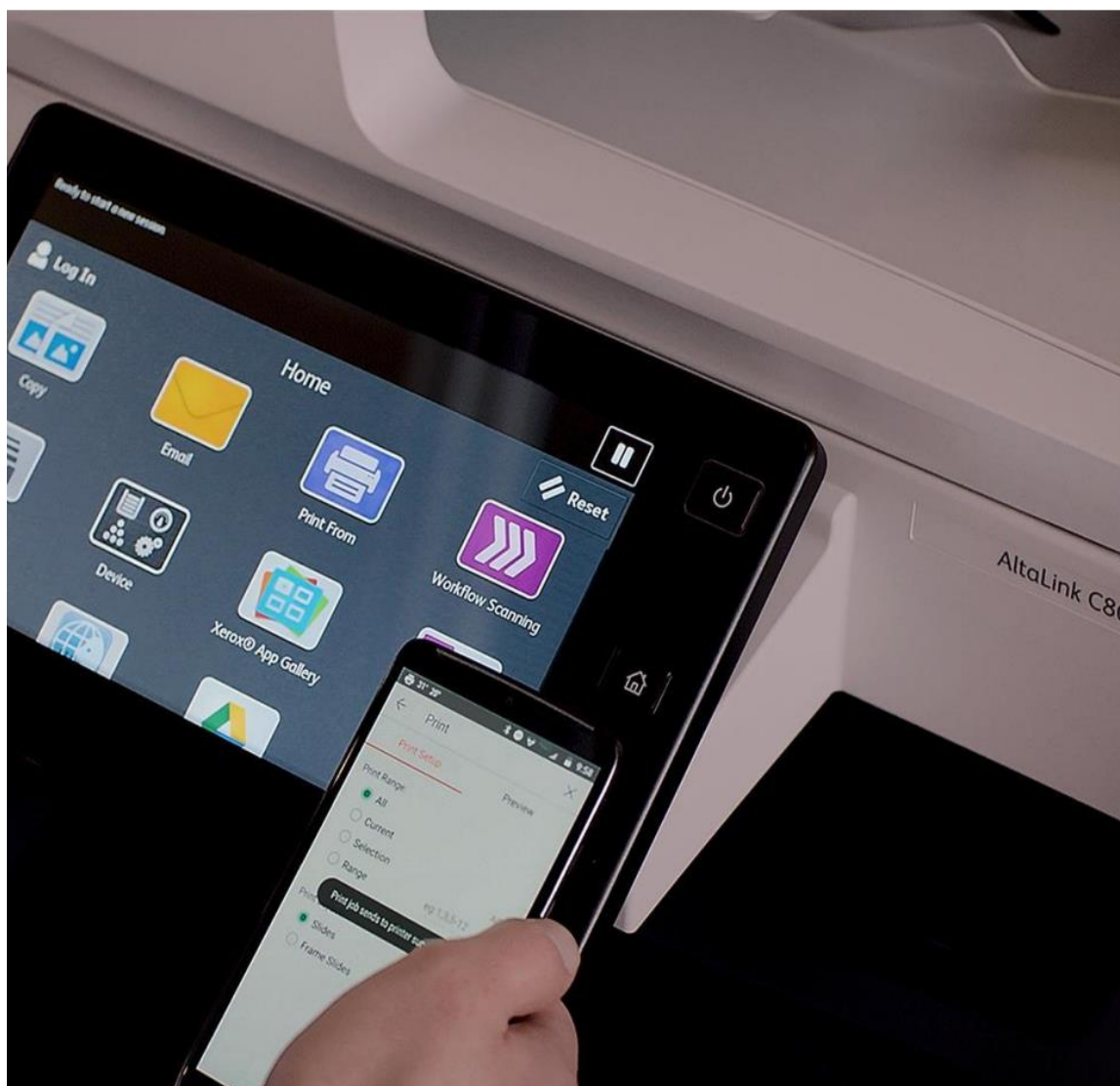


Security Guide

Xerox® Connect App for Dropbox™



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1. Introduction

Purpose

The purpose of the Security Guide is to disclose information for Xerox® Apps with respect to device security. Device security, in this context, is defined as how data is stored and transmitted, how the product behaves in a networked environment, and how the product may be accessed, both locally and remotely. This document describes design, functions, and features of the Xerox® Apps relative to Information Assurance (IA) and the protection of customer sensitive information. Please note that the customer is responsible for the security of their network and the Xerox® Apps do not establish security for any network environment.

