Instruction to Generate Violation Report by Innovus

1. Prepare LEF file and DEF file, and start Innovus. Here we use the testcase "ispd18_sample.tgz" which you can download from http://ispd.cc/contests/18/ispd18_sample.tgz.

2. After extract the testcase ispd18_sample, you can see the following files.
   a. ispd18_sample.input.lef // given LEF file
   b. ispd18_sample.input.def // given DEF file
   c. ispd18_sample.input.guide // given global routing guide
   d. ispd18_sample.solution.good.def // contains good routing solution
   e. ispd18_sample.solution.bad.def // contains bad routing solution

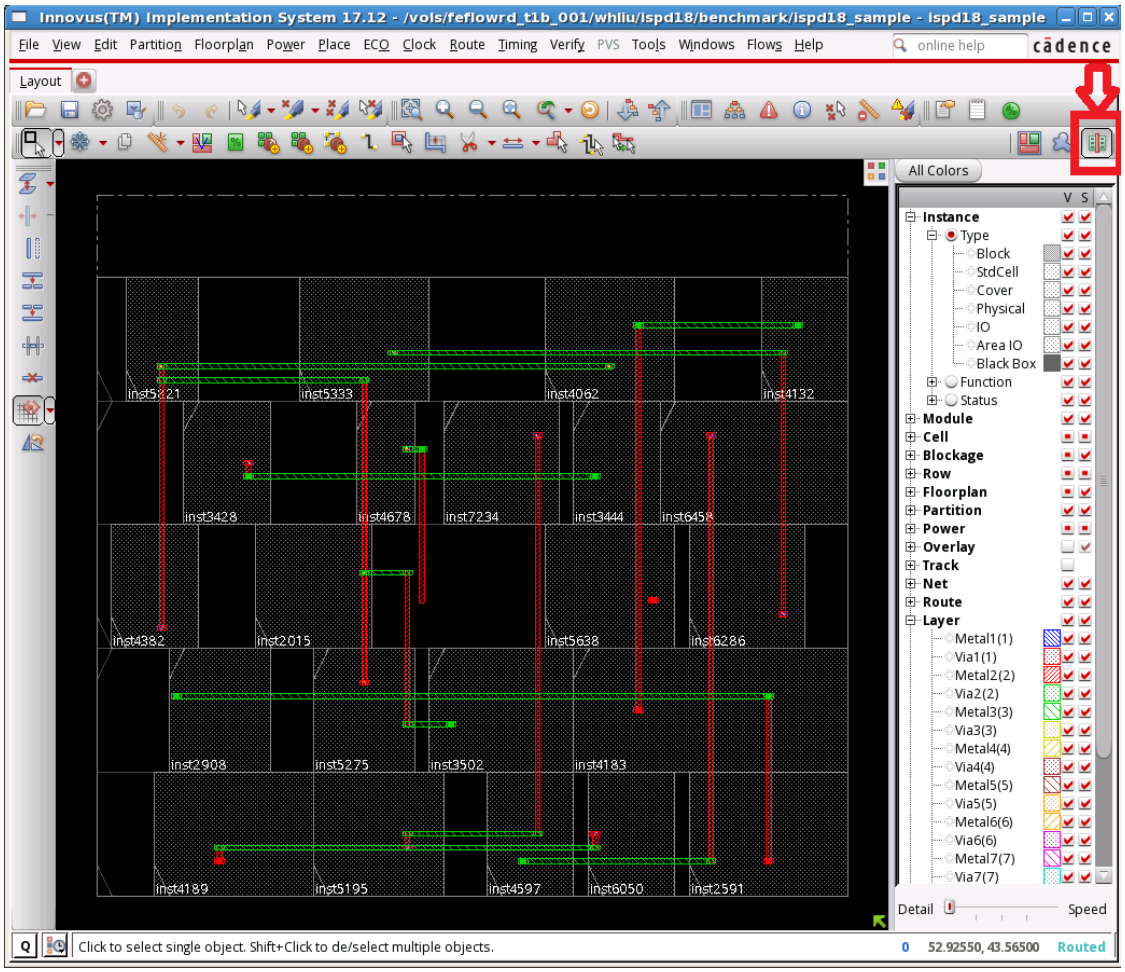
3. Load the LEF and DEF files
   a. To load LEF file, type "loadLefFile <LEF file name>" in the Innovus command line. For testcase ispd18_sample, you can do "loadLefFile ispd18_sample.input.lef" in the command line.

```
innovus 1> loadLefFile ispd18_sample.input.lef

Loading LEF file ispd18_sample.input.lef ...
Set DBUPerIGU to M2 pitch 400.

viaInitial starts at Sat Dec 16 09:08:01 2017
viaInitial ends at Sat Dec 16 09:08:01 2017
innovus 2>
```

