

## IP Forwarding Table MIB

### Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) 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 update to RFC 1354, "IP Forwarding Table MIB", for Classless Inter-Domain Routing (CIDR). That document was developed by the Router Requirements Working Group as an update to RFC 1213's ipRouteTable, with the display of multiple routes as a primary objective. The significant difference between this MIB and RFC 1354 is the recognition (explicitly discussed but by consensus left to future work) that CIDR routes may have the same network number but different network masks. Note that this MIB obsoletes a number of objects from RFC 1354. The reader should pay careful attention to the STATUS field.

## 2. The SNMP Network Management Framework

The SNMP Network Management Framework presently consists of three major components. They are:

- o the SMI, described in RFC 1902 [1], - the mechanisms used for describing and naming objects for the purpose of management.
- o the MIB-II, STD 17, RFC 1213 [2], - the core set of managed objects for the Internet suite of protocols.
- o the protocol, RFC 1157 [6] and/or RFC 1905 [4], - the protocol for accessing managed information.

Textual conventions are defined in RFC 1903 [3], and conformance statements are defined in RFC 1904 [5].

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 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 MIB consists of two tables and two global objects.

- (1) The object `ipForwardNumber` indicates the number of current routes. This is primarily to avoid having to read the table in order to determine this number.
- (2) The `ipForwardTable` updates the RFC 1213 `ipRouteTable` to display multipath IP Routes. This is in turn obsoleted by the `ipCidrRouteTable`.
- (3) The `ipCidrRouteTable` updates the RFC 1213 `ipRouteTable` to display multipath IP Routes having the same network number but differing network masks.

## 4. Definitions

IP-FORWARD-MIB DEFINITIONS ::= BEGIN

## IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, IpAddress, Integer32, Gauge32  
 FROM SNMPv2-SMI  
 RowStatus  
 FROM SNMPv2-TC  
 ip  
 FROM RFC1213-MIB  
 MODULE-COMPLIANCE, OBJECT-GROUP  
 FROM SNMPv2-CONF;

ipForward MODULE-IDENTITY

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DESCRIPTION

"The MIB module for the display of CIDR multipath IP Routes."

REVISION "9609190000Z"

DESCRIPTION

"Revisions made by the OSPF WG."

::= { ip 24 }

ipCidrRouteNumber OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of current ipCidrRouteTable entries  
 that are not invalid."

::= { ipForward 3 }

-- IP CIDR Route Table

-- The IP CIDR Route Table obsoletes and replaces the ipRoute  
 -- Table current in MIB-I and MIB-II and the IP Forwarding Table.  
 -- It adds knowledge of the autonomous system of the next hop,  
 -- multiple next hops, and policy routing, and Classless

-- Inter-Domain Routing.

```
ipCidrRouteTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IpCidrRouteEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This entity's IP Routing table."
    REFERENCE
        "RFC 1213 Section 6.6, The IP Group"
    ::= { ipForward 4 }

ipCidrRouteEntry OBJECT-TYPE
    SYNTAX      IpCidrRouteEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A particular route to a particular destina-
        tion, under a particular policy."
    INDEX {
        ipCidrRouteDest,
        ipCidrRouteMask,
        ipCidrRouteTos,
        ipCidrRouteNextHop
    }
    ::= { ipCidrRouteTable 1 }

IpCidrRouteEntry ::=
    SEQUENCE {
        ipCidrRouteDest
            IpAddress,
        ipCidrRouteMask
            IpAddress,
        ipCidrRouteTos
            Integer32,
        ipCidrRouteNextHop
            IpAddress,
        ipCidrRouteIfIndex
            Integer32,
        ipCidrRouteType
            INTEGER,
        ipCidrRouteProto
            INTEGER,
        ipCidrRouteAge
            Integer32,
        ipCidrRouteInfo
            OBJECT IDENTIFIER,
        ipCidrRouteNextHopAS
```

```
        Integer32,
        ipCidrRouteMetric1
        Integer32,
        ipCidrRouteMetric2
        Integer32,
        ipCidrRouteMetric3
        Integer32,
        ipCidrRouteMetric4
        Integer32,
        ipCidrRouteMetric5
        Integer32,
        ipCidrRouteStatus
        RowStatus
    }
```

**ipCidrRouteDest OBJECT-TYPE**

SYNTAX IpAddress  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The destination IP address of this route.

This object may not take a Multicast (Class D) address value.

