



# Low Power Design Through Cooperation

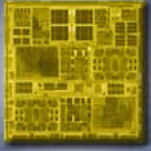
*Oscar M. Siguenza, Director, Platform Infrastructure*



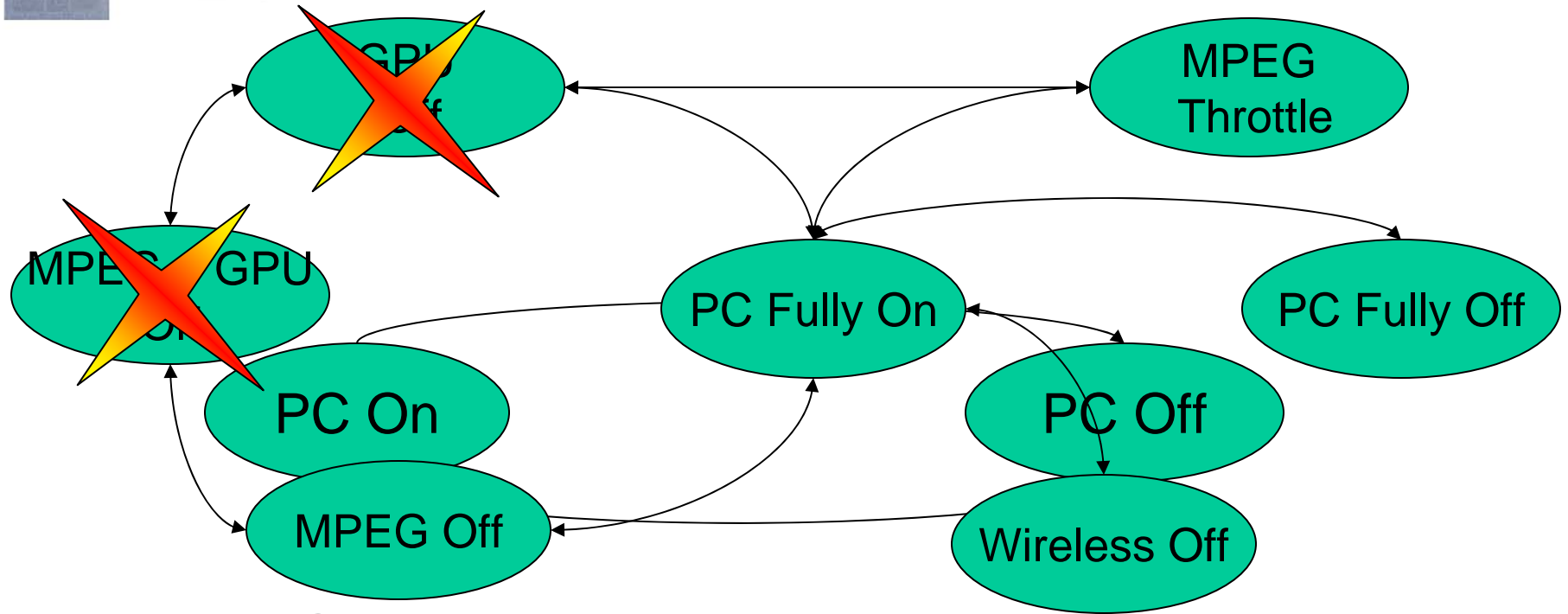


# Low Power Design Challenges

- What happened to my golden source?
- What happened to my power nets?
- What happened to my time-to-market (TTM)?
- What happened to my job!!!!



