



Competitiveness of the Aerospace & Defence Industry

BoostAero



World Class Standards



BOOST = Business Opportunities with new Organizations, Standards and Technologies

BoostAero – July 2008

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All major Aerospace & Defence companies launched supplier portals and e-supply chain exchanges



→ Better quality and reliability of the supply chain, reduction of costs, cycles and inventories

- **Airbus** : Sup@irWorld supplier portal
- **Boeing, Lockheed Martin, Raytheon, Bae Systems & Rolls Royce** : Exostar Market Place
- **Dassault Aviation** : DassaultSuppliers supplier portal
- **Safran** : e-fournisseurs supplier portal
- **Thales** : Exindus supplier portal
- ...

*Supply chain management, e-procurement, e-sourcing :
generalization of collaborative environments using Internet
technologies*



The image displays four screenshots of aerospace supplier portals. The top-left screenshot shows the 'Sup@irWorld Sourcing' portal with a banner for 'Welcome to EADS!' and an image of an aircraft. The top-right screenshot shows the 'EXOSTAR' portal with a 'Welcome to Exostar' message and 'The Secure Collaborative Business Network' tagline. The bottom-left screenshot shows the 'DASSAULT SUPPLIERS' portal with a 'Welcome to Dassault Aviation's Suppliers Website' message and images of fighter jets. The bottom-right screenshot shows the 'e-Fournisseur' and 'THALES' portals, with the latter featuring a 'teaming for your success' message and an image of a person.

Innovation and Competitiveness of the Aerospace & Defence industry

- Objective : improve competitiveness through e-supply chain best practices and digital exchanges
- BoostAero status : Developed in 2004
 - Adopted by ASD and AIA, European and American Aerospace associations
 - Used by a growing number of European and American companies
- Members :
 - BoostAero International Association : ATR, DAHER, DASSAULT AVIATION, EPICOS, EXOSTAR (Boeing, Lockheed Martin, Raytheon, Bae Systems, Rolls Royce), GIFAS, MAP, MBDA, POTEZ, RADIAL, SAFRAN Group, SKF Aerospace, THALES Group, ZODIAC Group, ...
 - ASD/AIA Advisory Group
- Information and contacts : www.boostaero.com

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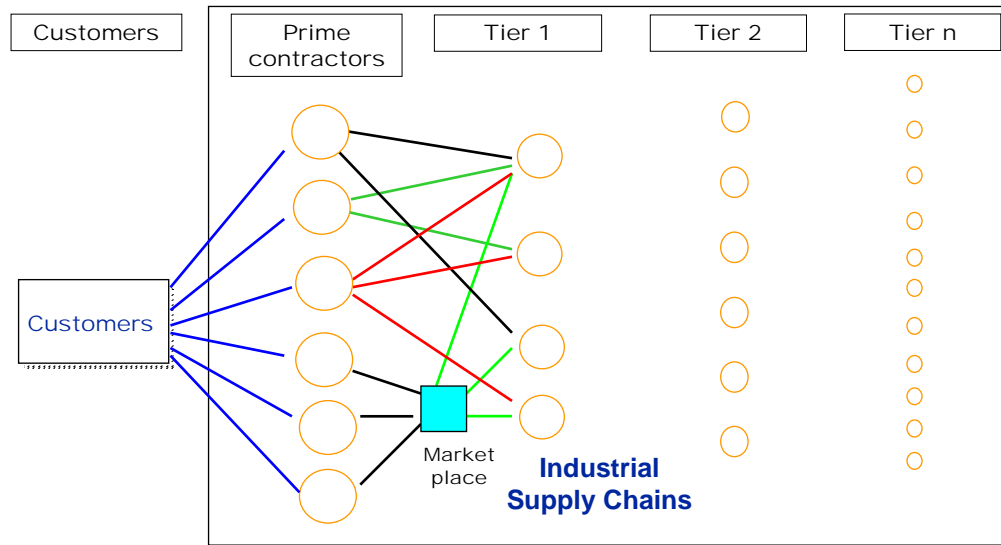


Competitiveness is a fight between extended enterprises
→ Digital integration of the supply chains key factor of competitiveness

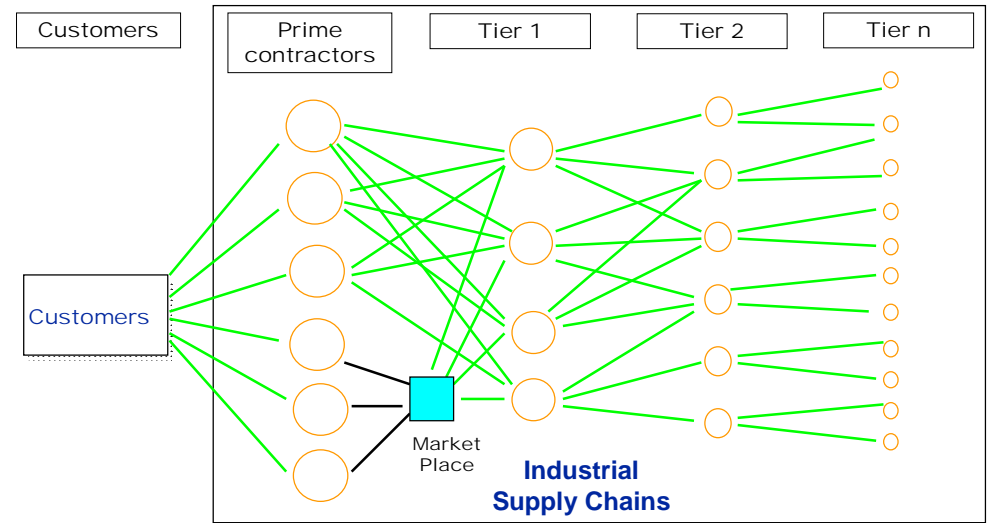
30% of the value

70% of the value

The digital integration is vital for the competitiveness, but most of the work has to be done



Standards and suppliers support mandatory for the digital integration of the supply chain

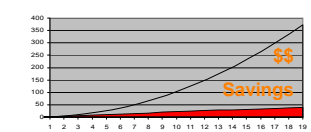
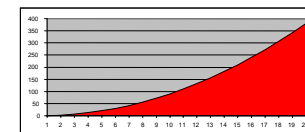
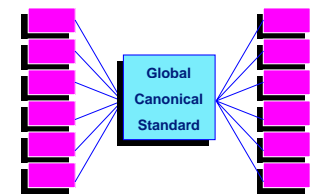
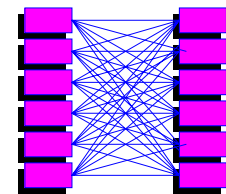


Business Process, Messages and Technical Architecture standardized
→ simplicity, quality, reliability

The Integration Problem & Goal (source AIA)

Current Point-to-Point Approach --- $n(n-1)$

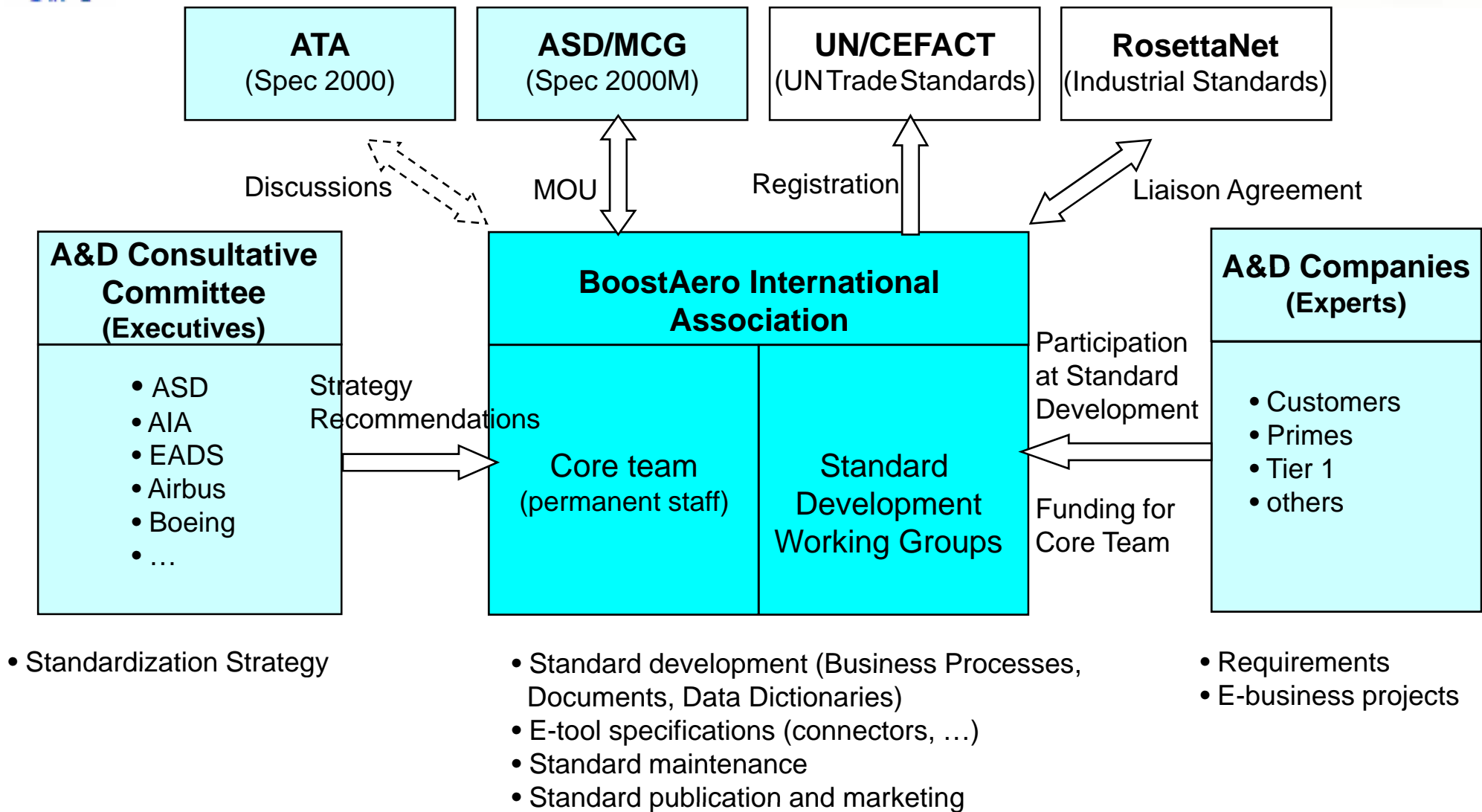
Future standardization Approach --- $2n$



Proprietary Business Processes, messages
 → intégration difficult, overcosts, quality problems



