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MAESTRO Terminology

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Abstract:

This note, initiated by ASP, should help all MAESTRO partners to share a common terminology

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EXECUTIVE SUMMARY

This document contains technical note **TN06-1-02** of the IST Integrated Project MAESTRO – Mobile Applications & sErVices based on Satellite and Terrestrial inteRwOrking (IST Integrated Project n° 507023).

MAESTRO project aims at studying technical implementations of innovative mobile satellite systems concepts targeting close integration & interworking with 3G and Beyond 3G mobile terrestrial networks.

MAESTRO aims at specifying & validating the most critical services, features, and functions of satellite system architectures, achieving the highest possible degree of integration with terrestrial infrastructures. It aims not only at assessing the satellite systems' technical and economical feasibility, but also at highlighting their competitive assets on the way they complement terrestrial solutions.

This note, initiated by ASP, should help all MAESTRO partners to share a common terminology.

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1 INTRODUCTION

The purpose of this document is to gather:

- Common Terminology and Definitions,
- Common Abbreviations,
- Common Architectures of Reference, illustrating the different points of view and levels of architecture of the SDMB; it is illustrated with UML architecture diagram embedding specialised icons for a more attractive representation.

Moreover, this document contains some additional sections:

- To decline how the SDMB functions could be classified within the UE and BM-SC sub-systems, taking into account their heritage 2G/3G,
- To provide an example of a high level operational scenario based on architecture concepts previously introduced,
- To propose a classification and naming for the SDMB services.

2 TERMS, DEFINITIONS, ABBREVIATED TERMS AND SYMBOLS

2.1 Terminology and definitions

BM-SC	Means the BM-SC as defined for MBMS and including specific SDMB features
Cell	Means the Terrestrial mobile network cell
Content	File or data stream transmitted by the SDMB system and possibly (for the Download service) completed by terrestrial retransmissions
Download service	A service that delivers some multimedia content with loose time constraints. The service is best map on 3GPP defined background traffic class capability.
End User	The End user owns the terminal, subscribes to the MNO & Mobile Portal services
Groupcast service	A service offered to end-user allowing to send in a cost efficient way the same content to a group of users. This may include streaming or download.
Mobile IP datacast service	A push service that delivers a set of Multimedia content to several recipients. The service includes information, which allows the user equipment to process the content according to the end-user's rights and terminal capabilities. The access to the service may be restricted to a certain group of users which may have to pay a fee. It includes streaming, download as well as groupcast services.
Relevant content	A multimedia content which is expected to interest the end user with respect to its user preference profile.
Service area	Refers to the area where the SDMB services are available. Basically it is defined taking into account a set of satellite spots providing the European coverage.
Spot area	Corresponds to the areas covered by a satellite spot beam. There is not necessarily a service continuity between two spot areas. We assume that the same data is datacast in a spot area and it differs from the data datacast in other spot areas.
Streaming service	A service that delivers some multimedia content with real time constraints. It may refers to TV or radio type of services. Such service is manually activated by the end-user. Content are played as soon as received by the end-user terminal. The service is best map on 3GPP defined streaming traffic class capability.
Terrestrial mobile network	The terrestrial mobile network(s) on which the SDMB system relies.
UE	The UMTS/GSM User equipment modified to include SDMB features.
User preference profile	The description of the SDMB-content related user preferences in the UE.

2.2 Abbreviations

Version 1.2		CPICH	Common Pilot Channel
2G	Second Generation (Wireless communication system)	DL	DownLink
3G	Third Generation (Wireless communication system)	DMB	Digital Multimedia Broadcasting
3GPP	3rd Generation Partnership Project	DRM	Digital Rights Management
A-CIT	Alcatel CIT, France (MAESTRO Partner)	DSP	Digital Signal Processing
AAC+	Improved Advanced Audio Coding	DVB	Digital Video Broadcasting
ABFN	Analogue Beam Forming Network	DVB-S	DVB Satellite
ACI	Adjacent Channel Interference	EC	European Commission
ACIR	Adjacent Channel Interference Ratio	EIRP	Equivalent Isotropically Radiated Power
ACLR	Adjacent Channel Leakage Ratio	ERCOM	Ercom Engineering Reseaux Communications, France (MAESTRO Partner)
ACS	Adjacent Channel Selectivity	ESA	European Space Agency
ADC	Analogue to Digital Conversion	E-TF1	E-TF1, France (MAESTRO Partner)
AGC	Automatic Gain Control	ETSI	European Telecommunications Standard Institute
AGILENT	Agilent Technologies Belgium SA, Belgium (MAESTRO Partner)	EVM	Error Vector Magnitude
AM/AM	Amplitude – Amplitude transfer function	FDD	Frequency Division Duplex
AM/PM	Amplitude – Phase transfer function	FDM	Frequency Division Multiplex
ASC	Ascom Systec AG, Swiss (MAESTRO Partner)	FDMA	Frequency Division Multiple Access
ASEL	Alcatel SEL AG, Germany (MAESTRO Partner)	FEC	Forward Error Correction
ASP	Alcatel Space, France	FHG/IIS	Fraunhofer Gesellschaft e.V., Germany (MAESTRO Partner)
AWE	AWE Communications GMBH, Germany (MAESTRO Partner)	FP5	5th Research Framework Programm of the European Commission
AWGN	Additive White Gaussian Noise	FP6	6th Research Framework Programm of the European Commission
BCF	Base Common Functions	FSS	Fixed Satellite Services
BCH	Broadcast Channel	G/T	Figure of merit
BER	Bit Error Rate	GD	Group Delay
BLER	Block Error Rate	GEO	Geostationary Earth Orbit
BM-SC	Broadcast Multicast Service Center	GF	Gain Flatness
BT	British Telecommunications PLC, United Kingdom (MAESTRO Partner)	GFI	GFI Consulting, France (MAESTRO Partner)
BYTL	Bouygues Telecom, France (MAESTRO Partner)	GNSS	Global Navigation Satellite System
CBS	Cell Broadcast Service	GPRS	General Packet Radio Service
CCI	Co-Channel Interference	GSM	Global System for Mobile Communications
CCN	Contract Change Notice	GUI	Graphic User Interface
CDD	Content Delivery Descriptor	GW	Gateway
CDMA	Code Division Multiple Access	HDFSS	High Density FSS
CDN	Content Delivery Network	HLR	Home Location Register
CNP	Combined Network Planning	HPA	High Power Amplifier
COTS	Commercial Off The Shelf	HTML	Hyper Text Markup Language
		HW	Hardware