This document does not provide tutorial level information about security, connectivity or Xerox® App features and functions. This information is readily available elsewhere. We assume that the reader has a working knowledge of these types of topics.

Target Audience

The target audience for this document is Xerox field personnel and customers concerned with IT security. It is assumed that the reader is familiar with the apps; as such, some user actions are not described in detail.

Disclaimer

The content of this document is provided for information purposes only. Performance of the products referenced herein is exclusively subject to the applicable Xerox® Corporation terms and conditions of sale and/or lease. Nothing stated in this document constitutes the establishment of any additional agreement or binding obligations between Xerox® Corporation and any third party.

2. Product Description

Overview

The Xerox® Connect for Dropbox™ App consists of two primary workflows. The two workflows are:

- Print files from a Dropbox™ repository
- Scan files to a Dropbox™ repository

The app and two workflows facilitate a combination of the following steps:

- Single Sign-On
- Authentication
- App Hosting
- Repository Navigation
- Scanning
- Printing
- Document Format Conversion
- Emailing
- SNMP & Device Webservice Calls

Application	What can I do?
Xerox® Connect for Dropbox™ App	<ul style="list-style-type: none">• Login to my Dropbox account• Select Print or Scan workflow• Navigate to a folder in my Dropbox repository• Scan a hard copy document to Dropbox with standard scan settings along with option to email the scanned document• Select one or more files in Dropbox and Print hard copies with standard print settings

Table 1 Xerox® App user benefits

APP HOSTING

The Xerox® Connect for Dropbox™ App depends heavily on cloud hosted components. A brief description of each can be found below.

The Xerox® Connect for Dropbox™ App

The Xerox® App consists of two key components, the device weblet and the cloud-hosted web service. The device weblet is a Xerox® App/EIP web app that enables the following behavior on a Xerox® Device:

- Presents the user with an application UI that executes functionality in the cloud.
- Interfaces with the EIP API, which delegates work, such as document scanning and printing.

The weblet communicates with the cloud-hosted web service, which executes the business logic of the app.

Dropbox™ Storage Service

For the Xerox® App to communicate and interact with the correct storage location, the user needs to establish a connection with their Dropbox repository.

For devices running the Gen3 EIP Browser, this connection process utilizes the authentication dialog provided by the storage service. The authentication dialog requests the username and password needed to access Dropbox content.

For devices running the Gen2 EIP Browser, this connection process utilizes the authentication dialog provided by the Cloud Repository Middleware from Xerox. The authentication dialog requests the username and password needed to access Dropbox content.

Single Sign-On via Xerox® Workplace Suite/Cloud and SSO Manager

To improve user experience, Xerox offers an optional Single Sign-On (SSO) capability that removes the need for a user to sign-in to the Xerox® App each time. Users can log into the printer and are then able to launch the app without the need to provide additional credentials.

Xerox Extensible Interface Platform®

During standard usage of the Xerox® App, calls to the device web services are used to initiate and monitor scan functions and to pull relevant details related to device properties and capabilities.

COMPONENTS

MFD with Xerox® Connect for Dropbox™ App – ConnectKey App

This is an EIP capable device that can print, scan and execute ConnectKey Apps installed from the Xerox® App Gallery. In this case, the device has the Xerox® Connect for Dropbox™ App installed.

The MFD communicates with the App Service, Middleware Service, App Gallery Service and Dropbox Authentication Service.

Xerox® Connect for Dropbox™ App – App Service

The App Service component is a web service hosted on the Microsoft Azure Cloud System. This component is responsible for hosting the web pages that display on the UI of the Xerox® Device. Additionally, this component provides the business logic service.

