Network Measurements: Learning from the Edge
Professor Edmundo de Souza e Silva

Abstract
Measurement, modeling and analysis have been essential areas of research since the dawn of the Internet. UCLA led the first measurement and analysis efforts for many years through its ARPANET Measurement Center. Since then, the Internet has experienced an enormous growth and has been playing an increasingly critical role in our daily lives.

As the core network expands, home networks (hosting PCs, tablets, mobile devices, Internet TVs, etc.) have also undergone tremendous growth in complexity. However, little is known about this recent environment.

Most measurements have been collected at routers that aggregate a huge number of network flows from thousands of homes. A detailed analysis of data at these measurements points is extremely costly and, in addition, privacy issues must be considered complicating the measurement efforts.

In this talk we focus on lightweight measurements performed at home gateway routers and subsequent data analysis. The home router plays an important role as the conduit to home devices, making it an ideal place to implement measurement functionalities. However, they have limited capacity. We leverage on an ongoing collaboration among Brazil and the USA (UFRJ and UMass), amid-size ISP in Brazil and a startup company incubated at UFRJ for data gathering and analysis.

Short bio
Edmundo de Souza e Silva received the B.Sc. and M.Sc. degrees in electrical engineering, both from Pontifical Catholic University of Rio de Janeiro (PUC/RJ), and the Ph.D. degree in computer science from the University of California, Los Angeles in 1984.
Edmundo was a visiting professor/researcher at renowned universities and research centers including the IBM T.J. Watson research Center, IBM Tokyo Research Laboratory, UCLA Department of Computer Science, Computer Science Department at USC, Politecnico di Torino, Chinese University of Hong Kong, IRISA/INRIA-Rennes, University of Massachusetts at Amherst. He has been involved with international cooperative research programs sponsored by NSF (USA) and CNPq (Brazil) and also with INRIA (France).

He has served as Technical Program Committee co-Chair of major international conferences including IEEE/Globecom’1999, ITC’2001, ACM/Sigmetrics'2002, IEEE/Infocom 2009. Edmundo was elected for the ACM/SIGMETRICS Board of Directors for 2 terms (2001-2005), and was Chair of the IFIP WG 7.3 for the 2008-2014 terms. He serves on the Editorial Board of the Journal of Internet Services and Applications (Springer) and the ACM Transactions on Modeling and Performance Evaluation of Computing Systems.

Currently he is a professor at the Federal University of Rio de Janeiro, COPPE, Systems Engineering and Computer Science Department. In 2008, he received the medal of the National Order of Scientific Merit from the President of Brazil. In 2012 he received the first “Highlight Award” for his scientific contributions in the area of Computer Networks and many services to the Computer Network community in Brazil, Brazilian Computer Society. In 2017 he was recipient of the title "Builders of the Internet.br", granted by the National Education and Research Network, in recognition of its essential role and important contribution in the construction and development of the Brazilian Academic Network and the Internet Brazil. He is a member of the Brazilian Academy of Sciences and the National Academy of Engineering (Brazil).

His areas of interest include the modeling and analysis of computer systems and communication multimedia networks, Machine Learning and network monitoring/measurements.