



KIV/SI

Přednáška č.7

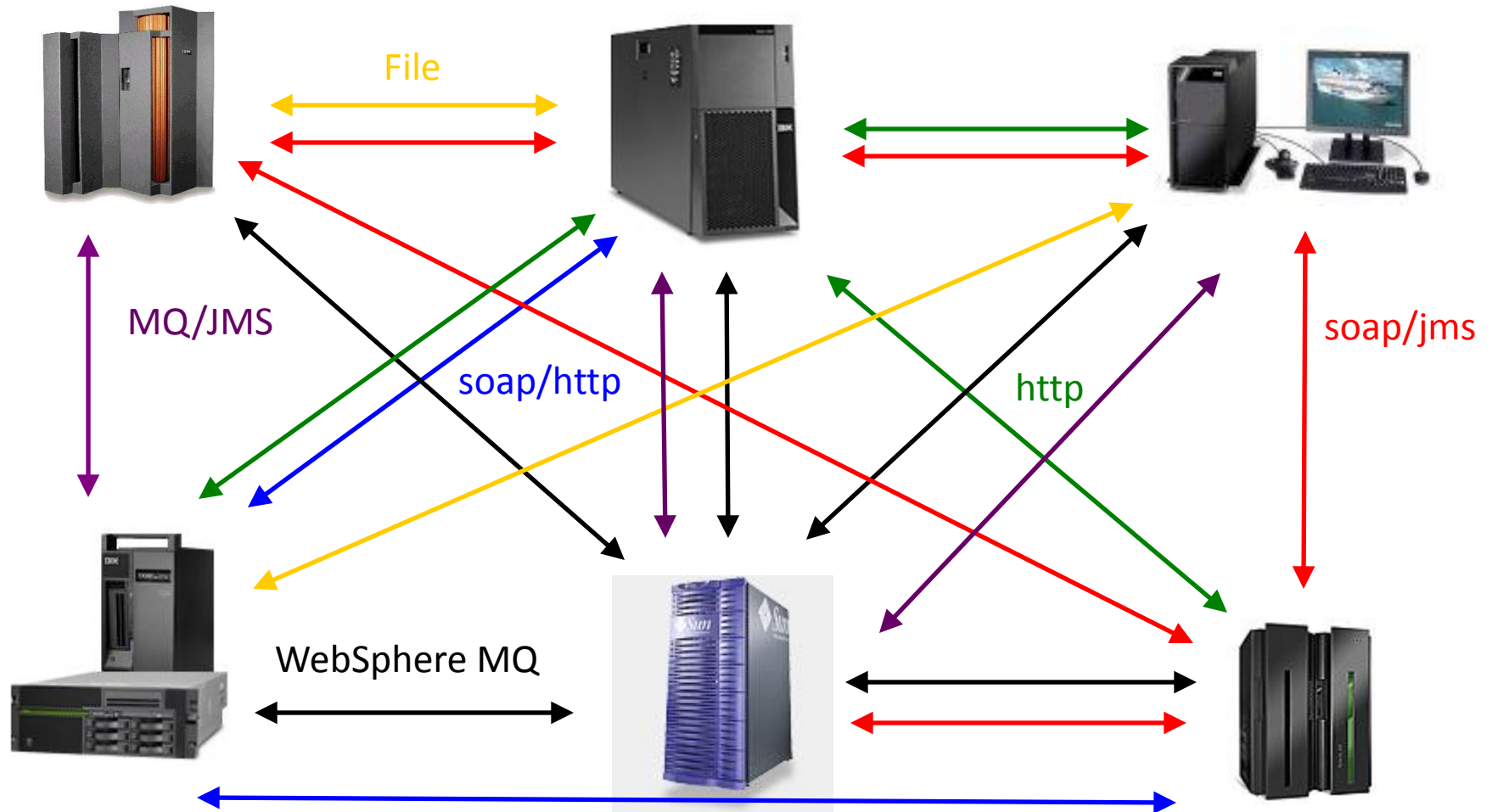
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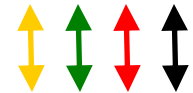
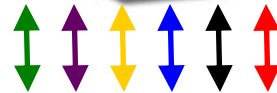
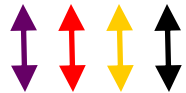
8.4.2013

Koncept Enterprise Service Bus (ESB)

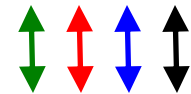
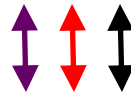


