LISP on Android and iOS

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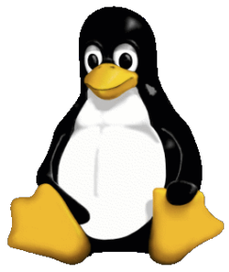
What is OPEN OVERLAY ROUTER ?

- Open Overlay Router (OOR) is an open source implementation to create programmable overlay networks



Linux

Android

OpenWRT

- Supports: LISP, VXLAN-GPE, Netconf and it is integrated with OpenDayLight

- https://www.openoverlayrouter.org

OPEN OVERLAY ROUTER

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iOS

- iOS in a nutshell
  - Based on Darwin (XNU Kernel).
  - Mostly POSIX-compliant. **No POSIX-certified.**
  - Objective-C and Swift are the main programming languages.

- What differences we have found compared OOR Linux implementation? Examples:
  - Timers have different implementation.
  - Missing Netlink Protocol Library Suite
  - Some signals are different or don’t exist.
  - Unable to create interfaces and raw sockets.
  - Forbidden access to interface file descriptors.
  - 80% of the code is reusable.

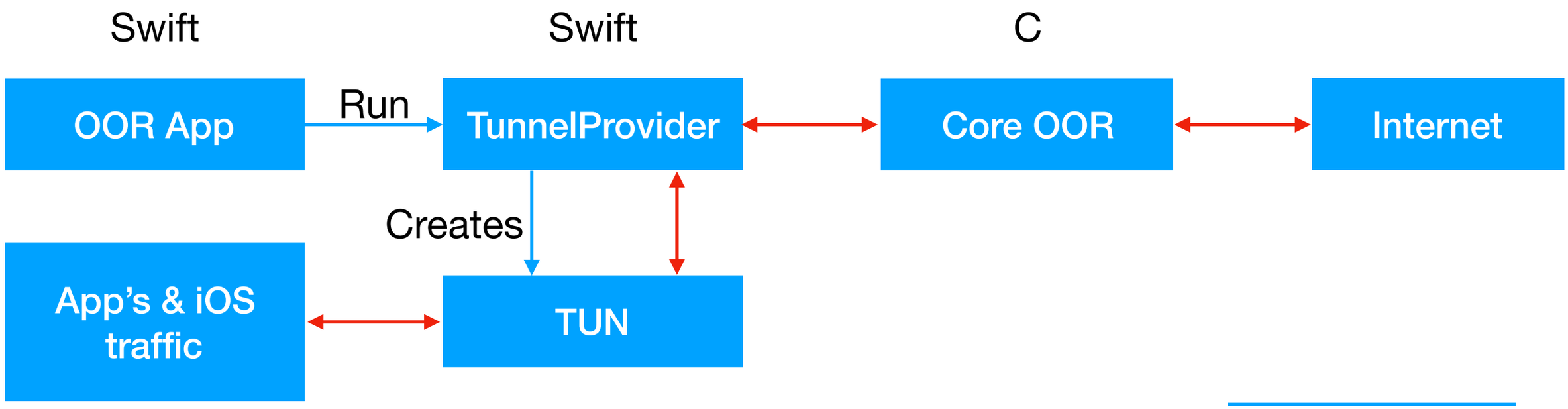
NetworkExtension Framework

The Network Extension framework contains APIs that can be used to customize and extend the core networking features of iOS and macOS. We used it to create the **TunnelProvider**, it allow us to:

- Manage VPN connections on iOS.
- Create TUN interface.
- Route traffic to TUN interface.
- Get and send traffic from TUN interface.
- Create and manage UDP connections.
- Protect OOR sockets from loops in the system.

- Available since iOS 8.0, before was necessary to talk with Apple and sign a NDA to develop any application with VPN requirements.
- Until iOS 10.0 need to request an entitlement with Apple. Now we need to request an entitlement for some functions.

