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Gatekeeping Out Of The Box: Open Source Software As a Mechanism to Obtain Reliability For Digital Evidence

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[1] Patent Assess tools and reports analyzing Apple Inc.'s utility patents that accompany the presentation "Software Patents: Overview and Recent Developments" (Patent Assess, LLC, 2011) (Patent Assess, 2011) (Patent Assess, 2011a) (Patent Assess, 2011b) (Patent Assess, 2011c) (Patent Assess, 2011d) (Patent Assess, 2011e) (Patent Assess, 2011f) (Patent Assess, 2011g) (Patent Assess, 2011h) (Patent Assess, 2011i) (Patent Assess, 2011j) (Patent Assess, 2011k) (Patent Assess, 2011l) (Patent Assess, 2011m) (Patent Assess, 2011n) (Patent Assess, 2011o) (Patent Assess, 2011p) (Patent Assess, 2011q) (Patent Assess, 2011r) (Patent Assess, 2011s) (Patent Assess, 2011t) (Patent Assess, 2011u) (Patent Assess, 2011v) (Patent Assess, 2011w) (Patent Assess, 2011x) (Patent Assess, 2011y) (Patent Assess, 2011z) (Patent Assess, 2011aa) (Patent Assess, 2011ab) (Patent Assess, 2011ac) (Patent Assess, 2011ad) (Patent Assess, 2011ae) (Patent Assess, 2011af) (Patent Assess, 2011ag) (Patent Assess, 2011ah) 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[82] 71 AM. JUR. TRIALS 111 & 118 (1999).

[83] *See, e.g.*, Ted Bridis, *Microsoft Acknowledges Its Engineers Placed Security Flaw in Some Software*, WALL ST. J., April 14, 2000, *available at* http://www.slashdot.org/articles/00/04/14/0619206.shtml (reporting, "Microsoft Corp. acknowledged Thursday that its engineers included in some of its Internet software a secret password -- a phrase deriding their rivals at Netscape as 'weenies' -- that could be used to gain illicit access to hundreds of thousands of Internet sites world-wide. [...]").

[84] *See generally infra* note 92.

[85] Interview with Thomas Oliver, Security Manager at SAIC (Jan. 15, 2001); series of interviews with Tom Perrine, Manager of Networking and Security at the San Diego Supercomputer (Fall 2000).

[86] *See generally* Kenneally, *supra* note 28; CEM KANER AND DAVID PELS, BAD SOFTWARE (1998).

[87] *See,* TITLE, *available at* http://www.netaction.org/opensrc/(date) (offering a qualitative listing of Open Source commentary and leading projects).

[88] TRUST IN CYBERSPACE, *supra* note 11 at 72.

[89] *See* Alan Cox, *The Risks of Closed Source Computing*, *available at* http://www.osopinion.com/Opinions/AlanCox/AlanCox1.html; interview with Thomas Oliver, Security Manager at SAIC (Jan. 15, 2001).

[90] TRUST IN CYBERSPACE, *supra* note 11 at 72.

[91] *Id*.

[92] *See generally*, *Impact of the New Federal Rules of Discovery on Evidence Practice*, CONTINUING EDUCATION OF THE BAR CALIFORNIA, Business Professional's Network, B-119-154 (January 26, 2001).

[93] *See* U.S. v. Tank, 200 F.3d 627 (9th Cir. 2000); Wisconsin v. Schroeder 613 N.W.2d 911 (2000).

[94] *See generally*, CERT/CC- Computer Emergency Response Team / Coordination Center, *at* http://www.cert.org/; Security Alert for Enterprise Resources, *at* http://www.safermag.com/; Security Focus, *at* http://www.securityfocus.com; Bugtraq, at http://www.bugtraq.securepoint.com; SANS Security Digest Services, *at* http://www.sans.org/newlook/digests/SAC.htm; Attrition, *at* http://www.attrition.org; Microsoft Technical Updates, Microsoft Security Bulletins, *at* http://www.microsoft.com/technet/security.

[95] *See, e.g.*, Peter Sommer, *Computer Forensics- An Introduction*, http://www.virtualcity.co.uk/vcaforens.htm (last visited March 2, 2001).

[96] TRUST IN CYBERSPACE, *supra* note 11 at 67.

[97] *Id*. at 65, 67.

[98] *Id*.

[99] *See* Sommer, *supra* note 94.

[100] *See* Raymond, *supra* note 7 at 17-18.

[101] *See, e.g.*, IEEE Syslog Project, Institute of Electrical and Electronics Engineers (IEEE) (visited June 3, 2000) http://standards.ieee.org/reading/ieee/std/se/12207.0-1996.pdf; *See*, *generally*, http://www.dacs.dtic.mil/databases/url/key.hts?keycode=2:2450&islowerlevel=1 for a list of education, training and conferences aimed improving software reliability. Most notably is ISACC (International Software Assurance Certification Conference), which aims to "bring together the best minds in the nation to address the growing concerns with software quality, reliability, and security" http://www.cigital.com/ISACC99/mission.html.

