What's Cooking in Xtext 2.0

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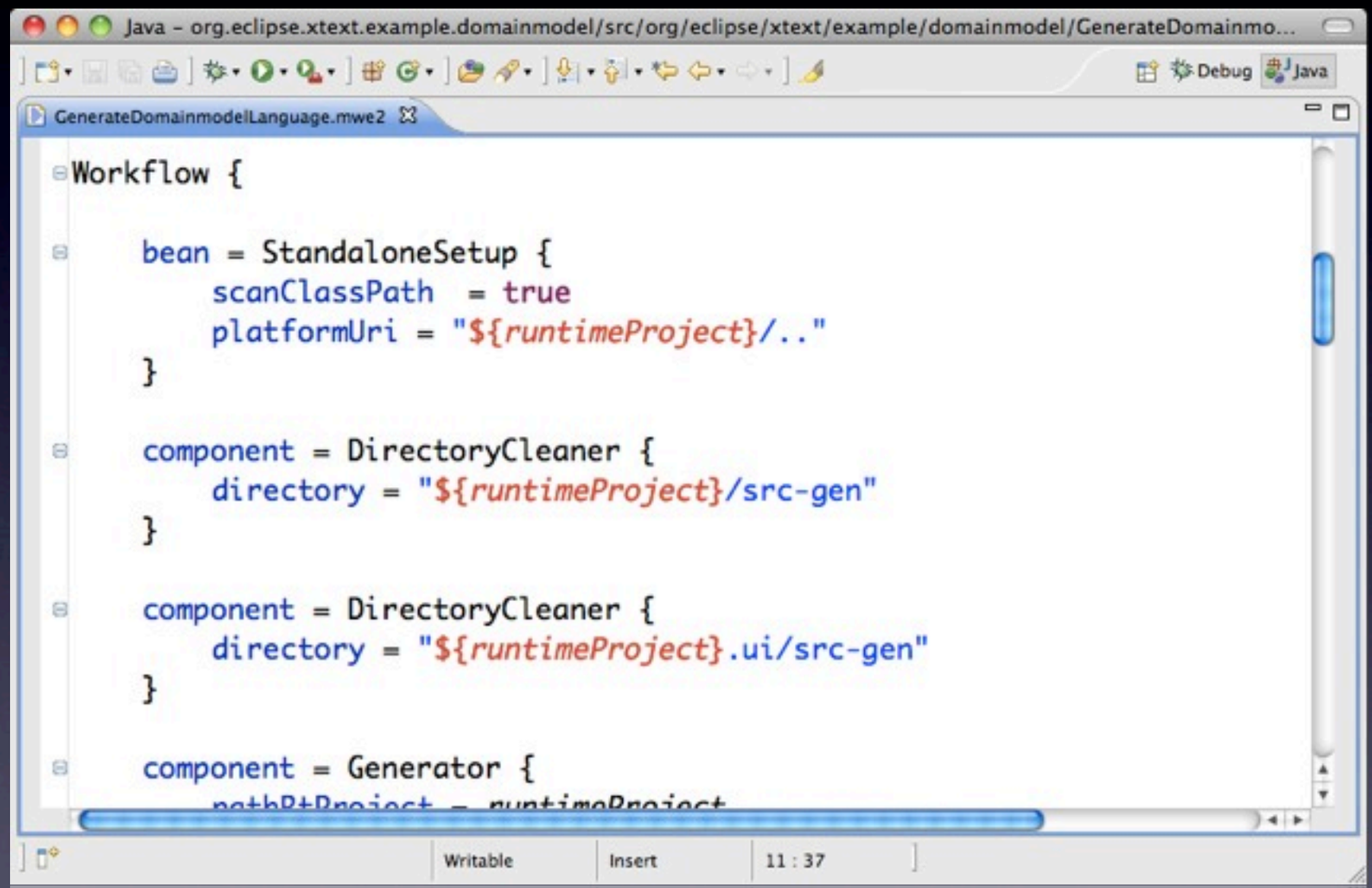
itemis

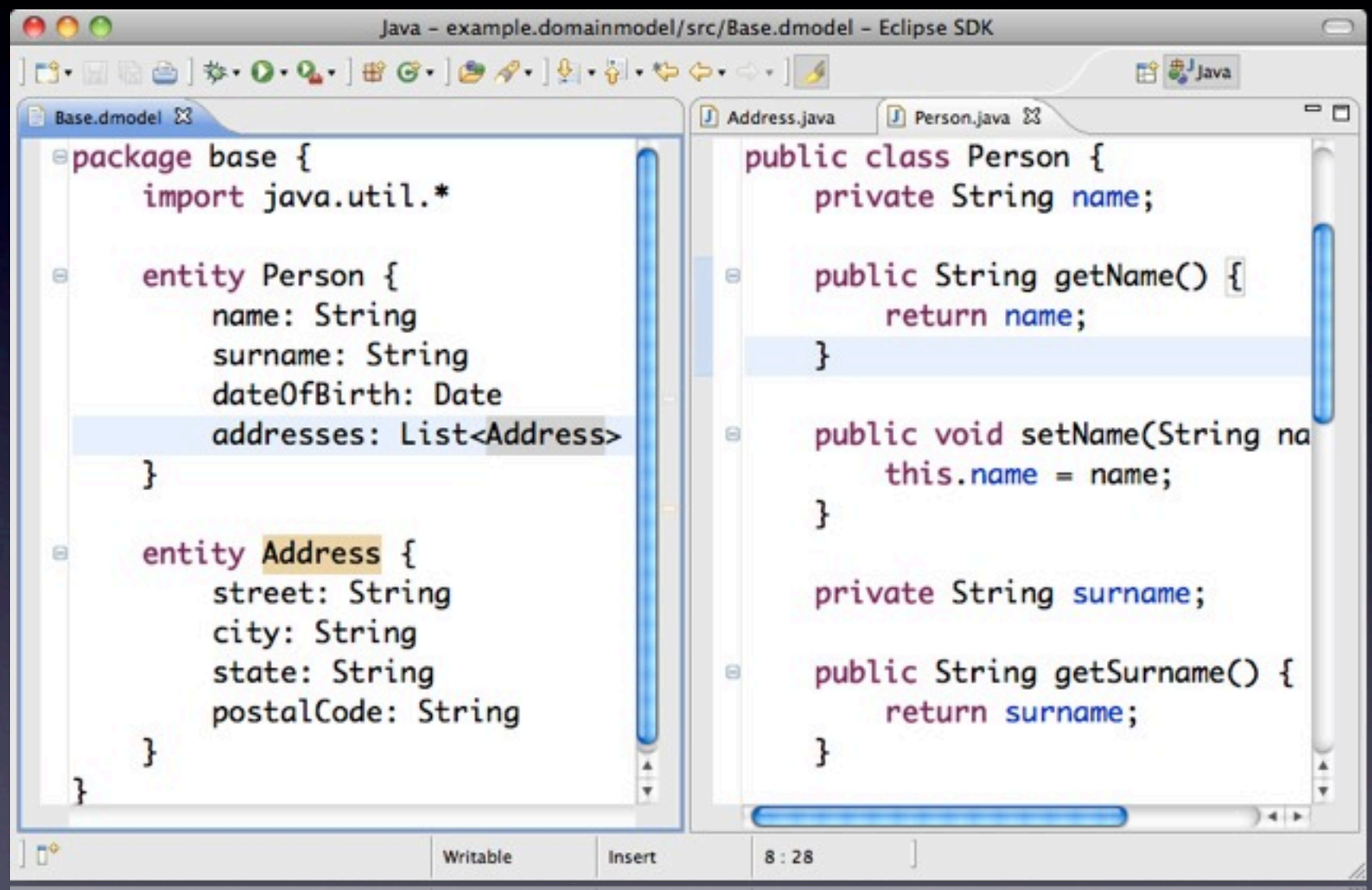
Xtext

A Language IDE Framework

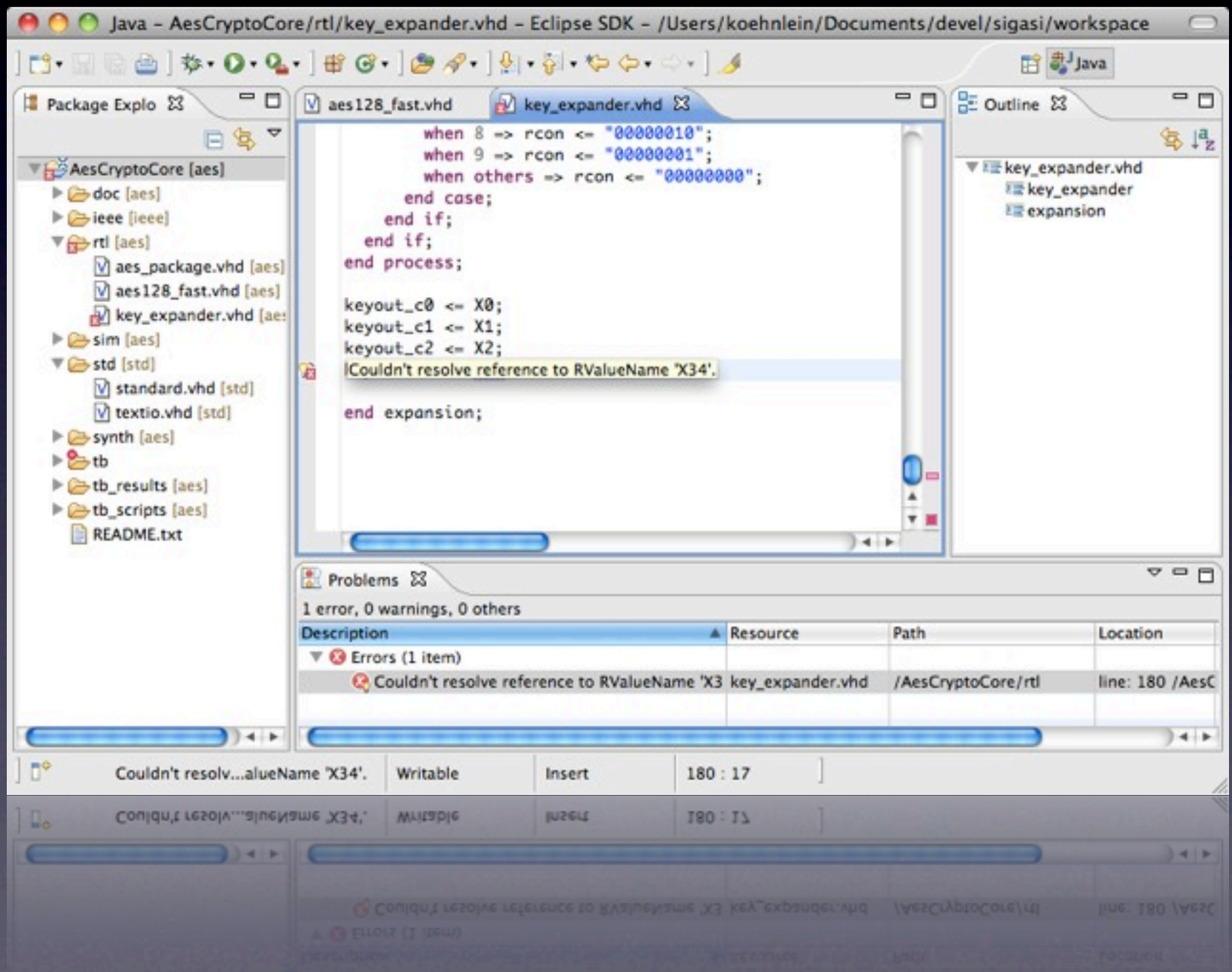
<NoXML/>


Java – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/GenerateDomainmo...
Debug
Java
GenerateDomainmodelLanguage.mwe2
Workflow {
bean = StandaloneSetup {
scanClassPath = true
platformUri = "${runtimeProject}/.."
}
component = DirectoryCleaner {
directory = "${runtimeProject}/src-gen"
}
component = DirectoryCleaner {
directory = "${runtimeProject}.ui/src-gen"
}
component = Generator {
Writable
Insert
11 : 37

