SRML Editor Tutorial (1)

CO7205 Advanced System Design

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Lab sheet and materials

http://www.cs.le.ac.uk/srml/



Introduction

service EasyBank is

```
components
```

```
EB : easyBank {
            intOR[init] : x INIT;
            intOR[term] : x FINAL;
        }
requires
    IS : invoiceService {
```

```
intGA[trigger] : default;
}
```

```
provides
```

BU: buyer

```
wires
        BE {
            nodeA BU;
            nodeB EB;
            connector {
                attachmentA {
                     placeOrder => S;
                         product=> i;
                 3
                attachmentB {
                     placeOrder => R;
                3
                interaction protocol straightP;
```

Functionalities:

 SRML code generation Wizard •Use Case → SRML wizard SRML document visualization •Syntax coloring Syntax checking / Error markers •Code completion (CTRL-Space) Navigation (holding the CTRL key and left-clicking) Code Folding •Outline Quick Outline (press CTRL-O)

Start SRML Editor in MSc lab

- Lab sheet and materials <u>http://www.cs.le.ac.uk/srml/</u>
- Start Eclipse 3.4
- Create a new workspace e.g. workspace_SRML

Workspace Launcher	X
Select a workspace	
Eclipse SDK stores your projects in a folder called a workspace. Choose a workspace folder to use for this session.	
Workspace: /home/hongyi/workspace_SRML	Browse
Use this as the default and do not ask again	OK Cancel

Create a SRML project

(1) Open project wizard window from eclipse menu

File->New->Other

File	<u> </u>				
	New	Alt+Shift+N ►	遪	Java Project	
	Open File		C2	Project	
			Ċ	Task	
			D.	Example	
			C2	Other Ctr	rl+N
	E	New			
		1 3 3 3 3			

(2) Type **SRML** here to search for SRML wizard.

(3) Select *srml Project* and click **next**

► New	×
Select a wizard	*
<u>W</u> izards:	
SRML	
 ✓ Srml Model Creation Wizards ✓ Srml Model ✓ Stext DSL Wizards ③ srml Editor file srml Project ✓ Examples ④ Srml Diagram 	
Image: Care state s	ncel



Write your first SRML - EasyBank

Step by Step

Please refer to Lecturer note -http://www.cs.le.ac.uk/srml/tutorial/easyBank_example.pdf



Create project with SRML wizard

(4) Create new project: Use *easyBank* as deafult project name and click Next

e			×		
Xtext DSL srml Proje	t				
Xtext DSL srml Project					
Project name: easyBank	:				
Use <u>d</u> efault location	E				00
Location: /home/hongy	SRML Wizard - Ger	eral Information			
	Specify a name for SRM	4L module (e.g. TravelBooking	g XXX)		
	CDMI				
(?)	SKIIL				
	SRML Module Name	easvBank			
	(?)	< <u>B</u> ack <u>N</u>	ext >	Einish	Cancel

(5) Type *easyBank* as SRML Module name then click Cext



	E		00
	SRML Wizard - Data Type		
1	Define data types used in the SRML specification		
	Add default SRML primitive Datatype		
	Primitive type		
	[SRML DataTypes]		Add
			Delete
🗖 Data	а Туре		Edit
Name	EasyBankType]	Rename
	OK Cano	el	
	? < <u>Back</u> <u>N</u> ext >	Einish	Cancel

DATATYPES

sorts: ProductType, BillType

(6) Add new data type
sets select [SRML
DataTypes] from SRML
data type window and
click "Add" button to
add a new data type
"EasyBankType"
As shown on the left.

(7) Edit data type sets-

Select "*EasyBankType*" node we just added and click "*Edit*" on the right. You should be able to see the Data Type Editor (next page) 7

SRML Data Type

SRML	L Datatype Editor				(
Dataty	pe Name Ea	svBankTvpe			
Primiti	ve Type Enumer	raction Type	Imported Types		
	SRML DataType		MappedTo		Add
	BillType	String		~	Delete
	em rype	oding			Delete
				ОК	Cancel
- 0	(SRML DataTy	/pes]			
	🕖 EasyBankT	ype			
	B BOOI				
	0000				

(6) Add new data structure to the data type set –

In easyBank example, we will need these two data types: ProductType and BillType , both of them are mapped to primitive data type String.

(7) Similarly, add other two data type sets: воог and string, which mapped to Bool and String respectively, as shown on the left.

