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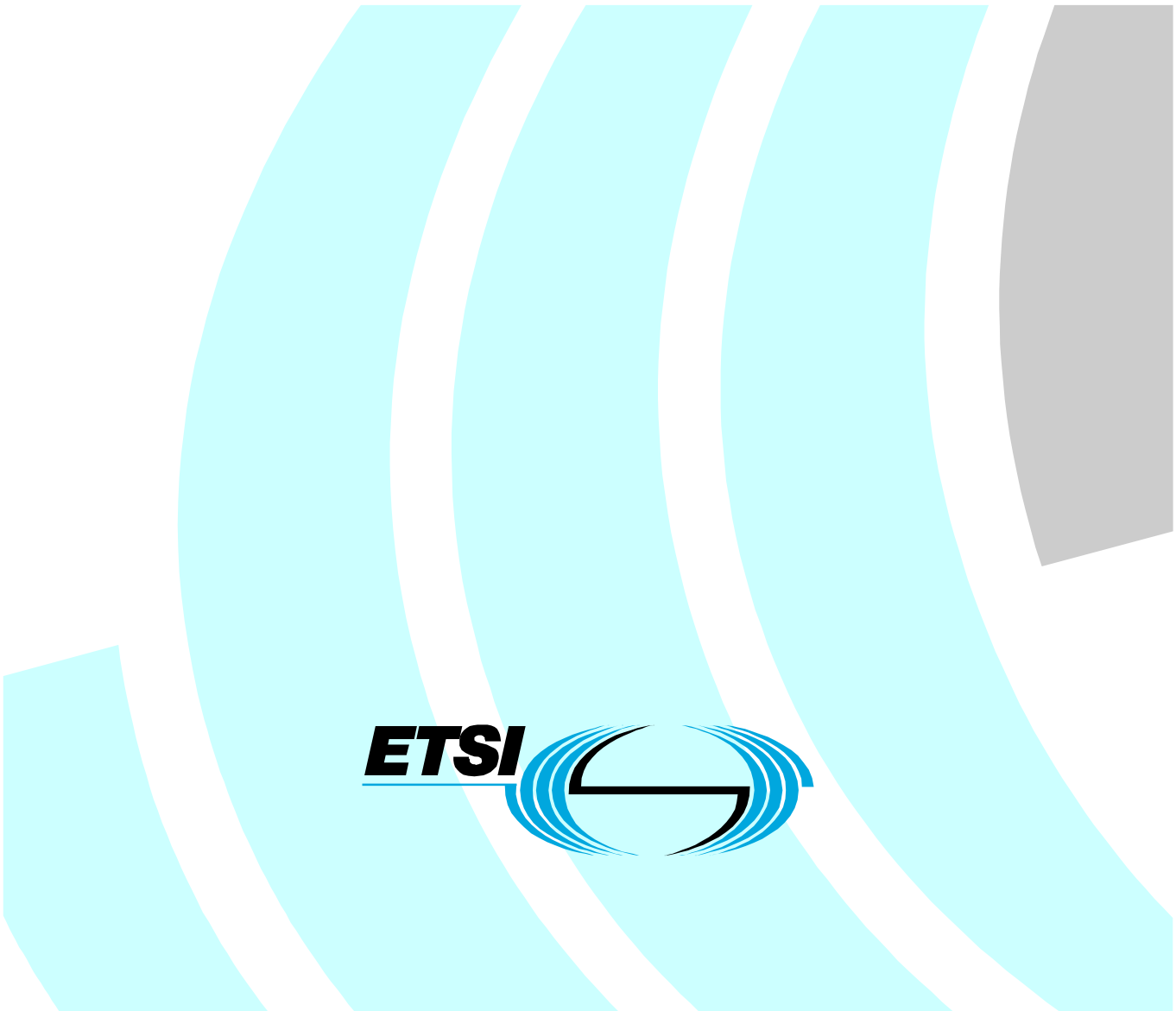
Technical Report

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Network Management; NGN Management standards; Overview and gap analysis



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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

1 Scope

The present document provides an overview of Network and Service Management related standards, both published and draft. For the present document "Standards" are the published outputs of defacto and de-jura Standards Organizations and Industry Forums. The standards are grouped by a number of criteria in order to assist the user in identifying relevant documents.

It is intended to be used as a reference document that can be used to identify relevant standards and hopefully avoid the development of duplicate standards where adequate standards are available.

A document of this kind in an evolving field can only ever be a "snapshot" of the current situation and will need to be frequently revised.

The present document is structured as follows:

- clause 4 identifies the organizations producing relevant standards;
- clause 5 provides an overview of the methodology used in grouping these standards;
- clause 6 provides an analysis of the standards identified based on the categories identified in clause 5;
- annex A provides a list of "standards" on a body by body basis.

2 References

For the purposes of this Technical Report (TR), the following references apply:

[1] ITU-T Recommendation M.3050: "Enhanced Telecommunications Operations Map (eTOM)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

example 1: text used to clarify abstract rules by applying them literally

NOTE: This may contain additional information.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	3rd Generation Mobile Communications Technology
3GPP	3rd Generation Partnership Project
3GPP2	3rd Generation Partnership Project 2
4G	4th Generation Mobile Communications Technology
A2A	Application to Application
AAA	Authentication, Authorization and Accounting
AD	Area Director
ADSL	Asymmetrical Digital Subscriber Line
ADSL MIB	Asymmetrical Digital Subscriber Line Managed Information Base
AIDC	Automatic Identification and Data Capture
AI-ESTATE	Artificial Intelligence - Exchange and Service Tie to All Test Environments
ANSI	American National Standards Institute
API	Application Program Interface

ARIB	Association of Radio Industries and Businesses
ASF	Alert Standard Format
AT	Access and Terminals
ATIS	Alliance for Telecommunications Industry Solutions
ATLAS	Abbreviated Test Language for All Systems
ATM	Asynchronous Transfer Mode
AVS	Audio Visual Services
B2B	Business to Business
BIOS	Basic Input Output System
BMWG	Benchmarking Methodology Working Group
BoD	Board of Directors
BRAN	Broadband Radio Access Networks
BSI	British Standards Institution
CAP	Cable Applications Platform
CCITT	Telegraph and Telephone Consultative Committee
CCSA	China Communications Standards Association
CDE	Common Desktop Environment
CDMA DG	CDMA Development Group
CDMA	Code Division Multiple Access
CDR	Call Data Record
CE	Consumer Electronics
CEA	The Consumer Electronics Association (USA)
CENELEC	European Committee for Electrotechnical Standardization
CIM	Common Information Model
CLI	Command Line Interface
CMM	Common Management Model
CN	Corporate Networks
COM/DCOM	Component Object Model/Distributed Component Object Model
CompTIA	Computing Technology Industry Association
COPS	Common Open Policy Service
CTP	Conformance Testing Program
DAFS	Direct Access File System
DCML	Data Center Markup Language
DECT	Digital Enhanced Cordless Telecommunications
DEN	Directory Enabled Networking
DMF	Data Management Forum
DMI	Desktop Management Interface
DMTF	Distributed Management Task Force DNS33
DSL	Digital Subscriber Line
DSS	Data Standards Subcommittee
DVS	Digital Video Subcommittee
EAN	European Article Numbering
EAN.UCC	EAN International Uniform Code Council
EAS	Emergency Alert Systems
EBU	European Blind Unions
ECMA TC32	ECMA Technical Committee 32
ECMA	European Computer Manufacturers Association
EDI	Electronic Data Interchange
EDIFICE	The European B2B forum for the Electronics Industry
EE	Environmental Engineering
EMC	ElectroMagnetic Compatibility
ENTMIB	ENtity Managed Information Base
ERM	Electromagnetic compatibility and Radio spectrum Matters
ESI	Electronic Signatures and Infrastructures
ETIS	The Global IT Association for Telecommunications
eTOM	Enhanced Telecom Operations Map
FAQ	Frequently Asked Questions
FAST	Federation Against Software Theft
FCC	Federal Communications Commission
FC-GS-x	SNIA Fibre Channel Work Group
FDD	Frequency Division Duplex
FWA	Fixed Wireless Access

GDD	Global Data Dictionary
GGF	Global Grid Forum
GMI	Global MSF Interoperability
GROW	Global Routing Operations
GSM Assn	GSM Association
GSM	Global System for Mobile communication
GSMP	Global Standard Management Process
HBA API	Host Bus Adapter Application Programming Interface
HDSL	High bit rate Digital Subscriber Line
HF	Human Factors
HFC	Hybrid Fiber/Coax
HIC	Heterogeneous InterConnect
HLA	High Level Architecture
HMS	Hybrid Management Sub-layer
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
HUBMIB	Ethernet Interfaces and HuB MIB
IA	Implementation Agreement
IAB	Internet Architecture Board
IANA	Internet Assigned Numbers Authority
ICS	Information and Communications Services
ICT	Information and Communications Technology
ID	Internet-Draft
IEC	International Electrotechnical Commission
IEC	International Engineering Consortium
IEEE	Institute of Electrical and Electronics Engineers
IESG	Internet Engineering Steering Group
IETF	Internet Engineering Task Force
ILM	Information Lifecycle Management
IMSS	Internet and Management Support for Storage
IMT	International Mobile Telecommunications
IN	Intelligent Network
INTAP	Interoperability Technology Association for Information Processing
IOP	Interoperability
IP	Internet Protocol
IPCC	International Packet Communications Consortium
IPCDN	IP over Cable Data Network
IPDR	Internet Protocol Detail Record Organization
IPFIX	IP Flow Information eXport
IPR	Intellectual Property Rights
IPS Forum	IP Storage Forum
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISC	International Softswitch Consortium
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISO/IEC	ISO/International Electrotechnical Commission
ISOC	Internet SOCiety
ISV	Independent Software Vendors
IT	Information Technology
ITIL	IT Infrastructure Library
ITSM	IT Service Management
itSMF	IT Service Management Forum
ITU	International Telecommunication Union
ITU-D	ITU - Development Sector
ITU-R	ITU - Radio Sector
ITU-T	ITU - Telecom Sector
J2EE	Java™ 2 Platform, Enterprise Edition
JCP	Java Community Process
JTC	Joint Technical Committee
LAN	Local Area Network
LCS	Line Code Specific

LDAP	Lightweight Directory Access Protocol
LI	Lawful Interception
LIF	Location Interoperability Forum
MAN	Metropolitan Area Network
MAU	Medium Attachment Units
MBONE	Multicast BackbONE
MBONED	MBONE Deployment
MCC	Mobile Commerce and Charging
MCM	Multiple Carrier Modulation line coding
MESA	Public Safety Partnership Project
MGIF	Mobile Games Interoperability Forum
MIB	Managed Information Base
MOF	Meta Object Facility
MOSS	Market Oriented Sector Service
MOWS	Management of Web Services
MPLS	Multi Protocol Label Switching
MRP	Market Representation Partners
MSDP MIB	Multicast Source Discovery Protocol Managed Information Base
MSF	Multiservice Switching Forum
MSG	Mobile Standards Group
MTS	Methods for Testing and Specification
MUWS	Management Using Web Services
MWIF	Mobile Wireless Internet Forum
MWS	Mobile Web Service
NAC	Network Applications Consortium
NAS	Network Access Server
NASD	Network-Attached Storage Devices
NASREQ	Network Access Server REQuirements
NCTA	National Cable and Telecommunication Association
NDM-U	Network Data Management - Usage
NETCONF	NETwork CONFiguration
NGN	Next Generation Networks
NGOSS	New Generation Operations Software and Systems
NMF	Network Management Forum
NMS	Network Management System
NNI	Network-Network Interface
OAGIS	Organization for the Advancement of Structured Information Standards
OAM&P	Operations Administration, Maintenance and Provisioning
OBSD	Object-Based Storage Device
OGC	Office of Government Commerce
OGSA	Open Grid Service Architecture
OGSI	Open Grid Service Infrastructure
OIF	Optical Internetworking Forum
OMA	Open Mobile Alliance
OS	Operating System
OSD	Object-based Storage Device
OSS	Operations Support Systems
OSSJ	OSS through Java
PASC	Portable Applications Standards Committee
PC	Personal Computer
PDC	Personal Digital Communication
PDF	Portable Document Format
PIB	Policy Information Base
PISN	Private Integrated Services Network
PLT	PowerLine Telecommunications
PoC	Push to talk over Cellular
PSAMP	Packet SAMPling
PSTN	Public Switched Telephone Networks
PTOMAINE	Prefix Taxonomy Ongoing MeAsurement and Inter NEtwork
QoS	Quality of Service
RAP	Resource Allocation Protocol
RBAC	Role-Based Access Control

RDMA	Remote Direct Memory Access
RFC	Request for Comments
RMON-2	Remote Monitoring
ROAMOPS	Remote Operations
RT	Railway telecommunications
SAF	Service Availability Forum
SAN	Storage Area Networks
SCM	Single Carrier Modulation line coding
SCP	Smart Card Platform
SCTE	Society of Cable Telecommunications Engineers
SCTP	Stream Control Transmission Protocol
SDO	Standards Development Organization
SES	Satellite Earth Stations and Systems
SG	Study Group
SHDSL	Symmetric High Digital Subscriber Line
SI	International System of Units
SMBIOS	System Management Basic Input Output System
SMI	Storage Management Initiative
SML	Storage Media Library
SNIA	Storage Networking Industry Association
SNMP	Simple Network Management Protocol
SNW	Storage Networking World
STQ	Speech Processing, Transmission and Quality Aspects
T1	Standards Committee T1 (USA)
TAC	Technical Advisory Council
TC	Technical Committee
TCP	Transmission Control Protocol
TDD	Time Division Duplex
TETRA	TErrestrial Trunked RAdio
TIA	Telecommunications Industry Association (North America)
TIPHON	Telecommunications and Internet Protocol Harmonization Over Networks
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networks
TM Forum	TeleManagement Forum
TM	Transmission and Multiplexing
TMF	TeleManagement Forum
TMN	Telecommunications Management Network
TOGAF	The Open Group Architecture Framework
TR	Technical Report
TSAG	Telecommunication Standardization Advisory Group
TSG	Technical Specification Group
TSG-A	TSG - Access Network Interfaces
TSG-C	TSG - cdma2000®
TSG-S	TSG - Services and Systems Aspects
TSG-X	TSG - Core Networks
TTA	Telecommunications Technology Association (Korea)
TTC	Telecommunications Technology Committee (Japan)
TWG	Technical Working Group
UCC	Uniform Code Council
UML	Unified Modelling Language
UMTS	Universal Mobil Telecommunications System
UNI	User Network Interface
UTRA	Universal Terrestrial Radio Access
V6OPS	Ipv6 OPerationS
VDSL	Very high speed Digital Subscriber Line
VHDL	Very High Speed Integrated Circuits Hardware Description Language
VoIP	Voice over IP
WAP	Wireless Access Protocol
WBEM	Web-Based Enterprise Management
WG	Working Group
WLAN	Wireless LAN
WSDM	Web Services Distributed Management
WSRF	Web Services Resource Framework

WTO	World Trade Organization
XML	eXtended Markup Language
xmlCIM	Extended Markup Language Common Information Model

4 Standards organizations

This clause identities the organization (standards bodies and forums) whose documents are referenced in the present document and provides short description of the organization.

4.1 Standards Development Organizations (SDOs)

Standards Development Organizations (SDOs) may be International, Regional or National. The main International SDOs are the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU). These three principal organizations in global standardization, have complementary scopes.

The Regional SDOs include CEN and ETSI. It should be noted however that some regional SDOs (e.g. ETSI) become defacto global SDOs.

National SDOs include ATIS (USA), CCSA (China), TTC (Japan) etc. It should be noted however that some national SDOs (e.g. ATIS) become defacto regional or even global SDOs.

The following list of SDOs is provided in alphabetical order.

4.1.1 ATIS (Alliance for Telecommunications Industry Solutions)

http://www.atis.org/

4.1.1.1 Overview

The Alliance for Telecommunications Industry Solutions (ATIS) is a U.S.-based organization that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide using a pragmatic, flexible and open approach. ATIS is an ANSI (American National Standards Institute) accredited SDO and has the following committees:

- T1A1 - Interfaces, Power and Protection of Networks;
- T1E1 - Interfaces, Power and Protection of Networks;
- TMOC (formerly T1M)1 - Telecom Management and Operations Committee;
- T1S1 - Services, Architectures and Signalling;
- T1P1 - Wireless/Mobile Services and Systems;
- T1X1 - Digital Hierarchy and Synchronization;
- OBF - Ordering and Billing Forum;
- ESIF - Emergency Services Interconnection Forum;
- INC - Industry Numbering Committee;
- NIIF - Network Interconnection Interoperability Forum;
- TCIF - Telecommunications Industry Forum;
- IITC - Internetwork Interoperability Test Coordination Committee;
- IFAST - International Forum on ANSI-41 Standards Technology;

- ACTA - The Administrative Council for Terminal Attachments;
- IVR - Interactive Voice Response (IVR) Accessibility Forum;
- NRSC - Network Reliability Steering Committee;
- 05 - Accredited Standards Committee O5 - Wood Poles and Products;
- TFPC - Telecommunications Fraud Prevention Committee;
- TTY Forum;
- IOC - IMSI Oversight Council;
- PEG - Protection Engineers Group.

4.1.1.2 Key technical subcommittees

4.1.1.2.1 TMOC (formally T1M1)

http://www.atis.org/0130/index.asp

The Telecom Management and Operations Committee (TMOC) develops operations, administration, maintenance and provisioning standards and other documentation related to Operations Support System (OSS) and Network Element (NE) functions and interfaces for communications networks - with an emphasis on standards development related to U.S.A. communication networks in coordination with the development of international standards**.** TMOC (Formerly T1M1-OAM&P Committee) is sponsored by the Alliance for Telecommunications Industry Solutions (ATIS) and is accredited by the American National Standards Institute (ANSI).

Scope

The scope of the work in TMOC includes the development of standards and other documentation for communications network operations and management areas, such as Configuration Management, Performance Management (including in-service transport performance management), Fault Management, Security Management (including management plane security), Accounting Management, Coding/Language Data Representation, Common/Underlying Management Functionality/Technology and Ancillary Functions (such as network tones and announcements). This work requires close and coordinated working relationships with other domestic and international standards development organizations and industry forums.

TMOC Major Initiatives

Common OAM&P Functionality and Technology Initiative

Work efforts and standards formulated in this area provide for significant standards efficiency and industry efficiency by providing for the common frameworks and models that many or all Inter-Administration OAM&P standards and Network Technology Specific OAM&P standards can utilize as a foundation. This provides for the rapid formulation of Inter-Administration OAM&P standards and Network Technology Specific OAM&P standards as well as the opportunity for efficient implementations thereof. The primary areas of work are common aspects of OAM&P related OSS/NE architecture, protocol, functionality, information interchange, interfaces and methodology.

