Country Presentation: Telefónica, Spain.
NGN Charging

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01 NGN Charging capability: main goals.

- **Next-generation networks (NGNs) offer the convergence of fixed and mobile telecom services and data networks.**

- **Charging capability in NGNs will handle charging associated to all sort of services and applications rendered to the end-user.**

- **Main challenges:**

  — *Services are independent of access technology.*

  — *Generalized mobility, among different access technologies: it allows an ubiquitous provision of services to users.*

  — *Customized services and promotions per subscriber. These promotions could apply simultaneously to services supported over legacy and new access technologies.*

  — *Maximum flexibility and minimum time to market to face new business models.*
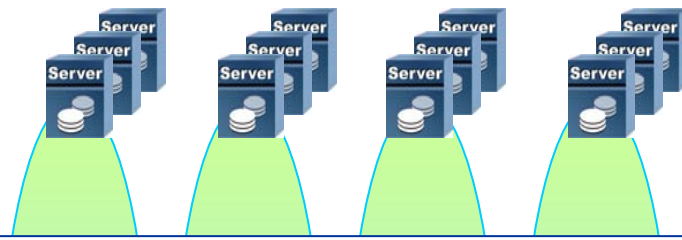
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01 NGN Charging capability: main goals.

- NGNs bring the operator a big opportunity: to evolve current networks as well as to offer new innovative services.
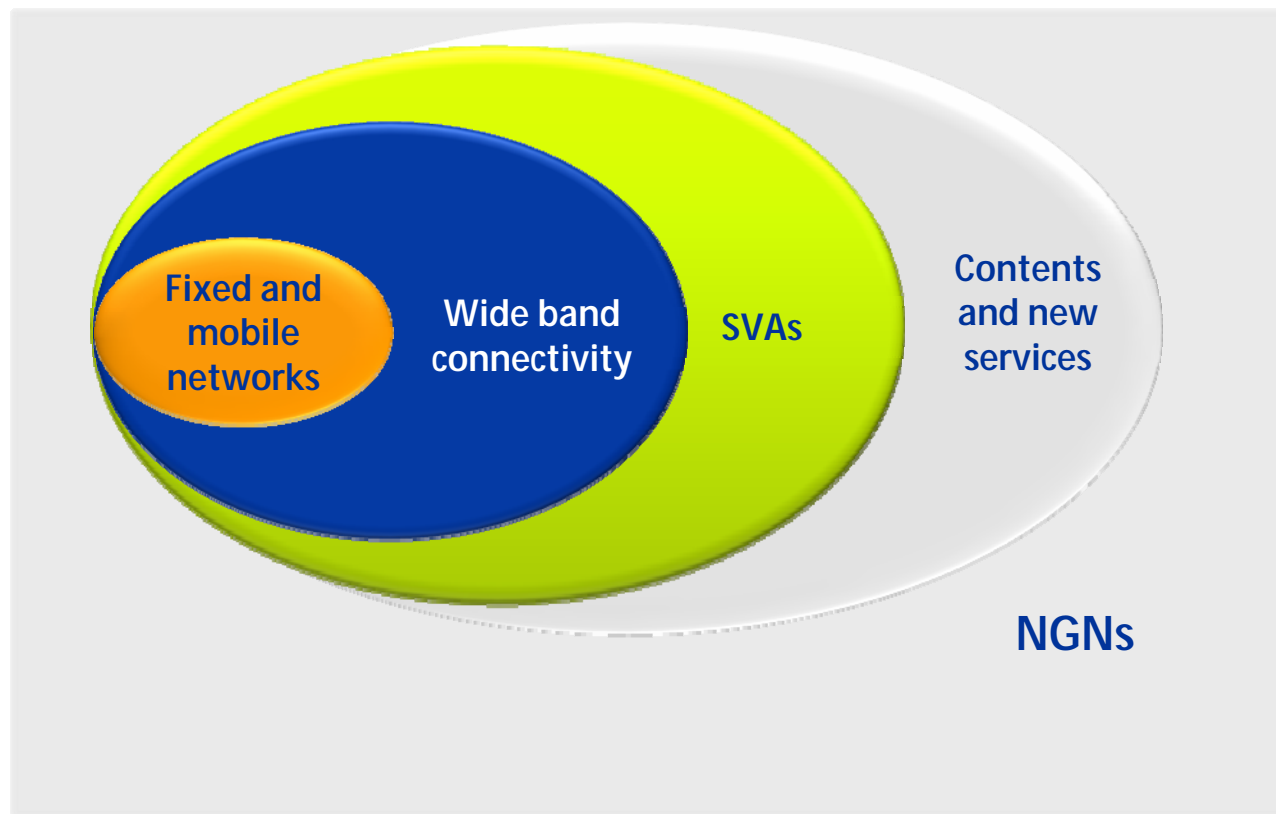
01 NGN evolution

Before NGN
Not a cross-service model !!
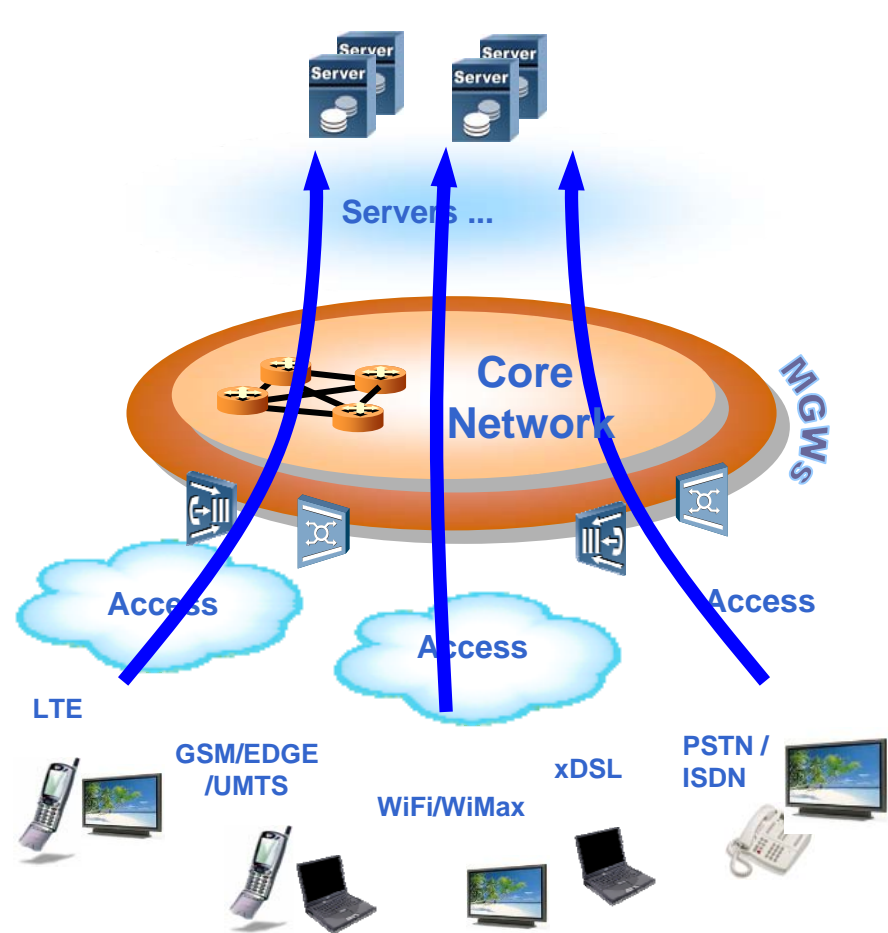
Services   Services   Services   Services

Services are specific for each access.

For each access it existed a specialized billing.

PSTN

NGN
Service Model independent of access

Services and Contents

Servers ...

