SS03

A scalable fibre sensing architecture for telecom operators

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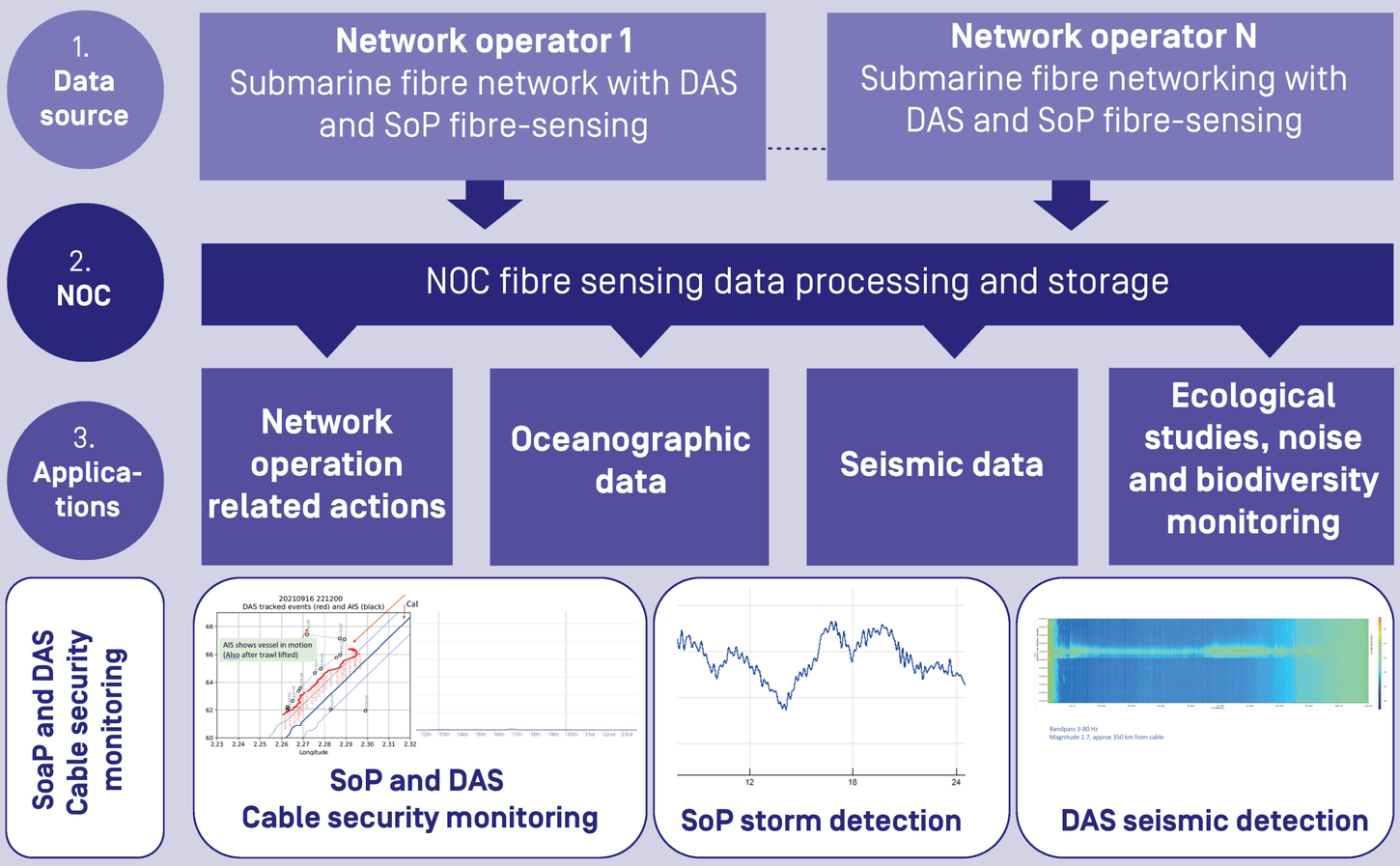
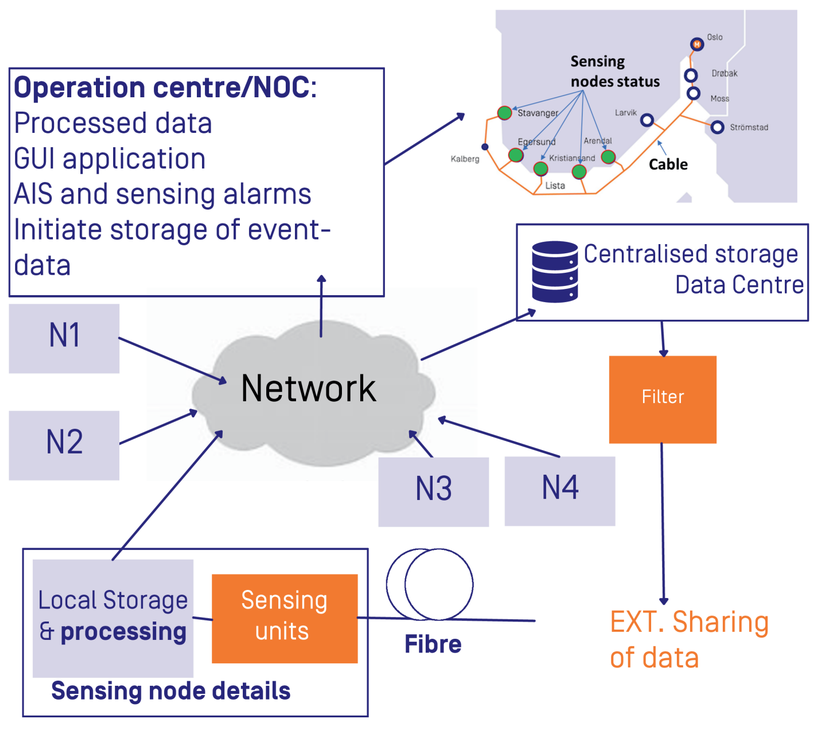
Distributed Acoustic Sensing (DAS) and State of Polarization (SoP) fibre sensing technologies are applicable for subsea telecom cable monitoring and applications in environmental and geophysical research.
Large data volumes must be managed. We propose a scalable architecture for data processing and storage.
We find that tailoring the data processing for different use cases to be essential.

