Adaptive Enterprise Environments for OpenVMS Customers:

What Do I Do to Get There?

Session ID: 3771

Mick Keyes, Senior Architect HP
Business Critical Servers,

Mick.keyes@hp.com

+353-87-2232086

Agenda…

- **What is happening in the industry**
  - **Areas driving the need for e-integration.**

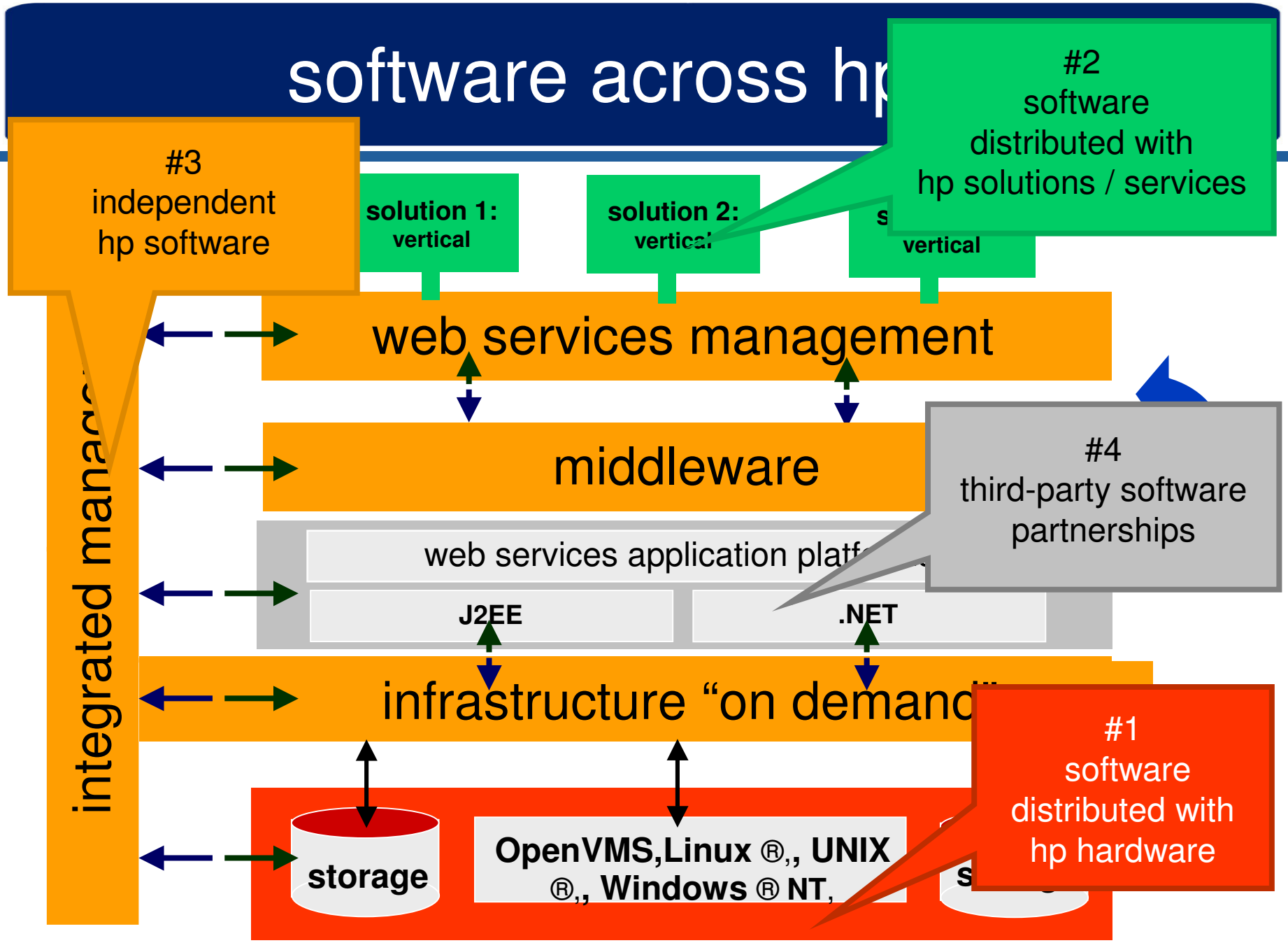
- **OpenVMS e-integration infrastucture**
  - **Solutions (What When and Where)**
  - **Data integration**
  - **Refacing existing VT applications**
  - **.NET integration with OpenVMS systems**
  - **J2EE based solutions**

- **Examples - Deploying Adaptive Infrastucture based solutions**
  - **Integrated multi-platform environments**
  - **Applying Adaptive Infrastructure to OpenVMS environments**
- **Challenges for IT industry**
- **Questions… and how to get started**

What areas are leading activity to-day.

- Customers which need highly stable, efficient, adaptive systems
  - Cross segment integration (ie Mfg./Transport)
- World bank / EU expansion projects
  - Social security, Customs, etc
- Govt. based integration and control systems
- Regulatory directions are driving adoption
  - Disaster tolerance regulations Banking/Healthcare regulations
  - EU and world trade directions
  - Population Security concerns
- E-emergency Response Systems (public protection)
- RTU (Rapid Traceability Utilities)
- RFID based adoption

software across hp



Implementing an Adaptive Infrastructure-based environment

Why will Adaptive Infrastructure principles be more successful than the previous technology “Silver Bullets”?

- Applications are architected to Industry standards (J2EE/.NET).
  - SOA principles for architecture
- Software vendors and other providers are investing heavily to make implementations simpler
- Enables new business models that drive dramatic business benefits
  - Extended Enterprise Computing
- Scalable
- Leverages the huge investment in Internet Infrastructure and Technology
- Investment protection
- Pay per use focus (Hardware and application software)

Technology toolkits for an Integrated Adaptive Infrastructure Environment

- Application Servers
  - J2EE and .NET
    (MS, BEA, IBM, Oracle, JBoss, etc)
- Web services
  - XML, SOAP, WSDL, UDDI
    (All vendors)
- Integration servers
  - Data integration (Attunity, Connex, BEA etc)
  - Application integration (Webmethods, Tibco, BEA, IBM, Iona, Attunity, WRQ, Spiritsoft, etc)
- Management - OpenView suite

OpenVMS Integration Strategy

Enrich the strengths of the OpenVMS operating system with an infrastructure that allows application, middleware, and data integration in a global, multi-platform environment

Create the solution to your integration problem, extending your ROI as you modernize your business, and building on an industrial strength operating system

OpenVMS Customer challenges and Questions

- **Develop new applications or enhance existing ones**
- **Technology to use (J2EE/.NET…or both)**
- **OpenVMS or Multi-platform OS for Tiered applications**
- **Skills gap breaching**
  - **Can I re-use traditional skills in the new approach**

- **Implementing "package based solutions" which:**
  - **Integrate with existing Applications**
  - **Re-use existing Data stores**

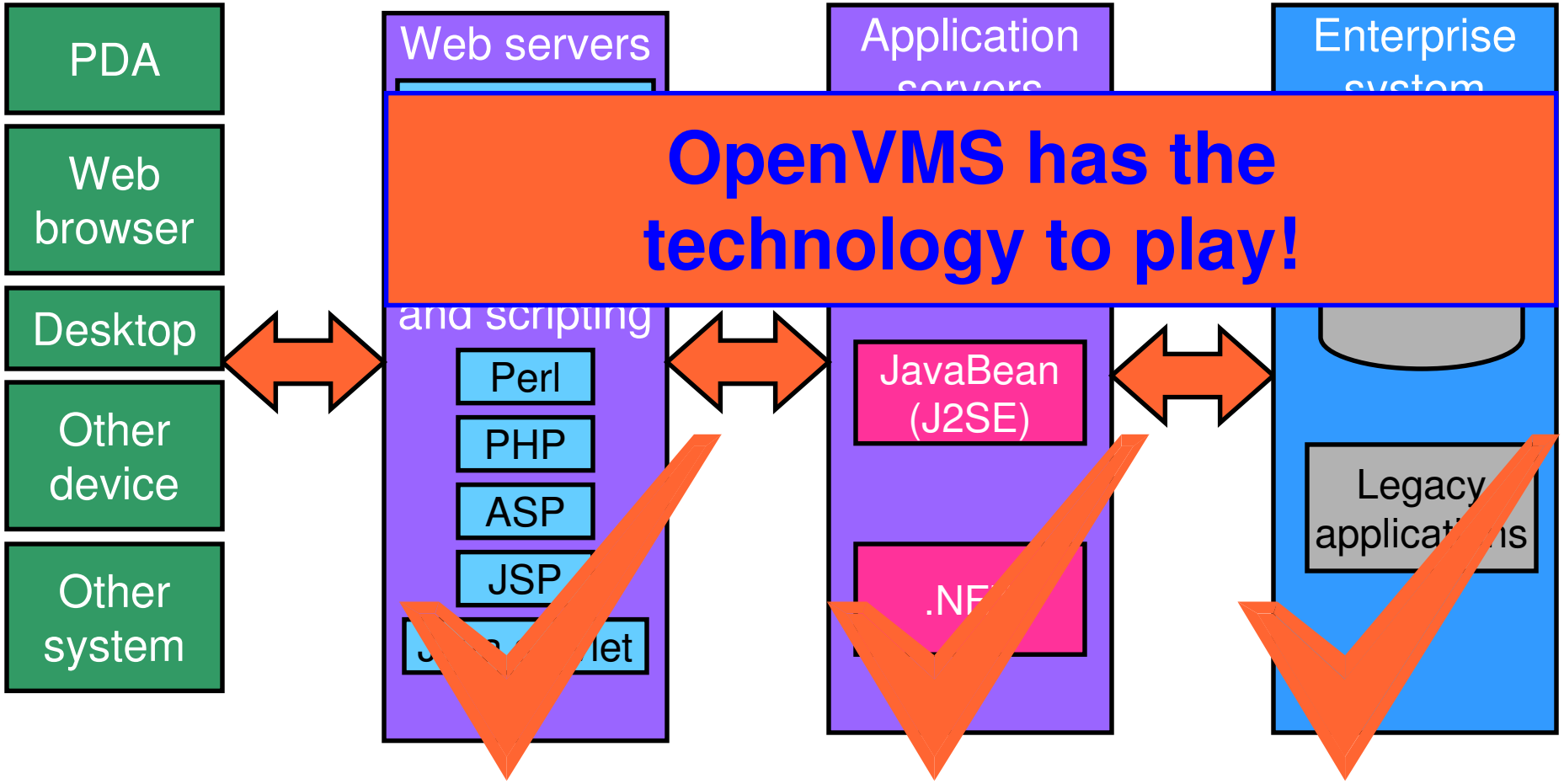
- **Developing "Platform agnostic" Applications (Repeatable solutions)**

- **Existing VT based applications**
  - **Internet access / PDA access/ Integration with other applications**
  - **Re-writing the GUI/Application logic**

OpenVMS e-Business and Integration Products and Technology

- **Web servers and browsers**
  - Secure Web Server (Apache)
    - PHP, Perl, Tomcat (JSP)
  - Secure Web Browser (Mozilla)
- **Web Services**
  - Simple Object Access Protocol (SOAP) Toolkit
  - XML Technology (parsers and stylesheet processors)
- **Legacy integration**
  - Attunity/WRQ/ERICOM/BWX
  - TP Web Connector/TP Desktop Connector
- **Application servers**
  - BEA WebLogic Server (J2EE)
  - Tomcat/Jboss
- **Directory services**
  - Enterprise Directory (LDAP)
- **Development tools**
  - Java SDK (J2SE)
  - 3GLs
    - C, C++, Fortran, COBOL, Basic, Pascal, Ada
  - NetBeans IDE
- **Security**
  - Kerberos
  - LDAP ACME agent
  - CDSA (Common Data Security Architecture)
  - GnuPG
  - SSL (Secure Socket Layer)
  - Stunnel (Secure Tunnel)
  - SSH (Secure Shell)
- **Middleware**
  - Reliable Transaction Router (RTR)
  - 2AB orb2 (CORBA ORB), iLock (ORB security)
  - Attunity Connect (data access)
  - BEA MessageQ (messaging), Tuxedo (TP)
  - Ericom Host Publisher (terminal access)
  - IBM WebSphere MQ (messaging)
  - SpiritSoft SpiritWave (JMS-messaging integration), JCache
  - Tibco Rendezvous and SmartSockets (messaging)
  - WRQ Verastream (terminal adapter and integration broker)

Today's Environment



What, when, where?

Integration technologies and products

Data integration

Screen level integration

Application integration

.NET integration

Web Services

The Attunity Integration Solution

- I want to integrate Web based applications to my Datastores directly
- I have multiple data stores (SQl, Oracle, DB2, Cache)
- Bi-directional connectivity
- Synchronous interactions and a-synchronous events
- Open and flexible solution
- Strong .NET/J2EE integration capabilities

Optimal solution: Attunity connect suite

www.attunity.com

Data Integration

- Multiple platforms
  - OpenVMS, Tru64 UNIX, HP-UX, NSK, Windows, *IX

Attunity Connect

- Multiple data sources
  - Hierarchical,
  - Network (DBMS),
  - Flat, including OpenVMS RMS
  - Relational (Rdb, 9i, Ingres, Sybase, Adabas),
  - MS products (anything supporting OLE/DB or ADO),
  - 'home-grown'
- Access any and all data sources with one SQL statement across all platforms

Technology Scope (Attunity)

Platforms

- AIX
- Alpha/VAX OpenVMS
- AS/400
- HP-UX
- Linux
- NSK
- OS/390, Z/OS
- Solaris
- Tru64 UNIX
- Windows 98/ME
- Windows NT, 2000, XP

Client Interfaces

- JCA
- JDBC
- ODBC
- OLE DB / ADO
- ADO.Net
- WS (SOAP, WDSL)
- XML
- Microsoft BizTalk
- WLI (BEA WLI)

Data Drivers

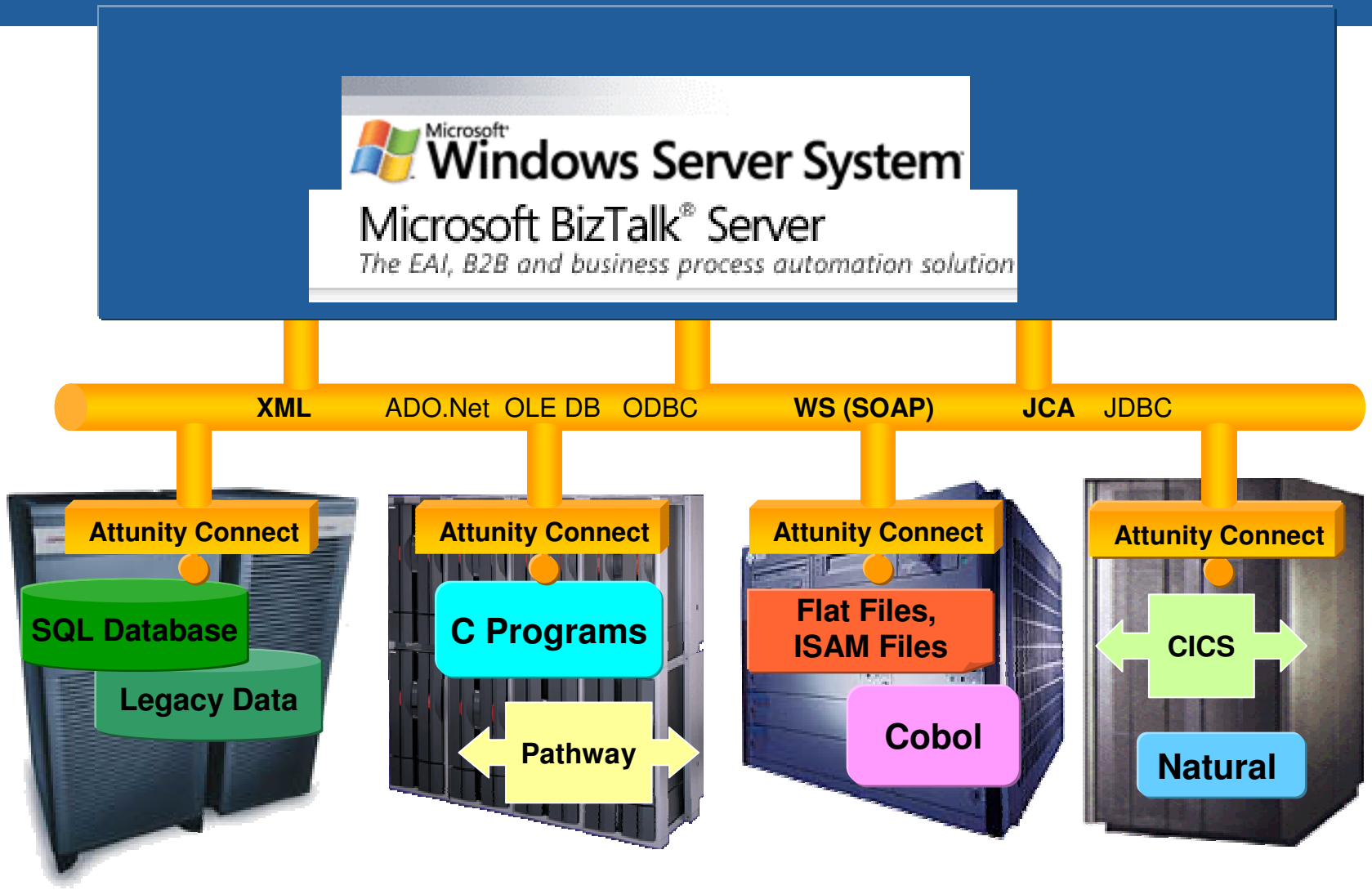
- SQL Server
- Oracle
- DB2/DB400
- Oracle RDB
- Ingres/Open Ingres II
- Sybase
- Informix
- NonStopSQL/MP
- Red Brick Warehouse
- Codasyl DBMS
- Adabas
- IMS/DB
- RMS
- VSAM
- Btrieve
- Enscribe
- Flat Files, Text Files