Inter-Administration OAM&P Initiative

Work efforts and standards formulated in this area provide for interoperability and intercommunications between and among service providers, i.e. CLEC-ILEC, IXC-LEC, etc. The key areas of work are Coding and Language Data Representation (CLDR) for information interchange and selected Operations Support System (OSS) to OSS Interconnect Interface Application Standards (e.g. Trouble Administration), and OSS Interconnection Technologies (i.e. protocols, etc.). This initiative includes support for global data definitions for inter-administration information exchange.

Network Technology Specific OAM&P Initiative

Work efforts and standards formulated in this area provide for network technology specific OAM&P interoperability between and among service providers' and suppliers' systems, i.e. network technology specific OAM&P interoperability between and among OSSs, Element Management Systems (EMSs), NEs.

4.1.2 ECMA (European Association for Standardizing Information and Communication Systems)

http://www.ecma-international.org/

4.1.2.1 Overview

ECMA International is an industry association founded in 1961 and dedicated to the standardization of Information and Communication Technology (ICT) Systems. The aims of ECMA are:

- to develop, in co-operation with the appropriate National, European and International organizations Standards and technical reports in order to facilitate and standardize the use of ICT systems;
- to encourage the correct use of standards by influencing the environment in which they are applied;
- to publish these standards and technical reports in electronic and printed form; the publications can be freely copied by all interested parties without restrictions.

Since 1961 and continuing in full force today, ECMA International facilitates the timely creation of a wide range of global Information and Communications Technology (ICT) and Consumer Electronics (CE) standards, for:

- Scripting and Programming Languages;
- Communication Technologies;
- Product Safety;
- Environmental Design Considerations;
- Acoustics and ElectroMagnetic Compatibility (EMC);
- Optical and Magnetic Storage;
- Volume and File structure;
- High speed interconnects.

4.1.2.2 Key technical subcommittees

4.1.2.2.1 TC32 - Communications, networks and systems interconnection

Scope

To maintain an overall view and strategy for standardization in the field of private/corporate telecommunications and to prepare ECMA standards and technical reports required in this field.

To monitor and pursue standardization at a global level with regard to ISO/IEC JTC 1 and the international standardization world in general.

To work together with ETSI within the framework for standardization under the terms of the Co-operation Agreement between ETSI and ECMA, for publication of European standards and technical reports.

To promote unified international standards, the field of private/corporate telecommunications includes architecture, service, protocol, interoperability, management and application aspects of Corporate Telecommunication Networks (CNs). CNs include narrowband and broadband Private Integrated Services Networks (PISNs) and private networks based on the Internet Protocol (IP).

4.2 ETSI

http://www.etsi.org

4.2.1 Overview

The European Telecommunications Standards Institute (ETSI) is an independent, non-profit organization, whose mission is to produce telecommunications standards for today and for the future. Based in Sophia-Antipolis in the south of France, ETSI unites almost 700 members from 55 countries, and brings together manufacturers, network operators and service providers, administrations, research bodies and users - providing a forum in which all key players can contribute.

ETSI's Members determine the Institute's work programme, allocate resources and approve its deliverables. As a result, ETSI's activities are closely aligned with market needs and there is wide acceptance of its products. ETSI's standards are built on consensus.

Work within ETSI is organized into a number of Technical Committees and Projects.

Technical Committees:

- AT Access and Terminals;
- BROADCAST EBU/CENELEC/ETSI on Broadcasting;
- ECMA TC32 Standardizing information and communications systems;
- EE Environmental Engineering;
- ERM EMC and Radio Spectrum Matters;
- ESI Electronic Signatures and Infrastructures;
- HF Human Factors;
- LI Lawful Interception;
- MSG Mobile Standards Group;
- MTS Methods for Testing and Specification;
- PLT Powerline Telecommunications;
- SAFETY Safety;
- SES Satellite Earth Stations and Systems;
- STQ Speech Processing, Transmission and Quality Aspects;
- TISPAN Telecommunications and Internet converged Services and Protocols for Advanced Networks;
- TM Transmission and Multiplexing.

ETSI Projects:

- BRAN Broadband Radio Access Networks;
- DECT Digital Enhanced Cordless Telecommunications;
- RT Railway telecommunications;
- SCP Smart Card Platform;
- TETRA Terrestrial Trunked Radio.

ETSI Partnership Projects:

- 3GPP Third Generation Partnership Project;
- MESA Public Safety Partnership Project.

4.2.2 Key technical subcommittees and projects

Current management work is being undertaken in TISPAN Working Group 8 (Network Management), in partnership project 3GPP (see clause 4.2.1) and in project BRAN.

TISPAN WG8

TISPAN is the ETSI core competence centre for fixed networks and for migration from switched circuit networks to packet-based networks with an architecture that can serve in both.

TISPAN is responsible for all aspects of standardization for present and future converged networks including the NGN (Next Generation Network) and including, service aspects, architectural aspects, protocol aspects, QoS studies, security related studies, mobility aspects within fixed networks, using existing and emerging technologies. This work is in line with, and driven by, the commercial objectives of the ETSI membership.

TISPAN WG8 is responsible for developing a consistent and harmonized approach to Telecommunications Management across all disciplines and technologies under the umbrella of the ETSI Standardization activities. Telecommunications Management encompasses the management of all types of telecommunication equipment, networks, and services. Currently TISPAN WG8 has work items for NGN Management (Vision, Requirements and Architecture) and Requirements for an Equipment Identification in Telecommunications.

BRAN

With the advent of deregulation of the telecommunications industry and the emergence of multimedia applications and advanced information services, demand for radio based broadband access has emerged as well. Already, service providers are experimenting with new technologies that allow them to reach their customers in a simple and competitive manner using radio technology.

These Broadband Radio Access Networks shall be capable of efficiently carrying existing services like voice and Integrated Services Digital Network (ISDN), as well as providing the transport mechanism(s) for future services. Both circuit-oriented and packet-oriented transport protocols including IP and ATM shall be supported at a peak rate of at least 25 Mbit/s at the user network interface. The main application environments to be addressed with licensed broadband access systems are access networks serving residences and small to medium business premises. The main application environments for license exempt broadband access systems are the general office, industrial automation and audio/visual production.

Broadband Radio Access Networks will provide an alternative to or compete with wired access systems delivering telecommunications services into and within residences and businesses via transport mechanisms such as ADSL, VDSL and cable modems.

The aim of Broadband Radio Access Networks (BRAN) Project is to meet the demand for standards for a new generation of networks that meets the above needs for service independent broadband radio access networks and systems for licensed as well as licence exempt applications. The BRAN Project is a response to EPIC Project 1.1 of the European Information Infrastructure (EII). It is also intended that BRAN should support Global Multimedia Mobility (GMM) targets.

Broadband Radio Access Networks are a major growth area in the industry and within ETSI. These answer the emerging needs of users as well as operators and service providers for broadband (> 20 Mb/s) access to wired networks and to telecommunications infrastructure systems. The Project is working together with the 3rd Generation Partnership Project (3GPP™) to ensure interworking between the Broadband Radio Access Networks and the UMTS™.

EP BRAN has a leading position in this field; no comparable work is being performed by other regional standardization forums. In order to maintain this leading position, the Project intends to realize an aggressive schedule and to deliver high quality standards that assure interoperability of systems and products that conform to its standards.

NOTE: In addition to the work of TISPAN WG8 and BRAN, work is underway in AT Digital for a MIB for Lawful interception of Multi-Media Services on Broadband Digital Cable Networks.

4.2.3 International Engineering Consortium (IEC)

4.2.3.1 Overview

The International Engineering Consortium (IEC) is a non-profit organization dedicated to catalyzing technology and business progress worldwide in a range of high-technology industries and their university communities. Since 1944, the IEC has provided high-quality educational opportunities for industry professionals, academics, and students. In conjunction with industry-leading companies, the IEC has developed an extensive, free, on-line educational program. The IEC conducts industry-university programs that have substantial impact on curricula. It also conducts research and develops publications, conferences, and technological exhibits that address major opportunities and challenges of the information age. More than 70 leading high-technology universities are IEC affiliates, and the IEC handles the affairs of the Electrical and Computer Engineering Department Heads Association.

4.2.4 ISO (International Organization for Standardization)

http://www.iso.org/

4.2.4.1 Overview

ISO is a network of national standards institutes from 148 countries working in partnership with international organizations, governments, industry, business and consumer representatives. A bridge between public and private sectors.

ISO occupies a special position between the public and private sectors. This is because, on the one hand, many of its member institutes are part of the governmental structure of their countries, or are mandated by their government. On the other hand, other members have their roots uniquely in the private sector, having been set up by national partnerships of industry associations.

Therefore, ISO is able to act as a bridging organization in which a consensus can be reached on solutions that meet both the requirements of business and the broader needs of society, such as the needs of stakeholder groups like consumers and users.

ISO - together with IEC (International Electrotechnical Commission) and ITU (International Telecommunication Union) - has built a strategic partnership with the WTO (World Trade Organization) with the common goal of promoting a free and fair global trading system. The political agreements reached within the framework of the WTO require underpinning by technical agreements. ISO, IEC and ITU, as the three principal organizations in international standardization, have the complementary scopes, the framework, the expertise and the experience to provide this technical support for the growth of the global market.

ISO standards are developed by technical committees comprising experts on loan from the industrial, technical and business sectors which have asked for the standards, and which subsequently put them to use. These experts may be joined by others with relevant knowledge, such as representatives of government agencies, testing laboratories, consumer associations, environmentalists, and so on. The experts participate as national delegations, chosen by the ISO national member institute for the country concerned. These delegations are required to represent not just the views of the organizations in which their participating experts work, but of other stakeholders too. According to ISO rules, the member institute is expected to take account of the views of the range of parties interested in the standard under development and to present a consolidated, national consensus position to the technical committee.

JTC1 Technical Committee responsible for the standardization of the Information Technology. It has the following sub-committees:

- JTC 1/SC 2 Coded character sets.
- JTC 1/SC 6 Telecommunications and information exchange between systems.
- JTC 1/SC 7 Software and system engineering.
- JTC 1/SC 17 Cards and personal identification.
- JTC 1/SC 22 Programming languages, their environments and system software interfaces.
- JTC 1/SC 23 Optical disk cartridges for information interchange.

- JTC 1/SC 24 Computer graphics and image processing.
- JTC 1/SC 25 Interconnection of information technology equipment.
- JTC 1/SC 27 IT Security techniques.
- JTC 1/SC 28 Office equipment.
- JTC 1/SC 29 Coding of audio, picture, multimedia and hypermedia information.
- JTC 1/SC 31 Automatic identification and data capture techniques.
- JTC 1/SC 32 Data management and interchange.
- JTC 1/SC 34 Document description and processing languages.
- JTC 1/SC 35 User interfaces.
- JTC 1/SC 36 Information technology for learning, education and training.
- JTC 1/SC 37 Biometrics.

4.2.4.2 Key technical Committees

JTC 1/SC 6: 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 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.

4.2.5 International Telecommunication Union (ITU)

http://www.itu.int/home/index.html

4.2.5.1 Overview

The International Telecommunication Union (ITU), headquartered in Geneva, Switzerland is an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services.

The ITU has 3 Sectors, the Radio Sector (ITU-R), The Telecom Sector (ITU-T) and the development Sector (ITU-D).

4.2.5.2 ITU-D

The ITU's Telecommunication Development Bureau has well-established programmes of activities to facilitate connectivity and access, foster policy, regulatory and network readiness, expand human capacity through training programmes, formulate financing strategies and e-enable enterprises in developing countries.

4.2.5.3 ITU-R

The ITU-R is responsible for the allocation of bands of the radiofrequency spectrum, the allotment of radio frequencies and the registration of radio frequency assignments and of any associated orbital position in the geostationary satellite orbit in order to avoid harmful interference between radio stations of different countries. It also coordinates efforts to eliminate harmful interference between radio stations of different countries and to improve the use made of radio-frequencies and of the geostationary-satellite orbit for radio communication services.

The Radiocommunication Study Groups deal with the following subjects:

- Spectrum management (SG 1);
- Radiowave propagation (SG 3);

- Fixed-satellite service (SG 4);
- Broadcasting services (SG 6);
- Science services (SG 7);
- Mobile, radiodetermination, amateur and related;
- satellite services (SG 8);
- Fixed service (SG 9).

In addition to these seven Study Groups, there is:

- the Coordination Committee for Vocabulary (CCV);
- the Conference Preparatory Meeting (CPM); and
- the Special Committee on Regulatory/Procedural Matters (SC).

4.2.5.4 ITU-T

ITU-T which was created on 1 March 1993, replacing the former International Telegraph and Telephone Consultative Committee (CCITT) whose origins go back to 1865. The public and the private sectors cooperate within ITU-T for the development of standards that benefit telecommunication users worldwide. The ITU-T's mission is to ensure an efficient and on-time production of high quality standards (Recommendations) covering all fields of telecommunications.

The ITU-T has 14 study groups:

- Study Group 2 Operational aspects of service provision, networks and performance. Lead Study Group on Service definition, Numbering, Routing and Global Mobility;
- Study Group 3 Tariff and accounting principles including related telecommunications economic and policy issues;
- Study Group 4 Telecommunication management, including TMN. Lead Study Group on TMN;
- Study Group 5 Protection against electromagnetic environment effects;
- Study Group 6 Outside plant;
- Study Group 9 Integrated broadband cable networks and television and sound transmission. Lead Study Group on integrated broadband cable and television networks;
- Study Group 11 Signalling requirements and protocols. Lead Study Group on intelligent networks;
- Study Group 12 End-to-end transmission performance of networks and terminals. Lead Study Group on Quality of Service and performance;
- Study Group 13 Multi-protocol and IP-based networks and their internetworking. Lead Study Group for IP related matters, B-ISDN, Global Information Infrastructure and satellite matters;
- Study Group 15 Optical and other transport networks. Lead Study Group on Access Network Transport and on Optical Technology;
- Study Group 16 Multimedia services, systems and terminals. Lead Study Group on multimedia services, systems and terminals, e-business and e-commerce;
- Study Group 17 Data Networks and Telecommunication Software. Lead Study Group on frame relay, communication system security, languages and description techniques;
- SSG Special Study Group "IMT-2000 and Beyond". Lead Study Group on IMT 2000 and beyond and for mobility;

- TSAG - Telecommunication Standardization Advisory Group TSAG reviews priorities, programmes, operations, financial matters and strategies for the Sector, follows up on the accomplishment of the work programme, restructures and establishes ITU-T Study Groups, provides guidelines to the Study Groups, advises the Director of TSB, elaborates A-series Recommendations on organization and working procedures;

- Next Generation Networks (NGN) 2004 Project - The major task of the NGN 2004 Project will be to describe all elements required for interoperability and network capabilities to support applications globally across Next Generation Networks.

Study groups may be further divided into Working Parties (e.g. WP2/4 which is Working Party 2 of Study group 4) each of which has a number of study questions (e.g. Question 10/4 which is question 10 of Study group 4). It is these study questions that develop the text of new and revised Recommendations.

4.2.5.5 Key Working Parties and Questions

Current management work is being undertaken in Study group 4 and Q14/15 (Question 14 of Subgroup 15). Related work on Management requirements is being carried out in Study group 2. The key questions are:

- Q7/4 Management principles and architecture;
- Q9/4 Requirements for B2B and C2B management interfaces;
- Q10/4 Framework for the management of Next Generation Networks including the convergence of voice, data and multimedia for wire-line and wireless;
- Q12/4 Management interface methodology and infrastructure management information models;
- Q14/4 Application specific information models;
- Q18/4 Protocols for management interfaces;
- Q14/15 Network management for transport systems and equipment;
- Q3/2 Management and development of voice and non-voice based telecommunication services;
- Q4/2 Human factor issues in international telecommunication services;
- Q5/2 Service quality of networks;
- Q6/2 Network management;
- Q7/2 Traffic engineering for personal communications;
- Q8/2 Traffic engineering for SS No. 7- and IP-based signalling networks;
- Q9/2 Traffic engineering for networks supporting IP services.

It should be noted that the ITU-T is to consider a reorganization during the summer of 2004. This clause will require an update to reflect any new structure.

4.2.6 TTC

http://www.ttc.or.jp/

4.2.6.1 Overview

The purpose of this committee is to contribute to standardization in the field of telecommunications by establishing protocols and standards for telecommunications networks and terminal equipment, etc. as well as to disseminate those standards.

This committee will:

1) develop protocols and standards for telecommunications networks;

2) conduct studies and research on protocols and standards for telecommunications networks;

3) disseminate protocols and standards for telecommunications networks;

4) engage in activities accompanied by the above items; and

5) engage in other business activities necessary to achieve the purpose of the committee.

The Telecommunication Technology Committee (TTC) was established as a private standardization organization in October 1985 to contribute to further activation of the field of telecommunications, in which the free competitive market principle was introduced based on the implementation of the Telecommunication Business Law in 1985, and to respond to the Japan/US Market Oriented Sector Service (MOSS) Conference, which was held in the same year.

The Technical work of TTC is undertaken in 15 working groups. These are:

- Architecture;
- Signalling;
- NNI and UNI Transmission;
- DSL;
- Network Management;
- Multimedia Coding;
- Multimedia Platform;
- Enterprise Network;
- Home Network;
- AVS (Audio Visual Services) Upstream;
- Mobile Network Management;
- 3GPP Collaboration;
- 3GPP2 Collaboration;
- IP-based IMT Platform;
- PDC and FWA.

4.3 Industry Forums

Industry Forums have a number of roles depending on their constitution. However they tend to fall into 2 main groups where the topic of standards is involved. They either try to influence standards through co-operation with and/or input to SDOs or they produce their own "defacto" standards.

The following list of Industry Forums is provided in alphabetical order.

4.3.1 3GPP

http://www.3gpp.org/

4.3.1.1 Overview

The 3rd Generation Partnership Project (3GPP) is a collaboration agreement that was established in December 1998. The collaboration agreement brings together a number of telecommunications standards bodies which are known as "Organizational Partners". The current Organizational Partners are ARIB, CCSA, ETSI, ATIS, TTA and TTC.

The establishment of 3GPP was formalized in December 1998 by the signing of the "The 3rd Generation Partnership Project Agreement".

