

CU*ANSWERS HIGH AVAILABILITY PROGRAM REVIEW

EVENT DATE: 9/13/2015 – 9/23/2015

SUMMARY

As part of an ongoing business continuity program, CU*Answers actively maintains a high-availability (HA) core-processing environment with real-time CU*BASE/GOLD data replication between identical hosts located at two geographically dispersed, state-of-the-art datacenters. A minimum of twice each year, HA rollover events are scheduled to redirect core-processing and operations to the secondary datacenter (located in Muskegon, MI) for a minimum period of 72 hours. At the completion of each event, core-processing is redirected back and operations resumed at the primary datacenter (located in Kentwood, MI). These HA rollover events are invaluable in our effort to validate our procedures and ensure our ability of recovering CU*BASE/GOLD core processing in an effective and timely manner.

Procedures followed during this rollover exercise were similar to the previous event, performed on April 12-15, 2015. Each of these rollover exercises brings with it a unique set of circumstances and challenges, but common among them are the goals and objectives of a successful continuity and recovery program.

Notable characteristics of this event include:

- Typical rollover periods are scheduled for three business days. This rollover event was scheduled for ten consecutive days so that scheduled network maintenance could be performed at the primary datacenter without risk of downtime to CU*BASE/GOLD core processing.
- This rollover event began on the same day (9/13) of the CU*BASE/GOLD 15.2 beta release in addition to significant software updates to online and mobile banking platforms.
 - The number of upgrades and events that occur on a regular basis have reduced opportunity windows to perform isolated HA rollover exercises. Combining these types of events has become the norm and challenges us to consider and prepare for potential uncertain outcomes.
- This is the first rollover event scheduled since the completion of the ATM/Debit card encryption project with third-party EFT vendors.
- In an effort to expand the pool of available skilled and experienced recovery team members, one new participant from the Network Services Team was added.
- Third-party EFT vendors were notified prior to the HA rollover process, reducing the time required to resynchronize host communications (with one exception noted below).

The following sections identify any challenges observed, lessons learned, and recommendations for consideration related to this event.

EVENT DETAILS

On Sunday, September 13, at 10:00 PM ET, the production host was taken offline and rollover procedures initiated. By 10:40 PM, recovery teams began testing core-processing applications on systems at the secondary datacenter. At 10:52, all applications were confirmed and CU*BASE/GOLD brought online.

On Wednesday, September 23, at 9:58 PM ET, the rollback process was initiated bringing CU*BASE/GOLD core-processing back to the primary datacenter. This process was completed and systems back online by 10:48 PM.

CHALLENGES

As we continue to expand and improve our products and services to a growing client network, systems and environments experience an increased number of changes at a rapid pace. Performing these rollover exercises in a planned, controlled setting during non-peak business hours is a small investment to best prepare us should the need arise under less optimal conditions to perform a true recovery during an unplanned disruption.

Maintenance windows necessary to perform these rollover events continue to shrink as more daily tasks are required of system operators. It is important that we continuously seek ways to improve processing efficiency through automation and managed productivity, while at the same time become even more creative in testing our operational resilience.

Due to the nature of these 'live' rollover exercise (redirecting production traffic from 200+ credit union locations to systems at the secondary datacenter), some challenges and issues are to be expected (identified below). By following test-verified procedures and processes, recovery teams were able to meet and exceed expectations, minimizing the impact to the network at large.

- Network connectivity following rollover to secondary datacenter.
 - On the morning following the initial rollover, support calls were received from three credit union sites reporting that they were not able to connect to the HA host.
 - For networks that are not managed or controlled by CNS, it is important that strict adherence is applied to published standards and best practices regarding connectivity to the CU*Answers primary and secondary datacenters.
 - DNS configuration:
<https://kb.cuanswers.com/cuanswers/consumer/kbdetail.asp?kbid=3574>
 - IP Routing configuration:
<https://kb.cuanswers.com/cuanswers/consumer/kbdetail.asp?kbid=3572>
- On the morning following the initial rollover, early CU*BASE/GOLD users attempting to log in were presented with an error message indicating that the GOLD version was not current.
 - The error condition was created during the GOLD Beta release process earlier that day (incorrectly configured GOLD Release Control File) and not directly related to the HA rollover event.

