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Electronic Court Records (ECR) System and Business Recovery Report

Department of Judicial Administration
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Executive Summary

On Friday, June 24, 2005 at the close of the business day, the Electronic Court Records System (ECR) suffered a major system failure. On Tuesday June 28, 2005 the ECR failover system was activated, as it was clear that system recovery would take more than one day. The Department of Judicial Administration/Clerk's Office (DJA) technology staff worked through the week to repair the system and was able to bring it up the following Saturday, July 2, 2005. Later that afternoon, after a day of scanning and indexing done by DJA staff, the ECR system failed again, this time even more seriously. That same weekend, action steps were taken to begin the replacement process for the failed hardware. The system was fully restored to all users by August 1, 2005, after four weeks of hardware replacement work, system and data repair work and data synchronization.

This report provides details on the failure and recovery events related to the ECR computer system. This report describes the cause of failure, the steps taken from a technical and operations perspective during the recovery phase, the current status, lessons learned, actions taken to date and recommendations for future activity.

This report is organized into five (5) sections. The **Background** section includes information about the purpose and the history of the ECR system. There are two **Incident** sections that include details about the system failure. There are two **Response** sections that include the recovery steps taken. There is a **Lessons** section that includes lessons learned, and finally there is a section on **Conclusions, Actions to Date, and Future Plans**.

Background

The Department of Judicial Administration serves as the Office of the Superior Court Clerk and is the official record keeper for Superior Court case files. Prior to January 2000 documents were received and stored in paper form on file shelving units located in the DJA offices at three separate facilities. DJA receives more than 8,000 documents each day. Because court files must be kept indefinitely and due to storage and preservation concerns, paper files are transferred to archive status after court action is complete. Prior to the ECR system deployment, archived files were sent to a vendor to be microfilmed; the microfilm budget averaged \$250,000 per year. The ECR system was developed in 1999 by Sierra Systems, Inc. ECR was first used for archived cases, proving that the conversion of paper records to electronic, via scanning, could be done effectively and efficiently, and that viewing court records electronically was a viable option.

Beginning with new cases filed January 2000, all documents are scanned by DJA staff when filed. The documents are then "indexed" into the ECR system, which is the process for associating a document with a case number. Finally the documents are sent electronically to a work queue where attributes of the document can be input into a state-wide database (SCOMIS) and specific actions related to each document can be carried out, which is "docketing."

Most paper documents are destroyed after they have been committed to the system and stored for a period of time for backup confirmation. Files are viewed via the primary ECR system in the

public areas of the Clerk's Office or by any computer connected to the county's Wide Area Network (WAN).

The ECR system stores more than 65 million images. More than 50,000 images are added, and more than 100,000 images are retrieved, each business day. In June, 2003 DJA invested in a backup system, referred to as the failover system. This system contains a copy of the entire image repository and is updated continuously with new images as they are added. This system is located at the Regional Justice Center (RJC), in Kent, Washington.

Components of the production ECR System environment include six application servers, FileNet document image scanning and repository software, multiple large-scale transactional databases, custom-developed server software, middleware, Windows client applications, and web browser interfaces, high-speed document scanners, approximately five terabytes of data, and a dedicated high-speed tape backup system. In total, the system supports an average of approximately 300 concurrent users during business hours, and will service several thousand user sessions during a typical business day. Diagrams depicting the structure of both the current ECR system and the system as it was before the downtime incident are included as Appendix A to this report.

In 2005 E-Filing was added to the ECR system. Documents can now be filed electronically and are stored in the same document repository as the scanned images. The addition of a document format other than TIFF required that a new viewer be developed. There has not been final acceptance of the new viewer, as of the time of the writing of this report.

Incident #1

On June 24, 2005 at 4:15pm the ECR system experienced a system failure. DJA technology staff found that a storage array had failed and become non-functional. The specific device was a Duratec Storage Array and the failure also corrupted data necessary for the operation of Windows 2000 and resulted in an inability to boot the operating system ("blue screen of death"). Additionally corrupted was the SQL Server master database necessary for the database management system to function, as well as the databases necessary for operation of ECR. This also caused the loss of FileNet (document repository system) and SQL Server binary executables.

Response #1

Technology staff notified the Deputy Director that the system had suffered a major failure and that they would be working on it all weekend.

Several technology related activities took place Saturday, June 25 – Sunday, June 26, technology staff tested existing data backups, verified functionality and status of backup FileNet system, and configured ECR web-viewers to provide read-only access to the document repository residing on the backup FileNet system. Staff found that the failover database system required modification to work properly with the newly released web viewer; they performed the necessary programming to work around this issue. Technology staff also discovered and alerted management that the failover system could not support demand load of the typical full production usage.

Technology related activities Monday, June 27 – Thursday, June 30, technology staff worked with vendors related to hardware (storage array) and FileNet (document management system). Staff recovered the operating system and with remote support from the vendor restored the storage array to functionality. Staff identified and replaced necessary SQL server binaries, recovered the master database from last good backup, and recovered ECR and FileNet databases from backup. Once the FileNet database was recovered, staff identified and replaced necessary FileNet binaries, began the process of recovering temporary data from backup of FileNet cached objects. A FileNet technician arrived on site and assisted with the FileNet restoration and testing.

Operations related activities, on Monday, June 27, 2005 while the ECR system was down and it was unknown how long it would be down, staff were directed to perform tasks that did not involve the ECR system. These tasks included such things as processing pre-ECR documents and assisting with filing papers and files. Customers were helped as possible with hard copy files. Customers whose requests could not be filled were asked to leave their name and telephone number so they could be contacted when the system was again operational. The ECR failover system became available late in the afternoon.

On Tuesday, June 28, 2005 access to the ECR failover system was provided to the high priority case file users: Superior Court Commissioners, Criminal Presiding Departments, DJA staff assisting customers, and DJA staff working on quick turnaround calendars. Office staff were assigned to tasks such as: unclaimed property research, processing hard copy documents, prepping and staging incoming documents for scanning, reassembling papers, making file folders, filing documents into file folders, filing file folders on the shelves, pulling and sending vital statistic forms to the state, docketing select critical items into SCOMIS from paper documents, providing copies of documents to courts and the public, and processing notifications to Department of Licensing.

Communication about system status was placed on the DJA web site and e-mailed to internal King County ECR users.

Upon learning that the system would be available for light testing on Friday and production work on Saturday, a plan was developed for testing the recovered ECR system and a schedule was created for working Saturday and Sunday to get caught up on document processing. On Friday, July 1, 2005 preliminary testing was successful and staff was directed to report to work on Saturday, July 2, 2005. On Saturday, 30 staff reported to work and began catching up on the backlog of work that was staged and ready to process. All ECR related activities were extremely slow, impacting the speed at which the backlog could be cleared. At 4:00 pm on Saturday, July 2, 2005 after ECR went down, all processing staff were sent home for the day and directed not to report to work on Sunday, July 3, 2005.

Incident #2

On July 2, 2005 at 3:45 pm the storage array failed again. Data loss from the storage array this time was more extensive.

Technology related activities Sunday, July 3 – Tuesday, July 5, began with assessing the possibility of recovering the system and continuing to use the existing equipment. A conclusion

was reached that this was not a good option, so work began to develop specifications for replacement equipment for system servers and storage devices. Purchases were coordinated with vendors with the fastest available delivery times.

Operations related activities, on Sunday, July 2, 2005 staff and customers were informed that the ECR system was not operational and it was estimated that it would be at least one week before an estimate could be made as to when the system would become operational. DJA began to make plans to operate in the paper mode for public and court file access. Photocopying originals would allow for access, while the original documents could be staged for eventual scanning.

On Tuesday, July 5, 2005 it was determined that document information needed to get input into the state-wide database, SCOMIS, since it was the only functional resource available to see what documents were being filed while the ECR system was down. Photocopies were made from the original documents. Copies were sent to staff to process, while the originals were prepped and staged for scanning as soon as the system was brought back up.

Staff and the court continued to use the failover system to see documents filed before the ECR failure. Staff and the court used SCOMIS to learn of newly filed documents and then requested those from the copies made for processing. Once the copies were processed they were sent to be sorted according to case number so they could be located upon request.

This mode of operation continued for documents filed between June 22 and July 21, 2005.

Taking advantage of the scanner downtime, staff arranged for contract scanner technicians to come on-site and perform routine maintenance on the scanning equipment, in preparation for long extended use.

Technology related activities Thursday, July 7 – Tuesday, July 12, a FileNet technician was needed to reinstall the FileNet system, the skill needed was from a special group within FileNet that is normally scheduled well in advance. Work was done and coordinated with FileNet so that a specialist could be sent out at the earliest opportunity once the new hardware had arrived and was ready for the FileNet installation.

The new equipment arrived and was unpacked, inventoried, physically assembled, and the hardware burn-in testing ran overnight. The old equipment was removed from the rack, new equipment was physically installed to the rack, cabled, and the new system was tested. The operating system was installed and configured. SQL Server was installed and the ECR and FileNet SQL databases were rebuilt on the new system. The old system was brought back online and the transfer of recoverable data from the old system was started. Additional OS and SQL Server configuration and testing, patching, and installation of utility software was done.

Wednesday, July 13, - Friday, July 15 worked with the FileNet technician on-site to re-install the FileNet system. They ascertained that some FileNet image repository data recovered from the old system was corrupt: in addition to missing data, the presence of corrupt data prevented the FileNet system from functioning. Staff arranged for a data recovery specialist from FileNet to come on-site to assist with the recovery process and they arranged acquisition of portable storage devices to speed transfer of backup image repository data from failover system.

Tuesday, July 19 – Friday, July 22, worked with the FileNet data recovery specialist and restored FileNet to functionality, began the process of data recovery, developed procedures for completion of data recovery from failover, and system auditing and testing.

Saturday, July 23 – Tuesday, July 26, the image repository data was recovered from the backup system to the new primary system. The new primary system configuration was duplicated to the new standby hardware.

