Integrating application code

- This section is not intended equip you with the knowledge to write modules...
- It is aiming to present an overview of how modules are written and structured
- A one day course is being developed to solely cover module writing

Overview of module writing

- You can encapsulate C, C++ and Fortran code for execution control by the AVS/Express Object Manager
- Unlike AVS5 the module compute function and the user interface are now defined independently
- There are a suite of module generation and code management tools in AVS/Express
  - “Projects” inherit from the base system and allow you to customise the system e.g., adding modules
- “Add Module” is the Express tool for defining and generating modules (c.f. AVS5 MODGEN)

Module components

- There are two parts to a module:
  - V description
  - C, C++ or Fortran code
  - Remember the user interface is independent
- We will use the Threshold module as an example

Threshold module - V code

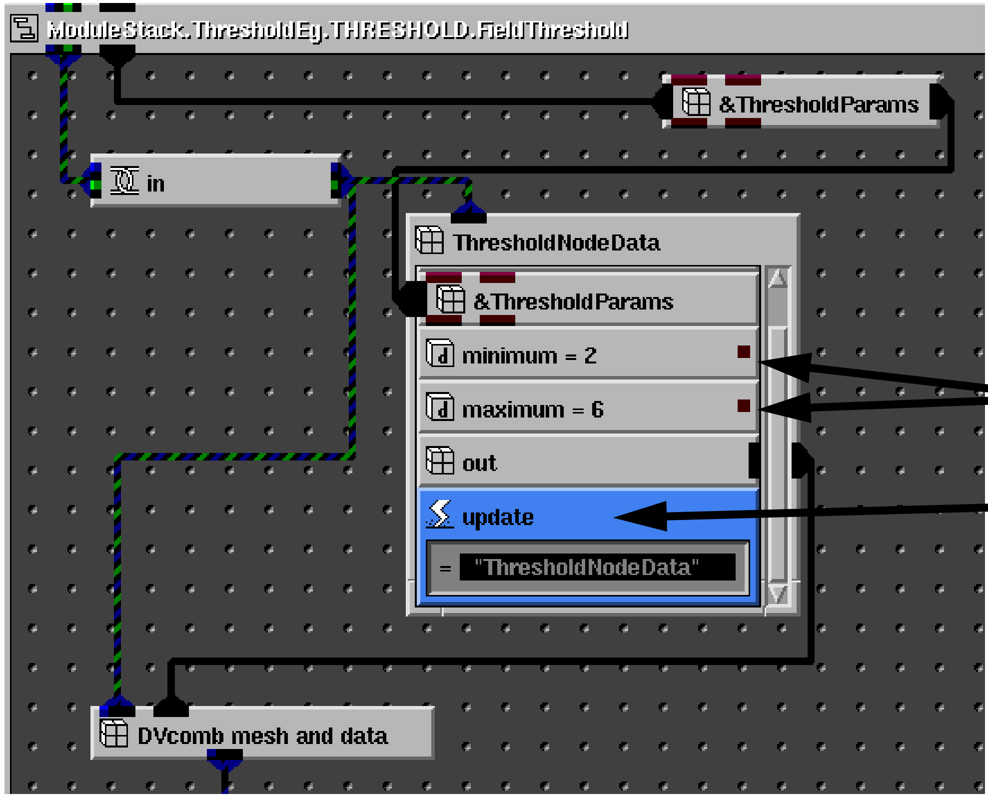
- ❑ This describes the parameters and method to call:

```
group ThreshNodeData {

  Node_Data+read+notify+req &in;
  double+read+notify+req minimum;
  double+read+notify+req maximum;
  Node_Data+write+nonotify out;

  omethod+notify_val update = “ThresholdNodeData”;
}
```

Application code (method)



if any of these parameters change

call the update method "ThresholdNodeData"

ThresholdNodeData is a C/C++/Fortran routine

Threshold module - C code

- You need to write the function the method invokes...

```
int ThreshNodeData(
        OMobj_id Parent_Id,
        ...,
        ...)
{
        APPLICATION CODE
}
```

Application code

- Use OM routines to get handles to objects...

