CAPELLA TECHNOLOGIES

Megatrack

White Paper

The purpose of this white paper is to describe the technical hurdles involved with monitoring, tracking and ultimately controlling printing costs.

Background

As the business environment becomes more competitive, and profit margins become slimmer, the need for companies to become more efficient and cost-effective has never been more important.

While some business expenses are easy to calculate and control, others can be just as elusive. For instance, the often-overlooked cost associated with printing.

It's important to realize that the cost of printing goes beyond paper, ink and toner consumption. Other contributing factors to this necessary expense include the type of printer being used, wear and tear on the unit, maintenance costs and depreciation—all of which must be considered and added to the cost of each page printed.

Once accurate information has been gathered, end-user waste can be identified and eliminated. In addition, costs can be further defrayed by billing the appropriate department or client for each printed page.

Tracking Print Activity

The following basic steps must be performed in order take control of the printing environment and reign in costs:

- Tracking print activity
- Calculating costs and identifying abuse and/or waste
- Limiting waste and abuse
- Allocating costs

The solution to this dilemma is MegaTrack from Capella Technologies, Inc.

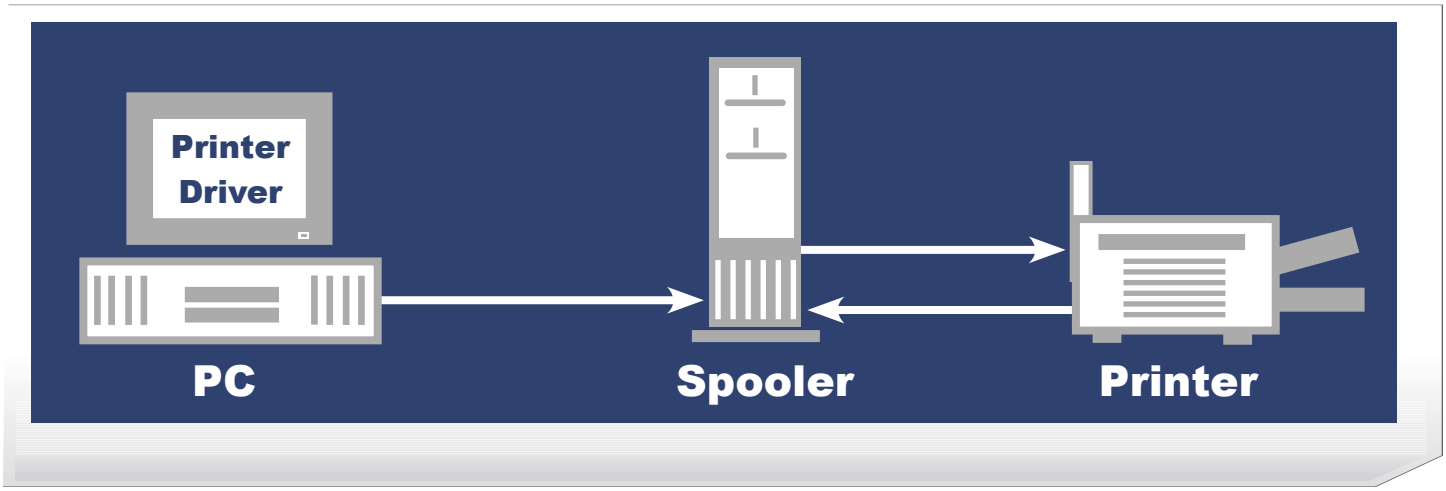
MegaTrack is the ideal way to monitor, allocate and, ultimately, optimize your printing costs. By monitoring local and remote print-servers, MegaTrack provides comprehensive statistical information on printer usage and the cost of printing – data that can be broken down according to the department, cost-center, project or even individual employees and printers. The end result is data that can be used to optimize the cost efficiency of printing.

