WHITE PAPER

Key Elements to Successful High Volume Distributed Card Issuance

Achieving Increased Productivity, Reliability and Security in Organizations Employing Distributed Credentials Issuance

Overview

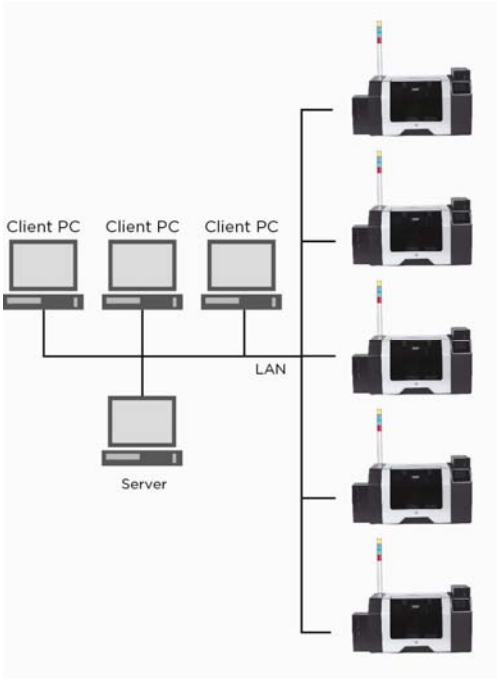
High duty cycle distributed card issuance is easily scalable, lowers operational and service costs and optimizes credential output – whether each finished credential requires physical, electronic or visual personalization, or any combination of these elements.

Scalability, cost savings and optimized output make distributed card issuance a viable, effective alternative to centralized issuance for government agencies, card service bureaus, large universities and corporations. This white paper highlights key elements of a productive, secure and reliable distributed credential issuance system.

Distributed Card Issuance Defined

Distributed card issuance enables greater flexibility with regard to system structure, allowing more customized solutions to meet organizational needs. By design, a distributed system may be structured in one of three ways:

1. **Grouped**. A group of printer/encoder units networked together in a single location can produce moderate to increasingly larger volumes of identification cards in continuous batch runs. Multiple units located in a centralized facility provide the benefit of print array redundancy to ensure continuity and simplified maintenance during card production shifts. In the event an individual printer/encoder is taken offline for routine maintenance or service, the remaining printers in the system can continue card production.
2. **Geographically dispersed**. Individual printer/encoder units in geographically dispersed locations can be securely networked, sharing one or more common or centrally managed databases. This allows, for example, governments to issue citizen IDs through a central database to multiple sites serving distinct population centers.
3. **Combined**. Geographically dispersed groups of printer/encoder units leverage benefits of both grouped and geographically dispersed structures, providing the insurance of site redundancy.



In contrast to the distributed issuance system options described above, a centralized issuance operation is dependent on a lone, large-volume printer and card production is suspended during extended periods of maintenance, hampering productivity. Further, for multiple-site entities, centralized distribution can add time and

expense to the credentials distribution process; either finished credentials must be packaged and sent to individuals, or card recipients are required the inconvenience of travel to a centralized location to obtain credentials.

Key Printer Selection Criteria

When networking printers into a high duty cycle distributed card issuance system, five important system criteria should be considered:

1. Flexible print technology
2. Printer system reliability
3. System performance
4. Operational convenience
5. System scalability

Flexible Print Technology

When building a high duty cycle distributed card issuance system, it is important to specify printers that seamlessly integrate all relevant printing and encoding elements for the finished credentials. This will ensure maximum productivity, reliability and security.

A broad spectrum of identification card materials and electronic components are in use today. Composite card materials are often used to lengthen card life, including PVC, PET, PETG, ABS, PC, and new configurations are likely on the horizon. Organizations should consider both current needs and future expectations for ID card composition. Accordingly, the selected printers should accommodate potential variations in card composition, material or thickness.

Organizations must also consider the embedded electronic elements of the ID card – contact and contactless smart chips or combination technologies – to ensure encoding requirements are met.

When it comes to print technology, retransfer or high definition printing (HDP®), offers distinct advantages over traditional direct-to-card printing. With HDP, a dye image is reverse-printed onto the underside of an adhesive film. The film is then transferred to the card surface, adding a durable layer of protection to the card and its components. The HDP process, wherein the printhead avoids direct contact with the card surface and any embedded electronics, is preferred for personalizing technology cards and mitigates the risk of damage to the electronics. Further, retransfer film conforms to ridges and indentations in the card surface, making it compatible with a wider array of card materials and thicknesses.

Printer System Reliability

Most card printers are not deployed into contaminant-free, climate-controlled environments. High duty cycle printing systems are generally at high risk for exposure to contaminants, pollutants and debris. These conditions can reduce the quality of finished cards, resulting in lower yields from batch card printing operations, and can cause premature wear on printer systems.

In fact, internal printer environments are subject to high temperatures and exposure to unanticipated airborne debris during operation. In high-duty environments, continuous high heat inside a printer may disrupt card throughput and severely distort finished credentials, reducing print productivity and increasing the total cost of operation to organizations.

For best results, choose printers that are ruggedized for continuous operation in tough environments. Following is a checklist of features that will help ensure the reliability of a high duty cycle printer unit:

- Redundant card cleaning systems that routinely remove contaminants and debris from card surfaces during the personalization process.
- Heavy-duty positive air flow and internal filtration systems that ensure consistent, stable performance.
- Rugged metal construction, for durability and tamper-resistance.
- Electronic temperature sensors that control print settings for optimal quality and performance.
- Strong printer stepper motors that maintain card throughput during extended batch and shift printing.
- Efficient card input gate systems to eliminate multiple card feed issues.
- Enhanced material handling systems with high duty cycle metal components to prevent ribbon breaks and film errors.
- Finely-tuned consumables cartridges with precision rollers and aluminum spindle shafts for consistent print image production.
- Lifetime printhead warranty and a three-year warranty on all other components.

