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ITU-T The leader on ASN.1 Standards

ASN.1 and its Encoding Rules

- X.680 Basic notation
- X.681 Information objects
- X.682 Constraint notation
- X.683 Parameterization
- X.690 Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER)
- X.691 Packed Encoding Rules (PER)
- X.692 Encoding Control Notation (ECN)
- X.693 XML Encoding Rules (XER)
- X.694 Mapping W3C XML schema definitions into ASN.1
- X.695 Registration and application of PER encoding instructions

Generic applications of ASN.1

- X.891 Fast infoset
- X.892 Fast Web Services
- X.893 Fast infoset security

For more information on ASN.1:

ASN.1 home http://www.itu.int/itu-t/asn1

ASN.1 module database http://www.itu.int/itu-t/asn1/database/

OID repository http://www.oid-info.com

ASN.1 means

- A revolution of new possibilities:
 - 3GPP (UMTS)
 - ITS (Smart Highway)
 - VoIP (Voice over Internet Protocol)
 - RFID (Radio Frequency Identification)
 - Secure e-mails
 - Network security
 - Telebiometrics
 - Emergency Telecommunication
- Seamless information transfer in any format (audio, data, video, XML markup, text, etc.) regardless of programming language, data structure, OS, or target platform characteristics.
- Less network bandwidth and less processing power (hence a higher transaction processing rate) for Web Services (see X.892).

ASN.1 Adoption Forecast

ASN.1 is being increasingly used outside the telecommunication industry in such areas as security, transportation, banking, genetic research and many others.

Logistics: FAA, FedEx, ICAO, etc.

Manufacturing: Ford, Mercedes Benz, Mitsubishi, etc.

Information Network: Cisco, Compaq, HP, IBM, Intel, Microsoft, Sun, etc.

Financial Services: American Express, GTE, MasterCard, Visa, etc.

Telecommunication: AT&T, MCI, Motorola, Nokia, Sprint, France Telecom, etc.

ASN.1

Abstract Syntax Notation One

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Your Interoperability Solution



workshops: www.itu.int/ITU-T/worksem/ e-flash and news: www.itu.int/ITU-T/news/ membership: www.itu/ITU-T/membership/

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The Power of International Standards

ASN.1 - Compact, Efficient, Reliable Information Transfer

Extensibility Interworking betwee deployed system older and new updated versions of signed years ap	ry: Reliable ns: Reliable er; tems to ente de- art been implemente s	itty: ability: d sys- erprise 1 has d with uccess	Scalability: Infinitely scalable from prototype to mission critical deployment		Interoperability: Platform and language independent. Tools on almost all op- erating systems support ASN.1
Efficiency: ASN.1 supports multiple encoding rules that can transmit the messages in text formats such as XML or in compact binary formats that can be 1/100th the size of XML	Modularity: Enables one standard to be used as the build- ing blocks of another standard	Human-F	ASSAUS iendly Schema Language //eadability: XER allows data display in human readable format in the browser of your choice	In use sin continue meet cur future in	Simplicity Easy to learn, easy to use bility: nce 1984 and s to evolve to rrent and dustry needs

ASN.1 is a notation (unique in the world, currently) that allows the definition, in a language and platform and encoding independent manner, of the content of messages that are exchanged between computers. ASN.1 describes such a definition as an «abstract syntax for communication».

It can be contrasted to the concept in ABNF of «valid syntax», or in XSD of a «valid document», where the focus is entirely on what are valid encodings of data, without concern with any meaning that might be attached to such encodings. That is, without any of the necessary semantic linkages. An ASN.1 definition can be readily mapped (by a pre-run-time processor) into a C or C++ or Java data-stricture that can be used by application code, and supported by run-time libraries providing encoding and decoding of representations in either an XML or a TLV format, or a very compact packed encoding format.

ASN.1 is widely used in industry sectors where efficient (low-bandwidth, low-transactioncost) computer communitcations are needed, but is also being used in sectors where XMLencoded data is required (for example, transfer of biometric information).

ITU-T Study Group 17 is responsible for studies related to data communication. For more detailed information, see http://www.itu.int/ITUT/studygroups/com17

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