The App Service accepts requests from the MFD and communicates with Xerox Cloud Repository Middleware and File Conversion Services.

Xerox Cloud Repository Middleware

The Cloud Repository Middleware component is a service hosted on the Microsoft Azure Cloud System. The primary function of this middleware is to serve as the cloud storage interface adapter for current and future products and services.

The Cloud Repository Middleware accepts requests from the MFD and the App Service and communicates with the Dropbox authentication service and Dropbox API.

The Cloud Repository Middleware also interfaces with the Document Conversion Engine from Xerox, which converts non-printable document formats into printable document formats.

Xerox Document Conversion Engine

The Document Conversion Engine component is a service hosted on the Microsoft Azure Cloud System. The Document Conversion Engine converts a variety of document formats to a format that is printable by Xerox® Devices.

Xerox App Gallery

The App Gallery component is a web application, with services, hosted on the Microsoft Azure Cloud System. The App Gallery is accessed to ensure the Application is entitled to run. The

application can only be run when a “Trial” license has not expired OR a “Purchased” license has not expired.

After an entitled weblet is installed on a device, App initialization will contact App Gallery:

- to ensure the Application is entitled to run on the device.
- to retrieve App Gallery App Configuration parameter values set by an App Gallery user.

Xerox File Conversion Service

The File Conversion API component is a VM hosted on the Microsoft Azure Cloud System. This component converts a variety of original or scan document formats into formats supported by the App. It is primarily used for cloud-based OCR workloads when converting a scanned document into one of the following Microsoft® Office document formats: Word (DOCX), Excel (XLSX), PowerPoint (PPTX).

The File Conversion Service accepts requests from the App Service.

Twilio SendGrid API

The Twilio SendGrid API is a, 3rd Party, cloud hosted service. The Twilio SendGrid API is used to email scanned documents as attachments.

Xerox Mobile Login Service

The Mobile login Component is a service hosted on the Microsoft Azure Cloud System. It is responsible for interfacing with the Connect for Exchange Service and the User’s mobile phone browser. It provides a path for user login at the MFD utilizing the authentication dialog provided by Microsoft, displayed on the user’s Mobile phone.

