

## [Interoperability](#) [1]

Submitted by erinmr on Tue, 2013-01-15 14:46

“The capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units.” According to ISO/IEC 2382-01, Information Technology Vocabulary, Fundamental Terms

The IEEE (Institute of Electrical and Electronics Engineers) defines interoperability as: “the ability of two or more systems or components to exchange information and to use the information that has been exchanged.”

## Types of Interoperability

### Syntactic

“If two or more systems are capable of communicating and exchanging data, they are exhibiting syntactic interoperability. Specified data formats, communication protocols and the like are fundamental. In general, XML or SQL standards provide syntactic interoperability. This is also true for lower-level data formats, such as ensuring alphabetical characters are stored in ASCII format in both of the communicating systems.” Syntactical interoperability is a necessary condition for further interoperability. Source Syntactic interoperability: <http://en.wikipedia.org/wiki/Interoperability> [2]

### Semantic

“Beyond the ability of two or more computer systems to exchange information, semantic interoperability is the ability to automatically interpret the information exchanged meaningfully and accurately in order to produce useful results as defined by the end users of both systems. To achieve semantic interoperability, both sides must defer to a common information exchange reference model. The content of the information exchange requests are unambiguously defined: what is sent is the same as what is understood.” Source Semantic interoperability: <http://en.wikipedia.org/wiki/Interoperability> [2]

## Approaches to Interoperability

There are two approaches:

- Build a new system which may incur higher cost
- Utilize the pre-existing legacy system and bring it up to speed

Regardless of which path is selected, both require:

- A service-oriented approach that underlies much of today’s World Wide Web
  - New systems shall use a service-oriented approach to making their data available to distributed communities of scientists
- Transaction-oriented and conceptual aspects of Web 2.0

## Interoperability Standards

- Open Geospatial Consortium (OGC) Standards
- ESIP Federation Open Search Open-source Project for a Network Data Access Protocol (OPeNDAP)
- Metadata (ISO 19115)

## Interoperability

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- File Formats

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### Links:

[1] <http://commons.esipfed.org/node/1260>

[2] <http://en.wikipedia.org/wiki/Interoperability>