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Informational PWG Document

The Printer Working Group

PWG: Imaging Counter MIB v1.0

Status: Approved

Abstract:
This document defines the PWG Imaging Counter (IC) MIB v1.0 that supports monitoring of system-, service-, and subunit-level counters on imaging devices (dedicated systems) and imaging servers (multipurpose systems). The IC MIB can be used for fleet management, enterprise billing, field service, and other applications. The IC MIB is entirely freestanding, but it also facilitates use of the IETF Host Resources MIB [RFC1514] [RFC2790] and IETF Printer MIB [RFC1759] [RFC3805] for imaging device and imaging server monitoring. The IC MIB was developed by the PWG's Web-based Imaging Management Service (WIMS) project and is based on the PWG Imaging System Counters specification.

This document is available at:
ftp://ftp.pwg.org/pub/pwg/informational/info-wimscountmib10-20051223.pdf , doc

The ASN.1 source for the IC MIB is available at:
ftp://ftp.pwg.org/pub/pwg/informational/info-wimscountmib10-20051223.mib

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 Industry Standards and Technology Organization member organizations include printer manufacturers, print server developers, operating system providers, network operating systems providers, network connectivity vendors, and print management application developers. 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/).
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About the Printer Working Group

The Printer Working Group (or PWG) is a Program of the IEEE-ISTO. All references to the PWG in this document implicitly mean "The Printer Working Group, a Program of the IEEE ISTO." The PWG is chartered to make printers and the applications and operating systems supporting them work together better. In order to meet this objective, the PWG will document the results of their work as open standards that define print related protocols, interfaces, data models, procedures and conventions. Printer manufacturers and vendors of printer related software would 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.

Contact information:


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

PWG Web Page: http://www.pwg.org
PWG Mailing List: pwg@pwg.org (subscribers only)
WIMS Mailing List: wims@pwg.org (subscribers only)
```


Members of the PWG and interested parties are encouraged to join the PWG and WIMS WG mailing lists in order to participate in discussions, clarifications and review of the WG product. Instructions for subscribing to the PWG and WIMS WG mailing lists can be found at:

http://www.pwg.org/mailhelp.html

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1 Introduction

This document defines the PWG Imaging Counter (IC) MIB v1.0 that supports monitoring of system-, service-, and subunit-level counters on imaging devices (dedicated systems) and imaging servers (multipurpose systems). The IC MIB can be used for fleet management, enterprise billing, field service, and other applications. The IC MIB is entirely free-standing, but it also facilitates use of the IETF Host Resources MIB [RFC1514] [RFC2790] and IETF Printer MIB [RFC1759] [RFC3805] for imaging device and imaging server monitoring. The IC MIB was developed by the PWG's Web-based Imaging Management Service (WIMS) project and is based on the PWG Imaging System Counters specification.

2 Terminology

2.1 Conformance Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as defined in [RFC2119].

2.2 Imaging Terminology

Normative definitions and semantics of the following imaging terms are imported from the PWG Imaging System Counters spec [PWG-COUNT]:

```
Availability (class of System and Service counters)
Auxiliary (subclass of Work counters)
Blank Image (unit of Work)
Black Impression (unit of Work)
Blank Impression (unit of Work)
Device (abstract object)
Down Mode (condition of System or Service)
Datastream (subclass of Work counters)
Full Color Image (unit of Work)
Full Color Impression (unit of Work)
Highlight Color Impression (unit of Work)
Image (unit of Work)
Impression (unit of Work)
Job (unit of Monitoring counters)
Maintenance (subclass of Work counters)
Maintenance Mode (condition of System or Service)
Media Used (class of System and Service counters)
Message (unit of Work)
Monitoring (class of System and Service counters)
Monochrome Image (unit of Work)
Monochrome Impression (unit of Work)
Sheet (of hardcopy medium)
System (abstract object)
Two Sided Impression
```



```
User Mode (condition of System or Service)
Waste (subclass of Work counters)
Work (class of System and Service counters)
WorkTotals (class of Work counters)
```

2.2.1 Service

The normative definition and semantics of the imaging term Service (an abstract object) are imported from the PWG Imaging System Counters specification [PWG-COUNT], including the standard set of Service types imported from the 'JmJobServiceTypesTC' textual convention in the IETF Job Monitoring MIB [RFC2707]:

```
Copy (scan and print)
EmailIn (input email messages)
EmailOut (output email messages)
FaxIn (input PSTN fax images)
FaxOut (output PSTN fax images)
NetworkFaxIn (input network fax images)
NetworkFaxOut (output network fax images)
Print (output hardcopy impressions)
Scan (input softcopy images)
```

The PWG Imaging System Counters specification [PWG-COUNT] also defines the following additional Service type:

```
Transform (convert document format)
```

2.2.2 Subunit

The normative definition and semantics of the imaging term Subunit (an abstract object) are imported from IETF Printer MIB v2 [RFC3805], including the standard set of Subunit types imported from the 'PrtAlertGroupTC' textual convention:

```
Console (local console)
Cover (cover, door, or interlock)
InputTray (input media container)
OutputBin (output media container)
Marker (output Sheet impression marker)
MediaPath (from input tray to output bin)
Channel (input job channel)
Interpreter (interpreter or transformer)
```

This document defines the following additional Subunit types:

