IBM System z and SOA Technical Conference

How to select the best infrastructure to support your SOA project ?

Yann Kindelberger – IT Architect
Montpellier PSSC Design center
yannkindelberger@fr.ibm.com

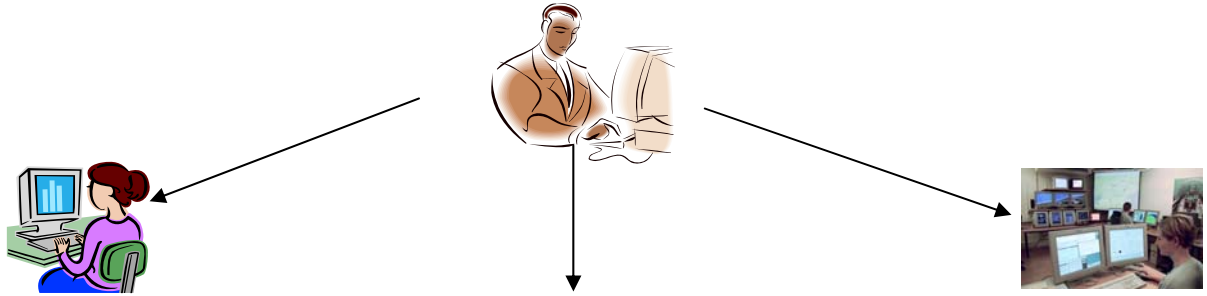
Presented by
Fernando Nogal – Consultant IT Specialist
SPGIT IMT System z Technical Consultant

Madrid, November 6, 2007

Agenda

- Overview on the design center approach for SOA infrastructure
- Methodology and patterns
- Customer design session
- Conclusion

The Customer Target solution



Business processes

Front end channel

Access

Brand (as a parameter)

Roles

Brand Management

Payments | Insurance | Saving | Lending

Flexible connections

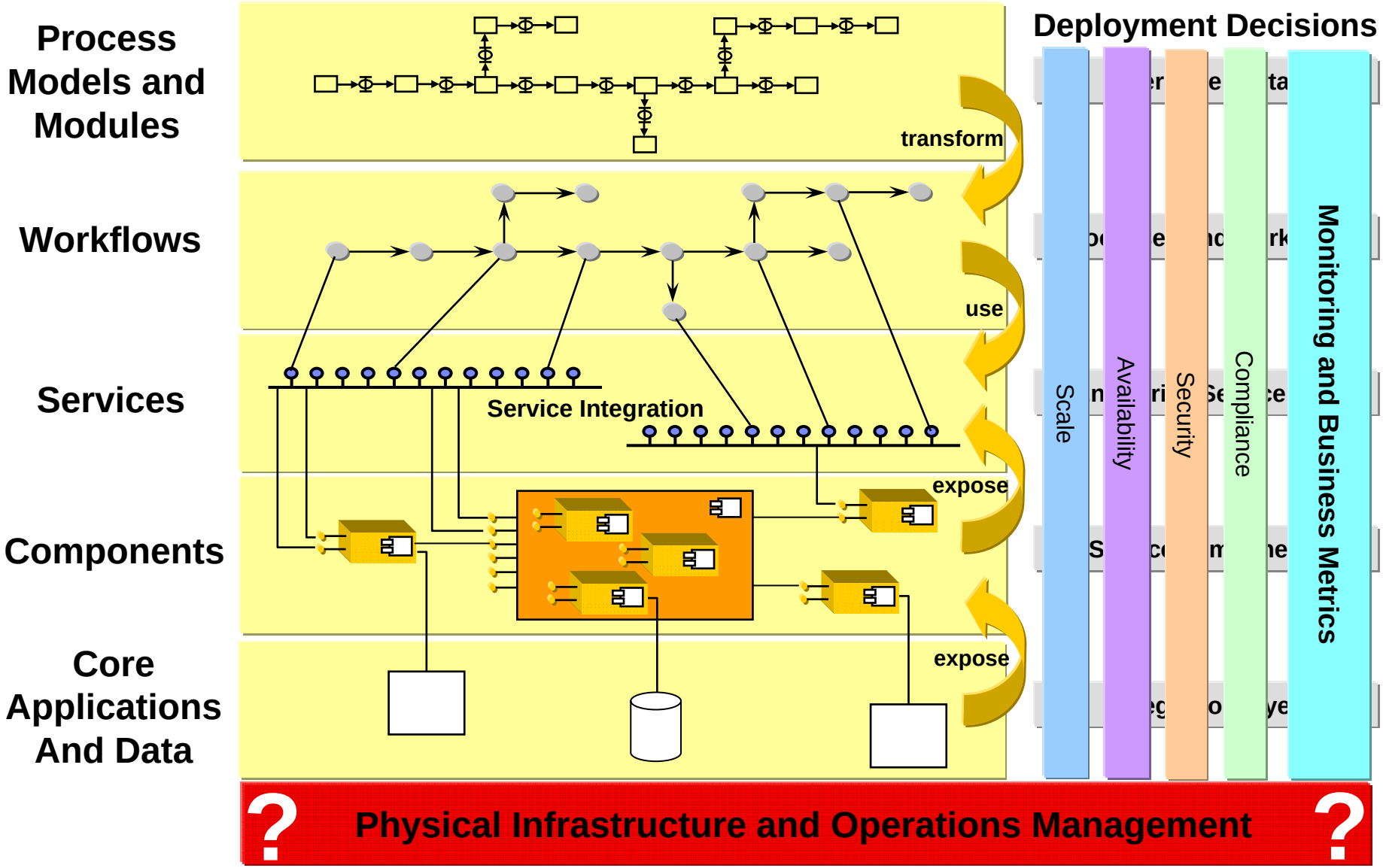
Business services

ISA	BACS	Motor Insurance	Interest Calc	Mortgages
CHAPS	Account Servicing	Home Insurance	Loans	Savings
Reporting	Risk			

One set of data

GL | MI | Reporting

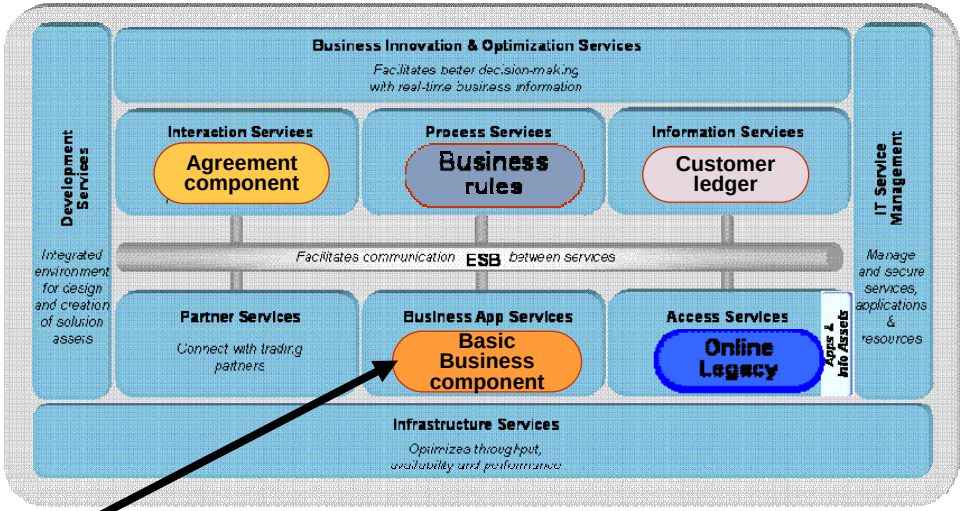
The Design Center approach

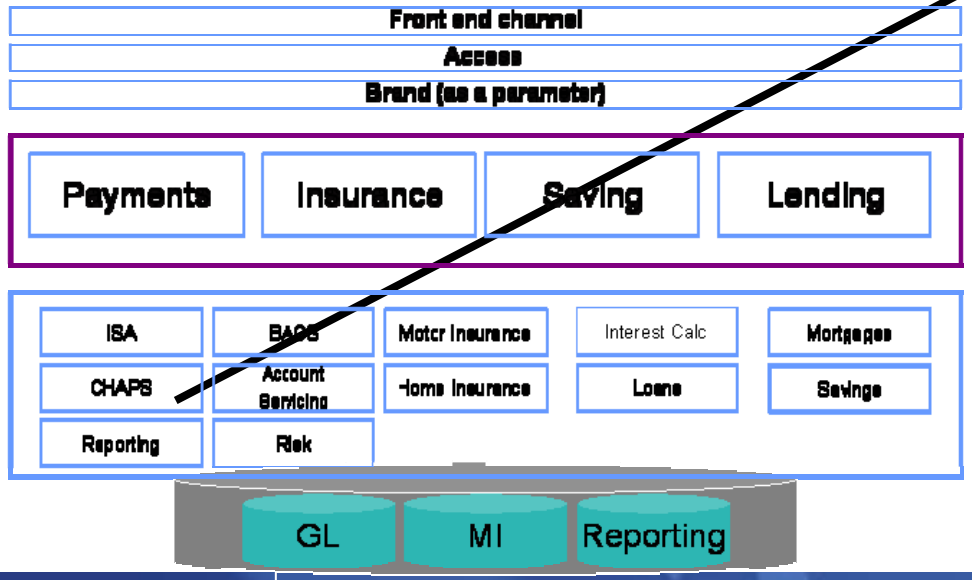


Agenda

- Overview on the design center approach for SOA infrastructure
- Methodology and patterns
- Customer design session
- Conclusion

