



Landgate - Cloud Transition Case Study

The Landgate Land Titles system, which delivers Land Titles registration and searching capability to users, has been live on Amazon Web Services (AWS) for over a year processing all land registration transactions in Western Australia. It is a critical system relied upon for 99.98% of all registrations.

On the weekend of the 4th and 5th June 2016 NSW, and Sydney in particular, was hit by severe storms and at 3.47pm on the 5th AWS first warned of the outage affecting Elastic Compute in its Sydney Availability Zone (AZ) via its status page at 3:47pm, and an hour later confirmed the issue was related to a power problem.

The issue affected many services running in AWS including some notable companies who rely on online transactions for their business operations.

Landgate's Land Titles system was also affected by the outage but thanks to good architectural design based on business risk impact analysis, the system was only affected by the outage for just a short 4 - 5 minute database fail-over.

The CIO for Landgate, David Dans confirms that 'We can only estimate the 4 - 5 minutes from aggregated logs (it may have been shorter), as there were no staff required to recover the deployment - it was all (as designed) automatic.'

Landgate's decision to go to cloud

The decision to change core technology platform, especially to move from on premise to cloud is always a major decision and not one taken lightly. Landgate's decision was driven by business needs, a number of SWOT/TOWS analyses of the disruption taking place in the industry and a considered view of what Landgate would need from its technology to meet these challenges.

Building on an initial proof-of-concept and following an extended IT strategy and development planning process, Landgate determined it needed a significant rebuild of its information systems. A range of options, approaches, factors and constraints were considered and reviewed in the strategy development process. These options were reviewed and endorsed by Landgate's Corporate Executive, the Landgate Board and independently validated by external consultants.

Critically, Landgate also looked at business continuity elements from day one and this was baked into the architectural thinking both for the services they would acquire from any provider as well as the fundamental application design. Both security and resilience start at the design stage to derive the maximum benefit.

Well Architected Solution

In utilising AWS Cloud Landgate adopted the recommendations for "well architected" that AWS has espoused for years. Indeed, the Service Level Agreement (SLA) for AWS EC2 depends upon usage of more than one Availability zone. Landgate has since extended its recovery model to utilize an additional Availability zone now available.

Cloud architecture options provide a broad range of cost effective choices for the 4 pillars of enhanced Business Continuity

1. Reliability
2. Resilience
3. Redundancy and
4. Recovery

David Dans said, "It's important to consider failure at every point, and where possible, make use of data durability options where appropriate, and build in automatic retry, recovery, or re-launch from individual failures in a way that does not risk data integrity. Important decisions around where and how data is stored, encrypted, accessed and logged should be considered." As part of the solution, Landgate decided to use self-healing blob (object) storage and managed database services, holding data encrypted at rest and in flight, with strong authentication chains for system and user access.

This considered approach served Landgate well when the severe weather event impacted some of AWS data centre infrastructure in NSW in early June 2016. Landgate's failover mechanisms performed automatically and without human intervention – unlike some other large organisations. This level of resilience, redundancy and recovery would of course be possible in a physical on-premise deployment, but at significantly higher cost.

Western Australian Government agencies have in the past struggled to implement disaster recovery and business continuity capabilities with the [Office of Auditor General in 2014](#) stating that, "64 per cent of the agencies still did not have adequate business continuity arrangements."

Adoption of Cloud services and the advanced features allows cost effective implementation of DR/BCP and as seen in this case study can ensure that critical systems survive catastrophic outages and continue delivering the services they are created to deliver.

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