Trust Issues

Chapter 14 of the book "Operating the Internet" discusses the evolving challenges in managing the internet's infrastructure, notably trust issues among gateways and the complexities of routing and congestion. In the early days, trust among gateways, which exchange routing information, was implicit under the unified management of DARPA. However, the proliferation of multiple wide area networks under various administrations has introduced concerns about the potential for a rogue gateway to disrupt the internet. Efforts are underway to develop solutions for managing untrustworthy gateways and enhancing the routing of data across multi-homed networks.

The chapter also touches on the issue of capacity and congestion, particularly on the ARPAnet during peak hours. The planned expansion of links aims to address these problems, dictated by the future direction set by the Internet Architect and the Internet Activities Board (IAB). The IAB consists of several committees led by experts overseeing different areas of the internet infrastructure, including autonomous networks, end-to-end services, and privacy, among others.

Routing, a critical function for directing traffic from its source to its destination, is explored through the analogy of a child navigating a restaurant. The chapter elaborates on IP gateways (routers) that facilitate traffic flow between networks based on IP header information and network state. Routing protocols can vary significantly, with some requiring complete network knowledge (the "adult algorithm") and others only a subset, often used in hierarchical networks to avoid loops.

Two types of routing protocols are highlighted: static routing, suitable for small networks or as a default route in networks with a single gateway, and RIP (Routing Information Protocol), which is adapted for IP from the Xerox Network System. While

static routing is reliable for simple setups, RIP is more dynamic but best suited for networks with small diameters due to its reliance on hop-count metrics, which can be problematic in networks with links of varying speeds or congestion levels.

The chapter concludes by discussing efforts to improve RIP through documentation and refinement to make it more effective for larger networks, indicating an ongoing evolution of internet management practices to address the challenges of growth, reliability, and complexity.