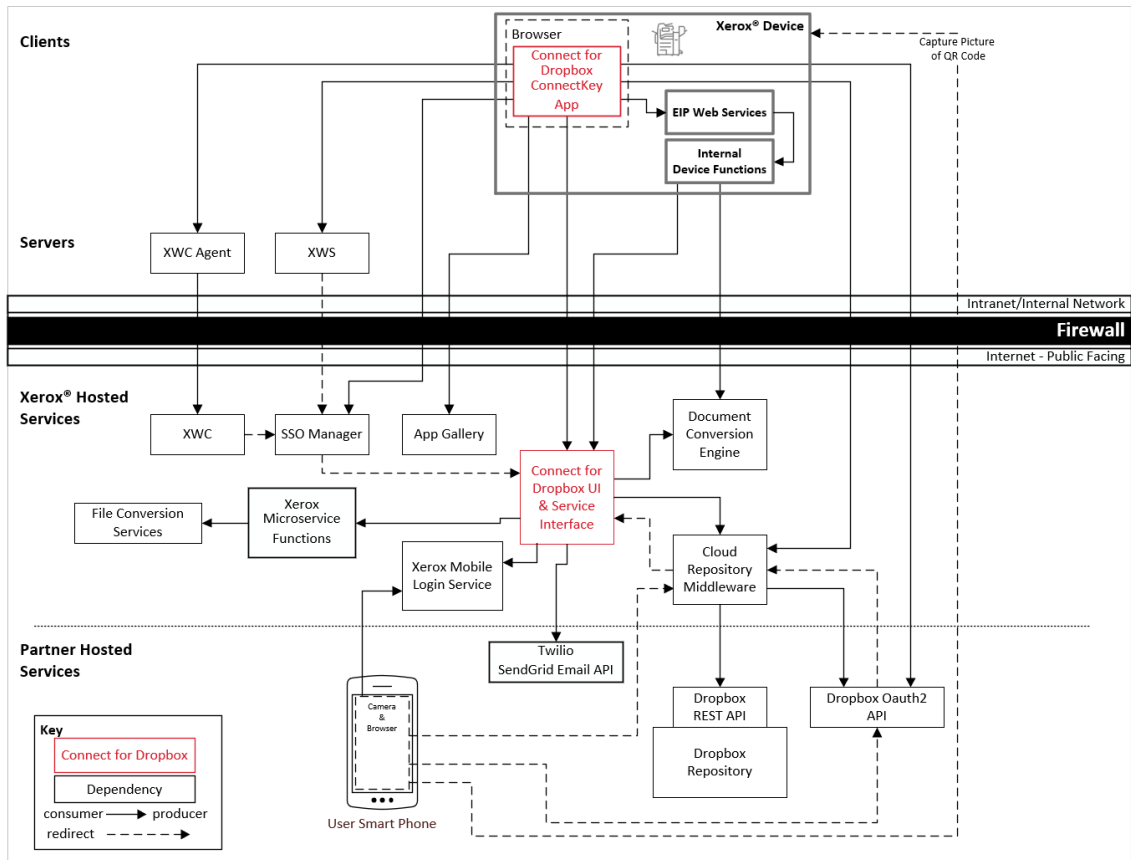
User’s mobile phone browser

A QR Code displayed on the MFD’s screen will retrieve and display the login URL from the Xerox Mobile Login Service, The user’s browser displays the Microsoft authentication dialog and interfaces with the Connect for exchange service, providing the login result redirect.

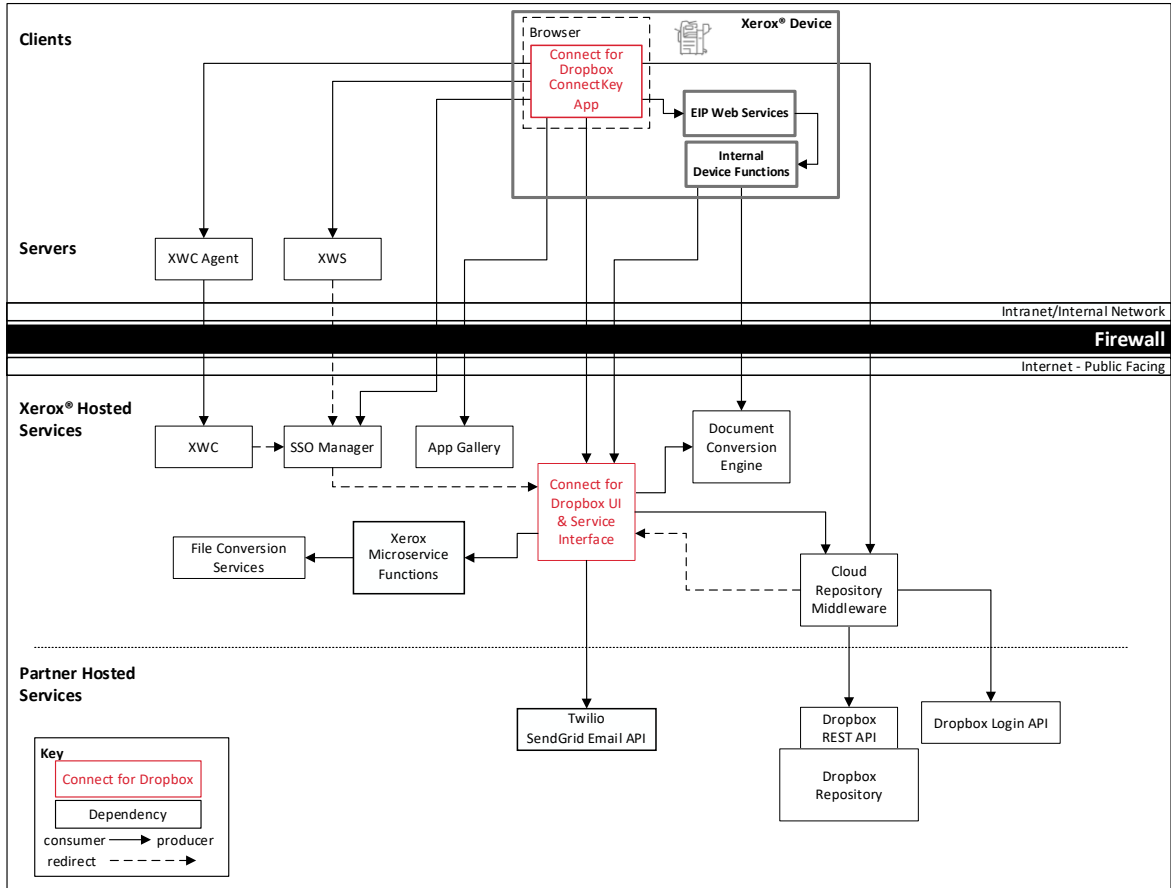
Architecture and Workflows

DATA FLOW DIAGRAM

Dropbox OAuth 2.0 Authentication - XWS/XWC SSO Architecture



Dropbox Cloud Repository Middleware Authentication - XWS/XWC SSO Architecture



Workflows

Authentication Workflow – Local Authentication

- Step 1:** User selects local authentication.

- Step 2:** User authenticates to the Dropbox repository directly on the device.

Authentication Workflow – Mobile Login

- Step 1:** User select Mobile login

- Step 2:** QR Code is displayed on the device

- Step 3:** User scans QR Code with Mobile Phone.

- Step 4:** User completes Dropbox authentication process on Mobile Phone.

App Printing Workflow

- Step 1:** User Launches the App on the Xerox® Device.

- Step 2:** User authenticates to the Dropbox repository using Local or Mobile login authentication. (If first login, user can agree to save credentials to XWS/C storage for future use. On subsequent logins, credentials are automatically retrieved and applied.)

- Step 3:** User navigates the folder structure to locate the file to be printed.

- Step 4:** User optionally selects to Preview the document to be printed.

- Step 5:** User selects a file and modifies the print options (ie; single sided, etc...).

- Step 6:** User selects the Print button to print their file at the device.

App Scanning Workflow

- Step 1:** User Launches the App on the Xerox® Device.
- Step 2:** User authenticates to the Dropbox repository using Local or Mobile login authentication. (If first login, user can agree to save credentials to XWS/C storage for future use. On subsequent logins, credentials are automatically retrieved and applied.)
- Step 3:** User navigates to and selects the destination folder for the scanned document.
- Step 4:** User modifies the scanning options (ie; single sided, resolution, output format, preview, email, etc...).
- Step 5:** User selects the Scan button to scan the document to the selected folder.
- Step 6:** If the Preview option was selected in Step 4, the user views the scanned document before deciding to allow the document to be saved to the selected destination folder.
- Step 7:** If the Email option was selected in Step 4, the scanned document is emailed to the specified recipients.
- Step 7:** The document is saved to the selected destination folder.

User Data Protection

AUTHENTICATION AND CLOUD REPOSITORY ACCESS

For the Xerox® App to access data stored in the Dropbox repository, the user is required to authenticate with their Dropbox login credentials.

Gen3 EIP Browser

For devices running the Gen3 EIP Browser, the protocol used to authenticate is OAuth 2.0. The authentication process is hosted and controlled by Dropbox. An authentication dialog provided by Dropbox, requests the username and password. Additional data may be required if 2-Factor authentication is enabled.

Upon successful login, an authentication code is returned to the device browser, via an HTTP redirect to the Cloud Repository Middleware. The Cloud Repository Middleware then uses the authentication code to obtain an Access and Refresh Token from Dropbox. The Access and Refresh Tokens are returned to the device browser via an HTTP redirect to the Xerox® App. The Cloud Repository Middleware utilizes the Dropbox API with a valid Access token to access the user's data in the Dropbox repository.

The account credentials provided by the user are accessible to only Dropbox. The App script operating within the EIP browser does not store usernames and passwords. Usernames and passwords are secured using Dropbox's implementation of the OAuth2 protocol. That data is protected during transmission to Dropbox servers using the TLS 1.2 network security protocol.

