Personal Communication Assistant Application for comprehensive FMC support

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Agenda

1. FMC Definition and different Flavors

2. Typical End User Scenario

3. Requirements for User Centric Service Convergence

4. Application Layer based FMC Solution

5. Conclusion

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1   FMC Definition and different Flavors

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Fixed Mobile Convergence

FMC:

"In a given network configuration, the capabilities that <u>provide service and application to the end-user irrespective</u> of the fixed or mobile <u>access technologies and independent of user's location</u>…"
[Source: ITU-T NGN Study Group 19]

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Four different flavors of FMC

Service convergence
Same services are offered in wireline and wireless/mobile networks.

Device convergence
One device for access to services via different network technologies.

Network convergence
Same infrastructure is used for wireline and wireless/mobile services.

Commercial convergence
The marketing and administration personnel of both the fixed and mobile departments are pooled together.

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User Centric View of Service Convergence

Service convergence

Homogeneous delivery of service features independent of the access networks, network technologies and end user terminals
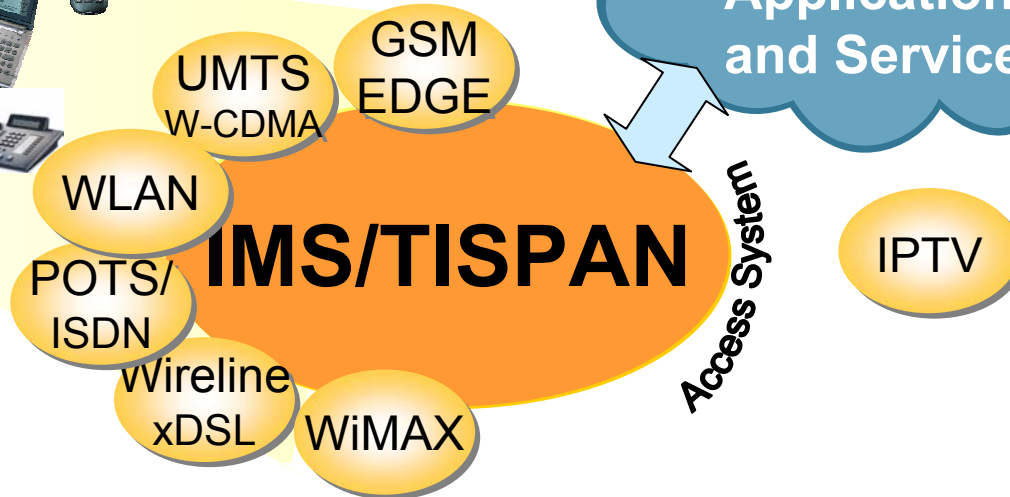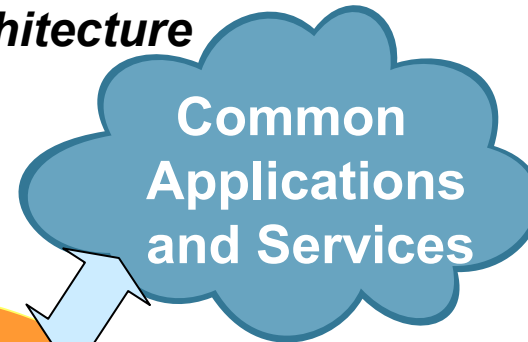
- Services usage independent of the current access point and terminals
  - Application Layer controlled media layer adaptation/conversion
- Service mobility: any service is accessible
  - from any location,
  - any access network (technology and operator) and
  - any terminal
- Multitude of services (person to person, person to content/service, content to person and service to service)
- Unique User ID across any service, network technology, terminals, ..
- "Any terminal becomes my terminal"
- Enables the delivery of user-centric ubiquitous services

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*Support **access-agnostic** Application and Services **and** Open Service Creation Architecture*

*Support the **full range of devices***

Common Applications and Services

UMTS W-CDMA

GSM EDGE

WLAN

IMS/TISPAN

POTS/ ISDN

Wireline xDSL

WiMAX

Access System

IPTV

*Support of converged All-IP network infrastructure for **all access network types***

**But this is NOT sufficient from user centric viewpoint on service convergence**

2 Typical End User Scenario

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Typical End User Scenario

Multiple subscription to different access and service providers

- Mobile Device: subscription with a GSM service provider
- POTS/ISDN: subscription with a ISDN/IN service provider
- IPTV: subscription with an IPTV service provider
- Internet Service Providers as MSN, ICQ, Yahoo, Google, Skype,
- …
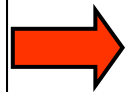
➡ Problem: No interworking or convergence between services of these providers

What about the support for user's social networking

- Typically the social contacts have their own service subscriptions
- Is there any kind of user tweakable profile sharing or content sharing?

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Convergence of Telco and Internet Services

Fixed/Mobile Network Service Providers and STD

Phone: **+12 345 678**

Fax: **+12 346 587**

Mobile: **+13 286 574**

...

Several billion customers (world-wide)

Telco infrastructure: SS7, SIP, ...

Standardized numbering (E.164)

