NonStop Server as an Integration Hub for Data and Applications

Mike Zivkovic, Sr. Product Manager, HP
Wil Marshman, Product Manager, HP
Larry Mendoza, Product Manager, HP
Agenda

- **Integration architectures – Mike Zivkovic**
  - Modern architectures: Adaptive Enterprise, RTE/ZLE, Service Oriented Architecture (SOA)
  - Integration hub vs no-hub, advantages and benefits
  - Technology choices: RPC, messaging, database access, Web Services

- **Application integration – Wil Marshman**
  - Messaging solutions: JMS, Tibco, WebSphere MQ
  - EAI solutions: WebLogic Integration, SeeBeyond, Gresham, Infravio
  - Customer Examples

- **Data Integration – Larry Mendoza**
  - ETL solutions: Genus HSDCI, Ascential, Informatica
  - Data synchronization: NS DTE, GoldenGate, ITI Shadowbase, NTI
  - Customer examples
HP Adaptive Enterprise
- *Business and IT synchronized to capitalize on change*

1. Extract business processes and business rules from applications, and adopt SOA.
SOA Goal: Virtual Enterprise Network
- Burton Group (2005)

Enabling business processes to span boundaries
Enable ad hoc integration of processes
Composite applications
Support all constituencies
Employees, partners, suppliers, and customers
Maintain quality of service
Security, reliability, availability, scalability, performance, etc.

But it requires fundamental changes...

A recent survey (Oct. 2004) of 473 enterprise buyers by the Yankee Group of Boston revealed that in the next 12 months, 75% plan on investing in the technology and staffing necessary to enable a service-oriented architecture. Yankee’s survey results point out that the greatest investments in SOA are coming from the wireless telecom and manufacturing markets (78%), while financial services (77%) and health care (71%) are not far behind.
Current 5-tier application architecture
- *Fundamental Changes Required*

- **Client Tier**
  Application clients, Flash, applets, and other GUIs

- **Presentation Tier**
  ASP, JSP, Servlets, and other UI elements

- **Business Tier**
  Connects to business objects

- **Integration Tier**
  Connectors to data and legacy systems

- **Resource Tier**
  Databases, external systems and legacy resources

running on client

running on server
New SOA architecture
- We need to get there

Shared, reusable services

- Open account
- Change address
- Process order

Service bus or service HUB

- Retail banking
- Customer service
- Web self-service
- Portfolio management

Applications sharing services

Critical choice of architecture/topology
Multipoint Web Services (SOA)
- Availability, scalability, security… issues

• Many Web Services clients to many Web Services servers

• Organizations have some ~50 key applications; if only half of them need to be integrated \((n(n - 1) = 2,450)\) connections, adding one more app adds 50 more interfaces!

• Availability, scalability, security… issues

"Through 2006, more than 90% of internal and business-to-business service-oriented business applications will be subjected to Web services outages, performance issues and failure"
(Gartner - September 2004)
Hub for Web Services (SOA)

- Real-time brokering, security, management, data

• Brokering in proxy mode

• Scalable, fault-tolerant, high performance

• Model, configure, deploy and monitor Web Services across full range of heterogeneous systems from a single point

• Invokes delivery services as needed (e.g. Security)

• Create Orchestrated Web Services using services from applications running on various systems
Real-time Enterprise Architecture
- Enables high value ZLE applications

Customer Facing Systems:
- Portal (Web)
- Call Center
- Mobile
- TP (ATM, POS)

ZLE Apps & SOA hub
- Fraud Prevention
- Real-time sell & cross-sell recommendations
- Single customer view
- Enterprise personalization…

Enterprise Apps:
- ERP
- Sales
- Billing
- Manufacturing…

EAI
ODS
(enterprise data cache)

Extract, transform, load (ETL)

Enterprise Data Warehouse
HP Adaptive Enterprise, ZLE, and SOA
- Simplicity, agility, value

AE: Business and Information Technology (IT) synchronized to capitalize on change
+ 

SOA: Technology and network independence
+ 

ZLE: Ability to react in real-time, any time
= 

Business benefits: simplicity, agility, value
SOA doesn’t have to be Web Services!

