XService Workflow Designer Users Manual

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Table of Content

Picture Explication

Table Explication

1 Summarization

1.1 Background Introduction

This task root in Nation 863 high science and technology plan named “Net environmental system software core technique and workbench”, its number is 2001AA113030；

Based on this task, researching goal is advanced as follows: via research of Web Services and BPEL’s principles，to design and to develop a modeling system and web services workflow cooperating platform , to build model for assembling Web Service application visually.

1.2 Principles Introduction

Via provide visual look，accepts input of user(the person who is modeling),achieve assemble Web Services visually namely sequenced work flows’ definition files — BPEL(Businesses Process Executive Language) and extended elements files, and finally build work flows engine executive unit work for engine parsing and execute.

1.3 Designation Introduction

Work flow modeling tools is composed of WSDL importing module, WSDL simulating module, WSDL elements registering module, user login module, user interface module, control module, model data module, embedded engine and permanence module ,deploying cell creating module.。via all module cooperation, achieve model work flows and create executive files.

1.4 Production Introduction

XService Workflow model Design software（namely ACT WSWD）is a based on Web services assembled opened standard process modeling tools. It aim at providing supports for Web Service assembled applications .ACT WSWD modeling tools provide two types modeling style: one is based on design modeling mode, another is based on assembling Web services modeling mode. The first one is used when Web services assembled are not provided. Exactly it means when modeling, Web services are not exited which can be used in assembling, function must be simulated when modeling, such as provide a mechanism defining the names of portType, operation and message. When implemented web services are provided, the portType can be displaced by another portType which has the same name, so can the message.

The second type is suitable when Web services are already exited when modeling.， just import to real web services' WSDL to parse, and used by model.

Further, ACT WSWD modeling tools also provides some functions ,such as ,workflow debugging, toggling breakpoint at certain workflow's activity, and checking if the workflow is suitable via examine current variable, thereby, workflow's correctness can be insured for modeling personnel.

2 Term and Abbreviation（Table）

Term and Abbreviation	Illumination
WSDL：	Web Service Descriptions Language
BPEL	Business Process Execution Language for Web Services
Flow	Web services logical assemblage
Activity	Elements which are make of flow
Work flow engine	Solve the execution of assembled web services under the condition of loose coupling and different structured Web
Modeling	Process of defining abstract flow or executive work flow

表 1 Term and Abbreviation

3 Usage

3.1 Function presentation

3.1.1 Software rank function

- Startup, close and help in software

Run software:

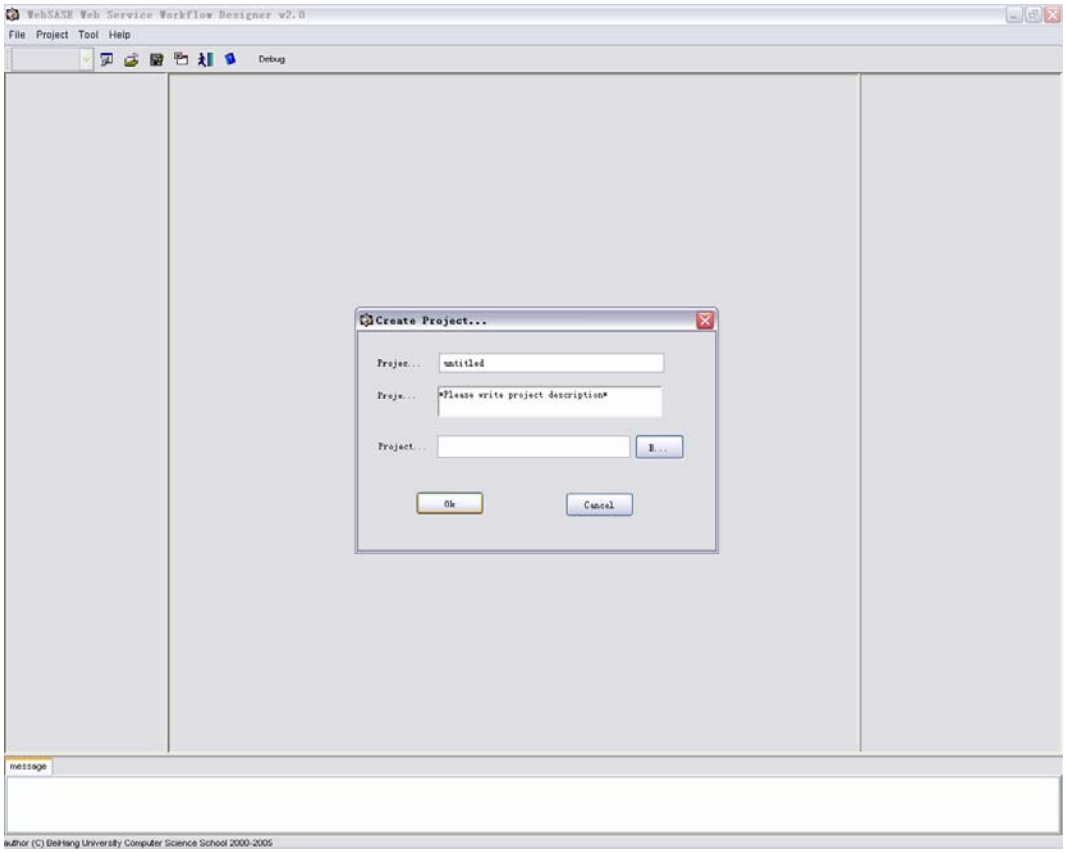
Close software，press “exit ”icon or select “file—exit” or press the icon “X” on the top right corner.

Obtain help information , press the icon “help”

3.1.2 Project rank function

- New project

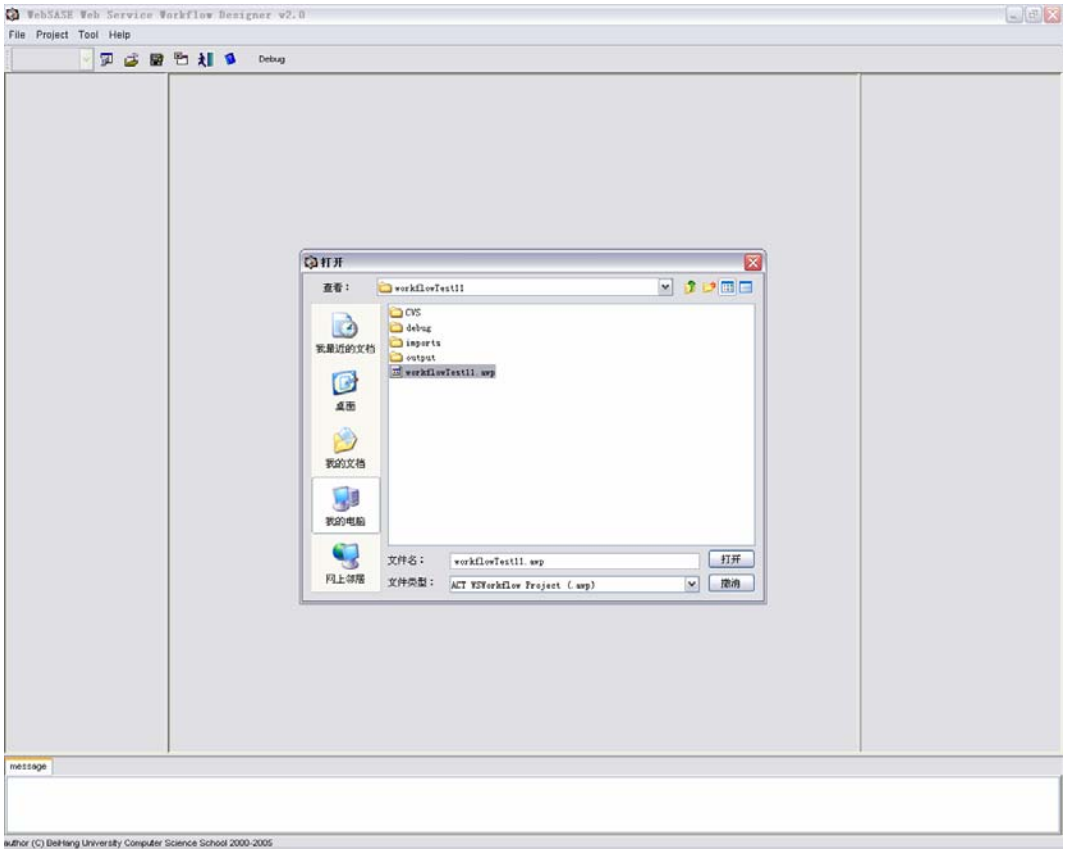
Press icon “new project ” or select “file—new project”，fill project’s name and description information and site at attribute frame , the press OK .



Pic 1 New a project

- Open project

Press the icon “open project ”or select “file –open project””, then select the deserved-open project (file as *.awp), press OK.



Pic2 Open a project

- Save project

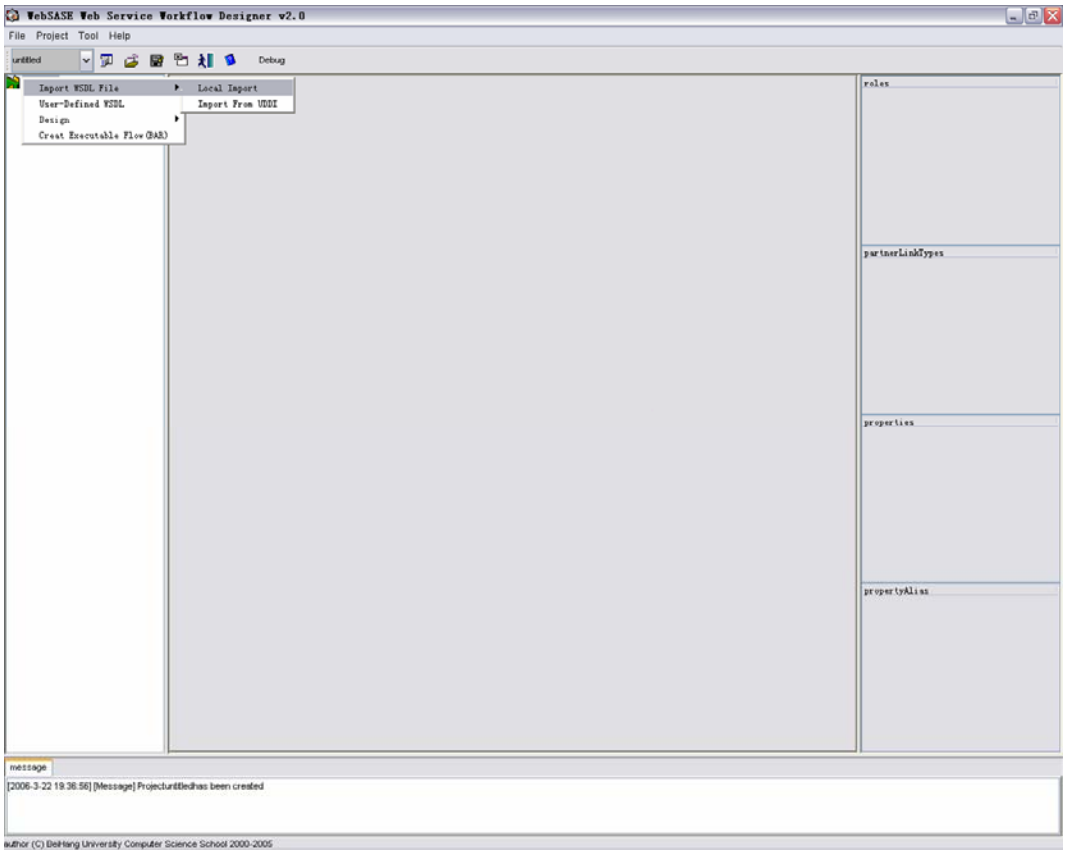
Press icon “save project” or select “file---save project”

- Close project

Press icon “close project” or select “file---close project”

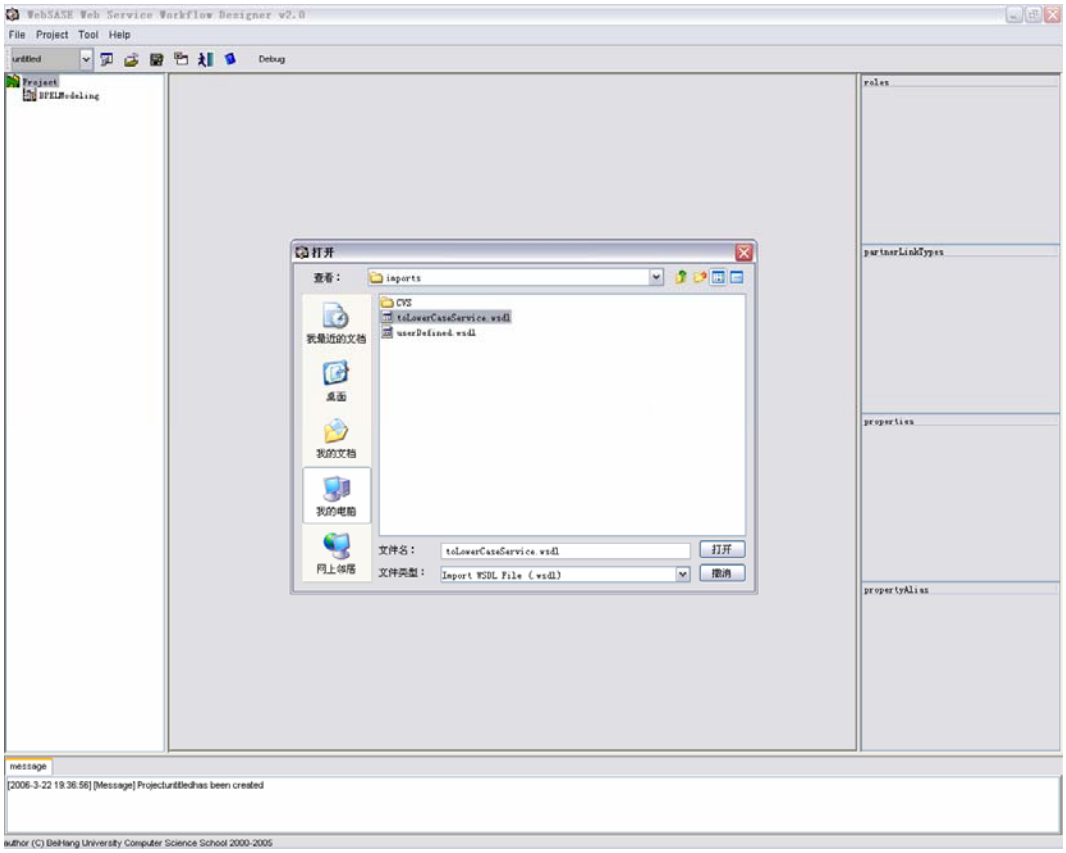
- Import local WSDL file

At the view of project tree, select icon project, press right button, and select “import WSDL file---local import”



Pic3 Import WSDL file---- import from local site

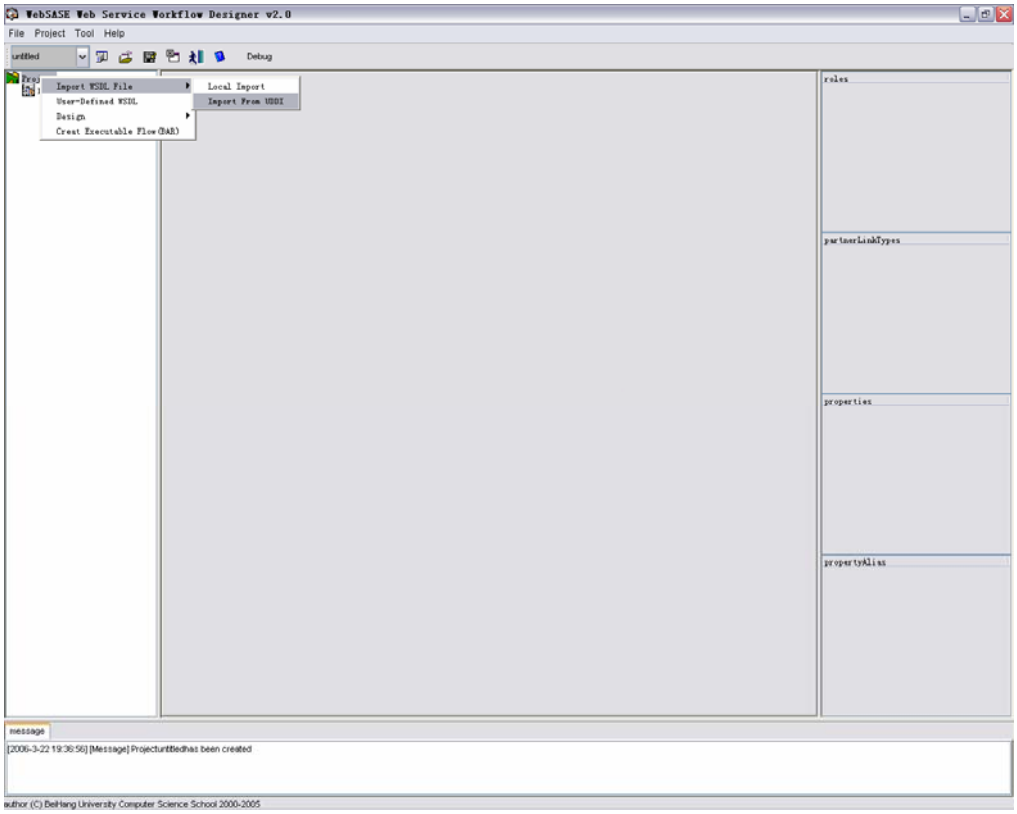
Then select deserved file and press open



Pic4 Import WSDL file ----select a file from local site

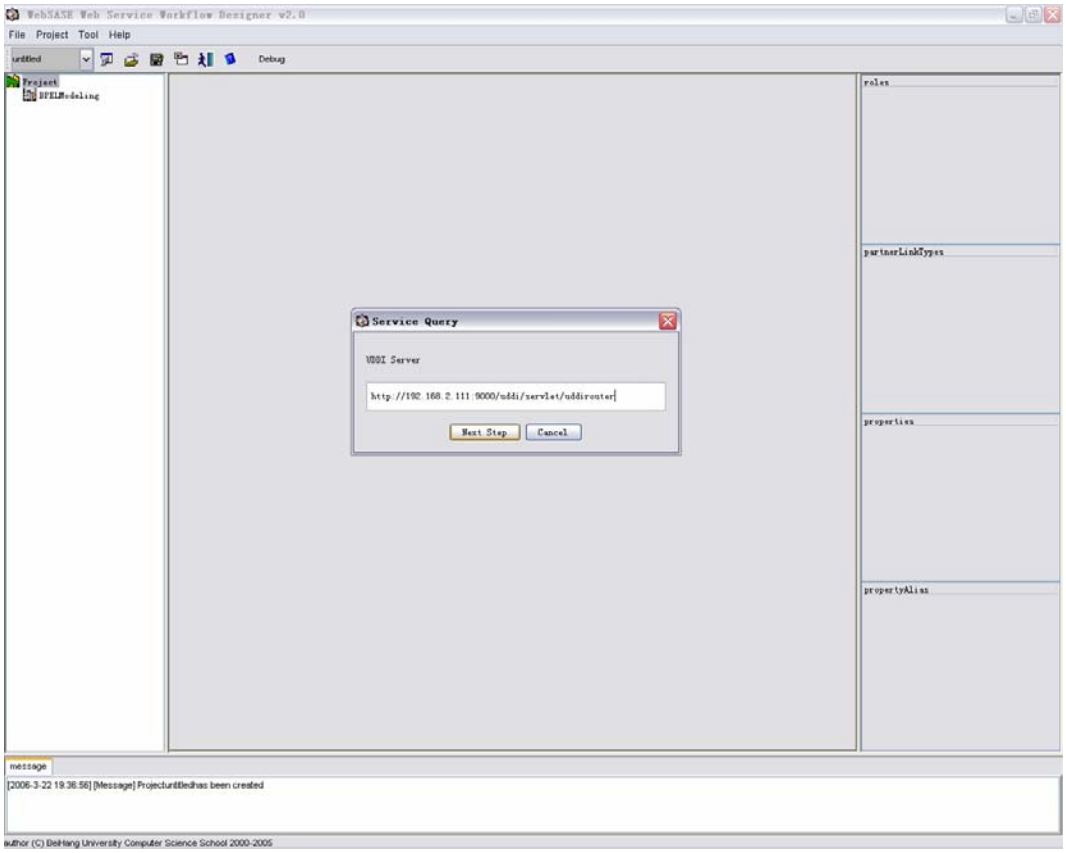
■ Import WSDL file from UDDI

At the view of project tree, select icon project, press right button, and select “import WSDL file---query from UDDI”



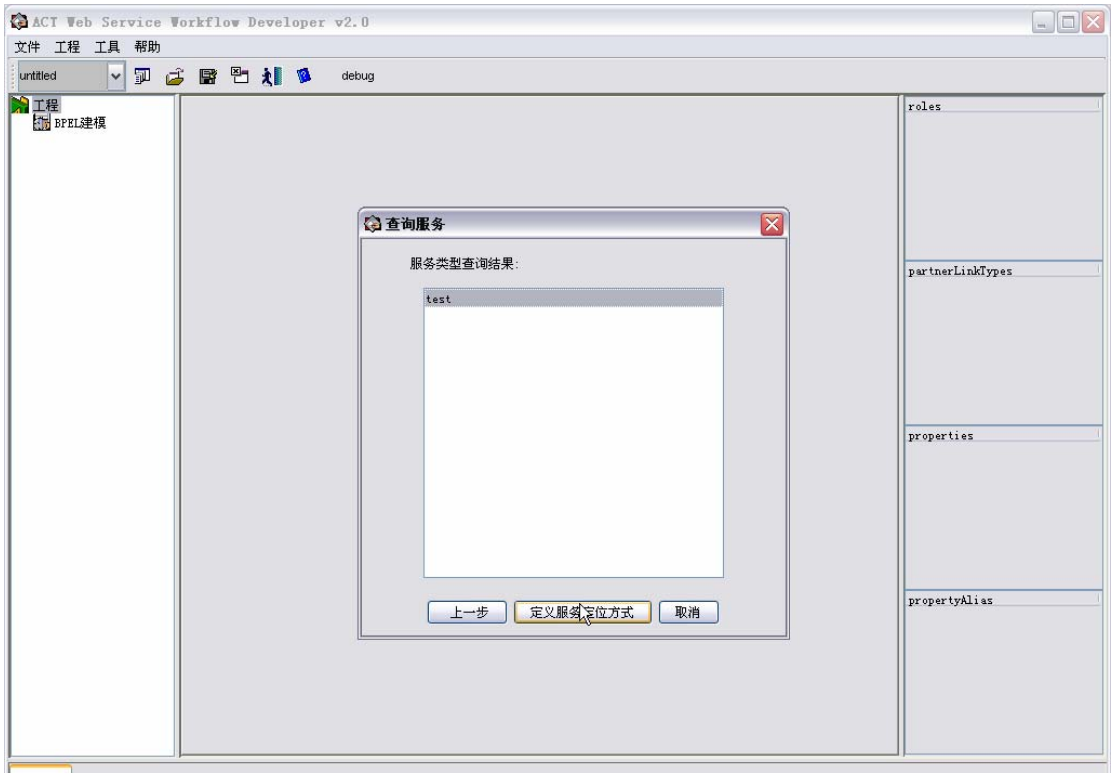
Pic5 Import WSDL file---- check from UDDI

Fill correct UDDI server address, then press next



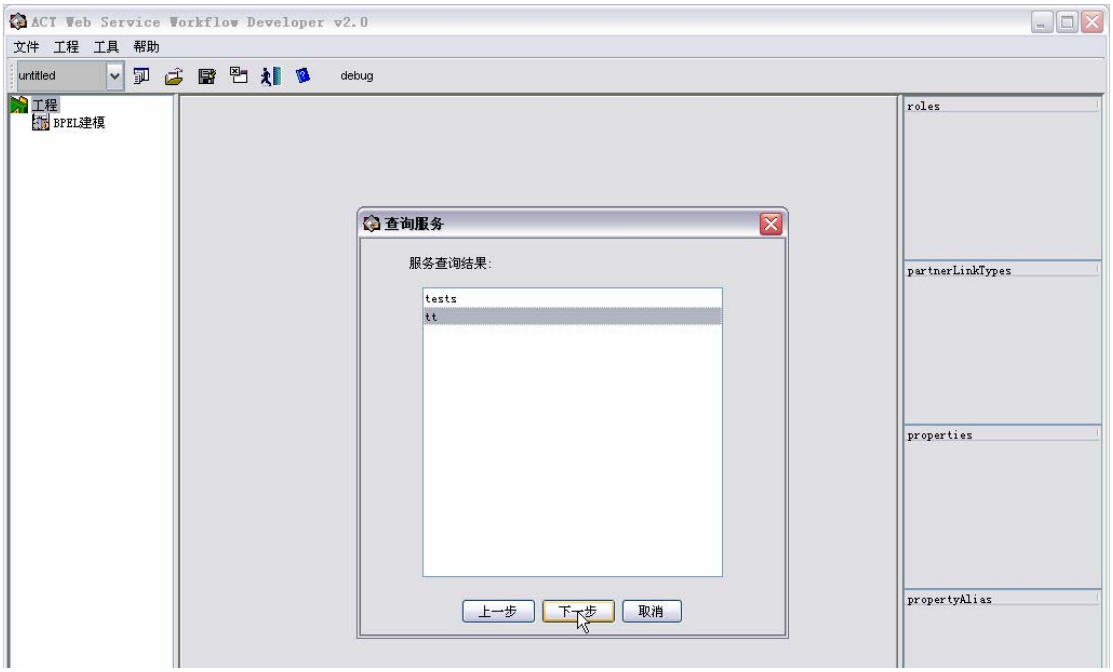
Pic6 Fill UDDI server address

Select deserved Model, then press" define locating server mode"



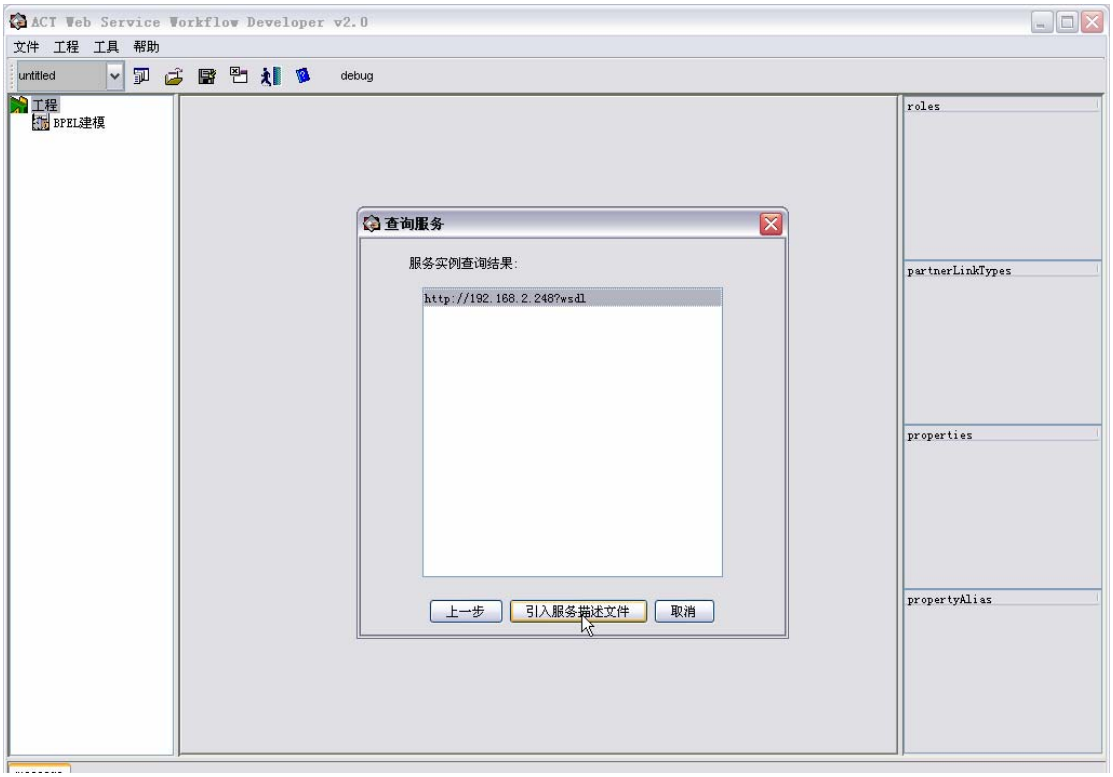
Pic7 Checking Result of service's type

Select deserved server , then press next



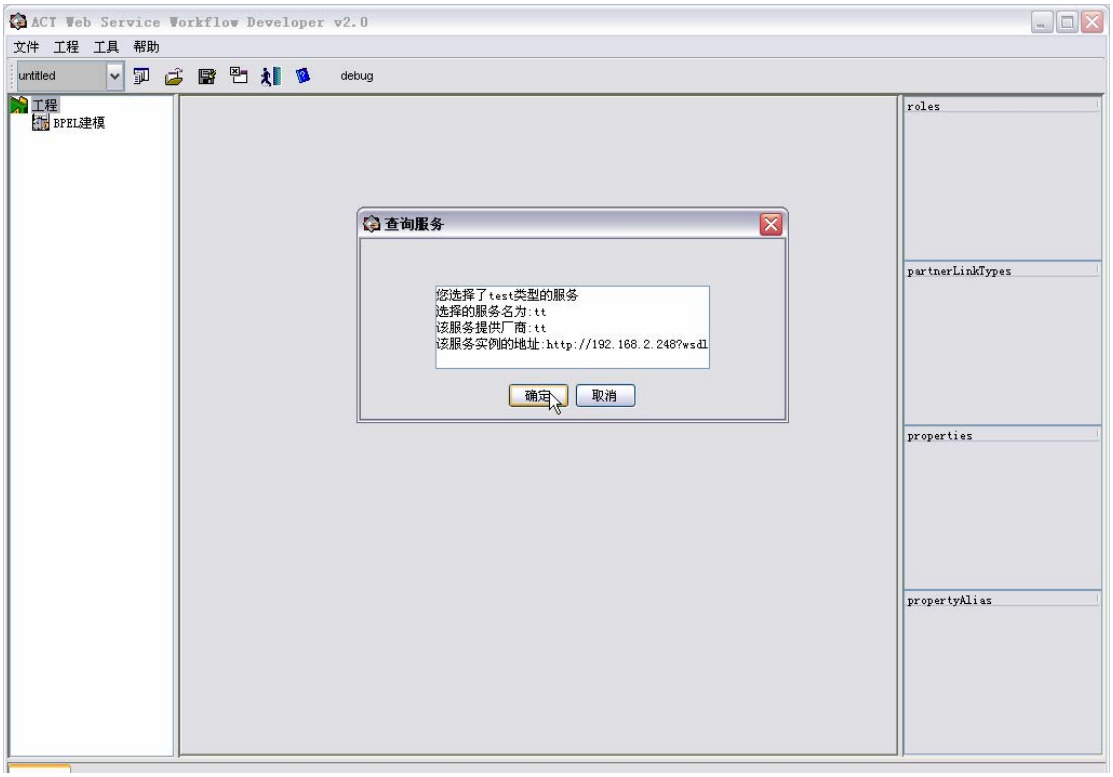
Pic8 Result of querying services

Select result of querying services instance, press “import services description file”



Pic9 Result of querying services instances

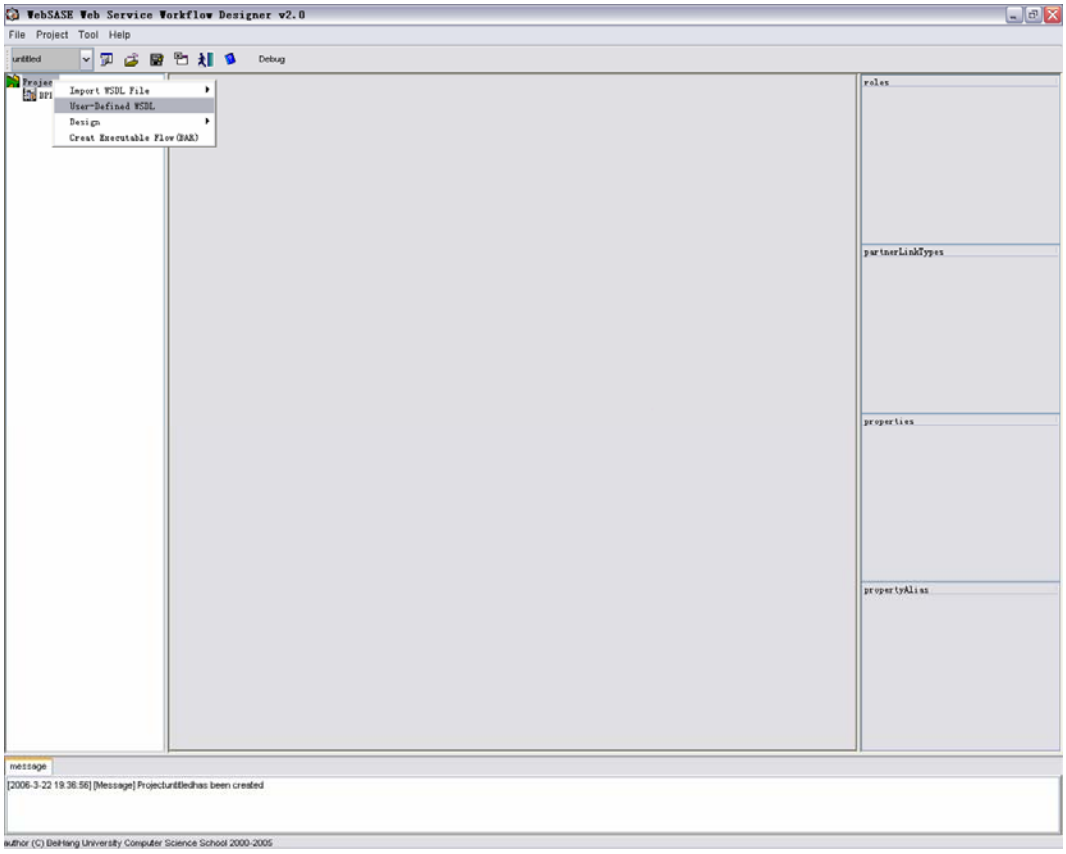
Examine services information, press “OK ”



