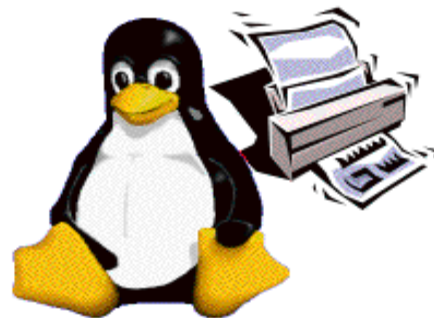
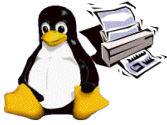


Printer Driver





Printer Driver & Objectives

■ Printer Driver API is:

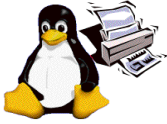
- ✗ A printer driver interface for requesting driver/printer information and accepting/printing print jobs.
 - ◆ Vector API's supporting PDL based printers
 - ◆ Raster API's supporting Raster based printers

■ Printer Driver API contains:

- ✗ Commands to query/set capabilities
- ✗ Commands to create and control print jobs
- ✗ Vector / Raster transfer commands

■ Objectives

- ✗ To be a common interface for printing to printers
- ✗ To isolate the application from the details of individual printers
- ✗ To isolate the application from the details of individual PDLs
- ✗ To have printer drivers support a set of common job properties
- ✗ Performance Optimization
 - ◆ Achieve full speed printing
 - ◆ Utilizes graphical acceleration feature supported by printer controllers



Printer Driver API

- Job Control
 - ✗ Open/Close driver
 - ✗ Set Job/Document/Page attributes

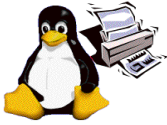
- Graphics State Operation
 - ✗ Set attributes for each graphics objects

- Drawing Operations
 - ✗ Path
 - ✗ Text
 - ✗ Bitmap Image
 - ✗ Scanline
 - ✗ Raster Image

- Stream Data (embedded PDL)



Printer Driver API – Details (1)



Printer Context

- ✗ OpenPrinter()
 - ◆ Create printer context
 - ◆ Register API entry pointers
 - ◆ Specify file descriptor for data stream
- ✗ ClosePrinter()
 - ◆ Closes printer context
 - ◆ Driver releases all resources

Job Control

- ✗ A print job consist of documents.
- ✗ A document consist of pages.
- ✗ StartJob(), EndJob()
- ✗ StartDoc(), EndDoc()
- ✗ StartPage(), EndPage()
- ✗ Job, doc and page attributes are specified by each StartXxx() function.

Query Device Capabilities & Information

- ✗ QueryDeviceCapability()
 - ◆ Query if the device can do number-up, duplex, etc.
 - ◆ Information such as media size, media source and etc. which are supported by the device can be retrieved.
- ✗ QueryDeviceInfo()
 - ◆ Query current settings of the device.

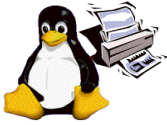
Graphics State Object Operations

- ✗ Graphics State is managed as GS object
 - ◆ Operation to GS – InitGS, SaveGS, RestoreGS
- ✗ Controls to each items in GS
 - ◆ CTM (Coordinate Translate Matrix)
 - ◆ Color Space
 - ◆ Raster Operation – ROP3
 - ◆ Fill Mode – even/odd or winding
 - ◆ Alpha Constant
 - ◆ Line Style – width, dash/solid, cap, join
 - ◆ Paint Mode – opaque or transparent
 - ◆ Stroke and fill color – brush control
 - ◆ Foreground and background color – solid brush

Path Operations

- ✗ A path is a virtual track object
 - ◆ Will be visible by stroke or fill operations
 - ◆ Will be used to define clip region
- ✗ Lines, rectangles, polygons, arc/pie and bezier are all treated as “path.”
- ✗ Operations:
 - ◆ NewPath() – Declare start of a path
 - ◆ EndPath() – Declare end of a path
 - ◆ StrokePath(), FillPath(), StrokeFillPath() – make visible path
 - ◆ SetClipPath(), ResetClipPath() – defines clip region by current path

Printer Driver API – Details (2)



Text Operations

- ✗ Still under investigation...
- ✗ Current DrawBitmapText() will be removed.
- ✗ Text Operations will includes:
 - ◆ Define and Query font metrics
 - ◆ Device Font Utilization
 - ◆ Font Downloading

