KYOCERA Document Solutions Inc.

Kyocera Cloud Print and Scan Security White Paper

Version 20220801

Revision history

Release Date	Revision	Chapter	Details
May/17/2021	1.0	-	First release
May/18/2021	1.1	-	First official draft created
May/20/2021		3. Multitenancy	Added "Users not in KCPS system" in data access table.
		Various	Used TLS in place of SSL/TLS and removed other references to SSL
		4. Encryption Algorithm for Sensitive Information	Removed this section. Moved information about KCPS encryption to the section Data Protection -> Encryption, and TLS to the section Data Protection -> HTTPS Protocol
		6.1.1 Access Control	Replaced users with operators to distinguish KCPS users for IT Ops/DevOps with access to cloud provider deployment.
June/28/2021		6.4 Security vulnerability testing	Added new section, updated Table of Contents
July/09/2021		4.3 Automatic logout	Added new section
January/04/2022	1.2	4.3 Automatic logout	Updated section to mention that the automatic logout is now customizable for the Desktop client depending on specific RHQ deployment requirements.
		4.4 PIN Authentication	Added new section
		4.5 ID Card Authentication	Added new section
		6.4 Security vulnerability testing	Corrected timing of Security vulnerability test
		7. Device Authentication	Updated to add "PIN login"
June/05/2022	1.3	5. Firewall Configuration	Updated TCP ports for Desktop client (5000/5001 -> 5570/5571)
		2. System Overview	Added SharePoint Online to supported third-party cloud storage
		4.5 ID Card	Updated text to indicate that registration of

		Authentication	ID cards is now supported on the customer portal
		4.6 Azure Active Directory	New section detailing Azure AD support
August/01/2022	1.3.2	5. Firewall Configuration	Updated source detail for port 5570
		1.4 Regarding trademarks	Added new trademarks
		1.5 Important notice	Added new section

Contents

1. Introduction

1.1. About this document

This document describes Kyocera Cloud Print and Scan (KCPS) version 1.3.

1.2. Target reader

This document is intended for staff members Kyocera Document Solutions UK and their partners.

1.3. Abbreviation

- KCPS is the abbreviation for Kyocera Cloud Print and Scan.
- TA is the abbreviation for TA Triumph-Adler.
- TACPS is the abbreviation for TA Cloud Print and Scan.
- AWS is the abbreviation for Amazon Web Services.

