Charging in multiservice IP networks

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Agenda

- Background
- Objectives of the thesis
- Multiservice IP networks
- Charging in multiservice IP networks
- Call cases
- Conclusions

Background

- A single (mostly) IP based infrastructure for different telecommunication services is evolving.

- There was a need for better understanding of charging in this new environment.

Objectives of the thesis

- To study charging in multiservice IP networks concentrating on the analysis of possible charging models and the available service utilisation information from a live test environment.

- The scope is limited to fixed networks.

- Charging of the end customer.

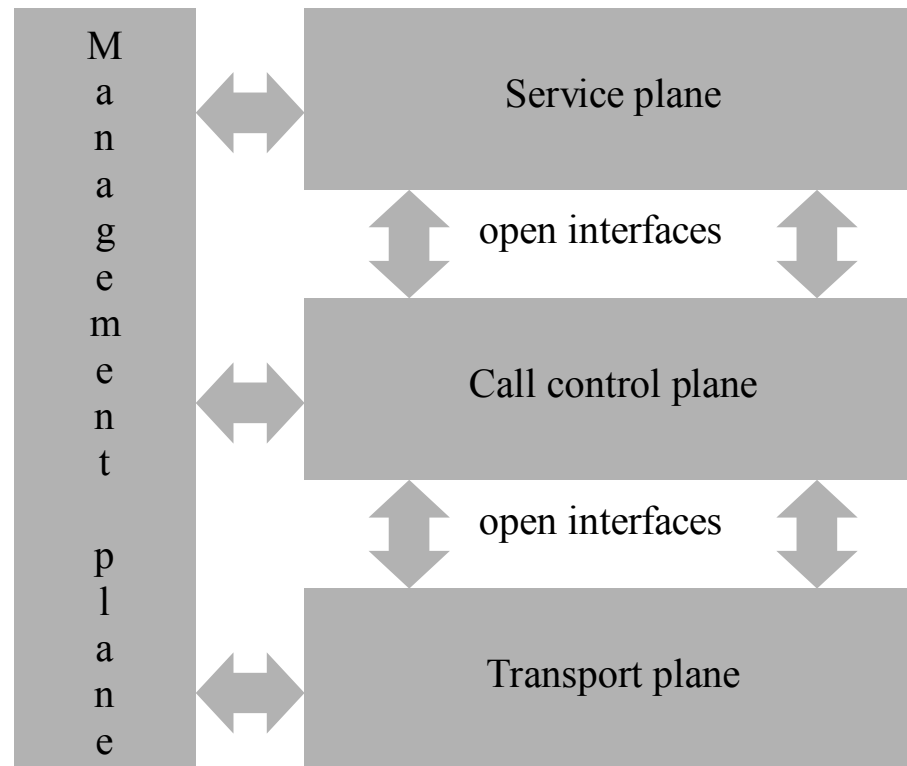- Literature and analytical study.

Evolution towards multiservice IP networks (1)

- The currently separate IP, fixed line and mobile networks are converging towards a single combined infrastructure over which all telecommunication services, voice and data transport as well as a wide range of new services, are offered.

- An IP packet network will be used as the backbone for carrying the traffic, including that generated by real-time applications.

- The concept is often called Next Generation Network (NGN).