```
Finisher (hardcopy finisher)
Interface (hardware port associated with a Channel)
Scanner (softcopy image scanner)
```


3 Requirements

3.1 Rationale for Imaging Counter MIB

The PWG Imaging System Counters specification [PWG-COUNT] defines:

- (a) A rationale for abstract counters for Imaging Systems.
- (b) A set of use models for monitoring and billing, management, and accounting using these abstract counters.
- (c) A set of design requirements for these abstract counters.
- (d) A set of abstract counters that satisfies these design requirements.
- (e) A set of conformance requirements for implementations of these abstract counters in Imaging Systems.

In order to implement these abstract counters they MUST be mapped into a concrete encoding and transferred from Imaging Systems to monitoring applications via a concrete protocol.
Currently, the most widely implemented system management protocol on Imaging Systems is SNMP [RFC3410]. Therefore, this document defines a standard mapping of these abstract counters into SMIv2 [RFC 2578] that is accessible via any version of SNMP [RFC3584].

3.2 Use Models of Imaging Counter MIB

3.2.1 Network Server

The IC MIB MAY be implemented by a network server (typically running other non-imaging applications) that supports one or more downstream imaging devices.
If the network server implements the IETF Host Resources MIB [RFC1514] [RFC2790], then it SHOULD implement a row in the 'hrDeviceTable' with an appropriate 'hrDeviceType' for each downstream imaging device supported and it SHOULD implement rows in the 'hrSWInstalledTable' and the 'hrSWRunTable' for each local imaging service supported.

3.2.2 Imaging Device

The IC MIB MAY be implemented by an imaging device (typically running an embedded operating system and possibly multiple imaging services).
If the imaging device implements the IETF Host Resources MIB [RFC1514] [RFC2790], then it SHOULD implement a row in the 'hrDeviceTable' with an appropriate 'hrDeviceType' for each local imaging device supported and it SHOULD implement rows in the 'hrSWInstalledTable' and the 'hrSWRunTable' for each local imaging service supported.

3.3 Design Requirements for Imaging Counter MIB

- (1) The IC MIB design MUST follow all object naming and MIB structuring requirements defined in IETF SMIv2 [RFC2578].
- (2) The IC MIB design SHOULD follow all best practices defined in IETF Guidelines for Authors and Reviewers of MIB Documents [MIB-GUIDE].
- (3) The IC MIB design MUST include all abstract counters defined in the PWG Imaging System Counters specification [PWG-COUNT].
- (4) The IC MIB design MUST NOT require implementation of any version of the IETF Host Resources [RFC1514] [RFC2790] or IETF Printer MIB [RFC1759] [RFC3805] (for low cost of implementation).
- (5) The IC MIB design MUST include System-level counters (see all use models in [PWG-COUNT] and in this document).
- (6) The IC MIB design MUST include Service-level counters and efficient 'direct lookup' of Service keys (see all use models in [PWG-COUNT] and in this document).
- (7) The IC MIB design MUST support extensions for new Service types (see section 3.2 'Imaging System Services' in [PWG-COUNT] and section 4 'Data Classes' in the PWG Semantic Model/1.0 [PWG5105.1]).
- (8) The IC MIB design SHOULD include Subunit-level counters and efficient 'direct lookup' of Subunit keys (see all use models in [PWG-COUNT]).
- (9) The IC MIB design SHOULD support extensions for new Subunit types (see section 2.2 'Printer Sub-Units' in IETF Printer MIB [RFC1759] [RFC3805]).
- (10) The IC MIB design SHOULD support extensions for Job-level counters (see all use models in [PWG-COUNT] and IETF Job Monitoring MIB [RFC2707]).
- (11) The IC MIB design SHOULD include counter notifications (e.g., new service created) in order to implement efficient fleet management and accounting applications.
- (12) The IC MIB design SHOULD be fine-grained (e.g., defining two-sided impression counters and overall impression counters in separate object groups) in order to support clear conformance requirements and to minimize implementation costs.

4 Overview of Imaging Counter MIB

4.1 Structure of Imaging Counter MIB

Before reading the IC MIB you should be familiar with the contents of the PWG Imaging System Counters specification [PWG-COUNT].
The IC MIB is written in SMIv2 [RFC2578] and defines only 'read-only' objects. The IC MIB does NOT define any 'read-write' or 'read-create' objects (i.e., SNMP Set operations are not supported). The IC MIB also defines one notification (i.e., SNMP trap).
The IC MIB defines five mandatory object groups:

- General Group - four scalar objects
- Key Group - one index and four columnar objects
- Service Group - two index and three columnar objects
- Time Group - two index and four columnar objects
- Monitor Group - two index and seventeen columnar objects

The IC MIB defines six conditionally mandatory object groups:

- Subunit Group - two index and two columnar objects
- Image Group - three index and three columnar objects
- Impression Group - three index and five columnar objects
- Two Sided Group - three index and five columnar objects
- Sheet Group - three index and five columnar objects
- Traffic Group - three index and four columnar objects

The IC MIB defines two optional object groups:

- Media Used Group - three index and eight columnar objects
- Alert Group - four index and five columnar objects

4.2 Indexing of Imaging Counter MIB

The Key table in the IC MIB supports _inverted_ lookups and is analogous to the 'jmJobIDTable' in the IETF Job Monitoring MIB [RFC2707]. The Key table supports system allocation of an abstract key for each pair of: (a) 'icServiceType' and 'icServiceIndex' for a Service; or (b) 'icSubunitType' and 'icSubunitIndex' for a Subunit. This abstract key allows both Services and Subunits to _share_ the common counter tables.
The Service table in the IC MIB supports _direct_ lookup of the abstract key for each configured Service type and instance and is indexed by:

- (1) A value from 'IcServiceTypeTC' that identifies the type of Service for the entry (e.g., copy, print, scan, etc.).
- (2) A value of 'icServiceIndex' that identifies the instance of this type of Service.

The Subunit table in the IC MIB supports _direct_ lookup of the abstract key for each configured Subunit type and instance and is indexed by:

- (1) A value from 'IcSubunitTypeTC' that identifies the type of Subunit for the entry (e.g., console, marker, channel, etc.).
- (2) A value of 'icSubunitIndex' that identifies the instance of this type of Subunit.

The Time (Availability) and Monitor tables in the IC MIB are indexed by:

- (1) A value of 'icKeyIndex' that identifies the Service or Subunit instance.
- (2) A value from 'IcPersistenceTC' that identifies the persistence of the entry (i.e., lifetime, since last reboot, or since last reset).

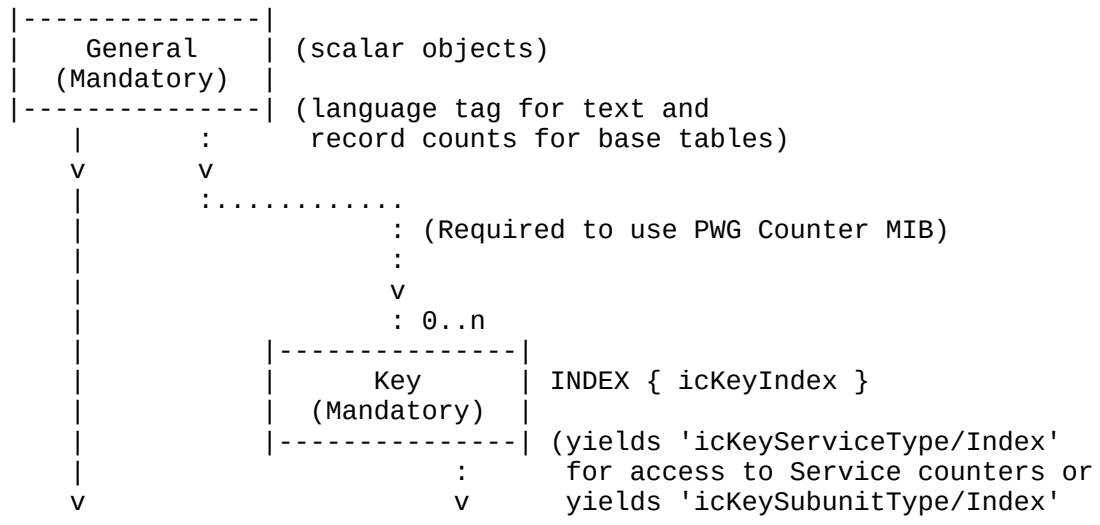
The Media Used and Alert tables in the IC MIB are indexed by:

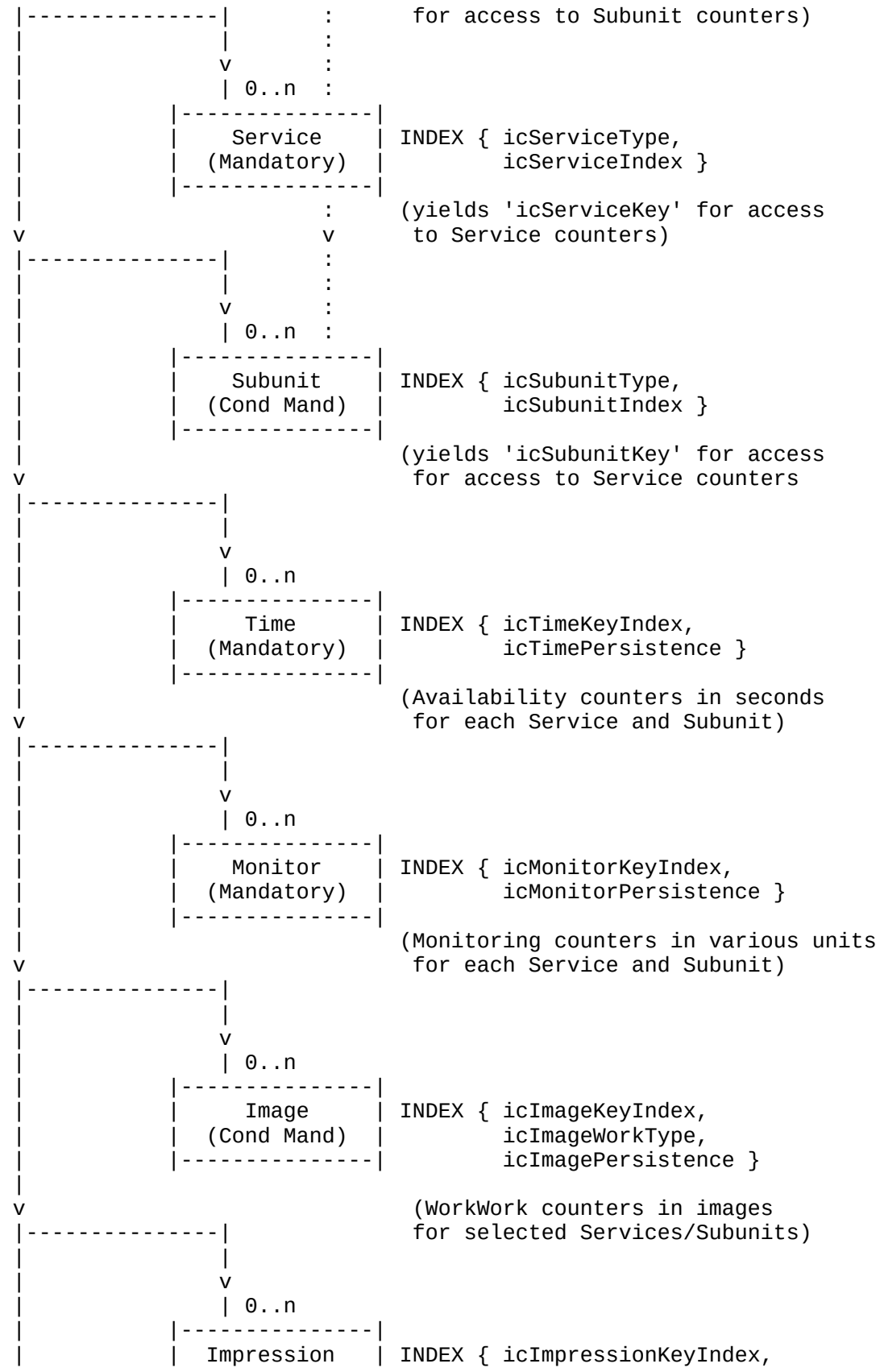
- (1) A value of 'icKeyIndex' that identifies the Service or Subunit instance.
- (2) For the Media Used and Alert tables only, a value of 'icXxxIndex' that identifies the instance of this entry.
- (3) A value from 'IcPersistenceTC' that identifies the persistence of the entry (i.e., lifetime, since last reboot, or since last reset).

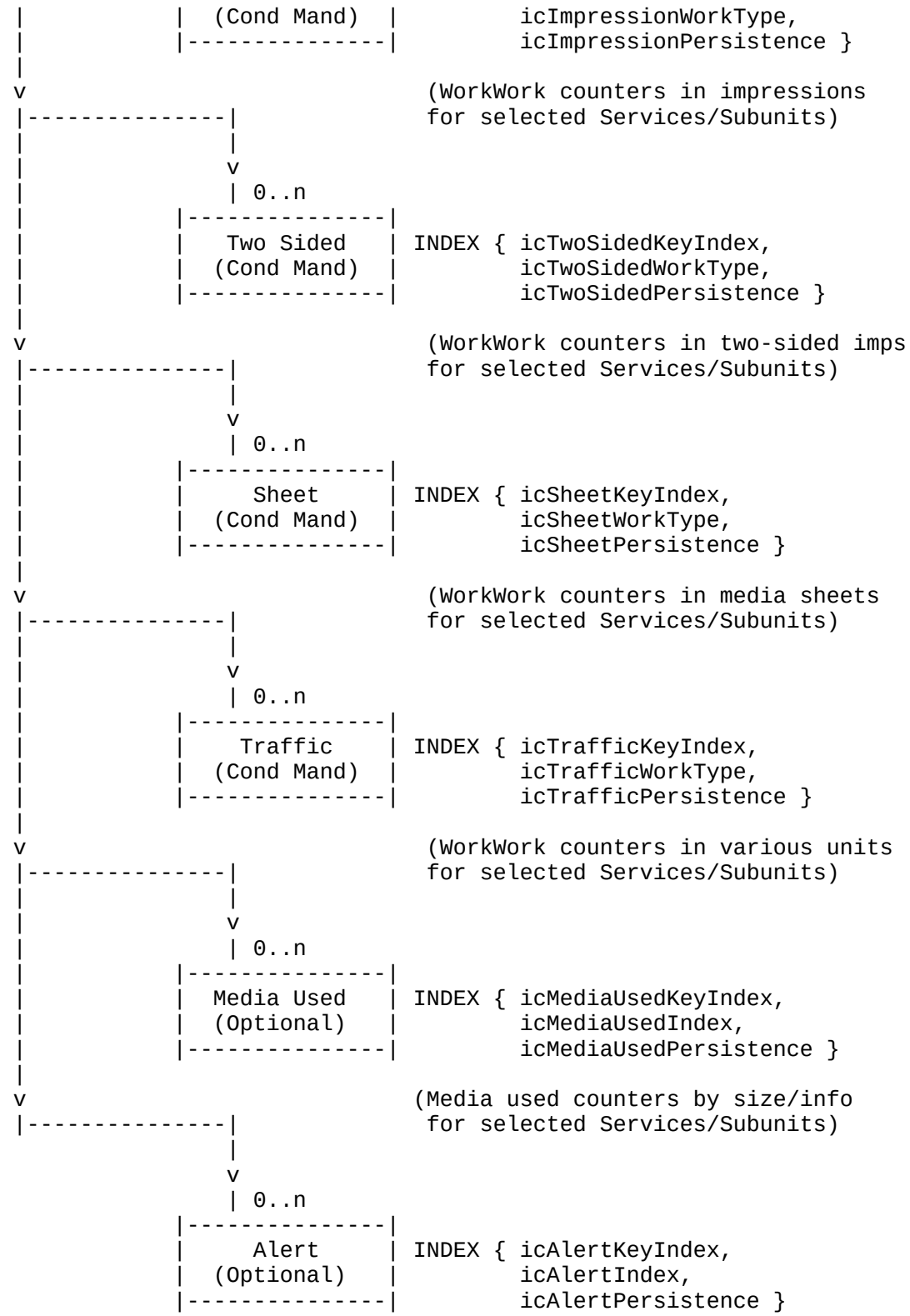
The Image, Impression, Two Sided, Sheet, and Traffic work counter tables in the IC MIB are indexed by:

- (1) A value of 'icKeyIndex' that identifies the Service or Subunit instance.
- (2) A value from 'IcWorkTypeTC' that identifies the type of work for the entry (workTotals, datastream, auxiliary, waste, or maintenance).
- (3) A value from 'IcPersistenceTC' that identifies the persistence of the entry (i.e., lifetime, since last reboot, or since last reset).

4.3 Diagram of Imaging Counter MIB







4.4 Relationship to Other MIBs

4.4.1 Relationship to IANA Printer MIB

The IC MIB defines the 'icSubunitTypeTC' textual convention whose values are aligned with 'PrtAlertGroupTC' in the IANA Printer MIB (originally published in [RFC3805]), for best interworking.

```
See:  'prtAlertGroup' in [RFC1759] [RFC3805].
See:  'PrtAlertGroupTC' in [RFC3805] and IANA Registry at:
      http://www.iana.org/assignments/ianaprinter-mib
```

4.4.2 Relationship to IETF MIB-II

The IC MIB defines the 'icAlertTimeStamp' object, which MAY contain a value of 'sysUpTime' in the IETF MIB-II [RFC1213], as a relative timestamp (since last system boot).

```
See:  'sysUpTime' in [RFC1213].
```

4.4.3 Relationship to IETF Host Resources MIB

The IC MIB defines the 'icMonitorStorageAllocErrors' object, which is a generalization of the 'hrStorageAllocationFailures' object in the IETF Host Resources MIB [RFC1514] [RFC2790].

```
See:  'hrStorageAllocationFailures' in [RFC1514] [RFC2790].
```

The IC MIB defines the 'icAlertDateAndTime' object, which MAY contain a value of 'hrSystemDate' in the IETF Host Resources MIB [RFC1514] [RFC2790], as an authoritative timestamp.

```
See:  'hrSystemDate' in [RFC1514] [RFC2790].
```

4.4.4 Relationship to IETF Printer MIB

The IC MIB defines the 'icMonitorConfigChanges', 'icMonitorTotalAlerts', and 'icMonitorCriticalAlerts' objects, which are generalizations of the corresponding 'prtGeneralConfigChanges', 'prtAlertAllEvents', and 'prtAlertCriticalEvents' objects in IETF Printer MIB v2 [RFC3805].

```
See:  'prtGeneralConfigChanges' in IETF Printer MIB [RFC1759]
[RFC3805].
See:  'prtAlertCriticalEvents' and 'prtAlertAllEvents'
      in IETF Printer MIB v2 [RFC3805].
```

4.5 Mapping from PWG Imaging System Counters

The IC MIB conforms to all best practices for MIBs written in SMIv2 [RFC2578], which required mapping from the abstract counters defined in the PWG Imaging System Counters specification [PWG-COUNT], as follows:

- (1) All IC MIB object names are scoped by an unambiguous group (e.g., 'icGeneral') or table (e.g., 'icService') prefix.
- (2) Some IC MIB object names are abbreviated from the corresponding abstract counter names in [PWG-COUNT] (e.g., 'Impressions' --> 'Imps'), to ensure that

no IC MIB object name is longer than 31 characters (to avoid common portability problems with MIB compilers).

- (3) Some IC MIB object names are modified in word order from the corresponding abstract counter names in [PWG-COUNT] (e.g., 'BlankImpressionsTwoSided' --> 'TwoSidedBlankImpressions'), to ensure that each counter object name ends in a plural noun indicating the units of that counter (as recommended by SMIv2 [RFC2578]).
- (4) All IC MIB counter objects with common units (e.g., 'impressions') are grouped into separate tables (for support of fine-grained IC MIB implementation conformance requirements).

4.5.1 Mapping from Abstract Counter Groups

Abstract counter groups defined in [PWG-COUNT] are mapped to IC MIB tables as follows:

Abstract Group	MIB Table	Counter Units
*Work	icImageTable	images
	icImpressionTable	impressions (Imps)
	icTwoSidedTable	impressions (Imps)
	**icSheetTable	sheets
	icTrafficTable	koctets (of messages), messages
MediaUsed	icMediaUsedTable	sheets
Availability	icTimeTable	seconds
Monitoring	icMonitorTable	config changes, alerts jobs, errors, warnings, koctets (of storage)

*Work = WorkTotals, Datastream, Auxiliary, Waste, and Maintenance

**icSheetTable = IC MIB extension for work in sheets (e.g., finishing)

4.5.2 Mapping from Abstract Counter Elements

Abstract counter elements defined in [PWG-COUNT] are mapped to IC MIB columnar objects as follows:

Abstract Group/Element	IC MIB Table/Object
[*Work]	[icImageTable]
Images	icImageTotalImages
MonochromeImages	icImageMonochromeImages
FullColorImages	icImageFullColorImages
[*Work]	[icImpressionTable]
Impressions	icImpressionTotalImps
MonochromeImpressions	icImpressionMonochromeImps
BlankImpressions	icImpressionBlankImps
FullColorImpressions	icImpressionFullColorImps
HighlightColorImpressions	icImpressionHighlightColorImps

[*Work]	[icTwoSidedTable]
ImpressionsTwoSided	icTwoSidedTotalImps
MonochromeImpressionsTwoSided	icTwoSidedMonochromeImps
BlankImpressionsTwoSided	icTwoSidedBlankImps
FullColorImpressionsTwoSided	icTwoSidedFullColorImps
HighlightColorImpressionsTwoSided	icTwoSidedHighlightColorImps
[*Work]	[icTrafficTable]
InputKOctets	icTrafficInputKOctets
OutputKOctets	icTrafficOutputKOctets
InputMessages	icTrafficInputMessages
OutputMessages	icTrafficOutputMessages
[*Work]	[**icSheetTable]
	icSheetTotalSheets
	icSheetMonochromeSheets
	icSheetBlankSheets
	icSheetFullColorSheets
	icSheetHighlightColorSheets
[MediaUsed]	[icMediaUsedTable]
Sheets	icMediaUsedTotalSheets
MonochromeSheets	icMediaUsedMonochromeSheets
BlankSheets	icMediaUsedBlankSheets
FullColorSheets	icMediaUsedFullColorSheets
HighlightColorSheets	icMediaUsedHighlightColorSheets
MediaSizeName	icMediaUsedMediaSizeName
MediaInfo	icMediaUsedMediaInfo
MediaName	icMediaUsedMediaName
[Availability]	[icTimeTable]
TotalTime	icTimeTotalSeconds
DownTime	icTimeDownSeconds
MaintenanceTime	icTimeMaintenanceSeconds
ProcessingTime	icTimeProcessingSeconds
[Monitoring]	[icMonitorTable]
ConfigChanges	icMonitorConfigChanges
TotalAlerts	icMonitorTotalAlerts
CriticalAlerts	icMonitorCriticalAlerts
AbortedJobs	icMonitorAbortedJobs
CanceledJobs	icMonitorCanceledJobs
CompletedJobs	icMonitorCompletedJobs
CompletedFinisherJobs	icMonitorCompletedFinisherJobs
MemoryAllocErrors	icMonitorMemoryAllocErrors
MemoryAllocWarnings	icMonitorMemoryAllocWarnings
StorageAllocErrors	icMonitorStorageAllocErrors
StorageAllocWarnings	icMonitorStorageAllocWarnings
LocalStorageKOctets	icMonitorLocalStorageKOctets
RemoteStorageKOctets	icMonitorRemoteStorageKOctets

*Work = WorkTotals, Datastream, Auxiliary, Waste, and Maintenance

**icSheetTable = IC MIB extension for work in sheets (e.g., finishing)

5 Definition of Imaging Counter MIB

```
PWG-IMAGING-COUNTER-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
    Integer32, enterprises
        FROM SNMPv2-SMI                 -- RFC 2578
    TEXTUAL-CONVENTION, DateAndTime, DisplayString, TimeStamp
        FROM SNMPv2-TC                  -- RFC 2579
    MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
        FROM SNMPv2-CONF                -- RFC 2580
    SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB;        -- RFC 3411

imagingCounterMIB MODULE-IDENTITY
    LAST-UPDATED    "200512230000Z" – 23 December 2005
    ORGANIZATION    "Printer Working Group, a Program of IEEE/ISTO"
    CONTACT-INFO
        "Web-based Imaging Management Service (WIMS) Project

        Web:    http://www.pwg.org
        FTP:    ftp://ftp.pwg.org/pub/pwg/wims
        Email:  wims@pwg.org (subscribers only - see Web page above)

        Editor: Ira McDonald
        Postal: High North Inc
                PO Box 221 - E21761 Ridge Ave
                Grand Marais, MI  49839
                USA
        Tel:     906-494-2434
        Email:  imcdonald@sharplabs.com"
    DESCRIPTION
        "The MIB module for passive monitoring of availability,
        monitoring, media used, and work counters for managed services
        and managed subunits on an Imaging System.

        Copyright (C) IEEE/ISTO PWG (2005)."

    -- revision history
    REVISION    "200512230000Z" – 23 December 2005
    DESCRIPTION "Approved Informational PWG Document"

    ::= { enterprises pwg(2699) mibs(1) imagingCounterMIB(3) }

--  PWG Secretary - MIB module number should be assigned/registered


icMIBNotifications      OBJECT IDENTIFIER ::= { imagingCounterMIB 0 }
icMIBObjects            OBJECT IDENTIFIER ::= { imagingCounterMIB 1 }
icMIBConformance        OBJECT IDENTIFIER ::= { imagingCounterMIB 2 }
icMIBObjectGroups       OBJECT IDENTIFIER ::= { icMIBConformance 2 }
icMIBNotificationGroups OBJECT IDENTIFIER ::= { icMIBConformance 3 }
```



```
--
-- Textual Conventions
--

IcCounter32 ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The 32-bit counter syntax (datatype), restricted to a 31-bit
        positive integer range (i.e., high-order bit MUST NOT be set),
        that conforms to the PWG Imaging System Counters specification
        and is used in all counter object definitions in this MIB.
        Each counter object instance MUST be initialized to zero '0'."
    REFERENCE
        "Section 4.1.12 'integer' datatype in IPP/1.1 (RFC 2911)."
    SYNTAX      Integer32 (0..2147483647)

IcCounterEventTypeTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The type of counter event in this 'icAlertTable' entry."
    REFERENCE
        "prtAlertCode in Printer MIB (RFC 1759/3805).
        PrtAlertCodeTC in IANA Printer MIB (RFC 3805
            and http://www.iana.org/assignments/ianaprinter-mib)."
    SYNTAX      INTEGER {
        other(1),                       -- non-standard type
        unknown(2),                     -- unknown type

        counterCreated(3),              -- counter created
        --  any counter element

        counterForErrors(4),            -- counter for errors
        --  icTimeDownSeconds
        --  icMonitorCriticalAlerts
            -- see prtAlertCriticalEvents in Printer MIB v2 (RFC 3805)
        --  icMonitorAbortedJobs
        --  icMonitorMemoryAllocErrors
        --  icMonitorStorageAllocErrors

        counterForWarnings(5),          -- counter for warnings
        --  icTimeMaintenanceSeconds
        --  icMonitorTotalAlerts (for warning alerts)
            -- see prtAlertAllEvents in Printer MIB v2 (RFC 3805)
        --  icMonitorCanceledJobs
        --  icMonitorMemoryAllocWarnings
        --  icMonitorStorageAllocWarnings

        counterReset(6),                -- counter reset (admin action)
        --  any counter element

        counterWrap(7),                 -- counter wrap (to zero)
        --  any counter element

        serviceCreated(8),              -- service created
```



```
        --  icServiceKey

        subunitCreated(9),              -- subunit created
        --  icSubunitKey

        mediaUsedCreated(10)            -- media used created
        --  icMediaUsedKeyIndex (for Service or Subunit)
    }

IcPersistenceTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The persistence for these counters."
    REFERENCE
        "prtMarkerLifeCount and prtMarkerPowerOnCount in Printer MIB
            (RFC 1759/3805)."
    SYNTAX      INTEGER {
        other(1),                       -- non-standard type
        unknown(2),                     -- unknown type
        lifetime(3),                    -- since last install
                                        -- see 'prtMarkerLifeCount'
        powerOn(4),                     -- since last power-on
                                        -- see 'prtMarkerPowerOnCount'
        reset(5)                        -- since last counter reset
                                        -- by administrative operation
    }

IcServiceTypeTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The type of this managed service on this Imaging System."
    REFERENCE
        "JmJobServiceTypesTC and jobServiceTypes in Job Mon MIB
            (RFC 2707)."
    SYNTAX      INTEGER {
        other(1),                       -- non-standard type
        unknown(2),                     -- unknown type
        systemTotals(3),                -- Imaging System totals
        copy(4),                        -- copy (scan and print)
        emailIn(5),                     -- email (input messages)
        emailOut(6),                    -- email (output messages)
        faxIn(7),                       -- PSTN fax (input images)
        faxOut(8),                      -- PSTN fax (output images)
        networkFaxIn(9),                -- network fax (input images)
        networkFaxOut(10),              -- network fax (output images)
        print(11),                      -- print (output impressions)
        scan(12),                       -- scan (input images)
        transform(13)                   -- transform (convert format)
    }

IcSubunitTypeTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The type of this managed subunit on this Imaging System."
    REFERENCE
        "Section 2.2 'Printer Sub-Units' and prtAlertGroupIndex in
```



```
            Printer MIB (RFC 1759/3805)."
        SYNTAX      INTEGER {
            other(1),                       -- non-standard type
            unknown(2),                     -- unknown type
            console(4),                     -- Imaging System local console
            --  generalPrinter(5) not supported - not a subunit
            cover(6),                       -- cover, door, or interlock
            --  localization(7) not supported - not a subunit
            inputTray(8),                   -- input media container
            outputBin(9),                   -- output media container
            marker(10),                     -- hardcopy impression marker
            --  markerSupplies(11) not supported - part of marker
            --  markerColorant(12) not supported - part of marker
            mediaPath(13),                  -- from input tray to output bin
            channel(14),                    -- input job source
            interpreter(15),                -- interpreter/transformer
            --  consoleDisplayBuffer(16) not supported - part of console
            --  consoleLights(17) not supported - part of console
            --  alert(18) not supported - not a subunit
            finisher(30),                   -- hardcopy finisher
            interface(40),                  -- local/network hardware port
            scanner(50)                     -- softcopy image scanner
        }

    IcWorkTypeTC ::= TEXTUAL-CONVENTION
        STATUS      current
        DESCRIPTION
            "The type of work for these counters."
        SYNTAX      INTEGER {
            other(1),                       -- non-standard type
            unknown(2),                     -- unknown type
            workTotals(3),                  -- work totals
                                            -- in user or maintenance mode
            datastream(4),                  -- work on user datastream
                                            -- in user mode
            auxiliary(5),                   -- hardcopy aux (banner, etc.)
                                            -- in user mode
            waste(6),                       -- hardcopy waste
                                            -- in user mode
            maintenance(7)                  -- work on maintenance jobs
                                            -- in maintenance mode
        }


    --
    --  General Group
    --

    icGeneral               OBJECT IDENTIFIER ::= { icMIBObjects 1 }

    icGeneralNaturalLanguage OBJECT-TYPE
        SYNTAX      DisplayString (SIZE(0..63))
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The natural language tag (RFC 3066), specified in US-ASCII,
```



```
        for all localized text string objects defined in this MIB
        with syntax of 'SnmpAdminString'.

        If this object is empty, then the natural language for
        all localized text string objects defined in this MIB MUST
        default to 'en-US' (US English)."
    REFERENCE
        "attributes-natural-language in IPP/1.1 (RFC 2911);
        prtGeneralCurrentLocalization in Printer MIB (RFC 1759/3805)."
    DEFVAL      { ''H }                 -- no natural language tag
    ::= { icGeneral 1 }

icGeneralTotalServiceRecords OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "records"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total managed services configured on this Imaging System,
        and therefore the number of entries in 'icServiceTable'."
    ::= { icGeneral 2 }

icGeneralTotalSubunitRecords OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "records"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total managed subunits configured on this Imaging System,
        and therefore the number of entries in 'icSubunitTable'."
    ::= { icGeneral 3 }

icGeneralTotalMediaUsedRecords OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "records"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total records of specific media used by some managed service or
        managed subunit on this Imaging System, and therefore the number
        of entries in 'icMediaUsedTable'."
    ::= { icGeneral 4 }


--
--  Key Group
--

icKey                   OBJECT IDENTIFIER ::= { icMIBObjects 2 }

icKeyTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcKeyEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of the local unique integer keys for managed services
```



```
        and managed subunits on this Imaging System."
    ::= { icKey 1 }

icKeyEntry OBJECT-TYPE
    SYNTAX      IcKeyEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A entry of one local unique integer key for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icKeyIndex }
    ::= { icKeyTable 1 }


IcKeyEntry ::= SEQUENCE {
        --  key index elements
        icKeyIndex                      Integer32,

        --  key description elements
        icKeyServiceType                IcServiceTypeTC,
        icKeyServiceIndex               Integer32,
        icKeySubunitType                IcSubunitTypeTC,
        icKeySubunitIndex               Integer32
    }


icKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System.

        Usage:  The value of this key can be used in 'icXxxKeyIndex'
        for lookup of counters on this Imaging System."
    ::= { icKeyEntry 1 }

icKeyServiceType OBJECT-TYPE
    SYNTAX      IcServiceTypeTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of this managed service on this Imaging System
        (e.g., print, copy, etc.) or 'unknown' if not a service key."
    DEFVAL      { unknown }             -- no service type
    ::= { icKeyEntry 2 }

icKeyServiceIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Local unique integer identifier of this managed service
        on this Imaging System, or zero if not a service key.
```



```
        If an Imaging System also implements the Host Resources MIB
        (RFC 1514/2790) then the value of 'icKeyServiceIndex' for each
        configured managed service SHOULD be the same as the value of
        'hrSWRunIndex' and 'hrSWInstalledIndex' for that service."
    DEFVAL      { 0 }                   -- no service identifier
    ::= { icKeyEntry 3 }

icKeySubunitType OBJECT-TYPE
    SYNTAX      IcSubunitTypeTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of this managed subunit on this Imaging System
        (e.g., input, marker, etc.) or 'unknown' if not a subunit key."
    DEFVAL      { unknown }             -- no subunit type
    ::= { icKeyEntry 4 }

icKeySubunitIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Local unique integer identifier of this managed subunit
        on this Imaging System, or zero if not a subunit key.

        If an Imaging System also implements the Printer MIB
        (RFC 1759/3805) then the value of 'icKeySubunitIndex' for each
        configured managed subunit SHOULD be the same as the value of
        'prtXxxIndex' for that subunit (if it is print-related)."
    DEFVAL      { 0 }                   -- no subunit identifier
    ::= { icKeyEntry 5 }


--
--  Service Group
--

icService               OBJECT IDENTIFIER ::= { icMIBObjects 3 }

icServiceTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcServiceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of managed services on this Imaging System."
    ::= { icService 1 }

icServiceEntry OBJECT-TYPE
    SYNTAX      IcServiceEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry for a managed service on this Imaging System."
    INDEX     { icServiceType,
                icServiceIndex }
```



```
    ::= { icServiceTable 1 }


IcServiceEntry ::= SEQUENCE {
        --  service index elements
        icServiceType                   IcServiceTypeTC,
        icServiceIndex                  Integer32,

        --  service description elements
        icServiceKey                    Integer32,
        icServiceInfo                   SnmpAdminString,
        icServiceJobSetIndex            Integer32
    }

icServiceType OBJECT-TYPE
    SYNTAX      IcServiceTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of this managed service on this Imaging System
        (e.g., print, copy, etc.)."
    ::= { icServiceEntry 1 }

icServiceIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local unique integer identifier of this managed service
        on this Imaging System.

        If an Imaging System also implements the Host Resources MIB
        (RFC 1514/2790) then the value of 'icServiceIndex' for each
        configured managed service SHOULD be the same as the value of
        'hrSWRunIndex' and 'hrSWInstalledIndex' for that service."
    ::= { icServiceEntry 2 }

icServiceKey OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (for lookup of counters)
        on this Imaging System.

        DEFVAL intentionally omitted - valid service key is REQUIRED."
    ::= { icServiceEntry 3 }

icServiceInfo OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The description of this managed service on this Imaging System,
        for use with remote network management scripts and GUIs,
        specified as a Unicode string encoded in UTF-8 (RFC 3629)
```



```
        in the language specified in 'icGeneralNaturalLanguage'.

        For example:    'Print service supporting IPP and PSI'."
    DEFVAL      { ''H }                 -- no service description
    ::= { icServiceEntry 4 }

icServiceJobSetIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..32767)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of 'jmGeneralJobSetIndex' in Job Mon MIB (RFC 2707)
        for this managed service, if the Job Mon MIB is implemented and
        this managed service is represented there, or zero if none."
    DEFVAL      { 0 }                   -- no service job set (queue)
    ::= { icServiceEntry 5 }


--
--  Subunit Group
--

icSubunit               OBJECT IDENTIFIER ::= { icMIBObjects 4 }

icSubunitTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcSubunitEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of managed subunits on this Imaging System."
    REFERENCE
        "prtGeneralTable in Printer MIB (RFC 1759/3805)."
    ::= { icSubunit 1 }

icSubunitEntry OBJECT-TYPE
    SYNTAX      IcSubunitEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry for a managed subunit on this Imaging System."
    INDEX     { icSubunitType,
                icSubunitIndex }
    ::= { icSubunitTable 1 }


IcSubunitEntry ::= SEQUENCE {
        --  subunit index elements
        icSubunitType                   IcSubunitTypeTC,
        icSubunitIndex                  Integer32,

        --  subunit description elements
        icSubunitKey                    Integer32,
        icSubunitInfo                   SnmpAdminString
    }

icSubunitType OBJECT-TYPE
```



```
    SYNTAX      IcSubunitTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of this managed subunit on this Imaging System
        (e.g., channel, marker, etc.)."
    ::= { icSubunitEntry 1 }

icSubunitIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local unique integer identifier of this managed subunit
        on this Imaging System.

