CLABBY ANALYTICS

Case Study

Al Rajhi Bank's 3,000 MIPS IBM Mainframe: The Best Machine for the Job

Introduction

A major United States-based information technology (IT) research and analysis firm (Gartner) recently published a report suggesting that IT managers who are operating mainframes (IBM System z) in the 2,000-3,000 MIPS range might want to consider rehosting their applications to other, less expensive computer systems. But Riyadh, Saudi Arabia's Al Rajhi Bank disagrees with that advice. And here's why:

- According to Ahmed Mohammed Anwar, Al Rajhi Bank's Head of Production, a move to distributed computers would not help the bank meet is processing goals in the timeframe the bank needs to meet them due to government mandated deadlines. Mr. Anwar claims that distributed systems and scale-up Unix servers (the target platforms that Gartner infers System z users should move to), can't handle the bank's massive payroll transaction processing and batch processing jobs in the timeframe allowed by the government if other platforms were used.
- Mr. Anwar further questioned whether the target systems recommended by Gartner can meet the bank's strict security requirements — as well as meet the bank's high-availability and resiliency requirements (the bank has only experienced one information systems outage in the past 10 years — and that was due to a problem on a storage device, not on its mainframe).

In fact, Mr. Anwar questioned why an information technology (IT) manager who is in the customer service business (as banks are) — and who has to provide computing services to hundreds of thousands of users — would use any other architecture than a mainframe. So much for Gartner's advice...

In this *Case Study*, *Clabby Analytics* takes a closer look at Al Rajhi bank's System z environment. We describe the bank's IT infrastructure, its workloads — and we also discuss the bank's mainframe staffing situation. And based upon our interview with Mr. Anwar, we agree with Mr. Anwar's assessment — and we ask: "why would an IT manager with mission critical workloads who needs to service hundreds of thousands of clients want to move to a different platform architecture?"

Al Rajhi Bank: Background

Al Rajhi Bank is the world's largest Islamic bank — and one of Saudi Arabia's oldest banks (this bank's financial activities originating over 50 years ago). Additionally, it is one of the largest joint stock companies in the Kingdom of Saudi Arabia. Further, unlike banks around the world, this bank performed spectacularly during the worldwide economic downturn due to its Islamic-focused lending policies (Islamic banking requires greater loan security than other banks — hence the bank was not holding a bunch of bad loans).

At present, Al Rajhi bank has 3,000,000 active accounts (and an equal number of less active accounts). Its headquarters are in Riyadh, Saudi Arabia. And the bank currently has 630 branches, and 2750 ATMs and more than 21,000 point-of-sale terminals installed with merchants. This bank is well run and profitable — and it is expanding services throughout Saudi Arabia, Kuwait, and Malaysia.

Al Rajhi Bank's Focal Point: The Workload That Should Dictate the System Choice

When it comes to information technology, Al Rajhi is a strong believer in buying the best — not the cheapest — platform, operating environment, application and database solutions to suit their particular computing needs. What this means is that the bank looks at the applications that they are trying to run, it then determines the level of service that must be met — and then it chooses the best system environment for the job. In Al Rajhi Bank's case, this means that the company operates several different types of computer systems including System z, midrange Unix servers, and x86-based servers (in towered and blade configurations).

As the bank evaluates systems platforms, it closely examines:

- Systems performance characteristics;
- Availability characteristics;
- Reliability characteristics; and,
- Security capabilities.

At the high-end of its information infrastructure, Al Rajhi Bank operates mainframes; in the midrange, the bank uses IBM POWER- and HP Itanium-based servers; and in the data center and at the branch level, Al Rajhi bank operates x86 servers. The bank's IT environment, therefore, is comprised of heterogeneous systems — each chosen on the basis of being the best type of system to handle a given job. Clabby Analytics would like to see more IT executives follow Al Rajhi Bank's example when making systems platform choices.

As an aside, the bank has approximately 170 people in its IT organization, plus around 150 outsourced resources.

The Primary Reason Why Al Rajhi Bank Uses Mainframe Technology

Mr. Anwar clearly understands the differences between mainframe systems characteristics and the characteristics of his distributed systems. What he has found, through experience, is that distributed servers are good for running certain types of banking applications (transaction processing, for instance) — but that they don't run batch jobs well. And a lot of the bank's workload processing involves batch processing.

As Mr. Anwar and I discussed the differences between the two systems types, he observed that mainframes are outstanding "general workload processors" that have been designed to handle a variety of workloads simultaneously, and in a balanced fashion. Unix, Linux, and Windows servers, on the other hand, are usually designed to serve one application type very well (application server, mail server, database server — and so on). And this ability to handle multiple workloads in a balanced fashion while providing high degrees of reliability and security are big reasons why the bank uses mainframes for its most critical business applications.