Myšlenka konceptu Sběrnice služeb – ESB





Enterprise Service Bus



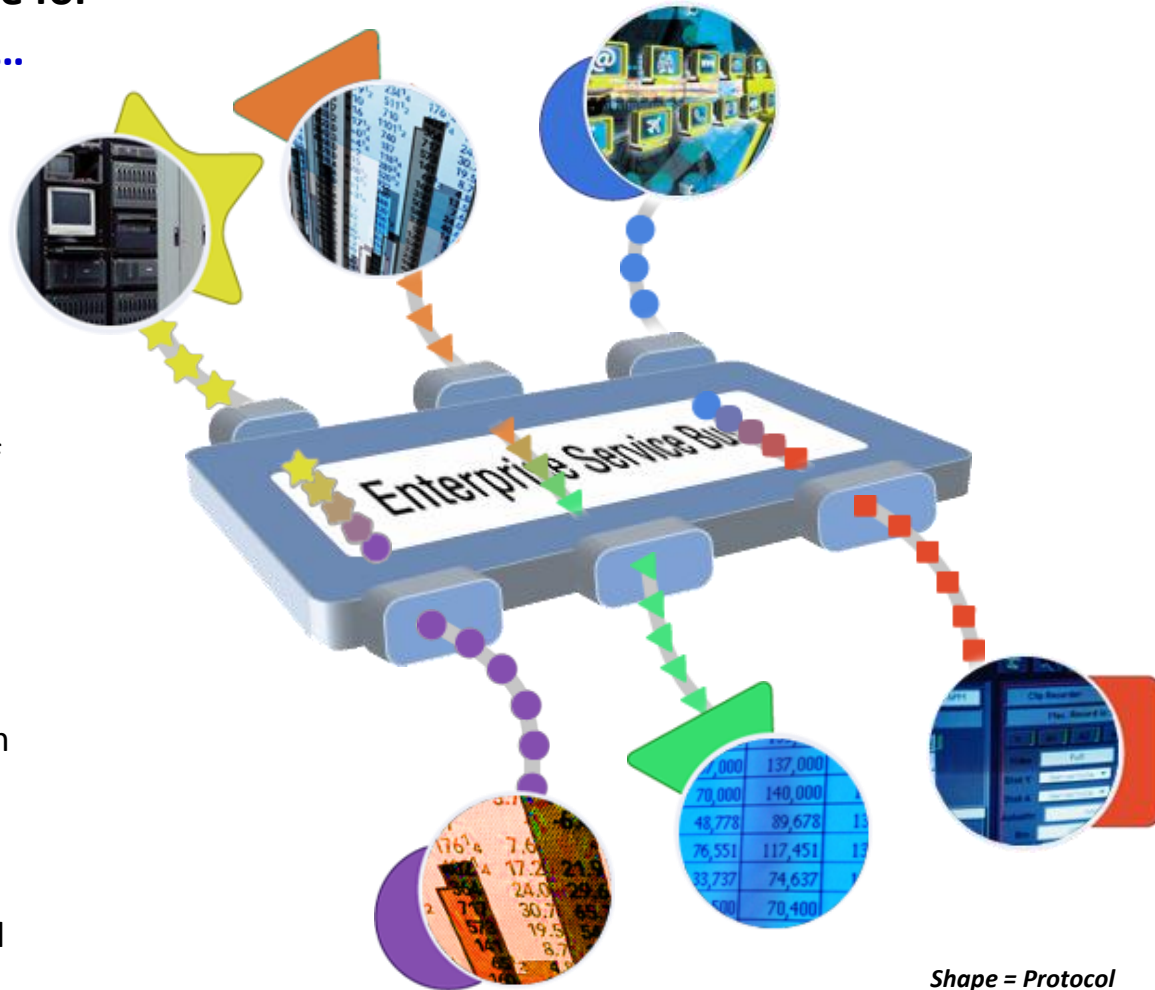
What is an Enterprise Service Bus (ESB)?

A flexible connectivity infrastructure for integrating applications **as services...**