Create Executable DSLs



Build IDEs for Existing Languages



Xtext 2.0

Java – example.domainmodel/src/Base.dmodel – Eclipse SDK

Test.xtend | Example.dmodel | Refactoring.dmodel | Reference.dmodel | Base.dmodel | Business.dmodel

```
import java.util.*

/**
 * <h1>Xtext Hover</h1>
 *
 * You can now define <em>hovers</em> for Xtext elements.
 * The default implementation parses comments in a JavaDoc-like fashion.
 * Any <em>HTML</em> is allowed, even
 * <a href="www.eclipsecon.org">hyperlinks</a> and images.
 * <img src="http://www.eclipse.org/eclipse.org-common/themes/Nova/images/ecl
 */
entity Person {
    nam
    sur
    dat
    add
}

entity
    str
    cit
    state: String
    postalCode: String
}
```

Entity **Person**

Xtext Hover
You can now define *hovers* for Xtext elements. The default implementation parses comments in a JavaDoc-like fashion. Any *HTML* is allowed, even hyperlinks and images.

Hover

Writable | Insert | 13 : 15

Java – example.domainmodel/src/Reference.dmodel – Eclipse SDK

Refactoring.dmodel

```
package refactoring {
    import java.util.List

    entity SomeName {
        name: String
        someRef : SomeName
    }

    entity YetAnother extends SomeName {
        op getIt(SomeName x) : SomeName {
            x
        }
    }
}
```

Reference.dmodel

```
package references {
    import refactoring.*
    entity InOtherFile extends SomeName {
        aRefTo : SomeName
    }
}
```

Writable | Insert | 3 : 36

Java – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK – /U...

Debug | Java

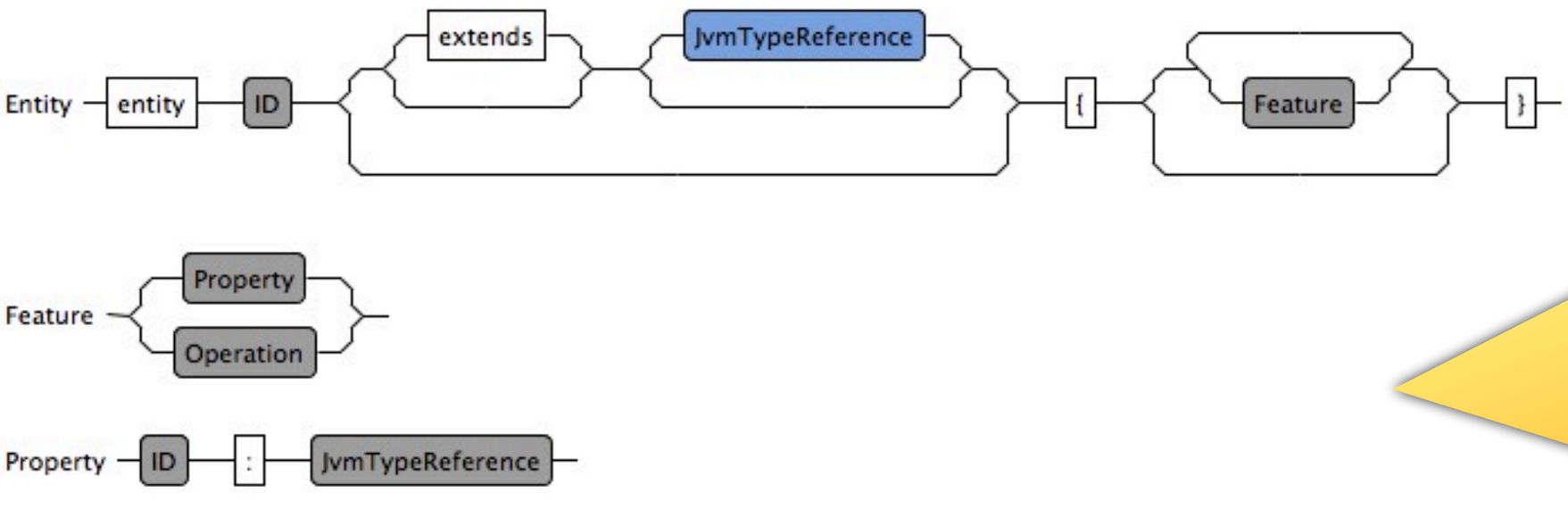
Domainmodel.xtext

```
Entity:
    'entity' name=ID ('extends' superType=JvmTypeReference)? '{'
        features+=Feature*
    '}';

Feature:
    Property | Operation;

Property:
    name=ID ':' type=JvmTypeReference;
```