Core Network

MGWs

Access

Access

Access

LTE

GSM/EDGE /UMTS

WiFi/WiMax

xDSL

PSTN / ISDN

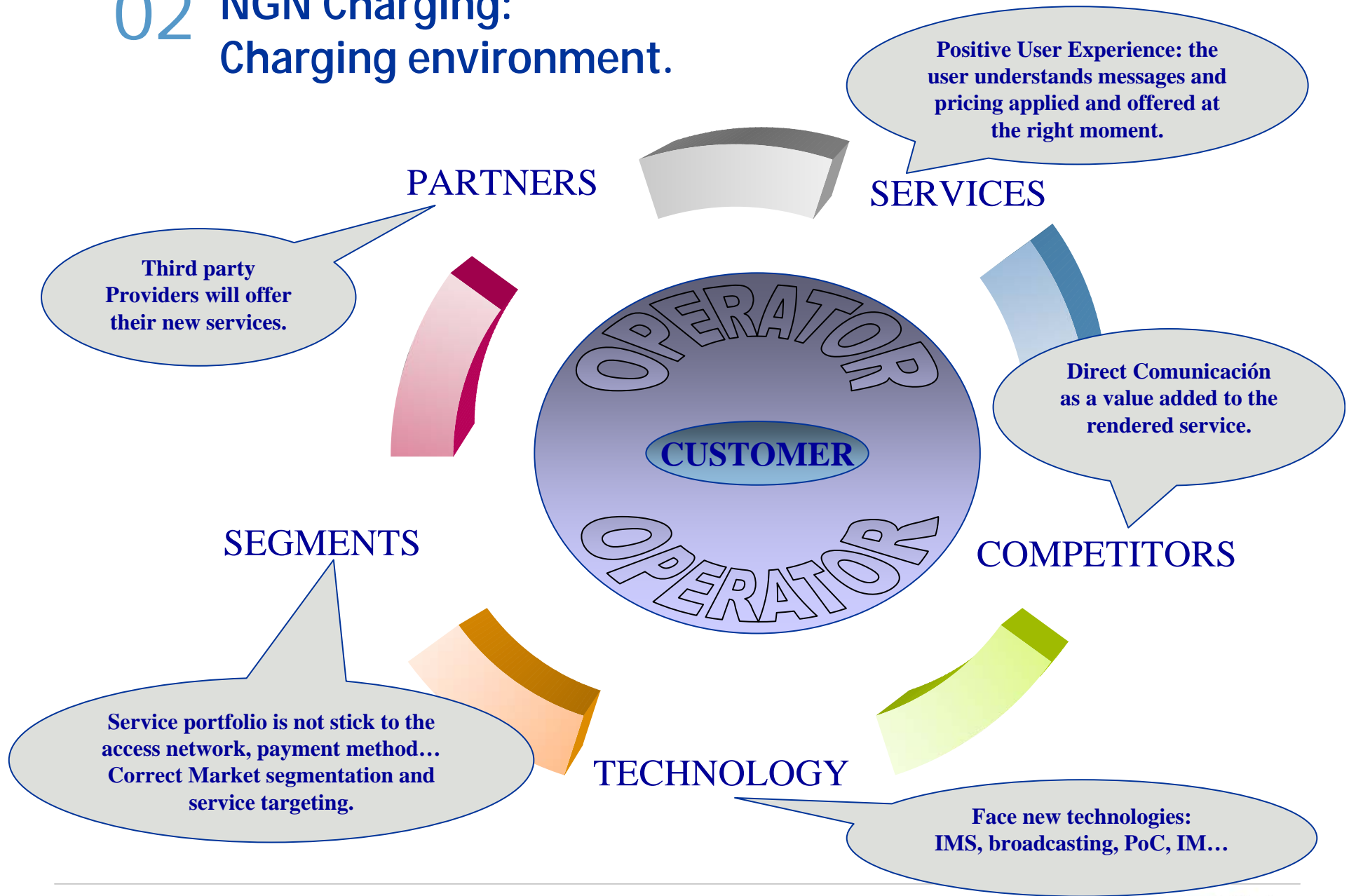# Contents

02 NGN Charging: main dependencies.

- **Numbering scheme**
  - tied neither to the access network nor to the service.

- **Access network used**
  - Services will be rendered regardless of access network but the access type could be an input to the rating engine.

- **Mobility, Service and session Continuity**
  - Charging/billing record may be adjusted depending on the type of access and the bandwidth used. In case of session continuity (e.g. change of access networks) the charging systems should provide a single record for a dedicated session.

- **Terminals with different user profiles.**
  - The user can switch among different profiles and charging should be applied according the type of terminal and the selected profile.

- **E2E QoS applied.**
  - QoS should be supervised all the time and charging decisions should be taken. Different e2e QoS applied will entail new charging models.

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02 NGN Charging: main dependencies.

- **Time Zone,**

- **Location,**

  - Fixed and mobile merge could imply different charging depending on location, e.g. home zone service.

  - The customer, if using a mobile phone, should be informed about the rate it will be applied.

- **The specific service or flow activated within a specific bearer for a specific session.**

  - Deep packet inspection capability to accurately identify a service flow.

  - Simultaneous charging at different levels (e.g. GPRS and IMS).

  - Correlation should be applied to avoid overcharging the end-customer.

- **Provide all the information needed in order to show the end-users all their activity whilst the session.**

- **Online vs offline control.**

  - Tied to the access network? Services should be the same and should be completely independent of the payment method.

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03 NGN Charging. NGN charging requires a special rating engine.

- **This rating engine should be able to charge and correlate different sessions spread simultaneously among different associated bearers for the same subscriber.**

  - Therefore, Charging Correlation among different charging sources located in different layers

- **Have a rating engine able to apply different charging schemes, simultaneously in the same session for the same subscriber.**

- **The mid-session renegotiations have to be handled and charged accordingly.**

- **Depending on operator's policy: charging limit definition, i.e. the maximum amount the user is willing to pay for a specific NGN service or for a set of services.**

  - Solution based on several account consumption Counters with Accumulated cost for each type of traffic/service flow.

  - Different types of account control, static per counter or dynamic (on demand), applicable to each counter: informative, Restrictive without blocking, Restrictive.

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03 NGN Charging. CDR generation.

■ **Per session, a CDR is generated with Session information and customer status. Among others, main parameters are the following:**

— Account consumption meters status.

– Be careful, mainly in data volume counters, with counter roll-over !!

— If several charging periods or promotions have been applied in the same session, a different container is generated for each one, with all accounting and charging details: units sent/received, time stamps and Charging criteria identification.

— Same applies to renegotiations and any mid-call event: each one should be recorded in different containers, with traffic descriptions, affected flows, QoS if applied.

— CDRs coming from access network (and processed by Billing System) or coming from online charging systems?