An Example of What Makes a Mainframe Different: Simultaneous Transaction/Batch Processing
As an example of balanced workload processing, Mr. Anwar described the bank's payroll processing application. "In Saudi Arabia, employees are paid once a month on the 26th and 27th of the month. And this means that we have to run a big payroll application that consumes a lot of systems resources on those two days. Payroll processing is data intensive — so we need to do a lot of database processing. The transaction processing characteristics of this application are straightforward, but major batch updates need to be run as payroll claims are processed. And no other system in the world does batch processing as well as a mainframe".

"The government, by the way, mandates that we must pay employees within four hours of the receipt of payment of the payroll funds from the employer. [Saudi Arabia's banking watchdog organization Saudi Arabian Monetary Agency now mandates that banks disperse the money that they have received with four hours of having received it]. To do this, we need a system that can perform payroll processing for hundreds-of-thousands of customers — and we need extra computing capacity for those two days. So we make use of IBM's capacity-on-demand services to process our workloads in the timeframe required" he continued. (Capacity-on-demand services allow Al Rajhi bank to utilize CPU power that resides in their System z on an on-demand basis. The CPUs sit idle for much of the month, but are available for use whenever the bank wants them. The bank pays a fee whenever it wants to "buy" additional computing power).

> ***"No other platform can do this kind of volume workload processing [3 million transactions plus associated batch workload processing] like a mainframe," claimed Mr. Anwar.***

The Bank Also Chooses Best-of-Breed Software Environments
Al Rajhi Bank's insistence on using the best tools for the job does not stop with the systems platform architectures that it chooses:

- From a program-to-program messaging perspective, the bank has chosen to use IBM's MQ Series to provide message broker services across its System z and distributed servers;
- In transaction processing, the bank runs CICS — the world's most sophisticated transaction management environment.
- WebSphere is used to provide the infrastructure basis for application services;
- IBM's Tivoli management environment is used (albeit for only one application) to provide back-up services; and it uses
- Rational software for stress testing purposes.

In addition to using a variety of IBM products for messaging, transaction processing, and management purposes, Al Rajhi Bank is also a big user of IBM's DB2 database and the COBOL programming language. Even though the COBOL language has been around for over forty years, it is still used by IBM customers around the world to rapidly access DB2 databases — and in the bank's case, it provides instantaneous access to customer data on 700,000 accounts. As for maintaining COBOL skills, the bank claims that this is not a problem (despite what some research analyst firms seem to indicate). This is because the

bank outsources its COBOL development to Italy (and this practice of outsourcing COBOL is consistent with other Clabby Analytics case studies where, if skills are not available locally, they can be found at reasonable prices elsewhere).

> ***The bank's continued, heavy use of COBOL makes us wonder what kind of performance the bank would see if it followed Gartner's advice and moved to another systems platform. COBOL has been designed to be a high-performance/highly efficient language that enables programmers to build applications that can access DB2 data much more rapidly than other language environments. And given that COBOL does not run as well on distributed systems, we wonder why Gartner would even consider recommending that users migrate to other systems environments given this very distinct mainframe COBOL/DB2 advantage.***

The bank's System z software environment is not exclusively an IBM environment. Several different tools provided by other mainframe software vendors are used to provide management services — most notably CA's job scheduler software.

Beyond Performance: Reliability and Security

Because the bank runs a variety of server environments, it knows full well that various servers have different reliability and availability characteristics. And in the case of the mainframe, Mr. Anwar stated that he has "full trust" in the reliability and availability of mainframe systems.

To illustrate why he has such trust in his System z environment, Mr. Anwar described his company's mainframe back-up/restore process. "Our back-up environment is highly automated and simple to run — and data stored in this environment can be easily recovered if need be. The bank backs up its data to a tape-based storage subsystem (an IBM 3595) — and it has a second mainframe offsite for fail-over purposes should a failure ever occur. But with one non-mainframe-based failure over the past ten years, a mainframe failure is not likely to happen."

> ***As Mr. Anwar puts it: "How's that for reliability?" He also said, "sometimes in the x86 world a back-up doesn't execute. And when you ask the IT manager why, he says: 'I don't know.' This doesn't happen in the mainframe world."***

As for security, the bank uses RACF from IBM. And given IBM's EAL Level 5 certification (the highest security rating in the industry for a commercial server), Mr. Anwar is confident that his System z environment is highly secure.

Only One Issue: Software Pricing

Al Rajhi Bank also runs POWER Systems and Itanium servers ─ and the bank's informal cost comparison shows that the costs for mainframes (including operational as well as hardware costs) as compared with distributed and scale-up Unix servers are similar from a hardware/software/services perspective. The bank, therefore, believes that it is paying a reasonable price for systems security, reliability, and related maintenance.

