Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X
IMPACT FACTOR: 6.017

IJCSMC, Vol. 6, Issue. 3, March 2017, pg.98 – 101

Rural Ambient Networks (RAN) Content-Routed Asynchronous Communication Router Based Notification Router (RnR)

[2] **Umesh Sehgal**
A.P, Research Scholar
Email id: - umeshsehgal_ind@yahoo.com

[1] **Rajeev Sharma**, A.P
Chandigarh Engineering College, Landran,
Email id: - cecm.cse.rajeev@gmail.com

Abstract:- The industry and the academic community have been making strong research efforts on the autonomic communications and self-management paradigms and they have produced several architectures and techniques aimed at allowing network devices to make their own configuration decisions. This paper addresses such factor of the autonomic systems introducing RAN. This system aims to be a complete rule based, distributed system specially designed and implemented to enable present and future autonomic behavior.

1. Introduction:-

An ambient network is a network combination that was developed to solve issues and problems related to switching. It is used to build up a network that is compatible for current and forthcoming physical network infrastructures. Ambient networking provides appropriate mobile technology for the emerging mobile communication and WAN communication environment.

Those proposals usually embody technologies like generic abstract thought machines, metaphysics modeling and probabilistic prediction that, with some exceptions like [1], are developed for resource-generous devices. However, the common assumption that, for instance, memory or cupboard space are nearly free and thus forgotten, might not correspond with the fact of some artifact devices like domestic wireless routers or with the economy of some communities. In one hand, driven by RAN intense competition, the price of domestic wireless routers has born to costs that are reasonable in developing regions creating of them a superb

chance to deploy inexpensive communications infrastructures for communities suffering of the thus known as Digital Divide. Within the alternative hand, the hardware resources of these devices have conjointly been cut down so as to be economically viable for the vendors. This example imposes severe constraints to the code which will be run in those cheap devices and thus, specific techniques for embedded systems should be used.

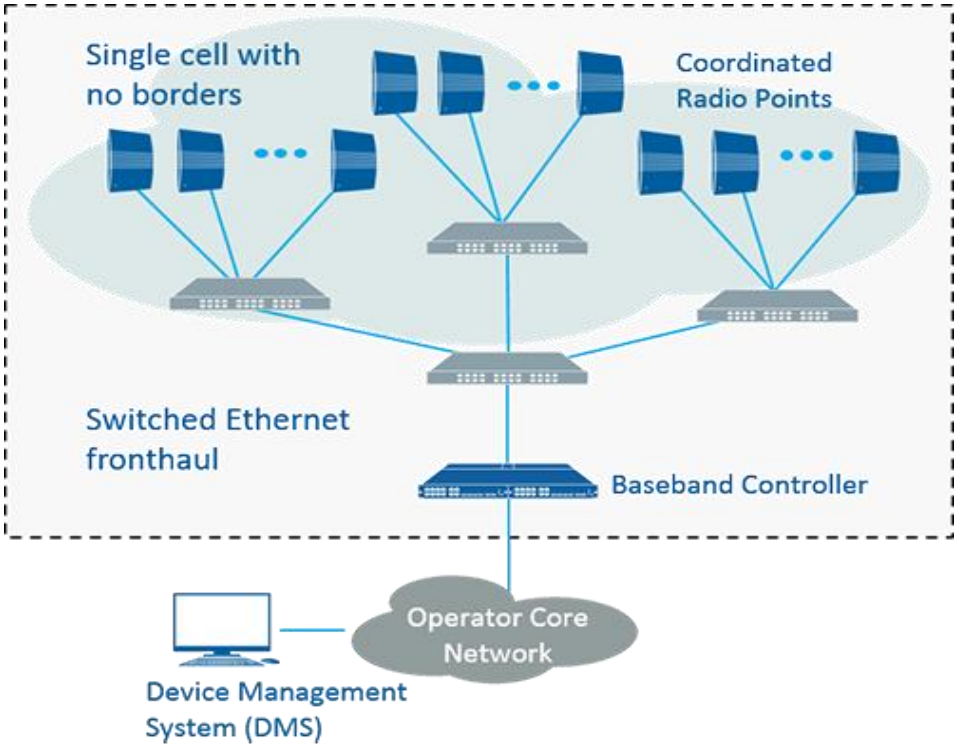

Figure 1. C RAN small runs

2. RAN System Design:-

RAN designs fire alarm systems by understanding a building's occupancies and incorporating the protection philosophy of management. The Rural Ambient Networks project (RAN) [2] was designed to improve connectivity of remote rural communities in the less expensive possible manner. The RAN project deployed a mobile computing infrastructure based on low-cost wireless routers that supports the production of community based cooperatives. It can also provide voice and text communications between remote sites, and it may promote cultural initiatives like local radio or news services. These user applications are based in a network infrastructure founded over the Ambient Networks (AN) [3] concepts, taking into account the geographical characteristics of rural areas, the economic situation of its members and the cultural profile of rural communities. The basic supporting technologies for the RAN environment are Mesh Networking, introduced by the IETF Mobile Ad-hoc Networking (MANET) Working Group V, the IEEE 802.11 set of wireless LAN standards (usually known as Wi-Fi), GSM/GPRS and other evolving mobile communications standards such as 3G.

