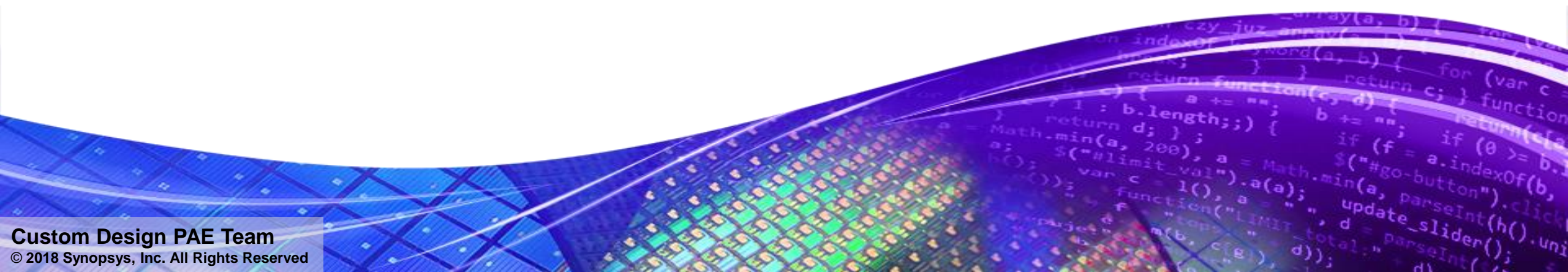


Custom Compiler

Schematic Editor (SE)

Hierarchy Configuration

O-2018.09



Unit Objectives



- **After completing this unit, you should be able to:**
 - Understand the Configuration View
 - Understand the importance of the Configuration View using the Hierarchy Editor
 - Create and Edit the Configuration View
 - Define and use the various selection rules and bindings

Hierarchy Configuration

- **The config cellView stores a reference to the root cellView of the hierarchy and the rules necessary to traverse the design.**
- **Used to configure hierarchical designs for:**
 - Netlisting
 - Parasitic re-simulation
 - Mixed-signal simulation design partitioning
 - SDL

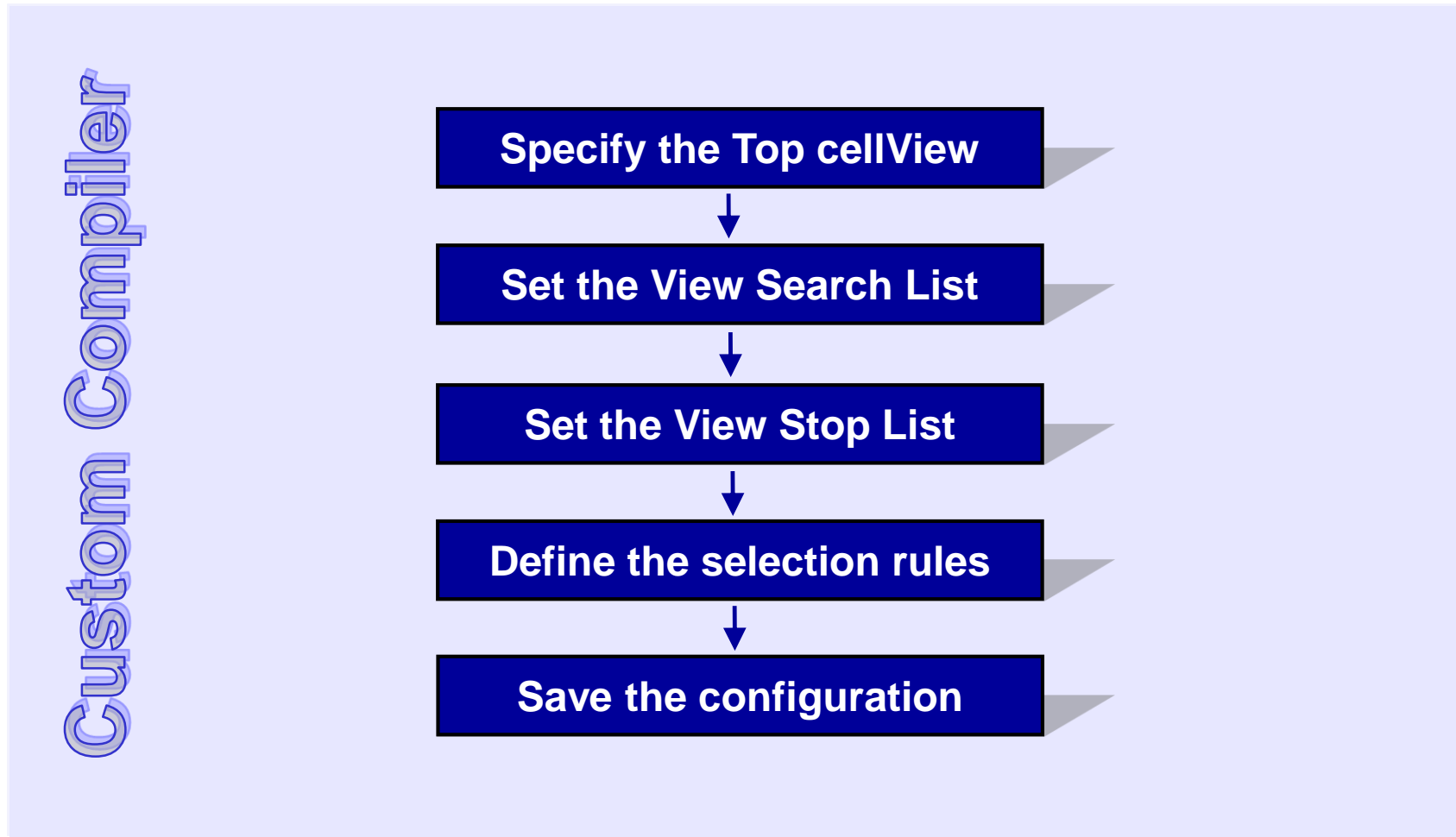
Why Configuration Views?

- Different testbench for each level of abstraction
- Mixed-signal simulation
- Easy way of changing test benches
- Analyzing and verifying systems early and continuously during the design phase
- Simulating large systems in a reasonable time
 - Using VHDL, Verilog-A.
- Reconfigure schematic top design for SDL editing

Hierarchy Editor

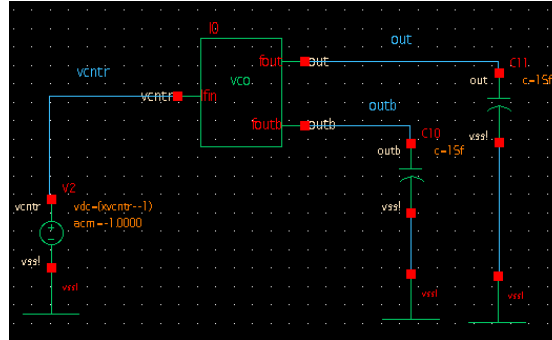
- **Allows users to create a configuration that defines which cellViews, under a top-level cell, are to be considered as part of a hierarchical design**
- **Multiple Purposes**
 - Allows users to override default bindings for purposes of netlisting, design traversal (Descend/Return), ...
 - ◆ Can bind on multiple levels: cell, instance, occurrence
 - ◆ Overrides default switch view list
 - Excludes portions of design (bind to open)
 - View Cell/Tree Configuration Panes

