Talla

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1. What is Talla?

2. A very quick introduction to the Erlang programming language.

3. The architecture of Talla.

4. A walk over a tiny bit of the source code.

What is Talla?

- An attempt to build a well-designed implementation of a Tor relay daemon in Erlang.
- An attempt for me to understand the inner workings of the Tor network better.
- A typical “evenings-only open source project” :-)
- I believe it will add diversity to the network over time.

History

Linus Nordberg
@ln4711

Following

My crystal ball indicates that one day there will be a Tor relay implemented in Erlang. Makes sense.

LIKE
1

10:13 AM - 18 Apr 2014

1

- The official Tor in C.
- PurpleOnion in C#.
- GoTor in Google's Go language.
- Galois Inc's Haskell implementation.
- Orchid, tor-research-framework, and OnionCoffee in Java.
- node-Tor in JavaScript.
- Oppy, pycepa, and TorPylle in Python.
- Complete list on https://trac.torproject.org/projects/tor/wiki/doc/ListOfTorImplementations

Carefulness

- Running experimental Tor implementations on the “production network” would be irresponsible.
- Test networks.
- Directory Authorities?
- Chutney :-)
- See email thread on tor-dev: https://lists.torproject.org/pipermail/tor-dev/2016-August/011300.html

Why Erlang?

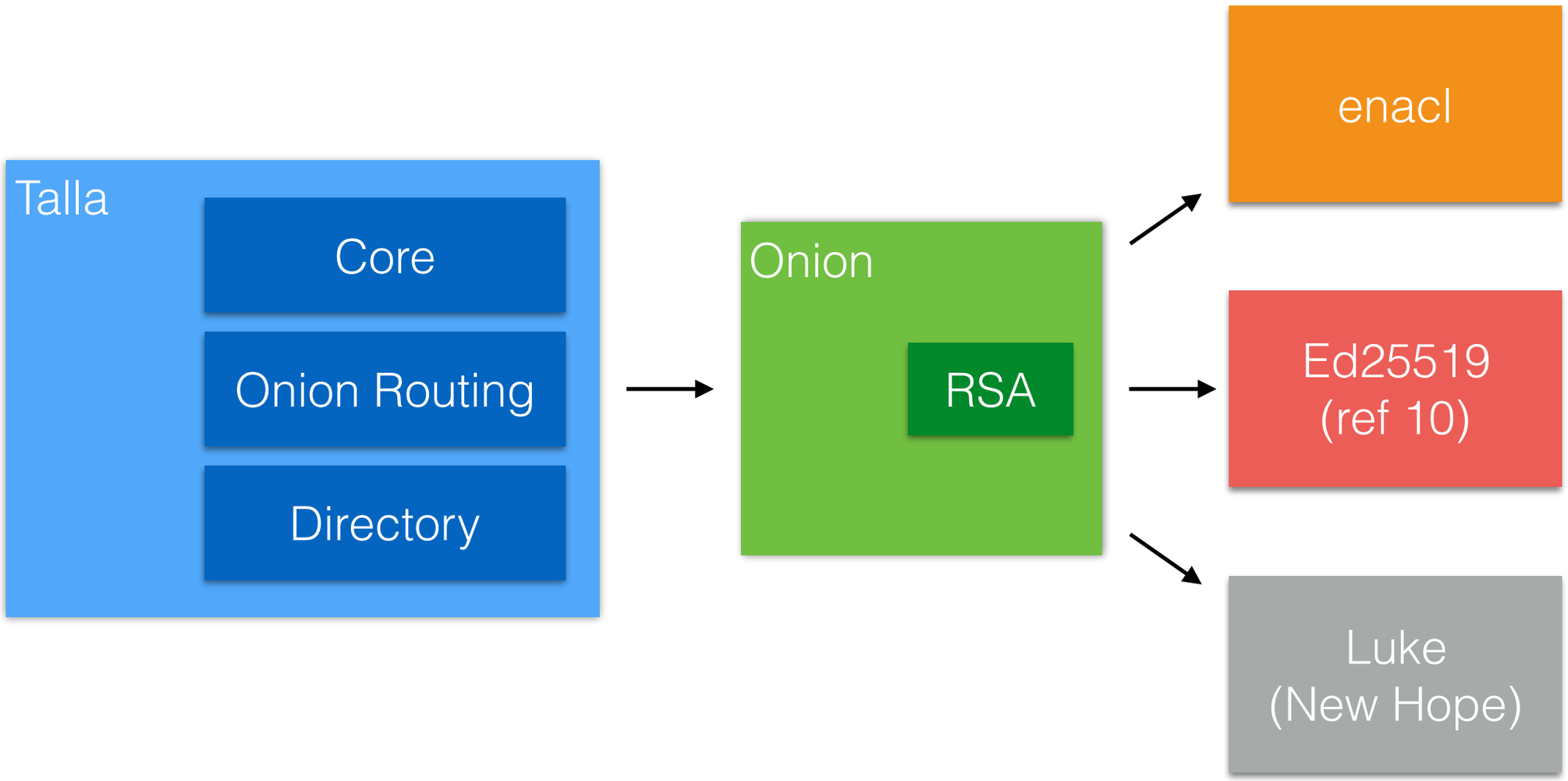
- Functional programming language designed by Ericsson in Sweden.
- Focus on concurrency via message passing.
- Extremely powerful when it comes to working with network protocols.
- Running on the BEAM virtual machine.

