

Design of Internet of Things architecture for interoperable heterogeneous networks with special focus on RPC areas

Supervisor - Prof.Ole Brun Madsen
Co – Supervisor - Prof. Ramjee Prasad
Prof.U.B.Desai

Project Duration

15 Nov 2009 to 14 Nov 2012

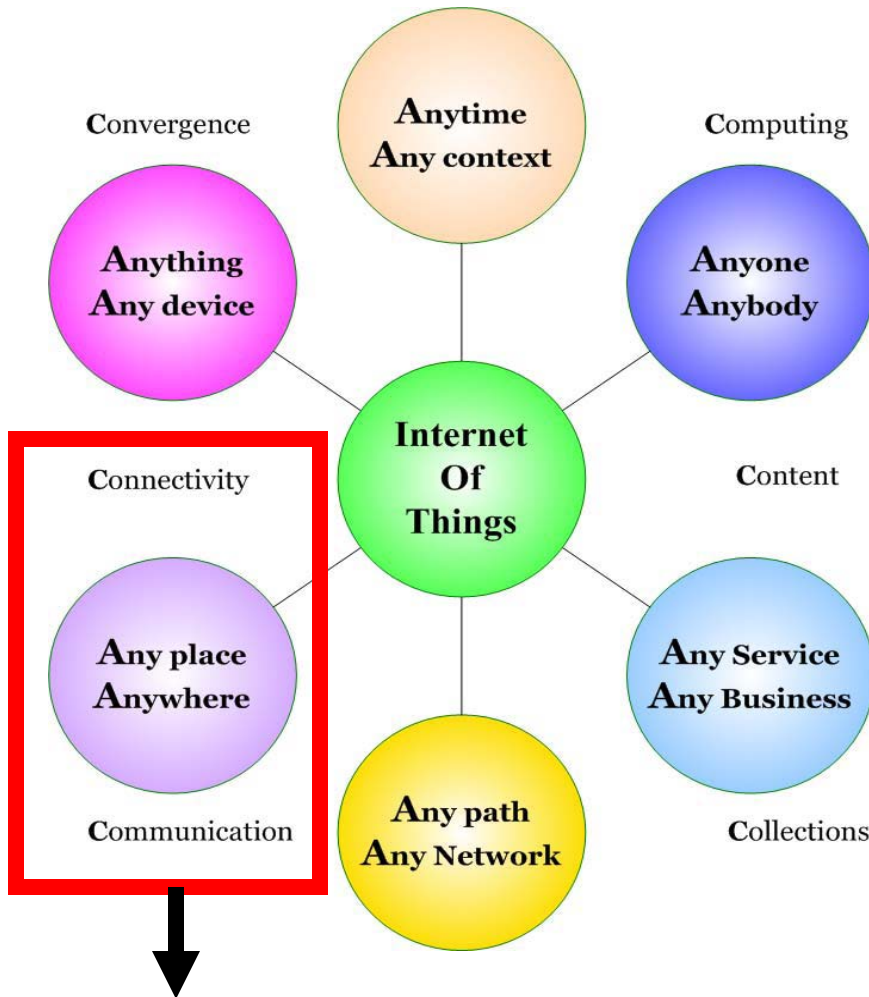
By

Dipashree Milind Bhalerao

Table of content

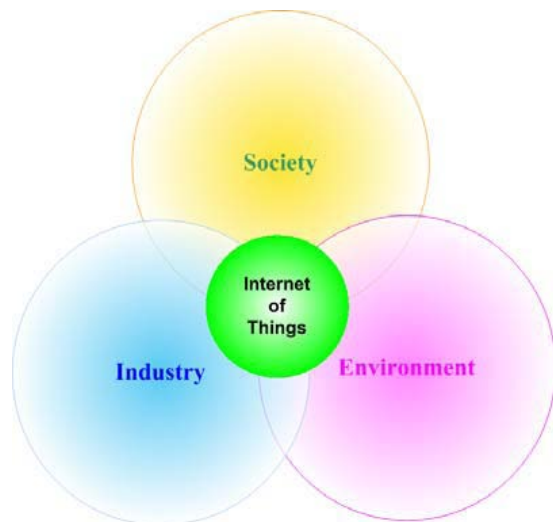
- IoT
- Objectives
- State of the art
- Suggested solution

Internet of Things



- an integrated part of Future Internet
- Dynamic global network infrastructure with self configuring capabilities
- Standard and interoperable communication protocols
- Physical and virtual “things” characterized by identities, physical attributes, and virtual personalities
- use intelligent interfaces
- seamless integration into the information network

