

By Randy Bush for participation in the ICANN
Second Security, Stability, and Resiliency of the DNS (SSR2)
Review Team

An ex-compiler writer, realtime kernel hacker, and a software engineering manager, I have almost 50 years in the computer industry. I have been a user and occasional implementer of networking from the ARPANET to the current day Internet.

I have three and a half full-time jobs:

- I work as a Research Fellow at [Internet Initiative Japan Research Lab](#), where I do routing research, Internet measurement, and security.
- Through Dragon Research Labs, I do routing security protocol design and implementation.
- Also through Dragon Research Labs, I am chief cat herder for the [CrypTech Project](#), and open source HSM design effort.
- I have been involved for over 25 years with the deployment and integration of appropriate networking technology in the developing world. I was founder and an original PI for the [Network Startup Resource Center, originally an NSF sponsored pro bono effort](#). I gave a [speech](#) on my motivations at Rhodes University in April 2002.

I spent a bit over a year at AT&T doing global Internet architecture and research, but I was just not telphat material. I gained considerable network operational experience as as the founding engineer at [Verio](#), a backbone provider, from which I graduated in 2001 as VP of IP Networking after five years. Before that, I was the principal engineer of RAINet, Oregon's and Washington's premier ISP, which was Verio's first acquisition.

Community Service

- I helped found and organize a number of operators' fora and RIRs: [NANOG](#), [Afnog](#), [Afrinic](#), [ARIN](#), etc.
- I have served on many TPCs and conference organizations.
- I spent many years in the IETF in service roles and [co-]authored far too many Internet-Drafts and RFCs. For a curmudgeonly view see [here](#)
- I participated in a number of computer language standards efforts. E.g. For a decade, I led the US Modula-2 language standards efforts. I do not recommend the language as murdered by the international effort, [as well documented](#) by Pat Terry, though N Wirth's original designs have withstood the tests of time.
- I authored, but did not design, the basic [FidoNet protocol standard](#).

Publications

D. Hauweele, C. Pelsser, R. Bush, and B. Quoitin, [What do parrots and BGP routers have in common?](#) Computer Communications Review, pp. 1-6, Jun. 2016.

D. Hauweele, B. Quoitin, C. Pelsser, R. Bush [The Origin of BGP Duplicates](#), [CoRes 2016](#)

Thomas Holterbach, Cristel Pelsser, Randy Bush, Laurent Vanbever [Quantifying Interference between Measurements on the RIPE Atlas Platform](#), 2015 ACM Internet Measurement Conference.

Philipp Richter, Mark Allman, Randy Bush, Vern Paxson. [A Primer on IPv4 Scarcity](#), ACM SIGCOMM Computer Communication Review April 2015. Invited paper at SIGCOMM 2015. Not peer reviewed.

Daniele Iamartino, Cristel Pelsser, Randy Bush. [Measuring BGP Route Origin Registration and Validation](#), PAM 2015.

Josh Bailey, Dean Pemberton, Andy Linton, Cristel Pelsser, Randy Bush. [Enforcing RPKI-Based Routing Policy on the Data Plane at an Internet Exchange](#) Poster at HotSDN 2014.

Nejc Skoberne, Olaf Maennel, Iain Phillips, Randy Bush, Jan Zorz, and Mojca Ciglaric, [IPv4 Address Sharing Mechanism Classification and Tradeoff Analysis](#), IEEE/ACM Transactions On Networking April 2014.

C. Pelsser, L. Cittadini, S. Vissicchio, and R. Bush, [From Paris to Tokyo: On the Suitability of Ping to Measure Latency](#), 2013 Internet Measurement Conference.

Simon Knight, Hung X Nguyen, Iain Phillips, Olaf Maennel, Randy Bush, Nickolas Falkner, Matthew Roughan, [An Automated System for Emulated Network Experimentation](#), ACM CoNEXT 2013.

Olaf Maennel, Iain Phillips, Debbie Perouli, Randy Bush, Rob Austein, and Askar Jaboldinov, [Towards a Framework for Evaluating BGP Security](#), CSET'12, 5th Workshop on Cyber Security Experimentation and Test.

Kenjiro Cho, Cristel Pelsser, Randy Bush, Youngjoon Won, [The Japan Earthquake: the impact on traffic and routing observed by a local ISP](#), ACM CoNEXT 2011 Special Workshop on the Internet and Disasters. December 6, 2011.

M. Roughan, W. Willinger, O. Maennel, D. Perouli, and R. Bush, [10 Lessons from 10 Years of Measuring and Modeling the Internet's Autonomous Systems](#), IEEE Journal on Selected Areas in Communications, Vol. 29, No. 9, Oct. 2011.

Cristel Pelsser, Olaf Maennel, Pradosh Mohapatra, Randy Bush, and Keyur Patel, [Route Flap Damping Made Usable](#), in PAM 2011, March 2011.

Luca Cittadini, Wolfgang Mühlbauer, Steve Uhlig, Randy Bush, Pierre Francois, Olaf Maennel, [Evolution of Internet Address Space Deaggregation: Myths and Reality](#), in IEEE Journal on Selected Areas in Communications, Vol. 28, No. 8, October 2010.

