



QATS products for ERTMS

For proactive railway operators

A brief look

Company Profile



Established in
2005



INNOVATION LEADER
IN BIG DATA, MONITORING
& TROUBLESHOOTING
SOLUTIONS FOR RAILWAY
AND MOBILE NETWORKS



Certified and award-
winning company



60+
team Members



25+
railway customers



International Leader in
GSM-R and ETCS
monitoring for railway
operators

They trust us

Our references

Railway Operators:



Mobile Network Operators:



Partners, Distributors, Vendors & Providers:



■ Clients
■ Distribution Network

ABOUT US

VIAVI, OUR PARENT COMPANY

1923

DATE OF
ESTABLISHMENT

4100+

EMPLOYEES

2133

PATENTS

1113 M€

2019 TURNOVER

137+

COUNTRY COVERED

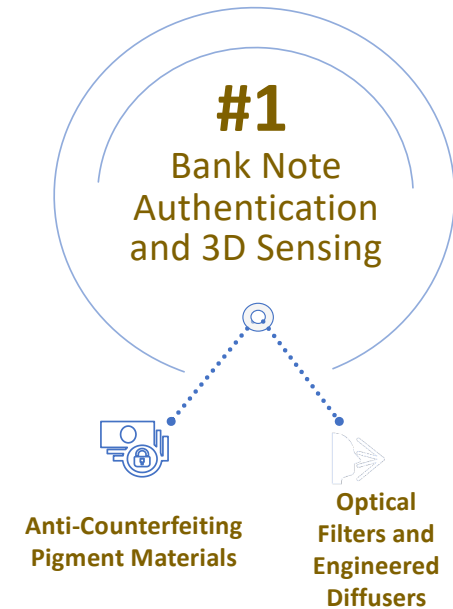
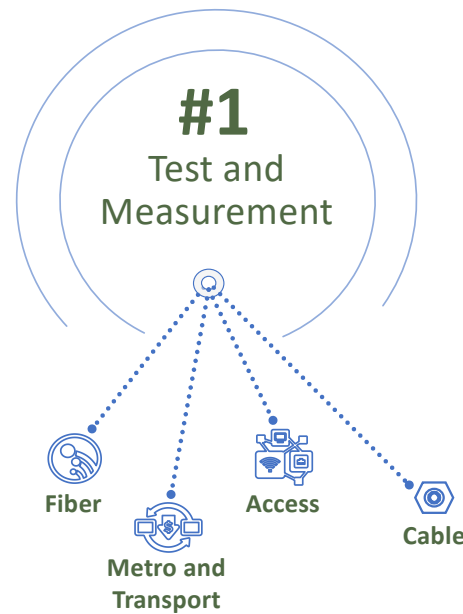
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OFFICES WORLDWIDE

BEST IN CLASS

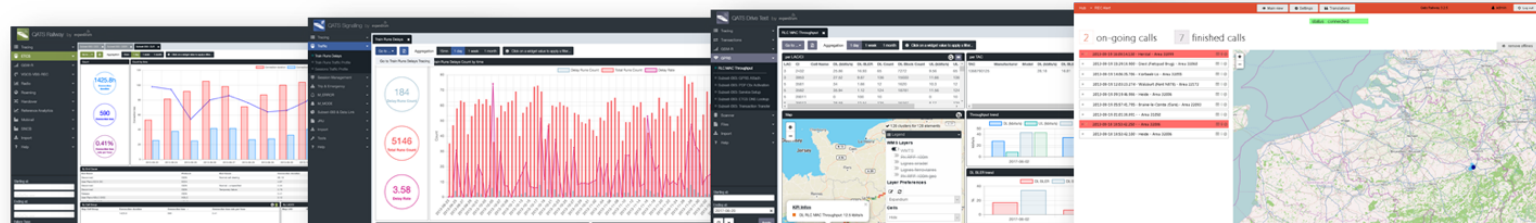
RAN 4G
RAN 5G

CRITICAL (MILITARY, AVIATION)



Developed for Train operating companies

Railway product portfolio



QATS Railway

- GSM-R & ETCS Monitoring
- Real-time
- End-to-end transaction CDRs
- Machine Learning for Predictive Maintenance



QATS Signalling

- ETCS L2 Monitoring
- Train Delay Investigation
- Call tracing & Telecom Frame Tracing (R/T)
- Movement Authority Analysis



QATS Drive Test

- Radio Quality Analysis
- Detect Interferences
- Subset-093 KPIs/Metrics
- Paired with Expandium's Unattended Probes
- Spots areas non-compliant with EIRENE specifications