Configuration flow using Hierarchy Editor

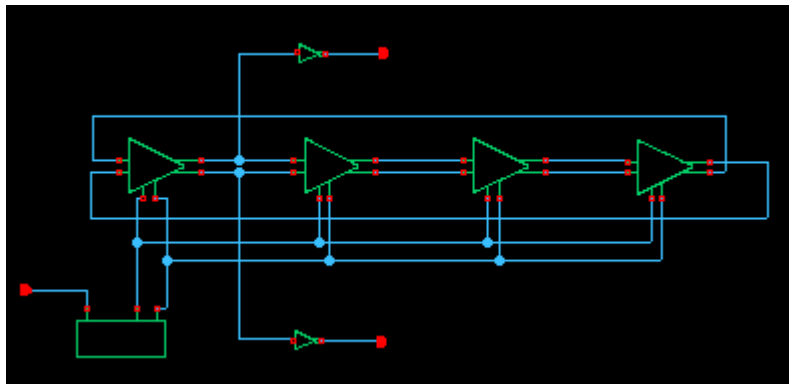


Placed Master vs Switched Master

Placed master is symbol



Switched master is schematic



Switched master is veriloga

```
include "constants.vams"
include "disciplines.vams"

module vco (fout, fouth, lfin);
    output fout;
    output fouth;
    input lfin;
    electrical fout, fouth, lfin;

    analog begin

    end
endmodule
```

Hierarchy Editor Window

Top cellView Information →

Global bindings →

Instance/Occurrence bindings →

Explain view binding

The screenshot shows the Synopsys Hierarchy Editor window for a project named '4 Hierarchy Editor - Custom Compiler'. The window title bar includes the Synopsys logo and standard window controls. The menu bar includes File, Edit, View, Window, and Help. The toolbar contains various icons for file operations and editing. A blue circle highlights the 'Explain view binding' button in the toolbar.

The main content area is titled 'Top Cellview' and contains the following fields:

- Library: HE
- Cell: VCO_test
- View: schematic

Below these fields are three search lists:

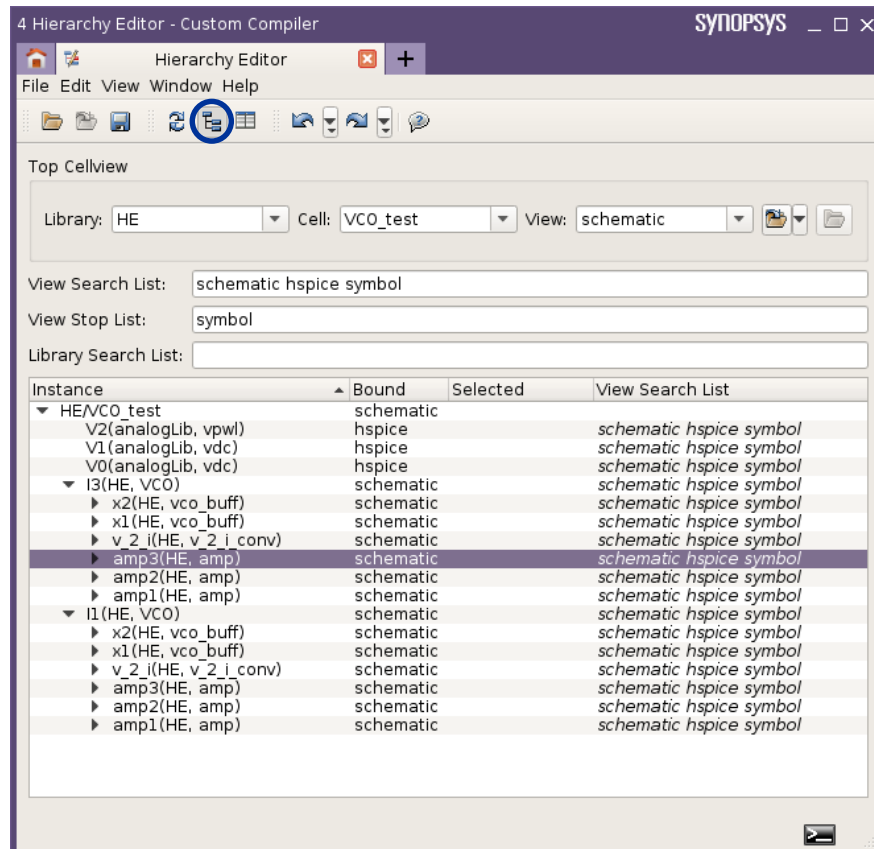
- View Search List: schematic hspice symbol
- View Stop List: symbol
- Library Search List: (empty)

The main table displays the hierarchy of instances and their bindings. The table has four columns: Instance, Bound, Selected, and View Search List.

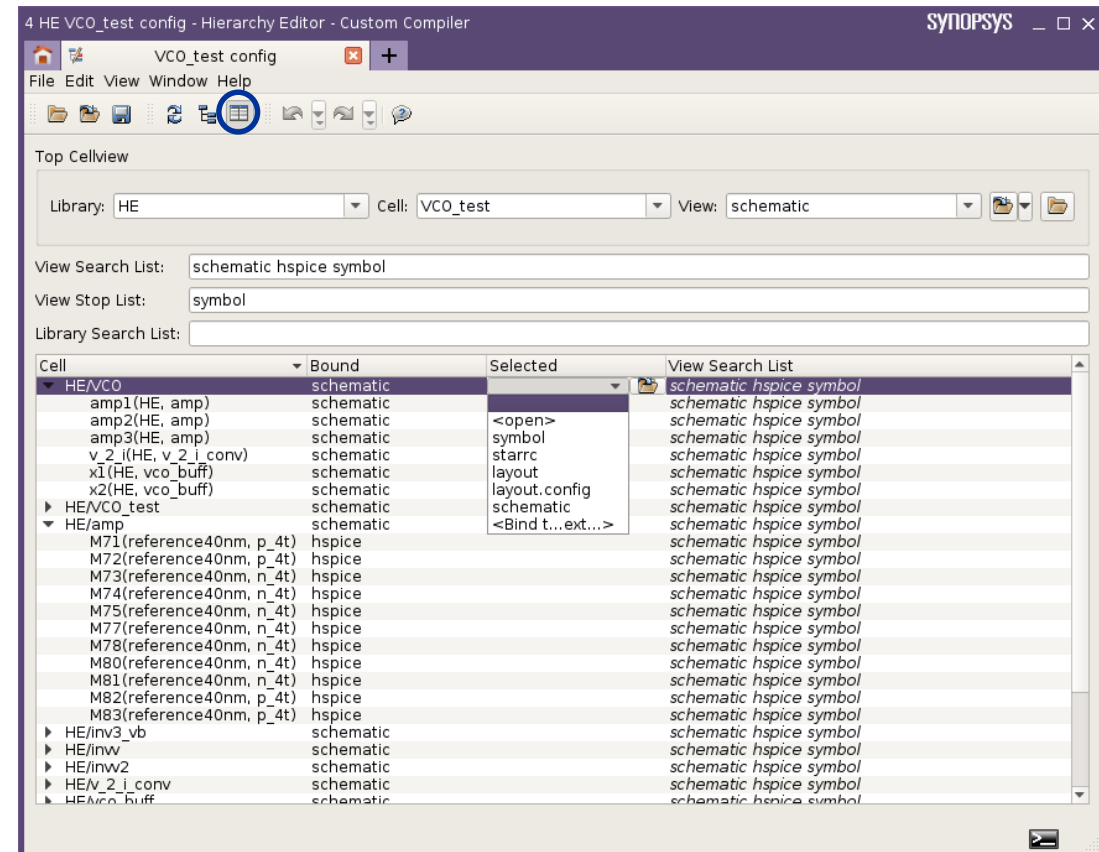
Instance	Bound	Selected	View Search List
HE/VCO_test	schematic		
V2(analogLib, vpwl)	hspice		schematic hspice symbol
V1(analogLib, vdc)	hspice		schematic hspice symbol
V0(analogLib, vdc)	hspice		schematic hspice symbol
I3(HE, VCO)	schematic		schematic hspice symbol
x2(HE, vco_buff)	schematic		schematic hspice symbol
x1(HE, vco_buff)	schematic		schematic hspice symbol
v_2_i(HE, v_2_i_conv)	schematic		schematic hspice symbol
amp3(HE, amp)	layout	layout	schematic hspice symbol
amp2(HE, amp)	schematic		schematic hspice symbol
amp1(HE, amp)	schematic		schematic hspice symbol
I1(HE, VCO)	schematic		schematic hspice symbol
x2(HE, vco_buff)	schematic		schematic hspice symbol
x1(HE, vco_buff)	schematic		schematic hspice symbol
v_2_i(HE, v_2_i_conv)	schematic		schematic hspice symbol
amp3(HE, amp)	layout	layout	schematic hspice symbol
amp2(HE, amp)	schematic		schematic hspice symbol
amp1(HE, amp)	schematic		schematic hspice symbol

