Ejercicio MIB-OSI de un Bridge

-- Managed Object Classes

```
oBridge      MANAGED OBJECT CLASS
             DERIVED FROM        "ISO/IEC 10165-2":top;
             CHARACTERIZED BY
             pBridgePkg PACKAGE
                     ATTRIBUTES
                             aBridgeAddress               GET,        -- naming attribute
                             aBridgeName                  GET-REPLACE,
                             aBridgeNumPorts      GET,
                             aBridgePortAddresses    GET,
                             aBridgeUpTime                GET;
                     ACTIONS
                             aBridgeReset;
                     NOTIFICATIONS
                             "ISO/IEC 10165-2":attributeValueChange,
                             nBridgeResetEvent;;;
             CONDITIONAL PACKAGES
                     pSpanTreePkg         PRESENT IF spanning tree algorithm implemented,
                     pSourceRoutePkg  PRESENT IF source route algorithm implemented;
REGISTERED AS {ieeeBridgeMOC 1};


pSpanTreePkg         PACKAGE
             BEHAVIOUR DEFINITIONS
             bSpanTreePkg        BEHAVIOUR DEFINED AS
                     See 802.1d;;
             ATTRIBUTES
                             aBridgeSpanPriority       GET-REPLACE,
                             aBridgeSpanTimeSinceTopologyChange        GET,
                             aBridgeSpanTopologyChangeCount  GET,
                             aBridgeSpanTopologyChangeFlag    GET,
                             aBridgeSpanDesignatedRoot     GET,
                             aBridgeSpanRootCost          GET,
                             aBridgeSpanRootPort          GET,
                             aBridgeSpanMaxAge            GET,
                             aBridgeSpanHelloTime         GET,
                             aBridgeSpanForwardDelay                 GET,
                             aBridgeSpanBridgeMaxAge                  GET-REPLACE,
                             aBridgeSpanBridgeHelloTime     GET-REPLACE,
                             aBridgeSpanBridgeFwdDelay      GET-REPLACE,
                             aBridgeSpanHoldTime          GET;
             NOTIFICATIONS
                             nBridgeSpanTopologyChange;
REGISTERED AS {ieeeBridgePackage 1};

pSourceRoutePkg         PACKAGE
             BEHAVIOUR DEFINITIONS
             bSourceRoutePkg        BEHAVIOUR DEFINED AS
                     See source route standard;;
             ATTRIBUTES
                             aBridgeSRBridgeSize       GET-REPLACE,
                             aBridgeSRBridgeNum        GET-REPLACE,
                             aBridgeSRRDLimit          GET-REPLACE,
                             aBridgeSRRERTimer         GET-REPLACE,
                             aBridgeSRRetryCnt         GET-REPLACE;
REGISTERED AS {ieeeBridgePackage 2};
```

```
oBridgeFilteringDB       MANAGED OBJECT CLASS
             DERIVED FROM        "ISO/IEC 10165-2":top;
             CHARACTERIZED BY
             pBridgeFilteringDBPkg  PACKAGE
                     BEHAVIOUR DEFINITIONS
                             bBridgeFilteringDB       BEHAVIOUR DEFINED AS
                                     See 802.1D, clause 3.9;;
                     ATTRIBUTES
                             aBridgeFDBID                             GET,
                                                                      -- naming attribute
                             aBridgeFDBMaxSize           GET,
                             aBridgeFDBNumStatic           GET,
                             aBridgeFDBNumDynamic        GET;;;
REGISTERED AS {ieeeBridgeMOC 2};


oBridgeFilteringDBEntry               MANAGED OBJECT CLASS
             DERIVED FROM        "ISO/IEC 10165-2":top;
             CHARACTERIZED BY
             pBridgeFilteringDBEntryPkg            PACKAGE
                     BEHAVIOUR DEFINITIONS
                             bBridgeFilteringDBEntry       BEHAVIOUR DEFINED AS
                                     See 802.1D, clause 3.9;;
                     ATTRIBUTES
                             aBridgeFDBEntryMacAddr               GET-REPLACE,
                                                                  -- naming attribute
                             aBridgeFDBEntryType                  GET-REPLACE,
                             aBridgeFDBEntryPortNumber        GET;;;
             CONDITIONAL PACKAGES
             pBridgeFilteringDBEntryDynamicPkg          PRESENT IF dynamic entries,
             pBridgeFilteringDBEntryStaticPkg   PRESENT IF static entries;
REGISTERED AS {ieeeBridgeMOC 3};


pBridgeFilteringDBEntryDynamicPkg             PACKAGE
             BEHAVIOUR DEFINITIONS
             bBridgeFilteringDBEntryDynamicPkg BEHAVIOUR DEFINED AS
                     See 802.1D, clause 3.9.2;;
             ATTRIBUTES
                             aBridgeFDBAgeingTime          GET;
REGISTERED AS {aBridgePackage 3};

pBridgeFilteringDBEntryStaticPkg   PACKAGE
             BEHAVIOUR DEFINITIONS
             bBridgeFilteringDBEntryStaticPkg BEHAVIOUR DEFINED AS
                     See 802.1D, clause 3.9.1;;
             ATTRIBUTES
                             aBridgeFDBEntryOutboundPorts        GET;
REGISTERED AS {ieeeBridgePackage 4};

oBridgePermDB       MANAGED OBJECT CLASS
             DERIVED FROM        "ISO/IEC 10165-2":top;
             CHARACTERIZED BY
             pBridgePermDBPkg    PACKAGE
             BEHAVIOUR DEFINITIONS
             bBridgePermDB       BEHAVIOUR DEFINED AS
                     See 802.1D, clause 3.9.3;;
             ATTRIBUTES