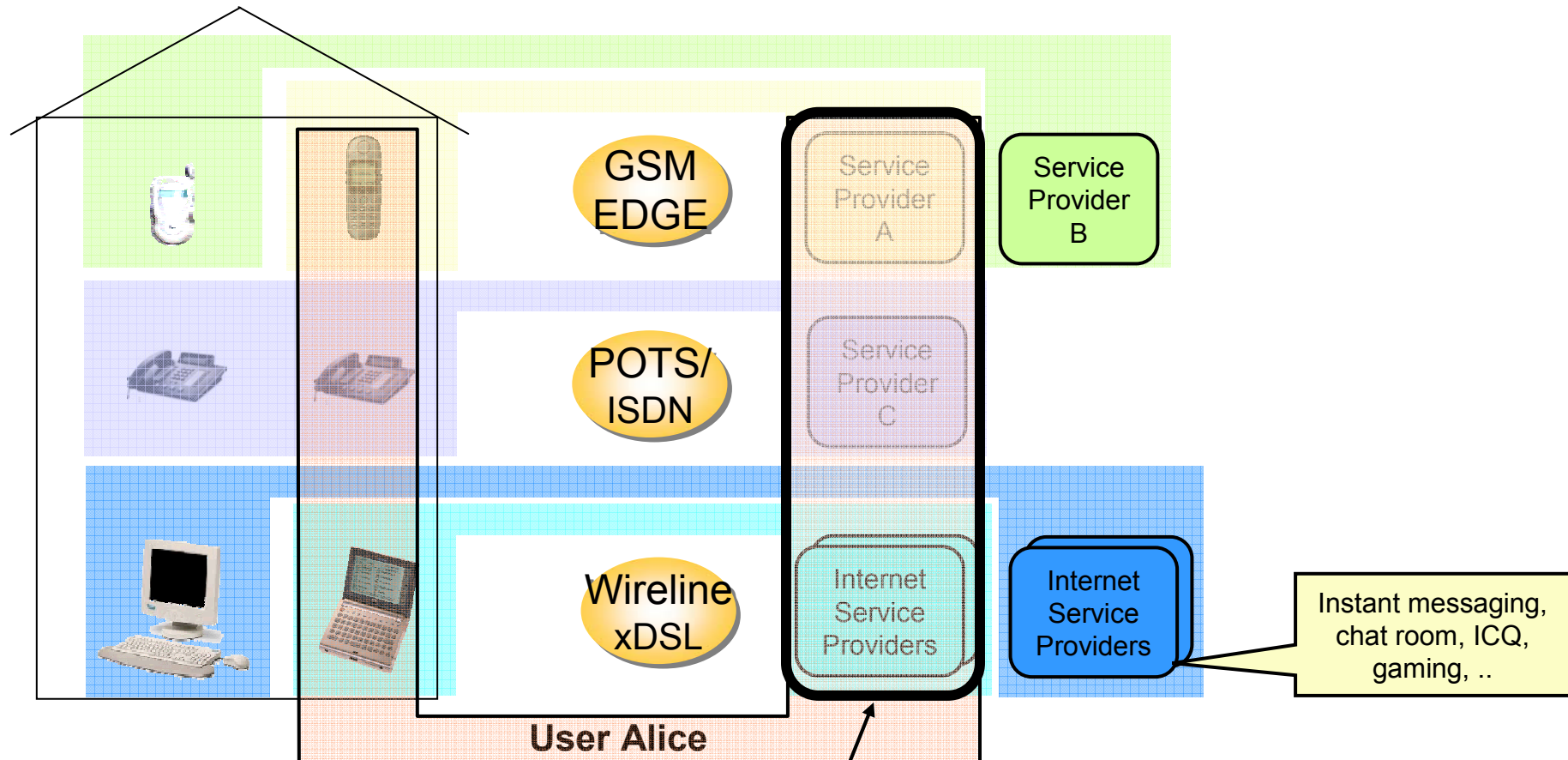## Internet Communication Service Providers

Skype: **abcdefgh**

MSN: **abc@def.gh**

ICQ: **12345678**

Yahoo: **abcdefgh**

Several 100 Mio users

IT infrastructure, proprietary protocols

Various ID types

User-centric Convergence

Unified communication

User-friendly, simple to use

May involve more than one operator

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Typical Communication Service Situation for a User/Family

GSM EDGE

POTS/ ISDN

Wireline xDSL

Service Provider A

Service Provider C

Internet Service Providers

Service Provider B

Internet Service Providers

Instant messaging, chat room, ICQ, gaming, ..

User Alice

User Centric Service Convergence requires:
The user experience one homogeneous package of service offering

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Typical Communication Service Situation for a User/Family

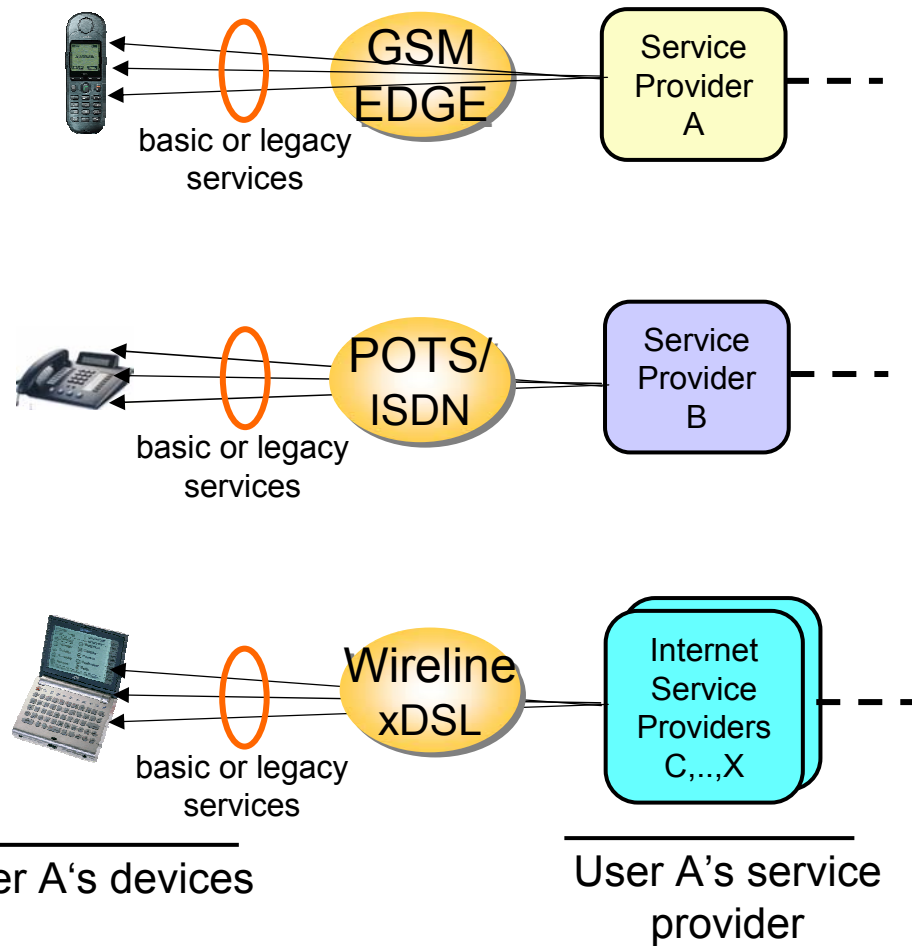| | GSM EDGE | Service Provider A | Service Provider B |
| POTS/ ISDN | | Service Provider **?** | |
| Wireline xDSL | | Internet Service Providers | Internet Service Providers |

