CU*ANSWERS HIGH AVAILABILITY PROGRAM REVIEW

EVENT DATE(S): 3/9/2025 – 3/16/2025

SUMMARY

As part of an ongoing business continuity program, CU*Answers actively maintains a high-availability (HA) core processing environment with near real-time data replication between identical hosts located at two geographically dispersed, state-of-the-art data centers. A minimum of twice each year, live HA rollover events are scheduled to redirect CU*BASE production and operations to the secondary data center (located in Yankton, SD) for a period of one full business week or longer. At the conclusion of the rollover event, core processing is redirected back, and operations resumed at the primary data center (located in Kentwood, MI).

These live production HA rollover events are invaluable to ensure the ability to recover CU*BASE GOLD core processing in an effective and timely manner when unexpected incidents occur that threaten to disrupt business operations. A secondary benefit of regular scheduled rollovers is to allow time to bring production systems offline without incurring downtime for users, so that planned maintenance tasks can be performed. This helps to ensure peak system performance and the application of applicable software and security updates.

The CU*Answers Spring HA rollover was performed as planned, starting on Sunday, March 9th through Sunday, March 16th, lasting one week with minimal challenges or issues observed.

The objectives of the spring HA rollover centered around three primary goals:

1. Testing the functionality and performance for soon-to-launch CBX (web-based GOLD) from both the primary and secondary web server pools with connectivity to the HA host,
2. Testing of the CTE (Custom Training Edition) library environment, previously unavailable during HA rollovers, and
3. Additional testing of performance and network latency for third-party applications including RTP® and the FedNow® service with core processing production from the secondary data center in Yankton, SD.

All goals and objectives were met. The data collected from this exercise will be extremely helpful in our continued planning and implementation of the new data center in Las Vegas, NV which seeks to serve credit unions west of the Rockies. In fact, part of the testing described below includes CBX web servers and infrastructure which will be relocated later this Summer to the new data center in advance of the CU*Answers Fall HA rollover.

The remainder of this report reflects the details of the event, challenges observed, and continuing efforts to improve the HA rollover process, given the significance it plays in ensuring availability of CU*BASE core processing during potentially disruptive scenarios.

All times noted in this report are Eastern Time.

EVENT DETAILS AND TIMELINE

One objective not mentioned in the section above but included all in rollover and recovery exercises is the understanding that any disruption or downtime has a unique impact for credit unions and their members across each time zone. Scheduling and performing each rollover on systems in the eastern time zone early on a Sunday morning results in potential interruptions for members in the Pacific or Hawaii time zone later Saturday evening. This is compounded each March during the Spring HA rollover with Daylight Savings time change during either the rollover or rollback dates.

A project has been launched in 2025 to remediate this by deploying a new production data center in Las Vegas to serve credit unions west of the Rockies. This will allow planned maintenance activities to occur during low-traffic windows, reducing the impact to members in the region. It is expected that credit union will operate live on systems at the new data center in late 2025 or early 2026.

Timeline of events:

Sunday, March 9th

On the morning of Sunday, March 9th, beginning at **3:00 AM ET**, teams initiated the procedures to bring CU*BASE subsystems offline and start the process for the high availability rollover. At **3:11 AM**, after pre-roll checks were completed, the official role-swap process began. This is the stage of the rollover process where PROD and HA (aka Source and Target) trade places, lasting approximately 20 minutes. The server at the Yankton, SD, becomes the CU*BASE production host, and all core processing network traffic is directed at it for the duration of the rollover period.

At **4:05 AM**, all data integrity checks were completed and subsystems back online. Teams began performing application testing. By **4:17 AM**, all tests had completed, and nightly processing (EOD/BOD) resumed for all time zones at the secondary data center in Yankton, SD.

Wednesday, March 12th

On the morning of Wednesday, March 12th, traffic for the CBX alpha/beta test group was redirected to the secondary web server pool at the Grand Rapids, MI, data center for a period of 24 hours. This server pool will eventually be relocated to the new Las Vegas data center later this summer. This gave teams an opportunity to test the functionality and performance of the servers, load balancers, and web application firewalls, as well as test for any changes in network latency. All tests were successful. CBX traffic was redirected back to the production web servers on the morning of Thursday, March 13th.

