Printer Management Objects: Input, Output, Medium Resource, and Finisher Classes

Michael MacKay, Xerox Corporation
Harry Lewis, Pennant Systems, an IBM Company

This document specifies class and object definitions for management of printing devices and resources through programmatic interfaces such as the Desktop Management Task Force (DMTF) Desktop Management Interface (DMI), and also through management protocols such as SNMP or CMIP.

Specifically, this document defines classes and objects supporting management of

- input sources for printing media, their characteristic attributes, and controls,
- medium resources and their characteristics,
- output destinations for delivery of printing media, their characteristic attributes, and controls, and
- finishing mechanisms for production of printed documents, their characteristic attributes and controls.

The syntax utilized for definitions in this document is loosely based on the restricted form of ASN.1 employed for specification of SNMP MIB objects. The reader should *not* assume that any restriction is necessarily implied by the selection of this syntax, as its primary purpose is solely as an aid to concise communication of the specification.

Input Source Class

Input sources are managed as a tabular, indexed collection of possible devices capable of providing media for input to the printing process. Input sources 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.

Basic Input Source Class

Object definitions specified as part of the Basic Input Source Class are mandatory for all conforming implementations.

```
inputDeviceTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF InputDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A list of input devices capable of providing printing media resources
        to this printer including information regarding their identity, possible and
        current configuration, and status."

inputDevice OBJECT-TYPE
    SYNTAX  InputDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "An input device entry in the table of possible input devices
        supported by this printer."
    INDEX   { inputDeviceId }

InputDevice ::=
    SEQUENCE {
        inputDeviceId
            INTEGER,
        inputDeviceType
            INTEGER,
        inputDeviceDimsUnits
            INTEGER,
        inputDeviceCurrentDimsAcrossFeedDirection
            UInteger32,
        inputDeviceCurrentDimsInFeedDirection
            UInteger32,
        inputDeviceCapacityUnits
            INTEGER,
        inputDeviceMaxCapacity
            UInteger32,
        inputDeviceCurrentCapacity
            Gauge32,
        inputDeviceState
            INTEGER
    }
```

```
inputDeviceId OBJECT-TYPE
    SYNTAX  INTEGER
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "A unique value used by this printer to identify an associated input
        device. Although these values may change due to a major reconfiguration
        of the device (e.g. the addition of new input devices to the printer), values
        are expected to remain stable across successive printer power cycles."

inputDeviceType OBJECT-TYPE
    SYNTAX INTEGER {
        sheet-feed-auto-removable-tray (1),
        sheet-feed-auto-bin (2),
        sheet-feed-manual (3),
        continuous-roll (4),
        continuous-fan-fold (5),
        other (6)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This value indicates the type of technology (discriminated primarily
        according to feeder mechanism type) employed by the input device.
        Note, the Optional Input Source Class provides for a descriptor field
        to further qualify the other choice"

inputDeviceDimsUnits OBJECT-TYPE
    SYNTAX INTEGER {
    inches-in-thousandths (1),
    inches-in-hundredths (2),
    inches-in-tenths (3),
    inches (4),
    millimeters-in-hundredths (5),
    millimeters-in-tenths (6),
    millimeters (7),
    centimeters (8)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This object provides a technology-independent means for input devices to
        identify the units of measurement for use in calculating and relaying
        dimensional values."
```

inputDeviceCurrentDimsAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the current dimensions supported by the input device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

inputDeviceCurrentDimsInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the current dimensions supported by the input device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

inputDeviceCapacityUnits OBJECT-TYPE
SYNTAX INTEGER {
pages (1),
inches (2),
feed (3),
yards (4),
millimeters (5),
centimeters (6),
decimeters (7),
meters (8),
characters (9),
tens-of-characters (10),
hundreds-of-characters (11),
thousands-of-characters (12),
lines (13),
tens-of-lines (14),
hundreds-of-lines (15),
thousands-of-lines (16),
other (17)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides a technology-independent means for input devices to identify the units of measurement for use in calculating and relaying capacity values."