                             aBridgePDBID             GET,
                                                                     -- naming attribute
                             aBridgePDBMaxSize           GET,
                             aBridgePDBNumEntries         GET;;;
REGISTERED AS {ieeeBridgeMOC 4};
```

```
oBridgePermDBEntry   MANAGED OBJECT CLASS
        DERIVED FROM        "ISO/IEC 10165-2":top;
        CHARACTERIZED BY
        pBridgePermDBEntryPkg           PACKAGE
        BEHAVIOUR DEFINITIONS
        bBridgePermDBEntry   BEHAVIOUR DEFINED AS
                See 802.1D, clause 3.9.3;;
        ATTRIBUTES
                aBridgePDBEntryMacAddr              GET-REPLACE,
                                                    -- naming attribute
                aBridgePDBEntryPortNumber    GET-REPLACE,
                aBridgePDBEntryOutboundPorts     GET-REPLACE;;;
REGISTERED AS {ieeeBridgeMOC 5};


oBridgePortTable        MANAGED OBJECT CLASS
        DERIVED FROM        "ISO/IEC 10165-2":top;
        CHARACTERIZED BY
        pBridgePortTablePkg    PACKAGE
                ATTRIBUTES
                        aBridgePortTableID        GET;;;
                                                    -- naming attribute
REGISTERED AS {ieeeBridgeMOC 6};


oPortEntry   MANAGED OBJECT CLASS
        DERIVED FROM        "ISO/IEC 10165-2":top;
        CHARACTERIZED BY
        pBridgePortEntryPkg    PACKAGE
                BEHAVIOUR DEFINITIONS
                bPortEntryPkg        BEHAVIOUR DEFINED AS
                        See 802.1D, clauses 6.6.1, 6.8.2;;
                ATTRIBUTES
                        aPortNumber          GET,
                                                    -- naming attribute
                        aPortName            GET-REPLACE,
                        aPortType            GET,
                        aPortUserPriority        GET-REPLACE,
                        aPortAccessPriority      GET-REPLACE,
                        aPortFramesFwdDiscardsIn     GET,
                        aPortFramesRecv                        GET,
                        aPortFramesForwarded         GET,
                        aPortFramesDiscardNoBuffer       GET,
                        aPortFramesDiscardTransDelay      GET,
                        aPortFramesDiscardOnError     GET,
                        aPortFramesDiscardOnErrorDetail GET;;;
        CONDITIONAL PACKAGES
        pPortEntrySpanTreePkg              PRESENT IF
                                        spanning tree algorithm implemented,
        pPortEntrySourceRoutePkg          PRESENT IF
                                        source route algorithm implemented;
REGISTERED AS {ieeeBridgeMOC 7};
```

```
pPortEntrySpanTreePkg PACKAGE
        BEHAVIOUR DEFINITIONS
        bPortEntrySpanTreePkg BEHAVIOUR DEFINED AS
                See 802.1d;;
        ATTRIBUTES
                        aPortSpanUpTime                          GET,
                        aPortSpanPriority        GET-REPLACE,
                        aPortSpanState          GET-REPLACE,
                        aPortSpanPathCost        GET-REPLACE,
                        aPortSpanDesignatedRoot                  GET,
                        aPortSpanDesignatedCost                  GET,
                        aPortSpanDesignatedBridge     GET,
                        aPortSpanDesignatedPort                  GET,
                        aPortSpanTopChangeACK                GET;
REGISTERED AS {ieeeBridgePackage 5};


pPortEntrySourceRoutePkg          PACKAGE
        BEHAVIOUR DEFINITIONS
        bPortEntrySourceRoutePkg          BEHAVIOUR DEFINED AS
                See source route standard;;
        ATTRIBUTES
                        aPortSRSegmentNum         GET-REPLACE,
                        aPortSRAPESent           GET,
                        aPortSRAPERecv            GET,
                        aPortSRSpecSent                          GET,
                        aPortSRSpecRecv                          GET,
                        aPortSRNonRoutedSent           GET,
                        aPortSRNonRoutedRecv           GET,
                        aPortSRSTESent           GET,
                        aPortSRSTERecv           GET,
                        aPortSRRingMismatch         GET,
                        aPortSRBridgeMismatch          GET;
REGISTERED AS {ieeeBridgePackage 6};


-- Attributes

counter64    ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Counter64;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR        counter64Behaviour      BEHAVIOUR DEFINED AS
                The behaviour is as defined in ISO/IEC 10165-2 for the
                counter attribute type.  The behaviour is further
                constrained by the limitation on the range of values that
                must be supported (0 to 2**64 - 1).
                Note: since this attribute is never instantiated, it has no
                registration object identifier;;

aBridgeAddress        ATTRIBUTE
        DERIVED FROM        "IEEE802-1FGuidelines":aMACAddress;
        BEHAVIOUR
                bBridgeAddress        BEHAVIOUR DEFINED AS
                        See 802.1D, clause 3.12.5.  The MAC address for
                        this bridge;;
REGISTERED AS {ieeeBridgeAttribute 1};


 aBridgeName        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.CharName;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgeName        BEHAVIOUR DEFINED AS
                        A text string of up to 32 characters, of locally
                        determined significance;;
REGISTERED AS {ieeeBridgeAttribute 2};
```