1.4. Regarding trademarks

1.5. Important notice

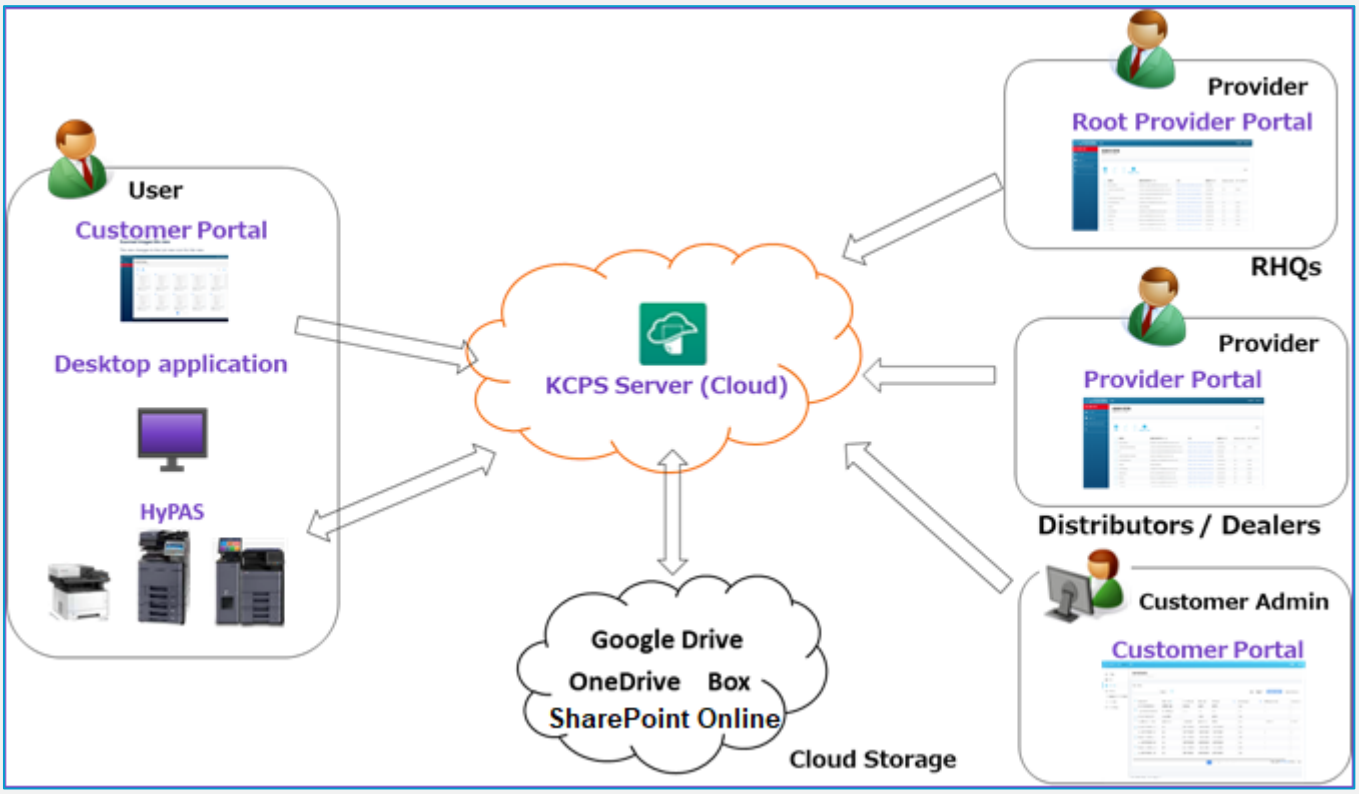
In the environment where multiple users share a single PC, there was timing when others can see, print or delete your print job while your desktop client is old version (v1.3.1 or lower). We strongly recommend that you use this version which contains this fix.

※KCPS desktop client does not support server OS, virtual desktop environments such as Citrix, and using KCPS desktop client as shared printer drivers is not supported.

2. System Overview

Kyocera Cloud Print and Scan (KCPS) is a cloud-based office printing and scanning solution that allows administrators to easily manage users, register Kyocera multi-functional printer (MFPs), and track print activities for their own organizations.
This white paper informs dealers and users about security measures in KCPS. Kyocera's priority is to provide secure protection of information assets that are handled by KCPS. These information assets are rigorously protected by the secure configuration and security features of KCPS.

KCPS consists of the following components:



Root provider portal: The root provider (RHQ) can access the **root provider portal** using a web browser. With this portal, RHQs can manage the URL links of the End User License Agreement (EULA), Privacy Statement, and the KCPS Desktop client package for their region. This portal also has an Organization tree for RHQs to view the hierarchy of all the organizations in their region.

Provider portal: The provider (RHQ, SC, Dealer) can access the **provider portal** using a web browser. They can add, edit, or delete organizations for child providers or for their customers.

Customer portal: The customer admin or customer user can access the **customer portal** using a web browser. The customer admin can add user accounts for their own organization and configure settings related to print limit and print policy.
Customer users can check their print job status and download scanned documents.

Desktop client: The Desktop client connects to the KCPS server. Customers can upload their print jobs. Depending on the spooling configuration (cloud spool or local spool), the print jobs are

either stored in the desktop or stored in the KCPS server.

HyPAS application (MFP client): The HyPAS application must be installed for MFP to be used with KCPS systems. The HyPAS application connects to the KCPS server. Customers can release their print jobs that they uploaded using the Desktop client. Customers can also scan their documents using this application.

Cloud Storage: As third-party cloud storage, KCPS supports integrations with Google Drive, Box, OneDrive, and SharePoint Online. By linking your cloud storage account with your KCPS account, you can print from and send scanned data to your cloud storage.