inputDeviceMaxCapacity OBJECT-TYPE

```
inputDeviceMaxCapacity OBJECT-TYPE
    SYNTAX  UInteger32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The maximum capacity of the input source in input device capacity units."
```

inputDeviceCurrentCapacity OBJECT-TYPE

```
    SYNTAX Gauge32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The current capacity of the the input source in input device capacity units."
```

inputDeviceState OBJECT-TYPE

```
    SYNTAX INTEGER {
        ready (1),
        busy (2),
        on-request (3),
        unavailable (4),
        selected (5),
        lowering (6),
        lowered (7),
        raising (8),
        tray-missing (9),
        jammed (10)
    }
    MAX-ACCESS read-only
    STATUS  current
    DESCRIPTION
        "This value indicates the current state of the specific input device.
         State           Definition
         ready           the input device is operational and available for all requests
         busy            the input device is operational, but is currently occupied
                         with a request for activity
         on-request      the input device is not currently available to service requests,
                         but it could be made available (brought to the ready state)
                         with possibly some human intervention such as adding
                         paper; the on-request state will most commonly be reported
                         through inputDeviceAlert traps when a device is out of paper
         unavailable     the input device is unavailable for use (this is the same
                         as "broken" in some other terminologies)
         selected        the input device is the currently selected input source
         lowering        the input device is a bin and it is lowering
         lowered         the input device is a bin, and it has settled in the lowered
                         configuration
         raising         the input device is a bin, and it is raising
         tray-missing    the input device is a tray, and the tray is removed
         jammed          the input device is reporting a paper misfeed."
```

Optional Input Source Class Specification

```
inputDeviceTypeExtended OBJECT-TYPE
    SYNTAX InputDeviceTypeExtended
    MAX-ACCESS not-accessible
    STATUS mandatory
    DESCRIPTION
        "A list of information suitable for extended input device management."
    AUGMENTS
        { inputDevice }

InputDeviceTypeExtended ::=
    SEQUENCE {
        inputDeviceName
            DisplayString ( SIZE ( 0 .. 255 ) ),
        inputDeviceModel
            DisplayString ( SIZE ( 0 .. 255 ) ),
        inputDeviceSerialNumber
            DisplayString ( SIZE ( 0 ..  255) ),
        inputDeviceDescriptor
            DisplayString ( SIZE ( 0 ..  255) )
    }

inputDeviceName  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        " The name assigned to this input device."

inputDeviceModel  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        " The model name of this input device."

inputDeviceSerialNumber  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        " The serial number assigned to this input device."

inputDeviceDescriptor  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "A free-form text description of this input device."
```

```
inputDeviceDimsExtended OBJECT-TYPE
    SYNTAX InputDeviceDimsExtended
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of information suitable for extended input device management."
    AUGMENTS
        { inputDevice }

InputDeviceDimsExtended ::=
    SEQUENCE {
        inputDeviceMaxDimsAcrossFeedDirection
            UInteger32,
        inputDeviceMaxDimsInFeedDirection
            UInteger32,
        inputDeviceMinDimsAcrossFeedDirection
            UInteger32,
        inputDeviceMinDimsInFeedDirection
            UInteger32,
        unprintableMarginAcrossFeedDirection
            UInteger32,
        unprintableMarginInFeedDirection
            UInteger32
        }

inputDeviceMaxDimsAcrossFeedDirection OBJECT-TYPE
    SYNTAX UInteger32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This object provides the value of the maximum dimensions supported by the
        input device for measurements taken ninety degrees relative to the feed
        direction associated with that device. The value zero specifically indicates
        that the input device places no restriction on values for this dimension."

inputDeviceMaxDimsInFeedDirection OBJECT-TYPE
    SYNTAX  UInteger32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This object provides the value of the maximum dimensions supported by the
        input device for measurements taken parallel relative to the feed direction
        associated with that device. The value zero specifically indicates
        that the input device places no restriction on values for this dimension."
```

inputDeviceMinDimsAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the minimum dimensions supported by the input device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

inputDeviceMinDimsInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the minimum dimensions supported by the input device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

unprintableMarginAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value for dimensions of the unprintable margin area for media supported by this input device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

unprintableMarginInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value for dimensions of the unprintable margin area for media supported by this input device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the input device places no restriction on values for this dimension."

Input Source Class Controls

defaultInputDevice OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object enables the caller either to interrogate, and optionally, if properly authorized, to set the default input device for the associated printer. The value is the value of the corresponding input device's inputDeviceId object value."

Input Source Class Notifications

inputDeviceAlert NOTIFICATION-TYPE
OBJECTS { inputDeviceId, inputDeviceState }
STATUS current
DESCRIPTION
"An inputDeviceAlert trap signifies that the reporting agent has determined a significant change in the state of the indicated input device. This trap should be used to direct polling of the input device for further determination of the exact nature of the problem."

Medium Resource Class

The Medium Resource class 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 Medium Resource class is conceptually built in the form of an SNMP "AUGMENTS" construction off of the InputDevice table. In this manner, a minimally conforming implementation may choose to not support reporting of media resources if it cannot do so.

The Medium Resource Class is separated into two levels of support, a *basic* set and a more comprehensive *extended* set. In practice, implementors will choose between one of the two sets, since they both AUGMENT the InputDevice table similarly and are differentiated only by the collection of objects accessible through them. That is, the *extended* version of the Medium Resource Class does not augment the *basic* version. Rather, the two definitons overlap and simply represent different levels of support suitable to the goals of different products and the markets that they serve.

mediumResourceBasic OBJECT-TYPE
    SYNTAX MediumResourceBasic
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of medium resources capable of heing provided by the associated input device."
    AUGMENTS
        { inputDevice }

MediumResourceBasic ::=
    SEQUENCE {
        mediumName
            DisplayString (SIZE (0 .. 255)),
        mediumSizeEnumerated
            INTEGER,
    }

mediumResourceExtended OBJECT-TYPE
    SYNTAX MediumResourceBasic
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of medium resources capable of heing provided by the associated input device."
    AUGMENTS
        { inputDevice }

```
MediumResourceExtended ::=
    SEQUENCE {
        mediumName
            DisplayString ( SIZE ( 0 .. 255 ) ),
        mediumSizeEnumerated
            INTEGER,
        mediumDimsUnits
            INTEGER,
        mediumSizeAcrossFeedDirection
            UInteger32,
        mediumSizeInFeedDirection
            UInteger32,
        mediumWeight
            UInteger32,
        mediumType
            DisplayString ( SIZE ( 0 .. 255 ) ),
        mediumColor
            DisplayString ( SIZE ( 0 .. 255 ) ),
        mediumFormParts
            INTEGER
        }

mediumName  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "This object identifies the name of the medium associated with the input
        device"

mediumSizeEnumerated  OBJECT-TYPE
    SYNTAX  INTEGER  {
        -- the enumeration values for media size are based on the standard ISO, JIS,
        -- and North American medium size identifiers; these values are conveniently
        -- defined in both the ISO10175 specification, and the NPA Printing Protocol
        -- specification, and are not duplicated in this proposal
    }
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "This object identifies the standard size of the medium associated with
        the input device"
```

mediumDimsUnits OBJECT-TYPE
SYNTAX INTEGER {
inches-in-thousandths (1),
inches-in-hundredths (2),
inches-in-tenths (3),
inches (4),
millimeters-in-hundredths (5),
millimeters-in-tenths (6),
millimeters (7),
centimeters (8)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides a technology-independent means for medium specifications to identify the units of measurement for use in calculating and relaying dimensional values."

mediumSizeAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object identifies the size of the medium for measurements taken ninety degrees relative to the feeding mechanism path of the associated input device. The value is interpreted relative to the value of the mediumDimsUnits object."

mediumSizeInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object identifies the size of the medium for measurements taken parallel relative to the feeding mechanism path of the associated input device.
The value is interpreted relative to the value of the mediumDimsUnits object."

mediumWeight OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object identifies the weight of the medium in grams / per meter squared"

```
mediumType  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “This object is a named identifier useful for qualifying the type of the medium
        Standard named values for this object include the following:
            stationery
            transparency
            envelope
            continuous-long
            continuous-short
            tab-stock
            multi-part-form

        These values are standardized in ISO10175 (DPA) and in ISO10180 (SPDL),
        and include associated Object Identifer values.”

mediumColor OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “This object is a named identifier useful for qualifying the color of the medium
        Standard named values for this object include the following:
            white
            pink
            yellow
            buff
            goldenrod
            blue
            green
            transparent

        These values are standardized in ISO10175 (DPA) and in ISO10180 (SPDL),
        and include associated Object Identifer values.”

mediumFormParts  OBJECT-TYPE
    SYNTAX  INTEGER
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “The number of parts associated with this media if it is a multi-part form.”
```

Output Class

Ouput destinations are managed as a tabular, indexed collection of possible devices capable of receiving media delivered from the printing process. Output destinations 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.