aBridgeNumPorts   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeNumPorts   BEHAVIOUR DEFINED AS
                        The number of bridge ports, i.e. MAC entities;;
REGISTERED AS {ieeeBridgeAttribute 3};

aBridgeUpTime   ATTRIBUTE
        DERIVED FROM   counter64;
        BEHAVIOUR
                bBridgeUpTime   BEHAVIOUR DEFINED AS
                        The count in seconds of the time elapsed since
                        the bridge was last reset or initialized;;
REGISTERED AS {ieeeBridgeAttribute 4};

aBridgePortAddresses   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.PortAddresses;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgePortAddresses   BEHAVIOUR DEFINED AS
                        A list specifying for each port:
                        port number, the number of the bridge port, and
                        port address, the specific MAC address of the
                        individual MAC entity associated with the port;;
REGISTERED AS {ieeeBridgeAttribute 5};

aBridgeSpanPriority   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanPriority   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.7.;;
REGISTERED AS {ieeeBridgeAttribute 6};

aBridgeSpanTimeSinceTopologyChange   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bBridgeSpanTimeSinceTopologyChange   BEHAVIOUR DEFINED AS
                        See 802.1D, Clause 6.8.1.1.3(2);;
REGISTERED AS {ieeeBridgeAttribute 7};

aBridgeSpanTopologyChangeCount ATTRIBUTE
        DERIVED FROM   counter64;
        BEHAVIOUR
                bBridgeSpanTopologyChangeCount BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.8.1.1.3(4);;
REGISTERED AS {ieeeBridgeAttribute 8};

aBridgeSpanTopologyChangeFlag   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                                IEEE802-1DBridgeDefinitions.BooleanFlag;
        MATCHES FOR Equality;
        BEHAVIOUR

                bBridgeSpanTopologyChangeFlag   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.12;;
REGISTERED AS {ieeeBridgeAttribute 9};

aBridgeSpanDesignatedRoot   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.BridgeIdentifier;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanDesignatedRoot   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.1;;
REGISTERED AS {ieeeBridgeAttribute 10};

