E-Speak Enables a Fully Automated Order Fulfillment System with HP Suppliers

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This presentation describes…

- how HP's first generation e-speak product enabled the creation of a private marketplace for an order fulfillment supply-chain for the procurement of HP replacement parts for HP products
- the components of the architecture
- the results of the pilot and lessons learned
- the expansion and utilization of next generation e-speak in future solutions

Business Opportunity for Web Service Solution

HP Service and Support business at HP Customer Support (HPCS) is responsible for the repair and distribution of support parts to service HP products throughout the world, which means procuring and supporting several thousands of parts and shipping to thousands of locations. The cost of keeping an inventory of these parts is huge, so a solution had to be found to reduce inventory and warehousing costs by using supplier-managed inventory when possible.

Unlike typical manufacturing supply chains, where latency often exists in the link between the buyers and suppliers, the HPCS supply chain supports customers with mission critical systems that tolerate very little latency. In some cases, orders must be shipped to the customer in four hours or less.

Thus, HPCS turned to technology to reduce supply chain latency and to reduce costs.

E-Speak Pilot Objectives

- Replace the previous proprietary B2B solution that was point-to-point in nature, one-directional, expensive, and often difficult for suppliers to integrate with
- Create a marketplace for real-time bi-directional integration and interaction between and among trading partners
- Reduce proprietary representations of information, leverage on the (evolving) industry standards
- Provide real-time integration with supplier's SAP system
- Create the *foundation* for a truly dynamic marketplace where buyers and suppliers can dynamically negotiate prices, terms, etc., in an automated and real-time fashion
- Prove e-speak as a viable technology to model and enable business processes