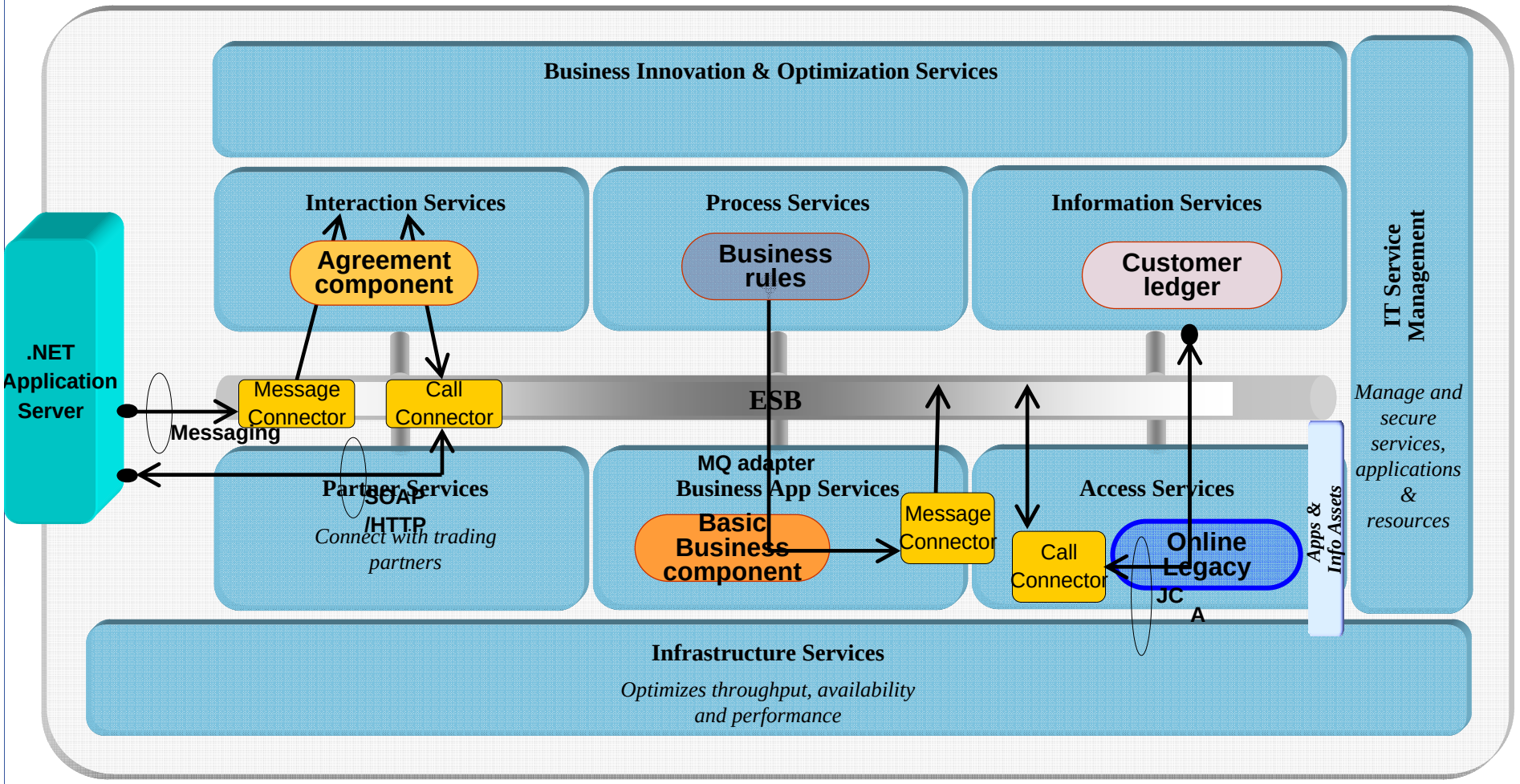
Step 1 : Map components



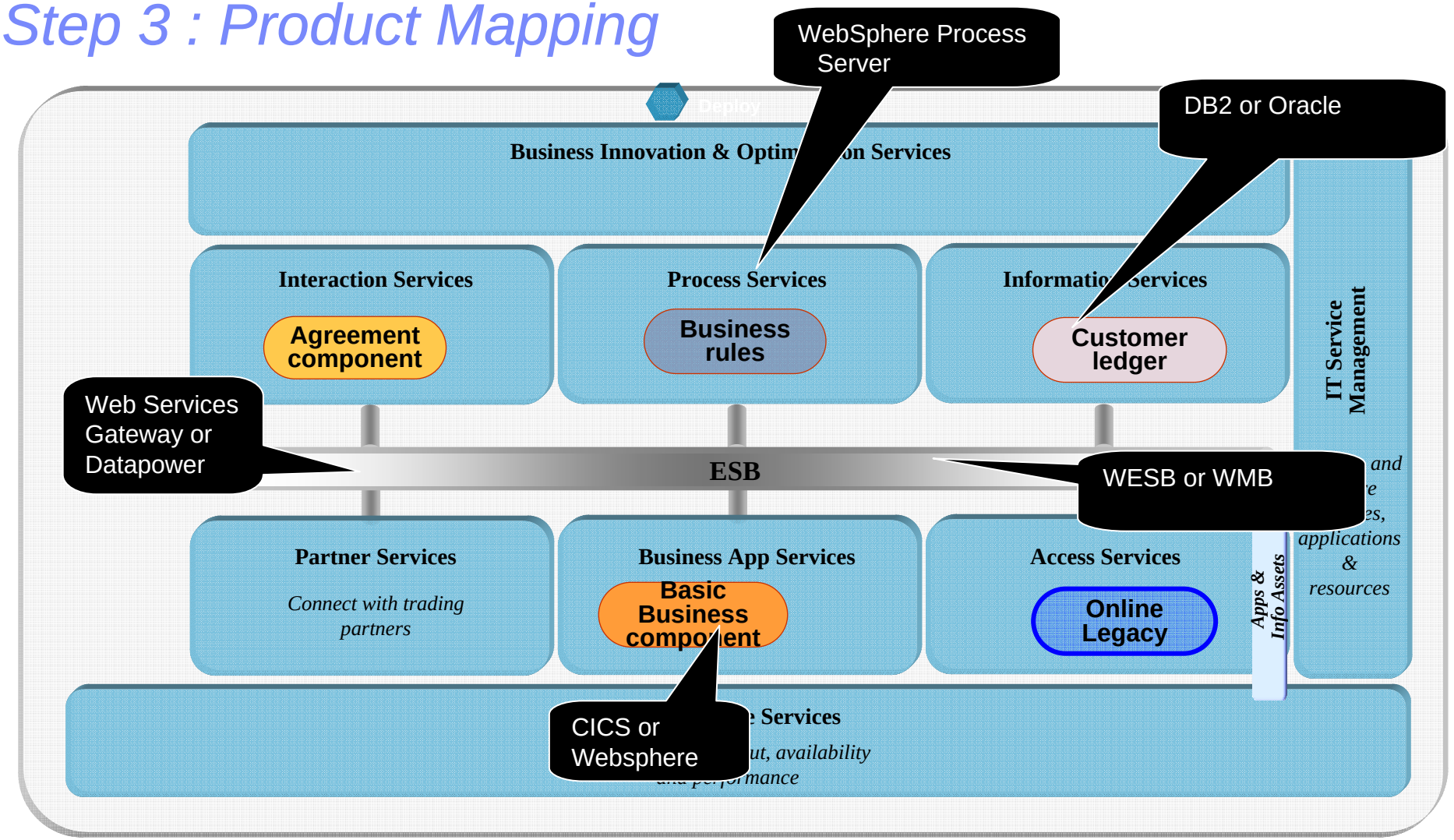


…to the SOA Reference Architecture

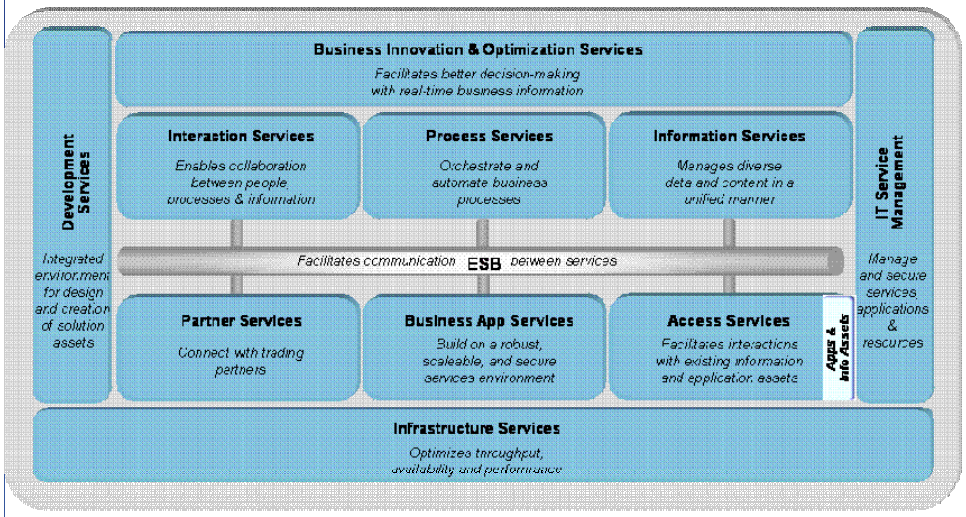
Step 2 : Architecture decisions for Integration

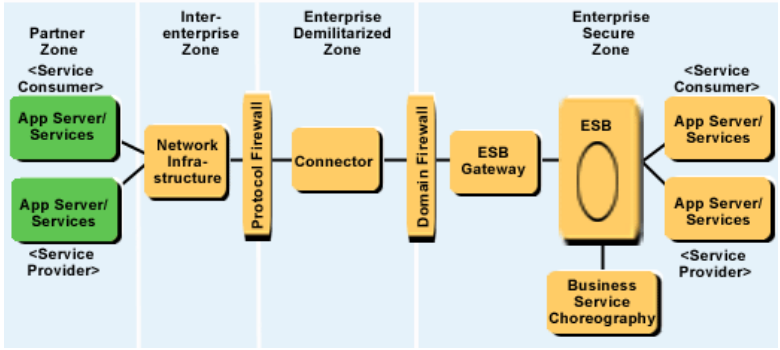


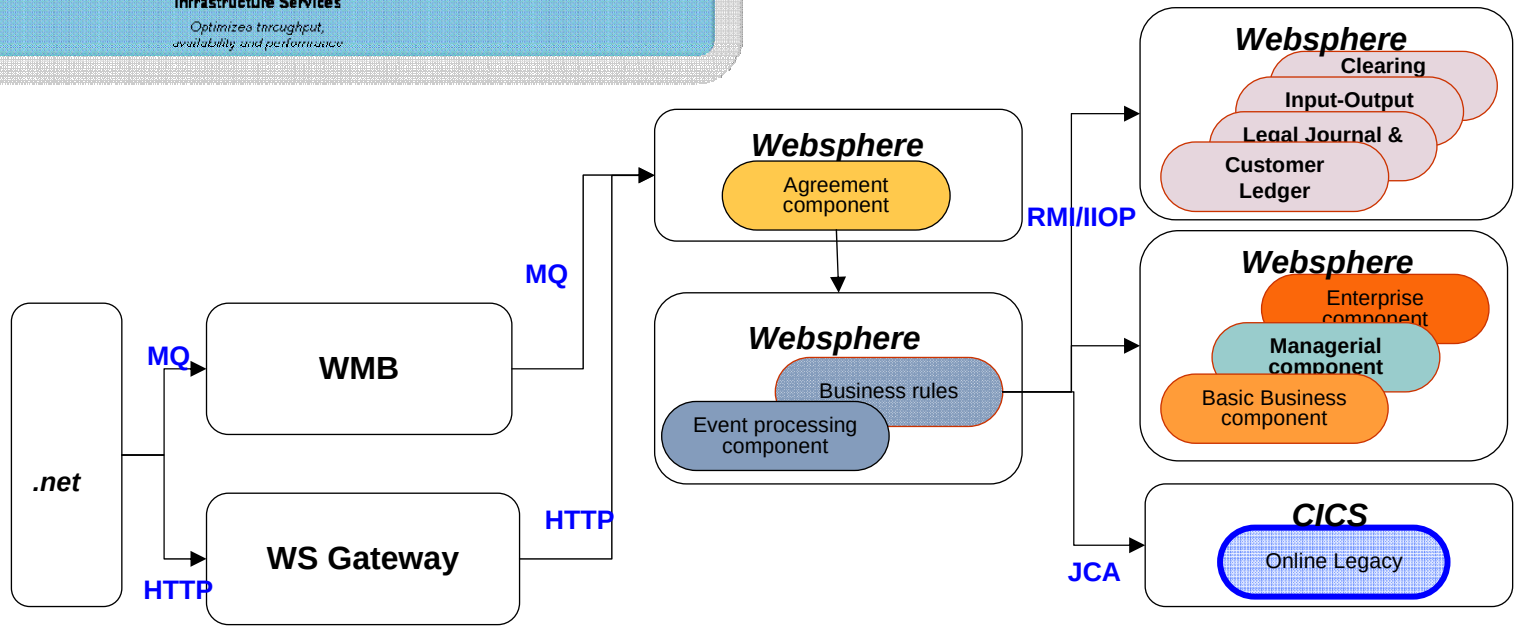
Step 3 : Product Mapping



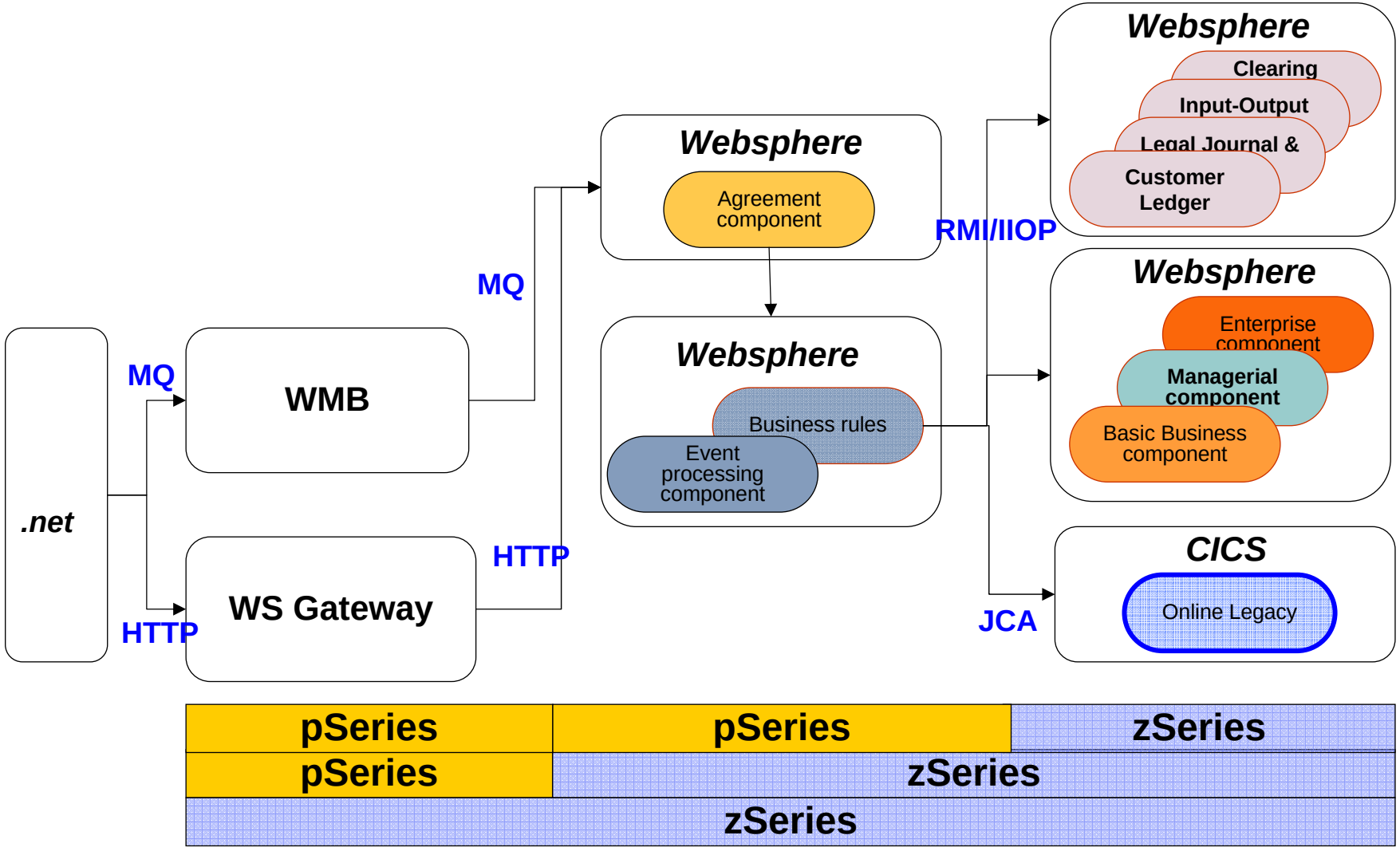
Step 4 : Apply pattern for logical model



