Drools Business Logic integration Platform/

Drools Expert & Fusion

What a rule-based program is

Made up of discrete rules, each of them models a specific aspect of your domain
Simpler because you can concentrate on the rules for one situation at time
Flexible in the face of fragmentary or poorly conditioned inputs

Declarative (What to do) Vs. Imperative (How to do it)

Features

Hybrid reasoning
- Forward and Backward Chaining
- Reactive, Query and Materialized Views

Functional Programming
Truth Maintenance
Temporal Reasoning
Complex Event Processing
Calendar and Timer Support
Dynamic Object Classification (Traits)

Examples

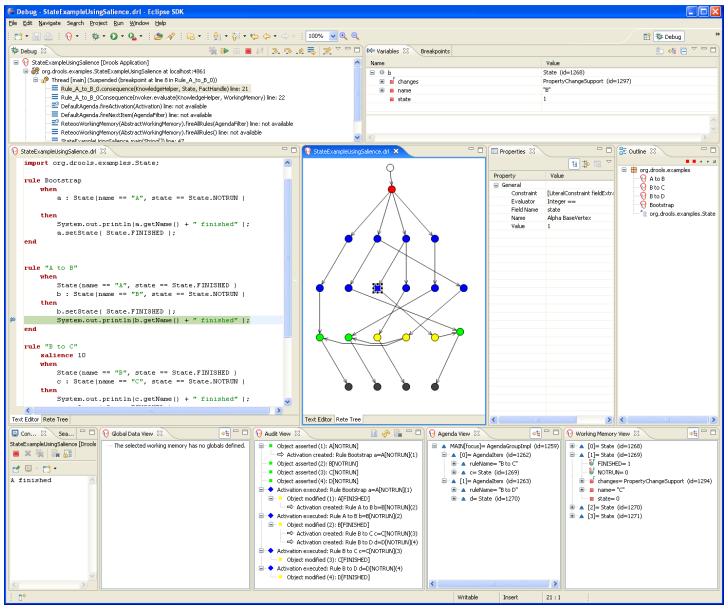
```
rule "Check age"  when
   $a : Applicant( age < 18 )
then
   modify( $a ) { valid = false }
end

rule "Acknowledgement Failure"  when
   $req : BuyReq()
   not BuyAck( this after[15s] $req )
then
    channel["alerts"].send( new Alert( $req ) );
end

rule "Buy More Stock" when
    TradingWindow( status == OPEN )
    Accumulate( $t : Ticker( name == "RHT") over window:time(4m),
                $avg : avg( $t.price ) )
    eval( $avg > 100 )
then
    channel["buy channel"].send( new BuyReq( "RHT" ) );
end
```

Complex Event Processing with Drools Fusion

Understands and handles events as a first class platform citizen (specialized Facts)
Selects a set of events in a cloud and detect the relavant relationships among them
Takes appropriate action based on the patterns detected and the events' temporal relationships

When should you use Drools?

The problem is beyond any algorithmic solution or isn't fully understood
The business-logic changes often
Domain expert or business analysts are readily available but are nontechnical
You want to isolate the key parts of your logic *especially the really messy parts*



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Drools Integration

… with Spring

Spring is a popular framework for enterprise Java development.

Drools ships with a Spring-ready module that allows Drools to be configured and deployed into the Spring container without any glue code.

For more details on spring, visit:

http://www.springsource.org

Sample Configuration - Spring

Example 2.2. kbase definition example

```
<drools:kbase id="kbase1" node="node1">
   <drools:resources>
      <drools:resource source="classpath:org/drools/spring/IntegrationExampleTest.xls"
                       type="DTABLE">
         <drools:decisiontable-conf input-type="XLS" worksheet-name="Table_2" />
      </drools:resource>

      <drools:resource ref="resource1"/>

      <drools:resource source="classpath:org/drools/container/spring/model.xsd" />
   </drools:resources>

   <drools:configuration>
       <drools:mbeans enabled="true" />

      <drools:accumulate-functions>
         <drools:accumulate-function name="func1" ref="func1Instance" />
         <drools:accumulate-function name="func1" ref="func2Instance" />
      </drools:accumulate-functions>
   </drools:configuration>

</drools:kbase>
```

… with Apache Camel

Apache Camel is a powerful open source integration framework based on known Enterprise Integration Patterns.

Drools ships with an Apache Camel endpoint implementation for out of the box integration with hundreds of other products that also integrate through Apache Camel.

For a list of Apache Camel components, visit:

http://camel.apache.org/

Sample Configuration - Camel

Example 1.1. Drools EndPoint configured with the CXFRS producer

```
<bean id="droolsPolicy" class="org.drools.camel.component.DroolsPolicy" />

<camelContext id="camel" xmlns="http://camel.apache.org/schema/spring">
   <route>
      <from uri="cxfrs://bean://rsServer"/>
         <policy ref="droolsPolicy">
            <unmarshal ref="xstream" />
            <to uri="drools:node1/ksession1" />
            <marshal ref="xstream" />
         </policy>
      </route>
```

Drools Server

The Drools Execution Server (drools-server) module is a war, which can be deployed in a application server (such as JBoss AS), and allows applications to execute KnowledgeBases remotely for any sort of client application. This is not limited to JVM application clients, but any technology that can use HTTP, through a REST interface.

The execution server leverages both Drools Camel and Drools Spring modules to support stateless and stateful sessions in a native way.

Check the Drools Integration documentation for more information:

www.jboss.org/drools/documentation.html

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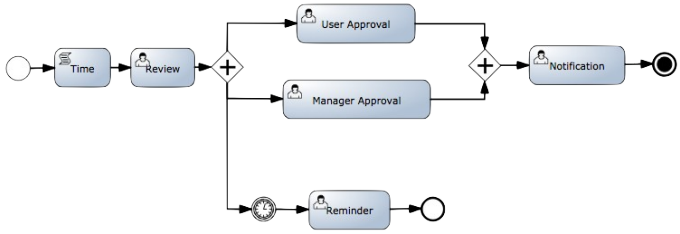
jBPM

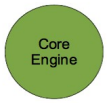
Makes your work flow.