The BoostAero International Association



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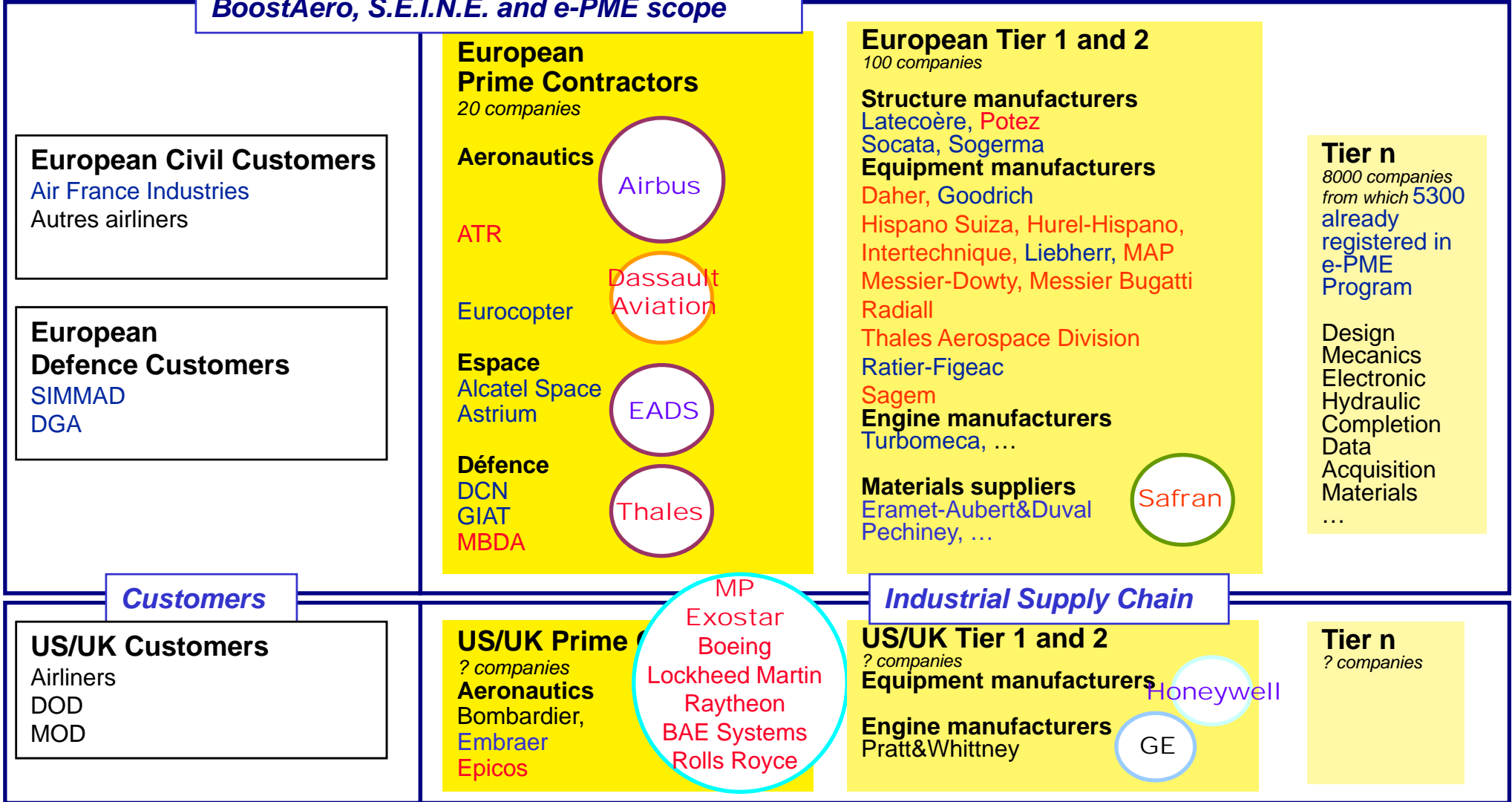
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Involvement of major Aerospace & Defence companies in BoostAero (in red : members of BoostAero International)



BoostAero, S.E.I.N.E. and e-PME scope





BoostAero Reference documents 2.001





	Task	Name of working documents	Type	Description	Date	Langage	Version
BP							
	Business Process functional specifications <i>(Spécifications fonctionnelles des Business Process)</i>	BoostAero_CEFAC_T_BRS_R2.00	pdf	UMM description of business documents used in boostAero (for CEFAC submission) - Including Use Case and Activity Diagram	nov-07	ENGLISH	2.00
Components							
	Data dictionary Definition <i>(Définition du dictionnaire de données)</i>	BoostAero_Consolidation_R2.00	XLS	BoostAero components	sept-07	ENGLISH	2.00
	Composition of the messages <i>(Composition des messages)</i>	BoostAero_CC_UML_Class_Diagrams_R2.00	DOC	UML class diagrams	sept-07	ENGLISH	2.00
Schemas							
	XML schemes development <i>(Développement des schémas XML)</i>	BOOSTAERO International_Documents_R2.00_Schemas_R2.000	ZIP	XML Schemas	sept-07	ENGLISH	2.000
Methodes and project management							
	Management et Methodologie de projet	BoostAéro_Normative_Documents_R1.03	XLS	Normative Document	juin-07	ENGLISH	1.03

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 BoostAero and UN/CEFACT
 BoostAero

Business Processes

BoostAero – Cross Industry UN/CEFACT



SPL et KANBAN

SYNCHRONE

One shot

VsMI

Consigned VsMI

CONTRACT

Supply Agreement (Contrat)

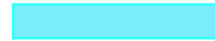
SUPPLY AGREEMENT, SUPPLY AGREEMENT RESPONSE



ORDER

Order (Commande)

ORDER, ORDER CHANGE, ORDER CANCEL, ORDER RESPONSE



SCHEDULING

Demand Forecast (Plan d'approvisionnement)

DEMAND FORECAST / DEMAND FORECAST RESPONSE



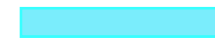
Supply Instruction (Appel de Livraison)

SUPPLY INSTRUCTION, SUPPLY INSTRUCTION CHANGE, RESPONSE, AMENDMENT, CANCEL



Inventory Forecast (Stock projeté)

INVENTORY FORECAST



Supply Notification (plan de livraison)

SUPPLY NOTIFICATION



SHIPPING

Despatch Advice (Avis d'Expédition)

DESPATCH ADVICE



Carrying Advice (Avis d'enlèvement)

CARRYING ADVICE



Receipt, control (Réception)

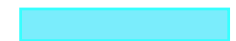
RECEIPT ADVICE



INVOICE

Invoice (Facture)