Outline

- grammar org.eclipse.xtext.e:
  - generate domainmodel
  - DomainModel
  - AbstractElement
  - Import
  - PackageDeclaration
  - Entity
  - Feature
  - Property
  - Operation
  - Visibility
  - QualifiedNameWithWildCa

Xtext Syntax Graph

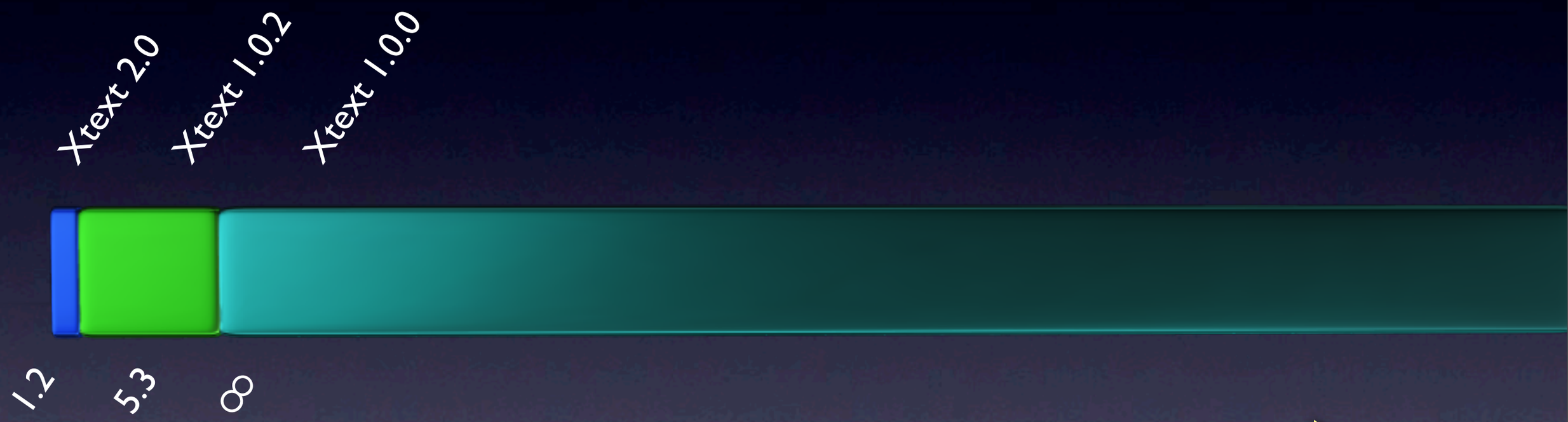


Syntax View

Writable | Insert | 27 : 52

Build Time [min]

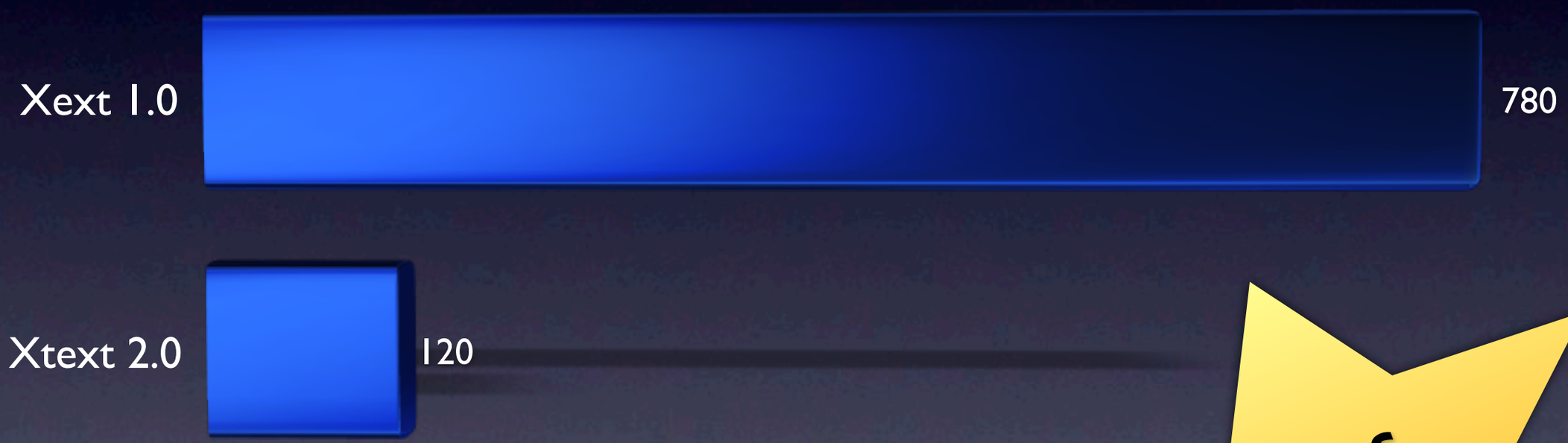
(4000 resources in 2 projects)