- OLE DB
- ODBC
- *Procedures (DLL)*
- *Custom Data Driver (SDK)*

Application Adapters

- Tuxedo
- ACMS
- CICS
- IMS/TM
- Natural
- Pathway
- COM
- LegacyPlug (DLL)
- Custom Application Adapter (SDK)

Universal Connectivity for EAI (Attunity)

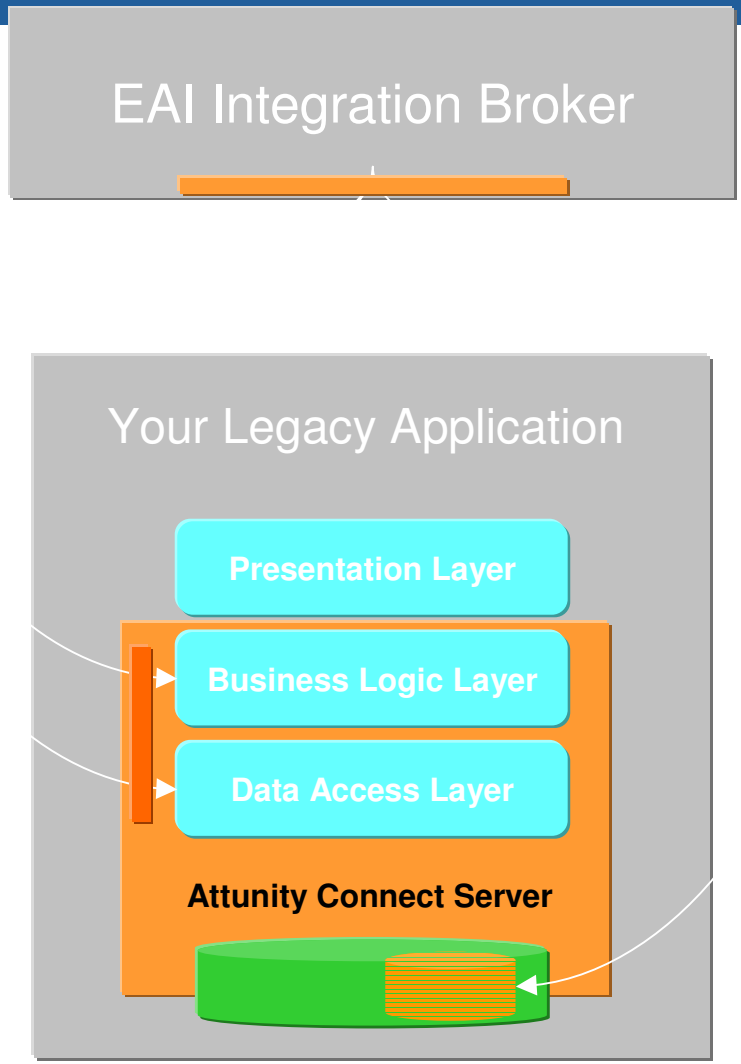


OS/390, NSK, OpenVMS, AS400, Unix, Windows

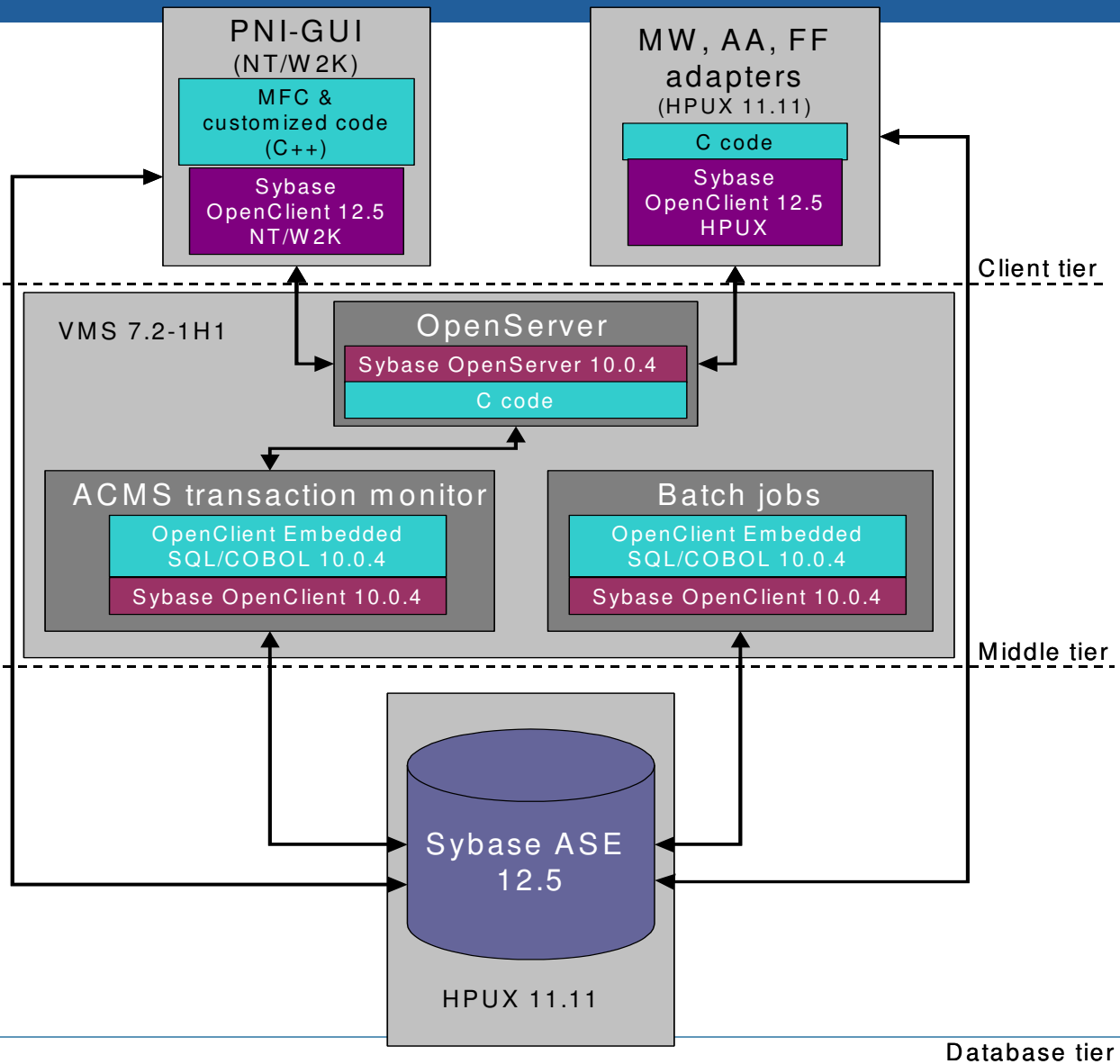
Opening up your legacy application

- Application & Data connectivity via standards
  - XML
  - JCA
  - SOAP,WSDL (WS)
- Ready-to-use built-in adapters
- Rapid application adapter development

AccuWeather case study
AccuWeather.doc



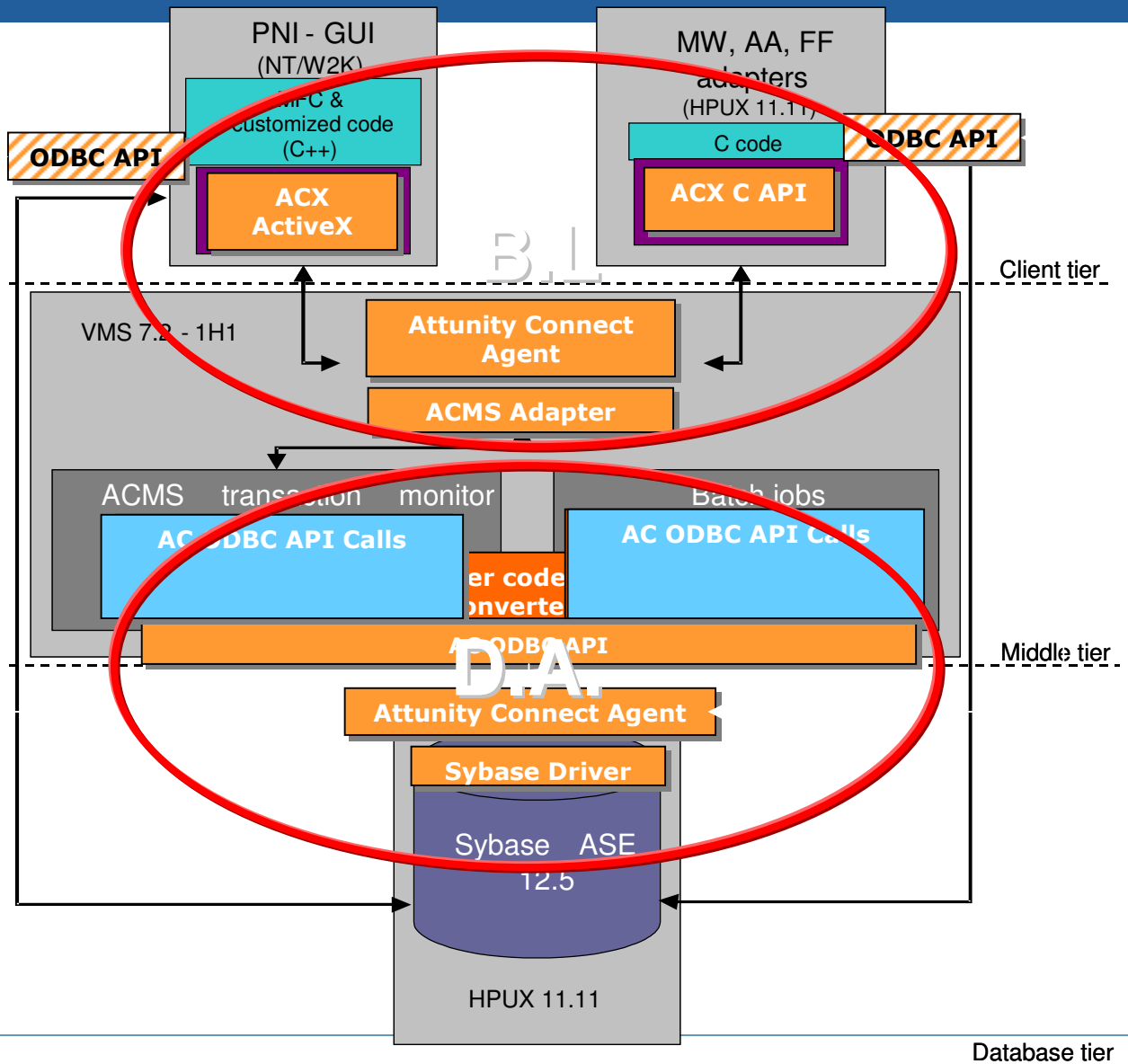
Example: European Telco



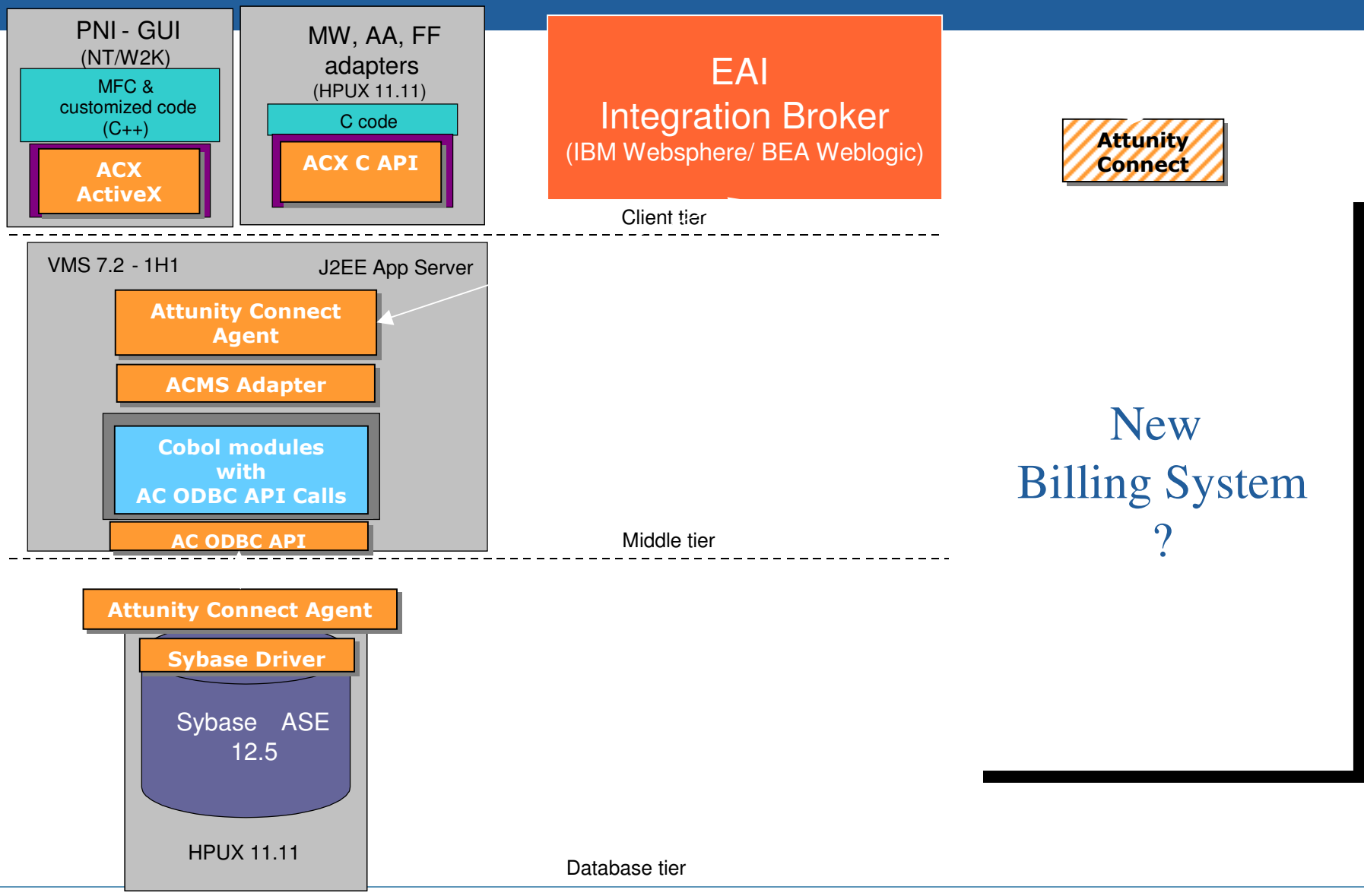
Requirements

- Replace Sybase OpenClient & OpenServer on OpenVMS ASAP
- New development/maintenance using Industry standard technologies (HP-ux Itanium our Unix of choice)
- “Tier” the application for future package consideration
- Multiple front end GUI access
- Cost effective and no performance impact
- Support continuity
- Provide high availability (mission critical criteria)
- Keep DR functionality
- Integrate with internal testing and deployment procedures
- *Position IT infrastructure as value-add in merger discussions*

Immediate Future Configuration



Future Migration/Integration options



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Web Services

The challenge

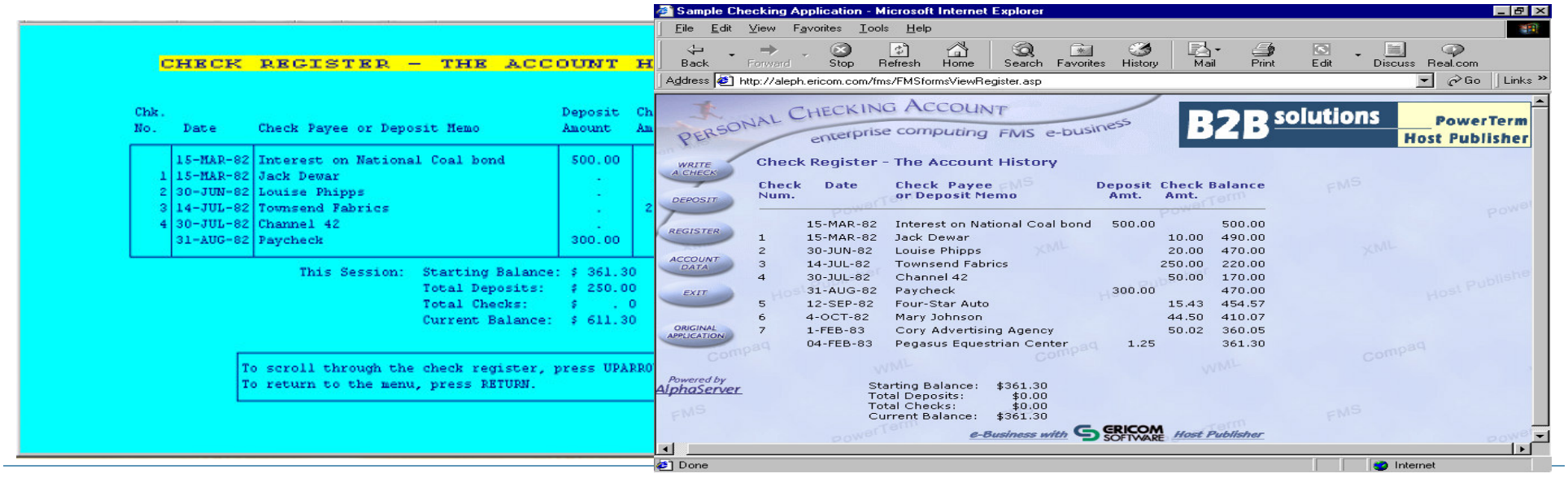
- Existing applications use VT based GUI interface
  - Decforms, FMS, SMG, All-in-1 etc etc
- Perception that interface is “ageing”
- Difficult to integrate with other applications
- Industry difficulty acquiring VT terminals
- New users more familiar with Web based GUI’s.
- Need to have parallel GUI in production environment (VT and web etc)

How to address. 2 options

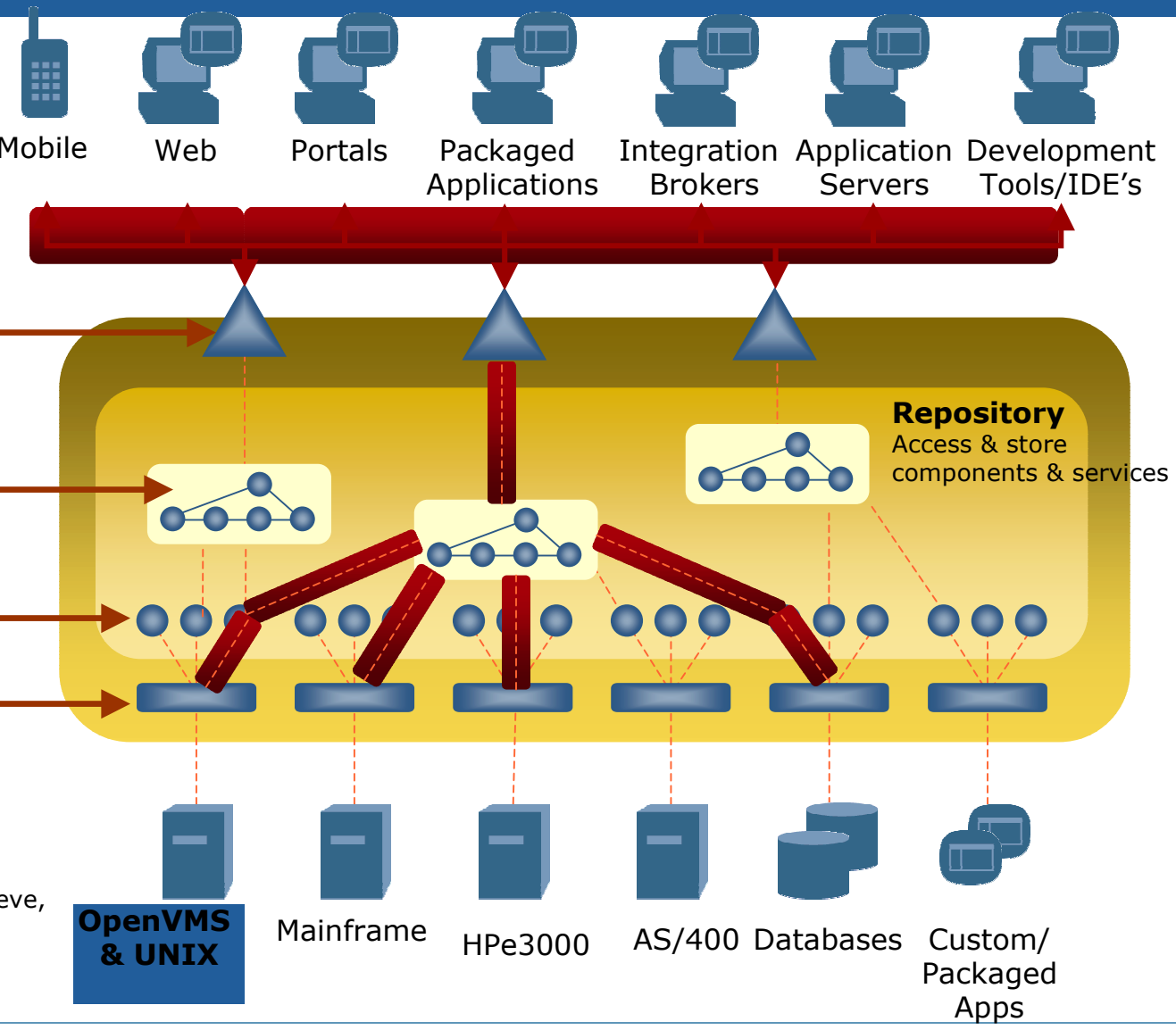
- Replace existing VT interface
  - .NET or Java based GUI
  - Must first manually remove exchange steps in application code
- Use existing VT GUI code to generate new interfaces
  - .NET or Java based GUI
  - Keep existing VT GUI interface
  - WRQ/Ericom product set available

Web Enabling Forms-Based Applications

- Put a GUI front end on an existing application
  - DECforms Web Connector
  - WRQ
  - Ericom Host Publisher
- Just change the front end, leave the logic alone



WRQ's SOA enable enterprise legacy applications



OpenVMS Success Story
Southeastern Freight Lines

Industry: Trucking Company

The Business Challenge:

- Provide a solution that allows SEFL users and customers to access critical business transaction documents from multiple SEFL business applications over the WEB.

SEFL Business Process:

- Large volumes of (paper) customer documents are scanned each day into SEFL business systems.
- OpenVMS character based applications are used to manage all business transactions.
- Supporting paper documents must be accessible electronically for customer support and business management.

OpenVMS Success Story
Southeastern Freight Lines

The WRQ Solution:

- Created a custom WEB application using WRQ Reflection for the WEB's powerful API and a 3rd party Java based (.tiff) viewer.
- The new application allows SEFL users, managers and customers transparent access to OpenVMS applications while automatically selecting and loading appropriate customer image documents from multiple business systems (billing, claims, trip tickets) for viewing

- **Project Duration: 1 Month**

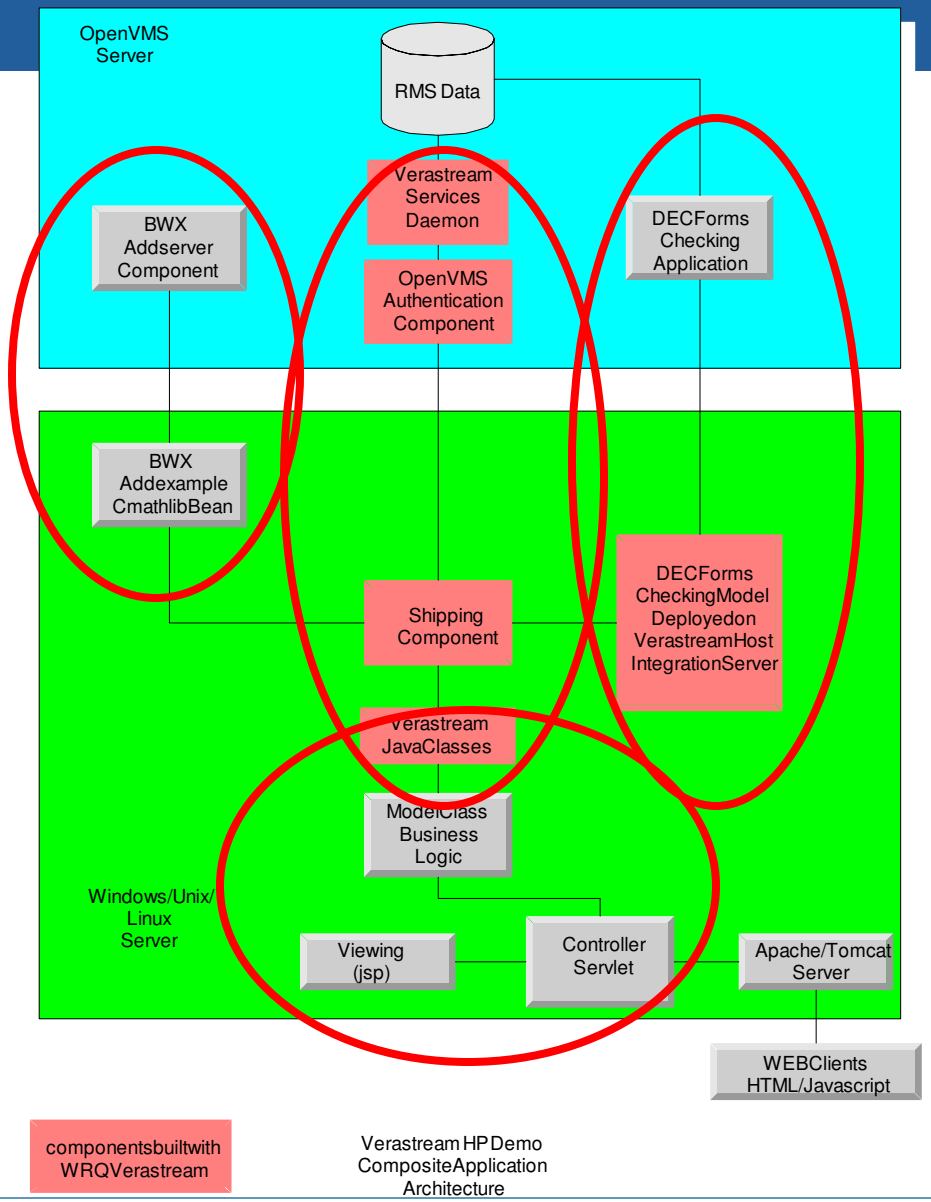
Verastream Development Process

Freight Claims Payment Development Process

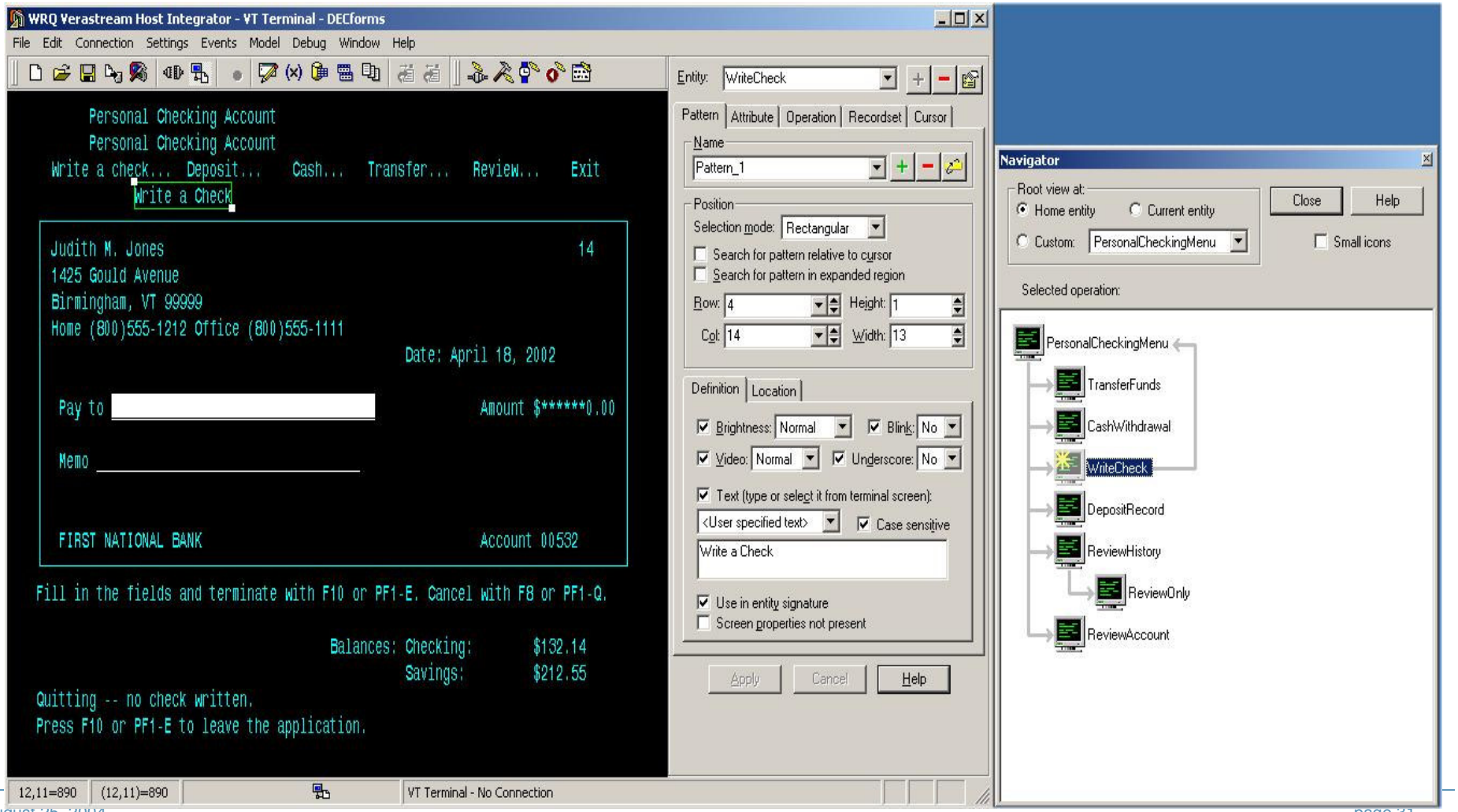
Five simple steps:

- Build the components
- Add the components to the Repository
- Assemble the composite application
- Deploy the composite application
- Test the composite application
- Mission Accomplished!

