## Dell Document Hub vs. HP MFP Cloud Functionality

**DECEMBER 2013**

## EXECUTIVE SUMMARY

Buyers Lab LLC (BLI) was commissioned by Dell Inc. to conduct a comparative evaluation of Dell Document Hub (tested on a Dell C2665dnf Multifunction Color Laser Printer) and HP's comparable offerings for delivering scanned, editable documents to various cloud storage services: HP Connected, formerly HP ePrint Center, and related MFP apps and desktop applications (tested with an HP LaserJet Pro 500 color MFP M570dn). BLI was contracted to assess the two offerings in several key areas: Features, User Experience, Workflow, Document Processing Performance, and Cost Analysis.

Dell Document Hub is an MFP- and cloud-based document processing, routing and printing solution that can be accessed from an "app" resident on supported Dell MFPs (to date, the C2665dnf Multifunction Color Laser Printer, with other models to follow). It allows users to easily scan documents to, and print documents from, popular online repositories (Box, Dropbox, Google Drive, SharePoint Online, and SkyDrive) right from the MFP's control panel. Thanks to available OCR (optical character recognition) processing, users can create searchable, editable files in popular office formats (PDF, RTF, DOC, DOCX, XLS, PPTX) in addition to the more common image formats (static PDF, TIFF, JPG) that most capture programs can create. Notably, that OCR processing occurs in the cloud; there is no need to load or launch software at the user's desktop to accomplish this. The OCR service is available free of charge during the solution's initial trial phase (until March 2014), at which point Dell will start charging a fee for processed pages.

The analogous HP solution for small business customers is a combination of the "apps" available for download to supported HP ePrint MFPs, the Readiris Pro 12 OCR desktop utility that ships with the MFP, along with the HP Connected online service (formerly called HP ePrint Center). The MFP-resident apps allow users to scan files to, and print files from, online storage services. At the time of this report, apps for connecting to Box and Google Docs were available. Note that file format choices available for scan and upload are limited to black or color image PDFs. In order to create editable files, users must scan the file to themselves via the MFP's scan to email or scan to folder functionality, launch the bundled Readiris software program at their desktop, and process and save the file in the desired format before manually uploading it to the destination service. The free HP Connected service adds more features, such as the ability to print to registered printers via mobile devices (by emailing files to the printer's unique email address) and to access, view, print and share files printed in this way within the past 30 days. HP Connected also delivers printer status alerts,

such as consumables warnings, as well as a library of other apps available for download to the MFP. Note that HP also offers a fee-based online document management service, HP Flow CM, which is accessible via an app on supported HP MFPs (the M570dn included). This service is covered in a sidebar to this report.

The Dell and HP solutions each have their strengths. When specifically addressing the features, functionality and workflow associated with scanning documents to, and printing documents from, various cloud storage services (the thrust of this report), BLI feels Dell Document Hub is the superior solution. Dell's offering supports delivery to more cloud services than HP does via its MFP-resident eStorage apps. When retrieving and printing files at the MFP, Dell Document Hub allows users to search across multiple cloud services at once. With the HP eStorage apps, users must first select the service where they believe a desired file resides. In addition, Dell's available cloud-based OCR processing means users can deliver searchable, editable file formats to the desired cloud destination. The HP MFP apps deliver only static image files to the cloud services. If searchable/editable files are desired, HP users need to employ the included desktop OCR software and then load the processed files from the desktop, which adds complexity and time to the capture workflow. Moreover, BLI found that Dell's OCR processing created documents that were more true to the original for documents with moderate- to heavy formatting. So in general, for creating editable/searchable documents Dell Document Hub delivered better OCR accuracy with an easier, less time-consuming workflow, which can mean greater productivity for users.

In its favor, the HP bundle includes a full-featured OCR program that offers more power and flexibility than Dell's automatic OCR processing, and customers own the software and hence do not have to pay extra for OCR processing. The MFP apps for connecting to cloud services are supported on a wider array of MFPs, and each supported device also includes mobile printing functionality thanks to a unique email address assigned to each ePrint-compatible printer and MFP. In addition, the associated HP Connected online portal keeps a history of printed and scanned jobs (up to 30 days) for later retrieval, and that portal offers a catalog of apps to extend the MFP's functionality.

| Findings At-a-Glance | Dell Document Hub | HP MFP Cloud Features |
|---|---|---|
| Range of cloud services supported | √ | |
| File formats supported for capture | √ | |
| Search for stored files | √ | |
| Security features | √ | √ |
| Range of other on-MFP apps available | | √ |
| User interface at MFP | √ | |
| User interface for cloud portal | √ | √ |
| Scanning static (image) files to cloud | √ | √ |
| Scanning editable files to cloud | √ | |
| OCR accuracy: simple text document | √ | √ |
| OCR accuracy: complex text document | √ | |
| OCR accuracy: simple Excel document | √ | √ |
| OCR accuracy: complex Excel document | √ | |
| OCR accuracy: PowerPoint document | √ | |

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## Dell Document Hub Advantages over HP Solution