IoT Application Domains - Description and Examples



Domain	Description
Industry	Activities involving financial or commercial transactions between companies, organisations and other entities
Environment	Activities regarding the protection, monitoring and development of all natural resources
Society	Activities/ initiatives regarding the development and inclusion of societies, cities, and people

Internet of things Applications

- **E -Learning**
- **Health care**
- Intelligent Buildings
- Medical Technology
- Aerospace and aviation
- Automotive
- Independent Living
- Pharmaceutical
- Retail
- Logistics
- **Agriculture and Breeding**
- **Environment Monitoring**
- People and Goods Transportation
- Product Lifecycle Management
- Manufacturing
- Processing industries - Oil and Gas
- Safety, Security and Privacy
- Food traceability
- Media, entertainment and Ticketing
- Insurance ,Recycling
- Supply Chain anagement

Many More.....

Internet of Things

Communication

Processing

Identification

Localization

Storage

Security

Sensors

Device

Network Planning

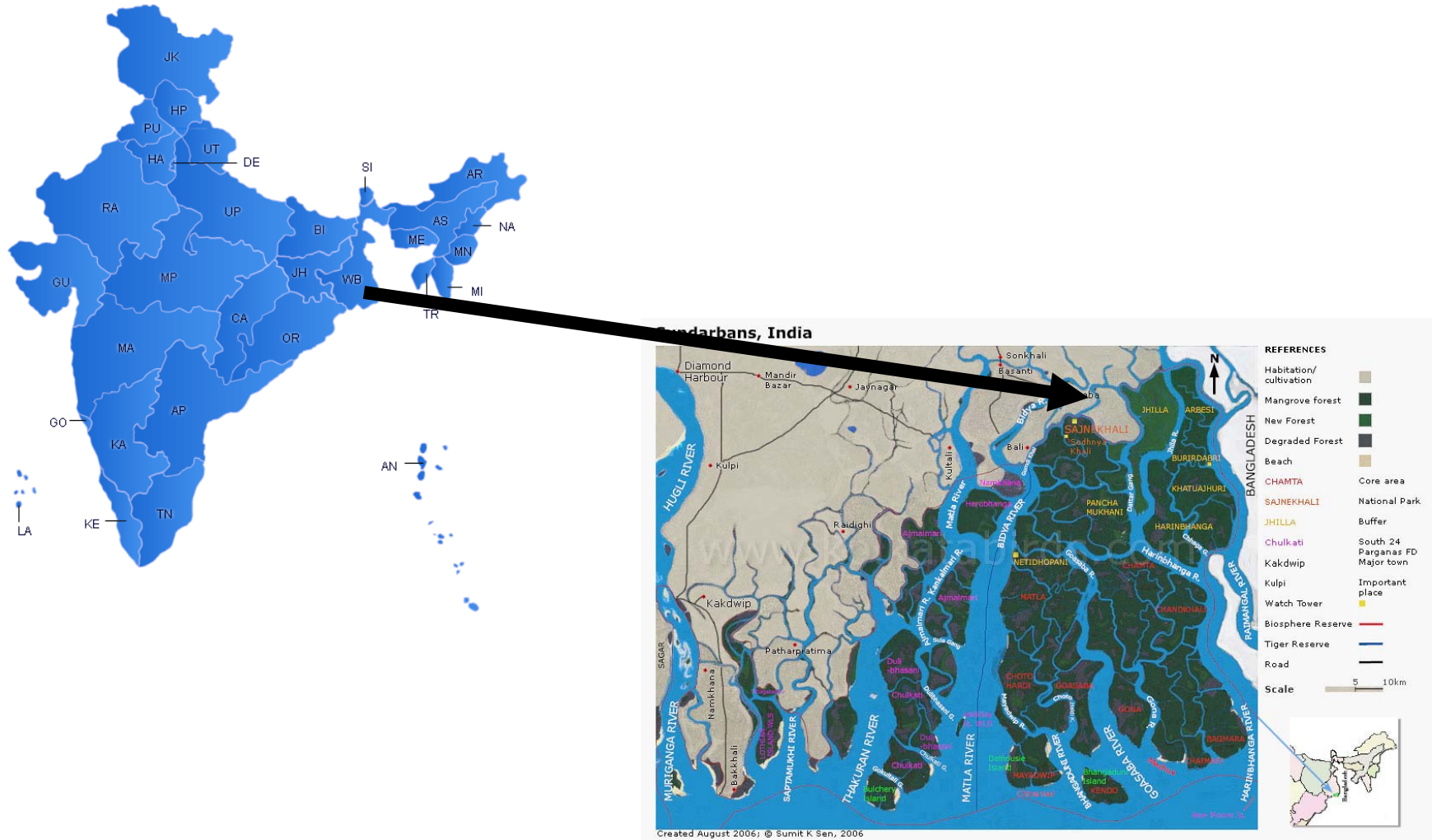
Interoperability

- Heterogeneous Networks
- Devices
- Medium
- Technologies

objective

- To provide internet connectivity to rural area for achieving basic needs.
 - To provide maximum coverage area.
 - To provide e-learning, e-medicine etc.
 - **To provide low cost solutions for rural and poor area.**
- To standardize the rural area connectivity all over the world.
- To find out methods for lowering the power consumption.
- To provide catastrophic area connectivity to internet for emergency communication help.