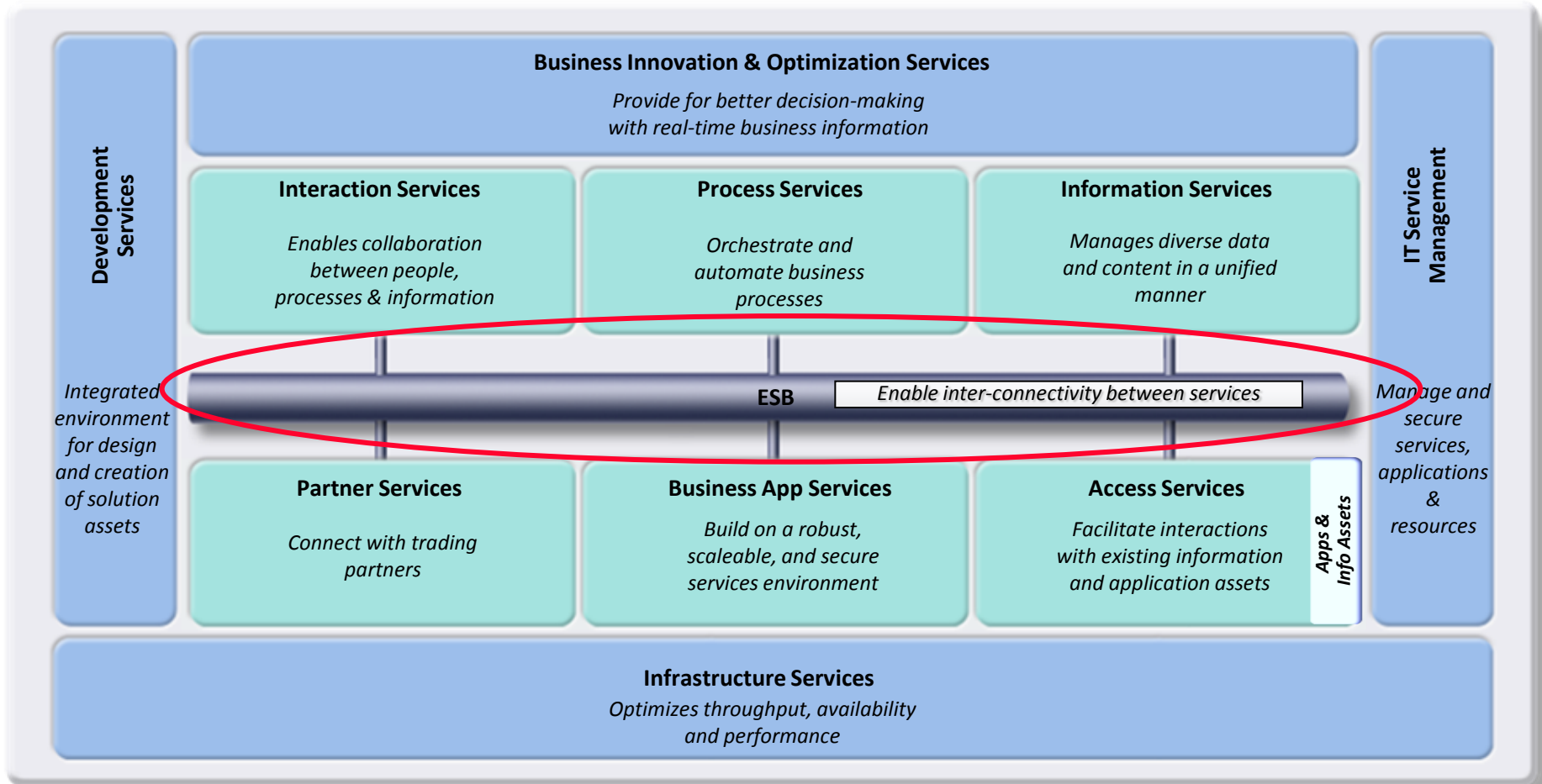
.....which reduces the number, size, and complexity of interfaces.

An ESB:

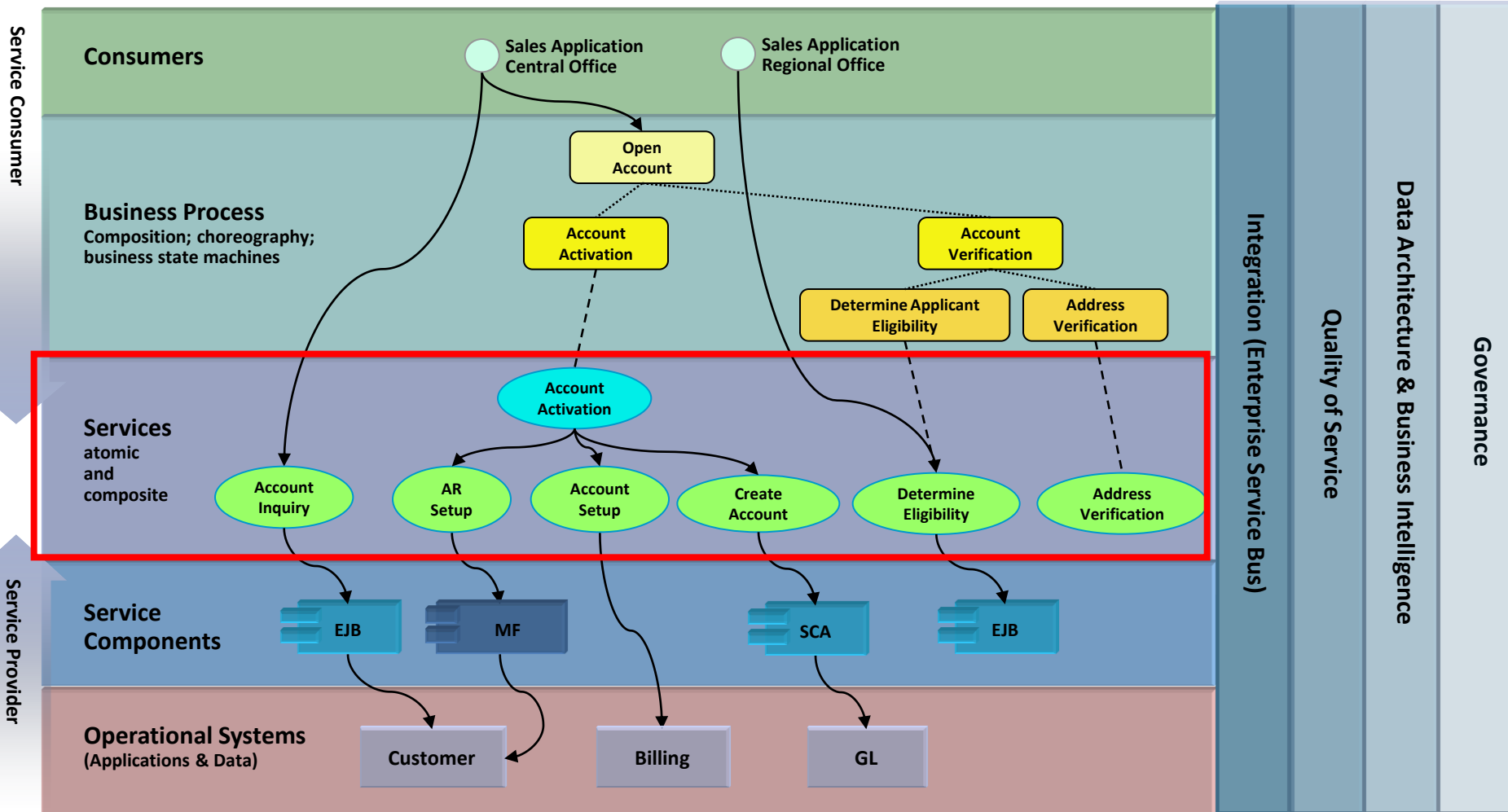
- ▶ **VIRTUALIZES** the location and identity of participants
- ▶ **CONVERTS** between different transport protocols used by the participants
- ▶ **TRANSFORMS** message formats between participants
- ▶ **APPLIES** appropriate qualities of service for the given interaction and **Route** the communication between Consumers and Providers.
- ▶ **DISTRIBUTES** business event information to/from disparate sources.



