PAPI

Overview, Status, and Discussion

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PAPI 1.0 Draft Status

- 0.9 (1.0 release candidate) released in December 2002

- Need to get PAPI 1.0 approved for implementations to proceed

- Is the current spec satisfactory to all interested parties?

- Do we have a process in place for approving FSG standards?

PAPI 1.0 Overview

- Provides abstraction of server, queues (printers and classes), and jobs

- High-level API concentrates on providing a common interface to multiple printing systems

- Currently supports server connection and authentication, basic queue and job enumeration, job submission, and printer state/capabilities

- Implementations for CUPS, System V lp, and Berkeley lpr exist, release as OSS pending

PAPI 1.0 Overview (con't)

- Data types introduced by PAPI:
  - papi_status_t - status/error code enumerations
  - papi_service_t - server/service connection
  - papi_job_t - job object
  - papi_stream_t - stream object
  - papi_printer_t - printer object
  - papi_job_ticket_t - job ticket object
  - papi_filter_t - filter for limiting printer lists

PAPI 1.0 Overview (con't)

- Service API:
  - papiServiceCreate - creates a new service object for submitting jobs, listing printers, etc.
  - papiServiceDestroy - destroys a service object
  - papiSet*Foo* - sets the corresponding service object attribute (UserName, Password, Encryption, AuthCB, AppData)
  - papiGet*Foo* - gets the current value of the corresponding service object attribute

PAPI 1.0 Overview (con't)

- Printer API:
  - papiPrintersList - retrieves a list of printer/class queues
  - papiPrinterQuery - queries detailed information about a printer object
  - papiPrinterModify - sets printer object attributes
  - papiPrinterPause, papiPrinterResume - stops and starts a printer object
  - papiPrinterPurgeJobs - cancels all jobs on a printer
  - papiPrinterListJobs - lists jobs on a printer

PAPI 1.0 Overview (con't)

- Printer API (con't):
  - papiPrinterGetAttributeList - gets a list of the attributes from a printer object
  - papiPrinterFree - frees a printer object
  - papiPrinterListFree - frees a list of printer objects

PAPI 1.0 Overview (con't)

- Attributes API:
  - papiAttributeListAdd, papiAttributeListAdd*Foo* - adds a single attribute to an attribute list; "Foo" is String, Integer, Boolean, Range, Resolution, Datetime, or Collection
  - papiAttributeDelete - deletes a single attribute
  - papiAttributeListGet*Foo* - gets the value associated with an attribute
  - papiAttributeListFree - frees an attribute list

PAPI 1.0 Overview (con't)

- Attributes API (con't):
  - papiAttributeListFind - searches for the first matching attribute in a list
  - papiAttributeListGetNext - searches for the next matching attribure in a list
  - papiAttributeListFromString - creates an attribute list from a string using a text-based format defined in the spec
  - papiAttributeListToString - creates a string from an attribute list using the format defined in the spec

PAPI 1.0 Overview (con't)

- Job API:
  - papiJobSubmit, papiJobSubmitByReference - submits a file or URL for printing
  - papiJobValidate - verifies that the document format and job attributes are valid for/supported by the printer object
  - papiJobStreamOpen - opens a job stream for on-the-fly printing
  - papiJobStreamWrite - writes print data to a job stream
  - papiJobStreamClose - closes the job stream and finishes printing

PAPI 1.0 Overview (con't)

- Job API (con't):
    - papiJobQuery - gets a list of specific job attributes
    - papiJobModify - modifies the job attributes
    - papiJobCancel - cancels a job
    - papiJobHold, papiJobRelease - holds and resumes a job
    - papiJobRestart - restarts a stopped or canceled job
    - papiJobGetAttributeList - gets a list of all job attributes

PAPI 1.0 Overview (con't)

- Job API (con't):
  - papiJobGet*Foo* - gets the corresponding attribute for a job; "Foo" can currently be PrinterName, Id, or JobTicket
  - papiJobFree - frees a job object
  - papiJobListFree - frees a list of job objects

PAPI 1.0 Overview (con't)

- Miscellaneous API:
  - papiStatusString - returns the textual representation of a papi_status_t enumeration (generally the IPP-defined string from RFC 2911)

PAPI 1.1/2.0 Discussion

- Constraints attributes from PAPI Capabilities 0.3 Draft?

- Media: margins, dimensions, media-col support?

- Fonts: name, family, style/appearance, weight, vendor, version, encoding, character repetoire?

- Colorspaces and/or profiles?

- Context sensitive information, e.g. the supported attributes and values for a particular document format?

PAPI 1.1/2.0 Discussion (con't)

- Localization/globalization support in PAPI?

- Additional printer state data - ink types, levels, media remaining, media loaded, etc?

- Extension support, i.e. define an interface/attribute listing the available extensions/extension attributes?

- Support for other languages besides C/C++ required?

- Support document object?

PAPI 1.1/2.0 Discussion (con't)

- Newer 2003 IPP attributes/stuff?

- Anything else?

Constraints Attributes

- Example constraints:

```
job-constraints-col =
  /* Constraint: no high print quality with 240 dpi    */
  /* resolution - (print-quality == high) AND           */
  /*              (printer-resolution == 240dpi)         */
  {
    print-quality = high
    printer-resolution = 240dpi
  },

  /* Constraint: no transparency with duplex -           */
  /* (sides != one-sided) AND (media == transparency)    */
  {
    job-constraints-inverted = sides
    sides = one-sided
    media = transparency
  }
```

Where Do We Go From Here?

- Need to get 1.0 approved

- Need to get OSS 1.0-based implementation(s) out for developers to play with

- Is GNOME/KDE/OpenOffice support important for general adoption?

- Do we provide a test suite which conforming PAPI implementations must pass?

- Should the future print graphics API(s) interface with PAPI to tailor their output to the destination device, or do we push for device-independent?