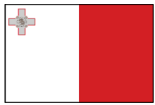


# BLUEMASSMED DEMONSTRATION EXECUTIVE PLAN VERSION 1.3



	Name	Date	Visa
<b>Validation</b>	<b>For the BMM Steering Group, the Project Director :</b> <b>Jean-Marie Van Huffel</b>		

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## SUCCESSIVE MODIFICATIONS

<b>Version</b>	<b>Date</b>	<b>Page(s) &amp; § concerned</b>	<b>Change description</b>
1.1	20-03-2012	Whole document	New document, new title
1.2	04-04-2012	Pag.27,28 - §A2.3 Experimental demonstration conduct	Complete review
1.3	16-04-2012	Whole document	Complete review

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## ACRONYMS LIST

AIS	Automatic Identification System
BMM	Blue Maritime Surveillance System for the Mediterranean sea(BlueMaSSMed)
CCTP	Cahier des Clauses Techniques Particulières
COP	Common Operational Picture
DG MARE	Directorate-General for Maritime Affairs and Fisheries
EC	European Commission
EMSN	European Maritime Surveillance Network
EU	European Union
GIS	Geographic Information System
LRIT	Long-Range Identification and Tracking
MSS	Maritime Surveillance Systems
NAF	NATO Architecture Framework
PN	Primary Node
QoS	Quality of Service
SBCMP	Shared Basic Common Maritime Picture
SN	Secondary Node
SOA	Service Oriented Architecture
SOP	Standard Operating Procedures
TCP/IP	Transmission Control Protocol/Internet Protocol
VMS	Vessel Maritime System
WAN	Wide Area Network
XMSN	eXperimental Maritime Surveillance Network

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- A. CAHIER DES CLAUSES TECHNIQUES PARTICULIERES (CCTP). 09th August, 2010
- B. BluemassMed System View. 16<sup>th</sup> May, 2011

# 1 CONTEXT

The sea is a space of liberty and freedom. It is a vast and rich space where the humanity will find and build a part of its future. Given the geo-strategical importance and specificity of the seas and the state of the international law of the seas, States are prominent actors.

The seas also are an area where illegal or criminal activities are expanding. This reinforces the duties the States have with regard to the seas. States have missions on the seas, additional knowledge, rescueing, environment protection, safety and security, etc...

Within each Member State of the European Union, a number of governmental agencies, each for its part of responsibility, collect and analyze information. Single-agency, single-state or combined interventions need sharing of information and intelligence between, and not only, the European Member States or their agencies. While exchange mechanisms of sectoral nature or in limited ways already exist, a wide and commonly used mechanism, firmly grounded on the conviction and the availability of actors, has not yet been established to allow improvements on data exchange quality and efficiency terms.

Such exchanges face unwillingness or inertia from the agencies and theirs agents, as well as different kind of obstacles (technical, legal, administrative).

The European Union is willing to develop an Integrated Maritime Policy. A fundament of this policy is the Maritime surveillance capability and effectiveness, first by European entities, but further in relation with third partners.

# 2 BLUEMASSMED PROJECT

In the global framework of the complex move of Maritime surveillance within the European Union, the BlueMassMed (BMM) pilot project is dedicated to enhancement of Maritime surveillance cooperation between actors from partners Member States (littoral to the Mediterranean sea and its Atlantic approaches), aiming at :

- founding the basement of their cooperation in information sharing, while examining the practical obstacles and solutions,
- conceiving an appropriate architecture therefore,
- building a corresponding network linking the selected existing maritime surveillance systems (MSS) of BMM partners,
- experiencing this organised cross sector and cross border exchange,
- widely proposing the results to the European Union and third interested parties.

Six EU Members States (Italy, Spain, Portugal, Greece, Malta, France), are participating to the project leaded by France. It gathers 37 governmental partners involved in state action at sea.

The project is based on a strong implication of the governmental partners.

The main BMM goal is to propose a federated decentralised model through which the existing Maritime Surveillance Systems (MSS) of BMM partners and the existing EU wide maritime reporting systems (such as AIS, VMS, LRIT) can contribute to build a **Shared Basic Common Maritime Picture (SBCMP)** through the exchange of harmonised Common Services, ultimately enhancing the regional maritime situational awareness.

The BMM project aims, as well, to develop methodologies and standard operating procedures (SOP) to be proposed and shared by all the European Union Member States in order to optimise and maximise the maritime surveillance data exchange, taking into account the inherent dual nature (civil and military) of Maritime surveillance tasks.

It aims to prove the feasibility of a European permanent surveillance capacity of the Mediterranean maritime area and its Atlantic approaches by:

- determining the extent to which the project partners are potentially able to set up an information exchange mechanism at a cross sectoral and cross border level that is viable and durable in time
- identifying the legal, administrative and technical obstacles that may hinder these exchanges
- studying the appropriate different kind of solutions (technical solutions ; best practices and/or legal adjustments ; etc) to overcome the obstacles identified
- illustrating the relevance of the proposals by realising an experimental exchange system between some of the existing national maritime surveillance systems; this exchange system will be implemented during a demonstration, which is part of the BMM project.

Thus BMM intends to contribute to the global effort to improve coherence and cohesion within maritime agencies and competent authorities, therefore supporting multiple projects in the field of Maritime surveillance, and particularly the implementation of the CISE roadmap.

### **3 BLUEMASSMED DEMONSTRATION STRATEGY**

#### ***3.1 NATURE AND OBJECTIVES OF THE OVERALL DEMONSTRATION***

Based on User and Technical Requirements established during the design phase, a BMM prototype network has been designed and established connecting operational nodes through an open interoperable service oriented architecture.

Based on such prototype BMM network, a “BMM demonstration phase” has been scheduled in the last phase of the project. During this phase, a shared basic common maritime picture (SBCMP) and a basic set of harmonised common services will be available to all partners taking part in the demo, either as primary nodes (those with Maritime surveillance Systems directly connected to BMM Network) or secondary nodes (connected to BMM network through a primary node web portal).

The SBCMP integrates all the basic information (as defined in the User Requirements document) made available by the partners systems from all sources, adopting a minimum set of common semantic rules and a service based track exchange logic in order to enable the maximum interoperability Thanks to the adoption of an open technical standards baseline and of a pure SOA web service paradigm, the designed network architecture also enables the connection of future systems or systems already under development by the different EU agencies, without having to coordinate or subordinate the respective national systems evolutions.

Annex I reports the reference technical baseline of the established BMM prototype network.

The experimental demonstration by the means of establishing and maintaining for a sufficient period of time a SBCMP is the attractor of the project that mobilizes all project actors by confronting them to concrete realisation of the output of their work. Moreover it demonstrates the added value offered to operational participants by running realistic scenarios like pollution incidents and customs issues.

The experimental demonstration process shall offer an optimal harvest of lessons learnt, with the following objectives:

- place partners in capacity of practicing systematic data exchanges, from basic upwards into sensitivity, and benefit from adding value services,
- exercise of info exchange, gradual in complexity, both cross-sectoral (including internal cooperation) and cross-border (and cross-users communities), with the aim of added value to participants by running realistic and pertinent scenarios,
- test and improve the requirements for the best practices in sharing and exchanging data and services during an in-depth demonstration, based on realistic scenarios which focus on activities carried out by the partners in their mission,
- establish and maintain a SBCMP for a sufficient period of time.
- culminate in the process of identifying and solving obstacles,
- disseminate the lessons learnt, estimate the investment and life cycle costs.

In order to conduct an adequate demonstration, the operational and technical requirements have been streamlined appropriately, considering the purposes and the available time for this demonstration to occur.

Since each member state involved in the demonstration will develop its own node, the requirements originally specified have been adjusted and augmented to every context, as necessary, to support a proper and complete procurement process.

## **3.2 GOVERNANCE**

### **3.2.1 General**

The overall governance of the demonstration is led by the Steering group.

The Core group endorses specific responsibilities in the construction of the BMM network.

A team composed of the UWG leader, the TWG leader, and the Operational manager, in close connection with the Project Director, and with the support of the LWG leader whenever needed or wished, is in charge of the successive steps of the demonstration as described below. This team is named “the coordinator”.

### **3.2.2 Preparation**

#### **THE COORDINATOR**

The coordinator drives the detailed preparation and the concrete implementation of the experimental demonstration. The coordinator is supported in his tasks by the recruited “Experimental demonstration Expert”

The Tasks of the coordinator are (not comprehensive list):

- laying down the detailed tree of the schedule,
- writing concrete guidelines for different experimental demonstration steps,...), and checking the guidelines and schedule with the Tech and Ops networks (availability, feasibility, practical problems and solutions, etc...),
- preparing and completing the needed tools for the experimental demonstration (scenarios, handbook for execution, ...)
- establishing the details of experimental demonstration events (content, dates, duration, red thread,...)
- fixing the lessons learnt aspects (handbooks for method, writing, diffusion, and soon use of it),

- define a methodology for reporting the result of the demonstration (content of the report, indicators design according to User and Technical requirements, end users questionnaire, writers designation, schedule, process for feedback and compilation, etc...)

### **BMM NETWORK CONNECTIVITY, AVAILABILITY AND READINESS**

Those activities are under the responsibility of the Core group members. The TWG leader coordinates the actions with the support of the recruited PN reviewer through the PN Technical managers.

### **TECH and OPS NETWORKS**

Two networks are constituted whose work is driven by the coordinator, a Tech network and an Ops network.

The Tech network takes the responsibility of ensuring the technical working order – availability, maintenance, improvement- of its PN/SN during the demonstration.

The respective PNTM of each PN is responsible for :

- build a PN compliant with the BMM System view,
- ensure the connection of its PN to the BMM Network,
- ensure the connection of the related SNs if they are not directly connected to the BMM Network,
- contribute to all the testing phases following the testing plan decided by the Coordinator.
- coordinating the Tech issues at national level.

