Reading Assignment 2

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Summary

The article describes why the Internet was designed the way it is and what the fundamental thoughts behind the design choices were. It also gives a brief history of who developed Internet and why.

The article begins with describing the fundamental goals of the DARPA Internet Architecture, and does so by describing how the new Internet were to be able to connect to already existing networks and other, not yet invented, networks in an efficient manner. The author also describes the fundamental structure of the internet as a packed switched communication facility in which a number of distinguishable networks are connected together using packet communication.

The author den goes into more detailed on how, in designing the Internet architecture, effectiveness was to be defined and presents a list of goals in priority order. The list is as follows:

1. Internet communication mus continue despite loss of networks or gateways.
2. The Internet must support multiple types of communications service.
3. The Internet architecture must accommodate a variety of networks.
4. The Internet architecture must permit distributed management of its resources.
5. The Internet architecture must be cost effective.
6. The Internet architecture must permit host attachment with a low lever of effort.
7. The resources used in the internet architecture must be accountable.

It is noted that it is important to understand that the architecture might have looked completely different if the order had been different.

First goal

The first goal was meet by using something called fate-sharing. This technique allows for great flexibility should an error in the network occur, because in the event of failure the connection will not be lost and it is instead up to the host application to determine if it is necessary to gather all information that was supposed to be sent or if it is of non-importance. This technique was also chosen because it was easier to engineer than the also potential implementation of replication.

Second goal

The second goal of being able to support multiple types of services and this goal was met by build two types of protocols namely TCP and IP. The TCP protocol was built as to ensures a reliable stream of data while IP is more of a building block to build more sophisticated applications on top of. The service that IP provide is that of datagrams and that was chosen because of its simple nature and supports serviceability. It is important to note that datagrams is the fundamental architectural feature of the Internet. They provied a service that eliminates the need for connection states and intermediate switching nodes. This also, as described above with IP and TCP, provides the ability to build different kind of services on top of.

Third goal

The Internet supports the goal of being able to serve different kinds of networks by assuming very little of the networks, the only assumptions made is that they support the transport of datagrams or packages.

Other goals

The rest of the goals listed were not as efficiently met as the other three goals. This is partly because had lower priority than the goals that came before them and there fore was not as completely engineered as other goals. At the same time some goals were not implemented sufficient because of trade-offs that had to be made to accommodate higher prioritized goals.

Implementation

The implementation of the Internet protocols have been found to be hard. This is due to the fact that different implementations of Internet can differ significantly and therefore one have to look at the actual engineering of the software within the particular host or gateway. This also meant that one of the major challenges of the architectural development was to be able to give guidance to the designer of a realization and how the outcome would be for a specific realization.

Conclusion

The Internet architecture have been really successful in its design as it is being used by a large amount of people today, both commercially and in military environments. How ever it lacks supports for some of the goals listed at the start of the project. This suggests that future development of the Internet will take these goals into more consideration when being designed.