1046-68-2132 **Paul Barford*** (pb@cs.wisc.edu), University of Wisconsin-Madison, 7393 Computer Science & Statistics, 1210 West Dayton Street, Madison, WI 53706. *Internet Topology Inference*

Understanding the Internet's structure through empirical measurements is important in the development of protocols, traffic engineering and troubleshooting, among other things. While prior studies of Internet topology have been based on active probe-based measurements, passive measurements of packet traffic offer the possibility of a greatly expanded perspective of Internet structure with much lower overhead. In this talk, we describe algorithms for inferring network structure from simple passive measurements of IP packet traffic. We describe algorithms that enable 1) traffic sources that share network paths to be clustered accurately without relying on IP address or autonomous system information, 2) topological structure to be inferred accurately with only a small number of active measurements, 3) missing information to be recovered, which is a serious challenge in the use of passive packet measurements. We demonstrate our techniques using a series of simulated topologies and empirical data sets. We also show the trade-offs between selectively applied active probes and the accuracy of the inferred topology between sources. Finally, we characterize the degree to which missing information can be recovered from passive measurements, which further enhances the accuracy of the inferred topologies. (Received October 02, 2008)