



HostServe

White Paper 5.01

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Industry Challenges

New printers, formats and Page Description Languages (PDLs):

Printers and their associated PDLs have evolved radically over the last 40 years. Earlier systems embedded printer control codes directly in the application. This tied an application to a particular PDL. These applications were expensive to develop and, with relatively minor changes, continue to meet today's business needs. Given their excellent and reliable performance, no business case exists for replacing or modifying them to support modern PDLs. The business investment in these applications must be protected. Yet modern printers, or better yet modern viewing systems, are much less expensive than legacy printer systems and offer features that can significantly improve business communication. Finally new information distribution and storage systems including the Internet, print-on-demand, ERP and ECM, provide significant business advantages. Incorporating legacy PDLs into these system has, until now been prohibitively expensive. Actually the point has been reached where it is cheaper to use these systems to modernize appearance and functionality of print delivery systems.

Common format storage for long-lived documents:

The unparalleled growth of computer storage systems allows large-scale, on-line document storage. Online archival systems can now store, index and retrieve almost any desired communication in virtually any desired format. The information in these systems may persist for many years. Once retrieved the data in these systems is useless unless it can be interpreted. Imagine trying to retrieve a document stored in a 1950s PDL 50 or 60 years from now. How will it be rendered so that it can be used? Rendering systems must be available for the native storage format for the life of the information. Is a common storage format the solution? Perhaps, but an inappropriate choice of a common storage format can radically increase cost. An extreme case of this is storage in a rendered format such as bitmap images in a system that requires the ability to edit documents in the future. Such a choice turns the archival system into the electronic equivalent of microfilm. This limits usability and increases cost when compared to more information centric approaches to a common storage format. Careful consideration should be given before choosing a storage format. Important factors include intended future use, security, legal and regulator requirements, privacy concerns and future rendering needs.

Web use in the distribution of Information:

Speed in information distribution is a key edge for today's businesses. Print and distribute, while still a key component of business strategy cannot meet the demands of time critical information. Alternative distribution including, web, intranet, e-mail, FTP are critical for both customer satisfaction and key decision processes. Enterprise content management systems take another step by

integrating Web content, document, and digital asset management. These enabling technologies provide the infrastructure necessary for the knowledge workers communication and collaboration—elements key to corporate success in our increasingly knowledge driven society.

Personalized variable data printing:

Customers in today's market are bombarded with diverse, attractively packaged, messages. Personalized, eye catching and attractive communication is essential in garnering new customers and keeping current ones. The ability to integrate individualized information in a personalized package adds to corporate advantage.

Increased use of color:

Success in personalized communication often dictates the creative use of color. Older PDLs supported only limited use of color. Preprint cannot meet the need for customization. Integration of older PDLs with flash in personal communication requires the ability to add and modify color and images.

Solution:

What we need is an agent that allows the integration of a wide range of source systems into a single unified information source. This system must support document PDL translation and on the fly modification and must be supported by a vendor that will provide a 100% guarantee and proven support record.

Introducing HostServe

American PrintWare Inc.'s HostServe is a Windows based document delivery and interconnectivity system capable of transforming mainframe, network, and web data streams (SNA Character String, LCDS DJDE/Metacode, XES, AFP, IPDS, XEROX XEROX VIPP™, Line Printer, PCL, PostScript, PDF, TIFF, JPEG, DOC, RTF, HTML, EMF) into an array of output formats (PCL, PostScript, PDF, TIFF, JPEG, BMP, HTML, XML, ASCII or Data Base, with associated indexes) and offers the user great freedom in the delivery and formatting of vital business information. Users can view, edit/repurpose, index, sort, print, and archive documents—regardless of origination—anywhere, at any time using a wide variety of printers, viewers, archival, content management or document management systems.

APWI HostServe flexibility allows the user to meet there needs quickly and efficiently. Whether you have gigabytes of host-stored information that requires rapid distribution to hundreds of branch offices, many different customers, in several formats, across thousands of miles, or require a solution that supports printing host documents to centralized printers, or need to automate Web distribution of documents, HostServe meets your needs.

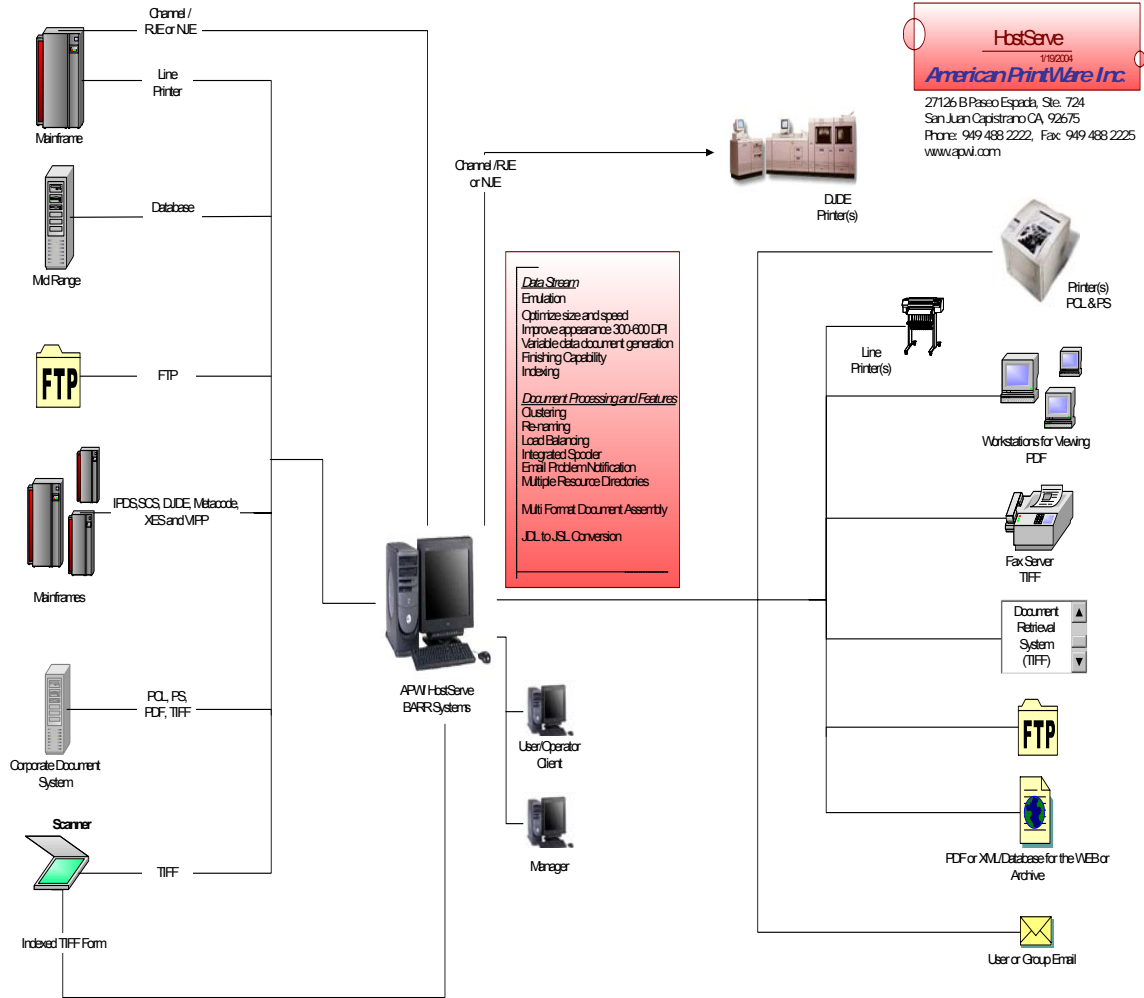
HostServe Operating Environment:

HostServe operates on a Microsoft Windows 2000/XP/2003, and, above Servers and can be attached either by TCP/IP or an SNA network, FTP, E-mail, Web Server, via Channel, Twinax, Serial or Coax depending on your application. HostServe presents

a printer, document or data base interface to the application program. It accepts the incoming document, processes the data (adding resources where applicable, reformatting and sorting documents as it goes, and/or converting data formats), and directs the information to the designated output device or system.

DATA SOURCES

DATA SINKS



HostServe connects data sources to data sinks:

HostServe supports SNA, RJE/NJE, Serial, Disk Transfer or TCP/IP connection to your mainframe, AS/400, UNIX host or network. The physical connection can be BUS/TAG input or output, ESCON, Ethernet, SCSI or IDE, Twinax, Token Ring, FTP Client or Serial. The type of connection used depends entirely on your needs. HostServe's integrated communication solutions allow tremendous flexibility even supporting multiple communication protocols in a single installation. This allows drop-in solution to your document translation and reformatting needs.

Data Source Connections

Input PDLs	TCP/IP	SNA or HIS	Serial	RJE NJE	Ethernet or Token Ring	ESCON Bus/TAG	Twinax
IPDS AFP	•	•					
SCS DSC/DSE		•					
LCDS DJDE/Metacode XES or XEROX XEROX VIPP™	•	•	•	•	•	•	•
PCL, Post Script, TIFF, PDF and XML	•	•	•	•	•	•	•
Scanned TIFF	•		•		•		
.DOC .RTF EMF	•				•		

Data Sinks

- Windows Server Print Queues
- TCP/IP files, printers and printer pools
- FTP Sites
- Viewers
- Archival and Content Management Systems
- WEB
- E-Mail Systems
- FAX System

Anything in and anything out!

HostServe accepts a wide variety of PDLs as input data. It translates, cleans, separates, combines, enhances appearance, indexes (when appropriate) data, and delivers the information. Supported output data types are shown in the following table.

Output Drivers

Host Type	HostServe can accept these printing Streams	PCL	PS PDF	TIF F	BMP JPG	ASCII Database	XML HTML
Mainframe or AS/400	AFP Non-IPDS (SCS, DSC, DSE)	√	√	√	√	√	√
Mainframe or AS/400	AFP IPDS	√	√	√	√		√
Mainframe, AS/400 or Unix	LCDS DJDE/Metacode XEROX XEROX VIPPTM and XES	√	√	√	√	√	√
Client/Server-Based PC or any host	PCL, PS, PDF TIFF,DOC, RTF, EMF	√	√	√	√	√	√
Scanner	TIFF	√	√	√	√	√	√

HostServe Input Systems

Interfacing with IBM 390

JESS

When interfacing with IBM’s JES program a TCPIP LPD/LPR connection is established and use of APWI’s Port Monitor program is recommended.

VPS

When interfacing with IBM’s VPS program a TCPIP Sockets connection is recommended and use of APWI’s Sockets program is recommended.

CA-SPOOL

When interfacing with CA-SPOOL program a TCPIP LPD/LPR connection

is established and use of APWI's Port Monitor program is recommended.

Possible Mainframe Connection difficulties.

- Speed of Transmission. Solution uses a high speed server, possibly a Xeon class server
- Unbalancing the server processing. HostServe processing options allow the limiting of processing of jobs to one queue to allow other jobs from other queues to be processed on time.
- Maintaining Document Order. HostServe processing insures order integrity in any single queue. All Jobs in a single Queue are printed in order.
- Document Name Integrity. APWI's LPD/LPR program can provide print file document naming. Document naming can also be gathered from the print data file.

Interfacing with the IBM AS400

When interfacing with IBM's AS400 a TCPIP LPD/LPR connection is established and use of APWI's LPD/LPR program is recommended. This program allows various parameters from the AS400 to be transferred to HostServe. These can include copies, duplex, and tray calls.

When HostServe is installed a special driver for the AS400 can be installed to insure that these parameters are available at the printer.

Interfacing with UNIX/Linux

When interfacing with a UNIX/Linux System a TCPIP LPD/LPR connection is established and use of APWI's LPD/LPR program is recommended. This program allows various parameters from the System to be transferred to HostServe. These can include, copies, duplex, and tray calls.

APWI Interfaces

APWI Port-Monitor

The APWI Port-Monitor is a high performance Windows server print file receiver. If you can print to a Windows server then the Port Monitor can intercept the file. The file is placed in a directory, one for each printer, for HostServe to pick up for processing. The APWI Port-Monitor can handle as many printers as the server can manage, at least 256 on most servers. APWI Port-Monitor supports multiple network connections, i.e. several print jobs at the same time.

