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| MAINFRAME COMPUTERS IN THE MODERN AGE |
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**MAINFRAME COMPUTERS IN THE MODERN AGE**

Eddie Fuller

**INTRODUCTION**

Ask an average person what a mainframe computer is, and they’ll most likely talk to you about giant, room sized computers number-crunching away at unheard of speeds…which isn’t a totally inaccurate description. The first mainframes were made back in the 1960s for just such a task, and the physical description of them is accurate enough. Mainframes are designed to last. As of 2007, it’s been reported that some mainframes have been actively running without any problems for over a decade now. (Wikipedia). Even hardware upgrades or software upgrades (if a Parallel Sysplex is in place) don’t interrupt service (Wikipedia). But have the days of the mainframe come to an end? With most mainframe software and such being written in either COBOL or Assembly language, and with a lack of younger mainframe experts to replace the aging group of mainframe users nearing retirement, might some industry leaders think it easier to just replace the old workhorse rather than prep a new batch of people to take the place of those retiring? COBOL and assembly language see less and less usage now, in lieu of more modern languages such as C#, VB, and others. So where is the mainframe heading?

**ALTERING THE PAST TO SUIT THE FUTURE**

Some industries are using mainframes just as much today as they were 20 years ago without many complaints. Hewitt Associates, for example, still uses its z/OS mainframe for much of its work. However, the mainframe itself is helped out by means of a Linux-based grid computing system (Desmond). The main reason being cost. As powerful as mainframe computers are, they are massively expensive for most companies. The grid based system allows less taxing work to be shunted off to the Linux system for number-crunching, then passed back to the z/OS mainframe to be completed and transmitted back to the original query. This back and forth of resources has cut runtime on their systems by up to 90% (Desmond). On another front, IBM itself, the last manufacturer of mainframe computers in the US (Knorr), has begun to implement its Rational development tools, which generate COBOL code for mainframe computers using a VB or Java style interface that more modern programmers can understand and work with (Knorr).

**SIGNS OF AGE**

Despite the reliability mainframes have shown over the years, still some companies see the writing on the wall, as it were. The VAX mainframe, for example, developed by Digital Equipment Corp., later acquired by Compaq, and then discontinued by HP (but still supported) is seeing a sharp decline in use (Thibodeau, VAX users see the writing on the wall). Although it is estimated that 150,000 to 175,000 VAX systems are still in use in the world, Bob Blatz of HP estimates that this number is dropping by approximately 10% annually (Thibodeau, VAX users see the writing on the wall). However, with no new VAX systems in development, the systems are beginning to show a bit of age. Even though OpenVMS is still supported and developed by HP, the legacy software in place on VAX systems needs to be continuously hacked up with custom system calls and the like in order to make it work with other systems. This, along with HP’s increased maintenance costs for supporting VAX systems, has companies who rely upon VAX systems starting to look at the idea of porting their systems to something a bit more modern (Thibodeau, VAX users see the writing on the wall).

**IT – THE NEXT GENERATION**

One of the major hurdles facing mainframes and their place in tomorrow’s workplace is the seeming lack of interest by today’s IT students in specializing in anything mainframe related. A system that runs primarily on COBOL and Assembly languages doesn’t hold the appeal to modern IT and CS majors as it once did, and given that the average mainframe administrator is of baby boomer age or older indicates a crisis brewing on the horizon (Thibodeau, Shortage of mainframe skills may give IT execs gray hairs). A lack of COBOL students in colleges today is of particular concern to companies which make use of mainframes, as a good deal of software used on mainframes are written in COBOL (Mitchell). Although for now, the work done with COBOL is more of a maintenance issue, people looking towards the future are beginning to have applications done with more modern tools, such as Java and WebSphere (Mitchell).

**IBM’S PERSPECTIVE**

While a lot of mainframes in use today run their architecture on COBOL and Assembly language, these two languages alone aren’t enough to cut it in today’s world. With IBM’s new System z9 series, they hope to alleviate some of these concerns. After all, if the IBM series of mainframes had not opened its doors to technologies such as Java, TCP/IP, Apache, Linux, and other distributed technologies, their place in the world today might be very different, indeed (Thibodeau, Vendor expects mainframe uptick). Security is also an issue addressed by IBM in its new System z9 series. Mainframes are designed for their customers, after all, and in today’s world, security is becoming more and more of a hot topic for customers of IBM. So the System z9 series has focused more on security issues with various encryption techniques than any other previous release (Thibodeau, Vendor expects mainframe uptick). IBM is also attempting to make sure that a future generation of IT and CS people are equipped to handle the concerns of customers using their mainframes. IBM’s Academic Initiative is an attempt to work with various colleges and universities to tailor students to becoming familiar with mainframe architecture by offering online courses, hands-on experience, and reference material for future mainframe users and administrators to work with (Thibodeau, Shortage of mainframe skills may give IT execs gray hairs). Of course, it’s not just the people in the industry who are reaching the retirement ages, either. For example, at DeKalb University, one of the schools enrolled in IBM’s Academic Initiative, a large portion of the teachers and professors who teach the mainframe skills are of baby boomer age or older as well. Not only is IBM seeking to train a new generation of IT professionals in various mainframe skills, but a crisis is looming as well where new teachers of these skills will be in high demand, as well (Thibodeau, Shortage of mainframe skills may give IT execs gray hairs).

**WHY MAINFRAMES ARE SAFE FOR NOW**

Of course, in the end, it all boils down to the all-mighty dollar. While the primary concerns of companies using mainframes are the costs of maintenance and the availability of both software and users for their mainframes, the short and long term costs of migrating to another type of architecture (Gomolski) is equally daunting. For a large number of companies, millions, if not billions, of dollars have already been spent on securing mainframes or mainframe services, and their associated upkeep. Plus, many of the programs in place on their mainframes have the benefit of years of usage, tweaking and prodding, so that their reliability is very high. Migration to new systems would mean new software, a daunting cost in and of itself, but also opens a company up to problems with that new software…just ask the companies who switched to Windows Vista when it first surfaced.

**CONCLUSION**

It’s an issue that isn’t going to go away overnight. Midrange system vendors are constantly pushing larger companies to migrate to lower costs systems such as server virtualization or SOA (service-oriented architecture) (Gomolski). And with a whole new generation of IT professionals and computer programmers that have only a fledgling idea of how mainframes work, businesses in the future are going to be under more and more pressure to trade up. But for right now, companies who have already made the plunge to mainframes are better off staying where they are. Mainframes may be showing their age, but they’re far from being put out to pasture just yet by next big thing.

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