

An aerial photograph of a large park, likely Ibirapuera Park in São Paulo, Brazil. In the foreground, there is a prominent stone archway with three openings. The park is filled with lush green trees and a wide, paved path that leads towards the background. In the distance, a dense urban skyline with various high-rise buildings is visible under a clear blue sky. The overall scene is bright and sunny.

CoLisEU: Coleta e Análise de Experiência de Usuários

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Marcelo Marotta (UnB)

Cronograma

- Visão geral do GT-CoLisEU
- Histórico
- Principais resultados
- Monitoramento e coleta de dados no eduroam
- Atividades previstas

Apresentação do CoLisEU

- Grupo de trabalho da RNP:
 - Título: GT-CoLisEU: Grupo de Trabalho para Coleta e Análise de Experiência de Usuários



<http://coliseu.rnp.br>



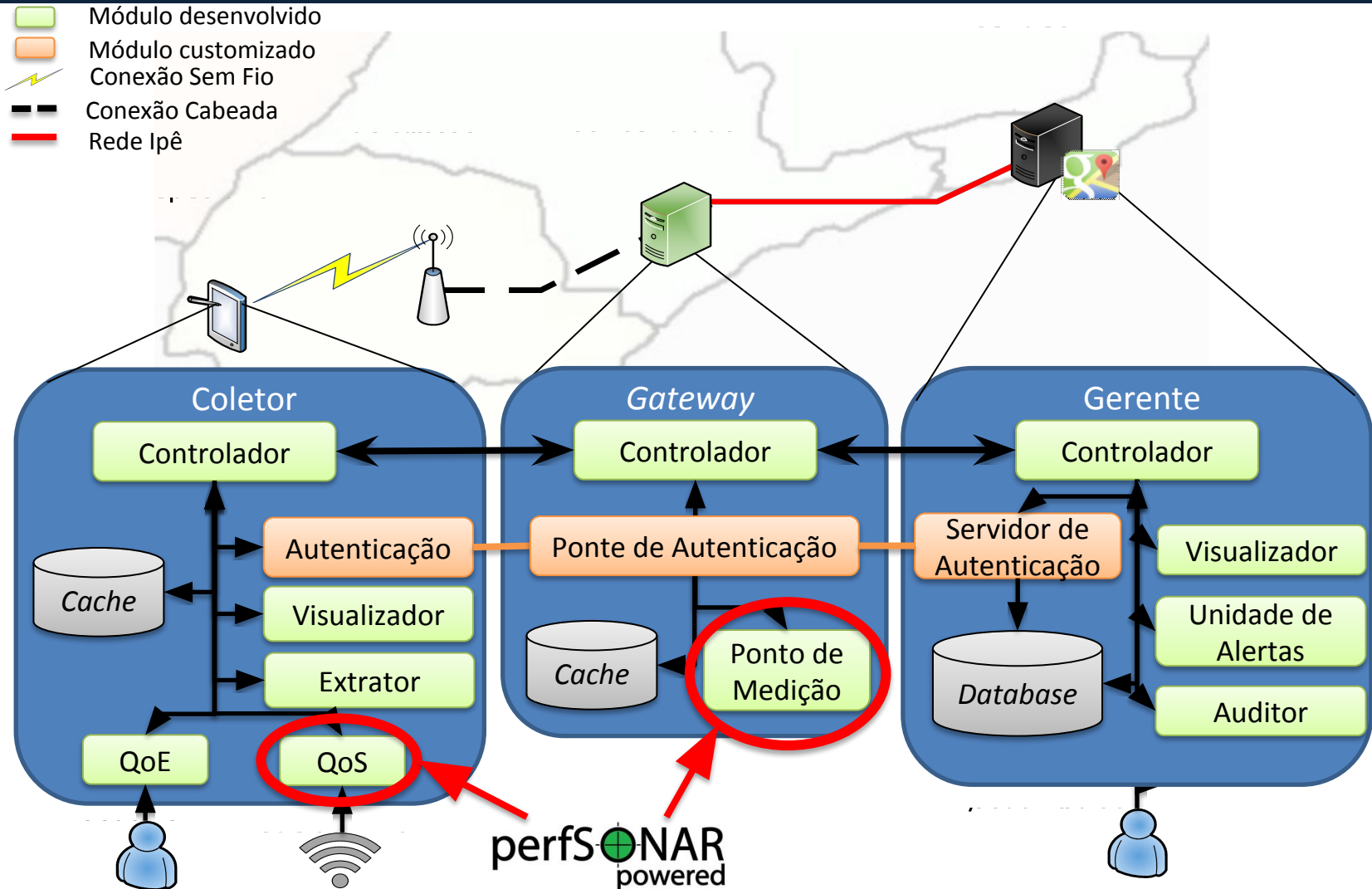
Histórico

- **2013** - Proposta submetida com o título "Grupo de Trabalho em Qualidade de Serviço e Experiência para eduroam"
- **2014** - Primeiro ano - Desenvolvimento da versão mobile (Android)
- **2015** - Segundo ano - versão iOS e sistema de gerenciamento
- **2016** - Terceiro ano (seis meses) - sistema de gerenciamento voltado para eduroam