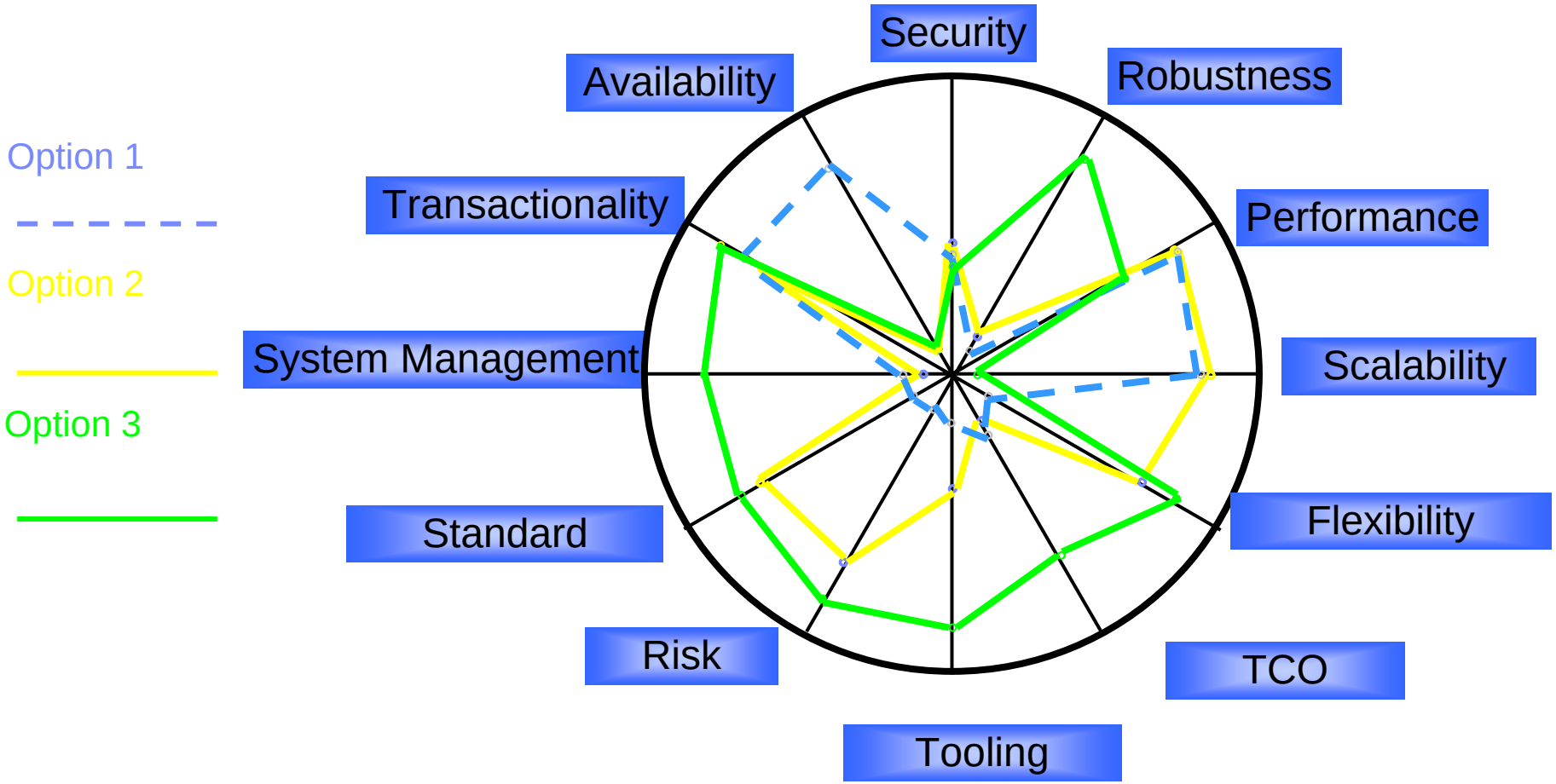




Step 5 : Evaluate Physical platforms



Customer criteria



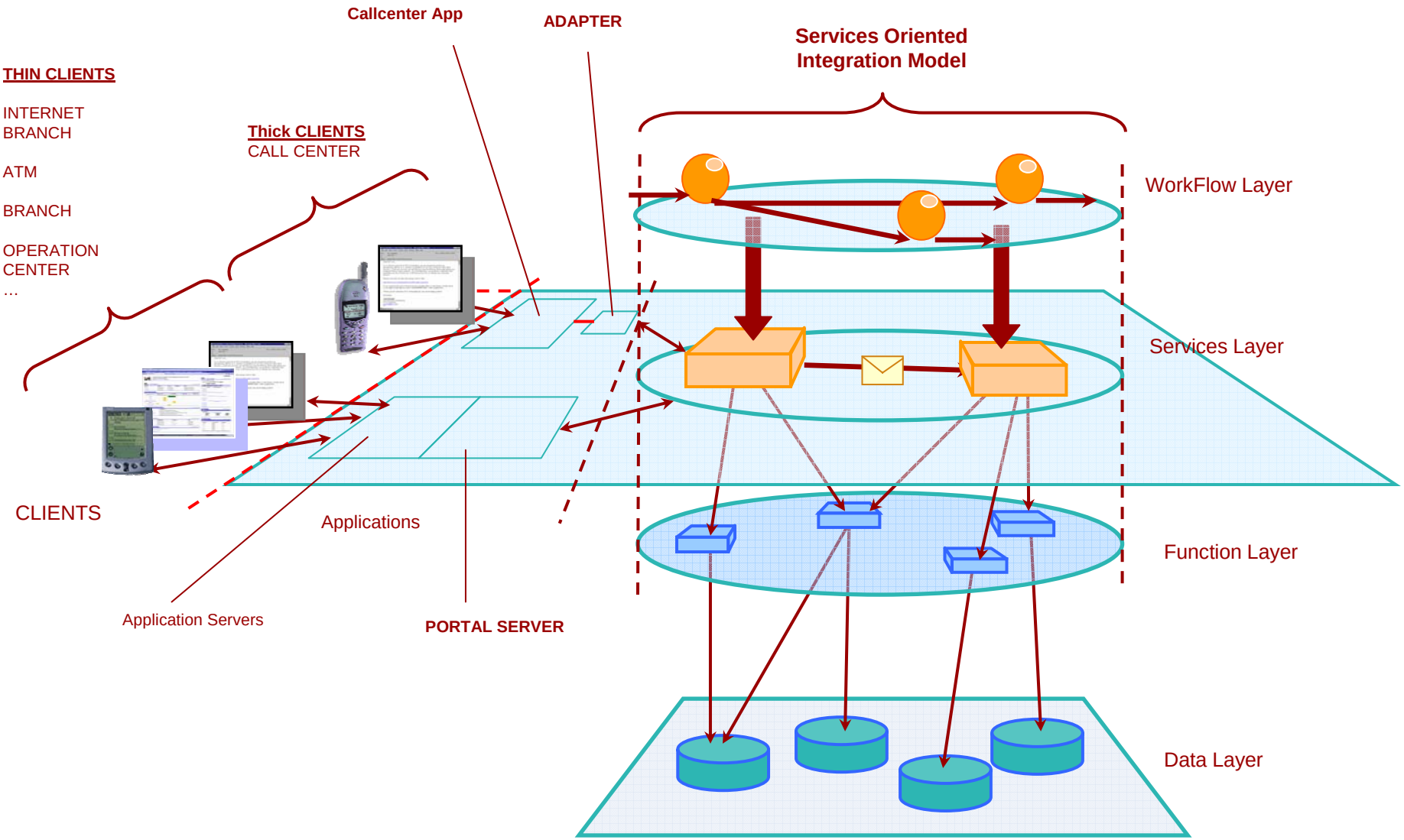
Agenda

- Overview on the design center approach for SOA infrastructure
- Methodology and patterns
- Customer design session
- Conclusion

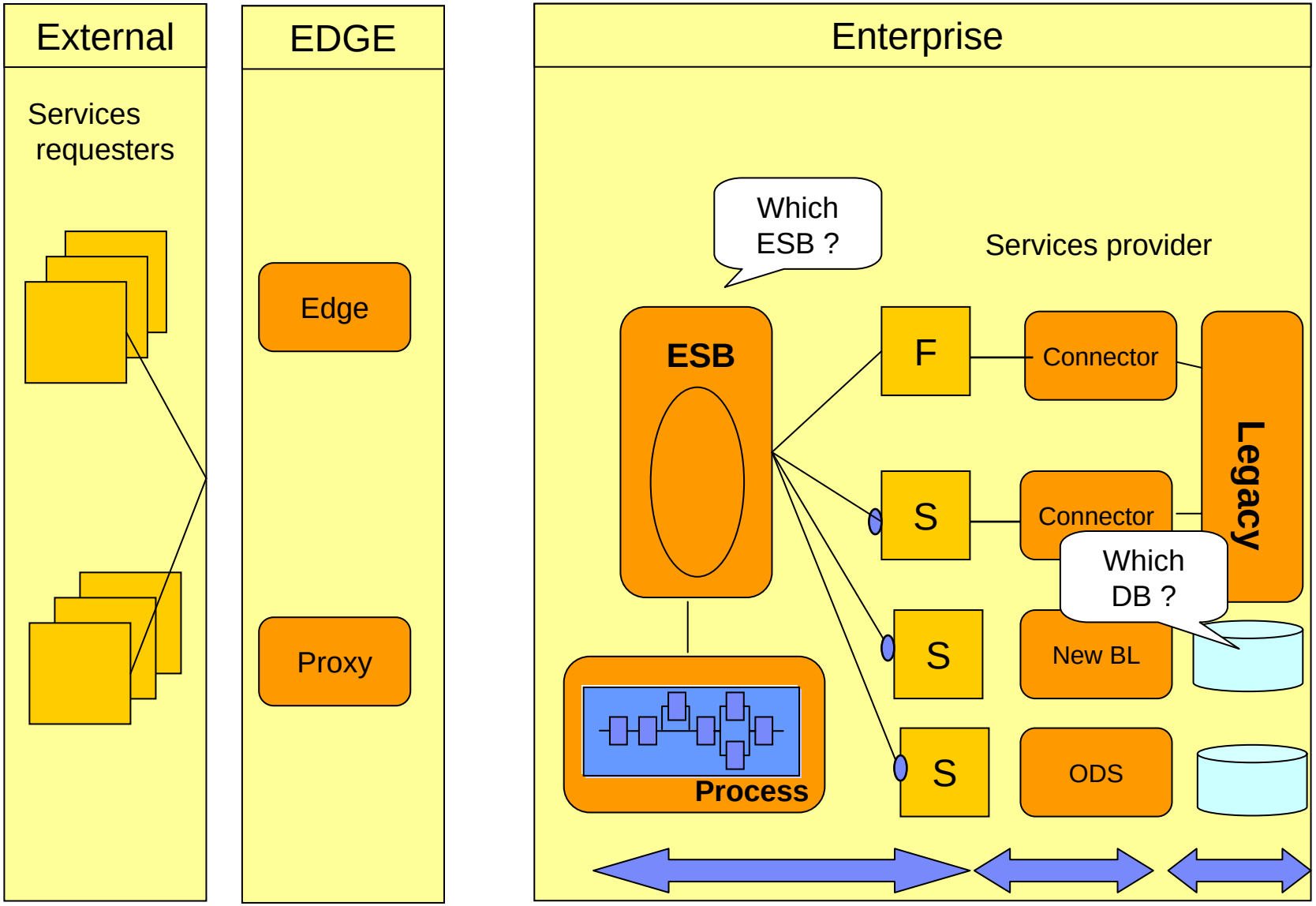
Customer Business Context

- Large bank in SPGIT running its core banking solution on IBM System z.
- Customer strategy was to :
  - Be the market leader and maintain position as the most preferred bank
  - Increase market share in corporate, commercial and retail business
  - Provide uninterrupted service to its customer
- To support these Business objectives, IT challenge was to have a flexible infrastructure which will respond to business requirements.
- Customer IT strategy was based on :
  - Core bank Renewal (Transformation)
  - Building an enterprise wide DW and Operational Data Model
  - Compliance with Basel II
  - SOA Architecture implementation
- System z platform was not seen as the preferred one.
  - Customer wanted to leave System z for its Core banking renewal mainly because of cost reason.

