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Application note

SNMP OID
OWL Family

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Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

Contents

Contents

1 SNMP OID

OID (Object Identifier) is the designation for a numeric identifier that unambiguously identifies each value in SNMP. This identifier consists of a progression of numbers separated by a point. The shape of the each OID is determined by the identifier value of the parent element and then this value is complemented by a point and a current number. So it is obvious that there is a tree structure. It is stored in the MIB (Management Information Base) that contains names and descriptions of the numeric identifiers.

1.1 Tree structure

The following figure shows the basic tree structure used for creating all of OIDs.

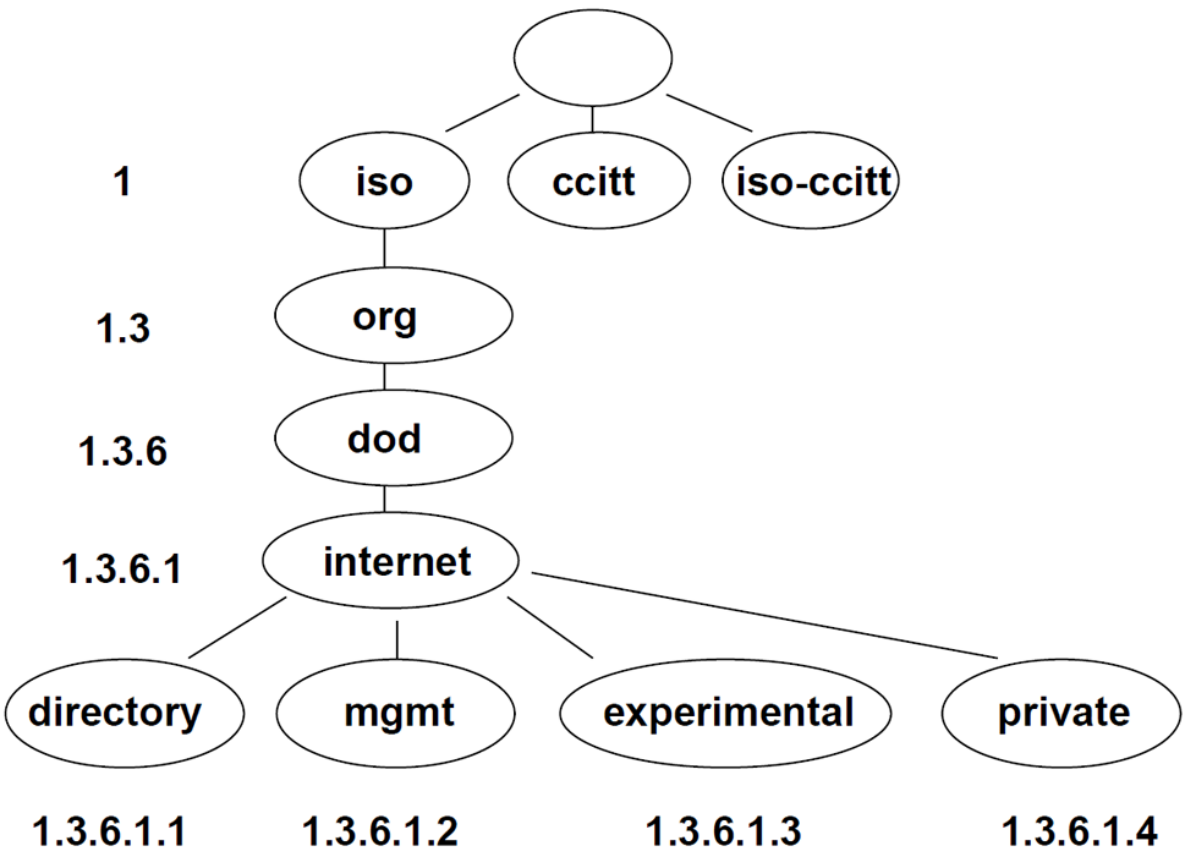

Figure 1: Basic structure

In the standard MIB table, the `mgmt` item is further divided into the following groups:

OID	Group Name	Note
.1.3.6.1.2.1.1	system	For more information see section 1.2
.1.3.6.1.2.1.2	interfaces	For more information see section 1.3
.1.3.6.1.2.1.3	at	Not supported by OWL routers
.1.3.6.1.2.1.4	ip	For more information see section 1.4
.1.3.6.1.2.1.5	icmp	For more information see section 1.5
.1.3.6.1.2.1.6	tcp	For more information see section 1.6
.1.3.6.1.2.1.7	udp	For more information see section 1.7
.1.3.6.1.2.1.8	egp	Not supported by OWL routers

Table 1: Basic groups

OID	Group Name	Note
.1.3.6.1.2.1.9	transmission	Not supported by OWL routers
.1.3.6.1.2.1.10	snmp	Not supported by OWL routers

Table 1: Basic groups

An example of OID value can be.1.3.6.1.2.1.4. This value corresponds to the text version of the MIB `iso.org.dod.internet.mgmt.mib-2.ip` (provides information about IP addresses).

1.2 System

OID	Object	Description
.1.3.6.1.2.1.1.1	sysDescr	A textual description of the entity.
.1.3.6.1.2.1.1.2	sysObjectID	Identification of the network management subsystem contained in the entity.
.1.3.6.1.2.1.1.3	sysUpTime	The time (in hundredth of a second) since the network management portion of the system was last reinitialized.
.1.3.6.1.2.1.1.4	sysContact	The textual identification of the contact person. If it is unknown, the value is a zero-length string.
.1.3.6.1.2.1.1.5	sysName	System name. If it is unknown, the value is a zero-length string.
..1.3.6.1.2.1.1.6	sysLocation	The physical location (for example, second floor). If it is unknown, the value is a zero-length string.
.1.3.6.1.2.1.1.7	sysServices	A value which indicates the set of services that this entity primarily offers.
.1.3.6.1.2.1.8	egp	Not supported by Hirschmann routers

Table 2: System

1.3 Interfaces

OID	Table	Description
.1.3.6.1.2.1.2.1	ifNumber	The number of network interfaces (regardless of their current state).
.1.3.6.1.2.1.2.2	ifTable	A list of interface entries. The number of entries is given by the value of ifNumber.

Table 3: Interfaces

`IfTable` is the parent element for a group `ifEntry` (OID.1.3.6.1.2.1.2.2.1). This group includes scalar objects that store information relating to a particular interface.

1.4 IP

OID	Object	Description
.1.3.6.1.2.1.4.1	ipForwarding	The indication of whether this entity is acting as an IP gateway in respect to the forwarding of datagrams received by, but not addressed to this entity.
.1.3.6.1.2.1.4.2	ipDefaultTTL	The default value inserted into the Time-To-Live field of the IP header of datagrams originated at this entity, whenever a TTL value is not supplied by the transport layer protocol.
.1.3.6.1.2.1.4.3	ipInReceives	The total number of input datagrams received from interfaces, including those received in error.
.1.3.6.1.2.1.4.4	ipInHdrErrors	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, etc.
.1.3.6.1.2.1.4.5	ipInAddrErrors	The number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity.
.1.3.6.1.2.1.4.6	ipForwDatagrams	The number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination.
.1.3.6.1.2.1.4.7	ipInUnknownProtos	The number of locally-addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
.1.3.6.1.2.1.4.8	ipInDiscards	The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space).
.1.3.6.1.2.1.4.9	ipInDelivers	The total number of input datagrams successfully delivered to the IP user-protocols (including ICMP).
.1.3.6.1.2.1.4.10	ipOutRequests	The total number of IP datagrams which the local IP user protocols (including ICMP) supplied to the IP that requests for transmission. Note that this counter does not include any datagrams counted in ip-ForwDatagrams.
.1.3.6.1.2.1.4.11	ipOutDiscards	The number of output IP datagrams for which no problem is encountered to prevent their transmission to their destination, but which were discarded (for example, the lack of buffer space). Note that this counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.

