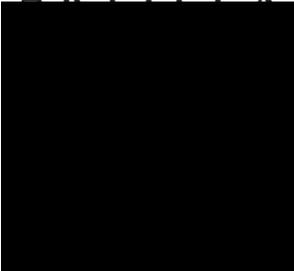




# Professional Document Processing

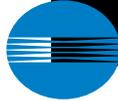
with  **ghostscript**<sup>®</sup>  and  **Mi**<sup>™</sup> **MuPDF**



# Timeline

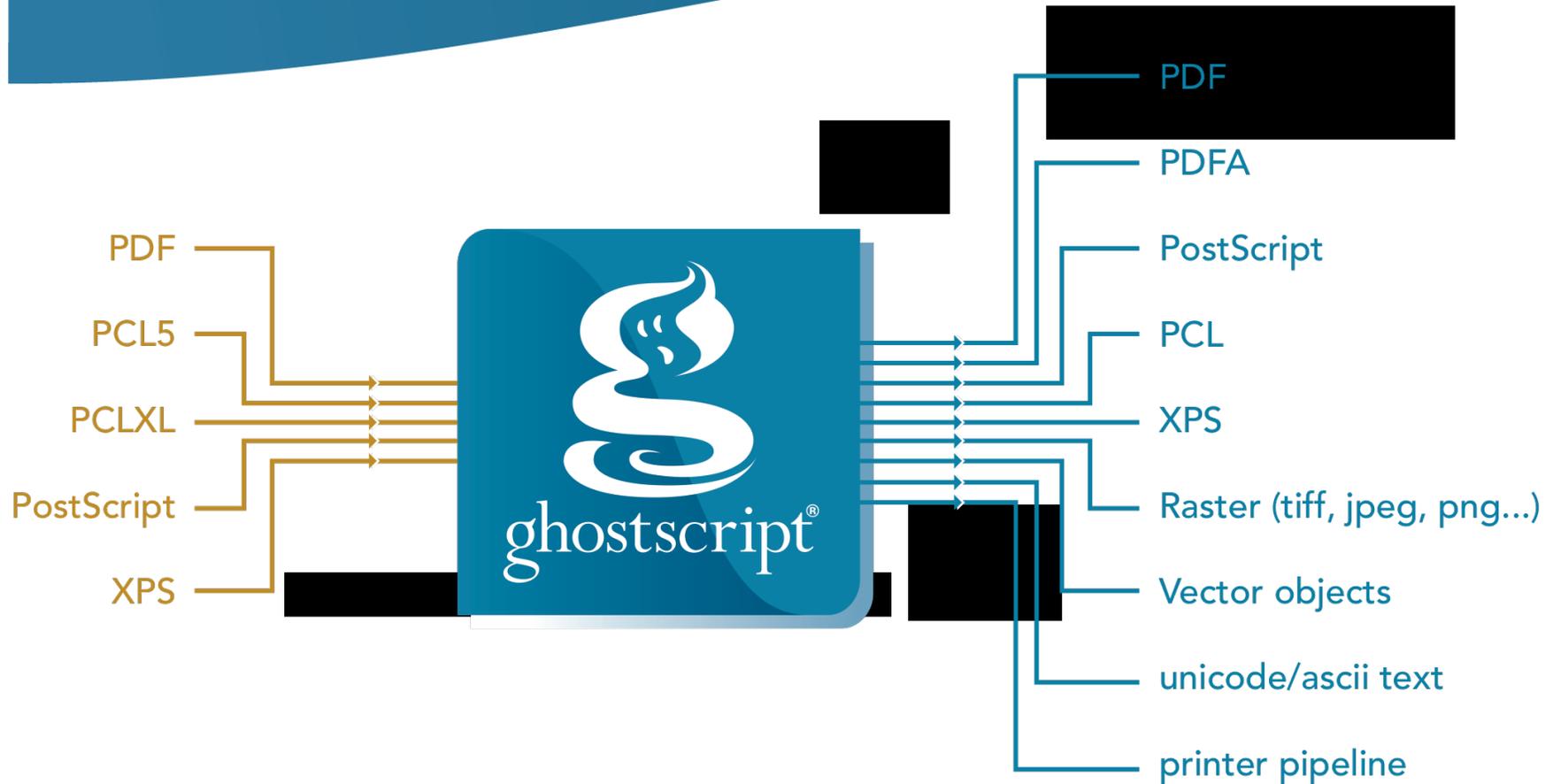
- 1990 -
  - In 1988 Ghostscript development begins
  - 1990 was the first release of Ghostscript PCL interpreter (1 [redacted])
  - In 1993 Artifex released first PDF interpreter before everyone except Adobe (Substantially ahead of all of our competition)
- 1995 -
  - In 1996 Artifex released first PCLXL interpreter before anyone but HP (Substantially ahead of all of our competition)
- 2000 -
  - In 1998 Artifex released PCL6 (PCL5/PCLXL) interpreter
  - In 2000 Artifex released PostScript LL 3 interpreter
  - In 2002 Artifex released first PDF 1.4 transparency interpreter before anyone but Adobe
  - In 2002 Kyocera releases first native PDF printer for PostPDF (now over 20 products and [redacted] of units sold [redacted])
- 2005 -
  - In 2003 MuPDF development begins
  - In 2006 Artifex released PDF 1.7 interpreter
- 2010 -
  - In 2008 Artifex released XPS interpreter
  - In 2010 Artifex released new color-handling
- 2014 -
  - In 2012 MuPDF 1.0 is released
  - In 2013 MuPDF includes Javascript and all interactive features