Hierarchy Editor Window

Tree View (Default): For Instance/Occurrence View Selection



Cell View: For Cellview Selection



Configuration View Creation

■ Configuration View can be created in three ways:

- From the Schematic Design Editor
 - ◆ Open a design in the schematic editor
 - ◆ Invoke the Hierarchy Editor using Tools > Hierarchy Editor
 - ◆ Specify the selection rules
 - ◆ Save
- From the Library Manager
 - ◆ Create the config cellView
 - Opens up the Hierarchy Editor if the “Open on Create” option is checked
 - ◆ Specify the top cellView
 - ◆ Specify the selection rules
 - ◆ Save
- By initializing SDL
 - ◆ Optionally open layout.config view, update selection rules and save

View Selection Rules/Bindings

- **Following selection rules are used for hierarchy configuration**
 - View Search List
 - Occurrence View Selection
 - Instance View Selection
 - Cell View Selection
 - Open Selection

Rules Precedence

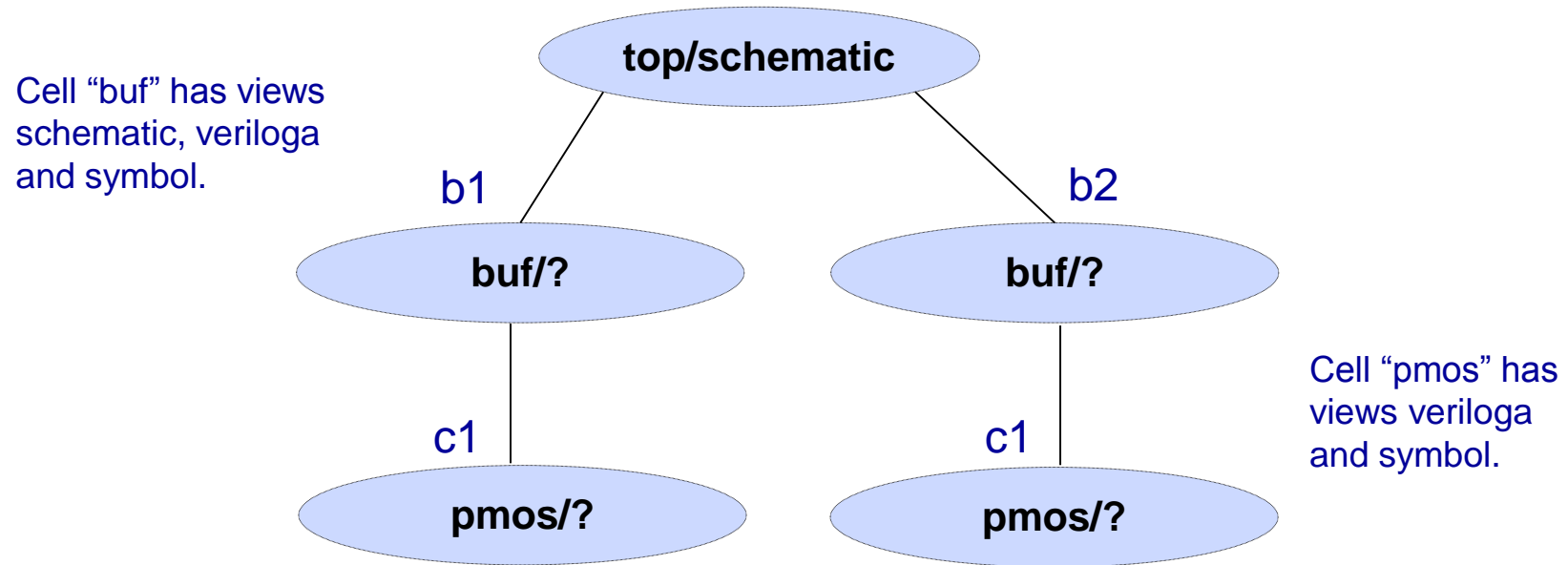
■ Binding precedence from the highest to the lowest

- Occurrence Bind to Open
- Occurrence View selection
- Occurrence Inherited View Search List
- Instance Bind to Open
- Instance View Selection
- Instance Inherited View Search List
- Cell Bind to Open
- Cell View Selection
- Cell Inherited View Search List
- Global View Search List