Pic10 Services instance information

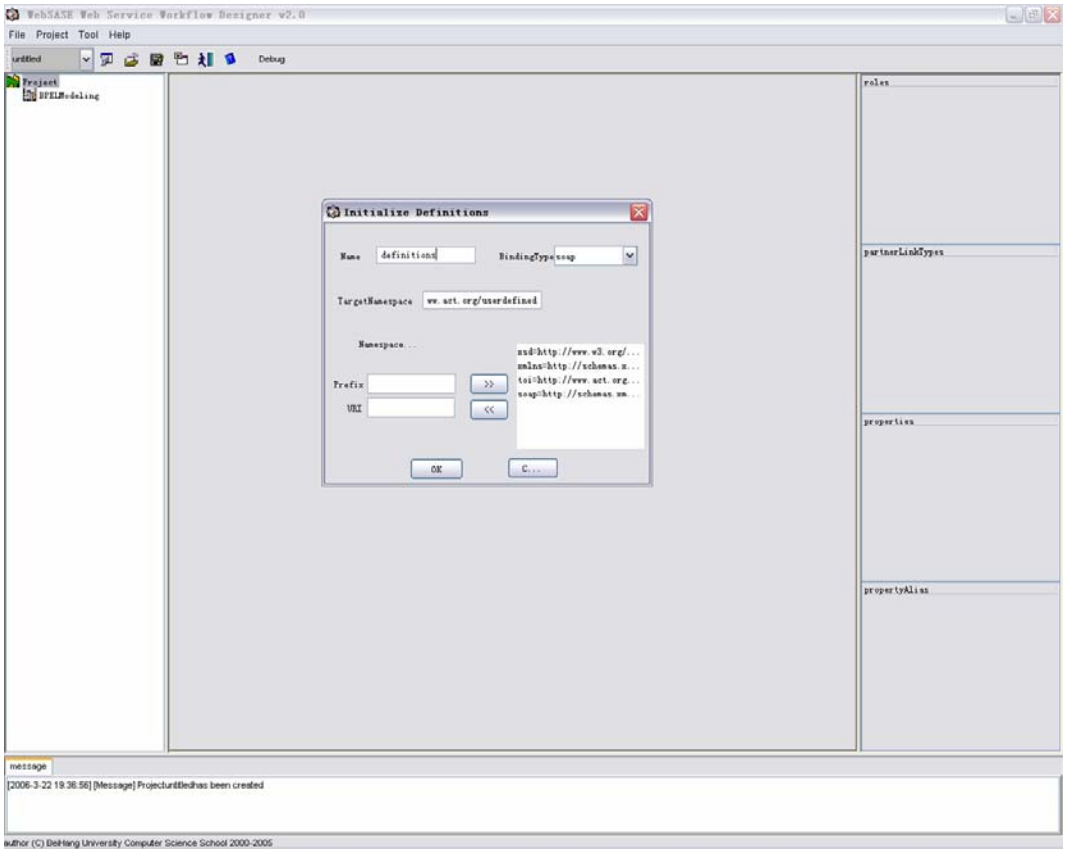
- Define WSDL

At the view of project tree, press right button, then select “define WSDL”



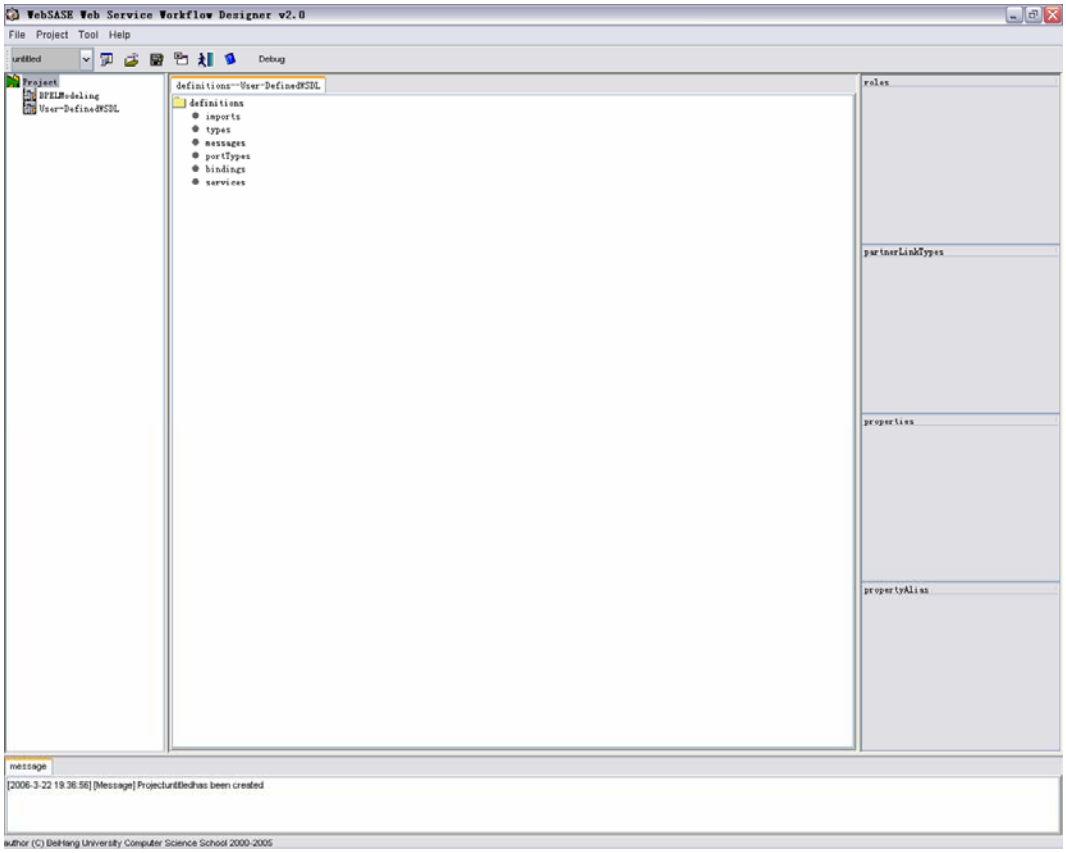
Pic11 Define WSDL

Initialize attributes of definiton



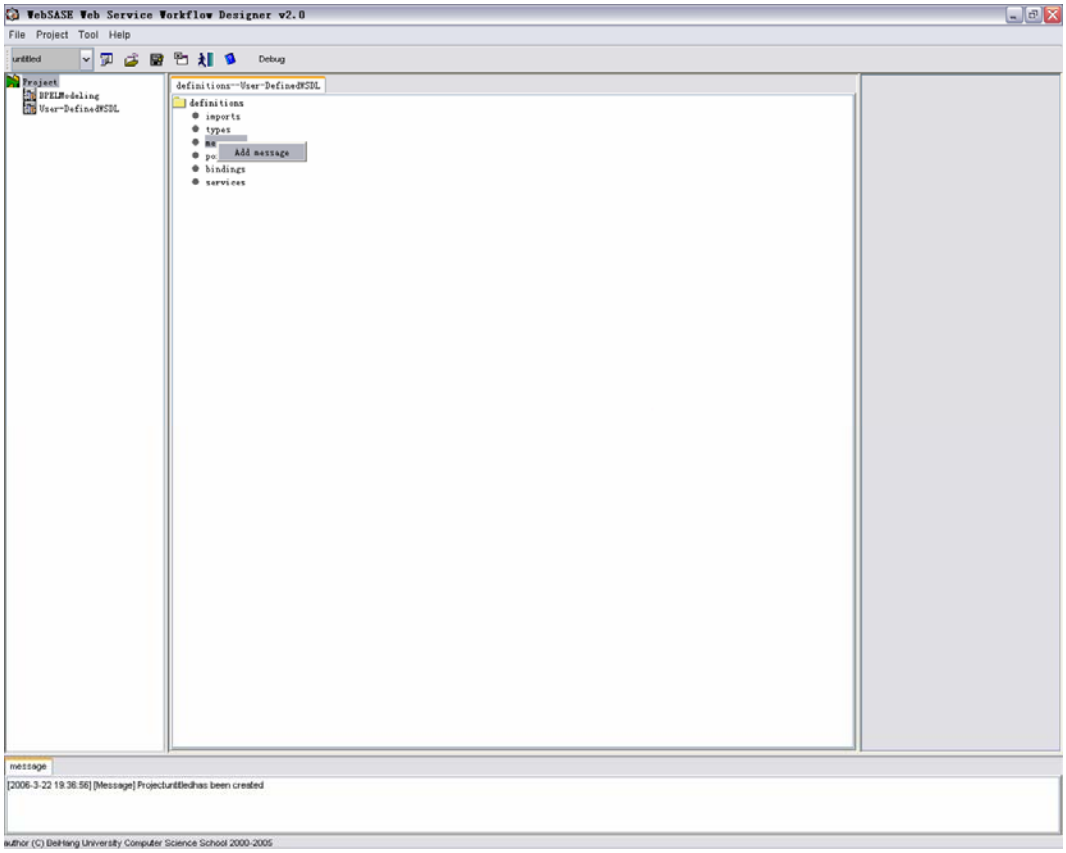
Pic12 WSDL definition initial interface

Enter in defining WSDL edit interface, via tree structure, displaying all elements of WSDL files

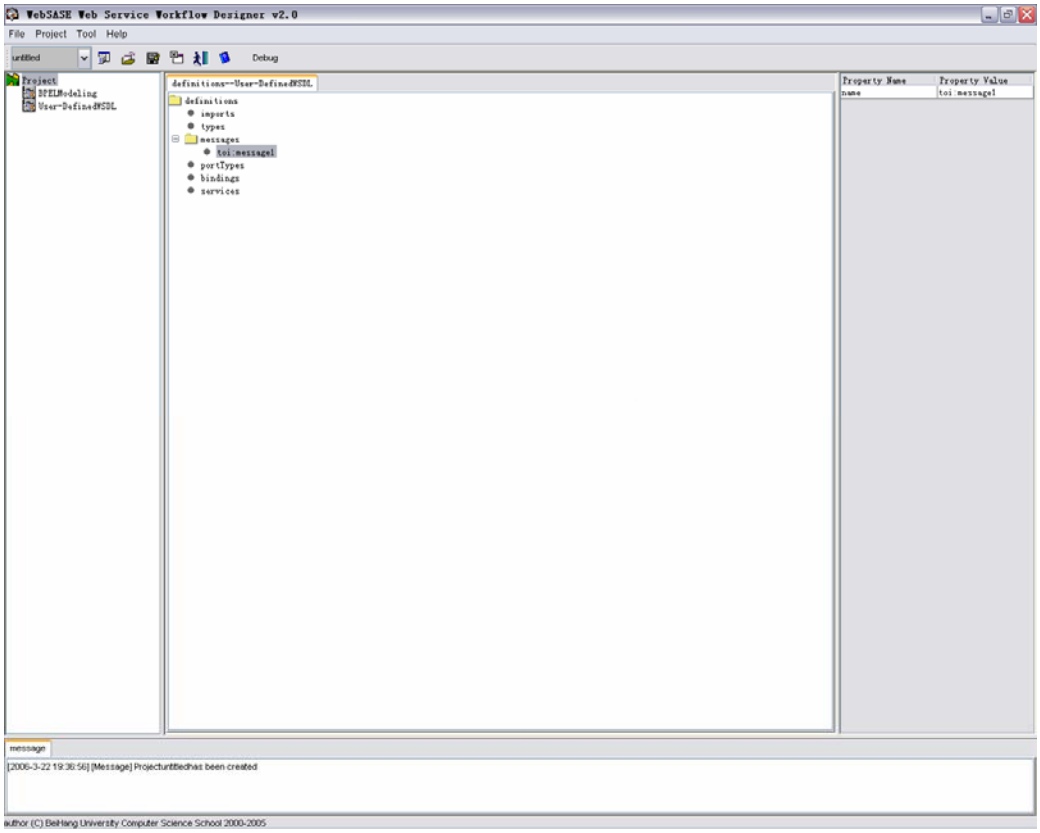


Pic13 WSDL editing interface

Via pressing right button on tree nodes, adding all elements of WSDL file, such as , press ”messages”-→”add messages”

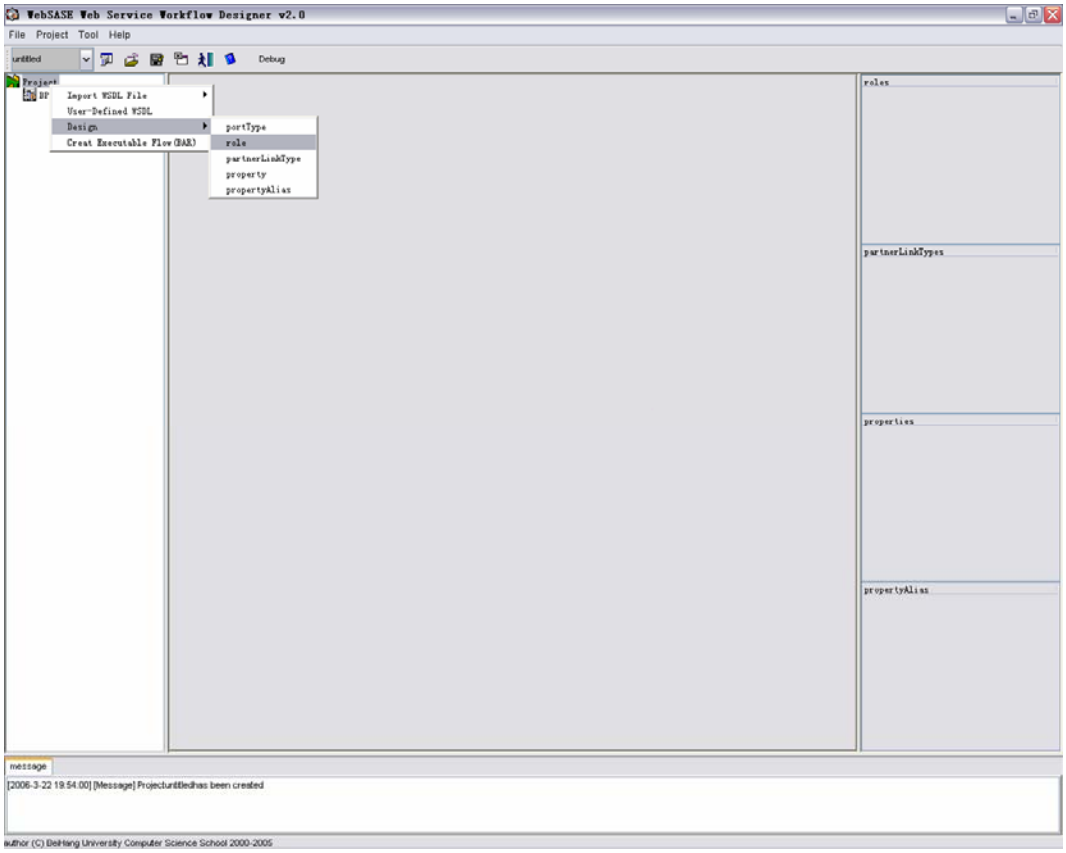


Pic14 WSDL editing interface--adding messages

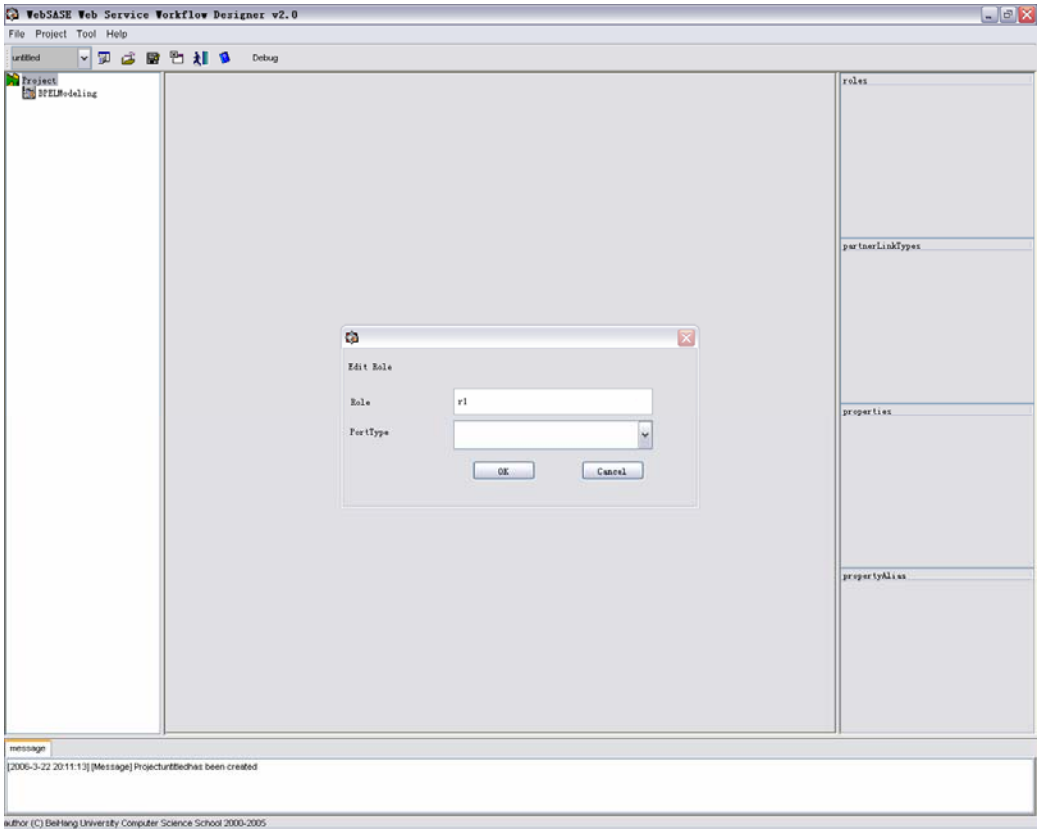


Pic15 WSDL editing interface--after adding message

- Adding role element for WSDL

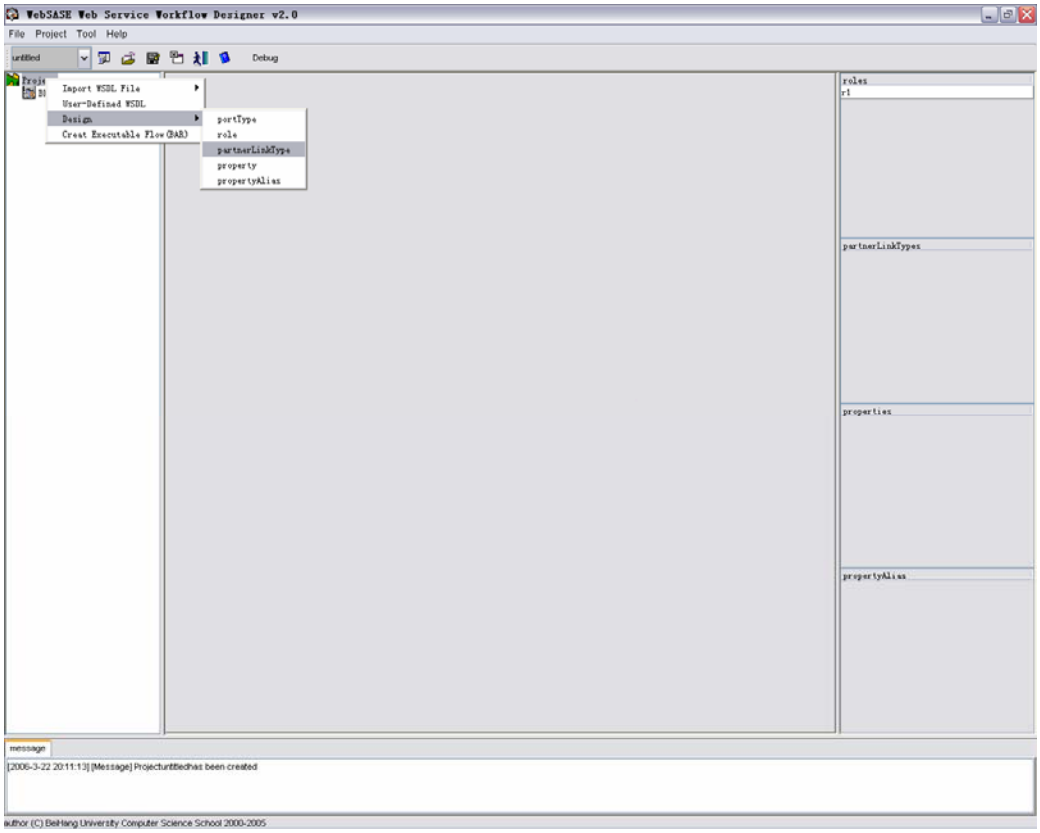


Pic16 Adding role element interface

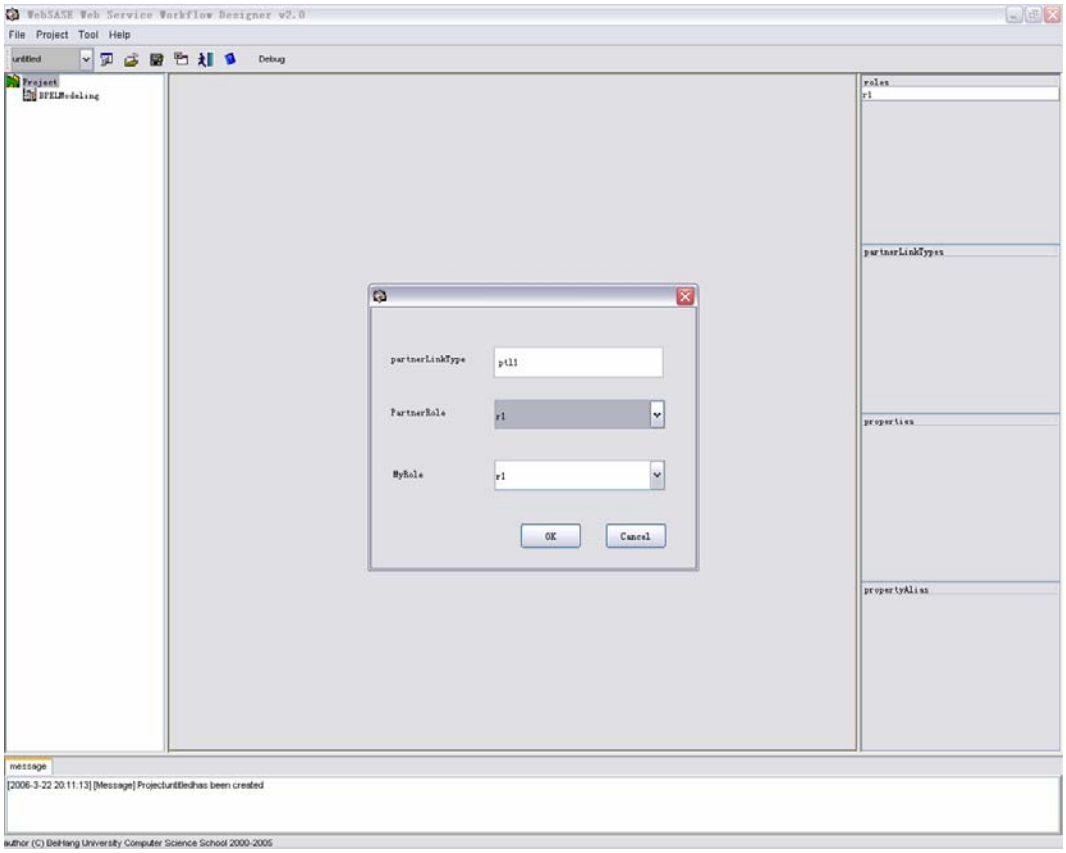


Pic17 Define role editing interface

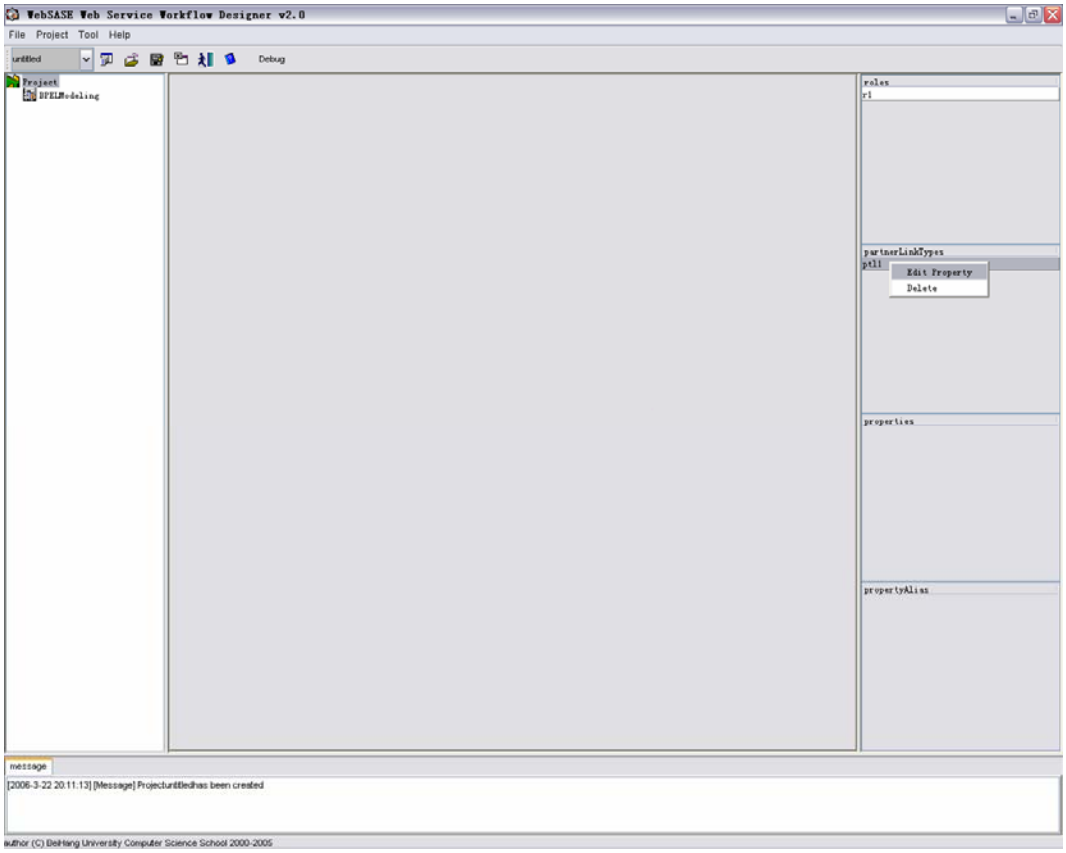
■ Adding partnerLinkType element for WSDL