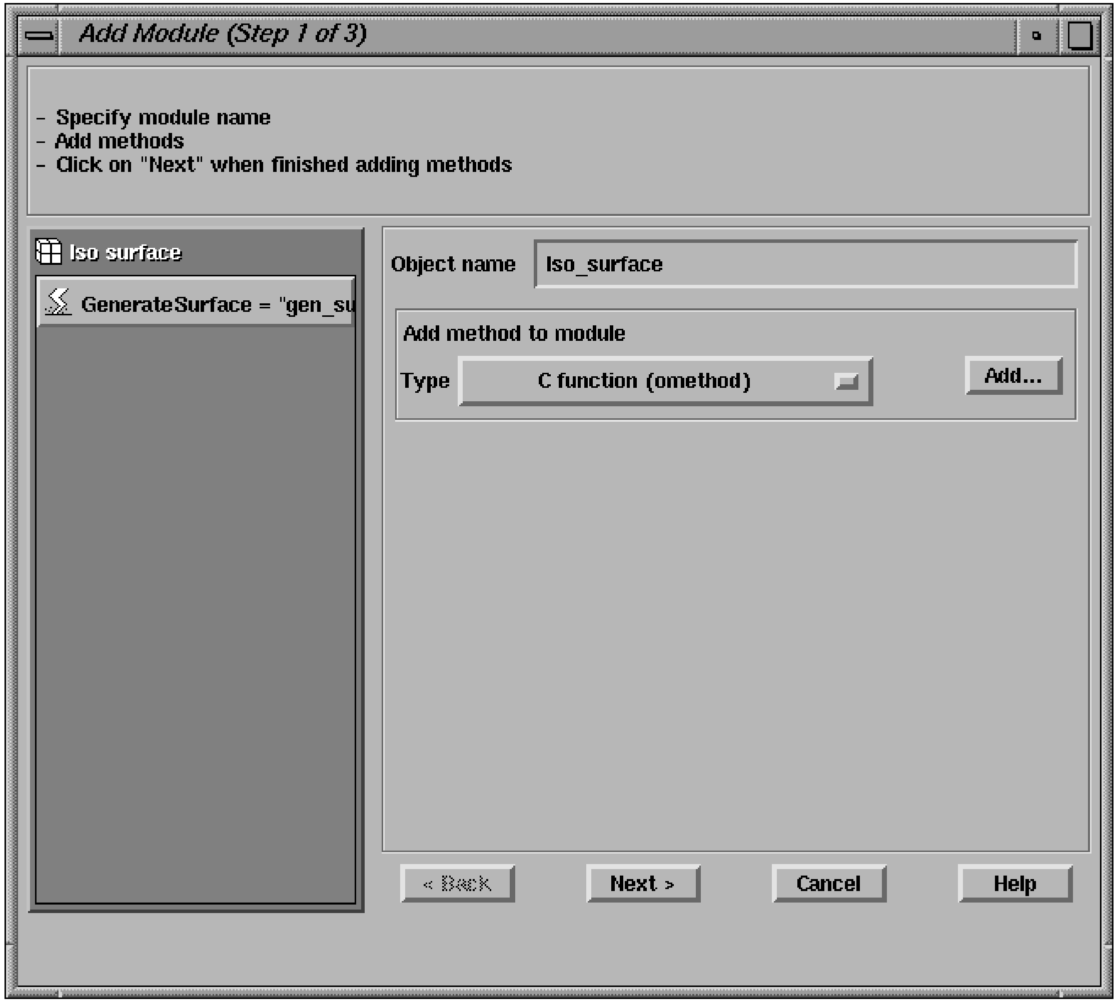
```
field_in_id = OMfind_subobj(Parent_Id,
OMstr_to_name("in"), OM_OBJ_RD);
```

- You access values and create an Express field using the FLD C API
  - FLDset_points(), FLD_set_ndim(), FLDget_nnodes()

