Abstract: This document defines an update to the IANA-PRINTER-MIB (originally published in RFC 3805) to provide support for SNMP alerts in a multifunction device (MFD) and an equivalent update to IPP “printer-state-reasons” [STD92] and IPP “printer-alert” [PWG5100.9].

This document is a PWG Working Draft. For a definition of a "PWG Working Draft", see:


This document is available electronically at:

This document may be copied and furnished to others, and derivative works that comment on, or otherwise explain it 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, this paragraph and the title of the Document as referenced below 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 IEEE-ISTO and the Printer Working Group, a program of the IEEE-ISTO.

Title: PWG MFD Alerts v1.1 (MFD Alerts)

The IEEE-ISTO and the Printer Working Group DISCLAIM ANY AND ALL WARRANTIES, WHETHER EXPRESS OR IMPLIED INCLUDING (WITHOUT LIMITATION) ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

The Printer Working Group, a program of the IEEE-ISTO, reserves the right to make changes to the document without further notice. The document may be updated, replaced or made obsolete by other documents at any time.

The IEEE-ISTO takes no position regarding the validity or scope of any intellectual property or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; neither does it represent that it has made any effort to identify any such rights.

The IEEE-ISTO invites any interested party to bring to its attention any copyrights, patents, or patent applications, or other proprietary rights which may cover technology that may be required to implement the contents of this document. The IEEE-ISTO and its programs shall not be responsible for identifying patents for which a license may be required by a document and/or IEEE-ISTO Industry Group Standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention. Inquiries may be submitted to the IEEE-ISTO by e-mail at: ieee-isto@ieee.org.

The Printer Working Group acknowledges that the IEEE-ISTO (acting itself or through its designees) is, and shall at all times, be the sole entity that may authorize the use of certification marks, trademarks, or other special designations to indicate compliance with these materials.

Use of this document is wholly voluntary. The existence of this document does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to its scope.
About the IEEE-ISTO

The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities that support the implementation and acceptance of standards in the marketplace. The organization is affiliated with the IEEE (http://www.ieee.org/) and the IEEE Standards Association (http://standards.ieee.org/).

For additional information regarding the IEEE-ISTO and its industry programs visit:

http://www.ieee-isto.org

About the IEEE-ISTO PWG

The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization (ISTO) with member organizations including printer manufacturers, print server developers, operating system providers, network operating system providers, network connectivity vendors, and print management application developers. The group is chartered to make printers and the applications and operating systems supporting them work together better. All references to the PWG in this document implicitly mean “The Printer Working Group, a Program of the IEEE ISTO.” In order to meet this objective, the PWG will document the results of their work as open standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these standards.

In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has multiple, independent and interoperable implementations with substantial operational experience, and enjoys significant public support.

For additional information regarding the Printer Working Group visit:

http://www.pwg.org

Contact information:

The Printer Working Group
c/o The IEEE Industry Standards and Technology Organization
445 Hoes Lane
Piscataway, NJ 08854
USA
## Table of Contents

1. Introduction .............................................................................6

2. Terminology ...........................................................................6
   2.1 Conformance Terminology ..............................................6
   2.2 Printing Terminology .....................................................6
   2.3 Protocol Role Terminology ............................................7
   2.4 Other Terminology .......................................................7
   2.5 Acronyms and Organizations .........................................7

3. Requirements .........................................................................7
   3.1 Rationale .........................................................................7
   3.2 Use Cases .........................................................................8
      3.2.1 MFDs with OEM Components .................................8
      3.2.2 MFDs with Alert Messages ....................................9
   3.3 Exceptions .......................................................................9
   3.4 Out of Scope ....................................................................9
   3.5 Design Requirements ..................................................9

4. SNMP Printer Model Extensions .........................................10
   4.1 ScanDevice .....................................................................10
   4.2 FaxDevice ......................................................................10
   4.3 OutputChannel ............................................................10

5. MFD Alerts ...........................................................................10
   5.1 MFD Subunit Alert Groups ..........................................10
   5.2 MFD Subunit Alerts .....................................................11
   5.3 IPP printer-state-reasons (1setOf type2 keyword) ..........13

6. Conformance Requirements ................................................15
   6.1 SNMP Agent Conformance Requirements ..................15
   6.2 SNMP Client Conformance Requirements ..................15
   6.3 IPP Printer Conformance Requirements ......................16
   6.4 IPP Client Conformance Requirements .......................16

7. Internationalization Considerations ..................................17
   7.1 IPP Internationalization Considerations ......................17
   7.2 SNMP Internationalization Considerations ..............18

8. Security Considerations .....................................................18
   8.1 IPP Security Considerations ........................................18
   8.2 SNMP Security Considerations ....................................18

9. IANA and PWG Considerations .........................................18
   9.1 Alert Groups ................................................................18
   9.2 Alert Codes ..................................................................19
   9.3 IPP Attribute Value Registrations ...............................21

10. References ..........................................................................22
    10.1 Normative References ..............................................22
    10.2 Informative References ..............................................24

11. Author’s Address ..............................................................24

12. Change History ...................................................................26
    12.1 13 February 2019 .......................................................26
    12.2 28 December 2018 ......................................................26
List of Tables

119  Table 1: MFD Alert Groups ........................................................................................................ 10
120  Table 2: MFD Subunit Alerts .................................................................................................... 11
121  Table 3: IPP MFD printer-state-reasons ................................................................................... 13
122
123
1. Introduction

This document defines simple extensions to the originally printer-specific IETF Printer MIB v2 [RFC3805] (new enumeration values in prtAlertCode) and IETF IPP/1.1 [STD92] (new keyword values in "printer-state-reasons") to add support for alert information for multifunction devices (MFDs), which are now very popular alternatives to using separate printer, copier, and facsimile equipment. Prior to the introduction of MFDs, printer vendors and application developers had already created tools, management systems, and device drivers based upon the Printer MIB v2 [RFC3805] and the prtAlertTable. MFDs are typically less expensive than an equivalent set of individual devices, and have the additional advantage of occupying much less office space.

The printer portion of an MFD is used by the print, copy, and facsimile (fax) functions. Additional scanner and scan media path components are used by the copy and fax functions. The fax function also uses a fax modem component with a PSTN interface.

The Printer Working Group (PWG) developed the IETF Printer MIB v2 [RFC3805], which is now implemented in most network printers sold today and defines the prtAlertTable that may be used, with or without SNMP traps, to implement an effective warning and error reporting system.

2. Terminology

2.1 Conformance Terminology

Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD, SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. The term CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that applies when a specified condition is true.

2.2 Printing Terminology

Normative definitions and semantics of printing terms are imported from IETF Printer MIB v2 [RFC3805], IETF Finisher MIB [RFC3806], and IETF Internet Printing Protocol/1.1: Model and Semantics [STD92].

Document: An object created and managed by an IPP Printer that contains the description, processing, and status information. A Document object may have attached data and is bound to a single Job.

Job: An object created and managed by an IPP Printer that contains description, processing, and status information. The Job also contains zero or more Document objects.
Logical Device: a print server, software service, or gateway that processes jobs and either forwards or stores the processed job or uses one or more Physical Devices to render output.

Output Device: a single Logical or Physical Device

Physical Device: a hardware implementation of an endpoint device, e.g., a marking engine, a fax modem, etc.

2.3 Protocol Role Terminology

This document also defines the following protocol roles in order to specify unambiguous conformance requirements:

IPP Client: Initiator of outgoing connections and sender of outgoing IPP operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

IPP Printer: Listener for incoming connections and receiver of incoming IPP operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more Physical Devices or a Logical Device.

SNMP Printer: Listener for incoming SNMP Get and Set management requests and sender of optional outgoing SNMP notifications for a Printer or MFD.

SNMP Client: Initiator of outgoing SNMP Get and Set management requests and receiver of optional incoming SNMP notifications for a Printer or MFD (i.e., an SNMP Manager).

2.4 Other Terminology

Capitalized Term In Italics: definition of the term with any references as appropriate.

2.5 Acronyms and Organizations

IANA: Internet Assigned Numbers Authority, http://www.iana.org/


3. Requirements

3.1 Rationale

The IETF, and PWG standards in the printing industry include:
1. An abstract model of a PrintDevice in section 2.2 of the IETF Printer MIB v2 [RFC3805].

2. An SNMP Alert table for a PrintDevice to support the service and maintenance functions in section 2.2.13 of the IETF Printer MIB v2 [RFC3805].

3. A set of design goals for status monitoring in a printing protocol in section 3.1.3 “Viewing the status and capabilities of a printer” (for End User), section 3.2.1 “Alerting” (for Operator), and section 3.3 “Administrator” (the bullet requirement to “administrate billing or other charge-back mechanisms”) of the IETF IPP Design Goals [RFC2567].

4. A set of MFD service types for Imaging Systems in the JmJobServiceTypesTC textual convention in section 4 of the IETF Job Monitoring MIB [RFC2707].

5. An abstract model of an MFD job in section 2 of the IETF Job Monitoring MIB [RFC2707].

6. An abstract model of an MFD in the PWG MFD Model and Common Semantics [PWG5108.1].

7. In the years since the Printer MIB v2 [RFC3805] was published printers have evolved into MFDs. Prior to the introduction of MFDs, printer vendors and application developers had already created tools, management systems, and device drivers based upon the Printer MIB v2 [RFC3805] and the prtAlertTable. Now that these same vendors are building MFDs, there is an urgent need to leverage these existing tools and management applications.

8. This document defines a new set of MFD alert groups and MFD component alerts that will allow the applications currently using the prtAlertTable to support MFDs.

### 3.2 Use Cases

Provide use cases for the document in subsections using the casual use case format.

#### 3.2.1 MFDs with OEM Components

Company A markets complete systems, including a full range of computers, printers, and other office peripheral devices. Most of the equipment included with these systems are manufactured by Company A. The remaining equipment is Company A branded (i.e., OEM), but manufactured by others. All of these systems include a management application that monitors all systems components and automatically initiates service calls.

For printer maintenance, the management system uses the prtAlertTable. New system configurations now offer MFDs as options for printers. By including the MFD Alerts in the MFDs and in Company A’s management system, Company A can now offer full management and maintenance support for these new MFDs.
3.2.2 MFDs with Alert Messages

Company B is now adding a new series of MFDs to its extensive line of printers. The current printer families include a deluxe driver that monitors the prtAlertTable to provide status information to the end user. The monitor function does not interpret the prtAlertCode or the prtAlertLocation values, but instead queries and displays the prtAlertDescription value to indicate the fault condition. This feature allows the end user to initiate any action that may be required to complete the user’s jobs. The fault information may be related to a job that precedes the user’s current job so, if the owner of the previous job is not able or to does not wish to act, the owner of the new job may take the appropriate action so that normal operation can resume. By including the MFD Alerts in their new MFD family, Company B can now offer the monitor function for these new MFDs.

3.3 Exceptions

There are no significant exceptions to describe for the above use cases

3.4 Out of Scope

The following are considered out of scope for this specification:

1. Definition of any components that are not already defined in the PWG MFD Model and Common Semantics [PWG5108.1];
2. Definition of any semantics for workflow applications;
3. Definition of any semantics for document repositories; and

3.5 Design Requirements

The design requirements for this specification are:

1. Define a set of alert groups to provide alert capability for MFDs equivalent to the capability currently provided for printers for registration in the PrtAlertGroupTC in the IANA Printer MIB [IANAPRT];
2. Define new alert groups for MFD components only where functionally equivalent groups do not already exist for the PrintDevice (for example, a ScanMediaPath is inherently entirely separate from any print MediaPath);
3. Do not define new alert groups for MFD components where functionally equivalent groups already exist for the PrintDevice (for example, ScanDevice covers should be modeled using the existing Cover group);
4. Define a set of component-specific alerts for new ScanDevice and FaxDevice components for registration in the PrtAlertCodeTC in the IANA Printer MIB [IANAPRT]; and

5. Define a set of component-specific extension alerts for existing Input, Output, and MediaPath alert groups that correspond to extensions for the ScanMediaPath alert group.

4. SNMP Printer Model Extensions

This section briefly summarizes extensions to the abstract SNMP Printer Model, originally defined in section 2 of IETF Printer MIB v2 [RFC3805], based on the PWG MFD Model and Common Semantics [PWG5108.1], to include the ScanDevice and FaxDevice, their additional subunits, and the new OutputChannel subunit.

4.1 ScanDevice

The ScanDevice uses the following subunits: Console, Cover, Interface, Interpreter, OutputChannel, Processor, ScanMediaPath, Scanner, Storage, and optionally the VendorSubunit.

4.2 FaxDevice

The FaxDevice uses the following subunits: Console, Cover, FaxModem, Finisher, InputChannel, InputTray, Interface, Interpreter, Marker, MediaPath, OutputChannel, OutputTray, Processor, ScanMediaPath, Scanner, Storage, and optionally the VendorSubunit.

4.3 OutputChannel

An OutputChannel is the opposite of an InputChannel – it sends jobs and user data from an MFD via a configured application protocol (e.g., SMTP) to specified destinations.

