



Partner Spotlight

Elevating Applications to the 3rd Platform – Migrating Mission-Critical Workloads to x86 and Linux With LzLabs

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INTRODUCTION

LzLabs GmbH is a startup founded in 2011 in Wallisellen, near Zurich, Switzerland. The company is bringing its mainframe application migration solution to general availability in 2016. LzLabs' main focus is the migration of mission-critical workloads from legacy mainframe environments to x86 Linux platforms, without having to rewrite or recompile the code base for the entire application.

This paper describes how trends like digital transformation (DX) and Big Data are creating new challenges for European organizations and what infrastructure considerations they need to take in order to remain competitive. Different approaches to datacenters and applications are discussed, as well as the growing importance of Linux as the operating system (OS) of choice for developers. Against this backdrop, the paper summarizes how LzLabs differentiates its offerings from other workload, application, and data migration solutions on the market, with a focus on its partnering with Red Hat and use of Red Hat's open source technology.

NEED FOR MISSION-CRITICAL PLATFORMS

The IT industry is currently undergoing major transformation as European companies gradually embrace 3rd Platform technologies such as Big Data, cloud, mobility, and social business. Digital transformation has started to touch every industry and company size, and organizations are under growing pressure to make their IT operations more agile if they don't want to lose out to competitors. New market entrants are increasingly challenging incumbents by driving up efficiency based on innovative IT solutions and the use of cloud and analytics.

As a mature, highly controlled environment, the mainframe has long been regarded as a sound mission-critical platform. However, ageing technology, a shortage of skills, and vendor lock-in, alongside the rise of more flexible platforms and rapid agile development environments, have made the mainframe environment increasingly expensive to maintain. There is, however, a vast population of legacy applications that more than adequately power many organizations, albeit often with minimal or missing documentation and source code. It is therefore easy to see the attractiveness of a migration solution that maintains the application investment while providing a migration path to modern 3rd Platform architectures.

Big Data has risen to the top of executives' and developers' agendas as the technology has evolved. However, the main challenge is not the data or its volume, but the ability to generate value from it. While some Big Data workloads are heavy on the compute side, they require the latest processors and in-memory technologies for supercomputing type calculations, for example in scientific research and risk modelling. Others are heavier on the storage capacity and memory side because they involve huge databases and run file systems such as Hadoop, with the focus on moving data in and out of these as effectively as possible.

The emergence of cloud solutions is posing additional challenges for IT managers running mission-critical applications on legacy environments. Since most organizations take advantage of the public cloud in some form, it is important to integrate these environments with on-premises resources so that workloads can be moved seamlessly when required, enabling greater scalability and possibilities to combine data sources for analytics. It is also worth considering the different skillsets required from IT professionals for architecting and managing such hybrid environments.

CHALLENGES AROUND APPLICATIONS

Many large corporations built up legacy infrastructures for their mission-critical applications decades ago and have not gone through any major modernization process apart from gradual upgrades to their existing platforms and systems. These are mainly based on non-x86 machines such as RISC (Reduced Instruction Set Computing), CISC (Complex Instruction Set Computing), and EPIC (Explicitly Parallel Instruction Computing) architectures, often running mainframe or Unix operating systems. While all these legacy systems have their specific advantages, they are often seen as not agile enough for many workloads in the digital age, especially where large amounts of data are processed and analyzed. Therefore, IT organizations look to migrate workloads to industry-standard x86 servers, which can be very challenging for the following reasons:

- The high risk associated with any downtime or data loss during migration
- The lack of executive support for such projects due to conflicting priorities
- The need to rewrite many applications for compatibility
- The large applications and the major task of migrating these
- The need to cut applications into chunks for gradual migration – it can be challenging to determine where to make these cuts and establish the right size for the chunks
- Integration with existing environment may require external consultants' skills
- The need to identify other areas that the application needs to be integrated with, such as Big Data and analytics platforms
- The difficulty of measuring the benefits of migration – overall spending may not decline as a result of greater efficiencies because greater volumes could be processed as usage is encouraged
- Established vendor relationships and contracts with BMC, CA, Fujitsu, IBM, Oracle, Unisys, etc. that are difficult to break due to lock-ins, staff skills shortages, retraining needs, and personal preference/relations

USE CASES

LzLabs has already run tests for several customers. It is still too early for a complete case study, but examples include:

- A customer from the financial sector that was looking to use data to expand its business in a specific segment. The customer wanted to launch a modern marketing campaign and had useful data in a mainframe back-end, but didn't manage to get fast-enough access to the data. This business need was the reason why the customer evaluated LzLabs' software.
- Test data sent to LzLabs by a customer facing source-code availability issues when trying to migrate to x86. LzLabs asked for a compiler listing, which revealed that the application hadn't been changed since it was written in the '90s and would need to be decompiled and rewritten. LzLabs provided a solution that avoids these cumbersome steps.

