KING COUNTY

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

Signature Report

November 7, 2017

Motion 14989

Proposed No. 2017-0274.1   Sponsors von Reichbauer

1   A MOTION relating to the executive response to

2   2015/2016 Budget Ordinance, Ordinance 17941, Section

3   123, as amended by Ordinance 18239, Section 40,

4   Expenditure Restriction ER1, requiring the executive to

5   submit a report on the Exchange to Office 365 pilot

6   migration.

7   WHEREAS, the executive has responded to 2015/2016 Budget Ordinance,

8   Ordinance 17941, Section 123, as amended by Ordinance 18239, Section 40, Expenditure

9   Restriction ER1, by submitting a report that includes results of the cloud email pilot, and

10   WHEREAS, the executive has responded to the proviso by submitting a summary

11   of user satisfaction with communication and downtime for users, and

12   WHEREAS, the executive has responded to the proviso by submitting a summary

13   of user experience during the migration to the cloud email system, and

14   WHEREAS, the executive has responded to the proviso by submitting a report

15   including system availability compared with both cloud and on premise email, and

16   WHEREAS, the report on the cloud email pilot has been approved by the business

17   management council;

18   NOW, THEREFORE, BE IT MOVED by the Council of King County:

19   The Report on Exchange to Office 365 Pilot Project - Response to 2015/2016

20   Budget Ordinance, Ordinance 17941, Section 123, as amended by Ordinance 18239,

21   Section 40, Proviso ER1, Attachment A to this motion, is accepted.

22

Motion 14989 was introduced on 8/14/2017 and passed by the Metropolitan King County Council on 11/6/2017, by the following vote:

Yes: 9 - Mr. von Reichbauer, Mr. Gossett, Ms. Lambert, Mr. Dunn, Mr. McDermott, Mr. Dembowski, Mr. Upthegrove, Ms. Kohl-Welles and Ms. Balducci
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

J. Joseph McDermott, Chair

ATTEST:

Melani Pedroza, Clerk of the Council

Attachments: A. Report on Exchange to Office 365 Pilot Project - April 6, 2017

Attachment A

Report on
Exchange to Office 365 Pilot Project

Response to 2015-2016 Budget Ordinance 18239, Section 40, Proviso ER1

April 6, 2017

Contents

Executive Summary

Section 40, Proviso ER1 of 2015/2016 Budget Ordinance 18239 requires that "no funds shall be expended to transition more than two departments to cloud e-mail until the executive transmits a report on the results of the cloud e-mail pilot (CIP 1127266) and a motion that accepts the report is passed by the council." In accordance with this directive, King County Information Technology (KCIT) conducted an Exchange to Office 365 Pilot Project between April and October of 2016. This pilot project successfully migrated email for all staff in KCIT and Superior Court from on-premises servers to Microsoft's Government Cloud email environment (also known as "Exchange Online").

KCIT retained the services of Slalom, Inc. to assist in planning and performing the email migration. Slalom brought extensive experience in Office 365 email migrations. The project team also included IT staff from the two pilot departments: KCIT and Superior Court.

In summary, the project team migrated 1.5 terabytes of data to the cloud for 1143 user mailboxes. The pilot project took seven months and spent $255K out of the $491K budget. Here are some key findings.

- Results show the migration of email data was very reliable, accurate, timely, and consistent.

- The project team successfully applied a proven method for email migrations, with a foundation that included ample communication, and well trained on-site technical support. The final wave included a mobile depot to quickly resolve mobile phone issues.

- The same methodology can be applied to migrate email for the remaining county departments and agencies.

- Users' email was migrated overnight with no interruption to email on the desktop. Mobile phones typically needed to wait for an overnight synchronization process to resume use of email.

- Post-migration survey requests were sent to all migrated staff. Details of surveys are presented for each pilot in section 3.3 of this report. A fuller picture of the user experience can be gained by also looking at the low number of incidents for Superior Court in their largest final wave and the quick resolution for these issues, and at the 4.1 out of 5 stars evaluation of the migration by Superior Court shown in section 3.0.

- The project team and Steering Committee recommend proceeding with Phase 2 of the email migration as soon as possible to enable the county to realize the full benefits of this project

- We have had no downtime in the Exchange Online environment since the migration, while our on premise Exchange environment has suffered multiple outages.

1.0 INTRODUCTION

This report responds to Section 40, Proviso ER1 of 2015/2016 Budget Ordinance 18239 for the "Cloud E-Mail Pilot." It documents the Exchange to Office 365 Pilot Project goals, process, and results in response to the requirements of the proviso described below. It was prepared by the KCIT project team with input from Slalom, Inc., consultants for the project, and Superior Court IT staff who participated on the project.

