A Net based Learning Environment for Host Identity Protocol (HIP)

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HIP Overview

Host Identity Protocol (HIP) is a potential future Internet protocol currently under research. The main idea with HIP is the separation between the location and identity information by introducing a new cryptographic name space, called Host Identity (HI). The differences of HIP compared to the traditional IP (Internet Protocol) stack is shown in Figure 1.

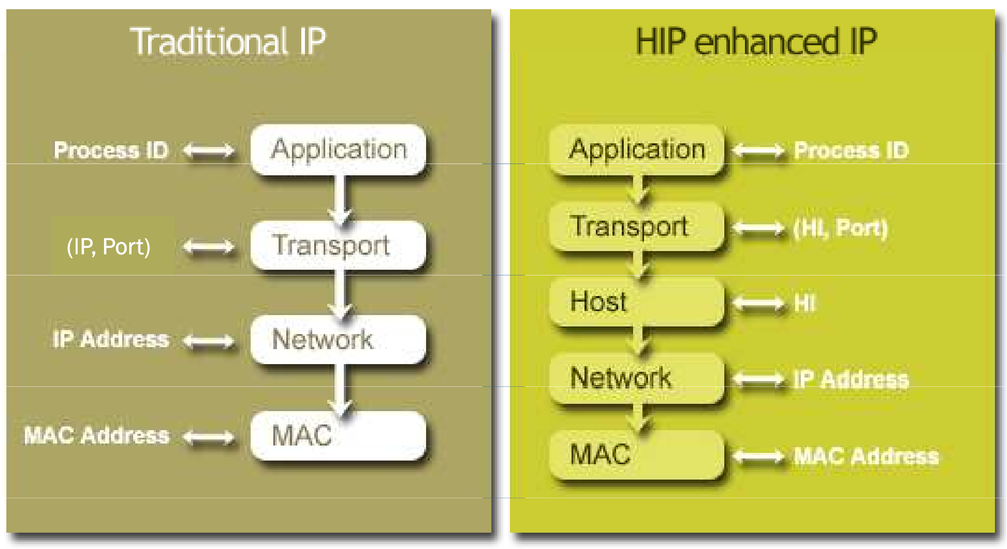

Figure 1. Traditional IP and HIP enhanced IP protocol stacks

A HI is a globally unique public key used to represent the identity of a host. IP addresses are only used as locators. These features provide
- enhanced network security
- easy management of mobility and multi-homing

HIP is a strong candidate to complement current IP protocols and replace the Mobile IP protocols.

The Learning Environment

The learning environment is a web interface to a set of Flash animations simulating the functionality of HIP in different network communication scenarios.

A user can study how the data flow appears on different network layers. A user can also compare how communication between two network nodes using HIP differs from network communication in the current IP protocol. The animation will be equipped with audio and audio text to make the learning easier.

The objective is to provide the user knowledge of:
- the HIP architecture
- the HIP base exchange used for setting communication channels between HIP nodes
- how HIP provides mobility and multi-homing
- the combination of HIP and ESP (Encapsulation Security Protocol) for security

Learning Environment User Interface

The user interface is shown in Figure 2:

