

EUROPEAN MIDDLEWARE INITIATIVE

GUIDE TO ARC IN EMI

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INTRODUCTION

EMI middleware distribution includes all key ARC components, sufficient to deploy a fully functional site or even an infrastructure consisting of several sites.

The goal of this document is to give a very brief overview of ARC components in EMI and provide references for further reading.

The following components are covered:

1. **ARC Core** (Section 1) – includes Hosting Environment Daemon (HED) and relevant libraries
2. **ARC Compute Element** (Section 2) – includes A-REX execution service, its batch systems backends, information providers and user mapping utility
3. **ARC Clients** (Section 3) – includes clients to A-REX and other Grid services, as well as old ARC clients for compatibility
4. **ARC Information System** (Section 4) – information indexing services and visualisation tools
5. **ARC GridFTP server** (Section 5) – GridFTP server used by A-REX and simple storage elements

A number of other ARC components are currently released outside EMI and are available in ARC releases from NorduGrid repositories (*not certified by EMI*):

- *Chelonia* – the lightweight self-consistent storage solution
- *ISIS* – the WS based peer-to-peer information system
- *ACIX* – cache indexing service
- *WS Monitor* – visualisation tool for information published via WS interfaces
- *ARCJobTool* – graphical user interface based on ARC client libraries

1 ARC CORE

ARC Core component refers to a set of packages that provide common basis for ARC services and tools. Most importantly, it includes the Hosting Environment Daemon (HED) – ARC Web Services hosting environment. Most documentation pertaining to ARC Core is actually HED documentation.

HED or its libraries are needed by most other ARC services and tools, and will be installed automatically from EMI repositories whenever an ARC service or client package will be installed.

On its own, ARC Core provides no standalone functionality, therefore there is no corresponding *meta-package*, neither there is a User Guide or a System Administrator Guide beyond HED documentation.

ARC Core also includes all ARC documentation, distributed as a dedicated package.

- Release Notes <http://www.nordugrid.org/documents/emi/arc-core-rn-1.1.0.pdf>
- Functional Description http://www.nordugrid.org/documents/ARCHED_article.pdf
- Software Design Description http://www.nordugrid.org/documents/ARCHED_article.pdf
- Service Reference Card <http://www.nordugrid.org/documents/emi/arc-core-src-1.1.0.pdf>

2 ARC COMPUTE ELEMENT

ARC Compute Element (CE) is a set of services and tools implementing execution service functionality to accept Grid jobs from authorised users, direct them to the local resource management system (LRMS), manipulate on them on user's requests, and publish necessary information about service and jobs status. The key component of ARC CE in EMI is *A-REX* (ARC Resource-coupled EXecution service); it makes use of data staging utilities, local file cache, LRMS back-ends and other ancilliary parts of the ARC CE. Most documentation relevant to this component concerns A-REX.

As it is not exposed to end-users, there is no User Guide, only System Administrator Guide.

This component is available in EMI through *nordugrid-arc-compute-element* metapackage.

- Release Notes <http://www.nordugrid.org/documents/emi/arc-ce-rn-1.1.0.pdf>
- Functional Description http://www.nordugrid.org/documents/arex_tech_doc.pdf
- Software Design Description http://www.nordugrid.org/documents/arex_tech_doc.pdf
- System Interface Description http://www.nordugrid.org/documents/arex_tech_doc.pdf
- System Administrator Guide http://www.nordugrid.org/documents/arex_tech_doc.pdf
- Service Configuration Template <http://svn.nordugrid.org/repos/nordugrid/arc1/trunk/src/doc/arc.conf.template>
- Service Reference Card <http://www.nordugrid.org/documents/emi/arc-ce-src-1.1.0.pdf>
- Other documentation
 - Migration to EMI guide http://wiki.nordugrid.org/index.php/Gm_to_arex_migration
 - JURA http://www.nordugrid.org/documents/jura_tech_doc.pdf
 - Data staging Wiki http://wiki.nordugrid.org/index.php/Data_Staging
 - Janitor handbook http://www.knowarc.eu/download/D2.5-1_documentation.pdf
 - LRMS back-ends <http://www.nordugrid.org/documents/Backends-arc1.pdf>

3 ARC CLIENTS

ARC Clients component includes command line interface to A-REX and other services, such as other execution services (CREAM, ARC's Grid Manager) data storages (different protocols are supported), data indexing (LFC) and VOMS.

Since the ARC command line interface is designed to be installed by end-users, there is no System Administrator Guide, only User Guide.

ARC Clients in EMI are available through the *nordugrid-arc-client-tools* metapackage.

- Release Notes <http://www.nordugrid.org/documents/emi/arc-clients-rn-1.1.0.pdf>
- Functional Description <http://www.nordugrid.org/documents/arc-ui.pdf>
- User Guide <http://www.nordugrid.org/documents/arc-ui.pdf>

- Client Installation and Configuration <http://www.nordugrid.org/documents/arc-client-install.html>
- User Troubleshooting Guide http://wiki.nordugrid.org/index.php/Documentation/Troubleshooting_Guides/ARC_Clients
- Service Reference Card <http://www.nordugrid.org/documents/emi/arc-clients-src-1.1.0.pdf>
- Other documentation
 - Legacy ARC CLI <http://www.nordugrid.org/documents/ui.pdf>
 - Legacy ARC CLI Installation <http://www.nordugrid.org/documents/ng-client-install.html>
 - xRSL manual <http://www.nordugrid.org/documents/xrsl.pdf>
 - EMI migration guide http://wiki.nordugrid.org/index.php/ARC_Client_Tools_Transition

4 ARC INFORMATION SYSTEM

ARC Information System component refers to a set of services in charge of information publishing and visualisation. *ARIS* (ARC Resource Information Service) publishes information about A-REX and its jobs in LDAP format, *EGIIS* (Enhanced Grid Information Indexing Service) serves as a registry of ARISes (also LDAP), and *LDAP Monitor* presents information collected via EGIIS and ARIS in a user-friendly browsable form.

Only a part of this component (EGIIS) is available through *nordugrid-arc-information-index* metapackage, since typically, no single machine would host all three services.

- Release Notes <http://www.nordugrid.org/documents/emi/arc-infosys-rn-1.1.0.pdf>
- Functional Description http://www.nordugrid.org/documents/arc_infosys.pdf
- Software Design Description http://www.nordugrid.org/documents/arc_infosys.pdf
- User Guide http://www.nordugrid.org/documents/arc_infosys.pdf
- System Administrator Guide http://www.nordugrid.org/documents/arc_infosys.pdf
- Service Reference Card <http://www.nordugrid.org/documents/emi/arc-infosys-src-1.1.0.pdf>
- Other documentation
 - Monitor Manual <http://www.nordugrid.org/documents/monitor.pdf>

5 ARC GRIDFTP SERVER

ARC GridFTP server is primarily needed by A-REX in order to provide backwards-compatible interface to legacy ARC clients, but can also be used to set up a very basic storage element.

By itself, ARC GridFTP server offers no standalone functionality, thus has neither dedicated metapackage, no end-user documentation.

- Release Notes <http://www.nordugrid.org/documents/emi/arc-gridftp-server-rn-1.1.0.pdf>

- Functional Description <http://www.nordugrid.org/documents/gridftpd.pdf>
- Software Design Description <http://www.nordugrid.org/documents/gridftpd.pdf>
- System Administrator Guide <http://www.nordugrid.org/documents/gridftpd.pdf>
- Service Reference Card <http://www.nordugrid.org/documents/emi/arc-gridftp-server-src-1.1.0.pdf>