SOA Reference Architecture – Enable SOA



The SOA Solution Stack





ESB Offerings from IBM WebSphere

WebSphere ESB

Built on WebSphere Application Server for an integrated SOA platform

WebSphere Message Broker

Universal connectivity and transformation in heterogeneous IT environments



WebSphere DataPower Integration Appliance

Purpose-built hardware ESB for simplified deployment and hardened security

- Communication Protocols & Interaction Patterns
 - Protocol conversion, HTTP(S), MQ, JMS, SOAP, WS-Security
 - (A)synchronous, request-reply, one-way, pub/sub
- Message Models & Meta-models
 - XML, text, XSD, Industry Schemas via WebSphere Transformation eXtender
- Mediation Flows and Mediation Patterns
 - XSLT, filtering, DB enrichment
 - Message routing, content-based routing
 - Logging, exception handling
- Qualities of Service
 - High availability, build in failover and scalability features
- Additional Features
 - Graphical tool environment
 - Integration with other IBM WebSphere and Tivoli products
 - Leverage Rational development tools capability
 - Basic runtime configuration change capability

Vstupní operace

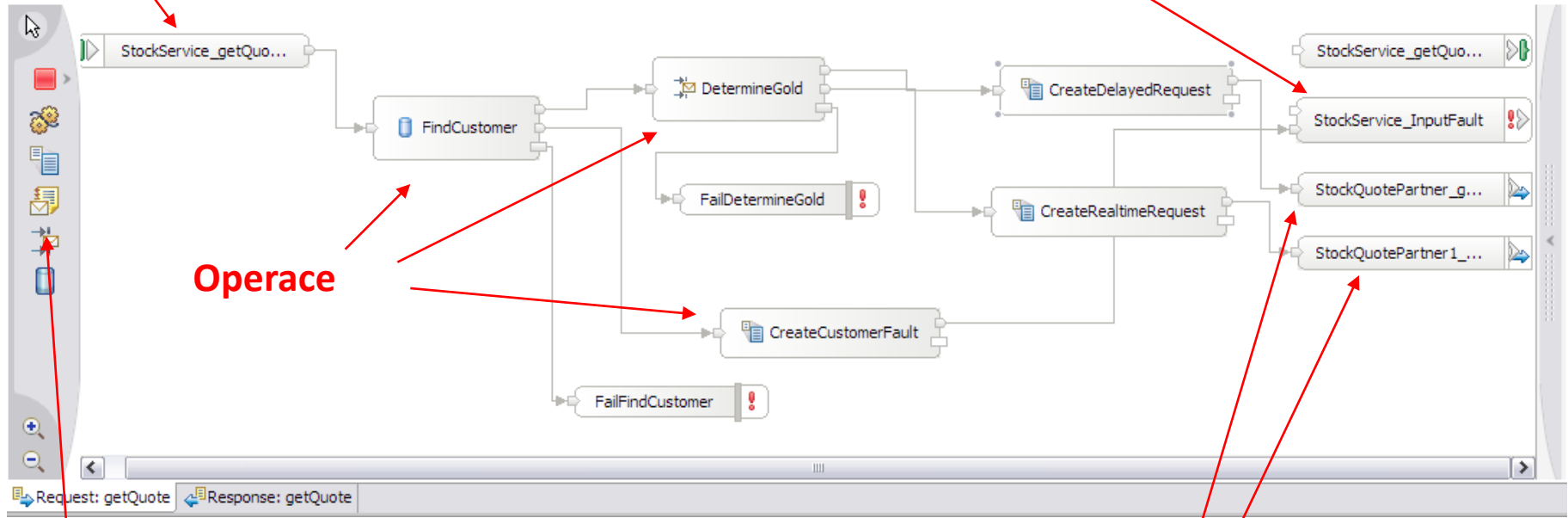
Ošetření chyby

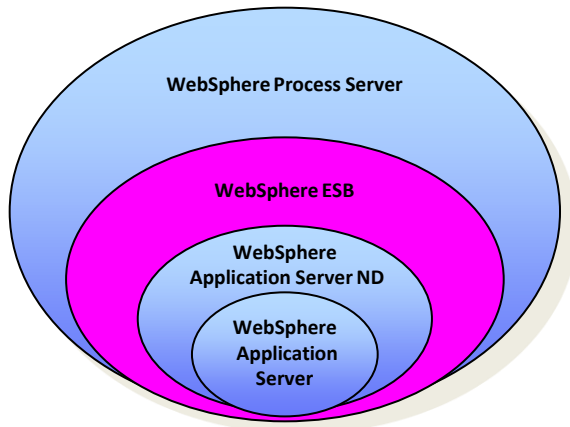
Operace

Volané služby
(aplikační funkce)

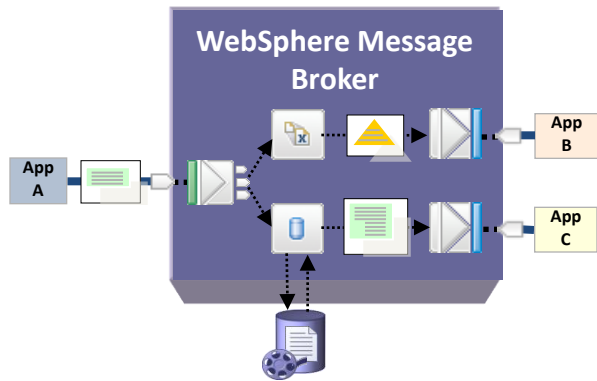
Paleta
komponent

Odpověď





- Based on SOA standards for service composition,
- Delivers messaging and web services engines from WebSphere AS
- Optimized for standards:
 - Native SCA (module to module)
 - HTTP Access (REST, XML/HTTP)
 - Web Services (SOAP/HTTP, SOAP/JMS)
 - Messaging (JMS, MQ, JMS, MQ)
 - J2EE Applications (Session EJB)
 - Java Connectivity Architecture (JCA 1.5) adapters
 - Technology Adapters (Email, FTP, Flat Files, JDBC,...)
 - Application Adapters (JD Edwards, Oracle EBS, PeopleSoft, SAP, Siebel, ..)



WebSphere MQ, JMS, HTTP, Web services standards, Java, C++, ESQL, COBOL, Industry formats

- ESB built for universal connectivity and transformation in heterogeneous IT environments
- Broad range of protocols
 - MQ, JMS, HTTP(S), WebServices, File, TCP/IP, FTP, TIBCO EMS, SonicMQ, Tuxedo, TIBCO Rendezvous and user-defined
- Wide range of data formats
 - XML, COBOL, SOAP, EDI, SWIFT, SEPA, positional/delimited, HL7, HIPAA
- Extendable by using C / C++, ESQL, and Java
- Optimized for high-volume processing and complex mediation capabilities
- Telemetry device integration
- Graphical tooling and pre-built mediation function
- WebSphere Adapters for enterprise applications
 - SAP, Oracle EBS, Siebel ...

