Modernizing NonStop Applications
using modern tools, programming models and technologies

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Agenda

• Quick intro to modernization – What and Why
• Types of modernization with customer examples
  • User Interface modernization
  • Application interface modernization
  • Application infrastructure modernization
  • Database modernization
  • Development tools modernization
  • Systems management tools modernization
Over the years, many customers have upgraded their hardware, but their applications have not evolved!

Still green-screen

Pathway (COBOL, TAL)

Still COBOL, TAL

Still Enscribe
Locking up the value of their application assets

- Integration & SOA
- Rich User Interfaces
- Remote DB Access
- Reports
- Internet
NonStop has capabilities to unlock the value of legacy apps, plus create new apps with modern capabilities.
Modernization helps customers to ...

Move to common standards
• Lots of developers on market
• Significant TCO reduction
• Still build on NonStop fundamentals
Aspects to modernizing classic NonStop apps

- **User Interface** *(green screen)* modernization
  - Re-face existing applications with Rich-UIs
  - Ease end-user workforce training

- **Integrate NonStop Apps (SOA)**
  - Make existing applications and data accessible from heterogeneous platforms
  - Use standard interfaces and protocols
  - Eliminate application silos
  - Deploy new business processes quickly

- **Information Layer (DB) Modernization**
  - Get existing Enscribe data into NonStop SQL relational form
  - Lower development cost
  - Enable information to be readily used in new ways
Other aspects of modernization

- **Modern Development Tools**
  - Leverage industry standard programming languages, tools and frameworks
  - Increase programmer productivity
  - Lower development & maintenance costs

- **Modern Management Tools**
  - Manage NonStop in heterogeneous environments with common management view for all HP platforms
  - Increase operator productivity
User Interface Modernization
User Interface (UI) Modernization

**Challenges**
- Many apps are still using green-screens
- Steep learning curve
- Low productivity
- Cost of conversion
- Lack of conversion skills

**Needs**
- Easy to use, rich user interface
- Browser based UI to avoid deployment effort and cost
- Mashups
User Interface Modernization

**NonStop Product Offering**

- Java Products for web/browser-based UI’s
  - NSJSP, plus Open Source Frameworks
    - myFaces for Java Server Faces
    - Spring MVC and Webflow
  - JToolkit for Pathway integration
- SOA products for off platform GUIs (e.g. VB.net)

**Partner Offerings**

- comForte’s CSL Studio and JPath, CommitWork’s OmnivoBase, CAIL’s CAIL Studio, NuWave’s SOAP/AM, Crystal Point’s AppViewXS

**NonStop Service Offering**

- ATC Services
Customer example
Pre-modernized environment: Pathway app
The Problem

– Application development
  • Hard to find COBOL programmers to maintain & develop SCOBOL requesters
  • No modern IDE (ex. Eclipse) support for SCOBOL development

– User experience
  • Old fashioned for gen X web users
  • Huge learning step
    – Where is the <F16> key?
The Solution

NonStop provided service to convert 600 Pathway Screen-Cobol Screens to Web Screens

Design Time Environment (workstation)

- SCOBOL Sources
- DDL Reports
- SCOBOL-to-JSF Generator
- Java Code

Run-Time Environment (NonStop)

- Browser-based UI
- iTP WS
- myFaces
- Pathway
- NSJSP
- User Appl

still supported!
SCOBOL to JSF* Generator Tool

– Workstation based tool – Eclipse plug-in

– Consists of
  • Java-based parser for SCOBOL and DDL
  • Generator
    – JSF generator
    – Code generator
      • Java Beans for SCOBOL Working Storage elements
      • “Requester” code

*JSF=Java Server Faces, a Java EE standard server-side UI framework for web apps. JSF runs on any standard web container, including NSJSP.
Conversion Rules

- SCOBOL screen = JSF page
- SEND = JPathSend
- Transaction support = JTA/TMF
- WorkingStorage = Java Beans and POJOs
- Procedure Division = Java code in Java Beans
Integrating JSF front-end with Pathway back-end
**Example SCOBOL Screen**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LICENSE PLATE</td>
<td></td>
</tr>
<tr>
<td>YEAR</td>
<td>MAKE</td>
</tr>
<tr>
<td>ENGINE #</td>
<td>NUMBER OF AXLES</td>
</tr>
<tr>
<td>SALES PRICE</td>
<td></td>
</tr>
<tr>
<td>VEHICLE TYPE</td>
<td>MODEL</td>
</tr>
<tr>
<td>HORSEPOWER</td>
<td>SMOG DATE</td>
</tr>
</tbody>
</table>

