



*PROTECTRAIL (242270) - The Railway-Industry Partnership
for Integrated Security of Rail Transport*

RESILIENT ONBOARD TO GROUND PROTOCOL FOR ALARMS PROCESSING



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OBJECTIVE:

- **Ensure the best usage of limited and unstable communications between train and wayside in case of train alarms**
- **Be able to assess, from a wayside SOCC, the train situation, based on videos and associated metadata acquired onboard (real-time and near-real-time)**



SOLUTION TESTED

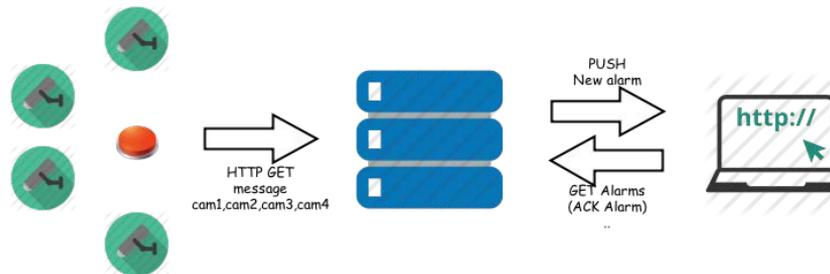
- **A flexible communications onboard server with roaming and data rate management to adapt the throughput of information to QoS**
- **Priority given to alarms and info requests, CCTV data being delivered only as requested and as communications allow**
- **Wayside supervision tool optimized to call directly, through the NVR, the information (live or near-real-time) associated to the alarms**
- **New alarms can be processed while already active with a previous alarm**
- **System is alarm type and format agnostic**

1) MULTIPLE MODES AVAILABLE IN NORMAL OPERATION

- Live Mode for viewing live videos
- Replay Mode for viewing recorded videos
- Alarm Mode for viewing a list of alarms with a contextual menu
 - ⇒ Replay associated videos directly from the list
 - ⇒ Acknowledge alarms