I/O	Input / Output	P-CCPCH	Primary Common Control Physical Channel
IBO	Input Back-Off	PER	Packet Error Rate
IMR	Intermediate Module Repeater	PFD	Power Flux Density
IMT-2000	International Mobile Telecommunications 2000	PICH	Paging Indicator Channel
IP	Internet Protocol	PIM	Protocol Interface Module
IRT	Intelligent Ray Tracing	P-SCH	Primary Synchronisation Channel
IST	Information Society & Technology	PSSP	Public Security Service Provider
ITU	International Telecommunication Union	PTP	See p-t-pt
KO	Kick-Off	p-t-p	Point to Point
LBS	Location Based Services	PVR	Personal Video Recorder
LDR	Large Deployable Reflector	QoS	Quality of Service
LMS	Land Mobile Satellite	R1	MAETRO Test Bed Release 1
LNA	Low Noise Amplifier	R2	MAETRO Test Bed Release 2
LNB	Low Noise Block	RAN	Radio Access Network
LOGICACMG	LogicaCMG UK Limited, United Kingdom (MAESTRO Partner)	RLC	Radio Link Control
LOS	Line Of Sight	RNC	Radio Network Controller
LTWTA	Linearised Travelling Wave Tube Amplifier	RNPT	Radio Network Planning Tool
MAC	Medium Access Control	RNS	Radio Network Subsystem
MAESTRO	Mobile Applications & sErVICES based on Satellite and Terrestrial inteRwOrking	S-CCPCH	Secondary Common Control Physical Channel
MBMS	Multimedia Broadcast/Multicast Service	SDMB	Satellite Digital Multimedia Broadcasting
MM	MultiMedia	S-DMB	See SDMB
MMI	Man Machine Interface	S-DVB	Satellite Digital Video Broadcasting
MMS	Multimedia Messaging Service	SES	SES Astra, Luxembourg (MAESTRO Partner)
MNO	Mobile Network Operator	SF	Spreading Factor
MODIS	IST FP5 Mobile Distribution project - MOBILE Digital broadcast Satellite	SFN	Single Frequency Network
MP3	Moving Picture Experts Group Layer-3 Audio (audio file format/extension)	SGSN	Serving GPRS Support Node
MPA	Multi-Port Amplifier	SIM	Subscriber Identity Module
MPC	Multi-Port Combiner	SMS	Short Message Service
MPD	Multi-Port Divider	SPH	Space Hellas SA, Greece (MAESTRO Partner)
MPEG4	Motion Picture Experts Group 4 (Standard - Compressed Video at 64 Kbps)	S-SCH	Secondary Synchronisation Channel
MSC	Mobile Switching Centre	SSPA	Solid State Power Amplifier
MSPS	Motorola Semiconducteurs SAS, France (MAESTRO Partner)	S-UMTS	Satellite UMTS
MSS	Mobile Satellite Services	SW	Software
NLOS	Non Line Of Sight	TBC	To Be Confirmed
Node B	UMTS Base Station	TBD	To Be Defined
O&M	Operation and Maintenance	TDD	Time Division Duplex
OBO	Output Back-Off	T-UMTS	Terrestrial UMTS
OMC	Operation and Maintenance Center	TV	Television
OMUX	Output Multiplexer	TWTA	Travelling Wave Tube Amplifier
PA	Power Amplifier	UCL	University College London, United Kingdom (MAESTRO Partner)
		UDCAST	Udcast, France (MAESTRO Partner)
		UE	User Equipment
		UMTS	Universal Mobile Telecommunications System

UNIS	The University of Surrey, United Kingdom (MAESTRO Partner)
UoB	Alma Mater Studiorum Universita Di Bologna, Italy (MAESTRO Partner)
URAN	UMTS Radio Access Network
USB	Universal Serial Bus
UT	User Terminal
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network
Uu	UMTS air interface
W-CDMA	Wideband Code Division Multiple Access
WH	Walsh – Hadamard
WP	Work Package
WRC	World Radio Conference
XHTML	Extensible Hypertext Markup Language
XML	eXtensible Markup Language

3 ARCHITECTURES OF REFERENCE

3.1 General overview

The following figure illustrates the different concepts of architecture which could be useful along the MAESTRO study.

It's aim is to propose a common vocabulary avoiding further ambiguous interpretations.

These concepts represent different points of view allowing to consider back/white boxes in accordance to the domain of interest.

For example:

- Some end-to-end scenarios, could consider the “Operational System” contour to focus on the User, resp. Content Provider, interactions.
- The “Core System” contour may be useful to focus on the UE behaviour against the User interactions, whatever the underlying media (terrestrial or satellite); an example is suggested in section 5.
- The “SDMB system” gathers the “SDMB infrastructure” plus the UE and BM-SC “SDMB enabled”; the section 4 uses these contours to propose a partitioning of the functions across the SDMB system components.

Names are TBC (particularly “Core System”).