– Anyway, some control information could be put in access network CDRs (FurnishChargingInformation procedure)

03 NGN Charging. Charging Duality: Real time charging versus offline charging (I).

- **A billing system for offline users? And an Online Charging System for online users?**

  — Information regarding the usage of network and application resources is reported to the billing system AFTER using them.

    When Online control is applied, the resource control applies at the same time the service is granted, checking before granting service if the user has enough balance to access the service or destination required, bringing the appropriate announcements and messages depending on the user profile.

  — Offline control is CDR processing based.

    When online control is activated, Network or service enablers meter the resource usage, and they will report this information in real time. Accuracy is guaranteed and information about the consumption can be provided just before/middle/after rendering the service.

03 NGN Charging. Charging Duality: Real time charging versus offline charging (II).

— When offline control is used, Subscribers can use IVR or web to check their month's consumption. But source of this information are the CDRs transferred from network or enablers and processed by the billing system till the moment the subscriber consults. This process could imply much more latency compared to online control and therefore the information provided is not accurate.

> With Online control, subscribers can also use IVR or web to check their consumption, but exactly till the moment the subscriber consults.

— Charging service models based on "Point in Service" policy do NOT apply when offline charging is used.

> With online charging, online interaction are to be used: the subscriber can consult the price the service will be rendered, taking into account that this price can be bundled to specific promotion and his consumption.

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03 NGN Charging.

- In NGN networks, IMS becomes the common control system, regardless the access used.
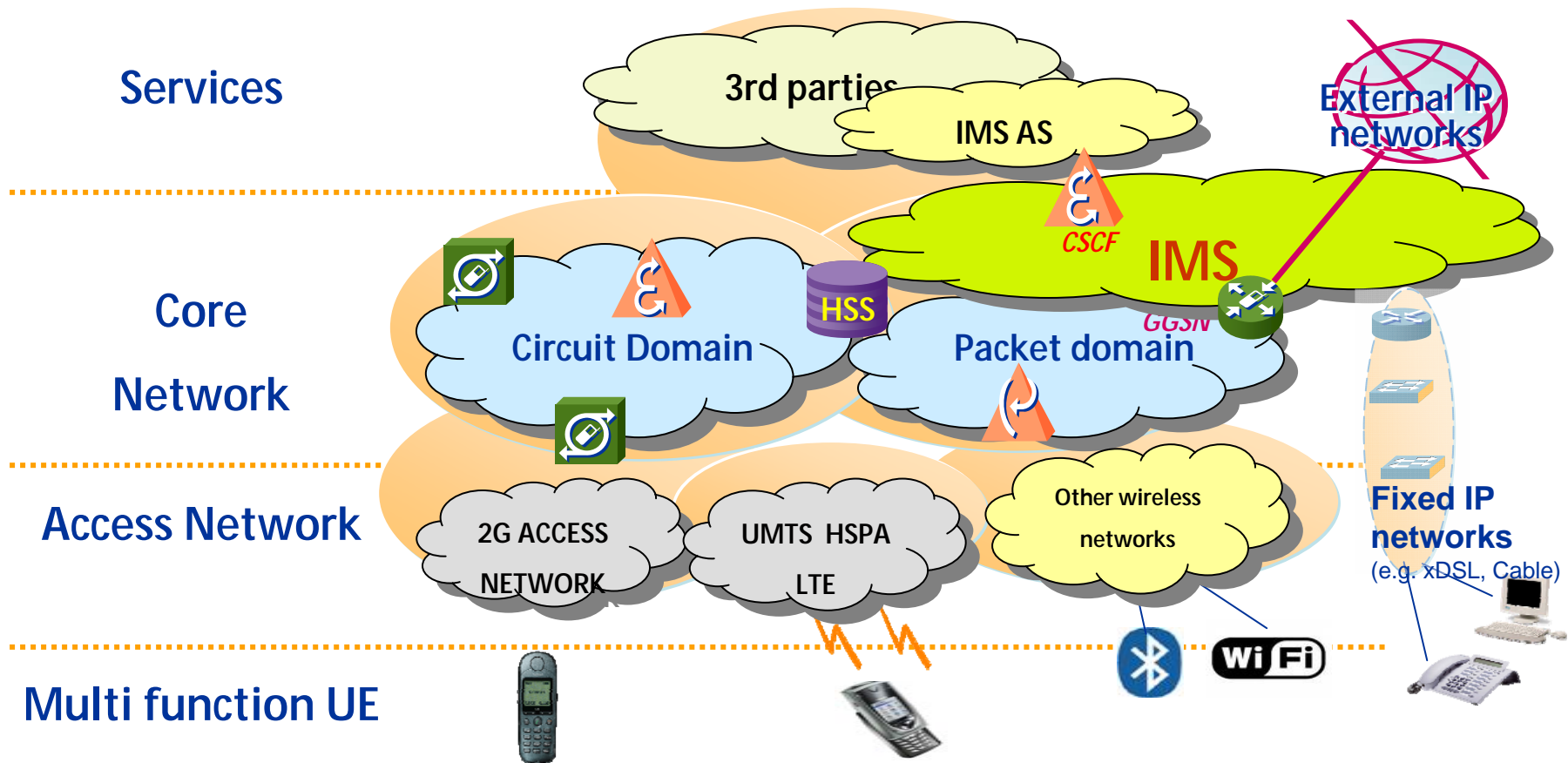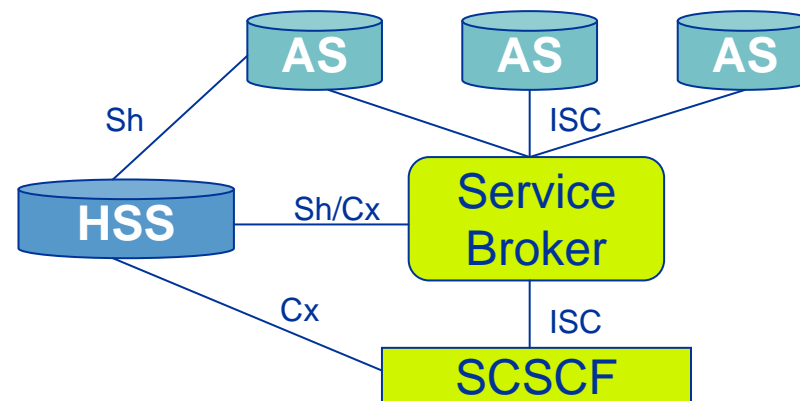
03 NGN Charging : 3-layer charging.

- **3-layer charging:**

  — Access (Flow Based charging).

  — Control, based on IMS charging done in IMS network nodes.

  — Service (rendered by IMS Application Servers (VCC, MMTel ...) and other Application Services such as Streaming ...)

- **With NGN, charging correlation is needed:**

  — each network node (e.g. GGSN from the PS network, a IMS S-CSCF, ...) and IMS Application Server are up to charge only about the functionality it carries out.

  — All Charging data, whenever generated, should be correlated in charging systems.

  — All needed correlation keys should be transferred to the charging systems.

> Correlation is a huge operation for
>
> charging systems to carry out.

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03 NGN Charging : Charging Correlation.

- **Correlate within IMS control layer: Combining different services**

  — With iFCs defined in CSCF, just static service composition can be fulfilled. It is needed to study if service brokering overcomes this lack of flexibility to specific operator services.

  — Possible use of a service brokering. An AS with this role could trigger a complete CCR message with all the information needed to charge instead of using correlation of charging information served by individual AS.

- **Correlate IMS and access network. Coordination needs the use of Policy-based and Charging Control, specified by TISPAN and 3GPP.**

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04 NGN Service Charging.
Data Services (I).

Let us raise these ideas with

our current Data service.

04 NGN Service Charging.
Data Services (II).

- **In the past, only bytes sent/received were used to charge data usage. The customers didn't have any control over the amount of data sent/received from the application and the terminal. So customers run into a psychological barrier:**

    — **How much money do I spend with my daily data activities (web surfing, email download…)?**

- **Duality about quality of service versus service provided. What do you charge, the quality rendered or the service (with different quality) as such?**

NGN Service Charging.
Data Services (III)
Towards a daily flat rate in Data Services.

postpaid (Prepaid)

In the past

Daily rate

€/día

2 (3) €/MB.

Maximum 1o
(15) €per day

1o (15) €/day

1 (3) €/day

Volume

(MB./day)

10 MB.

90 (40) MB.

