Document Classification: **PUBLIC DOMAIN**

SATNET PROJECT

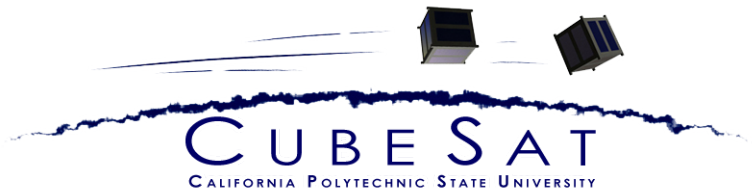
RELEASE SPECIFICATION

REFERENCE:

SATNET-2-R1-RELEASESPECIFICATION

DATE: OCTOBER 26, 2013

ISSUE: DRAFT



1 Document Control Data

1.1 Distribution License

1.2 Contact

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1.3 Change History Log

Date	Revision	Author	Description of Changes
2013.10.26	DRAFT	Ricardo Tubio	Initial version for release 1.

1.4 List of Acronyms

AD	Applicable Document
G-Client	Ground Station Client
	Software component of the SATNet network for ground station operators to share their facilities.
M-Client	Mission Operation Client
	Software component of the SATNet network for satellite operators to utilize remote ground station facilities.
N-System	Network Communications System
	Central cloud-computing based component of the SATNet network for interconnecting G-Client(s) and M-Client(s).
RD	Reference Document
	User interface for spacecraft operators to access to the services of the SATNet network.
SATNet	SATellite Network
TBC	To Be Confirmed

1.5 Table of Contents

Contents

1.6 Applicable Documents

ID	Title	Reference	Author	Issue
AD-0	SATNet Project Management Plan	satnet-0-ManagementPlan	CalPoly - rtubiopa@calpoly.edu	TBD
AD-1	User Specification	satnet-1-UserSpecification	CalPoly - rtubiopa@calpoly.edu	1

1.7 Reference Documents

ID	Title	Reference	Author	Issue
RD-0	Space Engineering - System Engineering General Requirements	ECSS-E-ST-10C	ECSS - www.ecss.nl	C
RD-1	Space Engineering - Technical Requirements Specification	ECSS-E-ST-10-06C	ECSS - www.ecss.nl	C

1.8 Object & Scope

The object of this document is to contain a selection of the features defined in document [AD-01] which must be implemented for the release 1 of the software.

The first section of this document briefly describes the release objectives and the planned scheduled. The second section contains the selection of the applicable requirements for the release 1 of the software.

The contents of this document are applicable for the development of the first release of the software.

2 Software Release

2.1 Objectives

The main objective for this software release (R1) is to provide a first software version of a system that permits:

1. Mission Operators registering.
2. Spacecraft Configuration.
3. Ground Station Operators registering.
4. Ground Station Configuration (no need for ASR rules).
5. Spacecraft remote commanding through direct matching of compatible ground stations.

There is also to bear in mind that no security or privacy system is going to be implemented for this software release. This way, this first implementation can focus on providing a set of basic communications features between spacecraft and ground stations.

This first release will implement a very simple booking system for clients to directly make a reservation on the compatible ground stations that they required. This is more or less the definition for the scheduling services described in [AD-1], but the difference is that the N-System must not check whether the ground station will contact the spacecraft of the mission operator. Therefore, the planning and contact simulation for a given spacecraft is a task up to the spacecraft operators.

Feature 5 defines the direct data messages exchange after booking the remote utilization of a given ground station. In this case, M-Clients will start sending messages to the N-System, using as destination address the identifier of the ground station that they had previously booked. In case the ground station is not available or the booked operation sloted has not started yet, the N-System will report an error to this communication attempt. This protocol shall be defined in detail in docuemnt [AD-3].

For meeting these objectives, from among all the features given in document [AD-1], a set of minimum requirements has been selected. This subset of requirements is described in subsections below.

2.2 Schedule

The development of this release is structured in the 3 phases described in the sections below. The following figure describes the roadmap for this release.

