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With the proliferation of PCs and the growing demand for access to the Internet for pleasure, education, research and commerce, communities and students are turning, in growing numbers, to libraries, schools and universities to provide Internet access, and with it, print services.

VendPrint software, a series of products from VendPrint, Inc., was developed to address the specific needs of organizations that offer open access to network printers. VendPrint's focus is the management, control, and recovery of the cost of documents and information printed on network printers. The following typically provide such services to their patrons and students:

- Libraries, public and university
- University Computer Labs
- K12 School districts.

VendPrint provides solutions to all of the above listed environments. The VendPrint product family is feature rich and very easy to implement and use. Organizations will begin to recover the costs of investing in VendPrint software, the very first day it is installed. Once VendPrint software is installed, all network based printing costs are controlled and tracked in detail, allowing for charges to be imposed on an exact per page basis. In addition, VendPrint has added "Print Savant" for organizations, who unlike Libraries, schools and universities, may not want to directly charge for printing, but do have the need to allocate costs to users and/or departments for monitoring and charge back purposes.

When VendPrint is implemented in your environment, no jobs will be printed without payment and/or a record of the job. This eliminates waste due to mistakes and/or abuse as well as indiscriminate printing. Furthermore, with the ability to charge for network printing, it allows you to offer better quality print choices to your patrons/students, including high end color printing as well as enhanced paper choices, et al. Gone forever is the problem of unwanted and/or unclaimed prints as well. VendPrint can, in many environments, be cost justified just on the strength and cost effectiveness of reduced waste and the elimination of unwanted prints, even prior to implementing the cost recovery and charge back capabilities of VendPrint.

VendPrint software adjusts to your environment. During installation, your existing network printers and/or connected digital copiers (devices) are described to VendPrint. Pricing is established for each device and pricing can vary for each device based on the device's capabilities. For example, charges can be established based on the paper quality and size chosen for the document being printed, as well as based on whether the selected output device is 1.) a black and white laser printer, 2.) a color inkjet printer, or 3.) a color laser printer or 4.) a connected digital copier.

VendPrint is very non-intrusive software and does not require any special client software to be installed. VendPrint supports printers from all of the popular printer and/or connected copier manufacturers by working with the printers' or copiers' native print drivers, whether they are Windows, Mac or Unix drivers.

VendPrint works ingeniously by managing jobs after they have been sent to a print queue. VendPrint software constantly monitors the print queue to which files are spooled, and automatically gathers information about every job that is spooled, as the jobs arrive at the queue. The only requirement VendPrint software imposes on its customers is that the queue(s) VendPrint manages reside on a Windows 2000 or XP Pro workstation or a Windows 2000 or 2003 (server or workstation) system. Built on the Windows' native queuing capabilities (Figure 1), VendPrint doesn't even require any special software to be installed on the queue's host computer(s). VendPrint software runs as a Windows application and can be run on the queue's host computer or any Windows 2000 or XP Pro workstation with access, via a network connection, to the

host computer's queue(s). VendPrint software is installed only on systems, called "release stations" that will be used to manage and control the desired queues. No Windows Registry entries are made during the VendPrint installation. VendPrint is very easy to install and can be relocated with ease, offering unparalleled flexibility when implementing VendPrint.

