IEEE P802.11
Wireless LANs

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| Security Inputs to IEEE 802.11 TGai |
| Date: March 14, 2012 |
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**All motions are relative to Section 4 of the sfd document (12/151r5).**

Device joining may include an authentication scheme, where two devices A and B derive a shared key (key agreement) and show that these have computed correctly (key confirmation) in each of the following scenarios:

1. Both devices do not share a secret key, but each shares a key with a mutually trusted third party.
2. Both devices do have (access to) a certificate of their public key, issued by a trusted third (certificate authority).
3. Both devices do share a weak secret key.
4. Both devices do share a secret key.

**Strawpoll #1:**

Scenario #1 should be included, where devices are STA and AP respectively and third party is AS.

**MOTION #1:**

**The draft should include an authentication scheme, where STA and AP derive a shared key (key agreement) and show that these have computed correctly (key confirmation), where both devices do not share a secret key, but each shares a key with a mutually trusted third party AS.**

**Strawpoll #2:** Scenario #2 should be included, where devices are STA and AP respectively and where AS may provide authorization service.

**MOTION #2:**

**The draft should include an authentication scheme, where STA and AP derive a shared key (key agreement) and show that these have computed correctly (key confirmation), where both devices do have (access to) a certificate of their public key, issued by a trusted third party (certificate authority), and where AS may provide authorization service.**

Authenticated key agreement schemes generally include the following security properties:

1. Key establishment
2. Key Agreement
3. Implicit key authentication
4. Explicit key authentication
5. No unilateral key control
6. Forward secrecy
7. Entity authentication
8. Unknown Key Share Resilience

**Strawpoll #3:** This should include all properties (mutually), except #6.

**MOTION #3:**

**The authentication scheme(s) in the draft shall provide the following security properties:**

1. **Key establishment**
2. **Key Agreement**
3. **Implicit key authentication**
4. **Explicit key authentication**
5. **No unilateral key control**
6. **Entity authentication**
7. **Unknown Key Share Resilience**

**Here, properties are provided mutually.**

**Strawpoll #4:** This should include all properties (mutually), including #6. Y/N/A = 4/3/20.

**MOTION #4:**

**The authentication scheme(s) in the draft should provide forward secrecy.**

Security properties may include:

1. Identity protection

**Strawpoll #5:** Optional support for #1 should be included.

**MOTION #5:**

**The authentication scheme(s) in the draft should optionally provide for identity protection.**

Further considerations:

1. Schemes shall be demonstrably free of known security weaknesses (burden on proposers)
2. Schemes shall be well-studied by the cryptographic community
3. Schemes should be standardized via int ernationally accepted cryptographic standards (NIST/FIPS series, IETF)

**Strawpoll #6:** Schemes should satisfy #1, where the onus is on proposals/proposers to provide solid evidence.

**MOTION #6:**

**The authentication scheme(s) in the draft shall be demonstrably free of *known* security weaknesses.**

**Strawpoll #7:** Schemes should satisfy #2, where the onus is on proposals/proposers to provide solid evidence.

**MOTION #7:**

**The authentication scheme(s) in the draft shall be well-studied by the cryptographic community.**

**Strawpoll #8:** Schemes should satisfy #3, where the onus is on proposals/proposers to provide solid evidence.

**MOTION #8:**

**The authentication scheme(s) in the draft Schemes should be standardized via internationally accepted cryptographic standards (such as NIST/FIPS series, IETF, etc.).**

Joining protocols would involve authorization, where:

1. Authorization of the STA may be provided by the third party AS;
2. The third party providing authorization may be different from the third party potentially providing authentication support.

**Strawpoll #9:** Scenario #1 should be supported. Y/N/A = 9/0/7.

**MOTION #9:**

**With the authentication scheme(s) in the draft, authorization of the STA may be provided by the third party AS.**

**Strawpoll #10:** Scenario #2 should be supported.

**MOTION #10:** (NOT RIGHT NOW)

*Considerations on cryptographic strength (\*new\*)*

Crypto schemes should generally be designed conservatively and take into account:

* Protection lifetime;
* Progress in cryptanalytic attacks;
* Progress in computational speed.

NIST, NESSIE, IETF generally recommend a so-called cryptographic bit strength of 112 bits, which is higher than 80-bit (and not longer recommended by NIST). NSA’s Suite B and most IETF drafts go for 128 bit cryptographic bit strength.

NOTE: AES-128 and, e.g., the GCMP mode of operation have 128-bit cryptographic *design* strength.

**MOTION #11:**

**The authentication scheme(s) in the draft SHALL have cryptographic strength of at least 80 bits and SHOULD have cryptographic strength of 128 bits.**