Distributed User Authentication in Wireless LANs

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Outline

- **Motivation**
- **Our approach**
- **Benefits & Challenges**
- **Summary**

Motivation

- Increasing use of WLANs
- User authentication a prerequisite
- Present mechanisms:
  - Often NO security at all (open wireless networks)
  - Login information via a web page
    - Needs periodical re-entering
    - Some Wi-Fi devices actually miss a display or a browser
  - Manual key management
    - Some times not straightforward for end-users
  - Other challanges such as mobility support

Design Objectives

- Disruption-free user authentication
- Protection from external attacks
- Host mobility and multihoming
- Data integrity and confidentiality

Our Approach

- A HIP-based distributed authentication architecture:
  - A HIP proxy on a central gateway
  - A HIP-aware firewall on every Wi-Fi Access Points
  - Identity/Keys dissemination mechanism

Distributed Authentication Model
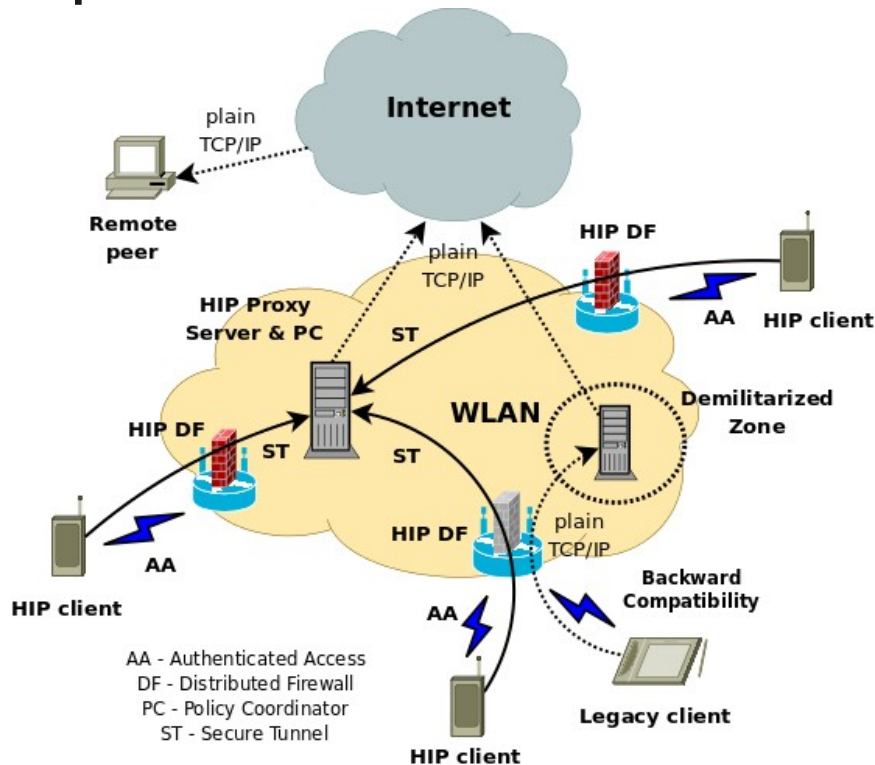
- First-time registration
  - HIT ←→ Identity
- HIT-based filtering
- Rules in Access Control List (ACL)
- ACL synchronization between all firewalls
- Clustering and sorting the rules for efficient filtering and fast handovers

Benefits

- Client authentication in a distributed manner (irrespective of location)
- First-time registration only
- Clients are mobile
- Secure tunnel over wireless link, data encryption by IPsec
- Incremental deployment

Challenges

- Architectural issues
  - HIT registration, ACL, rule clustering
- Development issues
  - Migration to other platforms
  - Cross-compiling, extra bugs
- Performance issues
  - Limited resources of Wi-Fi APs
- Deployment issues
  - HIP-enabled mobile clients

Summary

- Two-level approach preferred:
  - HIP-aware FW on access points
  - HIP proxy on a gateway
- Key/Identity dessimination with a central policy coordinator server
- Wireless access points (such as Gateworks Avila or Fonera FON2100) can handle filtering by HIT
- Deployment is challanging ⟷ host modifications required

Questions?

Thank you!