



Indo-European dialogue on ICT standards & Emerging Technologies

(Growth, Profitability & Nation Building)

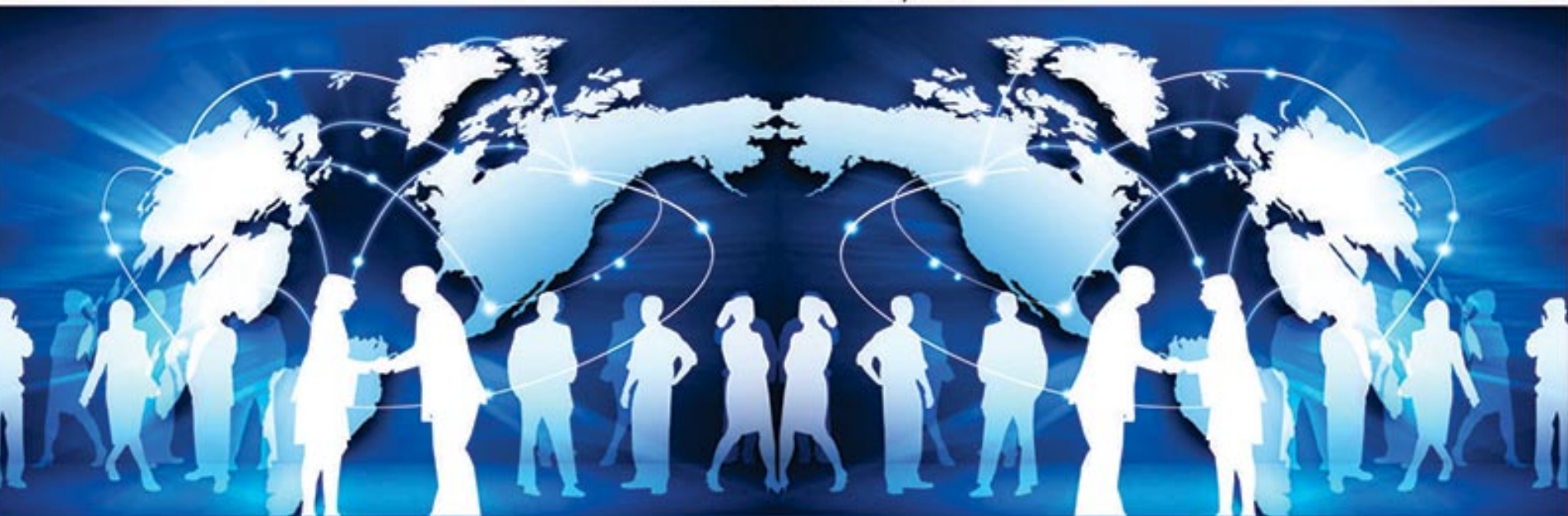
13-14th March 2014 • New Delhi, INDIA

IN THE FRAMEWORK OF

Project

SESEI

<http://eustandards.in/>



Machine to Machine Communication Network



सी-डॉट
C-DOT

