PrinterLogic by VASION

Unify EMR and ERP Printing with PrinterLogic Output Management

How bridging the gap between front and back-end printing optimizes efficiency and security for enterprise organizations

Table of Contents

The Challenges of Enterprise Output Processes

Many enterprise organizations rely heavily on various printing and output processes to keep their operations moving and delivering. Any interruption or extended downtime can be detrimental—from lost productivity to cost. The demand for efficient and reliable output management solutions to protect and streamline critical printing and document processes and to enhance overall productivity is rising. In 2022, output management made up about 16.6% of the global software market, with the projected market share continuing to grow over the next five years.[1]

Typically, administrators lack true ownership of print queues within back end systems, and deployments or changes must go through EMR/ERP applications first, which can be a bottleneck. Any lateral print queue changes to support or address issues with general front-office printing can require manual, time-consuming workarounds.

Industry Use Cases

Enterprise industries like Healthcare, Manufacturing, Financial Services, Banking, and Insurance are some of the largest consumers of output management solutions. Their environments require the ability to service high volumes of documents and data that often live within legacy EMR/EHR/ERP systems like Oracle Cerner, Epic, and SAP.

- **Banking, Financial Services, Insurance (BFSI) -** Financial organizations must ensure industry compliance requirements like GDPR, PCI DSS, and security protocols to protect client financial information and documents daily.
- **Healthcare -** Hospitals and clinics must provide continuous and timely patient care, which requires access and visibility to high volumes of clinical records that meet security and compliance standards like HIPAA.
- **Manufacturing/Logistics -** Manufacturing and distribution organizations rely heavily on documents and the ability to automate critical processes with those documents. As a result, downtime or failures creates costly disruptions to business efficiency.

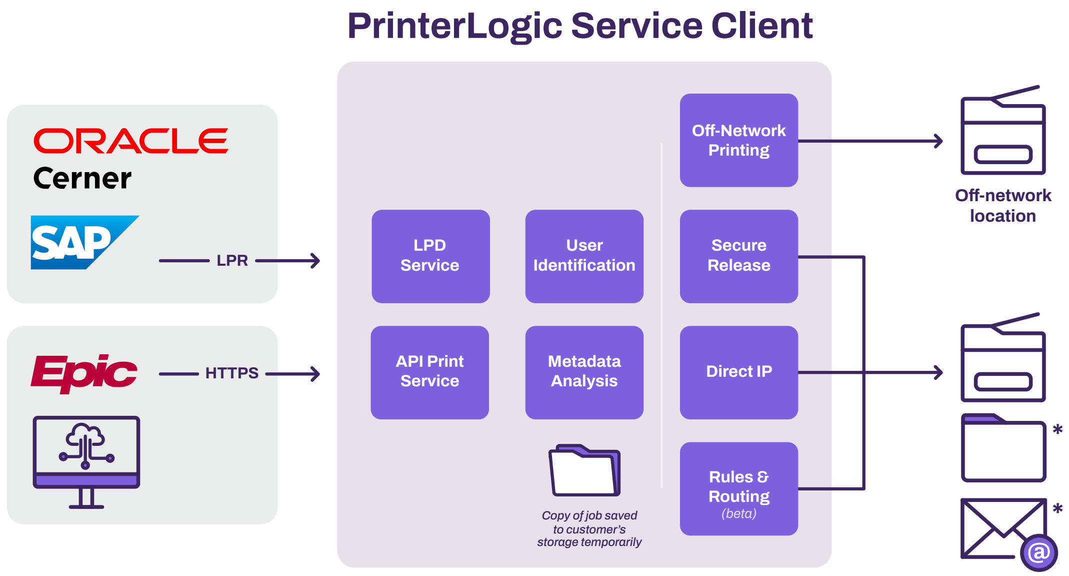
[1] Output Management Software Market by End-user, Deployment, and Geography - Forecast and Analysis 2023-2027, Nov 2022

PrinterLogic Output Management Connectors

PrinterLogic's Output Management solution offers seamless connections among top-rated EMR/ERP systems and web-based applications, to provide automated document routing, conversions, and delivery, all from a centralized location. The volumes and needs of our customers are continuously changing; as a result, we are purposely developing features within our Output Management solutions to enhance the document routing and automation experience. The connections to EMR/ERP systems unifies front and back end printing to seamlessly manage and direct outputs from core systems to various desired destinations, eliminating the manual intervention previously required and protecting critical business processes.