The Tech responsible person for each SN is responsible for :

- put in place a computer with an internet access and able to activate a web browser,
- ensure the connection of its Secondary Node to the BMM Network by respecting the given instruction configuration),
- contribute to the testing phases involving secondary nodes, following the testing plan decided by the Demo Driving Team.

The Ops network, eg each Ops responsible person of each PN/SN, takes the responsibility of ensuring the operational working order -compliant, active and productive participation to the experimental demonstration-, of its PN/SN during the demonstration.

### **3.2.3 Legal aspects**

This activity is under the responsibility of the LWG leader.

A handbook for the experimental demonstration, for the benefit of scenarios completing and reviewing teams, and for the ops rooms actors during the experimental demonstrations conduct, needs to be realised before the end of the connectivity test phase.

This handbook should be an efficient tool for the partners involved in the experimental demonstrations, especially in the perspective of evaluating and proposing changes in the rules governing the information exchanges.



### 3.2.4 Outputs dissemination and communication

The Coordinator endorses general responsibility on producing outputs, with the support of the Communication working group (“selling points”) which takes charge of communication.

The priority dissemination target is the European Union : Maritime surveillance community, DG Mare and other DGs, Member States not partners, European agencies, etc...

BMM will present itself, with the outputs gained then, at European Maritime days in Göteborg on May 21 and 22.

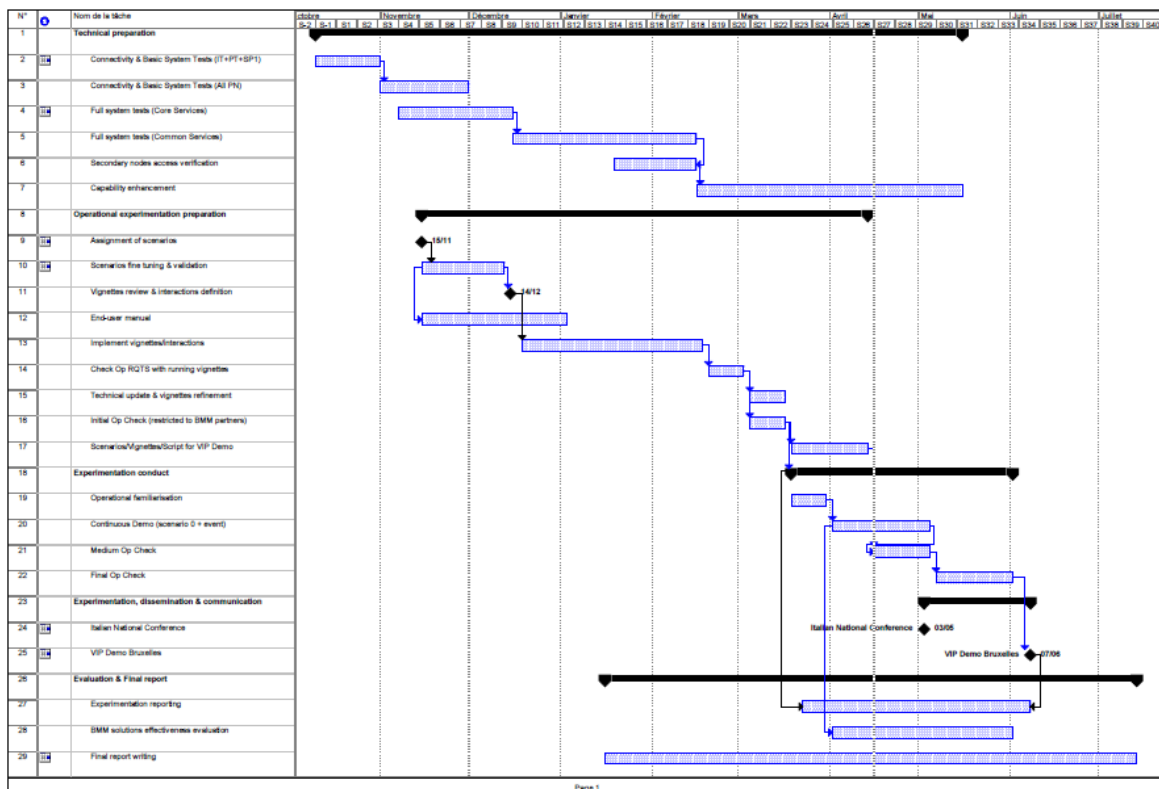
The principal event for communicating and disseminating the outputs and proposals of BMM will be the EU VIP demonstration event placed on June 7.

Out of national purposes, VIP demonstrations could also be foreseen. This matter will be discussed and assessed later on. Such VIP demo could be performed during the step “continuous experimental demonstration” (around mid May 2012).

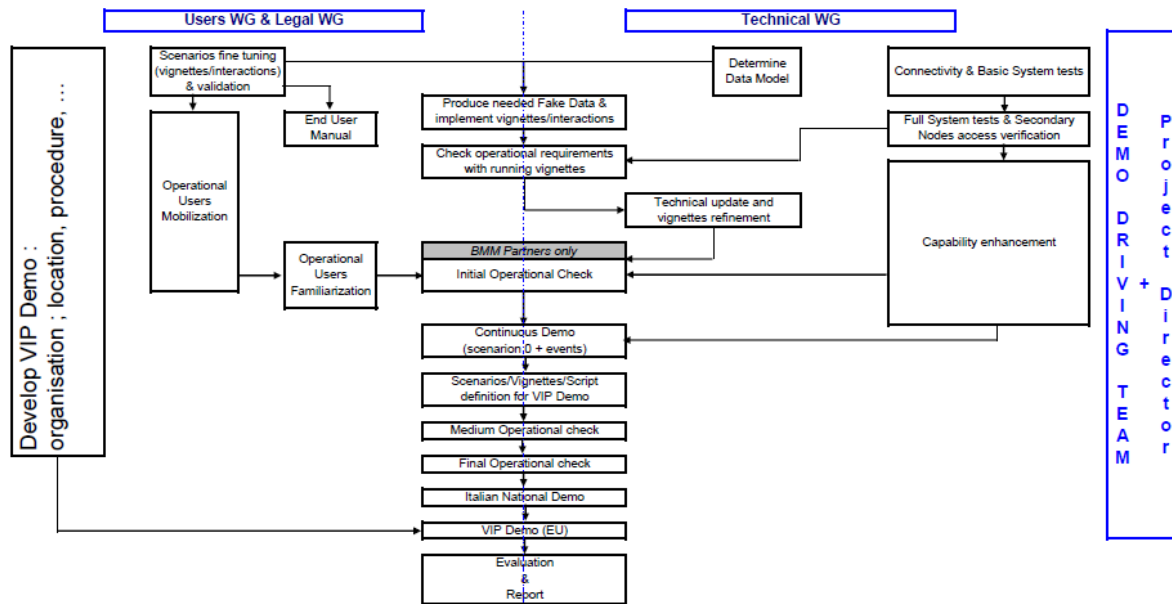
A “third parties” VIP demonstration, dedicated to non EU Member States from Mediterranean countries, belongs equally to the political perspectives of the project, together with the development of the cooperation in matters of integrated maritime policy in the Mediterranean basin. Its principle is settled, though it will be further discussed and fed by the SG.

### 3.2.5 Demonstration diagram and schedule

The BMM experimental demonstration will be implemented in successive steps following the Master plan below.



In particular, the experimental demonstration phase has been divided into a “continuous experimental demonstration phase” and a “VIP Demo” phase, dedicated to the preparation, execution and dissemination of the VIP demo event.



The continuous experimental demonstration phase will be organised in four different steps:

- 1- Operational preparation, dedicated to the connection, familiarisation and fine tuning of the operational nodes interaction with the SBCMP and the BMM common services
- 2- Initial Operational Capability, devoted to the execution and fine tuning of the demonstration scenarios
- 3- Medium Operational Capability, devoted to the selection and optimisation of the VIP demo scenario
- 4- Final Operational Capability, devoted to the execution of the VIP demo scenario and the preparation of the VIP Demo Events.

Please refer to section A.II for the detailed organisation of the experimental demonstration phase.

### 3.2.6 Final report

The final reporting in the framework of the Grant agreement, inter alia consists of:

- collect results and lessons, and evaluate on hand of an indicators battery, analyse what further technical, administrative and legal aspects at national, EU, and international levels are needed to get a complete CISE,
- determine the extent to which this cooperation between the project partners has resulted in added value -qualitative and quantitative- in relation to already existing cross border and cross sectoral cooperation between partners in the selected domains of surveillance activities.

The plan for the final report (draft version), nominating the responsible persons by domain and detailing the persons in charge of collecting and writing, with an imperative schedule, is in Annex 5.

The elaboration of the report shall be terminated on July 15.

# ANNEX I - BMM NETWORK

## **A1.1 GENERAL**

The partners have elaborated the “BMM network Operational Requirements” and the “BMM network Technical Requirements”, to present a solution for the establishment of a European wide integration of maritime surveillance. They have built up a BMM Prototype Network, according to the criteria established in the Users Operational View and associated Technical Requirements, to show not only their resolve but also a feasible technical solution for the exchange of maritime surveillance information.

The construction of the BMM network and its various tests to achieve the availability of an interoperable framework -technical, legal- for networking of in service systems has been realised under national responsibility. Although progress in the enhancing of capabilities will continue in coordination for each node with the support of the industry, the state of play allows to jump in a short future into the experimental demonstration..

According to the specifications developed so far, the future EMSN architecture, resulting from the BMM project activities, shall include three main components:

- The Primary Nodes (PNs), i.e. the SOA-adapted National Systems participating in the BMM information sharing environment through the harmonised exchange of added value services and data, thus feeding the (virtual) Shared Basic Common Maritime Picture. As consideration, SBCMP is not a single real picture residing in one single centralised database but it is the picture resulting from all the tracks that the Primary Nodes have decided to exchange and it is distributed over all the Primary Nodes tracks databases.
- The Secondary Nodes (SNs), i.e. the adapted National Systems participating in the BMM information sharing environment through a web-browser connection to the Primary Nodes web portals or National and European agencies willing to access the (virtual) Shared Basic Common Maritime Picture;
- The BMM Network, i.e. the communication architecture needed to establish a transport mechanism among the Primary and Secondary Nodes, supporting the platform independent exchange of core and common services across the nodes, basic information protection measures, and Quality of Service (QoS) requirements negotiation and enforcement.

