IBM Systems MEDIA

Transform z/OS Output to Accessible PDF for the Visually Impaired

Learn how to augment information from AFP input and produce accessible PDF output that's compliant with the ISO 14289-1 PDF/UA standard or WCAG 2.0 AA.

02/01/2018

In an earlier Hot Topics article "Transform Your Data Into a PDF File to Share Across the Cloud" (August 2015, issue 29) (http://publibfp.dhe.ibm.com/epubs/pdf/e0z3n110.pdf), we described how to transform Advanced Function Presentation (AFP) input to PDF format using the AFP to PDF transform product. In this article, we will describe how to augment information from AFP input and produce accessible PDF output that's compliant with the ISO 14289-1 PDF/UA standard or WCAG 2.0 AA.

Accessibility regulations are increasingly gaining traction to meet the needs of individuals with varying degrees of visual disabilities. A growing number of organizations and corporations are looking for ways to enhance and enable their existing production print solutions to comply with new regulations and produce accessible digital content. The PDF/UA format can meet these needs and requirements.

The AFP architecture, which is a key part of production print solutions on z/OS and other platforms, doesn't

support the information that's required to insert tags and generate accessible PDF documents. IBM has recently delivered a new print transform feature called the IBM Print Transform from AFP to Accessible PDF (Accessible PDF Transform) that can help meet these needs.

Accessible PDF documents can be viewed as normal PDF documents that use the common viewers, such as Adobe. However, when used with assistive technology, such as JAWS or NVDA, the tagged content allows an individual with visual disabilities to navigate the document content with the assistive technology interface.

The Accessible PDF Transform provides the following techniques to allow organizations to comply with accessibility regulations and meet the needs of people with visual disabilities:

- Insertion of specific and mandatory tagging enhances the document navigation.
- Read order setting helps to navigate content in a logical sequence and allows users to skip sections of documents.
- Tables can be identified with individual headings and row descriptions so that the content of a table is easier to navigate and understand.
- Graphical elements, such as figures, graphs and images, can be tagged as non-text elements to provide meaningful descriptions of what the graphical elements represent.
- Natural language settings for the whole or parts of the document are important for multilingual documents. These settings allow speak aloud software to properly pronounce the language that's being used as it changes throughout the document.
- When you produce accessible PDF documents for web-based viewing, special font handling can reduce PDF file size by not embedding some of the common fonts.

Augment Information

The standard input to the from AFP to PDF transform doesn't provide the necessary information that's required to generate accessible PDF. The new feature is designed to augment the AFP information with special commands file, Index Command File (ICF).

The ICF contains special syntax, commands and rules designed to instruct the Accessible PDF Transform to watch for specific text strings, images, objects, etc. in the standard AFP input and, when found, insert the necessary tags into the PDF output document. The name of an ICF is passed to the PDF transform using a new job attribute, pdf-user-accessibility-control-file. The Accessible PDF Transform then combines the ICF with the input AFP and tags all the elements that it finds in the input AFP for which there are rules in the ICF.

Typical Use Case

The commands and rules in an ICF must match the input file or category of similar files. Organizations will need to create unique sets of ICFs for groups of input AFP documents. An example of a group of similar documents is a monthly utility bill where the overall structure and flow of the document is consistent while the input details vary for each utility customer.

The combination of a proper ICF used with the Accessible PDF Transform allows organizations to automatically convert high-volume transaction and variable content print production files into PDF/UA format. A specialized initial effort is required to produce ICFs that meet the needs of an organization. The team generating the ICFs should have good understanding of APF architecture as well as accessibility regulations and techniques.

Create an ICF Using Pro Designer

Creating an ICF that correctly inserts all the tags to produce a compliant PDF/UA or WCAG 2.0 AA is fairly

complex. The purchase of the Accessible PDF Transform feature entitles you to a complimentary copy of a tool that makes it easier to generate ICFs. This tool is a Windows-based GUI called Pro Designer, provided by Crawford Technologies. This tool provides an easy-to-use WYSIWYG interface for creating an ICF from the standard AFP input. After you install the Accessible PDF Transform feature, refer to the /usr/lpp/IBM/PrintXform /V1R2/samples/accessible_ReadMeFirst.txt file for details about how to obtain the Pro Designer GUI Tool.

The Pro designer GUI enables a user to identify each element on the input document and add appropriate triggers and tags while viewing the expected result in output view. It's expected that users of this GUI are familiar with moving data and files between Windows and z/OS platforms. IBM recommends the use of fully composed production-ready AFP files as input to the Pro Designer. Clients can use the AFP Conversion and Indexing Facility, a feature of Print Services Facility, to package input and associated resources into a fully composed AFP document.

Figure 1 is an example of the Pro Designer GUI with a sample input file that's viewed and tagged.