5. MFD Alerts

5.1 MFD Subunit Alert Groups

The new MFD subunit alert groups and the associated alert group values are defined in this section for registration in PrtAlertGroupTC in IANA Printer MIB [IANAPRT].

Table 1: MFD Alert Groups

<table>
<thead>
<tr>
<th>MFD Alert Group</th>
<th>PrtAlertGroupTC Value</th>
</tr>
</thead>
</table>

MFD Alert Group | PrtAlertGroupTC Value
---|---
scanDevice | 50
scanner | 51
scanMediaPath | 52
faxDevice | 60
faxModem | 61
outputChannel | 70

### 5.2 MFD Subunit Alerts

The new MFD subunit alerts and the associated alert values are defined in this section for registration in PrtAlertCodeTC in IANA Printer MIB [IANAPRT].

Note: The original Printer MIB v1 [RFC1759] and subsequent Printer MIB v2 [RFC3805] did not define any (Input)Channel-specific alerts. Therefore, this MFD Alerts specification does not define any OutputChannel-specific alerts. The generic alerts (subunitXxx) originally defined in [RFC3805] and registered in [IANAPRT] may be used for both (Input)Channel and OutputChannel subunits.

#### Table 2: MFD Subunit Alerts

<table>
<thead>
<tr>
<th>MFD Subunit Alert</th>
<th>PrtAlertCodeTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>-- Input Group</td>
<td></td>
</tr>
<tr>
<td>inputMediaTrayFeedError</td>
<td>814</td>
</tr>
<tr>
<td>inputMediaTrayJam</td>
<td>815</td>
</tr>
<tr>
<td>inputMediaTrayFailure</td>
<td>816</td>
</tr>
<tr>
<td>inputPickRollerLifeWarn</td>
<td>817</td>
</tr>
<tr>
<td>inputPickRollerLifeOver</td>
<td>818</td>
</tr>
<tr>
<td>inputPickRollerFailure</td>
<td>819</td>
</tr>
<tr>
<td>inputPickRollerMissing</td>
<td>820</td>
</tr>
<tr>
<td>-- Output Group</td>
<td></td>
</tr>
<tr>
<td>outputMediaTrayFeedError</td>
<td>905</td>
</tr>
<tr>
<td>outputMediaTrayJam</td>
<td>906</td>
</tr>
<tr>
<td>outputMediaTrayFailure</td>
<td>907</td>
</tr>
<tr>
<td>-- Marker Supplies Group</td>
<td></td>
</tr>
<tr>
<td>markerCleanerMissing</td>
<td>1116</td>
</tr>
<tr>
<td>markerDeveloperMissing</td>
<td>1117</td>
</tr>
<tr>
<td>markerFuserMissing</td>
<td>1118</td>
</tr>
<tr>
<td>markerInkMissing</td>
<td>1119</td>
</tr>
<tr>
<td>markerOpcMissing</td>
<td>1120</td>
</tr>
<tr>
<td>markerPrintRibbonMissing</td>
<td>1121</td>
</tr>
<tr>
<td>markerSupplyAlmostEmpty</td>
<td>1122</td>
</tr>
<tr>
<td>markerSupplyEmpty</td>
<td>1123</td>
</tr>
<tr>
<td>markerSupplyMissing</td>
<td>1124</td>
</tr>
<tr>
<td>markerWasteAlmostFull</td>
<td>1125</td>
</tr>
<tr>
<td>markerWasteFull</td>
<td>1126</td>
</tr>
<tr>
<td>markerWasteMissing</td>
<td>1127</td>
</tr>
<tr>
<td>markerWasteInkReceptacleMissing</td>
<td>1128</td>
</tr>
<tr>
<td>markerWasteTonerReceptacleMissing</td>
<td>1129</td>
</tr>
<tr>
<td>MFD Subunit Alert</td>
<td>PrtAlertCodeTC</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>markerTonerMissing</td>
<td>1130</td>
</tr>
<tr>
<td><strong>-- Media Path Group</strong></td>
<td></td>
</tr>
<tr>
<td>mediaPathFailure</td>
<td>1305</td>
</tr>
<tr>
<td>mediaPathJam</td>
<td>1306</td>
</tr>
<tr>
<td>mediaPathInputRequest</td>
<td>1310</td>
</tr>
<tr>
<td>mediaPathInputFeedError</td>
<td>1311</td>
</tr>
<tr>
<td>mediaPathInputJam</td>
<td>1312</td>
</tr>
<tr>
<td>mediaPathInputEmpty</td>
<td>1313</td>
</tr>
<tr>
<td>mediaPathOutputFeedError</td>
<td>1321</td>
</tr>
<tr>
<td>mediaPathOutputJam</td>
<td>1322</td>
</tr>
<tr>
<td>mediaPathOutputFull</td>
<td>1323</td>
</tr>
<tr>
<td>mediaPathPickRollerLifeWarn</td>
<td>1331</td>
</tr>
<tr>
<td>mediaPathPickRollerLifeOver</td>
<td>1332</td>
</tr>
<tr>
<td>mediaPathPickRollerFailure</td>
<td>1333</td>
</tr>
<tr>
<td>mediaPathPickRollerMissing</td>
<td>1334</td>
</tr>
<tr>
<td><strong>-- Scanner Group</strong></td>
<td></td>
</tr>
<tr>
<td>scannerLightLifeAlmostOver</td>
<td>5101</td>
</tr>
<tr>
<td>scannerLightLifeOver</td>
<td>5102</td>
</tr>
<tr>
<td>scannerLightFailure</td>
<td>5103</td>
</tr>
<tr>
<td>scannerLightMissing</td>
<td>5104</td>
</tr>
<tr>
<td>scannerSensorLifeAlmostOver</td>
<td>5111</td>
</tr>
<tr>
<td>scannerSensorLifeOver</td>
<td>5112</td>
</tr>
<tr>
<td>scannerSensorFailure</td>
<td>5113</td>
</tr>
<tr>
<td>scannerSensorMissing</td>
<td>5114</td>
</tr>
<tr>
<td><strong>-- Scan Media Path Group</strong></td>
<td></td>
</tr>
<tr>
<td>scanMediaPathTrayMissing</td>
<td>5201</td>
</tr>
<tr>
<td>scanMediaPathTrayAlmostFull</td>
<td>5202</td>
</tr>
<tr>
<td>scanMediaPathTrayFull</td>
<td>5203</td>
</tr>
<tr>
<td>scanMediaPathFailure</td>
<td>5205</td>
</tr>
<tr>
<td>scanMediaPathJam</td>
<td>5206</td>
</tr>
<tr>
<td>scanMediaPathInputRequest</td>
<td>5210</td>
</tr>
<tr>
<td>scanMediaPathInputFeedError</td>
<td>5211</td>
</tr>
<tr>
<td>scanMediaPathInputJam</td>
<td>5212</td>
</tr>
<tr>
<td>scanMediaPathInputEmpty</td>
<td>5213</td>
</tr>
<tr>
<td>scanMediaPathOutputFeedError</td>
<td>5221</td>
</tr>
<tr>
<td>scanMediaPathOutputJam</td>
<td>5222</td>
</tr>
<tr>
<td>scanMediaPathOutputFull</td>
<td>5223</td>
</tr>
<tr>
<td>scanMediaPathPickRollerLifeWarn</td>
<td>5231</td>
</tr>
<tr>
<td>scanMediaPathPickRollerLifeOver</td>
<td>5232</td>
</tr>
<tr>
<td>scanMediaPathPickRollerFailure</td>
<td>5233</td>
</tr>
<tr>
<td>scanMediaPathPickRollerMissing</td>
<td>5234</td>
</tr>
<tr>
<td><strong>-- Fax Modem Group</strong></td>
<td></td>
</tr>
<tr>
<td>faxModemMissing</td>
<td>6101</td>
</tr>
<tr>
<td>faxModemLifeAlmostOver</td>
<td>6102</td>
</tr>
<tr>
<td>faxModemLifeOver</td>
<td>6103</td>
</tr>
<tr>
<td>faxModemTurnedOn</td>
<td>6104</td>
</tr>
<tr>
<td>faxModemTurnedOff</td>
<td>6105</td>
</tr>
<tr>
<td>faxModemInactivityTimeout</td>
<td>6110</td>
</tr>
<tr>
<td>faxModemProtocolAlert</td>
<td>6111</td>
</tr>
<tr>
<td>faxModemEquipmentFailure</td>
<td>6112</td>
</tr>
</tbody>
</table>
MFD Subunit Alert                  PrtAlertCodeTC
faxModemNoDialTone                6113
faxModemLineBusy                  6114
faxModemNoAnswer                  6115
faxModemVoiceDetected             6116
faxModemCarrierLost               6117
faxModemTrainingFailure           6118