Performance?

An introduction to Erlang

The architecture of Talla

Applications and Libraries



enacl

- Written by Jesper Louis Andersen who is here at BornHack as well.
- Used for its `/dev/urandom` interface.
- Used for x25519 Diffie-Hellman.
- Source code: https://github.com/jlouis/enacl

Ed25519

- Used for ed25519 signatures to the directory services.
- Multiple implementations of Ed25519 :-(
- Major thanks to Yawning Angel from Tor.
- Source code: https://lab.baconsvin.org/talla/ed25519_ref10

Ed25519
(ref 10)

Luke

- Experimental Erlang NIF of the New Hope Post-Quantum cryptographic system.

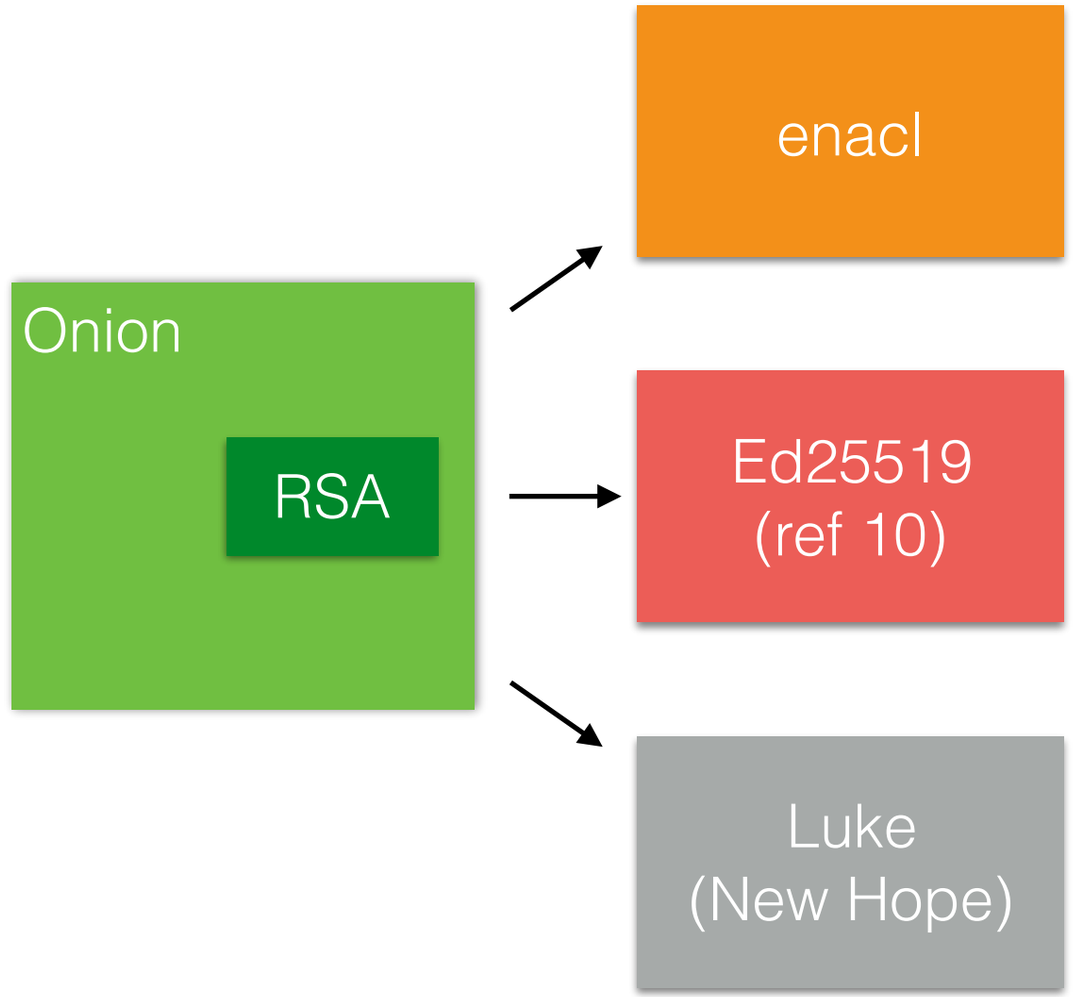
- Supports “normal” New Hope and Tor New Hope (Tor Proposal #270 by Isis Lovecruft and Peter Schwabe).

