

Exercise: XML Format Design

Design an XML format that lets the network administrator of an ethernet TCP/IP LAN to represent some information about network hosts, addresses and names, according to the following specifications.

1. Each host must be uniquely identified by a name in the XML document.
2. Each host can be a computer, a printer or a router. The host type must be included in the XML document.
3. Hosts are grouped into groups. Each host may belong to zero or more groups (and each group may include zero or more hosts). The information about what hosts belong to what groups must be included in the XML document
4. Each group must be uniquely identified by a name in the XML document.
5. Each group must have an associated optional description.
6. For each host, the XML document must always include the following information:
 - The name of a host administrator (one and only one).
 - The IP addresses assigned to the host (one or more; each IP address can be assigned to only one host)
 - The MAC address assigned to each IP address
7. For each host, the XML document must have the possibility to include an optional textual description.
8. For each IP address, the XML document must include the names assigned to it by the DNS (each IP address must be assigned at least one name).

Possible solution

```
network
|----- group * element
|       |----- id 1      attribute (ID)
|       |----- description ? element
|
|----- host * element
|       |----- id 1      attribute (ID)
|       |----- type (computer, printer, router) 1      attribute
|       |----- interface * element
|       |       |----- IP 1 attribute
|       |       |----- name + element
|       |       |----- MAC 1 element
|       |----- group * attribute (IDREFS)
|       |
|       |----- administrator 1      element
|       |----- description ?      element
```

```
network.dtd:
<!ELEMENT network (group*,host*)>
<!ELEMENT group (description?)>
<!ATTLIST group
    id ID #REQUIRED>
<!ELEMENT description (#PCDATA)>
<!ELEMENT host (administrator,description?,interface+)>
<!ATTLIST host
    id ID #REQUIRED
    type (computer|printer|router) "computer"
    groups IDREFS #IMPLIED>
<!ELEMENT administrator (#PCDATA)>
<!ELEMENT interface (MAC,name+)>
<!ATTLIST interface
    IP NMTOKEN #REQUIRED>
<!ELEMENT MAC (#PCDATA)>
<!ELEMENT name (#PCDATA)>
```