# Section 1.4 Computer Networks Fundamentals

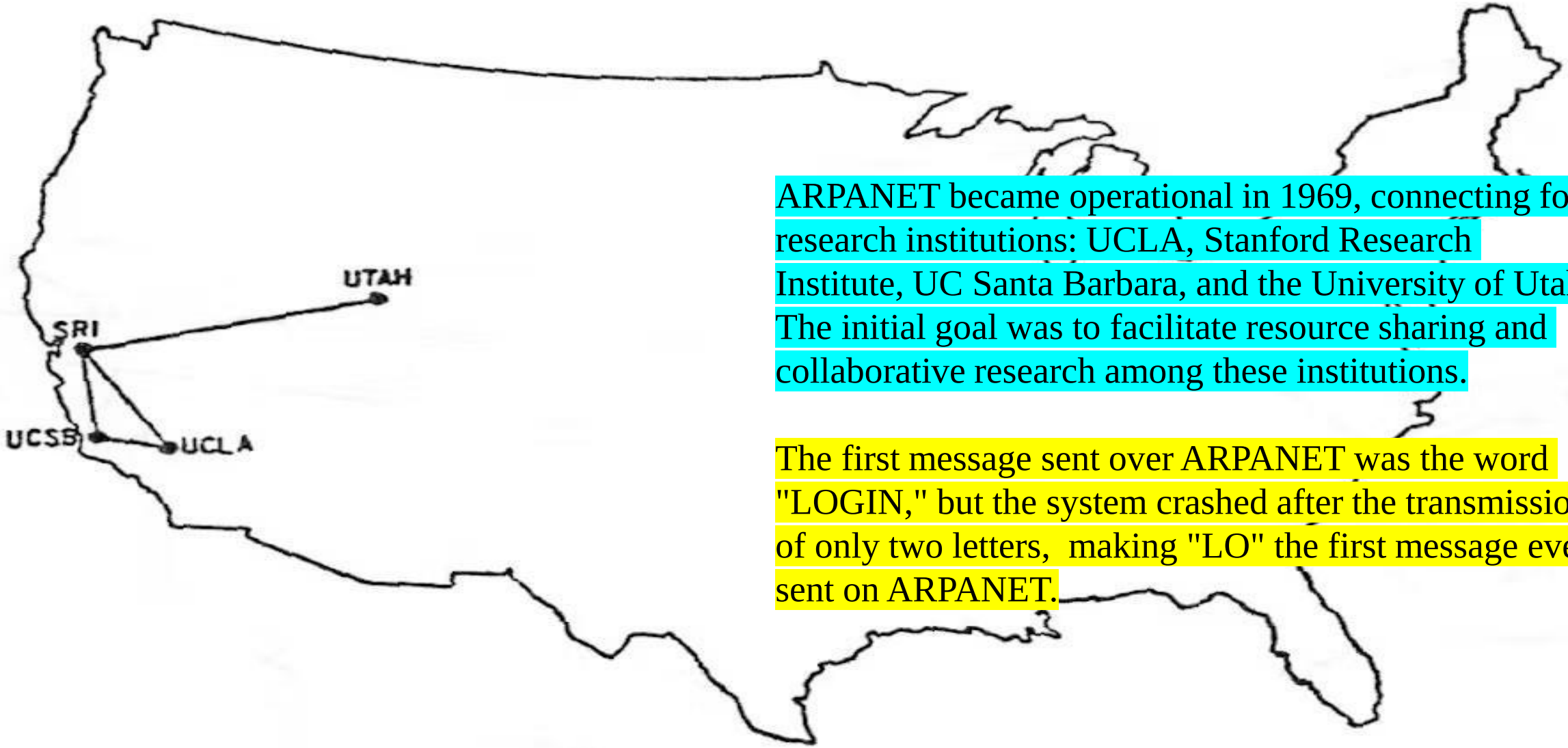
# Networking History

## Cracking OSCP: Your Roadmap to Ethical Hacking Success

- YouTube: HackProKP – Kailash Parshad
- LinkedIn: Kailash Parshad
- Github: https://github.com/at0m-b0mb/Cracking-OSCP-Your-Roadmap-to-Ethical-Hacking-Success
- Complete Playlist: https://www.youtube.com/watch?v=MvkNbn8i2so&list=PLyrv3TPh3ejYNZipa0OIUvkdjHeUTRJ3J&index=1&t=0s

# Early Concepts (1960s):

- The concept of computer networks began in the 1960s with the development of time-sharing systems. Researchers explored the idea of connecting computers to share resources and information.
- One of the earliest examples was the development of **ARPANET (Advanced Research Projects Agency Network)** by the U.S. Department of Defense's ARPA (now DARPA). ARPANET, which became operational in **1969**, is considered the precursor to the modern internet.




The ARPANET in December 1969

ARPANET became operational in 1969, connecting four research institutions: UCLA, Stanford Research Institute, UC Santa Barbara, and the University of Utah. The initial goal was to facilitate resource sharing and collaborative research among these institutions.

The first message sent over ARPANET was the word "LOGIN," but the system crashed after the transmission of only two letters, making "LO" the first message ever sent on ARPANET.

# ARPANET (1969):

- ARPANET was the first network to use the **packet-switching** technique, which breaks data into packets for transmission and reassembles them at the destination. This was a fundamental development for modern networking.
- Email was one of the first applications developed for ARPANET.

# TCP/IP Protocol Suite (1970s):

- In the 1970s, the development of the TCP/IP (Transmission Control Protocol/Internet Protocol) suite became a key milestone. This set of protocols standardized communication across diverse networks, forming the basis for the modern internet.
- **TCP/IP** was adopted as the standard for ARPANET in **1983**.

# Ethernet (1973):

- Ethernet, developed by Robert Metcalfe and his team at Xerox PARC in 1973, was a significant breakthrough in local area networking (LAN). It became a widely adopted standard for connecting computers within a limited area.

# Commercialization and Expansion (1980s):

- The 1980s saw the commercialization of networking technologies. Companies started developing and selling networking products for businesses.
- Local Area Networks (LANs) became more common, connecting computers within organizations.

# World Wide Web (1990s):

- The invention of the World Wide Web by Tim Berners-Lee in 1989 and its subsequent development in the early 1990s revolutionized how information is accessed and shared over the Internet.
- The web browsers, such as Mosaic and later Netscape, made the internet accessible to a broader audience.

# Broadband and High-Speed Internet (2000s):

- The 2000s witnessed the widespread adoption of broadband internet, enabling faster and more reliable connections for homes and businesses.
- Technologies like DSL, cable, and fiber-optic connections became more prevalent.

# Mobile Networking, Cloud Computing (2010s):

- The proliferation of smartphones and mobile devices led to the growth of mobile networking technologies, including 3G, 4G, and the ongoing development of 5G.
- Cloud computing emerged as a dominant paradigm, enabling the storage and processing of data on remote servers.

# Internet of Things (IoT) and Future Trends (2020s):

- The current era is characterized by the rise of the Internet of Things (IoT), where everyday devices are connected to the Internet to enhance functionality and gather data.
- Ongoing developments include the expansion of 5G networks, the exploration of edge computing, and the continuous evolution of networking technologies.

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