System Performance

The success of an organization's card identification system is directly related to credentials issuance security, personalized card throughput, and the efficacy of the finished ID cards. Therefore, the mission of a card issuance program is to produce valid credentials, at a rate commensurate with demand and in a form that will perform reliably over the useful life of each issued card.

Issuance Security

The first level of security in a high duty cycle card issuance system limits operator access to its physical components. Mechanical locks should restrict access to printers, including card input and output hoppers and rejected cards. Further, physical locks should be placed on all access points to protect ribbon and film consumables.

Electronic security is also critical. Ideally, operator access to each printer is controlled via personal identification numbers (PIN). Print job data packets should meet or exceed advanced encryption standard, such as (AES) 256 bit data encryption, to ensure system privacy, integrity and authentication to the final issuance endpoint.

An often overlooked area that can significantly reduce the risk of identity theft is to ensure automatic elimination of personal data on used ribbon panels.

Card Throughput

With sophisticated microprocessors at their cores, contemporary card printing and encoding systems are capable of performing multiple operations simultaneously, yielding card throughput efficiency and speed. Each individual station can work independently, yet simultaneously with other printer/encoder units, to seamlessly print visual personalization, encode data via one or multiple technologies – magnetic stripe, smart card, or proximity – and finally to apply layers of secure, protective lamination.

Multiple print mode settings introduce varied card throughput rates based upon the organization's card design. Higher throughput card personalization speed for cards requiring graphics-only personalization may be alternated with higher definition, high resolution image quality personalization requirements and the flexibility to print at more traditional card throughput speeds.

Another feature that can enhance throughput is a dual input hopper. When one card type is being issued, the printer will pull blank cards from the full hopper, while the second hopper is being refilled, enabling continuous operation. If multiple card types are being issued, each printer can automatically select between two card blanks to produce the correct credentials for each card request, eliminating the need for manual hopper changes during multi-card-type production.

Credential Efficacy

Ultimately, the efficacy of any identification system comes down to how effectively the issued credentials meet the demands of use over the desired life of the card.

This is another area in which HDP, or retransfer, print technology provides distinct advantages. HDP film protects printed images, creating more durable credentials and providing clear visual evidence if tampering is attempted.

For additional security and durability, organizations may choose from specialty retransfer films, which may incorporate visual security elements to deter counterfeiting – such as custom holograms, fluorescing images or microtext – and provide improved card abrasion resistance for long-life use.

To maximize security and durability, and significantly extend card life, additional in-line card lamination may be applied over the retransfer film that can further extend life to the card and varying levels of overt or covert visual security elements.

Operational Convenience

Even the heartiest machines require routine maintenance – from reloading card hoppers and changing ribbon cartridges, to dislodging the occasional card that has jammed. Advanced printers are engineered to minimize operator time and effort required for maintenance, thus maximizing uptime and system throughput.

When repair is necessary, the more quickly a technician can identify the problem and implement a solution, the more quickly that printer gets back online. Often, diagnosis requires technicians to physically examine individual machines to assure each is operating properly. However, today's more advanced printers are equipped with automated diagnostic systems that can alert operators as issues arise, via andon lights or graphic displays; touch screen interfaces and Help screens enable easier problem identification and resolution.

The objective is to seek solutions that lower the total cost of operation while reducing downtime. Look for the following features to help ensure operational ease:

- Visible card feed mechanism: Enables unobstructed operator access to cards in print, programming or lamination stages to quickly identify and remove card jams.
- Card personalization reject bin: Automatically segregates mis-programmed cards from completed cards.
- Dual high-capacity input and output hoppers: Enables continuous card personalization runs, while reducing frequency of operator intervention for loading and unloading.
- Touch screen display: Provides intuitive graphical interface for system feedback and operator input.
- In-line card flattening mechanism: Minimizes and corrects post-personalized warpage due to variation in card material construction and improves throughput yield.
- Sealed print mechanism: Mitigates risk of card contamination during print process.
- Dual-cleaning stations: Pre and post personalization, to ensure optimal quality of finished cards.

System Scalability

The modular architecture of distributed card issuance systems enables greater versatility and flexibility. Field upgradeable modules may be easily added to meet current or future specialized credential needs, such as:

- ISO magnetic encoding
- Large capacity card input hoppers
- Dual-side printing
- Contact or contactless card encoding
- ISO card flattening
- Single- or dual-sided lamination
- Laser engraving

The volume of card output is also easily scalable with distributed card issuance systems. When building an initial system, an organization can specify a network of printers that precisely meets current needs with regard to output. As the organization grows and card issuance needs increase, the network can expand in defined increments to meet demand simply by connecting additional printers. Inversely, if credentials issuance needs decrease over time, output can be trimmed by reducing the number of printers in the network.

About the author

As the world leader in distributed credentials issuance, HID Global pioneered the High Definition Printing™ (HDP®) – or retransfer printing – process, and continues to lead the industry in applying HDP to produce more secure, reliable identification cards. HID Global's secure issuance solutions provide the most comprehensive array of printers for custom card personalization, from creating high-quality color photo IDs to encoding smart cards. With the industry's first fully modular, scalable and future-proof Direct-to-Card (DTC) and High Definition (HDP) printer portfolio, along with its complete line of visual security products and accessories, HID's secure issuance solutions meet the card customization needs of small businesses, global enterprise organizations and government agencies worldwide. HID Global also offers complete card read/write interoperability for all Genuine HID™ and other technology cards.

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