aBridgeSpanRootCost   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanRootCost   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.2;;
REGISTERED AS {ieeeBridgeAttribute 11};

aBridgeSpanRootPort   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanRootPort   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.3;;
REGISTERED AS {ieeeBridgeAttribute 12};

aBridgeSpanMaxAge   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanMaxAge   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.4;;
REGISTERED AS {ieeeBridgeAttribute 13};

aBridgeSpanHelloTime   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanHelloTime   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.5;;
REGISTERED AS {ieeeBridgeAttribute 14};

aBridgeSpanForwardDelay   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanForwardDelay   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.6;;
REGISTERED AS {ieeeBridgeAttribute 15};

```
aBridgeSpanBridgeMaxAge          ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanBridgeMaxAge          BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.8;;
REGISTERED AS {ieeeBridgeAttribute 16};


aBridgeSpanBridgeHelloTime          ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanBridgeHelloTime          BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.9;;
 REGISTERED AS {ieeeBridgeAttribute 17};


aBridgeSpanBridgeFwdDelay          ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1BridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanBridgeFwdDelay          BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.10;;
REGISTERED AS {ieeeBridgeAttribute 18};


aBridgeSpanHoldTime   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSpanHoldTime   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 4.5.3.14;;
REGISTERED AS {ieeeBridgeAttribute 19};


aBridgeSRBridgeSize    ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSRBridgeSize BEHAVIOUR DEFINED AS
                        When source routing is used, routes are composed of 16 bit
        quantities where part of the 16 bits is designated as the
        bridge number and the remaining bits are used for the ring
        number. This object specifies how many bits are to be used
        for the bridge number. The default value is 4.
                        (See Source Routing standard);;
REGISTERED AS {ieeeBridgeAttribute 20};


aBridgeSRBridgeNum   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSRBridgeNum   BEHAVIOUR DEFINED AS
        A bridge number is a value that uniquely identifies a bridge
        among multiple source routing bridges spanning the same two
                        LANs (so that parallel bridges can be distinguished). A bridge
```

```
                number is an aBridgeSRBridgeSize bit quantity. A value of
        65535 signifies that no bridge number or an illegal bridge
        number has been assigned to this bridge.
                        See Source Route standard;;
REGISTERED AS {ieeeBridgeAttribute 21};


aBridgeSRRDLimit       ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeSRRDLimit        BEHAVIOUR DEFINED AS
        This determines the maximum routing descriptors that are
        allowed in a source routed frame. Currently the default is
        14. This limit is useful in knowing when to terminate a
        route discovery frame (esp. if loops exist). Implementations
        may place an artificial upper bound on this quantity.
                        See Source Route standard;;
REGISTERED AS {ieeeBridgeAttribute 22};


aBridgeSRRERTimer    ATTRIBUTE
        DERIVED FROM        counter64;
        BEHAVIOUR
                bBridgeSRRERTimer    BEHAVIOUR DEFINED AS
        Timer used to detect when a route discovery process has failed
        or has ended. The default value is 1 second. If this timer
        goes off before any results to the route discovery query have
        been received the bridge may either retry the discovery (see
        aBridgeSRRetryCnt) or assume that the station is currently
        unreachable.  See Source Route standard;;
REGISTERED AS {ieeeBridgeAttribute 23};


aBridgeSRRetryCnt       ATTRIBUTE
        DERIVED FROM        counter64;
        BEHAVIOUR
                bBridgeSRRetryCnt       BEHAVIOUR DEFINED AS
        The number of times a route discovery frame should be sent
        before the bridge determines that the station being
        discovered is currently unreachable. A station may be
        unreachable due to many reasons. A couple of examples are
        due to a lack of a route, or the station is offline. The
        recommended default value for this object is 4.
        See Source Route standard;;
REGISTERED AS {ieeeBridgeAttribute 24};


aBridgeFDBID            ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.CharName;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgeFDBID            BEHAVIOUR DEFINED AS
                        The naming attribute for the bridge forwarding
                        database table;;
REGISTERED AS {ieeeBridgeAttribute 25};
```

aBridgeFDBMaxSize   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBMaxSize   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.1.1.3(1);;
REGISTERED AS {ieeeBridgeAttribute 26};

aBridgeFDBNumStatic   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBNumStatic   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.1.1.3(2);;
REGISTERED AS {ieeeBridgeAttribute 27};

