LRS CloudPrint Desktop Clients

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INTRODUCTION

LRS CloudPrint is a print management solution that eliminates the need for on-premise print servers. It is a multi-tenanted 'Software as a Service' platform and runs in the public Microsoft® Azure® cloud where it is managed by LRS. In addition to a set of cloud services, LRS CloudPrint includes clients for both desktop and mobile platforms.

Much of the operation of LRS CloudPrint is predicated on the desktop clients. Without the LRS CloudPrint™ Desktop Client, the desktop user cannot install and make use of LRS CloudPrint-defined printers and print jobs from any source (desktop or mobile) cannot be delivered to print devices. Future development of LRS CloudPrint will only reinforce the importance of the desktop clients.

Supported Desktop OSs	Prerequisites
Windows 10, 64 bit (all versions to date) Windows 11	.Net Core Runtime 3.1 or later ASP.Net Core Runtime 3.1 or later (will be installed if missing)
macOS 10.13 (High Sierra) and above	

FAQs	
Is there a desktop client for Chromebook®?	Currently there is no support for Chromebook either as a desktop client or a mobile client. This is listed as a future development but not yet prioritized.

DEPLOYMENT OF DESKTOP CLIENTS

Desktop clients are deployed from the logged-in user portal page at

https://app.lrscloudprint.com

When browsing from Windows or macOS, if no locally-installed client is detected by the site, a message is displayed at the bottom of the printer list page (the default landing page for the portal) with a link to download and install the client. The logged-in user must have sufficient privileges to install the client. Once the client is installed by the user, it is kept updated automatically in step with any changes made in the cloud components of LRS CloudPrint, and to make available any new features and improvements in the client. The Windows client can be uninstalled at any point using the standard Windows program uninstaller.

When browsing from Windows® 10 or macOS®, if a local client is installed but no user is logged in locally to the client, a warning is displayed to this effect in the browser. There must be a logged-in user at the client to enable printer installation and deletion, printing and the upload of job statistics and discovered device information.

There should be nothing installed or configured on the client which prevents either the initial deployment from the portal or subsequent updates of the desktop client via the web.

FAQ	
Can the desktop clients be distributed using SCCM or other corporate deployment tools?	In the first instance, yes, but because the desktop client must remain in step with any changes made in the cloud components of LRS CloudPrint, the clients must be allowed to check for updates update themselves from the web as and when required, from first installation onwards.

DESKTOP CLIENT COMPONENTS

In Windows, the desktop client comprises four components:

- An LRS CloudPrint client service;
- Accompanying update and device services; and
- a system tray application.

The client service runs in the Local System account and is responsible for (amongst other things, see below) for the installation and removal of printers as requested by the user via the

LRS CloudPrint portal. The client service is accessible for requests only from localhost and from the LRS IOT Notification Hub in the cloud. When the client service detects that an update is available, it starts the updater service which then downloads and installs any update before terminating. The system tray application runs in the Windows® account of the desktop user and allows login to the desktop client. The tray application also provides a quick web link to the LRS CloudPrint™ portal, and some 'About' information.

The device service is currently unused but will be required by future features of LRS CloudPrint.

In macOS a broadly similar design is employed, with a client service and corresponding update service together with a menu bar application.

DESKTOP CLIENT: PRINTER DEPLOYMENT

When the user selects Install for a printer in the LRS CloudPrint portal, the locally installed desktop client carries out the following steps:

- (direct print only) It obtains the IPP attributes of the printer either from storage or the device;
- Using the available OS APIs, the printer is installed as an IPP printer; and
- Confirmation is returned to the browser that the installation has been completed

Communication between the browser and the locally installed client takes place via port 39149 (or in the case of the Firefox® browser, port 39150), so this port should not be blocked on the client platform.

DESKTOP CLIENT: PUSH PRINTING

When the user prints to an LRS CloudPrint printer, the locally installed desktop client carries out the following steps:

- The spooled printer file is handed off by the OS and stored in encrypted form by the client;
- A decrypted copy of the file is parsed for statistical purposes;
- The decrypted job is handed to the client's 'internal' IPP proxy, which checks that the print device is available before dispatching the job using either IPP or IPPS, depending on the device capability. The URI used for job submission is the one 'discovered' or set by the administrator at the time the device was created in LRS CloudPrint, and it must be accessible to the client at print time.
- Once the job is successfully printed (or not), the job status together with the parsed statistics are uploaded to the cloud and the encrypted job file is deleted.

Communication with the IPP Proxy is carried out over port 39149, so again this port should not be blocked on the client platform. Standard IPP and IPPS ports are used for print submission to the print device.

FAQ	
Can print jobs be directed from client to printer via the cloud, if the printer URI is not accessible to the client at print time e.g. in a zero-trust network configuration?	Yes – this is the Cloud Tunnel feature, which must be enabled by the service owner before individual printers can be designated Cloud Tunnel printers and jobs sent to the printer via the cloud. NB. At least one client must be present on the network to which the printer is attached for this workflow to function.

DESKTOP CLIENT: PULL PRINTING

In pull printing, the job is retained at the client until the user identifies themselves at the print device and releases the job using the appropriate mobile client app (Android® or iOS®) in conjunction with a scannable QR code attached to the device. At this point a message is sent to the client from the cloud to release the job.

The messaging pathway between the cloud and the client that facilitates release requires only that https is not blocked, though for enhanced performance MQTT can be used if port 8883 outbound is open on the client.

Pull Printers can also be designated Cloud Tunnel: in this case print jobs are spooled and sent to the cloud for storage until the job is released. NB. At least one client must be present on the network to which the printer is attached for this workflow to function.

DESKTOP CLIENT: DEVICE DISCOVERY AND IPP SCAN

Devices can be defined manually to LRS CloudPrint by the Administrator. In larger installations where this is impractical the Bonjour® zero-configuration protocol can be enabled (even if only temporarily) on printer devices, and the LRS CloudPrint™ desktop clients (Windows® 10 or macOS®) used to discover the printers using this protocol.

Each desktop client carries out a 'sweep' every time the client service starts up, and at intervals thereafter. This is limited to the same subnet as the client. Any devices previously undiscovered are reported to the cloud to be added to the list of available devices; the administrator can then create printers and/or pull printers based on those devices as required.

Device discovery by the desktop client requires that port 3702 outbound remains available on the client and should not be blocked.

Bonjour discovery by clients can be disabled globally across the tenant by the service owner if required.

A further option for discovering devices is the IPP Scan feature available to administrators in the portal. A range of addresses can be specified for sweeping for IPP-enabled devices, and in the same way as Bonjour discovery, any devices discovered will be added to the available lists in Create Printer and Create Pull Printer.

DESKTOP CLIENT: MOBILITY PRINT

LRS CloudPrint provides mobile client apps for both Android® and iOS® mobile devices. These apps can be used to submit print jobs to the cloud, where they are converted to PDF and sent to the print device, either as a direct print operation or a pull print operation. The only difference between the two is that pull print doesn't happen until the user releases the job.

The job is printed via the medium of a desktop client: the cloud services are aware as to which client has either discovered the intended print device, or has a printer installed which is directed to the same device.

The messaging pathway between the cloud and the client that facilitates mobility print requires only that https is not blocked, though for enhanced performance MQTT can be used if port 8883 outbound is open on the clients.