

FUSION MIDDLEWARE

ORACLE TUXEDO APPLICATION RUNTIME FOR CICS AND BATCH

PREMIER MAINFRAME
REHOSTING PLATFORM

KEY FEATURES

- IBM CICS programming model, related services on top of robust and scalable architecture
- EXEC CICS support via the built-in pre-processor
- 3270 and BMS map support, Web UI integration option
- CICS resource editing UI and CICSplex-like distribution
- Multi-node and MRO capable, app grid and cloud-ready
- Integrated CICS region monitoring in TSAM/OEM
- JES services for batch job control with distributed initiators
- Batch environment with JCL functions, standard utilities
- CICS/Batch integration enables CICS to submit batch jobs to INTRDR and batch jobs to invoke CICS transactions.
- Agile server and workload management

KEY BENEFITS

- 50-80% cost reduction vs. the mainframe
- Faster and simpler migration avoiding the risk and cost of a re-write
- Addresses risk of mainframe skills attrition through open, extensible job scripts, standards-based online integration options, simplified architecture and operations
- Linear scalability and Active/Active HA and DR configurations at a fraction of the mainframe cost
- Open, agile foundation for further modernization using Java, SOA, and Oracle Fusion Middleware solutions
- Future-proofs the applications by providing scalable growth and broad evolution options to meet changing needs
- Helps to address key business needs by shifting more IT budget from maintenance to innovation

Oracle Tuxedo Application Runtime for CICS and Batch runs IBM mainframe applications rehosted to Oracle Tuxedo with no change to business logic. Providing CICS programming models and services, COBOL containers, 3270 BMS support, standard JCL functions and common utilities, and access to migrated VSAM, DB2, and flat file data, as well as remote access to mainframe DB2, the runtime helps online and batch mainframe applications run unchanged, preserving decades of investment in business logic and data. In conjunction with the Tuxedo Application Rehosting Workbench this solution helps to rehost mainframe applications and migrate their data to open systems faster and with low risk, and to run even large scale applications efficiently and reliably on horizontally scalable Oracle Tuxedo – an industry-leading COBOL and C/C++ application server, leading to significant cost savings and greater flexibility. The result – high performance and ultra scalable CICS and batch applications running on open systems at a fraction of the mainframe cost.

Rehost Mainframe Applications Intact to Reduce Costs and Increase Agility

Oracle Tuxedo Application Runtime for CICS and Batch helps organizations migrate online and batch mainframe applications to open systems without having to re-write them to Java or .Net. It is powered by the premier COBOL and C/C++ application server – Oracle Tuxedo. Running COBOL applications with CICS APIs and services, JCL functions, standard utilities, and data access provided by the CICS and batch runtimes enables application migration without a re-write – preserving decades of investment in business logic and data, protecting users from change, and avoiding the risk and cost of changing business-critical applications.

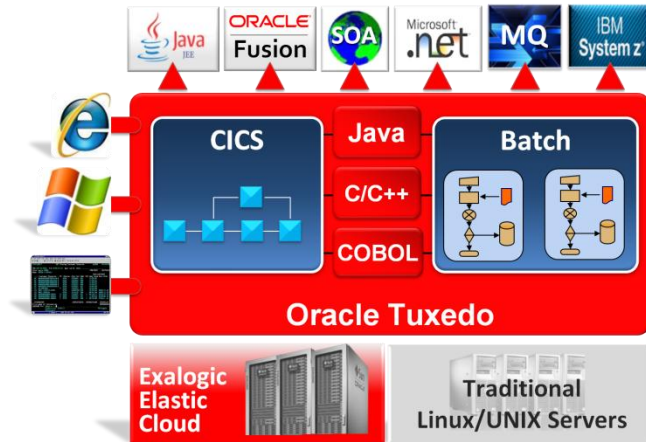


Figure 1. Oracle Tuxedo Application Runtime for CICS and Batch

Rehosted CICS applications run in Tuxedo containers using the programming model and services provided by the CICS runtime, including CICS transaction services, DPL programs, 3270 BMS, IBM MQ connectivity, and distributed resource management. Rehosted batch jobs run under the batch runtime, which provides robust job management similar to z/OS JES and delivers production features of JCL and standard batch utilities in the execution container.

Tuxedo delivers a robust platform to run high-volume applications across distributed, heterogeneous computing environments, enabling transactions that stretch from customer-facing, business-critical applications to back-office processes, across any system, anywhere in the world.

Tuxedo Application Runtime for CICS and Batch leverages this foundation to run rehosted IBM applications unchanged. It helps IT to regain control by reducing complexity of rigid IT infrastructure, providing choice and flexibility, and addressing mainframe skills attrition with simplified architecture and operations, standards-based integration and extensibility, and cloud deployment options

Rehosted CICS and Batch applications run in a native environment, not an emulation black box, and can leverage a rich set of Tuxedo integration options – from Tuxedo Mainframe Adaptors to Web Services, JCA adapter, JOLT and .Net clients, and IBM MQ gateway.

