



ITU-T Kaleidoscope Conference Innovations in NGN

Architecture and Business Model of Open Heterogeneous Mobile Network

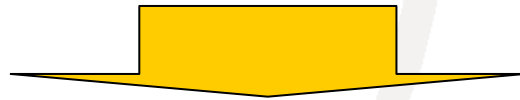
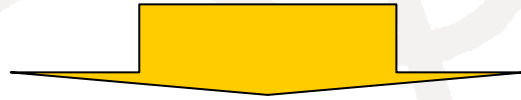
Yoshitoshi Murata
Iwate Prefectural University
y-murata@iwate-pu.ac.jp



Geneva, 12-13 May 2008

Purpose (1/2)

- How to continuously develop the mobile communication business?
 - Create **new markets** and raise them.
- Add an **open market model** to the vertical integration model for more competition.
- Develop a flexible mobile network which is suited for an open market model.



?????

Purpose (2/2)

- Open Heterogeneous Mobile Network
OHMN
 - ➔ OHMN business model
 - ➔ OHMN network architecture

Requirements for OHMN

■ Mobile Business Revitalization Plan by MIC

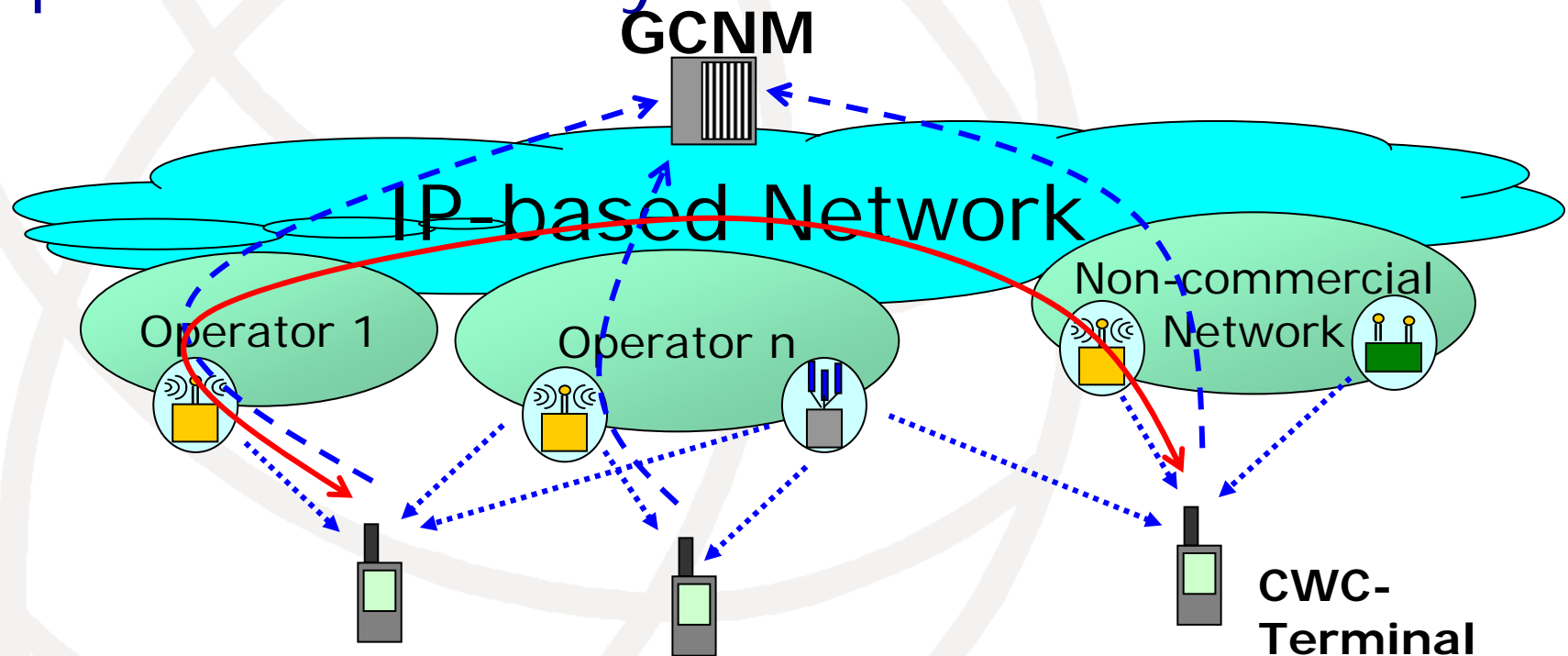
- Reconsider the sales model used for mobile terminals.
- Promote the entry of new mobile virtual network operators (MVNOs).
- Prepare a market environment to protect consumers: an authoritative for fee comparison and advice, etc.