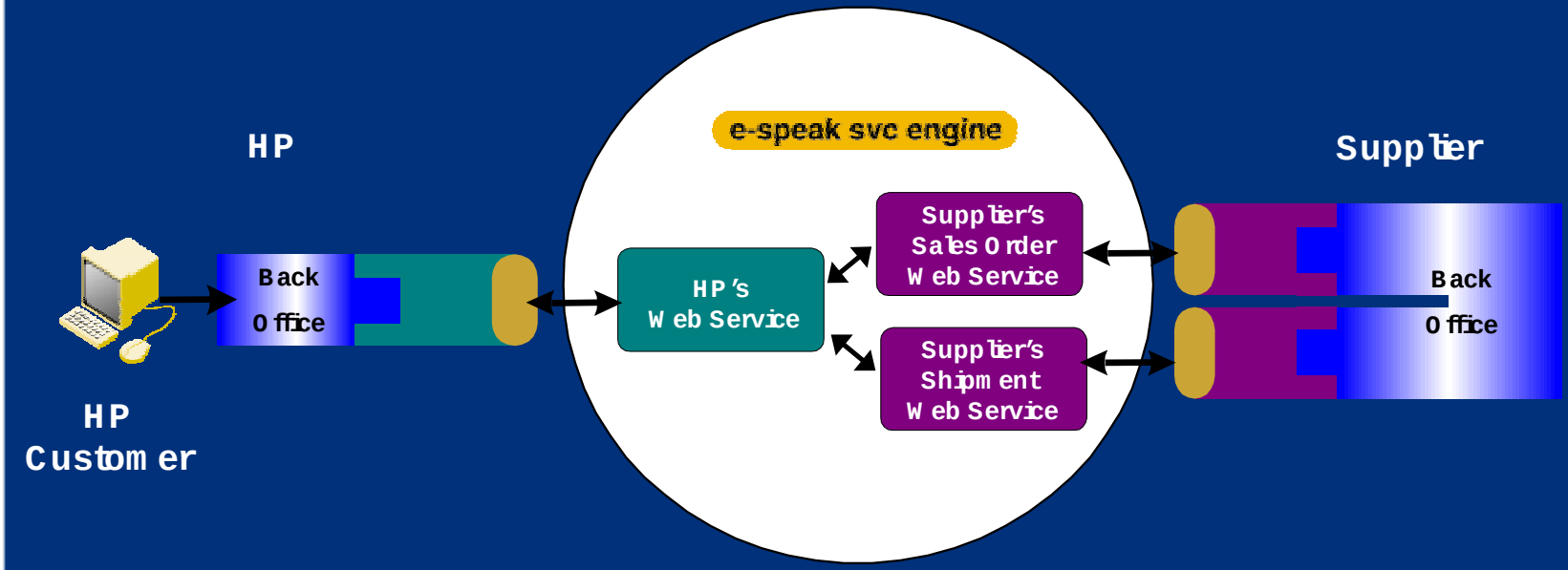
E-Speak Pilot Challenges

- Cost-effective SAP integration
- Secure marketplace environment and firewall traversal
- Entry cost of B2B integration
- Map proprietary business processes and data semantics to (emerging) industry standards
- Cross-company 24x7 fault-tolerance Network Object Model (NOM) solution

Architecture Components

- Design based on Network Object Model (NOM) to reduce latency
- Three e-speak engines (cores) – one running within HP, one running in DMZ, and (an optional) one running in supplier's environment
- Various web services that encapsulate business processes based on RosettaNet "Purchase Order" PIP
- Vocabulary – used for service/vocabulary descriptions and for service discovery (based on RosettaNet business dictionary)
- Payload based on RosettaNet XML document schemas
- Integration adapters into HP's back-end order management and finance systems and pilot supplier's SAP R/3 Sales Order & Shipment module
- Web portal for adhoc order status queries and manual intervention