APWI Sockets

The APWI Sockets Program is a high performance program that provides Socket printing reception from VPS or other sources. Sockets will allow multiple jobs to be sent as a single print job. This is important for modern printers.

The file is placed in a directory, one for each printer, for HostServe to pick up for processing.. APWI Sockets Program supports multiple network connections, i.e. several print jobs at the same time.

APWI LPD/LPR

The APWI LPD/LPR Program is a High Performance program that provides LPR printing reception from IBM AS400 and UNIX/Linux Systems. The APWI LPD/LPR retains the LPD/LPR control file and places it at the beginning of the data file. HostServe will detect this data file and provide the necessary processing control. This can include such items as file naming, banner page generations and printing directions. The APWI LPD/LPR Program can handle as many printers as the server can manage, at least 256 on most servers. APWI LPD/LPR Program supports multiple network connections, i.e. several print jobs at the same time.

Channel

APWI will provide a Channel Receiver. For more information on this option contact our Sales Department.

Coax

For Coax connections we normally interface with the existing Rumba or IBM Client Access programs. We expect the User to already have these programs.

Source PDLs:

HostServe supports the following document and PDL inputs:

- SNA Character String (SCS/DSC/DSE)
- IPDS
- AFP
- LCDS DJDE/Metacode
- XES
- XEROX VIPP™
- Line Printer
- PCL
- PostScript
- PDF
- TIFF/JPEG
- .DOC
- .RTF
- EMF
- HTML

Refer to the following sections for information about the individual print streams.

SNA Character String

Important: While we do not cover them in detail here, HostServe also supports two other non-IPDS PDLs: DSC and DSE.

SNA Character String (SCS) is an IBM protocol that defines control information for simple line print formatting. When an IBM mainframe or AS/400 host generates EBCDIC output, it uses SCS to transmit the data to a destination device. IPDSServe allows you to print your SCS mainframe documents on any printer within your Windows NT/2000 environment.

Users may generate SCS PDL data streams using a variety of mainframe applications. These include programs such as DisplayWrite. These text-only print streams are sent to HostServe via the Microsoft SNA Server. APWI's HostServe converts the PDL into the appropriate output format (if applicable), and sends the data to the destination device.

HostServe can accept SCS print streams and:	For:
Pass them on unchanged	printing on SCS printers.
Convert them to PCL	printing on PCL laser printers.
Convert them to TIFF/DataBase	faxing, viewing, or archiving.
Convert them to PDF or XML	Viewing, emailing, database or printing on non-PCL printers.
Convert them to Postscript	printing on postscript printers.
Convert them to ASCII	printing on an impact printer.
Convert them to HTML	viewing

Intelligent Print Data Stream (IPDS).

IPDS is a bi-directional SNA protocol that delivers print data and manages resources, handshaking, security, and error recovery. IPDS is both a page-description language and a printer-control protocol. When an IBM host (or AS/400) generates EBCDIC output, it uses IPDS to transmit the data to a destination device. IBM's Advanced Function Printing (AFP) architecture controls IPDS print jobs from initial print request to final output.

AFP was originally designed by IBM for use on their mainframe and midrange systems to manage high-speed printers within a data center. AFP has expanded to include use with other platforms and is ideal for managing distributed printers across large enterprises. Because it allows the distribution of mainframe output to remote locations, AFP can help businesses become more efficient and competitive. IPDSServe HostServe's integrated IPDSServe brings AFP printing of IPDS to the Windows 2000, XP and 2003 environment.

Users generate IPDS using a mainframe or remote application. This may include text, graphics, bar codes, or scanned images. PSF (Print Services Facility), the AFP print driver, manages the AFP printing resources including fonts, images, overlays, signatures, and bar codes combining them with the source data stream.

AFP resources are stored in libraries on the host, in databases at the server, or in the printer. Once PSF receives the appropriate resources for the job, it interacts with IPDSServe via a TCP/IP connection or Microsoft SNA/Host Integration Server to verify its ability to handle the request. The PSF then:

- Translates the AFPDS data into IPDS.
- Manages and tracks resources, downloading all non-resident fonts and overlays to the target printer.
- Tailors the IPDS print stream to the target printer (e.g. sends barcodes as IPDS or images).
- Delivers the print stream to the printer and handles error recovery.

HostServe converts the print stream into the appropriate output format (if applicable), and sends the data to the destination device.

IPDSServe can accept IPDS print streams:	For:
Pass IPDS on unchanged	Printing on IPDS printers (pass through).
Convert them to PCL	Printing on PCL laser printers.
Convert them to TIFF/Database	Faxing, viewing, or archiving (with HostServe)
Convert them to PDF/XML	Web viewing, emailing, or printing on non-PCL printers--
Convert them to PostScript	Printing on PostScript printers (with HostServe).

AFP:

AFP is a protocol that delivers document data and manages resources. AFP is a page-description language. When an IBM host (or AS/400) generates a document it uses AFP to format the data. IBM's Advanced Function Printing (AFP) architecture controls IPDS print jobs from initial print request to final output.

AFP was originally designed by IBM for use on their mainframe and midrange systems to manage high-speed printers within a data center. AFP has expanded to include use with other platforms and is ideal for managing distributed printers across large enterprises. Because it allows the distribution of mainframe output to remote locations, AFP can help businesses become more efficient and competitive. HostServe's AFP module brings AFP printing to the Windows 2000, XP and 2003 environment.

AFP resources include:

Resource:	Description:
Form Definitions (FORMDEFS)	Defines the physical layout of the page. They specify: <ul style="list-style-type: none"> <input type="checkbox"/> the number of copies to be printed <input type="checkbox"/> whether the output is to be printed on both sides of the paper (duplex) or one side of the paper (simplex) <input type="checkbox"/> page orientation (portrait or landscape) <input type="checkbox"/> which overlays, if any, are to be used <input type="checkbox"/> the input bin from which the paper will be fed
Page Definitions (PAGE DEFS)	Control blocks that define the logical placement of data on a page. Line spacing and fonts can be specified.
Overlays	An electronic version of preprinted forms. An overlay consists of text and/or graphics and can be stored on the printer and re-used in different print jobs.
Page 14 of 58 Segments	Pre-defined output that can be printed anywhere on the page. Typical uses of page segments include a company's logo and a user's signature. Most page segments are image. A page segment is similar to an overlay, except that it is stored without specified instructions for type style and position on the page. Instead, it is printed in the type style and location appropriate to the document at hand.
Fonts	Contain the raster patterns for all printable characters. A raster pattern is the way the printer puts dots on the paper in the same shape of a character.

Network loading can be an important consideration in the distribution of mainframe print jobs to remote locations. Mainframe applications typically send a complete page description, including many redundant resource definitions, for each page. This represents a significant network demand in bandwidth-limited environments. HostServe compresses print data streams by removing redundant information and encoding it into a single macro. This macro is sent once per print job rather than for each page. The reduction in data stream size can significantly reduce network load particularly for large print jobs.

DJDE/Metacode:

Line Conditioned Data Streams, Dynamic Job Descriptor Entry is a production printer language developed by Xerox Corporation primarily to map data to forms. It combines print data stream specification, variable data printing and forms development. The output is targeted at Xerox laser printers. Resources, including forms, fonts, graphics and logos were developed with a variety of tools provided by many different companies. These were stored at the printer. When the print data stream was sent from the host to the printer, commands in the data stream referenced resources stored at the printer. The printers were generally directly connected to the host computer usually via Channel. HostServe takes LCDS data to any network printer, e-mail, fax server, or content management system.

LCDS DJDE/Metacode print streams either contain or allow the following:

Description of the input (type, format, characteristics)

Definition of processing functions (logical processing)

Description of the output (type, format, font selection, primary color selection, accounting options)

LCDS DJDE/Metacode meets diverse application needs with its wide range of formatting controls. Fonts may be mixed on a page-to-page, line-to-line, or character-to-character basis. Page orientation and positioning controls allow page orientation to change on a page-to-page basis and even within a single page. Multiple logical pages can be condensed to print on a single sheet for review or internal distribution. Document modification is easily achieved on a copy to copy basis allowing, for instance, differently formatted copies of the same document tailored for a specific function or department. Groups of formatting settings can be stored in a Job Source Library (JSL) file. Radical changes to the printed format can occur through relatively simple changes to the JSL. All of these capabilities provide a rich source language for page description. Unfortunately, LCDS DJDE/Metacode printers are expensive and difficult to maintain. HostServe allows mainframe document programmers to use a language with which they are familiar and allows existing applications to continue to print without modification while allowing you to print these jobs on more modern and less expensive printers and, perhaps more importantly, to distribute and archive documents electronically rather than in printed form. HostServe fully supports all LCDS DJDE/Metacode commands as well as all JSL commands.

HostServe's resource conversion functionality supports both source code and compiled versions or all LCDS DJDE/Metacode resources and formatting instructions. In some cases original source for these resources is no longer available. HostServe produces exact reproductions of LCDS DJDE/Metacode printer output without sources. For cases where the source has been lost and modification is necessary, HostServe produces ASCII text files from compiled resources. This allows modification of jobs that could only be done previously by completely rewriting the code for the document. Where source code for large libraries has been lost or misplaced, this capability can save the day.

HostServe can accept LCDS DJDE/Metacode and XES print streams and:	For:
pass them on unchanged	printing on DJDE printers.
Convert them to PCL	printing on PCL laser printers.
Convert them to TIFF/Data Base	faxing, viewing, or archiving.
Convert them to PDF or XML	Viewing, emailing, database or printing on non-PCL printers.
Convert them to Postscript	printing on postscript printers.
Convert them to ASCII	printing on an impact printer.

XES/UDK Data Streams:

Xerox developed “Xerox Escape Sequence” (XES) as a departmental printer language. It allowed extensive document formatting include full facilities for forms, fonts, signatures, and logos and was supported on lower cost Xerox departmental printers. HostServe contains a full XES emulation allowing you to render any XES formatted document on virtually any printer or to publish it electronically.

XEROX VIPP™ DATA:

XEROX VIPP™ is a set of page layout functions bundled as a PostScript prolog. XEROX VIPP™ extends PostScript’s already rich formatting capabilities. Unfortunately XEROX VIPP™ documents only render properly on expensive XEROX VIPP™ enabled printers.

HostServe prints XEROX VIPP™ documents on any network printer and supports electronic distribution and publishing of XEROX VIPP™ documents.

HostServe can accept XEROX VIPP™ print streams and:	For:
Convert them to PCL	printing on PCL laser printers.
Convert them to TIFF/Data Base	faxing, viewing, or archiving.
Convert them to PDF or XML	Viewing, emailing, database or printing on non-PCL printers.
Convert them to Postscript	printing on postscript printers.
Convert them to ASCII	printing on an impact printer.

See [Appendix A](#) for complete details on features included in XEROX VIPP™.

Network PDLs:

Distributed network computers, mainframe hosts, storage/retrieval and scanning systems generate a wide variety of output formats. This diversity challenges the printing resources, file systems and content management systems available within a single organization. This presents a significant obstacle to the effective distribution of information. HostServe can produce data in a common format that prints on all printers at rated speed, can be viewed by all users, and can be used for many years without dependence on legacy printers. HostServe provides output in the following formats:

PCL:

Hewlett-Packard created the PCL Printer language to provide an economical and efficient way for application programs to control a range of printer features across a number of printing devices. The PCL printer language commands are compact escape sequence codes that are embedded in the print job data stream.

This approach minimizes both data transmission and command decoding overhead. HP PCL printer language formatters and fonts are designed to quickly translate application output into high-quality, device-specific, raster print images. Formatted properly PCL can be very efficient on the network and run faster printers at rated speed. HostServe enables this.

PostScript:

The Postscript language is a simple interpretive programming language with powerful graphics capabilities. Its primary application is to describe the appearance of text, graphical shapes, and sampled images on printed or displayed pages, according to the Adobe imaging model. A program in this language can communicate a description of a document, form a composition system to a printing system or control the appearance of text and graphics on a display. The description is high-level and device independent.

TIFF:

TIFF describes image data that typically comes from scanners, frame grabbers, and paint- and photo-retouching programs. TIFF is not a printer language or a PDL, rather its purpose is to describe and store raster image data. TIFF provides a rich environment within which applications can exchange image data. Though TIFF is a rich format, it can easily be used for simple scanners and fax applications because the number of required elements is small. Tiff will continue to evolve as new imaging needs arise. A high priority has been given to structuring TIFF so the future enhancements can be added while maintaining compatibility with existing TIFF specifications.

JPEG:

JPEG is a term for any graphic image file produced by using a JPEG standard. A JPEG file is created by choosing from a range of compression qualities (from one of a suite of compression algorithms). When a JPEG is converted from another file format or created, quality of image needs to be specified. The highest quality results in the largest file. JPEG is one of the image file formats supported on the World Wide Web, usually with the file suffix of ".jpg".

BMP:

BMP is a proprietary Microsoft Windows image format. It's a standard bitmap image format on Windows-compatible computers. Bitmap images can be saved for Windows or OS/2 systems and support 24-bit color.

PDF:

Portable Document Format (PDF) is the open de facto standard for electronic document distribution worldwide. Adobe PDF is a universal file format that preserves the fonts, formatting, graphics, and color of any source document, regardless of the application and platform used to create it. Adobe PDF files are compact and can be shared, viewed, navigated, and printed exactly as intended by anyone with free ADOBE Acrobat Reader software. HostServe accepts PDF files as input and produces PCL, PostScript, Tiff, and PDF output from any supported input format.

XML:

(Extensible Markup Language) is an application as defined in the Standard Generalized Markup Language (SGML). It is designed to enable the use of generalized markup in the context of Internet applications and has been adopted as a standard by the World Wide Web consortium (W3C). The term XML is also informally used to refer to a number of related initiatives that augment and supplement XML in the areas of resource description, document schemas, data typing, linking, addressing, and style sheets. HostServe produces XML output.

.DOC:

Microsoft Word product produces *.DOC documents. This format has become a standard for editable electronic document distribution worldwide. Microsoft Word is a universal file format that preserves the fonts, formatting, graphics, and color of any source document. Microsoft Word PDF files are compact and can be shared, viewed, navigated, and printed almost exactly as intended HostServe accepts .DOC files as input and produces PCL, PostScript, Tiff, and PDF output from any supported input format

.RTF:

The Rich Text Format (RTF) Specification provides a format for text and graphics interchange that can be used with different output devices, operating environments, and operating systems. Version 1.8 of the specification contains the latest updates introduced by Microsoft Office Word 2003. RTF uses the American National Standards Institute (ANSI), PC-8, Macintosh, or IBM PC

character set to control the representation and formatting of a document, both on the screen and in print. With the RTF Specification, documents created under different operating systems and with different software applications can be transferred between those operating systems and applications.

EMF:

EMF (Enhanced Meta File) is a term for spool file format used in printing by the Windows operating system. When a print job is sent to the printer, if it is already printing another file, the computer reads the new file and stores it, usually on the hard disk or in memory, for printing at a later time. Spooling allows multiple print jobs to be given to the printer at one time.

The EMF format is the 32-bit version of the original Windows metafile (WMF) format. The EMF format was created to solve the deficiencies of the WMF format in printing graphics from sophisticated graphics programs. The EMF format is device-independent. This means that the dimensions of a graphic are maintained on the printed copy regardless of the resolution in dots-per-inch of the printer. In a network, the smaller file size of the EMF format reduces network traffic. EMF is the spool file used by the Windows operating system.

HTML:

HTML (Hypertext Markup Language) is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page. The markup tells the Web browser how to display a Web page's words and images for the user. Each individual markup code is referred to as an element (but many people also refer to it as a tag). Some elements come in pairs that indicate when some display effect is to begin and when it is to end.

HTML is a formal Recommendation by the World Wide Web Consortium (W3C) and is generally adhered to by the major browsers, Microsoft's Internet Explorer and Netscape's Navigator, which also provide some additional non-standard codes. The current version of HTML is HTML 4.0. However, both Internet Explorer and Netscape implement some features differently and provide non-standard extensions. Web developers using the more advanced features of HTML 4 may have to design pages for both browsers and send out the appropriate version to a user. Significant features in HTML 4 are sometimes described in general as dynamic HTML. What is sometimes referred to as HTML 5 is an extensible form of HTML called Extensible Hypertext Markup Language (XHTML).

Improvements to HostServe Engine 5.01

Major Speed Improvements

Imports PCL TrueType fonts

Allows Scalable fonts to be included in PCL and PDF outputs.

Improvements to PDLs

American PrintWare, Inc. has improved the output of PDLs through conversion with the following initiatives.

DJDE Initiatives:

The DJDE System Language has been extended.

- Additional Finishing Commands have been added to the standard JSL and DJDE Commands
- Fonts can be scalable TrueType Fonts
- Forms can be any of 17 formats including PCL5e Forms
- Multiple resource directories will stop machine replacement collisions
- Automatic Commands have been developed for:
 - AutoBar Graybar
 - AutoStart Capability
 - AutoPage fits the printing on the page

See [Appendix B](#) for details on advanced features included in DJDE Plus.

XES Initiatives:

The XES System Language has been extended.

- Additional Finishing Commands have been added to the standard XES Commands
- Fonts can be scalable TrueType Fonts
- Forms can be any of 17 formats including PCL5e Forms
- Multiple Resource Directory will stop machine replacement collisions
- Automatic Commands have been developed for:
 - AutoBar Graybar;
 - AutoStart Capability
 - AutoPage fits the printing on the page

Builder Initiatives:

- Extended the script command set to include:
 - Improved Finishing Commands
 - Improved paper handling with Media Calls
 - AutoGrayBar
- Extended the Command Set to PCL, PS, and PDF

See [Appendix C](#) for complete details on advanced features included in Builder Plus.

PCL Initiatives:

- Allows integrated use of Builder Commands with PCL5e/c input files.

- Allows PjL editing capability
- Allows PCL command editing
- Origin Movement Processing: Edge to Edge
- Improved HPGL Plotter operations (Still not 100 percent compatible)

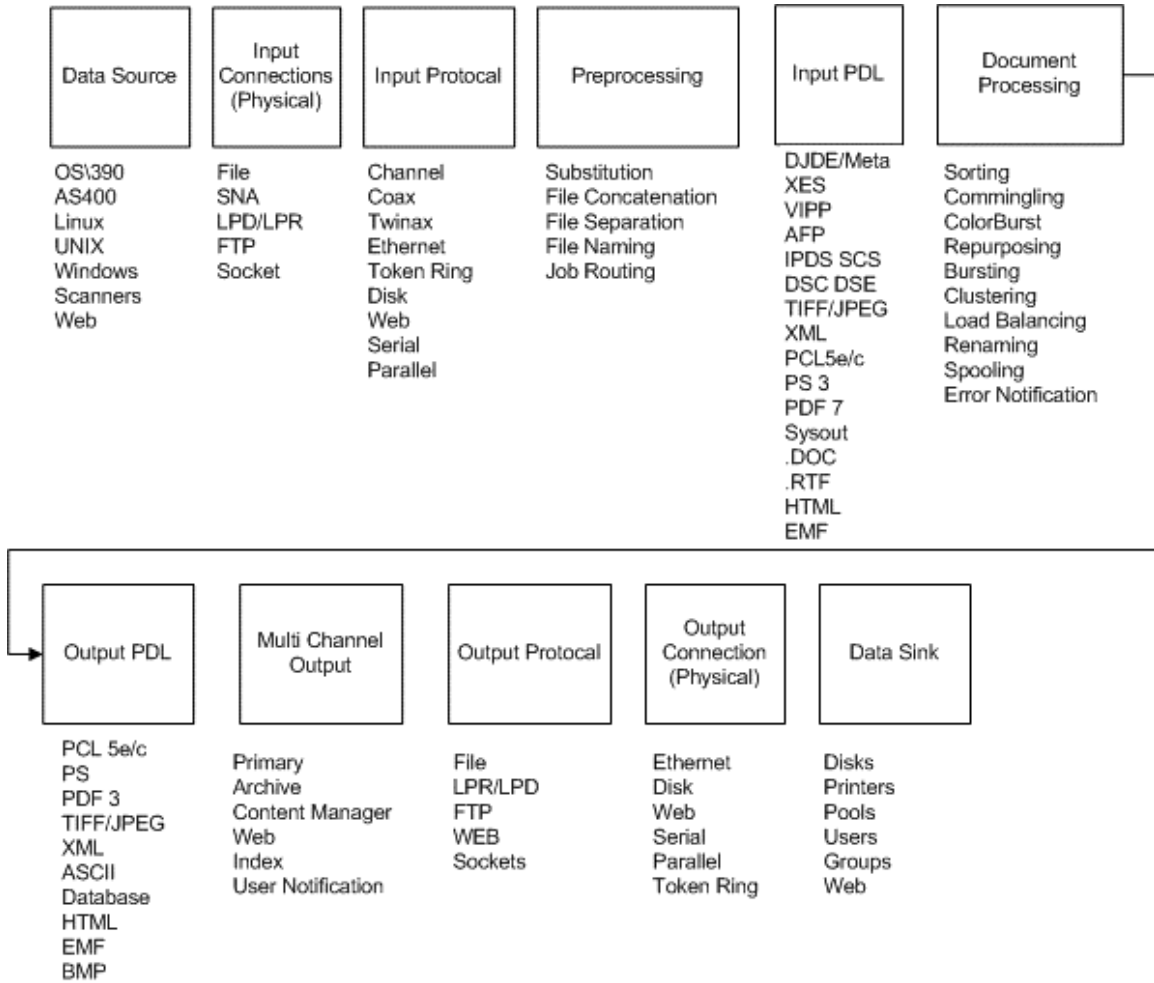
PostScript Initiatives:

- Handles Complex Graphic Files Quickly.
- Reduces many types of Graphics Files to a series of icons for faster processing
- Handles a variety of Finishing Commands XRX, KSK, Media Calls
- Cleans all unnecessary commands.
- Handles to Edge-to Edge issues correctly

Tiff Initiatives:

- Handles Complex Graphic Files Quickly.
- *Reduces many type of Graphics Files to a series of icons for faster processing
- handles Edge-to Edge issues correctly

HostServe Flow Chart:



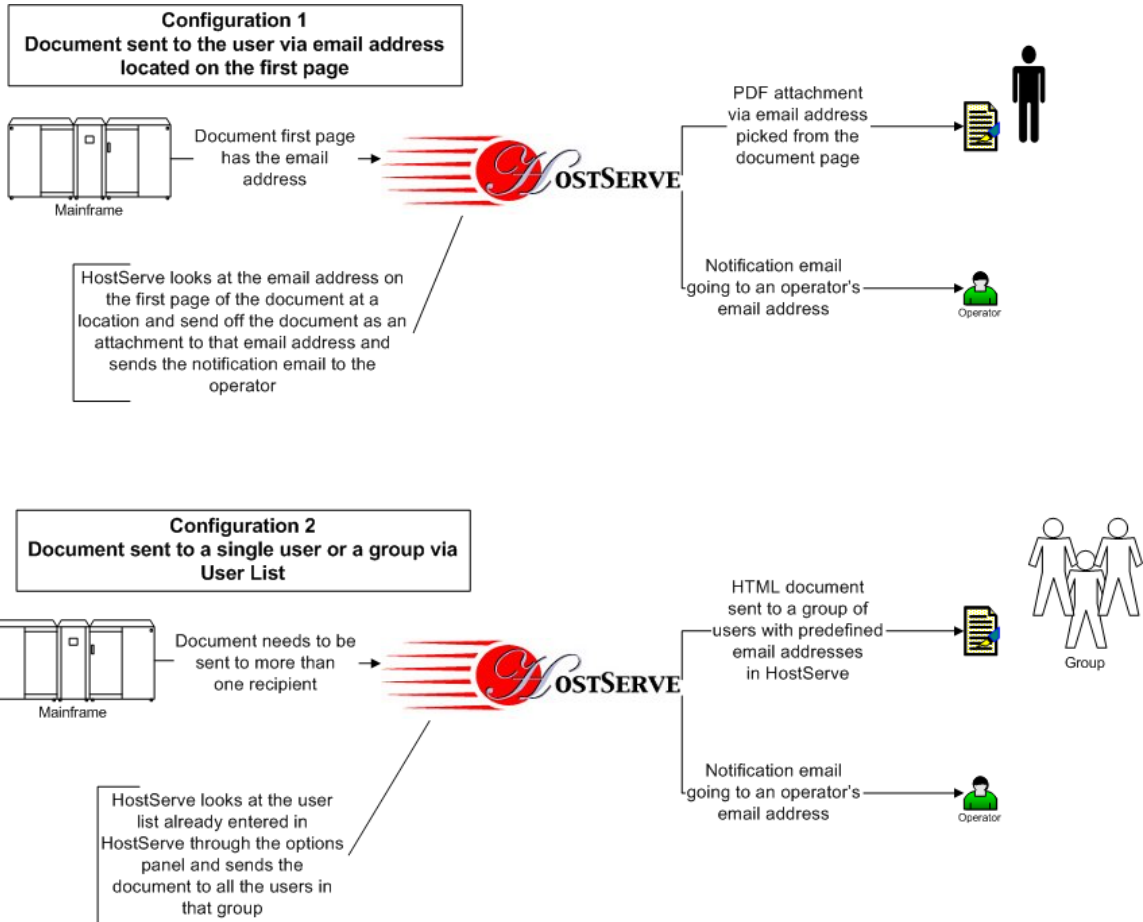
Out Put PDLs: HostServe can convert all the inputs to:

PCL, PostScript, TIFF, JPEG, BMP, HTML, XML, PDF, XML, ASCII, EMF, and Database

Delivery Systems:

Printers, Printer Pools. File Archiving, Viewing, WEB, E-Mail, FAX, FTP, Users (500) and Groups (100)

Diagram of Email process through Users is below.



Problem Configuration 1: Customer wants to send a document to a recipient via email. Email address is unknown to the customer and can be retrieved from the first page of the document. User wants the document in PDF. A successful delivery notification needs to be generated for the customer.

Solution: Customer sends the document to HostServe. HostServe picks up the email address from the first page of the document, converts the document to PDF and it's sent as a PDF attachment to the user's mailbox. Once the delivery has been made, an email notification is sent to the customer's email box.

Problem Configuration 2: Customer wants to send a document to multiple recipients via email. Email addresses are known to the customer. Customer through HostServe GUI (built in user module) creates a User List. A successful delivery notification needs to be generated for the customer. Users want the document in HTML.

Solution: Customer sends the document to HostServe. HostServe gets the email addresses of the users from the User List and sends the document to all of them either as a HTML document. After each successful email delivery, a notification is sent to the Customer's email box.

Advanced Features:

Multi-Channeling:

A HostServe job can be sent to a primary output, which can be a printer, printer pool, enterprise content manager, or a user and group, and, at the same time, can send the output to secondary destinations including archive file, a content management system, indexing and the web. All of this is done during a single pass of the input data stream. This can mean a great saving particularly in mainframe resources where reprinting often requires complete reprocessing of the selected job

Printers and Printer Pools:

HostServe jobs can be sent to a single printer or to a pool of printers. In single printer applications all output is sent to a single printer. This is the common window's model. Printer pooling within HostServe allows the grouping of up to 10 printers. Load balancing and clustering options allow flexible control of printer utilization within a printer pool and are set within the HostServe interface. While a pool can contain only one type of printer – PCL, PostScript etc.-- each printer within the pool can be assigned different finishing options and commands.

Load Balancing and Clustering:

Load balancing is sending a job to the next available printer. Clustering is analyzing the print job, parsing parts of the printing requirement to different printers within the cluster by sheet count or set count.

HostServe offers three options.

- **Load Balancing:**
Output is sent to the next available printer in the pool.
- **Automatic mode: for set or sheet splitting**
Output is divided between printers in the pool based on page or sheet count.
- **Manual mode:**
Long jobs are evenly split between printers in the pool.

See [Appendix D](#) for Printer Clustering Advantages.

Load Balancing Printer Selection Criteria:

- **First in Printer List**
Always prints the processed job to the first printer in the pool regardless of its status.
- **Next Available Printer**
Always prints the processed job to the next available printer in the list i.e. skip the busy printers in the pool.
- **Lowest Copy Count**
Always prints the processed job to the printer that has the lowest copy count (the printer that has the lowest no. of copies printed on it in the pool.)

The user can use any combination of the above three Options. For instance, if the user wants to split the jobs among the available printers in the list starting with the printer that has the lowest copy count, he can do this by selecting the desired options.

Routing, Users 500 concurrent outputs:

HostServe allows simultaneous outputs to 500 users at one time. A job can be sent to 500 different people with different output options specified for each user. These outputs are fax, email, printer, FTP and viewing. So a user that has a fax number specified will receive the job on his fax machine with the same job going to another user via email. HostServe can handle 500 concurrent users. Advanced versions of HostServe can handle an almost unlimited number of users.

Groups:

The operator can define a group of users to whom he wants to send the jobs. These groups can be accounting, sales, executive etc. The operator can have 100 such groups and each group can have any number of users, provided the total number of users from all the groups doesn't exceed 500. The same user can reside in more than one group but only one type output can be associated with the user in every group. For example, if Sam were going to receive his output via email then he would have the same output type in each group he is associated with.

NexCM Outputs:

Next Generation Content Management: This output allows the user to provide portal software to load the documents in a content management system. These software packages must be certified by APWI before they can be integrated with the system.

See [Appendix E](#) for details on the Content Manager interface.

Color Burst

HostServe ColorBurst solves the problem of economically printing mixed color and Black and White Documents, "ColorPlexed". There are two basic modes depending on the capabilities of your production printer.

Many production printers have an inserter tray, often called an interposer. If your system has this tray then the ColorBurst production is virtually labor free. If the printer does not have this feature then the documents must be reassembled.

Operation with an Interposer tray.

Input can be PCL5c, PostScript, PDF, XEROX VIPP™, Database, DJDE, AFP or IPDS. HostServe processes the ColorPlex file and produces two files. One file is the ColorFile and it is routed to the color printer. After the color printer has finished printing the ColorFile, the output pages are placed in the BW production printer's interposer tray. The second file called the ColorPlexFile will print the black and white page on the printer and insert the color pages from the interposer tray between the printed black and white pages. A complete finished product is produced with a minimum of time, effort and energy. For maximum efficiency the ratio of the speed of the color printer and the black and white printers should be close to the ration of black and white to color in the original document.

This technique works with variable data document of variable length. HostServe can be set to break jobs into appropriated sized sections so that processing can run in parallel between the two machines. HostServe can act as the Spooler to schedule the various printing job after they have been processed by HostServe. HostServe will run normal separations at about 1000 pages per minute. HostServe can easily reprint section of the job on either the black and white or color printer in the event of a printer misprint.

Operations without an Interposer tray.

The operation is the same as above except the output print jobs are offset at ever change of paper. This requires some reassemble, but the process is quick and normally error free.

See [Appendix F](#) for Cost Analysis for Color Burst.

The saving of \$4050.00 from Appendix E is accomplished in less than a normal working shift. There is some latency time loss in the system. An hour should be added to the printing time to finish the job.

Commingling and Data Sorting

HostServe as a Windows based document delivery and interconnectivity system is capable of transforming mainframe, network, and web data streams into an array of output formats and offers the user great freedom in the delivery and formatting of vital to business information. Users can view, print, and archive documents—regardless of origination—anywhere, at any time using a wide variety of printers, viewers, archives, content management or document management systems.

HostServe's flexibility allows you to meet customer needs quickly and efficiently. Whether you have gigabytes of host-stored customer information that requires rapid distribution to hundreds of branch offices, many different customers, in several formats, across thousands of miles, or require a solution that supports printing host documents to centralized printers, or need to automate Web distribution of documents, HostServe meets your needs.

HostServe is a beautiful fit to document sorting and processing world. HostServe has an array of rich features that allow customers to print and distribute the documents in the best way possible.

HostServe Document Sorting and Commingling

Features:

- **Consolidation:** HostServe has the unique ability to consolidate any number of documents coming from different sources into one print file.
- **Document Sorting:** HostServe can take in any number of files, process the files and then resort the output based on recipient information eliminating the need for manual sorting. Once the output is printed, it's already sorted and is ready to be sent to the automatic stuffer. In this way, the recipients receive the mailings in one envelope resulting in postage savings for the customer.
- **Stuffer Sorting:** Output can be sorted by total number of mail pages to allow use of different types of envelopes. This results in printing the output so that all the mailings that consist of one page are printed first, then the mailing having two pages and so on.
- **Management Sorting:** Sort documents for different reasons based on needs. Example, sorting documents for separate approvals or handling.
- **Zip code Sorting:** HostServe reads the document address and sends this information to a postal presorting module for additional postage savings.
- **All inputs:** HostServe can take in database files or print ready (PCL, PostScript, PDF, TIFF, LCDS DJDE/Metacode, DOC, RTF, EMF, XEROX VIPP™, AFP or IPDS) files for consolidation, commingling and conversion to PCL, PostScript, TIFF or PDF.
- **Variable Data Document Generation and Repurposing:** This HostServe feature enables the customer to build any form and remap

the data, or add color to the form for the processed output. This includes moving the address blocks to fit the window of different envelopes or change the form.

- **Variable Data Driven Graphics:** Customers can generate beautiful and powerful new graphic form information in a database or a print file.
- **Telescoping:** This unique feature allows the customer to save money by printing multiple up jobs on larger sized paper. Documents are pre-sorted correctly for cutting, mailing and insertion.
- **Add Inserter Controls:** Bar codes and OMR marks can be added to the output to take advantage of folders and inserters.
- **Indexing and Archiving:** Customers can index any source document for easier archiving or label generation.
- **Print Accounting Log:** Accounting Log helps the customer keep track of the number of pages printed for accurate billing.
- **Add Document Set Numbers:** Document Set Numbers help preserve the integrity of the source document by alerting the customer if any document set failed to process/print.

See [Appendix G](#) for Commingling concept with example.

Repurposing, Tagging, and Indexing Languages

APWI's repurposing language allows the decomposition of print stream data. If the data is graphic then the OCR module must be used to generate a text-based document before decomposition. The basic items for decompositions are:

- Text
- Graphics
- Lines
- Forms

All print stream files variable information is generated from a Viewport technology that maps a portion of the printed page to an XML Tag. The Viewport technology allows HostServe to read the pages for variable information. The Viewport has absolute location reading capability. It will also browse an area for a sequence of text that indicates the type of document. The Viewport technology allows the user to specify a fixed page, multiple page, or variable page document indexing strategy. APWI Viewporting technology will work on both text and graphic files. The text file can be AFP, SCS, IPDS, DJDE, XEROX VIPP™, XES, PCL5e/c PostScript, PDF, .DOC, .RTF.

The graphics file can be TIFF, JPEG, BMP and all of the text files if the data is rendered as an image. Data file can be any of the Normal HostServe Outputs.

NOTE: The Graphic files will require our OCR option. (See Graphic Documents Indexing section).

When used for **Repurposing** the document is converted to XML tags. These tags are then processed by the repurposing recipe and then written by HostServe's XML Imager. When used as an **XML generator**, the XML file is

used directly. When this process is used to make **Indexes**, the XML document is converted into an index file.

Language Syntax

Type, Instruction, Owner, Owner Level, Tag Name, Item, Detect, x, y, x1, y1;

Types: Text, Graphics, Lines, and Forms

Text Instruction: Text, Conditional "ABCDEF", Syntax "XXXXXX", LinebyLine, Continuous

Graphic Instruction: Remove, Resize, Colorize

Lines: Remove, Colorize

Owner"

Owner, multiple owners are possible, ANY is also useable

Viewported value

In a document page that contains the users account number, this account number can be Viewported and placed in a XML Tag.

View ported Indirection

This mapping may contain a single indirection in each viewport. For example, if the page viewport contained the words, "Past Due", the past due text would be looked up in the JIL (Job Instruction Language, an APWI script language) and the index entry could contain the record "Delinquent". For example, if an invoice needs to be parsed on the basis of account numbers then anything unique on the page where the account numbers change becomes the trigger field. In addition, the user also wants to use the customer name and address which become the index fields that will go in the accompanying index file. This trigger information and the index fields information needs to be placed somewhere for the APWI program to access, that place is the JIL (Job Instruction Library). Below is a typical JIL entry for the above example:

JOBCOND=-, 1150-1160, 310-487, E, "Welcome", WELCOMELETTER, BOP;

In the above jil entry, the trigger is the word "Welcome" at the given x,y locations.

WELCOMELETTER is the name of the DAT file that contains the index field information which in this case is name and address.

Constant value

The index can also include constant values. For example, for invoices, the document type in the index file can be set to "Invoices".

Document Number

The Document Number normally starts at 000001 and counts the documents in a large document-processing file.

Pages, Images

The Index can also contain number of pages and/or images in the document.

Date

The Index can contain the processing data in several formats

FileName

The index can contain the Data files name.

Index File Name Prefix

This option allows the name of the Data File to contain a prefix so that the Destination can determine the type of document. For example, for an index file named Invoice_PWIndex.csv, the prefix "Invoice" can be used to determine that this index file belongs to the Invoice Document. This is not a mandatory entry and if not present, the index file will be named PWIndex.csv.

The index can be generated in either a fixed width or delimited file format. The delimiter character is user specified, normally a comma. The width table must be user specified.

The Indexes are generally a separate .CSV file.

The index can be placed in AFP, HTML, PCL, PostScript, PDF, XML or TIFF files.

NOTE: Indexes that are placed in files are usually special order items.

Example:

HostServe converting a PCL document into TIFF with a CSV index file.

The requirement was to parse the PCL document into different sets of policies so the set of policies having number 12345 has its own separate TIFF output file (Single or Multipage) and a separate entry in the index file. The same goes for all sets of policies in that PCL file. This was accomplished by keying on a trigger field on the first page of each set of policies. The trigger field told HostServe when a new policy set was starting.

Once it was determined that HostServe needs to extract the policy number and date fields from the PCL document, a viewport file was generated which had the x,y coordinates for the fields. This file has a DAT extension. This file contains the viewport information. HostServe reads the viewport information from this file and extracts the data from the locations. For each different kind of document, there can be a different DAT file depending on the location and desired index fields.

The first field is the file name of the companion TIFF file for each policy set. The file name is renamed to have the policy number and then the extension. The policy number and the document date were extracted from the PCL file. The document type field is Commercial Certificate. The next two fields are standard HostServe fields; one is the current date. PW stands for PrintWare identification.

Following is a small sample of the index file.

```
"File Name","Policy Number","Document Type","Document Date","Capture Operator","Import Date"  
"647159.Tif","647159","Commercial Certificate","08/30/04","PW","01/28/2005"  
"647173.Tif","647173","Commercial Certificate","08/30/04","PW","01/28/2005"
```

"647189.Tif", "647189", "Commercial Certificate", "08/30/04", "PW", "01/28/2005"

Graphic Documents Indexing

HostServe provides all the capabilities for indexing a document and entering it in a content manager system or document processing system. This capability becomes really important when the documents are coming from different sources. For example, a scanner, a host, or any other application all need to be indexed and put in a content manager or document processor. Scanned Graphic documents pose the greatest challenge, as there is no text on the scanned image after the document has gone through the scanning process.

HostServe can take in any graphic document and index it based on the index information provided by the customer. This information is in the form of regions called "Viewports" from where the customer wishes to extract data. The customer can have as many Viewports on a page as desired and HostServe will go through each of the Viewport and extract the data into a separate record of the index file.

Graphic Documents are difficult to index because there is no text in the document. These types of documents are usually:

TIFF BMP JPG PDF PCL5e/c PostScript

Apart from the being graphic documents, PCL5e/c, PostScript, and PDF can also be text documents that need to be indexed using other methods.

Graphics Documents that are generated by an application, a print driver or an output program are the easiest to decode. Scanned documents are usually harder to decode. This is partly because there can be scanning quality issues resulting, from a dirty scanning glass. Also the input documents can be distorted or deformed due to coping or fax handling which adds to the quality issues. Also the resolution of the document is important. If the document is generated or scanned at a higher resolution, there is more data to work with in the decoding process. If the document is scanned in as a gray scale document instead of a black and white document, the chances of decoding the information improve.

Suggested process

This is the suggested method for sending graphics documents to HostServe.

- Scan the document at 600 dpi to a TIFF file.
- Run the data through a scan clean-up program that will de-skew and clean slight quality abnormalities.
- Place the document in a HostServe input queue.
- HostServe will then use a "Viewport Detection" system on the document and determine the document type.
- HostServe will get a detailed "Viewport Description" of the document:
- HostServe runs the adaptive locator to find the correct location of the document
- HostServe runs the adaptive sizer to correct the size of the document
- HostServe runs de-skew to align the document.
- HostServe will now extract the data in the viewports, submit them to an OCR function, and place the output data in the index.

HostServe can now check the index data for accuracy. This is accomplished by:

- Finding two instances of an index field (customer provided) on the page and comparing them
- Checking the detected index field with a database and checking the name on the document
- Checking the index field for syntax.

HostServe Indexed Output

HostServe can output indexed documents in several ways.

- HostServe can output linked files where the index contains the name of the companion graphics file.
- HostServe can output files that have the name of any index field from the document, often the policy number.
- HostServe can output single files that have an invisible indexing section. This means that the indexing information is extracted and put in front of the document in white ink so that it is invisible to the printer.

Data Output

The Graphics Data file that was generated or scanned at 600 dpi and is very bulky can now be reduced to 200dpi, CCITT4, or 300 dpi black and white. This will reduce the bulk storage size required. PCL5e/c, PostScript, and PDF are currently restricted to 300 dpi.

Index Companion File

The Index file can be a CSV (comma separated) or a XML file. The index can contain the data file name, the import time, and the type of document decoded together with the index fields from the document.

Error Detection

In the event that HostServe cannot decode a document, the document is placed in the output directory with a different extension. This document must then be hand indexed. Error Detection include:

- Can't find the type of document
- Can't align the document
- Can't correct the size of the document
- Data Syntax Errors
- Data Checking Errors

System Performance

HostServe will process 600 dpi black and white TIFF files at the rate of about 500 pages per minute. This assumes a 3gig Pentium processor with adequate ram and disk capabilities.

Additional Simultaneous Output:

Indexes:

HostServe has an advanced Indexing capability. We are using the viewport technology for the indexing. The indexing can be based on fixed form data location or keyed location, which means a location specified by the user and the sub-pieces of an area. The viewport in each instance will go to the desired location and pick up the data. The data could be comma delimited or tab delimited or anything. For example, in the case of a telephone bill, the software will pick up the numbers from the bill and the total and make a new page out of that information or if you only want to pick up the total, you can specify that location and only the total amount would be picked up by the software.

Archives:

A processed job can be archived through the software. The operator needs to set the "Change Archive Flag" to yearly, monthly, weekly or daily. (He will also be notified if the archive folder reaches a certain size specified by him for any action he needs to take based on that info.) Archive folders can also have PCL files. The software will have a different folder for PostScript files. The software is intelligent enough to distinguish between the various types of jobs so the correct type of job goes into the respective archive folders.

See [Appendix H](#) for details on various Archive options.

Web Outputs:

A job can be directly output to the web. This is particularly important for remote clients. Instead of using the fax or FTP facility, the operator can send the output directly to a secure website where it can be viewed by the intended users. The jobs can be output as PDF or HTML.

See [Appendix I](#) for HTML specifications.

E-Mail Notification:

HostServe is capable of sending e-mail notifications to the operator if a job does not process for any reason. The operator will receive the email in his mailbox with the description of the problem. There is no need to constantly monitor HostServe's operation. After receiving the email, the operator can rectify the problem and send the same job for processing again. HostServe will not store the file so if there is a problem with the file then the file needs to be resent after the problem is rectified.

Spooling:

When jobs arrive at the server they are placed in the “Pending Jobs” window. These jobs can arrive as either automatically processed jobs, or as Manual Jobs. Automatic jobs are processed when print time is available. Held jobs can be released, or moved to another queue for processing. Held jobs can be viewed using the input file viewer. This viewer has Text, ASCII, EBDIC, PCL, TIFF, PostScript, and PDF viewing capability.

When the jobs arrive, they are analyzed for PDL, Language, Job name, and Type. At this time these jobs can automatically be placed in the correct queue for processing. These jobs can also be parsed into various sections, so that separate start commands, processing options, and printers, can be utilized for each section. This can be either a Manual or Automatic operation. The jobs can be combined so that larger jobs are submitted to the printers. This increases printer efficiency.

The operation of the spooler:

The operation of the spooler can occur in two modes, Automatic and Manual. In the Automatic mode all of the jobs arriving in the input queue are routed to the first available printer. The first printer is chosen from the idle printers based on one of the following methods:

- Next Printer
- Closest Printer
- Lowest Print Count Printer

Manager and User Clients:

- Remote Control
User Client; Controls only his jobs
Management Client: Controls all jobs
- HostServe allows control of the system from your desk. No more trips to the server room saving time and eliminating hassle.

Extensive Variable Data Printing:

HostServe creates pages by taking line printer data plus comma delimited data for processing with flash forms

- Reformats a Line Printer page and add a flash form
- Creates an automatic barcode job to handle sys-out data
- Corrects and improves the appearance of PCL, PS, PDF, and IPDS Jobs
- Reads the input data and correctly formats individual pages.

Extended command scripts are available in PCL, PostScript, PDF and IPDS

Multiple Resource Directories:

HostServe enables the User to keep departments, divisions and company resources separate for easy maintenance and accuracy of printing.

Resource directories

A system Cartridge directory where resources can be put that are not to be modifiable by the users.

One Resource directory for each Path

One Security directory for each path

The advantage of having Multiple Resource Directories is that the operator can send two jobs belonging to two different companies in two different paths at the same time specifying respective resource directories for each path. So a job of Company A will get the resources needed for processing from the Company A Resource Directory and similarly the job for Company B will get the Company B resources from the Resource Directory. Another feature of the Resource Directory is Secure Directory.

Secure Directories:

Secure Directories is useful when a company has certain resources that it doesn't want in the normal resource directory for security reasons. These directories and resources can only be accessed by the intended operator.

Output Enhancement:

The print can be upgraded to 600 dpi for better looking output. The system contains a quality font and graphic smoothing capability for an improved appearance. Yes, you can go from 600dpi to 300dpi to reduce file size for storage or processing as well as enhance the video image.

Powerful Finishing Output:

HostServe uses print PDTs, (Printer Definition Tables) to drive many different models and brands of printers.

A flexible control system enables the right finishing for each and every job in the system.

Here is what one of the PDTs look like.

```
<Printer Name>
  <Language PCL>
    <Command Border On      PJJ = @PJJ SET
      EDGETOEDGE=OFF</Command>
    <Command Border Off    PJJ = @PJJ SET
      EDGETOEDGE=ON</Command>
    <Command Resolution 300 PJJ = @PJJ SET
      RESOLUTION=300</Command>
    <Command Resolution 600 PJJ = @PJJ SET
      RESOLUTION=600</Command>
    <Command Duplex Off    PJJ = @PJJ SET DUPLEX=OFF</Command>
    <Command Duplex On     PJJ = @PJJ SET DUPLEX=ON</Command>
```

```

<Command Binding LongEdge PJJ = @PJJ SET BINDING=LONGEDGE
                                </Command>
<Command Binding ShortEdge PJJ = @PJJ SET BINDING=SHORTEDGE
                                </Command>
<Command Staple Off           PJJ = @PJJ COMMENT %KDKRequirements:
                                staple(none)</Command>
<Command Staple TopLeft      PJJ = @PJJ = @PJJ COMMENT
                                %KDKRequirements: staple(front)</Command>
<Command Staple Top          PJJ = @PJJ COMMENT %KDKRequirements:
                                staple(front)</Command>
<Command Staple Left         PJJ = @PJJ COMMENT %KDKRequirements:
                                staple(front)</Command>
<Command Punch Off           PJJ = @PJJ SET PUNCH=OFF</Command>
<Command Punch Left          PJJ = @PJJ SET PUNCH=LEFT</Command>
<Command Punch Top           PJJ = @PJJ SET PUNCH=TOP</Command>
</Language>
</Printer>

```

For Tray and Bin commands, you can have media calls in PDTs.

