



## Network Emulation Case Study

*AXA Technologies Proof of Concept Successful with the Anue Network Emulator*

### Summary

The AXA Group, ranked #15 on the Fortune Global 500 list, is one of the world's largest insurance companies with over \$1 trillion of assets under management. AXA's operations are dispersed geographically, with major operations in Europe, North America and Asia. AXA Technologies, the technology provider for the AXA group of companies, launched a proof of concept to validate that their data center storage and recovery plan would meet its business' requirements.

"The Anue Team's expertise and technology were a key part of the success of our project. By implementing Anue's recommendations and leveraging the full feature set of the device, we were able to validate the solution on multiple levels. We're now going to deploy our data center consolidations worldwide with the assurance that we'll meet all of the business requirements."

-Hugo Espinoza  
AXA Technologies

### Customer Profile

As the AXA group grew, so did their data needs. Motivated by the business requirement to have real time data backups and recovery instead of doing tape backups, AXA Technologies initiated a proof of concept study to establish that real time backup and recovery between geographically disparate data centers would be successful.

With limited time to roll out the POC, the team had to identify a way that they could fully test the plan without the cost and time required to use actual network connections between data centers.

### Customer Initiative

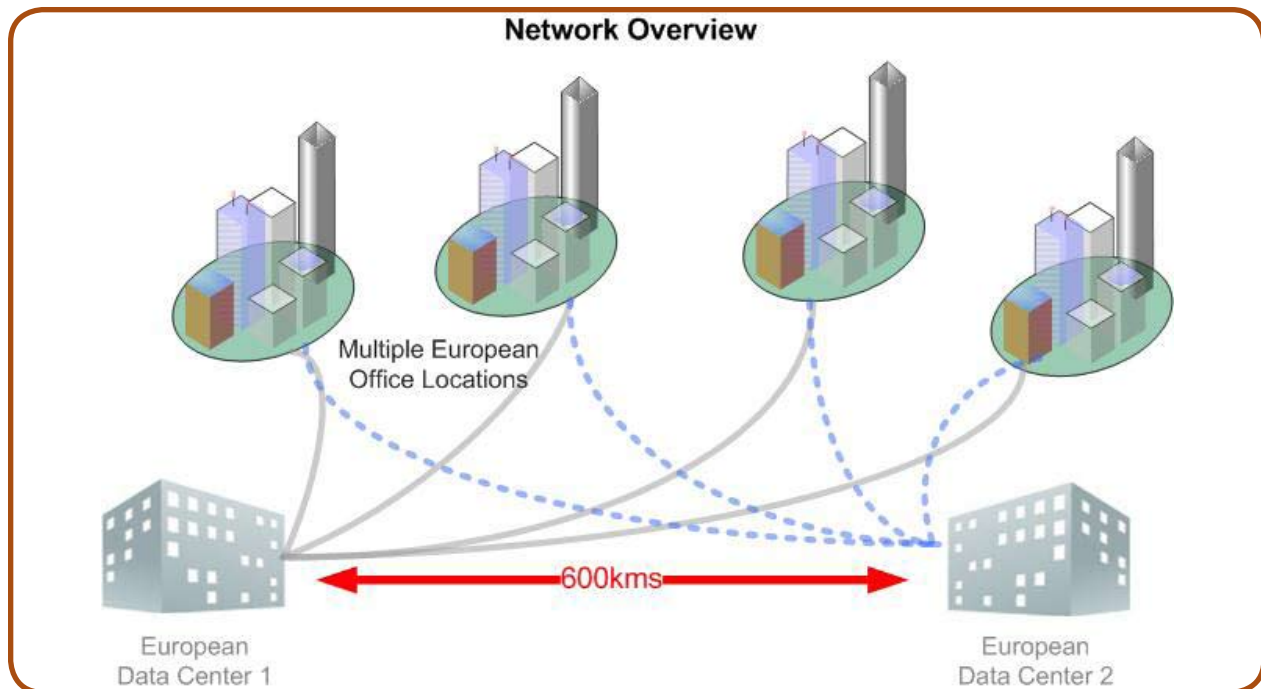
To streamline data storage and recovery processes the goal was to consolidate to four regional data centers worldwide. In addition to running the applications that handle the core business, these data centers would also function as remote disaster recovery sites. Before undertaking this project, they needed to validate that their business requirements would be met, as well as, test new technologies to be deployed as part of the solution.

