



CLABBY ANALYTICS

Case Study

India's ELCOT: A Next Generation Mainframe Cloud Services Provider?

Executive Summary

Electronics Corporation of Tamil Nadu Limited (ELCOT) is a government owned provider of ICT (information and communications technologies) services to various government organizations located in the Indian state of Tamil Nadu. Its many services include the deployment of systems/storage/network products and operating environments; custom applications for design and development; technology consulting; and ICT training.

As a government-owned ICT service provider, ELCOT must follow government mandates. And one such mandate is to promote the use of open source software. Further, ELCOT has also been tasked with finding ways to reduce the cost of IT. And the combination of these two mandates has led ELCOT to the purchase of an IBM System z9 mainframe.

At ELCOT, IBM's System z9 is positioned as a "consolidation server" (the z9 has the capacity to run a workload that is equivalent to 250 Linux/x86 server workloads). And because the z9 supports Web services, service-oriented architecture (SOA), the Linux operating environment, Eclipse infrastructure, and more — the z9 is an ideal platform for running open source software.

At present, ELCOT has persuaded several government departments to adopt the open source model. For instance, a number of eCitizen applications (such as the state's "Family Card" application which is used to subsidize food purchases) now run on ELCOT's mainframe. And several of ELCOT's own enterprise resource planning (ERP) applications are now hosted on Linux on a System z9. But convincing government departments to move to the open source model is a slow process. So, at present, ELCOT has a lot of computing capacity on its System z 9 that is not being used.

Dr. Santhosh Babu, who is ELCOT's Managing Director and Director of e-Governance, wants to fix this situation. Dr. Babu hates wasting IT resources. And, from his personal perspective (the forthcoming ideas have not been discussed with ELCOT's board and/or the government), he would like to find a business partner who is willing to help manage/sell the unused capacity on his System z9 to other government users and/or to commercial businesses — in order to make better use of his z9 mainframe and reduce wasted computing cycles. If he succeeds in implementing this plan, Dr. Babu will essentially build an advanced "cloud computing" environment that runs inside his System z9. And, if he is successful in this endeavor, ELCOT's z9 will be the first example of a mainframe-based computing cloud that *Clabby Analytics* (that's me) has ever seen.

In this case study, *Clabby Analytics* examines ELCOT's goals and objectives with respect to open source adoption and scale-up server consolidation. I note that convincing ICT (information and communications technology) users to move to open source is a bit of a

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challenge at present. But ELCOT is making solid progress as it drives India's open source initiative. And ELCOT is also demonstrating creativity and ingenuity as it experiments with hosting cloud computing services on its IBM z9 mainframe.

Background

Clabby Analytics recently visited ELCOT's headquarters in Chennai, India where I met with Dr. Santhosh Babu. A gracious host, Dr. Babu provided background information on how and why ELCOT chose to acquire a z9 mainframe — as well as provided a little bit of background about his own ICT experience.

Dr. Babu is not a technologist — in fact, he is a medical doctor. His background is in operations and project management — and his strength is that he knows how to build applications that serve governmental and citizen needs.

Dr. Babu did not make the strategic decision to adopt mainframe technology. He credits that decision to his predecessor, Mr. C Umasankar, who recognized that a mainframe represents the pinnacle platform for consolidating Linux servers.

Having inherited the charter to drive Linux applications onto a mainframe, Dr. Babu described his two biggest challenges in this respect as:

1. Trying to convince his clients (a wide variety of government organizations) to more aggressively adopt the use of open source software; and,
2. Persuading more and more departmental computing users to centralized, scale-up resources.

Both of these challenges bear closer scrutiny.

Challenge #1: Getting Departments to Buy Into Open Source

For years, Indian IT buyers have been purchasing commercial-off-the-shelf (COTS) products from a variety of vendors. But government open source mandates have now directed ELCOT to aggressively promote the use of open source software wherever possible to help lower software licensing costs. To facilitate the deployment of open source software, ELCOT has implemented an IBM System z9 with a Linux operating environment (Novell/SUSE), with an open source infrastructure environment and related open source development tools, as well as Oracle database software.