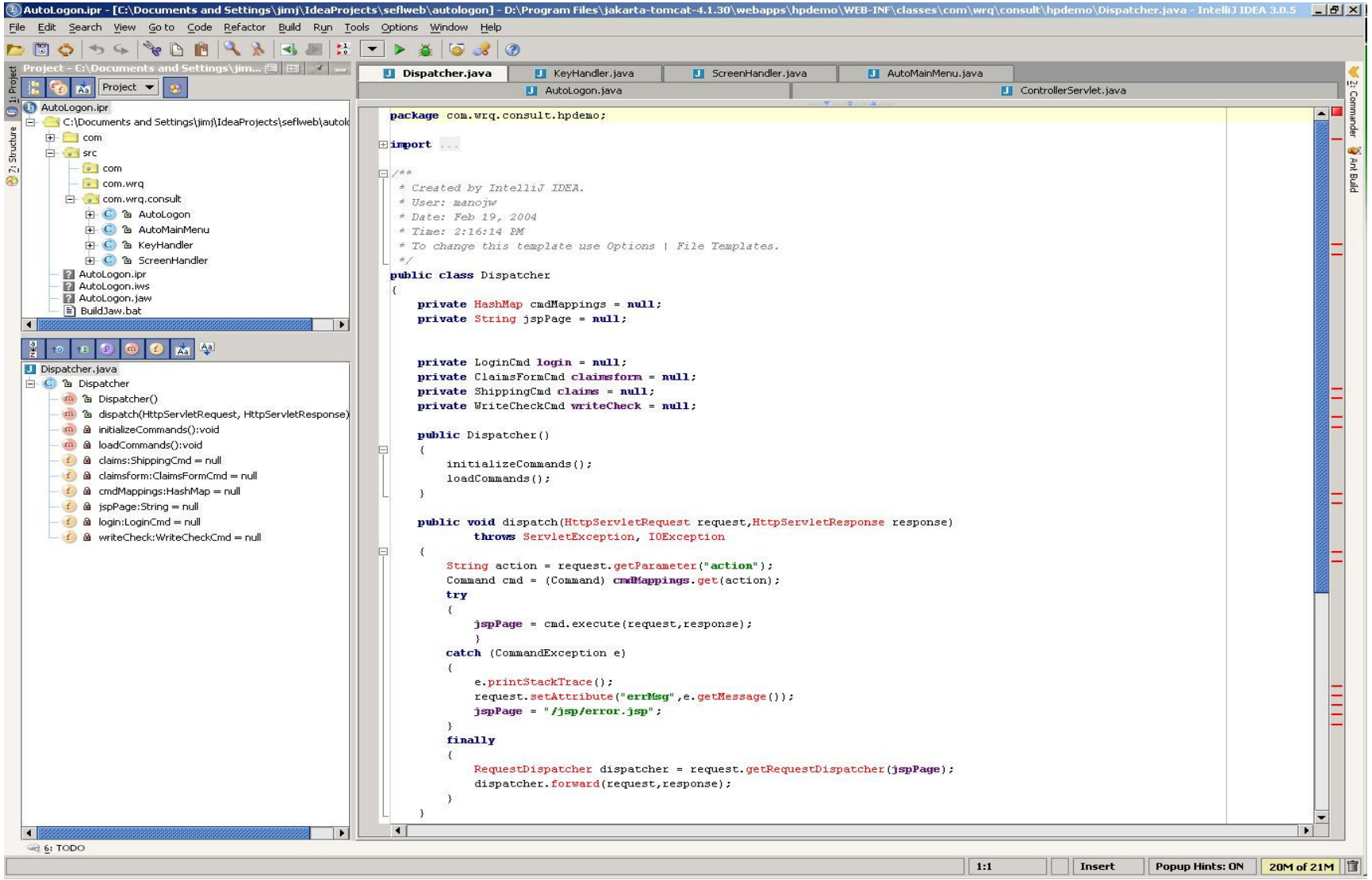
Freight Claims Composite Application Architecture Overview



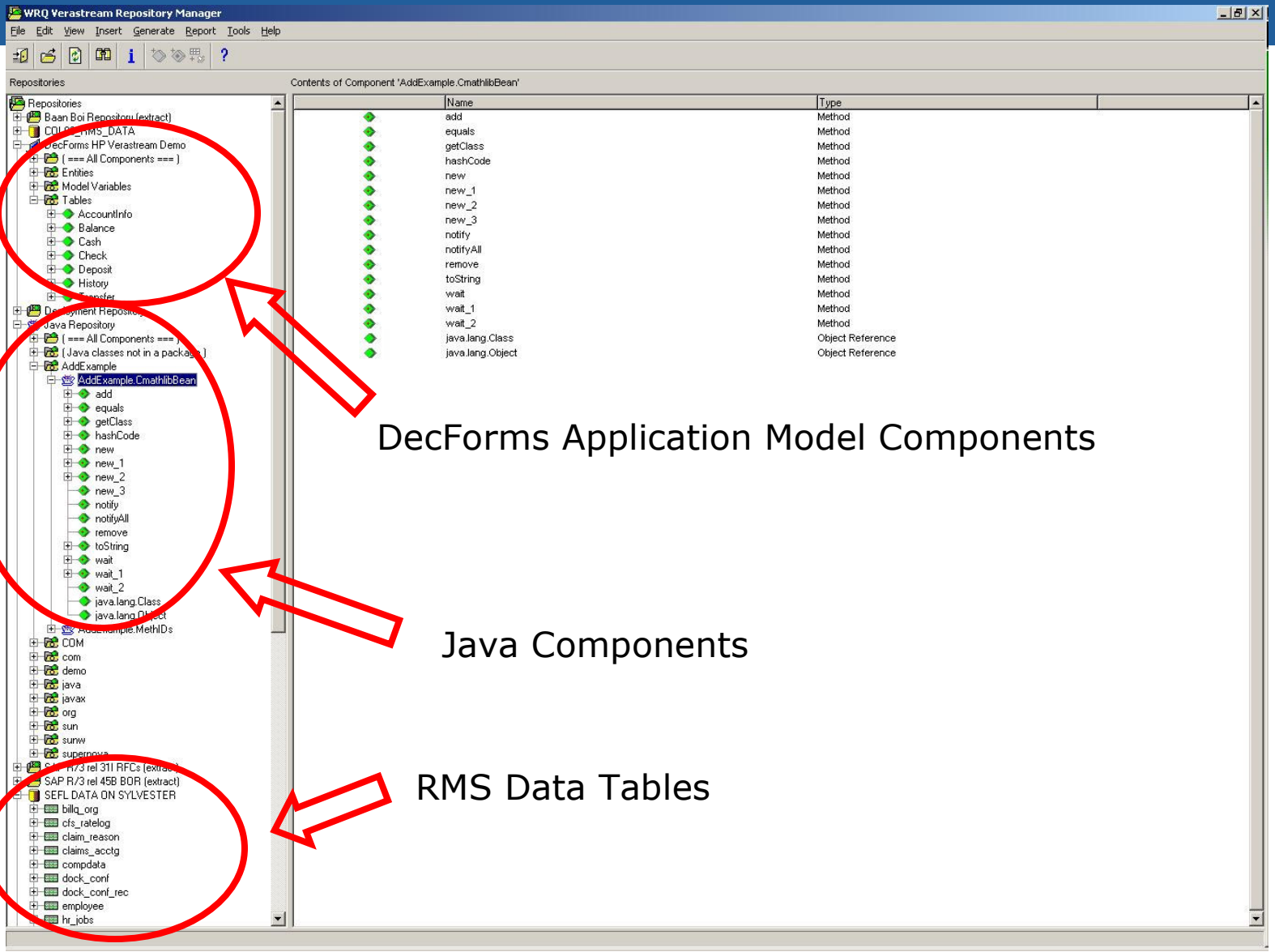
Building the DECforms Application Model



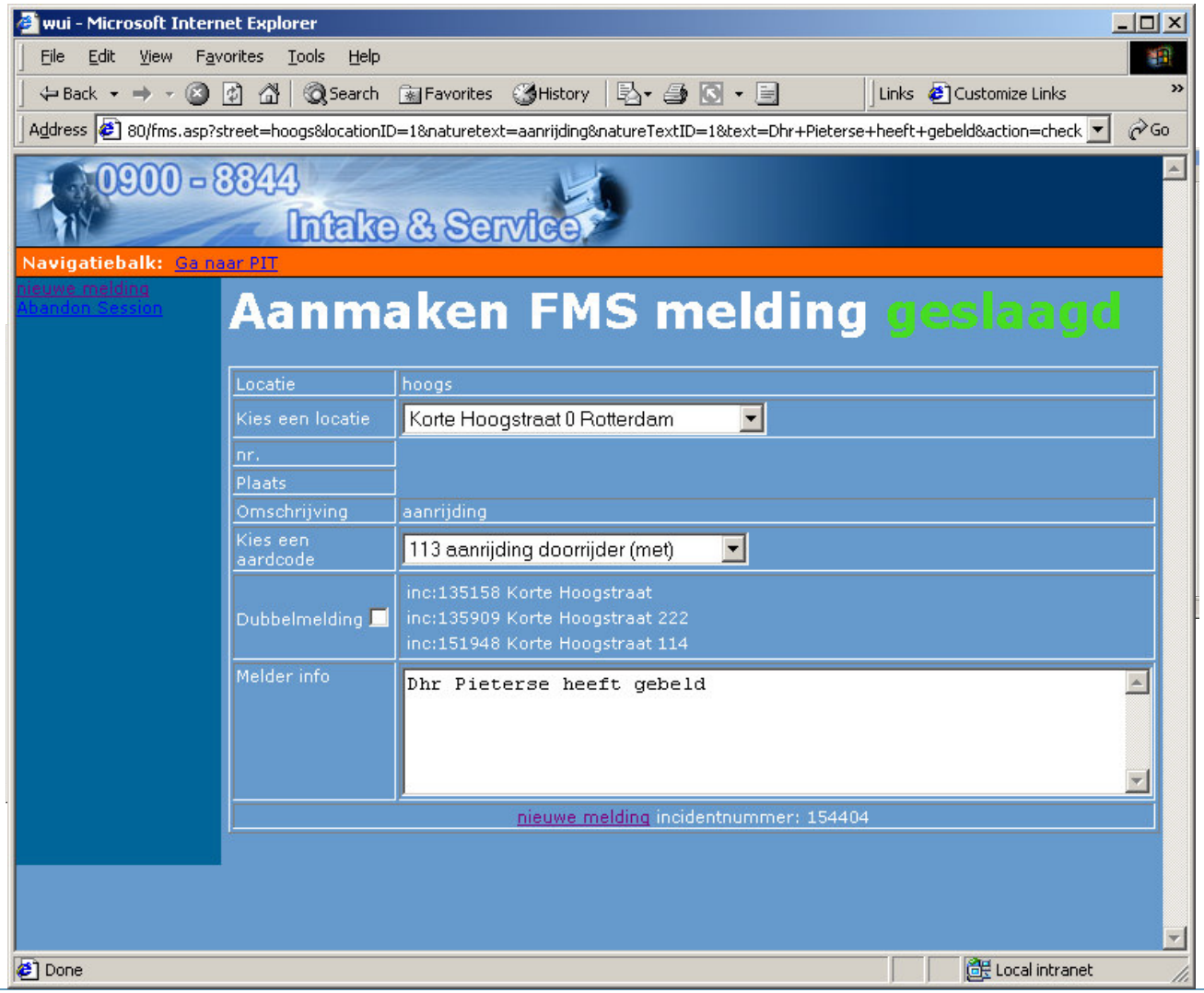
Building the Java Components



Component Management
WRQ Verastream Repository



Scenario 2: Web-App Front End



What, when, where?

Integration technologies and products

Data integration

Screen level integration

Application integration

.NET/J2EE integration

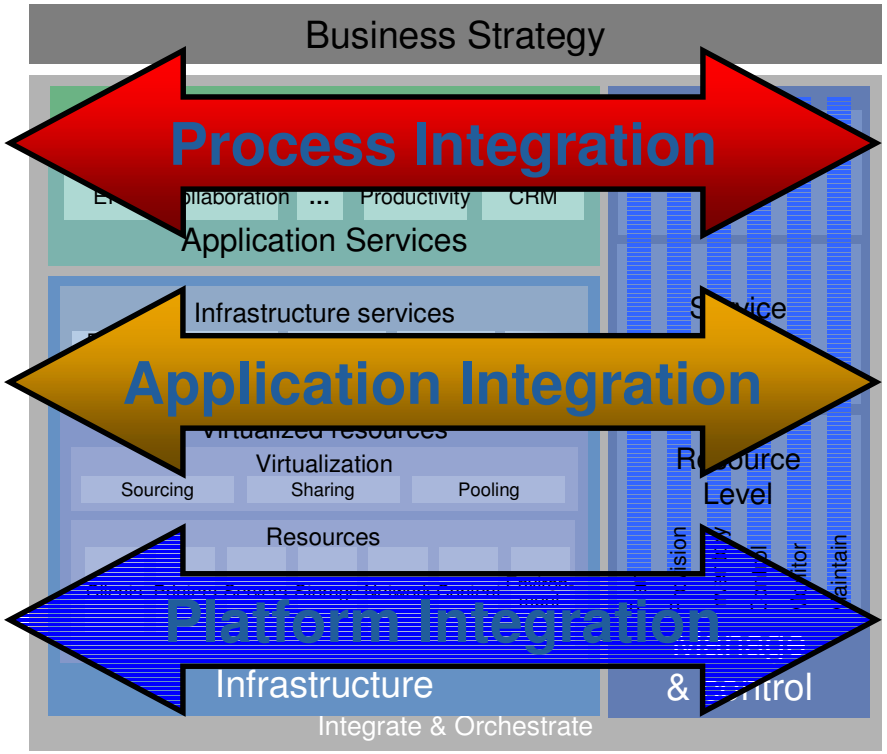
Web Services

Questions

- Will you reuse existing Application logic
  - Code level integration
- Can you remove the existing terminal I/O
- How modular is your code?
- What platforms are involved in integration
- Skills in house
- Do you need to integrate with other EAI technologies ie MQ, Seebeyond, Tibco, Ensemble, Webmethods etc etc

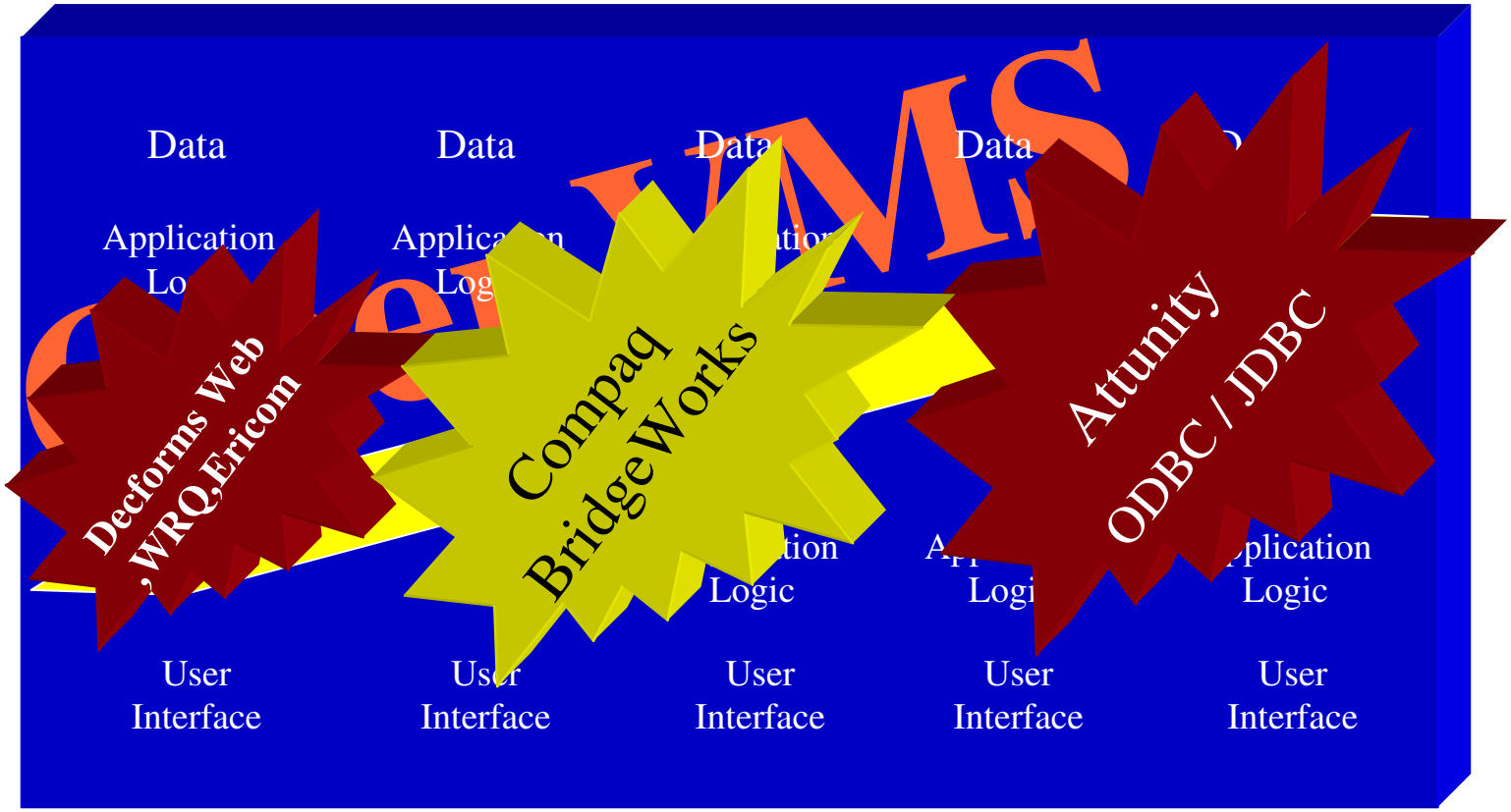
Integration Technologies (EAI)

- Tibco
- Seebeyond
- Webmethods
- BEA WLI
- Websphere Integrator
- Ensemble
- Spiritsoft
- Attunity
- WRQ Verastream
- Bridgeworks



Big focus on Web Services based integration
XML, SOAP, WSDL, UUDI based components

Different Tools for Different Needs?