Principais resultados

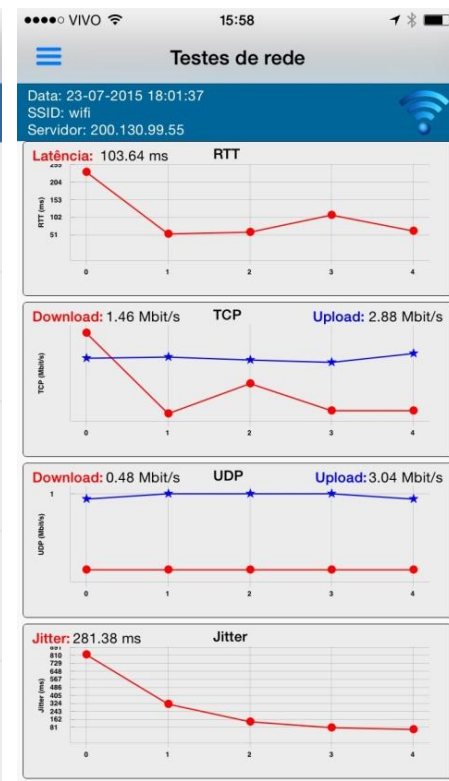
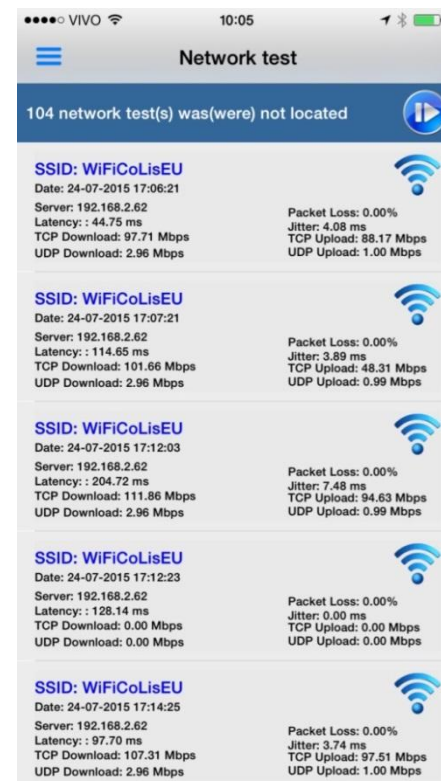
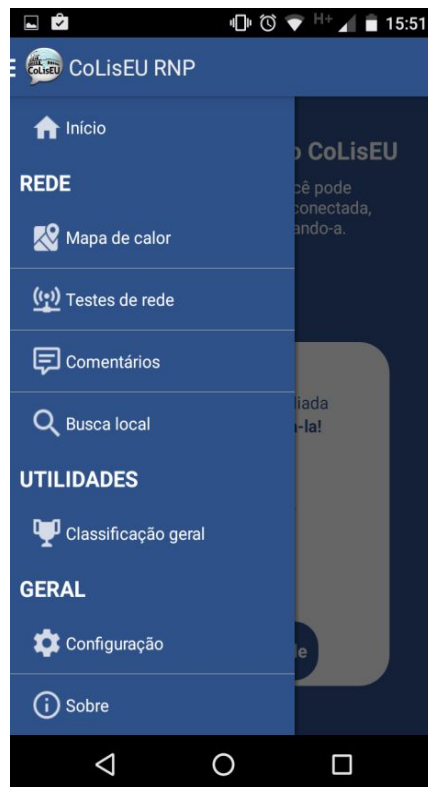
- Três registros de software
 - Coletor (BR512016001237-4)
 - Gateway (BR512016001235-8)
 - Gerente (BR512016001236-6)
- Artigo publicado na Computer Networks (A1), 2015
- Resumo apresentado na TERENA Networking Conference (TNC)
- Demonstrações no WRNP 2014, 2015 e 2016
- Demonstração no FISL 2015
- Ferramenta open-source disponível no GitHub

Arquitetura



Coletores

- Avaliações objetivas QoS



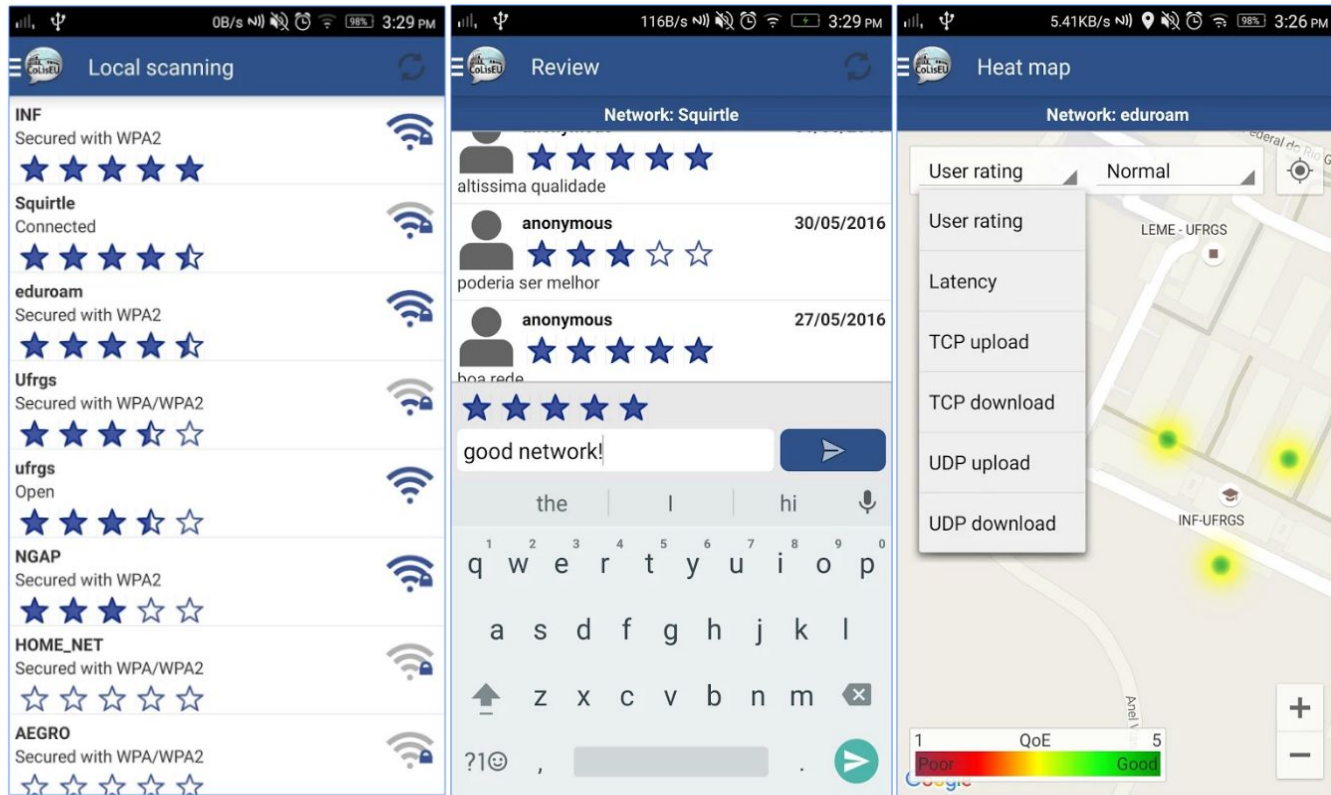
Ferramentas: Coletor

- Coletor
 - Avaliações objetivas QoS
 - Latência
 - Vazão TCP (Uplink e Downlink)
 - Vazão UDP (Uplink e Downlink)
 - Jitter (Uplink e Downlink)
 - Perda de pacotes (%)
- Ferramentas:
 - BWCTL
 - 1.5.4
 - Iperf
 - 2.0.5
 - 3.0.11
 - OWAMP
 - Ping
 - Traceroute



