

Contents lists available at [ScienceDirect](#)

Telecommunications Policy

URL: www.elsevierbusinessandmanagement.com/locate/telpol

A layered United States Universal Service Fund for an everything-over-IP world[☆]

Scott Jordan

Department of Computer Science, University of California, Irvine, CA 92697-3435, USA

ARTICLE INFO

Keywords:

Policy formulation
Universal service
Internet

ABSTRACT

Support through the United States Federal Universal Service Fund for high-cost areas has been principally defined in terms of telephone service. Fund growth due to increases in wireless lines and implicit support for broadband infrastructure has created an untenable situation, and fundamental reform is expected. The cause underlying this growth is convergence between the telephone network, wireless networks, the Internet, and cable networks. This convergence will pose additional serious long-term challenges to the fund. This paper proposes a restructuring of the high-cost funds based on a layered model. Both contributions and distributions are focused on network infrastructure, without distinction between voice and broadband. The proposal uses a new definition of communication services to guarantee technology neutrality, and includes service area reform and cost efficiency measures. This layered approach repositions the fund for future converged networks.

© 2009 Elsevier Ltd. All rights reserved.

1. Introduction

The United States Universal Service Fund (USF), as established in the 1996 Communications Act, was created to provide access to advanced telecommunications and information services in all regions of the Nation. Universal service, however, has to date been defined principally in terms of telephone services. Correspondingly, the high-cost funds have focused on support to eligible telecommunication carriers (ETCs) to support telephone network infrastructure, and assessments have been placed on interstate revenue from telephone calls.

Communication and computer networks, however, are continuing a long-term trend toward integration of physical facilities and the applications they support. Whereas four separate networks historically supported telephone calls, cable video broadcasting, Internet, and wireless communications, increasingly these networks are integrating into a merged infrastructure that supports a wide variety of voice, video, and data applications.

This convergence of physical networks and applications poses several long-term challenges to the USF. As technology has changed, revenue from telephone calls has decreased from the fund. Differences in the service areas of incumbent local exchange carriers (ILECs) and wireless ETCs has required new rules to combat cream-skimming. The development of voice over IP (VoIP) presents a classification challenge, in that debate has started about whether VoIP infrastructure should be supported by the fund and whether revenue from VoIP services should be assessed for the fund. As video over IP starts to come into the consumer marketplace, this will pose a similar challenge to classification. In addition, many policymakers

[☆] Part of this work was presented at the 36th Research Conference on Communication, Information and Internet Policy (TPRC 2008). These ideas do not necessarily represent the views of the University of California (his employer), Senator Ben Nelson (in whose office he served as a Congressional Fellow), or IEEE-USA (which funded the Congressional Fellowship).

E-mail address: sjordan@uci.edu

wish to see the USF support broadband access, but there is some reticence to assess broadband access, and many worry that support for broadband will cause a further massive increase in the size of the fund.

Because of all these problems caused by technological convergence, the fundamental structure of the high-cost funds must be reconsidered. This paper proposes an approach to reformulation of the high-cost funds. In recognition of convergence, a new term *communication services* is introduced to replace *telecommunication services*, based on a layered model, to restrict both contributions and distributions to network infrastructure not applications. Communication services infrastructure encompass the lower layers of all public interconnected networks, whether to support voice, video, or data. Support is thus focused directly on communications network infrastructure, without reference to a standardized basket of telecommunication services that qualify as universal service. Similarly, contributions are required from all communication services, whether to support voice, video, or data.

This technology-neutral approach repositions the USF for future converged networks. In particular, such a layered approach erases the distinction between support for telephone service and broadband access. To resolve the disappearing distinction between intrastate and interstate revenue, the proposal allows the fund to assess both. To resolve incompatibilities between the service areas of multiple types of network providers, service area reform is implemented using disaggregation. Finally, data is presented that indicates that a significant component of USF growth has been caused by implicit support for wireline broadband; the proposals suggest that allowing policymakers to determine an overall limit on the size of the fund is more viable in the long-term than artificial distinctions between voice and broadband distributions.

Although many components of the proposal strictly concern elements of the United States USF (e.g., intrastate versus interstate, and USF growth), a layered approach to USF may apply to other countries universal service programs.

Section 2 briefly reviews the related literature, the current debate, and recent Congressional bills. Section 3 briefly states updated goals for universal service. Section 4 proposes a layered approach to high-cost fund distributions, and Section 5 proposes cost efficiency mechanisms based on this approach. Finally, Section 6, applies this layered approach to fund contributions.

2. Related literature

There is a voluminous literature on problems of the USF and proposed modifications. [Abernathy \(2005\)](#) gives a good overview of issues with the fund posed by the transition from circuit-switch voice services to packet-switched communication services. On the contribution side, she discusses decreasing long distance telephone call revenues, classification of VoIP, and whether the Federal Communications Commission (FCC) has authority to assess the telecommunication portion of information services such as broadband access. On the distribution side, she discusses support for broadband, whether the FCC has authority to support an information service under USF, and the identical support rule. [Marcus \(2005\)](#) discusses the burdens put on the fund from wireless carriers, and motivations to expand the fund to VoIP and broadband. [Taylor \(2007\)](#) discusses a future of everything-over-IP communication services in which it no longer makes sense to distinguish between interstate and intrastate, between wireline and mobile, or between the telephone network and the Internet. On the contribution side, he discusses whether contributions should be required from all those who benefit from the network, from infrastructure providers all the way up to content providers. On the distribution side, he argues that under everything-over-IP, there will be no minimum standard universal service package.

There is a large academic literature on the economic efficiency (or lack thereof) of the fund. An excellent starting point for digesting this literature is [Turner \(2006\)](#). His economic analysis shows that USF assessments produce a financial burden that falls heaviest on rural consumers who make large amounts of long distance calls, due to the elasticity of demand for rural long distance. In contrast, he presents an analysis that concludes that subsidizing broadband would likely produce benefits that exceed costs. He argues for assessments based on numbers and capacity, a broadband mandate on USF recipients, and the use of actual forward-looking costs.

There are also many papers that compare the approaches to universal service taken by the United States and other countries. [Schejter \(2007\)](#) finds that European countries are deploying broadband more quickly than the United States using a system that is more focussed, simple, efficient, and responsive to technology change. [Jayakar and Sawhney \(2007\)](#) examine new universal service policies in countries that have high broadband growth rates and conclude that they offer a multiplicity of services instead of focussing on voice as a universal service, with consumers able to choose the services that they value the most.

A number of papers discuss whether there is a digital divide, and if so the nature of it. [Downes and Greenstein \(2006\)](#) studied availability of dial-up Internet service providers (ISPs). They found that in rural counties, population was the single most important determinant of ISP entry, and that entry was largely provided by ISPs with local focus. This leaves open the question of whether broadband Internet will become less universally available than dial-up service due to differences in explicit USF support for local phone versus broadband. [Prieger \(2003\)](#) presents an analysis that quantifies that differential in broadband availability between urban and rural areas, and finds that concentration of rural households is a more important factor than income.

Download English Version:

<https://daneshyari.com/en/article/557063>

Download Persian Version:

<https://daneshyari.com/article/557063>

[Daneshyari.com](https://daneshyari.com)