Presented by Vipin Tyagi ,Director , Centre for development of Telematics

Network Evolution

Changing Role of Networks



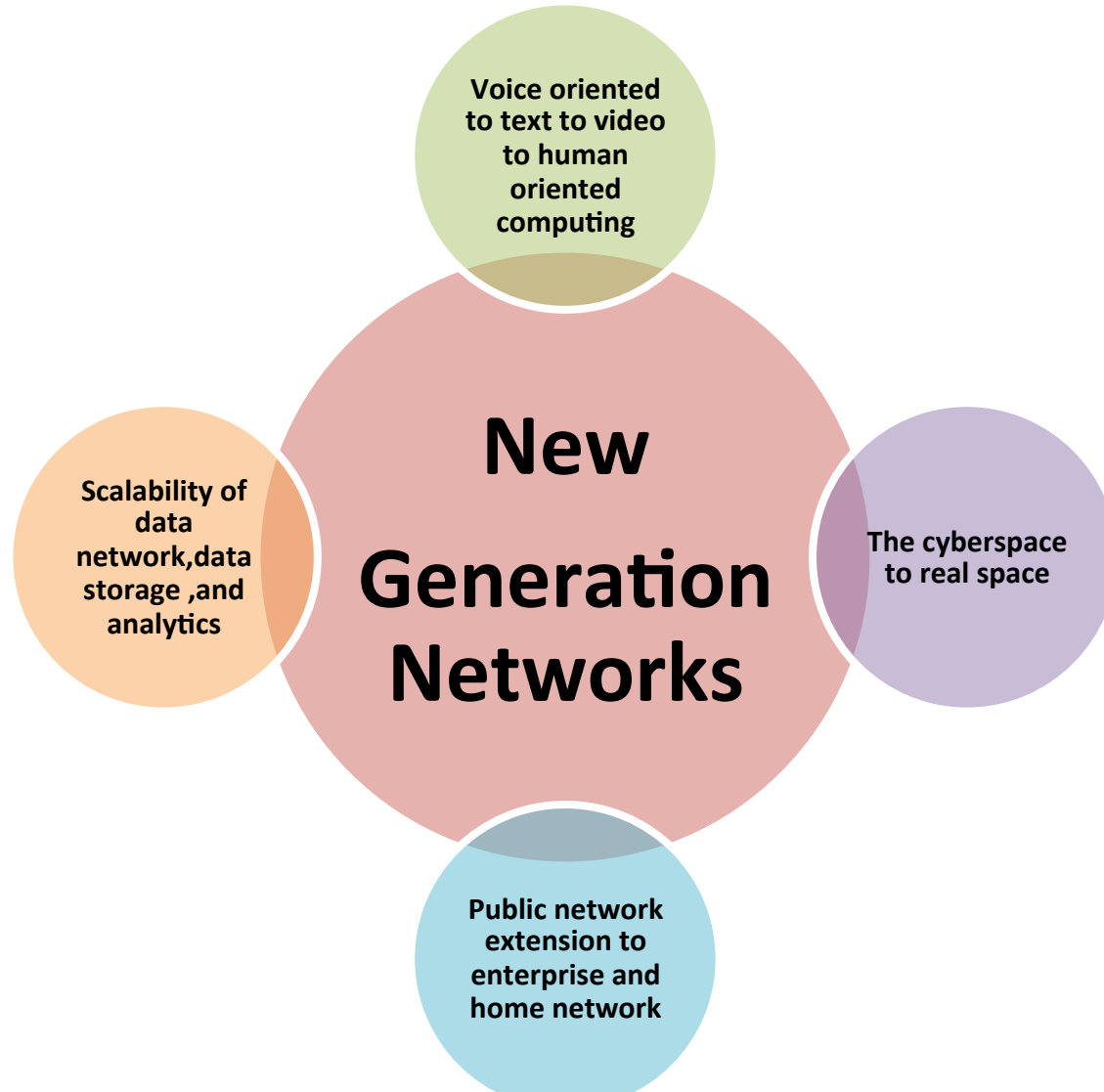
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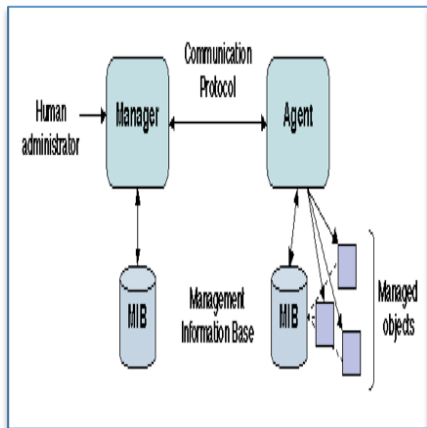


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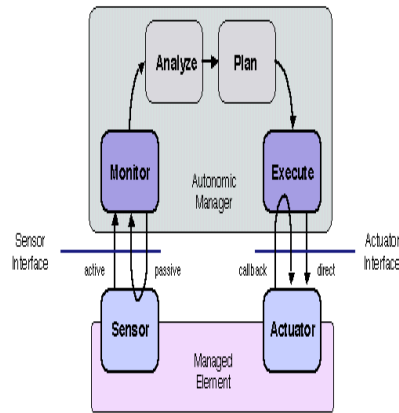
The Network evolution continues



