Building Trust and Confidence in Voting Systems

Panel on Specification, Testability, Accreditation and Qualification

NIST's Role in Standards and Testing
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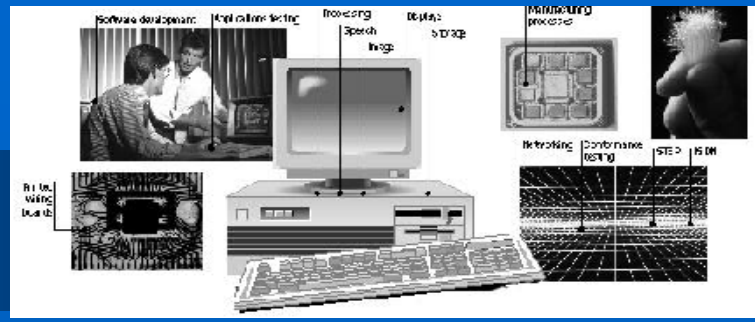
Today's Objectives

- Focus on the specification, testing, and certification processes
- Panel to address: various aspects, give perspectives
  - Informative and stimulus for discussion
  - Panel guidelines
- Open Discussion
  - Challenges and opportunities
  - Moving forward together
- NIST's Role in Standards and Testing
  - Overview of standards and testing, an IT perspective

Background



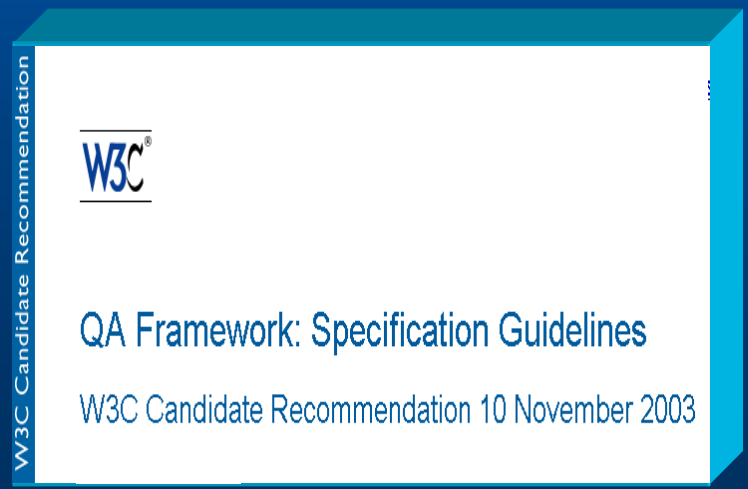
- NIST works with industry and Federal agencies to develop standards and tests to improve the quality of software and achieve interoperable solutions
- NIST has many years experience with
  - Formal standards organizations and Consortia
  - Developing conformance test suites, tools, reference implementations
  - Developing validation and certification testing programs

Good Specs are the Key

- Goal is correct, reliable software
- Requirements are captured in a specification
- Spec should be clear, unambiguous, complete, and testable
- Ideal spec would be defined in a formal language – not English