Pic18 Add partnerLinkType

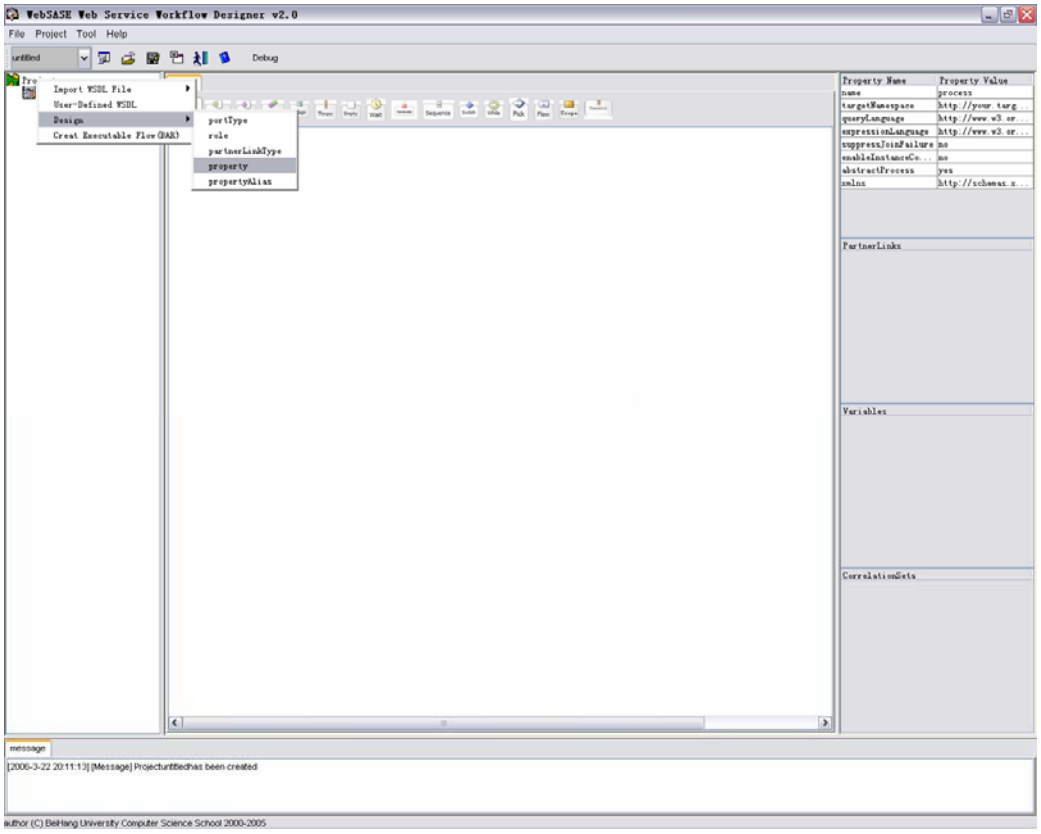


Pic19 Defining partnerLinkType

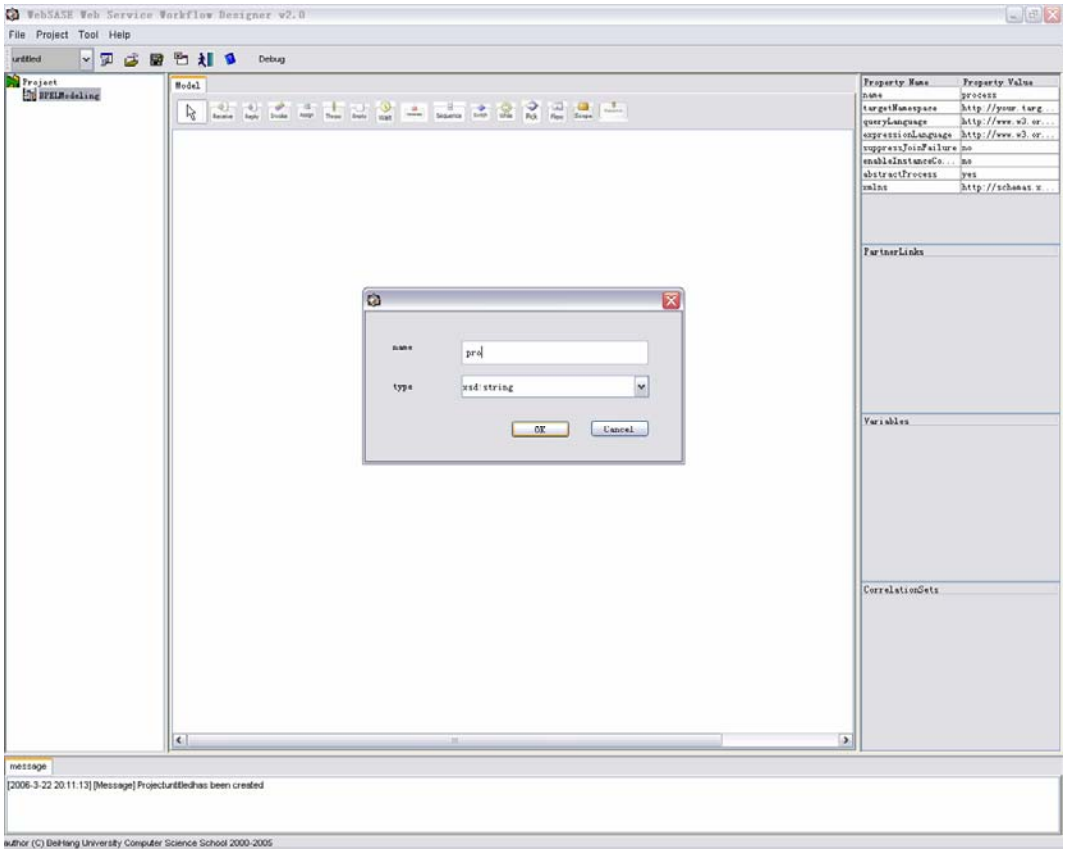


Pic20 Modify partnerLinkType's attributes

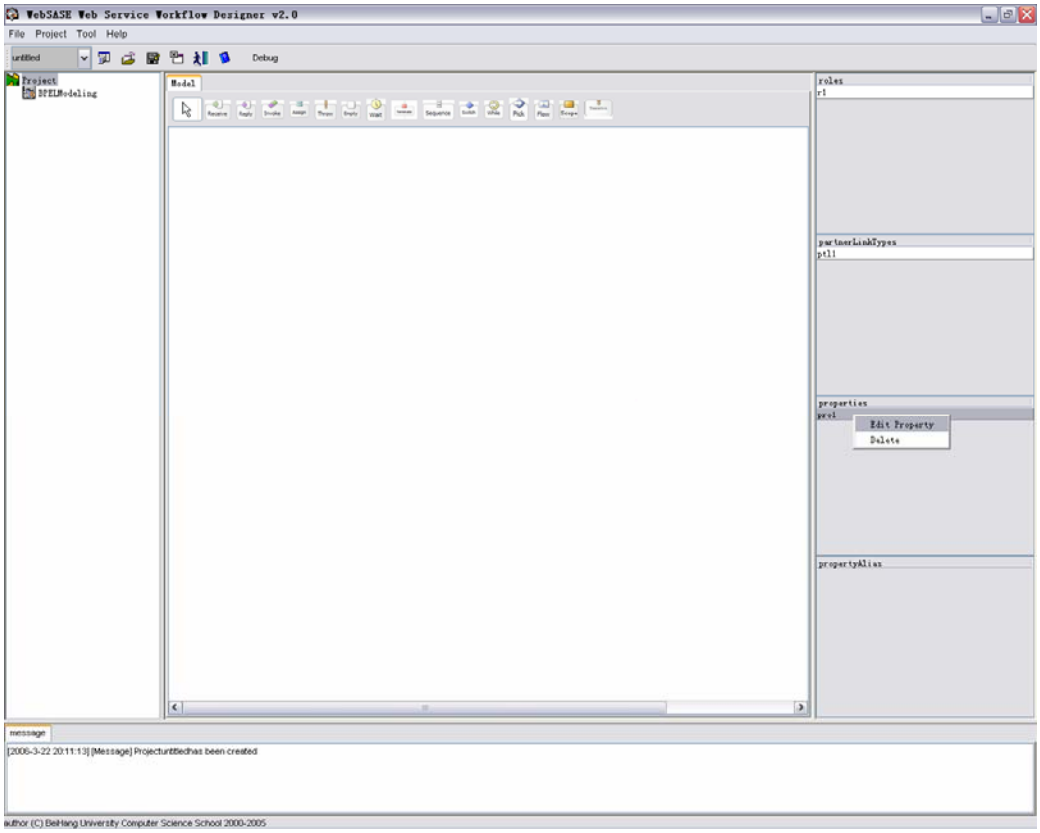
■ Adding property element for WSDL



Pic21 Add property

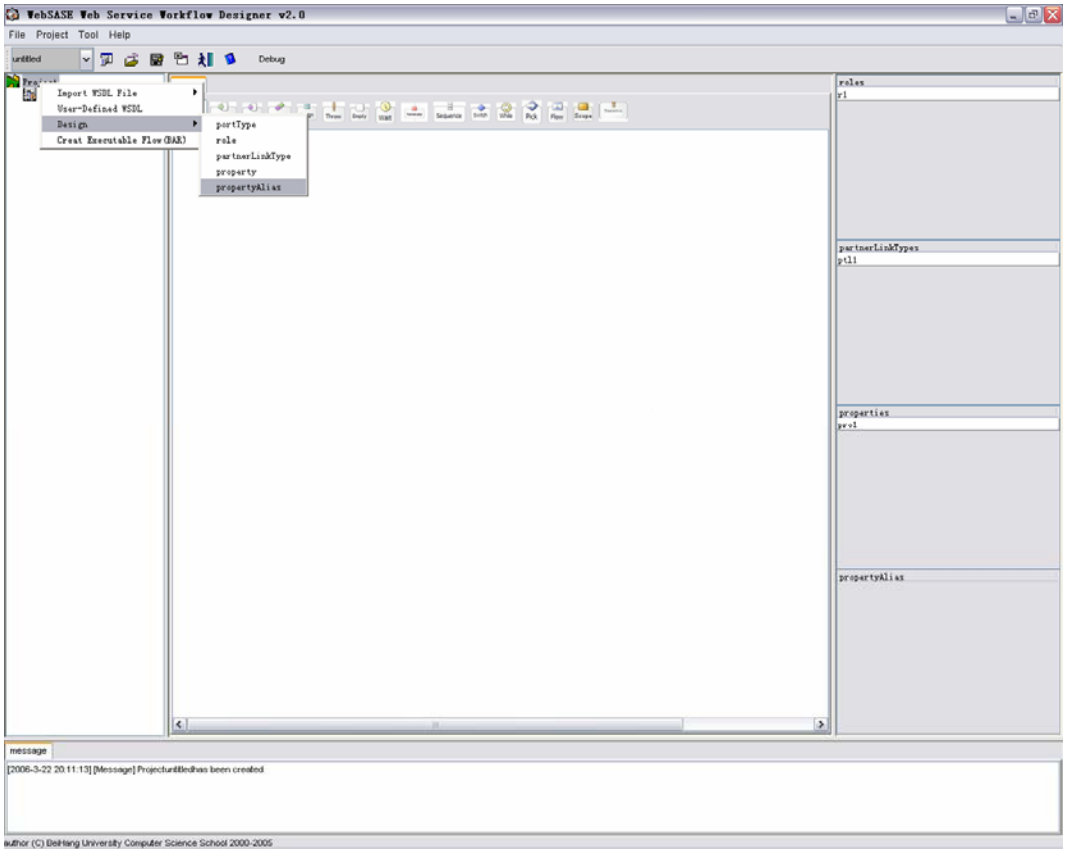


Pic22 Define property

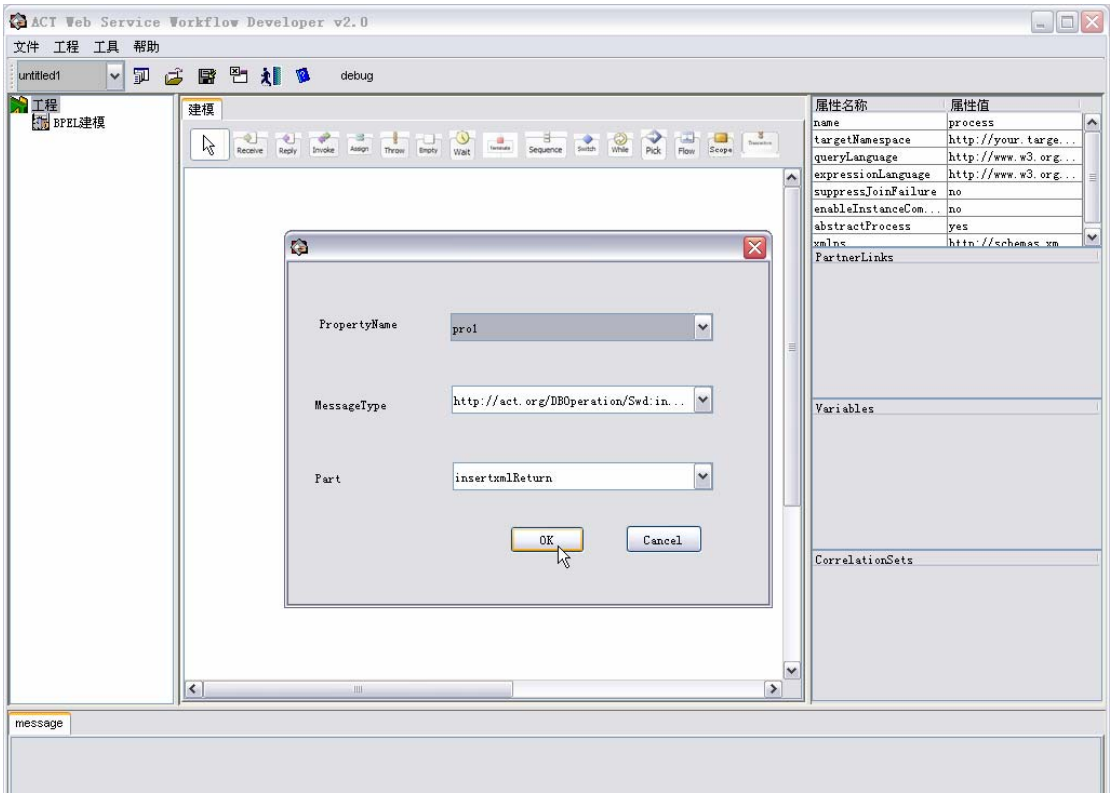


Pic23 Modify property's attributes

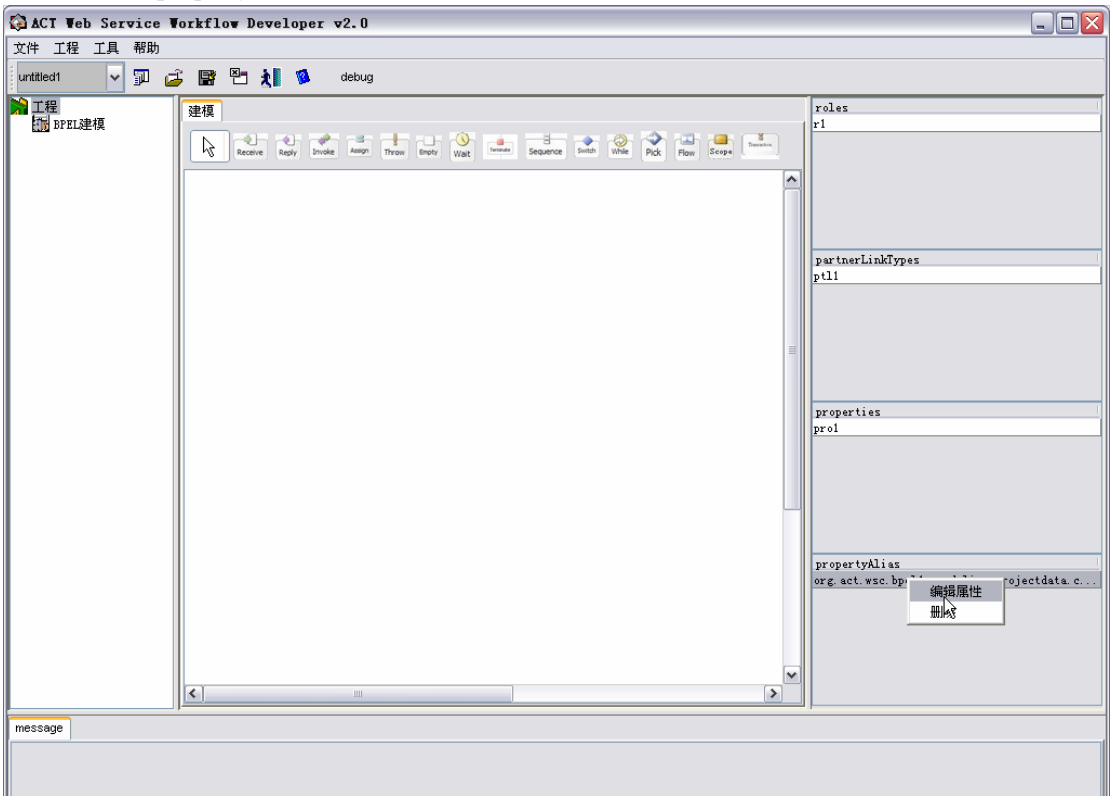
- Adding propertyAlias elements for WSDL



Pic24 Add propertyAlias



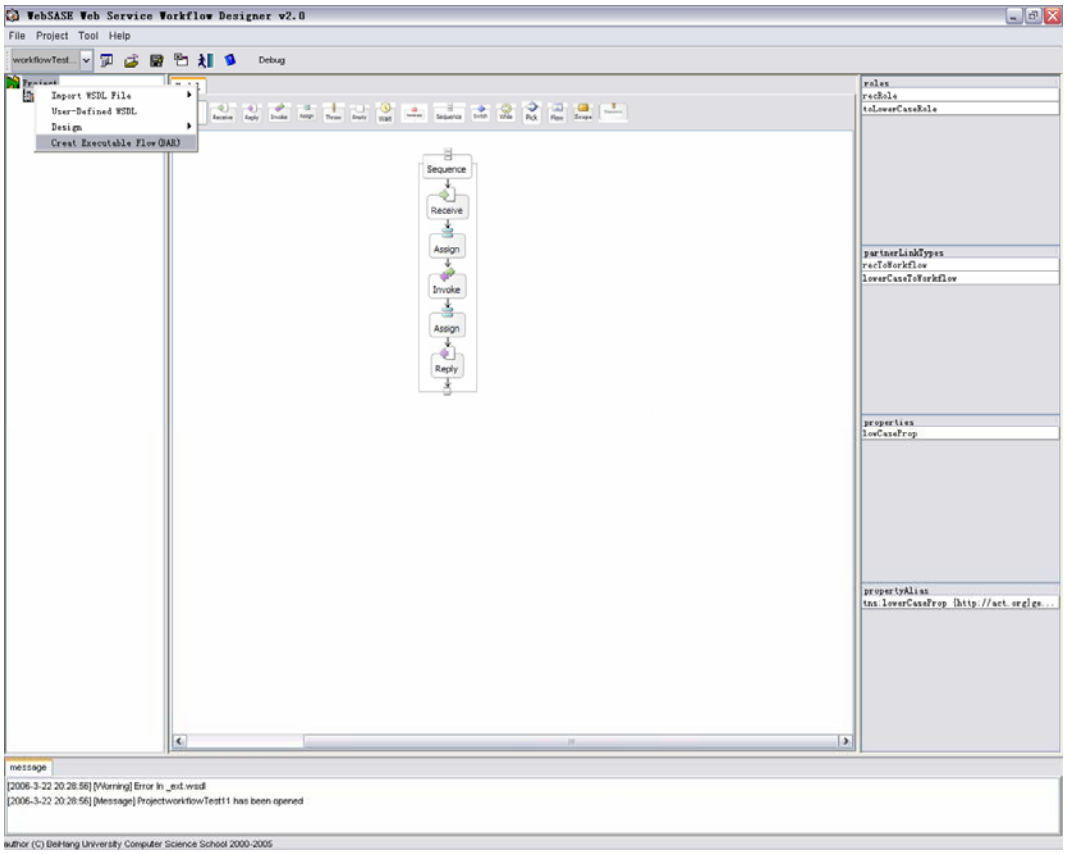
Pic25 Define propertyAlias



Pic26 Modify propertyAlias's attribute

- Create executive flow（BAR）

At the view of project tree, select icon project, press right button, then select "create executive flow"（BAR）。

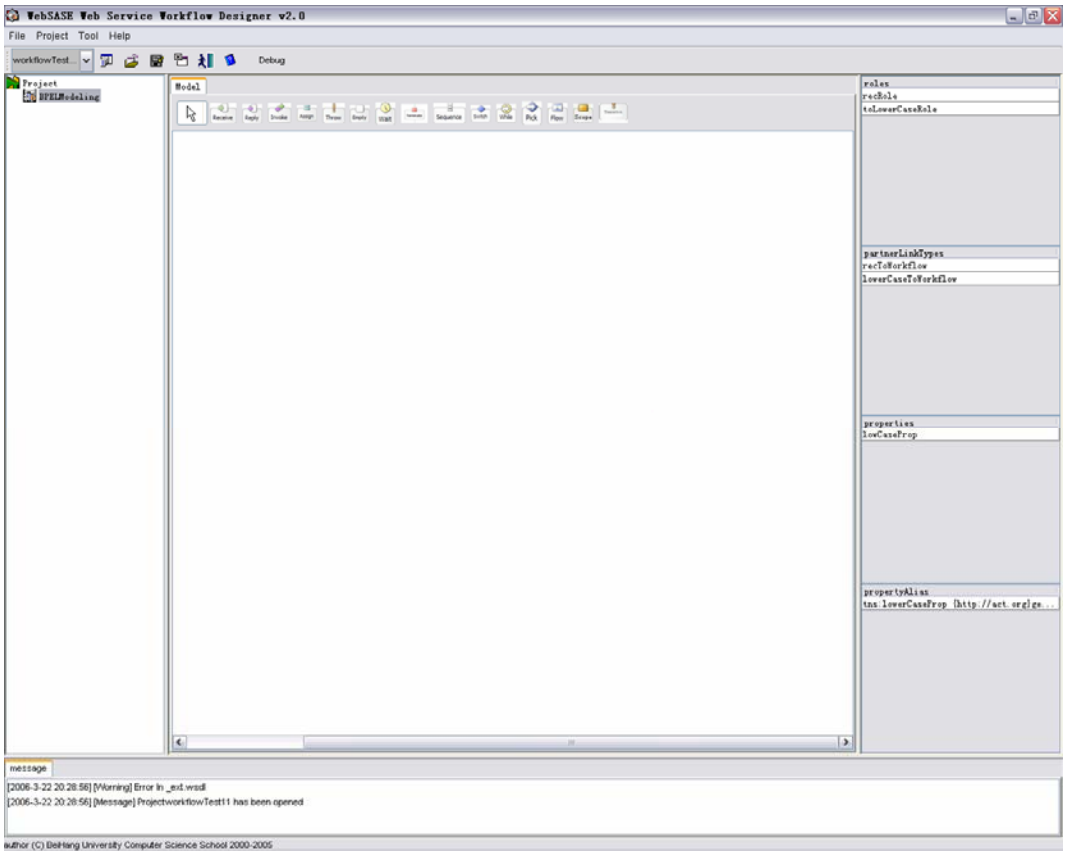


Pic27 Create executive flow （BAR）

3.1.3 Flow modeling rank function

- Define flow

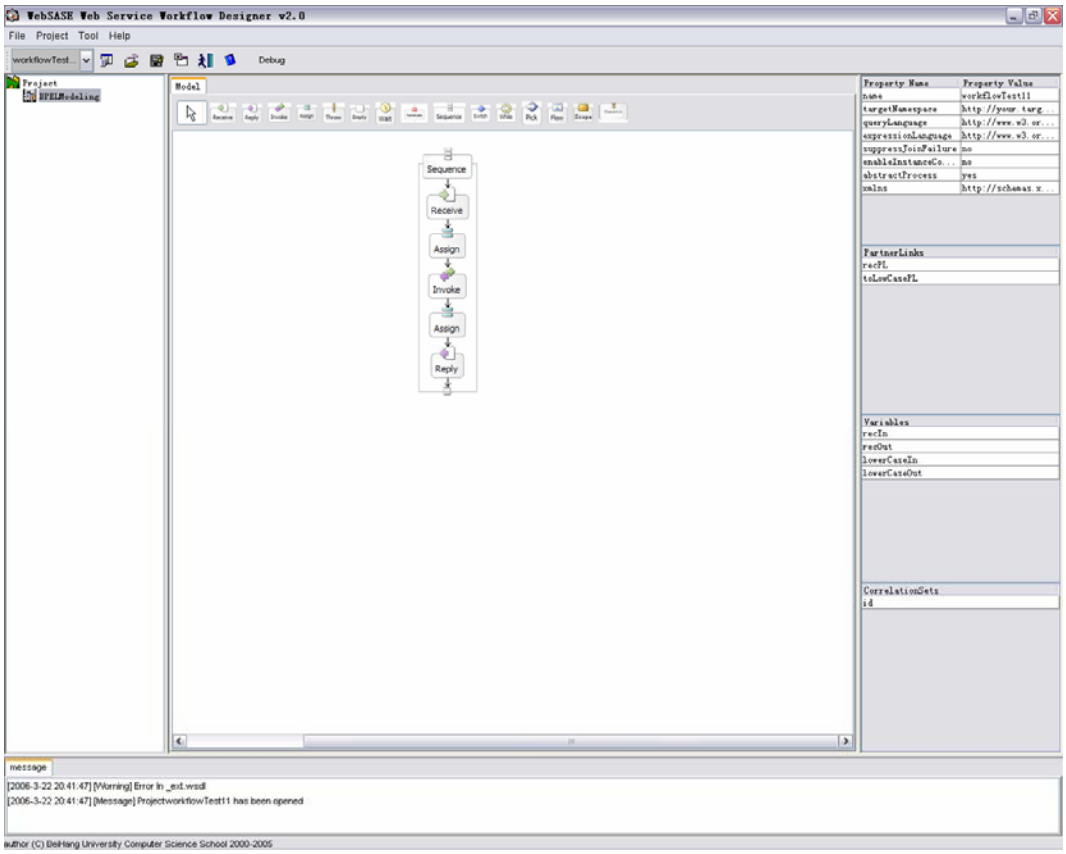
At the view of project tree structure , press “BPEL modeling”, editing area in the middle appears a view modeling. If it is first time press this icon , a new flow will be created, if not ,defined project will opened and displayed as pictures.



Pic28 Enter in flow edit interface

- Set flow attributes

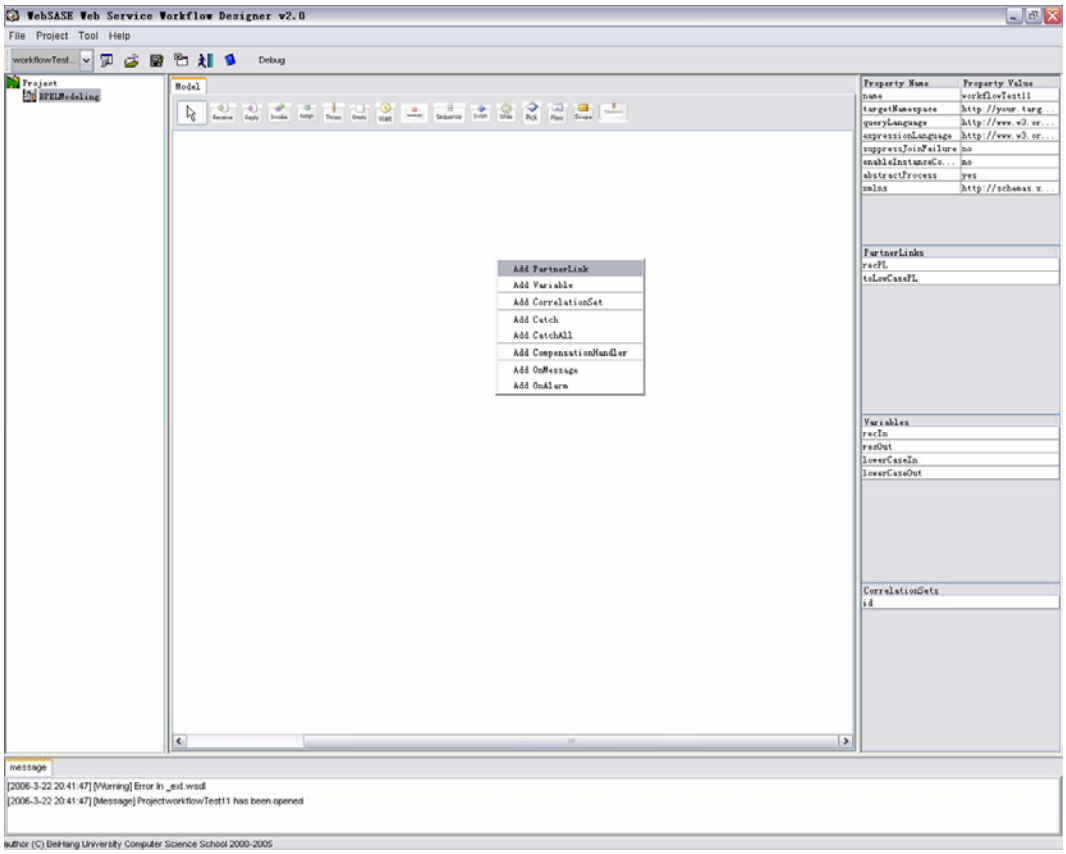
Press blank area of the flow view, all attributes of flow will displayed at the right attributes editing area. Each attribute can be edited through pulling menu or editing straightly.



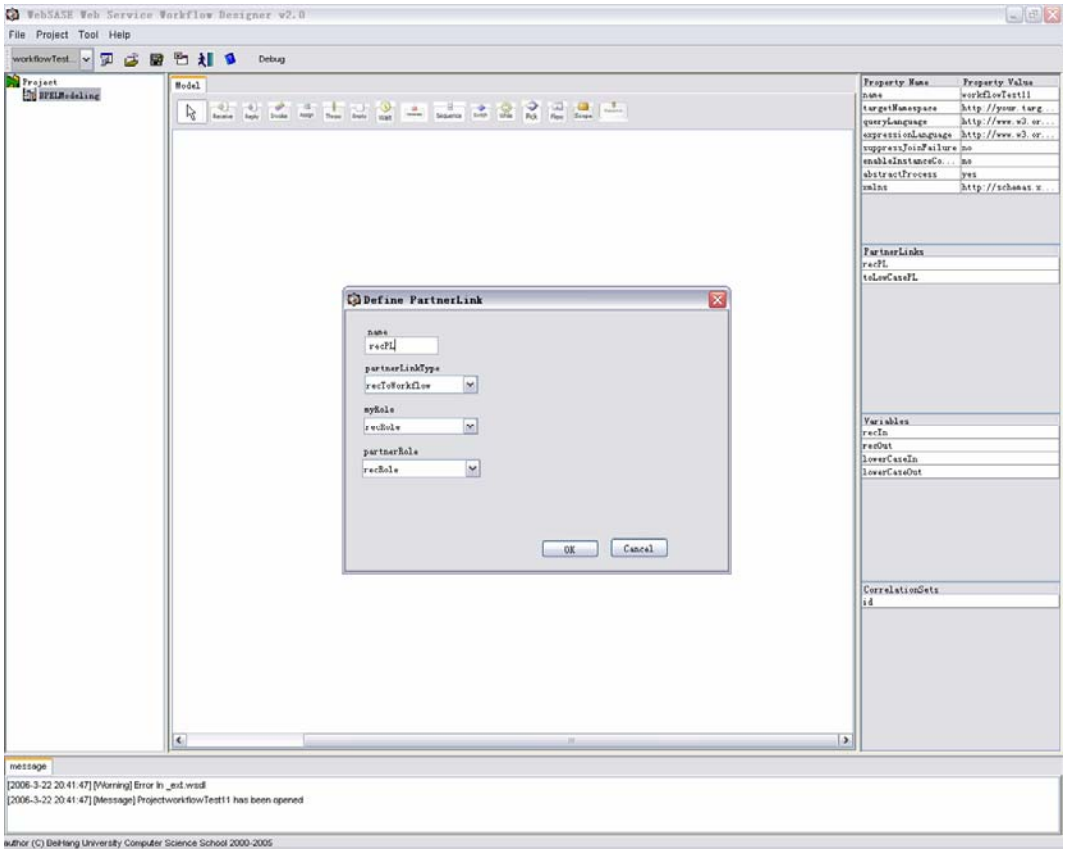
Pic29 Edit Flow's attributes（open already existed flow workfowTest11）

■ Adding flow non-active sub-elements

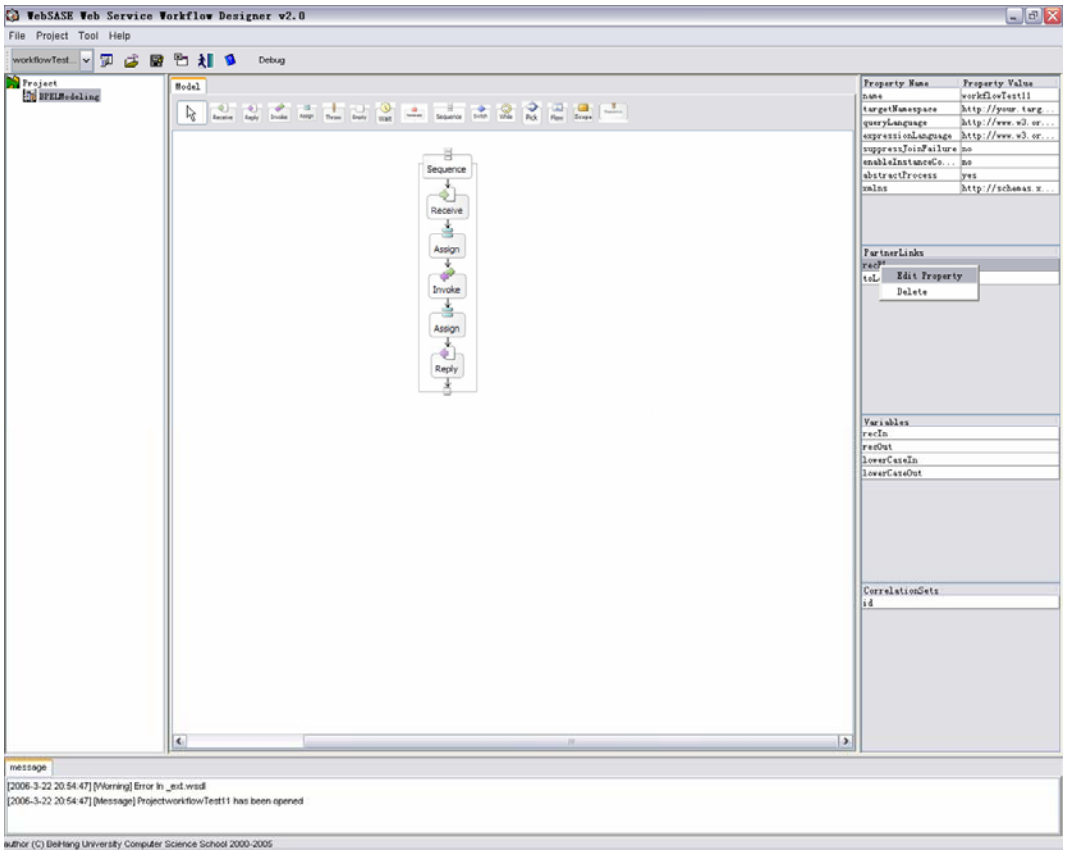
Press blank area of flow view, select deserved element, then in the pop-up dialog box define every element. Beside through pressing right button on added elements in attribute area, corresponding elements attributes can be modified by selecting "editing attributes. Non-activities are not displayed as picture.



