

Frame by Frame

eduroam

"A user cannot get on Eduroam
no matter what we have tried"

- Help Desk



No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-65 dBm			
20	09:39:52.544	0.006	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.144	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
24	09:39:52.700	0.012	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-65 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

EAP-TLS



Supplicant



Authenticator



Authentication
Server

No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000									
15	09:39:52.379	0.000									
16	09:39:52.395	0.016									
17	09:39:52.396	0.001									
18	09:39:52.538	0.142									
19	09:39:52.538	0.000									
20	09:39:52.544	0.006									
21	09:39:52.544	0.000									
22	09:39:52.688	0.144									
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

DA	Info Short	SSID
Broadcast	Beacon	"eduroam"
Broadcast	ProbeREQ	"eduroam"
Broadcast	ProbeRESP	"eduroam"
ACCESS-POINT	Auth	



 eduroam

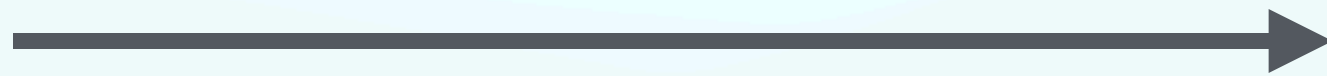
1. Beacon frame: eduroam



2. Probe Request: eduroam



3. Probe Response: eduroam



No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
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4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	ASSOCREQ	eduroam	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
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15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.144	LAPTOP	ACCESS-POINT	Auth						
23	09:39:52.688	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK						
24	09:39:52.700	0.011	ACCESS-POINT	LAPTOP	Auth						
25	09:39:52.700	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
26	09:39:52.849	0.144	LAPTOP	ACCESS-POINT	Auth						
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
28	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			



 eduroam

4. Authentication: Open System



6. Authentication: Open System



12.3.3.2 Open System authentication

12.3.3.2.1 General

Open System authentication is a null authentication algorithm.

Any non-DMG STA requesting Open System authentication can be authenticated if dot11AuthenticationAlgorithmsTable at the peer STA includes an entry with dot11AuthenticationAlgorithm equal to openSystem and dot11AuthenticationAlgorithmActivated equal to true.

A STA may decline to authenticate with another requesting STA. Open System authentication is the default authentication algorithm for a pre-RSNA STA.

Open System authentication utilizes a two-message authentication transaction sequence. The first message asserts identity and requests authentication. The second message returns the authentication result. If the result is “successful,” the STAs shall be declared mutually authenticated.

In the description in 12.3.3.2.2 and 12.3.3.2.3, the STA initiating the authentication exchange is referred to as the *requester*, and the STA to which the initial frame in the exchange is addressed is referred to as the *responder*. The specific items in each of the messages described in the following subclauses are defined in 9.3.3.11, Table 9-40, and Table 9-41.

12.3.3.2.2 Open System authentication (first frame)

Upon receipt of an Open System MLME-AUTHENTICATE.request primitive, the requester shall construct an Open System authentication request carried in an Authentication frame and transmit it to the responder.

12.3.3.2.3 Open System authentication (final frame)

Upon receipt of an Authentication frame requesting Open System authentication, the responder may authenticate the requester using the following procedure:

- a) Issue an MLME-AUTHENTICATE.indication primitive to inform the SME of the authentication request.
- b) Construct and transmit a response carried in an Authentication frame with the fields as defined in 9.3.3.11 and the status field as defined in 9.4.1.9.

If dot11AuthenticationAlgorithmTable does not include an entry with dot11AuthenticationAlgorithm equal to openSystem and dot11AuthenticationAlgorithmActivated equal to true, the result code shall not take the value “successful.”

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4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.143	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.000	LAPTOP	ACCESS-POINT	AssocREQ		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.142	ACCESS-POINT	LAPTOP	AssocRESP		37	-42 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
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34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

LAPTOP	ACCESS-POINT	AssocREQ
	LAPTOP (98:0d:af:94:46:66) (RA)	ACK
ACCESS-POINT	LAPTOP	AssocRESP
	ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK



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8. Association Request



10. Association Response



No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.143	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
23	09:39:52.688	0.000									
24	09:39:52.700	0.012	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
25	09:39:52.700	0.000									
26	09:39:52.849	0.144	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
28	09:39:52.853	0.000									
29	09:39:52.853	0.000									
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

ACCESS-POINT	LAPTOP	QOS Data
	ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK
LAPTOP	ACCESS-POINT	QOS Data
	LAPTOP (98:0d:af:94:46:66) (RA)	ACK