Resulting Operational Impacts

Documents filed between June 22 – July 21 had already been entered into SCOMIS and the needed clerk's actions had already been completed. The work required for these documents was a reconciliation process to get the information from SCOMIS into the ECR system. Documents filed since July 21 had not been docketed into SCOMIS and the actions had not been taken. This was backlogged work that needed to be completed. Approximately 216,000 documents were filed during the time that the ECR system was down.

Staff had to catch up, plus process the approximately 8,000 documents received per day. Because of the backlog it was still necessary to sort and process documents out of order due to their priority. As of September 2, 2005 staff had caught up on 80,000 of the 216,000 documents filed. A three week push of overtime, staff reassignment, and reprioritization of duties was developed to catch up the remaining 136,000 documents by September 23, 2005. That work was completed on September 24, 2005.

Lessons Learned

The following is a list including many of the lessons learned through the Downtime and Recovery process. This list represents the lessons we've identified as this report is completed. It is anticipated that as this report is shared with ECR users and other interested groups, the list of lessons will increase as we more about our customer's experiences.

The King County Superior Court, Clerk's Office, and all the court and clerk's customers lived through and recovered from a five week downtime period of a critical application. Our intent is that we would not experience anything like that again, but we now have better knowledge, tools and experience that will serve us in many ways.

The Clerk's Office implemented many business "failover" systems on the fly as problems presented themselves during the downtime event. These failovers were critical to keeping the court operational during the downtime event. Business process failover abilities are as important as technology system failover abilities.

The ECR system is heavily relied on by many King County agencies and the public, in addition to the heavy reliance placed on it by the court and by DJA. This application has been completely supported by DJA staff and treated as a high priority departmental application, rather than as an enterprise-class application.

The failover system could be used to view documents though some documents were not immediately available. Additional testing should have been done when the failover system was

built in order to assure all documents could properly be viewed. This was time consumptive during the recovery process.

The failover system was not robust enough to handle both document viewing and scanning. Not being able to scan for 6 weeks caused many business hurdles that were difficult to recover from.

As the ECR system has changed over time there should have been tests with its operation and the ECR failover system.

Our use of the ECR system in what we demand of it is extremely high. We may need to devote more dedicated resources to the support and maintenance of the system.

We (courts) are unique in that our use of a document management system is both in adding new records to the system *and in high volume viewing demands* that we place on the system. We need to consider some re-architecting of the system to separate viewing from the scanning, so that the high impact viewing does not take away from the performance of the system.

Communicating with users, with the press and with local legislators is very important in any system failure and recovery incident. Without direct, knowledgeable, frequent, straightforward communication, rumors take hold.

We had emphasized the importance of data recovery in our failover system and back-ups. Data Recovery was in fact successful. No loss of images (court documents) was experienced.

The failover system, though not robust enough for all users to use in place of the main ECR system, allowed the Clerk's Office the ability to print for all users needs. Printing from the failover was a key to keeping the business of the court going.

Prioritizing use of the failover to the high volume calendar courts, (all the commissioner calendars, and the chief criminal and chief civil courts) was important to the success of the failover.

Conclusions, Actions to Date, and Future Plans

Technology systems will break. Breakdown events must be anticipated and contingency planning must occur, for both the technology and the business operations that rely on that technology. DJA and the Court recovered from this major system downtime event. A similar catastrophe in the hard copy arena would have been much more difficult, if not impossible, to recover from. Technology systems allow for back-ups, failovers, etc. that do not exist in the paper world.

DJA has already taken steps in an attempt to avoid an ECR downtime event as long as was experienced during this event. Other steps are planned and will be taken in the near future. The following describes our actions to date and future plans.

The new equipment purchased to replace the failed equipment is more robust and of better quality than the equipment that was in place. In addition, stand by equipment was purchased and

set up to help mitigate against this type of failure in the future. Diagrams depicting the changes to the system and an explanation of those changes are attached as Appendix A to this report.

DJA is actively working with the Office of Information Resource Management (OIRM) overall-County effort related to business continuity, in an effort to fully mitigate the failure of our primary system.

DJA has a document management system (DMS) replacement project funded, via the 2005 technology capital improvement project process. DJA technology staff will be evaluating options to alleviate the demand on ECR's primary image repository before beginning that project. Plans are now that the project will include a review of ways to separate the read-only activity (viewing) from the image input activity (scanning) in ECR.

DJA plans to contract with a consultant to review the downtime event, the recovery activities, and our plans for the future, to give us independent feedback and advice. An independent, non-biased look at what happened, the events of the recovery, and our plans for the future will be valuable to us, though the exposure of such a review may be similar to that of an audit. Any "findings" from such a review would help us formulate and support future technology CIP requests to improve and support ECR.

DJA plans to vet this report and the events of the downtime and recovery with our users and other interested parties. ECR user feedback will be valuable to us in planning to avoid and mitigate such an event in the future. It is clear from the feedback already received that many many King County justice system workers and leaders depend on ECR to accomplish their work. DJA has received requests to speak and/or write about the ECR event and recovery, from such entities as the King County Council Law Justice and Human Services committee and the Judicial Information Systems Committee (JIS). Plans are to continue to take input from any of our user groups on what could have helped them more during the downtime, and to continue to fulfill requests to educate others about what happened with the ECR system downtime and recovery.