

# Glide Player – An Ad-hoc Media & File Sharing

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**Abstract**— Seamless media sharing between individual mobile devices is not so easily achievable by current products. Most devices rely on having to share physical files with other devices wirelessly through file transferring applications. However, media is not always treated like most files. Media sharing is usually a temporary “for-the-moment” situation, where a user may need to play a file on another device easily and quickly, and after they separate, the file is no longer required to persist on the other user’s device. Our proposed idea is for an application that can make such temporary, local media sharing quick and accessible, abstracting away the process of setting up a network and having to send each physical file between devices for a session and then have to delete the files after the session is complete. In our proposed application, users can create and connect to a logical group that is understood by the application and set up within the application. Once this group session is initiated, each user can freely explore the media library of each other user in the group and play any media file they so choose. By this method, the file is transferred over to the receiving device on demand and cached. This method does not require an internet connection or a nearby access point as each device could act as a local hotspot. In addition to this functionality, each user has the freedom to customize their privacy, specifying exactly which media files can be visible to other users and which files shouldn’t be. Along with this, we also propose a mode of synchronous play which can be used by the group members to create one common queue of media that anyone can contribute to and that plays, seeks and skips at the exact same time on all devices if the users wish to experience media together, but without having to use a single common audio output; each user can just use their own device and audio output peripheral.

**Keywords:** Media, Ad-hoc, Android.

## I. EXISTING SYSTEMS

\* There are already a lot of file sharing applications for mobiles out now.

\* These apps lets people who are near each other to wirelessly copy files from one device to another

\* But we’ve noticed two main things lacking in existing products.

\* There are few applications that provide file sharing and functionality specific to media like music and videos

\* Once you copy a file to another device, it is permanent. The other user can keep the copy and do whatever they want with it. Sometimes we need to share a file only temporarily and it should be deleted once the two devices move away from each other. Maybe because the file is confidential, or to avoid clogging the device with many shared files over time that the receiver forgets to delete.

## II. INNOVATION

In this day and age of wireless connectivity, sharing media and files wirelessly between devices has quite comfortably become the norm for the current generation. What used to require using a physical storage medium such as a flash drive or optical disc can now be done easily using one of

many wireless technologies that come built into most portable electronic computers.

However, there are 2 drawbacks to most mainstream solutions to file and media sharing these days. First, many solutions are designed to use the internet. One user can share their files with other’s through a shareable cloud storage network like Google Drive or Dropbox. Although useful for sending files across large distances, these methods are unnecessary for quickly and efficiently sharing files between nearby devices, especially when there are restrictions on the bandwidth or data caps and charges.

The second drawback is that most solutions are built for permanently sharing a copy of the file. Sometimes a file only needs to be shared temporarily, and only as long as the users are within range. This could be a requirement when the receiver does not wish to keep copies of each file and also when the sender may not be allowed to legally share a copy of the file, or desires to keep the file confidential and only needs to share it with someone temporarily.

This application idea attempts to solve these issues. This application is built for quick, at-the-moment, media or file sharing with a larger focus on and specialized functionality for audio and video files.

## III. SOLUTION

This application allows multiple users of the app who are within wireless range of each other to

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- \* Form a temporary network from within the app
- \* Be able to view and open any media or regular files on any other user's device in the group
- \* Customize which files or media is accessible to others

With the main focus on media files, the application will have built in media player functionality. This makes media related sharing more intuitive as the app presents a "library" view of audio and video files. Once connected to a group, the library is extended to show both local and remote media, giving to freedom to the user to select and play media on-demand. Until a file is opened, it does exist physically on the receiver end. When it is opened, the file is transferred and temporarily cached on the receiver's device. Finally, when the group is disbanded, all cached files are deleted.

For the focus on security, users could have the option to encrypt files that are being shared onto other devices. When a file is encrypted, it can be decrypted using a generated key that is unique to that particular group session. Once the session is closed, the key is destroyed and the file can no longer be accessed in case it is not already cleared from the cache.

For regular files, the app can provide a familiar "file explorer" interface, except that the user will be exploring accessible files on other user devices and as mentioned before, the file is transferred and cached only when it is chosen to be opened on the receiver device.