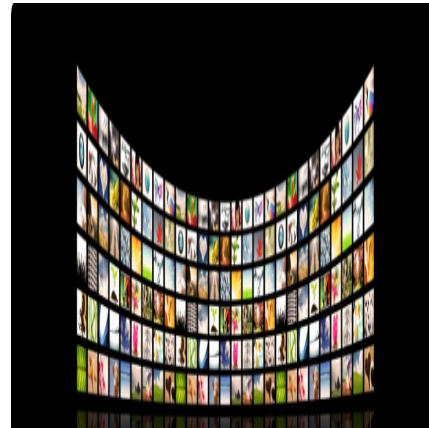
Future Network Characteristics



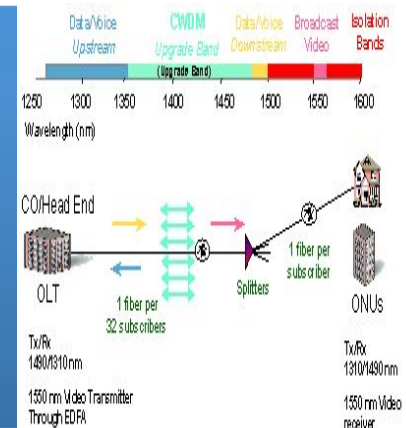
Smart Management
Software oriented



Sensors & Actuators
Remote application



Video based
Decision/ image algorithms



Optical Networks in
Access and aggregation
Example : G-PON

1G

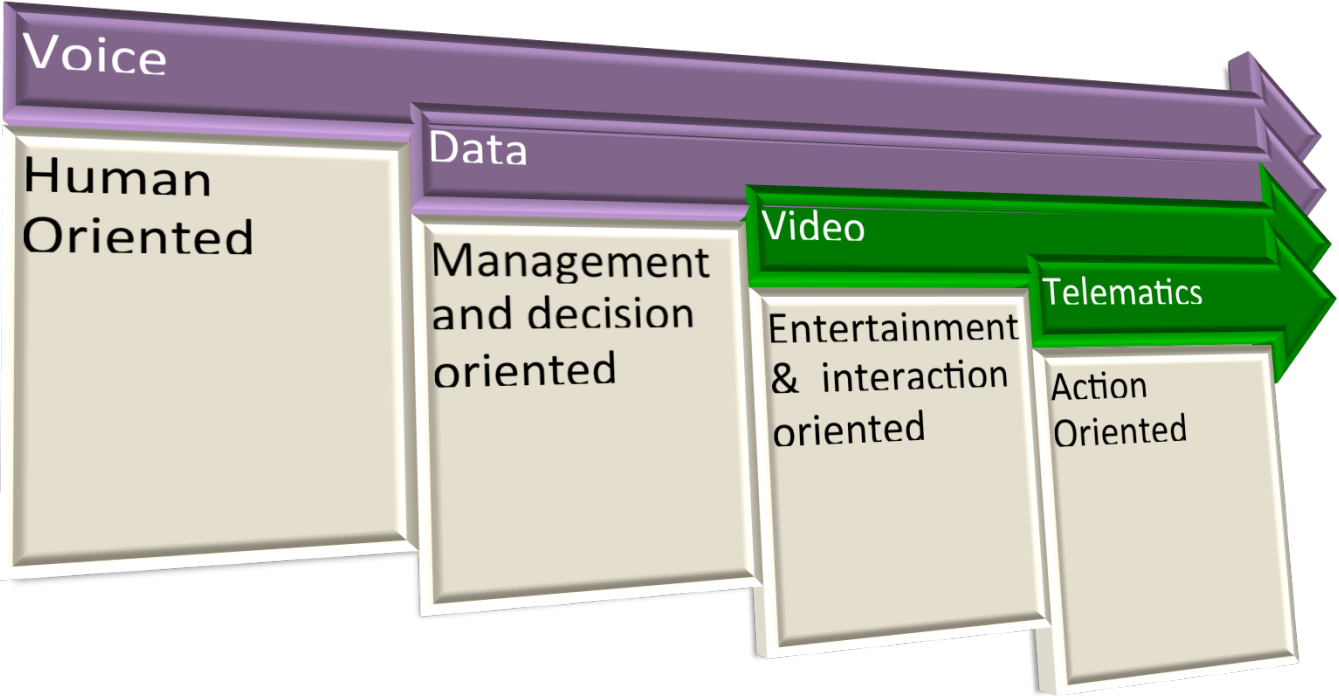
10G

40G

100 G

Ever Growing Bandwidth Demand

M2M will have increasingly higher level of implication



Voice oriented to text to video to human oriented computing

- Camera are having cognitive ability and analysis
- Microphone is for voice recognition
- Televisions and displays are getting better then real
- All most all buttons are having a processors in new generation machines

The cyberspace to real space

- Machine to Machine communication
- Augmentation Reality
- Actuators/Sensors
- Smart Grid
- Automotive Telematics

Third dimension –the drone

Big,Mini ,micro



How much a thermostat and smoke detector startup company is worth?



Google gains entry to home and prized team with \$3.2 billion Nest deal



Security for M2M Networks

Actions Orientation has larger security Implication



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सी-डॉट
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M2M-It is difficult to find who is who
without a system ?

