Internet Draft   M. R. Bannister
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                 Directory-Based Information Services:
                              Devices

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Abstract

   This document extends Directory-Based Information Services (DBIS)
   described in [draft-bannister-dbis-mapping-00] to support ethers and
   bootparams databases.

   The database schemas SHALL be backwards compatible with the Network
   Information Service [NIS] but stored within [X.500] entries so that
   they may be resolved with the Lightweight Directory Access Protocol
   [RFC4510].

   An ethers database maps 48-bit Ethernet addresses to IP addresses or
   host names, and bootparams maps hosts to boot-time kernel parameters.

   This document describes LDAP object classes and attributes required
   to extend hosts entries [draft-bannister-dbis-hosts-00] to support
   parameters for ethers and bootparams maps.

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED" and "MAY" in this document are
   to be interpreted as described in [RFC2119].

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1. Configuration Maps

1.1. Scope

   The automount database uses the standard configuration maps defined
   in [draft-bannister-dbis-mapping-00], section 3.

   Additionally, dbisMapConfig entries for ethers databases SHALL have
   assigned the object class dbisEtherConfig, and entries for bootparams
   databases SHALL have the object class dbisBootConfig.

   It is RECOMMENDED that the dbisMapConfig entry for an ethers or
   bootparams database have the dbisMapFilter attribute set according to
   the following table:

```
        -----------------------------------------------
        Database      dbisMapFilter
        -----------------------------------------------
        ethers        objectClass=ieee802Device
        bootparams    objectClass=bootableDevice
        -----------------------------------------------
```

1.2. Example Configuration Map Entry

   The following gives an example of a configuration map entry for an
   ethers database:

```
    dn: cn=ethers,en=sales.corp,ou=domain-mappings,o=infra
    objectClass: top
    objectClass: dbisMapConfig
    objectClass: dbisEtherConfig
    cn: ethers
    dbisMapDN: ou=hosts,o=infra
```

```
        dbisMapDN: ou=lab,ou=hosts,o=infra
        dbisMapFilter: objectClass=ieee802Device
        profileTTL: 900
        description: Primary ethers database
```

The following is an example of a configuration map entry for a
bootparams database:

```
        dn: cn=bootparams,en=sales.corp,ou=domain-mappings,o=infra
        objectClass: top
        objectClass: dbisMapConfig
        objectClass: dbisBootConfig
        cn: bootparams
        dbisMapDN: ou=hosts,o=infra
        dbisMapDN: ou=lab,ou=hosts,o=infra
        dbisMapFilter: objectClass=bootableDevice
        profileTTL: 900
        description: Primary bootparams database
```

[2](). Database

[2.1](). ethers

[2.1.1](). Definition

An ethers database contains the following fields:

- 48-bit Ethernet address in colon-separated form.

- Host name.

The information that makes up a database entry is obtained from the
attributes described in the following sections.

[2.1.2](). Object Classes

[2.1.2.1](). Introduction

A dbisMapConfig entry for an ethers database SHALL be assigned the
object class dbisEtherConfig.

A host entry, defined by the object class ipv4HostObject or
ipv6HostObject [[draft-bannister-dbis-hosts-00]()], MAY be augmented by
the ieee802Device class to add information for the ethers map.

[2.1.2.2](). dbisEtherConfig

The dbisEtherConfig class is defined as follows:

```
        objectclass ( 1.3.6.1.4.1.23780.219.1.37
          NAME 'dbisEtherConfig'
          DESC 'DBIS ethers configuration map'
          SUP dbisMapConfig STRUCTURAL )
```

2.1.2.3. ieee802Device

The ieee802Device class is defined as follows:

```
        objectclass ( 1.3.6.1.1.1.2.11 NAME 'ieee802Device'
          DESC 'A device with a 48-bit Ethernet address'
          SUP top AUXILIARY
          MAY macAddress )
```

This is an auxiliary class and it is RECOMMENDED that it is
associated with ipv4HostObject or ipv6HostObject entries. However,
if it is preferred for Ethernet addresses to be kept in separate
entries it MAY be associated with the device class instead [RFC2256].

2.1.3. Attributes

2.1.3.1. macAddress

The 48-bit Ethernet address is stored in the LDAP attribute
macAddress which MAY be associated with an ieee802Device entry:

```
        attributetype ( 1.3.6.1.1.1.1.22
          NAME ('macAddress')
          DESC 'MAC address in maximal, colon separated hex
                  notation, eg. 00:00:92:90:ee:e2'
          EQUALITY caseIgnoreIA5Match
          SYNTAX 1.3.6.1.4.1.1466.115.121.1.26 )
```

2.1.4. Example Host Entry with ieee802Device

The following is an example of an ipv4HostObject entry in LDIF format
[RFC2849] with an ieee802Device class:

```
        dn: rn=kilcher,ou=hosts,o=infra
        objectClass: top
        objectClass: ipHostObject
        objectClass: ipv4HostObject
        objectClass: ieee802Device
        rn: kilcher
        ipv4Address: 10.11.12.13
        macAddress: 08:00:27:00:50:f2
```

2.2. bootparams

2.2.1. **Definition**

A bootparams database contains the following fields:

- Host name.

- Boot parameters.

The boot parameters are interpreted by the operating system kernel and vary between platforms. This schema does not attempt to define unique attributes for each parameter.

2.2.2. **Object Classes**

2.2.2.1. **Introduction**

A dbisMapConfig entry for a bootparams database SHALL be assigned the object class dbisBootConfig.

