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Presentation of Specification to TSG or WG

Presentation to:	**TSG SA Meeting #21**
Document for presentation:	**TR 22.800, Version 2.0.0**
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Abstract of document:

This technical report was requested by SA on the basis of the awareness that:

"A technical study is needed to assess the different technical requirements that the relation among subscriptions to different domains as well the relation among the operators of the different domains could generate. This is a pre-condition for the evaluation of the implications at system level as well as requirements and technical feasibility of the separation of USIMs and ISIMs, on separate independent UICC.

SA1 need to further develop and analyze a number of scenarios based on S1-021773. The different scenarios shall be analyzed and evaluated in order to derive the system and the services requirements that the 3GPP specification should support."

For full details please refer to the related WID.

Changes since last presentation to TSG-SA Meeting #19:

　　1) Conclusions chapter has been added including SA1's judgement on the scope of each scenario for 3GPP.

　　2) Scenarios were clarified

　　3) Description of Access Independence clarified

Outstanding Issues:

Section 13.6: Roaming aspects for scenario "Non-3GPP access scenario with roaming"

Contentious Issues:

SA1 has not been able to agree whether or not the Multiple IMS scenario in section 7 and 8 is within the scope of 3GPP. The fundamental issue is whether requirements can be put on the 3GPP CN in order for it to be capable of supporting an operator, which is only operating an IMS.

3GPP TR 22.800 V2.0.0 (2003-07)

Technical Report

3rd Generation Partnership Project;
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IMS Subscription and access scenarios
(Release 6)

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3GPP

Contents

Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1   Scope

This document studies scenarios between subscribers and operators, mainly from IMS subscriptions point of view and verifies the compatibility of the possible scenarios within 3GPP Scope. Release 6 includes several work items like IMS enhancements, WLAN interworking that needs to be better understood so that clear requirement can be agreed and relevant technical specifications can be developed in time.

The document will identify the requirements arising from the following issues:

- Identification of requirements for 3GPP operators to implement only some of 3GPP system domains? (For example an IMS system separated from the PS domain and access network. What is the relationship between the AN/CN/IMS networks in this case? Are there conflicts in privacy issues due to several subscriptions?)

- Operator control of networks used to access / provide IMS services. For example operator may want to limit the subscriber to access the IMS via a specific 3GPP access network.

- Non-3GPP access network implications.

- Simultaneously access to IMS by one user with multiple devices. .

- UE functionality split (if any implications).

- Deployment of UICC with several USIM and ISIM applications from different parties.

- Analyse aspects of user interaction when activating USIM and ISIM applications on the UICC (e.g. manually, automatically, PIN, NON-PIN).

Below issues need to be described in scenarios :

- Generic issues

- Security

- Charging

- Privacy

- Roaming

- Regulatory (e.g lawful interception) etc.

- Quality of service

- User experience

Further TR needs to translate the scenarios, which fit in the scope of the 3GPP system to 3GPP service requirements.

Criteria for requirements to be included:

1. In scope with 3GPP access (UTRAN, GERAN) or access that 3GPP has specified interworking with (WLAN).

2. In scope with 3GPP core network(s).

3. In scope with 3GPP enabling technologies.

4. Scope of this work is limited to identify service requirements derived from scenarios capturing various business requirements. No architectural solutions will be considered in this TR.

Note: 3GPP should not place requirements, which would prohibit the possibility to use non-3GPP defined access for IMS.

Note: The SA2 within its own documentation shall look into technical feasibility and architecture implications of scenarios and requirements defined by SA1 and contact SA3 and SA5 for deeper technical understanding if necessary. Overall architecture implications shall consider also UICC implications (e.g. if it is appropriate to have several ISIMs on one UICC and possibility of having empty field for either ISIM or USIM in a UICC.?) and accordingly contact T3 for deeper technical understanding if necessary.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 21.905: "Vocabulary for 3GPP specifications"

[2]   3GPP TS 22.101: "Service principles"

[3]   3GPP TS 22.228: "IP multimedia (IM) CN subsystem, stage 1"

[4]   3GPP TS 22.115: "Charging and Billing"

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Note: In this document "UTRAN" includes also UTRAN evolution.

3GPP Access Operator: an operator offering access network over 3GPP specified radio access form (e.g. GERAN/UTRAN).

3GPP Access Domain: Domain administrated by 3GPP Access Operator.

Access independence: the ability for the subscribers to access their IP Multimedia services over any access network capable of providing IP-connectivity, e.g. via:

- 3GPP (UTRAN, GERAN)

- Non 3GPP accesses with specified interworking (e.g. WLAN with 3GPP interworking)

- Other non 3GPP accesses (e.g. xDSL, PSTN, satellite, WLAN without 3GPP interworking)

Business Agreement: a relation between two or more parties, it may include one or more of the following elements: roaming agreement, charging agreement, authentication agreement and settlement agreement.

Domain: Unless specifically stated otherwise, the word "domain" is used to denote an administrative domain. An administrative domain is under the control of an actor (e.g. company). Some domains used in the present document may (roughly) correspond to technical domains specified by 3GPP. The technical details regarding such relationships are not covered by the document.

IMS Operator: The operator of 3GPP compliant IP multimedia CN subsystem (IMS). IMS operator provides the users of its IMS domain with identity/identities by which the users are known.

IMS domain: Domain administrated by IMS operator

IMS Roaming: IMS roaming refers to the possibility for subscribers of one IMS to obtain IMS services from an IMS the users have not subscribed to, due to a business agreement between the two IMS service providers.

Non-3GPP Access Operator: an operator offering IP-connectivity over an access form not being conformant to 3GPP specifications (e.g. WLAN, xDSL).

PS Roaming: PS roaming refers to the possibility for subscribers of one 3GPP operator to obtain GPRS service from an other 3GPP operators that users have not subscribed to, due to a business agreement between the operators.

Further definitions are given in 3G TR 21.905 [1].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

PDA   Personal Digital Assistant
UICC   Universal Integrated Circuit Card
xDSL   x Digital Subscriber Line

Further abbreviations are given in 3G TR 21.905 [1].

4 General Aspects

4.1 Modularity of the 3GPP system

Since the days of GSM many operators have selected more that one vendor to provide network elements to their network. The 3GPP system has always been designed modular and flexible, allowing operators to chose among different vendors and manufactures to implement various configurations based on 3GPP system specifications.

4.2 UICC platform

3GPP release 99 introduced the UICC, a smart card platform that can contain several applications. From the 3GPP point of view the most important are the USIM and SIM applications. The USIM is designed for UTRAN access, but can also be used for GERAN access. The UICC design allows several USIM applications to be stored on the same UICC, but due to architectural reasons and UE capabilities, only one of the USIMs can be active at any given time.

In general the 3GPP specifications do not have any position on commercial scenarios, e.g. ownership of the UICC is not specified by the 3GPP. In practise, the UICC is understood to be owned by the network operator, who thus has control over all applications installed on the UICC. However the specifications do not prohibit other scenarios.

For Rel 5, the 3GPP has developed and specified the IMS as a means to provide IP multimedia based services. Part of the development includes a UICC application to be used for access to IMS, i.e. the ISIM application.

4.3 IMS access independence

For release 5 3GPP agreed on the requirements for a UICC application – the ISIM, which sufficiently provides the necessary security mechanisms for accessing the IMS domain. There are two requirements, which are release 5 specific. In [2] it is stated: *"In Rel5 the ISIM application shall require the presence of a USIM application on the same UICC."* Further [3] states: *"In R5 the ISIM application shall require the presence of a USIM application on the same UICC. This shall not preclude the possibility in later releases of having an ISIM in a UICC that does not contain a USIM."* In release 5 these two specific requirements are satisfied by the fact that the only way of accessing the IMS domain is through the GPRS access (architectural limitations). There is no explicit mechanism developed for checking the existence of a USIM on the UICC in case there were an ISIM on the same UICC.

Access independence of the IMS was not included in Rel 5. SA2 decided to postpone the Access Independence, in order to complete Release 5 in timely manner, thus only GPRS access is supported for IMS, and thus service requirement was removed from Rel 5 [3].

Access independence is assumed to mean the ability for the subscribers to access their IP Multimedia services over any access network capable of providing IP-connectivity, e.g via:

- 3GPP (UTRAN, GERAN)

- Non 3GPP accesses with specified interworking (e.g. in Rel 6W-LAN with 3GPP interworking)

- Other non 3GPP defined accesses (e.g. xDSL, PSTN, satellite, WLAN without 3GPP interworking). S1 understanding is that the impact on 3GPP specification due to the inclusion of interworking with non-3GPP defined accesses cannot be known in advance. Therefore consideration of each new non-3GPP access is subject to a work item, which has to be agreed by 3GPP.

A remaining issue is whether an actor (e.g. a company) can assume the role of IMS Operator only, without having a 3GPP access operator role, too. The ISIM requirements are associated with this issue.

4.4 Interworking

Interworking aspects are in principle considered by 3GPP, however interworking with other systems not already covered by the activity of 3GPP are considered to be outside the current scope.

5 Basic IMS scenario

5.1 Description

Actors

Operator 'BigGreens'

BigGreens runs a 3GPP mobile access network and an IMS domain. It has also deployed WLAN using 3GPP interworking.

Operator '3cent'

3cent is any 3GPP operator, which has a Business Agreement with Operator BigGreens that enables PS Roaming across the two operator's networks. 3cent does not have an IMS.

Operator 'Cool'

Cool is any operator that has a Business Agreement with BigGreens that enables PS Roaming across the two operator's networks, and it also runs its own IMS.

Customer

Jill, the customer, has a subscription with operator BigGreens (Both IMS and PS).

When roaming on 3cent or Cool, Jill can access the BigGreens' IMS. Please see section 5.6
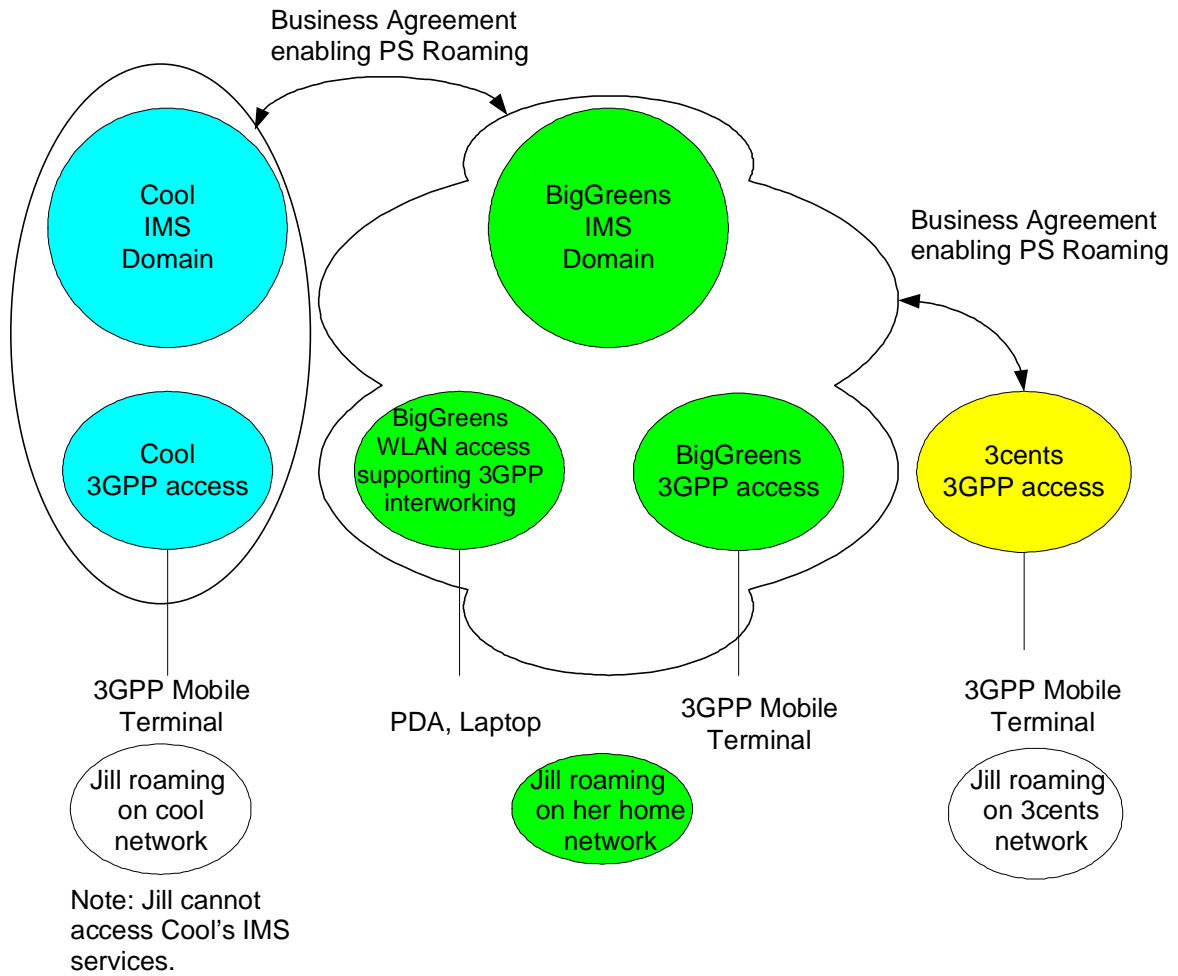
Figure: 5.1

- From the solutions identified for WLAN 3GPP system interworking this scenario uses the UICC for authentication for using BigGreens' WLAN.

