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| <b>Telecommunications and Information Exchange Between Systems</b><br><b>ISO/IEC JTC 1/SC 6</b> |
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## **BUSINESS PLAN FOR ISO/IEC JTC 1/SC 6**

### **Telecommunications and Information Exchange Between Systems**

**Period Covered :** April 2008-November 2008

**Submitted by:** Dae Young KIM for approval at the SC 6 Plenary

#### **1. MANAGEMENT SUMMARY**

##### **1.1 STATEMENT OF SCOPE**

Standardization in the field of telecommunications dealing with the exchange of information between open systems including system functions, procedures, parameters, and equipment, as well as the conditions for their use. This standardization includes both the lower layers that support the physical, data link, network, and transport protocol and services, including private integrated services networking, as well as the upper layers that support the application protocols and services such as Directory and ASN.1. A vital aspect of this work is done in effective cooperation with ITU-T and other worldwide and regional standardization bodies e.g. IEEE and IETF.

##### **1.2 ORGANIZATION**

WG 1 – Services and protocols in the physical and data link layers

WG 7 – Services and protocols in the network and transport layers

WG 8 – Services and protocols in Directory

WG 9 – Specification of Abstract Syntax Notation one (ASN.1), its Encoding Rules, Generic Applications and related Registration Authorities

##### **1.3 PROJECT REPORT**

JTC 1/SC 6 is responsible for 328 published International Standards and 42 open project items. See JTC 1/SC 6 Programme of Work contained in 6N13134 for complete set of projects along with active project information and status.

##### **1.4 COOPERATIONS WITH OTHER ORGANIZATIONS**

[Internal liaison within ISO/IEC JTC 1]

ISO/IEC JTC 1/SC 17

ISO/IEC JTC 1/SC 25

ISO/IEC JTC 1/SC 27

ISO/IEC JTC 1/SC 31

[Internal liaison within ISO/TCs and IEC/TCs]

ISO TC 215 (Health Informatics)

[External - Category A liaison]

ETSI (European Telecommunication Standards Institute)

Ecma International

IETF (The Internet Engineering Task Force)

ITU-T (International Telecommunication Union – Telecommunication Standardization Sector)

OASIS (Organization for the Advancement of Structured Information Standards)

[External - Category B liaison]

SITA (International Society for Airline Telecommunication and Information)

[External - Category C liaison]

IP/MPLS Forum

IEEE 802 LMSC (LAN/MAN Standard Committee)

## **2. PERIOD REVIEW**

### **2.1 MARKET INITIATIVES**

Data traffic for Internet continues to grow faster and the request for data transfer facilities with multimedia QoS attributes are more widespread. The standards developed in SC6 are challenged to increase speed and provide greater quality in service.

Local Area Networks continue to be a major worldwide industry with the increased speed of Ethernet from 10 Mbps to over 10Gbps level.

Wireless LAN standards are now a multi-Billion business with the increased speed up to and over 100 Mbps. New frequencies are now exploited for wider market.

Public-key certificates (as part of the work on Directories carried out in collaboration with ITU-T and IETF) are used extensively, since the SSL service employed to secure Internet commerce uses these certificates to secure the transmission.

Many new ISO, and ISO/IEC Standards continue to use ASN.1 as the notation of choice for defining protocols, and SC6 continues to work to enhance the notation to support new user needs. The latest use of ASN.1 is for the Common Alerting Protocol that will be used to disseminate information about impending disasters such as Tsunamis. This protocol was originally defined only for XML encoding, but a strong user input demanded efficient binary encodings (provided by ASN.1), because alerting over "the last mile" was likely to be using low-band-width technologies. ASN.1 is also being increasingly used in the automotive industry for communication between vehicles, components within a vehicle, and communication with an information centre. Another recent application is in support of the growing online gaming industry.