1.1 Proviso Background

Section 40, Proviso ER1 of 2015/2016 Budget Ordinance 18239 includes a proviso that placed the following restriction on King County Information Technology for the expenditure of the $491,000 appropriation for the Cloud E-Mail Pilot (CIP 1127266). The proviso stipulated, "Of this appropriation, no funds shall be expended to transition more than two departments to cloud e-mail until the executive transmits a report on the results of the cloud e-mail pilot (CIP 1127266) and a motion that accepts the report is passed by the council."

The report was to contain a summary of the user experience of the migration and of the cloud email system. It was also to be approved by the Business Management Council. The entire proviso is included in Appendix A.

1.2 Report Contents and Organization

This report contains sections 2 through 3 for the overall pilot and the two individual pilot groups, describing the migration and evaluating the results. Section 4 then looks ahead to Phase 2, which is dependent on the County Council's approval. It outlines recommended steps to prepare for Phase 2 and recommendations for the Phase 2 plan, based on experience gained and lessons learned during the pilot migration. Finally, the report summarizes its overall conclusions for the Council. Appendices are included for the proviso and the recommendations of the Slalom consultants for the Phase 2 plan.

2.0 DESCRIPTION OF THE PILOT PROJECT

2.1 Project Background

The Strategic Technology Plan passed in 2013-2016 endorsed an information technology (IT) strategy associated with mobility, which involved continued development of the County's cloud strategy and increased use of the Microsoft government cloud platform. Similarly the 2016-2019 Strategic Information Technology Plan includes mobility as a strategic goal. The government cloud is a secure hosting environment for "software as a service" Office 365 platforms, designed specifically to comply with governmental certification standards.

KCIT's strategy is to migrate data, services, and applications to this government cloud environment, in order to contain IT costs, enhance collaboration, and increase mobile access to information and data. In support of this strategy, King County standardized on Microsoft Office 365. King County had already taken a major step in this direction with the migration of SharePoint (intranet) to Office 365, successfully implemented in 2015.

2.2 Project Objectives

The Exchange to Office 365 Pilot Project had the following objectives:

- **Increased storage in the cloud**: Exchange (email) Online offers 25X more storage per user, eliminating the need for separate PST files (mail folders stored locally on the user's laptop, and therefore not available via web-based email). With Exchange Online all emails are stored in the cloud, enabling robust search features and increased mobility.

- **Automatic system upgrades**: Cloud-based Exchange allows users to begin using productivity enhancements and features almost instantaneously as updates to the software are installed automatically, covering both security updates and new versions of Exchange. Fully supported, continuous, gradual, and automatic updates/upgrades will keep employees on the latest software versions and allow for the leveraging of the latest technology improvements (e.g. new software features).

- **Fully integrated employee collaboration**: All employees will have access to the most updated versions of email and collaboration (SharePoint Online and OneDrive for Business). With access to one tool suite, employees will have a common access paradigm and experience to exchange information, documents, discussions and work.

- **Fully enabled mobile and remote access**: All employees will have full access to work from any device, anywhere, anytime, without the need for the remote access scenario (VPN), which requires a connection to their main work desktop.

- **Maximization of strategic investments and cost containment**: Fuller adoption of Office 365 tools hosted in the cloud will further maximize the tools and integration capabilities of the Office 365 platform.

- **Improved eDiscovery support**: Keeping all email in Exchange Online will provide greater support for records retention and public disclosure policies, including the ability to search archived mail from anywhere, as opposed to just from the user's laptop.

- **Enhanced email stability**: The County's on premise servers are aging and migrating to Microsoft's government cloud reduces risk to the County.

2.3   Project Staffing

KCIT retained the services of Slalom, Inc. to assist in planning and performing the email migration. Slalom brought extensive experience in Office 365 email migrations. Slalom provided a project manager and engineer.

2.4   Project Budget

Here is the final status of the pilot project budget. The vendor bids came in under the original estimate, thereby contributing to a project surplus.

Budget Item	Amount
Project Budget	**$490,912**
Breakdown of Costs:	
Vendor (Slalom consulting)	$171,905
KCIT Project Manager	$58,980
KCIT Business Analyst	$5,369
Total Final Costs	**$236,254**
Final Balance	$254,658

2.5   Project Timeline

Here are the high-level phases for the pilot project.

Task Name	Start Date	End Date
Project initiation and planning	04/01/2016	05/31/2016
Conduct procurement for vendor	05/25/2016	07/18/2016
Plan and design with vendor	07/18/2016	08/11/2016
Build/configure for migration	07/25/2016	08/11/2016
Test migration	08/09/2016	08/19/2016
KCIT pilot migration	08/15/2016	09/28/2016
Superior Court pilot migration	09/29/2016	10/24/2016
Close out pilot project	10/24/2016	11/15/2016

3.0   PILOT MIGRATION

The project team worked with the Slalom consultants to tailor Slalom's proven methodology for successful email migrations to the particular circumstances of King County. A thorough communication plan was utilized, with a series of announcements to impacted staff from two weeks before their migration through the day of the migration, with follow-up information to reinforce the message. FAQs and other training materials were posted online for staff.