- Wider array of cloud-service destinations supported from the MFP control panel

- For file retrieval and printing at the MFP, user can search across all associated cloud services, rather than having to search each one individually

- More file-format choices available for "scan to" operations, including the popular Word, Excel, Power-Point and searchable PDF formats

- OCR processing in the cloud delivers editable Office documents and searchable PDFs to destination folders, rather than requiring learning and use of third-party software at the user desktop and subsequent manual uploading of OCRed files

- Users can create OCRed documents from any Dell Document Hub device; they are not reliant on scanning to the PC where the OCR software is installed

- An unlimited number of users can access Dell Document Hub and its OCR capabilities, not only those with a licensed desktop OCR application

- During setup of the connection to cloud services, users can opt to join an existing company account, which is convenient for small businesses that maintain shared accounts on cloud services that multiple employees access

- Includes E-Mail Me function for scanning a file to the user's email address based on their Dell Document Hub login

- Includes Business Card Reader function for capturing business cards to vCard format and delivering to the user's email address for import into Outlook, Gmail, or any application that can import vCards

- Superior document-formatting retention for complex files scanned to Excel and Word format with default settings

## HP Solution Advantages over Dell Document Hub

- Wider range of MFP models currently support the HP solution

- HP ePrint service supports email-to-print function from a wider array of mobile devices

- Bundled Readiris desktop application delivers more OCR/image-processing functionality and control than does Dell Document Hub's cloud-based automatic OCR processing (except for support for converting to PowerPoint format), and those OCR capabilities are free of charge for one licensed user (additional users require purchase of additional licenses)

- HP Connected service keeps history of email-to-print jobs for later retrieval

- HP Connected portal offers wide range of "apps" for use on MFP

# DETAILED ANALYSIS

Following is a detailed analysis of Dell Document Hub and how it compares to the analogous bundled HP solutions in the areas contracted by Dell to be evaluated by BLI.

## Features

**Scan to cloud services:**  Dell Document Hub supports scanning to Box, Dropbox, Google Drive, Share-Point Online and SkyDrive. The HP Connected catalog offers "eStorage" apps for Box, Google Drive and HP Flow CM.  **Advantage: Dell**

**File formats supported for capture:**  From the MFP's control panel, Dell Document Hub's Email Me and Smart OCR Scan tasks support scanning to static image file formats (PDF, JPG, and TIFF) as well as searchable/editable file formats (searchable PDF, encrypted PDF, DOC, DOCX, PPTX, RTF, XLS, and XLSX). The eStorage apps available from the control panel of the tested HP MFP support scanning to static image file formats (black or color PDF); processing via the included OCR desktop software is required to create searchable/editable files formats.  **Advantage: Dell**

**Scan settings available for cloud capture:** When scanning a file to a cloud service from the MFP, Dell Document Hub allows the user to select the destination service, the desired folder, the desired file format choice, and to enter a filename for the document. The user can also press the settings button (represented by a gear icon) to change a wide variety of scan settings including color/monochrome, resolution, simplex/duplex, darken/lighten, contrast, sharpness, auto-exposure, original size, file name prefix/suffix, and margin. When scanning via the eStorage apps on the HP MFP, the user selects the destination folder and then can enter a filename, the document type (as noted, limited to color or black PDF), paper size, resolution, and darkness setting.  **Advantage: Dell**

**Print from cloud services:**  For retrieving and printing documents from the MFP, Dell Document Hub offers a Search for Files task that allows the user to enter a keyword search term. The app then searches the filenames of documents stored on all of the cloud storage repositories the users has associated with his or her Dell Document Hub account, which means the users can query multiple cloud services with a single search. The search results list shows the list of documents that match the search term, an icon representing the service it resides on, an icon for the file type, and the file name. The results list can be sorted alphabetically, reverse alphabetically, or by service. The user then selects one or more files from the list and presses Print to print those files.

To print from a cloud service on the HP MFP, the user selects the desired eStorage app (Box, Google Drive, or HP Flow CM) and then presses Download & Print. The display then shows the folders and files that reside on the chosen cloud service, and the user can navigate to the desired folder, select the file or files and press Print. There is no search feature to search the repository for a keyword contained in a filename, and in order to retrieve files from another cloud storage services the user must launch the eStorage app for that service separately.  **Advantage: Dell**

**Scan-to-email functionality:** Dell's solution offers an "Email Me" task in the Dell Document Hub menu. When that button is pressed, a scan-to-email job is initiated with the user's registered email address pre-filled as the destination. The user then selects the desired file format for the attachment (PDF, TIFF, JPG, RTF, DOC, DOCX, XLS, XLSX, PPTX, searchable PDF) and enters a subject line for the email message. The user is not offered the opportunity to name the file attachment; it gets the name "img-" followed by a generic string of numbers. The user presses Send, and the message and attachment are sent. The message then appears in the user's registered email system's Inbox with the "From" field populated with "Dell Document Hub." The MFP also offers native scan-to-email functionality via the Scan menu, where the user can set scan settings for the attachment, enter recipients, and so on.

