

eduroam database specification (ver17042008)

1. Overview

The eduroam database is introduced in order to provide necessary information needed for operation of the eduroam service. eduroam database will be build as a central database but with the mechanism that enables automatic data collection from NROs. It is the task of SA5 group to finalise the design of eduroam database and ensure it's properly implemented and duly filled with respective information. eduroam OT should provide proper maintenance and tools in order to ensure day to day operations of the eduroam database as well as it's connection with other elements of eduroam service (i.e. web site).

The information stored in the eduroam database includes:

- NRO representatives and respective contacts.
- Local-institutions (both SP and IdP) official contacts.
- Information about eduroam hot spots (SP location, technical info).
- Monitoring information.
- Information about the usage of the service.

The access to the database will be provided via eduroam web site with the different access rights in relation to the use cases.

eduroam database model is presented by the following picture:



Whole eduroam database can be divided into 3 main parts:

- general data
- monitoring data
- usage data

The general data part is used to store information about the:

- NRO representatives and respective contacts.
- institutions (both SP and IdP) official contacts.
- eduroam hot spots (SP location, technical info).

More detailed information about the proposed database model is provided in Section 2.

The general and usage data will be collected from the NROs on regular basis. It is envisaged that the usage data will be collected monthly while general data will be refreshed weekly or on NROs demand. Monitoring data will be automatically acquired from the monitoring system.

NROs should provide general and usage data in the defined XML format. The data should be available at the specified URL (<http://www.eduroam.<tld>/usage/> for usage data and <http://www.eduroam.<tld>/general/> for general data) which should be accessible only from the eduroam database server site. SA5 will develop detailed proper tools for data collection.

2. eduroam database specification

In this section we list the database tables and respective fields (attributes) with the basic description. Note that required fields are listed with bold typeface.

General data part

table: realm

Contains general information about the NROs i.e. member federations.

field name	field description
id	automatically generated identifier
country	federation's two letter country code; (e1 and e2 may be used to save info about TLRs and respective OT members)
stype	0= FLRS, 1=(E)TLRS
org_name*	NRO's corporate name
address_street	NRO's address
address_city	NRO's address
contact_name**	NRO's representative: name
contact_email**	NRO's representative: e-mail
contact_phone**	NRO's representative: phone no.
info_URL***	NRO's web page
policy_URL***	NRO's Policy
ts	date: last changed

*** multiple names can be specified via respective XML file; note that it is mandatory to provide language info; name in English is required;**

**** multiple contact info can be specified via respective XML file**

***** multiple URLs can be specified via respective XML file; note that it is mandatory to provide language info;**

table: institution

Contains information about the institutions inside federations.

field name	field description
id	automatically generated identifier
realmid	id of respective realm (i.e. federation); handled by central application
type	1=IdP, 2=SP, 3=IdP&SP
inst_realm****	Institution's realm (for IdPs only)
org_name*	institution's corporate name
address_street	institution's address
address_city	institution's address
contact_name**	institution's representative: name
contact_email**	institution's representative: e-mail
contact_phone**	institution's representative: phone no.
info_URL***	institution's web page with the information related to the service
policy_URL***	institution's Policy
ts	date: last changed

** multiple names can be specified via respective XML file; note that it is mandatory to provide language info; name in English is required;*

*** multiple contact info can be specified via respective XML file*

**** multiple URLs can be specified via respective XML file; note that it is mandatory to provide language info;*

***** multiple realms can be specified via respective XML file; for type 2 no realms should be specified*

table: service_loc

Contains information about the eduroam service locations.

field name	field description
id	automatically generated identifier
institutionid	id of respective institution; handled by central application
longitude	geographic coordinates
latitude	geographic coordinates
loc_name*	location's name
address_street	location's address
address_city	location's address
contact_name**	on site support: name
contact_email**	on site support: e-mail
contact_phone**	on site support: phone no.
SSID	SSID must be specified
enc_level	list of supported encryption levels separated by , (example: WPA/TKIP, WPA/AES, WPA2/TKIP, WPA2/AES)
port_restrict	0=default, 1 if there are port restrictions
transp_proxy	0=default, 1 if there is a transparent proxy

