

Data Network Consultant

As a professor at Penn State and also a key principal in a private data networking consulting firm, it is absolutely essential that the tools that Dr. Phil Hippensteel relies on are accurate and reliable. Dr. Hippensteel relies on PacketStorm Communications test equipment for his network emulation requirements.

One such project involved the competitive evaluation of various IP-PBX's, and their resiliency in the face of imperfect networks. The professor created a lab set up which recreated the operating conditions that these IP-PBX's would encounter in the real world. The IP-PBX's were attached to the PacketStorm Hurricane network emulator. Parameters of the simulated network were adjusted with the PacketStorm. Various amounts of packet loss, network delay, and jitter were introduced to the emulated network via the PacketStorm Hurricane. Multiple VoIP endpoints then went about the task of generating VoIP calls. Voice quality was then measured at the endpoints. In subsequent test, the IP-PBX parameters were varied such as changing the codec from the G.711 setting to the G.729 setting. Again, adverse network conditions were emulated and voice quality measured. Using these techniques and test environment, Doctor Hippensteel was able to provide a comprehensive report recommending not only the best performing IP-PBX, but to also provide data of the expectations the client should expect under various IP-PBX settings.

Another project that Dr. Hippensteel undertook also made use of the PacketStorm's unique network emulation features. The objective of this project was to develop a course to cover the timer operations, window sizing algorithms, and performance of the TCP protocol. Two PC's were set up to do file transfers using FTP. The PacketStorm Hurricane was placed between the two PC's, and was used to introduce various network impairments. The TCP protocol was observed under ideal network conditions and then again under various PacketStorm-induced impaired network conditions. With this controlled environment, Dr. Hippensteel was able to clearly illustrate the inner workings of TCP performance and error correction procedures as they affected file transfer times.

In addition, Dr. Hippensteel made use of the PacketStorm Hurricane network emulator for an evaluation of a commercial vendor's network measurement and network monitoring equipment. One of the main functions of the vendor's equipment was to monitor, measure, and report on various network impairment conditions. Using the PacketStorm Communications Hurricane network emulator, Dr. Hippensteel was able to precisely control a host of network impairments such as dropped packets, jitter, fragmented packets, duplicate packets, etc. These accurately reproduced network impairment conditions were then compared to the measurements and reports outputted by the measurement and monitoring equipment and checked for accuracy.

“When I'm trying to test or research customer technology platform such as VoIP or wireless, Packetstorm's network emulators are the best part of my toolkit. I've gotten amazing information that impresses both clients and audiences to my presentations.”

Dr. Phil Hippensteel,
Industry Consultant