- A CIO looking to future-proof his IT environment. This is the classic dilemma for CIOs that on the one hand prefer not to change anything, but on the other hand are aware that the business will have higher demands due to digital transformation. The solution lies in shifting gradually to x86 and reducing costs year over year without taking major risks.
- A customer from the manufacturing sector that was experiencing business performance issues with a legacy batch job. After migrating the application to Red Hat Linux with LzLabs' solution, faster performance was achieved than on the original legacy platform.
- Some customers turning to LzLabs and Red Hat to reduce their reliance on mainframes, looking for greater openness and less vendor lock-in.
- A senior consultant with a telecoms and finance background who had migrated from mainframes to x86 in the past, and was excited about the solution proposed by LzLabs mainly because it can leave codes unchanged and promises a much smoother and quicker migration than previous approaches.

Example: Swiss IT Service Provider

IDC also interviewed a Swiss IT service provider that runs various applications on mainframes but has also built out a parallel x86 infrastructure in several of its datacenters. The provider is excited about the opportunities that LzLabs offers for migrating workloads to x86, having previously tried to move workloads with other solutions that have all failed due to high complexity as well as technical and security related issues. At the same time the company is under increasing pressure to improve efficiency in its datacenters so that it can produce more while achieving cost savings, and is especially looking at solutions that cut the cost of software licensing and capital expenditure associated with large machines.

LzLabs proactively contacted this potential customer, and a proof of concept is scheduled for 2Q16. The actual migration process is expected to take several months and could run into hurdles that may not be overcome. However, given early results, the provider is optimistic that LzLabs' solution will work, unlike less credible approaches launched by competitors in the past.

Linux is an important consideration for this service provider, but the choice of OS is primarily determined by its end customers. Such enterprise customers already have various applications running on Red Hat Enterprise Linux (RHEL) and are in favor of greater Linux adoption due to the predominance of databases based on open environments like Hadoop and Mongo DB.

Expert View: Robert Soprano, Freelance Transition Director and Consultant, Former IBM Global Services Transition Manager

IDC spoke to a former IBM transition manager based in the U.S. who is familiar with mainframe migrations and the associated complexities. When speaking with IDC, he advised that the greatest challenge is around moving very large applications running on mainframes: "In traditional mainframe environments, when an application replatform was initiated, everything had to be moved over in one shot, which was very difficult. With LzLabs, this can be done more gradually."

As a major differentiator of LzLabs he also pointed out that subsystems don't require upgrading and everything can be moved over with the existing codes that don't need to be recompiled. This approach, combined with LzLabs' lower unit costs, allows migrations to be carried out in a more targeted manner by only moving over certain applications or departments as required. This can lower the risk and disruption caused by the migration, can lead to more efficient use of resources in the long run, and can deliver significant savings. It is also a lot easier to convince clients of the feasibility of migrations by starting small and with less critical applications. Once these are completed successfully, clients are more willing to migrate their key mission-critical platforms. Soprano believes that LzLabs' solution will also be able to run in public cloud infrastructure-as-a-service environments, with fewer restrictions than offered by mainframe suppliers.

LINUX DRIVE BY DEVELOPERS

Linux has evolved as the preferred solution for public cloud infrastructure; driven by the desire for greater openness, it has also found its way into private cloud deployments. App developers particularly favor open environments because they facilitate the portability of their work if code is transparent and openly available. Instead of cracking proprietary codes and rewriting applications for different OS, they can concentrate on value creation more efficiently. Since many apps are cloud-based, current developers' expertise mainly lies in Linux, which has become their OS of choice for the following reasons:

- **Platform independence.** Since the kernel is open source, Linux can run any platform on any device or server hardware, freeing up developers from having to write to vendors' compatibility regulations or limiting themselves to only one type of platform.
- **Portability.** The OS image with any software on top can easily be ported to other architectures. Linux is structured in layers and is highly configurable so that it can be optimized to specific workloads and underlying hardware resources.
- **Community support.** The strong Linux community is efficient in resolving any bugs and threats in a timely and transparent manner, providing higher security levels than proprietary OS.

