The ART and Practice of Mainframe Rehosting for CICS, IMS, and Batch Applications Leveraging Oracle Tuxedo ART

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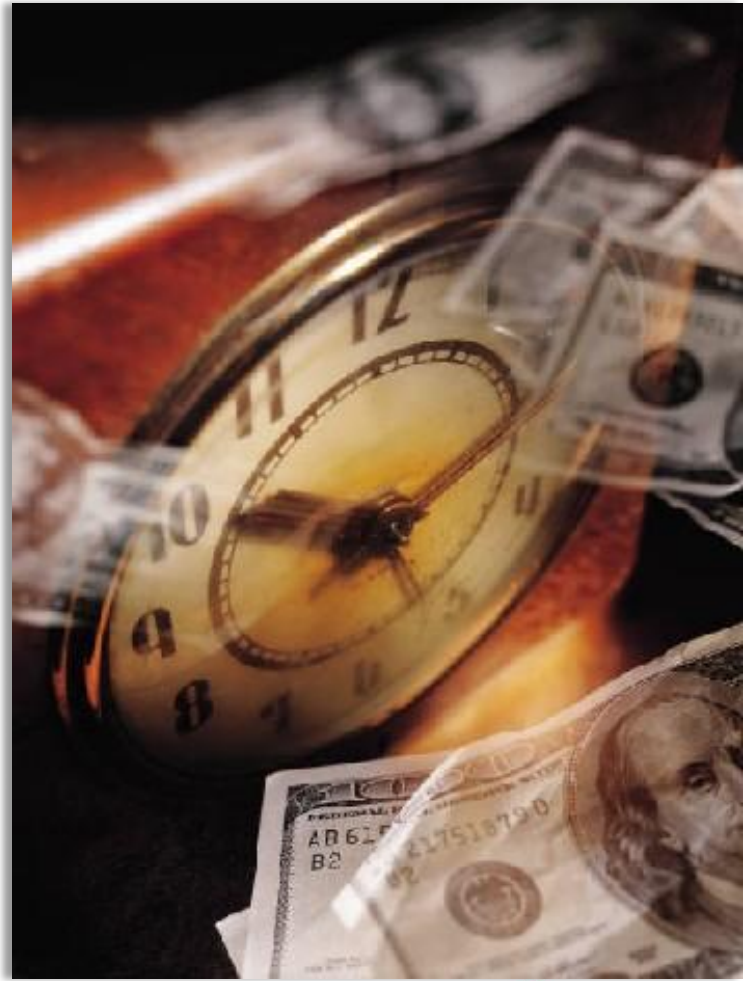
Agenda

- **Mainframe Migration Overview**
- Customer Examples
- Industrialized Methodology
- Key Technology Requirements
- Summary and Q&A

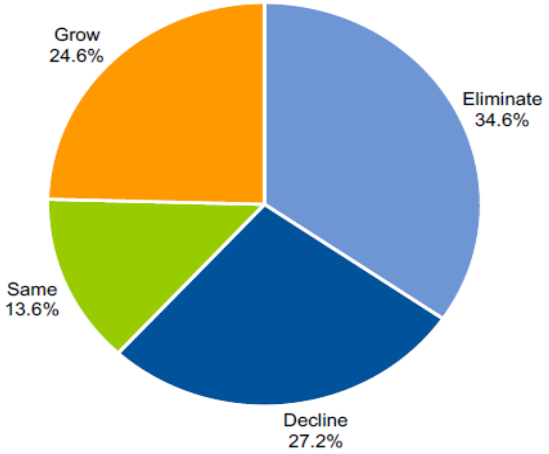


Mainframe Migration and Modernization Market

"Fully 75.4% of respondents indicated their mainframe footprint will remain the same, decline or be eliminated completely.. About half of the respondents that indicated no growth identified complete mainframe elimination as their option (34.6%)."

- **"Gartner cannot ignore the concerns expressed by our clients over this platform. These include their perception of the total cost of ownership of this platform, concern over an aging workforce that is the most knowledgeable about this platform, and dissatisfaction with their existing application portfolio and their ability to modernize it while remaining on this platform."**

- **"The reported interest of large mainframe shops (greater than 10,000 MIPS) in mainframe elimination is surprising, even though we have seen growing interest in this option in increasingly larger mainframe shops over the last several years."**

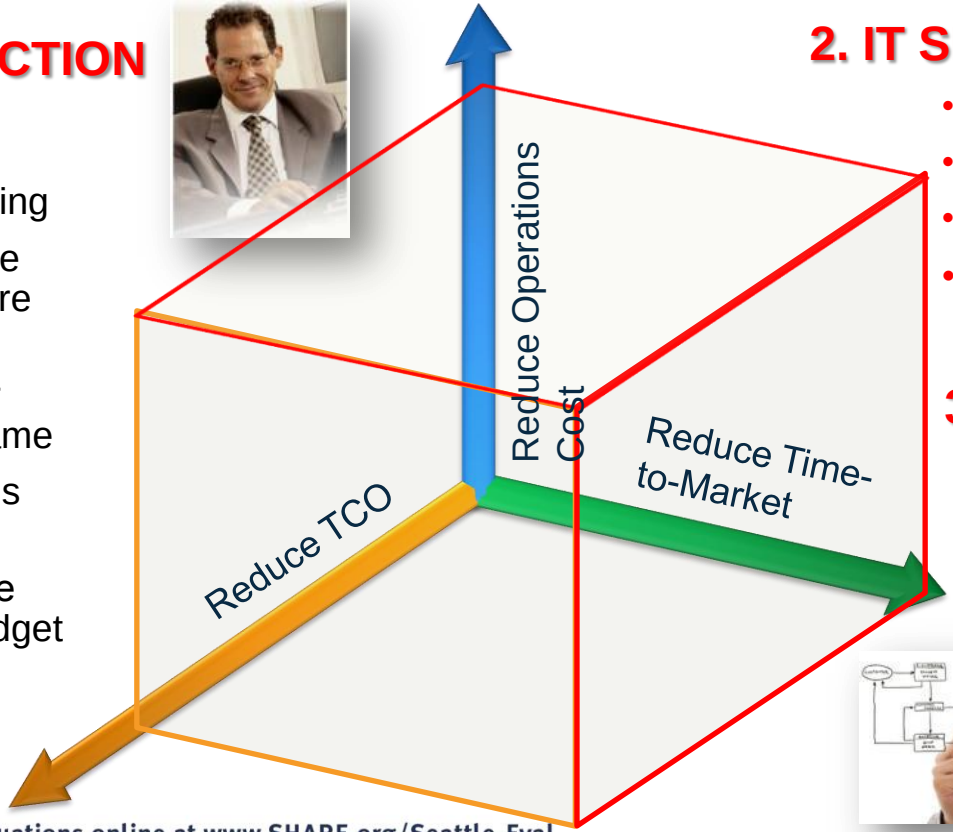


Source – Gartner: The Changing IBM Mainframe Market, October 4, 2013

Customer Drivers

1. COST REDUCTION

- 50%-80% Annual savings after mainframe rehosting
- Simpler, affordable HA/DR architecture
- Scalability at significantly lower cost vs. a mainframe
- Simpler operations
- Broader choices, more “bang for the buck”, greater budget flexibility



2. IT SIMPLIFICATION

- Horizontal Scale-out
- Dynamic Load-balancing
- Automated Operations
- PaaS/Private Cloud Deployment

3. SPEED UP BUSINESS

- Service-enabled/SOA-ready
- Easily extend COBOL/C with Java

- Built-in integration options: Web Svcs, JCA, SCA, ESB
- Plug-n-play BPM, ODI, BI, packaged components

Why Start with Rehosting Approach?

SAFEST FOR STRATEGIC APPLICATIONS

- Differentiated services and business logic
- Alignment with corporate standards
- Future-proof for further modernization, growth

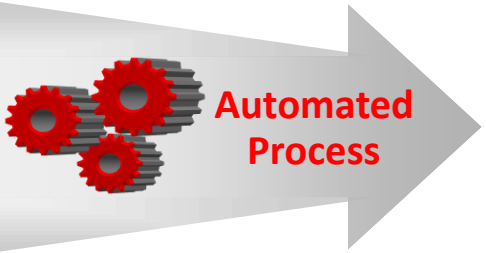
THE MOST COST-EFFECTIVE MODERNIZATION OPTION

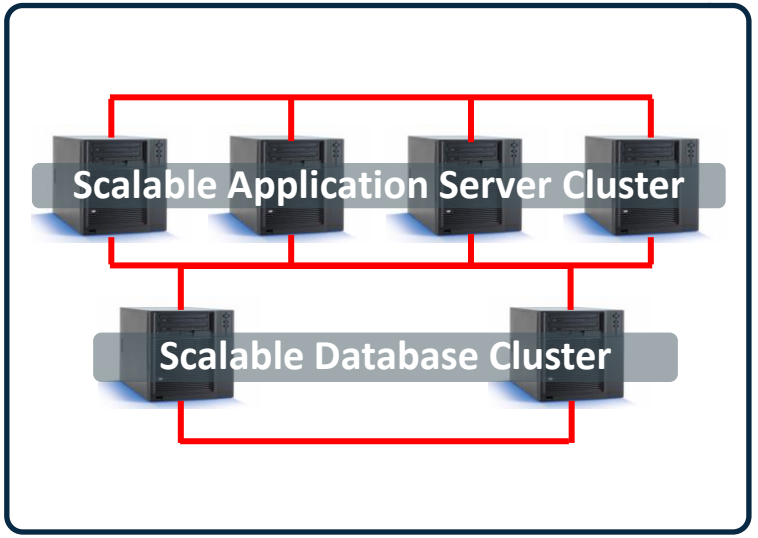
- Proven, predictable, quickest path to savings
- No impact on users, no retraining
- Open, flexible, doesn't constrain any future choices

ELIMINATE RISKS

- Retiring mainframe staff
- Technology obsolescence
- Vendor lock-in

Common Premises





- Migrate MF Applications to Open Systems
  - Without Cost, Risk of a Re-Write
  - Ensure compatibility for CICS, IMS, & Batch apps
- Reduce Costs up to 50%-80% vs. Mainframe
  - Eliminate or reduce MIPS, defer an upgrade
  - Increase choice, budget flexibility

- Maintain and Extend Mainframe QoS
  - Improve scalability with elastic, horizontal scale-out at lower cost
  - Improve availability with rolling upgrades, active/active HA/DR
- Improve IT Responsiveness, Agility
  - Easily integrate in SOA, extend with Java
  - Unlock non-relational data to the enterprise

Key Technology Requirements for Mainframe Migration & Modernization

JCA
WMQ
SOAP/REST

CICS & IMS TM Adapters

Remote DB2 & IMS DB Access

Integration

Utilities, Productivity Tools

Batch Environment | CICS Runtime | IMS TM Runtime

Foundational Services

Scalable Application Server Cluster

Distributed Cache

Indexed File Store | Database Cluster

Scalable Data Management

Virtualization

Servers, Storage, Network

Resilient Infrastructure

Java

C/C++

COBOL

SDLC Tooling and IDE

Development

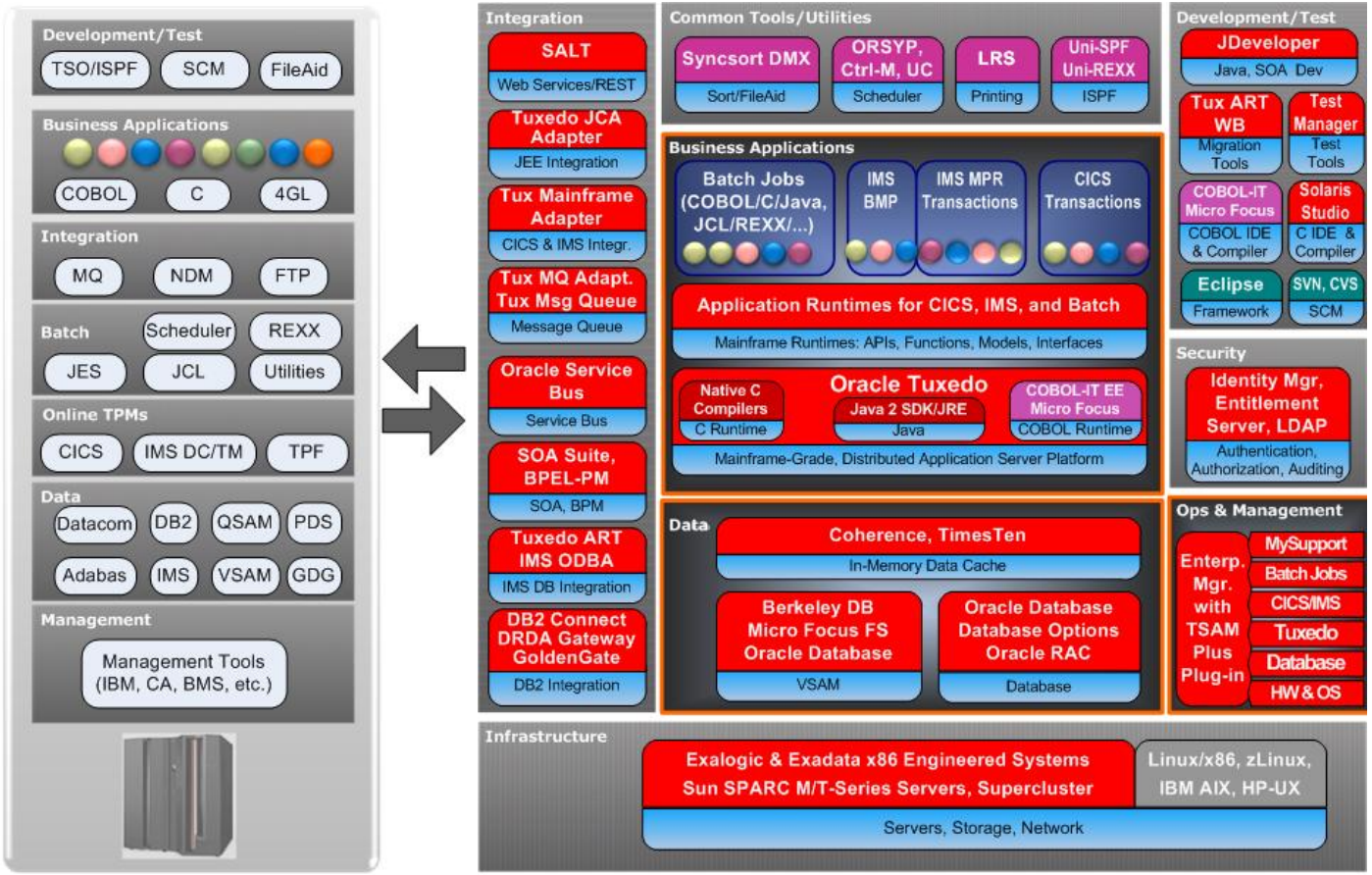
Authentication, Fine-grained Authorization, Auditing

Security

Batch Production
CICS/IMS Regions
App Server
Database
HW & OS

Operations and Monitoring

Oracle Reference Architecture for Mainframe Migration & Modernization



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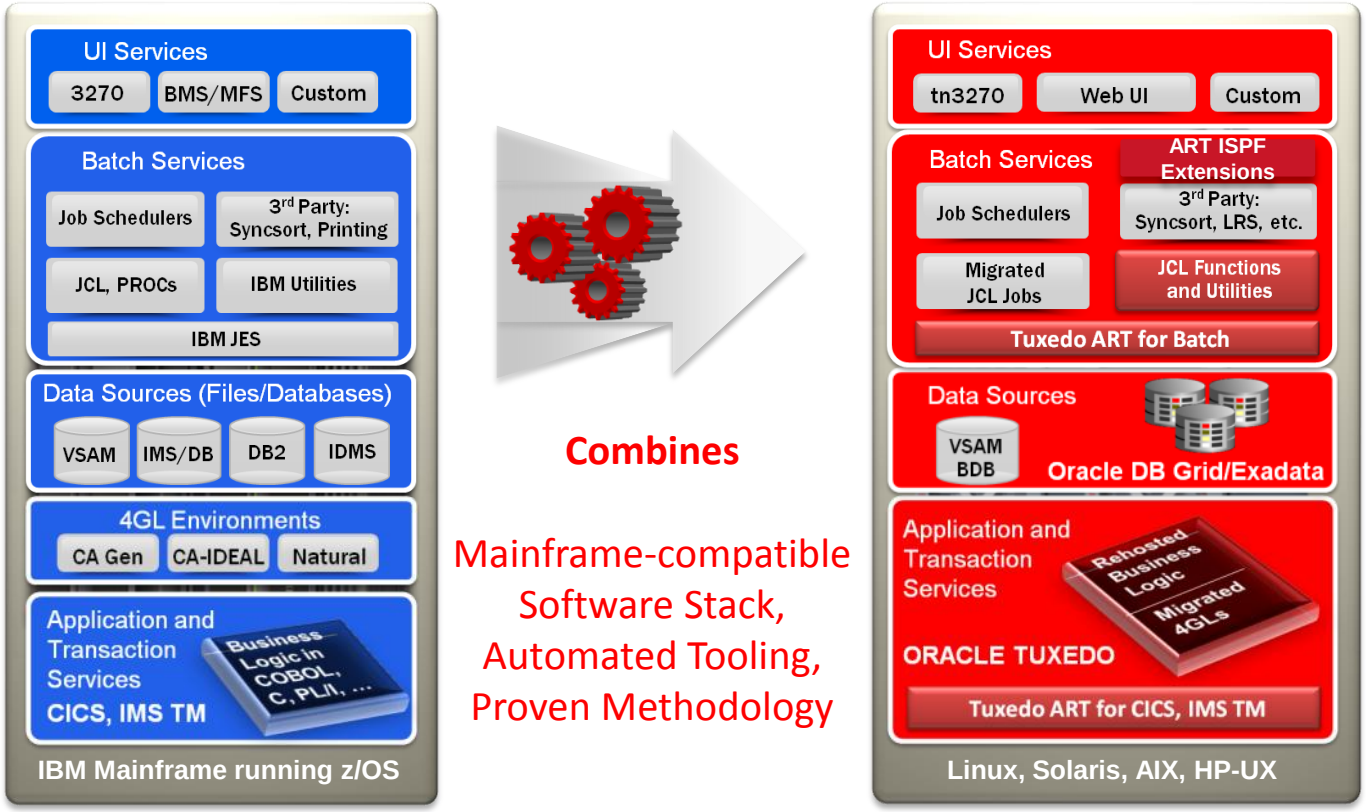
Rehosting Mainframe to Extensible Architecture



Users retain access via tn3270 emulators, custom clients, or switch to Web UI

Batch jobs run on Tuxedo ART with converted JCL and standard utilities

Databases migrate to Oracle, VSAM to VSAM fs, BDB, or Oracle DB

Online applications run on Tuxedo ART under CICS, IMS programming models

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Sample of over 200 Mainframe Migrations to Tuxedo

Banking

Caisse des Dépôts · Crédit Mutuel · Caixa Penedès · RSI · gcs German Card Switch GmbH · Nordea · 中国农业银行 AGRICULTURAL BANK OF CHINA

Insurance

Debeka Versichern • Bausparen · DELTA DENTAL · SwissLife · AG2R LA MONDIALE · LVE LIVERPOOL VICTORIA

Retail Manufacturing Utilities

PG&E · mazda · MARKET BASKET "MORE FOR YOUR DOLLAR" · eurocopter an EADS Company · Carrefour · lisi AUTOMOTIVE · NTT DATA

Public Sector

United States Department of Veterans Affairs · Caisse Nationale d'Assurance Maladie · TEXAS Department of Assistive and Rehabilitative Services · msa santé famille retraite services · Försäkringskassan

Sample Mainframe Customer Wins and Active Migrations to Oracle Tuxedo

Top 20 European Bank
Migrating ISV trading application
5000 MIPS – CICS, DB2, MQ

European Horse Racing/Betting
Rehost as 1st phase of modernization
8500 MIPS – IMS TM & DB, CICS, DB2, MQ

European Airline
Plane repair & maint., revenue mgmt.
1000 MIPS – IBM CICS, Batch, DB2

US HHS Department
Debt Mgmt Collection System
300 MIPS – CICS, Batch, VSAM

Banking ISV for Top Nordics Bank
Trade finance solution for major banks
IBM CICS to Tuxedo ART CICS on Linux

Top 5 European Bank
SWIFT messaging/payments ISV solution
Looking to increase throughput 10X

Top 10 Global Bank present in >70 countries
Rehost in France – 48 MF apps/20M LoC
2000 MIPS - CICS, Batch, DB2

Top Multi-line Mutual Insurer in Europe
Quote System/Pricing Engine
4000 MIPS - CICS, Batch, DB2, MF Integr.

US-based Global Distributor
Order mgmt. & fulfillment, inventory
800 MIPS - CICS, Batch, DB2, MQ

Major North American Telco
7 Initial Apps out of ~6000 MIPS portfolio
CICS, IMS TM, IMS DB, DB2, VSAM, SAS

Legend: In Production In Parallel Run

Much Lower TCO – 9:1 Cost Reduction

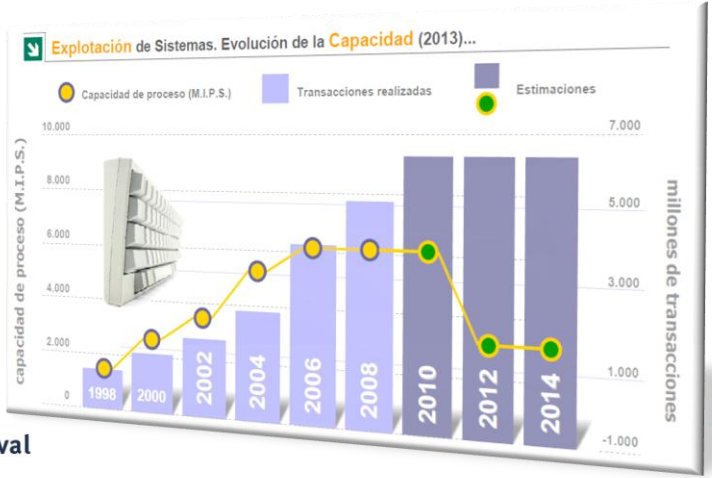
Mid-Size European Bank With 3600 Branches, 80K POS Systems

Objective: Migrating mission-critical applications to open systems to reduce operating costs, while

- Migrating rapidly
- Ensuring the same functionality
- Ensuring the same level of performance
- Ensuring the "day after"

Results:

- 68% of all transactions run through migrated system
- Architecture open to SOA
- Cost reduction 9:1
- 50% transaction growth since 2007 while MIPS stayed flat
- 75% MIPS reduction by 2012

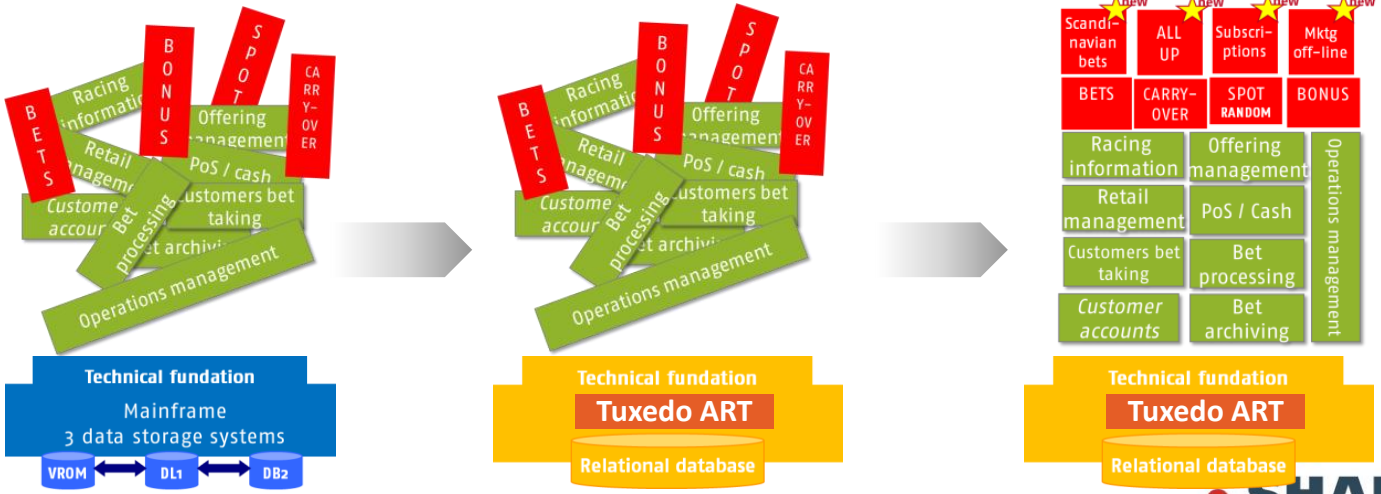


An 8500 MIPS European Sports Betting/Horse Racing Co.

Customer Situation

- CICS/IMS FP/Batch-based application portfolio
- 10X transactions peak 5 min before main race
- 2-Stage Migration and Modernization Plan

COBOL & C
CICS TS/CTG
IMS FP EMH
VROOM Cache
IMS DEDB/VSO
DB2

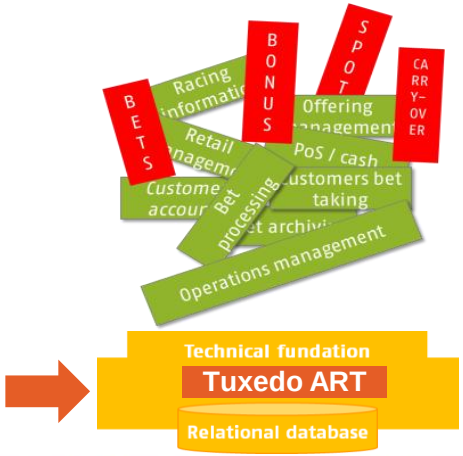


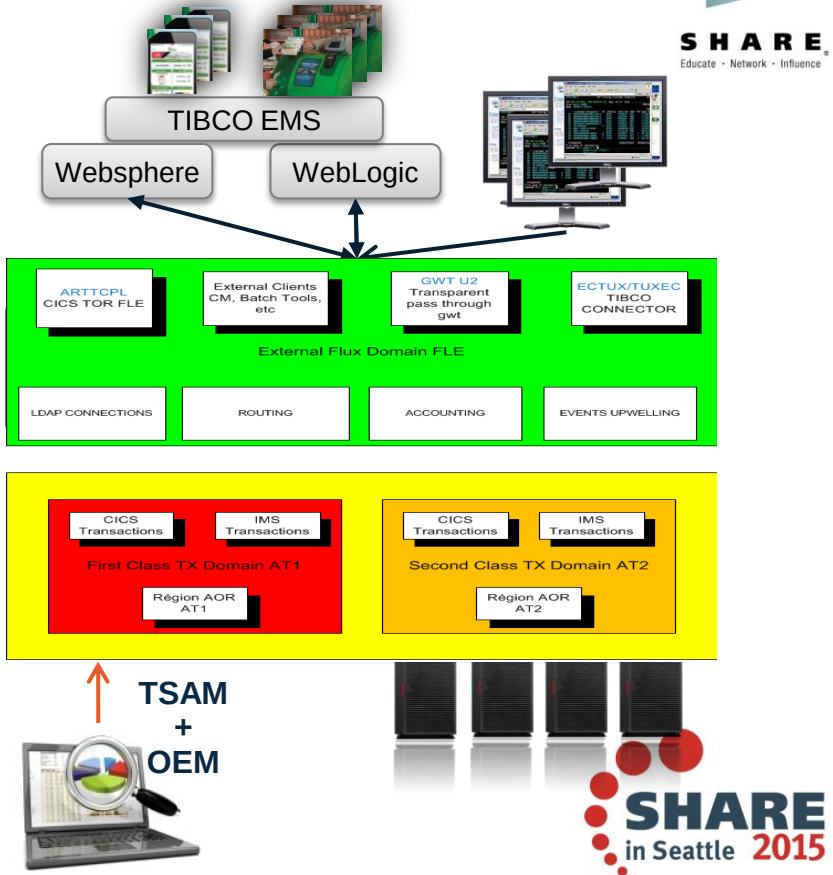
An 8500 MIPS European Sports Betting/Horse Racing Co.

