

CableHome™ CAP MIB Specification

Superseded

CH-SP-MIB-CAP-I04-030801

Issued

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Document Status Sheet

Document Control Number: CH-SP-MIB-CAP-I04-030801
Document Title: CableHome™ CAP MIB Specification
Revision History: I04 – August 1, 2003 I03 – April 11, 2003 I02 – September 20, 2002 I01 – April 5, 2002 D03 – March 21, 2002 D02 – January 31, 2002 D01 — January 8, 2002
Date: August 1, 2003
Status: Work in Progress Draft Issued Closed
Distribution Restrictions: Author Only CL/Member CL/CableHome/Vendor Public

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Work in Progress	An incomplete document, designed to guide discussion and generate feedback, which may include several alternative requirements for consideration.
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1 SCOPE

This specification describes CableHome Addressing Portal (CAP) requirements.

2 REFERENCES

2.1 Normative References

In order to claim compliance with this specification, it is necessary to conform to the following standards and other works as indicated, in addition to the other requirements of this specification. Notwithstanding, intellectual property rights may be required to use or implement such normative references.

- [1] CableHome 1.0 Specification, CH-SP-CH1.0-I05-030801, August 1, 2003.
- [2] CableHome 1.1 Specification, CH-SP-CH1.1-I02-030801, August 1, 2003.

2.2 Reference Acquisition

CableLabs Specifications:

- Cable Television Laboratories, Inc., <http://www.cablelabs.com/>

3 ACRONYMS

This specification uses the following acronyms:

CAP	CableHome Addressing Portal
CDC	CableHome DHCP Client (component of CDP)
CDP	CableHome DHCP Portal
CDS	CableHome DHCP Server (component of CDP)
CMP	CableHome Management Portal
CTP	CableHome Test Portal
DHCP	Dynamic Host Configuration Protocol
NAPT	Network Address and Port Translation
NAT	Network Address Translation
PS	Portal Services

4 REQUIREMENTS

The CableHome™ CAP MIB MUST be implemented as defined below.

```

CABH-CAP-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32          FROM SNMPv2-SMI
    TEXTUAL-CONVENTION,
    TimeStamp,
    TruthValue,
    RowStatus,
    PhysAddress         FROM SNMPv2-TC
    OBJECT-GROUP,
    MODULE-COMPLIANCE  FROM SNMPv2-CONF
    InetAddressType,
    InetAddress,
    InetPortNumber     FROM INET-ADDRESS-MIB
    clabProjCableHome  FROM CLAB-DEF-MIB;

cabhCapMib MODULE-IDENTITY
    LAST-UPDATED      "200308010000Z" --August 1, 2003
    ORGANIZATION      "CableLabs Broadband Access Department"
    CONTACT-INFO
        "Kevin Luehrs
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        E-mail: k.luehrs@cablelabs.com; mibs@cablelabs.com"
    DESCRIPTION
        "This MIB module supplies the basic management objects
        for the CableHome Addressing Portal (CAP) portion of
        the PS database."
    ::= { clabProjCableHome 3 }

-- Textual conventions

CabhCapPacketMode ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The data type established when
        a binding/mapping is established."
    SYNTAX      INTEGER {
        napt(1),      -- NAT with port translation
        nat(2),       -- Basic NAT
        passthrough(3) -- Pass Through External Address
    }

cabhCapObjects      OBJECT IDENTIFIER ::= { cabhCapMib 1 }
cabhCapBase         OBJECT IDENTIFIER ::= { cabhCapObjects 1 }
cabhCapMap          OBJECT IDENTIFIER ::= { cabhCapObjects 2 }

=====
--
-- General CAP Parameters