Progress has been slow, but steady, in promoting the use of open source software. One reason that there has not been a massive influx of users rushing to deploy their applications on mainframes is that the existing user base currently runs of Unix and Windows platforms — and mainframes do not support either Unix or Windows. So for ELCOT's existing base to move to a mainframe, existing applications would need to be migrated from Unix or Windows to Linux (and, for many departments, there is not a lot of incentive to migrate their applications simply to rehost them on a different platform). Accordingly, the applications that are making their way to the mainframe are either:

1. Net new applications that are being designed from the ground up; or,
2. Existing Unix applications that are easy to port to Linux on a mainframe.

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Clabby Analytics expects that more and more Indian Unix users will eventually move toward open source over time because Unix (and related infrastructure) licenses are expensive — so moving to low cost open source environments makes good economic sense. Further, moving to Linux from Unix is often a straightforward port. On the other hand, Clabby Analytics expects few Windows applications to wend their way to Linux (because those applications are tightly tied to the Windows operating environment).

Challenge #2: Getting Users to Move to a Scaled-up, Centralized Server Environment

In the computing industry, one of the most wasteful trends in systems designs has been to deploy individual, towered servers in hard-to-manage distributed systems configurations. Servers in these designs are frequently configured to use only 5-15% of their total processing capacity in order to leave plenty of headroom to deal with spikes in demand. By comparison, most mainframes operate in the 80%+ range (and *Clabby Analytics* has met many mainframe owners who consistently operate at full capacity, achieving 100% capacity use on a regular and sustained basis).

At ELCOT, one of the driving factors for purchasing a mainframe was to improve the utilization rate for government ICT assets. But the problem that ELCOT is facing as it drives its scale-up computing agenda is that a "I-want-my-own-physical-server" buying behavior has become ingrained and instantiated in government departments throughout India (and for that matter, throughout the world). Hence, one of ELCOT's major challenges is to change this buying behavior by demonstrating the many advantages government departments can achieve by moving to centralized, scale-up computing architectures such as an IBM mainframe.

How an IBM z9 Mainframe Is Helping ELCOT to Achieve Its Goals

ELCOT's two big challenges are to convince government users to move to the open source model of computing, and to drive systems utilization rates up using scale-up architecture. IBM's mainframe architecture is ideal for helping ELCOT achieve these goals because:

- IBM System z mainframes are capable of running a wide range of open source software, including the Linux operating environment, open source infrastructure software, and a variety of open source applications;
- IBM also offers a complete, turnkey service-oriented architecture (SOA) environment that can be easily deployed and managed on its System z platforms;
- Systems z has incredible scalability. For instance, tests now show that a System z9 can run the equivalent of 250 Linux/x86 server workloads — in a system enclosure that is only a fraction of the size of 250 x86 towers; and,
- Mainframes can consistently operate at up to 100% utilization.

In addition to its open source and server consolidation capabilities, ELCOT has found mainframes to be highly-secure; highly reliable, available, and serviceable (RAS); and ELCOT notes that mainframes use significantly less power and cooling; and significantly less floor space.

What ELCOT May Do With Its Current Unused Capacity

As ELCOT continues its efforts to convince government departments to use open source software — and to use highly-efficient, scale-up servers — unused server capacity on its

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mainframe is going to waste. And ELCOT knows that there are ways to exploit that unused server capacity and make it available to other government departments and potentially to commercial interests.

When I visited ELCOT headquarters, Dr. Babu and I discussed some of ELCOT's options for increasing mainframe utilization. Some of the points and technologies that we considered include:

- The use of billing and accounting software to determine computing resource use. With such software, ELCOT would be able to meter how much computing time and resource an external user used on its mainframe — and could bill for that use accordingly.
- The concept of cloud computing. Cloud computing is an evolving computing architectural model that calls for unused computing resources to be returned to a common “virtualized” resource pool. Resources in this pool can then be made constantly available to users who need computing power.

With respect to metering the use of a mainframe, IBM currently offers advanced accounting and billing software that can measure use of mainframe resources and generate bills accordingly. This software is called Tivoli Usage and Accounting Manager (or UAM for short). IBM's local staff is currently in the process of familiarizing ELCOT with this software.

