

Independent Assessment

by Alan Radding

IBM zEnterprise 196/zBX case study: Canada Dept. of National Defence

From mainframe serving to hybrid enterprise hosting

Executive Summary

In Nov. 2010, John Palmer, Manager/Enterprise Hosting wrote: Two short years ago, mainframes were literally and figuratively being pushed out of Canada's Department of National Defence (DND). With the growth of the distributed world and a veritable glut of Windows admins, walls were built up against "those expensive mainframes", who responded by putting up walls of their own. Since mainframes never "broke" nobody ever complained, and eventually the only people who knew they existed were those who supported them and those who counted the money, and only one of those groups was interested in keeping them.

This fiscal year, DND's mainframe support section received funding to allow for unprecedented growth, including virtualized Linux, model upgrades, increased redundancy and the upcoming purchase of a fourth mainframe. The DND has a new IBM zEnterprise 196 (z196) and is expecting a zEnterprise BladeCenter Extension (zBX) imminently. In addition, it will be ordering before the end of this year two more z196 machines and two zBX devices as the mainframe team upgrades its two existing System z10 machines.

Today, led by the zEnterprise, mainframe computing plays a central role in DND's computing strategy. The first z196 initially is targeted for business recovery, but Palmer plans to quickly add development/test and production applications to its workload.

This case study looks at how a visionary, dedicated mainframe team turned an end-of-life mainframe situation around and elevated the mainframe in the eyes of the DND to true hybrid (multiplatform) enterprise hosting due to the power and versatility of the z196 and zBX.

Challenge—Evolve from Mainframe Hosting to Enterprise Hosting

Here was the challenge presented to John Palmer by his director, Winston Sorfleet: “I want you to find new ways to use and grow the [new mainframe] technology.” In a large organization with a variety of platforms, competing IT agendas, and a history of diffuse control, this is easier said than done.

In terms of mainframe hardware, Palmer started with an eclectic mix:

- IBM System z10 BC—running small workloads but was converted into a coupling facility
- IBM System z9 EC—running SAP, DB2 for a military acquisition application
- IBM System z10 EC—running SAP, CICS, MQSeries, DB2 for the military pay, supply, and financial management systems

In addition Palmer faced contending Linux on z and distributed Linux factions. Plus, there were Oracle systems, AIX, other UNIX, Solaris, and more.

Then there was the problem of business recovery. The DND was relying on a third party service provider. This had to be brought in house fast.

Finally, the mainframe team faced one overriding question: What, if any, are the possible points of synergy with other units and how were they going to fit the System z into that? His team would have to solve this puzzle if the mainframe was to, indeed, evolve into a true hybrid enterprise host.

Background—Canadian Department of National Defence (DND)

Canada's National Defence program consists of the Department of National Defence and the Canadian Forces—Army, Navy, Air Force. Its mission is to protect Canada, help defend North America, and contribute to international peace and security through various missions.

In most respects, the Department of National Defence is an organization like other departments of government. It is established by a statute – the National Defence Act – which sets out the Minister's responsibilities, including the Minister's responsibility for the Department and the Canadian Forces. Under the law, the Canadian Forces are an entity separate and distinct from the Department.

The Department is headed by a Deputy Minister of National Defence, the Department's senior civil servant, while the Canadian Forces are headed by the Chief of the Defence Staff, Canada's senior serving officer. Both are responsible to the Minister.

The Canadian Forces and the Department of National Defence have complementary roles to play in providing advice and support to the Minister of National Defence and in implementing the decisions of the Government on the defense of Canada and of Canadian interests at home and abroad. The separate authorities of the Deputy Minister and the Chief of the Defence Staff give rise to different responsibilities. In broad terms:

- The Deputy Minister has responsibility for policy, resources, interdepartmental coordination, and international defense relations
- The Chief of the Defence Staff has responsibility for command, control and administration of the Canadian Forces and military strategy, plans and requirements

Canadian Forces personnel are highly trained and receive ongoing professional development throughout their careers. In terms of technology they deploy leading-edge military technology and some of the best equipment in the world – from the Light Armored Vehicle III (LAVIII) to the modernized CF-18 fighter jet to the Navy's Halifax-class frigates.