Note: SNMP Printer subunit alert codes ending in “Error” only occur when the MFD/Printer is stopped.

5.3 IPP printer-state-reasons (1setOf type2 keyword)

The new MFD alert values of "printer-state-reasons" [STD92] are defined in this section for registration in IANA IPP Registry [IANAIPP]. The table below defines new MFD alert values of "printer-state-reasons" [STD92] and their mapping to/from new MFD alert values of 'PrtAlertCodeTC' [IANAPRT] defined above in section 5.2.

<table>
<thead>
<tr>
<th>SNMP MFD PrtAlertCodeTC</th>
<th>IPP MFD printer-state-reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>-- Input Group</td>
<td></td>
</tr>
<tr>
<td>inputMediaTrayFeedError(814)</td>
<td>input-media-tray-feed-error</td>
</tr>
<tr>
<td>inputMediaTrayJam(815)</td>
<td>input-media-tray-jam</td>
</tr>
<tr>
<td>inputMediaTrayFailure(816)</td>
<td>input-media-tray-failure</td>
</tr>
<tr>
<td>inputPickRollerLifeWarn(817)</td>
<td>input-pick-roller-life-warn</td>
</tr>
<tr>
<td>inputPickRollerLifeOver(818)</td>
<td>input-pick-roller-life-over</td>
</tr>
<tr>
<td>inputPickRollerFailure(819)</td>
<td>input-pick-roller-failure</td>
</tr>
<tr>
<td>inputPickRollerMissing(820)</td>
<td>input-pick-roller-missing</td>
</tr>
<tr>
<td>-- Output Group</td>
<td></td>
</tr>
<tr>
<td>outputMediaTrayFeedError(905)</td>
<td>output-media-tray-feed-error</td>
</tr>
<tr>
<td>outputMediaTrayJam(906)</td>
<td>output-media-tray-jam</td>
</tr>
<tr>
<td>outputMediaTrayFailure(907)</td>
<td>output-media-tray-failure</td>
</tr>
<tr>
<td>-- Marker Supplies Group</td>
<td></td>
</tr>
<tr>
<td>markerCleanerMissing(1116)</td>
<td>marker-cleaner-missing</td>
</tr>
<tr>
<td>markerDeveloperMissing(1117)</td>
<td>marker-developer-missing</td>
</tr>
<tr>
<td>markerFuserMissing(1118)</td>
<td>marker-fuser-missing</td>
</tr>
<tr>
<td>markerInkMissing(1119)</td>
<td>marker-ink-missing</td>
</tr>
<tr>
<td>markerOpcMissing(1120)</td>
<td>marker-opc-missing</td>
</tr>
<tr>
<td>markerPrintRibonMissing(1121)</td>
<td>marker-print-ribbon-missing</td>
</tr>
<tr>
<td>markerSupplyAlmostEmpty(1122)</td>
<td>marker-supply-almost-empty</td>
</tr>
<tr>
<td>markerSupplyEmpty(1123)</td>
<td>marker-supply-empty</td>
</tr>
<tr>
<td>markerSupplyMissing(1124)</td>
<td>marker-supply-missing</td>
</tr>
<tr>
<td>markerWasteAlmostFull(1125)</td>
<td>marker-waste-almost-full</td>
</tr>
<tr>
<td>markerWasteFull(1126)</td>
<td>marker-waste-full</td>
</tr>
<tr>
<td>markerWasteMissing(1127)</td>
<td>marker-waste-missing</td>
</tr>
<tr>
<td>markerWasteInkReceptacleMissing(1128)</td>
<td>marker-waste-ink-receptacle-missing</td>
</tr>
<tr>
<td>markerWasteTonerReceptacleMissing(1129)</td>
<td>marker-waste-toner-receptacle-missing</td>
</tr>
<tr>
<td>markerTonerMissing (1130)</td>
<td>marker-toner-missing</td>
</tr>
<tr>
<td>-- Media Path Group</td>
<td></td>
</tr>
<tr>
<td>SNMP MFD PrtAlertCodeTC</td>
<td>IPP MFD printer-state-reasons</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>mediaPathFailure(1305)</td>
<td>media-path-failure</td>
</tr>
<tr>
<td>mediaPathJam(1306)</td>
<td>media-path-jam</td>
</tr>
<tr>
<td>mediaPathInputRequest(1310)</td>
<td>media-path-input-request</td>
</tr>
<tr>
<td>mediaPathInputFeedError(1311)</td>
<td>media-path-input-feed-error</td>
</tr>
<tr>
<td>mediaPathInputJam(1312)</td>
<td>media-path-input-jam</td>
</tr>
<tr>
<td>mediaPathInputEmpty(1313)</td>
<td>media-path-input-empty</td>
</tr>
<tr>
<td>mediaPathOutputFeedError(1321)</td>
<td>media-path-output-feed-error</td>
</tr>
<tr>
<td>mediaPathOutputJam(1322)</td>
<td>media-path-output-jam</td>
</tr>
<tr>
<td>mediaPathOutputFull(1323)</td>
<td>media-path-output-full</td>
</tr>
<tr>
<td>mediaPathPickRollerLifeWarn(1331)</td>
<td>media-path-pick-roller-life-warn</td>
</tr>
<tr>
<td>mediaPathPickRollerLifeOver(1332)</td>
<td>media-path-pick-roller-life-over</td>
</tr>
<tr>
<td>mediaPathPickRollerFailure(1333)</td>
<td>media-path-pick-roller-failure</td>
</tr>
<tr>
<td>mediaPathPickRollerMissing(1334)</td>
<td>media-path-pick-roller-missing</td>
</tr>
<tr>
<td>-- Scanner Group</td>
<td></td>
</tr>
<tr>
<td>scannerLightLifeAlmostOver(5101)</td>
<td>scanner-light-life-almost-over</td>
</tr>
<tr>
<td>scannerLightLifeOver(5102)</td>
<td>scanner-light-life-over</td>