# Partial Customer List

		 KONICA MINOLTA	 The Content Experts™	
 ACCELERATE	 RIPit® Computer Corporation	 LuraTech	 RIPs for Creative Professionals	
				 Leading the iPaper Revolution
 translating technology into productivity		 Printing for Professionals		
 The global printing solution Sw Rip made in Italy				



# Ghostscript Flow Diagram





# Ghostscript Interpreters

- Portable Document Format (PDF) 1.2 → 1.7
- PostScript Language Level 3
- PCL 5e and 5c support including HP GL2
- PCLXL 3.0 (compatible with the HP Color LaserJet 4700)
- XPS
- Tested using Quality Logic FTS, A [redacted] and proprietary files from [redacted] customers and users



# Ghostscript Color Architecture

- Easy to interface different Color Management Modules with Ghostscript
- Defined all color spaces (including PS) in terms of ICC profiles
- Cache linked transformations and profiles
- Easily accessed manager for ICC profiles
- Devices communicate their ICC profiles and [redacted] ICC profile set

[redacted]

[redacted]

[redacted]

[redacted]



# Ghostscript Color Architecture

- Enhanced Object Type rendering (page rendering) exclusive object type (e.g. image, graphic, text) and rendering intent into the computation of the linked transform within a single page:

Images: visually pleasing images

Graphics: saturated vector graphics

Text: deep black text

This Enhanced Object Type rendering for print should improve the overall look and feel of the output. It should improve the overall look and feel of the output. It should improve the overall look and feel of the output.

- Operate efficiently in a multithreaded environment
- Color manage named colors with ICC named color profile or proprietary format
- Color management of Device-N colors



## Cross-platform

Ghostscript runs on all major operating systems, including:

- MS Windows: 95, 2000, XP, Vista, 7, 8
- Mac OS X
- UNIX
- LINUX
- Embedded environments:
  - VxWorks
  - ThreadX
  - Android
  - iOS
  - WebOS
  - Symbian OS

# Font Technologies

## Font renderers for all major font formats

- TrueType
- Type 1
- Type 42
- CID
- CFF
- Double-byte
- OpenType
- Intellifont

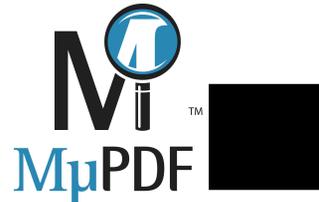
## Font packages:

- Type 1: 35 PS or 80 PS fonts
- TrueType: 80 PCL/PS or 136 PCL/PS
- Option of pre-integration with Monotype UFST

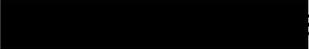




# MuPDF



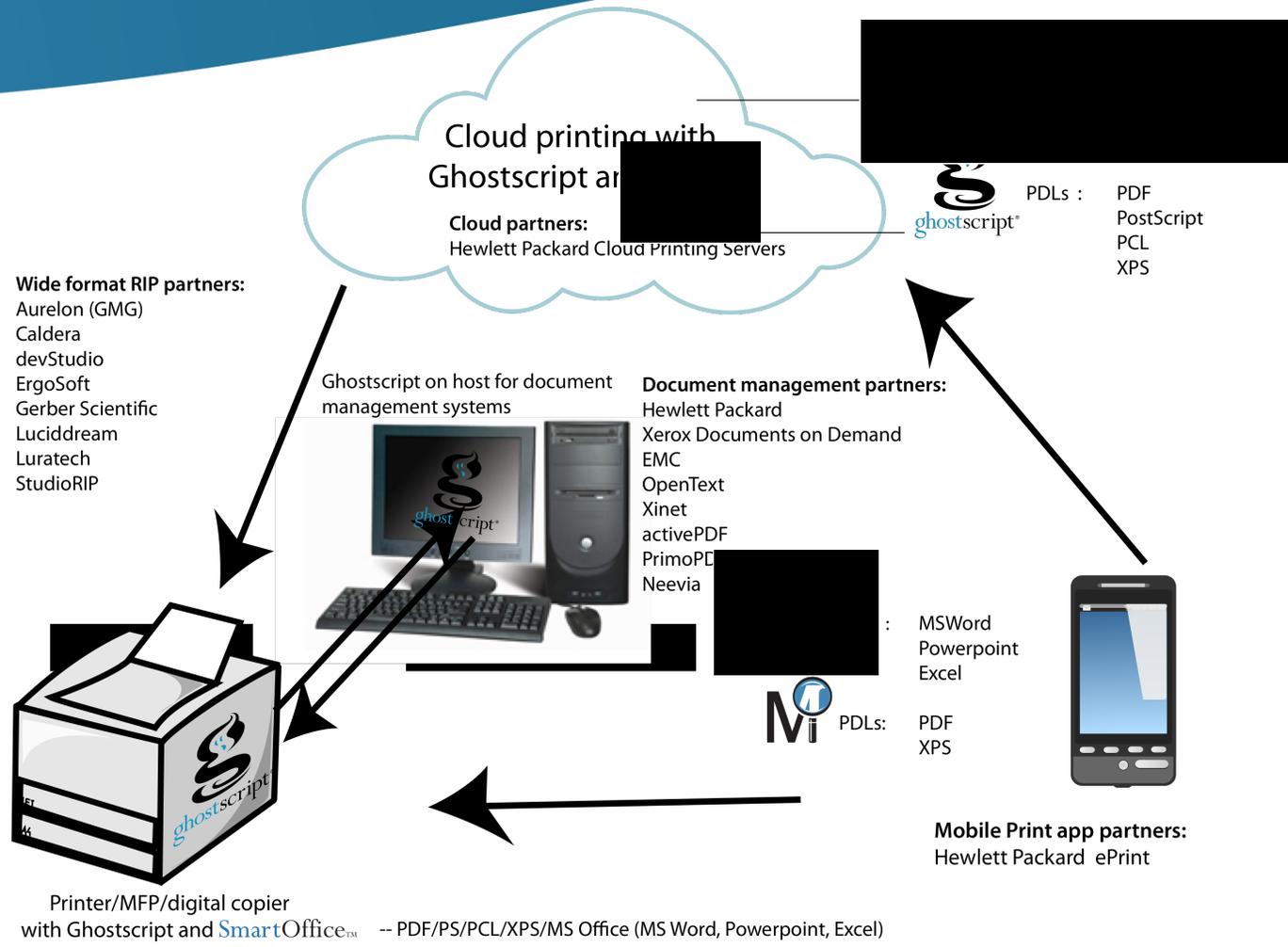
MuPDF has been specifically designed as a viewer for implementation into ebooks, browsers and PDA's. MuPDF is a lightweight PDF and XPS viewer and toolkit written in portable C.