In terms of information technology, the DND uses a wide mix of hardware and software. However, it is modernizing and centralizing around multiple zEnterprise 196 (z196) machines and will be acquiring one or more zBX devices.

The z196 Brings Enterprise Hosting to the DND

The DND path to enterprise hosting with the z196 began with consolidation within the mainframe group itself. Palmer brought all three existing mainframes under centralized organizational management. This entailed the consolidation of all mainframe-related tasks, including:

- Hardware / Software / Storage support
- Contracting for Software / Hardware / Maintenance
- Business Recovery contract management
- Role of BR Manager transferred as well
- Transfer of all mainframe-related funding

This brought all mainframe planning, purchasing, upgrades, and management under one unit, which enabled the mainframe team to control the entire environment, top to bottom.

The process actually started at SHARE in spring 2009. There the seeds were planted for the idea of bringing z/VM into the shop and running Linux on z. Following SHARE and a visit to IBM in the fall of that year Palmer began actively selling the idea of the mainframe as the organization's primary IT delivery vehicle.

The first test case emerged around the organization's widespread use of distributed Oracle applications. Here Palmer proposed Oracle running on Linux on z with z/VM. As expected, the mainframe team encountered resistance. Other groups made attempts to move applications, primarily SAP, off the mainframe to servers running AIX. Palmer countered by proposing DB2 on AIX as a front end for Linux on z.

Palmer, who previously had spent a large part of his career at DND as a Windows administrator, still had credibility with the distributed server people. He won the initial battle, but tension lingered between the mainframe Linux team and the distributed Linux proponents.

The mainframe team quickly moved forward and began implementing a variety of projects that, eventually, would prepare the group to bring in the z196, which they felt would enable them to achieve the enterprise hosting that was the goal. These projects included an upgrade of the existing System z10 for redundancy, additional IFLs for z/VM to support more Linux on z, an upgrade of the z9 EC to a z10 EC, and the creation of a pilot environment for Linux on z projects. In the process, the mainframe team developed a closer working relationship with the distributed Linux group.

The groundwork now was in place for the arrival of the z196. Its first workload: business recovery.

Hybrid Computing—Overcoming Resistance

The zEnterprise, consisting of the z196 and the zBX extension cabinet, is IBM's first hybrid machine, a single system that can run different operating systems on different hardware platforms and proactively manage everything from the z196 as a single virtual machine. The zEnterprise Unified Resource Manager, sometimes referred to as the zManager, is the primary vehicle for achieving this.

As a hybrid machine, the zEnterprise can encompass z/OS, Linux on z, z/VM, zIIP and zAAP specialty processors, Power blades, AIX, and x86 blades, which initially will run Linux and specially optimized workloads like analytics but is expected to handle Windows workloads as well. All these operating systems and platforms and the applications that run on them have their advocates in the enterprise. It would be extremely naïve to not expect resistance from those who, understandably, will feel threatened.

At DND Palmer certainly encountered resistance. He overcame the resistance by setting up a proof of concept (POC) around Oracle running with Linux on z. It picked an Oracle application—enterprise IT service management (ITSM)—that benefits from an abundance of processing horsepower. By running it on the z10 EC with additional IFLs, the mainframe team was able to demonstrate superior performance. Based on the results of the POC, Palmer could build a compelling business case emphasizing the dramatic licensing cost savings. With the strong support of management, the mainframe group prevailed.

One successful POC, however, may not be enough to overcome resistance to the mainframe from the distributed IT ranks. People are concerned about preserving their skills and, more importantly, their jobs. The idea of consolidating on the mainframe a number of varied workloads presently running on non-mainframe platforms and other operating systems is threatening. While the *we-can-do-it-cheaper-on-z* claim can be a powerful argument, mainframe managers have to address the real threats these people feel to their livelihoods. *Independent Assessment* can suggest three arguments immediately:

- You continue to manage/administer your applications as before—the mainframe is only managing the virtualized hosting platform they are running on.
- Your AIX, Linux, Power, and x-based skills continue to be valuable—those operating systems and platforms remain viable and active in the enterprise as do the applications running on them. Thus, your skills continue to be in demand.
- You get rid of platform headaches—the z team will manage the platforms while you get to do the rewarding work with the applications and users without platform worries.