**Owner Maintenance**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERSON-ID</td>
<td>NAME</td>
</tr>
<tr>
<td></td>
<td>FIRST</td>
</tr>
<tr>
<td></td>
<td>MIDDLE</td>
</tr>
<tr>
<td></td>
<td>LAST</td>
</tr>
<tr>
<td></td>
<td>SUFFIX</td>
</tr>
<tr>
<td>ADDRESS</td>
<td>STREET</td>
</tr>
<tr>
<td></td>
<td>CITY</td>
</tr>
<tr>
<td></td>
<td>STATE</td>
</tr>
</tbody>
</table>

F3 - SCREEN PRINT @: $S.#XXX
F1 - INSERT DATA, F15 - NEW VEHICLE, SF16 - EXIT

Please select one of the functions above.
Displayed JSF Page

MOTOR VEHICLE REGISTRATION SYSTEM
NEW VEHICLE ENTRY

LICENSE PLATE: [ ]
YEAR: [ ]
ENGINE #: [ ]
NUMBER OF AXLES: [ ]
SALES PRICE: [ ]

VEHICLE TYPE: [ ]
MAKE: [ ]
MODEL: [ ]
HORSEPOWER: [ ]
SMOG DATE: [ ]

OWNER MAINTENANCE

PERSON-ID: [ ]
NAME:
FIRST: [ ]
MIDDLE: [ ]
LAST: [ ]

ADDRESS:
STREET: [ ]
CITY: [ ]
STATE: [ ]
POSTAL CODE: [ ]

F3 - SCREEN PRINT @:
F1 - INSERT DATA, F15 - NEW VEHICLE, SF16 - EXIT

Please select one of the functions above
Adding CSS style sheets
If you’d like to modernize your SCOBOL UI

– Contact your HP rep for NonStop modernization services
  • Generator not sold as a product
  • Highly customizable service
Application Interface Modernization
With SOA and Web Services
What is SOA?

- SOA and web services describe a methodology and a set of technologies to present applications in a standard way, as services
  - Enabling them to be easily invoked by heterogeneous clients (service consumers)
- SOA encourages *service reuse* that enables existing services to be applied easily to new business processes
  - Reduces the time to implement a new business process leading to business agility
Why should you care about SOA on NonStop?

- Wouldn’t it be nice to expose the value of your Pathway apps to other apps in the enterprise?
- Exposing Pathway services as web services enables
  - Pathway apps to interoperate with external apps in the enterprise
  - Enterprise apps to interoperate without any knowledge of Pathway
  - Enterprise apps to inherit the QoS characteristics of SOA-based Pathway services

Use SOA to extend the reach of Pathway services beyond the NonStop server
SOA is not just for invoking Pathway services
– NonStop SOA has capabilities that enable
  • NonStop apps to invoke external SOA services
  • External SOA services to invoke business logic implemented as a DLL, a NonStop process, a Java component
SOA enables legacy apps to retain their legacy interfaces while providing new ones.

Legacy apps can be augmented by new apps to provide SOA service implementation.
SOA provides standards-based integration with a wide range of external apps.
NonStop provides two Web Service stacks

- **NonStop SOAP**
  - No coding
  - C-based
  - Included in J-series OS

- **iTP WebServer**

- **NonStop TS/MP**

- **NonStop OS**

- **Apache Axis2**
  - Some coding
  - Java-based
  - Open source, free

- **NSJSP (Tomcat)**

- **NonStop TS/MP**

- **NonStop OS**
Customer example: Their reasons for modernization

Business driven

- SEPA (Single European Payment Area) regulations
- Siebel (Customer View) integration
- WebSphere/MQ integration
Customer’s approach to modernization: They developed ...

– SOAP/XML integration framework
  • SOAP/XML façade for COBOL applications
  • Utilizes XMLThunder from Canam Software, PC based code generator (http://nonstop.xmlthunder.com)

– XML Archival solution
  • Contains SEPA transactions
  • Utilizes XMLVault from NuWave Technologies (sold by HP)
SOAP/XML integration framework
Architecture

NonStop Server

Cobol Application
Cobol Application
Cobol Application

SOAP/XML Framework

Get routing information from message

Select message parser based on routing

Transform message
IPM -> XML
XML -> IPM

MQ Connector

HTTP Connector

SOAP/XML Application
SOAP/XML Application
SOAP/XML Application

Msg A Parser DLL
Msg B Parser DLL
Msg C Parser DLL
Msg X Parser DLL
SOAP/XML integration framework

