On the persistence of wireless advertising without infrastructure support

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Introduction

- **Framework:** D2D infrastructureless connectivity + Opportunistic communications [1]

- **Purpose:** Support infrastructureless distributed content sharing over a certain geographic area to ensure availability of content items for a given time period.

- **Methods:**
  - Take advantage of data detected locally to be disseminated.
  - Offload information transfers from current infrastructure.

- **Evaluation through experiments:**
  - Real mobility patterns of users,
  - Communication protocols,
  - Specific propagation characteristics in the chosen area.

Implementation

- Development of an Android app that uses Wi-Fi Direct to spread messages:
  - within an area marked by means of a geofence,
  - within a fixed time horizon.

- **Dynamic setting:**
  - Devices move in space and time.
  - Devices create and join networks on the fly.

- The app can be used to advertise events and share contents without requiring cellular or hot spot connectivity.

- Characterize some performance aspects:
  - Availability of devices.
  - Contacts among users.
  - Efficiency with which content items are accessed by users.

- Predict the effectiveness of services in a campus/large office setting.

- Our approach is limited by the specific features of available protocols for opportunistic D2D communications.

Wi-Fi Direct API modifications for our purpose

- **How do devices form a group?** [2]

- Periodic scans and automated connections between devices through the use of persistent groups. No user interaction needed. [2]

Experimental Setup

- Ads generation every 10 minutes.
- Maximizing the number of devices infected.
- User interaction allowed in any part of the process but not mandatory.

- Logs collected from the app (JSON).
- Parser in Python to study the results.

Results

- Results collected over one week of operation.
- 1 hour experiments.

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  - Devices move in space and time.
  - Devices create and join networks on the fly.

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References