

# ***e-IANA System***

***Andrzej Bartosiewicz***  
***ICANN meeting, Vancouver***  
***2005***



# Agenda

- NASK: who are we?
- e-IANA System: requirements
- Development plan
- Architecture
- Implementation
- Example: modify Primary NS
- Future plans



**NASK: who are we?**




# NASK background

- Established in 1991
- Research & Development public entity
- Supervised by *Ministry of Science and Information Society Technologies*
- Registry for .PL, and +48 (ENUM project)

# NASK background

- 280 employees (total) including
- 40 employees in DNS Division including 5 employees in IT Projects Team
- Member of ITU, CENTR, RIPE, etc.
- Collaboration with ICANN, ENISA etc.



# **e-IANA System: requirements**



# Requirements: functionality

- Described in: „Requirements for Automated Management of TLD IANA database“ ver. 1.11
- Processes defined in the document cover almost all IANA functions including:
  - Replace TLD Manager, Technical and Administrative Contact
  - Modify Primary and Secondary Name Servers
  - Modify Whois Server, TLD Manager attributes, Check the status of a TLD
  - Modify Administrative and Technical Contact attributes, URL for registration services

# Requirements: attributes

- Document defines attributes of the „actors“ (see example below)

Attribute Name of „TLD“ Actor	Data Type	Req?	Mult?	Public?
TLD Name	Text	Y	N	Y
TLD Manager	Contact	Y	N	Y
Address	Text	Y	N	Y
Phone Number	Text	Y	N	Y
Fax Number	Text	Y	N	Y
Email Address	Text	Y	N	Y
Administrative Contact	Contact	Y	N	Y
Technical Contact	Contact	Y	N	Y
Primary Name Server	Name Server	Y	N	Y
Secondary Name Server	Name Server	Y	Y	Y
URL for Registration Services	Text	Y	N	Y
Whois Server	Text	N	Y	Y



# Requirements: Processes

- Based on the „Requirements for Automated Management of TLD IANA database“ NASK has prepared graphic representation of the processes according to ISO 9001:2000:

*[IANA.dns.pl/process\\_definition.html](http://IANA.dns.pl/process_definition.html)*

- Current process definition requires modifications

# Requirements: Authentication

- Neither document „Requirements...” nor the working system determine the Authentication method.
- It's possible to use different authentication models or the combination of the authentication models of including inter alia:
  - PGP
  - Passwords
  - One time passwords (popular in home-banking systems)
  - DNSsec



# Development Plan



# Development Plan

- Start: Aug. 3, 2005
- 1st Release: Sep. 7, 2005
- Ready in 5 weeks!
- Project Team:
  - 4 Full-Time Developers
  - 1 Full-Time DNS Expert
  - 1 Part-Time Quality Assurance Officer

# Development Priorities

High

Availability

Reliability

Security

Flexibility


Extensibility

Maintenance

Performance

Low





# Development Platform

- J2EE
  - Proven industry standard
  - Write once run anywhere
  - Reliable
- Rational Unified Process
  - Proven development process
  - To develop
    - High quality software
    - On time and under budget
- ISO 12207



# Architecture



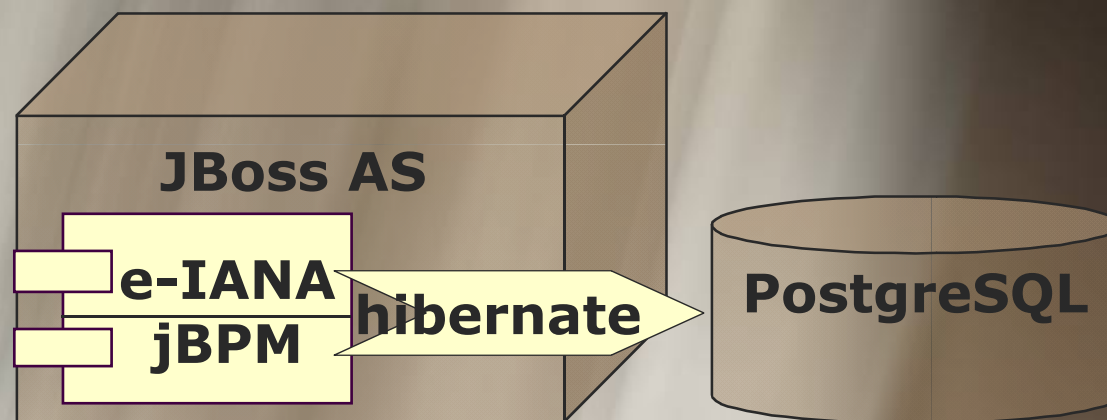
# Architecture Overview

- JBoss jBPM
  - Business Process Management
  - Workflow engine
- Hibernate
  - Object/Relational Mapping tool
- JBoss AS
  - J2EE-based application server
- PostgreSQL
  - Database engine
  - Easily replaceable thanks to the use of hibernate



