MM Wireless distribution

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Music Distribution: an incoming future

- The digital music revolution was substantially driven by two main inventions (and distribution models)
  - P2P file sharing (Napster, first), and
  - online music libraries (iTunes, first)
- Wireless music is coming into the picture, new seamless services will make soon possible mobile music downloading a reality

Anywhere users

- MM distribution is exiting from traditional places and is becoming now an anywhere activity
- From Home or places devoted to entertain to:
  - Car
  - Flight
  - Just anywhere

Networks

- More than a fifth of American households has a high-speed, always-on, Internet access
- Anywhere entertainment services broadly exploit mobile technologies, such as:
  - Wireless 2,5 and 3 G: universality goal failed
  - 802.11 standards
  - WPAN & ad hoc networks

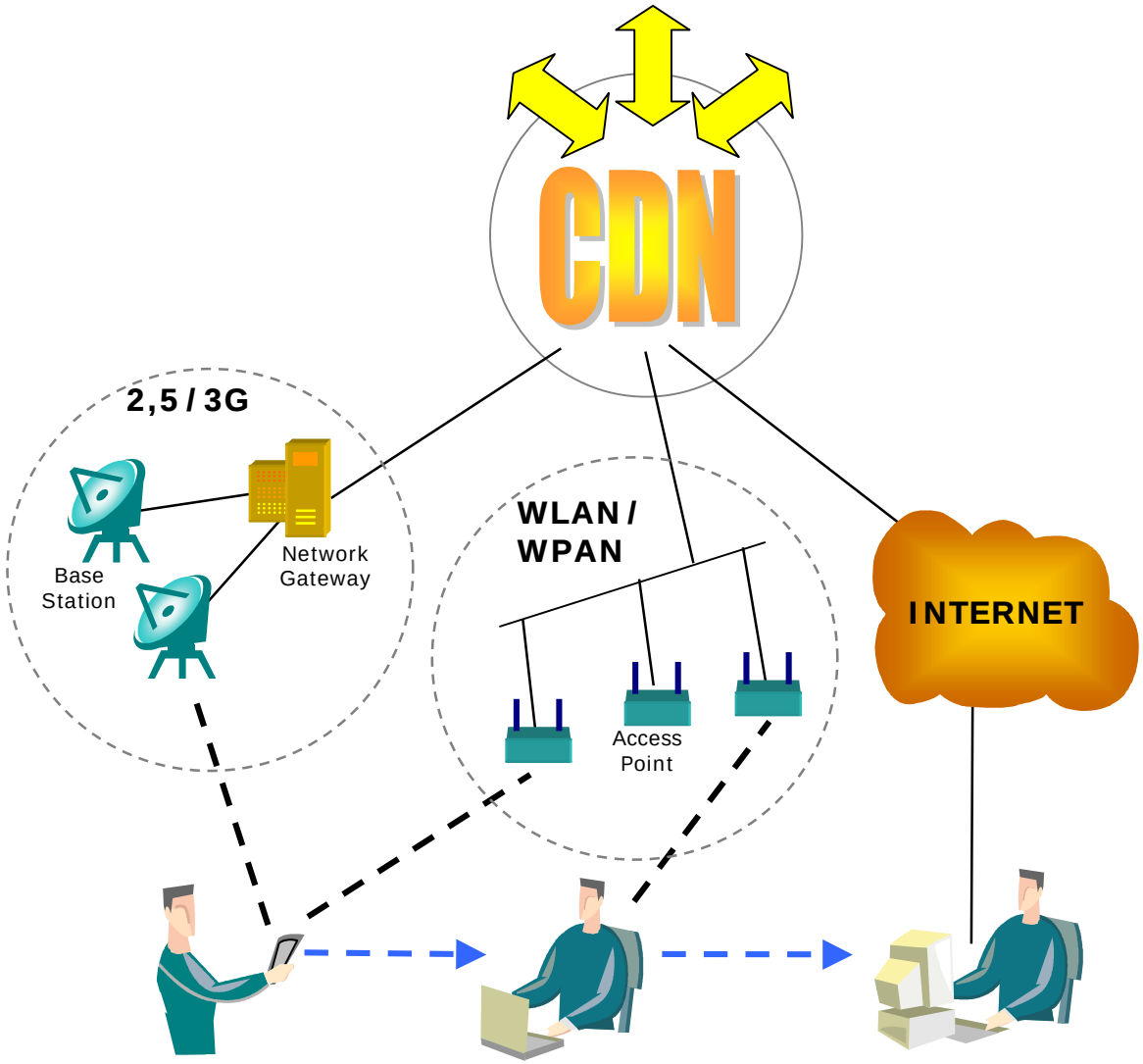
Seamless connectivity

- Seamless connectivity is an emerging issue
- A transparent switching activity (from a network to another) is needed to preserve service continuity.
- Different solutions have been proposed that reach continuity:
  - IP level
  - Transport Layer
  - Session layer

ABC

- ABC is an emerging model supporting mobile computing and its main issue is to offer to users the opportunity to choose the "*best*" connection regarding to his application context
- The system may switch not just to preserve continuity but also to guarantee (or improve) quality
- The word *best* is frequently used just to refer to bandwidth or delay but could be more generally related to a complex set of criteria that focus on the user's service perception

Nomadicity


CDN
2,5 / 3G
Base Station
Network Gateway
WLAN / WPAN
Access Point
INTERNET

Network connection

- Whishes list:
  - Automatically switch connection in case of network failure or handoffs
  - Automatically freeze a download, in case of total absence of available networks
  - Automatically resume a download frozen for total absence of network coverage
  - Automatically switch the download among different available connections, if some user-defined conditions are true
  - Froze a download, if required by the user
  - Resume a download intentionally interrupted, if required by the user
  - Transfer the download to a different terminal, if required by the user

Mobile music consumer: the new picture

- Simple future scenarios are :
  - **3G wireless** entry points to music delivery may offer a large collection of songs to authorized nomadic users
  - **WLAN** distribution services may works as digital music showers thus extending the reach to Web-based music delivery on a local basis
  - Bluetooth (or similar ad hoc wireless network technologies) may enable further **WPAN**-based music sharing opportunities on a personal basis (opportunistic music communities)

What about distribution models?

- New models are emerging that mixes P2P and centralized mechanisms:
  - People uses peer exchanges when is simple and quick (i.e. I meet a friend who gift me a song by transfer it directly from his player to mine)
  - People uses centralized system when is simple and quick (i.e. I want to listen to a new song and I use an I-tune like service to transfer it on my player)

Conclusions

- From traditional music distribution mechanisms to very complex environments, where users are:
  - Still moving and still connected
  - Doing something
  - Meeting (and sharing) together
- For music distribution, technology is ready and users too.
- What about more complex MM?
  - Adaptivity
  - Streaming/downloading
  - …