With respect to cloud computing, Dr. Babu was already familiar with the cloud computing concept. On his PC desktop at the time of the interview, Dr. Babu was operating a program that contained links to various applications that run on a variety of servers in the ELCOT infrastructure. Dr. Babu did not know the physical location of those servers, nor did he care. All he cared about was getting access to those application services that were somewhere out there in “the cloud”. To be a true cloud, servers running Dr. Babu's applications would need to constantly return unused computing power to a virtualized resource pool (which I doubt is the case at present — although virtualizing resources on a mainframe is straightforward to achieve). But one of the basic concepts of cloud computing — access to applications wherever they reside — in a transparent fashion is already being practiced at ELCOT.

The use of billing and metering software, and the creation of a virtualized resource management environment on ELCOT's mainframe will enable ELCOT to create an advance, self-contained z9 computing cloud. The benefit of a mainframe cloud architecture to ELCOT would be that ELCOT could then use its mainframe to generate revenue — thus offsetting mainframe costs. And the benefit to users would be that ELCOT's mainframe could deliver a more secure computing environment with enterprise class reliability, availability, and serviceability (RAS).

One final note on this potential move to cloud computing: Dr. Babu would prefer to use an outside business partner to market and support this potential cloud computing environment on his mainframe. In other words, he would like to simply make his computing resources available to outside users — without having to manage those users himself. This concept of providing resources to an outside supplier is again consistent with how the cloud computing model is evolving. Using the cloud computing model, ICT managers with

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excess capacity can actually sell that unused capacity to service providers — and generate revenue for their organizations or enterprises while doing so.

Summary Observations

One of the Indian government's stated goals is to broaden the adoption of open source software. The reason for this initiative is that the government doesn't want to spend big money for Unix/Windows operating systems, and related infrastructure and applications. So, over time, the government would like to see Unix/Windows applications migrate to the Linux/open source model of computing.

As a provider of advanced technology services and consulting to government organizations, ELCOT needs to be in the forefront of technology trends. ELCOT needs to clearly understand how technology can be exploited to deliver benefits to Indian citizens and businesses — while operating at maximum efficiency. And one way that ELCOT has found to achieve maximum efficiency is to deploy a highly virtualized mainframe environment that can easily run at 100% of capacity for lengthy, sustained time periods. Further, mainframe technology also helps ELCOT to drive down systems acquisition and total cost of ownership (TCO) costs. And, by consolidating server environments, ELCOT can use its mainframe to drive down management costs and reduce management complexity.

When all is said-and-done, ELCOT's biggest challenge is to change government ICT users' current purchasing pattern. Many government offices and departments still have the “we-want-our-own-server” mentality — a mentality that ensures the proliferation of hundreds or even thousands of stand-alone, towered departmental servers. These configurations are difficult to manage — and are massively underutilized. ELCOT and the Indian government know that changing this buying behavior will take time — and a lot of convincing. Buying and deploying a mainframe goes a long way toward demonstrating and proving the kind of efficiencies that can be achieved by moving to a centrally managed scale-up model. The use of an IBM z9 should help persuade many ICT users to rethink their current buying behavior.

ELCOT's biggest challenge is to change this “we-want-our-own-physical-server”. Mainframes have the ability to create “logical” servers that have the exact same characteristics as physical servers. Only those “physical server” are contained in secure “virtual partitions” within mainframes. Changing this physical server mentality is a challenge faced by the whole industry — and requires education, education, and more education of the user community. This community needs to be understand the concepts of logical “virtualized” servers and the benefits that can be achieved by moving away from physical servers into centrally managed, logical servers such as an IBM mainframe environment.

Finally, it is important to note that Dr. Babu's creative thinking regarding how to maximize the use of ELCOT's mainframe environment is very admirable. Dr. Babu eschews waste — and is actively seeking ways to maximize his resource utilization while undercutting his costs. More ICT executives should demonstrate the kind of insight and ingenuity that Dr. Babu has shown.

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