Infrastructure Support for Host Identity Protocol

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Background

- Funding from: Tekes (Finnish goverment), TKK, Nokia, Ericsson, Elisa, Finnish Defense Forces
  - 2,5 years, mid 2004-2007
- Project Goals
  - Study and develop the infrastructure support necessary for a wide deployment of HIP.
  - Provide scientific results and play a leading role in the standardization of HIP

People Involved

- Doc. Pekka Nikander, Prof. Martti Mäntylä (HIIT)
- Prof. Antti Ylä-Jääski (TKK)

- Andrei Gurtov, PhD, project manager
- Dmitry Korzun, PhD
- 3 PhD students
- 3 MSc students

International Connections

- ICSI, Berkeley (Scott Shenker)
- UC Berkeley (Ion Stoica, Anthony Joseph)
- M.I.T (Hari Balakrishnan, Mike Walfish)
- Meetings so far
  - Collaboration meeting, Berkeley, 11/04
  - HIP Workshop, Washington, 11/04
  - OASIS retreat and i3 meeting, Tahoe, 1/05

InfraHIP Work Packages

1. Next gen. Internet architecture
2. HIP on Linux
3. Rendezvous and naming
4. Multiple HIP identities
5. Application migration
6. HIP applications
7. Corporate HIP

WP1. Architectural

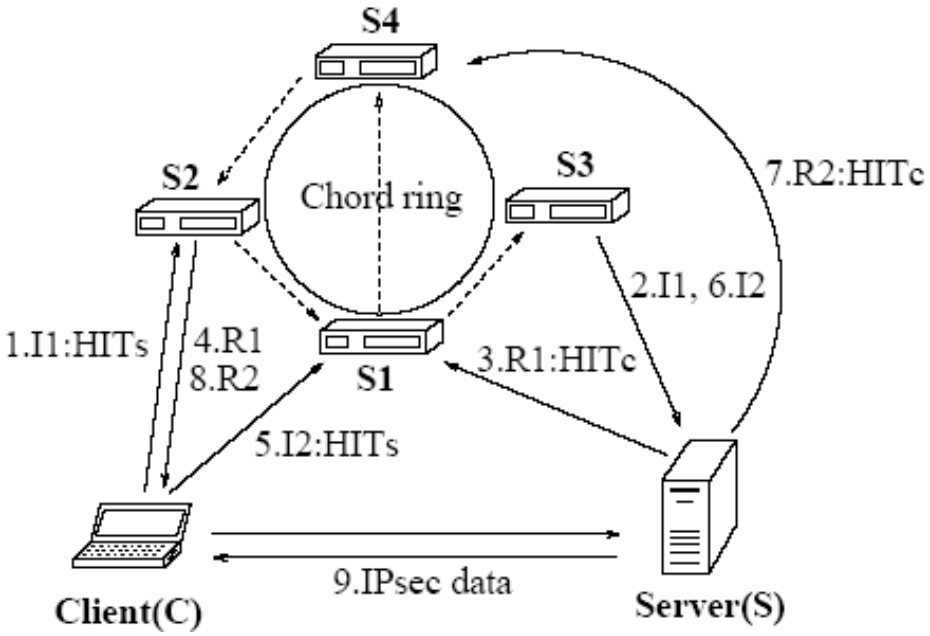
- Explore the effect of identifier/locator split
- Study alternative solutions to HIP
  - *i*^{3} Internet Indirection Infrastructure
  - Multi6/shim6, Mobile IP, …
- Produce a report on findings
  - Comparison criteria for alternatives to HIP
- Cooperate on integrating HIP as one component of the next-generation Internet architecture

WP2. HIP on Linux

- Finalize HIP implementation in Linux kernel
- Release as open source, maintained, and easily usable software
- Integrate into official Linux kernel
- Performance evaluation
- Regular interop testing
- Demonstrations
- Further development of native HIP API

WP3. Rendezvous & Naming

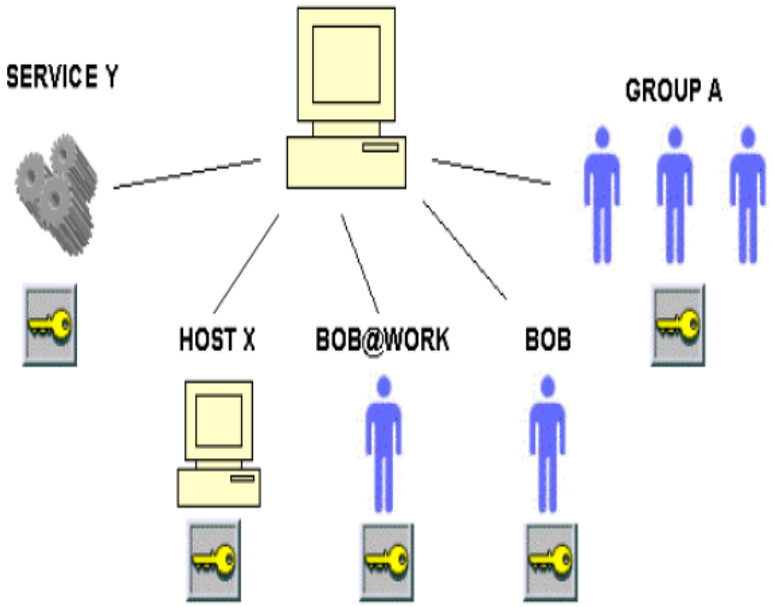
- Infrastructure for resolving Host Identities to IP addresses
  - DNS Extensions
  - Use of Distributed Hash Tables or i3 systems
  - Rendezvous servers
- Deploy an experimental infrastructure on a wide-scale testbed PlanetLab



WP4. Multiple Identities

- How to manage and store multiple host identifiers on a single operating system
  - Needed e.g. for privacy protection
- Major extensions to HIP API and implementation

Various entities with HIP identities inside a host.



WP5. Application Migration

- Study migration of a running HIP application between hosts
  - Maintaining communication transparency
  - Avoiding residual dependency
- Delegation-based approach
  - Destination re-establishes the associations with remote peers
  - Destination receives an authorization to use old HIT using a signed certificate
- Implementing a prototype using ZAP migration system from Columbia University

WP6. Applications for HIP

- Evaluate new possible applications enabled by HIP
- ”Road warrior” = mobile VPN user
  - E.g. distributed file system with back-up
- Search in peer-to-peer systems
- Faster WLAN access control
- Device peering
- Ad-hoc networking

WP7. Corporate

- Study use of HIP in the corporate sector
- NAT/Firewall traversal
- Group communication
- Management of HIP hosts, MIBs
  - Make network renumbering easier
- VPN solutions

Summary

- InfraHIP
  - Funded by Finnish goverment and companies
  - 2.5 years, ~8 people
  - 7 work packages
- http://infrahip.hiit.fi