Swift - C



Startup Procedure

Input / Output traffic

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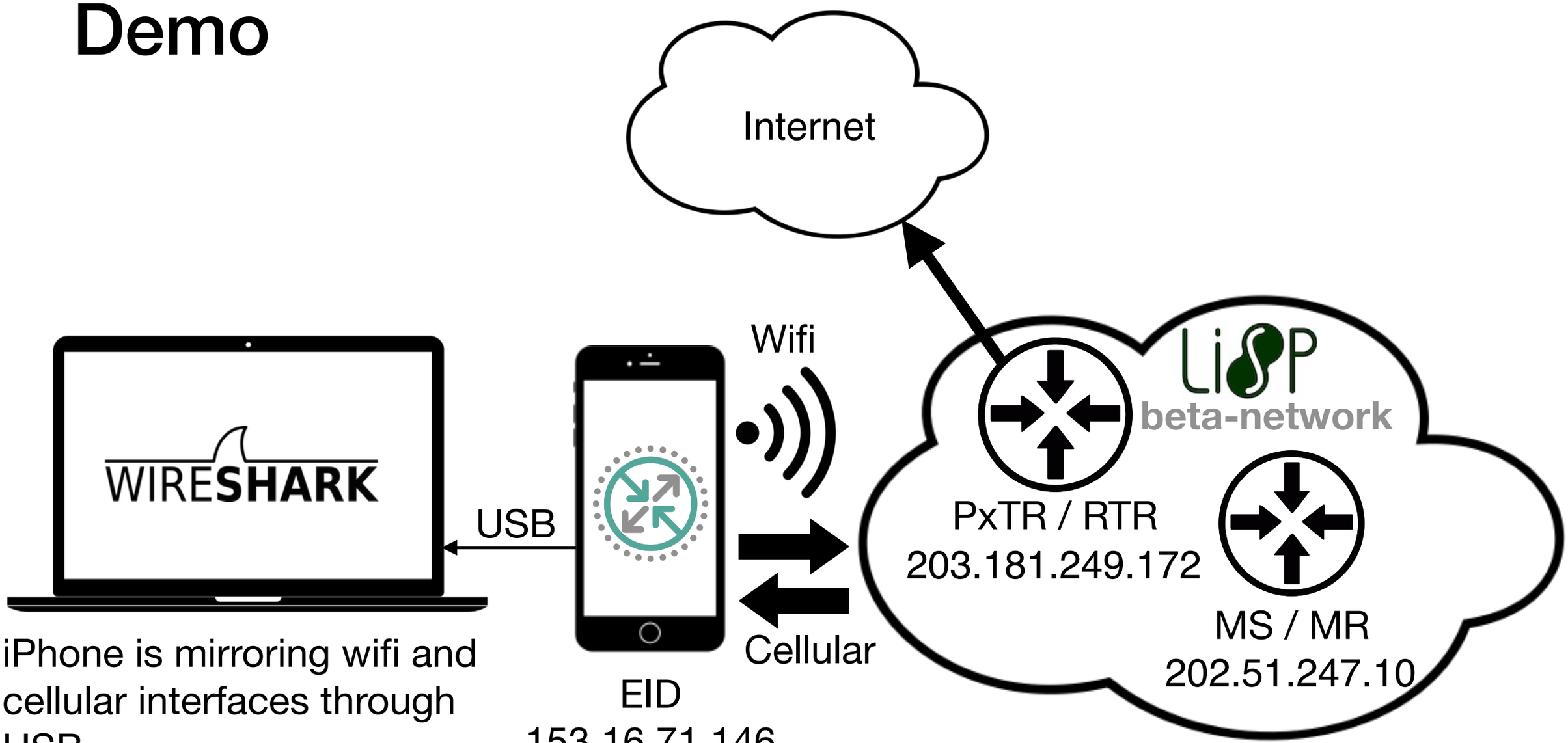
Demo



iPhone is mirroring wifi and cellular interfaces through USB.

OPEN OVERLAY ROUTER

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