Elaborating a Hierarchy

View Search List: schematic veriloga symbol

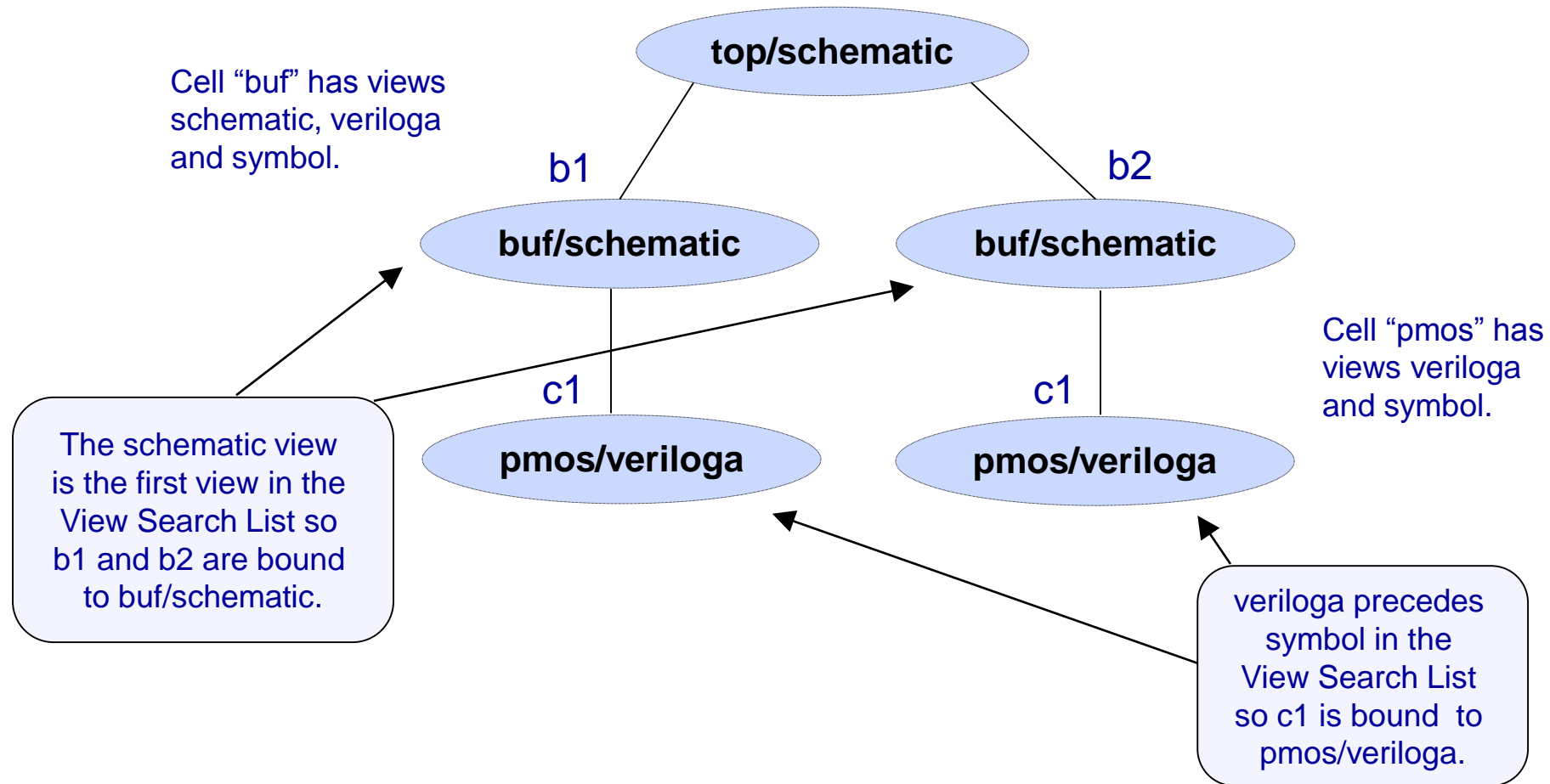
View Stop List: symbol



Elaborating a Hierarchy

View Search List: schematic veriloga symbol

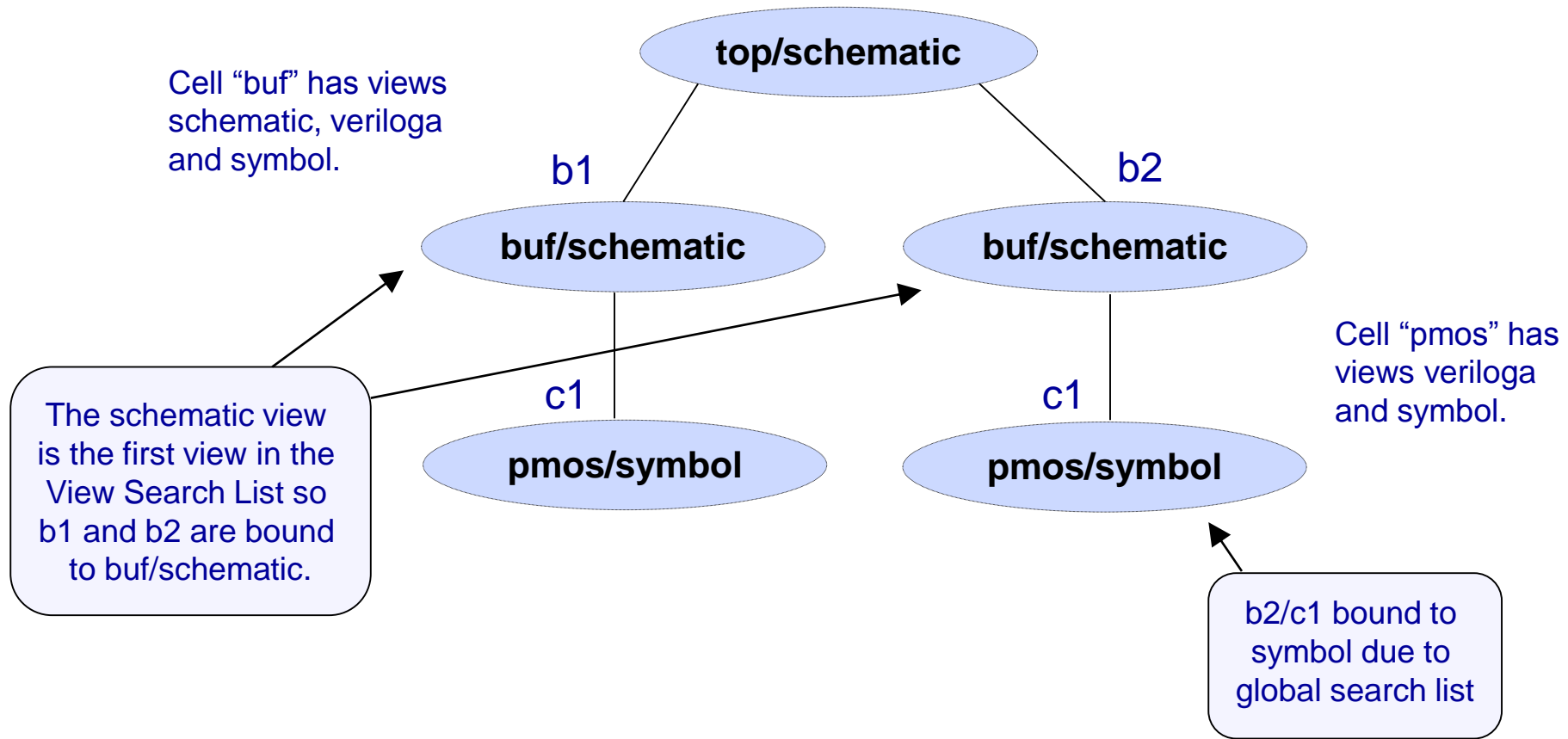
View Stop List: symbol



Elaborating a Hierarchy

Global View Search List: schematic symbol

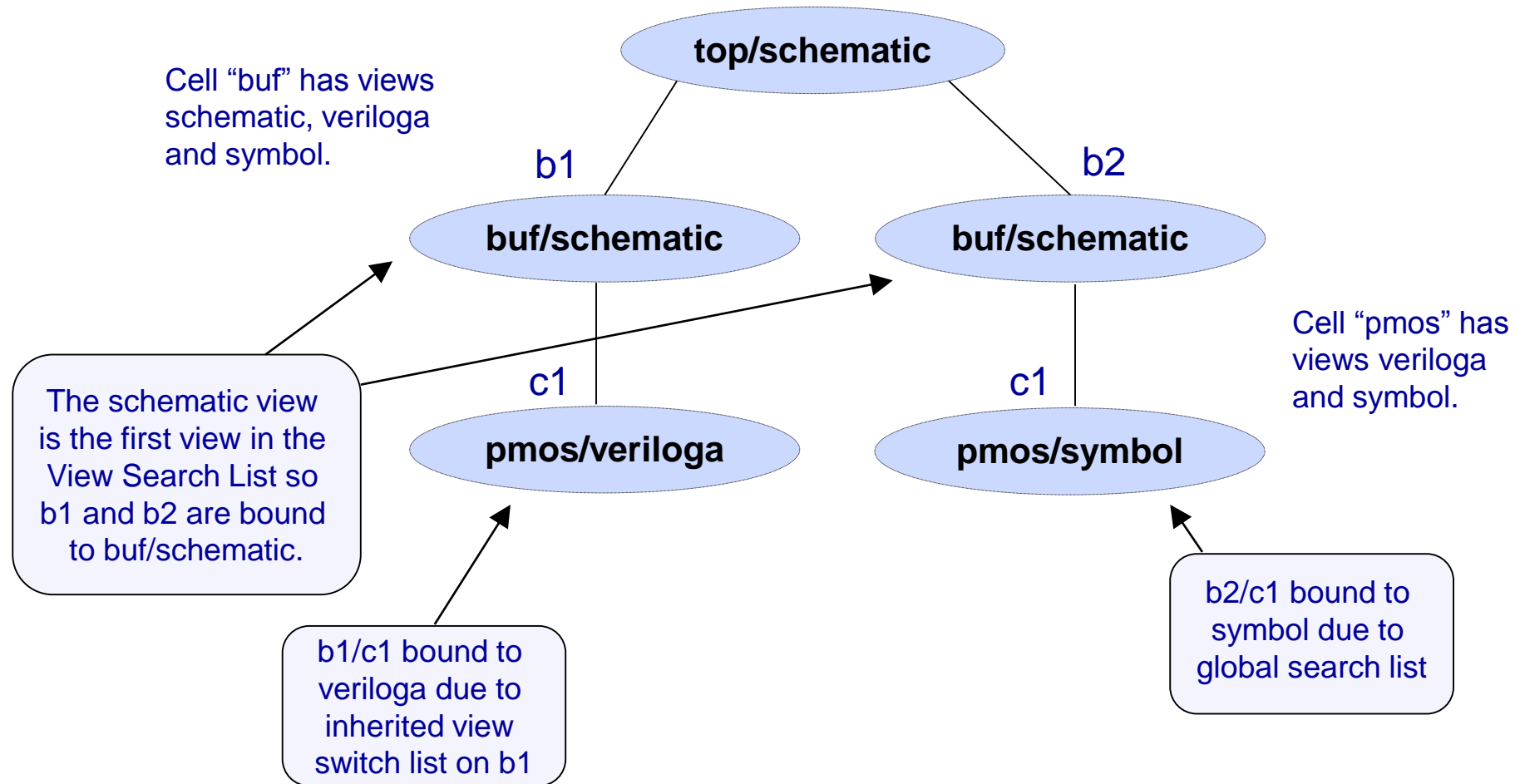
Inherited View Search List on “b1”: schematic veriloga