Basic Ouput Class

Object definitions specified as part of the Basic Output Class are mandatory for all conforming implementations.

```
outputDeviceTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF OutputDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A list of output devices capable of accepting and delivering printed media
        from an associated printing process to this printer including information
        regarding their identity, possible and current configuration, and status."

outputDevice OBJECT-TYPE
    SYNTAX  OutputDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "An output device entry in the table of possible output devices
        supported by this printer."
    INDEX   { outputDeviceId }

OutputDevice ::=
    SEQUENCE {
        outputDeviceId
            INTEGER,
        outputDeviceType
            INTEGER,
        outputDeviceCapacityUnits
            INTEGER,
        outputDeviceMaxCapacity
            UInteger32,
        outputDeviceCurrentCapacity
            Gauge32,
        outputDeviceState
            INTEGER
    }
```

outputDeviceId OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS current
DESCRIPTION
"A unique value used by this printer to identify an associated output device. Although these values may change due to a major reconfiguration of the device (e.g. the addition of new output devices to the printer), values are expected to remain stable across successive printer power cycles."

outputDeviceType OBJECT-TYPE
SYNTAX INTEGER {
unsecure-tray (1),
unsecure-bin (2),
secure-tray (3),
secure-bin (4),
continuous-roll-device (5),
mailbox (6),
other (7)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This value indicates the type of technology supported by the output device. Note, the Optional Output Class provides for a descriptor field to further qualify the *other* choice"

```
outputDeviceCapacityUnits OBJECT-TYPE
    SYNTAX INTEGER {
        pages (1),
        inches (2),
        feed (3),
        yards (4),
        millimeters (5),
        centimeters (6),
        decimeters (7),
        meters (8),
        characters (9),
        tens-of-characters (10),
        hundreds-of-characters (11),
        thousands-of-characters (12),
        lines (13),
        tens-of-lines (14),
        hundreds-of-lines (15),
        thousands-of-lines (16),
        sets (17),
        other (18)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        “This object provides a technology-independent means for output devices to
        identify the units of measurement for use in calculating and relaying
        capacity values.”

outputDeviceMaxCapacity OBJECT-TYPE
    SYNTAX  UInteger32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        “The maximum capacity of the output destination in output device capacity
        units.”

outputDeviceCurrentCapacity OBJECT-TYPE
    SYNTAX Gauge32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        “The current capacity of the output destination in output device capacity
        units.”
```

```
outputDeviceState OBJECT-TYPE
    SYNTAX INTEGER {
        ready (1),
        busy (2),
        on-request (3),
        unavailable (4),
        selected (5),
        lowering (6),
        lowered (7),
        raising (8),
        tray-missing (9),
        jammed (10)
    }
    MAX-ACCESS read-only
    STATUS  current
    DESCRIPTION
        "This value indicates the current state of the specific output device.
         State           Definition
         ready           the output device is operational and available for all requests
         busy            the output device is operational, but is currently occupied
                         with a request for activity
         on-request      the output device is not currently available to service
                         requests, but it could be made available (brought to the ready
                         state) with possibly some human intervention
         unavailable     the output device is unavailable for use (this is the same
                         as "broken" in some other terminologies)
         selected        the output device is the currently selected output destination
         lowering        the output device is a bin and it is lowering
         lowered         the output device is a bin, and it has settled in the lowered
                         configuration
         raising         the output device is a bin, and it is raising
         tray-missing    the output device is a tray, and it is not currently installed
         jammed          the output device is reporting a paper misfeed."
```

Optional Output Class Specifications

The following optional object definitions may be used by devices to consistently report configuration and status information about a wide variety of common, but optional product capabilities associated with printing output.

