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Les Web Services sur votre Mainframe

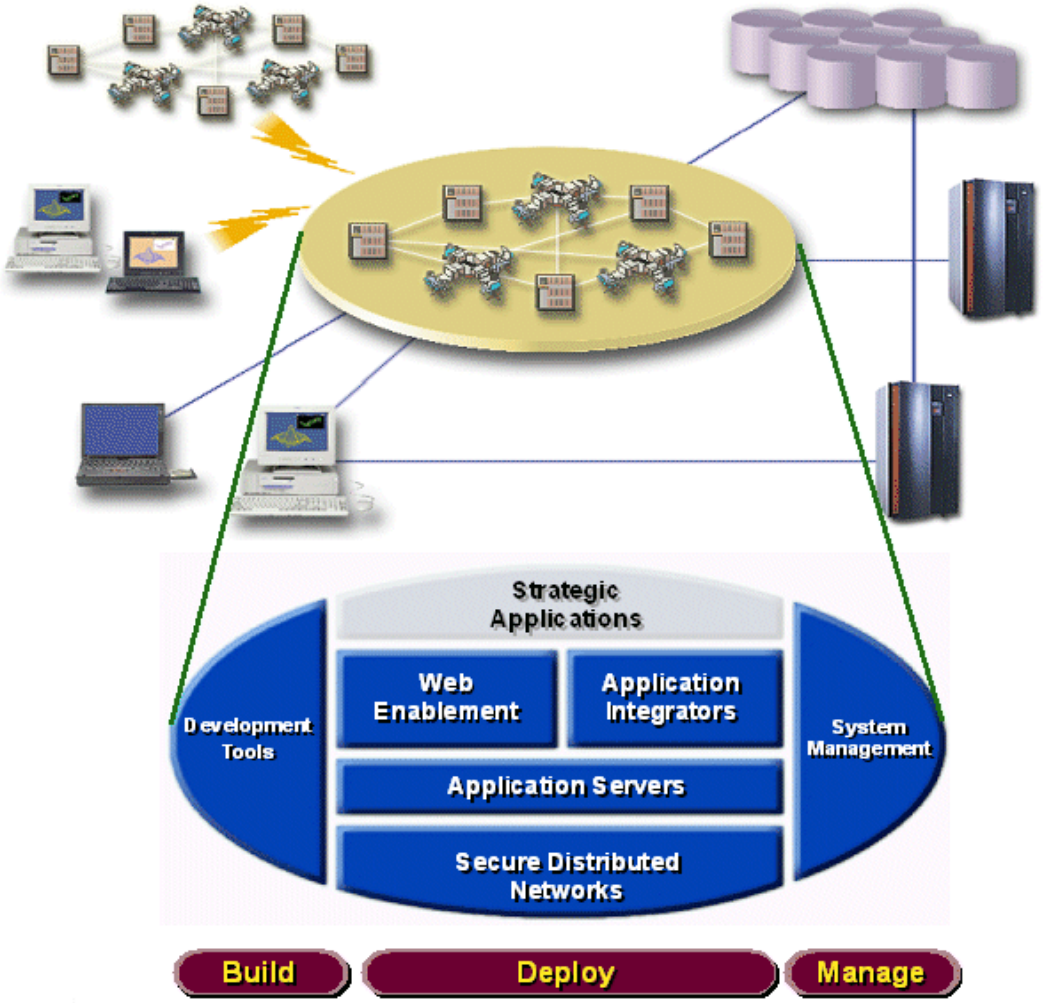
3 mars 2005 | Stéphane Faure

Agenda

- Introduction aux Services Web
- Les spécifications
- CICS TS 3.1 Support
- WebSphere Application Server for z/OS
- Web Services Gateway
- WebSphere Business Integration Server Foundation

Besoins

- Communiquer à travers Internet avec des clients, partenaires ou fournisseurs sans avoir à se soucier de leur infrastructure.
- Intégrer les applications internes en utilisant des protocoles standardisés
- Réutiliser les transactions existantes sans modification et en minimisant tout développement
- Partager les ressources informatiques à travers des réseaux hétérogènes tout en contrôlant la Qualité de Service.
- Gérer et contrôler les échanges entre applications



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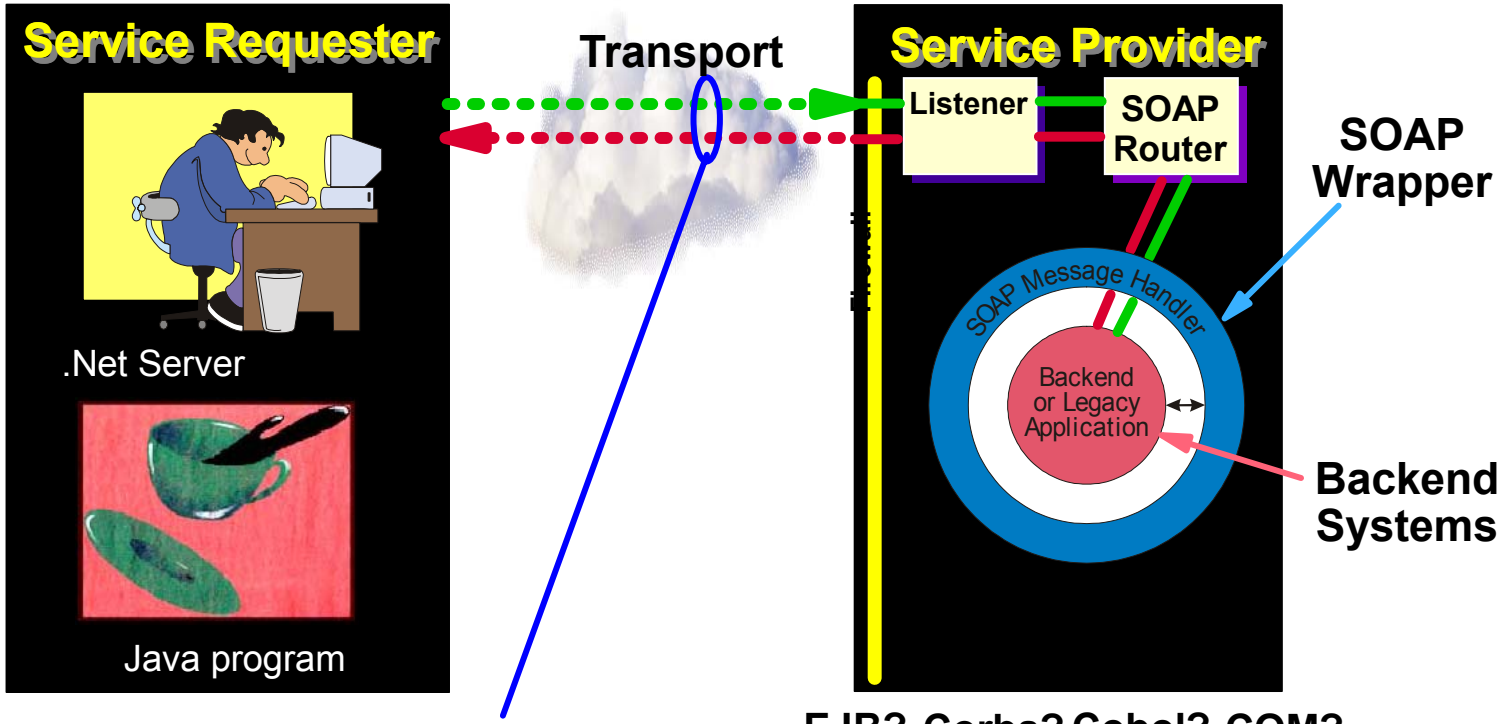
Les bases des Web Services

