Paper Review Report

Title: A survey of Identifier-Locator Split Addressing Architectures

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In the original Internet, the TCP/IP architecture and Sockets API were designed on the assumption of stable or persistent addresses because hosts were immobile. However, nowadays, due to technological advancements: mobile end-user equipment and dynamic network environments, devices are becoming pervasive and addresses are not persistent. Since TCP connections are created based on the same addresses used by the underlying network layer, the address changes happening due to the pervasive nature of devices creates a problem(connection will be lost).

The author start discussing about the addressing related challenges of current TCP/IP architecture: mobility, multihoming, site renumbering, Route scalability and Internet transparency. They then talk about the variety of solutions that have been proposed for the above listed challenges. The solutions have been grouped into three categories as Solutions based on core-edge elimination, Gateway-based solutions and Solutions based on core-edge separation.

The core-edge elimination solutions, such as HIP, LIN6, MAT, FARA, MILSA, SHIM6, Six/One and ILNP, are end-to-end solution that require changes both at the client and server sides. Originally they were designed specific to IPv6 deployment only but now they have been extended to be used with any new addressing architecture. The Gateway-based solution, a hybrid solution that requires changes both at the the end-hosts and middleboxes, typically requires a modified client and a new gateway or a proxy that terminates the traffic, so that the server side remains unmodified. Such solutions include TRAID, IPNL,i3,NODEID, NUTSS, HRA and Mobile IP. The core-edge separation solutions, such as GSE and LISP, are middlebox -based solutions where solutions are deployed at the edge-routers instead of deploying them at the end-hosts.

Finally, qualitative analysis, comparing the above mentioned solutions architectures, have been done by the authors.

Overall, the survey paper is well organized as it has done a more extensive survey on the addressing related problems to the current TCP/IP architecture with the corresponding existing solutions.

Title: Host Identity Protocol (HIP): Connectivity, Mobility, Multi-homing, Security, and Privacy over IPv4 and IPv6 Networks

Authors: Pekka Nikander, Andrei Gurtov, Thomas R. Henderson

The Internet architecture was designed assuming that devices are immobile(with constant/static IP addresses) and trustworthy environment. However, due to the commercialization of Internet services and technological advancements: mobile end-user equipment and dynamic network environments, addresses are nowadays non-persistent. Since transport layer use IP addresses as its connection identifier(share the same namespace); i.e. it becomes dependent on the location of the end-host and its data flows are interrupted when the end host changes its point of attachment to the network.

In the paper, Host Identity Protocol and architecture, a core-edge elimination based solution that adds a namespace used between the network and transport layer, has been proposed. The namespace consists of a cryptographic identifier, thereby implementing the so-called identifier/locator split, that allows end-hosts to authenticate each other and protect their data flows. Current issues of TCP/IP architecture, such as Mobility, multi-homing,multi-access, NAT traversal, IPv4-IPv6 interoperability and baseline end-to-end security, have been addressed in HIP architecture.

The paper starts with an introduction about HIP architecture, followed by discussion on some of the evolving environments and description of the key challenging problems of the Internet: Loss of universal connectivity, Poor support for mobility and multi-homing, Problems with multicast, Unwanted traffic, and Lack of authentication, privacy and accountability.

The authors then discuss about the HIP architecture and base exchange in detail: Approach, basics, HITs and LSIs, protocols and packet formats, detailed layering, functional models, managing the HIP namespace and other costs.

The paper then presents about the study conducted on how HIP, together with a number of defined and prospective extensions, can be used to address the above mentioned problems. It also talks about the benefits potential drawbacks, and ongoing work of the HIP architecture. Finally, HIP's standardisation and implementation status, with examples, have been discussed.