

ACT

Useful Books

- Programming in Ada 95
 - by John Barnes (Addison Wesley)
- High Integrity Ada: The SPARK Approach by John Barnes (Addison Wesley)
- **Object-Oriented Software Construction**
 - by Bertrand Meyer (Prentice Hall)
- Objects Unencapsulated: Java, Eiffel, and C++
 - by Ian Joyner (Prentice Hall)
- **C Traps and Pitfalls**
 - by Andrew Koenig (Addison Wesley)
- Effective C++
 - by Scott Myers (Addison Wesley)



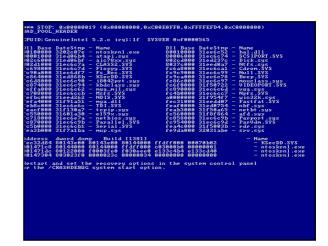
Relevant Links

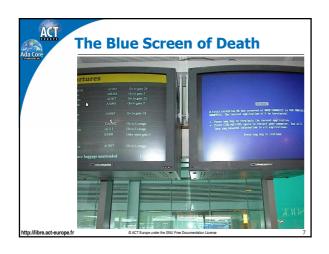
- http://www.fsf.org
 - The site of the GNU project and the Free Software Foundation
- http://libre.act-europe.fr
 - Interesting Free Software projects written in Ada 95
- http://www.adahome.com/Tutorials/Lovelace /lovelace.htm
 - Lovelace, on-line Ada 95 tutorial
- http://www.adaic.com/whyada/ada-vsc/cada_art.html
 - Comparing Development Costs of C and Ada

Software Dependability

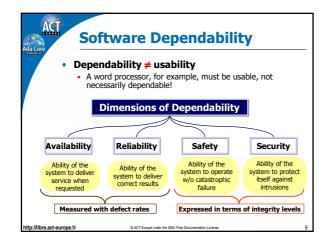
Degree of confidence that can be justifiably placed on the system to operate as expected and not to fail in normal use

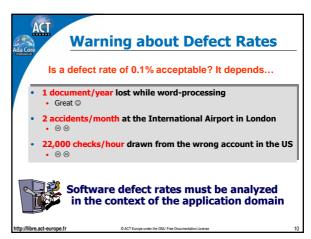
http://libre.act-europe.fr

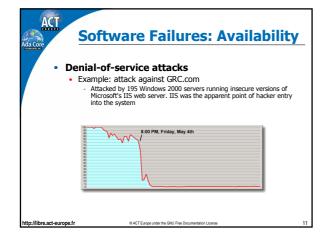


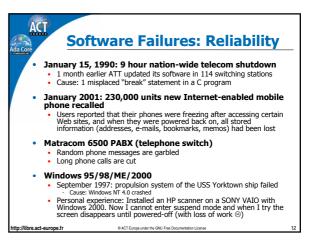














Software Failures: Safety

- 1986: Therac 25 radiation machine kills patients
 - Cause: poor testing of the software
- June 4, 1996: maiden flight of Ariane 5 failed: rocket destroyed
 - Cause: Code from Ariane 4 guidance system reused in Ariane 5 but not tested
- · 2000: Deadly accident in French highway
 - Cause: Software malfunction in car braking system. Car manufacturer acknowledges responsibility



Software Failures: Security

- November 2, 1988 Internet Worm
 - A self-replicating program was released upon the Internet

 - This program (a worm) invaded VAX and Sun computers running versions of Berkeley UNIX, and used their resources to attack still more computers.

 Within hours this program had spread across the U.S., infecting thousands of computers and making many of them unusable due to the burden of its activity.
 - Cause: undetected buffer overflow in C routine gets()
- Many more interesting virus stories (especially on Windows ...)

1 in 3 Software Projects **Doesn't Even Get There!**

- US Internal Revenue Service Modernization
 - \$4 Billion, dropped in early 1997
- FBI Fingerprint system
 - \$500 million, dropped
- Bell Atlantic 411
 - November 1996, outage, backed out of upgrade

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