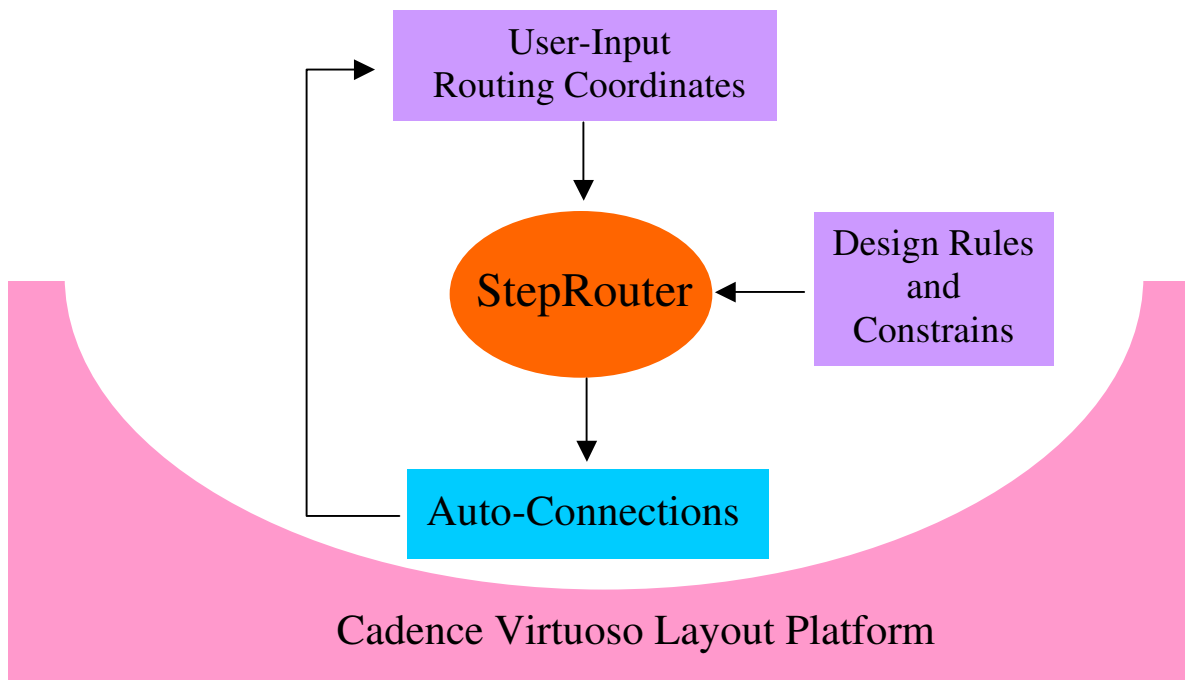


StepRouter

A coordinate-to-coordinate grid-less auto-router directly runs on as-is layout window. The router creates an auto-connection along the user-input routing-coordinates in compliance with the routing rules and constrains. Based on what is created, the router can be Path Router, Bus Router, Matched Path Router and Matched Bus Router. (US patent pending)



Flow Chart
On Cadence Virtuoso Layout Platform

The Skillcad stepRouter introduces a click-and-connect routing method for custom layout design. It automatically adds vias and jumps routing layers to create a DRC clean connection along the user-given path. The connection also meets constraints such as minimum array size (columns/rows) of vias and maximum stack levels of vias. Further, the connection is also optimized based on a cost value. The cost value can be a function of layer routing directions (for maximum routability), resistance (for minimum resistance), capacitance (for minimum capacitance) and RC (for minimum delay).

