



4th SSN LRIT Group Meeting

AIS data quality

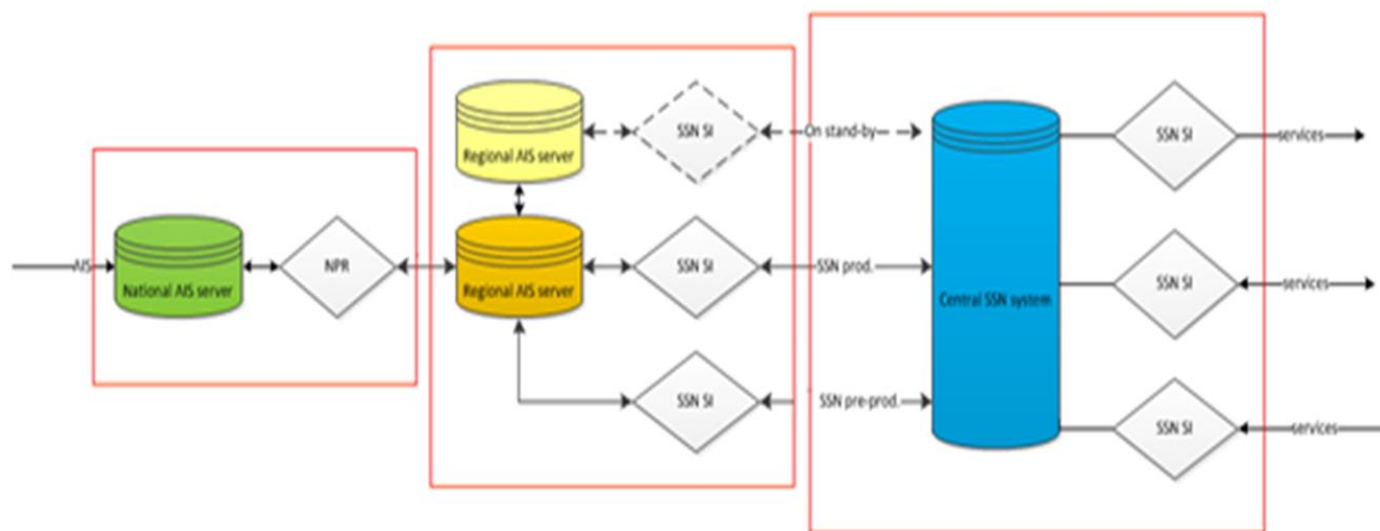
Agenda item 4.5.4

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Department C: Operations / Unit C.2.1

Lisbon / 23 October 2018

Background

- Article 4.4 of the IFCD requires MSs to ensure that SSN messages are stored and then transmitted to the central SSN system when communications and/or systems have recovered.
- The AIS data buffering and retransmission:
 - an important functionality that allows storing the data during the time of malfunction and retransmits the data as soon as the connection resumes;
 - directly linked to the data availability and quality issues;
 - shall be ensured by all 3 levels: national, regional and central.





Solutions implemented by EMSA and RSs:

- SSN SI installed at the regional server site shall be capable of storing AIS data for up to 12 hours (with or without down sampling);
- In the event of a failure of SSN SI the regional AIS server shall buffer the received AIS messages (up to 12 hours) and retransmit them once the connection to SSN SI has resumed.
- NPRs, installed at the MS site, begins storing the data in a local DB (for a short period*) when the connection with RS is down, and begins sending the real time and the stored information when the connection is restored.
- On 18 October, the NPR software was upgraded for the MARES participating MSs (up to 12 h).

