Business challenge

With 17 percent year-on-year growth in transaction processing ahead, and with new harmonization initiatives on the horizon, CTIE needed to modernize its applications to enable greater flexibility.

Transformation

To manage ongoing growth in applications and support new tax harmonization initiatives within the government of Luxembourg, CTIE deployed one of the first IBM® z13s™ servers—achieving more than a 25 percent increase in Java performance and accelerating both interactive and batch workloads.

Business benefits

>25%
boost in Java performance, through increase in zIIP capacity

Increased
flexibility through application modernization

Rapid
non-disruptive implementation with zero downtime provides headroom for growth

CTIE

Delivering faster, more efficient government services on the new z13s

The Centre des Technologies de l'Information de l'Etat (CTIE) is the public body in Luxembourg responsible for commissioning and running centralized IT services for the state. Supporting a broad range of functions and web applications for civil servants, businesses and citizens, CTIE supports more than three billion transactions and 500 million web accesses each year.

"Moving to e-services means we can't afford downtime—and this is why we choose to run our key applications and databases on the z Systems platform."

—Marc Theis, DP Manager, CTIE

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Adaptive government

Luxembourg is one of the world's smallest sovereign states, with just 560,000 inhabitants, but also one of its richest, with per capita GDP of more than USD100,000 in 2015. In recent years, the country moved to align its banking secrecy laws with those prevalent elsewhere in the EU and to adopt Organisation for Economic Co-operation and Development (OECD) standards in a number of areas, including tax, justice and visas. This shift in policy sparked a number of major business transformation projects within the government and its shared IT services center: the Centre des Technologies de l'Information de l'Etat (CTIE).

Marc Theis, DP Manager at CTIE, comments: "Over the past decade, the environment we manage has been highly dynamic. To cope with new business requirements, the ministries have tasked us with several major projects, including complete rewrites of the core systems for justice, finance and other departments."

The majority of critical government systems in Luxembourg—and especially those that rely on large databases—continue to run on the IBM z Systems® platform with IBM DB2®, IBM WebSphere® Application Server and IBM CICS®. Over the years, CTIE has continually developed its systems to take advantage of the latest technologies. For example, the early 2000s saw the introduction of J2EE to web-enable the existing CICS transaction processing systems. More recently, the organization has been building out a componentized architecture with IBM WebSphere software, enabling the rapid assembly of new capabilities from "building blocks" in a service-oriented architecture. In addition to powering fast, low-cost responses to emerging business requirements, this initiative enables the number of supported applications to rise without a corresponding increase in headcount.

Guy Scheck, IT Specialist at CTIE, says: "We run more than 70 major applications on the z Systems platform, including the state register of companies, the national identity register, tax collection and administration systems, and VAT refund operations. These services must be available 24/7 and with the highest levels of security, so z Systems remains the natural choice. Of course, scalability is another priority: the demand for services is always rising, and new government policies are driving increased emphasis on exchanging information electronically with other EU governments."

With application growth estimated at more than 17 percent year on year, and major new cross-border harmonization initiatives on the horizon, CTIE needed to expand its existing transaction processing capabilities. Against a backdrop of budgetary pressure, the organization considered all options to find a solution that would meet its requirements in terms of availability, ease of maintenance, security and performance.

Available, scalable, manageable

CTIE decided to invest in the new IBM z13s server, which provides unprecedented scale in terms of memory, I/O and processing power within a single frame footprint.

"IBM z Systems is a strategic platform for CTIE and the government of Luxembourg, but we still needed to build a viable business case for the z13s," says Marc Theis. "IBM proposed both a z Systems Solution Edition for WebSphere and an Application Development Solution Edition, enabling us to make significant savings and giving us known software costs over four years. This helped us to justify the investment in the increased performance and scalability of the z13s."

CTIE participated in IBM's Early Support Program (ESP) for the IBM z13s hardware, and went live on the new platform very rapidly, replacing the older of two z Systems platforms in its existing Geographically Dispersed Parallel Sysplex™ (GDPS®) cluster. Participating in the ESP enabled CTIE immediately to leverage new functions such as Shared Memory Communications Direct Memory Access (SMC-D) and simultaneous multi-threading (SMT). The second platform—an IBM zBC12—remains in an active/active cluster with the new z13s, meaning that CTIE can tolerate the failure of an entire data center without loss of data or interruption to processing in its z Systems landscape. The two data centers, which are 40 kilometers apart, offer a combined 6,000 Central Processor (CP) MIPS and 8,500 z Systems Integrated Information Processor (zIIP) MIPS.