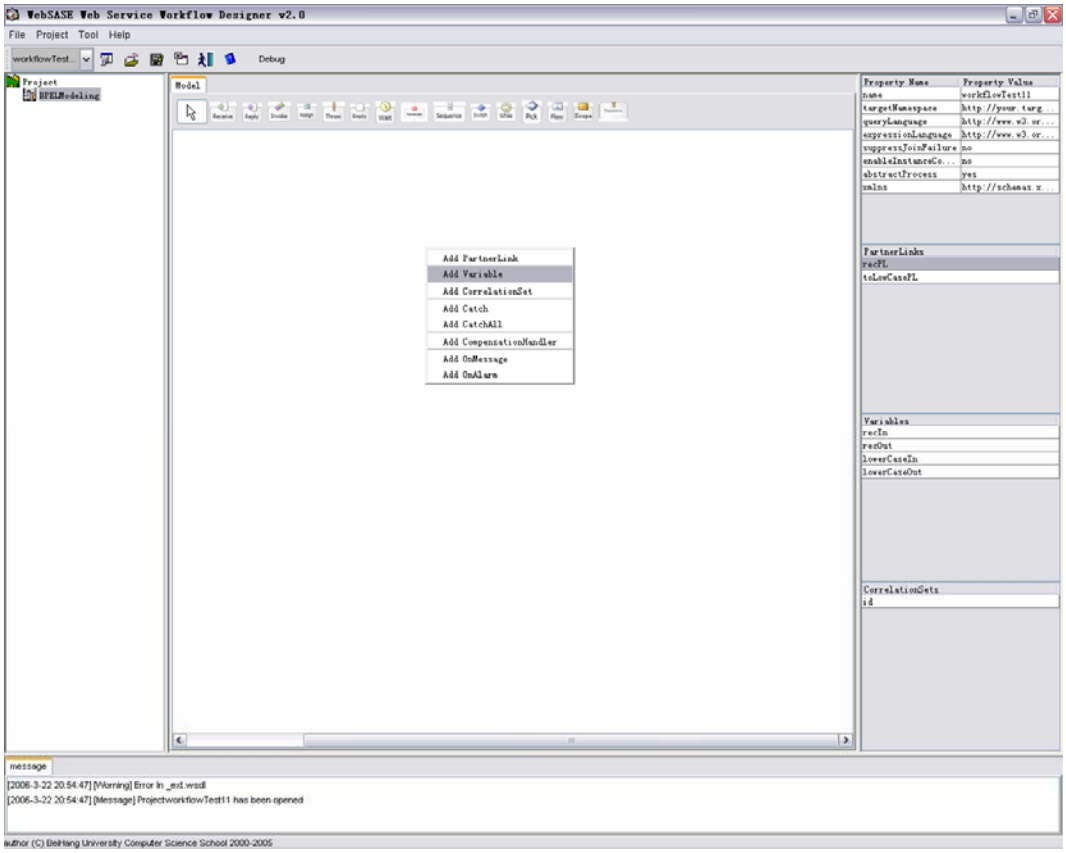
Pic30 Add flow partnerLink elements interface



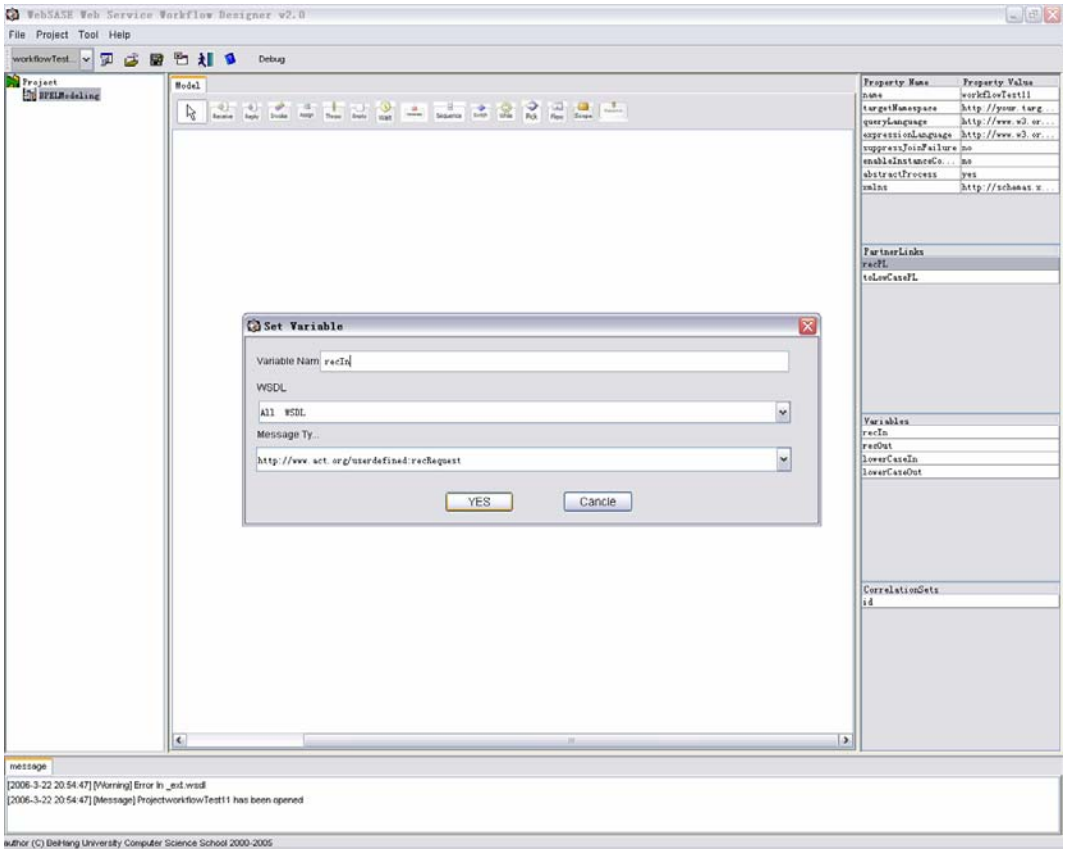
Pic31 Define partnerLink



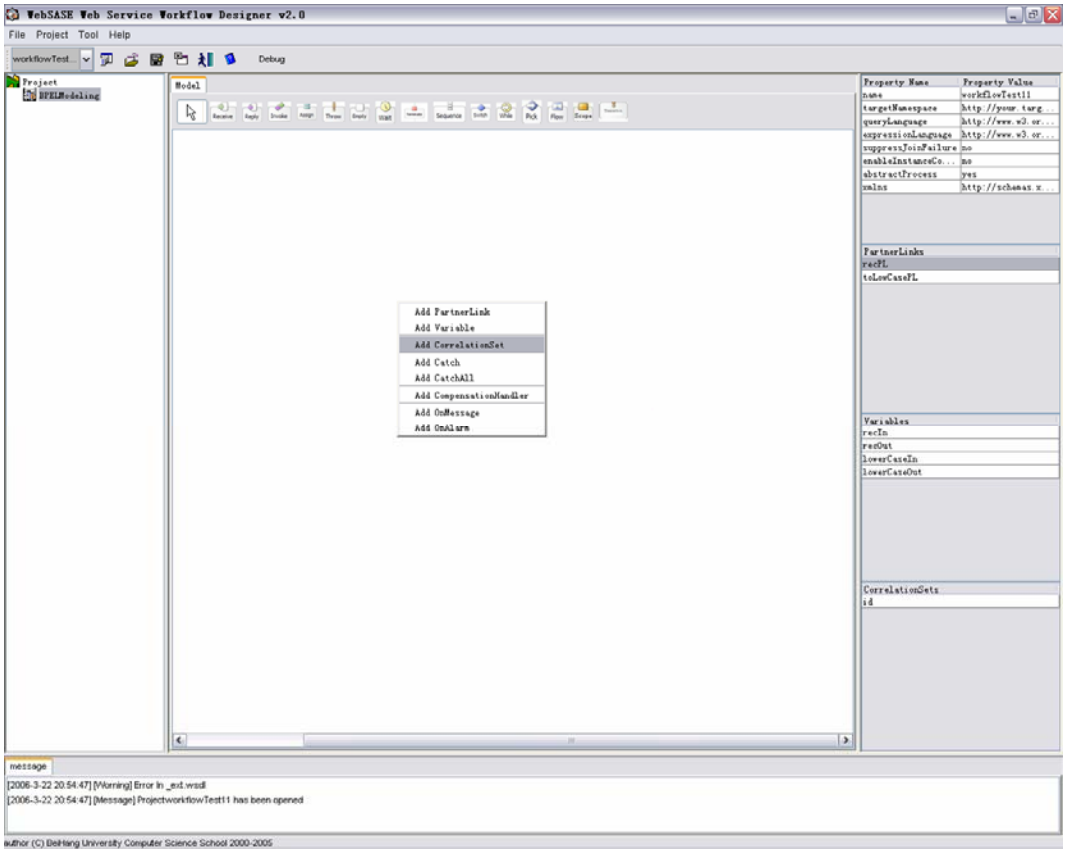
Pic32 Modify defined partnerLink's attributes



Pic33 Add flow variable elements interface

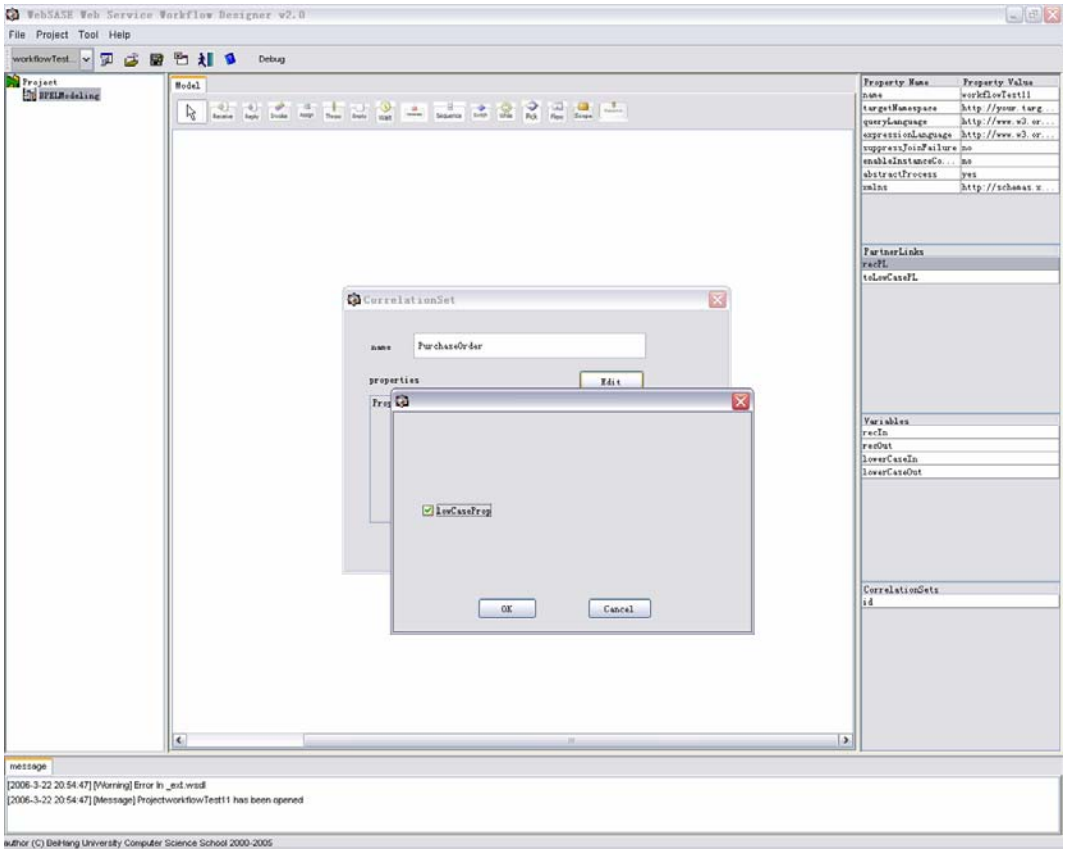


Pic34 Define variable

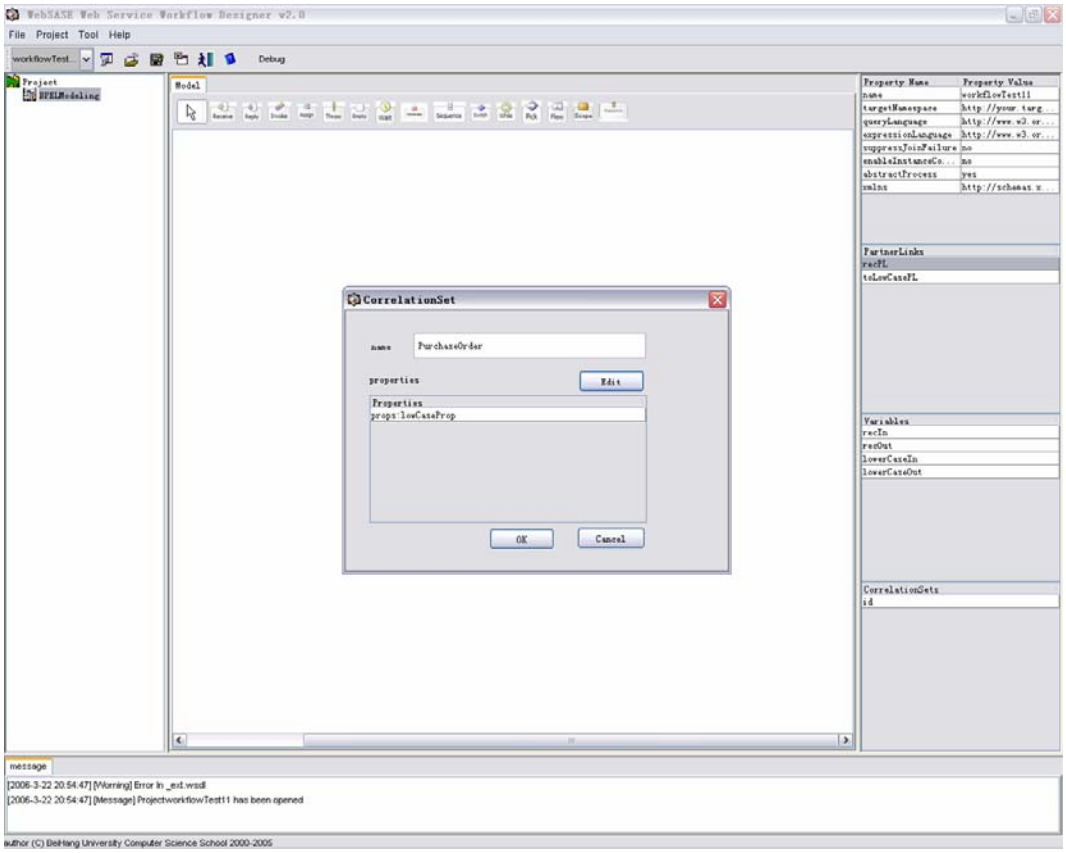


Pic35 Add correlationSet

At the pop-up box correlationSet editing interface, press “Edit” button，add property for correlationSet



Pic36 Define correlationSet



Pic37 Result of Pic 36

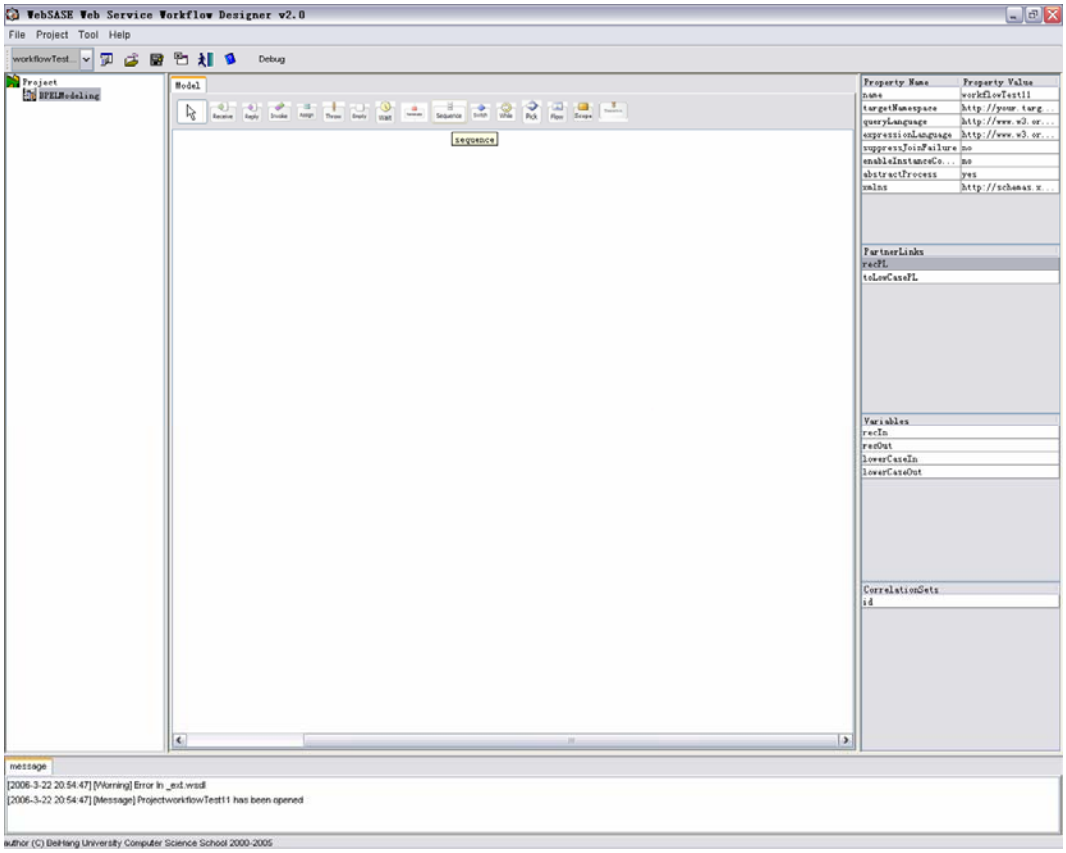
■ Add flow activity sub-elements

Two step in the activity：

1、select wanted activity

Clicking corresponding icon in the toolbars one time means selected already, since adding this activity，it will recover to selected status automatically ; dblclick corresponding icon means selected continuance, this activity can be added continuum until others icon are clicked.

Click sequence icon at the graph editing area's toolbar

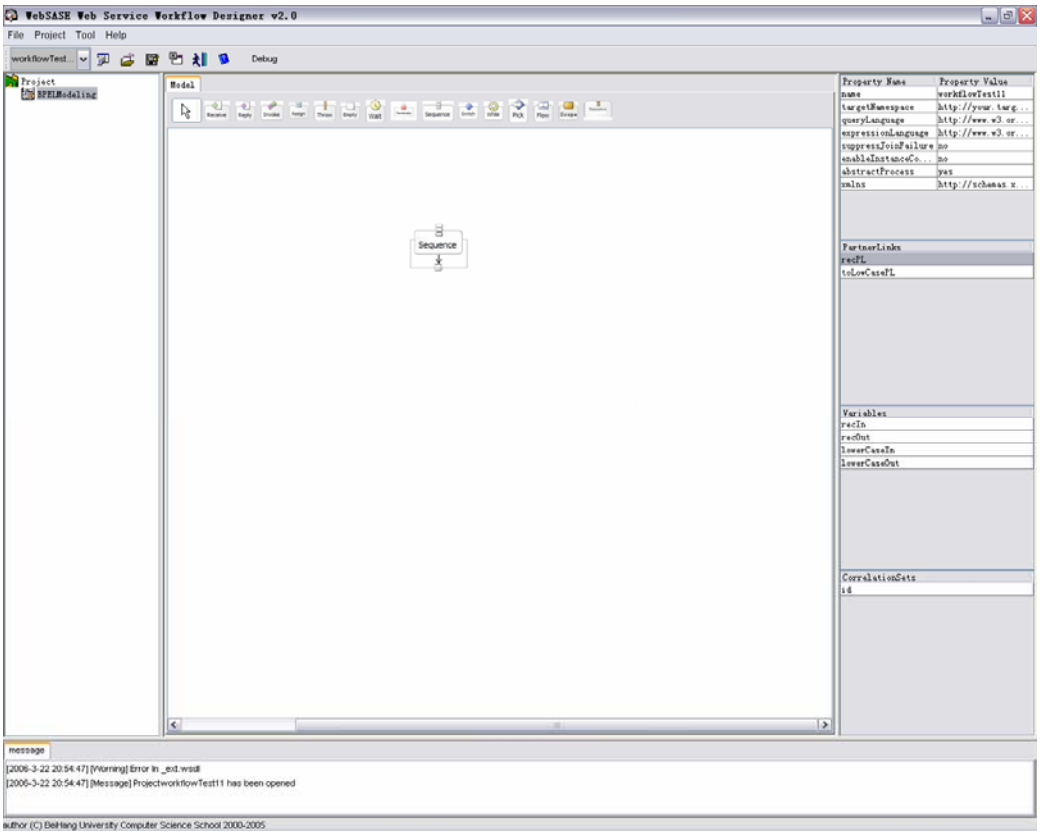


Pic38 Add activity sequence

2、Insert new activity in the flow

- Add the top activity

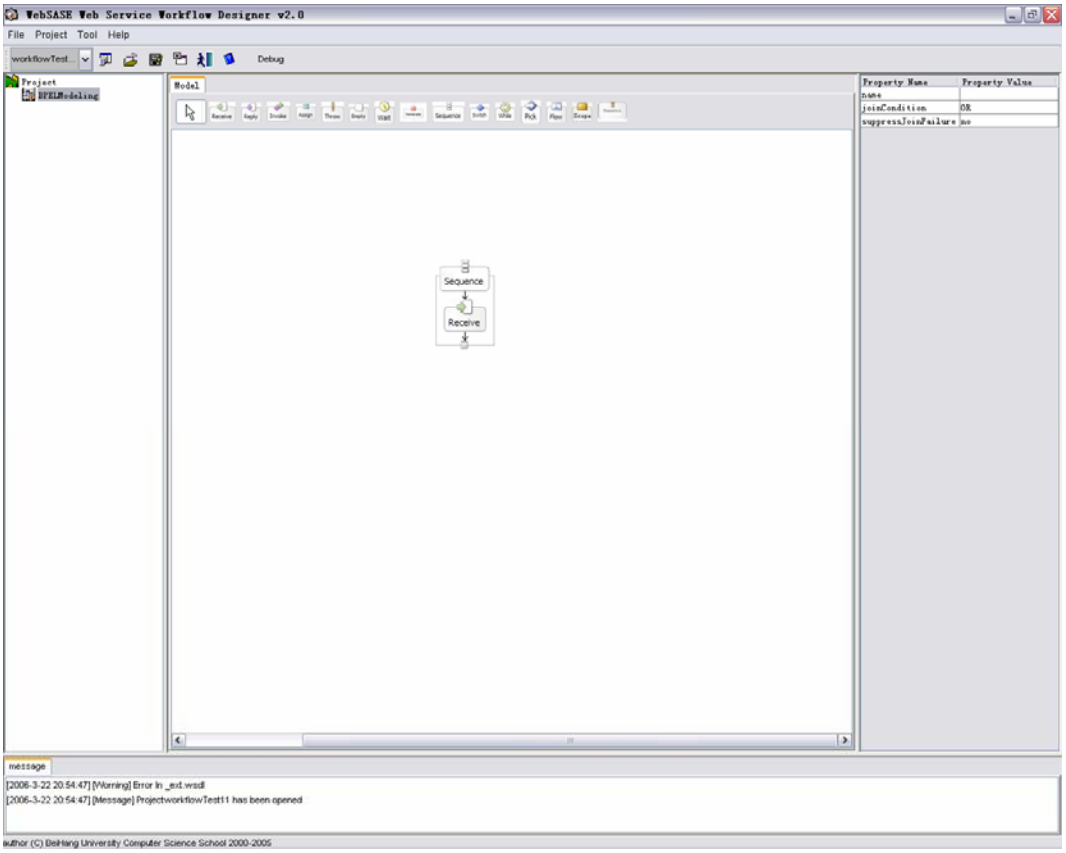
  Select the first-added activity，click on the blank area at graph editing section. Structured activity sequence will be added as next picture.



Pic39 Result of adding top activity sequence

- Add sequence structured activity's sub-activity

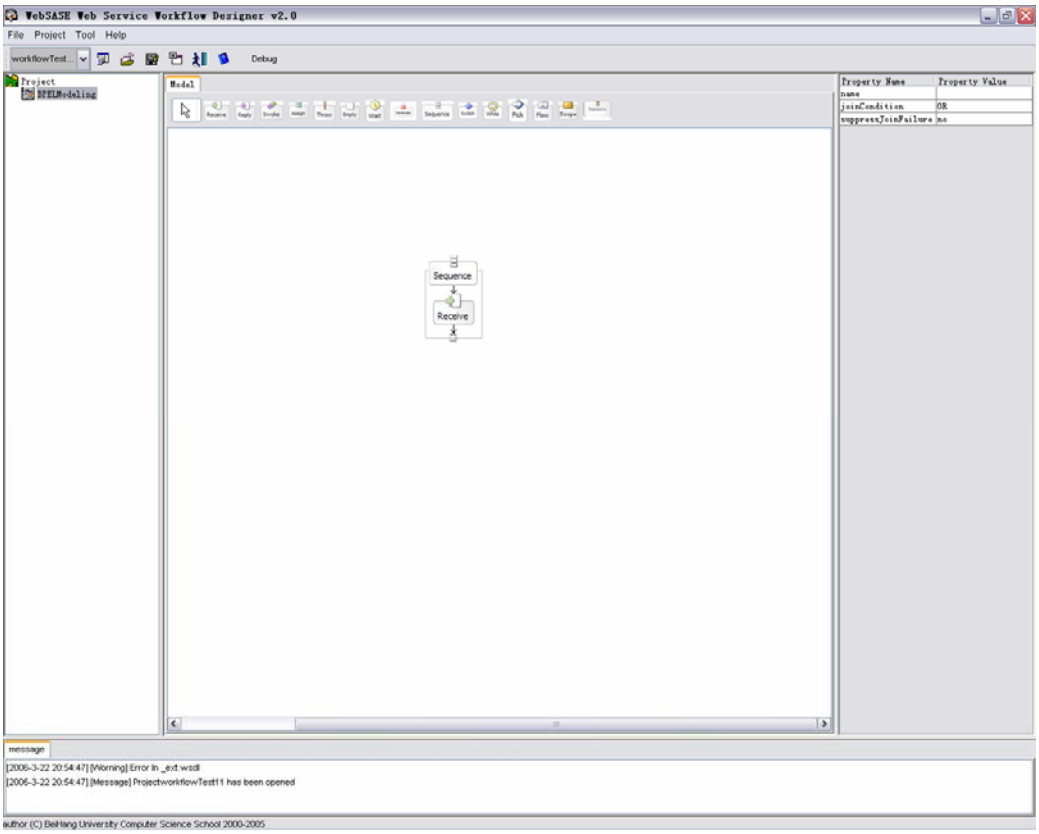
  If clicking sequence, a new activity will be inserted as first activity of sequence



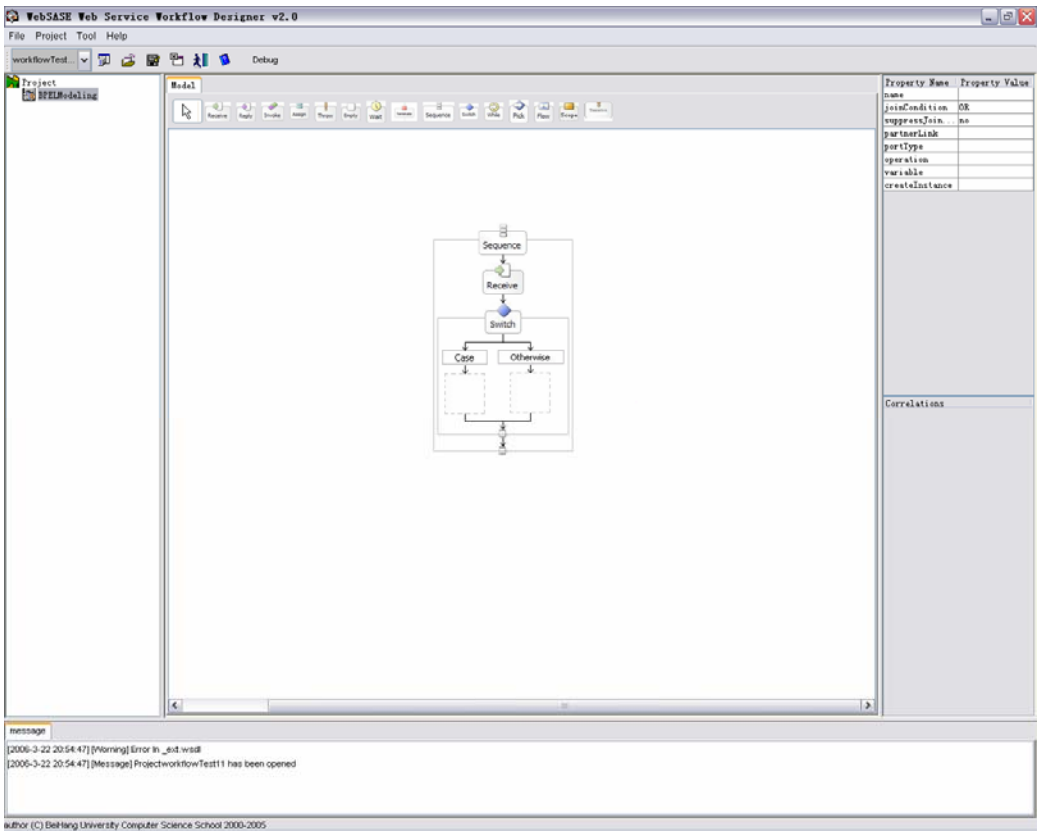
Pic40 Add sub-activity named receive for sequence

Click sequence's certain sub-activity, if this activity is simple activity, clicking this activity can add a new activity next itself, if the sub-activity is a structured activity, click at rail of this activity, a new activity will be inserted after this activity.

After selecting activity switch, then click activity receive

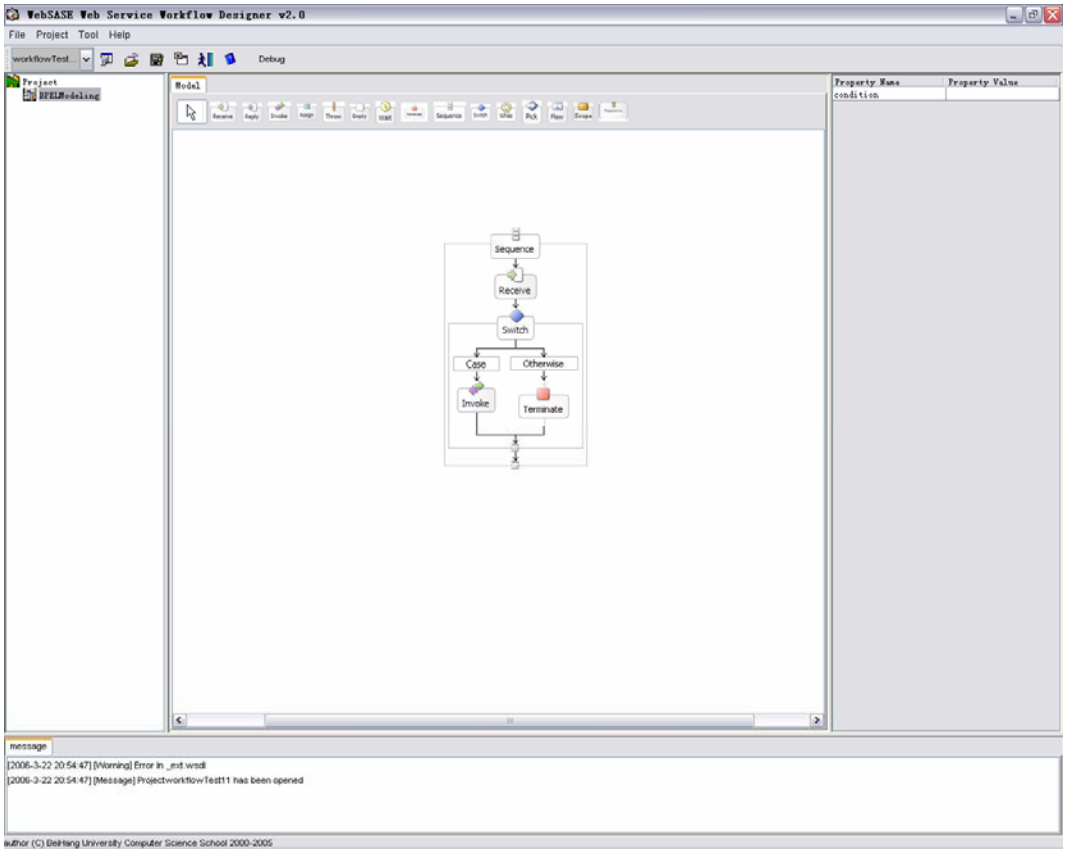


Pic41 Insert activity after sequence's simple sub-activity

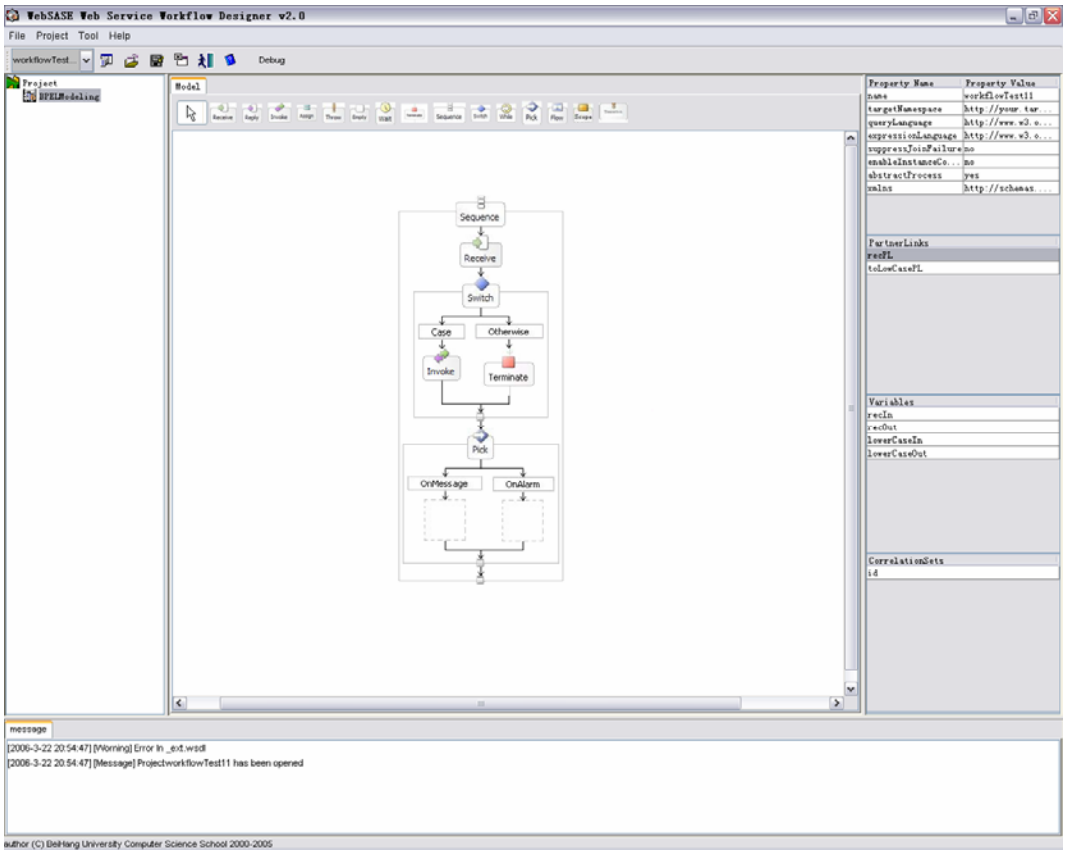


Pic42 Result of Pic41

After select activity pick, click the end-icon of activity switch , as follows:



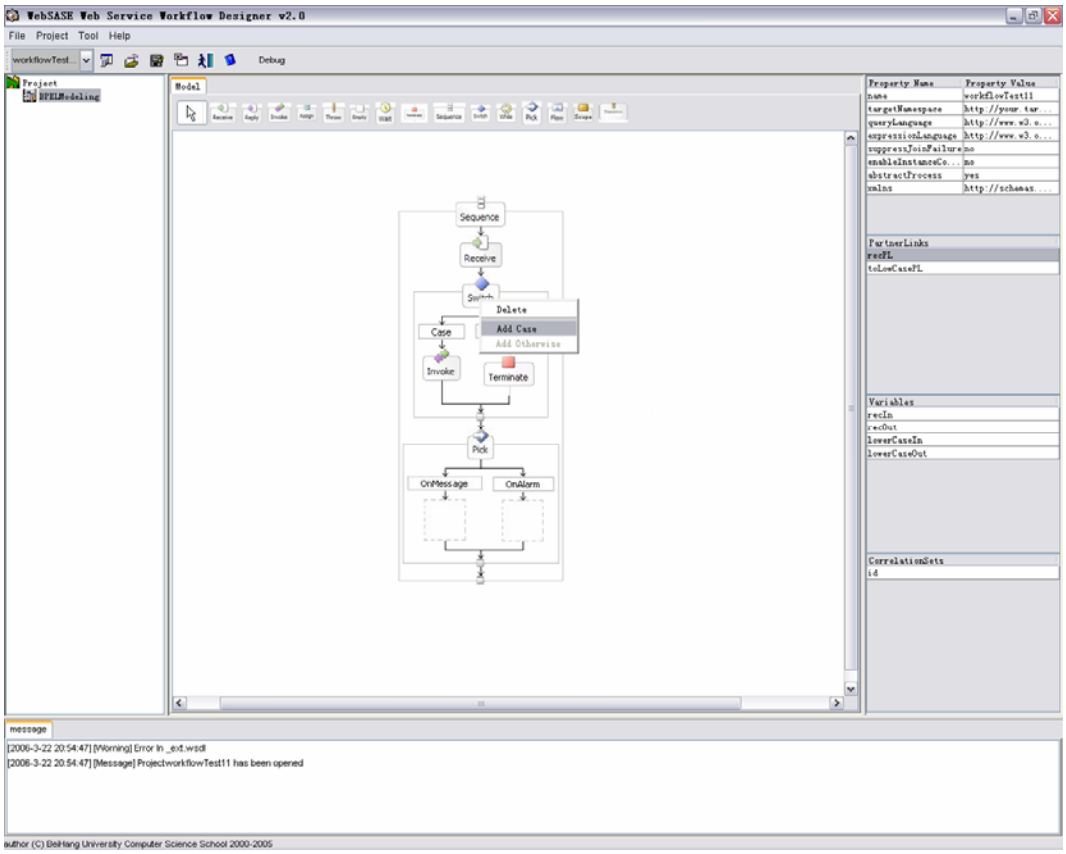
Pic43 Add activity after sequence's structured sub-activity



Pic44 Result of Pic 43

- Add structured sub-activity like switch、pick、flow

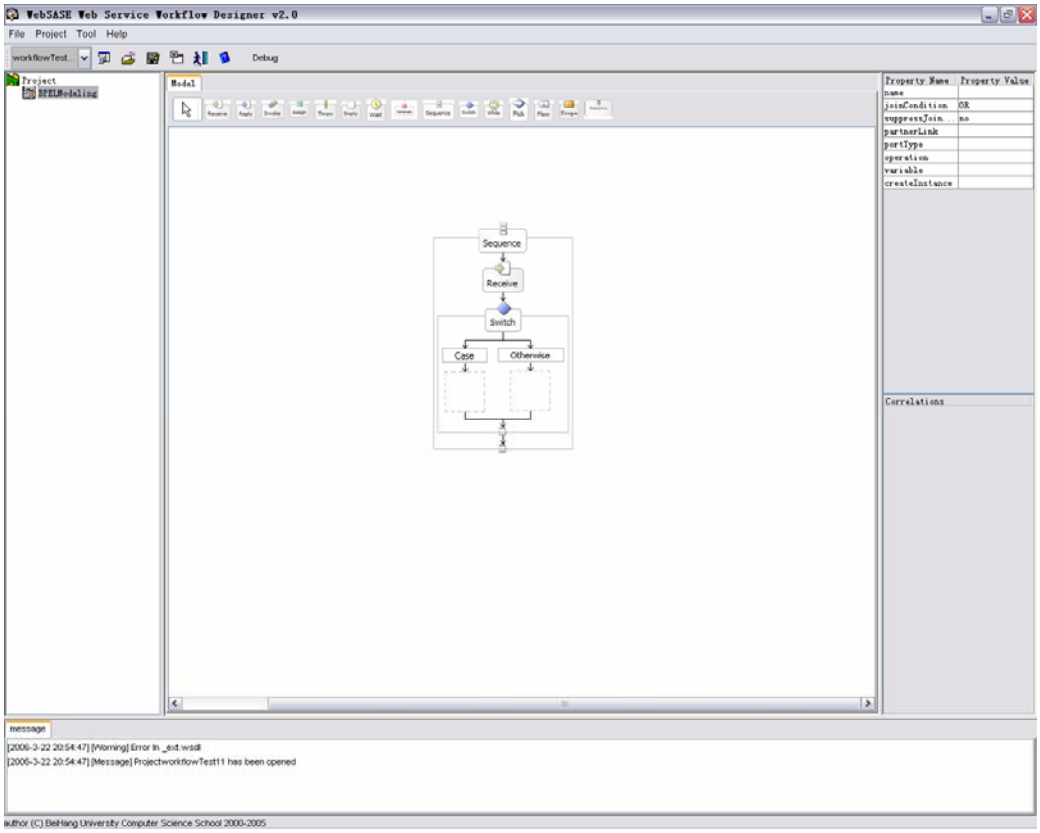
Click right button on icon activity, add or delete branch at menu. Showing use switch as example, via click right button on switch label, popup menu appears, then select “add case”



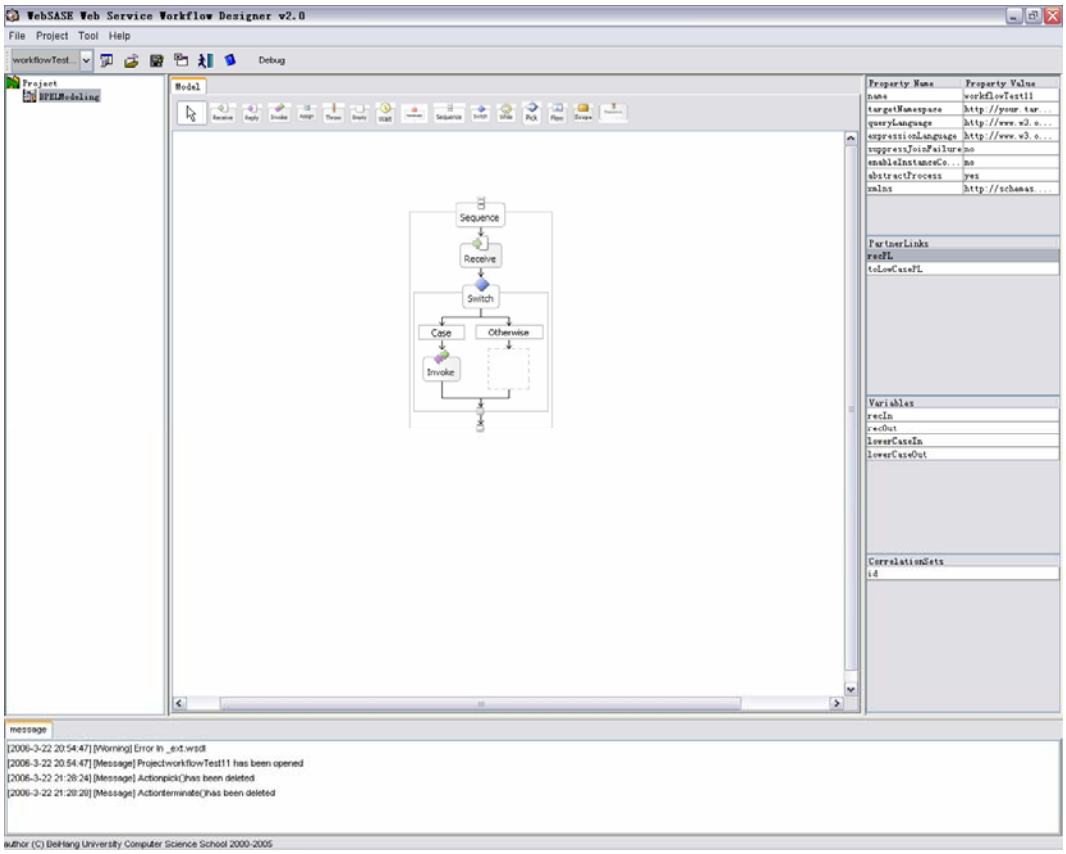
Pic45 Add case for switch’s structured activity

- Add sub-activity of case、otherwise、onMesssage、onAlarm and flow branch’s structured label

Select activity（such as invoke）, click weak-frame under structured label（show example using case in switch）



Pic46 Add case's sub-activity



Pic47 Result of Pic 46

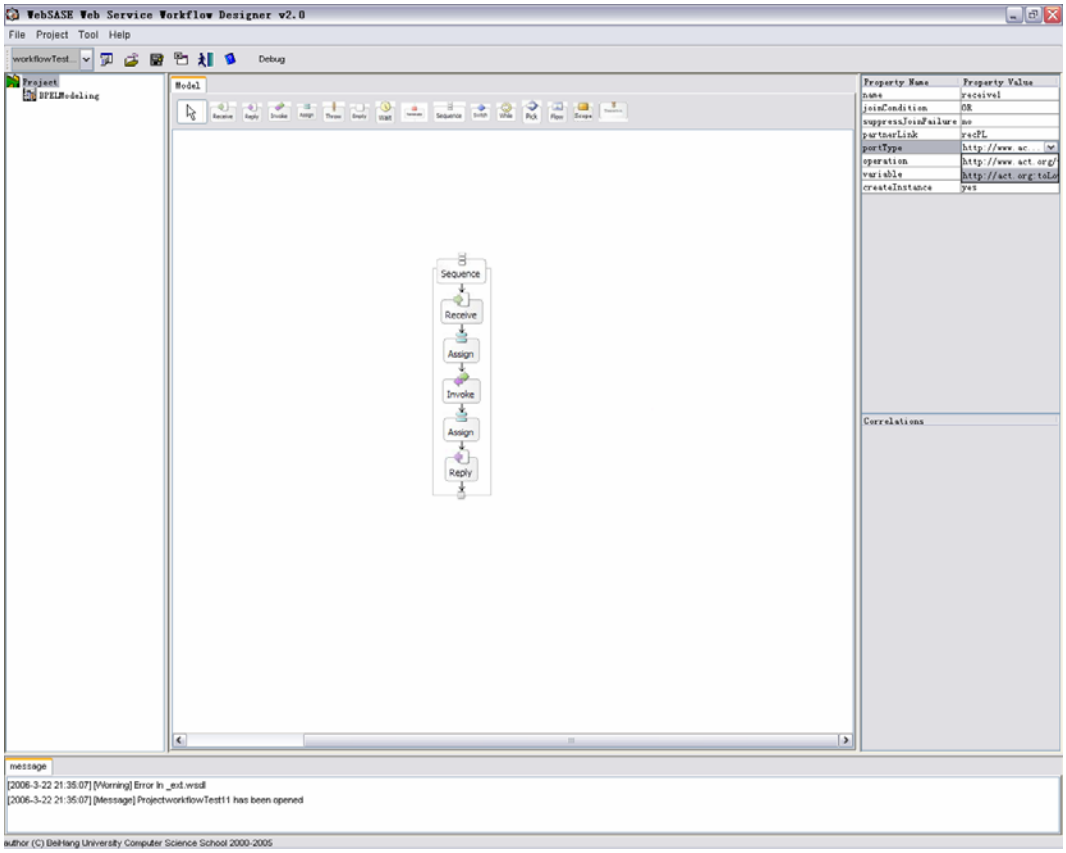
■ Delete activity

Every activity or activity's branch can be deleted via clicking right button. In the popup menu ,choosing "delete ",selected object will be deleted.

3.1.4 Activity rank function

■ Examine/edit activity attribute

Click target activity，all attributes of this activity appear in the right attributes area. And every attribute can be edited through pull menu or straightly.

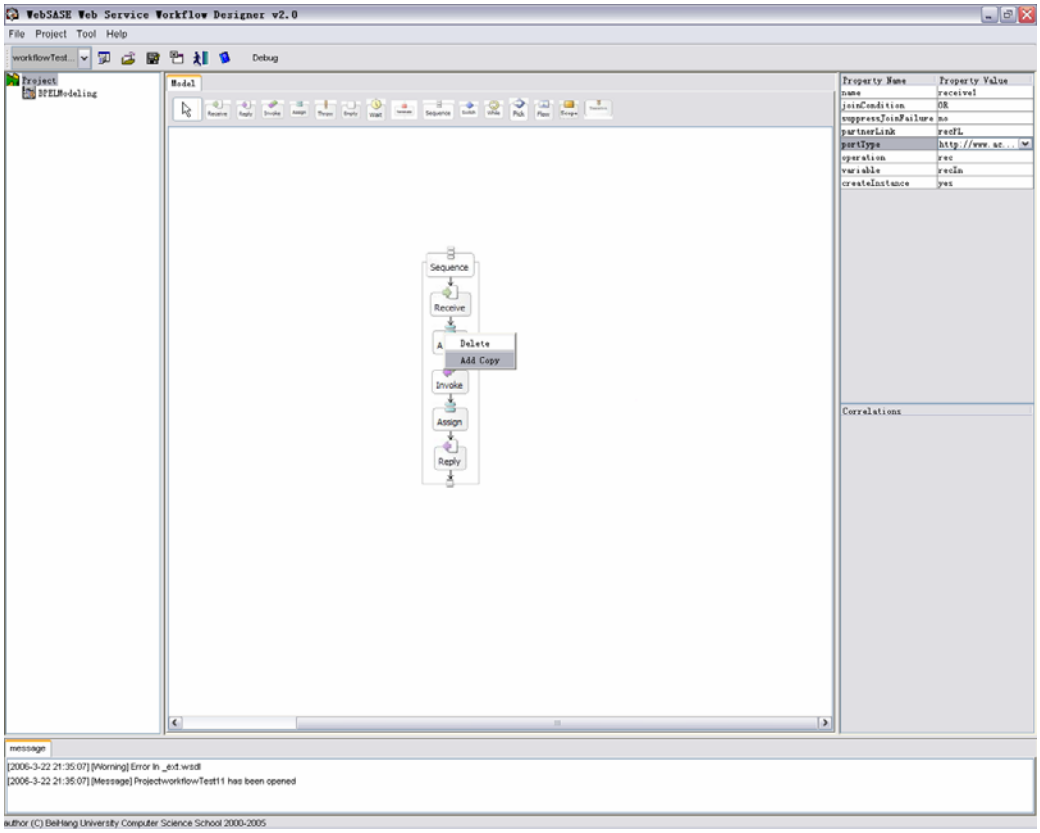


Pic48 Examine /edit receive 's attributes

■ Add special activity's non-activity elements

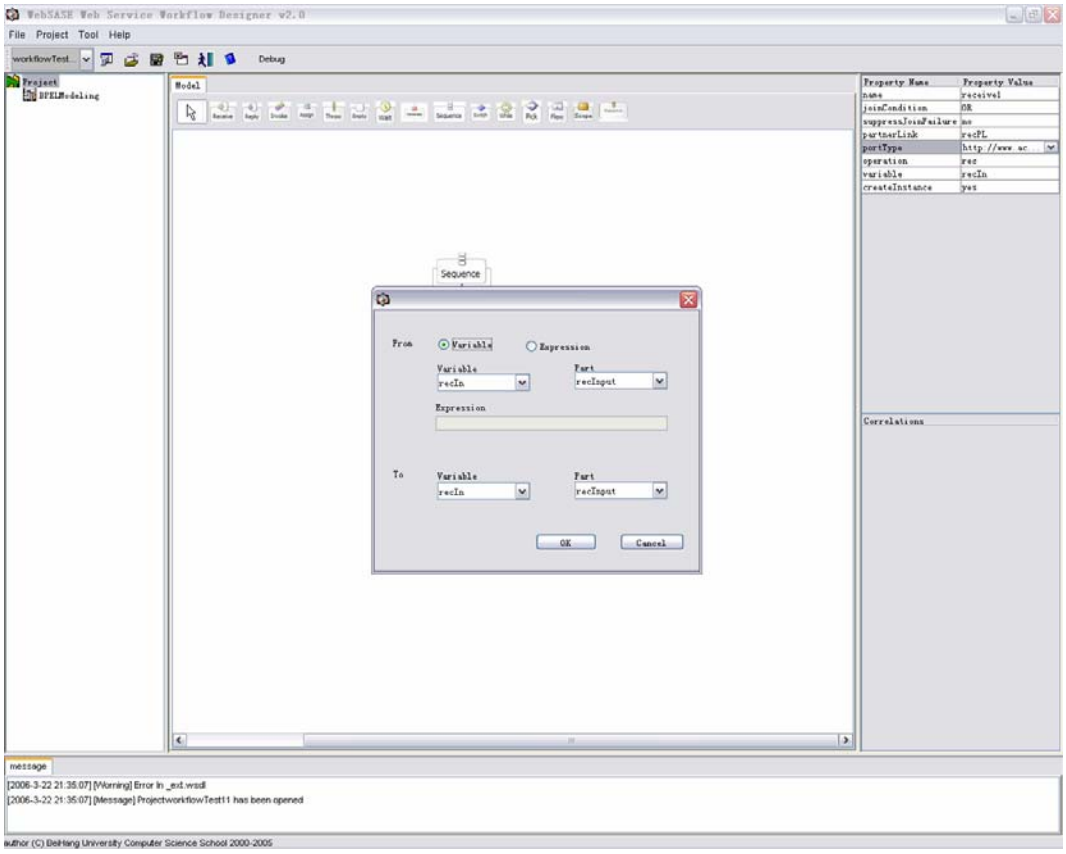
● Add copy element for assign

Clicking right button on assign，select "add copy"



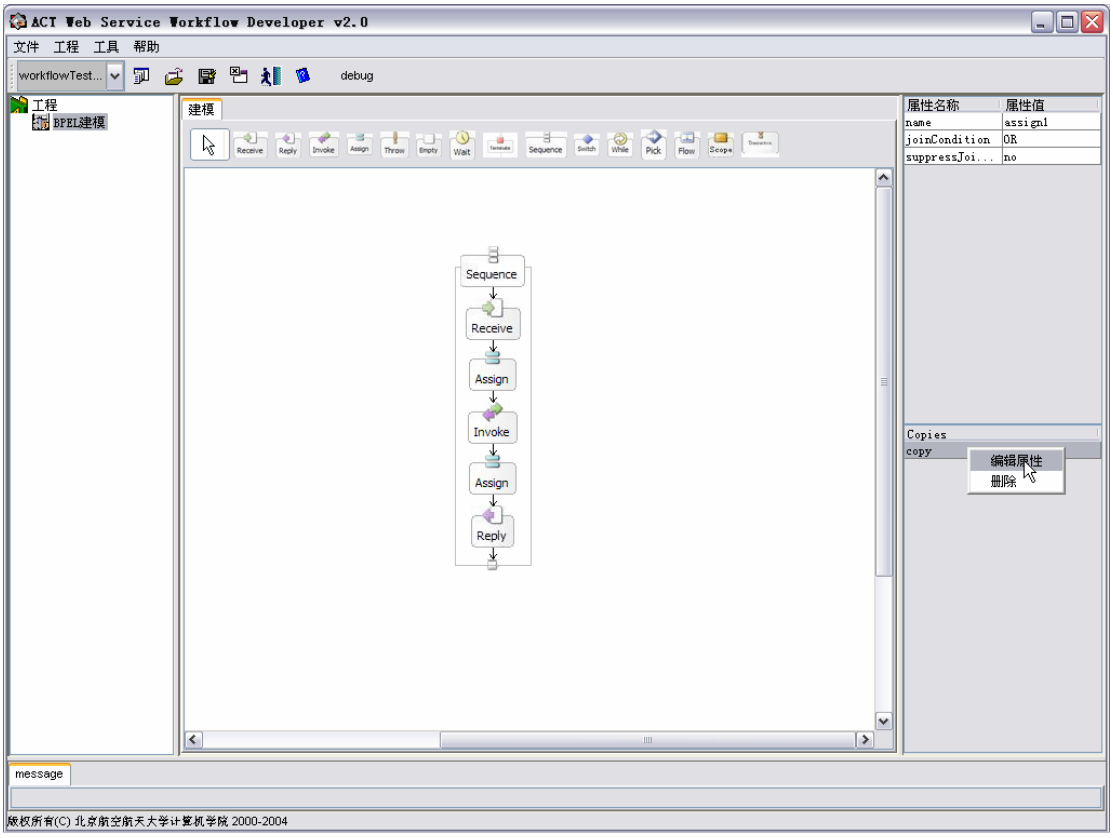
Pic49 Add copy for assign

Select source variable and target variable for copy



Pic50 Define copy

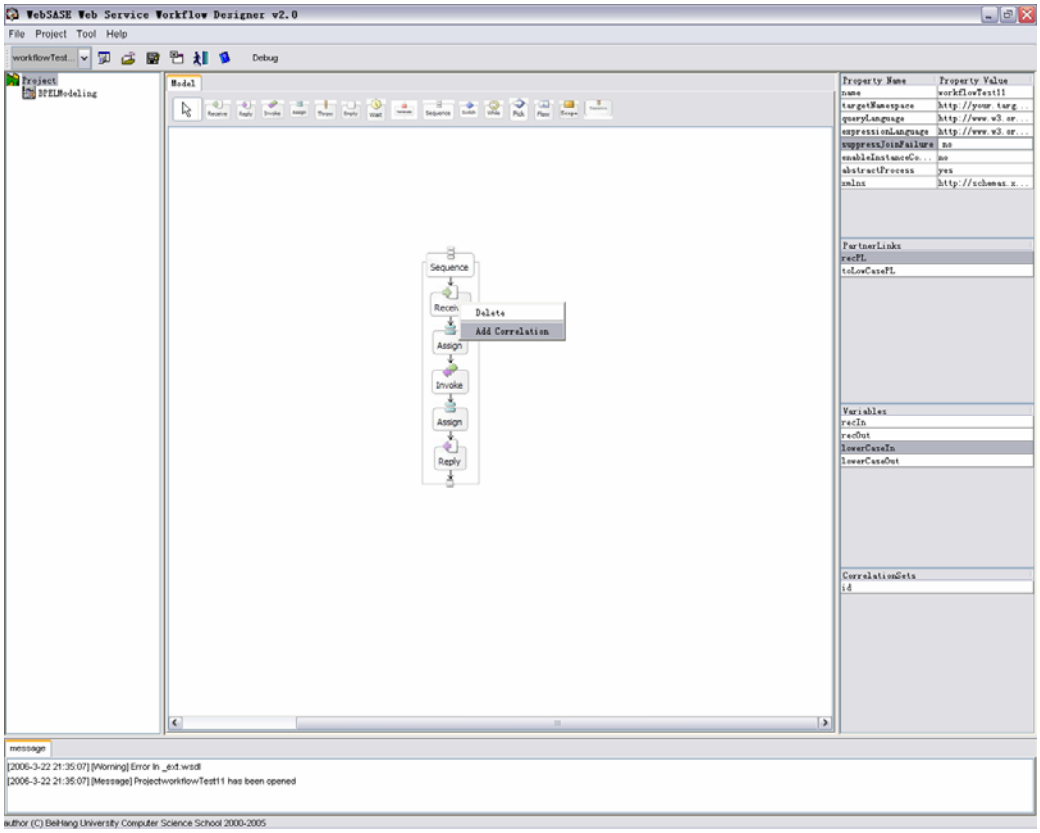
Redefine already existed copy elements，click right button on copy in attributes area, select “attributes edit”，definition of copy editing interface will pop up.



Pic51 Modify copy’s attributes

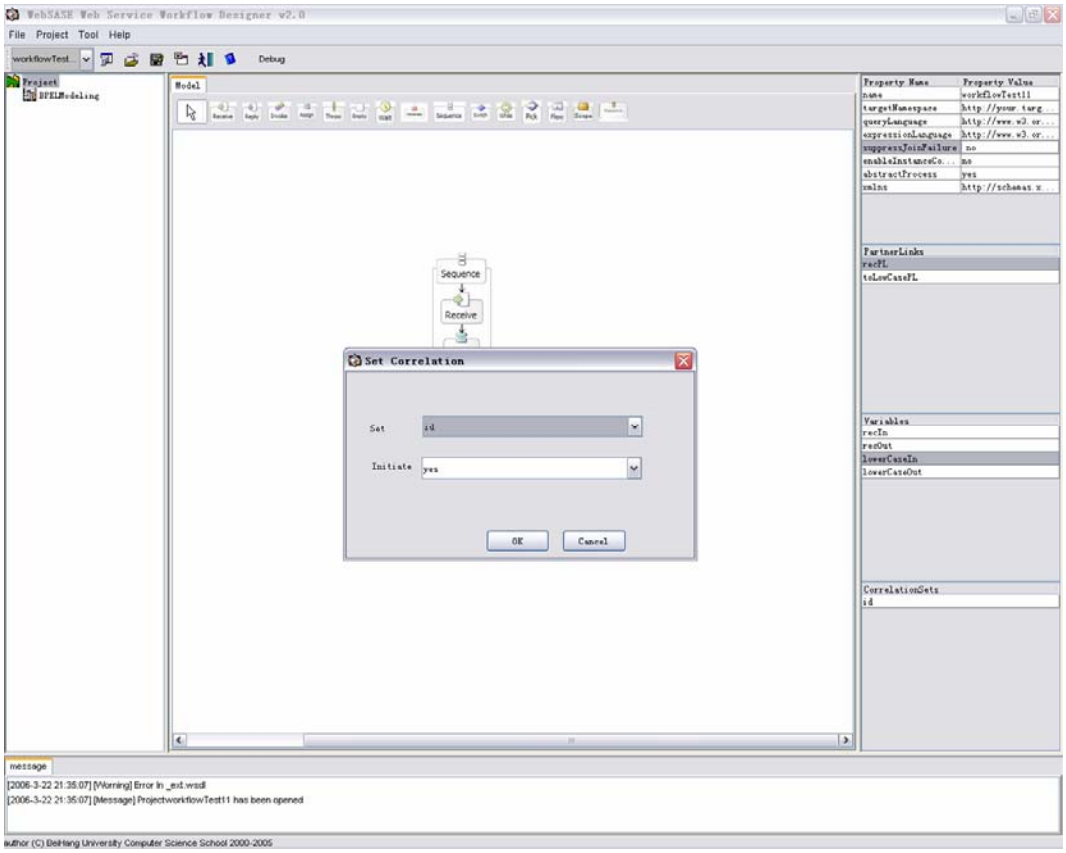
- Add correlation elements for receive、reply、invoke and onMessage

Show using receive，click right button on receive activity，select “add correlation”



Pic52 Add correlation to receive

Define correlation，set its attributes



Pic53 Edit Correlation’s attributes

- Add variable and correlatinSet elements for scope

Click right button on scope，select “add variable”or “add correlationSet”，this operation is same to operation of adding variable and correlationSet elements for flow（see in 2.3 section）。

3.1.5 Flow debug function

■ Enter in debug status

Click toolbars “debug” button，enter in debug status，debug toolbar appears，button” start、resume、stepInto、setpOver、stepOut” are arranged on this toolbar.（these functions are same to others common debug tools’）

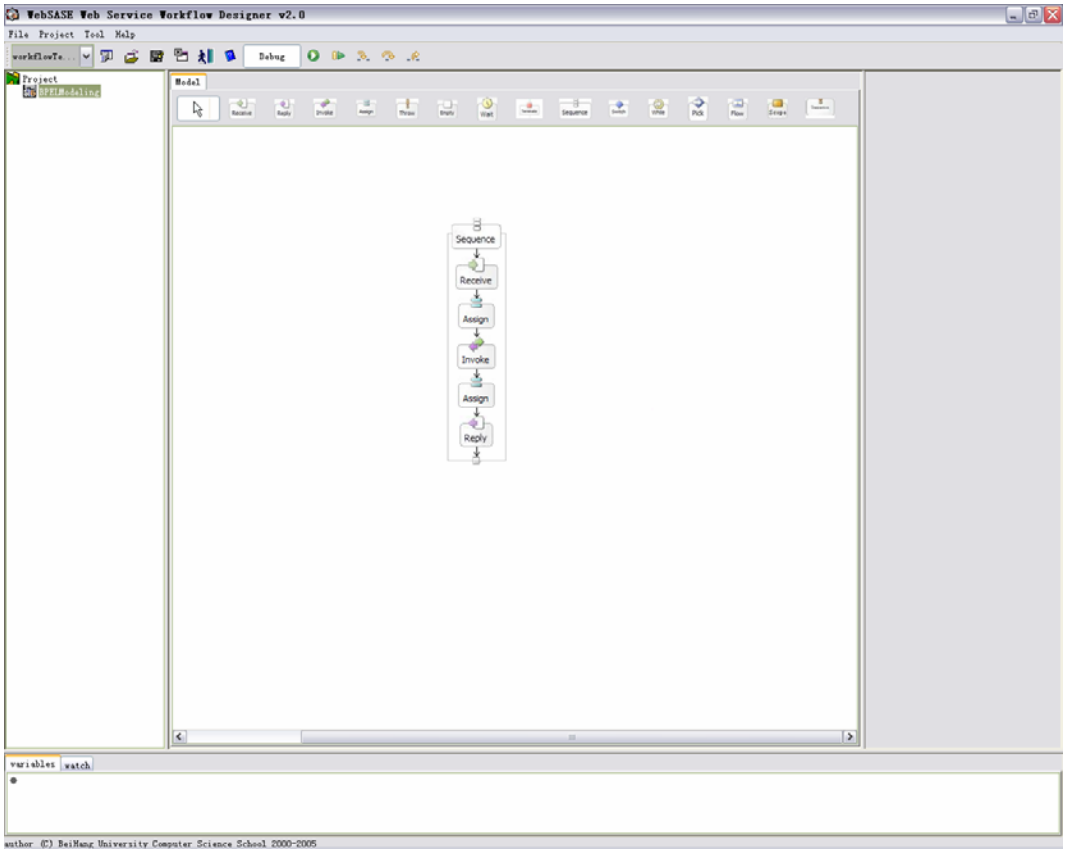
Start：start debug

Resume：run to next breakpoint

stepInto：enter into Structured activity

setpOver：run to next activity

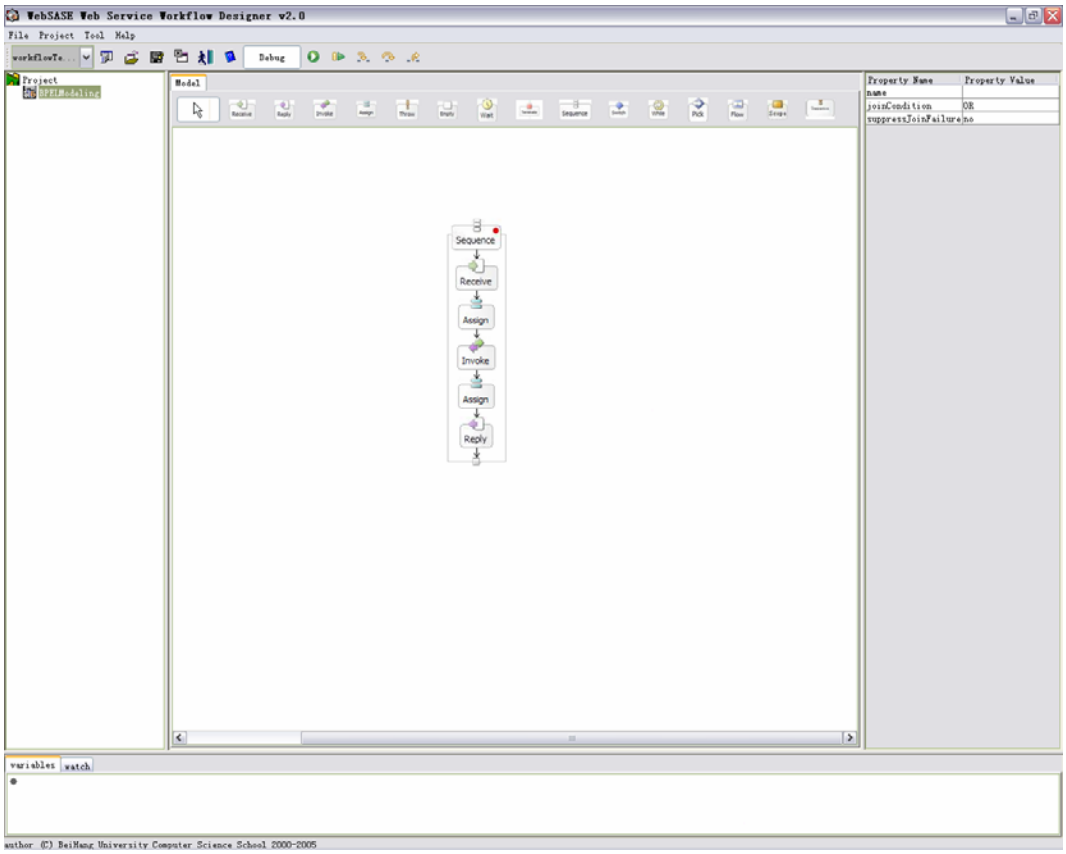
stepOut：



Pic54 Enter into debug state

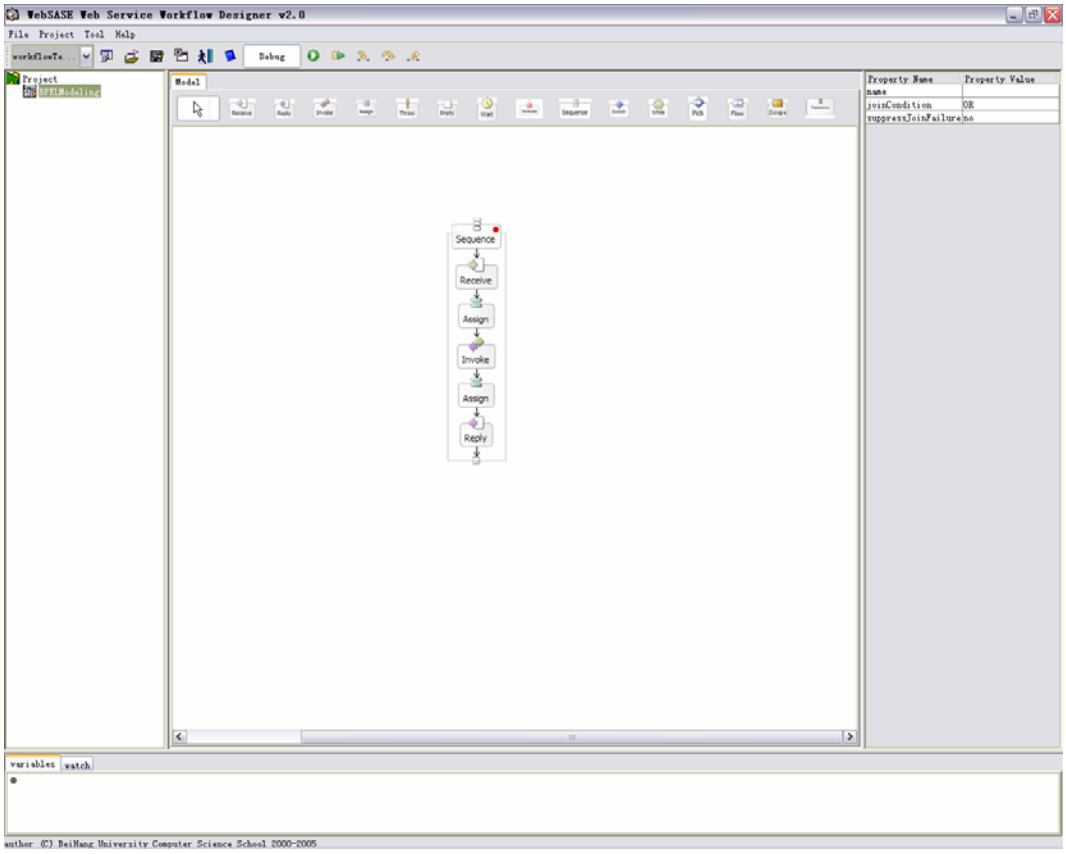
■ Set breakpoint

After enter into debug status，dblclick icon activity，and set breakpoint，then a red point labels on the activity icon.