aBridgeFDBNumDynamic   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBNumDynamic   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.1.1.3(3);;
REGISTERED AS {ieeeBridgeAttribute 28};

aBridgeFDBEntryMacAddr   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802CommonDefinitions.MACAddress;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBEntryMacAddr   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.5.1.2. The MAC address of
                        the entry;;
REGISTERED AS {ieeeBridgeAttribute 29};

aBridgeFDBEntryType   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.FDBEntryType;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBEntryType   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.5.3.3. (dynamic or static);;
REGISTERED AS {ieeeBridgeAttribute 30};

aBridgeFDBEntryPortNumber   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBEntryPortNumber   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 3.9. If this is a dynamic entry
                        then the value represents the outbound port number
                        to which frames with the destination address equal
                        to the MAC address specified for the entry are to be
                        forwarded. If this is a static entry, then this value
                        represents the inbound port number from which
                        frames with the destination address equal to the
                        MAC address specified for the entry are to be
                        forwarded to the ports specified in the outbound

port map for the entry;;
REGISTERED AS {ieeeBridgeAttribute 31};

aBridgeFDBAgeingTime   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgeFDBAgeingTime   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.1.1.3(4) (seconds);;
REGISTERED AS {ieeeBridgeAttribute 32};

aBridgeFDBEntryOutboundPorts   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX   IEEE802-1DBridgeDefinitions.OutboundPorts;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgeFDBEntryOutboundPorts   BEHAVIOUR DEFINED AS
                        The outbound ports of the port mapping for the
                        entry as specified in 802.1D, clause 6.7.5.1.2(3)
                        and clause 3.9.1. For the inbound port number,
                        specified in the aBridgeFDBEntryPortNumber
                        attribute of the entry, on which frames are
                        received, this attribute specifies for each outbound
                        port on which frames may be transmitted, whether
                        frames shall be filtered or forwarded to that port.
                        This object is treated as a bit map where each bit
                        represents a port. If the value is 0 then this MAC is
                        not allowed to have frames forwarded to that port.
                        If the bit value is 1then the MAC address is allowed
                        to have frames forwarded to that port. The
                        aBridgeFDBEntryPortNumber bit must always be 0. ;;
REGISTERED AS {ieeeBridgeAttribute 33};

aBridgePDBID   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.CharName;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgePermDBID   BEHAVIOUR DEFINED AS
                        The naming attribute for the bridge permanent
                        database table;;
REGISTERED AS {ieeeBridgeAttribute 34};

aBridgePDBMaxSize   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgePDBMaxSize   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.4.1.3(1);;
REGISTERED AS {ieeeBridgeAttribute 35};

aBridgePDBNumEntries ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                        IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgePDBNumEntries BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.7.4.1.3(2);;
REGISTERED AS {ieeeBridgeAttribute 36};

aBridgePDBEntryMacAddr   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802CommonDefinitions.MACAddress;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgePDBEntryMACAddr   BEHAVIOUR DEFINED AS
                        The MAC Address of the entry;;
REGISTERED AS {ieeeBridgeAttribute 37};

aBridgePDBEntryPortNumber   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bBridgePDBEntryPortNumber   BEHAVIOUR DEFINED AS
                        The inbound port number of the entry;;
REGISTERED AS {ieeeBridgeAttribute 38};

aBridgePDBEntryOutboundPorts   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.OutboundPorts;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgePDBEntryOutboundPorts   BEHAVIOUR DEFINED AS
                        The outbound ports of the port mapping for the
                        entry as specified in 802.1D, clause 6.7.5.1.2(3)
                        and clause 3.9.1. For the inbound port number,
                        specified in the aBridgeFDBEntryPortNumber
                        attribute of the entry, on which frames are
                        received, this attribute specifies for each outbound
                        port on which frames may be transmitted, whether
                        frames shall be filtered or forwarded to that port.
                        This object is treated as a bit map where each bit
                        represents a port. If the value is 0 then this MAC is
                        not allowed to have frames forwarded to that port.
                        If the bit value is 1then the MAC address is allowed
                        to have frames forwarded to that port. The
                        aBridgeFDBEntryPortNumber bit must always be 0. ;;
REGISTERED AS {ieeeBridgeAttribute 39};

aBridgePortTableID   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.CharName;
        MATCHES FOR Equality;
        BEHAVIOUR
                bBridgePortTableID   BEHAVIOUR DEFINED AS
                        The naming attribute for the bridge port table;;
REGISTERED AS {ieeeBridgeAttribute 40};