IPv6	0=default, 1 for IPv6 support
NAT	0=default, 1 for NAT
AP_no	number of APs (number of enabled sockets for wired access)
wired	0=default, 1 if wired access is provided
info_URL***	additional info page (e.g with additional restrictions if port_restrict set to "1")
ts	date: last changed

** multiple names can be specified via respective XML file; note that it is mandatory to provide language info; name in English is required;*

*** multiple contact info can be specified via respective XML file*

**** multiple URLs can be specified via respective XML file; note that it is mandatory to provide language info;*

Usage data part

table: realm_data

Contains basic demographic data related to the eduroam service inside a federation.

field name	field description
id	automatically generated identifier
realmid	id of respective realm (i.e. federation); handled by central application
number_inst	total number of institutions that are eligible to participate in eduroam service
number_user	total number of users (individuals) that are eligible to participate in eduroam service
number_id	total number of issued e-identities (credentials) that may be used for authentication in eduroam service
number_IdP	total number of institutions that act only as IdP
number_SP	total number of institutions that act only as SP
number_SPIpP	total number of institutions that act both as IdP and SP
ts	date: last changed

table: realm_usage

Contains basic numbers related to the eduroam service usage at a federation (NRO) level.

field name	field description
id	automatically generated identifier
realmid	id of respective realm (i.e. federation); handled by central application
national_sn	total number of successfully authenticated sessions per day – national level (inside the federation); monitoring requests must be filtered out
international_sn	total number of successfully authenticated sessions per day – international level; monitoring requests must be filtered out
date	date (gggg:mm:dd)

table: institution_usage

Contains basic numbers related to the eduroam service usage at an institution level.

field name	field description
id	automatically generated identifier

institutionid	id of respective institution (institution table); handled by central application
local_sn	total number of successfully authenticated sessions per day – local level (same institution / RADIUS server); monitoring requests must be filtered out
national_sn	total number of successfully authenticated sessions per day – national level (inside the federation); monitoring requests must be filtered out
international_sn	total number of successfully authenticated sessions per day – international level; monitoring requests must be filtered out
date	date (gggg:mm:dd)

Monitoring data part

table: mon_realm

Contains information related to federation monitoring.

field name	field description
id	automatically generated identifier
tested_realm	realm used for testing (usually eduroam)
tested_country	country code used for testing (usually respective realm's country code)
realmid	id of the monitored realm (i.e. federation)
mon_type_sel	coded type of tests to be preformed (0 = PAP, 1=EAP-TTLS, 10= PAP & EAP-TTLS, ...)
last_mon_logid	id of the last successful monitoring job for this realm
ts	date: last changed

table: mon_ser

Contains information related to RADIUS server monitoring.

field name	field description
id	automatically generated identifier
name	server's (host) name
mon_realmid	id of respective realm used for testing (mon_realm table)
ip	server's IP address
port	RADIUS server: port number
timeout	RADIUS server: timeout
retry	RADIUS server: number of retries
secret	RADIUS server: secret
stype	0=TLRS, 1=FLRS, ...
reject_only	0=default, 1 if only reject logic tests are performed
radsec	0=default, 1 if it is RadSec server
monitoring	0=default, -1 if this server should not be tested
last_mon_logid	id of the last successful monitoring job for this server
ts	date: last changed

table: mon_ser_log

Contains results of RADIUS server monitoring.

field name	field description
id	automatically generated identifier
mon_serid	id of respective server
mon_type	coded type of performed tests (0 = PAP, 1=EAP-TTLS, ...)
status	RADIUS server status: 0=OK, -1=reject logic test failed, -2= accept logic test failed, -3= both tests failed
a_resp_time	response time for accept test
r_resp_time	response time for reject test
ts	date: created
mon_logid	id of the respective monitoring job

table: mon_realm_log

Contains results of infrastructure monitoring.

