Welcome to the Virtual IMS *CONNECTION* newsletter. Virtual IMS *CONNECTION* at www.virtualims.com is an independently-operated vendor-neutral site run by and for the IMS user community.

Virtual IMS *CONNECTION* IMS presentation

The latest webinar from Virtual IMS *CONNECTION* was entitled, "Understanding Specialty Processors", and was presented by Tom Harper, an IMS product author, from NEON Enterprise Software. Tom has been in software development for 48 years and in that time helped start BMC Software, and is currently the Director of IT on the SHARE Board of Directors.

Tom started by looking at z/OS platform evolution and the big leap forward in around 1995 with the introduction of smaller CMOS processors. This heralded an era of large numbers of processors, large memory, a steeply dropping price/performance curve, and escalating software costs.

This led to a big change in software licence charges. Early software was often free, with vendors slow to realize its value. However, prices began to escalate out of control and customers tended to be locked in. IBM looked for a way to help, but they got caught up in software licence issues themselves.

One consequence in terms of hardware was the introduction of specialty processors. The first specialty processors were the Integrated Coupling Facility (ICF) and the Integrated Facility for Linux (IFL). Specialty processors have been available on a number of IBM hardware boxes including z/890, z/990, z8, z9, and z10s. The more recent specialty processors are the Integrated Information Processor (zIIP) and the Application Assist Processor (zAAP).

Tom suggested that IBM's goal was to preserve existing hardware and software licence revenues, and to be competitive in "new" workloads. In order to achieve this, IBM's plan was to create the concept of specialty processors, and (perhaps not surprisingly) do a great deal of marketing.

Moving on to an overview of the hardware, Tom informed us that physically, all the processors in a Central Electronic Complex (CEC) are identical. The processors reside in a Multi-Chip Module (MCM). On a z/10, each MCM can contain up to five PUs. MCMs also contain storage control chips.

Contents:

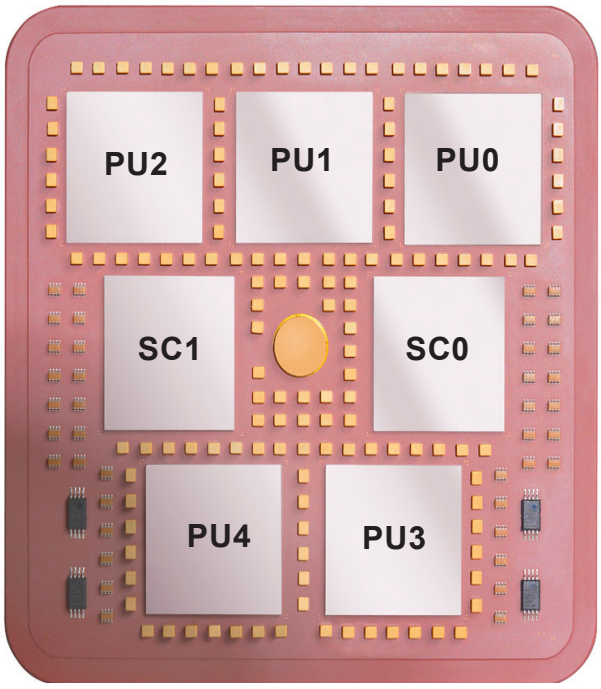

Figure 1: Central Electronic Complex

This is illustrated in Figure 1.

Each PU contains four cores, and each core can be a CP, zIIP, zAAP, etc. There can be up to twenty cores per MCM. Each MCM has 107 layers. Each processor includes 64K level-1 cache and 3MB level 1.5 cache, and each chip contains 24MB level 2 cache shared by processors on the MCM. There are 993 million transistors and a 4.5Ghz cycle.

It can handle 894 instructions, 75% in hardware, and there can be a maximum of 64 processors. A customer can order one zIIP and one zAAP for each Central Processor (CP). The important thing is the pricing (plus monthly maintenance). For a CP, it's $250,000. For a zIIP or zAAP its $42,000 – assuming you actually pay book price.

Customers can order up to 1.5TB of memory. Memory access costs 600 cycles, so there is a significant cost to accessing storage on another processor. Processors can be configured and brought online without a Power On Reset (POR) on z10s, and a spare processor costs IBM nothing to activate.

MCMs are grouped into "books". There are a maximum of four books. It is more expensive to switch from a processor in one book to a processor in another book than one in the same book.

Interstingly, CPs can run at a variety of speeds. This enables IBM to sell CPs to customers tailored to their needs. These processors are known as "knee-capped" processors. It's worth

noting that zIIPs and zAAPs always run full speed, they are never knee-capped. For Enterprise-class machines, knee-capping is 25, 50, 75, or 100%

Processor capacity can be marketed in a variety of ways:

- Outright purchase (the traditional method).
- Capacity on Demand, in which a monthly fee is charged based on a four-hour rolling average of CP time used (zIIPs and zAAPs excluded).
- Indirectly, via IBM Global Services.

There are over 100 capacity settings on a z10 processor.

After configuration, processors are marked as a CP, zIIP, or zAAP. z/OS must be IPLed on a CP processor. IBM has enabled Java and XML work to be shifted over to a zAAP processor and enabled certain new DB2 work to be shifted over to a zIIP processor

In addition, IBM has permitted ISVs to create work to run on zIIP processors.

Specialty processors are masked off from I/O interrupts and they are also masked off from timer interrupts.