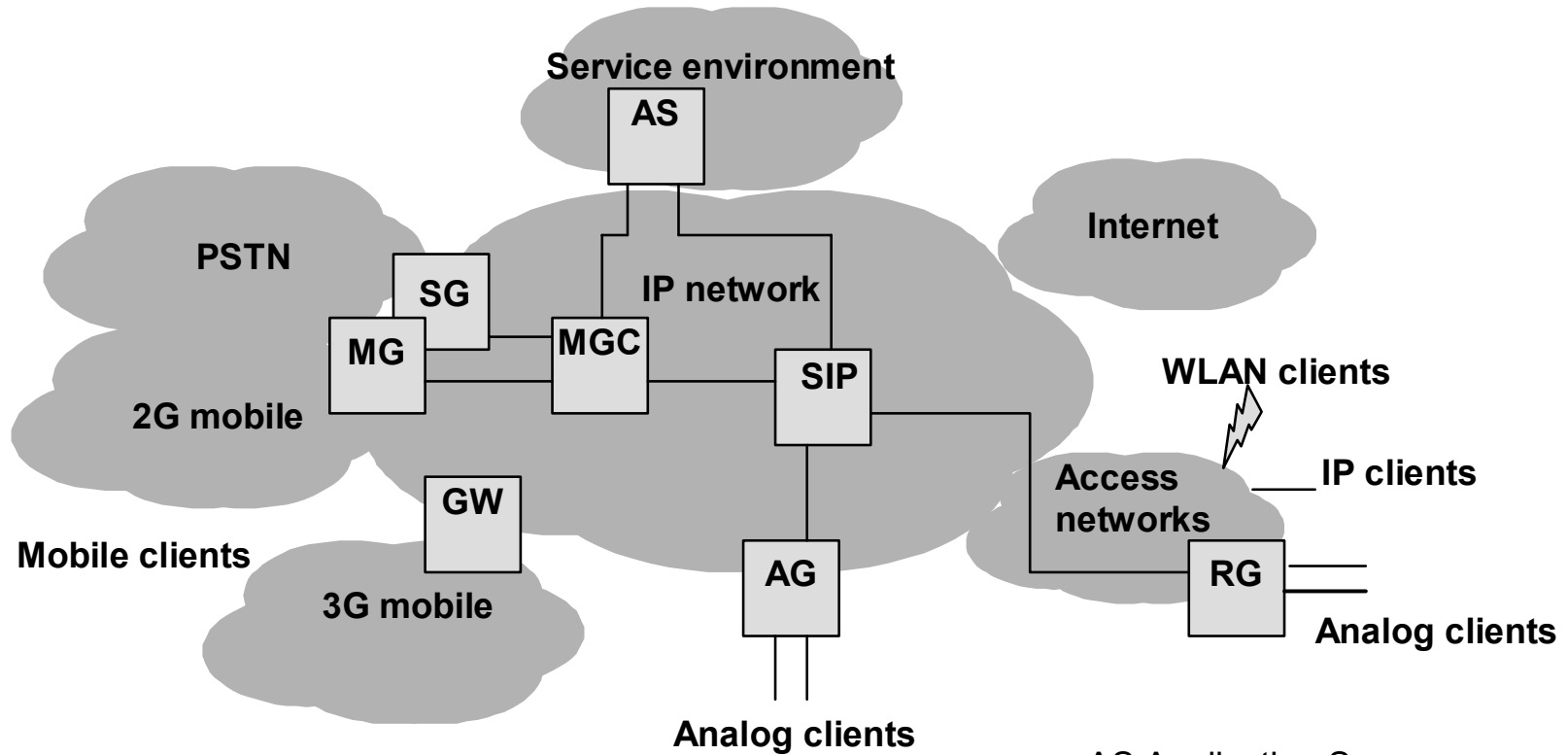# Evolution towards multiservice IP networks (2): Drivers

- Development in IP technologies have made it possible to offer real-time traffic over packet networks.
- A single network is expected to become cheaper than separate networks.
- The architecture uses open interfaces. An operator can choose the most suitable components on the market.
- Open standardised Application Programming Interfaces (API) benefit service creation.
- The integration of voice transmission and Internet technologies is considered to provide possibilities for interesting new services.

Three layered model

(International Softswitch Consortium)