UNIX Command Line Example

The following UNIX command line example uses sample files that are shipped with the Accessible PDF Transform feature in the /usr/lpp/IBM/PrintXform/V1R2/samples directory:

```
afpxpdf -o accessible_sample.pdf -c pdfua -j
"pdf-user-accessibility-control-file='accessible_sample.icf' pdf-title='PDF UA Title' " accessible_sample.afp
```

AOPBATCH Example

In this example, the input file SAMPLE.INPUT.BAXTERBB is combined with sample ICF accessible_sample.icf using transform class pdfua and special job attributes to produce an Accessible PDF output 'SAMPLE.PDFUA01'. The resulting PDF file is then emailed to a recipient by using a printer definition designed to send emails with Infoprint Server send email support:

```
//PDFUA001 JOB (SAMPLE01),
//         CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1),TIME=1440,REGION=4096K
//STEP1   EXEC PGM=AOPBATCH,
// PARM='/afpxpdf -c pdfua -jatt=//DD:ATTR -o//DD:OUT //DD:IN'
//IN    DD DSN=SAMPLE.INPUT.BAXTERBB,DISP=SHR
//OUT   DD DSN=SAMPLE.PDFUA01,DISP=(NEW,CATLG,DELETE),
//     DCB=(RECFM=VB,LRECL=1024,BLKSIZE=1028),SPACE=(CYL,(5,5))
//ATTR   DD *
pdf-user-accessibility-control-file='Accessible_sample.icf'
pdf-title='This is a sample PDF Title text - PDFUA'
pdf-keywords='This is a sample PDF Keywords list, PDF/UA, Accessible'
pdf-subject='This is a sample PDF Subject text'
pdf-author='This a sample PDF Author name'
/*
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//STDENV DD *
AOP_MVS_RETURN_CODES=YES
/*
//STEP2   EXEC PGM=IEBGENER
//OUT1 OUTPUT  CLASS=C,DEST=PXEMAIL,
//             PRTATTRS='document-format=pdf',
//             MAILTO='userid@us.ibm.com',
//             TITLE='SAMPLE_PDFUA_PDF',
//             MAILFILE='SAMPLE.PDFUA01.PDF'
//*
//SYSUT1   DD DSN=SAMPLE.PDFUA01,DISP=SHR
//SYSUT2   DD SYSOUT=(,),OUTPUT=(*.OUT1)
//SYSPRINT DD SYSOUT=*
//SYSIN    DD DUMMY
//*
```

To use the UNIX command line and AOPBATCH examples, users will need to install and set up the Accessible PDF Transform feature and add a special transform class pdfua in the /etc/Printsrv/aopxfd.conf file. To configure for sending PDF documents as email attachments, see the Infoprint Server User's Guide for details.

Enable Accessible PDF

The following Infoprint Server job attributes have been added to support the Accessible PDF Transform feature:

pdf-user-accessibility-control-file: Specifies the UNIX file name of the Index Command File (ICF).

pdf-title: Title of the PDF that is displayed in the document properties Title field of the output PDF.

pdf-keywords: Specifies one or more PDF keywords. This value is displayed in the document properties Keywords field of the output PDF.

pdf-subject: Subject of the PDF that is displayed in the document properties Subject field of the output PDF.

pdf-author: Author of the PDF that is displayed in the document properties Author field of the output PDF.

The following aopxfd.conf class environment variables have been added to support the Accessible PDF Transform feature:

AOP_ACCESSIBLE_COMPLIANCE_TYPE: Specifies the PDF/UA compliance type that the output PDF document conforms to.

AOP_PDF_TITLE: Title of the PDF that is displayed in the document properties Title field of the output PDF.

AOP_PDF_KEYWORDS: Specifies one or more PDF keywords. This value is displayed in the document properties Keywords field of the output PDF.

AOP_PDF_SUBJECT: Subject of the PDF that is displayed in the document properties Subject field of the output PDF.

AOP_PDF_AUTHOR: Author of the PDF that is displayed in the document properties Author field of the output PDF.

AOP_UACF_LOCATION: The directory location of the UNIX file pdf-user-accessibility-control-file job attribute value.

AOP_PDF_LANGUAGE: Specifies the language and optional country code to specify the natural language of the tagged data.

Detailed information about these job attributes and environment variables can be found in the Print Transforms from AFP for Infoprint Server for z/OS V1.2 User's Guide (https://www-304.ibm.com/servers/resourcelink /svc00100.nsf/pages/zOSV2R3G3252634/$file/aokfa00_v2r3.pdf). Watch a YouTube video describing how Pro Designer is used. (https://youtu.be/_fban1JAZJM)

Meeting Regulations

The Accessible PDF Transform provides clients the ability to generate output documents for the visually impaired. This function is provided to meet accessibility regulations by government agencies and a growing number of corporations.

By Anthony Mingo (http://ibmsystemsmag.com/Authors/anthony-mingo) and Tariq Choudhry (__ _____ _____ _____ _____ ..