

Printer MIB Working Group

Ron Bergman
Hitachi Koki
Gary Gocek
Consultant
Harry Lewis
IBM Corp.
Ira McDonald
High North Inc.
Randy Turner
2Wire, Inc.
15 November 2001

Expires 15 April 2002

Printer MIB v2
<draft-ietf-printmib-mib-info-10.txt>

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of Section 10 of RFC 2026 [17].

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or made obsolete by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

To learn the current status of any Internet-Draft, please check the "lid-abstracts-txt" listing contained in the Internet-Drafts Shadow Directories on ftp.is.co.za (Africa), nic.nordu.net (Europe), munnari.oz.au (Pacific Rim), ftp.ietf.org (US East Coast), or ftp.isi.edu (US West Coast).

For tips on printing this document or on modifying the original Microsoft Word source document, see [1].

Abstract

This document provides definitions of models and manageable objects for printing environments. The objects included in this MIB apply to physical, as well as logical entities within a printing device. This

MIB definition makes explicit references to the Host Resources MIB (RFC 2790 [28]), as well as the Interfaces Group of MIB-II (RFC 1213 [14]). This document obsoletes RFC 1759.

Table of Contents

Status of this Memo.....	1
Abstract.....	1
1. Introduction.....	4
1.1 Network Printing Environment.....	4
1.2 Printer Device Overview.....	5
1.3 Categories of Printer Information.....	6
1.3.1 Descriptions.....	6
1.3.2 Status.....	6
1.3.3 Alerts.....	6
1.4 The SNMP Management Framework.....	7
2. Printer Model.....	8
2.1 Overview of the Printer Model.....	10
2.2 Printer Sub-Units.....	10
2.2.1 General Printer.....	10
2.2.1.1 International Considerations.....	11
2.2.2 Inputs.....	11
2.2.3 Media.....	12
2.2.4 Outputs.....	12
2.2.5 Finishers.....	12
2.2.6 Markers.....	13
2.2.7 Media Paths.....	13
2.2.8 System Controller.....	14
2.2.9 Interfaces.....	14
2.2.10 Print Job Delivery Channels.....	14
2.2.11 Interpreters.....	15
2.2.12 Console.....	15
2.2.13 Alerts.....	15
2.2.13.1 Status and Alerts.....	16
2.2.13.2 Overall Printer Status.....	16
2.2.13.2.1 Host Resources MIB Printer Status.....	18
2.2.13.2.2 Sub-unit Status.....	22
2.2.13.3 Alert Tables.....	23
2.2.13.4 Alert Table Management.....	23
2.3 Read-Write Objects.....	25
2.4 Enumerations.....	26
2.4.1 Registering Additional Enumerated Values.....	27
3. Groups from other MIB Specifications.....	27
3.1 System Group.....	27

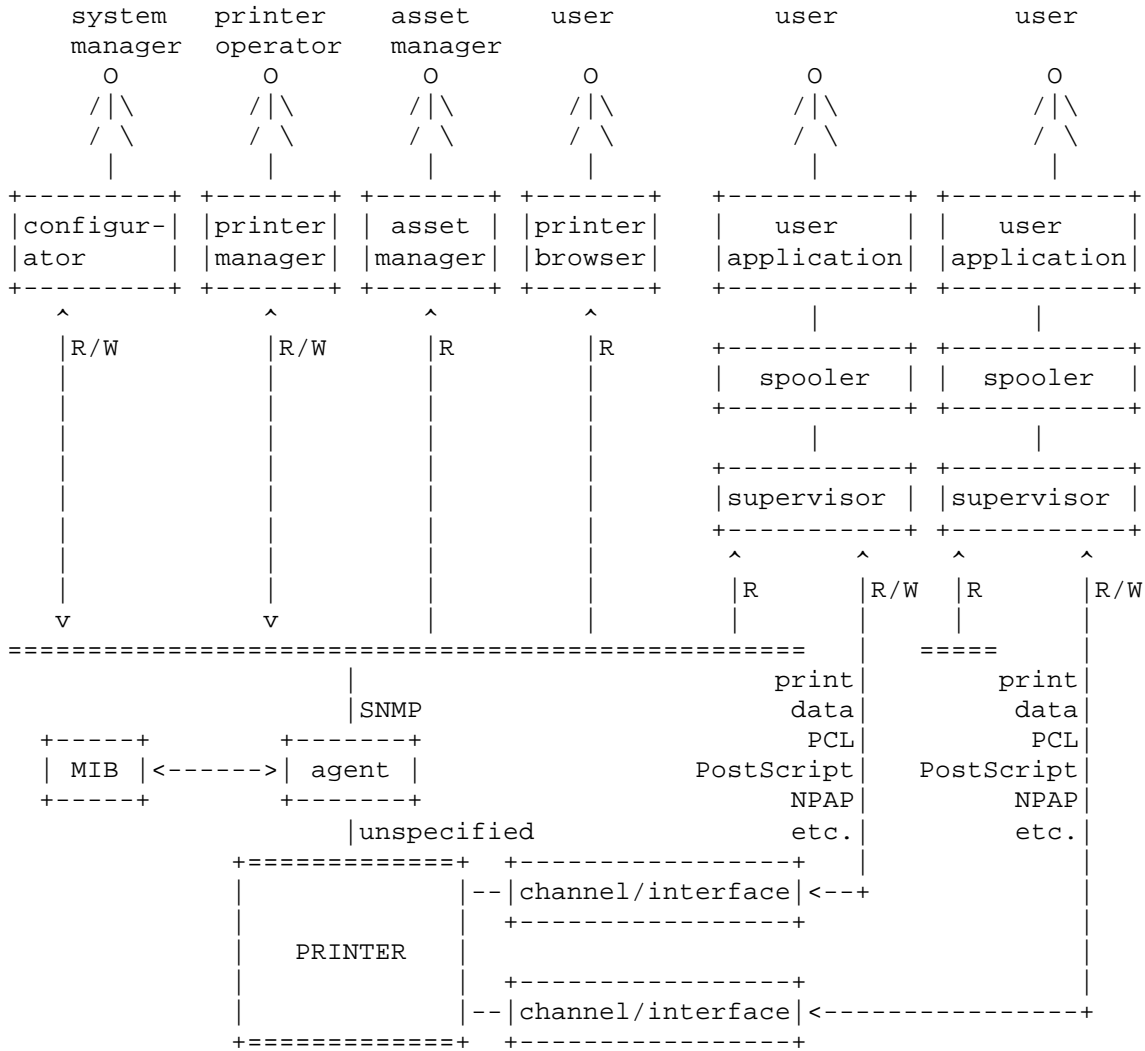
3.2	System Controller.....	28
3.3	Interface Group objects.....	28
3.3.1	Interface Types.....	28
4.	Differences from RFC 1759.....	28
5.	The Printer MIB.....	31
--	Textual conventions for this MIB module.....	32
--	The General Printer Group.....	66
--	The Responsible Party group.....	69
--	The Auxiliary Sheet Group.....	72
--	Administrative section (The General V2 Group).....	73
--	General alert table section (Alert Table V2 Group).....	74
--	The Cover Table.....	74
--	The Localization Table.....	76
--	The System Resources Tables.....	77
--	The Input Group.....	79
--	The Extended Input Group.....	85
--	The Input Media Group.....	86
--	The Input Switching Group.....	88
--	The Output Group.....	90
--	The Extended Output Group.....	93
--	The Output Dimensions Group.....	94
--	The Output Features Group.....	96
--	The Marker Group.....	97
--	The Marker Supplies Group.....	102
--	The Marker Colorant Group.....	105
--	The Media Path Group.....	107
--	The Print Job Delivery Channel Group.....	111
--	The Interpreter Group.....	118
--	The Console Group.....	122
--	The Alerts Group.....	126
--	Conformance Information.....	131
6.	IANA Considerations.....	144
7.	Internationalization Considerations.....	144
8.	Security Considerations.....	144
9.	Copyright Section.....	145
10.	References.....	145
	Appendix A - Glossary of Terms.....	150
	Appendix B - Media Size Names from ISO/IEC 10175	
	Document Printing Architecture.....	154
	Appendix C - Media Names.....	156
	Appendix D - Roles of Users.....	161
	Appendix E - Overall Printer Status Table.....	165
	Appendix F . Participants.....	166
	Authors' Addresses.....	166

1. Introduction

1.1 Network Printing Environment

The management of producing a printed document, in any computer environment, is a complex subject. Basically, the task can be divided into two overlapping pieces, the management of printing and the management of the printer. Printing encompasses the entire process of producing a printed document from generation of the file to be printed, selection of a printer, choosing printing properties, routing, queuing, resource management, scheduling, and final printing including notifying the user. Most of the printing process is outside the scope of the model presented here; only the management of the printer is covered.

Figure 1 - One Printer's View of the Network



1.2 Printer Device Overview

A printer is the physical device that takes media from an input source, produces marks on that media according to some page description or page control language and puts the result in some output destination, possibly with finishing applied. Printers are complex devices that consume supplies, produce waste and may have

mechanical problems. In the management of the physical device the description, status and alert information concerning the printer and its various subparts has to be made available to the management application so that it can be reported to the end user, key operators for the replenishment of supplies or the repair or maintenance of the device. The information needed in the management of the physical printer and the management of a printing job overlap highly and many of the tasks in each management area require the same or similar information.

1.3 Categories of Printer Information

Information about printers is classified into three basic categories: descriptions, status and alerts.

1.3.1 Descriptions

Descriptions convey information about the configuration and capabilities of the printer and its various sub-units. This information is largely static information and does not generally change during the operation of the system but may change as the printer is repaired, reconfigured or upgraded. The descriptions are one part of the visible state of the printer where state means the condition of being of the printer at any point in time.

1.3.2 Status

Status is the information regarding the current operating state of the printer and its various sub-units. Status is the rest of the visible state of the printer. As an example of the use of status, a management application must be able to determine if the various sub-units are ready to print or are in some state that prevents printing or may prevent printing in the future.

1.3.3 Alerts

An Alert is the representation of a reportable event in the printer. An event is a change in the state of the printer. Some of those state changes are of interest to a management application and are therefore reportable. Typically, these are the events that affect the printer's ability to print. Alerts usually occur asynchronously to the operation of the computer system(s) to which the printer is attached. For convenience below, "alert" will be used for both the event caused by a change in the printer's state and for the representation of that event.

Alerts can be classified into two basic categories, critical and non-critical. A critical alert is one that is triggered by entry into a state in which the printer is stopped and printing can not continue until the condition that caused the critical alert is eliminated. "Out of paper", "toner empty" and "output bin full" are examples of critical alerts. Non-critical alerts are triggered by those events that enter a state in which printing is not stopped. Such a non-critical state may, at some future time, lead to a state in which printing may be stopped. Examples of these kinds of non-critical alerts are "input media low", "toner low" and "output bin nearly full". Or, a non-critical alert may simply provide information, such as signaling a configuration changed in the printer.

Description, status and alert information about the printer can be thought of as a database describing the printer. The management application for a printer will want to view the printer data base differently depending on how and for what purposes the information in the database is needed.

1.4 The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in RFC 2571 [RFC2571].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIv1 and described in STD 16, RFC 1155 [RFC1155], STD 16, RFC 1212 [RFC1212] and RFC 1215 [RFC1215]. The second version, called SMIv2, is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [RFC1157]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [RFC1901] and RFC 1906 [RFC1906]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [RFC1906], RFC 2572 [RFC2572] and RFC 2574 [RFC2574].
- o Protocol operations for accessing management information. The

first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [RFC1157]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [RFC1905].

- o A set of fundamental applications described in RFC 2573 [RFC2573] and the view-based access control mechanism described in RFC 2575 [RFC2575].

A more detailed introduction to the current SNMP Management Framework can be found in RFC 2570 [RFC2570].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

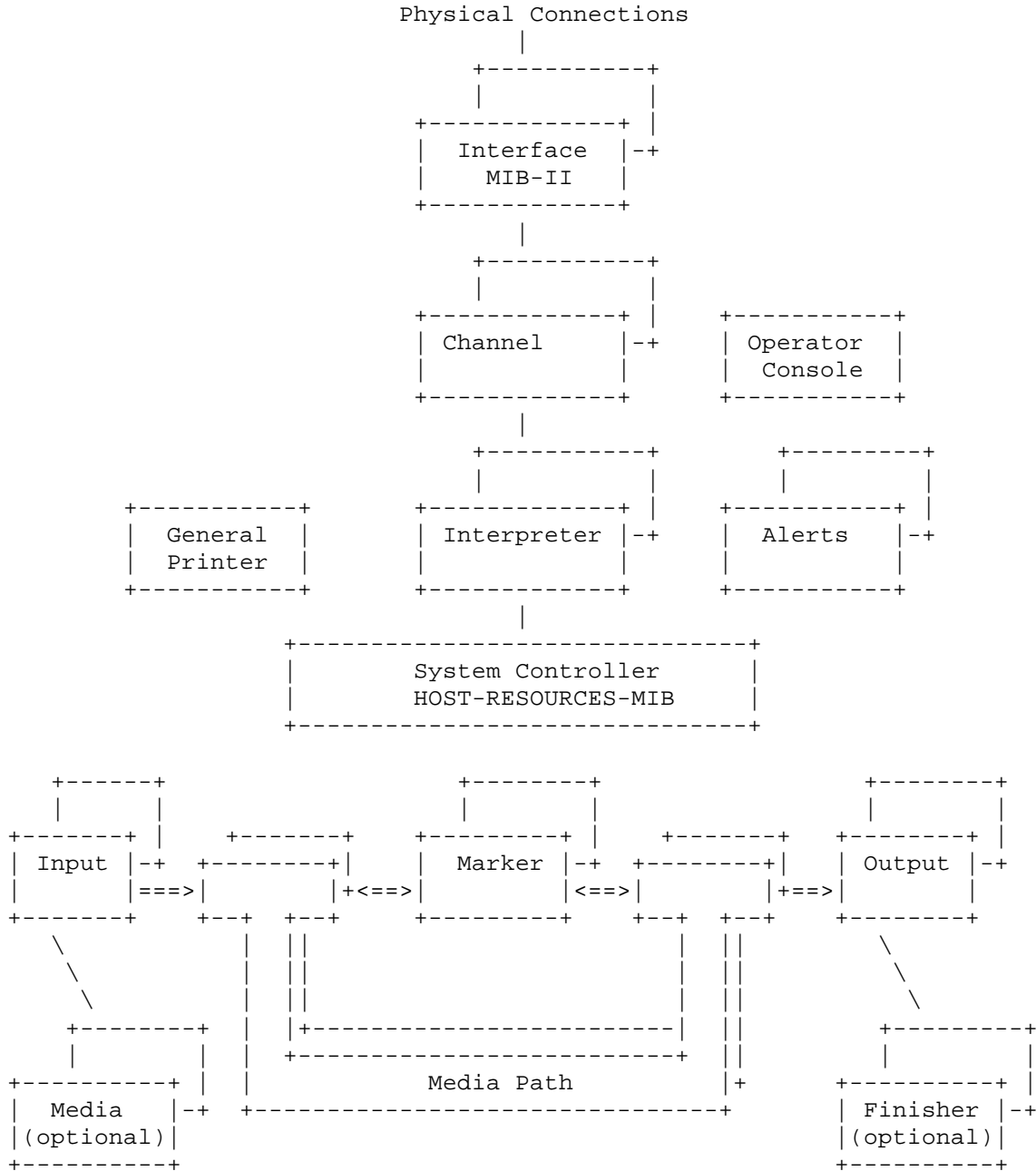
This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

2. Printer Model

In order to accomplish the management of the printer, an abstract model of the printer is needed to represent the sub-units from which the printer is composed. A printer can be described as consisting of 13 types of sub-units. It is important to note that the sub-units of a printer do not necessarily relate directly to any physically identifiable mechanism. Sub-units can also be a set of definable logical processes, such as interpreters for page description languages or command processors that set various operating modes of the printer.

Figure 2 shows a block diagram of the printer and its basic 13 sub-units.

Figure 2 - Printer Block Diagram



2.1 Overview of the Printer Model

The model has three basic parts: (1) the flow of a print file into an interpreter and onto the marker, (2) the flow of media through the marker and (3) the auxiliary sub-units that control and facilitate the two prior flows. The flow of the print data comes through a physical connection on which some form of transport protocol stack is running. The data provided by the transport protocol (interface) appears on a channel, which is the input to an interpreter. The interpreter converts the print data into a form suitable for marking on the media.

The media resides in Input sub-units from which the media is selected and then transported via a Media Path first to a Marking sub-unit and then onto an Output sub-unit with (optionally) some finishing operations being performed. The auxiliary sub-units facilitate control of the printer, inquiry/control of the operator panel, reporting of alerts and the adaptation of the printer to various natural languages and characters sets. All the software sub-units run on the System Controller that represents the processor, memory and storage systems of the Printer. Each of the sub-units is discussed in more detail below.

All of the sub-units other than the Alerts report only state information, either a description or a status. The Alerts sub-unit reports event information.

2.2 Printer Sub-Units

A printer is composed of 13 types of sub-units, called groups. The following sections describe the different types of sub-units.

2.2.1 General Printer

The general printer sub-unit is responsible for the overall control and status of the printer. There is exactly one general printer sub-unit in a printer. The General Printer Group in the model represents the general printer sub-unit. In addition to the providing the status of the whole printer and allowing the printer to be reset, this Group provides information on the status of the packaging of the printer, in particular, the covers. The general printer sub-unit is usually implemented on the system controller.

2.2.1.1 International Considerations

The localization portion of the general printer sub-unit is responsible for identifying the natural language, country, and character set in which certain character strings are expressed in this MIB.

There may be one or more localizations supported per printer. The available localizations are specified in the Localization table. Localization SHOULD only be performed on string objects which are named 'xxxDescription' (sub-unit descriptions) or 'prtConsoleDisplayBufferText' (local console text).

The agent SHALL return all other character strings in coded character sets in which code positions 0-127 (decimal) are US-ASCII [6]. The agent SHOULD return all other character strings in the UTF-8 (RFC 2279 [21]) transform of ISO 10646 [8], to conform with the IETF Policy on Character Sets and Languages (RFC 2277 / BCP 18 [19]). Control codes (code positions 0-31 and 127 decimal) SHALL NOT be used unless specifically required in the DESCRIPTION of an object.

The character set portion of the general printer Localization table is responsible for identifying the possible character sets for the operator console, and network management requests for display objects. There may be one or more character sets per printer. Default coded character sets for interpreter unit and output octets are described in the interpreter sub-unit by prtInterpreterDefaultCharSetIn and prtInterpreterDefaultCharSetOut. These input/output character sets may be overridden by commands in the interpreter language itself.

2.2.2 Inputs

Input sub-units are mechanisms that feed media to be marked on into the printer. A printer contains one or more input sub-units. The Input Group in the model represents these. The model does not distinguish fixed input bins from removable trays, except to report when a removable tray has been removed.

There are as many input sub-units as there are distinctly selectable input "addresses". For example, if one tray has both a manual and auto feeding option, then this is two input sub-units if these two sources can be (must be) separately selected. However, the above would be considered one input sub-unit if putting a sheet in the manual feed slot overrides feeding from the contents of the tray. In

the second case there is no way to separately select or address the manual feed slot.

2.2.3 Media

An input sub-unit can hold one or more instances of the media on which marking is to be done. Typically, there is a large set of possible media that can be associated with an input. The Media Group is an extension of the Input Group, which represents media in an input sub-unit. The Media Group only describes the current contents of each input and not the possible content of the input sub-unit.

2.2.4 Outputs

Output sub-units are mechanisms that receive media that has been marked on. The Output Group in the model represents the one or more output mechanisms contained by a printer. The model does not distinguish fixed output bins from removable output bins, except to report when a removable bin has been removed.

There are as many output sub-units as there are distinctly selectable output "addresses". Output sub-units can be addressed in two different ways: (1) as a set of "mailboxes" which are addressed by a specific mailbox selector such as a bin number or a bin name, or (2) as a set of "slots" into which multiple copies are collated. Sometimes both modes of using the output sub-units can be used on the same printer. All that is important from the viewpoint of the model is that the output units can be separately selected.

2.2.5 Finishers

A finisher is a sub-unit that performs some operations on the media other than marking. The Finisher Group in the model represents the finisher sub-units. Some examples of finishing processes are stapling, punching, binding, inserting, or folding. Finishing processes may have supplies associated with the process. Stapling, binding, and punching are examples of processes that have supplies. A printer may have more than one finishing sub-unit and each finishing sub-unit may be associated with one or more output sub-units. Finishers are not described in this MIB.

The model does not specify the exact interaction and sequencing between an output device and its associated finisher. It depends on the type of finishing process and the exact implementation of the printer system. This standard allows for the logical association of a

finishing process with an output device but does not put any restrictions on the exact sequence or interaction with the associated output device. The output and finisher sub-units may or may not be separate identifiable physical mechanisms depending on the exact implementation of a printer. In addition, a single output device may be associated with multiple finishing sub-units and a single finishing sub-unit may be associated with multiple output devices.

2.2.6 Markers

A marker is the mechanism that produces marks on the print media. The Marker Group in the model represents the marker sub-units and their associated supplies. A printer can contain one or more marking mechanisms. Some examples of multiple marker sub-units are a printer with separate markers for normal and magnetic ink or an imagesetter that can output to both a proofing device and final film. Each marking device can have its own set of characteristics associated with it, such as marking technology and resolution.

In this model the marker sub-unit is viewed as very generalized and encompasses all aspects of a marking process. For example, in a xerographic process, the marking process as well as the fusing process would be included in the generalized concept of the marker. With the generalized concept of a marking process, the concept of multiple marking supplies associated with a single marking sub-unit results. For example, in the xerographic process, there is not only a supply of toner, but there can also be other supplies such as a fuser supply (e.g., fuser oil) that can be consumed and replaced separately. In addition there can be multiple supplies of toner for a single marker device, as in a color process.

2.2.7 Media Paths

The media paths encompass the mechanisms in the printer that move the media through the printer and connect all other media related sub-units: inputs, outputs, markers and finishers. A printer contains one or more media paths. The Media Path Group in the model represents these. The Media Path group has some objects that apply to all paths plus a table of the separate media paths.

In general, the design of the media paths determines the maximum speed of the printer as well as the maximum media size that the printer can handle. Media paths are complex mechanisms and can contain many different identifiable sub-mechanisms such as media movement devices, media buffers, duplex units and interlocks. Not all

of the various sub-mechanisms reside on every media path. For example, one media path may provide printing only on one surface of the media (a simplex path) and another media path may have a sub-mechanism that turns the media over and feeds it a second time through the marker sub-unit (a duplex path). The duplex path may even have a buffer sub-mechanism that allows multiple copies of the obverse side to be held before the reverse side of all the copies is marked.

2.2.8 System Controller

The System Controller is the sub-unit upon which the software components of the Printer run. The Host Resources MIB represents the System Controller in the model. This MIB allows for the specification of the processor(s), memory, disk storage, file system and other underlying sub-mechanisms of the printer. The controller can range from simple single processor systems to multiprocessor systems. In addition, controllers can have a full range of resources such as hard disks. The printer is modeled to have one system controller even though it may have more than one processor and multiple other resources associated with it.

2.2.9 Interfaces

An interface is the communications port and associated protocols that are responsible for the transport of data to the printer. A printer has one or more interface sub-units. The interfaces are represented by the Interfaces Group of MIB-II (RFC 1213 [14]). Some examples of interfaces are serial ports (with little or no protocol) and Ethernet ports on which one might run Internet IP, Novell IPX, etc.

2.2.10 Print Job Delivery Channels

The print job delivery channel sub-units identify the independent sources of print data (here print data is the information that is used to construct printed pages and may have both data and control aspects). A printer may have one or more channels. The channel sub-units are represented by the Print Job Delivery Channel Group in the Model. The electronic path typically identifies each channel and service protocol used to deliver print data to the printer. A channel sub-unit may be independently enabled (allowing print data to flow) or disabled (stopping the flow of print data). It has a current Control Language that can be used to specify which interpreter is to be used for the print data and to query and change environment variables used by the interpreters (and SNMP). There is also a

default interpreter that is to be used if an interpreter is not explicitly specified using the Control Language. Print Job Delivery Channel sub-units can, and usually are, based on an underlying interface.

2.2.11 Interpreters

The interpreter sub-units are responsible for the conversion of a description of intended print instances into images that are to be marked on the media. A printer may have one or more interpreters. The Interpreter Group in the Model represents the interpreter sub-units. Each interpreter is generally implemented with software running on the System Controller sub-unit. The Interpreter Table has one entry per interpreter where the interpreters include both Page Description Language (PDL) Interpreters and Control Language Interpreters.

2.2.12 Console

Many printers have a console on the printer, the operator console that is used to display and modify the state of the printer. The console can be as simple as a few indicators and switches or as complicated as full screen displays and keyboards. There can be at most one such console. The Console Group in the model represents this console sub-unit. Although most of the information displayed there is also available in the state of the printer as represented by the various Groups, it is useful to be able to query and modify the operator console remotely. For example, a management application might like to display to its user the current message on the operator console of the remote printer or the management application user might like to modify the current message on the operators console of the remote printer. As another example, one might have a remote application that puts up a pseudo console on a workstation screen. Since the rules by which the printer state is mapped onto the console and vice versa are not standardized, it is not possible to reproduce the console state or the action of console buttons and menus. Therefore, the Console Group provides access to the console. The operator console is usually implemented on the system controller with additional hardware for input and display.

2.2.13 Alerts

The alert sub-unit is responsible for detecting reportable events, making an entry in the alert table and, if and only if the event is a critical event, initiating a trap. The exception to this rule is when the "alertRemovalofBinaryChangeEntry" trap is generated. The alert

sub-unit is represented by the Alerts Group and, in particular, the Alert Table. This table contains information on the severity, sub-unit, and detailed location within the sub-unit, alert code and description of each critical alert that is currently active within the printer. Each reportable event causes an entry to be made in the Alert Table.

2.2.13.1 Status and Alerts

Summary information about the state of the printer is reported at three separate levels: (1) The status of the printer as a whole is reported in the Host Resources MIB, (2) The status of various sub-units is reported in the principle table of the Group that represents the sub-unit, and (3) Alert codes are reported in the Alert Table.

2.2.13.2 Overall Printer Status

Of the many states a printer can be in, certain states are more "interesting" because of the distinct actions they are likely to provoke in the administrator. These states may be applied to the printer as a whole, or to a particular sub-unit of the printer. These named states are:

Non Critical Alert Active - For the printer this means that one or more sub-units have a non-critical alert active. For a sub-unit, this means that the sub-unit has a non-critical alert active.

Critical Alert Active - For the printer this means that one or more sub-units have a critical alert active. For a sub-unit, this means that the sub-unit has a critical alert active.

Unavailable - The printer or sub-unit is unavailable for use (this is the same as "broken" or "down" in other terminology). A trained service person is typically necessary to make it available.

Moving on-line or off-line - The printer is either off-line, in the process of moving off-line or moving back on-line. For example, on printers with motorized hoppers, reloading paper involves a transition to off-line to open the paper bin, filling the hopper and, finally, a transition back to on-line as the paper bin is repositioned for printing.

Standby - The printer or sub-unit is not immediately available but can accept new instructions.

Available - The printer or subunit is functioning normally.

Idle - The printer or subunit is immediately available.

Active - The printer or subunit is performing its primary function.

Busy - The printer or subunit is performing a function (not necessarily its primary function) and is not immediately available for its primary function.

