Appendix A

RDF schema for application layer discovery

I now illustrate sample RDF schema that can be used for information discovery. For the sake of brevity I provide only a subset of the schema. I show examples that include combination of basic and extended sets of classes and their associated properties. For example a network class will have properties of type L2 and L3. An L2 class will have properties such as network-id, operator, location and neighbor information.

Schema primitives

I present sample primitives in ASN.1 format that can be transported as part of RDF schema.
Network class has two properties, namely 12 for layer-2 information and 13 for higher-layer information. Any property can be added to this class in an extended schema.

L2 class has properties that are specific to link-layer. The properties include network-id, operator, location and neighbor-information properties. Any property can be added to this class in an extended schema.

This property contains a name of the operator. It could be the same as network-id property.

This property contains an identifier of the network. It may contain an SSID.
Network ::= ENUMERATED(L2Info, L3info, Location)
L2Info ::= ENUMERATED {802.11, 802.16, GSM, GPRS, W-CDMA, cdma2000}
L3info ::= ENUMERATED {IPv4, IPv6}
Location ::= SEQUENCE {
    Geo-location ::= String
    Civic-addr ::= String
}
802.11 ::= SEQUENCE {
    Standards ::= BITMAP(802.11a, 802.11b, 802.11g)
    SSID_Network_Name ::= String(SIZE(1..32))
    BSSID ::= NumericString(SIZE(6))
    Channel ::= INTEGER
    Phy ::= ENUMERATED(CCK, DSSS, OFDM)
    Data_Rates ::= INTEGER
    Network_Service_Provider_Code ::= String
    Network_Service_Provider_Name ::= String
    Network_Service_Provider_Tariff ::= String
    Cipher_Suites ::= BITMAP {WEP, TKIP, AES-CCMP}
    Authenticated_Key_Management_Suites ::= BITMAP {WE, PSK, 802.1x}
    KeyManagementProtocol ::= ENUMERATED {11i4WayHandshake}
    Quality_of_Service ::= ENUMERATED {802.11e}
    Cost ::= INTEGER
    Roaming_List ::= String
    Mobility ::= ENUMERATED {802.11r, 802.11u, 802.21, PreAuth}
}
IPv4 ::= SEQUENCE {
    Router_Address ::= String
    DHCP_Server_Address ::= String
    DomainName ::= String
    Subnet ::= String
    SIP_Server_Address ::= String
    KeyManagementProtocol ::= ENUMERATED {IKEv1, IKEv2}
    Authentication ::= ENUMERATED {PANA, UAM}
    PacketCiphering ::= ENUMERATED {IPsec}
    Internet_Service_Provider_Code ::= String
    Internet_Service_Provider_Name ::= String
    Internet_Service_Provider_Tariff ::= ???
    Mobility ::= ENUMERATED {IPv4, CT, CARD, Preauth}
    Quality_of_Service ::= ENUMERATED {...}
    VPN_Gateway_Address ::= String
    NAT_Address ::= String
}
MIPv4 ::= SEQUENCE {
    HomeAgent_Address ::= String
    ForeignAgent_Address ::= String
}
PANA ::= SEQUENCE {
    PAA_Address ::= String
    EP_Address ::= String
}

Figure A.2: RDF Schema of ASN.1 primitives