- **Unified Print Management** - Bridge the disconnect between legacy systems and general office printing from a single pane of glass.
- **Remote Printing Capabilities** - Send print jobs to and from remote facilities within the company network without expensive VPNs.
- **High Availability and Redundancy** - Ensure documents are received and delivered as expected with multiple failover scenarios to protect critical operations.
- **Consolidated Reporting** - Gain visibility into front and back end print activity.
- **Lower Operating Costs** - Cut down on the cost of multiple print management and secure printing solution licenses and from operational inefficiencies.
- **Digital Delivery** - Introduce paperless document processes by converting documents to PDFs and sending them directly to a digital storage folder or an email address.

How It Works



* The ability to route documents to digital storage or email will be available soon.

FIGURE 1: PrinterLogic receives print jobs from Oracle Cerner, SAP, and other applications supporting LPR protocols by routing to the desired printers via the LPD Service. Epic print jobs are received via the PrinterLogic Epic Connector, leveraging HTTPS and our API Print Service, which enables connectivity to additional web-based applications that do not natively support printing.

The Output Management Service

The Output Management Service facilitates a connection from applications like Oracle Cerner, Epic, SAP, and web-based systems and routes the document to a printer tray, digital storage folder, or directly to a recipient via email.

The line printer daemon (LPD) protocol receives print jobs from workstations on the same network using the line printer remote (LPR) protocol. The LPD Service resides on a **PrinterLogic Service Client**, a small software agent installed on a workstation or device with network access that is enabled by an administrator in the PrinterLogic Admin Console.

These ports receive print traffic and extract the documents' metadata, including who initiated printing, the targeted printer, and document printing details (e.g., duplex, B/W, output tray).[2] Based on that metadata and/or document characteristics, the print job is routed to the desired printer or held for release if requested. The metadata is also included in print job reports within the Admin Console, including details like initiating user, destination printer, timestamp, and filename.

[2] For a complete list of all metadata PrinterLogic stores, visit our documentation page.

Documents can route to the printer immediately with direct IP printing or be held encrypted on a Service Client to release later. As part of the Output Management solution, we're continuing to build and deliver digital solutions that allow organizations to streamline digital document processes, including the ability to send the documents to a shared digital storage location or an email address.[3] Additionally, administrators can establish output rules to automate complex printing processes for enhanced flexibility and control over their output processes with Rules & Routing.

Let's dive deeper into the individual output processes with Oracle Cerner, Epic, SAP, and the API Print Service.

Printing with Oracle Cerner

The Output Management Service receives print jobs via the LPR protocol from Oracle Cerner-hosted print queues. These print queues are directed to the IP address of the Output Management Service running the LPD Service. A load balancer, if employed within the organization's environment, redirects the job to a designated Service Client through its IP address to better distribute print traffic across the network.

When the LPD Service receives a print job, it examines the metadata to learn which user originated the print job and its intended destination. The print job is then printed via direct IP printing or held and released at a networked printer via Secure Release Printing over port 9100, or at an affiliate clinic printer via Off-Network Printing over port 443.

The Output Management Service allows administrators more control over print queue changes in cases of print failure. An administrator can redirect the connection laterally by simply rerouting the IP address of the Service Client to a new print queue to recover from failures quickly, without needing to contact Oracle Cerner to make the change.

Printing with SAP

SAP forwards print jobs to PrinterLogic via Access Method U (Unix Berkeley LPR) and the LPD Service. The SAP spool server builds the print job into a print-ready file format and is then sent and received by the LPD Service. SAP print queues are directed to the IP address of the Output Management Service running the LPD Service. A load balancer, if employed within the organization's environment, directs the queues to its virtual IP address, redirecting the job to a designated Service Client based on traffic.

[3] Document Conversions can automatically convert documents to different file types to meet standard and compliant formatting requirements.