The original scope of 3GPP was to produce globally applicable Technical Specifications and Technical Reports for a 3rd Generation Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e. Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes). The scope was subsequently amended to include the maintenance and development of the Global System for Mobile communication (GSM) Technical Specifications and Technical Reports including evolved radio access technologies (e.g. General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE)).

The discussions that led to the signing of the 3GPP Agreement were recorded in a series of slides called the "Partnership Project Description" that describes the basic principles and ideas on which the project is based. The Partnership Project Description has not been maintained since its first creation but the principles of operation of the project still remain valid.

4.3.1.2 Key Technical Committees

3GPP is organized into a number of Technical Bodies, the Management Standardization activity is carried out by SA5 (Telecomm Management). SA5 specifies the management framework and requirements for management of the 3G system, delivering the architecture descriptions of the telecommunication management network (TMN) of the 3G system and coordinating across TSGs all relevant specification work pertinent to the 3G system telecom management. Its work is organized into 4 subworking groups (SWGs):

- SWG A: Telecommunications Management Architecture and Requirements, Trace, Subscription Management.
- SWG B: Charging Management.
- SWG C: OAM Interface Definition.
- SWG D: OAM Data Definition.

4.3.2 3GPP2

http://www.3gpp2.org

4.3.2.1 Overview

The Third Generation Partnership Project 2 (3GPP2) is:

- a collaborative third generation (3G) telecommunications specifications-setting project;
- comprising North American and Asian interests developing global specifications for ANSI/TIA/EIA-41 Cellular Radiotelecommunication Intersystem Operations network evolution to 3G; and
- global specifications for the radio transmission technologies (RTTs) supported by ANSI/TIA/EIA-41.

3GPP2 was born out of the International Telecommunication Union's (ITU) International Mobile Telecommunications "IMT-2000" initiative, covering high speed, broadband, and Internet Protocol (IP)-based mobile systems featuring network-to-network interconnection, feature/service transparency, global roaming and seamless services independent of location. IMT-2000 is intended to bring high-quality mobile multimedia telecommunications to a worldwide mass market by achieving the goals of increasing the speed and ease of wireless communications, responding to the problems faced by the increased demand to pass data via telecommunications, and providing "anytime, anywhere" services.

3GPP2 is a collaborative effort between five officially recognized SDOs. They are, ARIB - Association of Radio Industries and Businesses (Japan), CCSA - China Communications Standards Association (China), TIA - Telecommunications Industry Association (North America), TTA - Telecommunications Technology Association (Korea) and TTC - Telecommunications Technology Committee (Japan).

These SDOs are known as the Project's Organizational Partners (OPs). 3GPP2 requires that a participating individual member company be affiliated with at least one of the Organizational Partners.

In addition, the Project has welcomed Market Representation Partners (MRPs) who offer market advice to 3GPP2 and bring a consensus view of market requirements (e.g. services, features and functionality) falling within the 3GPP2 scope. They are:

- the CDMA Development Group (CDG);
- IPv6 Forum.

The work of producing 3GPP2's specifications resides in the Project's four Technical Specification Groups (TSGs) comprised of representatives from the Project's Individual Member companies. The TSGs are:

- TSG-A (Access Network Interfaces);
- TSG-C (cdma2000®);
- TSG-S (Services and Systems Aspects);
- TSG-X (Core Networks).

All TSGs report to the Project's Steering Committee, which is tasked with managing the overall work process and adopting the technical specifications forwarded by each of the TSGs.

4.3.3 ATM Forum

http://www.atmforum.org

4.3.3.1 Overview

The ATM Forum is an international non-profit organization formed with the objective of accelerating the use of ATM (Asynchronous Transfer Mode) products and services through a rapid convergence of interoperability specifications. In addition, the Forum promotes industry cooperation and awareness. Since its formation in 1991, The ATM Forum has generated very strong interest within the communications industry. Currently, The ATM Forum consists of approximately 80 member companies, and it remains open to any organization that is interested in accelerating the availability of ATM-based solutions.

The ATM Forum consists of a worldwide Technical Committee, marketing awareness programs such at Broadband Exchange, and the User Committee, through which ATM end-users participate.

The ATM Forum Technical Committee works with other worldwide standards bodies selecting appropriate standards, resolving differences among standards, and recommending new standards when existing ones are absent or inappropriate. The Technical Committee was created as one, single worldwide committee in order to promote a single set of specifications thereby ensuring interoperability between all vendors as ATM products and services become available. The Technical Committee consists of a variety of working groups, which investigate different areas of ATM technology.

As the ATM industry moves towards a new era of broadband networking, it becomes evident that a new direction is needed to drive the necessary development work in broadband technologies. The ATM roadmap identifies six key emerging market opportunities - three new networking architectures and three innovative application areas. The ATM Forum Broadband Roadmap does not set out to replace the existing contribution led work items. This work is still much needed and the member input much required. However, over time the vision outlined by the roadmap will act as a guide to these contributions - both for The ATM Forum and for all other groups involved in the joint definition of broadband technologies.

The three new network architectures are, Converged Network Services, Next Generation Networks and Optical Networking.

The three emerging application areas are 3G/4G Networks, Homeland Security and Public Safety Networks, and Content Delivery Networks.

4.3.4 DCML (Data Center Markup Language)

http://www.dcml.org/

4.3.4.1 Overview

DCML (Data Center Markup Language), sponsored by the DCML Organization, a self-funded non-profit organization consisting of over 20 of the world's leading software, service provider, and systems vendors, provides the first specification that provides a structured model and encoding to describe, construct, replicate, and recover data centre environments and elements. Using DCML, companies now have a standard method to enable data centre automation, utility computing, and system management solutions to exchange information about the data centre environment to make the vision of automated computing a reality.

DCML provides the only open, XML-based specification designed to do for the data centre what HTML did for content and IP did for networking - achieve interoperability and render proprietary approaches irrelevant by providing a systematic, vendor-neutral way to describe the data centre environment and policies governing the management of the environment - a fundamental requirement for utility computing.

DCML provides the first standard model to describe both a recipe and a blueprint of one or more data centre environments. Much as a culinary recipe provides both the list of ingredients and the instructions for successfully combining them, DCML provides both an inventory of data centre elements and the desired functional relationship between them. Just as an architectural blueprint established an easily understood, multi-dimensional plan for constructing or replicating a building, DCML can be used to provision or reproduce a complete data centre infrastructure - with all of its component relationships, dependencies, configuration, operational policies and management processes.

The following working groups are actively meeting and working on the specification in their respective areas:

- Framework Working Group;
- Server Working Group;
- Network Working Group;
- Application/Service Working Group;
- Marketing Committee.

4.3.5 DMTF (Distributed Management Task Force)

http://dmtf.org

4.3.5.1 Overview

Distributed Management Task Force, Inc. (DMTF), developer of CIM (Common Information Model), is the industry organization leading the development, adoption, and interoperability of management standards and initiatives for enterprise and Internet environments. Founded in 1992, the DMTF brings the technology industry's customers and top vendors together in a collaborative, working group approach that involves DMTF members in all aspects of specification development and refinement. Board member companies include 3Com, Cisco Systems, Dell Computer Corp., Hewlett-Packard, IBM, Intel, Microsoft, NEC, Novell, Oracle, Sun Microsystems, Symantec and VERITAS Software.

DMTF works closely with its Alliance Partners, including CompTIA, Consortium for Service Innovation, Federation Against Software Theft (FAST), Global Grid Forum (GGF), Interoperability Technology Association for Information Processing (INTAP), IT Service Management Forum (itSMF), Network Applications Consortium (NAC), Northwest Energy Efficiency Alliance, The Open Group, Storage Networking Industry Association (SNIA) and TeleManagement Forum (TMF). These top industry standards bodies are working with and participating in the development of DMTF's CIM - and its semantically rich definitions of management information - as a common approach to address the challenge of providing interoperable distributed management.

The DMTF Common Information Model (CIM) is a conceptual information model for describing computing and business entities in enterprise and Internet environments. It provides a consistent definition and structure of data, using object-oriented techniques. CIM does not require any particular instrumentation or repository format. It is only an information model - unifying the data, using an object-oriented format, made available from any number of sources. In addition, CIM's goal is to model all the various aspects of the managed environment, not just a single problem space. To this end, various "Common Models" have been created to address System, Device, Network, User, Application, and other problem spaces. All of the problem domains are interrelated via associations and sub-classing. They all derive from the same fundamental objects and concepts - as defined in the Core Model.

DMTF working groups are established and dissolved on an as-needed basis. Participation is open to all DMTF members - associate members may participate in one technical and one marketing working group, while contributing members may participate in as many groups as required.

The Technical Committee develops standards and initiatives for the DMTF. The Technical Committee oversees the following working groups:

- Applications/Metrics;
- Architecture;
- Behaviour and State;
- Database;
- Desktop Management Interface (DMI);
- DEN/LDAP Mapping;
- Networks;
- Policy;
- Pre-OS;
- Security Protection and Management;
- Server Management;
- Support;
- System and Devices;
- User and Security;
- Utility Computing;
- Technologies.

Common Information Model (CIM): CIM allows for the exchange of management information in a platform-independent and technology-neutral way. It is an object-oriented model, describing an organization's computing and networking environments (its hardware, software and services). All managed elements are positioned within this model, clarifying semantics, streamlining integration and reducing costs by enabling end-to-end multi-vendor interoperability in management systems.

Web-Based Enterprise Management (WBEM): WBEM leverages existing Internet and Web services technologies for the interoperable exchange of management information. WBEM is a set of technologies, including an information model (CIM), an encoding specification (xmlCIM Encoding Specification), and a set of operations against the model with a transport mechanism (CIM Operations over HTTP).

Directory Enabled Networks (DEN): DEN is focused on communicating the benefits, usage and structure of a directory as a component in a complete management environment. Classes are mapped from CIM to a directory, and this information is integrated with other elements of the management infrastructure. DEN utilizes existing user and enterprise-wide data already present in a company's directory, empowers end-to-end services, and supports distributed, network-wide service creation, provisioning and management operations.

Desktop Management Interface (DMI): The industry's first desktop management standard, DMI gave component vendors - for the first time - a consistent and non-proprietary way to make their products manageable. DMI generates a standard framework for managing and tracking components in a desktop PC, notebook or server. Due to the rapid advancement of newer DMTF technologies, DMTF has announced an "End of Life" process for DMI, which will take place through March 31, 2005.

Alert Standard Format (ASF): ASF is designed to fill the gap of OS-absent systems management. The problem of systems manageability without an operating system has historically been solved with proprietary and relatively expensive solutions. ASF defines remote control and alerting interfaces for networked devices, and thereby reduces the downtime associated with typical triage and repair required to solve hardware and software failures.

System Management BIOS (SMBIOS): The SMBIOS Specification addresses how motherboard and personal computer vendors present management information about their products in a standard format, extending the BIOS interface on Intel architecture systems. SMBIOS defines the structure of this system information, allowing its retrieval by management applications that use DMI, CIM or direct access, and eliminating the need for error prone operations, such as probing system hardware for presence detection.

4.3.5.2 Key Working Groups

Pre-OS: The Pre-OS workgroup is chartered with providing specifications that define interfaces and capabilities for:

- Managing a system in OS-absent environments;
- Communicating OS-absent management hardware configuration and capabilities to the OS-present environment.

Server Management: The goals of the Server Management Working Group are to define a platform independent, industry standard management architecture instantiated through wire level protocols built upon IP based technologies that:

- Extend the CIM schema (presenting the work in parallel to the Sys/Dev WG) to represent new server system topologies.
- Leverage the CIM/XML protocol and identify enhancements if necessary.
- Define a CLI protocol (syntax and semantics).
- Define profiles for different server system topologies in order to support base-level compliance.
- Define an architectural model for understanding the semantic behaviour of server management components.
- Demonstrate interoperability.

Support: To improve customers' experience with the support processes that involve multiple vendors, while reducing costs for those providing support. This is accomplished through standardized exchange of Service Incidents (cases, trouble tickets, and support requests) and Solutions (information about known problems and FAQs) between independent implementers. The exchange preserves knowledge content (the relationship between pieces of information) by defining a common Support schema (object and transaction model) that leverages the power of the Common Information Model (CIM) and the interoperability of Web-Based Enterprise Management (WBEM).

System and Devices: System and Devices is responsible for defining general and system-level abstractions, services and entities (such as computer systems, physical location, diagnostic services, logs and log records, and storage configuration services). It models both component (static and inventory-related objects and features) and behavioural (events, rules and methods) aspects of the existing high-level System, Computer System, Operating System, Logical Device and Physical Element classes, and their derived and related objects. The team coordinates with the WBEM Interoperability and User and Security Working Groups to:

- Add event notification and security/encryption-related objects in support of computing platforms.
- Associate credentials and identities with systems and devices.
- Manage Role-Based Access Control (RBAC) related to object entities such as Computer and File Systems.
- Model Logical Device events and methods.

The group works by deriving new objects and associations from the basic entities, and extending the models to better address System and Storage Area Networking requirements (with developments in such areas as clusters, and work with the Network Working Group regarding storage topology and connectivity definitions). The group is also working to simplify the Core Model's concepts and classes, continue the development of a common diagnostic test infrastructure, and to better model virtual and partitioned computing platforms. Some aspects of the latter are worked jointly with the Application Server sub-team of the Applications WG.

Utility Computing: The goals of the Utility Computing Working Group are to:

- Unify the computer industry on a common manageability model and profiles for utility computing. In support of this goal, the WG will write or collaborate with other standards organizations to create interoperable profiles for utility computing services.
- Define how to assemble complete service definitions, that is, the composition of the models, the management building blocks, the business/domain specific functional interfaces, bindings, and transports.
- Aspects of utility computing that are within the scope of this working group are defined by the GGF OGSA workgroup architecture document on services. This work builds on the existing CIM v2.x Schema. Enhancements to the CIM Schema will be fed back to the DMTF "owning" working groups. It is not a goal of this working group to replace or reproduce the standards and models of other industry organizations.

4.3.6 DSL Forum

http://www.dslforum.org/

4.3.6.1 Overview

DSL Forum is a consortium of nearly 200 leading industry players covering telecommunications, equipment, computing, networking and service provider companies. Established in 1994, the Forum continues its drive for a global mass market for DSL broadband, to deliver the benefits of this technology to end users around the world over existing copper telephone wire infrastructures. In nine years, the DSL Forum has moved through defining the core Digital Subscriber Line technology to delivering maximum effectiveness in its deployment and use.

The global standardization of ADSL and SHDSL has been done. VDSL and more will follow. These will provide a complete portfolio of digital subscriber line technologies designed to deliver ubiquitous broadband services for a wide range of situations and applications that will continue the transformation of our day-to-day lives in an on-line world.

Best practices for auto-configuration, flow-through provisioning, equipment interoperability and other key facilitators of scaleable, global, mass-market deployment of DSL broadband, are fast-tracked by DSL Forum.

Outcomes of that work are published as Technical Reports for use throughout the global industry and are available from the DSL website www.dslforum.org/aboutdsl/tr_table.html.

Industry-wide support for and contribution to DSL Forum's prioritized action plan to support the global mass-market has been unparalleled with a consistently high membership of nearly 200 global DSL companies. Each member company contributes to the work of the Forum through the development of the technology and its effective delivery. They participate in technical and marketing working groups, sharing their knowledge, experience and expertise to create common, agreed protocols, processes and best practice recommendations for use by the industry and for standards and other related industry bodies.

Technical working groups

- Architecture and Transport.
- DSLHome-Technical.
- Operations and Network Management.
- Testing and Interoperability.

Marketing working groups

- Best Practices and Summit.
- DSLHome-Marketing.
- European Market Focus Group.
- Strategic Communications.

The Forum meetings foster a sharing of knowledge and best practices between members to make DSL the world's primary choice for broadband services. Through its marketing activities - an extensive, continuous global public and industry education campaign, the DSL Forum also ensures a growing international understanding of the benefits of DSL broadband. In meeting its core objectives, the Forum continues to establish essential and proven processes for DSL broadband delivery that accelerate the affordable and faster delivery of DSL to the mass market.

4.3.7 EAN.UCC System

http://www.ean-ucc.org/

4.3.7.1 Overview

EAN International and The Uniform Code Council, a Member Organization of an expanded EAN International, are voluntary standards organizations charged by their respective boards with the co-management of the EAN.UCC System and the Global Standard Management Process (GSMP). The EAN.UCC System standardizes bar codes, EDI transactions sets, XML schemas, and other supply chain solutions for more efficient business. By administering the assignment of company prefixes and coordinating the accompanying standards, EAN International and the Uniform Code Council maintain the most robust item identification system in the world.

EAN International and the Uniform Code Council, Inc. (UCC) created the Global Standards Management Process (GSMP) to support standards development activity for the EAN.UCC System. The GSMP was developed to maintain standards-based solutions for global trade using EAN.UCC System technologies. The GSMP uses a global consensus process to develop supply chain standards that are based on business needs and user-input.

The objective of the GSMP is to bring together users from all industries, from anywhere in the world, to allow for a uniform approach and methodology for global standards management. This includes but is not limited to standards development, standards maintenance, and implementation support. The GSMP is built on these core activities:

- identify and assess business needs;
- gather business requirements;
- document best practices;
- gain solution consensus;
- develop and implement standards.

The development of new e-business standards by EAN and the UCC has created a critical need to store, reuse and share precise core component and business definitions and their equivalent representations in targeted standards such as EDI, XML and AIDC. The storage for this data is the EAN.UCC Global Data Dictionary (GDD). This repository is developed to fully support the EAN.UCC Business Message Standards and EAN.UCC XML Standard Schemas.

4.3.8 EDIFICE

EDIFICE: http://www.edifice.org/

4.3.8.1 Overview

EDIFICE represents the majority of the European electronics industry and is recognized as such by other organizations. It is a forum to be educated in B2B processes and technologies and also avail of the knowledge and experiences of other member companies. EDIFICE provides an opportunity to contribute to the direction and evolution of B2B standards and processes that will benefit the industry.

EDIFICE is the European RosettaNet user group that provides a forum for companies with interests in computing, electronics and telecommunications which as a group, drives and enables global standardized B2B adoption in Europe through best practice, information sharing and influencing of standards development.

EDIFICE has two kinds of Task Groups:

- EDIFICE Business area Task Groups;
- EDIFICE support TASK GROUPS.

The technical activities are carried by the EDIFICE Business area Task Groups.

4.3.8.2 Key Working Groups

Automatic Data Capture (ADC)

This group works on guidelines and recommendations to facilitate the implementation of bar/2-D codes on labels in conjunction and in support of B2B electronic message exchange. Strong focus is put on compliance to International standards and cooperation with standardization bodies and other industry groups.

