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Definitions of Managed Objects for Parallel-printer-like
Hardware Devices using SMIV2

Status of this Memo

This document specifies an IAB standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Introduction

This memo defines an extension to the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects for the management of Parallel-printer-like devices.

2. The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework consists of four major components. They are:

- o RFC 1442 [1] which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.
- o STD 17, RFC 1213 [2] defines MIB-II, the core set of managed objects for the Internet suite of protocols.

- o RFC 1445 [3] which defines the administrative and other architectural aspects of the framework.
- o RFC 1448 [4] which defines the protocol used for network access to managed objects.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Overview

The Parallel-printer-like Hardware Device MIB applies to interface ports that would most probably support the Character MIB. The most common example is Centronics-like printer port.

The Parallel-printer-like Hardware Device MIB is mandatory for all systems that have such a hardware port supporting services managed through some other MIB.

The Parallel-printer-like Hardware Port MIB includes Centronics-like and Data-Products-like parallel physical links with a similar set of control signals.

The MIB contains objects that relate to physical layer connections.

The MIB comprises one base object and three tables, detailed in the following sections. The tables contain objects for ports and input and output control signals.

3.1. Relationship to Interface MIB

The Parallel-printer-like MIB is one of many MIBs designed for layered use as described in the Interface MIB [5]. In most implementations where it is present, it will be in the lowest interface sublayer, that is, the Parallel-printer-like MIB represents the physical layer, providing service to higher layers such as the

Character MIB [6].

Although it is unlikely that a parallel printer port will actually be used as a network interface, which is the intent of the Interface MIB, the Parallel-printer-like MIB is closely connected to the Character MIB, which can share hardware interfaces with network operation, and relate to the RS-232 MIB [7].

The Interface MIB's ifTestTable and ifRcvAddressTable are not relevant to the Parallel-printer-like MIB.

The Parallel-printer-like MIB is relevant for ifType values para(34) and perhaps others.

The Parallel-printer-like MIB requires the conformance groups ifGeneralGroup, and ifFixedLengthGroup.

Usefulness of error counters in this MIB depends on the octet counters in ifFixedLengthGroup.

4. Definitions

```
PARALLEL-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,  
    Counter32, Integer32  
    FROM SNMPv2-SMI  
    InterfaceIndex  
    FROM IF-MIB  
    transmission  
    FROM RFC1213-MIB  
    MODULE-COMPLIANCE, OBJECT-GROUP  
    FROM SNMPv2-CONF;
```

```
para MODULE-IDENTITY
```

```
    LAST-UPDATED "9405261700Z"  
    ORGANIZATION "IETF Character MIB Working Group"  
    CONTACT-INFO  
        "          Bob Stewart  
        Postal: Xyplex, Inc.  
              295 Foster Street  
              Littleton, MA 01460  
  
        Tel: 508-952-4816  
        Fax: 508-952-4887  
        E-mail: rlstewart@eng.xyplex.com"
```

```
DESCRIPTION
    "The MIB module for Parallel-printer-like hardware devices."
 ::= { transmission 34 }

-- Generic Parallel-printer-like information

paraNumber OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of ports (regardless of their current
         state) in the Parallel-printer-like port table."
    ::= { para 1 }

-- the Parallel-printer-like Port table

paraPortTable OBJECT-TYPE
    SYNTAX SEQUENCE OF ParaPortEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of port entries. The number of entries is
         given by the value of paraNumber."
    ::= { para 2 }

paraPortEntry OBJECT-TYPE
    SYNTAX ParaPortEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Status and parameter values for a port."
    INDEX { paraPortIndex }
    ::= { paraPortTable 1 }

ParaPortEntry ::=
    SEQUENCE {
        paraPortIndex
            InterfaceIndex,
        paraPortType
            INTEGER,
        paraPortInSigNumber
            Integer32,
        paraPortOutSigNumber
            Integer32
    }
```

```
paraPortIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The value of ifIndex for the port.  By convention
        and if possible, hardware port numbers map directly
        to external connectors.  The value for each port must
        remain constant at least from one re-initialization
        of the network management agent to the next."
    ::= { paraPortEntry 1 }

paraPortType OBJECT-TYPE
    SYNTAX INTEGER {
        other(1),
        centronics(2),
        dataproducts(3)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The port's hardware type."
    ::= { paraPortEntry 2 }

paraPortInSigNumber OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of input signals for the port in the
        input signal table (paraPortInSigTable).  The table
        contains entries only for those signals the software
        can detect and that are useful to observe."
    ::= { paraPortEntry 3 }

paraPortOutSigNumber OBJECT-TYPE
    SYNTAX Integer32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of output signals for the port in the
        output signal table (paraPortOutSigTable).  The
        table contains entries only for those signals the
        software can assert and that are useful to observe."
    ::= { paraPortEntry 4 }
```

-- Parallel-printer-like Input Signal Table

```

paraInSigTable OBJECT-TYPE
    SYNTAX SEQUENCE OF ParaInSigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of port input control signal entries."
    ::= { para 3 }

paraInSigEntry OBJECT-TYPE
    SYNTAX ParaInSigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Input control signal status for a hardware port."
    INDEX { paraInSigPortIndex, paraInSigName }
    ::= { paraInSigTable 1 }

ParaInSigEntry ::=
    SEQUENCE {
        paraInSigPortIndex
            InterfaceIndex,
        paraInSigName
            INTEGER,
        paraInSigState
            INTEGER,
        paraInSigChanges
            Counter32
    }

paraInSigPortIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The value of paraPortIndex for the port to which
        this entry belongs."
    ::= { paraInSigEntry 1 }

paraInSigName OBJECT-TYPE
    SYNTAX INTEGER { power(1), online(2), busy(3),
                    paperout(4), fault(5) }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Identification of a hardware signal."
    ::= { paraInSigEntry 2 }

```

```

paraInSigState OBJECT-TYPE
    SYNTAX INTEGER { none(1), on(2), off(3) }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The current signal state."
    ::= { paraInSigEntry 3 }

paraInSigChanges OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of times the signal has changed from
        'on' to 'off' or from 'off' to 'on'."
    ::= { paraInSigEntry 4 }

-- Output Signal Table

paraOutSigTable OBJECT-TYPE
    SYNTAX SEQUENCE OF ParaOutSigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A list of port output control signal entries."
    ::= { para 4 }

paraOutSigEntry OBJECT-TYPE
    SYNTAX ParaOutSigEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Output control signal status for a hardware port."
    INDEX { paraOutSigPortIndex, paraOutSigName }
    ::= { paraOutSigTable 1 }

ParaOutSigEntry ::=
    SEQUENCE {
        paraOutSigPortIndex
            InterfaceIndex,
        paraOutSigName
            INTEGER,
        paraOutSigState
            INTEGER,
        paraOutSigChanges
            Counter32
    }

```

```
paraOutSigPortIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The value of paraPortIndex for the port to which
        this entry belongs."
    ::= { paraOutSigEntry 1 }

paraOutSigName OBJECT-TYPE
    SYNTAX INTEGER { power(1), online(2), busy(3),
                    paperout(4), fault(5) }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Identification of a hardware signal."
    ::= { paraOutSigEntry 2 }

paraOutSigState OBJECT-TYPE
    SYNTAX INTEGER { none(1), on(2), off(3) }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The current signal state."
    ::= { paraOutSigEntry 3 }

paraOutSigChanges OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of times the signal has changed from
        'on' to 'off' or from 'off' to 'on'."
    ::= { paraOutSigEntry 4 }

-- conformance information

paraConformance OBJECT IDENTIFIER ::= { para 5 }

paraGroups      OBJECT IDENTIFIER ::= { paraConformance 1 }
paraCompliances OBJECT IDENTIFIER ::= { paraConformance 2 }
```

```

-- compliance statements

paraCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for SNMPv2 entities
    which have Parallel-printer-like hardware
    interfaces."

  MODULE -- this module
    MANDATORY-GROUPS { paraGroup }
  ::= { paraCompliances 1 }

-- units of conformance

paraGroup OBJECT-GROUP
  OBJECTS { paraNumber, paraPortIndex, paraPortType,
    paraPortInSigNumber, paraPortOutSigNumber,
    paraInSigPortIndex, paraInSigName,
    paraInSigState, paraInSigChanges,
    paraOutSigPortIndex, paraOutSigName,
    paraOutSigState, paraOutSigChanges }
  STATUS current
  DESCRIPTION
    "A collection of objects providing information
    applicable to all Parallel-printer-like interfaces."
  ::= { paraGroups 1 }

END

```

5. Acknowledgements

This memo was produced by the IETF Character MIB Working Group.

6. References

- [1] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1442, SNMP Research, Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.
- [2] McCloghrie, K., and M. Rose, Editors, "Management Information Base for Network Management of TCP/IP-based internets: MIB-II", STD 17, RFC 1213, Hughes LAN Systems, Performance Systems International, March 1991.

- [3] Galvin, J., and K. McCloghrie, "Administrative Model for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1445, Trusted Information Systems, Hughes LAN Systems, April 1993.
- [4] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for version 2 of the Simple Network Management Protocol (SNMPv2)", RFC 1448, SNMP Research, Inc., Hughes LAN Systems, Dover Beach Consulting, Inc., Carnegie Mellon University, April 1993.
- [5] McCloghrie, K., and F. Kastenholz, "Evolution of the Interfaces Group of MIB-II", RFC 1573, Hughes LAN Systems, FTP Software, January 1994.
- [6] Stewart, B., "Definitions of Managed Objects for Character Stream Devices using SMIV2", RFC 1658, Xyplex, Inc., July 1994.
- [7] Stewart, B., "Definitions of Managed Objects for RS-232-like Devices using SMIV2", RFC 1659, Xyplex, Inc., July 1994.

7. Security Considerations

Security issues are not discussed in this memo.

8. Author's Address

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