INVOICE, INVOICE RESPONSE



REMETTANCE ADVICE

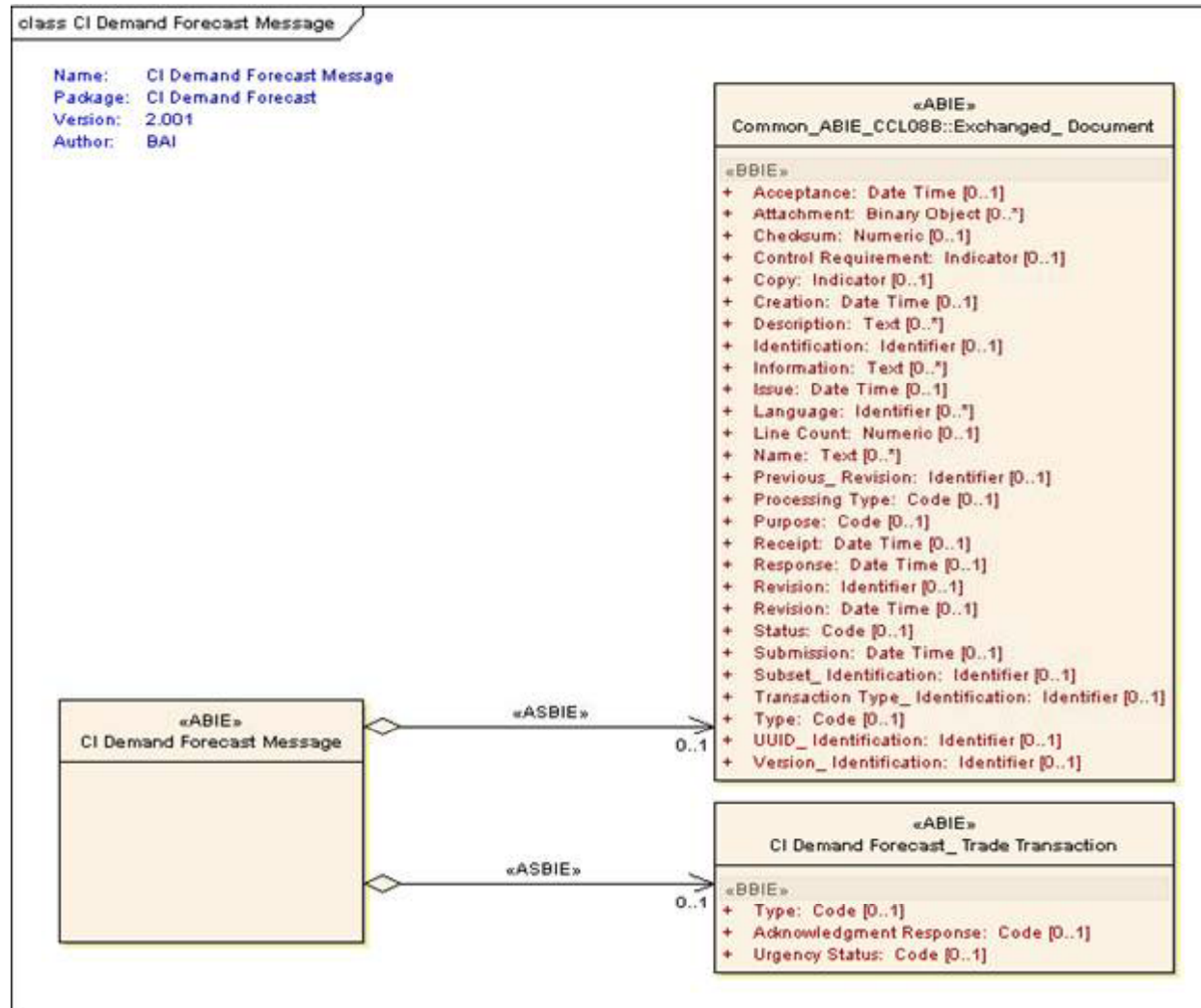


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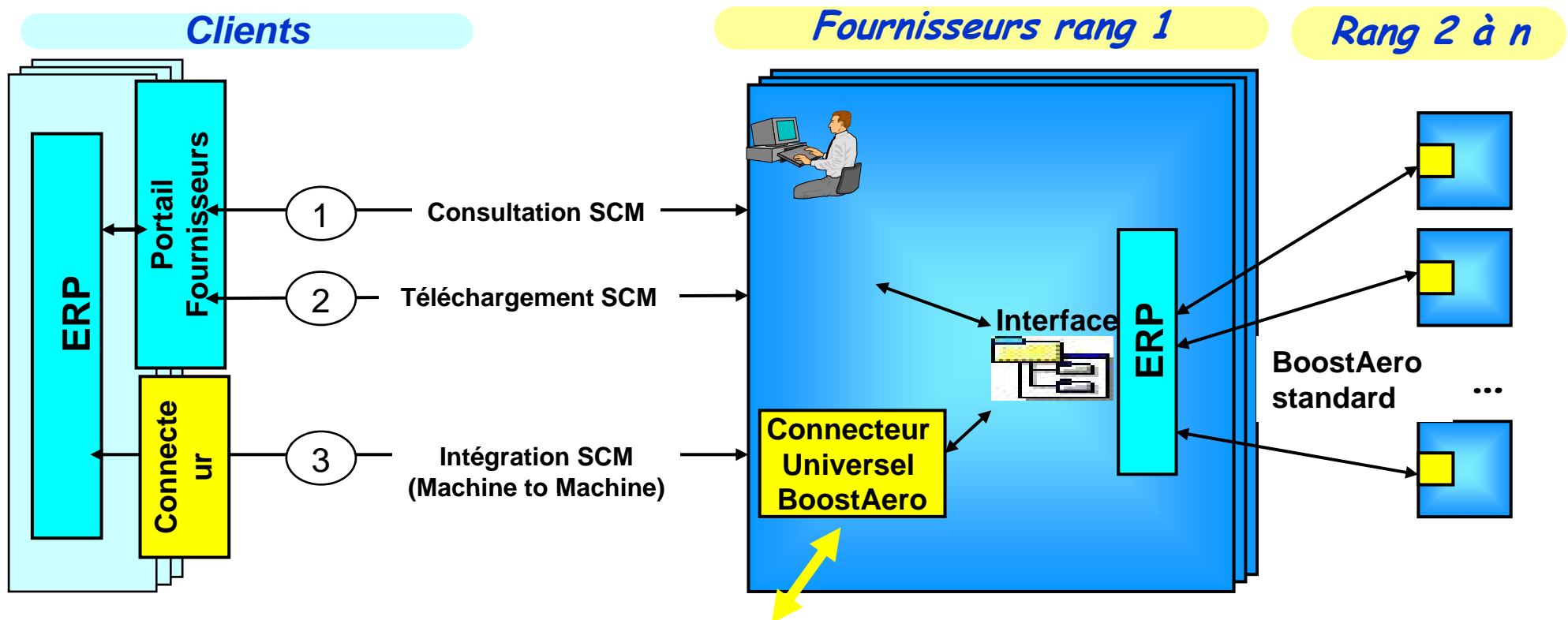
Exemple : Demand Forecast