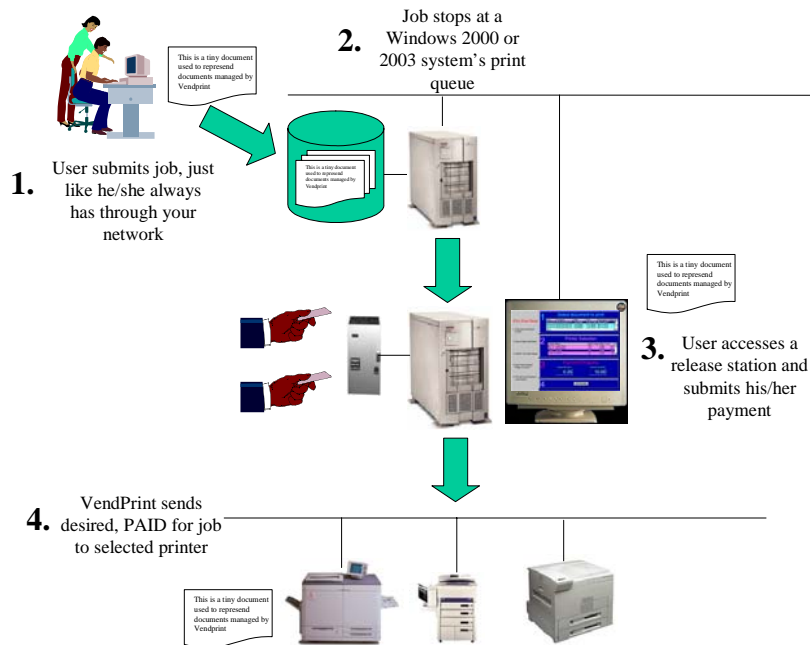


Figure 1 – VendPrint Architecture & Flow

VendPrint passively analyzes each job in the queue and determines the type of job, i.e., PostScript or PCL, as well as the following details:

1. When the job was sent (date and time)
2. Who (user name) the sender of the job was
3. Where (computer name) the document originated
4. The name of the document printed
5. The number of pages in the job (counted by VendPrint for guaranteed accuracy)
6. The page size of the job

VendPrint holds jobs in the queue until they are paid for or cancelled. If desired in your environment, depending on your installation options, VendPrint can insure that no job is ever released until the job is paid for by the user. Payment options include quotas, debit cards, cash, account billing against a prepaid running balance, and/or account billing by statements.

When VendPrint is implemented in an environment, users continue to print as they always have prior to the installation of VendPrint. After they print one or more jobs, users are directed to the VendPrint pop up (Figure 2) or release station (Figure 3) to pay for the job(s) they wish to print. The VendPrint release station screen features a very simple to use and follow user interface. The screen details the steps each user must take to select their job(s), select the desired output printer, submit the appropriate payment then release their job(s). Only after payment is made, does the job actually print. Printed jobs are deleted based on your choice as follows:

1. Delete immediately after print
2. Delete after a system defined retention period for printed files

If for any reason, the patron or student does not print his/her job(s), the unclaimed job (s), will be automatically removed from the queue based on the passage of a non-printed file retention period you define (defined in minutes up to 99,999).

