



“...but **MY** chip is different...”

IP Personalization, and how it is applied to Memory Controller and Hard PHY IP

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Dealing with IP Personalization



- Soft IP
 - Determine the range of personalization
 - Build a compiler for the RTL *and all scripts*
- Hard IP
 - Use best-in-class sub-blocks
 - Make sure sub-blocks are Portable
- All IP: Make sure the documentation matches the personalization

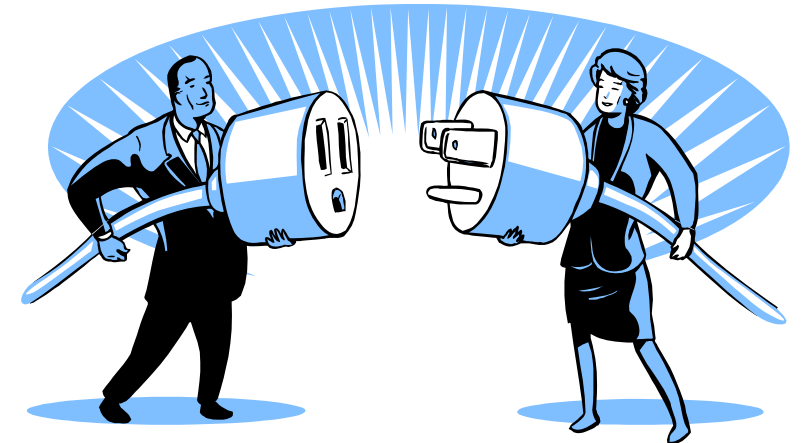


...but the manual said “in order to lower the convertible top...”

“...but MY Bus Type is Different”



- Support all the popular on-chip busses
 - AHB, AXI, BVCI, CoreConnect (PLB), Denali, OCP
 - Use the simplest possible bus for less popular busses
- Use standard interfaces
 - PCIe=PIPE, Ethernet=xMII
 - Or develop one where none existed: DFI (DDR PHY Interface)
- Be ready for unusual customizations



“...but MY feature list is different”

Denali

- Frequency, Latency, Bandwidth, Area, Power, Features
 - You can't have it all at once
 - Understand how your IP will be used
 - Make sensible options
 - Allow users to make the tradeoffs



“...but MY silicon is different...”



- Foundry, Geometry, Vt, PVT, Library, # Tracks, Metal Layers, Oxide Thickness, Wirebond/FlipChip, In-line or Staggered Pads...
 - Customers really want GDSII of their macro blocks
- What's a Hard IP Vendor to do?
 - Choose best-in-class sub-blocks
 - Develop a methodology to assemble them rapidly



“... can Denali help me?”



- DDR solutions chosen for 240 chip designs, 93 chips in silicon
- Memory Controller IP
 - Customizable for Memory type (DDR1/2/3, LPDDR, SDR, LP-SDR), bus type, number of bus ports, widths, queue depths, speed, power, latency, bandwidth, and more...
- DDR Hard PHY IP
 - Best-in-class DLLs proven in many processes, choice of IOs, flexible placement, flexible IO ring, timing closed GDSII delivered to you for **YOUR** chip!!



Come see us at booth #6060

Ask about DDR Memory solutions for YOUR chip

See the 90nm 400MHz/DDR2-800 Hard PHY in action!

Thank you!



- Please stay and talk with Marc
- Explore Denali IP at ChipEstimate.com
- Use Denali IP to Plan a Chip at DAC (get a DAC Trip Report!)