Data Collection

The first step in this process is establishing a means of observing print activity and then saving the data to a central location. In a typical network environment, data can be collected from a number of different points along the data stream. Before continuing, it might be helpful to first understand how print data in a typical network environment flows.

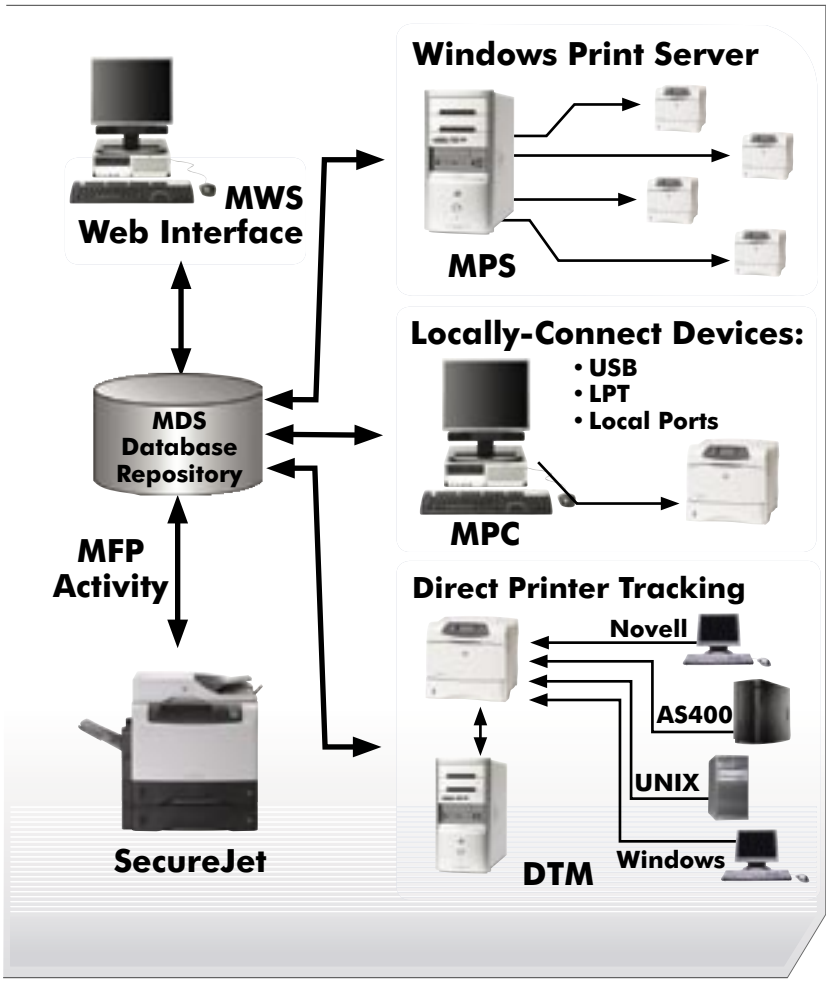
Data Flow

Normally, the print job begins at the end-user's PC. The print driver accepts the request and sends it through a port monitor and then to either a print spooler or directly to the printing device. After the document has printed, the printer sends a message to the spooler to indicate the job has completed and it's removed from the queue.



Although useful information can be gleaned from numerous points in this configuration, the ideal location to collect data is from the spooler. By being part of the print system's spooler, the MegaTrack Printer Server (MPS) is able to gather the maximum possible information regarding users and printers on the network.