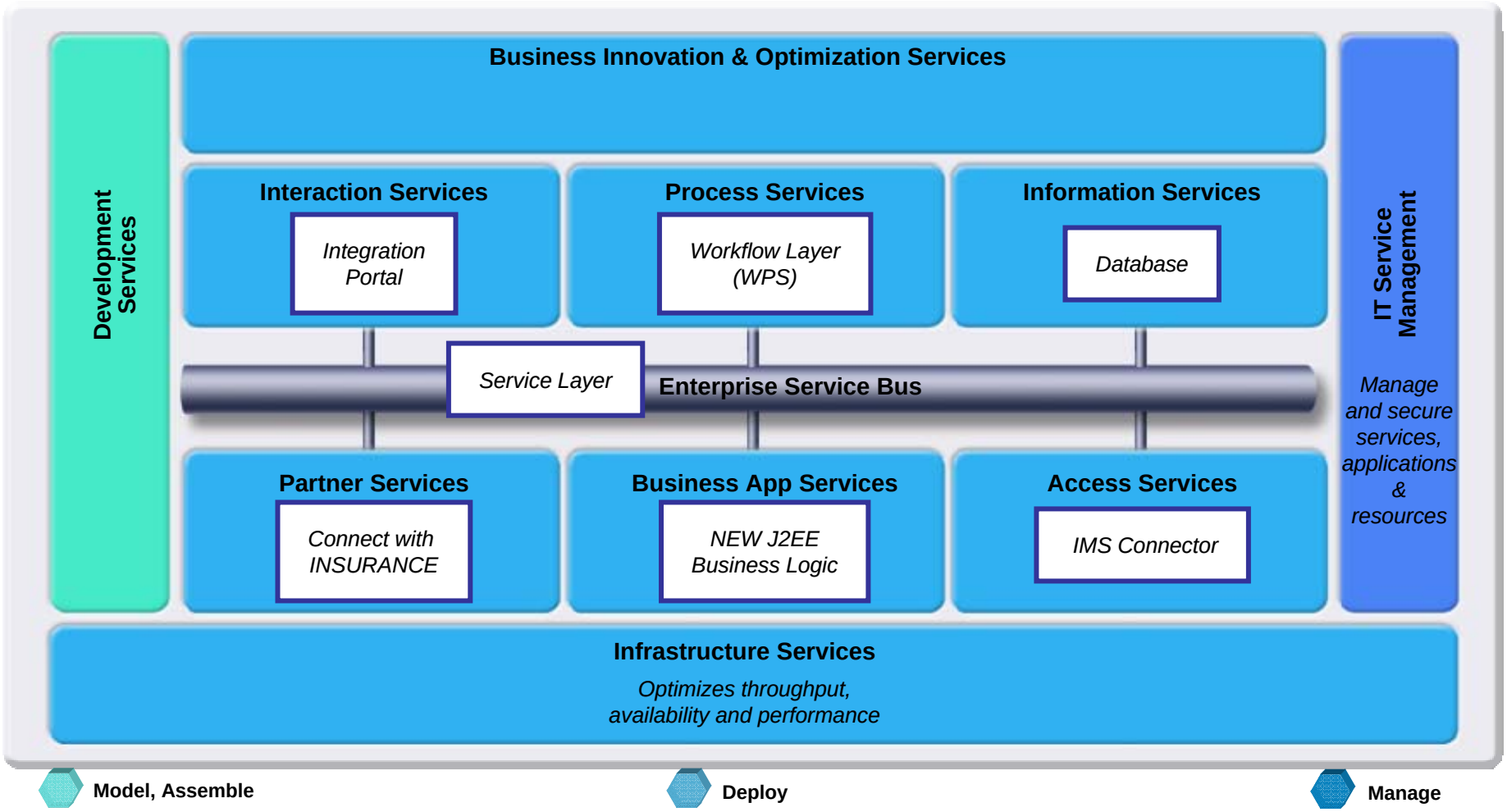
Architecture overview diagram



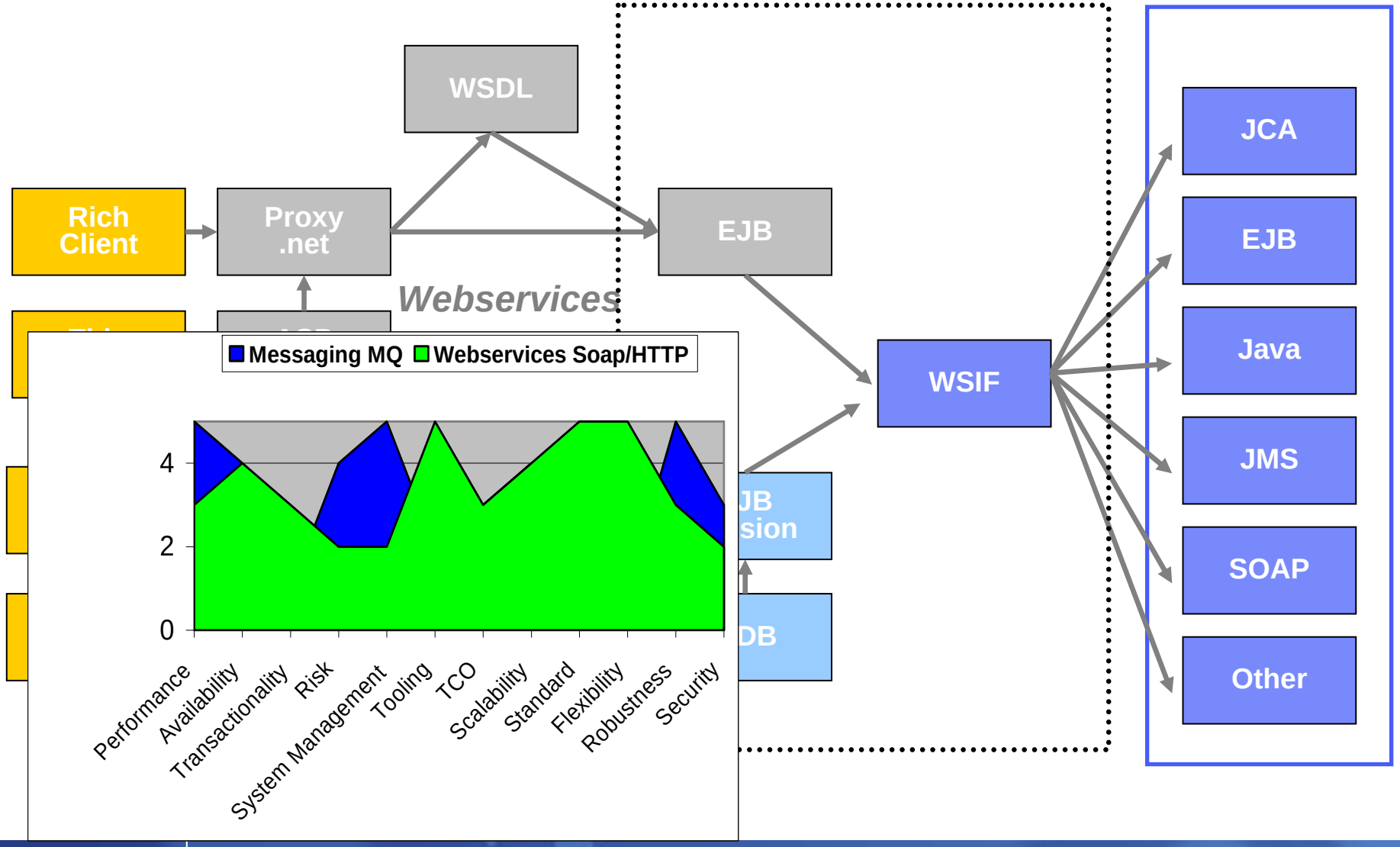
Customer challenges



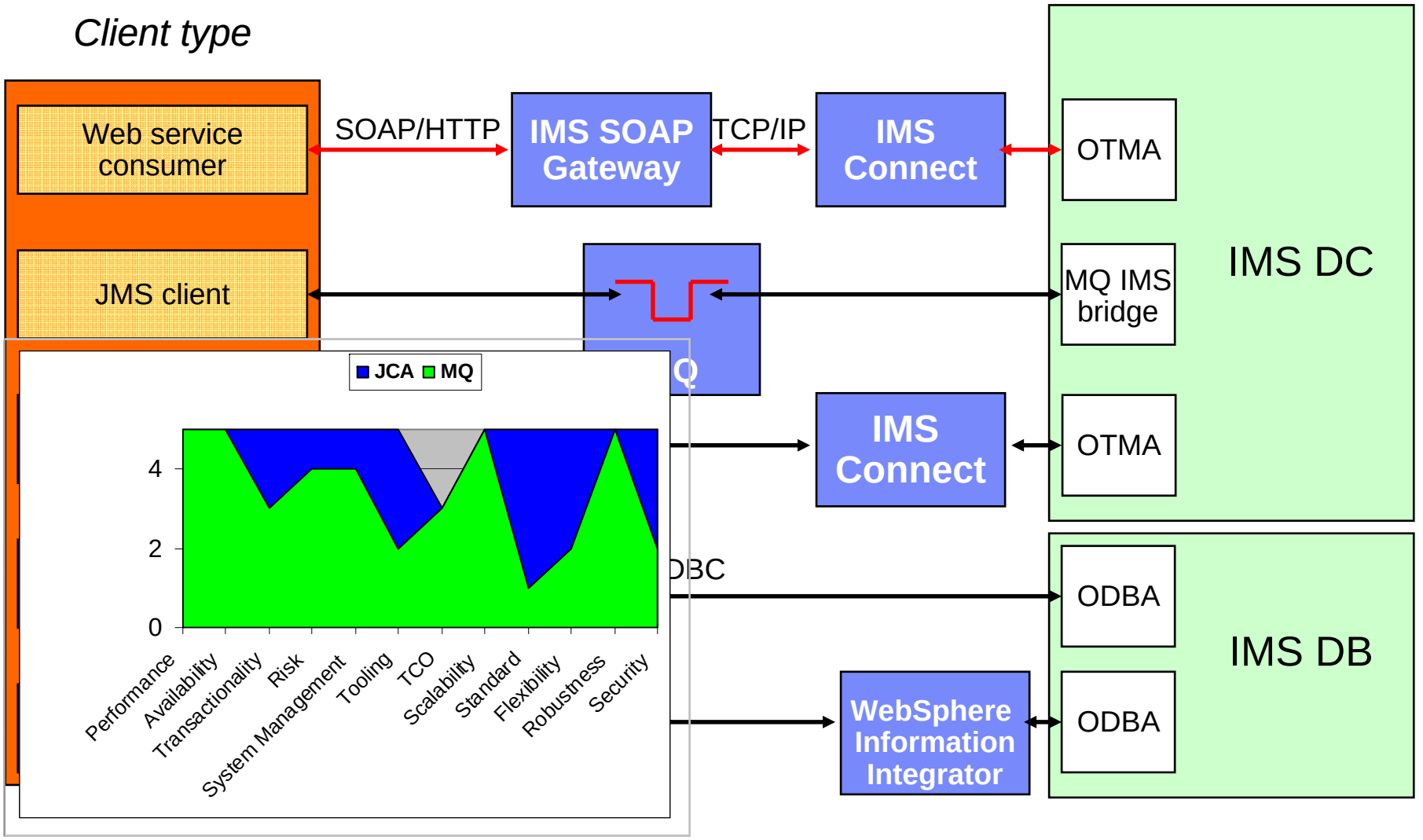
Step 1 : Map components to SOA reference



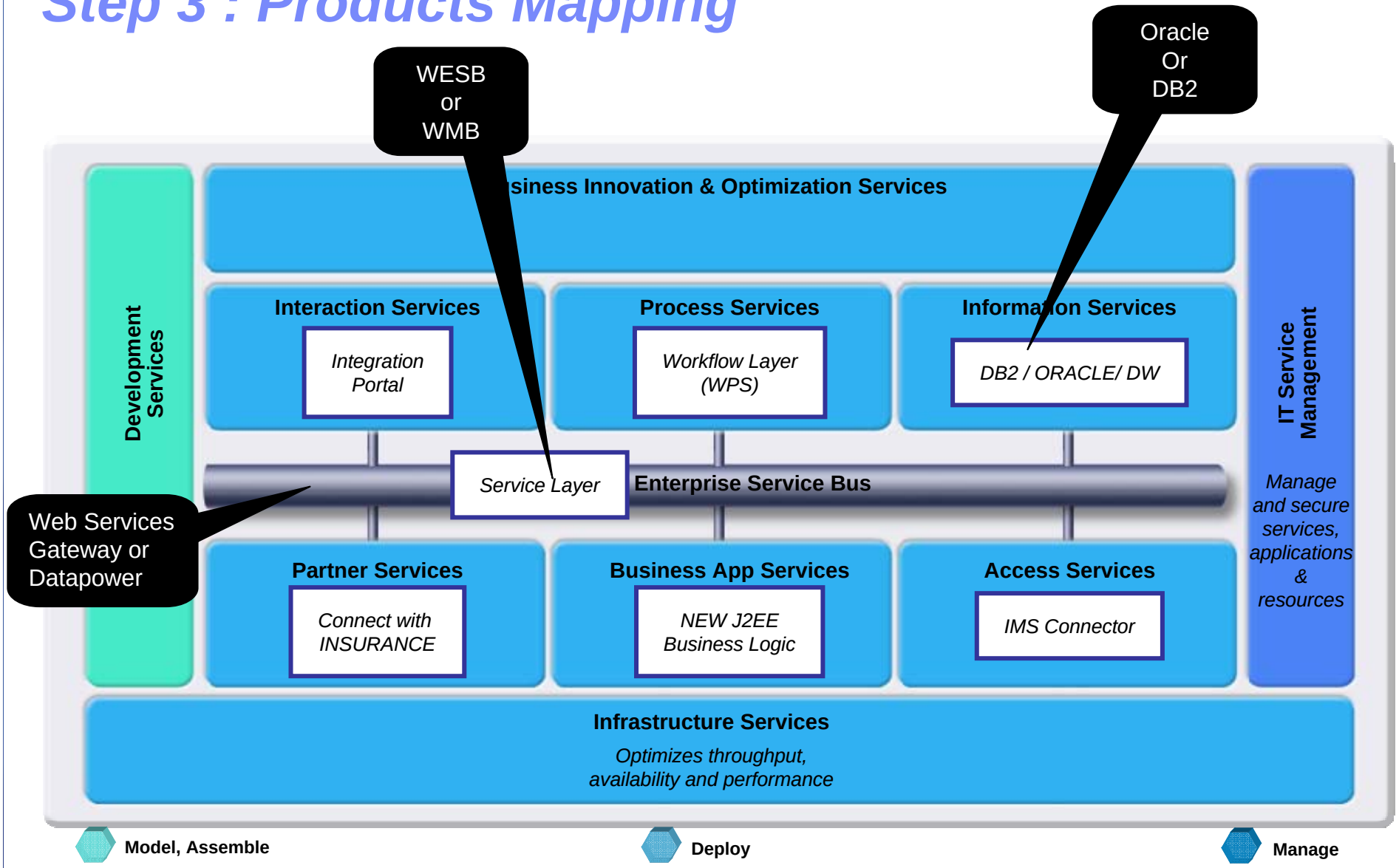
Step 2 : Architecture decisions for Integration
.NET integration option



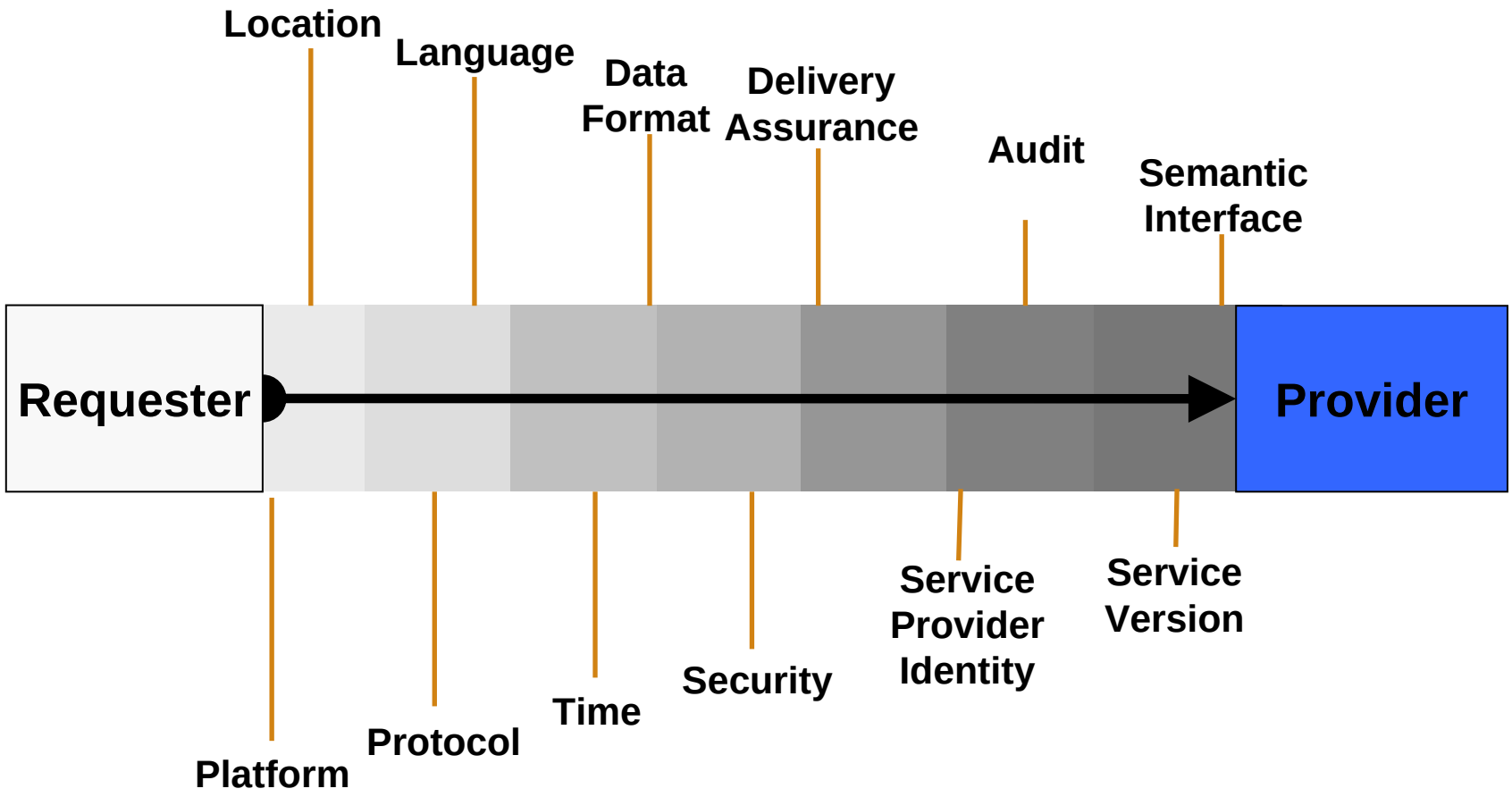
Step 2 : Architecture decisions for Integration
IMS Integration Options



Step 3 : Products Mapping



What product for ESB ?



- Communication
- Service interaction
- Security
- Management and autonomic

- Message Processing
- Service level
- Integration
- Quality of service

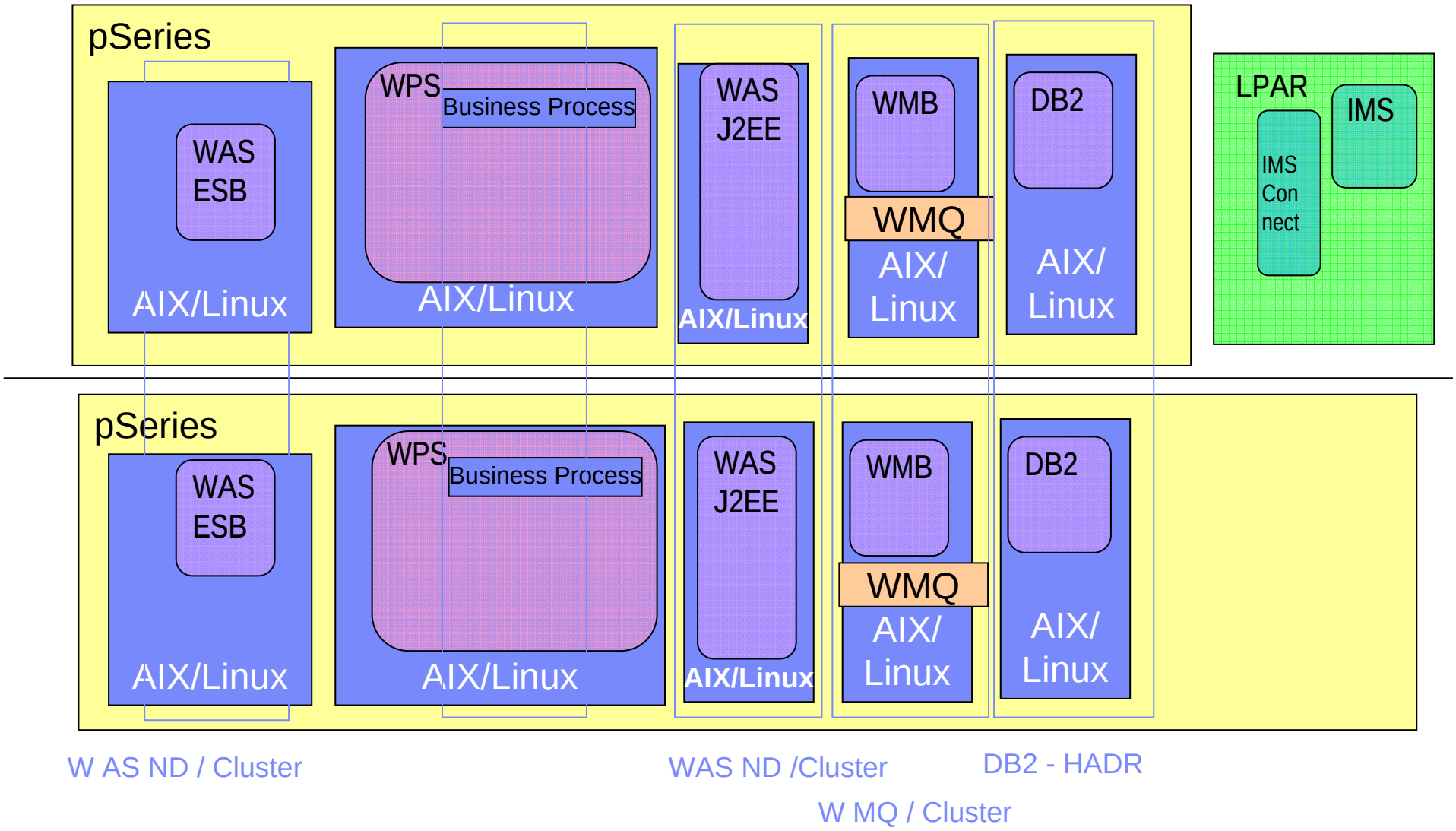
High level ESB product comparison

	WBI-MB V6	W-ESB V6.0.1	SIBus V6	WSGW V5.1	DataPower
Performance	High	Unknown	Medium	Medium-High	Very High
Mediation API	MB Nodes	W- ESB Mediations	SIBus Mediations JAX-RPC handlers	JAX-RPC handlers	XSLT
Programming Model	ESQL, JavaCompute node using XPath	SCA/Service Message Objects (= SDO plus msg headers)	SDO (SIBus schema and API) JAX-RPC/SAAJ	JAX-RPC/SAAJ	XSLT; flows
J2EE Support	No (basic Java only)	Yes	Yes	Yes	No
Mediation Tooling	Eclipse based	WebSphere Integration Developer 6.0.1	None (only testing in RAD)	None	Web UI for building flows; 3rd party Eclipse plugins for XSLT
Administration	WBI-MB	WAS	WAS	Standalone application	Standalone application
WS* support	No	Yes	Yes	Yes	Yes
JAX-RPC handlers	No	Yes	Yes	Yes	No
Adapter and host support	WBI Adapters, Native CICS, VSAM	WBI Adapters; WebSphere J2C Adapters(?)	none	none	XI50 supports COBOL copybooks and MQ
Legacy MQ Integration	Native	SIBus MQLink or JMS Provider	MQLink or JMS Provider	none	Yes (XI50)
MQ/JMS Support	Yes (native in V6)	Yes (MQ challenging)	Yes	SOAP/JMS only	Support for MQ, JMS only through MQ
Message Types natively supported	Universal (incl non-XML)	XML and SOAP	XML, SOAP, JMS (text and binary)	SOAP	SOAP, XML (XI50 supports any datatype)

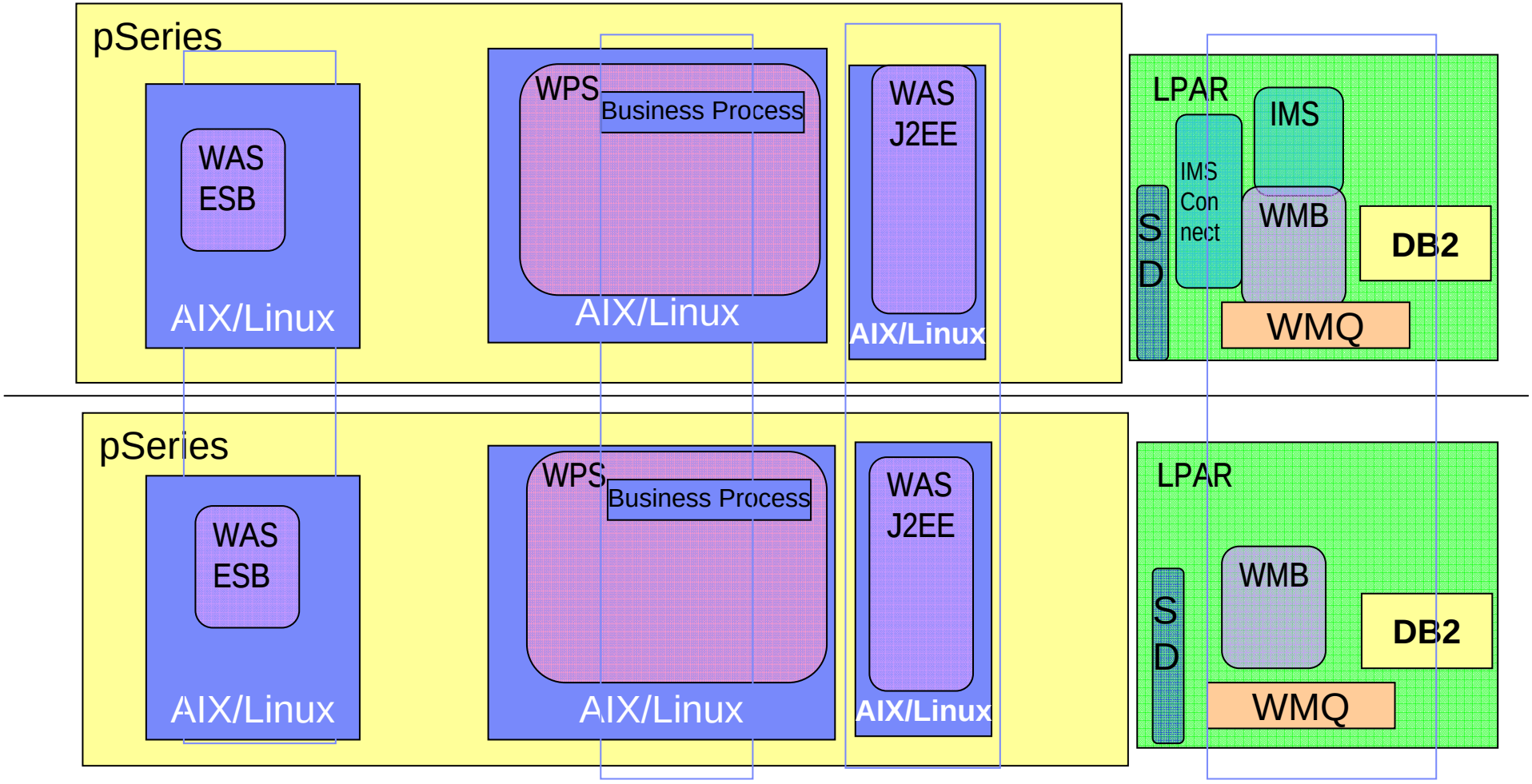
Step 4 : Evaluate Physical platforms

	ESB	WorkFlow	BL	Data
H10	p	p	p	p (Oracle)
H11	p	p	p	p (UDB)
H22	p	p	p	z/OS (DB2)
H30	z/Linux	z/Linux	z/Linux	z/Linux (Oracle)
H31	z/Linux	z/Linux	z/Linux	z/OS (DB2)
H41	z/OS	z/OS	z/OS	z/OS (DB2)
H50	x	x	x	p (Oracle
H51	x	x	x	p (UDB)
H52	x	x	x	z/OS (DB2)

H11 Topology – pSeries / DB2



H22 Topology – pSeries/zSeries

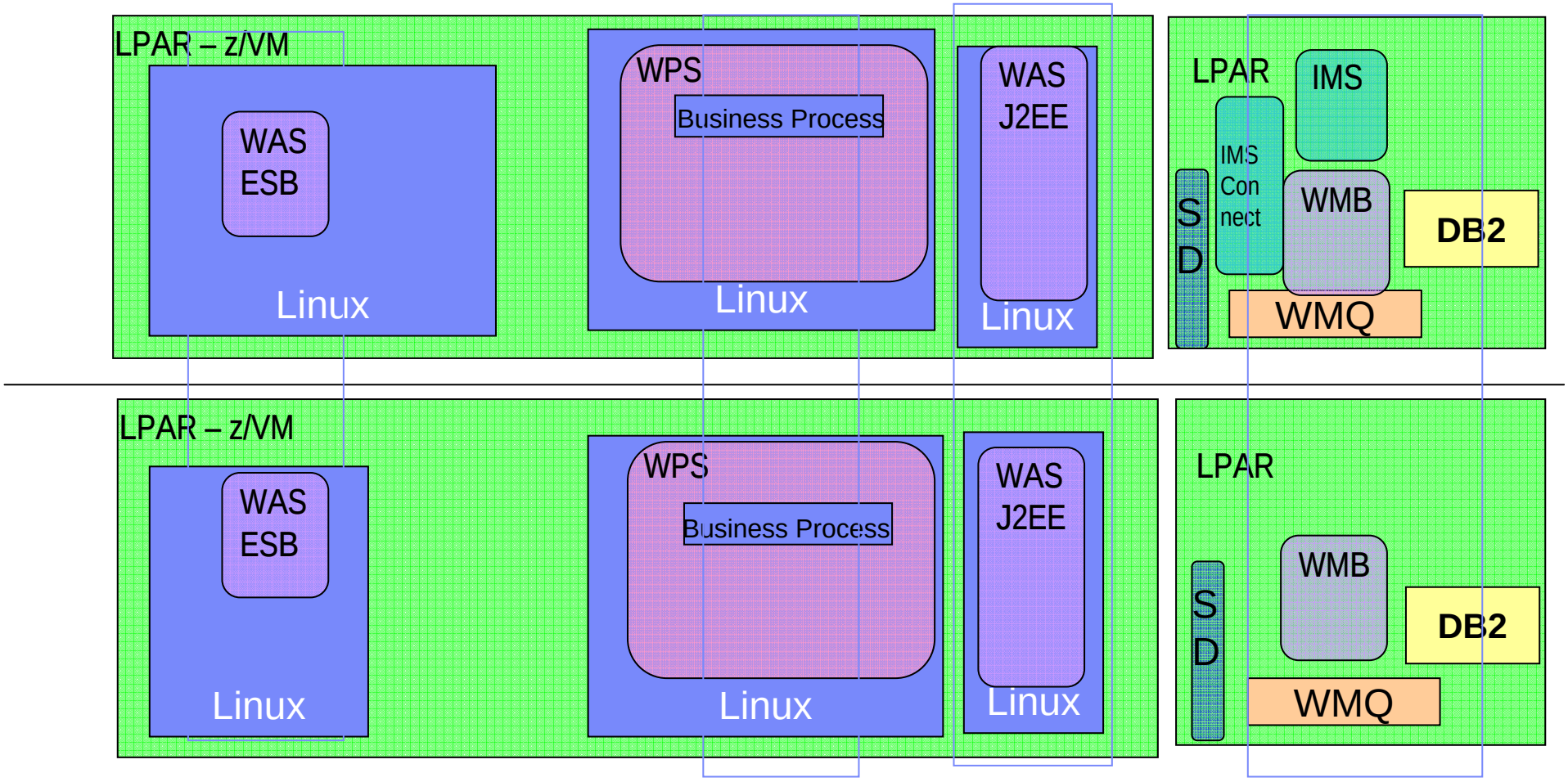


W AS ND / Cluster

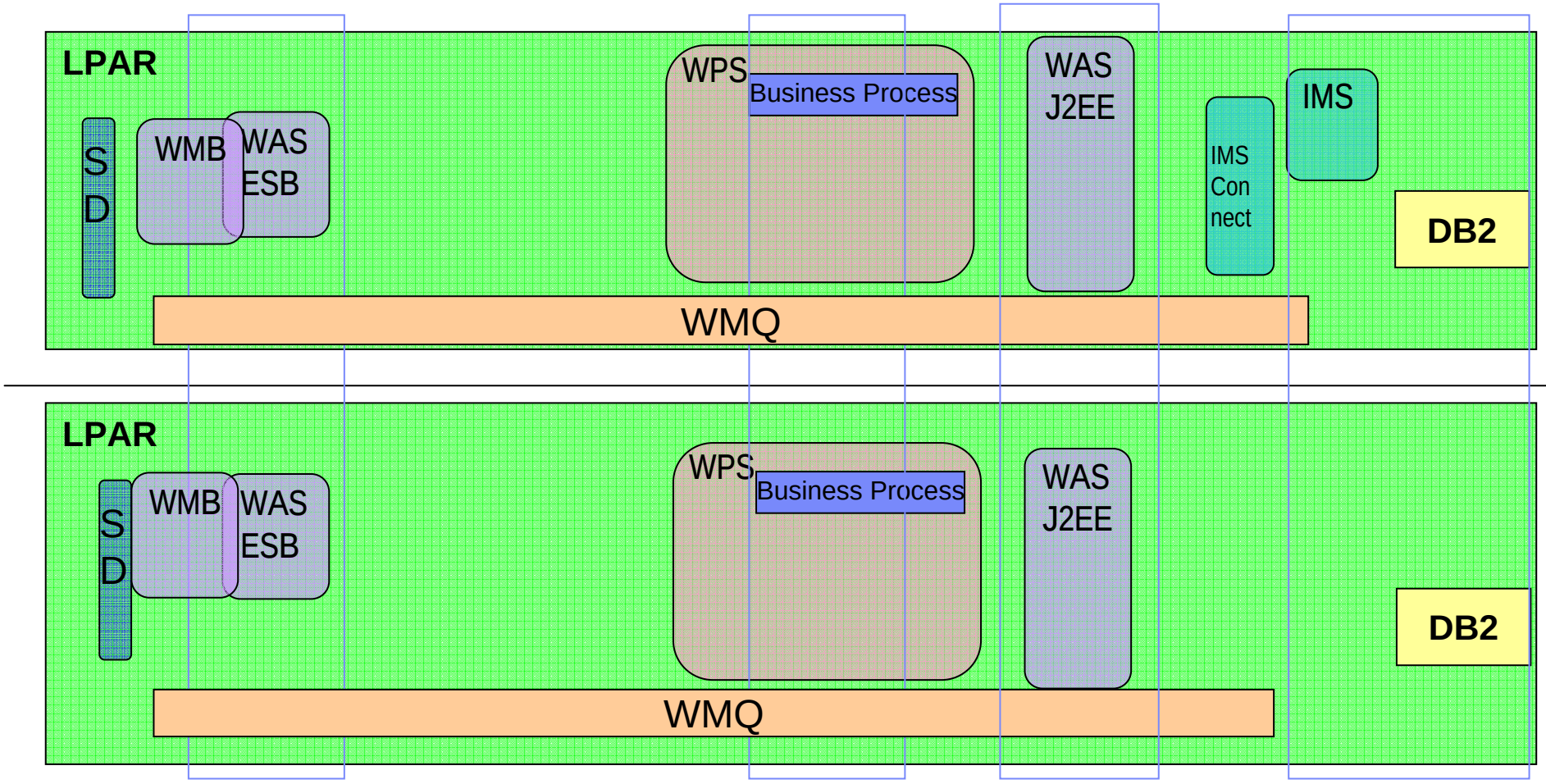
WAS ND /Cluster

DB2 Data Sharing
WMQ cluster (shared queue)

H31 Topology – IBM System z (z/OS + Linux)



H41 Topology - IBM System z (z/OS)



The main Non Functional Requirements to consider

- Business Continuity
- System management
- Flexibility
- Performance & Scalability
- Quality of Service
- Security
- Transactionality

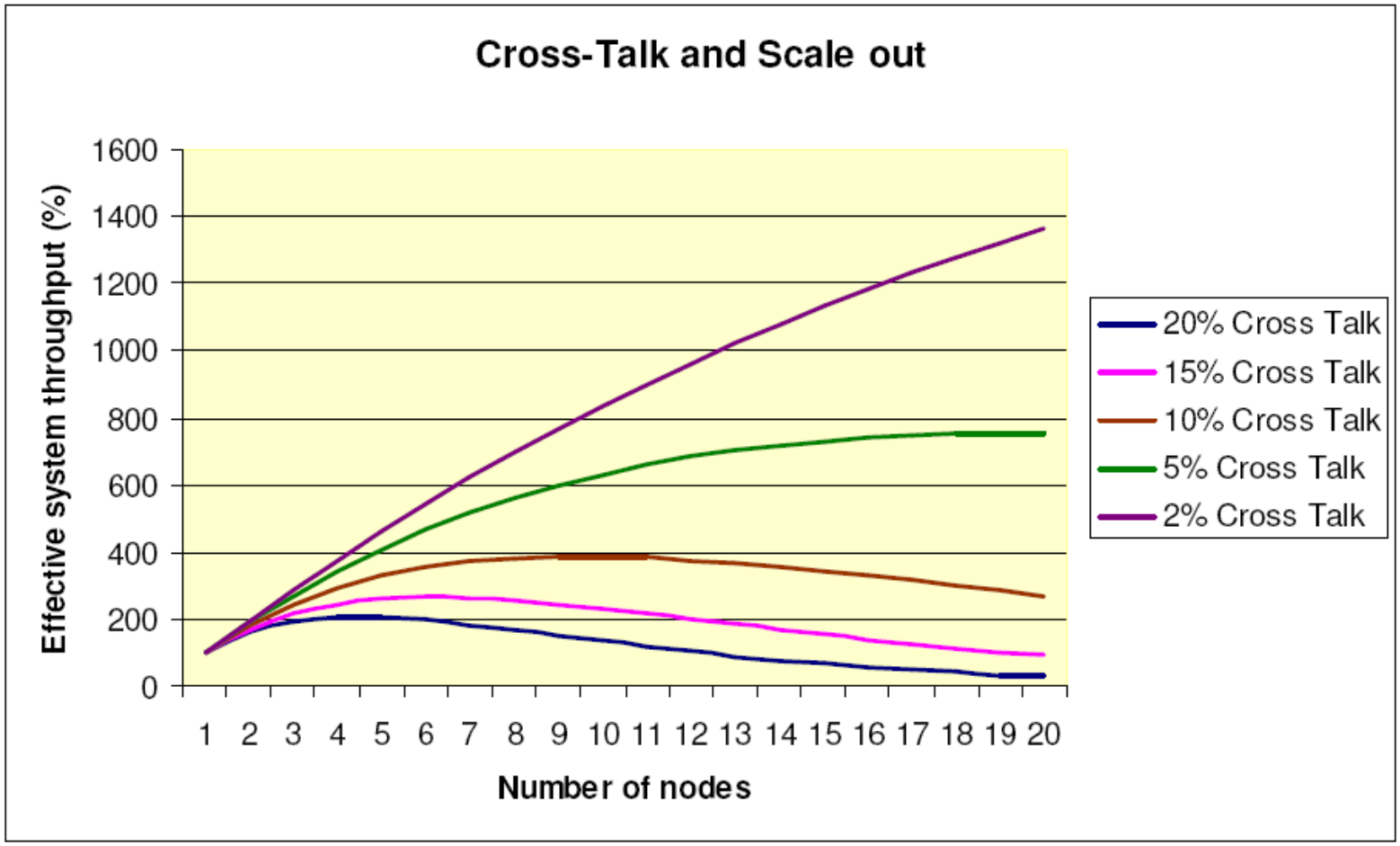
Business Continuity

- Definitions
  - **High-availability** - Designed to provide service during defined periods, at acceptable or agreed upon levels, and masks unplanned outages from end-users. It employs Fault Tolerance; Automated Failure Detection, Recovery, Bypass Reconfiguration.
  - **Continuous Operations** - Designed to continuously operate and mask planned outages from end-users. It employs non-disruptive hardware and software changes, non-disruptive configuration, and software coexistence.
  - **Disaster Recovery** - The ability to recover a datacenter at a different site, on different hardware, if a disaster destroys the primary site or renders it inoperable.
- Points to be considered
  - Unplanned outage
  - Planned outage
  - Load balancing capabilities
  - Disaster recovery capabilities

Unplanned outage

	z/OS IBM Sytem z	Linux z IBM System z	pSeries
Server reliability	99.999% (++) MTBF in decades	99.999% (++) MTBF in decades	+ Less than z
Cluster Technology	Parallel Sysplex (data sharing)	▪Linux Virtual Server and Linux-HA ▪Applicative cluster (Oracle RAC…)	▪AIX Cluster 1600 ▪Linux Virtual Server and Linux-HA ▪Applicative cluster (Oracle RAC…)
Cluster Performance ▪Coupling factor	See perf. result	See perf. Result	See perf. result
Cluster recovery management ▪Ability to detect failure ▪Ability to initiate recovery ▪Ability to take over responsibility for failed member	▪Policy driven (SFM) ▪Policy driven (ARM) ▪WebSphere HA	Heartbeat WebSphere HA	Heartbeat WebSphere HA
Cluster resources management ▪Preferred workload protection when running on degraded configuration ▪Need oversized resources	WLM / IRD WAS XD No	VM RM / “limited” IRD WAS XD No (Depends on the configuration)	EWLM WAS XD Yes
Cluster management	See system management topic	See system management topic	See system management topic
Data recovery	Hyperswap manager	Hyperswap manager	

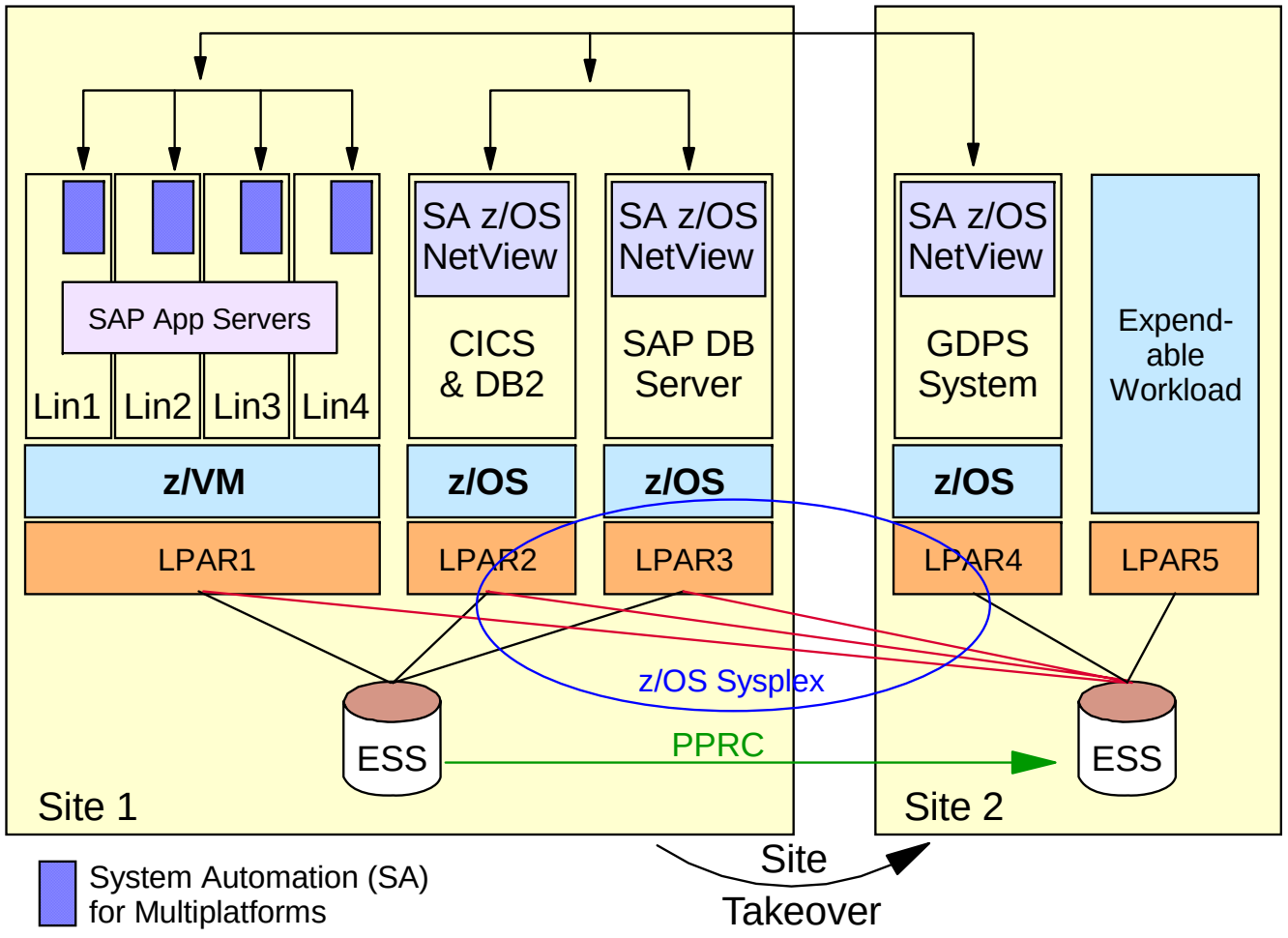
Cluster scalability projection



Disaster Recovery

	z/OS IBM Sytem z	Linux z IBM System z	pSeries
Single Site Continuous Availability for the data	**Continuous availability of data Parallel Sysplex GDPS/PPRC Hyperswap Manager**	**Continuous availability of data GDPS/PPRC Hyperswap Manager**	**HACMP**
Two Site – Metropolitan distance	**Disk mirroring GDPS/PPRC Hyperswap Manager**	**Disk mirroring GDPS/PPRC Hyperswap Manager**	**Disk mirroring GDPS/PPRC**
Two Site – Unlimited distance	**Disk mirroring GDPS/XRC Global Mirror**	**Disk mirroring Global Mirror**	**Disk mirroring Global Mirror**

GDPS™/PPRC Multiplatform Resiliency for System z



- Designed for customers with distributed applications
- SAP application server running on Linux for zSeries
- SAP DB server running on z/OS
- Coordinated near-continuous availability and DR solution for z/OS, Linux guests, and z/VM
- Uses z/VM HyperSwap function to switch to secondary disks
- Sysplex support allows for site recovery

Flexibility

- Definition
  - Increase or decrease the system capabilities as the requirements change.

- Points to be considered
  - Server partitioning capabilities
  - On demand hardware capacity upgrade
  - Deployment services
    - Roll-out & Install of new OS and Servers
    - Software Distribution / sharing
  - Multi-environment support capabilities

Flexibility

	z/OS IBM Sytem z	Linux z IBM System z	pSeries
Server partitioning capability	LPAR (PRSM)	▪LPAR (PRSM) ▪z/VM	DLPAR MicroPartitioning
On demand hardware capacity upgrade	zSeries capacity On Demand	zSeries capacity On Demand	pSeries capacity On Demand
Install of new OS and Servers	▪msys for setup	▪Guests cloning capabilities using z/VM (See Demo) ▪Tivoli Provisioning Manager ▪IBM Director	▪NIM cloning ▪Tivoli Provisioning Manager ▪IBM Director
Software distribution/sharing	Share everything	▪Minidisk sharing ▪IBM Director	▪IBM Director
Multi-environment support capability (Prod, Integration, Test, Dev…)	Yes	Yes	Yes

Transactionality

- Definition
  - Transactionality is defined as system's ability to deliver application functionality in a predictable and reliable manner. The main transactionality requirement is based on the principle that no transaction failure shall result in irrecoverable data loss.
- Points to be considered
  - Possibility of building applications with two-phase commit transaction processing.
  - Support standard specifications (J2EE, WS…)

Transactionality

	z/OS IBM Sytem z	Linux z IBM System z	pSeries
Support standard specifications	Yes + RRS optimization	Yes	Yes

- J2EE 1.4 Specifications
  - Component-level transaction model (EJB 2.1,…)
- System-level transaction model (JCA V1.5)
  - JTA XAResource-based transaction management
  - J2EE server and R.A implement XAResource interface
  - Oracle/DB2/CICS support 1 or 2PC in their XAResource implementations
- CORBA Transaction Service
  - JTS API uses IIOP protocol for transaction propagation between servers
- Web Services Transaction Standards
  - Web Service Coordination – WS Transaction
  - Web Service Atomic Transaction – WS Business Activity

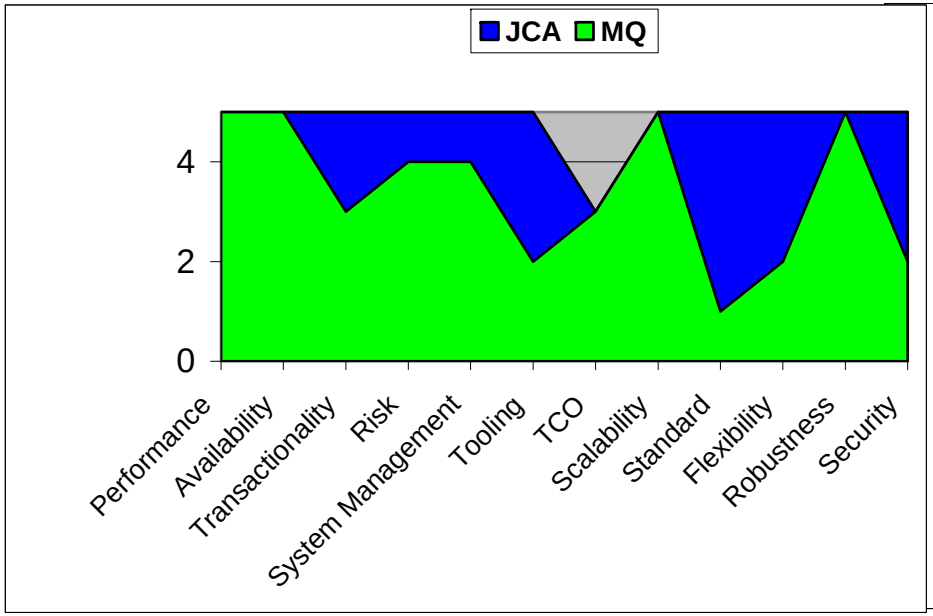
Topology rating

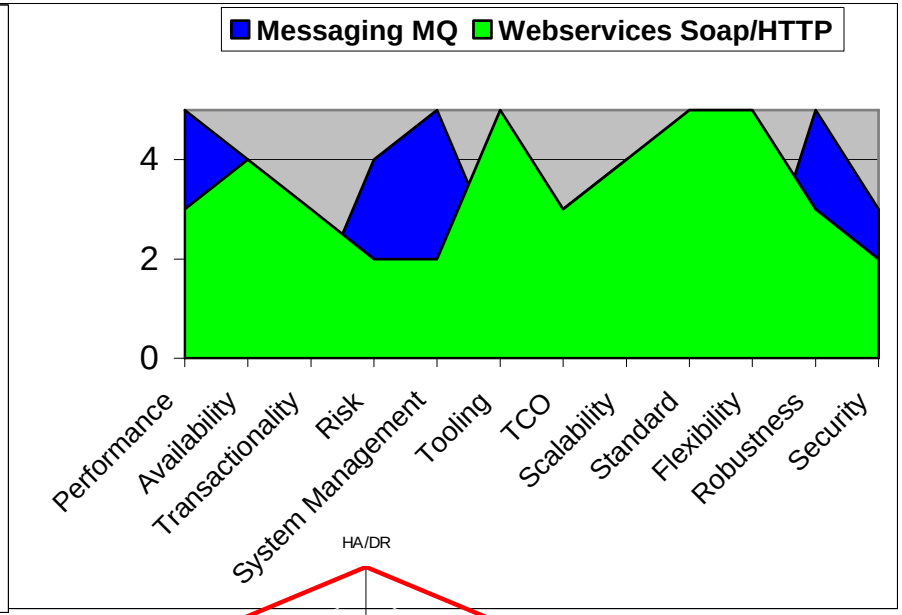
	HA/DR	Transact.	System Mngt	Flexibility	Perf.	Scalability	QoS	Security
H10	* *	* * * *	* * * *	* * *	* * *	* * *	* * *	* * *
H11	* *	* * * *	* * * *	* * *	* * *	* *	* *	* *
H22	* * * *	* * *	* * * *	* * *	* * * * *	* * * * *	* * *	* * * *
H30	* *	* * * *	* * * *	* * * * *	* * *	* * * *	* * *	* * *
H31	* * * *	* * * *	* * * *	* * * * *	* * * *	* * * * *	* * * *	* * * *
H41	* * * * *	* * * * *	* * * * *	* * * *	* * * *	* * * * *	* * * * *	* * * * *
H50	*	* *	* *	* * * (VMWARE)	* *	* * *	* *	* *
H51	*	* *	* *	* * * (VMWARE)	* *	* *	*	*
H52	* * *	* *	* * *	* *	* * *	* * * *	* * *	* * *

Agenda

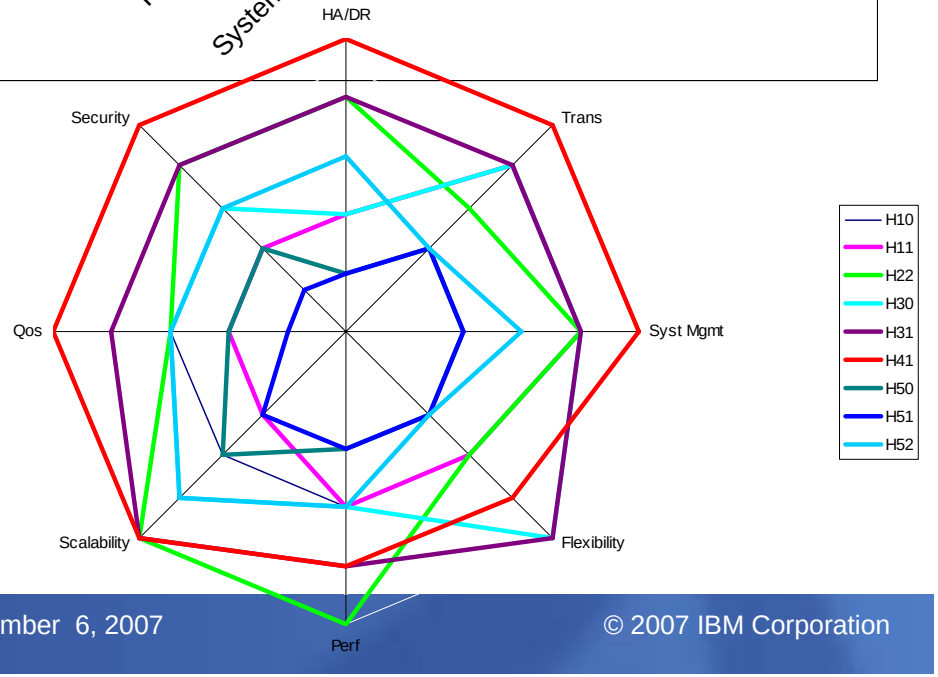
- Overview on the design center approach for SOA infrastructure
- Methodology and patterns
- Customer design session
- Conclusion

The Infrastructure Design Workshop Outcomes





	ESB	WorkFlow	BL	Data
H10	p	p	p	P (Oracle)
H11	p	p	p	P (UDB)
H22	p	p	p	z/OS (DB2)
H30	z/Linux	z/Linux	z/Linux	z/Linux (Oracle)
H31	z/Linux	z/Linux	z/Linux	z/OS (DB2)
H41	z/OS	z/OS	z/OS	z/OS (DB2)
H50	x	x	x	P (Oracle)
H51	X	X	X	P(UDB)
H52	x	X	X	Z/OS(DB2)



The Infrastructure Design Workshop next steps

- A “TCO” Study has been asked by customer CIO with the following topologies
  - H11
  - H22
  - H31
  - H42
- A 1-week ITICA study has been run at customer site.
- Following the Infrastructure Design Workshop and ITICA study, customer decided to keep IBM System z for its core banking solution renewal

	ESB	WorkFlow	BL	Data
H10	p	p	p	P (Oracle)
H11	p	p	p	P (UDB)
H22	p	p	p	z/OS (DB2)
H30	z/Linux	z/Linux	z/Linux	z/Linux (Oracle)
H31	z/Linux	z/Linux	z/Linux	z/OS (DB2)
H41	z/OS	z/OS	z/OS	z/OS (DB2)
H50	x	x	x	P (Oracle)
H51	X	X	X	P(UDB)
H52	x	X	X	Z/OS(DB2)

ITICA – IT Infrastructure Cost Analysis

Conclusion / Wrap-up

- At this end of the session you should understand :
  - How the design center can help you
  - The proposed approach to build the SOA infrastructure
  - The value for you and for your customer
- This is for your customer and for you, don’t hesitate !!
- Contact PSSC team :
  - Françoise Alabiso, Yann Kindelberger

End Of Presentation

Thank You
United Kingdom

Obrigado
Portugal

Dziekuje
Poland

Dankschen
Austria

Thanks
United States

Takk
Norway

Toda
Israel

Gracias
Spain

Danke
Germany

Bedankt
Netherlands

Tak
Denmark

Dekuju
Czech Republic

Merci
France

Engraziel
Switzerland

Tesekkür ederim
Turkey

Tack
Sweden

Dank u
Belgium

Thank You
United Kingdom

Grazie
Italy

Jag tackar
Finland

Dakujem
Slovakia

Спасибо
Russia

Trademarks

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries. For a complete list of IBM Trademarks, see www.ibm.com/legal/copytrade.shtml: AS/400, DBE, e-business logo, ESCO, eServer, FICON, IBM, IBM Logo, iSeries, MVS, OS/390, pSeries, RS/6000, S/30, VM/ESA, VSE/ESA, Websphere, xSeries, z/OS, zSeries, z/VM

The following are trademarks or registered trademarks of other companies

Lotus, Notes, and Domino are trademarks or registered trademarks of Lotus Development Corporation
Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries
LINUX is a registered trademark of Linux Torvalds
UNIX is a registered trademark of The Open Group in the United States and other countries.
Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.
SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.
Intel is a registered trademark of Intel Corporation
* All other products may be trademarks or registered trademarks of their respective companies.

NOTES:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

References in this document to IBM products or services do not imply that IBM intends to make them available in every country.

Any proposed use of claims in this presentation outside of the United States must be reviewed by local IBM country counsel prior to such use.

The information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.