Open-source business process management project offering:
- **generic process engine supporting native BPMN 2.0 execution**
- **targeting developers and business users**
- **collaboration, management and monitoring using web-based consoles**
- **powerful rules and event integration**



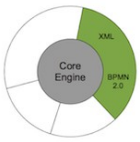
Core Engine

Core engine is a workflow engine in pure Java
- Lightweight
- Embedded
- Generic
- Extensible



BPMN2

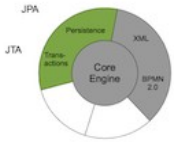
OMG Specification
- Model, Notation, Execution
- Understandable
- Collaboration and Choreography



Persistence and Transactions

Persistence (JPA, pluggable)
- Runtime Persistence
- History logging
- Services

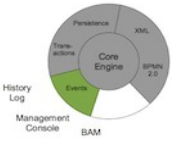
Transactions (JTA, pluggable)
- Command scoped
- User-defined



Console

Web-based management
- Targets Business Users

Features
- Manage process instances
- User task lists / forms
- Reporting



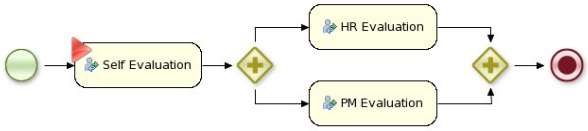
Integration

Domain-Specific processes
- Extend palette with custom, declarative service nodes

Human-Task Service (WS-HT)
- Task Lists, Task Lifecycle

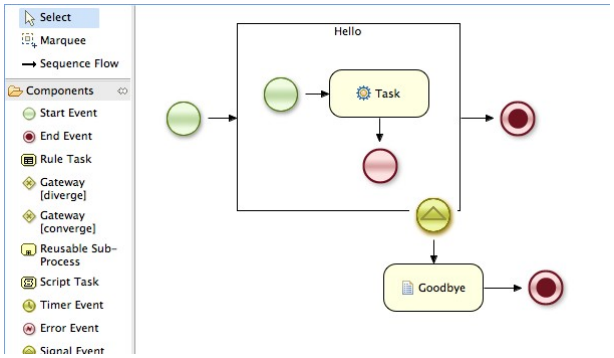
Task Clients
- Task form generation

jBPM Console



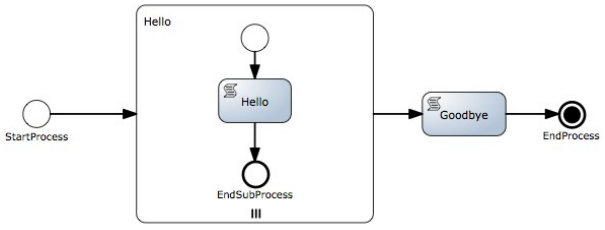
- **Manage process instances:** start new process instances, inspect the state of currently running instances (status window and

jBPM Eclipse Plugin



- **Design:** create/update your business process via graphical representation.
- **Test and Debug:** test specific process scenarios and temporarily halt process executions to inspect their current state
- **Simulate:** visualize process progress, manipulate the execution clock, send triggers, validate assertions at specific execution points, and

jBPM Designer



- **Design:** create and update your business processes in the Web-based environment
- **Validate:** validate your business processes visually.
- **Generate:** generate fully executable process and task forms. Generate your process images and view your process in numerous formats.
- **Connect:** connect to the jBPM Service Repository to install numerous domain-specific service nodes.
- **Migrate:** migrate your existing jBPM 3 process definitions to BPMN2 with a single click.