Billing/Self-Billing

The business area dealing with the exchange of billing information between supplier and customer for products and/or services, which have been delivered. The scope includes both invoicing in the traditional direction from supplier to customer and self-billing scenarios where the invoice is raised by the customer for goods received or consumed. The area extends to the remittance advice information flow, which provides the link to the payment area.

Forecast and Inventory Management (FIM)

To develop EDIFICE practice around the areas of Forecast and Inventory management including consigned inventory, between customer and supplier.

Portals and Marketplaces (P&M)

To promote standardized B2B information exchange with Portals and Marketplaces and users of Portals and Marketplaces. To provide consultancy to define and describe business processes and underlying standards.

Supplier/Distributor (S&D)

The business area, dealing with information exchanged between an Electronic Components manufacturer and his distributor related to the scenario specific to the business relation as outlined in their business agreement. The current focus of this Group is based around RosettaNet developments.

All the documents are available only for members.

4.3.9 ETIS

ETIS: http://www.etis.org/

4.3.9.1 Overview

ETIS is the Global IT Association for Telecommunications. It is the platform for the interchange of information, experiences and professional networking at the heart of the Telecommunications industry. It is an industry led group, which brings together telecommunications operators, suppliers and content providers on key information and communication technology issues and facilitates co-operation among them. The mission of ETIS is to enable telecommunications service providers to improve their business performance by using information technology effectively. It offers a managed forum for the exchange of ideas and experiences on IT-related matters for providers, suppliers and users in the telecommunications industry and it facilitates co-operation between them.

ETIS has the following Working Groups:

Information Security Group

In January 2004, the Information Security Working group was established as a follow up to a meeting at the Global Security Conference in Sophia Antipolis in November 2003. The working group boasts 25 members from 19 companies. Topics that are being studied and addressed are:

- security culture;
- fight on terrorism from a Telco's perspective;
- financial losses due to security breaches;
- security standards, information insurance;
- network security;
- outsourcing.

The role of the group is to provide requirements to the industry, standardization and standard based products. The group is the only security group to concentrate on the telecom market.

Electronic Billing Group

In recognition of the growing interest in electronic commerce, and of billing as an integral part of this, ETIS set up a working group to develop and promote the use of a standard subset of the UN EDIFACT INVOIC message. This subset was completed some years ago and is now in everyday use within several ETIS member companies, and is in a trial phase within other companies. In 2003 the group finished an XML standard for the telecom industry in addition to the existing EDIFACT message. The XML schema and related software for implementation is available for Telecom operators who can now choose if they want their invoices in EDIFACT or XML. The ETIS EDIFACT and XML standard and solution are the only standard on the market, there are currently no other developments in XML to define telecom invoices for end-customers.

Enterprise Architecture Group

The objective of the Enterprise Architecture group is to seek to identify and share best practice in the development and use of Enterprise Architectures in the business context of its members. Liaison with standards bodies and appropriate government institutions as well as suppliers can help to ensure a quality solution to the problem as well as reducing cost and making the optimum use of scarce resources of manpower.

International Settlements Group

ETIS International Settlements group cooperates to implement EDI solutions, and to develop standard solutions in co-operation with ITU-T. This group has agreed to cooperate to implement EDI solutions for exchange of statements of accounts wherever and whenever feasible, and to develop together standard solutions which meet new business needs. The group maintains the User Guide and the Common Code Tables. The ultimate objective is to have these standards implemented by all operators, which exchange statements of accounts. EDI Exchange of international settlement accounts between operators, through the use of the Flat File Format, is based upon the ITU-T recommendation D190. An XML solution is being developed in parallel.

Benchmarking Study Group

Each year ETIS carries out a Benchmarking Exercise. Not only does the survey allow members to compare their own effectiveness and efficiency with others, it also provides an opportunity for the exchange of information, ideas, the latest information about business drivers and strategies of companies in the telecommunications industries, it allows participants to do so in a confidential way, confident that their information is shared only by participants.

4.3.10 Global Grid Forum

http://www.gridforum.org

4.3.10.1 Overview

The Global Grid Forum (GGF) is a community - initiated forum of thousands of individuals from industry and research leading the global standardization effort for grid computing. GGF's primary objectives are to promote and support the development, deployment, and implementation of Grid technologies and applications via the creation and documentation of "best practices" - technical specifications, user experiences, and implementation guidelines.

GGF efforts are also aimed at the development of a broadly based Integrated Grid Architecture that can serve to guide the research, development, and deployment activities of the emerging Grid communities. Defining such an architecture will advance the Grid agenda through the broad deployment and adoption of fundamental basic services and by sharing code among different applications with common requirements. Wide-area distributed computing, or "grid" technologies, provide the foundation to a number of large-scaled efforts utilizing the global Internet to build distributed computing and communications infrastructures. As common Grid services and interoperable components emerge, the difficulty in undertaking these large-scale efforts will be greatly reduced and, as importantly, the resulting systems will better support interoperation.

The GGF's primary goals are:

- to facilitate and support the creation and development of regional and global computational grids that will provide to the scientific community, industry, government and the public at large dependable, consistent, pervasive and inexpensive access to high-end computational capabilities;
- to address architecture, infrastructure, standards and other technical requirements for computational grids and to facilitate and find solutions to obstacles inhibiting the creation of these grids;
- to educate the scientific community, industry, government and the public regarding the technologies involved in, and potential uses and benefits of, computational grids;
- to facilitate the application of grid technologies within educational, research, governmental, healthcare and other industries;
- to provide a forum for exploration of computational grid technologies, applications and opportunities, and to stimulate collaboration among the scientific community, industry, government and the public regarding the creation, development and use of computational grids; and
- to exercise all powers conferred upon corporations formed under the Illinois General Not-For-Profit Corporation Act in order to accomplish its charitable, scientific and educational purposes and to take other actions necessary, advisable or convenient to carry out any or all of these purposes.

The work of Global Grid Forum is performed within its various working groups and research groups. A working group is generally focused on a very specific technology or issue with the intention to develop one or more specific documents aimed generally at providing specifications, guidelines or recommendations. A research group is often longer-term focused, intending to explore an area where it may be premature to develop specifications.

4.3.10.2 Key Working Groups

The following WGs are pertinent for the network and/or service management:

Open Grid Service Common Management Model (CMM)

In Grids (and IT systems in general) there are many entities that need to be managed through a set of management operations. The original purpose of this working group was to define the Common Management Model (CMM), which provides management functionality that is of broad and general use in Grids.

The CMM-WG is now working in cooperation with the OGSA-WG, creating a management framework for OGSA and doing a gap analysis of management in OGSA.

Open Grid Service Architecture (OGSA)

The purpose of the OGSA Working Group is to achieve an integrated approach to future OGSA service development via the documentation of requirements, functionality, priorities, and interrelationships for OGSA services. Topic areas that we expect to scope and outline early are common resource model and service domain mechanisms, but the precise set to be addressed will be determined in early discussions.

The output of this WG will be an OGSA architecture roadmap document that defines, scopes, and outlines requirements for key services. It is expected that the development of detailed specifications for specific services will occur in other WGs (existing or new). When the present document is produced, the WG will consult internally and with the GFSG to determine whether to close or, alternatively, to work to produce a second edition.

Open Grid Service Infrastructure (OGSI)

The purpose of the OGSI Working Group is to review and refine the Grid Service Specification and other documents that derive from this specification, including OGSA-infrastructure-related technical specifications and supporting informational documents.

On January 20, 2004, as new set of draft specifications was released based on the concepts of OGSI and enhanced by experts from the Web Services community. Called the WS-Resource Framework (WSRF), these specifications will be submitted to a standards organization in the near future. The OGSI Working Group is now hosting an open discussion of these specifications.

GridFTP

At this stage, the group focuses on improvements of FTP and GridFTP v1.0 protocol with the goal to produce bulk file transfer protocol suitable for grid applications. New protocol should be backward compatible with RFC 959 FTP as much as possible with new features added as (negotiable) extensions. Some desired extensions include parallel transfers, GSI authentication and striped transfers.

Open Grid Services Architecture Security Working Group (OGSA - SEC -WG)

The purpose of the OGSA Security WG (OGSA-Sec) is to enumerate and address the Grid Security.

4.3.11 IEEE

4.3.11.1 Overview

The IEEE is a non-profit, technical professional association of more than 360 000 individual members in approximately 175 countries. The full name is the Institute of Electrical and Electronics Engineers, Inc., although the organization is most popularly known and referred to by the letters I-E-E-E.

Through its members, the IEEE is a leading authority in technical areas ranging from computer engineering, biomedical technology and telecommunications, to electric power, aerospace and consumer electronics, among others.

Through its technical publishing, conferences and consensus-based standards activities, the IEEE:

- produces 30 % of the world's published literature in electrical engineering, computers and control technology;
- holds annually more than 300 major conferences; and

- has nearly 900 active standards with 700 under development.

The IEE Is organized into a number of Working/Groups, these include:

- Aerospace Electronics.
- Broadcast Technology:
  - Video Compression (Digital) Measurement (P1486).
  - Video Distribution and Processing (P205).
- Components and Materials.
- Electromagnetics.
- Information Technology:
  - AI-ESTATE (P1232).
  - Architectural Description (P1471).
  - ATLAS (Abbreviated Test Language for All Systems).
  - Learning Technology (P1484).
  - Delay and Power Calculation (P1481).
  - Embedded Core Test (P1500).
  - Floating-Point Arithmetic (P754).
  - Heterogeneous InterConnect (HIC) IEEE Std. 1355-1995.
  - High Level Architecture (HLA) (P1516, P1516.1, P1516.2).
  - High Performance Serial Bus Bridges (P1394.1).
  - LAN/MAN (P802).
  - Mixed-Signal Test Bus (1149.4) .
  - Microprocessor Standards.
  - PASC (Portable Applications Standards Committee).
  - Programmable Devices: Boundary-Scan-based In System Configuration (P1532).
  - Public-Key Cryptography (P1363).
  - Software Engineering Standards.
  - Standard Test Interface Language (P1450).
  - Storage Systems (P1244, P1563).
  - Test and Diagnosis for Electronic Systems (SCC20).
  - VHDL - Analog and Mixed-Signal Extensions (P1076.1).
  - Year 2000.
- Instrumentation and Measurement.
- Medical Device Communications.
- National Electrical Safety Code .

- Portable Battery Technology.
- Power Electronics.
- Power and Energy.
- Quantities, Units, and Letter Symbols:
  - Letter Symbols for Units of Measurements;
  - International System of Units (SI).
- Reliability.
- Voting System Engineering.

4.3.11.2 Key Technical Committees

Management work is undertaken within each technical committee developing a standard. The key Technical committees are:

- 802.1;
- 802.3;
- 802.10;
- 802.11;
- 802.15;
- 802.16.

4.3.12 IETF (Internet Engineering Task Force)

http://www.ietf.org

4.3.12.1 Overview

The Internet Engineering Task Force is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g. routing, transport, security, etc.). Much of the work is handled via mailing lists. The IETF holds meetings three times per year.

The IETF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Internet Engineering Steering Group (IESG). Providing architectural oversight is the Internet Architecture Board, (IAB). The IAB also adjudicates appeals when someone complains that the IESG has failed. The IAB and IESG are chartered by the Internet Society (ISOC) for these purposes. The General Area Director also serves as the chair of the IESG and of the IETF, and is an ex-officio member of the IAB.

The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. The IANA is chartered by the Internet Society (ISOC) to act as the clearinghouse to assign and coordinate the use of numerous Internet protocol parameters.

RFCs (Request for Comments)

Each distinct version of an Internet standards-related specification is published as part of the "Request for Comments" (RFC) document series. This archival series is the official publication channel for Internet standards documents and other publications of the IESG, IAB, and Internet community. RFCs can be obtained from a number of Internet hosts using anonymous FTP, gopher, World Wide Web, and other Internet document-retrieval systems. RFCs cover a wide range of topics in addition to Internet Standards, from early discussion of new research concepts to status memos about the Internet. RFC publication is the direct responsibility of the RFC Editor, under the general direction of the IAB.

IDs (Internet-Drafts)

During the development of a specification, draft versions of the document are made available for informal review and comment by placing them in the IETF's "Internet-Drafts" directory, which is replicated on a number of Internet hosts. This makes an evolving working document readily available to a wide audience, facilitating the process of review and revision. An Internet-Draft that is published as an RFC, or that has remained unchanged in the Internet-Drafts directory for more than six months without being recommended by the IESG for publication as an RFC, is simply removed from the Internet-Drafts directory. At any time, an Internet-Draft may be replaced by a more recent version of the same specification, restarting the six-month timeout period. An Internet-Draft is NOT a means of "publishing" a specification; specifications are published through the RFC mechanism described in the previous clause. Internet-Drafts have no formal status, and are subject to change or removal at any time.

4.3.12.2 Key Working Groups

The network and/or services management issues are handled by the **Operations and Management Area:** http://www.ops.ietf.org/

Currently, there are the following active Working Groups within the Operations and Management Area.

Authentication, Authorization and Accounting (aaa) Working Group:

http://www.ietf.org/html.charters/aaa-charter.html

The Authentication, Authorization and Accounting Working Group is focused on the development of requirements for Authentication, Authorization and Accounting as applied to network access. Requirements were gathered from NASREQ, MOBILE IP, and ROAMOPS Working Groups as well as TIA 45.6. The AAA WG then solicited submission of protocols meeting the requirements, and evaluated the submissions. The key management issues in the AAA working group are:

- Accounting. The accounting operational model should be described for each type of network access.
- Data model. The proposal should offer logical separation between the protocol and the data model and should support rich data types.
- MIBs. A MIB must be defined, supporting both IPv4 and Ipv6 operation.

ADSL MIB (adslmib) Working Group

http://www.ietf.org/html.charters/adslmib-charter.html

The working group will define a set of managed objects to be used for management of Very high speed Digital Subscriber Line (VDSL) services as defined by T1E1.4/2000-009R2. It is a goal, though not a requirement, that the resultant MIB be published as an extension to the ADSLMIB. The MIB defined by this group will be generated using SMIv2, will be consistent with the SNMP management framework, and will describe the relationship of the objects defined to existing MIBs such as those described by the current ADSLMIB and HDSL2/SHDSL MIB, the interfaces MIB, and the AtoM MIB.

The working group will also define two sets of line code specific (LCS) managed objects to be used for management of Very high speed Digital Subscriber Line (VDSL) services, one for Multiple Carrier Modulation line coding (MCM), and one for Single Carrier Modulation line coding (SCM). The working group will consider the input of the DSL forum and the ITU in the definition of this MIB.

AtoM MIB (atommib) Working Group

http://www.ietf.org/html.charters/atommib-charter.html

The AtoM MIB Working Group is currently chartered to:

- Maintain and advance on the standards track the existing specifications for ATM management (RFC 2512 to 2515).
- Maintain and advance on the standards track other trunk-mib specifications (i.e. for DS0 - DS3-E3, RFC 2493 to 2496).

- The objects defined by the working group will be consistent with the Internet-standard Management framework.

Benchmarking Methodology Working Group (BMWG)

http://www.ietf.org/html.charters/bmwg-charter.html

The major goal of the Benchmarking Methodology Working Group is to make a series of recommendations concerning the measurement of the performance characteristics of various internetworking technologies; further, these recommendations may focus on the systems or services that are built from these technologies. Each recommendation will describe the class of equipment, system, or service being addressed; discuss the performance characteristics that are pertinent to that class; clearly identify a set of metrics that aid in the description of those characteristics; specify the methodologies required to collect said metrics; and lastly, present the requirements for the common, unambiguous reporting of benchmarking results.

Bridge MIB (Bridge)

http://www.ietf.org/html.charters/bridge-charter.html

The Bridge MIB Working Group is chartered to define a set of managed objects that instrument devices that conform to the IEEE 802.1 standards for MAC-layer bridges.
This set of objects should be largely compliant with (and even draw from) those objects defined within each of the IEEE 802.1 standards, although there is no requirement that any specific object be present or absent. The set of objects should not duplicate, nor conflict with any MIB object definitions defined by the IEEE 802.1 standards themselves. The MIB object definitions produced will be for use by SNMP and will be consistent with other SNMP objects, standards, and conventions.

Distributed Management Working Group (DISMAN)

http://www.ietf.org/html.charters/disman-charter.html

The Distributed Management Working Group is chartered to define an initial set of managed objects for specific distributed network management applications, which can be consistently developed and deployed. A distributed network manager is an application that acts in a manager role to perform management functions and in an agent role so that it can be remotely controlled and observed.
The working group will limit its work to distributed network management applications where the main communication mechanism for monitoring and control is SNMP. Future work (and other working groups) may be chartered to investigate other distribution techniques such as CORBA or HTTP. The objects defined by the working group will be consistent with the SNMP architecture defined in RFC 2571.

The working group will especially keep security considerations in mind when defining the interface to distributed management.

Entity MIB (ENTMIB)

http://www.ietf.org/html.charters/entmib-charter.html

The working group is chartered to standardize a set of managed objects representing logical and physical entities and the relationships between them. Logical entities can occur when a single agent supports multiple instances of one MIB, such as RFCs 1493, 1525 or 1850 where each instance represents a single (logical) device/entity. Physical entities are the actual physical components on which the logical entities operate; typically, the physical components exist in a hierarchy.

The set of objects is intended be consistent with the SNMP framework and existing SNMP standards.
The scope of the defined managed objects should allow an NMS to interrogate a standard SNMP context and thereby discover what logical and physical entities exist, how to access the MIB information of each logical entity, and the relationships between the various entities. The MIB should support both a single agent or multiple agents in one physical entity. The WG also standardizes a set of managed objects representing sensor entities. Sensor entities are physical entities that report a value based on external conditions, such as temperature sensors, power monitors, etc. The Sensor Entity MIB will augment the basic Entity MIB to allow an NMS to obtain the value reported by a sensor. This MIB will not contain internal support for alarms or thresholds, but should work with standard alarm and threshold MIBs, such as RMON-2.

Global Routing Operations (grow)

http://www.ietf.org/html.charters/grow-charter.html

The purpose of the GROW is continue and expand on the original charter of the PTOMAINE WG. In particular, the purpose of the GROW is to consider and measure the problem of routing table growth, the effects of the interactions between interior and exterior routing protocols, and the effect of address allocation policies and practices on the global routing system. Finally, where appropriate, the GROW documents the operational aspects of measurement, policy, security, and VPN infrastructures.