File Concatenation:

Send several small jobs and HostServe will combine those jobs into one large job eliminating cycle down on the printer. The concatenation is based on three parameters, the file size, the maximum number of jobs to be concatenated, and the time limit. The operator can specify either of the first two but the time option is mandatory. If he wants to stop the consolidation of the jobs when a large file reaches 2MB, then he can specify that in the GUI. If he puts in the number of jobs to be concatenated as 12, even if the file size hasn't reached 2MB, the software will stop the consolidation when the number of jobs reaches 12. If all the options are selected and the time limit has been reached then the consolidation will stop even if none of the other two conditions are fulfilled. HostServe works on the principal of first in, first out so the file order is preserved during consolidation.

Robust GUI:

The GUI allows viewing of the inputs, resources, and outputs. It allows destination changes on the fly and allows scheduling of jobs and reprinting of jobs.

Print Logs: Tells you who got what, when, and where.

Accounting Logs: Tells you how much was printed on each printer, when it was printed and where. More detailed output log than Print Log.

Error Logs: Tell you what the error was when a job was dialed to process. Gives you a complete list of errors that HostServe encountered while running jobs. The error log can be used to rectify the problem and the jobs can be run again.

See [Appendix J](#) for Accounting and Print Log Specifications.

Conclusion

Information and technology – the most vital business tools today. Accessing, distributing, and sharing information is at the core of your competitive advantage. American PrintWare understands the technology necessary to deliver your information to the destination your business needs it most. Whether it's customer statements, billing records, or archived files – we'll tailor specific solutions to help you meet your requirements.

APWI provides software-based tools and solutions for web, network, mainframe document distribution and host connectivity. American PrintWare works closely with companies to help them extend the life, the reach, and the value of their existing information systems. American PrintWare is headquartered in Southern California, with distribution worldwide.

For more information visit our Web Site at www.apwi.com or contact one of our sales representatives at 949-488-2222.

Appendix A – XEROX VIPP™ Specifications

The advantages of the XEROX VIPP™ module is that you can convert XEROX VIPP™ files into PCL5e, PostScript, PDF, TIFF, Line Printer, Database, XML, and Indexes.. Use XEROX VIPP™ module as your variable data processing system and use the output for printing, document distribution, web populating, and content management. It will also e-mail or fax the documents to the appropriated user.

XEROX VIPP™ module takes in most types of resources, PostScript, PCL, DJDE, 4235, XES, fonts graphics, and forms. XEROX VIPP™ module also takes in FSLs (Forms Source Language), and any Windows based form, plus Window True Type Fonts. TIFF forms and graphics. Many, types of resources are imported.

XEROX VIPP™ module has added commands to address bills and other documents directly to recipients.

XEROX VIPP™ module has added commands that interface directly with the PDT tables so that finishing options can be entered once and they will be correct for the printer chosen.

HostServe will also automatically switch emulators from DJDE, Builder, XES, and Xerox VIPP™ module. The first XEROX™ module installation was used to drive 300 printers in a hospital from dual servers with dual processors. This provided speedy printing and reliability.

Common Question for Customers interested in Xerox VIPP™ Plus are:

Will it handle all of my Xerox VIPP™ commands? Answer: Yes.

Will it handle my highlight colors? Answer: Yes and it's easy to add full color or go back to Black and White

How do I build resources for XEROX VIPP™ module? Answer: Use HostServe ComposerHS Utility

Who is going to maintenance my print jobs, make the forms, get the fonts and code the jobs? Answer: American PrintWare, Inc.

Can I run a billing job, print some, e-mail some and fax others. Answer: Yes

Can I run all Four XEROX VIPP™ data modes? Answer: Yes.

How are the 3D Color Graphics? Answer: Great.

Appendix B – DJDE Plus Specifications

DJDE Plus is based on the Xerox DJDE printing language but has many added features to provide more capabilities for the users. These capabilities are:

- More automatic to reduce operator requirements
 - Automatically distributes documents to reduce cost
 - Uses simple resources to reduce auxiliary programs required
 - Uses a wider range of resources for more functionality
 - Provides extended finishing capabilities for more functionality
 - Provides full color capability for more functionality
 - Uses most network printers for more flexibility
-
- AutoJob. Documents are scanned for a job name in the banner page and special job names are matched with DJDE Jobs. This reduces operator workload.
 - Automatically Distribute Printing. Distribute and Print and Content Management are cutting the needs for production printing. With HostServe these volumes can be further reduced. While HostServe provides the Distribute and Print capability and the Content Manager interface, HostServe will route documents to a user's printer and notify them with an email that it is printing, or just send them an email or a Fax of the document.
 - Extended JSL and DJDE commands to call TrueType scalable Fonts
 - Easier to run and maintain
 - Multiple types of Forms as resources
 - Any Windows generated form B&W or Color
 - FSL Color Forms
 - XEROX VIPP™ Color Forms
 - DJDE Forms
 - 4235 Forms
 - Multiple types of Graphics
 - BMP B&W or Color
 - Tiff B&W or Color
 - DJDE
 - Additional JSL and DJDE Finishing commands and capabilities.
 - Punching All modes
 - Stapling All modes
 - Binding As Required
 - Duplex Operation for short printer path operation
 - Additional Printer Matching Commands such as booklet etc.
 - All Color Palettes Available
 - JSL and DJDE Command to support full color operation
 - Color Forms and Graphics Resource
 - Color Overlay mapping for variable data
 - Multiple Resource directories per installation to allow multiple client operation.

- Complete delivery system for modern corporations.
- Installation and service people that understand the printers and the environment.
- After sale support.
 - Forms
 - Printer Management

Appendix C – BUILDER Plus Specifications

BUILDER Plus is an enhanced Builder language. It has a lot more features and commands added to it that makes it stand out against the Builder language. With Builder Plus capabilities, HostServe becomes the premiere Document Repurposing Engine (DRE). HostServe takes most documents as inputs and extracts, the documents contents. The extracted data is available as either Line Printer or Database entries.

The extracted data can then be used directly as input to an information source, content manager, or be reformatted by HostServe as a different document, or a more powerful document of the same type. These new documents can then be printed, sent to the web or automatically delivered in a variety of formats.

HostServe provides a top of the line companion ComposerHS utility for reformatting the data, providing the resources, fonts, graphics, and building color or BW forms. The design tool will then tie this document styling project to a particular document type and will automatically run the next time the document is processed.

HostServe also provides a Scripting language “Builder Scripts” for document and multiple document processing. HostServe can merge documents. Documents from several billing systems can be merged with marketing information driven by a database and triggered by the document information from the index. Builder Scripts can merge, burst, sort, and deliver documents depending on data contained either in the document or from an external database. HostServe will provide finished documents and indexes into web applications. HostServe contains extensive logs of system operation and document processing and deliveries. HostServe also feeds an archival system. HostServe enables the advanced functions of multifunction devices. Punching, Stapling, and Booklet making are available on dissimilar printers. HostServe has a set of formats called Printer Definition Table (PDT) for all popular printers over 50PPM and can be edited by the system operator to interface with most printers. This allows the switching of a print job from one printer to another without modifications. This is called Printer Tracking.

Common Question for Customers interested in BUILDER Plus are:

Will it Handle XEROX VIPP™ Jobs?
Completely.

Answer:

Can it Handle DJDE Metacode?

Answer: Yes.

Will it Handle IPDS

Answer: Yes

How about PCL

Answer: Yes

How about PostScript and PDF?

Answer: Yes.

What happens to the original form?

Answer: It is discarded.

What does it do about over printing?

Answer: HostServe can under GUI control discard all over-strikes, underlines, and forms

What happens if the original document is not printed from top to bottom?

Answer: The Extracted Data is sorted top to bottom, left to right

Will HostServe provide Postal Sorting?

Answer: Yes, but an external postal sorting program must be used to provide the raw data.

Can it handle Barcodes?

Answer: Yes many Barcode fonts are included as well as the algorithms for formatting them.

Can it make up graphics from the data?

Answer: Yes it handles 11 different graphics formats.

What Kind of Graphics Files are produced?

Answer: HostServe provides: BW, Gray Scale, Smart Palette Color, and 24 bit Color Documents. HostServe often reduces the size of data images so that the printing is faster and easier.

Appendix D - Cluster Printing Advantages

Getting the cost down, getting the job done and keeping the quality high is what keeps the customer happy.

Today, laser printer technology has improved to the point that customers can now buy production quality features on smaller, less expensive, network printers. We now have multifunction network devices that connect workgroups with networks, and not only copy but also do printing, faxing and scanning. Business, schools, government offices and even print-for-pay shops can get more printers to do more work and not sacrifice quality.

A concern with large production printers is balancing small jobs with large jobs. Once a large job is started, it is almost impossible to interrupt and run a quick priority job. When the features of a production printer are needed, they are not always available. How can a print operator do a job quickly if the one and only large production printer in house is down or is busy.

If there are printing peaks then clustering is a definite advantage. These demands can be accomplished more economically with a printing cluster. If most of your jobs occur during a short period, at the beginning of the week, the end of the month, or the beginning of the month for example, then having four printers with 200PPM capability can handle the printing demand more quickly than a larger, slower printer.

Today, with cluster printing, many of those concerns can be eliminated. How? Instead of having one large 100+PPM printer, you can use 2, 3 or 4 network printers. If the input and finishing features needed are available on the network printer, you can run the big jobs on the smaller less expensive printers with Clustering.

With HostServe you can distribute host data to two or more printers attached to a network or host. You can now split large print jobs at page count or set count allowing you to maximize your printing system with all the advanced printing functions.

HostServe allows for multiple clusters and printers to be attached to more than one cluster, and all the networked printers can be easily attached and removed from any cluster.

And how does this add up to make your production printing job easier?

- **Get the job done in a timely manner** – With HostServe it is now possible to split a large print job by the number of pages or a set count and then send the job to two or more printers and distributed to the point of need.

- **No sacrifice in quality** – With HostServe a job can get the same finishing resolution, and format with network printers as with production printers.
- **Keep costs down** – Maximize printer usage with HostServe, and get better monthly volume control. Select printer finishing by feature, speed and finishing requirements where needed or wanted. Spread the reliability across several printers and choose the first available printer specified by the economic model with HostServe's load balancing feature.

HostServe allows for multiple clusters and printers to be attached to more than one cluster, and all the networked printers can be easily attached and removed from any cluster. Now take advantage of the less expense, practical production printing solution today. Let HostServe manage the job!

Compare a Printing Cluster to One Larger Printer.

Performance: The best performance comes from load balancing.

High Availability: It is highly unlikely for an entire Cluster to fail. This means that while 1 or 2 printers may fail due to maintenance issues the remaining printers can be used to pick up the workload. There is rarely any downtime.

Scalability: Adding or subtracting print devices based on workload can be done with just a few mouse clicks.

Price vs. Performance: The cost of smaller network print devices is significantly less than that of a big production printer and even purchasing 4 or 6 of them will not even come close to the cost of one large printer. Also by setting up these printers together you can utilize their speed to your advantage. For example: 4 fifty page per minute printers all running at the same time generate 200 pages per minute of output (4 x 50 = 200).

	<u>Single Printer</u>	<u>Cluster Printers</u>
Predictability	Very low, work load dependant on one	Very High, work load based on statistics
Reliability	Only one point of failure System fails when one printer fails	Multiple failure points System fails only when all printers fail
Serviceability	Productivity lost due to printer downtime. No work can be done while printer is being serviced	No productivity loss as other printers can be used to take up the load from the printer that is currently being serviced

- A Cluster System is 10 times more reliable based on statistics.
- A Cluster System can run from 2 to 3 times faster at equivalent cost.
- A Cluster System can deliver up to a 50% cost savings with the same productivity including Capital Cost.
- A Cluster system can handle priority jobs more efficiently.
- A Cluster system can handle peak loads more efficiently.
- If production printing decreases these assets can easily be redeployed.