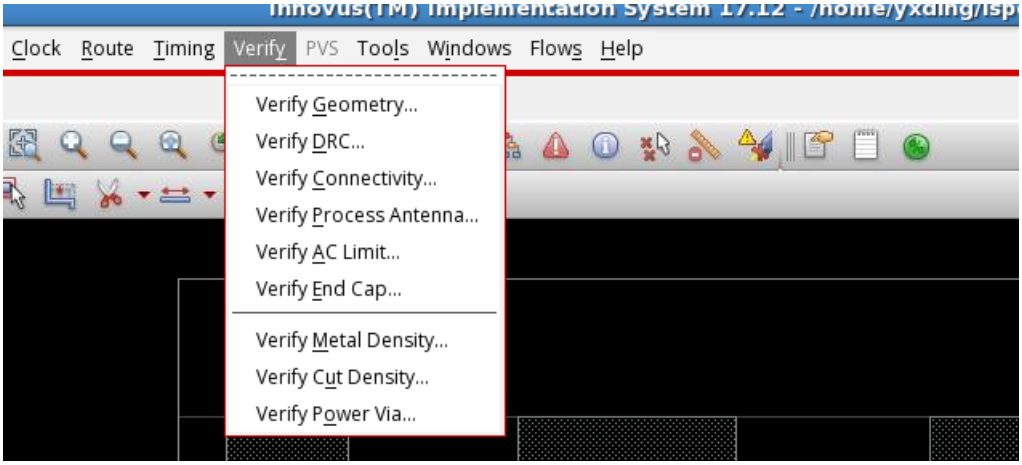
   b. To load DEF file, type "loadDefFile <DEF file name>" in the Innovus command line. For testcase ispd18_sample, you can do "loadDefFile ispd18_sample.solution.bad.def" in the command line.

```
innovus 2> loadDefFile ispd18_sample.input.def
loadDefFile  loadDrc
innovus 2> loadDefFile ispd18_sample.input.def
Creating netlist for top cell: ispd18_sample ...
Reading 22 COMPONENTS ...
Done.
Reading 0 PINS ...
Done.
Reading 11 NETS ...
Done.
*** End DEF_netlist parsing (cpu=0:00:00.0, real=0:00:00.0, mem=453.8M) ***
```

   c. Now you can visualize routing solution in the Innovus GUI for testcase ispd18_sample. If you cannot see nets displayed on the GUI, please click the highlighted icon in the following picture.



4. To verify DRC, click “Verify” in the menu bar, then click “Verify Geometry…”, and click “OK” in the pop-up window. You can also type “verifyGeometry -report <report file name>” in the Innovus command line. Either way, a geometry violation report will be generated in the same folder. A sample DRC report file is shown below, which shows the DRC violation type and location.



```
 1 ############################################################
 2 #  Generated by:      Cadence Innovus 17.10-p006_1
 3 #  OS:                Linux x86_64(Host ID sjfib187)
 4 #  Generated on:      Sat Dec 16 13:50:23 2017
 5 #  Design:            ispd18_sample
 6 #  Command:           verifyGeometry -report ispd18_sample.solution.bad.verifyGeo.rpt
 7 ############################################################
 8
 9 SHORT: Regular Wire of Net net1232 & Regular Wire of Net net1231  ( Metal2 )
10 Bounds : ( 42.665, 43.000 ) ( 42.735, 43.260 )
11
12
13 SHORT: Regular Via of Net net1232 & Regular Via of Net net1231  ( Metal2 )
14 Bounds : ( 42.635, 43.190 ) ( 42.765, 43.260 )
15
16
17 SHORT: Regular Via of Net net1240 & Regular Wire of Net net1231  ( Metal2 )
18 Bounds : ( 45.465, 40.340 ) ( 45.535, 40.410 )
19
20
21 AREA: Regular Via of Net net1238  ( Metal2 )
22 Bounds : ( 48.635, 41.670 ) ( 48.765, 41.740 )
23 Actual:     0.0091     Min:     0.02
```

5. To verify connectivity, click “Verify” in the menu bar, then click “Verify Connectivity…”, and click “OK” in the pop-up window. You can also type “verifyConnectivity -report <report file name>” in the Innovus command line. Either way, a connection violation report will be generated in the same folder. A sample connectivity report is shown below.

```
 1 ############################################################
 2 #  Generated by:      Cadence Innovus 17.10-p006_1
 3 #  OS:                Linux x86_64(Host ID sjfib187)
 4 #  Generated on:      Sat Dec 16 13:50:37 2017
 5 #  Design:            ispd18_sample
 6 #  Command:           verifyConnectivity -report ispd18_sample.solution.bad.verifyConn.rpt
 7 ############################################################
 8 Verify Connectivity Report is created on Sat Dec 16 13:50:37 2017
 9
10
11
12 Net net1237: has regular routing with opens at (45.860, 39.995) (46.300, 42.260)
13 Net net1237: has regular routing with opens at (49.460, 39.900) (49.540, 40.400)
14 Net net1237: dangling Wire at (46.300, 39.995) (46.300, 39.995) on layer: Metal2
15 Net net1237: dangling Wire at (49.500, 39.995) (49.500, 39.995) on layer: Metal2
16
17 Begin Summary
18     2 Problem(s) (IMPVFC-92): Pieces of the net are not connected together.
19     2 Problem(s) (IMPVFC-94): The net has dangling wire(s).
20     4 total info(s) created.
21 End Summary
```

6. To see a violation-free solution, load “ispd18_sample.solution.good.def”. After verifying DRC and connectivity, you will have the following two reports showing no violation.

```
#############################################################
#  Generated by:      Cadence Innovus 17.10-p006_1
#  OS:                Linux x86_64(Host ID sjfib187)
#  Generated on:      Sat Dec 16 13:46:48 2017
#  Design:            ispd18_sample
#  Command:           verifyGeometry -report ispd18_sample.solution.good.verifyGeo.rpt
#############################################################


Begin Summary ...
   Cells       : 0
   SameNet     : 0
   Wiring      : 0
   Antenna     : 0
   Short       : 0
   Overlap     : 0
End Summary

No DRC violations were found
```

```
#############################################################
#  Generated by:      Cadence Innovus 17.10-p006_1
#  OS:                Linux x86_64(Host ID sjfib187)
#  Generated on:      Sat Dec 16 13:46:59 2017
#  Design:            ispd18_sample
#  Command:           verifyConnectivity -report ispd18_sample.solution.good.verifyConn.rpt
#############################################################
Verify Connectivity Report is created on Sat Dec 16 13:46:59 2017



Begin Summary
    Found no problems or warnings.
End Summary
```

7. We will provide an evaluator to read the two reports and output a score. The evaluator will be provided by 12/21/2017.