FSG Open Print

PAPI (Open Printing API)

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Introduction

- 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 it's objects.
- PAPI is an API for applications to use to perform print service interaction.



Objectives

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



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

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Overview (cont)

- Currently supports
 - Server connection (and authentication were applicable)
 - □ Basic queue operations:
 - enumerate, query, enable, disable, modify, enumerate/purge jobs
 - □ Basic job operations:
 - submit, stream, query, cancel, hold, release, modify



Data types introduced by the PAPI:

- □ papi_status_t
- papi_service_t
- □ papi_printer_t
- □ papi job t
- □ papi_attribute_t
- □ papi stream t
- □ papi_job_ticket_t
- □ papi_filter_t

status/error code enumeration

server/service connection

printer object/handle/context

job object/handle/context

object attributes

stream object/handle/context

job ticket

filter for limiting printer lists



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
 - UserName, Password, Encryption, AuthCB, AppData



Printer API

- □ papiPrintersList
 - Retrieves a list of printer/class queues
- papiPrinterQuery
 - Queries for detailed information about a printer object
- □ papiPrinterModify
 - Sets printer object attributes
- papiPrinterPause / papiPrinterResume
 - Stop and start job processing on a printer object

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Details

- Printer API (cont)
 - papiPrinterPurgeJobs
 - Cancels all jobs on a printer
 - papiPrinterListJobs
 - Lists jobs on a printer
 - □ papiPrinterGetAttributeList
 - Retreive an attribute list from printer object
 - papiPrinterListFree / papiPrinterFree
 - Deallocate resources associated with a printer object or list of printer objects



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

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Details

- Job API (cont)
 - 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



Job API (cont)

- papiJobGetAttributeList
 - Retreive the corresponding attribute list from a job object for further lookup or enumeration using the Attribute interface
- papiJobGet*
 - Retreive the corresponding PrinterName, Id or JobTicket from a job object
- papiJobListFree / papiJobFree
 - Free a job object of list of job objects and their associated resources



Attribute API

- papiAttributeListAdd / papiAttributeListAdd*
 - Adds a single attribute (and value) to an attribute list
 - Supported types include
 - String, integer, boolean, range, resolution, datetime, collection, metadata
- papiAttributeListGet*
 - Retreive the value associates with an attribute
- papiAttributeListFind
 - Search for an attribute in a list



Attribute API

- 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



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

Accomplishments

- Sep 2002
 - □ Published template code for v0.5 of specification
- Nov 2002
 - □ Published v0.9 of specification
- Dec 2002
 - Released implementation of v0.9 on top of CUPS
 - Implemented, but have not released implementation of PAPI on top of System V LP
- Jan 2004
 - □ Published v0.91 of specification

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Accomplishments (cont)

- Feb 2004
 - □ Released PAPI based code on SourceForge
 - PAPI dynamic library
 - PAPI over CUPS
 - BSD/SYSV print commands implemented on top of the PAPI
- March 2004
 - □ Released PAPI over RFC-1179 support

What's next - schedule

- Expand functionality in PAPI
 - □ Administrative operations
 - □ Document object
- Implement and Release PAPI over IPP support
- Release IPP server implemented over PAPI
- Integrate support for various Open Source projects:
 - ☐ GNOME, KDE, OpenOffice, Mozilla, Samba, etc.

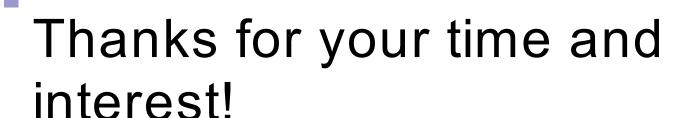


PAPI Working Group Info

- Participants
 - □ Norm Jacobs (Sun) current editor
 - □ Alan Hlava (IBM)
 - Mike Sweet (EasySoftware)
 - □ Ira McDonald (High North Inc)
 - ☐ Glen Petrie (Epson)

PAPI Working Group Info (cont)

- Email
 - □ printing-spool@freestandards.org
 - □ Subscribe
 - http://freestandards.org/mailman/listinfo/printing-spool
 - □ Archive
 - http://freestandards.org/mailman/listinfo/printing-spool
- IRC:
 - □ irc.gnome.org#openprinting
- Source
 - □ http://sourceforge.net/projects/openprinting



Questions and/or comments

This presentation is located at