The Host Resources MIB (RFC 2790 [28]) provides three status objects that can be used to describe the status of a printer: (1) hrDeviceStatus in the entry in the hrDeviceTable; (2) hrPrinterStatus in the hrPrinterTable; and (3) hrPrinterDetectedErrorState in the hrPrinterTable. These objects describe many of the states that a printer can be in. The following table shows how the values of the three printer-related objects in the Host Resources MIB relate to the states named above:

Printer Status	hrDeviceStatus	hrPrinterStatus	hrPrinterDetected-ErrorState
Idle	running(2)	idle(3)	none set
Busy/ Active	running(2)	printing(4)	
Non Critical Alert Active	warning(3)	idle(3) or printing(4)	could be: lowPaper, lowToner, or serviceRequested
Critical Alert Active	down(5)	other(1)	could be: jammed, noPaper, noToner, coverOpen, or serviceRequested
Unavailable	down(5)	other(1)	
Moving off- line	warning(3)	idle(3) or printing(4)	offline
Off-line	down(5)	other(1)	offline
Moving on-line	down(5)	warmup(5)	
Standby	running(2)	other(1)	

These named states are only a subset of the possible states - they are not an exhaustive list of the possible states. Nevertheless, several things should be noted. When using these states, it is not possible to detect when both critical and non-critical alerts are pending - if both are pending, the Critical Alert Active state will prevail. In addition, a printer in the Standby state will be represented in the Host Resources MIB with a device status of running(2) and a printer status of other(1), a set of states that don't uniquely distinguish this important printer state.

Detailed status per sub-unit is reported in the sub-unit status fields.

2.2.13.2.1 Host Resources MIB Printer Status

For completeness, the definitions of the Printer Status objects of the Host Resources MIB (RFC 2790 [28]) are given below:

```
hrDeviceStatus OBJECT-TYPE
    SYNTAX  INTEGER {
        unknown(1),
        running(2),
        warning(3),
        testing(4),
        down(5)
    }
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
        "The current operational state of the device
        described by this row of the table.  A value
        unknown(1) indicates that the current state of the
        device is unknown.  running(2) indicates that the
        device is up and running and that no unusual error
        conditions are known.  The warning(3) state
        indicates that agent has been informed of an
        unusual error condition by the operational software
        (e.g., a disk device driver) but that the device
        is still 'operational'.  An example would be high
        number of soft errors on a disk.  A value of
        testing(4), indicates that the device is not
        available for use because it is in the testing
        state.  The state of down(5) is used only when
        the agent has been informed that the device is
        not available for any use."
    ::= { hrDeviceEntry 5 }
```

```
hrPrinterStatus OBJECT-TYPE
    SYNTAX INTEGER {
        other(1),
        unknown(2),
        idle(3),
        printing(4),
        warmup(5)
    }
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
        "The current status of this printer device.  When in the
        idle(3), printing(4), or warmup(5) state, the corresponding
        hrDeviceStatus should be running(2) or warning(3).  When in
        the unknown(2) state, the corresponding hrDeviceStatus should
        be unknown(1)."
```

```
::= { hrPrinterEntry 1 }
```

hrPrinterDetectedErrorState OBJECT-TYPE

SYNTAX OCTET STRING (0..128)

ACCESS read-only

STATUS mandatory

DESCRIPTION

"This object represents any error conditions detected by the printer. The error conditions are encoded as an OCTET STRING with the following definitions:

Condition	Bit #
lowPaper	0
noPaper	1
lowToner	2
noToner	3
doorOpen	4
jammed	5
offline	6
serviceRequested	7
inputTrayMissing	8
outputTrayMissing	9
markerSupplyMissing	10
outputNearFull	11
outputFull	12
inputTrayEmpty	13
overduePreventMaint	14

Bit # 15 is not assigned.

If multiple conditions are currently detected and the hrDeviceStatus would not otherwise be unknown(1) or testing(4), the hrDeviceStatus shall correspond to the worst state of those indicated, where down(5) is worse than warning(3), which is worse than running(2).

Bits are numbered starting with the most significant bit of the first byte being bit 0, the least significant bit of the first byte being bit 7, the most significant bit of the second byte being bit 8, and so on. A one bit encodes that the condition was detected, while a zero bit encodes that the condition was not detected.

This object is useful for alerting an operator to specific warning or error conditions that may occur, especially those requiring human intervention."

```
 ::= { hrPrinterEntry 2 }
```

2.2.13.2.2 Sub-unit Status

Sub-unit status is reported in the entries of the principle table in the Group that represents the sub-unit. For sub-units that report a status, there is a status column in the table and the value of this column is always an integer formed in the following way.

The SubUnitStatus is an integer that is the sum of 5 distinct values, Availability, Non-Critical, Critical, On-line, and Transitioning. These values are:

Availability	value	
Available and Idle	0	000'b
Available and Standby	2	010'b
Available and Active	4	100'b
Available and Busy	6	110'b
Unavailable and OnRequest	1	001'b
Unavailable because Broken	3	011'b
Unknown	5	101'b
Non-Critical		
No Non-Critical Alerts	0	
Non-Critical Alerts	8	
Critical		
No Critical Alerts	0	
Critical Alerts	16	
On-Line		
State is On-Line	0	
State is Off-Line	32	
Transitioning		
At intended state	0	
Transitioning to intended state	64	

For example, an input (tray) that jammed on the next to the last page may show a status of 27 (unavailable because broken (3) + a critical

state (16), jammed, and a noncritical state (8), low paper).

2.2.13.3 Alert Tables

The Alert Group consists of a single table in which all active alerts are represented. This section provides an overview of the table and a description of how it is managed. The basic content of the alert table is the severity (critical or non-critical) of the alert, the Group and entry where a state change caused the alert, additional information about the alert (a more detailed location, an alert code, and a description), and an indication of the level of training needed to service the alert.

The Alert Table contains some information that is redundant, for example that an event has occurred, and some information that is only represented in the Alert Table, for example the additional information. A single table was used because a single entry in a group could cause more than one alert, for example paper jams in more than one place in a media path. Associating the additional information with the entry in the affected group would only allow one report where associating the additional information with the alert makes multiple reports possible. Every time an alert occurs in the printer, the printer makes one or more entries into the Alert Table. The printer determines if an event is to be classified as critical or non-critical. If the severity of the Alert is "critical", the printer sends a trap or event notification to the host indicating that the table has changed. Whether or not a trap is sent, the management application is expected to poll the printer on a regular basis and to read and parse the table to determine what conditions have changed, in order to provide reliable information to the management application user.

2.2.13.4 Alert Table Management

The alert tables are sparsely populated tables. This means the tables will only contain entries of the alerts that are currently active and the number of rows, or entries in the table will be dynamic. More than one event can be added or removed from the event tables at a time depending on the implementation of the printer.

There are basically two kinds of events that produce alerts: binary change events and unary change events. Binary change events come in pairs: the leading edge event and the trailing edge event. The leading edge event enters a state from which there is only one exit; for example, going from running to stopped with a paper jam. The only

exit from this state is fixing the paper jam and it is clear when that is accomplished. The trailing edge event exits the state that was entered by the leading edge event. In the example above, fixing the paper jam is the trailing edge event.

It is relatively straightforward to manage binary change events in the Alert Table. Only the leading edge event makes an entry in the alert table. This entry persists in the Alert Table until the trailing edge event occurs at which point this event is signaled by the removal of the leading edge event entry in the Alert Table. That is, a trailing edge event does not create an entry; it removes the corresponding leading edge event. Removing the leading edge entry may cause the unary change event "alertRemovalofBinaryChangeEvent" to be added to the table. With binary change events it is possible to compute the maximum number that can occur at the same time and construct an Alert Table that would hold that many events. There would be no possibility of table overflow and no information about outstanding events would be lost.

Unfortunately, there are some events that are not binary changes. This other category of event, the unary change event, is illustrated by the configuration change event. With this kind of event the state of the machine has changed, but to a state which is (often) just as valid as the state that was left and from which no return is necessary. For example, an operator may change the paper that is in the primary input source from letter to legal. At some time in the future the paper may be changed back to letter, but it might be changed to executive instead. This is where the problem occurs. It is not obvious how long to keep unary change event entries in the Alert Table. If they were never removed, the Alert Table would continue to grow indefinitely.

The agent needs to have an algorithm implemented for the management of the alert table, especially in the face of combinations of binary and unary alerts that would overflow the storage capacity of the table. When the table is full and new alerts need to be added, an old alert to be deleted should be chosen using the following rules:

1. Find a non-critical unary alert and delete it. If there are multiple non-critical unary alerts, it is suggested that the oldest one is chosen. If there are no non-critical unary alerts, then,
2. Find a non-critical binary alert and delete it. If there are multiple non-critical binary alerts, it is suggested that the oldest one is chosen. If there are no non-critical binary alerts, then,

3. Find a critical (binary) alert and delete it. If there are multiple critical alerts, it is suggested that the oldest one be chosen. Agent implementers are encouraged to provide at least enough storage space for the maximum number of critical alerts that could occur simultaneously. Note that all critical alerts are binary.

In the event that a critical binary alert has been deleted out of the alert table; when space allows and the alert condition still exists, the alert should be re-added to the alert table even if there was no subsequent transition into the associated state. It is recommended that this be done for non-critical binary alerts as well. Note that the new alert entry will not have the same index as the original entry that was moved out of the table.

Note that because the Alert Index is a monotonically increasing integer there will be gaps in the values in the table when an alert is deleted. The management application may want to re-acquire the Printer state and check for state changes that it did not observe in the Alert Table if such gaps are detected.

2.3 Read-Write Objects

Some objects in the printer MIB reflect the existence or amount of a given resource within the printer. Some examples of such resources are the size and number of sheets in a paper tray or the existence of certain output options. Some printers have automatic sensors for these resources. Most printers lack sensors for every property of every resource. The management application is allowed to write into objects that hold descriptive or existence values for printers that cannot sense these values. The ability to change the value of a read-write object may depend on the implementation of the agent. Many objects in the MIB are given read-write access, but a printer implementation might only permit a management application to change the value if the printer can not sense the value itself. Note that even though some objects explicitly state the behavior of conditional ability to change values, any read-write object may act this way.

Generally, an object is given read-write access in the Printer MIB specification if:

1. The object involves installation of a resource that some printers cannot themselves detect. Therefore, external means are needed to inform the printer of the installation. (Here external means include using the operator console, or remote management application) and

2. The printer will behave differently if the installation of the resource is reported than the printer would if the installation were not reported; that is, the object is not to be used as a place to put information not used by the printer, i.e., not a "sticky-note". Another way of saying this is that the printer believes that information given it and acts as if the information were true. For example, on a printer that cannot sense the size, if one paper size is loaded, but another size is set into the paper size object, then the printer will use the size that was set as its current paper size in its imaging and paper handling.

3. The printer may get hints that it may not know about the existence or properties of certain resources. For example, a paper tray may be removed and re-inserted. When this removal and insertion happens, the printer may either assume that a property, such as the size of paper in the tray, has not changed or the printer may change the value of the associated object to "unknown", as might be done for the amount of paper in the tray. As long as the printer acts according to the value in the object either strategy is acceptable.

4. It is an implementation-specific matter as to whether or not MIB object values are persistent across power cycles or cold starts. It is particularly important that the values of the prtMarkerLifeCount object persist throughout the lifetime of the printer. Therefore, if the value of any MIB object persists across power cycles, then the prtMarkerLifeCount object must also persist.

2.4 Enumerations

Enumerations (enums) are sets of symbolic values defined for use with one or more objects. Some common enumeration sets are assigned a symbolic data type name (textual convention). These enumerations are listed at the beginning of this specification. All of the enumerations in the Printer MIB which are defined in textual conventions are:

- a) used more than once in the Printer MIB itself; or
- b) imported and used in the companion Finisher MIB; or
- c) imported and used in vendor private MIBs.

The Printer MIB also has defined the following enumeration set for use with objects of the syntax "Integer32", to define conditions that

are outside of the normal numeric range; other(-1) and unknown(-2). The Integer32 range field indicates in which objects these enumeration values are valid.

2.4.1 Registering Additional Enumerated Values

This working group has defined several type of enumerations. These enumerations differ in the method employed to control the addition of new enumerations. Throughout this document, references to "enumeration (n)", where n can be 1, 2 or 3 can be found in the various tables. The definitions of these types of enumerations are:

enumeration (1) All the values are defined in the Printer MIB specification (RFC for the Printer MIB). Additional enumerated values require a new RFC.

enumeration (2) An initial set of values are defined in the Printer MIB specification. Additional enumerated values are registered after review by this working group. The initial versions of the MIB will contain the values registered so far. After the MIB is approved, additional values will be registered through IANA after approval by this working group.

enumeration (3) An initial set of values are defined in the Printer MIB specification. Additional enumerated values are registered without working group review. The initial versions of the MIB will contain the values registered so far. After the MIB is approved, additional values will be registered through IANA without approval by this working group.

3. Groups from other MIB Specifications

This section identifies the groups from other MIBs that shall be supported to supplement and complete a printer MIB implementation. The section also describes some of the less obvious characteristics of the Printer MIB structure that are related to the inclusion of these other MIB groups.

3.1 System Group

All objects in the system group of MIB-II (RFC 1213 [14]) shall be implemented; however, as described in paragraph 2.4, implementers should carefully consider what constitutes the "system".

3.2 System Controller

The storage and device groups of the Host Resources MIB (RFC 2790 [28]) shall be implemented to support the printer(s) system controller, and any supporting devices. If deemed appropriate by the implementer, other groups of the Host Resources MIB (System, Running Software, Running Software Performance, and Installed Software) may be implemented.

Because of the structure of the Host Resources MIB, the devices constituting the system controller are at the same level as the printer.

3.3 Interface Group objects

All objects in the Interfaces Group of MIB-II (RFC 1213 [14]) shall be implemented for all print information interfaces to the printer, including non-network interfaces.

3.3.1 Interface Types

The interfaces group of RFC 1213 [14] contains only a partial list of interface types that can be specified in the "ifType" object. For a complete list of interface types, refer to the IANA registry at "ftp://ftp.isi.edu/mib/ianaiftype.mib"

4. Differences from RFC 1759

This draft supercedes and replaces RFC 1759. However, a compliant implementation of RFC 1759 is also compliant with this draft. The following changes to RFC 1759 are included:

- Minor editorial corrections and changes. Updated the cover page and added the "SNMP Management Framework" boilerplate to section 1.
- Updated figure 2 to use MIB names instead of RFC numbers.
- Updated Coded Character Set description and IANA registration process.
- Change hrPrinterDetectedErrorState "coverOpen" (bit 4) to "doorOpen" per RFC 2790.
- Added second octet of hrPrinterDetectedErrorState as partially described and assigned in the updated Host Resources MIB (RFC 2790).

- Remove fixed association of hrDeviceStatus (warning/down) from hrPrinterDetectedErrorState per RFC 2790.
- Instead of showing bit 15 as "not assigned" in the quote from RFC 2790 in the hrPrinterDetectedErrorState object, removed that from the tabular form and added it as a sentence, because the RFC doesn't show bit 15 in the tabular form.
- Clarified the international considerations.
- Added prtChannelInformation to the Channel Group textual-conventions on a per channel basis to clarify the channel description and enhance interoperability.
- Deprecated some obsolete channel types.
- Extended the Alert Table and PrtMarkerSuppliesSupplyUnit textual conventions to include values from the Finisher MIB.
- Clarified alerts based on unary vs. binary change events.
- Added (optional) unary change event alertRemovalOfBinaryChangeEntry(1801).
- Establish a convention for contact information for prtGeneralCurrentOperator and prtGeneralServicePerson.
- Added prtAuxiliarySheetStartupPage PresentOnOff
- Added prtAuxiliarySheetBannerPage PresentOnOff
- Added prtGeneralPrinterName OCTET STRING
- Added prtGeneralSerialNumber OCTET STRING
- Added prtInputNextIndex Integer32
- Added the Input Switching Group
- Added prtAlertCriticalEvents Counter32
- Added prtAlertAllEvents Counter32
- Updated PrtAlertCode enums including generic alert codes.

- Created five OBJECT-GROUPs (prtAuxilliarySheetGroup, prtInputSwitchingGroup, prtGeneralV2Group, prtAlertTableV2Group, prtChannelV2Group). Added the nine new objects to them (prtAuxiliarySheetStartupPage, prtAuxiliarySheetBannerPage, prtGeneralPrinterName, prtGeneralSerialNumber, prtAlertCriticalEvents, prtAlertAllEvents, prtInputMediaLoadTimeout, prtInputNextIndex, prtChannelInformation). Created one new NOTIFICATION-GROUP (prtAlertTrapGroup) to contain printerV2Alert. Included the new OBJECT-GROUPs and the NOTIFICATION_GROUP in prtMIBCompliance, all in GROUP (not MANDATORY-GROUP) clauses. The nine new objects are optional, i.e., this draft is backward compatible with RFC 1759.
- prtAlertTime is strongly recommended.
- Deprecated the use of alert codes doorOpen(501) and doorClosed(502), in favor of coverOpened(3) and coverClosed(4).
- Added the PrtConsoleDisableTC and PrtMarkerAddressabilityUnitTC textual conventions, and changed the PrtConsoleDisable and PrtMarkerAddressabilityUnit objects' syntax to use those TCs, and changed the PrtGeneralEntry and PrtMarkerColorantEntry SEQUENCES to reflect the new syntax.
- Added textual conventions "LocalizedDescriptionStringTC" and "ConsoleDescriptionStringTC" and updated several objects to use them.
- Changed most enumerations to textual conventions and therefore changed the SYNTAX of many objects from RFC 1759 to specify the appropriate textual conventions. (28 TCs were added.)
- Changed the TC names "MediaUnit" to "PrtMediaUnitTC", "CapacityUnit" to "PrtCapacityUnitTC", and "SubUnitStatus" to "PrtSubUnitStatusTC"
- All objects with a MAX-ACCESS of read-write now have a MIN-ACCESS of read-only.
- Added 'IANA Considerations' and 'Internationalization Considerations' as top level sections, per IETF guidelines.
- Updated Security and Copyright sections.
- Updated references.

- Added Appendix E - Overall Printer Status Table.
- Updated participant and contact information.
- Added 'unknown(2)' enumeration to CodedCharSet textual convention.
- Removed all comment statements that indicated objects or groups are mandatory or optional. Avoids any potential conflicts with the conformance section.
- Added text to empty description clauses. (prtStorageRefTable, prtDeviceRefTable, prtMarkerTable, prtMediaPathTable, prtChannelTable, prtInterpreterTable, prtConsoleLightTable, and prtAlertTable)
- Added "DEFVAL { unknown }" to prtInterpreterDefaultCharSetIn and prtInterpreterDefaultCharSetOut.
- Changed "...values are expected to remain stable..." to "...values SHOULD remain stable..." in the description clauses for the index object in all tables.
- Added ranges to all objects with a syntax of Integer32.
- Revised the description clause for prtAlertGroupIndex.
- Added additional text to the description clause for prtMediaPathEntry, prtChannelEntry, prtInterpreterEntry, and printerV2Alert.
- Added text to section 2.4 to explain the usage of textual conventions in this MIB and others. Also added a note defining the common usage of the enumerations 'other(-1)' and 'unknown(-2)'
- Changed range of prtStorageRefSeqNumber, prtDeviceRefSeqNumber, and prtConsoleLightIndex from (0..65535) to (1..65535) since index values cannot be zero. (Typo in RFC 1759)

5. The Printer MIB

```
Printer-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, Counter32, Integer32, TimeTicks,  
    NOTIFICATION-TYPE, OBJECT-IDENTITY, mib-2 FROM SNMPv2-SMI
```

TEXTUAL-CONVENTION FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP FROM SNMPv2-CONF
hrDeviceIndex, hrStorageIndex FROM HOST-RESOURCES-MIB;

```
printmib MODULE-IDENTITY
  LAST-UPDATED "200111150000Z"
  ORGANIZATION "IETF Printer MIB Working Group"
  CONTACT-INFO
    "Harry Lewis
     IBM Corporation.
     6300 Diagonal Hwy
     Boulder, CO 80301
     harryl@us.ibm.com"
  DESCRIPTION
    "The MIB module for management of printers."
  REVISION      "200111150000Z"
  DESCRIPTION
    "Printer MIB v2.
     Five new OBJECT-GROUPS: prtAuxilliarySheetGroup,
     prtInputSwitchingGroup, prtGeneralV2Group,
     prtAlertTableV2Group, prtChannelV2Group.
     Nine new objects added to those groups:
     prtAuxiliarySheetStartupPage, prtAuxiliarySheetBannerPage,
     prtGeneralPrinterName, prtGeneralSerialNumber,
     prtAlertCriticalEvents, prtAlertAllEvents,
     prtInputMediaLoadTimeout, prtInputNextIndex,
     prtChannelInformation.
     One new NOTIFICATION-GROUP: prtAlertTrapGroup which contains
     printerV2Alert.
     In MODULE-COMPLIANCE prtMIBCompliance, new OBJECT-GROUPS and
     the NOTIFICATION_GROUP, all in GROUP (not MANDATORY-GROUP)
     clauses. The nine new objects are optional, i.e., this draft
     is backward compatible with RFC 1759."
  REVISION      "199411250000Z"
  DESCRIPTION
    "The original version of this MIB, published as RFC1759."
 ::= { mib-2 43 }
```

```
-- Textual conventions for this MIB module
--
-- Generic unspecific textual conventions
--
```

```
PrtMediaUnitTC ::= TEXTUAL-CONVENTION
  -- This is a type 1 enumeration.
```



```
STATUS      current
DESCRIPTION
  "Units of measure for media dimensions."
SYNTAX      INTEGER {
              tenThousandthsOfInches(3),  -- .0001
              micrometers(4)
            }

PrtCapacityUnitTC ::= TEXTUAL-CONVENTION
-- This is a type 1 enumeration.
STATUS      current
DESCRIPTION
  "Units of measure for media capacity."
SYNTAX      INTEGER {
              other(1),
              unknown(2),
              tenThousandthsOfInches(3),  -- .0001
              micrometers(4),
              sheets(8),
              feet(16),
              meters(17),
              -- Values for Finisher MIB
              items(18),
              percent(19)
            }

PrtPrintOrientationTC ::= TEXTUAL-CONVENTION
-- This value is a type 1 enumeration.
STATUS      current
DESCRIPTION
  "A generic representation for printing orientation on a 'page'."
SYNTAX      INTEGER {
              other(1),
              portrait(3),
              landscape(4)
            }

PrtCoverStatusTC ::= TEXTUAL-CONVENTION
-- This is a type 2 enumeration.
STATUS      current
DESCRIPTION
  "Values for encoding the state of a particular cover or access
  panel on the printer case or enclosure."
SYNTAX      INTEGER {
              other(1),
```

```

    coverOpen(3),
    coverClosed(4),
    interlockOpen(5),
    interlockClosed(6)
}

```

PrtSubUnitStatusTC ::= TEXTUAL-CONVENTION

-- This is a type 1 enumeration.

STATUS current

DESCRIPTION

"Status of a printer sub-unit.

The SubUnitStatus is an integer that is the sum of 5 distinct values, Availability, Non-Critical, Critical, On-line, and Transitioning. These values are:

Availability		Value
Available and Idle	0	0000'b
Available and Standby	2	0010'b
Available and Active	4	0100'b
Available and Busy	6	0110'b
Unavailable and OnRequest	1	0001'b
Unavailable because Broken	3	0011'b
Unknown	5	0101'b
Non-Critical		
No Non-Critical Alerts	0	0000'b
Non-Critical Alerts	8	1000'b
Critical		
No Critical Alerts	0	0000'b
Critical Alerts	16	1 0000'b
On-Line		
State is On-Line	0	0000'b
State is Off-Line	32	10 0000'b
Transitioning		
At intended state	0	0000'b
Transitioning to intended state	64	100 0000'b"

```
SYNTAX      INTEGER (0..126)
```

```
PresentOnOff ::= TEXTUAL-CONVENTION
```

```
-- This is a type 1 enumeration.
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"Presence and configuration of a device or feature."
```

```
SYNTAX      INTEGER {  
                other(1),  
                on(3),  
                off(4),  
                notPresent(5)  
                }
```

```
CodedCharSet ::= TEXTUAL-CONVENTION
```

```
-- This is a type 3 enumeration.
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"A coded character set value that specifies both a set of  
characters that may be used and an encoding (as one or more  
octets) that is used to represent the characters in the set.  
These values are to be used to identify the encoding employed  
for strings in the MIB where this is not fixed by the MIB.
```

```
Some objects that allow a choice of coded character set are: the  
prtLocalizationCharacterSet object in the LocalizationTable and  
prtInterpreterDefaultCharSetIn. The  
prtGeneralCurrentLocalization and prtConsoleLocalization objects  
in turn contain the index in the LocalizationTable of the  
current localization (country, language, and coded character  
set) of the 'description' objects and the console, respectively.
```

```
The current list of character sets and their enumerated values  
used to reference them are contained in the IANA Character Set  
registry. The enum value is indicated by the MIBenum entry in  
the registry. The enum symbol is indicated by the Alias that  
starts with 'cs' for character set.
```

```
The IANA character sets registry is [4]. To add a new character  
set to the IANA Registry, see RFC 2278 or BCP 19 [20].
```

```
The textual conventions LocalizedDescriptionStringTC and  
ConsoleDescriptionStringTC are required for use with objects  
that are controlled by prtGeneralCurrentLocalization and  
prtConsoleLocalization, respectively."
```

```

SYNTAX      INTEGER {
                other(1),    -- used if the designated coded
                             -- character set is not currently
                             -- registered by IANA
                unknown(2)  -- used as a default value

-- See [4] for registered character sets and
-- use the MIBenum integer value.
            }

LocalizedDescriptionStringTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "An object MUST use this textual convention when its
        'charset' is controlled by the value of
        prtGeneralCurrentLocalization."
    SYNTAX      OCTET STRING (SIZE(0..255))

ConsoleDescriptionStringTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "An object MUST use this textual convention when its
        'charset' is controlled by the value of
        prtConsoleLocalization."
    SYNTAX      OCTET STRING (SIZE(0..255))

--
-- General Group textual-conventions
--

PrtGeneralResetTC ::= TEXTUAL-CONVENTION
    -- This value is a type 3 enumeration.
    STATUS      current
    DESCRIPTION
        "Values for reading and writing the prtGeneralReset object.

        If a device does not have NVRAM, the device shall none the less
        respond to a SET with the value resetToNVRAM(5) with some sort of
        warm reset that resets the device to some implementation-defined
        state that is preferably under control of the system administrator
        by some means outside the scope of this MIB specification."

    SYNTAX      INTEGER {
                notResetting(3),

```

```

        powerCycleReset(4), -- Cold Start
        resetToNVRAM(5), -- Warm Start
        resetToFactoryDefaults(6) -- Reset contents of
                                   -- NVRAM to factory
                                   -- defaults
    }

--
-- Channel Group textual-conventions
--

PrtChannelStateTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS      current
    DESCRIPTION
        "The state of this print job delivery channel. The value
         determines whether print data is allowed through this channel."
    SYNTAX      INTEGER {
        other(1),
        printDataAccepted(3),
        noDataAccepted(4)
    }

PrtChannelTypeTC ::= TEXTUAL-CONVENTION
    -- This is a type 2 enumeration.
    STATUS      current
    DESCRIPTION
        "This enumeration indicates the type of channel that is
         receiving jobs."
    SYNTAX      INTEGER {
        other(1),
        chSerialPort(3),
        chParallelPort(4),
        chIEEE1284Port(5),
        chSCSIPort(6),
        chAppleTalkPAP(7),
        -- AppleTalk Printer
        -- Access Protocol (PAP)
        --
        -- prtChannelInformation entry:
        --
        -- Printer Name
        -- Keyword:      Name
        -- Syntax:       Name
        -- Status:       Optional
    }

