I-Demo-Basic Demo Script
Jussi Stader – 5 June 2007

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Revisions

This document is part of I-Demo version 1.0. It was written for I-X version 4.0 and has been revised for version 4.1. Although the demo will run as documented here under I-X version 4.2, features that have been added in version 4.2 are not considered. Currently, it is assumed that the demo is run under Windows; instructions for Unix/Linux platforms are in preparation.

1 Introduction

I-Demo-Basic is a basic demonstrator in the I-Demo suite of demonstrators. It contains a single I-X Process Panel which is used as an intelligent to-do list. I-Demo-Basic illustrates how to perform the following tasks using I-X technology:

- start up an agent's' process panel,
- use the I-X Process Panel interface to support an agent's tasks
- use process knowledge to deal with activities (i.e. expand them),
- add a current, new issue,
- add a current, new activity,
- specify an activity's details during run-time,
- add current, dynamic state information,
- load and save plans.

See the I-X User Guide for more detail on the appearance and use of I-X applications and process panels.

In the following sections, we describe the different aspects of I-X Process Panels as they become relevant in the run-through of the sample application. At the end of the run-through there is a summary of steps that have been taken by the user in this exercise. This can be used as a quick reminder of what to do when demonstrating the application.

1.1 The Scenario

The basic building block of I-X applications is the I-X Process Panel. An I-X Process Panel may be seen as an independent agent who carries out tasks, therefore this example application is also provided in such a setting. This example application is a system that aims to support an operator to move objects from their initial locations to given locations using different forms of transportation.

2 Running the Example Application

The walk-through is described below in two phases. First, the panel for the agent is started and initialised to reflect the knowledge the agent has about the state of the world and the expertise it has for dealing with activities. Second, a run-through of the application scenario is shown, performing actions in the process panel.

2.1 Starting I-X Process Panels

We assume that you are running under Windows and that the I-X software is installed in a directory that we refer to as <ix-base>. If you have installed the I-X software in a directory "D:\ix-4.0\I-X", we would call this the I-X base directory and refer to it as <ix-base>. The I-Demo applications can be found in the "apps" folder in the base directory. This section describes the simplest version of the application, which can be found in <ix-base>/apps/idemo-basic/. To run this application, the process panel that represents the agent in the example scenario first needs to be started. So the first step under Windows is to run the windows-specific script in idemo-basic/scripts/win/operator.bat.

run <ix-base>/apps/idemo-basic/scripts/win/operator.bat (double-click on this file)

Starting up under Unix/Linux will be documented in the next (extended) version of this document.

Running this script brings up two windows. First, there is a system console, labelled "Operator Command Console", in which messages will appear concerning the status of the application. This window is mostly for debugging I-X and can be ignored (minimize it). The second window is an I-X Process Panel, labelled "Operator Panel", which is the interface for the Operator agent in which requests for moving objects can be dealt with. This window is your interface to the application.

The Operator panel, like every I-X panel, contains four main areas:

- Issues: This area lists all the problems to be dealt with at this point in time.
- Activities: This area lists all the activities that are to be done.
- State: This area contains information about the current state of the world.
- Annotations: This area contains notes and comments.

This reflects the fact that I-X Process Panels are <I-N-C-A> engines (**I**ssues-**N**odes-**C**onstraints-**A**nnotations) that can work with <I-N-C-A> objects, specifically <I-N-C-A> process models where the nodes are activities and the constraints relate to the world state. We shall go into more detail as it becomes necessary.

The Operator panel has been set up to contain initial information about the world state (shown in the State part of the panel) and to contain expert knowledge of how to perform activities. The operator also has an initial item on its activity list ("move medical-box1 60 70"). This is the agent's initial plan. There are other ways of placing activities onto a process panel, e.g. using the "New | New Activity" menu option and typing in the activity's pattern, using the test menu as a short-cut, or sending an activity as a message from another panel (see idemo-coop for this). Activities that have been placed on a panel are shown in the Activities part of the panel.

2.2 Using the Application

In the Operator panel the initial plan consists of an activity to move a medical box to a given pair of coordinates. This activity is listed in the panel's activity area, showing the activity pattern ("move medical-box1 60 70"), an annotation (blank for now), a priority with which this activity is to be considered (Normal), and an "Action" field. The "Action" field is currently set to "No Action" as no action has been taken yet. Note that the "Action" field is currently orange. The colour of this field is used to show the activity's status, which is currently "doable", i.e. actions can be taken now. Other colours used are white (not doable), green (in progress), blue (done successfully), and red (failed). The "Action" field also contains a drop-down menu of possible actions that can be taken to deal with this activity. To see the drop-down menu, click on the action field of the activity. As shown in Figure 1, the menu that appears for the operator's activity gives four possible actions.