- CU*BASE user profile beginning with “Q” not replicated to HA host
 - On Monday following the rollover, it was reported by one credit union that one staff member was not able to login to CU*BASE/GOLD. It was discovered that the user profile did not exist on the HA host. Since many IBM system user profiles (unique to each host) begins with “Q”, these profiles are not replicated by default. Each profile beginning with “Q” must be flagged by the IBM System Administrator whether or not to replicate.
- Purged library file discovered on PROD after the rollback
 - On Thursday morning following the rollback to PROD, an audit process reported a newly created QUEARYAU file with default authority permissions that did not exist prior to the initial rollover. Since many IBM system files unique to each host begin with “Q”, replication and deletion setting must be set individually.
 - This file had been deleted on PROD prior to the rollover as part of a deconversion project. This library file was not configured for deletion on the HA host (control process in place to prevent unintentional deletion). During the rollover process when HA assumed the role of primary host, the replication process determined that the file did not exist on PROD and created it. Once detected, the file was manually deleted on both hosts.
 - The creation of this file with default authority permissions in the production environment is also considered a security incident and has been processed accordingly by the CU*Answers Internal Network Team. The library file contained sensitive member data from a previously deconverted credit union and was potentially exposed to all authorized users on the CU*BASE platform for a brief period of time until detected by an automated security audit process. System logs indicate that the contents of the library file were not disclosed to any CU*BASE user (no unauthorized access).
- Network communication disruption for EFT vendor (FIS)
 - On the evening of the rollback (Wednesday) an Operations Team member contacted an operator from FIS to restart services on the remote host to restore connectivity (standard HA rollover procedure for this vendor). The FIS operator experienced a delay in attempting to escalate the request to an authorized team member resulting in a 10 minute extension for FIS network connectivity. During the disruption, all applicable transactions were processed as per the vendor “stand-in” configuration.
- Missing iSeries Daily Reports following HA rollover
 - It was reported that iSeries Daily Audit Reports for Sunday, September 13, were not present in the appropriate OUTQ on the morning following the initial rollover. These reports provide activity for auditing purposes unique to each host. Typically generated each morning for the previous day’s activity, this report was generated on the evening of the rollover.

CONTINUING EFFORTS AND RECOMMENDATIONS

Whether planned or unexpected, each recovery test and high-availability rollover exercise provides us the opportunity to continually improve the process and adjust our procedures. The best way to accomplish this is to “Practice. Learn. Repeat”. The following is a list of action items and projects relative to this rollover event that we are pursuing to get us closer to that goal:

1. On the morning following the initial rollover, all but three of the 200+ credit union branches were successfully redirected to systems at the secondary datacenter without the need for additional support. We will increase the frequency of our communications campaign to educate and remind clients on the requirements and importance of complying with standard network configuration settings for connecting to CU*BASE/GOLD as well as procedures for testing at the credit union.
2. We have reviewed the process for configuring replication of files and objects in light of the challenges observed with those beginning with "Q". In addition, daily/weekly audit procedures have been modified to confirm proper configuration settings and compliance.
3. We have reviewed and revised rollover procedures to ensure that iSeries daily audit reports are completed and printed prior to the rollover process.
4. We will continue to work with third-party EFT vendors to improve the recoverability of network communications and minimize downtime during high-availability and recovery events.
 - a. We will continue to be proactive in communications prior to the HA rollover events in an effort to minimize downtime.
 - b. The scope of future HA rollovers will be expanded to include the redirection of network traffic to the secondary datacenter for those vendors who have invested in high-availability technologies.
 - c. The growing size and amount of time required for the transmission of the card maintenance files has been squeezing the available windows for performing these types of tests and exercises. We will continue our efforts to collaborate with third-party EFT vendors on solutions such as increasing bandwidth to reduce time required for file transmissions.
5. Celebrate our success, then press forward
 - a. When we step back and evaluate all of the planning and effort invested over the years to achieve the level of preparedness the CU*Answers network has obtained through rigorous HA rollover exercises every six months on 'live' production systems, we gain the confidence needed to continue building the networks and systems that will meet the demands of tomorrow.

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