</tr>
<tr>
<td>scannerLightFailure(5103)</td>
<td>scanner-light-failure</td>
</tr>
<tr>
<td>scannerLightMissing(5104)</td>
<td>scanner-light-missing</td>
</tr>
<tr>
<td>scannerSensorLifeAlmostOver(5111)</td>
<td>scanner-sensor-life-almost-over</td>
</tr>
<tr>
<td>scannerSensorLifeOver(5112)</td>
<td>scanner-sensor-life-over</td>
</tr>
<tr>
<td>scannerSensorFailure(5113)</td>
<td>scanner-sensor-failure</td>
</tr>
<tr>
<td>scannerSensorMissing(5114)</td>
<td>scanner-sensor-missing</td>
</tr>
<tr>
<td>-- Scan Media Path Group</td>
<td></td>
</tr>
<tr>
<td>scanMediaPathTrayMissing(5201)</td>
<td>scan-media-path-tray-missing</td>
</tr>
<tr>
<td>scanMediaPathTrayAlmostFull(5202)</td>
<td>scan-media-path-tray-almost-full</td>
</tr>
<tr>
<td>scanMediaPathTrayFull(5203)</td>
<td>scan-media-path-tray-full</td>
</tr>
<tr>
<td>scanMediaPathFailure(5205)</td>
<td>scan-media-path-failure</td>
</tr>
<tr>
<td>scanMediaPathJam(5206)</td>
<td>scan-media-path-jam</td>
</tr>
<tr>
<td>scanMediaPathInputRequest(5210)</td>
<td>scan-media-path-input-request</td>
</tr>
<tr>
<td>scanMediaPathInputFeedError(5211)</td>
<td>scan-media-path-input-feed-error</td>
</tr>
<tr>
<td>scanMediaPathInputJam(5212)</td>
<td>scan-media-path-input-jam</td>
</tr>
<tr>
<td>scanMediaPathInputEmpty(5213)</td>
<td>scan-media-path-input-empty</td>
</tr>
<tr>
<td>scanMediaPathOutputFeedError(5221)</td>
<td>scan-media-path-output-feed-error</td>
</tr>
<tr>
<td>scanMediaPathOutputJam(5222)</td>
<td>scan-media-path-output-jam</td>
</tr>
<tr>
<td>scanMediaPathOutputFull(5223)</td>
<td>scan-media-path-output-full</td>
</tr>
<tr>
<td>scanMediaPathPickRollerLifeWarn(5231)</td>
<td>scan-media-path-pick-roller-life-warn</td>
</tr>
<tr>
<td>scanMediaPathPickRollerLifeOver(5232)</td>
<td>scan-media-path-pick-roller-life-over</td>
</tr>
<tr>
<td>scanMediaPathPickRollerFailure(5233)</td>
<td>scan-media-path-pick-roller-failure</td>
</tr>
<tr>
<td>scanMediaPathPickRollerMissing(5234)</td>
<td>scan-media-path-pick-roller-missing</td>
</tr>
<tr>
<td>-- Fax Modem Group</td>
<td></td>
</tr>
<tr>
<td>faxModemMissing(6101)</td>
<td>fax-modem-missing</td>
</tr>
<tr>
<td>faxModemLifeAlmostOver(6102)</td>
<td>fax-modem-life-almost-over</td>
</tr>
<tr>
<td>faxModemLifeOver(6103)</td>
<td>fax-modem-life-over</td>
</tr>
<tr>
<td>faxModemTurnedOn(6104)</td>
<td>fax-modem-turned-on</td>
</tr>
<tr>
<td>faxModemTurnedOff(6105)</td>
<td>fax-modem-turned-off</td>
</tr>
<tr>
<td>faxModemInactivityTimeout(6110)</td>
<td>fax-modem-inactivity-timeout</td>
</tr>
<tr>
<td>faxModemProtocolAlert(6111)</td>
<td></td>
</tr>
<tr>
<td>faxModemEquipmentFailure(6112)</td>
<td>fax-modem-equipment-failure</td>
</tr>
<tr>
<td>faxModemNoDialTone(6113)</td>
<td></td>
</tr>
<tr>
<td>faxModemLineBusy(6114)</td>
<td></td>
</tr>
</tbody>
</table>
SNMP MFD PrtAlertCodeTC | IPP MFD printer-state-reasons
--- | ---
faxModemNoAnswer(6115) | 
faxModemVoiceDetected(6116) | 
faxModemCarrierLost(6117) | 
faxModemTrainingFailure(6118) | 

302
303 Note 1: IPP “printer-state-reasons” ending in “error” only occur when the MFD/Printer is stopped.
305
306 Note 2: FaxModem alerts for transient conditions are NOT mapped to “printer-state-reasons”.
308

6. Conformance Requirements

6.1 SNMP Agent Conformance Requirements

To claim conformance to this specification, an SNMP Agent implementation for a Multifunction Device:

(a) MUST implement the prtAlertTable defined in IETF Printer MIB v2;
(b) SHOULD implement the prtAlertTable defined in IETF Printer MIB v2 [RFC3805] as persistent across power cycles and hardware reconfigurations, for reliable fleet management.
(c) MUST support the MFD alert groups defined in section 5.1 of this specification which are registered in PrtAlertGroupTC in IANA Printer MIB [IANAPRT], if the corresponding functionality (e.g., scan) is supported on the MFD;
(d) MUST support the MFD alert codes defined in section 5.2 of this specification which are registered in PrtAlertCodeTC in IANA Printer MIB [IANAPRT], if the corresponding functionality (e.g., scan) is supported on the MFD; and
(e) MUST encode and interpret values of the prtAlertGroup and prtAlertCode objects defined in IETF Printer MIB v2 [RFC3805] according to the registry in IANA Printer MIB [IANAPRT].