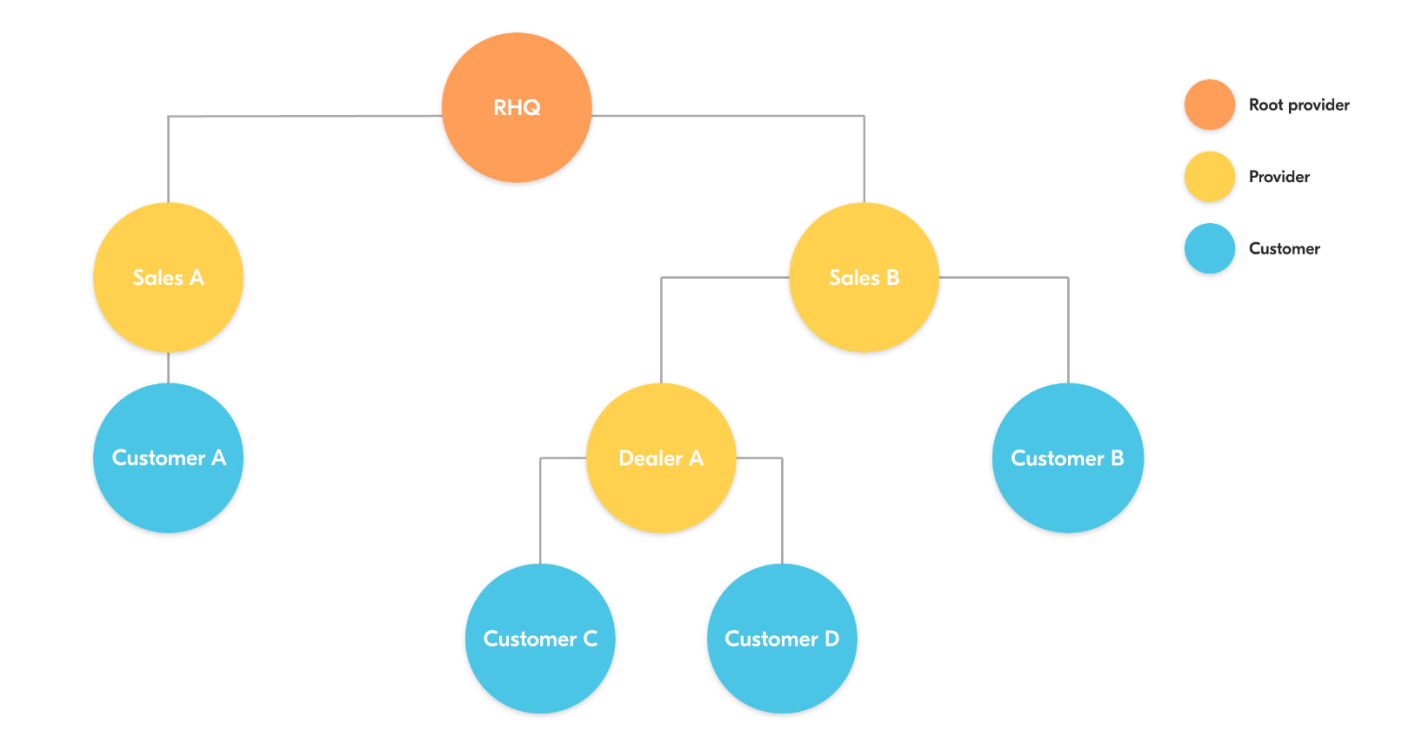
KCPS was developed at Kyocera Document Solutions Development America (KDDA) which is certified to ISO 27001.

3. Multitenancy

KCPS uses multi-tenancy to accommodate multiple sales companies, dealers, and customer organizations. Each sales company, dealer, and customer are treated as one organization. Access control is enforced through a hierarchical tree structure. (Fig. 2-1)

Organizations are classified into two types: a provider organization and a customer organization. A provider organization is focused on managing one or more customer organizations. Provider organizations have auditing and reporting features while customer organizations would provide features directly related to office functions like printing and scanning.

The hierarchical structure is patterned after the common sales hierarchical structure used in Kyocera. An RHQ (regional headquarters) is the parent organization (root provider organization) with sales companies under the RHQ as children provider organizations. Customers of sales companies would be the customer organizations and leaf nodes in the hierarchical tree structure.



