

**CU*ANSWERS HIGH AVAILABILITY PROGRAM REVIEW -
ONLINE AND MOBILE BANKING ENVIRONMENT
EVENT DATE(S): 9/9, 9/15/2020**

EVENT SUMMARY

Following the successful pattern of the HA rollover program for CU*BASE core-processing, recovery teams at CU*Answers performed the annual live production rollover for the online and mobile banking environment (known as **It's Me 247**) on September 15, 2020. This was the third successful online banking rollover scheduled, in part, as a result of the [recovery effort](#) initiated on February 8, 2019, due to an extreme winter storm causing a loss of utility power and generator failure at the primary production data center.

The online/mobile banking environment consists of a pool of load-balanced, redundant servers at the primary production facility in a secure DMZ environment. A clone of this environment is installed on servers at the secondary data center. Application updates are applied to servers at both the primary and secondary data centers to ensure synchronization.

A new twist added to this event was a goal to combine rollovers for both CU*BASE core processing and **It's Me 247** online banking. For the first time, members were accessing online banking web servers at the secondary data center while posting transactions on the high-availability core host (HA) at our data center in Yankton, SD.

This full-day rollover was preceded by a brief, 90-minute "practice" rollover during the early hours of 9/9/20 before peak traffic is observed, to validate network configurations and end-to-end connectivity. This enabled recovery team members to focus on application level testing during the main rollover event, a significant feat given the level of integration with 60+ third-party EFT vendor interfaces for services such as bill pay, account transfers, and check image retrieval.

The rollover process consists primarily of making DNS changes to the applications that operate in the server environment (including **It's Me 247**, **It's My Biz 247**, APIs, PIB, Mobile, etc.). Once DNS changes are applied (allowing for propagation throughout the public Internet), network traffic is redirected to the secondary data center.

The timeline proceeded as follows:

September 9, 6:00 – 7:30 AM ET	Brief "practice" It's Me 247 rollover conducted
September 13, 3:00 – 4:00 AM ET	HA rollover performed to bring CU*BASE online at the Yankton, SD data center. Primary production would remain until the rollback scheduled for September 20.

September 15, 6:00 AM – 11:00 PM ET	Full-day live It's Me 247 rollover is performed with transactions posting to the secondary CU*BASE host at the Yankton, SD data center.
September 20, 3:00 AM – 4:00 AM ET	HA rollback is performed to bring CU*BASE online at the Kentwood, MI data centers, returning both environments to normal production.

*NOTE: The purpose of this report is to highlight the details of the **It's Me 247** online banking rollover event. A separate report has been published with the details of the CU*BASE/GOLD rollover event.*

During the online banking rollover event, relatively few issues were reported. Early during the “practice” rollover, teams identified issues regarding slow load time for check images and account summary pages (due to banner and logo requests requiring a network routing configuration change. In addition, a host-based firewall configuration change was required for access from credit unions hosted on the Site-Four production CU*BASE host. These issues were resolved within the time allotted for the brief maintenance period. This set the stage for the big event: the **It's Me 247** rollover during a CU*BASE rollover.

Although very much a successful exercise, there were several significant considerations made during the planning phase. Perhaps the largest was the ongoing global pandemic with several states and municipalities enforcing partial shutdowns and stay-at-home mandates. This resulted in a substantial increase in the use and dependency of digital services such as online/mobile banking. Intentionally forcing a brief disruption during the rollover process had to be monitored very closely with prompt failback plans in place. Potentially more severe was those members in credit unions in the hurricane region with the active season that this has been, during the same week that tropical storm (turned hurricane) Sally had her eyes on the Gulf Coast region. Extra precautions and preparations were made to allow us to test our level of resilience during such a volatile time, for both the core processing and online banking environments. The value and experience obtained from this test equals, if not exceeds, the efforts invested.

A post-event briefing was conducted to discuss and collect all relevant information for the event. The following sections identify the timeline of events as they unfolded, as well as challenges observed, lessons learned, and recommendations for consideration.

EVENT TIMELINE

Prior to the rollover event, communications were sent to all CU*BASE credit unions informing them of the scheduled rollover with a request that they participate by providing prompt feedback of any issues reported by their staff and members.

The online banking rollover scheduled for September 15 was originally planned to be a 24-hour event. In the days prior, teams were notified by one of the Internet Service Providers of planned maintenance during the early hours (1:00-6:00 AM) on September 16. Rather than reschedule, the decision was made to shorten the rollover to 17 hours, ending at 11:00 PM instead of 6:00 AM.