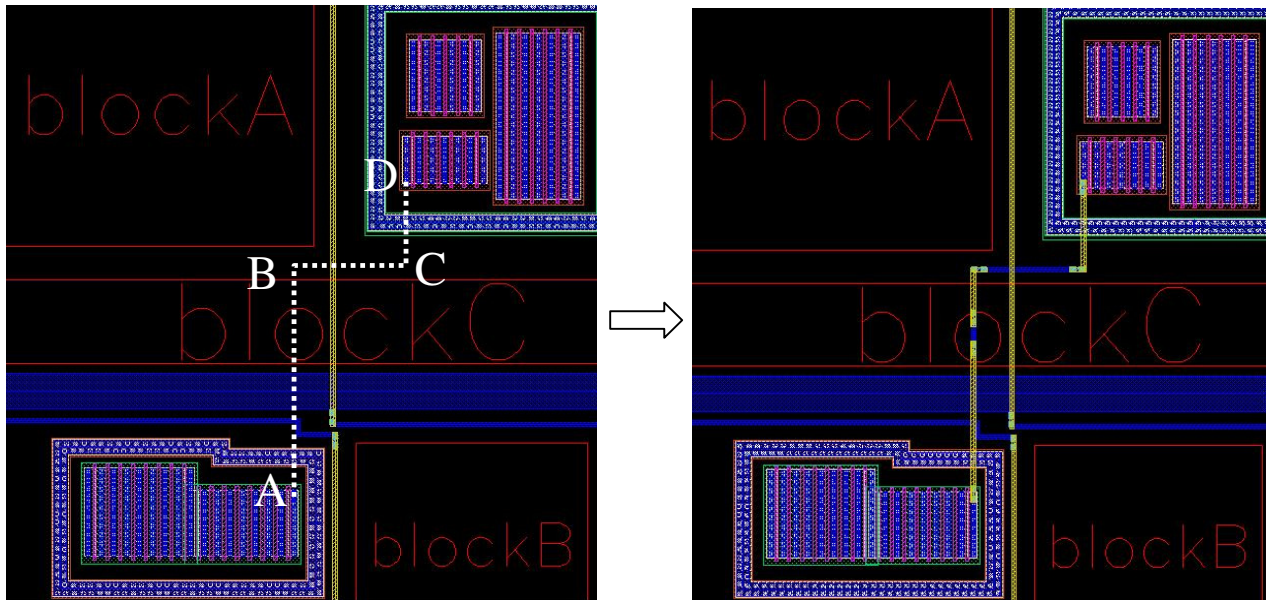


FIG.1 StepRouter enables the user to create this path connection simply by 4 sequential clicks at A, B, C and D.

Meanwhile, StepRouter enables the user to do the routing without seeing the details of the block level cells.

Additionally, StepRouter's click-and-connect routing method can also be used to create bus, matched paths and matched buses.

