

**SENTINEL**

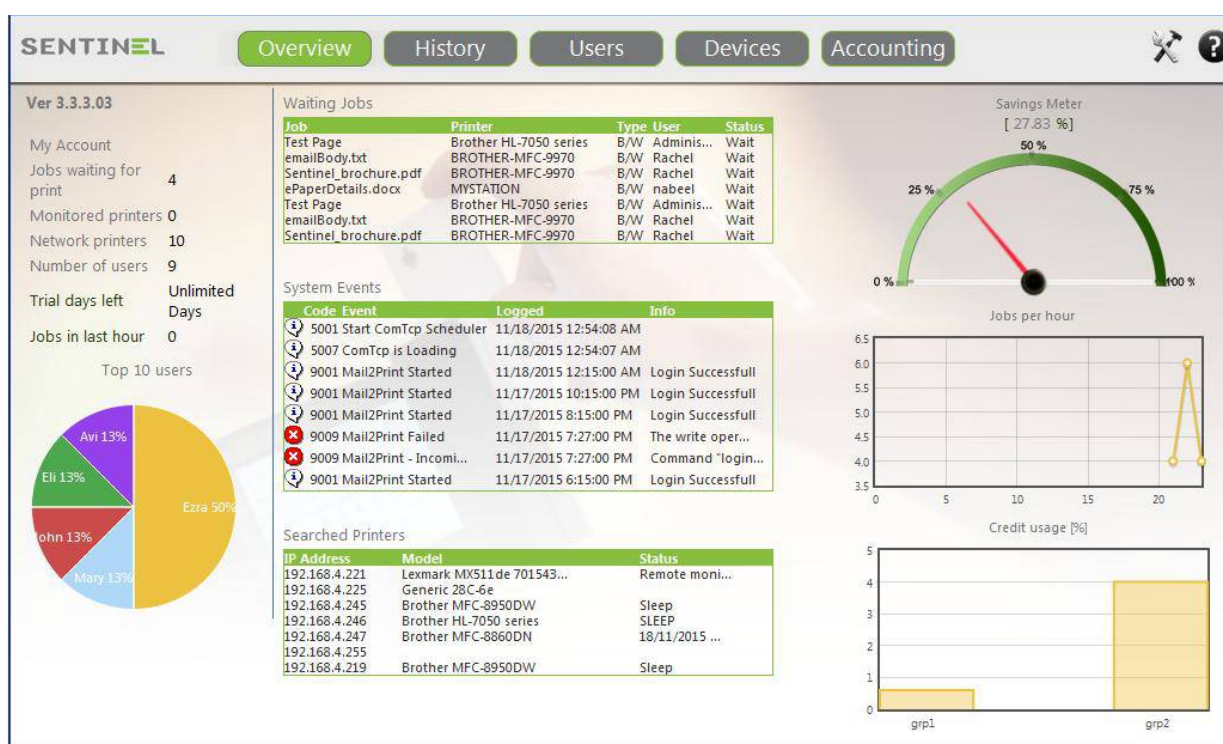
# Product Description

November 2015

## The Sentinel Advantage—Secure Printing

Each day, your organization may be wasting money in the form of paper, toner, and employee time, as print jobs are sent to the wrong printer or lost in piles of output, **causing users to reprint them**. Some sources estimate that this waste may be costing companies as much as 4.5% of their turnover!<sup>1</sup> Worse, sensitive material may be left unsupervised at a printer, allowing anyone to remove it.

Most solutions are costly, limited in features, or too inconvenient for users and the system administrator. But now, there is Sentinel...



## The Sentinel Solution

Sentinel is a comprehensive printing management and control system that addresses the problems of waste and security. Sentinel provides significant benefits for your organization's printing needs:

### Security



- ☐ Users see and collect only their own print jobs.
- ☐ Printed material is not left unattended.
- ☐ The system administrator receives alerts via email and can effectively monitor the system.
- ☐ Print jobs are not lost or collected by others, reducing wasteful reprinting.

<sup>1</sup> Waste Watch ([www.wastewatch.org.uk](http://www.wastewatch.org.uk))





## Economy



- Print quotas (limits on number of pages printed) can be set for each user.
- Users can be limited to certain printers or copiers.

## Management and Control



- The “follow me” feature allows users to transfer print jobs from one printer to another by self identifying at a different device.
- All printing information is collected in a database, enabling generation of organization-wide reports.
- The central Web-based server allows users to control their own print jobs, and the system administrator to manage printing permissions and activity efficiently.
- Printers can be limited to certain access hours to make sure that no one is printing outside working hours.

- Fewer printed pages means savings in toner, paper, electricity, and other resources.

## Environmental

- Wasteful personal printers that take up space in individual offices or work areas can be eliminated.

## Responsibility



Sentinel allows you to use a centralized print center without sacrificing print job security.

## Highlights

Sentinel provides a powerful solution for your printing needs. With Sentinel, you can:

- Control printing for individual users or groups by limiting how print jobs can be released, including the ability to cancel, pause, and resume print jobs.
- Users determine their preferred release method: using an ID card, typing a code at the printer, identifying a QR code or an NFC tag via a smartphone, or releasing the job from the Web interface.
- Account and control the number of pages each user can print on each printer. This lets you bill accurately, charging customers for their exact print usage.
- Define black/white or color page quotas for each user, blocking users who exceed their quota.

