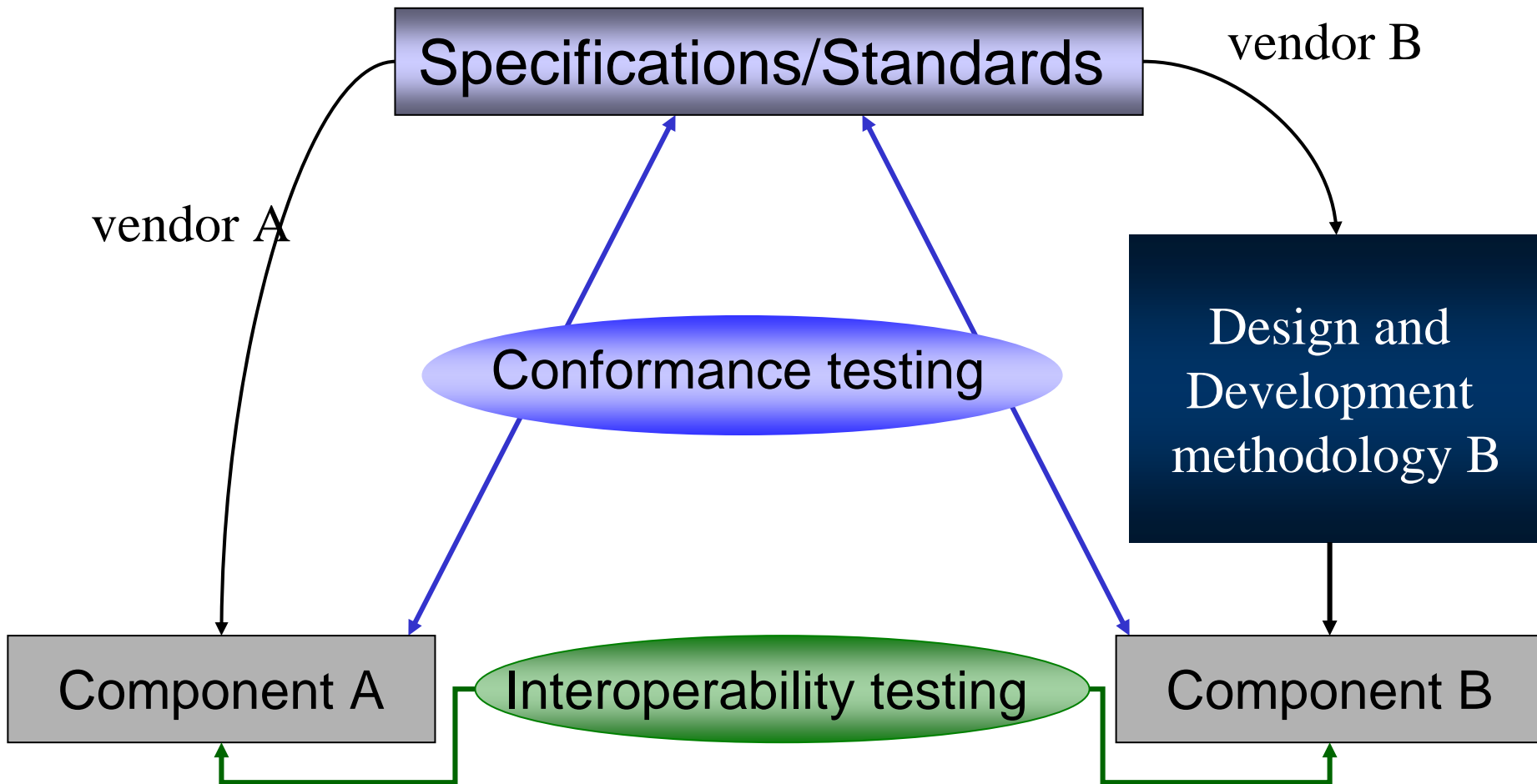

About interoperability testing

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Conformance versus interoperability testing



Why interoperability is important ?

- ❑ Interoperability is the **final goal** of any product developed in communicating systems area
- ❑ Interoperability has always been considered as a **critical feature in the Internet community**
- ❑ It is important to give to the market a strong signal **proving the interoperability degree** of various products

But...

