

UDC 004

Development of Multi-EAP Radius Configuration for eduroam Service

Arthur S. Petrosyan, Gurgen S. Petrosyan, Robert N. Tadevosyan and Kevork Kh. Arsalanian

Institute for Informatics and Automation Problems of NASRA
e-mail: arthur@sci.am, gurgen@sci.am, robert@sci.am, kevork.arsalanian@sci.am

Abstract

This paper describes the mechanism of authenticating multiple-realm eduroam users via a single multi-EAP radius configuration. The solution is based on the fact that some organizations, which are willing to join the eduroam community and use the service, especially in small communities, do not have a huge number of users, thus it will be cost-effective to use a single RADIUS server for them instead of having a separate radius server per each realm. The solution is unmatched in terms of practical open implementation. It has been implemented and tested in ASNET-AM network.

Keywords: eduroam, WiFi, Wireless, EAP, Authentication, Radius

1. Introduction

In the original eduroam model [1], Institutions that would like to join eduroam have to install and configure their own Institutional RADIUS Server (IRS), which should be registered at Federation Level RADIUS Server (FLRS) within the National Roaming Operator (NRO), meaning that every organization should follow these steps regardless of their number of users, which is not cost-effective for organizations with a few number of users. Therefore, the solution of using a single RADIUS server for multiple institutions (Organizations, Universities, etc.) has been thought up, developed and successfully implemented.

2. Architecture

Generally, for each realm in eduroam, a separate radius server is being configured, which is normal for big organizations with thousands of active users. But for organizations with hundreds or tens of users having a separate radius server, it may not be so practical. In addition, some NROs provide hosted radius solutions for connecting institutions, and in case of such relatively

small ones it would be much more cost-effective for NRO to use a single RADIUS server for multiple supported realms instead of creating separate radius servers for each supported realm.

With this configuration, it is now possible to use a central RADIUS Server with multiple Extensible Authentication Protocol (EAP) configuration for each supported realm [2]. The number of realms supported is unlimited. The authentication itself is performed at the institution site, as before, using the authentication method that is applicable to a particular institution (IMAP-based email authentication, LDAP-based, etc.). When a user tries to authenticate, the request will be directed from the visited institution to the Central RADIUS Server and from there to the user organization to get authenticated (Fig. 1).

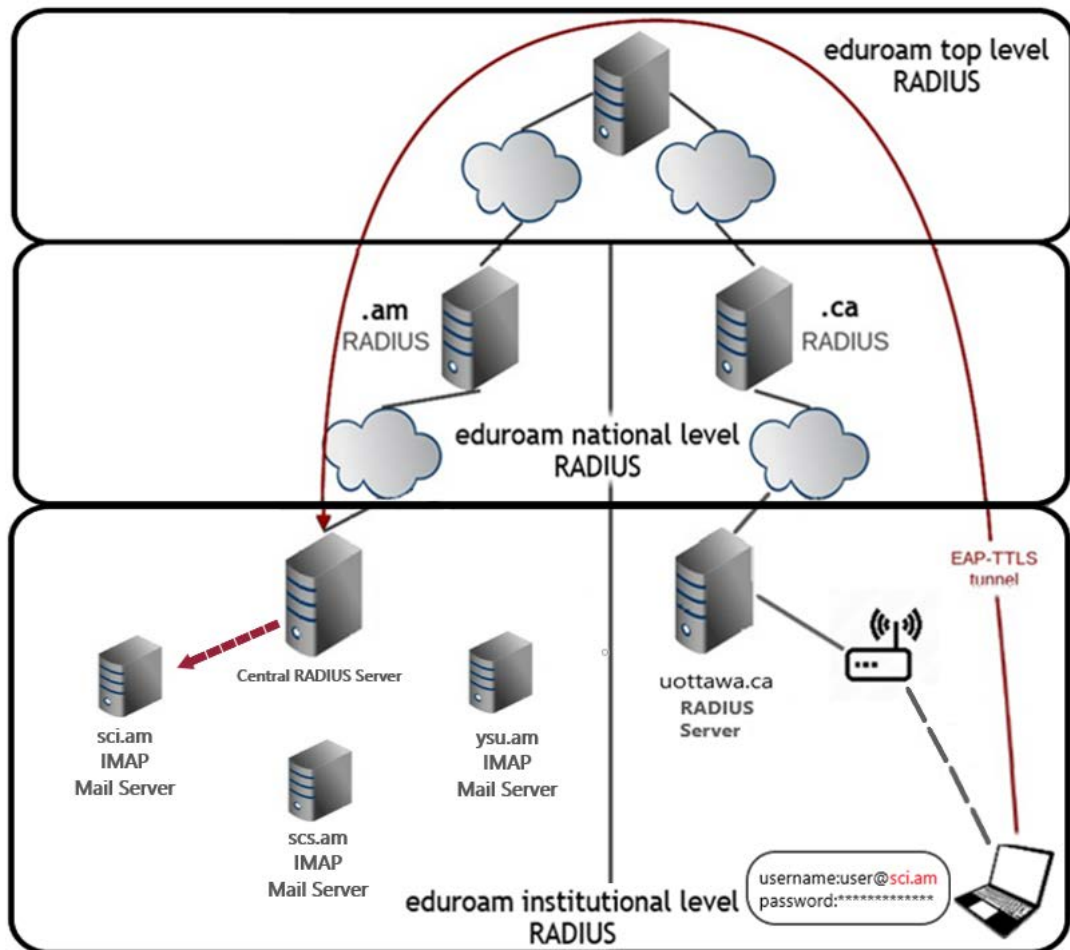


Fig. 1. Authentication process.