```

```
-- Multiplicity: Single
-- Description: The name of the printer within
-- the AppleTalk naming scope
chLPDServer(8),
-- prtChannelInformation entry:
--
-- Printer queue name
-- Keyword: Queue
-- Syntax: Name
-- Status: Mandatory
-- Multiplicity: Single
-- Description: queue name as
-- defined in RFC 1179 [12].
chNetwareRPrinter(9),
-- Novell, Inc.
-- For each entry of this type, the
-- prtChannelInformation must have a pair of
-- keywords. For Netware 3.x channels this must
-- be a (PServer, Printer) pair. For Netware 4.x
-- channels and for IntranetWare channels this
-- must be a (NDSTree, NDSPrinter) pair.
--
-- prtChannelInformation entries:
--
-- Print Server Name
-- Keyword: PServer
-- Syntax: Name
-- Status: Mandatory
-- Multiplicity: Single
-- Description: The Pserver's SAP name
--
-- Printer Number
-- Keyword: Printer
-- Syntax: Integer
-- Status: Mandatory
-- Multiplicity: Single
-- Description: The printer number
--
-- NDSTree
-- Keyword: NDSTree
-- Syntax: Name
-- Multiplicity: Single
-- Description: The tree's SAP name
--
-- NDS Printer object
```

```

-- Keyword:      NDSPrinter
-- Syntax:       Text (Unicode)
-- Status:       Mandatory
-- Multiplicity: Single
-- Description:  The fully qualified
--               name of the Printer
--
-- In the Netware 3.x environment, the
-- client checks the Bindery object
-- representing the named PServer. The
-- client then checks for queues which
-- are associated with the numbered
-- printer. In the 4.x and IntraNetware
-- environment, the client looks up the
-- queues which are associated with the
-- NDS Printer Object in the named Tree.
-- Depending on client access rights to
-- those queues, the client submits jobs
-- to the appropriate queue.
chNetwarePServer(10),
-- Novell, Inc.
-- For each entry of this type, the
-- prtChannelInformation must have a pair
-- of keywords. For Netware 3.x channels
-- this must be a (Server, PServer) pair.
-- For Netware 4.x and IntranetWare
-- channels, this must be a
-- (NDSTree, NDSPServer) pair.
--
-- prtChannelInformation entries:
--
-- Server Name
-- Keyword:      Server
-- Syntax:       Name
-- Status:       Mandatory
-- Multiplicity: Single
-- Description:  The SAP name of the
--               server for which the PServer is defined.
--
-- PServer
-- Keyword:      PServer
-- Syntax:       Name
-- Status:       Mandatory
-- Multiplicity: Single
-- Description:  The bindery name of

```

```
--          the PServer
--
-- NDS Tree
-- Keyword:   NDSTree
-- Syntax:   Name
-- Status:   Mandatory
-- Multiplicity: Single
-- Description: The NDS Tree name
--
-- PServer
-- Keyword:   NDSPServer
-- Syntax:   Text (Unicode)
-- Status:   Mandatory
-- Multiplicity: Single
-- Description: The fully qualified
--             name of the PServer object in the tree.
--
-- In the 3.x environment, the client
-- checks the bindery object
-- representing the named PServer on the
-- named Server. In the 4.x and
-- IntranetWare environment,
-- the client checks the NDS object
-- representing the named PServer in the
-- named Tree. In either case, the
-- client then checks for all queues
-- associated with the Pserver object.
-- Depending on client access rights
-- to those queues, the client submits
-- jobs to the appropriate queue.
chPort9100(11),
-- DEPRECATED
-- (see chPortTCP . 37; chBidirPortTCP . 38)
chAppSocket(12),
-- A bi-directional, LPD-like,
-- protocol using 9101 for
-- control and 9100 for data.
-- Adobe Systems, Inc.
chFTP(13),          -- RFC 959 [11]
chTFTP(14),         -- RFC 1350 [13]
chDLCLLCPort(15),
chIBM3270(16),     -- IBM Coax
chIBM5250(17),    -- IBM Twinax
chFax(18),
chIEEE1394(19),
```



```
chTransport1(20),
  -- TCP port 35, see reserved TCP port list
  -- in RFC 1700 [15] or current "Assigned
  -- Numbers" files. This RFC should also be
  -- referenced for other channel
  -- enumerations utilizing TCP port
  -- numbers 0 through 1024.
chCPAP(21),      -- TCP port 170
  -- Digital Equipment Corp.
chDCERemoteProcCall(22), -- OSF
  -- DEPRECATED
chONCRemoteProcCall(23), -- SUN Microsystems
  -- DEPRECATED
chOLE(24),      -- Microsoft
  -- DEPRECATED
chNamedPipe(25),
chPCPrint(26),  -- Banyan
chServerMessageBlock(27),
  -- File/Print sharing protocol used by
  -- various network operating systems
  -- from IBM 3Com, Microsoft and others
  --
  -- prtChannelInformation entry:
  --
  -- Service Name
  -- Keyword:      Name
  -- Syntax:      Name
  -- Status:      Optional
  -- Multiplicity: Single
  -- Description: The service name of
  --              the printer
chPSM(28),      -- Printing Systems
  -- Manager, IBM
chDLLAPI(29),  -- Microsoft
  -- DEPRECATED
chVxDAPI(30),  -- Microsoft
  -- DEPRECATED
chSystemObjectManager(31), -- IBM
chDECLAT(32),
  -- Digital Equipment Corp.
  --
  -- prtChannelInformation entries:
  --
  -- Port Name
  -- Keyword:      Port
```

```

-- Syntax:      Name
-- Status:      Conditionally
--              Mandatory
--              (see note below)
-- Multiplicity: Single
-- Description:  LAT port name
--
-- Service Name
-- Keyword:     Service
-- Syntax:      Name
-- Status:      Conditionally
--              Mandatory
-- Multiplicity: Single
-- Description:  LAT service name
--
-- The LAT channel may be
-- identified by either a port or
-- service, so either a
-- Port or Service entry must be
-- specified, but not both.
chNPAP(33),
chUSB(34),    -- Universal Serial Bus
chIRDA(35),   -- Infrared Data Assoc. Prot.
chPrintXChange(36), -- PrintXChange Protocol
chPortTCP(37),
-- A unidirectional "raw" TCP
-- channel that uses an administratively
-- assigned TCP port address.
--
-- prtChannelInformation entry:
--
-- Port Number
-- Keyword:     Port
-- Syntax:      decimal number
-- Status:      Mandatory
-- Multiplicity: Single
-- Description:  TCP port number
chBidirPortTCP(38),
-- A bi-directional version of chPortTCP
--
-- prtChannelInformation entries:
-- (See chPortTCP)
chUNPP(39),
-- Universal Network Printing
-- Protocol(UNPP). A bi-directional,

```

```
-- multiport network printing
-- application protocol available on
-- multiple transport protocols.
-- Underscore, Inc.
-- Contact: info@underscore.com
chAppleTalkADSP(40),
-- AppleTalk Data Stream Protocol.
-- ADSP is part of the AppleTalk
-- suite of protocols.
-- It is a symmetric, connection-
-- oriented protocol that makes
-- possible the establishment
-- and maintenance of full-duplex
-- streams of data bytes between
-- two sockets in an AppleTalk
-- internet.
-- See [5].
chPortSPX(41),
-- Sequenced Packet Exchange (SPX)
-- socket.
-- Novell, Inc. Similar to TCP, a
-- bi-directional data pipe using
-- Novell SPX as a transport.
--
-- prtChannelInformation entries:
--
-- Network Number
--   Keyword:      Net
--   Syntax:       HexString
--   Status:       Mandatory
--   Multiplicity: Single
--   Description:  The network number
--
-- Node Number
--   Keyword:      Node
--   Syntax:       HexString
--   Status:       Mandatory
--   Multiplicity: Single
--   Description:  The node number
--
-- Socket Number
--   Keyword:      Socket
--   Syntax:       HexString
--   Status:       Mandatory
--   Multiplicity: Single
```

```
-- Description: The SPX socket number
--
-- There must be exactly one "Net" and
-- one "Node" and one "Socket" entry. A
-- HexString is a binary value
-- represented as a string of
-- ASCII characters using hexadecimal
-- notation.
chPortHTTP(42),
-- Hypertext Transfer Protocol. See RFC 1945 [16]
-- and RFC 2616 [27].
chNDPS(43),
-- Novell, Inc.
--
-- prtChannelInformation entry:
--
-- Printer Agent Name
-- Keyword: PA
-- Syntax: Name
-- Status: Mandatory
-- Multiplicity: Single
-- Description: The NDPS Printer
-- Agent Name
chIPP(44)
-- Internet Printing Protocol (IPP),
-- (IPP/1.0 - see RFC 2910 [3] and RFC 2911
-- [2]), also applies to all future versions
-- of IPP.
--
-- IPP Printer URI
-- Keyword: URI
-- Syntax: URI (Unicode UTF-8 per
-- RFC 2396 [22])
-- Status: Mandatory
-- Multiplicity: Single
-- Default: not applicable
-- Description: URI of this IPP Printer within
-- the Internet naming scope. Unicode
-- UTF-8 RFC 2279 [21] string with
-- hexadecimal escapes for any non-ASCII
-- characters (per RFC 2396 [22]).
-- Conformance: An IPP Printer shall list all
-- IPP URI it supports (one per IPP Channel
-- entry). If a URI contains the 'http:'
-- scheme it MUST have an explicit port.
```

```
-- See: RFC 2279 [21], RFC 2396 [22], RFC 2910
-- [3], RFC 2911 [2].
--
-- IPP Printer Client Authentication
-- Keyword:      Auth
-- Syntax:       Keyword
-- Status:       Optional
-- Multiplicity: Single
-- Default:      'none'
-- Description:  A client authentication
-- mechanism supported for this IPP Printer
-- URI:
--   'none'
--     no client authentication mechanism
--   'requesting-user-name'
--     authenticated user in 'requesting-
--     user-name'
--   'basic'
--     authenticated user via HTTP Basic
--     mechanism
--   'digest'
--     authenticated user via HTTP Digest
--     mechanism
--   'certificate'
--     authenticated user via certificate
--     mechanism
-- Conformance: An IPP Printer should list all
-- IPP client authentication mechanisms it
-- supports (one per IPP Channel entry).
-- See: [2] and [3].
--
-- IPP Printer Security
-- Keyword:      Security
-- Syntax:       Keyword
-- Status:       Optional
-- Multiplicity: Single
-- Default:      'none'
-- Description:  A security mechanism supported
-- for this IPP Printer URI:
--   'none'
--     no security mechanism
--   'ssl3'
--     SSL3 secure communications channel
--     protocol
--   'tls'
```

```

--      TLS secure communications channel
--      protocol
--      Conformance: An IPP Printer should list all
--      IPP security mechanisms it supports
--      (one per IPP Channel entry).
--      See: RFC 2246 [18], RFC 2911 [2].
--
-- IPP Printer Protocol Version
-- Keyword:      Version
-- Syntax:      Keyword
-- Status:      Optional
-- Multiplicity: Multiple
-- Default:     '1.0'
-- Description: All of the IPP protocol
--      versions (major.minor) supported for this
--      IPP Printer URI:
--      '1.0'
--      IPP/1.0 conforming Printer
--      '1.1'
--      IPP/1.1 conforming Printer
-- Conformance: An IPP Printer should list all
--      IPP versions it supports (all listed in
--      each IPP Channel entry). An IPP Client
--      should select the highest numbered
--      version that the client supports for use
--      in all IPP Requests (for optimum
--      interworking).
--      See: RFC 2911 [2].
}
--
-- Interpreter Group textual conventions
--
PrtInterpreterLangFamilyTC ::= TEXTUAL-CONVENTION
-- This value is a type 2 enumeration.
STATUS      current
DESCRIPTION
    "This enumeration indicates the type of interpreter that is
    receiving jobs."
SYNTAX      INTEGER {
    other(1),
    unknown(2),
    langPCL(3),
-- PCL. Starting with PCL version 5,
-- HP-GL/2 is included as part of the
-- PCL language.

```

```

-- PCL and HP-GL/2 are registered
-- trademarks of Hewlett-Packard
-- Company.
langHPGL(4), -- Hewlett-Packard Graphics Language.
-- HP-GL is a registered trademark of
-- Hewlett-Packard Company.
langPJL(5), -- Peripheral Job Language. Appears in
-- the data stream between data intended
-- for a page description language.
-- Hewlett-Packard Co.
langPS(6), -- PostScript (tm) Language
-- Postscript - a trademark of Adobe
-- Systems Incorporated which may be
-- registered in certain jurisdictions
langIPDS(7), -- Intelligent Printer Data Stream
-- Bi-directional print data stream for
-- documents consisting of data objects
-- (text, image, graphics, bar codes),
-- resources (fonts, overlays) and page,
-- form and finishing instructions.
-- Facilitates system level device
-- control, document tracking and error
-- recovery throughout the print
-- process.
-- IBM Corporation.
langPPDS(8), -- IBM Personal Printer Data Stream.
-- Originally called IBM ASCII, the name
-- was changed to PPDS when the Laser
-- Printer was introduced in 1989.
-- Lexmark International, Inc.
langEscapeP(9), -- Epson Corp.
langEpson(10),
langDDIF(11), -- Digital Document Interchange Format
-- Digital Equipment Corp., Maynard MA
langInterpress(12), -- Xerox Corp.
langISO6429(13), -- ISO 6429. Control functions for
-- Coded Character Sets (has ASCII
-- control characters, plus additional
-- controls for
-- character imaging devices.)
langLineData(14), -- line-data: Lines of data as
-- separate ASCII or EBCDIC records
-- and containing no control functions
-- (no CR, LF, HT, FF, etc.)

```

```
-- For use with traditional line
-- printers. May use CR and/or LF to
-- delimit lines, instead of records.
-- See ISO 10175 Document Printing
-- Application (DPA) [7].
langMODCA(15), -- Mixed Object Document Content
               -- Architecture
               -- Definitions that allow the
               -- composition, interchange, and
               -- presentation of final form
               -- documents as a collection of data
               -- objects (text, image, graphics, bar
               -- codes), resources (fonts, overlays)
               -- and page, form and finishing
               -- instructions.
               -- IBM Corporation.
langREGIS(16), -- Remote Graphics Instruction Set,
               -- Digital Equipment Corp., Maynard MA
langSCS(17),   -- SNA Character String
               -- Bi-directional print data stream for
               -- SNA LU-1 mode of communication.
               -- IBM
langSPDL(18), -- ISO 10180 Standard Page Description
               -- Language
               -- ISO Standard
               -- Tektronix Corp.
langTEK4014(19),
langPDS(20),
langIGP(21),  -- Printronix Corp.
langCodeV(22), -- Magnum Code-V, Image and printer
               -- control language used to control
               -- impact/dot-matrix printers.
               -- QMS, Inc., Mobile AL
langDSCDSE(23), -- DSC-DSE: Data Stream Compatible and
                -- Emulation Bi-directional print data
                -- stream for non-SNA (DSC) and SNA LU-3
                -- 3270 controller (DSE) communications
                -- IBM
langWPS(24),   -- Windows Printing System, Resource
               -- based command/data stream used by
               -- Microsoft At Work Peripherals.
               -- Developed by the Microsoft
               -- Corporation.
langLN03(25), -- Early DEC-PPL3, Digital Equipment
               -- Corp.
langCCITT(26),
```



```
langQUIC(27),      -- QUIC (Quality Information Code), Page
                  -- Description Language for laser
                  -- printers. Included graphics, printer
                  -- control capability and emulation of
                  -- other well-known printer.
                  -- QMS, Inc.
langCPAP(28),     -- Common Printer Access Protocol
                  -- Digital Equipment Corp.
langDecPPL(29),  -- Digital ANSI-Compliant Printing
                  -- Protocol
                  -- (DEC-PPL)
                  -- Digital Equipment Corp.
langSimpleText(30),
                  -- simple-text: character coded data,
                  -- including NUL, CR , LF, HT, and FF
                  -- control characters. See ISO 10175
                  -- Document Printing Application (DPA) [7].
langNPAP(31),    -- Network Printer Alliance Protocol
                  -- (NPAP). This protocol has been
                  -- superseded by the IEEE 1284.1 TIPSII
                  -- Std (ref. LangTIPSII(49)).
langDOC(32),     -- Document Option Commands, Appears in
                  -- the data stream between data
                  -- intended for a page description.
                  -- QMS, Inc.
langimPress(33), -- imPRESS, Page description language
                  -- originally developed for the
                  -- ImageServer product line. A binary
                  -- language providing representations
                  -- of text, simple graphics, and some
                  -- large forms (simple
                  -- bit-map and CCITT group 3/4
                  -- encoded).The
                  -- language was intended to be sent over
                  -- an 8-bit channel and supported early
                  -- document preparation languages (e.g.,
                  -- TeX and TROFF).
                  -- QMS, Inc.
langPinwriter(34),
                  -- 24 wire dot matrix printer for
                  -- USA, Europe, and Asia except
                  -- Japan.
                  -- More widely used in Germany, and
                  -- some Asian countries than in US.
                  -- NEC
```

```
langNPDL(35),      -- Page printer  for Japanese market.
                  -- NEC
langNEC201PL(36), -- Serial printer language used in
                  -- the Japanese market.
                  -- NEC
langAutomatic(37), -- Automatic PDL sensing.  Automatic
                  -- sensing of the interpreter
                  -- language family by the printer
                  -- examining the document content.
                  -- Which actual interpreter language
                  -- families are sensed depends on
                  -- the printer implementation.
langPages(38),    -- Page printer Advanced Graphic
                  -- Escape Set
                  -- IBM Japan
langLIPS(39),     -- LBP Image Processing System
langTIFF(40),    -- Tagged Image File Format (Aldus)
langDiagnostic(41), -- A hex dump of the input to the
                  -- interpreter
langPSPrinter(42), -- The PostScript Language used for
                  -- control (with any PDLs)
                  -- Adobe Systems Incorporated
langCaPSL(43),   -- Canon Print Systems Language
langEXCL(44),    -- Extended Command Language
                  -- Talaris Systems Inc.
langLCDS(45),    -- Line Conditioned Data Stream
                  -- Xerox Corporation
langXES(46),     -- Xerox Escape Sequences
                  -- Xerox Corporation
langPCLXL(47),   -- Printer Control Language. Extended
                  -- language features for printing, and
                  -- printer control.
                  -- Hewlett-Packard Co.
langART(48),     -- Advanced Rendering Tools (ART).
                  -- Page Description language
                  -- originally developed for the Laser
                  -- Press printers.
                  -- Technical reference manual: "ART IV
                  -- Reference Manual", No F33M.
                  -- Fuji Xerox Co., Ltd.
langTIPSI(49),   -- Transport Independent Printer
                  -- System Interface (ref. IEEE Std.
```

```

-- 1284.1)
langPrescribe(50),
-- Page description and printer
-- control language. It can be
-- described with ordinary ASCII
-- Technical reference manual:
-- "PRESCRIBE II Programming Manual"
langLinePrinter(51),
-- A simple-text character stream which
-- supports the control codes LF, VT,
-- FF, and plus Centronics or
-- Dataproducts Vertical Format Unit
-- (VFU) language is commonly used on
-- many older model line and matrix
-- printers.
langIDP(52),
-- Imaging Device Protocol
-- Apple Computer.
langXJCL(53),
-- Xerox Job Control Language (JCL).
-- A Job Control language originally
-- developed for the LaserPress printers
-- and is capable of switching PDLs.
-- Technical reference manual:
-- "ART IV Reference Manual", No F33M.
-- Fuji Xerox Co., Ltd.
langPDF(54),
-- Adobe Portable Document Format
-- Adobe Systems, Inc.
langRPDL(55),
-- Ricoh Page Description Language for
-- printers.
-- Technical manual "RPDL command
-- reference" No.307029
-- RICOH, Co. LTD
langIntermecIPL(56),
-- Intermec Printer Language for label
-- printers.
-- Technical Manual: "IPL Programmers
-- Reference Manual"
-- Intermec Corporation
langUBIFingerprint(57),
-- An intelligent basic-like programming
-- language for label printers.
-- Reference Manual: "UBI Fingerprint
-- 7.1", No. 1-960434-00
-- United Barcode Industries
langUBIDirectProtocol(58),
-- An intelligent control language for
```

```

-- label printers.
-- Programmers guide: " UBI Direct
-- Protocol", No. 1-960419-00
-- United Barcode Industries

langFujitsu(59)
-- Fujitsu Printer Language
-- Reference Manual:
-- "FM Printer Sequence" No. 80HP-0770
-- FUJITSU LIMITED
}

--
-- Input/Output Group Textual Conventions
--

PrtInputTypeTC ::= TEXTUAL-CONVENTION
-- This is a type 2 enumeration.
STATUS      current
DESCRIPTION
    "The type of technology (discriminated primarily according to
    feeder mechanism type) employed by a specific component or
    components."
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                sheetFeedAutoRemovableTray(3),
                sheetFeedAutoNonRemovableTray(4),
                sheetFeedManual(5),
                continuousRoll(6),
                continuousFanFold(7)
            }

PrtOutputTypeTC ::= TEXTUAL-CONVENTION
-- This is a type 2 enumeration.
STATUS      current
DESCRIPTION
    "The Type of technology supported by this output sub-unit."
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                removableBin(3),
                unRemovableBin(4),
                continuousRollDevice(5),
                mailBox(6),
                continuousFanFold(7)
            }

```

}

PrtOutputStackingOrderTC ::= TEXTUAL-CONVENTION

-- This is a type 1 enumeration.

STATUS current

DESCRIPTION

"The current state of the stacking order for the associated output sub-unit. 'firstToLast' means that as pages are output, the front of the next page is placed against the back of the previous page. 'lastToFirst' means that as pages are output, the back of the next page is placed against the front of the previous page."

SYNTAX INTEGER {
 unknown(2),
 firstToLast(3),
 lastToFirst(4)
}

PrtOutputPageDeliveryOrientationTC ::= TEXTUAL-CONVENTION

-- This is a type 1 enumeration.

STATUS current

DESCRIPTION

"The reading surface that will be 'up' when pages are delivered to the associated output sub-unit. Values are Face-Up and Face Down (Note: interpretation of these values is, in general, context-dependent based on locale; presentation of these values to an end-user should be normalized to the expectations of the user."

SYNTAX INTEGER {
 faceUp(3),
 faceDown(4)
}

--

-- Marker Group Textual Conventions

--

PrtMarkerMarkTechTC ::= TEXTUAL-CONVENTION

-- This value is a type 2 enumeration.

STATUS current

DESCRIPTION

"The type of marking technology used for this marking sub-unit"

SYNTAX INTEGER {
 other(1),
 unknown(2),

```

electrophotographicLED(3),
electrophotographicLaser(4),
electrophotographicOther(5),
impactMovingHeadDotMatrix9pin(6),
impactMovingHeadDotMatrix24pin(7),
impactMovingHeadDotMatrixOther(8),
impactMovingHeadFullyFormed(9),
impactBand(10),
impactOther(11),
inkjetAqueous(12),
inkjetSolid(13),
inkjetOther(14),
pen(15),
thermalTransfer(16),
thermalSensitive(17),
thermalDiffusion(18),
thermalOther(19),
electroerosion(20),
electrostatic(21),
photographicMicrofiche(22),
photographicImagesetter(23),
photographicOther(24),
ionDeposition(25),
eBeam(26),
typesetter(27)
}

```

PrtMarkerCounterUnitTC ::= TEXTUAL-CONVENTION

-- This value is a type 1 enumeration.

STATUS current

DESCRIPTION

"The unit that will be used by the printer when reporting counter values for this marking sub-unit. The time units of measure are provided for a device like a strip recorder that does not or cannot track the physical dimensions of the media and does not use characters, lines or sheets."

SYNTAX INTEGER {

```

    tenThousandthsOfInches(3), -- .0001
    micrometers(4),
    characters(5),
    lines(6),
    impressions(7),
    sheets(8),

```

```
        dotRow(9),
        hours(11),
        feet(16),
        meters(17)
    }

PrtMarkerSuppliesTypeTC ::= TEXTUAL-CONVENTION
-- This value is a type 3 enumeration.
STATUS      current
DESCRIPTION
    "The type of this supply."
SYNTAX      INTEGER {
        other(1),
        unknown(2),
        toner(3),
        wasteToner(4),
        ink(5),
        inkCartridge(6),
        inkRibbon(7),
        wasteInk(8),
        opc(9), -- photo conductor
        developer(10),
        fuserOil(11),
        solidWax(12),
        ribbonWax(13),
        wasteWax(14),
        fuser(15),
        coronaWire(16),
        fuserOilWick(17),
        cleanerUnit(18),
        fuserCleaningPad(19),
        transferUnit(20),
        tonerCartridge(21),
        fuserOiler(22),
-- Values for Finisher MIB
        water(23),
        wasteWater(24),
        glueWaterAdditive(25),
        wastePaper(26),
        bindingSupply(27),
        bandingSupply(28),
        stitchingWire(29),
        shrinkWrap(30),
        paperWrap(31),
        staples(32),
```

```

        inserts(33),
        covers(34)
    -- End of values for Finisher MIB
    }

```

```

PrtMarkerSuppliesSupplyUnitTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS      current
    DESCRIPTION
        "Unit of this marker supply container/receptacle."
    SYNTAX      INTEGER {
        other(1),
        unknown(2),
        tenThousandthsOfInches(3),  -- .0001
        micrometers(4),
        impressions(7),
        sheets(8),
        hours(11),
        thousandthsOfOunces(12),
        tenthsOfGrams(13),
        hundrethsOfFluidOunces(14),
        tenthsOfMilliliters(15),
        feet(16),
        meters(17),
        -- Values for Finisher MIB
        items(18),    -- e.g. number of staples
        percent(19)
    }

```

```

PrtMarkerSuppliesClassTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS      current
    DESCRIPTION
        "Indicates whether this supply entity represents a supply
        that is consumed or a receptacle that is filled."
    SYNTAX      INTEGER {
        other(1),
        supplyThatIsConsumed(3),
        receptacleThatIsFilled(4)
    }

```

```

PrtMarkerColorantRoleTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS      current
    DESCRIPTION

```



```

    "The role played by this colorant."
SYNTAX    INTEGER { -- Colorant Role
                other(1),
                process(3),
                spot(4)
                }

PrtMarkerAddressabilityUnitTC ::= TEXTUAL-CONVENTION
-- This value is a type 1 enumeration.
STATUS    current
DESCRIPTION
    "The unit of measure of distances, as applied to the marker's
    resolution."
SYNTAX    INTEGER {
                tenThousandthsOfInches(3), -- .0001
                micrometers(4)
            }

--
-- Media Path Textual Conventions
--

PrtMediaPathMaxSpeedPrintUnitTC ::= TEXTUAL-CONVENTION
-- This value is a type 1 enumeration.
STATUS    current
DESCRIPTION
    "The unit of measure used in specifying the speed of all
    media paths in the printer."
SYNTAX    INTEGER {
                tenThousandthsOfInchesPerHour(3),-- .0001/hour
                micrometersPerHour(4),
                charactersPerHour(5),
                linesPerHour(6),
                impressionsPerHour(7),
                sheetsPerHour(8),
                dotRowPerHour(9),
                feetPerHour(16),
                metersPerHour(17)
            }

PrtMediaPathTypeTC ::= TEXTUAL-CONVENTION
-- This value is a type 2 enumeration.
STATUS    current
DESCRIPTION
    "The type of the media path for this media path."

```

```
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                longEdgeBindingDuplex(3),
                shortEdgeBindingDuplex(4),
                simplex(5)
            }

--
-- Interpreter Group Textual Conventions
--

PrtInterpreterTwoWayTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS      current
    DESCRIPTION
        "Indicates whether or not this interpreter returns information
        back to the host."
    SYNTAX      INTEGER {
                yes(3),
                no(4)
            }

--
-- Console Group Textual Conventions
--

PrtConsoleColorTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS      current
    DESCRIPTION
        "The color of this light."
    SYNTAX      INTEGER {
                other(1),
                unknown(2),
                white(3),
                red(4),
                green(5),
                blue(6),
                cyan(7),
                magenta(8),
                yellow(9),
                orange(10)
            }
```

```
PrtConsoleDisableTC ::= TEXTUAL-CONVENTION
-- This value is a type 2 enumeration.
STATUS      current
DESCRIPTION
    "This value indicates whether or not input is accepted from
    the operator console. A value of 'operatorConsoleEnabled'
    indicates that input is accepted from the console, and a value
    of 'operatorConsoleDisabled' indicates that input is not
    accepted from the console. The other values indicate that
    limited input is accepted from the console, and the limitations
    are product specific. Limitations are generally less restrictive
    for operatorConsoleEnabledLevel1 than for
    operatorConsoleEnabledLevel2, which is less restrictive than
    operatorConsoleEnabledLevel3."
SYNTAX      INTEGER {
                operatorConsoleEnabled(3),
                operatorConsoleDisabled(4)
            }
```

```
--
-- Alert Group Textual Conventions
--
```

```
PrtAlertSeverityLevelTC ::= TEXTUAL-CONVENTION
-- This value is a type 1 enumeration.
STATUS      current
DESCRIPTION
    "The level of severity of this alert table entry. The printer
    determines the severity level assigned to each entry in the
    table. A critical alert is binary by nature and definition. A
    warning is defined to be a non-critical alert. The original and
    most common warning is unary. The binary warning was added later
    and given a more distinguished name."
SYNTAX      INTEGER {
                other(1),
                critical(3),
                warning(4),
                warningBinaryChangeEvent(5)
            }
```

```
PrtAlertTrainingLevelTC ::= TEXTUAL-CONVENTION
-- This value is a type 2 enumeration.
STATUS      current
DESCRIPTION
    "The level of training required to handle this alert, if human
```

intervention is required. The noInterventionRequired value should be used if the event does not require any human intervention. The training level is an enumeration that is determined and assigned by the printer manufacturer based on the information or the training required to handle this alert. The printer will break alerts into these different training levels. It is the responsibility of the management application in the system to determine how a particular alert is handled and how and to whom that alert is routed. The following are the four training levels of alerts:

Field Service - Alerts that typically require advanced training and technical knowledge of the printer and its sub units. An example of a technical person would be a manufacturer's Field Service representative, or other person formally trained by the manufacturer or similar representative.