### **2.2 ACHIEVEMENTS**

Among numerous standards SC6 has developed and maintains, the following has been the list of some successful industry standards:

|                    |   |
|--------------------|---|
| ISO/IEC 8877       | ISDN connector specifications and pin assignments |
| ISO/IEC 13239      | HDLC procedures                                   |
| ISO/IEC 7776       | X.25 LAPB Protocol                                |
| ISO/IEC 8208       | X.25 Packet Layer Protocol                        |
| ISO/IEC 8882-2 & 3 | X.25 Conformance Testing                          |
| ISO/IEC 8802-2     | Logical Link Control                              |
| ISO/IEC 8802-3     | CSMA/CD   |
| ISO/IEC 8802-5     | Token Ring  |
| ISO/IEC 8802-11    | Wireless LAN                                      |
| ISO/IEC 11571      | Numbering and Addressing for PISN                 |
| ISO/IEC 11579      | Reference Configuration for PISN                  |
| ISO/IEC 11572      | QSIG Basic PISN Call Function                     |

|                     |   |
|---------------------|---|
| ISO/IEC 11582       | QSIG Generic Functional Protocol                              |
| ISO/IEC 13247       | BQSIG Basic Call/connection control protocol                  |
| ISO/IEC TR 9577     | Protocol identifiers for worldwide multi-protocol environment |
| ISO/IEC 8348        | NSAP Addressing   |
| ISO/IEC 10589       | IS-IS routing protocol  |
| ISO/IEC 10747       | Inter-domain routing protocol                                 |
| ISO/IEC 10021-x     | Message Handling System (X.400)                               |
| ISO/IEC 9594-x      | Directory (X.500)   |
| ISO/IEC 8824-x      | Abstract Syntax Notation One Specifications (X.680)           |
| ISO/IEC 8825-x      | Abstract Syntax Notation One Encoding rules (X.690)           |
| ISO/IEC 24824-x     | Generic Applications of ASN.1                                 |
| ISO/IEC 9834 series | ASN.1 Object Identifier Registration                          |

### 3. FOCUS DURING NEXT WORK PERIOD

#### 3.1 DELIVERABLES

- 1) Completion of 10 Gbps CSMA/CD standard and extensions of wireless LAN standards towards higher bit rates up to 54 Mbps.
- 2) Continued development of end-to-end multicast communications protocol in cooperation with ITU-T.
- 3) Progression in standardization of PISN in IP environment.
- 4) Progression of amendments to the 5th edition of the Directory Specifications to cover extended communications support and federation among Privilege Management Infrastructures. Finalize the 6th edition of the Directory standards for Consent during the September 2008 ITU-T meeting, followed by FDIS.
- 5) Continued progression of amendments to ASN.1, including completion of several that are underway and production of a new Edition incorporating all Amendments and Corrigenda.
- 6) Further development of ASN.1 PER Encoding Instructions and of Registration and ASN.1 Standards for internationalised Object Identifiers.

#### 3.2 STRATEGIES

- 1) Optimize processing of standards developed elsewhere through the Fast Track Process and coordination between IEEE 802 LMSC and SC6/WG1.
- 2) Consolidate Registration Activities for several of Standards within SC6/WG9.
- 3) Develop strategy for efficient coordination with IETF and ITU-T on Network, Transport, Directory and ASN.1 standards.
- 4) Develop strategy for efficient coordination with ETSI, ITU-T, IETF and Ecma International in relation to Internet telephony.

#### 3.3 OPPORTUNITIES

- 1) Reduced cost for standardization process highlights attractiveness of JTC1 Fast Track process.
- 2) Determine place for SC6 Network/Transport standards in industry resulting in increased focus on SC6 as a development source for these standards.
- 3) Attract new projects to SC6 because of its expanded charter including all layers of the protocol reference model.
- 4) Continue to develop and explore the role of ASN.1 as a means of providing binary encoding of XML content, and as an XML Schema notation.
- 5) Support of the next generation network directory protocol.
- 6) Sensor Networks
- 7) Initiation of a new project area, Future Network.