Hung Nguyen, Matthew Roughan, Simon Knight, Nick Falkner, Olaf Maennel, Randy Bush, [How to Build Complex, Large-Scale Emulated Networks](#), The 6th International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities, Berlin, Germany, May 2010.

R Bush, O Maennel, M Roughan, S Uhlig [Internet Optometry: Assessing the Broken Glasses in Internet Reachability](#), ACM SIGCOMM Internet Measurement Conference, November 2009. [[in Japanese](#)]

Anja Feldmann, Luca Cittadini, Wolfgang Mühlbauer, Randy Bush, Olaf Maennel, [HAIR: Hierarchical Architecture for Internet Routing](#), in Proceedings of Workshop on Rearchitecting the Internet, December 2009.

Bellovin, S.M., Bush, R. [Configuration Management and Security](#), IEEE Journal on Selected Areas in Communications, Volume 27, Issue 3, April 2009 Page(s):268 - 274

Zheng Zhang, Ying Zhang, Y. Charlie Hu, Z. Morley Mao, Randy Bush [*iSPY: Detecting IP Prefix Hijacking on My Own*](#), ACM SIGCOMM 2008.

Randy Bush; James Hiebert; Olaf Maennel; Matthew Roughan; Steve Uhlig, [*Testing the reachability of \(new\) address space*](#), Proc. of ACM SIGCOMM workshop on Internet Network Management, Kyoto, Japan, August 2007.

Feng Wang, Z. Morley Mao, Jia Wang, Lixin Gao, and Randy Bush, [*A Measurement Study on the Impact of Routing Events on End-to-End Internet Path Performance*](#), *Proceedings of ACM SIGCOMM 2006*.

James Hiebert, Peter Boothe, Randy Bush and Lucy Lynch, [*Determining the Cause and Frequency of Routing Instability with Anycast*](#) Asian Internet Engineering Conference (AINTEC) 2006;

Matthew Roughan, Jun Li, Randy Bush, Zhuoqing Mao and Timothy Griffin, [*Is BGP Update Storm a Sign of Trouble: Observing the Internet Control and Data Planes During Internet Worms*](#), by *Proceedings of SPECTS 2006*.

Jun Li, Randy Bush, Z. Morely Mao, Timothy Griffin, Matthew Roughan, Daniel Stutzbach, Eric Purpus. [*Watching Data Streams Toward a Multi-Homed Sink Under Routing Changes Introduced by a BGP Beacon*](#). Conference on Passive and Active Measurements ([*PAM 2006*](#)), Adelaide, Australia, 2006. "Lecture Notes in Computer Science" Springer-Verlag.

Randy Bush, [*Editorial zone: Into the Future with the Internet Vendor Task Force: a very curmudgeonly view, or testing spaghetti*](#), ACM SIGCOMM Computer Communication Review Volume 35 Issue 5, October 2005.

Steven M. Bellovin, John Ioannidis, and Randy Bush. [*Position Paper: Operational Requirements for Secured BGP*](#). DHS Secure Routing Workshop, March 2005.

Randy Bush, Timothy G. Griffin, Z. Morley Mao, Eric Purpus, and Dan Stutsbach, [*"Happy Packets: Some Initial Results"*](#) IEEE INFOCOM 2005

Lan Wang, Xiaoliang Zhao, Dan Pei, Randy Bush, Daniel Massey, Allison Mankin, S. Felix Wu, Lixia Zhang, [*"Protecting BGP Routes to Top Level DNS Servers"*](#), bibl. In Collection: "Proceedings of the 23rd International Conference on Distributed Computing Systems."

Randy Bush, and Timothy G. Griffin, [*Integrity for Virtual Private Routed Networks*](#), [*INFOCOM 2003*](#).

Soon-Tee Teoh, Kwan-Liu Ma, S. Felix Wu, Dan Massey, Xiao-Liang Zhao, Dan Pei, Lan Wang, Lixia Zhang, Randy Bush, [*Visual-based Anomaly Detection for BGP Origin AS Change \(OASC\) Events*](#) DSOM, October 2003.

Z. Morley Mao, Randy Bush, Timothy G. Griffin, Matthew Roughan, [*BGP beacons*](#). In *Proceedings of the 2003 ACM SIGCOMM conference on Internet measurement*.

Lan Wang, Xiaoliang Zhao, Dan Pei, Randy Bush, Daniel Massey, Allison Mankin, S. Felix Wu, Lixia Zhang, "Observation and analysis of BGP behavior under stress", bibl. In ACM SIGCOMM Internet Measurement Workshop, (2002). proceedings presented of Collection: , "Proceedings of the second ACM SIGCOMM Workshop on Internet measurement" S. Bellovin, R. Bush, T. Griffin, J. Rexford, [*Slowing routing table growth by filtering based on address allocation policies*](#), unpublished, June 2001.

Stephen Ruth , Randy Bush, [*Leveraging decision-making tools in capacity building planning*](#) in *Information Technology for Development* Volume 8 Issue 1, August 1998.

Randy Bush, [*FidoNet: technology, tools, and history*](#), *Communications of the ACM* Volume 36 Issue 8, August 1993.