```

```

--
=====

cabhCapTcpTimeWait OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object is the maximum inactivity time to wait before
        assuming TCP session is terminated. It has no relation to
        the TCP session TIME_WAIT state referred to in [RFC793]"
    DEFVAL { 300 }
    ::= { cabhCapBase 1 }

cabhCapUdpTimeWait OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The inactivity time to wait before destroying
        CAP mappings for UDP."
    DEFVAL { 300 } -- 5 minutes
    ::= { cabhCapBase 2 }

cabhCapIcmpTimeWait OBJECT-TYPE
    SYNTAX      Unsigned32
    UNITS       "seconds"
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The inactivity time to wait before destroying
        CAP mappings for ICMP."
    DEFVAL { 300 } -- 5 minutes
    ::= { cabhCapBase 3 }

cabhCapPrimaryMode OBJECT-TYPE
    SYNTAX      CabhCapPacketMode
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The Primary Packet Handling Mode to be used."
    DEFVAL { napt }
    ::= { cabhCapBase 4 }

cabhCapSetToFactory OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Reading this object always returns false(2). When the
        cabhCapSetToFactory object is set to true(1), the PS must
        take the following actions:

        1. Clear all entries in the cabhCapMappingTable and
           cabhCapPassthroughTable.
        2. Reset the following objects to their factory default
           values:
           cabhCapTcpTimeWait,
           cabhCapUdpTimeWait,
           cabhCapIcmpTimeWait,"

```

```

        cabhCapPrimaryMode"
 ::= { cabhCapBase 5 }

cabhCapLastSetToFactory OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of sysUpTime when cabhCapSetToFactory was
        last set to true. Zero if never reset."
 ::= { cabhCapBase 6 }

-----
--
--      cabhCapMappingTable (CAP Mapping Table)
--
--      The cabhCapMappingTable contains the info for all CAP mappings.
--
-----

cabhCapMappingTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF CabhCapMappingEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains IP address mappings between private
        network addresses, or network addresses and port
        numbers/ICMP sequence numbers, assigned to devices on
        the subscriber's home LAN, and network addresses, or
        network addresses and port numbers/ICMP sequence number,
        assigned by the cable operator, presumed to be on a
        separate subnetwork than the private IP addresses.
        The CAP Mapping Table is used by the CableHome Address
        Portal (CAP) function of the PS to make packet
        forwarding decisions."
 ::= { cabhCapMap 1 }

cabhCapMappingEntry OBJECT-TYPE
    SYNTAX      CabhCapMappingEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "List of the private IP (LAN) address - to - cable
        operator assigned IP (WAN) address mappings stored
        in the PS and used by the PS to make packet
        forwarding decisions."
    INDEX { cabhCapMappingIndex }
 ::= { cabhCapMappingTable 1 }

CabhCapMappingEntry ::= SEQUENCE {
    cabhCapMappingIndex      INTEGER,
    cabhCapMappingWanAddrType  InetAddressType,
    cabhCapMappingWanAddr     InetAddress,
    cabhCapMappingWanPort     InetPortNumber,
    cabhCapMappingLanAddrType  InetAddressType,
    cabhCapMappingLanAddr     InetAddress,
    cabhCapMappingLanPort     InetPortNumber,
    cabhCapMappingMethod      INTEGER,
    cabhCapMappingProtocol    INTEGER,
    cabhCapMappingRowStatus   RowStatus
}