DATA MANAGEMENT IS KEY



- DAS and SoP fibre sensing data streams can be tailored to the needs of different user groups.
- Applying filtering techniques and machine learning (ML) algorithms, the data can be processed, reduced, refined, and shared across various stakeholders with distinct objectives.
- Aggregating data from multiple cables, across different cable owners/telecom operators enables large sets of data and gain from correlation.
- A vessel dragging an anchor may be detected and stopped before damaging other cables.

SCALABILITY THROUGH EDGE COMPUTE

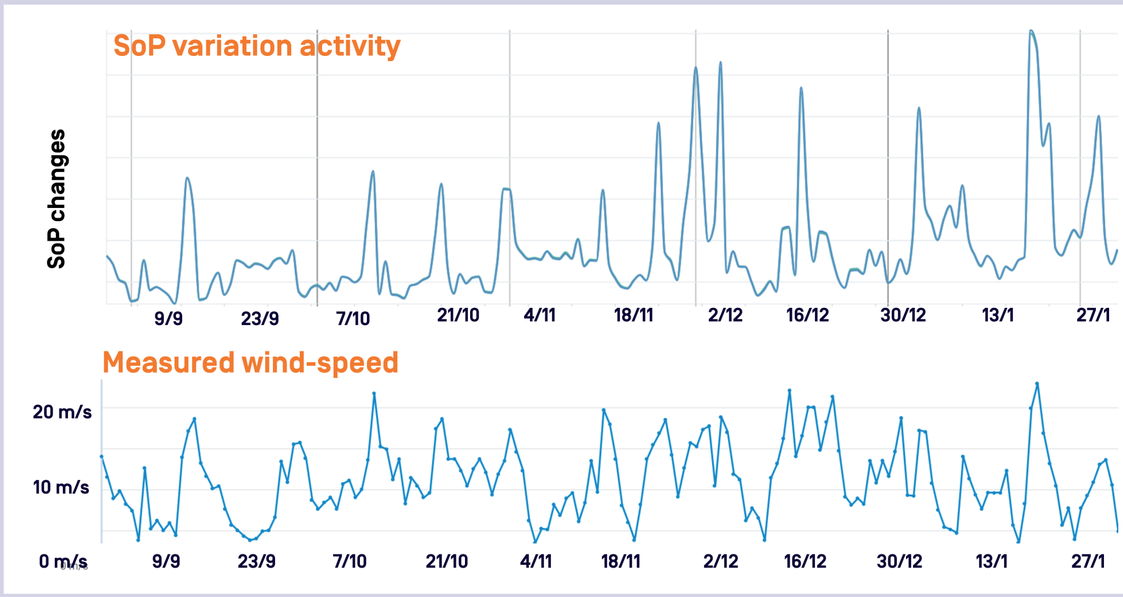


- For scaling the cost of a system with the deployment the processing and storage is distributed. Processing and storage scales with the number of sensing units.
- Distributed storage for short-term storage, storing raw-data. Centralized storage for storing clips of raw-data or processed data from events for a longer time-period and analysis purposes.

APPLICATIONS AND DATA MANAGEMENT

Sensing method / application	Microseism	Earthquake	Cable security and integrity	Environmental parameters
DAS	High sensitivity	High precision	High sensitivity Saturates	Gravity waves Tide waters, ...
SoP	No	Strong earthquakes	Low sensetitivy No saturation	Gravity waves, tide water, slow variations

- Combining DAS and SoP for detection of objects approaching the cable using the DAS, and physical movements of the cable using SoP.
- SoP to trigger alarms of potential cable damage
- DAS for information of object hitting the cable and the position of this object



DETECTING WAVES USING SoP AT YME – EGERSUND CABLE

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