Ouput Device Features and Controls

```
outputDeviceFeatures  OBJECT-TYPE
    SYNTAX OutputDeviceFeatures
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The outputDeviceFeatures object extends the basic outputDevice table with
        standardized and commonly useful, but possibly optional objects not required
        of a minimally conforming implementation."
    AUGMENTS
        { outputDevice }

OutputDeviceFeatures ::=
    SEQUENCE  {
        outputFaceUp
            INTEGER,
        outputFaceDown
            INTEGER,
        outputBursting
            INTEGER,
        outputDecollating
            INTEGER,
        outputPageCollated
            INTEGER,
        outputJobCollated
            INTEGER,
        outputOffsetStacking
            INTEGER,
        outputSlipsheet
            INTEGER
    }
```

```
outputFaceUp OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        “By its presence, this object indicates that the output device supports
        face-up delivery of pages, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature.”

outputFaceDown OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        “By its presence, this object indicates that the output device supports
        face-down delivery of pages, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature.”

outputBursting OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        “By its presence, this object indicates that the output device 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-formred perforations.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature.”
```

```
outputDecollating OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device 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.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature."

outputPageCollated OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        page collation, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature."

outputJobCollated OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        job collation, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature."
```

```
outputOffsetStacking OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        offset stacking, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature."

outputSetSlipsheet OBJECT-TYPE
    SYNTAX  INTEGER {
        off (0),
        on (1)
    }
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        slipsheet insertion between sets, and if so, whether the feature is enabled.
        Properly authorized management consoles may be permitted to use this value
        as a control to enable / disable this feature."
```

Output Device Associated Finisher

Finisher devices are typcially complicated systems and can (or should be) dealt with largely isolated from the "output device." Since there are so many configuration options for finisher devices (and some of them may indeed be integrated within the output device itself), the question is whether to deal with finishers as part of output device management, or whether to deal with them separately. The merit of separating the two "types" of devices is that it enables greater modularity across the widest variety of interesting configurations, and that is the approach taken in this specification.

A common model for basic management of finisher devices is provided later in this proposal in the Finisher Class section.

```
outputDeviceAssociatedFinisher  OBJECT-TYPE
    SYNTAX OutputDeviceAssociatedFinishing
    MAX-ACCESS not-accessible
    STATUS  current
    DESCRIPTION
        "The outputDeviceAssociatedFinisher object extends the basic
        outputDevice table with standardized and commonly useful, but possibly
        optional objects not required of a minimally conforming implementation."
    AUGMENTS
        { outputDevice }

OutputDeviceAssociatedFinisher ::=
    SEQUENCE  {,
        outputStitching
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputFolding
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputBinding
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputPunching
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputTrimming
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputInserting
            DisplayString ( SIZE ( 0 .. 255 ) )
    }

outputStitching OBJECT-TYPE
    SYNTAX DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        stapling as a process accessible in the production path associated with it. The
        value returned by this object is the identifier for the associated finishing device;
        the value serves as the index for identifying the device in the FinisherDevice
        table."
```

outputFolding OBJECT-TYPE
SYNTAX DisplayString (SIZE (0 .. 255))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"By its presence, this object indicates that the output device supports folding as a process accessible in the production path associated with it. The value returned by this object is the identifier for the associated finishing device; the value serves as the index for identifying the device in the FinisherDevice table."

outputBinding OBJECT-TYPE
SYNTAX DisplayString (SIZE (0 .. 255))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"By its presence, this object indicates that the output device supports binding as a process accessible in the production path associated with it. The value returned by this object is the identifier for the associated finishing device; the value serves as the index for identifying the device in the FinisherDevice table."

outputPunching OBJECT-TYPE
SYNTAX DisplayString (SIZE (0 .. 255))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"By its presence, this object indicates that the output device supports punching as a process accessible in the production path associated with it. The value returned by this object is the identifier for the associated finishing device; the value serves as the index for identifying the device in the FinisherDevice table."

outputTrimming OBJECT-TYPE
SYNTAX DisplayString (SIZE (0 .. 255))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"By its presence, this object indicates that the output device supports trimming as a process accessible in the production path associated with it. The value returned by this object is the identifier for the associated finishing device; the value serves as the index for identifying the device in the FinisherDevice table."

```
outputInserting OBJECT-TYPE
    SYNTAX DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "By its presence, this object indicates that the output device supports
        inserting as a process accessible in the production path associated with it. The
        value returned by this object is the identifier for the associated finishing device;
        the value serves as the index for identifying the device in the FinisherDevice
        table."
```