field name	field description
id	automatically generated identifier
mon_realmid	id of respective realm (mon_realm table)
mon_type	coded type of performed tests (0 = PAP, 1=EAP-TTLS, ...)
status	federation status: 0=OK, -1=reject logic test failed, -2= accept logic test failed, -3= both tests failed
a_resp_time	response time for accept test
r_resp_time	response time for reject test
mon_serid	id of TLRS used for test
ts	date: created
mon_logid	id of the respective monitoring job

table: mon_log

Contains internal monitoring information (e.g. info on scheduled tasks)

field name	field description
id	automatically generated identifier
scheduled	0=automatic; 1=manual
ts_scheduled	scheduled time
ts_start	start time
ts_end	stop time
type	job type (10=all servers; 11=single server; 20=all realms; 21=single realm)
status	job status (0=END, 1=RUNING, 2=START, -1=ERROR)

table: mon_creds

Contains credentials used for monitoring

field name	field description
id	automatically generated identifier
username	test username
password	test password / automatically generated
mon_realmid	id of respective realm used for testing (mon_realm table)

3. Data collection

As explained in Section 1. NROs should provide general and usage data in the defined XML format. The data should be available at the specified URL (<http://www.eduroam.<tld>/usage/> for usage data and <http://www.eduroam.<tld>/general/> for general data) which should be accessible only from the eduroam database server site.

The data collection mechanism will allow both pull (standard) and push data collection method. Pull method will be used by the central server according to the agreed schedule. Push method will provide NRO with ability to select the time for data collection and initiate the process regardless of the agreed schedule. This might be used in case of massive changes in the data or when an urgent correction is needed.

The XML specification for general and usage data

In this subsection we list appropriate XML Schemas (XSD files) – one per database table with exception of institution.xml that covers tables institution and service_loc.

Schema for <http://www.eduroam.<tld>/general/realm.xml>

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleType name="eduroam_realm_stype">
    <xs:restriction base="xs:int">
      <xs:enumeration value="0">
        <xs:annotation>
          <xs:documentation>FLRS</xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="1">
        <xs:annotation>
          <xs:documentation>(E) TLR</xs:documentation>
        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>
  <xs:element name="realms">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="realm">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="country" type="xs:string"/>
              <xs:element name="stype" type="eduroam_realm_stype"/>
              <xs:element name="org_name" maxOccurs="unbounded">
```

```

<xs:complexType>
<xs:simpleContent>
<xs:extension base="xs:string">
<xs:attribute name="lang" type="xs:string" use="required"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="address">
<xs:complexType>
<xs:sequence>
<xs:element name="street" type="xs:string"/>
<xs:element name="city" type="xs:string"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="contact" maxOccurs="unbounded">
<xs:complexType>
<xs:sequence>
<xs:element name="name" type="xs:string"/>
<xs:element name="email" type="xs:string"/>
<xs:element name="phone" type="xs:string"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="info_URL" maxOccurs="unbounded">
<xs:complexType>
<xs:simpleContent>
<xs:extension base="xs:anyURI">
<xs:attribute name="lang" type="xs:string" use="required"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="policy_URL" maxOccurs="unbounded">
<xs:complexType>
<xs:simpleContent>
<xs:extension base="xs:anyURI">
<xs:attribute name="lang" type="xs:string" use="required"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="ts" type="xs:dateTime">
<xs:annotation>
<xs:documentation> Format: 2008-02-29T12:00:00 </xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>

```

Schema for <http://www.eduroam.org/general/institution.xml>

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:simpleType name="eduroam_institution_type">