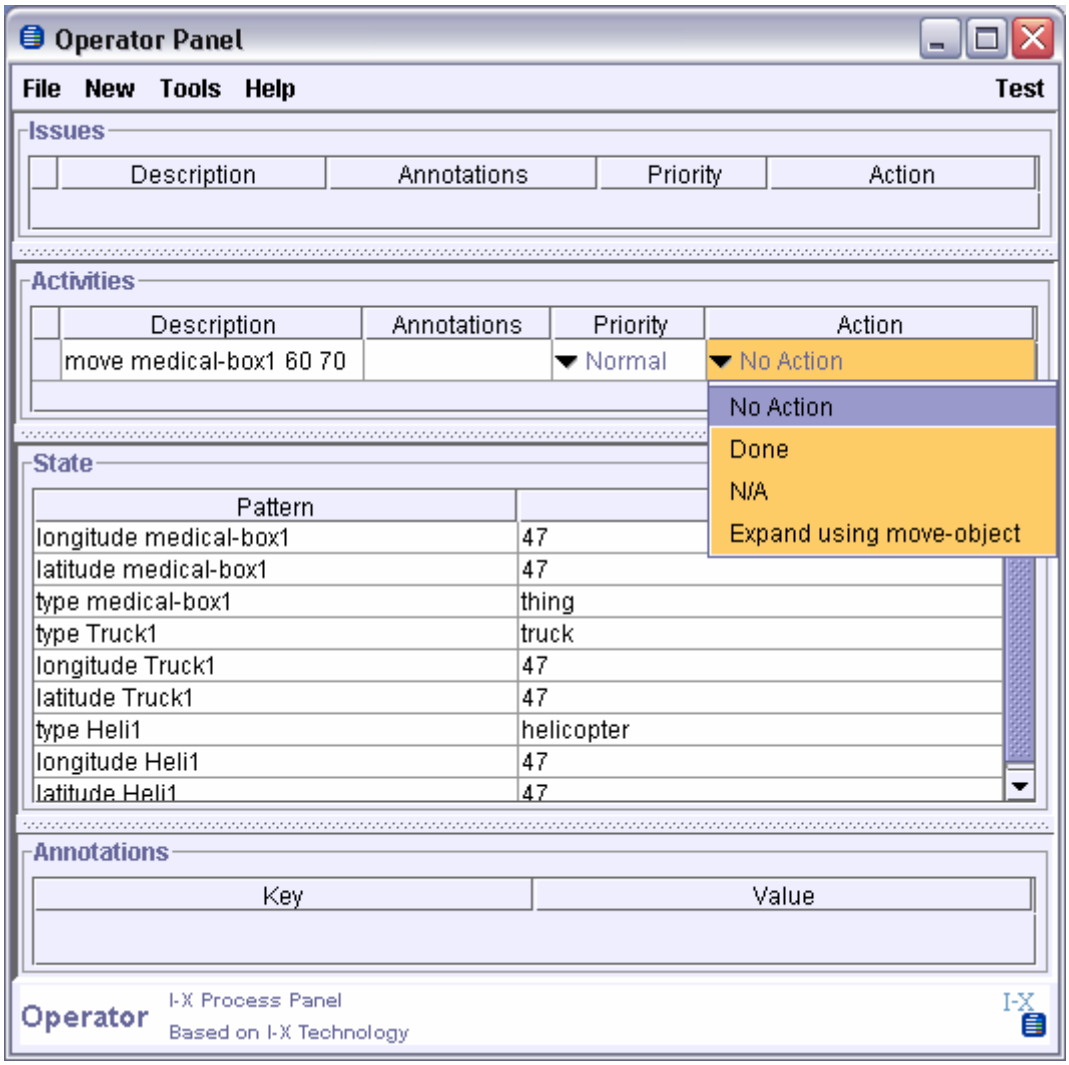

Figure 1: Activities and Actions

The top three of these options are general options that are always available. “No Action” is the initial setting for a new activity as nothing has been done yet; “Done” indicates that this activity has been completed without further assistance from the application and requires not further action. The “N/A” option can be chosen to indicate that this action is not applicable in the current context. The fourth, and in this case the final option, is specific to the current activity and to the application’s configuration. In this case, the fourth option indicates that the Operator’s domain model (model of expertise) has information about how to expand the activity into more detail. To generalise, there are three categories of actions: generally applicable actions that are always available (the first three), expand-actions that allow the user to apply previously generated process models, and actions that pass activities to other agents (not part of this demo – see I-Demo-Cooperate).