Elaborating a Hierarchy

Global View Search List: schematic symbol

Inherited View Search List on “b1”: schematic veriloga



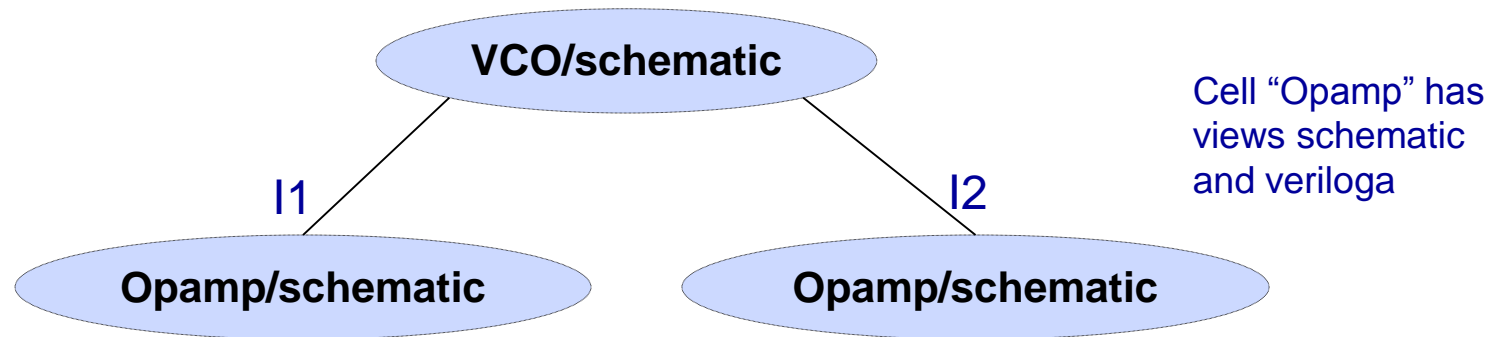
Cell View selection

- Bind all instances of a given cell to a specific view name
- Override global and inherited View Search Lists of the specified cell

View Search List: schematic hspiceD

View Stop List: hspiceD

Bind Cell “Opamp” to view “veriloga”