- Authentication to the IMS domain is according to 3GPP specified mechanism.

5.2 Charging implications

Charging is already developed or being developed within 3GPP.The access to the home IMS may require the exchange of additional charging information compared to the PS roaming (to be addressed and analysed in the stage 2).

No additional specific requirements are identified at stage 1 development level.

5.3 Security

Security is already developed or being developed within 3GPP.

No additional specific requirements are identified at a stage 1 development level

5.4 Privacy implications

No additional specific requirements are identified at a stage 1 development level.

5.5 Regulatory aspects

Already developed or being developed within 3GPP.

No additional specific requirements are identified at a stage 1 development level.

5.6 Roaming

Already developed or being developed within 3GPP. A simple Business Agreement, which allows for PS Roaming only, is sufficient for IMS access. However, it may be beneficial for operators to have a more complex Business Agreement that allow and/or improve IMS service offering when roaming e.g. related to charging correlation and QoS.

An IMS operator shall be able to control access to its IMS domain when a user is roaming outside her home network.

5.7 Quality of service

Already developed or being developed within 3GPP. No additional specific requirements are identified at a stage 1 development level.

5.8 User experience

No additional impacts identified.

5.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

5.9.1 Subscription requirements

This scenario neither requires nor prevents the logical separation of IMS and PS subscriptions.

5.9.2 Other Potential new requirements

- An IMS operator shall be able to control access to its IMS domain when user is roaming outside her home network.

5.9.3 Issues for stage 2/3 technical studies

- The access to the home IMS could require the exchange of additional charging information compared to the PS roaming.

- PS Roaming is sufficient for IMS access. However, it may be beneficial to operators to have a business agreement that allow and/or improve IMS service offering when roaming e.g. related to charging correlation and QoS.

- Investigate whether an IMS operator can control access to its IMS domain when a user is roaming outside her home network.

- The requirement for the interface between entry point of IMS domain and 3GPP access network should be studied.

6 IMS roaming scenario

6.1 Description

Actors

Operator 'BigGreens'

BigGreens runs a 3GPP mobile access network and an IMS domain. It has also deployed WLAN using 3GPP interworking.

Operator 'Cool'

Cool is an operator that has a Business Agreement with BigGreens that enables PS Roaming and IMS Roaming across the two operator's networks, and it also runs its own IMS.

Customer

Jill, the customer, has a subscription with operator BigGreens (Both IMS and PS domains).

When roaming on Cool, Jill can access the BigGreens' IMS.

Jill may also access the IMS of Cool subject to the Business Agreement that allows IMS Roaming between BigGreens and Cool (If no agreement exists then Jill cannot use cool's IMS). In this scenario Jill cannot access Cools IMS services outside of Cool's domain.

Business Agreement enabling
PS Roaming and IMS Roaming

Cool
IMS
Domain

BigGreens
IMS
Domain

Cool
3GPP access

BigGreen
WLAN access
supportin
3GPP
interworking

BigGreens
3GPP access

3GPP Mobile
Terminal

PDA, Laptop

3GPP Mobile
Terminal

Jill roaming
on Cool
network

Jill roaming
on her home
network

Note: Jill can access IMS
services simultaneously from
both Cool and BigGreens IMS
domain.

Figure: 6.1

- IMS Roaming refers to the possibility for subscribers of one IMS to obtain IMS services from an IMS the users have not subscribed to, due to a business agreement between the two IMS service providers.

- Specific mechanism to support the access and the authentications in the IMS roaming case are required.

6.2   Charging implications

IMS charging should be taken into account within the Business Agreement between the two operators that allows IMS Roaming.

Functionality to support the transfer of charging information from visited network to home network shall be specified for IMS Roaming.

6.3   Security

Same level of security shall be guaranteed as in the Basic IMS scenario.

 IMS authentication and encryption mechanism shall be extended to support the IMS Roaming case.

6.4 Privacy implications

Same level of privacy shall be guaranteed as in the Basic IMS scenario.

6.5 Regulatory aspects

An operator should be able to support Lawful Interception in a similar way to its own subscribers and to roaming subscribers.

6.6 Roaming

This scenario allows the use of visited IMS operator services, subject to the Business Agreement between the two operators.

6.7 Quality of service

An operator should be able to support the same QoS to its own subscribers and to roaming subscribers.

6.8 User experience

A user shall always have a possibility to use IMS services provided by the home IMS operator. The user shall also be able to access the services provided by the visited IMS operator, subject to the Business Agreement between the two operators.

6.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

6.9.1 Subscription requirements

This scenario neither requires nor prevents the logical separation of IMS and PS subscriptions.

6.9.2 Other Potential new requirements

This scenario allows the use of visited IMS operator services, subject to the Business Agreement between the two operators.

- Functionality to support charging information to be transferred from visited network to home network shall be specified for IMS roaming.

- An operator should be able to support Lawful Interception in a similar way to its own subscribers and to roaming subscribers.

- An operator should be able to support same QoS to its own subscribers and to roaming subscribers.

- Specific mechanisms to support access and the authentication in the IMS roaming case are required.

Note: The last bullet needs to be further expanded by SA1 in order derive the appropriate requirement.

6.9.3 Issues for stage 2/3 technical studies

- IMS charging should be taken into account within IMS Roaming.

The requirement for the interface between entry point of IMS domain and 3GPP access network should be studied.

7 Multiple IMS scenario (part one)

7.1 Description

Changes in business relations like mergers (or take over) may create situations were flexibility in IMS operator and subscriber relations are desirable. One example would be an operator, 'Untouched', merging with another operator BigGreens, and buying access network services from that other operator (BigGreens) in the future. (Resulting scenario in picture below.) Untouched would remain offering IMS services and would keep business relationship with its subscribers unchanged. Subscribers of the former two companies are free to choose between BigGreens' IMS services and Untouched's IMS services (possibly using both simultaneously). Untouched goes on with its business and becomes the big global IMS operator. It makes Business Agreements with other operators where it acts as a 3rd party IMS only operator.

Note: This scenario is different from the IMS Roaming scenario in section 6. In this scenario there is a direct commercial relationship between the subscriber and the IMS operator. In section 6 the term "IMS roaming" refers to the possibility for subscribers of one IMS to obtain IMS services from an IMS the users have not subscribed to, due to a business agreement between the two IMS service providers.

Actors

Operator 'BigGreens'

BigGreens is a 3GPP Access Operator and also IMS Operator.

BigGreens has a business relationship with Untouched.

Operator '3cent'

3cent is any 3GPP Access Operator supporting the 3GPP PS domain (not necessarily having IMS). 3cent has a Business Agreement with BigGreens that enables PS Roaming but has no relationship with Untouched.

Operator 'Untouched'

Untouched is the IMS only operator (i.e. IMS Operator) covering a number of countries perceived to be the market leader in IMS services. The scenario assumes that Untouched does not have a PLMN identifier (i.e. MCC+MNC).

Customer

Jill is customer of Untouched for IMS services. She is also a customer of BigGreens for complete service offering. BigGreens offers her the opportunity also to use the IMS of Untouched.

Jill should be able to access IMS services to both BigGreens and Untouched.

Despite Untouched not having a business relationship with 3cent, Jill will still be able to access the IMS services from Untouched whilst roaming on 3cent (bearer capabilities allowing).

Dependent on the business arrangement Untouched could be acting as an MVNO and own it's own customers.

The assumptions are that Jill has been issued a UICC belonging to BigGreens.
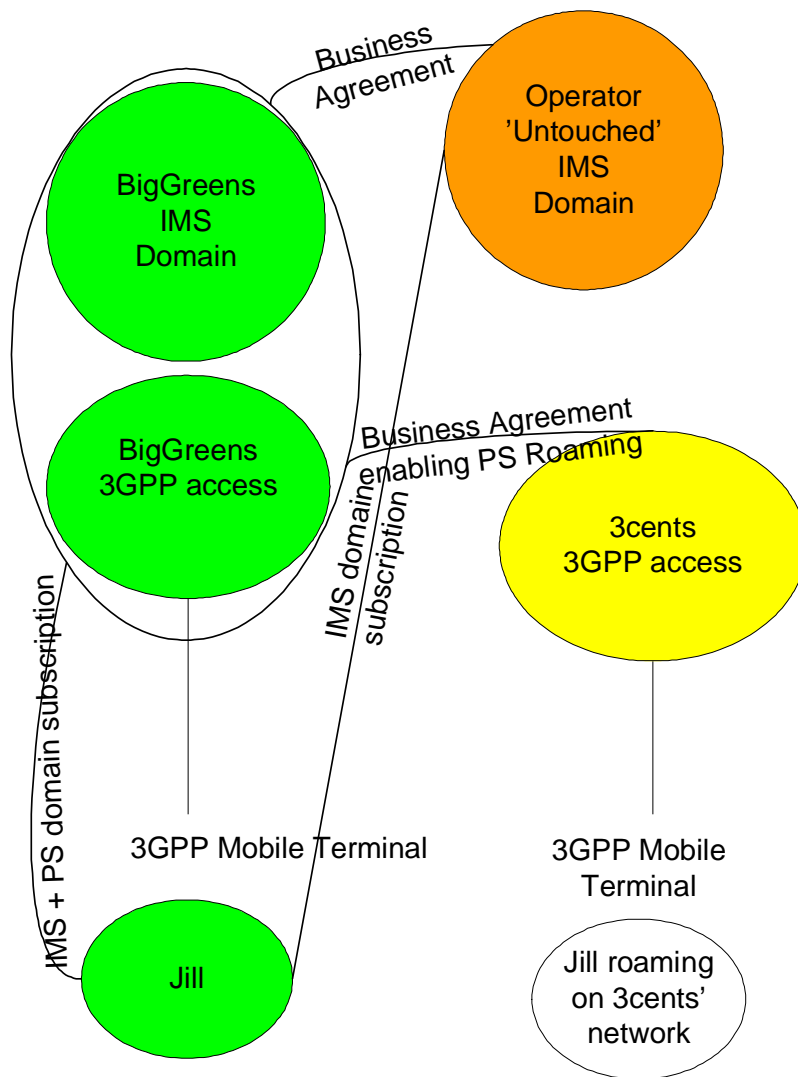
Figure: 7.1

- Untouched manages its own subscriptions.

- Untouched authenticate and authorise customers to use Untouched's domain.

- BigGreens has the billing relationship with Jill.

- It should be possible for Jill to access both Untouched and BigGreens IMS domain, preferably simultaneously.

7.2 Charging implications

Untouched provides BigGreens with the necessary charging information for charging the customer (Jill). The charging information allows BigGreens to perform correlation between bearer, session and event layer.

7.3 Security

The scenario envisages that Untouched will provide the same level of security as BigGreens.

It is be possible for an operator of an IM CN Subsystem to control the mechanisms for managing its own subscriptions and authorize access to its own domain.

7.4 Privacy implications

The scenario envisages that Untouched can ensure the same level of privacy as BigGreens.

7.5 Regulatory aspects

The scenario envisages that Untouched and BigGreens can perform legal interception.

Since Untouched is operating a subsystem (IMS) in partnership with another operator (to complete the 3GPP system deployment), it may be subjected to different regulatory aspects. Potential new mechanisms could be required.

7.6 Roaming

While roaming on 3cent, Jill chose between BigGreens IMS and Untouched IMS the same usual way she always does. The scenario envisages that although Jill is roaming on 3cent it is transparent to Jill.

7.7 Quality of service

No issues identified within this TR.

