- **Chapter #**
    - CHAPTER 2

- **Intro of TCP/IP**
    - Building Blocks of TCP

    - At the heart of the Internet are two protocols, IP and TCP. The IP, or Internet Protocol, is what provides the host-to-host routing and addressing, and TCP, or Transmission Control Protocol, is what provides the abstraction of a reliable network running over an unreliable channel.

    - TCP/IP is also commonly referred to as the Internet Protocol Suite and was first proposed by Vint Cerf and Bob Kahn in their 1974 paper titled "A Protocol for Packet Network Intercommunication."

- **TCP intro continued; earliest versions**
    - The original proposal (RFC 675) was revised several times, and in 1981 the v4 specification of TCP/IP was published not as one, but as two separate RFCs:

    - • RFC 791—Internet Protocol

    - • RFC 793—Transmission Control Protocol

- **Above continued**
    - Since then, there have been a number of enhancements proposed and made to TCP, but the core operation has not changed significantly.

    - TCP quickly replaced previous protocols and is now the protocol of choice for many of the most popular applications: World Wide Web, email, file transfers, and many others.

- **TCP as abstraction; designed for accurate rather than timely deliver.**
    - TCP provides an effective abstraction of a reliable network running over an unreliable channel, hiding most of the complexity of network communication from our applications: retransmission of lost data, in-order delivery, congestion control and avoidance, data integrity, and more.
    - When you work with a TCP stream, you are guaranteed that all bytes sent will be identical with bytes received and that they will arrive in the same order to the client.
    - As such, TCP is optimized for accurate delivery, rather than a timely one.
    - This, as it turns out, also creates some challenges when it comes to optimizing for web performance in the browser.
- **PARAGRAPH**
    - The HTTP standard does not specify TCP as the only transport protocol.
    - If we wanted, we could deliver HTTP via a datagram socket (User Datagram Protocol or UDP), or any other transport protocol of our choice, but in practice all HTTP traffic on the
- **PARAGRAPH**
    - Internet today is delivered via TCP due to the many great features it provides out of the box.
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    - Because of this, understanding some of the core mechanisms of TCP is essential knowledge for building an optimized web experience.
    - Chances are you won't be working with TCP sockets directly in your application, but the design choices you make at the application layer will dictate the