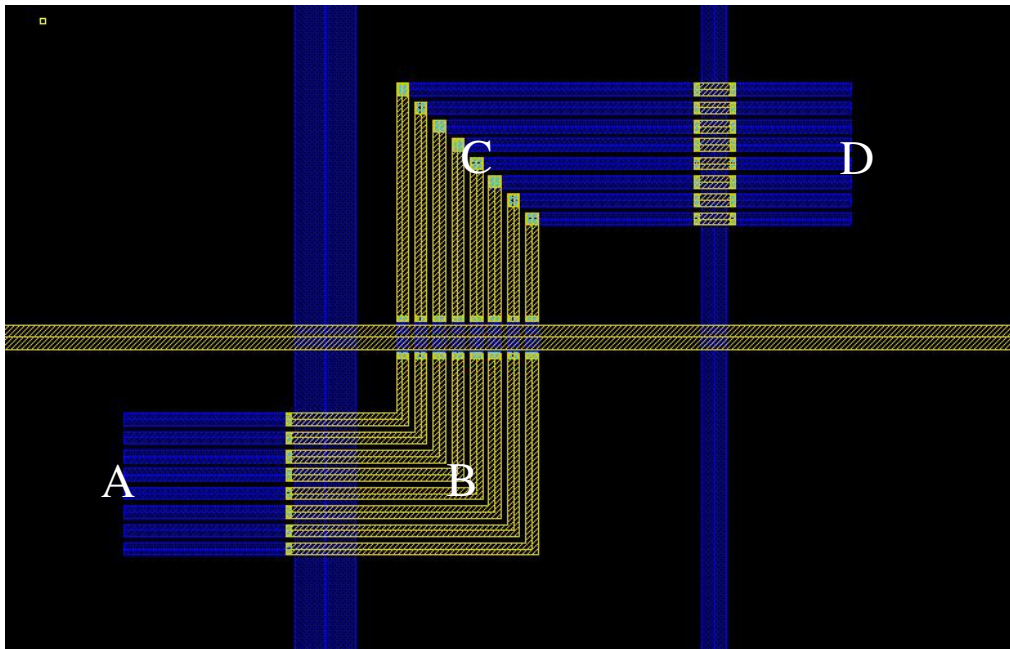


FIG. 2 A bus connection created by 4 sequential clicks at A, B, C and D.

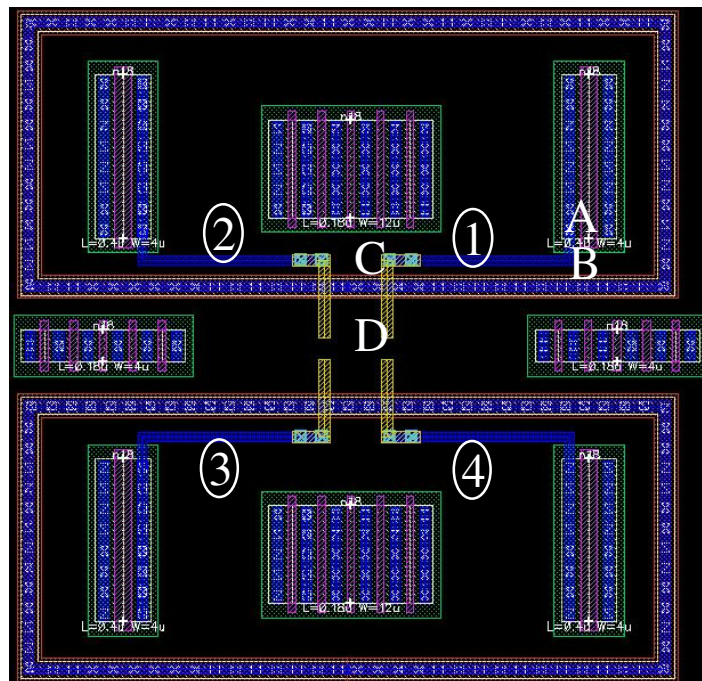


FIG. 3. Connections 1,2,3,4 are matched (identical) connections. The 4 connections are created in the same time simply by clicks at A, B, C and D.

