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WHITEPAPER

MAINFRAME TEST ENVIRONMENTS: a new approach, the project.

José Ronaldo Martins, July 2021.

So far, building and maintaining test environments on mainframes has been a costly and challenging task, and because of the use of databases in parallel tests, there are many conflicts between tests, making these provisioned and built environments unfeasible.

The solution adopted so far includes replicating an entire environment across multiple LPARs to allow as many test sessions to run in parallel as there are LPARs or copy everything within the same LPAR.

Maintenance includes processes for equalizing program versions as they enter Production, promoting test program versions for a given environment, database synchronization, among other tasks. These tasks are all carried out by provisioning teams dedicated to these environments.

Putting in the tip of the pencil the personnel costs, any additional MIPS (MSUs), software licenses replicated in the LPARs, time and processor resources dedicated to the synchronization processes and promotion of components and databases, additional disks for database replication data, eventual replication of distributed platform structures (service channels) that are used in Mobile or Internet communicating with the Mainframe, the cost per test becomes almost prohibitive, even more considering the limited amount of LPAR.

The Intelligence of the ***Eccox Application Environment Management for Parallel Testing*** (***Eccox APT***) product allows running several tests in parallel without the need to replicate LPAR and service channels of the distributed platform demanding services to the Mainframe. **Instead, all run under the same hardware and software framework** without interfering with each other, and only one channel is needed.

Using ***Eccox APT***, the personnel in charge of preparing the test cases oriented to each project select those components that are part of the project change and the databases that will change during the execution of the

tests, or even those bases that need to be amended prior to testing to include special conditions to satisfy testing requirements. The APTWeb interface allows this work to be performed from the resource preparer/provider's laptop, freeing them from in-depth mainframe knowledge.

These selected components and databases are typically a small fraction of a system. Such components and databases will be duly cloned; that is, they will have a corresponding copy that will replace the original programs and databases in the environment at the time of use during the execution of the tests. A process that, in the universe of the distributed platform, is similar to the Containerization process. This technique allows you to run several simultaneous tests on a single LPAR, without a set limit and without increasing the cost of infrastructure with MIPS (MSUs) and licensing.

During the execution time of the tests, which can sometimes take a few days, your cloned bases remain positioned according to the need and the progress of the tests, without any interference from other tests or other external agents, resulting in productivity gains conducting the tests.

Also, during the tests, if any problem that requires program correction is detected, it can be corrected and its new version replaced in the test CONTAINER with just one click on APTWeb.

USE CASE

In an IMS® & CICS® transactional environment, or BATCH Jobs, including accesses to DB2® tables or VSAM® files, at the time an application program is called (can be the IMS® or CICS® transaction head program, or STEP batch head or a subprogram of applications) ***Eccox APT*** intercepts and checks if this program is registered in its CONTAINER, and if it is, ***Eccox APT*** puts it to execute the clone program. Otherwise, it runs the original program, and in the case of DB2 table accesses, ***Eccox APT*** also intercepts and checks whether it is to access the original or the clone table.

HYBRID EXECUTION:

This allows that when an IMS®, CICS® transaction, or even a Job Batch is executed, it will be possible to execute in the same transaction original programs and clones, as well as accessing original DB2® tables and clones in the same process. Example:

- Assuming that a TED transaction executes 500 programs, and only 10 of these have been changed in SCM (Changeman® or ENDEVOR®), when ***Eccox APT*** creates the Container, it first goes to SCM and gets the 10 changed programs that are in the package. SCM, clone these 10 programs into your Container. Then, when the TED transaction is executed, with the ***Eccox APT*** intercept intelligence, the 10 cloned programs plus the 490 original programs that were already in the homologation LPAR will be executed. For DB2 tables cloned in Container, every time a program accesses, access will be made to the clone table, and accesses to tables that do not belong to the Container will be made to the original tables.

This container creation intelligence, together with the ***Eccox APT*** intercept capability at the time of execution of the Batch, IMS® or CICS® applications, creates the benefit of running the tests with CPU OVERHEAD (MIPS) less than 1%. The Containers creation process, on the other hand, is carried out via Batch during the developers' day-to-day activities, and they will use the same MIPS already available in the LPAR for approval or testing; that is, this Container maintenance process will use the same MIPS already used by the processes and routines of CONTROL-

M®, IMS® or CICS®, that's why the ***Eccox APT*** **doesn't need investments in more MIPS** to attend the creation of its Containers.

After the end of a test case and the corresponding collection of evidence, the entire structure that was created – the clones of components and databases – is destroyed with the touch of a click, freeing up all the initially occupied disk space.

The entire structure created can be kept as a testing environment asset for future testing purposes. After recovering the old structure you will change/modify as your convenience to reuse this valuable asset.

All component and database selection activities, construction of their clones, replacement of component or database version and their final destruction are carried out automatically, by a user click, without additional personnel, without the need to fill out requests and wait for SLA compliance. The build time scale changes from weeks to hours.

Finally, consider the possibility of the unlimited running of concurrent tests without the need to wait for the preparation of an LPAR and without interference from other runs to reduce downtime of test personnel, improving the quality and agility of these tests, delivering better-tested products and in less time. Again, the benefits considerably outweigh the costs.

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