What Makes a Good Spec

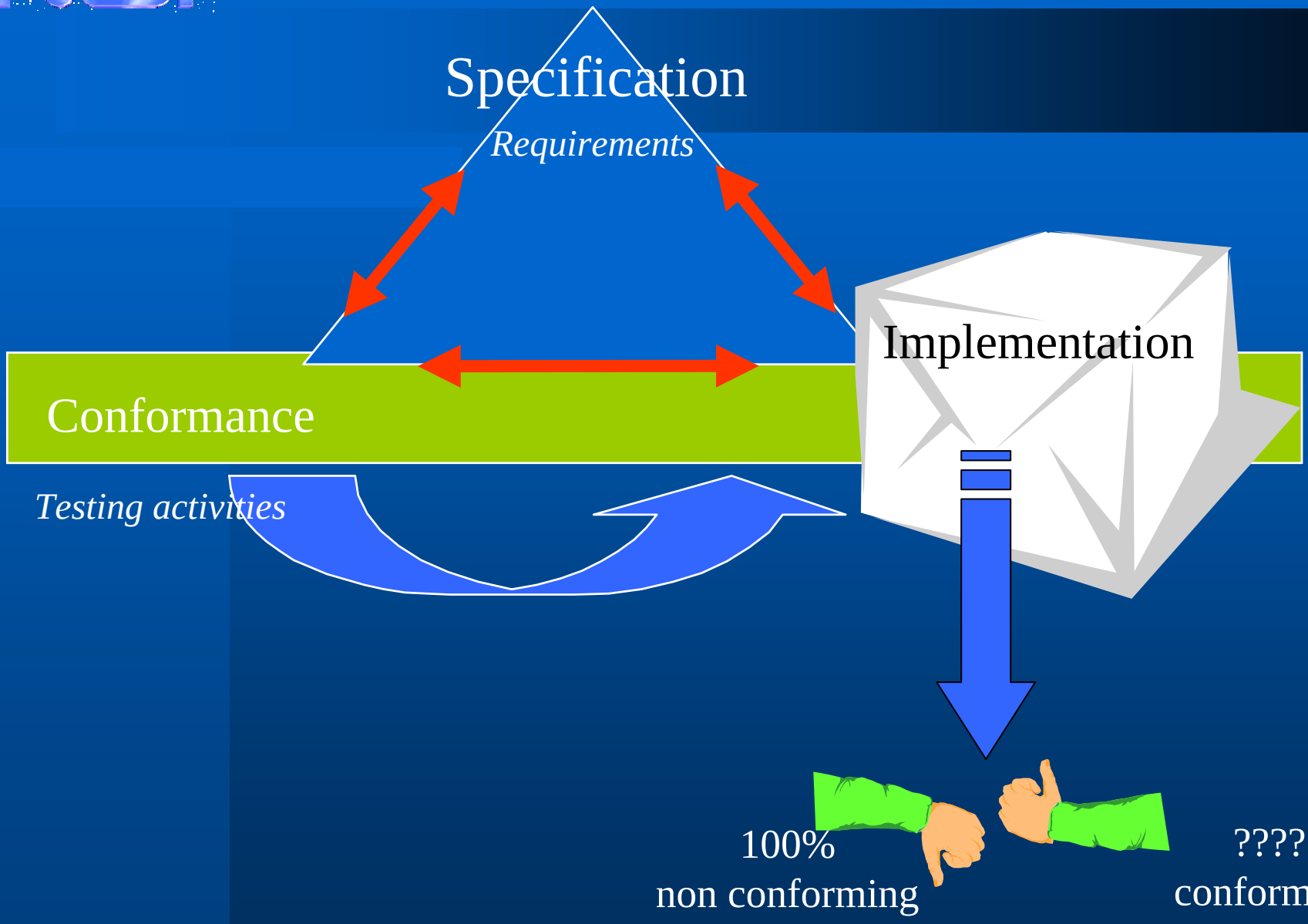
- NIST is working with W3C to define how a spec should be written
  - Addresses what a spec should contain with respect to conformance and testability
- Addresses:
  - How to define conformance
  - How to sub-divide a spec
  - Discretionary items
  - Extensions
  - Test assertions



Conformance Testing

- Methodology
  - Falsification testing
  - Find errors by means of experimentation
- Outcomes
  - Show presence of errors not their absence
  - Demonstrates non-conformance; can never prove conformance
- Issues
  - How much testing is enough?
  - How can we produce more tests with less resources?
- Early involvement improves quality of software

Moving Towards Trust and Confidence



Relevant NIST Efforts

- Automatic Test Generation From Formal Specs
- Automatic Test Generation using XML Technologies
- Software Component Integration Testing
- National Software Reference Library (NSRL) to determine whether software has been altered

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