7.8 User experience

The user has different public identities with its IMS Operators (Big Greens and Untouched). The assumption is that users can use services from both IMS domains at their own request, even simultaneously (presumably by using different client applications, which are associated to respective IMS).

7.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

7.9.1 Subscription requirements

A subscriber can have subscriptions with more than one IMS Operator on the same UE.

7.9.2 Other Potential new requirements

- A user can register to multiple IM CN Subsystems simultaneously.

- It shall be possible to allow a user roaming within a visited PS domain to access the all IMS services she is subscribed to (subject to bearer capabilities of the visited network).

7.9.3 Issues for stage 2/3 technical studies

From a technical point of view, does an IMS only operator like "Untouched" need to have an MCC and MNC? The analysis should confirm the feasibility of simultaneous registrations for a single user to multiple IM CN Subsystems.

Investigate the impact of the requirements on the 3GPP specification.

8 Multiple IMS scenario (part two)

8.1 Description

This scenario continues from the previous one (Multiple IMS scenario part1).

Actors

Operator 'Tealeaf'

Tealeaf is a 3GPP Access Operator and also IMS Operator.

Tealeaf has a business relationship with Untouched.

Operator 'BigGreens'

BigGreens is the same operator as in the previous scenario and which has its own IMS. They allow their customer to access the IMS of Untouched. BigGreens and Tealeaf do not have any Business Agreements.

Operator 'Untouched'

Untouched is the same IMS only operator (i.e. IMS Operator) from the previous scenario, covering markets in a number of countries perceived to be the market leader in IMS services.

Customer

Jill is the customer of BigGreens (Same person Jill as in part one of this scenario). As in the previous scenario BigGreens offers her the opportunity to use the IMS of Untouched.

One day Jill arrives in the country where Tealeaf is running its business. Jill buys a prepaid subscription with Tealeaf and can access the IMS of Untouched due to the Business Agreement between the two. Jill has a dual UICC slot mobile where she was only using one of the slots. So in the empty slot she can insert the UICC hosting the USIM of the prepaid subscription she just has bought. The assumption is that BigGreens is not aware of Jill's initiative at all.

In this scenario Jill want to maintain her public identity and service offering from Untouched despite of used access.

Summary Jill has following subscriptions:

- Untouched IMS

- BigGreen complete service offering

- TeaLeaf Prepaid for at least PS services

After some while Jill decides to stay in her new country and terminates her subscription with BigGreens. This raises the interesting issue about UICC card ownership, when applications belonging to different companies are on the same card (BigGreens' card in this scenario). If the ownership of BigGreens' UICC is transferred to Untouched, can Untouched assume the control of the card? What are the technical difficulties and security related issues? (See section 20)

Frank has only subscribed to Untouched. Untouched offers him to choose among various access operators. Frank has chosen Tealeaf. (Alternative scenario is that Untouched chose Tealeaf for him based on a number of suitable criteria.) Frank has thus access to Tealeaf's PS domain, but the billing relationship is managed completely by Untouched.

Frank can access the (IMS) services of Untouched and PS bearer services from Tealeaf.

The assumptions are that Frank has been issued a UICC belonging to Untouched.

Untouched is acting as an MVNO and own it's own customers.
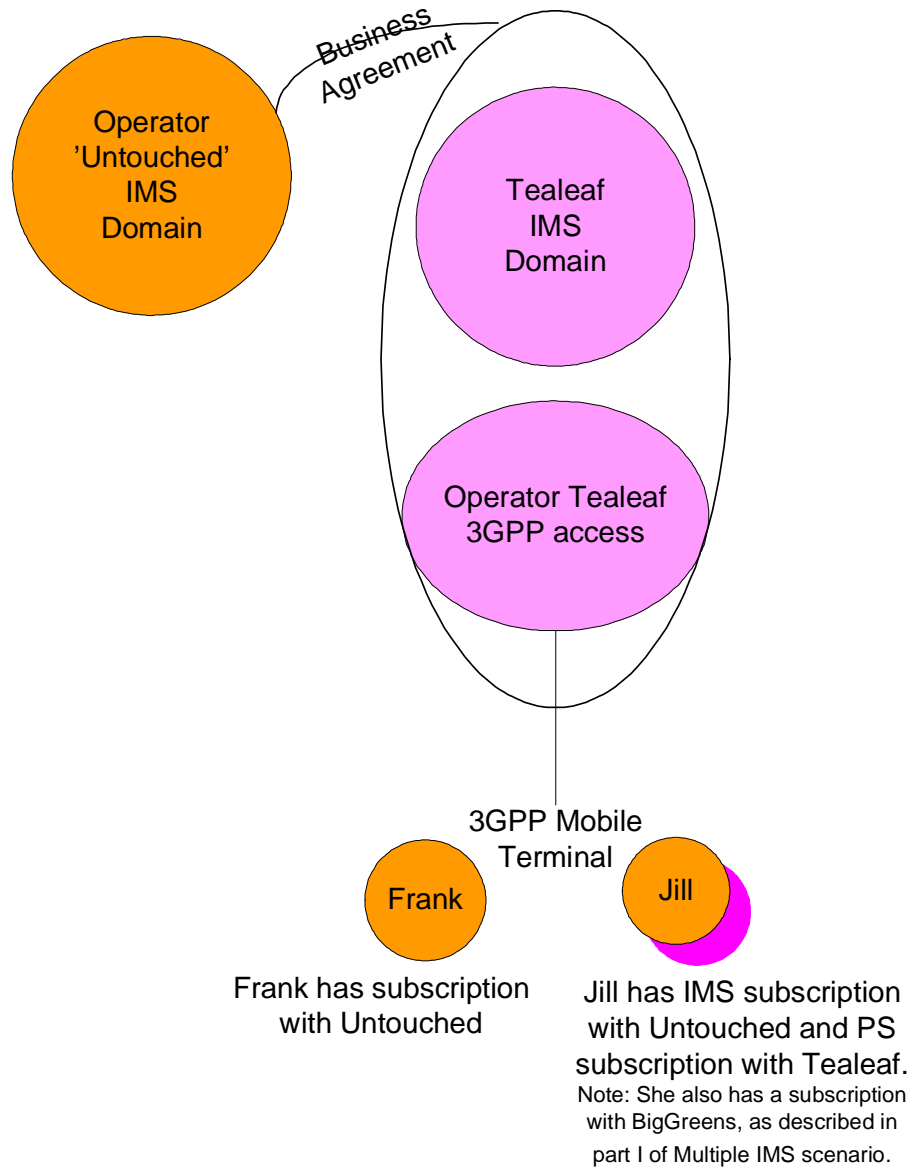
Figure: 8.1

- Untouched manages its own subscriptions.

- Untouched authenticate and authorise customers to use Untouched's domain.

- Untouched has the billing relationship with Frank.

- Tealeaf has the billing relationship (prepaid) with Jill.

8.2 Charging implications

Tealeaf provides Untouched with the necessary charging information for charging the customer (Frank). The charging information allows Untouched to perform correlation between bearer, session and event layer. Tealeaf sells capacity to Untouched on a wholesale basis in this case.

Untouched provides Tealeaf with the necessary charging information for charging the customer (Jill). The charging information allows Tealeaf to perform correlation between bearer, session and event layer.

8.3 Security

The scenario envisages that Untouched will provide the same level of security as Tealeaf can for its IMS.

8.4 Privacy implications

The scenario envisages that Untouched can ensure the same level of privacy as Tealeaf can for its IMS.

8.5 Regulatory aspects

The scenario envisages that Untouched and Tealeaf can perform legal interception.

8.6 Roaming

No issues identified. Neither Frank nor Jill is considered to be roaming in this scenario (part 2).

8.7 Quality of service

No issues identified within this TR.

8.8 User experience

In the case that Jill accesses Untouched from a 3GPP Access operator, which has no commercial relationship with Untouched, the scenario envisage that Untouched has the mechanisms to detect such a condition and take appropriate actions. Such actions could be to inform Jill that the IMS service may be impacted (e.g. Jill might need to pay for incoming calls) or that she is not allowed to use the IMS service of Untouched at all. The rationale is to inform a user that the access she has chosen may not support everything she is normally used to. No implication on 3GPP specification is assumed because of this.

8.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

8.9.1 Subscription requirements

A customer can have independent subscription relationships with its IMS Operator and its 3GPP Access Operators. (Jill can access Untouched's IMS services from Tealeaf's network, or BigGreens' network or from any other 3GPP Access Operator.)

8.9.2 Other Potential new requirements

None have been identified in this section of theTR.

8.9.3 Issues for stage 2/3 technical studies

Verify the assumption made in section 8.8 on User Experience.

Investigate the feasibility of the requirements in 8.9.1.

9 Non-3GPP access scenario (part one)

9.1 Description

Actor

BigGreens acts as IMS Operator, 3GPP Access Operator and Non-3GPP Access Operator. Despite being capable of offering one subscription for all these domains, BigGreens has also decided to offer subscriptions for a subset of its services (domains). This decision has been taken for commercial reasons. The company thinks they will optimize its sales in some segments of the market by not bundling its service offering there.

The first section of the scenario includes one actor only. In the next sections other actors are introduced in order to describe more complex business relationships.

Customers

Jane has two subscriptions with operator BigGreens. The first subscription allows access to BigGreens' IMS domain and the second subscription allows access to the non-3GPP Access domain.

BigGreens also has customers, which subscribe to all of BigGreens services. In this scenario it is assumed that although this type of customers are a substantial part of all BigGreens' customers, the number of clients like Jane are also many.

Figure: 9.1

- The security mechanisms for accessing BigGreens' Non 3GPP access is out of scope of 3GPP. In this scenario it is based on user ID and password.

- Security mechanism for accessing BigGreens IMS domain is according to 3GPP.

- BigGreens is the owner of Jane's UICC(s).

- BigGreens has the billing relationship (prepaid/post-paid) with its customer Jane.

- BigGreens' non-3GPP access may be of any type providing IP connectivity, e.g. fixed lines, LAN, xDSL, etc.

9.2 Charging implications

BigGreens charges its customers for using the IMS. The charges may include charges levied by the called party's IMS (i.e. calling party pays scheme).

The scenario assumes that charging related to Jane's usage of IMS due to her IMS only subscription includes all resources she consumes (events, session, transport). The scenario assumes further that the 3GPP specification provides

the necessary mechanisms so that the charging guidelines for IMS in [4] are fulfilled, also for any non-3GPP Accesses. This enables for instance that Jane does not necessarily have to pay for access charges for incoming sessions. It is assumed that these mechanisms include charging correlation and offline/on-line charging is supported.

Note: Jane uses only the non-3GPP Access.

Charging related to Jane's usage of the non-3GPP Access for other purposes than usage of IMS is outside the scope of 3GPP.

9.3 Security

The same level of IMS security should be provided by the 3GPP specification when the non-3GPP Access is used as when the 3GPP Access is used.

9.4 Privacy implications

The same level of IMS privacy should be provided by the 3GPP specification when the non-3GPP Access is used as when the 3GPP Access is used.

9.5 Regulatory aspects

In some countries, regulations only require lawful interception on "telephony networks" and not "data networks" but the situation can be expected to change. BigGreens could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so, also for sessions over the non-3GPP Access.

9.6 Roaming

Roaming is not considered in this scenario. Please refer to the section "Non-3GPP access scenario with roaming".

9.7 Quality of service

If the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is not applicable to non-3GPP Access. No new mechanisms are required within 3GPP specifications. This does not imply that the perceived QoS will be worse in this case, on the contrary appropriate mapping between 3GPP QoS parameters and access QoS that might be available, may even result in a better perceived QoS than the one provided through a 3GPP access.

9.8 User experience

Although 3GPP specified QoS is not applicable to non-3GPP Access, the QoS perceived by the user may still be acceptable or even excellent depending on the access networks.

9.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

9.9.1 Subscription requirements

Jane does not have a subscription for the PS or CS domain of BigGreens and therefore cannot access her IMS through these domains. She can however access the services of BigGreens' IMS domain through BigGreens non-3GPP Access.

- It shall be possible to offer subscription to IM CN Subsystem independently from any PS/CS CN domain subscription.

Note: Here domain is used in the same sense as in [2], section 15.

9.9.2 Other Potential new requirements

- The 3GPP specification shall include the mechanisms to allow an operator of an IM CN Subsystem domain, 3GPP Access domain and non-3GPP Access domain to offer its IMS services to its subscribers regardless of how they obtain IP-connection (e.g. GPRS, fixed lines, LAN, xDSL).

Note: Within the scope of the present document the above requirement does not have any implications on, or make any assumptions about whether an IMS subscription has to be linked to a PS subscription or if subscriptions for the IMS domain can be offered independently from any created or activated PS/CS CN domain subscription.

- The 3GPP specification shall include the mechanisms to allow an actor operating an IM CN Subsystem, 3GPP Access domain and a Non-3GPP Access (e.g. xDSL, LAN, WLAN) to perform online/offline charging and charging correlation (session/transport) so that the 3GPP charging guidelines [4] for IP-Multimedia services can be fulfilled.

9.9.3 Issues for stage 2/3 technical studies

With the assumptions made in this scenario, investigate the impact on 3GPP specification when allowing IMS domain subscriptions to be independent of any PS/CS domain subscription.

Charging implications need to be further analysed from a technical point of view.

Security implications need to be further analysed from a technical point of view.

10 Non-3GPP access scenario (part two)

10.1 Description

This section continues the scenario from the previous section X.

Actor

BigGreens acts as IMS Operator, 3GPP Access Operator and Non-3GPP Access Operator. Despite being capable of offering one subscription for all these domains, BigGreens has also decided to offer subscriptions for a subset of its services (domains). This decision is based on commercial reasons. The company thinks they will optimize its sales in some segments of the market by not bundling its service offering there.

TommiTyres is a large enterprise, which has its own corporate LAN. In this section BigGreens IMS is accessed from this LAN. The scenario assumes that there are no business agreements between BigGreens and TommiTyres. To make this clear the scenario assumes that the two actors are not aware of each other's existence.

Customers

Jill is another customer of BigGreens and has one subscription, which allows access to BigGreens' IMS domain and only to that domain (IMS only subscription). TommiTyres is Jill's employer and allows Jill to use BigGreens IMS services over the corporate LAN. (*An alternative scenario could be a company buying IMS only subscriptions for its employees. The implications described in this section would not change.*)

BigGreens also has customers, which subscribe to all of BigGreens services. In this scenario it is assumed that although these customers are a substantial part of all BigGreens' customers, the number of clients like Jill are also many.

Figure 10.1

- The security mechanisms for accessing TommiTyre's non-3GPP Access are based on user_id and password and is clearly not specified by 3GPP.

- Authentication to BigGreens IMS domain is according to 3GPP specified mechanisms.

- BigGreens is the owner of Jill UICC.

- BigGreens has the billing relationship (prepaid/post-paid) with its customer (Jill).

- BigGreens allows users to access its IMS domain from the public Internet.

10.2   Charging implications

BigGreens charges its customers for using the IMS. The charges may include charges levied by the called party's IMS (i.e. calling party pays scheme). The scenario assumes that there is <u>no</u> exchange of charging related information between TommiTyres and BigGreens. No new SA1 charging requirements are foreseen as a result of this scenario.

10.3 Security

The same level of IMS related security should be provided by the 3GPP specification when the TommiTyres non-3GPP Access is used for accessing the IMS as compared to accessing the IMS from BigGreens' 3GPP Accesses.

10.4 Privacy implications

The same level of IMS privacy should be provided by the 3GPP specification when the non-3GPP Access is used as when the BigGreens' 3GPP Access is used. BigGreens should at least have the mechanisms for denying access to its IMS from access domains it knows of and doesn't consider secure enough. No impact on 3GPP specification assumed.

10.5 Regulatory aspects

In some countries, regulations only require lawful interception on "telephony networks" and not "data networks" but the situation can be expected to change. BigGreens could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so, also for sessions over TommiTyres non-3GPP Access.

10.6 Roaming

Roaming is not considered in this scenario. Please refer to the section "Non-3GPP access scenario with roaming".

10.7 Quality of service

If the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is not applicable to non-3GPP Access. No new SA1 requirements are foreseen as a result of this part of the scenario.

10.8 User experience

Although 3GPP specified QoS can not be assumed when accessing IMS from a non-3GPP access, the QoS perceived by the user may still be acceptable or even excellent depending on the access networks.

In the case that Jill accesses her IMS from a domain, which has no commercial relationship with the IMS Operator, the scenario envisages that the IMS service has the mechanisms to be aware of such a condition and take appropriate actions. Such actions could be to inform the user if the IMS service may be downgraded, or that she is not allowed to use the IMS service at all. No implication on 3GPP specification is assumed. The rationale is to inform a user that the access she has chosen may not support everything she is normally used to.

10.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

10.9.1 Subscription requirements

Jill does not have a subscription for the PS or CS domain of BigGreens and consequently cannot use any services within these two domains. She can only access BigGreens' IMS domain and she does so from TommiTyres network.

- It shall be possible to offer subscription to IM CN Subsystem independently from any PS/CS CN domain subscription.

- Note: Here domain is used in the same sense as in [2], section 15.

10.9.2 Other Potential new requirements

- The 3GPP system shall allow an operator of an IM CN Subsystem and 3GPP Access domain to offer its services to its subscribers regardless of how they obtain IP-connection (e.g. GPRS, fixed lines, LAN, xDSL). The operator providing the IP-connectivity may be different than the one operating the IM CN Subsystem (e.g. any ISP, WISP or corporate LAN).

Note: Within the scope of the present document the above requirement does not have any implications on, or make any assumptions about whether an IMS subscription has to be linked to a PS subscription or if subscriptions for the IMS domain can be offered independently from any created or activated PS/CS CN domain subscription.

10.9.3 Issues for stage 2/3 technical studies

With the assumptions made in this scenario, investigate the technical impact of 3GPP specification when allowing IMS domain subscriptions to be independent of any PS/CS domain subscription.

Confirm that assumption made in the section on User Experience is valid.

Confirm that assumption made in the section on Privacy is valid.

Investigate any technical impacts to the IMS security, when IMS is accessed from a non-3GPP Access, which is owned by another actor than the operator of the IMS CN Subsystem.

11 Non-3GPP access scenario (part three)

11.1 Description

This section continues the scenario from section X.

Actor

BigGreens is the same actor from the previous sections of the scenario. It acts as IMS Operator, 3GPP Access Operator and Non-3GPP Access Operator and has not change it's business philosophy.

Blitz is a company acting as non-3GPP Access Operator. (Not just W-LAN!)

Customers

Jim is another customer of BigGreens. He has a subscription, which allows him to access BigGreens' IMS domain and only that domain (IMS only subscription). Jim also has a subscription with Blitz

Figure: 11.1

- The security mechanisms for accessing Blitz's non-3GPP Access are based on user_id and password.

- Blitz authenticates Jim and authorizes access to its domain.

- Authentication to BigGreens IMS domain is according to 3GPP specified mechanisms.

- BigGreens is the owner of Jim's UICC.

- BigGreens has a billing relationship (prepaid/post-paid) with its customer (Jim) for IMS services (See charging section x.2).

- Blitz has the billing relationship with Jim for the for the use of Blitz's services.

11.2 Charging implications

BigGreens charges its customers for using the IMS. The charges may include charges levied by the called party's IMS (i.e. calling party pays scheme). The scenario assumes that charging related to Jims's usage of IMS due to his IMS only subscription includes all resources he consumes (events, session, transport). The scenario assumes further that the 3GPP specification provides the necessary mechanisms so that the user related charging guidelines for IMS in [4] are fulfilled, also for any non-3GPP Accesses. It is also assumed that the non-3GPP Access is able to meet the technical conditions required for this. This enables for instance that Jim does not necessarily have to pay for access charges for incoming sessions. It is assumed that these mechanisms include charging correlation and offline/on-line charging is supported.

Charging related to Jim's usage of the non-3GPP Access for other purposes than usage of IMS is outside the scope of 3GPP.

11.3 Security

The same level of IMS related security should be provided by the 3GPP specification when the Blitz's non-3GPP Access is used for accessing the IMS as compared to accessing the IMS from BigGreens' 3GPP Access.

11.4 Privacy implications

The same level of IMS privacy should be provided by the 3GPP specification when the non-3GPP Access is used as when the BigGreens' 3GPP Access is used.

11.5 Regulatory aspects

In some countries, regulations only require lawful interception on "telephony networks" and not "data networks" but the situation can be expected to change. BigGreens could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so, also for sessions over Blitz's non-3GPP Access.

11.6 Roaming

Roaming is not considered in this scenario. Please refer to the section "Non-3GPP access scenario with roaming".

11.7 Quality of service

If the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is not applicable to non-3GPP Access. No new mechanisms are required within 3GPP specifications. This does not imply that the perceived QoS will be worse in this case, on the contrary appropriate mapping between 3GPP QoS parameters and access QoS that might be available, may even result in a better perceived QoS than the one provided through a 3GPP access.

11.8 User experience

Although 3GPP specified QoS can not be assumed on the non-3GPP access, the QoS underlineperceived by the user may still be acceptable depending on the access networks.

11.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

11.9.1 Subscription requirements

- It shall be possible to offer subscription to IM CN Subsystem independently from any PS/CS CN domain subscription.

Note: Here domain is used in the same sense as in [2], section 15.

11.9.2 Other Potential new requirements

- The 3GPP specification should specify the interworking mechanisms to allow an operator of an IM CN Subsystem domain and an operator of a Non-3GPP Access (e.g. xDSL, LAN, WLAN) to perform online/offline charging and charging correlation (session/transport). This shall allow the IMS operator to

charge its customer using the IM CN Subsystem and a Non-3GPP Access (e.g. xDSL, LAN, WLAN) according to the IMS charging guidelines [4] for IP-Multimedia services, where applicable.

Note: It is assumed that the non-3GPP Access is able to meet the technical conditions required for this. It is assumed also that the non-3GPP Access Operator is able to charge adequately.

11.9.3   Issues for stage 2/3 technical studies

Investigate the feasibility of the potential new requirements identified.

12   Non-3GPP access scenario for 3GPP access operator– access independence

12.1 Description

Actors

The scenario includes three actors.

Operator BigGreens runs the IMS domain, the 3GPP Access domain as well as a non-3GPP access providing IP-connectivity, e.g. WLAN or LAN.

Company TommiTyres operates a non-3GPP-access system domain providing IP-connectivity. Operator BigGreens and Company TommiTyres does not have any business agreement.

Company Blitz operates a non-3GPP-access system domain providing IP-connectivity. Operator BigGreens and company Blitz have a business agreement, which allows Jill to access Blitz's domain.

Customer

The customer Jill has a subscription with operator BigGreens. The subscription allows access to BigGreens' IMS domain and to the BigGreens Accesses.

Jill also uses other companies' accesses, which provides IP-connectivity. Company TommiTyres could for instance be her employer. Jill has also chosen company Blitz, which is one of many companies offering IP-connectivity to the public.. In this scenario the relation of Jill with TommiTyres and Blitz are out of the scope of 3GPP specifications.

Figure: 12.1

- TommiTyres and Blitz authenticate their users and authorize access to their domains. (Anonymous access may be plausible depending on the exact circumstances, which are left outside the scope of the scenario.)

- BigGreens, TommiTyres and Blitz may have billing relationships with their customer, which is something that is left outside scope of this scenario.

- The TommiTyres and Blitz Company's access may for example be of the type xDSL, LAN, WLAN.

- Authentication to the BigGreens IMS domain is according to 3GPP specified mechanism.

- BigGreens authenticates its customer and authorizes access to its domain.

- BigGreens has the billing relationship (prepaid/post-paid) with its customer. Also, please see charging section below.

- The scenario assumes that BigGreens has the billing relationship with the customer and that it is also the owner of the UICC(s).

In this scenario it is assumed that when BigGreens offers IMS services via Blitz or TommiTyres the IMS charging are linked to the IMS subscriber identity.

- When Jill accesses Big Greens IMS service via Tommi Tyres, Big Greens will have a billing relationship with Jill for the usage of the IMS services and Tommi Tyres could have a billing relationship with Jill for the access.

- When Jill accesses Big Greens IMS service via Blitz, Big Greens will have a billing relationship with Jill for the usage of the IMS services and potentially for the access via Blitz. The latter case is based on the Business Agreement between Big Greens and Blitz and its implementation is supposed to be left outside the 3GPP specifications,

- Jill has a single subscription, issued by BigGreens, which grants access to all BigGreens domains.

In the scenario it can be envisaged that users wants to register with their IMS service from various terminal equipments over different accesses at the same time. User may want to receive some sessions on specific terminal equipment, e.g. "heavy" multimedia sessions, and other session on other terminal equipments (e.g videocalls).

12.2   Charging implications

BigGreens charges its customer for using the IMS.