The BMM System View document reports the description of the main system components and functionalities applicable to the Primary and Secondary Nodes and to the Network, according to the NATO Architecture Framework (NAF) methodology followed so far in BMM.

## **A1.2 BMM OPERATIONAL NODES**

The Operational Nodes in Blue Mass Med are the agencies that are partners.

A BMM node is defined as an agency or partner which:

- produces (or uploads/downloads) information related to maritime surveillance and is able to make it available to other nodes by publishing it, so that the nodes that are

interested in that information can subscribe.

- consumes information related to maritime surveillance published by other nodes.

Two types of BMM nodes are defined:

- **Primary Nodes:** a Member State node that implements the BMM common interface through adaptation of own legacy systems and can therefore publish BMM common and core services.
- **Secondary Nodes:** a Member State nodes that participate in the BMM information sharing environment through a web-browser connection to the Primary Nodes web portals or National and European agencies willing to access the Shared Basic Common Maritime Picture through a web-browser connection.

BMM is Service Oriented, meaning that no pure data access or data repository is foreseen in the network. No global, remotely accessed situation database is created in the global EMSN architecture. The database will be a local data repository that will collect and store data and information, acquired by its own national legacy system or exchanged via BMM services.

BMM Primary nodes are virtual nodes that host a BMM Application Layer implementing BMM services available for other BMM nodes having the necessary privileges.

Nodes enable the maximum freedom to implement and grant added value services to the BMM community. BMM services can be implemented adapting native services of the existing legacy systems or adding additional service chains to comply with recognised Maritime Community service requirements.

At national level, BMM nodes will be interfaced, by Local Service Bus, gateways, adapters or dedicated peer-to-peer connections, to available National systems in order to exchange maritime data and information.

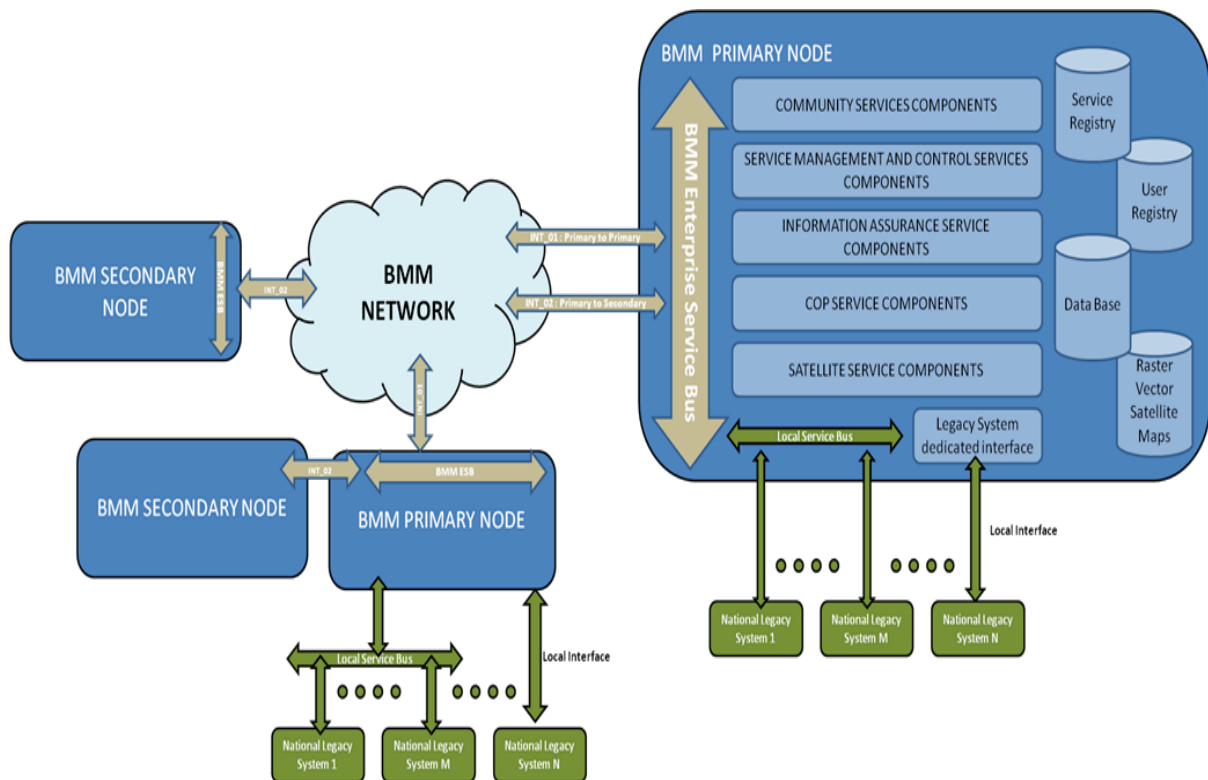
In an architectural perspective, the Primary Nodes will be seen as National Systems adapted so as to:

- feed the SBCMP implementing the BMM common and core services
- provide access to the SBCMP for the Secondary Nodes through dedicated web-portals

At the time of the experimental demonstration phase start, the BMM XMSN Demonstrator consists of the following Primary Nodes:

1. Italian Interagency Primary Node
2. French Interagency Primary Node
3. Spanish Navy Primary Node
4. Spanish Guardia Civil Primary Node
5. Portuguese Marinha & Guarda Nacional Republicana Primary Node

The BMM XMSN comprises the Secondary Nodes that are connected either to their respective national Primary Nodes through a Local Area Network or directly to other (foreign) Primary Nodes through the public internet.



### A1.3 BMM NETWORK

The BMM Network has been designed to support flexible sharing, integration and exploitation of heterogeneous Maritime Surveillance Data by Competent Authorities.

The BMM Networking Architecture is an open, flexible network based on a net-centric and decentralised approach: no central controlling entity, but a distributed virtual BMM centre over each node.

The basic implementation choice for this kind of network is generally recognised to be the creation of a Wide Area Network (WAN) connection over the TCP/IP public network, with the proper information protection mechanisms to ensure a secure, transparent and guaranteed end-to-end transport layer among the network nodes.

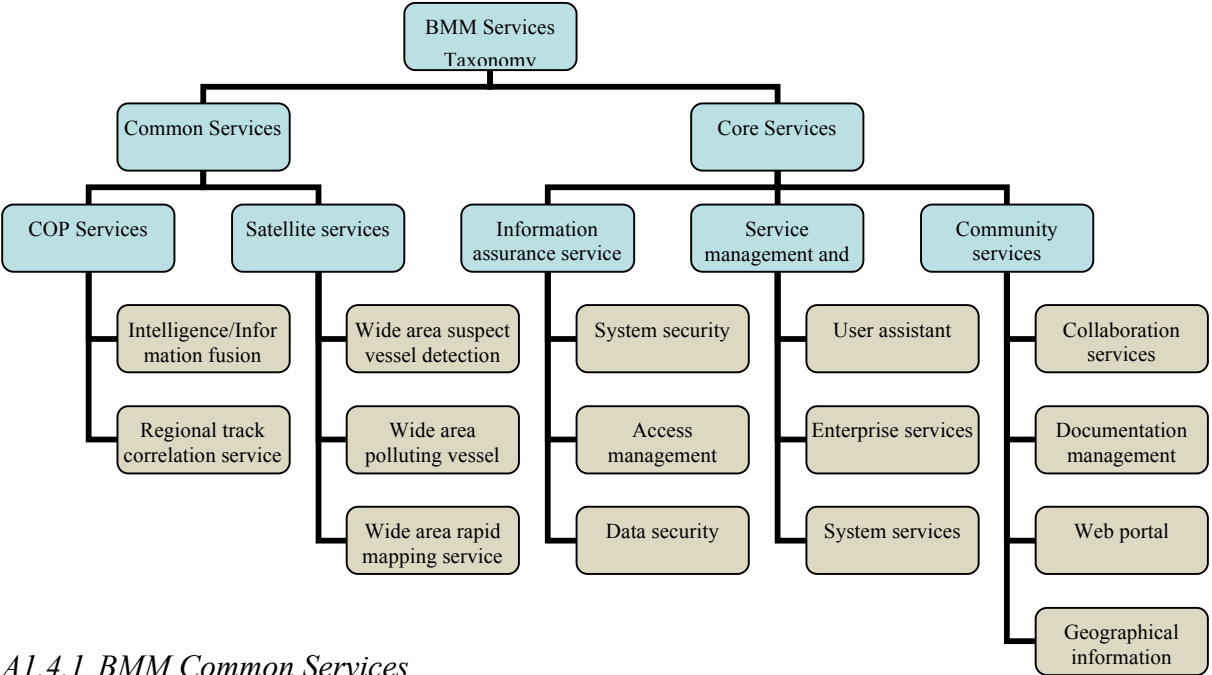
The BMM XMSN Network shall be a broadband TCP/IP network implemented through https/ssl protocol over the Public Internet.

Unclassified data (basic and non-basic as well as sensitive and non sensitive) will be exchanged using the XMSN.

### A1.4 BMM HARMONISED SERVICES

The BMM Network is based on a Service-Oriented-Architecture (SOA), assuring cooperative nodes to share information accessing services providing added value information for the enhancement of the Maritime Situational Awareness.

The following service taxonomy has been defined: BMM Common Operating Picture, BMM Satellite, BMM Information Assurance, BMM Service Management and Control, and BMM Community services.



1.4.1 BMM Common Services

BMM Common Services are the Operational Services enhancing the awareness and decision support capability of each connecting node and complying with the basic User requirements to provide operations on the SBCMP and other added value functions specified by the User Requirements.

