Analysis


Production Printing & Media

May 2012

# Global Graphics Demonstrates Power with Latest Harlequin RIP

*Harlequin well-placed to Benefit from Emerging High-speed Print Opportunity*

**Service Areas**

Production Workflow Solutions

**Prepared for**

GLOBAL GRAPHICS software

Comments or Questions?

InfoTrends A Questex Company

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## Executive Summary

Global Graphics, a long standing raster image processer (RIP) developer, has just launched its Harlequin Host Renderer 3 (HHR3). This product is a highly-configurable RIP that digital hardware equipment manufacturers can use in their digital front-ends (DFEs) to drive their print equipment.

To demonstrate the power of the HHR3, Global Graphics asked RIT to do a speed test and commissioned InfoTrends to write an analysis on its technology and the findings of the speed test. The results show that a typical configuration of the Harlequin RIP can easily drive most printers at a speed that is well in excess of the rated speed of the device. When needed, the architecture is also scalable enough to get more performance by adding additional RIPs.

### Key Findings

- The high-speed (inkjet) printing market is expected to grow phenomenally in terms of speed, width, and productivity, which will put tremendous requirements on the RIP in terms of data throughput and processing power. Global Graphics has demonstrated it can play in this market with highly efficient, scalable, and robust technology.

- The Harlequin product is based on an architecture that allows for efficient, parallel rendering using multiple CPUs. Global Graphics has also developed technology that automatically detects and optimizes variable data jobs, which increases performance and removes the need for proprietary VDP languages.

- With the PDF-playing field leveled because of PDF being an open standard now, Global Graphics is well positioned to drive high-end PDF ripping and benefit from the AFP/IPDS to PDF migration.

### Recommendations

- OEMs developing high-speed, high-volume printing equipment should consider adding Global Graphics to their evaluation list when sourcing RIP technology.

- OEMs that develop mid-range or office type equipment will also benefit from Harlequin technology. While the scope of this white paper is on the high-end (as optimization plays a bigger role there), the product comes with flexible and cost-effective licensing that make it a good fit for those markets, as well.

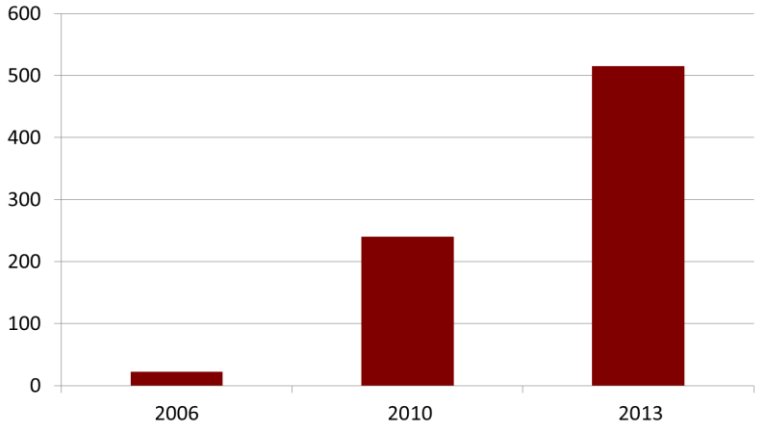
## Introduction

Digital, continuous-feed color inkjet is the fastest growing segment in the printing industry. High-speed printing, however, puts tremendous requirements on the DFE in terms of data processing speed and throughput. With its long history and strong background in high-speed ripping, Global Graphics is in a strong position to benefit from this emerging high-speed printing opportunity. This whitepaper explores the strengths of the Harlequin RIP technology and highlights the role Global Graphics plays in shaping this changing print landscape. The paper also features an independent speed-test carried out by the Rochester Institute of Technology (RIT) to demonstrate the performance of the Harlequin technology.

## The High-speed Printing Opportunity

Digital, continuous-feed color inkjet is rapidly growing. InfoTrends expects worldwide print volumes for those devices to grow by 40% year-over-year between 2012 and 2017. Placements will double in the next two years as new models and new vendors are entering the market.

**Figure 1: Exponential Rise in Continuous Feed Inkjet Printer Placements, North America and Western Europe**




*Source: InfoTrends High-Speed Continuous Feed Color Inkjet Opportunity, 2011*

**15GB**

***per second*** is the amount of data required to run an HP T400 Web Press at rated speed (600 ft/min)

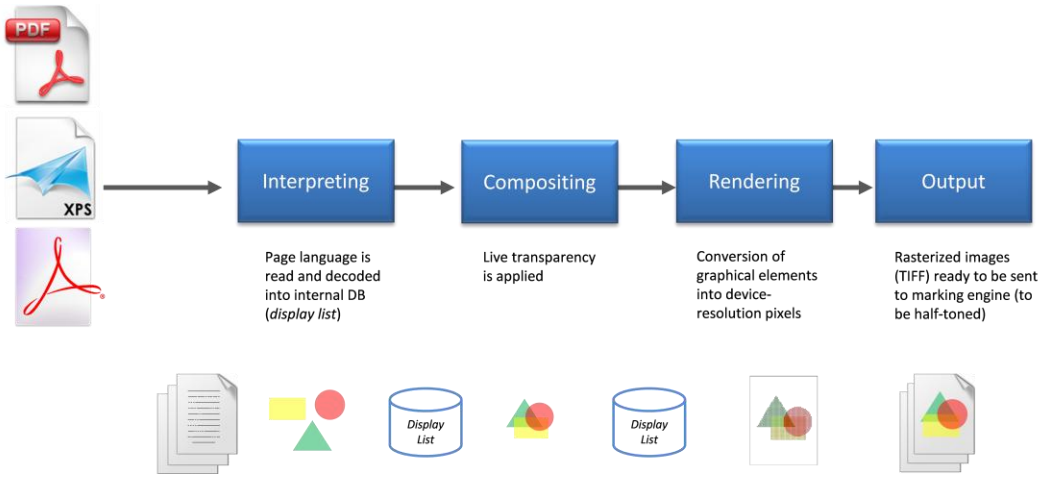
High-speed printing puts a big requirement on the DFE in terms of data processing speed and throughput, especially when personalization or graphically-intense elements, such as live transparencies, are involved. As the technological limits of inkjet printing in terms of printing speed and width are still a long way from being achieved, we can expect the requirements for faster data processing only to grow phenomenally in the decade to come.

The Harlequin RIP is Global Graphics' premier offering in the digital print production space.

## Harlequin Technology

The core of the Harlequin technology is a Raster Image Processor (RIP) that converts incoming page description languages, such as PostScript or PDF, to a machine readable output raster using a variety of screening techniques. The Figure below explains the four key RIP phases.

**Figure 2: The RIP process explained**




The Harlequin RIP technology goes back to 1988 when it was first released as a PostScript renderer under the name ScriptWorks, providing an alternative to Adobe's Configurable PostScript Interpreter (CPSI). Over the years, Harlequin was extended with the need to support more data formats; multi-core CPU processing; and various in-RIP capabilities, such as font emulation, color management, trapping, imposition, and more screening options.

Harlequin has supported native PDF processing since 1997 and live transparencies since 2002, which is much earlier than other players in the market. As a result, the Harlequin technology is generally considered to be a mature and a well-performing RIP solution.

Harlequin comes in three product versions:

1. **Host Renderer SDK**
    - A highly optimized, configurable Harlequin RIP component that OEMs or Independent Software Vendors (ISVs) can use for high-speed RIPing.
    - A single DFE can contain multiple Harlequin Host Renderers, and each host renderer benefits from multi-threading, multi-core CPU processing and other speed-enhancements capabilities.
        i. For light and medium production devices, a single RIP with multiple threads is typically sufficient

ii. For high-volume production printers, multiple RIPs (with multiple threads) are typically used in a RIP farm

- The Host Renderer is found in the HP SmartStream Production Pro and Ultra Print Servers, as well as in other products.

2. **Embedded SDK**

- This version enables manufacturers of Multi-Functional Peripheral (MFP) and other office and SOHO printers to use Harlequin technology to power their embedded controllers. Korea-based MFP provider Sindoh is a Harlequin Embedded SDK customer.

3. **Server RIP**

- The Harlequin Server RIP is a flexible RIP server that OEMs or ISVs can use as a RIP server with their own Graphical User Interface (GUI).

For inkjet or high-speed production print manufacturers looking for RIP technology to power their products, the Harlequin Host Renderer is the component that is most suited.

## Key Strengths of Harlequin

As inkjet is getting faster and enables higher-quality printing, there is a higher demand for specialized ripping solutions. Global Graphics' aim is to provide this type of technology that gives OEMs enough fire-power to meet their growing demands.

**Table 1: Key Strengths of the Harlequin Host Renderer Technology**

| Key Strength | Explanation | Benefits |
|---|---|---|
| Optimized for high-speed | Multi-core and multi-threading capabilities, as well as a "Parallel Pages" feature, which allows multiple pages to be interpreted and rendered at the same time | High-speed RIPing at lower cost by maximizing available hardware |
| Scalability | Flexible architecture that allows for high scalability—up to hundreds of RIP instances can be run simultaneously, depending on the architecture of the DFE | Harlequin can drive a range of print devices, from low-end to very high-end |
| Handling of large files | Harlequin is designed to handle large jobs with a very high number of pages | No need to break large jobs into multiple smaller jobs; A single PDF can fill a paper roll, which avoids the risk of needing to stop the continuous-feed printer mid-roll |
| Graphic arts output quality | Harlequin comes with screening functionalities as well as in-built color management and color separations for high-quality output | Strong heritage in graphic arts technology that enables Harlequin to generate high quality digital output |

| Key Strength | Explanation | Benefits |
|---|---|---|
| Accuracy | The rendering of graphic files, especially when they contain live transparencies, is a technologically complex process | Long standing experience and proven technology |
| In-RIP workflow features | Supports trapping, calibration, font-handling, imposition, and more | No need for additional solutions |
| Variable Data Support | The Harlequin VariData feature reduces VDP complexity by enabling efficient reuse of re-occurring objects. In external mode, rasters are managed and merged post-RIP using vendor-supplied technology. The internal mode provides an easy entrance for digital press vendors into VDP optimization by caching and merging all rasters within the RIP itself | The Harlequin VariData feature significantly reduces the amount of RIP data, and thus time; it also removes the need to use proprietary VDP languages |
| Native PDF rendering | Supported since 1997, native PDF rendering removes the need for conversion to PostScript; PDF/VT is supported since 2010 | Increased print output consistency and higher speeds |
| 64-bit on Windows and Linux Operating Systems | The Harlequin RIP is available as a 64-bit application under Windows and Linux | 64-bit computing enables the Harlequin RIP to use more than 4GB RAM memory (under 32-bit), which helps to gain higher RIP performance at a relatively small investment |

## The Rising Importance of PDF in High-volume Printing

The Harlequin RIP supports native PostScript, PDF (including PDF/VT), and XPS rendering. According to InfoTrends' latest DFE study (2011), PDF is the top page description language (PDL) for static and variable print. Close to 99.6% of print service providers use or expect to use PDF for the production of professional print.

### The Leveled Playing Field of PDF

Adobe, developers of the PDF document format, decided to relinquish control of PDF to the International Organization of Standardization (ISO) in 2008. By doing this, PDF became an open industry standard for document exchange that helps developers across the world to achieve compatibility and influence the development direction through becoming part of ISO's working groups.

Besides the normal PDF standard (ISO 32000-1), additional subsets have been defined. The three most well-known subsets include:

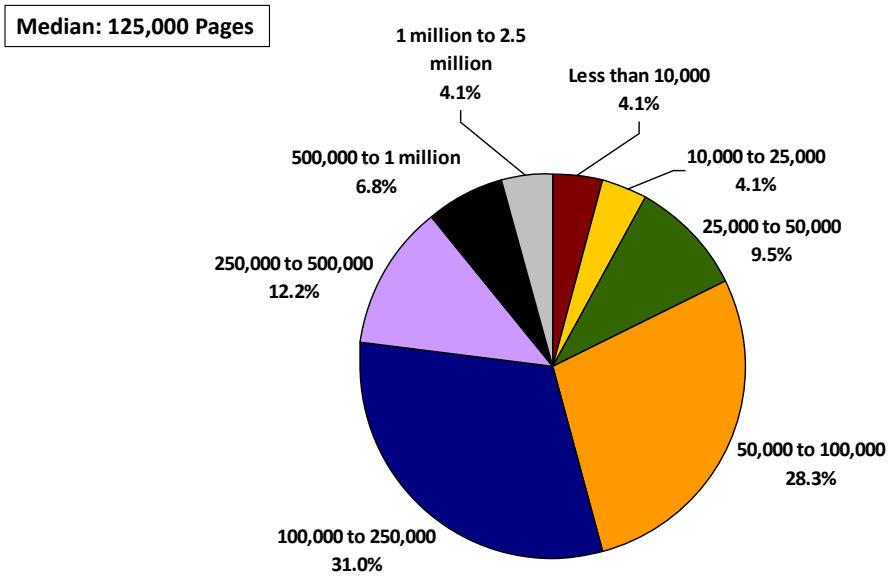
- **PDF/X:** Specialized exchange format for the printing and graphic arts industries that has additional requirements, such as the embedding of fonts
- **PDF/A:** Format optimized for the digital preservation of electronic documents by excluding features that are ill-suited to long-time archiving (e.g., the inclusion of external references, JavaScript, video or audio files, or encrypted content)
- **PDF/VT:** Specialized format for variable data jobs that comes with support for live transparencies; ICC-color profiles; and efficient processing of repeating text, graphic, or image content
    - PDF/VT can consist as a self-contained file or be streamed from the host application to the RIP software

The PDF subsets have been developed by committees of leading industry experts, including hardware and software vendors as well as end users. Global Graphics has been a member of those working group committees, and its CTO Martin Bailey is considered to be the U.K.'s principal expert on ISO for PDF, PDF/A, and PDF/VT. Not surprisingly, Harlequin technology supports all PDF file formats natively. Global Graphics is committed to continue to influence the development of PDF in the future and especially want to make it work well in high-volume environments.

## Variable Data Processing

It is important to realize that the number of pages in a typical variable data processing (VDP) job in data-driven, high-volume environments is of a completely different magnitude than what is found in a typical print on-demand (POD)/graphic arts print shop. In a data-driven environment, the median number of pages is close to 125,000 (U.S. Letter equivalent), while a typical Graphic Arts VDP job has about 500 *records* (most promotional VDP jobs are placed 2- or 4-up on a page). As a result, ripping performance and support for large files is of much more importance in high-speed and high-volume environments than in graphic arts.

**Figure 3: Average Variable Data Page Count in High-volume Environments**




N = 74 Respondents that work for a Database Marketing/Direct Mail Company, In-plant Data Center or a Data Processing Printer/Service Bureau

*Source: InfoTrends Digital Front-End Study, 2011*

125k

125,000 pages is the average page count (median) for a variable data job in transactional environments. The average VDP job in commercial print is less than 500 pages.

## The Convergence of Transactional and POD

As the inkjet revolution has only just begun, faster and higher print quality products will come on the market in the coming years. We can also assume that the cost per page will continue to decline as adoption rises and manufacturers are getting more scale.

As a result, more print service providers (PSPs) will invest in inkjet. There is also a need to fill those machines, which will increasingly happen with a mix of applications. For instance, service bureaus that primarily produce transactional documents are looking to capture more POD work, while commercial printers are making steps in the transactional or direct mail space.

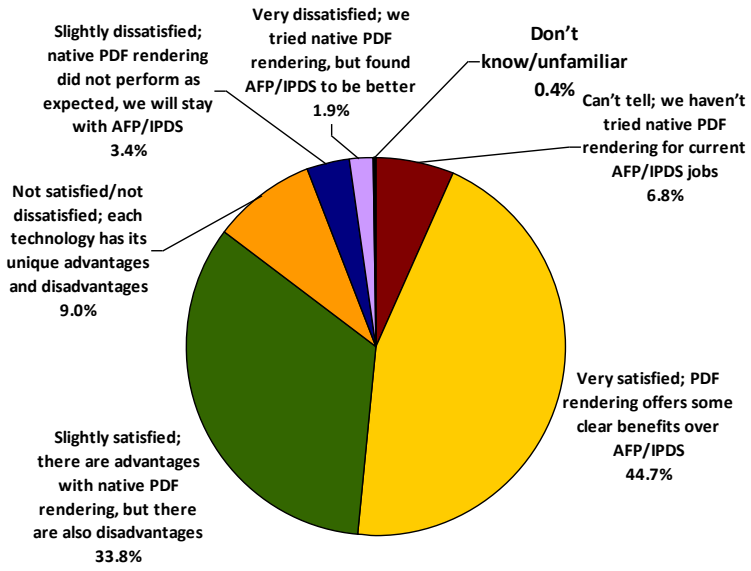
From a data format perspective, InfoTrends firmly believes there is a place for AFP/IPDS on the high-end (transactional only), but there are increasingly clear benefits for a PDF-based workflow on the cross-over point, which tends to be more medium-sized providers:

- PDF (including PDF/VT) enables PSPs to continue using their PDF-based workflows, which includes preflighting, proofing, and imposition solutions
- PDF is a universal format familiar to print buyers
- PDF and PDF/VT can be easily exchanged
- PDF is typically more cost-effective than implementing a AFP/IPDS workflow

Recent research from InfoTrends confirms that PSPs that use native PDF rendering and AFP/IPDS see a clear benefit of using PDF over AFP/IPDS, see the Figure below.

**Figure 4: Room for PDF/VT next to AFP/IPDS**

Q: What are your experiences with native PDF rendering versus AFP/IPDS-based rendering?




N = 266 Respondents that use native PDF rendering and AFP/IPDS

*Source: InfoTrends Digital Front-End Study, 2011*

For Global Graphics, the move to PDF in high-volume environments is important as this plays perfectly to the strength of their product offering. The speed test from RIT confirms that the latest edition of Harlequin Host Renderer is well-suited to power this emerging inkjet print opportunity.

## Harlequin Speed Test by RIT

The Rochester Institute of Technology (RIT) School of Media, under auspices of Administrative Chair and Gannett Distinguished Professor Chris Bondy, has conducted a speed test to independently validate the processing power of the Harlequin RIP. The speed test was carried out at Global Graphics' headquarters in Cambourne, U.K. in March 2012.

The test file suite, developed by RIT, was composed of files in six different categories, see Table 1. For each category, multiple test files were created with different page counts and

characteristics to reflect the variety in real-world production jobs. Each test file was ripped twice using a server that consisted of ten RIP instances. The speeds recorded were then averaged across the two experiments and the ten RIP instances. The average speed per RIP for each job category is presented in Figure 6.

## Test Hardware

The DFE was installed on an HP ProLiant Density Line server. This is a complete server unit that does not share components (like power and cooling) with other servers. In this sense, it is not different than a normal computer but it has the advantage that it can be placed in a server rack and be easily scaled. While HP equipment was chosen for this test, the Harlequin RIP can run equally well on hardware from other manufacturers.

At time of writing, the retail cost for the HP ProLiant DL 360 G7 unit is around $7,000 (€5,300 or £4,400). As the speed results will show Harlequin RIPs running on a single server like this provide enough power to drive most of today's available print devices on the market. For certain demanding RIP applications, multiple servers are needed.

**Figure 5: HP ProLiant DL360 G7**

**Table 2: RIP Test Computer Specification**

| | |
|---|---|
| Manufacturer | Hewlett-Packard |
| Model | Proliant DL360 G7 |
| Processors | 2 |
| Processor Model | Intel Xeon X5670 @ 2.93 GHz (6-core) |
| Installed RAM | 12 GB |
| Hard disk | 280 GB |
| Operating System | Windows Server 2008 R2 (64-bit) |
| RIP product | Harlequin Host Renderer SDK 3 |

## Test Suite

The RIP print test files were created using InDesign, QuarkXPress, XMPie, and GMC. These software applications provide good representation of the standard production tools used to create static and variable data pages for the six sample categories.

The obtained ripping speed is a function that involves many variables including how well the document is designed, the image resolution used, level of transparency, coverage, and the usage of variable content. The speed test in this analysis provides an average based on

real-world production jobs and should provide a good indication of how well the Harlequin RIP behaves in practice.

**Table 3: RIP Speed Test File Categories**

| Type[i] | Number of tests | Pages per test file | Description |
|---|---|---|---|
| **Labels**  | 6 | 50<br>125<br>500 (4x) | From simple address labels to complex labels with text, image (raster), and graphics (vector) variables on each unique label in multiple-up impositions |
| **Complex VDP**  | 10 | 500<br>5,000 (5x)<br>10,000 (4x) | Advanced Promotion and Direct Mail. Live PDF transparency in 10% of the test pages. Complex VDP files also include single-use or variable images. Imposition of multiple items (e.g. postcards) with full-bleed backgrounds selected from a small set of options for each recipient |
| **Simple VDP**  | 8 | 5,000<br>10,000 (7x) | Transaction/TransPromo documents. Image data in device CMYK color space and no live transparency. Simple VDP documents have considerable re-use of page elements. Reoccurring objects were placed in the same location, scale, and rotation on the page |
| **Publication**  | 5 | 8<br>16<br>32<br>64<br>98 | Books, Magazines, and Manuals. These test files are designed with standardized U.S. letter page size and designed to be bound on the left edge of a portrait page with ring/comb-binding, or saddle-stitched or perfect bound. PDF transparency is used for approximately 10% of the pages |
| **Commercial**  | 5 | 1<br>2<br>4<br>8 (2x) | General Office/Presentations, Proposals & Reports, and Promotional Brochures. Typically very few pages, from a single side to a single 4/1 or 4/4 page with heavy coverage. Generally half-folded, z-folded, gate-folded, or can be a small saddle-stitched booklet |
| **Photo Book**  | 5 | 24 (5x) | The photo book test files have heavy image coverage, typically with RGB images and have live PDF transparency on approximately 5% of the pages. |

Note that the difference between simple and complex VDP does not relate to the complexity in designing the document or the sophistication of business rules, but to the complexity that is found from a ripping perspective (e.g., level of coverage, variable elements, or transparencies).

## RIP Test Results

Figure 6 shows the speeds that RIT has measured for the different print types. Pages were rendered at 600dpi to CMYK, representing a typical digital press. Output was in 8 bits-per-pixel contone with a mask; suitable for use in post-RIP aggregation technologies.

For VDP and labels, a single Harlequin RIP instance of our test server ripped, on average, between 1,905 ppm and 3,269 ppm. Please note that the Harlequin VariData optimization technology provides additional speed benefits here (See Table 1). Ripping speeds slow down when heavy coverage and imagery is introduced, as those characteristics limit the amount of optimization that can be applied. Nevertheless, even when large amounts of calculation are required, the Harlequin Host Renderer 3 provides enough firepower to drive most printers with a single server, certainly on the cut-sheet side. It is also important to note that every page in the test file is unique. In real-world production, publication and commercial applications especially have run lengths that are longer than one which equates to faster speeds as the DFE can re-use those pages and does not need to rip them again.

**Figure 6: Measured Speeds of a single Harlequin RIP by Category**

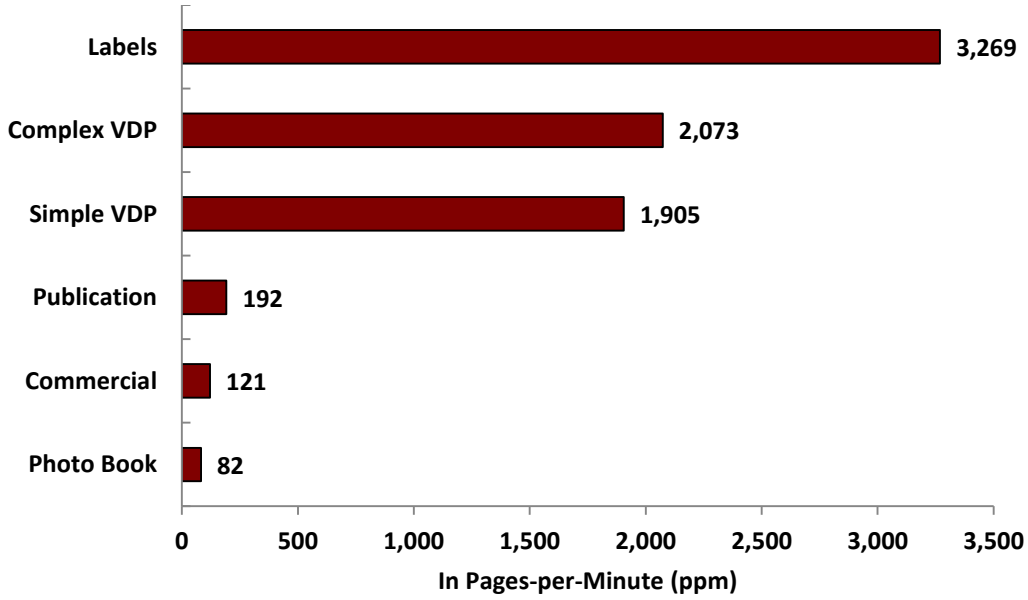



Table 4 provides an overview of selected printer models and the number of Harlequin RIP instances that are required to drive those machines based on the speed test results from RIT. The first and second column states the model and speed of the machine in pages per minute (U.S. Letter equivalent). For the label printing presses, we have calculated print speed based on the linear speed of the device and the number of n-up pages that fit the printing width (2-up landscape for the Xeikon and 1-up portrait for the Indigo).

We also multiplied the stated engine speed by 2.5 to account for the fact that jobs are not always well-designed and some of those may impact performance. Assuming that the RIP speeds as mentioned in column 'PPM 2.5x' would be able to drive a machine at rated

speed, we then provided for each application category the number of Harlequin instances required, as well as the number of servers between brackets. The speeds shown below each category description are results from RIT, see Figure 6.

It is important to note that the number of RIP instances and servers are *theoretical values* based on measurements using average hardware. In practice, the number of servers on the high-end can be reduced by using higher-spec hardware and the Harlequin RIP can be further configured to the specific demands of each unique print category.

**Table 4: Required # of Harlequin RIP instances (or Servers) by Print Device**

| | | | RIP once, print many | | Re-using cached elements | | | Every page is unique (single run length) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Publ. | Com. | Labels | Complex VDP | Simple VDP | Publ. | Com. | Photo Book |
| **Print Device** | **PPM** | **PPM 2.5x** | *14,400 ppm** | *6,050 ppm*** | *3,269 ppm* | *2,073 ppm* | *1,905 ppm* | *192 ppm* | *121 ppm* | *81 ppm* |
| HP T410 Color Inkjet Web Press | 5,000 | 12,500 | 1 (1) | 3 (1) | - | 15 (2) | 16 (2) | *162 (16)* | *258 (26)* | - |
| Kodak Prosper 5000XL | 3,600 | 9,000 | 1 (1) | 2 (1) | - | 10 (1) | 11 (1) | *117 (12)* | *185 (19)* | - |
| Kodak VersaMark VX5000 | 2,180 | 5,450 | 1 (1) | 1 (1) | - | 6 (1) | 7 (1) | *70 (7)* | *112 (11)* | - |
| Océ ColorStream 3500 | 1,010 | 2,525 | 1 (1) | 1 (1) | - | 3 (1) | 3 (1) | *32 (3)* | *52 (5)* | - |
| HP Indigo W7200 | 240 | 600 | 1 (1) | 1 (1) | - | 1 (1) | 1 (1) | 7 (1) | 12 (1) | 18 (2) |
| HP Indigo WS6000 | 143 | 358 | - | - | 1 (1) | - | - | - | - | - |
| Xeikon 3500 | 129 | 323 | - | - | 1 (1) | - | - | - | - | - |
| HP Indigo 7500 | 120 | 300 | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 3 (1) | 6 (1) | 9 (1) |
| Xerox iGen4 | 110 | 275 | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 3 (1) | 5 (1) | 8 (1) |
| Ricoh C901 | 90 | 225 | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 2 (1) | 4 (1) | 6 (1) |
| Konica Minolta C8000 | 80 | 200 | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 2 (1) | 4 (1) | 6 (1) |
| Canon imagePRESS C7000VP | 70 | 175 | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 1 (1) | 2 (1) | 3 (1) | 5 (1) |

** Based on an average run length of 75; ** - based on an average run length of 50; the number of RIPs required depends on the average run length as well as the type of content (e.g. color vs. monochrome, raster or vector data, etc.). The data here is just an indication. The italic values in dark grey represent options that are not or hardly used in practice but they do demonstrate the ripping power that is required to drive the top end of the market*

This overview shows that the Harlequin Host Render 3 satisfies a very critical market requirement to deliver pages to the printer at speeds in excess of the rated speed of the print device and, where necessary, can scale up to offer a greater performance. By delivering pages at over twice the performance of typical production printer, service providers using the Harlequin RIP will be assured of running the print device at rated speeds, which is a fundamental requirement in today's competitive market and also often cited by end-users as a barrier to digital high-end printing.

In addition to this overview, RIT reported that Harlequin rendered all files flawlessly and performed efficiently across all files, even on the most complex documents. Further information can be obtained by contacting Global Graphics.

## InfoTrends' Opinion

Global Graphics is well positioned to benefit from the growth in the high-production inkjet market. Its high-quality RIP technology is mature, consistent in output, extremely efficient, robust, and scalable. As the independent speed test has demonstrated, the Harlequin Host Renderer 3 can deliver pages to printersat speeds that exceed the rated speeds of the print devices.

By using the latest developments in computer hardware, such as multi-core processors and 64 bit development, as well as using RIP-optimization features that are marketed as Harlequin VariData and Parallel Pages (See Table 3), Global Graphics ensures that the latest version of the Harlequin Host Renderer remains top of the bill.

As we are only at the beginning of the inkjet revolution, we can expect to see faster, wider and more productive inkjet products coming onto the market in the next few years. High-speed printing puts a big requirement on the DFE in terms of data processing speed and throughput, especially when personalization or graphically-intense elements (such as live transparencies) are involved. Companies that invest in inkjet printing should carefully consider their RIP partner as speed requirements for RIPing tend to rise exponentially, which may form an important cost to the overall printed product.

Hardware vendors that are looking for RIP technology to drive their digital print equipment should include Global Graphics on their evaluation list. With 20 years of experience, a very focused approach to engineering, and a range of high-performing products, Global Graphics is a company that should not be overlooked.

# Appendix: Global Graphics Company Profile

## Company Background

Global Graphics is a European software company active in the digital printing space. The company was founded in 1996 in France, is listed on the Euronext stock exchange in Brussels, and has its corporate headquarters in the United Kingdom.

### *Product Lines*

The company is active with three major product lines:

- **Harlequin:** A robust RIP on the market that can natively process PostScript, PDF, and XPS. The Harlequin RIP is found in digital print DFEs, such as the HP SmartStream Pro and Ultra, as well as in other solutions, such as workflow management solutions marketed by Agfa.
- **Jaws:** A native PostScript and PDF RIP kernel designed for integration with OEM solutions, Jaws is extensively used in DFEs for the wide format market. It can also be found in print-related software solutions that require on-the-fly interpreting or rendering capabilities, such as VDP or Workflow Management systems.
- **gDoc:** Global Graphics' latest product line, it focuses on electronic document conversion, merging of incompatible document formats, as well as PDF and XPS-based document creation.

This analysis focuses on the Harlequin technology since that technology is most suited to drive high-end production printers.

### *Partnerships*

Global Graphics sells to a wide variety of business partners ranging from digital or wide format print manufacturers to workflow software or variable data printing providers. Customers include Agfa, Canon, Compose, Corel, Delphax, FujiXerox, Hewlett-Packard, Kodak, Presstek, Quark, Rampage, Ryobi, Onyx, Miyakoshi, Screen, and Showa Information Systems.

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Kaspar Roos is an Associate Director for InfoTrends' Production Workflow & Custom Communications Solutions Services. Mr. Roos is responsible for conducting market research, providing forecast analysis, consulting with clients, and creating editorial content for product and market analysis reports. His primary focus area is on the graphic communications industry and data processing markets.

Comments or Questions?

[i] The images do not reflect the actual files used for the RIP test. Images are sourced from:
Labels: Harkwell Labels, http://www.harkwell-labels.co.uk/
Simple VDP: DocPath, http://www.docpath.com
Complex VDP: Aztec Mailing Centre, http://aztecmailingcentre.co.uk
Commercial: Snell Vliet, http://www.snellevliet.nl
Photo Book: Bonus Print, http://www.bonusprint.co.uk
Publication: http://myzerowaste.com