The Superior Court project team evaluated their migration experience as "successful," giving it a 4.1 out of 5 stars. In their report submitted to the project manager on October 23, they noted:

"Overall our team is very pleased with the outcome for this migration. The past 3 Waves allowed us to ensure our communications, process and support were in place and in sync with KCIT. Wave 3 was very crucial in getting our Presiding Judge as well as upper management and key departments completed. With the support of our Presiding Judge who communicated to all our users of her experience was very beneficial to our final transition."

Andy Hill, IT Director at Superior Court added this comment on March 31:

"The migration from Exchange to Office 365 was tremendously successful for Superior Court. KCIT and Superior Court IT worked closely and collaboratively to deliver a superior email experience for Superior Court staff. Superior Court staff now have enhanced access to their email with a greatly improved interface making for increased productivity and efficiency."

3.1   Summary of Issues
KCIT

Here is a summary of the number of incident tickets reported to the KCIT Service Center by staff being migrated. These incidents break down by type as follows:

1. Outlook Authentication. These include users receiving multiple prompts to provide their user ID and password. Some of these users had single accounts and others had dual accounts (termed "dual-forest"), for example, accounts in KCIT and Superior Court. The project team made configuration changes to various components to resolve these, and these were greatly reduced in later waves. Accordingly, this should not be a significant issue in future phases.

2. Mobile devices. These include incidents where users received a message that the Outlook application on their phone was being blocked. Improvements in FAQs and increased on-site support were adjustments made for this in later waves.

3. Other client-related (PC and laptop).

Superior Court

The Superior Court report summarized the number of incident tickets reported to their Help Desk by staff being migrated as follows:

1. Outlook. "Overall the issues were users who needed assistance with logging in, missing accounts or calendars. This was very minor and to be expected. It seems the majority of our users were able to utilize the communications provided to seamlessly log in with no issues." Issues that were resolved included missing calendars, Outlook permissions, and Aastra Phones.

2. Mobile devices. "Mobile Devices were our most challenging and frustrating for this migration." They took the most time to resolve, due to the variety of situations requiring different solutions. Having knowledgeable on-site IT support and a "mobile device depot" to which staff could bring their phones for rapid service was very important for making this a positive user experience. These strategies should be continued in Phase 2. Continued investigation to develop more consistent, repeatable solutions to the issues that arose in the pilot would be beneficial.

3. Mailbox. "The transition for the mailbox was very smooth from our perspective considering the quantity of users which were migrated."

One of the key findings of the Superior Court pilot was validation of the importance of having knowledgeable on-site IT staff provide "white glove" service to agency leaders and their administrative staff.

Notably absent in the pilot project were issues with the actual migration of data from on premise servers to the cloud. Out of 1143 mailboxes moved, there was just one case where the initial move of data for a mailbox experienced a mailbox failure during a migration night. An error in the set-up of this user account prevented the on premise mailbox from converting correctly after the mailbox was finished migrating to the cloud. This resulted in the user having to use the Web email client (OWA) for half a day while the project team corrected the issue.

3.2   User Experience Feedback
We received 47 comments from KCIT users and 23 from Superior Court. Here is a representative sampling of user comments after migrating to Exchange Online:

KCIT

"I love it! It's nice for my cell phone. I don't have to install MaaS360 yet it is as user friendly as an Android email app."

"There are some key features that are different in the new Exchange Online that are sufficiently different than OWA that would be beneficial to clearly train/educate users on. One example is how to set your "Out of Office" notice."

"Like one web login to access all options like e-mail, SharePoint, etc."

"The new interface is much more usable than the old OWA. I am able to easily use it on my phone."

"I like that I can do a "pop out" of any new email I write so I can have multiple emails and tabs open, making copy/search/write easy."

"It's cleaner and easier to use than the previous OWA interface, and largely replicates the desktop version."

"Works much better on iPads and mobile phones."

"I actually don't see any much difference. The important thing to me is that I can access email without having to use OWA or VPN."

"The interface is much cleaner and easier to navigate. I like it!"

"If you didn't tell me that the change occurred I would not have noticed. Thanks."

"Booking a room feels a lot easier online. When I go to my calendar, I select the time and when I go to add the room, it automatically provides me with the available free rooms to pick from. Natural and easy."

"Seamless migration. Came in next day and email just worked."

"This has been a fantastic upgrade. I am very diligent about migrating my received and sent mail in file folders named for Projects. The online folders have now replaced my PSTs. I can now access ALL my historical email from ANYWHERE. This has increased productivity and decreased hassle. Thank you KCIT!!!"

Superior Court

15 of the 23 responses were variations of: "I really haven't noticed much change?" and "It looks the same to me."

"When composing email it defaults to a view that requires an extra click on the "message" tab to bring up a ribbon allowing attachments to be added. It's not a catastrophe but it's an annoying extra step and I don't see what problem it solves."

