DUOLOGIK

Disaster Recovery As A Service

The Case Study

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The subject company for this case study is a registered user of Duologik's managed disaster recovery as a service solution (DRaaS) which protects their business information systems and guarantees recovery within 4 hours of a disaster declaration. Duologik offers the fastest return to productivity at an affordable cost, supported by a team of experienced DR Specialists and Project Manager who is responsible for the day to day management of the client's DR Plan. The end result of the test shows that implementing just a backup solution is not sufficient unless you can restore; therefore, organizations need to consider recoverability to ensure business continuity.

Executive summary

This Case Study is based on actual experience and testing conducted for a client who is a registered user of Duologik's managed disaster recovery solution (DRaaS) which protects their business information systems and guarantees recovery within 4 hours of a disaster declaration. Duologik is responsible for the day to day management of the client's DR plan.

For this test case, Duologik was able to demonstrate that it can offer the fastest return to

productivity at an affordable and favorable cost with the support provided by its team of experienced DR specialists and project managers. It also provides an insight into the value of testing the DR preparedness of this specific client and the applicability to potential future clients.

Due to the confidential nature of this case study, the client's name and other details are not disclosed or published.

The purpose of this case study

This Case Study is an example of Duologik's capability to serve the DR needs of a specific client, using its tried and proven methodology. Benchmarked against industry standards such as COBIT and ISO processes, the extent and depth of a typical Duologik disaster recovery test are noteworthy.

The test is designed specifically to identify problems with the client's DR preparedness plans. The results provide the client's CIO and senior IT management with insight into the operational reliability of their IT systems. In this manner, corrective and mitigating measures are taken to improve day-to-day operations before shortcomings and deficiencies are discovered in a real, high-pressure emergency situation, with high probability to impact their production environment.

The DR test description

The Duologik test involved recovering the client's production systems at their private cloud based data center. The design of the test involved restoring 41 business critical servers with 8TB of data within 1 hour, 6 systems with 3TB within 2 hours and 80 more servers with 12TB of data within 4 hours, simulating a real-life emergency where the client would have worldwide access to operate from Duologik's cloud premises until the Client's production sites are rebuilt and fully restored.

The test was designed to be highly interactive, and involved several of the client's business units. Their systems would be down for the day and global production would stop. A total of 3 Duologik and more than 8 of the client's employees worked together for over 15 hours to meet the high expectation for the test to be successful. By no means is this a small job given the tight recovery time, size of data to be recovered and North American locations, where the data resides.

The client

As noted earlier, Duologik cannot disclose the client identity for privacy reasons. The client is a global brand with more than 8000 employees worldwide. They invested heavily in innovation, technology, quality and operational effectiveness to remain competitive. They're also a leading blue chip manufacturer.

The objective of the test
• Determine the client's preparedness for an IT emergency
• Enable a flawless recovery
• Provide the client with assistance and advice for resolution of issues discovered

The recovery test process and test results

The terms of Duologik's SLO (Service Level Objective) provides for the management of the client's images every hour based on their Recovery Point Objective (RPO). This target is established early during an assessment process and designed to evolve with the client's changing business needs.

Duologik technical team is ready around the clock to perform recovery services in the event of a Client's disaster. As in most well run IT departments and given the sensitive nature of the recovery call and process, only a high level executive is authorized to **declare a disaster**.

The test was conducted on a Saturday in November, 2016. At 6 a.m., the client's VP of Global IT called Duologik's emergency line and declared a disaster. Duologik subsequently went through its security protocol to boot up the client's systems and load their data.

The first 40 servers were fully available to the client within less than an hour. One large sever went through disk check during boot up and ended the recovery 2 minutes past the hour. The client's subsequent tasks were to open business critical applications and access data on these recovered servers on Duologik site.

The second set of servers was fully recovered in less than 3 hours. In summary, 40 systems were recovered under the 1 hour Recovery Time Objective (RTO), 1 system was 2 minutes over the 1 hour RTO and the final 80+ systems were recovered about 1 hour below the 4 hours RTO .

Results matrix:

Date	Data size	Expected recovery time	Servers to be recovered	Recovery results	Actual recovery time	Performance
Nov. 2016	8 Tb	1 hr	41	40 Servers	1 hr	Meet RTO
				1 Server	1 hr 2 mins	2 mins over
	3 Tb	2 hrs	6	6 Servers	2 hrs	Meet RTO
	12 Tb	4 hrs	80	80 Servers	3 hrs	Exceed RTO by 1 hr
Duologik recovered the client's systems in record time						

The client impact

The client experienced a number of technical issues during the test. These are briefly highlighted in Appendix A. Many of these issues were a function of the client's technical environment. The joint technical team comprising of Duologik and the client's consultants were able to identify and address many of these issues during and after the test.

Main findings from the test

Based on the test results, the main finding was that the client's environment should be further optimized for a proper and effective recovery. Duologik identified 15 items that could impede a real-time recovery and if fixed would improve RTOs, RPOs, ease of process and workflow documentation.

As noted above, these findings are shown in Appendix A.

Discussion of relevance of the findings to other clients reviewing the case study

It is essential that Duologik's DR services work seamlessly with the client's live production. This means the client has to be able to login into their systems and start working within the RTO target. However, the previously unknown internal deficiencies that surfaced from the client's systems, slowed the client's login on various applications, some of which are described below and the major ones took about 8 hours to fix after recovery. Even though these issues were unrelated to Duologik recovery process, Duologik helped the client in order to succeed with production restoration during the

DR test, and to learn the client's environment more intimately so both parties can be better prepared for a real disaster.

