

Case Study: Airports Authority Of India Achieves Continuous Operations Despite Natural Calamity

The Comprehensive Planning, Recovery Automation, And Frequent Testing Of AAI And NIIT Technologies Delivers Results

by Naveen Chhabra
January 26, 2018

Why Read This Report

Infrastructure and operations (I&O) professionals get the importance of developing a comprehensive disaster recovery (DR) plan, testing it frequently, and automating it as much as possible. But firms in all countries and industries still suffer from lack of automation, limited scenario coverage, and infrequent recovery plan testing. How, then, can I&O pros meet the expectation of maintaining business continuity during a disaster? This report highlights the benefits that the Airports Authority of India achieved by diligent automation and frequent testing of recovery planning and execution.

Key Takeaways

Planning And Rehearsals Prepare You For A Stormy Day

Practice makes perfect. Your ability to recover from an outage depends on how comprehensively your plans capture potential disaster scenarios. Your ability to manage a disaster situation depends on how often you test for recovery, how successful those recovery rehearsals are, and how quickly you implement the lessons learned from failures. Every intermediate planning step prepares you to act fast and recover in a well-coordinated manner.

Automated Recovery Workflows Define Your Direction And Speed

The business expects you to deliver uninterrupted services. Automated recovery workflow is the only way to deliver the necessary recovery speed in the right direction.

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Dependence On Technology Is Growing, Yet Few Firms Are Resilient

Global weather patterns are more unpredictable than ever. Firms continue to experience costly technology outages due to catastrophic weather events like cyclones, hurricanes, floods, and tornados.¹ Forward-thinking I&O pros need to account for such disasters in their planning and proactively prepare a comprehensive DR plan — yet most do not. I&O pros lag because they don't document every possible recovery plan corresponding to disasters that can hit them.² Two-thirds of I&O pros test their recovery plans annually or less frequently.³ Even though businesses increasingly rely on technology and know that long outages can cost them dearly, they don't leverage automation tools and procedures for speedier recovery.⁴ As a result, only a slim majority feels prepared for major disruptions.⁵

Situation: Chennai Airport Was Underwater And Quickly Losing Power

On December 3, 2015, Chennai experienced its heaviest rainstorm in a century. Massive flooding submerged the entire city, incapacitating its infrastructure.⁶ At Chennai International Airport, water not only engulfed the tarmac and bays, but the entire facility, blocking any movement in or out; the airport quickly lost power. In the Chennai data center, the Airports Authority of India (AAI) runs a highly critical application, the airport management system (AMS), for functions including airport operations, passenger service, airline communication, and revenue generation.⁷ If this data center loses power and connectivity, AMS goes down, and airport operations must resort to daunting manual processes to manage their facilities. Hence, recovering this business-critical application is imperative; all operations teams must race against the clock to deliver seamless service to all stakeholders. AMS is regarded the lifeline of airport operations, as it:

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- › **Serves multiple airports.** Hosted in a multitenant fashion, AMS, which delivers services to 10 airports via its centralized facility in Chennai, is the nerve center of the airport operations control center (AOCC) at all 10 airports. The Chennai data center hosts the primary instance of AMS; the recovery home is in Kolkata.
- › **Is key to operational safety.** Air traffic control (ATC) communicates with pilots to inform them about what gates and runways inbound and outbound flights should use. ATC allocates gates to aircraft depending on factors like their type, size, arrival or departure time, and whether the gate is equipped to handle the aircraft. The system typically automates this resource allocation to avoid mistakes.
- › **Provides passengers with real-time updates.** All passenger communication — such as information regarding flight times, departure gates, and baggage carousels — depends on the data reported through AMS.
- › **Accurately reports resource usage data for airlines to settle payments with AAI.** Airlines are charged for the resources they use. AAI tracks the utilization of resources like aerobridges, bays, carousels, check-in counters, gates, hangars, and lounges for billing purposes. AMS holds this data and is used for communication with the airport operations team. Airlines also use AMS to review operational key performance indicators (KPIs) like on-time performance, ramp congestion, rescheduled or swapped flights, and arrival and departure information.

Approach: Comprehensive Planning, Automation, And Frequent Testing

In June 2013, AAI issued a request for proposal to build and operate the airport operations service for seven years.⁸ It selected systems integrator NIIT Technologies (NIIT) to implement AMS and establish AOCC at all 10 airports. AAI decided to run AMS in multitenant mode at its Chennai data center and chose Kolkata as the recovery site, with NIIT operating the data center.

