UMOBILE ACM ICN 2017 Tutorial
Now@ and Oi! Applications

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Now@ Overview

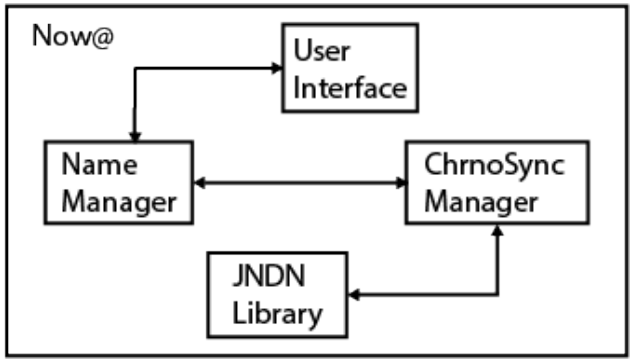
Now@ is an Android application which enables users to share data based on their interests over an NDN infrastructure.

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":"fkajhfjkadnfadkjfhadhndcksdhkashdfjasdhbasdncjsdjkhcaksdhmmasdklfamsdlfahsdkchsdhf
asdhfasdnadshmasdcasdkclahsdfjasdfhmachjdahdnagdcakjds",
"size":25,
"type":"text",
"user":"90",
"interest":"Music",
"date":"3:40:53","id":"521e55a7-d930-444e-b7cc-b02b47b4c9de2",
"segment":"45"}

Now@ Next Steps

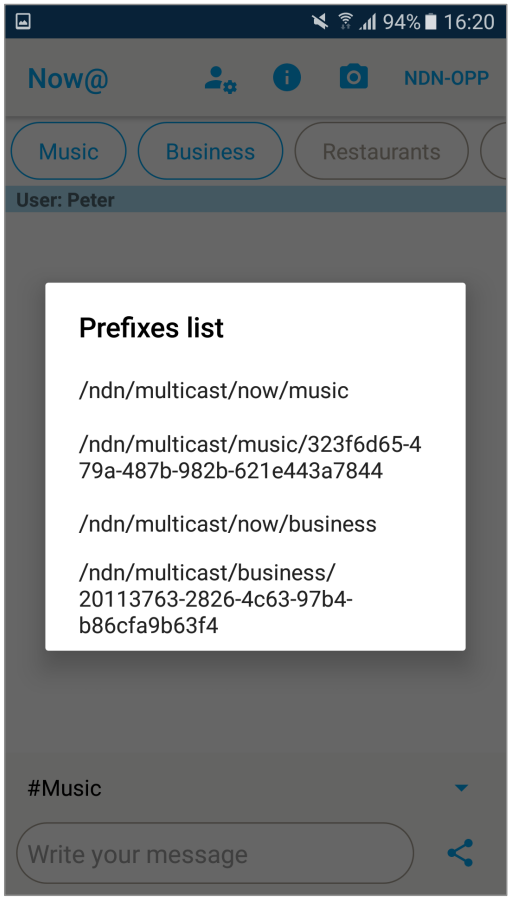
The following functionalities are going to be available in the next version of Now@:

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

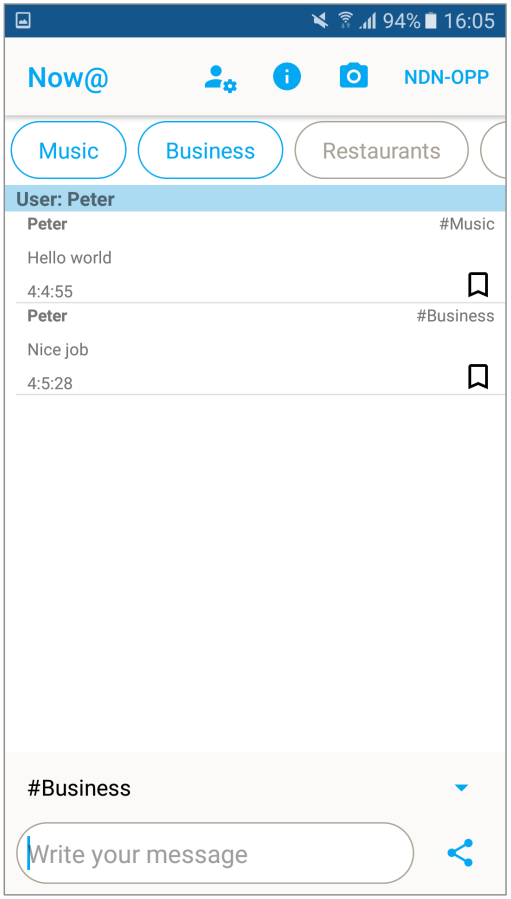
Usability of Now@ will be improved by:

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

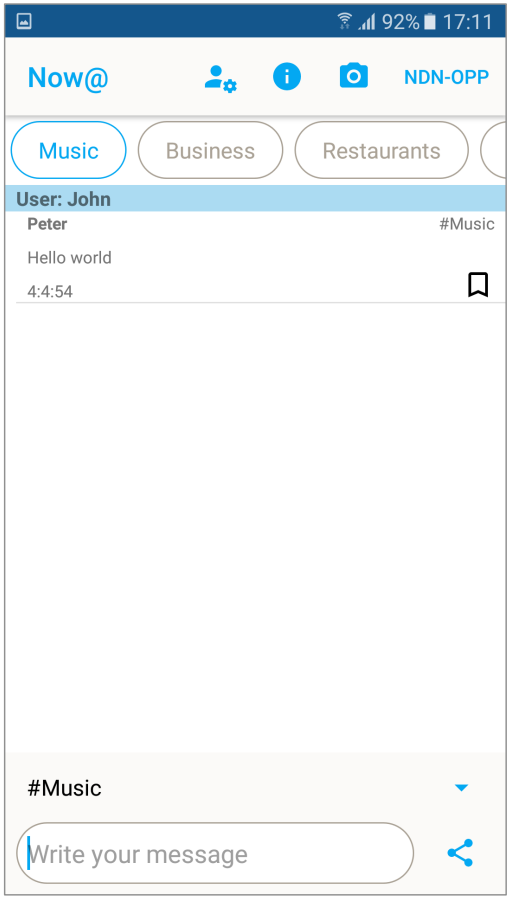
Now@ Demo



Interests Subscription

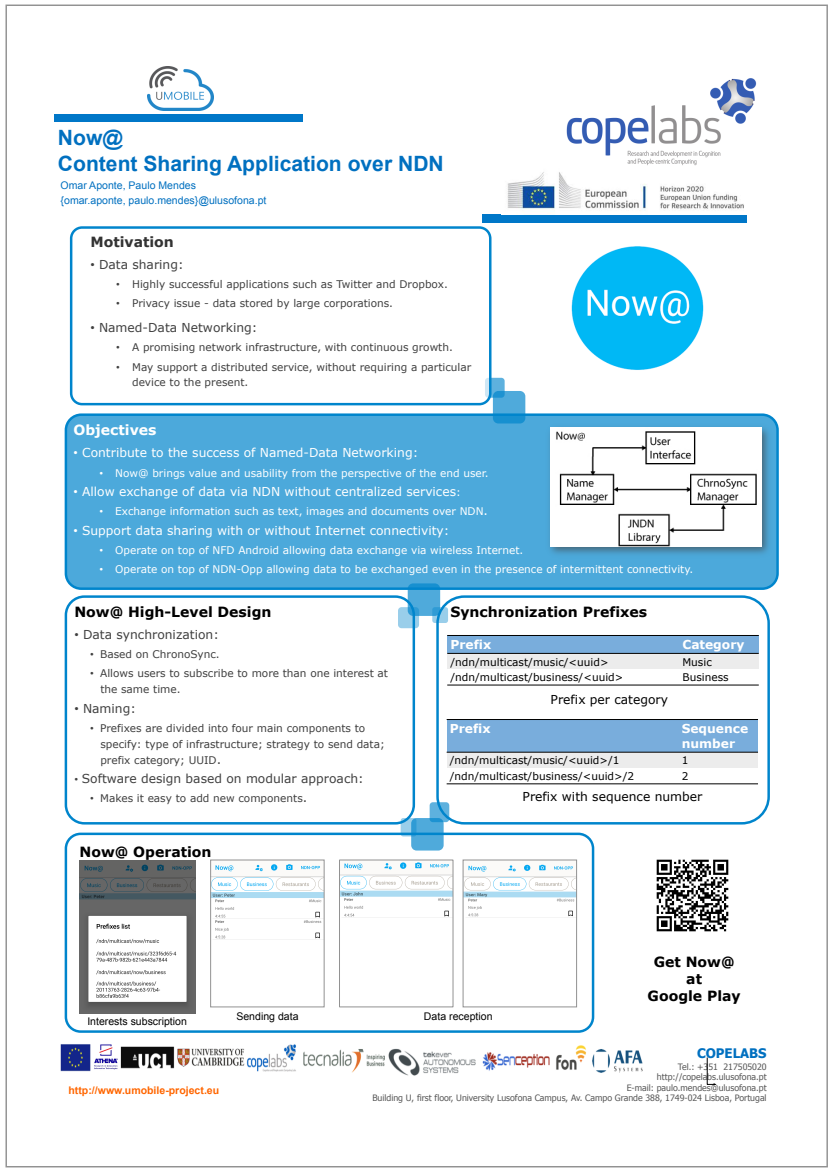


Sending Content



Content Reception

Now@ Poster



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Now@ poster

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

Short Messaging over NDN: Oi! App

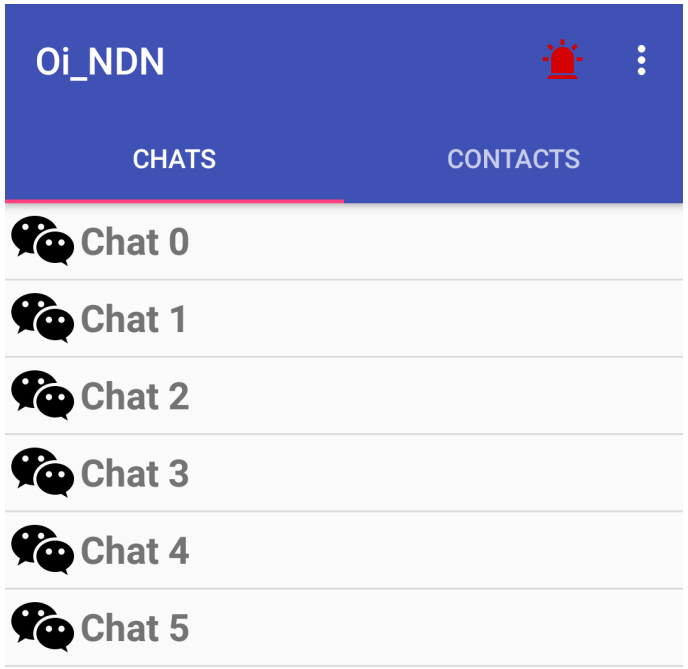
Oi is an Android application that allows users can send short messages over NDN without relying on existing Internet access or wireless infrastructure.

With Oi, users can:

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

Oi! Overview

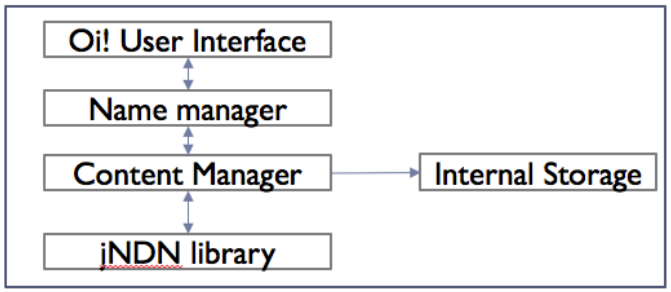
User interface design:



- 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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