

Notes for December 3, 1999

1. Greetings and Felicitations!
2. Puzzle of the Day
3. Ideal: program to detect malicious logic
 - a. Can be shown: not possible to be precise in most general case
 - b. Can detect all such programs if willing to accept false positives
 - c. Can constrain case enough to locate specific malicious logic
 - d. Can use: writing, structural detection (patterns in code), common code analyzers, coding style analyzers, instruction analysis (duplicating OS), dynamic analysis (run it in controlled environment and watch)
4. Best approach: data, instruction typing
 - a. On creation, it's type "data"
 - b. Trusted certifier must move it to type "executable"
 - c. Duff's idea: executable bit is "certified as executable" and must be set by trusted user
5. Practise: Trust
 - a. Untrusted software: what is it, example (USENET)
 - b. Check source, programs (what to look for); C examples
 - c. Limit who has access to what; least privilege
 - d. Your environment (how do you know what you're executing); UNIX examples
6. Practise: detecting writing
 - a. Integrity check files *à la* binaudit, tripwire; go through signature block
 - b. LOCUS approach: encipher program, decipher as you execute.
 - c. Co-processors: checksum each sequence of instructions, compute checksum as you go; on difference, complain
7. Network security
 - a. Main point: just like a system
8. Review of ISO model
9. Authentication protocols
 - a. Kerberos
10. PKI
 - a. Certificate-based key management
 - b. X.509 model, other models
11. PEM, PGP
 - a. Goals: confidentiality, authentication, integrity, non-repudiation (maybe)
 - b. Design goals: drop in (not change), works with any RFC 821-conformant MTA and any UA, and exchange messages without prior interaction
 - c. Use of Data Exchange Key, Interchange Key
 - d. Review of how to do confidentiality, authentication, integrity with public key IKs
 - e. Details: canonicalization, security services, printable encoding (PEM)
 - f. PGP v. PEM