

Implementation overview: NEAT and NEATPy

TAPS interim
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What is NEAT?

- Output of a European project that started in parallel with TAPS
 - Written in C, feature-rich, supports TCP, MPTCP, UDP, SCTP; policy manager
 - Typical "research project" code problems: implemented features match what was needed to show research results, not to satisfy a customer
 - E.g., SCTP support on Linux and FreeBSD, but multi-streaming only in FreeBSD
- NEAT project ended in 2018; this means...
 - NEAT is now not maintained by anyone
 - QUIC was never added: NEAT ended long before QUIC was finished
 - TAPS has moved on, NEAT is no longer in line with the TAPS API (but the core ideas and code "under the hood" are similar)

What is NEATPy?

- Python shim layer written in a master thesis to bring NEAT in line with TAPS
 - Thesis finished, code will probably also not be maintained
 - Time passes without mercy... thesis quote: "*The implementation of NEATPy is mostly based on version 4 and 5 of the interface draft.*"
- No changes to NEAT, only supports things that NEAT can support
- **Complete TAPS API, except:**
 - Selection properties: Interface Instance or Type; Provisioning Domain Instance or Type; Use Temporary Local Address
 - Connection properties: Retransmission Threshold Before Excessive Retransmission Notification; Connection Group Transmission Scheduler
 - Events: Soft Errors, Excessive Retransmissions
 - Security: secure connections supported, with TLS/TCP | DTLS/UDP | DTLS/SCTP, but no further customization from interface draft
 - Rendezvous

Conclusion

- Research toys looking for someone to pick them up and play!
 - A bit heavy code-wise, and a bit shaky, but kind of cool in what they offer – with NEATPy, I wrote the world's shortest code that uses SCTP streams (I'm sure) ;-)
 - Adding QUIC below NEAT would make this even cooler...
- Plenty of documentation available: NEAT project, papers, ...
 - Start here: <https://github.com/theagilepadawan/NEATPy>
 - Or, latest paper:

Michael Welzl, Safiqul Islam, Michael Gundersen, Andreas Fischer:
"Transport Services: A Modern API for an Adaptive Internet Transport Layer",
IEEE Communications Magazine, April 2021.

Preprint: <https://arxiv.org/abs/2102.11035>