



UMOBILE ACM ICN 2017 Tutorial Now@ and Oi! Applications

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Paulo Mendes, COPELABS / University Lusofona (paulo.mendes@ulusofona.pt)
Omar Aponte, COPELABS / University Lusofona (omar.aponte@ulusofona.pt)



Now@ Overview



Now@ is an Android application which enables users to share data based on their interests over an NDN infrastructure.

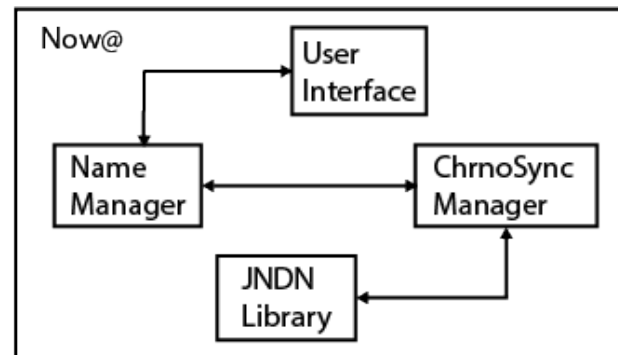
With **Now@**, users can:

- Subscribe interest (e.g Music, Restaurants,...).
- Receive text message and files directly from peers based on subscribed interests.
- Publish data across Named-Data Networking (NDN) environments.
 - NFD Android or NDN-OPP.
- Select and save content.

Now@ High-Level Design



Software Components



- Data Synchronization:
 - Based on ChronoSync.
 - Allows users to subscribe to more than one interest at the same time.
- Naming:
 - Prefixes are divided into four main components to specify: type of infrastructure; strategy to send data; prefix category; UUID.
- Software design based on modular approach:
 - Makes it easy to add new components.

Now@ Synchronization



- Uses ChronoSync for data dissemination.
- Functions within the NDN multicast namespace
/ndn/multicast
- Now@ identifies user devices by means of a UUID
31550312-535a-4662-b048-e3e24061307b
- User selecting Interest triggers prefix registration
/ndn/multicast/music
/ndn/multicast/business
- ChronoSync starts sending Interest packets
/ndn/multicast/music/<uuid>
- When the user creates content, an Interest is sent
/ndn/multicast/music/<uuid>/45
- In response to receiving such Interest, another ChronoSync somewhere will send an Interest for
/ndn/multicast/music/<uuid>/45

Synchronization Prefixes

Prefix	Category
/ndn/multicast/music/<uuid>	Music
/ndn/multicast/business/<uuid>	Business

Prefix per category

Prefix	Sequence number
/ndn/multicast/music/<uuid>/1	1
/ndn/multicast/business/<uuid>/2	2

Prefix with sequence number

Now@ Segmentation



- Uses JSON notation to define the messages format.

- Files are segmented using Base64 scheme.

- Typical Now@ content message:

```
{  
  "data": "fkajhfjkadnfdkjfhadhndcksdhkdshdfjasdhbasdncjsdjkhcaksdhmmasdklfamsdlfahsdkchsdhf  
  asdhfasdnadshmasdcasdkclahsdhfjasdfhmachjdahdnagdcajkds",  
  "size": 25,  
  "type": "text",  
  "user": "90",  
  "interest": "Music",  
  "date": "3:40:53", "id": "521e55a7-d930-444e-b7cc-b02b47b4c9de2",  
  "segment": "45"}  
}
```

Now@ Next Steps



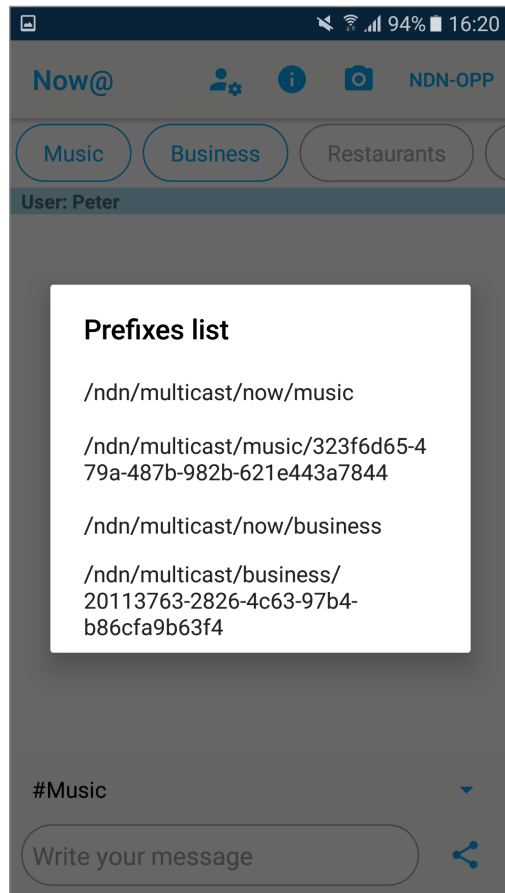
The following functionalities are going to be available in the next version of Now@:

- Synchronization of specific files.
- Preservation of content based on user preferences.
- Exploitation of Wi-Fi infrastructure and direct communications by using only NDN-OPP.

