

Case study: **Disaster Recovery solution** for Lucy's law app

SERVICE/APP:

Lucy web application for handling document management processes

DESCRIPTION:

Proof of Concept of the Disaster Recovery solution, based on the public cloud computing Amazon Web Services for the Lucy application - the law firm Domański Zakrzewski Palinka Sp. k.

INDUSTRY: legal

TIME FRAME: September 2022







AWS DRS



Security and Compliance



Scalable

SOLUTIONS USED FOR IMPLEMENTATION:

AWS EC2

AWS Lambda

1 Client

"Lucy" is DZP's business application. It is used to support document management processes and the lawyer's work with the document. Currently, there are over 5 million documents in the system.

The law firm DZP (Domański Zakrzewski Palinka sp. k.), which is one of the leading legal entities in Poland, has trusted us. Since 1993, they have been advising Polish and foreign clients from almost all sectors of the economy. DZP has a high position in international rankings, and what is important, it serves over 90 countries in its network of business relations.



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2 Challenge

DZP's client is distinguished by high security awareness and is constantly looking for technological solutions that increase the level of security.

Therefore, also in order to ensure the operational continuity of the Lucy application, the client decided to test an **additional security layer** - the Disaster Recovery location in the Amazon Web Services public cloud.

Before deciding on the production implementation of the solution, DZP entrusted us with the implementation of the Proof of Concept, aimed at validating the goal set for it.





The purpose of the Proof of Concept carried out by us for DZP was to obtain confirmation that the client's expectations of the solution were met and the most important were:

- failure-free restoration of the environment in the event of a failure in a substitute location within a maximum of five days,
- maintaining consistency, integrity and completeness of data,
- maintaining the appropriate RTO and RPO parameters, ensuring the highest level of data security, both during their migration to the cloud
- computing, as well as during the operational use of the disaster recovery solution in the AWS computing cloud.



3 Applied solutions

To validate the client's expectations, we carried out functional tests of AWS cloud services in the area of disaster recovery. The choice fell on the AWS Elastic Disaster Recovery (AWS DRS) service. It minimizes data loss and downtime with fast and reliable application recovery. At the same time, the solution is cost-optimal because it uses inexpensive storage and minimal computing power. The service provides continuous, incremental data replication, monitoring and the ability to test without interrupting replication continuity and ensuring the ability to quickly restore the infrastructure in the cloud.

AWS DRS allows you to restore the application to the last saved state or any available state before the failure using snapshot mechanisms. During replication, data is compressed to increase bandwidth efficiency and reduce replication set-up times.



3 Applied solutions

The activities of our team focused on the implementation of the following stages of the project:

- 1. Solution The LCloud architects designed the AWS Elastic Disaster Recovery environment that allows you to restore the application to the last saved state or any available pre-failure state, using snapshots. Snapshots also allow you to restore data to a selected point in time.
- 2. We have created dedicated accounts in Amazon Web Services with the appropriate IAM roles.
- 3. We prepared a VPC in AWS using Terraform with one NAT.
- 4. We created a VPN Gateway and pinned it to a VPC on AWS.
- 5. We have prepared a secure **VPN** connection between the client's main production environment (on-premises) and the AWS computing cloud.





- 6. We configured and launched AWS services and the recovery process enabling recreating a fully functional Lucy solution in the AWS cloud.
- 7. We set up replication of Lucy application data to the AWS cloud.
- 8. We performed **test restoration** procedures.
- 9. We conducted replication stability tests and tested the times
 - data replication and recovery.
- 10. We launched **failback tests** we restored the data of Lucy's

application from the AWS cloud to the customer's on-premises environment.

11. We created documentation and summarized the test results.







NAT getaway



AWS EBS



AWS Lambda



AWS EC2



AWS DRS







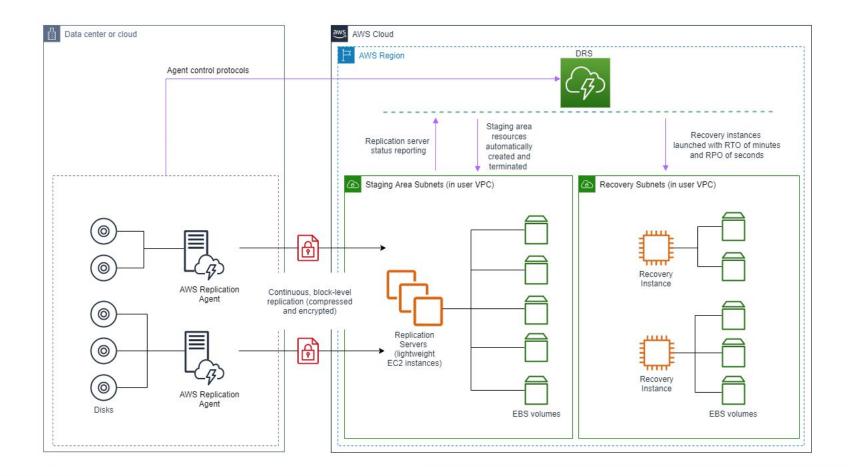




The project was implemented in accordance with the DevOps philosophy. The infrastructure was created in the IaC trend, using Terraform. The project used several solutions and applications that optimized its implementation in the spirit of Agile. The Redmine application was used to manage project milestones. We carried out ongoing communication using the Slack and Google Meet applications.



6 Disaster recovery architecture diagram







- During the tests, we performed incremental replication, which was carried out correctly and without any errors. Importantly - we obtained the synchronization state after the initial replication.
- We replicated over 5 TB of data to the AWS cloud using a secure VPN connection.
- We have obtained a **successful "failback" replication**.
- It took about 20 minutes to get the servers required to run a complete, fully functional "Lucy" application on the AWS cloud, which is a truly impressive result.



8 Results

During the tests, our experts showed that the AWS Elastic Disaster Recovery solution meets the expectations set by the DZP client.

We obtained a shortened, compared to the expected, data replication time - the correct replication of **5 TB** of Lucy application data to the AWS cloud, carried out using a secure VPN link, took **3 days** (expected time: **5** days or more).

Project replication time



40% shorter data and application replication time to the AWS cloud.





Continuous data replication was maintained for several days. It worked stably, although there were short-term slowdowns of the process, with a delay of about a maximum of 2 minutes. Thanks to the tests, we were able to estimate the RPO parameter of 2 minutes.

The AWS Elastic DR service is very **cost-effective** due to the fact that the large replicated servers are not maintained continuously, but only run at the time of the DR environment startup (Pay as you Go purchase model). The resources necessary to maintain continuous replication are relatively small, so the costs of maintaining replication in the cloud are not significant.

As the tests have shown, thanks to the implementation, the client gains a largely automated, safe disaster recovery solution, and thus the level of high availability of the application is significantly increased.



9 Customer feedback

"We are positively surprised how efficiently and without any problems all the tests necessary to analyze the effectiveness of the solution were carried out. Especially the time to restore applications and data in the AWS cloud turned out to be impressive.

We appreciate the cooperation with LCloud - a partner of Advanced AWS, who put a lot of effort into the design and implementation of the solution. Thanks to fruitful cooperation, we validated the concept of increasing high - availability for our application for lawyers - Lucy. LCloud are professionals who understand the needs, goals and expectations of the client and efficiently transform them into technological solutions. We recommend working with them."

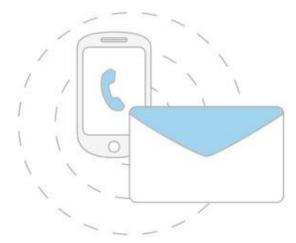
Marek Laskowski - CIO Domański Zakrzewski Palinka Sp.



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