Architecture

NonStop Server

- Cobol Application
- Cobol Application
- Cobol Application

SOAP/XML Framework

- Get routing information from message
- Select message parser based on routing
- Transform message
  - IPM -> XML
  - XML -> IPM

MQ Connector

HTTP Connector

- SOAP/XML Application
- SOAP/XML Application
- SOAP/XML Application

Msg A Parser DLL
Msg B Parser DLL
Msg C Parser DLL
Msg X Parser DLL
SOAP/XML integration framework
Implementation notes

- Framework written in C – multi-threaded Pathway server
- No code changes in business applications
  - Business logic is separated from transformation
- Supports Server and Client role
- Framework supports multiple connectors
- Every Request/Reply message has dedicated parser DLL
  - Provides modularity
  - Created by Canam XMLThunder
  - Very fast parsing (fast path)
XML-Archive Architecture

- **Pathway Serverclass**
  - Insert XML document
  - Select XML document
  - Delete XML document
  - Maintain XML archive

- **XMLVault Java API**

- **XMLVault logical databases**
  - Temp OLTP XML store
  - SQL/MX Database
  - XML Archive store
  - SQL/MX Database
SOA offerings on NonStop

NonStop Services
- Three standard SOA services:
  - SOA Quick Start / SOA Enablement / SOA Rapid Development
- Contact your HP rep for more!

NED Products
- NonStop SOAP + iTP Web Server
- NSJSP (Tomcat), plus
  - iTP Web Server
  - Open Source Frameworks (Axis2, Spring Web Services)

3rd Party Products
- comForte’s CSL Studio, NuWave’s SOAP/AM, ACI’s Secure SOA Enabler, Canam Software’s XMLThunder
Application Infrastructure Modernization
Java, Tomcat and Open-source Frameworks
Java infrastructure on NonStop

**Develop**
- Certified Java SE Platform (JDK and JRE)
- Apache Tomcat (Valued-added port)
- Open Source Java Frameworks

**Deploy**
- NonStop Clustering & Workload Management software
- NonStop OS
Why open source Java frameworks are important to modernize the NonStop Application Infrastructure?

• In the context of modernization, open source Java frameworks are important because
  – Java is a leading programming model for building modern applications
  – The frameworks address and simplify the development of all major components of an enterprise Java application (including web services, presentation, and business logic)

Open Source Frameworks can help you to get new services onto NonStop quickly!
Frameworks that are part of Open Source Java Frameworks on NonStop

- **Apache MyFaces**
  Component based web UI framework

- **Apache Axis2**
  Web services framework

- **Spring**
  Framework for developing apps using POJO components

- **Hibernate**
  Object Relational Mapping (ORM) framework

**SASH**: myFaces, Axis2, Spring, Hibernate
Which customer needs are addressed by SASH?

<table>
<thead>
<tr>
<th>Customer Need</th>
<th>Fit</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface Modernization</td>
<td>✓</td>
</tr>
<tr>
<td>Expose existing Business Logic as Services</td>
<td>✓</td>
</tr>
<tr>
<td>Build new, Modern Services and Applications</td>
<td>✓</td>
</tr>
<tr>
<td>Modernize Data Access</td>
<td>✓</td>
</tr>
<tr>
<td>Modernize Development Environment</td>
<td>✓</td>
</tr>
</tbody>
</table>
Open Source Java Frameworks on NonStop

**Enterprise Java on NonStop**
- Executes in NonStop’s Tomcat container
- Requires iTP WS, NSJ, NSJSP, TS/MP
- Leverages our scalability and availability
- Integrate existing Apps via JToolkit (Java)
- **Fully integrated and tested by NonStop QA!**

**Documentation & Examples**
- Documentation on [http://docs.hp.com](http://docs.hp.com)
- Covers NonStop-specifics and examples

**End-User Support through HP**
- GMCSC support
Benefits of SASH

• High market acceptance
• Open source, free
• Non proprietary, backed by major vendors
  – Portable apps, no vendor lock-in
• Light-weight
  • Simple components (POJOs)
  • No expensive app-server needed!
• De facto standards
  – JSF, JPA - part of Java EE spec
• Frameworks, not just a collection of APIs
  – Productivity increase from abstractions, consistency of app structure
  – Better quality apps by automatically embedding good design patterns
Benefits of SASH on NonStop –
Light-weight Enterprise Java leveraging our core values
Customer Example:
Their reasons for modernization