"I am not sure what the new version is compared to what was there before."

"When using via mobile phone it isn't clear how to navigate to get to other settings, etc."

"Moving to Exchange Online has been great with the increased mailbox size. There is never a need for additional space especially with the current records retention policy. Ease of use and capability to access your PST folders through the web is great."

3.3   Survey Results

We conducted two surveys. The first was immediately after users were migrated and focused on the migration process itself. The second was focused on satisfaction with the new Exchange Online service after 3 months of use. A majority of respondents in both surveys reported a positive experience with the migration itself and with the new Exchange Online service.

The post-migration survey covered satisfaction with four areas: the overall migration process, access to files, downtime and availability. KCIT was migrated first, and lessons learned in that

migration were applied prior to beginning the Superior Court migration, and the results of those process improvements are visible in the survey, with Superior Court employees reporting higher satisfaction on each of our four metrics. The results are shown below:

Were you pleased with the migration process, communications and training?[1]
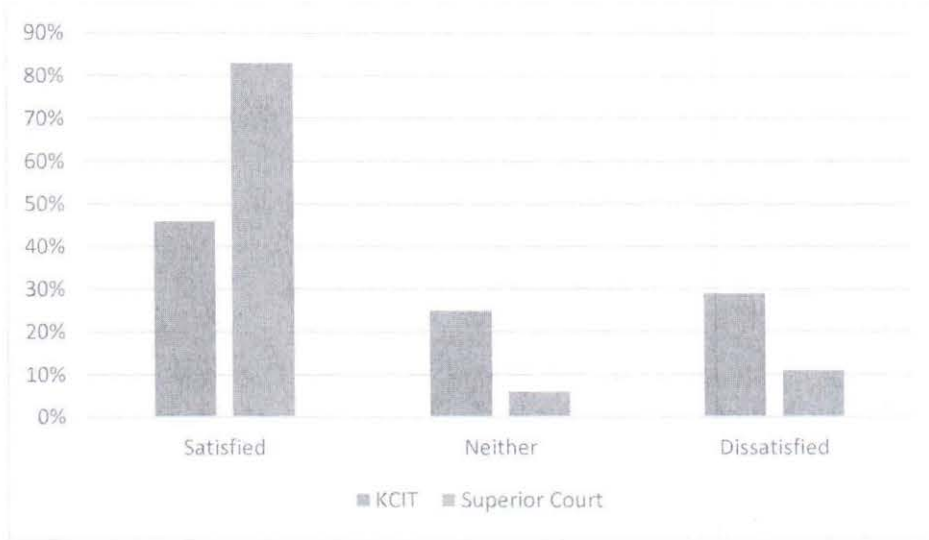
Were you satisfied with your access to archived email[2]

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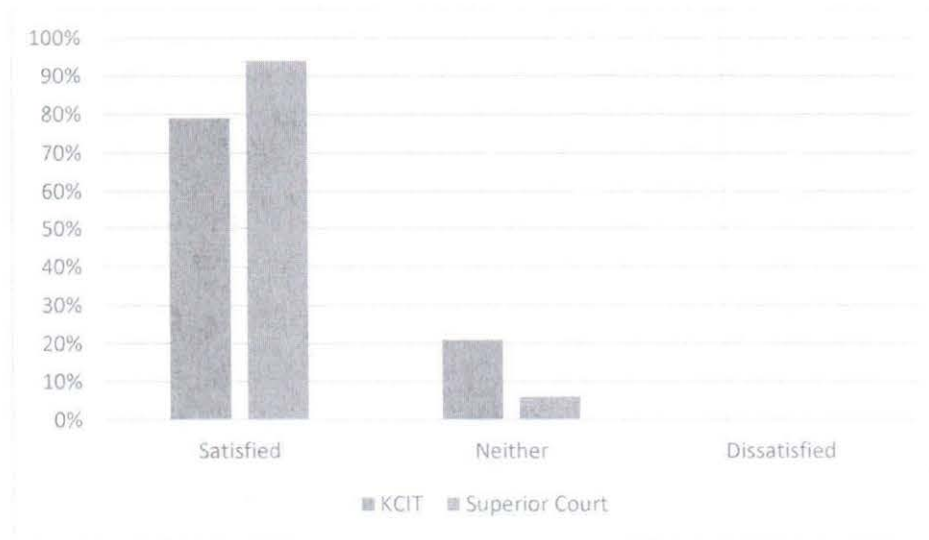
[1] Satisfaction with "Migration Process" was measured with the following question: Regarding the overall Office 365 email migration: I was pleased with the Exchange Online migration process, communications and training provided.
[2] Satisfaction with "Access to files" was measured with the following question: Regarding overall experience: After my migration process, I was able to access all my emails, including archives and PST files.

Note: migrations were handled overnight and there was no downtime associated with the migration for all but one of the 1143 mailboxes migrated, but some customers (less than 20 percent) had issues with mobile devices that required assistance, the downtime referred to in the next question is for that subset of users who use mobile devices.

