Should we support SDES in WebRTC?

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The Question

- We *are* going to mandate DTLS-SRTP be implemented, and *used* much of the time
  - Whenever the far-end does DTLS-SRTP
  - Whenever the Web connection is not HTTPS
- So the question is: should we *also* support MTI for SDES?

Photo: Rebecca (Becky/Bex)

Why bother?

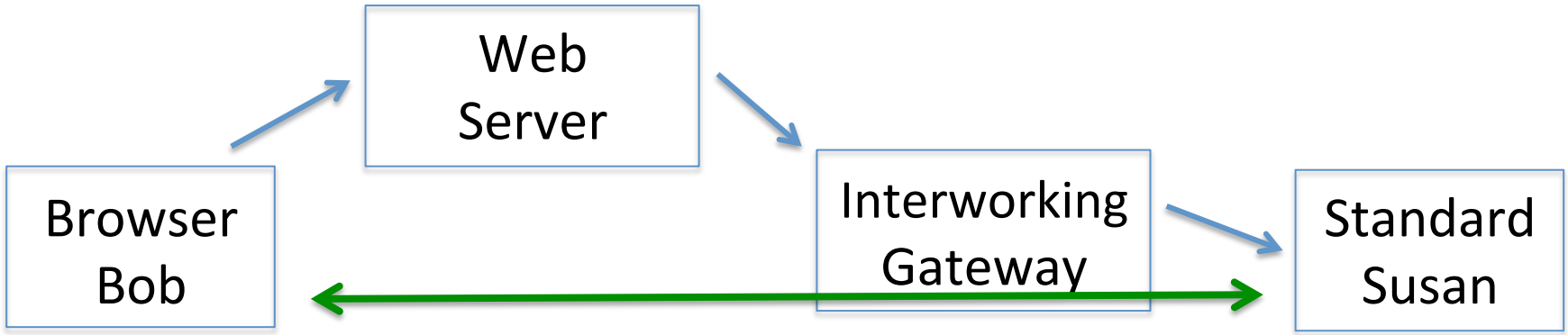
(hint: for WebRTC-SIP)

1. Reduced time-to-media (less clipping)
2. Reduced complexity for interworking gateways (i.e., less cost/perf-overhead)
3. Allows end-end SRTP for interworking cases
4. It is known to work and be interoperable
5. It's trivial additional complexity, assuming it does not truly degrade security
   - And that's the really big question

The concerns with including SDES

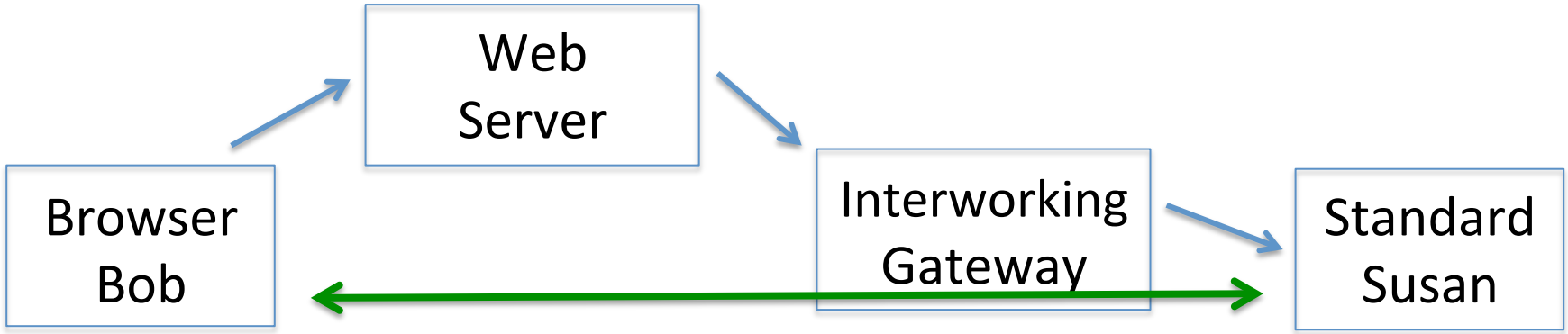
1. Enables eavesdropping
   - Enables malicious websites to snoop
2. No perfect-forward-secrecy
   - Logged SDES keys let one decrypt after-the-fact
3. Susceptible to downgrade attacks
   - Malicious website could force SDES every time
4. Unverifiable
   - Don't know if the media is secure end-end or not
5. Not complicated enough
   - Developers aren't challenged enough