6.2 SNMP Client Conformance Requirements

To claim conformance to this specification, an SNMP Client implementation that supports Multifunction Devices:

(a) MUST support the prtAlertTable defined in IETF Printer MIB v2;
(b) MUST support the MFD alert groups defined in section 5.1 of this specification which are registered in PrtAlertGroupTC in IANA Printer MIB [IANAPRT], if the corresponding functionality (e.g., scan) is supported on the SNMP Client;
(c) MUST support the MFD alert codes defined in section 5.2 of this specification which are registered in PrtAlertCodeTC in IANA Printer MIB [IANAPRT], if the corresponding functionality (e.g., scan) is supported on the SNMP Client; and
(d) MUST decode and interpret values of the prtAlertGroup and prtAlertCode objects
defined in IETF Printer MIB v2 [RFC3805] according to the registry in IANA Printer
MIB [IANAPRT].

6.3 IPP Printer Conformance Requirements

To claim conformance to this specification, an IPP Printer implementation for a
Multifunction Device:

(a) MUST support the IPP Printer “printer-alert” and “printer-alert-description” attributes
defined in PWG IPP Printer State Extensions [PWG5100.9];
(b) MUST support the MFD alert groups defined in section 5.1 of this specification
which are registered in PrtAlertGroupTC in IANA Printer MIB [IANAPRT] for
keyword values in “printer-alert”, if the corresponding functionality (e.g., scan) is
supported on the MFD;
(c) MUST support the MFD alert codes defined in section 5.2 of this specification which
are registered in PrtAlertCodeTC in IANA Printer MIB [IANAPRT] and IANA IPP
Registry [IANAIPP] for keyword values in “printer-alert” and “printer-state-reasons”,
if the corresponding functionality (e.g., scan) is supported on the MFD; and
(d) MUST encode and interpret values of “printer-alert” and “printer-state-reasons”
according to the IANA Printer MIB [IANAPRT] and IANA IPP Registry [IANAIPP].

6.4 IPP Client Conformance Requirements

To claim conformance to this specification, an IPP Client implementation that supports
Multifunction Devices:

(a) MUST support the IPP Printer “printer-alert” and “printer-alert-description” attributes
defined in PWG IPP Printer State Extensions [PWG5100.9];
(b) MUST support the MFD alert groups defined in section 5.1 of this specification
which are registered in PrtAlertGroupTC in IANA Printer MIB [IANAPRT] for
keyword values in “printer-alert”, if the corresponding functionality (e.g., scan) is
supported on the IPP Client;
(c) MUST support the MFD alert codes defined in section 5.2 of this specification which
are registered in PrtAlertCodeTC in IANA Printer MIB [IANAPRT] and IANA IPP
Registry [IANAIPP] for keyword values in “printer-alert” and “printer-state-reasons”,
if the corresponding functionality (e.g., scan) is supported on the IPP Client; and
(d) MUST decode and interpret values of “printer-alert” and “printer-state-reasons”
according to the IANA Printer MIB [IANAPRT] and IANA IPP Registry [IANAIPP].

Page 16 of 29 Copyright © 2012-2019 The Printer Working Group. All rights reserved.
7. Internationalization Considerations

7.1 IPP Internationalization Considerations

For interoperability and basic support for multiple languages, conforming implementations MUST support:

- Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8) [STD63] encoding of Unicode [UNICODE] [ISO10646]; and

- Unicode Format for Network Interchange [RFC5198] which requires transmission of well-formed UTF-8 strings and recommends transmission of normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

Unicode NFC is defined as the result of performing Canonical Decomposition (into base characters and combining marks) followed by Canonical Composition (into canonical composed characters wherever Unicode has assigned them).

WARNING – Performing normalization on UTF-8 strings received from Clients and subsequently storing the results (e.g., in Job objects) could cause false negatives in Client searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now 'hidden').

Implementations of this specification SHOULD conform to the following standards on processing of human-readable Unicode text strings, see:

- Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

- Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

- Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

- Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

- Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

- Unicode Collation Algorithm [UTS10] – sorting

- Unicode Locale Data Markup Language [UTS35] – locale databases

Implementations of this specification are advised to also review the following informational documents on processing of human-readable Unicode text strings:

- Unicode Character Encoding Model [UTR17] – multi-layer character model
7.2 SNMP Internationalization Considerations

The SNMP MFD alert groups and alert codes defined in this document do not add any internationalization considerations beyond those covered in section 8 of the IETF Printer MIB v2 [RFC3805]. The MFD extensions to the IPP Printer "printer-alert" and "printer-state-reasons" attributes defined in this document do not add any internationalization considerations beyond covered in section 7 of IPP/1.1 Model and Semantics [STD92].

8. Security Considerations

8.1 IPP Security Considerations

The IPP extensions defined in this document require the same security considerations as defined in the IPP/1.1: Model and Semantics [STD92].

Implementations of this specification SHOULD conform to the following standard on processing of human-readable Unicode text strings, see:


Implementations of this specification are advised to also review the following informational document on processing of human-readable Unicode text strings:

- Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

8.2 SNMP Security Considerations

The SNMP MFD alert groups and alert codes defined in this document do not add any security considerations beyond those covered in section 9 of the IETF Printer MIB v2 [RFC3805].
in the IETF Printer MIB v2 [RFC3805] section 5, to cover the new alert groups defined in
section 5.1 of this document. Add to PrtAlertGroupTC the following:

--- Values for the ScanDevice
scanDevice(50),                    -- MFD Extension
scanner(51),                       -- MFD Extension
scanMediaPath(52),                  -- MFD Extension
--- Values (50) to (59) reserved for the ScanDevice
--- Values for the FaxDevice
faxDevice(60),                      -- MFD Extension
faxModem(61),                       -- MFD Extension
--- Values (60) to (69) reserved for the FaxDevice
--- Values for other common subunits
outputChannel(70),                  -- MFD Extension
--- Values (70) to (79) reserved for common subunits

9.2 Alert Codes

This section contains the exact registration information for IANA to update the IANA-
PRINTER-MIB PrtAlertCodeTC Registry [IANAPRT], according to the procedures defined
in the IETF Printer MIB v2 [RFC3805] section 5, to cover the new alert codes defined in
sections 5.2 and 5.3 of this document. Add to PrtAlertCodeTC the following:

--- Input Group
inputMediaTrayFeedError(814),
inputMediaTrayJam(815),
inputMediaTrayFailure(816),
inputMediaTrayPickRollerLifeWarn(817),
inputMediaTrayPickRollerLifeOver(818),
inputMediaTrayPickRollerFailure(819),
inputMediaTrayPickRollerMissing(820),

--- Output Group
outputMediaTrayFeedError(905),
outputMediaTrayJam(906),
outputMediaTrayFailure(907),

--- Marker Supplies Group
markerCleanerMissing(1116),
markerDeveloperMissing(1117),
markerFuserMissing(1118),
markerInkMissing(1119),
markerOpcMissing(1120),
markerPrintRibbonMissing(1121),
markerSupplyAlmostEmpty(1122),
markerSupplyEmpty(1123),
markerSupplyMissing(1124),
markerWasteAlmostFull(1125),
markerWasteFull(1126),
markerWasteMissing(1127),
markerWasteInkReceptacleMissing(1128),
markerWasteTonerReceptacleMissing(1129).
markerTonerMissing(1130).
-- Media Path Group
  mediaPathFailure(1305),
  mediaPathJam(1306),
  mediaPathInputRequest(1310),
  mediaPathInputFeedError(1311),
  mediaPathInputJam(1312),
  mediaPathOutputFeedError(1321),
  mediaPathOutputJam(1322),
  mediaPathOutputFull(1323),
  mediaPathPickRollerLifeWarn(1331),
  mediaPathPickRollerLifeOver(1332),
  mediaPathPickRollerFailure(1333),
  mediaPathPickRollerMissing(1334),

-- Scanner Group
  scannerLightLifeAlmostOver(5101),
  scannerLightLifeOver(5102),
  scannerLightFailure(5103),
  scannerLightMissing(5104),
  scannerSensorLifeAlmostOver(5111),
  scannerSensorLifeOver(5112),
  scannerSensorFailure(5113),
  scannerSensorMissing(5114),

-- Scan Media Path Group
  scanMediaPathTrayMissing(5201),
  scanMediaPathTrayAlmostFull(5202),
  scanMediaPathTrayFull(5203),
  scanMediaPathFailure(5205),
  scanMediaPathJam(5206),
  scanMediaPathInputRequest(5210),
  scanMediaPathInputFeedError(5211),
  scanMediaPathInputJam(5212),
  scanMediaPathOutputFeedError(5221),
  scanMediaPathOutputJam(5222),
  scanMediaPathOutputFull(5223),
  scanMediaPathPickRollerLifeWarn(5231),
  scanMediaPathPickRollerLifeOver(5232),
  scanMediaPathPickRollerFailure(5233),
  scanMediaPathPickRollerMissing(5234),

-- Fax Modem Group
  faxModemMissing(6101),
  faxModemLifeAlmostOver(6102),
  faxModemLifeOver(6103),
  faxModemTurnedOn(6104),
  faxModemTurnedOff(6105),
  faxModemInactivityTimeout(6110), -- DEPRECATED
  faxModemProtocolAlert(6111), -- DEPRECATED
  faxModemEquipmentFailure(6112), -- DEPRECATED
  faxModemNoDialTone(6113), -- DEPRECATED
  faxModemLineBusy(6114), -- DEPRECATED
  faxModemNoAnswer(6115), -- DEPRECATED
  faxModemVoiceDetected(6116), -- DEPRECATED
  faxModemCarrierLost(6117), -- DEPRECATED
  faxModemTrainingFailure(6118), -- DEPRECATED
9.3 IPP Attribute Value Registrations

This section contains the exact registration information for IANA to update according to the procedures defined in [STD92].

The registry entry will contain the following information:

Section 2 (Keyword Attribute Values)

<table>
<thead>
<tr>
<th>Attribute Name (attribute syntax)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>printer-state-reasons (isetOf type2 keyword)</td>
<td>[STD92]</td>
</tr>
<tr>
<td>input-media-tray-feed-error</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-media-tray-jam</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-media-tray-failure</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-pick-roller-life-warn</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-pick-roller-life-over</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-pick-roller-failure</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>input-pick-roller-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>output-media-tray-feed-error</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>output-media-tray-jam</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>output-media-tray-failure</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-cleaner-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-developer-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-fuser-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-ink-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-opc-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-print-ribbon-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-supply-almost-empty</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-supply-empty</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-supply-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-waste-almost-full</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-waste-full</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-waste-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-waste-ink-receptacle-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-waste-toner-receptacle-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>marker-toner-missing</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-failure</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-jam</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-input-request</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-input-feed-error</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-input-jam</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-input-empty</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-output-feed-error</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-output-jam</td>
<td>[PWG5107.3]</td>
</tr>
<tr>
<td>media-path-output-full</td>
<td>[PWG5107.3]</td>
</tr>
</tbody>
</table>
media-path-pick-roller-life-warn
media-path-pick-roller-life-over
media-path-pick-roller-failure
media-path-pick-roller-missing
scanner-light-life-almost-over
scanner-light-life-over
scanner-light-failure
scanner-light-missing
scanner-sensor-life-almost-over
scanner-sensor-life-over
scanner-sensor-failure
scanner-sensor-missing
scan-media-path-tray-missing
scan-media-path-tray-almost-full
scan-media-path-tray-full
scan-media-path-failure
scan-media-path-jam
scan-media-path-input-request
scan-media-path-input-feed-error
scan-media-path-input-jam
scan-media-path-output-feed-error
scan-media-path-output-jam
scan-media-path-output-full
scan-media-path-pick-roller-life-warn
scan-media-path-pick-roller-life-over
scan-media-path-pick-roller-failure
scan-media-path-pick-roller-missing
fax-modem-missing
fax-modem-life-almost-over
fax-modem-life-over
fax-modem-turned-on
fax-modem-turned-off

10. References

10.1 Normative References


10.2 Informative References


11. Author’s Address

Ira McDonald
High North Inc
PO Box 221
Grand Marais, MI 49839
Phone: 906-494-2434
The following individuals also contributed to the development of this document:

- Charles Baxter  Xerox
- Ron Bergman  (original Author)
- John Boyd  Toshiba
- Lee Farrell
- Walt Filbrich
- Gail Giansiracusa  Kyocera Mita
- Smith Kennedy  HP Inc
- Sheng Lee  Toshiba
- Harry Lewis
- Christopher Rizzo  Xerox
- Stuart Rowley  InfoPrint Solutions
- Michael Sweet  Apple
- Ole Skov  MPI Tech
- Thomas Silver  Xerox
- Jerry Thrasher
- Paul Tykodi  Tykodi Consulting Services
- Bill Wagner  TIC
- Craig Whittle
- Rick Yardumian  Canon
- Peter Zehler  Xerox
12. Change History

12.1 13 February 2019

- Prototype draft revision (Ira McDonald) – changes per IPP WG review (January 2019).
- Global – Revised all tables to make first row (header) repeat on every page.
- Verified section 2.3 Protocol Role Terminology normative references to [RFC7230] – no change.
- Deleted section 3.2.3 MFDs with Web-based Fleet Management use case – out-of-scope.
- Revised section 3.3 Exceptions to say there are no significant exceptions and deleted corresponding Comment IM1.
- Revised section 4 SNMP Printer Model Extensions to delete Comment IM2 about exposing further Printer MIB subunits in IPP since we already decided not to do so.
- Revised section 6.3 IPP Printer Conformance Requirements and section 6.4 IPP Client Conformance Requirements to delete item (3) about implementing prtAlertTable since it’s out-of-scope.
- Revised section 7.1 IPP Internationalization Considerations to add bullets to all lists and change [UTR20] (withdrawn technical report) to [UNICODEXML] (UTR20 transitioned to W3C).
- Revised section 8.1 IPP Security Considerations to add bullets to all lists and correct an indentation issue in one paragraph.
- Global – Revised section 10 References to append trailing “/” to all Unicode references, update dated versions of all Unicode references, delete [UTR20] (withdrawn technical report) and add [UNICODEXML] (UTR20 transitioned to W3C).
- Revised section 10.1 Normative References to delete [RFC2616] but keep [RFC7230].

12.2 28 December 2018

- Interim draft revision (Ira McDonald) – changes per PWG F2F review (November 2018).
- **TODO** – Update section 10 References.

- Global – Replaced “[RFC8010]” and “[RFC8011]” with “[STD92]” and fixed References.

- Global – Replace “RFC2119” with “[BCP14]” and fixed References.

- Global – Changed SNMP and IPP protocol roles for clarity per section 2.3 (see below).

- Revised document title and URI from “pmp” to “pwg” scope and v1.0 to v1.1.

- Revised copyright in headers and page 2 to show span “2012-2018”.

- Revised Abstract to simplify.

- Revised section 2.3 Protocol Role Terminology to change “Client” to “IPP Client”, change “Printer” to “IPP Printer”, change “Printer MIB Agent” to “SNMP Printer”, and change “Printer MIB Client” to “SNMP Client”.

- Revised title of section 3.1 Rationale for Printer MIB and IPP MFD Alerts to “Rationale” and add numbering for clarity.

- Revised section 3.3 Exceptions to add Comment to define some (they’re missing).

- Revised section 3.4 Out of Scope to align text with current Document Object draft and add numbering.

- Revised section 3.5 Design Requirements to align text with current Document Object draft and add numbering.

- Revised title of section 4 Printer Model Extensions to “SNMP Printer Model Extensions” for clarity (i.e., these are extensions are to the Printer MIB v2 model).

- Revised title of section 5 MFD and Printer Extension Alerts to “MFD Alerts” for clarity.

- Revised title of section 5.1 MFD Alert Groups to “MFD Subunit Alert Groups” for clarity.

- Revised title of section 5.2 MFD and Printer Extension Subunit Alerts to “MFD Subunit Alerts” for clarity.

- Revised title of Table 2 MFD and Printer Subunit Alerts to “MFD Subunit Alerts” for clarity and added note about “Error” ending only when MFD/Printer is stopped.

- Revised title of Table 3 IPP printer-state-reasons to “IPP MFD printer-state-reasons” for clarity and added notes about “error” ending only when MFD/Printer is stopped and non-mapping of transient FaxModem alerts to IPP.

- Revised Table 3 IPP MFD printer-state-reasons to add missing hyphen to “scan-media-path-input-feed-error” to correct a typo.
- Revised title of section 7.1 IPP Standard Internationalization Considerations to “IPP Internationalization Considerations” for clarity and removed numbering in first list.

- Revised title of section 7.2 MFD Alerts Internationalization Considerations to “SNMP Internationalization Considerations” for clarity.

- Revised title of section 8.1 Standard IPP Security Considerations to “IPP Security Considerations” for clarity.

- Revised title of section 8.2 MFD Alerts Security Considerations to “SNMP Security Considerations” for clarity.

- Revised section 9.2 Alert Codes to suffix “—DEPRECATED” to all of the FaxModem transient alerts (NOT mapped to IPP).

- Revised title of section 9.3 IPP Attribute and Keyword Value Registrations to “IPP Attribute Value Registrations” for consistency and concatenated with former section 9.5

- Deleted original section 9.4 through section 9.8 (all redundant).

- Revised section 11 Author’s Address to move Ron Bergman down to Contributors (as original Author), remove Lexmark from Jerry Thrasher, and add Rick Yardumian and Christopher Rizzo.

12.3 13 August 2018

- Interim draft revision (Ira McDonald).

- Revised section 5.2 Table 2 MFD and Printer Subunit Alerts, to add 15 new Marker Supplies alerts, per Lee Hills (Xerox) and Mike Sweet (Apple).

- Revised section 5.3 Table 3 IPP printer-state-reasons, to correct numeric values for several Scanner alerts (per Table 2) and add “scannerSensorMissing(5114)”, per Rick Yardumian (Canon).

- Revised section 5.3 Table 3 IPP printer-state-reasons, to add 15 new Marker Supplies alerts, per Lee Hills (Xerox) and Mike Sweet (Apple).

- Revised section 9.2 Alert Codes, to add new Marker Supplies and Scanner alerts (per Table 2), per Lee Hills (Xerox), Rick Yardumian (Canon), and Mike Sweet (Apple).

- Revised section 9.3 IPP Attribute and Keyword Value Registrations, to add new Marker Supplies and Scanner alerts (per Table 3), per Lee Hills (Xerox), Rick Yardumian (Canon), and Mike Sweet (Apple).

- Revised sections 9.x to correct registration procedure references in RFC 8011.

- Deleted section 9.9 Semantic Model Registrations (no longer relevant).
- Revised section 10.1 Normative References, to add “STD92” for RFC 8010/8011 and delete PWG 5108.07 (no longer relevant).

12.4 9 February 2018

- Initial draft revision (Smith Kennedy).

- Converted original version to current PWG document template.