- Tailored for high quality anti-aliased graphics
- Renders text with metrics and spacing accurate to  $\frac{1}{10}$ th of a pixel for the highest fidelity in  the look of  
- Small footprint. A binary that includes the standard Roman fonts is only 1 megabyte. A build with full CJK support (including an Asian font) is approximately 5 megabytes.
- MuPDF implements all interactive features including form-filling, annotations, hyperlinks, digital signatures, progressive rendering, and text search.





# Only Artifex offers a complete PDL ecosystem





# Critical factors in choosing your PDL vendor

## Business

**Reputation.** Artifex has a long history as a [REDACTED] provider of PDL technologies.

Artifex had the first non-Adobe PDF solution, the first non-HP PCLXL solution, and the first non-Adobe PDF with transparency solution. For nearly 20 years Artifex has been a leader in providing full source code to all OEMs. Ghostscript is built into hundreds of products and is used by millions. The leading indicator of success for Artifex, is our OEM customers valuing our service, our engineers and our technologies.

**Company stability.** Artifex has never had a layoff [REDACTED] as had the same [REDACTED] management team for nearly 20 years, at the same location. Our staff tenure is nearly 10 years on average. Artifex has no corporate debt. Artifex has had 80+ consecutive profitable quarters.

**Global support.** Artifex has offices in Japan, U.S., UK, and Sweden.





# Critical factors in choosing your PDL vendor

## Technical

- 1) **Conformance/Compatibility.** Since all major competitors are at 99+% compatibility with PDF, PCL, PS and XPS it is hard for any company to make a clear distinction. Ghostscript is excellent. So are our competitors.
- 2) **Performance.** Getting accurate and appropriate benchmarks to measure performance requires knowing the specifics of your device (e.g. CPU speed, available memory, resolution, hardware assist). We believe Ghostscript's performance is very competitive and we invite you to do side-by-side comparisons of the vendor's solution in your specific environment. Only your staff can provide accurate performance comparisons.
- 3) **Technical Support.** The best way to evaluate a company's support is to use it. Please rely on our staff during your performance evaluation. With our staff's help it will save you time and money and make sure you get the best performance from Ghostscript. The evaluation of our support is as important as the evaluation of our technologies.



# Critical factors in choosing your PDL vendor

## Technical – Imaging Science (cont.)

4) **Imaging Science.** The overall quality of a product is more than just the spec sheet describing the feature-set. The two aspects that are not on the spec sheet are reliability and output quality. Output quality is determined by resolution and imaging science. Artifex's strength is our imaging science development.

**A) Screening.** Artifex offers a variety of outstanding high-performance screening technologies:

Even Tone Screening. An award winning even tone screen that eliminates most moirés and supports variable dot sizes.

Threshold array screen. Our high-quality threshold array screen has been used in a variety of devices over many years.



# Critical factors in choosing your PDL vendor

## Technical – Imaging Science (cont.)

**B) Advanced Color Handling.** Please see the white paper regarding our advanced color handling in Ghostscript.

### 5. Small ROM footprints:

Ghostscript: 4 Mbytes of ROM

MuPDF: 4 Mbyte of ROM

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As an Artifex OEM, your success is our priority. Please let us know what you need. We are flexible for your needs. Here is where a small company has the greatest advantage for you.