



PAPI & Objectives

■ PAPI stands for:

- ✗ Printing Application Programming Interface
- ✗ Pronounced “pappy” or “P.A.P.I.”

■ PAPI contains:

- ✗ **Data Structures** for interacting with basic print service objects.
- ✗ **Functions** to perform various operations against a print service or its objects.

■ PAPI is an API for applications to use to perform print service interaction.

■ Objectives

- ✗ Provide applications a means of interacting with print services without being tied to a particular service or protocol
- ✗ Allow a rich, extensible set of information to flow between application and print service
- ✗ Support a rich enough set of operations to be useful to most applications with printing needs





PAPI Overview

- Provides abstraction of server, queues (printers and classes), and jobs.
- High-level API focuses on providing a common interface to multiple printing systems and protocols.
- Uses extensible attribute sets based on IPP for representing queue and job information.
 - ✗ Multi-valued and typed
- Currently supports
 - ✗ Server connection (and authentication were applicable)
 - ✗ Basic queue operations:
 - ◆ enumerate, query, accept, reject, enable, disable, create, modify, delete, enumerate/purge jobs
 - ✗ Basic job operations:
 - ◆ submit, stream, query, cancel, hold, release, modify, *move*





PAPI Release

■ V1.0 Spec

- ✗ <ftp://ftp.pwg.org/pub/pwg/fsg/spool/papi-v1.0-2005-07-15.pdf>

■ Released PAPI code on SourceForge

- ✗ PAPI dynamic library (Dynamic library)
- ✗ PAPI over IPP (CUPS, Solaris LP, Windows XP, ...)
- ✗ PAPI over RFC-1179 (lpd, lprng, ...)
- ✗ BSD/SYSV print commands on top of the PAPI
- ✗ IPP Listening support on top of the PAPI

■ Released PAPI code on OpenSolaris

- ✗ <http://opensolaris.org/os/community/printing/>
- ✗ PAPI over Solaris LP

■ Others

- ✗ libgnomeprintpapi (integrated in 2.2)
- ✗ Mozilla (diffs in bug 317450)





Future Activities/Next Steps

- ■ Expand functionality in PAPI Specification and Implementation
 - ✗ More administrative operations
 - ✗ Document object
 - ✗ Async interface
 - ✗ PPD/Capabilities
- ■ Integrate support for various Open Source projects:
 - ✗ KDE/Qt, Open Office, Samba, GTK+, etc.





PAPI Status

■ ■ FSG PAPI PAPI/1.0 Public Release

✗ <ftp://ftp.pwg.org/pub/pwg/fsg/jobticket/spool/papi-v1.0-2005-05-09.pdf>

■ ■ PAPI WG Directory

✗ <ftp://ftp.pwg.org/pub/pwg/fsg/spool>

■ ■ PAPI 2006 Slides

✗ ftp://ftp.pwg.org/pub/pwg/fsg/April2006-OSDL-Printing-Summit-Slides/2006-04-11-FSG_PAPI_OSDL_Printing_Summit_Overview.pdf





PAPI Working Group Information

- ■ To subscribe to FSG PAPI mailing list:
 - ✘ <http://freestandards.org/mailman/listinfo/printing-spool>

- ■ To post a message to FSG PAPI mailing list
 - ✘ printing-spool@freestandards.org

- ■ To view FSG PAPI mailing list archives
 - ✘ <http://freestandards.org/mailman/listinfo/printing-spool>

- ■ To find FSG PAPI documents
 - ✘ <ftp://ftp.pwg.org/fsg/spool/>
 - ✘ <http://sourceforge.net/projects/openprinting>

- ■ Participants
 - ✘ Norm Jacobs (Sun) – chair
 - ✘ Alan Hlava (IBM)
 - ✘ Mike Sweet (Easy Software)
 - ✘ Ira McDonald (High North Inc)
 - ✘ Glen Petrie (Epson)





PAPI Details

■ Data types introduced by the PAPI:

- **papi_status_t** status/error code enumeration
- **papi_service_t** server/service connection
- **papi_printer_t** printer object/handle/context
- **papi_job_t** job object/handle/context
- **papi_attribute_t** object attributes
- **papi_stream_t** stream object/handle/context
- **papi_job_ticket_t** job ticket
- **papi_filter_t** filter for limiting printer lists
- **papi_encrypt_t** get/set the encryption type

■ Attribute API :

- **papiAttributeListAdd***
 - Adds a single attribute (and value) to an attribute list
- **papiAttributeListDelete**
 - Delete an attribute from an attribute list.
- **papiAttributeListGet***
 - Retrieve the value associates with an attribute
- **papiAttributeListFind**
 - Search for an attribute in a list
- **papiAttributeListGetNext**
 - Walk through an attribute list
- **papiAttributeListFromString**
 - create/append an attribute list using a text-based format
- **PapiAttributeListToString**
 - Convert an attribute list to a text base string form
- **papiAttributeListFree**
 - Deallocate resources associated with an attribute list

■ Service API

- **papiServiceCreate**
 - create a new service object for submitting jobs, listing printers, etc
- **papiServiceDestroy**
 - destroys a service object and all associated resources
- **papiGet*() / papiSet*()**
 - Get or set the corresponding service object attributes

* = Supported object attributes UserName, Password, Encryption, AuthCB, AppData, AttributeList, StatusMessage

■ Miscellaneous API :

- **papiStatusString**
 - Return a textual representation of a papi_status Enumeration
- **papiLibrarySupportedCalls**
 - Enumerate all papiCalls that do not simply return PAPI_OPERATION_NOT_SUPPORTED
- **papiLibrarySupportedCall**
 - Determine if a specific function is supported by the implementation

* = Supported types of value, string, integer, boolean, range, resolution, datetime, collection, metadata





■ Job API:

- **papiJobSubmit / papiJobSubmitByReference**
 - Submit a print job either immediately copying or postponing copy of the job data
- **papiJobValidate**
 - Verify that the document format and job attributes are valid for and supported by the designated print queue
- **papiJobStreamOpen / papiJobStreamWrite / papiJobStreamClose**
 - Open/write/close a stream for printing data on-the-fly
- **papiJobQuery**
 - Request job information from print service
- **papiJobModify**
 - Modifies the job attributes
- **papiJobCancel**
 - Cancels a print job
- **papiJobHold / papiJobRelease / papiJobRestart**
 - Hold, release, or restart a print job
 - Retrieve the corresponding attribute list from a job object for further lookup or enumeration using the Attribute interface
- **PapiJobPromote**
 - Promote a print job
- **papiJobGetAttributeList**
 - Retrieve the corresponding attribute list from a job object for further lookup or enumeration using the Attribute interface
- **papiJobGet***
 - Retrieve the corresponding attribute from a job object
- **papiJobListFree / papiJobFree**
 - Free a job object of list of job objects and their associated resources

■ Printer API :

- × **papiPrintersList**
 - ◆ Retrieves a list of printer/class queues
- × **papiPrinterQuery**
 - ◆ Queries for detailed information about a printer object
- × **PapiPrinterAdd / papiPrinterRemove**
 - ◆ Creates/destroys printer object
- × **papiPrinterModify**
 - ◆ Sets printer object attributes
- × **papiPrinterPause / papiPrinterResume**
 - ◆ Stop and start job processing on a printer object
- × **papiPrinterEnable / papiPrinterDisable**
 - ◆ Stop and start job queueing on a printer object
- × **papiPrinterPurgeJobs**
 - ◆ Cancels all jobs on a printer
- × **papiPrinterListJobs**
 - ◆ Lists jobs on a printer
- × **papiPrinterGetAttributeList**
 - ◆ Retrieve an attribute list from printer object
- × **papiPrinterListFree / papiPrinterFree**
 - ◆ Deallocate resources associated with a printer object or list of printer objects

* = Supported attributes are PrinterName, Id or JobTicket