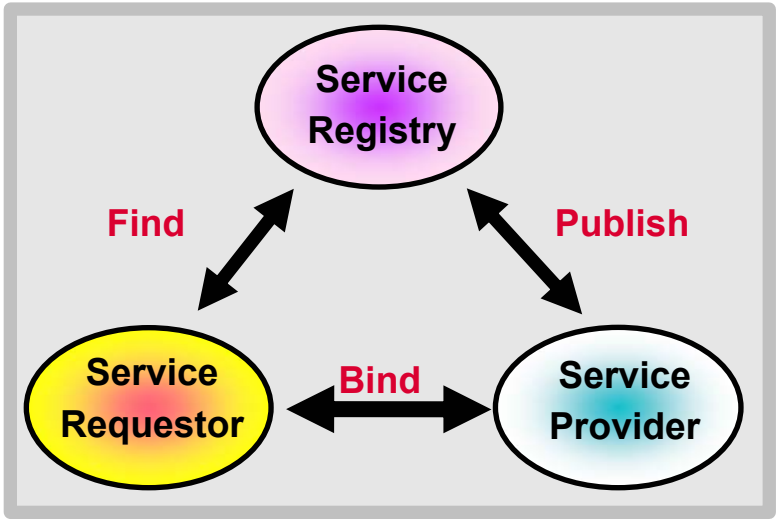


Simple, standard XML messages

- seul compte le format et le contenu du message
- l'implementation du service est totalement transparente pour le client
- SOAP défini l'enveloppe, le transport peut être HTTP, MQ/JMS, SMTP...
- WSDL défini la description des Web Services
- UDDI défini l'interrogation/publication des Web Services dans un annuaire

Composants de base Web Services

- Annuaire de Services
  - Enregistre la définition et la localisation des services disponibles
- Fournisseur de Service
  - Publie les services dont il est détenteur dans l'annuaire
  - Supporte les appels des clients
- Client de Service
  - S'adresse à l'annuaire pour localiser les services
  - Se connecte au fournisseur

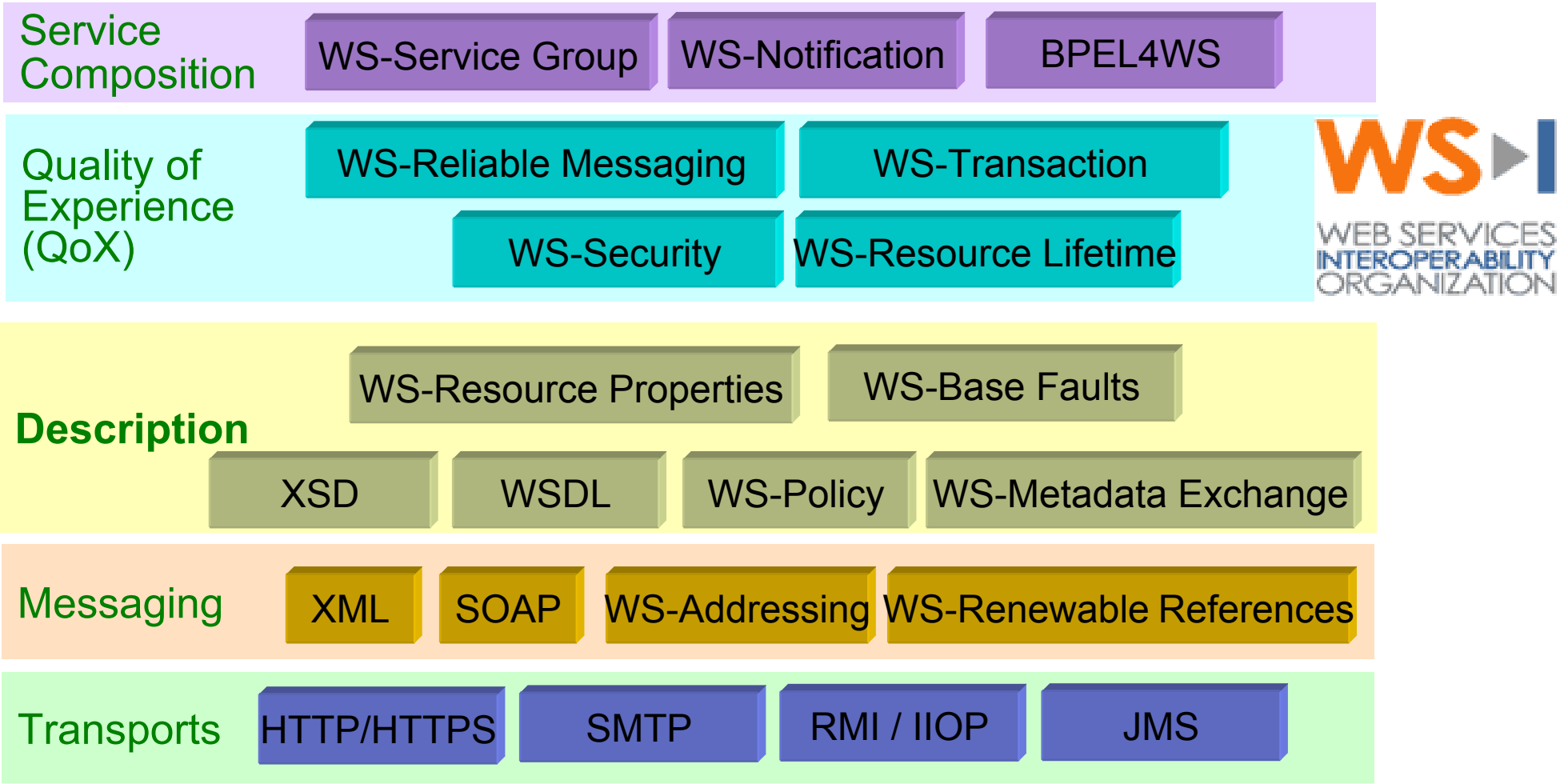


UDDI: Universal Description Discovery and Integration

WSDL: Web Services Description Language

SOAP: Simple Object Access Protocol

Les spécifications majeures



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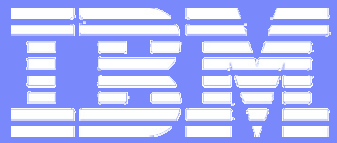

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Web Services in CICS TS 3.1

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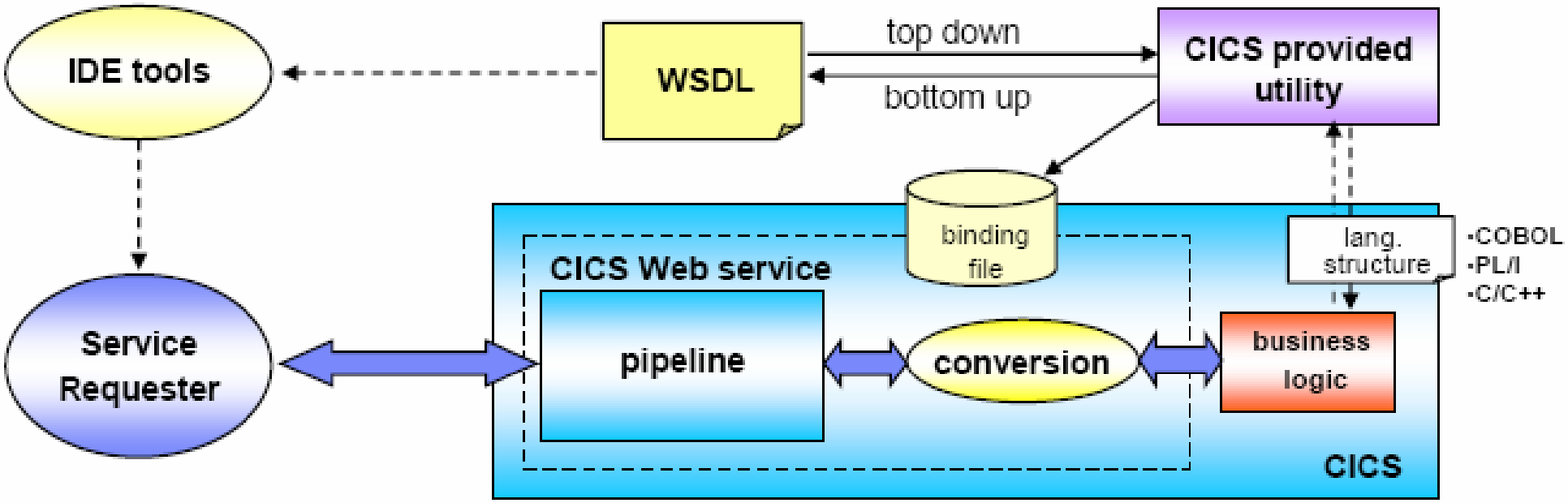
Objectifs

