Scheduling Subsystem
User Guide for the Create Array Panel, Scheduling Panel and Project/SB Search Panel

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Version A

2007-11-16

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Change Record

Version	Date	Affected Section(s)	Change Request #	Reason/Initiation/Remarks
A	2006-08-22	All	Created	
A	2006-08-28	All	Modified	Clarified portions after input from readers.
A	2006-10-05	3.2, 4.1, 4.3, 5, 6	Updated	Updated to reflect software state at R4
A	2006-10-26		Updated & added Snapshots	Updated for Holography user test.
A	2006-12-14	All	Modified	Update for new Scheduling Panel
A	2007-03-14	3, 4, 5	Redid all snapshots, modified almost all text.	Updated for GUI FBT enhancements/changes
A	2007-03-27	4.1, 4.8, 5		Updated a few things for the AntennaVerification branch
A	2007-05-01	4.4		Fixed mismatch to software
A	2007-05-07	4.3, 4.7		Added new section about status reporting of a SB's execution
A	2007-08-03	1.1, 1.2, 3.1, 3.2, 4.1-4.4, 4.7, 6		Update to reflect changes made during the GUI2 FBT.
A	2007-11-16	4.4, 5, 6		Updated queued scheduling section

Table of Contents

1 Description

1.1 Purpose

Provide information on how to create arrays and use the Scheduler Panels.

1.2 Scope

How to create arrays and how to use the Scheduler Panel features only.

2 Related Documents

2.1 References

2.2 Abbreviations and Acronyms

OMC – Operator Master Client from EXEC.
Plug-in – A graphical component within the OMC that can be docked or floating from the OMC.
GUI – Graphical User Interface.
ALMA-OT – ALMA Observing Tool.
CDB – Configuration Data Base.
SB – Scheduling Block.
CCL – Control Command Language.

3 Setup and Startup

If you do not set up the system yourself you can skip section 3.1. However keep in mind that the scheduling panel is best run with the FULL ALMA CDB!

3.1 CDB & Configuration additions

There needs to be an additional entry in the CDB. In the Components.xml file add the following entry:

```
<_ Name="*"
    Code="alma.scheduling.AlmaScheduling.Interactive_PI_to_SchedulingHelper"
    Type="IDL:alma/scheduling/Interactive_PI_to_Scheduling:1.0"
    Container="schedulingContainer"/>
```

```
<_ Name="*"
   Code="alma.scheduling.AlmaScheduling.Queued_Operator_to_SchedulingHelper"
    Type="IDL:alma/scheduling/Queued_Operator_to_Scheduling:1.0"
    Container="schedulingContainer"/>

<_ Name="*"
   Code="alma.scheduling.AlmaScheduling.Dynamic_Operator_to_SchedulingHelper"
    Type="IDL:alma/scheduling/Dynamic_Operator_to_Scheduling:1.0"
    Container="schedulingContainer"/>
```

NOTE: Change container name to proper container you wish to run scheduling components in.

Also, an addition inside the ExecConfig.xml file is needed. Inside the plug-in list add

<plugin name="CreateArray Panel"
class="alma.scheduling.AlmaScheduling.GUI.OmcSchedulingPanel.SchedulingPanelMainFrame" />

<plugin name="Scheduler Panel"
class="alma.scheduling.AlmaScheduling.GUI.OmcSchedulingPanel.SchedulingPanelGeneralPanel"
/>

<plugin name="Project Search Panel"
class="alma.scheduling.AlmaScheduling.GUI.OmcSchedulingPanel.SearchArchiveOnlyPlugin" />

3.2 Starting Create Array Panel inside the OMC

The create array panel is now a regular OMC plug-in which must be started from the plug-in's menu (if not already started from there and saved as open in the omc.layout file). See the OMC's documentation about starting plug-ins.

4 Functionality

4.1 General GUI Information and Functionality

4.1.1 Different types of schedulers

There are three different types of schedulers; Interactive, Queued and Dynamic. There is also a button to create a manual array but a scheduler does not get created for this type of array. When you click one of these buttons the array creation area becomes enabled and the array created (see section 4.2) will be assigned to the

scheduler type chosen. At which point a new plug-in for your scheduler will be created and displayed. For the manual array you will also get a new plug-in.

4.1.2 Default startup

When the OMC first starts and the ALMA system is in the OPERATIONAL mode the create array panel will connect to the scheduling system and a default of Interactive scheduling will be selected. See figure 1.