Next Generation Network

Service environment
AS

Internet

PSTN

SG

IP network

MG   MGC

2G mobile

SIP

WLAN clients

IP clients

Mobile clients

GW

Access
networks

3G mobile

AG

RG

Analog clients

Analog clients

AS Application Server
MG Media Gateway
SG Signaling Gateway
MGC Media Gateway Controler
GW Gateway
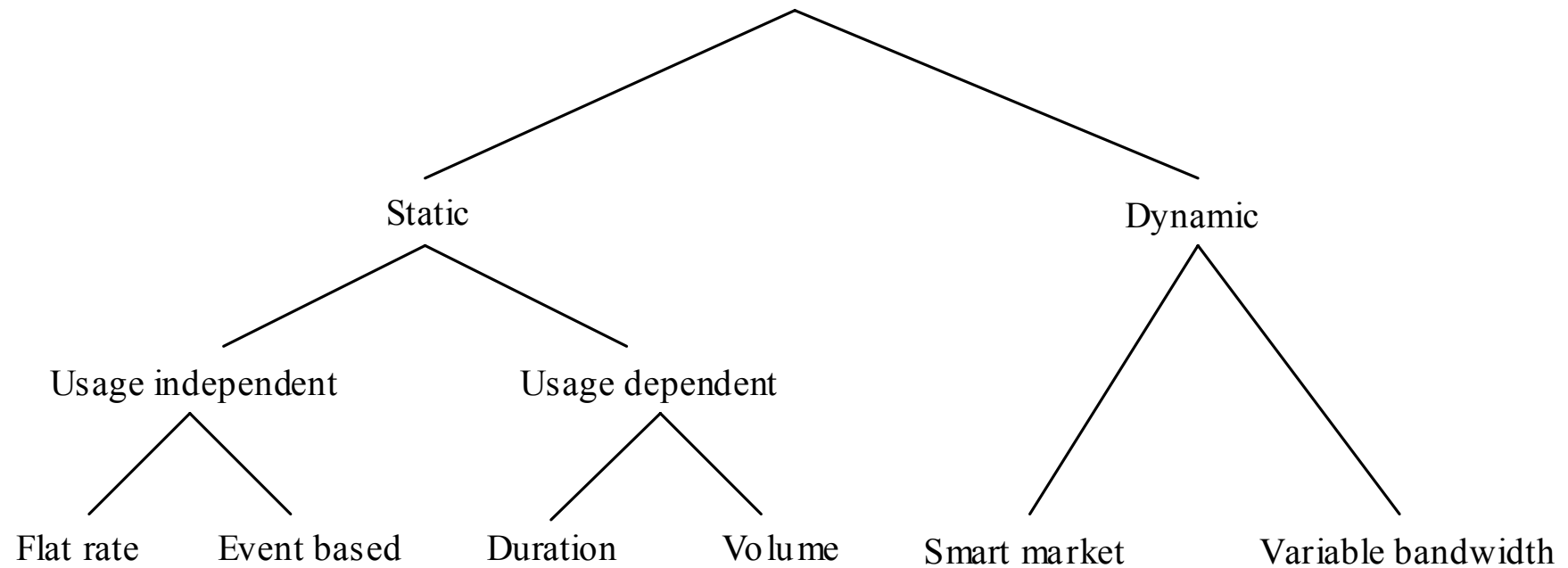AG Access Gateway
RG Residental Gateway

Services

- Conversational services
- A wide variety of value added services
- Content
- Data retrieval services

# Reference model for charging
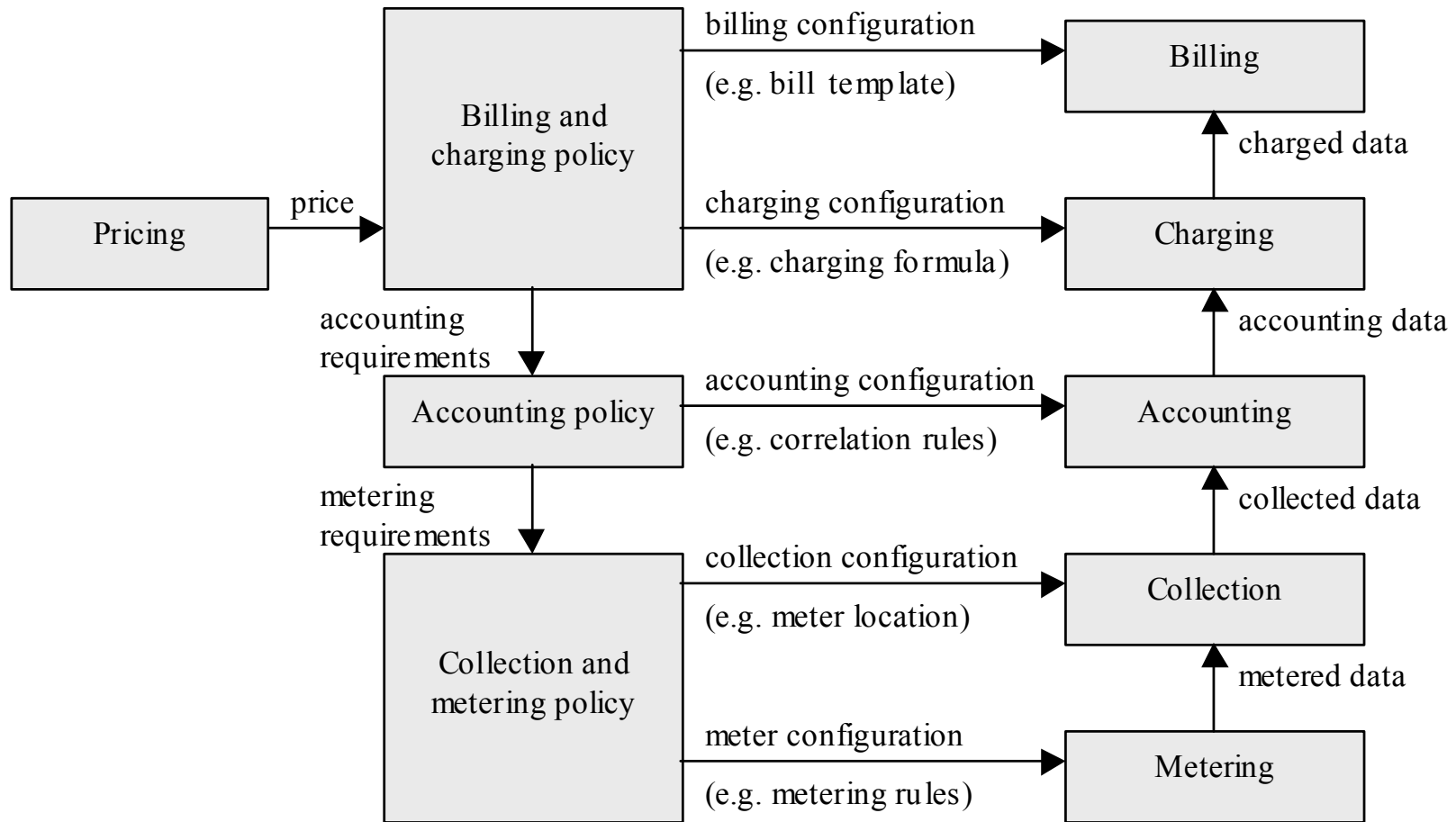
(Carle et al.)

Classification of charging models

```
                                  │
                    ┌─────────────┴─────────────┐
                  Static                      Dynamic
              ┌─────┴─────┐                ┌─────┴─────┐
      Usage independent  Usage dependent  Smart market  Variable bandwidth
      ┌─────┴─────┐      ┌─────┴─────┐
  Flat rate  Event based  Duration  Volume
```

Charging model considerations for conversational services

Charging model/ Evaluation criteria	Flat rate	Event based	Duration	Volume
Understandability	high	high	high	low
Predictability	high	medium	medium	medium
Ease of implementation	high	high	low	medium
QoS compliancy	low	low	medium	high
Usage sensitivity	low	medium	high	high
Possibility for congestion control through pricing	low	medium	high	high