Coletores

- Coleta de QoE (MOS)
 - Avaliações subjetivas



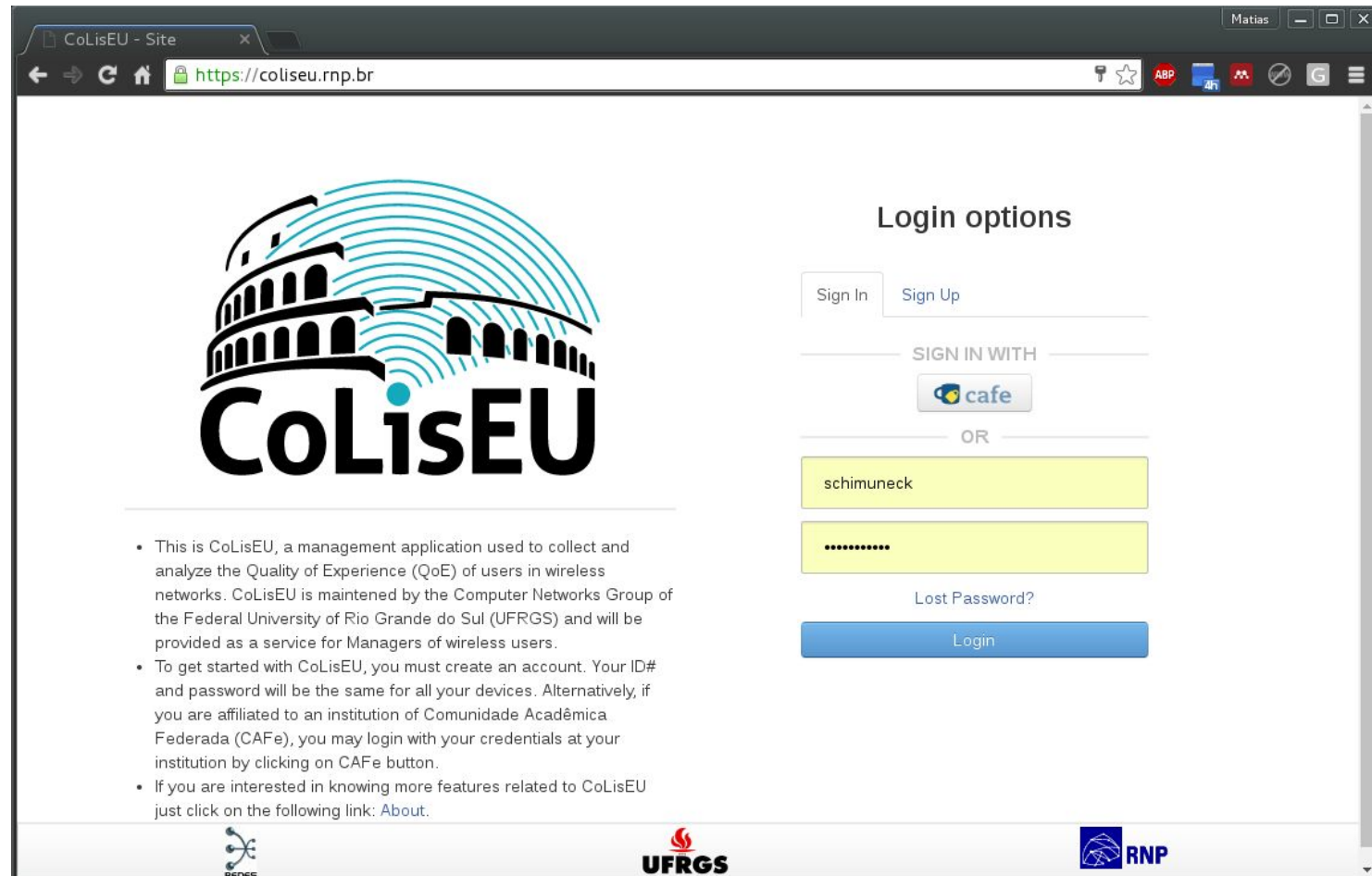
Pontos de Medição

- 2 Gateways
- 2 Pontos de Medições

Localização	Endereço	Tipo
Brasília – DF RNP	coliseu.rnp.br	Gateway POM
Porto Alegre – RS UFRGS	coliseu.inf.ufrgs.br	Gateway POM

Ferramentas: Gerente

- Portal Web



The screenshot shows a web browser window with the address bar displaying "https://coliseu.rnp.br". The page features the CoLisEU logo on the left, which includes a stylized building and the text "CoLisEU". Below the logo, there is a list of bullet points explaining the application and how to use it. On the right side, there is a "Login options" section with "Sign In" and "Sign Up" buttons, a "SIGN IN WITH" section featuring a "cafe" button, and a "Login" button at the bottom. The footer of the page includes logos for "REDES", "UFRGS", and "RNP".

CoLisEU - Site

https://coliseu.rnp.br

Matias

CoLisEU

- This is CoLisEU, a management application used to collect and analyze the Quality of Experience (QoE) of users in wireless networks. CoLisEU is maintained by the Computer Networks Group of the Federal University of Rio Grande do Sul (UFRGS) and will be provided as a service for Managers of wireless users.
- To get started with CoLisEU, you must create an account. Your ID# and password will be the same for all your devices. Alternatively, if you are affiliated to an institution of Comunidade Acadêmica Federada (CAFe), you may login with your credentials at your institution by clicking on CAFe button.
- If you are interested in knowing more features related to CoLisEU just click on the following link: [About](#).

Login options

Sign In Sign Up

SIGN IN WITH

cafe

OR

schimuneck

.....

Lost Password?