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14. EAP Identity Request



16. EAP Identity Response



	Time	Time Delta	SA	DA	Info Short
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data

Frame 14: 81 bytes on wire (648 bits), 81 bytes captured (648 bits) on interface en0, id 0

Radiotap Header v0, Length 34

802.11 radio information

IEEE 802.11 QoS Data, Flags:F.C

Logical-Link Control

802.1X Authentication

Version: 802.1X-2004 (2)

Type: EAP Packet (0)

Length: 5

Extensible Authentication Protocol

Code: Request (1)

Id: 223

Length: 5

Type: Identity (1)

No.	Time	Time Delta	SA	DA	Info Short
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data

> Frame 16: 100 bytes on wire (800 bits), 100 bytes captured (800 bits) on interface en0, id 0

> Radiotap Header v0, Length 34

> 802.11 radio information

> IEEE 802.11 QoS Data, Flags:TC

> Logical-Link Control

✓ 802.1X Authentication

Version: 802.1X-2001 (1)

Type: EAP Packet (0)

Length: 24

✓ Extensible Authentication Protocol

Code: Response (2)

Id: 223

Length: 24

Type: Identity (1)

Identity: m[redacted]@[redacted].org

No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.143	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.853	0.000	18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data			
31	09:39:52.853	0.000	19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK			
32	09:39:52.853	0.000	20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data			
33	09:39:52.853	0.000	21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK			
34	09:39:52.853	0.000									
35	09:39:52.853	0.000									
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			



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18. EAP Request TLS Start



20. EAP Response



No.	Time	Time Delta	SA	DA
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP

- > Frame 18: 82 bytes on wire (656 bits), 82 bytes captured (656 bits) on interface
- > Radiotap Header v0, Length 34
- > 802.11 radio information
- > IEEE 802.11 QoS Data, Flags:F.C
- > Logical-Link Control
- ∨ 802.1X Authentication
 - Version: 802.1X-2004 (2)
 - Type: EAP Packet (0)
 - Length: 6
- ∨ Extensible Authentication Protocol
 - Code: Request (1)
 - Id: 224
 - Length: 6
 - Type: Protected EAP (EAP-PEAP) (25)
 - ∨ EAP-TLS Flags: 0x20
 - 0... = Length Included: False
 - .0.. = More Fragments: False
 - ..1. = Start: True**
 -000 = Version: 0

No.	Time	Time Delta	SA	DA
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT

- > Frame 20: 82 bytes on wire (656 bits), 82 bytes captured (656 bits) on interface
- > Radiotap Header v0, Length 34
- > 802.11 radio information
- > IEEE 802.11 QoS Data, Flags:TC
- > Logical-Link Control
- ∨ 802.1X Authentication
 - Version: 802.1X-2001 (1)
 - Type: EAP Packet (0)
 - Length: 6
- ∨ Extensible Authentication Protocol
 - Code: Response (2)
 - Id: 224
 - Length: 6
 - Type: Legacy Nak (Response Only) (3)
 - Desired Auth Type: TLS EAP (EAP-TLS) (13)**

No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
8	09:39:52.371	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm		Implemented	Supported
9	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm		Implemented	Supported
10	09:39:52.371	0.000	LAPTOP	ACCESS-POINT	QOS Data		37	-65 dBm			
11	09:39:52.371	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
12	09:39:52.371	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
13	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
14	09:39:52.371	0.000	LAPTOP	ACCESS-POINT	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16	09:39:52.396	0.016	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
17	09:39:52.396	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
18	09:39:52.538	0.142	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
19	09:39:52.538	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
20	09:39:52.544	0.005	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
21	09:39:52.544	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
22	09:39:52.688	0.143	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

ACCESS-POINT	LAPTOP	QOS Data
LAPTOP	ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK
LAPTOP	ACCESS-POINT	QOS Data
LAPTOP (98:0d:af:94:46:66) (RA)	ACCESS-POINT	ACK

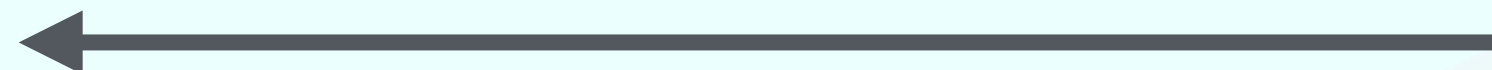


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22. EAP TLS Start



24. EAP Client Hello



No.	Time	Time Delta	SA	DA
22	09:39:52.688	0.143	ACCESS-POINT	LAPTOP
23	09:39:52.688	0.000	ACCESS-POINT (