Table 4: IP

OID	Object	Description
.1.3.6.1.2.1.4.12	ipOutNoRoutes	The number of IP datagrams discarded because no route are available to transmit them to their destination. Note that this counter includes any packets counted in ipForwDatagrams which meet this “no-route” criterion.
.1.3.6.1.2.1.4.13	ipReasmTimeout	The maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.
.1.3.6.1.2.1.4.14	ipReasmReqds	The number of IP fragments received which needed to be reassembled at this entity.
.1.3.6.1.2.1.4.15	ipReasmOKs	The number of IP datagrams successfully reassembled.
.1.3.6.1.2.1.4.16	ipReasmFails	The number of failures detected by the IP reassembly algorithm (for whatever reason: timed out, or errors).
.1.3.6.1.2.1.4.17	ipFragOKs	The number of IP datagrams that have been successfully fragmented at this entity.
.1.3.6.1.2.1.4.18	ipFragFails	The number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be.
.1.3.6.1.2.1.4.19	ipFragCreates	The number of IP datagram fragments that have been generated as a result of fragmentation at this entity.
.1.3.6.1.2.1.4.20	ipAddrTable	The table of addressing information relevant to this entity’s IP addresses.
.1.3.6.1.2.1.4.21	ipRouteTable	This entity’s IP Routing table.
.1.3.6.1.2.1.4.22	ipNetToMediaTable	The IP Address Translation table used for mapping from IP addresses to physical addresses.
.1.3.6.1.2.1.4.23	ipRoutingDiscards	The number of routing entries that are selected to discard even though they are valid.

Table 4: IP

1.5 ICMP

OID	Object	Description
.1.3.6.1.2.1.5.1	icmpInMsgs	The total number of ICMP messages which the entity received. Note that this counter includes all those counted by icmpInErrors.
.1.3.6.1.2.1.5.2	icmpInErrors	The number of ICMP messages which the entity receives but determined as having ICMP-specific errors (bad ICMP checksums, bad length, etc.).
.1.3.6.1.2.1.5.3	icmpInDestUnreachs	The number of ICMP Destination Unreachable messages received.
.1.3.6.1.2.1.5.4	icmpInTimeExcds	The number of ICMP Time Exceeded messages received.
.1.3.6.1.2.1.5.5	icmpInParmProbs	The number of ICMP Parameter Problem messages received.
.1.3.6.1.2.1.5.6	icmpInSrcQuenchs	The number of ICMP Source Quench messages received.
.1.3.6.1.2.1.5.7	icmpInRedirects	The number of ICMP Redirect messages received.
.1.3.6.1.2.1.5.8	icmpInEchos	The number of ICMP Echo (request) messages received.
.1.3.6.1.2.1.5.9	icmpInEchoReps	The number of ICMP Echo Reply messages received.
.1.3.6.1.2.1.5.10	icmpInTimestamps	The number of ICMP Timestamp (request) messages received.
.1.3.6.1.2.1.5.11	icmpInTimestampReps	The number of ICMP Timestamped Reply messages received.
.1.3.6.1.2.1.5.12	icmpInAddrMasks	The number of ICMP Address Mask Request messages received.
.1.3.6.1.2.1.5.13	icmpInAddrMaskReps	The number of ICMP Address Mask Reply messages received.
.1.3.6.1.2.1.5.14	icmpOutMsgs	The total number of ICMP messages which this entity attempted to send. Note that this counter includes all those counted by icmpOutErrors.
.1.3.6.1.2.1.5.15	icmpOutErrors	The number of ICMP messages which this entity did not send due to problems discovered within ICMP such as a lack of buffers.
.1.3.6.1.2.1.5.16	icmpOutDestUnreachs	The number of ICMP Destination Unreachable messages sent.
.1.3.6.1.2.1.5.17	icmpOutTimeExcds	The number of ICMP Time Exceeded messages sent.
.1.3.6.1.2.1.5.18	icmpOutParmProbs	The number of ICMP Parameter Problem messages sent.