Interim Results

- 1st phase – live since April 2014
- Performance benchmarks on z/OS vs. Tuxedo ART show better response time, more linear scalability, and faster batch
- 2nd phase – parallel runs start in March 2015

COBOL & C
CICS TS/CTG
IMS FP EMH
VROOM Cache
IMS DEDB/VSO
DB2





Recent IMS/CICS Migration Benchmark

Sports Betting/Payment Processing

Workload scenarios

- Peak Transaction Loads - massively real time transactional with peak loads (36 000 points of sale)
- Stressful Batch – heavy data processing: GAPR, RDG, & VALO
- Management workload – Batch & standard OLTP CICS

z/OS SYSPLEX: 8500 MIPS **Benchmark Configuration:** 3 VMs with Tuxedo ART on 16 cores P7+ @4.4 GHz

RESULTS

Noticeable improvements:

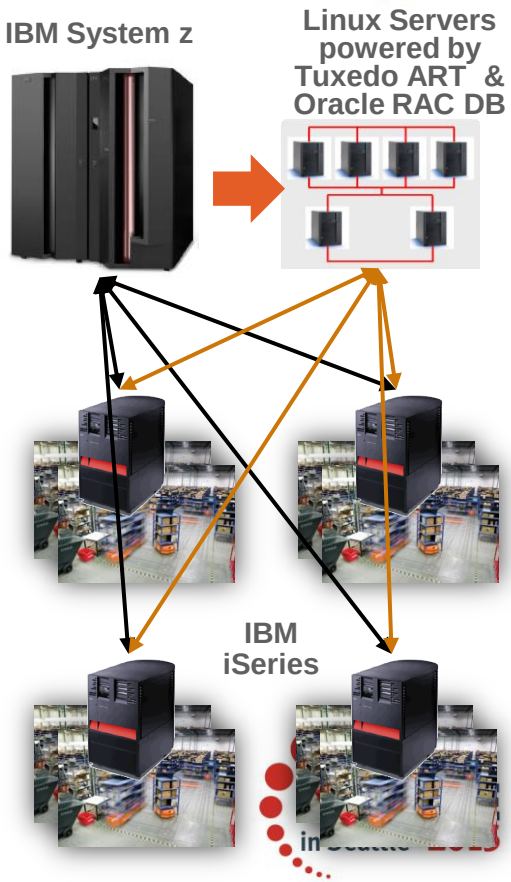
- Response Time: 7% to 50% faster
- Critical Batches: faster
- Transactional output : x2
- Scalability: n*100%
- Availability: Redundant Tuxedo ART Servers

Workload	Mainframe IMS FP & CICS	Unix Tuxedo ART
OLTP		
Online - 450 TPS	7 ms	4,1 ms
Online - 720 TPS	22 ms	4,6 ms
Online - 3 000 TPS	N/A	12,4 ms
Batch		
18 TPS // GAPR	13mn 05s	7mn 42s
1 600 TPS // RDG	34 s	21 s
3 000 TPS // VALO	133 s	95 s

A US-Based Global Books/Media Distributor – Full Migration

Customer Situation

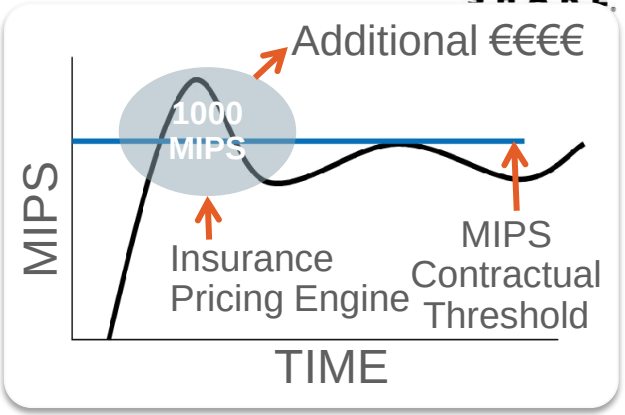
- Drivers: Expansion-driven business needs lower cost platform to scale and grow the business
- 800 MIPS CICS & Batch-based Order-to-Cash application set
  - Manages inventory, order processing and fulfillment for 38K customers
  - 300K JCL jobs/Daily runs of 15K jobs
  - MQ & DB2 DRDA for integration of z/OS and iSeries at 8 warehouses
- Chose Tuxedo ART for
  - Robust, automated migration capabilities
  - High availability and txn management in multi-DB environment
  - Resilient IBM MQ integration for order processing
  - Mainframe-class operations/monitoring
- Currently live with first two migrated applications, one batch and one CICS.
- Preparing for 2nd phase deployment and go-live



A Top Tier Mutual Insurer in Italy – Phased Migration

Customer Situation

- Drivers: Rapid cost reduction and streamlining due to market pressures
- 4000 MIPS CICS & Batch application portfolio
  - Policy issuance, underwriting, customer servicing at over 1000 agencies
  - ~1000 MIPS consumed by Pricing/Quote engine – often pushing total consumption above contracted threshold, leading to excessive costs
- Selected Tuxedo ART after POC due to:
  - Rapid, automated migration capabilities
  - Robust integration with remaining CICS transactions on the mainframe
  - High performance and mainframe-class operations/monitoring
- 5 months initial migration phase from start to go-live:
  - CICS pricing transactions re-hosted to Tuxedo/ART – 1200 MIPS
  - ART CICS – z/OS CICS integration using TMA benchmarked at 100 tps
  - Gradual rollout underway across 1000+ insurance agencies
  - Re-negotiated IBM agreement at lower cost



Next Steps:

- Migrating DB2 data to Oracle/Exadata
- Migrating the rest of CICS and Batch to Tuxedo/ART on Exalogic

A Top Asian Bank – Core Banking Applications Migration

Customer Situation

- Drivers: Cost reduction and reduced dependence on IBM
- 8000 MIPS CICS & Batch Enterprise (Centralized) Customer Information Facility (E-CIF)
  - 600M customer accounts
  - Concurrent users: 150…750
  - ¼ Rack Exalogic + ½ Rack Exadata
  - Also planning to migration Advanced Loan System (ALS) from FIS
- Completed Tuxedo ART POC and Benchmark to evaluate
  - Automated migration capabilities from z/OS to Linux/Exastack
  - **High volume tps scenarios: 13,900 transactions/sec**
  - Stability in long duration testing
  - Mainframe-class resilience and performance despite HW failures
  - Scalability, making effective use of HW resources
  - Recoverability after issues, outages
  - Mainframe and Open Systems interconnect (TMA)

Benchmark Environment and Results
Application Platform
Tuxedo/ART for CICS and Batch on ¼ Rack Exalogic X3-2
128 cores at 60% utilization
Database Platform
Oracle RAC on ½ Rack Exadata X3-2
64 DB cores at 90% utilization
Sustained tps: 13,900
109 tps/core – App Server
217 tps/core – DB Server

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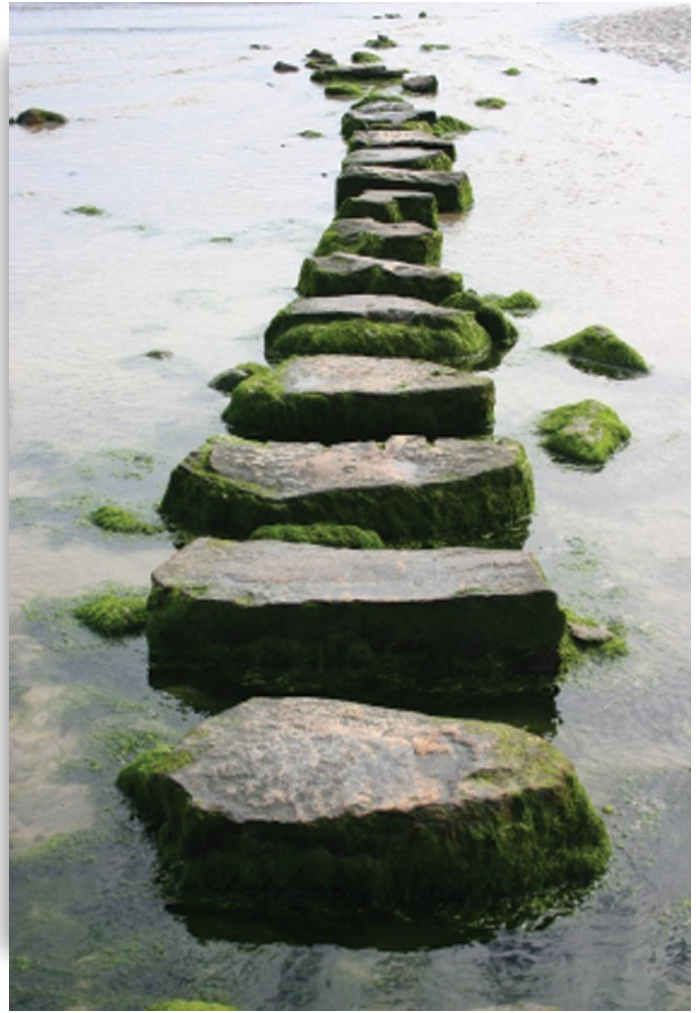
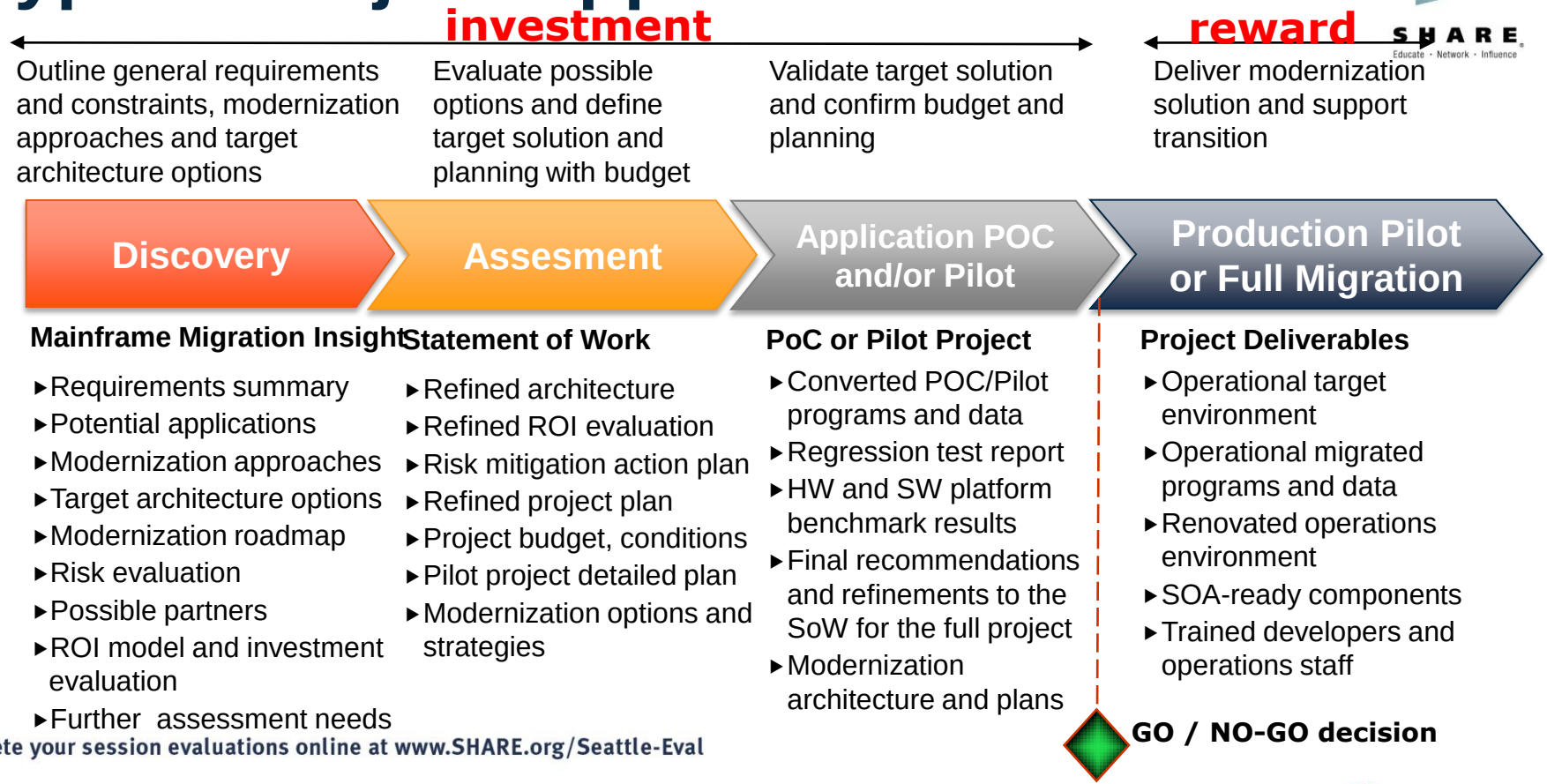


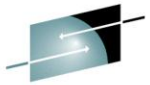
Typical Project Approach



Sample Mainframe to Open Systems Mapping

Environment Characteristics	Source	Target
Hardware	IBM z-Series	Exalogic, Sun M- or T-series, or customer preferred HW
Operating System	IBM z/OS	64 -bit Linux or Unix (Solaris, AIX)
TP Monitor/Screens/UI	CICS/IMS, BMS/MFS, tn3270	Oracle Tuxedo ART for CICS or IMS, BMS/MFS, tn3270/Web UI
Programming Languages	COBOL, Assembler, PL/1, C	COBOL, COBOL or C/C++ for Assembler, PL/1, C
DB2 Stored Procs	COBOL, PL/I	COBOL or C sub-pgms wrapped in Tuxedo services
Job Management	JES, JCL	Oracle Tuxedo ART for Batch, migrated JCL job scripts
Batch Languages	REXX, CLIST	KSH or OpenREXX for REXX
Compiler/Dev Environment	IBM Enterprise COBOL	Micro Focus or COBOL-IT Compiler, Eclipse-based IDE
Database	DB2, IMS DB	Oracle Database/RAC
Files	VSAM, GSAM, Flat files, GDGs	Oracle DB, BDB, or COBOL fs, Tuxedo ART GDG support
Reporting	Focus	Focus for UNIX or SQLPlus, BI Publisher
Sorting Utilities	DFSort, Syncsort	Syncsort DMX
Job Scheduler	BMC Control-M, ESP, OPC	Same or an alternate scheduler
Security	RACF, ACF2	Oracle IdM (LDAP, Identity Mgr., Entitlement Server)
Management/Monitoring	Netview, TMON, Omegamon XE	Oracle Enterprise Manager Grid Control (OEM GC) w/Tuxedo System & App. Monitor, Business Transaction Monitor (BTM)