AAI Needed Availability, Disaster Preparedness, And Quick Recovery

The AAI team worked with NIIT to develop a comprehensive DR and business continuity plan, ensure recovery readiness, and prepare to handle any outage. This plan had several components; to achieve its goals, AAI started by:

- › **Clearly defining service-level agreements (SLAs) for availability.** AAI had clearly articulated expectations of availability KPIs — both at the application level and at the level of every infrastructure component. It worked with the provider team to identify possible failure scenarios, response plans, and testing frequency. For example, it stipulated that the AMS application should be have 99% uptime — meaning that it could face a total downtime of about 15 minutes every day.

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- › **Enforcing the execution of quarterly test drills and saving the results for audit.** AAI demanded that the systems integrator test its DR preparedness on a quarterly basis, document every DR test, and retain DR drill results.⁹ These drill results had to be available for audit purposes and to measure sustainable operations.
- › **Improving its recovery readiness.** AAI improved its recovery readiness.¹⁰ It stipulated that DR test results must prove that they were successful 100% of the time. Every time the NIIT operations team runs the DR test, the DR site should run the active instance for 48 hours before it swings the primary instance back into service. This forces the systems integrator to update the DR setup every time there is a change in the production environment.

The Systems Integrator Upped The Ante By Preparing For Even More Stringent Timelines

The solution included building redundancies to handle local failures. To address the recovery scenarios, the NIIT project team prepared for even more stringent recovery targets than AAI specified. It developed the processes to align to AAI's demands, and its operations team prepared to handle any recovery operation by making sure it was able to:

- › **Beat the recovery time SLA by automating the recovery workflows.** The operations team had to comply with recovery times ranging from 15 minutes to 24 hours depending upon incident severity. Even a 60- to 90-minute outage would cause an inconsistent experience at various levels for all stakeholders, so the team decided to automate recovery procedures regardless of incident severity. Automation ensured that a site failure could easily be recovered in less than 15 minutes.

“A disaster like the Chennai flood has a severe impact on the availability of human resources. A time-tested DR plan is effective when it manages all possible breakpoint scenarios through intelligent automation rather than depending on human action.” (Arvind Mehrotra, president of infrastructure management services, NIIT Technologies)

- › **Achieve the lowest possible recovery point.** Minimizing data loss is critical to delivering a consistent experience. Therefore, the team envisioned a regular sync in near real time, if not real time. The project team developed the solution with a production data sync frequency of once per minute, and the operations team maintained a close watch on this KPI.
- › **Validate all dependencies in runtime.** The teams coordinated through the recovery procedure and validated infrastructure dependencies like database and network availability and configuration during runtime. This ensured faster recovery, shorter recovery times, and the absence of last-minute surprises.

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Results: AAI Airports Continued Business Operations Despite Calamity

The Chennai flood was a severe test of the recovery planning, testing, and simulation exercises that the teams had prepared in anticipation of a real event. Real recoveries can also take nasty turns, as a single misstep or minor failure in the recovery progress can result in a blackout. In the event, the various operations groups at the airport scrambled to manage the severe situation and contain its losses. To manage the technology ecosystem, business-critical services, and stakeholders, AAI and the NIIT Technologies operations team:

- › **Triggered the recovery workflow.** The tech operations team geared up to execute its best practices and pull the trigger for the final run; each team member was on a hotline, keeping a close watch on the progress. They triggered the workflow for an orchestrated recovery effort. The recovery instance of the AMS application went live in the Kolkata data center within 11 minutes. While the Chennai airport was out of commission, the fully operational AMS at the Kolkata recovery data center continued to serve the other nine airports.

“The Chennai deluge was sudden, but none of the airports lost AMS services. This ensured uninterrupted airport services — as if nothing had changed — while the Chennai airport took time to resume normal operations.” (S.V. Satish, executive director of IT, Airports Authority of India)

- › **Were ready for surprises and applied out-of-the-box thinking.** Every incident offers some lessons, and this one was no exception. On the day of the event, the MPLS network of both the primary and secondary network providers went down. In the absence of enterprise network connectivity, the teams looked for an innovative solution, ultimately making the connection via the mobile phone network. Keeping its sights on quick recovery, the network operations team successfully connected the primary and recovery sites using the mobile network and failed over the entire application to that network.

