The Infomom of Cybersecurity

An Inquisitive Mind and the Drive to Succeed

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It is a truly special individual who can call the D/DIRNSA's office, announce that the D/DIRNSA needs to meet with her, and have the meeting the next day. D/DIRNSA Chris Inglis held Ms. Rebecca "Becky" Bace in such professional regard that he would clear his usually jam-packed calendar to see her if she felt he must.

The computer security fraternity lost one of its finest on March 14, 2017, with the passing of Becky Bace. Lovingly referred to as "Infomom" by her numerous professional associates, the description accurately embodies the care and understanding with which she approached solutions to computer security challenges for over 30 years. Under her direction, the National Security Agency played a significant role in the maturation of the discipline of computer misuse and anomaly detection (MAD).

"Infomom," the nickname, originated during one of her frequent visits to Purdue University, and it became a lasting term of endearment Becky wore with pride. On this particular visit she was introduced to her audience by longtime friend and collaborator Dr. Eugene H. "Spaf" Spafford of Purdue, as the "Den mother of information security" in recognition of her ability to bring people together to provide practical solutions to complex security problems. That day several other speakers picked up on the moniker and Becky embraced the introduction with her characteristic good humor. Before long she would be known far and wide as "Infomom", and through the years incorporate the term into many of her email addresses and user names.

Rebecca "Becky" Bace and her mentor, colleague and friend Eugene H. Spafford, PhD Purdue University. Photo courtesy of Eugene H. Spafford

"Infomom" was born in Birmingham, Alabama, in 1955 to a father who was a WWII veteran and a mother with lineage to Japanese aristocracy. The family soon relocated to a farm near Leeds, Alabama. Having been eyewitnesses to the devastation of WWII, Becky's parents were committed to raising children who would be self-sufficient. At an early age, she learned practical mechanical and electrical

troubleshooting skills to help her parents sustain the farm business. Her father would depend upon her natural mathematical skill to calculate the amount of ammonium nitrate needed as an accelerant for the dynamite he used to clear the land, leading her to a lifelong curiosity with all things explosive.

As a young woman, Becky was determined to become a physician despite an economic situation that made it impossible for her parents to pay college tuition. By 1973, Becky's resoluteness toward her goal led her to the University of Alabama, Birmingham (UAB) on a full scholarship awarded her by the Teamsters Union. Upon arrival at UAB, she learned an earlier diagnosis of epilepsy automatically disqualified her from the career of her dreams so she enrolled in the medical records program at the school.

Having easily completed "the course of dread," Pre-Calculus, as a part of her medical records studies, she rediscovered a passion for mathematics. A quick consultation with a campus guidance counselor led to a change in major to engineering. She had been advised to speak with the engineering department because, "...the token woman in the engineering program just graduated and they've been looking for somebody else...." This was the first but not the last of many times Becky would confront, and conquer, the prejudice of her times. Medicine's loss became computer security's gain.

Low on scholarship funds and still a little short of an engineering degree, Becky accepted a position with a local Alabama division of Xerox as a field technician, with a promise of future tuition assistance from the company. At a Xerox training course in Virginia, she would meet her future husband, Paul Bace, who was employed by Xerox in Maryland. Before long, Becky transferred to Baltimore and in 1982 they married. Becky went on to finish her Engineering degree at Regents College and also earn an MS degree in Engineering Sciences before leaving Xerox for employment with a small local civil engineering firm providing Information Technology support. Through this job, her interest in the burgeoning field of computers emerged.

One day in 1983, as she leafed through Byte Magazine, she spotted a rather non-descript advertisement seeking technology professionals. Becky submitted both her and her husband's resumes for consideration. Her husband was hired by the National Security Agency (NSA) the following January, and he went to work to convince Becky to accept an offer she received a short time later. He told her, "You remember those people we went to school with who, on the one hand, could do really difficult differential calculations in their head in real time, but on the other hand, could not chew gum and walk down the hall without running into the wall? The place is crawling with them. You have to work here."

Becky's career in national security was about to begin.