Are you satisfied with any downtime incurred on the day you were migrated[3]
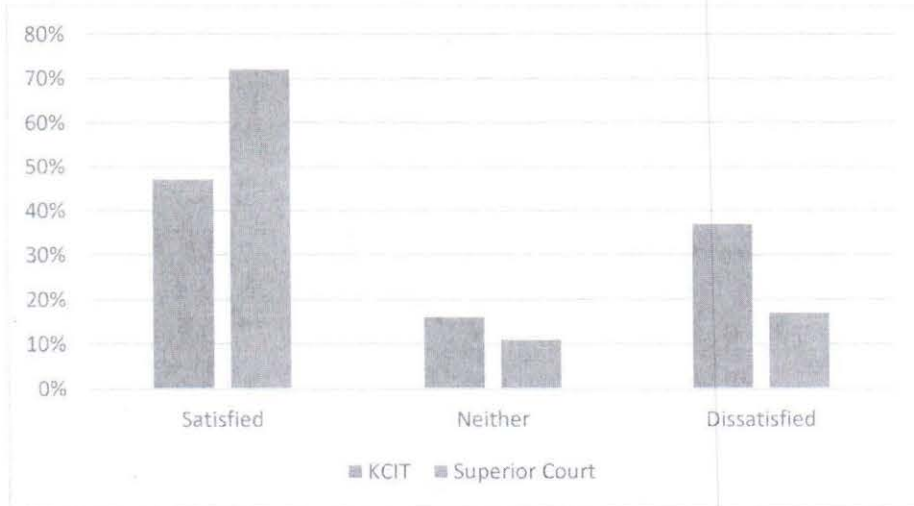
The second survey was conducted after employees had been using Exchange Online for at least 90 days. We asked a number of questions related to the expected benefits from a user experience perspective. The results are shown below:

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[3] Satisfaction with "Downtime" was measured with the following question: Regarding overall experience: The migration process did NOT affect my ability to remain productive during my workday on the day I was migrated to Exchange Online.

Have you received any notifications saying you've reached your space limit?[4]

Bar chart with categories "Yes" and "No", y-axis from 0% to 120%. Legend: KCIT, Superior Court. "Yes" shows a small bar near 5%. "No" shows bars near 100% and 95%.
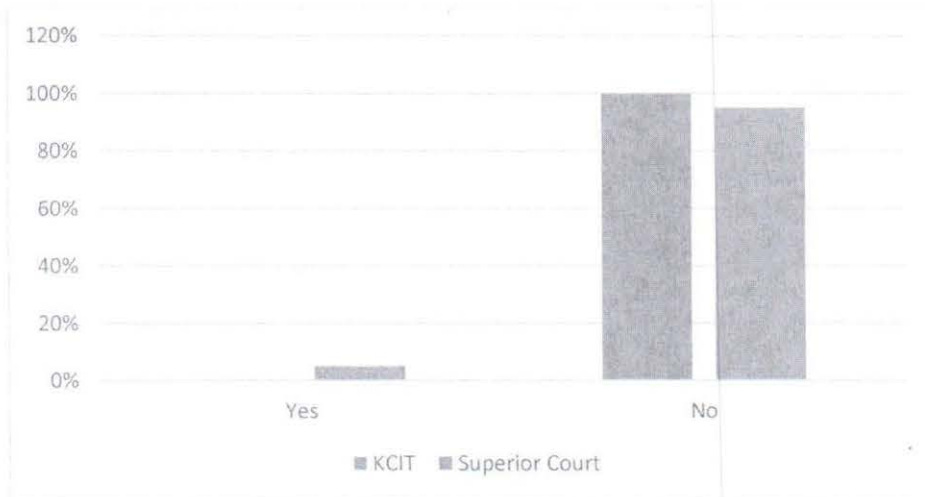
Are you using your new unlimited online email archive?[5]

Bar chart with categories "Yes" and "No", y-axis from 0% to 90%. Legend: KCIT, Superior Court. "Yes" shows bars near 32% and 19%. "No" shows bars near 56% and 81%.