#### **4. WORKING GROUP PROJECTS**

**Table 1. SC 6/WG 1 Standards Summary**

| Category          | Acr/No                               | Description   | Notes   |
|-------------------|--------------------------------------|---|---|
| Winning Standards | ISDN Connector (ISO/IEC 8877)        | Pin assignment for ISDN connector   | - Developed in collaboration with ITU- T  |
|                   | DTE/DCE Connector (ISO/IEC 2110)     | DTE/DCE connector pin assignment  | - Higher speed, usage in multimedia equipment   |
|                   | HDLC (ISO/IEC 13239)                 | High-level Data Link Control Procedures   | - Data Link Control Procedures implemented worldwide<br>- Has enhancement features for future uses  |
|                   | X.25 LAPB (ISO/IEC 7776)             | X.25 LAPB - Compatible DTE data link procedures   | - Data link protocol for the X.25 suite that is widely used in PSDN<br>- Developed collaboratively with ITU-T   |
|                   | X.25 LAPB (ISO/IEC 8882-2 & 3)       | X.25 Conformance testing: Data Link Layer & Packet Layer test Suite   | - Used to decide conformance of the X.25 equipment<br>- Has strong market potential   |
|                   | CSMA/CD LAN (ISO/IEC 8802-3)         | CSMA/CD MAC and PHY Layer Definition  | - Widely deployed for LAN protocol over 50 million accesses   |
|                   | Token Ring LAN (ISO/IEC 8802-5)      | Token ring MAC and PHY Layer Definition   | - Widely deployed for LAN protocol  |
|                   | Wireless LAN (ISO/IEC 8802-11)       | Wireless MAC control method and physical layer  | - Used worldwide for nomadic LAN<br>- Enhancement underway for better performance   |
|                   | MAC Bridge (ISO/IEC 15802-3)         | Medium Access Control sublayer Bridge specification   | - It is used extensively to interconnect various LANs<br>- it provides transparent connectivity spanning the network  |
| Niche Standards   | Wireless LAN (ISO/IEC 8802-11 Amd 6) | Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications Amendment 6: Medium Access Control (MAC) Security Enhancements | - This standard specifies enhanced security mechanism in the 8802-11 MAC layer in which WEP (Wired Equivalent Privacy) based on RC-4 has been used.<br>- The basic concept is to use RSN (Robust Security Network) which includes TKIP (Temporal Key Integrated Protocol) and CCMP. |
|                   | 26 pole Connector (ISO/IEC 11569)    | 26pole DTE/DCE connector for data networks  | - Higher speed, usage in multimedia equipment   |
|                   | LLC (ISO/IEC 8802-2)                 | Logical Link Control  | - It is used along with various LAN protocols   |
|                   | NFCIP-1 & 2 (ISO/IEC 18092 & 21481)  | Near Field Communication Interface and Protocols  | - Wireless communication within 20 Centimeters with data rate up to 400 Kbps  |
| Future Standards  | 10 Gbps CSMA/CD (ISO/IEC 8802-3)     | Amendments for 10 Gigabit CSMA/CD and DTE power via Media Dependent Interface under development   | - The future depends capability of supporting multimedia and mobility.<br>- The market for multimedia and wireless communication will explode   |

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|--|---|---|
| Wireless LAN<br>(ISO/IEC 8802-11)        | Wireless Medium Access Control (MAC) method and physical layer (PHY) specifications   | <ul style="list-style-type: none"> <li>- This standard specifies the WLAN protocol specified by IEEE 802.11 Working Group that has been deployed all over the world to provide high-speed wireless internet access.</li> <li>- The data rate provides 11 Mbps as well as 54 Mbps.</li> <li>- It provides diverse and extensive services for short-range communication, including multimedia data transfer and QoS management, based on ad hoc networking, using Binary CDMA technology.</li> </ul>            |
| Ad Hoc Wireless Network with QoS         | MAC/PHY standard for ad hoc wireless network to guarantee QoS in an industrial work environment   |   |
| Wireless LAN<br>(ISO/IEC 8802-11 DAM 4)  | Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications AMENDMENT 4: Further Higher Data Rate Extension in the 2.4 GHz Band                        | <ul style="list-style-type: none"> <li>- This standard supports extended data rate upto 54 Mbps at the 2.4 GHz band for the ISO/IEC 8802-11 WLAN specification.</li> <li>- It provides the backward compatibility to ISO/IEC 8802-11 WLAN specification operating at the 2.4 GHz band.</li> </ul>   |
| Wireless LAN<br>(ISO/IEC 8802-11 DAM 5)  | Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications Amendment 5: Spectrum and Transmit Power Management Extensions in the 5 GHz band in Europe | <ul style="list-style-type: none"> <li>- This standard provides MAC and PHY specifications of WLAN technology that can be extended to be used in Europe by adopting mechanisms of spectrum and power management.</li> <li>- The two mechanisms called DFS (Dynamic Frequency Selection) and TPC (Transmit Power Control) are adopted.</li> <li>- The DFS and TPC work together to protect pre-existing services running in this band from being interfered possibly by WLAN uses in the 5GHz band.</li> </ul> |
| High Rate Ultra Wideband (ISO/IEC 26907) | High Rate Ultra Wideband for Multimedia Services within 10 m range  | <ul style="list-style-type: none"> <li>- This standard specifies PHY and MAC specifications for High Rate Ultra Wideband WPAN networks upto 480 Mbps in transmission speed.</li> <li>- The communication range of HR UWB systems covers 10 m for the application areas of Audio/Video streaming.</li> <li>- The standard provides some level of QoS based on DRP (Distributed Reservation Protocol)</li> </ul>  |