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Guvnor – Decision Tables

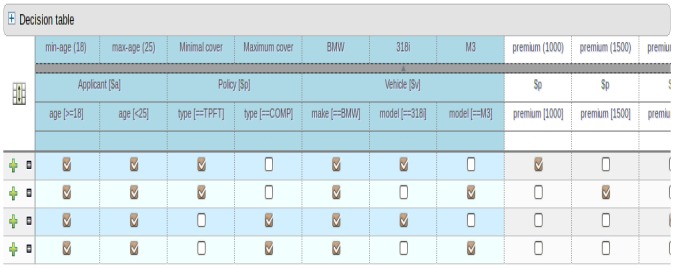
Types

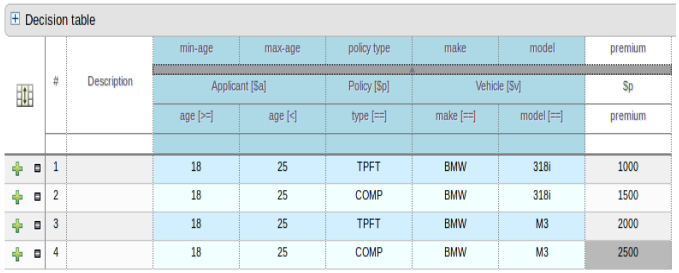
Limited Entry

Body contains boolean states indicating which constraints or actions apply

Extended Entry

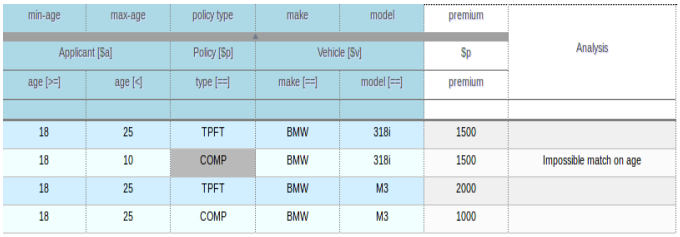
Body contains domain values





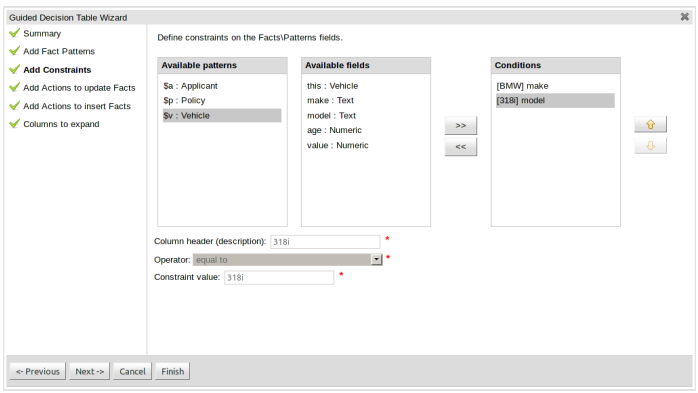
Analysis

Find errors and omissions



Let Guvnor guide you

Wizard to construct different types
Avoid errors
Generate expanded form



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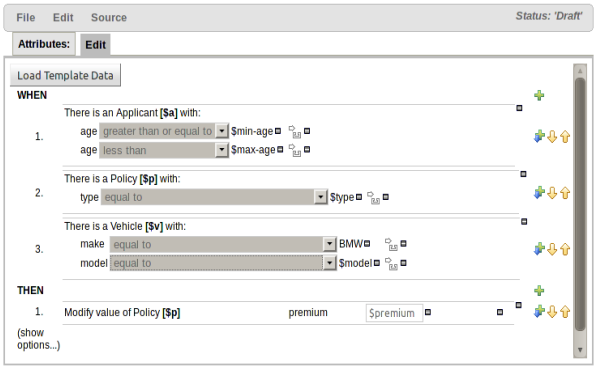
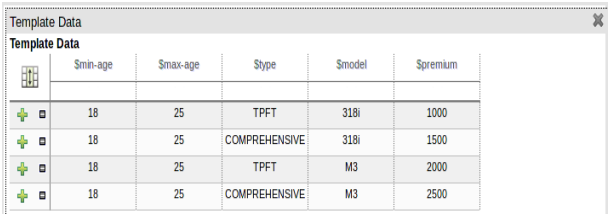
Guvnor - Templates

Scaffolding for rules

Quickly build similar rules
Author structure with the guided rule editor
Insert place-holders for variables
Define values for variables



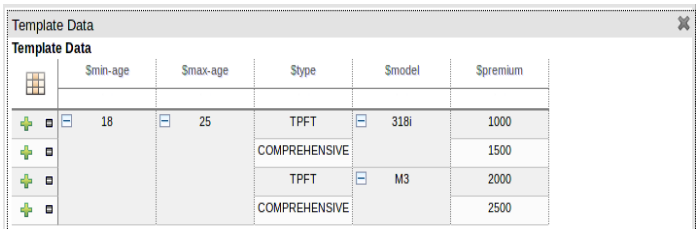


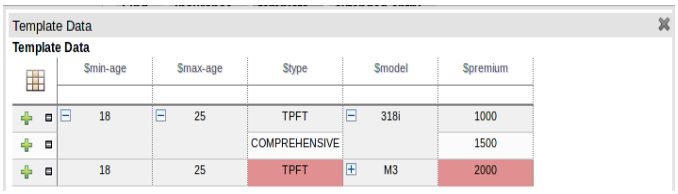
Flexible authoring

Keyboard or mouse navigation
Keyboard or mouse multi-cell selection
Copy and Paste or rows
Sorting column data
Column resizing

Merging of cells
Rapid authoring and maintenance

Grouping of cells
Hide areas whilst editing others
Focus attention to sub-sections





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Guvnor – Decision Tables

Flexible authoring

Keyboard or mouse navigation
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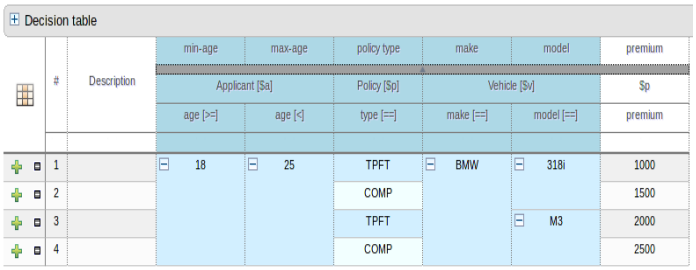
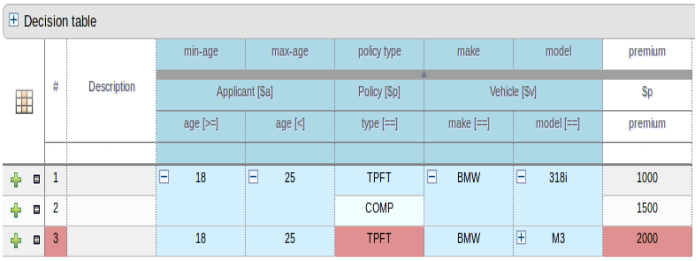
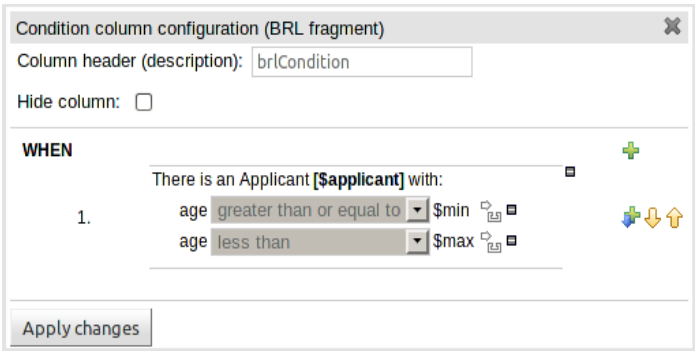


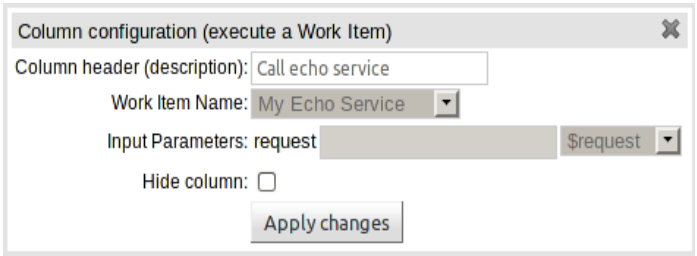


Integration

BRL columns
Ultimate in flexibility
Use BRL fragments in your decision table
Mix and match with regular column types



