

Enterprise Java Computing



A business case by
CSX Technology

CSX Technology



- Part of a Fortune 500, \$5B company
- Support CSXT, SeaLand, ACBL, CTI, Corporate, others
- Mix of Legacy Cobol/MF, C++, PB
- Networks migrating to TCP/IP
- In 1996, delivered more than 200 products resulting greater than 10:1 benefit / cost
- Implementing the Thin Client Religion

Pre 1996 Electronic Commerce



- EDI
- Mercury - proprietary dial-up solution
- No industry agreement on a solution
- Each RR had it's own unique package
- *Cusomers were frustrated and dissatisfied*
“Not a Business Enhancement”

The Customers Demanded:



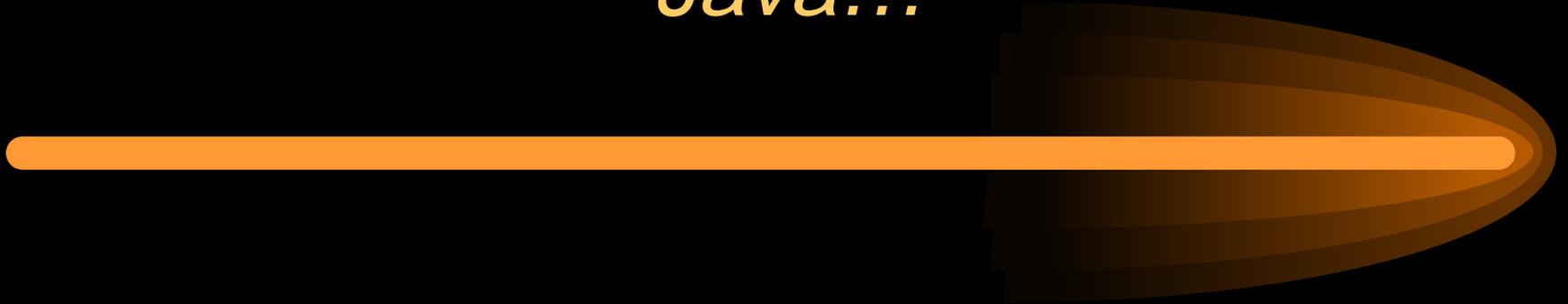
- Seamless integration within their business process:
 - Service Ordering
 - Service Management
 - Transaction Services
 - Communications
- A single interface for Rail Transportation
- Minimal technology intrusion
- Highly interactive and decision point driven ability
- The highest level of up-time, best response time, and complete security.

TWSNet at Shipper's Council



- HTML and Java technologies meet the needs
- Internet delivery allows unprecedented market share and penetration
- Prototype shows the promise
- *Customers demanded this solution!*

*I've heard of this language called
Java...*



The Plan



- Employee Skills
- Software development environment
- Security
- Infrastructure
- The Product

Employee Skills



- Highly interest / motivated
- Some mid-range/UNIX, no Internet or Intranet Development
- Highly skilled Object Oriented designers
- Skilled C++ programmers
- Cobol/CICS interface developers

The Development Environment

- Very young tools - Java JDK beta, Visual Tools
- Design before coding
- Design reviews and walk-throughs
- Scenario testing
- Software source code control and defect tracking mandatory
- Rigorous remote and integrated testing
- Strategic partners
- ***Software Engineering Fundamentals were the key!***

Security



- Ensure the integrity of CSX Corporation's technology assets by protecting them from any outside invasion.
- Strive to be unobtrusive to the end user.
- Provide a level of security and comfort to customers who needed assurance that their transactions were secure, encrypted and out of the public eye.
- Reassure shippers that their systems would not be compromised.

Infrastructure

- From 1 Sparc 5 to a robust, high-volume commerce site

Firewall

Proxy Servers

Mail Servers

Commerce Servers

Security Certificates

DASD

Introduction to the Backbone

Networking

Systems Management

Configuration control

Test to production

fail over / fall back

A large-scale team integration effort!

The Product



- Virtual development approach
- Tight CSX Technology design control
- Integrated **distributed** development and testing
- Rapid cycle implementation
- A mixture of HTML and Java, with all dynamic content

TWSNet



Does it work?



- Serving more than 100,000 hits / week
- Average active connection > 2 hours
- 97% uptime
- Less than 1% defect rate
- 28.8 response time is adequate

Customers Respond...



- More than 50 companies active, another 100 in the queue
- Average 8 users per company
- Continuous demand for more features

*Customers drove the industry to
Standardize on TWSNet*

By the numbers...



- Dramatic cost savings realized
 - Hardware
 - Communications
 - Development

More than \$5MM!!
- Broader/deeper market penetration
- Bottom line business for CSX

“A reason to partner with CSX”

On to Enterprise Java Computing



What we had learned...



- Java integrated well into our environment
 - Legacy systems, heterogenous deployments
 - Development environment
- We were realizing development savings
- Write once, run anywhere worked
- Network-centric computing enhanced our control of TCO

CSX Technology in 1997



- Java is the primary client and server programming language
- Defects are down more than 30%
 - faster time-to-market
 - lower cost
- Saved more than \$2MM in desktops
- ROI on projects increased by 10%

*Java Enterprise computing
makes business sense at
CSX Technology*