Sélection d'outils : Connecteurs et hub

Des connecteurs Universels certifiés BoostAero pour

- faciliter la mise en œuvre des échanges M2M (Solutions packagées pour les fournisseurs)
- garantir la bonne utilisation du standard BoostAero et la pérennité des investissements



- Echange des messages au standard BoostAero
- Mapping et transformation entre format BoostAero et format interne

BoostAero – Juin 2008



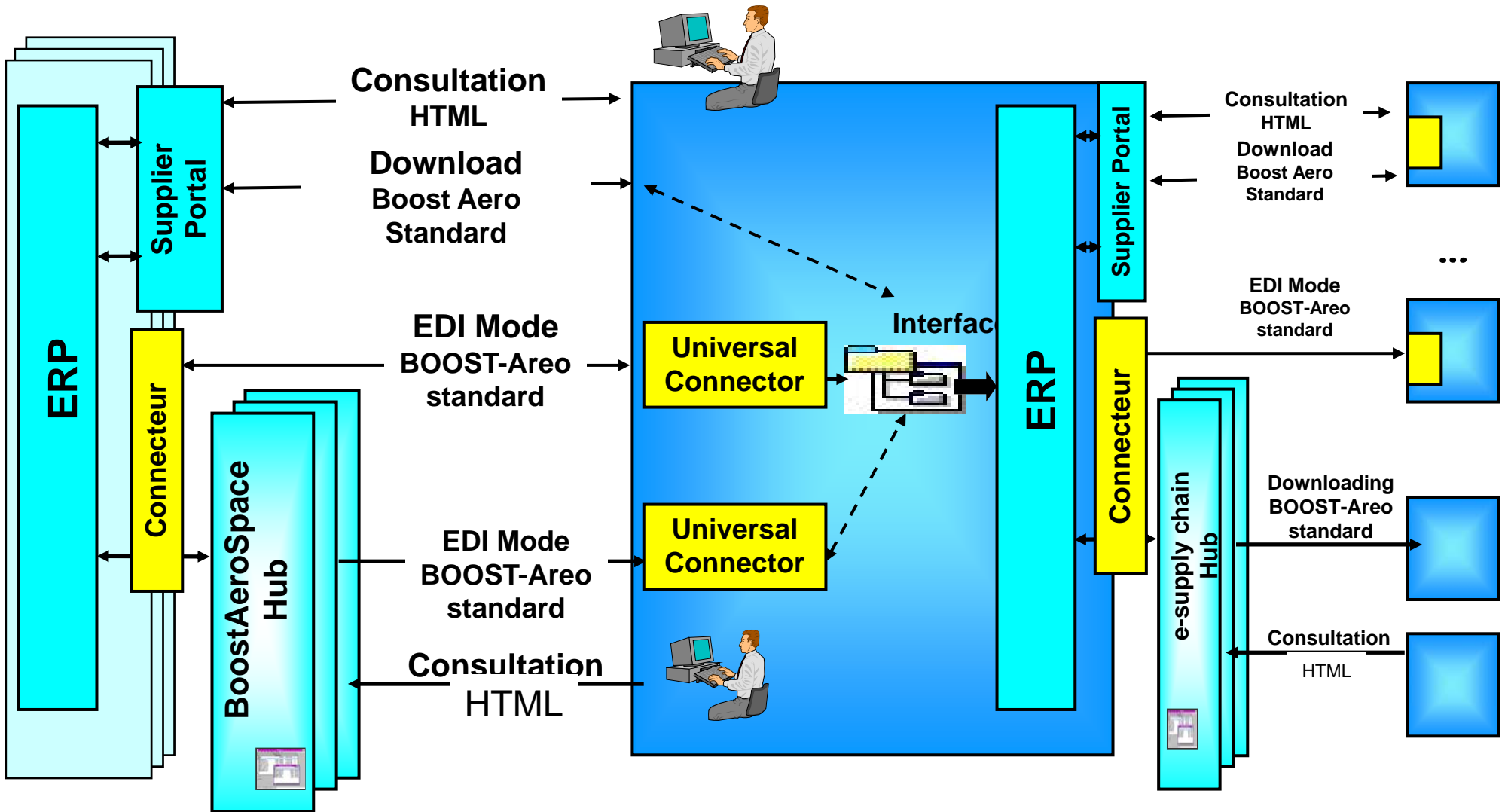
With standards and connector, universal Technical Architecture, simplicity, reliability



Customers

Tiers 1 Suppliers

Tier 2 Suppliers





B2B Benchmark protocol (TBC)