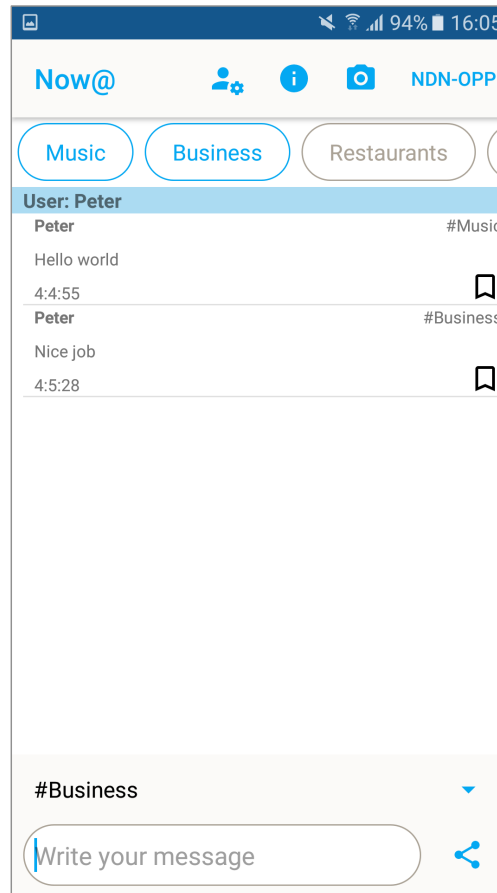
Usability of Now@ will be improved by:

- Evaluating app performance in the UMOBILE Lab.
- Performing field trial with users to verify user requirements.

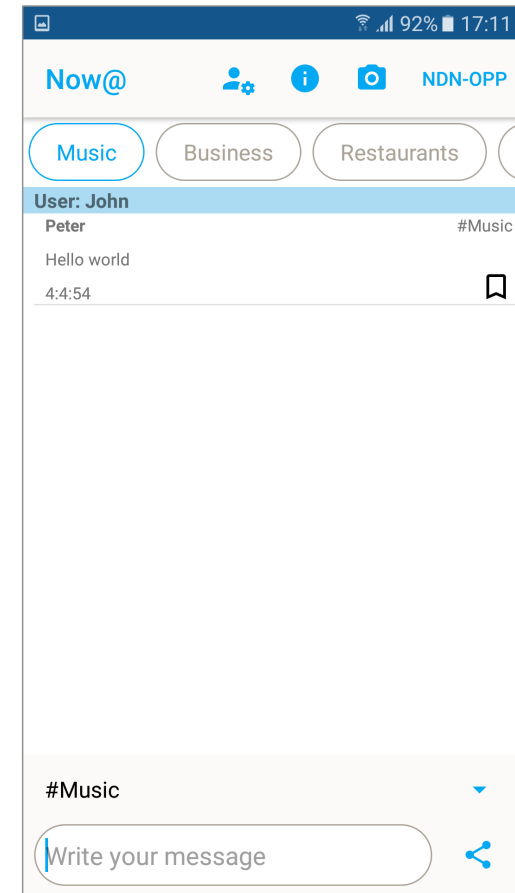
Now@ Demo



Interests Subscription




Sending Content



Content Reception


Now@ Poster






Now@
Content Sharing Application over NDN


Omar Aponte, Paulo Mendes
(omar.aponte, paulo.mendes)@ulusofona.pt




Research and Development in Cognitive and People-centric Computing



European Commission



Horizon 2020
European Union Funding
for Research & Innovation



Motivation

- Data sharing:
 - Highly successful applications such as Twitter and Dropbox.
 - Privacy issue - data stored by large corporations.
- Named-Data Networking:
 - A promising network infrastructure, with continuous growth.
 - May support a distributed service, without requiring a particular device to the present.

Objectives

- Contribute to the success of Named-Data Networking:
 - Now@ brings value and usability from the perspective of the end user.
- Allow exchange of data via NDN without centralized services:
 - Exchange information such as text, images and documents over NDN.
- Support data sharing with or without Internet connectivity:
 - Operate on top of NFD Android allowing data exchange via wireless Internet.
 - Operate on top of NDN-Opp allowing data to be exchanged even in the presence of intermittent connectivity.