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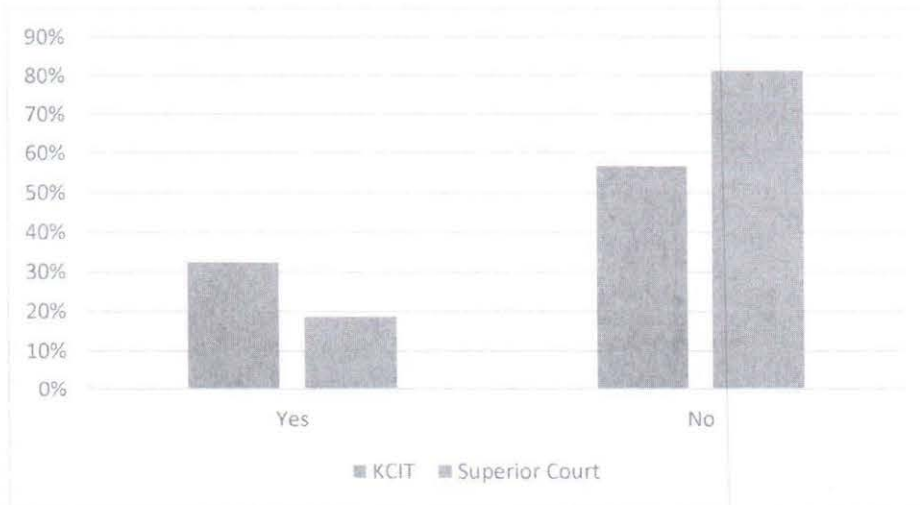
[4] Measured with the following question: After moving your mailbox to the Exchange Online Cloud, your new email capacity is 25 times larger (50 GB) and will soon grow to 100GB which is 50 times larger than your previous email capacity (2 GB). Have you received any messages that say you are reaching your space limit?
[5] Measured with the following question: You now also have a new archive mailbox that is unlimited in size. This replaces the PST files (personal folders). Have you transferred your PST files to the new archive mailbox?

Would you use your unlimited online archive if instructions were provided?[6]
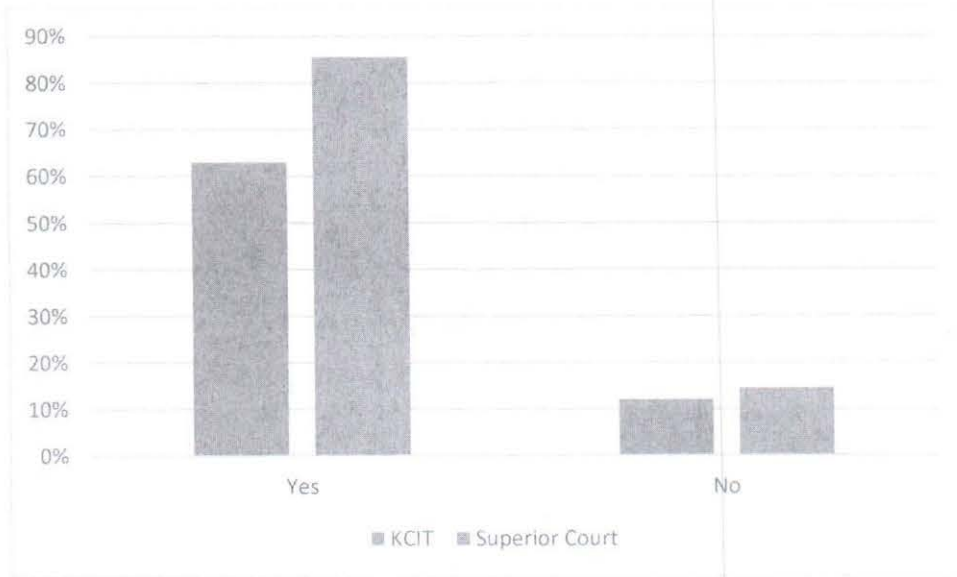
Have you accessed your email without using VPN[7]

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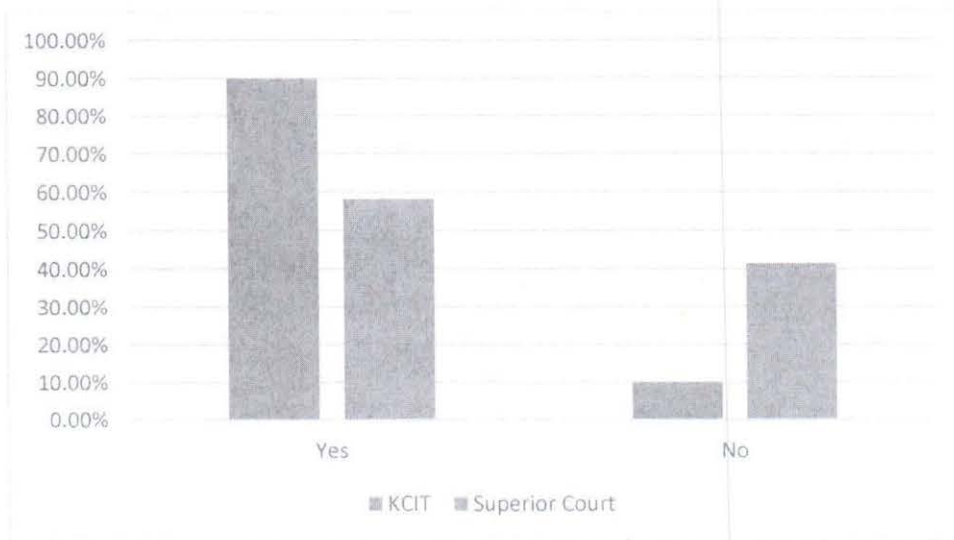
[6] Measured with the following question: Would you transfer PST files if there were instructions?

