

George Porter  
Home work 8  
CS 302

For my course, I chose the book:

High-Speed Networking: A systematic Approach to High-Bandwidth Low-Latency Communication

James Sterbenz and Joseph Touch  
John Wiley & Sons, New York, NY  
2001

I chose this book because of the set of topics it covers;

- Network subsystems
- Protocols that glue these together
- The network as a *system of systems*
- End-to-End delivery of high-bandwidth, low-latency data
- Applications that make use of high-speed networks

(paraphrased from the introduction)

The book is organized around fundamental design principles, rather than pieces of technology. Each section includes boxes that highlight a principle, and at the end of each chapter there is an itemized list of the principles from that chapter. There are examples where necessary, and separate, shaded boxes appear with real life technology information when needed.

1a)

Completeness:

The book covers a large amount of material related to the design of endhosts as well as network subsystems. It also covers design decisions and motivates their use in high speed networking. The chapters most relevant to me would be

- 2- fundamental design principles (covers tradeoffs)
- 3- scale and resource tradeoffs
- 6- end systems
- 7- end-to-end protocols
- 8- networked applications

What is missing is discussions of middleware as a way of decoupling applications, which I would include with tutorials and a reader

1b)

Consistency:

The approach that the book makes is to outline various tradeoffs and design decisions that one should make when building any distributed system. In this way, there is a pretty high

consistency with my approach. Rather than focusing on any particular technology or set of goals, I prefer to focus on the decisions one needs to make. This book is good at highlighting (into separate, numbered boxes) all the decisions that go into protocol and endhost design.

1c)

In terms of innovations, the largest one is its use of numbered principles (with a complete list of those at the end of each chapter and at the end of the book). It might be useful to have students organize their own work and projects by explicitly mentioning how their decisions relate to those principles. Otherwise, the book is pretty straightforward and doesn't include any CD or web links or anything like that.

1d)

There are not a lot of examples, but the examples included are very easy to find and understand. Their explanation is pretty clear, and they do a good job at outlining what is important at the high level while still going down to the low level of their topic.

1e)

Unfortunately, there are no exercises in this book.

1f)

The book doesn't include software or supplementary material, however there is a wealth of resources I can make use of on the internet (various simulators, software toolkits, etc)

1g)

The book is ok as a reference, but because it is organized around design decisions and principles, it wouldn't be my first "go-to" book. Part of that is because it isn't organized around **technology items** like most networking books are (i.e., chapter 1: switches, chapter 2: multicast). Its organized around all the decisions that one must make at each layer and at each role (endhost vs server, etc). I think that makes it a good textbook, but not such a good reference

1h)

Understanding these issues and tradeoffs will be extremely useful to anyone who wants to design networked systems. Not so sure about subsequent courses... Perhaps for future research.

2) The list as presented is pretty good. Completeness is good because students come to rely on their textbooks as the authoritative source of information, and so having a single such source is better than a patchwork of materials. Consistency is extremely important (perhaps more important) since if lecture doesn't match up to the book, there will be big problems. An additional item that is not on the list is cost. I would put cost at the very bottom of the list, but it should be there somewhere. This issue mostly comes up when an instructor assigns several expensive textbooks in one semester.