Any assignment (implicit or otherwise) of an instance of this object to a value x must be rejected if the bitwise logical-AND of x with the value of the corresponding instance of the ipCidrRouteMask object is not equal to x."

::= { ipCidrRouteEntry 1 }

**ipCidrRouteMask OBJECT-TYPE**

SYNTAX IpAddress  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"Indicate the mask to be logical-ANDed with the destination address before being compared to the value in the ipCidrRouteDest field. For those systems that do not support arbitrary subnet masks, an agent constructs the value of the ipCidrRouteMask by reference to the IP Address Class.

Any assignment (implicit or otherwise) of an instance of this object to a value x must be rejected if the bitwise logical-AND of x with

the value of the corresponding instance of the  
ipCidrRouteDest object is not equal to ipCidrRoute-  
Dest."

```
::= { ipCidrRouteEntry 2 }
```

```
-- The following convention is included for specification
-- of TOS Field contents. At this time, the Host Requirements
-- and the Router Requirements documents disagree on the width
-- of the TOS field. This mapping describes the Router
-- Requirements mapping, and leaves room to widen the TOS field
-- without impact to fielded systems.
```

#### ipCidrRouteTos OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The policy specifier is the IP TOS Field. The encoding of IP TOS is as specified by the following convention. Zero indicates the default path if no more specific policy applies.

PRECEDENCE	TYPE OF SERVICE	0
------------	-----------------	---

IP TOS		IP TOS	
Field	Policy	Field	Policy
Contents	Code	Contents	Code
0 0 0 0	==> 0	0 0 0 1	==> 2
0 0 1 0	==> 4	0 0 1 1	==> 6
0 1 0 0	==> 8	0 1 0 1	==> 10
0 1 1 0	==> 12	0 1 1 1	==> 14
1 0 0 0	==> 16	1 0 0 1	==> 18
1 0 1 0	==> 20	1 0 1 1	==> 22
1 1 0 0	==> 24	1 1 0 1	==> 26
1 1 1 0	==> 28	1 1 1 1	==> 30"

```
::= { ipCidrRouteEntry 3 }
```

#### ipCidrRouteNextHop OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"On remote routes, the address of the next system en route; Otherwise, 0.0.0.0."

```
::= { ipCidrRouteEntry 4 }
```

```
ipCidrRouteIfIndex OBJECT-TYPE
```

```
SYNTAX      Integer32
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

"The ifIndex value which identifies the local interface through which the next hop of this route should be reached."

```
DEFVAL { 0 }
```

```
::= { ipCidrRouteEntry 5 }
```

```
ipCidrRouteType OBJECT-TYPE
```

```
SYNTAX      INTEGER {
```

```
    other      (1), -- not specified by this MIB
```

```
    reject     (2), -- route which discards traffic
```

```
    local      (3), -- local interface
```

```
    remote     (4)  -- remote destination
```

```
}
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

"The type of route. Note that local(3) refers to a route for which the next hop is the final destination; remote(4) refers to a route for which the next hop is not the final destination."

Routes which do not result in traffic forwarding or rejection should not be displayed even if the implementation keeps them stored internally.

reject (2) refers to a route which, if matched, discards the message as unreachable. This is used in some protocols as a means of correctly aggregating routes."

```
::= { ipCidrRouteEntry 6 }
```

```
ipCidrRouteProto OBJECT-TYPE
```

```
SYNTAX      INTEGER {
```

```
    other      (1), -- not specified
```

```
    local      (2), -- local interface
```

```
    netmgmt    (3), -- static route
```

```
    icmp       (4), -- result of ICMP Redirect
```

```
-- the following are all dynamic
```

```
-- routing protocols
```

```

    egp          (5),  -- Exterior Gateway Protocol
    ggp          (6),  -- Gateway-Gateway Protocol
    hello        (7),  -- FuzzBall HelloSpeak
    rip          (8),  -- Berkeley RIP or RIP-II
    isIs         (9),  -- Dual IS-IS
    esIs         (10), -- ISO 9542
    ciscoIgrp    (11), -- Cisco IGRP
    bbnSpfIgp    (12), -- BBN SPF IGP
    ospf         (13), -- Open Shortest Path First
    bgp          (14), -- Border Gateway Protocol
    idpr         (15), -- InterDomain Policy Routing
    ciscoEigrp   (16)  -- Cisco EIGRP
  }

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The routing mechanism via which this route was learned. Inclusion of values for gateway routing protocols is not intended to imply that hosts should support those protocols."

::= { ipCidrRouteEntry 7 }

ipCidrRouteAge OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of seconds since this route was last updated or otherwise determined to be correct. Note that no semantics of 'too old' can be implied except through knowledge of the routing protocol by which the route was learned."

DEFVAL { 0 }

::= { ipCidrRouteEntry 8 }

ipCidrRouteInfo OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A reference to MIB definitions specific to the particular routing protocol which is responsible for this route, as determined by the value specified in the route's ipCidrRouteProto value. If this information is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntactically valid object identif-



ier, and any implementation conforming to ASN.1 and the Basic Encoding Rules must be able to generate and recognize this value."

::= { ipCidrRouteEntry 9 }

**ipCidrRouteNextHopAS OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Autonomous System Number of the Next Hop. The semantics of this object are determined by the routing-protocol specified in the route's ipCidrRouteProto value. When this object is unknown or not relevant its value should be set to zero."

DEFVAL { 0 }

::= { ipCidrRouteEntry 10 }

**ipCidrRouteMetric1 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The primary routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipCidrRouteProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipCidrRouteEntry 11 }

**ipCidrRouteMetric2 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipCidrRouteProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipCidrRouteEntry 12 }

**ipCidrRouteMetric3 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipCidrRouteProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipCidrRouteEntry 13 }

ipCidrRouteMetric4 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipCidrRouteProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipCidrRouteEntry 14 }

ipCidrRouteMetric5 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipCidrRouteProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipCidrRouteEntry 15 }

ipCidrRouteStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The row status variable, used according to row installation and removal conventions."

::= { ipCidrRouteEntry 16 }

-- conformance information

ipForwardConformance OBJECT IDENTIFIER ::= { ipForward 5 }

```
ipForwardGroups      OBJECT IDENTIFIER ::= { ipForwardConformance 1 }
ipForwardCompliances OBJECT IDENTIFIER ::= { ipForwardConformance 2 }

-- compliance statements

ipForwardCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for SNMPv2 entities
        which implement the ipForward MIB."

    MODULE -- this module
    MANDATORY-GROUPS { ipForwardCidrRouteGroup }

    ::= { ipForwardCompliances 1 }

-- units of conformance

ipForwardCidrRouteGroup OBJECT-GROUP
    OBJECTS { ipCidrRouteNumber,
               ipCidrRouteDest, ipCidrRouteMask, ipCidrRouteTos,
               ipCidrRouteNextHop, ipCidrRouteIfIndex, ipCidrRouteType,
               ipCidrRouteProto, ipCidrRouteAge, ipCidrRouteInfo,
               ipCidrRouteNextHopAS, ipCidrRouteMetric1,
               ipCidrRouteMetric2, ipCidrRouteMetric3,
               ipCidrRouteMetric4, ipCidrRouteMetric5, ipCidrRouteStatus
            }
    STATUS current
    DESCRIPTION
        "The CIDR Route Table."
    ::= { ipForwardGroups 3 }

-- Obsoleted Definitions - Objects

ipForwardNumber OBJECT-TYPE
    SYNTAX Gauge32
    MAX-ACCESS read-only
    STATUS obsolete
    DESCRIPTION
        "The number of current ipForwardTable entries
        that are not invalid."
    ::= { ipForward 1 }

-- IP Forwarding Table

-- The IP Forwarding Table obsoletes and replaces the ipRoute
-- Table current in MIB-I and MIB-II. It adds knowledge of
-- the autonomous system of the next hop, multiple next hop
```

-- support, and policy routing support.

ipForwardTable OBJECT-TYPE  
SYNTAX SEQUENCE OF IpForwardEntry  
MAX-ACCESS not-accessible  
STATUS obsolete  
DESCRIPTION  
"This entity's IP Routing table."  
REFERENCE  
"RFC 1213 Section 6.6, The IP Group"  
::= { ipForward 2 }

ipForwardEntry OBJECT-TYPE  
SYNTAX IpForwardEntry  
MAX-ACCESS not-accessible  
STATUS obsolete  
DESCRIPTION  
"A particular route to a particular destination,  
under a particular policy."  
INDEX {  
ipForwardDest,  
ipForwardProto,  
ipForwardPolicy,  
ipForwardNextHop  
}  
::= { ipForwardTable 1 }

IpForwardEntry ::=  
SEQUENCE {  
ipForwardDest  
IpAddress,  
ipForwardMask  
IpAddress,  
ipForwardPolicy  
Integer32,  
ipForwardNextHop  
IpAddress,  
ipForwardIfIndex  
Integer32,  
ipForwardType  
INTEGER,  
ipForwardProto  
INTEGER,  
ipForwardAge  
Integer32,  
ipForwardInfo  
OBJECT IDENTIFIER,  
ipForwardNextHopAS

