



**Facility for Rare Isotope Beams**

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**MICHIGAN STATE**  
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# NAMING SYSTEM - INSTALLATION MANUAL

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Version 2.3

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## Revision History

Version	Date	Author	Description
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# 1 Introduction

*DISCS Naming System Module* (or simply *Naming System*) is a software tool for managing the naming convention associated with an accelerator facility.

*Naming System* consists of the following:

- A database to store the accelerator facility's Naming Convention
- A Graphical User Interface (GUI)

## 1.1 Purpose

The objective of this document is to describe the installation of *Naming System*.

## 1.2 Scope

It is assumed that the required infrastructure (DBMS, Application Server, Web Server) is already installed. Even though we provide basic installation instructions for them, it is assumed that you are familiar with installation of these services.

## 1.3 Definitions, Acronyms, and Abbreviations

**Table 1 Definitions, Acronyms, and Abbreviations**

Item	Description
DBMS	Database Management System
DISCS	Distributed Information Services for Controls Systems
EPICS	Experimental Physics and Industrial Control System
ERD	Entity-Relationship Diagram
FRIB	Facility for Rare Isotope Beam
IOC	Input/Output Controller
RDBMS	Relational Database Management System
REST	Representational State Transfer

## 1.4 References

1. Naming System: Schema Design Manual, Open EPICS Web Site
2. Open EPICS Web Site, <http://openepics.sourceforge.net>



## 1.5 Overview

The next section lists the system requirements for Naming System. Installation Section describes the installation procedure.

## 2 System Requirements

Naming System has been developed using Java EE. It needs the following for its operation:

- Java 6
- MySQL Database Management System Version 5. *Naming System* has been tested with MySQL version 5.1.
- Java EE 6 Application Server
- A Web Server (preferably Apache 2)

*Naming System* has been tested in the following environment:

- MySQL version 5.1.63 running on Debian Squeeze
- Glassfish version 3.1.2.2 running on Debian Squeeze
- Apache version 2.2 running on Debian Squeeze

However, it should work with MySQL or Glassfish running on other platforms such Windows Server 2008, Windows 7, OS X, or other distributions of Linux.

## 3 Installation



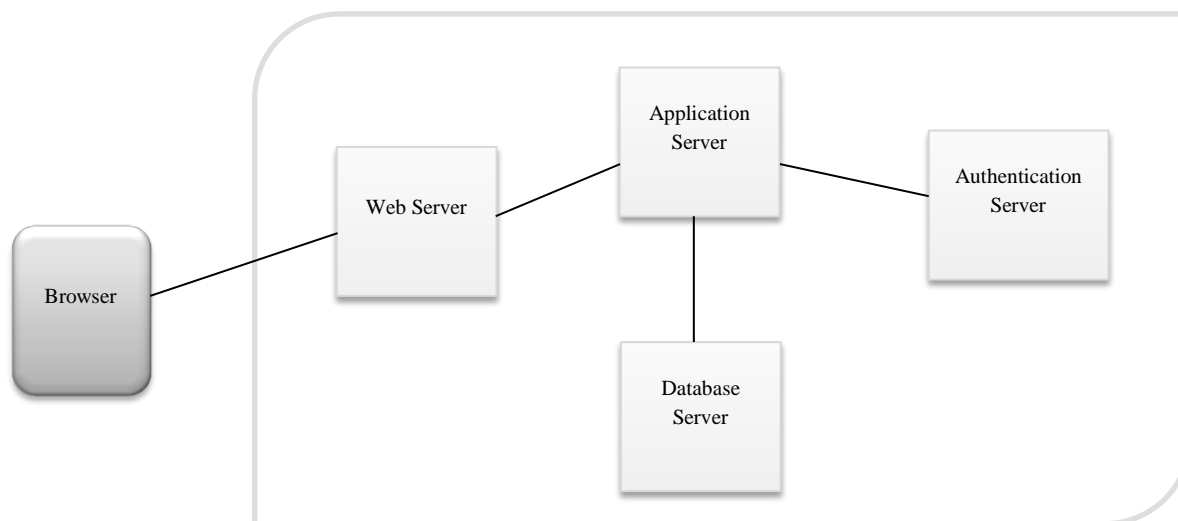


Figure 1 Deployment Environment

## 3.1 Introduction

Naming System contains the following packages:

- Database Schemas: One or more SQL DDL files containing SQL commands to create the database structures. It creates the following database (schema) in MySQL:
  - discs\_names (you may use any other name for the database)
- GUI Application: A WAR file to be installed on a Java EE Application Server
- Sample data: Data for trying out the Naming System
- Source: Source code for the service, GUI, API, documentation, and sample programs

### 3.1.1 Deployment Environment

As shown in Figure 1, you need the following logical servers<sup>1</sup> to install Naming System:

- An application server that supports Java EE 6. Naming System has been tested with Glassfish 3 but you may use other servers such as JBoss or WebSphere.
- A database server. Database Schemas are installed on the database server.
- A Web Server: Running Glassfish on the HTTP port (80) is not advised. Hence it is kept behind a web server. Preferred web server is Apache 2 but you may use any other web server that can interact with the application server. Nothing from Naming System is installed on the web server.

<sup>1</sup> These logical servers may be running on one or more physical servers.

- **Authentication Server:** This is optional based on the chosen authentication scheme. If LDAP based authentication is configured, then this is the LDAP server. If file based authentication is used, then this server is not needed (the application server performs the authentication).

### 3.1.2 Accessing the GUI and Service

Naming System GUI is a web application to be accessed through a browser. Based on your installation it can be accessed in one the following ways:

- You may access it directly through the application server: `https://app-server.domain:8181/names` where 'app-server.domain' is the name of your application server which is running on port 8181.
- A better way is to access it through a web server (direct access through the application server is disabled). In such case your URL will be something like `https://web-server.domain/names` where 'web-server.domain' is the name of your web server.

## 3.2 Pre Installation

The following steps are to be done first, and only once.

1. Download and install MySQL.
2. Create the *Naming System* schema (the schema is available on the Open EPICS website [2]).
3. Download and install Glassfish. See Appendix A – Glassfish Installation for details.
4. Configure Glassfish:
  - a. Login to the Glassfish administrator console (at `https://glassfishserver:4848`)
  - b. Go to Resources → JDBC → JDBC Connection Pools
    - i. Create new pool called "org.openepics.names.dbpool" (you may choose any other name).
    - ii. Resource Type = `javax.sql.ConnectionPoolDataSource`
    - iii. Datasource Classname  
`com.mysql.jdbc.jdbc2.optional.MysqlConnectionPoolDataSource`
    - iv. Additional Properties  
ServerName = <Name of Server> ex. localhost, qa01  
DatabaseName = `discs_names`  
User = <Database user> eg. namesapp  
Password = <Database user's password>
  - c. Resources → JDBC → JDBC Resources
    - i. Create a new resource called "org.openepics.conf.names". You must use this exact name for the resource.
    - ii. Pool Name = `org.openepics.conf.dbpool` (or the pool name used in Step b above).





### 3.3 Install

1. Obtain Naming System GUI Application package (the WAR file). You can download it from [2], or generate it by compiling the source code. For latter, please see the section *Compiling Naming System*. It is recommended that you compile the source code as each lab will need to make slight changes to Naming System's home page.
2. Deploy the WAR file. You can do this from Glassfish's administrator console or command-line. The procedure for deploying it from the administrator console is:
  - a. Login to the Glassfish administrator console (at <https://glassfishserver:4848>).
  - b. Go to Applications → Deploy
    - i. Choose the Naming System WAR file (as a 'Packaged file to be uploaded to the server')
    - ii. Choose *Type* as *Web Application*
    - iii. Enter *Context Root* as */names*
    - iv. Enter *Application Name* as *names-v2.3* (or any other name you prefer)
    - v. Deploy by clicking on 'OK'
3. If you prefer deploying the application from the command line, run the following command:

```
asadmin -H app-server-name deploy -contextroot=/conf names-v2.3.war
```