Wednesday, September 9, 2020

- 6:00 AM – Recovery teams initiate the rollover by changing DNS entries for sites that comprise the online and mobile banking environments. Within the first few minutes, traffic is detected on servers at the secondary data center.
- 6:15 AM – A performance issue is detected with the loading of check images and the loading of the Account Summary page in **It's Me 247** (the default landing page for many online banking members).
- 6:25 AM – To correct performance issues, routing changes are made for check image providers to secondary web servers, and adjustments are made to the loading of banner ads on the Account Summary page.
- 6:49 AM – A connectivity issue is detected between the application servers at the secondary data center and the CU*BASE host at Site-Four for credit unions on the CU*NorthWest and CU*South networks. A host-based firewall configuration change is made to resolve the issue. Access from all other self-processing credit unions is confirmed.
- 6:55 AM – Specific help files are not loading properly due to a permissions error on a web server virtual folder. This is corrected by setting permissions to match the production servers.
- 7:25 AM – All testing has completed, and procedures are followed to redirect online banking production traffic back to the primary data center in Kentwood, MI.

The initial “practice” test proved to be an extremely valuable exercise, allowing recovery teams to identify and resolve any issues discovered before high volume periods and the opening of credit union operations. Teams now shift their focus to the CU*BASE HA rollover that was performed during the early morning hours of Sunday, September 13 (details included in a separate report).

Tuesday, September 15, 2020

- 6:00 AM – Recovery teams initiate the full-day **It's Me 247** rollover by changing DNS entries for sites that comprise the online and mobile banking environments. Within the first few minutes, traffic is detected on servers at the secondary data center. As noted earlier in this report, transactions are posting for the first time from web servers at the secondary data center to the CU*BASE host at the Yankton, SD location.
- 8:25 AM – As credit unions open for business, reports are received from two locations indicating a failure to connect to the **It's Me 247** web servers at the secondary data center. The impact is limited to employees working remotely from home or from devices connected to the wireless network within the branch. Members were not affected. Technical teams were engaged to work with IT support teams at each credit union to diagnose and correct the issues by making the necessary firewall and routing changes.
- 10:00 AM – A member reported an issue accessing **It's Me 247** due to a Geo IP Address control in PIB. The PIB configuration was updated to allow access to the web servers at the secondary data center.
- 11:25 AM – Although not reported, recovery teams discovered an error in the log from a member attempting to access Fiserv Bill Pay. While diagnosing the problem, teams discovered an outdated configuration for iPay Bill Pay that was modified as part of a project on the production servers. The configuration changes were not applied to the secondary servers at that time. Once the changes were implemented, the issue was resolved.
- 11:00 PM – At the conclusion of the 17-hour exercise, procedures were followed to redirect online banking production traffic back to the primary data center in Kentwood, MI.

Support teams monitored calls for the remainder of the day. No additional issues were reported. During the early morning hours of Sunday, September 20, recovery teams performed the HA rollback to bring CU*BASE online at the primary data center, concluding the dual rollover exercise.

CHALLENGES OBSERVED

Considering that this was the third live rollover event conducted for online and mobile applications at the secondary data center ([first one performed in August of 2019](#)), combined with the fact that transactions were posting on the CU*BASE HA environment in Yankton, SD, teams anticipated issues and challenges to surface. While systems at both data centers are similar, they each require unique host and network configurations. Simply copying the configuration from one to the other will not function properly in a high availability environment. Both must be designed and constructed independently to meet the availability and security demands of the applications they host.

Compared to the 2019 exercise, relatively few issues were detected, and all were resolved during the 2020 events. This is attributed to the progress and maturity of the program and the level of preparedness involved. The experience gained during these rollover events gives us confidence in our strategy and capabilities for responding to incidents where unplanned emergency rollovers are necessary.

Many of the issues observed are noted earlier in this report in the Event Timeline section. Additional issues and challenges as we move forward and prepare for future rollovers are noted below.

