Xerox® Print Services

Information Assurance Disclosure

Contents

1. Introduction

The Xerox® Print Services plug-in for Android™ enables mobile printing to many Xerox® printers and multi-function devices without the need for third party apps or additional print drivers. Easily print photos, web pages and documents when your mobile device is connected to a compatible Xerox® printer through a wireless network. Control print settings including color, number of copies, paper orientation, staples, secure code release printing, and more.

1.1. Purpose

The purpose of the IAD is to disclose information for the Xerox® Print Services with respect to device security. Device security, in this context, is defined as follows:

1. How scan jobs are received, accessed, and transmitted.

2. How data is stored and transmitted.

3. How the product behaves in a networked environment.

4. How the product may be accessed, both locally and remotely.

This document describes design, functions, and features of the Xerox® Print Services relative to Information Assurance (IA).Please note that the customer is responsible for the security of their network and the Xerox® Print Services does not establish security for any network environment.

The purpose of this document is to inform Xerox® customers of the design, functions, and features of the Xerox® Print Services relative to Information Assurance (IA).

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

1.2. 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 Xerox® Print Services plug-in; as such, some user actions are not described in detail.

1.3. 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

2.1. Overview

The Xerox® Print Services Plug-in for Android enables printing to many Xerox® printers and multi-function devices without the need for third-party apps or additional print drivers. With Android 4.4 or later devices, printing support is built into the operating system. You can find and print to Xerox® printers or multifunction printers that are on a wireless network by downloading the Xerox® Print Services Plug-in for Android on the Google Play store.

2.2. Component Diagram

The architecture of the Xerox® Print Services plug-in incorporates technical controls to eliminate, where possible, information security risk from all information assets including software components, connected system components, and information owners. The Xerox® Print Services Architecture illustrates the relationship between the Xerox® Print Services plug-in and these other system components.
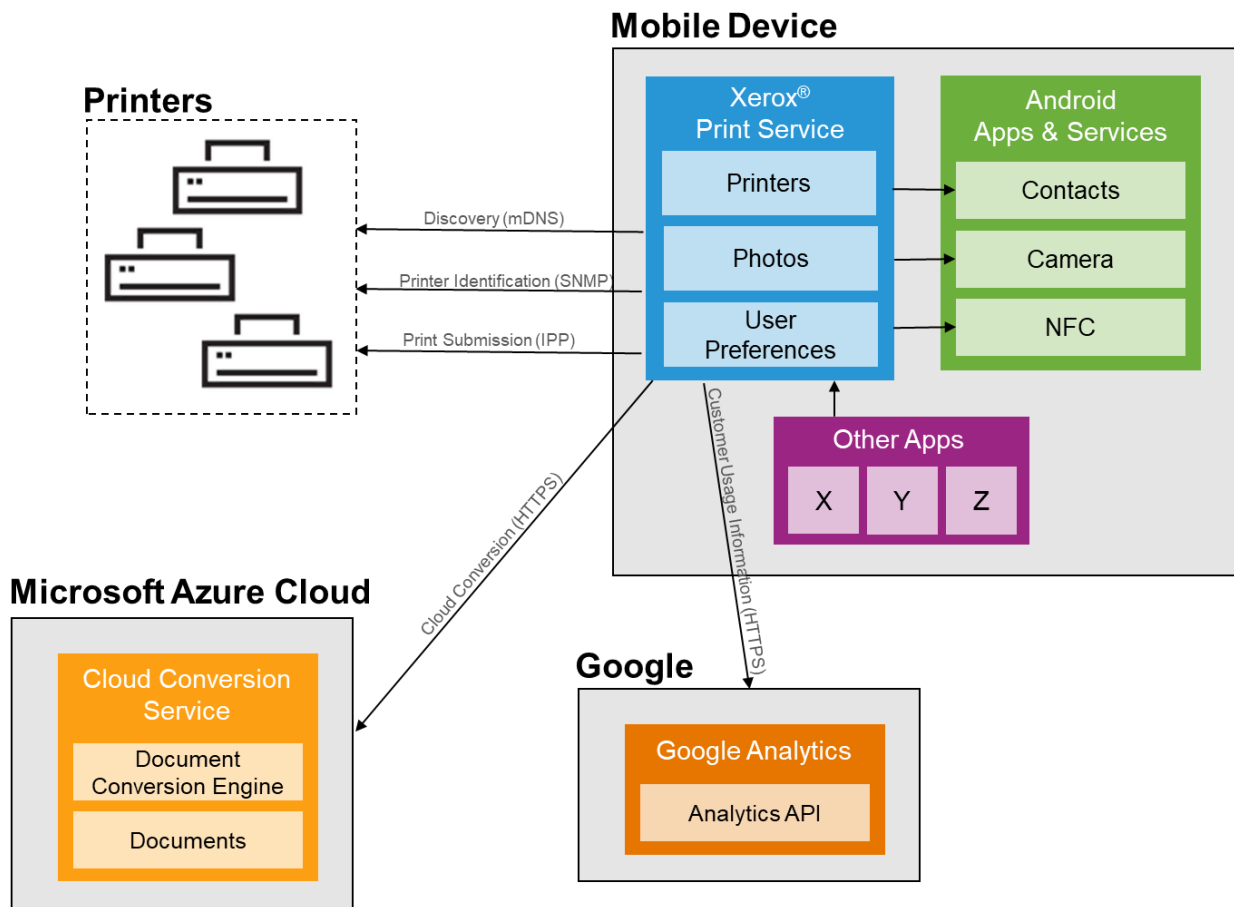

Figure 2.2-1: Component Diagram

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2.3. Description of System Components

Component	Description
Mobile User	End user using Android device with the Xerox® Print Services plug-in.
Xerox® Print Services plug-in	Mobile Phone plug-in that allows the user to find printers and submit print jobs.
Xerox® Print Services Local Storage	Used to information about the discovery printers, and user preferences (for Google Analytics).
Android Provided Apps and Services	Xerox® Print Services makes use of the Camera, NFC and Contacts. Permission must be granted by the user to use these services.
Other Apps	The Xerox® Print Services plug-in an Android print service. Users selecting a document from within any App that supports native printing will be able to initiate the plug-in.
Printer	Printer used for printing jobs which are output from the Xerox® Print Services plug-in. The printer must support IPP.
Cloud Conversion Service	If the user is attempting to print a file that is not in print ready format, then the Xerox® Print Services will use an Azure hosted Cloud Conversion Service to convert the file to a print ready format.
Google Analytics	If the user enables Google Analytics, then the App will collect non-sensitive usage information and will push this up to Google. This information provides Xerox with an understanding of how customers are using the app and can influence new features and functionality added in the future.

Table 2.3-1: System Components

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3. System Architecture

3.1. Sub-Systems

3.1.1. Xerox® Print Services Plug-In

3.1.1.1. Memory Information (SoV)

Volatile Memory					
Type (SRAM, DRAM, etc.)	Size	User Modifiable (Y/N)	Function or Use	Contains Customer Information	Process to Clear:
RAM	Varies	Y	Executable code, temporary storage	Yes	Power Off; Process Cleanup

Table 3.1.1-1: Xerox® Print Services **Volatile Memory**

Non-Volatile Solid State Memory					
Type (Flash, EEPROM, etc.)	Size	User Modifiable (Y/N)	Function or Use	Contains Customer Information	Process to Clear:
Mobile Phone Storage	N/A	N	Discovered printer information and user preferences (for Google Analytics)	Yes	Deletion of App to remove Configuration and App Content.

Xerox 3.1.1-2: Xerox® Print Services **Non-Volatile Memory**

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3.1.2. Cloud Conversion Service

3.1.2.1. Memory Information (SoV)

Volatile Memory					
Type (SRAM, DRAM, etc.)	Size	User Modifiable (Y/N)	Function or Use	Contains Customer Information	Process to Clear:
Azure storage – System Memory	Varies	Y	Executable code, temporary storage, username of logged in user	Yes	Power Off; Process Cleanup

Table 3.1.2.1-1: Xerox® Print Services Volatile Memory

Non-Volatile Solid State Memory					
Type (Flash, EEPROM, etc.)	Size	User Modifiable (Y/N)	Function or Use	Contains Customer Information	Process to Clear:
HDD Array	N/A	N	Original and converted documents to be printed.	Yes	Requires removal of Xerox roles. Job data is cleared based on job retention timers.

Xerox 3.1.2.1-2: Xerox® Print Services Non-Volatile Memory

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4. System Interaction

4.1. System Components

4.1.1. Xerox® Print Services Plug-In

The Xerox® Print Services plug-in is an Android Print Service, which works within the native print path of Android. Any Android App, that supports selection of document and native printing, will show the Xerox® Print Services plug-in as an option when printing. Access to the Xerox® Print Services plug-in will be controlled by the mobile devices authentication mechanism.

The Xerox® Print Services plug-in provides the following functions:

- Allows discovery or identification of printers via multi-cast DNS, QR Code scanning or NFC.
- Supports the ability to convert documents or files to a print ready format using a Cloud based conversion service. All communication with the Cloud Conversion Service is done using HTTPS over port 443.Transport Layer Security (TLS) cryptographic protocols are used for all communication to the Cloud Conversion Service.
- Submits print ready files to the selected printer using IPP or IPPS. By default the service will attempt to use IPPS if the printers support it and will fall back to IPP if not. Users may set a preference in the service to require TLS. This is a global setting that applies to all printers. When enabled, the service will always use IPPS. Printers that do not support IPPS will not be available when this setting is enabled.
- Collects non-sensitive user information (if enabled) and uploads this to a Xerox account using Google Analytics. All data collected is anonymous and is collected in an aggregate form such that any information collected cannot be associated with an individual. No PII (Personally Identifiable Information) is collected.

The Xerox® Print Services plug-in is available to all users using an App that supports the Android Print Service.

4.1.2. Xerox® Print Services Local Storage

The following data is stored in the Xerox® Print Services plug-in's assigned storage space on the mobile device. This is typical of all mobile apps and plug-ins. Other apps do not have access to this same space on the mobile device. The collection of stored information includes:

- Discovered Printers – Printer manufacturer, model, IP address, printer name, location, status, supported print options (color, 2-sided, etc.).
- User Preferences – Google Analytics enablement setting

The Xerox® Print Services uses the Android approved methods to encrypt and secure information stored on the device.

- If the mobile device is password protected by the user, then the Xerox® Print Services data is encrypted and secure.

4.1.3. Android Provided Services

The Xerox® Print Services may acquire data from the following services provided by the OS on the mobile device:

- Contacts
- Camera
- NFC

The user is asked to grant/deny permission to access these services/data stores the first time the plug-in needs to use them. The user can change their decision to grant/deny permission through Settings on their mobile device. Access to each of these services is managed individually.

Access to Contacts is used to retrieve the logged on user of the mobile device (i.e. their Google username/email). This information is used to as the user identity when submitting jobs to the printer. Typically you will see this name show up on the banner sheet of the print job. The username is only stored in RAM while the app is running.

The Camera and NFC apps/modules are used for printer identification. In addition to discovering printers on the Wi-Fi network, the Xerox® Print Services can also discover a printer if the devices QR identification code is scanned, or using the built-in NFC feature on some models of printers (e.g. AltaLink and VersaLink).

4.1.4. Interaction with Other Installed Apps

When a user opens any document from within an app and selects chooses the print option, the Android printing framework will receive the document information and it then presents printers discovered by the Xerox® Print Services. If the user selects any of these printers, the document is routed to the Xerox® Print Services plug-in for printing along with user selected print options. Once the user completes printing and exits the print interface, they return back to the original calling App.

4.1.5. Printers

The Xerox® Print Services can interact with any Xerox® printer that supports the ability necessary Discovery, Identification and Print Submission interfaces.

Discovery

Discovery of Xerox® printers uses Multi-Cast DNS (Domain Name System), over port 5353. Printers can also be discovered manually by these methods: Users can enter the IP address or DNS name of the printer, they may scan a QR code or they may use NFC discovery. All these methods of discovery will then try to contact the printer over IPP or IPPS (based on the user preference setting and if successful, the printer will be added to the discovered printer list.

Identification

Once a printer has been discovered the Xerox® Print Services will obtain the printers sysObjID using SNMP (Simple Network Management Protocol) over ports 161 and 162. This information is only used when printing documents that require conversion via the Cloud Conversion Service.

Print Capabilities and Submission

Determination of the printer capabilities, such as supported print options or supported PDLs (PDF, PS, PCL) as well as the actual submission of the print job is done using either IPP (Internet Printing Protocol) over port 631 or IPPS over port 443.

4.1.6. Mobile User

The mobile user is an end-user attempting to print a file using the Xerox® Print Services running on a mobile device. It is assumed that the client's security policy and systems have already authorized the user to access and use corporate resources (e.g. network, multi-function device).

4.1.7. Cloud Conversion Service

The Cloud Conversion Service is hosted in the Microsoft Azure Cloud. This service allows the Xerox® Print Services to upload files which are not in print ready format (e.g. a photo), it will then convert them into a print ready format (PS or PCL) and allows the plug-in to retrieve them. Assess to the Cloud Conversion Services is Xerox password protected. The Xerox® Print Services uses the HTTPS over TLS protocol on port 443 for all communication with the Cloud Conversion Service. It establishes an HTTPS secure connection with the Cloud Conversion Service relying on the mobile device operating system to validate the security certificate as part of establishing the TLS connection. The security certificate is issued by Comodo (a trusted certificate authority) and ensures that the application has been verified and validated.

The Windows Azure Platform operates in the Microsoft® Global Foundation Services (GFS) infrastructure, portions of which are ISO27001-certified.

Windows Azure Security Highlights:

- Built-in Identity Management for administrator access
- Dedicated hardware firewall
- Stateful packet inspection technology employed
- Application-layer firewalls
- Hypervisor firewalls
- Host-based firewalls
- SSL termination / load balancing / application layer content switching
- Each deployed hosted service is segmented in its own VLAN, preventing compromised node access

Please visit the following Microsoft web sites for more information:

1.   Windows Azure Security Overview:

http://azure.microsoft.com/blog/2010/08/10/new-windows-azure-security-overview-white-paper-now-available/

Select Windows Azure Security Overview.

2.   Microsoft Azure Trust Center:

https://azure.microsoft.com/en-us/support/trust-center/

4.1.8. Google Analytics

Google Analytics is a web analytics service offered by Google that tracks and reports website traffic. In this case, the Xerox® Print Services is using it to track usage and access information related to the plug-in module. This feature is optional and the user may choose to disable the sending of this information if desired. There is no customer or user sensitive information being collected. The app will track a small set of metrics like the number of pages, copies and printer model used to analyze usage. This will be done completely anonymously and cannot be associated with any individual since no PI (Personal Information) is collected. Google may track additional information like device model used, IP address by default. Refer to Google's privacy policy https://www.google.com/intl/en/policies/privacy/ for further details.

All data collected by the Xerox® Print Services plug-in is accessible only to Xerox® authorized personnel and is used to better understand how users are using the plug-in. This information is used to plan future features and software changes of the plug-in to better tailor it to the needs of our customers.

All communication between the Xerox® Print Services plug-in and the Google Analytics service is done via HTTPS over TLS on port 443.

5. Logical access, network protocol information.

5.1. Protocols and Ports

The following table shows the protocols and typical port numbers used in the Xerox® Print Services plug-in:

Protocol (Ports)	Protocols / Ports
mDNS (port 5353)	Device Discovery
IPP (port 631)	Printer Status, Capability, Print Submission and Print Status
IPPS (port 443)	Printer Status, Capability, Print Submission and Print Status
SNMP (port 161)	Device Identity
HTTPS (443)	Document conversion to print ready format.
HTTPS (443)	Google Analytics

Table 5.1-1: Protocols and Ports

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