And if some of the cost savings are shared with these groups, so much the better.

Enterprise Hosting with the z196/zBX

The z196 arrived on New Year's Eve. It came with 15 engines but all were shut off until needed for business recovery. DND initiated 2 IFLs and 1 zIIP. It didn't take long for the mainframe team to establish itself as the DND's enterprise hosting provider. In short order the mainframe took over responsibility for:

- Enterprise storage management
- All distributed Linux
- All AIX / Unix / Solaris

The first order of business: bring business recovery in house from an external commercial business recovery provider. Eventually Palmer wants another z196 just for that. The group also is completing the build out of the core z/VM with another IFL and the SUSE Linux on z environment for the purpose of replicating it to other areas.

And, of course, the zBX is expected this spring and two more later in the year. Once it is ready the mainframe group expects to load it with Power blades and x-blades for running Linux and AIX following a period of testing. DND intends zBX machines to run appropriate AIX and other workloads as part of a planned cloud-like environment. The initial focus will be dev/test with the goal to move selected production as soon as feasible.

At the same time, the team has put a zIIP specialty processor on each of its z10 EC machines, which run SAP, CICS, and MQ Series.

Longer term, the plan is to expand the mainframe into the open source sphere through Linux. As for business recovery, the z196 will not be part of the DND's mainframe sysplex. Mirroring, however, is a key part of the recovery strategy as the team works out mirroring plans as it hammers out its RPO and RTO goals.

Now, however, the biggest challenge appears to be recruiting and retaining skilled mainframe staff. Palmer hopes the new z196, zBX, Linux, and open source—sexy advanced technologies—will attract prospective staff.

Other challenges, Palmer notes, are better understanding of security for this emerging environment, engineering specialization, replication between the primary data center in Ottawa and a second data center 400 miles away, and culture. From an IT culture perspective, DND is undergoing a major shift from distributed platform hosting to centralized, mainframe-based enterprise hosting of both proprietary and open source systems.

Key DND z196 Components

z196 (15 engines)
z/OS
z/VM
IFL (2)
zIIP (1)
SUSE Linux
CICS
DB2
MQSeries
Oracle
SAP

Coming soon:

z196 (2)
zBX (3)

Lessons Learned

It is early in the DND z196/zBX experience but already lessons are apparent:

- Understand the organizational pain points
- Understand your space, power, and cooling needs and constraints
- Get control of your environment through organizational consolidation
- Look for possible synergies with other technology units
- Play nicely with others
- Win support through POC successes

It is possible to go from a mainframe-centric data center to an enterprise hosting center but it takes organization, planning, resources, and tools. If those tools happen to be the z196 and, expected shortly, the zBX, the task will be a lot easier.

Independent Assessment analysis

IBM has been evangelizing the hybrid server idea for over a year before the z196 was introduced as the first hybrid mainframe. Still, it wasn't clear what that meant in terms of actual data center operations. Now we know: true multiplatform enterprise hosting. Business recovery will be only the first of many DND workloads on the z196/zBX

The experience of the Canadian DND shows the future of a centralized, mainframe-based hybrid environment. The mainframe group, poised on the brink of extinction, effectively transformed itself from mainframe serving to multiplatform—z/OS, Linux, AIX—enterprise hosting based on the z196 and zBX while demonstrating a compelling economic advantage and winning support from the wider IT community.

About Independent Assessment

Independent Assessment is the IT and business assessment, analysis, and writing service of Alan Radding, an independent business and IT analyst/writer for over 20 years. It provides independent ROI and TCO analysis, competitive assessment and positioning reports, case studies, white papers, and Web content.

Independent Assessment publishes *DancingDinosaur*, the independent blog covering the System z.