

PostScript

An Introduction to the PostScript Language

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Language Objectives

- ♦ Uniformity & consistency
- ♦ High-level interface
- ♦ Device independence
- ♦ Target: raster imaging devices

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A Range of Applications

- ♦ Document Preparation
- ♦ CAD output
- ♦ Line printer applications
- ♦ Bar code printing
- ♦ Other stuff ...

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Requirements

- ◆ Device independent
- ◆ High-level imaging model
- ◆ Extensible interface

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Device Independence

- ◆ Resolution from 72 dpi to 2400 dpi
- ◆ Pixel depth from 1 to 48 bits/pixel
- ◆ Uniform treatment of graphics elements, not just lines, but fonts and images can be transformed as well
- ◆ Make the capabilities or limitations of the underlying hardware transparent to the client (user) of the interface

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Device Independence

- ◆ Specify what to draw, not how to draw it
- ◆ Base all locations on user coordinate system
- ◆ Implicitly separate client from the server

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High- Level Imaging Model

- ◆ Appropriate graphic elements
- ◆ High-quality fonts
- ◆ Generalized Clipping
- ◆ Coordinate Transformations

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Imaging Model

- ♦ "Paint" through "Stencil"
- ♦ The paint (source) defines the "color"
- ♦ The stencil (path) defines the "shape"
- ♦ Paths are built up from lines, arcs, and splines
- ♦ The result is the "Source" pushed through the "Stencil" onto the paper
- ♦ Source may be a color or a scanned image

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Imaging Model

- ♦ Characters are a shorthand way of specifying a path
- ♦ Coordinate transforms apply to all elements (sources and paths)
- ♦ Typographic-quality characters

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Imaging Model

- ♦ 2D, right-handed coordinate system
- ♦ floating-point, 1/72 inch default, user-definable units
- ♦ All graphics elements scale and transform with coordinates

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Extensible Interface

- ♦ A programming language: provides procedures and operations on them
- ♦ Allows clients to define procedures for particular task
- ♦ These can be stored (cached) for efficiency
- ♦ Printing task is just a program in this language

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Extensible Interface

- ♦ Interface is an ASCII-based, interpreted language
- ♦ PostScript code can be generated by any computer, in any language
- ♦ Can be transmitted in any number of formats and mediums
- ♦ Easy to inspect, modify, and update

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Extensible Interface

- ♦ A protocol, independent of any language or operating system
- ♦ Extensible over time
- ♦ Extensible for particular devices
- ♦ Clients can optimize to their needs

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Resources

PostScript Language Tutorial and Cookbook, by Adobe Systems, Inc., Addison-Wesley, 1985. ("The Blue Book")

PostScript Language Reference Manual, Second Edition, by Adobe Systems, Inc., Addison-Wesley, 1991. ("The Red Book")

Programming the Display PostScript System with NeXTstep, by Adobe Systems, Inc., Addison-Wesley, 1991. ("The Purple Book")