In order to scan to an email destination from the control panel of the HP MFP, the user will invoke the MFP's native scan-to-email feature. To do this, the users selects the Scan icon, then presses Scan to Email, then Send an Email. The user enters the address for the recipient(s), the subject line, and then Scan Settings to change the default settings if desired. But the file formats supported are limited to static PDF, not the searchable/editable file formats offered by Dell Document Hub.   **Advantage: Dell**

**Security features:** Both the Dell and HP solutions require the user to enter his login credentials (username and password) at the MFP before scan-to or print-from tasks can be initiated. Conveniently, each also offers a "remember me" feature so the user doesn't have to enter those each time, although selecting that option is only recommended in environments where a single user accesses the MFP, or where the registered cloud destination is a shared account. Neither solution supports scanning file to a secure format, such as encrypted PDF.   **Advantage: Tie**

**Other features:** Dell Document Hub also offers a Business Card Reader task, which lets a user scan a business card and have the scan delivered in vCard file format to their Inbox for import into his email application. The HP ePrint and HP Connected environments offer a range of apps and functionality, such as the ability to email files to the MFP's unique email address for printing from mobile devices (or from PCs where the print driver is not loaded); a range of printable templates, games and crafts; apps for Google Maps, Weather, Stamps.com and more; and the ability via the HP Connected online portal for users to re-print, retrieve or share files via the portal.   **Advantage: HP**

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## User Experience and Workflow

**Installation and sign-up:** Because Dell Document Hub is completely MFP- and cloud-based, there is no software to install. To get started, the user enters the provided URL (www.dell.com/dochub) into a browser on their PC and signs up for a free account. Alternatively, the user can press the Dell Document Hub entry on the MFP's menu and then select New User. The message on the next screen asks for an email address and informs the user that an email with further instructions will be sent to that address. That email arrived very promptly (within minutes) and the message explained the benefits of the service, along with a link to activate the account. Clicking on the link opens a new browser window where the user is prompted to enter his desired username and password to be used as their Dell Document Hub log-in. The user can also opt to join an existing company account, which is convenient for small businesses that maintain shared accounts on cloud services that multiple employees access. The next page on the site prompts the user to select which of the available cloud services (Box, Dropbox, Google Drive, SharePoint Online, SkyDrive) to associate with the Dell Document Hub solution, and prompts for the associated usernames and passwords. A confirmation message indicates that the service(s) has been successfully added to the Dell Document Hub account. From the initial MFP interaction to this confirmation screen, BLI technicians found the process well-thought-out, and it took less than 5 minutes to set up.

In order to connect to cloud services from the HP MFP, a user can employ the MFP-resident app for the desired cloud storage service; eStorage apps for Box, Google Drive, and HP Flow CM were already installed on the HP MFP BLI tested. In order to create editable files with the HP MFP akin to what Dell Document Hub delivers, the user must install the bundled Readiris desktop OCR software, which is wizard-driven and took BLI technicians 5 minutes to complete.

The HP Connected online portal also figures into the mix, allowing users to register devices whose e-print activity will then be monitored so files can be re-printed, retrieved or shared via the portal. To get started, the user enters the HP ePrint Center URL into a browser window on a desktop PC, as directed by the literature which comes with the printer; in BLI's case, this redirected to the new HP Connected portal. The user creates an account by entering an email address and a password; once that's done, the HP Connected home page opens. The portal has tabs for Collections, Services, Catalog, and Devices. The first step is to register a device with HP Connected. The user is prompted to enter a claim code (a unique identifier) generated at the MFP; this is done by pressing the Web Services icon on the MFP control panel, selecting Enable Web Services if this hasn't already been done when the MFP was set up initially. (In BLI's tests, it took a bit of trial-and-error to get the MFP to connect to the Internet, until technicians changed the DNS settings via the device's embedded web page utility.) Once HP Web Services is enabled, an information sheet prints that instructs the user to go online to create the HP ePrint Center (now called HP Connected) account and register the device. When BLI technicians entered the printer claim code on the Devices page of the HP Connected portal, we received an error message that stated that the claim code was invalid.

We subsequently learned that the HP ePrint servers were down at the time we first tried it, which is likely the cause of the problem. Unfortunately, claim codes generated at the MFP are only good for 24 hours, so subsequent attempts to register the device with HP Connected also failed. This server outage also negatively impacted BLI's initial attempts to scan files to a Box online account, and to use the Apps function of the MFP in general. In fact, the user interface of the MFP crashed several times in testing. The BLI technician pressed the Apps menu choice on the control panel, and was presented with a spinning circle as the MFP attempted to connect to the service. After several minutes, the technician pressed Cancel to abort the failed connection; a message came up that read "Canceling" but that then automatically switched back to "Connecting" with the spinning circle. Hitting the Home key failed to exit this loop, so the technician had to turn off the MFP and turn it back on again to make the MFP usable. This error loop was repeatable, and to BLI

indicates a serious flaw in how the MFP software handles (or fails to handle) a situation where the HP ePrint servers are unavailable; clearly, an error message that says the service is unavailable should appear at the MFP, and the MFP user interface should not get stuck in an endless loop that requires a reboot.

