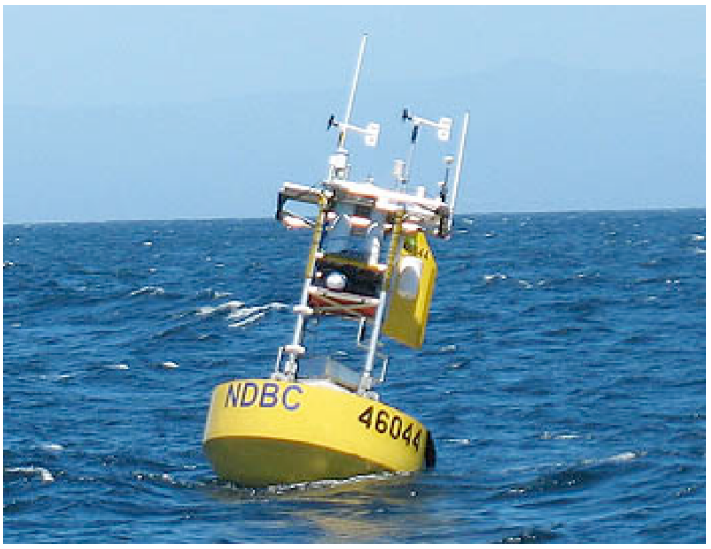
Final Exam for BBM485 Software Architectures

Date: 22.06.2020

Please read the description for the software that will be implemented and examine the current architecture design for the product.

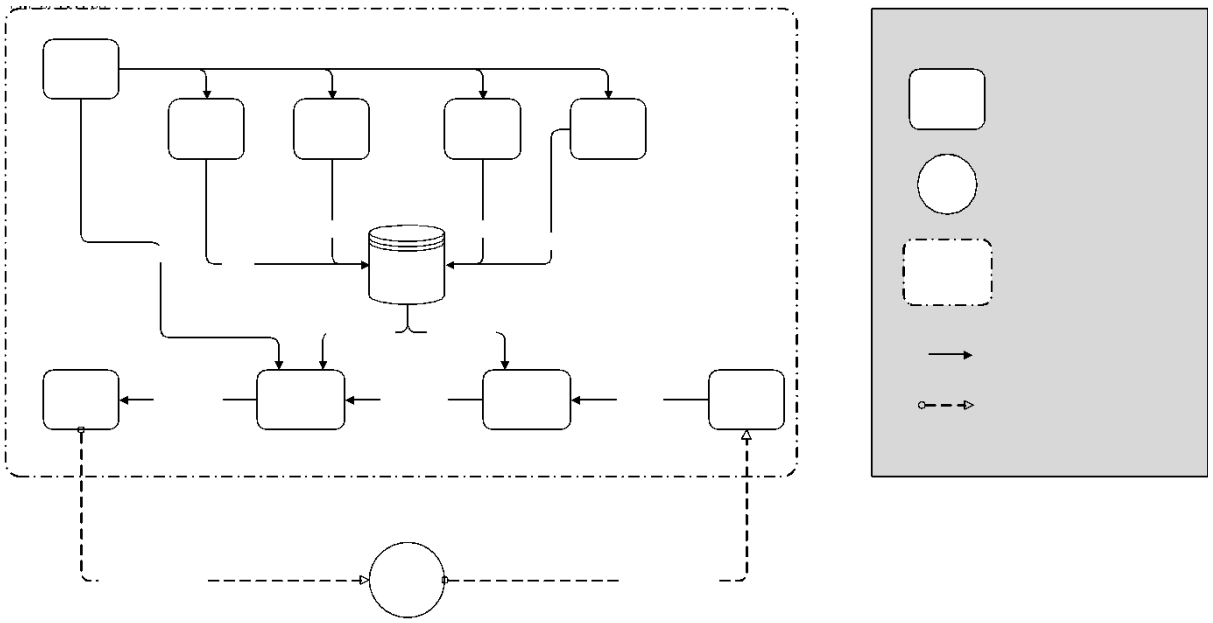
Software for sea buoys support for navigation at sea



There exists a collection of free-floating buoys that provide navigation and weather data to air and ship traffic at sea. The buoys collect air and water temperature, wind speed, and location data through a variety of sensors. Each buoy may have a different number of wind and temperature sensors and may be modified to support other types of sensors in the future. Each buoy is also equipped with a radio transmitter (to broadcast weather and location information) and a radio receiver (to receive requests from passing vessels). Software for each buoy must:

- maintain current wind, temperature, and location information; wind speed readings are taken every 30 seconds, temperature readings every 10 seconds and location every 10 seconds.
- broadcast current wind, temperature, and location information every 60 seconds.
- broadcast wind, temperature, and location information in response to requests from passing vessels; this takes priority over the periodic broadcast

You are the architect that supposed to design the software. And you have a design of process view as follows:



Please perform a Scenario-Based Architecture Analysis and answer the following questions:

1. (10 Points) Define the viewpoint of the Process View for this example architecture.
   ANSWER:

Name	
Stakeholders	
Concerns	
Elements	
Relations	
Constraints	
Notation	

2. (20 Points) Perform following What-if questions and write your scenarios for user and developer stakeholders:
   a. What if a sensor accuracy is not efficient and give a fault value in an hour?
   b. What if I want to add an air pressure sensor to the system?
   c. What if I want to send last 24 hour saved data in request of external system?

   ANSWER:

   User Scenarios:

Scenario	**Description**
U1	

U2	
U3	

Developer Scenarios:

Scenario	**Description**
D1	
D2	
D3	

3. (20 Points) Perform scenario evaluations for your scenarios and identify them as Direct/Indirect with corresponding change requests.
   ANSWER:

Scenario	**Short Description**	**Direct / Indirect**	**Changes Required**
U1			
U2			
U3			
D1			
D2			
D3			

4. (20 Points) Represent your scenario interactions using a table view.
   ANSWER:

Process	**Number of Changes**
Clock	
Wind Speed Sensor	
Air Temp Sensor	
Water Temp Sensor	
Location Sensor	
Sensor Database	

Message Responder	
Message Broadcaster	
Radio Receiver	
Radio Transmitter	

5. (30 Points) Make your overall evaluation and refine the architectural process view according to the improvements.
   ANSWER:

   Refined Process Diagram: