



High Capacity Enrollment and Authentication Solution for the Unique Identification Authority of India

Client

The Unique Identification Authority of India (UIDAI), established by the Government of India, is mandated to issue a unique identification number (called Aadhaar or UID) with associated biometric data to all residents to allow them to identify themselves anywhere in India, and to access a host of benefits and services.

Here is how LTIMintree helped the UIDAI develop a solution that could ramp up to support enrollment and authentication at a massive scale.

Challenges

The UIDAI required a one-of-a-kind enrollment and an authentication system capable of meeting the needs of 1.2 billion residents of India. Such a system was necessarily complex and called for innovative technology solutions. Key customer requirements included the following:

- UID enrolment: Ability to scale up to 100 million UIDs; process 1 million UID per day and sustain hourly throughput for 20 hours
- UID Authentication: Ability to handle 10 million authentication requests per day and sustain hourly output for 10 hours
- A dedicated production-like test environment for the project's colossal data generation needs
- Ascertaining all crucial components within the system could not only survive the high load but also deliver expected throughput consistently
- Monitoring and analyzing high volume I/O transactions across multiple storage centers
- Accurately measuring the scalability of big data systems
- Coordinating with multiple stakeholders, distributed across states


LTIMindtree Solution

LTIMindtree collaborated with the customer to develop two sub-systems: one sub-system to process enrollments, and the other to take care of authentication.

We focused on meeting SLAs and set up an elaborate and independent testing process. This 'Performance Characterization' exercise was carried

Business Benefits

- Built a robust system capable of processing 1 million enrolments and 10 million authentication per day
- Accelerated seeding process through reusable tools
- Delivered 8x improvement in response time for one sub-system
- Successfully met 40% higher than expected processing load for the other sub-system



out in multiple phases for the two primary applications called Enrollment Server (ES) and Authentication Server (AS). Altogether, we followed a five-phase approach:

Planning

We considered each application component and identified performance metrics associated with it; then devised a workload model built around real-time data.

Test Preparation

This phase included setting up a test environment with high-end infrastructure and preparing tens of millions of seed data points. Test data was created for enrolment servers as well as authentication servers.

Test Execution

During the execution phase we conducted tests and monitored performance. For example, for authentication servers we conducted load tests targeting 10 million authentications within 10 hours.

Tuning

Following successful text execution, the team carried out multiple rounds of tuning and refining.

Reporting and tools

Finally, we collated approximately 60 metrics at the application level and system level for reporting purposes. A one-click tool was created to process and generate different types of graphs from raw data. Further, a comparison report was used to showcase the improvement in performance following application tuning.