- Decision to conduct a brief “practice” rollover on September 9.
 - Teams discussed the need to perform this “practice” rollover in light of the ongoing circumstances during this season (as noted earlier: global pandemic, hurricane and severe weather, reliance on digital services, etc.). Balancing the impact of potential downtime with the value gained from the experience and validation of network and system configurations requires an informed decision by the group.
 - The few minutes of downtime during the practice exercise with low transaction volume may have saved more significant downtime during periods of higher volume. The exercise proved to be very productive and forced teams to button down the process and procedures and remain intensely focused on the task at hand.
 - This will be considered for similar rollover exercises in the future.
- Communicating routing and firewall configuration requirements for systems at the secondary data center.
 - Current documentation provided to credit unions for connectivity requirements detail necessary IP addresses and protocols for access from the credit union branch to CU*BASE and online banking applications at both our primary and secondary data centers. This same configuration is required for staff working from home (remote access networks) and staff working from devices on credit union wireless networks. As both of these scenarios are becoming more prominent, it’s important that connectivity requirements are applied to all CU*BASE GOLD workstations, no matter how they are connected to the credit union network.
 - Teams will review and assess the documentation provided to make any necessary changes and communicate this message.
 - Teams will discuss publishing a test page on web servers at the secondary data center that credit unions can test access periodically from each branch, between rollover events.

- Integration with the growing network of 60+ third-party vendors
 - As noted earlier in this report, the integration with multiple CU*BASE partners and self-processors, in addition to the more than 60 upstream and downstream third-party vendor interfaces, creates an application environment that is complex and dynamic. Change is constant and the discipline of implementing, testing, and maintaining those changes throughout each data center is required. Design and support teams must understand how each change impacts the ability to operate from both the primary and secondary sites. Future rollovers will dictate our success in this.
 - As a core-processor working with third-party vendors, one of the challenges is that developers often do not have (member) user accounts to test functionality. While a credit union can assist in testing the changes in the production environment, it is only during rollover events that we can validate the changes at the secondary data center. The nature and frequency of application changes will in part dictate how often future rollover events will be scheduled.

- Internet bandwidth requirements
 - During the previous (2019) online banking rollover event, we reported a limitation in bandwidth for Internet access (100 Mbps). Although traffic peaked at 55% on the circuit, the decision was made to invest in additional bandwidth and redundancy for future growth.
 - In the months following, a redundant 1 Gbps circuit was added and served as the primary access route for the 2020 event.
 - The existing circuit is being upgraded from 100 Mbps to 1 Gbps

EVENT SCOPE AND RECOMMENDATIONS

As with many web-based applications, there are ancillary products and services that comprise the end-to-end member experience. Many of these functions and features are provided by an external source or alternate hosts that do not share the same redundant components and high-availability strategy as the core **It's Me 247** application. For the purpose of this rollover event, those ancillary functions include the following:

- Hosted credit union web sites (entry to online banking for the member)
- OBC (Online Banking Community – customized for each credit union)
- MACO (Multiple Authentication Convenience Options)
- MAP/MOP (Membership Application/Opening Process)
- CU*Publisher (Mobile app controls)
- CU*Spy (Digital receipts, statements, reports, eSignatures, etc.)
- CheckLogic (check images through eDOC)
- RDC (Remote Deposit Capture through eDOC)

In the event of an actual disaster scenario, the applications listed above (hosted by a combination of physical and virtual servers) would not be readily available but would be restored from backup data in order of priority on available hardware at the secondary data center. While application rollovers are typically performed in minutes, recoveries are often measured in hours.

The cost of implementing a high-availability rollover strategy for each application environment can be significantly more expensive than that of a recovery strategy. Having validated the ability to quickly rollover the online and

mobile banking environment through testing, teams will seek to enhance the capabilities for additional applications, where it is cost-effective to do so and aligns with business objectives. These will be included in discussions and budget considerations throughout the 2021 fiscal year. Changes implemented will be included in the scope of future rollover events.

CLOSING REMARKS

Combining the CU*BASE HA rollover with the **It's Me 247** online/mobile banking rollover is a significant accomplishment and a goal that has been 18 months in the making. It marks a shift from a strategy of recovery (restore from backup) to rollover (synchronize servers and redirect network traffic). It reduces the amount of time required to bring applications back online in the event of an unplanned disruption at the primary production facility. **It's Me 247** now cements its role with CU*BASE GOLD in our high-availability rollover program.

Performing these rollover and recovery exercises on a regular basis helps us to improve our processes, sharpen our skills, and design and deliver better products in the 24x7 world we live in. CU*Answers is committed to that goal as demonstrated in this report.

Report submitted by Jim Lawrence - CBCP, CISSP | CU*Answers | Vice President of Business Continuity and Operations

Unless otherwise noted, all times noted in this report are Eastern Time.