REC Alert

- Enhance network safety
- REC real-time Monitoring
- Geolocation
- Reports
- Ease of use

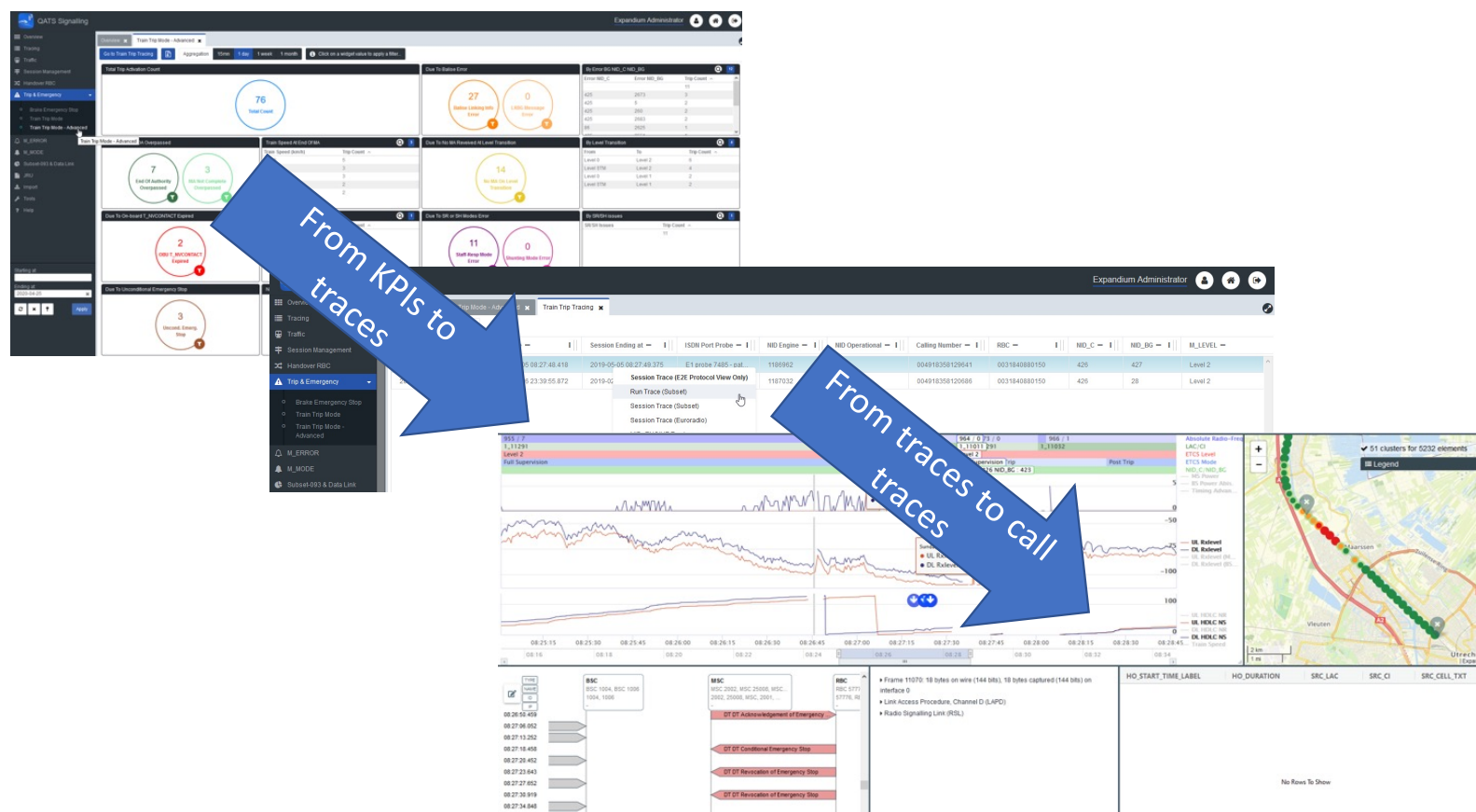


QATS Fusion

How QATS will help you

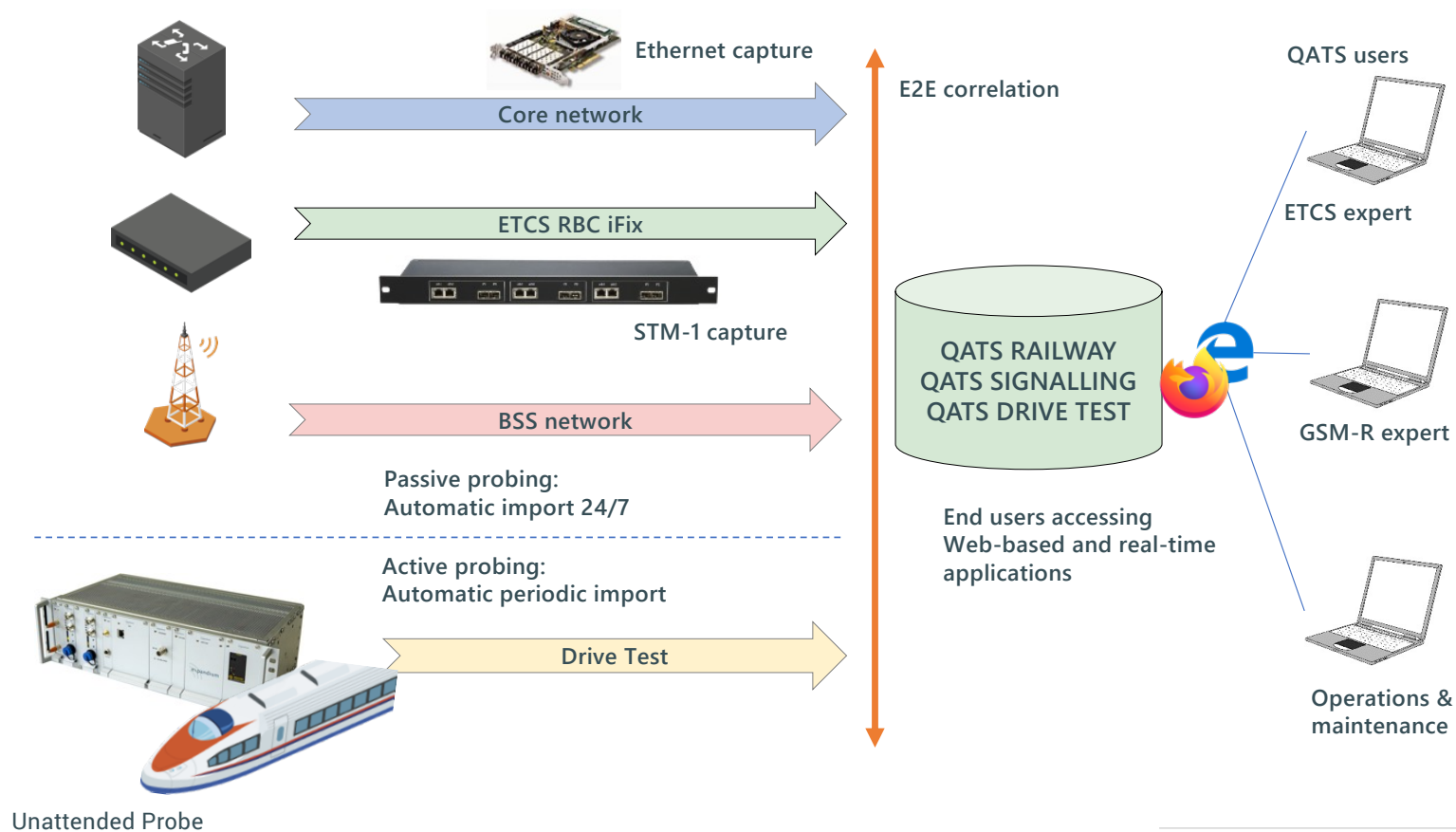
- Identify worst areas of the network in terms of radio coverage or interference, identify the interferer.
- HO ping-pong detection, unwanted HO
- Detect slow degradation of the cells or of a modem/antenna in a train. Preventive maintenance.
- Follow telecom and signalling events in real-time, send alarms on faults
- Is the GSM-R/GPRS network ready for ETCS ?
- Determine why a train in ETCS L2 stops: Radio issue ? Balise issue ? ETCS application layer issue ? HDLC link issue ?
- Log network activity, including reports on ReC calls
- Build you own reports or applications with APIs and automated reports

TROUBLESHOOTING FROM KPIS TO CALL TRACES

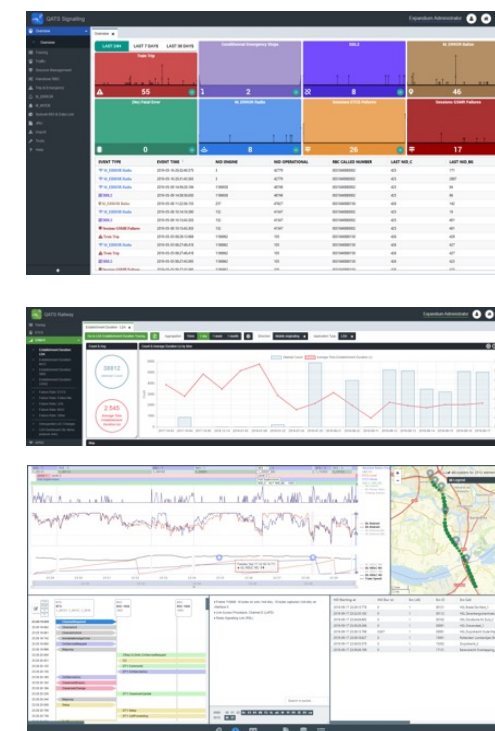


High level view

Architecture

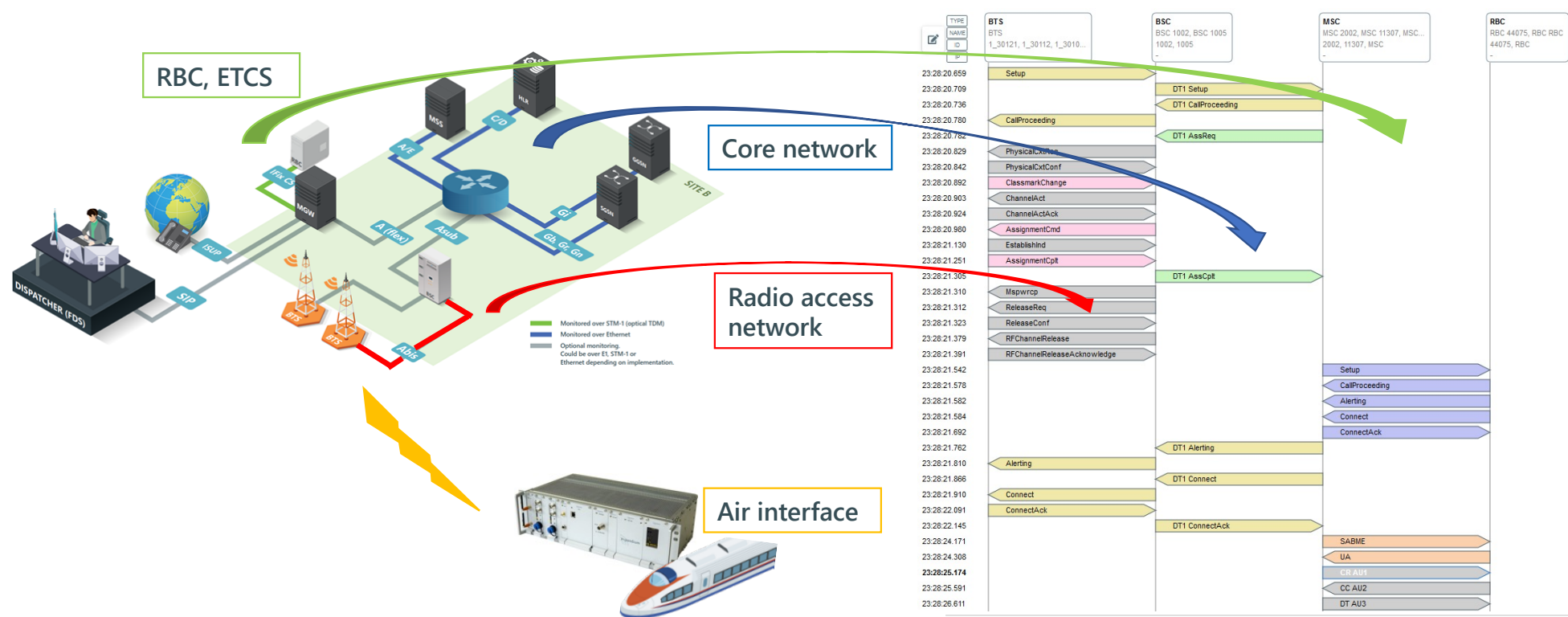


QATS Signalling, Railway, Drive-Test GUI



Call trace principles

E2E correlation



ERTMS performance monitoring

Problematic: Is GSM-R/GPRS network ready for ETCS?