Now@ High-Level Design

- Data synchronization:
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- Naming:
 - Prefixes are divided into four main components to specify: type of infrastructure; strategy to send data; prefix category; UUID.
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Synchronization Prefixes

Prefix	Category
/ndn/multicast/music/<uuid>	Music
/ndn/multicast/business/<uuid>	Business


Prefix per category

Prefix	Sequence number
/ndn/multicast/music/<uuid>/1	1
/ndn/multicast/business/<uuid>/2	2

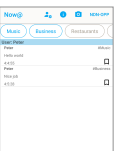
Prefix with sequence number

Now@ Operation

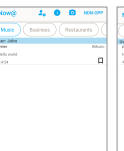
Interests subscription




Sending data




Data reception





**Get Now@
at
Google Play**



COPELABS
Tel.: +351 217505020
<http://copelabs.usulsofona.pt>
E-mail: paulo.mendes@ulusofona.pt

<http://www.umobile-project.eu>
Building U, first floor, University Lusofona Campus, Av. Campo Grande 388, 1749-024 Lisboa, Portugal

Now@ poster

To be presented during the poster section.
Wednesday 27th
Room: Foyer and SR055

Short Messaging over NDN: Oi! App



Oi is an Android application that allows users can send short messages over NDN without relying on existing Internet access or wireless infrastructure.

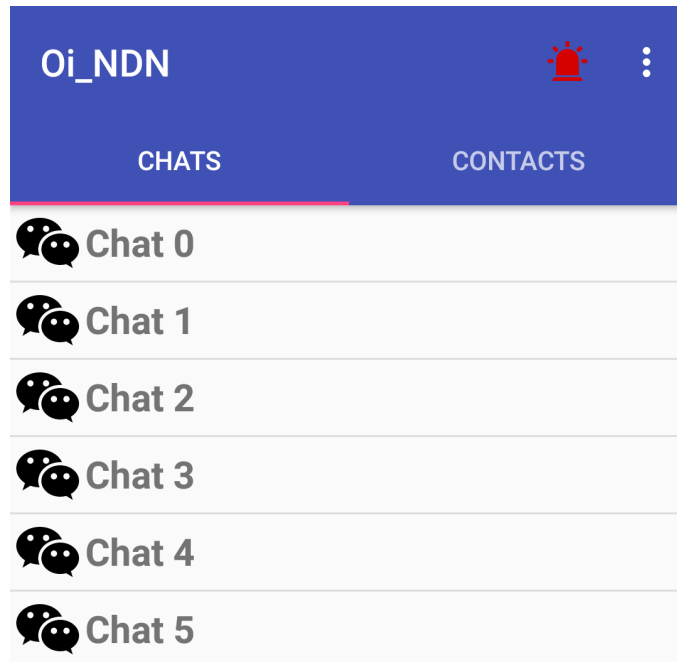
With Oi, users can:

- Send or receive short text messages directly from wireless peers.
- Preserve data shared.

Oi! Overview



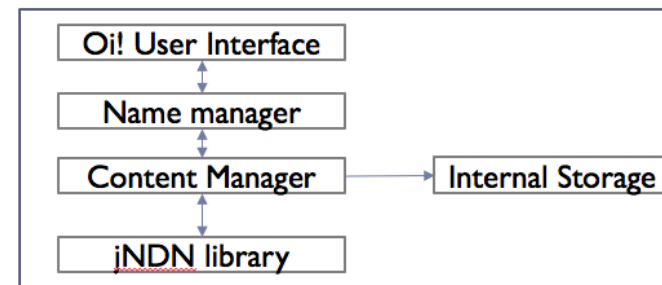
User interface design:



- Multiples Chats
- Contact information from contact list of the devices

High-level design:

- User interface: compose and read messages
- Content manager: handles sent and received messages
- Naming: prefixes are created with information of sender, receiver and conversation.
- jNDN library
- Contact list from the device is going to be used with the intention to identify the users



Oi! Next Steps



The following functionalities are going to be available in the next version of Oi!:

- Implementation of push model communication over NDN-OPP:
 - Long-lived interest.
 - Push data
- Messaging Acknowledge mechanism.
- Exploitation of Wi-Fi infrastructure and direct communications by using only NDN-OPP.

Usability of Oi! will be improved by:

- Evaluating app performance in the UMOBILE Lab.
- Performing field trial with users to verify user requirements.



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