The purpose of the common services is to provide a SBCMP and added value services for its exploitation, in order to understand the operational domain in terms of services supporting operational activities.

The established BMM Common Services relate to the following categories:

- COP Services:
  - Intelligence / Information Fusion Service
  - Regional Track Correlation Service
  
- Satellite Services:
  - Wide Area Suspect Vessel Detection Service
  - Wide Area Polluting Vessel Detection Service
  - Wide Area Rapid Mapping Service

1.4.2 BMM Common Services Definition

Intelligence / Information Fusion service

The IIF service provides basic and/or detailed information associated to a given track, identified by its MMSI/IMO number to a requesting node; it provides capability to issue a similar request to another node; and continuous collection and association/integration of information on the local node to establish relationships between heterogeneous data, thanks to semantic detection services and semantic reasoning processes (abnormal behaviour detection, specific event detection, scenario detection, collective action detection).

### Regional Track Correlation service

This service provides basic and/or detailed information associated to a given track, identified at least by its position and time to a requesting node. The association is based on kinematic data and if available on identity and voyage data and is providing an assessment of its performance, through a confidence level. Association techniques used will range from statistical correlation (when time difference is limited between local data and request information) to advanced reasoning processes. Moreover it provides basic and/or detailed track information associated to a given area, identified by its position and time window to a requesting node. The provided information is based upon the SBCMP manager; and the capability to issue similar requests to another node; SBCMP management through the continuous collection and association/integration of information on the local node to establish and maintain the local COP, and then through data exchange with the other BMM nodes, establish and maintain the SBCMP. This activity will perform automated data correlation and association/integration through statistical-based and high level reasoning techniques. In addition, the activity will ensure the track management with the other BMM nodes, thus ensuring that no duplicate tracks exist in the SBCMP and identifying potential conflicts.

### Wide Area Suspect Vessel Detection Service

Naval maritime traffic analysis by satellite is used to collect information on the position, dimensions of the ships detected and their direction and speed (where the wake is visible), on their time of passage through a given area and, by interpolating between successive observations, on the routes used to cross territorial waters.

Ships identification is possible only by incorporating the signals that must be by law transmitted by all sea-going vessels of a size exceeding a certain threshold or performing certain activities on the sea, as set in dedicated regulations. In case of illicit activities at sea, integrated ship detection service allows to identify and investigate on potential offenders.

During the BlueMassMed Demonstration, the Wide Area Suspect Vessel Detection Services exploit the integration of ship detection report obtained through the analysis of SAR (Synthetic Aperture Radar) satellite data and available identification systems datasets.

SAR satellites allow the detection of both cooperative and non-cooperative vessels, independently on the cloud coverage and the daytime.

### Wide Area Polluting Vessel Detection Service

Satellite observations of marine oil slicks allow to detect oil spots position, dimension and run forecasting models for oil drifting to help authorities in recovery actions and estimate relevant risks and damages to the environment.

The state of the art of the operational satellite based oil spill detection techniques is entirely developed through the SAR (Synthetic Aperture RADAR) satellites data source. Thanks to the presently in orbit SAR satellites, it is possible to detect oil slicks of different dimensions and shapes.

Oil substances form visco-elastic films on the marine surface reducing the backscatter due to sea surface roughness generated by the wind. This phenomenon smoothes the sea gravity-capillary waves and can be detected by SAR satellites operating with microwaves, as the oil film appears as a dark spot on the image.

In order to monitor the sea waters in NRT (Near Real Time), that means in up to 30 minutes from the satellite pass, it is necessary to process satellite data acquired by a ground receiving station which coverage mask includes the area to be monitored.

This new generation SAR satellites allow a strong improvement in terms of revisit time and resolution, so that the current operational applications are performed on a periodical pre-defined data procurement plan.

Vessel detection associated to data analyzed for oil pollution detection supports the end-Users in potentially identify offenders. The same image is processed to detect vessels which are close to the oil spot at the satellite acquisition time. By integrating also identification data coming from the ground based systems (AIS, VMS, LRIT, etc, as made available by the competent authorities) it is also possible to backtrack vessels and compare their route with respect to the oil shape and location.

#### Wide Area Rapid Mapping Service

A rapid and effective access to satellite data is vital in order to ensure effectiveness to EO based information during an emergency, where timeliness is the first goal. Moreover, the capacity to adapt the delivery mechanism to a wide range of user's schemas enlarges the product usability. Finally, the rush access to both raster and vector reference databases are crucial when basic information is needed in a very short time frame.

The end-Users require the service through the BMM Service Requesting Node, indicating the area of interest, the kind of data to be acquired and the products needed in support to the competent authorities.

#### 11.4.3 BMM Core Services

BMM Core Services are the System Services providing the core functions for the proper operation of the BMM network as well as the auxiliary functions for the connectivity, management, etc., and complying with the basic User requirements to provide a SBCMP and the additional User requirements to provide auxiliary connectivity functions.

The purpose of the core services is to provide essential services for assuring the correct operation of the BMM network and good connectivity and flexibility of cooperation among the connected nodes.

The following services are part of BMM Core Services:

- Information Assurance Services:
  - System Security
  - Access Management
  - Data Security
- Service Management and Control Services:
  - User Assistance
  - Enterprise Services
  - System Services
- Community Services :
  - Collaboration Services
  - Document Management
  - Web Portal
  - Geographic Information System Service



#### 1.4.4 BMM Core Services Definition

##### Access Management

This service provides operations to manage a LDAP Directory Service for both Spanish Navy Primary Node Prototype Services and other BMM Primary Nodes user's management.

##### Enterprise Service (Service Registry Publish)

This service provides the capability to publish a webservice into the web service Registry UDDI of any other BMM Primary Nodes.

##### Web Portal

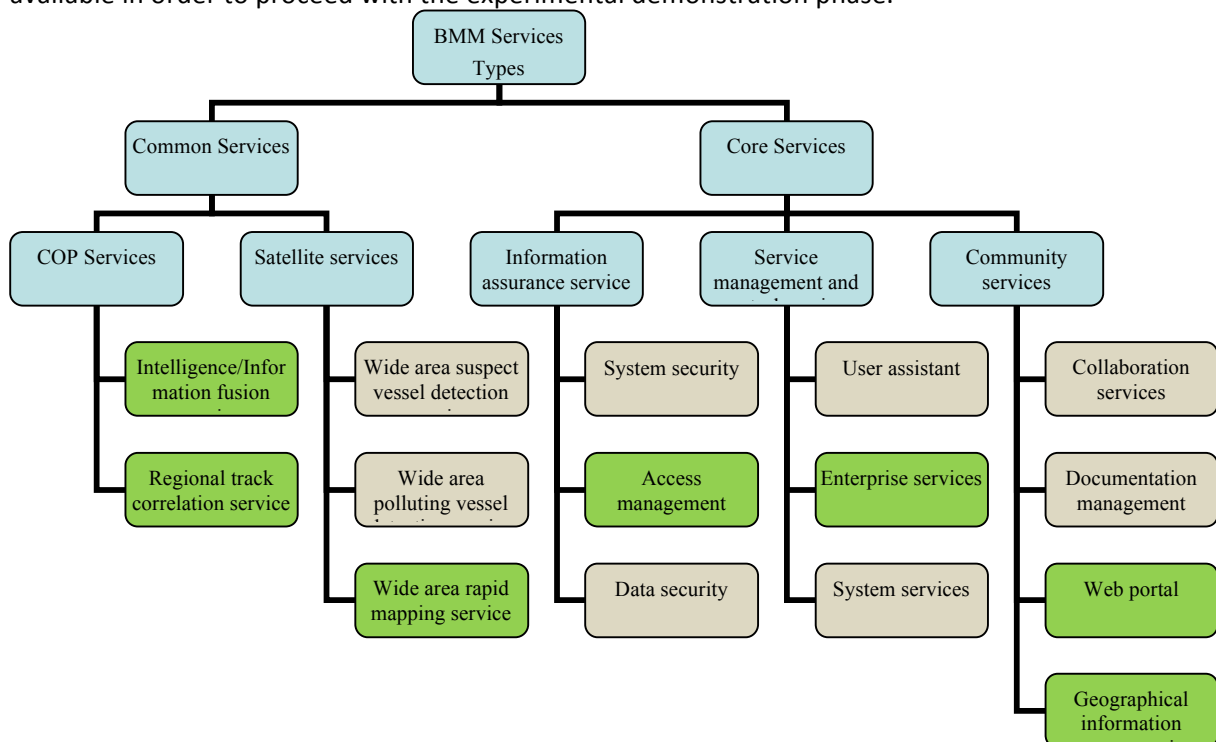
This service provides functionalities to allow BMM Users to access the (virtual) Shared Basic Common Maritime Picture using a web browser and to the collaborative tools.

##### Geographic Information System Service (WMS / WFS)

This service allows other BMM Primary Nodes to access to the WMS service.

#### 1.4.5 BMM Services Demonstration

The following table shows the minimum set of services that all the Primary Nodes need to make available in order to proceed with the experimental demonstration phase.