More Speed

Memory [MB]

(3MB very deep model)



Less Memory

Redesign

Outline

Serializer

Editing Experience

Expressions

```
<activeWhen>
    <iterate>
        <adapt type="org.eclipse.core.resources.IResource">
            <or>
              <test property="org.eclipse.core.resources.name"
                    value="*.java"/>
              <test property="org.eclipse.core.resources.name"
                    value="*.JAVA"/>
            </or>
        </adapt>
    </iterate>
</activeWhen>
```

Xtext 2.0

Xbase

DSLs unleashed

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
      - Sample.dmodel
  - META-INF
  - build.properties

*Sample.dmodel

```
package org.company {

    import java.util.List
    import org.company.types.*

    entity Person {
        firstName: String
        lastName: String
        gender: Gender


    }

}
```

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender

Problems | Javadoc | Declaration

0 items

Description	Resource	Path	Location	Type

Writable | Insert | 11 : 9

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - META-INF
  - build.properties

Sample.dmodel

```
package org.company {

    import java.util.List
    import org.company.types.*

    entity Person {
        firstName: String
        lastName: String
        gender: Gender

        op getFullName(): String {
            firstName + ' ' + lastName
        }
    }

}
```

Property **lastName : String**

Press 'F2' for focus

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender
    - getFullName() : String

Problems | Javadoc | Declaration

0 items

Description	Resource	Path	Location	Type

Writable | Insert | 8 : 17

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - META-INF
  - build.properties

Sample.dmodel

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender
    - getFullName() : String

New Source Folder

Source Folder

Create a new source folder.

Project name: sample — Browse...

Folder name: src-gen — Browse...

Update exclusion filters in other source folders to solve nesting

Cancel | Finish

Location | Type

sample

Screencast Runtime Instance Domainmodel

Java - sample/src-gen/org/company/Person.java - Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - src-gen
    - org.company
      - Person.java
  - META-INF
  - build.properties

Sample.dmodel | Person.java

```
package org.company;

import org.company.types.Gender;

public class Person {
    private String firstName;

    public String getFirstName() {
        return firstName;
    }

    public void setFirstName(String firstName) {
        this.firstName = firstName;
    }

    private String lastName;

    public String getLastName() {
        return lastName;
    }

    public void setLastName(String lastName) {
        this.lastName = lastName;
    }

    private Gender gender;
```

Outline

- org.company
- import declarations
- Person
  - firstName : String
  - getFirstName() : String
  - setFirstName(String) : void
  - lastName : String
  - getLastName() : String
  - setLastName(String) : void
  - gender : Gender
  - getGender() : Gender
  - setGender(Gender) : void
  - getFullName() : String

Problems | Javadoc | Declaration

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				

Writable | Smart Insert | 1 : 1

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - src-gen
    - org.company
      - Person.java
  - META-INF
  - build.properties

*Sample.dmodel

```
package org.company {

    import java.util.List
    import org.company.types.*

    entity Person {
        firstName: String
        lastName: String
        gender: Gender
        friends : List<Person>

        op getFullName(): String {
            firstName + ' ' + lastName
        }
    }

}
```

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender
    - friends : List<Person>
    - getFullName() : String