1. Test the results of real-time I/O operations including backups (and recovery) to a new data center 600km away from the primary datacenter.
2. Assess both synchronous and asynchronous data backup processes.
3. Verify that the service provider's service level promise between data centers is sufficient.

## Solution

### Strategy

Working with the Anue Systems Professional Services group, the team detailed the configuration of their different data centers and then designed a test plan that would allow them to measure application performance between data centers under multiple network condition profiles. The POC setup, shown below, utilized Hitachi Universal Replicators (HURs), two routers and two Ethernet switches.



The process was as follows:

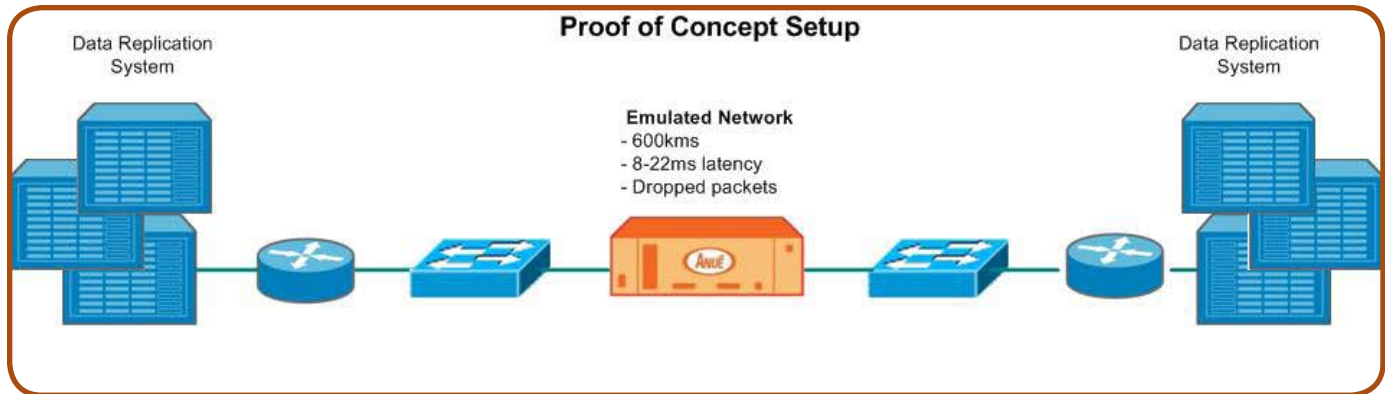
1. Create a virtual environment that will precisely emulate the conditions of the new network.
2. Establish pre-move baseline performance levels.
3. Inject projected latency and impairments into the virtual network environment.

### Data Backup and Recovery Validation

The AXA Team implemented the following as a baseline network profile for testing purposes:

- 600 Kilometer distance
- 12 Millisecond latency in each direction
- 500 Megabit bandwidth
- 64KB data drop threshold





Then, the following impairments/scenarios were tested to represent real world network conditions/possibilities:

1. Link Failure
2. Packet drops/lost
3. Cyclic Redundancy Check (CRC) corruption
4. Frame duplication
5. Simulation test 2, 3, and 4 in parallel

For each scenario, AXA and Anue observed and documented the HUR behavior, including verification of its ability to recover from the error condition, and ensured that data had been copied to the remote site.

### Service Level Validation

In addition to the test strategy for the proof of concept, AXA Technologies wanted to ensure that the service level for latency assured by their carrier would not impact the system. They checked with their carrier, France Telecom, on the amount of latency that was "guaranteed" between the two locations 600km apart. The service guarantee was only 22ms! Therefore, the network engineers increased the delay setting on the Anue Network Emulator from 12ms up to 30ms, to cover 22ms from the carrier plus 8ms from their own switches and routers.

In their testing, they gradually upped the delay amount to 40ms, in order to safely validate that their backup storage solution would perform acceptably under their service level guarantee.

### Customer Value

In record time the teams were able to confirm that the deployment of the new data center and their backup methodology would meet their business driven requirements, including: acceptable transaction response times, successful recovery from errors, and data integrity. The successful testing with Anue Systems of the new data center connectivity and backup mean that AXA's worldwide project could move forward with the assurance that the technologies and architecture will perform as required.