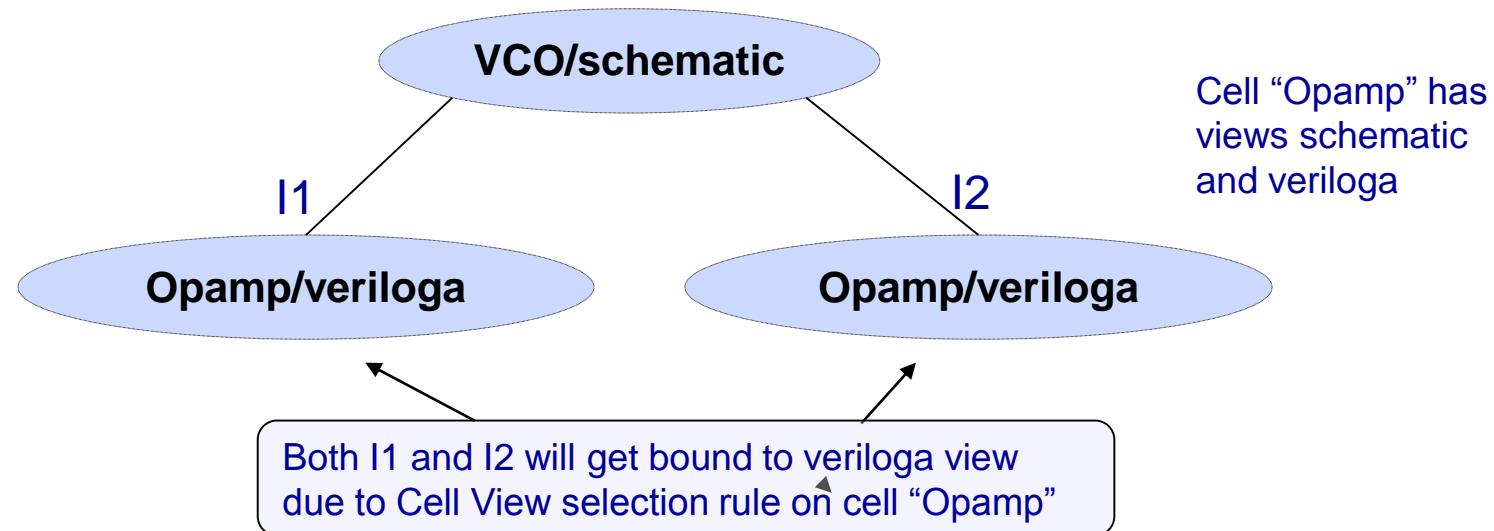
Cell View selection

- Bind all instances of a given cell to a specific view name
- Override global and inherited View Search Lists of the specified cell

View Search List: schematic hspiceD

View Stop List: hspiceD

Bind Cell “Opamp” to view “veriloga”



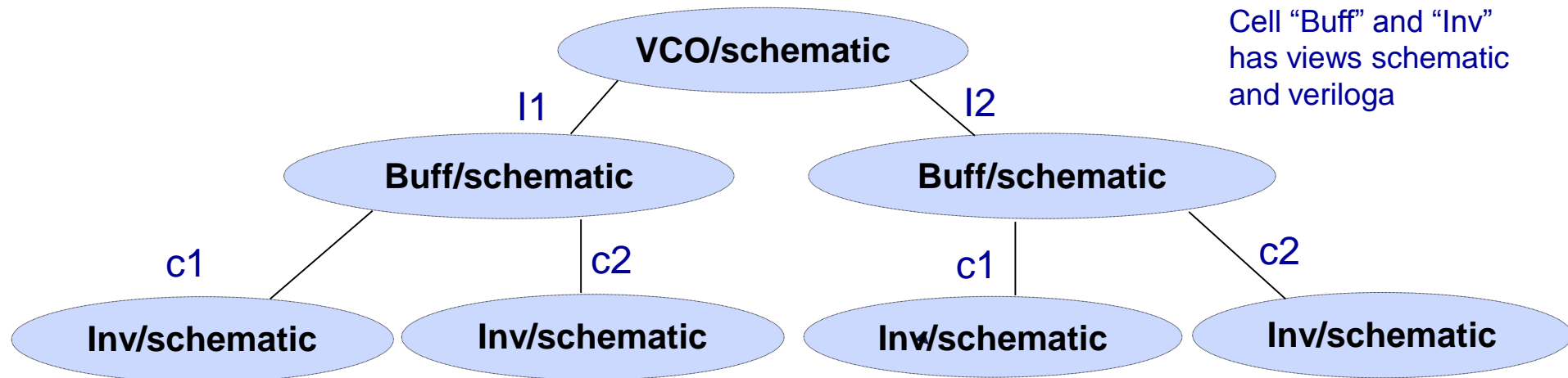
Instance View Selection

- Bind specific instance of a cell to a view
- Overrides Cell View Selection, inherited View Search Lists, and global View Search Lists for the specified instance

View Search List: schematic veriloga hspiceD

View Stop List: hspiceD

Bind instance “c1” to view “veriloga”



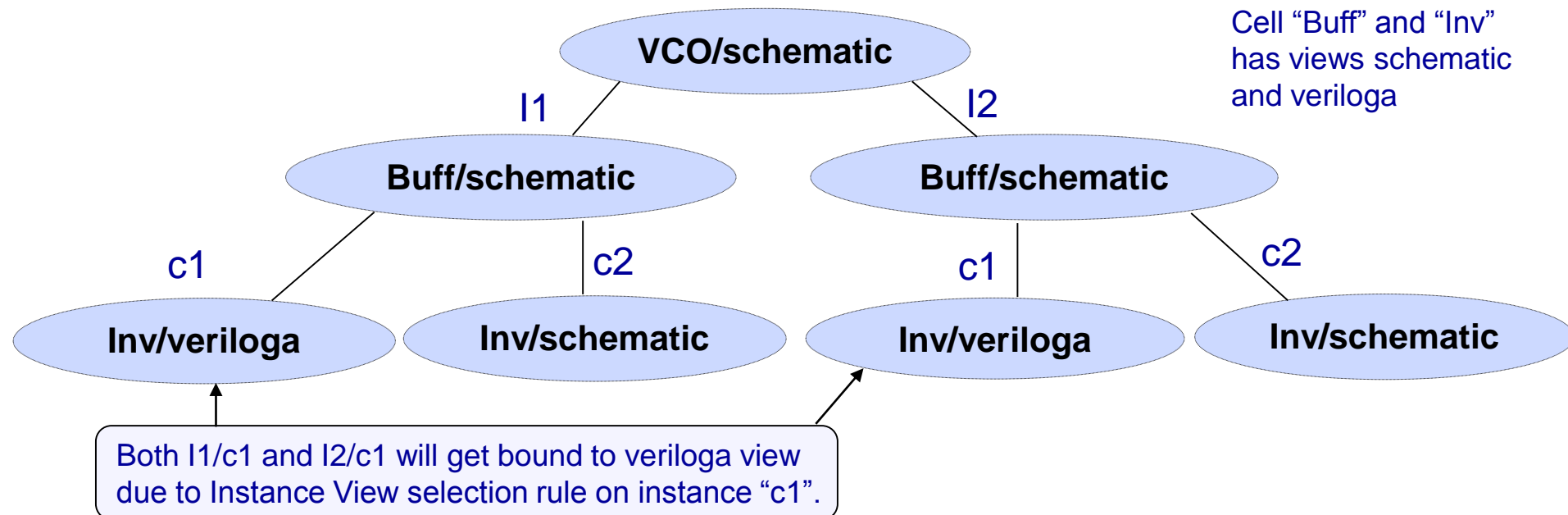
Instance View Selection

- Bind specific instance of a cell to a view
- Overrides Cell View Selection, inherited View Search Lists, and global View Search Lists for the specified instance

View Search List: schematic veriloga hspiceD

View Stop List: hspiceD

Bind instance “c1” to view “veriloga”