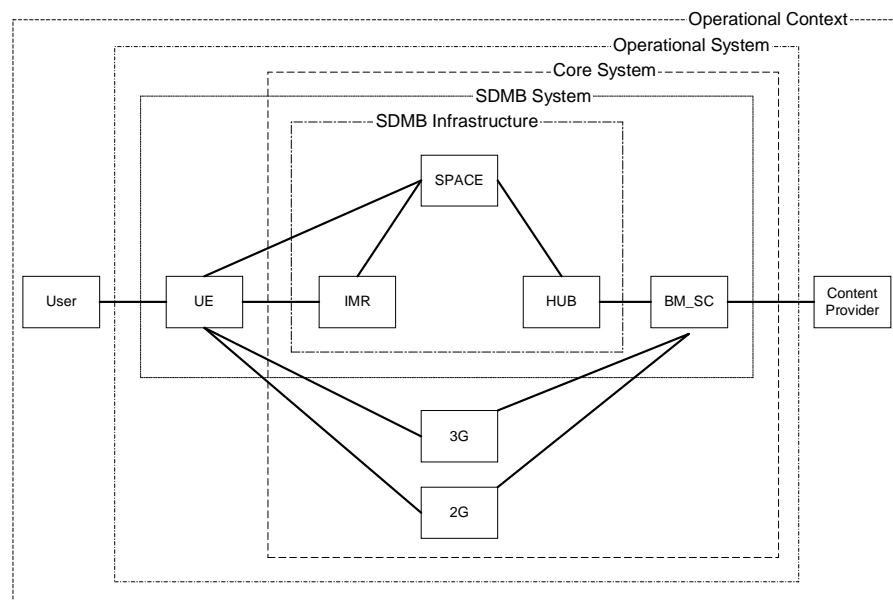


Figure 1: Architecture concepts

3.2 SDMB Infrastructure

Note the Uu* or lub interface type between Space and IMR depending on the IMR solution: On Channel/Frequency Conversion or Node B based.

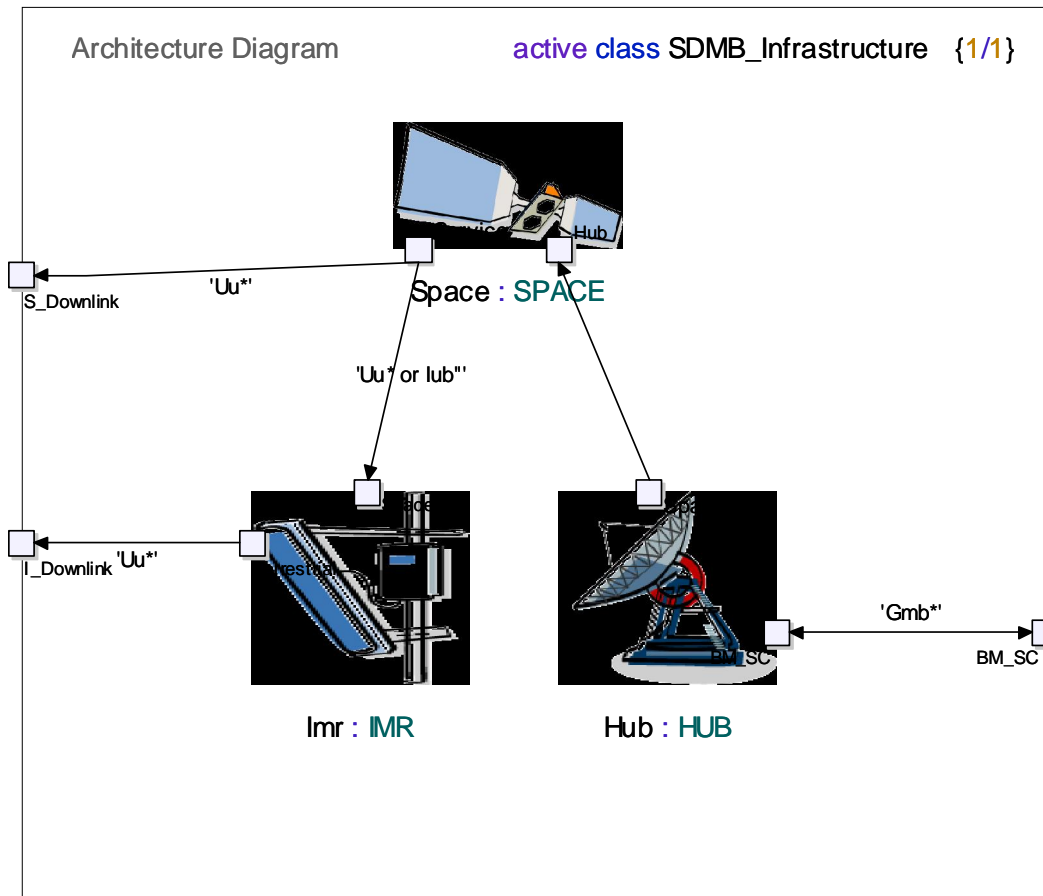


Figure 2: SDMB Infrastructure

3.3 SDMB System

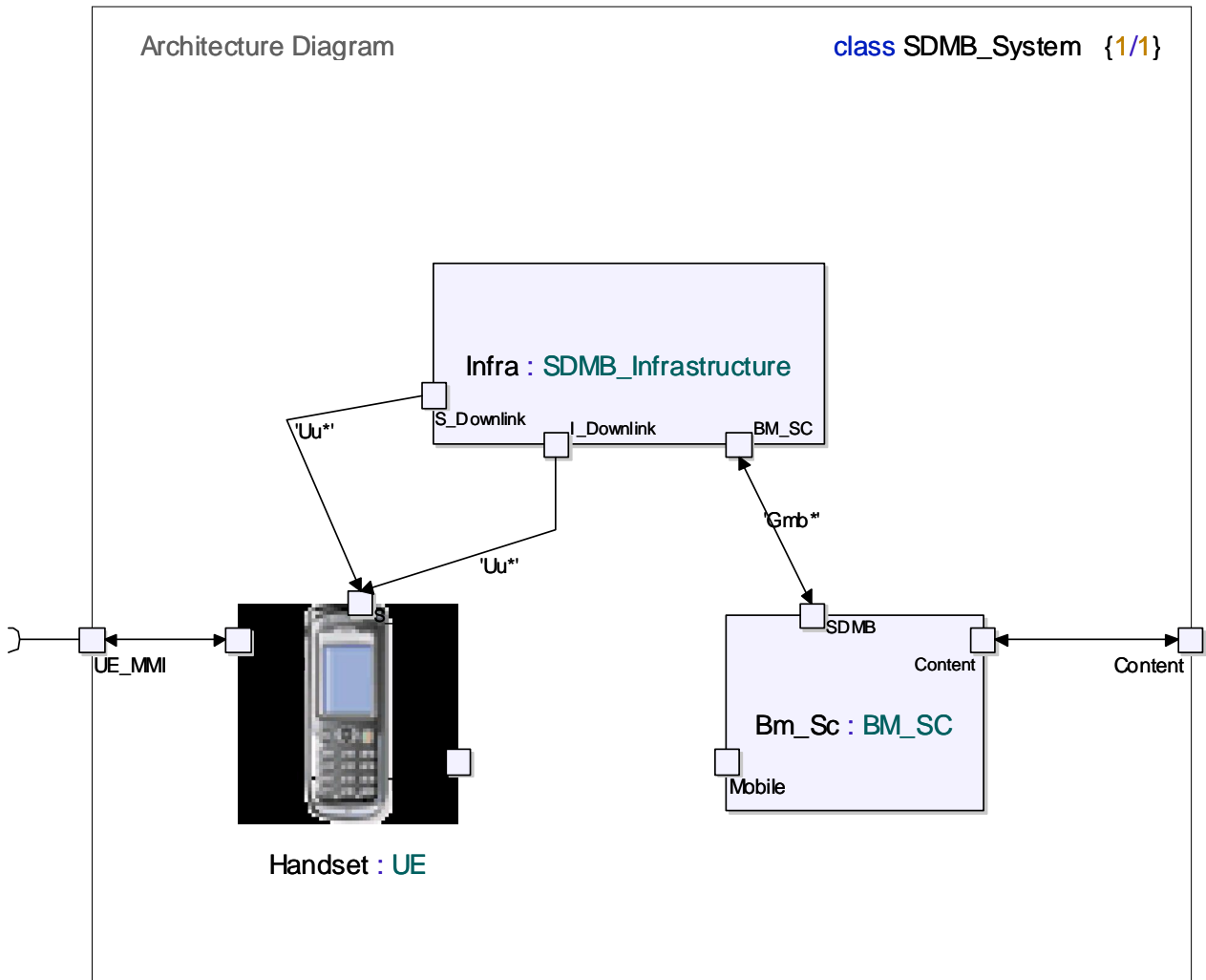


Figure 3: SDMB System

3.4 Core System

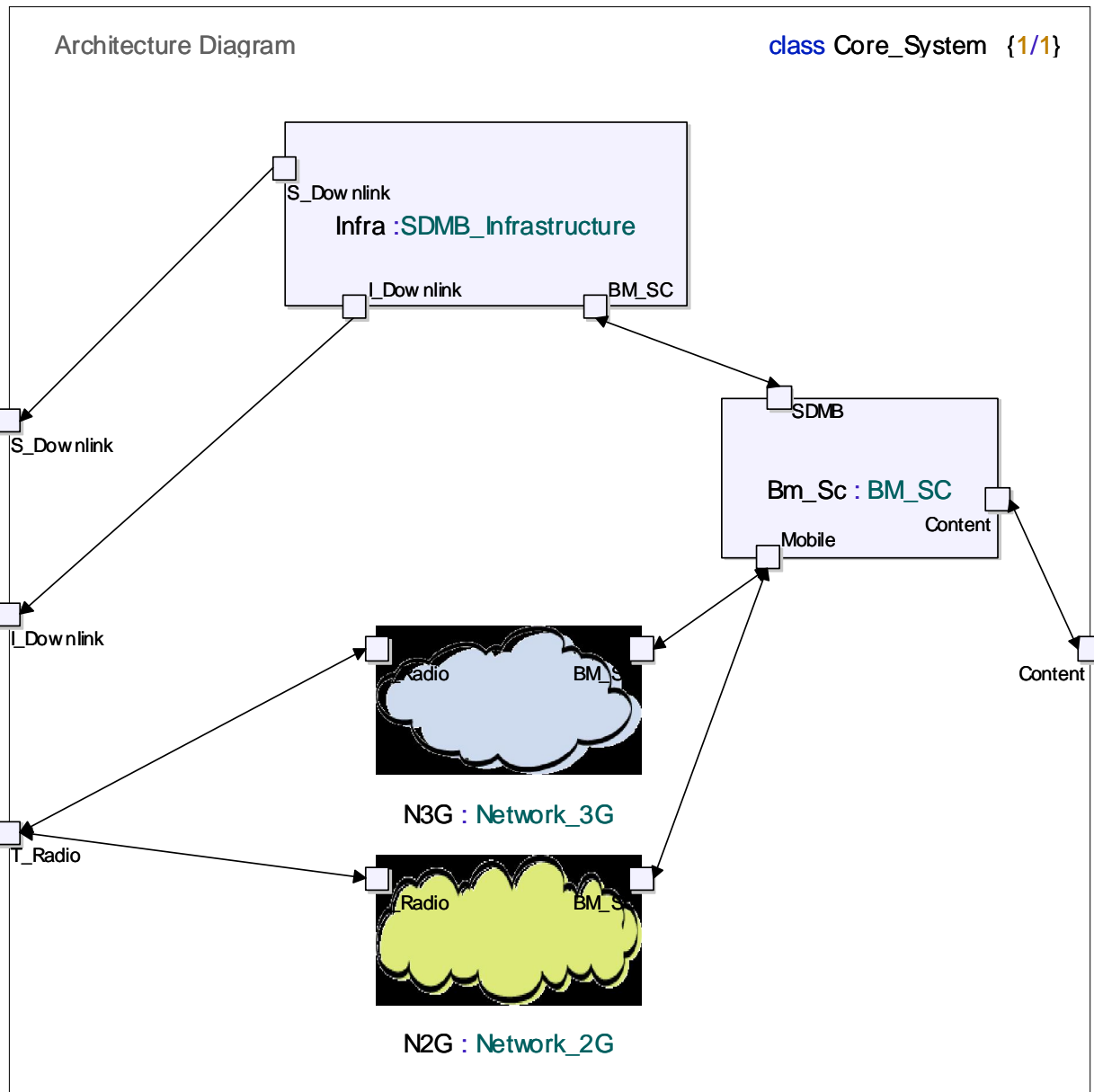


Figure 4: Core System

3.5 Operational System

3.5.1 Operational System View 1 (expanded)

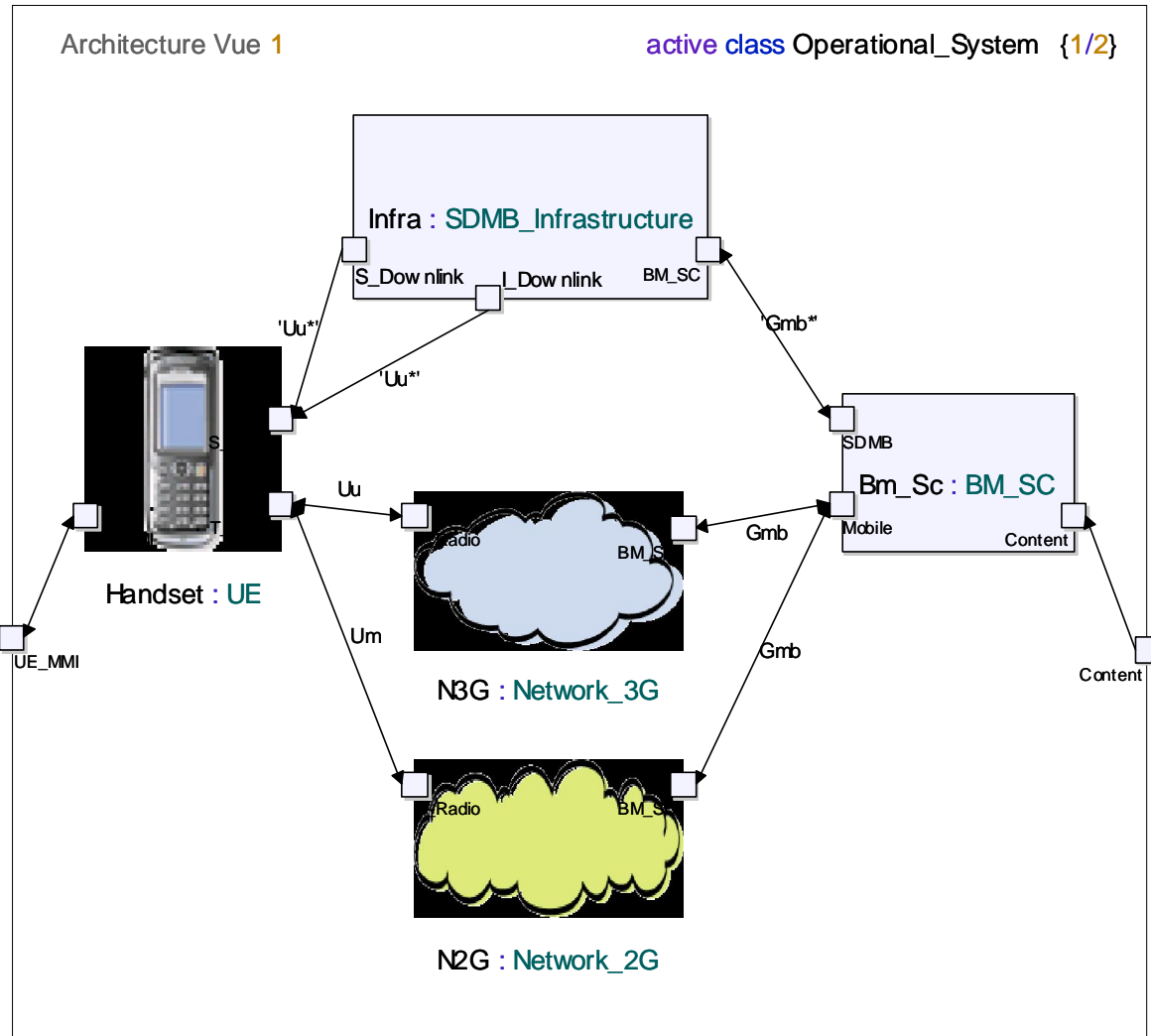


Figure 5: Operational System (expanded)

