# An Integrated Six/One HIP Implementation
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# Why

- Six/One implementation desired

- Integrating Six/One into HIP to maximize reuse
  - HIP already supports host multihoming (and mobility)
  - HIP already has large overlap in functionality
    - Address ownership verification
    - Context establishment
  - No support for traffic engineering in HIP
  - Six/One provides support for traffic engineering
    - Network can rewrite addresses
    - Hosts adapt to the new addresses

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# HIP Basic: Association Setup
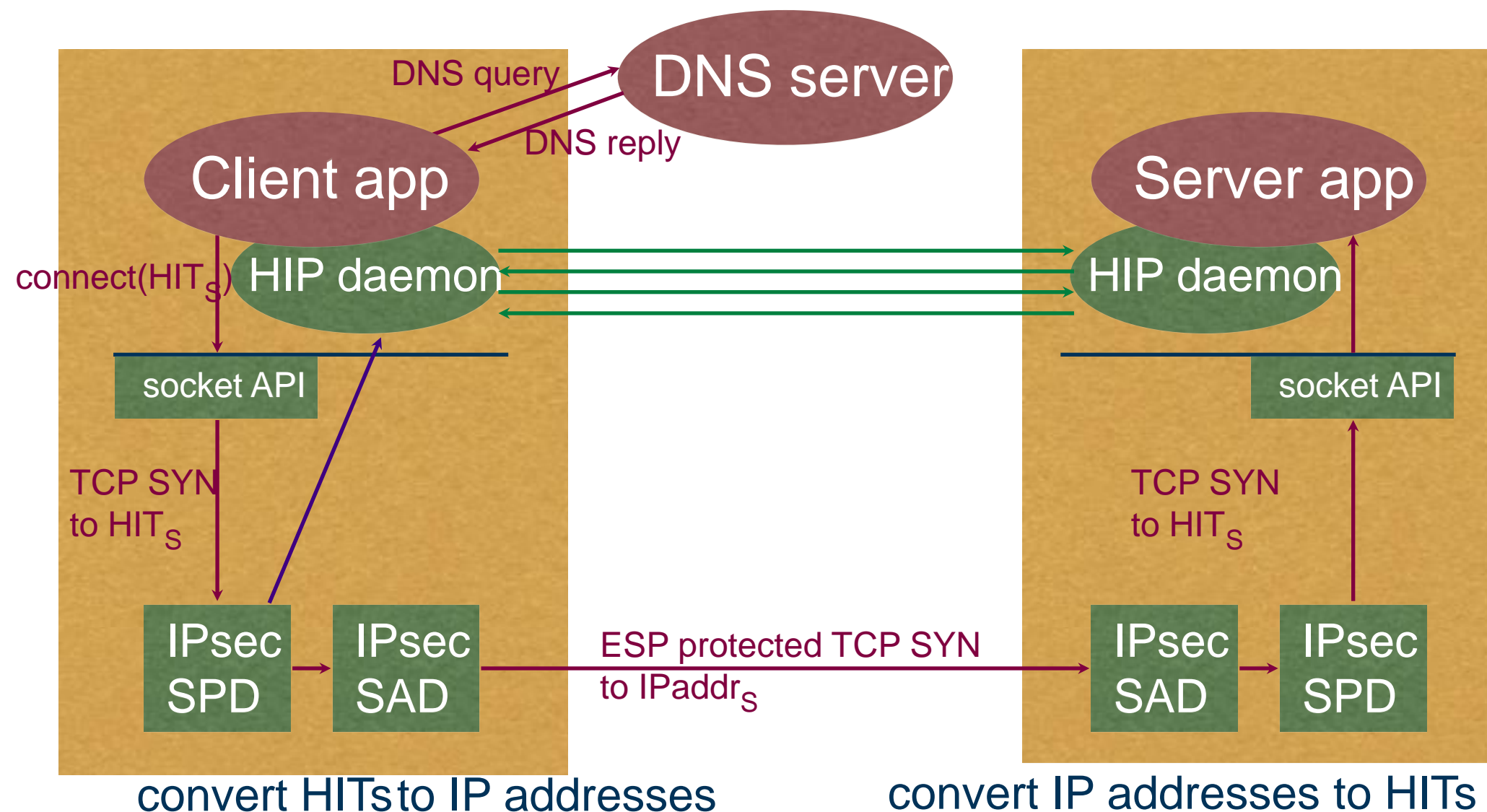


- Host Identity associated with one or more IP address
- SA created during 4-way handshake, currently ESP
- Applications see only Host Identity, IP address is for routing

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# Comparing Functionality

## Six/One

- IP address conf
- IP address selection
- Flow redirection

- Address ownership

- IP address mapping
- Context establishment

## HIP

- Exists
- Does not exist
- Does not exist (network function)

- Exists (Host Identity, reachability check)

- Exists (HIT)
- Exists (Base Exchange)

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# 1) IP address configuration

- Configure IP address bunch on one interface
  - Prefix from all available networks

- HIP: SPI based on interface
  - Small modification to HIP

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# 2) IP Address Selection

- Find a working IP address pair
  - Six/One: Probe using different local IP addresses and destination addresses

- HIP: RFC3484
  - Needs to be modified according to Six/One

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# 3) Flow Redirection

- Six/One: Router rewrites source IP address

- HIP basically end-host protocol
  - Not HIP related: A new function on the router

  - End-host related: Detect changed IP addresses at end-hosts

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# 4) Address Ownership

- CGA addresses

- Reachability verification


- HIP
  - Host Identities
  - Reachability verification exists (Mobility and Multihoming)

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# 5) IP Address Mapping

- Applications: see the selected IP address
- Six/One converts the adderss for applications

- HIP
    - Host Identities on upper layers
    - IP -> Host Identity conversion already done

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# 6) Context Establishment

- ## Establish context between hosts
  - Available IP addresses
  - Possible other parameters
  - Context ID in packets

- ## HIP: Base Exchange -> HIP association
  - Authentication of hosts
  - IP address exchange (existing HIP Multihoming function)

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# Summary: Six/One Implementation

- **Based on the current HIP for BSD**
  - http://hip4inter.net

- **Implementation work started**

- **Required modifications are small**
  - Only major is address rewriting in the network

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# Thank you

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