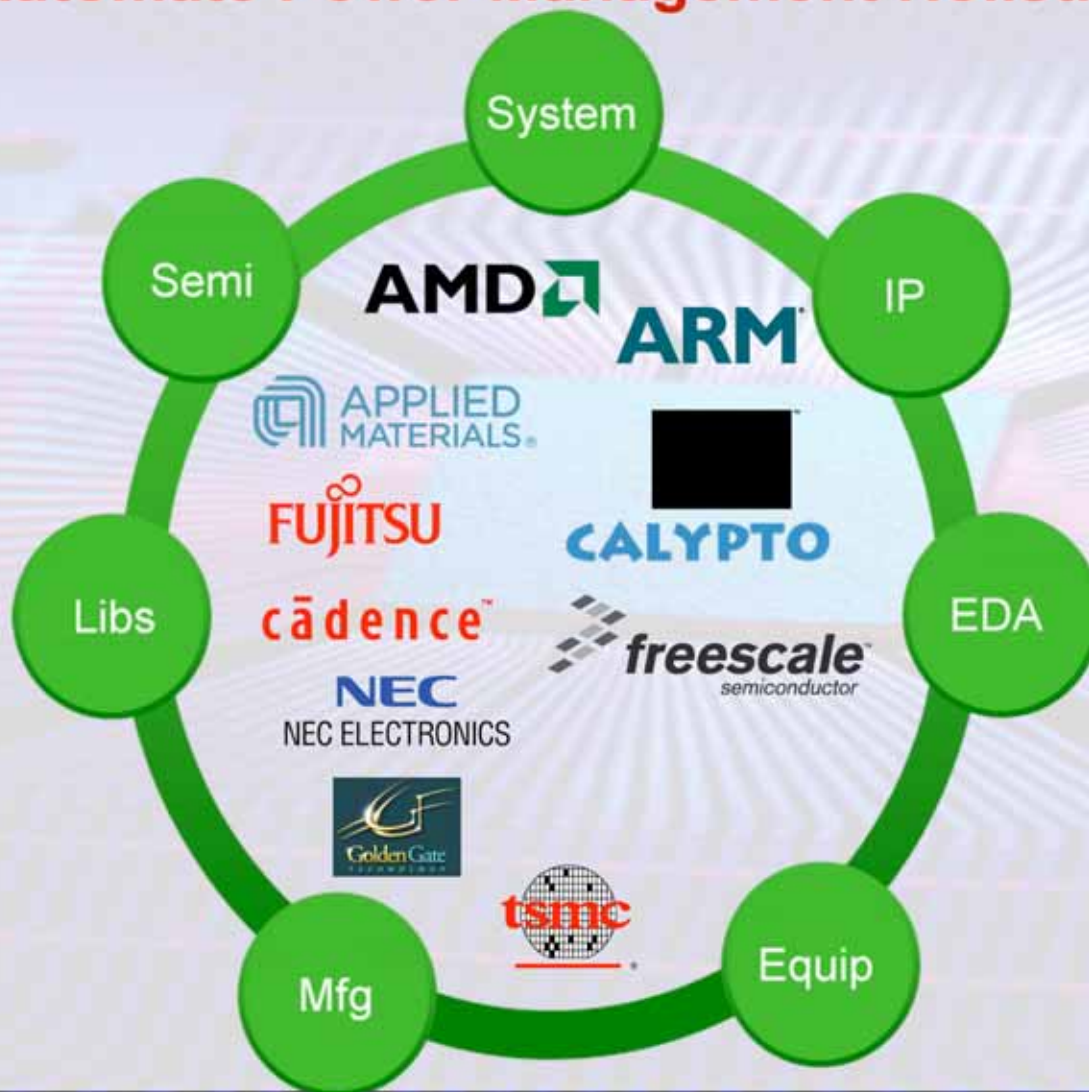


Common Power Format (CPF) Single File Format Capturing Power Intent



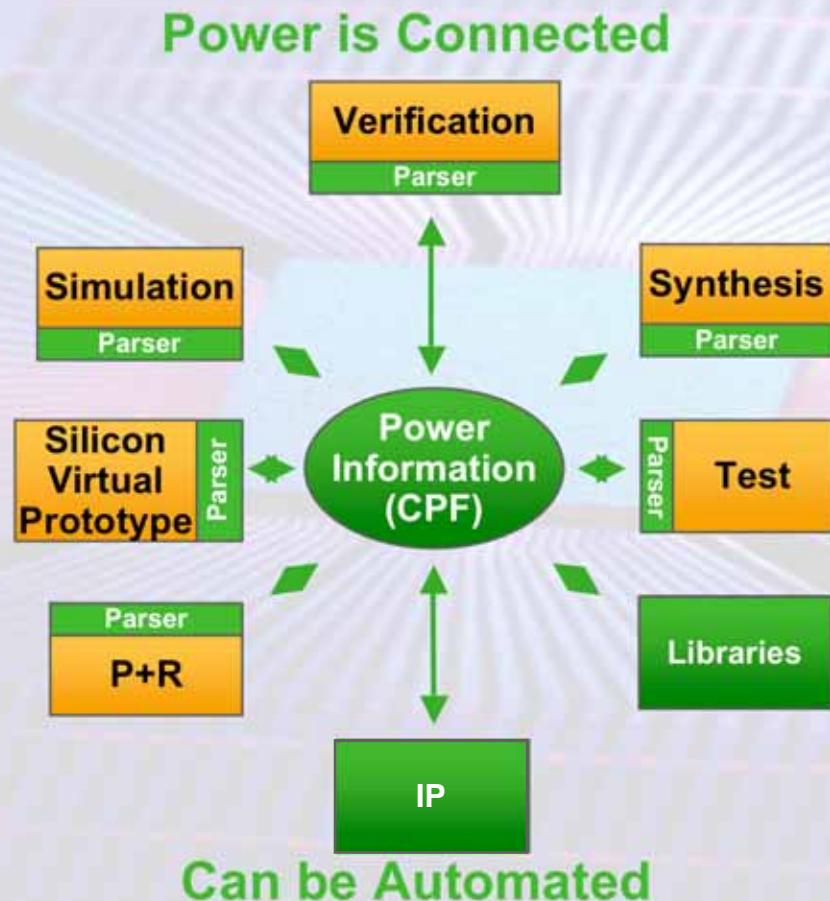
Power Forward Initiative launched May 2006 To Automate Power Management Holistically





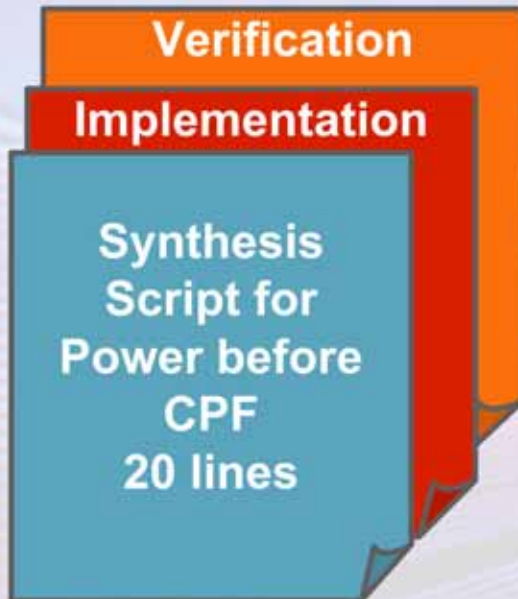
PFI Drives Common Power Format (CPF)

Single file format to automate low power holistically



CPF makes advanced low power design easier

Supports any language, tool choice and IP reuse



CPF Low Power intent
(same file for synthesis, layout, analysis, etc)