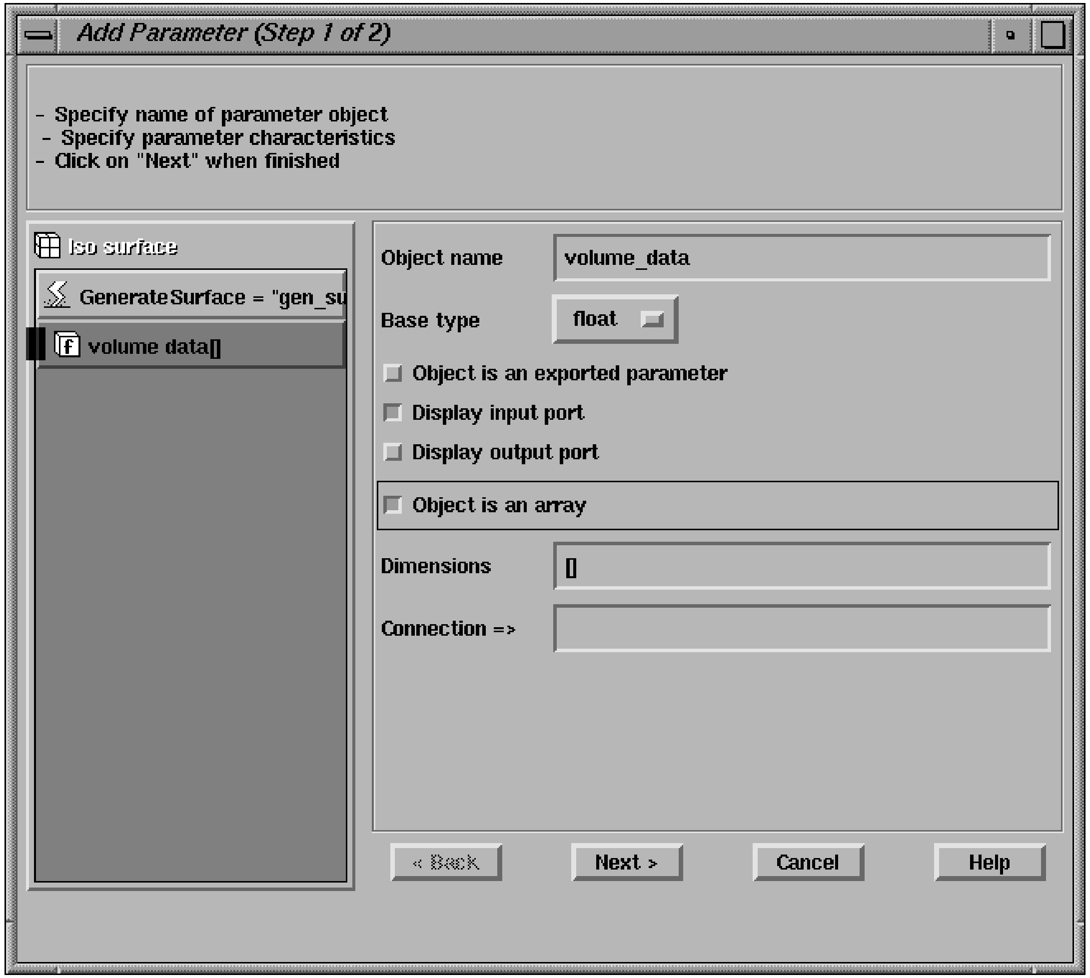
```
int field_in_nspace;
FLDget_nspace (field_in_id, &field_in_nspace);
```

- For C++ OMX interface simplifies and reduces amount of code...

