

GSS-API authentication support in SIP (work in progress)

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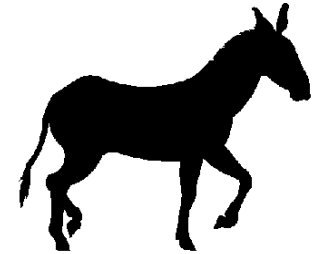
WANTED

**Strong and flexible authentication
method in SIP!**

SIP authentication

1) Digest Access Authentication (DAA) (RFC3261)

- mandatory
- weak
- widespread adoption
- used to authenticate locally within a domain/realm



2) S/MIME (RFC3261)

- Uses certificates, needs PKI = “complex and expensive”

3) Other authentication methods

- P-Asserted identity (RFC3325) – in a trusted environment
- Strong Identity (RFC4474) – using authentication service
- Other academic approaches.

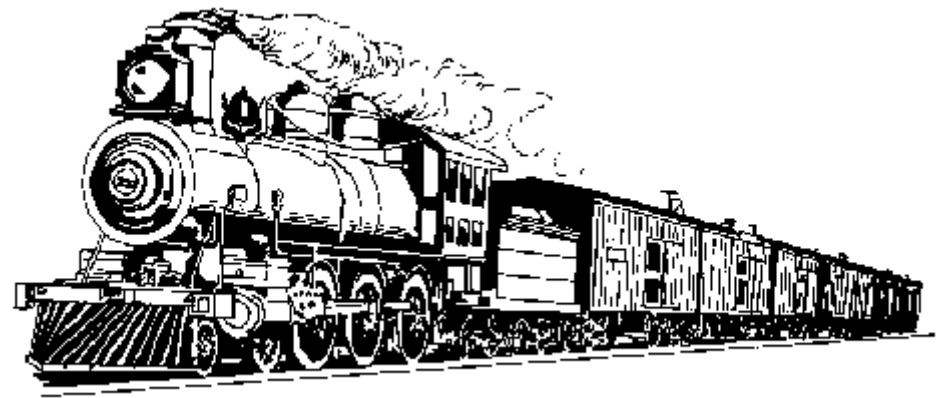


Problem

- SIP is flexible
- Problem: Different usage scenarios have different security requirements
 - Handheld devices vs. high-end SIP servers
- Goal: Modification to the SIP standard should be minimum
- Goal 2: A strong and flexible authentication methods wanted
- Solution: Add support for GSS-API