After a reboot, the BLI technician (still not realizing the problem was a server outage on HP's part) attempted to print a file from a Box online account using the preloaded app. The technician was able to log into the Box account and see the files stored there, but selecting a file and hitting "Print" presented an error message: "Error while submitting job to ePrint service." It took more troubleshooting and eventually a call to HP technical support (and a 15-mute wait on hold) for the technician to learn be told that the HP ePrint server was "experiencing issues" and to try again in 24 hours. **Advantage: Dell**

**User interface at MFP:** Both Dell Document Hub and the HP ePrint apps feature well-marked menu buttons on the MFP and clear menu screens for walking the user through tasks. The tested Dell device features a 4.3" capacitive touchscreen and user can move the menu "tiles" to their preferred order, rename them, and change their color. Up to 20 users can create and save personalized menus. The touchscreen on the tested HP device is smaller (3.5") and employs resistive touch technology which is generally not as responsive as capacitive touch technology. The menu buttons on the HP user interface are not customizable. **Advantage: Dell**
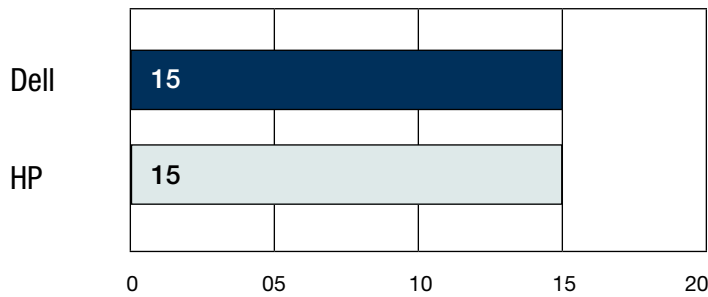
**User interface for cloud portal:** Both the Dell Document Hub portal and HP Connected portal are easy to navigate, and make tasks such as adding services and devices clear. **Advantage: Tie**

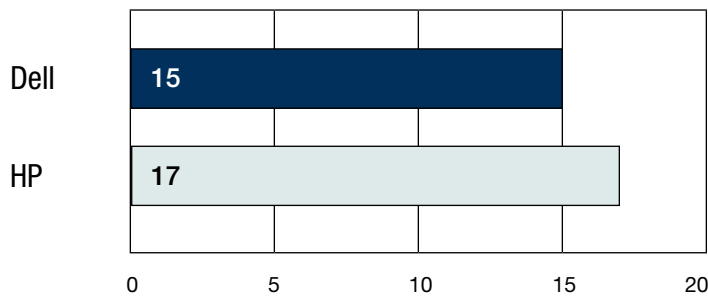## Time to Complete Workflows (shorter times indicate improved productivity)

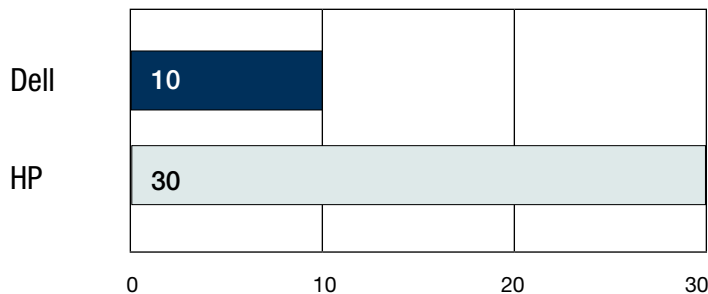### Scanning editable Word files to cloud (in seconds)

| | |
|---|---|
| Dell | 15 |
| HP | 240 |

0    100    200    300
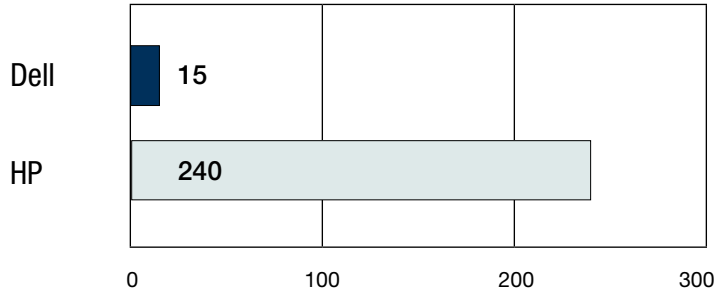
### Scanning static (image) file to cloud (in seconds)

| | |
|---|---|
| Dell | 15 |
| HP | 15 |

0    05    10    15    20

### Scanning to email (in seconds)

| | |
|---|---|
| Dell | 15 |
| HP | 17 |

0    5    10    15    20

### Searching two online cloud services for file to print (in seconds)

| | |
|---|---|
| Dell | 10 |
| HP | 30 |

0    10    20    30

**Workflow for scanning static (image) files to online repository:** Scanning from the MFP to the desired online service with either Dell Document Hub or the chosen HP ePrint app is similarly straightforward thanks to the on-screen prompts, and can be accomplished in 15 seconds (approximately five button presses, not including entering log-in credentials) on the MFP touch screen. **Advantage: Tie**

