

## *Abstract Generation*

Place and route tools do not require the full cell layout

Another view of the standard cells called the abstract view needs to be generated

The abstract view provides information like:

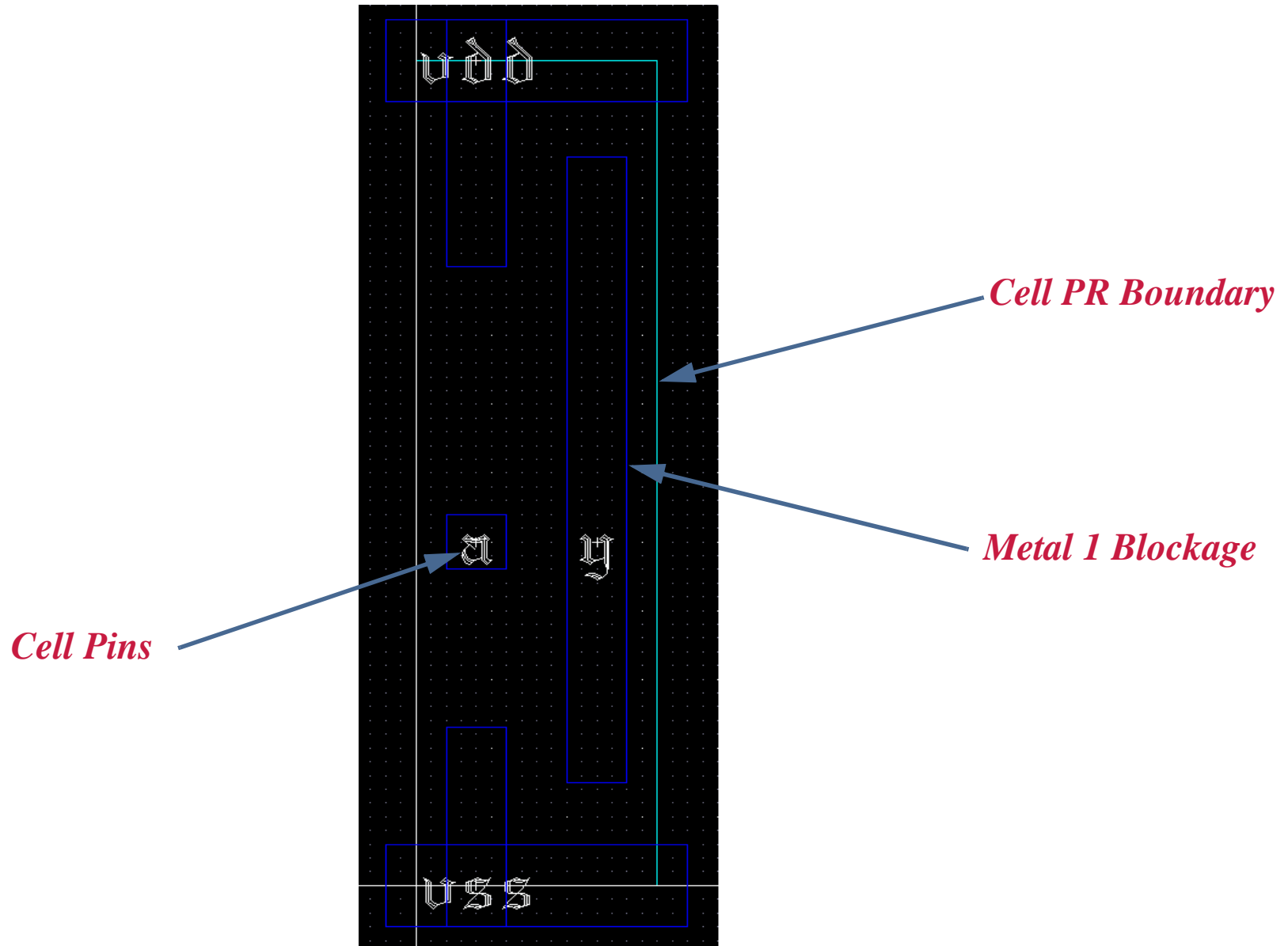
- Cell name, site name, cell orientation
- Cell PR boundary
- Pin names, locations, pin metal layer, type and direction (input/output/input-output)
- Also provides location of all metal track and vias in the layout (obstructions)