Gen2 EIP Browser

For devices running the Gen2 EIP Browser, the Cloud Repository Middleware is used to control the authentication process. The authentication process is hosted and controlled by Xerox. An authentication dialog provided by Xerox, requests the username and password. The Cloud Repository Middleware then uses a Dropbox API call to authenticate the username and password.

Upon successful login, an Access and Refresh Token are returned to the device browser, via an HTTP redirect, to the Xerox® App. The Cloud Repository Middleware utilizes the Dropbox API with a valid Access token to access the user's data in the Dropbox repository.

The account credentials provided by the user are accessible to Xerox and Dropbox. The App script, operating within the EIP browser, and the Cloud Repository Middleware do not store usernames and passwords. Usernames and passwords are protected during transmission to the Cloud Repository Middleware and Dropbox using the TLS 1.2 network security protocol.

The user's access security tokens may be persisted to Xerox managed cloud storage temporarily during the duration of the user's app session.

APPLICATION DATA STORED IN THE XEROX CLOUD

User data related to the categories below are stored in cloud persistent storage until a delete event occurs.

- Login to Dropbox account
- Scan preview images
- Print preview images
- Scan documents converted to MS Office formats.

The following activities will trigger a delete event, for digital document files that meet the associated criteria.

- A delete occurs when the system detects intermediate processing files exist after a job has completed.

- A delete occurs when the system detects that a document conversion job has completed, and the converted document has been downloaded.

The balance of data stored in the cloud, that is unrelated to user Personally Identifiable Information, may be stored indefinitely for event reporting purposes.

User documents that have been requested to be converted to a Microsoft® Office format are stored in cloud persistent storage until a delete event occurs.

The following activities will trigger a delete event, for the original digital document files and the converted document file.

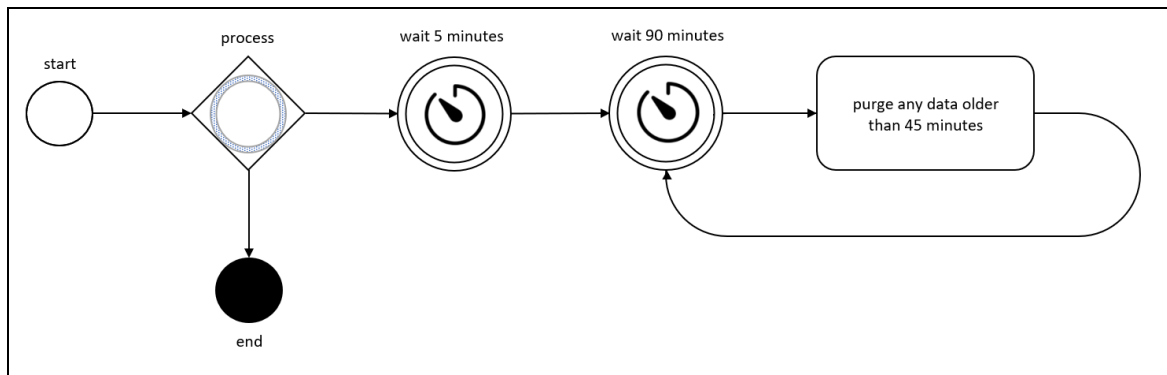
- A delete occurs when the system detects that the document conversion job has completed, and the converted document has been downloaded.

DELETE EVENTS

Delete events are triggered by background timer jobs running in the Xerox cloud.

Purge documents timer job

The timer host is an Azure App Service process. The timer event fires shortly after the Connector App Service host is instantiated and subsequent timer events stop when the timer host process terminates. The purge logic executes in-process.



LOCAL ENVIRONMENT

Application data transmitted

Application data related to the categories below are transmitted to/from the Xerox® Device.

- Account data
- Session data
- Job data

Application data stored on the Xerox® Device

The following app data is stored on the device, encrypted in Browser internal storage, until the App is uninstalled from the device.

- Device's SNMP V2 public community string

HTTP Cookies

The Xerox® Connect for Dropbox App does not store any cookies on the device.