Case1: Session between two SIP clients
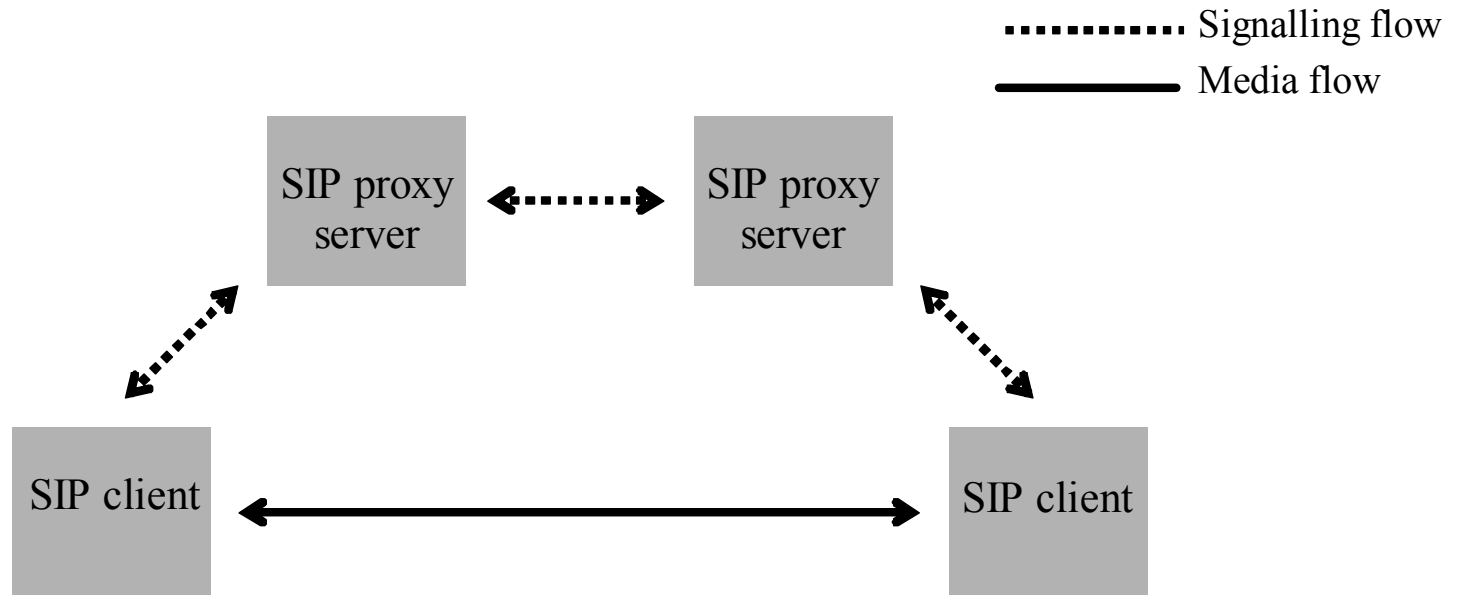
Case2: Call from SIP client to PSTN subscription
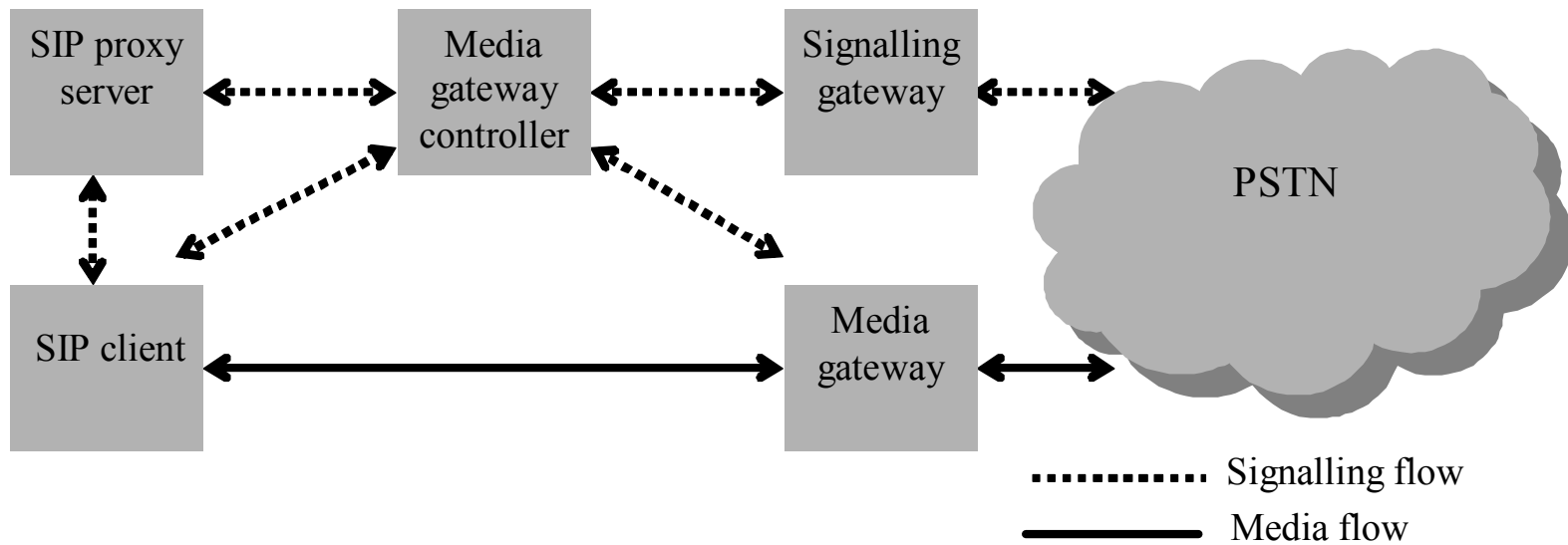
Conclusions

- No single charging model is the most suitable for all services, so it is likely that a variety of models and their combination will be seen.

- Complete understanding of a session can require considerable collection and accounting of information. This could be accomplished by a device similar to the mediation solutions used in existing networks.

- The reliability of service utilisation information can be an issue.

- The analysis of call cases suggest that the current generation of NGN elements is still to some extent immature.

Questions?

Thank you