        If an Imaging System also implements the Printer MIB
        (RFC 1759/3805) then the value of 'icSubunitIndex' for each
        configured managed subunit SHOULD be the same as the value of
        'prtXxxIndex' for that subunit (if it is print-related)."
    ::= { icSubunitEntry 2 }

icSubunitKey OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Local key of this managed subunit (for lookup of counters)
        on this Imaging System.

        DEFVAL intentionally omitted - valid subunit key is REQUIRED."
    ::= { icSubunitEntry 3 }

icSubunitInfo OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The description of this managed subunit on this Imaging System,
        for use with remote network management scripts and GUIs,
        specified as a Unicode string encoded in UTF-8 (RFC 3629)
        in the language specified in 'icGeneralNaturalLanguage'.

        For example:    'Marker subunit supporting simplex and duplex'."
    DEFVAL      { ''H }                 -- no subunit description
    ::= { icSubunitEntry 4 }


--
--  Time Group
--

icTime                  OBJECT IDENTIFIER ::= { icMIBObjects 5 }

icTimeTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcTimeEntry
```



```
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of availability counters for managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icTime 1 }

icTimeEntry OBJECT-TYPE
    SYNTAX      IcTimeEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of availability counters for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icTimeKeyIndex,
                icTimePersistence }
    ::= { icTimeTable 1 }


IcTimeEntry ::= SEQUENCE {
        --  time index elements
        icTimeKeyIndex                  Integer32,
        icTimePersistence               IcPersistenceTC,

        --  time counter elements
        icTimeTotalSeconds              IcCounter32,
        icTimeDownSeconds               IcCounter32,
        icTimeMaintenanceSeconds        IcCounter32,
        icTimeProcessingSeconds         IcCounter32
    }

icTimeKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icTimeEntry 1 }

icTimePersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icTimeEntry 2 }

icTimeTotalSeconds OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
```



```
    DESCRIPTION
        "Total time in seconds since this managed service or managed
        subunit was installed."
    REFERENCE
        "hrSystemUptime in Host Resources MIB (RFC 1514/2790)."
    ::= { icTimeEntry 3 }

icTimeDownSeconds OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Time in seconds that this managed service or managed subunit
        has spent in down mode (i.e., cannot process jobs), due to an
        error that requires intervention or to administrative action,
        since it was installed."
    REFERENCE
        "hrDeviceStatus of 'down' in Host Resources MIB (RFC
            1514/2790)."
    ::= { icTimeEntry 4 }

icTimeMaintenanceSeconds OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Time in seconds that this managed service or managed subunit
        has spent in maintenance mode (testing, field service,
        calibration, etc.) since it was installed."
    REFERENCE
        "hrDeviceStatus of 'testing' in Host Resources MIB (RFC
            1514/2790)."
    ::= { icTimeEntry 5 }

icTimeProcessingSeconds OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "seconds"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Time in seconds that this managed service or managed subunit
        has spent processing jobs in user mode since it was installed."
    REFERENCE
        "hrDeviceStatus of 'running' or 'warning' in Host Resources MIB
            (RFC 1514/2790)."
    ::= { icTimeEntry 6 }


--
--  Monitor Group
--

icMonitor               OBJECT IDENTIFIER ::= { icMIBObjects 6 }
```



```
icMonitorTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcMonitorEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of monitoring counters for managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icMonitor 1 }

icMonitorEntry OBJECT-TYPE
    SYNTAX      IcMonitorEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of monitoring counters for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icMonitorKeyIndex,
                icMonitorPersistence }
    ::= { icMonitorTable 1 }


IcMonitorEntry ::= SEQUENCE {
        --  monitor index elements
        icMonitorKeyIndex              Integer32,
        icMonitorPersistence           IcPersistenceTC,

        --  monitor counter elements
        icMonitorConfigChanges         IcCounter32,
        icMonitorTotalAlerts           IcCounter32,
        icMonitorCriticalAlerts        IcCounter32,
        icMonitorAbortedJobs           IcCounter32,
        icMonitorCanceledJobs          IcCounter32,
        icMonitorCompletedJobs         IcCounter32,
        icMonitorCompletedFinisherJobs IcCounter32,
        icMonitorMemoryAllocErrors     IcCounter32,
        icMonitorMemoryAllocWarnings   IcCounter32,
        icMonitorStorageAllocErrors    IcCounter32,
        icMonitorStorageAllocWarnings  IcCounter32,
        icMonitorLocalStorageKOctets   IcCounter32,
        icMonitorRemoteStorageKOctets  IcCounter32
    }

icMonitorKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icMonitorEntry 1 }

icMonitorPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
```



```
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icMonitorEntry 2 }

icMonitorConfigChanges OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "changes"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total configuration changes that have occurred on this managed
        service or managed subunit (e.g., changes to attributes)."
    REFERENCE
        "prtGeneralConfigChanges in Printer MIB (RFC 1759/3805)."
    ::= { icMonitorEntry 3 }

icMonitorTotalAlerts OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "alerts"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total alerts that have occurred on this managed service
        or managed subunit."
    REFERENCE
        "prtAlertAllEvents in Printer MIB v2 (RFC 3805)."
    ::= { icMonitorEntry 4 }

icMonitorCriticalAlerts OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "alerts"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Critical alerts that have occurred on this managed service
        or managed subunit."
    REFERENCE
        "prtAlertCriticalEvents in Printer MIB v2 (RFC 3805)."
    ::= { icMonitorEntry 5 }

icMonitorAbortedJobs OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "jobs"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total jobs that have been aborted (by the system software)
        on this managed service or managed subunit."
    REFERENCE
        "jmJobState and JmJobStateTC in Job Mon MIB (RFC 2707)."
    ::= { icMonitorEntry 6 }

icMonitorCanceledJobs OBJECT-TYPE
    SYNTAX      IcCounter32
```



```
    UNITS       "jobs"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total jobs that have been canceled (by an authorized user)
        on this managed service or managed subunit."
    REFERENCE
        "jmJobState and JmJobStateTC in Job Mon MIB (RFC 2707)."
    ::= { icMonitorEntry 7 }

icMonitorCompletedJobs OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "jobs"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total jobs that have been completed (successfully or with
        warnings/errors) on this managed service or managed subunit."
    REFERENCE
        "jmJobState and JmJobStateTC in Job Mon MIB (RFC 2707)."
    ::= { icMonitorEntry 8 }

icMonitorCompletedFinisherJobs OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "jobs"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total jobs that have been completed (successfully or with
        warnings and errors) and for which any finishing process was
        performed on this managed service or managed subunit."
    REFERENCE
        "finishing and JmFinishingTC in Job Mon MIB (RFC 2707)."
    ::= { icMonitorEntry 9 }

icMonitorMemoryAllocErrors OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "errors"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total times that data stored by this managed service
        or managed subunit to local Imaging System memory
        caused a memory allocation failure."
    REFERENCE
        "hrStorageSize, hrStorageUsed, and hrStorageAllocationFailures
            in Host Resources MIB (RFC 1514/2790)."
    ::= { icMonitorEntry 10 }

icMonitorMemoryAllocWarnings OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "warnings"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total times that data stored by this managed service
```



```
        or managed subunit to local Imaging System memory
        exceeded an implementation-defined or administratively
        configured memory allocation threshold.

        Usage:  This counter is intended to support increasing available
        memory on an Imaging System before job failures occur."
    REFERENCE
        "hrStorageSize, hrStorageUsed, and hrStorageAllocationFailures
            in Host Resources MIB (RFC 1514/2790)."
    ::= { icMonitorEntry 11 }

icMonitorStorageAllocErrors OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "errors"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total times that data stored by this managed service
        or managed subunit to a local or remote file system
        caused a storage allocation failure."
    REFERENCE
        "hrStorageSize, hrStorageUsed, and hrStorageAllocationFailures
            in Host Resources MIB (RFC 1514/2790)."
    ::= { icMonitorEntry 12 }

icMonitorStorageAllocWarnings OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "warnings"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total times that data stored by this managed service
        or managed subunit to a local or remote file system
        exceeded an implementation-defined or administratively
        configured storage allocation threshold.

        Usage:  This counter is intended to support increasing available
        storage on an Imaging System before job failures occur."
    REFERENCE
        "hrStorageSize, hrStorageUsed, and hrStorageAllocationFailures
            in Host Resources MIB (RFC 1514/2790)."
    ::= { icMonitorEntry 13 }

icMonitorLocalStorageKOctets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "koctets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total amount of data stored by this managed service
        or managed subunit to the local file system of this
        Imaging System."
    REFERENCE
        "hrStorageSize and hrStorageUsed in Host Resources MIB
            (RFC 1514/2790)."
    ::= { icMonitorEntry 14 }
```



```
icMonitorRemoteStorageKOctets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "koctets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total amount of data stored by this managed service
        or managed subunit to a remote file system from this
        Imaging System."
    REFERENCE
        "hrStorageSize and hrStorageUsed in Host Resources MIB
            (RFC 1514/2790)."
    ::= { icMonitorEntry 15 }


--
--  Image Group
--

icImage                 OBJECT IDENTIFIER ::= { icMIBObjects 7 }

icImageTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcImageEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of work counters in images for managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icImage 1 }

icImageEntry OBJECT-TYPE
    SYNTAX      IcImageEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of work counters in images for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icImageKeyIndex,
                icImageWorkType,
                icImagePersistence }
    ::= { icImageTable 1 }


IcImageEntry ::= SEQUENCE {
        --  image index elements
        icImageKeyIndex                 Integer32,
        icImageWorkType                 IcWorkTypeTC,
        icImagePersistence              IcPersistenceTC,

        --  image counter elements
        icImageTotalImages              IcCounter32,
        icImageMonochromeImages         IcCounter32,
        icImageFullColorImages          IcCounter32
```