When the LPD Service receives a file, it examines the metadata and document characteristics to learn which user initiated the print job and its intended destination. The print job is then either printed immediately over port 9100 via direct IP printing or through an off-network print queue via Off-Network Printing over port 443, or held for pull or Secure Release until user authentication at the printer to release it.

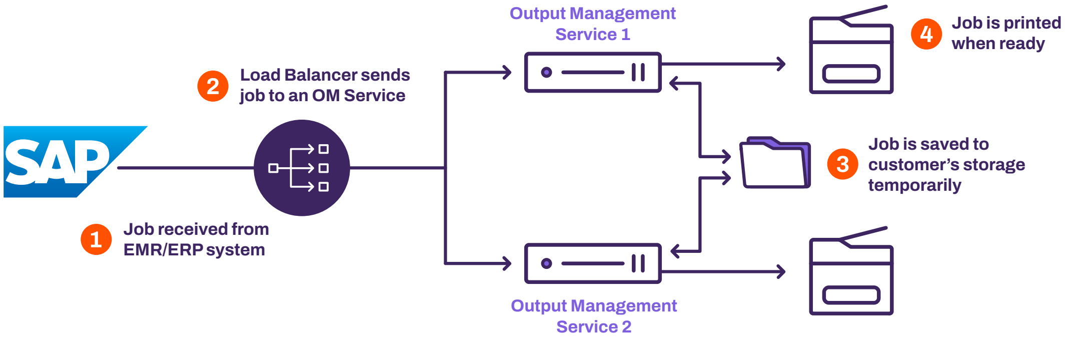

Output Management Service 1
4 Job is printed when ready
2 Load Balancer sends job to an OM Service
SAP
3 Job is saved to customer's storage temporarily
1 Job received from EMR/ERP system
Output Management Service 2

FIGURE 2: Print jobs are routed to redundant Output Management Service. A copy of the job is saved to a self-hosted shared storage location until the process is complete, then the file is removed.

Achieving High Availability

Any print interruption or failure is a detrimental loss of productivity and cost for daily operations that rely heavily on printing and other outputs. In a typical print server environment, administrators may set up multiple, often Windows, print servers behind a load balancer to split traffic and manage high print volumes. The challenge with this method is that it lacks central oversight of the print environment. If an issue occurs, finding and resolving it requires a high amount of searching and troubleshooting.

PrinterLogic's Output Management solution offers a robust failover scenario that catches errors and reroutes print jobs without needing the standard print server hardware or manual intervention. With a redundant Service Client(s) in place, as long as a print job has been received, it can be picked up if the original Service Client or queue fails.

Administrators can easily add additional Service Clients on workstations or servers for redundancy. If a print queue or Service Client were to fail, the load balancer simply routes to another Service Client. What's more, when the Output Management Service receives a print job, it stores a copy of the job on another Service Client temporarily for additional redundancy until the job has been successfully delivered, then the file is automatically removed.[4]

[4] Future functionality allows for retaining print files for reprinting later.

Printing with Epic

The Epic EMR connection functions slightly differently than the Oracle Cerner and SAP processes. Instead of leveraging the LPD Service, PrinterLogic integrates with the Epic system via Epic's Output Management API. Epic starts by building a print job into a document using the Epic Print Service. Admins can configure their system within Epic to send documents one of two ways:

1. Send the job to a print server where it is spooled and rendered by a driver and then forwarded to the printer.
2. Send the job to a pre-configured output management system like PrinterLogic.

The second option is where the PrinterLogic Epic Connector comes into play. Instead of rendering and printing the job via the print server, the Output Management Service receives and routes the job directly to the expected destination. An Epic administrator sets a URL for routing print jobs, then the Epic Print Service builds a document into a PDF, XPS, or text file. It then forwards the job, encrypted over HTTPS, to the assigned Output Management URL. If desired, the job will first hit a customer's load balancer to distribute jobs to as many redundant Output Management Service Clients as desired to prevent single points of failure.

The PrinterLogic Epic Connector receives the job, which analyzes the metadata and document characteristics and then temporarily duplicates it to a customer's shared storage for high availability. The PrinterLogic service interrogates the XML file included with the print job to learn about the destination printer, the user who initiated the job, print settings, and other relevant metadata for job delivery and reporting. If a Service Client fails while processing or holding a print job, a redundant Service Client sends the job instead.