- > Frame 22: 82 bytes on wire (656 bits), 82 bytes captured (656 bits) on interface
- > Radiotap Header v0, Length 34
- > 802.11 radio information
- > IEEE 802.11 QoS Data, Flags:F.C
- > Logical-Link Control
- ∨ 802.1X Authentication
 - Version: 802.1X-2004 (2)
 - Type: EAP Packet (0)
 - Length: 6
- ∨ Extensible Authentication Protocol
 - Code: Request (1)
 - Id: 225
 - Length: 6
 - Type: TLS EAP (EAP-TLS) (13)
 - ∨ EAP-TLS Flags: 0x20
 - 0... = Length Included: False
 - .0.. = More Fragments: False
 - ..1. = Start: True

No.	Time	Time Delta	SA	DA
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT
25	09:39:52.700	0.000	LAPTOP (08:00:00:00:00:00)	

- > Frame 24: 240 bytes on wire (1920 bits), 240 bytes captured (1920 bits) on interface
- > Radiotap Header v0, Length 34
- > 802.11 radio information
- > IEEE 802.11 QoS Data, Flags:TC
- > Logical-Link Control
- ∨ 802.1X Authentication
 - Version: 802.1X-2001 (1)
 - Type: EAP Packet (0)
 - Length: 164
- ∨ Extensible Authentication Protocol
 - Code: Response (2)
 - Id: 225
 - Length: 164
 - Type: TLS EAP (EAP-TLS) (13)
 - ∨ EAP-TLS Flags: 0x80
 - 1... = Length Included: True
 - .0.. = More Fragments: False
 - ..0. = Start: False
 - EAP-TLS Length: 154
 - ∨ Transport Layer Security
 - ∨ TLSv1.2 Record Layer: Handshake Protocol: Client Hello
 - Content Type: Handshake (22)
 - Version: TLS 1.0 (0x0301)
 - Length: 149

- Transport Layer Security
 - TLV1.2 Record Layer: Handshake Protocol: Client Hello
 - Content Type: Handshake (22)
 - Version: TLS 1.0 (0x0301)
 - Length: 149
 - Handshake Protocol: Client Hello
 - Handshake Type: Client Hello (1)
 - Length: 145
 - Version: TLS 1.2 (0x0303)
 - > Random: 4d7198b247a01ef802acfb2008bffc03b25fb1085570cddabdf13c965a50341c
 - Session ID Length: 0
 - Cipher Suites Length: 34
 - Cipher Suites (17 suites)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 (0xc02c)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 (0xc02b)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256 (0xc030)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 (0xc030)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xc02f)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256 (0xc031)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA (0xc00a)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA (0xc009)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA (0xc014)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA (0xc013)
 - Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)
 - Cipher Suite: TLS_RSA_WITH_AES_128_GCM_SHA256 (0x009c)
 - Cipher Suite: TLS_RSA_WITH_AES_256_CBC_SHA (0x0035)
 - Cipher Suite: TLS_RSA_WITH_AES_128_CBC_SHA (0x002f)
 - Cipher Suite: TLS_ECDHE_ECDSA_WITH_3DES_EDE_CBC_SHA (0xc008)
 - Cipher Suite: TLS_ECDHE_RSA_WITH_3DES_EDE_CBC_SHA (0xc012)
 - Cipher Suite: TLS_RSA_WITH_3DES_EDE_CBC_SHA (0x000a)
 - Compression Methods Length: 1

col: Client Hello

- Extension: signature_algorithms (len=24)
 - Type: signature_algorithms (13)
 - Length: 24
 - Signature Hash Algorithms Length: 22
 - Signature Hash Algorithms (11 algorithms)
 - > Signature Algorithm: ecdsa_secp256r1_sha256 (0x0403)
 - > Signature Algorithm: rsa_pss_rsae_sha256 (0x0804)
 - > Signature Algorithm: rsa_pkcs1_sha256 (0x0401)
 - > Signature Algorithm: ecdsa_secp384r1_sha384 (0x0503)
 - > Signature Algorithm: ecdsa_sha1 (0x0203)
 - > Signature Algorithm: rsa_pss_rsae_sha384 (0x0805)
 - > Signature Algorithm: rsa_pss_rsae_sha384 (0x0805)
 - > Signature Algorithm: rsa_pkcs1_sha384 (0x0501)
 - > Signature Algorithm: rsa_pss_rsae_sha512 (0x0806)
 - > Signature Algorithm: rsa_pkcs1_sha512 (0x0601)
 - > Signature Algorithm: rsa_pkcs1_sha1 (0x0201)