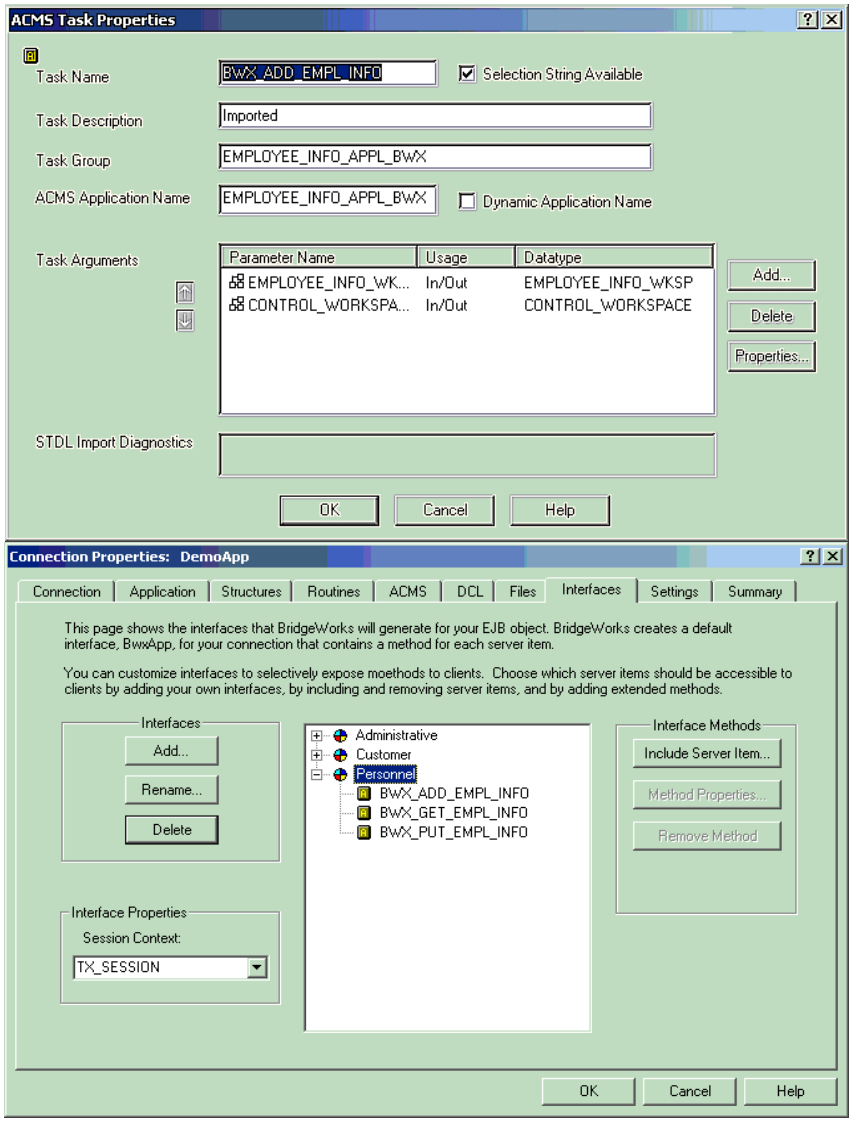
HP BridgeWorks

Generates robust EJB Interfaces from your TP or 3GL applications

- Creates J2EE Stateful Session Beans
- Creates 1 EJB per interface

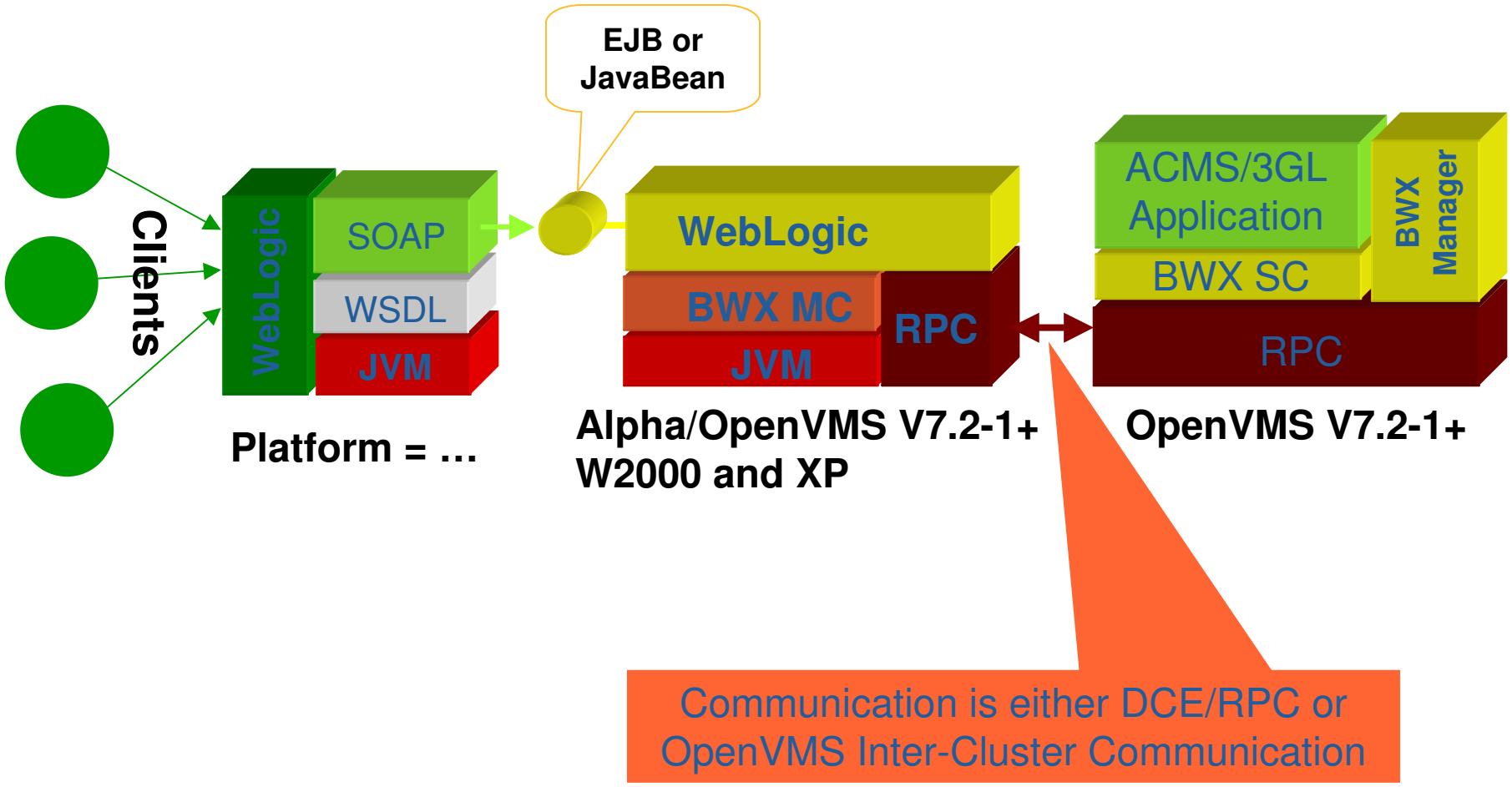
Generates JavaBean Interfaces from your TP or 3GL application

- Creates a single simple class per interface
- J2EE environment not needed to build or run



HP BridgeWorks (BWX) Components

Components in **green** you supply, **BridgeWorks** provides/generates the rest



Existing Applications

- OpenVMS Based 3GL Applications
  - Must be callable via OpenVMS Calling Standard
    - Can pass almost any OpenVMS data types
    - Can pass-by-value, reference, and descriptor
  - Must be relinkable with generated code
  - Must not contain Terminal I/O
  - May, or may not, be thread-safe

- ACMS Applications
  - Can pass almost any workspace/record definition
  - Must not contain Terminal/Forms Exchange steps
  - Can not rely upon a Transactional Context

What, when, where?

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.NET/J2EE integration

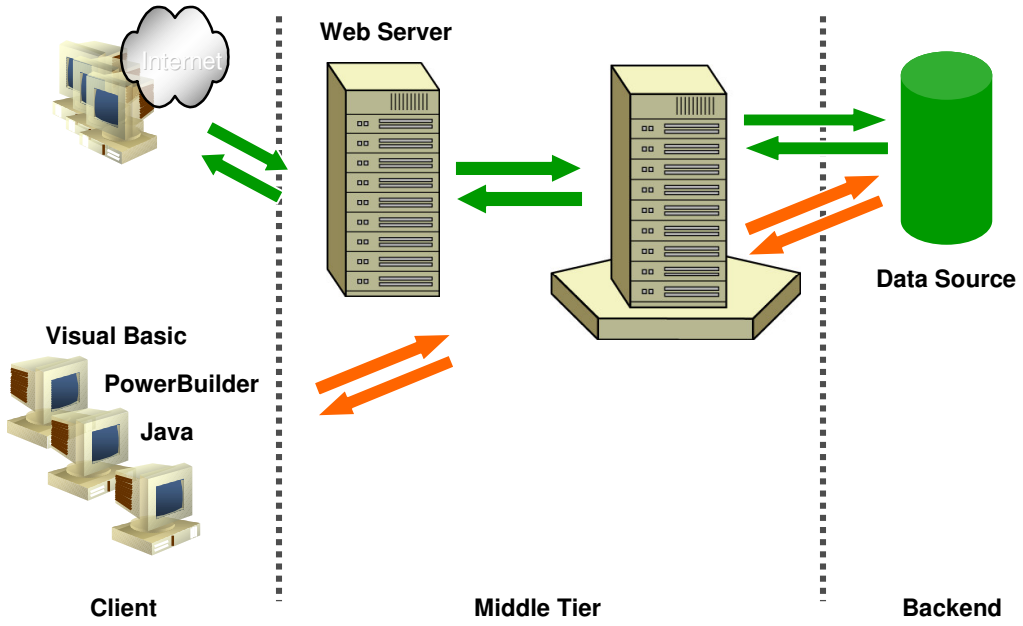
Web Services

What is Microsoft .NET?

- .NET is Microsoft's platform for Web Services
  - Microsoft calls it “XML Web Services”, but the underlying technology is still Web Services (XML, SOAP, WSDL, UDDI)

- For application development and deployment, .NET means:
  - Integration of Web Services capabilities into all Microsoft development and runtime products
  - Simple and easy creation and deployment of Web Services based applications

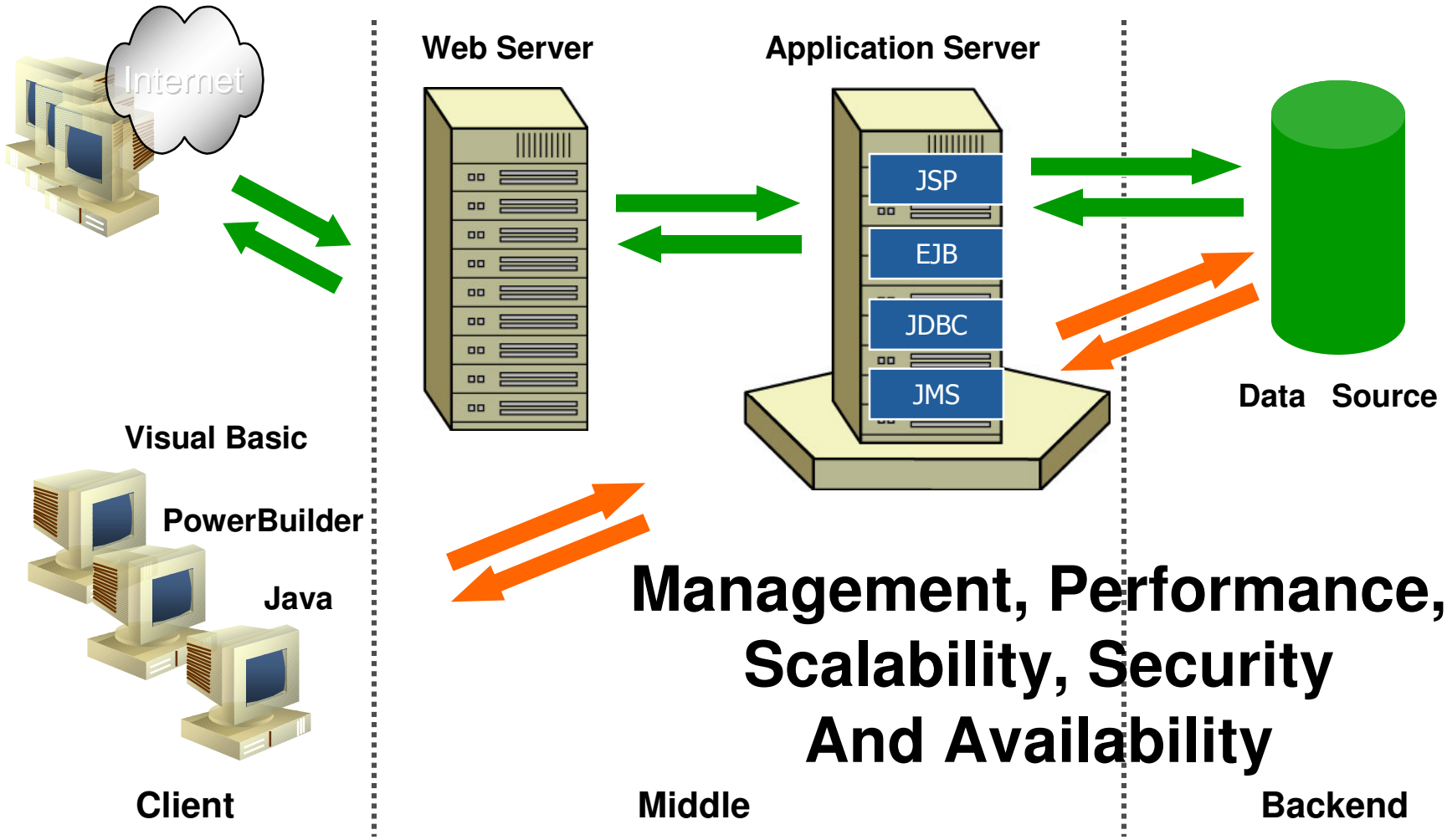
Role of Application Server



End-to-end security
- Multi-client
- Scaling (connection management, caching, ...)
- 24x7x365
- Resource Pooling
- Persistence