Login

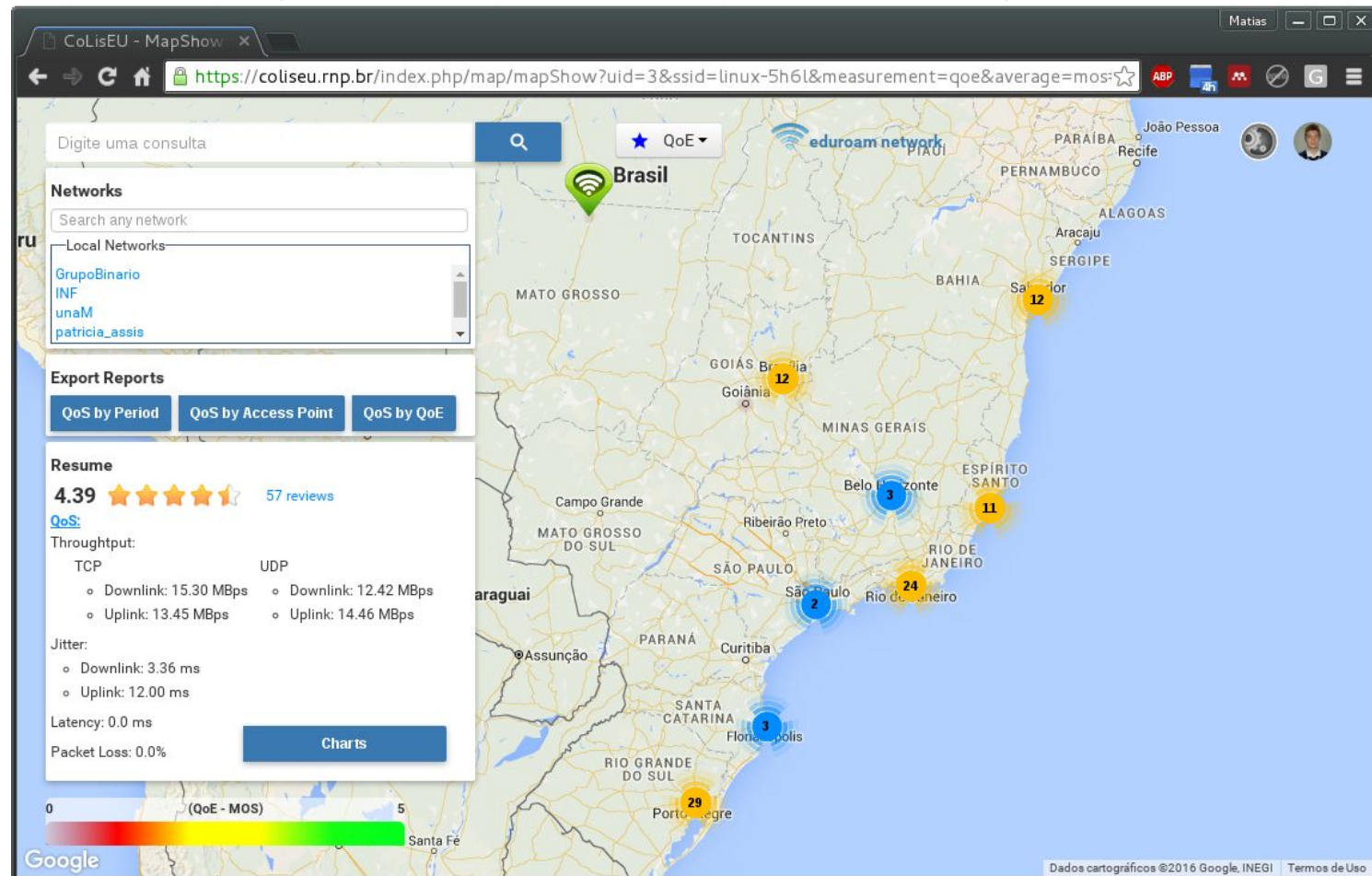
REDES

UFRGS

RNP

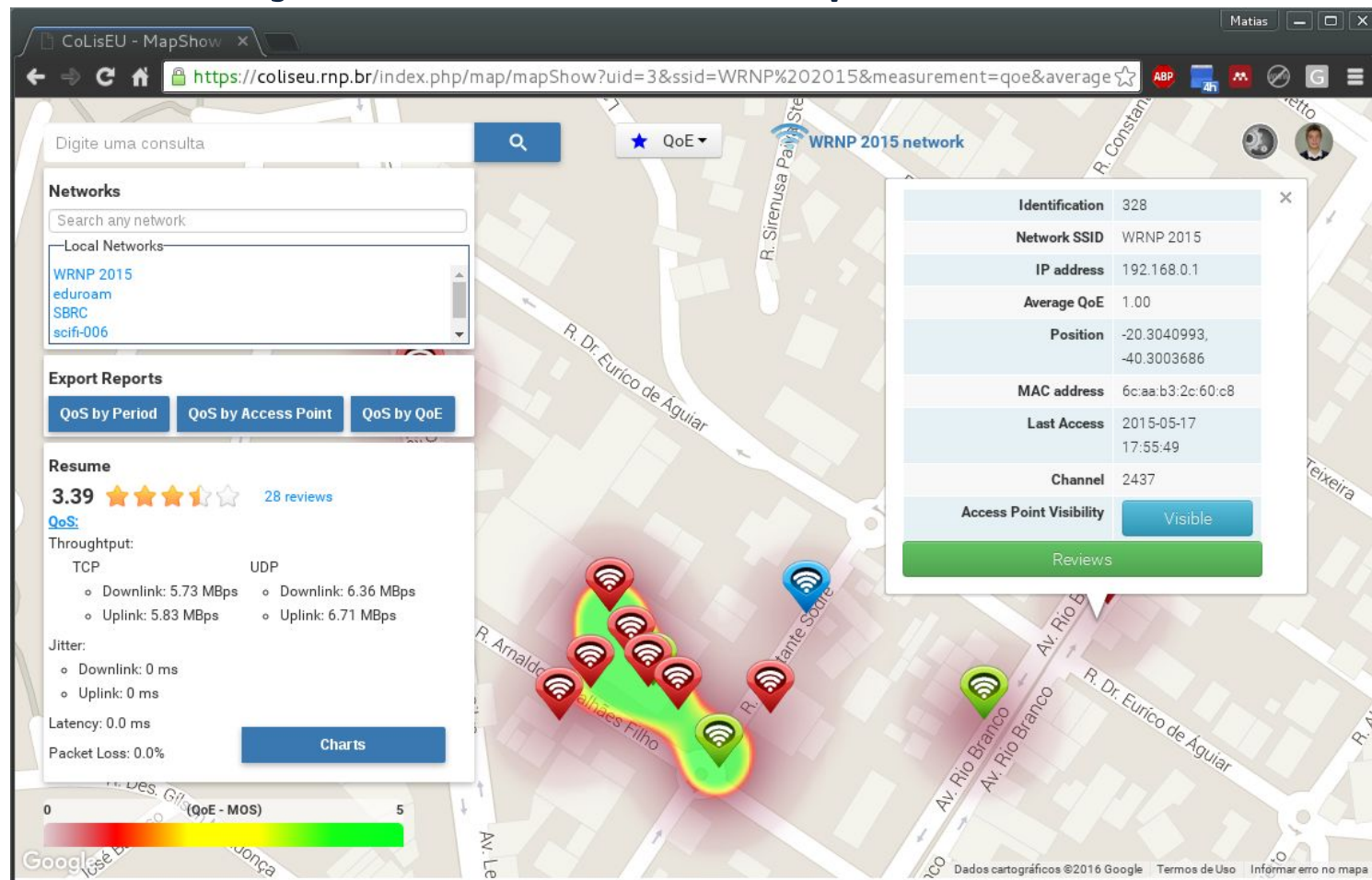
Ferramentas: Gerente

- Visualização e acesso a informações



Ferramentas: Gerente

- Visualização de APs no mapa



Ferramentas: Gerente

- Gráficos em tempo real



Ferramentas: Gerente

- Geração de relatórios



Average QoS by Access Point

Network: FISL16

Table Access Point vs Average QoS

MAC Address	UDP Upload (Kbits/s)	UDP Download (Kbits/s)	RTT (ms)	TCP Upload (Kbits/s)	TCP Download (Kbits/s)
32:b5:c2:9c:79:34	1283.00	62.67	855.58	8003.00	4573.67
66:70:02:68:94:da	5788.00	7305.00	161.29	1572.00	995.00
66:70:02:95:b1:78	639.00	0.00	45.97	587.00	1457.00
92:f6:52:c2:d3:2e	1438.90	1017.80	698.62	4459.10	4580.00
a2:f3:c1:3b:1e:4e	1828.00	1356.67	3160.9	367.25	1635.00
a2:f3:c1:3b:1e:84	4470.40	1436.80	28.56	7290.00	5581.80
a2:f3:c1:3b:25:52	812.00	676.00	15.35	11051.00	12491.00
a2:f3:c1:3b:32:ba	3143.33	0.00	657.84	735.75	1694.50
a2:f3:c1:3b:39:dc	20.00	489.00	248.68	151.00	6056.00
a2:f3:c1:3b:3b:78	0.00	0.00	170.53	1203.00	2618.00
a2:f3:c1:3b:3f:0a	0.00	0.00	526.77	0.00	118.00
c2:4a:00:bd:70:22	1343.63	50.00	2867.12	883.25	1465.10
c2:4a:00:bd:be:84	8638.00	9010.00	755.4	1284.00	800.00
c2:4a:00:bd:bf:60	186.67	220.33	262.32	2527.00	7116.33
c2:4a:00:bd:bf:92	3138.00	94.00	26.04	1242.00	4714.00
c2:4a:00:bd:bf:9e	474.44	856.89	457.23	1545.89	1105.33

Configuration

MAC Address	Channel	DNS
32:b5:c2:9c:79:34	2462	10.4.0.1
66:70:02:68:94:da	2412	10.4.0.1
66:70:02:95:b1:78	2437	10.4.0.1
92:f6:52:c2:d3:2e	2437	10.4.0.1
a2:f3:c1:3b:1e:4e	2412	10.4.0.1
a2:f3:c1:3b:1e:84	2412	10.4.0.1
a2:f3:c1:3b:25:52	2462	10.4.0.1
a2:f3:c1:3b:32:ba	0	10.4.0.1
a2:f3:c1:3b:39:dc	2462	10.4.0.1
a2:f3:c1:3b:3b:78	2462	10.4.0.1
a2:f3:c1:3b:3f:0a	2412	10.4.0.1
c2:4a:00:bd:70:22	2437	10.4.0.1
c2:4a:00:bd:be:84	2462	10.4.0.1
c2:4a:00:bd:bf:60	2462	10.4.0.1
c2:4a:00:bd:bf:92	2462	10.4.0.1
c2:4a:00:bd:bf:9e	2437	10.4.0.1

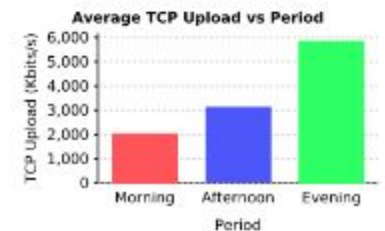
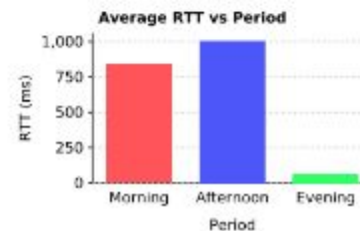
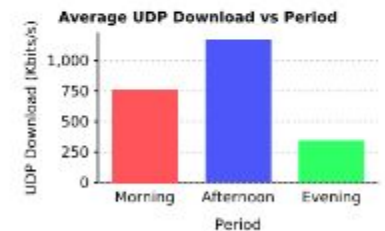
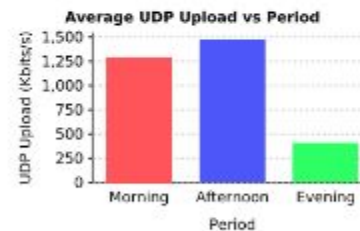


Average QoS by Period

Network: FISL16

Table Period vs Average QoS

Period	UDP Upload (Kbits/s)	UDP Download (Kbits/s)	RTT (ms)	TCP Upload (Kbits/s)	TCP Download (Kbits/s)	Number of measurements
Morning	1294.14	759.39	839.11	2044.58	2322.90	60
Afternoon	1467.77	1167.67	1006.68	3119.89	3367.72	47
Evening	406.00	338.00	62.92	5868.00	6656.00	2



Ferramentas: Gerente

- Gerência APs e Domínios

