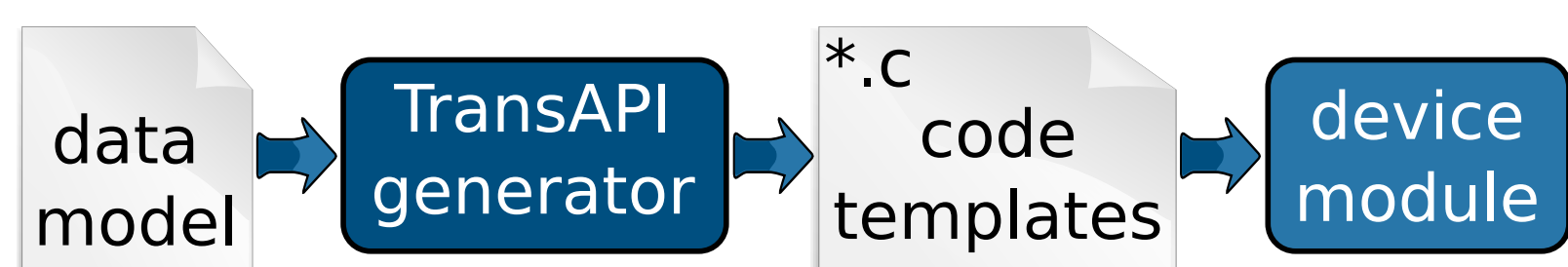




DEMONSTRATION

CONFIGURATION

- Implementation of **ietf-system** module [1].
- Selected items for system management:
 - platform information,
 - timezones settings,
 - `<set-current-datetime>` RPC,
 - `<system-restart>` RPC,
 - `<system-shutdown>` RPC.
- Implemented as *libnetconf* transAPI module.



- Approximately 350 LOC in C.

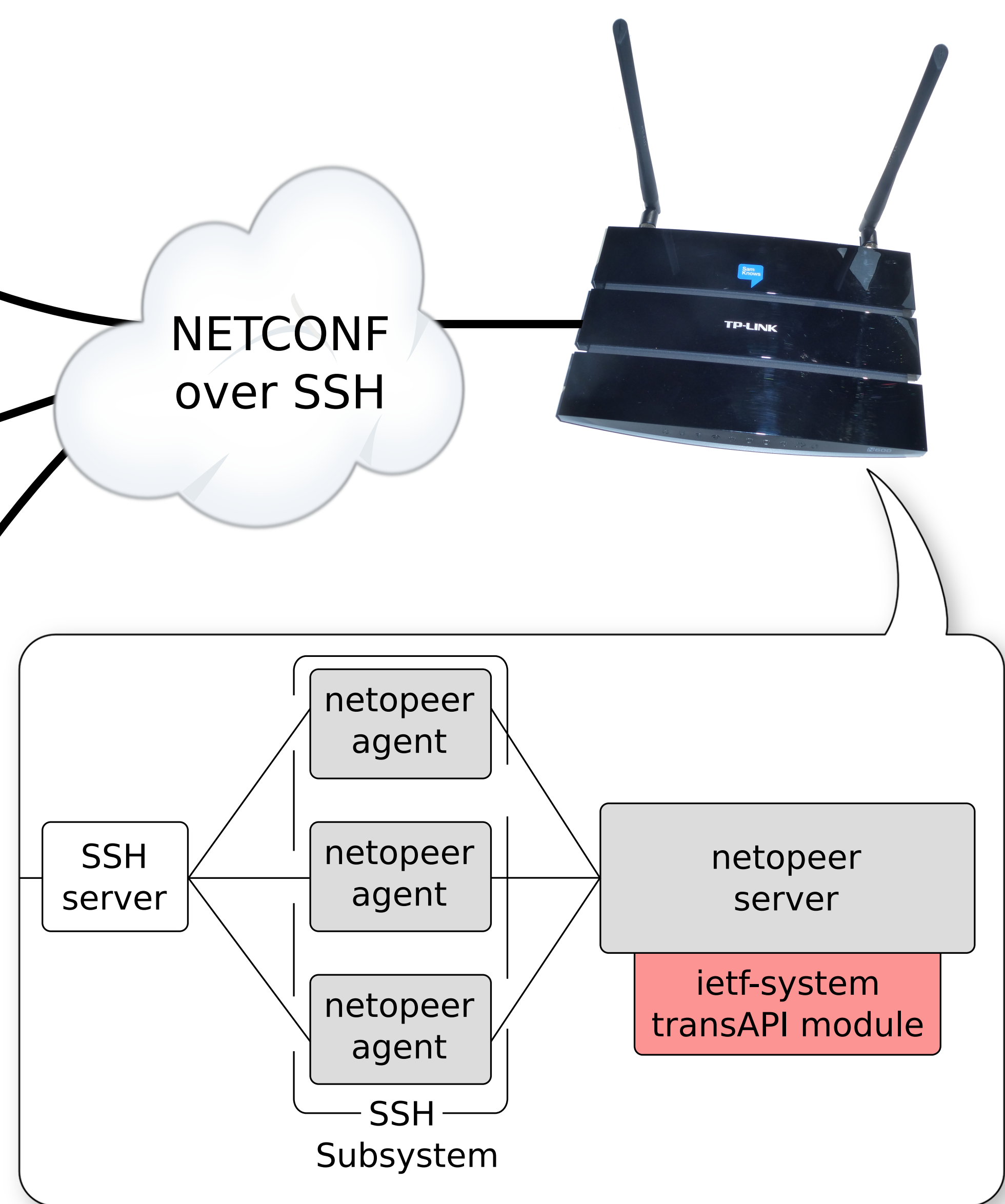
Netopeer webGUI



Netopeer CLI



ncclient



NETCONF CLIENTS

- Open-source NETCONF clients:
 - *ncclient* [2],
 - *Netopeer CLI* [3],
 - *Netopeer WebGUI* [3].