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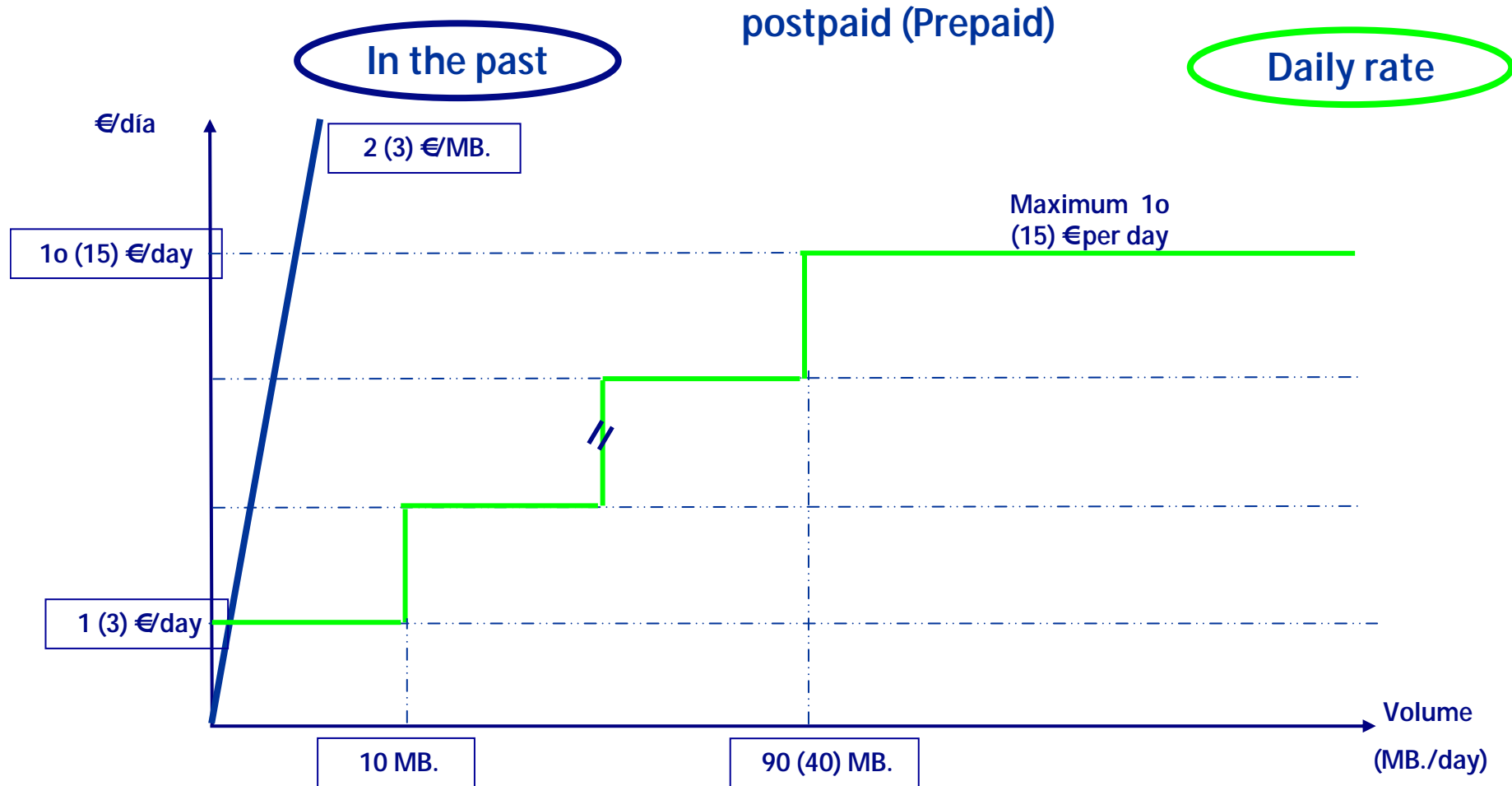
04 NGN Service Charging.
   Data Services (IV).

- **Towards Always-on connections.**

- **Enrich the always-on connection: New charging schemes, focused on fostering the data usage. New charging schemes come up, depending on:**

  — *the terminal type (mobile hadset, PDA, a laptop),*

  — *network quality selected (downlink -> 1 Mbps vs 3Mbps)*

  — *New tariff models according to the particular internet usage the subscriber plans to have.*
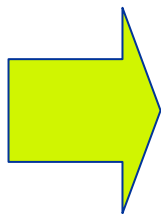
> The customers can select their personal rating scheme, and therefore his always on best connection.

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- **These new schemes also offers the possibility to connect to nomadic networks (Wifi) provided by Telefonica.**

- *Fair use policies*:

  — **The exceeding data is charged by volume steps** *(e.g. TP 1GB).*

    – *Beyond a specific number of steps, a flat rate is applied.*

  — **Peak rate reduction if the user exceeds a specific amount of data***.*

    – *Depending on the product, 1GB, 10 GB.*

    – *Real-time control is needed to know accurately when the threshold is reached.*

Name: "Tarifa Plana de Internet Premium"

Price: 59€

Network quality 3 Mbps: 3Mbps (downlink) and 1,4 Mbps (uplink). This promotion also allows WiFi connections to the Telefonica Network.

Traffic threshold: 10 GB

      Once customer reaches 10 GB, data rate is reduced to 128 kbps (down) and 64 kbps (uplink)

NGN Service Charging.
Data Services (VI).

In the past

So far ...

€/month

0,5 €/MB.

0,5 €/MB.

TP 1 GB. Max. 90 €/month (volume steps)

90 €

75 €

60 €

TP 10 GB. 59 €/month (Fair use policy, peak rate reduction)

45 €

TP 1 GB. 39 €/month (fair use policy, peak rate reduction)