File access to migrated VSAM or flat files data on open systems remains unchanged, while embedded DB2 SQL can be automatically adapted to Oracle SQL. Tuxedo Application Rehosting Workbench facilitates this process and automates data migration of flat and VSAM files, and DB2 tables. In addition to local data access, remote access to mainframe DB2 is supported via DB2 Connect. Tuxedo Mainframe Adapters also provide full connectivity to mainframe CICS and IMS TM, making rehosted components look like a remote CICS region.

Migrate CICS Applications Unchanged

An online z/OS application may use a wide range of services provided by IBM CICS. CICS Application Runtime for Tuxedo is built to run these applications unchanged by providing the same CICS programming model and services. This support provided by ART servers built on native Tuxedo infrastructure includes:

- EXEC CICS calls and the underlying functions
- Synchronous and asynchronous transactions, and DPL-callable programs
- Temporary Storage (TS) and Transient Data (TD) queues
- 3270 terminal server and BMS management, ECI client, Web UI integration
- Multi-Region Operations (MRO) configurations on single node or in a MP cluster
- File operations on VSAM files or mapped to Oracle Database or DB2 UDB
- EXEC SQL API either for DB2 access or adapted for Oracle Database
- APPC-based distributed transactions

The CICS runtime protects application’s functionality and enables it to run on a distributed Tuxedo cluster. Its message-oriented architecture is easy to configure for distributed operations in an application cloud, which provides dynamic load-balancing, scalability, automatic fail-over, and other benefits of distributed Tuxedo architecture. CICS transactions and DPL programs run as services deployed in active/active fault-tolerant mode. In addition to the traditional mainframe access via tn3270, CICS ECI or CTG clients, IBM MQ, DPL or DTP/APPC, they can be invoked via Tuxedo integration APIs: Web Services, JCA/WTC, ATMI, etc. Developers can maintain rehosted applications in CICS programming model or mix in native Tuxedo APIs, as well as extend them with new components using COBOL or any of the other Tuxedo-supported languages: C/C++, Java, Python, Ruby, and PHP, as well as with remote JEE and .Net components or packaged applications.

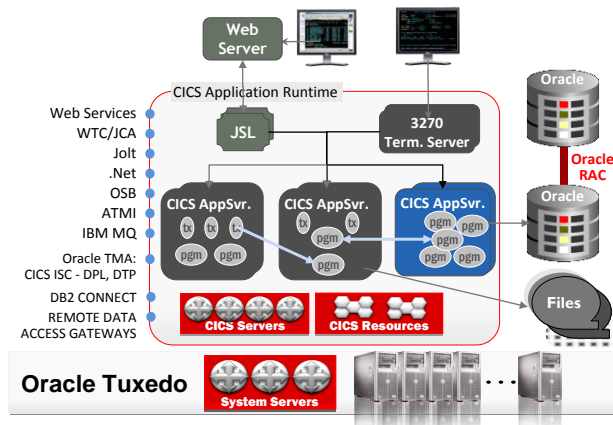


Figure 2. CICS Runtime – tn3270 and Web UI, Rich Standards-based Integration Options

RELATED PRODUCTS

- Oracle Tuxedo
- Oracle Exalogic Elastic Cloud
- Tuxedo Application Rehosting Workbench
- Tuxedo Application Runtime for IMS
- Tuxedo System and Application Monitor
- Tuxedo Mainframe Adaptors
- Tuxedo Message Queue
- Tuxedo JCA Adaptor
- Services Architecture Leveraging Tuxedo
- Oracle Berkeley DB
- Oracle GoldenGate
- Oracle Database EE

Offload Batch Workloads Unchanged

IBM z/OS batch applications rely on JES services, JCL functions, and standard utilities. The batch runtime helps to preserve the job flow and structure, batch programs, and execution characteristics by providing a similar environment of JES-compatible services, JCL functions, and utilities. It provides JES-like management (e.g., job queues, job control functions, standard job parameters and stages) to support a robust production environment for job scripts converted from JCL by Oracle Tuxedo Application Rehosting Workbench. Standard JES functions to submit, hold/release, cancel, purge, and query jobs cluster-wide are available through a command-line interface (CLI), open service API, and Web UI. This enables integration with any batch scheduler, including Oracle Enterprise and Database schedulers, as well as 3rd party enterprise schedulers, and mainframe schedulers. The service API enables other systems to submit and control jobs via Web Services, JCA adaptor, OSB, etc. Web UI in TSAM and EM enable end user job control, status views, and centralized access to job logs.

The jobs are processed through the usual stages are queued by job class and priority for pick up by a Tuxedo Initiator service that monitors its assigned job classes. Initiators control one or more job slots, and when a slot becomes available, the Initiator launches the highest priority job from its assigned queues. The runtime distributes the workload in a batch cloud by using Initiators on multiple nodes for parallel batch execution and provides robust file management and locking in local filesystem or in NFS for shared file access from multiple batch nodes.

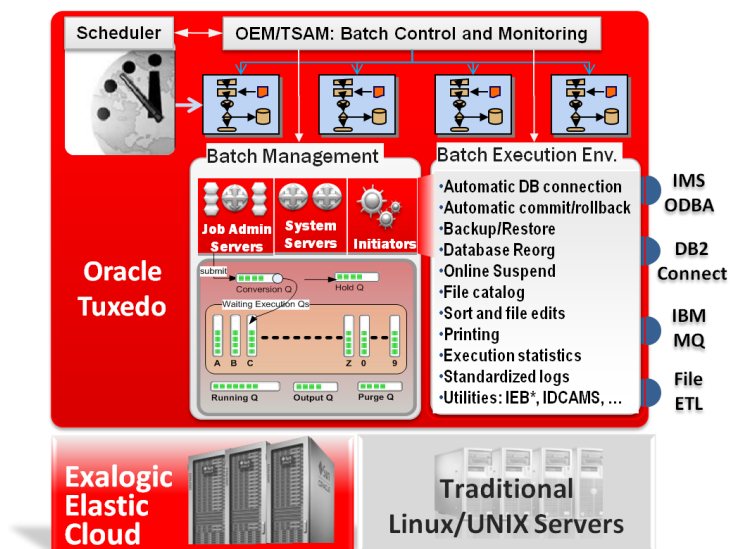


Figure 3. System View of Rehosted Batch Jobs

Once the job is launched, it leverages the typical production functions provided by the batch container, including a flexible program launcher, automatic Oracle and DB2 connections, database commit/rollback, sorts and field edits, robust concurrency control and file locking, and extensible logging. The batch runtime also supports mainframe GDG file functions for version control, with options to maintain the GDG metadata in the filesystem or in a database-backed file catalog. The latter offers more robust management and reporting for batch operations with large file volume and features a Web UI for end user file management and operations. The Web UI also provides SDSF-like job query and display facility with cluster-wide access to all jobs, their logs and SYSOUT files, and standard control functions.

In addition to using mainframe jobs converted by the Application Rehosting Workbench, users can extend them to run new COBOL, C/C++, or Java programs, native scripts or executables, packaged software, ODI and BI tools or build new jobs based on templates.

Mainframe Robustness and Scalability in a Cloud

Oracle Tuxedo Application Runtime for CICS and Batch can run large scale mainframe applications more efficiently on horizontally scalable open systems servers, engineered systems, and enterprise clouds, taking advantage of simplified provisioning, virtualization, dynamic scale-out, accounting/chargeback, and integrated monitoring and management – at a fraction of mainframe cost. Powered by the most scalable, ultra reliable and high-performance Tuxedo foundation, the CICS and batch runtimes leverage its core capabilities:

- Fault-tolerant application cloud infrastructure on open systems with autonomous health monitoring, automatic recovery, fail-over, and fail-back
- Dynamic load balancing, priority management, and resource management with Exalogic performance optimizations and cloud-ready features
- Multi-language SOA with COBOL, C/C++, Java, Python, Ruby, PHP containers
- XA-compliant distributed transactions (i.e., 2-PC or SYNC Level 2)

Similar to mainframe CICSplex, this foundation supports rehosted multi-region CICS environment (MRO) across multiple nodes. And unlike z/OS, in Tuxedo a CICS region is not limited to one processor, but can scale across all CPUs in a node or across a Tuxedo MP cluster, enabling elastic scalability and high availability, delivering mainframe-grade resilience and virtually eliminating any risk of an outage. The same Tuxedo cluster using the batch runtime provides centralized job control with distributed initiators, which enables batch workloads to use more resources and helps to parallelize batch execution whenever possible.

Elastic scale-out of CICS and batch environments is supported by the new Tuxedo Dynamic Resource Broker (DRB) in TSAM and Enterprise Manager as well as Tuxedo plug-in in Oracle Virtual Assembly Builder (OVAB) for introspection, packaging, and automated deployment of software appliances. DRB enables elastic scale-out of CICS and batch servers and initiators within a Tuxedo domain in physical and virtualized environments. OVAB software appliances are virtual machines that can be deployed with a single click on-demand or automatically based on defined conditions. Dynamic resource management resources in response to fluctuating online and batch workloads and service levels can provide additional capacity when needed or shift capacity between online and batch. Additionally, support for rolling upgrades can eliminate the need for any planned downtime at the application level.

The CICS and batch runtime simplify and accelerate migration by avoiding changes in applications, while running them on an open and agile platform. Combining the programming models with the performance and scalability of Tuxedo makes migration of the largest mainframe applications safe and cost-effective. Leveraging modern distributed systems, customers can handle growing online transactions more effectively and shorten the batch window. When deployed on Exalogic Elastic Cloud, rehosted mainframe applications benefit from Tuxedo optimizations delivering up to 8X performance gains and from rich enterprise cloud features. When running Oracle Database on Exadata, further optimizations increase data access up to 5X, which can significantly speed up online workloads and batch jobs.

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Hardware and Software, Engineered to Work Together