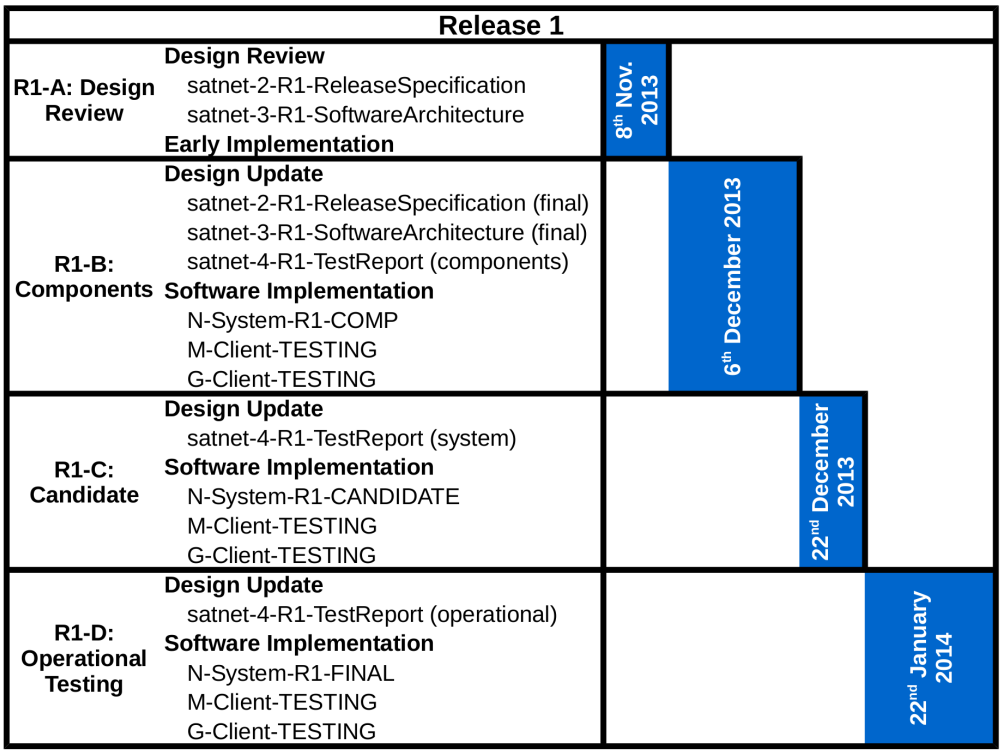

Figure 1: Release 1 roadmap

2.2.1 R1-A: Design Review

- Finalizes on 15th November 2013.
- Objectives:
  - Review requirements, design and schedule for the release 1.
  - Start the implementation of the software.
- Deliverables:
  - Documents: satnet-2-R1-ReleaseSpecification, satnet-3-R1-SoftwareArchitecture

2.2.2 R1B: Integration

- Finalizes on 6th December 2013.
- Objectives:
  - Update documentation whenever required.
  - Carry out component-level implementation and testing.
  - Develop the R1-Integration version of the software. This release must include:
    - N-System-R1-INTEGRATION: software tested at component level for the N-System.
    - M-Client-TESTING: software for testing the integration of the N-System.
    - G-Client-TESTING: software for testing the integration of the N-System.
- Deliverables:
  - Documents: satnet-2-R1-ReleaseSpecification (update), satnet-3-R1-SoftwareArchitecture (update)
  - Documents: satnet-4-R1-TestReport (components)
  - Software: N-System-R1-INTEGRATION, M-Client-TESTING, G-Client-TESTING

2.2.3 R1-C: Candidate

- Finalizes on 22nd December 2013.
- Objectives:
  - Update documentation whenever required.
  - Carry out component-level implementation and component integration testing.
  - Develop the R1-CANDIDATE version of the software. This release must include:
    * N-System-R1-CANDIDATE: software fully tested for the N-System.
    * M-Client-TESTING: software for testing the N-System.
    * G-Client-TESTING: software for testing the N-System.
- Deliverables:
  - Documents: satnet-4-R1-TestReport (system)
  - Software: N-System-R1-CANDIDATE, M-Client-TESTING, G-Client-TESTING

2.2.4 R1-D: Operational Testing

- Finalizes on 22nd January 2014.
- Objectives:
  - Carry out operational testing with the release candidate software.
  - Develop the R1-FINAL version of the software. This release must include:
    * N-System-R1-FINAL: software operationally tested for the N-System.
    * M-Client-TESTING: software for testing the N-System.
    * G-Client-TESTING: software for testing the N-System.
- Deliverables:

- Documents: satnet-4-R1-TestReport (system)
- Software: N-System-R1-FINAL, M-Client-TESTING, G-Client-TESTING

3 Features Selection

3.1 Selected Use Cases

3.1.1 Management and Scheduling Services

These are the very simple management services that will permit the registration of new software clients in the system. In addition, it will also permit the configuration of spacecraft and ground stations.

The usage of the simple booking service for scheduling is also illustrated in the figures below.