In its most distributed aspect, the system is mainly composed by independent units or nodes that work as peers deployed at each managed network device. Those nodes, as in the well-known

policy-based architecture described in [4], are composed by a Policy Decision Point (PDP), an Enforcement Point (EP) and an agent that monitors the state of the device and the behavior of the network. The PDP follows the event condition action (ECA) paradigm and the notifications sent by the monitoring agent of any of the nodes of the network is the source of events for the PDP of the same or any other node. All the communications between nodes, including control messages, notifications and request for actions are carried out by a content-routed asynchronous communication bus that organizes the nodes in a hierarchical overlay. Finally, a centralized management station is in charge of the edition, optimization and distribution of rules into the nodes. Within this framework, policies are implemented as condition-action rules where the condition may be the occurrence of some event (e.g., an alarm or a service request) or certain network state, and the action is the desired response to that condition event.

3. RnR:- Router based Notification Router:-

As stated before, all the communications between the entities of the RAN system are made asynchronously by means of a distributed notification service named RnR.RnR implements a simple content based notification service which distributes messages from publishers to subscribers.

The configuration file is a Lua script which is executed at service startup time. It is used to set configuration variables[8].

The variables are:-

my_ip IP address of the interface where the service accepts connections. By default is " *".

my_port IP port on which the service listens. By default is 8182.

my_name Name that identifies the node. If omitted an auto generated name will be used.

My_ip="192.168.1.50"—my public ip
my_port =8182
my_name ="router_gwl"
upstream [1] ={"192.168.1.1",8182}
upstream [2] = {"192.168.1.100",8182}

4. Future Scope:-

In particular the infield prototype that is already operational will be used for similar experiments. New experiments must be designed to test the scalability of the system on the number of policies driving the nodes (as per the pervious author implementation),and the network overhead caused for a high number of participating entities.

5. Conclusion:-

In this paper, we present the RAN system. This system was developed to serve the objectives of Rural Ambient Networks, a project that targets the so called Digital Divide Deploying low cost wireless mesh infrastructure in rural communities. The main contribution of this paper is to show that RnR perform such a review topic and complex task with devices with very few computational resources.

References:

[1] S. L. Keoh, N. Dulay, E. Lupu, K. Twidle, A. Schaeffer-Filho, M. Sloman, S. Heeps, S. Strowes, and J. Sventek, "Self-managed cell: A middleware for managing body-sensor networks," in Proc. Fourth Annual International Conference on Mobile and Ubiquitous Systems: Networking & Services MobiQuitous 2007, 6–10 Aug. 2007, pp. 1–5.
[2] E. Grampin, J. Baliosian, J. Visca, M. Giachino, and L. Vidal, "Wireless Network Architecture for Digital Inclusion in Rural Environments," in Global Information Infrastructure Symposium, 2007. GIIS 2007. First International, Marrakech, July 2–6, 2007, pp. 20–26.
[3] C. Kappler, P. Mendes, C. Prehofer, P. Pyhnen, and D. Zhou, "A framework for self-organized network composition," In Proc. of the 1st IFIP International Workshop on Autonomic Communication, pp. 18–19, 2004.
[4] B. Moore, E. Ellesson, J. Strassner, and A. Westerinen, "Policy Core Information Model – Version 1 Specification," RFC 3060 (Proposed Standard), Feb. 2001, updated by RFC 3460. [Online]. Available: http://www.ietf.org/rfc/rfc3060.txt
[5] "The RAN System wiki." [Online]. Available: http://www.ran.org.uy/wiki/field.php
[6] "The OpenWrt Project." [Online]. Available: http://openwrt.org/
[7] T. Clausen and P. Jacquet, "Optimized Link State Routing Protocol (OLSR)," RFC 3626 (Experimental), Oct. 2003. [Online]. Available: http://www.ietf.org/rfc/rfc3626.txt
[8] http://www.ran.org.uy/documentos/rnr_doc_en.pdf