The screenshot displays the CoLisEU - MapShow web interface. The browser address bar shows the URL: <https://coliseu.rnp.br/index.php/map/mapShow?uid=3&ssid=WRNP2016&measurement=qoe&average=mos#>. The interface has a dark sidebar on the left with the following menu items: ADMINISTRATION, Domain Control (selected), Notification Center, System Control, and Admin Delegation.

The main content area is titled "Domain Control" and has two tabs: "Management" (selected) and "Requests". Under "Management", there is a profile picture of a man, a list of domains (WRNPSBRC, eduroam, and ufrgs), and a "+ New Domain" link. Below this is the "APs List" section, which includes a "Show 10 entries" dropdown, a "Search:" input field, and a table of access points.

	Index	Rating	Mac	Latitude	Longitude	TCP Down	UDP Down	Jitter Down	Latency
☐	666	★★★★★	5c:0e:8b:72:e2:10	-30.0687093	-51.1202555	51.008	6.316	1.0	102.8
☒	666	★★★★★	5c:0e:8b:72:e2:10	-30.0687093	-51.1202555	51.008	6.316	1.0	102.8
☐	20	★★★★☆	5c:0e:8b:73:3b:81	-30.0686062	-51.1210058	1543.471	1528.776	27531.9	5273.3
☒	502	★★★★★	5c:0e:8b:73:16:a0	-30.06858849	-51.12007319	34.494	8.422	1.6	66.7
☐	539	★★★★★	20:bb:c0:1c:f3:d5	-30.0612753	-51.173936	0.000	10.626	0.0	0.0

Ferramentas: Gerente

- Criação de um domínio

The screenshot shows the CoLisEU web interface. The browser address bar displays the URL: <https://coliseu.rnp.br/index.php/map/mapShow?uid=3&ssid=WRNP2016&measurement=qoe&average=mos#>. The interface has a dark sidebar on the left with the 'CoLisEU' logo and navigation links: 'ADMINISTRATION', 'Domain Con...', 'Notification', 'System Con...', and 'Admin Deleg...'. The main content area is titled 'Name: eduroam' and has two tabs: 'Domain Settings' (selected) and 'Admin Delegation'. Under 'Domain Settings', there are two sub-tabs: 'Rule 1' and 'New Rule'. The 'Rule 1' tab contains a form with a text input field containing 'eduroam' and a blue 'Add SSID' button. Below this is a green button labeled 'Add Geo Position'. To the right of the form is a table with three columns: 'Network', 'MAC', and 'SSID'. The table contains 10 rows of data. Below the table, there is a section for 'SSID' and 'Geo Position' with the following values:

SSID	Geo Position
eduroam	
North Latitude	-12.985468619632432
South Latitude	-12.991218510739717
West Longitude	-38.525426387786865
East Longitude	-38.51838827133179

At the bottom right of the form area is a 'Submit' button. The browser window also shows a 'Matias' tab and various icons in the top right corner.