**Workflow for scanning to several online repositories:** If a user needs to scan documents from the MFP to multiple online services, both solutions require that the scans be repeated sequentially; a user can-not select multiple destinations for a single scan job. But with Dell Document Hub, the user does not have to enter login credentials for each service, since logging into Dell Document Hub at the MFP acts as "single sign-on" for all the associated cloud services. With the HP eStorage apps, the user needs to enter log-in credentials for each service at the start of the task (assuming the user has not checked the "remember me" option, which is not recommended on shared MFPs) **Advantage: Dell**

**Workflow for scanning to email:** Dell Document Hub features an E-mail Me task that automatically fills in the user's email address based on his log-in. The user can then enter the subject line and select the desired file format of the document (but not a file name), then hit Send. The task can be completed in 15 seconds (five button presses, not counting the keystrokes for entering the subject line). The MFP also features a native scan-to-email app for scanning and sending a file to other destinations, and users can enter email addresses manually or select recipients from the MFPs' address book. The HP MFP comes preloaded with a Scan to Email app that is similar in functionality to the native Dell feature, where the user enters email address destinations or selects from the stored address book. However, at this time the HP Connected catalog does not offer a "scan to me" app for quickly sending a file to oneself; for this task a user would have to select his address from the list; the process takes approximately 17 seconds (seven button presses). **Advantage: Dell**

**Workflow for searching and printing from online repository:** Dell Document Hub features a Search for Files task that allows the user to enter a keyword search term, and the service then searches the file names of all cloud repositories associated with that Dell Document Hub account and returns a list of match-es; this typically took less than 10 seconds in BLI's testing. Alternately, the user can start with the Browse for Files task, select the desired service, and then scroll through the list of folders and files that appears on-screen. The results list can be sorted alphabetically, reverse alphabetically, or by service. Once a file or files are selected the user can hit the Print button to have the MFP print the file(s).To find and retrieve a cloud-resident file from the HP MFP, the user first must know which service the files resides in. There is no way to search for a particular document via a keyword search, nor can the user see files stored on multiple cloud services with a single task. At the MFP, the user launches the desired cloud storage service's app, selects View & Print, scrolls through the folder/file list and selects the file or files. There is no way to sort the list; it appears in the same order as in the cloud service's interface. Searching for a file across two online storage services sequentially took approximately 30 seconds in BLI's experience. **Advantage: Dell**

**Workflow for scanning and delivering editable files to cloud repository:** The Dell Document Hub solution features optional in-cloud processing that can deliver searchable/editable files (file format support includes searchable PDF, DOC, DOCX, PPTX, RTF, XLS, and XLSX) to the user's chosen cloud destination or email Inbox in approximately five button presses at the MFP control panel, and no need to use desktop

software to convert the scans. For example, scanning a printed document to a cloud service in Microsoft Word format took approximately 15 seconds in BLI's testing.