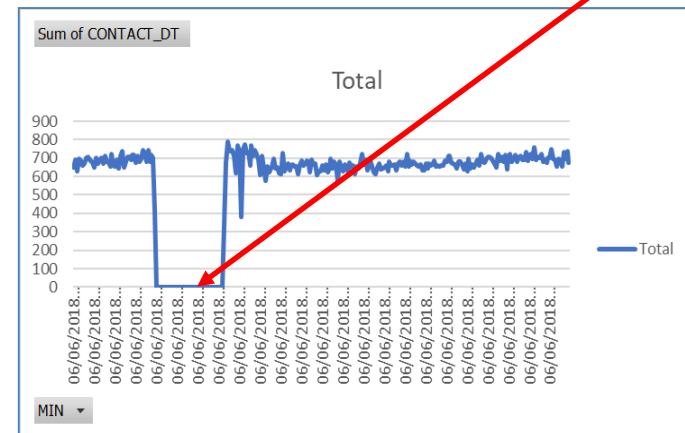
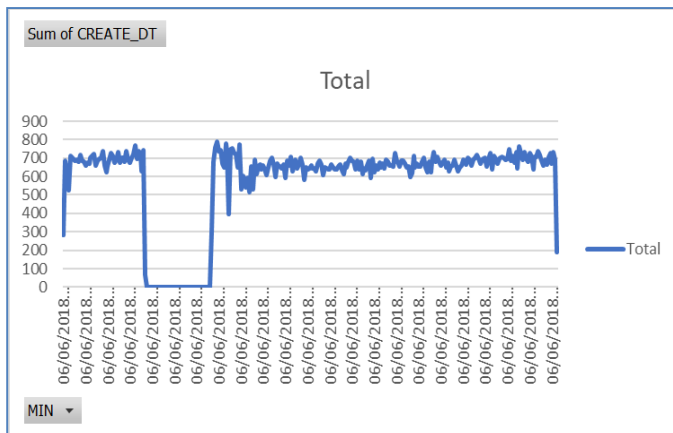
- **Based on incidents spotted during June–August 2018**
- 3 regions (North Sea/Atlantic; HELCOM; MARES)
- 14 MSs
- 22 incidents
- **QLIK monitoring tool:** to compare the values of indicators „**Create_DT**“ (presents the number of messages by their reception time stamp) and „**Contact_DT**“ (presents the number of messages by their creation time stamp).
- **SEG application:** to filter ships movements and visualize the AIS tracks, i.e. if the vessel track is complete following the incident.



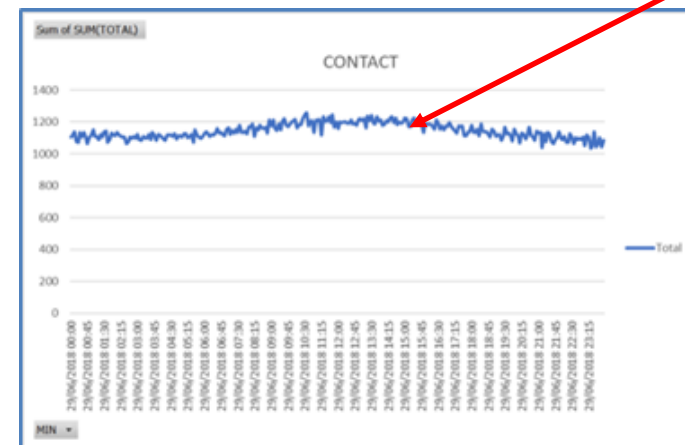
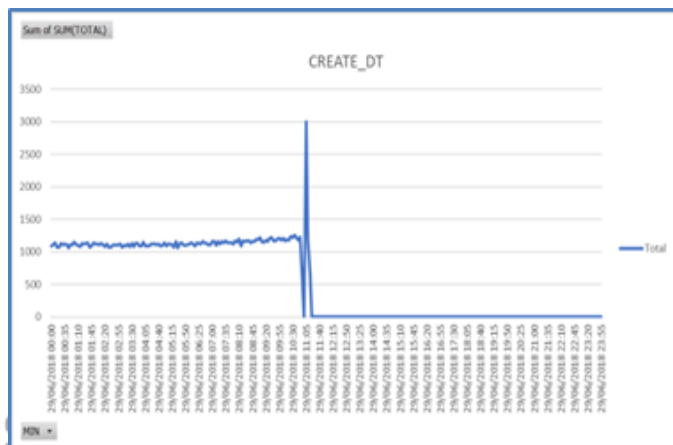
- Under normal conditions, both sensors “**Create_DT**” and “**Contact_DT**” should show a positive value (i.e. incoming messages are recorded by their reception time stamp and creation time stamp).
- In the event of a failure: the “**Create_DT**” value = “0”, confirming that the message reception time stamp is not recorded.
- In case the data is re-transmitted following the incident: the “**Contact_DT**” shows positive values for the incident period, confirming that the message creation time stamp is recorded.