✓ COP Services:

- Intelligence / Information Fusion Service (in the XMSN the service is limited to Data Augmentation Services for management of alerts, events on tracks, ship information reports and geospatial information linking to tracks)
- Regional Track Correlation Service (see the SBCMP procedure implementation in next section)

- ✓ Satellite Services:
  - Wide Area Rapid Mapping Service
  
- ✓ Information Assurance Services:
  - Federated LDAP directory
  - Secure Service Level Access Management
  
- ✓ Service Management and Control Services :
  - Federated UDDI service registry
  - Service Level User Profilation
  
- ✓ Community Services :
  - Web Portal
  - Geographic Information System Service
  - Federated Chat
  - Data Injection Portlet

### ***A1.5 PROCEDURE FOR THE ESTABLISHMENT OF THE SBCMP***

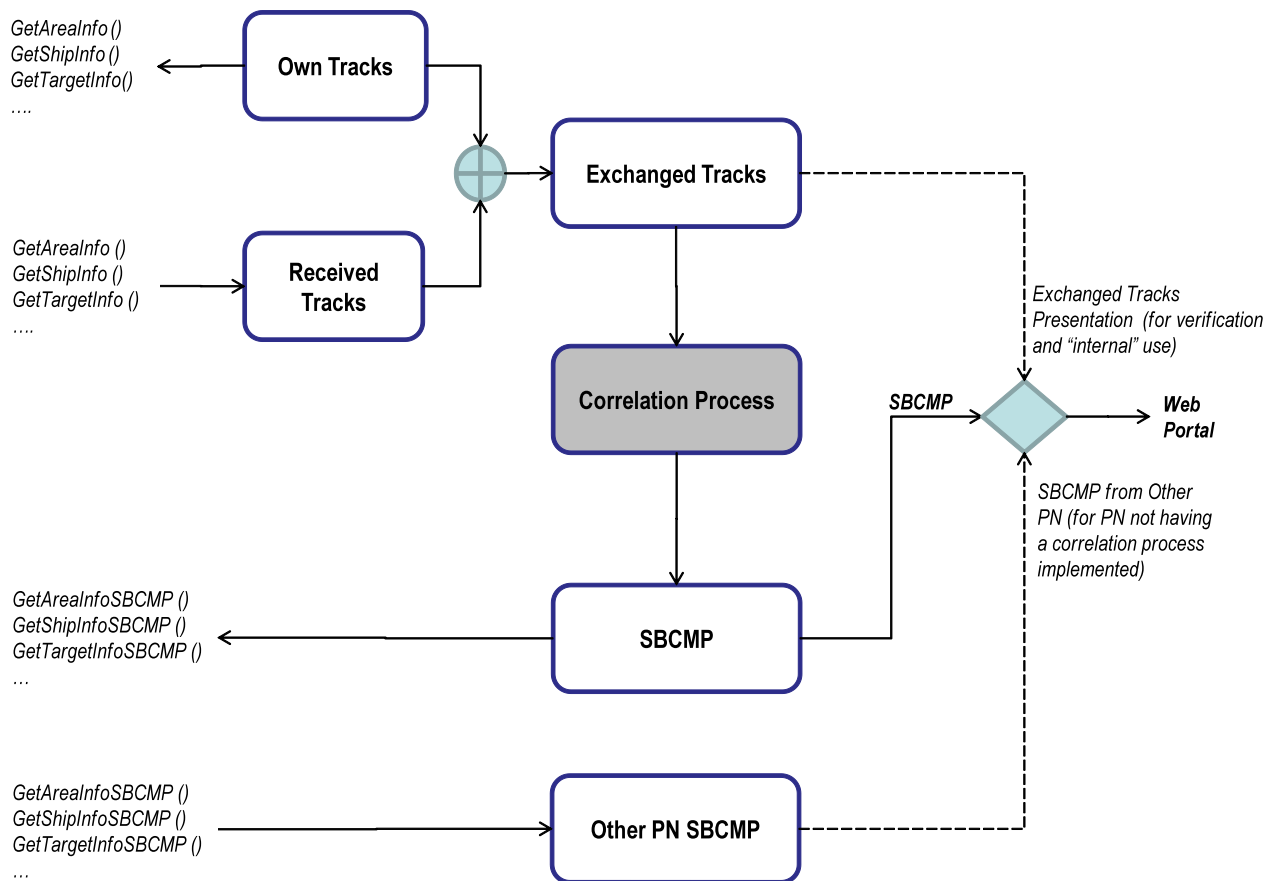
A Shared Basic Common Maritime Picture (SBCMP) is a single identical display of relevant maritime information shared by the nodes involved in BMM. A SBCMP facilitates collaborative planning and assists all echelons to achieve situational awareness.

SBCMP is part of the Web Portal developed by the nodes to provide BMM users a secure and user-friendly Web Based front-end application, which enables them dynamically and interactively access to wide range information and application services provided within BMM Network.

The Geographic Information System (GIS) Service provides support for accessing and exploiting digital geographic information, within BMM Network, in terms of GIS Application (including the use of web technologies), geo-database, and geo-catalogue.

### **SBCMP Building Principles**

Primary Nodes in the BMM network, participating to the establishment of the SBCMP, shall implement the basic procedure depicted in Fig. 1 and shall respect the following implementation requirements.



The following principles are the base for the development of a common picture, where track's information is managed by all nodes according to the same rules:

1. Tracks received by a PN from its back-end shall be promoted to the status of “**SBCMP tracks**” through conversion to the BMM Data Model as defined in the SV.
2. Tracks promoted to the SBCMP shall have:
  - a. an unique SBCMP identifier of the form *PN\_nnnn (IT\_000001, PT\_000001, SPA\_000001, SPG\_000001, etc.) (field 1\_Track\_Number\_or\_label)*
  - b. a time stamp with the time of validity of the last measurement or of the last PN specific processing (field 3\_Time GMT)
  - c. a track origin indicator marked as:
    - i. field 7\_Track Source (ordered by increasing nominal accuracy)  
(0-Unknown, 1-Other ShipRep, 2-AIS, 3- LRIT 4-SAR, 5-Radar, 6-Intel, 7- Visual)
    - ii. field 8\_Data Provider  
(0 – Scenario Fake Track, 1-999 Agency Code TBD by UWG)

d. a data classification level:

i. field *XX\_Data Sensitivity Level*

(0 – Basic, 1 –9 Sensitivity Level 1..9 TBC)

*Note: as a simplification for the XMSN implementation it shall be assumed that the Data Classification level assigned to each single track shall apply to all the “non-basic” data fields contained in the track (according to the BMM OV)*

e. a track data nature:

i. field *XX\_Simulated Object*

(0 – Real Object, 1 – Simulated)

f. a confidence indicator:

i. field *XX\_Confidence Type*

*(according to User Requirements)*

1 = very high confidence, verified data,

2 = high confidence (cooperative / non cooperative correlation),

3 = confident (non coop / non coop correlation or coop/coop correlation)

4 = low confidence (unsure source of verification, low confidence correlation)

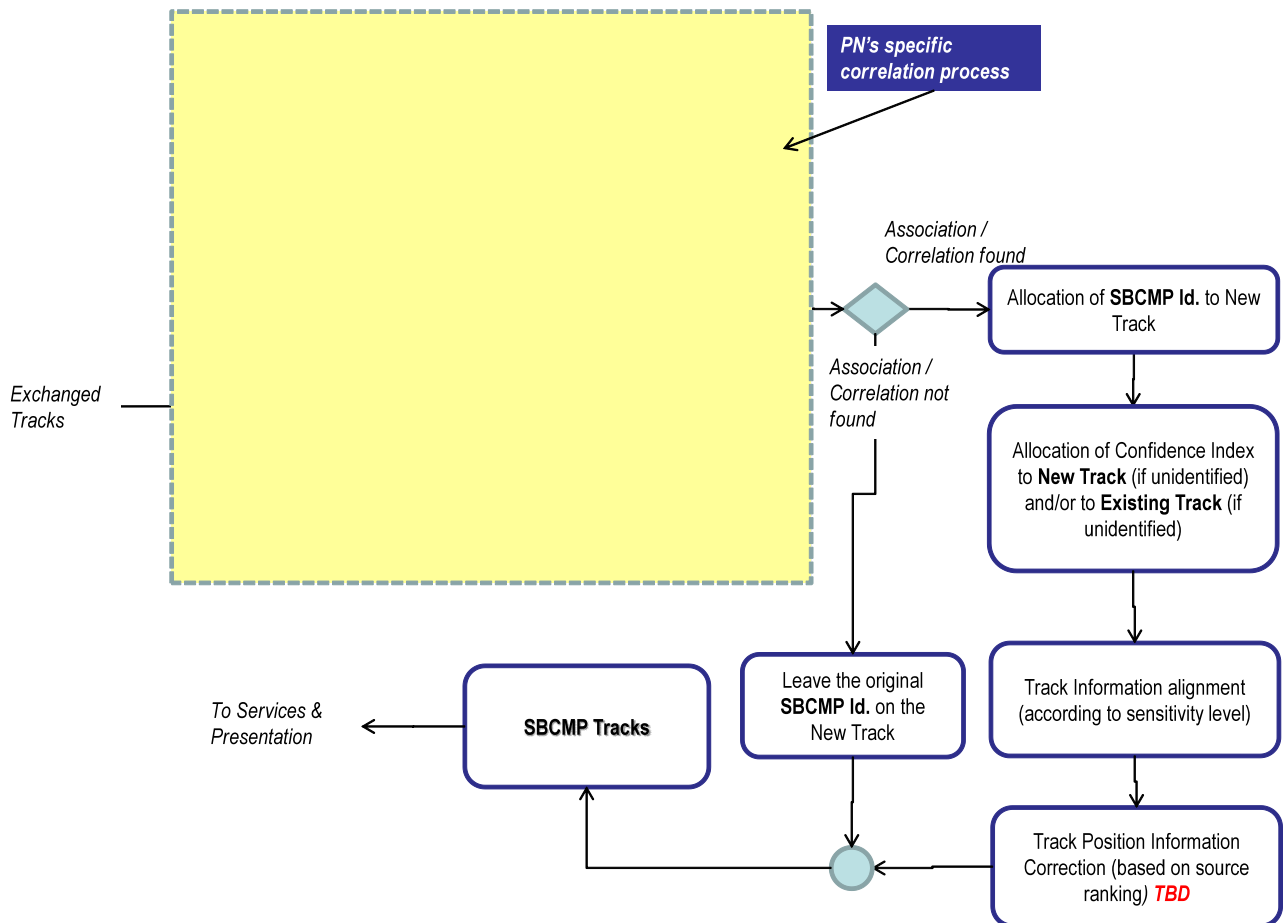
5 = very low confidence (no verification, co-operative target TBC)

3. Tracks generated by each PN (tracks with identifier NN=Own PN) are sent to the other PNs through the defined common services *GetAreaInfo()*, *GetShipInfo()*, *GetTargetInfo()*, etc..