- Ré-utilisation des programmes existants:
  - Sans modification
  - Par un accès standard
- Intégration:
  - Inbound (CICS est le serveur)
  - Outbound (CICS est le client)
- Supprimer les tiers intermédiaires

- **CICS provides the necessary tools and runtime**
  - WSDL can be generated from a utility
    - a bottom up approach from an existing application
  - Utility can generate language structures from WSDL
    - a top down approach to a new CICS service provider programs
    - for CICS service requester programs
  - CICS provides XML-language structure (COMMAREA) conversion



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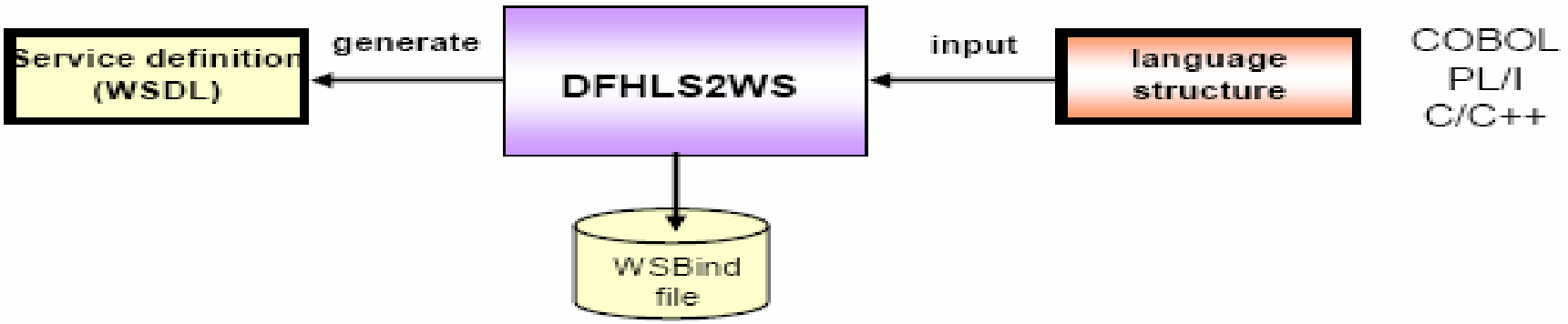
Web Service Utility Programs

DFHLS2WS (Language structure to Web service)

- For bottom-up development
- Input
  - Programming language data structure

    In COBOL or PL/I or C or C++

    Interface to the program can be COMMAREA or CHANNEL
- Output
  - Web services binding file
  - Web services description (WSDL)



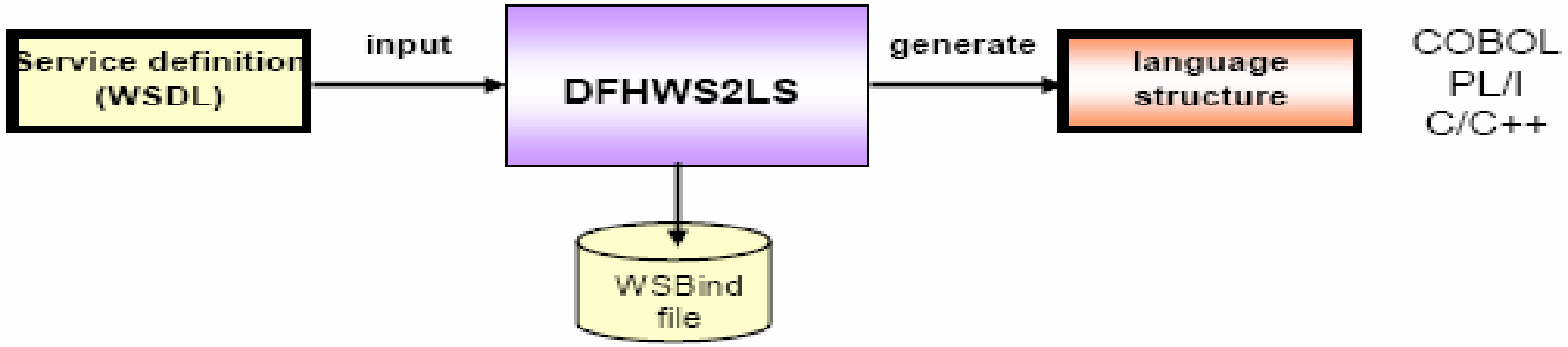
Web Service Utility Programs

DFHWS2LS (Web Service to Language Structure

- For top-down and service requester development
- Input
  - WSDL (Web Services Description)
- Output
  - Web services binding file
  - high level language data structure

    In COBOL or PL/I or C or C++

    Interface to the program can be COMMAREA or CHANNEL



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Web Services support in WebSphere Application Server

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Objectifs

- Support complet des spécifications Web Services
- Conformité des développement avec la norme J2EE
- Faciliter les nouveaux développement Java
- Réutiliser les développements en Java
- Intégration avec les outils de développement RAD (WSAD)

Support des Web Services dans WebSphere

WebSphere 4.0 & 5.0	WebSphere 5.02/5.1	WebSphere 6.0
Apache SOAP ▪ The programming model, deployment model and engine **Proprietary APIs** ▪ Because Java standards for Web services didn't exist **Not WS-I compliant**	**JAX-RPC (JSR-101) 1.0** ▪ New standard API for programming Web services in Java **JSR-109 1.0** ▪ New J2EE deployment model for Java Web services **SAAJ 1.1** **WS-Security** ▪ Extensions added **WS-I Basic Profile 1.0** ▪ Profile compliance **UDDI4J version 2.0 (client)** **Apache Soap 2.3 enhancements** The engine is a new high performance SOAP engine supporting both HTTP and JMS	**JAX-RPC (JSR-101) 1.1** ▪ Additional type support ▪ xsd:list ▪ Fault support ▪ Name collision rules ▪ New APIs for creating Services ▪ isUserInRole() **JSR-109 – WSEE 1.1** ▪ Moved to J2EE 1.4 schema types ▪ Migration of web services client DD moving to appropriate container DDs ▪ Handlers support for EJBs ▪ Service endpoint interface (SEI) is a peer to LI/RI **SAAJ 1.2** ▪ APIs for manipulating SOAP XML messages ▪ SAAJ infrastructure now extends DOM (easy to cast to DOM and use) **WS-Security** ▪ OASIS draft 17 ▪ Following WS-I Security Profile **WS-I Basic Profile 1.1** ▪ Attachments support **WS-TX (WS transactions)** **JAXR support** **UDDI v3 support** ▪ Includes both the registry implementation and the client API library ▪ Client UDDI v3 API different than JAXR (exposes more native UDDI v3 functionality not available in JAXR)