3. Network Information

Protocol, Ports and URLs

The following table lists the protocol, ports and URLs used by the Xerox® Connect for Dropbox™ App when executing within a customer's private network. All connections are outbound to Cloud hosted components.

Protocol	Transport and Port Value	Use	Component	URL
HTTPS using TLS	TCP 443	App UI, Folder Navigation, Document Scanning	ConnectKey App to Connect for Dropbox™ UI & Services Interface	c2a-o365-web.services.xerox.com
HTTPS using TLS	TCP 443	App Configuration	ConnectKey App to App Gallery	appgallery.services.xerox.com
HTTPS using TLS	TCP 443	Subscription Entitlement	ConnectKey App to App Gallery	entitlements-appgallery.services.xerox.com
HTTPS using TLS	TCP 443	Facilitate Authentication Flow	ConnectKey App to Cloud Repository Middleware	cloudmiddleware.services.xerox.com
HTTPS using TLS	TCP 443	OAuth 2.0 Login Flow	ConnectKey App to Dropbox OAuth2 API	www.dropbox.com
HTTPS using TLS	TCP 443	Single Sign On (SSO)	ConnectKey App to SSO Manager	ssomanager.services.xerox.com
HTTPS using TLS	TCP 443	Printing Converted Documents	Xerox® Device to Document Conversion Engine	xmpcws.services.xerox.com

Protocol	Transport and Port Value	Use	Component	URL
SNMP		Device capability discovery Public read Internal pathway use only Complies with the SNMP v2 data model	ConnectKey App initialization	localhost

Use of SNMP when operating the App

The App does not use the SNMP protocol while in use, so it is perfectly fine to disable SNMP connectivity if that protocol is not otherwise required by another app or service.

IMPORTANT: The App does interrogate MFD SNMP OIDs over an internal channel. That internal channel is independent and unrelated to the SNMP network connectivity protocol setting. Consequently, the SNMP V1/V2 Community READ String must be set.

The default SNMP V1/V2 Community READ String value is “public”.

The internal SNMP channel is enabled when the EIP SNMP Web Service setting is enabled. This setting must be enabled to operate the App as it was designed. The V1/V2 READ string setting is still required by the EIP SNMP Web Service even when the V1/V2 protocols are disabled by the MFD administrator.

Presuming the EIP SNMP Web Service setting is enabled, and the SNMP V1/V2 Community READ Name matches the App’s SNMP V1/V2 Community Name, then the SNMP queries executed by the App over the internal channel will be successful.

Use of SNMP when installing the App

App Gallery and potentially other deployment tools may use the SNMP protocol when discovering MFDs on the network during device discovery. If SNMP dependent tools are not used when deploying the App across a fleet, then it is not required to enable any version of the SNMP protocol after the MFD administrator sets the V1/V2 READ string using supported device configuration methods.

4. General Security Protection

User Data Protection within the products

DOCUMENT AND FILE SECURITY

File content is protected during transmission by standard secure network protocols at the channel level. Since document source content may contain Personally Identifiable Information (PII) or other sensitive content, it is the responsibility of the user to handle the digital information in accordance with information protection best practices.

HOSTING - MICROSOFT AZURE

The cloud services are hosted on the Microsoft Azure Network. The Microsoft Azure Cloud Computing Platform operates in the Microsoft® Global Foundation Services (GFS) infrastructure. Azure safeguards customer data in the cloud and provides support for companies that are bound by extensive regulations regarding the use, transmission, and storage of customer data.

The Apps hosted in the cloud are scalable so that multiple instances may be spun up/down as needed to handle user demand. The service is hosted in Microsoft Azure data centers located in the US and Ireland. Users will be automatically routed to the closest server based on their geographical location.

For full details on Microsoft Azure's standards and certifications, please follow this link:

<https://docs.microsoft.com/en-us/azure/compliance/>

CLOUD STORAGE – MICROSOFT AZURE

All Azure Storage data is secured when at rest using AES-256 encryption. Any documents, held temporarily, are contained in an Azure Storage account hosted in Microsoft Azure data centers located in Ireland and the United States. For users located in North America, Central America and the Caribbean the documents are temporarily held in the storage account hosted in the United States. For users located in the rest of the world, the documents are temporarily held in the storage account hosted in Ireland.