Trained - Alerts that require an intermediate or moderate level of knowledge of the printer and its sub-units. A typical examples of alerts that a trained operator can handle is replacing toner cartridges.

Untrained - Alerts that can be fixed without prior training either because the action to correct the alert is obvious or the printer can help the untrained person fix the problem. A typical example of such an alert is reloading paper trays and emptying output bins on a low end printer.

Management - Alerts that have to do with overall operation of and configuration of the printer. Examples of management events are configuration change of sub-units."

```
SYNTAX      INTEGER {
                other(1),
                unknown(2),
                untrained(3),
                trained(4),
                fieldService(5),
                management(6),
                noInterventionRequired(7)
            }
```

PrtAlertGroupTC ::= TEXTUAL-CONVENTION

```
-- This value is a type 1 enumeration for values in the range
-- 1 to 29.
-- Values of 30 and greater are for use in other MIBs that augment
-- tables in the Printer MIB. Therefore, other MIBs may assign
-- alert codes of 30 or higher to use the alert table from the
```

```

-- Printer MIB without requiring revising and re-publishing this
-- document.
STATUS    current
DESCRIPTION
    "The type of sub-unit within the printer model that this alert
    is related.  Input, output, and markers are examples of printer
    model groups, i.e., examples of types of sub-units.  Wherever
    possible, these enumerations match the sub-identifier that
    identifies the relevant table in the printer MIB.

    NOTE: Alert type codes have been added for the host resources
    MIB storage table and device table.  These additional types are
    for situations in which the printer's storage and device objects
    must generate alerts (and possibly traps for critical alerts)."
```

SYNTAX

```

    INTEGER {
        other(1),
        hostResourcesMIBStorageTable(3),
        hostResourcesMIBDeviceTable(4),
        generalPrinter(5),
        cover(6),
        localization(7),
        input(8),
        output(9),
        marker(10),
        markerSupplies(11),
        markerColorant(12),
        mediaPath(13),
        channel(14),
        interpreter(15),
        consoleDisplayBuffer(16),
        consoleLights(17),
        alert(18),
        -- Values for Finisher MIB
        finDevice(30),
        finSupply(31),
        finSupplyMediaInput(32),
        finAttributeTable(33)
        -- End of values for Finisher MIB
    }
```

```

PrtAlertCodeTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The code that describes the type of alert for this entry in the
```

table. Binary change event alerts describe states of the subunit while unary change event alerts describe a single event. The same alert code can be used for a binary change event or a unary change event, depending on implementation. Also, the same alert code can be used to indicate a critical or a non-critical (warning) alert, depending on implementation. The value of `prtAlertSeverityLevel` specifies binary vs. unary and critical vs. non-critical for each event for the implementation.

While there are some specific codes for many subunits, the generic codes should be used for most subunit alerts. The network management station can then query the subunit specified by `prtAlertGroup` to determine further subunit status and other subunit information.

An agent shall not add two entries to the alert table for the same event, one containing a generic event code and the other containing a specific event code; the agent shall add only one entry in the alert table for each event; either generic (preferred) or specific, not both.

Implementation of the unary change event `alertRemovalOfBinaryChangeEntry(1801)` is optional. When implemented, this alert code shall indicate to network management stations that the trailing edge of a binary change event has occurred and the corresponding alert entry has been removed from the alert table. As with all events, the `alertRemovalOfBinaryChangeEntry(1801)` alert shall be placed at the end of the alert table. Such an alert table entry shall specify the following information:

<code>prtAlertSeverityLevel</code>	<code>warningUnaryChangeEvent(4)</code>
<code>prtAlertTrainingLevel</code>	<code>noInterventionRequired(7)</code>
<code>prtAlertGroup</code>	<code>alert(18)</code>
<code>prtAlertGroupIndex</code>	the index of the row in the alert table of the binary change event that this event has removed.
<code>prtAlertLocation</code>	unknown (-2)
<code>prtAlertCode</code>	<code>alertRemovalOfBinaryChangeEntry(1801)</code>
<code>prtAlertDescription</code>	<description or null string>
<code>prtAlertTime</code>	the value of <code>sysUpTime</code> at the time of the removal of the binary change event from the alert table.

Optionally, the agent may generate a trap coincident with removing the binary change event and placing the unary change event `alertRemovalOfBinaryChangeEntry(1801)` in the alert table. For such a trap, the `prtAlertIndex` sent with the above trap parameters shall be the index of the `alertRemovalOfBinaryChangeEvent` row that was added to the `prtAlertTable`; not the index of the row that was removed from the `prtAlertTable`."

```
SYNTAX      INTEGER {
    other(1),
        -- an event that is not represented
        -- by one of the alert codes
        -- specified below.
    unknown(2),
        -- The following generic codes are common to
        -- multiple groups. The NMS may
        -- examine the prtAlertGroup object to determine
        -- what group to query for further information.
    coverOpen(3),
    coverClosed(4),
    interlockOpen(5),
    interlockClosed(6),
    configurationChange(7),
    jam(8),
    subunitMissing(9),
        -- The subunit tray, bin, etc.
        -- has been removed.
    subunitLifeAlmostOver(10),
    subunitLifeOver(11),
    subunitAlmostEmpty(12),
    subunitEmpty(13),
    subunitAlmostFull(14),
    subunitFull(15),
    subunitNearLimit(16),
    subunitAtLimit(17),
    subunitOpened(18),
    subunitClosed(19),
    subunitTurnedOn(20),
    subunitTurnedOff(21),
    subunitOffline(22),
    subunitPowerSaver(23),
    subunitWarmingUp(24),
    subunitAdded(25),
    subunitRemoved(26),
```

```
subunitResourceAdded(27),
subunitResourceRemoved(28),
subunitRecoverableFailure(29),
subunitUnrecoverableFailure(30),
subunitRecoverableStorageError(31),
subunitUnrecoverableStorageError(32),
subunitMotorFailure(33),
subunitMemoryExhausted(34),
subunitUnderTemperature(35),
subunitOverTemperature(36),
subunitTimingFailure(37),
subunitThermistorFailure(38),
-- general Printer group
doorOpen(501),      -- DEPRECATED
                   -- Use coverOpened(3)
doorClosed(502),   -- DEPRECATED
                   -- Use coverClosed(4)

powerUp(503),
powerDown(504),
printerNMSReset(505),
    -- The printer has been reset by some
    -- network management station(NMS)
    -- writing into 'prtGeneralReset'.
printerManualReset(506),
    -- The printer has been reset manually.
printerReadyToPrint(507),
    -- The printer is ready to print. (i.e.,
    -- not warming up, not in power save
    -- state, not adjusting print quality,
    -- etc.).

-- Input Group
inputMediaTrayMissing(801),
inputMediaSizeChange(802),
inputMediaWeightChange(803),
inputMediaTypeChange(804),
inputMediaColorChange(805),
inputMediaFormPartsChange(806),
inputMediaSupplyLow(807),
inputMediaSupplyEmpty(808),
inputMediaChangeRequest(809),
    -- An interpreter has detected that a
    -- different medium is need in this input
    -- tray subunit. The prtAlertDescription may
    -- be used to convey a human readable
```



```
-- description of the medium required to
-- satisfy the request.
inputManualInputRequest(810),
-- An interpreter has detected that manual
-- input is required in this subunit. The
-- prtAlertDescription may be used to convey
-- a human readable description of the medium
-- required to satisfy the request.
inputTrayPositionFailure(811),
-- The input tray failed to position correctly.
inputTrayElevationFailure(812),
inputCannotFeedSizeSelected(813),
-- Output Group
outputMediaTrayMissing(901),
outputMediaTrayAlmostFull(902),
outputMediaTrayFull(903),
outputMailboxSelectFailure(904),
-- Marker group
markerFuserUnderTemperature(1001),
markerFuserOverTemperature(1002),
markerFuserTimingFailure(1003),
markerFuserThermistorFailure(1004),
markerAdjustingPrintQuality(1005),
-- Marker Supplies group
markerTonerEmpty(1101),
markerInkEmpty(1102),
markerPrintRibbonEmpty(1103),
markerTonerAlmostEmpty(1104),
markerInkAlmostEmpty(1105),
markerPrintRibbonAlmostEmpty(1106),
markerWasteTonerReceptacleAlmostFull(1107),
markerWasteInkReceptacleAlmostFull(1108),
markerWasteTonerReceptacleFull(1109),
markerWasteInkReceptacleFull(1110),
markerOpcLifeAlmostOver(1111),
markerOpcLifeOver(1112),
markerDeveloperAlmostEmpty(1113),
markerDeveloperEmpty(1114),
markerTonerCartridgeMissing(1115),
-- Media Path Device Group
mediaPathMediaTrayMissing(1301),
mediaPathMediaTrayAlmostFull(1302),
mediaPathMediaTrayFull(1303),
mediaPathcannotDuplexMediaSelected(1304),
-- Interpreter Group
```

```

        interpreterMemoryIncrease(1501),
        interpreterMemoryDecrease(1502),
        interpreterCartridgeAdded(1503),
        interpreterCartridgeDeleted(1504),
        interpreterResourceAdded(1505),
        interpreterResourceDeleted(1506),
        interpreterResourceUnavailable(1507),
        interpreterComplexPageEncountered(1509),
        -- The interpreter has encountered a page
        -- that is too complex for the resources that
        -- are available.
-- Alert Group
    alertRemovalOfBinaryChangeEntry(1801)
        -- A binary change event entry has been
        -- removed from the alert table. This unary
        -- change alert table entry is added to the
        -- end of the alert table.
    }

-- The General Printer Group
--
-- The general printer sub-unit is responsible for the overall
-- control and status of the printer. There is exactly one
-- general printer sub-unit in a printer.

prtGeneral OBJECT IDENTIFIER ::= { printmib 5 }

prtGeneralTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtGeneralEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of general information per printer.
        Objects in this table are defined in various
        places in the MIB, nearby the groups to
        which they apply. They are all defined
        here to minimize the number of tables that would
        otherwise need to exist."
    ::= { prtGeneral 1 }

prtGeneralEntry OBJECT-TYPE
    SYNTAX      PrtGeneralEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION

```

"An entry exists in this table for each device entry in the host resources MIB device table with a device type of 'printer'"

```
INDEX      { hrDeviceIndex }
 ::= { prtGeneralTable 1 }
```

```
PrtGeneralEntry ::= SEQUENCE {
  -- Note that not all of the objects in this sequence are in
  -- the general printer group. The group to which an
  -- object belongs is tagged with a label "General", "Input"
  -- "Output", etc. after each entry in the following sequence.
  --
  prtGeneralConfigChanges      Counter32, -- General
  prtGeneralCurrentLocalization Integer32, -- General
  prtGeneralReset              PrtGeneralResetTC,
                                -- General
  prtGeneralCurrentOperator    OCTET STRING,
                                -- Responsible Party
  prtGeneralServicePerson      OCTET STRING,
                                -- Responsible Party

  prtInputDefaultIndex         Integer32, -- Input
  prtOutputDefaultIndex        Integer32, -- Output
  prtMarkerDefaultIndex        Integer32, -- Marker
  prtMediaPathDefaultIndex     Integer32, -- Media Path
  prtConsoleLocalization       Integer32, -- Console
  prtConsoleNumberOfDisplayLines Integer32, -- Console
  prtConsoleNumberOfDisplayChars Integer32, -- Console
  prtConsoleDisable            PrtConsoleDisableTC,
                                -- Console,
  prtAuxiliarySheetStartupPage PresentOnOff,
                                -- AuxiliarySheet
  prtAuxiliarySheetBannerPage PresentOnOff,
                                -- AuxiliarySheet
  prtGeneralPrinterName        OCTET STRING,
                                -- General V2
  prtGeneralSerialNumber       OCTET STRING,
                                -- General V2
  prtAlertCriticalEvents        Counter32, -- Alert V2
  prtAlertAllEvents            Counter32  -- Alert V2
}
```

```
prtGeneralConfigChanges OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
```

"Counts configuration changes within the printer. A configuration change is defined to be an action that results in a change to any MIB object other than those that reflect status or level, or those that act as counters or gauges. In addition, any action that results in a row being added or deleted from any table in the Printer MIB is considered a configuration change. Such changes will often affect the capability of the printer to service certain types of print jobs. Management applications may cache infrequently changed configuration information about sub units within the printer. This object should be incremented whenever the agent wishes to notify management applications that any cached configuration information for this device is to be considered 'stale'. At this point, the management application should flush any configuration information cached about this device and fetch new configuration information.

The following are examples of actions that would cause the prtGeneralConfigChanges object to be incremented:

- Adding an output bin
- Changing the media in a sensing input tray
- Changing the value of prtInputMediaType

Note that the prtGeneralConfigChanges counter would not be incremented when an input tray is temporarily removed to load additional paper or when the level of an input device changes."

```
::= { prtGeneralEntry 1 }
```

```
prtGeneralCurrentLocalization OBJECT-TYPE
```

```
SYNTAX      Integer32 (1..65535)
```

```
MAX-ACCESS  read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The value of the prtLocalizationIndex corresponding to the
current language, country, and character set to be used for
localized string values that are identified as being dependent
on the value of this object. Note that this object does not
apply to localized strings in the prtConsole group or to any
object that is not explicitly identified as being localized
according to prtGeneralCurrentLocalization. When an object's
'charset' is controlled by the value of
prtGeneralCurrentLocalization, it MUST specify
LocalizedDescriptionStringTC as its syntax."
```

```
::= { prtGeneralEntry 2 }
```

```
prtGeneralReset OBJECT-TYPE
    -- This value is a type 3 enumeration.
    SYNTAX      PrtGeneralResetTC
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting this value to 'powerCycleReset', 'resetToNVRAM', or
        'resetToFactoryDefaults' will result in the resetting of the
        printer.  When read, this object will always have the value
        'notResetting(3)', and a SET of the value 'notResetting' shall
        have no effect on the printer.  Some of the defined values are
        optional.  However, every implementation must support at least
        the values 'notResetting' and 'resetToNVRAM'."
    ::= { prtGeneralEntry 3 }

-- The Responsible Party group

prtGeneralCurrentOperator OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..127))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The name of the person who is responsible for operating
        this printer.  It is suggested that this string include
        information that would enable other humans to reach the
        operator, such as a phone number.  As a convention to
        facilitate automatic notification of the operator by the
        agent or network management station, the phone number,
        fax number or email address should be indicated by the
        URL schemes 'tel:', 'fax:' and 'mailto:', respectively.
        If either the phone, fax, or email information is not
        available, then a line should not be included for this
        information.

        NOTE: For interoperability purposes, it is advisable to
        use email addresses formatted according to RFC 822 [9]
        requirements."
    ::= { prtGeneralEntry 4 }

prtGeneralServicePerson OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..127))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
```

"The name of the person responsible for servicing this printer. It is suggested that this string include information that would enable other humans to reach the service person, such as a phone number. As a convention to facilitate automatic notification of the operator by the agent or network management station, the phone number, fax number or email address should be indicated by the URL schemes 'tel:', 'fax:' and 'mailto:', respectively. If either the phone, fax, or email information is not available, then a line should not be included for this information.

NOTE: For interoperability purposes, it is advisable to use email addresses formatted per RFC 822 [9] requirements."

```
::= { prtGeneralEntry 5 }
```

```
-- Default indexes section
```

```
--
```

```
-- The following four objects are used to specify the indexes of  
-- certain subunits used as defaults during the printing process.
```

```
prtInputDefaultIndex OBJECT-TYPE
```

```
SYNTAX      Integer32 (-1..65535)
```

```
MAX-ACCESS  read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The value of prtInputIndex corresponding to the default input  
sub-unit: that is, this object selects the default source of  
input media.
```

```
This value shall be -1 if there is no default input subunit  
specified for the printer as a whole. In this case, the actual  
default input subunit may be specified by means outside the  
scope of this MIB, such as by each interpreter in a printer with  
multiple interpreters."
```

```
::= { prtGeneralEntry 6 }
```

```
prtOutputDefaultIndex OBJECT-TYPE
```

```
SYNTAX      Integer32 (-1..65535)
```

```
MAX-ACCESS  read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"The value of prtOutputIndex corresponding to the default output
```

sub-unit; that is, this object selects the default output destination.

This value shall be -1 if there is no default output subunit specified for the printer as a whole. In this case, the actual default output subunit may be specified by means outside the scope of this MIB, such as by each interpreter in a printer with multiple interpreters."

::= { prtGeneralEntry 7 }

prtMarkerDefaultIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of prtMarkerIndex corresponding to the default marker sub-unit; that is, this object selects the default marker."

::= { prtGeneralEntry 8 }

prtMediaPathDefaultIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of prtMediaPathIndex corresponding to the default media path; that is, the selection of the default media path."

::= { prtGeneralEntry 9 }

-- Console general section

--

-- The following four objects describe overall parameters of the
-- printer console subsystem.

prtConsoleLocalization OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of the prtLocalizationIndex corresponding to the language, country, and character set to be used for the console. This localization applies both to the actual display on the console as well as the encoding of these console objects

in management operations. When an object's 'charset' is controlled by the value of prtConsoleLocalization, it MUST specify ConsoleDescriptionStringTC as its syntax."

```
::= { prtGeneralEntry 10 }
```

prtConsoleNumberOfDisplayLines OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of lines on the printer's physical display. This value is 0 if there are no lines on the physical display or if there is no physical display"
::= { prtGeneralEntry 11 }

prtConsoleNumberOfDisplayChars OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of characters per line displayed on the physical display. This value is 0 if there are no lines on the physical display or if there is no physical display"
::= { prtGeneralEntry 12 }

prtConsoleDisable OBJECT-TYPE
SYNTAX PrtConsoleDisableTC
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This value indicates how input is (or is not) accepted from the operator console."
::= { prtGeneralEntry 13 }

-- The Auxiliary Sheet Group
--
-- The auxiliary sheet group allows the administrator to control
-- the production of auxiliary sheets by the printer. This group
-- contains only the "prtAuxiliarySheetStartupPage" and
-- "prtAuxiliarySheetBannerPage" objects.

prtAuxiliarySheetStartupPage OBJECT-TYPE
SYNTAX PresentOnOff
MAX-ACCESS read-write
STATUS current

DESCRIPTION

"Used to enable or disable printing a startup page. If enabled, a startup page will be printed shortly after power-up, when the device is ready. Typical startup pages include test patterns and/or printer configuration information."

::= { prtGeneralEntry 14 }

prtAuxiliarySheetBannerPage OBJECT-TYPE

SYNTAX PresentOnOff

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Used to enable or disable printing banner pages at the beginning of jobs. This is a master switch which applies to all jobs, regardless of interpreter."

::= { prtGeneralEntry 15 }

-- Administrative section (The General V2 Group)

--

-- The following two objects are used to specify administrative
-- information assigned to the printer.

prtGeneralPrinterName OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..127))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"An administrator-specified name for this printer. Depending upon implementation of this printer, the value of this object may or may not be same as the value for the MIB-II 'SysName' object."

::= { prtGeneralEntry 16 }

prtGeneralSerialNumber OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..255))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"A recorded serial number for this device that indexes some type device catalog or inventory. This value is usually set by the device manufacturer but the MIB supports the option of writing for this object for site-specific administration of device inventory or tracking."

::= { prtGeneralEntry 17 }

```
-- General alert table section (Alert Table V2 Group)
--
-- The following two objects are used to specify counters
-- associated with the Alert Table.

prtAlertCriticalEvents OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A running counter of the number of critical alert events that
        have been recorded in the alert table. The value of this object
        is RESET in the event of a power cycle operation (i.e., the
        value is not persistent."
    ::= { prtGeneralEntry 18 }

prtAlertAllEvents OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A running counter of the total number of alert event entries
        (critical and non-critical) that have been recorded in the alert
        table"
    ::= { prtGeneralEntry 19 }

-- The Cover Table
--
-- The cover portion of the General print sub-unit describes the
-- covers and interlocks of the printer. The Cover Table has an
-- entry for each cover and interlock.

prtCover OBJECT IDENTIFIER ::= { printmib 6 }

prtCoverTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtCoverEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of the covers and interlocks of the printer."
    ::= { prtCover 1 }

prtCoverEntry OBJECT-TYPE
    SYNTAX      PrtCoverEntry
    MAX-ACCESS  not-accessible
```

```

STATUS      current
DESCRIPTION
    "Information about a cover or interlock.
    Entries may exist in the table for each device
    index with a device type of 'printer'."
INDEX { hrDeviceIndex, prtCoverIndex }
 ::= { prtCoverTable 1 }

PrtCoverEntry ::= SEQUENCE {
    prtCoverIndex      Integer32,
    prtCoverDescription LocalizedDescriptionStringTC,
    prtCoverStatus     PrtCoverStatusTC
}

prtCoverIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this Cover sub
        unit.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new cover
        sub-units to the printer), values SHOULD remain stable across
        successive printer power cycles."
    ::= { prtCoverEntry 1 }

prtCoverDescription OBJECT-TYPE
    SYNTAX      LocalizedDescriptionStringTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The manufacturer provided cover sub-mechanism name in the
        localization specified by prtGeneralCurrentLocalization."
    ::= { prtCoverEntry 2 }

prtCoverStatus OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX      PrtCoverStatusTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The status of this cover sub-unit."
    ::= { prtCoverEntry 3 }

```

```
-- The Localization Table
--
-- The localization portion of the General printer sub-unit is
-- responsible for identifying the natural language, country, and
-- character set in which character strings are expressed. There
-- may be one or more localizations supported per printer. The
-- available localizations are represented by the Localization
-- table.

prtLocalization OBJECT IDENTIFIER ::= { printmib 7 }

prtLocalizationTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtLocalizationEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The available localizations in this printer."
    ::= { prtLocalization 1 }

prtLocalizationEntry OBJECT-TYPE
    SYNTAX      PrtLocalizationEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A description of a localization.
         Entries may exist in the table for each device
         index with a device type of 'printer'."
    INDEX { hrDeviceIndex, prtLocalizationIndex }
    ::= { prtLocalizationTable 1 }

PrtLocalizationEntry ::= SEQUENCE {
    prtLocalizationIndex      Integer32,
    prtLocalizationLanguage   OCTET STRING,
    prtLocalizationCountry    OCTET STRING,
    prtLocalizationCharacterSet CodedCharSet
}

prtLocalizationIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this
         localization entry. Although these values may change due to a
         major reconfiguration of the device (e.g., the addition of new
```

```
        localization data to the printer), values SHOULD remain
        stable across successive printer power cycles."
 ::= { prtLocalizationEntry 1 }

prtLocalizationLanguage OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..2))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A two character language code from ISO 639.  Examples en,
        ca, fr, de."
 ::= { prtLocalizationEntry 2 }

prtLocalizationCountry OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..2))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A two character country code from ISO 3166, a blank string (two
        space characters) shall indicate that the country is not
        defined.  Examples: US, GB, FR, DE, ..."
 ::= { prtLocalizationEntry 3 }

prtLocalizationCharacterSet OBJECT-TYPE
    SYNTAX      CodedCharSet
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The coded character set used for this localization."
 ::= { prtLocalizationEntry 4 }

-- The System Resources Tables
--
-- The Printer MIB makes use of the Host Resources MIB to
-- define system resources by referencing the storage
-- and device groups of the print group.

prtStorageRefTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtStorageRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table defines which printer, amongst multiple printers
        serviced by one agent, owns which storage units."
 ::= { prtGeneral 2 }
```

```
prtStorageRefEntry OBJECT-TYPE
    SYNTAX      PrtStorageRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table will have an entry for each entry in the Host
        Resources MIB storage table that represents storage associated
        with a printer managed by this agent."
    INDEX       { hrStorageIndex, prtStorageRefSeqNumber }
    ::= { prtStorageRefTable 1 }

PrtStorageRefEntry ::= SEQUENCE {
    prtStorageRefSeqNumber  Integer32,
    prtStorageRefIndex     Integer32
}

prtStorageRefSeqNumber OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This value will be unique amongst all entries with a common
        value of hrStorageIndex. This object allows a storage entry to
        point to the multiple printer devices with which it is
        associated."
    ::= { prtStorageRefEntry 1 }

prtStorageRefIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of the hrDeviceIndex of the printer device that this
        storageEntry is associated with."
    ::= { prtStorageRefEntry 2 }

prtDeviceRefTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtDeviceRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table defines which printer, amongst multiple printers
        serviced by one agent, is associated with which devices."
    ::= { prtGeneral 3 }
```

```
prtDeviceRefEntry OBJECT-TYPE
    SYNTAX      PrtDeviceRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table will have an entry for each entry in the Host
        Resources MIB device table that represents a device associated
        with a printer managed by this agent."
    INDEX       { hrDeviceIndex, prtDeviceRefSeqNumber }
    ::= { prtDeviceRefTable 1 }

PrtDeviceRefEntry ::= SEQUENCE {
    prtDeviceRefSeqNumber  Integer32,
    prtDeviceRefIndex     Integer32
}

prtDeviceRefSeqNumber OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This value will be unique amongst all entries with a common
        value of hrDeviceIndex. This object allows a device entry to
        point to the multiple printer devices with which it is
        associated."
    ::= { prtDeviceRefEntry 1 }

prtDeviceRefIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of the hrDeviceIndex of the printer device that this
        deviceEntry is associated with."
    ::= { prtDeviceRefEntry 2 }

-- The Input Group
--
-- Input sub-units are managed as a tabular, indexed collection
-- of possible devices capable of providing media for input to
-- the printing process. Input sub-units typically have a
-- location, a type, an identifier, a set of constraints on
-- possible media sizes and potentially other media
-- characteristics, and may be capable of indicating current
```

-- status or capacity.

prtInput OBJECT IDENTIFIER ::= { printmib 8 }

prtInputTable OBJECT-TYPE

SYNTAX SEQUENCE OF PrtInputEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of the devices capable of providing media for input to the printing process."

::= { prtInput 2 }

prtInputEntry OBJECT-TYPE

SYNTAX PrtInputEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Attributes of a device capable of providing media for input to the printing process. Entries may exist in the table for each device index with a device type of 'printer'."