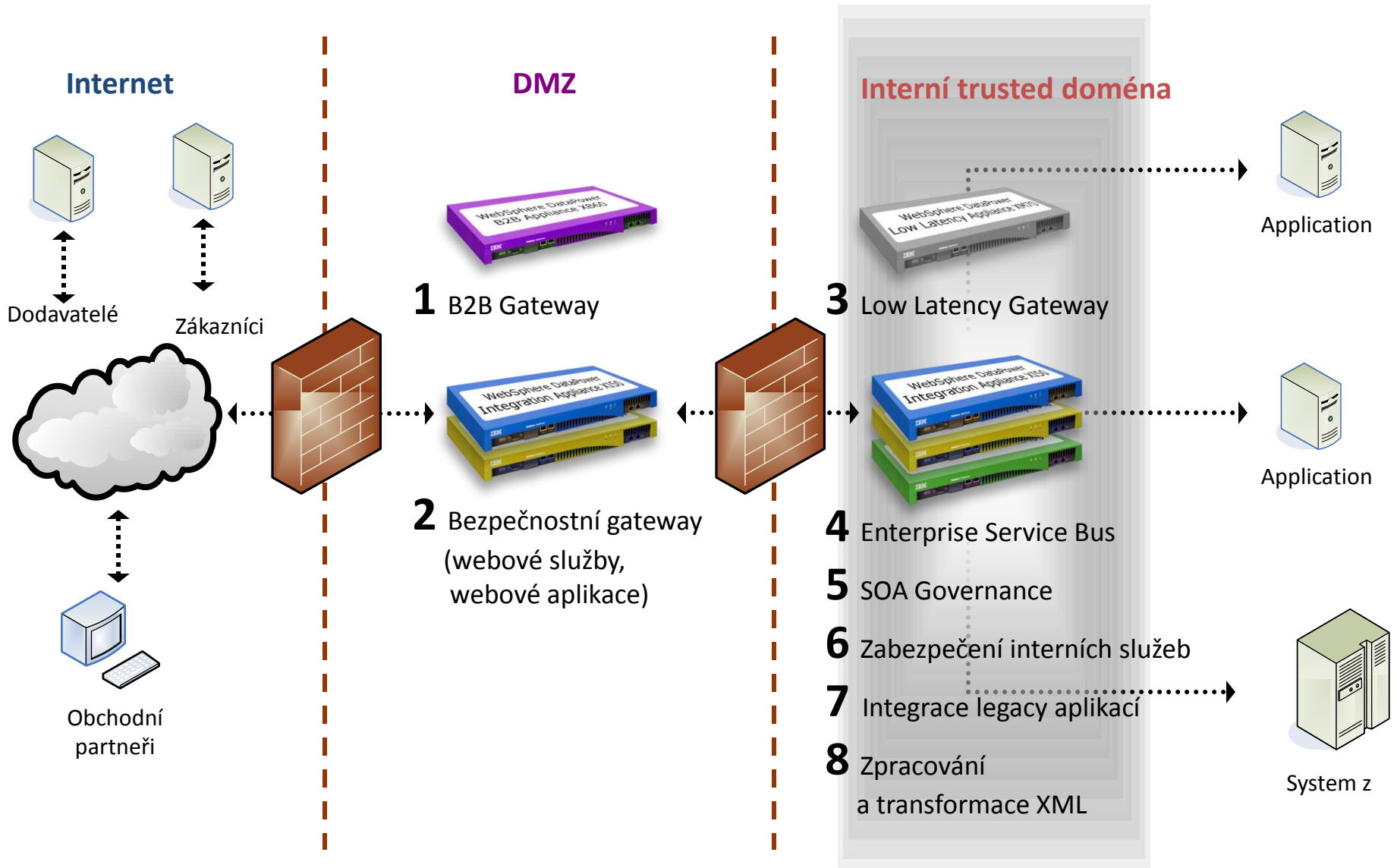
- Speciální zařízení pro bezpečný přístup nejen webovým službám
- Typické funkčnosti v jednom zařízení – bezpečnost, integrace, monitoring
- Velmi rychlé nasazení – instalace, implementace/parametrizace
- Velmi vysoký výkon s hardwarovou akcelerací XML – náhrada jednotek až desítek serverů
- Fyzicky zabezpečené hardwarové zařízení
- Integrace s aplikacemi a systémy od IBM i od cizích dodavatelů
- Jednoduchá vizualizovaná administrace