What It Means

Disasters Can Happen Anywhere — You Must Be Ready

Disasters come in many forms, their impact can vary widely in scope, and they happen everywhere. It could be a natural disaster like the Chennai floods or it could be the result of human (in)action, whether malicious or accidental. As we were preparing this report, new headlines announced a fire that took Atlanta’s Hartsfield-Jackson International Airport (the busiest in the world) off line for a full day and an Amtrak train derailment south of Seattle that resulted in multiple fatalities and business disruption.¹¹ Unlike the Chennai incident, the Atlanta and Amtrak events were preventable. As the Boy Scout motto says, “Be prepared.”

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Supplemental Material

Companies Interviewed For This Report

We would like to thank the individuals from the following companies who generously gave their time during the research for this report.

Airports Authority of India

NIIT Technologies

Endnotes

¹ Source: "Billion-Dollar Weather and Climate Disasters: Table of Events," National Centers for Environmental Information, 2017 (<https://www.ncdc.noaa.gov/billions/events/US/1980-2017>).

² Seventy-seven percent of respondents said that they update the business impact analysis annually or less frequently; 70% update the risk assessment annually or less frequently. See the Forrester report "[The State Of Business Technology Resiliency, Q2 2017.](#)"

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- ³ Sixty-five percent of respondents said that the frequency to test recovery plans is annually or less frequently. See the Forrester report "[The State Of Business Technology Resiliency, Q2 2017.](#)"
- ⁴ I&O pros need to take a comprehensive look at the cost of downtime using a comprehensive calculator. See the Forrester report "[Identify And Estimate The Costs Of Downtime On Your Business.](#)"
- ⁵ Fifty-five percent of respondents feel either prepared or very prepared to recover from a data center or sitewide outage. See the Forrester report "[The State Of Business Technology Resiliency, Q2 2017.](#)"
- ⁶ Chennai International Airport flooded as the region broke a 100-year-old rainfall record. Source: "5 Pics: Chennai Airport Flooded, Flight Operations Suspended," NDTV (<https://www.ndtv.com/photos/news/5-pics-chennai-airport-flooded-flight-operations-suspended-21068#photo-267828>).
- ⁷ AAI chose SITA's next-generation AMS to transform operations at 10 airports across India. Source: "SITA to transform operations at 10 more airports in India," SITA press release, September 26, 2013 (<https://www.sita.aero/pressroom/news-releases/sita-to-transform-operations-at-10-more-airports-in-india>).
- ⁸ AAI awarded the contract to NIIT Technologies to build and operate the AMS and AOCC for AAI. Source: "Airports Authority of India and NIIT Technologies launch multi-airport AOCC at Chennai Airport," NIIT Technologies press release, July 2, 2014 (<http://www.niit-tech.com/news-events/news/airports-authority-india-and-niit-technologies-launch-multi-airport-aocc-chennai>) and "NIIT Technologies wins Rs. 344 crore contract from Airports Authority of India," NIIT Technologies press release, April 25, 2013 (<http://www.niit-tech.com/news-events/news/niit-technologies-wins-rs-344-crore-contract-airports-authority-india>).
- ⁹ I&O pros should frequently test both the recovery plan and the recovery site infrastructure. Only 19% of the respondents said that they conduct tests every six months or less. Testing, both continuous and after a major change, are key to recovery readiness. It helps find cracks in the plan that could lead to failure otherwise. See the Forrester report "[The State Of Business Technology Resiliency, Q2 2017.](#)"
- ¹⁰ For more on the concept of recovery readiness, see the Forrester report "[Develop Insights Into Your Recovery: A Recovery Readiness View.](#)"
- ¹¹ Atlanta's busy Hartsfield-Jackson International Airport was completely shut down for 11 hours on December 17, 2017. Source: Julia Horowitz, "Atlanta airport mess: How does this happen?" CNN Money, December 18, 2017 (<http://money.cnn.com/2017/12/18/news/atlanta-hartsfield-jackson-power-outage-cause/index.html>).

Early on December 18, 2017, an Amtrak train derailed on its inaugural run from Seattle to Portland. Source: Jon Ostrower, Joe Sterling, and Ralph Ellis, "At least 3 dead in Amtrak derailment in Washington state, official says," CNN, December 19, 2017 (<http://www.cnn.com/2017/12/18/us/amtrak-derailment-washington/index.html>).

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