**Table 2. SC 6/Ex-WG 6 Standards Summary**

| Category          | Acr./No.                | Description   | Notes   |
|-------------------|-------------------------|---|---|
| Winning Standards | QSIG BC (ISO/IEC 11572) | "Basic Call" – Establishment and release of calls within Private ISDN Networks (QSIG: SIGNalling at the "Q" reference point, i.e. within and between private ISDN networks) | <ul style="list-style-type: none"> <li>- An MoU for QSIG has been signed by the 10-15 major manufacturers in the world; it has been implemented by practically all manufacturers</li> <li>- A Forum ("IPNS-Forum") has been established by major manufacturers for the particular purpose of promoting the implementation of QSIG</li> <li>- It is clearly visible that QSIG takes over the market from previous regional or proprietary standards, e.g. from DPNSS in the UK</li> <li>- QSIG has meanwhile even been taken as the basis for VPN applications in public ISDN networks.</li> </ul> |



|                              |                           |  |  |
|------------------------------|---------------------------|--|--|
| Niche Standards              | QSIG GF (ISO/IEC 11582)   | "Generic Functional Protocol" - Basic transport and support functions for ISDN supplementary services  | <ul style="list-style-type: none"> <li>- For the same reasons as given for QSIG BC above</li> <li>- It has become the basis for about 20 ISO-standardized supplementary services and related protocols for private ISDN networks</li> <li>- It's approach has been accepted for the standardization of ISDN supplementary services also beyond ISO/IEC JTC1, e.g. within ITU-T</li> <li>- It provides the basic numbering and addressing scheme used in private ISDN networks, in particular with regard to the "private numbering plans"</li> <li>- They provide the basic foundation for private ISDN networks, and have provided the framework for a number of derived ISO/IEC standards</li> </ul> |
|                              | ISO/IEC 11571             | "Numbering and Addressing"   |  |
|                              | ISO/IEC 11579 / TR14475   | "Reference Configuration" and "Architecture and Scenarios" for private ISDN networks   |  |
|                              | ISO/IEC 13871             | Digital channel aggregation  | <ul style="list-style-type: none"> <li>- It is important for a specific limited set of applications</li> </ul>   |
|                              | B-QSIG BC (ISO/IEC 13247) | "Basic Call" – Establishment and release of calls within Private B-ISDN Networks (B-QSIG: SIGnalling at the "Q" reference point, within and between private B-ISDN networks) | <ul style="list-style-type: none"> <li>- It will become the basis for a set of future standards in private B-ISDN networks</li> <li>- It complies with existing specifications of the ATM Forum, particularly PNNI signalling; its approach has been taken as the basis of further ATM Forum specs., e.g. AINI (ATM internetwork interface), and "Supplementary Service support".</li> </ul>   |
| Future Trends and Directions | CSTA ISO/IEC 18051-18053  | Computer supported Communications Application Services signalling protocol and glossary of terms   | <ul style="list-style-type: none"> <li>- Ecma International is drafting a new edition of ISO/IEC 18051 that supports SIP and multi-media calls. (18051 and 18056 now published)</li> </ul>   |
| Future Trends and Directions | WSDL                      | Web Services Definition Language   | <ul style="list-style-type: none"> <li>- Ecma International has developed a Web Services Definition Language specification (ECMA-348), which refers to SOAP 1.1 and WSDL 1.1. When the W3C updates those recommendations, ECMA-348 will be aligned with them and possibly will be submitted for fast track approval to ISO/IEC JTC1.</li> </ul>  |
| Future Trends and Directions | NFP ISO/IEC 18092         | Near Field Communications  | <ul style="list-style-type: none"> <li>A promising technology that has may find applications ranging from mobile payments to easy configuration. It has been positioned as the wireless connector for technologies that function as "cable replacement".</li> </ul>  |
| Future Trends and Directions | UWB ISO/IEC DIS 26907     | High Rate Ultra Wideband PHY and MAC Standard  | <ul style="list-style-type: none"> <li>A highly adaptive wireless high data rate technology for personal area, short range, networks.</li> </ul>   |