Enables Eavesdropping



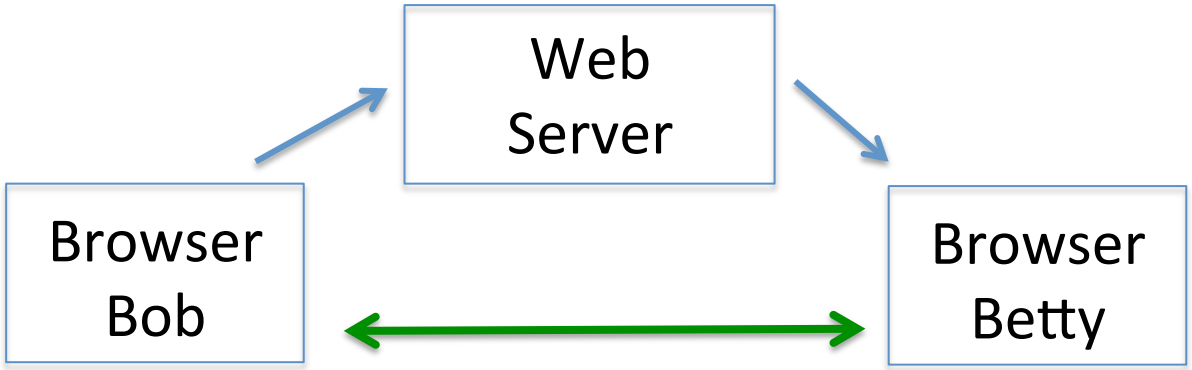
- With SDES, Web-server sees the key
  - IWF gateway sees the key even in DTLS-SRTP
- If evil Web-server force media to go through a path it can snoop, then it can decrypt media
- BUT, it can do that with DTLS-SRTP too
  - It just inserts itself as the IWF Gateway

No PFS



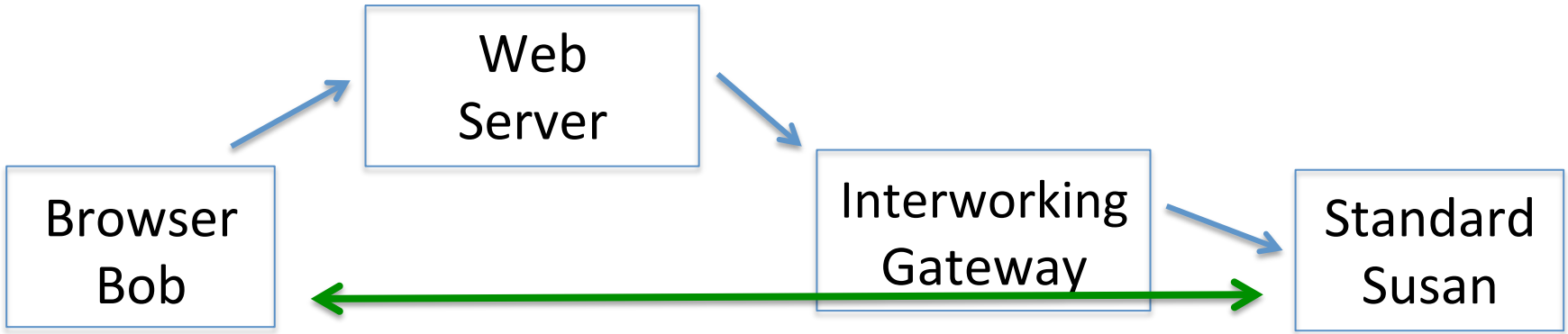
- With SDES, if a session key is ever discovered in the future, past media using it is compromised
  - Of course the media has to actually be available/ recorded
- BUT, DTLS-SRTP loses PFS with an IWF gateway too
  - Nothing prevents IWF from logging all keys

Susceptible to downgrade



- Evil Web-Server can make Bob think he's talking through an IWF Gateway, do SDES
- BUT, a Web-Server can already insert itself as a DTLS-SRTP B2BUA
  - It would be "cheaper" with SDES though

