

USAGI Project Experience

Linux Networking [IPv4/IPv6] Co-maintainer
USAGI/WIDE Project Co-chair
Keio University

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Linux IPv6

- Linux IPv6
 - Pedro Roque implementation in 2.1 (1996)
 - EXPERIMENTAL
 - “useless” because of quality
 - Unstable
 - Interoperability issues
 - API, Neighbor Discovery, Stateless Address Autoconfiguration
 - Missing pieces
 - IPsec, Mobile IPv6, packet filter

Linux IPv6 Users Group JP

- Linux IPv6 Users Group JP
 - Porting of applications
 - IPv6 experimental network
 - Formation of patches
 - “Battle” in Netdev
 - Linux Conference '99: “World of IPv6 connected with Linux”
 - Low specification conformity
 - Necessity of task force organization like KAME
 - Code name: USAGI Project

USAGI Project Outline

- USAGI Project
 - Universal Playground for IPv6
 - Established in Fall of 2000
 - Development of IPv6 on Linux systems
 - Cooperative consortium between industries and academics (8 industrial companies and 2 universities)
 - Leader: Jun MURAI (Keio University / WIDE Project)
 - Participation from the Linux IPv6 Users Group JP
 - Office
 - The University of Tokyo, Hongo Campus (-2002)
 - Keio Univ., Shin-Kawasaki Town Campus (2002-)
 - Joint use with KAME Project

Case 1:IPv6 Core

Barrier

- Main-line did not accept our “corrections” immediately
 - We were stranger
 - Considerably “big change” needed

Overcoming

- Communication
 - Face-to-face meeting
 - Ottawa Linux Symposium
- Quantitative analisys
 - TAHI Conformance Test / IPv6 Ready Logo
- Backup from community
- Strategic devision, coding style

Maintainership

- Continuous development / commitment
- Responsibility

Case 2: IPsec

- Early stage
 - FreeS/WAN
 - Klips: Kernel implementation
 - 2.0, 2.2, and 2.4
 - Pluto: IKE daemon
 - IABG
 - FreeS/WAN base
 - Unclean

Case 2: IPsec (cont'ed)

USAGI Implementation

- Features
 - Modularized encryption/hash engines using cryptoapi
 - Well-integrated in IP stack
 - PF_KEYv2 interface with FreeS/WAN extensions
 - Expecting support from users
 - Support transport/tunnel mode
 - IPv6/IPv4 universal
 - High quality (by TAHI Conformance Test)
- Proposal for 2.6 was not approved as proposed
 - Much more abstraction needed
 - Much more discussion with maintainers had been required

Case 2: IPsec (cont'ed)

- Switched to new design (XFRM)
 - Continue development of (IPv6) IPsec
 - Universal infrastructure

Case 3: Mobile IPv6

- Linux implementations at early days
 - MIPL (Mobile IPv6 for Linux)
 - Go-Core Project in HUT(Helsinki University of Technology)
 - For 2.4
 - Proposed for Kernel 2.5 but not accepted
 - Too big changes in kernel
 - USAGI implementation
 - Derived MIPL
 - Following the latest specifications
 - Cooperation to Ipsec
 - Improvement of stability
- MIPL2
 - Join effort between Go-Core / USAGI
 - Design discussed with co-maintainers
 - Splitting in progress for main-line inclusion

Case 3: Mobile IPv6 (cont'ed)

➤ MIPL2

- Join effort between Go-Core / USAGI
 - Design discussed with co-maintainers
- Preparation for inclusion in progress
 - Review and cleaning up from the view point of maintainer
 - Splitting changes in progress for main-line inclusion; e.g.
 - Subtrees / Policy Routing (2.6.18 or 19)
 - 20 changesets
 - Mobile IPv6 CN support (2.6.19 or 20)
 - 40 changesets

What Should We Do?

- Community
 - Be a good member
 - Open discussion
 - cool?
- Coding style
 - Devide your work into small pieces
 - For efficient review
 - Avoid changing cosmetic things with your real changes
 - Another patch for such changes
- Responsibility