1 Facilities at USC/ISI

The University of Southern California's *Information Sciences Institute* (USC/ISI) is a unique academic research center with extensive experience blending basic and applied research through exploratory system development. USC/ISI has a distinguished history of producing exceptional research contributions and successful prototype systems funded by a variety of government agencies.

USC/ISI's *Networking and Cybersecurity Division* (NCD) has a 40 year history of leadership in network research. It played major roles in such areas as specifying the basic Internet protocol suite, developing the Domain Name System, research on networked multimedia, integrated services, network security, active networks, virtual networks, sensor networks, Internet topology, optical networks, and space networking. ISI is also part of USC's Viterbi School of Engineering, and ISI staff frequently teach and advise students in the Computer Science and Electrical Engineering departments.

ISI's NCD operates a number of laboratories. The *Postel Center for Experimental Networking* provides laboratory space for visiting students and scholars. *DETERlab* is the first site in the Cyber Defense Technology Experimental Research testbed, with a 691-node testbed for security research with a programmable router fabric, with a deployment spanning USC/ISI, USC's main campus, and UC Berkeley, including support for Software-Defined Networking experiments. The *ANT Lab* (Analysis of Networking Traffic) carries out 24x7 monitoring of the IPv4 Internet for outages and supports over a petabyte of datasets with offsite backup. We also operate a 440-core/220 TB Hadoop cluster allowing big-data processing with hardware-level control, and 1.6 PB of RAID storage with off-site backup. The ANT lab shares research data: as of Dec. 2020, we have distributed 2194 datasets (402 TB of data compressed, 1.3 PB if uncompressed) to 452 researchers in 327 different organizations.

USC operates *b.root-servers.net*, one of the 13 root DNS nameservers, as a service for the Internet. Started when DNS was invented at USC/ISI, USC/ISI's root name server is currently operated collaboratively by the USC/ISI networks division and USC's Information Technology Services and is hosted at USC and 5 other sites spread geographically around the globe. All sites use a cluster of computers for performance and robustness. Our operation includes integrated measurement facilities in support of operation, and a dedicated 192-core Hadoop cluster. While recognizing the server's top priority is providing an operational service for the Internet, *b.root-servers.net* also serves as research infrastructure, supporting safe and privacy-sensitive experimentations and analysis.

USC/ISI has rich Internet connectivity, with OC-48c (2.4 Gb/s) connectivity between sites in L.A. and Virginia, dark fiber and 10 Gb/s connectivity to USC's downtown campus, and also Internet peerings through CALREN2 and Internet2/Abilene. In addition, USC's Distance Education Network supports remote education with multiple studios for class material's broadcast and webcast.