Another main proposed feature that not enough available products at this time consider is a mode of "synchronized play". With synchronized play, 2 or more devices in the group can be a part of one common session. Each user can contribute a media file to the session (or play queue), and once playback is started, the media files begin to play at the same time on all devices with minimal time difference and independent of who's device the actual file is present on. Any operation performed on the file, such as seeking time (forwarding or rewinding), skipping tracks, pausing or playing, are all done at the same time and on all devices. The process of copying the file to all devices, buffering and playing them at the same time is all handled by the application and abstracted from the users, allowing them to focus more on the experience.

#### **IV. USE CASES**

There are several situations when this application can prove to be a viable solution. Here are only a few examples chosen to try and convey not just use cases, but a clearer idea of what the app actually does and who it could be meant for.

#### **\* *Social events and entertainment:***

Suppose a group of peers are together and want to be able to pool in their music or videos, but not necessarily have to project it onto one device like a TV or stereo. Each peer wants to contribute their own library of media or files to the group so that they can all explore each other's libraries on their own personal devices, or alternatively, be part of one common music or video session. The application turns group events into a cooperative sharing experience without the hassle of setting up an infrastructure, no requirement of peripherals and no requirement of a connection to the internet. Just open the app, connect and have fun.

#### **\* *Quick file viewing for professionals:***

In the absence of a conference room and projector system, suppose a group of professionals want to share a quick document or video with each other and the only device available is each person's smartphone. All they need to do is open the app and connect and view the file from the owner's device. In situations where the file may be confidential, security is taken care of: once the group is disconnected, the file is no longer accessible by any of the other devices as the cache can be cleared and the file is encrypted to begin with.

#### **\* *Band practice, quick music sharing:***

Another common scenario is a music group gathered to begin a practice session. Many such practice sessions begin with all members listening to a song before trying to recreate it with their own instruments. In the absence of studio/stage equipment like a mixer or speaker system, it may not be feasible for all members to listen to the audio from the relatively weak speakers of one device (the device that contains the song). The usual solution is to transfer the song to all members either to file sharing applications or uploading to a cloud storage that everyone accesses. Instead, each member only requires the application to be installed. They open the app, connect, and all users can view the same song in a synchronized play mode and have it play at the same time on their own devices. Optionally, they can even use their own audio output like headphones to get a detailed hearing of the song but still be listening to it at the same time as everyone else.

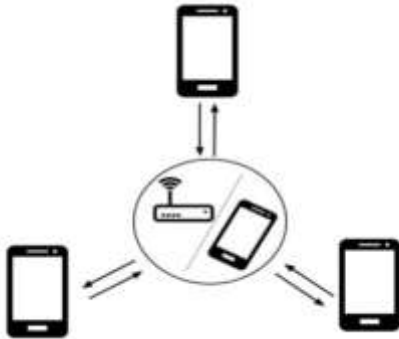
#### **V. TECHNOLOGY**

The proposed application can be developed to work on Android devices, although it should theoretically work between any devices that can be connected to a Local Area Network and handle sending data over a TCP or UDP protocol and viewing or playing files. Wireless connectivity will be established through Wifi.

The virtual “group” or “sharing session” can be set up between instances of the app running on multiple devices over a LAN. This LAN can be created through one of the following ways:

1. All devices are connected through a wireless router
2. One of the devices creates a local hotspot and the other devices connect to it.
3. All devices join together in group using Wifi-Direct.

Although options 2 and 3 seems similar, the advantage with Wifi-Direct over a regular Wifi ad-hoc network/hotspot is that a Wifi-Direct group is easier to set up on android devices and, on devices with supporting hardware, the phone can be connected to a router and be part of a Wifi-Direct group at the same time, meaning no loss of connectivity to the internet.