Linux is gradually growing its share in datacenters. IDC's Quarterly Server Tracker indicates that the Linux share of new server deployments in EMEA increased from 24.4% in 2012 to 30.5% in 2015, mainly at the expense of Windows but also some legacy Unix platforms.

Developer-driven workloads are increasingly moving to Linux, but container technology also leads to the OS being decoupled from apps' application programming interfaces (APIs), thus making them more OS agnostic. IDC also sees significant opportunities with Linux for hybrid and managed clouds with European telcos, hosters, managed service providers (MSPs), and enterprises.

LzLabs' Differentiation

As a provider of software for replatforming legacy applications, LzLabs is addressing the challenges involved in moving decades-old applications that have often been selected to be moved but have proved to be too complex or risky. Instead of going through the lengthy process of rebuilding whole applications, LzLabs offers its customers a quicker and less disruptive approach. This happens in three steps:

1. Applications are sliced into chunks that can be moved step by step to minimize risk, with applications data remaining unchanged.
2. Native data is simply moved onto Red Hat Linux environments to take advantage of the flexibility that Linux offers.
3. A managed software container utilizing faithful recreations of mainframe subsystems – i.e., job control language, TP monitors, and databases – is provided, making the applications believe they are still running on the original platform.

LzLabs' executives define the company as an independent software vendor. By working with open source software and being independent from proprietary vendors' strategies and products, LzLabs can provide an unbiased solution to customers that are looking for cost savings and increased agility, and are open to migrate to industry standard x86 architectures.

Despite being a recent startup, LzLabs benefits from the many years of experience of its diverse 100-strong workforce. Specialists with mainframe expertise have been brought together with Linux-savvy app developers to combine their skills in a value-add manner. In-depth knowledge of legacy technologies is crucial to get these migrations right, as well as deep understanding of threading

and concurrency on the Linux side. This type of intense collaboration between two opposing camps is still rare in the industry but is much needed to elevate traditional mission-critical workloads to the digital age.

LzLabs focuses on a solution that it calls Software Defined Mainframe, which is comparable with software-defined datacenters and networking. Real-time integration into Big Data and cloud-based platforms is a crucial element in migrating critical applications to take maximum advantage of 3rd Platform technologies. By having experts from these areas working alongside hardware and Linux specialists, important integration points can be built into these models that are needed to future-proof the technology.

LzLabs covers all industries without any preference for verticals, company size, or application types. However, as with all migrations, there are some cases where customization prevents easy migration. Consequently, the pre-evaluation phase of the migration project might identify areas that could lead to other non-migration options being considered.

LzLabs and Red Hat

LzLabs started off developing its software for CentOS Linux distribution. It quickly decided to choose Red Hat as a partner, however, because all the customers and prospects it talked to in the early stages pointed to Red Hat as the market leader in enterprise Linux. Linux is the obvious choice as the preferred OS for many customers due to the various advantages pointed out earlier in this paper, particularly for organizations that are developer or data driven, or require a high degree of mobility and portability.

Red Hat helps LzLabs to address high-availability and serviceability, which is being achieved through close cooperation with Red Hat's engineers.

Red Hat Connect for technology partners is a program run by the vendor that provides a range of benefits including access to Red Hat's technology, certifications, best practice guidance, and options for visibility at Red Hat's events. On the business side, Red Hat offers its partners the ability to earn additional margins or recurring revenue, various training programs for sales and marketing, and specific opportunities for ISVs and resellers.

Red Hat's open source ecosystem has a community focus and encourages partners to collaborate with each other. Its channel management practices help to get partners ready for business, especially with the Open for Business initiative. The idea is that partners gain maximum benefit from each other's strengths and diverse skillsets so that the sum of the parts is much greater than individual companies. This is especially true for smaller firms that specialize in niche areas and would find it hard to compete against larger players on their own.