aPortNumber   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bPortNumber   BEHAVIOUR DEFINED AS
                        Number of the bridge port;;
REGISTERED AS {ieeeBridgeAttribute 41};

aPortName   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.CharName;
        MATCHES FOR Equality;
        BEHAVIOUR
                bPortName   BEHAVIOUR DEFINED AS
                        A text string of up to 32 characters, of locally
                        determined significance;;
REGISTERED AS {ieeeBridgeAttribute 42};

aPortType   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.PortType;
        MATCHES FOR Equality;
        BEHAVIOUR
                bPortType   BEHAVIOUR DEFINED AS
                        The MAC entity type of the port, e.g. 802.3. 802.4;;
REGISTERED AS {ieeeBridgeAttribute 43};

aPortUserPriority   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bPortUserPriority   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.6.2;;
REGISTERED AS {ieeeBridgeAttribute 44};

aPortAccessPriority   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX
                    IEEE802-1DBridgeDefinitions.Integer;
        MATCHES FOR Equality, Ordering;
        BEHAVIOUR
                bPortAccessPriority   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.6.2;;
REGISTERED AS {ieeeBridgeAttribute 45};

aPortFramesFwdDiscardsIn   ATTRIBUTE
        DERIVED FROM   counter64;
        BEHAVIOUR
                bPortFramesFwdDiscardsIn   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.6.1.1.3(2);;
REGISTERED AS {ieeeBridgeAttribute 46};

aPortFramesRecv   ATTRIBUTE
        DERIVED FROM   counter64;
        BEHAVIOUR
                bPortFramesRecv   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.6.1.1.3(1);;
REGISTERED AS {ieeeBridgeAttribute 47};

aPortFramesForwarded   ATTRIBUTE
        DERIVED FROM   counter64;
        BEHAVIOUR
                bPortFramesForwarded   BEHAVIOUR DEFINED AS
                        See 802.1D, clause 6.6.1.1.3(3);;
REGISTERED AS {ieeeBridgeAttribute 48};

aPortFramesDiscardNoBuffer   ATTRIBUTE
          DERIVED FROM   counter64;
          BEHAVIOUR
                    bPortFramesDiscardNoBuffer   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 6.6.1.1.3(4);;
REGISTERED AS {ieeeBridgeAttribute 49};

aPortFramesDiscardTransDelay   ATTRIBUTE
          DERIVED FROM   counter64;
          BEHAVIOUR
                    bPortFramesDiscardTransDelay   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 6.6.1.1.3(5);;
REGISTERED AS {ieeeBridgeAttribute 50};

aPortFramesDiscardOnError   ATTRIBUTE
          DERIVED FROM   counter64;
          BEHAVIOUR
                    bPortFramesDiscardOnError   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 6.6.1.1.3(6);;
REGISTERED AS {ieeeBridgeAttribute 51};

aPortFramesDiscardOnErrorDetail   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX   IEEE802-1DBridgeDefinitions.Details;
          BEHAVIOUR
                    bPortFramesDiscardOnErrorDetail   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 6.6.1.1.3(7);;
REGISTERED AS {ieeeBridgeAttribute 52};

aPortSpanUpTime   ATTRIBUTE
          DERIVED FROM   counter64;
          BEHAVIOUR
                    bPortSpanUpTime   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 6.8.2.1.3(1);;
REGISTERED AS {ieeeBridgeAttribute 53};

aPortSpanPriority   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.Integer;
          BEHAVIOUR
                    bPortSpanPriority   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.1. The priority portion
                              of the port Identifier, which consists of the port
                              priority and the port number;;
REGISTERED AS {ieeeBridgeAttribute 54};

aPortSpanState   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX   IEEE802-1DBridgeDefinitions.PortState;
          BEHAVIOUR
                    bPortSpanState   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.4 and 4.5.2; ;
REGISTERED AS {ieeeBridgeAttribute 55};

aPortSpanPathCost   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.Integer;
          BEHAVIOUR
                    bPortSpanPathCost   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.3; ;
REGISTERED AS {ieeeBridgeAttribute 56};

aPortSpanDesignatedRoot   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.BridgeIdentifier;
          BEHAVIOUR
                    bPortSpanDesignatedRoot   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.4; ;
REGISTERED AS {ieeeBridgeAttribute 57};