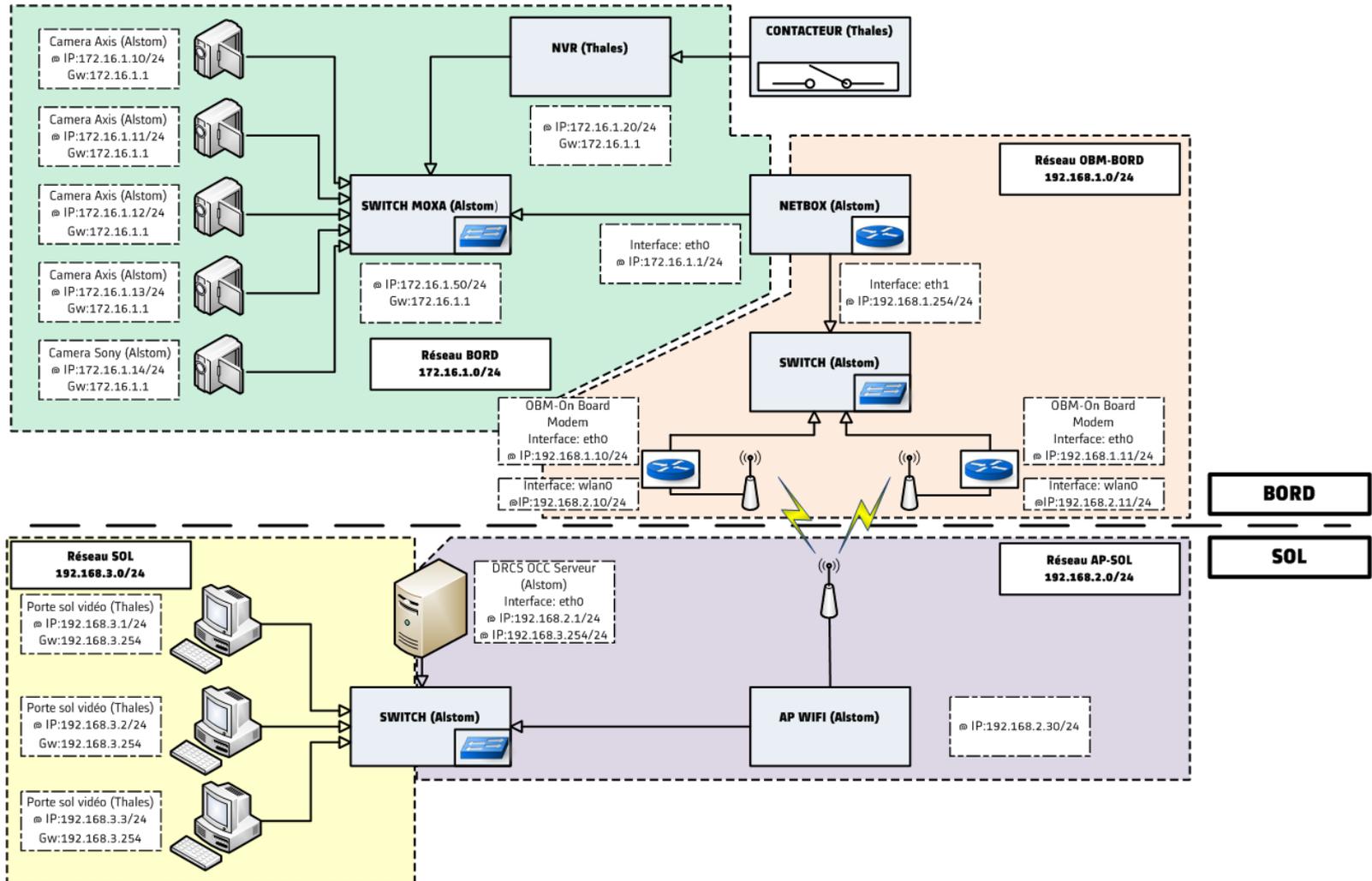
2) WHEN AN ALARM IS RAISED

- As soon as the application server is notified => communication via HTTP PUSH with the web client that is immediately notified
- The alarm list is updated and a banner is shown
- If available, associated videos are automatically played





PRESENTED DEMO ARCHITECTURE



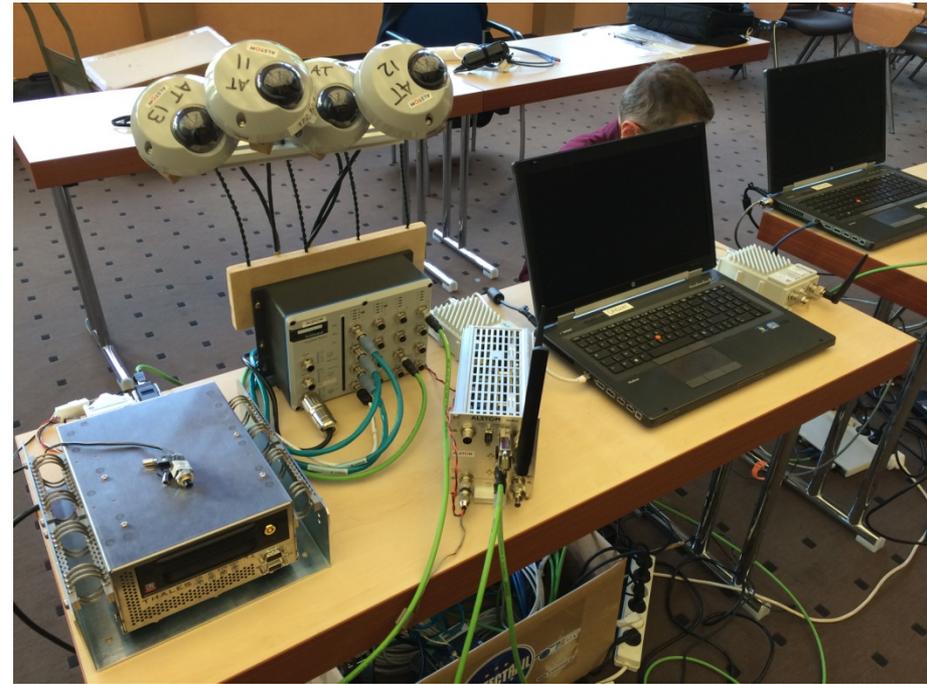


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INTEGRATION TESTS OCCURRED...