Customers can access a greater network of open source solutions providers and are more willing to experiment and try out different approaches if these are provided as options by their trusted Red Hat contacts. The key here is to demonstrate high agility and flexibility when responding to business needs, and offer tailored solutions for individual cases that differentiate Red Hat partners from the established proprietary vendors.

Red Hat's recent announcement around Enterprise Linux on Microsoft Azure provides further opportunities especially with customers that run workloads in hybrid cloud environments. The ability to move workloads onto the Azure cloud on the same Linux image as on-premise opens up new opportunities for developer-driven organizations and means greater incentives for moving from legacy and proprietary to standard open Linux-based architectures.

LzLabs has not yet developed a specific go-to-market strategy in conjunction with Red Hat, but this may be an opportunity for future collaboration once LzLabs goes fully live with its solutions and develops capacities to take on larger projects.

LzLabs intends to work as an active member of Red Hat's partner network by offering a complementary solution or partnering with other companies within the Red Hat community.

OPPORTUNITIES AND CHALLENGES FOR LZLABS

Opportunities

- **Joint go-to-market initiatives with Red Hat and other enterprise suppliers that align strategically.** As the startup grows its customer base and resources, it could take advantage of Red Hat's wider ecosystem, including partners from other backgrounds such as resellers and distributors.
- **Showcase customer cases.** Once the first customers are fully committed to LzLabs' solution and larger migrations are successfully completed, these cases could be referenced and promoted at events and in industry publications.
- **Extend offerings to migrations from x86 to x86.** Legacy migrations tend to be infrequent and complex, while customers increasingly migrate between different platforms on x86 architectures that could be addressed in a similar way with LzLabs' expertise.

Challenges

- **CIOs opposing larger migrations or having conflicting priorities.** LzLabs and Red Hat need to address concerns regarding migration risk and the potential for cost savings and greater agility through marketing and networking initiatives in order to open them up for potential business with LzLabs.
- **Competition from large players.** Incumbent providers of non-x86 servers have very good insight into their customer base and are closely watching how their clients are targeted for migrations; they have also set up their own incentives and have opened up their platforms to some extent, for example by offering Linux on mainframes. They may try to challenge LzLabs' intellectual property rights for codes relating to their platforms.
- **Irregular revenue streams.** The seasonality of the legacy refresh business and the focus on larger projects that may or may not go ahead put pressure on LzLabs' cash flow. Cost structures need to be kept low while resources can scale through a network of experts when projects come in, which can be tough at the beginning.

ESSENTIAL GUIDANCE

Organizations across many industries including finance, manufacturing, healthcare, and government continue to rely to a large extent on traditional applications that are still hosted on legacy infrastructure. This approach has worked well for decades without the need for major changes, focusing largely on version upgrades. However, in the current digital age, data volumes are growing exponentially and this is putting a strain on operating costs. At the same time, more and more linkages need to be created between systems, databases, and cloud resources to realize the value from IT advances. Mission-critical applications demand scalable, flexible platforms.

IDC recommends the following steps for companies looking to migrate applications to x86:

- **Run a complete cost comparison including all factors and assumptions.** This includes the servers, software licensing, power and cooling, IT specialists, and migration cost. In

particular, focus on running a deep analysis on recurring maintenance costs for OS, applications, and hardware. Comparisons may vary by system, location, and application, and this needs to be taken into account when deciding what to migrate.

- **Set out a clear vision of your IT.** This needs to be forward-looking, taking into account the drivers for 3rd Platform technologies such as the cloud, Big Data, and mobility. Analyze to what extent your legacy infrastructure can be connected to this new world in an efficient manner so that data can be shared and applications ported where needed.
- **Consider organizational implications.** Your IT may need to be reorganized to break up technology silos and opposition from your influential mainframe experts who may not be too keen to be retrained on Linux. Set out a business case for your executives.
- **Take a deeper look at coding once you decide that certain applications would run better on x86 to establish how difficult the migration would be.** LzLabs promises it can migrate most standard applications, but there may be challenges if the OS kernels have been modified for your individual use, or if you are using non-standard tools.
- **Run proof-of-concepts to convince yourself and your executives about the possibility and viability of the migration, increased scalability, performance, and cost savings.** Based on this, assess the risk of failure, downtime, and data loss to make your final decision.

About IDC

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