aPortSpanDesignatedCost   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.Integer;
          BEHAVIOUR
                    bPortSpanDesignatedCost   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.5; ;
REGISTERED AS {ieeeBridgeAttribute 58};

aPortSpanDesignatedBridge   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.BridgeIdentifier;
          BEHAVIOUR
                    bPortSpanDesignatedBridge   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.6 ;;
REGISTERED AS {ieeeBridgeAttribute 59};

aPortSpanDesignatedPort   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.Integer;
          BEHAVIOUR
                    bPortSpanDesignatedPort   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.7; ;
REGISTERED AS {ieeeBridgeAttribute 60};

aPortSpanTopChangeACK   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.BooleanFlag;
          BEHAVIOUR
                    bPortSpanTopologyChangeACK   BEHAVIOUR DEFINED AS
                              See 802.1D, clause 4.5.5.8; ;
REGISTERED AS {ieeeBridgeAttribute 61};

aPortSRSegmentNum   ATTRIBUTE
          WITH ATTRIBUTE SYNTAX
                              IEEE802-1DBridgeDefinitions.Integer;
          BEHAVIOUR
                    bPortSRSegmentNum   BEHAVIOUR DEFINED AS
                              See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 62};

aPortSRAPESent   ATTRIBUTE
          DERIVED FROM counter64;
          BEHAVIOUR
                    bPortSRAPESent   BEHAVIOUR DEFINED AS
                              See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 63};

aPortSRAPERecv   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRAPERecv   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 64};

aPortSRSpecSent   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRSpecSent   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 65};

aPortSRSpecRecv   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRSpecRecv   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 66};

aPortSRNonRoutedSent ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRNonRoutedSent BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 67};

aPortSRNonRoutedRecv ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRNonRoutedRecv BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 68}; -- REGISTERED AS{oPortEntry 27};

aPortSRSTESent   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRSTESent   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 69};

aPortSRSTERecv   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRSTERecv   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 70};

aPortSRRingMismatch   ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRRingMismatch   BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 71};

aPortSRBridgeMismatch ATTRIBUTE
        DERIVED FROM counter64;
        BEHAVIOUR
                bPortSRBridgeMismatch BEHAVIOUR DEFINED AS
                        See ##SourceRoot##, clause xx; ;
REGISTERED AS {ieeeBridgeAttribute 72};

-- Name Bindings

nbBridge   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridge;
        NAMED BY
        SUPERIOR OBJECT CLASS   "ISO/IEC 10165-2":system;
--   SUPERIOR OBJECT CLASS   "RFC1158-MIB":transmission;
        WITH ATTRIBUTE   aBridgeAddress;
REGISTERED AS   {ieeeBridgeNamebinding 1};

nbBridgeFilteringDB   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridgeFilteringDB;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridge;
        WITH ATTRIBUTE   aBridgeFDBID;
REGISTERED AS   {ieeeBridgeNamebinding 2};

nbBridgeFilteringDBEntry   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridgeFilteringDBEntry;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridgeFilteringDB;
        WITH ATTRIBUTE   aBridgeFDBEntryMacAddr;
        CREATE;
        DELETE   deletes-contained-objects;
REGISTERED AS   {ieeeBridgeNamebinding 3};

nbBridgePermDB   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridgePermDB;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridge;
        WITH ATTRIBUTE   aBridgePDBID;
REGISTERED AS   {ieeeBridgeNamebinding 4};

nbBridgePermDBEntry   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridgePermDBEntry;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridgePermDB;
        WITH ATTRIBUTE   aBridgePDBEntryMacAddr;
        CREATE;
        DELETE   deletes-contained-objects;
REGISTERED AS   {ieeeBridgeNamebinding 5};

nbBridgePortTable   NAME BINDING
        SUBORDINATE OBJECT CLASS   oBridgePortTable;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridge;
        WITH ATTRIBUTE   aBridgePortTableID;
REGISTERED AS   {ieeeBridgeNamebinding 6};

nbPortEntry NAME BINDING
        SUBORDINATE OBJECT CLASS   oPortEntry;
        NAMED BY
        SUPERIOR OBJECT CLASS   oBridgePortTable;
        WITH ATTRIBUTE   aPortNumber;
REGISTERED AS   {ieeeBridgeNamebinding 7};

