



# A JABBER-BASED MANAGEMENT FRAMEWORK FOR HETEROGENEOUS DEVICE NETWORK APPLICATIONS

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## ABSTRACT

*The incessantly increasing diffusion of application eventualities requiring pervasive knowledge sensing has cause the event of novel observation solutions investing on Heterogeneous device Networks (HSNs). At the instant, solely very little attention has been dedicated to the look of multi-purposes applications dedicated to method, filter and use knowledge from HSNs and geared toward providing composite services to the ultimate users. Most accessible networks ar presently managed by custom complete applications, wherever several low level details ar handled at application level. Actually, this approach presents several drawbacks in terms of system flexibility and flexibility. In such a situation, the most goal is to decouple application logic from low level implementation details as well as the HW/SW platform and also the artificial language. Moreover, the precise units of practicality ought to be organized into autonomous and connectable modules in operation in an exceedingly distributed computing surroundings. This paper presents a management framework for speedy and versatile preparation of HSNbased applications supported XMPP/Jabber, a widely known XML-based ASCII text file Instant electronic communication protocol. The projected answer aims to hurry up the mixing of various computer code modules into a network of services. the most edges of the projected answer embody a rise of code reusability, platform freedom, system quantifiability and modularity. the benefits of the projected approach ar incontestible by presenting 3 use-cases.*

## 1. INTRODUCTION

Heterogeneous device Networks (HSNs) ar device Networks (SNs) characterised by nonuniformity in terms of sensing devices, communication capabilities and knowledge formats. observation solutions supported HSNs ar rising a lot of and a lot of attention in each analysis and industrial world as a result of within the future they're expected to modify advanced functionalities supported fusion of knowledge perceived through totally different platforms and technologies. In current Sn architectures, back-end management applications ar typically connected to a particular node of the Sn, the alleged "sink node", acting as entrance. The Sn sink node is integrated with back-end applications through specific integration layers that create the management application attentive to the various technology-specific aspects of the Sn platform. In such situation, nonuniformity will represent a primal issue. In fact, whereas shaping and implementing a custom, technology-dependent integration layer is presently not a problem, the look of a multi-technology management application ready to deal transparently with totally different device network platforms, remains a challenge. the necessity for a heterogeneous Sn packet interpretation is one in every of the primary consequences of technologic nonuniformity. Currently, packet interpretation is usually hard-coded within integration layers, either by implementing manually packet interpreters or by exploitation selfgeneration tools like the Message Interface Generator (MIG), enclosed with the nesC compiler [11]. Such approaches cause poor system flexibility and small ability once even little modifications in Sn functionalities ar required. These problems are tackled by many solutions within the literature. In [9] and [21], as an example, packets ar processed dynamically, employing a wordbook containing protocol definitions that may be modified dynamically. whereas being less economical, this approach improves system flexibility and reduces development time. the answer bestowed in [18] leverages on XML-based languages (e.g. NetPDL) to outline AN application framework enabling HSN-based back-end applications to perform tasks like packet dissection, definition, process and filtering in an exceedingly more practical means. to maneuver forward to the recent progresses, we tend to propose to more improve flexibility and flexibility by adopting a middleware that realizes a Service homeward design (SOA) [20][8] and splits the total management method into variety of functionally freelance units ready to communicate and join forces with one another in an exceedingly distributed computing surroundings. a lot of specifically, the management framework bestowed during this paper depends on XMPP/Jabber [28][29], the well-known IETF instant electronic communication (IM) protocol, and on the NetPDL-based versatile packet interpretation layer projected in [18]. Some middleware infrastructures have already been projected for building context-aware applications and services [15][16][17]. However, a number of these solutions don't effectively address Sn nonuniformity. different analysis activities [19][30] propose the SOA approach at each



back-end and Sn levels. This paper is organized as follows. Section two details the SOA-based management framework, in conjunction with the system necessities it complies with and a few implementation notes. Section three illustrates 3 Wireless device Network (WSN)-based use cases that are enforced to demonstrate the functionalities of the projected framework. Conclusions are in section four.

## 2. PROJECTED ANSWER

The main contribution of this paper is that the proposal of a SOA-based versatile management framework permitting ease integration of HSNs into multi-purpose back-end applications. During this section, firstly, system necessities are investigated. Secondly, the final SOA bailiwick pattern is in brief introduced. Thirdly, our SOA-based proposal supported XMPP protocol is bestowed in conjunction with the connected reference design. Finally, some implementation details are provided.

### 2.1. useful and non-functional system necessities

In the heterogeneous observation and management application situation thought-about during this paper, specific Sn gateways give endless knowledge to be due device nodes to the back-end management platform. This platform ought to be ready to give functionalities like Sn management and management, yet as knowledge assortment, management and process. Additionally, it ought to give a right away access to the gathered data and post process results. Beside these useful necessities, the management platform ought to meet the subsequent non-functional necessities.

### 2.2. SOA approach

The system necessities bestowed higher than clearly cause a management framework wherever complicated functionalities are partitioned off into smaller tasks organized in modules. These modules distribute the general process load and at a similar time promote useful reprocess. In step with this standard approach, a back-end application consists of various computer code modules, which may be remarked as services implementing specific units of functionalities. These services are autonomous, dynamically inter-connectable and operate in an exceedingly distributed computing surroundings.

### 2.3. The projected SOA

Among the accessible implementations, we tend to propose to fulfill the system necessities bestowed in section two.1 with a (Extensible electronic communication and Presence Protocol) XMPP/Jabber based mostly SOA. XMPP [28][29] is an open all-purpose protocol for streaming XML (eXtensible Markup Language) components that are a viable answer to represent structured knowledge in an exceedingly moveable, practical, versatile and protractible means. XMPP has been adopted by IETF as technology answer for fast electronic communication (IM) and presence services. The first version of the protocol was resolute at intervals the Jabber [2] ASCII text file community, in the main in 1999. The core options embody the availability of a near-real-time electronic communication and request-response services, yet because the management of presence data (i.e. a standing indicating accessibility to communicate).

### 2.4. HSN Management framework

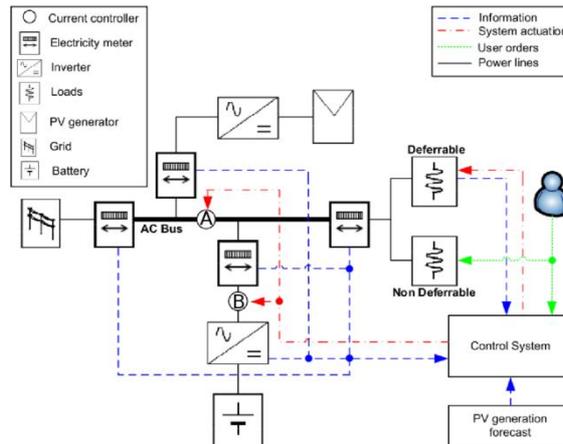
The known XMPP/Jabber-based SOA is employed to outline a versatile management framework for HSNs that meets the useful necessities known in section two.1. This can be done through a data structure organized into 3 main layers, every of that is completed by means that of various Service Entities human activity and cooperating with one another.

## 3. USE CASES

In order to demonstrate the benefits of the projected management framework for HSN-based distributed system, 3 totally different demonstration systems were developed to use to a similar use cases bestowed in [18], namely:

### 3.1. A Distributed Wireless device Network Packet someone

Packet sniffers, additionally referred to as network analyzers, are applications wont to intercept network traffic. Sniffing radio packets may be a technique that's wide used for network troubleshooting, performance analysis and security functions. Sniffers are getting used in WSN applications ([26]). typically speaking, a wireless packet someone is an application that listens to any or all knowledge broadcasted within its radio vary by employing a node in promiscuous mode (the alleged probe node) and decodes packets obtaining protocol descriptions from wordbook written by referencing standards issued by organizations like IEEE, IETF or others. During this demonstration system the protocol dictionaries are delineated in NetPDL language to require advantage of the options already enforced within the framework. Though some standardized technologies, particularly ZigBee and Bluetooth, is known, a longtime customary doesn't exist for WSN protocols, therefore an oversized variety of tailored, application-specific protocols are outlined. particularly throughout development and check part, application protocols are {often|will be|is|may be} changed often, thus any packet someone used with WSNs ought to be simple to customise. Moreover, lots of various platforms are accessible for WSNs, thus a serious demand for the someone is multiple platforms support.



**Fig:-1** Distributed, heterogeneous light and temperature monitoring system architecture

#### 4. CONCLUSIONS

The increasing diffusion of heterogeneous device networks is urging for economical and versatile frameworks that ease and speed up the mixing of freelance application modules in back-end computer code infrastructures. The answer projected during this paper tries to unravel this integration challenge by investing on Jabber/XMPP, the well-known XML-based protocol description language. The benefits of this approach are enlarged flexibility, ability and extensibility of application modules, because of the definition of a platform-independent management and communication abstraction layer. The delineated framework is wont to integrate modules providing totally different functionalities into a novel and coherent design. The projected system provides an entire and open SOA (Service homeward Architecture) and uses a publish-subscribe message-oriented communication model. The introduction of such design leads to totally different advantages:

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