Print jobs sent via direct IP printing are immediately forwarded to the printer. If Secure Release Printing or Off-Network Printing is used, the job is held on the Service Client until the user authenticates at the printer, where it is then released and printed. At this point, all stored redundancy data is deleted.

Printing with the API Print Service

Some organizations utilize web-based cloud applications that don't have a native printing function or capabilities to connect via LPD/LPR. With specific code elements, we can ingest the necessary information and easily connect to Output Management leveraging HTTPS. This is similar to the Epic Connector, where the original application communicates via API to the Output Management web service.

The API Print Service runs as an HTTPS web server and can receive print jobs from the originating application using API post requests. The request includes metadata about the print job, including the name of the destination printer matched to a PrinterLogic print queue, to determine where to send the print job and what automation or settings to apply.

The Output Management Service receives the job, analyzes the metadata, then encrypts and holds a copy of the job for redundancy until after the document has been successfully delivered. Any copies are deleted immediately after printing. Users can hold and release their print jobs in the office or to and from a remote location as long as the domain or IdP usernames are included in the HTTPS request.

Maintaining Zero Trust in Your Print Environment

Since PrintNightmare halted print server operations in hundreds of organizations in 2021, adopting Zero Trust principles within print environments has been top of mind. This initiative is familiar, especially when dealing with personal client data and sensitive business information daily. Zero Trust ensures all user identities are verified upon authentication and login to avoid adverse parties from gaining access to systems and documents.

Features like Secure Release Printing, requiring a two-step authentication process before a job print, and Off-Network Printing, enabling printing to a printer behind a network firewall to users with internet access, prevent these scenarios and maintain Zero Trust principles throughout the printing process for document and data integrity throughout the organization.

Secure Release print jobs are held on the Service Client and released at a networked printer after a user authenticates their identity. The end user must be identified via Active Directory to hold and release a print job.

Off-Network Printing is valuable for any organization with multiple offices or contractors and remote employees that need to print cross-location. Hospitals and their affiliate clinics with traveling doctors and nurses need to be able to print vital patient records as they go from one location to another, without requiring IT to add them as new users every time. This also eliminates the need for VPNs for printing in firms that work with third-party sites or sister offices.

Achieving Security and Compliance Standards

Many organizations are subject to data protection and compliance standards protecting sensitive client, patient, and partner information.

The following are examples of common regulations that organizations must adhere to:

- **The Health Insurance Portability and Accountability Act (HIPAA)** sets standards for the protection of individually identifiable health information (protected health information or PHI) and mandates the implementation of safeguards to protect electronic PHI (ePHI) and ensure the confidentiality, integrity, and availability of patient data. HIPAA regulations also impact insurance companies that handle health-related data.
- **General Data Protection Regulation (GDPR)** governs personal data protection across the European Union. Institutions that process the personal data of EU citizens must comply with GDPR's data protection requirements.
- **Sarbanes-Oxley Act (SOX)** is a U.S. law that imposes corporate governance and financial reporting requirements to protect investors and the public from accounting fraud and financial misconduct.
- **The Payment Card Industry Data Security Standard (PCI DSS)** protects payment transactions to prevent personal financial information loss and potential fraud.

As an ISO 27001:2013- and SOC 2 Type 2-certified solution, PrinterLogic SaaS has undergone rigorous investigation to ensure the solution meets industry security and compliance standards. Enterprise organizations can easily maintain and stay up-to-date with regulations through user-level print activity reports within the Admin Console and secure printing capabilities that protect print data from system to print tray. All print jobs originating from front-end office printing or back-end systems are accounted for with auditing so administrators can easily manage requirements.

Conclusion

As the demand for solutions that can be utilized with previously entrenched EMR/ERP applications increases, PrinterLogic's Output Management has become the trusted solution to link those processes and seamlessly unify and automate document management. This allows administrators more granular control and visibility into activity across various applications, improving security practices and compliance with industry regulations while creating more efficient workflows.

PrinterLogic's Output Management solution is available as an add-on bundle for PrinterLogic SaaS or VA core licenses. If you want to gain more granular control and visibility over your environment within a unified platform, schedule a demo with a representative of the Vasion sales team today.