Chapter 6 - Opening

Abstract Communication Channels

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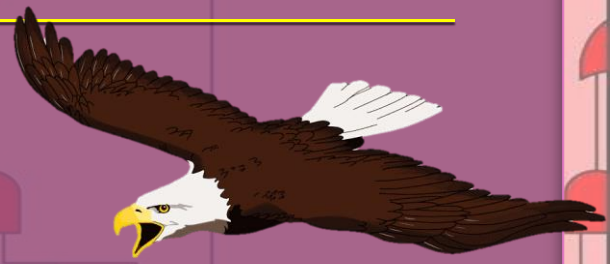
Abstract Communication Channels

This chapter introduces the concepts of channel communication that embeds in itself a higher abstraction of communication that hides many RT level details, such as clock level timing, individual word level transfer, and handshaking.
We start with RTL handshaking, followed by abstract handshaking to take off from detailed RTL handshaking. After that, we talk about channel concept that is used to model abstract communication. Then we will present various types of channels including primitive and hierarchical channels, followed by different examples.

Abstract Communication Channels

- RTL Handshaking
- Abstract Handshaking
- Channels
  - Basics of Channels
  - Primitive Channels
  - Hierarchical Channels
- Summary



A Bird's-Eye View of Outline

Abstract Communication Channels

- RTL Handshaking
  - Device to Device
  - Arbitration
  - Memory handshaking
  - Burst transfer
  - Serial-to-Parallel
  - SystemC implementation of S2P
- Abstract Handshaking
  - Serial to Parallel Stack Writer
- Channels
  - Basics of Channels
    - sc_signal
    - sc_mutex
  - Primitive Channels
    - Simple put-get buffer channel
    - FIFO channel
    - Stack non-blocking channel
    - Multi-way shared bus
    - Priority shared bus
    - Memory access, using sc_port and sc_export
    - Burst interface handler
  - Hierarchical Channels
    - Burst buffer with RTL interface
- Summary

Topic 6

Topic 7

Abstract Communication Channels

- In this chapter, we will be addressing the following outcomes:
  - Understanding channels, starting with RT level sc_signal
  - Learning abstract channels
  - Using and creating primitive and hierarchical channels
- Relation to the previous chapter:
  - The previous chapter explained SystemC linguistics
- Relation to the next chapter:
  - The next chapter will discuss SystemC Transaction Level Modeling (TLM)
- Is an assignment due for this chapter? Which one?
  - Yes, Homework 5 - SystemC channels