Based on our previous boost concept [3], we mainly implemented this solution using the IMAP/email authentication method, but since the solution is based on Freeradius [4], there is no limit for using any required authentication method. The solution described here has an appropriate Ansible playbook [5] to automate setting up the process for multi-EAP radius configuration.

3. Advantages

The main advantage of this solution is the creation of an automatically usable Freeradius-based multi-EAP radius configuration. The solution described in this paper will influence small organizations to use eduroam with minimal administrative overhead and minimal cost. While

carrying out investigations in this area, we found no such configuration described in public, except for the official general description [2], which lacks many important details about particular EAP types. So, this solution is unmatched in terms of practical open implementation.

4. Disadvantages

Although this solution of having multiple organizations on a single RADIUS server is cost-efficient, it is not an ideal solution for large organizations with thousands of users.

5. Conclusion

This solution may be interesting in cases, where NROs implement hosted radius solutions for relatively small connecting institutions (with hundreds or tens of users) to have a cost-effective single RADIUS server for multiple supported realms instead of creating separate radius servers for each supported realm.

References

- [1] [Online]. Available: <https://www.eduroam.org/>
- [2] [Online]. Available: https://wiki.freeradius.org/modules/Rlm_eap#I_want_to_enable_multiple_EAPTypes_how_can_I_configure
- [3] A. Petrosyan, G. Petrosyan, R. Tadevosyan and K. Arsalanian, “Identity Infrastructure Boost Concept for eduroam Service”, *Transactions of IIAP NAS RA, Mathematical Problems of Computer Science*, vol. 52, pp. 61-65, Yerevan 2019.
- [4] [Online]. Available: <https://freeradius.org/>
- [5] [Online]. Available: <https://github.com/asnet-am/eduroam-imap-playbook>

Submitted 10.02.2020, accepted 26.05.2020.

Բազմակի EAP radius կարգավորումների մշակում eduroam ծառայության համար

Արթուր Ս. Պետրոսյան, Գուրգեն Ս. Պետրոսյան, Ռոբերտ Ն. Թադևոսյան և Գևորգ Խ. Արսալանյան

ՀՀ ԳԱԱ Ինֆորմատիկայի և ավտոմատացման պրոբլեմների ինստիտուտ
e-mail: arthur@sci.am, gurgen@sci.am, robert@sci.am, _kevork.arsalanian@sci.am

Անփոփում

Հոդվածում նկարագրվում է eduroam-ի օգտագործողների վավերացման մեխանիզմը՝ բազմակի EAP radius կարգավորումների միջոցով: Լուծումը հիմնված է այն փաստի վրա, որ որոշ կազմակերպություններ, որոնք ցանկանում են միանալ eduroam համայնքին և օգտվել ծառայությունից, չունեն հսկայական քանակությամբ օգտվողներ, ուստի ծախսարդյունավետ կլինի նմանատիպ կազմակերպություններից յուրաքանչյուրի համար առանձին RADIUS սերվեր ունենալու փոխարեն, օգտագործել մեկ RADIUS սերվեր մի քանի կազմակերպության համար: Լուծումը եզակի է՝ գործնական բաց իրականացման առումով: Այն իրականացվել և փորձարկվել է ASNET-AM ցանցում:

Բանալի բառեր՝ eduroam, WiFi, անլար, EAP, նույնականացում, Radius.

Разработка конфигурации multi-EAP radius для сервиса eduroam

Артур С. Петросян, Гурген С. Петросян, Роберт Н. Тадевосян и Кеворк Х. Арсалаян

Институт проблем информатики и автоматизации НАН РА
e-mail: arthur@sci.am, gurgen@sci.am, robert@sci.am, _kevork.arsalanian@sci.am

Аннотация

В статье представлен механизм аутентификации пользователей eduroam с помощью конфигурации multi-EAP radius для сервиса eduroam. Решение основано на том факте, что некоторые, не имеющие большого количества пользователей, организации, желающие присоединиться к сообществу eduroam, могут использовать один общий RADIUS сервер. Данное решение не имеет аналогов с точки зрения практической открытой реализации. Решение реализовано и опробовано в сети ASNET-AM.

Ключевые слова: eduroam, WiFi, беспроводная связь, EAP, аутентификация, Radius.