- Implement SOA with Web Services, CORBA, Pathway…

✓ Fast
✓ QoS

Service Broker (Repository)

- Pathway
- Tuxedo
- CORBA
- J2EE

- PathSend tpcall()
- CORBA
- RMI

- Pathway
- NS Tuxedo
- NS CORBA
- J2EE

Service Consumer
 invocations
 Service Provider

- Tight coupling
- Fine or Coarse grained
- Not self-describing
- Technology dependent

- Loose coupling
- Coarse grained
- Self-describing
- Technology neutral

UDDI
Find

SOAP
Bind (invoke)

Publish
WSDL
Multi-tier deployment of services (SOA)
- Scale, performance, cost effectiveness...

- Data services, Business services
  - Oracle, DB2, MS SQL
  - JMS, MOM, RMI, IIOP, WTC, ODBC, JDBC T3,T4, SOAP, XML

- Presentation services, Business services
  - .NET, Web Services, SOAP, IIOP, RMI, JMS
  - HP/UX or Linux, or Win blades

- Clients
  - Internet
  - Firewall

- HP NonStop clusters
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Application messaging 101
- Open standards: JMS, PGM

- **Point-to-point (queuing)**
  - IBM WebSphere MQ
  - NonStop JMS

- **Many-to-many (pub/sub)**
  - TIBCO SmartSockets
  - NonStop JMS

- **One-to-many (multicast)**
  - TIBCO SmartPGM
NonStop JMS Architecture

- "JMS addresses the single most frustrating bugaboo in messaging middleware: the proprietary vendor interfaces. Arriving as it does as a standard just when enterprises are embracing messaging, it is certain to continue revolutionizing the middleware market. Gartner Group predicts compound annual growth for JMS of 100 percent through the year 2005. " – SD Times
NS JMS: Interoperability Example (1)  
- both servers on NSK

Bridging two JMS providers both running on NonStop server  
E.g. NSJMS and IBM WebSphere MQ with JMS (M88)
Major European bank
- WebSphere MQ

MQ Hub

Major Payments Link to SWIFT/Treasury

Retail Online Banking

Broker Services

Extranet Gateway

Corporate Links

Windows

Stockbrokers Hub
Application Integration (EAI) on NSK
- Leading solutions available

✓ **NonStop DTE 6.7.1** – SJ54V3, SJ55V3, SJ56V3
  • Data Transformation Engine from Ascential DataStage Tx

✓ **NonStop RTID 1.0**
  • XML processing to/from NonStop SQL

✓ **Partner EAI products shipping on NonStop:**
  ✓ **BEA WebLogic Integration 8.1** – including BPM
  ✓ **Gresham Casablanca 4.0**
  ✓ **Infravio Ensemble**
  ✓ **SeeBeyond eGate™ Integrator 5.0.4**

✓ Tested off-platform integration with TIBCO BusinessWorks, Siebel UAN, webMethods, Microsoft BizTalk, and SAP NetWeaver
Infravio Broker
- High Level Architecture on NonStop server

- WS Contract #…
- Delivery
- Transport
- Messaging
- Security
- Transformation
- Transaction
- Versioning
- SLA
- Alerts
- Reports

- Web Service
- Portal
- Call Center

Running as servlet

Running under TS/MP control for Fault Tolerance and Load distribution

Examples:
- Security: Safeguard
- Monitoring: DSM
- Transactions: TMF
North America Electronics Company
- NonStop SOAP and webMethods

1) SOAP Server creates WSDL from DDL for Pathway serverclass handling order processing

2) webMethod uses WDSL to access order processing on NonStop thru standard Web services

3) Web customers submit orders. From the Web server; they are send to the webMethod server. Part of its processing is to send the order to the Web service on the NonStop system and get a confirmation
HP Internal IT implementation
- RTID in a Supply Chain Application

Visibility App
Monitoring App
Other App

Integration Server
Adapter
JMS Adapter + WLS client library
SAP Adapter

WebLogic Server (WLS)
XML
NonStop RTID
Real Time Information Director

SQL
NonStop SQL
Real Time Data Store

SAP
SAP
SAP
Graphical Process Modeling
- new with BEA WebLogic Integration 8.1

• High Productivity Modeling Tool
  - GUI based
  - Drag and drop flow model
  - Access systems, people and trading partners

• Rapid connection with resources
  - Out-of-box Controls hide complexity
  - One click to Java if/when required

• Consistent, single environment
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Enterprise Data Today
– Variety, Velocity, Volume

• Today’s data is captured in legacy applications data stores
  – Distinct applications, each controls its own data
  – Traditional applications are largely defined by their database schemas