4. Tracks generated by other PN (tracks with identifier NN not= Own PN) are received by each PN through the defined common services *GetAreaInfo()*, *GetShipInfo()*, *GetTargetInfo()*, etc..

## **CORRELATION PROCESS**

The Basic Correlation Process Scheme is reported in the Fig. 2 below.



1. All exchanged tracks are processed at regular intervals, variables according to the operational needs (e.g. from 1 to 10 min) by each PN in order to establish the potential association/ correlation and solve conflicts in areas of overlapping
2. For any group of tracks having the same SBCMP identifier, only one correlation processing shall be performed using the track with the most recent time of validity.

Such correlation processing shall include performing association/correlation tests w.r.t. all the other tracks having a different SBCMP identifier and a position, reported at the same time of validity of the processed track, falling within an area of radius  $R_{min}$  from the processed track.

3. Tracks that are not associated nor correlated (based on space-time and/or basic\_Id criteria) are only processed by time normalisation for visualisation purposes, and are not modified throughout the Correlation process and keep their original identifier.
4. Tracks showing association of *Basic\_Id* parameters and/or time-space correlation of relevant positional data and/or motion parameters beyond a defined threshold, shall be processed according to the following steps:
  - The SBCMP identifier of the track with the older validity time shall be assigned to all correlated/associated tracks
  - All data fields that are void in one track (except positional data) shall be updated with data fields present in the associated/correlated tracks having lower

classification level; in case of conflicts among these data fields, the one present in the track with higher Track Confidence shall be used and a “Data Conflict” Alert shall be raised on the track.

- The positional data missing in each of the tracks (if any) is updated using the known positional data of the associated / correlated tracks (regardless classification level)
- In case the times of validity of the correlated / associated tracks are closer than 30 seconds, the positional data and time of validity of all those tracks shall be aligned using the positional data and time of validity of the track with higher *track\_source* indicator, and in case of ambiguity, the most recent time of validity
- The confidence indicator of the associated /correlated tracks is modified according to the following rules:

Confidence before correlation	Confidence after association with a very high confidence track	Confidence after association/correlation with a track from an alternate source (cooperative / non cooperative)	Confidence after association/correlation with a track from the same source (cooperative / non cooperative)
1	1	1	1
2	1	2	2
3	1	2	3
4	1	2	3
5	1	4	4

#### DISTRIBUTION OF SBCMP TRACKS

1. SBCMP tracks are distributed through a dedicated WS (SBCMP\_tracks\_exchange) including the two dedicated methods GetAreaInfo\_SBCMP() and GetShipInfo\_SBCMP().
2. The Basic data, accessible to all Users, are designated by the *classification\_level=0*. Access to tracks with sensitivity level>0 shall be allowed through the associated Service Authorisation logic (DDP filtering).
3. The SBCMP tracks (basic + sensitivity levels) are presented on the web portal / webgis with a multi-layer structure for use by authorised secondary nodes.

#### A1.6 COMMON SERVICES DEFINITION

For the up to date definition of common service please refer to the updated System View Document reflecting the technical baseline of CS definition after integration and testing among PNs.

## **A1.7 OPERATIONAL INTERFACES DEFINITION**

The operational interface for Users of the BMM network will be made of either:

- 1- a machine to machine web service interface translating actions and data on a User's own legacy system into the BMM network frontend node (Primary Node back end interface)
- 2- a human to machine web browser interface allowing direct interaction on the network and visibility of the SBCMP to Users not having legacy systems adapted and connected to the BMM front-end

While the first interface does not entail End User connectivity and familiarisation because these issues are solved automatically at m2m level by the web service approach (the user continues interacting with his legacy system as before BMM), the second interface requires the End Users to connect to a BMM web portal hosted by a Primary Node, and to understand the main operational functionalities of such portal in order to bring or take information to/from the BMM network.

Because most of the End User operational nodes will be interfaced to the BMM network through the second, web portal interface, it is absolutely necessary that the different portals developed by the established PNs are accompanied by a prompt End-User handbook explaining the principal operations and functions available to the connected Users. These aspects will be overlooked in section A2.

## **ANNEX II      EXPERIMENTAL DEMONSTRATION**

### **A2.1      TECHNICAL PREPARATION**

#### **Primary Nodes Readiness**

In order to allow the launch of the experimental demonstration, the established Primary Nodes shall have fully tested and validated:

- Web portals with web gis and basic functions for federated users and services management
- Full Users credentials profiling
- Track Data & Information Exchange common services
- SBCMP procedure and services implementation (at least in a first release)
- Federated chat tool allowing selective notifications exchange
- Data Injection portlet allowing manual insertion of tracks, fake tracks, events and track attributes or url to related contents
- Wide Area Mapping Service
- Data Augmentation Services (at least for track attributes, events, alerts and additional contents on track)

Full SBCMP and user/service authorization scheme shall be implemented by the medium/final operational capability phase.

The Demo Coordinator shall check together with the TWG leader the readiness of Primary Nodes and will establish if the conditions to start the experimental demonstration are met (at least two or three PN should be connected and operational in order to have a significant SBCMP).

Primary Nodes Technical Managers shall be responsible of the overall status of readiness of the respective PNs. All PNs are expected to be ready with different levels of readiness by April 16<sup>th</sup>.

#### **Operational Nodes access verification**

The Operational Nodes shall be connected to the BMM network:

- Either through an end-to-end adaptation of existing systems to the BMM front-end
- or through an internet browser connection to a web portal offered by one of the BMM PN

Currently the following Operational Nodes shall be checked for access to the network in one and/or the other way.



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BMM Network connected Nodes

<b>MS</b>	<b>Partner</b>	<b>Location</b>	<b>Description</b>
<b>FR</b>	<b>PN Defence (Navy)</b>	Toulon	Ministry of Defence, Navy
	<b>SN Defence</b>	Brest	Ministry of Defence, Navy
	<b>SN Marit Gendarm</b>	Toulon	Ministry of Defence, Gendarmerie
	<b>SN Inter-ministerial</b>	Paris	Interministerial
	<b>SN Customs</b>	Paris	Customs
	<b>SN Customs</b>	Marseille	Customs
	<b>SN Interior</b>	Rennes	Interior
	<b>SN CNES</b>	Toulouse	CNES
	<b>SN Maritime Affairs</b>	La Garde	Maritime Affairs
<b>GR</b>	Coast Guard	Piraeus	CoastGuard
<b>IT</b>	<b>PN Inter-ministerial</b>	Roma	Interministerial
	<b>SN Immigration</b>	Roma	Ministry of Interior
	<b>SN Drug</b>	Roma	Ministry of Interior
	<b>SN Finance</b>	Roma	Guardia di Finanza
	<b>SN Customs</b>	Roma	Customs
	<b>SN Defence</b>	Roma	Navy
	<b>SN Transport</b>	Roma	Ministry of Transport
	<b>SN Coast Guard</b>	Roma	CoastGuard
	<b>SN Environment</b>	Roma	Ministry of Environment

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<b>MT</b>	SN Defence	Valetta	Ministry of Defence
<b>SP</b>	<b>PN Defence</b>	Cartagena	Navy
	<b>SN SASEMAR</b>	Madrid	Maritime Affairs, Sasemar
	<b>SN DAVA</b>	Madrid	Customs
	<b>SN SEGEPESCA</b>	Madrid	Fisheries
	<b>PN Interior</b>	Madrid	Ministry of Interior (Guardia Civil)
<b>PT</b>	<b>PN Defence</b>	Lisboa	Navy
	<b>Interior</b>	Lisboa	Ministry of Interior (Guardia Nacional Republicana)
	<b>SN IPTM</b>		Maritime Affairs
	<b>SN FAP</b>		Air Force
	<b>SN SEF</b>		Border Police
	<b>SN DGAEIC</b>		Customs
	<b>SN ASAE</b>		Customs
	<b>SN PJ</b>		Criminal Police
	<b>SN SSI</b>		Internal Security
	<b>SN EMAM</b>	Lisboa	Interministerial

For each operational node, a technical reference person has been established who shall be responsible of:

- setting up an internet connection of at least 2 Mb/s and a suitable workstation with a web browser
- getting user credentials from the PN Technical Manager of the respective national PN
- accessing the web portal and execute / coordinate the training and experimental sessions according to the content of the subsequent sections.

The full connection of all the Operational Nodes is expected not later than April 18.

### **Experimental Demo Reporting**

The following technical facility shall be put in place in order to ensure a proper reporting of the experimental demonstration sessions:

- A “scenario master” workstation able to reproduce the evolution of the scenarios events and injections, in order to give the reference time and “behind the stage” orders to all participating nodes
- An auxiliary “super-user” access to all web portals with credentials to get significant screenshots of the established SBCMP (approx. 2-3 per day) as well as the log of the exchanged services and notifications
- A database to store the results of validation questionnaires compiled by users involved in the experimental demonstration trials

This technical facility shall be put in place and exploited by the “experimental demonstration expert” recruited to support the Demo Coordinator in the execution and supervision of the experimental demonstration phase.

## **A2.2 OPERATIONAL PREPARATION**

### **Scenarios fine tuning and validation**

The experimental demonstration will be based on realistic scenarios, one “day to day life” (Sc zero, utilised during the continuous experimental demonstration period identified –see master plan) and 3 simulated events to provide opportunities enough to test all the services.

Those Main events at sea will be run on top of the actual Shared Basic Common Maritime Picture.

These Main events will develop either simultaneously or consequently (depending on the cases) to conform the overall scenario.

Each of the Main Events (Vignettes) has an associated “list of injections” including the details of all the Data and Services to be exchanged (Date and time, data or service requested, consumer/requesting partner, producer/providing partner).

Each primary and secondary nodes will have the complete “list of injections” for the selected scenarios.

The list of data and services to be exchanged has been elaborated taking into account the limitations imposed to the different PNs according to the achieved level of integration of the SBCMP procedure and Common Services.

