

CYBERSECURE COMMUNICATION FOR DRIVERLESS RAIL

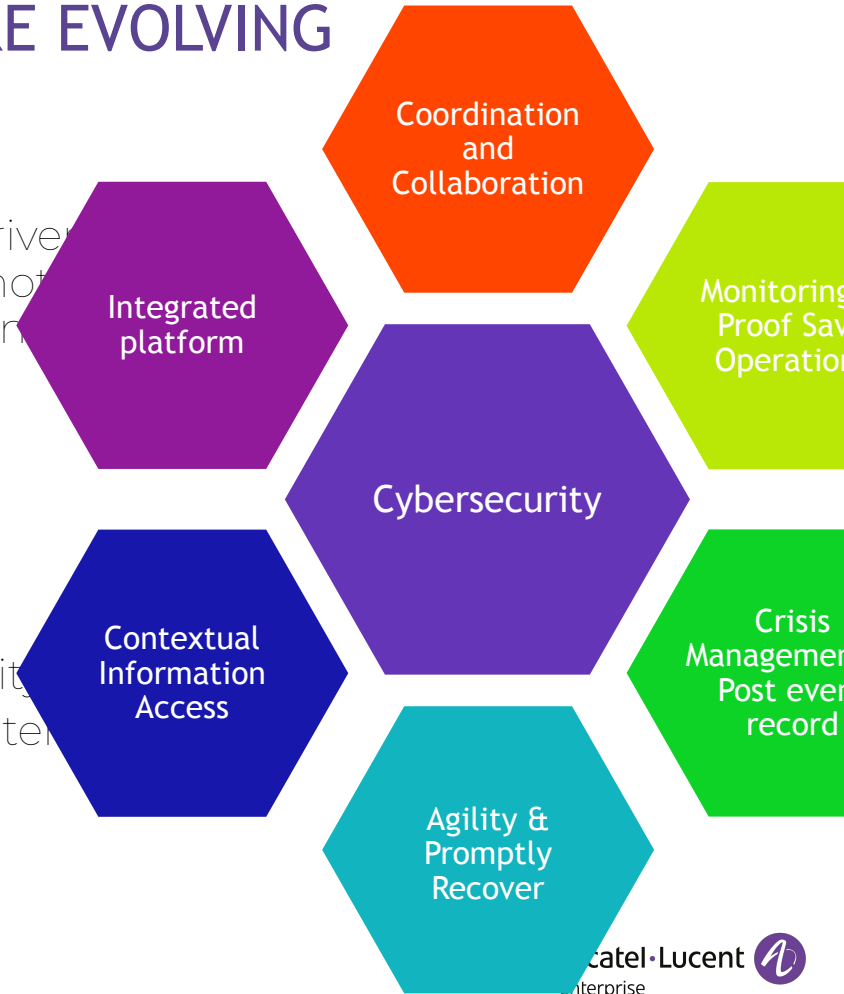