• Today’s composite applications require multiple data sources
  – Expectations for holistic, personalized & value-added content
  – Relational, XML, packaged apps, repositories, file systems, etc.
  – Expect wild variations in data store sizes

• Today’s requirements are moving to real-time data
  – Real-time state of the business
  – Real-time Analytics
  – Business Activity Monitoring
Spectrum of Data Integration
- Products for NonStop servers

• Complete line of products, partners
  – Covers the expanse from RT to bulk NRT needs

**Data Volumes**

**ETL** – HSDCI + Informatica, Ascential; DataLoader

**Transformations** – NonStop DTE

**Replication** – Golden Gate, ITI, NTI; RDF

**JDBC/J2EE, CORBA** – NonStop support

**ODBC** – NonStop SQL; Attunity, DataDirect

**Realtime Requirements**
### Data Integration for NonStop servers

- **ETL Benchmarks – Informatica, Genus**

#### Requirement (by priority)

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Xfer Rate</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Extract from NS SQL and transfer it to a flat file on HP - UX running Informatica</td>
<td>1.73MB/sec/cpu</td>
<td>5.5 Min.</td>
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<tr>
<td>2</td>
<td>Import a standard &quot;inbound&quot; file to NS SQL</td>
<td>526KB/sec/str</td>
<td>20 Min.</td>
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<tr>
<td>3</td>
<td>Extract from NS SQL, UPDATE the NS resident Database with values calculated using Extracted Data (Transform in place)</td>
<td>Successfully completed with 3.4 million records at the rate of 1.1 M records per hour</td>
<td></td>
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<tr>
<td>4</td>
<td>Extract from NS SQL and transfer it to a similar schema in an Oracle database running on HP – UX</td>
<td>1.55MB/sec/cpu</td>
<td>6.1 Min.</td>
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<tr>
<td>5</td>
<td>Extract from NS SQL, and post it to a different schema in an Oracle database running on HP - UX</td>
<td>1.44MB/sec/cpu</td>
<td>6.6 Min.</td>
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</table>

#### NonStop System Configuration
- System Type: S86000, 8 CPUs
- NS SQL: SQL/MX 1.8.5
- Memory: 4GB
- TCP/IP Size: 10MB
- Database Size: 10 GB

#### UNIX Configuration
- HP-UX: 4 CPU
- Database: Oracle 8i
- Database Size: 2GB (4GB Table Space) from ECW data
- PowerCenter Version 6.2.2 (one instance)

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March 3, 2005
Data Integration for NonStop servers
- ETL Use Case: Ascential, Genus

- HP UX TCP/IP

Parallel Load

Partitioning

Source

A-F

G-M

N-T

U-Z

last name

zip code

Repartitioning

Repartitioning

Repartitioning

Data Integration/Analysis Server

• HP UX

PX

Transaction Server or Warehouse Server

TCP/IP

TCP/IP

NonStop SQL

Parallel Extract

Data Integration/Analysis Server

Target

RDBMS

Transform

Aggregate

Aggregate
Data Synchronization Products for NonStop
- “Replication Plus”

- GoldenGate Software - GoldenGate v7
- ITI – Shadowbase v3
- Network Technologies International (DRNet)
- HP - RDF

<table>
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<tr>
<th></th>
<th>RDF</th>
<th>GG</th>
<th>S/B3</th>
<th>DRNet</th>
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<tr>
<td>TMF applications</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>non-TMF applications</td>
<td>w/AutoTMF</td>
<td>yes</td>
<td>w/AutoTMF</td>
<td>yes</td>
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<tr>
<td>cross platform</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>integrated into OS</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>data manipulation</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>sold and supported by hp</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>
Shadowbase® Use Case

*Database Synchronization for NonStop servers*

- Billing/Admin
  - Unicode-Oracle
  - Shadowbase
- Active-Active Load Balancing
  - NonStop1
  - Shadowbase
  - Shadowbase
  - NonStop2
  - Shadowbase
- Web Access to Voucher Info
  - Windows-SQL
- Recharge Cards & Air Time Transfer
  - NonStop3
  - Shadowbase
- Stock (Card) Reporting System
  - NonStop4
  - Shadowbase
  - Shadowbase

March 3, 2005
NonStop DTE
- Transformation and Integration

- Higher Level of Automation for integration of data to transactional and operational systems
- Less intervention as information changes
- Automated decisions on routing based on content of messages
- Tracking and enforcement of rules through extensible partner database
- Compliance with industry and government standard regulations governing data transfer and integration
ODBC/JDBC
- *Database Connectivity for NonStop servers*