After lingering issues were corrected a few weeks later, the client was finally in a position to maintain their IT-recovery related risks at an acceptable level aligned with their business goals.

Cost

The estimated cost of the test was about $20,000 (labour costs included) which is well worth the endeavour compared to downtime in a real disaster. The effort for smaller tests ranges from a few hours to a day. Duologik can certainly provide a more accurate estimate based on their extensive experience once a client's environment is assessed and test workload understood.

Lessons learned from this case study

Surviving IT threats in a world of ruthless viruses and "authorized" hacking at the government levels is vital. Duologik urges clients not to stop at a good backup and recovery plan, but go further and test their entire systems in order to

ensure they are running during the test as they are expected to in production.

Periodic testing of DR initiatives should be a commitment at the CIO level or higher and test results should be requested and read to understand their constraints (if any) and capabilities.

Clients can better survive a disaster if they take necessary steps to build a principal, functional structure for effective governance and management of their business continuity plans.

Duologik recommends that a DR test be conducted **annually** to minimize risk of IT downtime and its negative impact on productivity.

Conclusions and recommendations

Proactive DR planning and testing is highly effective at minimizing and or eliminating the negative consequences of a real emergency, which could take weeks to recover from. Duologik has recovered clients who have lost files, production servers and entire systems. Recovery is required more often than anticipated.

Lower cost: Choose a flexible, OPEX model that is a consumption based with predictive costs.

Recovery pressure: It is very common for the stress and pressure of an IT disaster to adversely affect the performance of individuals. Such pressure could lead to human errors and possible chaos.

Depend on the expertise of a specialized services provider: Clients will get better resource utilization and specialized knowledge on backup, recovery and related process if they have the right DR partner.

Be cognisant of the risks in addressing IT planning and recovery internally: Some clients have come to understand that if an IT disaster is the result of an external attack (such as a Cryptowall virus) and the client IT staff try to run their own disaster recovery provision inside their IT perimeter (i.e. same network or another connected network), it is quite likely that an attacker would have connected to and destroyed the in-house protection as well.

Outsource the DR workload: An external provider with a snapshot solution is better suited to handle IT disasters for exactly these reasons. Working with a strong DR service provider, such as Duologik, for effective support and peace of mind is well worth the long term investment.

For many of its clients, Duologik is independent of the client's IT department, while essentially being an extension of the clients IT resource. Over the years, Duologik engineers have developed in-depth knowledge and expertise with the client's networks, systems and

application topology. Working closely with their management and staff in various geographies has given Duologik unmatched experience with the Client's IT culture and business practices that strengthened Duologik's ability to successfully execute a recovery at any given time.

Duologik's capability to substantiate the client's preparedness and recover from an IT disaster was clearly evident from the test. Duologik would certainly welcome the opportunity to extend these same capabilities to other potential clients.

The end result of the test shows that implementing just a backup solution is not sufficient unless you can restore; therefore, organizations need to consider recoverability to ensure business continuity.

About the authors:

Zoreena Abas is an entrepreneur with over 20 years of IT leadership experience and a strong focus on customer satisfaction. She received her MBA from the Richard Ivey School of Business, and an ICD.D designation in director leadership and corporate governance from Rotman School of Management.

Dr. Louis Shallal is an IT executive with extensive and diversified CIO level experience in information technology, strategic planning and engineering.

Jeff Cohen is a Disaster Recovery Specialist with over 15 years of experience in storage, networking, security systems and infrastructure.

Appendix A

An overview of some of the Technical Issues Encountered in the Test for this Case Study.

Issue	Details
DNS resolution issue in the client's test environment	The client needed to update the DNS servers in the test network to reflect the updated DNS servers (Domain Controllers in this case)
Citrix portal, experiencing extreme slowness	Later in the day of the test, the speed of navigating through the Citrix folders was very slow. Duologik checked farms configuration and removed servers that were not included in the DRP. Once cleared and restarted, applications access started in good speeds.
Citrix web interface slow	This was related to unavailable XML service on the Citrix farm which has servers that are not being brought up as part of DRP. The HQCTX servers have the XML service not installed on the HQLIC01 server. Performance of the web interface should improve once the HQCTZ servers are up and running.
Replication	SQL RPO missed by 15 minutes due to large delta which didn't replicate after snapshot was taken.
Trust/Password Issue	One server came up with a trust relationship issue due to server changing account password between the server RPO and the DC's. Rejoining the domain fixed the issue.
Windows 2000 Server came up with the wrong time	Due to ESXi reporting UTC+0 time and Windows 2000 not understanding "Hardware time" to match to actual time zone.
Secondary IP conflict in DR network	One is primary IP for a server and the other is a secondary IIS website IP.
Application access through Citrix is not functioning properly	Configuration file refresh required for the application to work on Citrix. The file was part of the application and required a refresh to work.
Server didn't update its DNS record dynamically	After boot up, manual update fixed the issue.
Servers boot up order missed	SQL server came up after application servers causing issues with parts of the application, required 4 application servers reboot.

Issue	Details
One server network adapter	Discovered that this application is proxied to an external site that is blocking DR external IP.
Web application did not work	Unable to work properly due to limited connectivity to badge panels.
Employee time system application	One web application was accessible, but Duologik was unable to authenticate suspecting that a hard coded domain controller IP inside the source code and unavailable to test it further.
Authentication issue	A license that requires a MAC mapping tested successfully after modifying the VM MAC address and reboot.
One server with OEM software	After boot up, manual update fixed the issue
Web application did not work	This was due to use of a user account from an older domain membership. Once updated to the new domain account application started working again.