Raster Image Operations

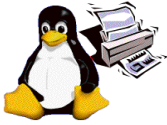
- ✗ StartRaster(), TransferRasterData(), EndRaster()
- ✗ Set to be extended by Raster Team

Stream Data Operations

- ✗ StartStream(), TransferStreamData(), EndStream()

Bitmap and Scanline Operations

- ✗ Bitmap is a bit oriented image data drawn in rectangle region
 - ◆ DrawImage()
 - ◆ StartDrawImage(), TransferDrawImage(), EndDrawImage()
- ✗ Scanline is a horizontal line defined by start and end point pairs.
 - ◆ Used to draw graphics rendered by renderer
 - ◆ StartScanLine(), ScanLine(), EndScanLine()

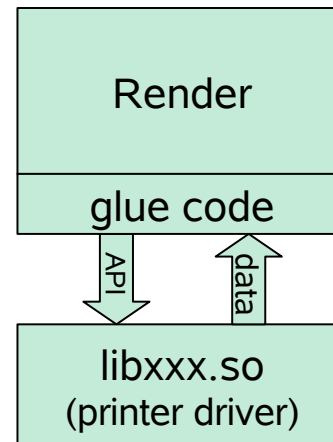


Linking

- Printer driver is provided as a dynamic library.
- Driver can be linked dynamically or via RPC.

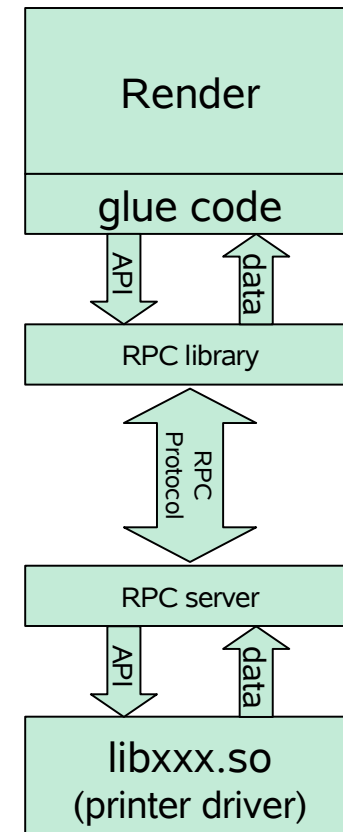
direct linking

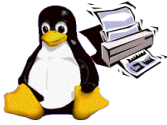
R: GPL
D: GPL
or
R: MIT
D: Closed or LGPL



RPC linking

R: any
D: any



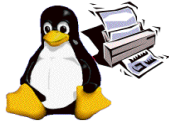


PDAPI Raster- Common Job Properties

■ Features

- ✘ Standardized name for common features
- ✘ Standardized keys and the values
- ✘ An extensible paradigm for non-standard features
- ✘ Coherence across the FSG OpenPrinting model

- | | |
|---------------------------------|--------------------------|
| ■ ColorInput | ■ PrintQuality |
| ■ ColorOutput | ■ Resolution |
| ■ Copies | ■ Rotation |
| ■ Margins | ■ ScalingType |
| ■ MediaBackCoating | ■ ScalingPercentage |
| ■ MediaColor | ■ SheetCollate |
| ■ MediaFrontCoating | ■ Sides |
| ■ MediaInputTrayName | ■ StitchingPosition |
| ■ MediaSizeName | ■ StitchingReferenceEdge |
| ■ MediaType | ■ StitchingType |
| ■ MediaUnprintableMargins | ■ StitchingCount |
| ■ NumberUp | ■ StitchingAngle |
| ■ NumberUpPresentationDirection | ■ Trimming |
| ■ OutputBinName | |



PD-Vector Working Group Information

- To subscribe to FSG Vector Printer Driver mailing list:
✗ <http://freestandards.org/mailman/listinfo/printing-japan>
- To post a message to FSG Vector Printer Driver mailing list
✗ printing-driver@freestandards.org
- To view FSG Vector Printer Driver mailing list archives
✗ <http://freestandards.org/mailman/listinfo/printing-japan>
- To find FSG Vector Printer Driver documents
✗ <ftp://ftp.pwg.org/pub/pwg/fsg/vector/>

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- | | |
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