Ferramentas: Gerente

- Delegação de um domínio ou subdomínio

The screenshot shows the CoLisEU web application interface. A modal window titled 'Name: eduroam' is open, displaying the 'Admin Delegation' tab. The modal contains a list of users with their IDs, usernames, and permissions. The background shows the main application interface with a sidebar menu and a data table.

Name: eduroam

Domain Settings | **Admin Delegation**

*marcelom87 *schimuneck *jhenrique

ID	Username	Permission
2	marcelom87	Management
3	schimuneck	Read and Write
39	jhenrique	Read

Submit

Ferramentas: Gerente

- Gerência de notificações

The screenshot shows a web browser window with the URL <https://coliseu.rnp.br/index.php/map/mapShow?uid=3&ssid=WRNP2016&measurement=qoe&average=mos#>. The page title is "CoLisEU - MapShow". The interface features a dark sidebar on the left with the "CoLisEU" logo and a menu under "ADMINISTRATION" including "Domain Control", "Notification Center" (selected), "System Control", and "Admin Delegation". The main content area is titled "Notification Center" and contains a "Notification List". At the top right of the list are "+ Create" and "- Delete" buttons. Below the buttons, it says "Show 10 entries" and "Search:". The table below has columns for Index, Begin, End, Message, Domain, User, Access Point, and Execute QoS. It displays two entries: one with Index 32 and a message about event satisfaction, and another with Index 37 asking about network usage. At the bottom, it says "Showing 1 to 2 of 2 entries" and has "Previous", "1", and "Next" navigation buttons.

	Index	Begin	End	Message	Domain	User	Access Point	Execute QoS
☐	32	2016-05-30	2016-06-04	You are satisfied with the event network?	All	All	All	No
☒	37	2016-06-07	2016-06-08	Would you use this network again?	All	All	All	Yes

Ferramentas: Gerente

- Gerência de Gateways e Pontos de Medição

The screenshot displays the 'CoLisEU - MapShow' web application. The left sidebar contains an 'ADMINISTRATION' menu with options: Domain Control, Notification Center, System Control (selected), and Admin Delegation. The main content area is titled 'System Control' and is divided into two sections: 'Gateway List' and 'Measurement Points'.

Gateway List

Buttons: + Create, - Delete

Show 10 entries Search:

	Index	Description	Location	Address	Latitude	Longitude	Priority
☐	1	Gateway at RNP	Porto Alegre - RS	200.130.99.55/gateway	-22.9125	-43.1735	1
☒	2	Gateway at the federal university of Rio Grande do Sul	Porto Alegre - RS	coliseu.inf.ufrgs.br/coliseu-gateway	-30.072	-51.1204	2
☐	3	Gateway	Rio de Janeiro	192.168.0.1	10	10.32	3

Showing 1 to 3 of 3 entries Previous 1 Next

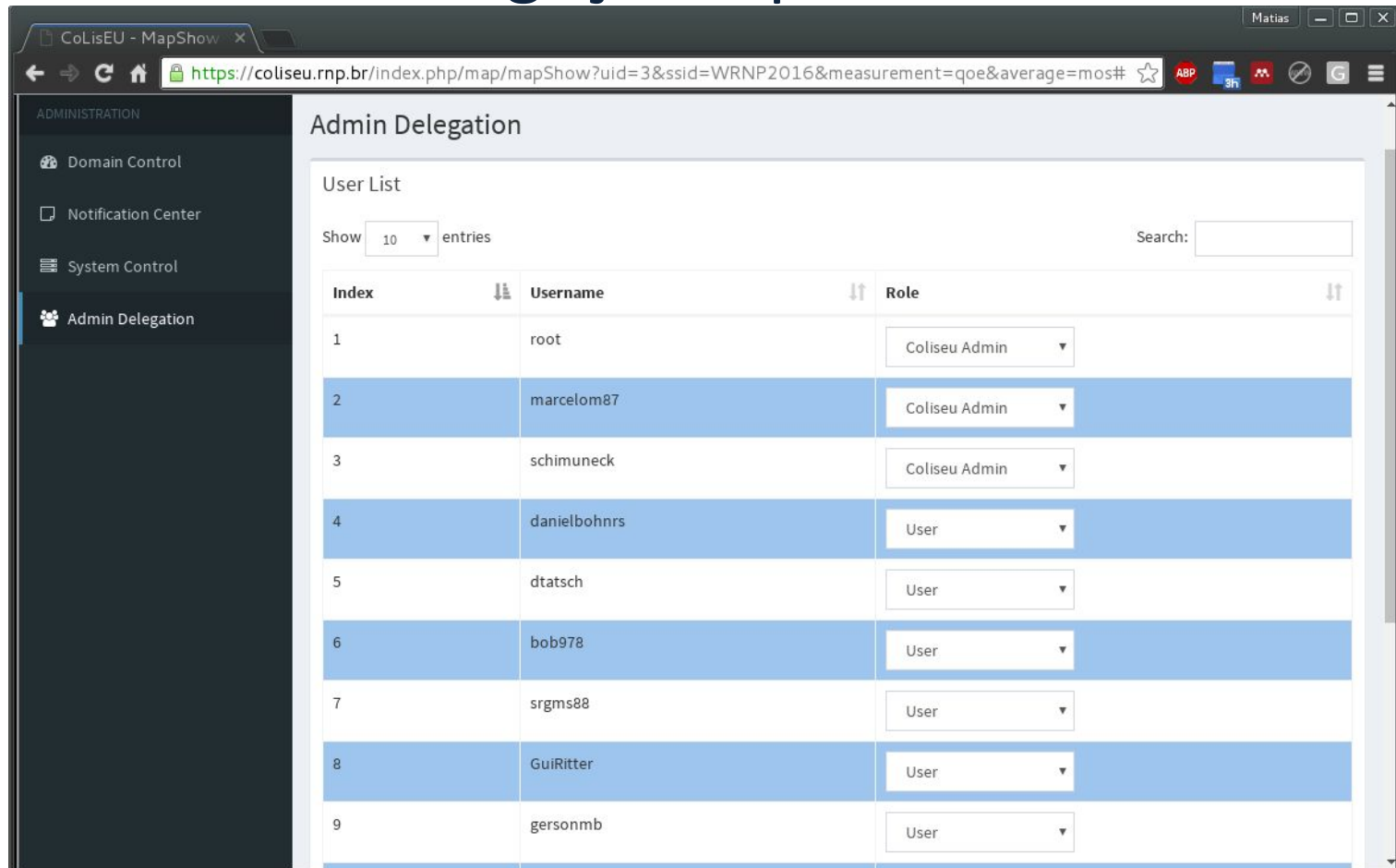
Measurement Points

Buttons: + Create, - Delete

- ☐ 7 - WRNP - 200.137.89.42 (11, 10)
- ☐ 9 - Porto Alegre - RS - 192.168.0.1 (10, 10)

Ferramentas: Gerente

- Sistema de delegação e permissões de usuários

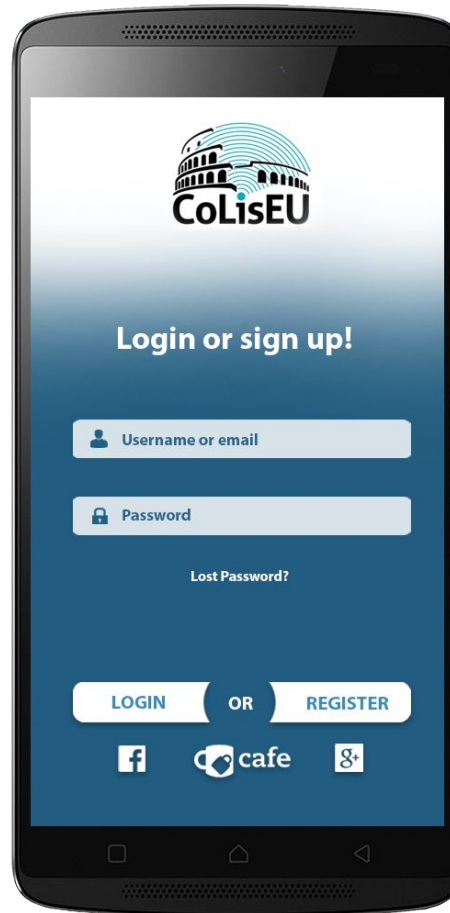


The screenshot displays the 'Admin Delegation' interface of the Coliseu system. The left sidebar shows the 'ADMINISTRATION' menu with options: Domain Control, Notification Center, System Control, and Admin Delegation (selected). The main content area is titled 'Admin Delegation' and contains a 'User List' section. Below the title, there is a 'Show 10 entries' dropdown and a 'Search:' input field. The user list is a table with columns: Index, Username, and Role. The roles are managed via dropdown menus.

Index	Username	Role
1	root	Coliseu Admin
2	marcelom87	Coliseu Admin
3	schimunek	Coliseu Admin
4	danielbohnrs	User
5	dtatsch	User
6	bob978	User
7	srgms88	User
8	GuiRitter	User
9	gersonmb	User

Atividades previstas: Agente

- Atualização e desenvolvimento da interface mobile



Atividades previstas: Agente

- Disponibilizar pontos de medição do perfSONAR

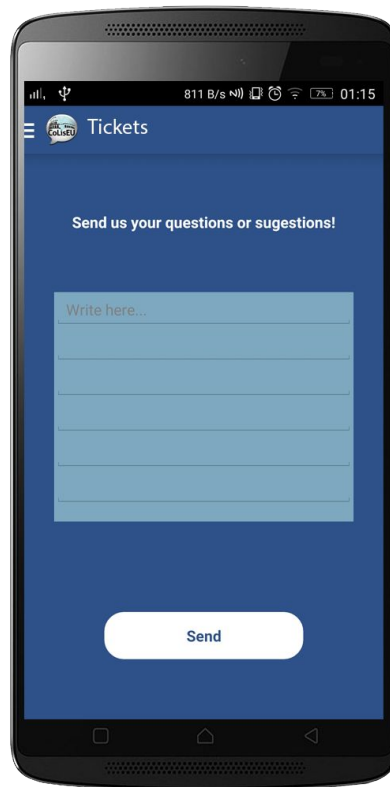


Atividades previstas: Agente

- Habilitar utilização do BWCTL
 - Ferramenta de testes avançados
 - Seleção de pontos de medição
 - Seleção de ferramentas
 - Alteração de parâmetros

Atividades previstas: Agente

- Sistema de criação de tickets de suporte para redes pertencentes a um domínio



Atividades previstas: Agente

- Integrar sistemas de permissões Agente/Gerente
 - Funcionalidades personalizadas para administradores

Possibilidades:

- Disponibilizar ferramenta registro automático de pontos de acesso para administradores de domínios
- Alerta de chamados entre administradores através da ferramenta móvel

Atividades previstas: Gerente

- Página inicial com informações de contato, explicação do serviço e acesso administrativo



This is **CoLisEU**, a management application used to collect and analyze the Quality of Experience (QoE) of users in wireless networks. CoLisEU is maintained by the Computer Networks Group of the Federal University of Rio Grande do Sul (UFRGS). To know more about it, [click here!](#)



Contact us: gt-coliseu@rnp.br

Login or sign up!

 Username or email

 Password

Lost Password?

LOGIN

OR

REGISTER

Atividades previstas: Gerente

- Sistema de recebimento, delegação e resolução de chamados de suporte

The screenshot displays the CoLisEU web application interface. On the left is a dark sidebar with the 'CoLisEU' logo and a menu under the 'ADMINISTRATION' header. The menu items are: Domain Control, Notification Center, System Control, Admin Delegation, Support Tickets (highlighted with a question mark icon), and Quality Control. The main content area is titled 'Support Tickets' and contains a 'Ticket List' section. At the top right of this section are '+ Create' and '- Delete' buttons. Below them is a 'Show 10 entries' dropdown and a 'Search:' input field. The ticket list is a table with columns for 'Index', 'Description', and 'QoS Test'. It contains two entries: Index 1 with description 'The network is not good!' and Index 2 with description 'Can my network get better results?'. Both entries have a blue 'Open QoS Test' link. The second entry is highlighted with a blue background.

