

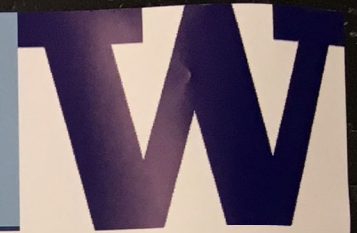


Device-to-Device (D2D) Offline Communications App

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Intro:

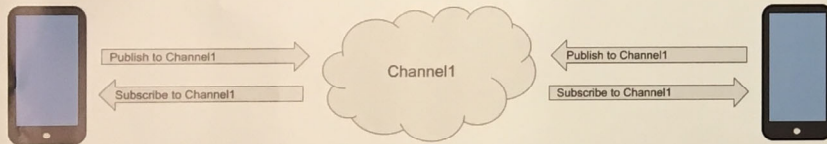
M87 is a Bellevue company that is developing products that use D2D connections to create and extend cellular networks. Their Proximity SDK is a new tool that uses WiFi Direct to create a D2D network between offline devices. Our app, Connect, highlights the Proximity SDK's ability to create new gaming experiences.

Purpose:

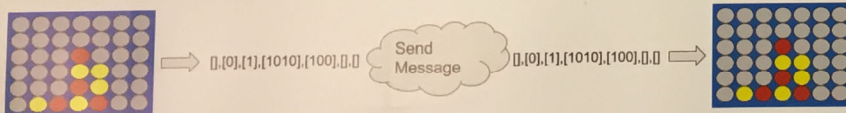
Create an app that uses the proximity SDK to create a D2D gaming experience.

Methods:

We used the proximity SDK to develop an Android app that could play a game of Connect4 between two offline smartphones.



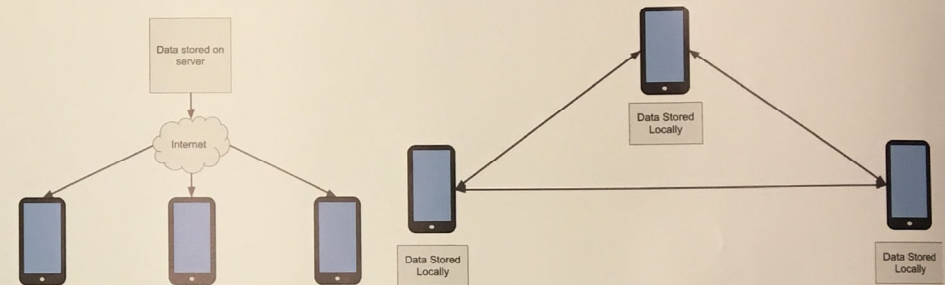
The proximity SDK uses the publisher/subscriber paradigm to advertise and create WiFi direct connections between devices. Devices publishing and subscribing to the same given channel can detect one another. Advertising devices can then send messages to one another directly without the need for external infrastructure.



The messages sent by the SDK could only be text-based. To send game messages, we made the games so they could be translated into text and back again. The game would be translated into text, sent as a text-based message, and translated back into a game file on the other phone.

Results:

Our app shows that the SDK provided by M87 can support all of the data transfers in an app that sends and maintains chat history and game state between offline devices. This demonstrates a D2D format that is new in mobile games.



All of the app data and chat history is stored locally and the data connections are between nearby devices as opposed to the traditional client server model. Potential applications we see include dating apps, social media, or games with elements of augmented reality.

Setbacks/Struggles:

Our project was impeded by a few setbacks.

- None of our team knew Android development or the SDK before the start of this project and, initially, it was a challenge designing app without being familiar with the limitations of our tools.
- The SDK is also new and relatively unused which meant that development was supported by relatively sparse documentation and few examples.
- We had to learn how to define a group dynamic between members with different schedules in a loosely defined class structure.
- Finally, we needed to generate and communicate expectations around a six-month, small-group project, which was a new experience for all of us.

Conclusion and Future Work

In summary, we were satisfied with our product, which showcases the proximity SDKs ability to propagate game data to nearby devices. We think it proves the viability, and highlights some of the benefits of this technology. If the SDK is improved to make it more developer friendly, we see the SDK having interesting applications for new app experiences. We envision a Pokémon Go that has one on one Pokémon battles between strangers on the street, or a Tinder that only passes your dating profile to people that you walk near in day.