# SONIC: SOcial Network InterConnect

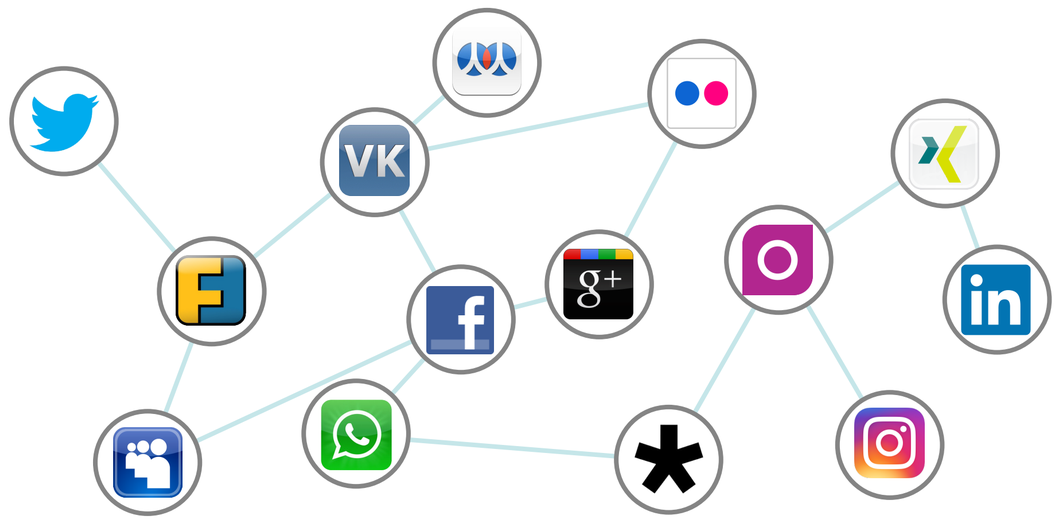
Sebastian Göndör, Felix Beierle, Axel Küpper, Senan Sharhan

## Building an Online Social Network Federation

Online Social Networks (OSN) have already become an integral part of our daily online lives. We communicate with each other, organize events, play games, exchange information and files, and keep contact to our friends and relatives. We believe that OSNs will continue to grow in importance for our communication habits and social lives in general and become a general platform for online communication and information exchange. This requires a standardized and open way to exchange information, so that everyone can participate - without being restricted to a certain software, service, or provider. Unfortunately, OSN platforms nowadays are mostly centralized and proprietary solutions, which restrict their users from freely communicating with other platforms. This well-calculated lock-in effect is used to keep users from switching to a competitors OSN solution, as doing so would result in loss of connection to one's online friends. We believe, that everyone should be able to choose - and even change - the OSN platform he or she likes most without being cut off from communicating with others that are using a different OSN solution or losing any data.

**Project Objectives**

Similar to OpenSocial, a standard that unifies APIs of OSN platforms for social applications, SONIC aims to become a standard for communication between all kinds of OSN platforms. By implementing the interfaces and protocols proposed by SONIC, OSN platforms gain the ability to communicate with other OSN platforms in a seamless fashion. The result would be an open, decentralized and heterogeneous Online Social Network Federation (OSNF).



## The SONIC Philosophy

Today's OSN platforms are mostly closed solutions, which are forcing their users to not only entrust all personal information to a single platform operator, but also to surrender copyrights. The personal data is then used e.g. for targeted advertisement or other forms of monetization with little or no control for users regarding how and what private information is used. The resulting consequences in terms of privacy and being locked-in by the OSN platform bother most users as control over one's data privacy is lost. Furthermore, users cannot connect and communicate freely with other platforms and services. Solutions proposed to address and mitigate these issues mainly proposed either alternative centralized OSN platforms themselves or rely on federated or completely decentralized architectures. All proposed alternatives have in common that users need to create a new user account within the new system, while seamless interaction with other OSN platforms is mostly still not possible. The motivation for users to abandon one closed system for another closed solution is therefore limited.

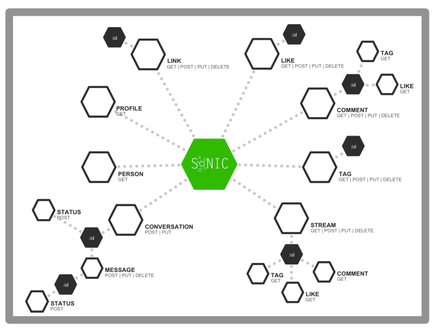
SONIC proposes a different paradigm. Here, a common protocol is used to allow different kinds of OSN platforms to interact directly. Following this approach, OSN platforms use open data formats and support a common API and protocol, which allows to exchange social information across platform borders, while addressing remotely hosted user accounts directly. To address the diversity of features of different OSN platforms, features that go beyond SONIC's core featureset are supported via protocol extensions, while users are empowered to migrate between OSN platforms at will without losing any data or connectivity to their friends. The result is an Online Social Network Federation (OSNF) defined as *a heterogeneous network of loosely coupled OSN platforms using a common set of protocols and data formats in order to allow seamless communication between different platforms* [1]. This way, users can choose the OSN platform they prefer while staying seamlessly connected to all friends using other OSNs. Hence, it is rendered irrelevant whether a user's friends are using the same or a different OSN platform.

