

Roller, S. and Young, R. M., EarthView: Using the Unity3D Game Engine to Visualize Packet Sniffing, in Eighth Annual North Carolina State University Research Symposium, pp. 71. Raleigh, NC. July 30, 2009.

EarthView: Using the Unity3D Game Engine to Visualize Packet Sniffing

Abstract

The World Wide Web truly is worldwide. Visiting a URL using a web browser can result in network responses from multiple computers located all over the world. Though this is invisible to the end user, using the Unity3D engine, we reveal this intercontinental traffic.

Combining a first-class packet sniffer with a GeoIP database, EarthView shows the user where Internet traffic is heading and coming from in real time. A user can see their traffic in a number of ways. An arc from source to destination can be displayed on a 3D or 2D map. Basic packet analysis includes listing which websites are being visited and showing a pie chart breakdown of bandwidth by host address.

Experimentation shows that many websites are exactly where one would expect: CNN.com is in Atlanta, Google.com is in California, BMW.de is in Germany. EarthView can also be used as a security tool; on one occasion, an attack was noticed due to unusual and unsolicited traffic coming from China.

EarthView is not without a number of limitations. Modern switched networks prevent EarthView from seeing traffic of neighboring computers. Placing EarthView on a large hub would result in more visible traffic from more sources. Additionally, EarthView only attempts to show the original source and final destination, even though packets always move between a number of destinations. In the future, traceroute support may be added so that a packet's full path is apparent. Finally, EarthView is slow and unable to visualize large amounts of traffic, such as those seen by a corporation or university. Further work is being done to improve it.