- Allow users to print email messages and attached files (documents and images), without connecting to your organization's intranet.
- Enable documents to be scanned and sent directly to the user's email address.
- Move print jobs from one printer to another; for example, a user can print to printer A, then use the ID card at the device controller for printer B. The print job shifts automatically to printer B, placing the output in the hands of the authorized user.
- Define printers that only specific users are allowed to use.
- Enforce rules or run organization-specific software in conjunction with Sentinel, using LUA scripts.
- Issue reports based on different parameters, such as the number of pages a certain user printed, the number of pages printed on specific printer, etc.
- Export data to any database application. All print information in the system is logged into a standard database, so the data can be exported for additional specialized calculation and reports.
- Send real-time warnings and exceptions (for example, attempted use with an unidentified ID card) to the system administrator by email.
- Display messages for each user on a personal Web page. Messages can inform users when they exceed their page quota, try to print to non-authorized printers, etc.

## How Does Sentinel Work?

### A Better Solution

Sentinel has several key advantages over other systems:

- Sentinel is an extremely stable system that can work in clustering form, thereby spreading resources amongst different servers (external SQL server, external file server). As a result, the system is “shock absorbing” even in less-than perfect network conditions.
- Sentinel's device controllers contain an internal switch, allowing them to be connected next to the printer without needing to add another network outlet.
- Sentinel accepts print jobs from many operating systems, including all standard Window operating systems, UNIX, mainframe, midrange (such as AS/400), and more.
- The database can be based on the local database or your organization's SQL server.
- Sentinel can be customized with special options for your system (contact your Sentinel vendor for details).





## Streamlined and Low Profile

Sentinel won't clutter up your office with bulky additional equipment. The device controllers are small and can be placed on a table or shelf, or mounted on a wall to save space.

There are several models of device controllers. All support the same system functions, but the touchscreen and built-in models provide additional features. The models can be used together within in the same Sentinel system.

All device types can work together on the same print server.

### Touchscreen controller



- Configured through the SNT Manager or directly through the device controller itself

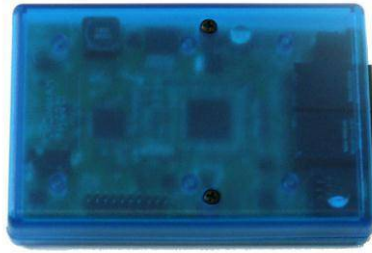
### Internal controller



- Supported by some Lexmark and Brother printers
- Control is via the printer panel

- Users can access with ID card or code
- For multifunction device, users can select Print or Copy
- When printing, users can select multiple queued jobs
- Jobs can be deleted through the Web-based interface or directly from the device controller
- When copying, users see their username, the device name, the number of copies remaining in their quota, and the number of copies in the current request
- A configurable timeout keeps user information from remaining on the screen (Users can reset if more time is needed)

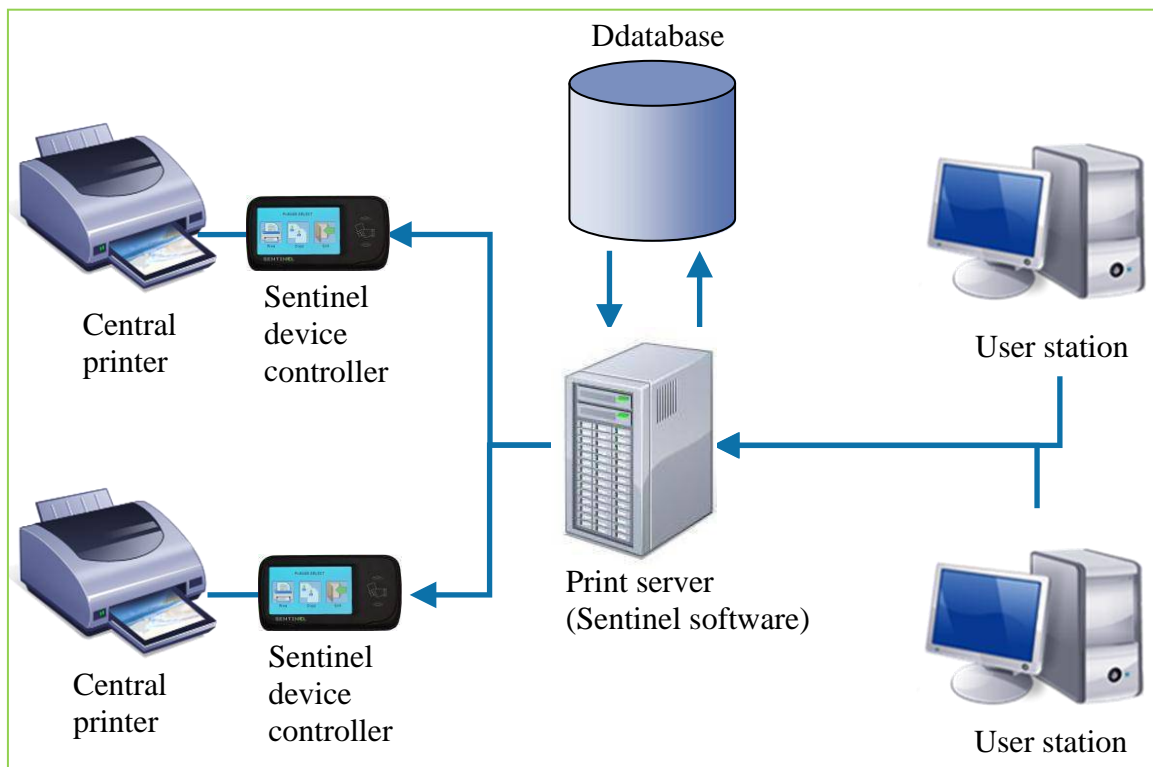
## External Light controller



- No panel or keypad
- No copy control (only print control)
- Users simply swipe their cards to collect their print jobs

The Sentinel system is composed of the server software, the database (local or SQL), and a device controller that sits between the server and each physical device (printer, copier, or multifunction device).

The server software is installed on the organization's print server.



On the printer driver in the server, the Print Processor is changed to *Sentinel Print Processor*. When a print job is sent to a printer that was defined in Sentinel, the job is not printed but saved in an internal queue. In addition, the print job, with rich metadata (user name, document name, number of pages, copies, etc.) is logged into the database.

When a user uses an ID card at one of the Sentinel device controllers, the Sentinel server receives the card ID via a UDP message from the device. The server then







searches the database for the corresponding user name. After finding the user name, a search is performed to find this user's print jobs that have not yet been released. Those jobs are then re-spooled to the printer connected to the device controller at which the ID card was used.

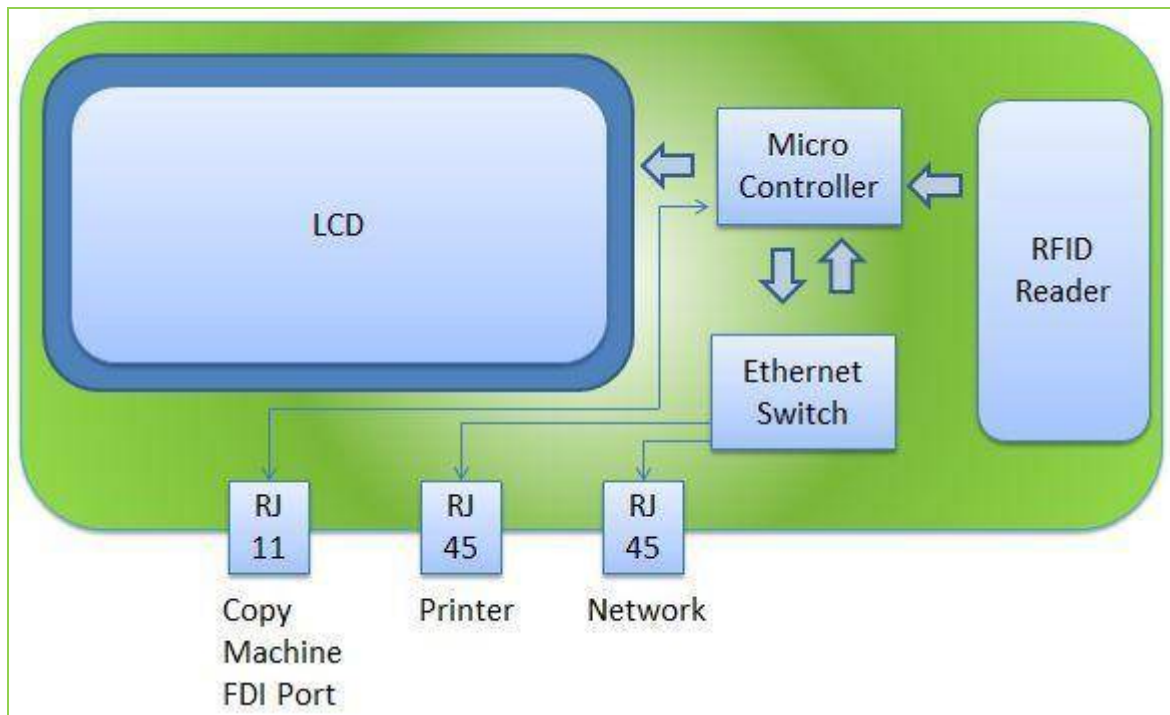
After the printing is performed, all the print job parameters are logged in the database. This data is then available for reports.

In an emergency situation, Sentinel can automatically switch back to standard Windows printing by changing all printer drivers' print processors to their original Windows print processors. This causes all print jobs to bypass Sentinel, allowing users to print in the standard way. After resolving the problem, all print processors can be switched back with a single command.

## Internal Sentinel Device Structure

The connection to the printer can be performed via an internal switch that does not interrupt communication with the printer (such as sending print jobs or communication and control protocols). This means that a Sentinel device controller can be located next to a printer without requiring an additional network outlet.

However, companies that do not allow connecting switches to the network can still work with the Sentinel solution as there is a logical connection between the Sentinel device and the printer in the print server.



The Sentinel device controller requires a unique fixed IP address, and the default communication protocol to the Sentinel server is UPD

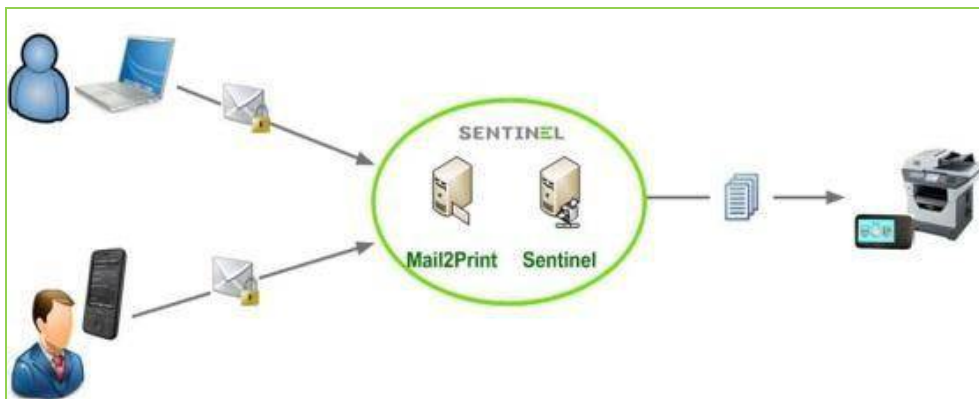
via the 7001, 7002, and 7003 ports. This means that the printer keeps working with the server as usual (with the standard Windows port).

## Key Features

### Send Emails to Print

The Sentinel **Mail2Print** feature directly prints your emails and attachments. This enables the user to print any document easily from a smartphone or mobile device such as an iPad or tablet.

1. Whether you are a recognized user or a guest, you can forward an email message to the Sentinel email account (for example, [sentinel@yourcompany.com](mailto:sentinel@yourcompany.com)), without connecting to the organization's LAN.
2. The user types the printer's IP address in the subject line of the email.
3. To receive their jobs at any printer:
  - Users who are registered in the system identify themselves, for example, by swiping an ID card at the printer.
  - Sentinel sends guest users an ID code, which they type in at the printer or Sentinel controller.



You can also decide which attached documents and images to print. Many document formats are possible, including DOC, XLS, HTML, PDF, TXT, PPT, JPG, TIFF, GIF, and BMP, even if you don't personally have the associated software installed.

### Scan Directly to Email

Sentinel's **Scan To Me** feature allows users to scan documents at a printer/scanner and send the generated documents as files—automatically to their email—without needing to type or select the email address from a list.



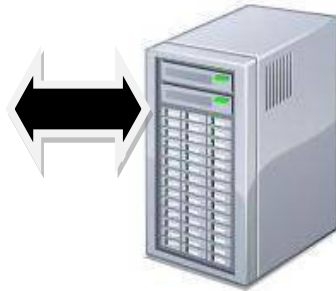




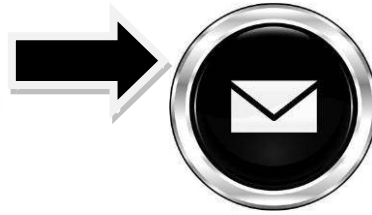
1. User self-identifies at the multifunction printer.



2. The Sentinel server software looks up the user's e-mail address and sets **Send to e-mail address** to the e-mail address defined in the user account.



3. User places the pages to be scanned on the printer and selects the **Scan** or **ScanDirect** option on the printer. Sentinel emails the document to the defined e-mail address.



## Mobile Printing (NFC or QR codes)

Users pull print jobs wirelessly from a network printer using a mobile device (such as a smartphone or tablet) via a QR code or NFC tag.

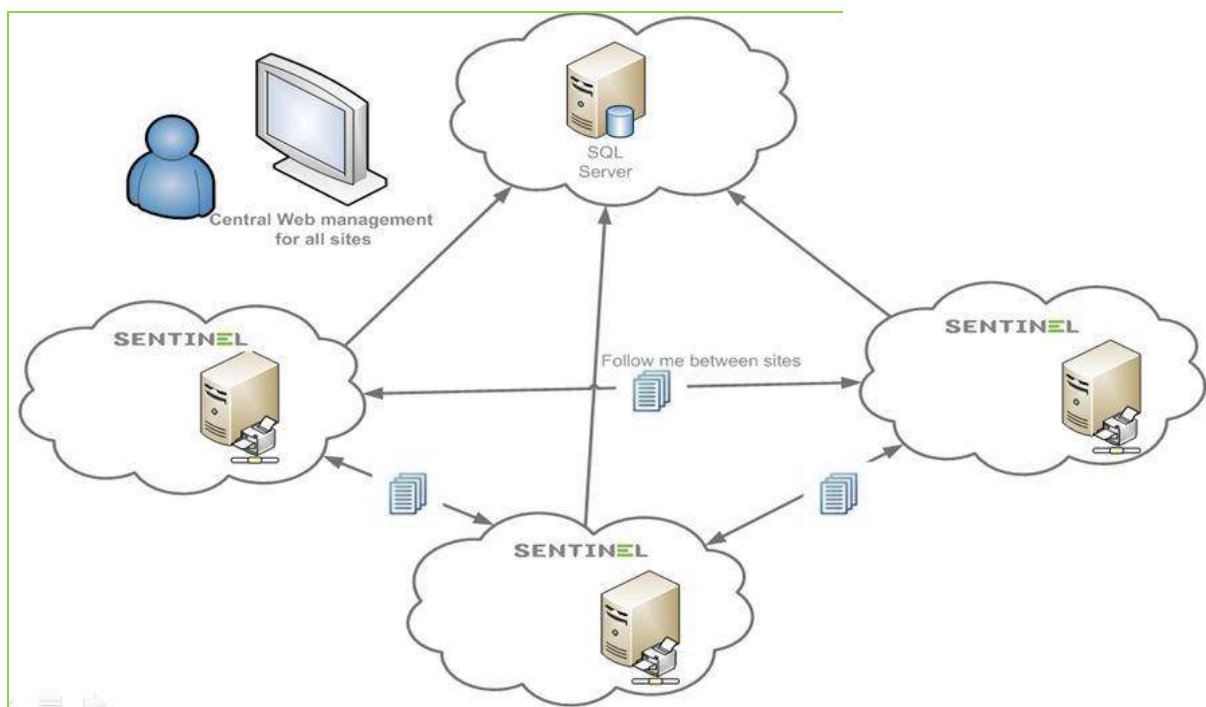
1. Sentinel generates QR codes for each printer, which you can print out. Alternatively, you can generate an NFC tag. The code/tag contains information identifying the printer and/or the Sentinel pull print server.
2. Attach the QR code or NFC tag to each printer.
3. The user's mobile device scans the code, and—using a web browser on the mobile—accesses the pull print server.
4. The server receives the printer ID and the mobile device ID. Upon recognizing the mobile device ID, the server retrieves a list of waiting print jobs for the user to process.



## Multiple Site Installations

Multi-site support means that Sentinel is installed on several sites and all sites are managed by central web management.

Each site is managed by a server using a “distributed installation,” which allows documents to move from site to site. Most of the print management is handled locally, via the LAN. The WAN is only involved when a user wants to print a document at another site. The upshot is that there is very little WAN overhead or drain on resources.



Sentinel behavior does not change across sites. This means your users can retrieve print jobs at their current locations, even when they are not in their usual offices, via the automatic “**follow me**” feature. A user might be in a conference room, on another floor, or visiting another site belonging to your organization. When the user is ready to pull a document, he/she can employ his/her mobile device or corporate tag (RFID-





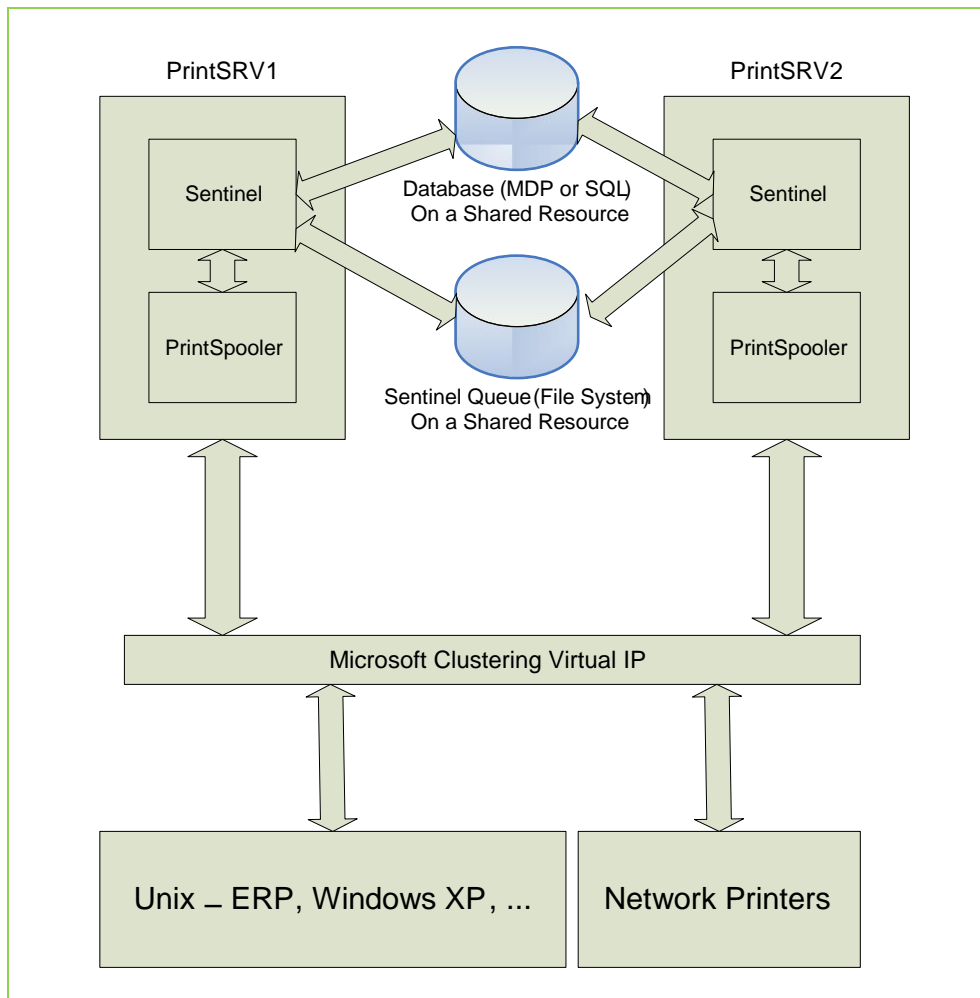
enabled or magnetic) to access the Sentinel system. The Sentinel server identifies the user's location and prints on the spot, even if the job originated at another site.

## Microsoft Clustering

This approach employs **Microsoft clustering**. There are two shared resources to the server: the Sentinel database and the Sentinel queue.

The database resource can be based on the organization's SQL server, which is secured and backed up regularly. The queue resource is actually a file server in which the print job files are stored until they are released, so it should be configured on the cluster shared resource.

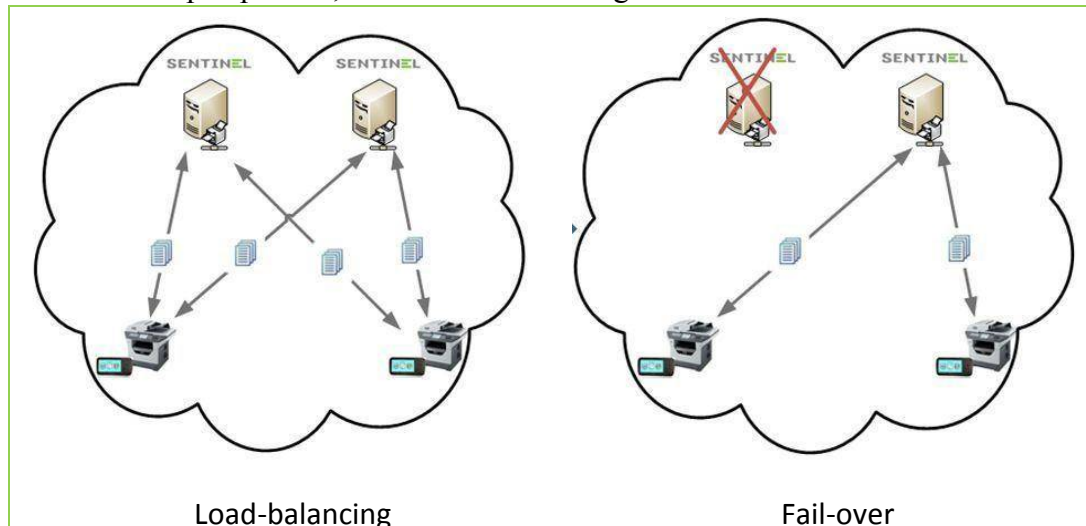
The Sentinel service is defined as a "generic service" in the cluster configuration that depends on spooler service. Server problems are dealt with smoothly, utilizing fail-over principles.



## Unique Load-Balancing and Fail-Over

One of the unique features of Sentinel is that the system is installed on several print servers, in a fail-over or load-balancing manner, but

from the user's perspective, Sentinel acts as a single server.



The Sentinel devices connect simultaneously with the bank of Sentinel servers in a load balancing mode. When one of the Sentinel servers ceases to operate, the devices automatically connect to the other server/s, acting as backup for the failed server.

## LUA Scripts

LUA scripts give the organization the ability to enforce specific rules, or to run the organization's software on top of Sentinel.

You can enable scripts written in the LUA scripting language ([www.lua.org](http://www.lua.org)) to run:

- When the user submits a job.
- When the user swipes an ID card at a printer.

Examples:

- Ensure duplex printing, depending on which group the user belongs to and which printer is being used.
- Save on toner by printing a lower quality, depending on the name of the document sent to print.

The following figure shows a sample LUA script.





```

28 package.cpath = {[C:\sentinel\?.dll]}
29 require "psaddptrn"
30
31 section = Submitter.UserName .. "-" .. Submitter.PrinterName
32 inifile = {[C:\sentinel\lua.ini]}
33
34 if (string.find(Submitter.JobName, "@SUBMITTER@" ~= nil) then
35     if (string.find(Submitter.JobName, "$w") then
36         winsert = "1"
37     else
38         winsert = "0"
39     end
40
41     if (string.find(Submitter.JobName, "$d") then
42         duplex = "1"
43     else
44         duplex = "0"
45     end
46
47     startPos, endPos, match = string.find(Submitter.JobName, "($s%d+)")
48     if (match ~= nil) then
49         tonersave = string.sub(match, 3)
50     else
51         tonersave = "0"
52     end;
53
54 WritePrivateProfileString(section, "winsert", winsert, inifile)
55 WritePrivateProfileString(section, "duplex", duplex, inifile)
56 WritePrivateProfileString(section, "tonersave", tonersave, inifile)
57 else
58     defaultsinifile = {[C:\sentinel\printerdefaults.ini]}
59     winsertdefault = GetPrivateProfileInt(Submitter.PrinterName, "winsert", 1, defaultsinifile)
60

```

## Synchronize Users and Card IDs

Another powerful feature of Sentinel is its ability to synchronize with existing employee data, such as the Active Directory (AD) or external SQL databases. In fact, the Sentinel ID card used at device controllers can use any unique identifier, including existing data, such as an employee ID number. This is useful when organizations maintain detailed user information in their Windows™ AD.

This ID can be entered automatically or manually in Sentinel. There are several ways to do so:

- **Manually:** Type in the user name and card number for storing in the Sentinel interface. This is often the preferred method for small organizations.
- **Automate via Active Directory:** If a field in the organization's AD has been assigned to contain the employee card number, Sentinel can automatically synchronize with the AD and pull the required data into the database. This is particularly convenient for large organizations that already use an employee code.
- **Synchronize with an external card control system:** For organizations that use an electronic employee ID card that gives access to building doors, Sentinel can talk to this external card control system and read the card numbers from it.

Sentinel provides additional flexibility and control of automatic synchronization with two options that can work together or independently:

- **Initiated synchronization** is performed at a fixed time, usually added to the server calendar to occur every night.
- **Automatic synchronization** is performed whenever the system detects a new user. When a new user sends a print job, and the system

identifies that this user is not yet listed in the Sentinel database, it approaches the AD or the synchronization interface, and uses it to register this user.

## Custom and Standard Sentinel Reports

True control comes from being able to analyze print usage. Since all Sentinel print information is stored in an Archive table in the database (local or SQL-type), it can be used to generate a wide variety of reports.

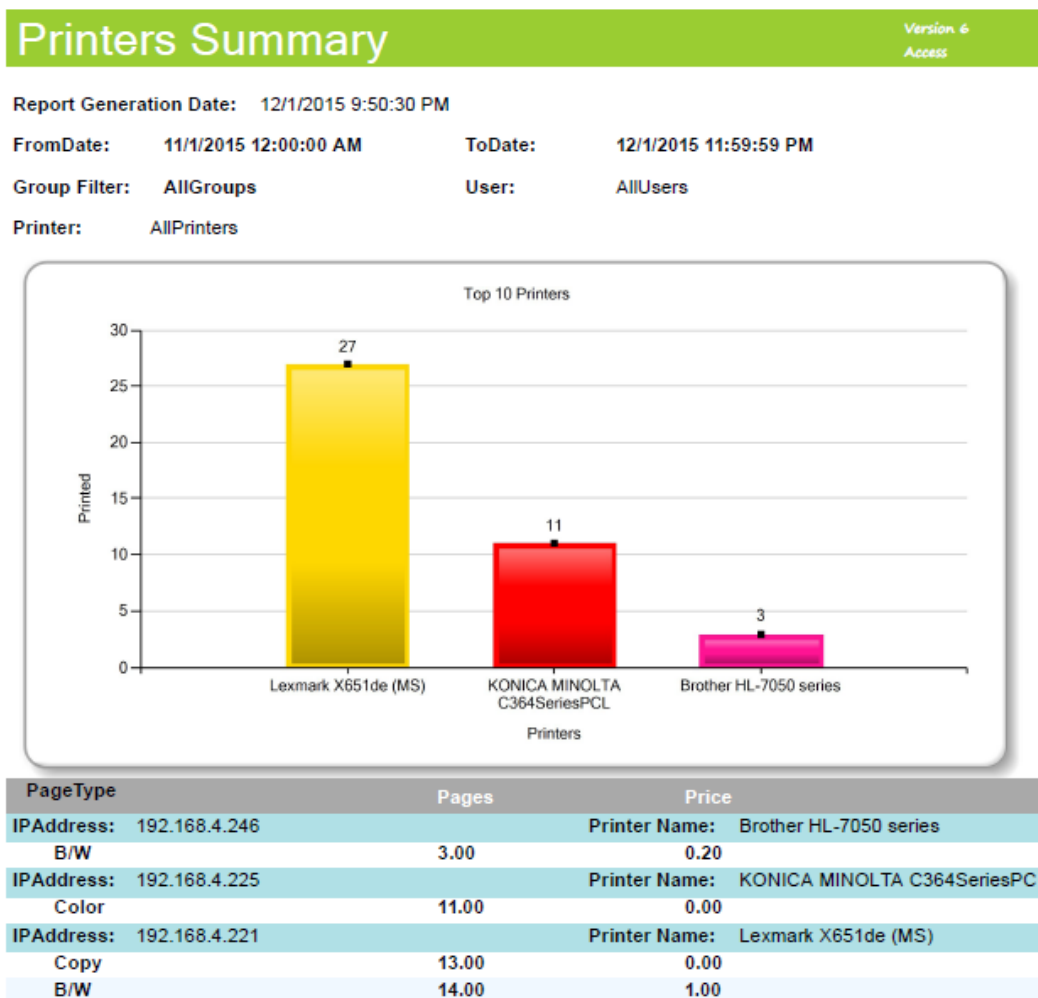
Additionally, these reports can be exported to Excel, Word, or to PDF format. This allows you to analyze parameters further or view the reports in different formats.

## Built-in Reports

You can generate several built-in reports from the Web interface.

Example 1:

Issue a printer summary report to view which printers are the busiest, shown in a graph. The following detailed report displays data for all printers. The data includes number and cost of printed pages for each print type, sorted by IP address /printer name.



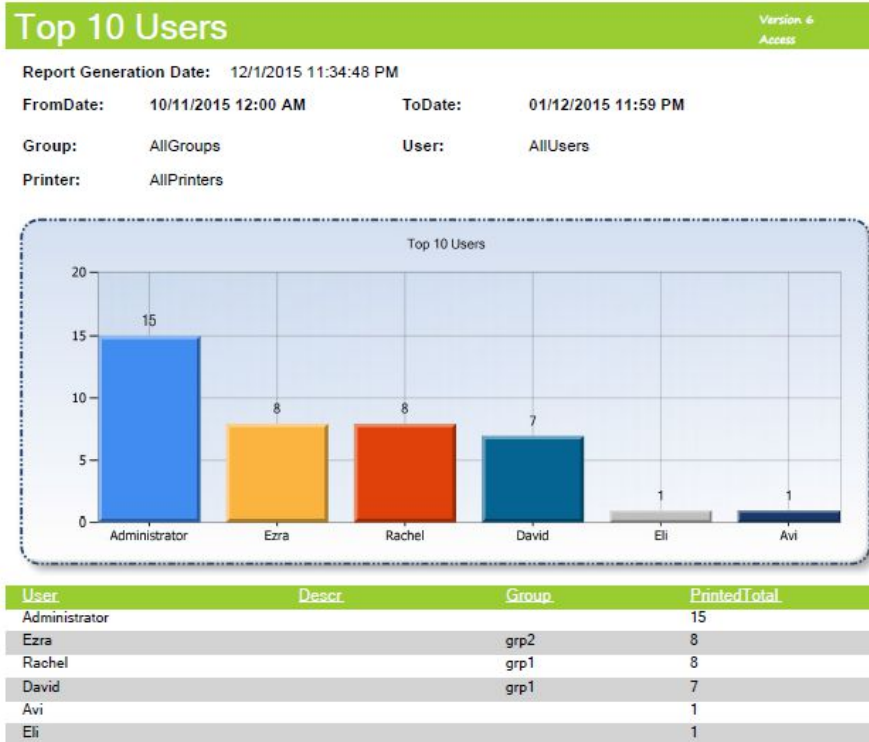
Example 2:





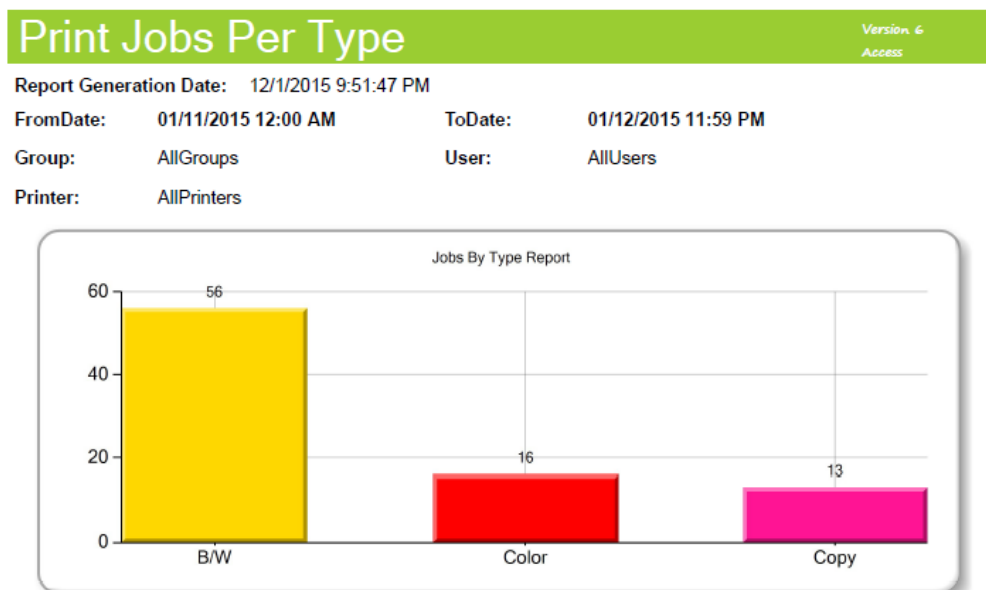


Issue top 10 users report to view which users printed most, displayed in graph following by detailed report displays data for top 10 users. The data includes number of printed pages for each of these users.



Example 3:

Issue a summary graph to see how many jobs of each print type are processed.



- The group summary report is a high-level view of groups of users and their print usage. You are shown the number of pages printed and their cost, according to user group (Administrator, Guest, etc.) in a graph and in a list.
- A high-level summary of activity per user, with the number of pages printed for each print type, both in graph form and as a table.

## Filters for Built-in Reports

You can customize these reports to add filters. For example, you might wish to base your report on a time range, on a specific printer, print type, or group of users.

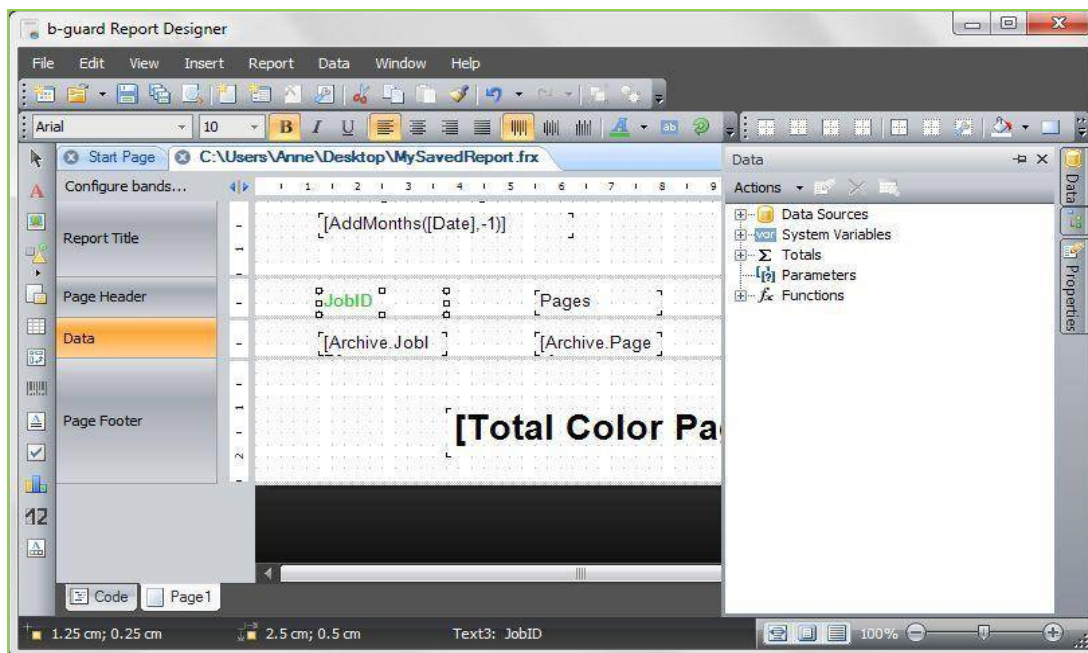
## Custom Reports

You can also build custom reports from scratch, using the FastDesigner report builder supplied with Sentinel.

For example:

- You can issue a user summary report to see which users print most often, and then issue printer summary reports only for those specific users. This way you can see which printers are being used by the high-volume users.
- You can issue a “top 50” jobs report and see which users are responsible for the largest print jobs. You can also see the names of the largest jobs and identify the applications from which they were sent.

The following screen shows a report in the process of being created in FastDesigner.



The following fields are available for use in your reports.





Field Name	Explanation
JobID	ID number of the job.
JobName	Name of the job.
SourcePrinter	Name of the printer driver you printed to, or, if you are copying, faxing, or scanning a job, the name of the device you are using.
DestinationPrinter	Name of the device where you collected the print job, or the name of the device where you printed, copied, or faxed.
User	User name.
OrigUser	User name of the user who initiated the print job (for example, secretary).
Pages	Number of pages (sides) in the print job, copy, fax, or scan job.
PageType	The type of document where 1 = Undefined, 2 = B/W, 3 = Colour, 4 = Cheques, 5 = Copy, 6 = Colour Copy, and 7 = Scan.
Size	Size of the file, in bytes.
Copies	Number of copies of the job.
Spooled	Date that the job was spooled to the server.
Released	Date that the job was released from the server.
Status	Status of the job, where Printed C = The print job was released by a user using an ID card at a device, Printed K = The job was released by a user typing a keypad code at a device, etc.
PrintedPages	Number of actual pages printed. This can be different to the value stored in Pages as this value treats a double sided print as one page whereas Pages treats a double-sided print as two pages (sides).
Field Name	Explanation
BillCode	The bill code of the job.
MachineName	The name of the computer where the job originated.
PaperSize	Size of paper where 9 = A4.
Duplex	Indicates if the job is simplex or duplex where 1 = simplex (single sided) and 2 = duplex (double sided).
Colour	Indicates the colour of the job where 0 = xxxx, 1 = B/W, and 2 = Colour.
Group	Indicates the group to which the user belongs.
BillCodeDescr	Description of bill code.
SourceServer	The name of the server that controls the jobs' activity. On a clusterbased system, the server could vary.
Icon	The icon used to display the job type.
Price	Price of the print job.
GroupID	The ID of the group to which the user belongs.

## Schedule Reports

You can schedule your reports to run on a regular basis whenever you want (daily, weekly, monthly) Specify the start date and frequency of recurrence.

You can save the generated reports as files for viewing when convenient.

### About e-Paper

e-Paper develops, produces, and markets innovative solutions integrating software with electronic devices for connecting peripheral units—in particular, printing units—to computing systems. e-Paper's products combine sophisticated hardware and software elements, which result in functional, low cost, easy to use, long-serving products.

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