SRML Specification

We will use SRML Editor wizard to generate following SRML Specification:

BUSINESS ROLE easyBank is

INTERACTIONS

rcv placeOrder

A product:ProductType

s&r doinvoice

product:ProductType

🖂 bill:BillType

snd forwardBill

A bill:BillType

ORCHESTRATION

BUSINESS PROTOCOL invoiceService is

INTERACTIONS

r&s doInvoice

A product:ProductType

⊠bill:BillType

BEHAVIOUR

BUSINESS PROTOCOL buyer is

•••

....



SRML Specification

Textual representation for SRML notation:



SRML Specification-Business Role

E

SRML Wizard - Specification

Create Business Role, Business Protocol, Layer Protocol and Interaction Protocol in the SRML specification

	Business Role
(B) easyBank	Name easvBank data type
	Datatypes available Importee
	BOOL EasyBankType
	STRING 55
	<<
< <u> </u>	
Add Delete	
add Node	
(?) < Back	Next > Einish Cancel

(8) Add Specification nodes -Click on "SRML Specification" node than click "Add" button, you can add new Business Role, Business Protocol Layer Protocol and Interaction Protocol to SRML Specification.

(9) Import data type
sets – Import *EasyBankType* to
Business Role
easyBank.

SRML Specification-Business Role

New Interact	ion		
Туре	rcv		v
Name	placeOrder		
ОК		Cancel	

(10) Add Interaction -

Select Business Role *easyBank* and click on *Add* Button to add a new interaction. Here we can give a name e.g. *placeOrder* as interaction name and selected rcv as interaction type.

SRML Wizard - Specification

Create Business Role, Business Protocol, Layer Protocol and Interaction Protocol in the SRML specification

 ✓ ● SRML Specification ✓ ⊕ easyBank 	Interaction placeOrder General Parameters Return
<pre> placeOrder Add Delete </pre>	Event Type Data Type Variable request ProductType product
0	< Back Next > Einish Cancel

(11)Add Interaction Parameter –

Switch to Parameters tab and add a new parameter **product** of **ProductType**. Select (*request*) as interaction event type.

SRML Specification-Business Role

SRML Wizard - Specification Create Business Role, Business Prot

 SRML Specification SRML Specification easyBank placeOrder doInvoice forwardBill
 ✓ B easyBank I placeOrder I doInvoice I forwardBill
placeOrder doInvoice forwardBill
doInvoice forwardBill
🛈 forwardBill
<<>
Add Delete

(12)Now let's add other two interactions: *dolnvoice forwardBill* as defined in lecturer note:



SRML Specification-Business Protocol

6

00

SRML Wizard - Specification

Create Business Role, Business Protocol, Layer Protocol and Interaction Protocol in the SRML specification

Importec	Imported Imported Imported Imported Imported BOOL STRING STRING Add Delete	Þ 🕕 in	asyBank woiceService	Name buver	
Image: placeOrder BOOL EasyBankType Image: placeOrder STRING >> Image: strain st	Image: placeOrder BOOL STRING STRING STRING Add Delete BOOL STRING String String String String String String String String Delete Bool String String <	- 🕫 b	uyer	Datatypes available	Importec
receiveBill STRING >> <	Image: String >> Add Delete	e	placeOrder	BOOL	EasyBankType
<	Add Delete				<<
Add Delete		<			

(12)The same for Business Protocol *invoiceService* and *Buyer*

BUSINES	SS PRO	DTOCOL	invoiceService	is
INTE	RACTION	45		
r&s	doInv	voice		
	A 1	produc	t:ProductType	
	⊠b	ill:Bi	llType	
BEHA	VIOUR			
BUSINES	S PRO	TOCOL	buyer is	
BUSINES	S PRO	TOCOL	buyer is	
BUSINES	S PRO	o TOCOL s order	buyer is	
BUSINES INTER SNd	S PRO ACTION place	TOCOL s Order produc	buyer is t:ProductType	
BUSINES INTER Snd rcv	S PRO RACTION place A recei	o TOCOL s Order produc veBill	buyer is t:ProductType	
BUSINES INTER Snd rcv	S PRO ACTION place A recei A 1	order produc veBill bill:B:	buyer is t:ProductType illType	
BUSINES INTER Snd rcv BEHAV	S PRO AACTION place A recei A 1 VIOUR	order produc veBill bill:B:	buyer is t:ProductType illType	

(13) Click Next when you finish.



