

# Assessing the suitability of OverCord to satisfy new advances in P2P SIP

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## 1. Introduction

The Session Initiation Protocol (SIP) is a signaling protocol created to set-up, manage and teardown multimedia sessions. SIP communication happens in client server environment where a centralised server to which SIP endpoints are connected remain in control during communication. This project is based on the work currently under way in the IETF, and work done at Rhodes University as a part of master thesis, where OverCord P2P framework was developed. This project objective is to assess the suitability of OverCord and recommend some changes to satisfy the new advances in the P2PSIP being discussed in the IETF where a P2PSIP working group was established.

## 2. Session Initiation Protocol

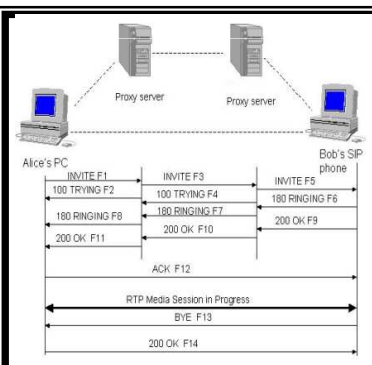


Figure 1: SIP session setup with SIP Trapezoid

Lets replace the lookup/routing functions of the proxies/registrar with a Distributed Hash Table (DHT) overlay built in the User Agents (UAs). We just add join, leave and lookup capabilities

## 3. P2PSIP

The IETF is working on a new P2P version of SIP called P2PSIP. The idea is for endpoints to replicate all SIP server functionality (shown in figure 1) by dividing up information normally stored in server spread that out among different devices. P2PSIP effectively distributes the registration, location and lookup steps of SIP. It handles two functions:

- Registering and looking up a phone/user in the P2P overlay network.
- Dynamically sharing information when peers join and leave to balance the load across peers, and to ensure that sudden loss of one or more peers does not cause the P2P network to lose track of its current registrars.

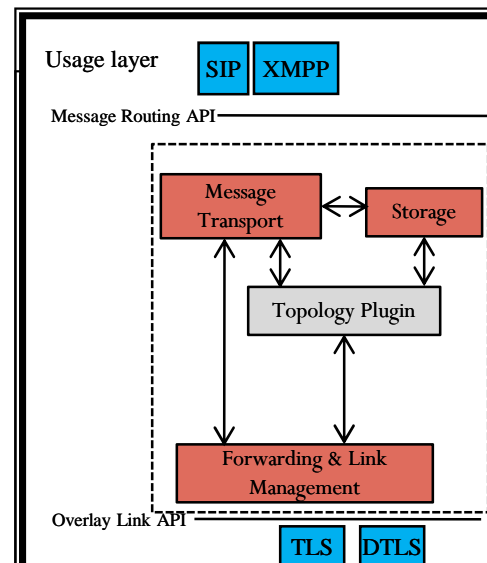


Figure 2: RELOAD Architecture. Adapted from [3]

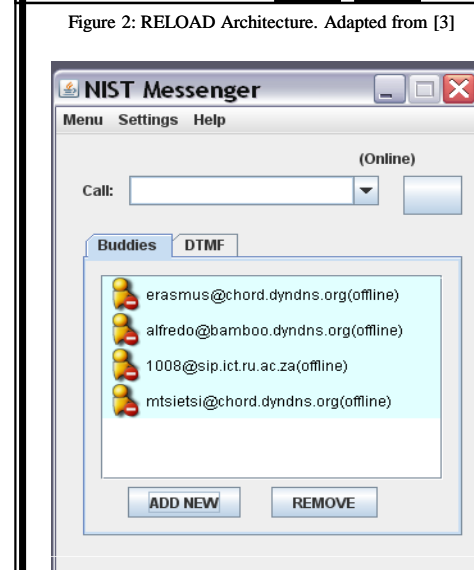


Figure 4: P2P JAIN SIP Applet Phone implemented with OverCord

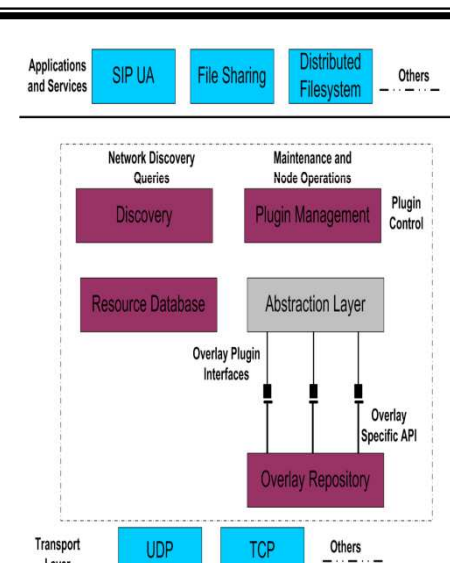


Figure 3: OverCord Architecture. Source [1,2]

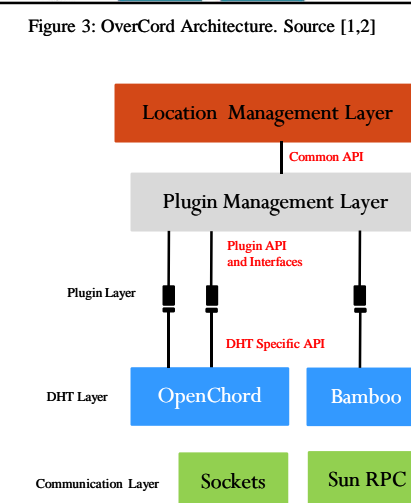


Figure 5: Part of OverCord core. Adapted from [2]

## 4. REsources LOcation And Discovery (RELOAD)

RELOAD is a P2P version of SIP, used for signaling on the Internet. Adapted by the P2PSIP Working Group as its starting point for the primary P2PSIP protocol. RELOAD can be used for other P2P application as it has two separate stack, SIP stack and P2P stack. In figure 2, we can see the RELOAD architecture. It has been designed with an abstract interface to the overlay layer to simplify implementing a variety of structured (DHT) and unstructured overlay algorithms, this promote interoperability and selection of overlay algorithms optimised for a particular application.

## 5. OverCord

OverCord is a P2P framework developed at Rhodes University as a part of master thesis. Just like RELOAD, it was unproven that it can be used for other P2P applications and has two separate stack (see figure 3). Implemented with two structured DHT algorithms, the OpenChord and Bamboo (see figure 5) but that is just mandatory. Like RELOAD, The abstraction layer in OverCord is similar to topology Plugin in RELOAD which provide abstract interface to the overlay repository. The only major different between RELOAD and OverCord is that RELOAD has central server and does recognise peers and clients

## 6. Conclusion

There is no standard P2PSIP protocol yet, the work toward standardising is still ongoing in the IETF P2PSIP working group. There still lot of issues to be solved such as drawbacks associated with NAT. The OverCord seems to predict well the protocol to be standardised, only few things need to be addressed for OverCord to reach RELOAD level but this does not make RELOAD better than OverCord .

## 7. Bibliography

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3. C. Jennings et al, REsource LOcation And Discovery (RELOAD) base Protocol, available online, March 2010, Internet Draft: draft-ietf-p2psip-base-08, work in progress, URL: <http://tools.ietf.org/html/draft-ietf-p2psip-base08>

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