INDEX { hrDeviceIndex, prtInputIndex }

::= { prtInputTable 1 }

PrtInputEntry ::= SEQUENCE {

prtInputIndex	Integer32,
prtInputType	PrtInputTypeTC,
prtInputDimUnit	PrtMediaUnitTC,
prtInputMediaDimFeedDirDeclared	Integer32,
prtInputMediaDimXFeedDirDeclared	Integer32,
prtInputMediaDimFeedDirChosen	Integer32,
prtInputMediaDimXFeedDirChosen	Integer32,
prtInputCapacityUnit	PrtCapacityUnitTC,
prtInputMaxCapacity	Integer32,
prtInputCurrentLevel	Integer32,
prtInputStatus	PrtSubUnitStatusTC,
prtInputMediaName	OCTET STRING,
prtInputName	OCTET STRING,
prtInputVendorName	OCTET STRING,
prtInputModel	OCTET STRING,
prtInputVersion	OCTET STRING,
prtInputSerialNumber	OCTET STRING,
prtInputDescription	LocalizedDescriptionStringTC,
prtInputSecurity	PresentOnOff,
prtInputMediaWeight	Integer32,


```

prtInputMediaType          OCTET STRING,
prtInputMediaColor         OCTET STRING,
prtInputMediaFormParts     Integer32,
prtInputMediaLoadTimeout   Integer32,
prtInputNextIndex          Integer32
}

```

prtInputIndex OBJECT-TYPE

```
SYNTAX      Integer32 (1..65535)
```

```
MAX-ACCESS not-accessible
```

```
STATUS      current
```

DESCRIPTION

"A unique value used by the printer to identify this input sub-unit. Although these values may change due to a major reconfiguration of the device (e.g. the addition of n input sub-units to the printer), values SHOULD remain stable across successive printer power cycles."

```
::= { prtInputEntry 1 }
```

prtInputType OBJECT-TYPE

```
SYNTAX      PrtInputTypeTC
```

```
MAX-ACCESS read-only
```

```
STATUS      current
```

DESCRIPTION

"The type of technology (discriminated primarily according to feeder mechanism type) employed by the input sub-unit. Note, the Input Class provides for a descriptor field to further qualify the other choice."

```
::= { prtInputEntry 2 }
```

prtInputDimUnit OBJECT-TYPE

```
SYNTAX      PrtMediaUnitTC
```

```
MAX-ACCESS read-only
```

```
STATUS      current
```

DESCRIPTION

"The unit of measurement for use calculating and relaying dimensional values for this input sub-unit."

```
::= { prtInputEntry 3 }
```

prtInputMediaDimFeedDirDeclared OBJECT-TYPE

```
SYNTAX      Integer32 (-2..2147483647)
```

```
MAX-ACCESS read-write
```

```
STATUS      current
```

DESCRIPTION

"This object provides the value of the declared dimension, in

the feed direction, of the media that is (or, if empty, was or will be) in this input sub-unit. The feed direction is the direction in which the media is fed on this sub-unit. This dimension is measured in input sub-unit dimensional units (controlled by prtInputDimUnit, which uses PrtMediaUnitTC). If this input sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed by management requests. Otherwise, the value may be changed. The value (-1) means other and specifically means that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."

::= { prtInputEntry 4 }

prtInputMediaDimXFeedDirDeclared OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object provides the value of the declared dimension, in the cross feed direction, of the media that is (or, if empty, was or will be) in this input sub-unit. The cross feed direction is ninety degrees relative to the feed direction associated with this sub-unit. This dimension is measured in input sub-unit dimensional units (controlled by prtInputDimUnit, which uses PrtMediaUnitTC). If this input sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed by management requests. Otherwise, the value may be changed. The value (-1) means other and specifically means that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."

::= { prtInputEntry 5 }

prtInputMediaDimFeedDirChosen OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The printer will act as if media of the chosen dimension (in the feed direction) is present in this input source. Note that this value will be used even if the input tray is empty. Feed dimension measurements are taken relative to the feed direction associated with that sub-unit and are in input sub-unit dimensional units (controlled by prtInputDimUnit, which uses PrtMediaUnitTC). If the printer supports the declared dimension, the granted dimension is the same as the declared dimension. If

not, the granted dimension is set to the closest dimension that the printer supports when the declared dimension is set. The value (-1) means other and specifically indicates that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."

```
::= { prtInputEntry 6 }
```

prtInputMediaDimXFeedDirChosen OBJECT-TYPE
SYNTAX Integer32 (-2..2147483647)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The printer will act as if media of the chosen dimension (in the cross feed direction) is present in this input source. Note that this value will be used even if the input tray is empty. The cross feed direction is ninety degrees relative to the feed direction associated with this sub-unit. This dimension is measured in input sub-unit dimensional units (controlled by prtInputDimUnit, which uses PrtMediaUnitTC). If the printer supports the declare dimension, the granted dimension is the same as the declared dimension. If not, the granted dimension is set to the closest dimension that the printer supports when the declared dimension is set. The value (-1) means other and specifically indicates that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."
::= { prtInputEntry 7 }

prtInputCapacityUnit OBJECT-TYPE
SYNTAX PrtCapacityUnitTC
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The unit of measurement for use in calculating and relaying capacity values for this input sub-unit."
::= { prtInputEntry 8 }

prtInputMaxCapacity OBJECT-TYPE
SYNTAX Integer32 (-2..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The maximum capacity of the input sub-unit in input sub-unit capacity units (PrtCapacityUnitTC). There is no convention associated with the media itself so this value reflects claimed capacity. If this input sub-unit can reliably sense this value,

the value is sensed by the printer and may not be changed by management requests; otherwise, the value may be written (by a Remote Control Panel or a Management Application). The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter. The value (-2) means unknown."

```
::= { prtInputEntry 9 }
```

```
prtInputCurrentLevel OBJECT-TYPE
```

```
SYNTAX      Integer32 (-3..2147483647)      -- in capacity units
                                                    -- (PrtCapacityUnitTC).
```

```
MAX-ACCESS read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

"The current capacity of the input sub-unit in input sub-unit capacity units (PrtCapacityUnitTC). If this input sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed by management requests; otherwise, the value may be written (by a Remote Control Panel or a Management Application). The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter. The value (-2) means unknown. The value (-3) means that the printer knows that at least one unit remains."

```
::= { prtInputEntry 10 }
```

```
prtInputStatus OBJECT-TYPE
```

```
SYNTAX      PrtSubUnitStatusTC
```

```
MAX-ACCESS read-only
```

```
STATUS      current
```

```
DESCRIPTION
```

"The current status of this input sub-unit."

```
::= { prtInputEntry 11 }
```

```
prtInputMediaName OBJECT-TYPE
```

```
SYNTAX      OCTET STRING (SIZE(0..63))
```

```
MAX-ACCESS read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

"A description of the media contained in this input sub-unit; This description is intended for display to a human operator. This description is not processed by the printer. It is used to provide information not expressible in terms of the other media attributes (e.g. prtInputMediaDimFeedDirChosen, prtInputMediaDimXFeedDirChosen, prtInputMediaWeight, prtInputMediaType). An example would be 'legal tender bond


```
SYNTAX      OCTET STRING (SIZE(0..63))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The version of this input sub-unit."
 ::= { prtInputEntry 16 }

prtInputSerialNumber OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(0..32))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The serial number assigned to this input sub-unit."
 ::= { prtInputEntry 17 }

prtInputDescription OBJECT-TYPE
SYNTAX      LocalizedDescriptionStringTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "A free-form text description of this input sub-unit in the
    localization specified by prtGeneralCurrentLocalization."
 ::= { prtInputEntry 18 }

prtInputSecurity OBJECT-TYPE
SYNTAX      PresentOnOff
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "Indicates if this input sub-unit has some security associated
    with it."
 ::= { prtInputEntry 19 }

-- The Input Media Group
--
-- The Input Media Group supports identification of media
-- installed or available for use on a printing device.
-- Medium resources are identified by name, and include a
-- collection of characteristic attributes that may further be
-- used for selection and management of them.
-- The Input Media group consists of a set of optional
-- "columns" in the Input Table. In this manner, a minimally
-- conforming implementation may choose to not support reporting
-- of media resources if it cannot do so.
```

```

prtInputMediaWeight OBJECT-TYPE
    SYNTAX      Integer32 (-2..2147483647)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The weight of the medium associated with this input sub-unit in
        grams / per meter squared. The value (-2) means unknown."
    ::= { prtInputEntry 20 }

```

```

prtInputMediaType OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..63))
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The name of the type of medium associated with this input sub
        unit. This name need not be processed by the printer; it might
        simply be displayed to an operator. The standardized string
        values from ISO 10175 (DPA) and ISO 10180 (SPDL) are:

stationery      Separately cut sheets of an opaque
                material
transparency    Separately cut sheets of a transparent
                material
envelope        Envelopes that can be used for
                conventional mailing purposes
envelope-plain  Envelopes that are not preprinted and
                have no windows
envelope-window Envelopes that have windows for
                addressing purposes
continuous-long Continuously connected sheets of an
                opaque material connected along the
                long edge
continuous-short Continuously connected sheets of an
                opaque material connected along the
                short edge
tab-stock       Media with tabs
multi-part-form Form medium composed of multiple layers
                not pre-attached to one another; each
                sheet may be drawn separately from an
                input source
labels          Label stock
multi-layer     Form medium composed of multiple layers
                which are pre-attached to one another;
                e.g., for use with impact printers.

```

Implementers may add additional string values. The naming conventions in ISO 9070 are recommended in order to avoid potential name clashes."

```
::= { prtInputEntry 21 }
```

prtInputMediaColor OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..63))
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The name of the color of the medium associated with this input sub-unit using standardized string values from ISO 10175 (DPA) and ISO 10180 (SPDL) which are:

- other
- unknown
- white
- pink
- yellow
- buff
- goldenrod
- blue
- green
- transparent

Implementers may add additional string values. The naming conventions in ISO 9070 are recommended in order to avoid potential name clashes."

```
::= { prtInputEntry 22 }
```

prtInputMediaFormParts OBJECT-TYPE
SYNTAX Integer32 (-2..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The number of parts associated with the medium associated with this input sub-unit if the medium is a multi-part form. The value (-1) means other and specifically indicates that the device places no restrictions on this parameter. The value (-2) means unknown."

```
::= { prtInputEntry 23 }
```

-- The Input Switching Group
--


```
-- The input switching group allows the administrator to set the
-- input subunit time-out for the printer and to control the
-- automatic input subunit switching by the printer when an input
-- subunit becomes empty.
```

prtInputMediaLoadTimeout OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"When the printer is not able to print due to a subunit being empty or the requested media must be manually loaded, the printer will wait for the duration (in seconds) specified by this object. Upon expiration of the time-out, the printer will take the action specified by prtInputNextIndex.

The event which causes the printer to enter the waiting state is product specific. If the printer is not waiting for manually fed media, it may switch from an empty subunit to a different subunit without waiting for the time-out to expire.

A value of (-1) implies 'other' or 'infinite' which translates to 'wait forever'. The action which causes printing to continue is product specific. A value of (-2) implies 'unknown'."

::= { prtInputEntry 24 }

prtInputNextIndex OBJECT-TYPE

SYNTAX Integer32 (-3..2147483647)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of prtInputIndex corresponding to the input subunit which will be used when this input subunit is emptied and the time-out specified by prtInputMediaLoadTimeout expires. A value of zero(0) indicates that auto input switching will not occur when this input subunit is emptied. If the time-out specified by prtInputLoadMediaTimeout expires and this value is zero(0), the job will be aborted. A value of (-1) means other. The value (-2) means 'unknown' and specifically indicates that an implementation specific method will determine the next input subunit to use at the time this subunit is emptied and the time out expires. The value(-3) means input switching is not supported for this subunit."

::= { prtInputEntry 25 }

```

-- The Output Group
--
-- Output sub-units are managed as a tabular, indexed collection
-- of possible devices capable of receiving media delivered from
-- the printing process. Output sub-units typically have a
-- location, a type, an identifier, a set of constraints on
-- possible media sizes and potentially other characteristics,
-- and may be capable of indicating current status or capacity.

prtOutput OBJECT IDENTIFIER ::= { printmib 9 }

prtOutputTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtOutputEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of the devices capable of receiving media delivered
        from the printing process."
    ::= { prtOutput 2 }

prtOutputEntry OBJECT-TYPE
    SYNTAX      PrtOutputEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Attributes of a device capable of receiving media delivered
        from the printing process. Entries may exist in the table for
        each device index with a device type of 'printer'."
    INDEX { hrDeviceIndex, prtOutputIndex }
    ::= { prtOutputTable 1 }

PrtOutputEntry ::= SEQUENCE {
    prtOutputIndex          Integer32,
    prtOutputType           PrtOutputTypeTC,
    prtOutputCapacityUnit  PrtCapacityUnitTC,
    prtOutputMaxCapacity   Integer32,
    prtOutputRemainingCapacity Integer32,
    prtOutputStatus        PrtSubUnitStatusTC,
    prtOutputName           OCTET STRING,
    prtOutputVendorName    OCTET STRING,
    prtOutputModel          OCTET STRING,
    prtOutputVersion        OCTET STRING,
    prtOutputSerialNumber  OCTET STRING,
    prtOutputDescription    LocalizedDescriptionStringTC,
    prtOutputSecurity       PresentOnOff,

```

```

prtOutputDimUnit          PrtMediaUnitTC,
prtOutputMaxDimFeedDir   Integer32,
prtOutputMaxDimXFeedDir  Integer32,
prtOutputMinDimFeedDir   Integer32,
prtOutputMinDimXFeedDir  Integer32,
prtOutputStackingOrder   PrtOutputStackingOrderTC,
prtOutputPageDeliveryOrientationTC,
                          PrtOutputPageDeliveryOrientationTC,
prtOutputBursting        PresentOnOff,
prtOutputDecollating     PresentOnOff,
prtOutputPageCollated    PresentOnOff,
prtOutputOffsetStacking  PresentOnOff
}

```

prtOutputIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value used by this printer to identify this output sub-unit. Although these values may change due to a major reconfiguration of the sub-unit (e.g. the addition of new output devices to the printer), values SHOULD remain stable across successive printer power cycles."

::= { prtOutputEntry 1 }

prtOutputType OBJECT-TYPE

-- This value is a type 2 enumeration

SYNTAX PrtOutputTypeTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of technology supported by this output sub-unit."

::= { prtOutputEntry 2 }

prtOutputCapacityUnit OBJECT-TYPE

SYNTAX PrtCapacityUnitTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The unit of measurement for use in calculating and relaying capacity values for this output sub-unit."

::= { prtOutputEntry 3 }

prtOutputMaxCapacity OBJECT-TYPE

```

SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The maximum capacity of this output sub-unit in output sub-unit
    capacity units (PrtCapacityUnitTC). There is no convention
    associated with the media itself so this value essentially
    reflects claimed capacity. If this output sub-unit can reliably
    sense this value, the value is sensed by the printer and may not
    be changed by management requests; otherwise, the value may be
    written (by a Remote Control Panel or a Management Application).
    The value (-1) means other and specifically indicates that the
    sub-unit places no restrictions on this parameter. The value
    (-2) means unknown."
 ::= { prtOutputEntry 4 }

```

```

prtOutputRemainingCapacity OBJECT-TYPE
SYNTAX      Integer32 (-3..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The remaining capacity of the possible output sub-unit capacity
    in output sub-unit capacity units (PrtCapacityUnitTC)of this
    output sub-unit. If this output sub-unit can reliably sense this
    value, the value is sensed by the printer and may not be
    modified by management requests; otherwise, the value may be
    written (by a Remote Control Panel or a Management Application).
    The value (-1) means other and specifically indicates that the
    sub-unit places no restrictions on this parameter. The value
    (-2) means unknown. The value (-3) means that the printer knows
    that there remains capacity for at least one unit."
 ::= { prtOutputEntry 5 }

```

```

prtOutputStatus OBJECT-TYPE
SYNTAX      PrtSubUnitStatusTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The current status of this output sub-unit."
 ::= { prtOutputEntry 6 }

```

```

--          OUTPUT MEASUREMENT
--
--  _____ | _____
--  ^           |           ^

```



```
SYNTAX      OCTET STRING (SIZE(0..63))
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The serial number assigned to this output sub-unit."
 ::= { prtOutputEntry 11 }

prtOutputDescription OBJECT-TYPE
SYNTAX      LocalizedDescriptionStringTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "A free-form text description of this output sub-unit in the
    localization specified by prtGeneralCurrentLocalization."
 ::= { prtOutputEntry 12 }

prtOutputSecurity OBJECT-TYPE
SYNTAX      PresentOnOff
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "Indicates if this output sub-unit has some security associated
    with it and if that security is enabled or not."
 ::= { prtOutputEntry 13 }

-- The Output Dimensions Group

prtOutputDimUnit OBJECT-TYPE
SYNTAX      PrtMediaUnitTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The unit of measurement for use in calculating and relaying
    dimensional values for this output sub-unit."
 ::= { prtOutputEntry 14 }

prtOutputMaxDimFeedDir OBJECT-TYPE
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The maximum dimensions supported by this output sub-unit
    for measurements taken parallel relative to the feed
    direction associated with that sub-unit in output
    sub-unit dimensional units (controlled by prtOutputDimUnit,
```

which uses PrtMediaUnitTC). If this output sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed with management protocol operations."

```
::= { prtOutputEntry 15 }
```

prtOutputMaxDimXFeedDir OBJECT-TYPE

```
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
```

"The maximum dimensions supported by this output sub-unit for measurements taken ninety degrees relative to the feed direction associated with that sub-unit in output sub-unit dimensional units (controlled by prtOutputDimUnit, which uses PrtMediaUnitTC). If this output sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed with management protocol operations."

```
::= { prtOutputEntry 16 }
```

prtOutputMinDimFeedDir OBJECT-TYPE

```
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
```

"The minimum dimensions supported by this output sub-unit for measurements taken parallel relative to the feed direction associated with that sub-unit in output sub-unit dimensional units (controlled by prtOutputDimUnit, which uses PrtMediaUnitTC). If this output sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed with management protocol operations."

```
::= { prtOutputEntry 17 }
```

prtOutputMinDimXFeedDir OBJECT-TYPE

```
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
```

"The minimum dimensions supported by this output sub-unit for measurements taken ninety degrees relative to the feed direction associated with that sub-unit in output sub-unit dimensional units (controlled by prtOutputDimUnit, which uses PrtMediaUnitTC). If this output sub-unit can reliably sense this value, the value is sensed by the printer and may not be changed with management protocol operations."

```
 ::= { prtOutputEntry 18 }

-- The Output Features Group

prtOutputStackingOrder OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      PrtOutputStackingOrderTC
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The current state of the stacking order for the
    associated output sub-unit. 'FirstToLast' means
    that as pages are output the front of the next page is
    placed against the back of the previous page.
    'LasttoFirst' means that as pages are output the back
    of the next page is placed against the front of the
    previous page."
 ::= { prtOutputEntry 19 }

prtOutputPageDeliveryOrientation OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      PrtOutputPageDeliveryOrientationTC
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The reading surface that will be 'up' when pages are
    delivered to the associated output sub-unit. Values are
    faceUp and faceDown. (Note: interpretation of these
    values is in general context-dependent based on locale;
    presentation of these values to an end-user should be
    normalized to the expectations of the user)."
 ::= { prtOutputEntry 20 }

prtOutputBursting OBJECT-TYPE
SYNTAX      PresentOnOff
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object indicates that the outputting sub-unit supports
    bursting, and if so, whether the feature is enabled. Bursting is
    the process by which continuous media is separated into
    individual sheets, typically by bursting along pre-formed
    perforations."
 ::= { prtOutputEntry 21 }
```



```
prtOutputDecollating OBJECT-TYPE
    SYNTAX      PresentOnOff
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object indicates that the output supports decollating, and
        if so, whether the feature is enabled. Decollating is the
        process by which the individual parts within a multi-part form
        are separated and sorted into separate stacks for each part."
    ::= { prtOutputEntry 22 }

prtOutputPageCollated OBJECT-TYPE
    SYNTAX      PresentOnOff
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object indicates that the output sub-unit supports page
        collation, and if so, whether the feature is enabled. See
        glossary for definition of how this document defines collation."
    ::= { prtOutputEntry 23 }

prtOutputOffsetStacking OBJECT-TYPE
    SYNTAX      PresentOnOff
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object indicates that the output supports offset stacking,
        and if so, whether the feature is enabled. See glossary for how
        Offset Stacking is defined by this document."
    ::= { prtOutputEntry 24 }

-- The Marker Group
--
-- A marker is the mechanism that produces marks on the print
-- media. The marker sub-units and their associated supplies are
-- represented by the Marker Group in the model. A printer can
-- contain one or more marking mechanisms. Some examples of
-- multiple marker sub-units are: a printer
-- with separate markers for normal and magnetic ink or an
-- imagesetter that can output to both a proofing device and
-- final film. Each marking device can have its own set of
-- characteristics associated with it, such as marking technology
-- and resolution.

prtMarker OBJECT IDENTIFIER ::= { printmib 10 }
```

```
-- The printable area margins as listed below define an area of
-- the print media which is guaranteed to be printable for all
-- combinations of input, media paths, and interpreters for this
-- marker.
```

```
prtMarkerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtMarkerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The marker table provides a description of each marker
        sub-unit contained within the printer."
    ::= { prtMarker 2 }

prtMarkerEntry OBJECT-TYPE
    SYNTAX      PrtMarkerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Entries in this table define the characteristics and status
        of each marker sub-unit in the printer."
    INDEX { hrDeviceIndex, prtMarkerIndex }
    ::= { prtMarkerTable 1 }

PrtMarkerEntry ::= SEQUENCE {
    prtMarkerIndex          Integer32,
    prtMarkerMarkTech      PrtMarkerMarkTechTC,
    prtMarkerCounterUnit   PrtMarkerCounterUnitTC,
    prtMarkerLifeCount     Counter32,
    prtMarkerPowerOnCount  Counter32,
    prtMarkerProcessColorants Integer32,
    prtMarkerSpotColorants Integer32,
    prtMarkerAddressabilityUnit PrtMarkerAddressabilityUnitTC,
    prtMarkerAddressabilityFeedDir Integer32,
    prtMarkerAddressabilityXFeedDir Integer32,
    prtMarkerNorthMargin   Integer32,
    prtMarkerSouthMargin   Integer32,
    prtMarkerWestMargin    Integer32,
    prtMarkerEastMargin    Integer32,
    prtMarkerStatus        PrtSubUnitStatusTC
}

prtMarkerIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
```

```
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "A unique value used by the printer to identify this marking
    SubUnit.  Although these values may change due to a major
    reconfiguration of the device (e.g. the addition of new marking
    sub-units to the printer), values SHOULD remain stable across
    successive printer power cycles."
 ::= { prtMarkerEntry 1 }

prtMarkerMarkTech OBJECT-TYPE
-- This value is a type 2 enumeration
SYNTAX      PrtMarkerMarkTechTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The type of marking technology used for this marking sub-unit."
 ::= { prtMarkerEntry 2 }

prtMarkerCounterUnit OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      PrtMarkerCounterUnitTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The unit that will be used by the printer when reporting
    counter values for this marking sub-unit.  The time units of
    measure are provided for a device like a strip recorder that
    does not or cannot track the physical dimensions of the media
    and does not use characters, lines or sheets."
 ::= { prtMarkerEntry 3 }

prtMarkerLifeCount OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The count of the number of units of measure counted during the
    life of printer using units of measure as specified by
    prtMarkerCounterUnit."
 ::= { prtMarkerEntry 4 }

prtMarkerPowerOnCount OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "The count of the number of units of measure counted since the
    equipment was most recently powered on using units of measure as
    specified by prtMarkerCounterUnit."
 ::= { prtMarkerEntry 5 }

prtMarkerProcessColorants OBJECT-TYPE
SYNTAX      Integer32 (0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of process colors supported by this marker.  A
    process color of 1 implies monochrome.  The value of this object
    and prtMarkerSpotColorants cannot both be 0.  The value of
    prtMarkerProcessColorants must be 0 or greater."
 ::= { prtMarkerEntry 6 }

prtMarkerSpotColorants OBJECT-TYPE
SYNTAX      Integer32 (0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of spot colors supported by this marker.  The value
    of this object and prtMarkerProcessColorants cannot both be 0.
    Must be 0 or greater."
 ::= { prtMarkerEntry 7 }

prtMarkerAddressabilityUnit OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      PrtMarkerAddressabilityUnitTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The unit of measure of distances, as applied to the marker's
    resolution."
 ::= { prtMarkerEntry 8 }

prtMarkerAddressabilityFeedDir OBJECT-TYPE
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The maximum number of addressable marking positions in the feed
    direction per 10000 units of measure specified by
```

prtMarkerAddressabilityUnit. A value of (-1) implies 'other' or 'infinite' while a value of (-2) implies 'unknown'."
 ::= { prtMarkerEntry 9 }

prtMarkerAddressabilityXFeedDir OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum number of addressable marking positions in the cross feed direction in 10000 units of measure specified by prtMarkerAddressabilityUnit. A value of (-1) implies 'other' or 'infinite' while a value of (-2) implies 'unknown'."

::= { prtMarkerEntry 10 }

prtMarkerNorthMargin OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The margin, in units identified by prtMarkerAddressabilityUnit, from the leading edge of the medium as the medium flows through the marking engine with the side to be imaged facing the observer. The leading edge is the North edge and the other edges are defined by the normal compass layout of directions with the compass facing the observer. Printing within the area bounded by all four margins is guaranteed for all interpreters. The value (-2) means unknown."

::= { prtMarkerEntry 11 }

prtMarkerSouthMargin OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The margin from the South edge (see prtMarkerNorthMargin) of the medium in units identified by prtMarkerAddressabilityUnit. Printing within the area bounded by all four margins is guaranteed for all interpreters. The value (-2) means unknown."

::= { prtMarkerEntry 12 }

prtMarkerWestMargin OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The margin from the West edge (see prtMarkerNorthMargin) of the medium in units identified by prtMarkerAddressabilityUnit. Printing within the area bounded by all four margins is guaranteed for all interpreters. The value (-2) means unknown."

::= { prtMarkerEntry 13 }

prtMarkerEastMargin OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The margin from the East edge (see prtMarkerNorthMargin) of the medium in units identified by prtMarkerAddressabilityUnit. Printing within the area bounded by all four margins is guaranteed for all interpreters. The value (-2) means unknown."

::= { prtMarkerEntry 14 }

prtMarkerStatus OBJECT-TYPE

SYNTAX PrtSubUnitStatusTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The current status of this marker sub-unit."

::= { prtMarkerEntry 15 }

-- The Marker Supplies Group

prtMarkerSupplies OBJECT IDENTIFIER ::= { printmib 11 }

prtMarkerSuppliesTable OBJECT-TYPE

SYNTAX SEQUENCE OF PrtMarkerSuppliesEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of the marker supplies available on this printer."

::= { prtMarkerSupplies 1 }

prtMarkerSuppliesEntry OBJECT-TYPE

SYNTAX PrtMarkerSuppliesEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Attributes of a marker supply. Entries may exist in the table for each device index with a device type of 'printer'."

```

INDEX { hrDeviceIndex, prtMarkerSuppliesIndex }
 ::= { prtMarkerSuppliesTable 1 }

PrtMarkerSuppliesEntry ::= SEQUENCE {
    prtMarkerSuppliesIndex      Integer32,
    prtMarkerSuppliesMarkerIndex Integer32,
    prtMarkerSuppliesColorantIndex Integer32,
    prtMarkerSuppliesClass      PrtMarkerSuppliesClassTC,
    prtMarkerSuppliesType       PrtMarkerSuppliesTypeTC,
    prtMarkerSuppliesDescription LocalizedDescriptionStringTC,
    prtMarkerSuppliesSupplyUnit PrtMarkerSuppliesSupplyUnitTC,
    prtMarkerSuppliesMaxCapacity Integer32,
    prtMarkerSuppliesLevel      Integer32
}

prtMarkerSuppliesIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this marker
        supply.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new marker
        supplies to the printer), values SHOULD remain stable across
        successive printer power cycles."
    ::= { prtMarkerSuppliesEntry 1 }

prtMarkerSuppliesMarkerIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of prtMarkerIndex corresponding to the marking sub
        unit with which this marker supply sub-unit is associated."
    ::= { prtMarkerSuppliesEntry 2 }

prtMarkerSuppliesColorantIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of prtMarkerColorantIndex corresponding to the
        colorant with which this marker supply sub-unit is associated.
        This value shall be 0 if there is no colorant table or if this
        supply does not depend on a single specified colorant."

```

```
 ::= { prtMarkerSuppliesEntry 3 }

prtMarkerSuppliesClass OBJECT-TYPE
  -- This value is a type 1 enumeration
  SYNTAX      PrtMarkerSuppliesClassTC
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "Indicates whether this supply entity represents a supply that
     is consumed or a receptacle that is filled."
  ::= { prtMarkerSuppliesEntry 4 }

prtMarkerSuppliesType OBJECT-TYPE
  -- This value is a type 3 enumeration
  SYNTAX      PrtMarkerSuppliesTypeTC
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "The type of this supply."
  ::= { prtMarkerSuppliesEntry 5 }

prtMarkerSuppliesDescription OBJECT-TYPE
  SYNTAX      LocalizedDescriptionStringTC
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "The description of this supply container/receptacle in the
     localization specified by prtGeneralCurrentLocalization."
  ::= { prtMarkerSuppliesEntry 6 }

prtMarkerSuppliesSupplyUnit OBJECT-TYPE
  -- This value is a type 1 enumeration
  SYNTAX      PrtMarkerSuppliesSupplyUnitTC
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "Unit of measure of this marker supply container/receptacle."
  ::= { prtMarkerSuppliesEntry 7 }

prtMarkerSuppliesMaxCapacity OBJECT-TYPE
  SYNTAX      Integer32 (-2..2147483647)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
    "The maximum capacity of this supply container/receptacle"
```


expressed in prtMarkerSuppliesSupplyUnit. If this supply container/receptacle can reliably sense this value, the value is reported by the printer and is read-only; otherwise, the value may be written (by a Remote Control Panel or a Management Application). The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter. The value (-2) means unknown."

```
::= { prtMarkerSuppliesEntry 8 }
```

prtMarkerSuppliesLevel OBJECT-TYPE
SYNTAX Integer32 (-3..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The current level if this supply is a container; remaining space if this supply is a receptacle. If this supply container/receptacle can reliably sense this value, the value is reported by the printer and is read-only; otherwise, the value may be written (by a Remote Control Panel or a Management Application). The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter. The value (-2) means unknown. A value of (-3) means that the printer knows that there is some supply/remaining space, respectively."
::= { prtMarkerSuppliesEntry 9 }

-- The Marker Colorant Group

```
prtMarkerColorant OBJECT IDENTIFIER ::= { printmib 12 }
```

prtMarkerColorantTable OBJECT-TYPE
SYNTAX SEQUENCE OF PrtMarkerColorantEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table of all of the colorants available on the printer."
::= { prtMarkerColorant 1 }

prtMarkerColorantEntry OBJECT-TYPE
SYNTAX PrtMarkerColorantEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Attributes of a colorant available on the printer. Entries may exist in the table for each device index with a device type of

Bergman, Gocek, Lewis, McDonald, Turner Expires 15 Apr 02 [Page 105]

```

    'printer'."
    INDEX { hrDeviceIndex, prtMarkerColorantIndex }
    ::= { prtMarkerColorantTable 1 }

PrtMarkerColorantEntry ::= SEQUENCE {
    prtMarkerColorantIndex      Integer32,
    prtMarkerColorantMarkerIndex Integer32,
    prtMarkerColorantRole       PrtMarkerColorantRoleTC,
    prtMarkerColorantValue      OCTET STRING,
    prtMarkerColorantTonality   Integer32
}

prtMarkerColorantIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this colorant.
        Although these values may change due to a major reconfiguration
        of the device (e.g. the addition of new colorants to the
        printer) , values SHOULD remain stable across successive
        printer power cycles."
    ::= { prtMarkerColorantEntry 1 }

prtMarkerColorantMarkerIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
        "The value of prtMarkerIndex corresponding to the marker sub
        unit with which this colorant entry is associated."
    ::= { prtMarkerColorantEntry 2 }

prtMarkerColorantRole OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX      PrtMarkerColorantRoleTC
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION
        "The role played by this colorant."
    ::= { prtMarkerColorantEntry 3 }

prtMarkerColorantValue OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only

```

```
STATUS      current
DESCRIPTION
  "The name of the color of this colorant using standardized
  string names from ISO 10175 (DPA) and ISO 10180 (SPDL) such as:
  other
  unknown
  white
  red
  green
  blue
  cyan
  magenta
  yellow
  black
  Implementers may add additional string values. The naming
  conventions in ISO 9070 are recommended in order to avoid
  potential name clashes"
 ::= { prtMarkerColorantEntry 4 }

prtMarkerColorantTonality OBJECT-TYPE
SYNTAX      Integer32 (2..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The distinct levels of tonality realizable by a marking sub
  unit when using this colorant. This value does not include the
  number of levels of tonal difference that an interpreter can
  obtain by techniques such as half toning. This value must be at
  least 2."
 ::= { prtMarkerColorantEntry 5 }

-- The Media Path Group
--
-- The media paths encompass the mechanisms in the printer that
-- move the media through the printer and connect all other media
-- related sub-units: inputs, outputs, markers and finishers. A
-- printer contains one or more media paths. These are
-- represented by the Media Path Group in the model.

prtMediaPath OBJECT IDENTIFIER ::= { printmib 13 }

prtMediaPathTable OBJECT-TYPE
SYNTAX      SEQUENCE OF PrtMediaPathEntry
MAX-ACCESS  not-accessible
STATUS      current
```

DESCRIPTION

"The media path table includes both physical and logical paths within the printer."

::= { prtMediaPath 4 }

prtMediaPathEntry OBJECT-TYPE

SYNTAX PrtMediaPathEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Entries may exist in the table for each device index with a device type of 'printer'. Each entry defines the physical characteristics of and the status of the media path. The data provided indicates the maximum throughput and the media size limitations of these subunits."

INDEX { hrDeviceIndex, prtMediaPathIndex }

::= { prtMediaPathTable 1 }

PrtMediaPathEntry ::= SEQUENCE {

prtMediaPathIndex	Integer32,
prtMediaPathMaxSpeedPrintUnit	PrtMediaPathMaxSpeedPrintUnitTC,
prtMediaPathMediaSizeUnit	PrtMediaUnitTC,
prtMediaPathMaxSpeed	Integer32,
prtMediaPathMaxMediaFeedDir	Integer32,
prtMediaPathMaxMediaXFeedDir	Integer32,
prtMediaPathMinMediaFeedDir	Integer32,
prtMediaPathMinMediaXFeedDir	Integer32,
prtMediaPathType	PrtMediaPathTypeTC,
prtMediaPathDescription	LocalizedDescriptionStringTC,
prtMediaPathStatus	PrtSubUnitStatusTC

}

prtMediaPathIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value used by the printer to identify this media path. Although these values may change due to a major reconfiguration of the device (e.g. the addition of new media paths to the printer), values SHOULD remain stable across successive printer power cycles."

::= { prtMediaPathEntry 1 }

prtMediaPathMaxSpeedPrintUnit OBJECT-TYPE

```
-- This value is a type 1 enumeration
SYNTAX PrtMediaPathMaxSpeedPrintUnitTC
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The unit of measure used in specifying the speed of all media
    paths in the printer."
 ::= { prtMediaPathEntry 2 }

prtMediaPathMediaSizeUnit OBJECT-TYPE
    SYNTAX PrtMediaUnitTC
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The units of measure of media size for use in calculating and
        relaying dimensional values for all media paths in the printer."
    ::= { prtMediaPathEntry 3 }

prtMediaPathMaxSpeed OBJECT-TYPE
    SYNTAX Integer32 (-2..2147483647)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The maximum printing speed of this media path expressed in
        prtMediaPathMaxSpeedUnit's. A value of (-1) implies 'other'."
    ::= { prtMediaPathEntry 4 }

prtMediaPathMaxMediaFeedDir OBJECT-TYPE
    SYNTAX Integer32 (-2..2147483647)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The maximum physical media size in the feed direction of this
        media path expressed in units of measure specified by
        PrtMediaPathMediaSizeUnit. A value of (-1) implies 'unlimited'
        a value of (-2) implies 'unknown'"
    ::= { prtMediaPathEntry 5 }

prtMediaPathMaxMediaXFeedDir OBJECT-TYPE
    SYNTAX Integer32 (-2..2147483647)
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The maximum physical media size across the feed direction of
        this media path expressed in units of measure specified by
```

```
    prtMediaPathMediaSizeUnit. A value of (-2) implies 'unknown'."
 ::= { prtMediaPathEntry 6 }

prtMediaPathMinMediaFeedDir OBJECT-TYPE
    SYNTAX      Integer32 (-2..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The minimum physical media size in the feed direction of this
        media path expressed in units of measure specified by
        prtMediaPathMediaSizeUnit. A value of (-2) implies 'unknown'."
 ::= { prtMediaPathEntry 7 }

prtMediaPathMinMediaXFeedDir OBJECT-TYPE
    SYNTAX      Integer32 (-2..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The minimum physical media size across the feed direction of
        this media path expressed in units of measure specified by
        prtMediaPathMediaSizeUnit. A value of (-2) implies 'unknown'."
 ::= { prtMediaPathEntry 8 }

prtMediaPathType OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX      PrtMediaPathTypeTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of the media path for this media path."
 ::= { prtMediaPathEntry 9 }

prtMediaPathDescription OBJECT-TYPE
    SYNTAX      LocalizedDescriptionStringTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The manufacturer-provided description of this media path in the
        localization specified by prtGeneralCurrentLocalization."
 ::= { prtMediaPathEntry 10 }

prtMediaPathStatus OBJECT-TYPE
    SYNTAX      PrtSubUnitStatusTC
    MAX-ACCESS  read-only
    STATUS      current
```

DESCRIPTION

"The current status of this media path."

::= { prtMediaPathEntry 11 }

-- The Print Job Delivery Channel Group

--

-- Print Job Delivery Channels are independent sources of print
-- data. Here, print data is the term used for the information
-- that is used to construct printed pages and may have both data
-- and control aspects. The output of a channel is in a form
-- suitable for input to one of the interpreters as a
-- stream. A channel may be independently enabled (allowing
-- print data to flow) or disabled (stopping the flow of
-- print data). A printer may have one or more channels.

--

-- The Print Job Delivery Channel table describes the
-- capabilities of the printer and not what is currently being
-- performed by the printer

--

-- Basically, the print job delivery channel abstraction
-- describes the final processing step of getting the print data
-- to an interpreter. It might include some level of
-- decompression or decoding of print stream data.
-- channel. All of these aspects are hidden in the channel
-- abstraction.

--

-- There are many kinds of print job delivery channels; some of
-- which are based on networks and others which are not. For
-- example, a channel can be a serial (or parallel) connection;
-- it can be a service, such as the UNIX Line Printer Daemon
-- (LPD), offering services over a network connection; or
-- it could be a disk drive into which a floppy disk with
-- the print data is inserted. Each print job delivery channel is
-- identified by the electronic path and/or service protocol
-- used to deliver print data to a print data interpreter.

--

-- Channel example

Implementation

--

-- serial port channel	bi-directional data channel
-- parallel port channel	often uni-directional channel
-- IEEE 1284 port channel	bi-directional channel
-- SCSI port channel	bi-directional
-- Apple PAP channel	may be based on LocalTalk,
--	Ethernet or Tokentalk
-- LPD Server channel	TCP/IP based, port 515

```
-- Netware Remote Printer          SPX/IPX based channel
-- Netware Print Server            SPX/IPX based channel
--
-- It is easy to note that this is a mixed bag.  There are
-- some physical connections over which no (or very meager)
-- protocols are run (e.g. the serial or old parallel ports)
-- and there are services which often have elaborate
-- protocols that run over a number of protocol stacks.  In
-- the end, what is important is the delivery of print data
-- through the channel.
--
-- The print job delivery channel sub-units are represented by
-- the Print Job Delivery Channel Group in the Model.  It has a
-- current print job control language, which can be used to
-- specify which interpreter is to be used for the print data and
-- to query and change environment variables used by the
-- interpreters (and Management Applications).  There is also a
-- default interpreter that is to be used if an interpreter is
-- not explicitly specified using the Control Language.
--
-- The first seven items in the Print Job Delivery Channel Table
-- define the "channel" itself.  A channel typically depends on
-- other protocols and interfaces to provide the data that flows
-- through the channel.
--
-- Control of a print job delivery channel is largely limited to
-- enabling or disabling the entire channel itself.  It is likely
-- that more control of the process of accessing print data
-- will be needed over time.  Thus, the ChannelType will
-- allow type-specific data to be associated with each
-- channel (using ChannelType specific groups in a fashion
-- analogous to the media specific MIBs that are associated
-- with the IANAIfType in the Interfaces Table).  As a first
-- step in this direction, each channel will identify the
-- underlying Interface on which it is based.  This is the
-- eighth object in each row of the table.
--
-- The Print Job Delivery Channel Table

prtChannel OBJECT IDENTIFIER ::= { printmib 14 }

prtChannelTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtChannelEntry
    MAX-ACCESS  not-accessible
    STATUS      current
```


DESCRIPTION

"The channel table represents the set of input data sources which can provide print data to one or more of the interpreters available on a printer "

::= { prtChannel 1 }

prtChannelEntry OBJECT-TYPE

SYNTAX PrtChannelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Entries may exist in the table for each device index with a device type of 'printer'. Each channel table entry is characterized by a unique protocol stack and/or addressing. The channel may also have printer dependent features that are associated with a printing language."

INDEX { hrDeviceIndex, prtChannelIndex }

::= { prtChannelTable 1 }

PrtChannelEntry ::= SEQUENCE {

prtChannelIndex	Integer32,
prtChannelType	PrtChannelTypeTC,
prtChannelProtocolVersion	OCTET STRING,
prtChannelCurrentJobCntlLangIndex	Integer32,
prtChannelDefaultPageDescLangIndex	Integer32,
prtChannelState	PrtChannelStateTC,
prtChannelIfIndex	Integer32,
prtChannelStatus	PrtSubUnitStatusTC,
prtChannelInformation	OCTET STRING
}	

prtChannelIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value used by the printer to identify this data channel. Although these values may change due to a major reconfiguration of the device (e.g. the addition of new data channels to the printer), values SHOULD remain stable across successive printer power cycles."

::= { prtChannelEntry 1 }

prtChannelType OBJECT-TYPE

SYNTAX PrtChannelTypeTC

MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The type of this print data channel. This object provides the linkage to ChannelType-specific groups that may (conceptually) extend the prtChannelTable with additional details about that channel."
 ::= { prtChannelEntry 2 }

prtChannelProtocolVersion OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(0..63))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The version of the protocol used on this channel. The format used for version numbering depends on prtChannelType."
 ::= { prtChannelEntry 3 }

prtChannelCurrentJobCntlLangIndex OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The value of prtInterpreterIndex corresponding to the Control Language Interpreter for this channel. This interpreter defines the syntax used for control functions, such as querying or changing environment variables and identifying job boundaries (e.g. PjL, PostScript, NPAP). A value of zero indicates that there is no current Job Control Language Interpreter for this channel"
 ::= { prtChannelEntry 4 }

prtChannelDefaultPageDescLangIndex OBJECT-TYPE
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
 "The value of prtInterpreterIndex corresponding to the Page Description Language Interpreter for this channel. This interpreter defines the default Page Description Language interpreter to be used for the print data unless the Control Language is used to select a specific interpreter (e.g., PCL, PostScript Language, auto-sense). A value of zero indicates that there is no default page description language interpreter for this channel."

```
 ::= { prtChannelEntry 5 }

prtChannelState OBJECT-TYPE
  -- This value is a type 1 enumeration
  SYNTAX      PrtChannelStateTC
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
    "The state of this print data channel. The value determines
    whether control information and print data is allowed through
    this channel or not."
  ::= { prtChannelEntry 6 }

prtChannelIfIndex OBJECT-TYPE
  SYNTAX      Integer32 (0..65535)
  MAX-ACCESS  read-write
  STATUS      current
  DESCRIPTION
    "The value of ifIndex in the ifTable; see the interface section
    of MIB-II (RFC 1213 [14]) which corresponds to this channel.
    When more than one row of the ifTable is relevant, this is the
    index of the row representing the topmost layer in the interface
    hierarchy. A value of zero indicates that no interface is
    associated with this channel."
  ::= { prtChannelEntry 7 }

prtChannelStatus OBJECT-TYPE
  SYNTAX      PrtSubUnitStatusTC
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "The current status of the channel."
  ::= { prtChannelEntry 8 }

prtChannelInformation OBJECT-TYPE
  SYNTAX      OCTET STRING (SIZE (0..255))
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "Auxiliary information to allow a printing application to use
    the channel for data submission to the printer. An application
    capable of using a specific PrtChannelType should be able to use
    the combined information from the prtChannelInformation and
    other channel and interface group objects to 'bootstrap' its use
    of the channel. prtChannelInformation is not intended to
```

provide a general channel description, nor to provide information that is available once the channel is in use.

The encoding and interpretation of the prtChannelInformation object is specific to channel type. The description of each PrtChannelType enum value for which prtChannelInformation is defined specifies the appropriate encoding and interpretation, including interaction with other objects. For channel types that do not specify a prtChannelInformation value, its value shall be null (0 length).

When a new PrtChannelType enumeration value is registered, its accompanying description must specify the encoding and interpretation of the prtChannelInformation value for the channel type. prtChannelInformation semantics for an existing PrtChannelType may be added or amended in the same manner as described in section 2.4.1 for type 2 enumeration values.

The prtChannelInformation specifies values for a collection of channel attributes, represented as text according to the following rules:

1. The prtChannelInformation is not affected by localization.
2. The prtChannelInformation is a list of entries representing the attribute values. Each entry consists of the following items, in order:
 - a. A keyword, composed of alphabetic characters (A-Z, a-z) represented by their NVT ASCII [10] codes, that identifies a channel attribute,
 - b. The NVT ASCII code for an Equals Sign (=) (code 61) to delimit the keyword,
 - c. A data value encoded using rules specific to the PrtChannelType to which the prtChannelInformation applies which must in no case allow an octet with value 10 (the NVT ASCII Line Feed code),
 - d. the NVT ASCII code for a Line Feed character (code 10) to delimit the data value.

No other octets shall be present.

Keywords are case-sensitive. Conventionally, keywords are capitalized (including each word of a multi-word keyword) and since they occupy space in the prtChannelInformation, they are kept short.

3. If a channel attribute has multiple values, it is represented by multiple entries with the same keyword, each specifying one value. Otherwise, there shall be at most one entry for each attribute.

4. By default, entries may appear in any order. If there are ordering constraints for particular entries, these must be specified in their definitions.

5. The prtChannelInformation value by default consists of text represented by NVT ASCII graphics character codes. However, other representations may be specified:

a. In cases where the prtChannelInformation value contains information not normally coded in textual form, whatever symbolic representation is conventionally used for the information should be used for encoding the prtChannelInformation value. (For instance, a binary port value might be represented as a decimal number using NVT ASCII codes.) Such encoding must be specified in the definition of the value.

b. The value may contain textual information in a character set other than NVT ASCII graphics characters. (For instance, an identifier might consist of ISO 10646 text encoded using the UTF-8 encoding scheme.) Such a character set and its encoding must be specified in the definition of the value.

6. For each PrtChannelType for which prtChannelInformation entries are defined, the descriptive text associated with the PrtChannelType enumeration value shall specify the following information for each entry:

Title: Brief description phrase, e.g.: 'Port name', 'Service Name', etc.

Keyword: The keyword value, e.g.: 'Port' or 'Service'

Syntax: The encoding of the entry value if it cannot be directly represented by NVT ASCII.

Status: 'Mandatory', 'Optional', or 'Conditionally Mandatory'

Multiplicity: 'Single' or 'Multiple' to indicate whether the entry may be present multiple times.

Description: Description of the use of the entry, other information required to complete the definition (e.g.: ordering constraints, interactions between entries).

Applications that interpret prtChannelInformation should ignore unrecognized entries, so they are not affected if new entry types are added."

::= { prtChannelEntry 9 }

-- The Interpreter Group

--

-- The interpreter sub-units are responsible for the conversion of a description of intended print instances into images that are to be marked on the media. A printer may have one or more interpreters. The interpreter sub-units are represented by the Interpreter Group in the Model. Each interpreter is generally implemented with software running on the System Controller sub-unit. The Interpreter Table has one entry per interpreter where the interpreters include both Page Description Language (PDL) Interpreters and Control Language Interpreters.

prtInterpreter OBJECT IDENTIFIER ::= { printmib 15 }

-- Interpreter Table

prtInterpreterTable OBJECT-TYPE

SYNTAX SEQUENCE OF PrtInterpreterEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The interpreter table is a table representing the interpreters in the printer. An entry shall be placed in the interpreter table for each interpreter on the printer."

::= { prtInterpreter 1 }

prtInterpreterEntry OBJECT-TYPE

SYNTAX PrtInterpreterEntry

```

MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "Entries may exist in the table for each device index with a
    device type of 'printer'.  Each table entry provides a complete
    description of the interpreter, including version information,
    rendering resolutions, default character sets, output
    orientation, and communication capabilities."
INDEX { hrDeviceIndex, prtInterpreterIndex }
 ::= { prtInterpreterTable 1 }

```

```

PrtInterpreterEntry ::= SEQUENCE {
    prtInterpreterIndex          Integer32,
    prtInterpreterLangFamily    PrtInterpreterLangFamilyTC,
    prtInterpreterLangLevel     OCTET STRING,
    prtInterpreterLangVersion   OCTET STRING,
    prtInterpreterDescription   LocalizedDescriptionStringTC,
    prtInterpreterVersion       OCTET STRING,
    prtInterpreterDefaultOrientation PrtPrintOrientationTC,
    prtInterpreterFeedAddressability Integer32,
    prtInterpreterXFeedAddressability Integer32,
    prtInterpreterDefaultCharSetIn CodedCharSet,
    prtInterpreterDefaultCharSetOut CodedCharSet,
    prtInterpreterTwoWay        PrtInterpreterTwoWayTC
}

```

```

prtInterpreterIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value for each PDL or control language for which there
        exists an interpreter or emulator in the printer.  The value is
        used to identify this interpreter.  Although these values may
        change due to a major reconfiguration of the device (e.g. the
        addition of new interpreters to the printer), values SHOULD
        remain stable across successive printer power cycles."
    ::= { prtInterpreterEntry 1 }

```

```

prtInterpreterLangFamily OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX      PrtInterpreterLangFamilyTC
    MAX-ACCESS read-only
    STATUS      current
    DESCRIPTION

```

```

    "The family name of a Page Description Language (PDL) or control
    language which this interpreter in the printer can interpret or
    emulate."
 ::= { prtInterpreterEntry 2 }

prtInterpreterLangLevel OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..31))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The level of the language which this interpreter is
        interpreting or emulating.  This might contain a value like '5e'
        for an interpreter which is emulating level 5e of the PCL
        language.  It might contain '2' for an interpreter which is
        emulating level 2 of the PostScript language.  Similarly it might
        contain '2' for an interpreter which is emulating level 2 of the
        HPGL language."
 ::= { prtInterpreterEntry 3 }

prtInterpreterLangVersion OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..31))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The date code or version of the language which this interpreter
        is interpreting or emulating."
 ::= { prtInterpreterEntry 4 }

prtInterpreterDescription OBJECT-TYPE
    SYNTAX      LocalizedDescriptionStringTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A string to identify this interpreter in the localization
        specified by prtGeneralCurrentLocalization as opposed to the
        language which is being interpreted.  It is anticipated that
        this string will allow manufacturers to unambiguously identify
        their interpreters."
 ::= { prtInterpreterEntry 5 }

prtInterpreterVersion OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..31))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```



```

    "The date code, version number, or other product specific
    information tied to this interpreter.  This value is associated
    with the interpreter, rather than with the version of the
    language which is being interpreted or emulated."
 ::= { prtInterpreterEntry 6 }

prtInterpreterDefaultOrientation OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      PrtPrintOrientationTC
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "The current orientation default for this interpreter.  This
    value may be overridden for a particular job (e.g., by a command
    in the input data stream)."
```

```
 ::= { prtInterpreterEntry 7 }
```

```
prtInterpreterFeedAddressability OBJECT-TYPE
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The maximum interpreter addressability in the feed
    direction in 10000 prtMarkerAddressabilityUnits (see
    prtMarkerAddressabilityFeedDir ) for this interpreter.  The value
    (-1) means other and specifically indicates that the sub-unit
    places no restrictions on this parameter."
```

```
 ::= { prtInterpreterEntry 8 }
```

```
prtInterpreterXFeedAddressability OBJECT-TYPE
SYNTAX      Integer32 (-2..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The maximum interpreter addressability in the cross feed
    direction in 10000 prtMarkerAddressabilityUnits (see
    prtMarkerAddressabilityXFeedDir) for this interpreter.  The value
    (-1) means other and specifically indicates that the sub-unit
    places no restrictions on this parameter."
```

```
 ::= { prtInterpreterEntry 9 }
```

```
prtInterpreterDefaultCharSetIn OBJECT-TYPE
SYNTAX      CodedCharSet
MAX-ACCESS  read-write
STATUS      current
```

DESCRIPTION

"The default coded character set for input octets encountered outside a context in which the Page Description Language established the interpretation of the octets. (Input octets are presented to the interpreter through a path defined in the channel group.)"

DEFVAL { unknown }
 ::= { prtInterpreterEntry 10 }

prtInterpreterDefaultCharSetOut OBJECT-TYPE

SYNTAX CodedCharSet

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The default character set for data coming from this interpreter through the printer's output channel (i.e. the 'backchannel')."

DEFVAL { unknown }
 ::= { prtInterpreterEntry 11 }

prtInterpreterTwoWay OBJECT-TYPE

-- This value is a type 1 enumeration

SYNTAX PrtInterpreterTwoWayTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether or not this interpreter returns information back to the host."

::= { prtInterpreterEntry 12 }

-- The Console Group

--

-- Many printers have a console on the printer, the operator console, that is used to display and modify the state of the printer. The console can be as simple as a few indicators and switches or as complicated as full screen displays and keyboards. There can be at most one such console.

-- The Display Buffer Table

prtConsoleDisplayBuffer OBJECT IDENTIFIER ::= { printmib 16 }

prtConsoleDisplayBufferTable OBJECT-TYPE

SYNTAX SEQUENCE OF PrtConsoleDisplayBufferEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Physical display buffer for printer console display or operator panel"

::= { prtConsoleDisplayBuffer 5 }

prtConsoleDisplayBufferEntry OBJECT-TYPE

SYNTAX PrtConsoleDisplayBufferEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains one entry for each physical line on the display. Lines cannot be added or deleted. Entries may exist in the table for each device index with a device type of 'printer'."

INDEX { hrDeviceIndex, prtConsoleDisplayBufferIndex }

::= { prtConsoleDisplayBufferTable 1 }

PrtConsoleDisplayBufferEntry ::= SEQUENCE {

prtConsoleDisplayBufferIndex Integer32,

prtConsoleDisplayBufferText ConsoleDescriptionStringTC

}

prtConsoleDisplayBufferIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value for each console line in the printer. The value is used to identify this console line. Although these values may change due to a major reconfiguration of the device (e.g. the addition of new console lines to the printer). Values SHOULD remain stable across successive printer power cycles."

::= { prtConsoleDisplayBufferEntry 1 }

prtConsoleDisplayBufferText OBJECT-TYPE

SYNTAX ConsoleDescriptionStringTC

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The content of a line in the logical display buffer of the operator's console of the printer. When a write operation occurs, normally a critical message, to one of the LineText strings, the agent should make that line displayable if a physical display is present. Writing a zero length string clears the line. It is an implementation-specific

```

        matter as to whether the agent allows a line to be overwritten
        before it has been cleared. Printer generated strings shall be
        in the localization specified by prtConsoleLocalization.
        Management Application generated strings should be localized by
        the Management Application."
 ::= { prtConsoleDisplayBufferEntry 2 }

-- The Console Light Table

prtConsoleLights OBJECT IDENTIFIER ::= { printmib 17 }

prtConsoleLightTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtConsoleLightEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The console light table provides a description and state
        information for each light present on the printer console."
 ::= { prtConsoleLights 6 }

prtConsoleLightEntry OBJECT-TYPE
    SYNTAX      PrtConsoleLightEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX      { hrDeviceIndex, prtConsoleLightIndex }
 ::= { prtConsoleLightTable 1 }

PrtConsoleLightEntry ::= SEQUENCE {
    prtConsoleLightIndex      Integer32,
    prtConsoleOnTime          Integer32,
    prtConsoleOffTime         Integer32,
    prtConsoleColor           PrtConsoleColorTC,
    prtConsoleDescription     ConsoleDescriptionStringTC
}

prtConsoleLightIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this light.
        Although these values may change due to a major

```

reconfiguration of the device (e.g. the addition of new lights to the printer). Values SHOULD remain stable across successive printer power cycles."