Solution: All Subset-093 metrics calculated on real ETCS traffic:

- **Accessibility:** Connection Establishment Delay/Error Ratio, GPRS Attach Error Ratio, PDP Context activation Error Ratio...
- **Retainability:** Connection Loss Rate, PDP Context Error Ratio
- **Integrity:** Transfer Delay / Round Trip Time, Transmission interference / retransmission

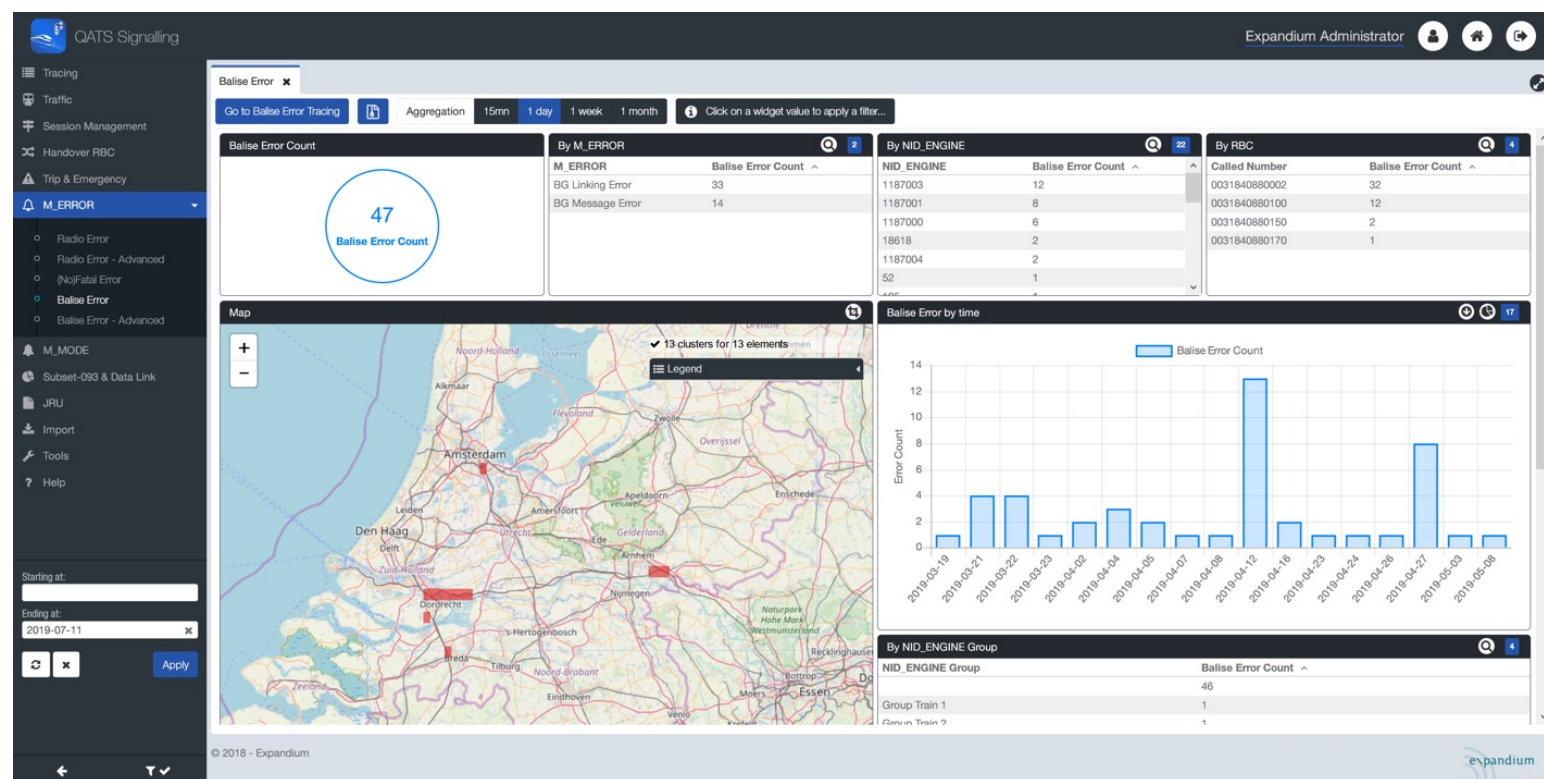


ERTMS performance monitoring

Problematic: Balise error / Balise linking error

Solution: QATS Signalling :

- Records and decodes measured balises
- Compares them with Movement Authority information provided by RBC
- Detects and alarms if difference is detected



THANK YOU!

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