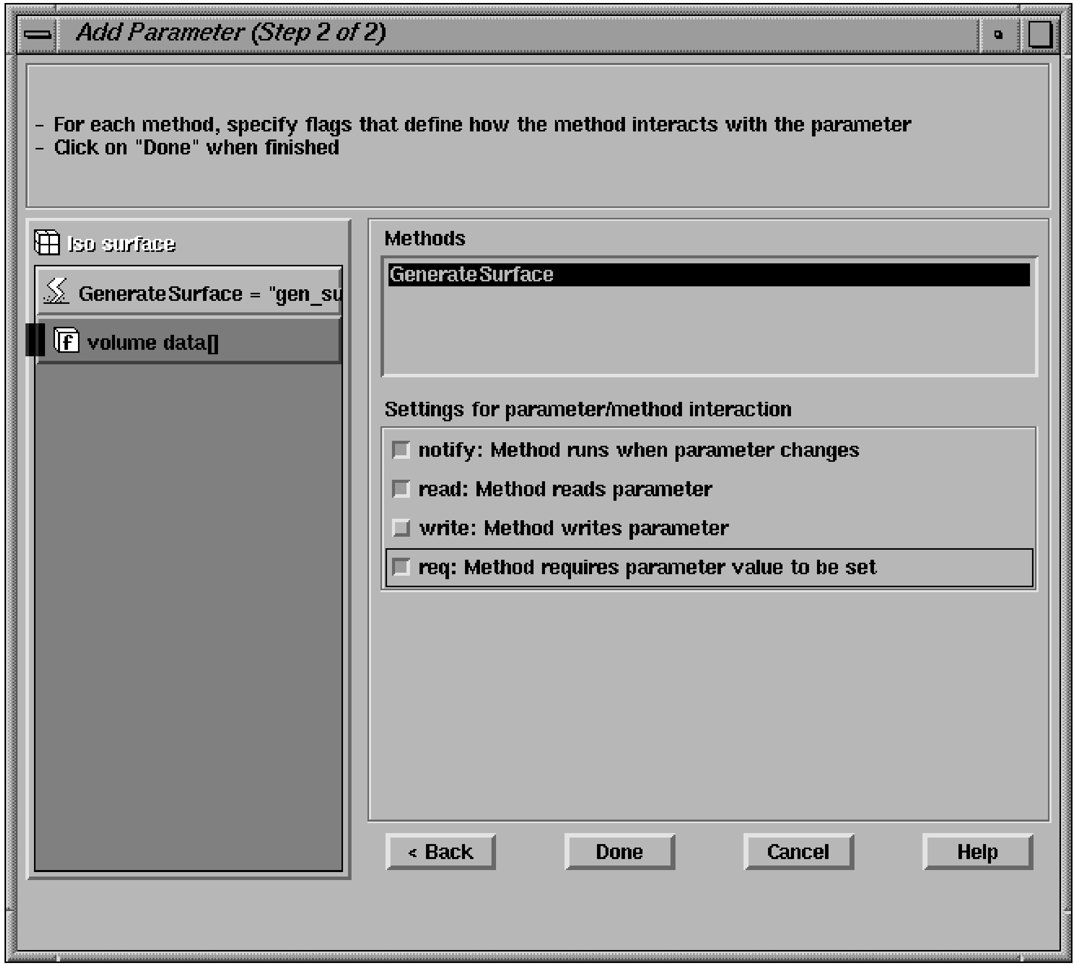
Add module - name and methods



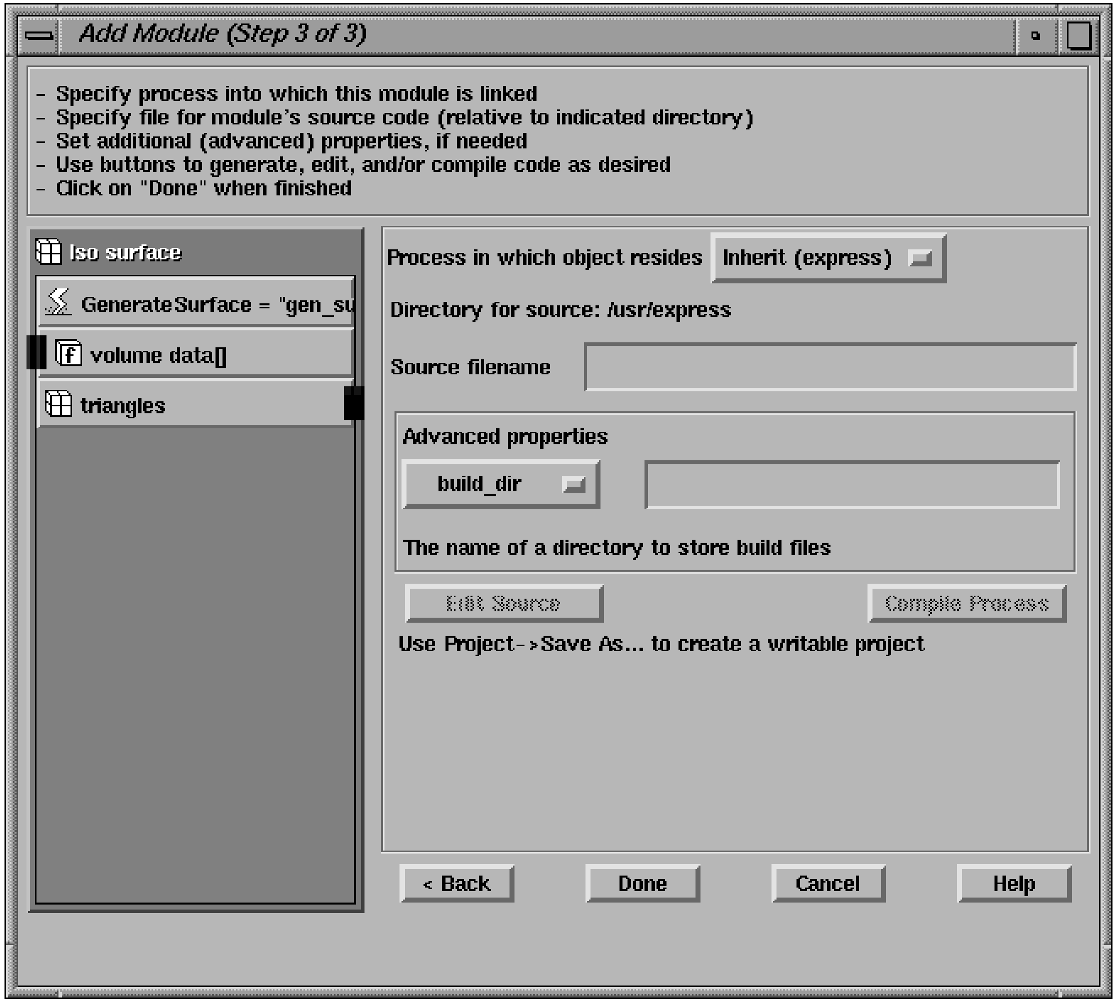
Add module - parameters



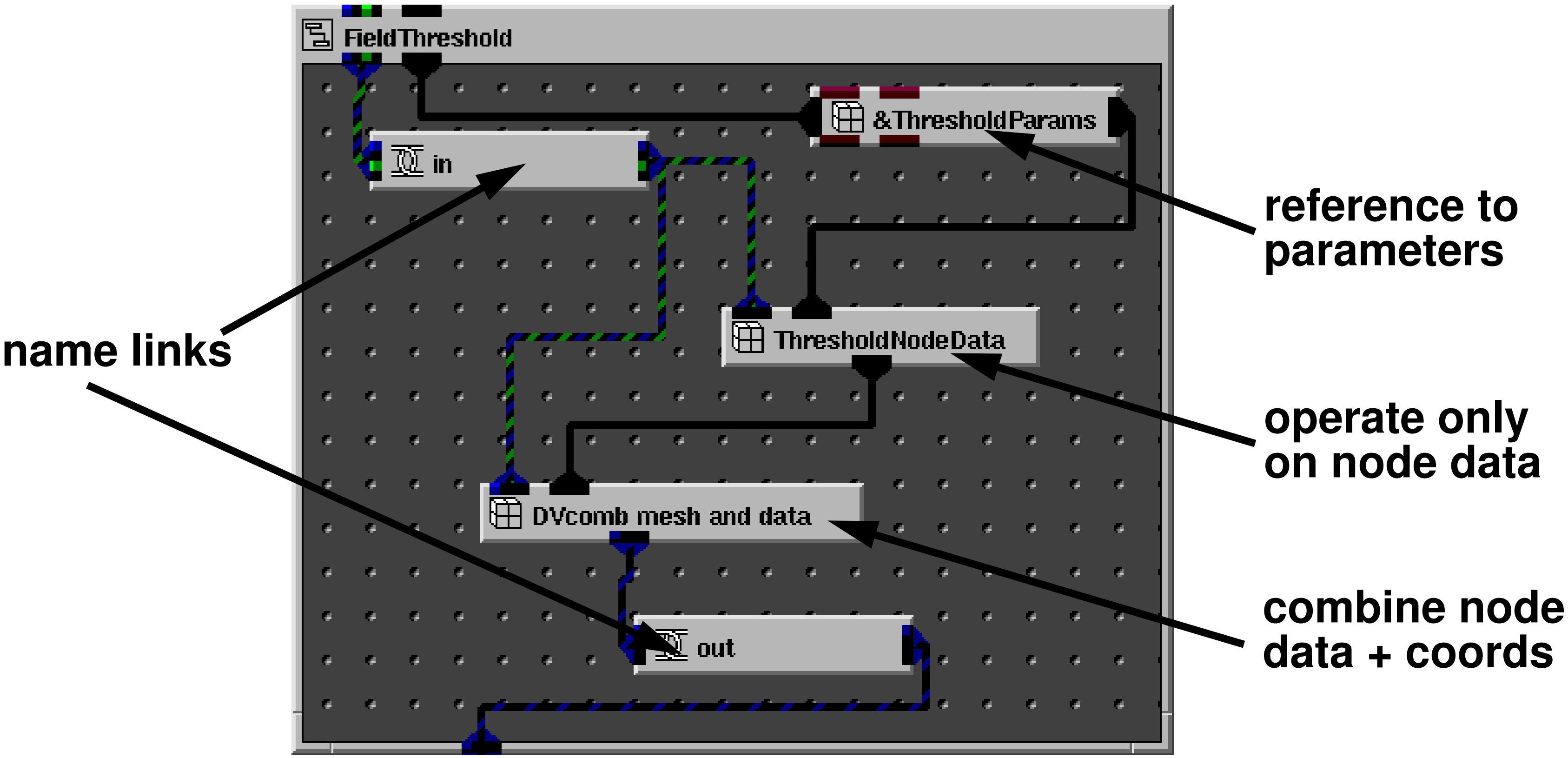