E-Fulfillment Marketplace

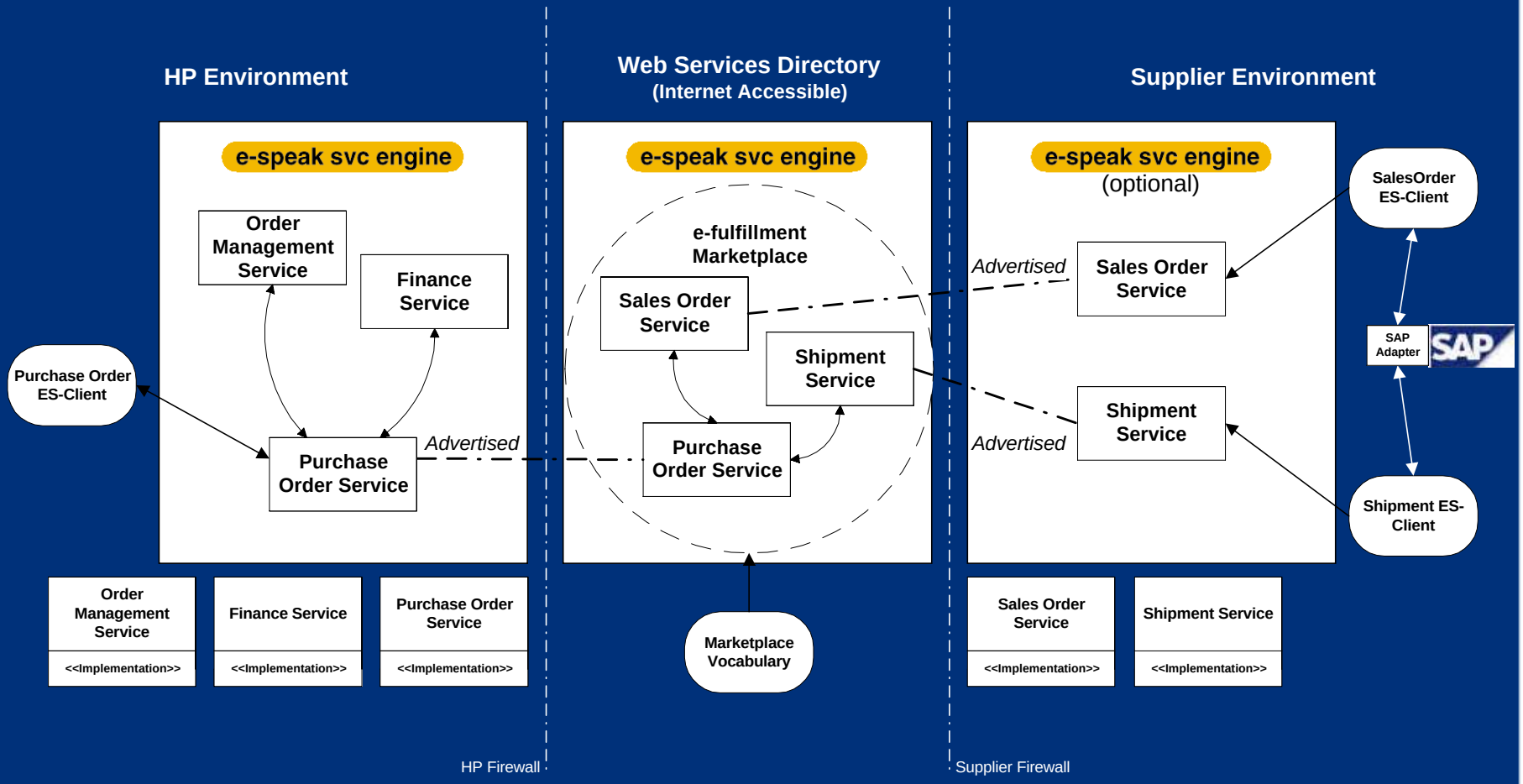


Routing orders to Supplier via Web Services

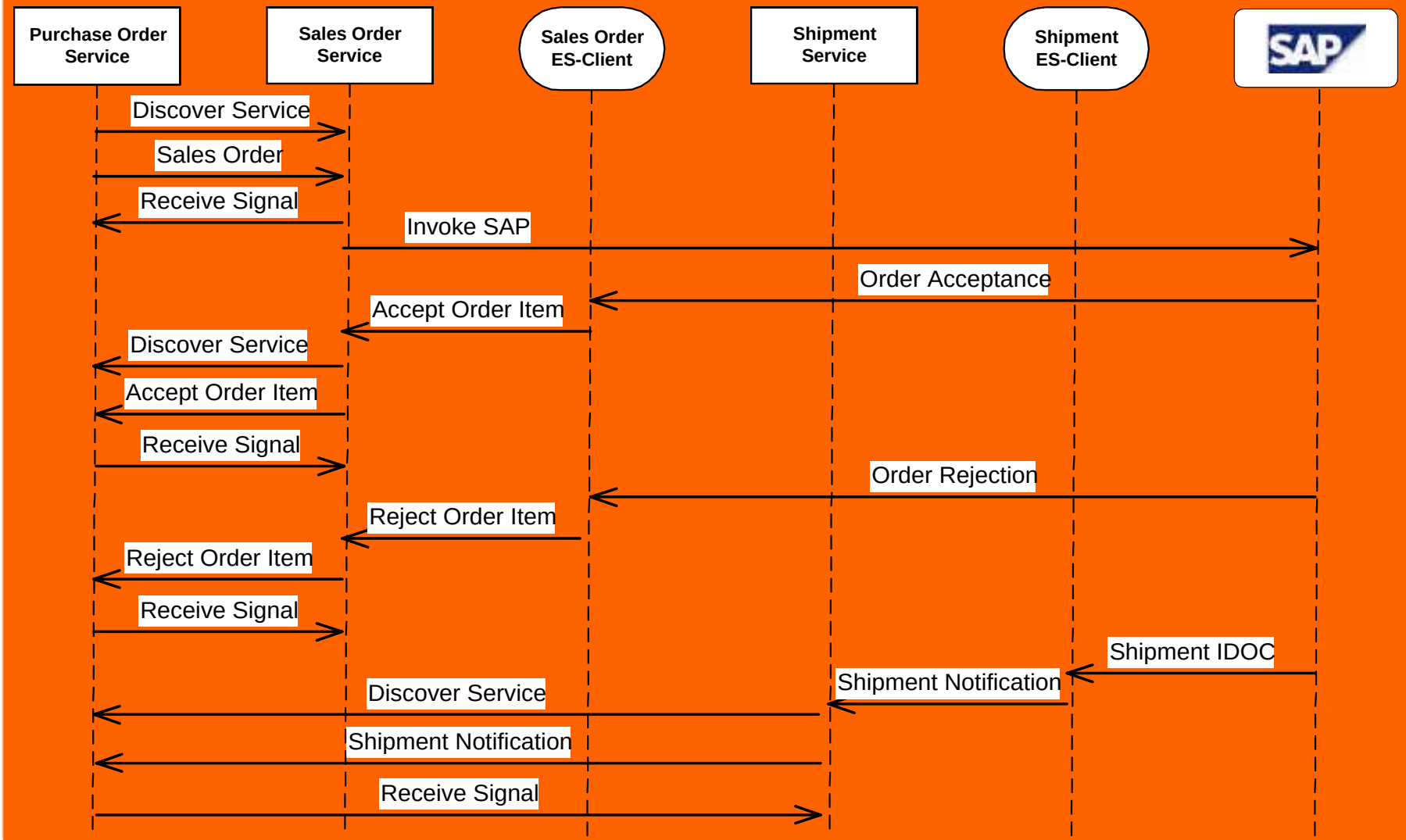
A word about Web Services…

- Three main web services were created for this pilot that map to the three main business processes. They are the Purchase Order Service, Sales Order Service, and the Shipment Service.
- Each service was implemented by its respective provider. Each is dynamically advertised, discovered, and remotely invoked in a virtual marketplace, but executed in its respective provider's host environment.

E-Fulfillment Marketplace Architecture



Transactional Process Sequence



Back-end Integration Tasks Decomposed

Required Tasks for *every* integration:

Inbound Data → 1. XML Pre-Processing → 2. Transalate RN XML to Native → 3. Specifc Pre-processing → 4. Supplier System Entry Point

Generic ⟷ **Specific**

4. XML Post-Processing ← 3. Transalate Native to RN XML ← 2. Supplier Specifc Post-processing ← 1. System Exit Point ← Outbound Data

E-speak's Enabling Features and Functionality

- **Web Service Directory** – e-speak's advertising service provides the directory lookup facility to dynamically discover vocabularies and services.
- **E-speak Vocabulary** – provides robust mechanisms to describe services (and other vocabularies) for dynamic service discovery.
- **Security** – a session layer security protocol based on certificates prevents the unauthorized access to the data or processes of any buyer or supplier in the market-place.
- **Secure Firewall Traversal** – E-speak supports two types of firewall traversal mechanisms, web-proxy and socks-server.
- **Fault-Tolerance** – provides resilient NOM service connections to the marketplace.
- **Meta-Data Persistence** – provides persistence of service vocabulary and service descriptions to retain service registration in the event of service or core failure.

E-Speak Pilot Results