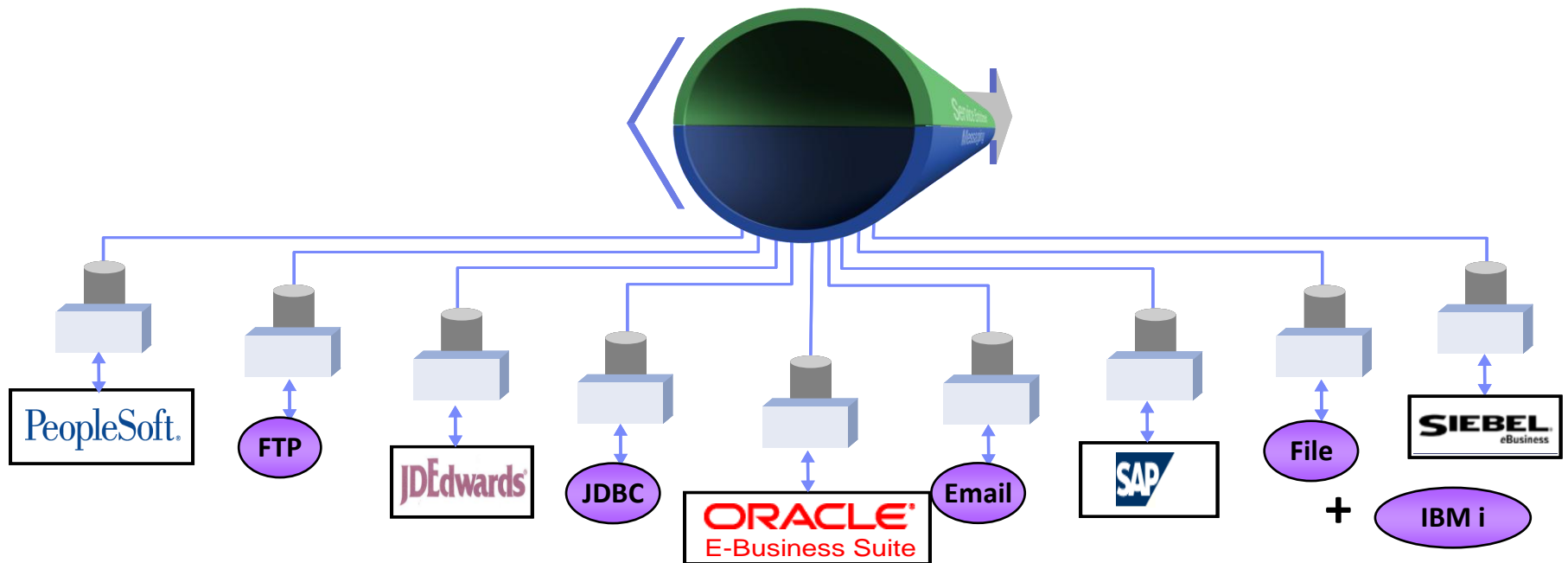
SOA Appliance

- **Zjednodušení** – specializovaná zařízení
- **Akcelerace** – speciální HW komponenty

WebSphere DataPower - Typické modely nasazení

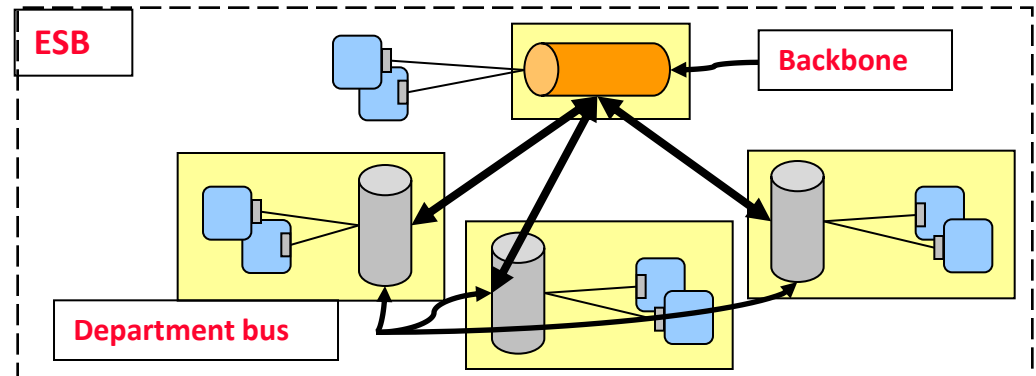
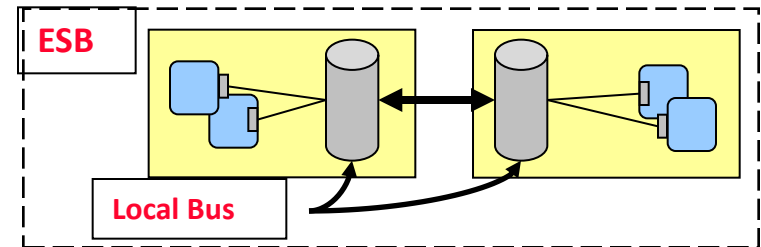


- Rychlá integrace EIS – v ČR zejména SAP, Siebel
 - Přímá SOA-based integrace s WAS, WESB, Message Broker
 - Licencování na aplikaci nebo tzv. Establishment licence (celá společnost)
-
- Automatické discovery služeb EIS
 - Přímá Integrace do vývojových nástrojů