-- Notifications

-- attributeValueChange: See ISO DIS 10164-2, 10165-2.
-- objectCreation: See ISO DIS 10164-1, 10165-2.
-- objectDeletion: See ISO DIS 10164-1, 10165-2.

```
nBridgeSpanTopologyChange        NOTIFICATION
        BEHAVIOUR
        bBridgeSpanTopologyChange        BEHAVIOUR DEFINED AS
                        Emitted only by the root bridge when it detects a
                        topology change via the spanning tree algorithm;;
        MODE UNCONFIRMED;
REGISTERED AS {ieeeBridgeNotification 1};

nBridgeResetEvent        NOTIFICATION
        BEHAVIOUR
        bBridgeResetEvent        BEHAVIOUR DEFINED AS
                        Emitted by a bridge when it is first initialized,
                        or initialized due to a management reset action;;
        MODE UNCONFIRMED;
REGISTERED AS {ieeeBridgeNotification 2};
```

-- Actions

```
aBridgeReset        ACTION
        BEHAVIOUR
                bBridgeReset        BEHAVIOUR DEFINED AS
                        To reset the specified bridge.  The forwarding
                        database is cleared and initialized with entries
                        from the permanant database, and the bridge
                        protocol entity is initialized.  See 802.1D,
                        clause 4.8.1;;
        MODE UNCONFIRMED;
 REGISTERED AS {ieeeBridgeAction 1};
```

ASN.1 Module

```
IEEE802-1DBridgeDefinitions        DEFINITIONS        ::=
BEGIN

ieeeBridgeReg        OBJECT IDENTIFIER  {iso standard(0)
                                iso8802(8802) hili(1) partd(3)}

ieeeBridgeMOC        OBJECT IDENTIFIER  {ieeeBridgeReg
                                managedObjectClass(3)}

ieeeBridgePackage        OBJECT IDENTIFIER  {ieeeBridgeReg
                                package(4)}

ieeeBridgeNameBinding OBJECT IDENTIFIER  {ieeeBridgeReg
                                        nameBinding(6)}

ieeeBridgeAttribute        OBJECT IDENTIFIER  {ieeeBridgeReg
                                attribute(7)}

ieeeBridgeAction        OBJECT IDENTIFIER  {ieeeBridgeReg
                                action(9)}

ieeeBridgeNotification  OBJECT IDENTIFIER  {ieeeBridgeReg
                                        notification(10)}
```

```
Counter64                ::=                INTEGER (0..18446744073709551615)
                                                --        0 to 2**64-1

OutboundPorts  ::=    BITSTRING
-- OutboundPorts        ::=                OCTET STRING (SIZE(32))

Integer                ::=                INTEGER

CharName                ::=                GraphicString (SIZE(32))
-- CharName                        ::=        DisplayString (SIZE(32))
PortIdentifier        ::=                SEQUENCE (portPriority [0] IMPLICIT INTEGER,
                                        portNumber   [1] IMPLICIT INTEGER}

BooleanFlag                ::=                BOOLEAN
-- BooleanFlag                ::=                INTEGER  {false (0),
--                        true  (1)}

BridgeIdentifier        ::=                OCTET STRING (SIZE (8))

MACAddress                ::=                OCTET STRING (SIZE (8))

PortState                ::=                INTEGER {
                                                disabled        (0),
                                                listening        (1),
                                                learning        (2),
                                                forwarding        (3),
                                                blocking        (4)                }

PortType        ::=                INTEGER {
                                p8023        (83),
                                p8024        (84),
                                p8025        (85)}
                -- Note: should PortType be type OBJECT IDENTIFIER so that
                -- new MAC types may be accomodated as they appear,
                -- e.g. FDDI?

FDBEntryType                ::= INTEGER {
                                                static        (0),
                                                dynamic        (1)
--                                                invalid        (3)  for use with SNMP
                                                }

Details        ::=                SEQUENCE OF DiscardDetail

DiscardDetail                ::=                SEQUENCE {
                                sourceAddress                [0] IMPLICIT MACAddress,
                                errorReason [1] IMPLICIT INTEGER {
                                                reasonTransmitSize (0) }}

PortAddresses                ::=                SEQUENCE OF PortAddress

PortAddress ::=                SEQUENCE                {
                                pName   [0] IMPLICIT CharName,
                                portAddr [1] IMPLICIT MACAddress }

END
```

Se pide dibujar los 3 árboles definidos en el modelo de información de gestión OSI.