SRML Module Node

Let's add these module nodes :



EB:

easyBank

IS:

nvoiceServic

Provide Interface

Component

Require Interface



	0
SRML Wizard - SRML Module configuration	
Create and initialise SRML Component and Interfaces	
Components Requires Provides Uses Serves Wires	
Business Role Component Name Add	
easyBank EB Delete	
< Back	Cancel

(13) Switch to
 Components tab in
 SRML Module
 configuration window
 then add component
 EB of type *easyBank*



	00
ML Wizard - SRML Module configuration	
eate and initialise SRML Component and Interfaces	
omponents Requires Provides Uses Serves Wires	
Business Protocol Require Interface Add	
invoiceService VIS	

(14) Switch to *Requires* tab in SRML
Module configuration
window then add
require interface *IS* of
type *invoiceService*



	00
SRML Wizard - SRML Module configuration Create and initialise SRML Component and Interfaces	
Components Requires Provides Uses Serves Wires	
Business Protocol Provide Interface Add	
buyer >>BU Delete	
Image: Section of the section of t	Cancel

(15) Switch to **Provide** tab in SRML Module configuration window then add require interface **BU** of type **buyer**

Create SRML Wires

New Wire						0						
Name (BI)						ж		(16	6) Add	Wires		
Node A IEB	Iow Wire	→	Node B IS	•	Ca	ncel		BE	E (BU-	→EB)		
	Name BE					ОК				BI	(EB→	S)
ſ	Node A BU		\rightarrow	Node B EB		Cancel						
	_	_		D IS			••	50	- Cum Broosta			
SRML Wiza Create and i	ard - SRMI nitialise SRMI	_ Module _ Compone	configurat nt and Interf	tion aces						,		
Componer	nts Require:	s Provides	: Uses Sen	ves Wires				BU: uyer	BE -	EB: easyBank	는 티 - 🏠	IS: voiceService
Na	ame : PE SS	nodeA :	_ →		nodeB							
	BI 🗆	EB	→		IS							_
				Add	Delete							
(?)		<	Back	<u>N</u> ext >	Einish	Cancel						10

Finished ! Click Finish to generate code.*



* If error occurs, please change *activity ... enda* pair to *service ..ends*



Visualize SRML file

- To enable Graphical Editor (GE), you can right click model.srml and select initialise srml_diagram_file
- Double click model.srml_diagram to open GE.





Functionalities:

(1)Create component and interface(2)Create wires between them(3)Reflect update to the source code in textural editor

Complete your EasyBank example

• Task

- Get familiar with basic SRML syntax
- Write a Business Role and Business Protocol without wizard.
- Try adding one Require Interface "DeliveryService" to the existing SRML file with the Graphical Editor



•Tips:

- (1) Read a completed SRML document:
 - http://www.cs.le.ac.uk/srml/example/travelBooking.txt
- (2) Full SRML syntax specification (BNF-linked grammar) can be found here:

http://www.cs.le.ac.uk/srml/example/srml_grammar.txt



SRML Modelling Environment Installation

SRML Modeling Environment is an Eclipse plugin thus can be installed and run on any platforms (windows/Linux)

- The latest version of SRML Model environment can found on this update site: <u>http://www.cs.le.ac.uk/srml/milestone/update/site.xml</u>
- **Step I** download Eclipse 3.4 from (Eclipse 3.4 SR2 (Ganymede)
- http://www.eclipse.org/downloads/packages/release/ganymede/sr2
 - * Please download this release: "Eclipse Modeling Tools (includes Incubating components))
- Step 2 install openArchitectureWare 4.3.1 for Eclipse 3.4/SDE from <u>http://www.openarchitectureware.org/updatesite/milestone/site.xml</u> (Menu: Help->Software Updates->Availables Software->add Site)



SRML Modelling Environment Installation

- Step 3 install SRML Modeling Environment from http://www.cs.le.ac.uk/srml/milestone/update/site.xml
- (Menu: Help->Software Updates->Availables Software->add Site)

Installed Software Available Software		-	Install
Name	Version	*	
 ☐ ④ Eclipse Update Site ☐ ④ EMF Update Site ☐ ④ EPP Usage Data Collector Update Site 		E	Properties
Ganymede Gong GMF Update Site Gong GMF Update Site Gong GMF Update Site	vml		Add Site
Interview of the second sec			Manage Sites
Intep://download.ecipse.org/toors/ger/update-site/releases/siteArin Shttp://actinice.com/f.2 v/ III		T.	Re <u>f</u> resh
Show only the latest versions of available software			
☑ Include items that have already been installed			
Open the 'Automatic Updates' preference page to set up an automatic update sche	edule.		
2			Close

Once the installation is completed, go to File->New->Other->srmlProject

and follow the wizard to generate a simple SRML file.