Importance critères	ebMS2 HTTP	ebMS2 SMTP	AS2	Web Services - SOAP WSDL	Web Services - SOAP WS-I sur WSDL	XML HTTPs (Download/Upload)	PUSH / PULL SPOKE HTTPs	AS1
A COMPLETER PAR								
Intégration du mécanisme de PKI - Permet le cryptage XML	5	OUI	OUI	NON	OUI	OUI	OUI (mais inutile)	
Acknowledgment Technique : Mécanisme de délivrance fiable	5	OUI	OUI	Acknowledgement avancé : Prévu	NON	OUI	OUI	NON
FIABILITE des échanges Mécanisme de délivrance fiable	5	OUI	Reliable Message Delivery :Livraison garantie, élimination des doublons, livraison dans l'ordre	Reliable Message Delivery :Livraison garantie, élimination des doublons, livraison dans l'ordre	Prévu	NON	OUI	OUI
Existence d'une certification sur le protocole ? Banc d'essai pour les implémentations	4	OUI	Drummond Group KTNET/KORBIT	KTNET/KORBIT	NON	OUI	NON	OUI
Nombre d'éditeurs certifiés connus (Drummond Group, EacKTNET)	5		6 2 ou 3	24	Aucun	Aucun	Pas de certification	Pas de certification
Possibilité de faire messagerie sur Internet	5	OUI	OUI	OUI	Pas sans HUB	Pas sans HUB	OUI	OUI
Référence Aéro et industrielle	5	Boeing (ebMS2 - HTTPs) Radiall AIAG (Automotive Industry Action Group) Administration Américaine Fournisseurs Asiatiques (Corée, Japon, Chine, ...) UK NHS (Health Service) HL7 (Canada) CDC ?	MBDA	Dassault (AS/2)	RADIALL, IDMM	Aucun	?	
Références : Filiales et acteurs	4	Netherlands Criminal Justice		Grande distribution : Walmart Auchan RosettaNet (RNIF puis AS/2)	Grande distribution : Walmart Auchan Carrefour Industriels de la GD ...	?	Nombreuses : Boeing, Airbus Aerexchange OneAero	?
SECURITE DES ECHANGES Messagerie Sécurisée + Authentification	5	OUI	OUI	OUI	OUI	OUI	OUI	
TRACABILITE : Permet la vérification d'un AR Legal	5	OUI	OUI	NON	Oui	Oui	NON	NON
Coût la solution pour les PME	4							
Gestion de l'interchange (numérique ou pas)	3	Dynamique et numérique grâce au mécanisme CPP / CPA		Paramétrage statique (en dur) et non numérique	Oui, via SOAP	Oui, via SOAP	NON	
Existence de produit Open Source Implémentation Open Source existantes	2	OUI	?	OUI	AS/1 : SMTP AS/2 : HTTP AS/3 : FTP	OUI	OUI	
Facilité de mise en œuvre pour un DO	2	Necessite une infra structure HTTP	SMTP		Necessite une infra structure HTTP	Necessite une infra structure HTTP	Necessite une infra structure HTTP	SMTP
Possibilité de fichiers attachés : Attachement de PDF et fichiers binaires	2	OUI	OUI	OUI	OUI	OUI	OUI	OUI
Multi-opérateurs	1	Multi-opérateurs : gestion des tiers		mono-opérateur : 1 adresse IP fixe Bricolage nécessaire si le message passe par un tiers Obligation d'ouvrir le document pour connaître le destinataire final	Oui	Oui	OUI	
Cohérence spécification ebXML de l'UNCEFACT	1	OUI	ebMS2	AS/2 n'est pas un standard ebXML	ebMS3	ebMS3	NA / NON	
Accès Registre Repository pour la gestion des business process, business transaction, le profil du partenaire, ...	1	OUI		NON	POSSIBLE	POSSIBLE	NON	

ebMS2 HTTP / ebMS2 SMTP

- **ebMS2 HTTP**

- **Avantages**

- ◆ Certification et implémentation HTTP ont été testées (Drummond, ETSI, eAC in Asia), et celles qui ne l'ont pas encore été, ont des directions claires pour réaliser leur interopérabilité'.
- ◆ Meilleur choix de produits logiciels ebMS sur HTTP.
- ◆ Meilleur pour l'interopérabilité future avec d'autres partenaires, dans d'autres filières.
- ◆ HTTP offre davantage d'options d'intégration avec Web services (TOUS les profils WS-I sont basés sur HTTP.)
- ◆ Dans le futur, les upgrades vers ebMS V3 seront plus faciles car ebMS V3 (qui est compatible avec Web services, et sur lequel la version suivante d'AS2 est en train d'être profilée) va d'abord être déployée et développée pour HTTP. Il y aura aussi des passerelles compatibles ebMS2+ebMS3, mais sur HTTP.

- **Inconvénients**

- ◆ Nécessité d'une infrastructure HTTP ou HTTPs
- ◆ Absence de directives claires de la spécification ebMS2 sur le point du cryptage (la section 4.1.4.5 n'est pas suffisamment explicite et fait référence à ...V1.0),

- **ebMS2 SMTP**

- **Avantages**

- ◆ Moins coûteux à mettre en œuvre (mais adresse IP fixe souhaitée pour des raisons de sécurité)
- ◆ Plus facilement acceptable par les responsables sécurité des industriels

- **Inconvénients**

- ◆ Certification et Implémentations non testées par Drummond, testée par KTNET
- ◆ Risques de problèmes de filtrage SPAM, qui obligent à un gymnastique pour les contourner (encryptage...).
- ◆ Absence de directives claires de la spécification ebMS2 sur le point du cryptage (la section 4.1.4.5 n'est pas suffisamment explicite et fait référence à ...V1.0),
- ◆ Absence de directives claires de la spécification ebMS2 sur le point de l'entête MIME en SMTP
- ◆ Moins de solutions connecteurs disponibles

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Main ebMS2 references



- **Références ebMS2:**

- Axway : British Telecom, Gouvernement Néerlandais, General Motors, Volkswagen
- CLEO : Arvin Meritor, Lear Corporation, DaimlerChrysler, Freightliner, Detroit Diesel
- SRCI : Radiall, IDMM, MBDA
- Boeing
- AIAG (Automotive Industry Action Group)
- Administration Américaine
- Fournisseurs Asiatiques (Corée, Japon, Chine, ...) UK NHS (Health Service)
- HL7 (Canada)
- Netherlands Criminal Justice System
- PHINMS : Messagerie du Center fir Disease Control
- T-Mobile US-Departement of Defense Arvin Meritor (USA), Lear Corporation (USA), DaimlerChrysler (USA), Freightliner (USA), Detroit Diesel (USA)

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Benchmark use of ebMS2



Entreprise	ebMS2 HTTP	ebMS2 HTTPs	ebMS2 SMTP	ebMS2 SMTPs	Cryptage	S/MIME	PGP / MIME	Cryptage HTTPs ou SMTPs	Éditeur
ArvinMeritor		X			Sans				Cleo
Lear Corporation		X			Sans				Cleo
Daimler Chrysler		X			Sans				Cleo
Freightliner		X			Sans				Cleo
Detroit Diesel		X			Sans				Cleo
IBM						X			Oasis
Star Alliance	X							SSL	Oasis
H2O						X			Oasis
Boeing		X						SSL - X509	Oasis
Kathryn						X			Oasis
Oracle						X			Oasis
British Telecom	X	X						XML ENC	Axway
Gouvernement Néerlanda	X	X						XML ENC	Axway
General Motors	X	X						XML ENC	Axway
Volkswagen	X	X						XML ENC	Axway
Thales	X								TIBCO
MBDA			X	X		X			SRCI
Radiall		X				X			SRCI
IDMM		X				X			SRCI
Latecoère		X				X			SRCI
Administration Américaine									
Fournisseurs Asiatiques		X	X						
UK NHS									
HL7									
CDC ?									
T-Mobile									
PHINMS									
US-DoD - Departement of Defense		?							