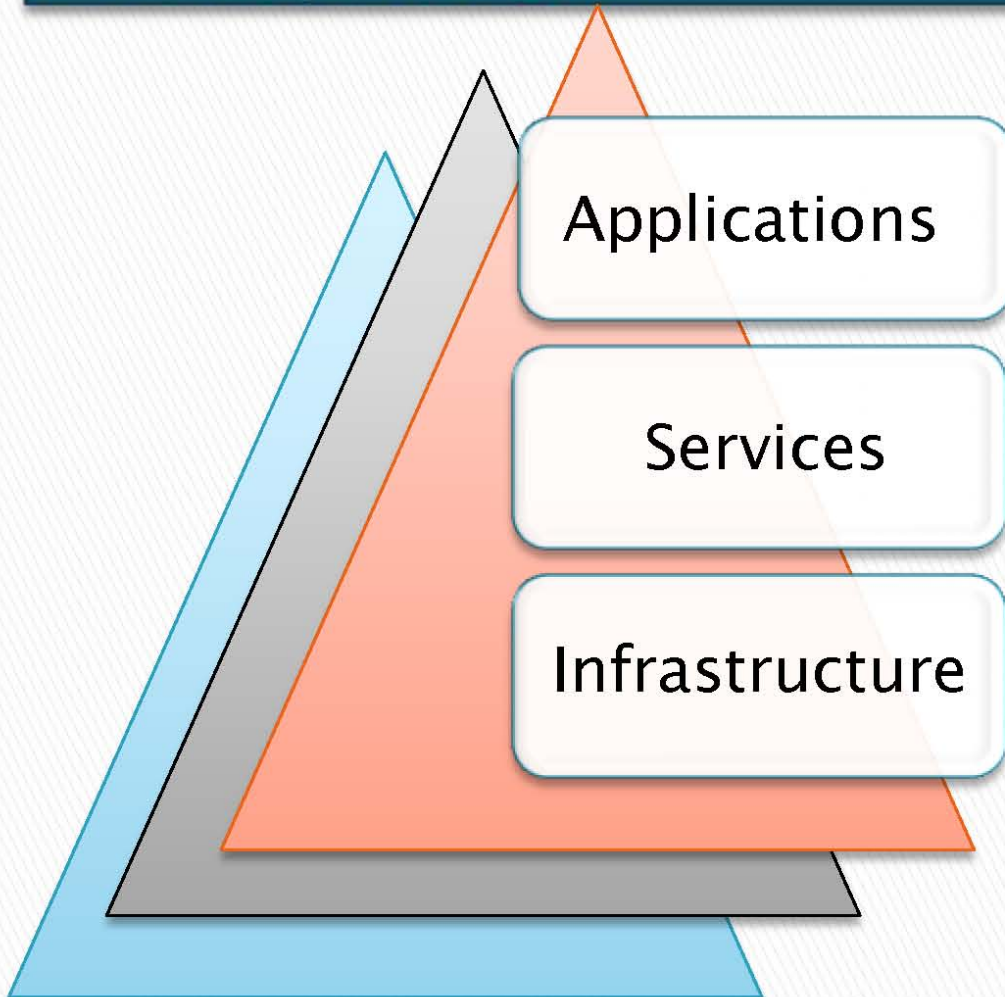


Major Security Threats



What Security measures to take?

8 Dimensions to protect against all major security threats



1. Access Control