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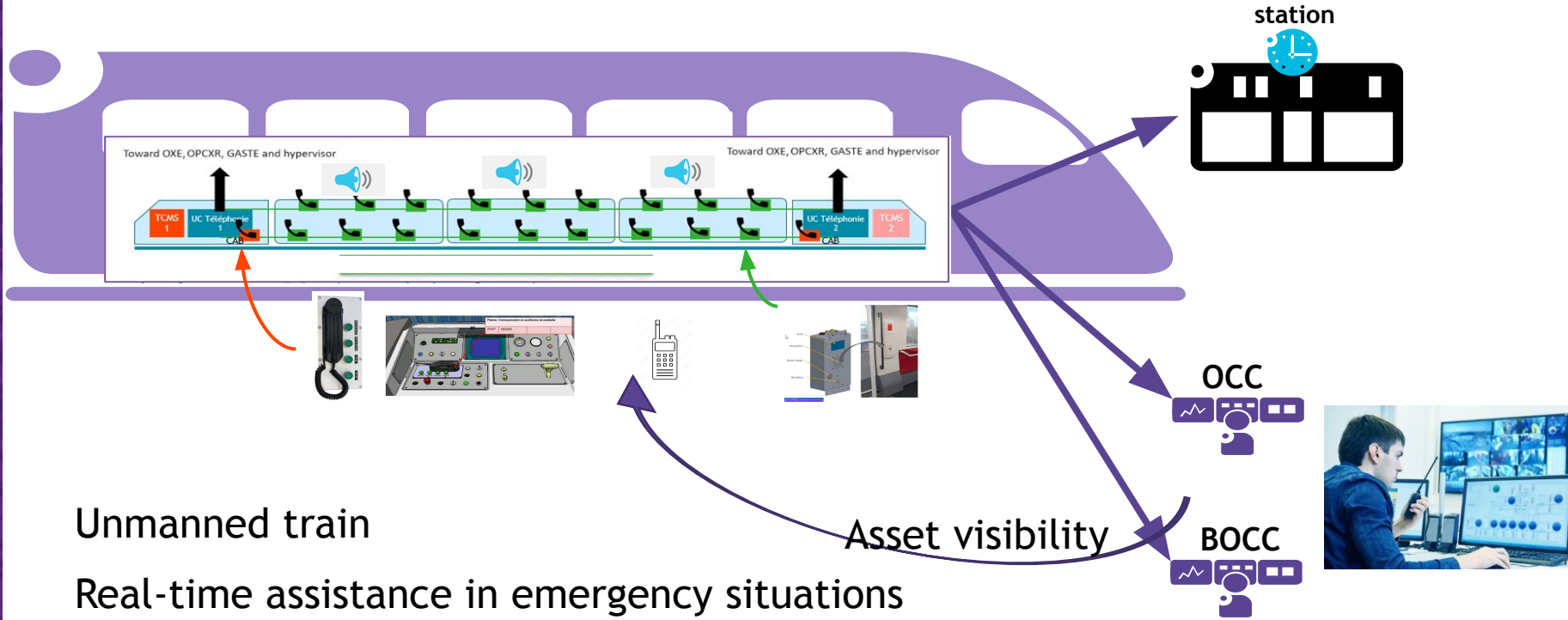
RAIL COMMUNICATION NEEDS ARE EVOLVING