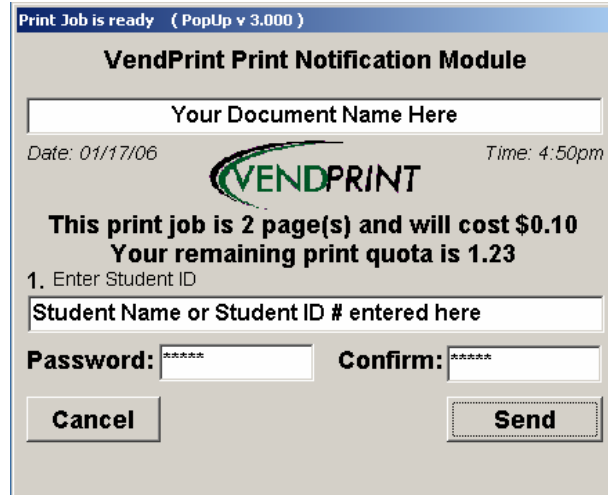


Figure 2 – VendPrint Optional Client Pop Up

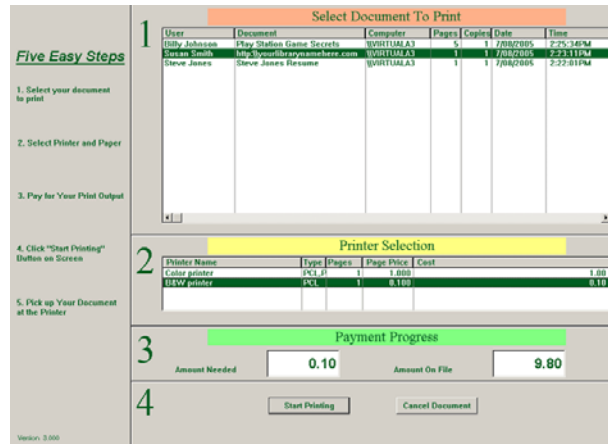


Figure 3 – VendPrint Release Station Screen

All VendPrint products are sold either by the release/override station or with a site license. The site license provides for an unlimited number of managed devices and/or release stations. When purchasing any VendPrint product, Print Savant (see item IV, below, for a description) is included with your site license. Additionally, VendPrint comes with a 60 day money back guarantee. If for any reason, VendPrint does not meet your requirements or expectations, you can return for a full refund. Annual support is available for 20% of the purchase price.

The following sections describe the different VendPrint products along with an overview of a typical installation. VendPrint’s software products are segmented as follows:

VendPrint Lite

Targeted at small libraries and colleges that need to manage and control their printing costs as well as recover those costs, VendPrint Lite is a low cost entry level product. VendPrint Lite provides customers with a solution that enables them to monitor and charge for their patrons/students printing. VendPrint Lite is a Windows based application that can be used to manage and control print queue(s) on a Windows 2000,

XP Pro or Server 2000 and 2003 based computer system. Like VendPrint Standard, VendPrint Lite intercepts the print jobs that are submitted by clients connected together through a LAN/WAN connection. Each user's print job is spooled (spooling is inherent to all Windows, Mac and Unix clients, thus no client software is required) to a designated queue. Thereafter the user, by accessing a VendPrint Release Station, can select his/her job to be printed and indicate to which printer the job will be printed. VendPrint Lite will calculate the cost of the job, allowing payment to be collected by your staff. The result is still significant savings and waste reduction, as well as total cost recovery. As with all VendPrint products, a detailed log file is written reflecting all jobs that have been printed.

VendPrint Professional

Targeted at libraries, colleges and universities that need to manage, control and automatically recover their printing costs. VendPrint Professional provides customers with a solution that enables them to monitor and automatically (through attendantless pay stations) charge for their patrons/students printing. VendPrint Professional is a Windows based application that can be used to manage and control print queue(s) on a Windows 2000, XP Pro or Server 2000 and 2003 based computer system. VendPrint intercepts the print jobs that are submitted by clients connected together through a LAN/WAN connection. Each user's print job is spooled (spooling is inherent to all Windows, Mac and Unix clients, thus no client software is required) to a designated queue. Thereafter the user, by accessing a VendPrint Release Station, can select his/her job to be printed and indicate to which printer the job will be printed. VendPrint Professional will calculate the cost of the job, allowing payment to be automatically collected by a number of means without intervention by an attendant. Payment means can include quotas, debit cards, cash, account billing against a prepaid running balance, and/or account billing by statements.

As with all VendPrint products, a detailed log file is written reflecting all jobs that have been printed.

Three popular methods to control print in K-12 education environments

Configuration option #1-Print Savant

Print Savant is targeted at organizations that have a need to manage and control their printing costs, but do not need or wish to provide a mechanism to pay for jobs prior to their printing. Print Savant automatically monitors and controls print queues on a Windows XP, 2000 or 2003 operating system. Jobs submitted to the identified queues will be costed and the information about the job written to a log file, prior to their automatic release. The result is a file that details all of the jobs printed, identifies who printed the job, the document name of the job printed, the number of pages and paper stock selection, and the cost of the job as printed. This log file can be used for analysis and or charge back purposes.

Print Savant works with any network connected PostScript or PCL printer that has line of sight to the network. Print Savant's log file can be manipulated to display the information in a number of predefined reports such as:

1. Jobs printed by printer
2. Jobs printed by sender
3. Jobs printed by department
4. Jobs printed by account number

Print Savant can reside on any PC throughout your network, and does not require a dedicated PC. Minimum requirements for Print Savant should be Pentium II 500Mhz Processor, 128MB System RAM, 9GB disk drive, CD-ROM and floppy disk drives, 10/100MB Ethernet network connection. The software can also reside on any existing Windows based server.

Configuration option #2-K-12 VendPrint

K-12 VendPrint allows administrators to create a database of users/students with a preset balance which can be used to automatically pay for print jobs. Jobs sent to a network print queue by a user/student are examined and the cost of the job is calculated based on administrator defined pricing. The senders' username is then used to lookup an account balance on file in the K12 VendPrint users/student database. If the user has a sufficient balance to pay for the print job, the job will automatically be released to the actual

printer. If not the job will be held until released by an administrator or the sender can optionally be allowed to print into a negative balance. Additionally, K12 VendPrint allows for the implementation of release stations with vending units allowing the users/students to use cash and/or debit cards to pay for jobs when they have no balance left, or add to their balance via cash and/or debit cards.

Configuration option #3-K-12 Print Monitor

K-12 Print Monitor insures that all jobs that have been printed to network attached printers have been released for print by a person who has been given the role of monitoring and printing jobs that are appropriate and necessary, as well as collecting funds when appropriate. K-12 Print Monitor intercepts the print jobs that are submitted by students connected together through a LAN/WAN connection. Each student's print job is spooled to a designated print queue. The student will be notified how many pages are in the job, and if appropriate, how much they will be charged. Students will also be given the choice to rename their print job for easier identification. Thereafter a designated monitor, by accessing a VendPrint Release Station, can select a student's job to be printed and indicate to which printer the job will be printed. The result is an environment where only appropriate and non-wasteful print jobs are printed by the students, and all jobs are tracked for cost analysis and review as needed.

VendPrint Installation - Requirements & Specifications

VendPrint is easy to install and easy to use. VendPrint is a Windows application written to run on any supported Windows platform from Windows 2000 and up. VendPrint consists of an executable file, a series of DLLs and 3 control files, a.k.a. INI files, that control the way VendPrint operates. The following lists the required files for VendPrint to operate:

FileName	Description	Install Location
VP.EXE	VendPrint main program	VendPrint directory – typically C:\VENDPRINT
PCLSPL32.EXE	Windows 32 bit spooler	VendPrint directory – typically C:\VENDPRINT
C4ASCX.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
C4DOSX.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
C4RUNX.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
C4TPSX.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
CLALIT32.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
PCLTWRAP.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
PCLXL32.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
PTC32.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
PTV32.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
SFPFF132.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
SFS44132.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
SFTFF132.DLL	DLL used by VendPrint	VendPrint directory – typically C:\VENDPRINT
VP.GIF	VendPrint Logo	VendPrint directory – typically C:\VENDPRINT
VP.ICO		
IMPORTFORMAT.TXT	Import control file	VendPrint directory – typically C:\VENDPRINT
PTC32.INI	INI file needed for PCL processing	VendPrint directory – typically C:\VENDPRINT
RUNCODE.INI	INI file needed for PCL processing	VendPrint directory – typically C:\VENDPRINT
VP.INI	VendPrint main INI file used to configure VendPrint and how it operates	Must be in the WINDOWS directory of the PC where VendPrint is installed, e.g., C:\WINDOWS or C:\WINNT

The VendPrint installation consists of copying the files from the distribution CD to the appropriate directories of the release station (remember VendPrint only runs on release station(s) and therefore is only installed on the release station(s)) usually C:\VENDPRINT, and the release station's windows directory, typically C:\WINDOWS or C:\WINNT. VP.INI is the only file that needs to be installed in the WINDOWS directory, all other files should be installed in the VendPrint directory of choice (typically C:\VENDPRINT). Once the files are copied, the next step is to describe the queue(s) that VendPrint will manage, to VendPrint through entries in the VP.INI file. The VP.INI file is an ASCII file that consists of several sections. The main sections are as follows:

1. Directory locations - Defines where the program is installed and where the SPOOL directory is
2. Input Printers - Defines the name of printers/queues to be managed by VendPrint
3. Output Printers – Defines the name of each output printer and the printer's configuration
4. Other – General VendPrint program controls

Each section consists of keywords and their corresponding values. The configuration of VendPrint and how it performs in your environment is entirely regulated through the VP.INI file, and the values chosen for each keyword therein.

VendPrint allows for the definition of multiple input queues/printers, however, in many environments, a single input queue is sufficient. The input queue is used as a holding area for print jobs. VendPrint can support both PostScript and PCL printers through the same input queue/printer, regardless of which printer driver is used to define the printer on the host computer. It is required that in all cases, the input queues/printers be configured for RAW file spooling.

The choice of printer driver for the input queue/printer on the queue's host computer is only significant if the driver will be downloaded to workstations during normal workstation configuration and setup. The only exception is in environments supporting Macintosh computers. When Macintosh computers are part of the supported mix of workstations, the input queue/printer's print driver must be a suitable PostScript print driver, which enables Macintosh computers to query the printer via the PAP (the Apple Printer Application Protocol).

Output queues/printers are defined based on the number of supported devices that will be controlled by VendPrint. VendPrint, as mentioned, runs only on release station(s). The user that is authenticated as logged in on the release station does need rights to access both the spool file directory where the host computer stores the queued files and the output queues/printers. If the host computer will be used as a release station, one of the directory paths would be specified in the VP.INI file as the SPOOL1 directory location. In the following example, the release station is not also the queues/printers host computer, so the SPOOL1 directory location is the path mapped to the share name of the C:\WINNT\SYSTEM32\SPOOL directory on the queue/printer's host system. Therefore, the SPOOL1 entry in the VP.INI file, points to the appropriate spool directory as F:\PRINTERS\. Please note, that if the queue that VendPrint will manage is on a different system than the release station, the appropriate spool directory must be shared with create, add and delete rights. Additionally, those same rights must be given to the username that will be logged in at the release station. Don't forget to give the release station user access to the appropriate Windows 2000 or 2003 spool directory as well, since share name permissions do not automatically grant directory level permissions.

The input queue/printer is typically shared allowing everyone rights to print to it. Once defined, the input queue is shared and the workstations (whether Windows PCs, Macs or Unix workstations) are directed to print/spool to the input queue. All managed jobs are sent to the input queue. The input queue is paused since it is used only to receive jobs. VendPrint examines the content of the input queue and selects files that are, as defined in the VP.INI to be managed by VendPrint. VendPrint opens all spooled files to count the pages in the document, but never alters the content of the spooled files.

Output printers can reside anywhere on the network. Typically, the rights to the output devices should be restricted to only the release station username(s) mentioned above. By restricting the rights to the actual output printer(s), users are not able to circumvent the VendPrint input queue and release station. The output printers need to be defined on a Windows XP, 2000 or 2003 system to enable VendPrint to use the Windows based API to spool the job to the destination printer. The destination of each printer is a share

name defined in the VP.INI for each printer. Bear in mind that multiple printer definitions can be sent to the same share name when a printer can accept several Page Composition Languages such as both PostScript and PCL if desired. The output printers can be defined on each release station if appropriate, or only on a central Windows system(s) if Windows XP, 2000 or 2003 operating system(s) is/are available to act as a print server(s). The final printer destination can be any type of network connected printer, including but not limited to Windows XP, 2000 or 2003 operating system, Novell servers, JetDirect servers and/or Unix servers that are sharing printers.

In the VP.INI file, where each output printer is defined to VendPrint, you can specify prices by printer by paper stock and size. For example, you can charge a different amount for black and white laser printing on 8.5x11 paper, than for black and white laser printing on 11x17 paper. Similarly, pricing can vary based on the output printer as well, allowing you to charge appropriately for each printer type as well as the paper stock and page size of the job being sent. Additionally, VendPrint allows you, via the VP.INI file, to specify price breaks based on the number of pages (see sample VP.INI file). You can also specify the number of free pages per job by printer, e.g., you can allow 5 free black and white pages for a black and white laser printer, but 0 free pages for a color laser printer. Also, on a printer by printer basis, you can limit how many pages may be spooled to a specific printer. For example, you can limit a job to 10 pages or less for a slow inkjet printer, 150 pages or less for a mid-volume laser printer, and unlimited pages for a production printer. In any event, jobs that are too many pages, cannot be spooled to a printer that, based on the page limit defined in the VP.INI file, cannot accommodate the job.

Bear in mind that paper definitions are significant in VendPrint controlled environments. If a printer is configured in the VP.INI file as having 8.5x11 and 8.5x14 paper only, it will not be eligible to print jobs calling for 11x17 paper, even if the printer is physically capable of printing on 11x17. In order for a job to be sent to a printer, the destination printer as defined in the VP.INI file, must have a paper tray defined for the called for size in the VP.INI file.

VendPrint, depending your environment and needs, supports four payment options:

- Manual via attended release station
- Automatic via cash/coin and/or debit card reader
- File based with preloaded balance (Quotas)
- File based with running balance for bill back

The *manual payment option via attended* release station, allows you to configure VendPrint (this is the only option for VendPrint Lite) to manage printed jobs in a setting that requires the patron/student to approach a reference desk with an attendant to pay for their job. There is no cash or debit card unit needed, the attendant runs VendPrint on a workstation acting as a release station. As directed by the patron/student, the attendant selects the desired print job(s), indicates the target printer, collects the payment (the amount is tallied automatically by VendPrint) and then manually releases the job(s). This option is ideal for lower volume areas such as smaller libraries, satellite branches or small computer labs. A log file is written, tracking each job and payment made for later review and/or analysis.

The *automatic payment option via cash and/or debit card reader*, allows for the deployment of one or more unattended release stations with a payment tending device attached to each release station. The payment tending device can be any number of cash only, cash and debit card reader or debit card reader only devices, from a variety of manufacturers. In this setting, patrons/students, after printing one or more jobs, approach the VendPrint release station where they themselves can select their job, the desired destination printer and submit their payment, without an attendant being present. The job is released to the printer only after payment has been made. A log file is written, tracking each job and payment made for later review and/or analysis.

Note that when file based processing is chosen, VendPrint includes a series of files for username authentication named USER.DAT and DEPARTME.DAT. To begin using VendPrint the presence of the files is not required, since, if they are not present upon first use, VendPrint will automatically create them with a default administrative user. Thereafter, user and department records can be added manually, or through an import routine. In certain environments, based on the AllowUserEntry keyword setting, users can log into VendPrint, and if they are not in the USER.DAT file, add themselves. There is also an import

utility that allows imports of user information from other systems. VendPrint's import utility is designed to import tab delimited ASCII files (text organized in set columns). Additionally, VendPrint can be customized to interface with real time databases, based on your environment.

The *file based with preloaded balance payment option*, is intended for environments where users are authenticated before they access communal PCs. Since users are authenticated, their unique user names flow to VendPrint when they print their jobs. Having unique user names enables VendPrint to display jobs sorted by user name or display jobs for only the logged in user (if VendPrint user login is enabled). In such settings, the school or library, at its discretion, assigns a preset balance to each user for their consumption through the course of the semester and/or year. Balances can be replenished, as needed by an administrator, at any release station. For start up purposes, VendPrint features an easy to use import facility that enables the importing of patron/student information and the global setting and/or resetting of balances. The user can then select their job(s), and based on a sufficient file credit balance, release their job. VendPrint debits their account (as defined by their user name) and then releases the job to the desired printer. If desired, negative balances are allowed by setting the appropriate flag in the VP.INI file, a sample of which follows. A log file is written, tracking each job and payment made for later review and/or analysis, as well as charge back purposes in the event the AllowNegativeBalance flag in the VP.IN file is enabled.

The *file based with running balance payment option*, functions similarly to the "preloaded balance" payment option, with the primary difference being that the users are not allocated a preset amount. The allow negative flag in the VP.INI file is set to on, and all prints are allowed at the release station as selected by the user. Each job that is printed, as with all VendPrint installs, is recorded in the log file. The log file includes the date and time the job was submitted, the user name of the job submitter, the document name of the printed job, the printer to which the job was printed, the number of pages printed and the cost of the job, amongst other fields. This log file can, therefore, be used for charge back purposes.

Other key options specified in the VP.INI file are as follows:

Figure 4 - Typical VendPrint Install

