计算机网络原理作业1

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选的论文: David D. Clark. "The Design Philosophy of the DARPA Internet Protocols", In: Proceedings of the ACM SIGCOMM' 88. Aug. 1988

本文的作者描述了早期Internet协议Suit-TCP / IP的设计动机，理念和体系结构，该协议最初是由DARPA在文章发表之日起将近15年之前提出的。 作者David Clark不仅讨论了早期Internet的初始设计目标，而且还讨论了这些目标如何改变以捕获Internet体系结构和功能的发展。 然后，他继续解释选择某些特定协议设计背后的原因。 本文分为两个主要思想：Internet的目标和体系结构

基本/主要目标

> 开发一种有效的技术来复用现有互连网络

还有一个替代目标

> 创建一个统一的系统，其中整合了各种不同的过渡媒体，多媒体网络

有不同的目标：我们是要一个支持多种应用程序的单一网络，还是一个只有一个专用案例的多个媒体网络？

已决定，信号，互连网络以及该网络将使用网关和实施存储转发算法，依靠分组交换进行通信。尽管此（主要）目标明确说明了应实现的目标，但未说明“有效”互连网络具有的特性。然后，作者在构建Internet时按重要性顺序列出了第二级目标：

> 1. 即使网络或网关丢失，Internet通信也必须继续
> 2. 互联网必须支持多种通信服务
> 3. 互联网架构必须容纳各种网络
> 4. 互联网体系结构必须允许对其资源进行分布式管理
> 5. 互联网架构必须具有成本效益
> 6. Internet架构必须允许以较低的工作量进行主机连接
> 7. Internet体系结构中使用的资源必须负责。

考虑优先级不同，Internet的设计可能会如何变化是非常有趣的。尽管我相信作者在描述互联网如何以及为什么发展到当前状态（直到该论文发表之日）方面做得很出色，但是他未能表达出这些目标的优先级如何根据互联网的未来而改变。需要。例如，与今天相比，今天的Internet不需要具有有效多媒体网络的网络。尽管它的设计是灵活的，但这种灵活性却得到了最大程度的强调。由于Internet并不是在创建之初就为此目的而设计的，因此我们必须继续根据不仅今天而且明天的需求重新考虑和重新设计Internet。为了创建更好的Internet，我们必须继续质疑创建之初提出的最初目标。

例如，考虑到上述替代目标，如果我们要创建一个混合网络，该混合网络可以将当今所有人的利益融合在一个互连的通用网络中，并将其与专用网络的利益相结合？也许那将使Internet能够更好地处理高带宽多媒体流量，该流量可以通过专门化数据包以使它们不会相互冲突而阻塞一般网络。随着Internet的不断扩展，我们必须对其进行调整以满足新的需求。

然后作者详细描述了前三个目标，并继续说明如何设计Internet体系结构（TCP / IP / Datagrams）来实现这些目标。总的来说，我认为这是一篇非常有用的论文，它是对我们在课堂上学到的东西的很好补充。

[英文写的]

The author of this paper describes the design motivations, philosophies, and architectures of the early Internet Protocol Suit - TCP/IP, which was first proposed by DARPA almost 15 years prior to the articles publishing date. The author, David Clark, discusses the not only the initial design goals of the early Internet, but also how these goals have changed to capture the evolution of the Internet architecture and functionality. He then continues to explain the reasoning behind the selection of certain specific protocol designs. The article is split into two main ideas: the goals and architecture of the internet.

The fundamental/primary goal, to

> develop an effective technique for multiplexed utilization of existing interconnected networks

and an alternative goal, to

> create a unified system which incorporated a variety of different transition media, a multimedia network

are contrasting goals: do we want a single network supporting a variety of applications, or a multiple media networks, each of which has only a single, specialized case?

It was decided that signal, interconnected network, and that network would rely on packet switching to communicate, using a gateways and the implementing a store and forward algorithm. Although this (primary) goal clearly states what should be achieved, but it does not state what properties an "effective" interconnected networks have. The author then lists the second level goals in order of importance at the time of the Internet's constructions:

> 1. Internet Communication must 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 level of effort
> 7. The resources used in the Internet architecture must be accountable.

It is quite interesting to think about how the design of the Internet might differ had the priorities been different. Although I believe the author does a great job of describing how and why the Internet was developed to its current state (up until the paper's publishing date), he fails to express how these the priority of the goals can change in the future according to its needs. For example, compared to today, a network with effective multimedia network was not needed, while the Internet today does. Although it was designed to be flexible, that flexibility is being stressed to its max. Since the Internet was not designed for this at its creation, we must continue to rethink and redesign the Internet based on the needs of not only today, but tomorrow as well. In order to create a better Internet, we must continue to question the initial goals proposed at the onset of its creation.

For example, considering the alternative goal stated above, what if we were to create a hybrid network that can unite the benefits of todays all in one interconnected general network with the benefits of specialized networks? Perhaps that would allow the Internet to better handle high bandwidth multimedia traffic that can congest general networks by specializing data packets so that they don't contravene upon one and another. As the Internet continues to expand, we must adjust it to meet new demand.

The author then describes the first three goals in detail, and the continues to explain how the Internet architecture (TCP/IP/Datagrams) was designed to fulfill these goals. Overall, I thought this was an extremely informational paper, and it is a great supplement to what we have been learning in class.