■ Additional proposals

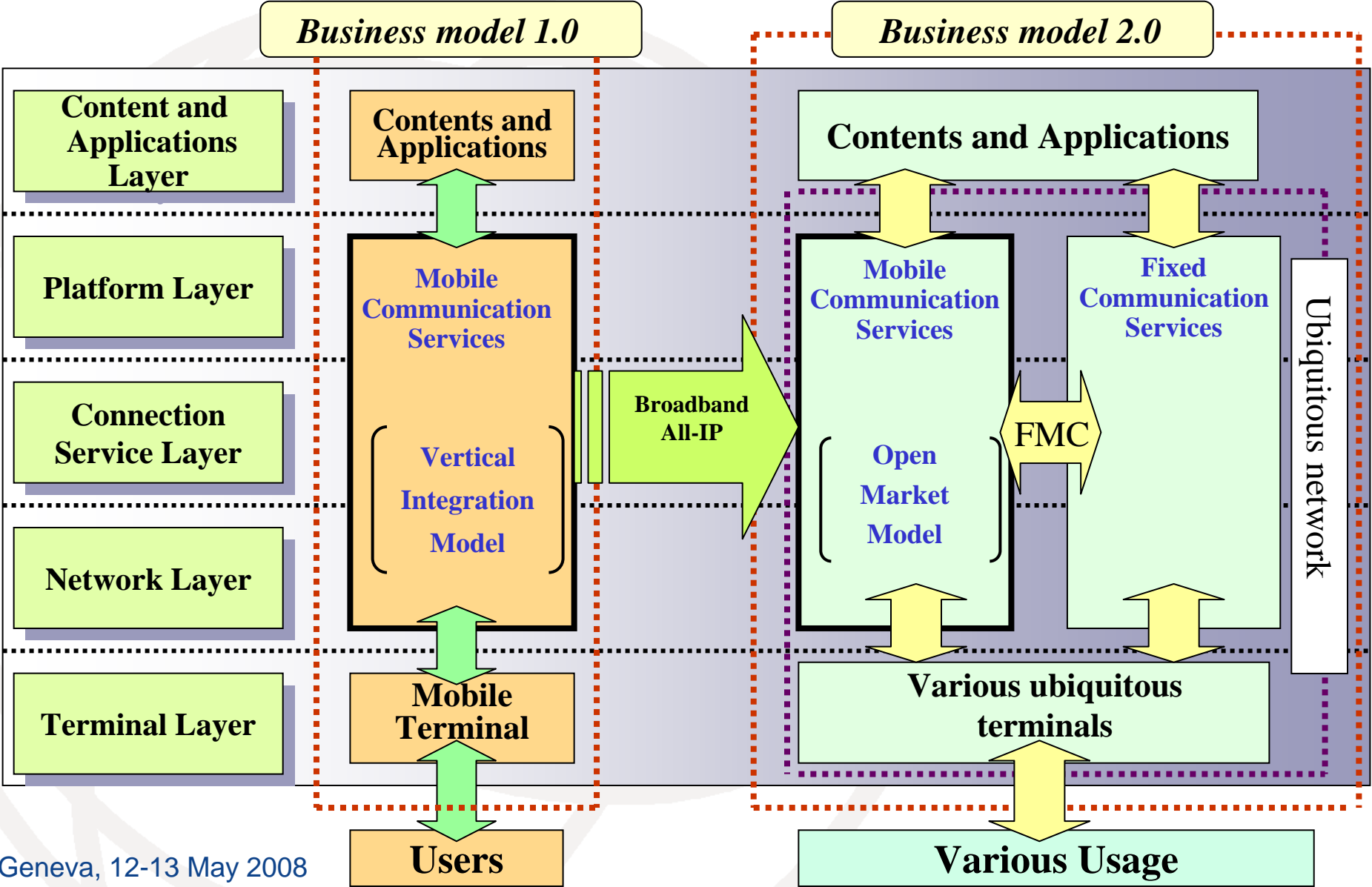
- The charging business should be separated from other service provision businesses to open up all layers to new business models.
- Each user should be able to connect his or her mobile terminal to a multiple access network, regardless of the network provider and radio system, depending on the user's current circumstances. ➡ **Cognitive Wireless Cloud**

Cognitive Wireless Cloud

- Choosing an operator and a base station for each communication based on a user's policy
- Terminal initiative connection control
- Spectrum efficiency



MIC Mobile Business Layer Model



Problems to realize an OHMN(1/2)

- Who keeps confidence of newcomers?
- Who keeps service quality of businesses?

 **Some supervising entity**

- Who and how manages the location of each terminal?
- Who provides a node gathering and storing information regarding open radio channels, available QoS, etc.?

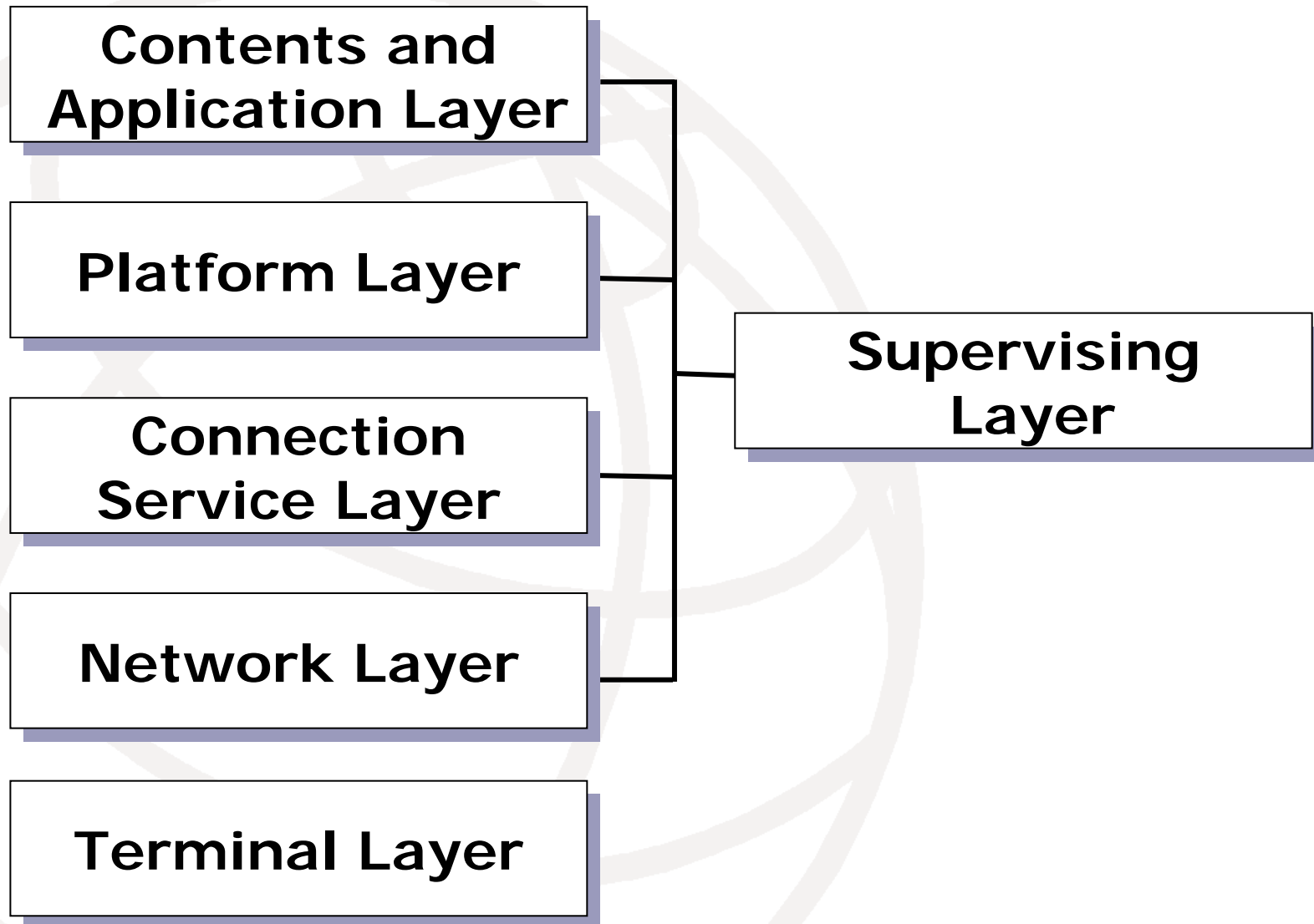
 **Connection service layer**

Problems to realize an OHMN(2/2)

- Who assigns a terminal ID to establish a session?
- Who registers each user, checks user's credit-worthiness and charge user?

 Platform layer

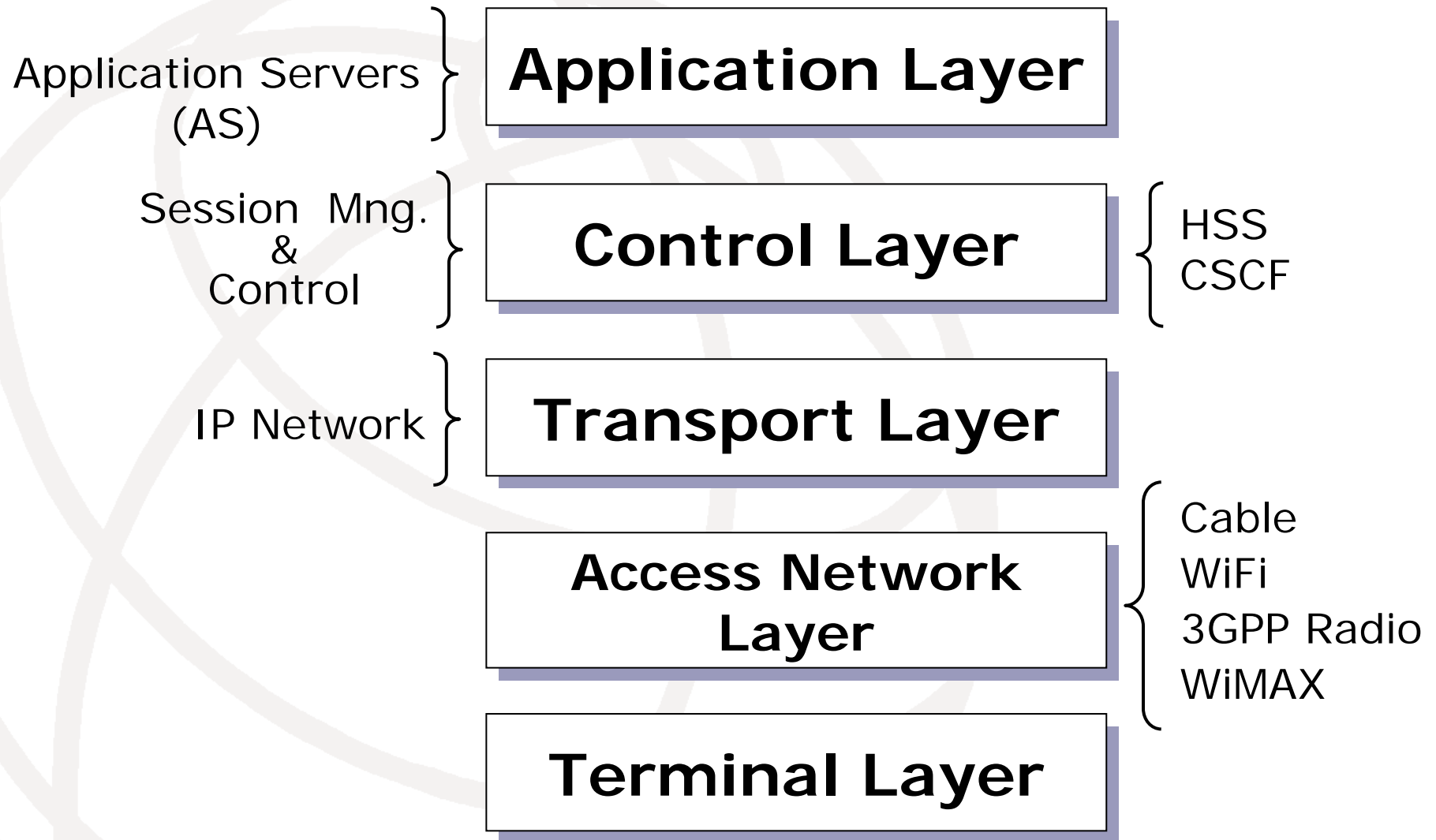
OHMN Business Layer Model



Geneva, 12-13 May 2008

First ITU-T Kaleidoscope Conference – Innovations in NGN

Layer Model of TISPAN-NGN



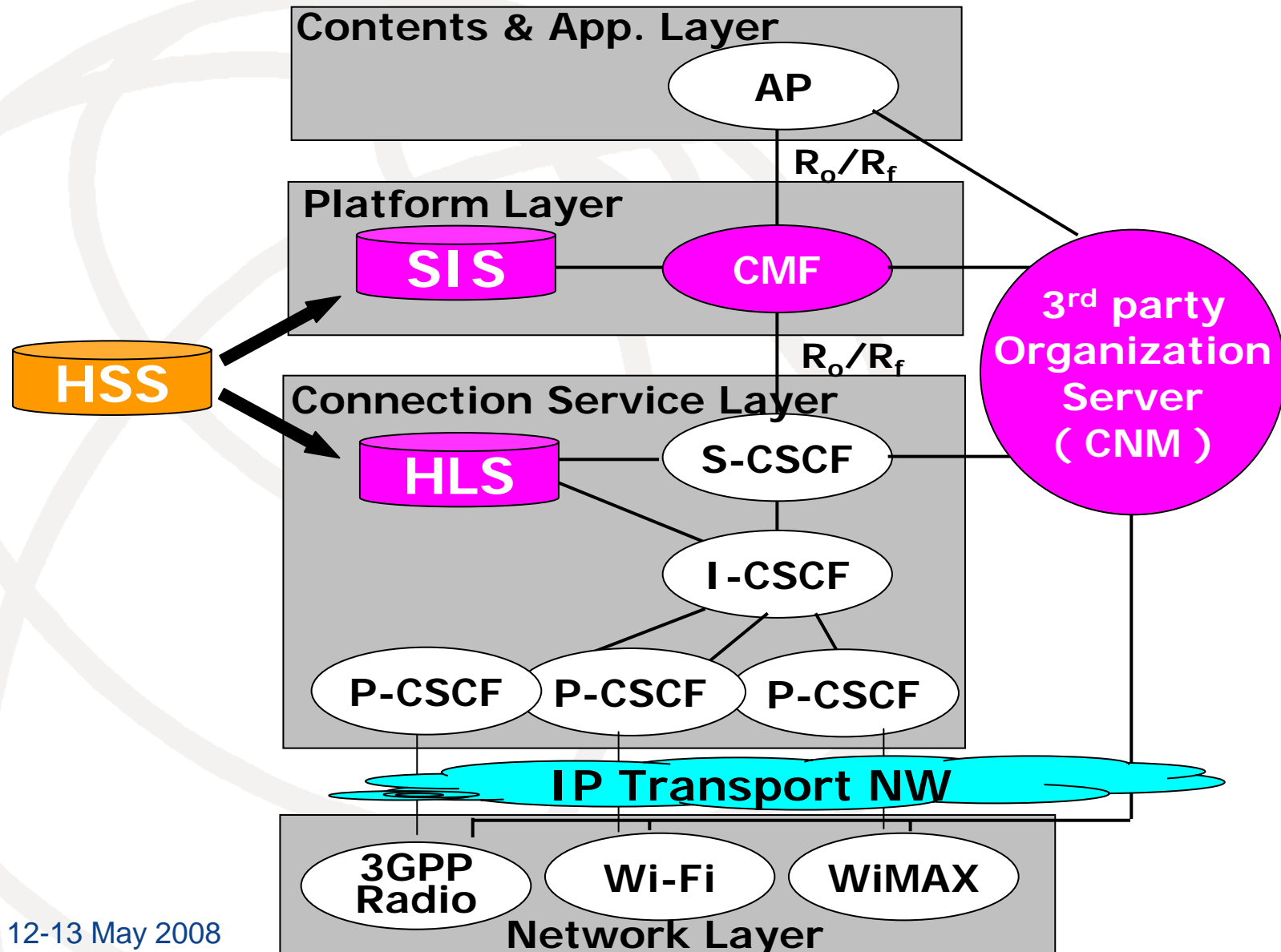
Geneva, 12-13 May 2008

First ITU-T Kaleidoscope Conference – Innovations in NGN

Differences between OHMN layer model and TISPAN-NGN layer model

| | OHMN layer model | TISPAN-NGN layer model |
|--|--|---|
| Business model | Open horizontal divided model | Vertical integrated model |
| Authentication & Session management | Both of them are divided | Both of them are integrated |
| Charging | Integrated with the authentication entity on the platform layer | Out of TISPAN-NGN |
| Information disclosing | Disclosing | Depending on each operator' manner |

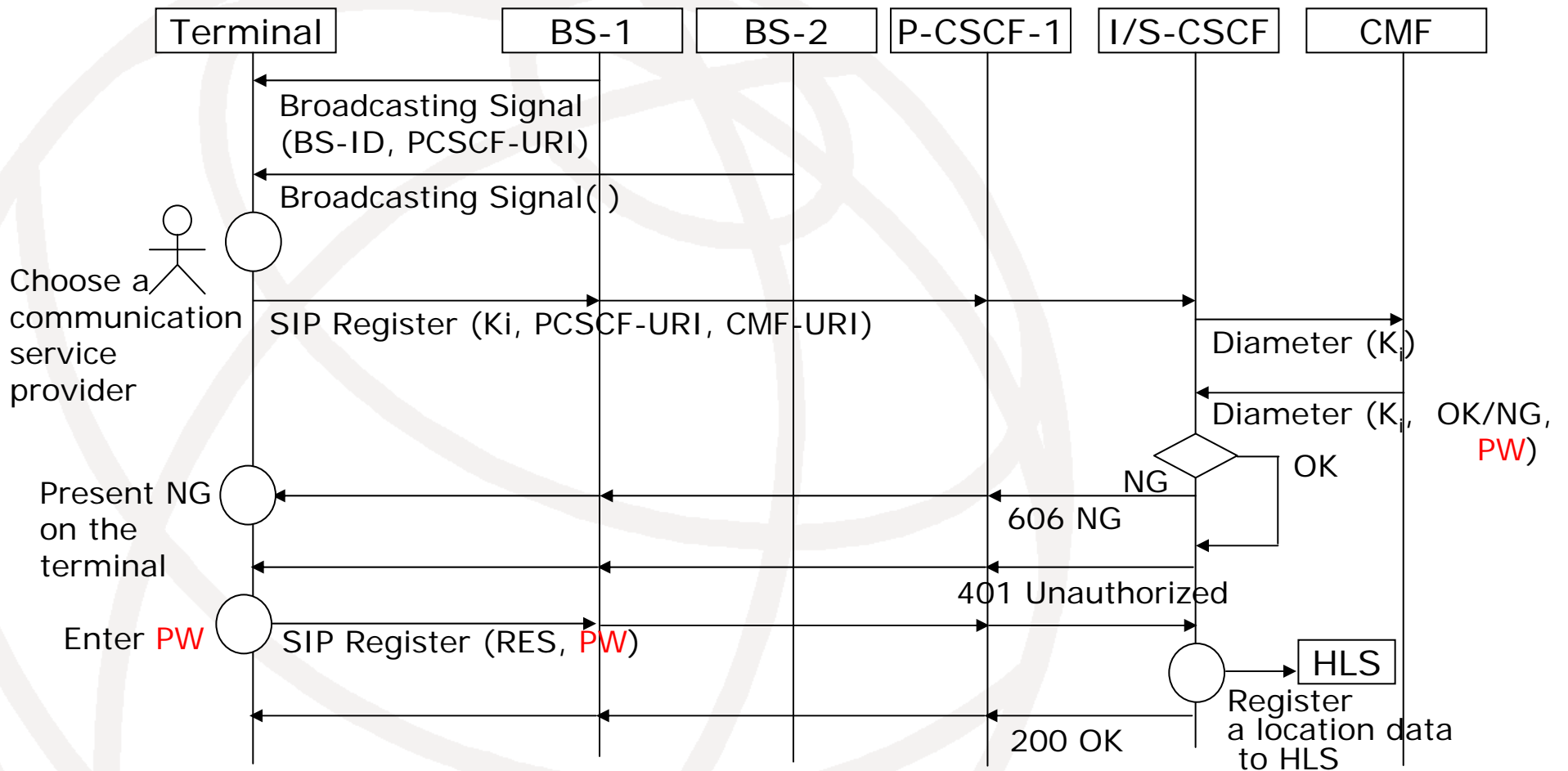
Network Structure of OHMN



Geneva, 12-13 May 2008




First ITU-T Kaleidoscope Conference – Innovations in NGN

Control sequence how to choose a BS



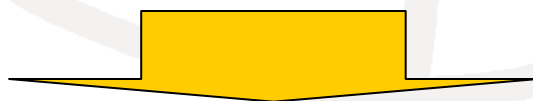
K_i : Individual Subscriber authentication Key

Relationship between service providers

| | Major Communication Company | Small Network Carrier & MVNO & AS | Small Network Carrier & AS |
|------------------------------|---|---|---|
| Platform Layer | Major Comm. Carrier | CMF | |
| Contents & Application Layer | AS-1 | AS-1 | AS-1 |
| Communication Service Layer | Major Comm. Carrier | MVNO | |
| Network Layer | 3GPP Wimax ... W-LAN ... | Wimax W-LAN ... | W-LAN |
| Terminal Layer |  |  |  |

Conclusion

- OHMN
 - will open up the mobile market.
 - makes it easier for newcomers to develop innovative terminals and services.
 - will also encourage the creation of many new business models and services.
- It would be easy to realize based on TISPAN-NGN.



- Users should be able to enjoy these benefits at reasonable rates.
- OHMN should generate a positive spiral of activity in the mobile market.