Wireless sensor network

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Abstract: *The Wireless sensor network play a vital role in collecting a Real – Time data, monitoring environmental conditions based on technology adoption. These sensor network is the combination of sensing, computation, and communication through a single tiny device. Here many tiny nodes assemble and configure themselves. It also controls actuators that extend control from cyberspace into the physical world. Here the sensor nodes communicate with the local peers rather than the high – power control tower or base station. Instead, of relying on a pre-deployed infrastructure, each individual sensor or actuator become part of the overall infrastructure. Here we have three hardware platforms that addresses the needs of wireless sensor netwoks. The operating system here uses an event based execution to support concurrency. The platform serves as a baseline and does not contain any hardware accelerators. . First platform serves as a baseline and it produces Operating system concepts for refining concurrency mechanisms. The second node validates the architectural designs and improve the communicational rates. The third node represents the full realization of the general architecture.*

Keywords— *node, platform, concurrency.*

I. Introduction

The increased adoption of wireless sensors across Industry is due, like most industrial technologies,To solid, practical reasons. Chief among these reasons is ease of implementation, ability to operate in harsh environments of performance.

If you've following the adoption of wireless sensor networks in industry at ay level, you're. Bound to be aware of their prevalence in the oil and gas and water industries- especially for use in tank farm and wellhead monitoring, where traditional wired communication is simply too costly when compared to wireless. Stories of wireless sensors successful in the beyond abound.

LITERATURE REVIEW

Wearable computation is getting integrated into our daily life day by day. In this work, we propose a generic framework to continuously monitor users' daily activities. The framework proposes light computation tasks on the wearable device to reduce the amount of data communicated between the wearable, and its host. A 9-axis wristbands are being used to collect user's activities. The collected signals are subject to light weight preprocessing and segmentation on the wearable device prior sending to the host, were it goes through activity detection algorithms. In this paper, we elaborate the feasibility of the proposed framework thru presenting two case studies. An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it[1]

WSNs (wireless sensor networks) are often high-densely deployed and nodes are easy to fail. All these uncertainty preclude manual configuration and design-time pre-configuration. In the paper, MTLT (mixed type logical topology) is proposed, by which the whole sensor network is organized as mixed-type logical topology according to the local density and energy constraint. Simulation experiments proved that MTLT is a simple, robust and low-latency topology for different types of data dissemination in dense deployed WSNs[2]. Estimating behavior of a GA-based topology control for self-spreading nodes in MANETs,

This paper presents a dynamical system model for FGA, a force-based genetic algorithm, which is used as decentralized topology control mechanism among active running software agents to achieve a uniform spread of autonomous mobile nodes over an unknown geographical area. Using only local information, FGA guides each node to select a fitter location, speed and direction among exponentially large number of choices, converging towards a uniform node distribution. By treating a genetic algorithm (GA) as a t in terms of its trajectory in the space of possible populations. We use Vose's theoretical model to calculate the cumulative effects of GA operators of selection, mutation, and crossover as a population evolves through generations. We show that FGA converges toward a significantly higher area coverage as it evolves [3]. The mobility of the sensor nodes is designed with the cost of communication and mobility in mind along with consideration of the possible scanning tasks of the nodes. Our mobility algorithm is developed in the context of a distributed system where, for any single mobile node, only local information about associated energy costs is known. We use a distributed simulated annealing framework to govern the motion of the nodes and prove that, in a limiting sense, a global objective function comprising mobility and communication energy costs are minimized. This paper concludes with a simulation study focusing on mobile sensors with dual roles of scanning and relaying higher priority tracking traffic from tracking nodes[4].

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3. PROPOSED METHODOLOGY

This paper contains the operating system and three generations of a hardware Platform . It is designed to address the needs of wireless sensor networks. Our operating system is called NetOS. *The NetOS operating system here uses an event based execution to support concurrency*. There are three hardware platforms we are used , First platform serves as a baseline and it produces Operating system concepts for refining concurrency mechanisms. The second node validates the architectural designs and improve the communicational rates. The second platform has become foundation of fifty wireless sensor network research around the world. The third node represents the full realization of the general architecture.

The main characteristics of a WSN include:

- Power consumption constraints for nodes using batteries or energy harvesting
- Ability to cope with node failures (resilience)
- Mobility of nodes
- Heterogeneity of nodes
- Scalability to large scale of deployment
- Ability to withstand harsh environmental conditions
- Ease of use
- Cross-layer design

Cross-layer is becoming an important studying area for wireless communications. In addition, the traditional layered approach presents three main problems:

1. Traditional layered approach cannot share different information among different layers , which leads to each layer not having complete information. The traditional layered approach cannot guarantee the optimization of the entire network.

2. The traditional layered approach does not have the ability to adapt to the environmental change.

3. Because of the interference between the different users, access conflicts, fading, and the change of environment in the wireless sensor networks, traditional layered approach for wired networks is not applicable to wireless networks.

So the cross-layer can be used to make the optimal modulation to improve the transmission performance, such as data rate, energy efficiency, QoS (Quality of Service), etc. Sensor nodes can be imagined as small computers which are extremely basic in terms of their interfaces and their components.