2.2.1 A Simple Scenario

Choose the “Expand…” action to apply the operator’s process knowledge and progress the demonstration.

Select “Expand using move-object“ from the action menu of the “move …” activity.

The activity will turn green to indicate that the activity has started. The action part of the activity now shows which action is being taken, and sub-activities appear underneath the activity, in this case four sub-activities. The new activities are indented to show that they are sub-activities of the “move …” activity. A small triangle also appears on the left of the “move …” activity, which can be used to expand and collapse the display of sub-activities.

Note that all our sub-activities share a variable “?vehicle” which is currently not bound to a value.

The first of the sub-activities, “select-transport-at …” is ready to be performed, indicated again by its orange colour. In addition to the generally available options, this operator’s process knowledge contains two processes that can deal with the activity, reflecting the choice between two different types of vehicle. Choose the “Expand using use-truck” option.

Select “Expand using use-truck” from the action menu of the “select-transport-at …” activity.

This has the effect that the activity turns blue (for “done”) because in this case the expansion does not introduce sub-activities. Instead, it updates the state information of the agent, adding “transport-assignment Truck1 = medical-box1” in the state area of the panel. The expansion also had the effect of binding a variable: the variable “?vehicle” is now bound to “Truck1”, as can be seen in the activity description in the Activity area of the panel.

Note that the next step, “load …”, has turned orange to indicate that it can now be performed. Step through all further sub-activities in the Operator panel as they become doable, each time using the “Expand…” action, and note how the world state information changes as the activities are performed (watch objects and vehicles moving positions).

Select “Expand using load-object-onto-vehicle” from the action menu of the “load …” activity.
Select “Expand using travel” from the action menu of the “travel …” activity. (updates vehicle locations)
Select “Expand using unload-object-from-vehicle” from the action menu of the “unload…” activity. (updates object location and sets Truck1’s transport assignment to “false”)

Note that once all the sub-activities have been done, the high-level activity (“move …”) is also marked as done.

You can end the demo here. So far the demo has illustrated how to start up a process panel and to deal with given tasks using an agent’s domain expertise.

2.2.2 Continuing the Scenario

If you want to continue, collapse the activity we have just finished using the triangle in the table’s first column and see the sub-activities being hidden.

Click on the small triangle in the first column of the “move …” activity.

To set the scene for a new activity, create another object to move, “provisions1”, and place it in the previous location: select the “New Constraint” option from the panel’s “New” menu and type in your new object information “type provisions1 = thing”; select “New Constraint” again and type in “longitude provisions1 = 47”; select “New Constraint” again and type in “latitude provisions1 = 47”;

Select the “New Constraint” option from the panel’s “New” menu and type in “type provisions1 = thing”.
Select the “New Constraint” option from the panel’s “New” menu and type in “longitude provisions1 = 47”.
Select the “New Constraint” option from the panel’s “New” menu and type in “latitude provisions1 = 47”.

The order in which you enter this information does not matter, and it does not matter what you call your new object (call it “my-new-suitcase” if you like!). However, it does matter that you are consistent (always call it “my-new-suitcase”), that you make no spelling mistakes, that you use the word order as given above (including the “=”), that you use the right domain keywords (“type”, “thing”, “longitude”, “latitude”), and the right locations (both 47). You can check that your constraint looks right by finding it in the State area of the panel. If you notice that you have added the wrong constraint, you can delete constraints by right-clicking on the constraint and selecting the “Delete” option on the menu. If you only want to change the value of the constraint, right-click on the constraint and select the “Change” option. This will bring up a messenger window with the current constraint in the message part, the message type set to “Constraint”, and the recipient set to “me”. Edit the constraint value by typing, and then click send. Note that the State view will not update table cells when they are selected. A cell is selected when you click on it and a faint blue line appears around the cell to show that it is selected. If you feel that a value should have changed but has not, click on a different cell in the table and check the cell in question again.

Once your state information is ready, you can place a new activity on the operator’s to-do list. To do this, select the “New Activity” option in the panel’s “New” menu. This brings up a window called “Operator Panel Activity Editor” which can be used to place activities onto the agent’s list of activities.

Select the “New Activity” option from the panel’s “New” menu and type in “move provisions1 60 70”.