User Bob
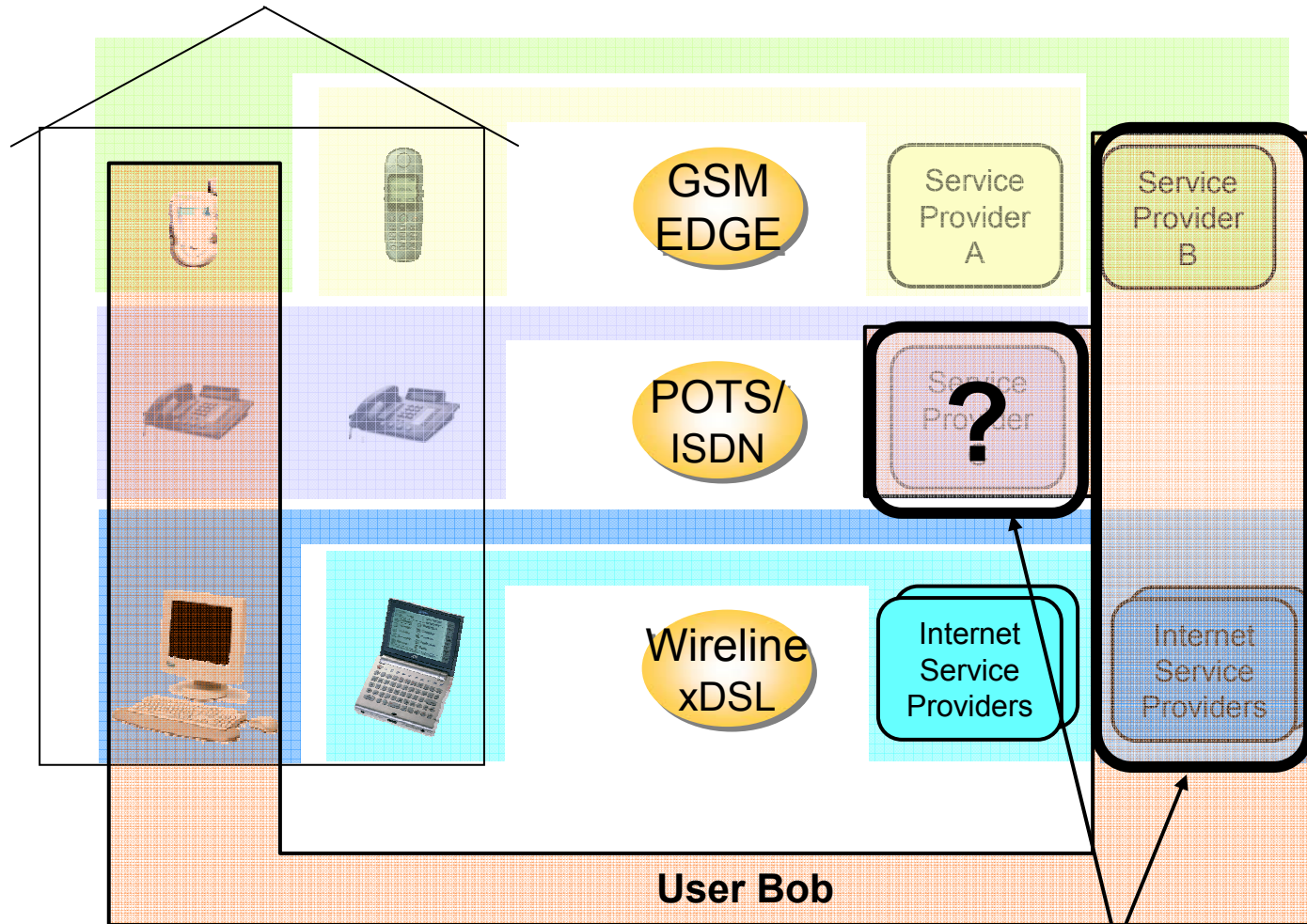
User Centric Service Convergence requires:
User experience a service sharing with his package of service

Typical Communication Service Situation for a User/Family

GSM EDGE

POTS/ISDN

Wireline xDSL

Service Provider A

Service Provider B

Ser Prov

Internet Service Providers

Internet Service Providers

User Alice

User Bob

Service Overlap:

Alice defines Bob as a trusted buddy of her

Alice shares a portion of her services with Bob

The shared service are added into the user profiles of both

The shared service appears as his service

Bob is billed for the service usage?
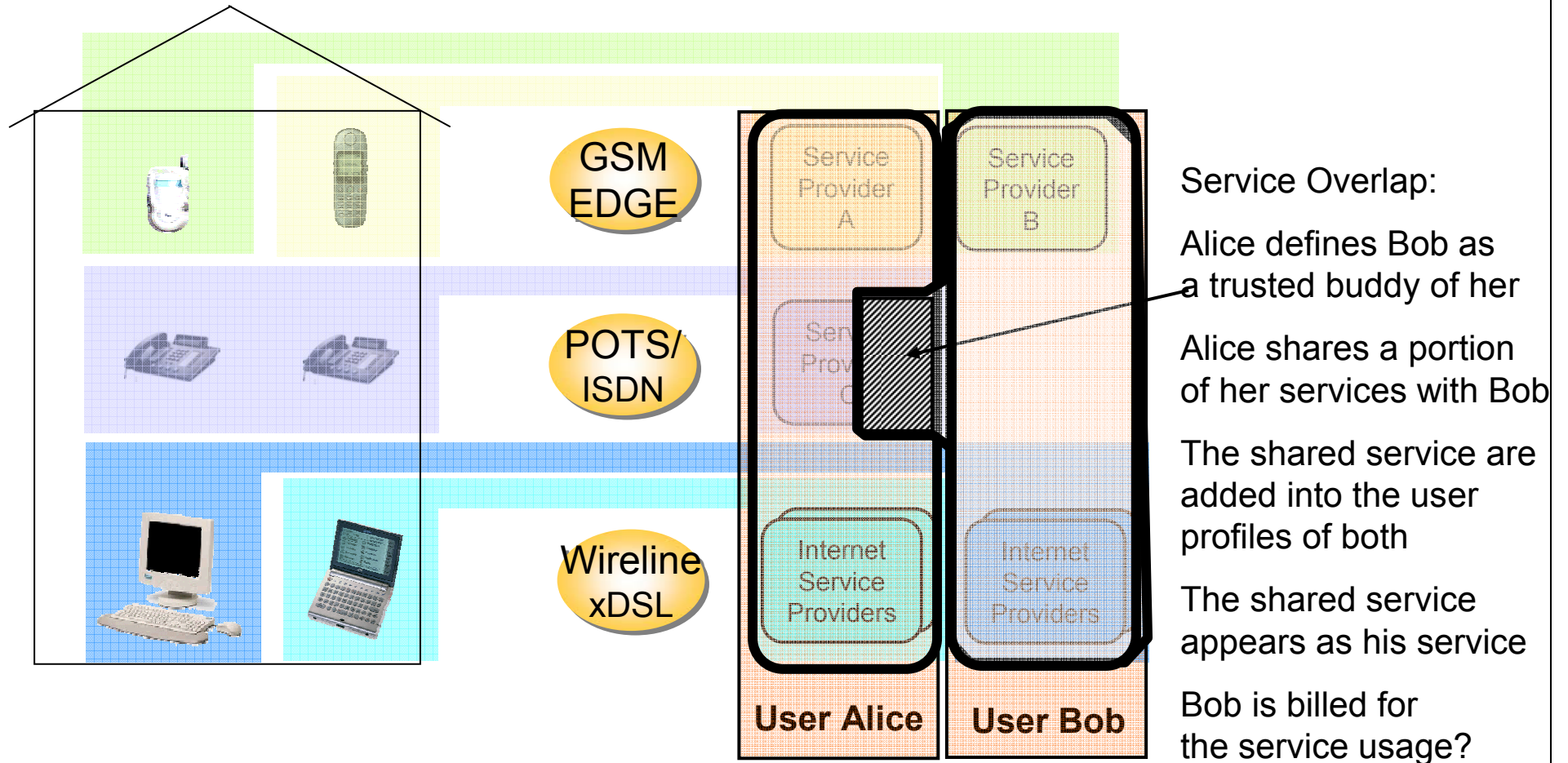
**User Centric Service Convergence requires:
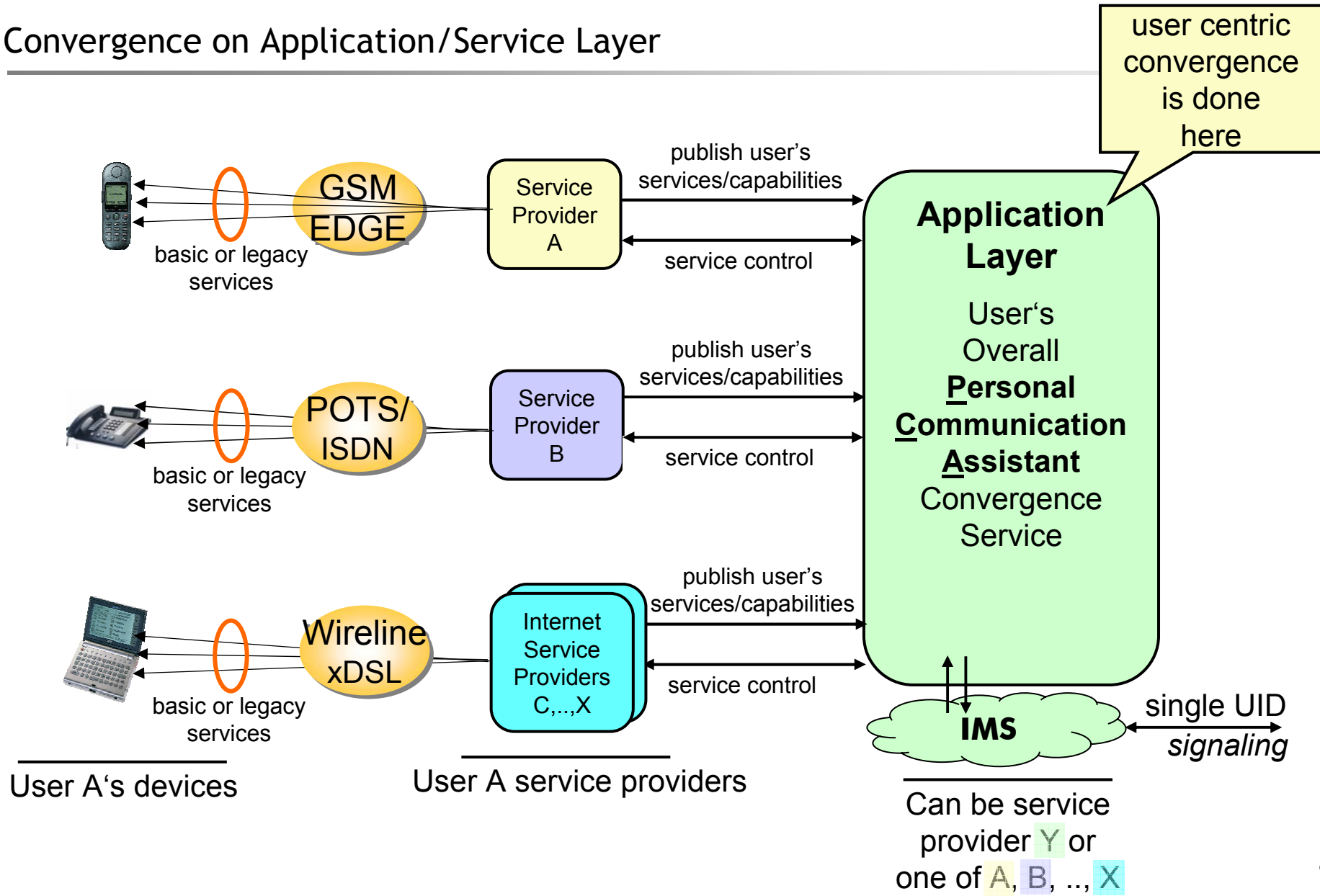User allows to share services from his package of service**