This information is passed to the P & R tool in the LEF format (Library Exchange Format)

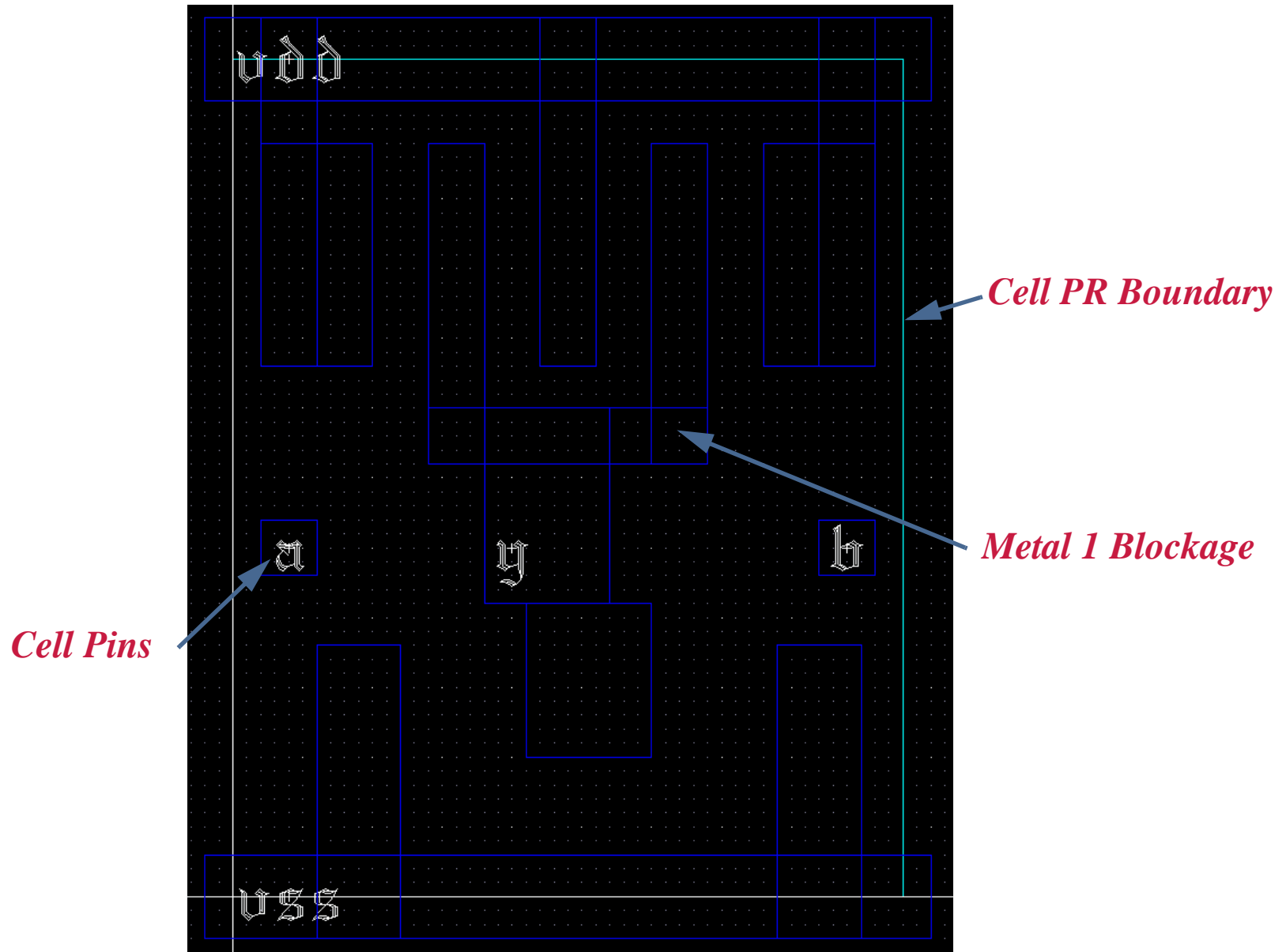
The LEF file contains technology information along with all the cell descriptions