Ethernet Interfaces and Hub MIB (HUBMIB)

http://www.ietf.org/html.charters/hubmib-charter.html

The Ethernet Interfaces and Hub MIB WG is chartered to define a set of managed objects that instrument devices, Medium Attachment Units (MAUs) and interfaces that conform to the IEEE 802.3 standard for Ethernet. This set of objects should be largely compliant with, and even draw from IEEE 802.3, although there is no requirement that any specific object be present or absent. The MIB object definitions produced are intended to be for use by SNMP and to be adequately consistent with other SNMP objects, standards and conventions.

Internet and Management Support for Storage Working Group (IMSS)

http://www.ietf.org/html.charters/imss-charter.html

The Internet and Management Support for Storage WG (IMSS) is chartered to address two areas, specifically:

- Ipv4 over Fibre Channel has been specified in RFC 2625. A corresponding specification for Ipv6 is needed.
- An initial Fibre Channel Management MIB has been developed by the IP Storage (ips) WG; extensions are needed to encompass management of additional aspects of Fibre Channel, such as zoning.

IP over Cable Data Network Working Group (ipcdn)

http://www.ietf.org/html.charters/ipcdn-charter.html

The IETF IPCDN Working Group develops and standardizes MIBs for IP-capable data-over-cable systems, for example cable modems, multimedia terminal adapters and associated cable-data equipment in a cable headend. These MIBs cover not only cable data interfaces, but also management of cable-data equipment and systems.

IP Flow Information Export (IPFIX)

http://www.ietf.org/html.charters/ipfix-charter.html

An IP flow information export system includes a data model, which represents the flow information, and a transport protocol. An "exporter," which is typically an IP router or IP traffic measurement device, will employ the IP flow information export system to report information about "IP flows," these being series of related IP packets that have been either forwarded or dropped. The reported flow information will include both (1) those attributes derived from the IP packet headers such as source and destination address, protocol, and port number and (2) those attributes often known only to the exporter such as ingress and egress ports, IP (sub)net mask, autonomous system numbers and perhaps sub-IP-layer information. This group is intended to select a protocol by which IP flow information can be transferred in a timely fashion from an "exporter" to a collection station or stations and define an architecture which employs it. The protocol must run over an IETF approved congestion-aware transport protocol such as TCP or SCTP.

MBONE Deployment Working Group (MBONED)

http://www.ietf.org/html.charters/mboned-charter.html

The MBONE Deployment Working Group is a forum for coordinating the deployment, engineering, and operation of multicast routing protocols and procedures in the global Internet. There are the following WG tasks relevant to the network management:

- develop mechanisms and procedures for sharing operational information to aid in operation of the multicast backbones and interconnects;
- complete the MSDP MIB.

Network Configuration Working Group (NETCONF)

http://www.ietf.org/html.charters/netconf-charter.html

The Netconf Working Group is chartered to produce a protocol suitable for network configuration, with the following characteristics:

- Provides retrieval mechanisms which can differentiate between configuration data and non-configuration data.
- Is extensible enough that vendors will provide access to all configuration data on the device using a single protocol.
- Has a programmatic interface (avoids screen scraping and formatting-related changes between releases).
- Uses a textual data representation, that can be easily manipulated using non-specialized text manipulation tools.
- Supports integration with existing user authentication methods.
- Supports integration with existing configuration database systems.
- Supports network wide configuration transactions (with features such as locking and rollback capability).
- Is as transport-independent as possible.
- Provides support for asynchronous notifications.

The Netconf protocol will use XML for data encoding purposes, because XML is a widely deployed standard, which is supported by a large number of applications. XML also supports hierarchical data structures.

Policy Framework Working Group (policy)

http://www.ietf.org/html.charters/policy-charter.html

This working group has three main goals. First, to provide a framework that will represent, manage, share, and reuse policies and policy information in a vendor-independent, interoperable, and scalable manner. Second, to define an extensible information model and specific schemata compliant with that framework that can be used for general policy representation (called the core information model and schema). For now, only a directory schema will be defined. Third, to extend the core information model and schema to address the needs of QoS traffic management (called the QoS information model and schemata). The viability of the framework will be proven by demonstrating that high-level policy information can be translated into device configuration information for network QoS applications. This requires the coordination of the core and QoS schemata, the PIB and MIB being developed in DiffServ, and possibly extensions to COPS provisioning, which is being developed in RAP. A secondary goal of this framework is to show that this general development process can be extended to other application domains.

Packet Sampling Working Group (PSAMP)

http://www.ietf.org/html.charters/psamp-charter.html

The focus of the WG is to:

- Specify a set of selection operations by which packets are sampled.
- Specify the information that is to be made available for reporting on sampled packets.

- Describe protocols by which information on sampled packets is reported to applications.
- Describe protocols by which packet selection and reporting configured.

A standard set of capabilities for network elements should be able to sample subsets of packets by statistical and other methods. The capabilities should be simple enough that they can be implemented ubiquitously at maximal line rate. They should be rich enough to support a range of existing and emerging measurement-based applications, and other IETF working groups where appropriate.

Prefix Taxonomy Ongoing Measurement and Inter Network Experiment Working Group (ptomaine)

http://www.ietf.org/html.charters/OLD/ptomaine-charter.html

The purpose of the Prefix Taxonomy Ongoing Measurement and Inter Network Experiment WG is to consider and measure the problem of routing table growth and possible interim methods for reducing the impact of routing table resource consumption within a network and the global Internet. The first step of the WG is to define the impacts on routing resource consumption and to identify the problems facing routing scalability.

Resource Allocation Protocol Working Group (rap)

http://www.ietf.org/html.charters/rap-charter.html

The working group is defining general-purpose objects that facilitate the manipulation of policies and provisioned objects available through COPS (Common Open Policy Service) COPS-PR (COPS - Policy Provisioning). Where appropriate, these will include frameworks clarifying the applicability of COPS objects and the best practices for the definition of additional objects defined in other working groups.

Remote Network Monitoring Working Group (rmonmib)

http://www.ietf.org/html.charters/rmonmib-charter.html

The RMON MIB Working Group is chartered to define a set of managed objects for remote monitoring of networks. These objects are intended to be the minimum necessary to provide the ability to monitor multiple network layers of traffic in remote networks; providing fault, configuration, and performance management, and to be consistent with the SNMP framework and existing SNMP standards.

Configuration Management with SNMP Woking Group (snmpconf)

http://www.ietf.org/html.charters/snmpconf-charter.html

The working group is intended to create a Best Current Practices document, which outlines the most effective methods for using the SNMP Framework to accomplish configuration management. The scope of the work includes recommendations for device specific as well as network-wide (Policy) configuration. The group is also chartered to write any MIB modules necessary to facilitate configuration management, specifically a MIB module, which describes network entities capabilities and capacities which can be used by management entities making policy decisions at a network level or device specific level. The working group will also write a MIB module, which describes management objects for the control of differentiated services policy in coordination with the effort currently taking place in the Differentiated Services Working Group.

Ipv6 Operations Working Group (V6OPS)

http://www.ietf.org/html.charters/v6ops-charter.html

The Ipv6 Operations Working Group (V6OPS) develops guidelines for the operation of a shared Ipv4/Ipv6 Internet and provides guidance for network operators on how to deploy Ipv6 into existing Ipv4-only networks, as well as into new network installations.

4.3.13 International Packet Communications Consortium

http://www.packetcomm.org/index.shtml

4.3.13.1 Overview

The International Packet Communications Consortium (IPCC) evolved from the International Softswitch Consortium (ISC), the industry's most longstanding advocate advancing the maturation of packet-based network technologies and markets.

The IPCC embodies the industry's primary mission: To develop the market for all products, services, applications and solutions utilizing packet-based voice, data and video communications technologies available today, regardless of transport medium - wireless, copper, broadband, fiber optics and more.

The IPCC promotes and defines the market acceptance of Packet Networks in four important ways:

- **Validation:** The IPCC acts as the public advocate for the development and acceptance of packet technologies. It facilitates the definition and acceptance of standards for interoperability and deployment and organizes interoperability test events.
- **Architecture and Operational Definitions and Information:** The IPCC publishes documentation on technical specifications and reference architectures. It offers the library of information on next-generation technologies and innovations. The Consortium also serves as a forum for enhancing the knowledge and ingenuity of its members. It coordinates international and domestic events to educate the industry on packet applications and deployment opportunities.
- **Advocacy:** The IPCC represents the collective concerns of its members to governments around the world through testimony, legal commentary and public education. The IPCC is an official reference and advisor organization to the FCC.
- **Diversity:** By establishing the most diverse group of next-gen companies in the industry, the IPCC is best positioned to advocate the advancement of Global Packet Technologies.

The IPCC is a non-profit organization financed and operated by its global membership. Each member is allowed one vote, and the membership collectively elects a Board of Directors (BoD) and a Technical Advisory Council (TAC). All members have the opportunity to initiate and participate in the various projects of the IPCC (including research, development of tools, documentation, etc.).

IPCC Projects in Process

Business Services Utilizing Packet Communications (i.e. Hosted Services including IP Centrex, IP PBX, wholesale hosted services, etc.): This project will involve writing reference documents, conducting research, and other methodology decided upon by IPCC members.

IPCC Research

The IPCC regularly commissions research on behalf of its members on topics that are most relevant for the industry at that time. The research is available to members only.

4.3.14 IPDR.org

http://www.ipdr.org

4.3.14.1 Overview

IPDR.org is an open consortium of leading service providers, equipment vendors, system integrators, and billing and mediation vendors collaborating to facilitate the exchange of usage and control data between network and hosting elements and operations and business support systems by deployment of IPDR standards. The main objective of the IPDR.org is to define and implement open, defacto standards for IP-based support system interoperability, enabling providers to profitably deploy next-generation services. This includes:

- Standardization of a usage-record encoding and multiple delivery protocols. The specifications represent an open, extensible, usage record in state-of-the-art encapsulation techniques. IPDR usage records can encapsulate the metrics and parameters for any service transaction, including an extension mechanism so network elements and support systems can exchange optional service metrics.
- Open-source libraries and tools assisting vendors in rapid adoption of IPDR standards.

- A repository of service specifications for emerging services, including core usage metrics and optional usage metrics.
- A certification process by which vendors can claim IPDR compliance.
- Additional standards under development to address provisioning and settlement of next-generation data services.

IPDR.org is a member-driven organization. Member companies contribute the knowledge, energy, and brainpower to identify requirements, define technical standards, and prove interoperability of working code.

Work is distributed amongst several "working groups" identified below, each with its own mission and leadership. Overlapping membership of working groups ensures adequate cross-propagation of knowledge. IPDR.org working groups comprise member volunteers who meet weekly by teleconference and quarterly in person.

As an "ad hoc" interoperability alliance, IPDR.org distinguishes itself from other standards organizations with an emphasis on rapid implementation. Instead of a "waterfall" model for standards development, we pursue an "iterative" approach that permits completed code and multi-vendor interoperation within six months of specification.

Initiatives

Members of IPDR.org are currently working on the following initiatives:

Network Data Management - Usage (NDM-U) Specification, Version 3.1.1

This production-ready standard is the culmination of 2+ years work by IPDR.org member companies, staff and specialized contractors. Also referred to as the IPDR standard, it delivers on the vision of IPDR.org founders and gives the industry a ready-to-deploy record format for next-generation services. NDM-U 3.1 features the following improvements and benefits:

- Multi-Service Support - The NDM-U v2.0 and up supports multiple classes of service (from access to applications). Thanks to "Service Specifications" and schemas for each, the industry can agree on a well-defined record and do correlation across service types.
- Human and Machine Readable - v3.0 and up permit both binary (XDR) and XML encodings. This means that data can be made available to partners or integrators in human-readable mode, but compacted by a factor of 5 for high-volume production.
- Vendor Extensibility - Traditional CDR's permit vendors to make proprietary extensions. Unfortunately, they remain just that - *proprietary*. IPDR schemas permit vendors to make extensions to standard "Service Specifications" and publish the extension so that other applications can automatically support them.
- Capabilities Discovery - The NDM-U permits vendor systems to query each other for details of their IPDR support and to dynamically adapt.

IPDR Service Specifications

These documents and XML schema are templates and recommendations for contents to appear in IPDR NDM-U records for different classes of services (e.g. VoIP, Streaming Media, etc.).

Reference Source Code

These source code and testing tools are designed to reduce the cost of implementation and increase the level of compliance for vendors adhering to IPDR standards. (Available to members only Q1 of 2002.).

IPDR Compliant™ Program

In order for companies to have their products considered to be IPDR Compliant™ systems they must have demonstrated the ability to interoperate with a variety of other IPDR Compliant™ systems under several light-usage real-world scenarios. It is a requirement that companies must use a shipping, production version of their product for the testing and the configuration used for testing must be available to product purchasers at the time of test. The exact requirements of IPDR Compliance vary according to the type of the vendor. The following describes the vendor types and their requirements.

"Producer" systems such as mediation packages have demonstrated the ability to monitor usage of one or more classes of applications: Voice Over IP, Streaming Media (e.g. Video On Demand), and Wireless Applications, and to generate detail records compliant with the current IPDR.org NDM-U specification. These records have been successfully read and processed by multiple "Consumer" systems in a vendor-neutral environment overseen by designated IPDR.org observers.

"Consumer" systems such as billing packages have demonstrated the ability to ingest IPDR detail records of one or more classes of applications such as Voice Over IP, Streaming Media (a.k.a. Video On Demand), and Wireless Applications, formatted according to the current IPDR NDM-U specification as supplied by multiple "Producer" systems. The "Consumer" systems have demonstrated appropriate business processing in a vendor-neutral environment overseen by designated IPDR.org observers.

IPDR.org maintains a list of upcoming testing events and observers. IPDR.org observers are appointed by the IPDR.org Technical Director as part of the scheduling of the observation. At the discretion of IPDR.org, compliance is subject to yearly review and re-testing in accordance with the current release of the NDM-U specification and compliant software. IPDR.org members in good standing will have priority in scheduling compliance testing with IPDR.org observers.

Working Groups

WLAN Accounting and Settlement Working Group

Its mission is to enable WLAN Roaming by publishing specifications that define open and extensible inter-operator Accounting and Settlement interfaces that support a rich set of WLAN service offerings.

Business Requirements Working Group

Its objective is to collect, describe, and validate business requirements and use-cases that will be addressed by the developing IPDR standard.

Protocol Working Group

The main objective is to define the notation, syntax, encoding, and transport used to convey usage information to business support systems.

Interoperability Pavilion Working Group

The mission of this Working Group is to increase the number of IPDR Compliant™ companies and products by hosting effective, low-cost interoperability test sessions.

Marketing Working Group

Its objective is to create increased exposure for IPDR.org and its members.

4.3.15 IT Infrastructure Library (ITIL)

http://www.itil.org.uk/

4.3.15.1 Overview

ITIL (IT Infrastructure Library) is the most widely accepted approach to IT Service Management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally. It is supported by a comprehensive qualification scheme, accredited training organizations, and implementation and assessment tools. The best-practice processes promoted in ITIL both support and are supported by the British Standards Institution's Standard for IT Service Management (BS15000).

ITIL consists of a series of books giving guidance on the provision of quality IT services, and on the accommodation and environmental facilities needed to support IT. ITIL has been developed in recognition of organizations' growing dependency on IT and embodies best practices for IT Service Management.

The ethos behind the development of ITIL is the recognition that organizations are becoming increasingly dependent on IT in order to satisfy their corporate aims and meet their business needs, this leads to an increased requirement for high quality IT services. ITIL provides the foundation for quality IT Service Management. The widespread adoption of the ITIL guidance has encouraged organizations worldwide, both commercial and non-proprietary, to develop supporting products as part of a shared "ITIL Philosophy".

OGC (Office of Government Commerce) worked closely with BSI and itSMF in rewriting the ITIL books in order that the BSI Management Overview (PD0005), BS15000-1 (Specification for service management), BS15000-2 (Code of practice for service management) and the ITIL series form part of the same logical structure. The BSI Management Overview serves as a management introduction to the detailed guidance in ITIL, and correspondingly, the individual ITIL books offer expanded information and guidance on the subjects addressed in within BS15000.

There is a wide range of products and services available. Non-proprietary elements include the ITIL Publications, Qualifications and the itSMF. Elements provided by commercial companies include consultancy, software tools and training.

BS15000

The ITIL (IT Infrastructure Library) forms the basis of the BS 15000 standard. It consists of 7 sets: Managers Set; Service Support; Service Delivery; Software Support; Networks; Computer Operations; Environmental.

Although the UK Government originally created the ITIL, it was rapidly adopted across Europe as the standard for best practice in the provision of IT Service. Although the ITIL covers a number of areas, its main focus is on IT Service Management (ITSM).

IT Service Management (ITSM) itself is divided into two main areas, Service Support and Service Delivery. Together, these two areas consist of 10 disciplines that are responsible for the provision and management of effective IT services.

BS15000 consists of two parts:

BS 15000-1:2002 IT Service Management: Specification for Service Management

BS15000-1 consists of 10 clauses: Scope, Terms and Definitions, Requirements for a Management System, Planning and Inplementing Service Management, Planning and Implementing New or Changed Services, Service Delivery Process, Relationship Processes, Resolution Processes, Control Processes, and Release Process.

BS 15000-2:2003 IT service management. Code of practice for service management

BS15000-2 provides assistance to organizations that are to be audited against BS15000-1 or are planning service improvements.

Other ITIL Deliverables:

- Software Asset Management.
- Service Support.
- Service Delivery.
- Planning to Implement Service Management.
- ICT Infrastructure Management.
- Application Management.
- Security Management.
- The Business Perspective.

4.3.16 IT Service Management Forum

http://www.itsmf.com

4.3.16.1 Overview

This not-for-profit organization is a prominent player in the on-going development and promotion of best practice IT Service Management standards and qualifications and has been since 1991. As businesses depend more and more on technology to promote and deliver their products to market, so the benefits of adopting Best Practice IT Service Management and of becoming part of the IT Service Management Forum become more apparent.

The itSMF provides an accessible network of industry experts, information sources and events to help you and your staff address IT service management issues and help you achieve the delivery of high quality, consistent IT service internally and externally through the adoption of Best Practice. The itSMF plays a pivotal role in the development of BS15000 and has a continuing and significant input into the development of ITIL.

The itSMF now boasts over 1 000 member companies, blue chip and public sector alike, and international itSMF Chapters in Australia, Austria, Belgium, Canada, Germany, Netherlands, USA, South Africa and Switzerland.