**Table 3. SC 6/WG 7 Standards Summary**

| Category          | Acr. / No. | Description               | Notes  |
|-------------------|------------|---------------------------|--|
| Winning Standards | 8208       | X.25 Packet Layer for DTE | Mature standard, very large worldwide installed base. New technologies now have the major share of new communications infrastructure, but X.25 base will remain large for many years and require some maintenance. |
|                   | TR9577     | Protocol Identifiers      | Global enablers for the multi-protocol environment. ITU-T, Frame Relay Forum and ATM Forum are among the organisations that look to SC6 documents to   |
|                   | 8348AnnA   | NSAP addressing           |  |

|                              |                |   |  |
|------------------------------|----------------|---|--|
|                              |                |   | assure worldwide interoperation.   |
|                              | 10589<br>10747 | IS-IS routing protocols, intra-domain and inter-domain  | Both protocols are widely used in Internet and Intranet environments, in the form of internet IS-IS routing and BGP4 respectively, such use appears likely to increase.  |
| Niche Standards              | 8073           | Connection-mode Transport Protocol  | Widely deployed in specific ITU-T applications, including TMN  |
|                              | CONS           | Connection-mode Network Protocols   | Deployed in OSI networking systems and in ITU-T applications.  |
|                              | CLNP           | Connectionless-mode Network Protocols   | Deployed in OSI networking systems and in ITU-T applications.  |
| Future Trends and Directions | 13236          | QoS Framework   | Trial for providing high level descriptions and solutions to consider Quality of service issues in OSI networking services and applications  |
|                              | 13243          | QoS Methods and mechanisms  |  |
|                              | 13252<br>14476 | Enhanced communications transport Service definition and Protocol specifications for one-to-many, many-to-one and many-to-many data transport | These enhancements are required for new high-speed, multicast and multimedia applications, and particularly enhanced end to end Quality of Service over IP multicast network environments (for example to enable ISPs to offer differentiated service levels to subscribers and thus expand their market offerings and revenue opportunities). |
|                              | 16513          | Group management protocol   | Provide group membership management services for multicast communication protocols   |
|                              | 16512          | Relayed Multi-Cast Protocol   | End-to-end overlay multicast communication protocols that may be used over current IP network where IP multicast is not fully deployed.  |

**Table 4. SC 6/WG 8 Standards Summary**

| Category          | Acr. / No. | Description       | Notes   |
|-------------------|------------|-------------------|---|
| Winning Standards | 9594       | Directory (X.500) | <ul style="list-style-type: none"> <li>- Used by major suppliers of directory services as foundation for LDAP access to such services in the Internet.</li> <li>- Directory can be useful for new applications like ID-based applications using RFID.</li> <li>- X.509 public key certificates is used extensively to secure transactions in Internet secure commerce based on SSL.</li> <li>- X.509 attribute certificates is used in Privilege Management Infrastructure (PMI) and in telebiometrics applications.</li> </ul> |

**Table 5. SC 6/WG 9 Standards Summary**

| Category                     | Acr. / No.          | Description                        | Notes  |
|------------------------------|---------------------|------------------------------------|--|
| Winning Standards            | 8824                | ASN.1                              | Standardized notation and Encoding Rules used for a large number of protocols and file formats.  |
|                              | 8825                |                                    |  |
|                              | 9834                | Registration of Object Identifiers | 81,000 Object Identifiers registered on the associated Web Site, probably twice that many actually allocated.  |
|                              | 24824               | Generic Applications of ASN.1.     | Efficient binary encoding of XML documents (Fast Infoset), binary encoding of SOAP wrappers (Fast Web Services), application of integrity and encryption to Fast Infoset (Fast Infoset Security) |
| Future Trends and Directions | 8825                | PER Encoding Rules                 | User control and variation of the PER Encoding Rules in order to support the use of ASN.1 to describe legacy protocols and file formats.   |
| Future Trends and Directions | 9834, 8824 and 8825 | International Object Identifiers   | Extension of the OID concept to allow names for arcs of the tree using any ISO/IEC 10646 character, with associated representation in protocols using Object Identifiers.                        |

**Table 6. SC 6 Standards Summary**

| Category          | Acr. / No. | Description       | Notes                                |
|-------------------|------------|-------------------|--------------------------------------|
| Winning Standards | 10021      | Messaging (X.400) | Deployed in enterprise EMAIL systems |