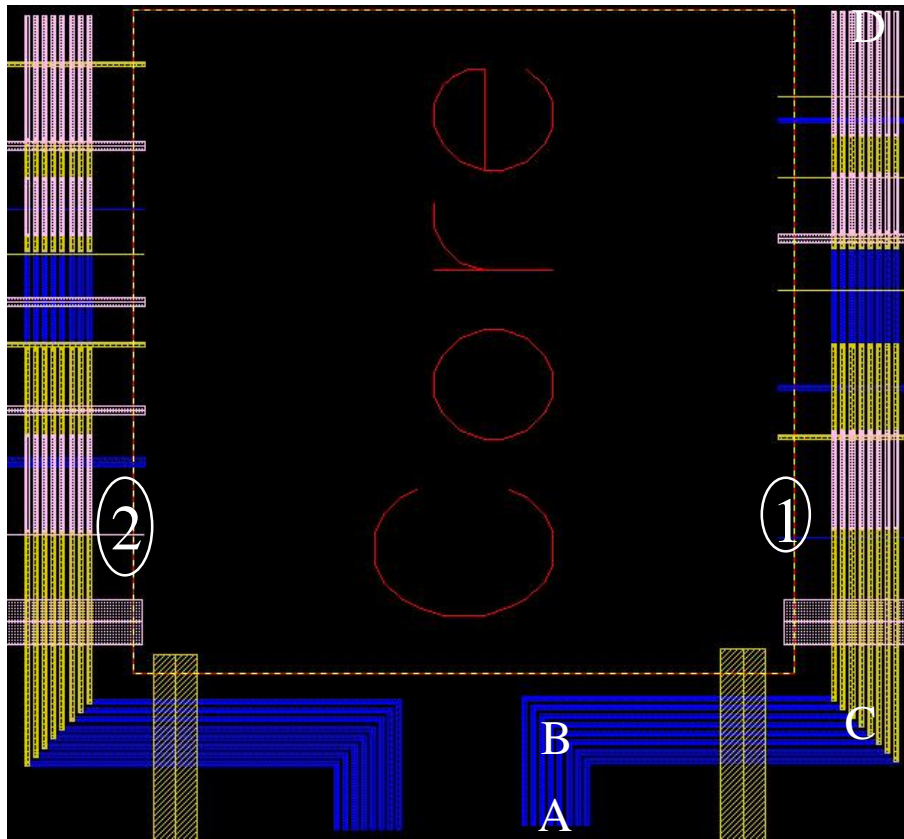


Fig.4 Connections 1 and 2 are matched (identical) bus connections. They are created at the same time as the user sequentially clicks A, B, C and D.

BENEFITS

- Substantially accelerating full custom layout
- Improving layout quality
- Relieving layout designers
- Reducing time-to-market
- Saving cost
- Easy-to-use menu driven setup and command form.

SkillCad® Setup Form
Close
Help

Template File:
...
Load
Check
Save
CheckSave

Steps:
Tech Layers
Equivalent Layers
Rules
Keepouts
Cost
Slot
Compile

TechLib
Routing Layers
Special Metals
Label Layers
Base Layers

Specify Metal/Via layers, the thickness and the dielectric constant of the oxide at each level .

	Number of Routing Layers:	Thickness(um)	Dielectric Const
metal6	METAL6 drawing	0.76	3.6
via5	VIA56 drawing	0.6	3.9
metal5	METAL5 drawing	0.6	3.6
via4	VIA45 drawing	0.6	3.9
metal4	METAL4 drawing	0.6	3.6
via3	VIA34 drawing	0.6	3.9
metal3	METAL3 drawing	0.6	3.6
via2	VIA23 drawing	0.6	3.9
metal2	METAL2 drawing	0.6	3.6
via1	VIA12 drawing	0.6	3.9
metal1	METAL1 drawing	0.5	3.6
metal1 to Substrate Distance		1.4	4.1
Contact	CONT drawing		

FIG. 5. Easy-to-use Menu-Driven Setup interface

SkillCad® Setup Form
Close
Help

Template File:
...
Load
Check
Save
CheckSave

Steps:
Tech Layers
Equivalent Layers
Rules
Keepouts
Cost
Slot
Compile

General
---METALs---
METAL1 drawing
METAL2 drawing
METAL3 drawing
METAL4 drawing
METAL5 drawing
METAL6 drawing
CTM5 drawing
---Cont/Vias---
CONT drawing
VIA12 drawing
VIA23 drawing
VIA34 drawing
VIA45 drawing
VIA56 drawing
---Base layers---
ptap
ntap
ntap_nw
pdiff
ndiff
npoly
ppoly

Minimum Width(um): 0.24
Minimum Area(um^2): 0.2
Current Density(mA/um): 1
Resistance(ohm/sq): 0.08

Copy Rules From:
METAL1 drawing
Copy

"METAL1 drawing" Spacing Rules:

When Width >= 0.24 space: 0.28
Add
Del
0 0.24
10 0.28

"METAL1 drawing" Enclosing "CONT drawing" Rules:

When Width >= 0.24 Side Enc: 0.24 End Enc: 0.24
Add
Del
0 0.005 0.06
10 0.06 0.06

"METAL1 drawing" Enclosing "VIA12 drawing" Rules:

When Width >= 0.24 Side Enc: 0.24 End Enc: 0.24
Add
Del
0 0.005 0.08
10 0.1 0.1

FIG. 6. Easy-to-use Menu-Driven Setup for deep-sub-micro design rules.