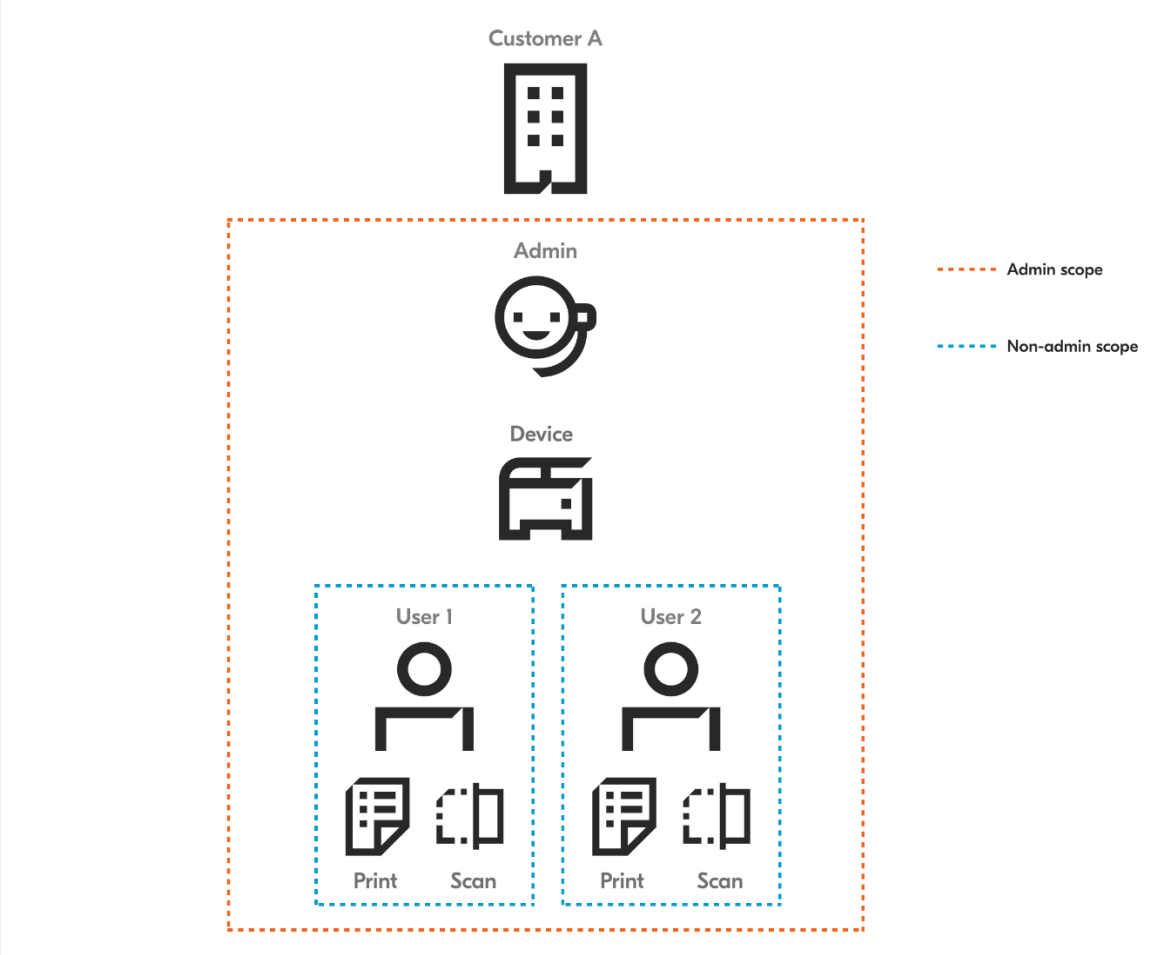
(Fig. 2-1) Hierarchical structure of KCPS Organizations

Any organization cannot view the data of another organization except for the parent organization. Data in customer organizations typically consists of user information, user's job data (e.g. print and scan jobs, job information), devices associated with the customer organization, and logs (jobs/pages printed, pages scanned). Data is scoped and access to data is limited. (Table 2-1)

User type	Users of customer organization	Devices of customer organization	Log data (jobs/pages printed/scanned)	Customer job data (print and scan documents)
Provider admin	Inaccessible	Accessible License info only	Inaccessible	Inaccessible
Provider support	Inaccessible	Accessible License info only	Inaccessible	Inaccessible
Customer admin	Accessible	Accessible	Accessible User report, User group report Device report	Accessible Can view own job data only
Customer user	Inaccessible	Inaccessible	Accessible Can view own log data only	Accessible Can view own job data only
Users not in KCPS system User who is set to destination for reports by the administrator	Inaccessible	Inaccessible	Accessible Provider contracts report Customer contracts report Contract history report	Inaccessible