- Data source integration
- Maintenance
- Troubleshooting
- Management
- Concurrency
- Transactional Integrity

The “Big Four” J2EE Services



Web Application Server = Next Gen. TP Monitor

- What's the same?
  - Vendors
  - Multi-tier client/server replacement
  - Thinner client
  - Service-based design center (re-use, integration)
  - Lighter-weight client sessions
  - Heavier-weight database sessions
  - Synchronous & asynchronous processing, …

BEA, IBM, Oracle, JBOSS

- What's different
  - Market size
  - Java (and C#)
  - J2EE/ Standard APIs
  - Deployment scale: Clients, *Integration*
  - Web UI & protocol stack
    - Multichannel
      - Browsers
      - Text messaging (IM, SMS, …)
      - Voice
      - And programmed client
    - Personalization, portal, content management, …
  - Focus on stateful services (session-orientation)
  - Web services, …

Analogies between J2EE and .NET

Feature	J2EE	.NET
Type of technology	Standard	Product
Middleware Vendors	30+	Microsoft
Interpreter	JRE	CLR
Dynamic Web Pages	JSP	ASP.NET
Middle-Tier Components	EJB	.NET Managed Components
Database access	JDBC SQL/J	ADO.NET
SOAP, WSDL, UDDI	Yes	Yes
Implicit middleware (load-balancing, etc)	Yes	Yes

.NET/J2EE integration with OpenVMS

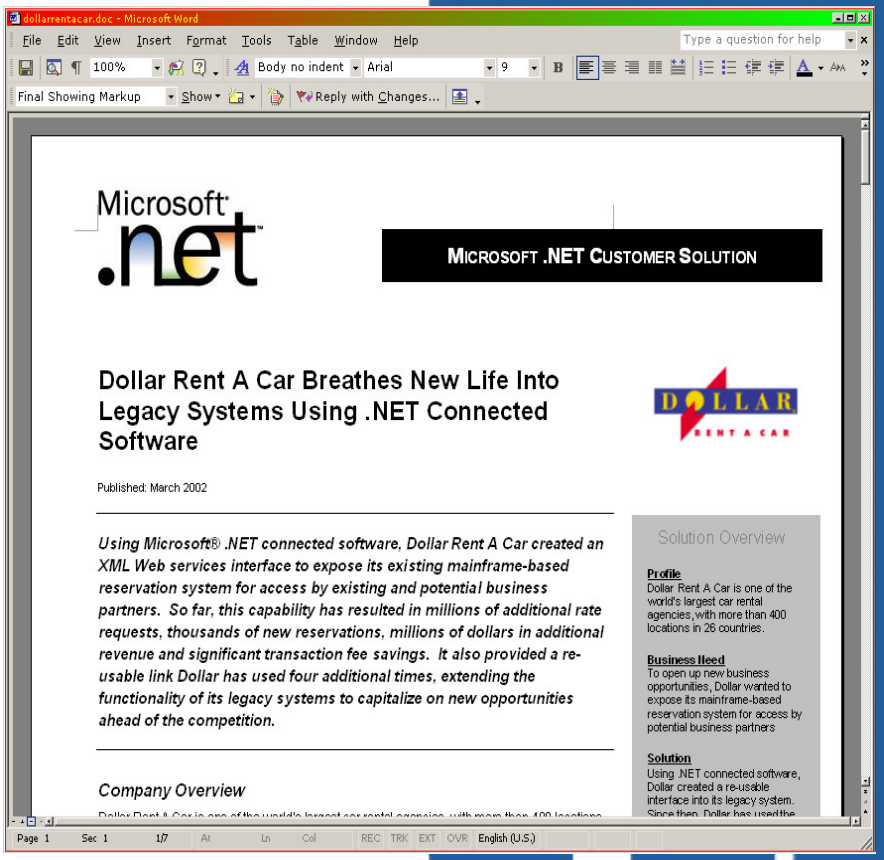
- Solutions for Integration to:
  - OpenVMS data
  - OpenVMS applications

  Solutions:

  - Attunity suite
  - Bridgeworks
  - TP Connectors..
  - WRQ/Eiricom suite
  - Spiritsoft / Spiritwave .NET API

Using the Service-oriented Architecture to integrate multiple systems using different technologies on heterogeneous platforms

Getting the best of both worlds,minimizing the risk!



Microsoft .net

MICROSOFT .NET CUSTOMER SOLUTION

Dollar Rent A Car Breathes New Life Into Legacy Systems Using .NET Connected Software

Published: March 2002

Using Microsoft® .NET connected software, Dollar Rent A Car created an XML Web services interface to expose its existing mainframe-based reservation system for access by existing and potential business partners. So far, this capability has resulted in millions of additional rate requests, thousands of new reservations, millions of dollars in additional revenue and significant transaction fee savings. It also provided a re-usable link Dollar has used four additional times, extending the functionality of its legacy systems to capitalize on new opportunities ahead of the competition.

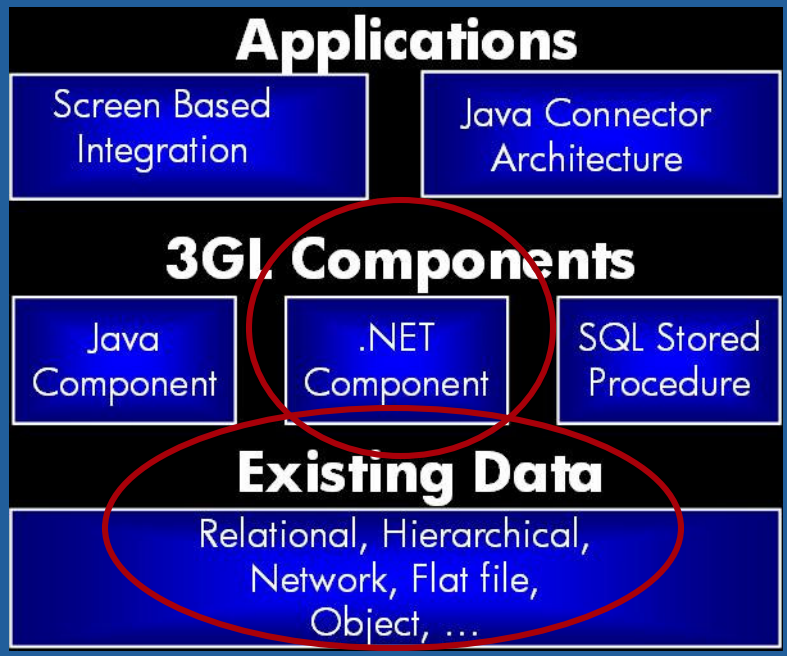
Company Overview

Solution Overview

Profile
Dollar Rent A Car is one of the world's largest car rental agencies, with more than 400 locations in 26 countries.

Business Need
To open up new business opportunities, Dollar wanted to expose its mainframe-based reservation system for access by potential business partners

Solution
Using .NET connected software, Dollar created a re-usable interface into its legacy system.



http://www.microsoft.com/resources/casestudies/CaseStudy.asp?CaseStudyID=11626

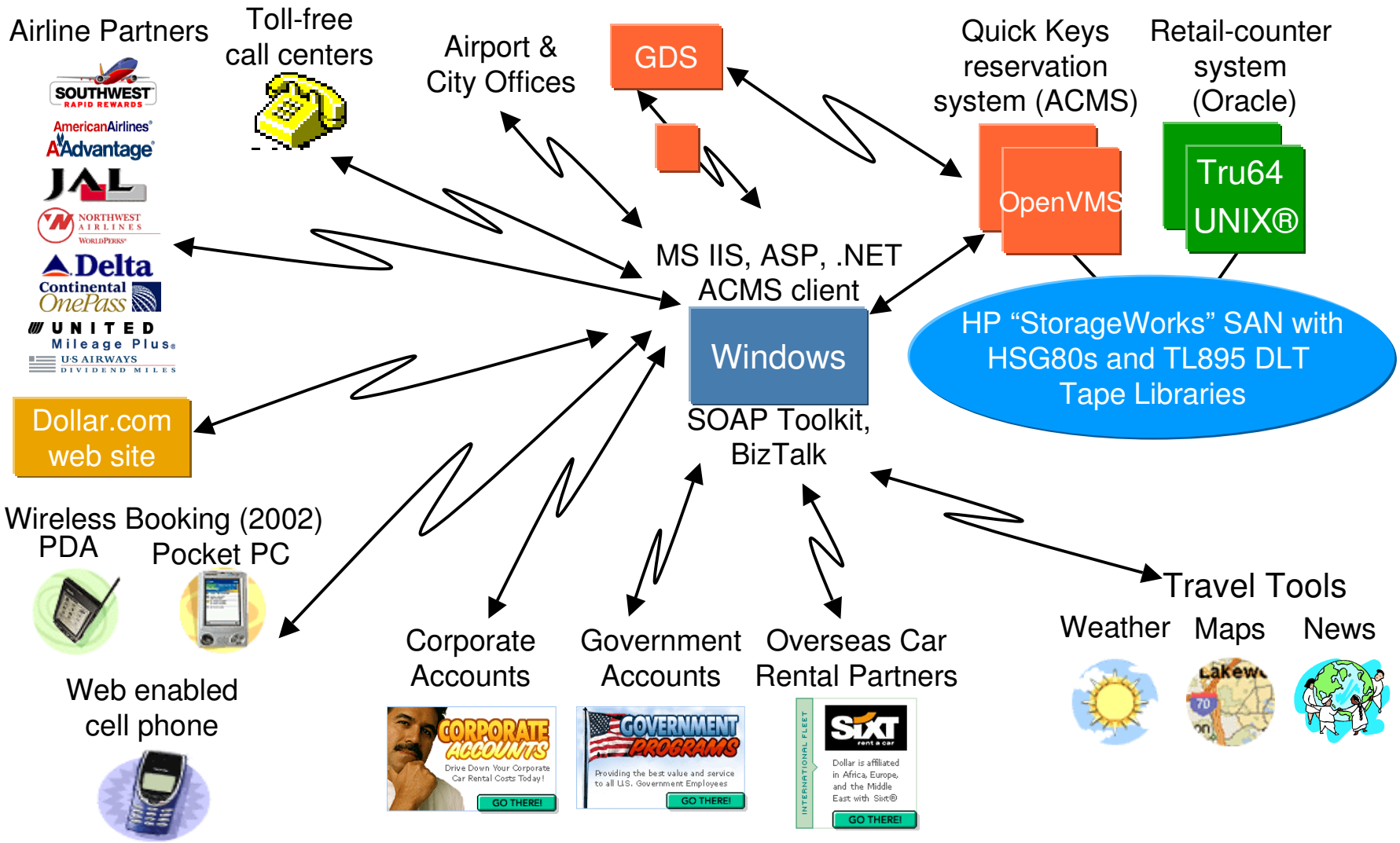
Background

- Dollar wanted to provide partners with direct access into its reservation system—an OpenVMS-based application known as Quick Keys.
- For Dollar, a key benefit of this capability would be the relatively low cost of acquisition for new reservations.
- The company received the majority of its reservations through Global Distribution Systems (GDS) such as Sabre or Apollo, paying a fee for each transaction.
- By integrating directly with partners, Dollar would be able to drive incremental reservations while lowering its customer acquisition costs—a very attractive combination.

Business benefits

- Dollar cost-effectively opened up another sales channel that has provided millions of additional rate requests and thousands of new reservations per year, equating to millions of dollars in additional revenue.
- The company expects to save a significant amount in annual GDS fees.
- Just as important, the company put in place a simple, re-usable interface into its reservation system that could be accessed by any system via the Internet. "We knew exposing our reservation system as an XML Web service would provide a standard interface that could be used by a wide range of other applications, both internal and external."
- Delivering a Palm Interface in 45 days
  - "Time required to integrate each new business partner reduced by 75 % — from two months down to two weeks — and we won't need to modify our mainframe applications for each new partner."
  - dollarrentacar.doc

Standards based Web services integration



J2EE integration example
Reusing Components from Existing Systems

Customer problem

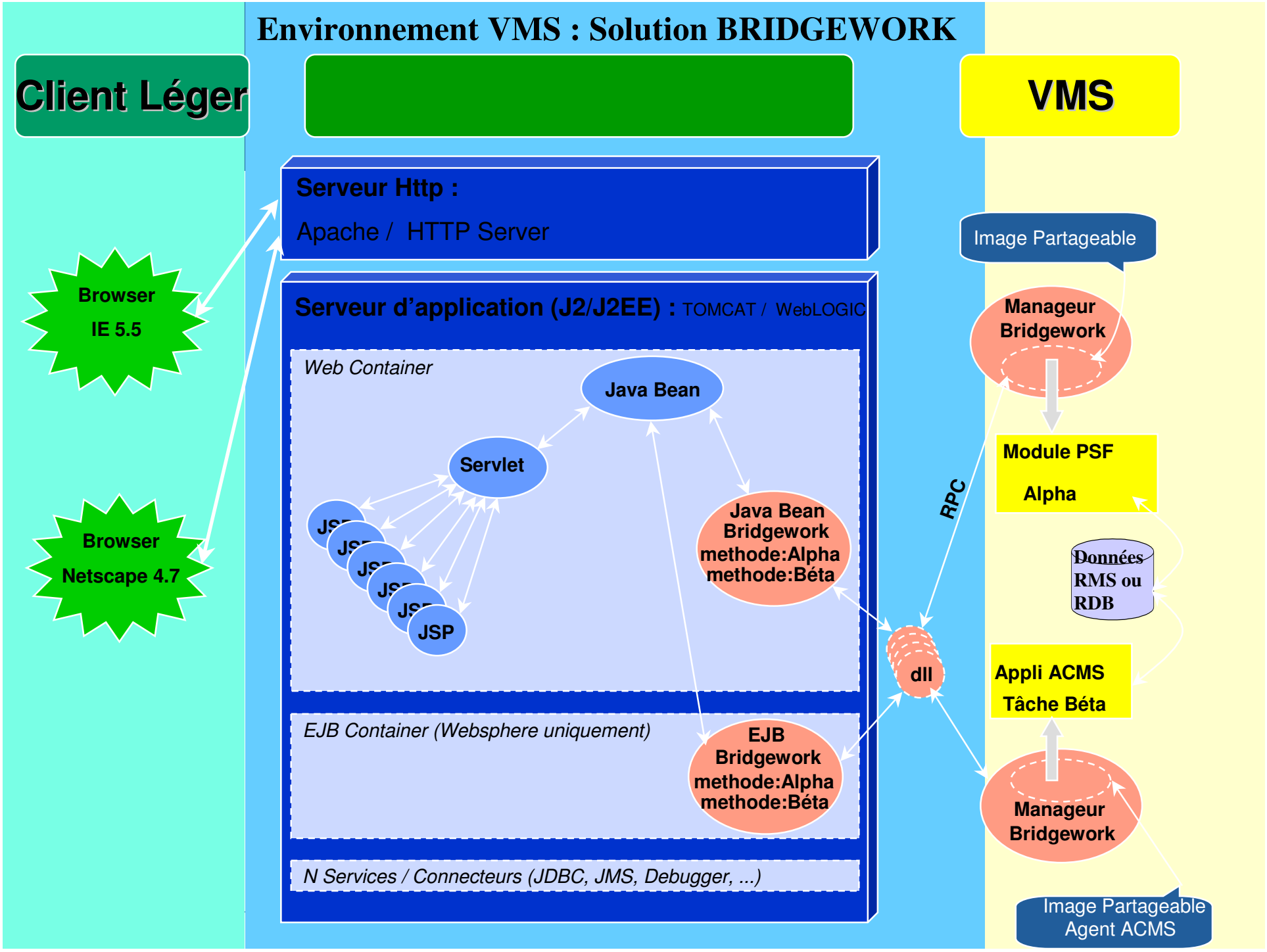
Develop new application software for production control systems with a life span of 10 years. Time available dictated re-use of existing modules from J2EE-based application server. Transactional integrity required across all systems.

