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TDS TELECOM

Government and Regulatory Affairs

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March 27, 1996

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: CC Docket 96-45, In the Matter of Federal-State Joint Board on Universal Service

Dear Mr. Caton:

On March 26, 1996, Arland Hocker, Kevin Hess, Kenneth Paker, Margot Humphrey and Elizabeth Valinoti met with the FCC's Kenneth Moran, Chief, Accounting and Audits Division, Common Carrier Bureau, and Deborah Dupont, of the Accounting and Audits Division's Legal Branch, to discuss the traffic sensitive nature of switching costs and the negative impact of combining Universal Service Fund (USF) and dial equipment minute (DEM) weighting mechanisms. In addition, the named TDS parties gave an overview of TDS TELECOM.

Enclosed herewith are the documents provided to Mr. Moran and Ms. Dupont during the above referenced meeting. I have enclosed two copies of this notice and attachments in accordance with sections 1.1206(a)(1) and 1.1206(a)(2) of the Commission's rules. Please date stamp and return the provided copy to confirm your receipt.

Respectfully submitted

Elizabeth H. Valinoti

Elizabeth H. Valinoti
Manager
External Relations

Attachments

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TDS TELECOM
Planning & Network Group

USF AND DEM WEIGHTING MECHANISMS SHOULD NOT BE COMBINED

Issue: The FCC, in its August 30, 1994, Notice of Inquiry ("NOI") and its July 13, 1995, Notice of Proposed Rulemaking ("NPRM"), *In the Matter of Amendment of Part 36 of The Commission's Rules and Establishment of a Joint Board*, CC Docket No. 80-286, proposed to combine local switching costs with loop costs in determining high-cost assistance for telephone companies. This proposal would combine the Dial Equipment Minute ("DEM") weighting mechanism with the Universal Service Fund ("USF"). While DEM weighting assists local exchange carriers ("LECs") with high switching costs, the USF assists LECs with high loop costs. As explained below, combining DEM weighting and USF would significantly reduce the accuracy of assistance targeting.

Again in its March 8, 1996, NPRM, *In the Matter of Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, the FCC questions the value of DEM weighting. While the FCC does not specifically propose combining USF and DEM weighting assistance in the instant NPRM, the Commission does suggest that continuation of DEM weighting might not be consistent with the pro-competitive, de-regulatory framework set forth in the Telecommunications Act of 1996. As outlined below, DEM weighting remains extremely valuable to small LECs and their customers as a proven method for keeping local rates affordable.

Analysis: Modern digital central office switches typically utilize a distributed processor approach where the size and function of the machine is engineerable based on the exchange to be served. This document will provide the qualitative analysis leading to the conclusion that digital central office switches are indeed a traffic usage sensitive network resource. Understanding this conclusion is imperative in the impact analysis of the proposal to combine USF with DEM weighting as proposed.

Each digital central office switch is engineered uniquely for the exchange for which it is to service. It is typical for a switching system vendor to employ a comprehensive and complex computer program to produce the final engineering configuration for the exchange based on a series of traffic engineering parameters. There are primarily three components that are input into these systems - number of subscriber lines to be physically terminated, number of interoffice trunks, and traffic usage. Traffic usage is far and away the component which has the most dramatic impact on the final configuration of the switching system. However, each of these components will be addressed in more detail in the following paragraphs.

Subscriber Line Switch Terminations: The amount of switching equipment needed to physically terminate a subscriber line is based on the line concentration ratio for that subscriber. Traffic usage per line determines the line concentration based on the blocking ratio needed to achieve the service quality expected by the telephone company. So, for example, in areas where the subscriber line usage is very low, a very high line concentration ratio (e.g. 10:1) exists within the switching equipment. This concentration ratio means that for every 10 lines, the switching system will guarantee a non-blocking path for only 1 of the lines at any given time. Compared to a heavy usage subscriber line (e.g. 4:1 concentration), the amount and cost of switching equipment required to provide quality service is significantly less for the low usage subscriber line.

Interoffice Trunking: The number of interoffice trunks is also a traffic usage sensitive value even though a digital switching system does not typically concentrate interoffice trunks as is done with subscriber lines. Again, this is based on traffic usage as there is not a 1:1 correspondence between physical lines served and interoffice trunks. Instead, similar blocking tables as those used to determine line concentration are used to determine the number of interoffice trunks to a particular destination based on the expected usage for that particular destination. So, in low usage areas, there will be fewer interoffice trunks than in high usage areas and therefore less switching equipment.

Traffic Usage: Traffic usage also drives the amount of common switching equipment needed for the exchange. Common switching equipment consists of such resources as tone decoders, tone generators, announcement circuits, bridging circuits, etc. It also includes the real-time processing capacity for the distributed switching system processors. As a result, usage must be determined for all *types* of calls in addition to the overall quantity of service expected. It is no surprise that many of today's advanced call handling features absorb more of the common switching resources than Plain Old Telephone Service (POTS) calls. High usage subscribers are typically those subscribers most likely to purchase advanced calling features and so there is also a compounding effect with regard to the true switching costs. It is for these reasons that modern digital switching systems also provide extensive traffic usage sensitivity measurements reports that alert the telephone company when resources are nearing exhaustion.

Summary: Digital central office switching system architecture's have evolved to take advantage of traffic usage characteristics in order to minimize equipment costs. Consequently, the costs of switching in a telephone network are tied directly to the usage of that network. The net effect of combining DEM weighting with the USF would be to artificially set the usage of switching systems to a constant. Because we have shown that the costs of switching vary greatly with usage, combining DEM weighting and USF would significantly reduce the accuracy of assistance targeting.

Kenneth H. Paker
Director - Technology Assessment
TDS Telecom
March 25, 1996

TDS TELECOM

- ✓ Serving 429,745 access lines in 28 states
- ✓ Operates 100 local exchange companies as of February 29, 1996
- ✓ Average number of access lines per company 4,297
- ✓ Largest company serves 50,677 access lines (Tennessee Telephone) and smallest company serves 450 access lines (Danube Telephone)
- ✓ Average number of access lines per square mile is 10.5; Average RBOC access lines per square mile is 330
- ✓ Company with the greatest density, 328 access lines per square mile and the company with least density, 0.5 access lines per square mile
- ✓ 99.8% of access lines are digital
- ✓ 65 companies settle with NECA on cost basis and 35 on an average schedule basis