Use jBPM Work Items as actions
Call your favourite jBPM Work Items
Pass bound variables in Work Items
Use Result Parameters to update Facts



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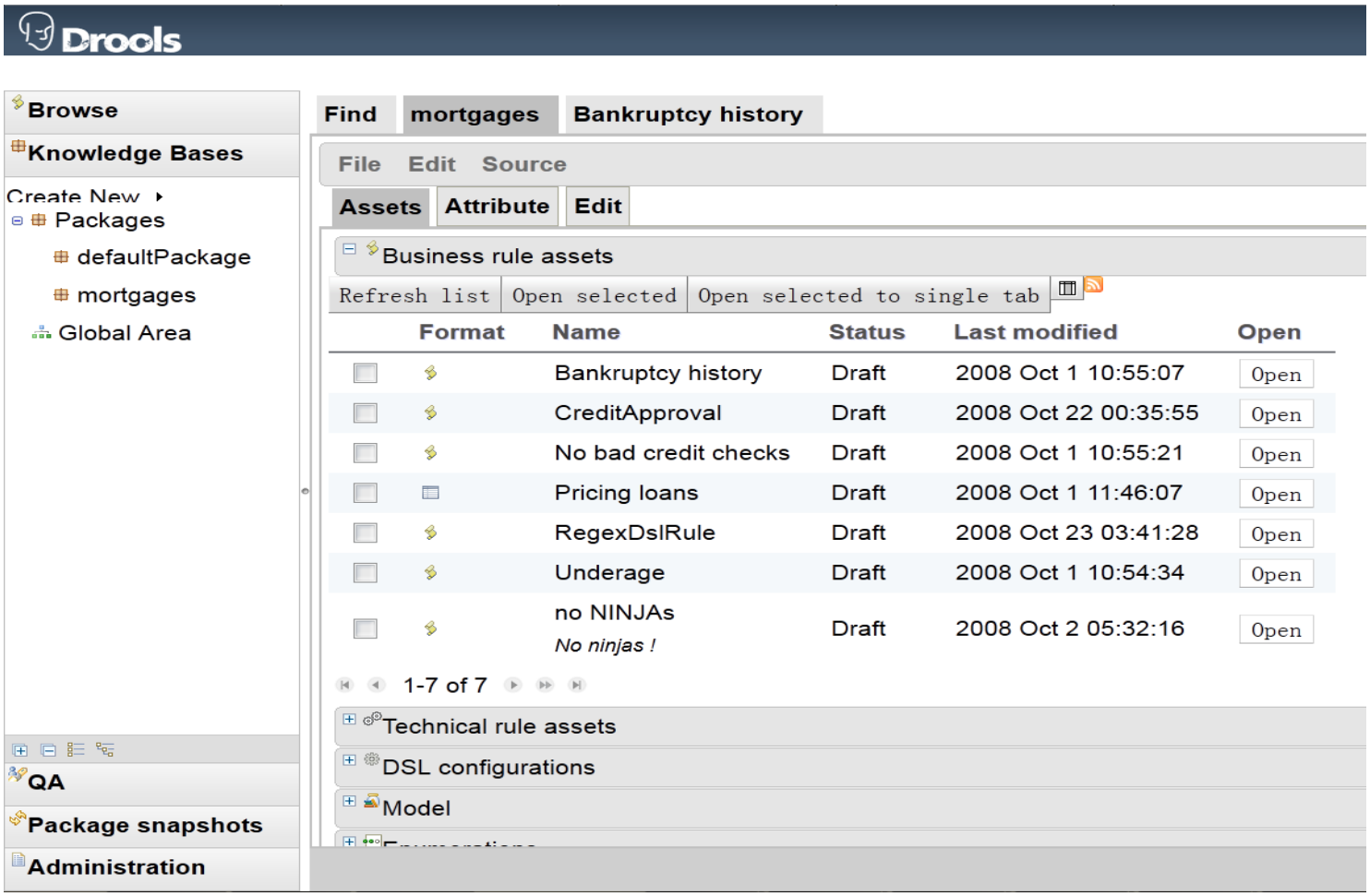
Managing Assets With Guvnor

Guvnor UI Overview:



Managing Assets:

Asset Attribute View

Save/Archive/Copy/Rename/Move/Validate assets.
View and edit asset meta data
Aset life cycle management
Version management
Discussion and discussion history
Atom/Feed

Asset Edit View

Each asset type has its own editor to edit asset content.

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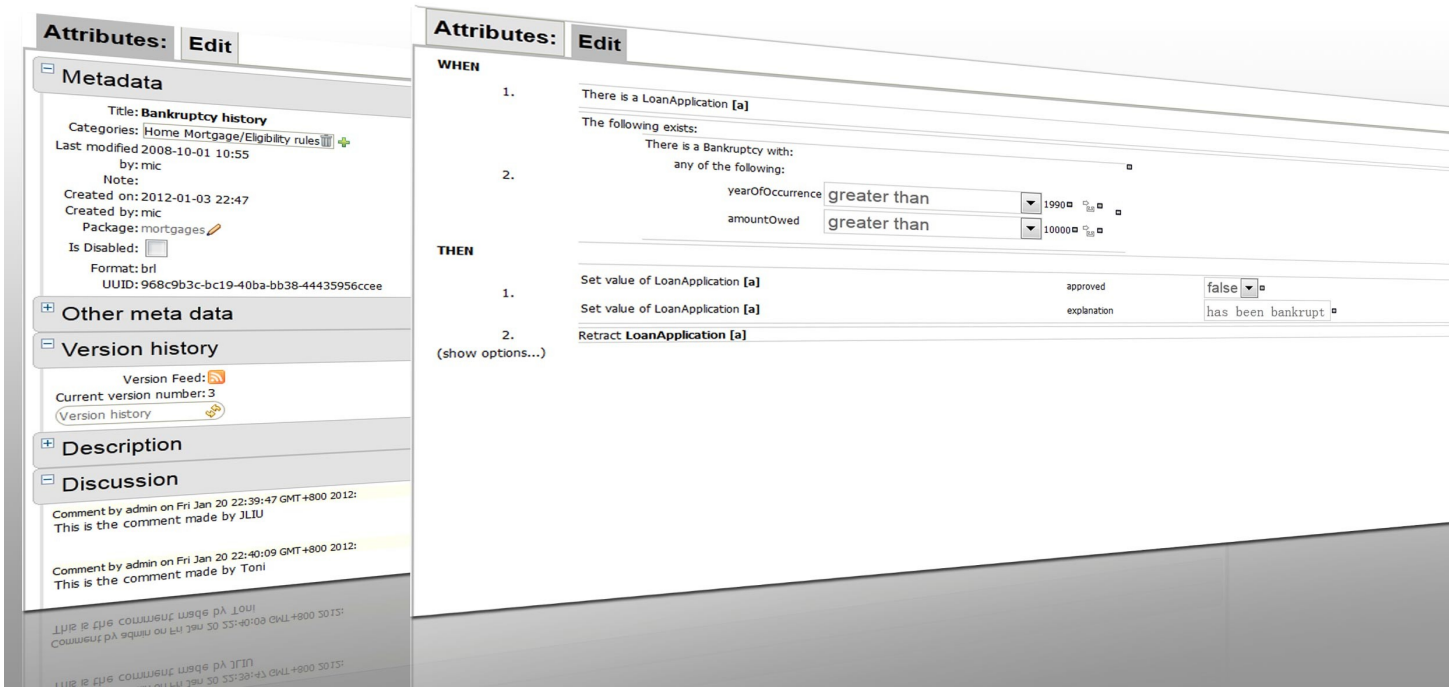
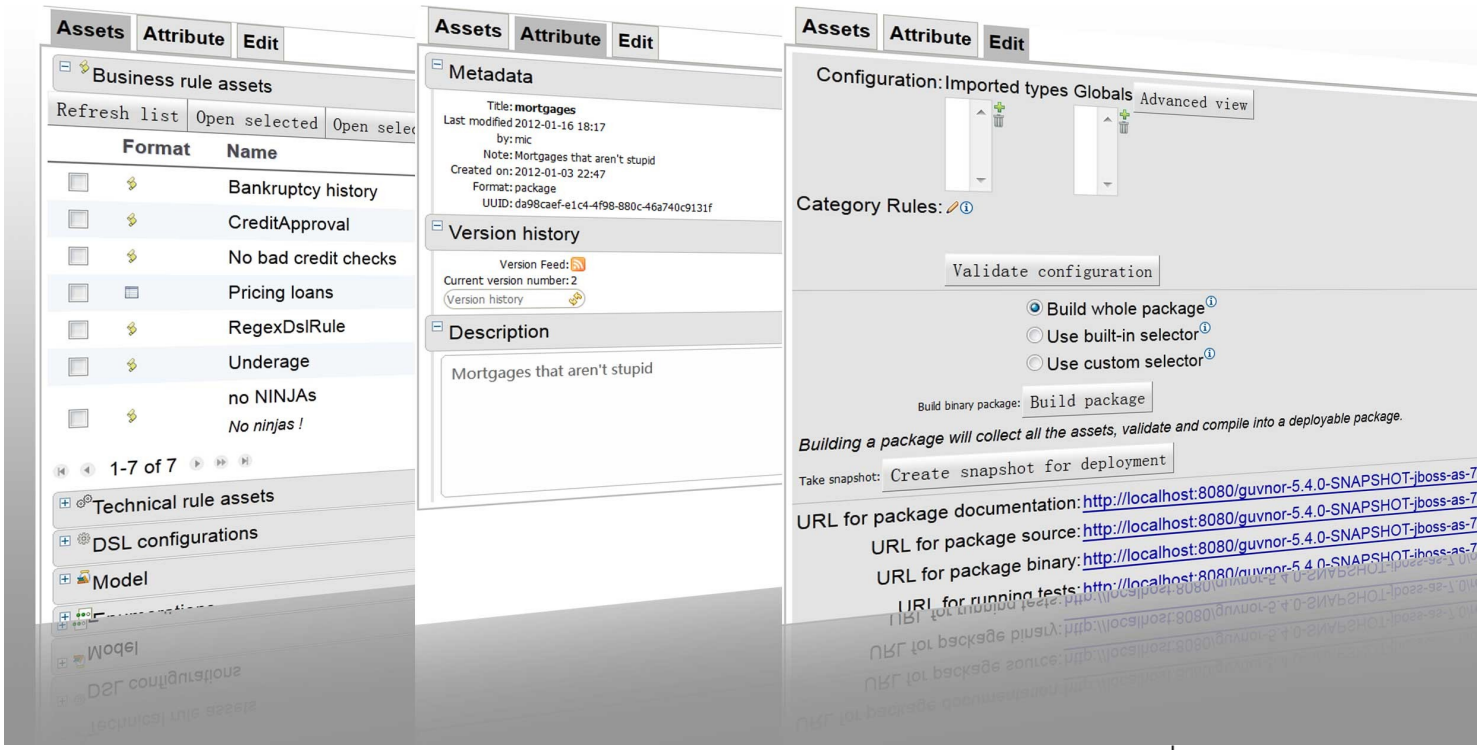
Managing Assets With Guvnor



Managing Packages:

Package assets list view: List all assets contained by the package based on asset types.
Package Attribute View – Same as Asset Attribute View
Package Edit View: Configure, build and deploy packages



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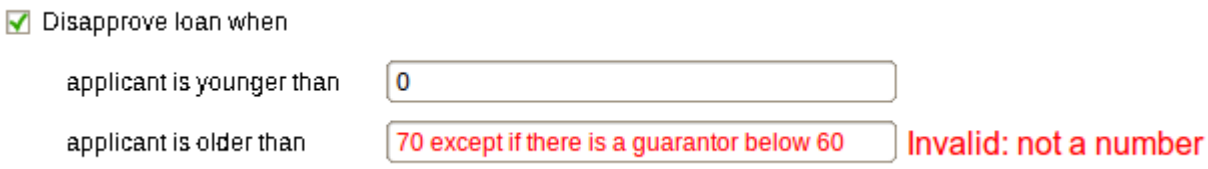
Guvnor for Drools and jBPM

Guided Rule Editor

Traditional applications fall short on flexibility:



With **the guided rule editor**, users can read, write and redefine business rules themselves:

With **DSL**, developers can build simple, readable rule pieces and users combine them as needed:

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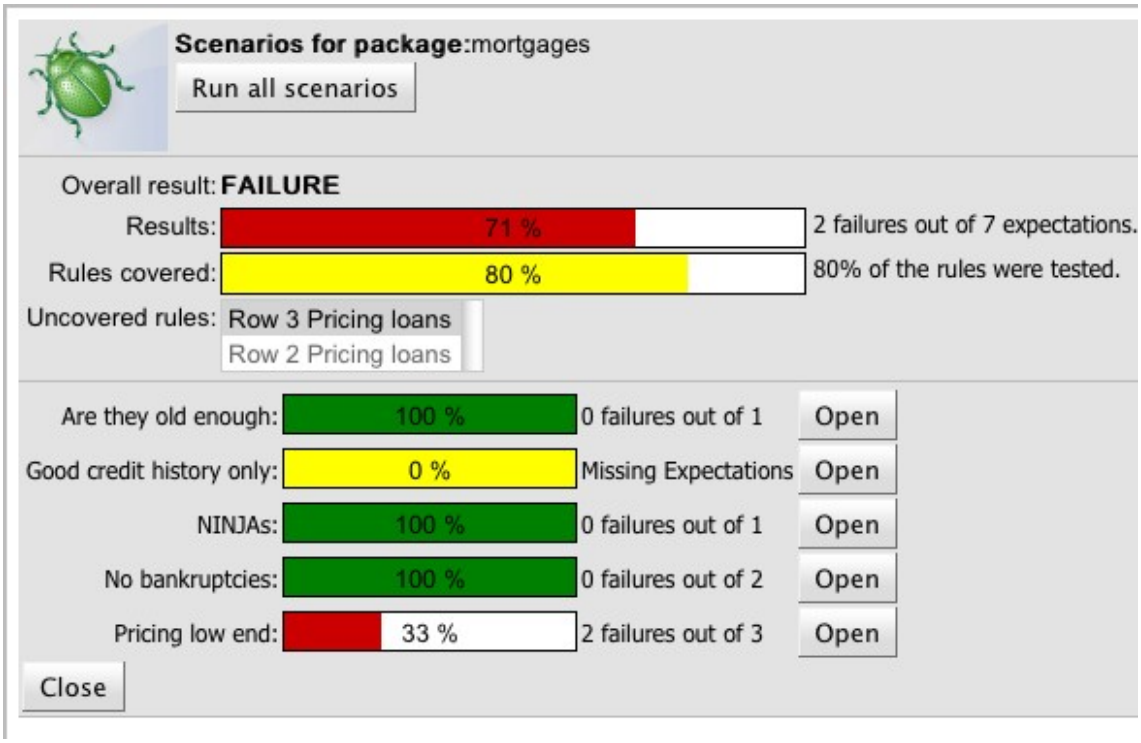
QA - Testing & Verification

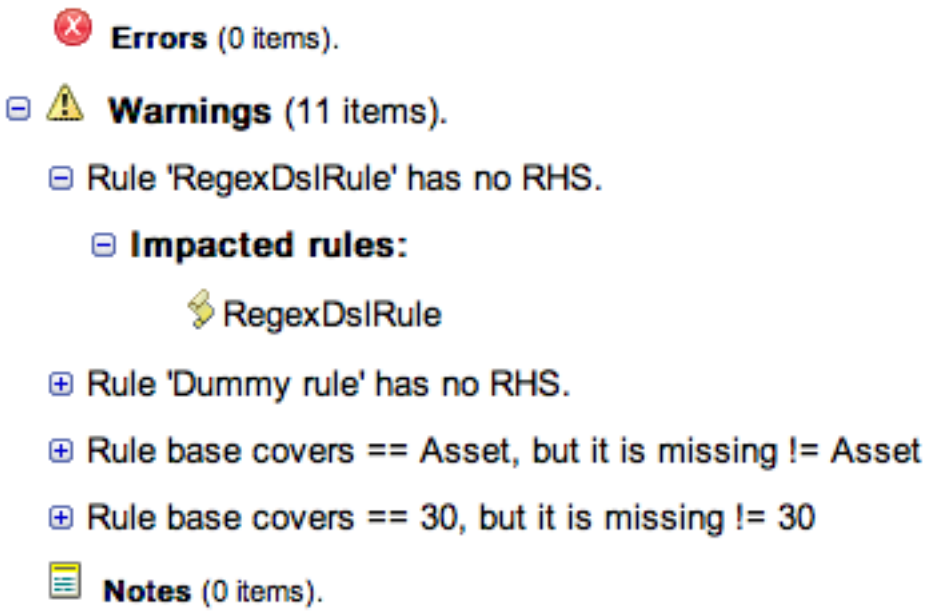
Scenario Tests

Test Scenarios are written by the rule authors to validate that the knowledge base is working.
Scenario report shows the test coverage and the test statuses.



Package Analysis

Package analysis uses Drools rules to statically analyze knowledge modules.
It produces a report that contains information about the quality of the knowledge module.



