Networking in Android

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1 Chapter Objecttives

- Review the knowledge of computer network
- Understand the basic knowledge of network in android
- Be able to apply networking in android to practical work

2 Network

1. Definition

   Network is a set of machines connected together

2. Purpose:

   - Transfrom infomation (Example: file, image, video, audio, ...)
   - Store data (Example: Network attached storage)
   - Super computer (a large number of small machines connected together that work very fast)

3. OSI model (network layers)

   - Application: end to end
   - Presentation: how you encapsulate data in each application (Example: wrap inside xml content)
   - Session: TCP layer make connection over there (Example: Request something from Facebook: first it has to connect here)
   - Transport: Lower layer that can only transport (no error check - error checked in session)

4. Network in Android

   - TCP: Transmission Control Protocol
   - IP: Internet Protocol
   - UDP: User Datagram Protocol
   - Protocol: HTTP / FTP / SIP / SMTP / IMAP /...

3 Permission

1. Definition
   - Each app has its own user ID and group ID
   - Without root account, one app cannot access to folder of another
   - So the app will crash without permission
2. Why?

   Privacy is very important
3. 2 types of permission
   - safe: not affect user ID
   - dangertous: affect user ID (Example: camera capture your face, SD card upload photo)
4. How?
   - Define what permissions are needed in the manifest
   - For internet access: uses-permission android:name="android.permission.INTERNET"

4 Embedded package

1. Create URL from string

   specify protocol (Example: usth.edu.vn)
2. Make a request to server
3. Receive response

   Example: OK:200, Error:4__, Error from server:5__)
4. Process response

   Example: Facebook: connect to server

   if people online: encapsulated in xml, tranfer avatar

   image response: decode data to bitmap, show it and disconnect

5 External library

1. Volley:
   - An Android HTTP Client library
   - Made within AOSP [Android OpenSource Project]
2. Why?

- Simple to use
- Powerful
- Extendable
- Cache
- Maintained by Google

3. How?
    - Add INTERNET permission
    - Clone volley repository: git clone https://android.googlesource.com/platform/frameworks/volley
    - Add volley as module
    - Right click project, open module settings, "+"
    - mport Gradle Project
    - Create request queue (one per app)
    - Create request with listeners
    - Add request to queue

6 Data representation

1. JSON
    - Can represent structured data
    - Simple to use
    - Less verbose
    - Getting more attraction
2. Example: Yahoo Weather service
    - Getting JSON data from server
    - Built-in JSONObject / JSONArray
    - Google's GSON
    - JsonPath
    - JSON data