(Table 2-1) Access to organization and user data by user type

For instance, if User 1 and User 2 are both users in organization Customer A, User 1 can only see his own print and scan jobs and cannot see print and scan jobs of User 2. (Fig. 2-2)

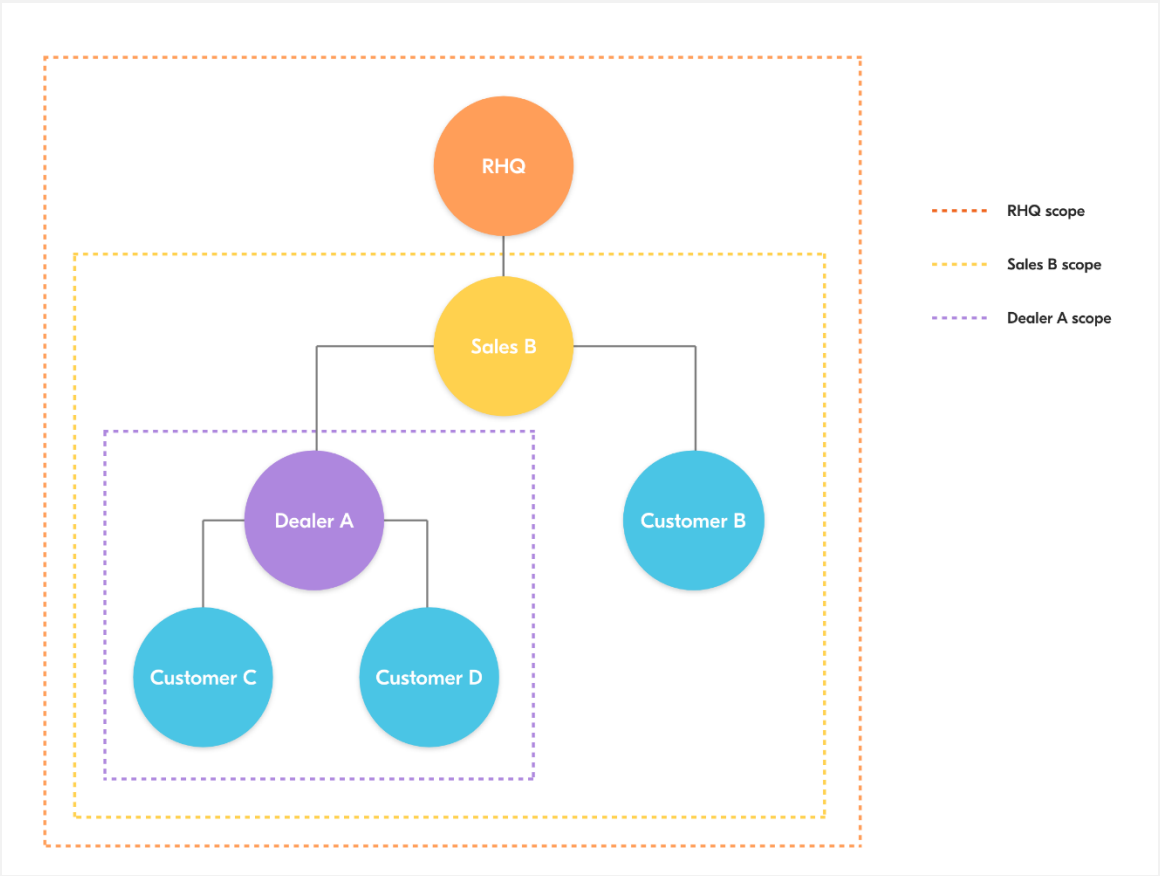


(Fig. 2-2) Access to user data for a customer organization

Additionally, User 1 and User 2 cannot see other users in organization Customer A from the customer portal, only Admin (who is an admin in Customer A) can see User 1 and User 2 (and himself, Admin) as users in the organization Customer A.

Finally, Admin cannot see print or scan jobs of other users, but Admin can see devices registered and associated to the organization Customer A.

