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)
- 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 trough 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
THANK YOU

Next
Sherlock solution to relocate perpetrators and suspects post incident
TNO