

# Foresight



KONGSBERG

## AIS Network Management

The AIS Network Management is an integral part of the Foresight product family, designed for maritime domain awareness. As our latest version, AIS Network Management is an essential component of any system that handles and stores real-time AIS data.

Employing commercial-off-the-shelf technology, AIS Network Management is a very high capacity, state-of-the-art system with a modular design that minimizes installation and maintenance issues and facilitates enhancements and upgrades.

AIS Network Management is used at central and remote sites to receive, filter, route and store AIS data. Underlying network protocols such as TCP, UDP and multicast are used in the data transport layer with a highly configurable network topology. Recipients of AIS data includes Foresight Traffic Display, web clients, hand-held devices, external systems, and 3rd party applications.

AIS Network Management is deployed as a series of software applications running on Microsoft Windows Server operating systems. Besides physical environments, virtual machines hosted by VMWare or Hyper-V are also supported.

### FEATURES

- Fully compliant to ITU and IEC AIS specifications
- Follows IALA recommendations for AIS networks
- Scalable AIS network that can be easily expanded as data and user loads increase
- Hot-standby support for critical services
- Storage of AIS data in real-time COTS databases with data query and replay
- Comprehensive and graphical administration tools
- Maximum number of AIS stations per node: ~80000
- Maximum number of users per node: ~500
- Runs on COTS servers and operating systems
- Compatible with CSAM for VAtON, Tidal and MetHyd data transmission

## NETWORK CONFIGURATION

The logical network is configured in a graphical tree topology using a series of nodes, ports, filters, and routers. There is no practical limit to the complexity of the logical network. Network configurations are stored in a database, centrally deployed from a single location, and with a full roll-back facility.

## DATA PROCESSING AND FILTERING

Sources of AIS data can be AIS base stations and/or external feeds from other organizations and countries. Incoming data that passes integrity checks is then filtered before being routed to users, applications or databases. A single AIS message can be routed to more than 1 destination and each with its own set of filter rules. Filter rules operate on the common AIS data fields, and can be combined with standard Boolean logic to ensure that only the required data is routed to a particular destination.

## DATA STORAGE

Raw AIS data is stored in real-time databases and from there archived into standard NMEA flat-files. The database is designed to hold many years of data in a schema that is storage size friendly. Database maintenance is handled automatically to ensure that the database does not grow unbounded. AIS Network Management has database query and replay tools to visualize historical data (e.g. for incident investigation).

## SECURITY

Access to network management and the various tools is role based and linked to Microsoft Active Directory users and user groups. This prevents unauthorized changes to the network. Access to real-time AIS data streams is tightly controlled by either IP address or a challenge/response mechanism. When used in conjunction with the AIS Proxy service, AIS data streams can be further protected using 2-way SSL with authentication.

## BASE STATION CONFIGURATION

Support for FATDMA slot planning using the IALA grid system with remote programming of base stations ensures that the base stations are compliant over the VHF datalink. This is configured from a central location.

## CLIENT MESSAGE HANDLING

Messages destined for vessels (e.g. a safety-related text message) are automatically routed in the system to the most appropriate base station for transmission. This includes text, safety, interrogation and assignment messages. Broadcast messages are also supported. Access rights for each client determine which messages will be processed by the system.

## HIGH THROUGHPUT, LOW LATENCY

The software processes have been designed to handle a very high throughput of messages with a latency of less than 250 ms. Low latency is important when AIS data is being fused with radar data. Real-time performance monitoring highlights system bottlenecks which can then be alleviated by a change in the logical network.

## VAToN, TIDAL, METHYD DATA TRANSMISSION

When combined with C-Scope Aton Management (CSAM) the system can transmit Virtual AtoN, Tidal and MetHyd data out of the most appropriate base station. The Tidal and MetHyd data adheres to IMO SN/Circ.236 for AIS Binary Messages.