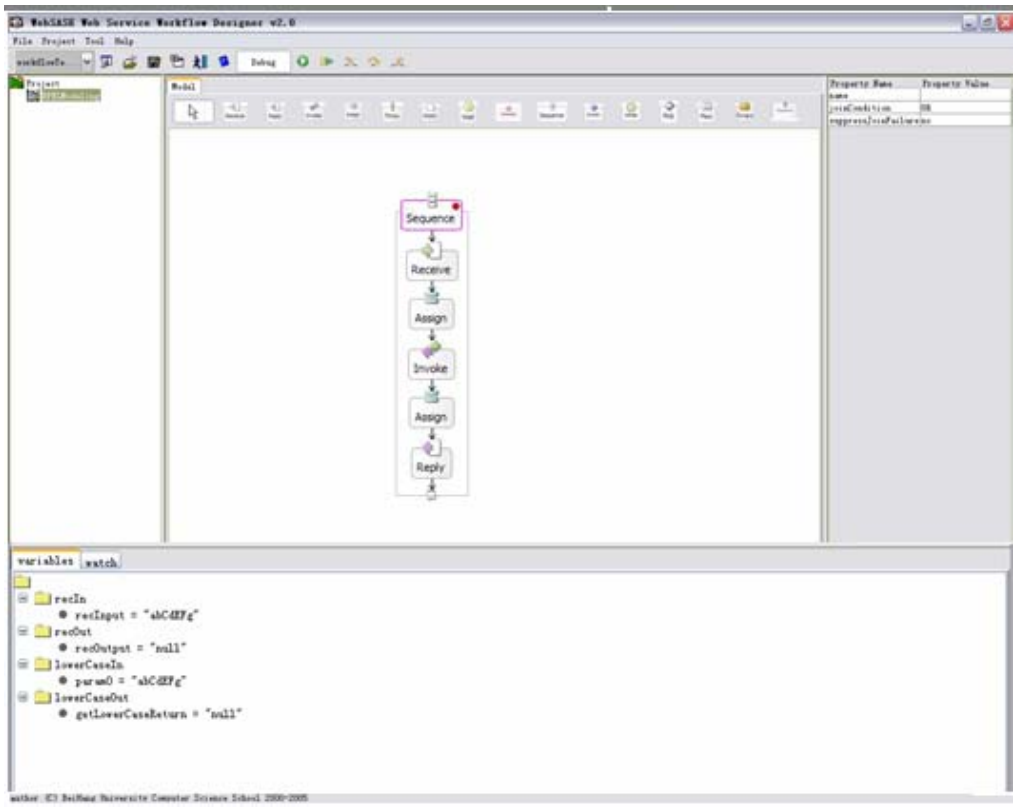
Pic55 Set breakpoint

Click button“start”，start workflow engine and enter into flow debug



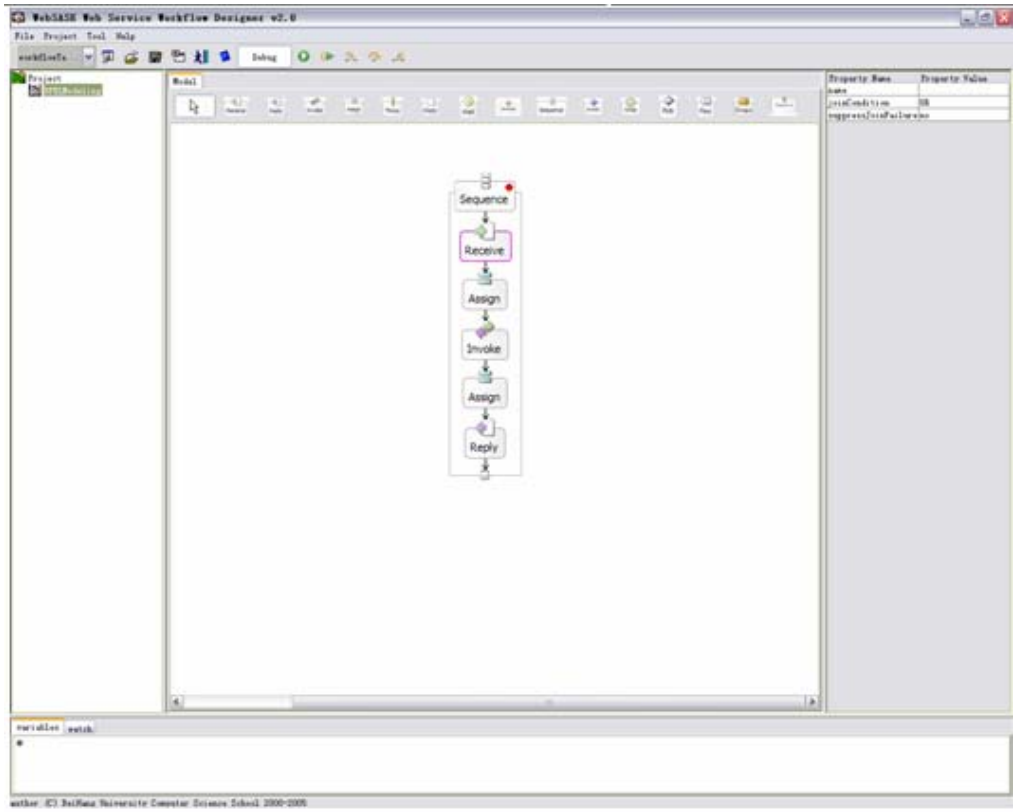
Pic56 Start engine to debug flow

When flow run to breakpoint，red frame appears, as following picture shows:



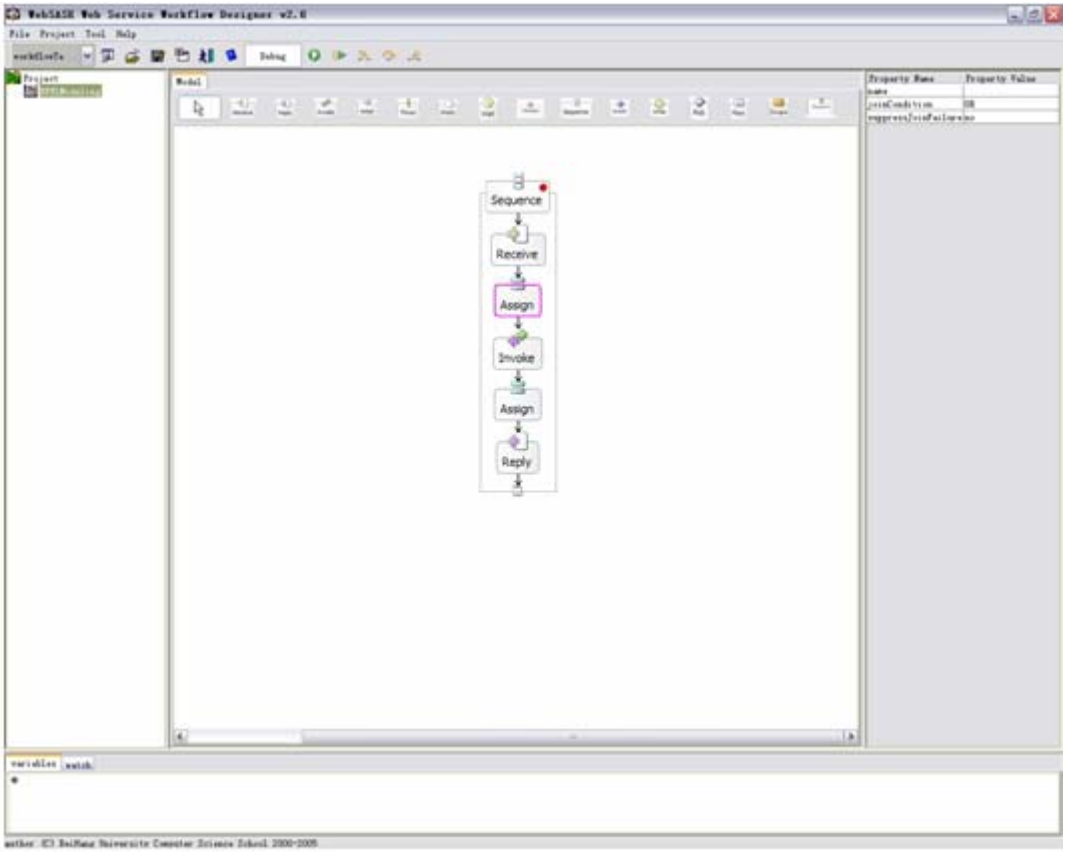
Pic57 Flow debug---run to the first breakpoint--sequence

Click button “stepInto”，debug and enter into structured activity’s sub_activity



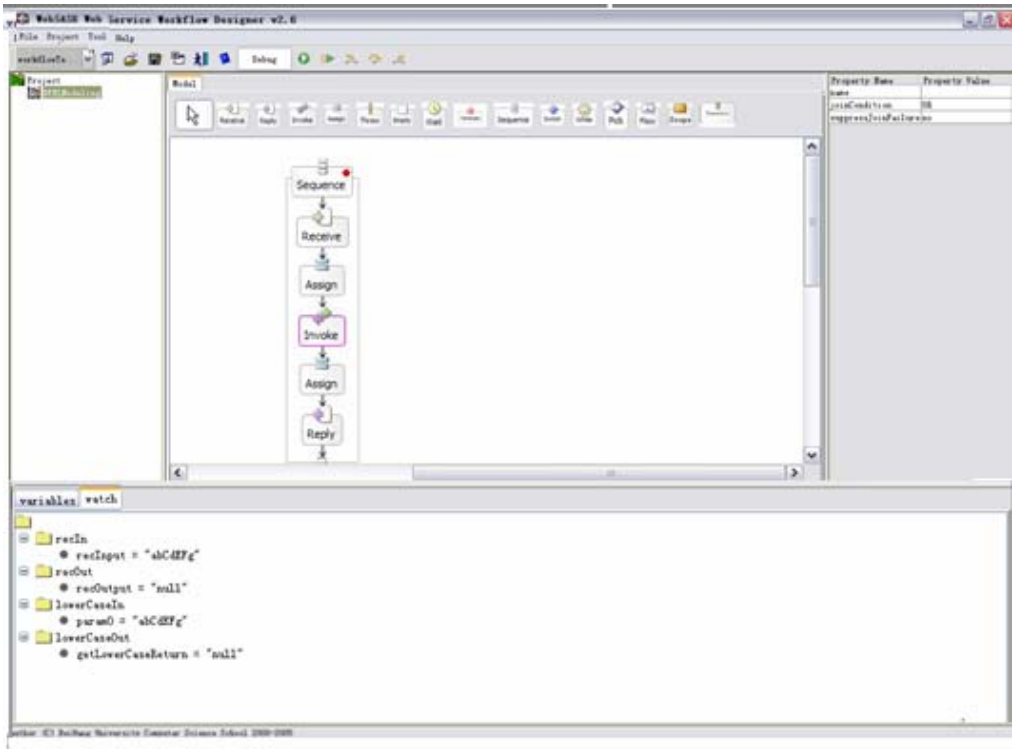
Pic58 Flow debug---run to sequence's first sub activity--receive

Click button "stepOver", and run the next activity of receive



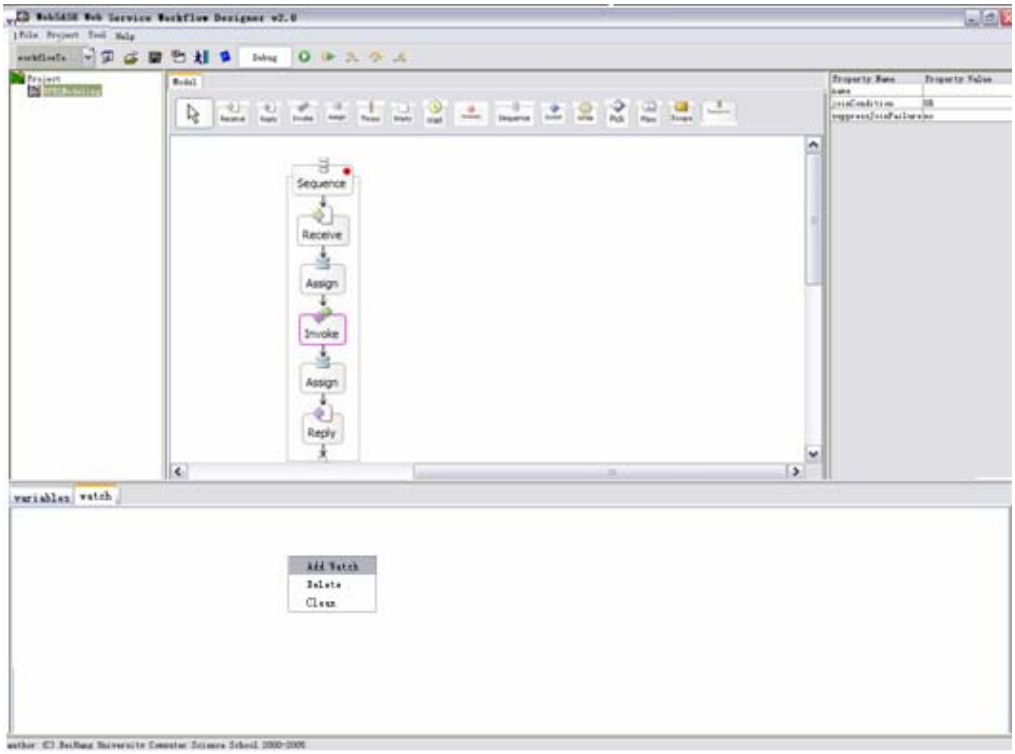
Pic59 Flow debug---run to sequence's second sub activity--assign

When running, all variables' value display at the bottom of windows variable, as following picture shows:



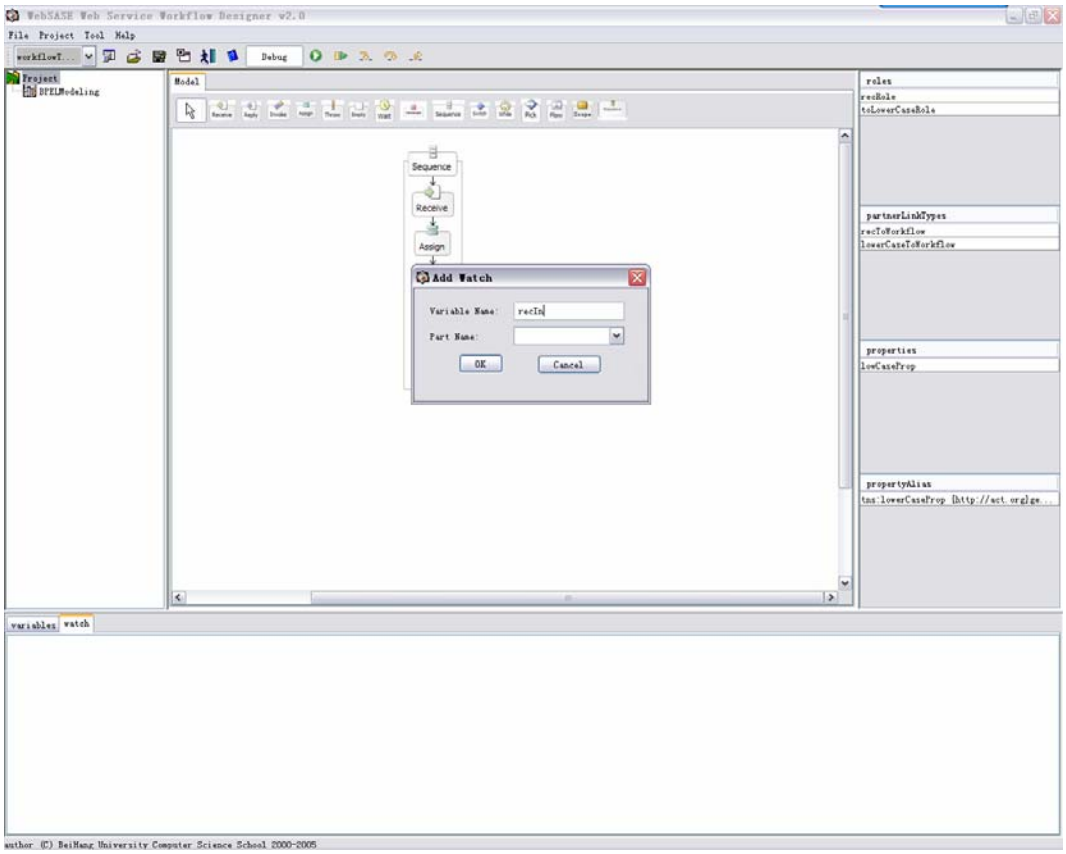
Pic60 Flow debug---display all variables when running

When running, certain variable's value can be checked in the watch windows on the bottom

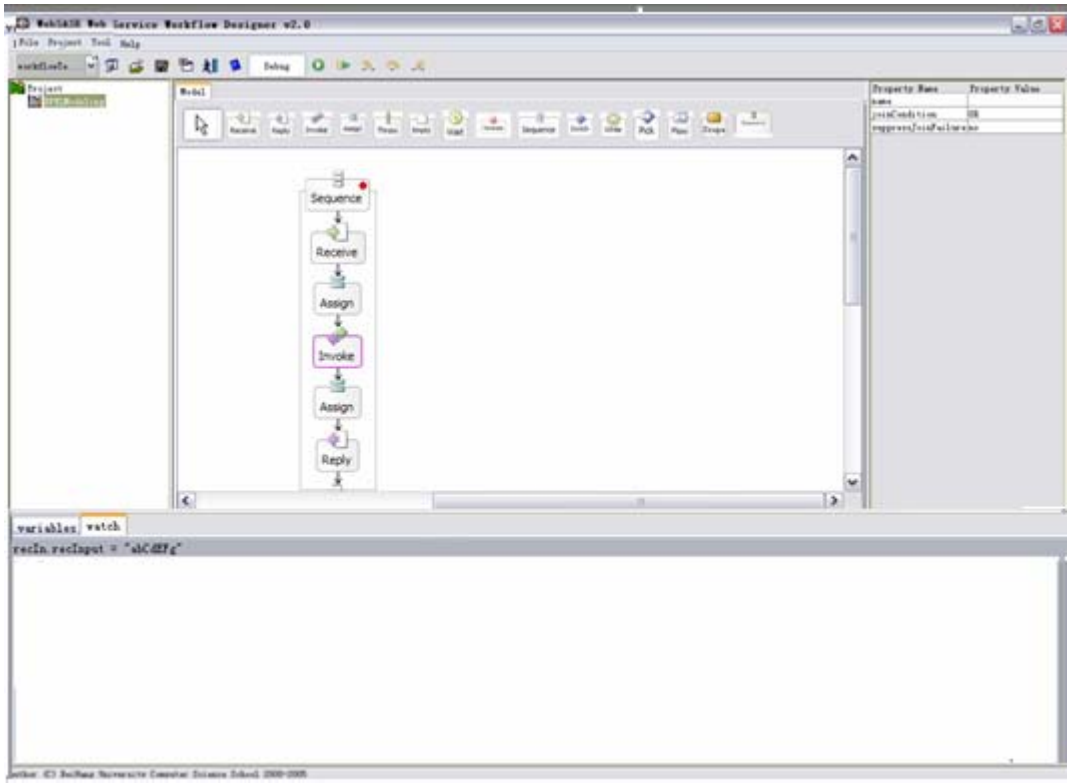


Pic61 First step at adding watch window

Input the name of variable，and select one part of the variable.



Pic62 Second step at adding watch window



Pic63 Result of previous picture

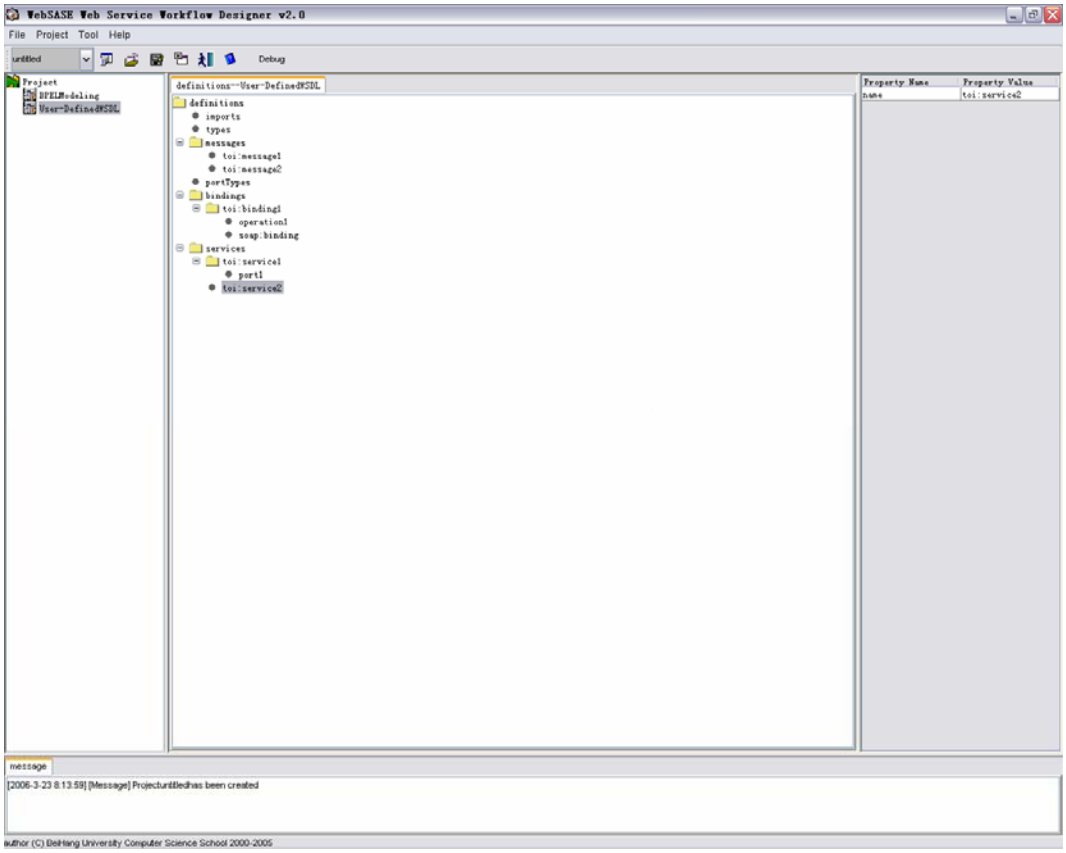
3.2 Usage steps

3.2.1 Modeling mode---Based on Integrating Web services

A instance of Based on Integration Web services' modeling mode's（modelTest1）:

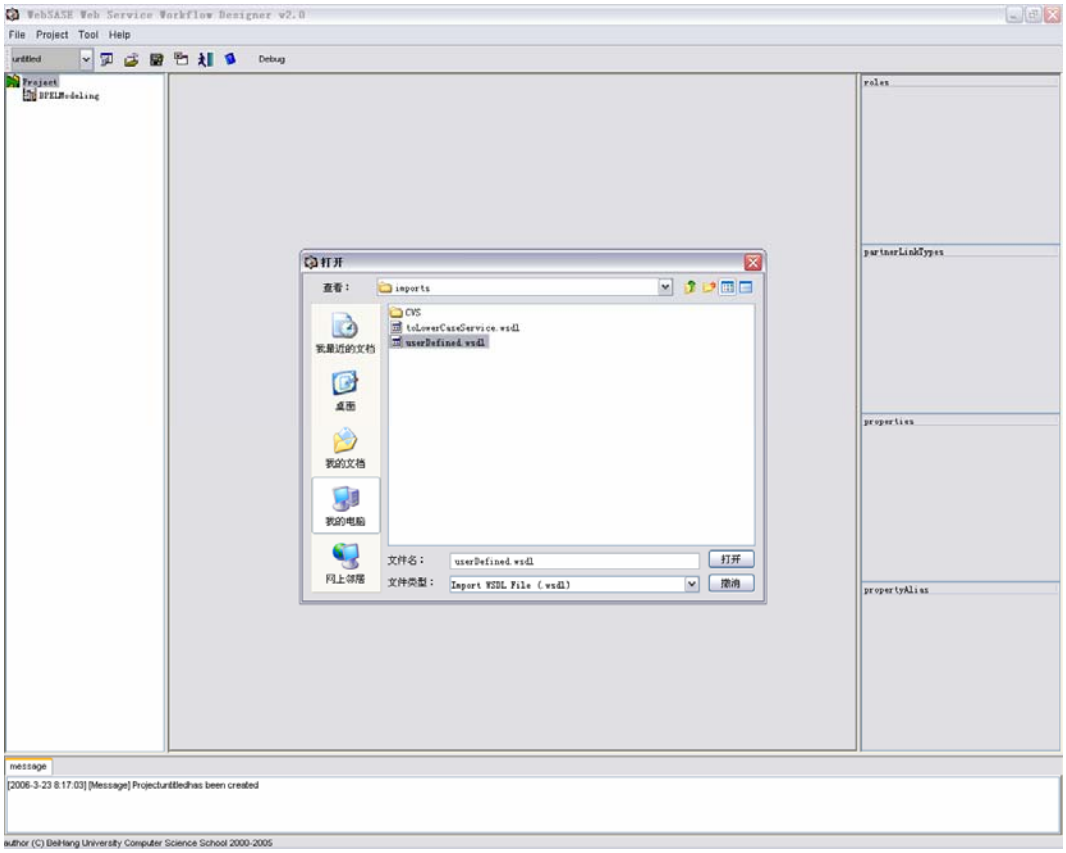
- First step：new a project named modelTest1（see also 2.2）

- Second step：define WSDL，define file WSDL for workflow（integration service）（interface describing file）（see also2.2）



Pic64 Result of defining WSDL

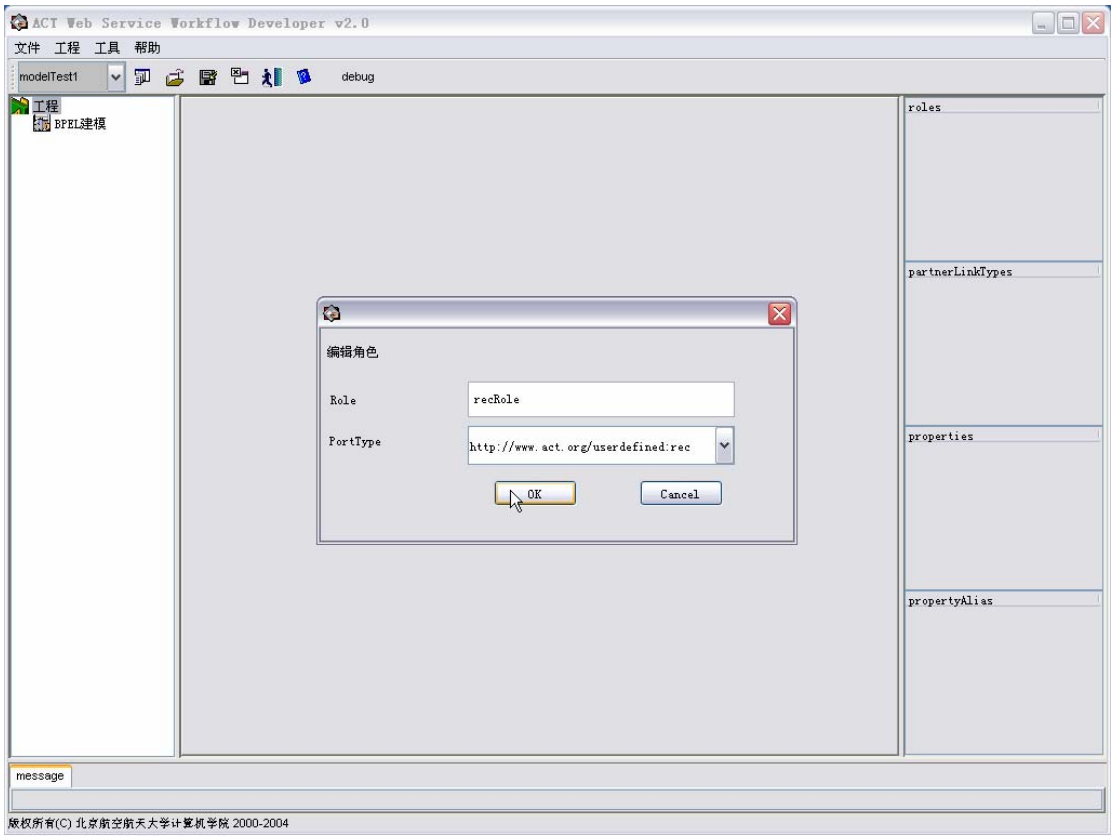
- Third step：import file WSDL：import WSDL from local or import from UDDI：project——〉import file WSDL——〉local/UDDI （see also 2.2）。In this case，import a instanced service's WSDL ,which name is toLowerCase. As following picture shows



Pic65 Import local WSDL file

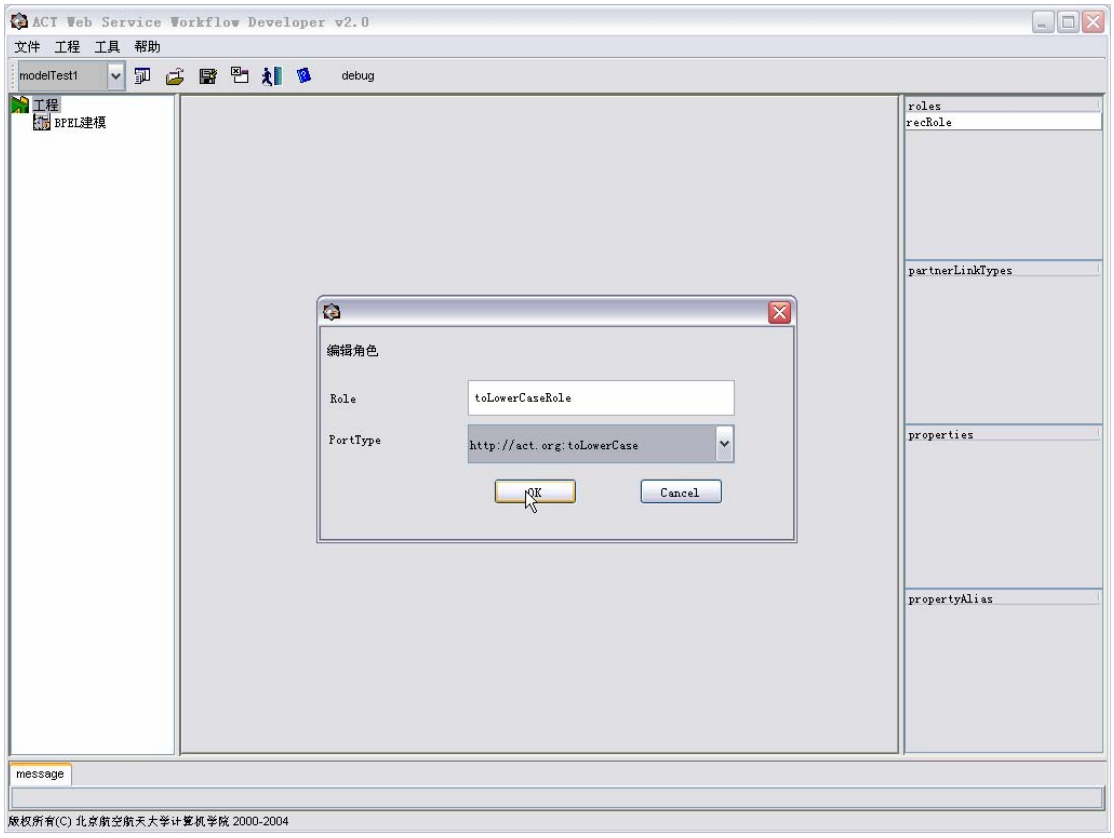
- Forth step：according to portType in WSDL imported or defined, define role，then according to role, define partnerLinkType（see also 2.2）

Define role recRole according to a portType which name is rec in file WSDL:

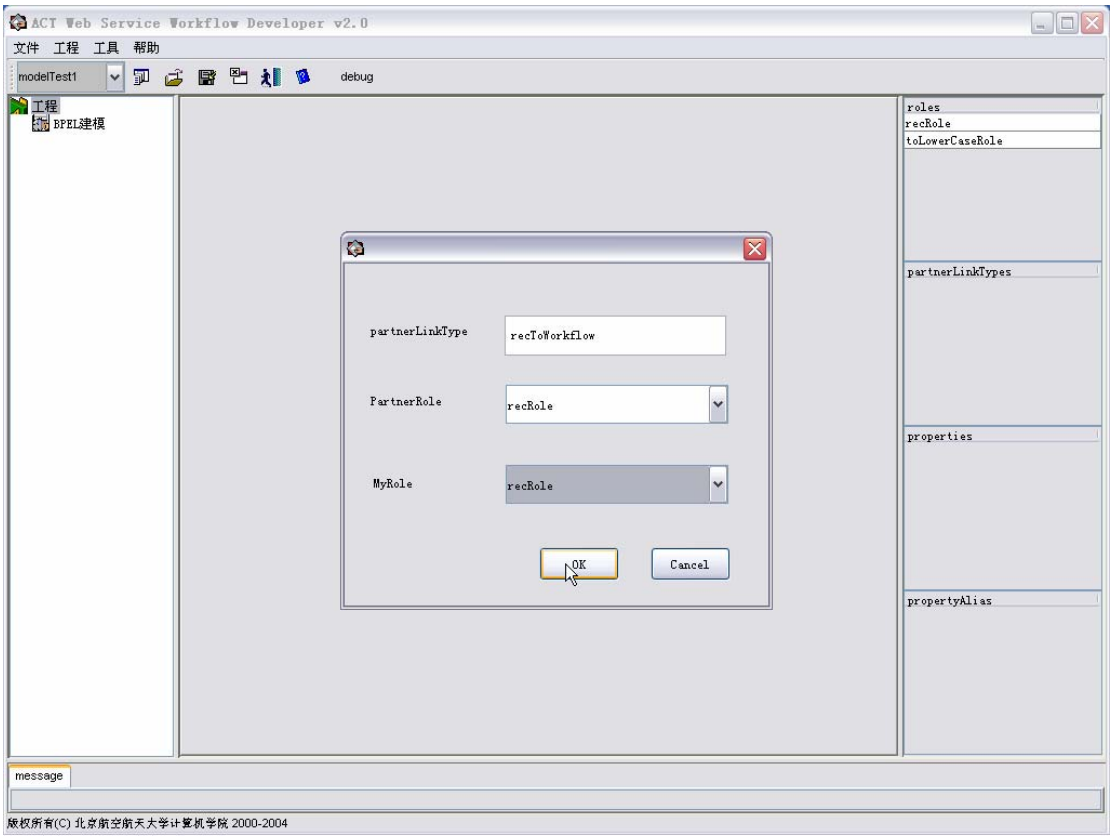


Pic66 Define role——recRole

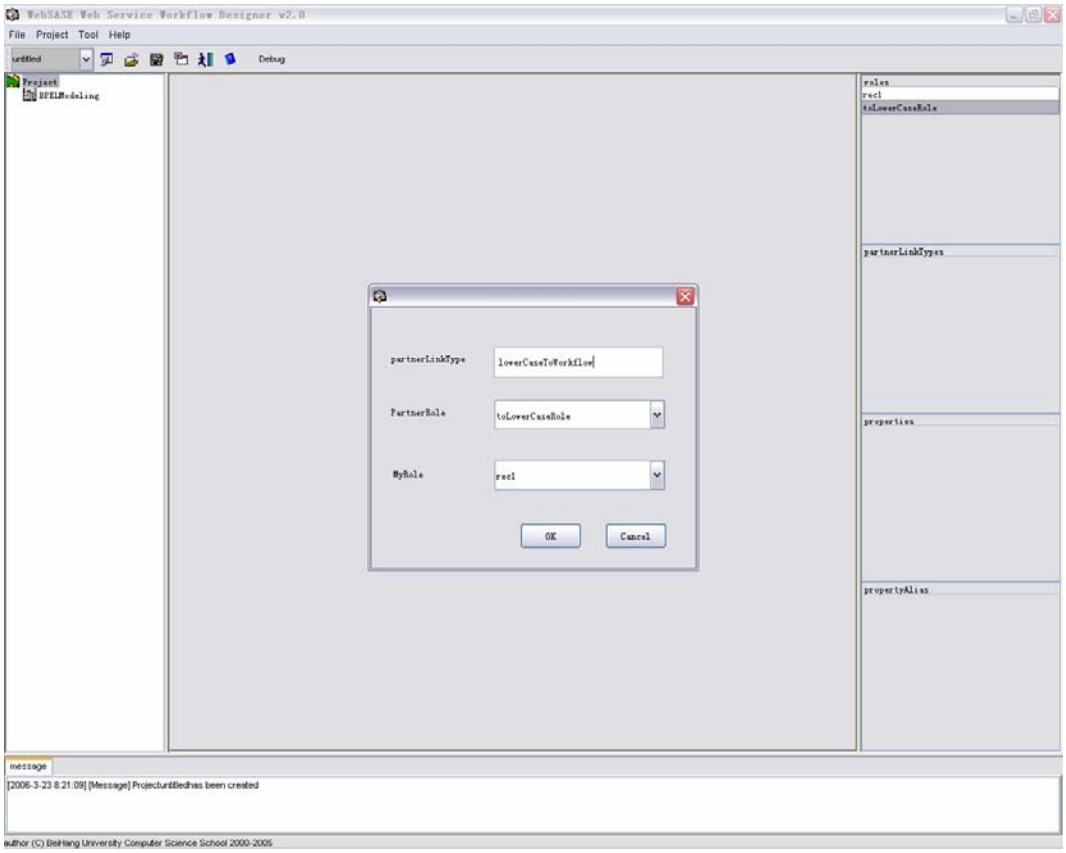
According to portType which name is toLowerCase in file WSDL imported, define role toLowerCaseRole：



Pic67 Define role——toLowerCaseRole

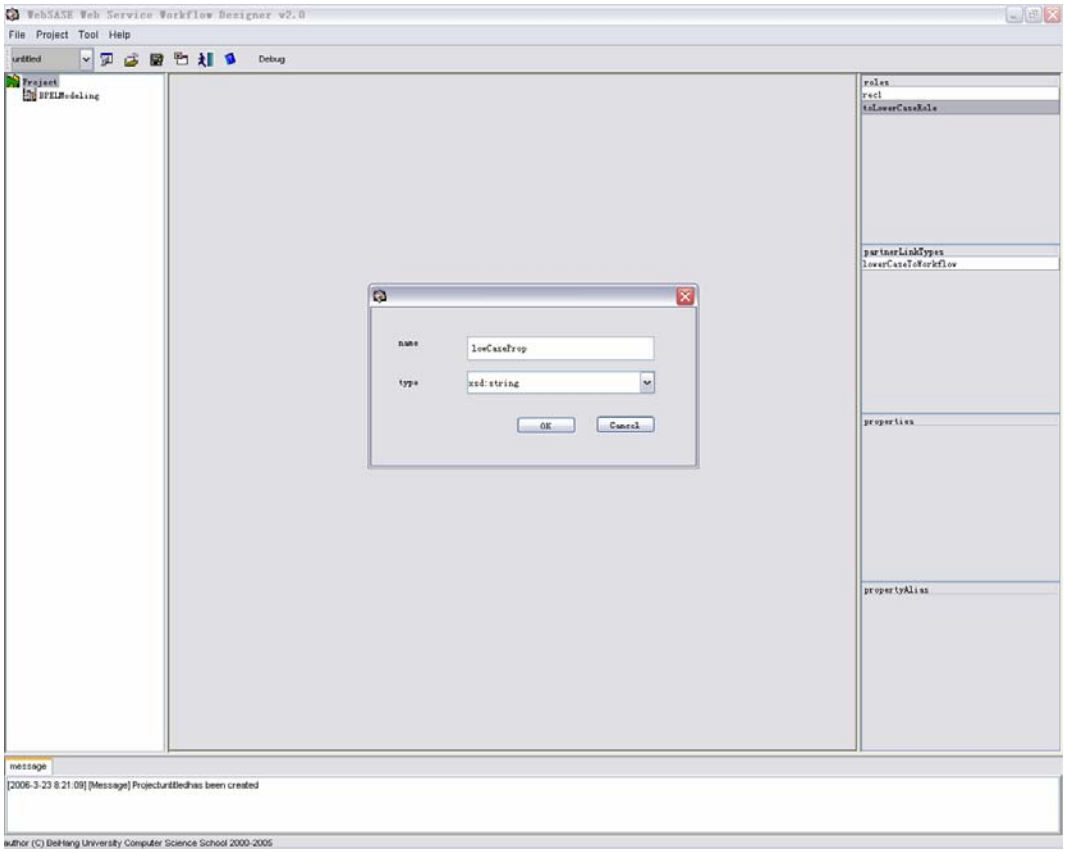


Pic68 Define partnerLinkType——recToWorkflow

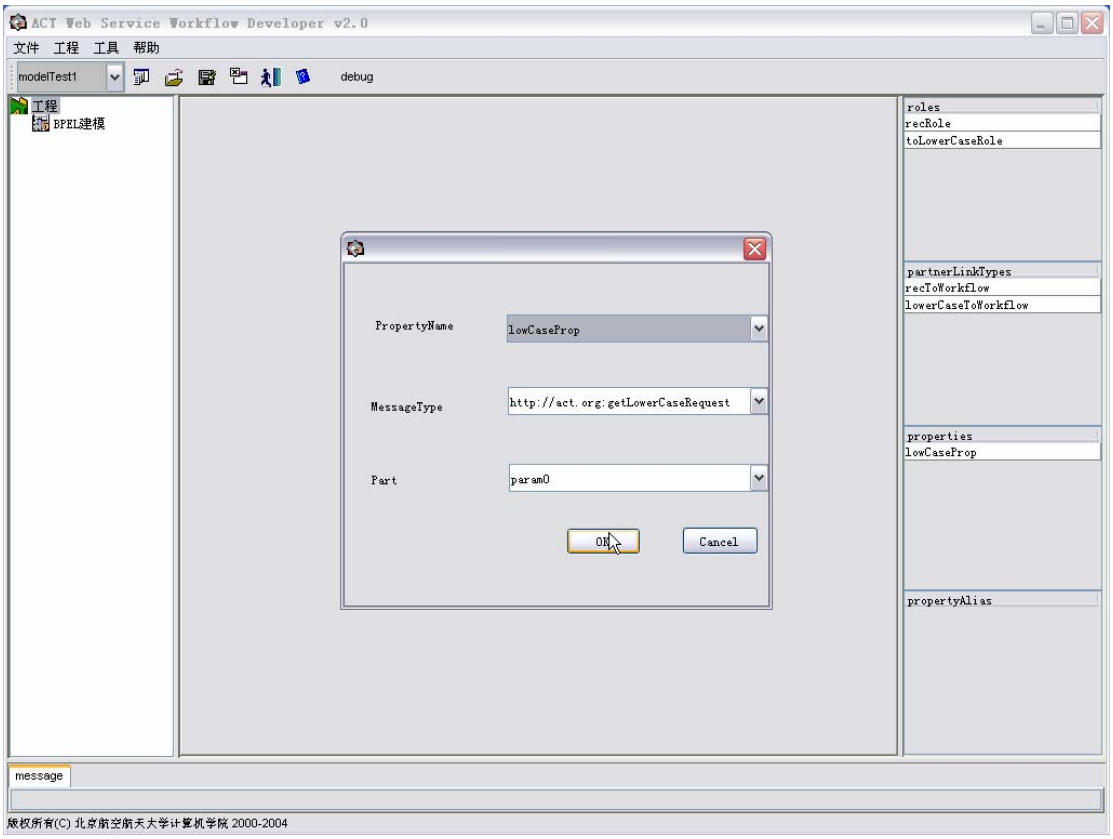


Pic69 Define partnerLinkType——lowerCaseToWorkflow

- Fifth step：define property，then define propertyAlias according to property（see also 2.2）



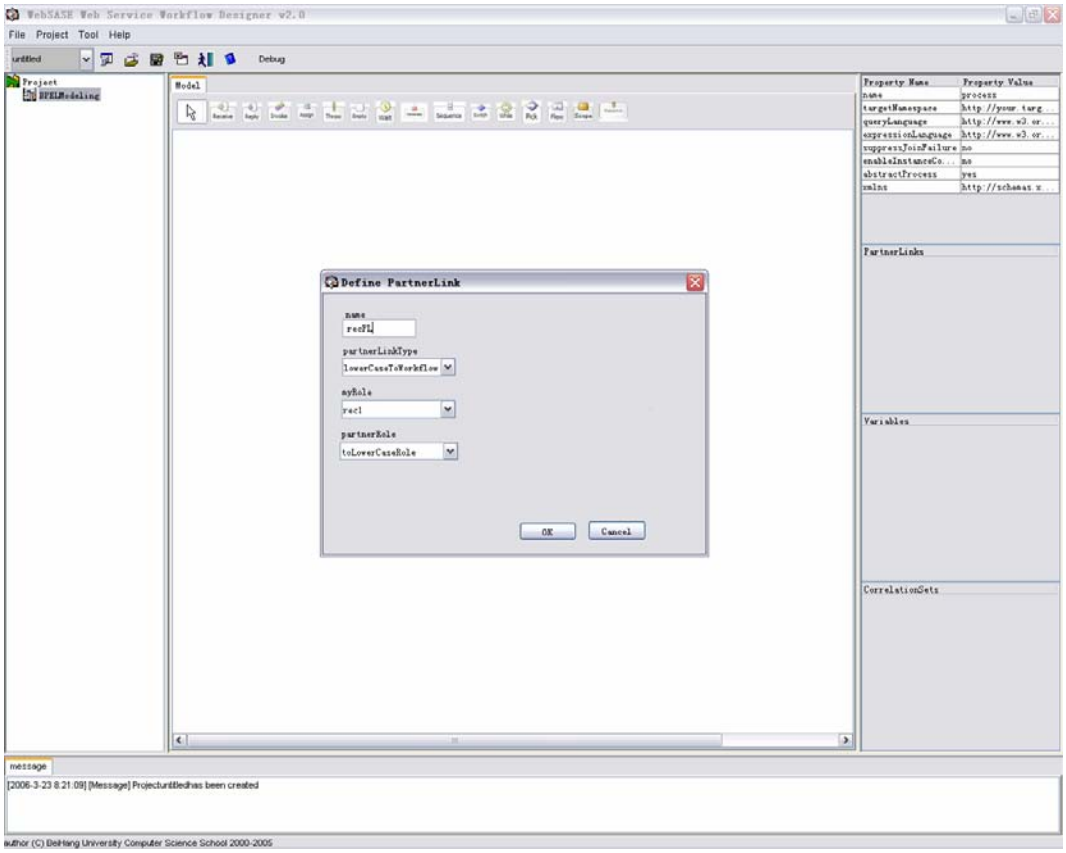
Pic70 Define property——lowCaseProp



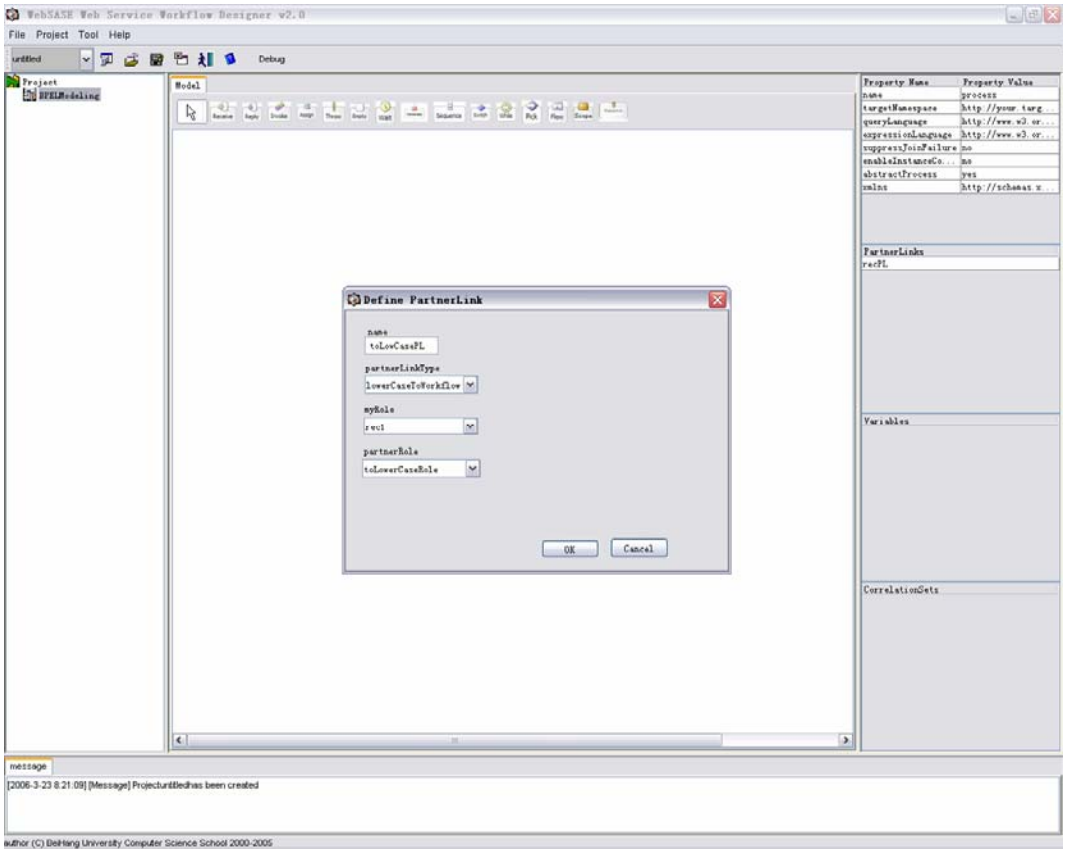
Pic71 Define propertyAlias

- Sixth step：flow modeling：set flow's attributes，add non-activity sub elements for flow, such as：partnerLink、variable、correlationSet；add activity for flow，then add sub-activity under structured activity， and set every activity's attributes（see also 2.3）

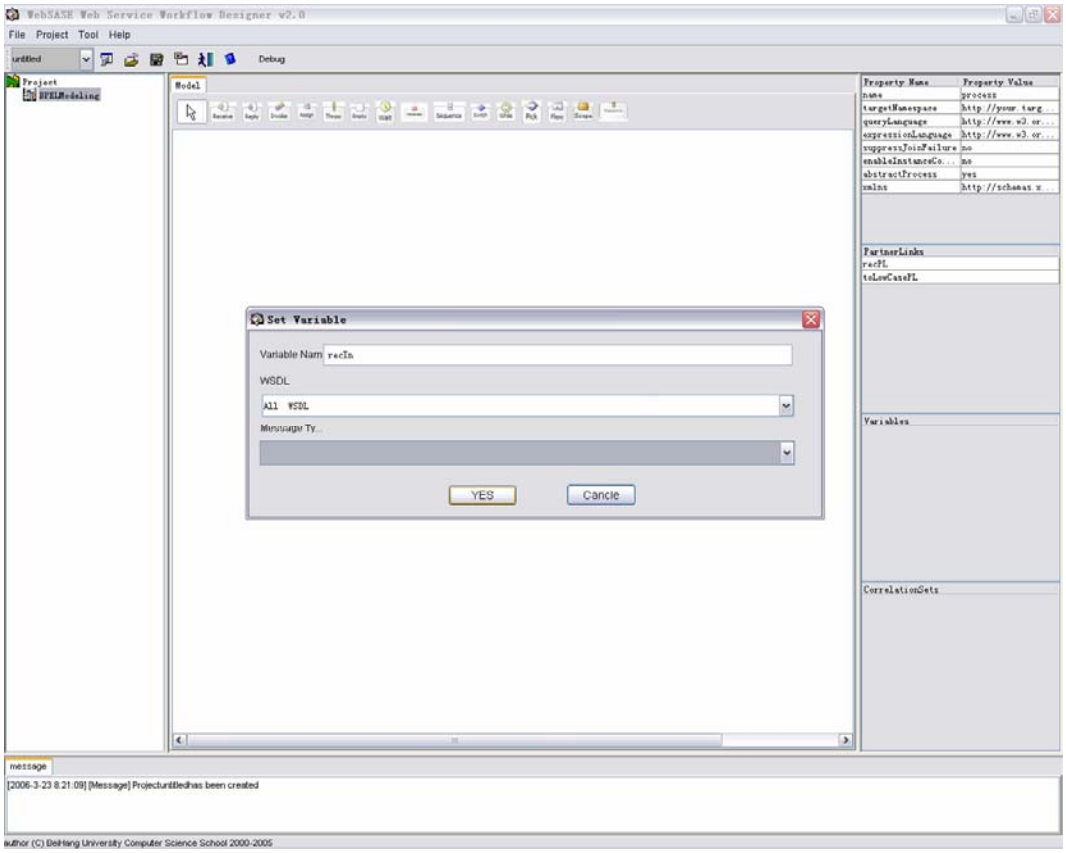
  1. add non-activity sub-elements：



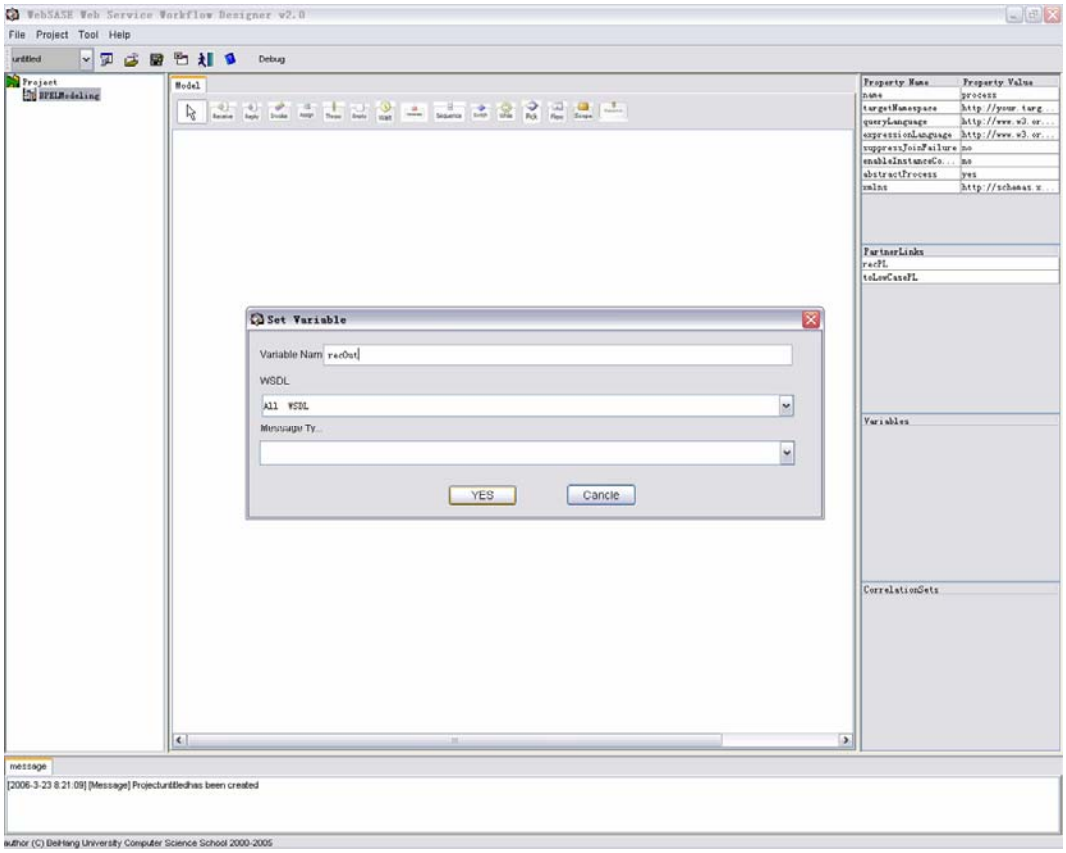
Pic72 Add partnerLink——recPL



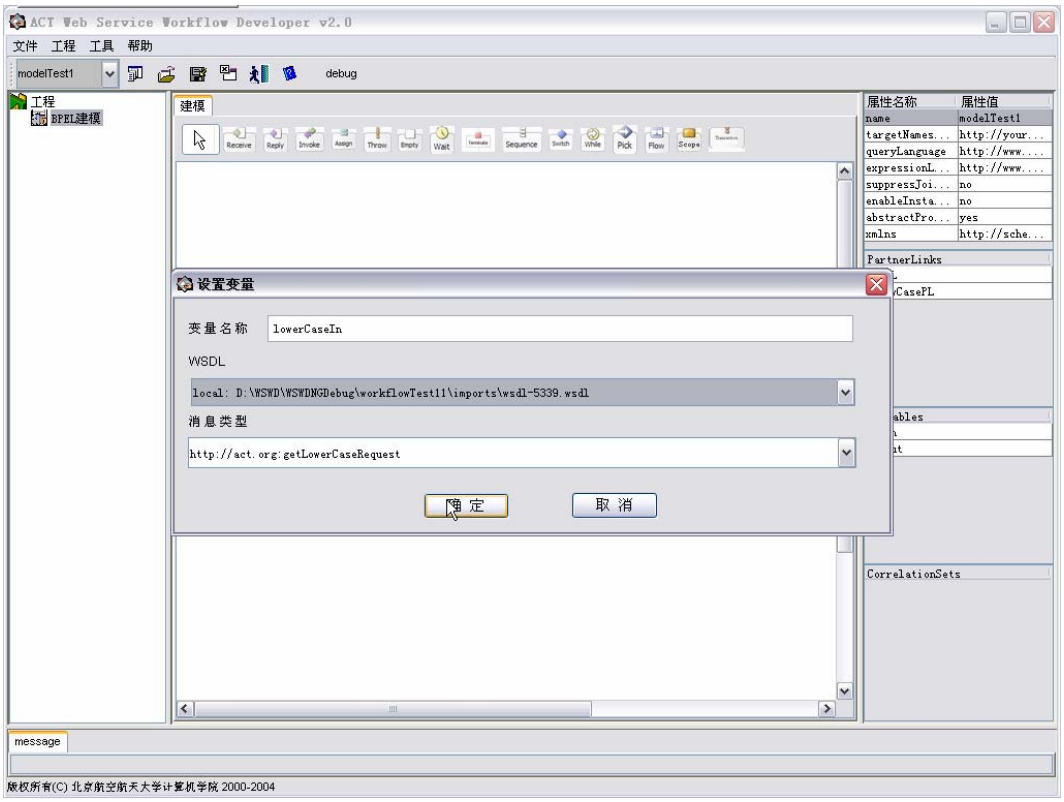
Pic73 Add partnerLink——toLowCasePL



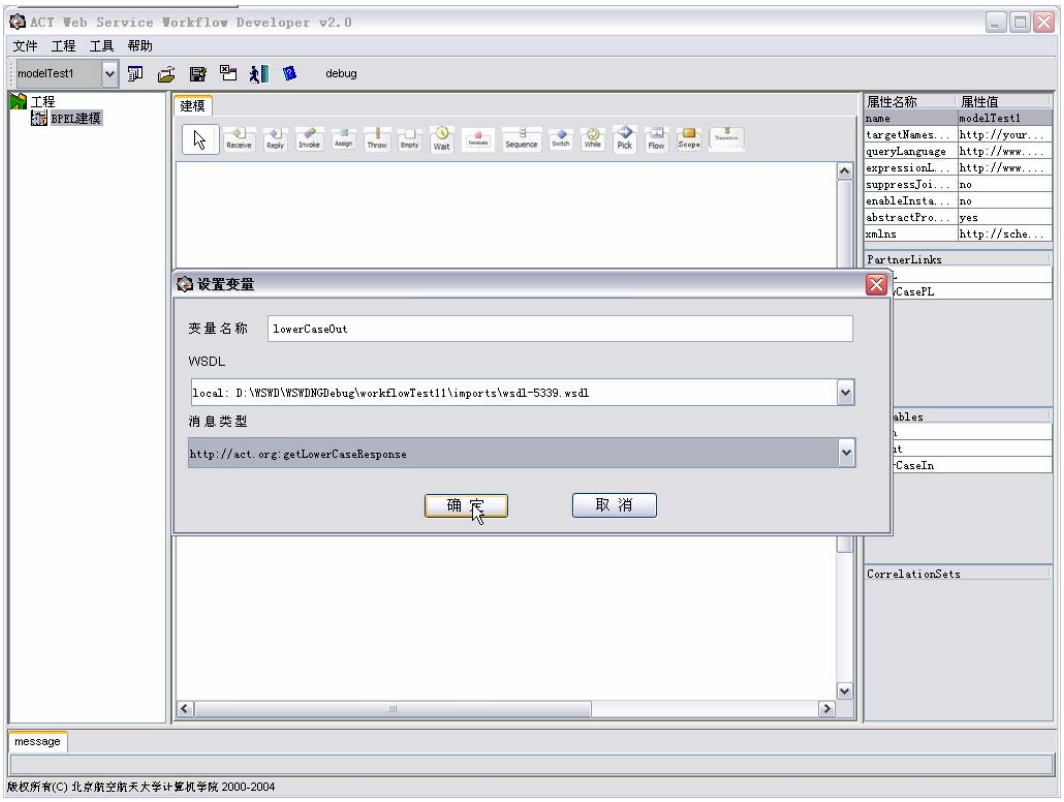
Pic74 Add variable——recIn



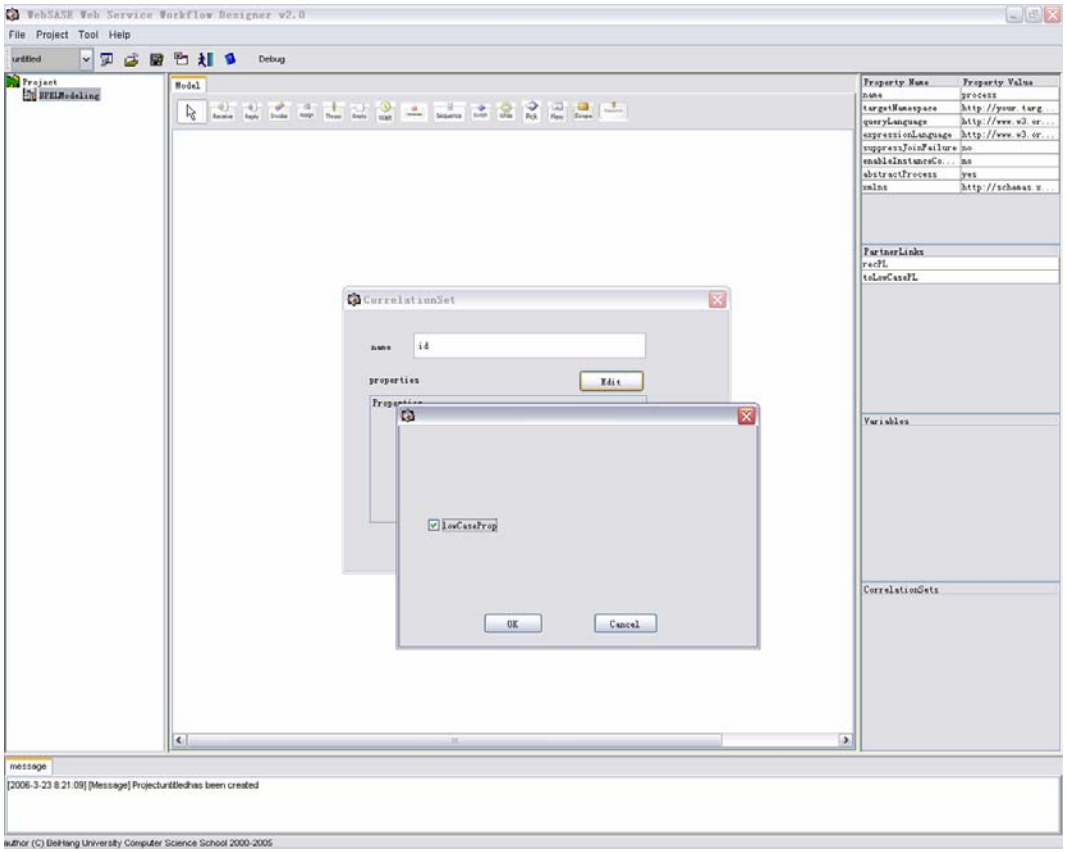
Pic75 Add variable——recOut



Pic76 Add variable——lowerCaseIn



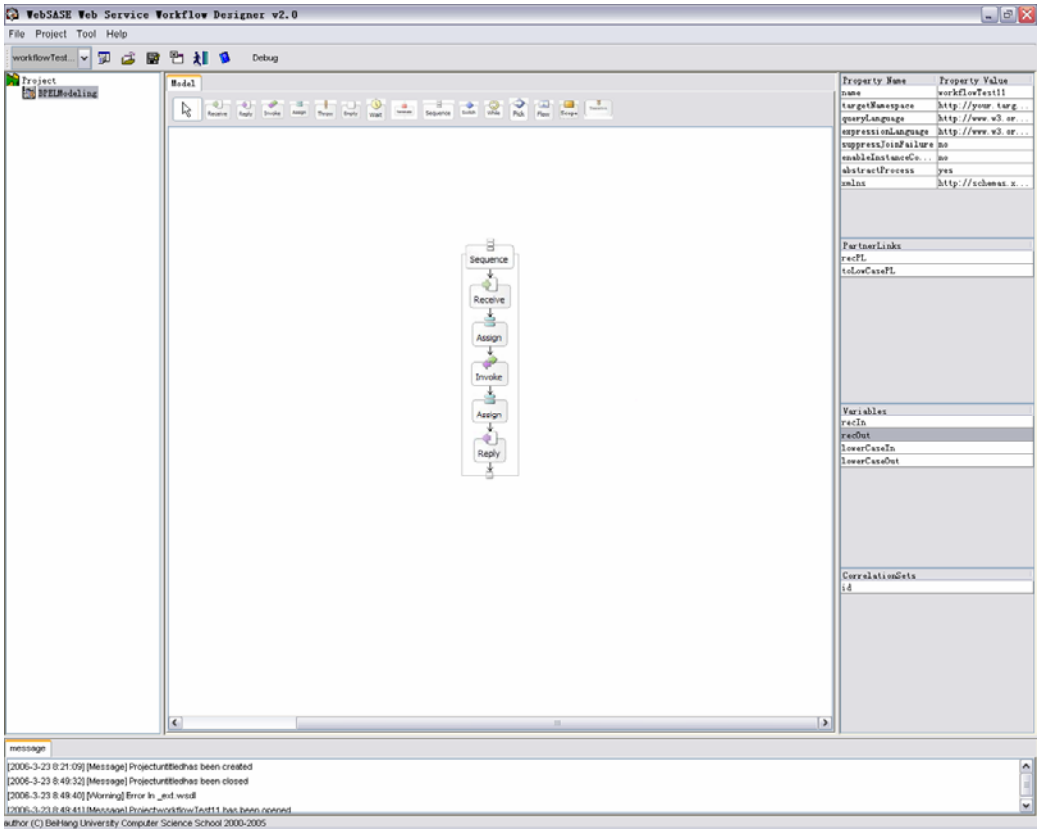
Pic77 Add variable——lowerCaseOut



Pic78 Add correlationSet——id

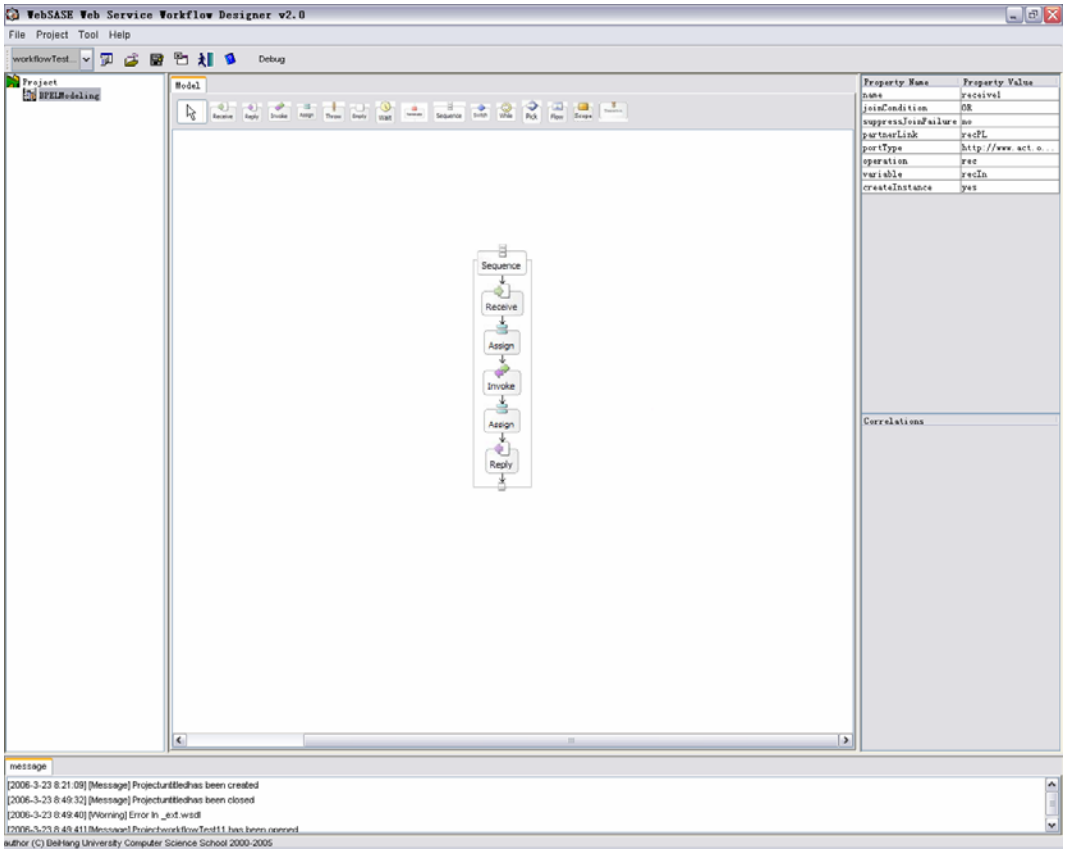
2. Add activity

Add sequence structured activity，and add five sub-activities under sequence activity ：including: receive、assign1、invoke、assign2、reply