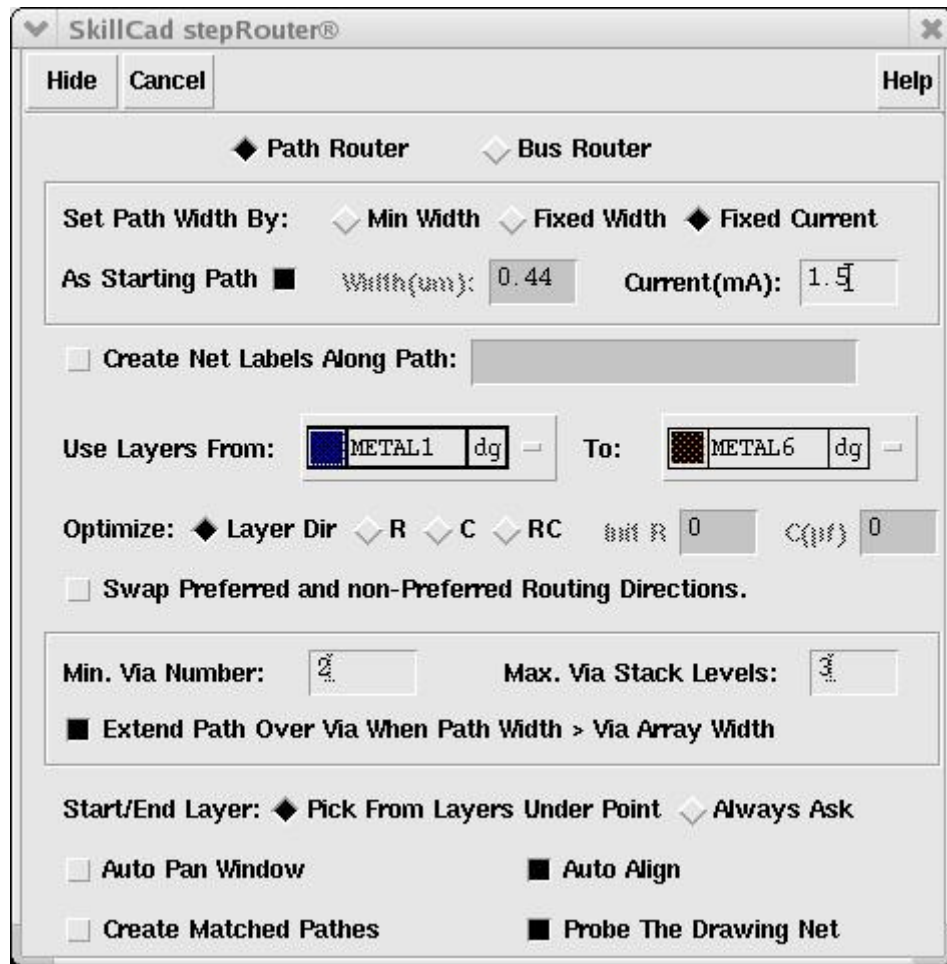


FIG. 7 The user can easily select a routing function, set constraints and pick a routing optimization method in one command form.

FEATURES

- Optimized by construction (layer directions, R, C or RC)
- Path, bus, matched path, matched bus routing
- Plug-and-play, short learning curve.

SPECIFICATIONS

- Unlimited design hierarchy
- Unlimited number of routing metal levels
- Specifiable redundant vias
- Specifiable preferred via stack levels
- Specifiable layers to be used for routing
- Auto width matching & path-center align
- Unlimited undo on routing
- Configurable user preference
- Deep sub-micron design rule support

INPUTS

- Layout database (CDBA or OA)
- Design rules and constraints
- Routing coordinates

OUTPUTS

- An optimized connection along the routing Coordinates in compliance with the Design Rules and Constraints

PLATFORM/OS

- Sun/Solaris
- HP-UX
- IBM AIX
- Linux

SKILLCAD SERVICES AND SUPPORT

- On-site or online training
- On-site or email/phone support
- Improvement or customization based on valuable ideas or feedbacks
- Maintenance on compatibility with new Cadence version releases.