EMSA analyses: QLIK examples

- Negative: the “Contact_DT” value for the incident period = 0



- Positive: the “Contact_DT” value for the incident period is positive



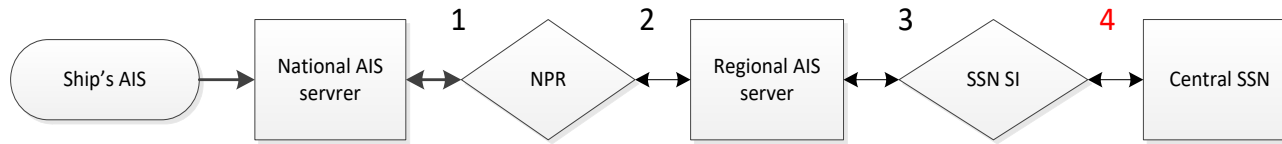
Preliminary conclusions

- 43% of the monitored systems were retransmitting the buffered data following the incident.
 - The results of analyses per Member States are presented in Annex 1 of the document SSM/LRIT 4.5.4
- The „random case“ evaluation does not allow to consider the individual conditions of each incident (e.g. lost connection with NPR, malfunctioning of the national server, communication problems etc.).
- Standardized tests shall be conducted to achieve more completed results.
- A specific procedure for the buffered/stored data resending should be agreed and specified in the Common operational procedures (COP) document.

Tests proposed

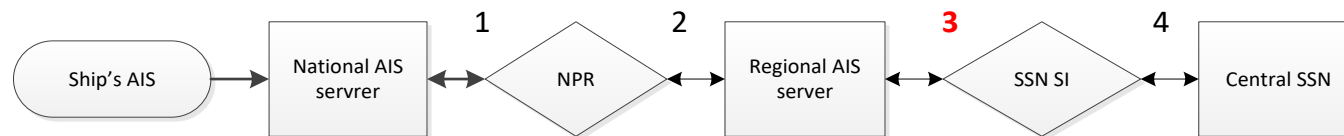
- **Objective:** to verify if the data buffering and retransmission is performed properly by all elements of the data exchange system (i.e. national AIS server, NPRs, RS and SSN SI).
- **Execution:**
 - On a scheduled bases, by involving an individual Member States and regional AIS servers.
 - The RS and SSN SI testing would impacting only a data stream connected to SSN pre-production.
 - The detailed test scenarios and the schedule will be provided at a later stage.
 - The results will be presented at the next meetings.