- Source code: https://lab.baconsvin.org/ahf/luke

Luke
(New Hope)

Onion

- Shared utilities needed for working with the Tor network.
- Small C function for generating an RSA key pair.
- Well-tested code.
- Automated test execution.
- The most stable part of Talla right now :-)
- Source code: https://lab.baconsvin.org/talla/onion

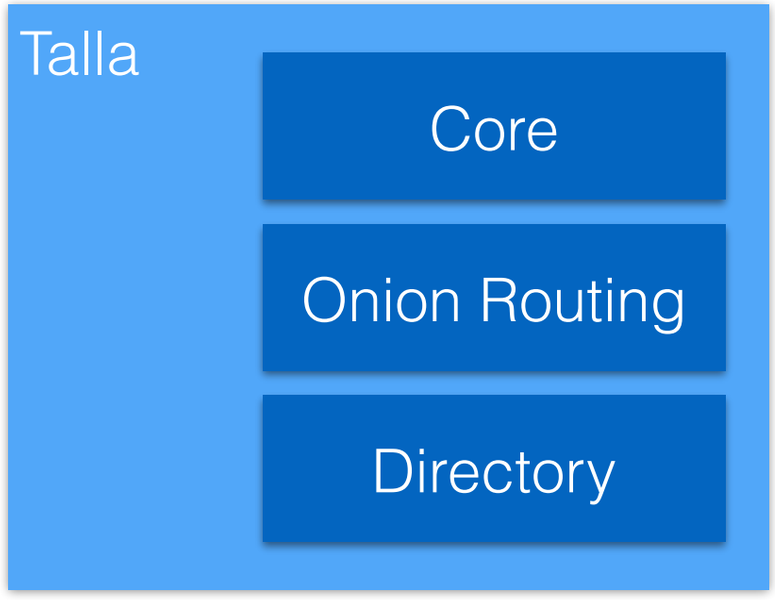


Talla

- Core application is for centralised services to the system.

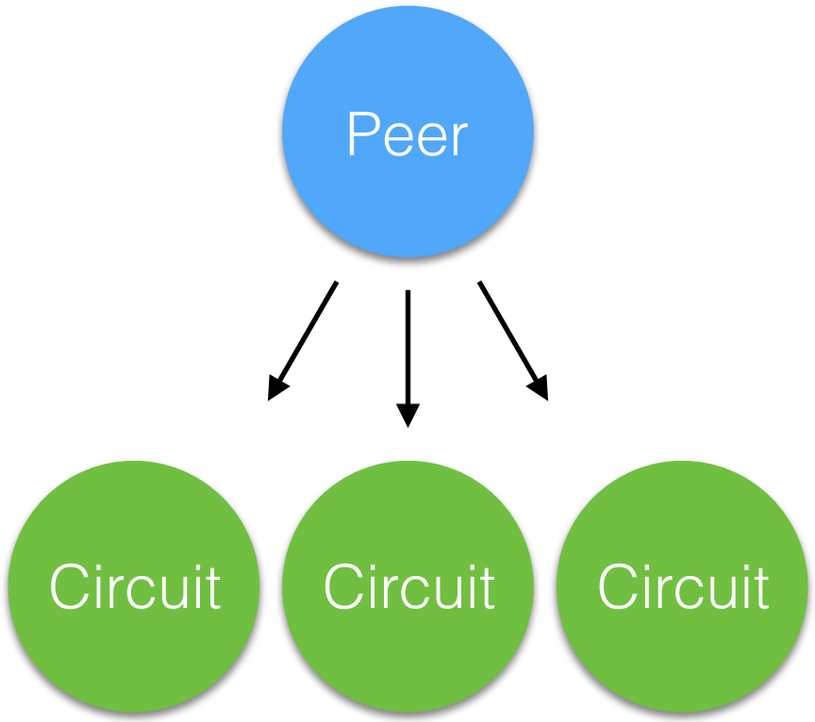
- One application for Onion Routing.

- One application is for Directory service (announcement only as of 2016).