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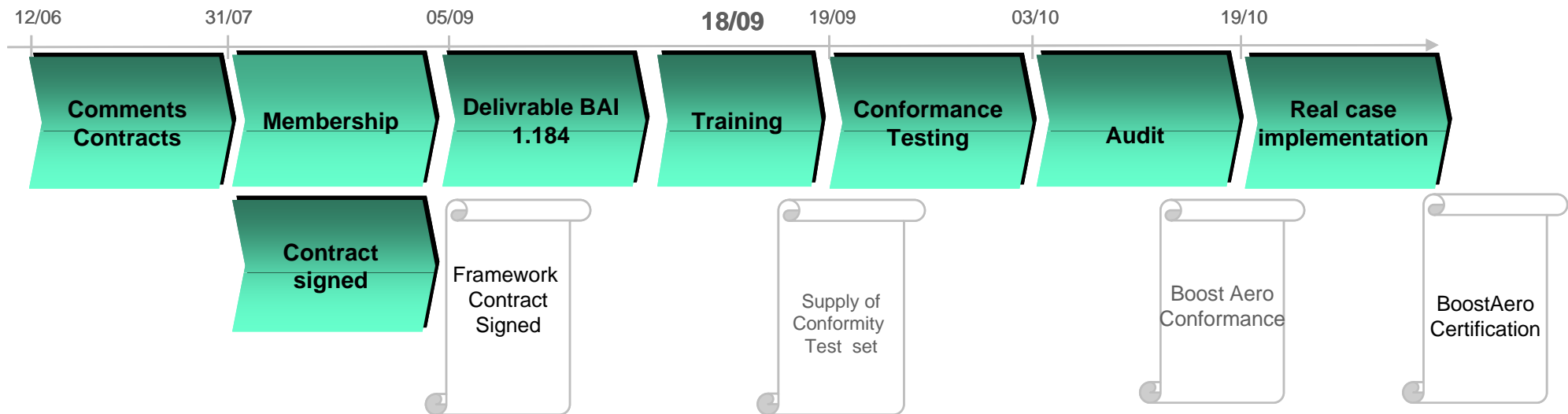
samy.scemama@boost-management.com

BoostAero process with Connector editors

Purpose of Certification

The purpose of certification is to provide a guarantee of BoostAero conformity, and thus of the re-usability, development and durability of connectors. This is vital if manufacturers are to be able to make use of Digital Exchange (EDI) with confidence with regard to partners conforming to BoostAero standards.

Certification also aims to ensure the quality of exchanges, the organisation of information circuits, the training and information of users.



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BoostAero Certification process



Business Process			X	X	X	
Doc - 1	BAI Process	Inspection consideration and conformance of BAI sub-processes.	BRS BAI.	X	X	X
Doc - 2	Activity	Tracing and Auditability of activities.	BRS BAI.	X		X
Main tests						
Documents			X	X	X	
Doc - 3	Instanciacion	Instanciacion of BoostAerotest set schemes	BAI Schemes.	X	X	X
Doc - 4	BAI Documents	Inspection consideration and conformance of BAI documents.	BAI Schemes.	X	X	X
Doc - 5	XML Validation	Validation of BAI instances.	Parser	X	X	X
ebMS2			X	X	X	
ebMS2 - 6	ebMS2	ebMS2Certification	ebMS2 Certificate	X	X	X
ebMS2 - 7	Protocol	Test with HTTP, HTTPs, SMTP and SMTPs	X509 Certificates.	X	X	X
Security			X	X	X	
ebMS2 - 8	Virus	Anti virus tests.	Anti virus.	X	X	X

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BoostAero Certification process



Main tests

Stage 1: Business Process and BoostAero documents conformance tests

The conformance tests include:

- 1. Confirmation of conformity with regard to BoostAero sub-processes,**
- 2. Auditability of activities,**
- 3. Inspection of XML instances generated by the editor from BoostAero International XSD on the basis of Test Sets provided by BoostAero International**
- 4. Confirmation of the application and conformance of BAI documents: Supply of an XML instance: ability to apply and display (in readable form) those instances in the connector**
- 5. Validation of BoostAero XML instances (parsing performed by the certification commission) – Ability of connectors to identify the errors**

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BoostAero Certification process



Main tests

- ◆ Stage 2: ebMS2 messaging

The conformance comprise the following elements :

6. Verification of ebMS2 certification

7. ebMS2 interoperability test based on 4 profiles: HTTP, HTTPS, SMTP, SMTPs

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Certification ebMS2



MAIN ISSUES :