• **ODBC/MX**
  - ODBC driver (Windows)
  - ODBC drivers (other platforms via Sequelink product)

• **JDBC drivers for SQL/MX**
  - Type 2 (V30, V31)
  - Type 3 (via Sequelink product)
  - Type 4 (V1.0)

• **Partners: Datadirect and Attunity**
  - Sequelink for NonStop SQL/MX (offered by NED)
  - Attunity Connect (offered by Attunity)
Where do we go from here?
- Application & Data integration - NonStop server hub

- Architecture matters! Hub is the right approach
- Implement using AE, SOA, ZLE/RTE principles
- Robust technologies are available
- Excellent customer experiences in production
- Contact your account team for further info and a demo, and…

"Don’t worry about the technology. . . Worry about how you’re going to integrate technology into your working culture. The crucial point is to understand how those technologies can improve enterprise performances, and to start rethinking business processes and working models."

-- Nigel Deighton, Gartner vice president
Questions?
Web Services considerations

- Performance (SOAP over HTTP)
- Efficiency (XML)
- Security (HTTPS, WS-Security)
- Transactions (long-running transactions)
- Etc.

… but re-use, interoperability, technology independence, openness and flexibility, ease of use, and many other benefits of Web Services are too great to pass on as 50,000 Amazon.com and 30,000 eBay developers already discovered
Gartner Predicts:
- SOA is changing IT!

“The single, most-important theme in modern application development is service-oriented architecture (SOA)... most enterprise-scale applications with long expected life spans will be built using SOA.”

– Roy Schulte, vice president and research fellow at Gartner

“A paradox of technology innovation is that those close to an innovation frequently focus on fine-grained technical changes, missing the sweeping impact of the innovation on the enterprise as a whole. Web services and, more generally, service-oriented architectures (SOAs), encourage a different metaphor for how IT delivers business processes.”

– Jim Duggan, vice president and research area director at Gartner
### Education & Training Options

<table>
<thead>
<tr>
<th>Title</th>
<th>Audience</th>
<th>Availability</th>
<th>Location/Type</th>
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</thead>
<tbody>
<tr>
<td>A consultant’s technical view of ZLE U7381S</td>
<td>Application developers</td>
<td>Now</td>
<td>United States Education Centers Lecture/Lab, RAIL</td>
</tr>
<tr>
<td>Architecture and tools for Zero Latency Enterprise (ZLE) U4142S</td>
<td>System designers</td>
<td></td>
<td></td>
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<tr>
<td>Java 4 API programming for HP NonStop servers U8560S</td>
<td>Programmer Analysts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open System Services (OSS) application development and porting on HP NonStop servers U5518S</td>
<td>Database Administrators Solution Architects</td>
<td></td>
<td></td>
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</tbody>
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### News from Nonstop Education & Training

**Free Hp Digital Camera promotion**
Take any two NonStop classes and earn a Free Hp Digital camera.

**Private training price reduction**
Up to 60% reduction on any 2 NonStop classes at your site.

### Your NonStop Education & Training Contacts

<table>
<thead>
<tr>
<th>Private Classes at your site:</th>
<th>Francine Barr</th>
<th><a href="mailto:francine.barr@hp.com">francine.barr@hp.com</a></th>
<th>(703)-8032931</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor-Led Live classes over Internet</td>
<td>Ben Wood</td>
<td><a href="mailto:ben.wood@hp.com">ben.wood@hp.com</a></td>
<td>(408) 285-9662</td>
</tr>
<tr>
<td>Scheduled classes at Education Centers</td>
<td>Ben Wood</td>
<td><a href="mailto:ben.wood@hp.com">ben.wood@hp.com</a></td>
<td>(408) 285-9662</td>
</tr>
<tr>
<td>Customer Conference Call enrollment</td>
<td>Dan Porter</td>
<td><a href="mailto:porter@hp.com">porter@hp.com</a></td>
<td>(412) 303-5213</td>
</tr>
<tr>
<td>Nonstop University Subscriptions</td>
<td>Tom Hill</td>
<td><a href="mailto:t.hill@hp.com">t.hill@hp.com</a></td>
<td>(408) 285-9874</td>
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</table>

March 3, 2005
Next month = “Secrets for Managing NonStop Files and Databases”

Thank You!