```

```
}

cabhCapMappingIndex OBJECT-TYPE
    SYNTAX      INTEGER      (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Index into the CAP Mapping Table."
    ::= { cabhCapMappingEntry 1 }

cabhCapMappingWanAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The IP address type assigned on the WAN side"
    DEFVAL { ipv4 }
    ::= { cabhCapMappingEntry 2 }

cabhCapMappingWanAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The IP address assigned by the cable operator's address
        (DHCP) server, and comprising the WAN-side IP address
        of the CAP Mapping tuple. This object is populated
        either dynamically by LAN-to-WAN outbound traffic or
        statically by the cable operator."
    ::= { cabhCapMappingEntry 3 }

cabhCapMappingWanPort OBJECT-TYPE
    SYNTAX      InetPortNumber
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The TCP/UDP port number or ICMP sequence number on the
        WAN side. A port number of 0 indicates a NAT mapping. A
        non-zero port number indicates an NAPT mapping."
    DEFVAL { 0 }
    ::= { cabhCapMappingEntry 4 }

cabhCapMappingLanAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The IP address type assigned on the LAN side."
    DEFVAL { ipv4 }
    ::= { cabhCapMappingEntry 5 }

cabhCapMappingLanAddr OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The IP address assigned by the DHCP server function of
        the PS (CableHome DHCP Server, CDS), and comprising the
        LAN-side IP address of the CAP Mapping tuple. This
        object is populated either dynamically as a result of
        LAN-to-WAN outbound traffic or statically by the cable
        operator."
    ::= { cabhCapMappingEntry 6 }
```

```

cabhCapMappingLanPort OBJECT-TYPE
    SYNTAX      InetPortNumber
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The TCP/UDP port number or ICMP sequence number on the
        LAN side. A port number/sequence number of 0 indicates
        a NAT mapping. A non-zero port number/sequence number
        indicates an NAPT mapping."
    DEFVAL { 0 }
    ::= { cabhCapMappingEntry 7 }

cabhCapMappingMethod OBJECT-TYPE
    SYNTAX      INTEGER {
                static(1),
                dynamic(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Indicates how this mapping was created. Static means
        that it was provisioned, and dynamic means that it
        was handled by the PS itself."
    ::= { cabhCapMappingEntry 8 }

cabhCapMappingProtocol OBJECT-TYPE
    SYNTAX      INTEGER {
                other(1),    -- any other protocol; e.g. IGMP
                icmp(2),
                udp(3),
                tcp(4)
                }
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The protocol for this mapping."
    ::= { cabhCapMappingEntry 9 }

cabhCapMappingRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The RowStatus interlock for the creation and deletion
        of a cabhCapMappingTable entry. Changing the value of
        the IP address or port number columns of the CAP
        Mapping Table may have an effect on active traffic,
        so the PS will prevent modification of this table's
        columns and return an inconsistentValue error when
        cabhCapMappingRowStatus object is active(1).

        The PS must not allow RowStatus to be set to
        notInService(2) by a manager.

        A newly created row cannot be set to active(1) until
        the corresponding instances of
        cabhCapMappingWanAddrType, cabhCapMappingWanAddr,
        cabhCapMappingLanAddrType, cabhCapMappingLanAddr,
        and cabhCapMappingProtocol have been set.

        When Primary Packet-handling Mode is NAPT
        (cabhCapPrimaryMode is napt(1)), required behavior

```

with respect to the cabhCapMappingRowStatus object is dependent upon the version of CableHome specification implemented in the product:

- In CableHome 1.0 compliant products configured for NAPT Primary Packet-handling Mode, a newly provisioned row can not be set to active(1) until a non-zero value has been set for cabhCapMappingWanPort and cabhCapMappingLanPort objects.
- Products compliant to CableHome specifications later than CableHome 1.0 are not subject to the cabhCapMappingWanPort and cabhCapMappingLanPort restrictions imposed on CableHome 1.0 compliant products. In CableHome 1.1 and later compliant devices configured to operate in NAPT Primary Packet-handling Mode, provisioned rows can be set to active(1) regardless of whether the value to which cabhCapMappingWanPort and cabhCapMappingLanPort have been set is zero or nonzero.

When Primary Packet-handling Mode is NAT (cabhCapPrimaryMode is nat(2)), a newly created row can not be set to active(1) if a non-zero value of cabhCapMappingWanPort and cabhCapMappingLanPort have been set."

```
::={ cabhCapMappingEntry 10 }
```

```
=====
--
-- cabhCapPassthroughTable (CAP Passthrough Table)
--
-- The cabhCapPassthroughTable contains the MAC Addresses
-- for all LAN-IP Devices which will be configured as
-- passthrough.
=====
```

```
cabhCapPassthroughTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF CabhCapPassthroughEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains MAC addresses for LAN-IP Devices
         which are configured as passthrough mode."
    ::= { cabhCapMap 2 }
```

```
cabhCapPassthroughEntry OBJECT-TYPE
    SYNTAX      CabhCapPassthroughEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "List of hardware addresses of LAN IP Devices
         which are configured for passthrough mode."
    INDEX {cabhCapPassthroughIndex}
    ::= { cabhCapPassthroughTable 1 }
```

```
CabhCapPassthroughEntry ::= SEQUENCE {
    cabhCapPassthroughIndex      INTEGER,
    cabhCapPassthroughMacAddr    PhysAddress,
    cabhCapPassthroughRowStatus  RowStatus
}
```

```

cabhCapPassthroughIndex OBJECT-TYPE
    SYNTAX      INTEGER (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The index into the CAP Passthrough Table."
    ::= { cabhCapPassthroughEntry 1 }

cabhCapPassthroughMacAddr OBJECT-TYPE
    SYNTAX      PhysAddress (SIZE(0..16))
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Hardware address of the LAN-IP Device to be
        configured as passthrough mode."
    ::= { cabhCapPassthroughEntry 2 }

cabhCapPassthroughRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The RowStatus interlock for the creation and
        deletion of a cabhCapPassthroughTable entry.
        Any writable object in each row can be modified
        at any time while the row is active(1)."

```

```
cabhCapGroup OBJECT-GROUP
  OBJECTS {
    cabhCapTcpTimeWait,
    cabhCapUdpTimeWait,
    cabhCapIcmpTimeWait,
    cabhCapPrimaryMode,
    cabhCapSetToFactory,
    cabhCapLastSetToFactory,
    cabhCapMappingWanAddrType,
    cabhCapMappingWanAddr,
    cabhCapMappingWanPort,
    cabhCapMappingLanAddrType,
    cabhCapMappingLanAddr,
    cabhCapMappingLanPort,
    cabhCapMappingMethod,
    cabhCapMappingProtocol,
    cabhCapMappingRowStatus,
    cabhCapPassthroughMacAddr,
    cabhCapPassthroughRowStatus
  }
  STATUS          current
  DESCRIPTION
    "Group of objects for CableHome CAP MIB."
 ::= { cabhCapGroups 1 }

END
```

5 ACKNOWLEDGEMENTS

The following contributors deserve genuine gratitude for their efforts in the development of the CAP MIB specification.

Roy Spitzer, Consultant to CableLabs
Mike Mannette, Consultant to CableLabs
Randy Dunton of Intel
Dmitrii Loukianov of Intel
Itay Sherman of Texas Instruments
Chris Zacker of Broadcom
Rick Vetter, Consultant to CableLabs
John Bevilacqua of YAS

Appendix I Revision History

The following Engineering Change Notices were incorporated into CH-SP-MIB-CAP-I02-020920:

ECN Number	ECN Date	Summary
CH1-N-02007	6/20/02	Modify the default values of the CAP Mapping Table timeout values for UDP, TCP, and ICMP protocols
CH1-N-02011	6/20/02	Eight technical/editorial changes
CH1-N-02017	8/15/02	Four technical/editorial changes
CH1-N-02019	8/15/02	Four technical/editorial changes

The following Engineering Change Notices were incorporated into CH-SP-MIB-CAP-I03-030411:

ECN Number	ECN Date	Summary
CH1-N-02054	1/23/03	Provide more descriptive text in the CAP MIB for various tables and for Row Status of various tables
CH1-N-03014	3/13/03	Clarify description of the cabhCapSetToFactory mib object.

The following Engineering Change Notices were incorporated into CH-SP-MIB-CAP-I04-030801:

ECN Number	ECN Date	Summary
CH1-N-03026	6/5/03	Define a Cap2MappingTable for CableHome 1.1, to support the static port forwarding feature.
CH-MIB-N-03052	7/3/03	Update CAP MIB to incorporate changes needed to align the CableLabs version with the version submitted to the IETF.