[7] Measured with the following question: Email is now accessible from any device via the secure government cloud. Have you successfully checked your email WITHOUT using VPN?

# 4.0 PROPOSAL FOR MIGRATION OF REMAINING AGENCIES

4.1 Planning Phase 2

Contingent upon the County Council's approval to proceed with Phase 2 of this email migration, KCIT will initiate a new project and form a new project team for that phase. Phase 2 will utilize existing funds and continued use of a 3rd party's expert guidance. Based on the experience in the pilot, the project team recommends retaining Slalom, Inc. again to perform the migration.

The pilot project gave the project team a detailed picture of areas for improvement for a larger rollout. Among the items already acted on are Active Directory attributes for users, User Principal Name (UPN) changes, FIM 2010 replacement, improved processes for provisioning and de-provisioning of users as they onboard and off board with the County, and port address translation capacity.

Issues for email on mobile phones took time to resolve due to a variety of root causes each requiring different solutions. As part of Phase 2 planning, KCIT expects to look at options for improved support that include better support of mobile devices under Mobile Device Management, investigating different approaches to synchronizing mobile devices and email, and process improvements based on lessons learned in the pilot.

5.0   CONCLUSION

In summary, the knowledge and skills gained through this pilot can be applied to improve success in migrating the rest of the County. The existing environment suffers from years of deferred maintenance which has caused outages recently. If we don't complete this migration, the County will incur significant costs to purchase hardware and consulting services required to upgrade the County to the latest version of on premise Exchange Server. This is a cost the County would incur approximately every 4-5 years. Estimates [See charts below and APPENDIX B & C] show a $6 million dollar cost avoidance over 10 years by going to Exchange Online over continuing to run this commodity service ourselves. That figure does not include the added expense of hiring an Exchange Engineer, which would also be required. We recommend proceeding with the migration for the rest of the County to Exchange Online.

Exchange on premise

Exchange Online - Mailbox
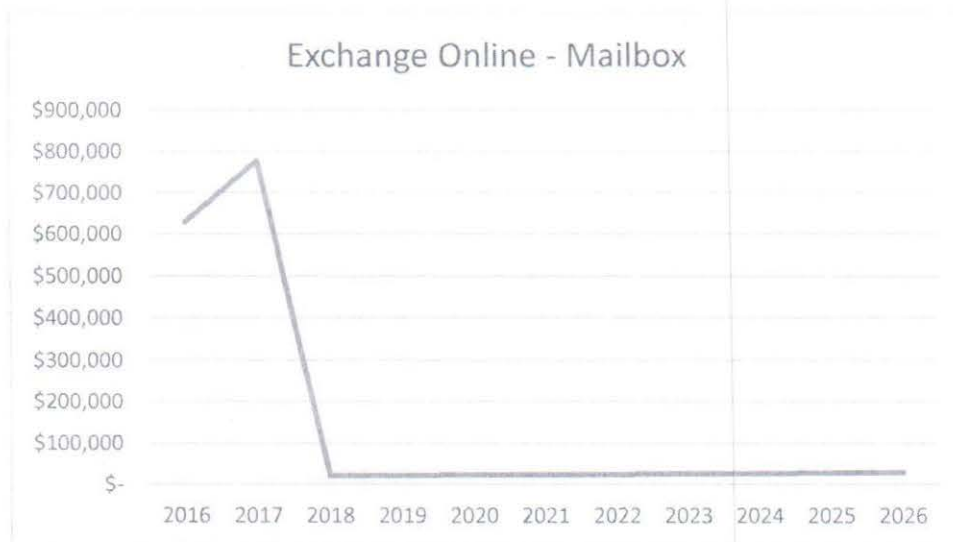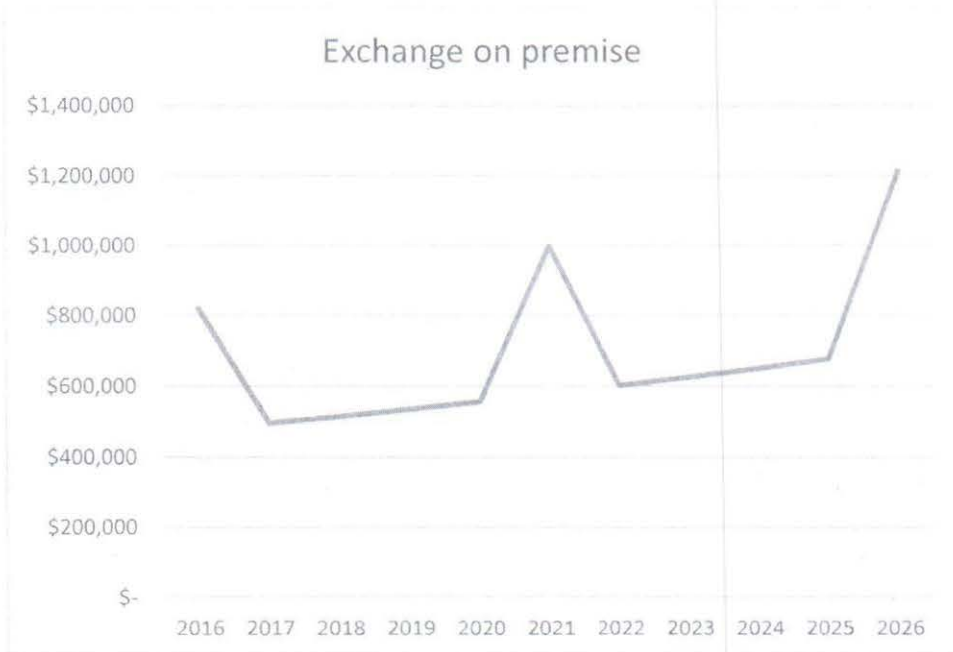
APPENDIX A: PROVISO