...IN ALSTOM ST OUEN LAB APRIL 16TH



AND IN UIC ROOM MAY 6TH



DEMONSTRATION SCENARIO

1) INITIAL STATE :

- The transmission is full bandwidth between the train and the ground through 2 x WiFi channels

2) PERTURBATIONS OCCUR :

- As the link performance decreases, the pictures quality becomes poor, but the alarms go on being immediately transmitted

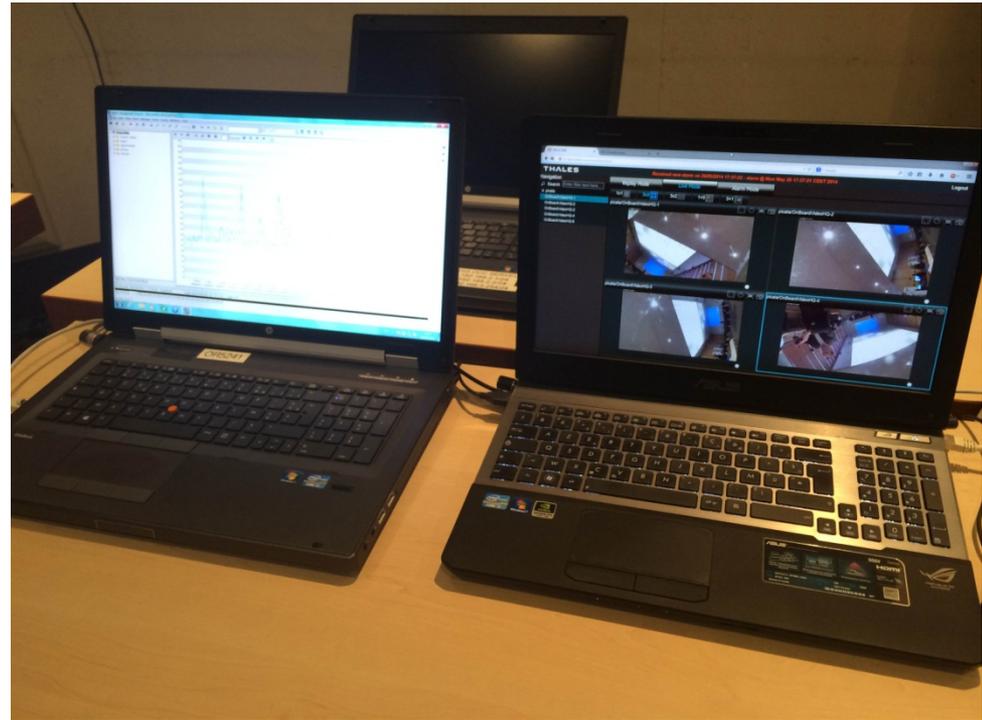
3) ULTIMATE STATE :

- The transmission is lost
- As soon as it is restored:
 - ⇒ first the alarms appear,
 - ⇒ then the pictures



ACHIEVEMENTS

- The demonstration shows that it is possible to give priority to alarms and directly associated videos
- Operators can adapt such priorities and manage transmissions accordingly
- When the transmission is disabled, alarms are transmitted as soon as the link is recovered
- A minimum bandwidth is nevertheless required to transmit alarms





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THANK YOU

***Next
Sherlock solution to relocate perpetrators
and suspects post incident
TNO***