```
    }

icImageKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icImageEntry 1 }

icImageWorkType OBJECT-TYPE
    SYNTAX      IcWorkTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of work for these counters."
    ::= { icImageEntry 2 }

icImagePersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icImageEntry 3 }

icImageTotalImages OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "images"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total images input (e.g., 'icServiceType' of 'scan')
        or output (e.g., 'icServiceType' of 'faxOut') by
        this managed service or managed subunit."
    ::= { icImageEntry 4 }

icImageMonochromeImages OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "images"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Monochrome images input (e.g., 'icServiceType' of 'scan')
        or output (e.g., 'icServiceType' of 'faxOut') by
        this managed service or managed subunit."
    ::= { icImageEntry 5 }

icImageFullColorImages OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "images"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```



```
        "Full color images input (e.g., 'icServiceType' of 'scan')
        or output (e.g., 'icServiceType' of 'faxOut') by
        this managed service or managed subunit."
    ::= { icImageEntry 6 }


--
--  Impression Group
--

icImpression            OBJECT IDENTIFIER ::= { icMIBObjects 8 }

icImpressionTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcImpressionEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of work counters in impressions for managed
        services and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icImpression 1 }

icImpressionEntry OBJECT-TYPE
    SYNTAX      IcImpressionEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of work counters in impressions for a managed
        service or a managed subunit on this Imaging System."
    INDEX     { icImpressionKeyIndex,
                icImpressionWorkType,
                icImpressionPersistence }
    ::= { icImpressionTable 1 }


IcImpressionEntry ::= SEQUENCE {
        --  impression index elements
        icImpressionKeyIndex            Integer32,
        icImpressionWorkType            IcWorkTypeTC,
        icImpressionPersistence         IcPersistenceTC,

        --  impression counter elements
        icImpressionTotalImps           IcCounter32,
        icImpressionMonochromeImps      IcCounter32,
        icImpressionBlankImps           IcCounter32,
        icImpressionFullColorImps       IcCounter32,
        icImpressionHighlightColorImps  IcCounter32
    }

icImpressionKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
```



```
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icImpressionEntry 1 }

icImpressionWorkType OBJECT-TYPE
    SYNTAX      IcWorkTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of work for these counters."
    ::= { icImpressionEntry 2 }

icImpressionPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icImpressionEntry 3 }

icImpressionTotalImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total hardcopy impressions printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "jmJobImpressionsCompleted in Job Mon MIB (RFC 2707);
        job-impressions-completed in IPP/1.1 (RFC 2911)."
    ::= { icImpressionEntry 4 }

icImpressionMonochromeImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Monochrome hardcopy impressions printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icImpressionEntry 5 }

icImpressionBlankImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Blank hardcopy impressions printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icImpressionEntry 6 }
```



```
icImpressionFullColorImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Full color hardcopy impressions printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "fullColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icImpressionEntry 7 }

icImpressionHighlightColorImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Highlight color hardcopy impressions printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "highlightColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icImpressionEntry 8 }


--
--  Two Sided Group
--

icTwoSided              OBJECT IDENTIFIER ::= { icMIBObjects 9 }

icTwoSidedTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcTwoSidedEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of work counters in two-sided impressions for
        managed services and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icTwoSided 1 }

icTwoSidedEntry OBJECT-TYPE
    SYNTAX      IcTwoSidedEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of work counters in two-sided impressions for a
        managed service or managed subunit on this Imaging System."
    INDEX     { icTwoSidedKeyIndex,
                icTwoSidedWorkType,
                icTwoSidedPersistence }
    ::= { icTwoSidedTable 1 }
```



```
IcTwoSidedEntry ::= SEQUENCE {
        --  two-sided impression index elements
        icTwoSidedKeyIndex              Integer32,
        icTwoSidedWorkType              IcWorkTypeTC,
        icTwoSidedPersistence           IcPersistenceTC,

        --  two-sided impression counter elements
        icTwoSidedTotalImps             IcCounter32,
        icTwoSidedMonochromeImps        IcCounter32,
        icTwoSidedBlankImps             IcCounter32,
        icTwoSidedFullColorImps         IcCounter32,
        icTwoSidedHighlightColorImps    IcCounter32
    }

icTwoSidedKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icTwoSidedEntry 1 }

icTwoSidedWorkType OBJECT-TYPE
    SYNTAX      IcWorkTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of work for these counters."
    ::= { icTwoSidedEntry 2 }

icTwoSidedPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icTwoSidedEntry 3 }

icTwoSidedTotalImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total hardcopy impressions printed two-sided by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "jmJobImpressionsCompleted in Job Mon MIB (RFC 2707);
        job-impressions-completed in IPP/1.1 (RFC 2911)."
    ::= { icTwoSidedEntry 4 }

icTwoSidedMonochromeImps OBJECT-TYPE
```



```
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Monochrome hardcopy impressions printed two-sided by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icTwoSidedEntry 5 }

icTwoSidedBlankImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Blank hardcopy impressions printed two-sided by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icTwoSidedEntry 6 }

icTwoSidedFullColorImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Full color hardcopy impressions printed two-sided by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "fullColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icTwoSidedEntry 7 }

icTwoSidedHighlightColorImps OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "impressions"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Highlight color hardcopy impressions printed two-sided by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "highlightColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icTwoSidedEntry 8 }


--
--  Sheet Group
--

icSheet                 OBJECT IDENTIFIER ::= { icMIBObjects 10 }

icSheetTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcSheetEntry
```



```
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of work counters in sheets for managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icSheet 1 }

icSheetEntry OBJECT-TYPE
    SYNTAX      IcSheetEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of work counters in sheets for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icSheetKeyIndex,
                icSheetWorkType,
                icSheetPersistence }
    ::= { icSheetTable 1 }


IcSheetEntry ::= SEQUENCE {
        --  sheet index elements
        icSheetKeyIndex                 Integer32,
        icSheetWorkType                 IcWorkTypeTC,
        icSheetPersistence              IcPersistenceTC,

        --  sheet counter elements
        icSheetTotalSheets              IcCounter32,
        icSheetMonochromeSheets         IcCounter32,
        icSheetBlankSheets              IcCounter32,
        icSheetFullColorSheets          IcCounter32,
        icSheetHighlightColorSheets     IcCounter32
    }

icSheetKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icSheetEntry 1 }

icSheetWorkType OBJECT-TYPE
    SYNTAX      IcWorkTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of work for these counters."
    ::= { icSheetEntry 2 }

icSheetPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
```



```
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icSheetEntry 3 }

icSheetTotalSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total media sheets consumed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "sheetsCompleted in Job Mon MIB (RFC 2707);
        job-media-sheets-completed in IPP/1.1 (RFC 2911)."
    ::= { icSheetEntry 4 }

icSheetMonochromeSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Monochrome media sheets consumed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icSheetEntry 5 }

icSheetBlankSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Blank media sheets consumed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icSheetEntry 6 }

icSheetFullColorSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Full color media sheets consumed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icSheetEntry 7 }

icSheetHighlightColorSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
```



```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Highlight color media sheets consumed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icSheetEntry 8 }


--
--  Traffic Group
--

icTraffic               OBJECT IDENTIFIER ::= { icMIBObjects 11 }

icTrafficTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcTrafficEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of work counters for traffic on managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icTraffic 1 }

icTrafficEntry OBJECT-TYPE
    SYNTAX      IcTrafficEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of work counters for traffic on a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icTrafficKeyIndex,
                icTrafficWorkType,
                icTrafficPersistence }
    ::= { icTrafficTable 1 }


IcTrafficEntry ::= SEQUENCE {
        --  traffic index elements
        icTrafficKeyIndex               Integer32,
        icTrafficWorkType               IcWorkTypeTC,
        icTrafficPersistence            IcPersistenceTC,

        --  traffic counter elements
        icTrafficInputKOctets           IcCounter32,
        icTrafficOutputKOctets          IcCounter32,
        icTrafficInputMessages          IcCounter32,
        icTrafficOutputMessages         IcCounter32
    }

icTrafficKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
```



```
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icTrafficEntry 1 }

icTrafficWorkType OBJECT-TYPE
    SYNTAX      IcWorkTypeTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of work for these counters."
    ::= { icTrafficEntry 2 }

icTrafficPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icTrafficEntry 3 }

icTrafficInputKOctets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "koctets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total amount of data received on ALL supported job channels
        by this managed service (e.g., 'icServiceType' of 'faxIn')
        or managed subunit."
    REFERENCE
        "prtChannelTable in Printer MIB (RFC 1759/3805);
        ifInOctets in MIB-II (RFC 1213)."
    ::= { icTrafficEntry 4 }

icTrafficOutputKOctets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "koctets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total amount of data sent on ALL supported job channels
        by this managed service (e.g., 'icServiceType' of 'faxOut')
        or managed subunit."
    REFERENCE
        "ifOutOctets in MIB-II (RFC 1213)."
    ::= { icTrafficEntry 5 }

icTrafficInputMessages OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "messages"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total messages received on ALL supported job channels
```



```
        by this managed service (e.g., 'icServiceType' of 'emailIn')
        or managed subunit."
    REFERENCE
        "prtChannelTable in Printer MIB (RFC 1759/3805);
        ifInUcastPkts in MIB-II (RFC 1213)."
    ::= { icTrafficEntry 6 }

icTrafficOutputMessages OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "messages"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total messages sent on ALL supported job channels
        by this managed service (e.g., 'icServiceType' of 'emailOut')
        or managed subunit."
    REFERENCE
        "ifOutUcastPkts in MIB-II (RFC 1213)."
    ::= { icTrafficEntry 7 }


--
--  Media Used Group
--

icMediaUsed             OBJECT IDENTIFIER ::= { icMIBObjects 12 }

icMediaUsedTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcMediaUsedEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of counters for each specific media consumed by one of
        the managed services or managed subunits configured
        on this Imaging System."
    ::= { icMediaUsed 1 }

icMediaUsedEntry OBJECT-TYPE
    SYNTAX      IcMediaUsedEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry of counters for one specific media consumed by one of
        the managed services or managed subunits configured
        on this Imaging System."
    INDEX     { icMediaUsedKeyIndex,
                icMediaUsedIndex,
                icMediaUsedPersistence }
    ::= { icMediaUsedTable 1 }


IcMediaUsedEntry ::= SEQUENCE {
        --  media used index elements
        icMediaUsedKeyIndex             Integer32,
        icMediaUsedIndex                Integer32,
        icMediaUsedPersistence          IcPersistenceTC,
```



```
        --  media used counter elements
        icMediaUsedTotalSheets          IcCounter32,
        icMediaUsedMonochromeSheets     IcCounter32,
        icMediaUsedBlankSheets          IcCounter32,
        icMediaUsedFullColorSheets      IcCounter32,
        icMediaUsedHighlightColorSheets IcCounter32,

        --  media used description elements
        icMediaUsedMediaSizeName        DisplayString,
        icMediaUsedMediaInfo            SnmpAdminString,
        icMediaUsedMediaName            SnmpAdminString
    }

icMediaUsedKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icMediaUsedEntry 1 }

icMediaUsedIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The instance of this specific media size."
    REFERENCE
        "icMediaUsedSizeName and icMediaUsedInfo in this MIB."
    ::= { icMediaUsedEntry 2 }

icMediaUsedPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence of these counters."
    ::= { icMediaUsedEntry 3 }

icMediaUsedTotalSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total sheets of this specific media printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "sheetsCompleted in Job Mon MIB (RFC 2707);
        job-media-sheets-completed in IPP/1.1 (RFC 2911)."
    ::= { icMediaUsedEntry 4 }
```



```
icMediaUsedMonochromeSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Monochrome sheets of this specific media printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icMediaUsedEntry 5 }

icMediaUsedBlankSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Blank sheets of this specific media printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    ::= { icMediaUsedEntry 6 }

icMediaUsedFullColorSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Full color sheets of this specific media printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "fullColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icMediaUsedEntry 7 }

icMediaUsedHighlightColorSheets OBJECT-TYPE
    SYNTAX      IcCounter32
    UNITS       "sheets"
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Highlight color sheets of this specific media printed by this
        managed service (e.g., 'icServiceType' of 'print')
        or managed subunit (e.g., 'icSubunitType' of 'marker')."
    REFERENCE
        "highlightColorImpressionsCompleted in Job Mon MIB (RFC 2707)."
    ::= { icMediaUsedEntry 8 }

icMediaUsedMediaSizeName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(0..63))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The media size self-describing name for this specific media,
        for use with remote network management scripts and GUIs,
        specified as a Unicode string encoded in UTF-8 (RFC 3629)
```



```
        in the language specified in 'icGeneralNaturalLanguage'.

        For example:    'na_letter_8.5x11in'."
    REFERENCE
        "PWG Media Standardized Names (IEEE/ISTO PWG 5101.1);
        icMediaUsedIndex and icMediaUsedInfo in this MIB."
    ::= { icMediaUsedEntry 9 }

icMediaUsedMediaInfo OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The description of this specific media,
        for use with remote network management scripts and GUIs,
        specified as a Unicode string encoded in UTF-8 (RFC 3629)
        in the language specified in 'icGeneralNaturalLanguage'.

        For example:    'Light blue deckle-edge letter stock'.

        This media description MUST clearly distinguish different
        instances of the same media size in 'icMediaUsedTable' (for
        example, by including specific media color, weight, etc.)."
    REFERENCE
        "icMediaUsedSizeName and icMediaUsedIndex in this MIB."
    ::= { icMediaUsedEntry 10 }

icMediaUsedMediaName OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE(0..63))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The friendly locally unique name for this specific media,
        for use with remote network management scripts and GUIs,
        specified as a Unicode string encoded in UTF-8 (RFC 3629)
        in the language specified in 'icGeneralNaturalLanguage'.

        For example:    'customer-reply' or 'na-letter-colored'."
    REFERENCE
        "Appendix C:  'media' keyword values and section 4.2.11 'media'
            in IPP/1.1 (RFC2911);
        mediumRequested and mediumConsumed in Job Mon MIB (RFC 2707)."
    ::= { icMediaUsedEntry 11 }


--
--  Alert Group
--

icAlert                 OBJECT IDENTIFIER ::= { icMIBObjects 13 }

icAlertTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IcAlertEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```