Scopes are also present between root provider, provider and customer organizations. At the organization level, data that is tracked and shared are license-related information (e.g. how many devices a customer organization is allowed to register) to help with billing. (Fig. 2-3)



(Fig. 2-3) Access to license-related information for each organization

The visibility of this data goes upward to parent organizations. This means that RHQ can see the aggregated data of Customer B, C and D but will not be able to distinguish between these organizations. This is because the organization names are anonymized in the provider contract reports. Similarly, Sales B can see aggregated data of Customer C and Customer D and will not be able to distinguish between them.

It is worth noting that parent organizations can identify the organizations that they created, since they created those child organizations themselves (and set the organization name during creation of the organization). This means that Sales B can see data of Customer B separately and identify that data as separate from aggregated Customer C and Customer D. Similarly, Dealer A can see and distinguish data between Customer C and Customer D.

4. User Identification and Authentication

When accessing KCPS, the user must log in with an activated account. An unauthorized user cannot access KCPS. The following features are supported as security features for login:

4.1. Account Lockout Policy

The Account Lockout Policy protects KCPS from password cracking attacks. When a user fails to login a pre-determined number of times, the user account will be locked for a certain period.

As shown in the table below, when reaching the account lockout threshold for failed login attempts of three times, the account will be locked. The setting will unlock the account after 30 minutes.

Number of continuous failed login attempts	3 attempts
Auto Unlock Time	30 minutes

4.2. Password Policy

A user needs to employ a strong password that is difficult to be analysed and must be applicable to the KCPS Password Policy.

A password that does not meet the password policy is prohibited. This policy prevents users from setting simple passwords and guards against unauthorized access by a third party.

All passwords in KCPS are hashed for storage and passwords transferred via a network can be encrypted when transmitted. The browser also masks all passwords.

The password length and complexity of password are defined in the table below.

Password Length	Between 8 to 64 characters
Password Complexity	Include at least one character from each category: - numbers between 0 and 9 - uppercase letters* - lowercase letters* - special symbols (!"#$%&'()*+,-./:;<=>?@[]^_`{|}~) *Only English alphabet characters (no Unicode characters like umlaut, Japanese kanji/hiragana/katakana, etc.)

4.3. Automatic logout

In order to prevent the case when a user has logged-in but has left their device un-attended, an automatic logout feature has been implemented to automatically log out the user upon detecting that their logged-in session has been idle after a certain period.

This automatic logout applies to all clients accessing the KCPS server; MFP/HyPAS, Desktop client, and web browser.
For the Desktop client, the automatic logout duration has been made to be customizable to cater to the specific needs of RHQs.

4.4. PIN Authentication

In order to cater to the ease of use of the KCPS HyPAS application, PIN authentication was implemented for easier login on the MFP. The PIN is a unique and randomly generated 6 digit number. In order to support security for the PIN authentication, the following features have been implemented:

- PINs are only generated by the KCPS system; i.e. user cannot specify their own PIN. The KCPS system makes sure that the randomly generated PINs are not duplicated among users
- New PINs can only be regenerated once every seven days; this prevents attempts for possible exhaustion of unique PINs

4.5. ID Card Authentication

Support for ID card authentication has also been added as an alternative method for ease of logging onto the KCPS HyPAS application. Registration and management of ID cards (e.g. deletion of a previously registered ID card) is performed on the KCPS web application. Registration of ID cards can also be performed on the HyPAS application after a user authenticates in the HyPAS application.

4.6. Azure Active Directory

Azure Active Directory (Azure AD) is supported by the web application. Once the administrator configures a customer organization to use a specific Azure AD instance, users that exist on that Azure AD instance can login to the KCPS web application and Desktop client using their Azure AD credentials.

When a user successfully logs in to the KCPS web application or Desktop client using their Azure AD credentials, a KCPS user is created pulling information from their Azure AD identity (email, group info). This KCPS user is a separate KCPS identity on the KCPS web application. Some things are important to note in this regard:

- KCPS does not keep Azure AD credentials; KCPS follows the OAuth2 authentication workflow and always routes to Azure AD to verify credentials
- KCPS does not manage the Azure AD user
    - If the equivalent KCPS user is deleted on KCPS, the Azure AD user is not deleted and still exists on Azure AD
    - If the Azure AD user is deleted, the KCPS user will still exist on KCPS but will not be

able to authenticate into KCPS with Azure AD credentials because the Azure AD user no longer exits

When Azure AD is configured for the organization, a user will not be able to login to HyPAS using their Azure AD credentials. ID card and PIN login are still available for the user to authenticate into the KCPS app on HyPAS.