TommiTyres could charge its customer for using its access (This is left outside 3GPP specifications).

The business agreement between BigGreens and Blitz could envisage that Jill will be charged by BigGreens for using Blitz's domain. The mechanism to support this charging is left outside 3GPP specifications, in this scenario.

Business settlement between Blitz and BigGreens is outside of the 3GPP scope.

12.3   Security

The same level of IMS security should be provided when the non-3GPP Access is used as when the 3GPP Access is used.

12.4   Privacy implications

The same level of IMS privacy should be provided when the non-3GPP Access is used as when the 3GPP Access is used.

12.5   Regulatory aspects

In some countries regulations only require lawful interception on "telephony networks" and not "data networks" but the situation can be expected to change. BigGreens could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so, also for sessions over the other companies' access.

12.6   Roaming

Roaming is not considered in this scenario. Please refer to the next section " Non-3GPP access scenario with roaming".

12.7   Quality of service

If the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is presumably not applicable at bearer level. Appropriate interworking could apply. No new mechanisms are required in 3GPP specifications due to that interworking which is left outside 3GPP specifications.

12.8   User experience

Although 3GPP specified QoS can not be assumed when accessing IMS from a non-3GPP access, the QoS perceived by the user may still be acceptable depending on the access networks.

12.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

12.9.1 Subscription requirements

This scenario neither requires nor prevents the logical separation of IMS and PS subscriptions.

12.9.2 Other Potential new requirements

No new requirements have been foreseen as a result of this scenario.

12.9.3 Issues for stage 2/3 technical studies

No specific impacts are expected on 3GPP specification from the point of view of QoS and charging compared to already existing ones, but this shall be carefully verified if the present and ongoing specifications related to this scenario are sufficiently flexible to allow the use of generic accesses offering IP connectivity. E.g. appropriate interworking functions should be of technical feasibility and of reasonable complexity.

13 Non-3GPP access scenario with roaming

13.1 Description

The scenario includes two actors. Operator BigGreens runs the IMS domain, the 3GPP Access domain as well as a non-3GPP access providing IP-connectivity, e.g. WLAN or LAN. Blitz operates a non-3GPP-access system domain providing IP-connectivity. The main difference with the previous scenario is that in this case BigGreens has a Business Agreement in place with Blitz, which give the possibility for BigGreens customers to use Blitz's internet access. The subscribers of BigGreens do not need to have a direct business relation with Blitz to attain connectivity. BigGreens is responsible for charging the subscriber also for the connectivity as well as authenticating and authorising the subscribers on Blitz.
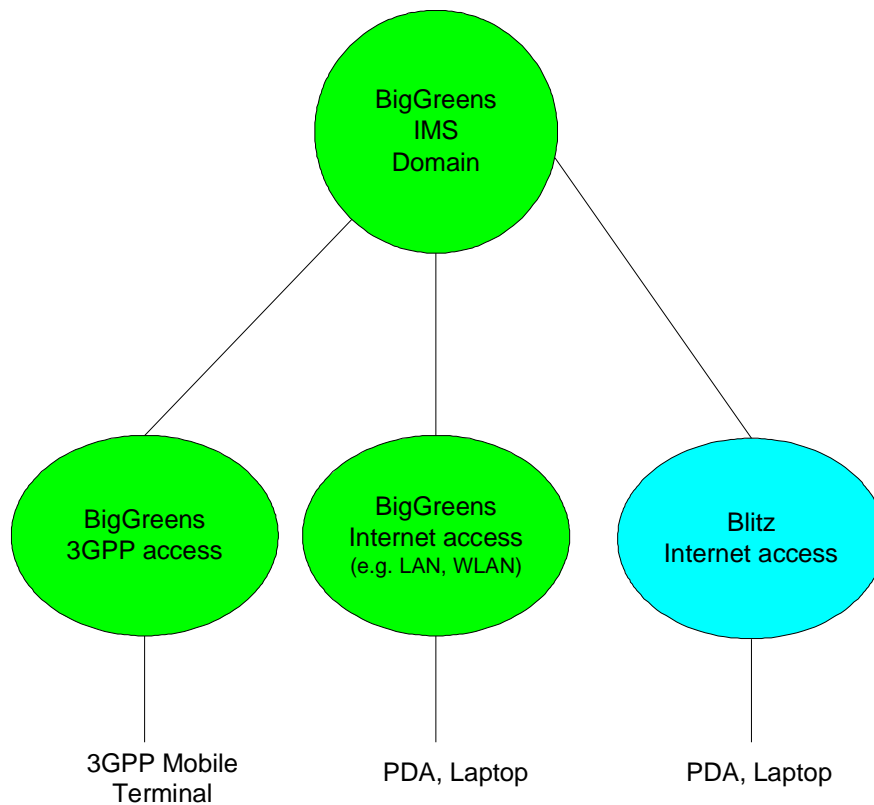
Figure 13.1

- The customer Jill has a subscription with operator BigGreens. The subscription allows access to BigGreens' IMS domain (and *possibly* only to that domain).

- Jill also uses other companies' accesses, which provided IP-connectivity. Jill has also chosen company Blitz when BigGreens does not offer IP connectivity (e.g. abroad).

- Operator BigGreens and company Blitz have a Business Agreement , which gives the possibility for BigGreens customers to use Blitz internet access..

- Operator BigGreens is the only actor with a billing relationship with Jill.

- The charges for the usage of Blitz's network are settled by BigGreens.

- Accessing IMS from Blitz domains should not degrade the security level of the IMS domain. [Editor's note: This bullet should probably be removed or put in the requirement summary.]

- Blitz's access may for example be of the type PSTN, xDSL, LAN, WLAN.

- BigGreens authenticates its customers when they try to access the Blitz network. The authentication may be performed using 3GPP mechanisms, but other forms of authentication may apply (e.g. AAA). The authentication method(s) used are assumed to be specified by the Business Agreement between BigGreens and Blitz.

- BigGreens authenticates its customers and authorizes access to its domain. This generally means that BigGreens owns the mechanisms for performing the task.

- BigGreens should be able to ensure the user's privacy when the IMS is accessed from Blitz's domain.

- The scenario envisages that the BigGreens has the mechanisms for providing lawful interception, also when the IMS is accessed from the Blitz domains.

- The scenario assumes that BigGreens (the company having the billing relationship with the customer) is also the owner of the UICC(s) (in the case a UICC is used for accessing a domain).

- In this scenario (and possibly others) it can be envisaged that users wants to register with their IMS service from various terminal equipments over different accesses at the same time. Some sessions they may want to receive on specific terminal equipment, e.g. "heavy" multimedia sessions, and other session they may want to receive with their mobile phone.

13.2   Charging implications

Blitz applies agreed charges to BigGreens when BigGreens customers use the Blitz access.

BigGreens charges its customers for using the IMS, the fee may include charges levied by the called party's IMS, ("calling party pays").

13.3   Security

The scenario prescribes that accessing the IMS from Blitz's domain will not in itself degrade the level of security of the IMS. The security requirements for accessing Blitz's domain are probably outside the scope of 3GPP.

13.4   Privacy implications

Ideally, BigGreens should be able to ensure the user's privacy when the IMS is accessed from Blitz's domain.

13.5   Regulatory aspects

In some countries, regulations only require lawful interception on "telephony networks" and not "data networks" but the situation may change. BigGreens could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so, also for sessions over the other companies' access.

13.6   Roaming

FFS

13.7   Quality of service

When the IMS services are attained through the non-3GPP network, the 3GPP QoS does not apply.

13.8   User experience

In this case a mapping of QoS parameters or a SLA may be necessary to guarantee a satisfactory experience of the service.

13.9   Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

13.9.1 Subscription requirements

This scenario neither requires nor prevents the logical separation of IMS and PS subscriptions.

13.9.2 Other Potential new requirements

No new requirements have been foreseen as a result of this scenario.

### 13.9.3 Issues for stage 2/3 technical studies

No specific impacts are expected on 3GPP specification from the point of view of QoS and charging compared to already existing ones, but this shall be carefully verified if the present and ongoing specifications related to this scenario are sufficiently flexible to allow the use of generic accesses offering IP connectivity. E.g. appropriate interworking functions should be of technical feasibility and of reasonable complexity.

14 Stand Alone IMS operator scenario

14.1 Description

This scenario includes four companies, Yazoo, Blitz, Cool and 3cents. They are all operating in the same country.

Actors:

Note: A stand-alone IMS operator is an IMS operator who does not own any type of access network. Yazoo is a stand-alone IMS operator. The term only applies in this scenario.

'Yazoo'

Yazoo is acting as IMS Operator and owns its customers. In this scenario Yazoo offers its IMS service to users of Blitz's, Cool's and 3cents' access domains. Yazoo does not own any 3GPP access network anywhere. Throughout this scenario Yazoo has the billing relationship with its customers for the IMS services it is offering. Yazoo buys capacity on a wholesale basis from Blitz, 3cents and Cool.

Note: Yazoo charges for bearer level resources used for IMS services. The existence of a commercial agreement between Yazoo and the access operators is assumed for achieving this.

'Blitz'

Blitz is a non-3GPP access operator offering IP-connectivity. Blitz has the billing relationship with its customers for using its domain. One exception though is as stated above the IMS services offered by Yazoo.

'3cents'

Despite 3cents being a low cost 3GPP Access Operator it has a UTRAN access network with almost nationwide coverage. The UTRAN access network of 3cents can only support modest QoS since it has been built with focus on keeping investment costs low. In this scenario 3cents has the billing relationship with its customers, except for the IMS service offered by Yazoo. 3cents important contribution to the offering is the nationwide coverage of the UTRAN access.

'Cool'

Cool is a 3GPP Access Operator. Cool's UTRAN access network has been designed to offer advanced QoS but the coverage is so far limited to urban areas. In this scenario Cool has the billing relationship with its customers, except for the IMS service offered by Yazoo.

The three companies Blitz, 3cents and Cool administrate their domains independently of each other. To make this clear the assumption of this scenario is that they are not even aware of each other's existence.

Customers:

The customers in this scenario are Jim, Jill and KevinGadgets (Jill's employer).

Jill & KevinGadgets:

Jill has a subscription with Yazoo. The subscription allows her to use the IMS services of Yazoo's domain.

Jill has a subscription with 3cents. The subscription allows her to use the services of 3cents domain. She uses her own terminal in this case.

KevinGadgets has a subscription with Cool. The subscription allows access to Cool's domain, including Cool's CS/PS and IMS domain. KevinGadgets allows Jill to use this subscription at work and she uses her employer's PDA in this case. She uses different PINs to authenticate herself towards Yazoo's and Cool's domain respectively. This prevents unauthorized use of Jill's subscription with Yazoo. (In the case some other employee uses the PDA.)

Jill continues to use the services of Yazoo, accessing them from 3cents access.

Jim:

Jim has a subscription with Yazoo. The subscription allows him to use the services of Yazoo's domain.

Jim has a subscription with Blitz. The subscription allows him to use the services of Blitz's domain. Jim does not have a subscription with 3cent or Cool or any other 3GPP Access Operator for that matter.

Figure 14.1

- The authentication mechanism for accessing Blitz's domain is not based on UICC in this scenario.

- Authentication to the IMS domain of Yazoo is according to 3GPP specified mechanism (i.e. UICC based).

- Blitz's access may for example be of the type xDSL, LAN, WLAN.

- Yazoo owns the UICC, which Jim uses for accessing the IMS domain of Yazoo.

- Cool owns the UICC, which TommiTyre's employee uses for accessing the domain of Cool.

- Yazoo owns the UICC, which Jill uses to access the domains of 3cents and Yazoo.

14.2   Charging implications

The scenario assumes that charging information associated with the bearer level can be exchanged between the 3GPP Access Operator and the Stand Alone IMS Operator. This exchange of information allows the Stand Alone IMS Operator to comply with the charging guidelines for IMS in [4]. The scenario also envisage that the similar exchange of charging information can be done also between the Stand Alone IMS Operator and a non-3GPP access operator, so that the charging guidelines for IMS in [4] can be fulfilled.

14.3 Security

The scenario prescribes that accessing the IMS from the Blitz domain will not in itself degrade the level of security (compared to accessing the IMS from a 3GPP Access Operator's domain).

14.4 Privacy implications

Ideally, Yazoo should be able to ensure the user's privacy when the IMS is accessed from Blitz's domain. Yazoo should at least have the mechanisms for denying access to its IMS from access domains it doesn't consider secure enough.

14.5 Regulatory aspects

In some countries regulations only require lawful interception on "telephony networks" and not "data networks" but the situation may change. Yazoo could be subject to facilitate lawful interception and the scenario prescribes that it has the means to do so.

14.6 Roaming

No issues identified. Roaming is not considered in this scenario.

14.7 Quality of service

If the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is not applicable. No new requirements have been identified.

14.8 User experience

Although 3GPP specified QoS cannot be assumed when accessing IMS from a non-3GPP access, the QoS perceived by the user may still be excellent depending on the access networks.

14.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

14.9.1 Subscription requirements

Subscription to IM CN Subsystem domain can be offered independent of PS/CS CN domain subscriptions.

14.9.2 Other Potential new requirements

- The 3GPP specification shall allow a Stand Alone IMS Operator to have absolute control of the mechanisms for authenticating its customers and authorize access to its own domain.

14.9.3 Issues for stage 2/3 technical studies

Investigate the feasibility of the requirements in 14.9.

15 Operator integration of domains

15.1 Description

Actors

The scenario includes two actors.

Operator BigGreens runs the IMS domain, the 3GPP Access domain as well as a non-3GPP access providing IP-connectivity, e.g. WLAN or LAN.

Company Blitz operates an IMS domain. Blitz operates 3GPP and non 3GPPaccess access system domains (but this is unessential to this scenario)

Customer

The customer Jill has a subscription with operator BigGreens. The subscription allows access to BigGreens' IMS domain and accesses (and possibly only to Big Greens domains).
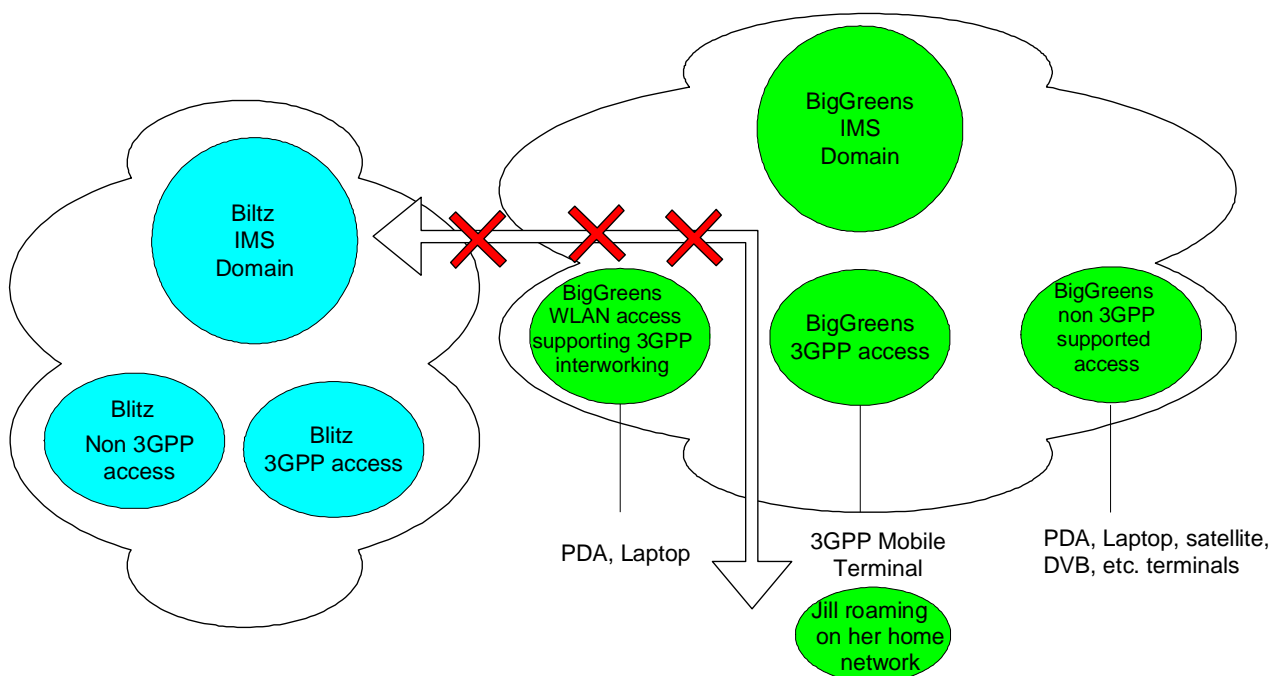
Figure: 15.1

Jill subscription to BigGreens foreseen that Jill can use BigGreens accesses in order to:

- Obtain services provided autonomously by the different access (e.g GPRS)

- Obtain IMS services by Big Green IMS (Only by the Big Greens IMS domain).

BigGreens benefits of a simplified customer provision and customer service profiling due to the integration between the IMS and PS subscription.

15.2 Charging implications

No additional specific requirements are identified at stage 1 development level.

15.3 Security

Authentication and authorization IMS and PS mechanisms shall be integrated.

15.4 Privacy implications

No additional specific requirements are identified at stage 1 development level.

15.5 Regulatory aspects

No additional specific requirements are identified at stage 1 development level.

15.6 Roaming

No additional specific requirements are identified at stage 1 development level.

15.7 Quality of service

No additional specific requirements are identified at stage 1 development level.

15.8 User experience

No additional specific requirements are identified at stage 1 development level.

15.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

15.9.1 Subscription requirements

- A 3GPP operator shall be able to manage IMS and UMTS PS subscription as a single subscription. The 3GPP system shall specify an efficient and integrated authentication and authorization signalling and management

15.9.2 Other Potential new requirements

A 3GPP access operator (including W-LAN access with 3GPP interworking) operator shall be able to prevent its customers to access to IMS services provided by other operators. The mechanism shall be explicitly specified in the 3gpp standards.

15.9.3 Issues for stage 2/3 technical studies

Investigate the feasibility of integration of IMS and PS authentication.

16 Interoperability scenario

16.1 Description

The company Blitz, which does not operate a 3GPP-access, offers its customers IP-connectivity and access to its IMS domain over its non-3GPP-access. BigGreens offers its customer, Jill, IP connectivity over its 3GPP access and also access to its IMS domain. This scenario allows customers of Blitz to interoperate with customers of BigGreens.

Actors

Operator 'BigGreens'

BigGreens is the same 3GPP operator as in the previous scenarios and which has its own IMS and 3GPP access.

Operator 'Blitz'

Blitz is ISP/WISP. Blitz's IMS is compliant to 3GPP IMS specifications (Rel 6 or later), thus Blitz is also an IMS operator. Blitz does not have 3GPP specified access, but it is offering non-3GPP internet access (WLAN, xDSL, etc.)

Figure 16.1

- Blitz manages its own subscriptions.

- Blitz authenticates and authorises customers to use Blitz's domains.

- Blitz has the billing relationship with its customer.

- The scenario envisages that all Blitz customers can communicate with persons/entities registered on other IMS domains and operators to maintain traditional mobile telephony charging schemes.

- Blitz access may be of the type PSTN dial-up, xDSL, LAN, WLAN.

- A customer of Blitz does not have to be known by BigGreens.

- BigGreens authenticates and authorises users to access its domain.

- Blitz has a Business Agreement with BigGreens (or possibly some intermediate actor, which has a Business Agreement with BigGreens)

16.2 Charging implications

The scenario envisages that Blitz can perform correlation of bearer, session and events in the same manner as the BigGreens can do for it's customers.

Various charging models (Calling-party pays, Called-party pays, etc.) need be supported for this scenario. For instance Jack could make a multimedia call to Jill and pay for that call (Calling-party pays). In the case Jill is roaming she will be charged for the roaming portion of the call, as she would do today.

16.3 Security

The scenario envisages that Blitz will be able to provide the same level of security for its IMS domain as BigGreens.

16.4 Privacy implications

Blitz is expected to be able to ensure the same level of privacy for its customers as BigGreens can do for its customers.

16.5 Regulatory aspects

In some countries, regulators only require lawful interception on "telephony networks" and not "data networks", but the situation may change. The scenario envisages that Blitz performs legal interception.

16.6 Roaming

Roaming is not applicable in this scenario.

16.7 Quality of service

When the IMS services are accessed through non-3GPP accesses, 3GPP specified QoS is not applicable.

16.8 User experience

[Editor's note: identified issues]

16.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

16.9.1 Subscription requirements

TBD

16.9.2 Other Potential new requirements

- The 3GPP system shall allow an actor operating an IM CN Subsystem domain and a Non-3GPP Access (e.g. xDSL, LAN, WLAN) to process charging information coming from an external network, so that the 3GPP charging guidelines [4] for IP-Multimedia services can be fulfilled.

-   The 3GPP specifications shall not preclude the mobile operator to offer their customers interoperability of IMS services with customers of ISP/WISP.
    Note that this ISP/WSIP interface towards operator needs to be compliant with 3GPP specifications, but the complete network implementation might not need to be compliant with all parts of 3GPP system specifications.

16.9.3 Issues for stage 2/3 technical studies

Verify the impact on the current 3GPP specification as a consequence of these requirements.

17 Interworking and interoperability scenario

17.1 Description

IMS operators Blackhorse and. Big Greens are offering IMS services to their customers.

This scenario allows to the two IMS to interoperate to provide communication facilities between the customers of the two operators.

The kind of access used (3GPP accesses, non 3GPPaccesses, non 3GPP accesses with 3GPP specified interworking) is not relevant in this scenario.

This scenario also allows IMS operators to interoperate with ISP/WISP (Glass&tyres) operator providing multimedia Services, to allow communication facilities between their customers. The interoperability considered is based on standard 3GPP interfaces. In order to present standard 3GPP interfaces it is expected that there will be some interworking function required.

Other interoperability and interworking case could apply for the interface between the IMS and the ISP/WISP operator, but the details are left outside of the scope of 3GPP specifications

Actors

Operator 'BigGreens'

BigGreens is a 3GPP IMS operator.

Operator 'Blackhorse'

Blackhorse is a 3GPP IMS operator.

Operator 'Glass&tyres'

Glass&tyres is ISP/WISP Glass&tyres is compliant to 3GPP (Rel 6 or later) interfaces at the border with IMS operators.

**3GPP compliant
interfaces**
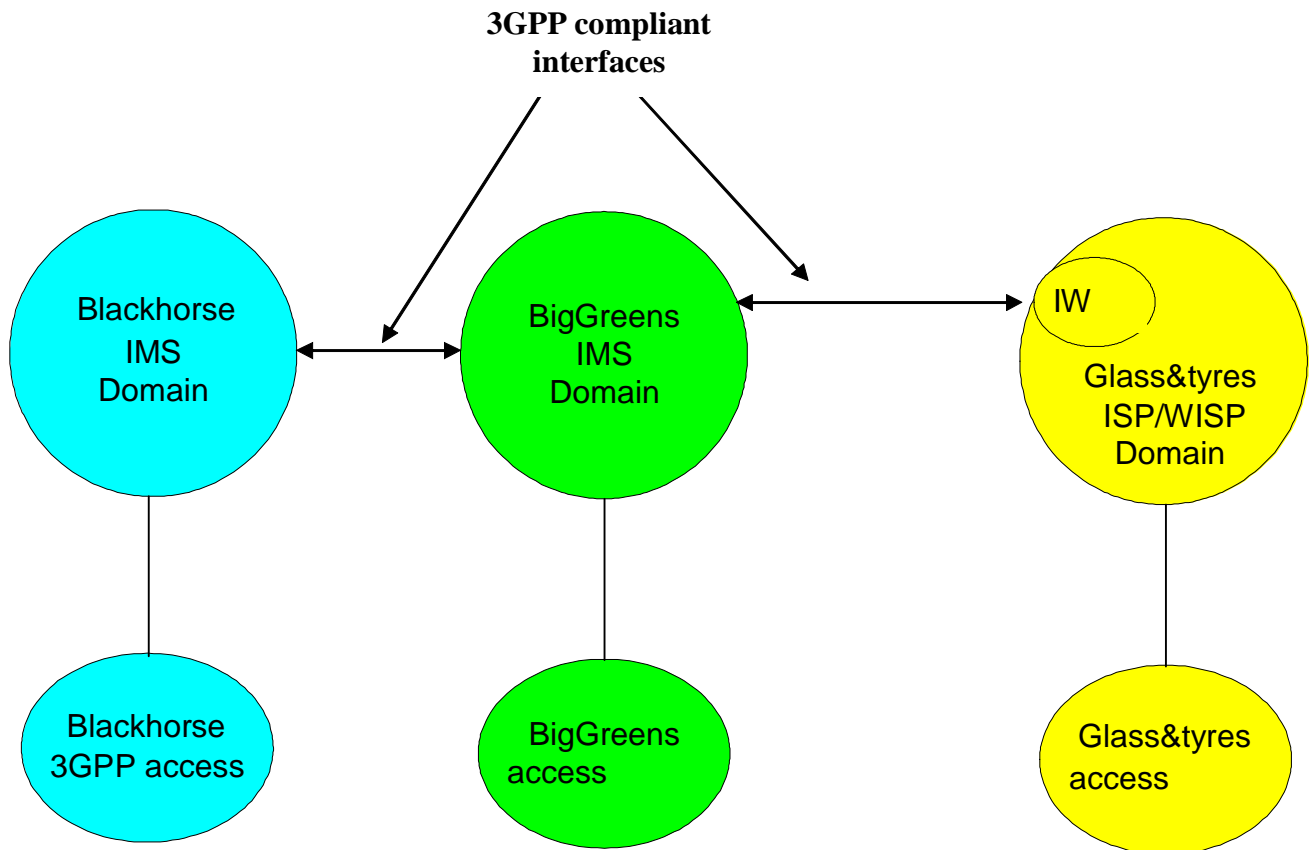
Figure: 17.1

- Glass&tyres, Blackhorse and BigGreens manage their own subscriptions.

