A Java API for unifying ad-hoc Wifi networking

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Milestone 3 (November 26)

- Divorce API Networking code from Direct Democracy application

- Expand and create networking functions

- Acquire DirectP2P capable adapters and Android phones for future testing

- Implement support for configuring devices in DirectP2P mode

- Create more specific exceptions

- Debug and correct connection problems between Windows 7/10 and Mac/Linux

Milestone 3 Progress (1/2)

Task	Completion %	Peter	Klaus	Michael	Robert	To Do
Divorce API Networking code from Direct Democracy application	0%	0%	0%	0%	0%	Extract sockets when P2P connections are complete
Expand and create networking functions	0%	0%	0%	0%	0%	Uncertain. Will depend on demo application.
Acquire DirectP2P capable adapters and Android phones for future testing	100%	25%	25%	25%	25%	None

Milestone 3 Progress (2/2)

Task	Completion %	Peter	Klaus	Michael	Robert	To Do
Implement support for configuring devices in DirectP2P mode	20%	30% of Linux P2P	20% of Mac P2P	20% of Windows P2P	20% of Windows P2P	MacOSX Multipeer, Windows Homegroups, Write scripts for OSes
Create more specific exceptions	100%	30%	30%	30%	10%	None
Debug and correct connection problems between Windows 7/10 and Mac/Linux	100%	15%	15%	35%	35%	None

Connection Issues with Windows (Resolved)

- Firewalls can be annoying

- Old scripts incorrectly use infrastructure mode

- Creating a profile allows for a true ad-hoc network

- Joining a network must be done through a profile

Pushed-back tasks

- Divorce API Networking code from Direct Democracy application
  - Intent was getting sockets from the connection. Decided to push back until P2P support is completed.
- Expand and create networking functions
  - Intent was support for various tasks an application would use like ASN1. Decided not an API responsibility at this time.

Direct Peer to Peer (Windows)

- Windows natively supports a type of P2P network referred to as "HomeGroup"

  - Essentially shares folders with other windows devices

  - Requires the GUI

- Not a general enough P2P network

  - Currently unable to connect to other OS

  - Scripting implementation isn't clear

  - Further research & experimentation is needed

Direct Peer to Peer (Mac)

- Solution #1 : Use build-in commands to establish P2P connection

Direct Peer to Peer (Mac)

- Solution #2 : Using wpa_supplicant to configure and create P2P networks

  - Wpa_supplicant did not compile in Mac OS Mojave (10.14.1)

  - Not a good solution because

    - Modify wpa_supplicant library

    - Include wpa_supplicant in API

Direct Peer to Peer (Mac)

- Solution #3 : Use Swift scripts to create P2P connection
  - Found MultiPeerConectivity library on Apple documentation
    - Only connects with iOS and MacOS devices
    - Wifi is not visible to other devices

Added Exceptions

- DeniedPermissionException - implemented on all platforms

- MissingArgumentsException - implemented on all platforms

- ScriptMissingException - implemented on all platforms

Direct Peer to Peer (Linux)

- Can find, join and create networks through wpa_supplicant manually

- Current way of using scripts cannot handle this task

- Research ongoing into using ProcessBuilder to interact with

  wpa_supplicant dynamically

Milestone 4 (February 2019)

- Complete DirectP2P support

- Complete DHCP option for Ad-hoc networks

- Implement Android P2P support

Milestone 4 Matrix

Task	Peter	Klaus	Michael	Robert
Complete DirectP2P support	30%	25%	20%	25%
Complete DHCP option for Ad-hoc networks	25%	25%	25%	25%
Implement Android P2P support	30%	17%	18%	35%

Demo

Questions?