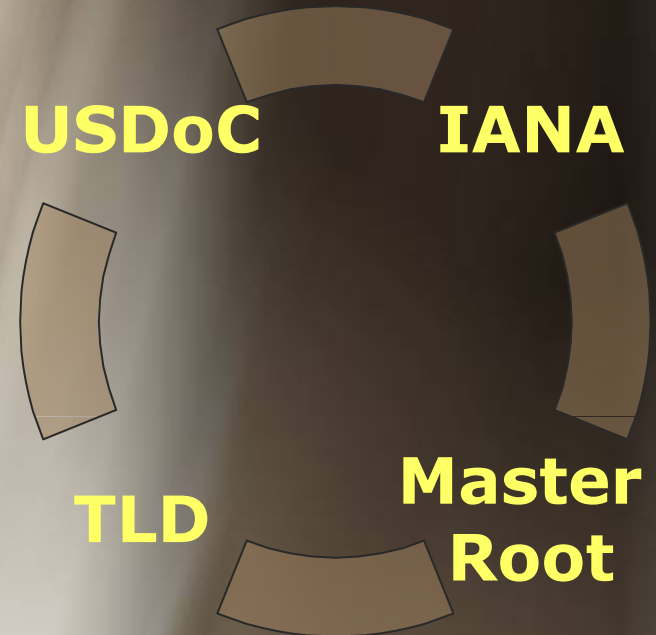
# Architecture Diagram

- **e-IANA** and **jBPM** components are deployed into **JBoss AS**
- **e-IANA** and **jBPM** use **hibernate** to communicate with **PostgreSQL** database