IT Service Management Forum provides a wide range of services to members:

- An annual 3-day conference and exhibition which is recognized as the leading event of its kind in the calendar.
- A series of one day seminars on topics of special interest to the membership.
- A bookstore for all the relevant best practice publications relating to IT service management (and other associated areas).
- A secure members website with discussion groups focused on the different disciplines within the service management field.
- Market Research on the latest issues being faced by IT Service Professionals.
- A bi-monthly magazine ServiceTalk containing articles, white papers, people news, press releases, advertisements plus news of itSMF and general service management related activities.
- Mailing facilities (for members only) to the IT Service Management Forum database.
- A Directory of products and services.
- Provision of high-level advice and guidance on Service Management issues from industry experts.
- Sponsorship and promotion of a series of Industry Awards to recognize major contributions to the industry.
- Access to regional groups to discuss topical issues.

The itSMF is primarily run by its membership through the Council of Members and the Management Board. Its mission is to provide a forum for the membership to enable them to exchange views, share experiences and participate in the continuous development of best practice and standards, as well as providing a range of services that provide significant value to the members.

The corporate objectives of the itSMF include:

- Establishment and maintenance of a membership base, covering the widest professional IT and business interests throughout the UK.
- Representation of the interests and views of the membership base.
- Provision of a forum for bringing together users, suppliers and other stakeholders of IT services and products.
- Supporting the development of best practice standards and guidelines for IT service management, such as the IT Infrastructure Library (ITIL).
- Development of a growing portfolio of services that deliver real benefit to the members.
- Recognition and rewarding individuals and organizations that make significant contributions to the advancement of best practice, standards and professionalism in the IT Service Management field.

4.3.17 Multiservice Switching Forum

http://www.msforum.org/

4.3.17.1 Overview

Multiservice Switching Forum (MSF) is a global association of service providers and system suppliers committed to developing and promoting open-architecture, multiservice switching systems. Founded in 1998, the MSF fosters cooperation among its members - the world's leading technology innovators - in the development of open communications systems.

The Multiservice Switching Forum Technical Committee is primarily responsible for driving the technical efforts of the forum. The Technical Committee reviews all proposals submitted by MSF's Working Groups, in order to produce technical documents that accelerate the deployment of MSF intra-switching system protocols and interfaces.

Architecture Working Group

The Working Group will define the functional and physical of MSF compliant networks. It will define:

- description and requirements of this functional architecture;
- description, high-level requirements and characteristics of the interfaces between functional elements;
- physical box architecture;
- physical/functional mapping.

The Working Group will also classify different physical boxes into categories for which other groups can write requirements.

Protocol and Control Working Group

The MSF Protocol and Control Working Group is responsible for developing detailed requirements and implementation agreements for behaviour, protocols and interfaces at reference points in the MSF architecture. The working group does not seek to create new protocols but rather looks to identify suitable candidate protocols and then work to maximize the prospects for interoperability with the chosen protocol.

The Working Group produces MSF Implementation Agreements (IAs) for each protocol adopted by the MSF. An IA takes the base protocol, closes down options, and provides clarification to behaviour where required. It is the aim of the Protocol and Control Working Group that where two vendors have followed an Implementation Agreement their equipment should interwork. The Protocol and Control Working Group also produces detailed requirements for the physical components of the MSF architecture as defined by the MSF Architecture Working Group. This enables vendors and operators to understand exactly what each component of the MSF architecture should provide.

The Management Advisory Working Group

The Management Advisory is a part of the Technical Committee. Its function is twofold:

- to advise the TC leadership and the technical working groups on all issues relating to Network Management of Multiservice Systems. This involvement takes various forms including;
- participation in the Architecture Working Group's definition of the management functions and interfaces in the MSF architecture;
- participate, as needed, in the Protocol and Control working group to develop the information and data models appropriate to their goals. This effort involves cooperation with standards bodies outside the MSF;
- to work with the Board of Directors on developing and managing liaison relationships with standards organizations and industry forums on network management issues.

The advisory was formed as a cross working group committee because there is a need for a coherent Multi Service System management strategy that eliminates the need for the current multiplicity of management standards and equipment required in today's systems.

Interoperability Working Group

The Interoperability Working Group will define test plans for each IA and for the scenarios involved in the GMI 2002 event. Together these events will provide solutions that prove the MSF Release 1 Architecture. Each test plan will define specific theoretical and procedural requirements for the participating member companies. The test plans relating to the protocol-specific IAs will define tests based directly on pieces of that IA and the specification(s) involved. Test plans relating to the GMI event will be defined from a high-level perspective, for multiprotocol interworking. Both sets of test plans will have detailed call/signalling flows documented.

MSF-Parlay Group Joint Working Group

The objectives of the Joint Working Group are to:

- enable a common understanding of how Parlay Applications run over an MSF Network Solution;
- demonstrate Parlay applications as part of the MSF GMI2004 (Global MSF Interoperability) event;
- promote Parlay Group member participation in the GMI2004 event for both Parlay GW and Parlay applications.

So far, MSF has produced the white paper: Management for Next generation Multi Service System Networks (MSF-TR-MGT-001-FINAL: http://www.msforum.org/techinfo/reports/MSF-TR-MGT-001-FINAL.pdf. The white paper discusses the issues involved in management of MSF MSSs (Multi Service Systems) and proposes a solution space that the MSF will explore. The paper also discusses areas where the MSF can cooperate with other industry bodies involved with management systems.

4.3.18 OAGIS (Organization for the Advancement of Structured Information Standards)

http://www.openapplications.org/

4.3.18.1 Overview

The Open Applications Group is a non-profit consortium focusing on best practices and process based XML content for eBusiness and Application Integration. It is the largest publisher of XML based content for business software interoperability in the world. Open Applications Group, Inc. members have over 6 years of extensive experience in building this industry consensus based framework for business software application interoperability and have developed a repeatable process for quickly developing high quality business content and XML representations of that content.

Open Applications Group's vision is to drive for a solution that enables an organization to buy more quickly and easily integrate their Business to Business (B2B) and Application to Application (A2A) software. The technical work of the Open Applications Group is divided into two types of projects, ***Content*** and ***Technical***. The ***Content*** work is comprised of defining the business processes, their messages, and the data dictionary. This work is contained in the OAGIS Specification and may be downloaded for free. The ***Technical*** work is comprised of XML design, development, UML repository work, and application architecture.

The OAGIS users groups are provided in order to help facilitate integrations using OAGIS as such they are free to everyone members and Non-members a like. Additional users groups will be created based on activity. All of the groups are on Yahoo! Groups:

General OAGIS Uset Group (http://groups.yahoo.com/group/oagis-users/): This group is available for general questions about OAGIS. The OAGIS Users Group is an open forum for those implementing the specifications of the Open Applications Group to communicate and share experiences, ideas, and feedback.

Using OAGIS with Oracle Applications User Group (http://groups.yahoo.com/group/oagi-OAGIS-Oracle-Apps/): The discussion group is provided for those users using OAGIS with Oracle Applications.

Using OAGIS with SAP R/3 User Group (http://groups.yahoo.com/group/oagi-OAGIS-SAP/): This group discusses mapping of OAGIS to/from SAP interfaces.

Using OAGIS with Tibco User Group (http://groups.yahoo.com/group/oagi-OAGIS-Tibco/): This group is provided for the users of OAGIS using Tibco to discuss issue and solutions.

Using OAGIS with WebMethods User Group (http://groups.yahoo.com/group/oagi-OAGIS-WebMethods/): This group enables OAGIS users using WebMethods to communicate with one another.

4.3.19 OASIS

http://www.oasis-open.org/home/index.php

4.3.19.1 Overview

The mission of OASIS is to drive the development, convergence, and adoption of structured information standards in the areas of e-business, web services, etc.

The technical work of OASIS is driven by the members; technical committees (TCs) are formed based on the proposals of the members, and the TCs (Technical Committees) set their own agendas and schedules. OASIS members have formed TCs in a number of areas including the following:

- Horizontal and e-business framework.
- Web Services.
- Security.
- Public Sector.
- Vertical industry applications.

The following TCs are related to the network and/or services management areas:

OASIS Emergency Management TC: http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=emergency

The purpose of this TC is to advance the fields of incident and emergency preparedness and response. This will be accomplished by designing, developing, and releasing XML Schema-based core and metadata standards to help facilitate and improve the real-world interoperability problems around incident and emergency management.

OASIS Web Services Distributed Management TC (WSDM):
http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsdm

The purpose of this TC is to define web services management, including using web services architecture and technology to manage distributed resources. This TC will also develop the model of a web service as a manageable resource.

The first activity area, called ***Management Using Web Services (MUWS)*** addresses the use of Web services technologies as the foundation of a modern distributed systems management framework - including using Web services to facilitate interactions between managed resources and management applications. The same characteristics that make Web services successful for application integration make them an excellent choice for use in solving the management integration problem - facilitating communications between managers and resources across numerous vendors, platforms, technologies, and topologies.

In addition to the use of Web services in the creation of a management framework, WSDM is addressing the specific requirements for managing Web services like any other IT resource. This activity is called ***Management of Web Services (MOWS)***. The manageability models that are being developed for Web services will be exposed using the techniques defined as part of the MUWS task.

OASIS Web Services Resource Framework TC:
http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrf

The purpose of the Web Services Resource Framework (WSRF) TC is to define a generic and open framework for modelling and accessing stateful resources using Web services. This includes mechanisms to describe views on the state, to support management of the state through properties associated with the Web service, and to describe how these mechanisms are extensible to groups of Web services. The first meeting of the WSRF TC will be held on 28 April 2004.

OASIS Management Protocol TC (Completed):
http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=mgmtprotocol

The Management Protocol TC closed in February 2003 after moving its work to the WSDM TC. The purpose of the Mgmt Protocol TC was to develop open industry standard management protocols to provide a web-based mechanism to monitor and control managed elements in a distributed environment based on industry accepted management models, methods, and operations.

4.3.20 Open Mobile Alliance (OMA)

4.3.20.1 Overview

The mission of the Open Mobile Alliance is to facilitate global user adoption of mobile data services by specifying market driven mobile service enablers that ensure service interoperability across devices, geographies, service providers, operators, and networks, while allowing businesses to compete through innovation and differentiation.

4.3.20.2 Openness and the Open Mobile Alliance

Maintaining an open organization is key to OMA's vision for broad industry participation and adoption. Openness in this sense comprises of actively collaborating with other organizations and inviting comments and communications with other industry organizations. Openness also means developing industry solutions in a transparent manner, allowing other organizations insight into the technical aspects of the organization. Being able to see and comment on early versions of documents and contributions allows external organizations to be more involved in and aware of evolving service enablers. Finally, openness means that any interested party may join OMA and contribute to the technical specifications, and any entity (both members and non-members) may build applications and services in accordance with OMA's open specifications and interfaces under the same conditions.

4.3.20.3 Working Groups and Committees

Architecture -The OMA architecture Working Group is responsible for defining the overall OMA architecture, enabling specification work in work groups and assuring, through review, adherence of specification work to OMA architecture, etc.

Browser and Content -The Browser and Content Working Group is responsible for the specification of application technologies used in the open mobile architecture, etc.

Data Synchronization- The Data Synchronization Working Group continues the work originated in the former SyncML Initiative. The group continues development of specifications for data synchronization, and the development of other similar specifications, including but not limited to SyncML technology, etc.

Developers Interest Group - The Developers Interest Working Group collects and publishes data relevant to developers, provides a means for software developers to articulate and specify their needs to OMA and identifies missing or inconsistent developer interfaces.

Device Management - The Device Management Working Group defines management protocols and mechanisms that enable robust management of the life cycle of the device and its applications over a variety of bearers. The Device Management Working Group continues the work previously conducted in the former WAP Forum and SyncML initiatives, etc.

Games Services - The Games Services Working Group continues the work of the Mobile Games Interoperability Forum (MGIF). The Games Services group is responsible for developing interoperability specifications, APIs and protocols for network enabled gaming, as well as, enabling game developers to develop and deploy mobile games to efficiently interoperate with OMA platforms and enable cost reduction for game developers, game platform owners and service providers, etc.

Interoperability - The OMA Interoperability (IOP) Working Group acts as a centre of excellence to identify, specify and maintain the required processes, policies and test programs for ensuring interoperability for OMA specified enablers and end-to-end services, etc.

Location - The OMA Location Working Group continues the work originated in the Location Interoperability Forum (LIF). This group develops specifications to ensure interoperability of Mobile Location Services on an end-to-end basis, etc.

Messaging The OMA Messaging Working Group is responsible for the specification of messaging and related enabling technologies. The goal of Messaging Working Group is to specify a set of basic messaging features that may be used to enable specific messaging paradigms, etc.

Mobile Commerce and Charging - The OMA Mobile Commerce and Charging (MCC) Working Group brings industry players (companies, forums, etc.) closer together to get a more coordinated effort on m-commerce and to provide an overall m-commerce industry perspective, etc.

Mobile Web Service - OMA's Mobile Web Services Working (MWS) Group is responsible for developing a specification that defines the application of web services within the OMA architecture and ensure that the specification provides for the application of web services that is converged with the work of external activities, etc.

Operations and Process - The Operations and Process Committee of OMA provides support on operational and process activities. From a Process perspective, the Operations and Process Committee develops and maintains the Process Materials by which the OMA Technical Plenary operates. This includes the review and analysis of the impacts of the process on the organization.

Presence and Availability - The Presence and Availability Working Group has the goals of specifying the service enablers to permit the deployment of interoperable mobile presence and availability services. "Presence and availability services" enable applications to exchange dynamic information (e.g. status, location, and capabilities) about resources (e.g. users and devices)…

Push to Talk Over Cellular - The Push to talk over Cellular (PoC) WG is positioned to develop application enabling specifications to permit the deployment of interoperable PoC services… The initial work of the Working Group will be focused on the tasks required to develop specifications for an open standard to enable adoption of PoC service over mobile networks…

Release and Planning Management - The OMA Release Planning and Management Committee is a committee of the OMA Technical Plenary responsible for planning and managing OMA Releases, defining OMA Releases based on OMA specifications and Interoperability Testing programmes, and defines the Release planning process, etc.

Requirements - The OMA Requirements Working Group specifies and identifies interoperability and usability requirements within OMA Working Groups, etc.

Security - The OMA Security Working Group develops secure communication protocols between mobile clients and servers at transport and application layers, security and trust services provided by/to mobile clients and servers, etc.

4.3.21 OMG (Object Management Group)

http://www.omg.org

4.3.21.1 Overview

Founded in April 1989 by eleven companies, the Object Management Group™ (OMG™) began independent operations as a not-for-profit corporation. Through the OMG's commitment to developing technically excellent, commercially viable and vendor independent specifications for the software industry, the consortium now includes approximately 800 members. The OMG is moving forward in establishing the Model Driven Architecture ™ as the "Architecture of Choice for a Connected World" ™ through its worldwide standard specifications including CORBA ®, CORBA/IIOP™, the UML™, XMI™, MOF™, Object Services, Internet Facilities and Domain Interface specifications.

The OMG was formed to create a component-based software marketplace by accelerating the introduction of standardized object software. The organization's charter includes the establishment of industry guidelines and detailed object management specifications to provide a common framework for application development. Conformance to these specifications will make it possible to develop a heterogeneous computing environment across all major hardware platforms and operating systems. Implementations of OMG specifications can be found on many operating systems across the world today.

The OMG's series of specifications detail the necessary standard interfaces for Distributed Object Computing. Its widely popular Internet protocol IIOP (Internet Inter-ORB Protocol) is being used as the infrastructure for hundreds of technology companies. OMG specifications are used worldwide to develop and deploy distributed applications for vertical markets, including Manufacturing, Finance, Telecoms, Electronic Commerce, Real-time systems and Health Care.

The OMG defines object management as software development that models the real world through representation of "objects". These objects are the encapsulation of the attributes, relationships and methods of software identifiable program components. A key benefit of an object-oriented system is its ability to expand in functionality by extending existing components and adding new objects to the system. Object management results in faster application development, easier maintenance, enormous scalability and reusable software.

The OMG is structured into three major bodies, the Platform Technology Committee (PTC), the Domain Technology Committee (DTC) and the Architecture Board. The consistency and technical integrity of work produced in the PTC and DTC is managed by an overarching Architectural Board. Within the Technology Committees and Architectural Board rest all of the Task Forces, SIGs, and Working Groups that drive the technology adoption process of the OMG.

There are three major methods of influencing the OMG process, in addition to the impact of general review, commentary and open discussion. The first is the ability to vote on work items or adoptions in the Task Forces that are ultimately reviewed and voted on at the Technology Committee level. The second is the ability to vote on work items or adoptions at one or both of the Technology Committee levels. The third is the ability to actually submit technology for adoption at one or both of the Technology Committee levels. Membership fees are based on these levels of influence.

Request for proposals (the requirements document that initiates each OMG standard-setting activity) and other key documents are available for viewing for anyone, member or not. Email discussion, meeting attendance, and voting are restricted to the members, except that prospective members are invited to attend a meeting or two as a guest observer while making their decision to join.

4.3.22 Open Group

http://www.opengroup.org

4.3.22.1 Overview

The mission of The Open Group is to drive the creation of Boundary-less Information Flow achieved by:

- working with customers to capture, understand and address current and emerging requirements, establish policies, and share best practices;
- working with suppliers, consortia and standards bodies to develop consensus and facilitate interoperability, to evolve and integrate specifications and open source technologies;
- offering a comprehensive set of services to enhance the operational efficiency of consortia; and
- developing and operating the industry's premier certification service and encouraging procurement of certified products.

So far, the Open Group has produced the documents on the following subject categories:

- Banking;
- Boundaryless Information Flow;
- Brand Program Documentation;
- Business Scenarios;
- CD-ROM Publications;
- CDE - Motif Documentation;
- COM/DCOM;
- Corrigenda;
- Data Interchange;
- Data Management;
- DCE Documentation;

- Desktop;
- Directory;
- Distributed Computing Support;
- General Topics;
- Internationalization;
- Interworking;
- LDAP;
- Locales;
- Network Computing;
- NMF SPIRIT Documentation;
- Object-oriented Technology;
- Operating System Services;
- Programming Languages;
- Procurement;
- Security;
- Single UNIX Specification;
- Systems Management;
- TOGAF Documentation;
- Transaction Processing;
- Wireless and Mobile Computing;
- Work Station Data Access.

4.3.23 Optical Internetworking Forum

http://www.oiforum.com/

4.3.23.1 Overview

The mission of the Optical Internetworking Forum (OIF) is to foster the development and deployment of interoperable products and services for data switching and routing using optical networking technologies. The OIF will encourage co-operation among telecom industry participants including equipment manufacturers, telecom service providers and end users; promote global development of optical internetworking products; promote nationwide and worldwide compatibility and interoperability; encourage input to appropriate national and international standards bodies; and identify, select, and augment as appropriate and publish optical internetworking specifications drawn from national and international standards. Being the only industry group uniting representatives from the data and optical networks, OIF's purpose is to accelerate the deployment of interoperable, cost-effective and robust optical internetworks and their associated technologies. Optical internetworks are data networks composed of routers and data switches interconnected by optical networking elements.

The OIF Technical Committee's mission is to accomplish the technical objectives of the OIF with the principal goal to cooperatively produce technical Implementation Agreements and other technical documents to accelerate the deployment of optical networking technology and facilitate industry convergence on interoperability.

Working Groups of the Technical Committee focus on specific areas where there is a need for Implementation Agreements:

- Architecture and Signalling Working Group.
- Carrier Working Group.
- Interoperability Working Group.
- OAM&P Working Group.
- Physical and Link Layer Working Group.
- Physical Layer User Group.

Operations Administration, Maintenance, and Provisioning (OAM&P) working group.

This Working Group would develop operations, administration, maintenance and provisioning requirements, guidelines, and implementation agreements related to optical internetworking. These requirements and guidelines may apply to planning, engineering and provisioning of network resources; to operations, maintenance or administration processes; or to requirements and recommendations for support systems and equipment that may be used to support these management functions. The OAM&P working group will also develop positions on related subjects under consideration in other domestic and international for a and standards bodies. Of necessity, the scope of this work requires a close and coordinated working liaison with other OIF groups of forums and standards setting bodies.

4.3.24 OSSJ

http://java.sun.com/products/oss/

4.3.24.1 Overview

The OSS through Java Initiative ("OSS" stands for "Operations Support Systems") produces a standard set of Java technology-based APIs to jump-start the implementation of end-to-end services on next-generation wireless networks, and leverage the convergence of telecommunications and Internet-based solutions.

The requirements of e-business, the proliferation of mobile workers, and the ever-increasing need for bandwidth have led to an explosive increase in demand for communications services. To meet this growing demand, service providers need a new approach to providing operations support system (OSS) solutions. Current OSS technology cannot cope with the rapidly increasing scale of networks, the diversity of communications technology, shortened time to market for new services, and heightened expectations for availability and reliability.

In short, service providers need carrier-grade OSS solutions in Internet time.

4.3.24.2 Goals of the OSS through Java Initiative

The goals of this initiative are:

- develop, through the Java Community Process (JCP) program, component API specifications, Reference Implementations, and Technology Compatibility Kits, for OSS integration and deployment;
- develop, through collaborative engineering within the Initiative, multi-vendor demonstrations based on the APIs;
- promote the J2EE platform as a technology for OSS development;
- encourage a marketplace for component-based OSS solutions.

4.3.24.3 Standards and Industry Forums

The members of the Initiative have decided against becoming a defacto standards group. Instead, they will leverage the work, particularly in the area of information modelling, of existing standards bodies and forums such as:

- 3rd Generation Partnership Project (3GPP);
- 3rd Generation Partnership Project 2 (3GPP2);
- Internet Engineering Task Force (IETF);
- TeleManagement Forum (TMF);
- Mobile Wireless Internet Forum (MWIF).

4.3.25 Parlay/OSA

http://www.parlay.org/

4.3.25.1 Overview

The Parlay Group is a multi-vendor consortium formed to develop open, technology-independent application programming interfaces (APIs) that enable the development of applications that operate across multiple, networking-platform environments. Parlay integrates intelligent network (IN) services with IT applications via a secure, measured, and billable interface. By releasing developers from underlying code, networks, and environments, Parlay open APIs allow for innovation within the enterprise. These new, portable, network-independent applications are connecting the IT and telecom worlds, generating new revenue streams for network operators, application service providers (ASPs), and independent software vendors (ISVs).

4.3.25.2 Mission

The Parlay Group's mission is to:

- Define, establish, and support a common specification for industry-standard APIs.
- Facilitate the production of test suites and reference code in multiple technologies that enable developers to create related products and services that operate across wireless, Internet-protocol (IP), and public-switched networks.
- Provide an environment in which Parlay Group Members can approve suggested revisions and enhancements that evolve the initial specifications; to make appropriate submissions to established agencies and bodies with the purpose of ratifying these specifications as an international standard; and, to provide a forum in which users can meet with developers and providers of products and services to identify requirements for interoperability and general usability.
- Educate the business and consumer communities as to the value, benefits, and applications for the Parlay APIs through publicity, publications, trade show demonstrations, seminars, and other programs established by the Parlay Group.
- Support the creation and implementation of uniform conformance test procedures and processes, which assure that Parlay API implementations are compliant with the specifications.
- Establish and maintain relationships with educational institutions, government research institutes, other technology consortia, and other organizations that support and contribute to the development of the specification.
- Foster competition in the development of new products and services based on specifications developed by the Parlay Group in conformance with all applicable antitrust laws and regulations.

4.3.26 Quest Forum

http://questforum.asq.org

4.3.27 SAF

http://www.saforum.org/home

4.3.28 SCTE (Society of Cable Telecommunications Engineers)

4.3.28.1 Overview

The SCTE standards program provides an ANSI-accredited forum for the development of technical specifications supporting the cable telecommunications industry. The work program includes: data and telephony over cable; application platform development; digital video; emergency alert systems; network monitoring systems; cables, connectors and amplifiers; and construction and maintenance practices.

The SCTE standards program is conducted by technical subcommittees. These are the consensus bodies for standards development. The overall program is supervised by the Engineering Committee of the SCTE Board of Directors:

Cable Applications Platform (CAP) Subcommittee

The objective is to explore the need for SCTE involvement in the development of standards for applications platform through coordination with NCTA, FCC and other related organizations.

Data Standards Subcommittee (DSS)

This subcommittee's objective is to explore the need for SCTE involvement in the development of standards for data services delivery through coordination with NCTA, FCC and other related organizations.

Digital Video Subcommittee (DVS)

Its role is to explore the need for SCTE involvement of standards for digital video signal delivery through the coordination of efforts with NCTA, FCC and other related organizations. The subcommittee has 5 Working Groups:

1) Video and Audio Services.

2) Data and Transport Applications.

3) Network Architecture and Management.

4) Transmission and Distribution.

5) Digital Program Insertion.

Emergency Alert Systems (EAS) Subcommittee

Its role is to interface with the FCC and other interest groups and arrive at workable solutions to improve the CATV industry's involvement in the EAS program. The other interest groups include vendors, NCTA emergency committees, FEMA, hearing impaired groups, etc.

Hybrid Management Sub-layer (HMS) Subcommittee

The main objective of the subcommittee is to specify a robust protocol suite to support cost-effective interoperability of management systems for the evolving Hybrid Fiber/Coax (HFC) network.

Interface Practices and In-Home Cabling Subcommittee (IPS)

It is aimed at developing standards for the cables, connectors and housings used in broadband telecommunications distribution plants.

4.3.29 Storage Networking Industry Association (SNIA)

http://www.snia.org

4.3.29.1 Overview

SNIA was incorporated in December 1997 and is a registered 501-C6 non-profit trade association. Our members are dedicated to "ensuring that storage networks become complete and trusted solutions across the IT community". SNIA works towards this goal by forming and sponsoring technical work groups, by producing (with our strategic partner Computerworld) the Storage Networking World Conference series, by building and maintaining a vendor neutral Technology Center in Colorado Springs, and by promoting activities that expand the breadth and quality of the storage networking market.

The SNIA is gathering its troops to tackle the challenges of managing multi-vendor storage networks with its Storage Management Initiative (SMI). Through SMI, SNIA will develop the Bluefin specification into a complete management standard and also evaluate other areas of storage management that need to be addressed.

SNIA's technical activities are driven by its Technical Council and Technical Work Groups. The SNIA Interoperability Committee also conducts technical activities through its two sub-groups, the Demos subgroup which organizes the Interoperability and Solutions Demo at SNW, and the SNIA Conformance Testing Program (SNIA-CTP) subgroup.

SNIA Technical activities

DAFS Implementers' Forum

The Direct Access File System (DAFS) protocol is a new file-access protocol designed to take advantage of emerging RDMA (remote direct memory access) interconnect technologies such as InfiniBand, VI and iWARP. The protocol will dramatically enhance the performance, reliability and scalability of web farm, compute farm, e-commerce and database applications in data centre environments.

The DAFS Implementers' Forum (initially proposed by Broadband Storage, Emulex, Intel, Network Appliance and VERITAS Software) was formed to advance the development, delivery and promotion of interoperable DAFS storage networking solutions.

DAFS Systems Developers Toolkit

Data Management Forum

The SNIA Data Management Forum is a cooperative initiative of IT professionals, vendors, integrators, and service providers formed to define, progress, qualify, and teach improved and reliable methods for the protection, retention, and lifecycle management of electronic data and information.

The Data Management Forum is currently operating two initiatives, The Data Protection Initiative and the Information Lifecycle Mgmt Initiative.

Unlike a trade association or vendor program, the DMF's "initiatives" are a community working together for a common cause. By combining the industry's leading authorities, IT professionals, integrators, service providers and vendors, each initiative operates as a nurturing and defining vehicle that allows all parties to participate. Our goals are to help IT professionals rapidly develop core competencies in technologies and solutions that support and ensure successful deployments and operations in the fields of data protection, retention and information management. The Data Management Forum's membership is open and rapidly growing, with 22 vendor firms and approximately 600 individuals, including hundreds of IT professionals.

Data Protection Initiative: Focused on all new methods for enhancing backup and data protection.

Information Lifecycle Management Initiative: Focused on market development and customer education in the emerging new field of ILM.

DMF Portal is accessible only for members.

IP Storage Forum (IPS Forum)

The Storage Networking Industry Association's IP Storage Forum (IPS Forum) is a vendor-neutral environment for end users to become informed on the current and future directions of IP-based storage technology. The IPS Forum was formed by SNIA member companies wishing to evangelize, market, promote, and accelerate the adoption of standa ds-based block storage networking solutions - that utilize IP networks. The Forum works closely with other groups within SNIA involved in IP Storage activities related to:

- Technology development.

- Interoperability tests of products.
- Education and training.
- Storage Management Initiative.

The IP Storage Forum is focused specifically on the creation of:

- Marketing collateral explaining the principles, features, and benefits of IP-based storage area networks.
- White papers covering the technical aspects of IP-based block storage solutions.
- Educational seminars and events for IT end-users and industry partners.
- Product and interoperability demonstrations of real-world applications.

SNIA Storage Management Initiative (SMI)

The SNIA's Storage Management Initiative (SMI) was created by the Storage Management Networking Industry Association (SNIA) to develop and standardize interoperable storage management technologies and aggressively promote them to the storage, networking and end user communities. This initiative is being developed and supported by many groups within the SNIA organization such as: the Storage Management Forum (SMF), SNIA's Technical Working Groups (TWG) and the Conformance Test Programs (CTP). The SMI will drive the SNIA activities in the following areas:

- Technology development.
- Conformance testing of products.
- Outbound marketing, education and training.

In order to support the adoption of this initiative within the Storage and Networking industry, key objectives are:

- To enable and streamline the integration of multi-vendor storage networks.
- To leverage the development of powerful management application.
- To encourage management consolation.
- To provide a common interface for storage vendors to incorporate in the development of new product for the industry.

The Storage Management Initiative (SMI) was created by the Storage Networking Industry Association (SNIA) to develop and standardize interoperable storage management technologies and aggressively promote them to the storage, networking and end user communities.

The Bluefin Specification and the SNIA Storage Management Initiative (SMI)

The Bluefin SAN management specification was contributed to the SNIA in mid-2002 by a group of 16 SNIA member companies as a foundation for unifying the storage networking industry on a management interface standard. The SNIA launched the Storage Management Initiative (SMI) to develop the Bluefin specification into a complete storage management standard and drive that standard to broad implementation. Bluefin applies CIM/WBEM object technology to create the basis for a complete management solution for interoperable, multi-vendor SANs.

Relevant Technical Work Groups

Fibre Channel Work Group

The Fibre Channel Work Group deals with Fibre Channel SAN management architecture and related specifications and guidelines. It develops demonstrations, reference implementations, and test suites for Fibre Channel Storage Network architecture and standards.

The Fibre Channel CIM work is an effort within the SNIA towards modelling Fibre Channel SANs and Fabrics using CIM/WBEM for both discovery and configuration. The modelling effort attempts to align with work done in T11 in FC-GS-x and the HBA API. As a result of this effort change requests are submitted to the DMTF (see recent accomplishments below). This work is an ongoing effort and includes interop demos as part of the emerging technologies area of SNW.

IP Storage Technical Work Group

The IP Storage Technical Work Group will act as the primary Technical focal point of the SNIA on IP Storage Issues, coordinating with the SNIA IP Storage Forum.

NAS Work Group

The NAS Work Group develops educational programs and standards for network-attached-storage. It provides a forum in which users and vendors can build understanding of NAS technologies and their operational and management issues.

OSD Technical Work Group

The Object-Based Storage Devices (OSD, formerly called OBSD) Technical Work Group enables the creation of self-managed, heterogeneous, shared storage for storage networks. The work is focused on moving low-level storage functions into the storage device itself, accessing the device through a standard object interface. The group plans to standardize and extend the output from the National Storage Industry Consortium's Network-Attached Storage Devices (NASD) Project and work closely with the ANSI T10/OSD committee.

Policy Work Group

The Policy Work Group will enable interoperable storage policies, covering all of the important aspects of storage network management. The Group provides requirements for, analysis of and extensions to the DMTF and IETF work on policies. Planned deliverables include definitions and reference implementations and/or test suites.

Storage Media Library Work Group

The Storage Media Library (SML) Work Group defines and promotes standards to ensure the rapid adoption of vendor-neutral, heterogeneous, management solutions for removable media libraries. These standards support a central mechanism to view and manage all Storage Media Libraries, as well as other storage resources in the enterprise, standardizing not only what information is available to management applications, but also how it is made available.

4.3.30 TeleManagement Forum (TMF)

http://www.tmforum.org

4.3.30.1 Overview

The TeleManagement Forum (TM Forum) is a non-profit global organization that provides leadership, strategic guidance and practical solutions to improve the management and operation of information and communications services. The TM Forum has an open membership of over 340 companies comprises incumbent and new-entrant service providers, computing and network equipment suppliers, software solution suppliers and customers of communications services. TM Forum has been contributing to the Information and Communications Services (ICS) Industry for over 15 years.

The TM Forum has established a number of Technical Programmes.

4.3.30.2 NGOSS Program

The TM Forum's New Generation Operations Software and Systems (NGOSS) program provides the tools and methodologies for service providers to drive automation into their business processes through easy to integrate OSS/BSS systems. The enhanced Telecom Operations Map® (eTOM) is part of the NGOSS program. The eTOM is a widely used and accepted standard for telecom business process classification.

4.3.30.3 Collaboration Program

Collaboration Teams work to solve specific industry challenges, delivering solutions which address business and technical issues. Collaboration Team work includes ready-to-implement interface definitions, use cases, and UML models, and encompasses numerous defacto industry standards.

4.3.30.4 Catalyst Program

The TM Forum's Catalyst Program allows service providers, system integrators and hardware/software vendors to work together to solve common, agreed, critical industry challenges. The work produced within the framework of the Catalyst Program is showcased twice a year during the TM Forum's TeleManagement World event.

4.3.30.5 Market Center Program

Market Centres provide a structure for focusing the efforts of industry experts into meaningful projects within a specific market segment of the OSS industry. Organizing issues and solutions around specific market segments enables TM Forum members with similar interests to address high-priority issues within their specific market sector.

4.3.30.6 Industry Liaison Program

Building successful co-operative working relationships with other industry groups is an essential element to the work of the TM Forum. It is increasingly important that selected industry groups are made aware of the on-going work of the TM Forum so that they may influence other industry developments.

4.4 Examples of Relationships between bodies

4.4.1 ITU-T and Regional/National SDOs

In order to facilitate the development of cooperative relationships with national and regional standards development organizations, and to encourage cooperation and information exchange, the ITU-T has established procedures for use when structuring the cooperation and information exchange process with Regional and National SDOs. These are documented in ITU-T Recommendation A.6.

The Regional and National Organizations which have a relationship with the ITU-T include:

CEA	The Consumer Electronics Association (USA)
CCSA	China Communications Standards Association (China)
ECMA	European Computer Manufacturers Association
ETSI	European Telecommunications Standards Institute
IEEE	Institute of Electrical and Electronics Engineers
TIA	Telecommunications Industry Association (North America)
TTA	Telecommunications Technology Association (Korea)
TTC	Telecommunications Technology Committee (Japan)
T1	Standards Committee T1 (USA)

Figure 1 illustrates the key Regional and National SDOs that have a formal relationship with the ITU-T.

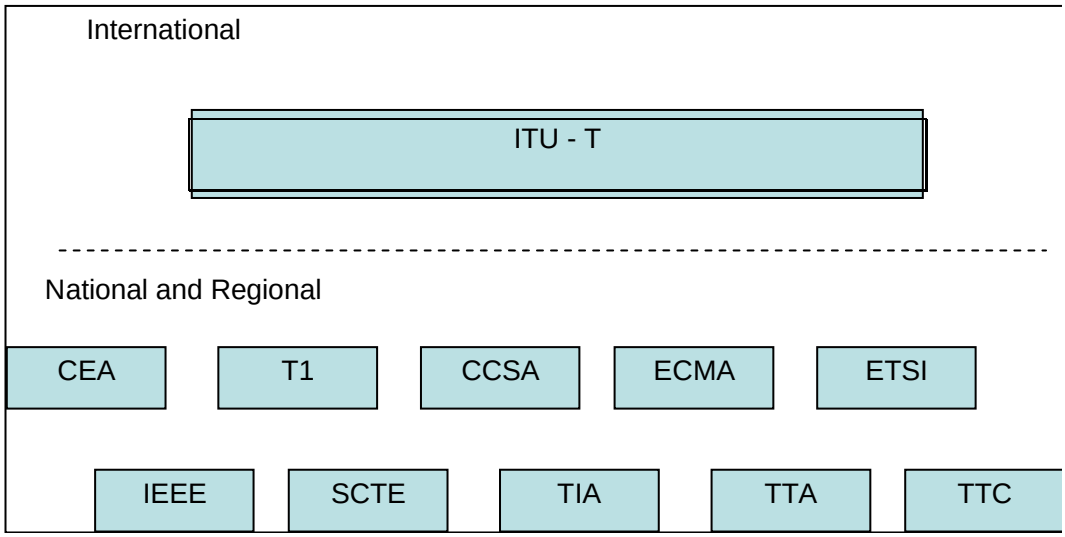

Figure 1: Relationship between the ITU-T and Regional and National SDOs

4.4.2 3GPPs and Partners

The two 3rd Generation Partnership projects share a number of common partners. The partner organizations include:

ATIS	Alliance for Telecommunications Industry Solutions
ARIB	Association of Radio Industries and Businesses
CCSA	China Communications Standards Association
CDMA DG	CDMA Development Group
ETSI	European Telecommunications Standards Institute
GSM Assn	GSM Association
IPv6 Forum	Internet Protocol version 6 Forum
TIA	Telecommunications Industry Association (North America)
TTA	Telecommunications Technology Association (Korea)
TTC	Telecommunications Technology Committee (Japan)
UMTS Forum	Universal Mobil Telecommunications System Forum

Figure 2 illustrates the relationship between the partners and the 2 partnership projects.

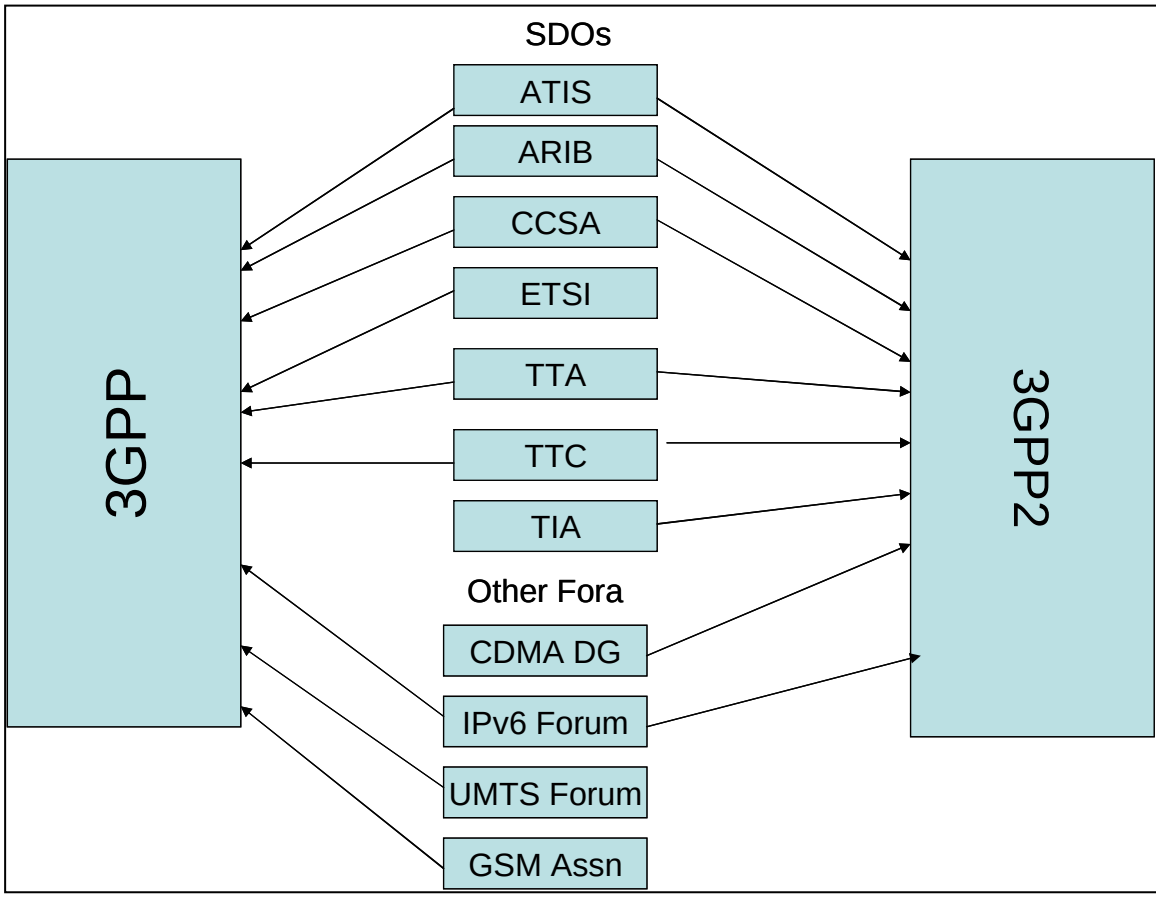

Figure 2: 3GPP Partnership Projects

4.5 Standards availability

Different organizations have different approaches to making their standards and draft standards available members and non members. Table 1 summarizes the approaches taken by the SDFOs and Fora identified in the present document.

Table 1: Standards availability

Body	Site	Availability (Published)	Availability (Drafts)
3GPP	http://www.3gpp.org/	Free download	Free download
3GPP2	http://www.3gpp2.org/	Free download	Members only (Free download of meeting contributions and reports)
ATISI (TMOC)	http://www.atis.org/0130/index.asp	Purchase	Members only (Free download of meeting contributions and reports)
ATM Forum	http://www.atmforum.org	Free download	Members only
DCML	http://dcml.org	Free download	Free download
DMTF	http://www.dmtf.org/home	Free download	Free download
DSL Forum	http://www.dslforum.org/	Free download	Members only
ECMA	http://www.ecma-international.org/	Free download	Members only
EDIFICE	http://www.edifice.org/	Free download	Members only
ETIS	http://www.etis.org/	Some Free (download) some private	Members only
ETSI	http://www.etsi.org/	Free download	Members only
Eurescom	http://www.eurescom.de	Some Free (download) some private	Members only
GRID	http://www.gridforum.org	Free download	Free download
IEEE	http://www.ieee.org/portal/site/mainsite/menuitem.e0007c26eb2a454de38570e85bac26c8/index.jsp?&pName=home	Download Free, Paper copy for purchase (discount to members)	Members Only (Free download of meeting contributions and reports)

Body	Site	Availability (Published)	Availability (Drafts)
IETF	http://www.ietf.org	Free download	Free download
IPCC	http://www.packetcomm.org	Free download	Free download
IPDR	www.ipdr.org	Free download	Members only
ISO	http://www.iso.org	Purchase	Members only
ITIL	http://www.ogc.gov.uk	Purchase	Purchase
ITU-D	http://www.itu.int/ITU-D/	Free download	-
ITU-R	http://www.itu.int/ITU-R/	Purchase	Members only
ITU-T	http://www.itu.int/home/index.html	Purchase	Members only
MSF	http://www.msforum.org	Free download	Members only
NPF	www.npforum.org	Free download	Members only
OAGIS	http://www.openapplications.org	Some free (download) some available for purchase	Some free (download) some available for purchase
OASIS	http://www.oasis-open.org/home/index.php	Free download	Members only
OMA	http://www.openmobilealliance.org/tech	Some free (download) some available to members only	(Free download of some meeting contributions and Work Items etc.)
OMG	http://www.omg.org/	Free download	Members only
Open Group	http://www.opengroup.org	Some free (download) some available for purchase	Some free (download) some available for purchase
Optical Interworking Forum,	http://www.oiforum.com	Free Download	Members only
OSS/J	http://java.sun.com/products/oss/	Free Download	Members only
PARLAY/OSA	http://www.parlay.org/	Free Download	Members only

Body	Site	Availability (Published)	Availability (Drafts)
SAF	http://www.saforum.org/home	Free download	Members only
SCTE	http://www.scte.org/home.cfm	Free download	Members only
SNIA	http://www.snia.org	Free download	Members only
TMF	http://www.tmforum.org	Free download for members Fee for non-members (some documents are free to non-members also)	Members only
TTC	http://www.ttc.or.jp/	Purchase	Members only
UCC/EAN	http://www.ean-ucc.org	Members only	Members only

5 Classification of standards

This clause describes the categories used to subdivide the standards identified.

5.1 Subject areas

The following subject areas are used to categorize the standards identified in annex A.

Table 2: Subject areas

Requirement areas	
N	Network - General
N-E	Network Equipment - General
N-EH	Network Equipment - Hardware
N-ES	Network Equipment - Software
N-C	Connectivity (including access) Management
N-SIG	Signalling Management
N-M	Network Mobility Management
N- INTEL	Network Intelligence Management
N-CM	Configuration Management
N-PM	Network Performance Management
N-FM	Network Fault Management
N-AM	Network Accounting
S	Service - General
S-M	Service Mobility and context aware services Management
S-AM	Service Accounting Management
S-B	Service business viewpoints Management
S-QM	Service Quality of Service Management
S- ACR	Access Control/Registration
S-E	Emergency Service
S-NUM	Service - Numbering
UE	User Equipment Management
G	General: Management standards related to architecture management functions or general platform capabilities or general service definitions
Sec	Security Management
P	Policy Management
T	Testing
U-Mgmt.	User Data Management

5.2 Interface types

The following interface types are used to categorize the standards identified in annex A.

Table 3: Interface types

Interfaces types	
Q	Intra-operator
X-O	Inter-operator and OSS to OSS e.g. ecommerce inter operator interfaces (B2B)
X-C	End Customer to Service Provider OSS e.g. ecommerce inter operator interfaces (C2B)
NE-NE	Between Network Elements within a Network
HM	Human-machine interface
P	Protocol
G	General
F	Operations System (OS) to Work Station (WS)

5.3 NGN planes

The following NGN Planes are used to categorize the standards identified in annex A.

Table 4: NGN planes

NGN planes		Optional addition
M	Management	
S	Service	S-PRES for Presence Service S-LOC for Location Service S-MOB for Mobility S-SM for Subscription Management S-Billing for Billing S-ACCESS for Service Accessibility S-QoS for Quality of Service
C	Control	C-SIG for Signalling C-ROUT for Routing C-CDR for Call Detail Records C-TM for Traffic Management
T	Transport	T-UMTS for Universal Mobile Telecommunication System T-GSM for Global System Mobile T-Radio for radio systems T-PDH for Plesiochronous Digital Hierarchy T-SDH for Synchronous Digital Hierarchy T-SONET for Synchronous Optical Network T-ATM for Asynchronous Transfer Mode T-FR for Frame Relay T-IP for IP-based networks T-xDSL for Digital Subscriber Technologies T-Cable for IP Cablecom T-HYPERMAN T-HYPERLAN T-ERMES for European Radio Message System T-LAN for Local Area Network T-WLAN for Wireless Local Area Network T- OAN for Optical Access Network T-ASON for Automatically Switched Optical Network T-DCME for Digital Circuit Multiplication Equipment T-OTN for Optical Transport Network T-BPON for Broadband Passive Optical Network T-EPON for Ethernet Passive Optical Network T-V5 for V5 T-DECT for DECT T-MAN for Metropolitan Area Networks

5.4 NGN partitions

The following NGN Partitions are used to categorize the standards identified in annex A.

Table 5: NGN partitions

NGN partitions	
E	Customer/Enterprise Networks
A	Access Network
C	Core Network
I	Interconnect

5.5 eTOM process

The following eTOM (ITU-T Recommendation M.3050) [1] processes are used to categorize the standards identified in annex A.

Table 6: eTOM processes

RM&O-OSR	Resource Management and Operations - Support and Resource Management and Operations - Readiness (maintenance/configuration)
RM&O	Resource Management and Operations
RM&O-F	Resource Management and Operations - Resource Provisioning
RM&O-A	Resource Management and Operations - Fault and Performance
RM&O-AF	Resource Management and Operations - Fault and Performance (Fault)
RM&O-AP	Resource Management and Operations - Fault and Performance (Performance)
RM&O-AB	Resource Management and Operations - Data Collection and Processing
SM&O	Service management and Operations Processes
SM&O-F	Service management and Operations Processes- Fulfilment
SM&O-AP	Service management and Operations Processes - Service Quality Management
SM&O-AF	Service management and Operations Processes - Service Problem Management
SM&O-B	Service management and Operations Processes - Billing
SM&O	Service management and Operations Processes
S/PRM	Supplier/Partner Relationship Management Processes
CRM	Customer Management
CRM-A	Customer Management - Assurance
CRM-F	Customer Management - Fulfilment
CRM-B	Customer Management - Billing

6 Analysis of standards identified

This clause contains an initial analysis of the standards, based on the categories identified in clause 5 .

This initial analysis is limited but provides an initial indication of gaps in existing standards.

It should be noted that some further refinement of the initial analysis is still required based on the content and appropriateness of the standards identified.

6.1 Subject areas

The initial analysis of the numbers of standards available, analysed by subject area, indicates the majority of existing standards are in the general/testing (33 %) or Network Management (39 %) areas. Equipment Management Standards represent a further 13 % of the standards identified.

Only 13,5 % of the standards identified were on the topic of Service Management.

However it should be noted that further analysis of the content and appropriateness of standards will be required to produce a definitive list.

Table 7 lists the number of standards for each subject ordered by the number of standards identified.

Table 7: Subject analysis

Subject areas		Number of standards
S- ACR	Access Control/Registration	0
N- INTEL	Network Intelligence Management	2
S-NUM	Service - Numbering	2
S-E	Emergency Service	2
S-QM	Service Quality of Service Management	12
N-M	Network Mobility Management	13
E	Equipment Management - General	13
N-AM	Network Accounting	17
S-B	Service business viewpoints Management	18
U-Mgmt.	User Data Management	21
S-M	Service Mobility and context aware services Management	23
P	Policy Management	24
N-FM	Network Fault Management	33
Sec	Security Management	36
N-SIG	Signalling Management	37
N-CM	Configuration Management	38
S-AM	Service Accounting Management	56
E-SM	Equipment Management Software administration	57
N-UE	Network -User Equipment/Device Management	60
S	Service - General	66
T	Testing	84
N-PM	Network Performance Management	85
N	Network - General	104
E-HM	Equipment Management Hardware (Network Equipment) Management	116
N-C	Connectivity (including access) Management	228
G	General: Management standards related to architecture management functions or general platform capabilities or general service definitions	440

6.2 Interfaces

An initial analysis of the numbers of standards available analysed by interface type indicates the majority of existing standards, almost 75 %, address the Q (intra Operator) interface or address either general or protocol issues.

22 % address Business to Business (B2B) or Customer to Business (C2B) interface issues (i.e. X interface).

Less than 1 % address Human Machine (G interface) or Operations System to Work Station (F interface) issues and 3 % address Network Equipment to Network Equipment (NE - NE) issues.

This illustrates that standardization effort has been concentrated on those interfaces used by an operator to manage his own network. Of the external (X) interfaces developed the vast majority have been for customers rather than between operators.

Table 8: Interface analysis

Interfaces types		Number of standards
Q	Intra-operator	803
X-O	Inter-operator and OSS to OSS e.g. ecommerce inter operator interfaces (B2B).	90
X-C	End Customer to Service Provider OSS e.g. ecommerce inter operator interfaces (C2B).	214
NE-NE	Between Network Elements within a Network	41
HM	Human-machine interface	11
P	Protocol	96
ALL	General	123
F	OS to WS	2

6.3 NGN planes

An initial analysis of the numbers of standards available analysed by NGN Planes shows the majority of existing standards address the general management issues (architecture, e-TOM, etc.), almost 27 % and NGN Transport Plane, more than 26 %.

For NGN Service Plane, there have been 281 standards and/or technical specifications indicated so far, which presents more than 15 % from all the documents investigated.

The initial analysis also shows that from the NGN Planes point of view, the worst situation, at least as concerns the number of standards and/or technical specifications, is at the Control Plane. This plane addresses only 123 standards and/or technical specifications, i.e. less than 7 % (see table 9).

However, some refinement of the initial analysis is still required with respect to the NGN Planes. This means, there is a need to analyse the standards and/or technical specifications with respect to further details, e.g. for the Service Plane it would be interesting to see how many standards are related to service location, service billing, service subscription, or service mobility issues. The similar refinement can be done for the other NGN Planes.

Table 9: NGN plane analysis

NGN planes		Number of standards
S	Service Plane	281
C	Control Plane	123
T	Transport Plane	482
M	Management (general architecture, eTOM, etc.)	487

6.4 NGN Partitions

Another analysis has been done from the NGN Partitions point of view, i.e. how many standards and/or technical specifications are related to the Customer/Enterprise Networks, Access Networks, Core Network and Network Interconnection.

The initial analysis has shown that the majority of management related standards and/or technical specifications has been produced for the Access (more than 36 %) and Core Network (more than 37 %).

On the other side, Network Interconnection and Customer/Enterprise Networks related standards represent a small part of standards identified. The standards for the Network Interconnection represent less than 7 % and the standards for Customer/Enterprise Networks less than 5 % of the total amount.

Similarly, like for NGN Planes, some refinement can be done for NGN Partitions, especially with respect to the technology the relevant standard and/or technical specification is related to (e.g. ISDN/PSTN, IP, GSM, UMTS, etc.).

Table 10: NGN partition analysis

NGN partitions		Number of standards
E	Customer/Enterprise Networks	88
A	Access Network	660
C	Core Network	677
I	Networks Interconnection	121

6.5 eTOM

An initial analysis of the numbers of standards available analysed by eTOM Process indicates the majority of existing standards, almost 83 %, address Resource Management (RM&O), 8 % address Supplier/Partner Relationship, about 4 % address Customer management (CRM) and 4 % Service Management.

This illustrates that standardization effort has been concentrated on Resource management aspects.

Table 11: eTOM process analysis

	eTOM processes	Number of standards
RM&O	Resource Management and Operations	307
RM&O-OSR	Resource Management and Operations - Support and Resource Management and Operations - Readiness (maintenance/configuration)	487
RM&O-F	Resource Management and Operations - Resource Provisioning	129
RM&O-A	Resource Management and Operations - Fault and Performance	
RM&O-AF	Resource Management and Operations - Fault and Performance (Fault)	43
RM&O-AP	Resource Management and Operations - Fault and Performance (Performance)	154
RM&O-AB	Resource Management and Operations - Data Collection and Processing	35
SM&O	Service management and Operations Processes	42
SM&O-F	Service management and Operations Processes- Fulfilment	6
SM&O-AP	Service management and Operations Processes - Service Quality Management	3
SM&O-AF	Service management and Operations Processes - Service Problem Management	1
SM&O-B	Service management and Operations Processes - Billing	1
SM&O	Service management and Operations Processes	
S/PRM	Supplier/Partner Relationship Management Processes	120
CRM	Customer Management	48
CRM-A	Customer Management - Assurance	9
CRM-F	Customer Management - Fulfilment	1
CRM-B	Customer Management -Billing	3

Annex A:
Management standards

Annex A is contained in an Microsoft Word Format file (DTR08003v007AnnexA.doc contained in archive ts_102647v010101p0.zip) which accompanies the present document.

History

Document history		
V1.1.1	October 2004	Publication