5. Firewall Configuration

Required Ports:

Source	Destination	Protocol	Port	Service
MFP / HyPAS	KCPS Server	TCP	443	HTTPS: Login and send job log and scan data to KCPS
KCPS Desktop Client	KCPS Server	TCP	443	HTTPS: Login and send job list to KCPS
Web Browser	KCPS Server	TCP	443	HTTPS: Access to the UI
KCPS Desktop Client	KCPS Desktop client	TCP	5570	HTTP: Used for internal / local communication only
MFP / HyPAS	KCPS Desktop client	TCP	5571	HTTPS: Get job list and job data

6. Data Protection

6.1. Protection of Stored Data

KCPS's information assets must be protected and not leaked or lost. KCPS implements security protection measures for stored information assets and a data recovery support through the features described below.

6.1.1. Access Control

KCPS's environment resources will be restricted to only individuals who will be maintaining/monitoring the environment (henceforth referred to as "operators", e.g. IT Ops, DevOps). Only operators with proper access control will have access to KCPS's AWS environment resources and as well as application data. Operators will be required to have proper RBAC (role-based access control) authorization.

6.1.2. Authentication

KCPS's database requires operator authentication to gain access to database data. Authentication credentials are configured during setup.

6.1.3. Encryption

KCPS uses the highest encryption standard supported by the Play Framework (2.6.6) and Silhouette (5.0.0) library version used: SHA-256 bit. Within the KCPS server, this encryption is specifically used for authentication (generating the authentication hash when a user makes a login attempt).

As described in Chapter 7, KCPS is hosted on the AWS platform. And MongoDB is used for the database.

AWS provides encryption at multiple levels to help secure your data, including encryption at rest, encryption in flight, and key management (using AWS Key Management), allowing AWS to support various encryption models.

Disks used by AWS Virtual Machines are protected by disk encryption. This protects both OS disk and data disks with full volume encryption. Disks are encrypted using 256-bit Advanced Encryption Standard (AES) and transparent to users.

Data at rest in KCPS's database is encrypted via MongoDB Atlas's provided encryption in their enterprise version. MongoDB utilizes by default 256-bit Advanced Encryption Standard in cipher Block Chaining mode (AES256-CBC), with other encryption options available. Encryption key used by MongoDB can be taken from the cloud provider's Key Management Service, with MongoDB automatic key rotation every 90 days. The encryption process is transparent to users.

Data stored via AWS S3 storage has default encryption provided. S3 encryption can utilize AWS

managed keys or customer master keys stored within the key management service.

Data in transit is also encrypted.

6.1.4. Information utilized by KCPS

KCPS Component	Information Assets (Used for the purpose of identification and communication within KCPS)
KCPS Server	• Organization information (URLs of each portal, email addresses of admins of each organization, organization type, license information, data retention periods) • User information (first and last names, username, email address, authentication hashes, authentication tokens of linked cloud storage accounts) of each KCPS user • Device information (serial number, network information such as host name and IP address) of each KCPS device, used for device registration and report generation. • Device logging information (number of scans, other device operations) for the purposes of usage report compilation (to assist with billing) and for maintenance/troubleshooting. • Print and scan job information • Print jobs (if cloud spooling) and scan jobs • Usage reports (used for billing purposes) by user, user group, device, provider and customer organizations.
KCPS HyPAS	• Authentication tokens generated by KCPS Server to authenticate the device or logged-in KCPS user to send info to and receive info from KCPS server. • Documents (PDF/JPG) to print or scanned from the device • Metrics (jobs and pages printed and scanned)
KCPS Desktop client	• Proxy settings of the network where the desktop is connected to; used to facilitate communication between the KCPS Desktop client and the KCPS Server • Authentication tokens generated by KCPS Server to authenticate the device or logged-in KCPS user to send info to and receive info from KCPS server. • Documents (PDF) printed from applications using the Desktop client print queue. Local spooling stores the PDF print jobs locally on the desktop while Cloud spooling uploads the PDF print jobs to the KCPS Server. • Print job information (document name, number of pages, location for KCPS HyPAS to download the print job from).