- Regulatory pressures driving new projects
- Many of their NonStop Cobol programmers are retiring
- New workforce trained in Java
- Eclipse is the IDE of choice
- Portability of code
- Take advantage of newer generation processors
- No forklift changes; building standards-based wrapper around existing functionality
Customer’s approach to modernization
They prototyped …

- Java App published as Axis2 web-service for access by .NET app
- Access to NonStop SQL data from off-platform Java apps
  - Type 4 JDBC driver for accessing SQL/MP or MX over the network
- Java App published as JPathway service for access to legacy
  - COBOL App
  - Enscribe files
Other architectural evaluations

– Access MS SQL Server from OSS
  • Using Microsoft’s JDBC Driver

– Access Enscribe file using Attunity’s JDBC Driver
  • Hibernate O/R Mapper linked to JDBC Driver
  • Object version of Enscribe data
  • All mappings between Object and Database are in XML
Database Modernization
Database Modernization

**Customer Challenges & Needs**
- Valuable assets are often in Enscribe files
- Difficult to access, expose and reuse
- Cost of conversion
- Customers want ANSI compliant database, tool support and fast & easy access

**NonStop Offering**
- ANSI compliant NonStop SQL/MX
- JDBC Type 4 and ODBC for remote access
- Supported by object-relational-mapper (e.g. Hibernate)
- Can use open tools – e.g. Report

**Partner Offering**
- Escort SQL from Carr Scott Software
- Enscribe-2-SQL from TANDsoft
- Attunity Connect

**NonStop Services from ATC**
Customer example: Pre-modernization environment

• Standard Pathway and Enscribe application
• Nightly loads to SQL Server database for online customer queries
Customer’s reasons for moving to NS-SQL

– Need for real time access to data
  • Able to get up-to-the-minute balances, order and shipment status and product information

– Eliminate nightly loads to SQL Server
Their approach

- Using Escort SQL allowed a staged migration to SQL/MP
- No code changes were necessary
  - With 1,200 files and 2,500 programs
- Plan to migrate to SQL/MX in the future
Development Tools Modernization

With Eclipse
NonStop Development Tools Modernization

**Customer Needs**
- High developer productivity
- Leverage ubiquitous skills
- Common development environment for all platforms
- Workstation based development

**Solution**
- Offer development tool infrastructure based on industry leading, open source Eclipse IDE
- NED offers commercial plugins (NonStop EPE)
- Partner-provided plugins, example from NexBridge Inc.
- Many industry plugins available to support any phase of the development lifecycle
- Support for Java out of the box
- Eases development with Open Source Frameworks
NonStop Development Tools Modernization

**NonStop EPE**

- Covers full development lifecycle
  - Editing (syntax highlighting, etc)
  - Compiling
  - Building/Linking
  - Debugging (coming soon)
  - Deploying
    - COBOL, C/C++, pTAL, SQL/MX, ...
    - local and remote builds
    - Available for S-Series and Integrity

**Visual Inspect**

- Debug your applications from a Windows workstation

**Services**

- Customized service offering from NonStop to modernize your development environment
Customer example: Pre-modernization environment

– Development environment consisted of:
  • RCS running under OSS for software repository
  • SlickEdit on PC for editing source code
  • make file for compiles
  • Manual testing
Reasons for modernizing their development environment

- Use of Eclipse IDE, their corporate standard
- Use of Subversion, their corporate standard version control software
- Use of free open source software
- Automated nightly compiles and testing while development system is idle
- NonStop developers “fit in” with others
Their approach to modernization
Leverage open source products

Hudson is a continuous integration Java-based tool, which runs in a servlet container or standalone. It supports SCM tools including CVS, Subversion, and Clearcase and can execute Apache Ant and Apache Maven based projects, as well as arbitrary shell scripts and Windows batch commands.