[102] Note, FRE 901(b) consists of illustrations of ways to authenticate evidence. These are only illustrative and not meant to limit the ways authentication can be accomplished. USCS FRE R. 901 (2000) Article IX. Authentication and Identification.

[103] *See* § II.B.4.a.ii (discussing black box testing), *supra.*

[104] *See* § II.B.3.d.*iii, supra*.

[105] Raymond, *supra* note 7 at 20. *See generally* Bruce Perens, The Open Source Definition, in Open Sources: Voices from the Open Source revolution, O'Reilly and Associates, Inc. (1999) http://eon.law.harvard.edu/property00/alternatives/reading4.htm for a more thorough analysis of the Open Source definition and model).

[106] *See* § II.A.1.b (discussing interoperability, error recovery (bug avoidance and fixing), efficiency, quality, etc.), *supra*.

[107] *See* Jonathan Eunice, Beyond the Cathedral and the Bazaar (May, 1998) http://www.illuminata.com/public/content/cathedral/intro.htm.

[108] See David Goodstein, "*How Science Works*" REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 2nd Edition, Federal Judicial Center (2000) http://air.fjc.gov/public/fjcweb.nsf/pages/74 (viewed February 23, 2001).

[109] *Id.*

[110] *See, e.g.*, Bruce Schneier, *Are We Ready for a Cyber-UL?,* ZDNet News Commentary (January 2, 2001) http://www.zdnet.com/zdnn/stories/comment/0,5859,2669708,00.html.

[111] *See* Oliver Cole, *White-Box Testing*, DR. DOBB'S JOURNAL (March 2000) http://www.ddj.com/articles/2000/0003/0003a/0003a.htm; *see generally*, Boris Beizer and Van Nostrand Reinhold, SOFTWARE TESTING TECHNIQUES, Second Edition, (1990) ISBN 1850328803

[112] *Id*.

[113] *Id*.

[114] *Id*. *See also* Murray Wood, *et al.*, *Comparing and Combining Software Defect Detection Techniques: A Replicated Empirical Study*, PROCEEDINGS OF THE 6TH EUROPEAN CONFERENCE HELD JOINTLY WITH THE 5TH ACM SIGSOFT SYMPOSIUM ON SOFTWARE ENGINEERING (1997).

[115] *See* § II.B.3.c, *infra*.

[116] Chesterene Cwiklik, *Evaluating Significance and Validity When There Are No Hard Numbers,* NATIONAL CONFERENCE ON SCIENCE AND THE LAW, San Diego, CA (October 11, 2000) at 5.

[117] The author bases this statement on the cumulative discussions with computer science professionals both at the San Diego Supercomputer Center and within industry.

[118] *See* http://www.ceu.fi.udc.es/opensource.org-mirror/docs/products.html.

[119] Reliability testing here was as measured by occurrence of hangs (loops indefinitely) or crashes with a core dump of Open Source GNU and Linux software as compared to commercial software. Specifically, the failure rate of public GNU utilities was lowest in study at 6% versus 15-43% for utilities on commercial versions of UNIX from 5 vendors. ftp://grilled.cs.wisc.edu/technical_papers/fuzz-revisited.pdf.

[120] *See* Todd Weiss, *Microsoft to Expand Windows source-code sharing program,* COMPUTERWORLD (February 2, 2001) http://www.computerworld.com/cwi/stories/0,1199,NAV47-68-84-88-93_STO57316,00.html.

[121] *See Recommendations of the Panel on Open Source Software for High End Computing*, PRESIDENT'S INFORMATION TECHNOLOGY ADVISORY COMMITTEE (September, 2000). *See, generally,* Marcus Maher, *Open Source Software: The Success of an Alternative Intellectual Property Incentive Paradigm*, 10 FORDHAM I.P., MEDIA & ENT. L.J. 619 (Spring 2000).

[122] *See* § II.A.1.b, *supra*.

[123] FED. R. EVID 702: If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

[124] *See, e.g.,* U.S. v. Jones, 107 F.3d 1147 (6th Cir. 1997) (admitting handwriting examiner testimony based on years of practical experience, training, and his detailed explanation of his methodology); Tassin v. Sears Roebuck, 946 F.Supp. 1241, 1248 (M.D.La. 1996) (admit ting testimony of design engineer when opinion based on facts, reasonable investigation, traditional technical/mechanical expertise, and a reasonable link between the information and conclusions).

[125] *Kumho,* 526 U.S. at 1178.

[126] Samuel Guiberson, *Panel IV. Scientific and Demonstrative Evidence, Is Seeing Believing*? PROCEEDINGS- NATIONAL CONFERENCE OF SCIENCE AND THE LAW at 163 (July 2000).

[127] *Lugashi*, 205 Cal. App. 3d 632.

[128] *Id.* at 640.

[129] *Id.*

[130] *Id.*

[131] *See* U.S. v. Tank, 200 F.3d 627 (9th Cir. 2000); Wisconsin v. Schroeder, 2000 WL 675942.