The only complaint that *Clabby Analytics* was able to elicit was that the bank feels that sometimes its mainframe software costs are too high. IBM's MLC (monthly license charge) for software is based on number of MIPS a system can run. And the bank runs a lot of MIPS. But *Clabby Analytics* knows that IBM is aggressively attacking this software

cost issue — and we describe how in our report on IBM Solution Editions. This report can be found at:
http://www.clabbyanalytics.com/uploads/SolutionEditionsFinal.pdf

Skill Set Issues

Yet another Gartner report advises that IT executives who operate mainframes might want to consider moving off of mainframes to "more modern" systems due to an alleged, pending, sometime-in-the-future mainframe skills shortage that will apparently be caused as aging mainframers retire. So, as a matter of course in *Clabby Analytics* case studies, we now ask IT managers to explain their mainframe skill set situation. In this subsection, I describe what Mr. Anwar told me about mainframe skill sets at Al Rajhi bank.

When asked about whether he believed that a mainframe skills shortage would happen within his organization at some point over the next several years, Mr. Anwar admitted to being concerned about older mainframers retiring and about a general lack of locally skilled mainframe resources. But then he explained that the bank has its own internal program for growing mainframe skill sets.

"In the mainframe world, the machine interface is different [he was referring to mainframe command line interfaces] — and the terms are different. But computers fundamentally operate in similar manners [he was referring to computers accessing and processing data, putting data in memory for faster processing, input/output systems, and the like). So what we do is take our own people and teach them what mainframe terms like DASD and CICS mean — and they can easily relate to those terms. We then teach them what a command line does and how to use it. So, we are training mainframe managers internally".

> ***Al Rajhi Bank knows it must establish a new mainframe culture. It has designed its own courses based upon the bank's best practices and specific requirements. And it teaches students about the basics in mainframe operating systems (foundations of operating systems); systems design (how systems are connected together); DB2; JCL, CICS; storage administration, and so on. And by growing resources using this organic approach, the bank believes it will be able to deal with any future mainframe skills shortages.***

When probed further, Mr. Anwar indicated that the training that the bank delivers consists of formal courses, plus mentoring from experienced mainframers. He also described some of the banks custom requirements, and how the bank teaches its future mainframers how to perform activities in the manner the bank wants them performed. He also described how the bank has formed its own "Error Knowledge Database" where issues are described in a common repository that can be used by IT managers to quickly identify an issue and rapidly find a solution.

In a discussing with the banks IBM distributor partner, SBM (Saudi Business Machines), *Clabby Analytics* also learned that SBM is actively trying to build its own group of mainframe-skilled managers and administrators.

Al Rajhi Bank's 3000 MIP Mainframe: The Best Machine for the Job

Summary Observations

What *Clabby Analytics* liked best about this interview is the bank's overall approach to computing. The bank looks closely at application and service level requirements — and then decides where an application should be placed to run in the most optimized fashion. *All IT executives should make their computing platform decisions in this manner*!

What we liked second-best is that, despite Gartner advice to the contrary, this case study provides a real world proof point that moving off of a 2,000-3,000 MIPS System z to another platform is not necessarily a good idea. In this case, the bank firmly believes that distributed servers or scale-up Unix servers cannot handle the bank's combined transaction processing/batch processing payroll workload in the time window necessarily for the bank to meet governmentally-mandated requirements. So much for Gartner's 2,000-3,000 MIPS advice…

What we liked third-best was the banks proactive approach toward growing mainframe resources internally. Although Gartner claims that a mainframe skills shortage will occur at same vague point in the near term as older mainframers retire, Al Rajhi bank serves as yet another proof point that this alleged skills shortage is just an urban myth. The bank has proactively built a professional mainframe skills training program designed to meet its specific requirements — and will be well prepared should its mainframe staff suddenly retire. Other mainframe accounts such as Corner Banca and Colacem —users of mainframes whose mainframe sites are located in remote locations have both told *Clabby Analytics* that they are able to grow mainframe skills from within their own organizations. Our report on Corner Bank can be found at http://www.clabbyanalytics.com/uploads/CornerBankFinal.pdf; and our report on Colacem can be found at http://www.clabbyanalytics.com/uploads/Colacem_Case_Study_Final_Final.pdf).

And what we liked fourth best was Mr. Anwar's parting words: "Mainframes will never die – they are the best computer for general workload processing in the industry. And, for "elephant-sized" organizations that need to provide instant service to their clients — particularly in financial and health care fields — there is no better platform than a mainframe".

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