Problems | Javadoc | Declaration

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				

Writable | Insert | 10 : 31

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - src-gen
    - org.company
      - Person.java
  - META-INF
  - build.properties

*Sample.dmodel

```
package org.company {

    import java.util.List
    import org.company.types.*

    entity Person {
        firstName: String
        lastName: String
        gender: Gender
        friends : List<Person>

        op getFullName(): String {
            firstName + ' ' + lastName
        }
        op getSortedFriends(): List<Person> {
            friends.so
        }
    }

}
```

sort : List<T> - ListExtensions.sort()
sort(List<T> arg0, Comparator<? extends
sortBy(List<T> arg0, Function1<T,C> arg1

^␣ to show java-like propos

<T> List<T>
org.eclipse.xtext.xbase.lib.ListExtensions.s
st<T> list)

Press 'F2' fo

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender
    - friends : List<Person>
    - getFullName() : String
    - getSortedFriends() : List<P

Problems | Javadoc | Declaration

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				

Writable | Insert | 16 : 23

Screencast Runtime Instance Domainmodel

Java – sample/src/Sample.dmodel – Eclipse Platform

Java | Resource

Package Explor | Hierarchy

- sample
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
    - org.company.types
      - Gender.java
    - Sample.dmodel
  - src-gen
    - org.company
      - Person.java
  - META-INF
  - build.properties

*Sample.dmodel

```
package org.company {

    import java.util.List
    import org.company.types.*

    entity Person {
        firstName: String
        lastName: String
        gender: Gender
        friends : List<Person>

        op getFullName(): String {
            firstName + ' ' + lastName
        }
        op getSortedFriends(): List<Person> {
            friends.sortBy(ele.full)
        }
    }

}
```

fullName : String - Person.getFullName()

^. to show java-like proposals

Outline

- org.company
  - java.util.List
  - org.company.types.*
  - Person
    - firstName : String
    - lastName : String
    - gender : Gender
    - friends : List<Person>
    - getFullName() : String
    - getSortedFriends() : List<P

Problems | Javadoc | Declaration

0 errors, 1 warning, 0 others

Description	Resource	Path	Location	Type
Warnings (1 item)				

Writable | Insert | 16 : 36

Closures

Operator Overloading

Concise Syntax

Xbase

Full Generics

Compiled To Java

<Java> – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK

Debug <Java>

Package Explorer

- org.eclipse.xtext.example.domainmodel
  - JRE System Library [J2SE-1.5]
  - Plug-in Dependencies
  - src
  - src-gen
  - xtend-gen
  - META-INF
    - MANIFEST.MF
  - about.html
  - build.properties
  - plugin.properties
  - plugin.xml
  - plugin.xml_gen
- org.eclipse.xtext.example.domainmodel.t
- org.eclipse.xtext.example.domainmodel.u

*Domainmodel.xtext | *org.eclipse.xtext.example.domainmodel

```
/*******************************************************************************
 * Copyright (c) 2009 itemis AG (http://www.itemis.eu) and others.
 * All rights reserved. This program and the accompanying materia
 * are made available under the terms of the Eclipse Public Licen
 * which accompanies this distribution, and is available at
 * http://www.eclipse.org/legal/epl-v10.html
 *******************************************************************************/
grammar org.eclipse.xtext.example.domainmodel.Domainmodel with or

generate domainmodel "http://www.xtext.org/example/Domainmodel"

DomainModel:
    elements+=AbstractElement*;

AbstractElement:
    PackageDeclaration | Entity | Import;

Import:
    'import' importedNamespace=QualifiedNameWithWildCard;

PackageDeclaration:
    'package' name=QualifiedName '{'
        elements+=AbstractElement*
    '}';
```

Outline

- grammar org.eclipse.xtext.examp
  - generate domainmodel
  - DomainModel
  - AbstractElement
  - Import
  - PackageDeclaration
  - Entity
  - Feature
  - Property
  - Visibility
  - QualifiedNameWithWildCard
  - QualifiedName