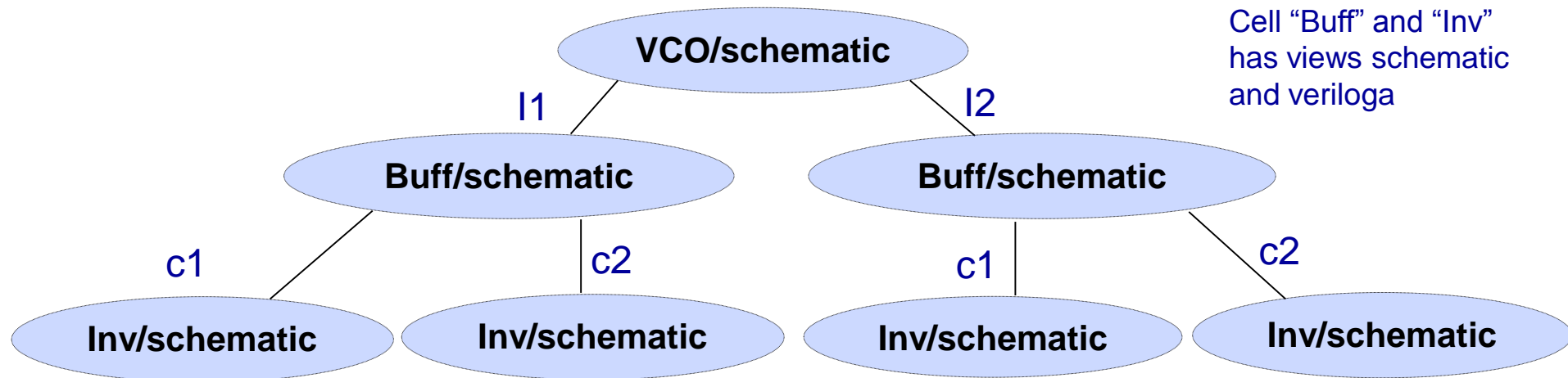
Occurrence View Selection

- Bind instance in a specific lineage to a specific view
- Overrides Instance bindings, Cell bindings and View Search Lists for the specified occurrence

View Search List: schematic veriloga hspiceD

View Stop List: hspiceD

Bind occurrence “I2/c1” to view “veriloga”



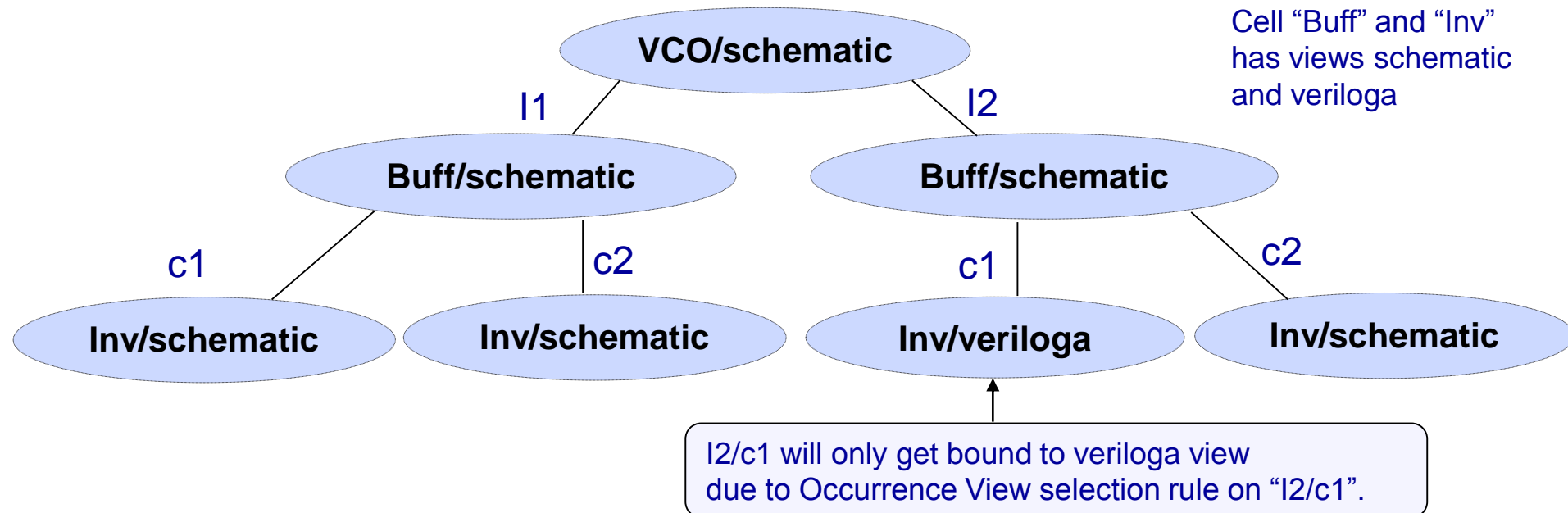
Occurrence View Selection

- Bind instance in a specific lineage to a specific view
- Overrides Instance bindings, Cell bindings and View Search Lists for the specified occurrence

View Search List: schematic veriloga hspiceD

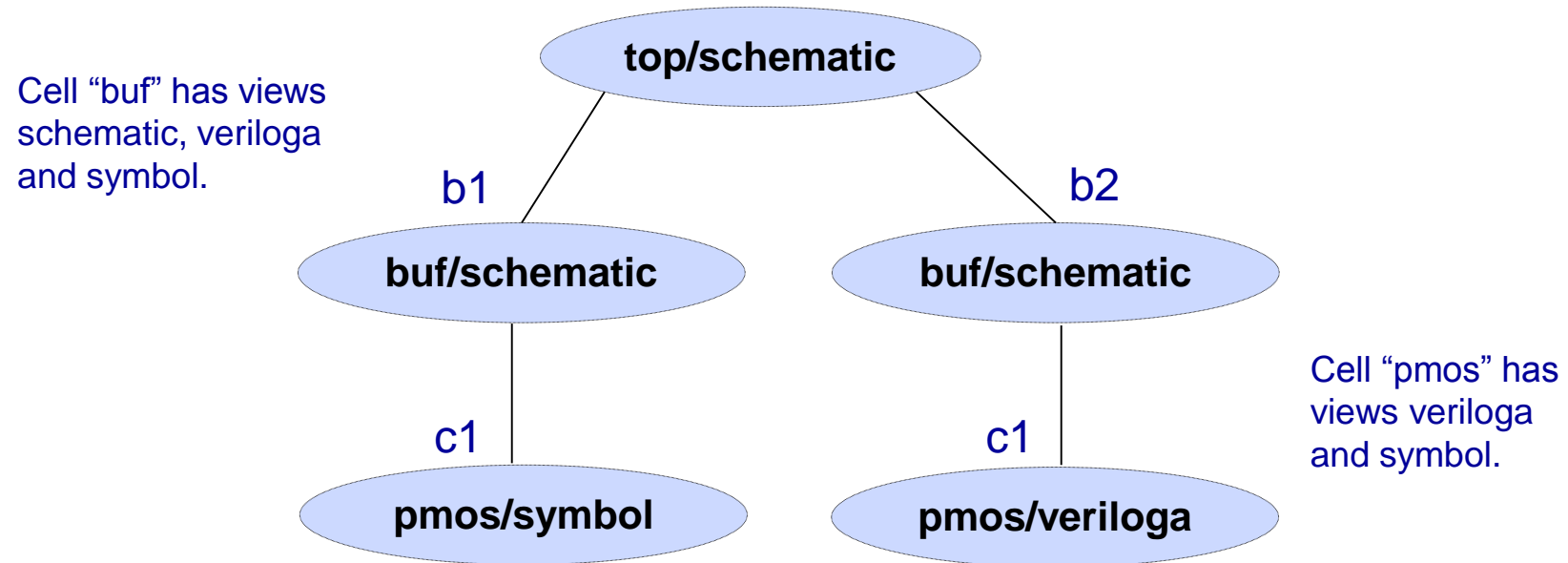
View Stop List: hspiceD

Bind occurrence “I2/c1” to view “veriloga”