### 3.4 Post Installation

1. Add the Naming Categories and User Privileges through SQL scripts.
2. Modify the front page of the GUI as per your lab's naming convention. The better way to do this is to modify the index.xhtml file before compiling the Naming System. This requires changing index.xhtml file. This is located in the application server's directories. On Glassfish, this is generally `<glassfish-install-dir>/glassfish3/glassfish/domains/<domain-name>/applications/names-2.3`.
3. Setup the security realm. Naming System authenticates users using the Application Server (such as Glassfish). The Application Server can be configured to authenticate users from a variety of sources such as Active Directory, PAM, a password file, a database etc. You have to setup the security realm in the Application Server for Naming System. Based on the authentication methodology chosen, you may have to get the required information from your local system administrator. In the Glassfish administrator console, do the following:
  - a. Go to Configurations → Server Config → Security → Realms
  - b. Click on 'New' to create new realm
  - c. Enter the name as *org.openepics.names.realm* (you must use this exact name)
  - d. Choose the appropriate Class Name based on the authentication source.
  - e. The rest depends on the chosen Class Name. For a LDAPRealm (in case you want to authenticate with Active Directory), you must setup a number of properties. Your local



Application Server Administrator or System Administrator will be able to help you the values for these properties.

Proteus: Naming System

Release: R003c 2013-04-23

Home Browse Request Reports Admin Preferences Help Login

Format and syntax of the name components shall be as shown in the figure below. Only the device name is required on drawings, name tags, etc. where the drawing or device name clearly indicates the system and subsystem including the equipment. However, where the system and/or subsystem are not apparent, the full name must be shown.

Minimum shown on documentation

SSSS\_BBBB : DDDD\_Q IIII : TTTT\_XXXX\_CCCC

System\_Subsystem Device Signal Name

Name Components			
Naming Part	Description	Requirements	Assigned By
SSSS	System	Names in Table 3. System name is required. Up to 4 characters.	Division Director
BBBB	Subsystem	Names in Table 4. May be omitted if subsystem is obvious from system name or device name. Up to 8 characters, but 4 is recommended.	Division Director
DDDD	Device Type	Names in Table 5 or IEEE 803 "Recommended Practice for Unique Identification in Power Plants and Related Facilities". Device type is required. Up to 4 characters. Devices in grey italics are reserved.	Control Account Manager
Q	Qualifier	Either "D" or "N" depending on the meaning of the following device instance number (for beam line components: "D" for distance along beamline, for others: "N" for sequential number). For each of the FRIB driver linac and ReA3, the RFQ input is set to have D=1000 (i.e. 100 m). All beam line components upstream from the RFQ input have D < 1000, all downstream ones have D>1000. The fragment separator has D=1000 at the production target. For Dual systems at the same distance, "D+1" can be used added to the original distance.	Control Account Manager
IIII	Device Instance	Number as defined under Q (see above). If Q="N", the device instance should also be a number. Alphabetic characters subject to Controls Dept. CAM approval. 4 characters mandatory.	Control Account Manager
TTTT	Signal Type	Signal types are defined in Table 6. Up to 4 characters.	Lead Engineer
XXXX	Signal Domain	Codes shown in Table 7. Up to 4 characters.	Lead Engineer
CCCC	Additional Signal Description	Use is optional. Up to 4 characters	Lead Engineer

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Figure 2 Naming System Home Page

## 4 Compiling Naming System

- Checkout the source files from [2].



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- The directory structure of the source is as follows. It contains a top-level directory named 'conf', and has the following sub-directories:
  - data: SQL scripts to load Naming Categories and User Privileges. Sample data.
  - docs: Design and installation documentation
  - design: Design artifacts (SQL DDL scripts, Enterprise Architect files etc)
  - src: Source code
- Use an IDE such as Netbeans or Text Editor to edit index.xhtml file. Replace the content with the naming convention appropriate for your lab.
- To generate the Naming System package:
  - Open it in Netbeans and start the build process (Project -> Build)
  - Or run the command 'mvn package' in the root directory of the source

You must have access to the Internet to be able to build these projects because the required libraries are downloaded from the repositories automatically. You may have to run the build process a couple of times; sometimes the library files do not get downloaded during the first try. If you access the Internet through a proxy server, you will need to specify that in the maven configuration.