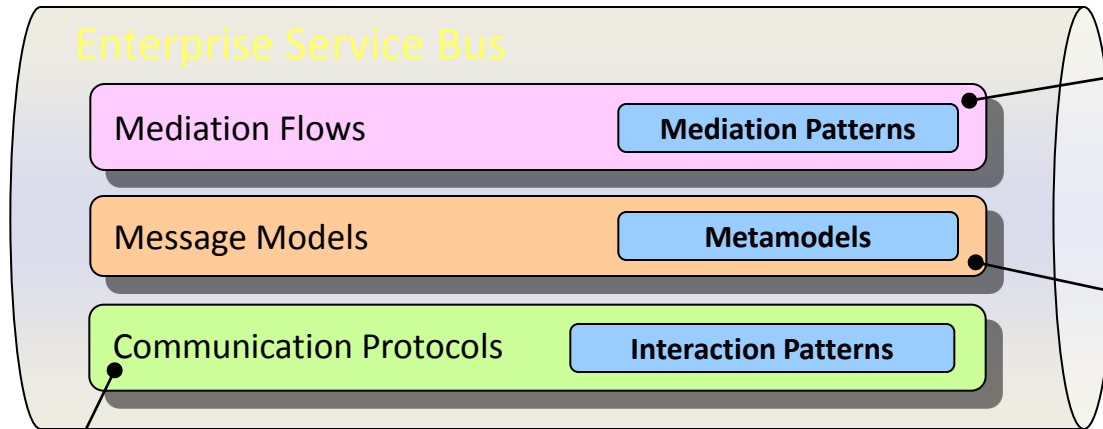
1. Choose ESB topology pattern and consider Business, Organizational and IT requirements
2. For each ESB in the topology, choose a product using the criteria:

- Communication Protocols & Interaction Patterns
- Message Models & Meta-models
- Management Integration
- Security integration
- Logging, Monitoring, auditing integration
- Metadata driven
- Qualities of service
- Non-functional



Mediation Flows

- Process messages exchanged between requester and provider
- Mediation Patterns define processing “steps” of a mediation flow



Message Models

- Describe messages (content) exchanged between requesters and providers
 - Based on Metamodels
- An ESB supports one or more message metamodels
An ESB supports multiple message (content) models

Communication Protocols

- Supply basic connectivity to requesters and providers
- Supply inherent Interaction Patterns

▪ Message Flows

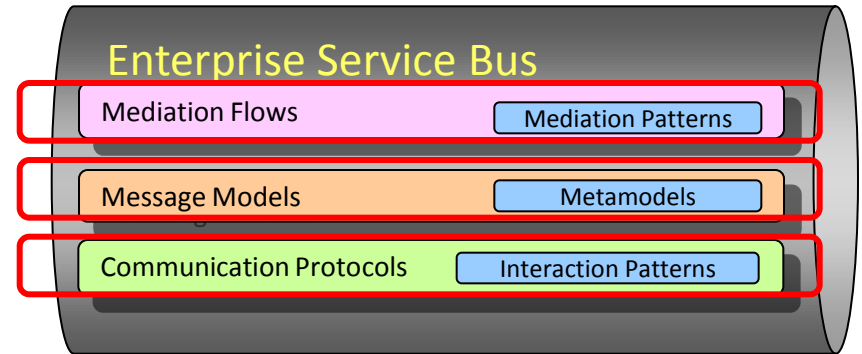
- Service Virtualization
- Transformation (Model, Metamodel)
- Enrichment
- Filtering
- Routing (static, dynamic)
- Service versioning

▪ Message Models & Meta-models

- Critical (e.g., specific XML schema)
- Accommodated
- “Associated” standards (e.g., SOAP headers, attachments)
- “Optimizing capabilities” (e.g., Weak-typing, validation)
- Parsers for standard format (e.g. SWIFT, SEPA)
- Adapters (e.g. SAP IDOC)

▪ Communication Protocols & Interaction Patterns

- Critical (e.g., MQ, SOAP/HTTP, pub/sub)
- “Associated” standards (e.g., WS-Security, headers)
- APIs (e.g., JMS)
- Adapters (e.g. SAP), Metadata driven (registry access)



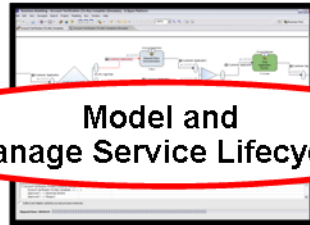
Visual Development & Test Tools

*Service Governance,
Life-Cycle and Policy*

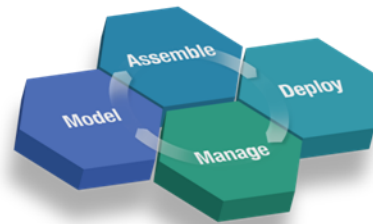


*Constructs for dynamic
and adaptive business
services based on an
integration platform*

Registry and Repository



**Model and
Manage Service Lifecycles**



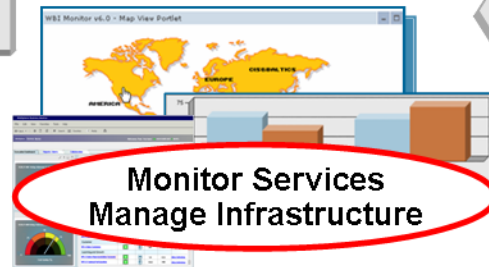
ESB Runtime



Deploy

Monitoring

*Feedback for
continuous
improvement*



**Monitor Services
Manage Infrastructure**

*Real time
management of ESB*

Dynamic selection