Instantiated across multiple tools

```
#!/bin/sh
# CPF script for synthesis, layout, analysis, etc

# Define clocks
define_clock -name phy_tclk_2 -period {expr 2 * $period} | phy_tclk_2
define_clock -name phy_rclk_2 -period {expr 2 * $period} | phy_rclk_2

# External delays
external_delay -clock clk -input 0 (rat_r* arbmasterin* ahsblavein* dna_force_ch_prio* dna_req_t*)
external_delay -clock clk -output 0 (ac_ni_innd_1* ac_ni_innd_2*)
external_delay -clock clk -output 0 (ac_ni_innd_1* ac_ni_innd_1* ac_ni_innd_1* ac_ni_innd_1* ac_ni_innd_2* ac_ni_innd_2* ac_ni_innd_2* ac_ni_innd_2*)
external_delay -clock phy_tclk_1 -input 0 (phy_coll_1* phy_crs_1*)
external_delay -clock phy_tclk_1 -output 0 (ac_txd_1* ac_txd_1*)
external_delay -clock phy_rclk_1 -input 0 (phy_rxd_1* phy_rxd_1* phy_rvrr_1*)
external_delay -clock phy_tclk_2 -input 0 (phy_coll_2* phy_crs_2*)
external_delay -clock phy_tclk_2 -output 0 (ac_txd_2* ac_txd_2*)
external_delay -clock phy_rclk_2 -input 0 (phy_rxd_2* phy_rxd_2* phy_rvrr_2*)

# Read power description (Common Power Format) file...
*** This is the same file used for simulation, layout, test, etc.
if [ $skip_cpf == 0 ] {
  read_cpf ./scripts/cdt.cpf
}

# Set up output directories...
if ([ !file exists $LOG_PATH ]) {
  avc mkdir $LOG_PATH
  puts "Creating directory $LOG_PATH"
}

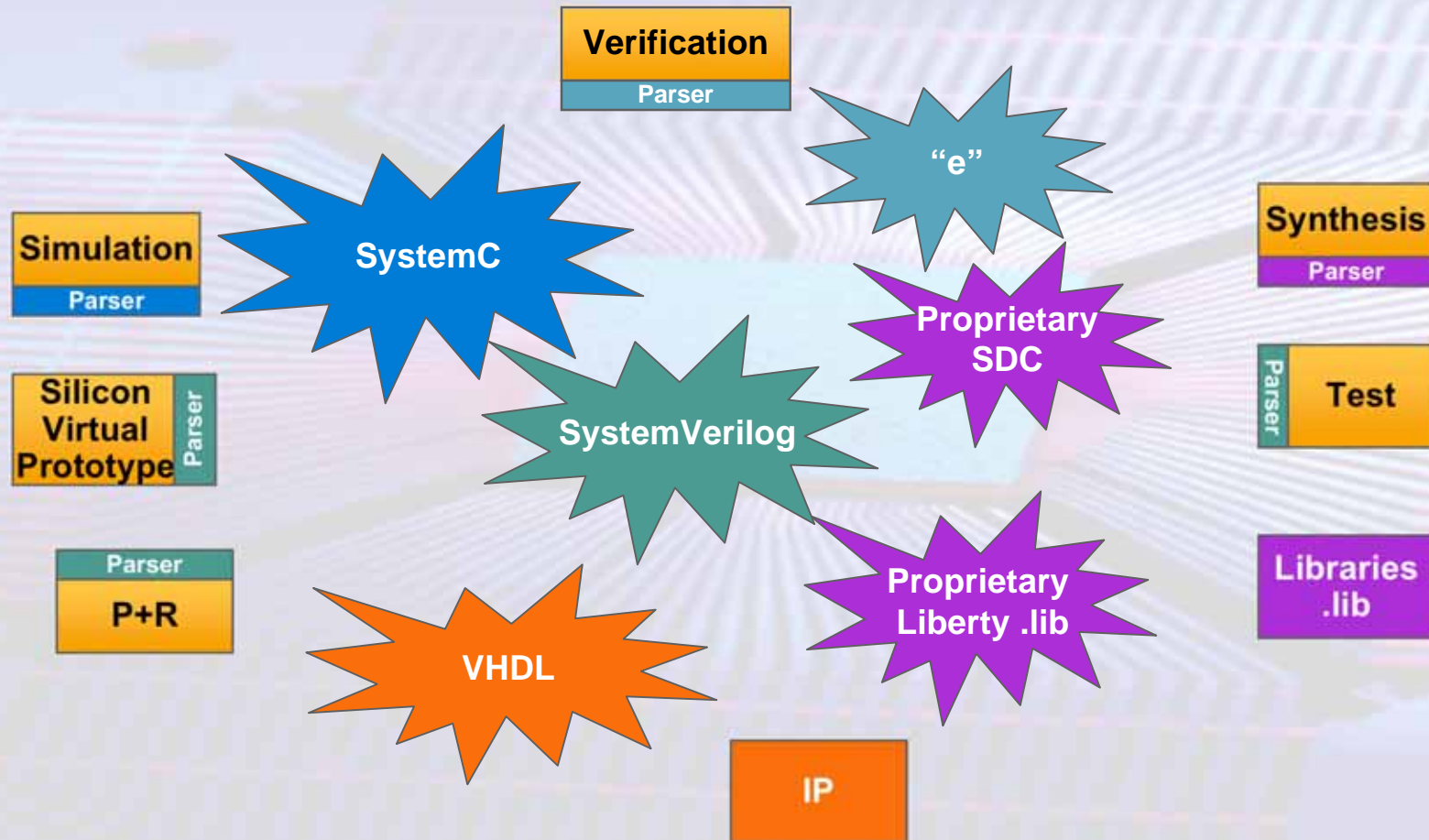
if ([ !file exists $OUTPUTS_PATH ]) {
  avc mkdir $OUTPUTS_PATH
  puts "Creating directory $OUTPUTS_PATH"
}
```

Same CPF file can drive the entire flow



Alternatives to single file format?

Update multiple files, languages, standards and proprietary formats





Power Forward Initiative

Begins IEEE Standardization Process

- Power Forward Initiative submitted project authorization request (PAR) to form the IEEE CPF Working Group on Sept. 1
 - Users to Chair
 - Accelerated by more than a year
- 14 companies already contributing to “preliminary” CPF 1.0
 - Broad, inclusive user coalition (PFI + IEEE WG)
 - Test chips, software development and customer projects underway
- Other EDA companies join PFI:
Azuro, Calypto, Globetech, Golden Gate, Sequence



Why IEEE?



- IEEE Open Standards Criteria
 - Requires all copyrights transferred to IEEE
 - Any IEEE member can join the Working Group
 - Corporate rules of one company, one vote

CPF will comply to all IEEE rules



Freescale's Milind Padhye to chair IEEE CPF working group

“Using a single file to capture all low power intent enables consistency across all phases of design, verification and implementation,” said Milind Padhye at Freescale. “We have been actively working with Cadence on the Common Power Format for more than 6 months and I am pleased to continue that work through leadership of the IEEE working group.”



CPF Enhances IP for low power productivity

“I see significant promise in the Common Power Format as a way for IP companies to unambiguously deliver power intent specifications along with IP that customers integrate within their designs. Metadata descriptions provide for significant aspect-oriented advantages. The promise is made much more powerful when the industry comes together on the format, structure, and content of this delivery.”

**Gary Delp, IEEE Working Group vice chair and
LSI Logic Distinguished Engineer, Platform Evangelist**



CPF standardization timeline



May 22

- PFI Advisory group forms

Sept 1

- PFI Opens to EDA advisors
- IEEE CPF WG PAR submitted

Sept 28

- CPF informational meeting held

Nov 2

- CPF WG informational meeting

Dec 6

- NesCom* meeting to approve IEEE CPF WG PAR
- Upon approval, CPF copyrights transfer to IEEE

- IEEE CPF WG works towards ballot in early 2007

*NesCom – IEEE New Standards Committee



What customers have asked for... **Power Forward is delivering**

- Single file format
- Quick deployment
- Open standardization
- Inclusive industry involvement
- Broad user coalition