Wireless Broadband Access project 1.5.2010 – 30.9.2012

WiBrA Workshop

15-Oct-2012

Background & Overview

- A public funded project with intentionally small scope and small number of participants:
  - Nokia Siemens Networks, Nokia, TeliaSonera, University of Helsinki, and TEKES.
  - Lightweight and everybody knows each other.
- Only two Work Packages.
- Established to get hands-on experience & research view to mainly standards oriented work!
- http://www.cs.helsinki.fi/group/wibra/publications.html

About work packages

- WP1 – Traffic Management for IPv6 – focused on intelligent and lightweight traffic management, especially how to bypass mobile operator core network and offload “bulk IP traffic” efficiently from the mobile operator network to alternate cheaper accesses as soon as possible. Also IPv6 transition mechanisms were in scope.
  - NSN (lead), Nokia, University of Helsinki, TeliaSonera Finland

- WP2 – Wireless Broadband Traffic Behaviour – focused on real-time traffic behavior with varying background traffic loads in notebooks and smart phones, and how the new attempts of making World Wide Web perform faster affect both end user service experiences with wireless devices and actual wireless operator networks.
  - NSN, Nokia, University of Helsinki (lead), TeliaSonera Finland

WP1 standards – (soon) completed

- RFC6459 – IPv6 in 3GPP EPS. (info)
- RFC6535 – Dual-Stack Hosts Using “Bump-in-the-Host”. (std)
- RFC6603 – Prefix Exclude Option for DHCPv6-based Prefix Delegation. (std)
  - 3GPP Release-10 prefix delegation solution; 3GPP CRs done.

- draft-ietf-behave-nat64-discovery-heuristic **in WGLC**
  - Prototype implemented.
- draft-ietf-behave-nat64-learn-analysis **in RFC Ed Queue**
- draft-ietf-mif-dns-server-selection **to be RFC6731**
  - Prototype implemented (+DHCPv6 routes). IETF demo.

- 3GPP CRs for OPIIS on DHCPv6 and RA based routing rules contributed.
- We also implemented RFC6408 but that is not in “IPv6 scope” but Diameter..

WP1 standards – in progress or dormant

- draft-korhonen-mif-ra-offload individual
  - Prototype implemented; also on GGSN side. IETF demo.
- draft-korhonen-dmm-prefix-properties individual
- draft-korhonen-dmm-local-prefix individual

- draft-savolainen-stateless-pd abandoned
  - Was the kick-off for RFC6603.
- draft-korhonen-edns0-synthesis-flag abandoned
  - Prototype implemented; also DNS server side.
  - WG consensus selected our alternative approach, which became draft-ietf-behave-nat64-discovery-heuristic.

WP1 publications – other

- “NAO: A Framework to Enable Efficient Mobile Offloading”, published in 12th ACM/IFIP/USENIX International Middleware Conference - Middleware PDT Workshop, December 12, 2011.

- “Speeding up IPv6 Transition: Discovering NAT64 and Learning Prefix for IPv6 Address Synthesis”, published in IEEE ICC International Conference on Communications - Workshop on Telecommunications: from Research to Standards, June 10, 2012.

- “Towards Network Controlled IP Traffic Offloading”, **submitted** to IEEE Communications Magazine - special issue for Telecommunications Standards, August 2012.

- “Evolving 3GPP Bearer Model Towards Multiple IPv6 Prefixes and Next-Hop Routers”, **submitted** to Springer Telecommunication Systems Journal – special issue on Mobility Management for Flat Networks, September 2012.

WP2 publications & standards

- "Harsh RED: Improving RED for Limited Aggregate Traffic", published in IEEE International Conference on Advanced Information Networking and Applications (AINA), March 2012.
- "Impact of TCP on Interactive Real-Time Communication", published in IAB/IRTF Workshop on Congestion Control for Interactive Real-Time Communication, July 2012.
- "Effect of Competing TCP Traffic on Interactive Real-Time Communication", **submitted** to Passive and Active Measurement Conference (PAM).
- "An experimental study of web transport protocols in cellular networks", Master's Thesis
- RFC 6675 – "A Conservative Loss Recovery Algorithm Based on Selective Acknowledgment (SACK) for TCP“ (std)
- draft-isomaki-rtcweb-mobile individual
  - RTCweb Considerations for Mobile Devices

Workshop style and targets

- Two themes:
  - IPv6 biased and Web & transport biased
- A bit of tutorial. A bit of Q&A session.
- We hope for interactive participation:
  - The experts in the audience know more about the mobile core internals than any of the presenters.
  - Hopefully we can exchange information – we want to learn more about the mobile core details to understand IP layer behavior better.

Agenda remainder

12:30 Opening, Jouni Korhonen, NSN
- Introduction to WiBrA TEKES project.
- Style and target of this session & workshop.

12:40 Network controlled IPv6 traffic steering and multiple interfaces
- Lightweight IPv6 and IPv4 traffic offloading using IPv6 neighbor discovery (possible online demo), Jouni Korhonen, NSN.
- IPv6 traffic offloading using DHCPv6, multiple interfaces issues, IPv6 prefix delegation, Teemu Savolainen, Nokia.
- NAT64 discovery and learning NAT64 prefix, Teemu/Jouni, Nokia/NSN.

13:20 Break

13:30 Making the Web faster and real-time, Markus Isomäki, Nokia.
- HTTP 2.0 and RTCWeb standardization in IETF and W3C

13:50 Short overview of buffering in a mobile network, Jouni Korhonen, NSN.

14:00 Google SPDY (HTTP 2.0) vs. HTTP/1.1 performance, Binoy Chemmaga, UH.

14:30 Break

14:40 Congestion control for Interactive Real-Time Communication, Hannes Tschofenig, NSN.
- IAB workshop summary

15:00 Protecting VoIP from TCP traffic, Ilpo Järvinen, UH.

15:30 Discussion on cellular network queuing and performance
- What would be the outcome and possible lessons learned from the studies.