- The WAR file will be generated in the 'target' directory.

## 5 Support

Please visit <http://openepics.sourceforge.net> to report problems or seek help.



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## Appendix A – Glassfish Installation

1. Download Glassfish (zip) distribution
2. Install it in /soft (/soft/glassfish3/...). You may choose some other directory.
3. Setup the startup scripts (/etc/init.d/glassfish):  
`update-rc.d glassfish defaults`
4. Start Glassfish server. Set admin password :  
`asadmin change-admin-password`
5. Enable secure/remote admin:  
`asadmin enable-secure-admin`
6. Restart Glassfish server:  
`asadmin restart-domain`
7. Add your organization's CA certificate. This is needed only if the MySQL server is using SSL (which is recommended if the MySQL server is running on another server).  
`keytool -trustcacerts -import -alias "your_ca_Cert" -file your-cacert.pem -keystore /soft/glassfish3/glassfish/domains/domain1/config/cacerts.jks`
8. Check the certificate:  
`keytool -list -v -keystore /soft/glassfish3/glassfish/domains/domain1/config/cacerts.jks`
9. Restart Glassfish server  
`asadmin restart-domain`
10. Configure for mod\_jk:  
`asadmin create-http-listener --listenerport 8009 --listeneraddress 0.0.0.0 --defaultvs server jk-connector`  
  
`asadmin set configs.config.server-config.network-config.network-listeners.network-listener.jk-connector.jk-enabled=true`
11. Patch installation



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## Appendix B – Apache and Glassfish

1. Install Apache2 and libapache2-mod-jk (debian). Make sure mod\_jk is enabled (in /etc/apache2/mods-enabled)
2. Install glassfish 3.x
3. Create /etc/apache2/workers.properties with following content

```
# Define 1 real worker using ajp13
worker.list=worker1
# Set properties for worker1 (ajp13)
worker.worker1.type=ajp13
worker.worker1.host=localhost
worker.worker1.port=8009
```
4. Add the following to httpd.conf

```
JkWorkersFile /etc/apache2/workers.properties
# Where to put jk logs
JkLogFile /var/log/apache2/mod_jk.log
# Set the jk log level [debug/error/info]
JkLogLevel debug
# Select the log format
JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "
# JkOptions indicate to send SSL KEY SIZE,
JkOptions +ForwardKeySize +ForwardURICompat -ForwardDirectories
# JkRequestLogFormat set the request format
JkRequestLogFormat "%w %V %T"
# Send everything for context /examples to worker named worker1 (ajp13)
# JkMount /examples/* worker1
```
5. Configure Glassfish

```
asadmin create-http-listener --listenerport 8009 --listeneraddress 0.0.0.0 --defaultvs
server jk-connector
asadmin set configs.config.server-config.network-config.network-listeners.network-
listener.jk-connector.jk-enabled=true
```
6. Create a site as follows (in /etc/apache2/sites/{available,enabled})



```
<VirtualHost *:80>
    ServerName server-name.nscl.msu.edu

    #DocumentRoot /var/www/Proteus3
    RewriteEngine On
    RewriteRule ^/$ /Proteus3/ [R]

    JkMount /Proteus3/* worker1

</VirtualHost>

<VirtualHost *:443>
    ServerName server-name.nscl.msu.edu
    SSLEngine on
    RewriteEngine On
    RewriteRule ^/$ /Proteus3/ [R]
    JkMount /* worker1
</VirtualHost>
```

## 7. Restart Apache and Glassfish



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## Appendix C – Application Server Configuration

Naming System requires the following resources to be defined in the Application Server:

Name	Description
org.openepics.names.data	JDBC Resource
org.openepics.names.realm	Security Realm

