Standards

●"A standard provides a model for development that makes it possible for a product to work regardless of the individual manufacturer"

Why use standards?

- The beauty of standards is that there are so many to choose from".
- Not restricted to single vendor for compatibility and interoperability
- Standards: agreed-upon rules.

Why standards are essential

Standards are essential in:

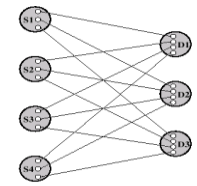
Creating/Maintaining Open and Competitive Markets.
Guaranteeing National/International Interoperability of data and telecommunications technology and processes.

Standards provide guidelines to manufacturers, vendors, government agencies, and other service providers to ensure the kind of interconnectivity necessary in today's marketplace and in international communications.

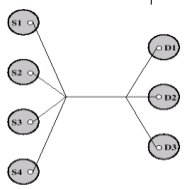
Why use standards?

- Standards provide a fixed way for hardware and/or software systems to communicate.
- Need for standard protocols so that software/hardware from different vendors could communicate
- Network operating systems follow strict rules (protocols) to control how each of the previous tasks are accomplished.
- For example, USB or physical network ports enables two pieces of equipment to interface even though they are manufactured by different companies.
- By allowing hardware and software from different companies to interconnect, standards help promote competition.
- Standards is essential in Creating/maintaining open and competitive markets
- Guaranteeing national/international interoperability.

Why standards are essential



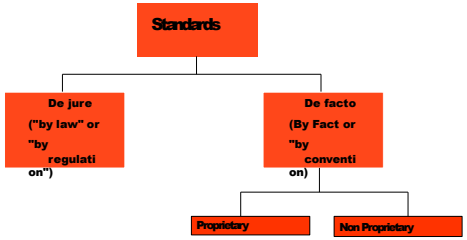
(a) Without standards: 12 different protocols; 24 protocol implementations



(a) With standards: 1 protocol; 7 implementations

Figure 2.2 The Use of Standard Protocols

Categories/Types of Standards



Types of Standards

There are two main types of standards:

- **De jure ("by law" or "by regulation') standards or Formal:**

A standard developed by an industry or government standards-making body

• **De facto ("by fact" or 'by convention'):** Proprietary standards: closed standards merge in the marketplace and are widely used, but lack official backing by a standards-making body

- Nonproprietary standards: open standards.

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De-facto

- Proprietary (Closed Standards)
- Standards that are originally invented by a commercial organization as a basis for the operation of its product.
- They are wholly owned by the company.
- They are also called Closed Standards because they close off communication systems.
- e.g. IGRP & EIGRP Routing Protocols.

De-facto(Cont:)

- Non Proprietary (Open Standards)
- They are originally developed by groups or communities that have passed them into public domains.
- They are also called Open standards because they open communication between different systems.

The Standardization Processes: Three Steps

- **Specification**: developing the classification and identifying the problems to be addressed.
- **Identification of choices**: identify solutions to the problems and choose the "optimum" solution.
- **Acceptance**: defining the solution, getting it recognized by industry so that a uniform solution is accepted.

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Standards Organizations

Standards are developed mainly by 3 entities:

Standard Creation Committees
Forums
Regulatory Agencies

STANDARDS CREATION COMMITTEES

American National Standards Institute (ANSI)

- ANSI is an organization composed of more than 1000 representatives from industry in addition to other fields, such as chemical and nuclear engineering, health and safety, and construction.
- ANSI also represents the United States in setting international standards.

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STANDARDS CREATION COMMITTEES

Electronic Industries Alliance (EIA)

- EIA is a trade organization composed of representatives from electronics manufacturing firms across the United States.
- EIA began as the Radio Manufacturers Association (RMA) in 1924; over time it evolved to include manufacturers of televisions, semiconductors, computers and networking devices.

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STANDARDS CREATION COMMITTEES

Institute of Electrical and Electronic Engineers (IEEE)

- The IEEE is an international society composed of engineering professionals.
- Its goals are to promote development and education in the electrical engineering and computer science fields.

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STANDARDS CREATION COMMITTEES

International Organization for Standardization (ISO)

- ISO is a collection of standards organizations representing 130 countries.
- ISO's goal is to establish international technological standards to facilitate global exchange of information and barrier-free trade.

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STANDARDS CREATION COMMITTEES

International Telecommunication Union (ITU)

- The ITU is a specialized United Nations agency that regulates international telecommunications, including radio and TV frequencies, satellite and telephony specifications, networking infrastructure, and tariffs applied to global communications.
- It also provides developing countries with technical expertise and equipment to advance those nations' technological bases.

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FORUMS

Frame Relay Forum

Formed by DEC, Northern Telecom, Cisco, and StrataCom to promote the acceptance and implementation of Frame Relay.

Issues under review include Flow control, encapsulation, multicasting. Results are submitted to ISO.

FORUMS

ATM Forum and ATM Consortium

To promote the acceptance and use of Asynchronous Transfer Mode (ATM) technology. ATM consortium is made up of Vendors of hardware and software that support ATM.

The ATM forum is made up of customers premises equipment vendors (e.g. PBX systems), and central office (e.g. telephone exchange) providers.

FORUMS

Internet Society (ISOC) and Internet Engineering Task Force (IETF)

ISOC concentrates on the users issues including enhancements to TCP/IP protocol suite.

IETF is the standards body for the Internet itself.

It reviews internet software and hardware. For example, the review of performance standards for routers, bridges.

REGULATORY AGENCIES

Federal Communications Commission (FCC)

Has authority over interstate and international commerce as it relates to communications.

Every piece of communication Technology must have FCC approval before it can be marketed.

Specific FCC responsibilities include:

Review rate and service charges
Review technical specs of hardware
To divide and allocate radio frequencies
To assign carrier frequencies for radio and television broadcasts.