Sunderban

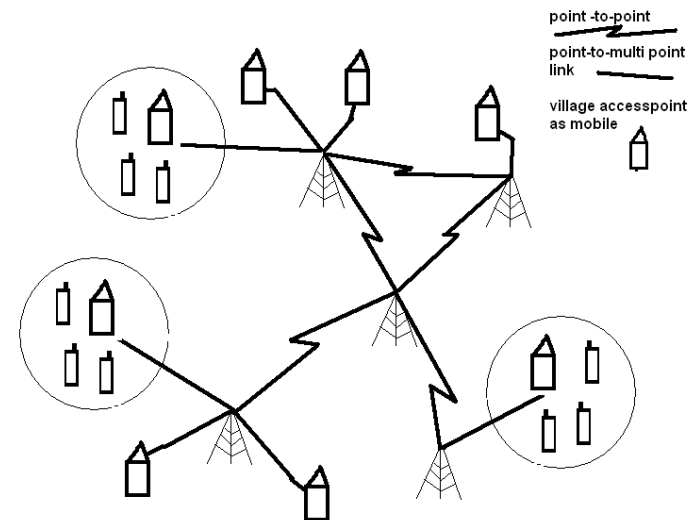


Available Internet communication means

Network	Penetration	Applications
Fixed line Telephone	14% global	Voice
Fixed line Broadband	2% Global	VoIP, email, file, web
Cellular telephone and data(GSM)	49.5% Global	Voice, touch-tone, text messages, VoIP, email, file, web
Mobile broadband	< 1% Global	VoIP, email, file, web
Satellite telephone (Iridium, Inmarsat)	Global	Voice, touch-tone, text messages, email, web
Power line communication	Nearly global	Voice, email, file, web, VoIP
Very low frequency	global	Voice, text messages

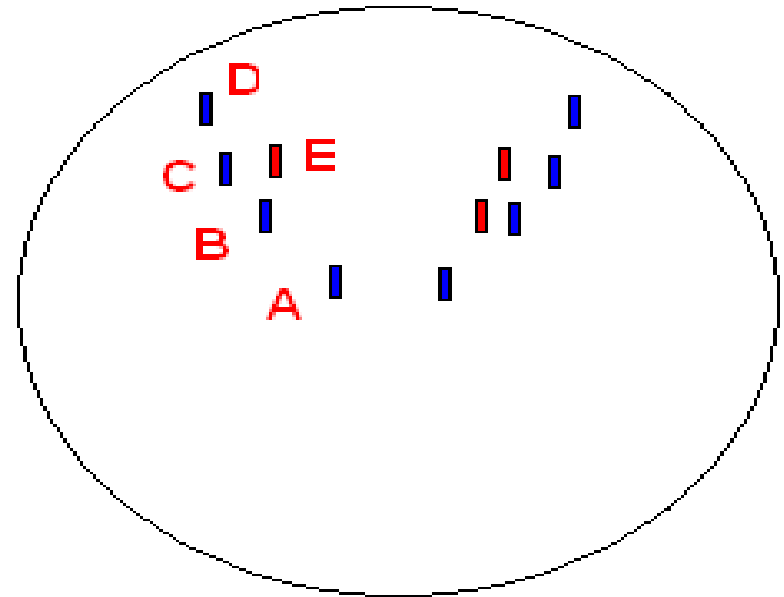
Possible Solution

- Use high Omni directional antennas which can cover a distance of say tens to hundreds km.
- Use of one to many point sector antennas.
- Make use of mobiles as sensor nodes for reaching to destination.



Mobile as Medium for transmission

- Multiple hopping
- Destination through route D-C-B-A OR D-E-B-A
- There can be n paths for connectivity to any node.
- Individual personal mobiles shall be utilized.



Catastrophic Area

1. Text messages / Call
 1. Actual catastrophic area
 2. Catastrophic condition in urban area

Thank you

Email ID-- Dmb@es.aau.dk

Suggestions....

Questions....