- Glass&tyres, Blackhorse and BigGreens authenticate and authorises their customers.

- Glass&tyres, Blackhorse and BigGreens have the billing relationship with their customer.

- A customer of Blackhorse doesn't have to be known by BigGreens and viceversa. The same apply to Glass&tyres customers.

- Glass&tyres, Blackhorse and BigGreens have a business agreement one to each other (or possibly with some intermediate actor) to support interconnection between their customers.

17.2   Charging implications

Various charging models (Calling-party pays, Called-party pays, etc.) need be supported for this scenario. For instance Jack could make a multimedia call to Jill and pay for that call (Calling-party pays). In the case Jill is roaming she will be charged for the roaming portion of the call, as she would do today.

17.3   Security

Already developed or being developed in 3GPP. No additional specific requirements are identified at stage 1 development.

17.4   Privacy implications

Already developed or being developed in 3GPP. No additional specific requirements are identified at stage 1 development.

17.5 Regulatory aspects

Already developed or being developed in 3GPP. No additional specific requirements are identified at stage 1 development.

17.6 Roaming

Roaming is not applicable in this scenario.

17.7 Quality of service

Already developed or being developed in 3GPP. No additional specific requirements are identified at stage 1 development.

17.8 User experience

Not relevant for this scenario.

17.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

17.9.1 Subscription requirements

This scenario neither requires nor prevents the logical separation of IMS and PS subscriptions.17.9.2 Other Potential new requirements

- None identified.

- Notes:

- The 3GPP system shall allow an actor operating an IM CN Subsystem domain to process charging information coming from an external network, so that the 3GPP charging guidelines [4] for IP-Multimedia services can be fulfilled.

- The 3GPP specifications shall not preclude the mobile operator to offer their customers interoperability of IMS services with customers of ISP/WISP.
  Note that this ISP/WISP interface towards operator needs to be compliant with 3GPP specifications, but the complete network implementation might not need to be compliant with all parts of 3GPP system specifications.

17.9.3 Issues for stage 2/3 technical studies

No specific impact are expected on 3GPP specification from the point of view of interoperability, but shall be carefully verified if the present and ongoing specifications are sufficiently flexible to not preclude the interoperability with ISP/WISP. E.g. appropriate interworking functions (left outside the 3gpp specifications) should of technical feasibility and of reasonable complexity

18 Multiple terminals scenario

18.1 Description

This scenario is for the following use case:

One subscriber is using his IMS services with several terminals at the same time. For the incoming sessions the user would have the same public identity / identities for all his devices (through which he has registered to the IMS system). In this example both terminals have their own UICC.

It should be noted that the registered applications (/capabilities) may be the same or different, e.g. the list of supported codecs. Thus the routing for incoming sessions needs to be based on additional information like capabilities of UEs or preferences of the user and the network.

In the scenario described in figure X customer has two UEs, UE #1 and UE #2 (e.g. PDA). Both UEs are registered to same IMS subscription and have unique, UE specific identities based on existing ones if possible.

Customer receives an incoming multimedia session. Operator BigGreens' IMS has received information on capabilities of both terminals. Customer has also been able to indicate his preferences on routing of the sessions. IMS knows that only UE #2 is able to handle this type of multimedia sessions. Therefore IMS directs the session to UE #2 using the UE specific identity.

Customer receive a second session. This time the session is a regular speech call. Both UEs alert. Customer answers using UE #1. UE #2 stops alerting.

Customer receives a third session. UE #1 alerts. Customer redirects the session to UE #2 since battery of UE #1 is almost empty.
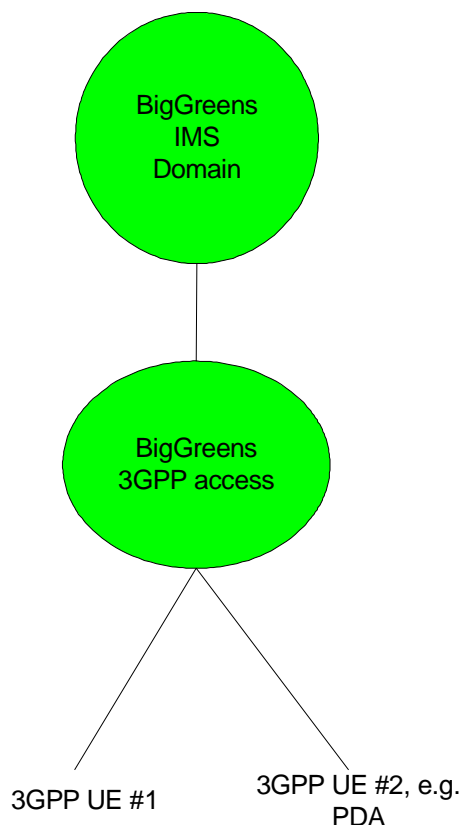
Figure: 18.1 Customer with two devices using IMS services.

18.2   Charging implications

The scenario envisages that it is possible to provide itemised billing per used UE.

18.3   Security

IMS shall use same security mechanisms for the multiple terminals case as in one terminal case.

18.4   Privacy implications

None identified.

18.5   Regulatory aspects

None identified.

18.6   Roaming

Roaming does not have a direct impact on this scenario, but combinations with the other scenarios described in this TR may bring implications.

18.7 Quality of service

QoS may vary depending on which one of the terminals answers.

18.8 User experience

End user is able to use both of his terminals without the need to switch UICCs between the UEs, and without the need to have two separate public identifiers.

18.9 Potential Requirements and Impacts relevant to the scenario

This section contains the potential requirements and impacts on 3GPP specifications, in case that the scenario is agreed to be supported by 3GPP.

18.9.1 Subscription requirements

-It shall be possible to use one subscription simultaneously in several terminals

18.9.2 Other Potential new requirements

This scenario implies the following potential requirements:

-One subscriber shall be able to use same public identity with several terminals simultaneously.

-IMS shall be able to support several registrations from different terminals per one public identity.

-IMS shall be able to support Intelligent routing towards the correct terminal(s), based on Terminal capability, User preference and/or Network preferences.

18.9.3 Issues for stage 2/3 technical studies

Verify the feasibility of the requirements in section 18.9 and impact on 3GPP specifications.

19 Conclusions

The scenarios contained within this TR are not exhaustive and should only be considered representative of possible deployments. It has been determined for each scenario whether is it in the current scope of 3GPP.

When the scenario has been marked as within scope then SA1 should further refine the requirements derived from that scenario and if applicable propose suitable changes to the respective stage 1 specifications.

When the scenario has been judged as out of current scope of 3GPP, then justifications are given why the scenario should be brought into scope and also justifications why the scenario should remain out of scope. If consensus for justification is reached then SA1 would propose to develop new Work item descriptions. If no consensus can be reached, then it is for the interested companies to propose new WiDs under the normal rules.

For the purpose of determining if a scenario where interworking is required is within the scope of 3GPP or not, reference was made to the principle in 4.4 of this TR.

19.1   Scenario Analysis

This section lists the rationale for each scenario as to why the scenario in itself may or may not be relevant for 3GPP within the context of release 6.

Section 5: Basic IMS scenario: This scenario is considered within the scope of 3GPP.

Based on future input contributions, SA1 will consider if changes are required to the stage 1 specifications to fulfil the requirements derived from this scenario.

Section 6: IMS roaming scenario: This scenario is considered within the scope of 3GPP.

Based on future input contributions, SA1 will consider if changes are required to the stage 1 specifications to fulfil the requirements derived from this scenario

Section 7 Multiple IMS scenario (part one): Some aspects of this scenario are considered to be within the current scope of 3GPP. There is no consensus on whether all aspects of this scenario are within the scope of 3GPP

Rationale why this scenario is relevant for 3GPP: By allowing external IMS Operators an operator can have an additional way of extending its own service offering. The reason for doing so could simply be lack of own resources for developing all niche services that the market could demand, or that some services cannot be offered in-house because of brand or ownership issues (e.g. government owned operator). Yet another possibility may be for the operator to make the best possible use of an external actor's customer relationships in order to bring traffic to its own network.

The Multiple IMS Scenario would also allow the support of related services from different independent companies, that the users wishes to use simultaneously.

An example of this would be gambling on a sporting event. A sports venue (e.g. a greyhound racing track), may wish to provide video streaming of the races to customers via a number of different network operators (they do not wish to tie themselves to just one). They therefore invest in a 3GPP Compliant IP MultiMedia Subsystem, and arrange with the network operators to provide video of the races to the end users of their networks.

An end user watching the races also wished to place a bet on the races, and so also wants to connect to the interactive gambling services of a bookmaker. The bookmaker has also invested in a 3GPP Compliant IP Multimedia Subsystem to provide a range of gambling services via a number of different network operators.

The end user may therefore wish to use the services of the two IMS operators simultaneously.

Rationale why this scenario is not relevant for 3GPP:

Fundamentally, IMS is defined as a subsystem that is part of a PLMN operator's core network architecture. It is not a standalone system to be deployed by third parties who are not mobile system operators. However, recognising that business models and relationships are evolving, should a PLMN operator wish to partner with a third party IMS provider, none of the network functionalities, service quality and end user usability shall be impacted adversely in any appreciable manner. In general, the onus of ensuring such criteria shall be the responsibility of the PLMN operator involved (e.g. customer trouble reports are expected to be directed to the PLMN). The following discussion provides details that negate the use of multiple IMS subscriptions simultaneously.

Upon close examination, it is apparent that the requirement for an end user to access multiple IP multimedia (IM) services not offered by its default IMS operator, e.g. banking or virtual shopping mall applications, can be satisfied by the existing IMS service control (ISC) architecture.   Specifically, such services are IM applications that reside on Application Servers accessible from the S-CSCF via the ISC interface using SIP. Simultaneous access to multiple IM service application servers are supported by establishment of multiple IP-connectivity paths from the UE, while maintaining the UE's original registration with the IMS.

"The ISC interface is between the Serving CSCF and the service platform(s).

An Application Server (AS) offering value added IM services resides either in the user's home network or in a third party location. The third party could be a network or simply a stand-alone AS." (Ref. TS 23.228 V6.1.0 Sect. 4.2.4)

If a particular desired AS is not accessible from the IMS ISC interface, it will be necessary for interconnection between two IMS operators' networks (e.g. IMS-a to IMS-b). In some cases, where a redirect of SIP application servers are involved, there may be a need for interconnection between more than two IMS operator networks (e.g. IMS-a to IMS-b to IMS-c). In other cases, SIP application servers may reside in external IP networks, such as the Internet or enterprise networks; however, the same principle of network interworking as defined in TS 23.228 applies. Authentication & Authorisation by the value-added application service provider will be performed at an application layer with the UE, in addition to the IMS registration procedures.

In all the cases described above, the end user's need to access a multiplicity of IM services either through its default IMS operator alone, or involving additional IMS operator networks or the public Internet can be satisfied by the Rel-5 or 6 IMS architecture as defined. Hence, there is no justifiable need to incur additional complexity in developing a new capability for an UE to access multiple IMS's simultaneously.

The presence of multiple IMS subscriptions on the UE would permit the user to choose the IMS operator among the subscriptions present. However, this is subject to the UICC ownership discussion and may necessitate a mechanism to link PS and IMS subscriptions, as may be required by operators. Nonetheless, such choice of IMS operator does not provide simultaneous access to multiple IMS subscriptions; i.e. only one IMS subscription may be active at any one time.