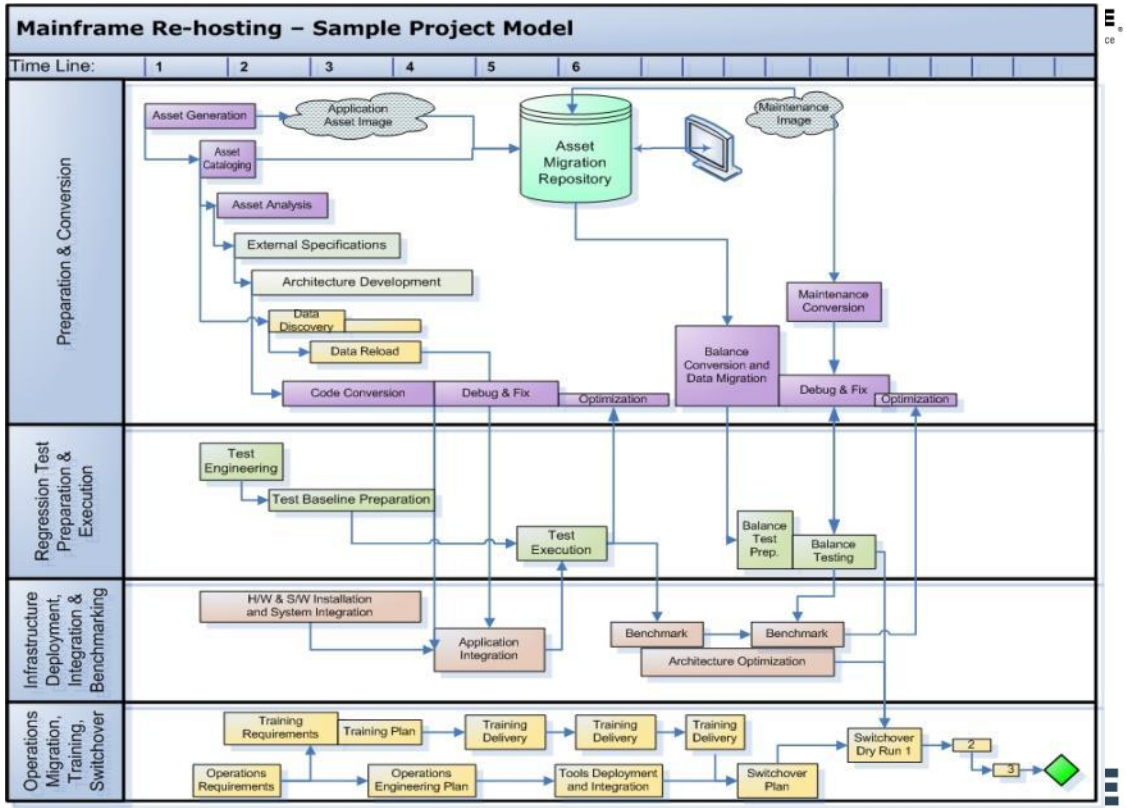
Rehost++ – Preserve and Improve



Rehost intact core components via automated tooling	Reduce, re-engineer, or replace with open system equivalents	Exploit flexibility of Oracle Tuxedo/RAC deployment architecture	Integrate with the remaining ecosystem – mainframe and open
• Migrate COBOL, C in CICS, IMS, and Batch • Convert PL/I to C/C++ or COBOL • Convert JCL jobs with standard utilities • Migrate DB2, VSAM, Flat Files, GDGs • Migrate pre-relational DBs (IMS, Datacom, IDSM, Adabas) and 4GLs	• Reduce Assembler, convert what remains to COBOL or C • Replace REXX with OpenREXX or convert to native scripting • Replace RACF/ACF2/Top Secret with LDAP for AuthN, and OES AuthZ, reducing complexity • Replace Syncsort with Syncsort DMX, LRS DRS with LRS VPSX, etc.	• Collapse multiple CICS and IMS regions into single Tuxedo domains to simplify management • Deploy in Active/Active configuration for HA/DR, adapt rolling upgrades, use built-in dynamic load-balancing • Use Oracle Partitioning for very large tables • Parallelize batch streams to reduce batch window	• Remaining CICS or IMS TM components (TMA: DPL, APPC/LU6.2, OTMA) • Reconnect IBM MQ Messaging • Re-establish remote DB connectivity using DB2Connect, OTG for DRDA, ODBA for IMS • Re-integrate open systems components using Tuxedo JCA, .Net libs, Oracle ESB

Multi-swim Lane Sample Project Model

- Discovery Workshop
- Application Assessment
- Application and Data Conversion (pilot application or entire portfolio)
- Test Planning and Engineering
- System and Application Integration
- Regression Testing
- Performance/Scalability Testing
- Resilience Testing
- Operations Migration
- Education and Training
- Switch-Over



Key Success Factors - The Long Term View

Migration	Go-Live	Production
Automation	Infrastructure	Stability/Resilience
Coverage	Staff	Performance
Accuracy	Operations	Dev Environment
Testing	Monitoring	App Evolution
	Supportability	Scalability
		TCO

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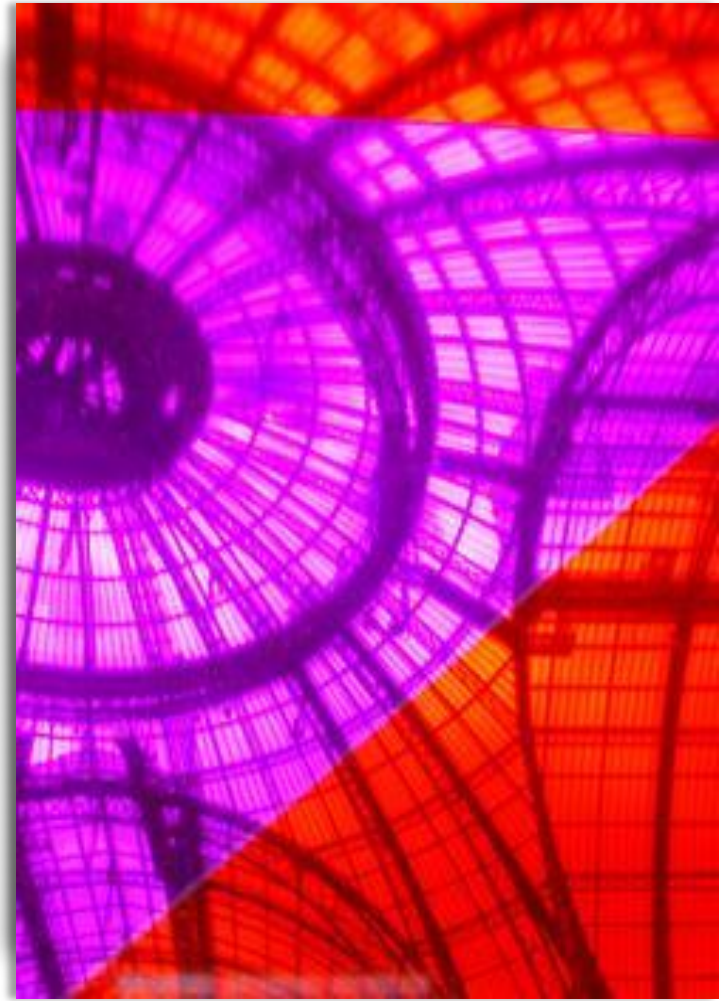
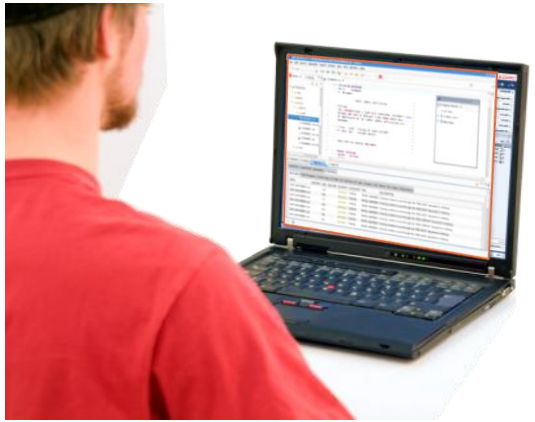


Automated, Uniform Transformation



- End-to-end Migration Life-Cycle
- Application repository & cataloger
- Language migration/adaptation: COBOL, JCL, SQL
- Data migration: VSAM, Flat Files, GDGs, DB2, IMS
- Configuration
- Build and Deploy
- Testing with automated results capture and compare

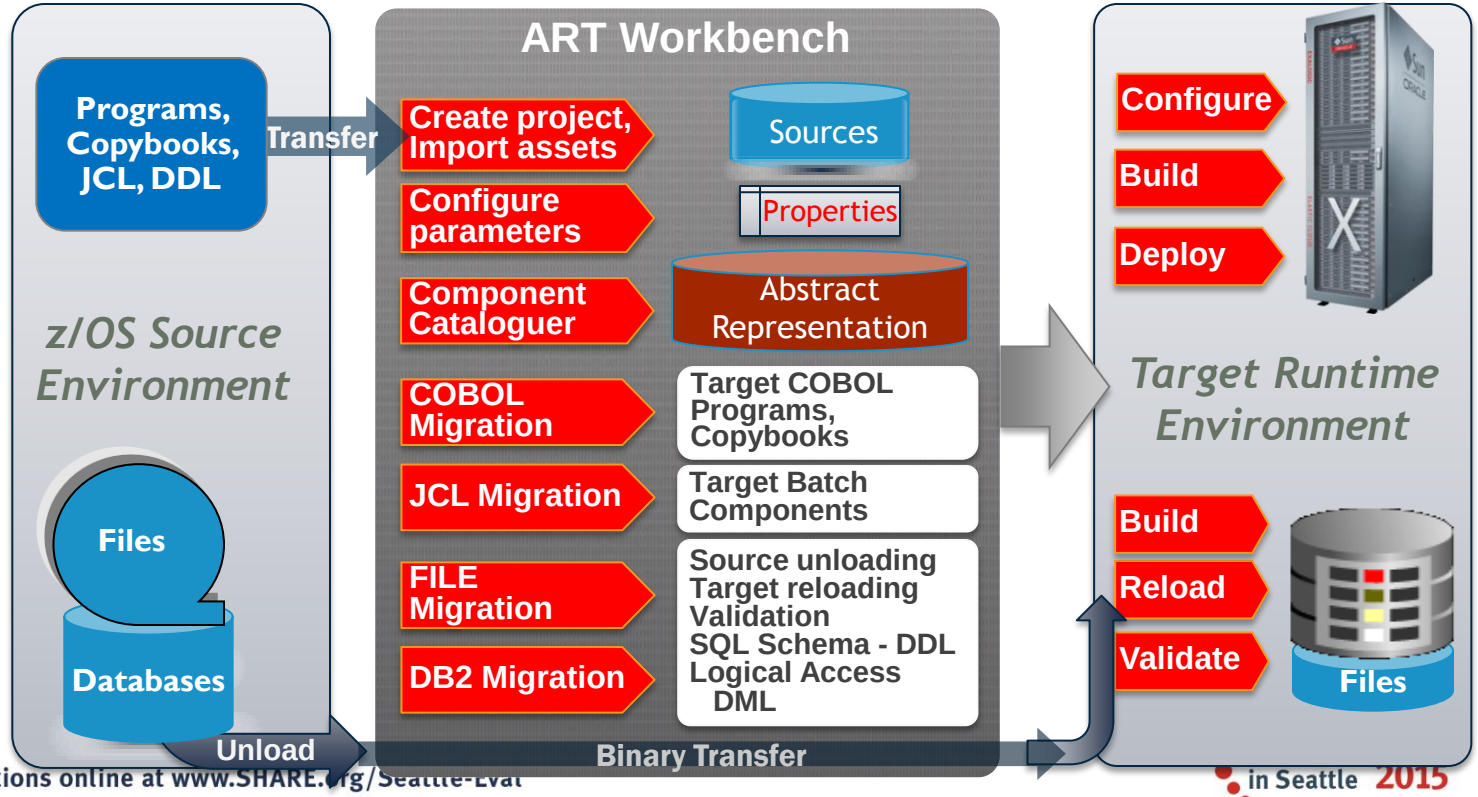
Economics of Automation

Faster Migration Project → **Lower Cost and Risk** → **Faster ROI**

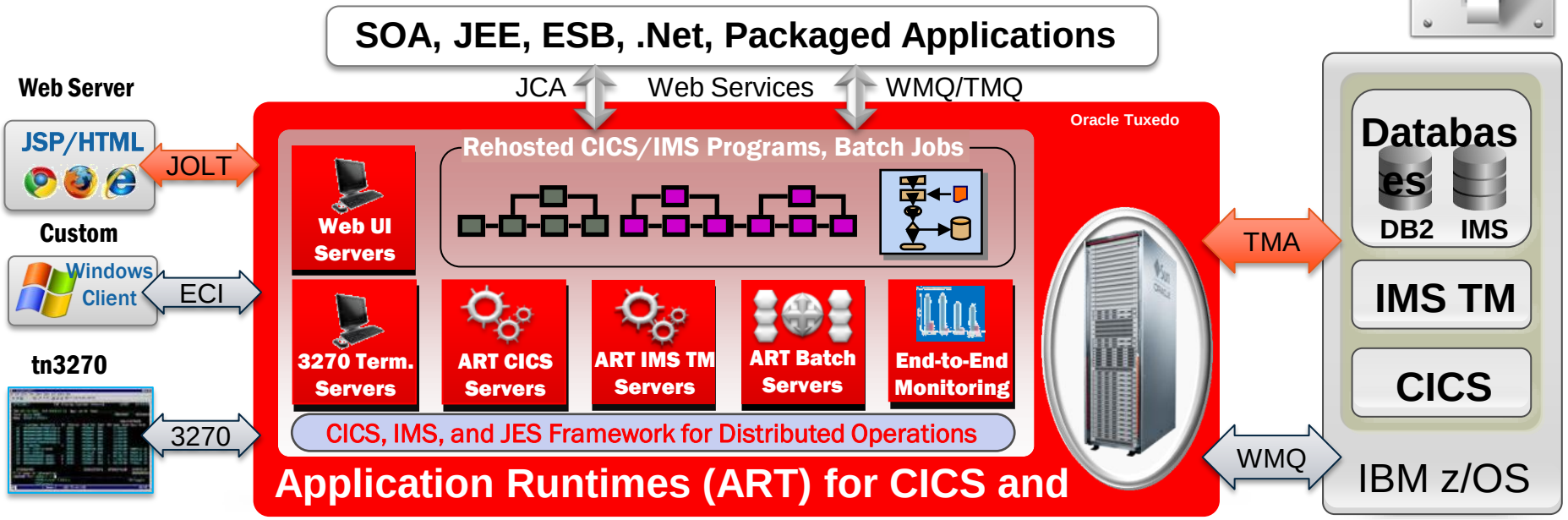
Application Rehosting Workbench

Automated, Industrialized Rehosting Process

- Uniformity, high accuracy reduce risk, cost of testing
- Automation, high efficiency speed up migration projects
- Configurable, extensible with custom rules for special needs

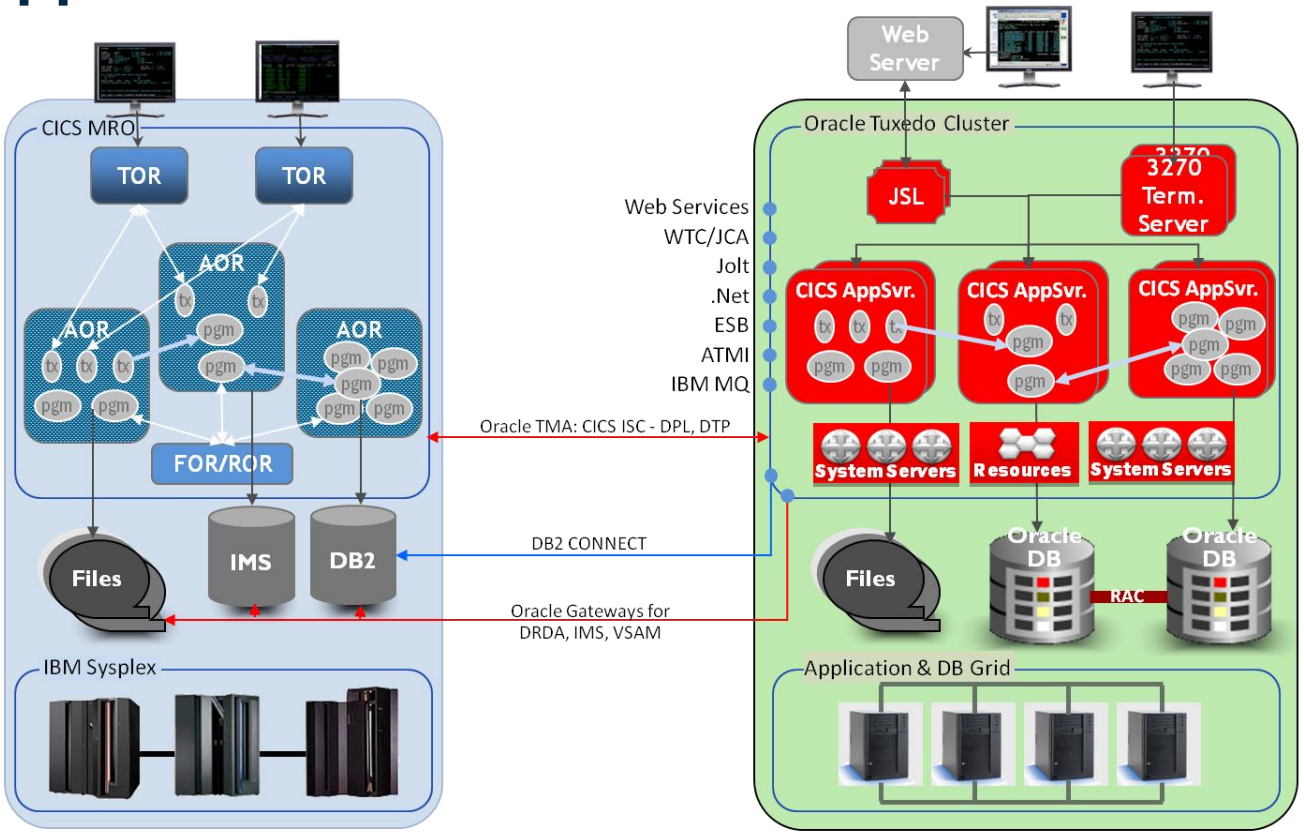


Resilient, Compatible Infrastructure



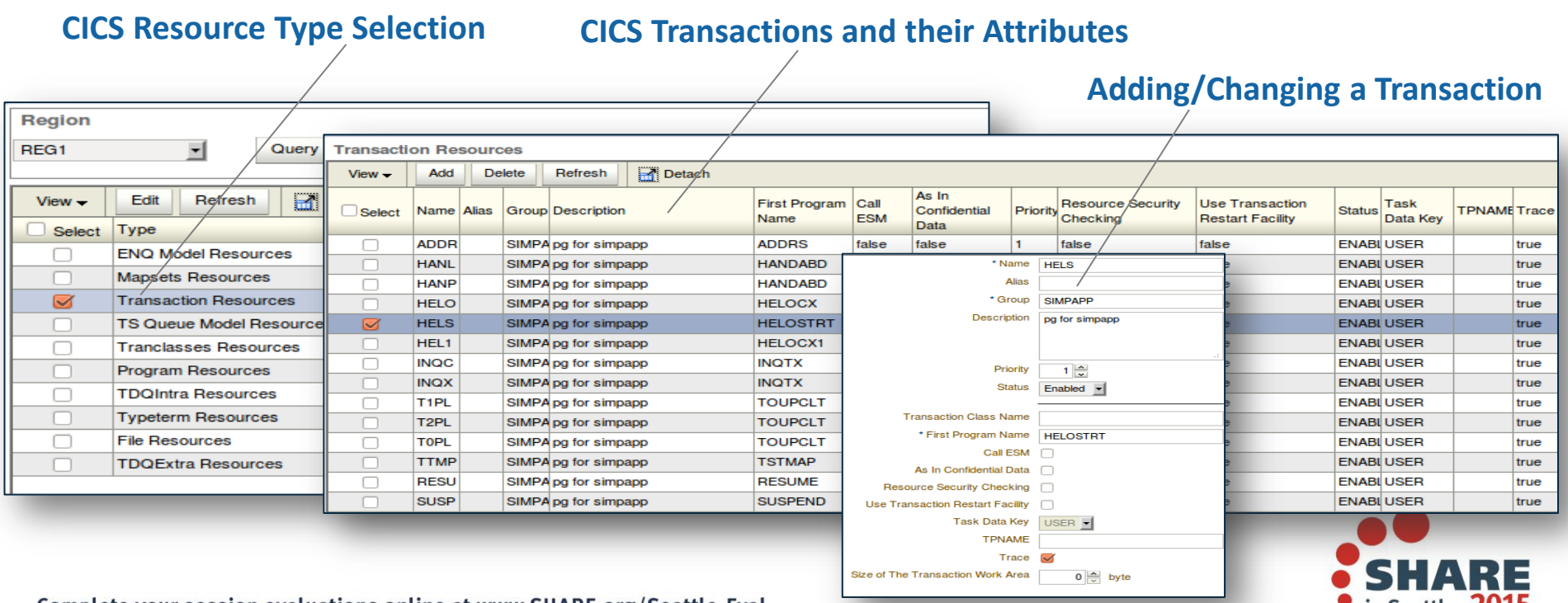
- Reduced risk, lower cost, faster migration and accelerated ROI
- Faster, simpler integration via SOA, extensibility in Java
- Scale-out CICS, IMS, and batch workloads, run with HA for non-stop operations

Application Runtime for CICS



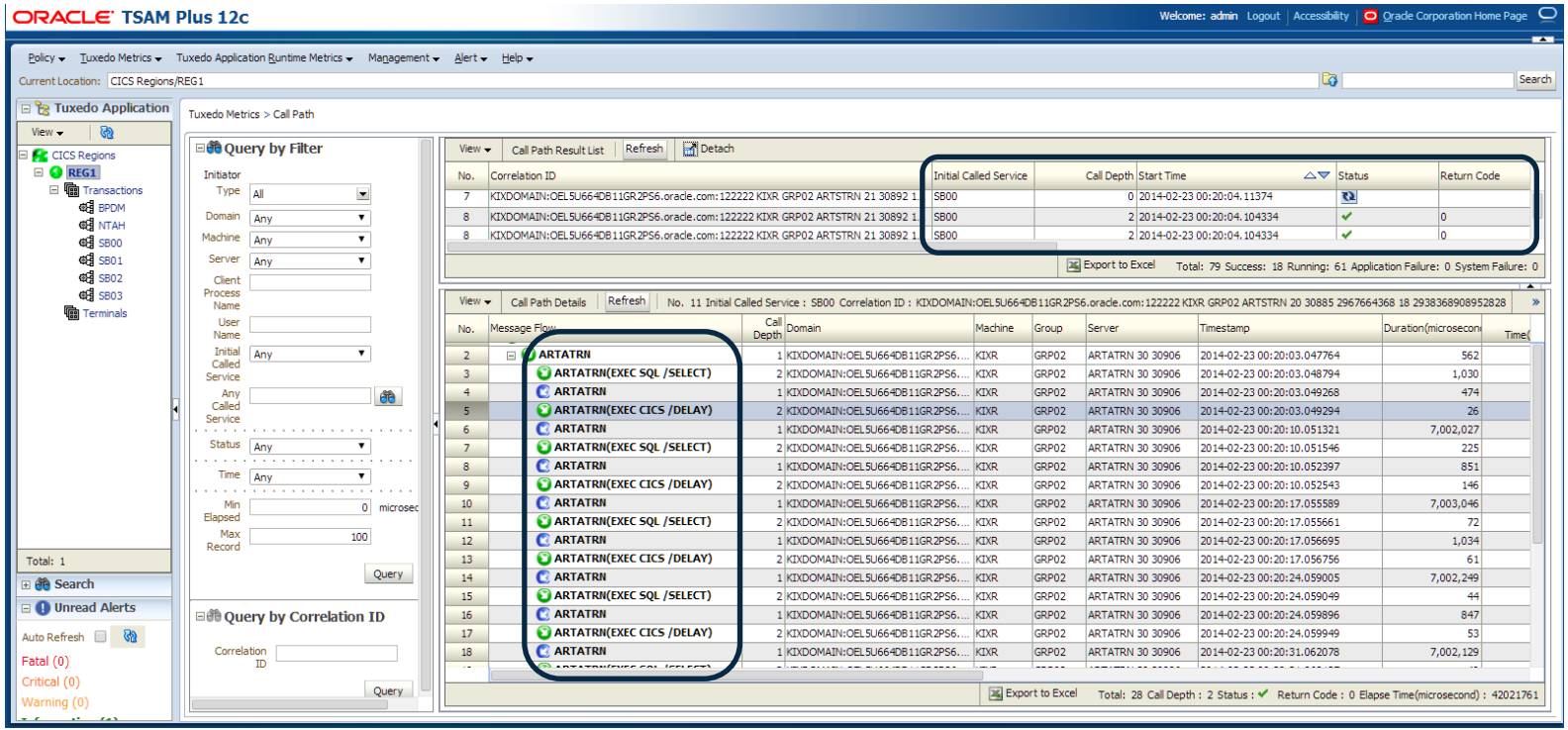
- ✓ Synch & Asynch transactions
- ✓ DPL programs
- ✓ TSQs/TDQs, TSPOOLs
- ✓ 3270/BMS
- ✓ EXEC CICS API
- ✓ SPOOL, INTRDR
- ✓ ECI Client
- ✓ JCA/CTG
- ✓ EXCI from Batch
- ✓ MQ-Initiated
- ✓ APPC Support
- ✓ CICSPlex like clustering
- ✓ Tracing and monitoring

Centralized Management of ART CICS(Plex) Resources

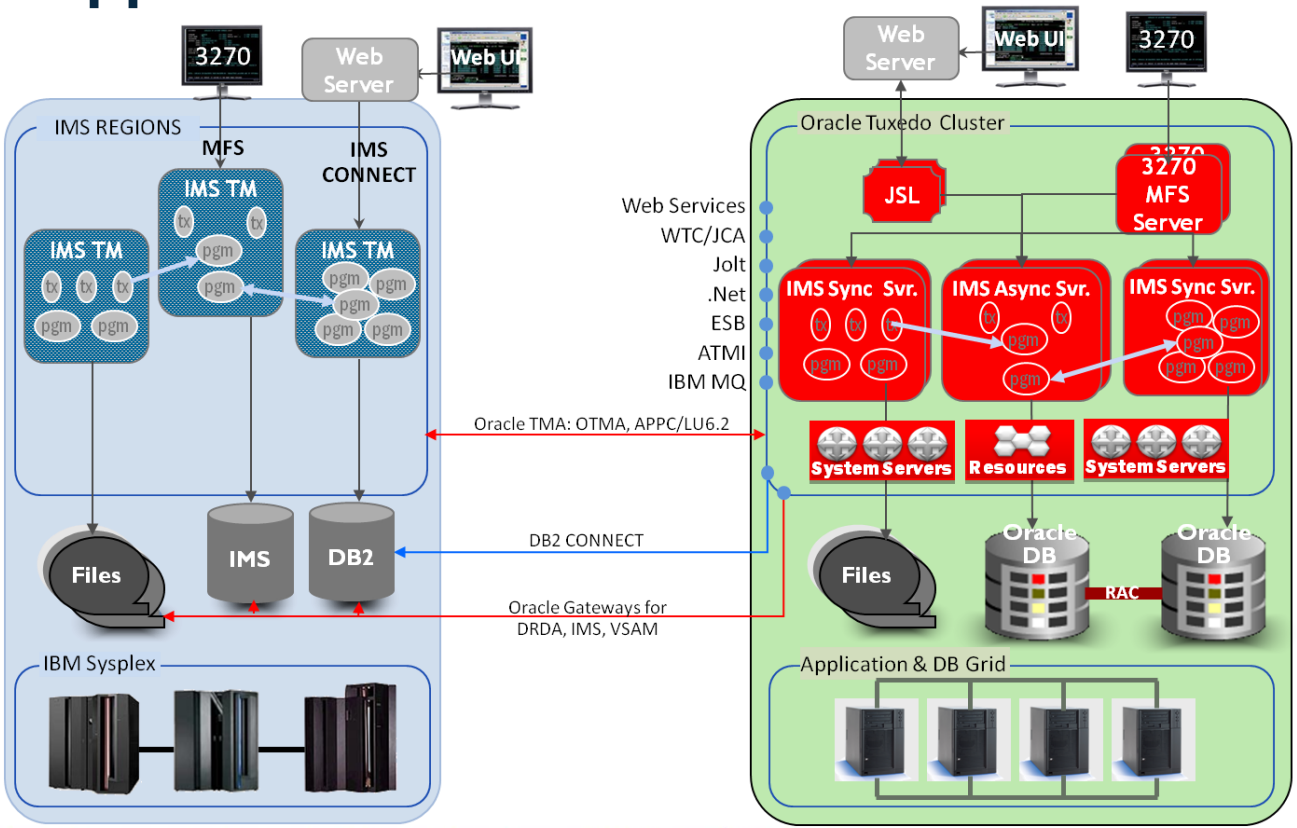


CICS Trace

Transactions Summary and Detail Drilldown (CICS verbs, SQL)



Application Runtime for IMS



Transaction types:
- ✓ Response / non-response mode
- ✓ Conversational / non-conv. mode

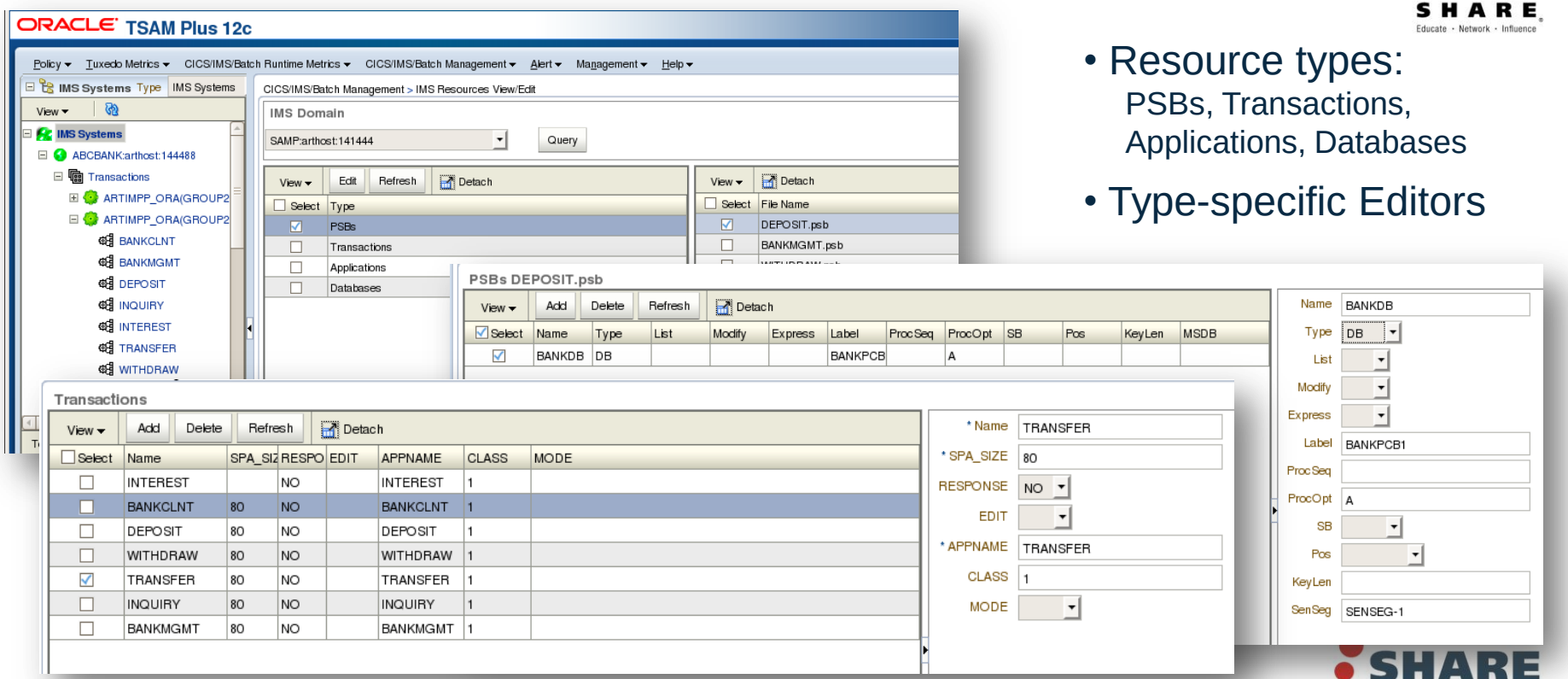
3270 support:
- ✓ tn3270 Interface
- ✓ Basic edit mode
- ✓ MFS mode/MFS bypass

MQ-IMS Bridge

IMS Batch:
- ✓ Start/stop region
- ✓ DFSRRC00 utility to schedule BMP region
- ✓ Transactional Batch

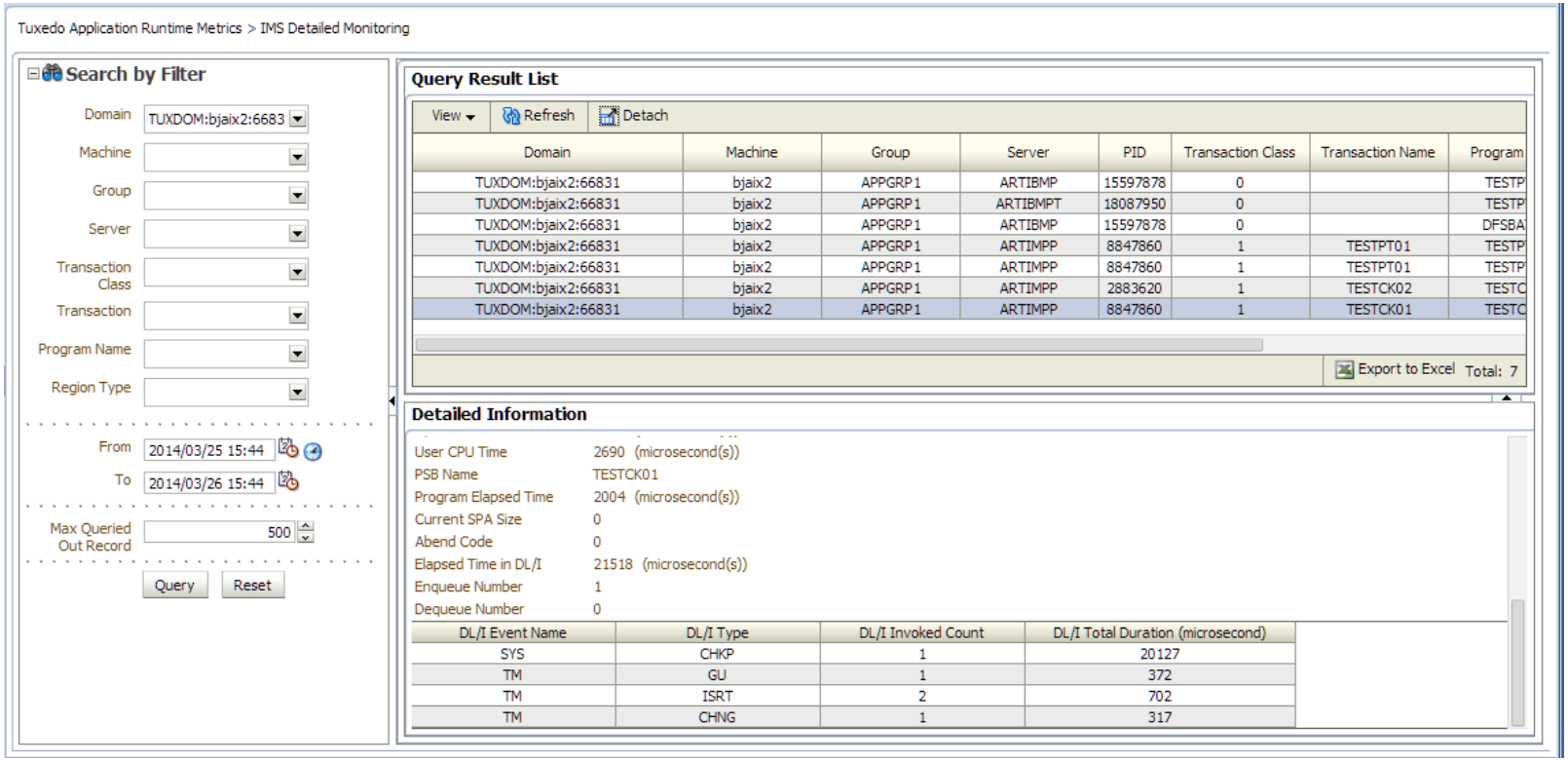
IMS DB Options
- ✓ Remote access via ODBA Gateway
- ✓ Migrate to Oracle with DLI-2-SQL Access

TSAM Plus – IMS Configuration Management



- Resource types:
  PSBs, Transactions, Applications, Databases
- Type-specific Editors

TSAM Plus – Detailed IMS Application Trace



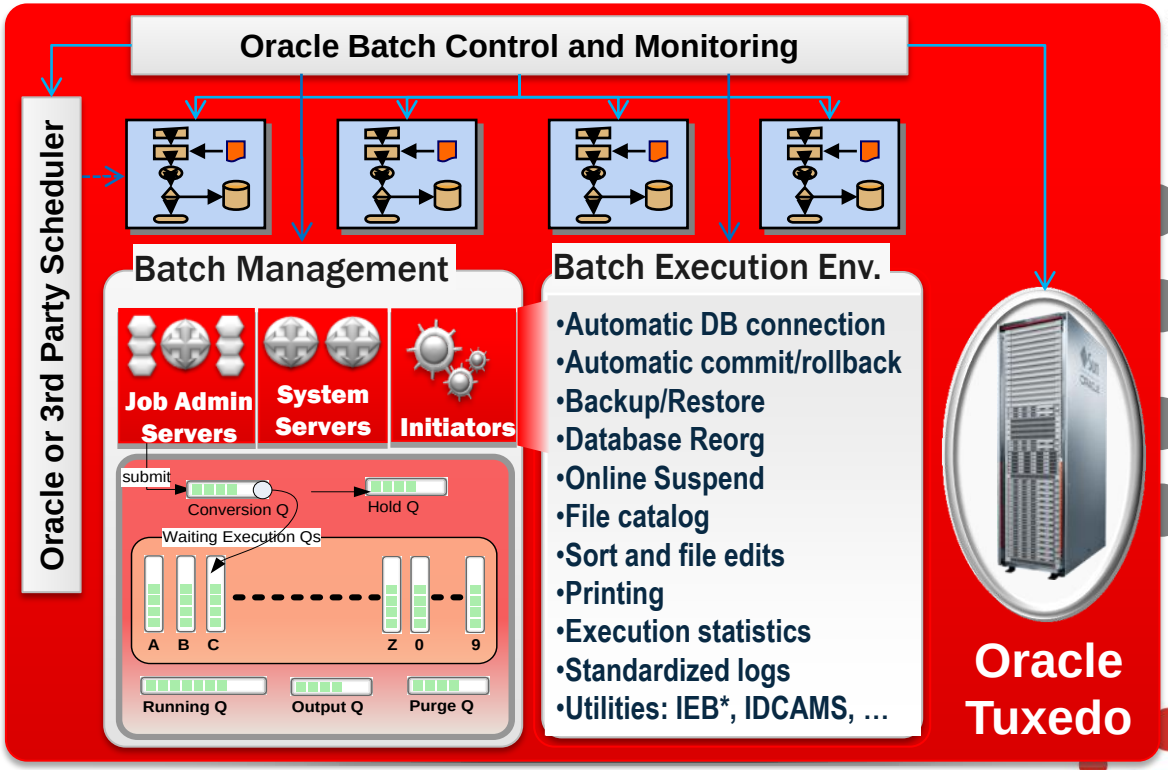
- IMS Transactions
- Transaction Details
- DL/I Stats by Type

Application Runtime for Batch

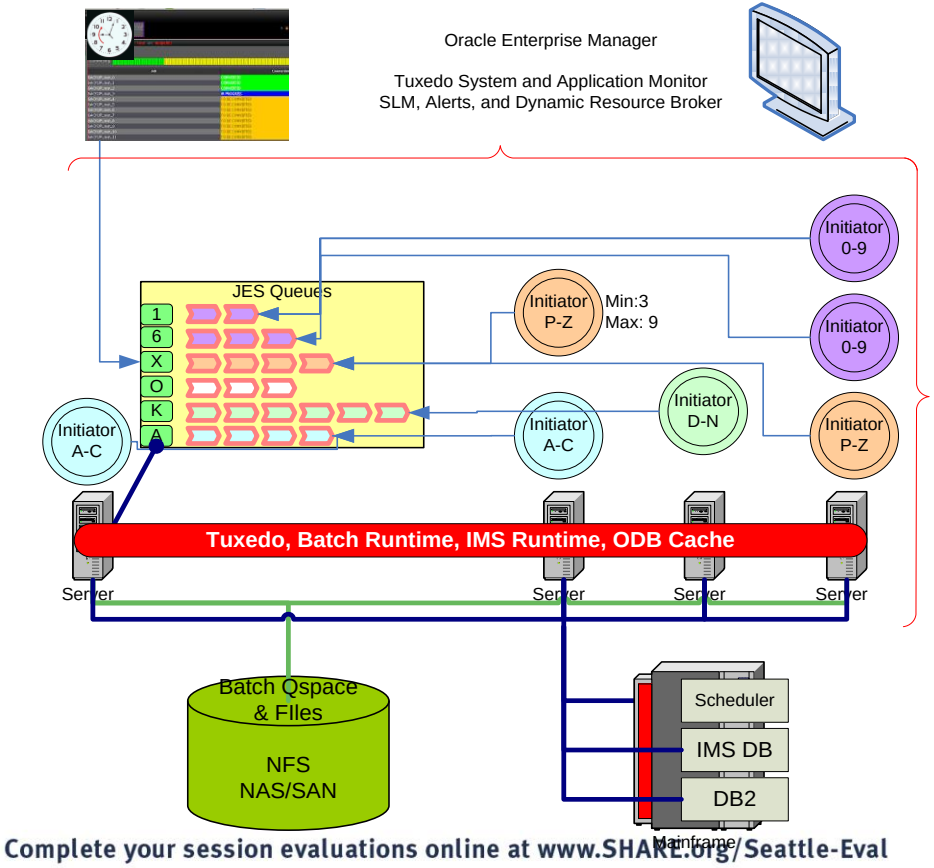
Preserves job flow and control, reduces migration cost and time

Reduces batch window through parallel execution, elastic resource utilization

Open, extensible - easily extend via scripts, Java programs, ODI, BI reports



Resilient Batch Cluster Architecture

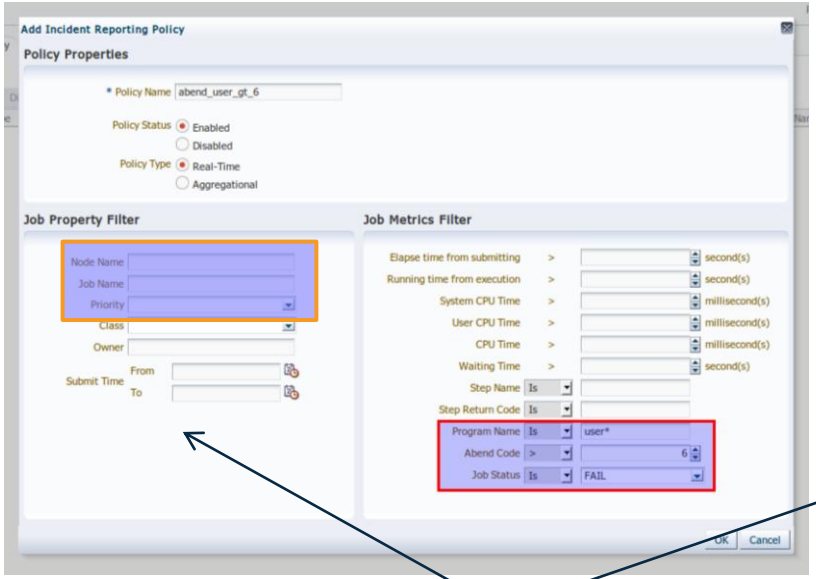


Key Requirements

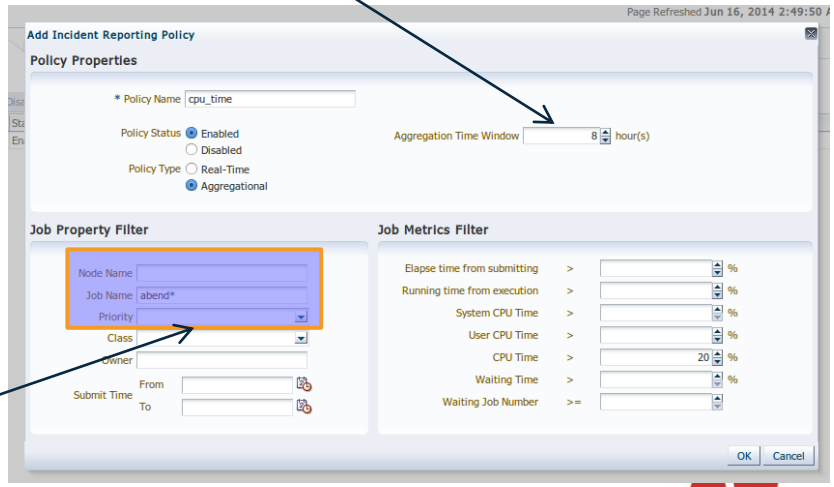
- Centralized JES Queues for Cluster-Wide Job Management
- Distributed Initiators for Scalable Job Execution
- Concurrency Control over NFS-backed Qspace and Shared Data
- Integrated Monitoring & Management
  - Infrastructure components
  - Batch jobs
- Broad Job Control Interfaces
  - Command line client – for interactive or script use, scheduler integration
  - Service invocation using Web services, JCA
  - ISPF-based operations
  - Web UI for Batch operations

SLA and Exception Monitoring for Batch

Real-time: Absolute wait, exec, or CPU time; exceptions – step or job return codes, and abends

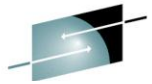


Aggregational: Relative (expressed in percent) value of wait, exec, or CPU time compared to past history over the specified aggregation time



Each policy has a defined scope in terms of nodes, job names, job class, owners and time range

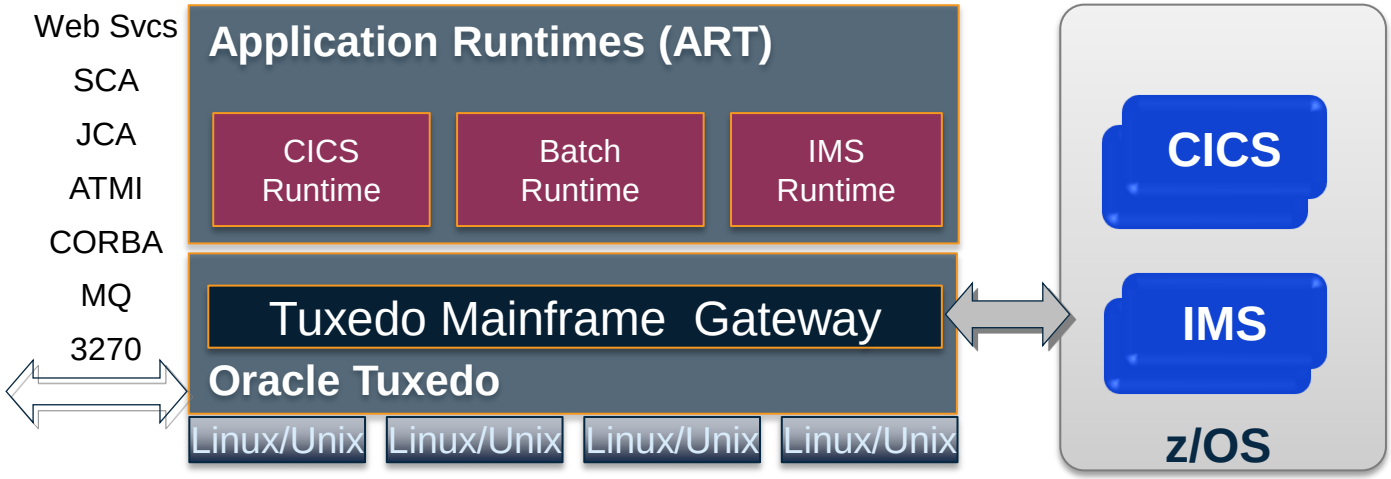
Tuxedo JES Framework for Mainframe-Grade Batch Support



- Cluster-aware job management
  - Centralized JES queues and spool for submitting and executing across a cluster
  - Distributed, fault-tolerant Initiators
  - Resilience through automated fail-over
  - Job control (submit/hold/release/cancel/print/purge) as a Service Call (ATMI, JCA, WS)
- Batch Event Management
  - Publishes state changes to Tuxedo Event Broker and OEM, enables autonomous management and SLA monitoring
- Security
  - User & DB connect info in encrypted profil
  - Built-in job authorization system
  - OOTB ESM (OES, LDAP) integration for role based authorization of job control functior

- File catalog and GDG support
- CLI for scripting, scheduler integration
  - artjesadmin – sync./async. job submit
    - Native JCL and converted ksh scripts
    - Operations: submit, hold, release, cancel, purge, print
  - JES SYSLOG
    - Consolidated batch log (jobs/steps + system events)
- ISPF using uni-SPF/uni-REXX
  - Native ISPF features: editors, file mgmt, REXX scripts
  - ART Batch operations & administration extensions
- Batch Operations Web UI
  - Job submit/Job View with SDSF-like search
    - Operations: Cancel, Hold, Release, Purge, Re-submit
    - Views: Logs, SYSOUTs, GDG management
  - Job archival and search (Metadata, Logs, SYSOUTs)
  - Abend notifications – incident management
  - Batch SLA alerting policies and automated actions
  - System utilization reports

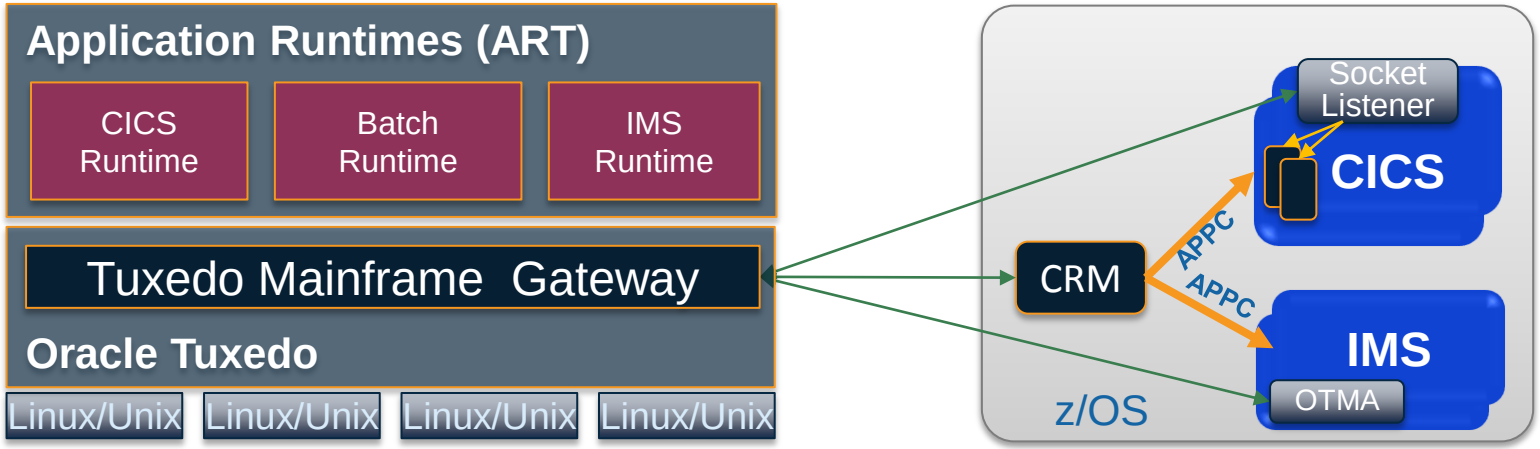
Hybrid Deployments Require Mainframe Adapters



- Bi-directional transaction integration with CICS and IMS
- Configuration-based integration for CICS DPL, DTP/APPC, IMS OTMA
- Global transaction integrity (XA) w/2-Phase Commit (Sync level 2)

- Data translation - full EBCDIC/ASCII conversion
- Link authentication and encryption
- Security propagation – User credentials passed to CICS
- Performance and scalability for 1000s of transactions/sec
- Mesh configuration and automatic reconnection for HA

Tuxedo Mainframe Adapter – Connection Protocols

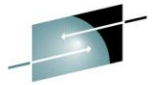


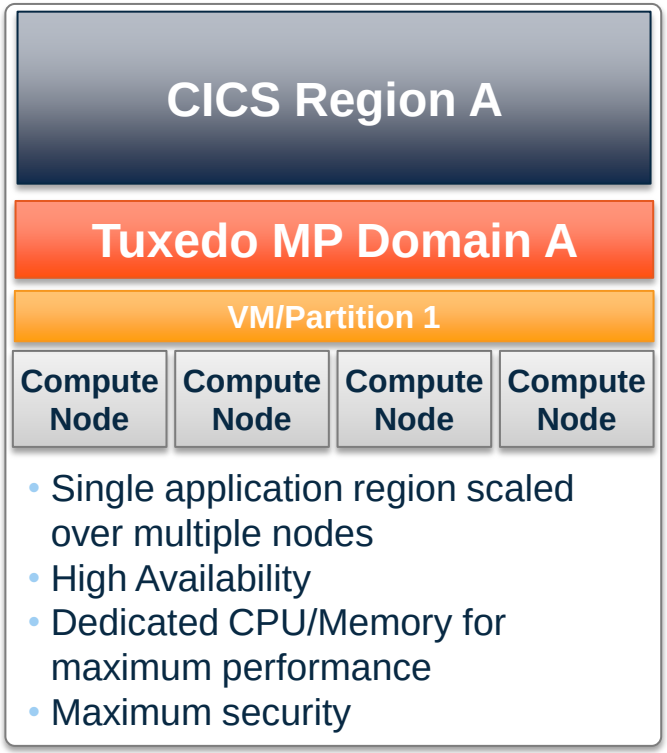
- CICS-CICS ISC Options
  - DPL (EXEC CICS LINK)
  - DTP/APPC (Send/Receive)
  - Transaction Routing
  - Channels/Containers
- OLTP/Batch Interactions
  - ART Batch jobs start z/OS CICS/IMS transactions
  - ART Batch jobs make EXCI calls to CICS
  - z/OS CICS submit batch jobs via TDQ to Tuxedo ART
  - z/OS Batch jobs start CICS/IMS transactions on Tuxedo ART
- IMS Options
  - OTMA
  - APPC (CPI-C)

Data Integration Options for Hybrid Deployments

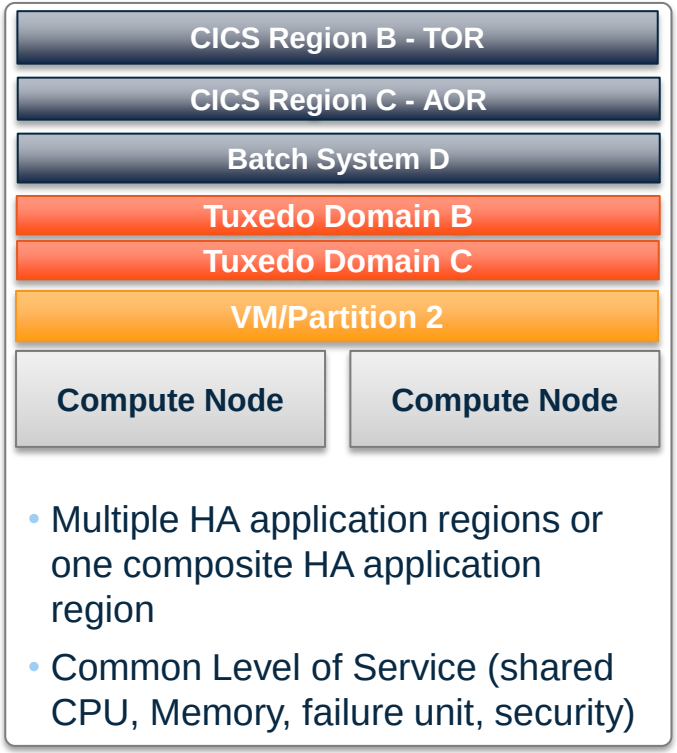
- IMS ODBA remote access from Tuxedo ART
- DB2 DRDA via DB2Connect or Oracle DRDA gateway
- Mainframe applications to Oracle via DRDA server
- GoldenGate based DB2-Oracle replication (one direction or bi-directional)
- File download/upload in batch jobs
- DB2 Stored Proc-based access to mainframe data

Flexible, Elastic, Scalable Runtime Deployment Configurations

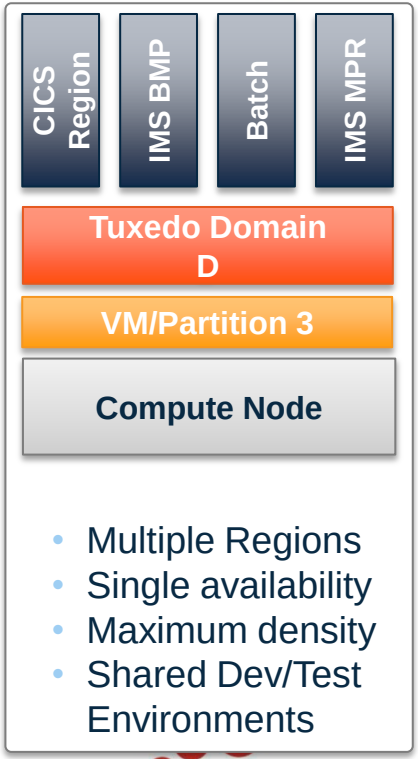




- Single application region scaled over multiple nodes
- High Availability
- Dedicated CPU/Memory for maximum performance
- Maximum security

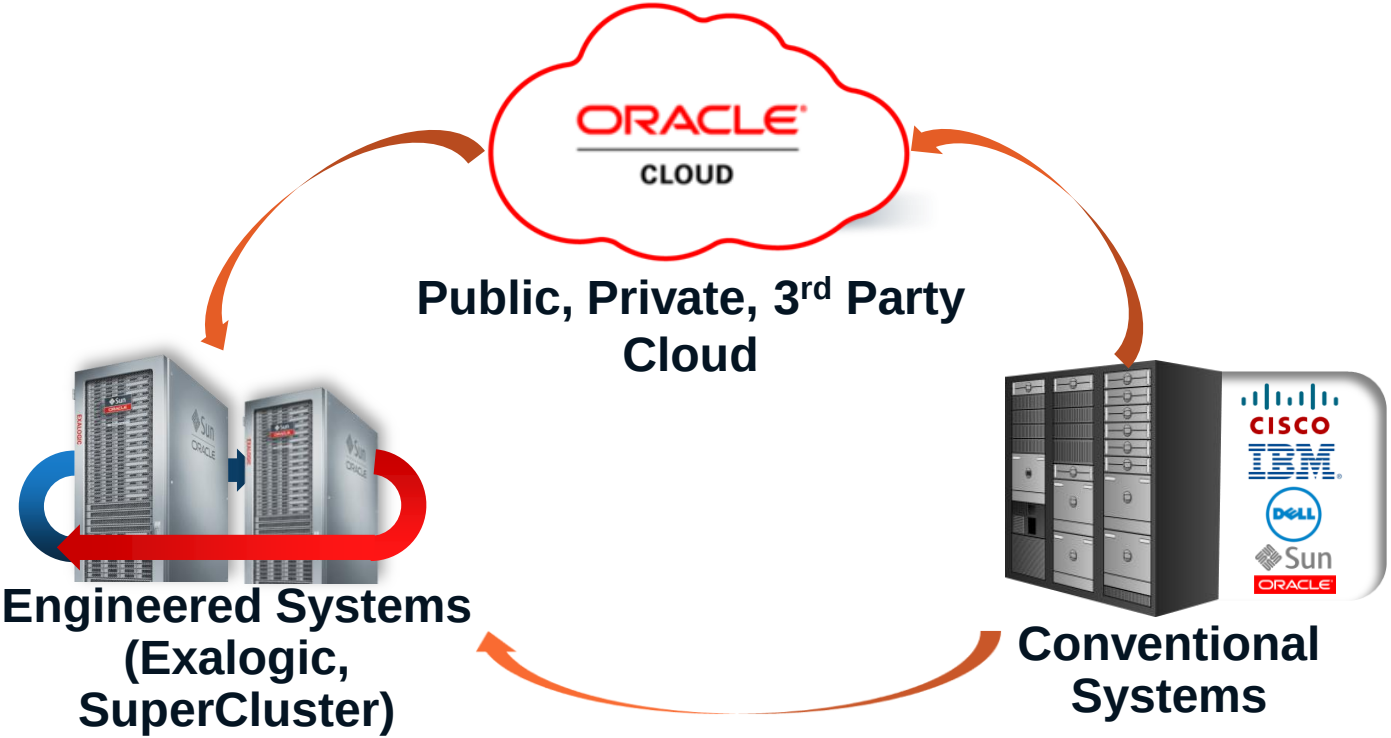


- Multiple HA application regions or one composite HA application region
- Common Level of Service (shared CPU, Memory, failure unit, security)

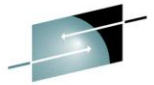


- Multiple Regions
- Single availability
- Maximum density
- Shared Dev/Test Environments

Deployment Options: On Premises and in the Cloud

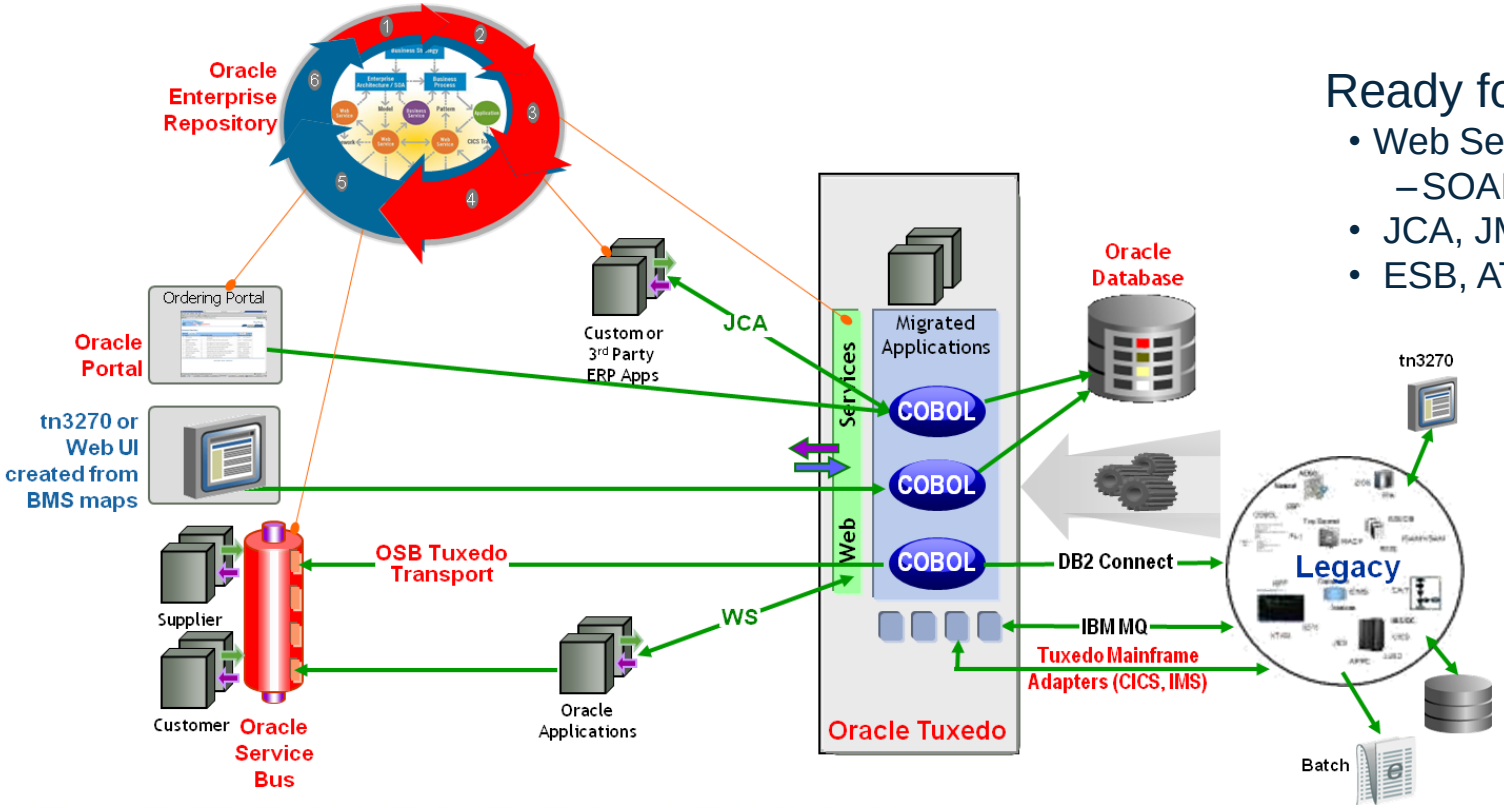


Leveraging Post-Rehost Modernization Options



- **SOA enable and integrate online services (CICS/IMS txns, DPL pgms)**
  - Expose existing CICS transactions as online services through Web Services, ESB, or JCA
  - Integrate rehosted CICS transactions/online services in a BPM-driven process
- **Migrate selected COBOL programs to Java**
  - Leverage Tuxedo Java server and built-in integration to re-engineer some business logic
  - Benefit from common platform services
- **Extend the application for new needs**
  - Heterogeneous components (Java, C/C++, PHP, Ruby, Python), optionally leveraging SCA for composite applications
  - Outbound calls to Web Services provided by other custom or packaged solutions
- **Convert 3270/BMS UI to JSP/HTML**
  - Enable Web browser access, further UI renovation, and/or portal integration
- **Unlock access to migrated legacy data**
  - Migrate VSAM files to Oracle DB and open up access to this data for BI, enterprise apps, etc.
- **Increase batch flexibility and agility**
  - Replace hardcoded process flows or rules in COBOL using BPM or Rules Engine
  - Replace batch utilities or programs with Oracle Data Integration or ETL tools
  - Replace hard coded reporting with Oracle BI tools
- **Integrate with Big Data/Hadoop**
  - Launch Hadoop jobs
  - Integrate results in Batch processing

SOA Enablement of Rehosted Components



Ready for Integration

- Web Services:
  - SOAP, REST, JSON
- JCA, JMS
- ESB, ATMI, WMQ, etc.

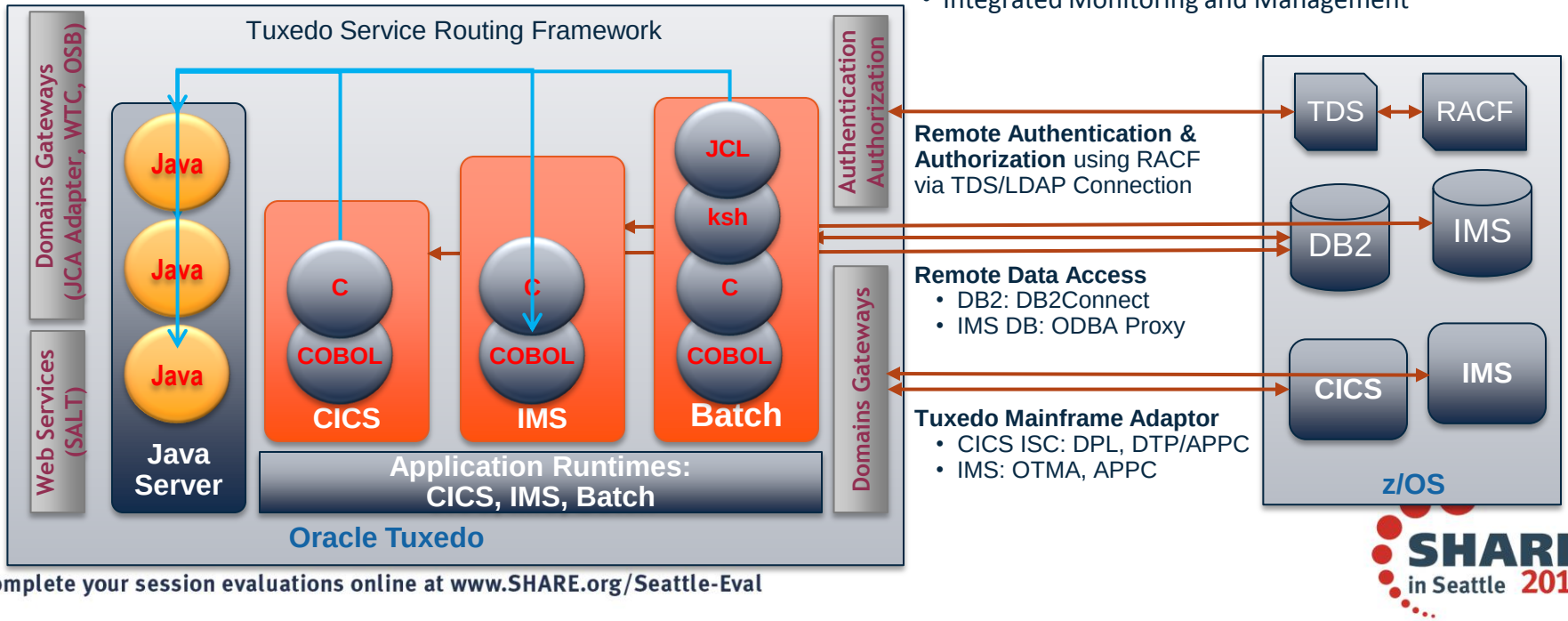
Migrating COBOL/C to Java and Interfacing to Legacy Re-hosted Code

Replace individual COBOL/C programs in phased manner with no impact

- From batch: Invoked via EXEC PGM= in batch jobs
- From CICS: Invoked via EXEC CICS Link <program> in CICS programs
- From IMS: Invoked via DL/I ISRT with ALT PCB

Benefits of Integrated Tuxedo Platform

- Common Transaction Mgmt & XA Optimization
- Common External Integration Channels
- Integrated Clustering, Scale-out, Failover
- Integrated Monitoring and Management



Foundation of Customer Success

FAST AND AUTOMATED MIGRATION

- Automated Code and Data Migration Tools
- Application Runtimes for CICS, IMS, Batch
- Industrialized Methodology

ROBUST AND SCALABLE INFRASTRUCTURE

- Mission-Critical Enterprise Cloud-Ready Platforms
- Best-in-class QoS attributes
- Dynamic scalability
- Automated operations

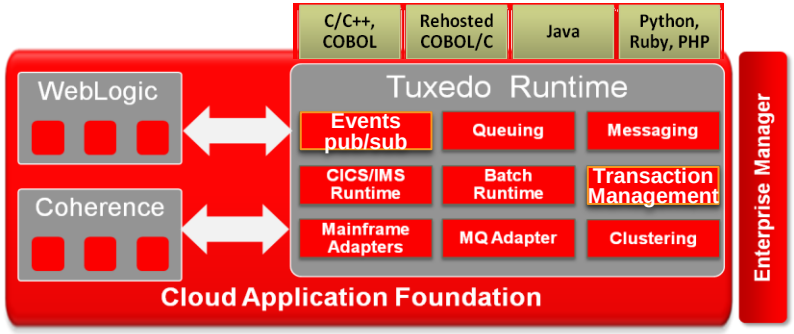
EASIER EVOLUTION AND MODERNIZATION

- Extensions in Java
- ODI/BI Integration
- Web Services
- JCA/JEE

Oracle Tuxedo – Mission-Critical Application Platform

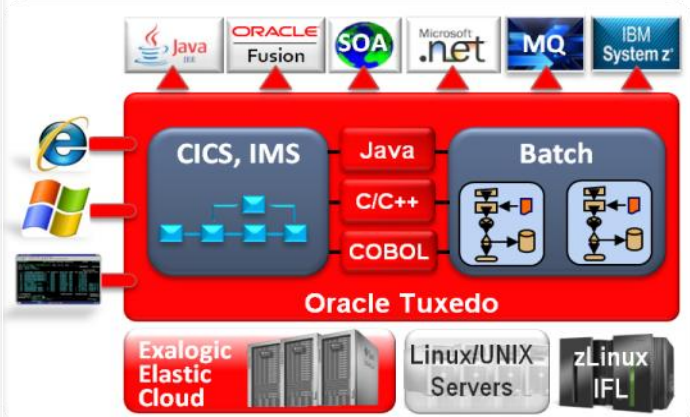
Application Server for Composite Applications (COBOL, Java, C/C++)

- Multi-language containers
- Very high throughput, low latency
- Linear scalability and high availability
- Integrated management and monitoring
- Out-of-the-box integration options



Platform for Mainframe Application Migration and Modernization

- 50-80% cost savings vs. the mainframe
- Flexible, scalable, cloud infrastructure
- Faster, simpler application evolution and modernization after migration



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