The scenario (SBCMP plus the “Main Events” and the associated “Lists of Injections”) comply with the following conditions:

- related to all the activities envisaged within the responsibility of the different partners.
- involving all the Primary Nodes, and the Secondary ones as much as possible.
- providing room enough to test the BMM Common Services implemented in the XMSN (from the Specifications Document) and also the Information Exchange Requirements (from the BMM Operational View 2.0).

Nevertheless, the list of injections is to be considered as the minimum to be exchanged during the demonstration.

Any opportunity to check the system against real world situations should be seized. In particular, during the experimental demonstration phase, the opportunity of involving real assets made available by participating agencies to simulate the actual presence at sea of the “target ships” shall be investigated, in order to allow a better validation of the added value provided by the SBCMP and BMM services.

The final version of the selected scenarios are given in annex IV, including:

- the storyboard description of the three selected scenarios
- the general injections list for the three scenarios
- the simulated events list for the three scenarios

Implementation of vignettes interaction will then be realised, allowing the checking of operational requirements with the running vignettes, followed by the necessary technical update and refinement of vignettes.

The selection and writing of the vignette to be the red thread of the VIP demonstrations shall result from the experimental demonstration phase.

### **End User (PN-SN) handbook**

A complete handbook for the experimental demonstration shall be provided to each Operational Node involved in the experimental demonstration. Such handbook (end users manual) will be composed of the following documents:

- 1- the present Demo Executive Plan with his annexes
- 2- the user manual of the Web Portal that the Operational Node will be expected to use during the experimental demonstration (to be prepared by PN Technical Managers)
- 3- the detailed injections list for that specific Operational Node and for all the scenarios (as taken from the general injections list reported in Annex IV)
- 4- the detailed event list for that specific Operational Node and for all the scenarios (as taken from the general event list reported in Annex IV)
- 5- the detailed list of reactions requested (questionnaire for reporting, as taken from the general requested reactions list reported in Annex III)

It will be completed and distributed under the supervision of the DDT.

## A2.3 EXPERIMENTAL DEMONSTRATION CONDUCT

The experimental demonstration phase is a critical part directly influencing the success of BlueMassMed pilot.

It will not only demonstrate that BMM partners will be able to exchange basic and sensitive data, but also that, exploiting the implemented BMM core and common services they will be able to improve the Maritime Situational Awareness enriching the information collected from their national back-end systems with the added value information shared at BMM level.

This approach has to be carefully taken into account when preparing the strategy for the experimental demonstration conduct.

In particular, the following aspects have to be stressed during the preparation of the experimental demonstration phases:

- **Familiarization of National Agencies Operators** with the BMM environment, in order to permit them to act an active role during the running of demonstration scenarios.
- **Implementation of BMM added value capabilities**, which will ensure the requested improvements with reference to performances of systems currently operating at national and sectorial level.
- **Identification of selling points in demonstration scenarios**, which will be tested during the experimental demonstration trials and which the final demo event will be focussed on.
- **Implementation of a scenarios management environment**, which will, firstly, ensure the simulation of fakes tracks, events and those data required by demonstration scenarios and which will, secondly, allow an effective assessment of the BMM network behaviour in response to the running scenarios.

The proposed approach for the experimental demonstration conduct reflects the necessity to assess the maturity of the above aspects within the implemented BMM node.

Accordingly, experimental demonstration trials will be structured in four different phases:

- **Operational familiarization:** The national members of the TECH and OPS networks will be responsible for training the End Users Operators in their respective fields (technical/procedure). At the end of this phase all personal involved in the coming experimental demonstration are ready to efficiently interact with the BMM network.
- **Initial Operational Capability (Scenario 0 and events):** an open period (as long as possible with respect with the global experimental demonstration time period) where successive experimental demonstrations slots will be organised and dedicated to specific purposes. This phase will be focussed to assess the readiness of End Users Operators, to perform minor refinements of scenarios and to check operational requirements with running scenarios. At the end of this phase scenarios are tuned and selling points are identified.
- **Medium operational capability:** running of VIP demo vignettes for internal assessment. During this phase, only VIP Demo vignettes will be played to analyse main achievements of the experimental demonstration with reference to the established validation criteria.
- **Final operational capability:** running of VIP demo vignettes for VIP Demo preparation and training for VIP Day.
- **Preparation for VIP Demo:** installation, setting-up, integration and test of VIP Demo environment and VIP Demo dry run.

The following sections provide detailed objectives and expected calendar for each of the above experimental demonstration phases.

## **Operational familiarization**

During the **operational familiarization phase** the following actions shall be completed and reported by each National Reference Point:

- 1 Connect all available Agencies and Operational Nodes to the BMM network through the Web Portal of at least one Primary Node,
- 2 Identify technical and operational reference persons for each operational node
- 3 Perform User profiling for all available Users
- 4 Perform End-Users Training concerning the basic access and exploitation of the BMM web portals (SBCMP analysis, Common Services requests, Data Injection & Notification Tools)
- 5 Familiarization with the end-user role within the foreseen scenarios, and preparation of the envisaged injections / notifications at each User ops room

The operational familiarization phase shall be considered closed for any operational node when:

- the Node is connected to at least one Web Portal, with a valid and profiled account
- a Technical and an operational reference persons are defined for the Node
- the Technical and operational persons for that node are familiar with the use of the Web Portal (SBCMP analysis, Common Services requests, Data Injection & Notification Tools)
- the injections / notifications lists concerning that Node are ready to be played

### *Calendar:*

The Operational familiarisation phase shall be performed in the period April 2<sup>nd</sup> – 20<sup>th</sup>.

## **Initial Operational Capability (Scenario 0 and events)**

The initial operational capability phase will be organized as follows:

### **A – Scenario 0**

- 1 A permanent SBCMP will be established and maintained with progressively evolving features (more PN contributing, sensitivity levels, ddp filtering, correlation in overlapping areas, etc.)
- 2 As many agencies as possible will be connected to the network and asked to provide operational feedback on the SBCMP through the federated chat and data injection tools
- 3 Operational and technical feedback will be analysed and reported, wrt the main “validation criteria” pertaining to the SBCMP:
  - a. Show “cooperative + non cooperative” track information exchange among National Systems
  - b. Show regional correlation in overlapping areas (increased awareness)

### **B – Events**

- 1 Responsible PNs will playback scenarios events (selected according to availability of technical tools)
- 2 Involved End-User Operators will interact with the scenarios according to the injections lists and the available technical tools & services
- 3 End-User feedback will be collected through validation questionnaires linked to the played events

- 4 Operational and technical feedback will be analysed and reported, wrt the main “validation criteria” pertaining to the BMM Services:
  - a. Show that operational scenarios are significant for the involved Users
  - b. Show that the SBCMP, Common Services and Collaborative Tools implemented are supporting the Users in the execution of their operational missions

**Calendar:**

The continuous experimental demonstration will start the 16<sup>th</sup> of April.

**Week 16** (16 -18 April): Scenario 0

- SBCMP will be updated each 10 minutes continuously by all available PN.
- Federated chat will be always up
- Operational Users shall inform the DDT about their planned log-in within the end of each day. Each session will be maximum XXX minutes in order to avoid overloading the network.

**Week 16-17** (19 –20, 23-26 April): Events

- SBCMP will be updated each 10 minutes continuously by all available PN
- Federated chat will be always up
- Data Injection tools will be always up
- PN will run Scenarios 3,4,5 according to the following timeline:
  - April 19-20: Scenario 5 reported on two days
  - April 23-24: Scenario 3 reported on two days
  - April 25-26: Scenario 4 reported on two days
  - April 27: Scenarios 3,4 5 reported on three hours each
- Operational Users shall log-in and provide the expected injections at the planned time according to the scenario execution plans (annex IV).
- Collected feedback will be analysed according to validation requirements at the end of each two-days session

**Medium operational capability**

The Medium operational capability phase will be organized as follows:

- 1 The SBCMP will be established and maintained with full features (all PN contributing, sensitivity levels management, ddp filtering, correlation in overlapping areas)
- 2 Wide Area Mapping and Data Augmentation Services will be available
- 3 Responsible PNs will playback different mix of scenarios 3,4,5 in order to establish the best VIP demo vignette
- 4 Involved End-User Operators will interact with the scenarios according to the injections lists and the available technical tools & services
- 5 End-User feedback will be collected through validation questionnaires linked to the played events
- 6 Lesson learnt will be analysed in order to prepare for the VIP day and refine the scenarios for the VIP demo

### *Calendar:*

The Medium operational capability will start the 30<sup>th</sup> of April.

#### **Week 18 (30 April -04 May):**

- Intermediate BMM demonstrations
- scenarios refinement

#### **Week 19 (7 – 11 May):**

- SBCMP will be updated each 10 minutes continuously by all available PN
- Federated chat, Data Injection tools will be always up
- Wide Area Mapping and Data Augmentation services will be available
- May 7 – May 9: PN will run each day a different mix of Scenarios 3,4,5 reported on three hours
- Operational Users shall log-in and provide the expected injections at the planned time according to the scenario execution plans (annex I).
- May 10 - 11: Analysis of lessons learnt and definition of VIP demo final scenario

After the end of the Medium Operational capability phase, an assessment of the capabilities will be performed by each Nation with the respective Operational Nodes and Primary Nodes (14-18 May).