```
        Integer32,  
        ipForwardMetric1  
        Integer32,  
        ipForwardMetric2  
        Integer32,  
        ipForwardMetric3  
        Integer32,  
        ipForwardMetric4  
        Integer32,  
        ipForwardMetric5  
        Integer32  
    }
```

**ipForwardDest OBJECT-TYPE**

SYNTAX IpAddress  
MAX-ACCESS read-only  
STATUS obsolete  
DESCRIPTION

"The destination IP address of this route. An entry with a value of 0.0.0.0 is considered a default route.

This object may not take a Multicast (Class D) address value.

Any assignment (implicit or otherwise) of an instance of this object to a value x must be rejected if the bitwise logical-AND of x with the value of the corresponding instance of the ipForwardMask object is not equal to x."

::= { ipForwardEntry 1 }

**ipForwardMask OBJECT-TYPE**

SYNTAX IpAddress  
MAX-ACCESS read-create  
STATUS obsolete  
DESCRIPTION

"Indicate the mask to be logical-ANDed with the destination address before being compared to the value in the ipForwardDest field. For those systems that do not support arbitrary subnet masks, an agent constructs the value of the ipForwardMask by reference to the IP Address Class.

Any assignment (implicit or otherwise) of an instance of this object to a value x must be rejected if the bitwise logical-AND of x with

the value of the corresponding instance of the ipForwardDest object is not equal to ipForwardDest."

```
DEFVAL { '00000000'h }      -- 0.0.0.0
 ::= { ipForwardEntry 2 }
```

```
-- The following convention is included for specification
-- of TOS Field contents. At this time, the Host Requirements
-- and the Router Requirements documents disagree on the width
-- of the TOS field. This mapping describes the Router
-- Requirements mapping, and leaves room to widen the TOS field
-- without impact to fielded systems.
```

#### ipForwardPolicy OBJECT-TYPE

```
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      obsolete
DESCRIPTION
```

"The general set of conditions that would cause the selection of one multipath route (set of next hops for a given destination) is referred to as 'policy'.

Unless the mechanism indicated by ipForwardProto specifies otherwise, the policy specifier is the IP TOS Field. The encoding of IP TOS is as specified by the following convention. Zero indicates the default path if no more specific policy applies.

PRECEDENCE	TYPE OF SERVICE	0
------------	-----------------	---

IP TOS		IP TOS	
Field	Policy	Field	Policy
Contents	Code	Contents	Code
0 0 0 0	==> 0	0 0 0 1	==> 2
0 0 1 0	==> 4	0 0 1 1	==> 6
0 1 0 0	==> 8	0 1 0 1	==> 10
0 1 1 0	==> 12	0 1 1 1	==> 14
1 0 0 0	==> 16	1 0 0 1	==> 18
1 0 1 0	==> 20	1 0 1 1	==> 22
1 1 0 0	==> 24	1 1 0 1	==> 26
1 1 1 0	==> 28	1 1 1 1	==> 30

Protocols defining 'policy' otherwise must either define a set of values which are valid for this object or must implement an integer-instanced policy table for which this object's value acts as an index."

::= { ipForwardEntry 3 }

ipForwardNextHop OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS obsolete

DESCRIPTION

"On remote routes, the address of the next system en route; Otherwise, 0.0.0.0."

::= { ipForwardEntry 4 }

ipForwardIfIndex OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"The ifIndex value which identifies the local interface through which the next hop of this route should be reached."

DEFVAL { 0 }

::= { ipForwardEntry 5 }

ipForwardType OBJECT-TYPE

SYNTAX INTEGER {

other (1), -- not specified by this MIB

invalid (2), -- logically deleted

local (3), -- local interface

remote (4) -- remote destination

}

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"The type of route. Note that local(3) refers to a route for which the next hop is the final destination; remote(4) refers to a route for which the next hop is not the final destination."

Setting this object to the value invalid(2) has the effect of invalidating the corresponding entry in the ipForwardTable object. That is, it effectively disassociates the destination identified with said entry from the route iden-

tified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive tabular information from agents that corresponds to entries not currently in use. Proper interpretation of such entries requires examination of the relevant ipForwardType object."

```
DEFVAL { invalid }
::= { ipForwardEntry 6 }
```

#### ipForwardProto OBJECT-TYPE

```
SYNTAX INTEGER {
    other      (1),  -- not specified
    local      (2),  -- local interface
    netmgmt    (3),  -- static route
    icmp       (4),  -- result of ICMP Redirect

    -- the following are all dynamic
    -- routing protocols
    egp        (5),  -- Exterior Gateway Protocol
    ggp        (6),  -- Gateway-Gateway Protocol
    hello      (7),  -- FuzzBall HelloSpeak
    rip        (8),  -- Berkeley RIP or RIP-II
    is-is      (9),  -- Dual IS-IS
    es-is      (10), -- ISO 9542
    ciscoIgrp  (11), -- Cisco IGRP
    bbnSpfIgp  (12), -- BBN SPF IGP
    ospf       (13), -- Open Shortest Path First
    bgp        (14), -- Border Gateway Protocol
    idpr       (15), -- InterDomain Policy Routing
}
MAX-ACCESS read-only
STATUS obsolete
DESCRIPTION
    "The routing mechanism via which this route was
    learned. Inclusion of values for gateway routing
    protocols is not intended to imply that
    hosts should support those protocols."
::= { ipForwardEntry 7 }
```

#### ipForwardAge OBJECT-TYPE

```
SYNTAX Integer32
MAX-ACCESS read-only
STATUS obsolete
DESCRIPTION
    "The number of seconds since this route was
```



last updated or otherwise determined to be correct. Note that no semantics of 'too old' can be implied except through knowledge of the routing protocol by which the route was learned."

DEFVAL { 0 }

::= { ipForwardEntry 8 }

ipForwardInfo OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"A reference to MIB definitions specific to the particular routing protocol which is responsible for this route, as determined by the value specified in the route's ipForwardProto value. If this information is not present, its value should be set to the OBJECT IDENTIFIER { 0 0 }, which is a syntactically valid object identifier, and any implementation conforming to ASN.1 and the Basic Encoding Rules must be able to generate and recognize this value."

::= { ipForwardEntry 9 }

ipForwardNextHopAS OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"The Autonomous System Number of the Next Hop. When this is unknown or not relevant to the protocol indicated by ipForwardProto, zero."

DEFVAL { 0 }

::= { ipForwardEntry 10 }

ipForwardMetric1 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"The primary routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipForwardProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipForwardEntry 11 }

**ipForwardMetric2 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipForwardProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipForwardEntry 12 }

**ipForwardMetric3 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipForwardProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipForwardEntry 13 }

**ipForwardMetric4 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's ipForwardProto value. If this metric is not used, its value should be set to -1."

DEFVAL { -1 }

::= { ipForwardEntry 14 }

**ipForwardMetric5 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-create

STATUS obsolete

DESCRIPTION

"An alternate routing metric for this route. The semantics of this metric are determined by the routing-protocol specified in the route's

```
        ipForwardProto value.  If this metric is not
        used, its value should be set to -1."
    DEFVAL { -1 }
    ::= { ipForwardEntry 15 }

-- Obsoleted Definitions - Groups
-- compliance statements

ipForwardOldCompliance MODULE-COMPLIANCE
    STATUS    obsolete
    DESCRIPTION
        "The compliance statement for SNMP entities
        which implement the ipForward MIB."

    MODULE -- this module
    MANDATORY-GROUPS { ipForwardMultiPathGroup }

    ::= { ipForwardCompliances 2 }

ipForwardMultiPathGroup OBJECT-GROUP
    OBJECTS { ipForwardNumber,
        ipForwardDest, ipForwardMask, ipForwardPolicy,
        ipForwardNextHop, ipForwardIfIndex, ipForwardType,
        ipForwardProto, ipForwardAge, ipForwardInfo,
        ipForwardNextHopAS,
        ipForwardMetric1, ipForwardMetric2, ipForwardMetric3,
        ipForwardMetric4, ipForwardMetric5
    }
    STATUS    obsolete
    DESCRIPTION
        "IP Multipath Route Table."
    ::= { ipForwardGroups 2 }

END
```

## 5. Acknowledgements

This work was originally performed by the Router Requirements Working Group at the request of the OSPF Working Group. This update was performed under the auspices of the OSPF Working Group. John Moy of Proteon Incorporated is the chair.

## 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.
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## 7. Security Considerations

Security is an objective not in this MIB view.

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