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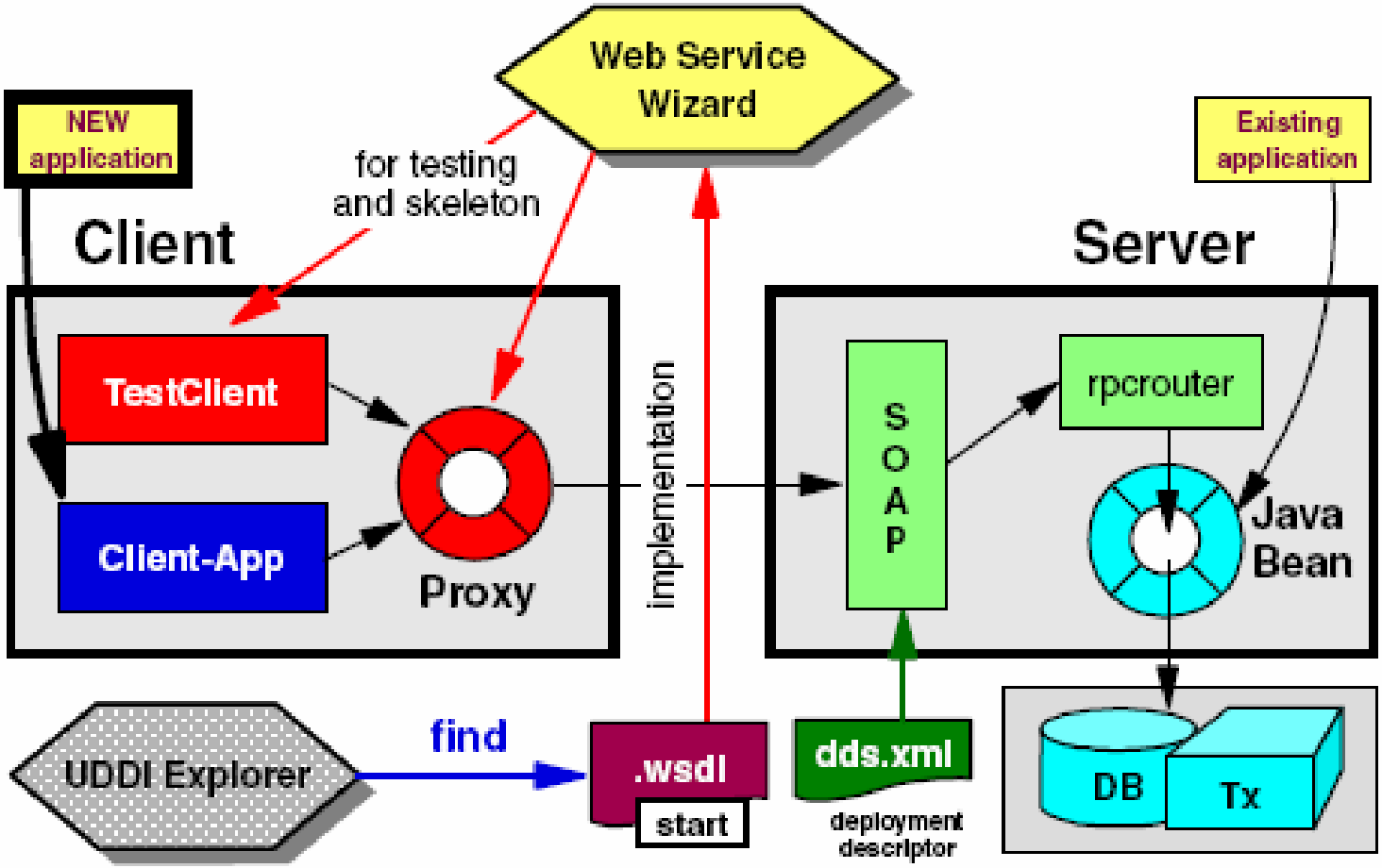
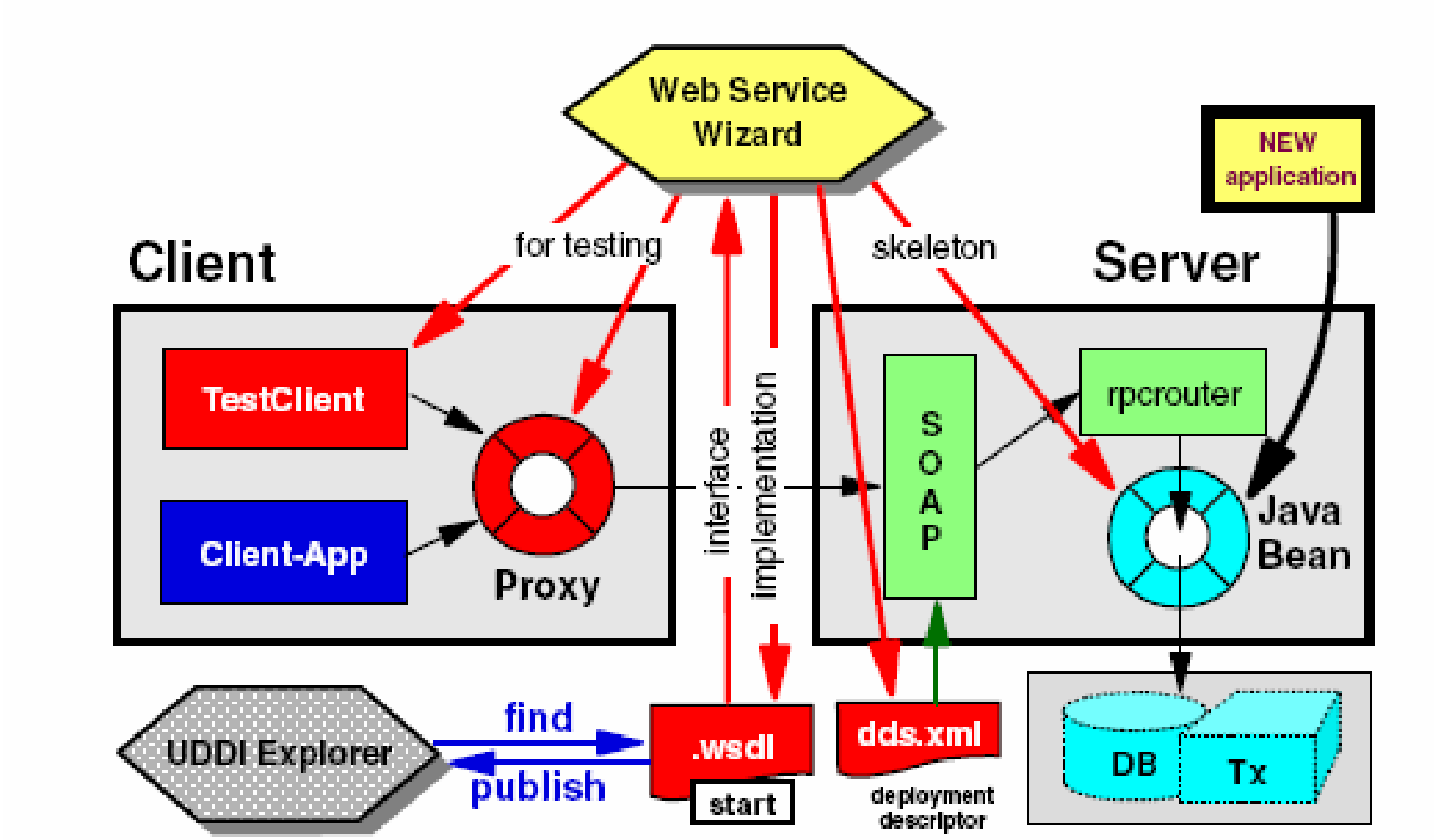
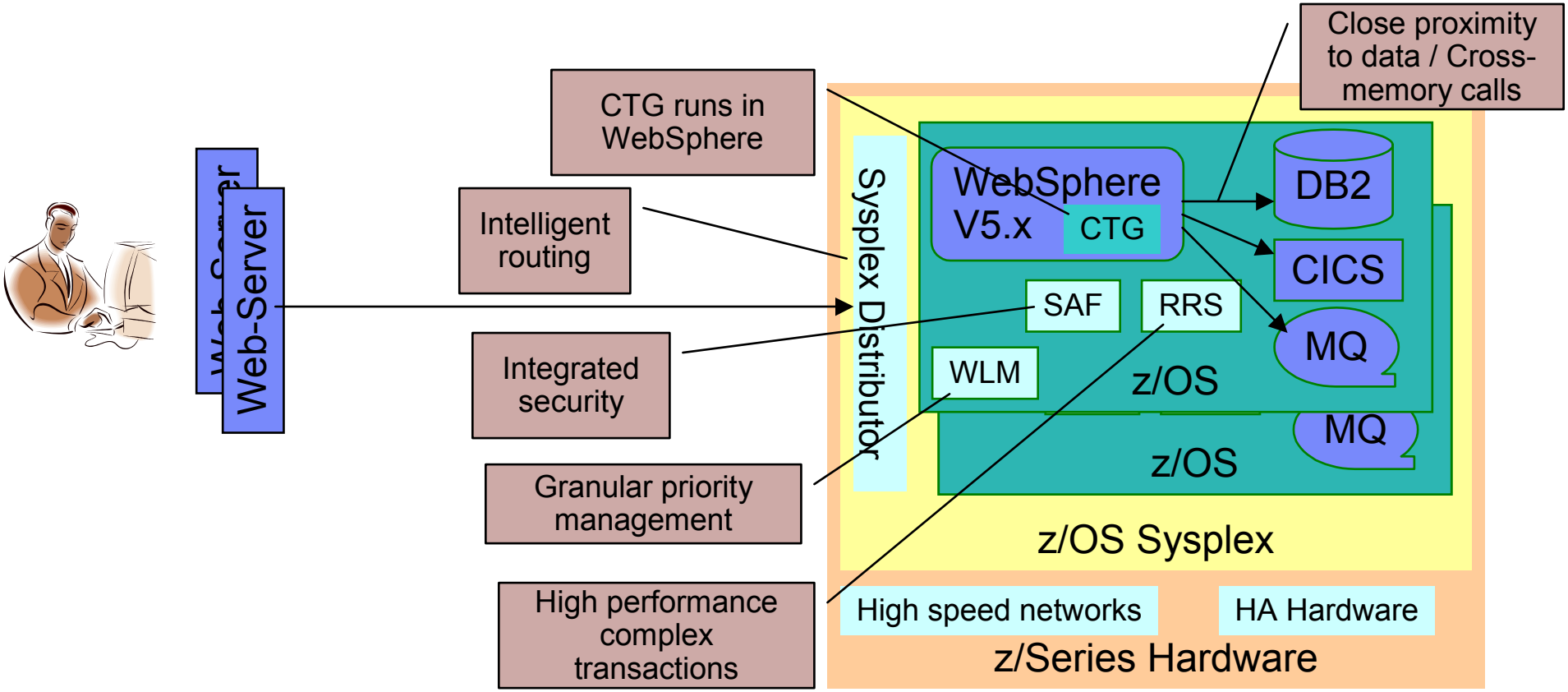
WSAD (RAD): Depuis un bean Java



WSAD (RAD): Depuis un fichier WSDL



WebSphere for z/OS Topology



- Integrated environment – single view of total application
- Maximum use of z/Series and z/OS facilities
  - Virtualization of resources and setting priorities of transactions
- Highest performance to “host based” resources

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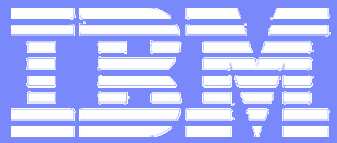
WebSphere Application Server Conclusion

- WebSphere z/OS offre toutes les fonctionnalités de WebSphere
  - Compatibilité complète pour le développement applicatif
  - Outils communs de déploiement et d'administration
  - Disponibilité des éditions "WAS-Netwok Deployement" et "WBI-SF"
- WebSphere z/OS tire parti de la qualité de service de z/OS
  - Scalabilité, disponibilité : équilibrage de charge par WLM, support Sysplex
  - Sécurité traitée par le gestionnaire de la plate-forme (RACF - interface SAF)
  - Automatisation : arrêt-relance par ARM, planification des opérations (OPC)
  - Reporting : utilisation de rapports RMF et enregistrement d'informations dans SMF
  - Connexions plus performantes aux applications legacy (CICS, IMS, DB2,...)
- A utiliser si :
  - Nécessité d'une très haute qualité de service (haute disponibilité, sécurité...)
  - Importance des connexions au "backend" z/OS (proximité des données)
  - Intégration à une production existante
  - Volonté de mutualiser les ressources



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Web Service Gateway

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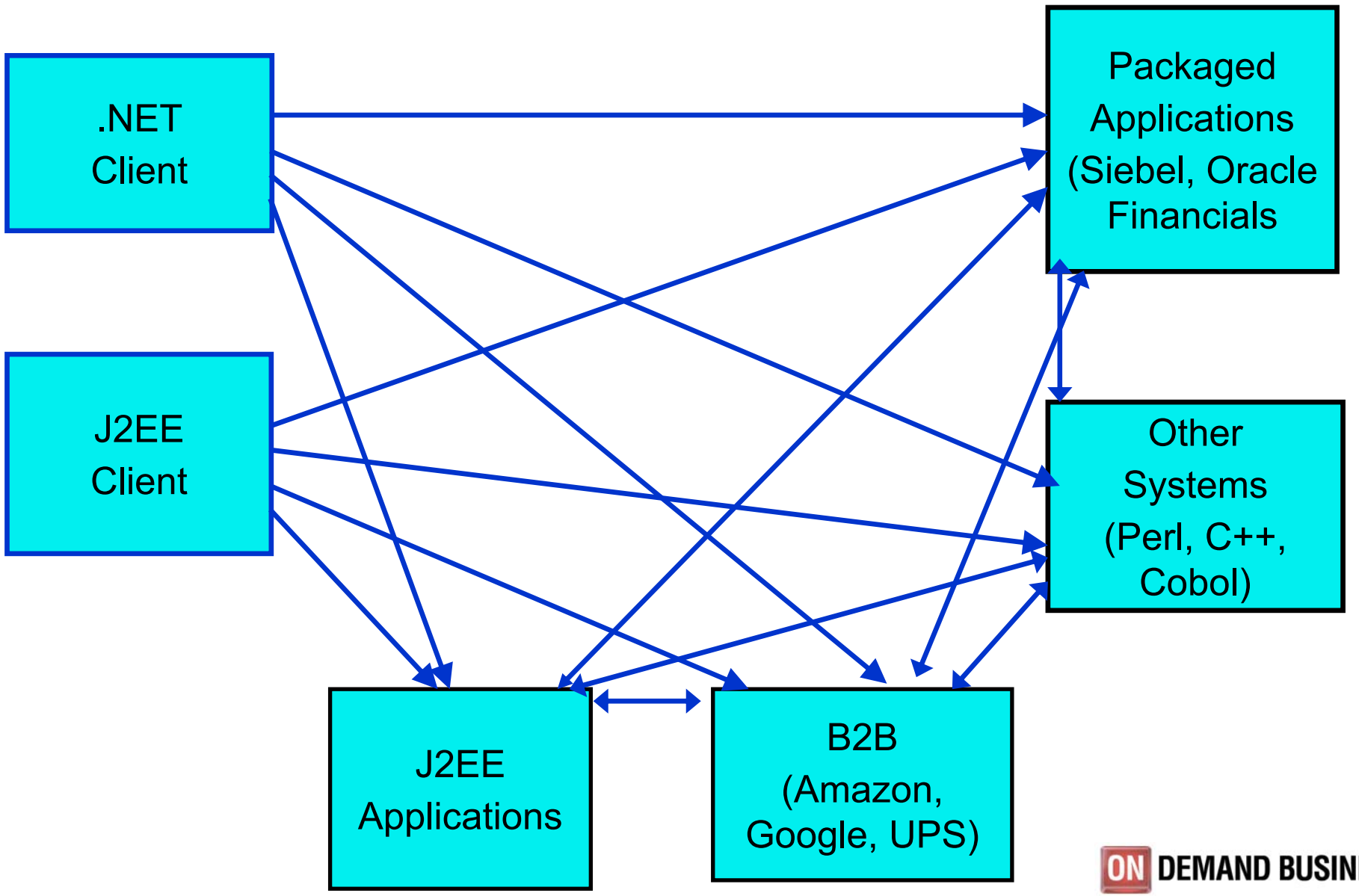
Enterprise Service Bus: Sans



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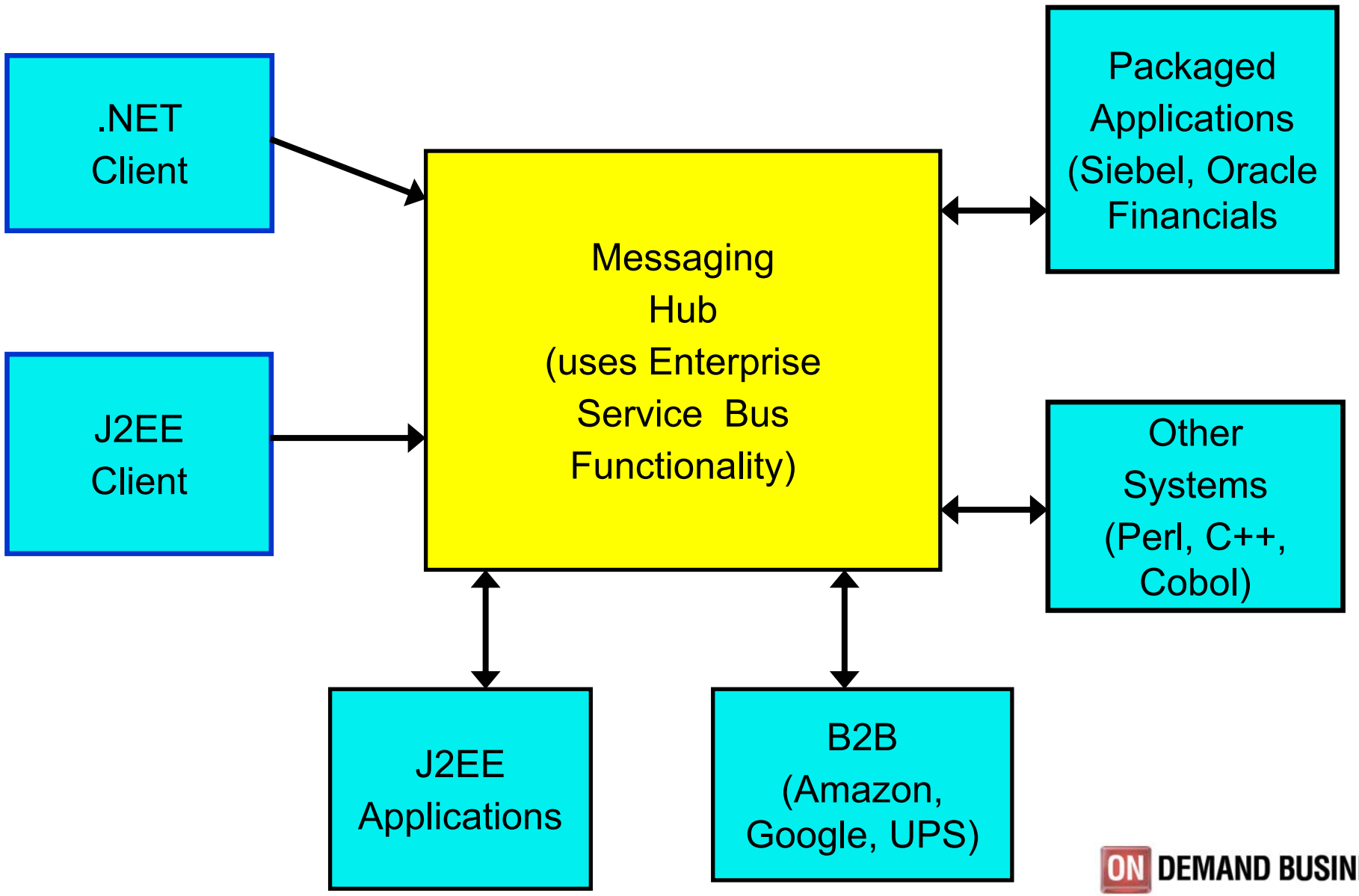
Enterprise Service Bus: Avec



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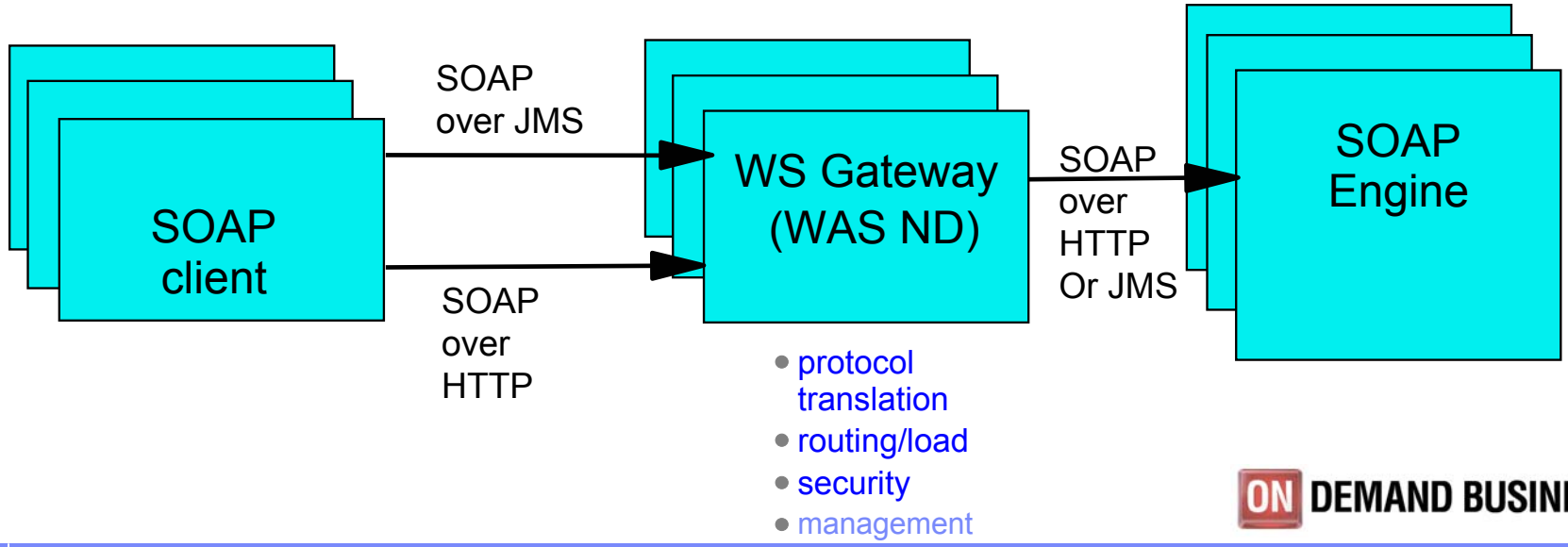
Enterprise Services Bus avec WAS WS Gateway

- Elimine les applications de routage propriétaires
- Support HTTP and JMS (MQ Series)
- Introduit les évantuelles transformations de données en amont des serveurs
- Autorise les changements de protocole de transport
- Permet de sécuriser les flots avant le serveur SOAP (éventuellement dans une DMZ)
- Est un unique point d'administration des flux SOAP



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WebSphere Business Integration Server Foundation 5.1

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"I want to quickly build and deploy flexible systems that are closely aligned with my business imperatives"

Increase business flexibility by leveraging a service oriented architecture to build modular applications that are designed to adapt quickly to change

"I want to decrease the complexity, risk, and cost of integration"

Maximize the return on your infrastructure investments by developing applications using industry supported open standards

"I want to accelerate my entire application development process, so that applications get delivered on time, within budget, and with the functionality my business requires"

Increase developer productivity by building composite applications using a highly integrated development environment with specialized integration functionality

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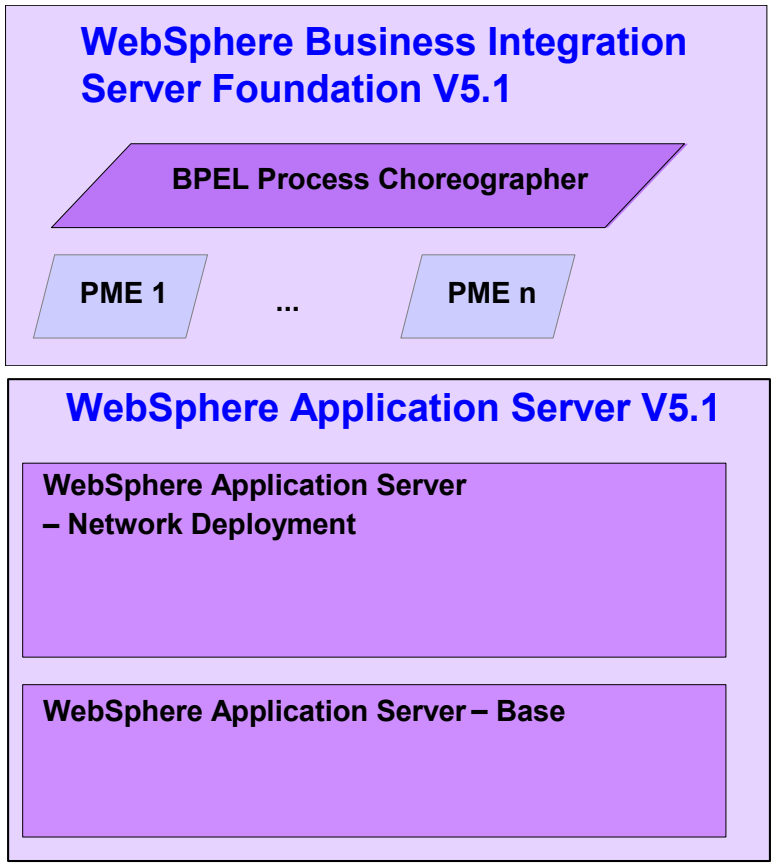
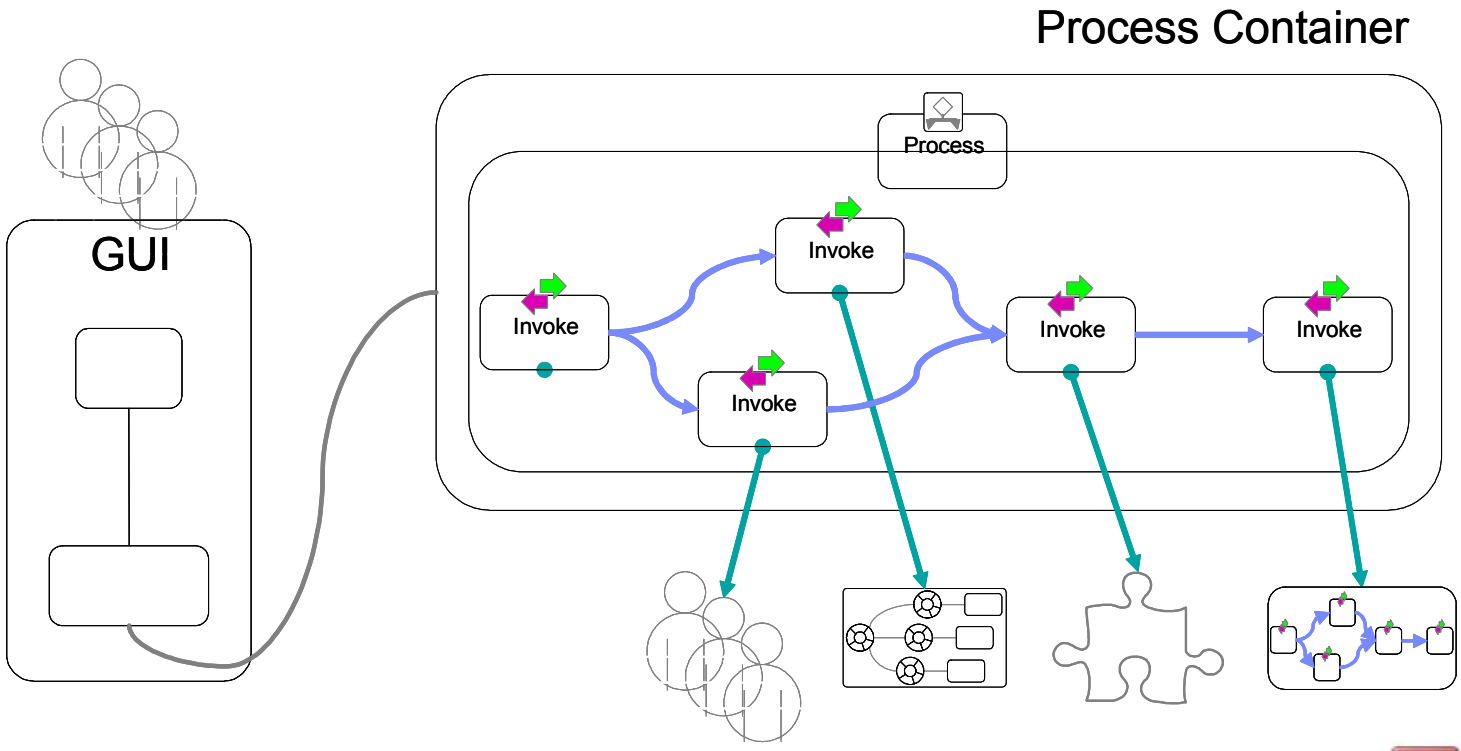
Composants

- WebSphere Enterprise -> WBI Server Foundation
- Toutes plates-formes - dont z/OS : Juin 2004
- Développement : WSAD Integration Edition
- WBI-SF = WAS-ND, plus extensions :
  - **BPEL process choreographer**
  - Programming model extensions
- WebSphere Application Server V5.1 z/OS
  - JDK 1.4.1 -> "ready for zAAP"
  - Serveur J2EE 1.3
  - Connectivité au backend
  - Exploitation de la QoS z/OS



Process Choreographer

- Process Engine basé sur le standard BPEL (Business Process Execution Language for Web Services) proposé par l'industrie pour la "chorégraphie" de services Web
- Exécution d'applications de type "Workflow"
- Extensions pour le support de compensation (Rollback)
- Extensions "Human Workflow"
- Workflow "synchrone" ou de type "long running"



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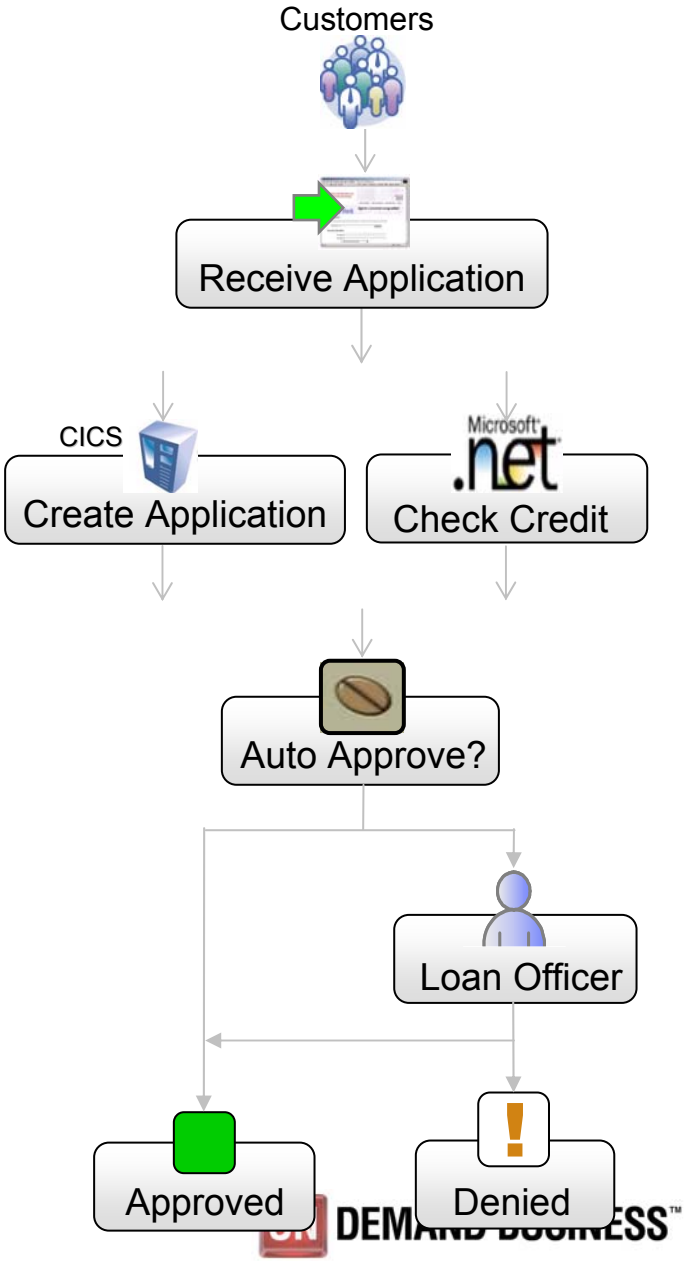
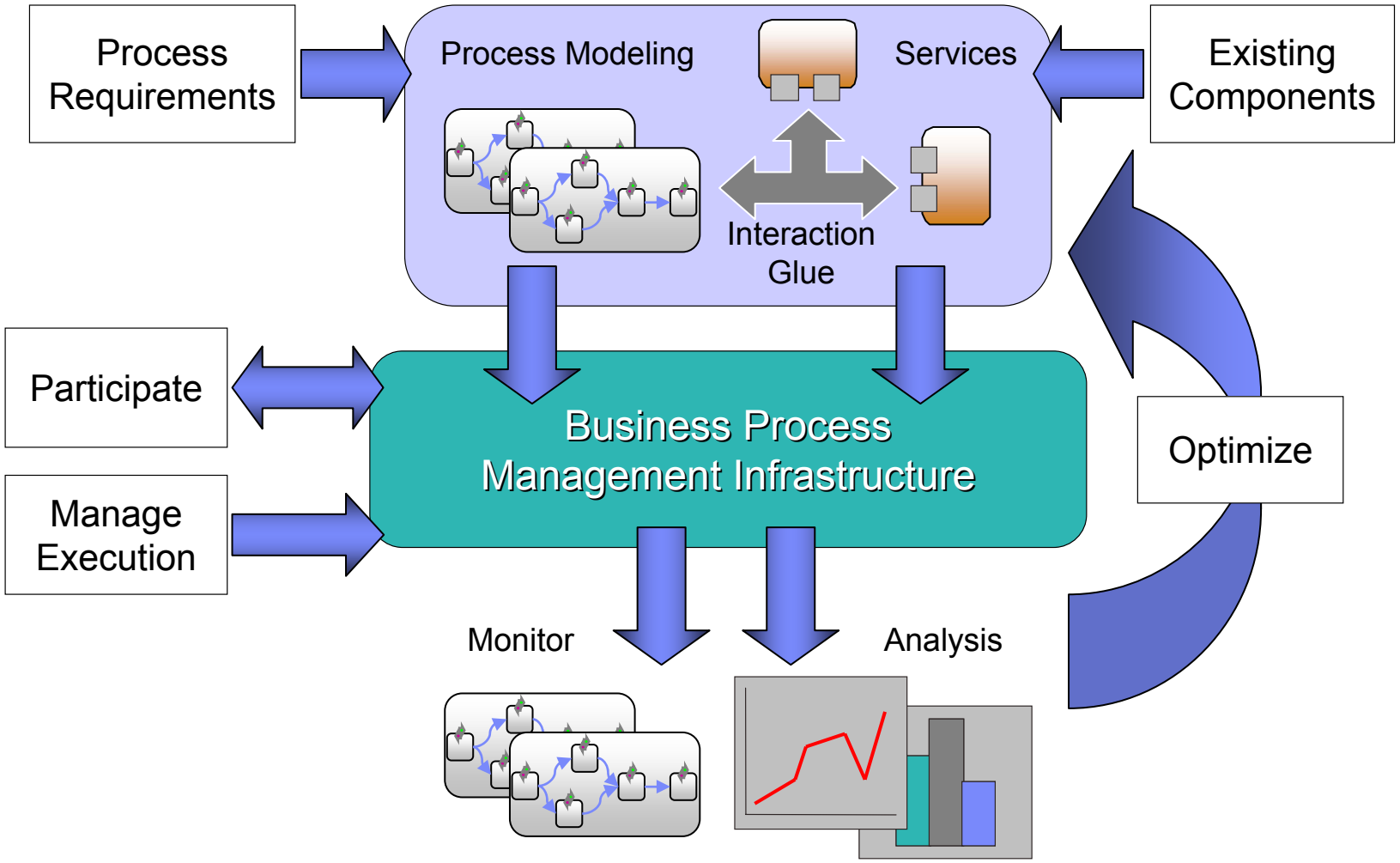
Business Process Execution Language for Web Services (BPEL)

- A language to specify behavior of business processes as Web services and between Web services
- Codified universal description language for processes
- Based on WSDL and other XML standards
- Proposed industry standard
  - 7/2002: Original 1.0 BPEL proposal from IBM, Microsoft and BEA.
  - 4/2003: OASIS Technical Committee formed. Standards-based follow-on to earlier BPEL work.
  - 5/2003: Revised 1.1 proposal with contributions from SAP and Siebel.



Cycle de vie



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For more information…

- Visit the zSeries Web site:
  - **ibm.com**/zSeries
- Visit the zAAP Web site:
  - **ibm.com**/zseries/zaap
- Visit the WebSphere Application Server for z/OS Web site:
  - **ibm.com**/software/webservers/appserv/zos_os390
- Visit the WebSphere Business Integration – Server Foundation Web site:
  - **ibm.com**/software/integration/wbisf/

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