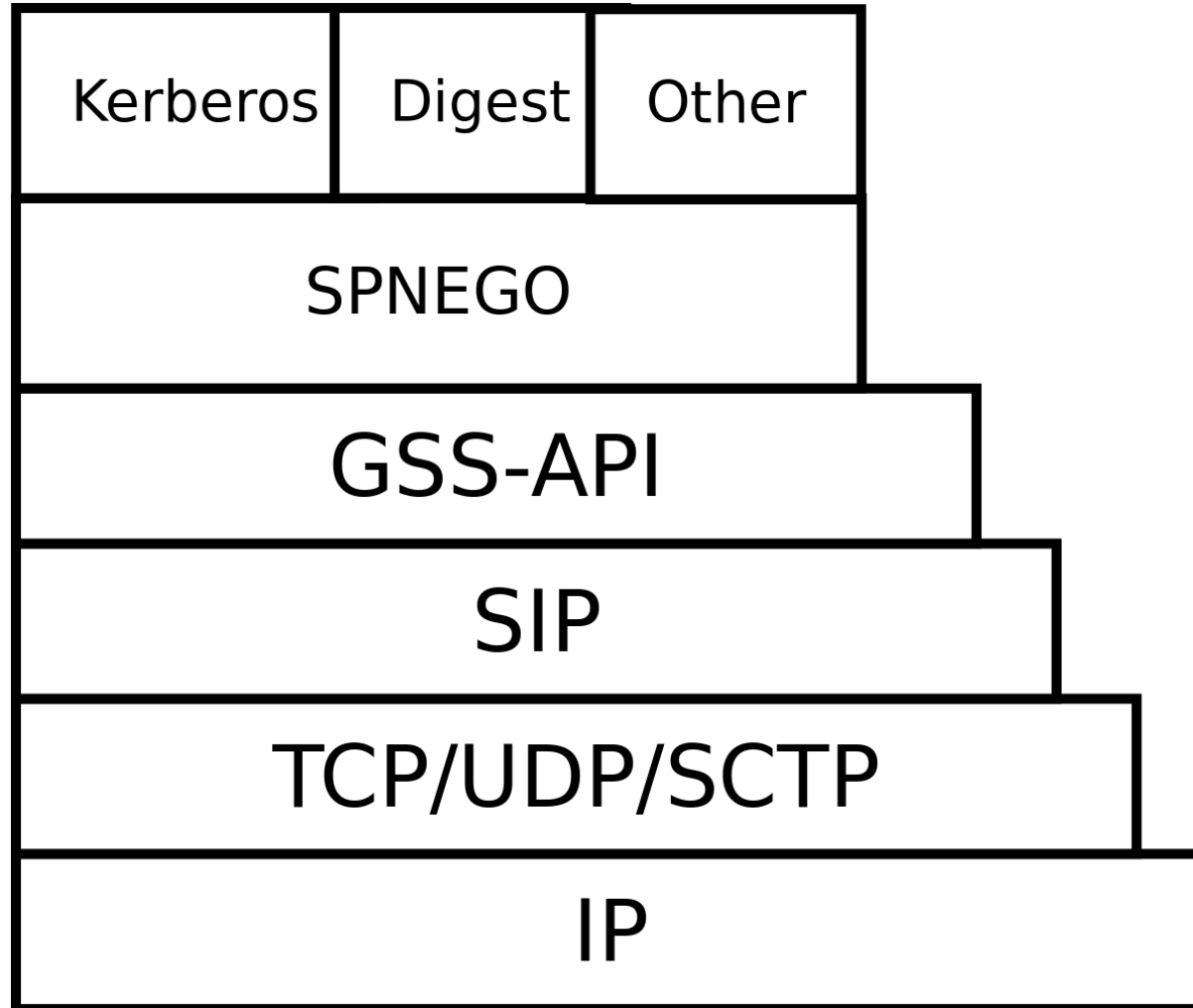


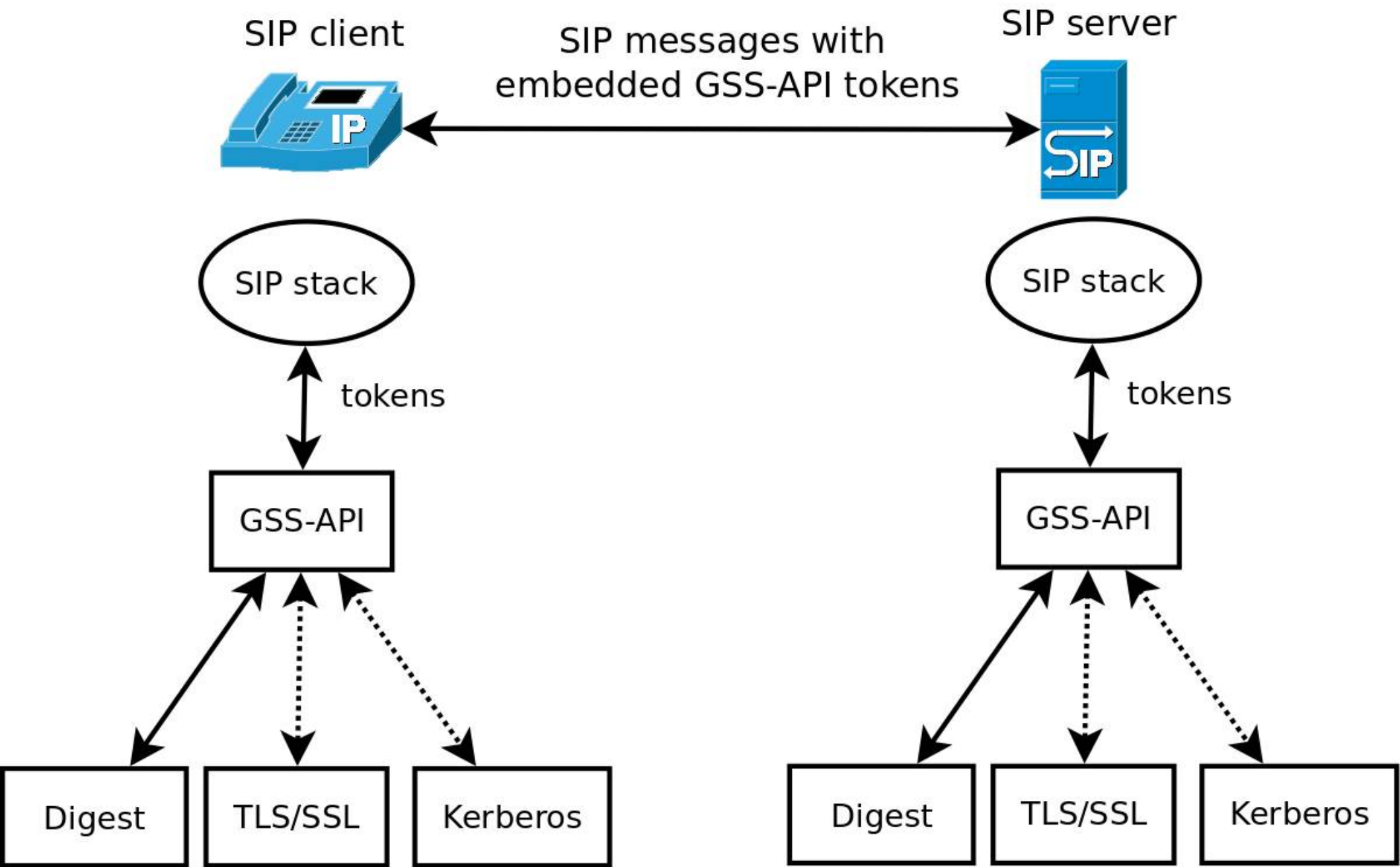
GSS-API



- **Generic Security Services Application Program Interface** = Interface for an application to access security services
- **Mature and well-proven standard (RFC2743)**
- **NOT a communication protocol**
 - Relies on the application (SIP) to pass data *tokens* between client and server
- **Does NOT provide any security in itself**
 - Relies on underlying security mechanisms
- **GSS-API implementations (may) support different authentication methods**
 - Digest
 - Kerberos
 - TLS
 - ...
- All methods are *transparent* to the application