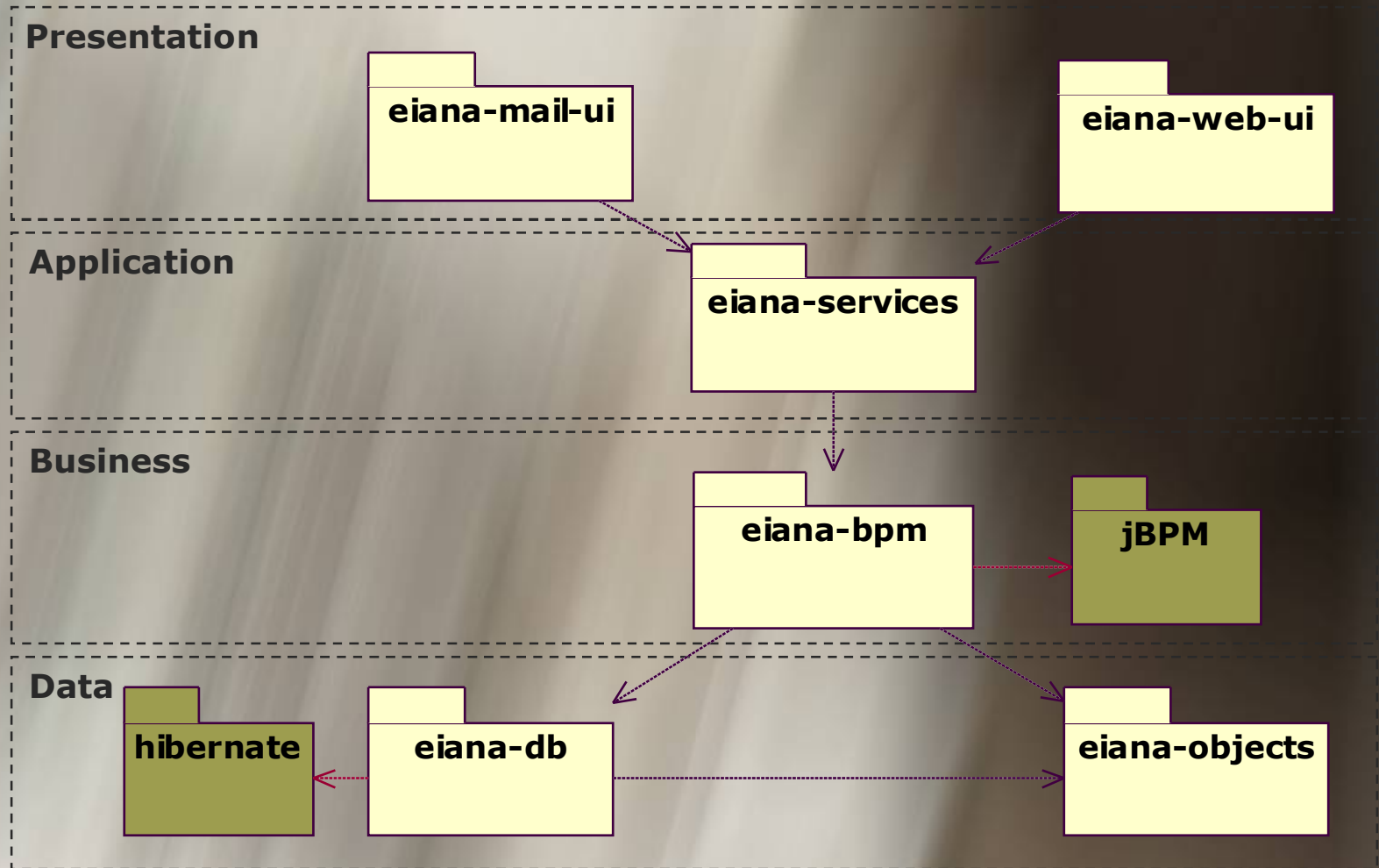


# jBPM as Workflow Engine

- Configurable business process
  - State management
  - Transition management
  - Pluggable actions
  - Tasks assignments
  - Process versioning
- Full audit-logs
- Scheduler
- Automated actions
  - Time-outs
  - Reminders



# Architecturally Significant Components





# Implementation

# Business Process Definition

## ■ XML file

```
| <task-node name='PENDING_IANA_CONFIRMATION'>
|   <task>
|     <assignment class="pl.nask.eiana.processes.assignment.RoleAssignment" >
|       <roles>iana,manager,admin,tech</roles>
|     </assignment>
|     <controller class='pl.nask.jbpm.controller.TemplateBasedTCHandler' config=
|       <templateName>modify-secondary-name-servers,signature</templateName>
|       <initHandler>pl.nask.eiana.bpm.pgp.SignatureInitializationHandler</i
|         [...]
|     </controller>
|   </task>
|   <transition name='withdraw' to='WITHDRAWN'></transition>
|   <transition name='ok' to='PENDING_IANA_APPROVAL'>
|     <action class='pl.nask.eiana.processes.pgp.SignatureValidationActionHand
|       [...]
|     </action>
|   </transition>
|   <timer name='time-out' dueDate='7 days' transition='withdraw'></timer>
| </task-node>
```



# Flow Configuration

- Nodes
  - Tasks, states, decisions
- Transitions
  - Time-outs
- Task templates
  - Templates as a base for UI
    - Mail parser based on template definition
    - Web-form generation based on template definition

# Template Configuration

- Regular expressions
- Set of pre-defined validators
- Pluggable validation framework
- Exemplary configuration:

```
} <template name="modify-secondary-name-servers" label="Modify Secondary Name Servers">
  <field name="name" label="Top-Level Domain Name" regex="\p{Alpha}{1,64}"/>
} </list>
} <section name="secondaryNameServers" label="Secondary Name Server">
} <field name="name" label="Secondary Server Hostname">
  <validator class="pl.nask.eiana.bpm.validators.HostNameValidationHand
} </field>
} </list>
} <field name="address" label="Secondary Server Netaddress">
  <validator class="pl.nask.eiana.bpm.validators.IpValidationHandle
} </field>
```

# PGP Authentication

- OpenPGP
  - RFC 2440
- Java Cryptography Extension (JCE)
- Cryptix
  - Implements OpenPGP
  - Provides JCE



# PGP Authentication

e-IANA supports *inter alia*:

- DSA,
- ElGamal,
- IDEA, TripleDES, CAST5, Blowfish, Twofish
- MD5,
- SHA-1,
- RIPEMD160,
- MD2,
- Tiger



How to log on?

