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## SITE-FOUR HIGH AVAILABILITY PROGRAM REVIEW

EVENT DATE(S): 05/06/2018 – 05/09/2018

### SUMMARY:

As part of an ongoing business continuity program, Site-Four, LLC actively maintains a high-availability (HA) core-processing environment with real-time CU\*Base/GOLD data replication between identical servers located at two geographically dispersed, state-of-the-art datacenters. Regular HA rollover events are scheduled to redirect core-processing and operations to the secondary/backup datacenter (located in Kentwood, MI) for up to seven business days. At the completion of each event, core-processing is redirected back to the primary location (located in Yankton, SD). These rollover exercises are invaluable to validate business continuity and recovery procedures, and to ensure the ongoing availability of CU\*Base/GOLD core processing.

The scope of this rollover event was expanded to include the transference of FIS switch communications to redirect traffic via it's disaster recovery connection to the Kentwood, MI facility. This test was run over a period of 24 hours and was completed on Tuesday, May 8.

The completion of the scheduled event was performed on Wednesday May 9, at which time core-processing of CU\*BASE/GOLD was transferred back to the primary facility in Yankton, SD.

This event was performed with the collaboration of recovery teams from Site-Four, CU\*NorthWest, CU\*SOUTH, and CU\*Answers as part of a reciprocated colocation agreement with CU\*Answers dating back to 2014. As a proactive measure and to minimize disruptions at credit union branch locations, the Group Providers announced this planned event and strongly encouraged credit unions to test connectivity to the secondary data center in advance of the rollover.

Notable characteristics regarding this rollover event include:

- Collaborated with FIS network services team to test rollover of their communications to our DR facility as noted above.
- During this rollover event, a six-hour processing period was completed by CU\*Answers OpsEngine data-center operators. This was completed as a crucial part of testing co-location processing capabilities. All processes were completed as delineated in the Site-Four run-sheets, on time, and with no issues from the secondary data center in Kentwood, MI.
- This role-swap event initiated a change in timing from starting the event on Sunday morning to 10:00pm CT Sunday evening. The primary reason for this change was to avoid delays caused by replication that were experienced in previous rollover events. This was also done in anticipation of upcoming changes in the processing environment and improved access to vendor support channels.

As highlighted in this report, the mutual colocation agreement between Site-Four and CU\*Answers not only includes shared facility space within a state-of-the-art data center, but also network and operations support throughout the rollover event. The end goal in this agreement is to provide seamless support and a level of readiness that allows the party experiencing the disaster time to focus on recovery and resumption while the unaffected party oversees daily operations from the high-availability data center.

The following sections identify other details, challenges observed, lessons learned, and recommendations for consideration.

### EVENT DETAILS:

On the evening of May 6, beginning at 10:00pm CT, the recovery team brought CU\*BASE/GOLD offline and began the role-swap process to redirect Site-Four core-processing from the PROD server in Yankton, SD to the high availability system in Kentwood, MI. At this time, a "splash-page" for online mobile banking was displayed to alert members that system maintenance was being performed. CU\*BASE/GOLD was back online by 5/7/18 11:35pm CT with all communications issues with vendors resolved by 1:03am CT.

The FIS communications testing was performed by the FIS data center team on 5/8/18 at 12:01am CT and continued for a period of twenty-four hours to conclude at midnight that same day.

The rollback was performed on May 9, beginning at 10:00pm CT to redirect core-processing back to the primary production server in Yankton, SD, thus completing the rollover event. CU\*BASE/GOLD was back online at 11:01am CT with all issues resolved by 12:30am CT.

## 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 very rapid pace. Performing these rollover exercises in a planned, controlled setting during non-peak business hours is a small investment to better prepare for a situation that is less ideal.

Maintenance windows necessary to perform these rollover exercises continue to shrink as more routine tasks are required of system operators and users of the system. This will accelerate in the future as we contemplate moving to seven-day-per-week standard processing and move towards a 24/7 processing environment. It is important that we continuously seek ways to improve processing effectiveness through automated and managed productivity, while at the same time becoming more creative in testing our operational resilience.

