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MEMO

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Subject: S/C unique ID for emergency support - Input to CCSDS SM study

Purpose

The objective of this proposal is to shorten as much as feasible the delay between a request and actual support in case of emergency.

The main idea is to create a standardised placeholder for safe mode. This allows establishment of tools and procedures which, in conjunction with inter agency dedicated routing solution, can be activated on request in a delay of few hours.

Concept

Emergency support can be split roughly into two categories:

A) S/C in safe mode, but TM and TC can be achieved normally. S/C only requires extensive commanding or orbit determination capacity to recover on-board anomaly.

In such case, the mission usually prefers to use already validated back-up stations.

This case is not concerned by this proposal.

B) S/C in emergency: TM, TC or localisation cannot be guaranteed. In these very rare and critical occasions, additional support of any available ground station with the proper capacity can help recover the situation.

Typical examples are the XMM RF switch anomaly, SOHO lose of attitude or Akatsuki/PLANET-C manoeuvre failure.

For such a case a common obstacle is the lack of a S/C specific name in the ground station configuration. The S/C name is used to save, load, receive or exchange files by nearly all subsystems (orbital prediction, radiometric measurements, TM recording, configuration tables). The tailoring of a new S/C name can in some case require a MMI change.

The current practice is to re-use an existing name as a work-around, but this is not always feasible and may harm the existing configuration. Manual configuration, renaming and data exchange can still be done, but any automation of the process requires a logical name.



By defining a generic standardize name for “emergency S/C support” in the CCSDS SM standard (e.g. SAFE), this name can be tailored in all subsystem as a placeholder. Technical details (frequency, modulation...) still need to be filled for each specific request. But configuration can be save and recalled, orbital predictions can be generated and radiometric measurement can be recorded under this name. It would remain the requester responsibility to root the generic SAFE name to the relevant S/C id internally.

As describe in Figure 1 - SAFE Id conversion and routing summary, the implementation on the provider side would be unique. The filling of the “configuration details” can be feed either via an adequate CCSDS SM request (A) if supported or manually (B).

On the requester side, the conversion can either be part of the design concept (A) or executed outside in a dedicated converter (B). This approach allows standardisation of emergency support independently of the provider’s CSSDS SM implementation level.

In addition, it may be convenient to agree on a peer to peer basis on:

- A dedicated emergency IP address to cross firewall. The address translation and port opening would then be activated only on request.
- Predefined password as needed (SLE, firewall). A unique SAFE SLE password should be agreed on inter-agency basis.
- RF license agreement in case U/L is needed.

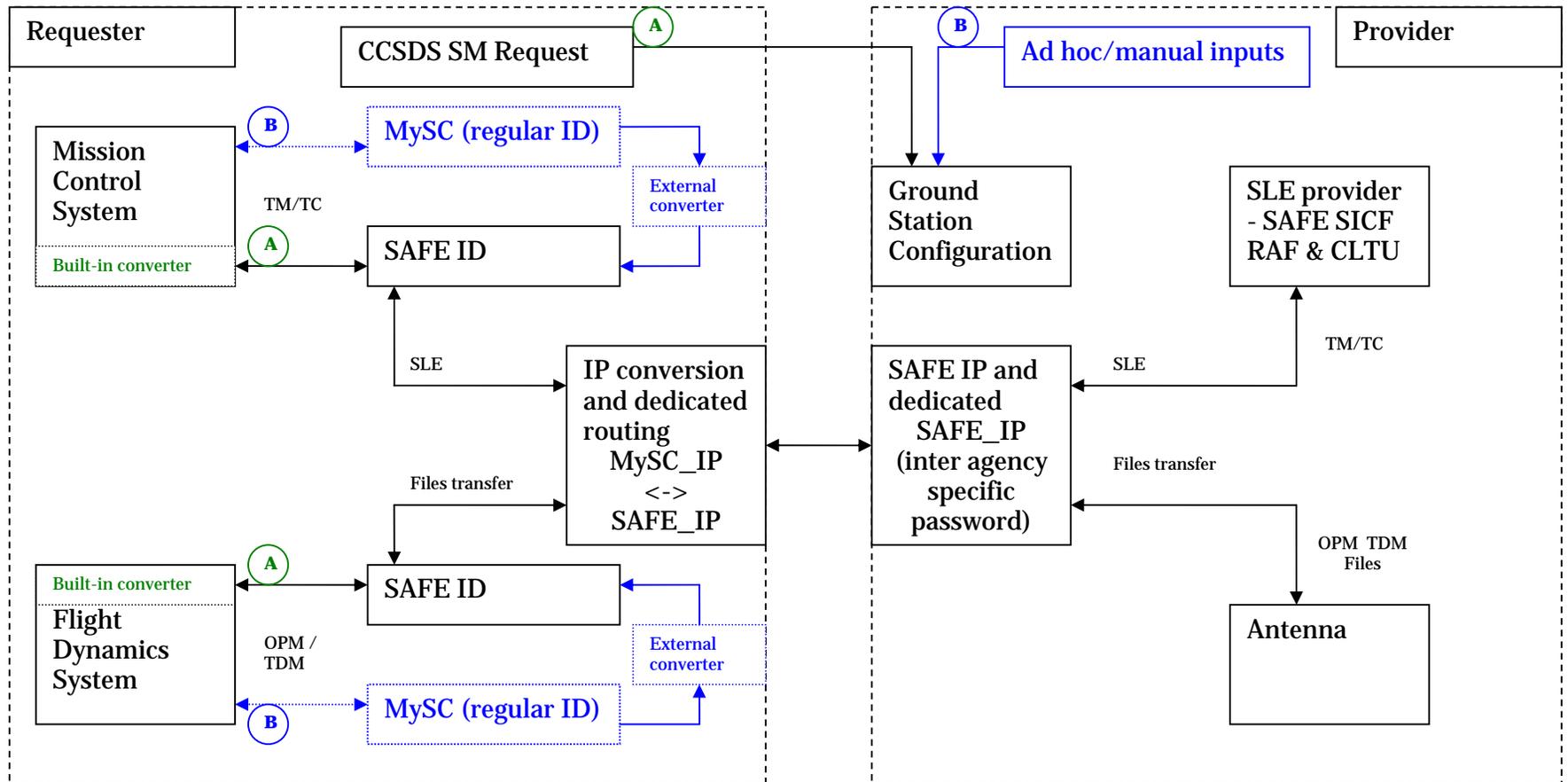


Figure 1 - SAFE Id conversion and routing summary