Sunday, March 16th

On the morning of Sunday, September 22nd, beginning at **2:50 AM ET**, teams initiated the procedures to perform the HA rollback. At **3:13 AM**, after pre-roll checks were completed, the official role-swap process began. At **3:57 AM**, all data integrity checks were completed and subsystems back online. Teams began performing application testing. By **4:05 AM**, all tests had completed, and nightly processing (EOD/BOD) resumed for all time zones at the primary production data center in Kentwood, MI.

CHALLENGES AND CONTINUING EFFORTS

Technology and system processes are always changing and evolving. As a result, there is an opportunity to learn and improve with each HA rollover performed. In this report, the challenges and continuing efforts are shared with all interested parties as evidence of the value received. During this exercise, the following challenges were observed:

1. During the HA rollover on Sunday, March 9th, teams were not able to connect to the remote host via the HMC (Hardware Management Console). This access is instrumental in low-level system administration tasks included binding the appropriate IP address to the correct subsystems and services.
   - Initial triage did not provide an obvious root cause. A manual workaround method was deployed to minimize downtime and complete the rollover process.
   - Once completed, teams returned to identifying and correcting the issue. Security controls around HMC access and connectivity are very strict, due in part to the nature of the tasks performed. In this scenario, a legitimate and authorized connection (internal iSeries Administrator) was being dropped. Once verified, the control was fine-tuned, and connectivity restored.
   - This is another example of the growing range of skills and expertise required for each high-availability rollover exercise. With the continual expansion and complexity of the network at large, combined with the ever-changing threat landscape, a high level of orchestration and collaboration from teams across the organization is required.

2. While bringing subsystems up after the initial rollover, an automated task at a credit union was persistent in attempting to connect and authenticate for access to the data warehouse, interrupting the sequence of events to bring CU*BASE back online.
   - A control was put in place to temporarily block the connection until the system was fully online and ready for transactions.
     - With the advancement of automation tools (including AI) and APIs, teams are observing a higher volume of traffic at times traditionally reserved for planned maintenance activities. This is further complicated with processing occurring across six time zones. The installation of the Las Vegas data center and second production host later in 2025 will help reduce this challenge and provide local access for credit unions in the region.

3. On Monday, March 10th, following the initial rollover, two credit unions that had recently converted to CU*BASE were unable to connect to the HA host.
   - Teams worked with the IT support teams at each credit union to apply the appropriate network routes and firewall access rules to restore connectivity.
     - In advance of each HA rollover, announcements and alerts are provided with instructions for testing connectivity to the secondary site.
     - Communications and preparation procedures for future rollovers will include additional action items for newly converted credit unions to confirm connectivity to the HA data center.

4. On the morning of Tuesday, March 11th, reports were received from multiple credit unions with API connectivity issues for Instant Card Issue since the rollover started.

- All impacted credit unions were instructed to add the IP address of the HA host to their DNS servers and clear the connection queues. The issue was not reported again for the remainder of the rollover event.

5. During the rollback on Sunday, March 16th, teams observed approximately 156 ICI (Instant Card Issue) messages in the process queue on the HA host that had not replicated to the PROD host.
   - Once the rollback was complete, teams copied over all remaining messages and processed them manually.
   - The interdependencies of the subsystems that make up 24/7 core processing is a delicate balance when actions are taken to manually bring systems offline. Integrity checks are in place, such as the one noted above, to identify any inconsistencies and correct them prior to bringing systems back online.

6. Also, during the rollback, a similar issue occurred with the incorrect IP address binding to the ISO/EFT subsystems when attempting to bring them back online for connectivity to third party vendors.
   - This was corrected by bringing the ISO subsystems and replication down, releasing the IP addresses, and bringing them up one at a time.
   - This was likely due to the manual process required during the initial rollover.

CLOSING REMARKS

Once again, the value that these regular high-availability rollovers provide is instrumental not only in the prevention and preparation for disruptive incidents, but also in the planning and implementation of new technologies as the core data center environment evolves. Major projects for 2025 include the full launch of CBX (web-based GOLD) as well as the build-out of a new production center in Las Vegas. This production center will host the systems to serve credit unions west of the Rockies, as well as host the new HA environment for the Gran Rapids production center starting in 2026.

With each change, additional testing is required. Through stress testing and forcing failovers between redundant systems, we are able to better design the technology layer that we soon host the products and services of the future.