Abacus Data Flow

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1. Overview

Abacus PCR is a Print Tracking and **Cost Recovery** application developed by American Reprographics Company. The Abacus Print Cost Recovery System is designed to provide unattended tracking and reporting of all printing, copying, and scanning requests for an Architecture/Engineering/Construction (AEC) office.

Using the system, you can provide billing data for your clients on a project by project basis. This helps you to assign accurate costs associated with printing to an individual project, and also, to provide you with the necessary information required to bill your client for reimbursable expenses incurred during printing, scanning, or copying. The Abacus Print Cost Recovery System also helps you to collect data on print requests, which are not assigned to a particular project. This facilitates you to manage the overhead costs associated with printing, copying, and scanning activities, which may not be reimbursable.

The Abacus Print Recovery System is composed of several components, which have been installed for you on your network. Your Facility Management (FM) provider preconfigured the system based upon the information that you have provided; however there will be an ongoing need to keep the system up to date so that it will continue to provide you with accurate information for your printing activities.

2. How the system works

Each time a print is sent by a user on your network, the Abacus Tracking will intercept the print request, and trigger a billing pop-up for the user. The user needs to fill out information regarding the project, the print media, and the purpose for the print. Once the information is entered, the data is added to the Abacus Database. You can access the database to prepare reports on your printing activity.

Several components are involved in this process, and are preconfigured for you by your FM provider. Here is a summary listing of the components involved, and a short description of what they each do.

Abacus Core Components

Abacus Database

The Abacus Database automatically collects project and print information each time a user on the system prints a document to a printer. The database records information relating to the date and time of the request, the user, the project and the project phase, as well as the media

type, the size, and the number of copies requested. This information is used by the Abacus Manager and reports to provide you with a variety of reports tailored for your individual billing needs.

Abacus Server

The Abacus Server is IIS based multiuser component that provides communication with all other Abacus components. Whenever a print job is submitted by the user, Abacus Server stores some detailed information to log files. Abacus Server runs Dispatcher Service for prompting a billing pop-up for the user each time the user submits a print.

Abacus Data Scheduler

The Abacus Data Scheduler, which runs on the server, allows creating, modifying, and scheduling the data import jobs, Repro Desk jobs, KIP log files jobs, Oce Account center jobs, etc. The Abacus Data Scheduler runs all the jobs scheduled at regular intervals based on the job schedule. To run the scheduled job, Abacus Schedule service should run at all times.

Client Components

Abacus Tracking

The Abacus Tracking is responsible for intercepting and interpreting print requests submitted by users on the network. The Abacus Tracking component usually runs on the Print Server on the network. As the user submits a print request, the print data is examined by either the Windows Print Notification System or the Abacus Print Processor. This information is then recorded to Abacus Database by Abacus Tracking.

The Abacus Tracking can be installed on multiple computers based on the requirements. The Abacus Tracking can also be installed on a workstation computer to track the local printers, which are not able to track from the Print Server.

Abacus Billing Popup

The Abacus Billing Popup is a service that runs on each workstation in the customer's network. Each time a print is requested the Abacus Billing Popup window is displayed and provide the user with menu options allowing them to reference a particular project and billing purpose for each print that they produce.

Configuration Management and Reporting Component

Abacus Manager

The Abacus Manager provides the system administrator with the ability to set up projects, printers, users, and media information for tracking. This component can be accessed by anyone at the customer site with a valid user ID and password. The Abacus Manager also allows you to configure all printer / user permissions on the system and prepare reports on your printing activity.

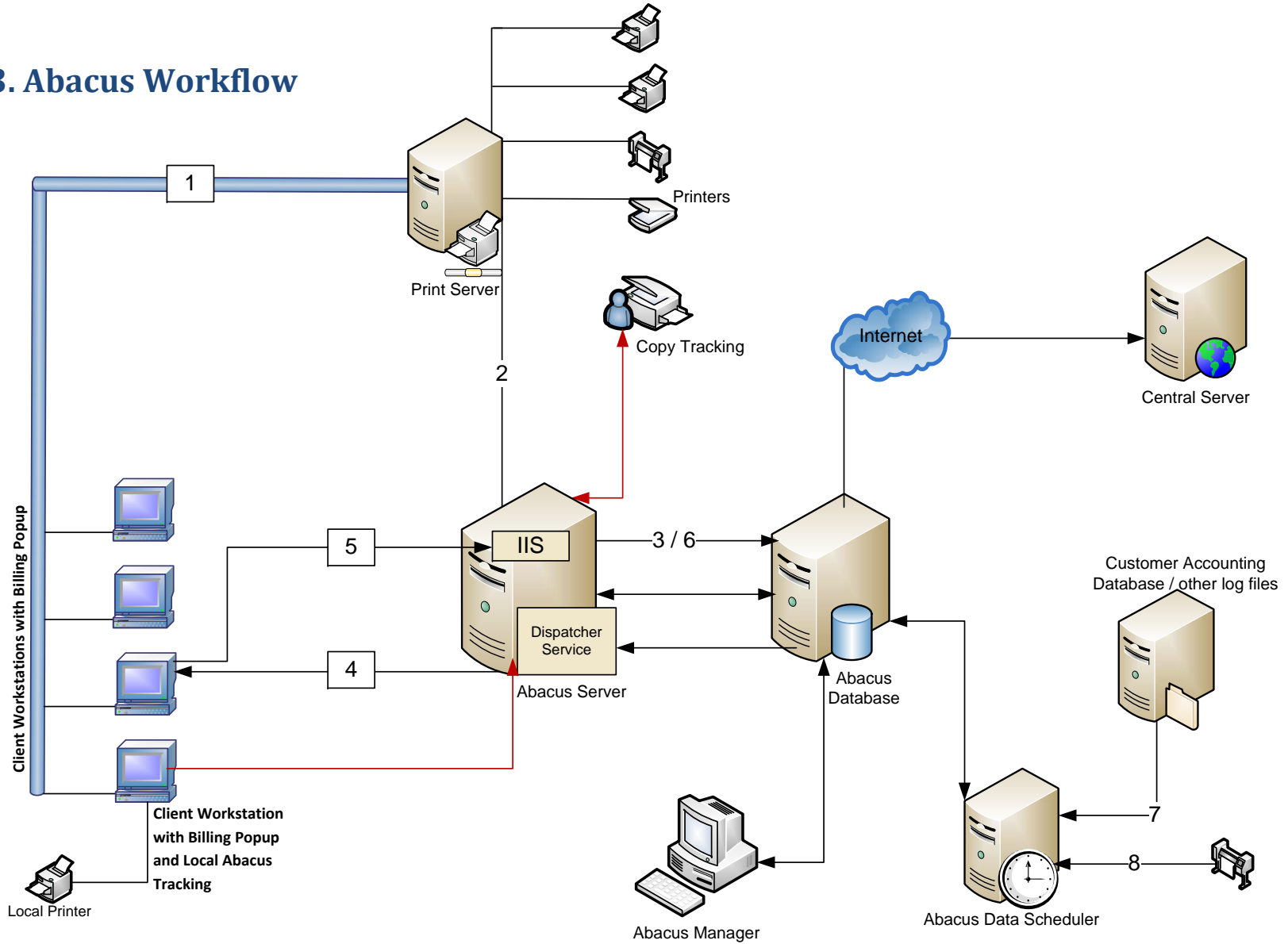# Data Collection and Consolidation Components

Abacus Central Database

The Abacus Central Database runs on a server located at the Reprographers office. Abacus can be configured so that billing information from the client office is uploaded to the Central Database automatically.

Abacus Central Server

The Abacus Central Server allows the hosting reprographer to connect to, and consolidate billing information from client offices running the Abacus Cost Recovery system.

3. Abacus Workflow

Printers

Print Server

Copy Tracking

Internet

Central Server

Client Workstations with Billing Popup

1

2

5

IIS

3 / 6

4

Dispatcher
Service

Abacus Server

Abacus
Database

Customer Accounting
Database / other log files

7

8

Client Workstation
with Billing Popup
and Local Abacus
Tracking

Local Printer

Abacus Manager

Abacus Data Scheduler

4. Abacus Cost Recovery Workflow

Print Tracking Process

1. A user submits a print job from their workstation.
2. The Print Server passes the print job to the printer. The **Abacus Tracking** component installed in the Print Server tracks the print job and notifies the **Abacus Server**.
3. The IIS makes an entry of this "Activity" in the **Abacus Database**. In this stage, the document information is captured in the **Abacus Database**.
4. The Dispatcher Service triggers **Abacus Billing Popup** on the user's workstation requesting for billing information from the user. User fills in the **Abacus Billing Popup** and submits the information.
5. The **Abacus Billing Popup** returns the information to the **Abacus Server**.
6. IIS updates the activity into the **Abacus Database**.
7. Run the jobs to import customer's project list from their accounting database to **Abacus Database**.
8. Run third-party printer log files for printers, which cannot be tracked through Abacus Tracking.

Copy Tracking (off the glass copying) Process

1. Abacus Copy Tracking application is installed in the Copier.
2. When a user walks to copier to copy, he needs to fill in the credentials / PIN number information in the Abacus Copy Tracking application.
3. The information is submitted to the IIS in the **Abacus Server**.
4. IIS updates the activity into the **Abacus Database**.

NOTE: An **Activity** is comprised of two parts – **Document information** and **Billing information**. When a user submits the print job, document information is captured in the Abacus Database through the IIS. Document information includes: document name, print size, print media, etc. The user fills the billing information through the Abacus Billing Popup. The billing information is then updated in the Abacus Database through the IIS.

5. Technical Specifications

Abacus Server Configuration

System Specifications	- Operating system - Microsoft Windows 2003 - For a firm with 10 or less number of systems – Windows XP SP2 - Hardware - RAM – minimum 512 MB; 1 GB recommended 20 GB of available Hard disk space
Network Specifications	Whenever a print job is performed, Abacus Server communicates with client workstations. Similarly, client workstations communicate with the Abacus Server to obtain updated Project lists. So **TCP/IP Port 80** and **UDP/5353** has to be opened both ways on the firewalls.
General Requirements	- To enable proper communication between the Abacus Server and the client workstations, Abacus Server should be a part of the domain. It is mandatory that Abacus Server should have **static IP address**. - If Abacus Server needs to connect to any other machine or database for importing log files, projects lists, etc, then Abacus Server should have proper network credentials. These credentials are stored in Abacus Database for connecting to these machine or database in future. - If Abacus Server and the workstations are in different subnet, then they should be routed appropriately.

Abacus Billing Popup Configuration
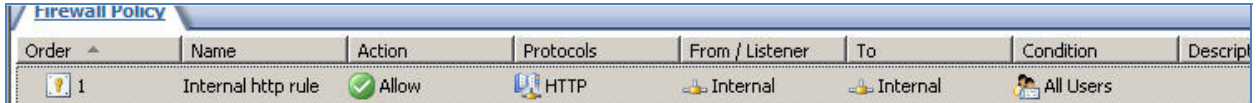
System Specifications	### Abacus Tracking Configuration		
	Network Specifications	**TCP/IP Port 9091** has to be opened both ways on the firewalls
	General	**Abacus Tracking** component

| | | Requirements | has two different tracking modes namely – Server Mode and Local Mode. Server mode is specified while installing Abacus Tracking on Print Servers. Local mode is specified only while installing Abacus Tracking on a local workstation. |

- Operating System
    - MS Windows 2000 or higher
    - Apple MAC OS 10.x
- Hardware
    - RAM – minimum 512 MB
    - 100 MB of available hard-disk space

| Network Specifications | **TCP/IP Port 9090** and **UDP/5353** has to be opened both ways on the firewalls. |

Proxy Servers – Configuration

Allows Abacus to receive unsolicited traffic and configure port exceptions. TCP/IP Port 80, TCP/IP Port 9090, and TCP/IP Port 9091 need to be opened to enable local LAN communication.

Example: For Microsoft ISA Server, create a firewall policy as shown in the following screenshot.

Local Firewalls – Configuration

If windows firewall is enabled on the system, the port exceptions are configured by default.

Other local firewalls including Norton, Anti Spyware, and Spam Filters may prevent Abacus Server communication. Therefore you need to open TCP/IP Port 80, TCP/IP Port 9090, and TCP/IP Port 9091.

Estimated Network Bandwidth Consumption

Data Cache

Data Cache is created containing all the latest project information and is pushed to all the billing pop-ups installed. This task is automatically performed by the Abacus server after any change to project and other information in the database.

Dispatch Service

Dispatch Service consists of two types of mode:
- Server Notification: In this mode the server sends pop-up notifications to workstations when billing is needed.
- Client Polling: In this mode all the billing pop-ups installed in every pop-up workstations poll the server for new activities periodically.

Data Cache	- Default time settings – 5 minutes - Data transferred per interval –1 to 1.5 Megabyte (approx).
Dispatch Services	

Server Notification	• Default time settings – As per activity recorded • Data transferred per interval – 254 bytes (approx)
Client Polling	• Default time settings – 3 seconds • Data transferred per interval – 254 bytes (approx)