With the HP MFP, the available Box and Google Drive apps do not deliver searchable/editable files to the cloud destination. Instead, the files are static image files. So to create more usable documents that can be edited, a user must employ the bundled Readiris Pro 12 OCR software at the desktop. To get started, the user can initiate a scan job from within the program's interface, or open an existing scanned file from a folder. Readiris features a wizard-driven interface for novices; experienced users can opt to not have the wizard automatically launch at startup. BLI opted to use the wizard, since this path seemed most straightforward. The user clicks on the OCR Wizard menu choice, selects the image source (the attached HP MFP's scanner or a folder), sets the document language, and selects the desired output program—almost three dozen are supported, including Acrobat (image and text PDFs), Microsoft Word (WordML and RTF file formats), Excel (SpreadsheetML format), the clipboard, NotePad, WordPerfect, StarOffice, all popular browsers, and others). The user can then select other settings, such as Paragraph breaks on/off for Word files. Multiple document files can be selected at once for batch processing. When ready, the user clicks Go, and the program processes the files. An Output File dialog box then appears, where the user is prompted to name the newly processed file. All processed pages appear in a Review window so the user can review the OCRed pages and correct any mistakes (suspect words are flagged to make them easier to spot). Once the document has been reviewed and saved, the user can upload the document to the desired cloud storage manually using the service's browser interface.
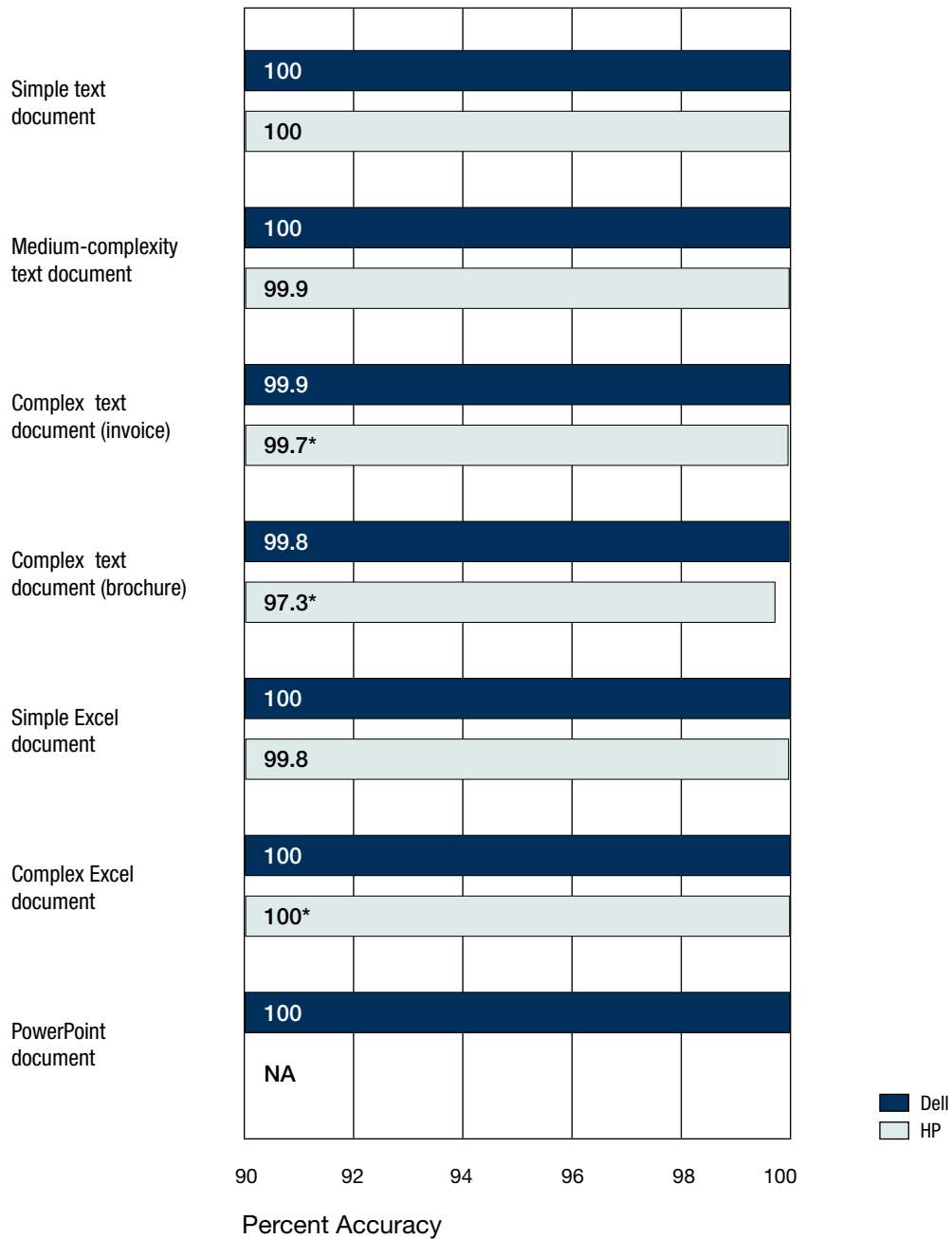
While the Readiris desktop OCR package is more powerful and flexible than the automatic OCR processing offered by Dell Document Hub, it requires more user intervention that can be measured in minutes per file, rather than seconds or the number of button presses. Once BLI technicians were familiar with the Readiris interface, it took approximately 4 minutes to scan the file at the MFP, launch Readiris at the PC, navigate to the scanned file, process the file to create a Word-friendly OCRed file, and upload that file to the cloud service.

**Advantage: Dell (ease of workflow); HP (OCR processing flexibility)**

## Document Processing Performance

The accuracy of the OCR processing is an important consideration for a document capture solution, since more accurate character-level translation and format retention means knowledge workers will spend less time manually correcting the editable files the OCR engine creates. For this evaluation BLI scanned printouts of a range of typical business documents. For Dell Document Hub, BLI technicians chose the desired output file format as offered at the MFP control panel, and evaluated the resultant files. For the HP MFP, BLI scanned the documents in PDF format to a desktop folder, and then used the Readiris Pro OCR software to process the documents (using default settings, except for selecting deskew where needed) and output them to the desired file format.

## OCR Accuracy Performance

| Document Type | Dell | HP |
|---|---|---|
| Simple text document | 100 | 100 |
| Medium-complexity text document | 100 | 99.9 |
| Complex text document (invoice) | 99.9 | 99.7* |
| Complex text document (brochure) | 99.8 | 97.3* |
| Simple Excel document | 100 | 99.8 |
| Complex Excel document | 100 | 100* |
| PowerPoint document | 100 | NA |

Legend: ■ Dell ☐ HP

Percent Accuracy: 90 92 94 96 98 100

*Poor format retention required manual readjusting

NA - Not applicable: The solution bundled by HP does not support creation of PowerPoint files.

