



Chapter II

Gigabit Internet to Every Home and School: A Conceptual Overview

Bill St. Arnaud
CANARIE, Canada

ABSTRACT

One of last great impediments to wide-scale and rapid deployment of the information society is the “last mile” issue. This chapter outlines some of the issues and history of the last mile problem and proposes a research and development program leading to early deployment of extreme high speed Internet access to schools and libraries (GITS), which will then underpin an architectural framework for high speed Internet access to the home-Gigabit Internet to the Home (GITH). The proposed strategy calls for the deployment of a third residential network service operating in parallel with existing telephone and cable delivery mechanisms and thereby avoiding the regulatory and technical hurdles of integrating traditional telephone and cable services into one common delivery mechanism.

INTRODUCTION

In recent years there have been major advances in the speed and capacity of Internet backbone networks such as the CANARIE optical Internet,

CA*net 3.¹ These networks offer a dramatic increase in bandwidth and quality of service for new advanced multimedia applications. As well, with the advent of innovative competitive service providers such as Qwest,² Level 3,³ and Frontier,⁴ there has been a significant reduction in prices commensurate with the development of these new service offerings.

While there have been dramatic changes in backbone capacities and the number of service providers, high speed local access to the home and individual businesses has been considerably slower to develop. Solving the “last mile” problem is one of the grand challenges facing the research community, government and industry. The realization of a Gigabit Internet to the Home (GITH) network will truly allow the wide-scale deployment of new high speed multimedia services and the ultimate realization of the information society.

The advent of low-cost high bandwidth to the home may usher in a new world of applications where the network, in effect, becomes the computer. Currently, there are few traditional applications that require bandwidth to the home in excess of a few megabits per second. But the same story was true for the personal computer, where 15 years ago there were few applications that required more than kilobytes of memory and all the data could be easily stored on a single floppy disk. It is now difficult to conceive of operating a PC with anything less than 32 Mbytes of memory and a 2 gigabyte drive.

It is expected that high bandwidth applications will follow a similar evolutionary path once high bandwidth is routinely available at low cost to the home, school and office. Schools, libraries and universities are currently the some of the biggest consumers of Internet service. Schools in particular have a pressing demand to increase their Internet capacity. Most schools are poorly served with low speed data lines. As multimedia instruction, educational streaming video and other services become increasingly popular, the demand for higher speed Internet access will be insatiable.

As will be described further in this chapter, there are many last mile access technologies including wireless, satellite, xDSL and cable modem services. While the capital cost of GITH to the home may be substantially greater than these alternatives, its life cycle costs are significantly smaller. The biggest single cost component of GITH is the installation of the fiber itself, whether it is in the ground or on poles. Governments and large utilities have the resources to raise money for 20- to 30-year life cycle infrastructures such as roads, bridges and hydro facilities. As such, government again can play a key role in the early deployment of a GITH network by leveraging its capability to easily raise infrastructure money for the deployment of such a network. One possible model would be for government to initially underwrite the infrastruc-

22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/gigabit-internet-every-home-school/26015

Related Content

Theoretical Analysis and Experimental Study: Monitoring Data Privacy in Smartphone Communications

Eralda Caushaj, Huirong Fu, Ishwar Sethi, Haissam Badih, Dion Watson, Ye Zhuand Supeng Leng (2013). *International Journal of Interdisciplinary Telecommunications and Networking* (pp. 66-82).

www.irma-international.org/article/theoretical-analysis-and-experimental-study/79282

Buffer Managed Multiple Replication Strategy Using Knapsack Policy for Intermittently Connected Mobile Networks

C. Poongodiand A. M. Natarajan (2014). *Multidisciplinary Perspectives on Telecommunications, Wireless Systems, and Mobile Computing* (pp. 1-22).

www.irma-international.org/chapter/buffer-managed-multiple-replication-strategy-using-knapsack-policy-for-intermittently-connected-mobile-networks/105669

Semantic Similarity Measurement Using Knowledge-Augmented Multiple-prototype Distributed Word Vector

Wei Lu, Kailun Shi, Yuanyuan Caiand Xiaoping Che (2016). *International Journal of Interdisciplinary Telecommunications and Networking* (pp. 45-57).

www.irma-international.org/article/semantic-similarity-measurement-using-knowledge-augmented-multiple-prototype-distributed-word-vector/160066

Transport Layer for Cognitive Radio Sensor Networks

Yasir Saleemand Farrukh Salim (2014). *Cognitive Radio Sensor Networks: Applications, Architectures, and Challenges* (pp. 231-257).

www.irma-international.org/chapter/transport-layer-for-cognitive-radio-sensor-networks/113369

QoE Measurements and Analysis for VoIP Services

Ramon Sanchez-Iborra, Maria-Dolores Cano, Salvador Moreno-Urreaand Joel J. P. C. Rodrigues (2016). *Emerging Research on Networked Multimedia Communication Systems* (pp. 285-308).

www.irma-international.org/chapter/qoe-measurements-and-analysis-for-voip-services/135475