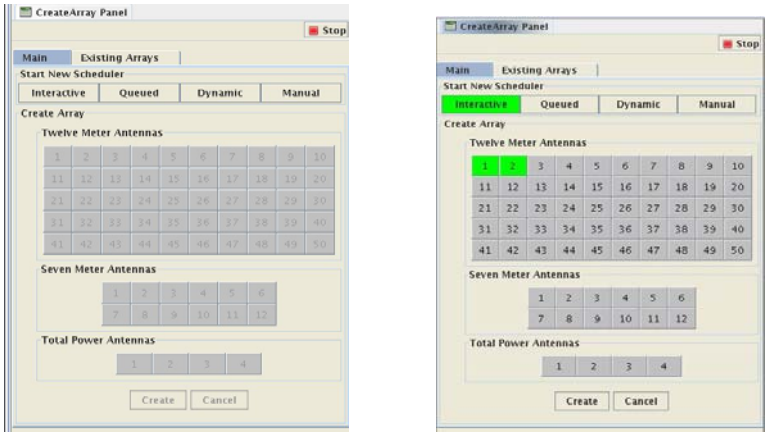

Figure 1: Scheduling Panel, offline & online views

4.1.3 Existing array tab

Another tab in the create array panel is for arrays that already exist. This tab shows all the current arrays and by selecting on, then using the right mouse button you can destroy the array.

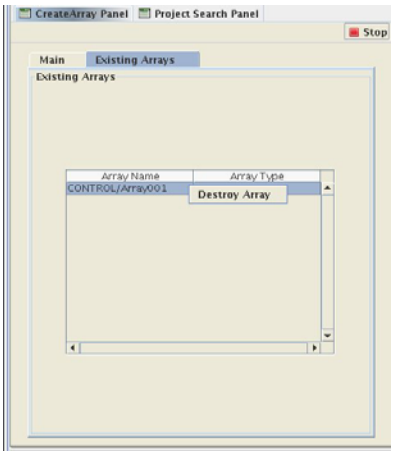

Figure 2: Existing Array

4.1.4 Search Archive Only Plugin

There is also a simple archive search plugin. This will allow you to search the archive for projects but will not allow the search results to be assigned to any scheduling session. See section 4.9 for more details. It is purely a view-only tab. See figure 3. This tab will hopefully be replaced by an archive plug-in search tool. It currently exists purely for convenience.

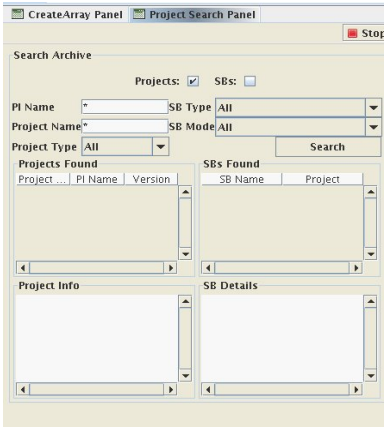

Figure 3: Search Archive plugin

4.2 Array Creation

As seen in figure 1, the create array section of the scheduling panel becomes enabled when one of the 4 buttons is pressed. The available antennas are then shown in green. To create an array select the antennas needed for the array and then press the 'Create' button. To select multiple antennas use the ctrl or shift keys with a regular mouse click. After the create array button is pressed the whole panel will be disabled until the array is created or a message is returned saying why the array cannot be created.

4.3 Interactive Scheduling

1. To start an interactive scheduler you must have created an interactive array. See section 4.2.
2. When your interactive array is created a new array tab in the OMC will be opened for your session. See OMC documentation for array tab information.
3. Within this array tab you will need to open a scheduler plugin. If your ExecConfig.xml is configured properly it will show up in the plugin menu of the OMC.

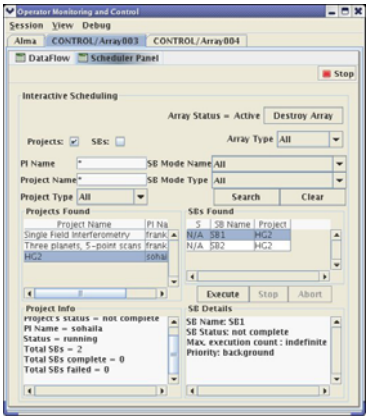

Figure 4: Interactive Scheduling

4. The default for interactive scheduling automatically searches the archive for all projects, selects the first project and selects the first scheduling block in that project. You can modify your search using the options at the top of the plugin.
5. To execute a scheduling block, select it in the SBs Found table (the one on the right hand side) and press the "Execute" button.
6. It is possible to stop a scheduling block when it is running normally using the "Stop" button. The scheduling block will stop after the currently running sub-scan has completed.
7. It is also possible to abort a scheduling block. This should stop a scheduling block no matter where it is in its execution.

4.4 Queued Scheduling

1. To start a queued scheduling session, being by creating an array on the main tab after clicking the “Queued” button.
2. You will then need to open a scheduler as described in section 4.3 step #3. The queued scheduler is seen in the following view (see figure 5)

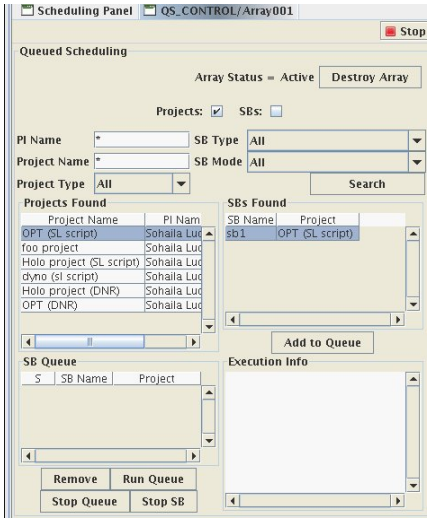

Figure 5: Queued Scheduling

3. To add scheduling blocks to the queue, you must first search for them. Then you must select them and click the “Add to Queue” button. This will add the selected SB to the lower left hand table. This is the SB Queue! See figure 6.

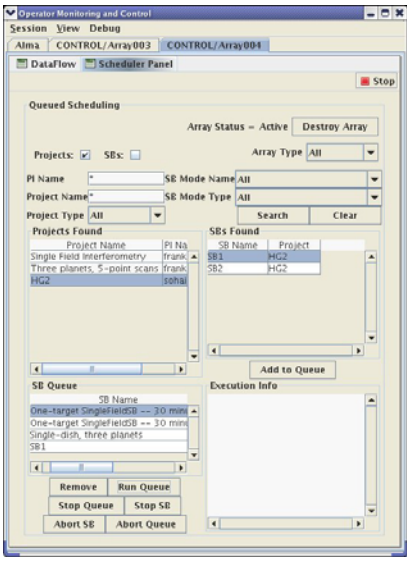

Figure 6: SBs in the queue

4. To remove SBs from the queue, select the one you want to remove in the lower left hand table and then click the “Remove” button. Removal of SBs is permitted if the queue is active or not. However, if the queue is active you can not remove the currently running SB.

5. To run the whole queue, press the “Run Queue” button. If this is the second time running the queue the status’ will be reset to ‘N/A’ and the queue will start again from the very topmost SB.

6. The StopSB button will stop the currently running SB in the queue and then it begins the next SB if there is one. Since this uses the stop method from the control system, the SB is stopped at the end of the next subscan so it may not stop immediately! Any results collected are archived.

7. The StopQueue button stops the currently running SB but does not continue to the next SB. Likewise with the stop button mentioned in step 6, it is stopped at the end of its next subscan and any results are archived.

8. The AbortSB button will abort the currently running SB immediately. No results are archived! The next SB will then be executed, if there is one in the queue.

9. The AbortQueue button will abort the currently running SB and will not continue to the next one. No results are archived!

10. The details of the SB's execution will be displayed in the lower right hand side of the tab. See figure 7.

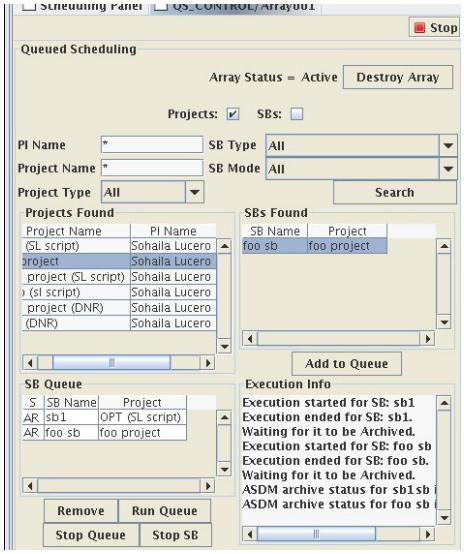

Figure 7: Queued scheduling, execution details

SBs are added to the queue at the bottom. It is not possible to change the order of the queue's list without removing and re-adding SBs. When the queue is running, it is possible to add and remove SBs in the queue, provided they are not currently being executed.
The stop and abort buttons are dependant on the state of the rest of the system. If there is a problem in another subsystem this could cause these buttons to not work properly.

4.5 Dynamic Scheduling

Disclaimer: Dynamic scheduling is only partially implemented in the scheduling panel and no guarantees about its interaction exist!!

1. When a dynamic array/scheduler is created. All the scheduling blocks appropriate for dynamic scheduling are selected. Appropriate SBs have finite execution counts. A scheduling block with in indefinite execution count will never be selected by a dynamic scheduler.

2. Before a scheduling block is executed by the scheduler, the list of the scheduler's top choices are displayed in the plug-in. The operator has the option to modify this list or accept it (before the time out has expired). See figure 8.