[www.eIANA.org](http://www.eIANA.org)



**Example:  
modify Primary NS**

# ccTLD – Main menu

*logged as Manager-PL*



You are logged in as manager-pl [Logout](#)

## MENU

Home

- ◆ [Home](#)
- ◆ [TLD Status](#)
- ◆ [Notifications](#)
- ◆ [Administration](#)
- ◆ [Monitoring](#)

### Tasklist

[Task Form Link Process](#)

[Start New Process Execution](#)

#### Process Link

- [Replace TLD Manager](#)
- [Replace Administrative Contact](#)
- [Replace Technical Contact](#)
- [Modify Primary Name Server](#)
- [Modify Secondary Name Servers](#)
- [Modify URL for Registration Services](#)
- [Modify Whois Servers](#)
- [Modify TLD Manager Attributes](#)

NASK Research and Academic Computer Network

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# Example:modify Primary NS

*logged as Manager-PL*

You are logged in as manager-pl

Task: Modify Primary Name Server

## **modify-primary-name-server**

Top-Level Domain Name:

### **Primary Name Server**

Primary Server Hostname:

Primary Server Netaddress:

Task Actions:

INITIAL

IANA\_CONFIRMATION

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE

# modify Primary NS

You are logged in as manager-pl

Task: PENDING\_IANA\_CONFIRMATION

## Modify Primary Name Server

Top-Level Domain Name:  [no change]

### Primary Name Server

Primary Server Hostname:  [no change]

Primary Server Netaddress:

[replace [243.224.106.28]]

### Signature

Modify Primary Name Server  
Top-Level Domain Name: pl [no change]  
Primary Name Server  
Primary Server Hostname: ns1.registry.pl [no change]  
Primary Server Netaddress: 123.123.123.123 [replace [243.224.106.28]]

Message:

Signature:

Task Actions:

*logged as  
Manager-  
PL*

INITIAL

IANA\_CONFIRMATION

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE

# modify Primary NS

*logged as IANA*

You are logged in as IANA

Task: PENDING\_IANA\_APPROVAL

## modify-primary-name-server

Top-Level Domain Name:  [no change]

### Primary Name Server

Primary Server Hostname:  [no change]

Primary Server Netaddress:   
[replace [239.189.130.215]]

Task Actions:

INITIAL

IANA\_CONFIRMATION

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE

# modify Primary NS

*logged as USGov DoC*

You are logged in as USDoC

Task: PENDING\_USDoC\_APPROVAL

## modify-primary-name-server

Top-Level Domain Name:  [no change]

### Primary Name Server

Primary Server Hostname:  [no change]

Primary Server Netaddress:   
[replace [239.189.130.215]]

Task Actions:

INITIAL

IANA\_CONFIRMATION

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE



# modify Primary NS

*logged as IANA*

You are logged in as IANA

Task: PENDING\_DATABASE\_UPDATE

## **modify-primary-name-server**

Top-Level Domain Name:  [no change]

### **Primary Name Server**

Primary Server Hostname:  [no change]

Primary Server Netaddress:  [replace [239.189.130.215]]

Save And Close

Cancel

INITIAL

IANA\_CONFIRMATION

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE

# modify Primary NS

*logged as VeriSign*

You are logged in as VeriSign

Task: PENDING\_ZONE\_UPDATE

## modify-primary-name-server

Top-Level Domain Name:  [no change]

### Primary Name Server

Primary Server Hostname:  [no change]

Primary Server Netaddress:  [replace [239.189.130.215]]

Save And Close

Cancel

IANA\_CONF

IANA\_APPROVAL

USDoC\_APPROVAL

DATABASE\_UPDATE

ZONE\_UPDATE

# Testing & Release

- Testing:
  - September 9 - October 21, 2005
  - [testbed@wwtld.org](mailto:testbed@wwtld.org) for bug reporting/suggestions etc.
  - 123 different people (excluding NASK) testing the system
  - Access to source code for interested parties (so far: UK, Mexico, Vatican)
- Final release of version 1.0:
  - October 31, 2005



**Contact:**  
**[Andrzej.Bartosiewicz@NASK.pl](mailto:Andrzej.Bartosiewicz@NASK.pl)**