Apache Ant is an open source Java-based build tool

Open source version control system

Open Source Integrated Development Environment (IDE) with HP Enterprise Plug-in for Eclipse

Subclipse – Subversion client Eclipse plug-in
Development process

1. Check out source code
2. Make modifications in Eclipse/EPE and ensure it will compile
3. Check source code back in

Eclipse with Enterprise Plugin for Eclipse

source code repository

Windows server
Automated compile and testing

**Hudson Ant script**
1. Check out source code
2. Compile source code
3. Test compiled code with Tuxedo ud
4. Send email with results

![Diagram showing automated compile and testing process]

- **Source code repository**
- **Windows server**
- **NB50000c**
- **Hudson**
- **Compiler**
- **Ud (Tuxedo driver program for unit tests)**
- **Object code**
- **ud scripts**
Management Tools Modernization
With HP SIM and NonStop Essentials
Management Tools Modernization

**Customer Needs**
- Flexible staffing models
- Reduced training costs
- Standardized responses to events
- Non-disruptive implementation
- Reduced administration efforts
- Quicker time to problem resolution

=> **Lower TCO**

**NonStop offering**
Unified Management Infrastructure based on HP Systems Insight Manager (SIM) and NonStop Essentials
HP SIM, Essentials and BTO products

Core management services: Discovery, inventory management, event notification, reporting, security

Supports
- Physical and virtual platforms
- Integrity Essentials
- Proliant Essentials
- NonStop Essentials

BTO (Business Technology Optimization) Software

STRATEGY
- Project & Portfolio Management Center
- CIO Office
- SOA Center
- CTO Office

APPLICATIONS
- Quality Center
- Performance Center
- Application Security Center

OPERATIONS
- Business Service Management
- Business Availability Center
- Operations Center
- Network Management Center
- Client Automation Center
- Data Center Automation Center
- Universal CMDB

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HP Systems Insight Manager (SIM)
The foundation for converged infrastructure management

- Installs on Windows, HP-UX, and Linux
- Manages all HP servers, including **NonStop**
- Extensible via plug-in architecture
NonStop integration with HP SIM

- Discovery and identification of NonStop systems via WBEM support provided by OSM
- NonStop alarms displayed in HP SIM
- NonStop hardware devices displayed in HP SIM
- NonStop Guardian and OSS commands invoked from HP SIM
- Links to drill-down for single system monitoring and event interfaces (OSM Service Connection and OSM Event Viewer)
- HP SIM ships free-of-charge with NonStop System Console DVD suite
NonStop Cluster Essentials

– One package to perform all cluster management tasks across multiple NonStop and Linux systems
  • Using same web-based user interface

| Any clustering technology                  | Integrated health monitoring                  |
| Integrated event monitoring               | Single-click boot                             |
| Integrated config & control               | Unified account management                    |
| Software consistency check                 | Integrated inventory reporting                |
NonStop Cluster Performance Essentials

- Plug-in to HP NonStop Cluster Essentials
  - Integrated with HP SIM
- Integrated view to monitor real-time performance issues across a cluster of NonStop and Linux systems
- Drill-down to discover performance bottlenecks
- Performance trend displays
- Alert notifications based on defined thresholds
- Secure communication between NonStop Cluster Performance Essentials and managed systems
- Support of CLIM performance monitoring
NonStop I/O Essentials

• A plug-in to HP SIM
• Virtualized configuration and control of all CLIM management tasks on NonStop BladeSystems and NS-Series systems
• Ability to perform all CLIM management tasks without knowing the syntax of NonStop or Linux commands
• Pre-defined management tasks shipped out-of-box to configure and control all aspects of CLIM
• Secure and encrypted communication between console and NonStop systems
• Integration with HP NonStop Cluster Essentials to enable CLIM management across NonStop clusters
HP BTO Centers

BTO Centers: Optimize key functions

- **STRATEGY**
  - Project and Portfolio Management Center
  - CIO Office
  - SOA Center
  - CTO Office

- **APPLICATIONS**
  - Quality Management
    - Quality Center
    - Performance Center
    - Application Security Center

- **OPERATIONS**
  - Business Service Management
    - Business Availability Center
    - Operations Center
    - Network Management Center

  - Business Service Automation
    - Data Center Automation Center
    - Client Automation Center

  - IT Service Management
    - Service Management Center

  - Universal CMDB

- **Industry-leading products and technology from**
  - HP OpenView
  - Mercury
  - Opsware
  - Peregrine Systems
  - Bristol Technologies
  - Novadigm/Consera
  - Talking Blocks

**NonStop support in many BTO Centers**
Summary
You can realize modernization benefits on NonStop today

- Develop your apps using industry standard app development tools
- Architect your apps using industry standard programming paradigms
- Deploy your apps on a scalable industry standard app server
- Integrate your apps with other apps in the enterprise as SOA services
- Store your data in a high performing standard relational database
- Access your data via industry standard database access technologies
- Connect using industry standard network protocols
Where do I get help?

Engage your HP rep

- NonStop has modernization service offering that can be customized for your needs
  - Assessment service
  - Architectural/Design service
  - Implementation service
Outcomes that matter.