

Mainframe Modernization and Agility:

Test Environment Automation for Parallel z/OS Testing

WHITEPAPER

Introduction to Eccox APT® – Application Environment Management for Parallel Testing

Eccox APT® redefines the way financial institutions manage and execute mainframe testing by introducing an automated, self-service, and isolated parallel testing paradigm—eliminating the inefficiencies of traditional testing approaches. Designed to address long-standing challenges such as resource contention, intricate application code and database dependencies, test data inconsistency, slow provisioning, and lack of agility, Eccox APT allows banks and insurers to fully embrace modern DevOps and Continuous Testing practices within their mainframe environments.

FROM LEGACY CONSTRAINTS TO AGILE TESTING

Historically, mainframe testing has been hindered by:

- Dependencies within the deeply coupled software component landscape makes frequent releases difficult.
- Manual environment setup requiring intensive configuration of datasets, regions, and load libraries
 - When engineering, test environments are not always up and running. Different deployments compete with each other and results in unforeseen instabilities.
- Shared testbed conflicts leading to rework, queueing, and data contamination.
 - Outside of official Production Readiness Verification test windows, the test environments are considered unstable and, often, not usable. Administrative reworks and coordinative efforts are high.
- Limited automation, impeding continuous integration and reuse.
- High infrastructure and personnel costs due to duplicated LPARs and support team dependency.
 - As a result, many teams use centrally coordinated releases to overcome a few of the issues – despite more effort – and wasted efforts outside of test windows.
- Misalignment with Agile & DevOps, delaying releases and reducing flexibility.
 - In addition, Tooling & Processes are currently not designed for a DevOps agile way of working.



Eccox APT replaces these Mainframe testing practices with a modern, containerized-like model — called Test Tracks — that enables on-demand, isolated, and reproducible test environments built directly within existing mainframe LPARs.

Core Concepts That Power the Transformation:

Discovery Services -- Intelligence Engine

- Automatically identifies and maps application dependencies (programs, call trees, program-to-datasets operations), execution paths across complex mainframe applications.
- Scans source code (COBOL, PL/I, JCL) and integrates with SCM tools like CA Endevor, ChangeMan ZMF, and Git platforms, as well as homegrown ones, to retrieve component versions, CRUD matrix and their relationships.
- Automates complex dependency mapping and impact analysis, reducing manual effort and potential errors.

Isolated Test Tracks – Logical Containerization on z/OS

- Dynamically clones only what is needed: programs, datasets, JCL, Db2/IMS structures.
- Redirects runtime calls (CICS, IMS, batch) to the isolated cloned components.
- Supports unlimited parallel test execution—without replicating entire subsystems.

Real Application Execution – No Mocking, No Simulations

- Executes parallel test cases running real transaction and batch flows on real data and infrastructure with complete isolation in between each test run.
- Fully integrated with existing z/OS components (Db2, CICS, IMS, MQ, VSAM, JES, etc.).
- Ensures accurate validation of business logic in production-like conditions.

ECCOX APT® KEY CAPABILITIES DRIVING BUSINESS IMPACT

Capability	Description	Impact
Discovery Services	Automatically maps execution chains, programs, datasets, and impact relationships	Accelerates planning, reduces manual errors
Data Snapshot & Mover	Clones point-in-time data snapshots or transfers from other environments	Enables reproducible, compliant, and self-service test data
Self-service Automated Provisioning + WebUI	Developers create environments instantly, without central support, select programs, versions, datasets to create encapsulated APT Test Tracks	Reduces setup time by up to 90%, boosts autonomy
DevOps & CI/CD Integration	SCMs (Endevor, Git), schedulers (Control-M), and REST APIs	Enables mainframe in modern hybrid cloud pipelines
Traceability & Auditability	Captures test configuration and execution lineage	Ensures full visibility, governance, and reusability
Lightweight Resource Usage	Minimal CPU consumption, zero new hardware. Installed on existing z/OS systems, network, middleware, gateways (Connect, DDF), RACF, Software packages, tools, Interfaces, SCM, Application Codebases, Databases, etc.	Maximizes ROI from existing mainframe infrastructure

What should we do?

The goal is to create a "Testing & Verification Environment" which is always up and running and makes "parallel Development and Testing" easier. Such environment contains always the production version of the applications, so that your changes can be tested and deployed anytime. By executing your automated regression test suite and passing a set of quality gates, you proof if you are ready to be installed in PROD without waiting for the next possible release.

STRATEGIC IMPACT ON BANKING, FINANCIAL SERVICES, AND INSURANCE – BFSI ORGANIZATIONS

Modernizes Mainframe Testing Workflows

- Automates provisioning and setup of ephemeral environments – APT Test Tracks.
- Eliminates manual bottlenecks and support team dependencies.
- Enables continuous testing across the entire SDLC.