3.5.2 Operational System View 2 (involving Core System concept)

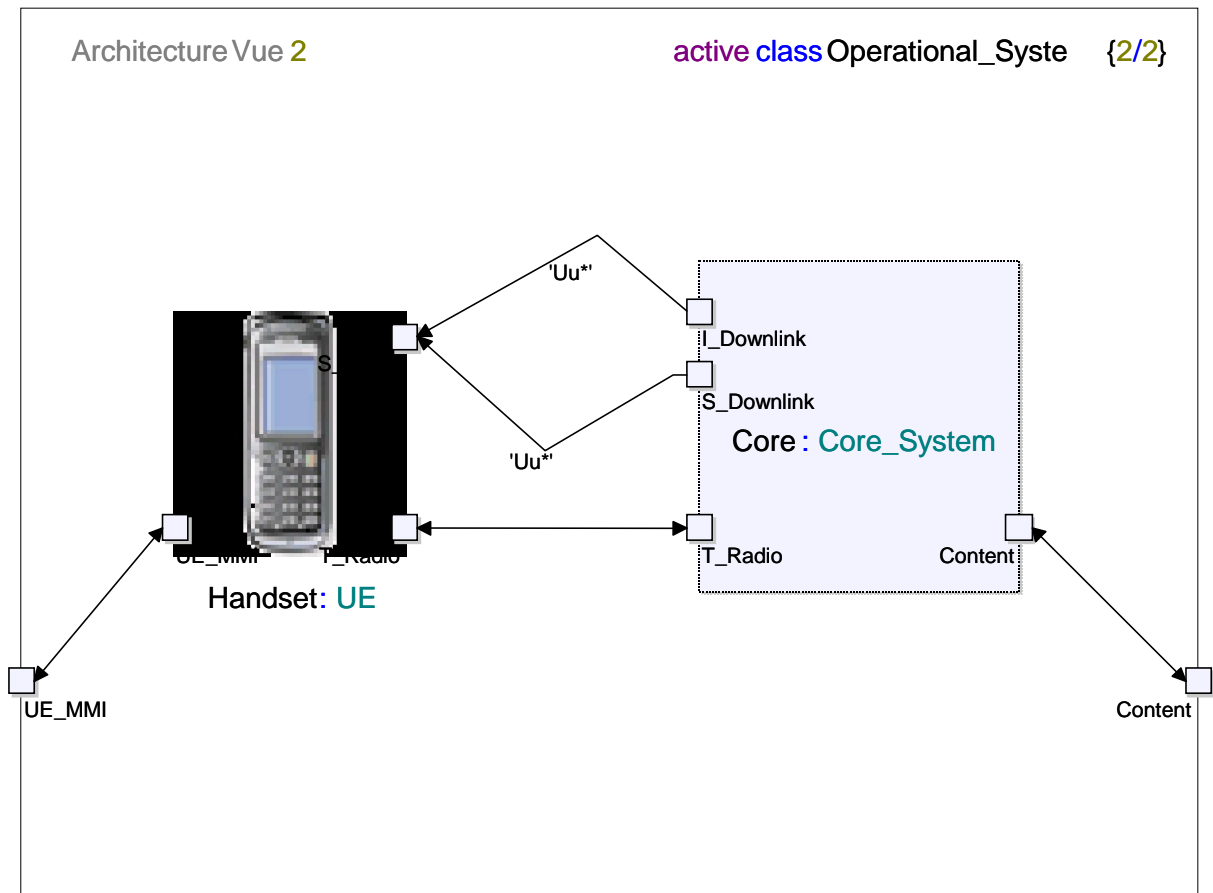


Figure 6: Operational System (with Core System)

3.6 Operational Context

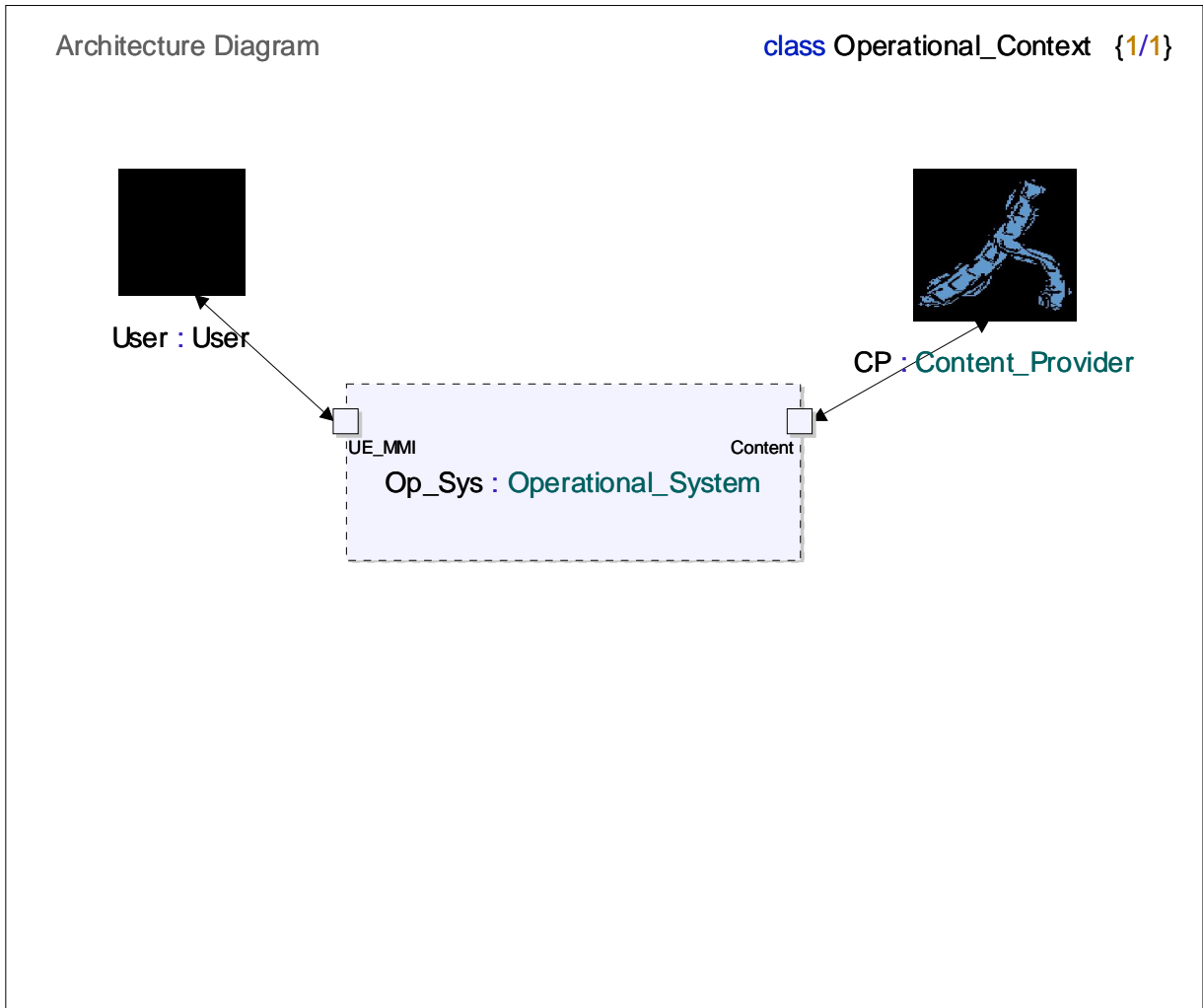


Figure 7: Operational Context

4 FUNCTIONS PARTITIONING WITHIN THE SDMB SYSTEM

The following figure illustrates the partitioning of the functions of the SDMB system elements through:

- SDMB specific,
- SDMB enabling,
- 2G/3G native functions.

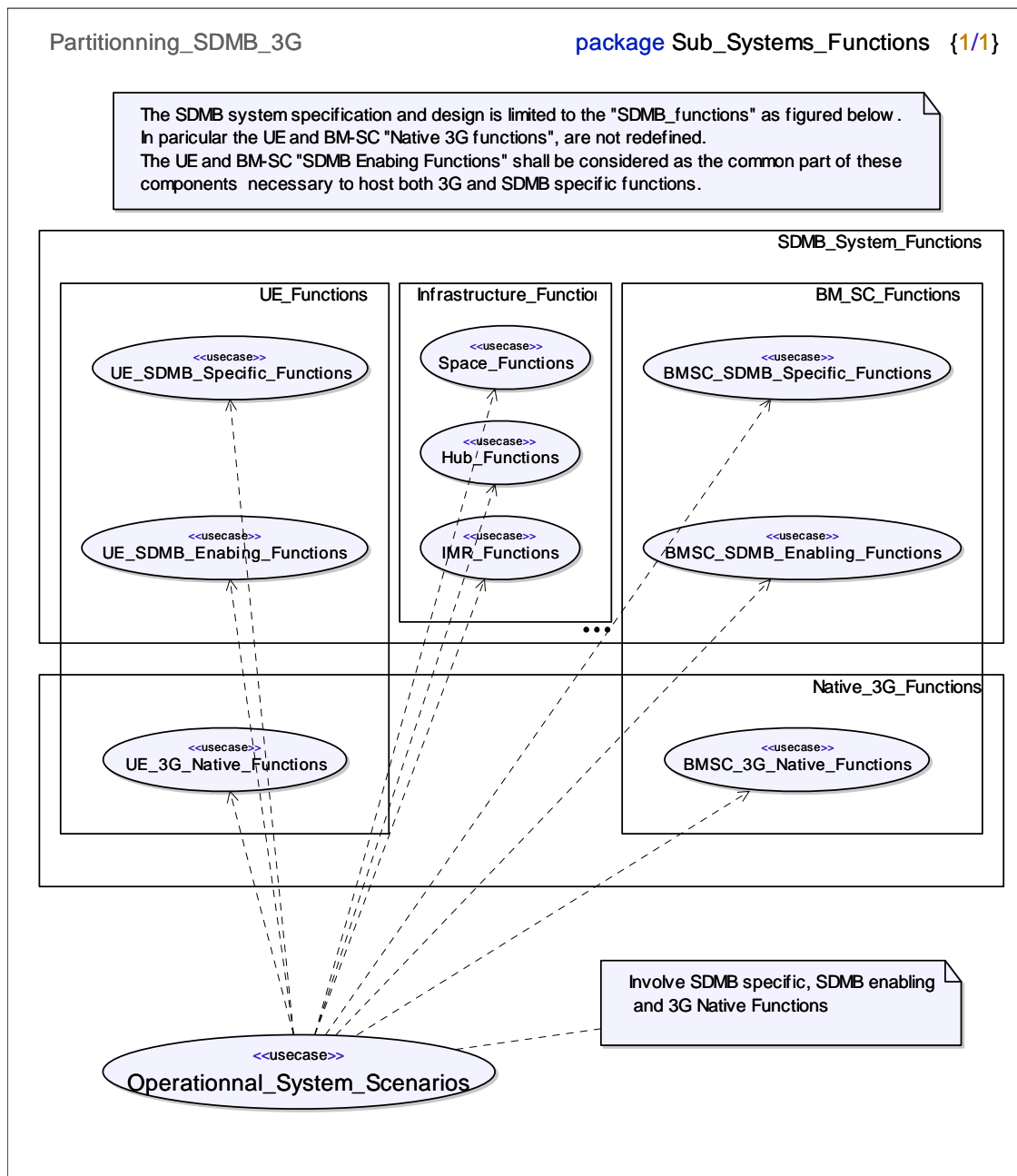


Figure 8: Functions partitioning

5 EXAMPLE OF OPERATIONAL SCENARIO

The following figure illustrate a scenario involving the “Core System” black-box.

