e-IANA System

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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 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)

<table>
<thead>
<tr>
<th>Attribute Name of „TLD” Actor</th>
<th>Data Type</th>
<th>Req?</th>
<th>Mult?</th>
<th>Public?</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLD Name</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>TLD Manager</td>
<td>Contact</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Address</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Phone Number</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Fax Number</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Email Address</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Administrative Contact</td>
<td>Contact</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Technical Contact</td>
<td>Contact</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Primary Name Server</td>
<td>Name Server</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Secondary Name Server</td>
<td>Name Server</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>URL for Registration Services</td>
<td>Text</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Whois Server</td>
<td>Text</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
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](IANA.dns.pl/process_definition.html)

- Current process definition requires modifications
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

- Reliability
- Security
- Availability
- Flexibility
- Extensibility
- Maintenance
- Performance
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
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
Implementation
<task-node name='PENDING_IANA_CONFIRMATION'>
  <task>
    <assignment class="pl.nask.eiana.processes.assignment.RoleAssignment">
      <roles>iana,manager,admin,tech</roles>
    </assignment>
  </task>
  <controller class='pl.nask.jbpm.controller.TemplateBasedTCHandler' configuration="modify-secondary-name-servers,signature">
    <initHandler>pl.nask.eiana.bpm.pgp.SignatureInitializationHandler</initHandler>
    [...]]
  </controller>
  <transition name='withdraw' to='WITHDRAWN'></transition>
  <transition name='ok' to='PENDING_IANA_APPROVAL'>
    <action class='pl.nask.eiana.processes.pgp.SignatureValidationActionHandler'>
        [...]]
  </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:

```xml
<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.HostNameValidationHandler"/>
      </field>
      <list>
        <field name="address" label="Secondary Server Netaddress">
          <validator class="pl.nask.eiana.bpm.validators.IpValidationHandler"/>
        </field>
      </list>
      <list>
      </list>
    </section>
  </list>
</template>
```
PGP Authentication

- OpenPGP
- RFC 2440
- Java Cryptography Extension (JCE)
- Cryptix
  - Implements OpenPGP
  - Provides JCE
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
Example:
modify Primary NS
ccTLD – Main menu

logged as Manager-PL

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
Example: modify Primary NS

logged as Manager-PL

Task: Modify Primary Name Server

modify-primary-name-server
Top-Level Domain Name: pl

Primary Name Server
Primary Server Hostname: ns1.registry.pl
Primary Server Netaddress: 123.123.123.123

Task Actions: fetch data ok Cancel
modify Primary NS

logged as Manager-PL

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
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: ok withdraw
modify Primary NS

logged as IANA

Task: PENDING_IANA_APPROVAL

modify-primary-name-server
Top-Level Domain Name:     [no change]
Primary Name Server
Primary Server Hostname:   [no change]
123.123.123.123
Primary Server Netaddress: [replace [239.189.130.215]]

Task Actions:  reject  ok  verify

Cancel
modify Primary NS

logged as USGov DoC

Task: PENDING_USDoC_APPROVAL

modify-primary-name-server
Top-Level Domain Name: pl [no change]

Primary Name Server
Primary Server Hostname: ns1.registry.pl [no change]
123.123.123.123

Primary Server Netaddress: [replace [239.189.130.215]]

Task Actions: reject ok withdraw

Cancel
modify Primary NS

logged as IANA

Task: PENDING_DATABASE_UPDATE

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 [239.189.130.215]]

Save And Close

Cancel
modify Primary NS

logged as VeriSign

Task: PENDING_ZONE_UPDATE

modify-primary-name-server
Top-Level Domain Name: pl [no change]

Primary Name Server
Primary Server Hostname: ns1.registry.pl [no change]
123.123.123.123

Primary Server Netaddress: [replace [239.189.130.215]]
Testing & Release

Testing:
- September 9 - October 21, 2005
- 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
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