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
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
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

Conformance

Testing activities

Specification

Requirements

Implementation

100% conforming

100% non conforming

???? conforming
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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