```



```
<xs:restriction base="xs:int">
<xs:enumeration value="1">
<xs:annotation>
<xs:documentation>IdP</xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="2">
<xs:annotation>
<xs:documentation>SP</xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="3">
<xs:annotation>
<xs:documentation>SPIdP</xs:documentation>
</xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:element name="institutions">
<xs:complexType>
<xs:sequence maxOccurs="unbounded">
<xs:element name="institution">
<xs:complexType>
<xs:sequence>
<xs:element name="country" type="xs:string"/>
<xs:element name="type" type="eduroam_institution_type"/>
<xs:element name="inst_realm" type="xs:string" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="org_name" minOccurs="1" maxOccurs="unbounded">
<xs:complexType>
<xs:simpleContent>
<xs:extension base="xs:string">
<xs:attribute name="lang" type="xs:string" use="required"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="address">
<xs:complexType>
<xs:sequence>
<xs:element name="street" type="xs:string"/>
<xs:element name="city" type="xs:string"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="contact" maxOccurs="unbounded">
<xs:complexType>
<xs:sequence>
<xs:element name="name" type="xs:string"/>
```

```
<xs:element name="email" type="xs:string"/>
<xs:element name="phone" type="xs:string"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="info_URL" minOccurs="1" maxOccurs="unbounded">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:anyURI">
        <xs:attribute name="lang" type="xs:string" use="required"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="policy_URL" maxOccurs="unbounded">
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:anyURI">
        <xs:attribute name="lang" type="xs:string" use="required"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="ts" type="xs:dateTime">
  <xs:annotation>
    <xs:documentation> Format: 2008-02-29T12:00:00 </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="location" maxOccurs="unbounded" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="longitude" type="xs:string"/>
      <xs:element name="latitude" type="xs:string"/>
      <xs:element name="loc_name" minOccurs="0" maxOccurs="unbounded">
        <xs:complexType>
          <xs:simpleContent>
            <xs:extension base="xs:string">
              <xs:attribute name="lang" type="xs:string" use="required"/>
            </xs:extension>
          </xs:simpleContent>
        </xs:complexType>
      </xs:element>
      <xs:element name="address">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="street" type="xs:string"/>
            <xs:element name="city" type="xs:string"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```



```

<xs:element name="number_SPIdP" type="xs:int"/>
<xs:element name="number_inst" type="xs:int" minOccurs="0"/>
<xs:element name="number_user" type="xs:int" minOccurs="0"/>
<xs:element name="number_id" type="xs:int" minOccurs="0"/>
<xs:element name="ts" type="xs:dateTime"/>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>

```

Schema for http://www.eduroam.org/usage/realm_usage.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="realm_usages">
<xs:complexType>
<xs:sequence maxOccurs="unbounded">
<xs:element name="realm_usage">
<xs:complexType>
<xs:sequence maxOccurs="unbounded">
<xs:element name="usage">
<xs:complexType>
<xs:sequence>
<xs:element name="national_sn" type="xs:int" minOccurs="0"/>
<xs:element name="international_sn" type="xs:int" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="date" use="required" type="xs:date"/>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="country" use="required" type="xs:string"/>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>

```

Schema for http://www.eduroam.org/usage/institution_usage.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="institution_usages">
<xs:complexType>
<xs:sequence maxOccurs="unbounded">
<xs:element name="institution_usage">
<xs:complexType>
<xs:sequence maxOccurs="unbounded">
<xs:element name="usage">
<xs:complexType>
<xs:sequence>
<xs:element name="local_sn" type="xs:int" minOccurs="0"/>
<xs:element name="national_sn" type="xs:int" minOccurs="0"/>
<xs:element name="international_sn" type="xs:int" minOccurs="0"/>
</xs:sequence>
<xs:attribute name="date" type="xs:date" use="required"/>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="inst_realm" type="xs:string" use="required"/>

```

```
</xs:complexType>  
</xs:element>  
</xs:sequence>  
</xs:complexType>  
</xs:element>  
</xs:schema>
```