- ❑ No agreement on a precise definition of interoperability and no unique standardized methodology for interoperability testing
- ❑ Different needs of interoperability (one-to-one, one-against-N, multi-party, etc.)
- ❑ Interoperability testing is considered as a pragmatic and practical ad-hoc requirement
- ❑ Conformance has been considered as a prerequisite for achieving interoperability
 - Effort has been concentrated on conformance testing (leading for instance to the existence of ISO-9646 framework)

Arguments in favor of interoperability testing methodology

- ❑ Some implementations may be considered conformant to their specification but may not interoperate with other implementations
 - Contradiction with the final goal of networks
- ❑ Some implementations may be considered not conformant to their specification but may interoperate with other implementations
 - What the end-user needs is interoperability, but does he want a product that doesn't realize what it is design for?

We need both conformance and interoperability
But, interoperability remains the main objective

Interoperability testing in the Internet: Internet Standards Process RFC-2026 [page 3]

- The goals of the Internet Standards Process are:
 - technical excellence;
 - **prior implementation and testing**;
 - clear, concise, and easily understood documentation;
 - openness and fairness; and
 - timeliness.
- ...
- These procedures are explicitly aimed at recognizing and adopting generally-accepted practices. Thus, **a candidate specification must be implemented and tested for correct operation and interoperability by multiple independent parties** and utilized in increasingly demanding environments, before it can be adopted as an Internet Standard.

Some issues: Dealing with "MAY, SHOULD" [RFC-2119]

- ❑ **SHOULD** This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- ❑ **MAY** This word, or the adjective "OPTIONAL", mean that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option **MUST** be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option **MUST** be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.)

Some other issues

- Interoperability test scenarios validation:
 - How to evaluate test coverage?
 - How to ensure that tests specification are correct?
- Test in practice:
 - Are executable tests correctly implemented?
 - What configurations, topologies?
 - Is the level of observation good enough?
 - What about the verdicts?
 - In case of multi-party testing, which component is guilty?

Interoperability testing: To make end-users more confident

- ❑ Providing precise/formal definitions of the notion of interoperability
- ❑ Providing a list of different interoperability testing architectures/configurations that can be used
- ❑ Defining associated methodologies for interoperability test generation

➤ Any existing interoperability test suite SHOULD indicate which notion of interoperability, which methodology and for which architectures, it is designed for



The IPv6 ready Logo Program

- ❑ Avoiding confusion in the mind of customers with a **unique program**
- ❑ Proving the **interoperability degree** of various IPv6 products
- ❑ Giving a **strong signal** to the market of IPv6 availability
- ❑ **Enhancing confidence** of users that IPv6 is currently operational



Interoperability testing procedure in the IPv6 Ready Logo Program Committee (the v6LC)

- ❑ Based mainly on interoperability testing results
- ❑ The ipv6ready-admin
 - Defining procedures and steps for the Logo Program
 - Giving the right to use the IPv6 logos for products
- ❑ The ipv6ready-tech
 - Test specification and test tools providing
 - Technical examination of applications



Interoperability Test specifications, Validation and updating

❑ Based on public validation

- The ipv6ready-tech identifies IPv6 protocols to be tested in the IPv6 Ready Logo and submits it to the ipv6ready-admin
- A group (IRISA, UNH-IOL, TAHI, TTA, NICI, BII) is in charge of providing test specification
- An internal review is done within the ipv6ready-tech
- The test specification is published for public review
 - Issues are resolved (either internally or after discussion with the IETF and the IPv6 Forum)
- The final version of test specifications are published on the IPv6ready Logo web-pages
- Test specifications may be updated giving other versions



Procedures for testing and steps for the Logo

- ❑ Based on self declaration mode
 - The applicant executes conformance and interoperability test suites based on the v6LC test specifications
 - Self-testing or during Interoperability events : IPv6 Plugtest (ETSI/Plugtest Service), Moonv6 (UNH-IOL) and TAHI IPv6 interoperability (TAHI project)
 - The applicant fills an Application Form and sends it to the v6LC with test results (log)
 - The technical group for the region (the local Logo officer) examines the application
 - IRISA->Europe, UNH-IOL->America, BII, NICI, TAHI and TTA->Asia
 - **Cross-checking are sometimes required**
 - If 100% PASS, the Logo officer requests the ipv6ready-admin for Logo attribution to the applicant



**You can trust in the
IPv6 ready Logo Program
Interoperability testing
methodology**

Thanks!

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