Test scenario 1: data buffering by SSN SI



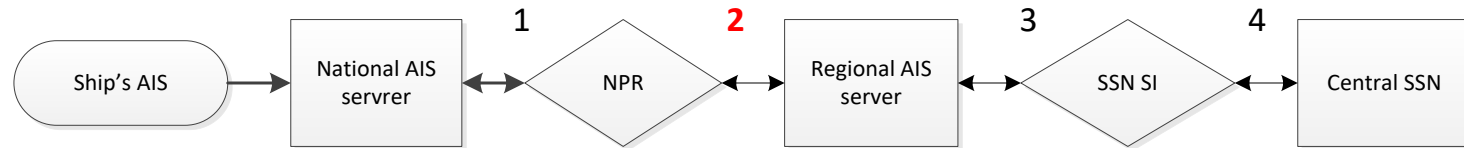
- **Requirement:** SSN streaming interface (SSN SI) installed at the regional server site shall be capable of storing AIS data for up to 12 hours (with or without down sampling).
- **Execution:** The link No 4 will be disconnected (or disabled) by the SSN admin., allowing SSN SI to buffer the received data for a specified period of time.
- Following the re-connection, the participants will compare the amount of data delivered/received before and after the disconnection.
- In case of the retransmission failure, the RS administrator will provide the data of the testing period (through FTP).
- **Participants:** EMSA and RSs.
- **Number of tests:** 1-2 per RS.

Test scenario 2: data buffering by the RS system



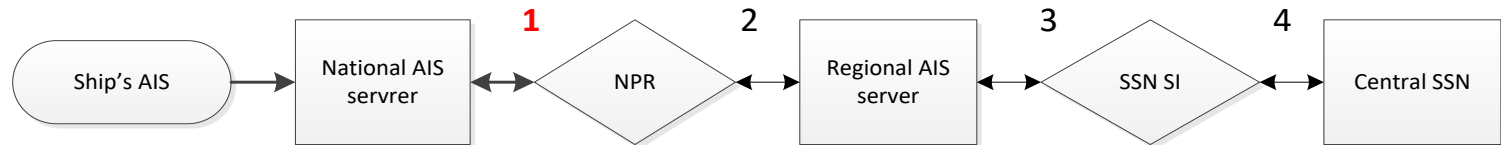
- **Requirement:** In the event of a failure of SSN SI the regional AIS server shall buffer the received messages (up to 12 hours) and retransmit them once the connection to SSN SI has resumed.
- **Execution:** The link No **3** will be disconnected (or disabled) by the RS (or SSN) admin., allowing RS to buffer the received data for a specified period of time.
- Following the re-connection, the participants will analyze the amount of data delivered/received before and after the disconnection.
- In case of the buffering/retransmission failure, the RS administrator will provide the dataset of the testing period (through FTP).
- **Participants:** EMSA and RS.
- **Number of tests:** 1-2 per the RS connection to SSN SI.

Test scenario 3: data buffering by NPR



- **Requirement:** The national proxy (NPR) installed at the MS site shall begin storing the AIS information in a local data base (for short period) when the connection with the regional AIS server is down, and sending to the regional AIS server both the real time and the stored information when the connection is restored.
- **Execution:** The link No **2** will be disconnected (or disabled) by the RS admin. allowing MPR to buffer the received data for a specified period of time.
- Following the re-connection, the participants will analyze the amount of messages delivered/received before and after the disconnection.
- In case of the buffering/retransmission failure, the MS administrator will provide RS the data of the testing period.
- **Participants:** EMSA, RS and MS.
- **Number of tests:** 1-2 per the NPR connection to RS.

Test scenario 4: Data buffering by national AIS server



- **Requirement:** In the event of a failure or a scheduled interruption, NCAs shall ensure that SSN messages are stored, and then transmitted to the central SSN system when communications and/or systems have recovered.
- **Execution:** The link No **1** will be disconnected (or disabled) by the MS administrator, allowing the national server to buffer the received data for a specified period of time.
- Following the re-connection, the participants will analyze the amount of messages delivered/received before and after the disconnection.
- In case of the buffering failure, the MS administrator will provide RS/SSN the dataset of the testing period.
- The MS technical capabilities to perform the test will be assessed prior the testing.
- **Participants:** EMSA, RS and MS.
- **Number of tests:** 1-2 per national AIS system

Actions required

- Member States are invited to provide their comments on the proposals:
- to conduct systematic tests to verify whether data buffering and re-transmission is carried out properly at all stages in the data exchange chain
- to draft and included in the Common Operational Procedures (COP) document the procedure for the buffering and re-transmission of AIS data by Member States



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