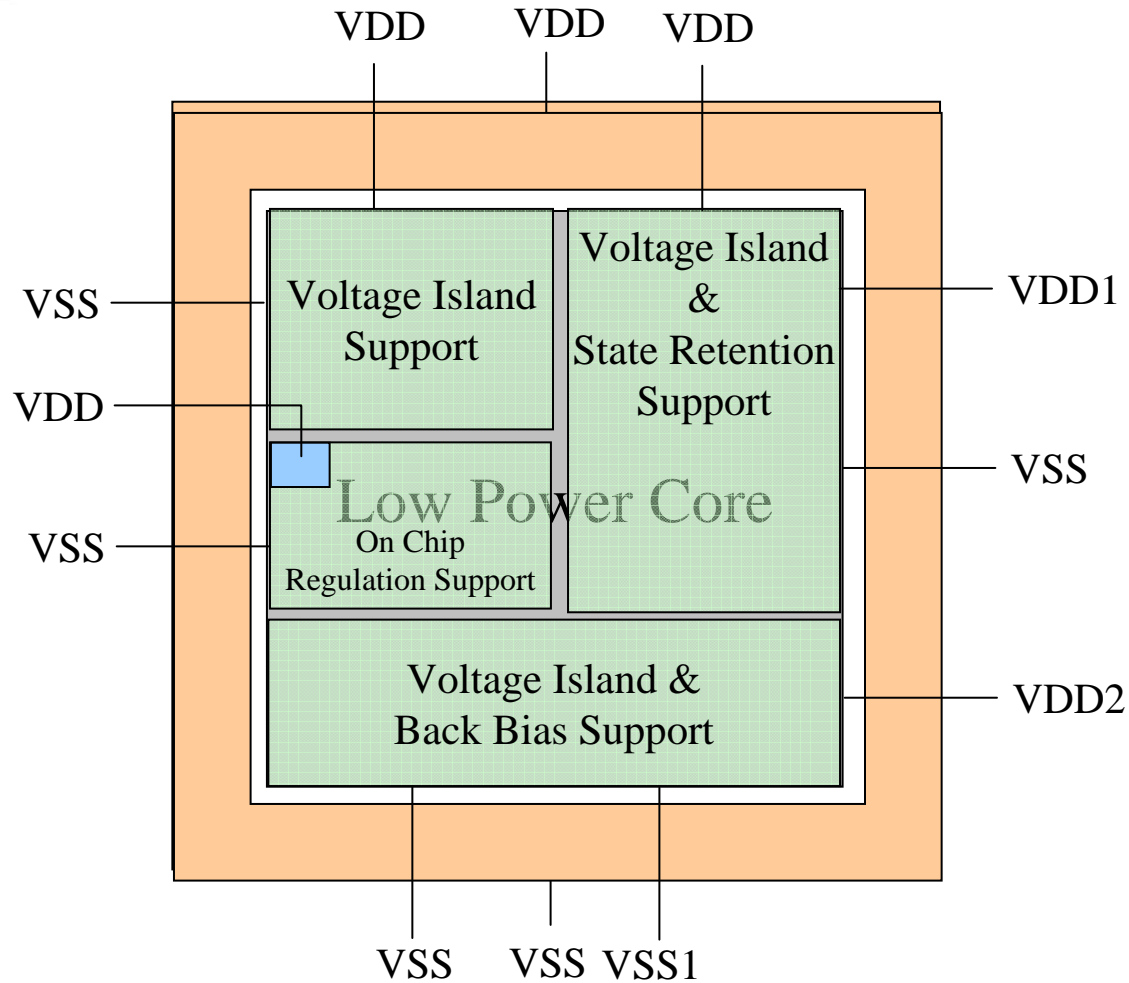
# What Happened To My Golden Source?



VDD Global  
GPU = VDD1, VSS  
MPEG = VDD2, VSS, VBN  
Wireless MAC/PHY = VDD3,  
VSS  
Others = VDD, VSS

Wait!!!  
VDD2 Derived from VDD1 !!!!  
Two States Equivalent!!!

# What Happened To My Power Nets?





## What Happened To My TTM?

- If there is no way to express your connectivity, how do you ensure your design intention is met?
- How do you make sure that your state transitions from one power mode to another are valid?
- How do you ensure that your hardware/software co-design deals with your different power modes?
- How do you make sure that you don't have latent shorts in your final design?
- ***How do you meet your time-to-market window?!***



# What Happened To My Job!!!





# Cooperation Is Key

- A low power design flow will become the prevalent design style in the industry
- Ensuring open, unencumbered standards are available is key to wide adoption
- Without industry wide cooperation...
  - Solutions will take much longer to implement
  - Resources will be wasted due to incompatible formats and semantics
  - Industry adoption of new technology nodes will slow down



# Virage Logic's Interest in Low Power Standardization Effort

- Low Power Standards are the key for new process adoption
  - Shorter time-to-market for
    - New projects
    - Prototypes
    - Volume production
- Standardization increases IP development productivity
  - Eliminates duplicated development effort on non-standard models
    - Up to 6 months of development effort per model
    - Up to 3 months of development on QA suite



## How Is Virage Logic Helping?

- Virage Logic is active in several standard bodies
  - Silicon Integration Initiative (Si2)
    - Open Modeling Coalition
    - Liberty Technical Advisory Board
  - Accellera Unified Power Format
- Virage Logic works with all of the major EDA vendors
  - Ensures compatibility for Ultra-Low-Power architecture features
- Our only wish is that some of the new efforts could have started sooner