Open Selection

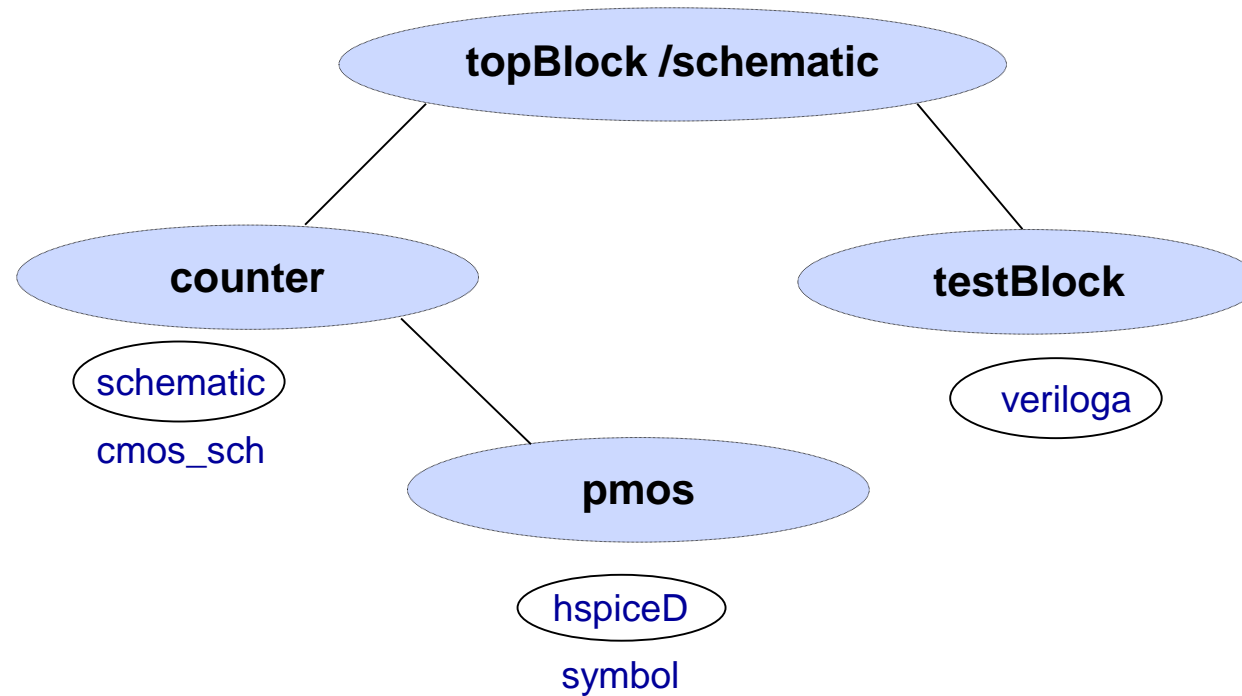
View Search List: schematic symbol
Instance “b2” bound to open



Questions: Switch/Stop List

View Search List: schematic hspiceD symbol cmos_sch veriloga

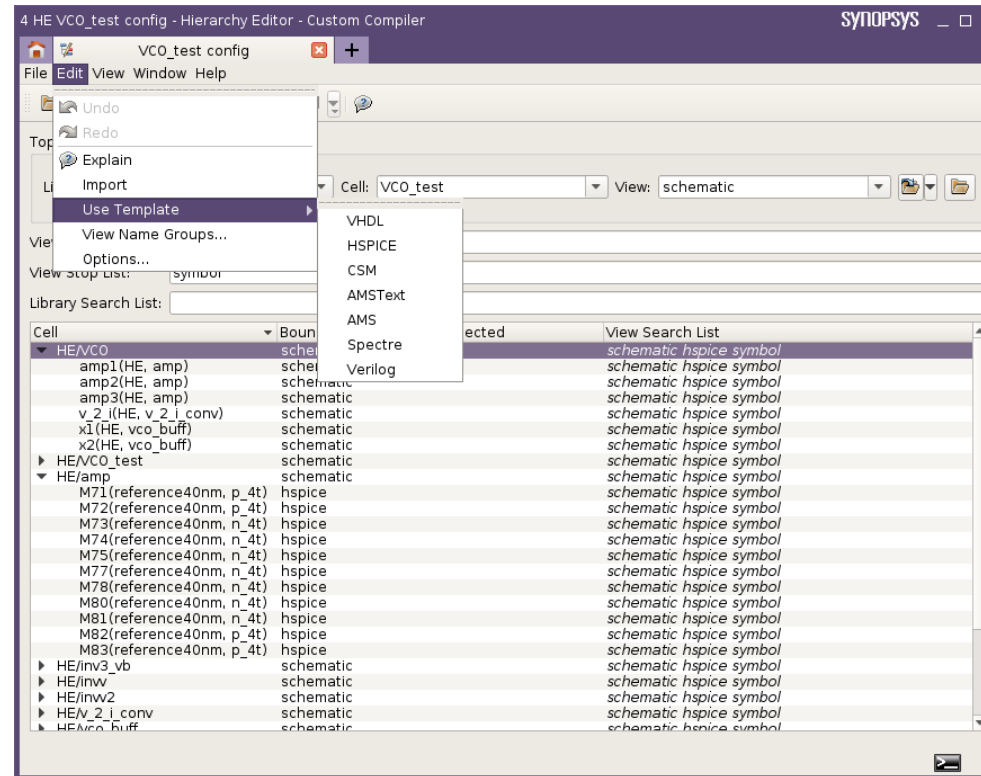
View Stop List: hspiceD symbol



Templates

■ Supports following predefined configuration templates:

- VHDL
- HSPICE
- CSM
- AMSText
- AMS
- Spectre
- Verilog



■ Template allows to automatically fill the View Search and Stop list fields based on the type of Simulator

Creating Own Templates

- Create a text file with the following information to define view search and stop list in XML format:

```
<config version="1" >  
    <stop_list>hspice hspiceD veriloga</stop_list>  
    <view_search_list>hspice schematic veriloga</view_search_list>  
</config>
```

- Execute the command:

```
he::createConfigTemplate myTemplateName -filePath <Path to the File>
```

- Observe, that myTemplateName appears in the list of available templates shown on slide number 25



- **View Search list is used to determine:**
 - Placed master
 - View master
 - Switched master
- **Occurrence View selection rule takes the precedence over all the rules: True / False**
- **Choose the correct statements:**
 - Occurrence selection rule binds all instances of a cell
 - Top cell view is not important to configure the design
 - Instance view selection binds to specific instance of the cell

Lab 1: Hierarchy Configuration View Creation



30 minutes

Goals:

- To understand the Configuration View creation using Hierarchy Editor and learn various selection rules to configure the design