- > Extension: ec_point_formats (len=2)
- > Extension: status_request (len=5)
- > Extension: signature_algorithms (len=24)
- > Extension: signed_certificate_timestamp (len=0)

[JA3 Fullstring: 771,49196-49195-52393-49200-49199-52392-49162-49161-49172-4

[JA3: dc6f33cb9a2b90d5f1a579aa582fc2ae]

No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371		ACCESS-POINT	LAPTOP							
7	09:39:52.371										
8	09:39:52.372			ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK					mented	Supported
9	09:39:52.372										
10	09:39:52.377		LAPTOP	ACCESS-POINT						mented	Supported
11	09:39:52.375										
12	09:39:52.379			LAPTOP (98:0d:af:94:46:66) (RA)	ACK						
13	09:39:52.379										
14	09:39:52.379		ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS						
15	09:39:52.379										
16	09:39:52.396			ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS						
17	09:39:52.396										
18	09:39:52.538		ACCESS-POINT	LAPTOP							
19	09:39:52.538										
20	09:39:52.544			ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
21	09:39:52.544										
22	09:39:52.688		LAPTOP	ACCESS-POINT							
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

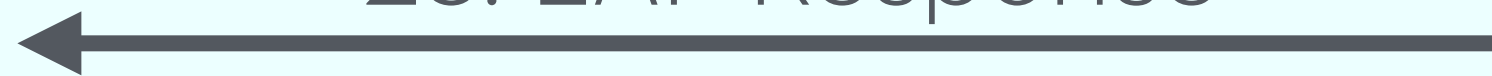


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26. EAP Request



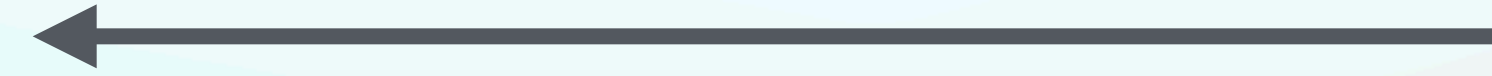
28. EAP Response



32. EAP Request



34. EAP Response



No.	Time	Time Delta	SA	DA	Info Short
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data
<ul style="list-style-type: none"> > Frame 32: 1080 bytes on wire (8640 bits), 1080 bytes captured (8640 bits) on interface e > Radiotap Header v0, Length 34 > 802.11 radio information > IEEE 802.11 QoS Data, Flags:F.C > Logical-Link Control <ul style="list-style-type: none"> 802.1X Authentication <ul style="list-style-type: none"> Version: 802.1X-2004 (2) Type: EAP Packet (0) Length: 1004 <li style="background-color: #0056b3; color: white; padding: 2px;"> <ul style="list-style-type: none"> Extensible Authentication Protocol <ul style="list-style-type: none"> Code: Request (1) Id: 227 Length: 1004 Type: TLS EAP (EAP-TLS) (13) <ul style="list-style-type: none"> EAP-TLS Flags: 0xc0 <ul style="list-style-type: none"> 1... = Length Included: True .1.. = More Fragments: True ..0. = Start: False EAP-TLS Length: 2904 					

No.	Time	Time Delta	SA	DA	Info Short	SSID	Ch.	Signal	SS	802.11k	802.11v
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	"eduroam"	37	-64 dBm		Implemented	Supported
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	"eduroam"	37	-44 dBm			Supported
3	09:39:52.344	0.028	ACCESS-POINT	Broadcast	ProbeRESP	"eduroam"	37	-65 dBm		Implemented	Supported
4	09:39:52.359	0.015	LAPTOP	ACCESS-POINT	Auth		37	-43 dBm			Supported
5	09:39:52.359	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
6	09:39:52.371	0.011	ACCESS-POINT	LAPTOP	Auth		37	-64 dBm			
7	09:39:52.371	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
8	09:39:52.372	0.001	LAPTOP	ACCESS-POINT	AssocREQ	"eduroam"	37	-43 dBm		Implemented	Supported
9	09:39:52.372	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
10	09:39:52.375	0.002	ACCESS-POINT	LAPTOP	AssocRESP		37	-65 dBm		Implemented	Supported
11	09:39:52.375	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
12	09:39:52.379	0.004	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
13	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-43 dBm			
14	09:39:52.379	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
15	09:39:52.379	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
16			ACCESS-POINT	LAPTOP	QOS Data						
17				ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
18			LAPTOP	ACCESS-POINT	QOS Data						
19				ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
20			LAPTOP	ACCESS-POINT	QOS Data						
21				ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
22				ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK						
23	09:39:52.688	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-43 dBm			
24	09:39:52.700	0.011	LAPTOP	ACCESS-POINT	QOS Data		37	-43 dBm			
25	09:39:52.700	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
26	09:39:52.849	0.149	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
27	09:39:52.849	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
28	09:39:52.853	0.004	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
29	09:39:52.853	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
30	09:39:52.997	0.144	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
31	09:39:52.998	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
32	09:39:52.999	0.001	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
33	09:39:52.999	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
34	09:39:53.002	0.003	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
35	09:39:53.002	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
37	09:39:53.148	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data		37	-42 dBm			
39	09:39:53.163	0.000		LAPTOP (98:0d:af:94:46:66) (RA)	ACK		37	-65 dBm			
40	09:39:53.307	0.143	ACCESS-POINT (6a:49:b2:3e:5d:d3) (TA)	LAPTOP (98:0d:af:94:46:66) (RA)	RTS		37	-65 dBm			
41	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	CTS		37	-42 dBm			
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data		37	-65 dBm			
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK		37	-42 dBm			

ACCESS-POINT	LAPTOP	QOS Data
	ACCESS-POINT (6a:49:b2:3e:5d:d3) (RA)	ACK
LAPTOP	ACCESS-POINT	QOS Data



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36. EAP-TLS Server Hello



38. EAP-TLS Response



No.	Time	Time Delta	SA	DA	Info Short
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data
<ul style="list-style-type: none"> > Frame 36: 1002 bytes on wire (8016 bits), 1002 bytes captured (8016 bits) on interface en0 > Radiotap Header v0, Length 34 > 802.11 radio information > IEEE 802.11 QoS Data, Flags:F.C > Logical-Link Control <ul style="list-style-type: none"> <ul style="list-style-type: none"> > 802.1X Authentication <ul style="list-style-type: none"> Version: 802.1X-2004 (2) Type: EAP Packet (0) Length: 926 > Extensible Authentication Protocol <ul style="list-style-type: none"> Code: Request (1) Id: 228 Length: 926 Type: TLS EAP (EAP-TLS) (13) <ul style="list-style-type: none"> > EAP-TLS Flags: 0x80 EAP-TLS Length: 2904 > [3 EAP-TLS Fragments (2904 bytes): #26(994) #32(994) #36(916)] <ul style="list-style-type: none"> <ul style="list-style-type: none"> > Transport Layer Security <ul style="list-style-type: none"> > TLSv1.2 Record Layer: Handshake Protocol: Server Hello > TLSv1.2 Record Layer: Handshake Protocol: Certificate > TLSv1.2 Record Layer: Handshake Protocol: Server Key Exchange > TLSv1.2 Record Layer: Handshake Protocol: Certificate Request > TLSv1.2 Record Layer: Handshake Protocol: Server Hello Done 					

No.	Time	Time Delta	SA	DA	Info Short
36	09:39:53.148	0.145	ACCESS-POINT	LAPTOP	QOS Data
37	09:39:53.148	0.000	ACCESS-POINT (62:40:00:00:00:00)	LAPTOP	ACK
<ul style="list-style-type: none"> > Frame 36: 1002 bytes on wire (8016 bits), 1002 bytes captured (8016 bits) on interface en0, id 0 > Radiotap Header v0, Length 34 > 802.11 radio information > IEEE 802.11 QoS Data, Flags:F.C > Logical-Link Control > 802.1X Authentication > Extensible Authentication Protocol <ul style="list-style-type: none"> Code: Request (1) Id: 228 Length: 926 Type: TLS EAP (EAP-TLS) (13) > EAP-TLS Flags: 0x80 EAP-TLS Length: 2904 > [3 EAP-TLS Fragments (2904 bytes): #26(994), #32(994), #36(916)] > Transport Layer Security <ul style="list-style-type: none"> > TLSv1.2 Record Layer: Handshake Protocol: Server Hello > TLSv1.2 Record Layer: Handshake Protocol: Certificate > TLSv1.2 Record Layer: Handshake Protocol: Server Key Exchange > TLSv1.2 Record Layer: Handshake Protocol: Certificate Request > TLSv1.2 Record Layer: Handshake Protocol: Server Hello Done <ul style="list-style-type: none"> Content Type: Handshake (22) Version: TLS 1.2 (0x0303) Length: 4 > Handshake Protocol: Server Hello Done 					