They usually consist of a *processing unit* with limited computational power and limited memory, *sensors* or

MEMS (including specific conditioning circuitry), a *communication device* (usually radio transceivers or alternatively optical), and a power source usually in the form of a battery. Other possible inclusions are energy harvesting modules,[10] secondary ASICs, and possibly secondary communication interface (e.g. RS-232 or USB).

The base stations are one or more components of the WSN with much more computational, energy and communication resources. They act as a gateway between sensor nodes and the end user as they typically forward data from the WSN on to a server. Other special components in routing based networks are routers, designed to compute, calculate and distribute the routing tables.

TO OVERCOME THE EXISTING SYSTEM

Traditional wired systems, deployment costs would be minimal. Instead of having to deploy thousands of feet of wire routed through protective conduit, installers simply have to place quarter-sized device, sensing point. The network could be incrementally extended by simply adding more devices – no rework or complex configuration.

Adaptation mechanisms can respond to changes in network topologies or can cause the network to shift between drastically different modes of operation. For example, the same embedded network performing leak monitoring in a chemical factory might be reconfigured into a network designed to localize the source of a leak and track the diffusion of poisonous gases. The network could then direct workers to the safest path for emergency evacuation. Current wireless systems only scratch the surface of possibilities emerging from the integration of low-power communication, sensing, energy storage, and computation.

Unlike traditional wireless devices, wireless sensor nodes do not need to communicate directly with the nearest high-power control tower or base station, but only with their local peers. Instead, of relying on a pre-deployed infrastructure, each individual sensor or actuator becomes part of the overall infrastructure. Peer-to-peer networking protocols provide a mesh-like interconnect to shuttle data between the thousands of tiny embedded devices in a multi-hop fashion.

The flexible mesh architectures envisioned dynamically adapt to support introduction of new nodes or expand to cover a larger geographic region. Additionally, the system can automatically adapt to compensate for node failures. Unlike cell phone systems that deny service when too many phones are active in a small area, the interconnection of a wireless sensor network only grows stronger as nodes are added.A core design challenge in wireless sensor networks is coping with the harsh resource constraints placed on the individual devices. The most difficult resource constraint to meet is power consumption.

As physical size decreases, so does energy capacity. Underlying energy constraints end up creating computational and storage limitations that lead to a new set of architectural issues. Many devices, such as cell phones and pagers, reduce their power consumption through the use specialized communication hardware in ASICs that provide low-power implementations of the necessary communication protocols [7] and by relying on high power infrastructure. However, the strength of wireless sensor networks is their flexibility and universality.

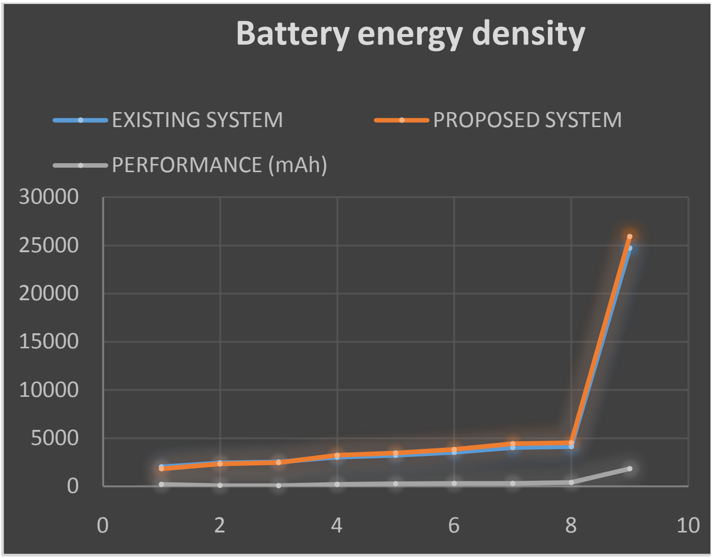
The wide range of applications being targeted makes it difficult to develop a single protocol, and in turn, an ASIC, that is efficient for all applications. A wireless sensor network platform must provide support for a suite of application-specific protocols that drastically reduce node size, cost, and power Consumption for their target application.

S.no	Existing system	Proposed system	Performance (mAh)
1	2000	1800	200
2	2400	2300	100
3	2500	2450	50
4	3000	3200	200
5	3200	3450	250
6	3500	3800	300
7	4000	4400	300
8	4100	4500	400
Total	24700	25900	1800

Table 1 shows the battery energy density

To show the above table how to increase battery energy density from existing to proposed system.

The results show the better performance of existing.



Conclusion:

Many application scenarios imagined by the people have been made satisfied by this System Architecture. It helps to provide insight into how an ecosystem operates and also improves efficiency. In future the wireless application can be used in military applications. The technology has been accepted by the military commanders such that the technology incorporate the data coming from senor networks without abandoning existing information sources. Another important futuristic analysis is that the security systems with extremely high levels of reliability and predictability in industries. In case of any failures causes millions of dollars in lost productivity, injury to personnel, and damage to equipment. While the adoption rate will be slow in these areas, the technological advantages of wireless sensor networks will outweigh the risks. All the control system in the industries will switch over to the wireless sensing and control points. Wireless mesh will replace the wiring systems in building control and automation systems. This technology will be small and cheap that has silicon chip interact with the physical world. . Tomorrow we will give little thought to wireless sensor network technology and the systems that have grown to impact every aspect of our lives.

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