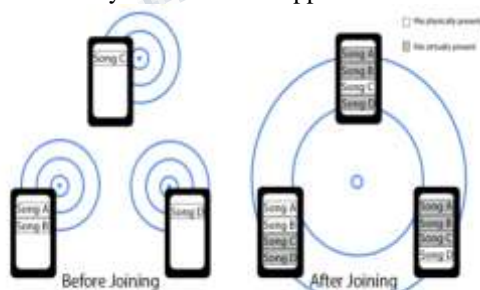


3 devices connected through an Access Point OR 4 devices connected through a hotspot set up on one device

Once the devices have created or joined a group, they exchange their libraries. A library defines the list of files present in one device along with meta-data such as size, artist, album etc.

When libraries of all devices have been exchanged each device now sees one large virtually merged library. From here, any device can access any file from any other device and it is accessed on demand.

The following diagram shows an example of how an available library of media files appears to each device



**Example scenarios that can benefit from our application:**

- \* Imagine a small group of people travelling together. They have limited internet access and there is no wireless router nearby.
- \* Suppose they are spending their time listening to music and they want to share their music with each other
- \* The only way to do this is to open a file sharing app, select the songs you want to share, and send it one by one to each other user. This is time consuming and difficult
- \* Also, the users want to be able to see each other's music library and play any song from any device as long as they are near each other.
- \* A second example. Imagine a group of professionals who want to review and discuss an important document like an excel report, or review some video or presentation.
- \* If there is no conference room tools like a projector nearby, it is difficult for them to share these files. All of them would have to crowd around one screen, or like the previous example, they have to share the file one by one to each device.
- \* What if there was an application that allowed users to simply connect, view each other's files temporarily, and after they are done, disconnect and continue without needing to keep a copy of the file?

**Our app:**

- \* We looked at these specific gaps in existing products and came up with the idea for our application.

\* Let's break up and explain our project title.

**oLocal:** The sharing of media and files is only done when the devices are nearby. They are shared using a Local Area Network which means the app is best suited for temporary sharing and it doesn't need an internet connection.

**oMedia and files:** The app has special functionality to act as a media player, containing music and video libraries, but can also share other file formats if the user's device supports it

**oSession:** The sharing of these files is temporary and confined to the current session. Once the group is disconnected, all files are cleared and no extra space needs to be clogged.

**Music and Video libraries:**

\* Before connecting to a group, the app behaves like a music and video app. It shows you a list of all media on your phone. You can queue them up and play them like a normal app.

\* Once you connect to a group, the app looks the same, but now if you look at your music or video library, it will list a combination of media on your device AND media from other user's devices, almost as if it's on your phone

\* When you queue up and play media, if it is on your device, it plays immediately. If it's on someone else's device, it sends a request, starts fetching the file, buffers it and plays it with minimal delay.

***Other files like documents:***

\* After connecting to a group. You can see all accessible files on other's devices (the ones they allow you to see). When you tap on a file, the file is fetched, cached and opens on your device using any app on your phone that can support the file format.

***Synchronized media playback:***

\* This feature is something we haven't seem implemented yet on any other existing products.

\* Instead of each user in a group just being able to see and play any media file from the group, synchronized playback allows all the users to share one common queue of songs or videos.

\* Anyone in the group can contribute to the queue by adding any media file to queue.

\* Once playback is started, the same item from the same queue will start playing on ALL devices at roughly the same time.

\* Playback controls like play, pause forward, rewind is reflected on all devices at the same time

\* This allows multiple users to view the same media from device, on their own phone at the same time, which is useful if many users want to watch a movie or listen to music together but don't have a stereo or TV nearby.

## **VI.FEATURES**

\* Security: We described the app being able to see and access all files on another user's device. Obviously not everyone will be comfortable with this. So the app lets the user choose which files can be seen by others which files cannot.

\* The app also lets the user choose whether other users can save your file offline, or if they should only be able to view it while you are nearby.

\* A third option is encryption. A user can choose to encrypt the file before sending to other devices. This way, the file can be decrypted only while you are nearby. Once the group is disconnected, decryption is no longer possible and so the cached files are useless.

## **VII. CONCLUSION**

- \* Our Application is a file sharing and a media sharing app .
- \* It also provides a better security for the confidential files and a temporary connection between two devices and more .
- \* It can also be used to get permanent connection only if the owner allows the other person to access files .