B2B tests are very consuming

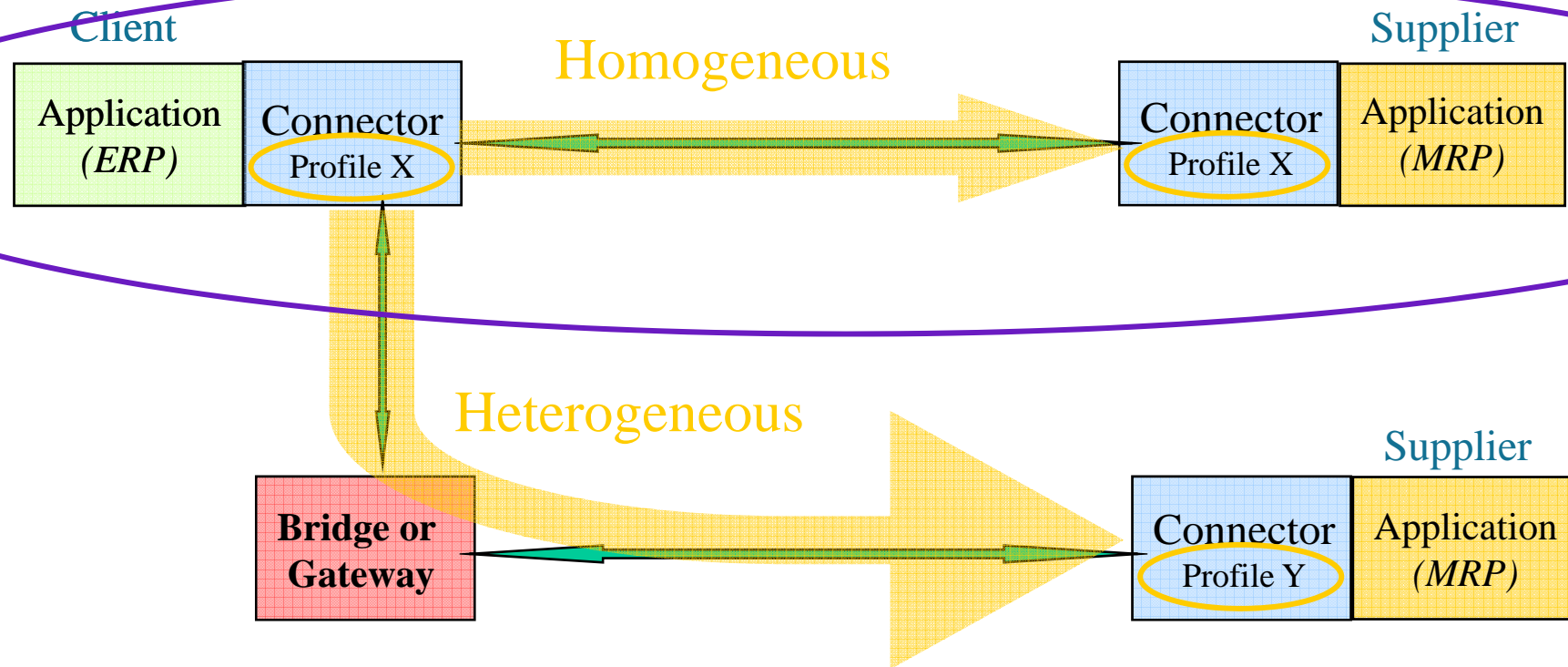
- **1- ebMS2 namespace (between Drummond CPA and KTNET CPA).**
- **2- SMTP: Header MIME : interpretation of the specification.**
- **3- Crypto problem (using S/MIME in SMTP or HTTP)**
- **4- Ack response on HTTP**
- **5- In SMTP, messages are stopped by intermediate servers**

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eBusiness communication process (abstract)



- ❑ Real field implementation could be more complex, involving for instance tier 2, tier 3 suppliers.
- ❑ The above figure is intending to identify the basic test framework.



BoostAero Test Suite

Initiated from Party A to Party B (same tests Initiated from Party B to Party A)

- Test Unit TU101-1 : ebMS2 Basic Interoperability (HTTP)
- Test Unit TU101-2 : ebMS2 Basic Request-Response Interoperability (HTTP)
- Test Unit TU102-1 : ebMS2 Secure Message (HTTP)
- Test Unit TU102-1b : : use a secure channel - HTTP/S
- Test Unit TU102-2 : ebMS2 Secure Request-Response (HTTP)
- Test Unit TU102-2b : Variant TU102-2b: use a secure channel - HTTP/S
- Test Unit TU103-1 : Test Unit TU103-1: ebMS2 Basic Interoperability (SMTP)
- Test Unit TU103-2 : ebMS2 Basic Request-Response (SMTP)
- Test Unit TU104-1 : ebMS2 Secure Message (SMTP)
- Test Unit TU104-1c : Variant TU104-1c: SMTP-AUTH is used.
- Test Unit TU104-1d : Variant TU104-1d: Message fully encrypted using S/MIME.
- Test Unit TU104-2 : ebMS2 Secure Request-Response (SMTP/S)
- Test Unit TU104-2b : Variant TU104-2b: SMTP-AUTH is used.
- Test Unit TU104-2c : Variant TU104-2c: Message fully encrypted using S/MIME.





For all informations : <http://www.boostaero.com>



- Available documents (members)
 - Business Process Requirement Specifications, Message Specifications
 - Data Dictionary, Interconnexion Architecture, XML Schemes
 - Steering Committees Reports
- Contacts
 - Projet Director : Pierre Faure, Boost-Aero Project Director, Dassault Aviation e-business & CRM Director, pierre.faure@dassault-aviation.fr
 - Boost-Aero standards functional support : S.Scemama samy.scemama@afnet.fr, 06 10 25 45 59
 - Site access : Jean Brange, jean@afnet.fr, 06 83 62 89 02, 01 53 43 82 70

The screenshot shows a web browser window displaying the BoostAero website. The page title is "BoostAero - Welcome to BoostAero". The URL is http://www.boost-aero.com/index_html/document_view?portal_status_message=Document%20changes%20saved. The page features a navigation menu with links for "home", "steering committee", "library", and "workinggroups". A search bar is located in the top right. The main content area displays a message "Document changes saved." and a section titled "Welcome to BoostAero". Below this, there is an "Extract from BoostAero Executive Summary" section, which discusses the digital integration of the supply chain in the Aerospace & Defence industry. The extract mentions that the current e-supply chain projects (Sup@irWorld, Exostar, Exindus, ...) have been driven separately, leading to heterogeneous and competing solutions. It also states that the GIFAS Board decided on 2003 December 4 to launch the BOOST-AERO project to decide upon the opportunity of standards for the A&D industry. The standards are intended to provide:

- A better quality, reliability and mastering of the supply chain, till tier n, through seamless and homogeneous digital connections.
- Costs savings because a common solution is less costly to develop than n specific solutions, and because the suppliers will have to invest once for all their customers, and not n times
- The convergence between the industrial and the maintenance sphere, for the civil (SPEC 2000) and for the defence (AECMA 2000M) customers, which leads to additional savings and a better

On the right side of the page, there is a "upcoming events" section showing "eBSG AIA" for "2005-10-23" and a calendar for "September 2005". The calendar shows the following dates: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.