30 €

15 €

Volume

200 MB.　　1 GB　　3 GB　　10 GB　　(GB/month)

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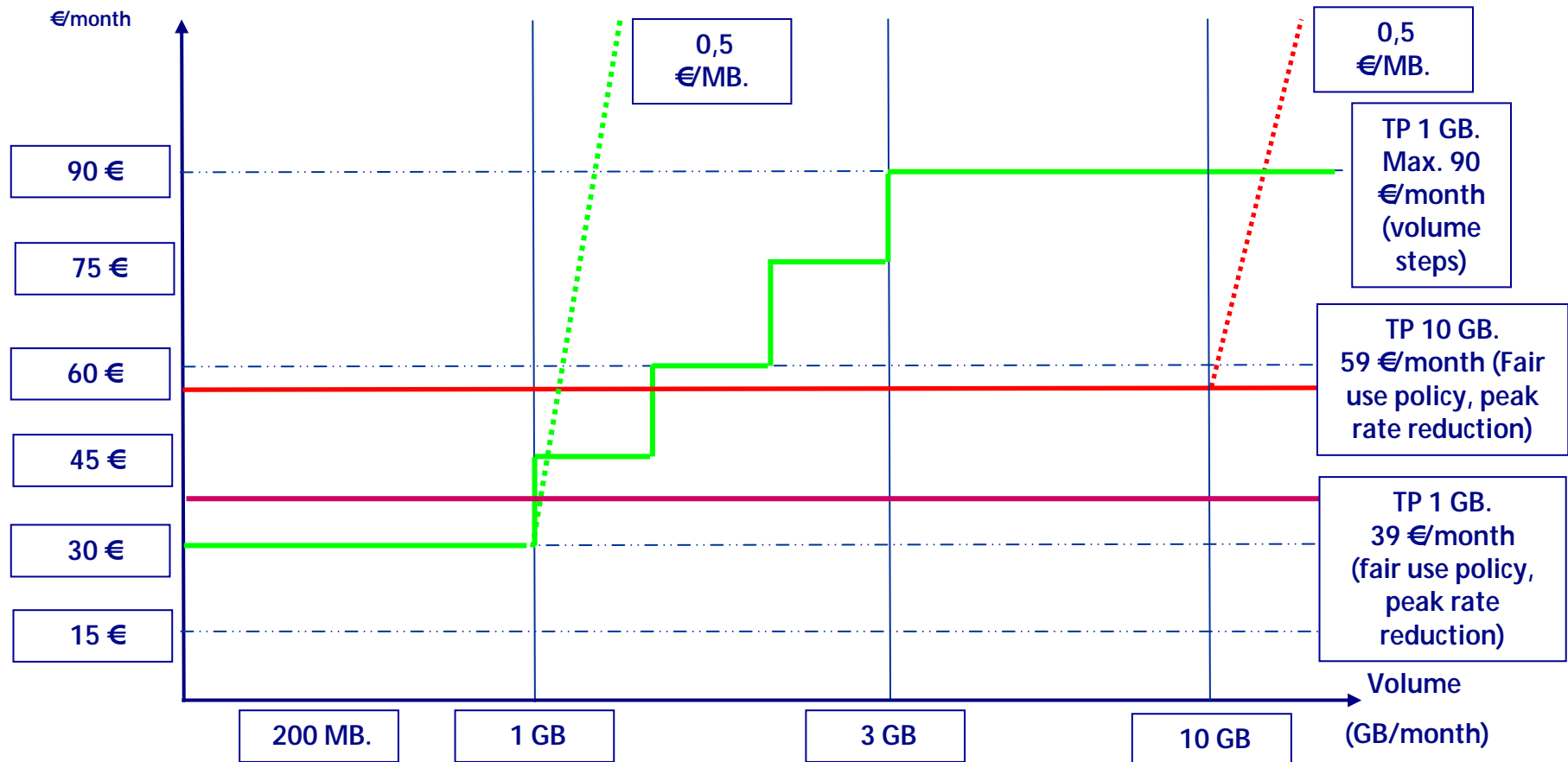
04 NGN Service Charging.
Data Services (VII).

- **New enriched data tariff models but in any case:**

 — Customers can keep under control the money spent on their data connections, and connections are all in real-time controlled and charged.

  — The user is able to set a charging limit allowing the user to define a maximum amount that is willing to pay for the service usage. When consumption reaches 80% (configurable) of the desired threshold, a message is sent out to the customer with this information.

  — Account/balance usage service control by the customer on request: whenever is required, exact information is provided.
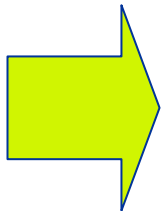
The customers can select their personal rating scheme,

therefore his always on best connection,

and the customers always have the costs under their control.

04 NGN Service Charging.
Promotions and bundling (I).

- **NGN brings us the technology to offer our customer special promotions and bundling linked to voice, data, TV and contents.**

  - About fixed access: we are currently using ADSL to bring combined service such as voice+data (DUO package).

  - Regarding TV service:

    - Broadcast specific TV channels: organizing individual channel or a set of TV channels. Price will be different **!**

    - PPV events.

    - VoD with virtual DVD functions. VoD can be delivered as a subscription or with specific promotions (e.g. pay 3 and have 4, 25% discount specific days)

    - Aside these items, charge a monthly fee if needed.

  - Combine voice +data + TV (TRIO package).