GSS-API stack



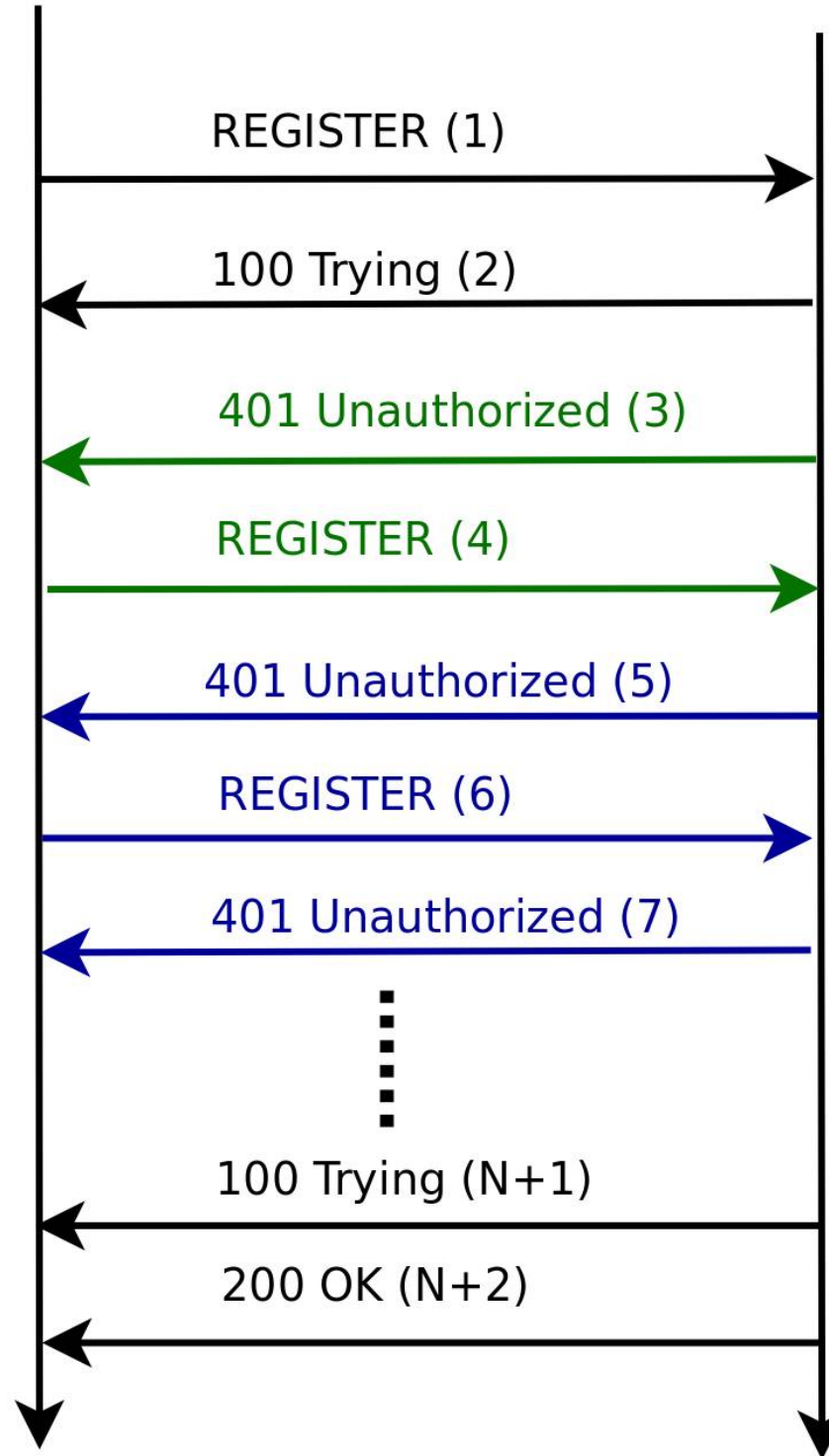




SIP Client



SIP Server



SIP REGISTER

```
1. REGISTER sip:CompanyA SIP/2.0
2. Via: SIP/2.0/UDP
   192.168.1.102;branch=z9hG4bK32F3EC44EB23347BFB0D488459C69E4E
3. From: Alice <sip:alice@CompanyA>;tag=1234648905
4. To: Alice <sip:alice@CompanyA>
5. Contact: "Alice" <sip:alice@192.168.1.102:5060>
6. Call-ID: 2B6449C74C10D4F95006A6C034E79E8E@CompanyA
7. CSeq: 19481 REGISTER
8. User-Agent: PolycomSoundPointIP-SPIP_550-UA/3.1.2.0392
9. Authorization: Digest
   username="alice",realm="asterisk",nonce="3b7a1395",response="ccbde1
   c3c129b3dcaa14a4d5e35519d7",uri="sip:CompanyA",algorithm=MD5
10. Max-Forwards: 70
11. Expires: 3600
12. Content-Length: 0
```

DAA

```
1. REGISTER sip:CompanyA SIP/2.0
2. Via: SIP/2.0/UDP
   192.168.1.102;branch=z9hG4bK32F3EC44EB23347BFB0D488459C69E4E
3. From: Alice <sip:alice@CompanyA>;tag=1234648905
4. To: Alice <sip:alice@CompanyA>
5. Contact: "Alice" <sip:alice@192.168.1.102:5060>
6. Call-ID: 2B6449C74C10D4F95006A6C034E79E8E@CompanyA
7. CSeq: 19481 REGISTER
8. User-Agent: PolycomSoundPointIP-SPIP_550-UA/3.1.2.0392
9. Authorization: GSSAPI
   token="0401000B06092A864886F712010202DACD139402AAF44350CDE32"
10. Max-Forwards: 70
11. Expires: 3600
12. Content-Length: 0
```

GSS-API token

Conclusion

- Minimal changes to the SIP standard
- Support a range of different authentication methods
- Flexible – different implementations can support different authentication methods
- New authentication methods can be added later WITHOUT change to SIP
- Future work
 - Add an SIP extension to maintain backwards compatibility?
 - Require some authentication methods to be supported as standard? Which?
 - Vulnerable for a REGISTRATION attack?
 - Look into different GSS-API auth methods
 - Compare with SASL and SAML