Supports Agile, DevOps, and Shift-Left

- Accelerates feedback loops by provisioning test environments in minutes.
- Facilitates testing earlier in development to reduce production bugs.
- Integrates seamlessly into enterprise CI/CD pipelines.

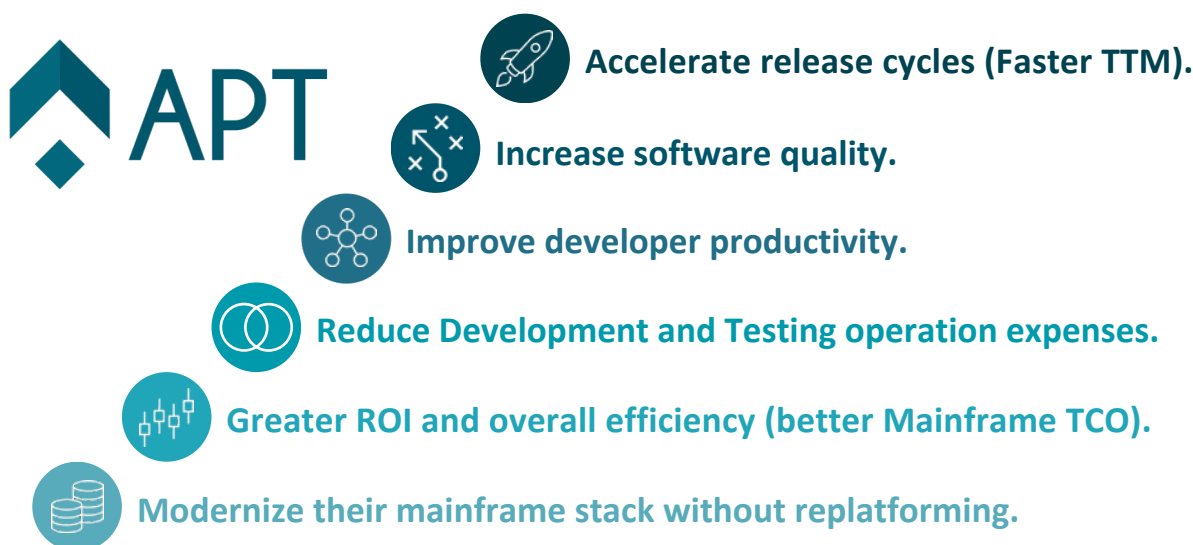
Reduces Costs While Boosting Efficiency

- No need for new LPARs or full subsystem clones (replicated testbeds).
- Cuts testbed refresh cycles, rework, and waiting times.
- Improves developer productivity by up to 3x.

Enhances Quality and Compliance

- Isolated, reproducible environments ensure accurate and reliable results.
- Ideal for regulated sectors needing traceability and audit trails.
- Reduces release risks and increases confidence in code quality.

In Summary: Eccox APT® transforms mainframe testing into an agile, scalable, and developer-friendly process by combining isolation, automation, reproducibility, and real-execution capabilities. It empowers financial organizations to:



For banks and insurances striving to stay competitive, compliant, and innovative in the digital era, Eccox APT is a strategic enabler of modern mainframe transformation.

TRANSFORMING TESTING AND DEVOPS FOR FINANCIAL INSTITUTIONS (BANKING, FINANCIAL SERVICES, AND INSURANCE – BFSI)

In the highly regulated, performance-sensitive, and complex world of banking and financial services, and Insurances (BFSI) mainframe applications remain mission-critical. However, BFSI companies face significant challenges modernizing and testing these applications efficiently due to infrastructure rigidity, shared environments, legacy practices, and siloed teams.

Eccox APT® delivers a breakthrough in agility and efficiency by introducing automated, isolated, and self-service test environments—called Test Tracks—on top of existing z/OS infrastructure.

1. Eliminating Resource Contention in Shared Mainframe Test Environments

Challenge:

Financial institutions often share test LPARs across multiple projects (e.g., core banking updates, new digital offerings, New App user interfaces integrations), leading to:

- Data corruption and version conflicts between teams.
- Manual coordination for test window scheduling.
- Long wait times, rework, and missed release windows.

Eccox APT Solution:

Eccox APT enables logical test environments through Isolated Test Tracks:

- Clones only the necessary components: modules, Db2/IMS/VSAM datasets, JCL, etc.
- Intercepts execution flows (CICS, IMS, Batch) and redirects them into the Test Track.
- Supports multiple parallel versions and configurations on a single LPAR.

Business Impact:

- Enables unlimited parallel testing with zero conflict or rework.
- Reduces testing lead time by up to 60%.
- One tier-1 bank reported an 85% gain in total test cycle productivity on core banking systems.

2. Accelerating Complex End-to-End Transaction and Batch Testing

Challenge:

Testing high-risk workflows (e.g., Realtime payments, daily settlements, regulatory updates, insurance contract claims) involves multiple systems (CICS, IMS, MQ, Db2, and batch jobs). Manual test setups are:

- Time-consuming and error-prone.
- Difficult to synchronize across environments.
- Lacking in visibility and reproducibility.

