

BY MIKE PUIU

# JES2 and a Million Jobs:

## A JES2 Migration Story from an ISV Viewpoint

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**THE** version of JES2 that ships with z/OS 1.2 has some very significant changes, both internal and external. I am sure many systems programmers groaned at the prospect of reworking their JES2 exits one more time.

As a developer for an independent software vendor (ISV), I have the dubious honor of looking after all the JES2 interfaces to our products, so I was really looking forward to the challenge of another \$ACTIVATE. The last one was so much fun!

Being an ISV, we are fortunate to get our hands on IBM's new releases before most installations. This release was so significant to us that we felt we had to start the support project several months before we were to receive the first cut of z/OS 1.2. It was a wise decision, as we needed all of the extra time.

### WHAT IS THE BIG DEAL WITH HJE7705?

Well, internally the checkpoint has changed again. The changes are nothing like the changes at HJE6604, but enough to be a serious pain to me. This release allows for six-digit job numbers, which do not fit in the old 2-byte fields, so new 4-byte fields have been created. The interesting thing about the checkpoint is the increase in size necessary to hold all those extra jobs. With the size increase comes a new chaining technique. Instead of 3-byte offsets, blocks are now linked with 3-byte indexes. These changes occur when a \$ACTIVATE command is entered specifying LEVEL=z2 or if a cold start is performed on a z/OS 1.2 system. The checkpoint can be converted back to

The recent trend in OS/390 and z/OS installations to eliminate or minimize in-house developed JES2 mods and exits is clear. And the reasons are clear...

## JES2 EXITS

### We have to get off the treadmill

**JES2 is volatile.** Since 1996, there have been 10 releases of OS/390 – several with substantial impact to JES2 internals. *And with z/OS Release 1.2 supporting one million jobs, there are major changes to JES2 internals once more.* Your in-house exits are impacted again and again.

**System maintenance is impeded.** JES2 exits, with their continual need for re-testing, if not major re-vamping, are one more obstacle in the path of each upgrade.

**The installation is vulnerable.** Exits are typically developed by the most senior system programmer who is often the only person able to do the ongoing support that is required.

**JES2 skills are becoming scarce.** Datacenter management is at risk of being dependent on individuals who may be difficult and expensive to replace.

**User impact constrains the datacenter.** The datacenter is trapped into maintaining custom functionality in perpetuity. Or they must make the hard choice to withdraw functionality that users have come to depend on.

Whatever OS/390 or z/OS upgrade is on your current project list, you must face your JES2 exits once again. But does that make business sense? The support of your in-house JES2 code has become a never-ending treadmill.

To many installations, ThruPut Manager® has been the long-awaited way out of JES2 user mods and exits, including the once-popular Mellon Mod. It provides more capability and brings greater improvement to your batch service, resource utilization and user productivity than in-house solutions can ever deliver.

**And ThruPut Manager® gets you off the treadmill.**

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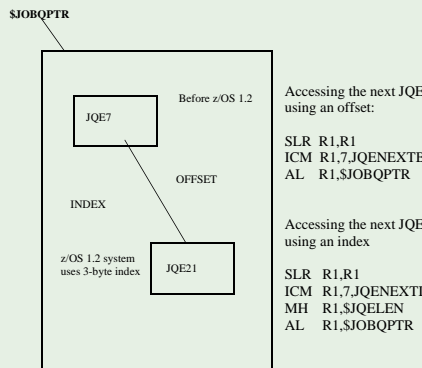
R4 mode (as long as you do not have any of those big job numbers) with the \$ACTIVATE command specifying LEVEL=R4. The checkpoint is not the only change for this release. Spool control blocks also carry the job number, thus requiring new larger fields. Pointers to checkpoint resident blocks from spool resident blocks have not changed because they were already 4-byte offsets. Of course, there are other internal changes, but they have minimal impact on exits and user modifications.

The obvious external change in this release is the impact of large job numbers. The traditional eight-character job identifier of JOBnnnnn becomes J0nnnnnn. You will be able to see these new identifiers in the system log, job logs, etc., whenever large job numbers are being used. Large numbers are not possible unless you run JES2 in z2 mode, and normally you will not see them unless you set the job number range to include numbers above 99999.

### An Example of the Differences in Accessing the JQE

If you must use open code to run JQE or JOE chains, this snippet is an example of the difference between accessing the next JQE before z/OS 1.2, where 3-byte offsets are used and after, where 3-byte indexes are used.

Note the name change of the "next" pointer in the JQE. It is still in the same location.



```

Accessing the next JQE
using an offset:
SLR R1,R1
ICM R1,7,JQENEXTB
AL R1,SJOBQPTR

Accessing the next JQE
using an index
SLR R1,R1
ICM R1,7,JQENEXTI
MH R1,SJQELEN
AL R1,SJOBQPTR

```

However, you may see large numbers for jobs arriving via NJE from nodes that do have a range above 99999. This means that if you are running in z2 mode, you must be prepared to recognize the new job identifier format in any programmed operator scripts or log scanning programs.

So now that you know why HJE7705 is a big deal, why do you care?

OK, so maybe you do not care. However, if you think you can just pick up your existing exits and point the assembler at the new macro library, think again. If your exits reference any of the fields that have increased in size, you will need to modify your code. IBM decided that the best way to protect you from an oversight was to change the name of every affected field, both old and new. Therefore, if you decide to continue using an old 2-byte job number field, you must make a conscious decision to do so by changing the label to the field's new name. If you are going to make a change anyway, why not change the label names to the new 4-byte field?

The recommended technique is to run your assemblies and then deal with all the flagged fields. You will need to use the assembler that ships with z/OS 1.2.

The good news is that you will not have to write dual path code if you use the politically correct services to access control blocks such as the JQA because the format will be the same whether you are in R4 mode or z2 mode. Additionally, you will be insulated from the chaining differences. Therefore, if you are not using \$DOGJQE to access the JQE, switch to it now. If you are running JQE or JOE chains, switch to \$QJQE and \$#JOE services. If you must use open code, see the code snippets in the sidebar for the differences. For further details on these services and the fields that

have changed, see the *JES2 Migration Notebook*.

## OBSERVATIONS

My experience was pretty good, and I had a few more alligators to wrestle than most. When I wrote this article, our product, ThruPut Manager, and all of its components, had been running on z/OS 1.2 for more than two months. We have switched modes in both directions with no apparent fallout, and we have also enabled and disabled support for large job numbers with no problems. I should point out that it is a little tricky to go back to R4 mode if you have ever enabled large job numbers. It is easy enough to get rid of all the jobs but the started tasks just do not want to go away. It usually takes an IPL after the job number range has been set below 99999 to get the started tasks to end. Then, once they have been purged, the \$ACTIVATE should work.

If you encounter any interesting twists in your own experience with converting modifications or exits to z/OS 1.2, send me a note at [mpuiu@mvssol.com](mailto:mpuiu@mvssol.com). I would like to hear from you.

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