The following figure illustrates how data flows within the MegaTrack Print System:



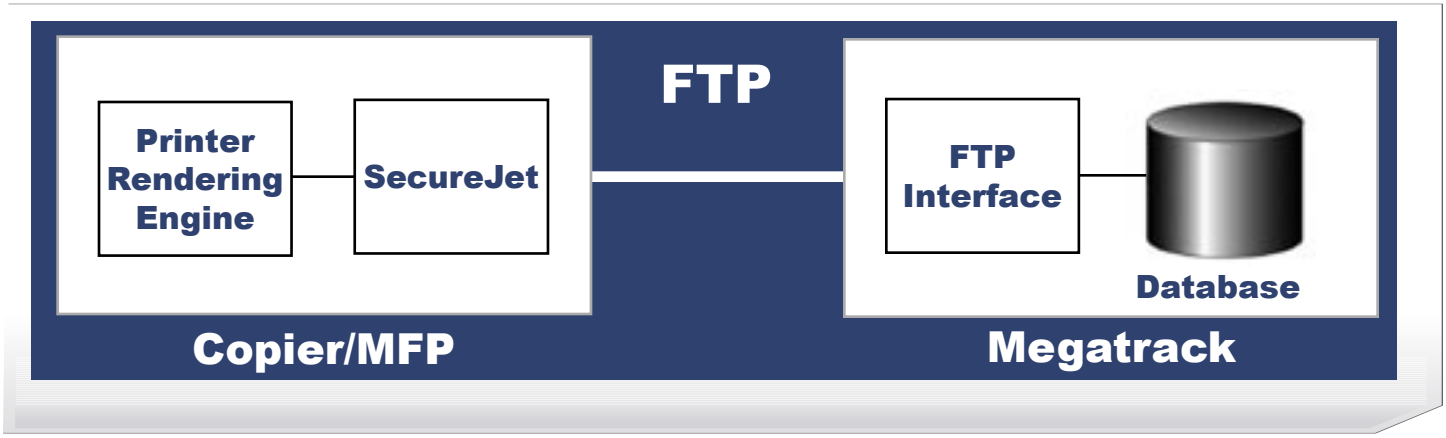
Standard Printers

Within this environment, standard network printers can be easily tracked and information related to their operation (color mode, duplex or simplex, user and workstation name, group, number of pages sent, time sent and ended, job status, media type and size, etc.) can be readily collected.

Copiers and Multi-Function Printers (MFP)

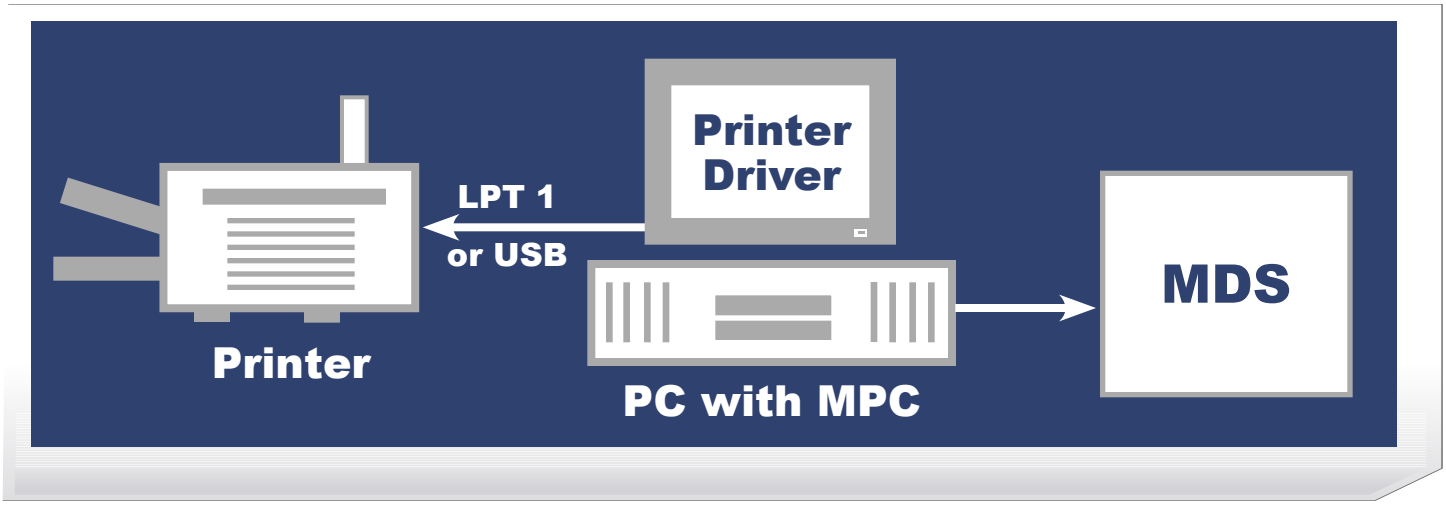
Copiers and Multi-Function Printers (MFP) present a unique challenge when attempting to track usage.

