Design Reuse

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Design Reuse

- Advantages of reuse
  - Design once – use many times
    - Saves resources
      - Design resources
      - Integration resources
      - SW development resources (assuming interface to SW)
    - Saves time
    - Reduces errors
      - Once proven, can be reused with high confidence

Design Reuse

- Disadvantages of reuse
  - May not be optimized
    - Use extra space (cost) for un-needed features
    - Use extra power for unused performance
  - Errors can propagate
    - A missed bug or failure mechanism can be spread to many designs

Design Reuse

- Types of reuse
  - Direct
    - Reuse the block with no modifications
  - Indirect
    - Move an existing verified design to a new technology
    - Functionality is guaranteed, performance is not
  - Modified
    - Add to or remove sections from an existing design
    - Offers some confidence but errors can be generated
  - Coded
    - Applicable to HDL and SW designs
    - Generics
    - #ifdef
    - Offers some confidence but errors can be generated

Design Reuse

- Impact of reuse
  - Saves time, $, opportunity costs, risk

  - So important, large companies have teams to develop reusable Intellectual Property (IP)

  - So important, large companies have organizations to force teams to develop their IP to be reusable