Appendix E – Content Manager and View Systems Interface

Interfacing with Content Manager Systems is one of APWI's strengths. APWI will take print ready documents and prepare them for use in a content manager. APWI can take in most print ready formats and some Microsoft formats and can also repurpose those documents in addition to outputting them in the desired formats. These inputs are: MS_DOC, MS_RTF, PCL5e, PCL5c, PostScript, PDF, DJDE, XEROX VIPP™, XES, AFP, IPDS, TIFF, Line Printer, and Databases.

Types of Content Management outputs TIFF, PDF, HTML, Line Printer
Most Content Managers prefer their data in one of the above formats. We provide all of the above output formats. Other than the TIFF format all of our output files are indexable. We also provide indexes for each input file that can be imported into a content manager system. Indexing is covered later.

- TIFF has been the preferred document storage medium because it passes the 15 year document storage requirement.
- PDF is starting to be used in document storage, but the changes to the format and capability cause concerns about reading documents after 15 years. PDF seems to be used in less critical systems.
- HTML is just starting to be used as a document storage medium. This is probably because so much of the data is available in this format.
- Line Printer is an old reliable type of document storage medium.

Document Preparation: Files, Documents, Pages.

Document Preparation most often involves document separations and indexing. Indexing will be covered later. Separation is called "Bursting" in our systems. We will look for a unique trigger on a page to burst. For example, we will burst on the appearance of a specific policy number, or the appearance of the beginning of a document. We will burst by the page, the document, or by the number of images or pages.

Content Management systems appear to have individual preferences as to how they want the data to be prepared. Some will take an entire file and index only items on the front page and others use titles and paragraph headers.

The most common interface is to convert the file to single page TIFF files and provide a document CSV (excel file) type index.

Another approach used for insurance policies and similar documents is to separate the documents into PDF documents and provide an index of the File name and Policy Numbers.

ViewPorting:

ViewPorting is "seeing" a Particular set of items, called keys, at particular places in a print stream page (Patent Pending).

The location of the keys can vary slightly as the documents may be prepared by different systems (Patent Pending).

The documents are graded by these viewed keys and a document Type is selected. The document index is then derived from the data found at the key's location on this document. All this location information is already available in the ViewPort data shown in the example.

In the following example the documents in this set of files are Notices of various types. Some companies have hundreds of notices. So far we have found one company with almost 200 notices of one particular type.

In this example, we are bursting on the Notice types and grabbing the Policy number and Date from the pages, which are our Index Keys. Each instance of "NOTICE OF PREMIUM DUE" is our bursting criteria. The pages that fall between two "NOTICE OF PREMIUM DUE" document beginnings are considered as one Document Set and are outputted to one Tiff file. Same is true for "NOTICE OF CANCELLATION" and "NOTICE OF EXPIRATION".

```
JOBCOND=-, 220-230,1910-2410,E,"NOTICE OF PREMIUM DUE", NOPD,BOP;  
JOBCOND=-, 265-280,1890-2410,E,"NOTICE OF CANCELLATION", NOC,BOP;  
JOBCOND=-, 220-230,1980-2435,E,"NOTICE OF EXPIRATION", NOE,BOP;
```

Three types of documents are decoded and three data seeing algorithms are employed to gather the index keys (policy number and document date). We are also renaming the generated TIFF for each document set to the policy number for that set. The TIFF's can be multiple page TIFFs or single page TIFFs depending on the frequency of bursting. Our ViewPort Program creates this data

```
FILEDATA-"File Name",1290,710,1520,720  
DATA-"Policy Number",1290,710,1520,720  
TEXT-"Document Type",Premium_Statement/Cancel_Notice  
DATA-"Capture Date",2105,710,2240,720  
TEXT-"Capture Operator",PW  
SYSTEM-Import Date
```

Indexes:

There are several types of indexes available. The one shown below is an Announced Comma Delimited data base format. The first line indicates the field name and there after that are the actual data gathered from the documents. Following are several lines of a typical index file.

```
"File Name","Policy Number","Document Type","Document Date","Capture Operator","Import Date"  
"1001272.TIF","1001272","Premium Statement/Cancel Notice","08/19/04","PW","15/09/2004"  
"1003553.TIF","1003553","Premium Statement/Cancel Notice","08/22/04","PW","15/09/2004"  
"1003572.TIF","1003572","Premium Statement/Cancel Notice","08/19/04","PW","15/09/2004"  
"1008048.TIF","1008048","Premium Statement/Cancel Notice","08/19/04","PW","15/09/2004"  
"1008073.TIF","1008073","Premium Statement/Cancel Notice","08/19/04","PW","15/09/2004"  
"1015927.TIF","1015927","Premium Statement/Cancel Notice","08/13/04","PW","15/09/2004"
```

We also provide Fixed Width Records and Announced Record where the field name precedes the record entry.



Depending on computer provided and the amount of work required in analyzing each page, HostServe will process from 500 to 3000 pages per minute.

Mostly HostServe works unattended and switches jobs as it reads the input data. HostServe can provide a record of all documents processed and there disposition.

Appendix F – Cost Analysis of Color Burst

Cost analysis. There is a general disagreement on the cost of printing so plug in your printing cost numbers and see what saving you come up with.

Assume a 36000 page job comes in that has ColorPlex ratio of 1 to 3. 9000 color pages and 27000 black and white pages.

Normal Cost

Normal Cost if the document is run through a 30PPM color printer.

Elapsed time is 20 hours

Cost of printing 36000 pages at 0.18 cents per page is **\$6480.00**

Color Burst Cost

ColorBurst Cost a 30PPM color printer and a 100PPM black and white printer.

Elapsed time 5 hours color printing

Elapsed time 4.5 hours black and white printing

Color Printing cost for 9000 pages at 0.18 cents is \$1620.00

Black and White printing cost for 27000 at 0.03 cents is \$ 810.00

Total Cost **\$2430.00**

Difference

Savings in less than 8 hours of printing **\$4050.00**

This saving is accomplished in less than a normal working shift. There is some latency time loss in the system. An hour should be added to the printing time to finish the job.

Appendix G – Commingling Concept

Cost Analysis

If we take an example of a Mail House and go through the steps that are needed to mail a document to a recipient, here is what we can come up with.

Normal Operation

Two Jobs A and B having several documents for multiple recipients is received by the Mail House. The jobs can have duplicate recipients meaning in Job A document X is for Customer John Doe and in Job B document Y is also for Customer John Doe. Document X is a two page document and Document Y is one page document. In the normal operation, Mail House operators will print each job separately and then the printed jobs are going to be manually sorted so that documents going to one customer are stacked together. This process is repeated for each job. Once the sorting is done then each job is sent to the inserter which puts the jobs into envelopes. The end result is John Doe is going to receive two envelopes, one each for document X and Y.

HostServe implementation

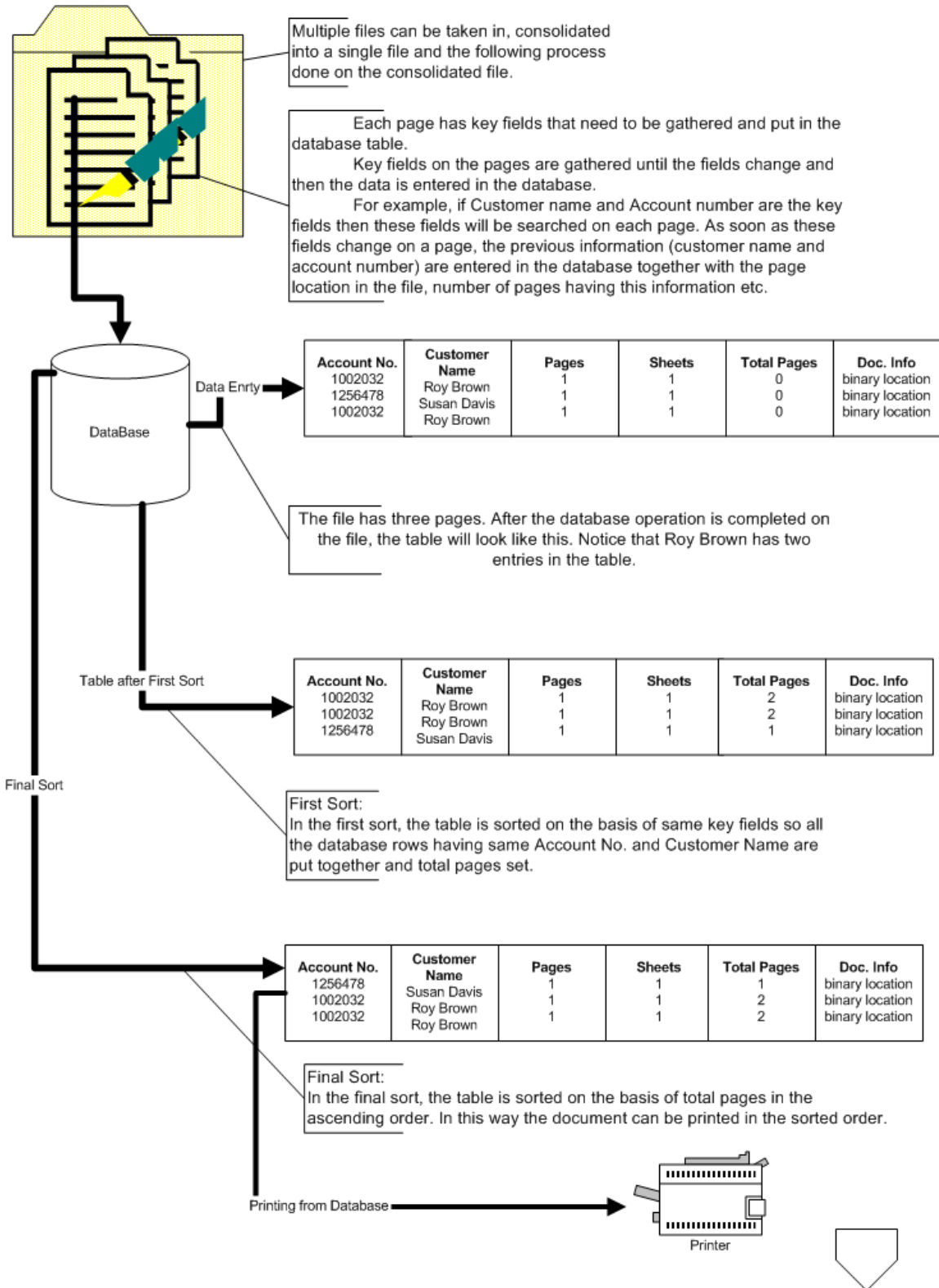
Two Jobs A and B having several documents for multiple recipients is received by the Mail House. The jobs can have duplicate recipients meaning in Job A document X is for Customer John Doe and in Job B document Y is also for Customer John Doe. Document X is a two page document and Document Y is one page document. Jobs are sent to HostServe for processing. HostServe will consolidate both jobs into one before processing. HostServe will look for the key fields on each page, for example, Account No., Customer Name and Company Name. A database entry is generated for each document of the consolidated job. The database is then sorted so that all the documents belonging to one customer are placed together. This would mean that John Doe documents will have consecutive entries in the database. Moreover an additional sorting is done so that all the recipients getting a one page document are first in the database then two pager recipients then three pager and so on. Once the sorting is done, HostServe will print the job from the database. The resulting print job is already sorted and is ready to be sent to the inserter. The end result is John Doe is going to receive only one envelope for both document X and Y. HostServe has the ability to print the jobs in telescoping mode meaning half of the job is printed on the left side of 11x17 paper and the other half is printed on right side. Since the job is already sorted so the 11x17 printed stack can be cut in half and left side put on top of the right side. The stack is now ready for the inserter machine.

Cost Saving

- No manual labor required (for sorting or for stuffing envelopes).
- Since the documents are presorted by the number of pages there is cost savings in terms of postage.
- Printer clicks are halved as the job is printed in the telescoping mode.

Features

- Key fields can be anywhere on the page. More than one field can be keyed on for entering in the database.
- The database can be exported for Mail Address Certification and after sorting can be re-imported.
- The table can be sorted in any manner and then printed in the final order. Processing and database creation is controlled by commands in the JIL.
- Multiple documents can be entered in the database and then printed in a final order as a single document.
- Multiple print sets can be generated to facilitate Insertion, Media or Management requirements.

