

## DECLARATION OF GERARD P. GRENIER

I, Gerard P. Grenier, am over twenty-one (21) years of age. I have never been convicted of a felony, and I am fully competent to make this declaration. I declare the following to be true to the best of my knowledge, information and belief:

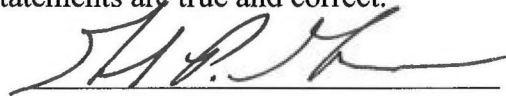
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3. Neither I nor IEEE itself is being compensated for this declaration.
4. Among my responsibilities as Senior Director of Content Management, I act as a custodian of certain records for IEEE.
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8. The article below has been attached as Exhibit A to this declaration:

A.	B.Rupp, et. al., “INDEX: a platform for determining how people value the quality of their Internet access” 1998 Sixth International Workshop on Quality of Service, May 18-20, 1998.
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9. I obtained a copy of Exhibit A through IEEE Xplore, where it is maintained in the ordinary course of IEEE’s business. Exhibit A is a true and correct copy of the Exhibit, as it existed on or about June 12, 2019.
10. The article abstracts from IEEE Xplore shows the date of publication. The date of publication is no later than the last day of the conference at which an article is presented. IEEE Xplore populates this information using the metadata associated with the publication.

11. B.Rupp, et. al., "INDEX: a platform for determining how people value the quality of their Internet access" was published as part of the conference proceedings for the 1998 Sixth International Workshop on Quality of Service. The 1998 Sixth International Workshop on Quality of Service was held from May 18-20, 1998. Copies of the conference proceedings were made available to attendees of the conference in accordance with IEEE's normal business practices no later than the last day of the conference. The article is currently available for public download from the IEEE digital library, IEEE Xplore.
12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

I declare under penalty of perjury that the foregoing statements are true and correct.

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#### Abstract:

The continuing exponential growth of the Internet and the emergence of new time-critical applications have led to the integration of a large number of different services on the Internet. In the process, the question of how to efficiently allocate bandwidth as a scarce resource has become a crucial issue for the continued proliferation of these new services. Future growth depends on the division of services into quality-differentiated market segments and the pricing structure of each segment. Successful growth requires service providers to offer combinations of quality and price that match user needs, but to do this, providers must understand the structure of user demand. Such understanding is lacking at present. This paper describes a platform designed to obtain a basic understanding of how individuals value Internet usage when offered different quality-of-service (QoS) choices. The Internet Demand Experiment (INDEX) has two main objectives: (a) measurement of user demand for Internet access as a function of QoS, pricing structure and application; and (b) the demonstration of an end-to-end system that provides access to a diverse group of users at attractive price-quality combinations. The data being collected is expected to reveal the correlation between user application and service demand, how demand varies with user experience, and to what extent

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