```
        "A table of counter event alerts for managed services
        and managed subunits on this Imaging System."
    REFERENCE
        "icServiceTable and icSubunitTable in this MIB."
    ::= { icAlert 1 }

icAlertEntry OBJECT-TYPE
    SYNTAX      IcAlertEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry for a counter event alert for a managed service
        or a managed subunit on this Imaging System."
    INDEX     { icAlertKeyIndex,
                icAlertIndex,
                icAlertPersistence }
    ::= { icAlertTable 1 }

IcAlertEntry ::= SEQUENCE {
        --  alert index elements
        icAlertKeyIndex                 Integer32,
        icAlertIndex                    Integer32,
        icAlertPersistence              IcPersistenceTC,

        --  alert description elements
        icAlertCounterEventType         IcCounterEventTypeTC,
        icAlertCounterName              DisplayString,
        icAlertCounterValue             IcCounter32,
        icAlertDateAndTime              DateAndTime,
        icAlertTimeStamp                TimeStamp
    }

icAlertKeyIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Local key of this managed service (value of 'icServiceKey')
        or managed subunit (value of 'icSubunitKey') on this
        Imaging System."
    ::= { icAlertEntry 1 }

icAlertIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The instance of counter event in this 'icAlertTable' entry."
    ::= { icAlertEntry 2 }

icAlertPersistence OBJECT-TYPE
    SYNTAX      IcPersistenceTC
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The persistence for this alert."
```



```
    ::= { icAlertEntry 3 }

icAlertCounterEventType OBJECT-TYPE
    SYNTAX      IcCounterEventTypeTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of counter event in this 'icAlertTable' entry.

        DEFVAL clause intentionally omitted on this type object."
    REFERENCE
        "prtAlertCode in Printer MIB (RFC 1759/3805)."
    ::= { icAlertEntry 4 }

icAlertCounterName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE(0..63))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The name of the counter for this 'icAlertTable' entry.

        DEFVAL clause intentionally omitted on this name object."
    REFERENCE
        "prtAlertDescription in Printer MIB (RFC 1759/3805)."
    ::= { icAlertEntry 5 }

icAlertCounterValue OBJECT-TYPE
    SYNTAX      IcCounter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of the counter for this 'icAlertTable' entry.

        DEFVAL clause intentionally omitted on this value object."
    REFERENCE
        "prtAlertLocation in Printer MIB (RFC 1759/3805)."
    ::= { icAlertEntry 6 }

icAlertDateAndTime OBJECT-TYPE
    SYNTAX      DateAndTime
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The date and time of creation of this 'icAlertTable' entry.

        DEFVAL clause intentionally omitted on this time object."
    REFERENCE
        "hrSystemDate in Host Resources MIB (RFC 1514/2790);
        prtAlertTime in Printer MIB (RFC 1759/3805)."
    ::= { icAlertEntry 7 }

icAlertTimeStamp OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```



```
        "The timestamp of creation of this 'icAlertTable' entry.

        DEFVAL clause intentionally omitted on this time object."
    REFERENCE
        "sysUpTime in MIB-II (RFC 1213);
        prtAlertTime in Printer MIB (RFC 1759/3805)."
    ::= { icAlertEntry 8 }


--
--  Alert Trap Group
--

icAlertV2Trap NOTIFICATION-TYPE
    OBJECTS { icAlertCounterEventType, icAlertCounterName,
              icAlertCounterValue, icAlertDateAndTime }
    STATUS  current
    DESCRIPTION
        "This trap is sent (to registered or configured notification
        receivers) when a counter event is added to the 'icAlertTable'.

        Note:  The values of the icAlertKeyIndex, icAlertIndex, and
        icAlertPersistence index objects are included in the instance
        qualifiers of the explicit variable bindings in this trap.  The
        value of icAlertTime (i.e., sysUpTime in IETF MIB-II, RFC 1213)
        is always included in SNMP traps, per RFC 3416."
    ::= { icMIBNotifications 1 }

--
--  Conformance Statements
--

icMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statements for Imaging Systems that implement
        the PWG Imaging Counter MIB.

        An Imaging System MUST support and implement the General group.

        An Imaging System MUST support and implement the Key group
        for 'icKeyServiceType' of 'systemTotals' (overall counters).

        An Imaging System MAY support and implement the Key group
        for individual managed services and managed subunits.

        An Imaging System MUST support and implement the Service group
        for 'icServiceType' of 'systemTotals' (overall counters).

        An Imaging System MAY support and implement the Service group
        for individual managed services.

        An Imaging System MUST support and implement the Time group
        for 'icServiceType' of 'systemTotals' (overall counters).

        An Imaging System MAY support and implement the Time group
```



```
        for individual managed services and managed subunits.

        An Imaging System MUST support and implement the Monitor group
        for 'icServiceType' of 'systemTotals' (overall counters).

        An Imaging System MAY support and implement the Monitor group
        for individual managed services and managed subunits.

        If an Imaging System also implements the Host Resources MIB
        (RFC 1514/2790) then the value of 'icServiceIndex' for each
        configured managed service SHOULD be the same as the value of
        'hrSWRunIndex' and 'hrSWInstalledIndex' for that service.

        If an Imaging System also implements the Printer MIB
        (RFC 1759/3805) then the value of 'icSubunitIndex' for each
        configured managed subunit SHOULD be the same as the value of
        'prtXxxIndex' for that subunit (if it is print-related)."
    MODULE  -- this module
    MANDATORY-GROUPS { icGeneralGroup,
                       icKeyGroup,
                       icServiceGroup,
                       icTimeGroup,
                       icMonitorGroup }

    GROUP   icSubunitGroup
    DESCRIPTION
        "Subunit group - columnar objects.

        An Imaging System MUST support and implement the Subunit group,
        if the Imaging System supports any managed subunit,
        for example, 'icSubunitType' of 'channel' for 'prtChannelTable'
        in Printer MIB (RFC 1759/3805)."

    GROUP   icImageGroup
    DESCRIPTION
        "Image group - columnar objects.

        An Imaging System MUST support and implement the Image group,
        if the Imaging System supports any managed service with
        'icServiceType' of 'copy', 'scan', 'faxIn', 'faxOut',
        'networkFaxIn', or 'networkFaxOut'."

    GROUP   icImpressionGroup
    DESCRIPTION
        "Impression group - columnar objects.

        An Imaging System MUST support and implement the Impression
        group, if the Imaging System supports any managed service with
        'icServiceType' of 'copy' or 'print'."

    GROUP   icTwoSidedGroup
    DESCRIPTION
        "Two Sided group - columnar objects.

        An Imaging System MUST support and implement the Two Sided
        group, if the Imaging System supports any managed service with
```



```
        'icServiceType' of 'copy' or 'print' that supports two-sided
        printing."

    GROUP   icSheetGroup
    DESCRIPTION
        "Sheet group - columnar objects.

        An Imaging System MUST support and implement the Sheet group,
        if the Imaging System supports any managed service with
        'icServiceType' of 'copy' or 'print'."

    GROUP   icTrafficGroup
    DESCRIPTION
        "Traffic group - columnar objects.

        An Imaging System MUST support and implement the Traffic group,
        if the Imaging System supports any managed service."

    GROUP   icMediaUsedGroup
    DESCRIPTION
        "Media Used group - columnar objects.

        An Imaging System MAY support and implement the Media Used
        group."

    GROUP   icAlertGroup
    DESCRIPTION
        "Alert group - columnar objects.

        An Imaging System MAY support and implement the Alert group."

    GROUP   icAlertTrapGroup
    DESCRIPTION
        "Alert Trap group - notifications.

        An Imaging System MAY support and implement Alert Trap group."

    OBJECT  icGeneralNaturalLanguage
    DESCRIPTION
        "If this object is empty, then the natural language for
        all localized text string objects defined in this MIB SHOULD
        default to 'en-US' (US English)."

    OBJECT  icKeyServiceIndex
    DESCRIPTION
        "If an Imaging System also implements the Host Resources MIB
        (RFC 1514/2790) then the value of 'icKeyServiceIndex' for each
        configured managed service SHOULD be the same as the value of
        'hrSWRunIndex' and 'hrSWInstalledIndex' for that service."

    OBJECT  icKeySubunitIndex
    DESCRIPTION
        "If an Imaging System also implements the Printer MIB
        (RFC 1759/3805) then the value of 'icKeySubunitIndex' for each
        configured managed subunit SHOULD be the same as the value of
        'prtXxxIndex' for that subunit (if it is print-related)."
```



```
    OBJECT  icMediaUsedMediaInfo
    DESCRIPTION
        "This media description MUST clearly distinguish different
        instances of the same media size in 'icMediaUsedTable' (for
        example, by including specific media color, weight, etc.)."

    ::= { icMIBConformance 1 }


--
--  Conformance Groups
--

icGeneralGroup OBJECT-GROUP
    OBJECTS {
        icGeneralNaturalLanguage,
        icGeneralTotalServiceRecords,
        icGeneralTotalSubunitRecords,
        icGeneralTotalMediaUsedRecords
    }
    STATUS      current
    DESCRIPTION
        "General group - scalar objects."
    ::= { icMIBObjectGroups 1 }

icKeyGroup OBJECT-GROUP
    OBJECTS {
        icKeyServiceType,
        icKeyServiceIndex,
        icKeySubunitType,
        icKeySubunitIndex
    }
    STATUS      current
    DESCRIPTION
        "Key group - columnar objects."
    ::= { icMIBObjectGroups 2 }

icServiceGroup OBJECT-GROUP
    OBJECTS {
        icServiceKey,
        icServiceInfo,
        icServiceJobSetIndex
    }
    STATUS      current
    DESCRIPTION
        "Service group - columnar objects."
    ::= { icMIBObjectGroups 3 }

icSubunitGroup OBJECT-GROUP
    OBJECTS {
        icSubunitKey,
        icSubunitInfo
    }
    STATUS      current
    DESCRIPTION
```



```
        "Subunit group - columnar objects."
    ::= { icMIBObjectGroups 4 }

icTimeGroup OBJECT-GROUP
    OBJECTS {
        icTimeTotalSeconds,
        icTimeDownSeconds,
        icTimeMaintenanceSeconds,
        icTimeProcessingSeconds
    }
    STATUS      current
    DESCRIPTION
        "Time group - columnar objects."
    ::= { icMIBObjectGroups 5 }

icMonitorGroup OBJECT-GROUP
    OBJECTS {
        icMonitorConfigChanges,
        icMonitorTotalAlerts,
        icMonitorCriticalAlerts,
        icMonitorAbortedJobs,
        icMonitorCanceledJobs,
        icMonitorCompletedJobs,
        icMonitorCompletedFinisherJobs,
        icMonitorMemoryAllocErrors,
        icMonitorMemoryAllocWarnings,
        icMonitorStorageAllocErrors,
        icMonitorStorageAllocWarnings,
        icMonitorLocalStorageKOctets,
        icMonitorRemoteStorageKOctets
    }
    STATUS      current
    DESCRIPTION
        "Monitor group - columnar objects."
    ::= { icMIBObjectGroups 6 }

icImageGroup OBJECT-GROUP
    OBJECTS {
        icImageTotalImages,
        icImageMonochromeImages,
        icImageFullColorImages
    }
    STATUS      current
    DESCRIPTION
        "Image group - columnar objects."
    ::= { icMIBObjectGroups 7 }

icImpressionGroup OBJECT-GROUP
    OBJECTS {
        icImpressionTotalImps,
        icImpressionMonochromeImps,
        icImpressionBlankImps,
        icImpressionFullColorImps,
        icImpressionHighlightColorImps
    }
    STATUS      current
```



```
    DESCRIPTION
        "Impression group - columnar objects."
    ::= { icMIBObjectGroups 8 }

icTwoSidedGroup OBJECT-GROUP
    OBJECTS {
        icTwoSidedTotalImps,
        icTwoSidedMonochromeImps,
        icTwoSidedBlankImps,
        icTwoSidedFullColorImps,
        icTwoSidedHighlightColorImps
    }
    STATUS      current
    DESCRIPTION
        "Two Sided group - columnar objects."
    ::= { icMIBObjectGroups 9 }

icSheetGroup OBJECT-GROUP
    OBJECTS {
        icSheetTotalSheets,
        icSheetMonochromeSheets,
        icSheetBlankSheets,
        icSheetFullColorSheets,
        icSheetHighlightColorSheets
    }
    STATUS      current
    DESCRIPTION
        "Sheet group - columnar objects."
    ::= { icMIBObjectGroups 10 }

icTrafficGroup OBJECT-GROUP
    OBJECTS {
        icTrafficInputKOctets,
        icTrafficOutputKOctets,
        icTrafficInputMessages,
        icTrafficOutputMessages
    }
    STATUS      current
    DESCRIPTION
        "Traffic group - columnar objects."
    ::= { icMIBObjectGroups 11 }

icMediaUsedGroup OBJECT-GROUP
    OBJECTS {
        icMediaUsedTotalSheets,
        icMediaUsedMonochromeSheets,
        icMediaUsedBlankSheets,
        icMediaUsedFullColorSheets,
        icMediaUsedHighlightColorSheets,
        icMediaUsedMediaSizeName,
        icMediaUsedMediaInfo,
        icMediaUsedMediaName
    }
    STATUS      current
    DESCRIPTION
        "Media Used group - columnar objects."
```



```
    ::= { icMIBObjectGroups 12 }

icAlertGroup OBJECT-GROUP
    OBJECTS {
        icAlertCounterEventType,
        icAlertCounterName,
        icAlertCounterValue,
        icAlertDateAndTime,
        icAlertTimeStamp
    }
    STATUS      current
    DESCRIPTION
        "Alert group - columnar objects."
    ::= { icMIBObjectGroups 13 }

icAlertTrapGroup NOTIFICATION-GROUP
    NOTIFICATIONS { icAlertV2Trap }
    STATUS      current
    DESCRIPTION
        "Alert Trap group - notifications."
    ::= { icMIBNotificationGroups 1 }

END
```


