Dependable Applications

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Fault Tolerance Challenges

- Dependable computing for the mass market in the presence of Murphy's Law.
    - Minimal human intervention. Transparent to the end user.
    - Shared/generic/standardized architectures. COTS.
    - Increased functionality. Reduced cost. Short time to market. High quality.
    - Certified systems. Modular certification. Generic correctness arguments.
    - Bring the cost down to automotive levels (from aviation levels)
- Arguments
    - Computer systems are becoming more pervasive; in home, in automobiles; throughout our life. They need to be inobtrusively dependable.
    - We can do more with silicon every year => we will try to do more with silicon every year.

Security-related challenges

- As computing becomes more and more pervasive, security must be attended to.

- Issues

  - Keeping the system up-to-date.

  - Certification of maintainers. Certification of changes.

  - Malicious changes by "trusted" agents.

  - Unauthorized changes.

Socio-economic challenges

- Pervasive computing raises new issues for society.
- Issues
  - Ethics -Who decides "failure" policy? On what basis? How much do you tell the end-user about policy decisions? About what can go wrong?
  - Privacy - Protection of information about the end user (or lack thereof).
  - Liability - A major issue for certain classes of dependable systems. If you make a system dependable and it fails what happens? If you *could* make a system dependable and you don't what happens?
  - Regulation - This can help to reduce liability issues, but at a cost. Is it worth it?