```
::= { prtConsoleLightEntry 1 }
```

prtConsoleOnTime OBJECT-TYPE
SYNTAX Integer32 (0..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object, in conjunction with prtConsoleOffTime, defines the current status of the light. If both prtConsoleOnTime and prtConsoleOffTime are non-zero, the lamp is blinking and the values presented define the on time and off time, respectively, in milliseconds. If prtConsoleOnTime is zero and prtConsoleOffTime is non-zero, the lamp is off. If prtConsoleOffTime is zero and prtConsoleOnTime is non-zero, the lamp is on. If both values are zero the lamp is off."
::= { prtConsoleLightEntry 2 }

prtConsoleOffTime OBJECT-TYPE
SYNTAX Integer32 (0..2147483647)
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object, in conjunction with prtConsoleOnTime, defines the current status of the light. If both prtConsoleOnTime and prtConsoleOffTime are non-zero, the lamp is blinking and the values presented define the on time and off time, respectively, in milliseconds. If prtConsoleOnTime is zero and prtConsoleOffTime is non-zero, the lamp is off. If prtConsoleOffTime is zero and prtConsoleOnTime is non-zero, the lamp is on. If both values are zero the lamp is off."
::= { prtConsoleLightEntry 3 }

prtConsoleColor OBJECT-TYPE
-- This value is a type 2 enumeration
SYNTAX PrtConsoleColorTC
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The color of this light."
::= { prtConsoleLightEntry 4 }

prtConsoleDescription OBJECT-TYPE

```
SYNTAX      ConsoleDescriptionStringTC
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The vendor description or label of this light in the
    localization specified by prtConsoleLocalization."
 ::= { prtConsoleLightEntry 5 }

-- The Alerts Group
--
-- The table contains information on the severity, component,
-- detail location within the component, alert code and
-- description of each critical alert that is currently active
-- within the printer. See 2.2.13 for a more complete
-- description of the alerts table and its management.
--
-- Each parameter in the Trap PDU is a full OID which itself is
-- indexed by the host resources MIB "hrDeviceIndex" object. In
-- order for a management station to obtain the correct
-- "hrDeviceIndex" associated with a particular Trap PDU, the
-- "hrDeviceIndex" value can be extracted from the returned OID
-- value in the Trap PDU when the PDU is received by the
-- Management station.

prtAlert OBJECT IDENTIFIER ::= { printmib 18 }

prtAlertTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtAlertEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The prtAlertTable lists all the critical and non-critical
        alerts currently active in the printer. A critical alert is
        one that stops the printer from printing immediately and
        printing can not continue until the critical alert condition
        is eliminated. Non-critical alerts are those items that do
        not stop printing but may at some future time."
    ::= { prtAlert 1 }

prtAlertEntry OBJECT-TYPE
    SYNTAX      PrtAlertEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Entries may exist in the table for each device
```

```

        index with a device type of 'printer'."
INDEX { hrDeviceIndex, prtAlertIndex }
 ::= { prtAlertTable 1 }

```

```

PrtAlertEntry ::= SEQUENCE {
    prtAlertIndex          Integer32,
    prtAlertSeverityLevel PrtAlertSeverityLevelTC,
    prtAlertTrainingLevel PrtAlertTrainingLevelTC,
    prtAlertGroup          PrtAlertGroupTC,
    prtAlertGroupIndex    Integer32,
    prtAlertLocation       Integer32,
    prtAlertCode           PrtAlertCodeTC,
    prtAlertDescription    LocalizedDescriptionStringTC,
    prtAlertTime           TimeTicks
}

```

prtAlertIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The index value used to determine which alerts have been added or removed from the alert table. This is an incrementing integer initialized to 1 when the printer is reset. (i.e. The first event placed in the alert table after a reset of the printer shall have an index value of 1.) When the printer adds an alert to the table, that alert is assigned the next higher integer value from the last item entered into the table. If the index value reaches its maximum value, the next index value used must be 1.

NOTE: The management application will read the alert table when a trap or event notification occurs or at a periodic rate and then parse the table to determine if any new entries were added by comparing the last known index value with the current highest index value. The management application will then update its copy of the alert table. When the printer discovers that an alert is no longer active, the printer shall remove the row for that alert from the table and shall reduce the number of rows in the table. The printer may add or delete any number of rows from the table at any time. The management station can detect when binary change alerts have been deleted by requesting an attribute of each alert, and noting alerts as deleted when that retrieval is not possible. The objects 'prtAlertCriticalEvents' and 'prtAlertAllEvents' in the 'prtGeneralTable' reduce the

```
    need for management applications to scan the 'prtAlertTable'."
 ::= { prtAlertEntry 1 }

prtAlertSeverityLevel OBJECT-TYPE
 -- This value is a type 1 enumeration
 SYNTAX      PrtAlertSeverityLevelTC
 MAX-ACCESS  read-only
 STATUS      current
 DESCRIPTION
    "The level of severity of this alert table entry.  The printer
    determines the severity level assigned to each entry into the
    table."
 ::= { prtAlertEntry 2 }

prtAlertTrainingLevel OBJECT-TYPE
 -- This value is a type 2 enumeration
 SYNTAX      PrtAlertTrainingLevelTC
 MAX-ACCESS  read-only
 STATUS      current
 DESCRIPTION
    "See textual convention PrtAlertTrainingLevelTC"
 ::= { prtAlertEntry 3 }

prtAlertGroup OBJECT-TYPE
 -- This value is a type 1 enumeration
 SYNTAX      PrtAlertGroupTC
 MAX-ACCESS  read-only
 STATUS      current
 DESCRIPTION
    "The type of sub-unit within the printer model that this alert
    is related.  Input, output, and markers are examples of printer
    model groups, i.e., examples of types of sub-units.  Wherever
    possible, these enumerations match the sub-identifier that
    identifies the relevant table in the printmib."
 ::= { prtAlertEntry 4 }

prtAlertGroupIndex OBJECT-TYPE
 SYNTAX      Integer32 (-1..2147483647)
 MAX-ACCESS  read-only
 STATUS      current
 DESCRIPTION
    "The low-order index of the row within the table identified
    by prtAlertGroup that represents the sub-unit of the printer
    that caused this alert, or .1 if not applicable.  The
    combination of the prtAlertGroup and the prtAlertGroupIndex
```


defines exactly which printer sub-unit caused the alert; for example, Input #3, Output#2, and Marker #1. Every object in this MIB is indexed with hrDeviceIndex and optionally, another index variable. If this other index variable is present in the table that generated the alert, it will be used as the value for this object. Otherwise, this value shall be -1."

::= { prtAlertEntry 5 }

prtAlertLocation OBJECT-TYPE

SYNTAX Integer32 (-2..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The sub-unit location that is defined by the printer manufacturer to further refine the location of this alert within the designated sub-unit. The location is used in conjunction with the Group and GroupIndex values; for example, there is an alert in Input #2 at location number 7. The value (-2) indicates unknown"

::= { prtAlertEntry 6 }

prtAlertCode OBJECT-TYPE

-- This value is a type 2 enumeration

SYNTAX PrtAlertCodeTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"See associated textual convention PrtAlertCodeTC"

::= { prtAlertEntry 7 }

prtAlertDescription OBJECT-TYPE

SYNTAX LocalizedDescriptionStringTC

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A description of this alert entry in the localization specified by prtGeneralCurrentLocalization. The description is provided by the printer to further elaborate on the enumerated alert or provide information in the case where the code is classified as 'other' or 'unknown'. The printer is required to return a description string but the string may be a null string."

::= { prtAlertEntry 8 }

prtAlertTime OBJECT-TYPE

```

SYNTAX      TimeTicks
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The value of sysUpTime at the time that this alert was
    generated.  Implementation of this optional object is STRONGLY
    RECOMMENDED for improved reliability and interworking."
 ::= { prtAlertEntry 9 }

printerV1Alert OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "The value of the enterprise-specific OID in an SNMPv1 trap sent
        signaling a critical event in the prtAlertTable."
    ::= { prtAlert 2 }

printerV2AlertPrefix OBJECT IDENTIFIER ::= { printerV1Alert 0 }

printerV2Alert NOTIFICATION-TYPE
    OBJECTS { prtAlertIndex, prtAlertSeverityLevel, prtAlertGroup,
              prtAlertGroupIndex, prtAlertLocation, prtAlertCode }
    STATUS      current
    DESCRIPTION
        "This trap is sent whenever a critical event is added to the
        prtAlertTable.

        NOTE: The prtAlertIndex object was redundantly included in the
        bindings of the 'printerV2Alert' notification in RFC 1759, even
        though the value exists in the instance qualifier of all the
        other bindings.  This object has been retained to provide
        compatibility with existing RFC 1759 implementaions."
    ::= { printerV2AlertPrefix 1 }

-- Note that the SNMPv2 to SNMPv1 translation rules dictate that
-- the preceding structure will result in SNMPv1 traps of the
-- following form:
--
-- printerAlert TRAP-TYPE
--     ENTERPRISE printerV1Alert
--     VARIABLES { prtAlertIndex, prtAlertSeverityLevel,
--                 prtAlertGroup, prtAlertGroupIndex,
--                 prtAlertLocation, prtAlertCode }
--     DESCRIPTION
--         "This trap is sent whenever a critical event is added
--         to the prtAlertTable."

```

```
--      ::= 1

-- Conformance Information

prtMIBConformance OBJECT IDENTIFIER ::= { printmib 2 }

-- compliance statements

prtMIBCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for agents that implement the
    printer MIB."
  MODULE -- this module
  MANDATORY-GROUPS { prtGeneralGroup, prtInputGroup,
                    prtOutputGroup,
                    prtMarkerGroup, prtMediaPathGroup,
                    prtChannelGroup, prtInterpreterGroup,
                    prtConsoleGroup, prtAlertTableGroup }
  OBJECT prtGeneralReset
  SYNTAX INTEGER {
    notResetting(3),
    resetToNVRAM(5)
  }
  DESCRIPTION
    "It is conformant to implement just these two states in this
    object. Any additional states are optional."

  OBJECT prtGeneralCurrentLocalization
  MIN-ACCESS read-only
  DESCRIPTION
    "It is conformant to implement this object as read-only"

  OBJECT prtGeneralCurrentOperator
  MIN-ACCESS read-only
  DESCRIPTION
    "It is conformant to implement this object as read-only"

  OBJECT prtGeneralServicePerson
  MIN-ACCESS read-only
  DESCRIPTION
    "It is conformant to implement this object as read-only"

  OBJECT prtGeneralPrinterName
  MIN-ACCESS read-only
```

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtGeneralSerialNumber

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputDefaultIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaDimFeedDirDeclared

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMaxCapacity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputCurrentLevel

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaName

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputName

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputSecurity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaWeight

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaType

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaColor

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInputMediaFormParts

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputDefaultIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputMaxCapacity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputRemainingCapacity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputName

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputSecurity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputMaxDimFeedDir

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputMaxDimXFeedDir

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputMinDimFeedDir

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputMinDimXFeedDir

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputStackingOrder

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputPageDeliveryOrientation

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputBursting

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputDecollating

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputPageCollated

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtOutputOffsetStacking

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtMarkerDefaultIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtMarkerSuppliesMaxCapacity

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtMarkerSuppliesLevel

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtMediaPathDefaultIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtChannelCurrentJobCntlLangIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtChannelDefaultPageDescLangIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtChannelState

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtChannelIfIndex

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInterpreterDefaultOrientation

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInterpreterDefaultCharSetIn

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtInterpreterDefaultCharSetOut

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtConsoleLocalization

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtConsoleDisable

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtConsoleDisplayBufferText

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtConsoleOnTime

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

OBJECT prtConsoleOffTime

MIN-ACCESS read-only

DESCRIPTION

"It is conformant to implement this object as read-only"

GROUP prtResponsiblePartyGroup

DESCRIPTION

"This group is unconditionally optional."

GROUP prtExtendedInputGroup

DESCRIPTION

"This group is unconditionally optional."


```
GROUP    prtInputMediaGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtExtendedOutputGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtOutputDimensionsGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtOutputFeaturesGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtMarkerSuppliesGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtMarkerColorantGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP    prtAlertTimeGroup
DESCRIPTION
    "This group is unconditionally optional."

-- the prtResponsiblePartyGroup, prtExtendedInputGroup,
-- prtInputMediaGroup, prtExtendedOutputGroup,
-- prtOutputDimensionsGroup, prtOutputFeaturesGroup,
-- prtMarkerSuppliesGroup, prtMarkerColorantGroup,
-- and the prtAlertTimeGroup are completely optional.

-- New to version 2 of this printer MIB:
OBJECT    prtAuxiliarySheetStartupPage
MIN-ACCESS read-only
DESCRIPTION
    "It is conformant to implement this object as read-only"

OBJECT    prtAuxiliarySheetBannerPage
MIN-ACCESS read-only
DESCRIPTION
    "It is conformant to implement this object as read-only"
```

```
OBJECT    prtInputMediaLoadTimeout
MIN-ACCESS read-only
DESCRIPTION
    "It is conformant to implement this object as read-only"

OBJECT    prtInputNextIndex
MIN-ACCESS read-only
DESCRIPTION
    "It is conformant to implement this object as read-only"

GROUP     prtAuxiliarySheetGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP     prtInputSwitchingGroup
DESCRIPTION
    "This group is unconditionally optional."

GROUP     prtGeneralV2Group
DESCRIPTION
    "This group is unconditionally optional."

GROUP     prtAlertTableV2Group
DESCRIPTION
    "This group is unconditionally optional."

GROUP     prtChannelV2Group
DESCRIPTION
    "This group is unconditionally optional."

GROUP     prtAlertTrapGroup
DESCRIPTION
    "This group is unconditionally optional."
 ::= { prtMIBConformance 1 }

prtMIBGroups    OBJECT IDENTIFIER ::= { prtMIBConformance 2 }

prtGeneralGroup OBJECT-GROUP
  OBJECTS { prtGeneralConfigChanges,
            prtGeneralCurrentLocalization,
            prtGeneralReset, prtCoverDescription,
            prtCoverStatus,
            prtLocalizationLanguage, prtLocalizationCountry,
            prtLocalizationCharacterSet, prtStorageRefIndex,
```

```
        prtDeviceRefIndex }
STATUS current
DESCRIPTION
    "The general printer group."
 ::= { prtMIBGroups 1 }

prtResponsiblePartyGroup OBJECT-GROUP
OBJECTS { prtGeneralCurrentOperator, prtGeneralServicePerson }
STATUS current
DESCRIPTION
    "The responsible party group contains contact information for
    humans responsible for the printer."
 ::= { prtMIBGroups 2 }

prtInputGroup OBJECT-GROUP
OBJECTS { prtInputDefaultIndex, prtInputType, prtInputDimUnit,
          prtInputMediaDimFeedDirDeclared,
          prtInputMediaDimXFeedDirDeclared,
          prtInputMediaDimFeedDirChosen,
          prtInputMediaDimXFeedDirChosen, prtInputCapacityUnit,
          prtInputMaxCapacity, prtInputCurrentLevel, prtInputStatus,
          prtInputMediaName }
STATUS current
DESCRIPTION
    "The input group."
 ::= { prtMIBGroups 3 }

prtExtendedInputGroup OBJECT-GROUP
OBJECTS { prtInputName, prtInputVendorName, prtInputModel,
          prtInputVersion, prtInputSerialNumber,
          prtInputDescription, prtInputSecurity }
STATUS current
DESCRIPTION
    "The extended input group."
 ::= { prtMIBGroups 4 }

prtInputMediaGroup OBJECT-GROUP
OBJECTS { prtInputMediaWeight, prtInputMediaType,
          prtInputMediaColor, prtInputMediaFormParts }
STATUS current
DESCRIPTION
    "The input media group."
 ::= { prtMIBGroups 5 }

prtOutputGroup OBJECT-GROUP
```

```
OBJECTS { prtOutputDefaultIndex, prtOutputType,
          prtOutputCapacityUnit, prtOutputMaxCapacity,
          prtOutputRemainingCapacity, prtOutputStatus }
STATUS current
DESCRIPTION
    "The output group."
 ::= { prtMIBGroups 6 }

prtExtendedOutputGroup OBJECT-GROUP
OBJECTS { prtOutputName, prtOutputVendorName, prtOutputModel,
          prtOutputVersion, prtOutputSerialNumber,
          prtOutputDescription, prtOutputSecurity }
STATUS current
DESCRIPTION
    "The extended output group."
 ::= { prtMIBGroups 7 }

prtOutputDimensionsGroup OBJECT-GROUP
OBJECTS { prtOutputDimUnit, prtOutputMaxDimFeedDir,
          prtOutputMaxDimXFeedDir, prtOutputMinDimFeedDir,
          prtOutputMinDimXFeedDir }
STATUS current
DESCRIPTION
    "The output dimensions group"
 ::= { prtMIBGroups 8 }

prtOutputFeaturesGroup OBJECT-GROUP
OBJECTS { prtOutputStackingOrder,
          prtOutputPageDeliveryOrientation, prtOutputBursting,
          prtOutputDecollating, prtOutputPageCollated,
          prtOutputOffsetStacking }
STATUS current
DESCRIPTION
    "The output features group."
 ::= { prtMIBGroups 9 }

prtMarkerGroup OBJECT-GROUP
OBJECTS { prtMarkerDefaultIndex, prtMarkerMarkTech,
          prtMarkerCounterUnit, prtMarkerLifeCount,
          prtMarkerPowerOnCount, prtMarkerProcessColorants,
          prtMarkerSpotColorants, prtMarkerAddressabilityUnit,
          prtMarkerAddressabilityFeedDir,
          prtMarkerAddressabilityXFeedDir, prtMarkerNorthMargin,
          prtMarkerSouthMargin, prtMarkerWestMargin,
          prtMarkerEastMargin, prtMarkerStatus }
```

```
STATUS current
DESCRIPTION
    "The marker group."
 ::= { prtMIBGroups 10 }

prtMarkerSuppliesGroup OBJECT-GROUP
OBJECTS { prtMarkerSuppliesMarkerIndex,
          prtMarkerSuppliesColorantIndex, prtMarkerSuppliesClass,
          prtMarkerSuppliesType, prtMarkerSuppliesDescription,
          prtMarkerSuppliesSupplyUnit,
          prtMarkerSuppliesMaxCapacity, prtMarkerSuppliesLevel }
STATUS current
DESCRIPTION
    "The marker supplies group."
 ::= { prtMIBGroups 11 }

prtMarkerColorantGroup OBJECT-GROUP
OBJECTS { prtMarkerColorantMarkerIndex, prtMarkerColorantRole,
          prtMarkerColorantValue, prtMarkerColorantTonality }
STATUS current
DESCRIPTION
    "The marker colorant group."
 ::= { prtMIBGroups 12 }

prtMediaPathGroup OBJECT-GROUP
OBJECTS { prtMediaPathDefaultIndex, prtMediaPathMaxSpeedPrintUnit,
          prtMediaPathMediaSizeUnit, prtMediaPathMaxSpeed,
          prtMediaPathMaxMediaFeedDir,
          prtMediaPathMaxMediaXFeedDir,
          prtMediaPathMinMediaFeedDir,
          prtMediaPathMinMediaXFeedDir, prtMediaPathType,
          prtMediaPathDescription, prtMediaPathStatus}
STATUS current
DESCRIPTION
    "The media path group."
 ::= { prtMIBGroups 13 }

prtChannelGroup OBJECT-GROUP
OBJECTS { prtChannelType, prtChannelProtocolVersion,
          prtChannelCurrentJobCntlLangIndex,
          prtChannelDefaultPageDescLangIndex, prtChannelState,
          prtChannelIfIndex, prtChannelStatus
        }
STATUS current
DESCRIPTION
```

```
    "The channel group."
 ::= { prtMIBGroups 14 }

prtInterpreterGroup OBJECT-GROUP
  OBJECTS { prtInterpreterLangFamily, prtInterpreterLangLevel,
            prtInterpreterLangVersion, prtInterpreterDescription,
            prtInterpreterVersion, prtInterpreterDefaultOrientation,
            prtInterpreterFeedAddressability,
            prtInterpreterXFeedAddressability,
            prtInterpreterDefaultCharSetIn,
            prtInterpreterDefaultCharSetOut, prtInterpreterTwoWay }
  STATUS current
  DESCRIPTION
    "The interpreter group."
 ::= { prtMIBGroups 15 }

prtConsoleGroup OBJECT-GROUP
  OBJECTS { prtConsoleLocalization, prtConsoleNumberOfDisplayLines,
            prtConsoleNumberOfDisplayChars, prtConsoleDisable,
            prtConsoleDisplayBufferText, prtConsoleOnTime,
            prtConsoleOffTime, prtConsoleColor,
            prtConsoleDescription }
  STATUS current
  DESCRIPTION
    "The console group."
 ::= { prtMIBGroups 16 }

prtAlertTableGroup OBJECT-GROUP
  OBJECTS { prtAlertSeverityLevel, prtAlertTrainingLevel,
            prtAlertGroup, prtAlertGroupIndex, prtAlertLocation,
            prtAlertCode, prtAlertDescription }
  STATUS current
  DESCRIPTION
    "The alert table group.  Implementation of prtAlertTime is
    RECOMMENDED."
 ::= { prtMIBGroups 17 }

prtAlertTimeGroup OBJECT-GROUP
  OBJECTS { prtAlertTime }
  STATUS current
  DESCRIPTION
    "The alert time group."
 ::= { prtMIBGroups 18 }

prtAuxiliarySheetGroup OBJECT-GROUP
```

```
OBJECTS { prtAuxiliarySheetStartupPage,
          prtAuxiliarySheetBannerPage }
STATUS current
DESCRIPTION
    "The auxiliary sheet group."
 ::= { prtMIBGroups 19 }

prtInputSwitchingGroup OBJECT-GROUP
OBJECTS { prtInputMediaLoadTimeout, prtInputNextIndex }
STATUS current
DESCRIPTION
    "The input switching group."
 ::= { prtMIBGroups 20 }

prtGeneralV2Group OBJECT-GROUP
OBJECTS { prtGeneralPrinterName, prtGeneralSerialNumber }
STATUS current
DESCRIPTION
    "The general printer group with new v2 objects."
 ::= { prtMIBGroups 21 }

prtAlertTableV2Group OBJECT-GROUP
OBJECTS { prtAlertCriticalEvents, prtAlertAllEvents }
STATUS current
DESCRIPTION
    "The alert table group with new v2 objects."
 ::= { prtMIBGroups 22 }

prtChannelV2Group OBJECT-GROUP
OBJECTS { prtChannelInformation }
STATUS current
DESCRIPTION
    "The channel group with a new v2 object."
 ::= { prtMIBGroups 23 }

prtAlertTrapGroup NOTIFICATION-GROUP
NOTIFICATIONS { printerV2Alert }
STATUS current
DESCRIPTION
    "The alert trap group."
 ::= { prtMIBGroups 24 }