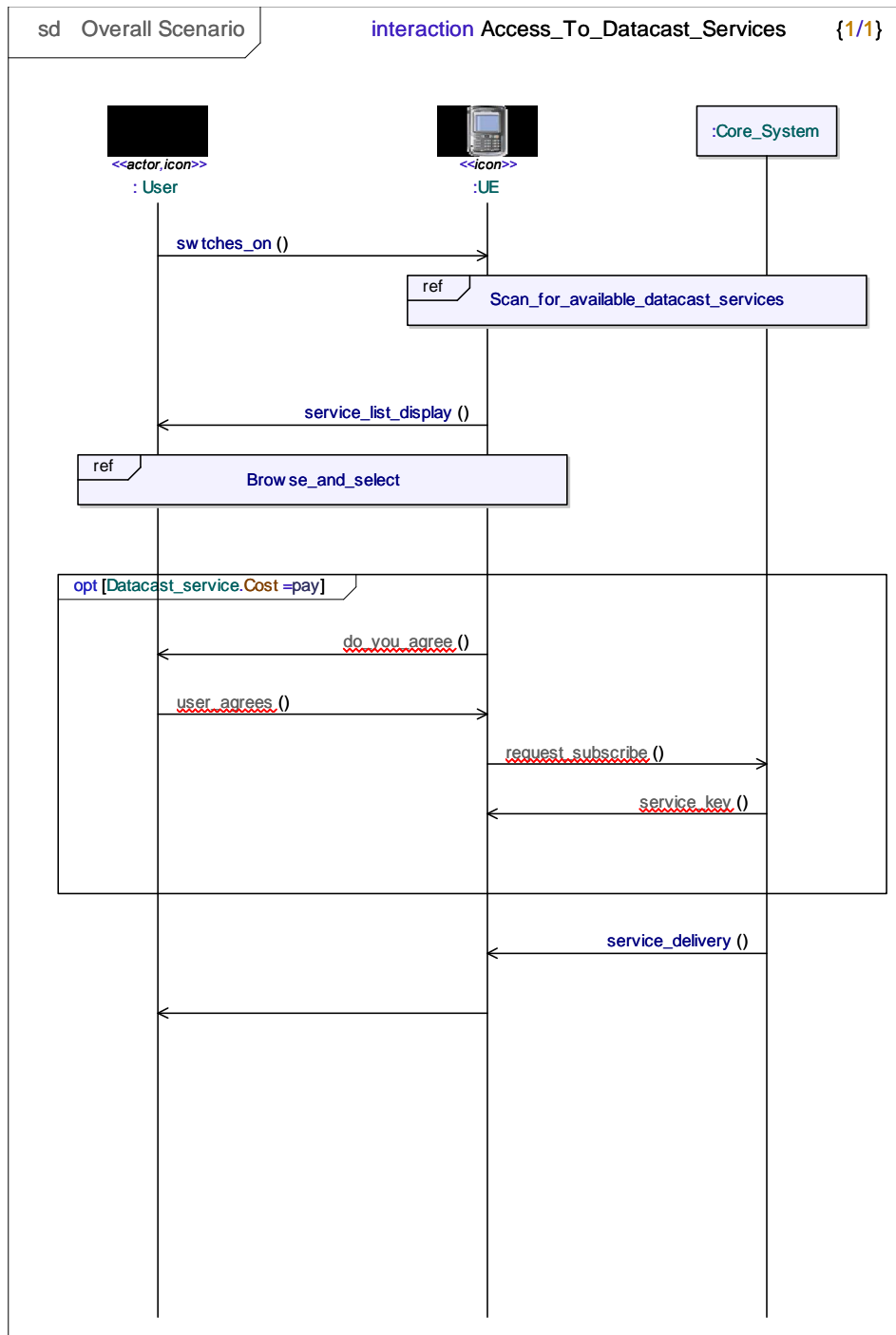


Figure 9: Example of scenario

6 SDMB SERVICES CLASSIFICATION

The following figure illustrates a classification and naming of the SDMB services.

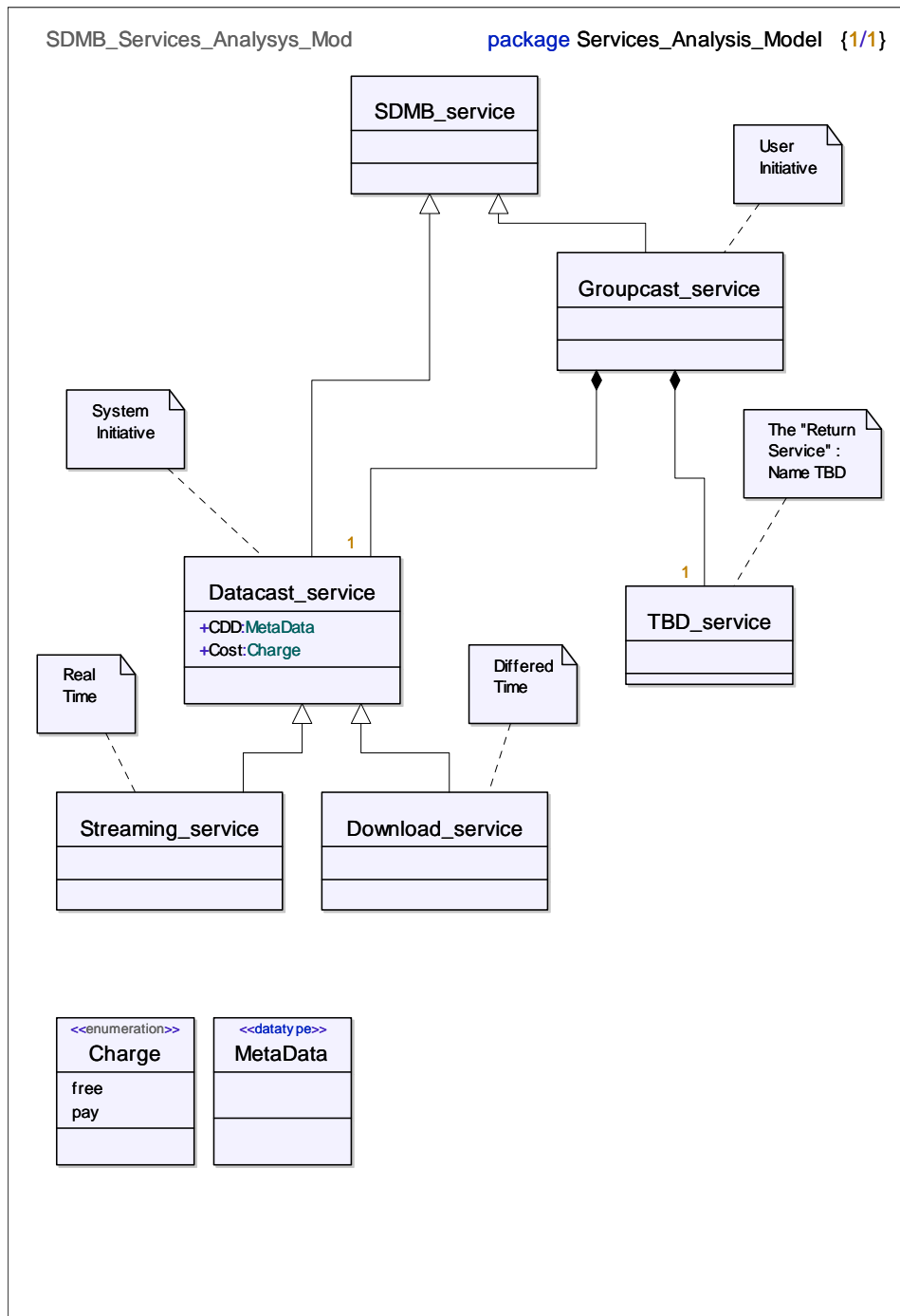


Figure 10: SDMB Services classification