No.	Time	Time Delta	SA	DA	Info Short
38	09:39:53.163	0.015	LAPTOP	ACCESS-POINT	QOS Data
<ul style="list-style-type: none"> > Frame 38: 1352 bytes on wire (10816 bits), 1352 bytes captured (10816 bits) on interface en0, id 0 > Radiotap Header v0, Length 34 > 802.11 radio information > IEEE 802.11 QoS Data, Flags:TC > Logical-Link Control > 802.1X Authentication <ul style="list-style-type: none"> <ul style="list-style-type: none"> Code: Response (2) Id: 228 Length: 1276 Type: TLS EAP (EAP-TLS) (13) <ul style="list-style-type: none"> EAP-TLS Flags: 0xc0 <ul style="list-style-type: none"> 1... = Length Included: True .1.. = More Fragments: True ..0. = Start: False 					
EAP-TLS Length: 2666					

	Time	Time Delta	SA	DA	Info Short	Ch.	Signal
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data	37	-65
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
44	09:39:53.312	0.005	LAPTOP	ACCESS-POINT	QOS Data	37	-42
45	09:39:53.312	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
46	09:39:53.458	0.146	ACCESS-POINT	LAPTOP	QOS Data	37	-65
47	09:39:53.458	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
48	09:39:53.461	0.003	LAPTOP	ACCESS-POINT	QOS Data	37	-42
49	09:39:53.461	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
50	09:39:53.608	0.146	ACCESS-POINT	LAPTOP	QOS Data	37	-65
51	09:39:53.608	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
52	09:39:53.612	0.004	LAPTOP	ACCESS-POINT	QOS Data	37	-42
53	09:39:53.612	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
54	09:39:53.762	0.149	ACCESS-POINT	LAPTOP	QOS Data	37	-65
55	09:39:53.762	0.000		ACCESS-POINT (6a:49:...	ACK	37	-43
56	09:39:53.763	0.001	ACCESS-POINT	LAPTOP	QOS Data	37	-65
57	09:39:53.763	0.000		ACCESS-POINT (6a:49:...	ACK	37	-43
58	09:39:53.764	0.001	LAPTOP	ACCESS-POINT	QOS Data	37	-43
59	09:39:53.764	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
60	09:39:53.766	0.001	ACCESS-POINT	LAPTOP	QOS Data	37	-65
61	09:39:53.766	0.000		ACCESS-POINT (6a:49:...	ACK	37	-43
62	09:39:53.767	0.000	LAPTOP	ACCESS-POINT	QOS Data	37	-43
63	09:39:53.767	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
64	09:39:53.768	0.000	LAPTOP	ACCESS-POINT	QOS Null	37	-42
65	09:39:53.769	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-61
66	09:39:53.783	0.014	LAPTOP	Broadcast	QOS Data	37	-41



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42. EAP Request



44. EAP Response - More Fragments



46. EAP Request



48. EAP Response - Fragments Assembled



No.	Time	Time Delta	SA	DA	Info Short
48	09:39:53.461	0.003	LAPTOP	ACCESS-POINT	QOS Data
> Frame 48: 212 bytes on wire (1696 bits), 212 bytes captured (1696 bits) on interface en0, id 0					
> Radiotap Header v0, Length 34					

- ▼ TLSv1.2 Record Layer: Change Cipher Spec Protocol: Change Cipher Spec
 - Content Type: Change Cipher Spec (20)
 - Version: TLS 1.2 (0x0303)
 - Length: 1
 - Change Cipher Spec Message
- ▼ TLSv1.2 Record Layer: Handshake Protocol: Encrypted Handshake Message
 - Content Type: Handshake (22)
 - Version: TLS 1.2 (0x0303)
 - Length: 40
 - Handshake Protocol: Encrypted Handshake Message

- > TLSv1.2 Record Layer: Handshake Protocol: Certificate Verify
- > TLSv1.2 Record Layer: Change Cipher Spec Protocol: Change Cipher Spec
- > TLSv1.2 Record Layer: Handshake Protocol: Encrypted Handshake Message