However, SecureJet provides a solution to this dilemma by requiring users to provide some form of identification (access card, PIN or a combination of both) before using the device. The print job and user data then becomes available to MPS. Once SecureJet is installed and properly configured, the following data flow can take place:



Local Printers

Local (non-network) printers can also be elusive, and difficult to track. Fortunately, the MegaTrack Print Client (MPC) can be installed on any Windows system. Whenever a user prints to the local printer, the information is gathered by the MPC and sent to the MDS.



MegaTrack Database Server (MDS)

Once print data has been collected by the MPS, MPC, DTM and/or SecureJet, it's sent to the MegaTrack Database Server and stored. This data can then be queried and evaluated as needed through the MegaTrack Web Server (MWS) by the system administrator or other authorized personnel utilizing a standard web browser.

MegaTrack in Action

The MegaTrack Print System consists of the following basic components:

MPS *(MegaTrack Print Server)*
The MegaTrack Print Server (MPS) software runs on as many local and remote NT print-servers as needed, transparently monitoring any or all printers attached to them. The MPS scans the network for print jobs, parses collected data and then creates a file on the local server that is either retrieved or "pushed" to the MDS module.

MDS *(MegaTrack Database Server)*
This is where all the collected data is stored and processed.

MWS *(MegaTrack Web Server)*
This web-based interface allows system administrators to configure MegaTrack, request queries and impose quotas on either individuals and/or printers.

MPC *(MegaTrack Print Client)*
This module is only required on PCs utilizing local (non-network) printers connected through either LPT1 or USB.

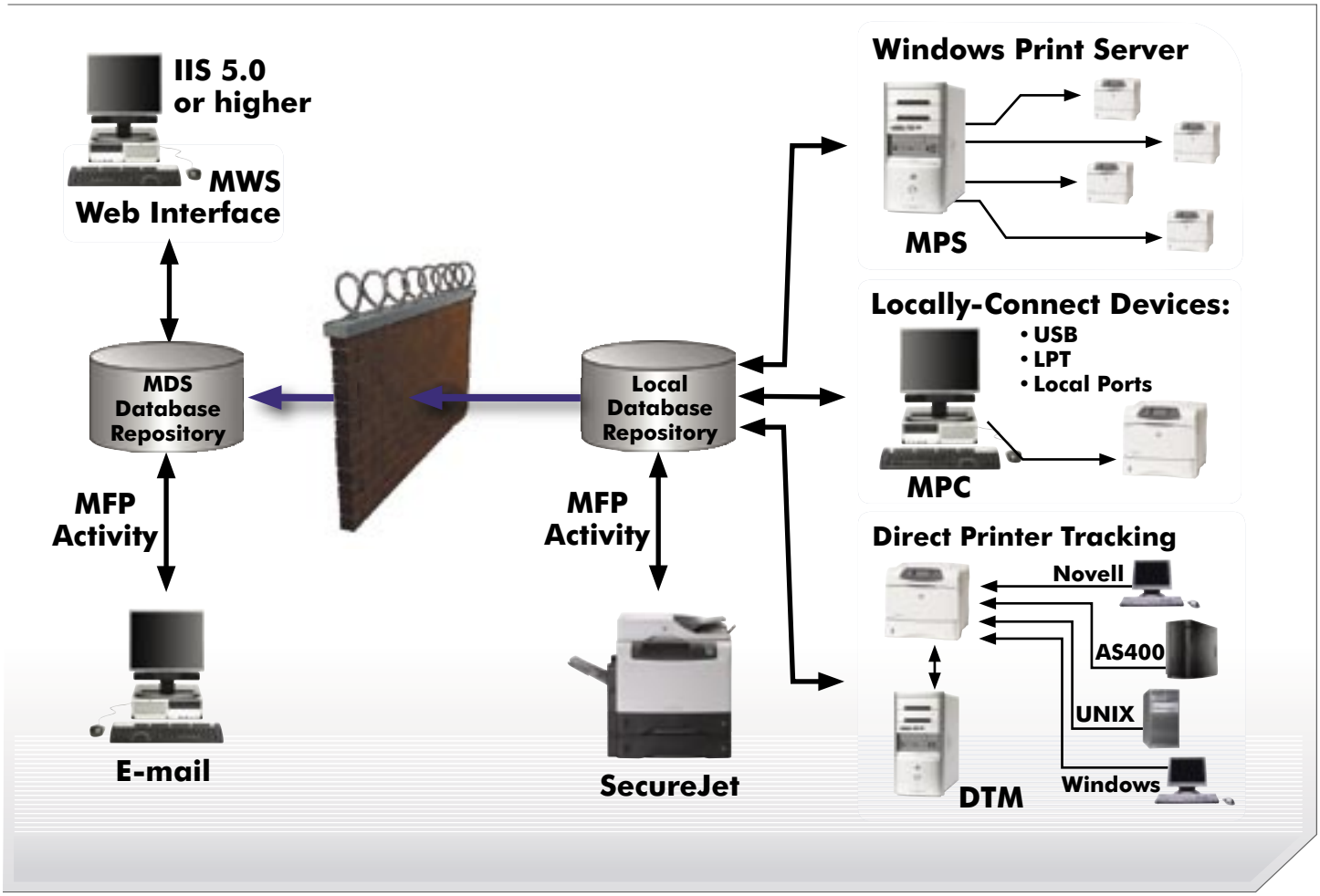
DTM *(Direct Tracking Module)*
This module locates HP devices on the network and retrieves MIB information whenever documents are printed on them.

These modules can be installed on either one or several machines on the network. Once installed, the MPS continuously monitors the network and collects information such as what documents are printed, user's identification, etc.

Push/Pull

MegaTrack is also capable of either "pulling" data over a network, or "pushing" utilizing Basic Network Protocol, FTP or HTTP.

One potential use for this feature would be to push data from a local data store through a company firewall and to an offsite repository, as shown in the figure below.



Tracking Print Usage

Once MegaTrack has collected the pertinent data and stored it, it can be presented in the form of detailed, customized reports that combine text and graphics that illustrate precisely how much your organization spends on printing. This data can also be used to forecast replacement needs for printing devices and consumables.

Calculating Costs

One of MegaTrack's most powerful features is the ability to perform queries and use the results to produce extremely accurate printing cost information and employ enterprise-level print cost control solutions in any organization.

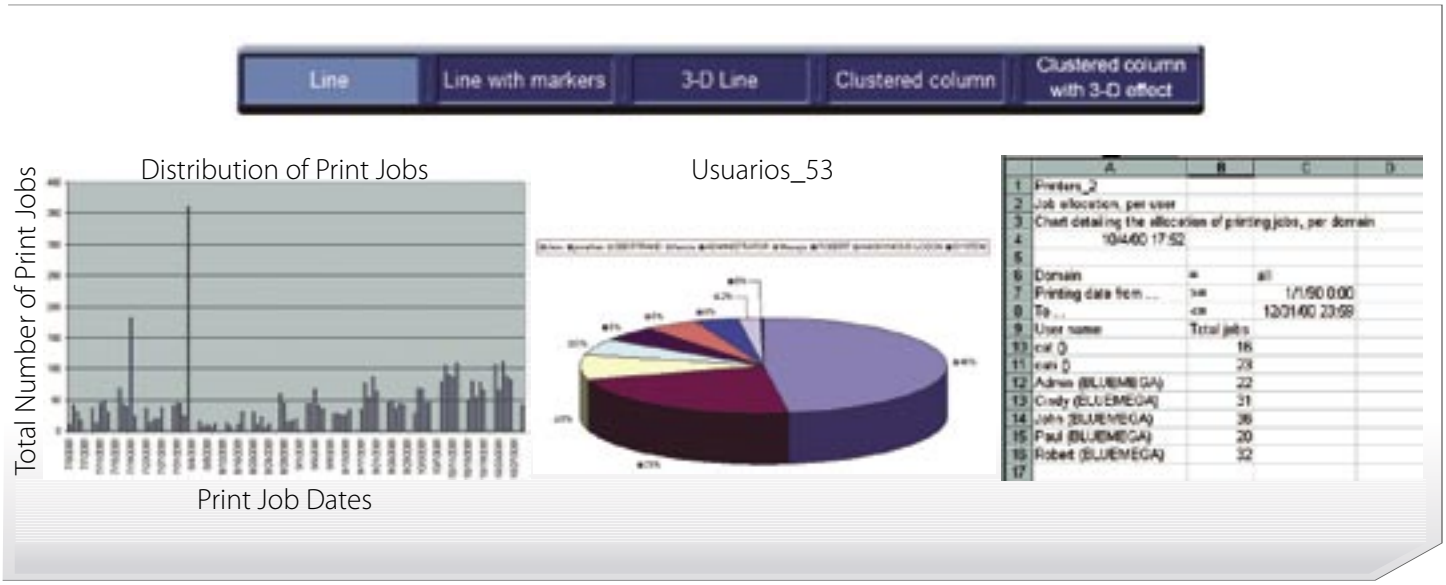
Queries instruct MegaTrack to sort through all the collected printing data and present concise statistical data relating to usage and printing costs. The system administrator normally performs queries, and their results can be displayed either graphically, textual or even output as a spreadsheet. Queries can be launched manually by the administrator at any time, or can be scheduled to be performed automatically on a regular basis.

Whenever a query is launched, the statistics related to that query and its matching parameters (or default parameters), are extracted from the MegaTrack Database Server and the information is then provided to the MegaTrack administrator or user in a specified format. The level of detail obtained from the query depends on the printers managed by MegaTrack, and particularly on the printer model (accessories, etc.), its sophistication level, and the communication language (PCL 5, 5e, 6…).

Query Results

Once queries have completed, the results can be displayed in a number of different ways.

Query results can be displayed in a number of methods which can be quickly and dynamically changed as needed. Data can appear as a standard graph, 3D pie charts and even be exported as an Excel spreadsheet.



Query results can then be used to pinpoint waste, identify abuse or to forecast maintenance requirements or consumable (paper, toner, ink) replacement.

Limiting Waste and Abuse

Once accurate printing costs have been determined and waste has been identified, MegaTrack's Quota Module can be used to ensure users don't exceed an established level of printing.

This optional feature allows the administrator to set restrictions on how much each user is permitted to print on each printer. A customizable warning message automatically notifies the user when they approach their quota limit. Once a user has exceeded their limit, any additional print jobs are automatically deleted. Quotas can be automatically renewed after a specified time period has elapsed.

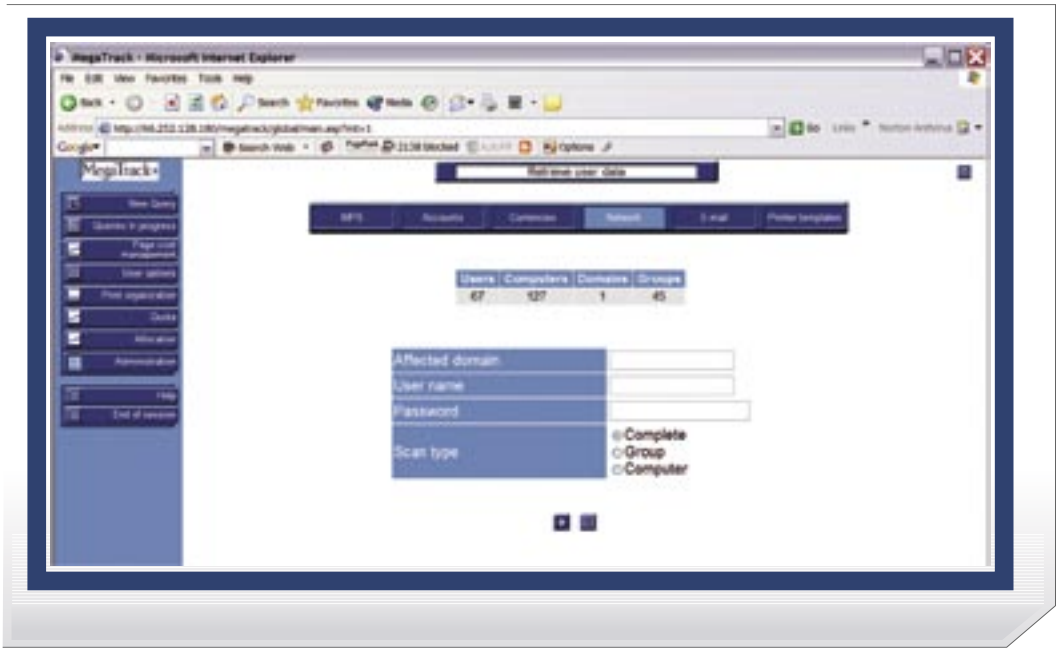
Quotas can be assigned to any or all users, and only count when using designated printers. For instance, you may require user's quotas to be applied to high-cost color or high-production devices, while not requiring them on smaller, low-cost black and white printers.

Allocation

Costs can be further controlled through MegaTrack's optional Allocation Module. This allows additional information to be included with each print job, and allows each page to be billed to the appropriate department or client. Allocation profiles can be created and linked to print jobs as needed. It is also possible to display the list of the printed jobs with or without allocation information and then link them to a specific profile.

Using MegaTrack

The MegaTrack interface is a user-friendly, easy-to-use application featuring a convenient remote control, as well as various buttons and icons which enable fast navigation through the range of functions. Online and context-sensitive help is available on every page of the application to assist the user in every step of the process.



Viewing the MegaTrack Print Server

The organization of the MegaTrack print system can be viewed at any time through the Print Organization screen. This module detects each print job, and then waits for a signal from the printer to indicate the page actually printed before logging it. This automatic error-checking ensures accurate tracking of pages that actually printed.

In addition, MegaTrack has an auto-detect feature that determines the type of the printer connected to the network and configures it automatically. However, in order for auto-detect to work, the printer must have been manufactured by Hewlett Packard (HP) and it must be connected directly to the network (as opposed to locally). If auto-detect isn't available, the administrator can manually enter the information.

Summary

As you can see, MegaTrack is the ideal solution to help manage your print system by improving cost management and task organization by shared printers in accordance to their usage.

In addition to providing accurate and comprehensive statistics to optimize printer deployment, workload and purchases of printer consumables, MegaTrack offers the following features and benefits:

- Tracking function completely transparent to users.
- Distributed Architecture Technology results in negligible impact on printing speed or LAN bandwidth.
- Controls multiple NT print-servers and an unlimited number of printers.
- Works with any operating system using TCP/IP connections to print via the NT print-server (UNIX, AS/400, OS/2, …)
- Automatic, scheduled e-mail reporting.
- Optimized for use with HP LaserJet printers.
- Operates on the Microsoft Windows print platform and integrates directly with your existing print system.

Regardless of the size of your company or organization, the ability to track, manage and control all printed copy throughout your local area network is now within your grasp—thanks to MegaTrack.

Best Practices

This section contains some frequently-asked questions and tips for enabling you to make the most of MegaTrack.

Module Configuration

MegaTrack is extremely flexible; capable of tracking a single stand-alone printer, or all the devices connected to the network of a massive corporation. However, depending on the environment where it is used, there are some important configuration differences to be aware of.

MegaTrack Print Server (MPS)

MPS can be configured on the same server as the MDS and MWS modules or a separate existing print server. Standalone configuration is recommended in either of the two cases:

More than 100 print queues on a server
or
More than 10,000 jobs or 50,000 pages printed per day

MegaTrack Database Server (MDS)

Before MDS can be installe d, either Microsoft SQL Server or MSDE must first be in place.

Refer to the following table to determine which component is right for your environment:

MSDE	SQL Server Standard Edition
Printed jobs are less than 10,000 per day or Printed pages are less than 50,000 per day	Printed jobs are more than 10,000 per day or Printed pages are more than 50,000 per day

Like the MPS, the MDS module can be configured as either standalone or along with the other MegaTrack components. Installing MDS on a dedicated server can be advantageous in large network, and is recommended when either of the following two conditions exist:

More than 100 print queues on a server

or

More than 10,000 jobs / 50,000 pages printed per day

If MDS is configured as standalone, then SQL Server (not MSDE) must be used. Another advantage of standalone configuration is job retrieval can be scheduled to occur every hour with minimal performance impact. When MDS, MWS and MPS all reside on the same server, job retrieval must be scheduled to be performed outside of regular business hours.

In the event of large print volumes (50,000 jobs/day) or a large number of SecureJet jobs (50,000 jobs/day), MDS must be a dedicated server (at least P4 with 1-GB RAM) running only SQL Server.

Optimizing SecureJet Devices

Although SecureJet enables convenient tracking of Multi-Function Printers and copiers via FTP, the resulting data flow can impact network performance, and is usually best performed outside of normal business hours. The system administrator can schedule precisely when job retrieval should occur.

In the event FTP is not an option, data can also be retrieved via either Port 9100 or NFS Client.

Print Processor vs. a Port Monitor

Which tracking method is best for your environment? Although Print Processor is preferred, it's not always feasible. Refer to the following table to compare the differences:

Print Processor	Port Monitor
Resides inside the spooler	Resides outside the spooler
Works only on 2000, XP and 2003 and is Windows 2000 cluster server compatible	Works on NT4.0, 2000, XP and 2003
Cannot be used with Allocation or Quota Modules	Quota, allocation or NT 4 require the port monitor
Bi-directional	Not bi-directional
Converts the application data to a PDL using the driver capabilities.	Sends raw data to the printer

System Prerequisites

What type of system is required to run MegaTrack? Refer to the table below for complete hardware and software requirements to use MegaTrack:

Module	Minimum	Recommended
MPS	PII 400-MHz 256-MB RAM* 512-MB free disk space Windows NT 4.0 Service Pack 6	P4 2-GHz 512-MB RAM* 1-GB free disk space Windows 2000 Server Service Pack 4
MDS	PIII 800-MHz 1-GB RAM* 2-GB free disk space Windows NT 4.0 Service Pack 6 MSDE 2000	P4 2-GHz 1-GB RAM* 10-GB free disk space Windows 2000 Server Service Pack 4 SQL Server Standard Edition
MWS	PIII 800-MHz 256-MB RAM* 1-GB free disk space Windows NT 4.0 Service Pack 6 IIS4	P4 2-GHz 1-GB RAM* 5-GB free disk space Windows 2000 Server IIS5

* In case of standalone installation, the 3 memory requirements must be cumulative.