While metro and rail services are becoming driverless, services are moving faster and need to be remotely supervised, communication paradigm is shifting.

- Mission critical communication
- Real time information
- Automation for faster reaction
- Remotely supervised and controlled
- Fully recorded with or without connectivity
- Integrated with stations and Control Center
- Cybersecurity by design at the core



ON-BOARD COMMUNICATIONS FOR PASSENGERS' SAFETY

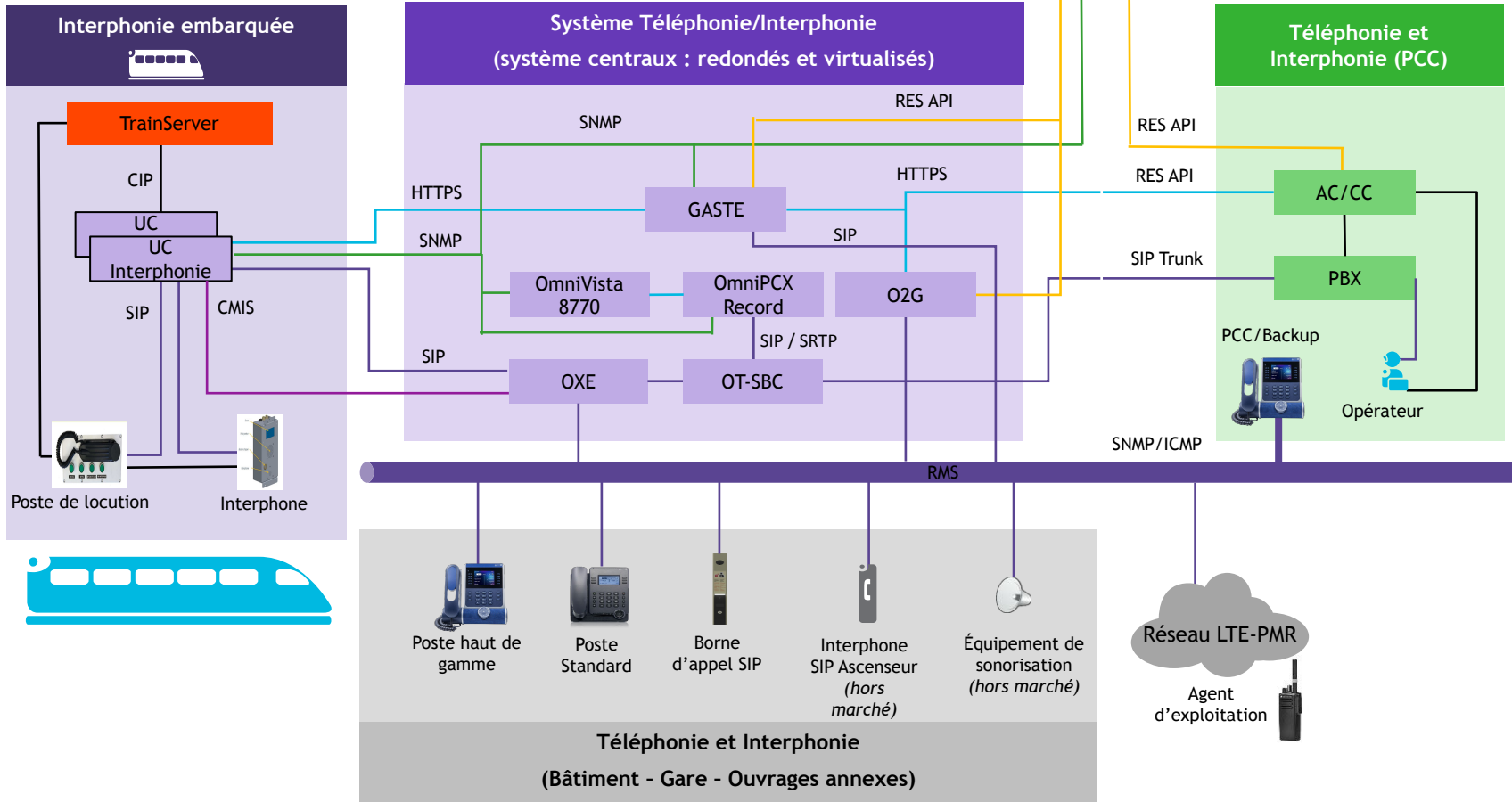


Unmanned train

Real-time assistance in emergency situations

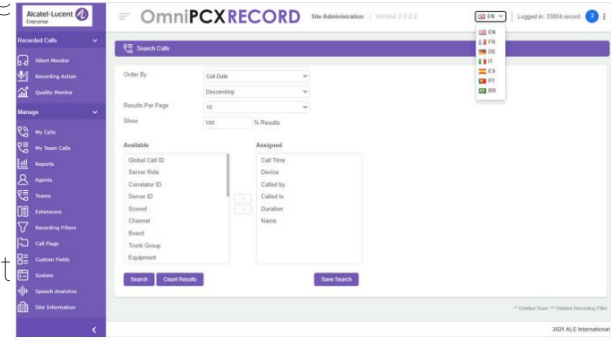
Mission critical communication

ARCHITECTURE FOR TÉLÉPHONIE-INTERPHONIE



OPERATIONAL SECURITY PROCEDURES INCREASED

1. Complex Recording environment
 - Record everything from everywhere
 - Enrich recording with situational info such as PK and geolocation for example
 - Discrete listening when emergency call before, during and after



2. Logs management and alarms
 - Enrich Logs mechanism and alarms (SNMP traps) with
 - All logs gathered in a single place to apply AI and ML.
 - i.e. if an admin has multiple connection rejected
 - Business oriented alarms with integrated or automatic call to action for the administrator
 - i.e. Server restart, warning cybersecurity breach, network disconnection...