Due to the nature of the rollover exercise (redirecting live production traffic from 80+ credit union locations to our HA/DR location), some challenges are to be expected. For this event, these challenges included the following:

- Rollover:
  - PTFs were applied to the high availability system prior to the rollover event.
  - A DDM error was encountered on double-check. This error does not cause issues with the rollover but has the potential to cause issues on the roll back to primary at the conclusion of the event. Consequently, it was decided by the i-Plan team to pause the process and address the issue before proceeding further.
    - This occurrence has been encountered in the past during CU\*Answers prior role-swap events. The i-Plan team referred to documentation from the prior events to effect recovery and the rollover proceeded once again.
    - The actual rollover took 8 minutes, 56 seconds and was completed at 23:13pm CT after the DDM errors were addressed.
  - There was an initial delay with communication back-hauling caused by a misconfiguration in the firewall on the DR (disaster recovery) network. The configuration was updated and all vendors were online at 12:10am CT with the exception of FSCC.
  - FSCC did not initially recover with the other switch vendors. Working with FSCC support, it was determined that traffic being redirected to a new server since the last rollover event had not been synchronized to the Site-Four firewall at the DR location. Corrections were made to the routes from the server and FSCC communications were recovered at 1:03am CT.
  - There was a connectivity issue with the GA server. On the transmission of RDC files immediately after the rollover, the transmission connection was dropped. A retry allowed all remaining RDC transmissions to complete. The same issue occurred during the role-swap event. A configuration (intrusion prevention) on the CU\*Answers firewall was interfering with the connection. A rule exception was implemented and the issue was resolved.
- Issues during role-swap
  - All issues during the role-swap were investigated to determine cause. Issues fell into two categories: 1) issues that existed prior to the rollover but were discovered during the course of the event; and 2) issues directly related to the rollover.
    - County Schools CU reported GOLD session failures at one branch; this turned out to be a local issue unrelated to the role-swap event and was resolved by the credit union's internal IT support.

- Printing Industries CU had changed their primary ISP and that information had not been passed on the CU\*Northwest or Site-Four. Corrections were made after hours. The connection was temporarily recovered by forcing communications to their backup ISP.
  - Connectivity issues were reported by CU\*South. Vernon Coleman and Ron Martin of CU\*South worked with Site-Four and the issues were quickly addressed. Both issues involved minor adjustments to the VPN tunnels.
  - RVA Financial FCU experienced difficulties maintaining a connection to GOLD during a portion of the rollover event. While initially approached as a rollover related issue, it was eventually determined due to ongoing issues past the completion of the event that it was not a rollover related issue. Due to these ongoing issues, Site-Four worked with CU\*A Network Services to rebuild the tunnels between Site-Four and the CU, rebooted the firewalls at the CU, reversed the peer priority of the VPN tunnels and activated the secondary firewall on the CU side. The connections are continuing to be monitored.
  - CU\*South successfully completed a new CU conversion during this role-swap event.
- PTFs were applied to the Production system during the rollover event.
- Rollback:
    - Rollback began at 10:00pm CT and by 10:53 processing was restored to the primary system. All vendors were active by 11:10pm CT with the exception of Visa.
    - Visa did not recover immediately. Site-Four engaged Visa and the issue was discovered to be at the vendor site and was escalated internally by Visa support. The assisting engineer found a corrupted translation table in the router; once he cleared the errors, the subsystems activated almost immediately. Visa was active by 12:30am CT.

#### CONTINUING EFFORTS AND RECOMMENDATIONS:

Each recovery test and high-availability rollover exercise provides us the opportunity to continually improve the process and adjust the needed procedures accordingly. The best way to accomplish this is to “Practice. Learn. Document. Repeat”. The following is a list of action items and projects that we are pursuing to get us closer to that goal:

- As noted in prior Gap Analyses, HA rollovers performed during the early morning hours are more prone to delays due to replication audits following EOD/BOD processing. To that end, we changed the rollover time for this test to Sunday evening and were able to avoid such delays. Future role-swap events will therefore adhere to this new timeline.
- During the rollover process on May 6<sup>th</sup>, we experienced a brief interruption in the rollover process as noted above. We will review this issue with the i-Plan team to determine if there are specific measures that can be taken to mitigate a recurrence.
- Processes are being reviewed regarding firewall changes at Site-Four to ensure ongoing synchronization between Production and HA network environments.

With the success of the EFT vendor test with FIS, we will look to expand recovery communications testing with additional vendors in future rollover events.

Respectfully,



Alan Rogers | CEO- Site-Four, LLC  
arogers@site-four.com