CloudFrame INSIGHT

RELOCATE

Capturing CPU Savings

with CloudFrame Relocate Server on z/OS

Reducing mainframe licensing costs can represent a significant win in today's budgetary environments, where every dollar counts. But with so many critical systems depending on COBOL and the skills IT teams have built to maintain it, ripping out and replacing all of an organization's legacy COBOL probably isn't a realistic option. Thankfully, there's an alternative because shifting existing workloads from expensive processors to inexpensive ones is more feasible than ever—and can significantly impact costs.

Understanding where the costs come from is important, so let's describe a baseline case. A traditional COBOL program on an IBM z/OS mainframe typically assigns work to the machine's central processors (CPs). The workload thus incurs charges under IBM's monthly (and steadily more expensive*) utilization-based pricing models. Under these models, fees are calculated each month by IBM based on the peak rolling four-hour average utilization (measured in "million service units," or MSUs) of the CPs—and this includes CPs that process queries or I/O operations relating to local DB2, VSAM, and QSAM datastores.

Expensive CPs are not the only option for getting work done, however. zIIP processors were developed by IBM to give z/OS mainframe customers the ability to shift and then scale up certain types of workloads—particularly Java workloads running inside Java Virtual Machines (JVMs)—and thus benefit from increased compute capacity without the burden of higher monthly licensing costs.

* Effective January 1, 2023, IBM's MLC fees for a range of products jumped 8%. See IBM Price Change Announcement

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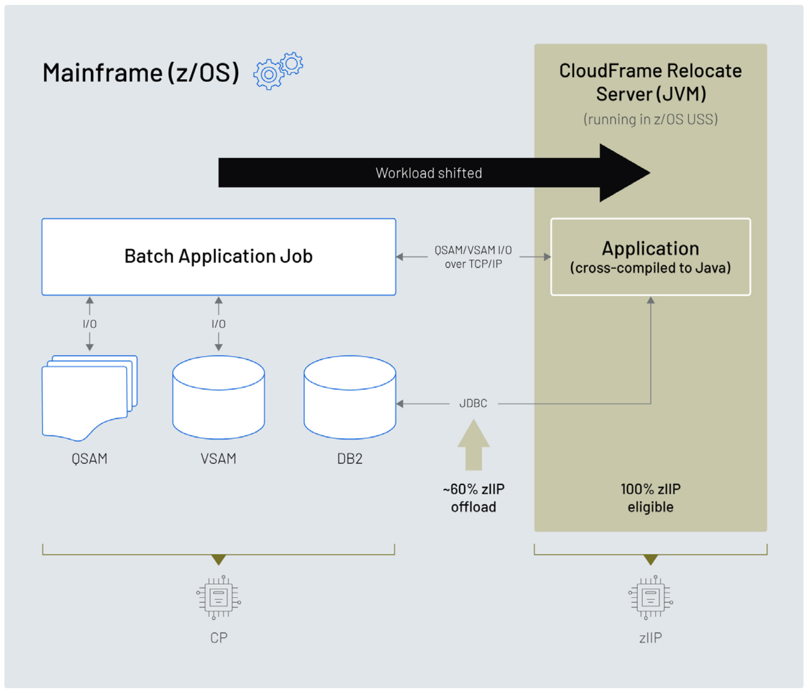
So, how to move from COBOL code running on CPs to JVMs running on zIIPs? The traditional answer would have been trans-compiling COBOL source code into Java. Still, that approach would mean you've got a new code base to maintain and a new skill set for you and your team to learn (while, incidentally, still being responsible for all of the remaining COBOL systems in your enterprise). The better way is cross-compilation, which converts COBOL source code directly into Java bytecode, allowing the resulting executable to run in a zIIP-eligible JVM. The source code remains in COBOL, meaning your team doesn't have to learn Java and can continue to use their existing development and testing processes.

CloudFrame Relocate provides an easy way to accomplish cross-compilation. CloudFrame Relocate cross-compiles COBOL into Java bytecode automatically and in a way that is transparent to the code's existing relationship with datastores and other infrastructure: stored procedures don't have to be rewritten; batch schedulers don't have to be adjusted; sort processes can be retained. From a process and workflow point of view, you're simply moving a COBOL workload from CPs to zIIPs without worrying about understanding or maintaining a new code base.

Shifting COBOL workloads with CloudFrame Relocate

Diagram #1: to JVM on zIIPs



Let’s take a look at one common implementation approach and its benefits.

CloudFrame Relocate Server can host the JVM—running the cross-compiled bytecode from COBOL—on the same mainframe as the original workload and its datastores, utilizing both z/OS UNIX System Services (USS) for connectivity and essential functions and the zIIP(s) for compute processing. In this implementation, the JVM accesses data stored in QSAM or VSAM via calls to a batch job that then pulls from (or writes to) those stores while it accesses data in DB2 via direct JDBC connectivity.

In terms of monthly licensing charges, the I/O operations initiated by the batch job to QSAM and VSAM remain chargeable since they’re still running on CPs. Significant savings are derived, however, from the JDBC threads to the DB2 database, which are 60% zIIP eligible (the same portion of work is thus no longer MLC-chargeable)—and even more so from the shift of the primary workload from CPs to JVM-on-zIIP, which becomes 0% MLC-chargeable.