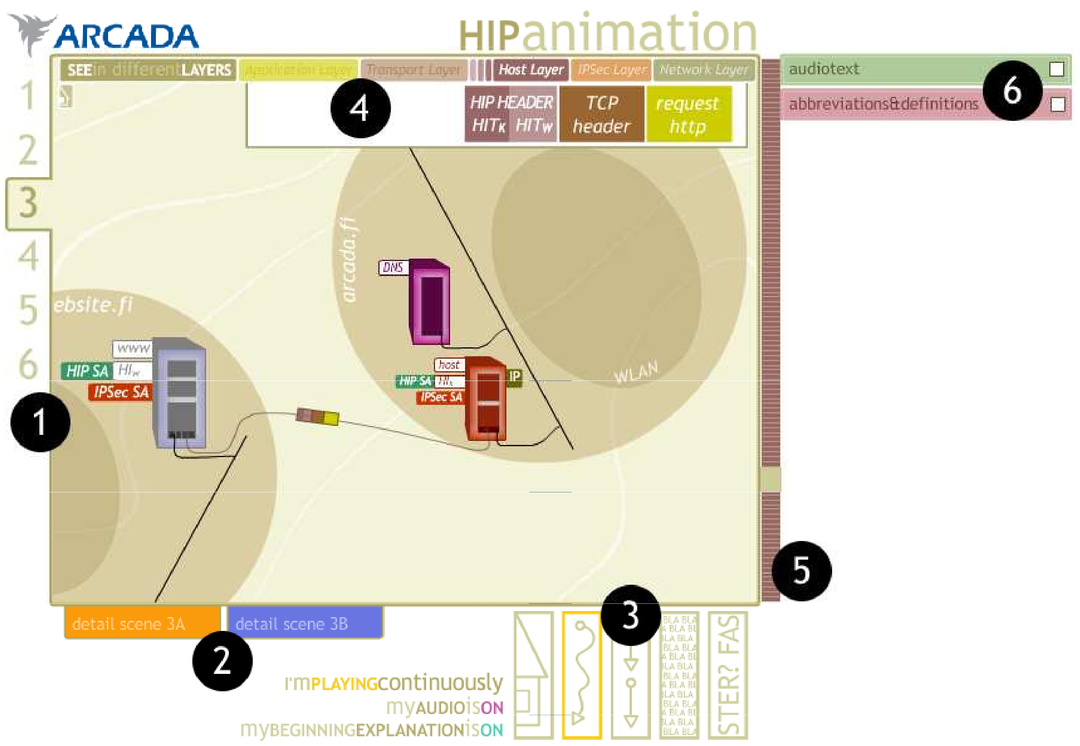

Figure 2. The elements of the user interface are: (1) Scene menu, (2) Detail Menu, (3) Control panel, (4) Layer menu, (5) Flow bar, (6) Audio text area, and abbreviations and definitions area

The interface consists of four main scenes that can be opened from the scene menu (1). The available main scenes are:
1. Plain TCP/IP communication
2. Plain HIP/TCP/IP communication
3. ESP protected HIP/TCP/IP communication
4. Mobile HIP/TCP/IP communication

In all main scenes a user can observe the data communication between two network nodes on different network layers.

After opening a main scene a user can choose to study details of certain parts of a main scene from the detail menu (2). In Figure 3, a screenshot is shown of where a user has chosen to watch details of a specific HIP package during HIP base exchange.

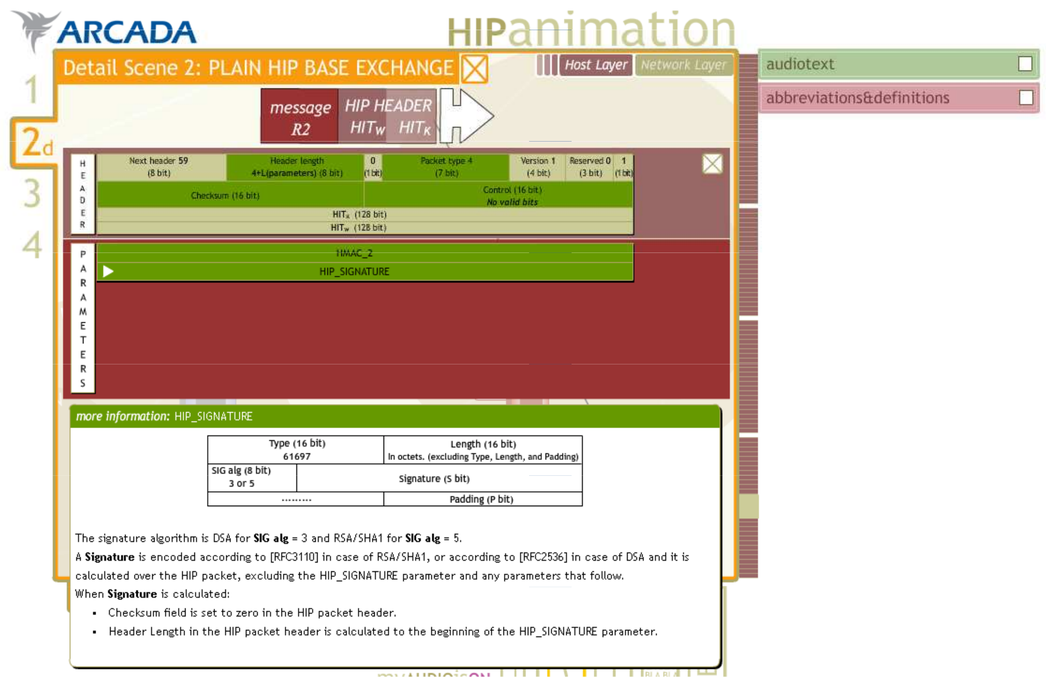

Figure 3. A detail scene showing the details of a HIP package