Session Description Protocol

- SDP is used for the description of the format of media streams
- For each media stream of a session, an SDP description is needed
- Note that SDP does not transport media: it is used only for their description
- SDP descriptions are carried in the body of SIP messages

Structure of SDP descriptions

- Session-level information
  - Protocol version
  - originator and session ID
  - Session Name
  - Session time
- Media description 1
  - Media name and transport
  - connection information
- Media description 2
  - Media name and transport
  - Connection information
- …

Session Description Protocol

- SDP descriptions are a sequence of lines with the following format:
  - field=value
- Where field is a single character
- Compulsory fields are:
  - v=
    - (version)
  - o=
    - (session origin and session identifier)
  - s=
    - (session name)
  - t=
    - start e stop time della sessione, used in special cases
  - m=
    - media type, transport protocol, port, payload type

Session Description Protocol

- Optional fields are:
  - u=
    - Specification of a URI
  - e=
    - email address
  - c=
    - Data about low-level network connection (IP)
  - b=
    - bandwidth
  - a=
    - Additional attributes

Session Description Protocol

- A field may have subfields
  - o= has 6 subfields
    - username
      - sip login identity of originator
    - session ID
      - unique ID of session
    - version
    - network type
      - - IN = Internet
    - address type
      - IP4 or IP6
    - address

Session Description Protocol

- m= has 4 subfields
  - media type
    - For example, audio
  - port
    - RTP port
  - transport
    - Type of transport used for the media: RTP
  - format
    - payload type
- example
  - m=audio 45678 rtp/avp 0 // (G.711)
  - Attributes could be
    - a=sendonly
    - a=rcvonly
    - a=orient:landscape
  - If multiple formats are available
    - a=rtpmap 2 G726-32/8000 (2 means priority 2)
    - a=rtpmap 4 G723/8000 (4 means priority 4)

Negotiation of media

- SDP descriptions are included in the INVITE message and in the following responses

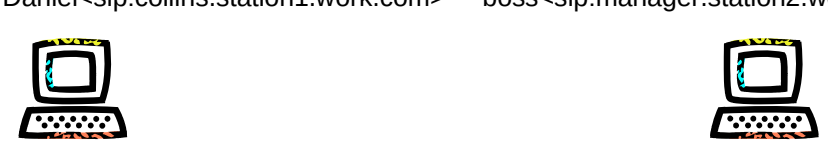
SDP and SIP

Daniel<sip:collins.station1.work.com> boss<sip:manager.station2.work.com>

```
INVITE sip:manager@station2.work.com SIP/2.0
FROM: Daniel<sip:collins.station1.work.com>;
                          tag = abcd1234
To: boss<sip:manager.station2.work.com>
CSeq: 1 INVITE
Content-Length: 213
Content-Type: application/sdp
Content-Disposition: session

v=0
o=collins 123456 001 IN IP4 station1.work.com
s=
c=IN station1.work.com
t=0 0
m=audio 4444 RTP/AVP 2
a=rtpmap 2 G726-32/8000
m=audio 4666 RTP/AVP 4
a=rtpmap 4 G723/8000
m=audio 4888 RTP/AVP 15
a=rtpmap 15 G728/8000
```

Daniel<sip:collins.station1.work.com> boss<sip:manager.station2.work.com>



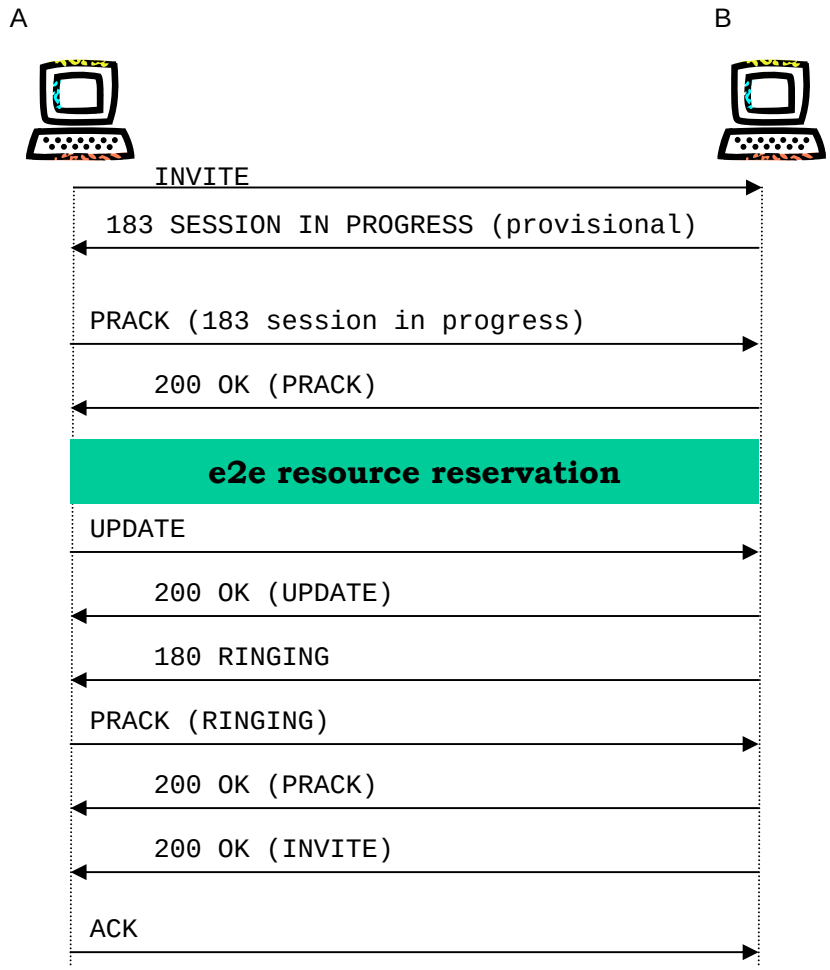
```
SIP/2.0 200 OK
FROM: Daniel<sip:collins.station1.work.com>;
                          tag = abcd1234
To: boss<sip:manager.station2.work.com>;
                          tag = xyz679
CSeq: 1 INVITE
Content-Length: 163
Content-Type: application/sdp
Content-Disposition: session

v=0
o=collins 45678 001 IP4 station2.work.com
s=
c=IN IP4 station2.work.com
t=0 0
m=audio 0 RTP/AVP 2
m=audio 0 RTP/AVP 4
m=audi0 6666 RTP/AVP 15
a=rtpmap 15 G728/8000
```