NETCONF SERVER

- Netopeer server [3].
- Based on *libnetconf* [4] open-source library.

MEASUREMENT AGENT (MA)

- SamKnows probe 3 (TP-Link WDR3600)
- AR9344 (MIPS), 560 MHz, 128 MB RAM
- OpenWRT-based system.

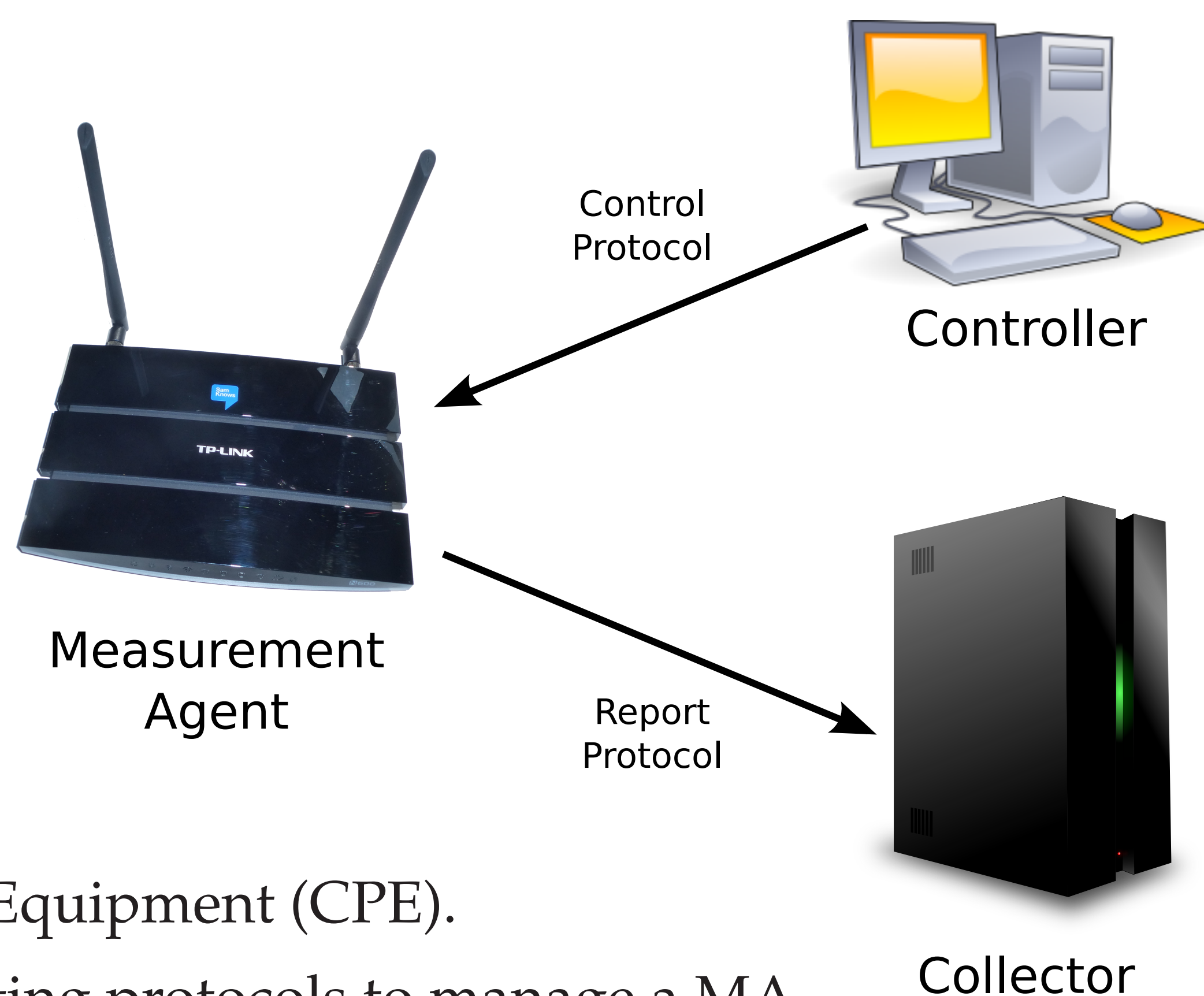
LMAP FRAMEWORK

The Internet Engineering Task Force (IETF) approved a Large-Scale Measurement of Broadband Performance (LMAP) working group in 2013 [5].

GOALS:

- Standardize interactions between various measurement platform elements.
- Provide measurement capability directly within a Customer Premises Equipment (CPE).
- Strong inclination towards using existing protocols to manage a MA.
- Network Configuration (NETCONF) [6] is one of the candidates of a LMAP control protocol.

LMAP Framework



SAMKNOWS PLATFORM

The SamKnows platform performs active measurements using dedicated hardware-based probes to assess broadband performance [7].



- Probes are off-the-shelf home routers flashed with OpenWrt.
- An open-source OpenWrt-based measurement overlay implemented by SamKnows.
- Around 40K probes deployed all around the globe.

REFERENCES

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- [4] libnetconf, <http://libnetconf.googlecode.com>
- [5] IETF LMAP Working Group, <http://datatracker.ietf.org/wg/lmap>
- [6] R. Enns, M. Bjorklund, J. Schoenwaelder, and A. Bierman, "Network Configuration Protocol (NETCONF)", RFC 6241, IETF, 2011
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