Chapter 10  
Provision of CDN Services to Third Parties

This case study involves a U.S. parent (USP) and multiple foreign subsidiaries. The Group’s business is multi-jurisdictional by its nature, and its infrastructure is geographically dispersed. Foreign affiliates own all the Group’s infrastructural assets in non-U.S. markets, which USP is permitted to utilize on a fee-for-service basis. As a point of departure, we illustrate why it is difficult to analyze this case under traditional transfer pricing methods. In lieu of such methods, we utilize both (a) a simplified version of the required return method, and (b) the simplified profit split method (under a modified set of assumptions).

10.1 Summary of Key Facts

The public Internet has grown exponentially in its brief history, albeit not in an overly structured or organized fashion. It consists of a large number of private networks that interconnect, allowing data packets to traverse the Internet through a complex system of servers, routers, switches, agreed-on protocols and other elements. While the Internet’s current architecture was adequate to handle traditional forms of use and volumes of traffic, demand for Internet-delivered content, particularly rich media content, has ballooned in recent years as a result of several factors:

1. A high and progressively increasing percentage of North American households have broadband Internet access. Broadband Internet penetration was nearly 50% in 2006 and is expected to reach 73% by 2010. European households are not far behind. Such access is a prerequisite to streaming or downloading rich media content onto personal computers and mobile devices.
2. Consumers increasingly expect on-demand access to a broad range of media content (videos, games, music, etc.).
3. In response to increased consumer demand, consumer electronics manufacturers have developed new mobile devices that are capable of connecting to the Internet.

As presently constituted, the Internet is not well-suited to accommodate high-volume demand for the delivery of rich media content. From an infrastructural standpoint, the public Internet is divided into four segments: (a) the connection
between origin servers and the Internet (the “First Mile”); (b) the “hosting” segment, consisting of data centers and the network infrastructure that is housed in these centers; (c) the “backbone” segment, which consists of the fiber connections that link data centers to points of presence (“POPs”) and both public and private peering points; and, (d) the connection between end-users and the Internet (provided by Internet Service Providers, or ISPs, and referred to as the “Last Mile”).¹ At each of these junctures, latency and reliability problems can and often do arise.

If a content provider chooses to manage its own Internet-facing infrastructure and does not have sufficient bandwidth, the First Mile can cause significant delays, particularly during periods of traffic surges (for example, in response to short-term Internet marketing campaigns). Data centers, while generally better equipped with bandwidth, also suffer from traffic congestion on a regular basis. The Internet backbone is another common source of delays in data transmission, in part because of the complexity of its pathways. Data packets are routed from point to point on the public Internet, and each such “hop” requires router processing to determine the subsequent destination. The number of hops and the potential for sub-optimal routing increases latency. Moreover, Internet traffic may exceed the capacity of routing equipment. The Last Mile likewise has its own infrastructural shortcomings. Here, too, bandwidth constraints may be a problem. Moreover, peering points between ISPs may be inefficient or non-functioning.

CDN services providers came into being in response to shortcomings in the public Internet. In essence, they have knitted together parallel, private Internets, consisting of a large number of edge and storage servers, routers, switches, enabling software and connectivity. These private networks have sufficient capacity and bandwidth to comfortably handle normal loads associated with rich media content, and to manage traffic spikes. CDN services providers also attempt to reduce latency and bypass congestion entirely by caching (or storing) commonly requested objects (that is, various kinds of rich media content) on servers located in comparatively close physical proximity to end-users. Firms in the business of developing rich media content utilize these alternative methods of delivering such content because customer satisfaction turns on a positive viewing or listening experience, without delays, freezes and other interruptions.

First-generation CDN services providers built systems that were less-than-well-suited to handle rich media content, which requires the transfer of very large data files. Instead, they were built to handle the less data-intensive files initially transmitted over the Internet (e.g., web pages). Second- and third-generation CDN services providers, such as Akamai, Limelight Networks, Level 3 Communications, Mirror Image, VitalStream (acquired by Internap Network Services Corporation) and Panther Networks, designed systems that could handle a more diverse range of file sizes. To varying degrees, this mandate is manifested in: