

Deliverable

24

Standardisation Roadmap v2 – Appendix

WP13 Standards and Collaboration

Joris Claessens (editor)

European Microsoft Innovation Center

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Version 1.0

TrustCoM

A trust and Contract Management framework enabling secure collaborative business processing in on-demand created, self-managed, scalable, and highly dynamic Virtual Organisations

SIXTH FRAMEWORK
PROGRAMME

PRIORITY IST-2002-2.3.1.9



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Authors: Alvaro Arenas (CCLRC), David Chadwick (UoK), Joris Claessens (EMIC), Theo Dimitrakos (BT), Jürgen Doser (ETH), Tomás Garcia (AtosOrigin), Christian Geuer-Pollmann (EMIC), Pablo Giambiagi (SICS), Jochen Haller (SAP), Yücel Karabulut (SAP), Paul Kearney (BT), Olle Olsson (SICS), Philip Robinson (SAP), Santi Ristol (AtosOrigin), Babak Sadighi (SICS), J Sairamesh (IBM), Lutz Schubert (HLRS), Ketil Stølen (SINTEF), Adomas Svirskas (CCLRC), Maroun Touma (IBM), Fredrik Vraalsen (SINTEF), Stefan Wesner (HLRS), Michael Wilson (CCLRC).

Reviewers: Tomás Garcia (AtosOrigin),
Olle Olsson (SICS)
Fredrik Vraalsen (SINTEF)

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1 Executive summary

The TrustCoM project is developing a framework for trust, security, and contract management for secure, collaborative business processing and resource sharing in dynamically-evolving Virtual Organisations. TrustCoM is committed to the adoption of open standards, and intends to build upon and extend interoperability specifications where necessary and appropriate.

Standards are a way to promote and achieve interoperability between technologies across different vendors. While businesses need to balance between agreed functionality, competitive advantage, and need for interoperability, interoperability is a key requirement in today's multi-vendor market. Standardisation is an important part of successful exploitation. TrustCoM therefore aims at building upon existing well established and accepted standards and published specifications, where appropriate. If new technology is not compatible with existing standards that are well established in the market, then it may be more difficult to commercialize this into products and services which can interact with products and services provided by others. TrustCoM furthermore intends to contribute to the evolution of, and feed research results into, standards, where and in which way appropriate.

This document provides appendices to Deliverable D24 "Standardisation Roadmap v2", and gives an update on:

- the nature and management of the standardisation activities in the context of the project;
- the standardisation activities of the individual partners in the project;
- the relevant standardisation bodies and initiatives.

2 Appendix: TrustCoM standards coordination

This appendix describes how the standardisation activities within TrustCoM are coordinated and supported. TrustCoM is substantially involved in a number of IST project clustering and concertation activities. The appendix also includes an outline and activity report of these and other standards-related liaison activities.

2.1 Standards team

Figure 1 shows the organisation of the TrustCoM standards team which manages and supports the standardisation activities within the project.

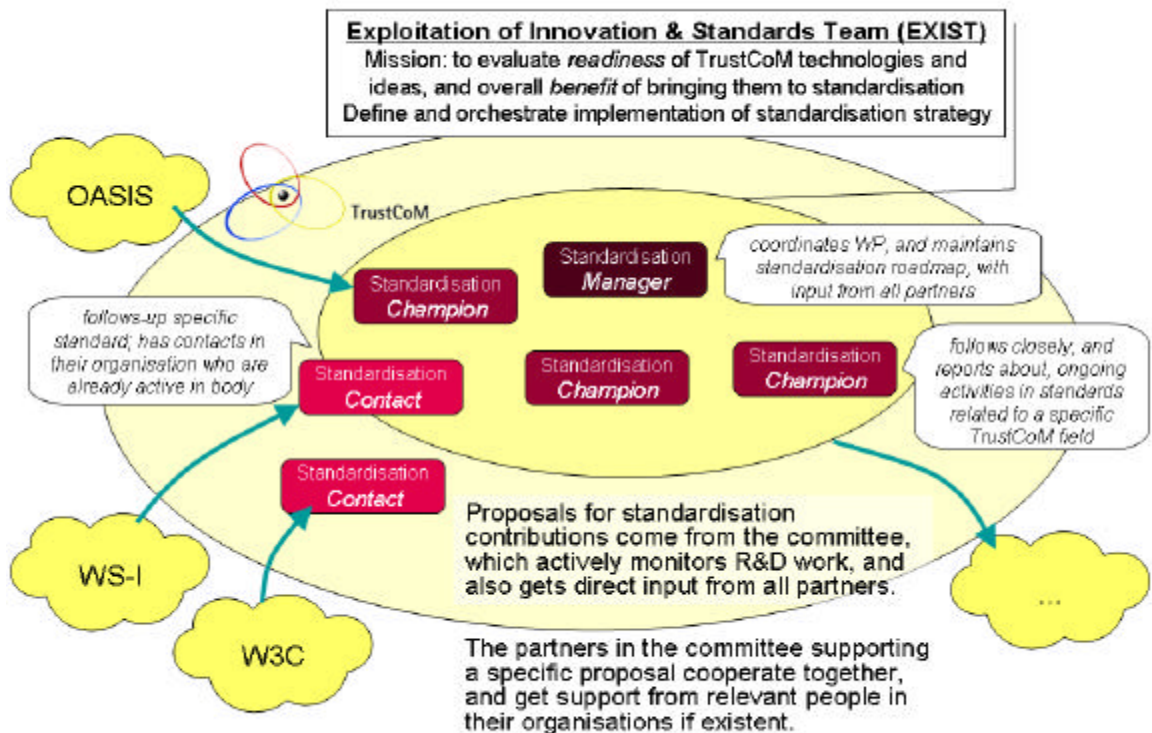


Figure 1: TrustCoM standards team and standardisation approach

The Exploitation of Innovation & Standards Team (EXIST) is responsible for the definition and orchestration of an exploitation and standardisation strategy for TrustCoM. Within EXIST, the Standards Team defines and orchestrates the implementation of a comprehensive standardisation strategy.

The standards team consists of those partners whose organizations are participating in current standardisation efforts related to TrustCoM. The current standardisation activities of the different, individual TrustCoM partners are outlined in appendix 3.

TrustCoM RTD area	Standardisation champion
Trust, PMI and PKI	David Chadwick (<i>UoK</i>)
Contracts & SLAs	Olle Olsson (<i>SICS</i>) + Jakka Sairamesh (<i>IBM</i>)
Policies & Security	Joris Claessens (<i>EMIC</i>) + Theo Dimitrakos (<i>BT</i>)
Collaborative business processes	Yücel Karabulut (<i>SAP</i>) + Jakka Sairamesh (<i>IBM</i>)
Web and Grid services	David Chadwick (<i>UoK</i>) + Joris Claessens (<i>EMIC</i>)
Semantic technologies	Alvaro Arenas (<i>CCLRC</i>)
Model driven security	Fredrik Vraalsen (<i>SINTEF</i>)

Table 1: TrustCoM standardisation champions

2.1.1 Mission and activities

The mission of the TrustCoM standards team is basically to ensure that the standardisation objectives of the TrustCoM project are met, and particularly that the limited resources dedicated to standardisation within the scope of the project are optimally spent in order to maximise results and potential impact. For this purpose, the activities of the standards team include:

- In the context of the project work as a whole, monitor the emergence and further evolution of relevant standards, as to ensure that the TrustCoM framework and reference architecture leverages the most up to date standards and interoperability guidelines.
- In close collaboration with the research and development workpackages, identify new potential standardisation opportunities and proposals, as to keep momentum with respect to standardisation work; and help to transform the identified standardisation opportunities into more concretely defined potential standardisation contributions.
- Evaluate the readiness (maturity) of potential contributions, and the technologies and/or ideas behind them; and assess the overall benefit of bringing them to standardisation, taking into account probability of success, timing, effort needed, and any other issues which may be relevant from the point of view of the project or the partners.
- For selected standardisation contributions, the partners in the standards team supporting a specific standardisation proposal will cooperate, orchestrate a submission to the suitable standardisation organisation, and define further steps to guide the particular contribution into the standardisation procedure of the respective body. Submission may be done through the support from people within the organisations of the partners that are already active in the targeted standardisation body.
- Disseminate (intermediate as well as finalised) project results within standardisation-related initiatives, indicate potential impact or contribution to standardisation, and gather feedback with respect to how the results are perceived and the feasibility of potential contributions. Also disseminate project results and findings within the partner organisations, as to ensure further adoption and success of potential contributions beyond the life-time and scope of the project.

2.1.2 Standardisation Manager

The standardisation manager coordinates the standards team, and is the editor of the standardisation roadmap (of which this deliverable is the second version).

Joris Claessens (*EMIC*) is the standardisation manager.

2.1.3 Standardisation Champions

Based on the State of the Art evaluation, the project S&T Roadmap, and an initial analysis of relevant specifications – refer to version 1 of the standardisation roadmap – we have identified seven research and technical development areas relevant to TrustCoM in the context of standardisation. For each of these areas, we have assigned one or two standardisation champions (i.e., members of the TrustCoM consortium). Table 1 lists the TrustCoM RTD areas and respective standardisation champions.

The standardisation champion reports about ongoing standardisation activities regarding the specific area. The standardisation champion monitors the emergence and further evolution of new and existing standards relevant in his area. The standardisation champion works closely with all the other activities in the project to identify and assess relevant standards, and to identify areas of technical development within this area, which may be suitable for standardisation.

2.1.4 Standardisation Contacts

As outlined in an appendix, a number of TrustCoM partners are already actively involved in various standardisation efforts through their participation in bodies including: the WS-Interoperability Organisation, W3C, OASIS, OMG, IETF, and GGF. Specific individuals and organisations have liaisons with specific standardisation bodies, and where appropriate – particularly in areas where we want to concentrate our efforts – TrustCoM leverages and supports the activities of individuals on existing working groups within a standardisation body.

2.2 Liaisons with other projects and initiatives

In addition to following up, liaising with, and contributing to the relevant standardisation forums, TrustCoM liaises with particular other EU projects and initiatives with respect to standardisation and interoperability, in order to maximise impact and to avoid duplication of effort.

2.2.1 Liaison with external cluster projects

The table below shows the list of external cluster projects that TrustCoM is collaborating with in some form or another as a part of the interoperability initiative by the EU commission (INTEROP). Within the eBusiness cluster, TrustCoM intends to collaborate with the cluster projects in a proactive fashion on specific related topics on integration, collaboration and standards.

Project	Description	Details of possible interaction	Status
ATHENA	ATHENA is committed to creating a long term impact for advancing interoperability which is mainstream, inclusive and has critical mass.	Interactions on Business Process integration, interoperability of business collaboration across the Internet	In progress
DBE	The project integrates expertise from the worlds of science, computing, business, and economic development. Work is simultaneously underway on	Interactions with DBE on every aspect of enabling business services through Web Services and other standards	Collaboration in Progress

Project	Description	Details of possible interaction	Status
	developing the fundamental principles of applying science to software evolution, modelling business processes, software services, and understanding the needs and competitive environment of SMEs in order to provide services that add value and increase profitability		
E-LEGI	E-Legi has taken a "Human centred design", to replace the classical, applicative approach to learning. With consideration of humans at the centre, learning is clearly a social, constructive phenomenon. It occurs as a side effect of interactions, conversations and enhanced presence in dynamic Virtual Communities: experimental research concepts integrating new powerful developments of services in the Semantic GRID.	Interaction in the form of collaborative applications around e-Learning. In addition, the role of Grid computing in providing the underlying secure infrastructure for E-Legi is another area of collaboration.	Work in progress. Participants from TrustCoM have shared interests for collaboration with E-Legi consortium.
INTEROP	INTEROP aims to create the conditions of an innovative and competitive research in the domain of Interoperability for Enterprise Applications and Software. INTEROP will facilitate the emergence of an interoperability research corpus through the fusion of three knowledge-components.	Interoperability is a big area of collaboration with the INTEROP group. Standards based collaboration is critical for integration across multiple organizations.	Progress has been made in collaborating with the NoE. Some of the partners in TrustCoM participate in the NoE.
PRIME	PRIME is a European RTD Integrated Project under the FP6/IST Programme. It addresses research issues of digital identity management and privacy in the information society. The project started on 1 March 2004 and will last for four years.	There is strong need for collaboration between TrustCoM and PRIME. TrustCoM focuses on Security and Trust in Collaborative Environments, and Prime focuses on User Identity and Privacy in a networked world.	Progress has been made here in collaborating with the PRIME group. Invited Presentations have been done.
SIMDAT	The strategic objectives of SIMDAT are to test and enhance data grid technology for product development and production process design, and to develop federated versions of problem-solving environments by leveraging enhanced grid services, and to exploit data grids as a basis for distributed knowledge discovery.	The main topic for collaboration will be on product design over federated and autonomic organizations over secure computing environments.	In progress.

Project	Description	Details of possible interaction	Status
NextGRID (and other Grid projects)	The objective of the NextGRID project is to develop the next generation Grid architecture.	In the scope of the Grid project collaboration effort, TrustCoM is a prominent contributor to the technical concertation group on trust and security.	Ongoing.

2.2.2 COPRAS

COPRAS [<http://www.w3.org/2004/copras/>] – Cooperation Platform for Research and Standards – is a 3-year Support Action under the European Commission's Information Society Technologies (IST) Programme. The members of the COPRAS consortium are the officially recognized European Standards Organizations - CEN, CENELEC, ETSI, together with The Open Group and the World Wide Web Consortium (W3C). All are members of the ICT Standards Board (ICTSB), the co-ordinating forum for European ICT standardization. The ICTSB will be kept regularly informed of the progress and will discuss the emerging research results to ensure they are directed appropriately.

The IST programme targets a number of key areas where research will help to increase innovation and competitiveness in European industry and to contribute to greater benefits for all European citizens. At the same time, the standards programme under the eEurope initiative will facilitate the adoption of the research results and provide feedback about their acceptance and challenges in their use.

The COPRAS project brings together these policy initiatives by surveying European Commission funded IST projects for standards-related technologies and providing information on standardization to help progress research results through appropriate standards bodies. It will also provide guidance for future calls under the European Framework Programmes to ensure that further research projects benefit from a harmonized, efficient and fruitful interface with standardization.

The COPRAS project examines new standards-related technologies evolving from over 300 European Commission funded IST research projects under the Framework 6 Programme spanning 23 key technology domains.

TrustCoM has participated in the COPRAS kick-off meeting, and a clustering activity with BioSec¹, eMayor², SECOQC³, and Digital Passport⁴ has been explored but not pursued further. Bilateral contacts have been opened up though, and TrustCoM has indicated that it could benefit from general COPRAS support.

2.2.3 Other projects and initiatives

TrustCoM intends to liaise with various other EU projects and initiatives as to maximise impact and avoid duplication of effort. This may particularly apply to standardisation and interoperability. In addition to the initiative described above, TrustCoM will further explore joint activities and relationships in the remaining course of the project, when opportunities arise.

2.3 TrustCoM standards and collaboration activities report

The following are a list of meetings, standards workshops, conferences and others that TrustCoM members have attended and presented the TrustCoM activities.

¹ BioSec. <http://www.biosec.org/>.

² eMayor. <http://www.emayor.org/>.

³ SECOQC. <http://www.secoqc.net/>.

⁴ Digital Passport. <http://www.eudigitalpassport.com/>.

- IETF Meeting, San Diego, 1-6 August 2004 – David Chadwick (UoS)
- Grid Trust & Security concertation, Brussels, 17 September 2005 – Joris Claessens, Theo Dimitrakos, and others
- GGF12 OGSA-Authzn WG Meeting, Brussels, 23 September 2004 – David Chadwick (UoS)
- COPRAS kick-off meeting, 14 October 2004, Joris Claessens (EMIC)
- IETF Meeting, Washington, 7-12 Nov 2004 – David Chadwick (UoS)
- ISO/ITU-T X.509 Meeting, Orlando, 8-10 November 2004 – David Chadwick (UoS)
- Grid intermediate Trust and Security concertation, Amsterdam, 17 February 2005 – Joris Claessens (EMIC) and Alvaro Arenas (CCLRC)
- Cluster Enterprise Interoperability meeting, Geneva, 21 Feb 2005, Santi Ristol (Atos Origin)
- GGF13 Seoul, 12-16 March 2005 – David Chadwick (UoK)
- Enterprise Interoperability Information day, OMG TC meeting, Athens, 13 Apr 2005 – Yücel Karabulut (SAP)
- Grid Standards Collaboration Group meeting, Brussels, 1 June 2005 – Joris Claessens
- Grid Trust and Security concertation, Brussels, 2 June 2005 – Joris Claessens, Theo Dimitrakos, Santi Ristol
- XACML meeting, Ottawa, 28-29 April 2005. Erik Rissanen (SICS)⁵
- GGF 14 Chicago, 25-29 June 2005 – David Chadwick (UoK)
- IETF Meeting, Paris, 31 July – 5 Aug 2005, David Chadwick (UoK)

⁵ Erik Rissanen participates on a regular basis of the XACML TC teleconferences. He is the editor of the delegation profile for XACML.

3 Appendix: standardisation activities of TrustCoM partners

This appendix lists the current standardisation activities of the involved, individual TrustCoM partners (in alphabetical order).

3.1 Atos Origin

Atos Origin is member of the following Standards organisations and bodies:

- TeleManagement Forum (TMF)

At the moment Atos Origin participates to the NGOSS compliance steering committee and to joint catalyst demonstrations (such as the one they are creating for may with Microsoft around Business Activity Monitoring of a billing process)

They are trying to "recruit" more participation from Atos Origin in the TMF and for that they are building a small document explaining what can the TMF offer and the benefits for a business unit to have someone participate to a working group.

- Atos Origin is also investigating joining the OSS through Java Initiative (OSS/J) <http://java.sun.com/products/oss/>.
- ITU-T

Atos Origin is an associate member of the ITU-T SG15 working group, that focuses on standards around optical networks.

They are allowed to participate to the group and to review the documents, but they don't have voting rights. The main contact is veronique.piperaud@atosorigin.com

- Voice XML Forum

The VoiceXML Forum (<http://www.voicexml.org/>) is an industry organization formed to create and promote the Voice Extensible Markup Language (VoiceXML) to enable speech-based applications and Internet information and content becoming voice and phone accessible.

The main contact is <mailto:ladan.etemad@atosorigin.com>

- Finally locally in France Atos Origin are also members of the AFUTT (French Telephone user association), <http://www.afutt.org/>, and Sophia Antipolis Telecom Valley (<http://www.telecom-valley.fr/>)

There is no standard specification related to TrustCoM in which Atos Origin is currently involved, but there is a heavy interest in participating and getting involved in OASIS and BPEL4WS, SLA and automatic contract building.

3.2 BT

BT is a member of the following bodies:

- 3GPP (ETSI EPP 3GPP)
- Alliance for Telecommunications Industry Solutions (ATIS)
- Asynchronous Transfer Mode Forum (ATMF)
- Bluetooth Special Interest Group

- British Standards Institution (BSI)
- CEN/ISSS (European Committee for Standardisation/Information Society Standardisation System)
- CENELEC (European Committee for Electrotechnical Standardisation)
- CEPT/ECC
- [Communications Research Network \(CRN\)](#)
- [Digital Living Network Alliance \(DLNA\)](#)
- Digital Subscriber Line Forum (DSLIF)
- Digital Television Group
- [Digital Video Broadcasting Project \(DVB\)](#)
- EPCglobal
- ETIS
- Eurescom
- European Electronic Messaging Association (EEMA)
- European Telecommunications Network Operators (ETNO)
- European Telecommunications Standards Institution (ETSI)
- Fixed Line Multimedia Messaging Service Forum (F-MMS Forum)
- Foundation for Intelligent Physical Agents (FIPA)
- FSAN/FS-VDSL Committee
- Global Platform
- GS1-UK
- GSM Association
- ICC (International Chamber of Commerce)
- Information & Communications Technologies Standards Board (ICTSB)
- International Standards Organisation (Joint Committee of ISO and International Electrotechnical Commission) (ISO/IEC)
- International Telecommunications Union (ITU-R).
- International Telecommunications Union (ITU-T).
- Internet Corporation for Assigned Names and Numbers (ICANN)
- Internet Engineering Task Force (IETF)
- IP Detail Records (IPDR)
- IPSphere
- IPv6 Forum
- JCP
- Liberty Alliance
- Location Interoperability Forum
- MetroEthernet Forum
- Mobile VCE

- MPLS and Frame Relay Alliance
- Multiservice Switching Forum (MSF)
- Network Interoperability Consultative Committee (NICC)
- OASIS
- Open Mobile Alliance (OMA)
- Open Network for Commerce Exchange
- OSGi
- OSS/J
- Parlay Group
- Professional MPEG Forum (Pro-MPEG)
- QuEST Forum
- RosettaNet
- SMPTE
- Tele Management Forum (TMF)
- The Application Home Initiative (TAHI)
- tScheme
- TV Anytime Forum (TVAF)
- UKTelco B2B Forum
- Universal Plug and Play Forum
- Web Services Interoperability Organisation (WS-I)
- Wi-Max Forum
- Wireless Broadband Alliance (WBA)
- Wireless World Research Forum (WWRF)
- World Wide Web Consortium (W3C)

3.3 CCLRC

CCLRC has been actively involved in British National (BSI) and ISO standards in the computer graphics area for thirty years, with CCLRC staff chairing the appropriate committees (ISO/IEC JTC1 SC24)⁶. The staff active in that area have recently retired, but CCLRC has an established reputation within ISO as a result, and some CCLRC staff have a knowledge of the workings of BSI and ISO, and have recently become active in the British Standards Institute (**BSI**) Technical Committee **IST/41** developing Document Schema Definition Languages⁷, through which Brian Matthews contributes to ISO/IEC JTC1/SC34 addressing Document Description and Processing Languages. This experience with BSI and ISO could be used to promote potential UK and multinational standards based on TrustCoM results, although as noted above in the discussion of ISO standards, this route can be very long, or have little impact.

⁶ A list of the 35 ISO standards produced is available at :
<http://www.iso.ch/iso/en/stdsdevelopment/tc/tclist/TechnicalCommitteeStandardsListPage.TechnicalCommitteeStandardsList?COMMID=117>

⁷ For further details of DSDL see <http://www.dSDL.org/>.

CCLRC staff have been active in W3C since its foundation, being members, hosts of the UK and Ireland Office, and the UK members of the ERCIM EEIG that hosts the European host of W3C. Michael Wilson is the W3C AC representative for CCLRC, the ERCIM Executive committee member for the UK and Manager of the UK and Ireland Office of W3C. He has experience of developing the SMIL, PNG, and SVG recommendations within W3C. Alistair Miles is currently active for CCLRC in the W3C Semantic Web Best Practices and Deployment Working Group coordinating the PORT Task force on Porting Thesaurii to RDF and OWL. This experience within W3C positions CCLRC to join with the industrial partners in TrustCoM to submit project results on trust as notes to W3C in order to initiate W3C recommendations.

CCLRC staff have been very active in GGF since its inception. Current CCLRC participation in GGF WG and RG is as follows:

Network Measurement Working Group via the Gridmon project
CA Operations (CAOPs-WG)
Grid Storage Management (GSM-WG)
PNPA-RG Particle and Nuclear Physics Apps
SAGA
FI-RG Firewall Issues
TC-RG Trusted Computing
OGSA-AUTHZ-WG OGSA Authorization
SAAA-RG Site AAA
AUTHZ-WG Authorization mechanisms
GCP-WG Grid Certificate Policy
GCE-RG – Rob Allan is European Co-Chair

The most relevant of these is the TC-RG (<https://forge.gridforum.org/projects/tc-rg>) standardisation on trusted computing, which addresses issues such as preventing release of critical data into undesired software environments and distributed firewalls for VOs to establish a trusted domain. However these crude security measures are not relevant to the policy level innovations in TrustCoM, and they have so far only produced two overview documents.

CCLRC are currently considering joining OASIS to become active in the standardisation of Grid technologies through OASIS.

3.4 EMIC

Microsoft Corporation is involved in multiple standards bodies and industry standardisation initiatives. The most relevant ones for TrustCoM are the World Wide Web Consortium (W3C), the Organization for the Advancement of Structured Information Standards (OASIS) and the WS-* efforts in which Microsoft and many partners (including IBM, SAP, BEA Systems, and multiple other ones) drive web service related specifications forward, before they are disseminated to an appropriate standardisation body. There are specific teams in Microsoft who are involved with different standards bodies and actively participate in standardisation meetings.

The European Microsoft innovation Center (EMIC) focuses on new technology, and research and development. Because of its close relationship with other teams inside Microsoft, EMIC will work together with the relevant people in Microsoft in order to have the necessary impact, in case that there will be the desire to influence or contribute to a particular standards effort.

3.5 HLRS

HLRS has contributed with results achieved in research projects to several standardisation bodies not only limited to the High Performance Computing domain but also to larger standardisation bodies such as IETF and ISO and is therefore familiar with the process and the approach e.g. for contributing TrustCoM results to these bodies.

Furthermore HLRS is involved in national and international bodies that will issue best practice recommendations such as the German D-Grid initiative and the UNICORE forum where staff involved in TrustCoM is an elected member of the technical board.

3.6 IBM

IBM participates in and contributes heavily to the work of standards consortia, alliances, and formal national and international standards organisations. Where appropriate, IBM adopts consensus technologies in order to maintain openness, interoperability, and application portability.

IBM's position on Standards is described by the phrase "Cooperate on Standards and Compete on Implementation techniques". IBM has actively participated in enabling Web Services and J2EE standards⁸ in its fundamental application server platform for application development, business integration and business portals.

IBM participates in W3C, J2EE, OASIS, ECLIPSE, ROSETTANET, SYNCML, Object Management Group (OMG), OSGi, OGSA (GRID) and other standards bodies and organizations to promote middleware based standards for advanced development, security, integration, system development, and computing frameworks. IBM is strongly committed to open standards for enabling businesses to conduct their business activities in a seamless fashion over the Internet.

IBM is the **co-founder** (founder for some of them) of many of the top standards bodies and standards such as

- XML.org
- Eclipse.org, OASIS
- RosettaNet
- OMG XML
- Webservices (UDDI.org, WebServices Interoperability and others).

IBM is committed to supporting a variety of standards at the operating and middleware system level such as Linux, Java, Apache, XML and others.

Most of the standards provide a strong basis for the TrustCoM middleware and they include WS-Agreement, WSRF, WS-ReliableMessaging, WS-Transactions, WS-Coordination, WS-BusinessActivities, WS-Policy and others.

3.7 SAP

SAP is actively participating in various standardisation organisations related to specifying (business) application related standards.

OASIS (Organization for the Advancement of Structured Information Standards) is focussing on standards supporting business applications in a service based environment. Important standards activities in this consortium are:

- OASIS WSBPEL
- OASIS WS-Security (OASIS WS-Security 1.0)
- OASIS UDDI (OASIS UDDI 2.0, OASIS UDDI 3.0)
- OASIS WS-Security (OASIS WS-Security 1.0) XML Core
- OASIS SAML

⁸ "Supporting Open Standards for Web Services and Java 2 Platform Enterprise Edition (J2EE)", White Paper by Sam Caruso and Jeff Reser, May 2002.

Activities directly related to application/business process oriented (web) service and related technology standardisation takes place in WS-I (Web Services Interoperability Organization), e.g. the WS-I Profiles (WS-I Basic Profile, WS-I Basic Security Profile 1.0), or in the W3C, such as W3C WSDL (W3C WSDL 1.1, W3C WSDL 2.0).

Further standardisation in the area of supporting technologies takes place in the JCP (Java Community Process), Liberty Alliance, Business Process Management Initiative (BPMI), and the The Workflow Management Coalition (WFMC).

3.8 SICS

SICS is a national research institute working with future and emerging technologies in the IT sector. Part of our R&D work has a bearing on standardisation issues, and we have for many years been involved in various standardisation efforts. Our institute is a member of the ERCIM group of European institutes, which brings in a transnational aspect to our work in different technology areas.

SICS is a member of Wireless World Research Forum (WWRF), which contributes to standards in wireless communication. We are also a member of the World Wide Web Consortium (W3C), concerning standards for the web. In addition, SICS is hosting the Swedish W3C Office, a national office for dissemination of information about W3C standards (a.k.a. Recommendations), and for providing a channel between the working groups of W3C and national technology providers and users. Personnel from the Swedish W3C Office is also participating in R&D in TrustCoM.

SICS is also a member of Organization for the Advancement of Structured Information Standards (OASIS), where effort is focussed on the OASIS eXtensible Access Control Markup Language (XACML) TC, to contribute to the XACML standard in the areas of support for delegation.

In addition we intend to be involved in standardisation work on standards originating in WS Agreement and WS Policy.

3.9 SINTEF

SINTEF is heavily involved in standardisation efforts within OMG and other bodies. For example, input has been given to the standardisation of UML, UML 2.0 and the UML for EDOC profile. Through work in the IST project CORAS, SINTEF actively took part in the standardisation of the UML Profile for Modelling Quality of Service and Fault Tolerance Characteristics and Mechanisms. Through work in the ESPRIT project COMPASS, SINTEF actively took part in the standardisation of the OMG General Ledger Facility (OMG GL) and Account Receivable/Account Payable in the Finance area. Through work in the ESPRIT project DISGIS, standardisation input has been provided to ISO/TC211 and OpenGIS on GIS service and data standards. SINTEF is taking actively part in the Special Interest Groups for Command Control Computer Communication Information (C4I DSig), Finance and Geographical Information Systems (GIS SIG). SINTEF is in close cooperation with several international partners involved in the MDA standardisation of MOF Query, View and Transformations (QVT), as well as the OMG RFP for Model to Text Transformation. SINTEF hosted the June 2000 OMG TC meeting in Oslo. SINTEF will be a major instrument for TrustCoM in relation to the Object Management Group; both for dissemination purposes and for involvement in standardisation activities.

3.10 UoK

The University of Kent currently participates in standardisation activity within the ISO/ITU-T, the IETF and the GGF. Staff are (or have been) editors of ISO/ITU-T standards (e.g. X.500), Internet RFCs and IDs (e.g. LDAP, PKIX), and GGF drafts (e.g. Grid Authorisation Service). The UoK is also putting input into OASIS (SAML and XACML) via the GGF and other OASIS members.

4 Appendix: Relevant standardisation bodies

Based on the initial assessment of the standardisation status in each of the defined TrustCoM areas, we compiled in version 1 of the standardisation roadmap an initial list of all different standardisation forums which may be relevant to TrustCoM in one or another way. This appendix lists these standardisation forums in no particular order. For each forum, a short description is given, and their relevance is explained.

The current list includes the W3C, OASIS, WS-I, OMG, IETF, Ecma International, as main relevant institutionalized standardisation consortia; IBM/Microsoft and Liberty Alliance, as key vendor groups; GGF and Internet2 (including Shibboleth), as issue-specific forums, ISO and UN/CEFACT as formal standardisation bodies, and a number of application domain-specific standardisation initiatives.

While we have here kept the descriptions of all standardisation bodies identified in version 1 of the roadmap, it is clear that a limited set of standardisation forums will constitute the core target for potential TrustCoM standardisation contributions, while other standardisation initiatives will be more important with respect to being aware of them and taking into account their work where appropriate.

4.1 W3C

The World Wide Web Consortium (<http://www.w3.org/>) was created in October 1994 to lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability. W3C has around 350 Member organizations from all over the world and has earned international recognition for its contributions to the growth of the Web. Essentially all corporate and governmental partners of TrustCoM are active within W3C and they include two regional W3C offices (CCLRC and SICS) where the individuals leading the office are directly involved in the project.

4.1.1 W3C's Mission

By promoting interoperability and encouraging an open forum for discussion, W3C commits to leading the technical evolution of the Web. In just over seven years, W3C has developed more than fifty technical specifications for the Web's infrastructure. (See <http://www.w3.org/TR/>). To meet the growing expectations of users and the increasing power of machines, W3C is already laying the foundations for the next generation of the Web. W3C's technologies will help make the Web a robust, scalable, and adaptive infrastructure for a world of information.

4.1.2 W3C's Goals

W3C's long term goals for the Web are:

- *Universal Access*: To make the Web accessible to all by promoting technologies that take into account the vast differences in culture, languages, education, ability, material resources, access devices, and physical limitations of users on all continents;
- *Semantic Web*: To develop a software environment that permits each user to make the best use of the resources available on the Web;
- *Web of Trust*: To guide the Web's development with careful consideration for the novel legal, commercial, and social issues raised by this technology.

4.1.3 W3C's Role

As with many other information technologies, in particular those that owe their success to the rise of the Internet, the Web must evolve at a pace unrivaled in other industries. Almost no time is required

to turn a bright idea into a new product or service and make it available on the Web to the entire world; for many applications, development and distribution have become virtually indistinguishable. At the same time, easy customer feedback has made it possible for designers to fine tune their products almost continually. With an audience of millions applying W3C specifications and providing feedback, W3C concentrates its efforts on three principle tasks:

Vision: W3C promotes and develops its vision of the future of the World Wide Web. Contributions from several hundred dedicated researchers and engineers working for Member organizations, from the W3C Team, and from the entire Web community enable W3C to identify the technical requirements that must be satisfied if the Web is to be a truly universal information space.

Design: W3C designs Web technologies to realize this vision, taking into account existing technologies as well as those of the future.

Standardization: W3C contributes to efforts to standardize Web technologies by producing specifications (called "Recommendations") that describe the building blocks of the Web. W3C makes these Recommendations (and other technical reports) freely available to all.

4.1.4 W3C's Organization

To meet its goals (universal access, semantic Web, Web of trust) while exercising its role (vision, design, standardization) and applying its design principles (interoperability, evolution, and decentralization), W3C process is organized according to three principles:

Vendor neutrality: The W3C hosts (MIT, KEIO, ERCIM) are vendor and market neutral, as is the Team. W3C promotes neutrality by encouraging public comment on specifications during their entire life cycle.

Coordination: The Web has become phenomenon so important (in scope and investment), that no single organization can or should have control over its future. W3C coordinates its efforts with other standards bodies and consortia such as the IETF (Internet Engineering Task Force), the Unicode Consortium, the Web3D Consortium, and several ISO committees. More details are available from the W3C Liaison Page.

Consensus: Consensus is one of the most important principles by which W3C operates. When resolving issues and making decisions, W3C strives to achieve unanimity of opinion. Where unanimity is not possible, W3C reaches decisions by considering the ideas and viewpoints of all participants, whether W3C Members, invited experts, or the general public.

4.1.5 W3C's operational structure

Work is coordinated by the W3C team (in MIT, KEIO and ERCIM) and is structured in Domains, Activities and Working Groups. W3C does most of its work with an explicit mandate from the Membership. The W3C Members review proposals for work called "Activity proposals". When there is consensus among the Members to pursue this work, W3C initiates a new Activity.

To facilitate management, the W3C Team organizes W3C Activities and other work into four domains:

- **The Architecture Domain** that develops the underlying technologies of the Web.
- **The Interaction Domain** that seeks to improve user interaction with the Web, and to facilitate single Web authoring to benefit users and content providers alike. It also works on formats and languages that will present information to users with accuracy, beauty, and a higher level of control.
- **The W3C Technology and Society Domain** that seeks to develop Web infrastructure to address social, legal, and public policy concerns.
- **The Web Accessibility Initiative (WAI)**, is pursuing accessibility of the Web through five primary areas of work: technology, guidelines, tools, education and outreach, and research

and development. WAI reflects W3C's commitment to lead the Web to its full potential includes promoting a high degree of usability for people with disabilities.

In addition, the Quality Assurance (QA) Activity and Patent Policy apply to all domains.

The motivation for introducing a W3C QA Activity is that, although W3C creates the technical specifications regarded by the Web Community at large as "Web standards", if W3C is to lead the Web to its full potential then W3C must ensure that its deliverables - W3C Recommendations - are implemented correctly. W3C has decided to take a new lead in improving the quality of implementation for W3C technologies. The Quality Assurance Activity gathers and formalizes QA efforts for the various languages and protocols developed by W3C.

The Patent Policy Working Group (PPWG) is part of the W3C Technology and Society Domain. The mission of the PPWG is to advise W3C on the means to address the growing challenge that patent claims pose to the development of open standards for the Web.

W3C Activities are generally organized into groups:

- **Working Groups** for technical developments. The primary goal of an Interest Group is to bring together people who wish to evaluate potential Web technologies and policies. An Interest Group is a forum for the exchange of ideas. There are no Good Standing requirements for Interest Group participation. Interest Groups do not create W3C Recommendations.
- **Interest Groups** for more general work. The primary goal of an Interest Group is to bring together people who wish to evaluate potential Web technologies and policies. An Interest Group is a forum for the exchange of ideas. There are no Good Standing requirements for Interest Group participation. Interest Groups do not create W3C Recommendations.
- **Coordination Groups** for communication among related groups. Coordination Group manages dependencies and facilitates communication with other groups, within or outside of W3C.

These groups, made up of representatives from Member organizations, the Team, and invited experts, produce the bulk of W3C's results: technical reports, open source software, and services (e.g., validation services). These groups also ensure coordination with other standards bodies and technical communities. There are currently over thirty W3C Working Groups.

4.1.6 W3C's standardisation process and timescales

These organizational principles are embodied in the Member contract and the W3C Process Document, which govern W3C's operations. (See <http://www.w3.org/2004/02/Process-20040205/>) The Process Document is a public document that describes the W3C Organization, W3C Activities and Groups, how consensus governs W3C work, the W3C Recommendation Track, and the W3C Submission Process. In summary, W3C takes about six months to establish a working group on a technology, and then eighteen months to three years to agree a recommendation, which is only released after public consultation and if there are working interoperable implementations of all functions in the technology, and enough of the members support it.

4.2 OASIS

OASIS stands for Organization for the Advancement of Structured Information Standards (<http://www.oasis-open.org/>).

OASIS is a global consortium aiming to drive the development, convergence and adoption of XML-based standards for e-business. This is currently a primary forum for the development of higher level XML specifications into accepted standards.

OASIS is, according to the mission statement, a "not-for-profit, global consortium that drives the development, convergence and adoption of e-business standards".

The organization is structured in technical committees (TCs) focusing on different main themes:

- [Web Services and SOA](#)
- [e-Commerce](#).
- [Security](#).
- [Law & Government](#)
- [Supply Chain](#).
- [Computing Management](#)
- [Application Focus](#)
- [Document-Centric Applications](#).
- [XML Processing](#)
- [Conformance/Interop](#)
- [Industry Domains](#).

Actual or candidate standards which are important for TrustCoM in these themes, sponsored by OASIS include WS-Security (OASIS Web Services Security TC), SAML (OASIS Security Services TC), XACML ([OASIS eXtensible Access Control Markup Language \(XACML\) TC](#)), WSRF (OASIS Web Services Resource Framework TC), BPEL ([OASIS Web Services Business Process Execution Language TC](#)), WS-Context and WS Coordination Framework ([OASIS Web Services Composite Application Framework \(WS-CAF\) TC](#)), WS Notification ([OASIS Web Services Notification \(WSN\) TC](#)), WSDM ([OASIS Web Services Distributed Management \(WSDM\) TC](#)) and ebXML. OASIS is likely to be a significant focus for TrustCoM's standardisation activities.

Of the TrustCoM partners, SAP, IBM, Microsoft, BAE Systems and BT are all OASIS members at various levels.

The following paragraphs will deal with OASIS internals, how to participate and contribute results into standardisation processes.

In order to contribute, one has to become first an eligible OASIS member. Membership is offered to organisations as well as individuals. Applying for membership follows a formal process outlined at http://www.oasis-open.org/join/membership_faq.php. It involves a yearly fee depending on the membership grade ranging from sponsor level (13500 \$/year) down to individual level (250 \$/year). Eligible members may observe running TC discussions without joining, but to exert voting rights they have to formally join a TC. Most of these administrative processes are enacted via mail or the OASIS homepage.

Generally, work inside OASIS in TCs is conducted via mailing lists and regular phone conferences and less involving face-to-face meetings.

If a eligible member or a consortium, such as TrustCoM, intendeds to disseminate results into OASIS suitable for standardisation, then this may happen in two ways:

1. found a TC from scratch
2. contribute to a suitable existing TC

To determine the right choice, the results have to be assessed based on certain criteria:

- significance and cardinality of results
- scope and size of problem domain
- is there an existing TC with suitable scope

If the results originate from a particular narrow problem domain and deal with a rather constraint field, it is recommended to contribute to a suitable existing TC, of course if one is identifiable. TCs are announced on the OASIS website, the scope can be deduced from its charter and a TC state is

shown as well. It makes no sense to start contributing if the TC is already in its final stage getting the standard specification ready.

In all other cases, it should be considered to form a TC from scratch. A formal process is set up which has to be followed for such standardisation activity:

1. First, at least one eligible member being aware of the results has to raise awareness OASIS internally as well. Results should be presented via the typical communication channels such as mailing lists or in phone conferences and meetings.
2. If at least three eligible OASIS members (in case of TrustCoM, more consortium partners are not excluded) agree to form a TC for standardising these results, a jointly written proposal may be submitted
3. after latest 15 days, a so-called TC admin provides feedback about acceptance or rejection
4. before, the TC chairs convene to assess the significance of the submitted proposal
5. In case of an approval, the TC is allowed to start and follows the TC lifecycle

TC results are delivered in regular intervals, reviewed and later on improved. The main milestones are:

- Committee draft
- Public review draft
- OASIS standard

The finally envisioned result is, of course, to pass the results into an OASIS standard. Intermediate community reviews ensure the document's quality and provide valuable feedback.

4.3 WS-* specifications from industry

The WS-* specification family is an effort mainly driven by IBM and Microsoft, along with a number of other organisations, to create an interoperable set of web service related specifications. These specifications are written by a group of industry partners. The effort is not intended as an alternative standardisation initiative, and the specifications should eventually move to the appropriate, existing standardisation bodies. The initial set of industry partners depends on the nature of the specification. These specifications are usually implemented in both the Microsoft .NET Framework (e.g. in Microsoft's Web Service Extensions WSE) and IBM's WebSphere family. The specifications are put forward on customer demand, in order to make Web services more secure, more reliable, and better able to support transactions⁹, and in addition to provide these capabilities while retaining the essential simplicity and interoperability found in Web services today. The majority of the work on technology cooperation is defined in a white paper¹⁰. The two companies have announced the formation of multiple work-groups to design and demonstrate through proof of concept implementations, the integration of systems with WebSphere and .NET frameworks.

These specifications are designed in a modular and composable fashion such that developers can utilize just the capabilities they require. This "component-like" composability should allow developers to create powerful Web services in a simple and flexible manner, while only introducing just the level of complexity dictated by the specific application.

These Web service technologies enable organisations to easily create applications using a Service-Oriented Architecture (SOA). Furthermore, IBM and Microsoft have demonstrated¹¹ secure, reliable,

⁹ Wall Street Journal, September 18th, 2003.

¹⁰ Don Ferguson et. al., "Secure, Reliable, Transaction Web Services: Architecture and Composition," White Paper, October, 2003, URL: <http://www-106.ibm.com/developerworks/webservices/library/ws-securtrans/>.

¹¹ IBM and Microsoft conducted a demo that showed a large auto manufacturer creating a next-generation supply chain solution for managing relationships with dealers and suppliers. The demo

transacted SOA applications that illustrate the richness of the business processes that can be created using this approach. Moreover, these demonstrations have been operating in a federated security environment on a heterogeneous collection of systems running IBM WebSphere and Microsoft .NET software, showing interoperability of the respective platform and development tools. These Web Service technologies are anticipated to be available in operating systems and middleware, with tools that will make it even easier for developers to use these technologies. The next generation of Web services-based solutions, including the TrustCoM framework, will thus clearly benefit from leveraging these emerging technologies.

4.4 WS-I

The Web Services Interoperability (WS-I) organization [<http://www.ws-i.org/>] is an open, industry forum promoting Web services interoperability, working across industry and standards organizations. In addition to the various individual Web Services standards developed in different standardization bodies, WS-I is developing implementation guidelines, tools, and a core collection of profiles that support interoperability for Web services functionality. A profile is a named group of Web services specifications at specific version levels, along with conventions about how they work together.

The WS-I has specified a Basic Profile (Version 1.1) and an Attachments and Simple SOAP Binding Profile for guaranteeing basic web services interoperability. In addition, the WS-I is working on a Basic Security Profile and security token profiles to guide web services security interoperability.

The release of these profiles means that several vendors will endorse the profile to guarantee that their offerings adhere to the standard, thus eliminating much of the research and guesswork that customers' organisations had to go through in order to build interoperable implementations. The WS-I determined that developers needed some way of knowing which products supported what level of specification. Profiles aim at solving this problem by containing a list of named and versioned Web services specifications, along with implementation and interoperability guidelines that recommend how the specified component should be used together to develop interoperable Web services.

The current WS-I profiles address the base Web services functionality and the Web services security aspects. The scope of WS-I should in principle cover all Web services related aspects in TrustCoM, provided that mature enough standards dealing with these aspects have emerged in the regular standardization bodies.

As WS-I develops interoperability profiles based on standards from other standardization bodies, WS-I is not the right target for introducing new standards, or contributing to existing standards, with specific TrustCoM functionality. WS-I may be a target for feedback and input related to our interoperability experiences of existing standards TrustCoM is building upon, and may also be a

highlighted the companies' joint work around security, federations, trust, secure conversion, policy, policy attachments, reliable messaging, and transactions & coordination specifications.

IBM and Microsoft have also created a set of applications that demonstrate sophisticated Web services interoperability between the WebSphere and .Net application platforms. The applications show three-tier interactions in a production-level deployment scenario in which both the foundational support for Web services and the IBM and Microsoft implementations of the latest Web services specifications are exploited. The two companies demonstrated this interoperability scenario at the XML Web Services One conference in Boston, August 26th through August 30th, 2002.

This scenario demonstrates a brokerage house which provides various services to its clients, including buying and selling shares of stock, answering account queries, providing a prospectus on a particular security, and general administrative functions. It includes two trading desks, one for the New York Stock Exchange and one for the NASDAQ exchange. The trading desks execute the trades. Clients of the brokerage house access the brokerage services via a Web browser or through a native windows application. Communications between the client and the brokerage house, and between the brokerage house and the two trading desks are through Web services. All transactions are secure and based on the authenticated identity of the requester.

target for new or enhanced interoperability profiles incorporating TrustCoM standards which may emerge.

WS-I supports industry education through participation in XML and Web services conferences. Activities include conference sponsorships, providing speakers, and hosting internal events, such as WS-I Community Meetings, to further a shared understanding of requirements and solutions for Web services interoperability.

4.5 Liberty Alliance

The Liberty Alliance Project [<http://www.projectliberty.org/>] is an alliance of more than 150 companies, non-profit and government organizations from around the globe. The consortium is committed to developing an open standard for federated network identity that supports all current and emerging network devices. Federated identity offers businesses, governments, employees and consumers a more convenient and secure way to control identity information in today's digital economy, and is a key component in driving the use of e-commerce, personalized data services, as well as web-based services. Membership is open to all commercial and non-commercial organizations.

Liberty is an open body working to address the technical, business, and policy challenges surrounding identity and web services. Its output includes: open technology specifications, business guidelines documents, privacy controls built into the specifications, privacy & security best practices, enabled compliance with global privacy legislation and industry regulations (i.e. Article 29, HIPAA), Liberty Interoperable Certifications that validate implementations and drive adoption.

Liberty focuses on providing a vertical solution to the specific issues of federated identity management for mobile and web-based communications and transactions. As federated identity management is a key part of the foundations for any trust and security framework, and Liberty is one of the leading candidates, TrustCoM will take into account the concepts and ideas in the Liberty specifications. TrustCoM will however less likely try to change the actual Liberty specifications.

The main Liberty Specifications are:

- ID-FF, the Identity Federation Framework
- ID-WSF, the Identity Web Services Framework
- ID-WSF DST 2.0, the Data Services Template
- ID-SIS, a collection of Identity Services Interface Specifications

Commercial products are now available to support the Liberty Alliance specifications, notably from Novell and Tivoli. The Liberty Alliance has been bolstered by new members including Intel and IBM. It expects to have 200 million users in 2005, including 50 million France Telecom customers. The Liberty Alliance has moved on to producing business guides around its existing technical specifications. IBM Tivoli Access Manager has been tested for Liberty conformance. Novell has produced a Liberty-certified Identity Federation Solution.

4.6 GGF

The objectives of the Global Grid Forum [<http://www.ggf.org/>] are the creation and documentation of "best practices" - technical specifications, user experiences, and implementation guidelines for Grid technologies and applications. It has research and working groups in the following areas: Applications and programming models and environments, Architecture, Grid Security, Information Systems and performance, Peer-to-Peer, and Scheduling and resource management.

The GGF is modelled along the lines of the IETF, in that it has Birds of a Feather (BOF) meetings of interested parties to determine if a working group (WG) should be established. If sufficient interest is generated, then before a WG is established it must have a draft charter, listing the WG's objectives

and deliverables, with timescales, and usually 2 people are nominated as WG chairs. The proposal is then sent to the Area Directors for approval, and once approved the first WG meeting will ratify the charter. Deliverables designed to be GGF standards go through the formal process of being GGF drafts, then proposed standards, draft standards and finally GGF standards (as in the IETF). WGs should have a specific focus and clear timescale. The GGF (like the IETF) does not like WGs that go on forever, by continually increasing/altering the scope of their charter. It is better to finish the work in a charter, close the group, and then start another one, again with a specific scope in mind.

Current GGF working groups of specific interest to the TrustCoM project are:

- *OGSA-Authz*: The objective of the OGSA Authorization WG is to define the specifications needed to allow for interoperability and pluggability of authorization components from multiple authorization domains in the OGSA framework. There are a number of authorization systems emerging in the Grid today (Akenti, PERMIS, CAS, VOMS, Cardea, etc.), these specifications will allow these solutions to be interchangeably used with middleware that requires authorization functionality.

The following research groups are of specific interest to the TrustCoM project:

- *Firewall Issues Research Group*: The objective of this group is to first document the type of issues that Grid applications experience when the need arises to control data transport policy enforcement devices. Once the types of issues have been identified, the group will relate these issues to specific categories of enforcement devices.
- *Trusted Computing Research Group*: The purpose of this research group is to evaluate how the capabilities of TC can be used in a grid context.

4.7 OMG

The Object Management Group (OMG) [<http://www.omg.org/>] is an open membership, not-for-profit consortium that produces and maintains computer industry specifications for interoperable enterprise applications. The OMG membership includes virtually every large company in the computer industry, and hundreds of smaller ones. Many of the companies that shape enterprise and Internet computing today are represented in the Board of Directors.

The flagship specification is the multi-platform Model Driven Architecture (MDA), recently underway but already well known in the industry. It is based on the modeling specifications the MOF, the UML, XMI, and CWM. OMG's own middleware platform is CORBA, which includes the Interface Definition Language OMG IDL, and protocol IIOP. The Object Management Architecture (OMA) defines standard services that will carry over into MDA work shortly. OMG Task Forces standardize Domain Facilities in industries such as healthcare, manufacturing, telecommunications, and others.

All current specifications may be downloaded without charge from the OMG website. Products implementing OMG specifications are available from hundreds of sources.

There are basically two strategies for how TrustCoM could provide input to, and influence the OMG standardisation efforts: (1) influence current ongoing adoptions around RFPs, and (2) contribute to future RFPs and their adoptions.

With the assumption of submitting TrustCoM results for input, it could particularly be considered to initiate an RFP process for instance for a UML profile for Trust. Of particular relevance for TrustCoM is also the emerging RFP on "Model Driven Access Control Architecture" – with assumed delivery of first proposals in summer 2005. See OMG document <http://doc.omg.org/mars/2004-06-11>.

Also of relevance is the discussion of the creation of a Protection Profile standard through the OMG process, based on the results of the Protection Profile Common Criteria and results from the CC project and ISO 15408. This is a dictionary of security requirements that includes a description of PP, protection profile, ST, Security Target and TOE, Target of Evaluation. See OMG document <http://doc.omg.org/security/2004-04-003>.

To have something included as an OMG-standard is hard work over a longer period of time, and should be done together with other partners. OMG has a lot of initiatives, and it is important to focus on the main area of interest of TrustCoM to get the ideas through, rather than spreading to thin on too many initiatives.

4.8 IETF

Internet Engineering Task Force [<http://www.ietf.org/>]

The primary focus of the IETF is to standardise protocols for the Internet. It does not in general standardise APIs, data models, user interfaces etc, unless they are essential for the protocol e.g. the MIB (Management Information Base) for SNMP (Simple Network Management Protocol) needed to be standardised. The IETF has 7 areas, each governed by 2 area directors. These are:

- APP Applications – concerned with Internet application protocols such as SMTP, LDAP etc
- GEN General – concerned with general issues such as IPR
- INT Internet – concerned with basic Internet infrastructure such as DNS, IPv6, VPNs etc
- OPS Operations and Management – concerned with management (various SNMP MIBs), policies and RADIUS
- RTG Routing – concerned with routing within the Internet and mobile networks
- SEC Security – concerned with Internet security, including IPsec, PKIX, S/MIME etc
- SUB Sub-IP – a temporary are concerned with Internet traffic engineering
- TSV Transport – concerned with transport layer work such as SIPs, TCP maintenance, IP telephony, multicast transport etc.

The main work of the IETF Working Groups is done via their email lists. There are also 3 international meetings per year that are used to checkpoint progress and take decisions (although all decisions are usually ratified via the mailing lists). Several thousand people usually attend IETF meetings, and countless thousands are on the mailing lists (which are free to join). The IETF 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. 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.

Final WG output (in fact IETF output in general) is published as RFCs. These can be of 3 types: Informational, Experimental or Standards Track. The last has the most rigorous process attached to it. Documents destined to be standards must first be presented to a WG as an Internet Draft (ID). The WG will review it, edit it (IDs usually go through several iterations, and 10 or 20 is not unusual for a large important protocol) and once the WG is happy with it (has consensus) then it is sent for Last Call. This notifies the larger community about the ID and invites comments from them over a 2 week period (though it can be longer or shorter I believe). All comments to the Last Call must be satisfactorily addressed and then the ID goes into the RFC queue, waiting for AD approval, RFC editor approval etc. It is not unusual for IDs to take a year or more if they are not seen to be urgent, since more important IDs can queue jump and get published within just a few months of finishing Last Call.

Progressing work inside the IETF:

All the main work of the IETF is done via the mailing lists of the WGs. Thus you should subscribe to the particular mailing list and then contribute to the discussions. Details of the lists can be obtained from the IETF web site (www.ietf.org). All work is voluntary, thus no-one will typically refuse help when it is offered.

New WGs are formed by first holding a Birds of a Feather (BOF) meeting at one of the IETF meetings. The purpose of the BOF is to determine if a working group (WG) should be established. If sufficient interest is generated, then before a WGs is established it must have a draft charter, listing

the WG's objectives and deliverables, with timescales, and usually 2 people who are nominated as WG chairs. The proposal is then sent to the Area Directors for approval, and once approved the first WG meeting will ratify the charter. Deliverables designed to be IETF standards go through the formal process of being Internet drafts, then proposed standards, draft standards and finally Internet standards, but the whole process typically takes several years (LDAP for example is still only a draft standard 6 years after first being published). WGs should have a specific focus and clear timescale. The IETF does not like WGs that go on forever, by continually increasing/altering the scope of their charter. It is better to finish the work in a charter, close the group, and then start another one, again with a specific scope in mind, although in practice closing a group down can be a long and painful process (as in the case of PKIX, S/MIME, LDAP etc.).

Current work within the IETF that is of specific interest to the TrustCoM project is:

- PKIX working group that is standardising X.509 PKI and PMI infrastructures;
- Kitten working group that is specifying the next generation GSS-API.

4.9 ISO

Further, for longevity of standards, it may be appropriate to use the ISO (International Organization for Standardization, <http://www.iso.org/>), which is the world's largest developer of standards.

Although ISO's principal activity is the development of technical standards, ISO standards also have important economic and social repercussions. Therefore, ISO standards make a positive difference, not just to engineers and manufacturers for whom they solve basic problems in production and distribution, but to society as a whole.

Its work concerns all the fields of standardization, except electrical and electronic engineering standards, which fall within the scope of the IEC (International Electrotechnical Commission). Most IT standards are established by the joint technical committee between ISO and IEC called ISO/IEC JTC1. This is the only "joint" committee within ISO and has slightly different ways of working to other ISO committees. JTC1 currently covers the work of the following sub-committees:

Committee	Title
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

This list illustrates that the technical coverage of the committees has potential overlaps. It is therefore not obvious, which sub-committee would be the appropriate one to take on work arising from TrustCoM, although SC 27 addressing IT Security techniques is the most likely to try, and also SC 25 or SC 32 could take it on. SC 6 is the group responsible for the X.509 standardisation work, so any standardisation work arising within PKIs and PMIs should be directed to this SC.

Proposals for standardisation normally go to ISO from national standards bodies, so involvement in the national body is required before an ISO activity can be initiated. Usually the chairs (or rapporteurs) of the national committees sit on the ISO sub-committee that develops an ISO standard. The TrustCoM consortium is fortunate in having one such national rapporteur as a member of its consortium, the BSI rapporteur for X.509, so it has a direct route into ISO for X.509 standardisation related work.

International Standards are developed by ISO technical committees and subcommittees by a six step process:

- Proposal stage
- Preparatory stage
- Committee stage
- Enquiry stage
- Approval stage
- Publication stage

Therefore, the standardisation procedure in ISO is very formal and could be very long-lasting, though it is possible to omit some steps in case of documents with a certain degree of maturity. Thus, potential inputs to ISO standards that could result from TrustCoM will probably be indirect and can fall beyond the lifetime of the project.

ISO has tried on several occasions to find a method to fast track proposals through the process. However, since the ISO process does not require demonstrated interoperability, or even any form of implementation of standards at any stage in the process, work items that have been through the fast track in the past have often never had any impact on the market, or even have not been developed or implemented (e.g. the HyTime standard was never implemented, since it was superseded in the marketplace by the World Wide Web). Because of this history, there is resistance to fast track work items through the long process.

TrustCoM project results could possibly contribute to the ISO/IEC 17799:2000 standard, which gives recommendations for information security management for use by those who are responsible for initiating, implementing or maintaining security in their organization. It is intended to provide a common basis for developing organizational security standards and effective security management practice and to provide confidence in inter-organizational dealings. ISO/IEC 17799:2000 was developed through JTC1 SC 27 addressing IT Security techniques which is chaired by Dr. Walter Fumy from Germany which has three currently active working groups addressing:

Committee	Title
JTC 1/SC 27/WG 1	Requirements, security services and guidelines
JTC 1/SC 27/WG 2	Security techniques and mechanisms
JTC 1/SC 27/WG 3	Security evaluation criteria

Another major current work item addressed in this subcommittee is ISO/IEC DIS 20886 addressing the Information technology – International Security, Trust, and Privacy Alliance – Privacy Framework. However, since this draft international standard was circulated to national bodies on 29th July 2004 it is probably too late in the process to have any significant influence over it.

4.10 Ecma International

Ecma International [<http://www.ecma-international.org/>] is an industry association founded in 1961 and dedicated to the standardisation of Information and Communication Technology (ICT) Systems. Originally, "ECMA" stood for "European Computer Manufacturers' Association".

The aims of Ecma International 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.

Ecma International consists of various Technical Committees and Task Groups in the areas of Information and Communications Technology and Consumer Electronics. Ecma International usually submits approved work to ISO, ISO/IEC JTC1 and/or ETSI for publication. Potentially relevant specifications to TrustCoM include Standard ECMA-219 – Authentication and Privilege Attribute Security Application with related Key Distribution Functions – Part 1, 2 and 3, 2nd edition (March 1996).

4.11 UN/CEFACT

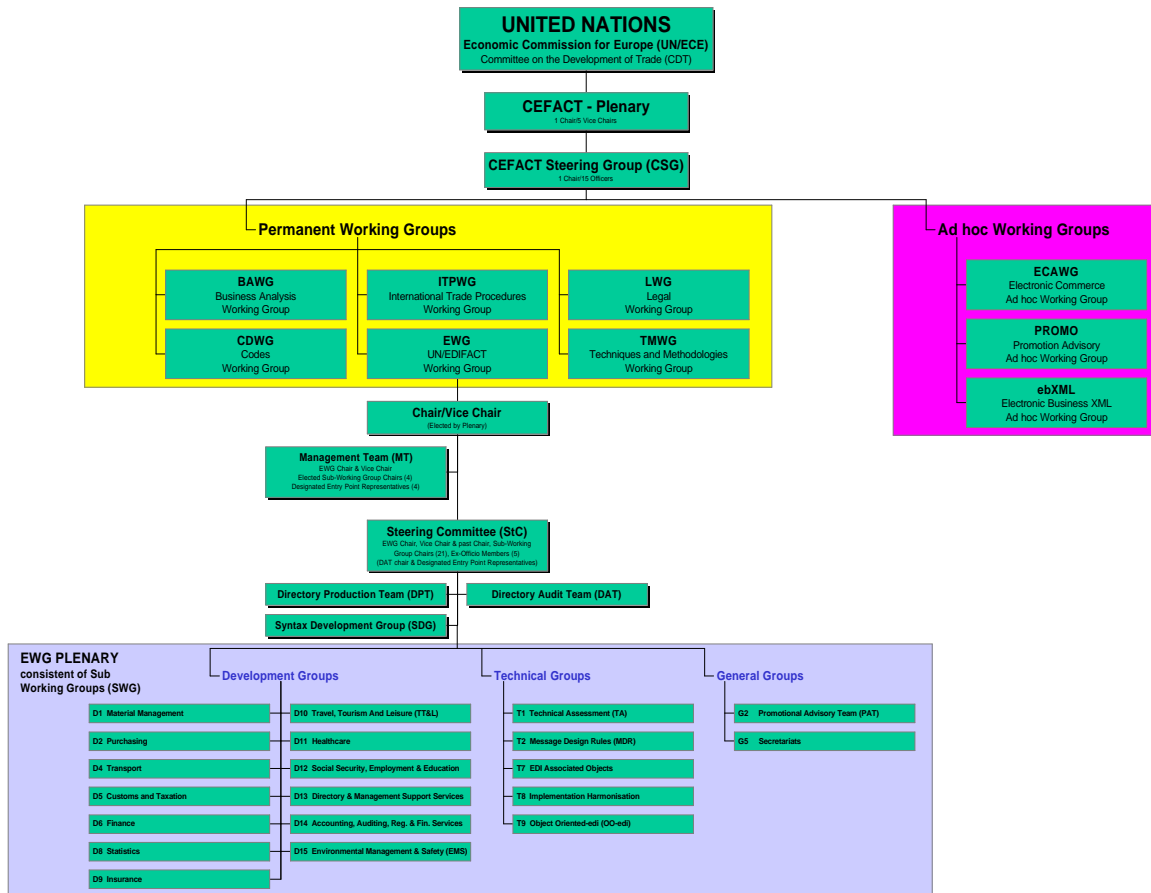
UN/CEFACT is the United Nations Centre for Trade Facilitation and Electronic Business. It is open to participation from Member States, intergovernmental organizations, and sectoral and industry associations recognized by the Economic and Social Council of the United Nations (ECOSOC). The Centre's objective is to be "inclusive" and it actively encourages organizations to contribute and help develop its recommendations and standards.

The participation of many private-sector associations in UN/CEFACT's work at the policy level, and of hundreds of private-sector technical experts in UN/CEFACT working groups, is a unique feature of the Centre which is forging new cooperative relationships between private business and public organizations.

Within the United Nations, UN/CEFACT is located in the Economic Commission for Europe (UN/ECE), which is part of the United Nations network of regional commissions. These regional commissions report to the highest United Nations body in the area of economics, trade and development: ECOSOC. This is the ideal location for developing practical recommendations for action because, within various work areas in the United Nations system, the regional commissions have the closest links to national Governments at the expert level.

4.11.1 UN/CEFACT structure

The following organizational chart summarizes the structure of UN/CEFACT and its relative locality within the United Nations.



4.11.2 UN/CEFACT Mission and objectives

The mission of UN/CEFACT is to improve the ability of business, trade and administrative organizations, from developed, developing and transitional economies, to exchange products and relevant services effectively - and so contribute to the growth of global commerce. Its main focus is the worldwide facilitation of international transactions, through the simplification and harmonization of procedures and information flows.

UN/CEFACT has the following objectives:

Expanding global commerce

Free trade agreements, while a necessary condition, are not sufficient to guarantee continued growth in world trade. Sustainable growth can only be accomplished by increasing the participation of small and medium-sized enterprises in international trade. For this to happen, international trade must be made easier and simpler, i.e. progress needs to be made in reducing and harmonizing the cumbersome and time-consuming paperwork, formalities and procedures often required for trading. This is the facilitation of administration, commerce and transport - and it is UN/CEFACT's goal.

Reducing bureaucracy and increasing transparency

While UN/CEFACT does considerable work in harmonizing and simplifying documents and data formats, this is only the tip of the iceberg. The fundamental issues are administrative and commercial procedures, as well as the way in which information is transferred between parties. To attack the problem of cumbersome and difficult procedures, UN/CEFACT:

- analyses the key activities and elements in international transactions;

- identifies the procedural constraints that affect them, including requests for unnecessary or duplicate information; and then
- develops recommendations to eliminate identified constraints, simplify data flows and harmonize remaining procedures;

UN/CEFACT also makes recommendations on best business practices with regard to when data should be received and by whom.

Creating better data flows through electronic commerce Facilitating business and administrative processes requires more than just identifying the minimum data requirements, one must also examine the best methods for transmitting the data. In this area, UN/CEFACT analyses the use of electronic commerce and information technologies in order to develop recommendations on best business practices in this area and, where appropriate, to develop methodologies and tools.

Lowering transaction costs

To actually reduce transaction costs, understanding the problem and presenting solutions is not enough - solutions must be implemented. Since procedures are frequently linked to administrative requirements, implementation often requires cooperation between Governments and the private sector. UN/CEFACT therefore works through government, industry and service association channels, as well as its delegations, to promote and implement facilitation recommendations, tools and associated best practices.

Developing a network of supporting institutions

To increase its effectiveness, UN/CEFACT actively coordinates with other international organizations such as

- the World Trade Organization (WTO);
- the World Customs Organization (WCO);
- the United Nations Conference on International Trade Law (UNCITRAL); and
- the United Nations Conference on Trade and Development (UNCTAD).

Many of these organizations participate directly in UN/CEFACT's work. In addition, since its work has broad applications beyond global trade, UN/CEFACT recognizes the need to secure coherence, particularly in electronic commerce methods. To do this, it meets regularly with other interested parties, such as the International Organization for Standardization (ISO), with which the Centre also has a Memorandum of Understanding. To enlarge its national impact, UN/CEFACT actively supports the establishment of local organizations working to facilitate trade.

Improving private and public sector management

In summary, UN/CEFACT's goal is to improve business and administrative processes, procedures and information flows. These determine how we collect, manage and exchange information. In the case of trade: information that is vital to the management of national economies as well as individual companies and organizations.

4.11.3 UN/CEFACT relevant standards

UN/CEFACT has been developing a significant number of standards, often in collaboration with other standardization bodies or consortia including ISO, IEC, ITU and OASIS. UN/CEFACT standards of particular interest to TrustCoM include:

- The Trade Partner Agreement (TPA)¹² proposed by RosettaNet, EDIFICE, ESIA and UN/CEFACT
- UN/EDIFACT including "ISO 9735 : Electronic data interchange for administration, commerce and transport (EDIFACT) - Application level syntax rules"
- ebXML that has been developed in conjunction with OASIS
- the Trade Partner Agreement (TPA) template jointly proposed by Rosetta
- ISO 7372 Trade Data Element Directory by UNECE
- Trade Facilitation Code Lists

4.12 Internet2

Although Internet2 [<http://www.internet2.edu/>] is not a standardisation body as such, we summarise its charter and activities because through its middleware and network development programme it has brought about frameworks such as Shibboleth [<http://shibboleth.internet2.edu/>], which are rapidly being established as de-facto standards technologies for research and educational networks. Furthermore corporations including CISCO Systems, HP, IBM, Microsoft and Sun Microsystems among others.

Internet2 is a USA-driven consortium being led by 206 universities working in partnership with industry and government to develop and deploy advanced network applications and technologies, accelerating the creation of tomorrow's Internet. Internet2 is recreating the partnership among academia, industry and government that fostered today's Internet in its infancy. The primary goals of Internet2 are to:

- Create a leading edge network capability for the national research community
- Enable revolutionary Internet applications
- Ensure the rapid transfer of new network services and applications to the broader Internet community.

Internet2 brings together institutions and resources from academia, industry and government to develop new technologies and capabilities that can then be deployed in the global Internet. Close collaboration with Internet2 corporate members will ensure that new applications and technologies are rapidly deployed throughout the Internet. Just as email and the World Wide Web are legacies of earlier investments in academic and federal research networks, the legacy of Internet2 will be to expand the possibilities of the broader Internet.

Internet2 and its members are developing and testing new technologies, such as IPv6, multicasting and quality of service (QoS) that will enable revolutionary Internet applications. However, these applications require performance not possible on today's Internet. More than a faster Web or email, these new technologies will enable completely new applications such as digital libraries, virtual laboratories, distance-independent learning and tele-immersion. A primary goal of Internet2 is to ensure the transfer of new network technology and applications to the broader education and networking communities.

Internet2 and the federally-led NGI are parallel and complementary initiatives based in the United States. Internet2 and NGI are already working together in many areas. For example, through participation in a NSF NGI program, over 150 Internet2 universities have received competitively awarded grants to support connections to advanced backbone networks such as Abilene and the very high performance Backbone Network Service (vBNS). Internet2 is also forming partnerships

¹² - The TPA Program, a project started in May 2001 and closed at the end of December 2001, was carried out as a Foundational Program of RosettaNet. Contributors to this effort were EDIFICE, the European Semiconductor Industry Association (ESIA), and the Legal Working Group (LWG) of the UN/CEFACT, with each involved in the review of the initial draft TPA.

with similar advanced networking initiatives around the world. Working together will help ensure a cohesive and interoperable advanced networking infrastructure for research and education, and the continued interoperability of the global Internet.

Internet2 has an active international programme and European partners include DANDE, which builds and operates pan-European networks for research and education in collaboration with the European Commission, and TERENA, which carries out technical activities and provides a platform for discussion to encourage the development of a high-quality computer networking infrastructure for the European research community. UK regional partners include the Joint Information Systems Committee (JISC), which supports further and higher education by providing strategic guidance, advice and opportunities to use Information and Communications Technology (ICT) for teaching, learning, research and administration, and UKERNA which is a company located at CCLRC Rutherford Appleton Laboratory that aims to advance and support the UK's education and research network.

4.13 Industry/domain-specific initiatives

Last but not least, TrustCoM wants to be aware of, and take into account where needed, specific standards in various particular industry domains such as electronics, telecommunications, solution provisioning, manufacturing, automotive, aerospace, etc. These industries are moving towards their own standards based on their way of specifying business information, interfaces, exchanges, protocols, reliability and business objects. Examples are RosettaNet (electronics, telecommunications and others) and AIAG (Automotive Technical Standards). The TrustCoM framework should be generic and flexible enough, and should as such have a way to map to these industry-specific terms and conditions defined in contracts and business objects. In addition to the general standards for computing and communication, some of the top standards bodies and standards that influence TrustCoM's research include XML.org, Eclipse.org, OASIS, RosettaNet, OMG XML, Webservices (UDDI.org, WebServices Interoperability and others) and eBXML.

Industry specific standards over the last decade are becoming key to the actual implementations of the B2B transactions and collaborations in specific sectors. RosettaNet is the farthest in its implementation and well recognized in the industry as the leading standard for supply-chain and demand-chain integration standards in several industrial sectors (e.g. Electronics, Telecommunications, Manufacturing, Solution providers and others). Rosettanet is a non-profit organization founded in 1998, and includes over 500 of the world's leading businesses in the consortium. RosettaNet is dedicated to open standards for ebusiness processes for global trading networks. RosettaNet focuses on closing the gaps in technology standards for e-Business exchanges, trading partner relationships, value-net efficiencies and transparencies.

RosettaNet provides a language and tools (dictionaries and grammar) to specify eBusiness process interfaces and interactions. RosettaNet leverages existing standards such as HTML, XML and others to implement Partner Interface Processes (or PIPs) for B2B exchanges of transactional information. RosettaNet is beginning to embrace ebXML and Web Services. Similarly, OASIS and other standards bodies are utilizing some of the established RosettaNet PIPs for enabling better B2B transactions and collaboration. RosettaNet also provides a framework based on dictionaries and naming (DUNS) for identifying companies, their business interfaces and functions.

AIAG is another Industry specific standards body that has a strong eBusiness group that focuses on defining the eBusiness standards for B2B transactions and collaboration within the Automotive Industry. They tend to leverage RosettaNet and ebXML and other relevant standards for their B2B processes, messages and business objects. AIAG was founded in 1982 to address the business integration, product quality, collaboration and supply chain management needs of the ever expanding and complex Automotive Industry. AIAG includes 1600 members from all over the world focussing on standards with a primary goal of reducing costs and complexity, and improving safety in the automotive value chain.

One of the most important areas of focus for AIAG is collaborative engineering and product development. This area involves complex supply chain integration of business processes for product design and sharing. The goal of the working group on Collaborative engineering is to

improve cost savings, lead-time reduction, and quality improvement in the global automotive supply chain through collaborative means and technologies. Another major area of standardization is the ecommerce and EDI integration. Automotive manufacturers depend on EDI for most of their business interaction with their suppliers and partners. The workgroup focuses on EDI messaging, real-time collaboration, EDI over XML and business modelling.

Another industry specific standard is PapiNet. This is global initiative to bring buyers, sellers, and all relevant parties engaged in buying, selling and transporting paper and paper related products worldwide. PapiNet focuses on XML standards for business to business exchange messages and interfaces for the paper industry.

Similar in spirit to the above three industry specific standards, several industries have taken a similar approach of forming consortia and leveraging the existing Internet, HTML and XML standards. In the coming years, with better adoption of ebXML and Web Services, the industry specific standards bodies will leverage and customize the standards to their own use.