Eccox APT Solution:

- Automates environment setup with Discovery Services (Transaction, Program, Job, Dataset).
- Executes real application code with real data in isolated Test Tracks.
- Supports full stack containerization, including CICS/IMS/Batch chains.
- Execution Traceability offers end-to-end lineage across the test flow.

Business Impact:

- Reduces end-to-end test prep and execution time by 50% or more.
- Boosts quality assurance with reliable, repeatable test paths.
- One bank achieved 69% time savings in testbed preparation for loan product validation.

3. Enabling Reproducible and Isolated Data for Regression and Compliance Testing

Challenge:

Test failures and false positives stem from inconsistent or contaminated shared databases. Manually setting up isolated data involves:

- Constant DBA/Sysprog intervention.
- High costs for duplicate testbeds.
- Delays in reproducing and verifying defects.

Eccox APT Solution:

- Snapshot: Creates reusable “Golden Copy” point-in-time data snapshots (Db2, IMS, VSAM, QSAM).
- Data Mover: Imports data from other environments on demand into Test Tracks.
- Self-service restoration and reset of test data by the end user.

Business Impact:

- Improves release reliability by ensuring consistent test data across cycles.
- Enables faster reproduction of production defects.
- Creates audit trails for compliance and reduces manual refresh overhead.

4. Integrating Mainframe into Modern DevOps and Hybrid Cloud Pipelines

Challenge:

Mainframe testing environments are traditionally disconnected from Agile/DevOps pipelines and distributed/cloud systems, causing:

- Fragmented CI/CD workflows.
- Lack of Test Setups version control and data traceability.
- Delayed delivery and weak collaboration across teams.

Eccox APT Solution:

- Integrates with homegrown SCM tools and market products like Endevor, ChangeMan, GitHub, GitLab, Azure DevOps.
- Supports batch schedulers (Control-M) and APIs for automated test track creation.
- Enables cross-platform workflows (z/OS + distributed/cloud) via secure isolated z/OS paths.

Business Impact:

- Brings mainframe into CI/CD pipelines and increases deployment velocity.
- Reduces integration errors across multi-platform apps.
- Drives digital transformation and hybrid cloud adoption while keeping the mainframe in the loop.

5. Empowering Developers with Self-Service and Autonomy

Challenge:

Provisioning mainframe test environments is often centralized and manual, causing:

- Weeks of delay waiting on environment setup.
- Bottlenecks in test cycles and blocked innovation.
- Overburdened DBA, infrastructure, and sysprog teams.

Eccox APT Solution:

- Provides a self-service WebUI for test creation, data snapshotting, and execution.
- Developers and testers create, configure, and destroy their own environments instantly.
- Pre-approved, automated, provisioning flows minimize risk and maximize autonomy.

Business Impact:

- Triples developer productivity.
- Frees up technical teams for strategic initiatives.
- Improves morale and reduces friction in agile teams delivering new services.

WHY IT MATTERS FOR FINANCIAL INSTITUTIONS

Eccox/APT addresses some of the most urgent and systemic challenges in financial IT:

- Shrinking time-to-market and regulatory deadlines.
- Growing complexity of digital offerings.
- Need for secure, governed, and compliant testing workflows.
- Escalating demand for parallel development and test cycles.

It turns legacy mainframe constraints into strategic agility by offering:

- Industrial-scale containerization for z/OS.
- Risk-free, conflict-free testing at scale.
- Integration-ready architecture for the hybrid enterprise.

Recommendation for Banking IT Leaders

If your institution is struggling with test delays, change bottlenecks, audit risks, or cross-platform integration issues, Eccox APT offers a proven, scalable path to modernization—with a track record of measurable ROI across large-systems environments.

Conclusion: Industrialize Your Mainframe Testing

Eccox APT brings the proven power of Git-like branching to the z/OS testing world. It transforms testing into an agile, scalable, and self-service capability — eliminating traditional bottlenecks.

By enabling dynamic, parallel, and on-demand testing across real mainframe environments, Eccox APT allows organizations to:

- Deliver faster.
- Test smarter.
- Reduce risks.
- Lower costs.
- Improve quality.

Ready to experience the future of mainframe testing?

Let's start your Proof of Concept and bring industrial agility to your enterprise systems.

About Eccox:

With over 30 years of experience in the global software market, Eccox proudly leads the way in creating innovative solutions. We specialize in intelligent technologies that enhance software development and testing on the z/OS platform. Our work delivers remarkable results, driving continuous improvement in software engineering, application quality assurance, automated development testing, and optimization. We're committed to helping you achieve peak efficiency with your Mainframe systems, ensuring your software solutions are not just effective, but truly exceptional!



For more information, visit our website:

www.eccox.com