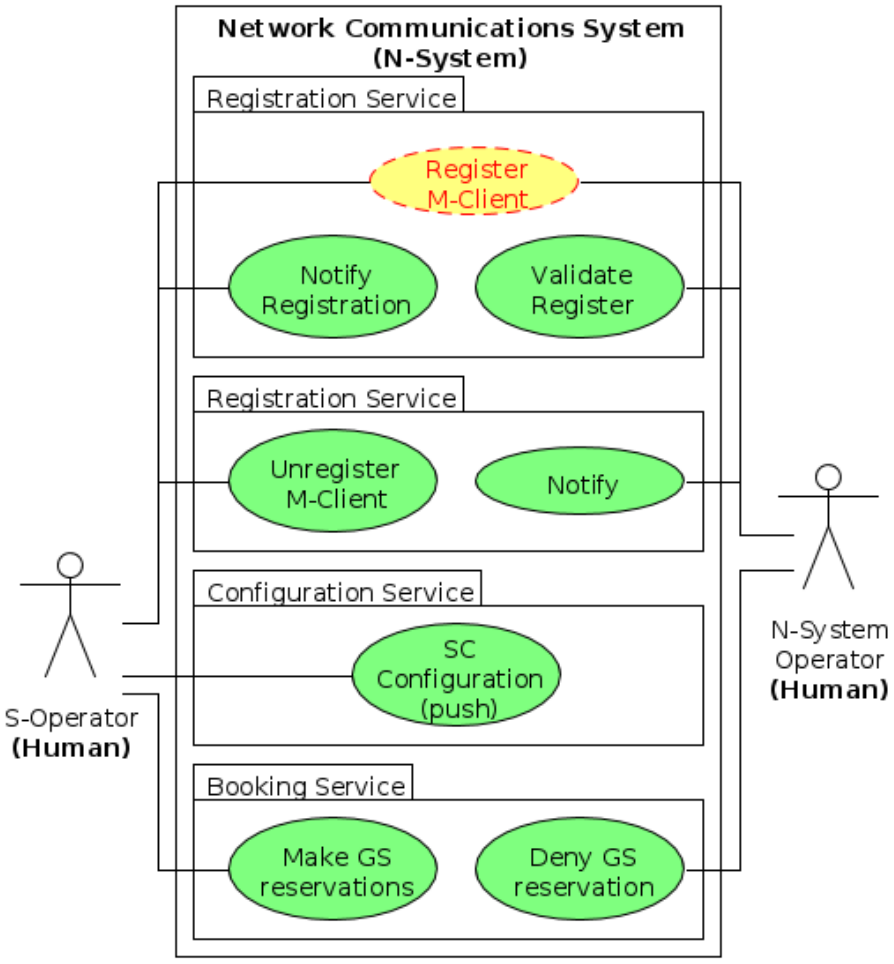

Figure 2: Registration and configuration, mission operators

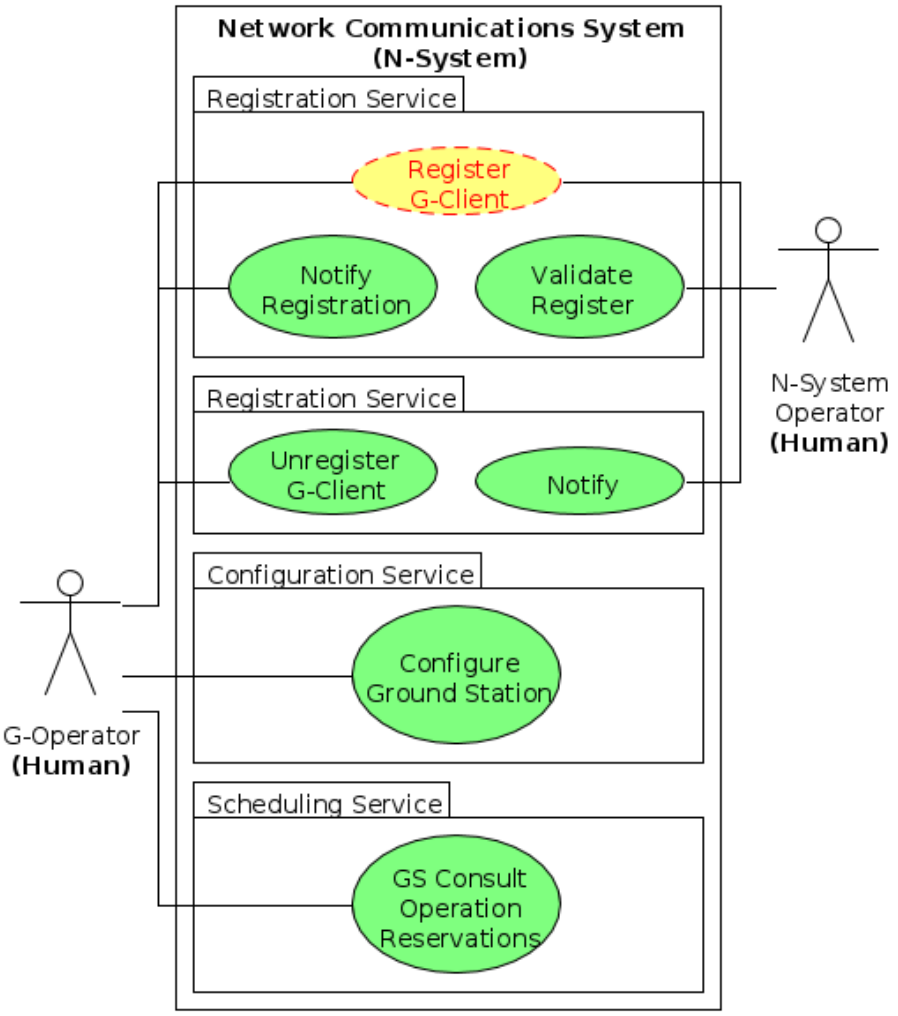

Figure 3: Registration and configuration, ground station operators

3.1.2 Typical Remote Spacecraft Operation

This is the typical remote spacecraft operation with no security or privacy mechanism. Besides, a simple error management mechanism is to be implemented.

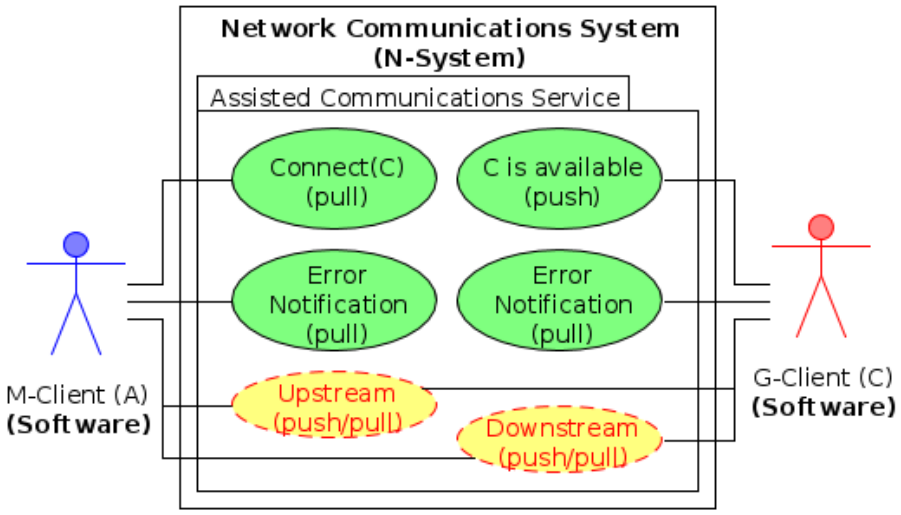

Figure 4: Assisted Operation

3.2 Selected Requirements

- General Requirements
  - USR-GEN-010, USR-GEN-020, USR-GEN-040, USR-GEN-050
  - USR-GEN-060, USR-GEN-070, USR-GEN-080, USR-GEN-090
  - USR-GEN-100, USR-GEN-110, USR-GEN-120, USR-GEN-130
- System Access and Security Requirements
  - USR-ACC-010, USR-ACC-020, USR-ACC-060
- Service Provision Requirements
  - USR-SRV-010, ONLY services 1, 2, 4, 6
  - Registration: USR-SRV-020, USR-SRV-050, USR-SRV-060, USR-SRV-070
  - Configuration (1): USR-SRV-080, USR-SRV-090, USR-SRV-100, USR-SRV-110
  - Configuration (2): USR-SRV-120
  - Scheduling: a new easy scheduling service for simple booking shall be defined in [AD-3].
  - Assisted Communications: USR-SRV-320, USR-SRV-350, USR-SRV-360
- Implementation Requirements
  - USR-IMP-010, USR-IMP-030, USR-IMP-050, USR-IMP-090
  - The applicable interface definition for this requirements can be found at [AD-3]:
    - USR-IMP-040, USR-IMP-060, USR-IMP-070