**OCR accuracy for simple text document:** When processing a simple three-page text document and outputting a Microsoft Word (.docx) file, Dell Document Hub's cloud-resident OCR engine produced a file with perfect character recognition: no errors in the 7,390 letters, numbers and spaces the document contained (a 100% accuracy rate). Layout retention was very good; the only issue was that the OCR engine failed to recognize line breaks on the third page, which the user would have to correct manually. Processing the same document via the bundled Readiris Pro OCR application at the desktop and outputting to WordML format, the HP solution delivered nearly perfect character recognition (three errors out of 7,390 characters, for a 99.96% accuracy rate) and perfect layout retention.   **Advantage: Tie**

**OCR accuracy for medium-complexity text document (contract):** When processing a fairly complex three-page contract document and outputting a Microsoft Word (.docx) file, Dell Document Hub's cloud-resident OCR engine produced a file with nearly perfect character recognition: one error in 8,784 characters (a 99.99% accuracy rate). Layout retention was very good; the OCR engine failed to recognize line breaks in bullet lists, which the user would have to correct manually. Processing the same document via Readiris at the desktop, the HP solution was nearly as good at character recognition (five errors out of 8,784 characters, for a 99.94% accuracy rate) and delivered perfect layout retention.   **Advantage: Tie**

**OCR accuracy for complex text document (invoice):** When processing a complex one-page invoice and outputting a Microsoft Word (.docx) file, Dell Document Hub's cloud-resident OCR engine produced a file with nearly perfect character recognition: three errors in 2,680 characters (a 99.89% accuracy rate). Layout retention was excellent, with all rows and columns intact and text placed in the proper location relative to the original scanned printout. Processing the same document via Readiris at the desktop, the HP solution delivered nearly as good character recognition: 8 errors (a 99.70% accuracy rate). Layout and formatting retention were poor, requiring a good deal of manual re-keying and re-jiggering to recreate the original.   **Advantage: Dell**

**OCR accuracy for complex text document (brochure):** When processing a very complex one-page brochure and outputting a Microsoft Word (.docx) file, Dell Document Hub's cloud-resident OCR engine produced a file with nearly perfect character recognition: five errors in 2,208 characters (a 99.77% accuracy rate). Layout retention was very good; the document needed a few line breaks corrected and fonts adjusted manually to more closely match the original printout. Processing the same document via Readiris at the desktop, the HP solution produced a document with 60 errors (a 97.28% accuracy rate). However, layout and formatting retention were poor, requiring a good deal of manual re-keying and re-jiggering to match the original.   **Advantage: Dell**

**OCR accuracy for simple Excel document:** When processing a simple one-page spreadsheet and outputting a Microsoft Excel (.xlsx) file, Dell Document Hub's cloud-resident OCR engine produced a file with perfect character recognition: no errors in the 955 letters, numbers and spaces the document contained (a 100% accuracy rate). Layout retention was also perfect, with all rows and columns of the original scanned printout reproduced faithfully. Processing the same document via the bundled Readiris Pro OCR application at the desktop, the HP solution delivered nearly perfect character recognition (two errors, for a 99.79% accuracy rate) and perfect layout retention.   **Advantage: Tie**

**OCR accuracy for complex Excel document:** When processing a more complex one-page spreadsheet and outputting a Microsoft Excel (.xlsx) file, Dell Document Hub's cloud-resident OCR engine produced a file with perfect character recognition: no errors in the 393 letters, numbers and spaces the document con-

tained (a 100% accuracy rate). Layout retention was also perfect, with all rows and columns of the original scanned printout reproduced faithfully. Processing the same document via the bundled Readiris Pro OCR application at the desktop, the HP solution delivered perfect character recognition (a 100% accuracy rate). But layout retention was poor, with entries not appearing in the rows they were in in the original and requiring a good deal of manual intervention to recreate the original.   **Advantage: Dell**

**OCR accuracy for PowerPoint document:**  When processing a 17-page printout of a PowerPoint presentation and outputting a Microsoft PowerPoint (.pptx) file, Dell Document Hub's cloud-resident OCR engine produced a file with nearly perfect character recognition: one error in the 12,720 letters, numbers and spaces the document contained (with rounding, a 100% accuracy rate). Layout retention was very good; some line breaks were incorrect and some entries' fonts needed to be adjusted manually to match the original. The Readiris Pro desktop OCR program does not offer PowerPoint as an output format. **Advantage: Dell**

**File sizes for captured documents:**  The OCR processing engines of both solutions produced file sizes that are in line with what would be expected of native Word, Excel, and PDF documents.  **Advantage: Tie**

## Cost Analysis

Dell Document Hub is a free solution that comes bundled with select Dell MFPs, such as the Dell C2665dnf Multifunction Color Laser Printer ($599 list price) used for this evaluation. The ability to scan static files (image PDF, JPG, TIFF) to supported cloud services is a capability that is made available at no charge for as long as the customer has a registered Dell Document Hub account. The ability to create and deliver searchable/editable file formats (Word, Excel, PowerPoint, searchable PDF) is included free of charge for all customers until March 2014. Thereafter, new customers will be offered a free trial for the OCR processing service. After the free trial expires, customers will be charged a per-page fee for OCR processing; that fee was not yet set at the time this report. Customers will not be limited as to the number of users or devices that can submit scanned files to Dell Document Hub for processing, and there are no further per-user license fees or per-device license fees. The fees will depend solely upon the number of OCR pages submitted to the service; as with most cloud services that charge an ongoing fee, the cost for the service could eventually outstrip the cost of purchasing individual desktop OCR licenses. However, because the solution is MFP- and cloud-based, there are no "soft costs" associated with IT overhead for installation and maintenance, and thanks to the straightforward nature of the solution, little to no training for end users should be required. Moreover, the streamlined workflow afforded by the automatic in-cloud OCR processing, as opposed to a manual workflow, will result in increased worker productivity and time savings, which also must be figured into the total-cost calculation.