- Far exceeded expectations. The pilot supplier, a leading global supplier of printer products, was able to reduce its operating costs by 79 percent. Pilot supplier's SAP integration costs were 80+ percent less than alternative B2B solutions.
- Demonstrated that e-speak has the capabilities to replace the previous proprietary and expensive B2B solutions
- Created a marketplace for real-time bi-directional integration and interaction between and among services
- Achieved integration using transactions based on industry standards (RosettaNet)
- Established the *foundation* for a truly dynamic marketplace where buyers & suppliers can dynamically interact in a secure, automated, and real-time fashion
- Proved e-speak as a viable technology to model and enable business processes

Lessons Learned

- B2B is not easy!
- Partners desire HP to provide adapters to their backend systems (I.e., SAP, BAAN, Oracle, MfgPro, BCTops, etc.)
- Backend integration is where the work is, which is true for any B2B fully-automated solution
- Some partners will call the shots
- Most partners do not have centralized systems, rather they run their different installations on different systems, which complicates integration

Lessons Learned (continued)

- Big need (opportunity) for the creation and support of non-proprietary integration "adapters" to back-end ERP's (for example, 3rd party implementers of Java Connection Architecture (JCA) specification)
- High-volume of low-dollar business transactions requires a fully-automated solution with no human intervention
- Focus on industry standards to represent data rather than proprietary formats.

HP's next generation e-speak Web Services platform

- Plays an integral part of the NetAction suite.
- Greater integration with HP Bluestone and Process Manager.
- Grater integration with J2EE framework and UDDI & SOAP.
- Greater emphasis on XML, continued leverage of standards.

Questions?