Output Device Type Extensions

These objects extend the basic OutputDevice table with objects suitable for management of more complex printing systems.

```
outputDeviceTypeExtended OBJECT-TYPE
    SYNTAX OutputDeviceTypeExtended
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The outputDeviceTypeExtended object defines additional, optional type
        information that is standardized and useful but not required for support by
        minimally conforming implementations."
    AUGMENTS
        { outputDevice }

OutputDeviceTypeExtended ::=
    SEQUENCE {
        outputDeviceName
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputDeviceModel
            DisplayString ( SIZE ( 0 .. 255 ) ),
        outputDeviceSerialNumber
            DisplayString ( SIZE ( 0 ..  255 ) ),
        outputDeviceDescriptor
            DisplayString ( SIZE ( 0 .. 255 ) )
    }

outputDeviceName  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        " The name assigned to this output device."
```

```
outputDeviceModel  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “ The model name of this output device.“

outputDeviceSerialNumber  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “ The serial number assigned to this output device.“

outputDeviceDescriptor  OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS  read-only
    STATUS  current
    DESCRIPTION
        “A free-form text description of this output device.“

outputDeviceDimsExtended OBJECT-TYPE
    SYNTAX OutputDeviceDimsExtended
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        “A list of information suitable for extended output device management.”
    AUGMENTS
        { outputDevice }

OutputDeviceDimsExtended ::=
    SEQUENCE {
        outputDeviceDimsUnits
            INTEGER,
        outputDeviceCurrentDimsAcrossFeedDirection
            UInteger32,
        outputDeviceCurrentDimsInFeedDirection
            UInteger32,
        outputDeviceMaxDimsAcrossFeedDirection
            UInteger32,
        outputDeviceMaxDimsInFeedDirection
            UInteger32,
        outputDeviceMinDimsAcrossFeedDirection
            UInteger32,
        outputDeviceMinDimsInFeedDirection
            UInteger32
        }
```

outputDeviceDimsUnits OBJECT-TYPE
SYNTAX INTEGER {
inches-in-thousandths (1),
inches-in-hundredths (2),
inches-in-tenths (3),
inches (4),
millimeters-in-hundredths (5),
millimeters-in-tenths (6),
millimeters (7),
centimeters (8)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides a technology-independent means for output devices to identify the units of measurement for use in calculating and relaying dimensional values."

outputDeviceCurrentDimsAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the current dimensions supported by the output device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

outputDeviceCurrentDimsInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the current dimensions supported by the output device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

outputDeviceMaxDimsAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the maximum dimensions supported by the output device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

outputDeviceMaxDimsInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the maximum dimensions supported by the output device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

outputDeviceMinDimsAcrossFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the minimum dimensions supported by the output device for measurements taken ninety degrees relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

outputDeviceMinDimsInFeedDirection OBJECT-TYPE
SYNTAX UInteger32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object provides the value of the minimum dimensions supported by the output device for measurements taken parallel relative to the feed direction associated with that device. The value zero specifically indicates that the output device places no restriction on values for this dimension."

Output Class Controls

defaultOutputDevice OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This object enables the caller either to interrogate, and optionally, if properly authorized, to set the default output device for the associated printer. The is the value of the corresponding output device's outputDeviceId object value."

Output Class Notifications

outputDeviceAlert NOTIFICATION-TYPE
OBJECTS { outputDeviceId, outputDeviceState }
STATUS current
DESCRIPTION
"An outputDeviceAlert trap signifies that the reporting agent has determined a significant change in the state of the indicated output device. This trap should be used to direct polling of the output device for further determination of the exact nature of the problem."

Finisher Class

The Finisher Class is an optional class, and is included in this specification for completeness due to its relationship to the Output Class.

In general, finishers are very complicated devices and their management is a topic suitable for considerable, additional investigation. The goal of this class is therefore *not* to standardize management of arbitrarily complex finishers. Rather, this class only standardizes basic management objects suitable for a very generic abstract finisher. The value of this, is that by defining this basic class we establish the architectural framework for a common approach which can then be augmented as required in a consistent manner by vendors and consortia.