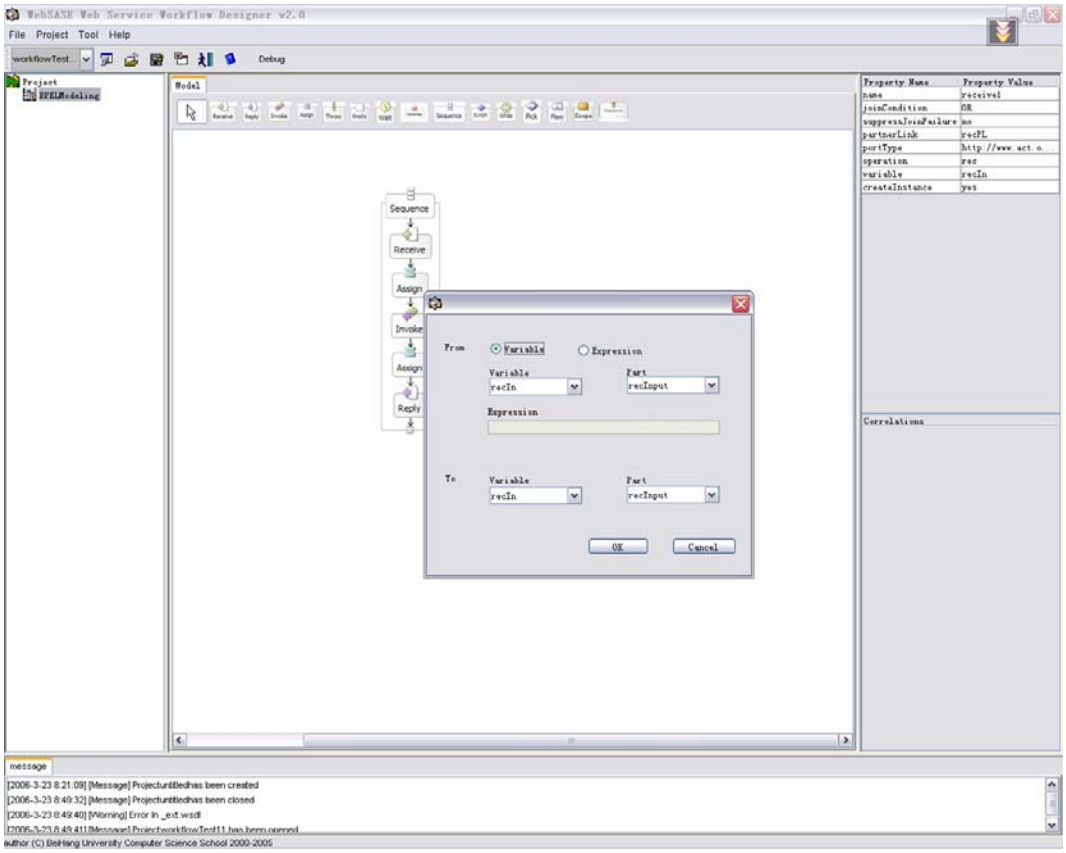


Pic79 Modeling interface

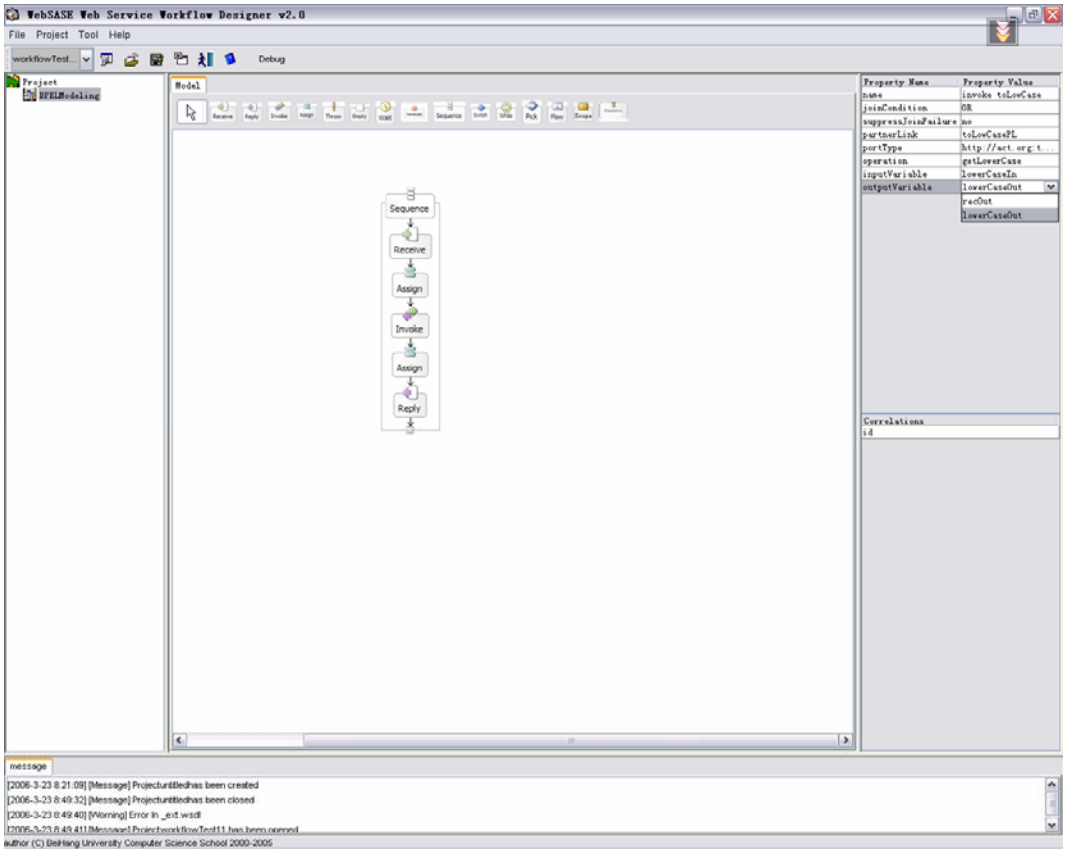
3. set every activity's attributes：



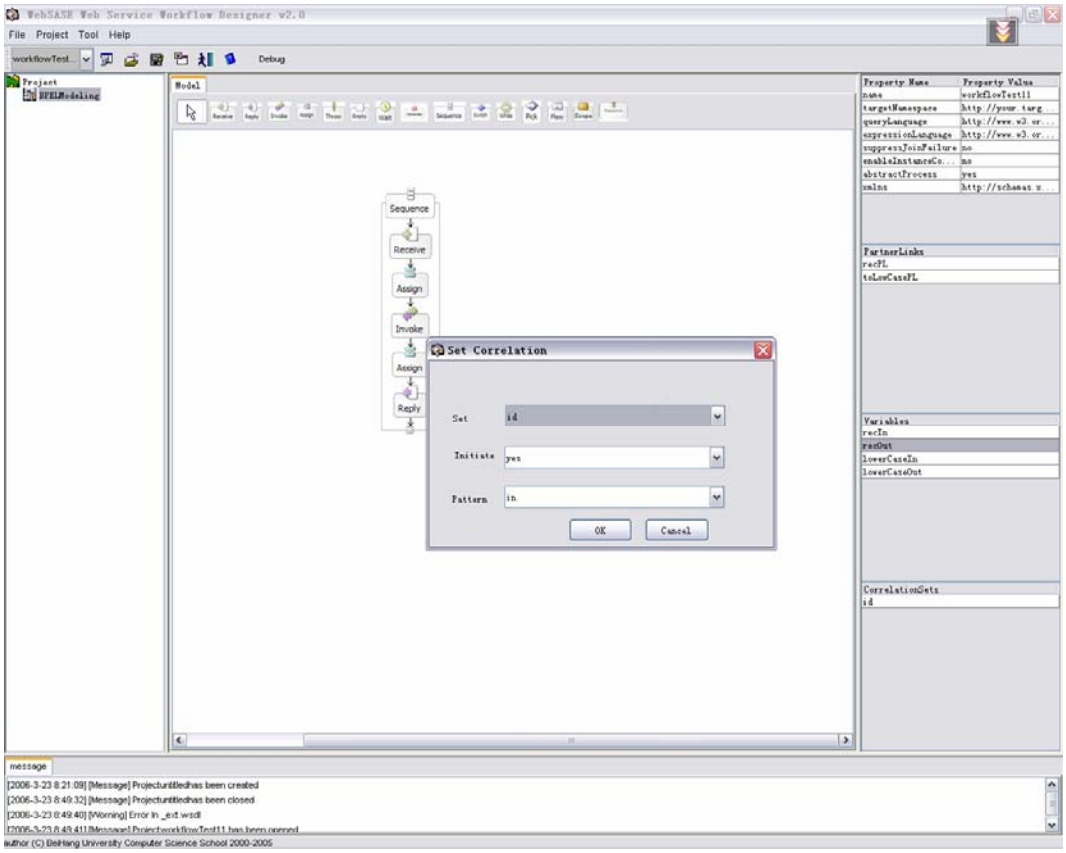
Pic80 Set receive's attributes



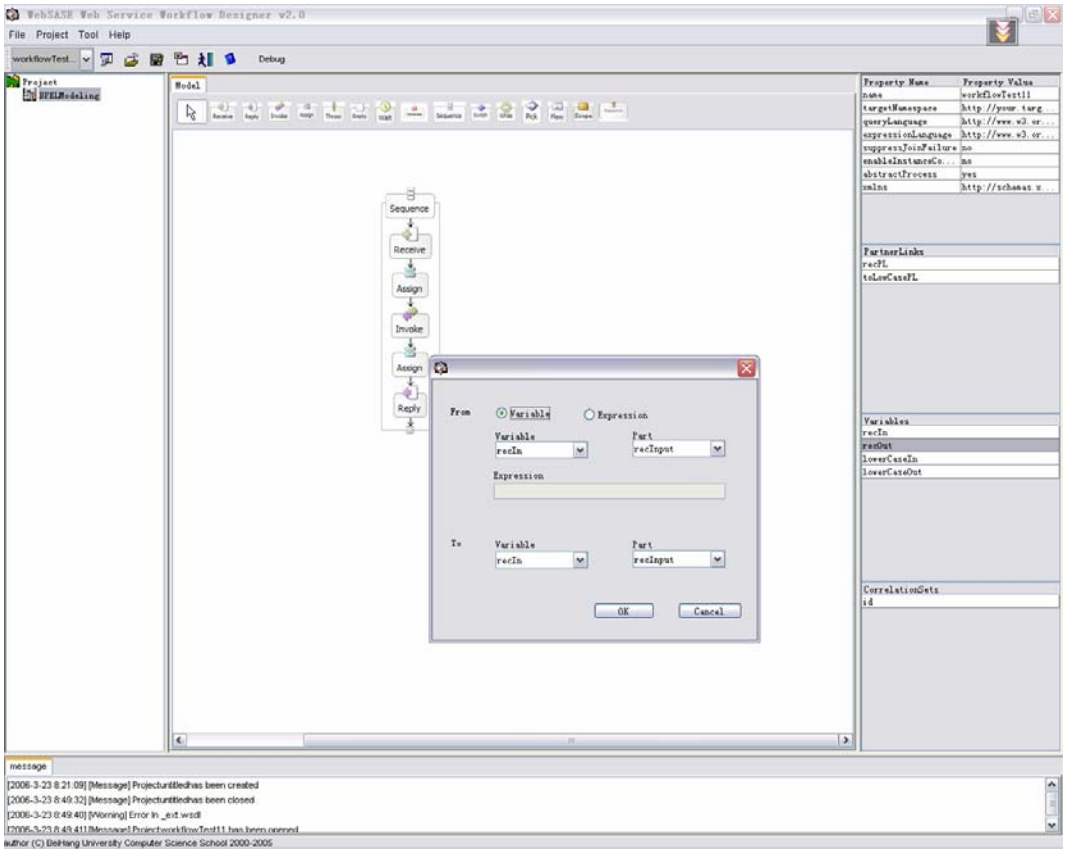
Pic81 Add element copy for assign1



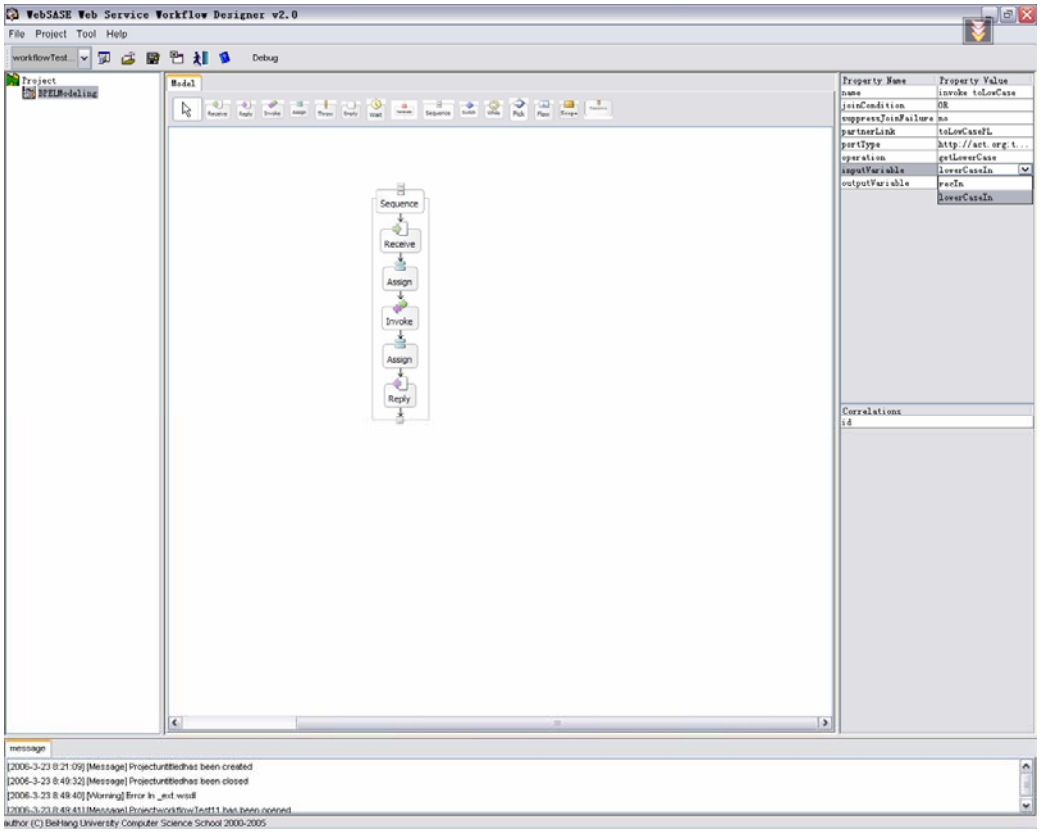
Pic82 Set invoke's attributes



Pic83 Add correlationSet for invoke

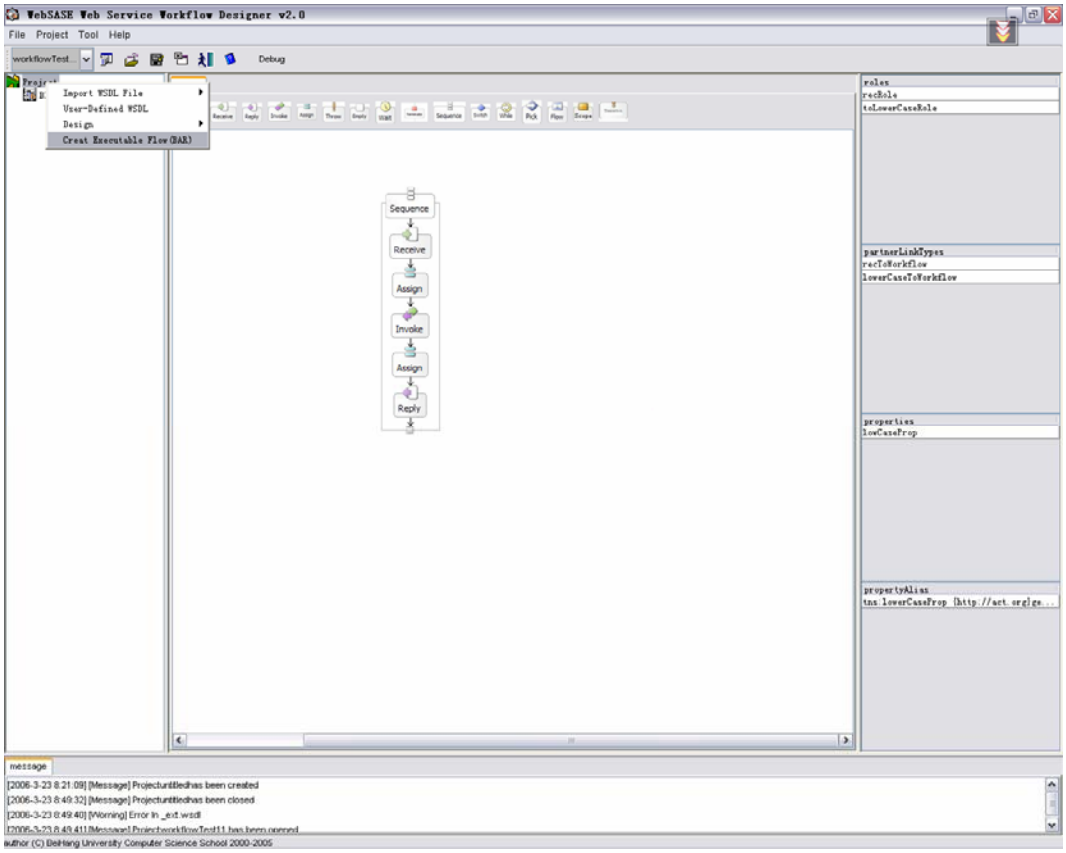


Pic84 Add copy for assign2



Pic85 Set reply's attributes

Seventh step：create executive flow（BAR）（see also2.2）



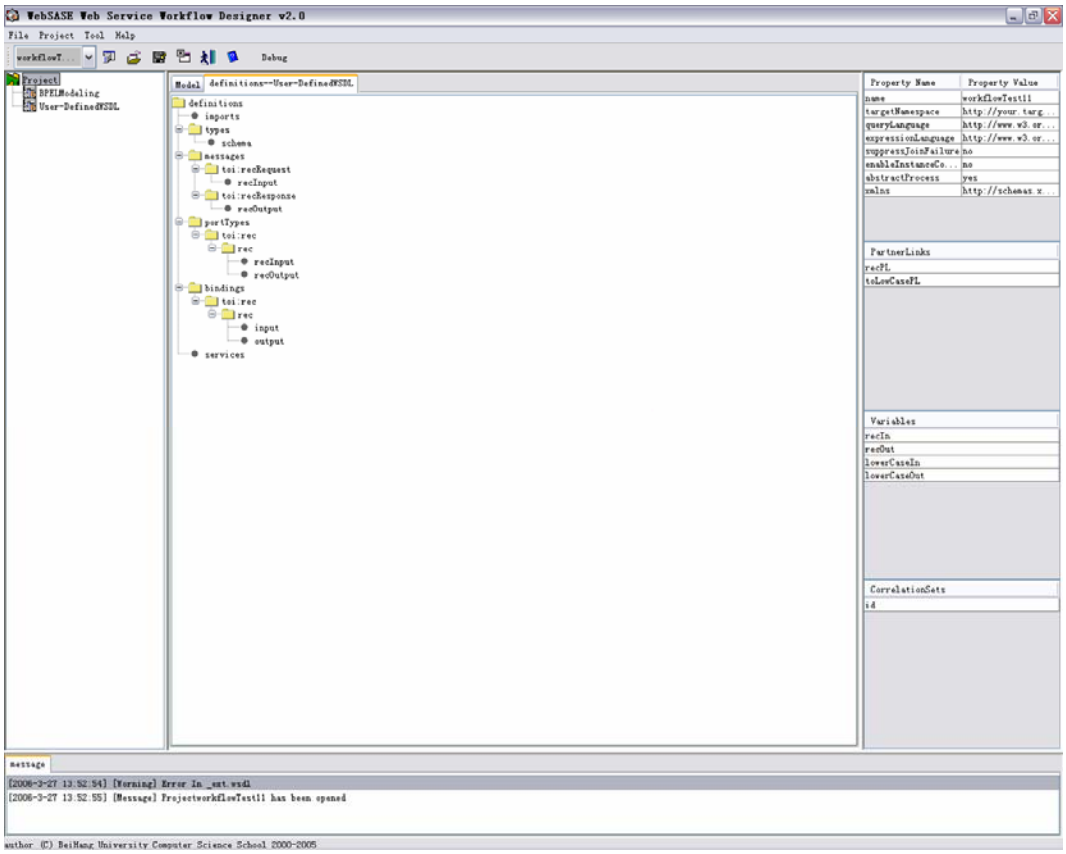
Pic86 Make BAR

3.2.2 Modeling mode---Based on design

Instance of Based on design modeling mode（modelTest2，this case is similar to modelTest1 3.1 section ，the different thing is the previous one is built on condition that there has not true services，and the posterior is modeling after importing true services' WSDL fie：

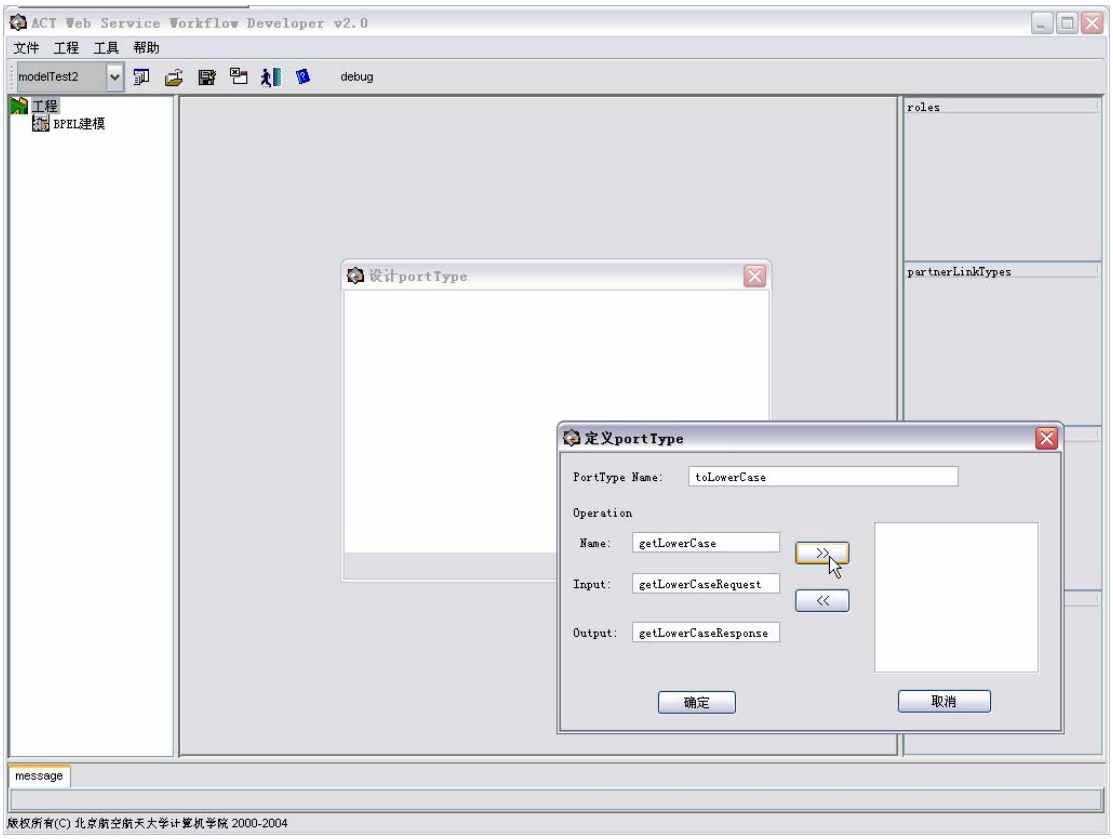
- First step：new modelTest2（see also2.2）

- Second step：define WSDL：define WSDL file for workflow（integration services）（interface describing file）（see also2.2）



Pic87 Result of defining WSDL

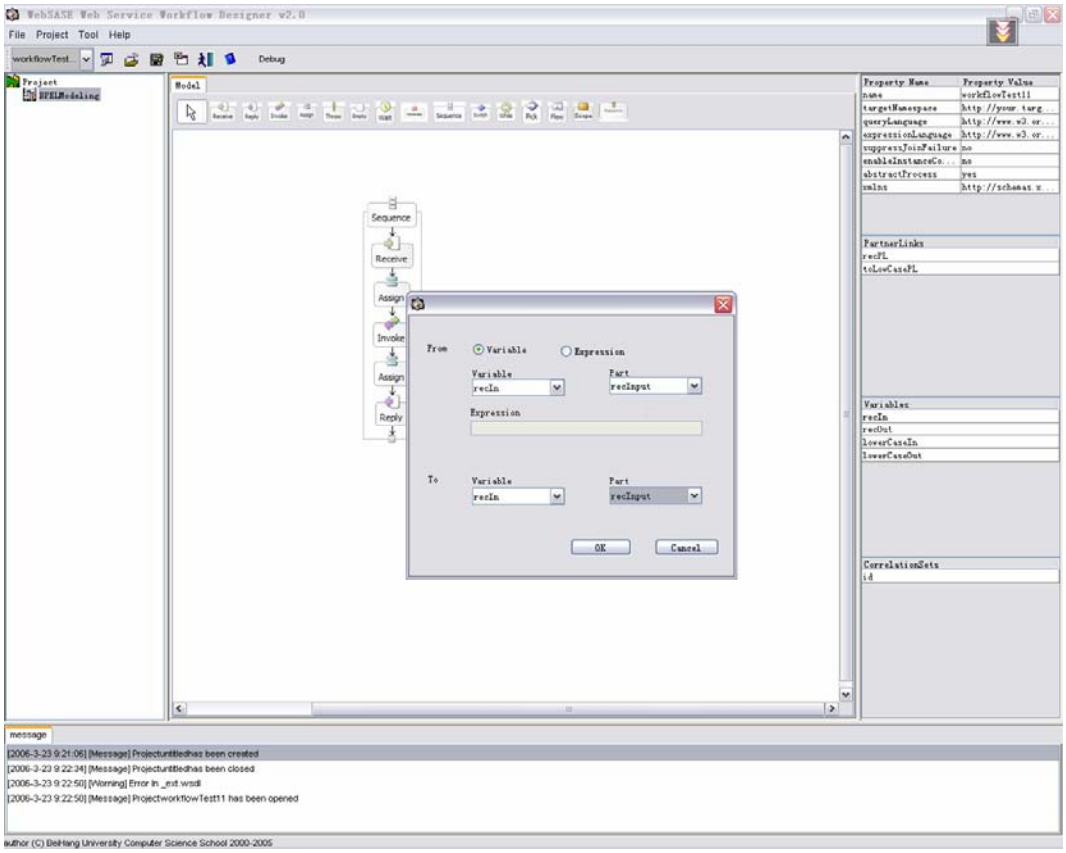
- Third step：Define portType，because there has not real services, modeling personnel should design interface which is need in the work flow by themselves.（see also 2.2）.Pic 88 is a picture which defining a portType which name is toLowerCase，this portType has a operation which name is getLowerCase and operation has input message getLowerCaseRequest and output message getLowerCaseResponse.



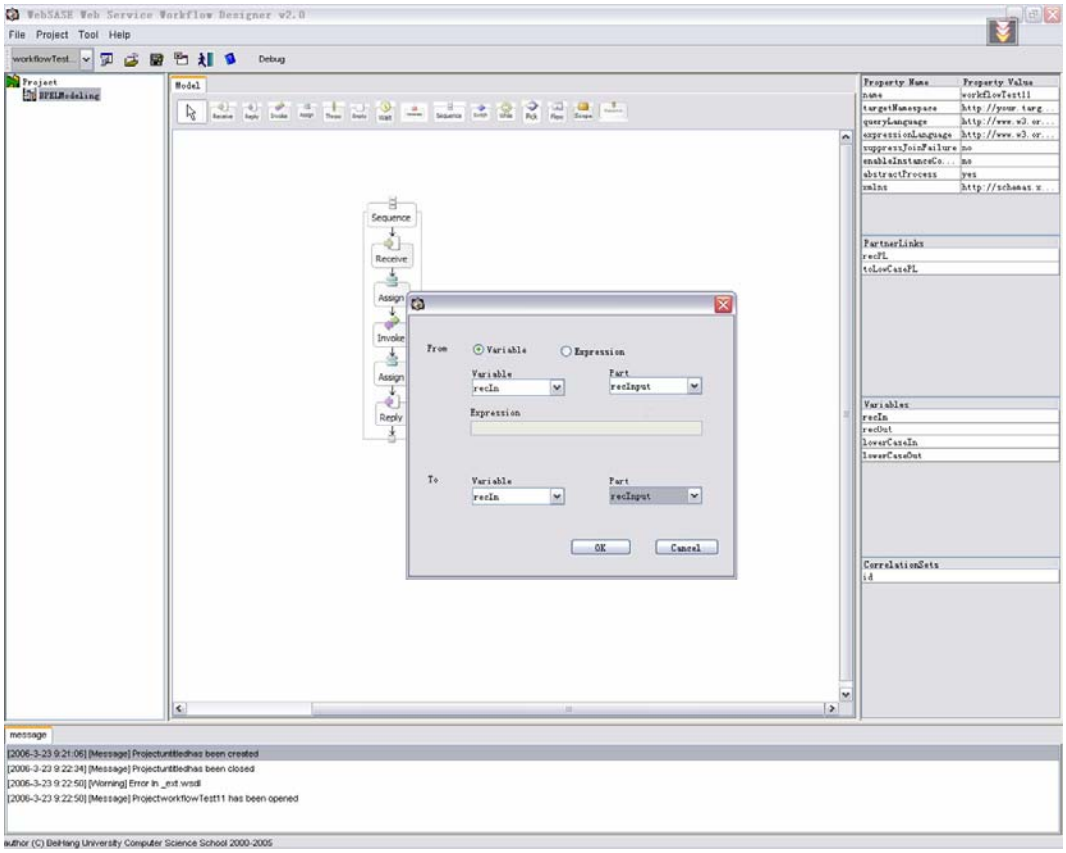
Pic88 Define portType

- Fourth step：define role，then define partnerLinkType according to role（same to 3.1fourth step）
- Fifth step：define property，then define propertyAlias according to property（same to 3.1fifth step）
- Sixth step：flow modeling：set flow's attributes，add non-activity sub-elements for flow,such as ：partnerLink、variable、correlationSet，add activity for flow，then add sub-activity below structured activity， and set attributes of each activity
  1. Add partnerLink、variable、correlationSet for flow，the operation is same to3.1 sixth step。
  2. Add sequence structured-activity for flow，then add five sub-activity below sequence activity, the five sub-activities are：receive、assign1、invoke、assign2、reply. The operation is same to 3.1 sixth step.
  3. Set attributes of each activity，except assign1 and assign2，the operation is same to3.1 sixth step

  When in the design mode, there has not any real services' WSDL file，modeling personnel should set a false name for message, and would not define part，so it is not necessary to add copy for assign
- Seventh step：import local WSDL of true service（same to 3.1 third step）
- Eighty step：Modify relating to message's activity，such as assign activity。（see also2.3）



Pic89 Add copy for assign1



Pic90 Add copy for assign2

- Ninth step：created executive flow（BAR）（same to 3.1 section seventh step）

4 Common question（Table）

Problem	Possible cause	Resolve

表 2 common question and resolve

5 Reference