Index	Description	QoS Test
1	The network is not good!	Open QoS Test
2	Can my network get better results?	Open QoS Test

Atividades previstas: Gerente

- Sistema de recebimento, delegação e resolução de chamados de suporte

The screenshot displays the CoLisEU web interface. On the left is a dark sidebar with the 'CoLisEU' logo and a menu under 'ADMINISTRATION' including 'Domain Control', 'Notification Center', 'System Control', 'Admin Delegation', 'Support Tickets' (highlighted), and 'Quality Control'. The main area is titled 'Support Tickets' and contains a 'Ticket List' section. This section has a '+ Create' and '- Delete' button, a 'Show 10 entries' dropdown, and a search bar. Below is a table with two tickets:

Index	Description	QoS Test
1	The network is not good!	Open QoS Test
2	Can my network get better results?	Open QoS Test

A 'QoS Test' window is open, showing test results for '07/06/2016 - 15:20'. The details are as follows:

- SSID: Eduroam
- Measurement Point IP: 200.139.99.55
- Latency: 170.43ms
- Data Loss: 0/322 (0%)
- TCP Download: 17.0Mbit/s
- TCP Upload: 15.2Mbit/s
- UDP Download: 2.1Mbit/s
- UDP Upload: 1.9 Mbit/s
- Jitter Download: 3.23 ms
- Jitter Upload: 8.6 ms

Atividades previstas: Gerente

- Automatizar a geração do XML de APs de um domínio
 - Formato EDUROAM

```
<realms xsi:noNamespaceSchemaLocation="realm.xsd">
  <realm>
    <country>country0</country>
    <stype>0</stype>
    <org_name lang="en">org_name0</org_name>
    <address>
      <street>street0</street>
      <city>city0</city>
    </address>
    <contact>
      <name>name0</name>
      <email>email0</email>
      <phone>phone0</phone>
    </contact>
    <contact>
      <name>name1</name>
      <email>email1</email>
      <phone>phone1</phone>
    </contact>
    <contact>
      <name>name2</name>
      <email>email2</email>
      <phone>phone2</phone>
    </contact>
    <info_URL lang="en">http://www.eduroam.org</info_URL>
    <policy_URL lang="en">http://www.eduroam.org</policy_URL>
    <ts>2006-05-04T18:13:51.0Z</ts>
  </realm>
</realms>
```

Atividades previstas: Gerente

- Sistema de eventos para controle de qualidade

The screenshot displays the CoLisEU web application interface. On the left is a dark sidebar with the 'ADMINISTRATION' menu, where 'Quality Control' is selected. The main content area is titled 'Quality Control' and contains two sections: 'Alert List' and 'Permission Requests'.

Alert List

Buttons: + Create, - Delete

Show: 10 entries Search:

Index	Description	Field	Value	Action
1	The MOS is too low!	MOS	3.5	<button>Generate Alert</button>

Permission Requests

Show: 10 entries Search:

Index	Description	Latitude	Longitude	Actions
1	A sub admin wants to expand your domain.	N: -29.77512, S: -29.78704	W: -51.14055, L: -51.13785	
2	Is this AP in your domain?	N: -31.91085, S: -60.25155	W: -37.81405, L: -58.12958	

Atividades previstas: Gerente

- Integrar o sistema administrativo com o mapa
 - Exemplo: Sistema de criação de domínios

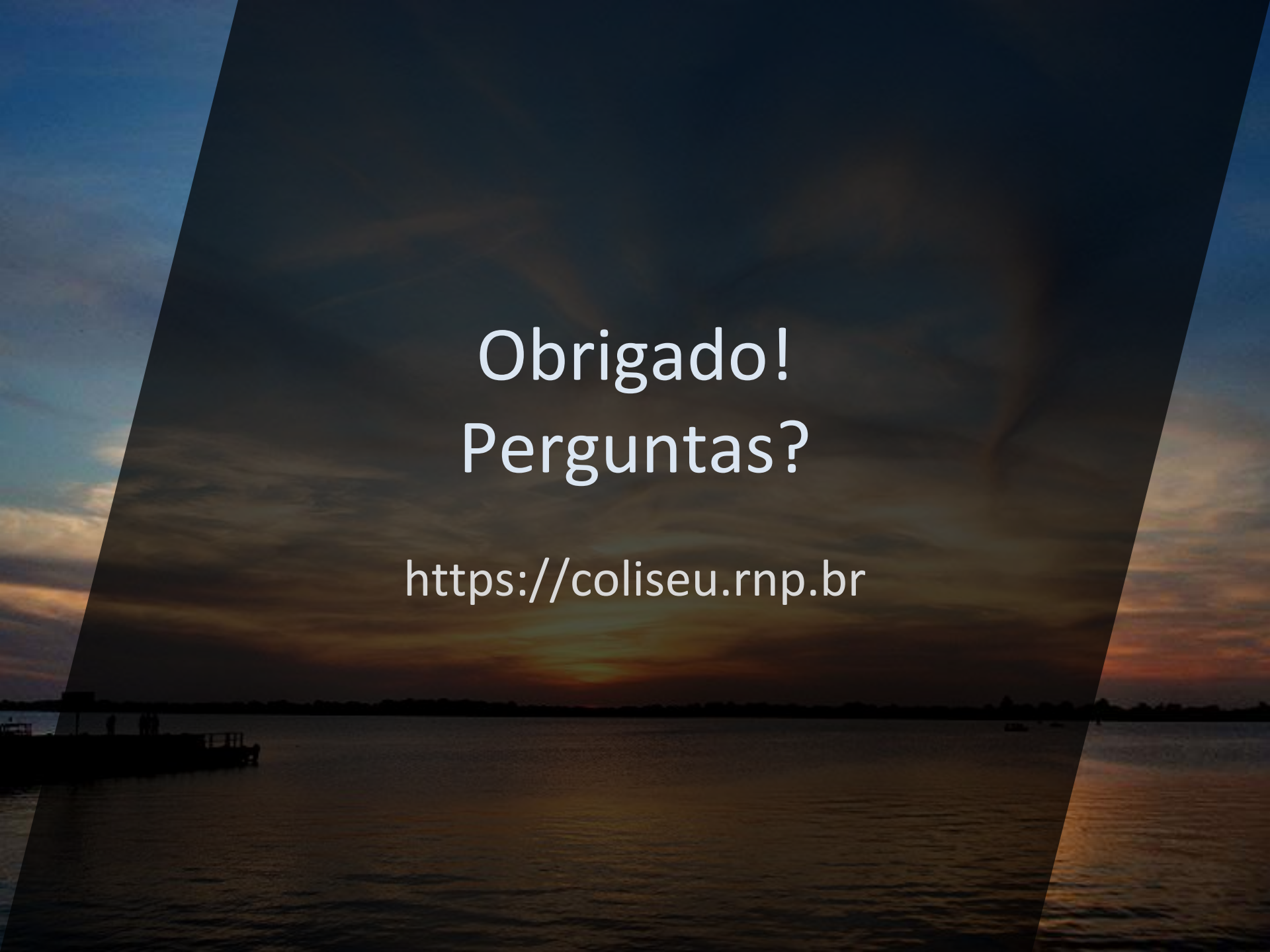
Name:

Domain Settings Admin Delegation

Rule 1 New Rule

Network	MAC	SSID
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Obrigado!
Perguntas?

<https://coliseu.rnp.br>