	Time	Time Delta	SA	DA	Info Short	Ch.	Signa
42	09:39:53.307	0.000	ACCESS-POINT	LAPTOP	QOS Data	37	-65
43	09:39:53.307	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
44	09:39:53.312	0.005	LAPTOP	ACCESS-POINT	QOS Data	37	-42
45	09:39:53.312	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
46	09:39:53.458	0.146	ACCESS-POINT	LAPTOP	QOS Data	37	-65
47	09:39:53.458	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
48	09:39:53.461	0.003	LAPTOP	ACCESS-POINT	QOS Data	37	-42
49	09:39:53.461	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
50	09:39:53.608	0.146	ACCESS-POINT	LAPTOP	QOS Data	37	-65
51	09:39:53.608	0.000		ACCESS-POINT (6a:49:...	ACK	37	-42
52	09:39:53.612	0.004	LAPTOP	ACCESS-POINT	QOS Data	37	-42
53	09:39:53.612	0.000		LAPTOP (98:0d:af:94:4...	ACK	37	-65
54	09:39:53.762	0.149	ACCESS-POINT	LAPTOP	QOS Data	37	-65
55	09:39:53.762	0.000		ACCESS-POINT (6a:49:...	ACK	37	-43
56	09:39:53.763	0.001	ACCESS-POINT	LAPTOP	QOS Data	37	-65
57			ACCESS-POINT	LAPTOP	QOS Data	37	-43
58						37	-43
59				ACCESS-POINT (6a:49:...	ACK	37	-65
60						37	-65
61			LAPTOP	ACCESS-POINT	QOS Data	37	-43
62						37	-43
63				LAPTOP (98:0d:af:94:4...	ACK	37	-65
64			ACCESS-POINT	LAPTOP	QOS Data	37	-42
65						37	-61
66	09:39:53.783	0.014	LAPTOP	Broadcast	QOS Data	37	-41



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50. EAP Request



52. EAP-TLS Response



54. EAP Success



No.	Time	Time Relative	SA	DA	Info Short	Info Long
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	Beacon frame, SN=3749, FN=0, Flags=.....C, BI=100, SSID="eduroam"
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	Probe Request, SN=2448, FN=0, Flags=.....C, SSID="eduroam"
3	09:39:52.344	0.102	ACCESS-POINT	Broadcast	ProbeRESP	Probe Response, SN=2996, FN=0, Flags=.....C, BI=100, SSID="eduroam"
4	09:39:52.359	0.118	LAPTOP	ACCESS-POINT	Auth	Authentication, SN=2449, FN=0, Flags=.....C
6	09:39:52.371	0.130	ACCESS-POINT	LAPTOP	Auth	Authentication, SN=89, FN=0, Flags=.....C
8	09:39:52.372	0.131	LAPTOP	ACCESS-POINT	AssocREQ	Association Request, SN=2450, FN=0, Flags=.....C, SSID="eduroam"
10	09:39:52.375	0.133	ACCESS-POINT	LAPTOP	AssocRESP	Association Response, SN=0, FN=0, Flags=.....C
14	09:39:52.379	0.138	ACCESS-POINT	LAPTOP	QOS Data	Request, Identity
16	09:39:52.396	0.154	LAPTOP	ACCESS-POINT	QOS Data	Response, Identity
18	09:39:52.538	0.297	ACCESS-POINT	LAPTOP	QOS Data	Request, Protected EAP (EAP-PEAP)
20	09:39:52.544	0.303	LAPTOP	ACCESS-POINT	QOS Data	Response, Legacy Nak (Response Only)
22	09:39:52.688	0.447	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
24	09:39:52.700	0.458	LAPTOP	ACCESS-POINT	QOS Data	Client Hello
26	09:39:52.849	0.607	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
28	09:39:52.853	0.611	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
32	09:39:52.999	0.758	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
34	09:39:53.002	0.761	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
36	09:39:53.148	0.906	ACCESS-POINT	LAPTOP	QOS Data	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
38	09:39:53.163	0.922	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
42	09:39:53.307	1.065	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
44	09:39:53.312	1.070	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
46	09:39:53.458	1.217	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
48	09:39:53.461	1.220	LAPTOP	ACCESS-POINT	QOS Data	Certificate, Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
50	09:39:53.608	1.367	ACCESS-POINT	LAPTOP	QOS Data	Change Cipher Spec, Encrypted Handshake Message
52	09:39:53.612	1.371	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
54	09:39:53.762	1.521	ACCESS-POINT	LAPTOP	QOS Data	Success