The HP ePrint and HP Connected services come free of charge with many HP OfficeJet and LaserJet models, including the HP LaserJet Pro 500 color MFP M570dn ($1,238 list) used for this evaluation. Customers will be able to employ the bundled and downloadable ePrint apps to deliver static image files to the services for which HP makes apps available at no charge. And printing files via the HP ePrint service is also included at no charge. In order to deliver editable files to cloud services, customers can use the bundled Readiris Pro software; the MFP comes with a single license. If multiple users require this capability, additional licenses of Readiris Pro can be purchased. Currently, version 12 (the version that came bundled with BLI's test unit) can

be purchased from a major online retailer for $39.99 per license; the latest version of the software, Readiris Pro 14, can be purchased online for $109.99. Assuming a small business scenario for 10 users, additional software licenses will cost approximately $360 to $990 depending on the version chosen. Installing the Readiris Pro software is straightforward enough that IT personnel do not need to get involved. Learning to use the software most effectively will require about an hour of training and trial-and-error (more for users not comfortable with desktop software), via video tutorials that are available online. But day-to-day MFP scanning workflows that require OCR and delivery to cloud services will take more time, since a desktop process is involved, impacting productivity and driving up "soft costs" for the solution.

**Advantage: Not rated** (the OCR pricing for Dell Document Hub was not yet set at the time of this report)

For Dell's internal use:

## Recommended Improvements

During the course of testing, BLI technicians noted a few areas where the Dell Document Hub solution could be improved:

- Support for more cloud destinations, including Evernote
- Support for scanning to PDF/A format in addition to the other available file formats
- The ability to scan to multiple destinations—such as two cloud services or email and a cloud service—with one scan task
- More clear presentation of the "Settings" menu choice for scan operations in Dell Document Hub; the current "gear" icon is not very noticeable and does not look like a user-selectable button
- The ability to enter a filename for the file attachment when using the "E-mail Me" task
- The ability to enter additional email recipients In the "E-mail Me" task
- The ability for the Search for Files results list to be sortable by upload date, so the newest files can appear on the top of list
- More clear presentation of the "Settings" menu choice for printing operations in Dell Document Hub's Search for Files sub-menus; the current "gear" icon is not very noticeable and does not look like a user-selectable button

## HP Flow CM Online Document Management Service

In addition to Box and Google Drive eStorage apps, the HP LaserJet Pro 500 color MFP M570dn tested by BLI also came preloaded with an app to access HP Flow CM from the MFP's control panel. HP Flow CM is HP's online document storage, management, and collaboration service. A fee-based offering, Flow CM offers user "libraries" that can be accessed from the MFP for scanning and printing documents. Documents scanned from the MFP to the service are delivered in static PDF format, then converted to searchable PDFs via the service's in-the-cloud OCR capabilities (included in the monthly fee) to make the contents of files accessible to search; users can also add "tags" at the point of capture (or when working with files in a browser) to make the files that much more searchable. Users cannot, however, convert files to editable formats, such as the Word, Excel and PowerPoint formats supported by Dell Document Hub.

Working with the HP Flow CM app at the MFP is straightforward. To capture hardcopy documents, the user selects Flow CM from the control panel's main menu, enters his login credentials, and then selects the Scan to Uploads task to scan documents to his library's Flow CM upload folder. The user is given the option to select scan settings, such as file format (limited to black or color PDF), 1-sided/2-sided, and resolution. The user then enters a file name and any tags to be associated with the file, then presses Upload. To print files stored in a Flow CM library, the user presses HP Flow CM on the main menu and selects the Browse task. He can then manually drill down into the folder structure to find a file, or enter keywords to find matching documents; keywords can be in the file name, a tag, or in the body of the document. Once a file or files are selected, the can select print settings, such as two-sided printing or number of copies, then press Print.

In addition to its MFP capture and printing features, Flow CM also offers a range of document management features. Users can access the service from a PC or mobile device to preview documents, view previous versions of a document, tag files, and "publish" documents to make them downloadable by others. To edit a document, the user would download the file to their desktop, make the desired changes, and upload the new version back to Flow CM; the service does not offer the ability to edit documents directly in the online library.

HP Flow CM can be initiated as a free 30-day trial by customers, and use beyond that requires purchase through an authorized HP reseller. The price is $19.95 per month per registered user, scaling to $500 per month for an unlimited number of users.