Table 5: ICMP

OID	Object	Description
.1.3.6.1.2.1.5.19	icmpOutSrcQuenchs	The number of ICMP Source Quench messages sent.
.1.3.6.1.2.1.5.20	icmpOutRedirects	The number of ICMP Redirect messages sent. For a host, this object will always be zero, since hosts do not send redirects.
.1.3.6.1.2.1.5.21	icmpOutEchos	The number of ICMP Echo (request) messages sent.
.1.3.6.1.2.1.5.22	icmpOutEchoReps	The number of ICMP Echo Reply messages sent
.1.3.6.1.2.1.5.23	icmpOutTimestamps	The number of ICMP Timestamp (request) messages sent.
.1.3.6.1.2.1.5.24	icmpOutTimestampReps	The number of ICMP Timestamp Reply messages sent.
.1.3.6.1.2.1.5.25	icmpOutAddrMasks	The number of ICMP Address Mask Request messages sent.
.1.3.6.1.2.1.5.26	icmpOutAddrMaskReps	The number of ICMP Address Mask Reply messages sent

Table 5: ICMP

1.6 TCP

OID	Object	Description
.1.3.6.1.2.1.6.1	tcpRtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets
.1.3.6.1.2.1.6.2	tcpRtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
.1.3.6.1.2.1.6.3	tcpRtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds.
.1.3.6.1.2.1.6.4	tcpMaxConn	The limit on the total number of TCP connections the entity can support. In entities where the maximum number of connections is dynamic, this object should contain -1.
.1.3.6.1.2.1.6.5	tcpActiveOpens	The number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
.1.3.6.1.2.1.6.6	tcpPassiveOpens	The number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
.1.3.6.1.2.1.6.7	tcpAttemptFails	The number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYNRCVD state.
.1.3.6.1.2.1.6.8	tcpEstabResets	The number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
.1.3.6.1.2.1.6.9	tcpCurrEstab	The number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
.1.3.6.1.2.1.6.10	tcpInSegs	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
.1.3.6.1.2.1.6.11	tcpOutSegs	The total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.

Table 6: TCP

OID	Object	Description
.1.3.6.1.2.1.6.12	tcpRetransSegs	The total number of segments retransmitted – that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
.1.3.6.1.2.1.6.13	tcpInErrs	The total number of segments received in error (e.g.,bad TCP checksums).
.1.3.6.1.2.1.6.14	tcpOutRsts	The number of TCP segments sent containing the RST flag.

Table 6: TCP

TCP also includes `tcpConnTable` table (.1.3.6.1.2.1.6.13) that is the parent element for the `tcpConnEntry` table. It is a table containing information about existing TCP connections and TCP listeners. This table is considered to be outdated and now is usually replaced by the `tcpConnectionTable` and `tcpListenerTable` tables.

1.7 UDP

OID	Object	Description
.1.3.6.1.2.1.7.1	udpInDatagram	The total number of UDP datagrams delivered to UDP users.
.1.3.6.1.2.1.7.2	udpNoPorts	The total number of received UDP datagrams for which there was no application at the destination port.
.1.3.6.1.2.1.7.3	udpInErrors	The number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
.1.3.6.1.2.1.7.4	udpOutDatagrams	The total number of UDP datagrams sent from this entity.

Table 7: UDP

This group also includes `udpTable` table that is the parent element for `udpEntry` table. It is a table containing information about a particular current UDP listener. There are two scalar objects `udpLocalAddress` (.1.3.6.1.2.1.7.5.1.1) and `udpLocalPort` (.1.3.6.1.2.1.7.5.1.2). The first gives the local address for UDP listener and the second gives the local port number for UDP listener.

A Further support

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