NEW RICH USER INTERFACES INTEGRATED IN HYPERVISORS

- Supervision (alarm and status)
 - All phones and intercoms (onboard, trackside, on stations, elevators...)
 - Sound Matrix
- Full asset visibility
- Each development requires a support contract for long-term maintenance

Statistics / Etat des Interphones

Custom GPE panel

Rames: Tout OK, Au moins 1 problème, Autotest en cours, Liaison Sol/PABX NOK pour les 2 serveurs, Arrêt (en cours)

Etat technique interphone: En service, En autotest, En panne

Etat téléphonique (fenêtre): Libre, Appel vers PCC, Appel du PCC, Conversation, Ecoute discrète, Garde, Rappel

Détails Interphone

Rame: 1
 Id: 4_V1
 N°: 50114
 Etat: Libre
 Enr. Train: Vrai
 Enr. Pabx: Vrai

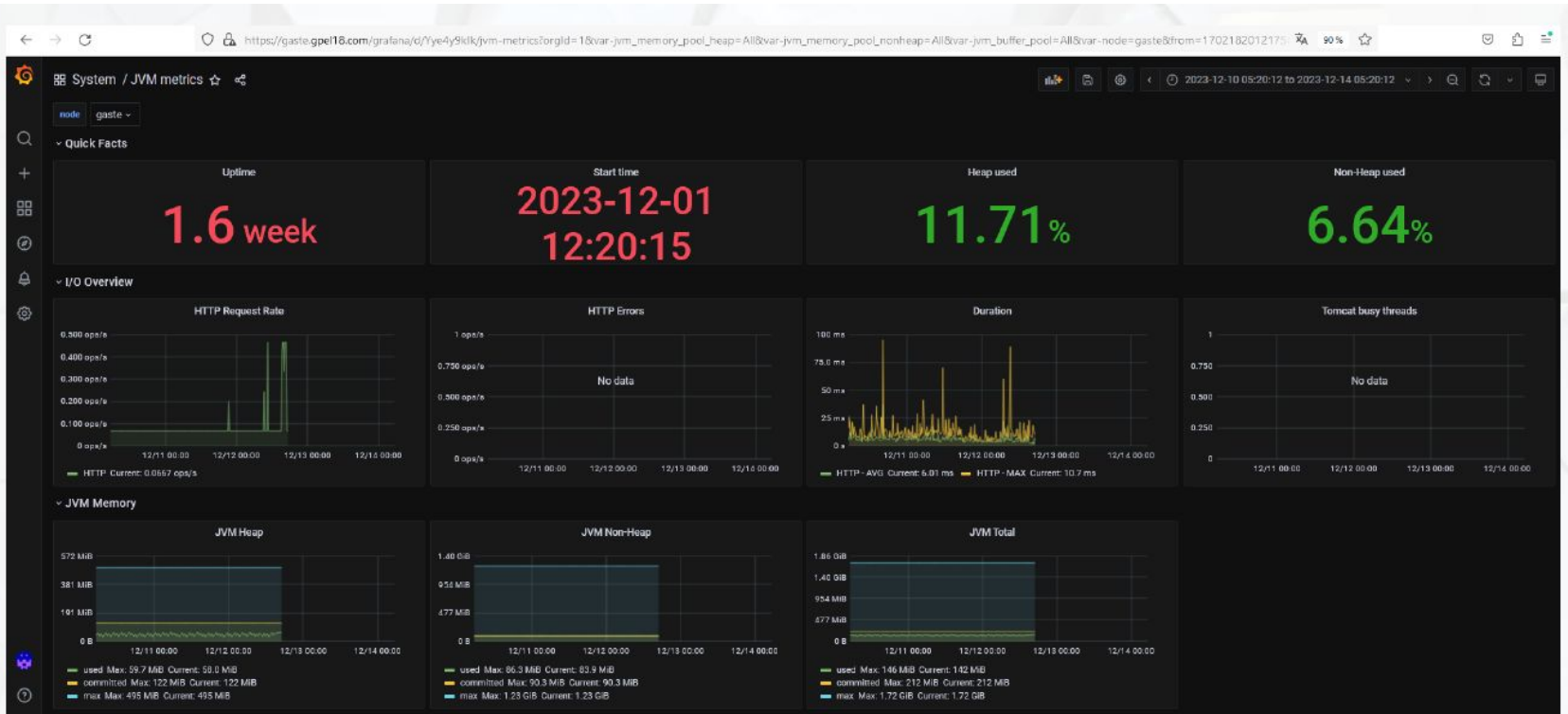
Détails Rame 2

Serveur	Adresse IP	Version SoftCmp	Version TCMS	Etat	Nb. téléphones enr.	Auto-test réalisé	Lecture MDP OK	Liaison Sol OK	Enregistreur OK	Config SoftCMP2 OK	Lien SoftCMP2 OK	TOMS OK	Maintenance	Arrêt en cours
rame2a	192.168.91.21	0.0.15-SNAPSHOT	TBD	standby	2	✓	✗	✗	✓	✓	✓	✓	✓	✗
rame2b	192.168.91.22	1.0.15-SNAPSHOT	TBD	main	2	✓	✗	✗	✓	✓	✓	✓	✓	✗

Téléphones connectés au mauvais serveur: 50201, 50215, 50216, 50217, 50218, 50219, 50220, 50221, 50222, 50223, 50224, 50225, 50226, 50227, 50228, 50202

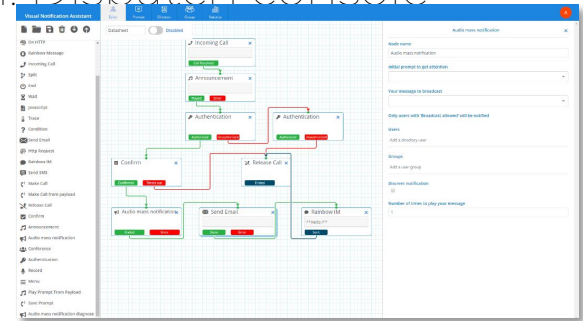
EASY TO READ DASHBOARD AND METRICS

7



STRONGER INTEGRATION IN OPERATION

1. Synchronization emergency call with CCTV and situational awareness
2. Trigger and monitor Emergency evacuation plan
3. Accelerate automation with human control: Dispatch console
4. Permanent improvement process
Live vulnerabilities patch following Pentest
Scrambling OS
5. ANSI and cybersecurity certifications



CYBERSECURITY BY DESIGN AT THE CORE

1. Authentication process 802.1X plus certificate management
From 1 certificate per system to 1 certificate per device
Each network equipment must connect to Radius server
2. Secure the Connections
Profile, generic technical account synchronization with Active Directory, new rules for password chge
Each device must be capable to change server for spatial redundancy
3. Encryption for voice and call control signaling
Voice and signaling encryption must be apply to all ecosystem bringing interworking compatibility challenges (interphone, door phone, emergency call points, elevators phones)
SIP and encryption validation must be conducted
Key exchange mode must be put in place with all devices (SRTP)

THE MAJOR DIFFERENCE IS WITH ONBOARD SERVICES

The background of the slide is a dark collage of various images related to a railway system. It includes aerial views of tracks, interior views of train stations and tunnels, and multiple computer monitors displaying complex maps and data, likely representing a control room or signaling system. The overall theme is modern, high-tech rail infrastructure.

- Mission critical is essential
- Full integration of communication application between train and ground
- Direct access to emergency team outside OCC from intercoms
- Enriched features with geolocation
- Communication services always up even without network, then resume with OCC
- Cybersecurity always on

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Communications



Digital Age
Networking



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Services



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and innovation



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- SBB Switzerland
- Metro Northbound Cityringen CPH
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- Manchester Metrolink (TfGM)
- ATM Milano Metro
- Florence Tramway
- Latvian Railway
- Infrabel - Sncb
- HVV Hamburger Verkehrsverbund
- St Gothard Rail Tunnel
- Prorail BV Netherland
- Railways Of The Slovak Republic
- Københavns Metro Denmark
- Adif Spain
- Madrid Metro
- Malaga Metro
- Barcelona Metro

THANK YOU...
TO TAKE THE JOURNEY WITH US!

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Enterprise