Mike Schmitz, IT Analyst, comments: "As we rely mainly on web services for sharing data both between departments and with external organizations and governments, the Java-optimized processor in the z13s is a great help. Equally, we have expanded our CP capacity by 16 percent and our zIIP capacity by 41 percent by deploying the z13s. The combination of increased memory, cache enhancements and improved I/O bandwidth is helping us to support fast growth in transaction volumes."

With features such as simultaneous multithreading (SMT) and improved CP Assist for Cryptographic Function (CPACF), the z13s offers significant enhancements in throughput-per-core performance for security-enabled applications, while the new Crypto Express5S encryption cards offer double the raw performance of the previous generation of crypto cards. In a country where online transactions for both enterprises and citizens are being encouraged, the ability to provide secure connections at high speed is a significant benefit. Additionally, CTIE uses IBM Public Key Infrastructure Services for z/OS® to create and manage trusted digital certificates for internal services.

IBM z Systems provides an extremely dynamic platform for CTIE, with continuous development to numerous applications, including more than 100 Java applications covering everything from universal taxation to departmental administration, and from farming subsidies to driving license applications. Although this application landscape is large and complex, the manageability of the z Systems platform enables CTIE to offer reliable services without requiring large numbers of system administrators. Patrick Nosbaum, IT Specialist, says: "The tools on the z Systems platform help us to provide efficient services. For example, we use the IBM zAware near real-time analytics embedded appliance to monitor our z/OS logs and automatically flag abnormal behavior in our production environment, helping us to maintain high availability."

As CTIE builds the new applications to power its move to e-government, it is evaluating further use of IBM Integration Bus—already in production for one transaction—as an enterprise service bus to facilitate the re-use of existing components.

Ready for the future

The deployment of the z13s at CTIE increased the organization's zIIP capacity by 41 percent, delivering more than a 25 percent improvement in Java performance, with further gains expected from the activation of the new SMT feature. Although response times were already very

good for users, the performance gains are important because they put CTIE in a strong position to handle its fast growing workload and the ongoing changes in the EU regulatory and tax frameworks.

Patrick Nosbaum comments: "Both online and batch performance have certainly improved, but the bigger benefit of the z13s is that it gives us the headroom to support upcoming growth in Java processing, which is very demanding on processing resources."

"The z13s gives us assurance that we are ready for whatever the future is likely to bring," says Marc Theis. "Our new contract with IBM is for four years rather than two, which is a vote of confidence in how long we believe this new generation of server will be at the cutting edge."

Mike Schmitz adds: "One of the benefits of the Solution Edition is that we have full visibility of the costs of the hardware, software and support over the lifetime of the contract. Having predictable costs for our projected workload is a great advantage as we plan our ongoing modernization."

As the government of Luxembourg continues along the road towards EU harmonization and full e-government, the importance of the IBM z Systems platform will only increase. As the focal point for all large databases and for an increasing number of web applications, the new z13s will play a key role in providing more convenient services to citizens and businesses, at lower cost to the taxpayer.

Marc Theis concludes: "We continue to value the z Systems platform for the high availability and the performance it offers. We run a huge number and variety of applications on z Systems, including the single sign-on government portal that gives every citizen and enterprise access to e-services. If we can ensure that services are always up and running, those people can transact their business at their own convenience on the web. And that means high satisfaction and reduced costs for providing government services. Of course, moving to e-services means we can't afford downtime or poor performance—and this is why we choose to run our most important applications and databases on the z Systems platform."

Solution components
- IBM® CICS®
- IBM DB2®
- IBM GDPS®
- IBM Integration Bus
- IBM WebSphere® Application Server
- IBM z13s™
- IBM zBC12

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To learn more about the IBM z Systems platform, please contact your IBM representative or IBM Business Partner, or visit the following website:
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