GLOBAL GRAPHICS® software

CASE STUDY

INDUSTRY SECTOR
Digital Production Printing

ISSUE
Digital Front Ends (DFEs) for digital presses need to cope with rapidly increasing data processing requirements as print jobs become more complex. At the same time the need for speed is an on-going challenge for press manufacturers: the DFE must process data quickly enough to keep up with the press and to drive it at full rated speed. If you're a press manufacturer how do you minimize the costs of your DFE compared with the cost of the press?

GLOBAL GRAPHICS' PRODUCT
Harlequin RIP®: processes PostScript® PDF and XPS natively in one RIP engine.

SOLUTION
Global Graphics has worked with HP to minimize the total costs of the DFE through optimization of the RIP software. A close, collaborative development partnership, whereby each party shares product roadmaps early, plays a crucial part in the success of projects.

High Speed at the Right Price

In recent years the amount of data consumed by the raster image processors (RIPs) that drive digital presses has increased significantly. Graphic design jobs are more complex because of the use of transparency, which increases the amount of processing a RIP has to do. The trend toward expanded use of personalization of direct marketing pieces, as well as transpromo jobs, has also increased the load on the RIP, as has the sharp rise in demand for image-heavy jobs such as photo books.

So the RIP, often the unsung hero of the printing process, has to be more intelligent and considerably faster than it used to be. When deployed in the RIP farms or DFEs that are driving state of the art digital presses the data rate out of the DFE has to be fast enough to drive the press at rated speed. And digital presses themselves getting faster and faster.

"You can't just throw a finished RIP over the wall and hope it works with your customer's hardware"
Martin Bailey

APPLICATIONS

The Harlequin RIP is the engine that drives the HP Indigo digital press range via either the HP SmartStream Production Pro Print Server or the HP SmartStream Ultra Print Server.

The presses that can be driven using the Harlequin RIP powered DFE are:

HP Indigo 7500 Digital Press
HP Indigo 7000 Digital Press
HP Indigo W7200 Digital Press
HP Indigo press 5500
HP Indigo press 5000
HP Indigo press ws4500
HP Indigo press ws4050
HP Indigo 3550 Digital Press
HP Indigo press 3500
HP Indigo press 3050
HP Indigo press w3250
HP Indigo press w3200
HP Indigo press 3000
Indigo Ultrastream
HP Indigo WS6000p Digital Press
HP Indigo press s2000

Variations on the HP DFEs are also used to drive HP's PageWide Web Presses.

Market factors

Let's look at that increase in data again. There is now more variable coverage in direct marketing pieces than there ever used to be. Simultaneously, there has been a move to add richer graphics into statements and bills. In parallel with that trend a lot of transactional work has been taken out of the data center where it used to be printed with AFP and is now printed from PDF on commercial presses.

What about photo printing? Just about the hardest common combination of things you can put into a PDF file, as far as the RIP is concerned, is a high-resolution image involving transparency. Drop shadows and soft edges are really becoming quite common in some photo book applications so there are far more instances of transparency than there used to be. Fortunately the Harlequin RIP excels at processing transparency, interpreting PDF natively since 1997 and interpreting live transparency natively since 2002, removing the need to flatten files.

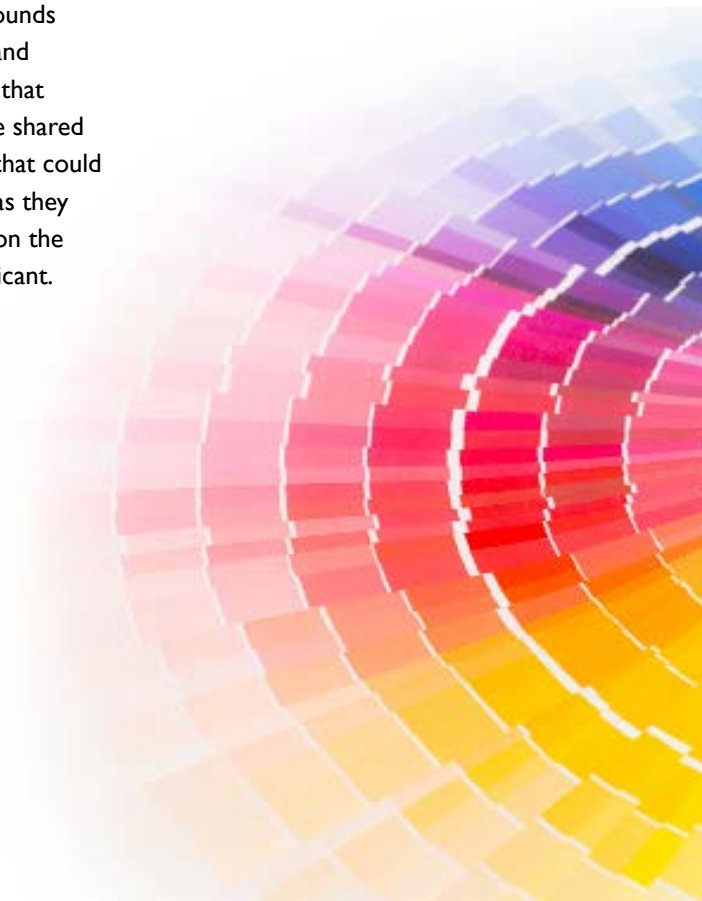
Optimize for what the customer needs

Given the right DFE architecture it's always possible to achieve rendering performance adequate to drive the digital press at rated speed. The challenge isn't just to be fast enough, it's to achieve that goal without incurring an uneconomically high cost for the bill of materials to build the DFE. By making the Harlequin RIP exceptionally fast and efficient Global Graphics has allowed HP Indigo to achieve engine speed with fewer copies of the RIP, with a concomitant reduction in the costs for hardware, operating systems and other associated software. And that makes it greener too, because you need fewer computers and less power for the DFE.

So how fast can the RIP be made to go when it is already a first-rate performer? Answer: focus on the biggest challenges facing your customer. In response to the increasing number of jobs containing transparency Global Graphics has, for several years, dedicated a team of programmers to optimize every line of code in the RIP. But the latest secret weapon is adding multi-threaded compositing of transparency. compositing is the part of the RIP that takes each transparent object and figures out what the final color has to be when you add a transparent layer on top of a sandwich of color objects. This certainly makes a big difference when processing photo book jobs with drop shadows and soft edges.

In the case of handling variable data, for some years now Global Graphics has been extending the 'PDF retained raster' feature in the RIP and this, together with the post-RIP stitching facilities provided by HPIndigo, has achieved some significant performance improvements. How does PDF retained raster work? "The RIP deconstructs the pages into foregrounds and backgrounds" says Martin Bailey, "and intelligently detects those backgrounds that are shared between multiple pages. The shared backgrounds are rendered just once – that could be once instead of 50,000 times – and as they often contain all the complex graphics on the page, the performance increase is significant.

There's no hard limit on the number of backgrounds in any one job but we usually say that if 10% of the pages in a job use the same background we'll recognize it as shared. You can change that default if you want to."
The reason this RIP feature is called PDF retained raster is that the background data is "retained" and returned to the RIP process when it is required, or handed off to an OEM partner's code if they've implemented that, as HP Indigo have done. Global Graphics has also developed solutions for other aspects of the DFE besides performance. Although Harlequin has included in-RIP color management for many years, that has needed some extensions to fully optimize for the HP Indigo's specific requirements, for example.



Sharing roadmaps

To achieve performance gains fine-tuned to a particular customer requires a very close integration of support teams. "You can't just throw a finished RIP over the wall and hope it works with your customer's hardware," says Martin Bailey, "It is critical that Global Graphics involves HP Indigo as a partner in the design and delivery process. Pre-planning can be several years in advance of a new model. We discuss quite some way ahead of time feature sets that we plan to put into our next RIP version and are willing to adjust schedules, prioritization and implementation details to meet specific needs.

You can only really do this effectively if you share product road maps in both directions".
It's important to continue that approach all the way through a project, says Bailey, so that as Global Graphics refines its RIP design, that level of detail is provided to the partner.

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>
> **Martin Bailey**

"You need to keep that cooperation going all the way through because it's easier to make changes earlier in the design process." Bailey states. "We provide early access to builds so that HP can start their development. And we provide even earlier access to high-level descriptions of the functionality and APIs. This drills down to more and more precision over time as we get toward sending over software so that HP Indigo can start designing their part of the equation even before they have something to plug it into."

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