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Convergence on Application/Service Layer

GSM EDGE

basic or legacy services

Service Provider A

POTS/ISDN

basic or legacy services

Service Provider B

How to achieve user centric service convergence?

Wireline xDSL

basic or legacy services

Internet Service Providers C,..,X

User A's devices

User A's service provider

Exemplary list of service, access network providers

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Convergence on Application/Service Layer

user centric convergence is done here

basic or legacy services

GSM EDGE

Service Provider A

publish user's services/capabilities

service control

Application Layer

User's Overall **P**ersonal **C**ommunication **A**ssistant Convergence Service

basic or legacy services

POTS/ ISDN

Service Provider B

publish user's services/capabilities

service control

basic or legacy services

Wireline xDSL

Internet Service Providers C,..,X

publish user's services/capabilities

service control

IMS

single UID *signaling*

User A's devices

User A service providers

Can be service provider Y or one of A, B, .., X

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Realization Scenarios

PCA service offered by converged telecom operator

GSM EDGE

POTS/ISDN

Wireline xDSL

PCA — Service Provider B — Internet Service Providers
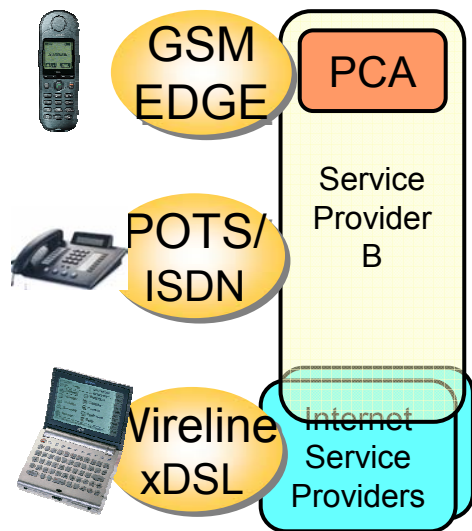
Single provider for all telecom services

PCA as value-added service

Hierarchical PCA solution

GSM EDGE

POTS/ISDN

Wireline xDSL

PCA — Service Provider B

PCA — Service Providers
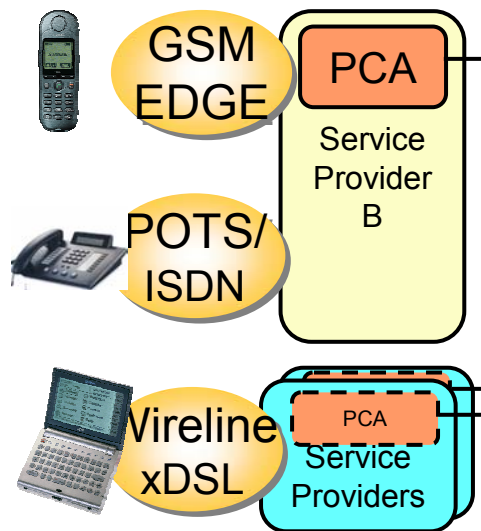
Main service provider (i. e., single-bill)

PCA support by additional service providers (e. g., ICQ)

All-embracing PCA

GSM EDGE

POTS/ISDN

Wireline xDSL

Service Provider B

Service Provider C

Internet Service Providers

PCA
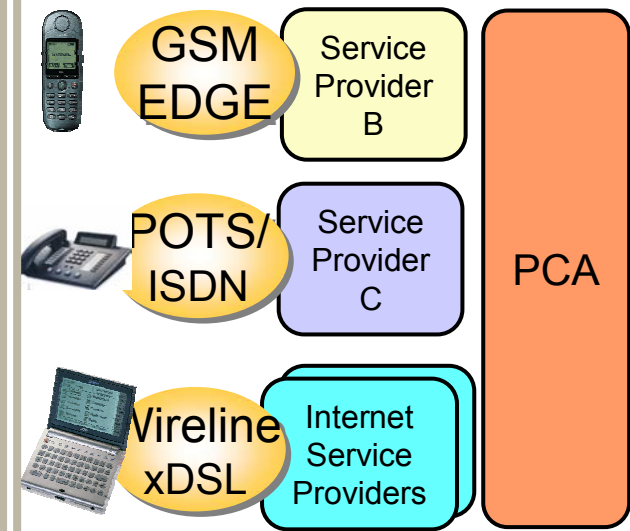
PCA as provider-independent service

PCA user configurable

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3

Requirements for User Centric Service Convergence

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Consequences and Challenges

Homogeneous package of service offering

- Services from different service providers are homogeneously integrated within a single user-centric/friendly service

- Unique personal user ID irrespective of the service (conversational, data)

