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## zData Perspectives

### Database Adventures in Linux for System z Land

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The mainframe database landscape has been very consistent for the past 25 or more years. IBM introduced DB2 for the mainframe back in 1983 and ever since then the mainframe roost has been ruled by DB2. Sure, the legacy DBMSs persist (IMS, IDMS, Datacom), but new workload runs on relational, SQL database systems – and DB2 is the z/OS DBMS of choice.

There have been other mainframe RDBMS products over the years, but none of them have been very successful. Oracle had a z/OS version of their DBMS, but the company is now focused on Linux for System z for mainframe Oracle deployment. The last version of Oracle's DBMS that runs natively on z/OS is Oracle Database 10gR2.

These days, Linux for System z is a burgeoning operating system choice for new mainframe development and, as such, it is becoming a battleground for DBMS implementations. Oracle

than Oracle with its DBMS offerings on Linux for System z. A particularly compelling new capability in DB2 LUW 9.7 is its ability to simplify migrating applications from Oracle to DB2. Using technology licensed from EnterpriseDB, DB2 can run applications written for Oracle without having to change any code. So IBM is definitely not conceding the fight to Oracle by any stretch of the imagination!

Because Linux (and therefore, Linux for System z) is an open source operating system you might also choose to run an open source DBMS. The impetus to use open source DBMS is basically the same as for using an open source operating system. There are many open source DBMSes from which to choose, but the most popular options are MySQL, PostgreSQL and EnterpriseDB.

There do not seem to be very many open source DBMS implementations running on Linux for System z, but there are some and I had the opportunity to speak to one of them. Nigel DeFreitas, managing architect at a leading provider of risk-

actively promotes and supports its database software on Linux for System z. There is even an IBM RedBook to help guide you through setting up Oracle solutions on Linux for System z ([SG24-7573-00](#)). Oracle's support for z/OS used to lag far behind other platforms when a new version of the Oracle DBMS was released. But Oracle has indicated that will no longer be the case for Linux for System z. Of course, neither 11g nor 11gR2 are available yet; the Oracle database releases that are generally available for Linux for System z are 9i, 10g and 10gR2. Oracle RAC (Real Application Clusters) and Oracle Application Server 10g are supported on Linux for System z, too.

Another helpful web site for shops choosing to implement Oracle on Linux for System z is the International zSeries Oracle SIG, a group of companies that have a license for Oracle on zSeries hardware. Membership is free via their website at <http://www.zseriesoraclesig.org>.

IBM, of course, supports the Linux for System z platform with its DBMS offerings, too. Both DB2 and Informix are generally available. Informix Dynamic Server 11.10, Dynamic Server Enterprise Edition 11.50, and Dynamic Server Workgroup Edition 11.50 are supported on Linux for System z.

What about DB2? It can make a lot of sense for mainframe folks who are used to using DB2 for z/OS to use DB2 for Linux, Unix, and Windows (LUW) when they migrate to Linux for System z. DB2 Versions 8.1, 8.2, 9, 9.5 and 9.7 are supported on Linux for System z. Not surprisingly, IBM is more up-to-date

assessment services and decision analytics, says his company runs Linux for System z on 5 IFLs and they implemented version 5.0.51a of MySQL Community Server. One application served 80 users and housed about 100 MB of data before it was migrated to VMWare and Microsoft SQL Server. According to DeFreitas, "We didn't have any problems using MySQL on Linux for System z."

If you are a mainframe professional starting to use Linux for the first time you will have a learning curve. There are the obvious differences such as interface, commands, JCL versus scripts, etc. But there are others; for example, tuning differences. With DB2 LUW, buffer pools and the Linux file cache perform similar functions. Each caches data in memory after reading it from disk. Data gets read into the Linux file cache and then into the DB2 buffer pool, duplicating effort. Direct I/O can be used to bypass the Linux file cache and read the data directly into the DB2 buffer pool. But direct I/O is not the default in Linux for System z; it can be enabled for tablespaces by specifying `NO FILE SYSTEM CACHING`.

And this is just one tuning consideration, for one of the DBMSs that you might choose to use with Linux for System z. While Linux for System z affords us the opportunity to consolidate many smaller servers and thereby save cost and conserve energy, we must remain cognizant of the fact that it is a different environment that needs to be managed differently than standard mainframe environments. This is true not only for the operating system, but also for our database systems.

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