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Drools Planner

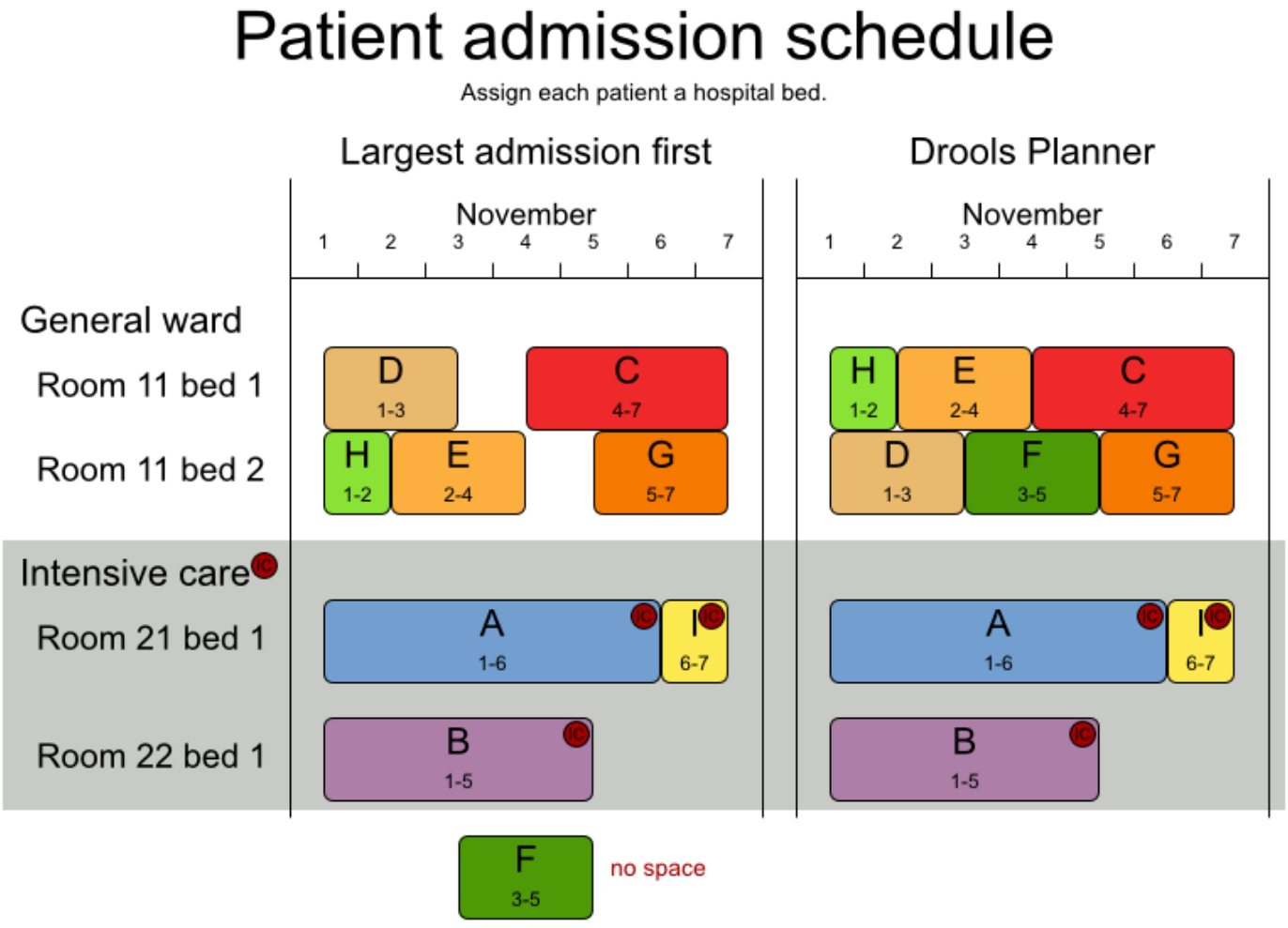
Planning optimization for Java™

Every organization has planning problems, such as:

- Employee rostering
- Task scheduling
- Vehicle routing
- Assembly line optimization
- Bin packing

Yet, they hardly optimize those problems. Why? Because those problems are “NP-complete”: computationally very difficult and humanly impossible to optimize.

A hospital can accommodate more patients when optimized with Drools Planner



Better planning algorithms reduce costs, improve service quality and help save the environment:

- Exam scheduling with Planner finds a feasible solution where common algorithms fail.
- Nurse rostering with Planner has on average **53%** less unwanted shift assignments.
- Process allocation to computers with Planner has on average **28%** less congested resources

To confirm these numbers for yourself, download Planner and run the examples.

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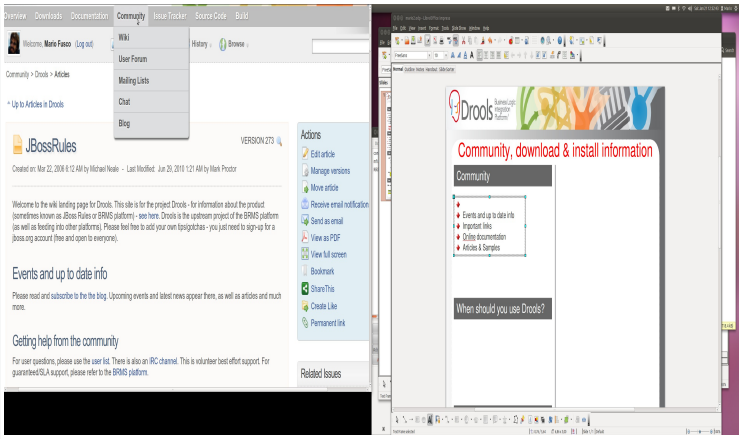
Community, download & install info

Community Information

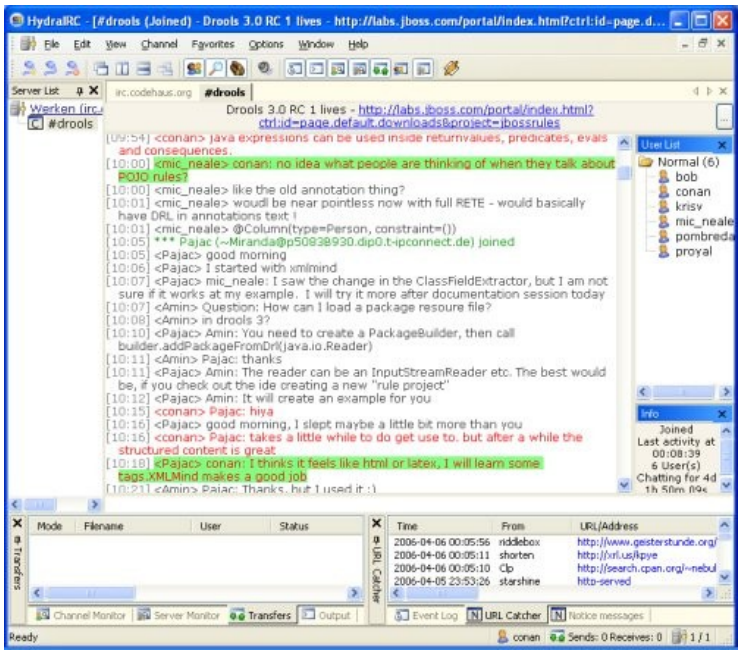
Events and up to date info
Important links
Online documentation
Articles & Samples
Tips, Tricks & FAQ for users (rule developers)
Patterns, best practices and guidelines
Presentations slides and videos