Problems | Console | Progress | Search | Call Hierarchy | Properties

0 items

Description	Resource	Path	Location	Type

68M of 254M | Writable | Insert | 3 : 16

Montag, 11. Juli 2011

<Java> – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK

*Domainmodel.xtext

```
/*******************************************************************************
 * Copyright (c) 2009 itemis AG (http://www.itemis.eu) and others.
 * All rights reserved. This program and the accompanying materials
 * are made available under the terms of the Eclipse Public License v1.0
 * which accompanies this distribution, and is available at
 * http://www.eclipse.org/legal/epl-v10.html
 *******************************************************************************/
grammar org.eclipse.xtext.example.domainmodel.Domainmodel with org.eclipse.xtext.xbase.Xbase

generate domainmodel "http://www.xtext.org/example/Domainmodel"

DomainModel:
    elements+=AbstractElement*;

AbstractElement:
    PackageDeclaration | Entity | Import;

Import:
    'import' importedNamespace=QualifiedNameWithWildCard;

PackageDeclaration:
    'package' name=QualifiedName '{'
        elements+=AbstractElement*
    '}';

Entity:
    'entity' name=ID ('extends' superType=Entity)? '{'
        features+=Feature*
    '}';

Feature:
    Property;

Property:
    name=ID ':' type=Entity;

enum Visibility:
```

82M of 254M | Updating projects: (69%) | Writable | Insert | 8 :

<Java> – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK

Debug <Java>

*Domainmodel.xtext

```
generate domainmodel "http://www.xtext.org/example/Domainmodel"

DomainModel:
    elements+=AbstractElement*;

AbstractElement:
    PackageDeclaration | Entity | Import;

Import:
    'import' importedNamespace=QualifiedNameWithWildCard;

PackageDeclaration:
    'package' name=QualifiedName '{'
        elements+=AbstractElement*
    '}';

Entity:
    'entity' name=ID ('extends' superType=JvmTypeReference)? '{'
        features+=Feature*
    '}';

Feature:
    Property ;

Property:
    name=ID ':' type=JvmTypeReference;

enum Visibility:
    public | private | protected;

QualifiedNameWithWildCard :
    QualifiedName  ('.' '*')?;

QualifiedName:
    ID ('.' ID)*
;
```

88M of 254M | Writable | Insert | 32

<Java> – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK

Debug <Java>

*Domainmodel.xtext

```
generate domainmodel "http://www.xtext.org/example/Domainmodel"

DomainModel:
    elements+=AbstractElement*;

AbstractElement:
    PackageDeclaration | Entity | Import;

Import:
    'import' importedNamespace=QualifiedNameWithWildCard;

PackageDeclaration:
    'package' name=QualifiedName '{'
        elements+=AbstractElement*
    '}';

Entity:
    'entity' name=ID ('extends' superType=JvmTypeReference)? '{'
        features+=Feature*
    '}';

Feature:
    Property | Operation;

Property:
    name=ID ':'

enum Visibility
    public | pr

QualifiedNameWi
    QualifiedNa

QualifiedName:
    ID ('.' ID)
;
```

Create rule 'Operation'

Create rule 'Operation'

77M of 254M

Writable | Insert | 32

<Java> – org.eclipse.xtext.example.domainmodel/src/org/eclipse/xtext/example/domainmodel/Domainmodel.xtext – Eclipse SDK

Debug <Java>

*Domainmodel.xtext

```
generate domainmodel "http://www.xtext.org/example/Domainmodel"

DomainModel:
    elements+=AbstractElement*;

AbstractElement:
    PackageDeclaration | Entity | Import;

Import:
    'import' importedNamespace=QualifiedNameWithWildCard;

PackageDeclaration:
    'package' name=QualifiedName '{'
        elements+=AbstractElement*
    '}';

Entity:
    'entity' name=ID ('extends' superType=JvmTypeReference)? '{'
        features+=Feature*
    '}';

Feature:
    Property | Operation;

Operation:
    'op' name=ID '(' (parameters+=JvmFormalParameter (',' parameters+=JvmFormalParameter)*)? ')'
        ':' returnType=JvmTypeReference
        body=XB
    ;

Property:
    name=ID '
enum Visibili
    public |
```

XAdditiveExpression
XAndExpression
XAssignment
XBlockExpression
XBooleanLiteral
XCasePart
XCastedExpression
XCatchClause
XClosure
XConstructorCall

ParserRule **XExpression**

78M of 254M