Unverifiable

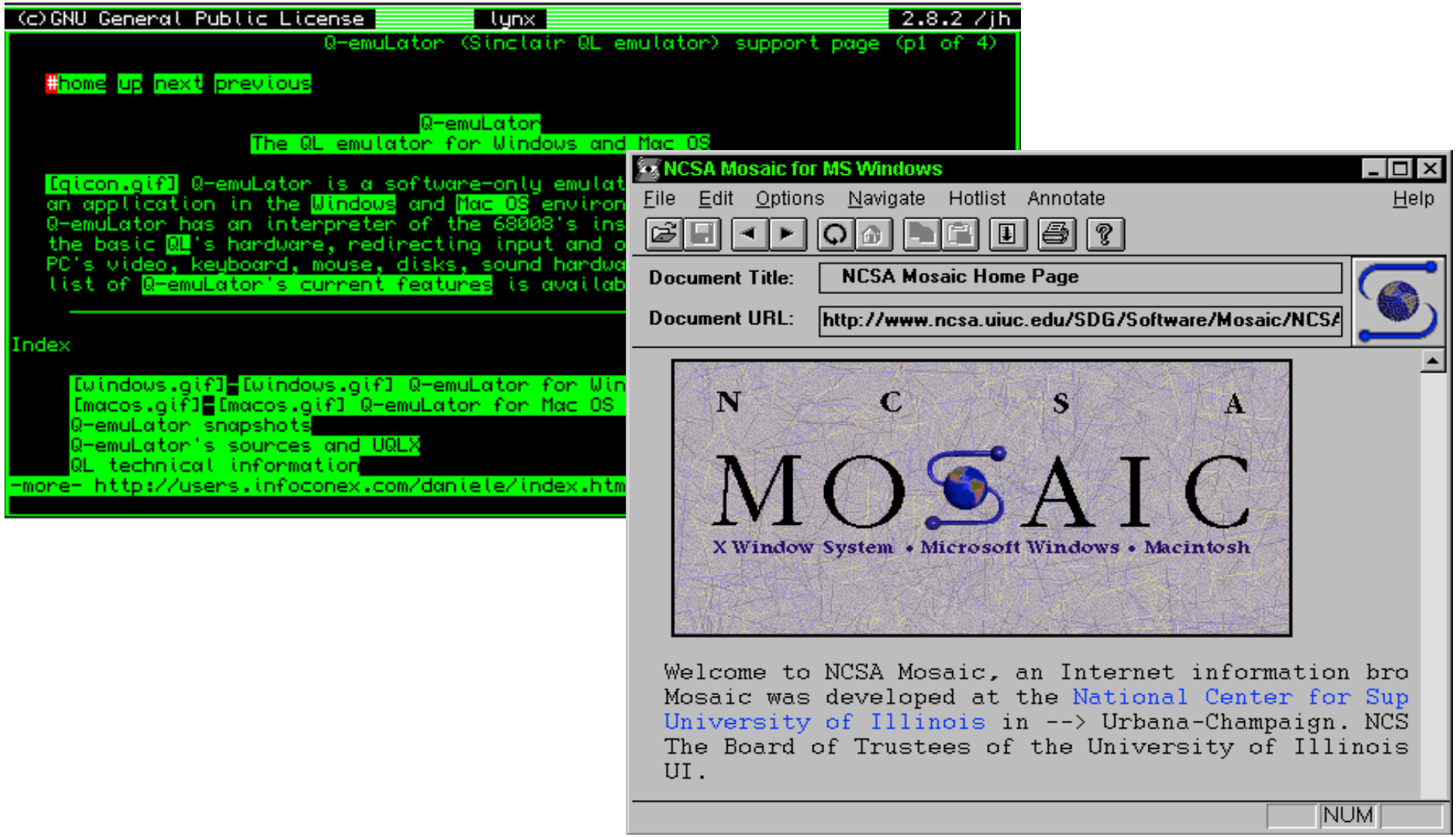


- With SDES, you don't know if the media is secure end-to-end
- The short answer is "yes you do know: it's NOT secure end-to-end"
  - DTLS-SRTP isn't either, until and unless you verify the fingerprints or we have an IdP solution *deployed*
  - And for interworking cases DTLS-SRTP is not end-to-end secure, but who would know?

What if we're wrong?

- We'd remove/deprecate it
  - Security issues cause updates all the time

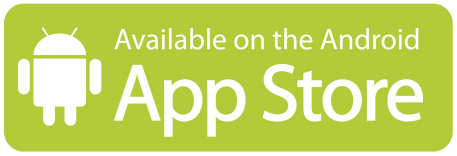
We've been told Browsers get upgraded often and quickly



Oh, oh...

- If SDES is found to have caused a security issue, and the news makes slashdot, browsers will remove it in short order
- The WebRTC server operators can’t control when user Browsers upgrade and remove functionality

Back up a step…



- What do most WebRTC-SIP operators really care about?
  - *Browser* support? Or *App* support?
  - Browsers are so 1990's… like legacy VT100 stuff
- Web-framework Apps have very different security and deployment/control properties
- But web-framework "Apps" aren't really in-scope for W3C/IETF compliance statements
  - That's ok – we can make an informational doc and if they want to comply they can or not

Compromise Proposal

- DTLS-SRTP is the only MTI for WebRTC
- Add a line of:

  “Native web-framework applications have different security properties if they, unlike Web Browsers, don’t load and execute unknown Javascript from random sources. Such applications SHOULD support SDES for SRTP key exchange, in order to directly interoperate with existing VoIP devices, incur less initial audio clipping, and reduce overhead.”

Time for the Mic-line

- Let the circus begin...