Furthermore the storage available in the UICC for applications must be considered as this could limit the number of subscriptions that can be stored on the UICC for the service providers.

Another reason why this scenario is not relevant is as follows: The case depicted (merge between operators running IMS) is really not realistic. Furthermore there are no reasons for Untouched to renounce its PLMN ID and its basic CN (HSS and GGSN at least), and the case could be solved with ordinary roaming, even if Untouched becomes a virtual operator (providing the regulators allowance for the virtual operator case in the country in subject).

Section 8 Multiple IMS scenario (part two): Same conclusion as section 7

Rationale why this scenario is relevant for 3GPP: See same rationale as in Section 7.

Rationale why this scenario is not relevant for 3GPP: See same rationale as in Section 7.

Section 9: Non-3GPP Access Scenario: This scenario is not considered within the current scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

In particular the IMS charging and security mechanisms may need to be modified in order to accommodate the non-3GPP access. Each non-3GPP access needs to be considered on a case by case basis and there may be instances where no modification to the 3GPP specifications is required.

Rationale why this scenario should be brought into scope of 3GPP: When bundled service offerings for IMS domain and PS/CS domain is the only option available for customers, the penetration of users capable of using IMS domain services is dependent on the penetration of PS/CS domain subscriptions (obviously). An operator may therefore want to offer IMS only subscriptions in order to cost efficiently increase the number of IMS users beyond the number of PS/CS domain subscriptions. Customers that actually use IMS services over GPRS will benefit from the increasing number of IMS users over non-3GPP Accesses, in a similar way that once early adopters of first generations of mobile telephony benefited from being able to communicate with fixed telephony users. It is assumed that the value of the service to the end-user increases with the number of users.

Rationale why this scenario should remain out of 3GPP: The scenario is not dealing with a specific access.

Note: See also Scenario 12.

Note: There are some concerns about the full understanding of this scenario. It may require further clarification.

Section 10: Non-3GPP Access Scenario: This scenario is not considered within the current scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why it is justified that this scenario is brought into scope for 3GPP: Same as Section 9

Rationale why this scenario should remain out of scope for 3GPP: Same as Section 9

Note: There are some concerns about the full understanding of this scenario. It may require further clarification.

Section 11: Non-3GPP Access Scenario: This scenario is not considered within the scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why this scenario should be brought into scope of 3GPP: Same as in Section 9

Rationale why this scenario should remain out of scope of 3GPP: Same as Section 9

Note: There are some concerns about the full understanding of this scenario. It may require further clarification.

Scenario 12: Non 3GPP access scenario for 3GPP access operator – Access Independence: This scenario is not considered within the scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why this scenario should be brought into scope of 3GPP:

It is believed that an IMS operator could provide IMS services using non 3GPP accesses in parallel with the 3GPP ones; so this case is relevant even though it is presently out of scope. In principle this scenario could be included as a general requirement; therefore the fact the this scenario does not imply any new protocol or interface does not have any impact on its relevance, or on the fact that could become in scope of 3GPP.

Rationale why this scenario should remain out of scope of 3GPP

Support of interworking with non-3GPP access can theoretically be done; provided that the necessary interworking functions are developed at the demarcation between the IMS and the non-3GPP access technology.

This scenario does not require any additional specification work and is out of scope. It might turn out to work but there is no need for 3GPP to do anything to ensure that it does.

Note: There are some concerns about the full understanding of this scenario. It may require further clarification.

Section 13: Non 3GPP access for Roaming: This scenario is not considered within the scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why this scenario should be brought into scope of 3GPP: Same as section 12.

Rationale why this scenario should remain out of scope of 3GPP : Same as section 12

Section 14: Stand Alone IMS Scenario: This scenario is not considered within the scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why this scenario should be brought into scope of 3GPP: In this scenario the (Stand Alone) IMS Operator is useful because it brings traffic to the 3GPP Access Operator's network. The IMS operator may be regarded as a "mobile virtual network operator" in an Internet context.

The scenario allows actors assuming the roles 3GPP Access Operator, Non-3GPP access Operator and IMS Operator respectively to bring an attractive offering to the market and still maintain their own customer relationship. No actor is controlling the other actors' customer relationship, which may make the business arrangements easier to accomplish.

The 3GPP Access Operator has a great opportunity in benefiting from the maybe hundreds of millions of experienced users for which the actor being the IMS Operator has superb marketing channel. Still the 3GPP Access Operator can maintain its own customer relationship, even for its own IMS services, which can be packaged with its other CS/PS services in order to create an attractive and different offering.

Experienced users, like Jim in the scenario, may soon discover that they need universal coverage for their service because the IMS operator does the "cross-marketing", i.e. convince its customers using non-3GPP Accesses that they should have access to the Stand Alone IMS Operator's services anywhere.

Rationale why it should remain out of scope of 3GPP: In case of Cool, 3Cent or Blitz customer the same service level can be obtained with an agreement between these operators Yazoo, allowing Yazoo to provide its services using the other operators infrastructure; Several services specifications (e.g. using multiple servers attached to the ISC interface) are already providing technical solution for this service case. On the other side, without an agreement with these operators the scenario could not be implemented in any case.

Fundamentally, IMS is defined as a subsystem that is part of a PLMN operator's core network architecture. 3GPP has not defined IMS as a standalone system to be deployed by third parties. This does not prevent third parties implementing systems based on the IMS sub system but 3GPP makes no specific actions to enable this.

Furthermore there are no reasons for Yazoo to not have its own PLMN ID and its basic CN (HSS and GGSN at least), and the case could be solved with ordinary roaming, even if Untouched is in this case a virtual operator (providing the regulators allowance for the virtual operator case in the country in subject).

Section 15: Operator integration of domains: This scenario is considered within the scope of 3GPP.

Why this scenario is relevant: This scenario is tightly related to the existence of domains within a single 3GPP system owned by different actors (domains here refers to 3GPP accesses, CN, IMS). If this case will happen, this scenario is really meaningful.

In this case the operators owners of each domain(s), have several reasons (e. g.: authorization, charging, etc.) to control the scope for which each domain is used by its own customer. As well it is an interest of these operators to try do design an integrated offer (e. g.: to integrated components of the service like QOS, location information, etc.).

If a service whose components reside on different domains requires integration e.g. an IMS service that is using an access which is not owned, it requires integration with the access owner.

A good example is already existing in the roaming case: the two operators involved need to develop an agreement and to implement a wide set of open interfaces (Authentication, charging, interconnection, etc.) amongst themselves.

This scenario also applies to the case when access and CN, or Access and IMS are owned by different actors.

Note: It shall finally note that it does not impact services provided autonomously by one domain (e.g.: If one of the service is the transparent interconnection to internet, this service does not require integration of domain if this service could be provided by a single operator).

Rationale why it is not relevant: One aspect of this scenario may not be relevant to 3GPP. In order to be able to provide IMS services the external IMS Operator will need a commercial arrangement with the 3GPP Access Operator in order to provide the adequate QoS and also to receive relevant charging information for billing purpose. Access by the user of an IMS external to a home operator is determined by this agreement and hence there is no need for explicit mechanisms that prevent access to external IMS Operator's services.

In general 3GPP should be very careful about developing mechanisms that arbitrarily would stop users from using services provided by actors that may not also be 3GPP Access Operators.

Note: There are some concerns about the full understanding of this scenario. It may require further clarification.

Based on future input contributions, SA1 will consider required changes to the stage 1 specifications to fulfil the requirements derived from this scenario.

Section 16: Interoperability Scenario: This scenario is not considered within the scope of 3GPP. There is no consensus on whether it is justified for this scenario to be investigated by 3GPP hence SA1 does not presently propose to take any action

Scope: This scenario is considered to be out of scope because it envisages not yet defined interworking with a system not standardized by 3GPP.

Rationale why it should be brought into scope of 3GPP: The value of being connected to a communication service increases with the number of users ("Metcalf's Law"). This is the basic observation, which provides the rationale as to why customers/users of ISPs and WISPs should also be able to use IMS services of this (W)ISP. The basic assumption is: the more IMS domains, the more users, the greater value, and the more traffic. (E.g. customer of an ISP establishing a session to a customer connected to a mobile network.)

The rationale for allowing ISP/WISP to set up their own IMS domains is to guarantee that they will be able to offer the IMS domain services to all its customers. Also treating these other companies as peers may increase their interest in the IMS technology, especially if considerations are given to the fact that (W)ISPs do not in general support 3GPP legacy mechanisms.

From a standardization point of view, embracing the "fixed" community may increase the chance of having one SIP related charging architecture for the mobile community and the fixed one.

Rationale why it should remain out of scope of 3GPP: Specific interfaces are foreseen through not well identified IP WISP; this leads to non clear identification of the requirements (Broadcast IP?, Satellite IP?, XDSL?....) Already specified interfaces for IMS should apply (and this is expected to be the most common case), therefore is no need of additional specification. In general, the specification of interworking with non 3GPP systems could be treated very carefully, Interworking shall be in charge of the most appropriate side. Residual cases when already existing interfaces could not be interworked can solved by proprietary solutions.

Note: Scenario 17 may illustrate the issue in a more appropriate way.

Section 17: Interworking and Interoperability Scenario: This scenario is considered within the scope of 3GPP.

Based on future input contributions, SA1 will investigate if changes are required to the stage 1 specifications to fulfil the requirements derived from this scenario

Section 18: Multiple Terminal Scenario: This scenario is considered within the scope of 3GPP. This scenario is relevant for 3GPP to support

SA1 has agreed the changes required to the stage 1 specifications to fulfil the requirements derived from this scenario.

20 Miscellaneous

20.1 Card Ownership issues

SA1 concludes that the card ownership is a commercial issue only and is therefore outside the scope of SA1-specifications.

20.2 UE functionality split

No scenario has explicitly addressed UE-functionality split.

20.3 MMI-aspects

[Editor's Note: E.g. analyse aspects of user interaction when activating different applications (e.g. manually, automatically, PIN, NON-PIN) on the UICC.]

20.4 Privacy Issues

SA1 has currently not identified any issues regarding privacy due to a subscriber having multiple IMS subscriptions.

Annex A (Informative): Scenario template

X.1 Description

[Editor's note: Description of the scenario including roles, actors, business agreements, , what value is created?, etc.]

X.2 Charging implications

[Editor's note: E.g. Interoperator charging issues, who is paying whom for what?, revenue stream,…]

X.3 Security

[Editor's note: Identification of security issues, e.g. concerning interoperator interfaces.]

X.4 Privacy implications

[Editor's note: General privacy issues and in particular issues relating to multiple subscriptions/ISIMs]

X.5   Regulatory aspects

[Editor's note: identification of requirements and related problems, e.g. legal interception]

X.6   Roaming

[Editor's note: identified issues]

X.7   Quality of service

[Editor's note: identified issues]

X.8   User experience

[Editor's note: identified issues]

X.9   Potential Requirements and Impacts relevant to the scenario

X.9.1   Subscription requirements

X.9.2   Other Potential new requirements

X.9.3   Issues for stage 2/3 technical studies

Annex B (Informative):
Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2002-10					First Draft		0.0.1
2002-10					Agreed skeleton		0.0.2
2002-10					First draft with content from Beijing IMS SWG		0.0.3
2002-10					Editorial cleanup of output version from Beijing		0.0.4
2002-11					Draft with content added from Busan IMS SWG		0.0.5
2002-11					Update following review of 0.0.5 in Busan IMS SWG		0.0.6
2002-11							0.1.0
2003-01					Baseline for future work. Result from Paris IMS SWG		0.2.0
2003-01					Editorial update of v0.2.0.		0.2.1
2003-01					Content added from San Francisco IMS SWG		0.3.0
2003-01					Inclusion of new scenario section 12		0.4.0
2003-02					Editorial clean-up - change of section numbering		0.4.1
2003-02					Modification of Language regarding "New Potential Requirements"		0.4.2
2003-02					Updated with agreed content from Rome IMS SWG		1.0.0
2003-04					Content added from Seoul IMS SWG		1.1.0
2003-05					Editorial modifications.		1.1.1
2003-05					Content added from San Diego IMS/22.800 drafting group first round Tdoc 613		1.2.0
2003-05					Content added from San Diego IMS/22.800 drafting group 2:nd round Tdoc 615		1.3.0
2003-07					Content added from Sophia Antipolis IMS SWG		1.4.0