Becky Bace's career at NSA spanned twelve years and, although her initial assignment at NSA was a poor match for her talents, she would soon receive awards for her computer programming support to operations and before long join the National Computer Security Center (NCSC). It was during this time, she would go on to say that her son's multiple health issues required her to develop an ability to think "much more expansively about general problems (and solution) spaces than I might have done otherwise." Her ability to see the bigger picture, often concealed by a myriad of technical details and theory, would pay dividends as she became increasingly interested in the development of computer misuse and anomaly (MAD) tools.

At the NCSC Becky was introduced to James P. Anderson's theoretical work on the use of computer internal audit systems as a basis for MAD tools. Anderson soon became not only a professional colleague of Becky's, but a mentor to her as well. Becky's tenure at the NCSC was marked by her strong advocacy for those inside and outside of the government with innovative ideas, especially women and minorities.

By 1989, Becky was responsible for the University Research Funding (URF) Program at the NCSC. Recognizing that theory which lacked real-world application was a hard sell to practitioners on the front lines of computer defense, she relied upon her "can do" attitude, a result of her own farm upbringing, and visited agricultural-engineering schools that traditionally emphasized workable solutions to real-life challenges. Eventually Purdue University, the University of California-Davis, M.I.T., Tulane and the University of New Mexico, among many others, would become beneficiaries of Becky's vision and the URF program.

Colleagues noted Becky's passion for intrusion detection solutions and teased that she was acting like an entrepreneurial CEO with funding. Actively managing the URF research funding at her disposal, she guided academic research and served as a force behind the movement of MAD from a reactive discipline in the early 1990s to the predictive practice it has become today. As a financial advocate for promising research at the NCSC, she helped orchestrate the conversion into product of many new security tools, including the Distributed Intrusion Detection System, and the Intrusion Detection Expert System—major leaps in the incorporation of predictive analysis into intrusion detection. Another product, Multics Intrusion Detection and Alerting System, was used to protect NSA's first public access unclassified internet system, DOCKMASTER, in 1987-88 and the first unclassified NSA logistics system, HAYSTACK.

Former NSA attorney Richard Marshall remembered Becky as the determined force behind NSA's first attempt at demonstrating the vulnerability of U.S. Government computers to hacking during ELIGIBLE RECEIVER 97. Working closely with Marshall to obtain Office of General Counsel (OGC) approval for the operation and procedures, Becky personally educated the attorney on the intricacies of computer intrusion. Once OGC approval was obtained, Becky took it upon herself to ensure every NSA operator walked the very narrow path of legal constraints throughout the entire operation. Marshall credited Becky with building the confidence between the operations organization and OGC necessary to make the operation a legal and NSA operational success.

Becky left NSA in 1996 in search of a change in environment after the passing of her son; she accepted an opportunity to work computer security initiatives at Los Alamos Laboratory. Finding Los Alamos to be heavily focused on theory and unable to satiate her need for the practical, she soon left the government altogether. After a short stint at CyLink, she co-founded Infidel.net with her friend Terri Gilbert to provide computer security consulting services for technology startup companies during the economic boom of the late 1990s.

Becky later provided technical advice during the evaluation of potential cybersecurity products under consideration as a venture partner for Trident Capital. Her final professional position was Chief Strategist in the Center for Forensics and IT Security at the University of South Alabama.

Becky is the author of a seminal work on computer security, Intrusion Detection (2000). Her book garnered praise from the likes of Gene Kim, then the Chief Technology Officer, Tripwire Security Systems, Inc. who stated, "Becky's book grounds the intrusion detection discussion in a way that is

readable, informative, and practical." In 2002 she co-authored a second book with attorney Fred Chris Smith. A Guide to Forensic Testimony allowed her to indulge her passion as an expert computer forensics trial witness and provide valuable advice to those who might follow in her footsteps.

"Infomom" leaves behind a legacy as a cybersecurity visionary with an entrepreneurial spirit and a heart for helping others. Her mentorship of computer security students, ability to bring theorists together with practitioners, and her talent for integrating diverse interests into a single vision provided an environment in which innovation could thrive. Although it is the theorists who compose the music of technology, and the practitioners who play the notes, it takes a conductor to give the technology symphony life. In the world of computer intrusion detection and cybersecurity, Becky Bace will always be remembered as a virtuoso.