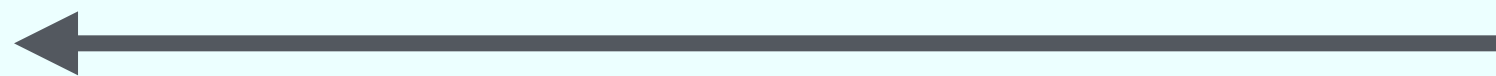


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Message 1



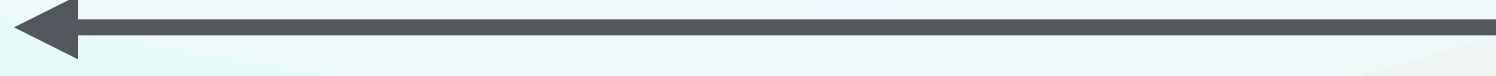
Message 2



Message 3



Message 4



No.	Time	Time Relative	SA	DA	Info Short	Info Long
1	09:39:52.241	0.000	ACCESS-POINT	Broadcast	Beacon	Beacon frame, SN=3749, FN=0, Flags=.....C, BI=100, SSID="eduroam"
2	09:39:52.315	0.074	LAPTOP	Broadcast	ProbeREQ	Probe Request, SN=2448, FN=0, Flags=.....C, SSID="eduroam"
3	09:39:52.344	0.102	ACCESS-POINT	Broadcast	ProbeRESP	Probe Response, SN=2996, FN=0, Flags=.....C, BI=100, SSID="eduroam"
4	09:39:52.359	0.118	LAPTOP	ACCESS-POINT	Auth	Authentication, SN=2449, FN=0, Flags=.....C
6	09:39:52.371	0.130	ACCESS-POINT	LAPTOP	Auth	Authentication, SN=89, FN=0, Flags=.....C
8	09:39:52.372	0.131	LAPTOP	ACCESS-POINT	AssocREQ	Association Request, SN=2450, FN=0, Flags=.....C, SSID="eduroam"
10	09:39:52.375	0.133	ACCESS-POINT	LAPTOP	AssocRESP	Association Response, SN=0, FN=0, Flags=.....C
14	09:39:52.379	0.138	ACCESS-POINT	LAPTOP	QOS Data	Request, Identity
16	09:39:52.396	0.154	LAPTOP	ACCESS-POINT	QOS Data	Response, Identity
18	09:39:52.538	0.297	ACCESS-POINT	LAPTOP	QOS Data	Request, Protected EAP (EAP-PEAP)
20	09:39:52.544	0.303	LAPTOP	ACCESS-POINT	QOS Data	Response, Legacy Nak (Response Only)
22	09:39:52.688	0.447	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
24	09:39:52.700	0.458	LAPTOP	ACCESS-POINT	QOS Data	Client Hello
26	09:39:52.849	0.607	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
28	09:39:52.853	0.611	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
32	09:39:52.999	0.758	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
34	09:39:53.002	0.761	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
36	09:39:53.148	0.906	ACCESS-POINT	LAPTOP	QOS Data	Server Hello, Certificate, Server Key Exchange, Certificate Request, Server Hello Done
38	09:39:53.163	0.922	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
42	09:39:53.307	1.065	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
44	09:39:53.312	1.070	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
46	09:39:53.458	1.217	ACCESS-POINT	LAPTOP	QOS Data	Request, TLS EAP (EAP-TLS)
48	09:39:53.461	1.220	LAPTOP	ACCESS-POINT	QOS Data	Certificate, Client Key Exchange, Certificate Verify, Change Cipher Spec, Encrypted Handshake Message
50	09:39:53.608	1.367	ACCESS-POINT	LAPTOP	QOS Data	Change Cipher Spec, Encrypted Handshake Message
52	09:39:53.612	1.371	LAPTOP	ACCESS-POINT	QOS Data	Response, TLS EAP (EAP-TLS)
54	09:39:53.762	1.521	ACCESS-POINT	LAPTOP	QOS Data	Success
56	09:39:53.763	1.522	ACCESS-POINT	LAPTOP	QOS Data	Key (Message 1 of 4)
58	09:39:53.764	1.523	LAPTOP	ACCESS-POINT	QOS Data	Key (Message 2 of 4)
60	09:39:53.766	1.525	ACCESS-POINT	LAPTOP	QOS Data	Key (Message 3 of 4)
62	09:39:53.767	1.526	LAPTOP	ACCESS-POINT	QOS Data	Key (Message 4 of 4)
64	09:39:53.768	1.527	LAPTOP	ACCESS-POINT	QOS Null	QOS Null function (no data), SN=2451, FN=0, Flags=0.....TC
66	09:39:53.783	1.542	LAPTOP	Broadcast	QOS Data	S, func=RR, N(R)=33; DSAP 0xcc Group, SSAP 0x22 Command

Additional Resources

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