Of this appropriation, no funds shall be expended to transition more than two departments to cloud e-mail until the executive transmits a report on the results of the cloud e-mail pilot (CIP 1127266) and a motion that accepts the report is passed by the council. The motion shall reference the subject matter, the proviso's ordinance, ordinance section, and proviso number in both the title and body of the motion.

The motion shall reference the subject matter, the proviso's ordinance, ordinance section, and proviso number in both the title and body of the motion.

The report shall be approved by the Business Management Council and include, but not be limited to:

A. A summary of user satisfaction with the migration experience addressing user satisfaction with communications, and downtime for users;

B. A summary of user experience with the new solution including ease of accessing e-mails formerly saved as PST files; and

C. System availability with cloud e-mail compared to on premise e-mail.

The executive must file the report and motion required by this proviso in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff and the lead staff for the government accountability and oversight committee, or its successor.

Upon acceptance by motion of the report, remaining funds may be spent to transition other departments to cloud e-mail.

APPENDIX B: COSTS TO MAINTAIN ON-PREMISE EXCHANGE INFRASTRUCTURE

	On upgrade	Yearly	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Software			$819,804	$494,804	$ 514,596	$ 535,180	$ 556,587	$ 997,417	$ 602,005	$ 626,085	$ 651,128	$ 677,173	$ 1,213,510
Microsoft Exchange Server licenses	$ -	$ 10,000											
Networker Exchange Client licenses	$ -	$ 2,000											
Servers													
6 MBX	$ -	$ 43,662											
2 Archive	$ -	$ 12,000											
2 UM	$ -	$ 14,554											
Test Environment	$ -	$ 12,980											
Disaster Recovery		$ 35,108											
Storage													
6 MBX	$ -	$120,000											
2 Archive	$ -	$ 43,000											
2 UM	$ -	$ -											
Disaster Recovery		$ 81,500											
Backups													
All servers	$ -	$120,000											
New server hardware	$ 150,000												
New storage hardware	$ 100,000												
Consulting Services	$ 75,000	$ -											
Total	$ 325,000	$494,804											
2016	$ 819,804												

Exchange on premise

Every 5 years need to do major hardware refresh and consultant to help with migration
Does not include costs of continuing to store, backup, and support PST files

Cumulative costs over 10 years   **$7,688,290**

APPENDIX C: COSTS TO MIGRATE TO EXCHANGE ONLINE

	One time (2016)	Yearly (2016-2017)	One time (2017)	Yearly (2018+)		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
						$628,196	$778,196	$ 20,799	$ 21,631	$ 22,496	$ 23,396	$ 24,332	$ 25,305	$ 26,317	$ 27,370	$ 28,465
Software																
Microsoft Exchange Server licenses	$ -	$ 10,000		$ 3,000												
Networker Exchange Client licenses	$ -	$ 2,000		$ -												
Servers																
6 MBX	$ -	$ 43,662		$ -												
2 Archive	$ -	$ 12,000		$ -												
2 UM	$ -	$ 14,554		$ 14,554												
Test Environment	$ -	$ 12,980		$ 3,245												
Storage																
6 MBX		$ 120,000		$ -												
2 Archive	$ -	$ 43,000		$ -												
2 UM	$ -	$ -		$ -												
Backups																
All servers	$ -	$ 120,000		$ -												
Project funding - 2 Departments	$ 250,000	$ -		$ -												
Project funding - Rest of County			$ 400,000													
Total	$ 250,000	$ 378,196	$ 400,000	$ 20,799												
2016	$ 628,196															
2017	$ 778,196															
2018 and thereafter	$ 20,799															

Does not include cost savings from not continuing to store, backup, and support PST files that have been migrated to the cloud

Cumulative costs over 10 years $ 1,626,504

Exchange Online - Mailbox