For a full description, please follow these links:

Azure Storage

<https://docs.microsoft.com/en-us/azure/storage/common/storage-service-encryption>
<https://azure.microsoft.com/en-us/blog/announcing-default-encryption-for-azure-blobs-files-table-and-queue-storage/>

XEROX® WORKPLACE SUITE/CLOUD AND SINGLE SIGN-ON SERVICES

The Xerox® ConnectKey App Single Sign-On feature integrates with the Xerox® Workplace Suite/Cloud authentication solution to store user access information for SSO-compatible Xerox Gallery Apps. After the user enters their storage service credentials the first time, the XWS/C solution acts as a storage vault where the login information is securely stored.

All content to be stored in the vault is encrypted with AES 256 by the SSO Manager server before being given to the SSO vault that resides on the XWS/C solution. This ensures that the SSO vault

can never view or use the contents being stored in the vault. Only the SSO Manager infrastructure knows how to decrypt the content stored in the vault and only the App knows how to use it.

The SSO Manager service manages the encryption key exchange required for secure communications and encrypts/decrypts the content saved in the vault.

For a full description, please review the Xerox® Workplace Suite/Cloud Information Assurance Disclosure: <https://security.business.xerox.com/en-us/products/xerox-workplace-suite/>

User Data in transit

SECURE NETWORK COMMUNICATIONS

The web pages and app services that constitute the Xerox® Solutions are deployed to Microsoft Azure App Services. All web pages are accessed via HTTPS from a web browser. All communications are over HTTPS. Data is transmitted securely and is protected by TLS security for both upload and download. The default TLS version used is 1.2.

The Xerox® App requires the user to provide proper/valid credentials in order to gain access to the application's features. Authenticated users are allowed to access the features and data using HTTPS.

At launch, the apps must get an authentication/session token through the solution's authentication process. The access token acquired is used for that session of the app.

When using the Xerox® Connect for Dropbox™ App installed on a Xerox® Device, if the customer environment includes an Authentication solution (e.g., Xerox® Workplace Suite/Cloud) with Single Sign-On functionality enabled, the user can agree to have their user credentials securely stored and automatically applied during subsequent app launches.

All communication is done via HTTPS and the data is transmitted securely and is protected by TLS security. The default TLS version used is 1.2. Xerox App Gallery supplies a link to a Certificate Authority root certificate for validation with the cloud web service. It is the responsibility of the customer to install the certificate on their devices and to enable server certificate validation on the devices.

For more information related to Azure network security, please follow the link: <https://docs.microsoft.com/en-us/azure/security/azure-network-security>

XEROX WORKPLACE SUITE/CLOUD AND SINGLE SIGN-ON SERVICES

The Xerox® Workplace Suite/Cloud server accepts credential storage requests from the App via the SSO Manager service (the Xerox® App retrieves a vault key from the SSO Manager and uses it to retrieve login credentials from the XWS/C service). All communication is via HTTPS and the data is transmitted securely and is protected by TLS security. The default TLS version used is 1.2.

5. Additional Information & Resources

Security @ Xerox

Xerox maintains an evergreen public web page that contains the latest security information pertaining to its products. Please see <https://www.xerox.com/security>.

Responses to Known Vulnerabilities

Xerox has created a document which details the Xerox Vulnerability Management and Disclosure Policy used in discovery and remediation of vulnerabilities in Xerox software and hardware. It can be downloaded from this page: <https://www.xerox.com/information-security/information-security-articles-whitepapers/enus.html>.

Additional Resources

Security Resource	URL
Frequently Asked Security Questions	https://www.xerox.com/en-us/information-security/frequently-asked-questions
Bulletins, Advisories, and Security Updates	https://www.xerox.com/security
Security News Archive	https://security.business.xerox.com/en-us/news/
Xerox Trust Center	https://trust.corp.xerox.com/

Table 2 Additional Resources