6 Conformance Requirements

Conforming implementations of the IC MIB:

- MUST implement every object defined in the General, Key, Service, Time, and Monitor object groups (although no specific service type need be supported);
- MUST initialize every object to the DEFVAL clause (or an actual value) for each OBJECT-TYPE statement in the MIB;
- MUST implement every object conformance requirement specified in the SYNTAX, MAX-ACCESS, and DESCRIPTION clauses for each OBJECT-TYPE statement in the MIB;
- MUST implement every object and group conformance requirement specified in the 'icMIBCompliance' MODULE-COMPLIANCE statement in the MIB.

7 IANA and PWG Considerations

There are no IANA considerations for IC MIB maintenance.
There are PWG considerations for IC MIB maintenance for the 'IcCounterEventTypeTC', 'IcPersistenceTC', 'IcServiceTypeTC', 'IcSubunitTypeTC', and 'IcWorkTypeTC' enumerated textual conventions.

8 Internationalization Considerations

The IC MIB fully conforms to the IETF Policy on Character Sets and Languages [RFC2277], as follows:

- The IC MIB defines one scalar object 'icGeneralNaturalLanguage', used to specify a natural language tag (that conforms to [RFC3066]) for all localized text strings (e.g., 'en-US' for the 'US dialect of English').
- The IC MIB imports one textual convention 'SnmpAdminString', used to define localized text string objects in the UTF-8 [RFC3629] charset (under the control of the natural language tag specified in 'icGeneralNaturalLanguage').

9 Security Considerations

The IC MIB does NOT define any 'read-write' or 'read-create' objects. Nonetheless, security considerations apply to the defined 'read-only' objects.
The IC MIB exposes a list of configured services in the the 'icServiceType' and 'icServiceInfo' objects.
The IC MIB exposes a list of configured subunits in the the 'icSubunitType' and 'icSubunitInfo' objects.
It is RECOMMENDED that implementors consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate access rights.

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11 Normative References

[PWG-COUNT] Lewis, Zehler.
PWG Standard for Imaging System Counters, PWG 5106.1, September 2005.

[PWG5101.1] Bergman, Hastings.
PWG Media Standardized Names, PWG 5101.1, February 2002.

[PWG5105.1] Zehler, Hastings, Albright.
PWG Semantic Model/1.0, PWG 5105.1, January 2004.

[RFC1213] McCloghrie, Rose.
IETF MIB-II, RFC 1213, March 1991.
(updated by [RFC2011], [RFC2012], and [RFC2013])

[RFC2119] Bradner.
Key words for use in RFCs to Indicate Requirement Levels, RFC 2119, March 1997.

[RFC2578] McCloghrie, Perkins, Schoenwaelder.
Structure of Management Information Version 2, RFC 2578, April 1999.

[RFC2579] McCloghrie, Perkins, Schoenwaelder.
Textual Conventions for SMIv2, RFC 2579, April 1999.

[RFC2580] McCloghrie, Perkins, Schoenwaelder.
Conformance Statements for SMIv2, RFC 2580, April 1999.

[RFC2707] Bergman, Hastings, Isaacson, Lewis.
IETF Job Monitoring MIB v1.0, RFC 2707, November 1999.

[RFC2790] Grillo, Waldbusser.
IETF Host Resources MIB v2, RFC 2790, March 2000.

[RFC2911] Hastings, Herriot, deBry, Isaacson, Powell.
IPP/1.1: Model and Semantics, RFC 2911, September 2000.

[RFC3066] Alvestrand.

Tags for the Identification of Languages, RFC 3066, January 2001.

[RFC3411] Harrington, Presuhn, Wijnen.
An Architecture for Describing SNMP Management Frameworks, RFC 3411, December 2002.

[RFC3629] Yergeau.
UTF-8, a transform of ISO 10646, RFC 3629, November 2003.

[RFC3805] Bergman, Lewis, McDonald.
IETF Printer MIB v2, RFC 3805, June 2004.

12 Informative References

[MIB-GUIDE] Heard.
IETF Guidelines for Authors and Reviewers of MIB Documents, work-in-progress, <draft-ietf-ops-mib-review-guidelines-xx.txt>.

[RFC1514] Grillo, Waldbusser.
IETF Host Resources MIB v1, RFC 1514, August 1990.
(obsoleted by [RFC2790])

[RFC1759] Smith, Wright, Hastings, Zilles, Gyllenskog.
IETF Printer MIB v1, RFC 1759, March 1995.
(obsoleted by [RFC3805])

[RFC2011] McCloghrie.
SNMPv2 MIB for IP using SMIv2, RFC 2011, November 1996.
(updates [RFC1213])

[RFC2012] McCloghrie.
SNMPv2 MIB for TCP using SMIv2, RFC 2012, November 1996.
(updates [RFC1213])

[RFC2013] McCloghrie.
SNMPv2 MIB for UDP using SMIv2, RFC 2013, November 1996.
(updates [RFC1213])

[RFC2277] Alvestrand.
IETF Policy on Character Sets and Languages, RFC 2277, January 1998.

[RFC3410] Case, Mundy, Partain, Stewart.
Introduction and Applicability Statements for Internet-Standard Management Framework, RFC 3410, December 2002.

[RFC3584] Frye, Levi, Routhier, Wijnen.
Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework, RFC 3584, August 2003.

13 Authors Addresses

Editor:

Ira McDonald (High North)
Phone: 906-494-2434
Email: imcdonald@sharplabs.com

Send comments using the Web-based Imaging Management Service (WIMS) Mailing List:

wims@pwg.org

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