Video Intro

Phil:

In this unit, we're going to dig into the transport layer. Recall that the transport layer provides the service for data communication between applications. This data communication can, in the case of UDP be simple, unreliable datagrams, or in the case of TCP a reliable, bidirectional byte stream. You'll learn about how these transport layers work, their abstractions, and their algorithms. You'll also learn a new network principle, called the "end-to-end argument" or the "end-to-end principle," which governs how and where you can implement a feature correctly.

Nick:

In this unit, we'll ask and answer questions such as "how exactly does TCP set up a connection?" "What do TCP segments look like?" "How can two computers reliably transfer data with high performance?" To transfer data reliably, TCP needs to know when data has been corrupted – you'll learn how to detect errors in data using three algorithms: checksums, cyclic redundancy checks, and message authentication codes. You'll also learn about a basic tools and approach to network protocol design, finite state machines, and walk through all of the details of the state machine TCP uses.

Phil:

At the end of this unit, you'll fully understand how TCP transfers data reliably and sets up connections to do so. We won't yet cover how TCP can be designed to run really fast – that's not until Unit 4, but we will cover how it can run reasonably well and, most importantly, correctly. You'll also know all of the details of UDP as well as ICMP, the internet control message protocol, used to carry control information like error notifications in the Internet. 1