- Subscription of further trusted services, WebServices and .Net services possible and seamlessly integrable
  - e.g. broker services on cost, best service, ..
  - location based service support

- Personal and session mobility with service adaptation are an integral feature

- Presence and preference is part of the package as all the usable services are announced to the PCA

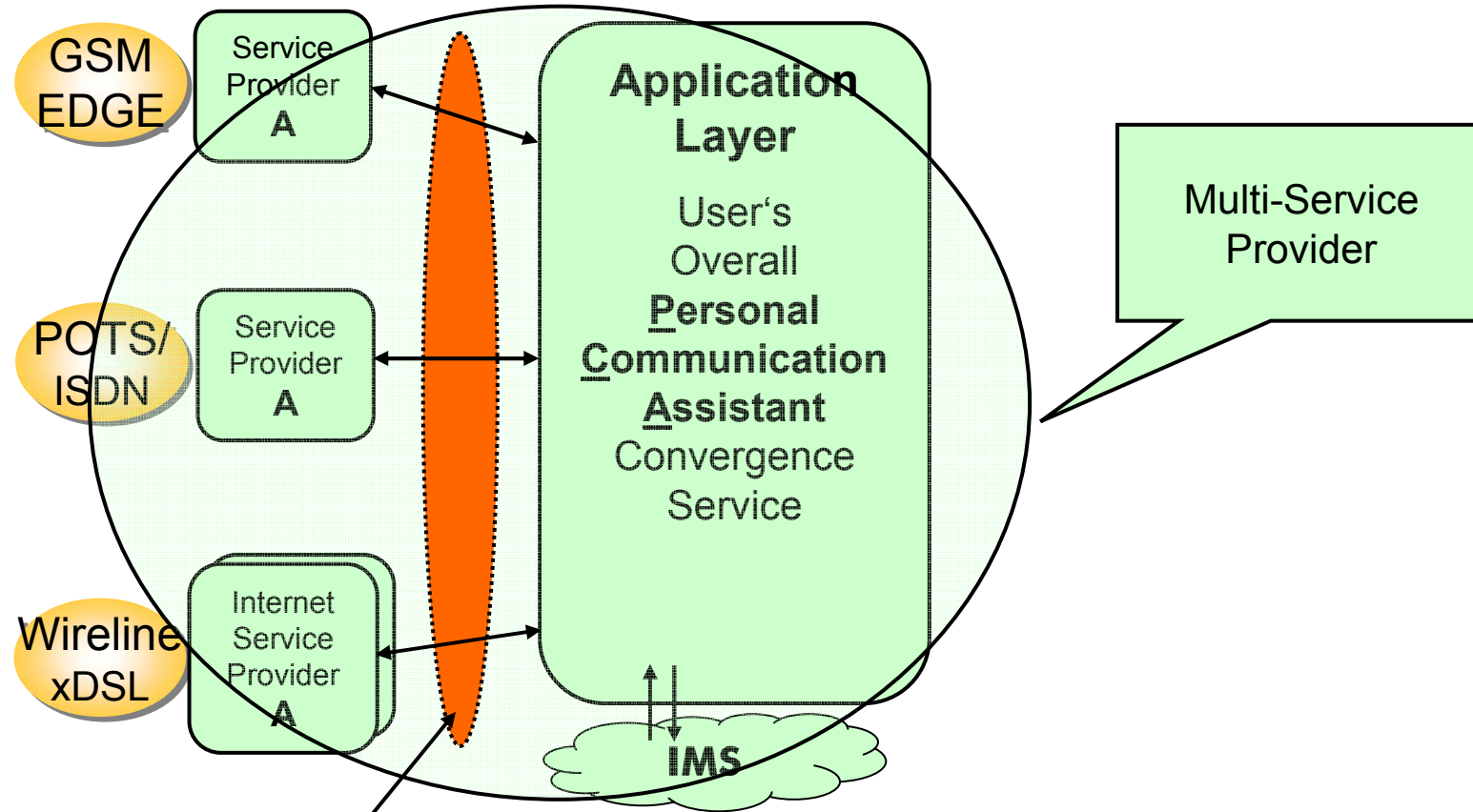- Any terminal becomes my terminal

Single bill from the Personal Communication Assistant service provider

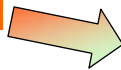Alcatel·Lucent

Consequences and Challenges

Challenges:

- Trust and security aspects
  - between different service providers and
  - service providers offering value-added services and PCA service
- Billing architecture
- User privacy
- Service level agreement on application and service layer
- Definition, implementation and integration of a middleware between application layer services
- A user friendly interface for configuration and control of the homogeneous service package
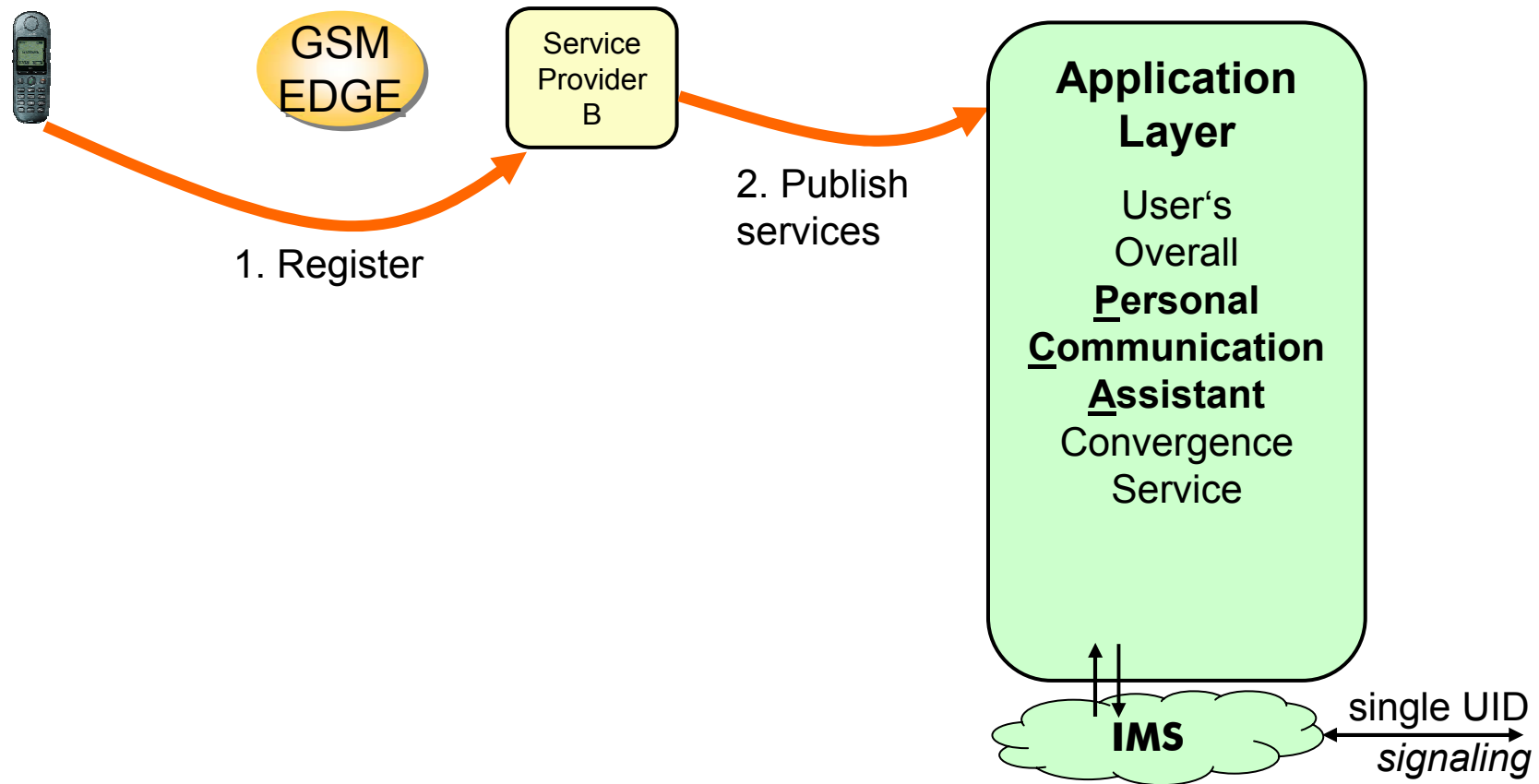
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Consequences and Challenges

GSM EDGE

POTS/ ISDN

Wireline xDSL

Service Provider **A**

Service Provider **A**

Internet Service Provider **A**

Application Layer

User's Overall **Personal Communication Assistant** Convergence Service

IMS

Multi-Service Provider

Security and Trust Issues

Can be reduced in case of Multi-Service Providers

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4 Application Layer based FMC Solution

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Convergence on Application/Service Layer

GSM EDGE

Service Provider B

1. Register

2. Publish services

Application Layer

User's Overall **P**ersonal **C**ommunication **A**ssistant Convergence Service

IMS

single UID *signaling*

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Convergence on Application/Service Layer

MSN
application started

Wireline
xDSL

MSN
Service
Provider

**Application
Layer**

User's
Overall
Personal
Communication
Assistant
Convergence
Service

1. Login

2. Publish
presence on
MSN service

IMS

single UID
signaling

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Convergence on Application/Service Layer

Receive SMS as MSN message

MSN@Service
Hallo Bob,..

Wireline xDSL

4 MSN Service Provider

Application Layer

3 Convert: SMS to MSN Message

User's Overall **Personal Communication Assistant** Convergence Service

Publish presence on MSN service

GSM EDGE

Service Provider

Publish service

2 If SMS@Service && MSN-logon

MSN

IMS

SMS@Service
Hallo Bob,..

1

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Convergence on Application/Service Layer

GSM EDGE

POTS/ ISDN

Wireline xDSL

Service Provider B

Service Provider C

Internet Service Providers

User's Overall Personal Communication Assistant

Bob's PCA

IMS

Bob's PCA gets any service Call setup:

- decides on rules
- forwards call to Alice's device

IMS, PSTN, core network

Calls Bob's unique UID

Tom

Alice's devices; Bob shares with Alice the ISDN service

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Convergence on Application/Service Layer

PCA Peering

User's Overall Personal Communication Assistant — **Bob**'s PCA

User's Overall Personal Communication Assistant — **Tom**'s PCA

Service Provider B

Service Provider C

Internet Service Providers
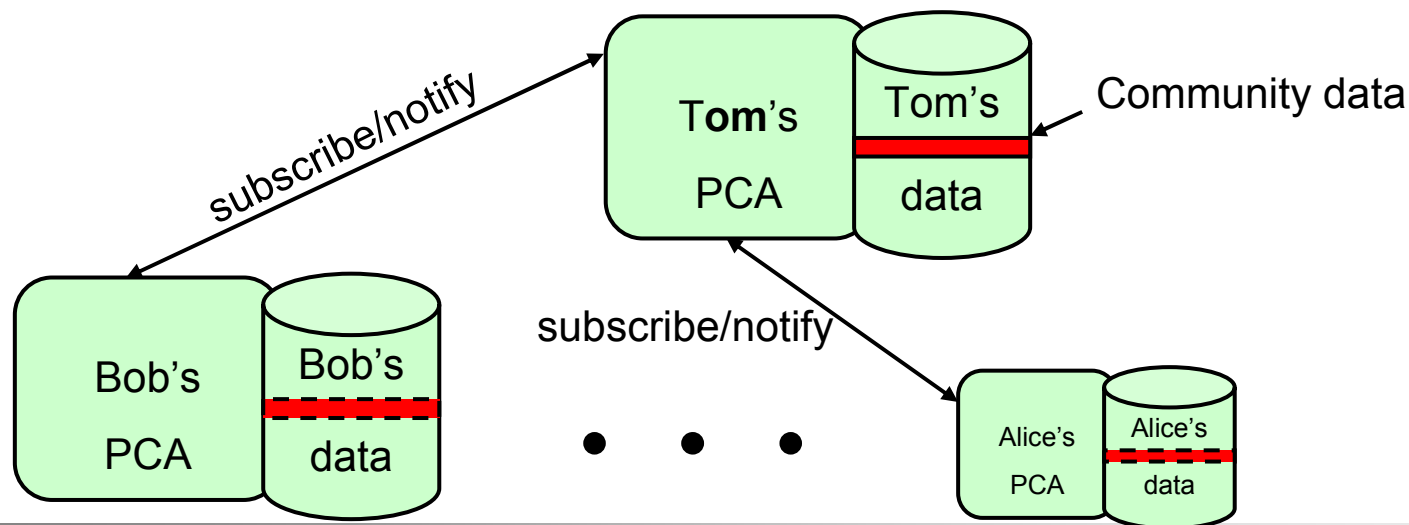
Service Provider X