What did we do:

- Ran a 2 day architectural workshop to map existing and new functionality
- Proposed a J2EE-based solution around BEA WebLogic Server
- Consulted on design of J2EE application and transactional integration with existing 3GL code
- Provided project management and technology transfer
- Assisted in a 2 month pilot to prove portability of J2EE application to any platform

Results enabled Customer to:

- Begin design and implementation of a J2EE-based architecture
- Wrap existing 3GL (COBOL) code as Enterprise JavaBeans
- Support use of new devices through use of standard J2EE technologies
- Outsource development of application modules due to use of standard technologies
- Ensure transactional consistency across all systems


Environnement VMS : Solution BRIDGEWORK
Client Léger
VMS
Serveur Http :
Apache / HTTP Server
Browser
IE 5.5
Browser
Netscape 4.7
Serveur d'application (J2/J2EE) : TOMCAT / WebLOGIC
Web Container
Java Bean
Servlet
JSP
Java Bean
Bridgework
methode:Alpha
methode:Béta
EJB Container (Websphere uniquement)
EJB
Bridgework
methode:Alpha
methode:Béta
N Services / Connecteurs (JDBC, JMS, Debugger, ...)
RPC
dll
Image Partageable
Manageur
Bridgework
Module PSF
Alpha
Données
RMS ou
RDB
Appli ACMS
Tâche Béta
Manageur
Bridgework
Image Partageable
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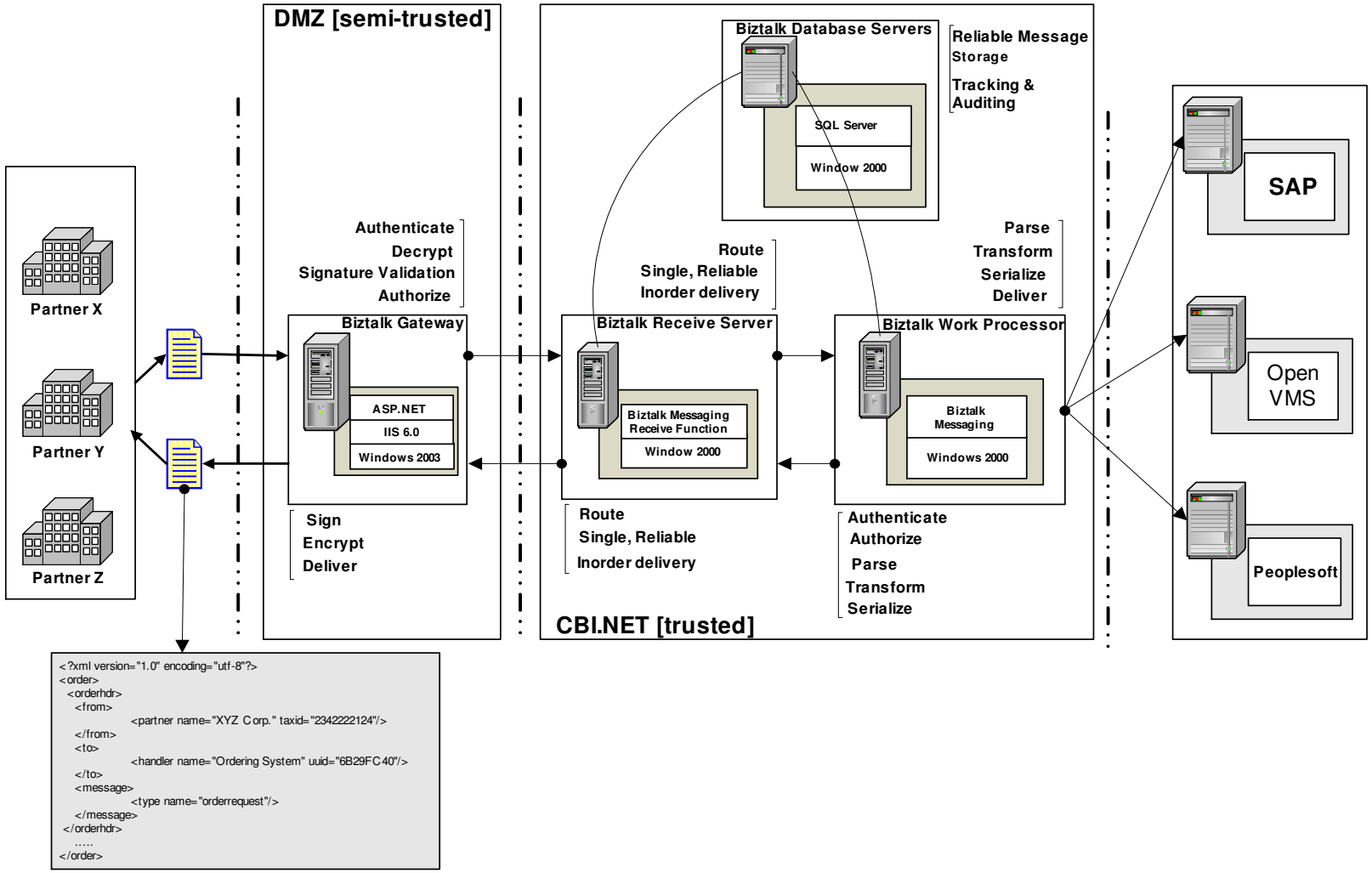
FRONTLINE PARTNERSHIP

HP Collaborative Business Infrastructure Initiative

CBI Core Architecture



Web services

What is Web Services?

- Enabling technology for integration solutions
  - Standards-based
  - Vendor, platform, and language independent
- The way to integrate with .NET
- An easy way to integrate with Java
  - JavaBeans and Enterprise JavaBeans (EJBs) can easily be turned into Web services
- A way to integrate legacy applications with application interface level integration

Foundational Web Services Standards

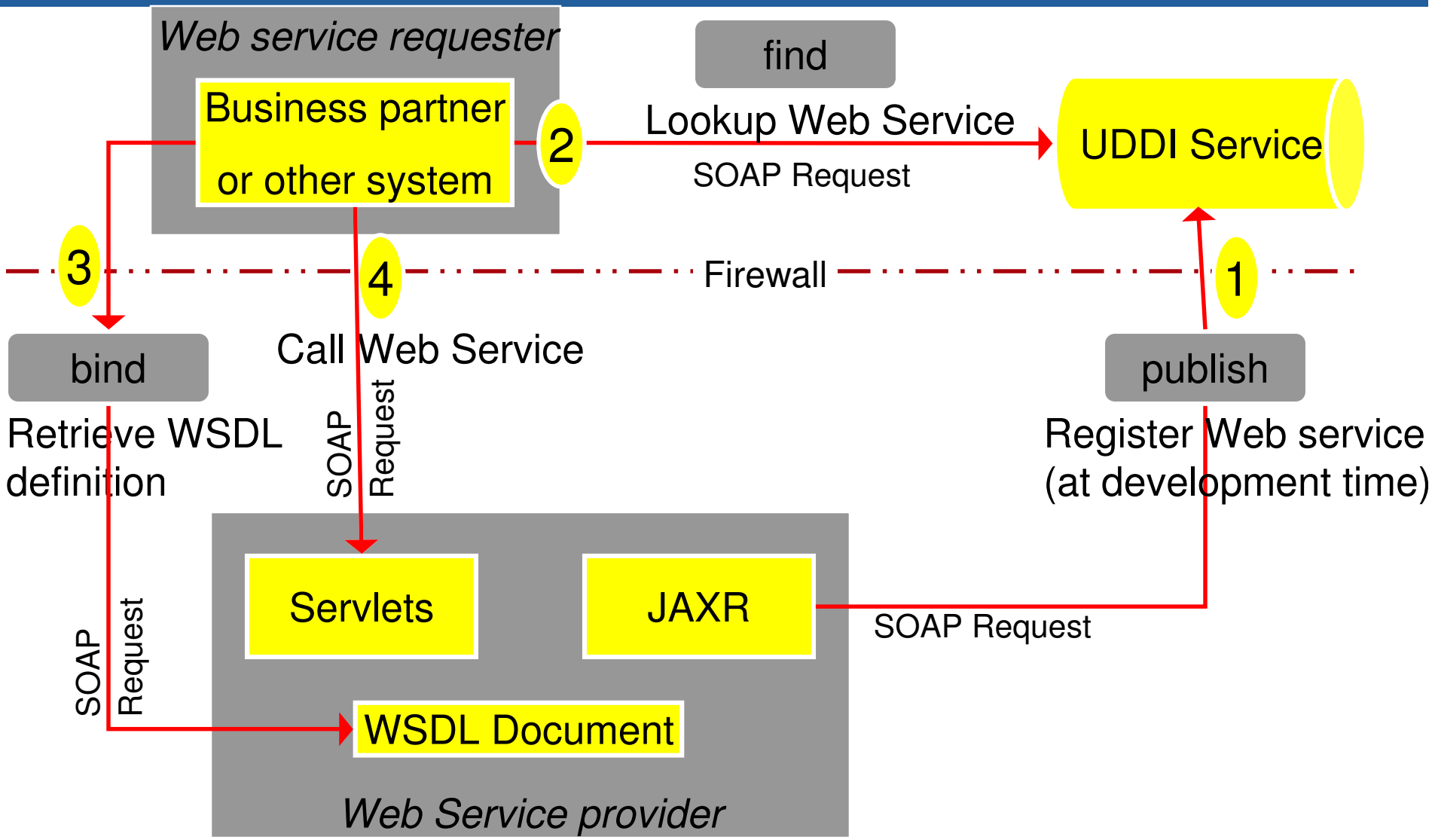
- XML - eXtensible Markup Language
  - the standard way to represent data
- SOAP - Simple Object Access Protocol
  - the standard XML-based message format
- WSDL - Web Services Description Language
  - the standard XML-based service description language
- UDDI - Universal Description, Discovery and Integration
  - the standard XML-based way to register and discover Web Services and service providers

Web Services – The *Big Picture*

The four main layers:

1. XML = Extensible Markup Language
2. SOAP = Simple Object Access Protocol
3. WSDL = Web Services Definition Language
4. UDDI = Universal Discovery Description Language

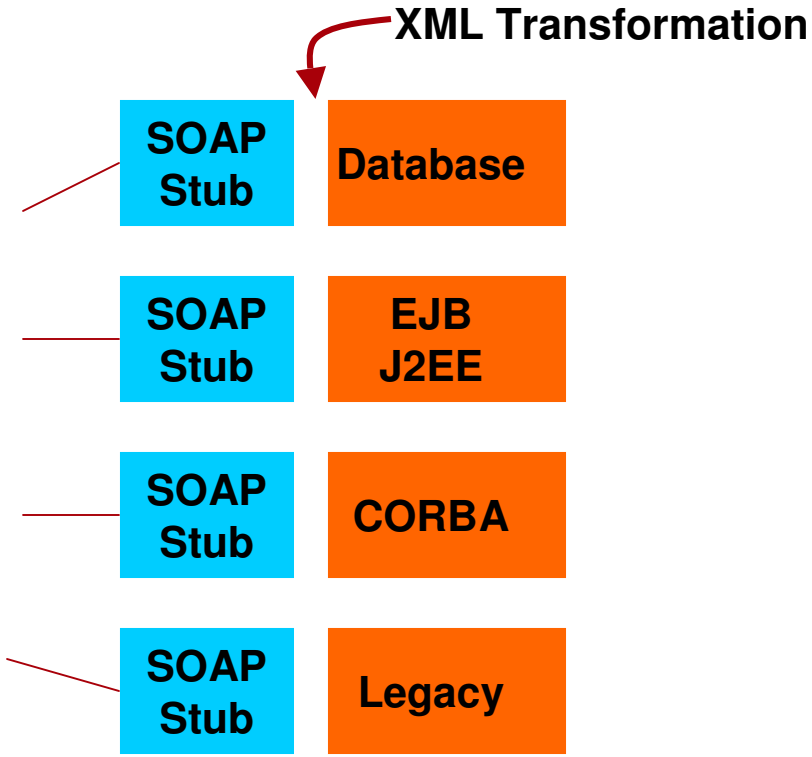
Web Services – The *Big Picture*



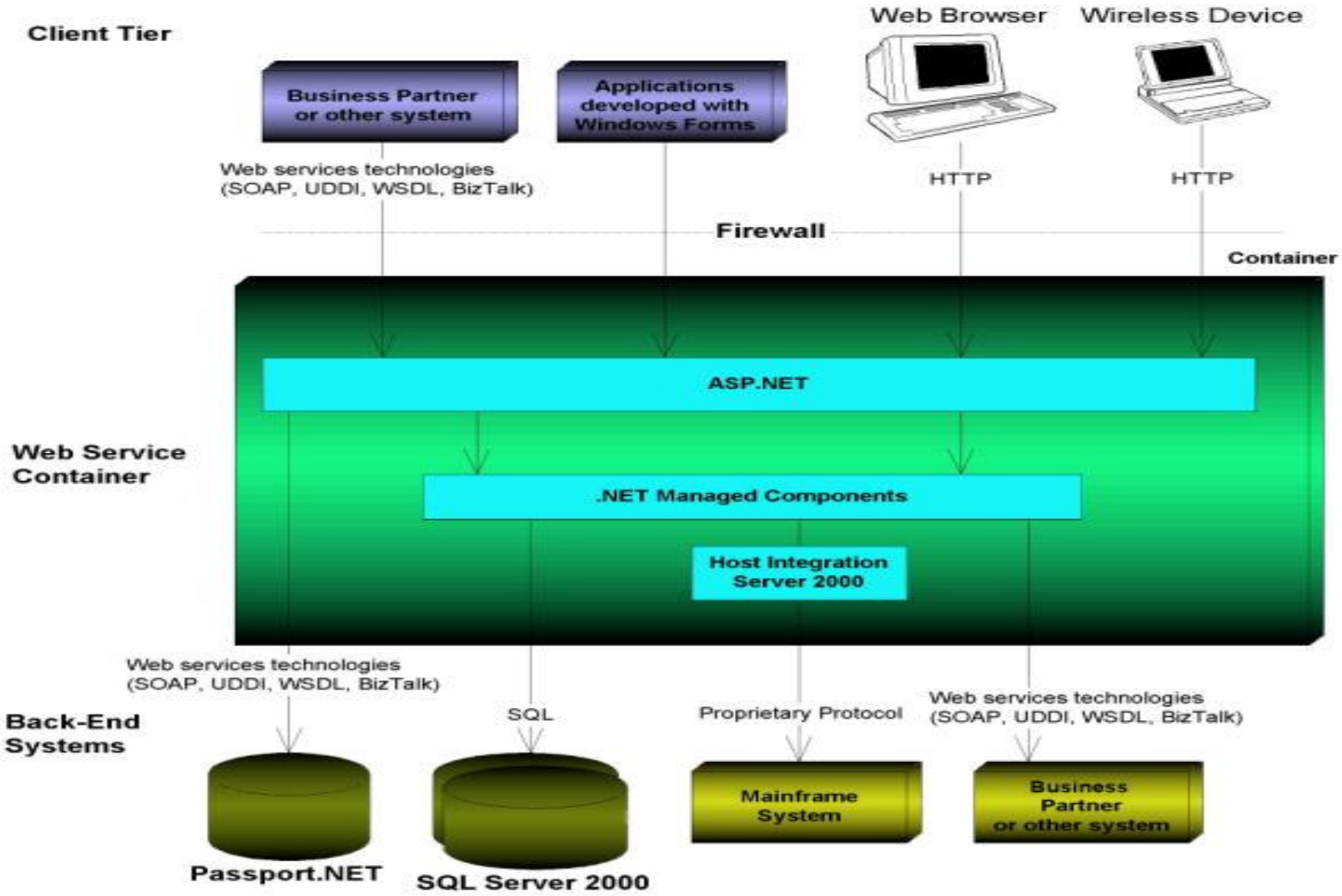
Web Services: Implementation of Business Logic

The Web Services Architecture (*does not cover the actual implementation of the business logic*-- of a Web Service. Web Services may be implemented using:

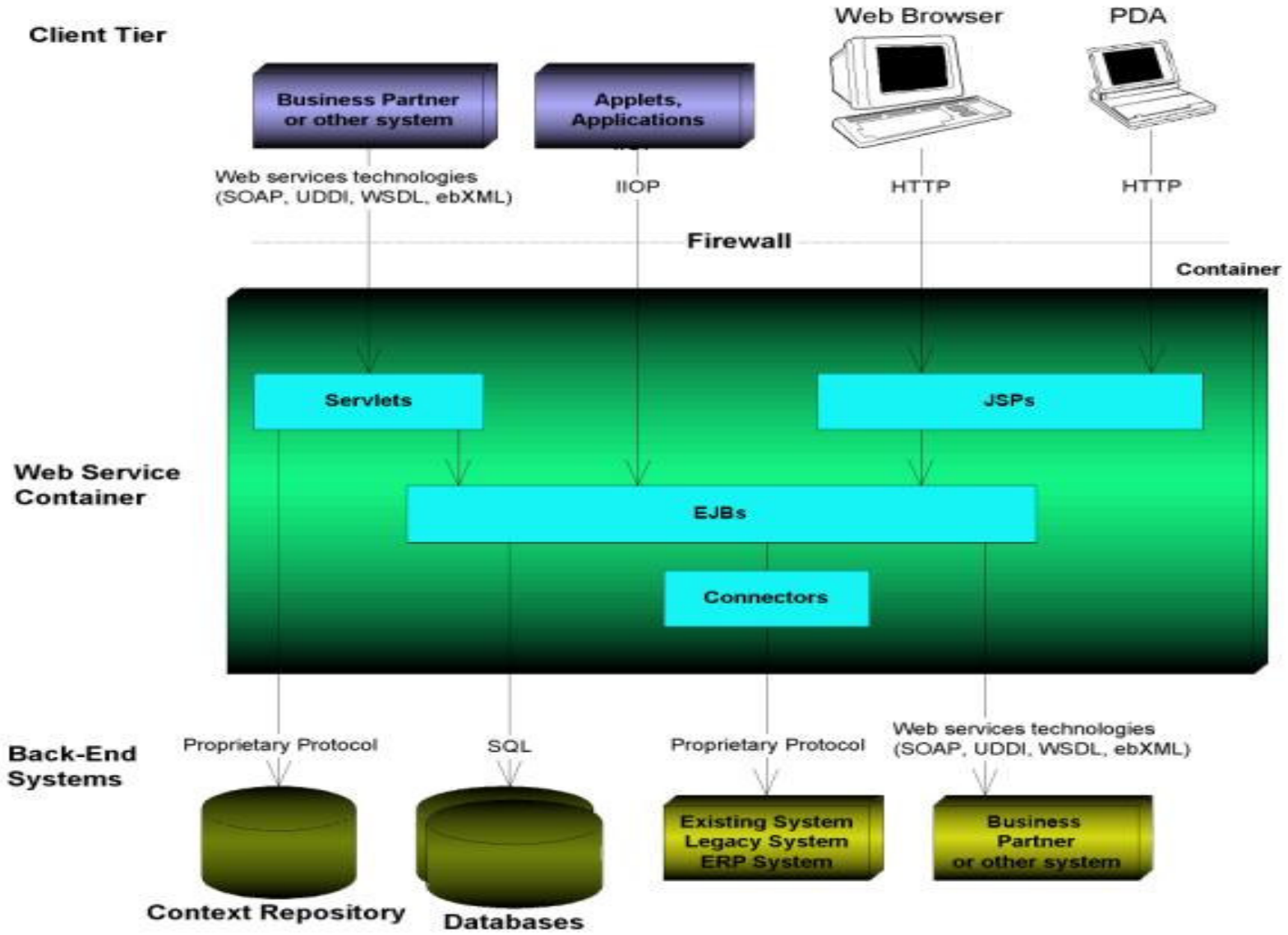
- COM+
- EJB/J2EE
- CORBA
- Legacy App or DB
- Other



Developing Web services with Microsoft.NET



Developing Web services with J2EE

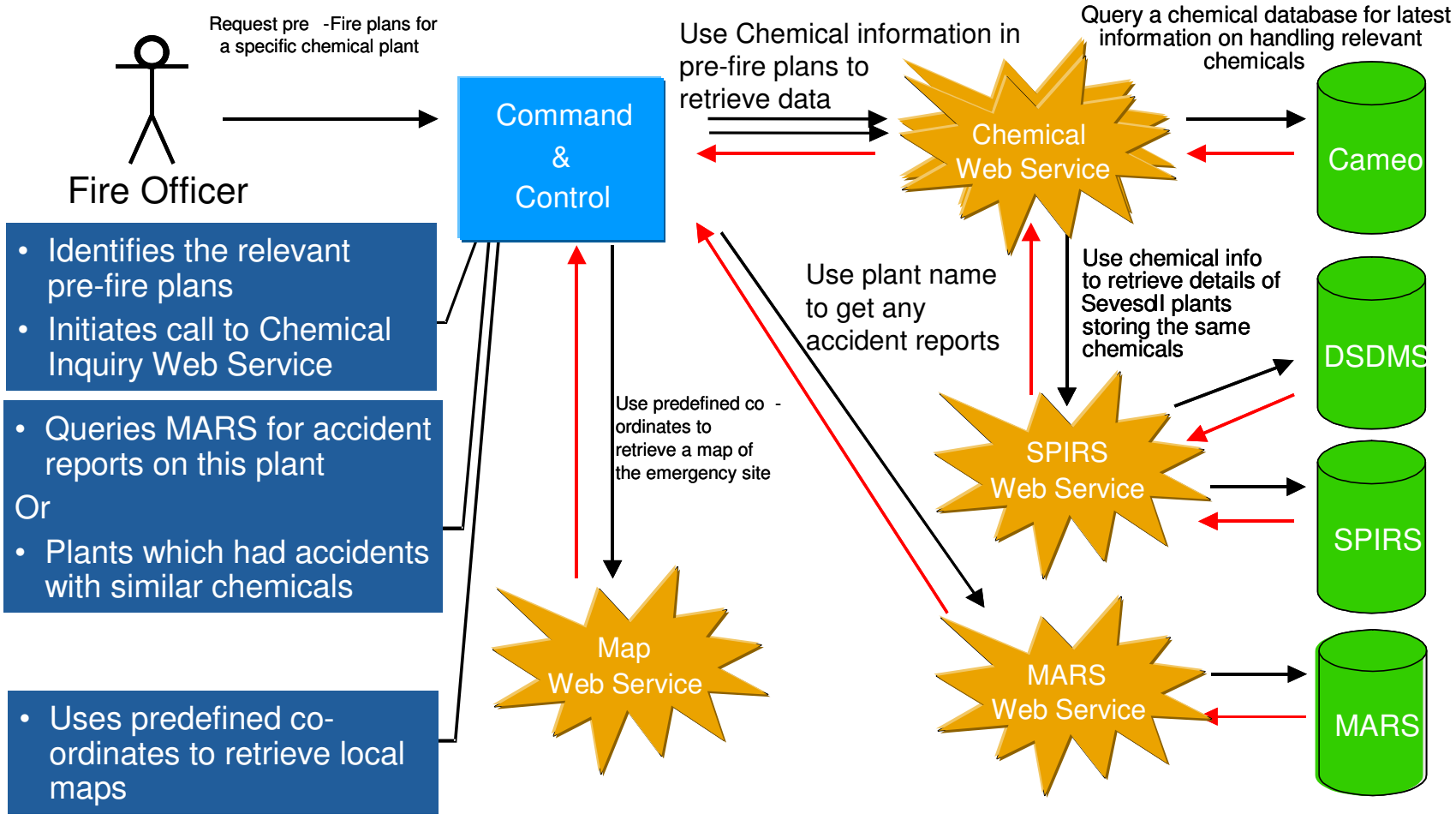


Example: E-emergency systems ...”Extreme Adaptive Infrastructure”

- AGE-GIS web services project (EU funded initially)
  - Emergency response planning
  - Risk identification and escalation
  - Movement restriction
  - Relocation and evacuation
  - Gas dispersion modeling services
- Developing standards around web service based implementations
- Affecting security, government, protection services, healthcare, weather, etc

Pan-European emergency services management solution

Fire Plans Web Service



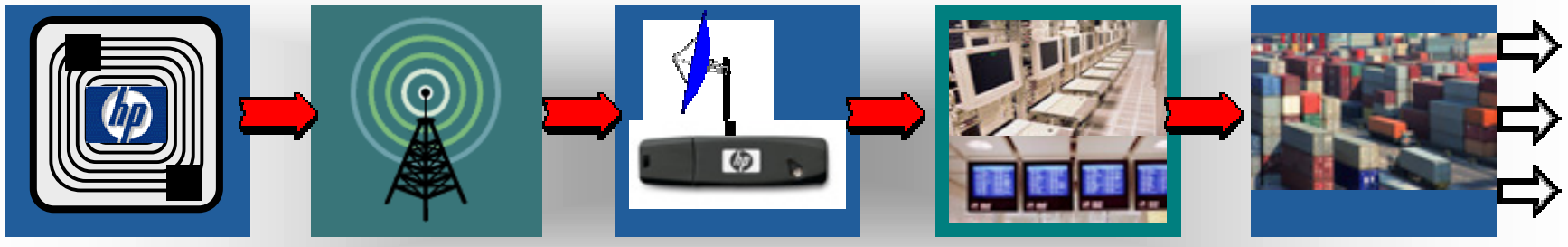
- Cameo, DSDMS, SPIRS, MARS are Chemical Datastores

RFID overview and Positioning

- RFID (Radio Frequency Identification) tag/label is a tag with digital information that can be electronically read at a distance even when not visible
- Many different applications exist for RFID, including:
  - Tracking, Tracing, Inventory Management, Anti-counterfeiting, Entertainment, Safety, Security, Auto-rejection, Transactions, Proof of ownership, Anti-tamper, anti-theft
- RFID is expected to grow from a $1B industry in 2002 to $3-4B+ by 2008 and potentially $15-25B by 2015
  - Supply-chain applications will drive large part of growth
- The timing of market growth is still uncertain
  - Lack of standards, high tag cost, open system deployments need to be addressed
  - Wal*Mart is a key driver – compliance mandate by January 1st, 2005; same for DoD.
- CPG, Retail to adopt first, Auto, Pharma & high-tech will follow

The Meu-chip is built using a conventional CMOS process.

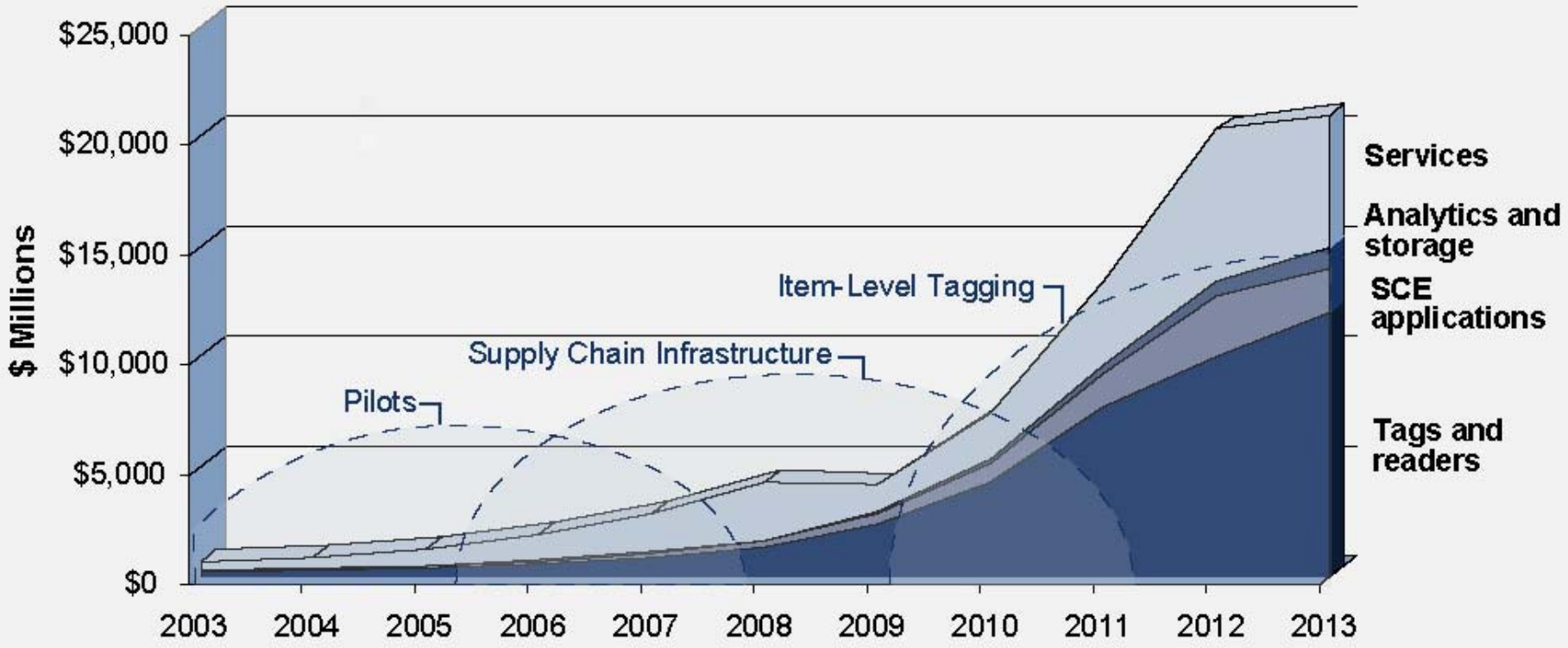
Key components of the RFID process



Tag	Antenna	Reader	Middleware	Supply chain execution
- Each item has a "tag" attached to it or embedded In it - Transmits identification data to a reader	- Coiled antenna of reader creates magnetic field with coiled antenna of tag - Waves turns into digital information	-Transmit data to middleware - Associates tag info with product info	- Process information from reader - Filters data - Sends data to backend servers	- Backend SCE or ERP systems receives Information Examples of SCE: - Updates inventory - Notifies shipment arrival - Triggers procurement

Market evolution according to AMR

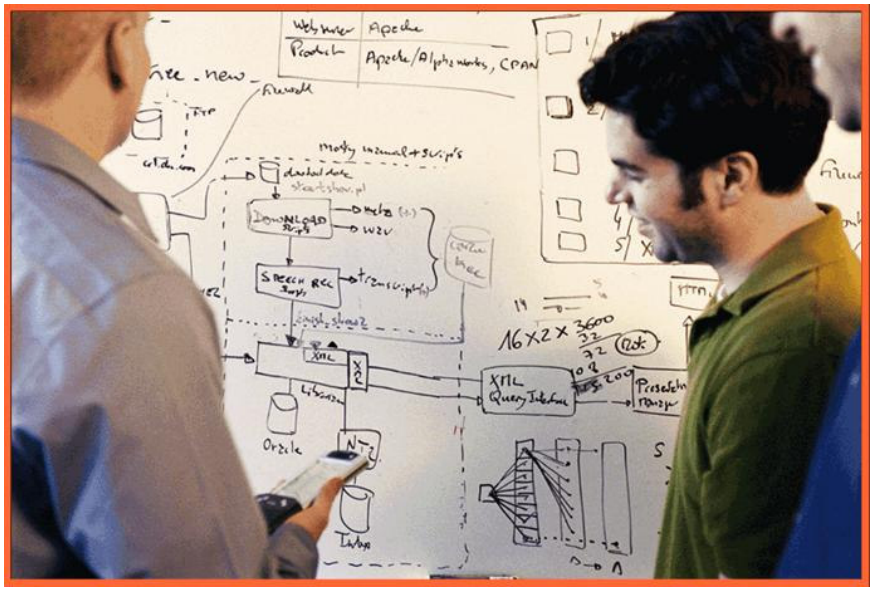
Figure 2: RFID market evolution



Source: AMR Research, 2003

Challenges for IT industry

- Applying business models to functional applications components
- “Metered” measurement of all aspects of an IT infrastructure
- Extended transactions in Web services environment
- Security of transactions
- Industry bodies or Software industry to define standards?



Summary…

- Target integration activities at specific business improvement initiatives
- Architect and design for a Service Oriented Architecture (fundamental to implementing AI)
- Architect with Web services in mind to expose your applications to outside
- Partner with industry leaders (MS, BEA, Oracle,Attunity,WRQ etc.)
- Develop/deploy on any HP platform
- Start with architectural workshop.

Questions?

Comments?

Request Workshop?

Mick.keyes@hp.com


hp
invent

Moving: Integrating the new with the existing