6.1.5. Data Backup

KCPS database backup on AWS is facilitated by MongoDB Atlas. MongoDB Atlas provides configurable cloud backup, which is managed by MongoDB. The current backup schedule is set to twice a day, kept for 7 days. Database restoration is also facilitated by MongoDB Atlas.

6.2. Protection of Communication Data

KCPS protects communication data regarding user access to use KCPS, and data communication to transfer data between KCPS and devices, respectively.
In order to protect KCPS communication data from masquerading, tapping or modifying the data, the communication data is encrypted, and KCPS components are mutually authenticated.

6.2.1. User Access

When a user accesses KCPS from an application (web application using a browser, Desktop client, or HyPAS application), an authenticated communication channel is established. KCPS user can access KCPS portal from the Web browser's client UI regardless of the user role. When a user accesses KCPS portal, the user is always identified and authenticated. If this identification and authentication are successful, the user can access KCPS portal based on his/her role. KCPS portal protects the communication data through HTTPS.

6.2.2. HTTPS protocol

HTTPS works over underlying secure protocols (TLS) that encrypt all traffic between browsers and servers. TLS require a certificate with a private key, a public key, domain information, and a chain of signatures by certificate authorities.

In KCPS, TLS is used to secure and protect sensitive information that is shared between KCPS server and a browser, device, or database. This information includes:

- KCPS user credentials and passwords
- Device authentication information
- User data
- Job metrics (print and scan jobs, pages printed, colour settings used, etc.)

The KCPS environment can also be configured by the environment administrator to utilize a self-signed certificate. Steps would need to be followed in order to either create a self-sign certificate within the environment or upload a self-signed certificate to the environment.
Certificates through Cert-manager have a lifespan of 90 days and will automatically renew when it reaches expiration. Self-signed certificates will need to be managed by environment Administrator.

6.3. Secure communication between the KCPS server and databases

KCPS on AWS will establish network connection to database using TLS encrypted network traffic. Database access is restricted to connections coming from Atlas's IP access list with the proper database authentication credentials.

6.4. Security vulnerability testing

In order to keep the KCPS system up-to-date with the latest security measures the following schedule will be followed for security vulnerability assessment:

- Perform internal security vulnerability assessment at the time of software release
- A yearly assessment will be conducted by an external/3rd party vendor specializing in security vulnerability testing for web applications

7. Device Authentication

To protect sensitive information transmitted between KCPS and Kyocera devices, security is enforced through HTTP over TLS. By default, the TLS protocol is enabled as the default for device communication.

The following options can be set in device authentication:

- Simple login
- ID card login
- PIN login

8. AWS Security Technical Details

KCPS is hosted on the AWS platform. AWS meets the broad set of internationally recognized information security controls and industry-specific compliance standards, such as ISO 27001, HIPAA, FedRAMP, SOC 1 and SOC 2 (see the detailed list of compliant standards in AWS Security Whitepaper).

The hosting environment is designed to utilize the AWS provided services and security features to help secure and monitor our application. The various features that are utilized include:

- Various AWS credential for login/access
- Security logs
- Instance isolation
- Firewalls/API access
- Secure HTTPS access points
- Network security (VPC isolation, Network Security groups, Network Access Control List, Internet Gateway, etc.),
- Storage
- Simple Notification Service monitoring CloudWatch application logs

KCPS is deployed to the following AWS regions:

- Tokyo (ap-northeast-1)
- Frankfurt (eu-central-1)
- North Virginia (us-east-1)

Refer to the Introduction to AWS Security and AWS Security Documentation for more details regarding global infrastructure and service-specific security.

KCPS uses MongoDB Atlas hosted on AWS for database storage. The hosted database cluster resides in the same region as the KCPS instance. This database cluster is configured as a 3-node replica set. MongoDB Atlas automatically deploys each node across availability zones within the region for redundancy and high availability.

Refer to MongoDB Atlas AWS Reference document for details regarding database cluster creation and deployment on AWS.

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