Close the activity specification window (click “Cancel”) and find the new activity in the activity area of the process panel. Choose the new activity’s “Expand using move-object” option. Then look at the actions of the “select-transport-at …” activity. The truck we used previously is in the wrong location to do the move, so the truck option is greyed out. Choose the “Expand using use-helicopter” option.

Select “Expand using move-object” from the action menu of the “move …” activity. Select “Expand using use-helicopter” from the action menu of the “select-transport-at …” activity.

This adds a “seek-authority ...” sub-activity for the “select-transport-at …” activity. This sub-activity reflects the need to seek permission from the supervisor to assign a helicopter. Running a process panel in isolation as we are, the panel cannot offer us any help with this (see I-Demo Cooperate for a panel set-up that can provide help). We mark the activity as done, thus telling the process panel that this task has been performed manually.

Select “Done” from the action menu of the “seek-authority …” sub-activity.

The next step, “load …”, can now be performed. Step through all sub-activities in the panel as they become doable, each time using the “Expand…” action, and note how the world state information changes as the activities are performed (watch objects and vehicles moving positions).

You can end the demo here, or you can continue if you want to use the panel’s test menu and if you want to see context-sensitive options.

2.2.3 Further Options

To start with, collapse or delete the last activity as before.

Click on the small triangle in the first column of the “move …” activity.

Choose the second option from the “Test” menu, “Send … location-b”, to move medical-box1 back to location-b where it started. The new activity appears in the panel’s activity area.

Choose the second option from the panel’s Test menu “Send … location-b”.

Expand the activity as before, using move-object.

Select “Expand using move-object“ from the action menu of the “move …” activity.

Explore the options of what you can do with activities and sub-activities by right-clicking on an activity. Which options are available depends on the activity’s characteristics (e.g. does it have sub-activities?) and on the state of the plan (e.g. is the activity in progress?). The options are:

- Show Details: this option is always available. Choosing it will bring up a simple activity editor with the activity’s details.
- Fold/Unfold: only available if the activity has been expanded into sub-activities, this option lets you change the display to show the sub-activities or not. Note that if the sub-activities are currently shown, the option is “Fold”; if they are not shown, the option is “Unfold”. Choosing this option has the same effect as clicking on the small triangle to the left of the activity’s description.
- Bind Variables: this option is only available if the activity specification contains variables that have not been bound. Choosing this option brings up a small window that lets you bind all variables in the specification. Once the variables have been bound, the option will no longer be available. Note that in our examples the variables are bound using the world state descriptions. If you bind the variables by hand, it may not be possible to commence normally with the scenario.
- Delete: deletes the activity from the to-do list.
- Insert: lets you insert a new activity before or after the one you clicked on. The simple activity editor window appears to let you specify the activity.
- Copy to Messenger: allows you to copy the activity into the Messenger tool to send it to another process panel. This option does not make sense when you are running with one process panel in isolation, as we are.

To see examples of such options and how they work, right-click on the top-level activity to see the options currently available for this activity.

Right-click on the top-level activity to bring up the options

Play with the options and step through the task as before, using the transport of your choice.

2.3 Summary of Demo Steps

run <ix-base>/apps/idemo-basic/scripts/win/operator.bat (double-click on the file)
Select “Expand using move-object“ from the action menu of the “move …” activity.
Select “Expand using use-truck” from the action menu of the “select-transport-at …” activity.
Select “Expand using load-object-onto-vehicle” from the action menu of the “load …” activity.
Select “Expand using travel” from the action menu of the “travel …” activity. (updates vehicle locations)
Select “Expand using unload-object-from-vehicle” from the action menu of the “unload…” activity. (updates object location and sets Truck1’s transport assignment to “false”)

Click on the small triangle in the first column of the “move …” activity.
Select the “New Constraint” option from the panel’s “New” menu and type in “type provisions1 = thing”.
Select the “New Constraint” option from the panel’s “New” menu and type in “longitude provisions1 = 47”.
Select the “New Constraint” option from the panel’s “New” menu and type in “latitude provisions1 = 47”.
Select the “New Activity” option from the panel’s “New” menu and type in “move provisions1 60 70”.
Select “Expand using move-object” from the action menu of the “move …” activity.
Select “Expand using use-helicopter” from the action menu of the “select-transport-at …” activity.
Select “Done” from the action menu of the “seek-authority …” sub-activity.

Click on the small triangle in the first column of the “move …” activity.
Choose the second option from the panel’s Test menu.
Select “Expand using move-object“ from the action menu of the “move …” activity.
Right-click on the toplevel activity to bring up the options
Right-click on a sub-activity to bring up its options
…play with options and run through demo as before…