#### **Final operational capability & Preparation for VIP Demo**

The Final operational experimental demonstration phase will be performed in the week 21<sup>th</sup> – 25<sup>th</sup> May and will be organised as follows:

May 21 - Identification and test of scenarios selling points

May 22 – 25:

- i. Recording and enhancement of VIP demo vignettes selling points
- ii. End-Users Training on VIP Demo scenario

May 28 – June 1<sup>st</sup> : Preparation of VIP Demo in Bruxelles

The detailed timing of each experimental demonstration session will result from the above calendar integrated with:

- The final execution plan of the selected scenarios (Annex I)
- The availability that will be communicated by the National participating agencies (operators and assets)
- The requirements of the Video Production Company for the recording of video sessions for the VIP demo



## ANNEX III - EVALUATION AND REPORTING

Evaluation and reporting aims at collecting End-Users' Operators feedback during the experimental demonstration, with respect to the pre-defined validation criteria, and then exploiting such feedback in order to:

- ✓ Validate the compliance of the BMM network wrt the defined User and Technical Reqs.
- ✓ Demonstrate the added value of the BMM model for cross sectorial cooperation in the scenario execution
- ✓ Identify and optimise selling points of the predefined scenarios suitable for live demo events

In order to support the evaluation and reporting phases the applicable User and Technical requirements have been grouped according to different validation criteria, defined in accordance to BMM added value capabilities that have to be validated during the experimental demonstration phase.

According to their roles in the experimental demonstration, all BMM partner will be requested to provide their feedback and reactions for each identified validation criterion. An appropriate questionnaire will be distributed to each participating agency. Questionnaire will include the list of expected reactions towards each BMM scenario.

As previously defined, questionnaire will be included in the End-Users Handbook and will be completed and distributed under the supervision of the DDT.

Finally, the analysis of End-Users questionnaire will be stated in the BMM Final Report and questionnaire will be included as annexes.

### VALIDATION CRITERIA & EXPECTED REACTIONS

The main User and Technical requirements have been grouped into categories of basic validation criteria.

Expected reactions will be reported by involved entities with respect to these Validation Criteria during the experimental demonstration. Expected reactions shall be collected per each category according to the actual behaviour of the system during the experimental demonstration and reported in the annexed tables for the three scenarios.

#### REF. TABLES:

- "EXPECTED REACTIONS TABLES – SCENARIO 3"
- "EXPECTED REACTIONS TABLES – SCENARIO 4"
- "EXPECTED REACTIONS TABLES – SCENARIO 5"

The following table reports the definition of each category and guidelines for expected reactions formulation.

<b>CATEGORY</b>	<b>VALIDATION CRITERIA</b>	<b>GUIDELINES (Operational Indicators to Assess)</b>
<b><i>C1 – Cross Sector Track Information Exchange</i></b>	National Surveillance Systems are able to share in near real time their maritime situation (tracks) establishing a SBCMP including cooperative and non-cooperative tracks	<ul style="list-style-type: none"> <li>• ship info not notified by own back-end systems,</li> <li>• historical data on ships of interest,</li> <li>• info on non-reporting ships (non-cooperative),</li> <li>• ships of interest in non-covered areas</li> <li>• .....</li> </ul>
<b><i>C2 - Data Augmentation</i></b>	Operational Users are able to enrich the SBCMP with additional near real time information, notifications, alerts, events and information reports about vessels of interest	<ul style="list-style-type: none"> <li>• events of interest at sea</li> <li>• alerts on ships of interest</li> <li>• additional information on ship of interest</li> <li>• responses to own notifications</li> <li>• .....</li> </ul>
<b><i>C3 – Regional Correlation</i></b>	The SBCMP procedure is able to generate awareness and not confusion in areas where multiple tracks overlap from different sources/countries	<ul style="list-style-type: none"> <li>• non ambiguous representation of the maritime picture in areas where monitoring capabilities overlap significantly,</li> <li>• handover on ships moving across areas covered by different countries / systems.</li> <li>• .....</li> </ul>
<b><i>C4 – Wide Area Rapid Mapping</i></b>	Operational Users have the capability to access efficiently and rapidly to Satellite Geospatial Products available in background from Satellite Service Provider Nodes, without the need of complex programming and in-advance scheduling	<ul style="list-style-type: none"> <li>• availability of satellite geospatial products covering areas of interest at the right moment</li> <li>• ship of interest detected by Satellite monitoring,</li> <li>• other mapping features of added value</li> <li>• .....</li> </ul>
<b><i>C5 – Data Distribution</i></b>	BMM partners (PN&SN) can share tracks, information, alerts, notifications and other data according to established rules allowing services and user authorisation filtering and implementation of data distribution plans	<ul style="list-style-type: none"> <li>• access to data and services according to the DDP</li> <li>• .....</li> </ul>
<b><i>C6 - Added Value in Operational Scenarios</i></b>	BMM partners are able to enhance their maritime situational awareness thanks to information shared on BMM network	<ul style="list-style-type: none"> <li>• added value provided by the information exchanged wrt the information already known for the execution of the tasks of competence in relation to the scenarios.</li> </ul>

For each category of requirements for validation, the following table defines the list of the main associated User / Technical requirements and the kind of reaction expected during the execution of the experimental demonstration by the involved entities.

CAT	NAME	LIST OF APPLICABLE REQUIREMENTS
C1	Track Information Exchange	[Req.1.12] The Track Data & Information Exchange Service will assure the capability to provide BMM Users (both local and remote) with current-time and/or historical track information available from connected National Systems and associated to targets already identified by the requesting entities (by IMO number, Ship Name, MMSI) in an area of interest.
		[BMM.DER.02] The data to be exchanged shall comprise the following categories: Positional data, Basic current voyage data, BASIC ID Data, Historical data (No basic), Other data. This data are mainly related to ships but not only, and comprises as well meteorological information, safety data, pollution information, etc.
		[BMM.DER.03] A BMM node shall be able to manage and share tracks with other nodes.
		[BMM.DER.03.03] A BMM node shall allow users to manually modify the number assigned for a track.
		[BMM.DER.03.05] A BMM node shall be able to automatically label tracks as not valid if they have been lost/dropped for agreed amount of time.
		[BMM.DER.03.06] Every track in the SCBMP shall have a unique identifier.
		[BMM.DER.03.07] Every track in the system shall be labelled with indication of its nature.
		[BMM.DER.03.08] BMM shall allow nodes to exchange track historic data.
		[BMM.DER.08] BMM nodes shall be able to exchange singular or multiple track data by using standardized message text formats and additional free text information.
		[BMM.DER.36] The data exchanged by BMM shall be geographically referenced on global scale.
[BMM.DER.37] Geodetic datum used in the interface shall be World Geodetic System 1984 (WGS-84).		
C2	Data Augmentation	[BMM.DER.02] The data to be exchanged shall comprise the following categories: Positional data, Basic current voyage data, BASIC ID Data, Historical data (No basic), Other data. This data are mainly related to ships but not only, and comprises as well meteorological information, safety data, pollution information, etc.
		[BMM.DER.07] BMM nodes shall be able to exchange additional free text information via electronic mail (e-mail).
		[BMM.DER.23] The BMM shall receive, manage and distribute alerts and warnings, i.e. suspect vessels, pirate vessels, vessels in danger, track of special interest, oil spill, etc.
		[BMM.DER.24] Alerts and warnings can be automatically generated by either a predefined set of rules or an operator. Alerts and warnings can also be received from other external systems. All above types of data set can be used to generate alerts and warnings.

CAT	NAME	LIST OF APPLICABLE REQUIREMENTS
		<p>[BMM.DER.28] The BMM shall receive, manage and distribute the following additional data:</p> <ul style="list-style-type: none"> <li>- Static Media files (pictures, video clips, satellite information as geo-media files),</li> <li>- Streaming Media files (Camera feed),</li> <li>- Telephone calls (IP-phone, hotline)</li> </ul> <p>[BMM.DER.29] It shall be possible to publish different types of geometric objects with optional attached meta-data: Lines, Points, Areas, Special marks.</p>
C3	SBCMP	<p>[BMM.DER.01] The BMM system shall allow partners to exchange data to improve their maritime situational awareness, establishing a Shared Common Basic Maritime Picture (SCBMP).</p> <p>[BMM.DER.04] BMM shall allow nodes to manage track correlation</p> <p>[BMM.DER.04.01] BMM shall allow users to correlate tracks.</p> <p>[BMM.DER.04.02] Every track distributed in the system shall contain an attribute indicating if it is a correlated track.</p> <p>[BMM.DER.04.03] A BMM node shall be able to automatically correlate tracks under established conditions and rules.</p> <p>[BMM.DER.04.05] BMM shall allow nodes to establish filters in subscriptions, so that only correlated data is sent.</p> <p>[BMM.DER.05] The BMM system shall support several layers of surveillance data: One basic data layer and Classified layers, as required by different partner's needs.</p> <p>[BMM.DER.14] A confidence value shall be allocated to the exchanged information:</p> <ul style="list-style-type: none"> <li>1 = very high confidence, verified data</li> <li>2 = high confidence</li> <li>3 = confident</li> <li>4 = low confidence, unsure source of verification</li> <li>5= very low confidence, no verification, co-operative target</li> </ul> <p>[BMM.DER.15] A quality value shall be allocated to the exchanged information.</p>
C4	Wide Area Rapid Mapping	<p>[Re.1.14] The Wide Area Rapid Mapping service will provide BMM Node Users with the capability to exchange Satellite Geospatial Products (including SAR images) available from their respective National Systems, over an Area of Interest or a Track of Interest.</p>
C5	Data Distribution	<p>[BMM.DER.04.04] Tracks correlated in a BMM node can be published to other nodes subject to user decision or due to automatic filtering.</p> <p>[BMM.DER.06] The BMM shall support multi security layer activity and shall be able of managing sensitive information (legal, commercial, open source intelligence, etc). The restrictions to the data exchange could be operational, political, commercial and legal.</p>

CAT	NAME	LIST OF APPLICABLE REQUIREMENTS
		[BMM.DER.17] The BMM nodes shall be able to limit the level of data exchange byfilter rules based on security level of the data or any other attribute.

## **ANNEX IV – SCENARIOS, DATA INJECTIONS AND EVENTS**

Please refer to the following tables attached:

1. Scenario 3
  - a) Scenario storyboard table
  - b) General Injections table
  - c) Simulated events table
  
2. Scenario 4
  - a) Scenario storyboard table
  - b) General Injections table
  - c) Simulated events table
  
3. Scenario 5
  - a) Scenario storyboard table
  - b) General Injections table
  - c) Simulated events table