Internals of Talla

Peer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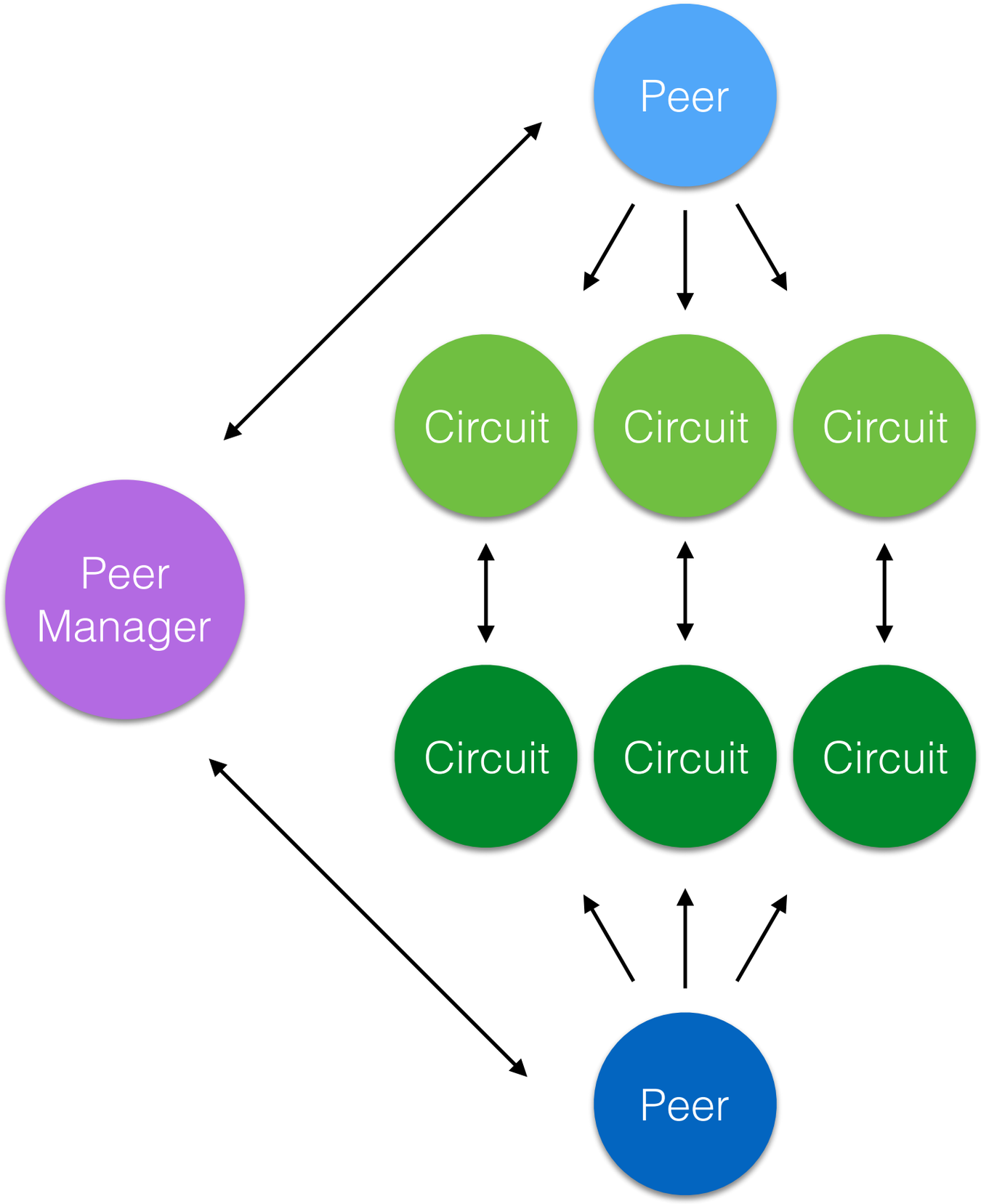
Peer
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Community

Hackers and people who want to follow the development of Talla should feel free to join **#talla** on **irc.baconsvin.org** or **6nbtgccn5nbcodn3.onion** with TLS on port **6697**.

Same IRC network as BornHack.

Source Code

The source code and issue tracker can be found at the Baconsvin Gitlab instance at https://lab.baconsvin.org/talla

Resources

- Tor specifications: gitweb.torproject.org/torspec.git - we are focused on tor-spec.txt and dir-spec.txt as of 2016.

- Ferd Hebert's Learn You Some Erlang for Great Good: learnyousomeerlang.com and erlang-in-anger.com

Questions?

Thanks to Linus, Yawning, the hackers of Celo and Baconsvin.

Chutney and Talla demo.