Add module - interaction



Add module - project management



Merging node and mesh data

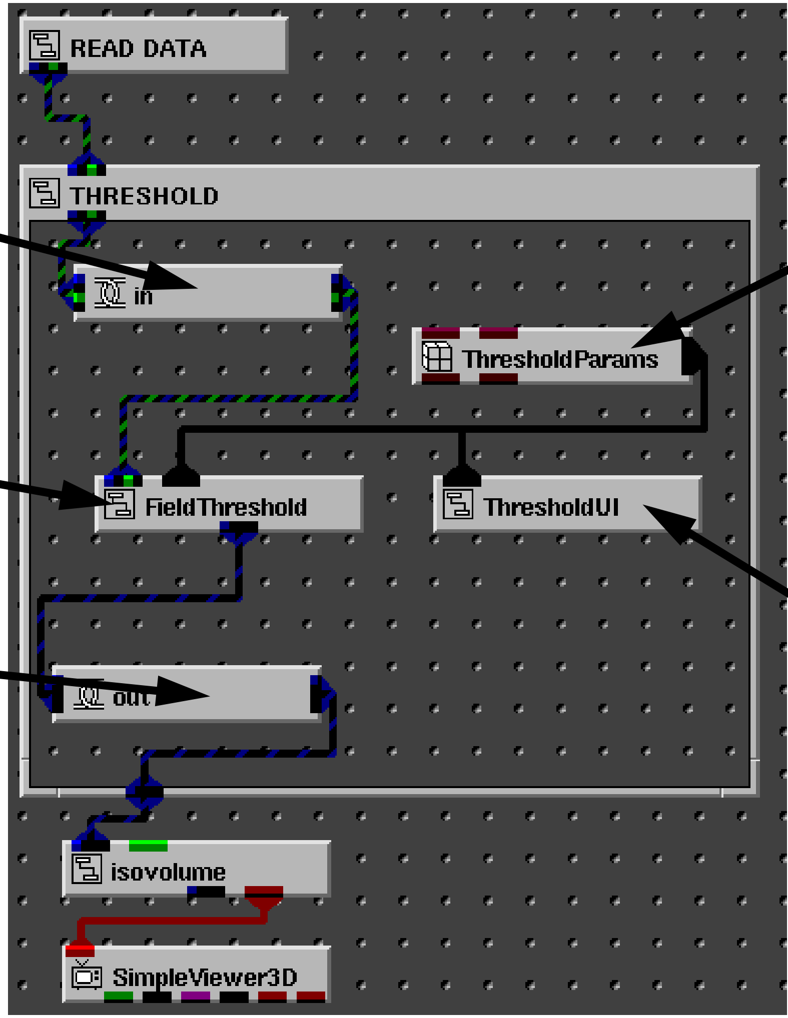


Building a user interface

in
name link to input

FieldThreshold
thresholds the data

out
name link to output



ThresholdParams
parameter values

ThresholdUI
user interface

User Interface