

The Design Philosophy of the DARPA Internet Protocols

- **Summary:**

The paper describes the rationale behind TCP/IP protocols' design (e.g., datagram motivation) illustrating how priorities shaped its features in a retrospective analysis of the DARPA-NET.

- **Important points:**

1. The internet protocols were designed for military purposes and only later were adopted by commercial networks. As such, the design goals of the Internet reflect the military requirements regarding the design and interoperability of networks.

Justification: This is important because the Internet has changed significantly since these principles were drafted. Nowadays, most of the organizations on the Internet are private entities with possibly different requirements. In addition, the military assumed a closed network with minimal considerations for "bad" guys, which is not the norm in today's Internet.

2. The Internet is not perfect! From the seven goals laid out, Clark acknowledges that more attention was paid to the primary goals, and, thus, the remaining goals were not as sufficiently addressed. For example, the Internet has insufficient tools for distributed management, especially regarding routing, and is not as cost-effective as it could be.

Justification: I found this important because it shows that there is room for improvement and evolution of the Internet architecture as different needs and actors arise. In other words, although many principles still apply today, the Internet can always be improved, and new principles can be added today.

3. The paper draws a relationship between the goals of the internet protocol, the features needed to achieve those goals, and the extent to which the goals can be or were met using those features. Practical and design limitations sometimes limit the features while being developed (e.g., the introduction of two protocols at the transport layer).

Justification: This is an important point because the paper gives a nice understanding of how Internet protocols have evolved from its conception almost 40 years ago, which has been a key in the success of the Internet as it has adapted as technologies, participants, and regulations have also changed and evolved.

- **Comments/Questions:**

1. The Internet protocols were initially designed for military purposes. One of the major concerns of the military is limiting access to classified information. Why did not this feature/principle get included in the list of goals? What about other security goals?

Justification: This question is important because if the original design included security goals (such as access to classified information) there is a possibility that we could have an Internet today that could keep us free of hackers, malware, etc., or at least we could have had a secure-oriented design from the Internet's conception.

2. Internet architecture is built to cater to various components such as design, protocols, topologies, applications, and types of services. This paper focuses on the protocol aspect of the Internet architecture, which is the foundation of the various components listed above and the design of the Internet that is still used today.

Justification: This comment is important because, without solid protocol design, the architecture could not have integrated different networks (with different administrative policies) into a single internetwork that we know as the big Internet.

- **Citation:**

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<http://doi.acm.org/10.1145/52324.52336>

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