ACK

SIP and resource management

- SIP can interact with signaling protocols for QoS negotiation and setup, such as RSVP

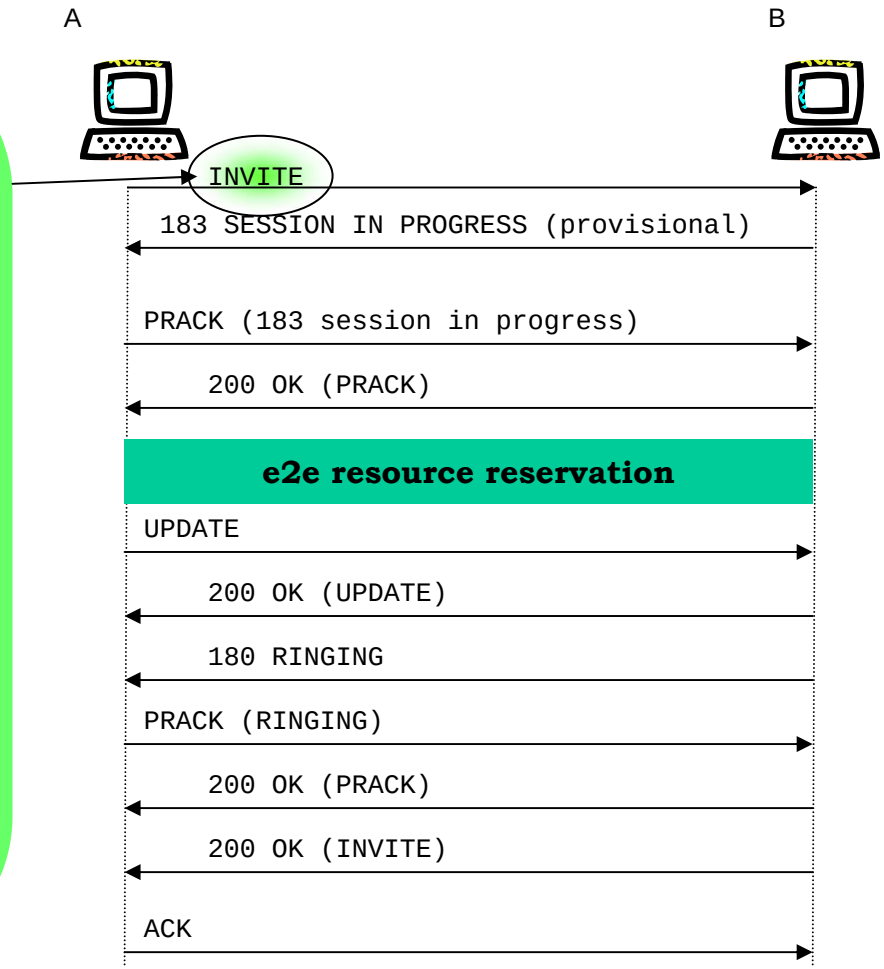


SIP and resource management

SDP description in INVITE

- v=0
- o=userA 45678 IN IP4 A.network.com
- s=
- c=IN IP4 A.network.com
- t=0 0
- m=audio 4444 rtp/avp 0
- a=curr: qos e2e none
- a=des: qos mandatory e2e sendrecv

Curr: current status
Des: desired status



SIP and resource management

SDP description in "session in progress"

V=0
O=userB 12345 IN IP4 stationB.network.com
S=
C=IN IP4 stationB.network.com
T=0 0
M=audio 6666 RTP/AVP 0
A=curr qos e2e none
A=des: qos mandatory e2e sendrecv
A=conf: qos e2e recv

Conf confirms that userB wants userA to reserve resources in the direction from userA to userB

SIP and resource management

SDP description in “update”

V=0

O=userA 45678 IN IP4
stationA.network.com

S=

C=IN IP4 stationA.network.com

M=audio 444 RTP/AVP 0

A=curr: qos e2e send

A=des: qos mandatory e2e sendrecv

SIP and resource management

SDP description in “200 OK”
V=0

O=userB 12345 IN IP4
stationB.network.com

S=

C=IN IP4 stationB.network.com

T=0 0

M=audio 666 RTP/AVP 0

A=curr: qos e2e sendrecv

A=des:qos mandatory e2e sendrecv