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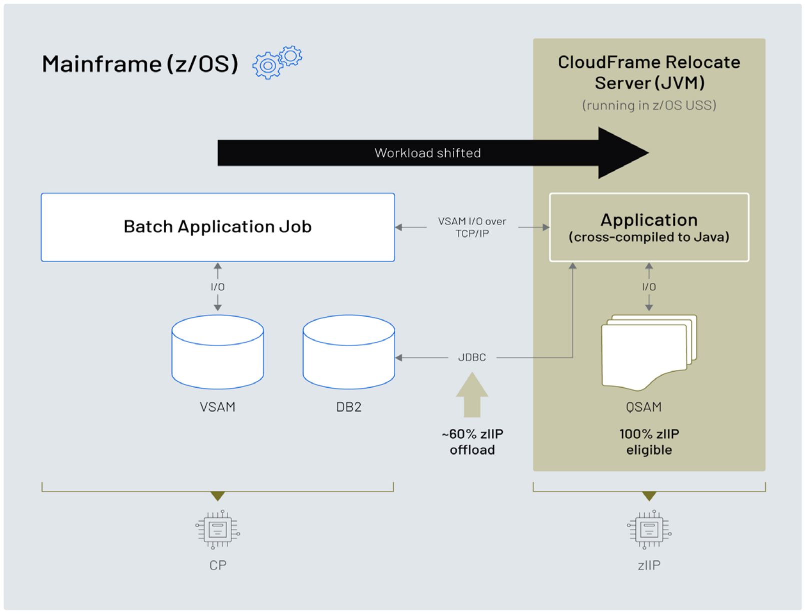
Diagram #2: to JVM on zIIPs, with QSAM



Other approaches exist.

For example, further savings can be achieved by shifting MVS QSAM datasets to USS and re-mapping them as local files within CloudFrame Relocate Server. This makes all of the I/O operations to QSAM 100% zIIP-eligible and uncharged while also improving latency metrics for data access. It should be noted, however, that this approach requires the batch job to be aware of the new location for the QSAM files, so some configuration changes would be necessary to the CloudFrame converted program profile on CloudFrame Relocate Server to map these files to USS.

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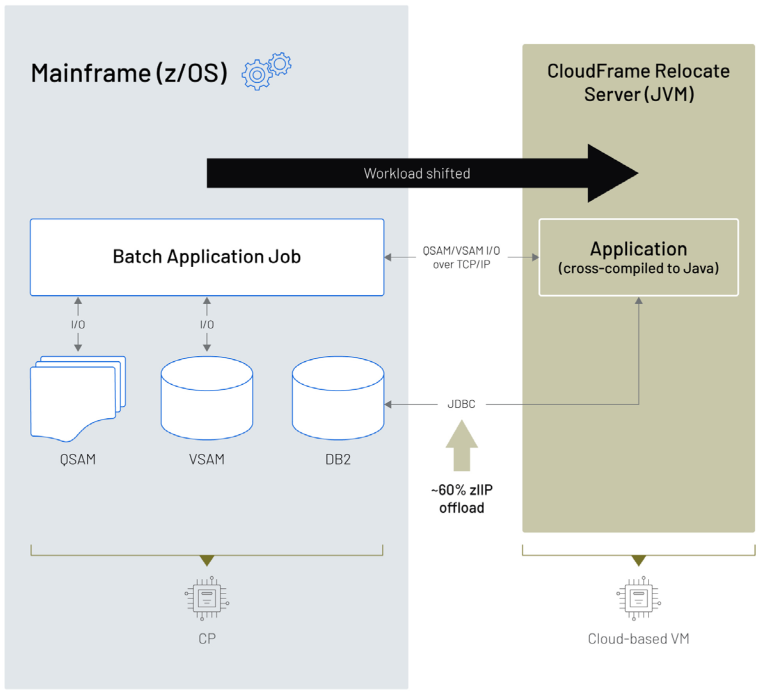
Diagram #3: to JVM on cloud-based VM



Alternatively, an enterprise could shift the COBOL workload off the mainframe entirely and into a JVM hosted in a virtual machine elsewhere in the data center or a public or private cloud. zIIP offload would still occur for the JDBC threads (again, at 60% savings) as they would be processed by the mainframe's zIIPs, while the primary workload savings would come not from zIIP eligibility but from the shift to a non-MLC-costed VM. Since network latency (now machine-to-machine or even network-to-network) could become more of a factor in the responsiveness of the overall solution, careful tuning and measurement may be required to ensure performance targets are maintained.

Whatever their nuances, all three of these application modernization approaches achieve the primary goal of moving workloads from expensive CPs to inexpensive zIIPs (or off-mainframe processors). The significant reductions in MLC charge that an enterprise can capture will enable managers to reallocate funding to urgent projects – or to self-fund a COBOL application modernization program that moves step-by-step through an enterprise's digital infrastructure, capturing savings as it proceeds. What's more, workload shifting will free up precious mainframe CP resources, which can be applied immediately to new tasks.

Happy managers. Happy engineers.

For more information on CloudFrame Relocate, click here.

To estimate the cost savings your organization could capture, explore the CloudFrame Business Case Calculator.

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