  - The NGN brings *mobility* in to the picture for further bundling:

    - in addition to the triple play services, include mobile services **!!**

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04 NGN Service Charging. Promotions and bundling (II).

- NGN brings the opportunity to combine your mobile, nomadic and fixed products: e.g. provide a monthly fee in order to be connected to internet, regardless of the access network: ADSL, WiFi, 3,5G.

Fixed Wide band   +   **Wifi**   +   **3,5G**

04 NGN Service Charging.
Promotions and bundling (III).

FIXED WIDE BAND	MOBILE WIDE BAND

ADSL 3Mb

(Monthly fee)

Internet en el Móvil Plus
Limitless (200MB) with Rate reduction.

WIFI connections.   **Monthly fee**

Tarifa Plana Internet
1GB (steps of 15 €/512K till max 90€)

Monthly fee

Tarifa Plana Internet Plus
Limitless (1GB) with Rate reduction.

WIFI connections   **Monthly fee**

Note: Bundles launched in july, 2008

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04 Charging Services in NGN.
Contents.

- Data connections, with either fixed or mobile access, bring us the possibility to buy contents in the network. Among many other criteria, content charging can be based on:

  - Event charging (single download, single URL), with or without reservation (ECUR, IEC respectibily).

  - Packages of n events.

  - Monthly subscription.

  - Several kinds of promotions.

- But, in mobile acccess:

  - Depending on operator charging policy, if the customer is located in home country, identify the session within the content has been download in order not to charge the content and, in addition, the bearer. In this case, operator could apply zero-rate to the bearer usage.

  - If the user is in roaming, operator could be interested in charging both, the content and the bearer, depending on the wholesale charges that operators impose on each other for providing cross-border services.

04 Charging Services in NGN.
Charging new services: MMTel and VCC.

- **Multimedia Telehony (MMTel).**

    - Evolution of former CS basic telephnoy service, now enriched with IMS capabilities.

    - Service embedded in an IMS Application Server.

    - Basic service and supplementary services.

    - Charging of supplementary services procedures such as registration, (de) activation, interrogation: per event, monthly fee …

    - Does the operator keep the same criteria than in the former CS networks when customers make use of supplementary services such as conditional call diversion?

    - Charging mobile terminated sessions when the customer is (not) abroad.

- **Voice Continuity Control (VCC).**

    - Charge the whole session… but rating could vary depending on the customer location and access technology.

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05 Towards Charging Convergence. Main Drivers.

Drivers	Comments
User Experience and segmentation	■ **User experience** has to be **positive** to build customer loyalty. ■ **User experience** should be the same for any subscriber, **independent of the payment method.** ■ **User experience** have to be independent of the network access.
Cross promotions and bundling.	■ **Cross promotions and bundles could be related to any service independent of the network access.** ■ **Convergence: cross promotions linked to fixed services (TV service) with mobile services (chat, MMS...), i.e. regardless of the access network.**

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Towards Charging Convergence. Main Drivers.

Drivers	Comments
Online Control and online charging, as a value added to the service rendered.	■ If possible, have direct communication with the user. Messages could be even personalized. ■ Important to communicate that the usage of a specific service will be rewarded with some free units, promotions …for free or with a special rate…, e.g. after sending some specific number of messages, notify to the user that he will get some more for free. ■ Realtime spending control: the subscriber understands how each service is priced. ■ It can provide instant information with the cost and possible promotions/bundles applied to the service that has just been delivered. ■ Possible to include some extra information before, during or just immediately the call has been released.

05   Towards Charging Convergence. Main Drivers.

Drivers	Comments
Charging aimed at providing solutions to new services and technologies.	■ Additional costs come up if it is needed to adapt service solutions to two different charging environements (postpaid, prepaid, others...). ■ Some new services require online control (e.g. Home Zone...) in order to inform to the user in the same call and before B-answer about the rate that will be applied. ■ Insert special announcements, send an USSD after the session.

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05 Towards Charging Convergence. Main Drivers.

— A <u>unique charging solution</u> embedded in the operator network for all subscribers.

— It <u>should enhance TTM of new charging services</u>: only one rating engine to develop in.

— A unique charging solution will be capable of handling any service and access method to be able to do cross product discounts and promotion bundles.

— Same services and bundling will be offered to all subscribers, <u>independent of their payment solution, offline or online.</u>

— A unique charging solution will also become the source for the charging information provided to the subscriber upon request (via IVR or web or other means) and based on which the bill, with all invoice details, is printed.

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06 Some recommendations.

- **Bring a personalized service, interact with the user and provide clear information at the moment that the user would understand it.**

- **Inform about the exact cost of the service, and provide different ways to the user in order to obtain this information. Provide this information in an accurate way.**

- **Service usage and revenues will grow if the customer understands perfectly how the service is charged. <u>The customers need to feel they have all service costs under control, and according their preferences</u>.**

- **If possible, develop a unique charging system. It provides the ability to launch cross promotions tied to different access network and contents.**

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Thank you
for your attention !