A host entry, defined by the object class ipv4HostObject or ipv6HostObject [draft-bannister-dbis-hosts-00], MAY be augmented by the bootableDevice class to add information for the bootparams map, which provides configuration information for rpc.bootparamd.

2.2.2.2. **dbisBootConfig**

The dbisBootConfig class is defined as follows:

        objectclass (1.3.6.1.4.1.23780.219.1.38
          NAME 'dbisBootConfig'
          DESC 'DBIS bootparams configuration map'
          SUP dbisMapConfig STRUCTURAL)

2.2.2.3. **bootableDevice**

The bootableDevice class is defined as follows:

        objectclass (1.3.6.1.1.1.2.12 NAME 'bootableDevice'
          DESC 'A device with boot parameters'
          SUP top AUXILIARY
          MAY (bootFile $ bootParameter))

This is an auxiliary class and it is RECOMMENDED that it is associated with ipv4HostObject or ipv6HostObject entries. However, if it is preferred for Ethernet addresses to be kept in separate entries it MAY be associated with the device class instead [RFC2256].

2.2.3. **Attributes**

2.2.3.1. **bootFile**

   The boot image name is stored in the LDAP attribute bootFile which
   MAY be associated with a bootableDevice entry:

       attributetype (1.3.6.1.1.1.1.24 NAME 'bootFile'
         DESC 'Boot image name'
         EQUALITY caseExactIA5Match
         SYNTAX 1.3.6.1.4.1.1466.115.121.1.26)

2.2.3.2. **bootParameter**

   Boot parameters are stored as "key=value" pairs in the LDAP attribute
   bootParameter which MAY be associated with a bootableDevice entry:

       attributetype (1.3.6.1.1.1.1.23 NAME 'bootParameter'
         DESC 'rpc.bootparamd parameter'
         EQUALITY caseExactIA5Match
         SYNTAX 1.3.6.1.4.1.1466.115.121.1.26)

2.2.4. **Example Host Entry with bootableDevice**

   The following is an example of an ipv4HostObject entry in LDIF format
   [RFC2849] with a bootableDevice class:

       dn: rn=kilcher,ou=hosts,o=infra
       objectClass: top
       objectClass: ipHostObject
       objectClass: ipv4HostObject
       objectClass: ieee802Device
       objectClass: bootableDevice
       rn: kilcher
       ipv4Address: 10.11.12.13
       macAddress: 08:00:27:00:50:f2
       bootParameter: root=alaska:/export/client/root
       bootParameter: domain=country.music.edu

3. **Attribute Syntax**

   The following syntaxes are used by the attributes defined in this
   document:

       Syntax OID   Value   Reference

       1.3.6.1.4.1.1466.115.121.1.26 IA5 String   [RFC4517]
       ----

[4](#). Implementation Notes

[4.1](#). NIS Compatible Field Mapping

[4.1.1](#). Introduction

   All fields that are required to generate NIS-compatible space-
   separated ethers or bootparams database formats exist in this schema
   and can be mapped to attribute types using common ABNF productions
   described in [[draft-bannister-dbis-netgroup-00](#)], [section 1.2](#).

   These are described for each database in the following sections.

[4.1.2](#). ethers

   The NIS-compatible ethers database fields are mapped as follows:

         ether-addr = macAddress
         hostname   = rn / en ; depending on class, see below

         ethers-entry = ether-addr SPACE hostname

   In the ethers mappings above:

   - hostname comes from the rn attribute if the ipv4HostObject or
     ipv6HostObject class was used. If instead the ieee802Device was
     associated with an object with the device class, then the hostname
     comes from the cn attribute.

[4.1.3](#). bootparams

   The NIS-compatible bootparams database fields are mapped as follows:

         hostname   = rn / en   ; depending on class, see below
         params   = bootParameter *(SPACE bootParameter)

         bootparams-entry = hostname SPACE params

   In the bootparams mappings above:

   - hostname comes from the rn attribute if the ipv4HostObject or
     ipv6HostObject class was used. If instead the bootableDevice was
     associated with an object with the device class, then the hostname
     comes from the cn attribute.

[4.2](#). Common Search Filters

[4.2.1](#). Search Parameters

This section provides example LDAP search filters [RFC4515] for
obtaining database entries with commonly used input criteria.

These filters augment those already provided for the hosts database
in [draft-bannister-dbis-hosts-00] and are intended to find ethers
and bootparams entries associated with ipv4HostObject or
ipv6HostObject classes.

Class and attribute names used in these search filters may be
modified by the dbisMapClass and dbisMapAttr attributes assigned to
the dbisMapConfig entry [draft-bannister-dbis-mapping-00].

4.2.2. Find Host by Ethernet Address

If a hosts entry has an Ethernet address "ether", its definition is
located using the following search filter.

```
(&(dbisMapFilter)(!(disableObject=TRUE))
    (objectClass=ieee802Device)(macAddress=ether))
```

5. Security Considerations

The security considerations discussed in [draft-bannister-dbis-
mapping-00] apply equally to this document.

6. References

6.1. Normative References

[RFC2119]   Bradner, S., "Key words for use in RFCs to Indicate
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[RFC4515]   Smith, M., Ed., and T. Howes, "Lightweight Directory
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6.2. Informative References

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Author's Address

   Mark R. Bannister
   Prose Consulting Ltd.
   73 Claygate Lane
   Esher, Surrey, KT10 0BQ
   United Kingdom

   Tel: +44 7764 604316
   EMail: dbis@proseconsulting.co.uk