By implementing the SONIC solution, OSN platforms can open their services and allow users to communicate with other OSN platforms. As users are able to choose a platform of their liking or even host a personal OSN platform on their own, control about who gains access to what part of one's social profile data remains with the users, while migration capability effectively mitigating the lock-in effects of today's OSN landscape.

## Results

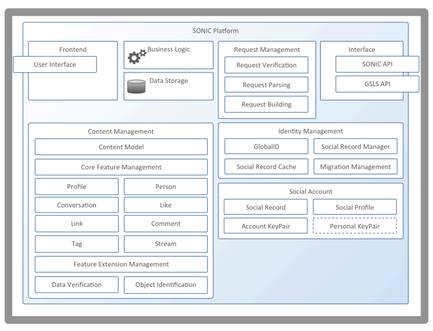
**SONIC Protocol**

Sonic proposes an open protocol and data formats that allow arbitrary OSN platforms to connect to each other [1]. The protocol covers all basic OSN functionality and provides support for additional features through dynamic extendibility. Furthermore, the protocol supports seamless migration of user accounts between OSN platforms [2].



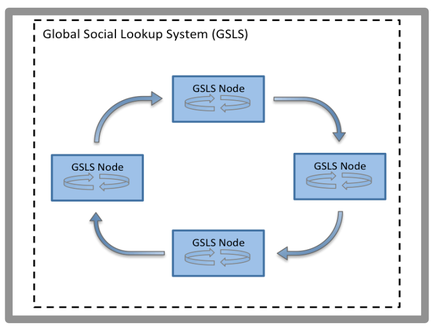
**SONIC Architecture**

The SONIC architecture describes the architectural components of the SONIC OSNF [3]. Here, social profiles exist independently from the OSN platform they are hosted on. Besides architectural components, the architecture defines an access permission model, role model, and security model.



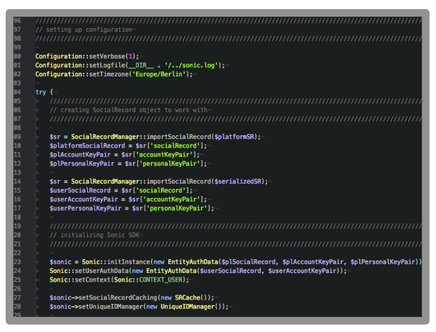
**Global Identity Management**

To facilitate seamless interaction between individual user accounts in an open and decentralized ecosystem, Sonic introduces GlobalIDs as domain-agnostic user identifiers. GlobalIDs are managed by a decentralized, global directory service built on state-of-the-art DHT technology, the Global Social Lookup System (GSLS) [4].




**SONIC SDK**

In order to ease the integration of the SONIC protocol into both existing OSN platforms as well as to support the development of new OSN projects, the SONIC SDK has been implemented. The SDK features a set of classes that provide functionality for formatting, parsing, signing, and validating SONIC data formats, as well as handling requests to and from other SONIC compliant platforms.



**SONIC OSN**

To showcase and evaluate the developed protocols, a prototypical Sonic compliant OSN platform has been implemented called Sonic OSN. The Sonic OSN builds on the Sonic SDK and the PHP framework Laravel. In order to allow for an easy identity management, Social Record and key management is implemented in a mobile Android App. Here, the keys associated with a social profile can be managed in the domain of the user without allowing access for third parties.

## Literature


① Göndör, S. and Hebbo, H. (2014). SONIC: Towards Seamless Interaction in Heterogeneous Distributed OSN Ecosystems. First IEEE WiMob 2014 Workshop on Dynamic Social Networks (DSoNets 2014). IEEE

② Göndör, S. and Beierle, F. and Evren Küçükbayraktar, E. and Hebbo, H. and Sharhan, S. and Küpper, A. (2015). Towards Migration of User Profiles in the SONIC Online Social Network Federation. 10th International Multi-Conference on Computing in the Global Information Technology (ICCGI 2015). IARIA

③ Göndör, S. and Beierle, F. and Sharhan, S. and and Hebbo, H. Küçükbayraktar, E.and Küpper, A. (2015). SONIC: Bridging the Gap between Different Online Social Network Platforms. 8th International Conference on Social Computing and Networking (SocialCom 2015). IEEE

④ Göndör, S. and Beierle, F. and Sharhan, S. and Küpper, A. (2016). Distributed and Domain-Independent Identity Management for User Profiles in the SONIC Online Social Network Federation. 5th International Conference on Computational Social Networks (CSoNet 2016). Springer


## For further information

The project web page is accessible at http://sonic-project.net, the SONIC SDK is available at https://github.com/sgoendoer/sonic

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