Basic Finisher Class

Object definitions specified as part of the Basic Finisher Class are optional for all conforming implementations.

```
finisherDeviceTable OBJECT-TYPE
    SYNTAX  SEQUENCE OF FinisherDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A list of finisher devices installed in the current print path."

finisherDevice OBJECT-TYPE
    SYNTAX  FinisherDevice
    ACCESS  not-accessible
    STATUS  current
    DESCRIPTION
        "A finisher device entry in the table of possible finisher devices
        supported by this printer."
    INDEX   { IMPLIED finisherDeviceId }
```

```
FinisherDevice ::=
    SEQUENCE {
        finisherDeviceId
            DisplayString ( SIZE ( 0 .. 255 ) ),
        finisherDeviceType
            DisplayString ( SIZE ( 0 .. 255 ) ),
        finisherNamedFinishings
            DisplayString ( SIZE ( 0 .. 255 ) ),
        finisherConsumableResourceUnits
            DisplayString ( SIZE ( 0 .. 255 ) ),
        finisherDeviceMaxComsumableResourceCapacity
            UInteger32,
        finisherDeviceCurrentComsumableResourceCapacity
            Gauge32,
        finisherDeviceState
            INTEGER
    }

finisherDeviceId OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "A unique value used to identify this finisher device."

finisherDeviceType OBJECT-TYPE
    SYNTAX DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A unique value used to name the type of finishing performed by this device.
        Commonly standardized names include:
            stitching,
            binding,
            trimming,
            die-cutting,
            punching,
            perforating,
            slitting,
            inserting,
            covers,
            folding
        These names are based on ISO10175 (DPA) and ISO10180 (SPDL)."
```

```
finisherNamedFinishings OBJECT-TYPE
    SYNTAX DisplayString ( SIZE ( 0 .. 255 ) )
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A unique value used to identify finishing operations available through this
        device. Commonly standardized names include:
            staple,
            staple-top-left,
            staple-bottom-left,
            staple-top-right,
            staple-bottom-right,
            saddle-stitch,
            edge-stitch,
            punch,
            cover,
            bind
        These names are based on ISO10175 (DPA) and ISO10180 (SPDL), and are
        specified with associated Object Identifiers in those standards."

finisherConsumableResourceUnits OBJECT-TYPE
    SYNTAX  DisplayString ( SIZE ( 0 .. 255 ) )
    ACCESS  read-only
    STATUS  current
    DESCRIPTION
        "The name of the resource units appropriate to this finisher device and its
        operation."

finisherDeviceMaxConsumableResourceCapacity OBJECT-TYPE
    SYNTAX  UInteger32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The maximum capacity of the finisher expressed relative to the named
        finisher units value. This value is particularly suited for providing a gauge that
        can reflect the current available resource capacity of the finisher."

outputDeviceCurrentConsumableResourceCapacity OBJECT-TYPE
    SYNTAX Gauge32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The current capacity of the finisher expressed relative to the named
        finisher units value. This value is particularly suited for providing a gauge that
        can reflect the current available resource capacity of the finisher."

finisherDeviceState OBJECT-TYPE
    SYNTAX INTEGER {
        ready (1),
        busy (2),
```

```
        on-request (3),
        unavailable (4),
        selected (5),
        jammed (6)
    }
    MAX-ACCESS read-only
    STATUS  current
    DESCRIPTION
        "This value indicates the current state of the specific output device.
```

State	Definition
ready	the finisher device is operational for all requests
busy	the finisher device is operational, but is currently occupied with a request for activity
on-request	the finisher device is not currently available to service requests, but it could be made available (brought to the ready state) with possibly some human intervention
unavailable	the finisher device is unavailable for use (this is the same as "broken" in some other terminologies)
selected	the finisher device is the currently selected device
jammed	the finisher device is reporting a paper misfeed."

Finisher Notifications

finisherDeviceAlert NOTIFICATION-TYPE

```
    OBJECTS { finisherDeviceId, finisherDeviceState }
    STATUS  current
    DESCRIPTION
        "A finisherDeviceAlert trap signifies that the reporting agent has determined
        a significant change in the state of the indicated finisher device. This trap
        should be used to direct polling of the finisher device for further determination
        of the exact nature of the problem."
```