

# Runtime Environment Concept

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# Applications in Grid

- ① **Fact:**  
**Grid is composed of heterogeneous hardware resources and operating systems**
- ① **Task:**  
**How to use and support applications in such environment?**
- ① **Proposed solution:**  
**Runtime Environment concept**

# Two ways, or levels, to run applications

## ① **Submit the application executable with input data**

- suitable for small in-house programs with 1 or 2 users
- simple, fast
- does not involve cluster administrators
- compilation and debugging environments?
- parallel environments?

## ① **Use application software installed on the resource**

- suitable for supported software packages with larger user base
- valuable service for users
- less file transfers
- parallel applications
- performance optimization
- resources dedicated to specified set of applications
- re-usability and synergy gains

# Application software is a resource

## ① **Application software is a resource as computational power or storage space**

- The availability is advertised in the Grid information system
- Can be requested in the job description xRSL-file using RuntimeEnvironment-attribute

## ② **Uniform interface to the application resource over the whole Grid is defined as Runtime Environment**

- implemented at computational resources as a shell script which sets up the environment, directory paths to executables, libraries, etc.

## ③ **Link list of interface definitions and documentation is collected into Runtime Environment Registry**

- presently manages also the Runtime Environment name space



# Making it easier for users

## ⤴ **Uniform interface**

- single interface on multiple hardware and OS platforms

## ⤴ **Documentation**

- how to use application efficiently in Grid-environment
- support channel

## ⤴ **Portals**

- are user interfaces
- portals (portal developers) still require an interface to local installation of the applications

# Making it easier for resource providers

## 🕒 Synergy gains

- Uniform interface on different platforms – less user-support requests
- Application installation documentation for system administrators who are not necessarily familiar with the use of the application
- Single set of user documentation to maintain for all sites providing the application



# Current issues

## ⤴ **Licensed software**

- grid-wide license agreements do not exist yet?
- technical means exist to enforce license policy using Grid Managers authorization plug-in

## ⤴ **RE (re)organization**

- RE documentation – “RE Homepages”
- Runtime Environment Registry – list of links to RE Homepages
- RE namespace management and design
- cleaning old REs

## ⤴ **Coupling to information system?**

- RE name space management
- enforcement?



# Summary

## ➤ Runtime Environment is

- application interface definition and documentation, RE Homepage
- resource attribute in information system
- implemented as environment initialization script at the computational resources

# References

➤ <http://www.nordugrid.org/>

➤ <http://www.csc.fi/grid/rer/>