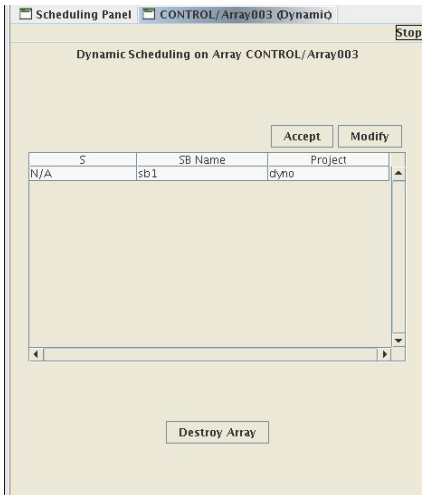

Figure 8: Dynamic Scheduling

NOTE: Modify is not currently implemented and eventually all the SBs the dynamic scheduler is considering will be displayed. Also, eventually there will be a displayed timer to show how much time is remaining before the scheduler runs what it thinks is best.

4.6 Creating a Manual Array

Since there is no scheduler associated with a manual array the plug-in is very simple. See figure 9. You are able to either destroy the manual array or you are able to launch a plug-in for a CCL console on this array. For documentation on the CCL, type "pydoc CCL" on a regular terminal where the software is installed, this will list the modules you can choose from. Then for more detailed information on additional models type "pydoc CCL.<mod name>" (replacing <mod name> with the actual module's name). The same documentation is available in the CCL Console by typing "import CCL" and "help(CCL)".

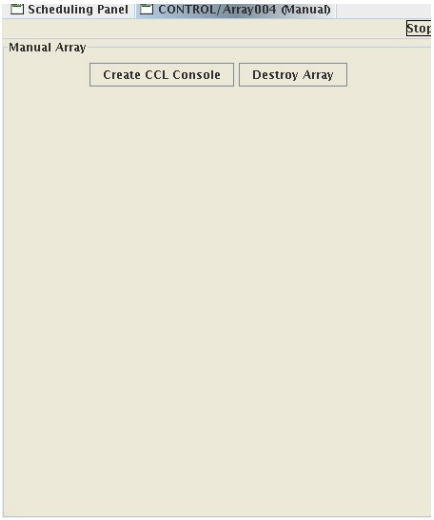

Figure 9: Manual Array

4.7 Displaying the status of a scheduling block's execution

The status of the execution will be displayed in the "S" column of the Scheduling Block table.
Possible statuses include:

- R – SB is running
- C – SB has completed execution
- AB – SB has been aborted
- S – SB's execution was successful
- AR – ASDM associated to this SB's execution has been archived
- F or FAIL – SB's execution has failed

4.8 Closing a Scheduler plug-in (does not destroy the array!)

To close a scheduler press the stop button that appears in the top right hand corner.

NOTE: This does not destroy the array!

4.9 Destroying an array

To destroy an array you have two options. The first is to use the "Destroy Array" button shown on every plug-in created after the array is created. See figures 4 – 9. The second option is to use the mouse's right click menu on a selected array in the Existing Arrays tab. See figure 2.

When a scheduler plugin is still open, the status of an array is will be displayed there. Current status' are Active and Destroyed.

4.10 Searching the archive

It is possible to search the archive and get results by project or by SB. To choose, select the appropriate check box on the top of the panel. See figure 10.

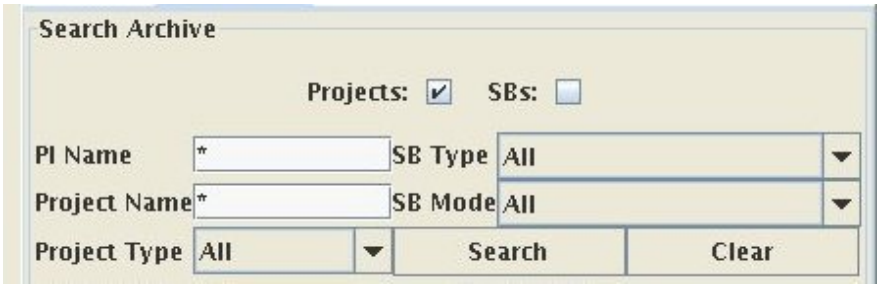

Figure 10: Archive Search Panel

There are 5 different parameters to search on; the PI name, the project name, the type of project, the type of SB and the mode of the SB. The types and mode correspond to what is defined in the ALMA-OT.
Wildcard (*) is permitted which searching for the PI and Project names. It should also be possible to search with a partial word plus a wild card (for example Sarah*).

5 List of Known Issues

1. Dynamic scheduling is not fully functional and I can almost guarantee problems will occur if using it!
2. You can not modify the list sent to the dynamic scheduler.
3. All SBs are not shown as choices in the dynamic scheduling tab.

6 Next official update

April 2008