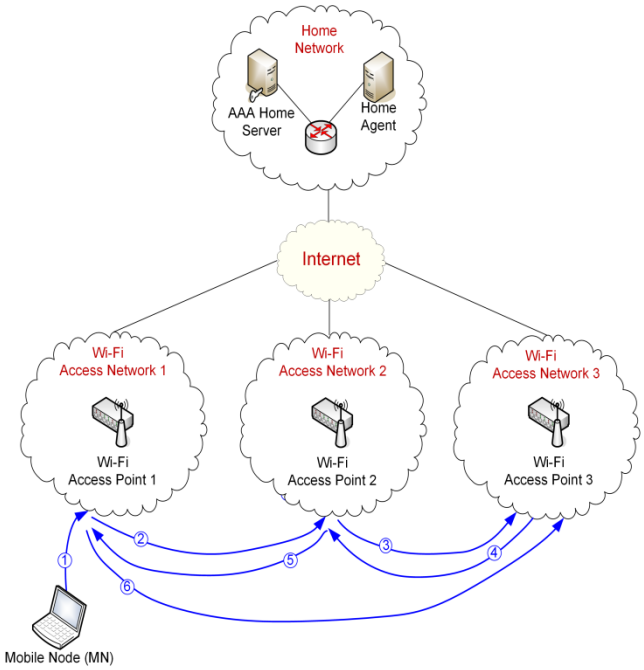
Compare and Contrast Mobility Support Protocols (Mobile IP vs. SDN)

Wireless connectivity is all around us. However, mobile users moving from one wireless network to another do not experience seamless roaming. This behavior occurs because every time a user roams from one access network to another, his device's IP address change and hence his applications sessions' break.



In the scope of this project, we will study two different approaches that can provide seamless mobility support for commuters. Firstly, a more traditional approach based on Mobile IP (or Mobile IPv6 [1]). Secondly, a more recent and innovative approach based on Software Defined Networking, and in particular, OpenFlow [2, 3].

The aim of this project is to compare and contrast the two aforementioned mobility support approaches on a theoretical and practical level. This would consist of an extensive qualitative and quantitative evaluation :

1) The qualitative evaluation will compare the two mobility support protocols on a functional and architectural level.
2) The quantitative evaluation will include setting up a mobility testbed to evaluate the two protocols by carrying out performance experiments (one example could be how quickly each approach performs handovers). References [4, 5] provide the tools to setup Mobile IPv6 and a Floodlight OpenFlow controller.

Requirements : This challenging, but very rewarding, project requires an enthusiastic student eager to learn new cutting edge networking protocols and experiment with them on a real testbed.

Contacts : Dr. Panagiotis Georgopoulos : panos@tik.ee.ethz.ch, ETZ G60.1
Vasileios Kotronis: vkotroni@tik.ee.ethz.ch, ETZ G93
Professor : Prof. Dr. Bernhard Plattner

References :

[1] C. E. Perkins and D. B. Johnson, "Mobility Support in IPv6," Proc. ACM Mobicom '96. Nov. 1996.

[2] N. McKeown, T. Anderson, H. Balakrishnan, G. Parulkar, L. Peterson, J. Rexford, S. Shenker, and J. Turner. Openflow: enabling innovation in campus networks. ACM SIGCOMM Computer Communication Review, 38(2):69–74, 2008

[3] K. Yap , M. Kobayashi, R. Sherwood, T. Huang, M. Chan, N. Handigol, and, N. McKeown. OpenRoads: Empowering research in mobile networks. ACM SIGCOMM Computer Communication Review, v.40 n.1, January 2010

[4] UMIP - Mobile IPv6 and NEMO for Linux. Available at : http://umip.org/

[5] Floodlight OpenFlow Controller. Available at : http://www.projectfloodlight.org/