

I, Kevin Jeffay, do hereby declare and state as follows:

1. I have been retained by Sony Corporation in connection with its petition for *inter partes* review of U.S. Patent No. 9,521,466 (“the ’466 patent”).
2. I am a tenured professor in the Department of Computer Science at the University of North Carolina at Chapel Hill (UNC) where I currently hold the position of Gillian T. Cell Distinguished Professor of Computer Science. I also currently serve as the Chairman of the Department.
3. I have a Ph.D. in computer science from the University of Washington, a M.Sc. degree in computer science from the University of Toronto, and a B.S. degree with Highest Distinction in mathematics from the University of Illinois at Urbana-Champaign.
4. I have been involved in the research and development of computing systems for over 30 years. I have been a faculty member at the University of North Carolina (UNC) since 1989 where I perform research and I teach in the areas of computer networks, multimedia networking, real-time systems, operating systems, and network performance evaluation, among others. A major theme of my research has been the development of technology to improve the performance of data transfers on the Internet. My research has examined problems ranging from network support for real-time multimedia applications such as audio and video streaming, voice-over-Internet protocol (VoIP) and Internet videoconferencing, to

measurements and analysis of network traffic to passively assess the performance of servers on the Internet. In addition, I have also explored problems in the design and implementation of operating systems.

5. Much of my research has been performed jointly with industry. For example, in the early 1990s, my research considered problems of real-time transmission of audio and video streams over packet-switched networks such as the Internet. Much of this work was performed jointly with Intel and IBM and led to demonstrations of some of the first videoconferencing systems for the Internet. I also collaborated with researchers from AT&T Bell Laboratories and later with Lucent Technologies Bell Laboratories on problems related to delivering video services over both the public telephone network as well as the Internet. Several papers written by my research group at UNC describing the results of these projects received awards for their research contributions at major international conferences and symposia.

6. In the late 1990s and 2000s, my research evolved to consider router-based mechanisms for controlling the performance of network traffic. This work involved algorithms and mechanisms for quality-of-service (QoS) queuing and scheduling in network routers. In much of this research, my students and I built and instrumented network routers and performed large scale experiments with this equipment. Based on these experiments, in 2003, my group at UNC won the most prestigious research award for original research in computer networking.

7. I have authored or co-authored over 100 articles in peer-reviewed journals, conference proceedings, texts, and monographs in the aforementioned areas of computer science and others. I have previously served as the Associate Editor for the journal *Real-Time Systems* and have served as the Editor-in-Chief for the journal *Multimedia Systems*. In addition, I have edited and co-edited numerous published proceedings of technical conferences and have edited a book of readings in multimedia computing and networking (with Hong-Jiang Zhang) published by Morgan Kaufman. I am a co-author (with Long Le and F. Donelson Smith) of a monograph related to computer network protocols, and a co-author (with Jay Aikat and F. Donelson Smith) of a second monograph related to experimental computer networking.

8. I have served on numerous proposal review panels for the National Science Foundation and other international funding agencies in the aforementioned areas of computer science. I have served as a program chair or member of the technical program committee for over 100 professional, international, and technical conferences, workshops, and symposia.

9. I am a named inventor on three U.S. Patents and have applications for two additional patents pending. These patents are generally related to computer networking and the delivery of services over networks.

10. I have served as an expert witness and technical consultant in litigation matters concerning computer networks, content delivery networks, video-on-demand systems, multimedia networking, internet protocol television (IPTV), cellular and wireline telephony, mobile computing, and operating systems, and among others. I have testified in several trials, arbitrations, and claim construction hearings as an expert witness.

11. I attach as Exhibit A my curriculum vitae, which includes a more detailed list of my qualifications, as well as a list of my publications and recent testimony.

12. I have reviewed the '466 patent, PCT Publication No. WO03/025726 ("Sparrell"), U.S. Patent Publication No. 2003/0067872 ("Harrell"), an PCT Publication No. WO02/05557 ("Rautila").

### **The '466 Patent**

13. The '466 patent describes communication systems and methods for providing and receiving "programs" that, generally speaking, are media streams. '466 patent, 2:17, 5:14, Fig. 3.

14. The '466 patent describes a user device that includes a transceiver unit connected to a controller that is adapted to: (i) receive a "program multiplex;" (ii) receive an indication that at least one program is to be removed from the multiplex; and (iii) selectively transmit a program removal response. '466 patent, 1:66-2:4. Also disclosed is a device to provide a program multiplex. The device includes,

e.g., a management unit adapted to consider a removal of at least one program from the multiplex in response to program viewing parameters, and determine the removal in response to at least one received user program removal response. '466 patent, 2:5-12. The '466 patent further describes a corresponding method for receiving programs that includes (i) receiving a “program multiplex,” and a program removal indication; and (ii) selectively transmitting a program removal response. '466 patent, 2:13-16. Also disclosed is a method for providing programs, which includes (i) providing a program multiplex to multiple user devices; (ii) considering removal of at least one program from the multiplex in response to program viewing parameters; (iii) allowing at least one user to respond to a possible removal of the at least one program; and (iv) determining whether to remove the at least one program in response to received user removal responses. '466 patent, 2:17-24.

15. The claims of the '466 patent are directed to methods and apparatuses for conserving “resources” associated with a packet television service comprising, determining if a resource conserving process should be activated and initiating an action to conserve resources comprising sending instructions to the content provider to halt the delivery of a video portion of the television content. '466 patent, 11:30-55, 12:39-65.

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