IBM provided software vendors with a zIIP API in order to develop software to utilize the specialty engine. The API requires work to run in enclave SRB mode. However, SRB mode does not allow any SVCs to be issued except ABEND – which isn't particularly useful. The only access methods allowed are VSAM, Media Manager, and STARTIO.

Other services are not available in SRB mode, such as ENQ. Therefore, code services need to be broken out from logic, and services need to be able to run in TCB or SRB mode. For example, ENQs can be replaced with latches. This means that QNAMEs and RNAMEs must be converted or interpreted to a latch number. It also means that they must release latches when percolating (write own RESMGR).

For third-party software vendors, I/O is one of the most difficult areas. VSAM was supposed to work in SRB mode, but they found that there were, in actuality, many issues. In the end, the STARTIO was the most workable solution, but complex to implement.

NEON Enterprise software, CA, SyncSort, and many other vendors now exploit support for zIIP processors. NEON's Eclipse IMS utilities allow off-loading of up to 98% to zIIP.

A copy of Tom's presentation is available for download from the Virtual IMS *CONNECTION* Web site at http://www.virtualims.com/presentations/specialtyproc.pdf.

IBM Data Champion

Technical communities, Web sites, books, conference speakers and blogs all contribute to the success of IBM's Data Management products. But these activities don't run themselves. Behind the scenes there are dedicated and loyal individuals who put in their own time to run user groups, manage community Web sites, speak at conferences, post to forums and write blogs. Their time is uncompensated.

For 2009, IBM honors the commitment of 88 individuals with a special designation — Data Champion — as a way of showing our appreciation for the time and energy these exceptional community members expend.

Data Champions are objective experts. They have no official obligation to IBM. They simply share their opinions and years of experience with others in the field, and their work contributes greatly to the overall success of Data Management.

Full details about the programme can be found at ibm.com/software/data/champion/. Trevor Eddolls, CEO at *i*Tech-Ed Ltd, and host at the Virtual IMS *CONNECTION* Webinars was made an IBM Data Champion in part because of his work with this user group. If you want to read full details of Trevor's profile on IBM's Data Champion Web site, it's at ibm.com/software/data/champion/profiles/eddolls.html.

IBM has recently decided to expand the Data Champion program and has changed its name to Information Champion.

Virtual IMS *CONNECTION* meeting dates

The following meeting dates have been arranged for the Virtual IMS *CONNECTION* user group:

- August 4, 2009 – Kevin Hite, IMS lead tester, IBM.
  "IMS Open DB functionality in IMS V11"
- October 6, 2009 – Rob Morris, Chief Strategy Officer, GT Software.

All meetings start at 10:30 Central Time (4:30 GMT in the winter and 3:30 GMT during daylight saving time). All members will be e-mailed the WebEx URL, access code, and password for each meeting. Members need to log in about five minutes before the meetings starts in order for the WebEx connection to complete, and to phone into the freephone number provided so they can join in with the audio component of the meeting.

IMS job bank

The Virtual IMS CONNECTION Web site contains a Job Bank section, where IMS professionals can put their resumes, and organizations can advertise any open positions they have. The service is completely free.

News Update

NEON Enterprise Software has announced NEON zPrime, which can facilitate the transfer of as much as 50 percent or more of a company's IMS, DB2, CICS, TSO/ISPF, and batch workloads from System z CPs to zIIP (System z Integrated Information Processor) or zAAP (System z Application Assist Processors) processors, and consequently reduce mainframe costs significantly – the company claims. Mainframe users now have more options of what workloads to move to a specialty processor to meet capacity planning and cost optimization objectives. NEON zPrime is 100 percent compliant with IBM specifications, rules and conditions for System z processor access to assure a seamless environment that makes IMS, CICS, TSO/ISPF, DB2, batch jobs, and NEON IMS utilities workloads eligible for processing on zIIPs or zAAPs. Full details are available at www.neonesoft.com/neon/news_063009.shtm.

WinterGreen Research, an analyst firm, has announced it has completed work on a Web-based calculator to measure the Total-Cost-of-Ownership (TCO) of mainframe SOA enablement when utilizing a zIIP specialty engine in combination with DataDirect Shadow integration middleware from DataDirect Technologies. The calculator can compute the daily and annual savings in dollars and MIPS capacity that can occur by exploiting the zIIP specialty engine rather than the General Purpose Processor (GPP). DataDirect Shadow Version 7 expands the utilization of the zIIP specialty engine beyond DB2 to include Adabas, IMS/DB, IDMS, and VSAM as well SOAP/XML parsing necessary for creating Web services within the mainframe to applications residing within CICS, IMS/TM, IDMS, and Natural – the company claims. Full details are available from www.datadirect.com/company/news/press/pressitem/pressrelease_1249553/index.ssp.

About Virtual IMS *CONNECTION*

Virtual IMS *CONNECTION* is a user group established as a way for individuals using IBM's IMS hierarchical database and transaction processing systems to exchange information, learn new techniques, and advance their skills with the product.

The Web site at www.virtualims.com provides a central point for coordinating periodic meetings (which are technically-oriented topics presented in a webinar format), and will provide articles, discussions, links, and other resources of interest to IBM IMS practitioners. Anyone with an interest in IMS is welcome to join Virtual IMS *CONNECTION* and share in the knowledge exchange.

To share ideas, and for further information, contact trevor@itech-ed.com.

The Virtual IMS *CONNECTION* user group is free to its members. Various sponsorship opportunities are available to vendors of IMS-related products. Full details of these opportunities and can be found *here*.