.

7. Known Issues

At the time of writing, the following issues are known.

7.1 *File Import*

Empty directories cannot be imported.

Directories must contain at least one file somewhere within the subdirectories. Any empty subdirectories will not be imported.

7.2 *File Export*

Export of directories from DESHL to local storage is not currently supported. However, export of individual files is supported.

7.3 *Copying directories between DEISA Sites*

Empty directories cannot be copied.

Directories must contain at least one file somewhere within the subdirectories. Any empty subdirectories will not be copied.

7.4 *Configuration Security*

Currently the DESHL client is configured locally via a comma-separated-variable text file, where an entry is required for each site that the user wishes to access. Each entry defines the name of the site, a path to a valid certificate for that site and optionally a password for the certificate.

If the password for the certificate is not stored in the configuration file, the user is prompted for the password each time a DESHL operation is performed. This is the most secure means of operation for the DESHL client.

Note that the configuration file is not encrypted. If passwords are stored in the configuration file then it becomes the responsibility of the user to ensure that the file is kept in a secure location with appropriate permissions to prevent it from being read or accessed by other users. (The UNIX version of the DESHL command script includes a check which prints a warning if the configuration file can be viewed by other users.)

Another alternative might be that users keep their certificate on a USB memory stick, and only insert and mount the drive when they require DESHL access.