We will use Cadence Abstract Generator tool for producing the abstract view from your standard cell layout view

*Inverter (invx1) Abstract View*



*NAND (nand2x4) Abstract View*



### *Technology File for Abstract*

The abstract generator requires modifications to the technology file from NCSU that you use for your layouts

The new technology file with these modifications is available on my webpage  
[\*AMI06\\_abstract \(AMI06\\_abstract.tar.gz\)\*](#)

*Warning: This library is read-only, do not change these permissions*

Create a new library and attach the above library as the technology library to it

The input to the abstract generator is either the layout view or the GDS II description of the standard cells

To bring the cells from you design library into the new library above, dump the GDS II view of all you layouts from the design library and read them into the new library

Again modifications are required to the NCSU provided GDS II layer map file

Download the modified file from my webpage  
[\*ami06\\_StreamLayerMap.txt\*](#)

## Cell Layouts (GDS II)

On the CIW, click File -> Export -> Stream  
The stream export form pops up

Virtuoso® Stream Out

OK Cancel Defaults Apply Help

User-Defined Data And Options User-Defined Data Options Set Fast Options

Template File Load Save

Library Browser

Run Directory

Library Name

Top Cell Name

View Name layout

Output  Stream DB  ASCII Dump

Output File

Compression  gzip  bzip2  compress  none

Scale UU/DBU 0.00100000

Units  micron  millimeter  mil

Your Design Library

Cell Name

Output GDS filename

## *Cell Layouts (GDS II)*

Fill in the required information

- Library Name
- Cell Name you want to dump
- Output GDS II file name (.gds)

Click on *User-Defined Data tab* on the *Stream Out* Form

In the *Layer Map Table* field put the path to the layermap file you downloaded from my webpage (*ami06\_StreamLayerMap.txt*)

Hit OK, the log is produced in a file called PIPO.log. Check the file to make sure you don't have any errors or warnings. The only warning it should have is that the technology library is unwritable (we want this).

Now you can import the layout into your new library and generate the abstract view

Use CIW File -> Import -> Stream

Provide GDS II filename, cell name (same as before) and the library (new library)

## Abstract Generation

Invoke the Abstract Generator using *abstract* from the same directory where you run *icfb*

Bin	Cells	Cell	Layout	Logical	Pins	Extract	Abstract	Verify
Core	0							
IO	0							
Corner	0							
Block	0							
Ignore	0							

Interpreter:  Tcl  Skill

Log

```
LOG (ABS-1420): Starting Abstract version 5.0.0 03/19/04 20:09 (lvlinuxy), sub-version 5.0.33.14, on Linux 2.4.18-17.7.xsmp
```

Command History

abstract> |

*All Standard cells go under the core bin*

*IO cells go under the IO and Corner bins*

## *Abstract Generation*

Click File -> Library -> Open and select the new library that you created

Click File -> General Options. Under the general tab make sure the values are **CORE** for *default bin* and **5.5** for *LEF Version*

Abstract Generation requires four steps

- Pins (extracts pin information using overlap of text and metal)
- Extract (connects all the shapes that fall on a single net)
- Abstract (combines information from above steps and generates blockages)
- Verify (verifies that the cell is properly constructed using a target P & R tool)

Before you can start the process you need to setup the options for each of these steps

The options are saved in a file called `.abstract.options` inside the directory for your library

My abstract options file is provided on the webpage. Copy this file into your library.  
*abstract.options*

We will discuss each of the options with a live demo in the class