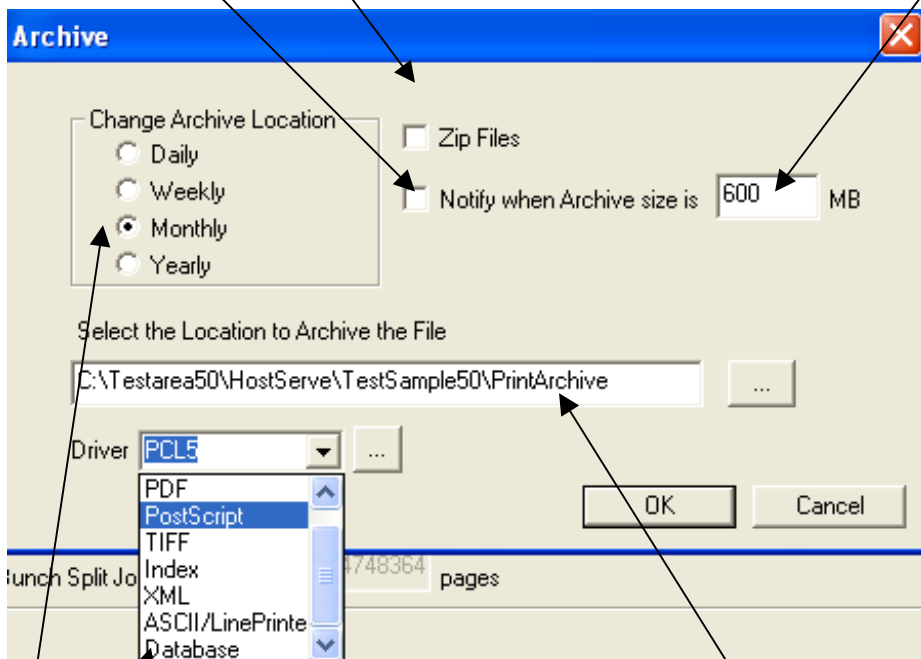


Appendix H – Archive Output

Output Options

Zip Files: HostServe has the capability to zip the archive files before they are sent to the archive location. For example, if a customer wants to print a file in PDF to the archive location, he has the option to get a zipped PDF file in his Archive location. HostServe will zip each file before it is output to the Archive location.

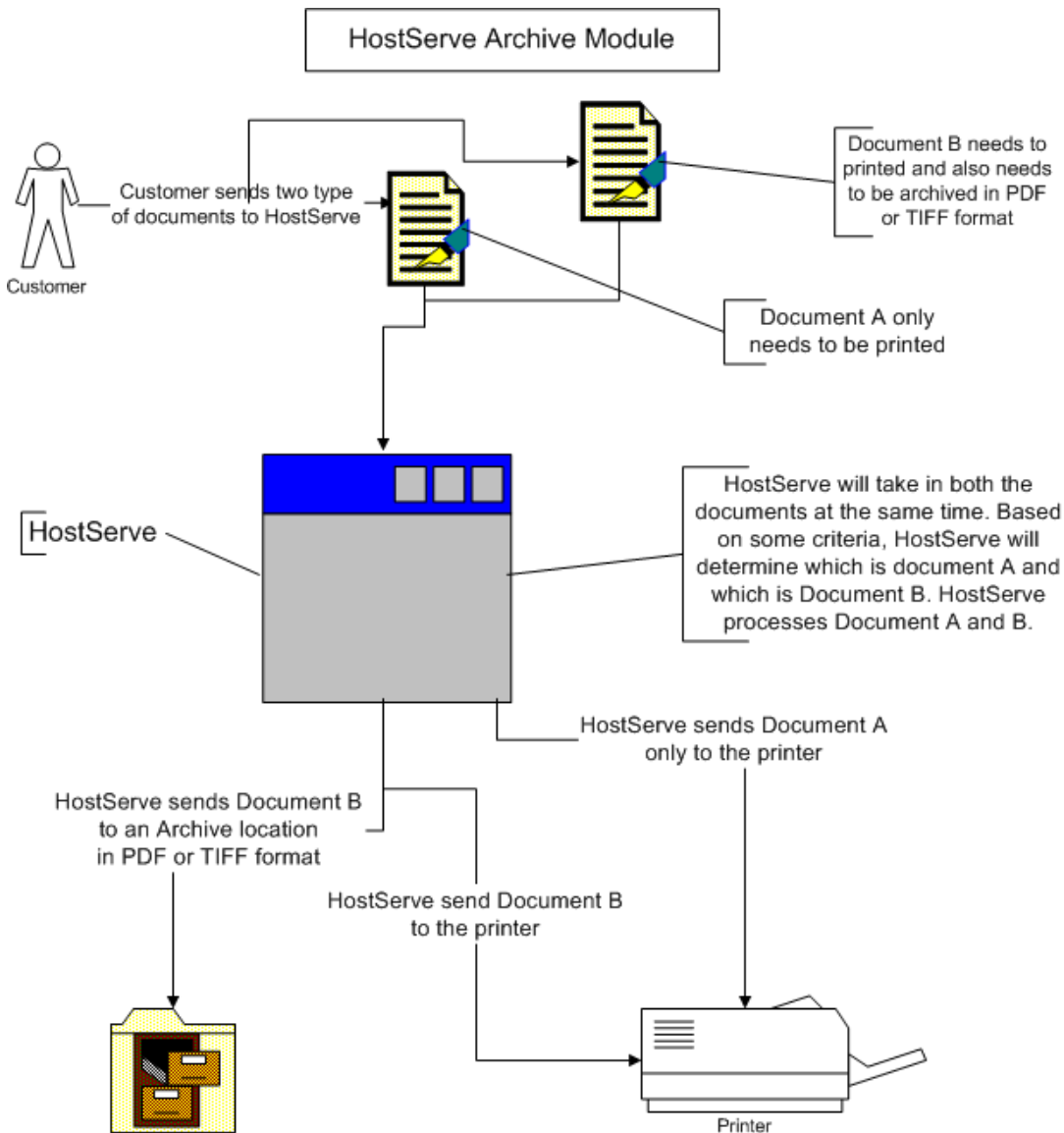
Notify Size: This option will tell the user if the Archive directory has reached the set limit. In this case, if “C:\Testarea50\HostServe\TestSample50\PrintArchive” directory size is over the 600MB limit then HostServe will give a message to the customer asking him if he wants to change the Archive Location.



Change archive Location: This is a message for the customer to see if he wants to change the archive location. If the Monthly option is set, this means that HostServe will produce a message asking the customer if he wants to change the Archive Location. Similarly, if the Daily option is set, HostServe will produce a message everyday. Weekly options and yearly options can also be set.

Output Driver Types: The Customer has the option to set the driver type for the files that are going to be sent to the Archive location. He can choose from any of the driver types and HostServe will print the files in that format to the Archive location. For example, if a customer has a PCL file then he can archive the PCL

file after it gets processed in PostScript, PDF, TIFF, or Line Printer formats. PDF and TIFF are the most popular Archive formats.



Customer problem:
 Customer has two types of Documents A and B. Customer only wants to print Document A to the printer. Customer wants Document B to be printed to the printer plus wants to Archive Document B in TIFF or PDF format.

Solution:
 Customer uses HostServe to print and Archive the documents. HostServe uses its Multi-Channeling capability to output the files through more than one channel. For example, in this case, Printer and Archive are the two channels. HostServe will process Document B only once and output it to the Archive location and to the printer at the same time. Document A will only be sent to the printer. There will be some trigger in the file that will tell HostServe which type of Document it is (A or B).

Appendix I - HTML Output and Specifications

There are several HTML Output options.

Simple PCL, PostScript, PDF, Line Printer, to HTML

This output is for line printer output that is intended for displaying line printer output on the web and can be used for disabled users. This is ideal for mainframe reports. This output produces the simplest type of HTML page and disregards complex formatting. If the input is already formatted for printing, the APWI line printer option can often* restore it to a line printer format.

This output provides fixed width output to most web browsers. The Web Details such as file naming and navigation scheme are detailed below.

Complex

Complex is a WYSIWIG rendered HTML. These outputs are very acceptable for PCL, PostScript, PDF, Line Printer, DJDE, XES, AFP, and IPDS outputs. The specialty fonts have been mapped into the fonts most browsers have and other signatures, and logos are provided as graphics. The file naming and navigation scheme are detailed below.

Database for Complex Operation

Database operation can be added to this model so that documents can be sorted. This provides the capability to sort documents so policies numbers, can be placed in numerical order and documents with the same policy numbers can be grouped together. An external index of the documents can be provided. This option requires the database module and typically requires some service support.

Document Generation

This document can be a database generated report of variable forms, paragraphs, data driven graphics, data driven pictures, and data that is converted to HTML. The data driven graphics provide up to 23 different types of graphics, in either 2D or 3D.

File Naming

The documents title without any spaces is used as the HTML file name (DocumentName.html).

Navigation

If the job file contains more than one document a navigation pane is put on the left side of the HTML output. The navigation pane has the entries of all the pages that are present in that HTML document. The navigation entries on the left side will be specified as page1, page 2, page 3 and so on.

Appendix J - Log Specifications

Accounting Log specification

All Accounting logs conform to this specification.

Completed
Time
Product
Path Name
Printer Destination
Source File Name
Source File Type
Source File Size
Destination File Name
Destination File Type
Destination File Size
Copies
Duplex
Page Size
Color
CRLF

The entries are comma delimited. The termination is Carriage Return followed by Line Feed.

Example

Completed, HostServe, 10/02/2005 11:09:05, Printer1, Invoice.prn, PCL,16667, Invoice.PDF, PDF, 2400, 5, No, Letter, No

Print Log Specification

All Print Logs conform to this specification.

JobName
Start Date Time
Section X of Y Pages
Images
Destination
Total Images
End Date Time

Example

**Job Start JobName: 0e56806d Started at: 10/02/2005 11:08:42
Section 1 of 1 Pages and 2 Images to Printer File in C:\Program Files\HOSTServe\PrintFiles
named "INPUTFILE".PS
Job Completed: Total Images 2 at 10/02/2005 11:09:05

Appendix K – Resource Explanation

General

HostServe, HostServe Engines, and ComposerHS have the following Resource capabilities.

- Font, Forms, and Images are interchangeable from Emulator to Emulator.
- HostServe can have separate resource directories for each queue or virtual printer path.
- HostServe can have a secure directory for each queue or virtual printer path.
- When Form resources are imported an FSL is generated. An FSL is a written set of commands that will recreate the form. These files can be edited and recompiled by HostServe to create a modified form.

Resources

Resources are classified by their file extensions and by the first few data bytes. The extensions are:

Xerox Resources

DJDE Resources

DJDE FSL Form	FSL
DJDE JSL	JSL
DJDE JDL	JDL, XJT
DJDE PDE	PDE
DJDE PDS	PDS
DJDE CME	CME
DJDE CMS	CMS
DJDE Font	FNT, F97, L97
DJDE LGO	LGO
DJDE Form	FRM, F9M
DJDE IMG	IMG

XEROX VIPP™ Resources

XEROX VIPP™ Forms	,XGF, FRM, VFR
XEROX VIPP™ JDT	JDT
XEROX VIPP™ XDT	XDT
XEROX VIPP™ DBM	DBM
XEROX VIPP™ Fonts	PS Type 1, Type 3

XES Resource

XES fonts	FNT, XFN, XFL, X2X, X2L, X37, X2P, F27, USX;
XESF Forms	FRM, XES

4235 back up resources

MRCF Fonts	FNT, MFN
MRCF Forms	FRM, MFR
MRCF Image	IMG, MIM

3700 back up resources

STND Fonts	FNT, SFN
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Network Resource

Pcl5 Resources

PCL Bitmap Fonts	FNT, SFP, SFL, HPP, HPL, P, L
PCL Forms	PRN, PFM

PostScript Resources

PostScript Fonts	PS Type 1, Type 3
PostScript Forms	.PS
TIFF	
Forms	TIF, TIFF, TIFFRM
Graphics	TIF, GRF, TIFGRF

Windows Resource

TrueType Fonts	.TTF
BMP Graphics	.BMP
EMF Forms	.EMF
WMF Forms	.WMF

APWI Resources

Forms	MAC, SFP
Forms	MLT

IBM Resources are covered in the AFP White Paper