https://community.jboss.org/wiki/JBossRules

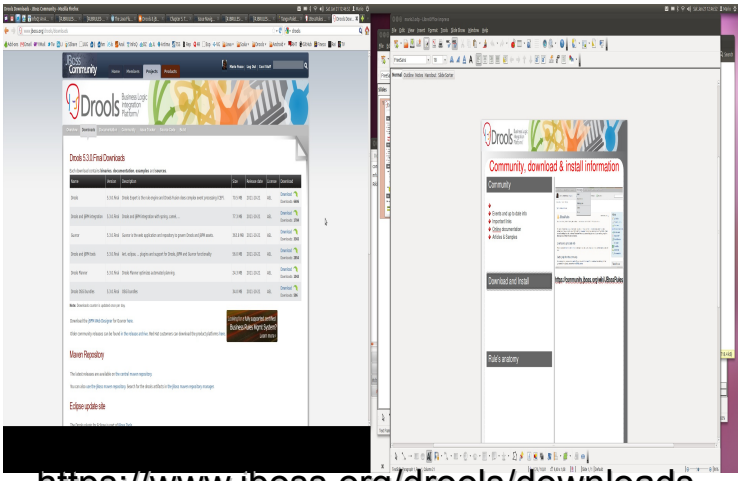
Getting help (and helping out)

As normal, the maniacs can be found in the drools IRC room at irc.codehaus.org.
Web client available for those behind a firewall http://irc.codehaus.org
2 mailing list:
"user" list for end user issues
"dev" for questions about with the internals
Jira to check existing issues and log yours is available at https://issues.jboss.org/browse/JBRULES



Download and Install

Download binaries, documentation, examples and sources in a single file
Projects are available on both the central Maven repository and on the JBoss one
Latest releases readily available including Beta and Canditate ones
Drools plugin for Eclipse available for download as part of the Jboss Tools at http://www.jboss.org/tools/download.html or using the standard Eclipse Marketplace Client



https://www.jboss.org/drools/downloads

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The importance of Product and Project

Branding

JBoss BRMS is the branded product offering from Red Hat; for which you can buy support subscriptions and professional services, such as training and on-site consultancy. JBoss itself is a Red Hat brand for it's Java middleware.

JBoss BRMS is made up from a number of community projects - Drools Expert, Fusion, jBPM and Guvnor.

Multi-Year Support

Red Hat commits to supporting a product release over a large number of years, the length varies from product to product. Cumulative patch releases ensure you get the fixes without the risk of new features. And the assurance that we will be there for the long term. .org does not do maintenance releases it's a continuously forward moving R&D project. If you want the fixes you are going to get all the new features too, and the risks that come with them. Getting community support for previous .org releases can be hard, leaving you to the mercy of a volunteer based community.

Multi-Year Support

Released products are tested across the range of JBoss and Red Hat products and also multiple versions. So if you are using JBoss BRMS you'll know it'll work on the range of AS services, or the JBoss SOA stack.

We also check compatibility across other platforms such as Websphere and even IBM z/OS. .org. Community releases do not go through this compatibility matrix level of testing.

Feature	JBoss Community	JBoss by Red Hat
Open Source	x	x
Benefits from testing by worldwide Community	x	x
Recommended for Production Use		x
Patch Update & Service Pack Program		x
Security Errata Program		x
Automated Software Update & Alert Service		x
Defect & Feature Escalation & Prioritization Process		x
Developer Support		x
24x7 Production Support & Services		x
Platform Certifications & Training Certifications		x
Defined Support SLA and End-of-Life Policy		x
Out-of-the-Box Configured for Enterprise Use		x
Operations Management Tools		x
Platform testing & certification process		x
Redistribution of modified JBoss technologies		x
Red Hat Open Source Assurance (Legal Protection)		x

Sanity through Sanitization

A common fear with OSS is due to the transparency of R&D. From casual inspection this can seem quite hairy as end users are exposed to all the unstable, unfinished and experimental works. This leaves a lot of uncertainty and fear in using OSS in a production environment.

Closed source companies get to do all their R&D behind closed doors, and end users are only exposed and aware of the highly polished marketing.

.com addresses this issue by removing or demarcating experimental or unstable features. To ensure there is a level of sanity and trust in what you are using. The product is typically 3 to 6 months behind in features, but offers strong levels of stability as a result.

Unburden R&D

Everything that goes into ensuring a great product for the enterprise version entails a lot of work. You need a lot of resources that have meticulous attention to detail. Their priorities will be different to the R&D developers priorities. Stability and maintenance are the enemy of innovation. To ensure we have continued innovation at a project level it's important that we isolate R&D from these pressures. So everything about the product process is about freeing up the .org R&D developers so they can focus on ideas and innovations.

Community Independence

By separating .org from .com it ensures that R&D can be bottom up user and community driven. This ensures a healthy eco system for ideas and innovation and collaboration - compared to a top down marketing driven model. The life cycle of .com and .org feeding into each other ensures the best of both worlds and help's maintain an important but delicate balance of innovation versus sanity and stability.

I should add that .org is still relevant and important for .com customers as it provides an open environment for them to get involved and upstream their work, which may eventually end up in the product.

Direct Impact on Road Map

Customers you have a direct line to influence roadmaps and bugs. Resources are prioritized for customers versus community jira's or mailing lists posts. It is also the only way to get Red Hat engineering resources of legacy releases, they will ignore .org legacy issues in the community.

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