END
```

6. IANA Considerations

See section 2.4.1, 'Registering Additional Enumerated Values'.

7. Internationalization Considerations

See section 2.2.1.1, 'International Considerations'.

8. Security Considerations

The Printer MIB specifies a database and not necessarily a protocol for accessing the database. With regards to the security of the information within the database, it is anticipated that the primary vehicle for accessing this data will be through the use of the Simple Network Protocol (SNMP). There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

SNMPv1 by itself is not a secure environment. Even if the network is secure (for example by using IPSec), there is no control as to who on the secure network is allowed to access and GET/SET (read/change) the objects in this MIB.

It is recommended that implementers consider the security features provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model (RFC 2574 [25]) and the View-based Access Control Model (RFC 2575 [RFC2575]) is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET them.

Where the operational capability of the printing device are especially vulnerable or difficult to administer, certain objects within this MIB have been tagged as READ-ONLY, preventing modification. Further, for all READ-WRITE objects within the MIB, the working group has included specific conformance guidelines stating that vendors are free to implement these objects as READ-ONLY. This conformance allowance should cover cases where specific vendor vulnerabilities may differ from product to product. (See conformance section with regards to MIN-ACCESS clauses).

9. Copyright Section

"Copyright (C) The Internet Society 1995, 1997, 2001. All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

10. References

Find RFCs and Internet Drafts at www.ietf.org. Find ISO, the International Organization for Standardization, at www.iso.ch.

- [1] Gahrns & Hain, "Using Microsoft Word to create Internet Drafts and RFCs", Internet Draft <draft-hain-msword-template-03.txt>, 2000.
- [2] deBry et al, "Internet Printing Protocol/1.1: Model and Semantics", RFC 2911, 2000.
 - section 4.1.5 'uri' (attribute syntax)
 - section 4.4.1 'printer-uri-supported'
 - section 4.4.2 'uri-authentication-supported'
 - section 4.4.3 'uri-security-supported'

- section 4.4.14 'ipp-versions-supported'
 - section 5 'Conformance'
- [3] Herriot et al, "Internet Printing Protocol/1.1: Encoding and Transport", RFC 2910, 2000.
- section 3.4.1 'Version-number'
 - section 5 'IPP URL Scheme'
 - 8.1.2 Transport Layer Security (TLS) (includes SSL3)
 - section 9 'Appendix A: Protocol Examples'
 - section 9.1 'The "version-number" Parameter'
- [4] Simonsen et al, IANA character sets registry, 2000:
<ftp://ftp.isi.edu/in-notes/iana/assignments/character-sets>
- [5] Apple staff, "Inside MacIntosh: Networking", 1994.
- [6] ANSI, "Coded Character Set - 7-bit American Standard Code for Information Interchange", ANSI X3.4-1986.
- [7] ISO, "Document Printing Application (DPA)", ISO 10175, 1996.
- [8] ISO, "Universal Multiple-Octet Coded Character Set (UCS) - Part 1: Architecture and Basic Multilingual Plane", ISO 10646, 1993.
- [9] Crocker, "Standard for the format of ARPA Internet text messages", RFC 822, 1982.
- [10] Postel & Reynolds, "Telnet Protocol Specification", RFC 854, 1983.
- [11] Postel & Reynolds, "File Transfer Protocol", RFC 959, 1985.
- [12] McLaughlin, "Line printer daemon protocol", RFC 1179, 1990.
- [13] Sollins, "The TFTP Protocol (Revision 2)", RFC 1350, 1991.
- [14] McCloghrie & Rose, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", RFC 1213, 1991.
- [15] Reynolds & Postel, "Assigned Numbers", RFC 1700, 1994.
For new assignments, see <ftp://ftp.isi.edu/in-notes/iana/assignments>
- [16] Berners-Lee et al, "Hypertext Transfer Protocol - HTTP/1.0", RFC 1945, 1996.

- [17] Bradner, "The Internet Standards Process - Revision 3", RFC 2026, 1996.
- [18] Dierks & Allen, "The TLS Protocol Version 1.0", RFC 2246, 1999
- section 9 'Mandatory Cipher Suites'
- [19] Alvestrand, "IETF Policy on Character Sets and Languages", BCP 18, RFC 2277, 1998.
- [20] Freed & Postel, "IANA Charset Registration Procedures", BCP 19, RFC 2978, 2000.
- section 4 'Registration Procedure'
- [21] Yergeau, "UTF-8, a transformation format of ISO 10646", RFC 2279, 1998
- section 2 'UTF-8 Definition'
- [22] Berners-Lee et al, "Uniform Resource Identifiers (URI): Generic Syntax", RFC 2396, 1998
- section 2.1 'URI and non-ASCII characters'
- [25] Blumenthal & Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", RFC 2574, 1999.
- [27] Fielding et al, "Hypertext Transfer Protocol - HTTP/1.1", RFC 2616, 1999.
- [28] Waldbusser & Grillo, "Host Resources MIB", RFC 2790, 2000.
- [RFC1155] Rose, M., and K. McCloghrie, "Structure and Identification of Management Information for TCP/IP-based Internets", STD 16, RFC 1155, May 1990.
- [RFC1157] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "Simple Network Management Protocol", STD 15, RFC 1157, May 1990.
- [RFC1212] Rose, M., and K. McCloghrie, "Concise MIB Definitions", STD 16, RFC 1212, March 1991.
- [RFC1215] M. Rose, "A Convention for Defining Traps for use with the SNMP", RFC 1215, March 1991.

- [RFC1901] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Introduction to Community-based SNMPv2", RFC 1901, January 1996.
- [RFC1905] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1905, January 1996.
- [RFC1906] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1906, January 1996.
- [RFC2570] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction to Version 3 of the Internet-standard Network Management Framework", RFC 2570, April 1999.
- [RFC2571] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing SNMP Management Frameworks", RFC 2571, April 1999.
- [RFC2572] Case, J., Harrington D., Presuhn R., and B. Wijnen, "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", RFC 2572, April 1999.
- [RFC2573] Levi, D., Meyer, P., and B. Stewart, "SNMPv3 Applications", RFC 2573, April 1999.
- [RFC2574] Blumenthal, U., and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", RFC 2574, April 1999.
- [RFC2575] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", RFC 2575, April 1999.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.
- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Textual Conventions for SMIv2", STD 58, RFC 2579, April 1999.

[RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J.,
Rose, M., and S. Waldbusser, "Conformance Statements for
SMIv2", STD 58, RFC 2580, April 1999.

Appendix A - Glossary of Terms

Addressability - On the marker, the number of distinct marking units (pels) per unit of addressability unit that can be set; for example, 300 dots per inch is expressed as 300 per 1000 Thousandths Of Inches and 4 dots per millimeter is 4 per 1000 Micrometers. Addressability is not resolution because marks that are one addressability position apart may not be independently resolvable by the eye due to factors such as gain in the area of marks so they overlap or nearly touch.

Alert - A reportable event for which there is an entry in the alert table.

Bin - An output sub-unit which may or may not be removable.

Binary Change Event - An event which comes in pairs; the leading edge event and the trailing edge event. The leading edge event enters a state from which there is only one exit. A binary change event may be critical or non-critical. See unary change event.

Bursting - The process by which continuous media is separated into individual sheets, typically by bursting along pre-formed perforations.

Channel - A term used to describe a single source of data which is presented to a printer. The model that we use in describing a printer allows for an arbitrary number of channels. Multiple channels can exist on the same physical port. This is commonly done over Ethernet ports where EtherTalk, TCP/IP, and SPX/IPX protocols can be supplying different data streams simultaneously to a single printer on the same physical port.

Collation - In multiple copy output, placing the pages from separate copies into separate ordered sets, ready for binding.

Control Language - A data syntax or language for controlling the printer through the print data channel.

Critical Alert - An alert triggered by an event which leads to a state in which printing is no longer possible; the printer is stopped.

Decollating - The process by which the individual parts within a multi-part form are separated and sorted into separate stacks for each part.

Description - Information about the configuration and capabilities of the printer and its various sub-units.

DPA - ISO 10175 Document Printing Application standard. A standard for a client server protocol for a print system, including (1) submitting print jobs to and (2) managing print jobs in a spooler.

Event - A state change in the printer.

Group - A collection of objects that represent a type of sub-unit of the printer.

Host Resources MIB - See RFC 2790 [28].

IANA - Internet Assigned Numbers Authority. See STD 2, RFC 1700 [15].

Idempotent - Idempotence is the property of an operation that results in the same state no matter how many times it is executed (at least once). This is a property that is shared by true databases in which operations on data items only change the state of the data item and do not have other side effects. Because the SNMP data model is that of operations on a database, SNMP MIB objects should be assumed to be idempotent. If a MIB object is defined in a non-idempotent way, the this data model can break in subtle ways when faced with packet loss, multiple managers, and other common conditions.

In order to fulfill the common need for actions to result from SNMP Set operations, SNMP MIB objects can be modeled such that the change in state from one state to another has the side effect of causing an action. It is important to note that with this model, an SNMP operation that sets a value equal to its current value will cause no action. This retains the idempotence of a single command, while allowing actions to be initiated by SNMP SET requests.

Input - A tray or bin from which instances of the media are obtained and fed into the Media Path.

Interpreter - The embodiment of an algorithm that processes a data stream consisting of a Page Description Language (PDL) and/or a Control Language.

Localization - The specification of human language, country, and

character set needed to present information to people in their native languages.

Management Application (a.k.a. Manager) - A program which queries and controls one or more managed nodes.

Management Station - A physical computer on which one or more management applications can run.

Media Path - The mechanisms that transport instances of the media from an input, through the marker, possibly through media buffers and duplex pathways, out to the output with optional finishing applied. The inputs and outputs are not part of the Media Path.

Non-critical Alert - An alert triggered by a reportable event which does not lead to a state in which printing is no longer possible; such an alert may lead to a state from which printing may no longer be possible in the future, such as the low toner state or the alert may be pure informational, such as a configuration change at the printer.

Output - A bin or stacker which accepts instances of media that have been processed by a printer.

Page Description Language (PDL) - A data syntax or language for the electronic representation of a document as a sequence of page images.

Printer - A physical device that takes media from an input source, produces marks on that media according to some page description or page control language and puts the result in some output destination, possibly with finishing applied.

Printing - The entire process of producing a printed document from generation of the file to be printed, choosing printing properties, selection of a printer, routing, queuing, resource management, scheduling, and finally printing including notifying the user.

Reportable event - An event that is deemed of interest to a management station watching the printer.

Status - Information regarding the current operating state of the printer and its various sub-units. This is an abstraction of the exact physical condition of the printer.

Sub-mechanism - A distinguishable part of a sub-unit.

Sub-unit - A part of the printer which may be a physical part, such as one of the input sources or a logical part such as an interpreter.

Tray - An input sub-unit which is typically removable.

Unary Change Event - An event that indicates a change of state of the printer, but to a state which is (often) just as valid as the state that was left, and from which no return is necessary. See binary change event.

Visible state - The portion of the state of the printer that can be examined by a management application.

Warning - A non-critical alert. See non-critical alert.

Appendix B - Media Size Names from ISO/IEC 10175
Document Printing Architecture

For the convenience of management application developers, this appendix lists the standardized media size names from ISO/IEC 10175 Document Printing Application (DPA), [7]. Management applications that present a dialogue for choosing or displaying media size are encouraged to present relevant names from this list to avoid requiring the user to remember the physical dimensions used to describe the size of the media. A printer implementing the Printer MIB has no knowledge of these names, however; all media sizes in the MIB are given in terms of media dimensions as the values of prtMediaDimFeedDir and prtInputChosenMediaDimXFeedDir.

String name	Description
other	
unknown	
na-letter or letter	North American letter size: 8.5 by 11 inches
na-legal or legal	North American legal size: 8.5 by 14 inches
na-10x13-envelope	North American 10x13 envelope size: 10 by 13 inches
na-9x12-envelope	North American 9x12 envelope size: 9 by 12 inches
na-number-10-envelope	North American number 10 business envelope size: 4.125 by 9.5 inches
na-7x9-envelope	North American 7x9 size: 7 by 9 inches
na-9x11-envelope	North American 9x11 size: 9 by 11 inches
na-10x14-envelope	North American 10x14 envelope size: 10 by 14 inches
na-number-9-envelope	North American number 9 business envelope size: 3.875 by 8.875 inches
na-6x9-envelope	North American 6x9 envelope size: 6 by 9 inches
na-10x15-envelope	North American 10x15 envelope size: 10 by 15 inches
a	engineering A size 8.5 inches by 11 inches
b	engineering B size 11 inches by 17 inches
c	engineering C size 17 inches by 22 inches
d	engineering D size 22 inches by 34 inches

e	engineering E size	34 inches by 44 inches
iso-a0	ISO A0 size:	841 mm by 1189 mm
iso-a1	ISO A1 size:	594 mm by 841 mm
iso-a2	ISO A2 size:	420 mm by 594 mm
iso-a3	ISO A3 size:	297 mm by 420 mm
iso-a4	ISO A4 size:	210 mm by 297 mm
iso-a5	ISO A5 size:	148 mm by 210 mm
iso-a6	ISO A6 size:	105 mm by 148 mm
iso-a7	ISO A7 size:	74 mm by 105 mm
iso-a8	ISO A8 size:	52 mm by 74 mm
iso-a9	ISO A9 size:	37 mm by 52 mm
iso-a10	ISO A10 size:	26 mm by 37 mm
iso-b0	ISO B0 size:	1000 mm by 1414 mm
iso-b1	ISO B1 size:	707 mm by 1000 mm
iso-b2	ISO B2 size:	500 mm by 707 mm
iso-b3	ISO B3 size:	353 mm by 500 mm
iso-b4	ISO B4 size:	250 mm by 353 mm
iso-b5	ISO B5 size:	176 mm by 250 mm
iso-b6	ISO B6 size:	125 mm by 176 mm
iso-b7	ISO B7 size:	88 mm by 125 mm
iso-b8	ISO B8 size:	62 mm by 88 mm
iso-b9	ISO B9 size:	44 mm by 62 mm
iso-b10	ISO B10 size:	31 mm by 44 mm
iso-c0	ISO C0 size:	917 mm by 1297 mm
iso-c1	ISO C1 size:	648 mm by 917 mm
iso-c2	ISO C2 size:	458 mm by 648 mm
iso-c3	ISO C3 size:	324 mm by 458 mm
iso-c4	ISO C4 size:	229 mm by 324 mm
iso-c5	ISO C5 size:	162 mm by 229 mm
iso-c6	ISO C6 size:	114 mm by 162 mm
iso-c7	ISO C7 size:	81 mm by 114 mm
iso-c8	ISO C8 size:	57 mm by 81 mm
iso-designated	ISO Designated Long	
	size:	110 mm by 220 mm
jis-b0	JIS B0 size	1030 mm by 1456 mm
jis-b1	JIS B1 size	728 mm by 1030 mm
jis-b2	JIS B2 size	515 mm by 728 mm
jis-b3	JIS B3 size	364 mm by 515 mm
jis-b4	JIS B4 size	257 mm by 364 mm
jis-b5	JIS B5 size	182 mm by 257 mm
jis-b6	JIS B6 size	128 mm by 182 mm
jis-b7	JIS B7 size	91 mm by 128 mm
jis-b8	JIS B8 size	64 mm by 91 mm
jis-b9	JIS B9 size	45 mm by 64 mm
jis-b10	JIS B10 size	32 mm by 45 mm

Appendix C - Media Names

For the convenience of management application developers, this appendix lists the standardized media names from ISO/IEC 10175 Document Printing Application (DPA), [7]. Management applications that present a dialogue for choosing media may wish to use these names as an alternative to separately specifying, size, color, and/or type. Using standard media names will mean that a single management application dealing with printers from different vendors and under different system managers will tend to use the same names for the same media. If selection of media by name is used, the attributes (size, type or color) implied by the name must be explicitly mapped to the appropriate object (prtInputDeclared-MediaDimFeedDir, prtInputDeclaredMediaDimXFeedDir, prtInputMediaType and prtInputMediaColor) in the MIB. The object prtInputMediaName is intended for display to an operator and is purely descriptive. The value in prtInputMediaName is not interpreted by the printer so using a standard name for this value will not change any of the other media attributes nor will it cause an alert if the media in the input sub-unit does not match the name.

Simple Name	Descriptor Text
other	
unknown	
iso-a4-white	Specifies the ISO A4 white medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a4-coloured	Specifies the ISO A4 colored medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a4-transparent	Specifies the ISO A4 transparent medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a3-white	Specifies the ISO A3 white medium with size: 297 mm by 420 mm as defined in ISO 216
iso-a3-coloured	Specifies the ISO A3 colored medium with size: 297 mm by 420 mm as defined in ISO 216
iso-a5-white	Specifies the ISO A5 white medium with size: 148 mm by 210 mm as defined in ISO 216
iso-a5-coloured	Specifies the ISO A5 colored medium with size: 148 mm by 210 mm as defined in ISO 216
iso-b4-white	Specifies the ISO B4 white medium with size: 250 mm by 353 mm as defined in ISO 216
iso-b4-coloured	Specifies the ISO B4 colored medium with size: 250 mm by 353 mm as defined in ISO 216
iso-b5-white	Specifies the ISO B5 white medium with size: 176 mm by 250 mm as defined in ISO 216

iso-b5-coloured	Specifies the ISO B5 colored medium with size: 176 mm by 250 mm as defined in ISO 216
jis-b4-white	Specifies the JIS B4 white medium with size: 257 mm by 364 mm as defined in JIS P0138
jis-b4-coloured	Specifies the JIS B4 colored medium with size: 257 mm by 364 mm as defined in JIS P0138
jis-b5-white	Specifies the JIS B5 white medium with size: 182 mm by 257 mm as defined in JIS P0138
jis-b5-coloured	Specifies the JIS B5 colored medium with size: 182 mm by 257 mm as defined in JIS P0138

The following standard values are defined for North American media:

na-letter-white	Specifies the North American letter white medium with size: 8.5 inches by 11 inches
na-letter-coloured	Specifies the North American letter colored medium with size: 8.5 inches by 11 inches
na-letter-transparent	Specifies the North American letter transparent medium with size: 8.5 inches by 11 inches
na-legal-white	Specifies the North American legal white medium with size: 8.5 inches by 14 inches
na-legal-coloured	Specifies the North American legal colored medium with size: 8.5 inches by 14 inches

The following standard values are defined for envelopes:

iso-b5-envelope	Specifies the ISO B5 envelope medium with size: 176 mm by 250 mm as defined in ISO 216 and ISO 269
iso-b4-envelope	Specifies the ISO B4 envelope medium with size: 250 mm by 353 mm as defined in ISO 216
iso-c4-envelope	Specifies the ISO C4 envelope medium with size: 229 mm by 324 mm as defined in ISO 216 and ISO 269
iso-c5-envelope	Specifies the ISO C5 envelope medium with size: 162 mm by 229 mm as defined in ISO 269
iso-designated-long-envelope	Specifies the ISO Designated Long envelope medium with size: 110 mm by 220 mm as defined in ISO 269

na-10x13-envelope Specifies the North American 10x13 envelope
medium with size: 10 inches by 13 inches

na-9x12-envelope Specifies the North American 9x12 envelope
medium with size: 9 inches by 12 inches

na-number-10-envelope Specifies the North American number 10
business envelope medium with size: 4.125
inches by 9.5 inches

na-7x9-envelope Specifies the North American 7x9 inch envelope

na-9x11-envelope Specifies the North American 9x11 inch envelope

na-10x14-envelope Specifies the North American 10x14 inch envelope

na-number-9-envelope Specifies the North American number 9
business envelope 3.875 by 8.875 inches

na-6x9-envelope Specifies the North American 6x9 inch envelope

na-10x15-envelope Specifies the North American 10x15 inch envelope

The following standard values are defined for the less commonly
used media (white-only):

iso-a0-white Specifies the ISO A0 white medium
with size: 841 mm by 1189 mm
as defined in ISO 216

iso-a1-white Specifies the ISO A1 white medium
with size: 594 mm by 841 mm
as defined in ISO 216

iso-a2-white Specifies the ISO A2 white medium
with size: 420 mm by 594 mm
as defined in ISO 216

iso-a6-white Specifies the ISO A6 white medium
with size: 105 mm by 148 mm
as defined in ISO 216

iso-a7-white Specifies the ISO A7 white medium
with size: 74 mm by 105 mm
as defined in ISO 216

iso-a8-white Specifies the ISO A8 white medium
with size: 52 mm by 74 mm
as defined in ISO 216

iso-a9-white Specifies the ISO A9 white medium
with size: 39 mm by 52 mm
as defined in ISO 216

iso-a10-white Specifies the ISO A10 white medium
with size: 26 mm by 37 mm
as defined in ISO 216

iso-b0-white Specifies the ISO B0 white medium
with size: 1000 mm by 1414 mm
as defined in ISO 216

iso-b1-white Specifies the ISO B1 white medium
with size: 707 mm by 1000 mm
as defined in ISO 216

iso-b2-white Specifies the ISO B2 white medium
with size: 500 mm by 707 mm
as defined in ISO 216

iso-b3-white Specifies the ISO B3 white medium
with size: 353 mm by 500 mm
as defined in ISO 216

iso-b6-white Specifies the ISO B6 white medium
with size: 125 mm by 176 mm i
as defined in ISO 216

iso-b7-white Specifies the ISO B7 white medium
with size: 88 mm by 125 mm
as defined in ISO 216

iso-b8-white Specifies the ISO B8 white medium
with size: 62 mm by 88 mm
as defined in ISO 216

iso-b9-white Specifies the ISO B9 white medium
with size: 44 mm by 62 mm
as defined in ISO 216

iso-b10-white Specifies the ISO B10 white medium
with size: 31 mm by 44 mm
as defined in ISO 216

jis-b0-white Specifies the JIS B0 white medium with size:
1030 mm by 1456 mm

jis-b1-white Specifies the JIS B1 white medium with size:
728 mm by 1030 mm

jis-b2-white Specifies the JIS B2 white medium with size:
515 mm by 728 mm

jis-b3-white Specifies the JIS B3 white medium with size:
364 mm by 515 mm

jis-b6-white Specifies the JIS B6 white medium with size:
257 mm by 364 mm

jis-b7-white Specifies the JIS B7 white medium with size:
182 mm by 257 mm

jis-b8-white Specifies the JIS B8 white medium with size:
128 mm by 182 mm

jis-b9-white Specifies the JIS B9 white medium with size:

91 mm by 128 mm
jis-b10-white Specifies the JIS B10 white medium with size:
64 mm by 91 mm

The following standard values are defined for engineering media:

- a Specifies the engineering A size medium with
size: 8.5 inches by 11 inches
- b Specifies the engineering B size medium with
size: 11 inches by 17 inches
- c Specifies the engineering C size medium with
size: 17 inches by 22 inches
- d Specifies the engineering D size medium with
size: 22 inches by 34 inches
- e Specifies the engineering E size medium with
size: 34 inches by 44 inches

Appendix D - Roles of Users

Background

The need for "Role Models" stemmed in large part from the need to understand the importance of any given proposed object for the MIB. Many times the real world need for a proposed object would be debated within the group; the debate would typically result in the need to describe the potential usage of the object in terms of a "live" person performing some type of printing-related task.

Determining the value of a proposed object through identification of the associated human users was found to be so common that a more formalized model was required for consistent analysis. The model describing categories of human-oriented tasks is called "Role Models" in this document.

In developing the Role Models it was necessary to identify the common, primary tasks that humans typically face when interacting with a printer and its related printing system(s). It was expected that certain kinds of tasks would serve to identify the various Role Models.

In presenting the set of Role Models, the set of "Common Print System Tasks" are first presented, followed by the set of Role Model definitions. Finally, a simple matrix is presented in which Role Models and Tasks are cross-compared.

Common Print System Tasks

Upon researching the many tasks encountered by humans in dealing with printers and printing systems, the following were found to be pervasive within any operating environment:

Printer job state - Determine the status of a job without a printer.

Printer capabilities - Determine the current capabilities of a printer, for example, the available media sizes, two-sided printing, a particular type of interpreter, etc.

Printer job submission - Submit a print job to a printer.

Printer job removal - Remove a job from a printer.

Notification of events - Receive notification of the existence of a

defined printer event. An event can be of many types, including warnings, errors, job stage completion (e.g., "job done"), etc.

Printer configuration - Query the current configuration of a printer.

Printer consumables - Determine the current state of any and all consumables within a printer.

Print job identification - Determine the identification of a job within a printer.

Internal printer status - Determine the current status of the printer.

Printer identification - Determine the identity of a printer.

Printer location - Determine the physical location of a printer.

Local system configuration - Determine various aspects of the current configuration of the local system involved with the operation of a printer.

These "tasks" cover a large spectrum of requirements surrounding the operation of a printer in a network environment. This list serves as the basis for defining the various Role Models described below.

Proposed Role Models

Following is the list of "Role Models" used to evaluate the requirements for any given Printer MIB object. Note that the keyword enclosed in parentheses represents an abbreviation for the particular Role Model in the matrix described later in this document.

User (USER) - A person or application that submits print jobs to the printer; typically viewed as the "end user" within the overall printing environment.

Operator (OP) - A person responsible for maintaining a printer on a day-to-day basis, including such tasks as filling empty media trays, emptying full output trays, replacing toner cartridges, clearing simple paper jams, etc.

Technician (TECH) - A person responsible for repairing a malfunctioning printer, performing routine preventive maintenance, and other tasks that typically require advanced training on the printer internals. An example of a "technician" would be a

manufacturer's Field Service representative, or other person formally trained by the manufacturer or similar representative.

System Manager (MGR) - A person responsible for configuration and troubleshooting of components involved in the overall printing environment, including printers, print queues and network connectivity issues. This person is typically responsible for ensuring the overall operational integrity of the print system components, and is typically viewed as the central point of coordination among all other Role Models.

Help Desk (HELP) - A person responsible for supporting Users in their printing needs, including training Users and troubleshooting Users' printing problems.

Asset Manager (AM) - A person responsible for managing an organization's printing system assets (primarily printers). Such a person needs to be able to identify and track the location of printing assets on an ongoing basis.

Capacity Planner (CP) - A person responsible for tracking the usage of printing resources on an ongoing basis for the purpose of planning printer acquisitions and/or placement of printers based on usage trends.

Installer (INST) - A person or application responsible for installing or configuring printing system components on a local system.

Accountant (ACCT) - A person responsible for tracking the usage of printing resources on an ongoing basis for the purpose of charging Users for resources used.

Matrix of Common Print System Tasks and Role Models

To better understand the relationship between the set of defined "Common Print System Tasks" and the various "Role Models," the following matrix is provided.

It is important to recognize that many of the tasks will appear to be applicable to many of the Role Models. However, when considering the actual context of a task, it is very important to realize that often the actual context of a task is such that the Role Model can change.

For example, it is obvious that a "System Manager" must be able to

submit print jobs to a printer; however, when submitting a print job, a person identified as a "System Manager" is actually operating in the context of a "User" in this case; hence, the requirement to submit a print job is not listed as a requirement for a System Manager.

Conversely, while a "User" must be able to remove a job previously submitted to a printer, an "Operator" is often expected to be able to remove any print job from any printer; hence, print job removal is a (subtly different) requirement for both the "User" and "Operator" Role Models.

Role Models

Requirement Area	USER	OP	TECH	MGR	HELP	AM	CP	INST	ACCT
Print job status	xx	xx	xx	xx	xx				
Printer capabilities	xx			xx	xx				
Print job submission	xx								
Print job removal	xx	xx							
Notification of events		xx	xx						
Printer configuration				xx				xx	
Printer consumables	xx						xx	xx	
Print job identification	xx			xx	xx		xx		xx
Internal printer status	xx	xx	xx	xx					
Printer identification	xx	xx	xx	xx	xx	xx	xx	xx	
Printer location							xx		
Local system configuration				xx				xx	

Appendix E - Overall Printer Status Table

The Status Table establishes a convention for the top 25 printer errors. The table defines a suggested relationship between various printer states and the variables Printer hrDeviceStatus, hrPrinterStatus, hrPrinterDetectedErrorState, prtAlertGroup, prtAlertCode and various sub-unit status variables (prtInputStatus, prtOutputStatus, prtMarkerStatus, prtMediaPathStatus and prtChannelStatus). This table is the recommended implementation of these variables. It is provided to guide implementors of this MIB and users of the MIB by providing a sample set of states and the variable values that are expected to be produced as result of that state. This information supplements that provided in Section 2.2.13.2 "Overall Printer Status". This is not an exhaustive list rather it is a guideline.

The definition of PrtSubUnitStatusTC specifies that SubUnitStatus is an integer that is the sum of 5 distinct values/states: Availability, Critical, Non-Critical, On-line and Transitioning. Thus when a non-critical alert or alerts are present the values for Availability, On-Line and Transitioning will be summed with the Non-Critical Alerts (8) value.

The table was generated in landscape format and is located at <ftp://ftp.pwg.org/pub/pwg/pmp/contributions/Top25Errors.pdf>.

Appendix F . Participants

The following people attended at least one meeting of the Printer Working Group; many attended most meetings.

Ron Bergman - Hitachi Koki
Luis Cubero - Hewlett-Packard
Jay Cummings - Novell
Andy Davidson - Tektronix
Lee Farrell - Canon
Joel Gyllenskog - Microworks
Tom Hastings - Xerox
Scott Isaacson - Novell
Binnur Al-Kazily - Hewlett-Packard
Rick Landau - Digital Equipment Corporation
David Kellerman - Northlake Software
Harry Lewis - IBM
Pete Loya - Hewlett-Packard
Jay Martin . Underscore, Inc.
Bob Pentecost - Hewlett-Packard
Dave Roach - Unisys
Stuart Rowley - Kyocera
Bob Setterbo - Adobe
Ron Smith - Texas Instruments
Mike Timperman - Lexmark
Randy Turner - 2Wire, Inc.
Bill Wagner - NETsilicon, Inc.
Chris Wellens - Interworking Labs
Craig Whittle . Sharp Labs
Don Wright - Lexmark
Lloyd Young - Lexmark
Atsushi Yuki - Kyocera
Steve Zilles - Adobe

Authors' Addresses

Ron Bergman (Chairman)
Hitachi Koki Imaging Solutions
1757 Tapo Canyon Road
Simi Valley, CA 93063-3394
Phone: (805) 578-4421
Email: rbergma@hitachi-hkis.com

Gary Gocek (Editor)
15 Red Post Crescent
Fairport, NY 14450
(585) 223-3826
Email: gary@gocek.org

Harry Lewis (Editor)
IBM
6300 Diagonal Hwy.
Boulder, CO 80301
Phone (303) 924-5337
Email: harryl@us.ibm.com

Ira McDonald
High North Inc
Phone: (906) 494-2434 or (906) 494-2697
Email: imcdonald@crt.xerox.com

Randy Turner
2Wire, Inc.
1704 Automation Parkway
San Jose, CA 95131
Phone (408) 895-1216
Email: rturner@2wire.com

Significant contributors

Joel Gyllenskog
Microworks, Inc.
Phone: (208) 375-1234
Email: joelgyllen@aol.com

Thomas N. Hastings
Xerox Corporation
Phone: (310) 333-6413
Email: hastings@cp10.es.xerox.com

Scott Isaacson
Novell
Phone: (801) 861-7366
Email: sisaacson@novell.com

Binnur Al-Kazily
Hewlett-Packard, Inc.
Phone: (208) 396-6372
Email: binnur_al-kazily@hp.com

David Kellerman
Northlake Software
Phone: (503) 228-3383
Email: kellerman@nls.com

Matt King
Lexmark International
Phone: (859) 232-6907
Email: emking@lexmark.com

Jay Martin
Underscore, Inc.
Phone: (603) 889-7000
Email: jkm@underscore.com

Mike McKay
Novell, Inc.

Bob Pentecost
Hewlett-Packard
Phone: (208) 396-3312
Email: bpenteco@boi.hp.com

Stuart Rowley
Kyocera
Phone: (510) 299-7206
Email: stuart.rowley@kyocera.com

Ronald L. Smith
Texas Instruments
Phone: (817) 774-6151
Email: rlsmith@nb.ppd.ti.com

Gail Songer
Peerless Systems Networking
Phone: (650) 569-4414
Email: gsonger@peerless.com

William Wagner
NETsilicon, Inc.
Phone: (781) 398-4588
Email: bwagner@digprod.com

Chris Wellens
Interworking Labs
Phone: (408) 685-3190
Email: chrisw@iwl.com

F.D. Wright
Lexmark International
Phone: (859) 232-4808
Email: don@lexmark.com

Lloyd Young
Lexmark International
Phone: (859) 232-5150
Email: lpyoung@lexmark.com

Stephen N. Zilles
Adobe Systems, Inc.
Phone: (415) 962-4766
Email: szilles@mv.us.adobe.com