IMS

IMS

Bob

Tom

PCAs:

• are intelligent, application layer components – PCA –

• are representing a user

• have freedom for autonomous service decisions on user's rules

• perform automatic service conversions depending on user activity (SMS -> MSN message)

• perform telecom service and IT data services convergence

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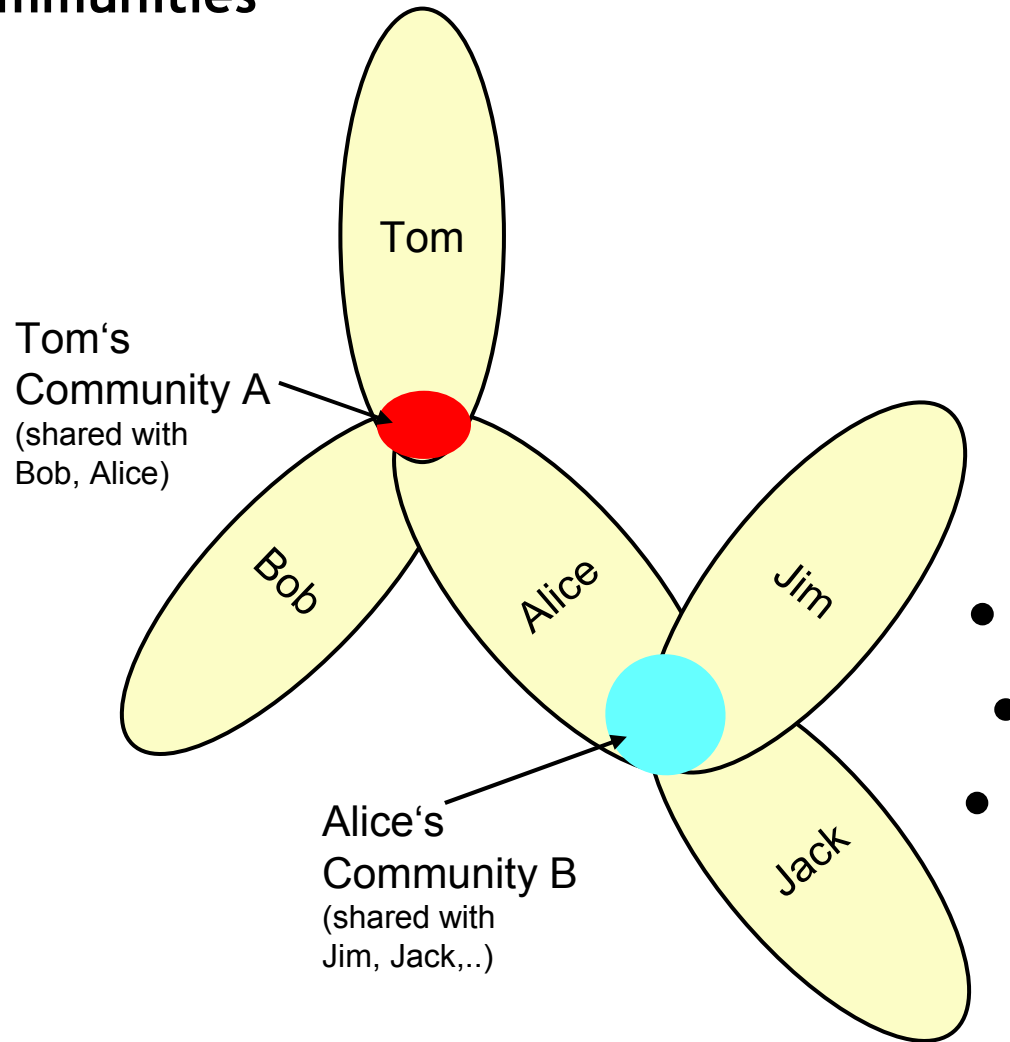
Convergence on Application/Service Layer

Convergence also for typical IT services

- PCA service can also (directly or indirectly) store any kind of user (computing) data
- Preference and presence concepts are extended over the user data
- Retrieval of user data can be restricted with preference models and can be billed
- → Communities can be organized with subscribe/notify concept
- → Communities are homogeneously integrated within the telecom world

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Convergence on Application/Service Layer

Communities

Tom

Tom's
Community A
(shared with
Bob, Alice)

Bob

Alice

Jim

Jack

Alice's
Community B
(shared with
Jim, Jack,..)

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4 Conclusion

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Conclusion

Current FMC solutions do not satisfy the user centric service convergence requirements

- full mobility features
  - network, terminal, session, personal
  - access network technology agnostic
  - with service adaptation on user or terminal requirements
  - without restriction of service provider selection
- homogeneous and integrative service

Presented FMC requirements can only be solved on the Application Layer

Proposal of an application layer end-user assistant that provides

- homogeneous full service (telecom and IT) package

Challenges:

- Security and trust
- Middleware and inter Application Layer interfaces

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