2. Authentication



3. Non-repudiation



4. Data Confidentiality



5. Communication security



6. Data Integrity



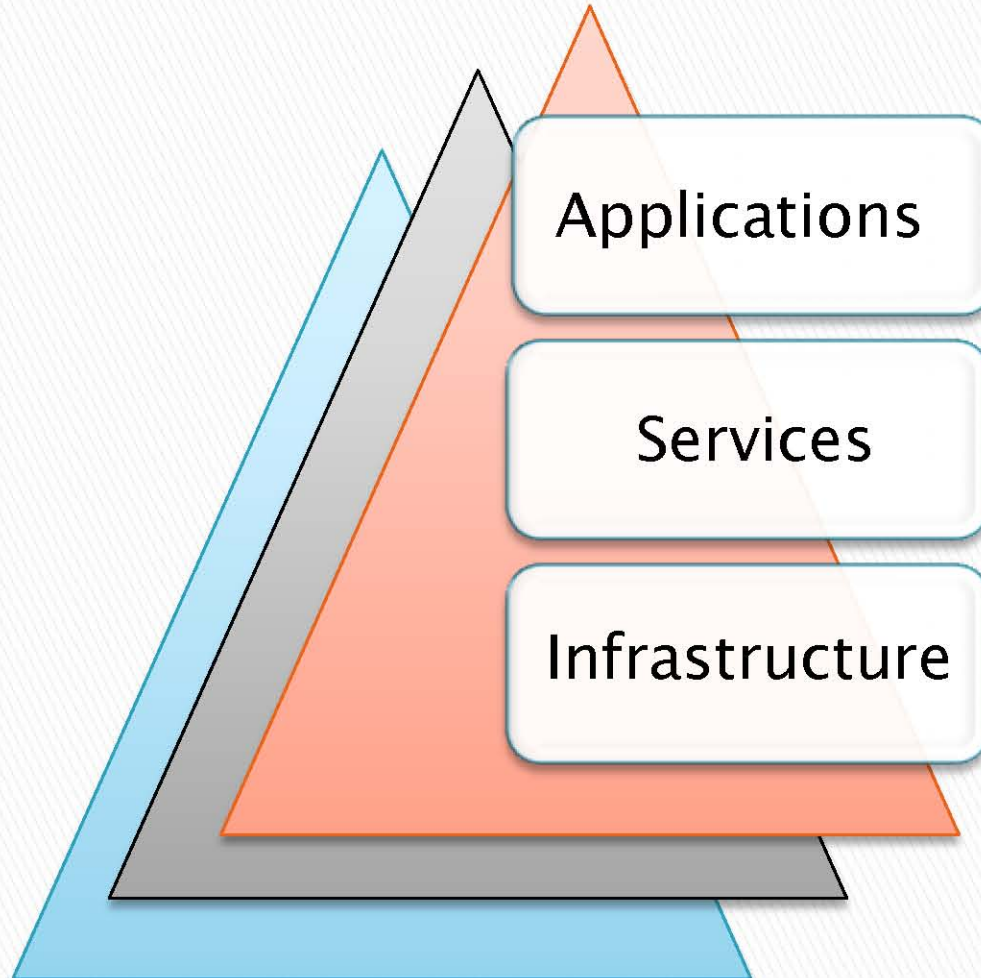
7. Availability



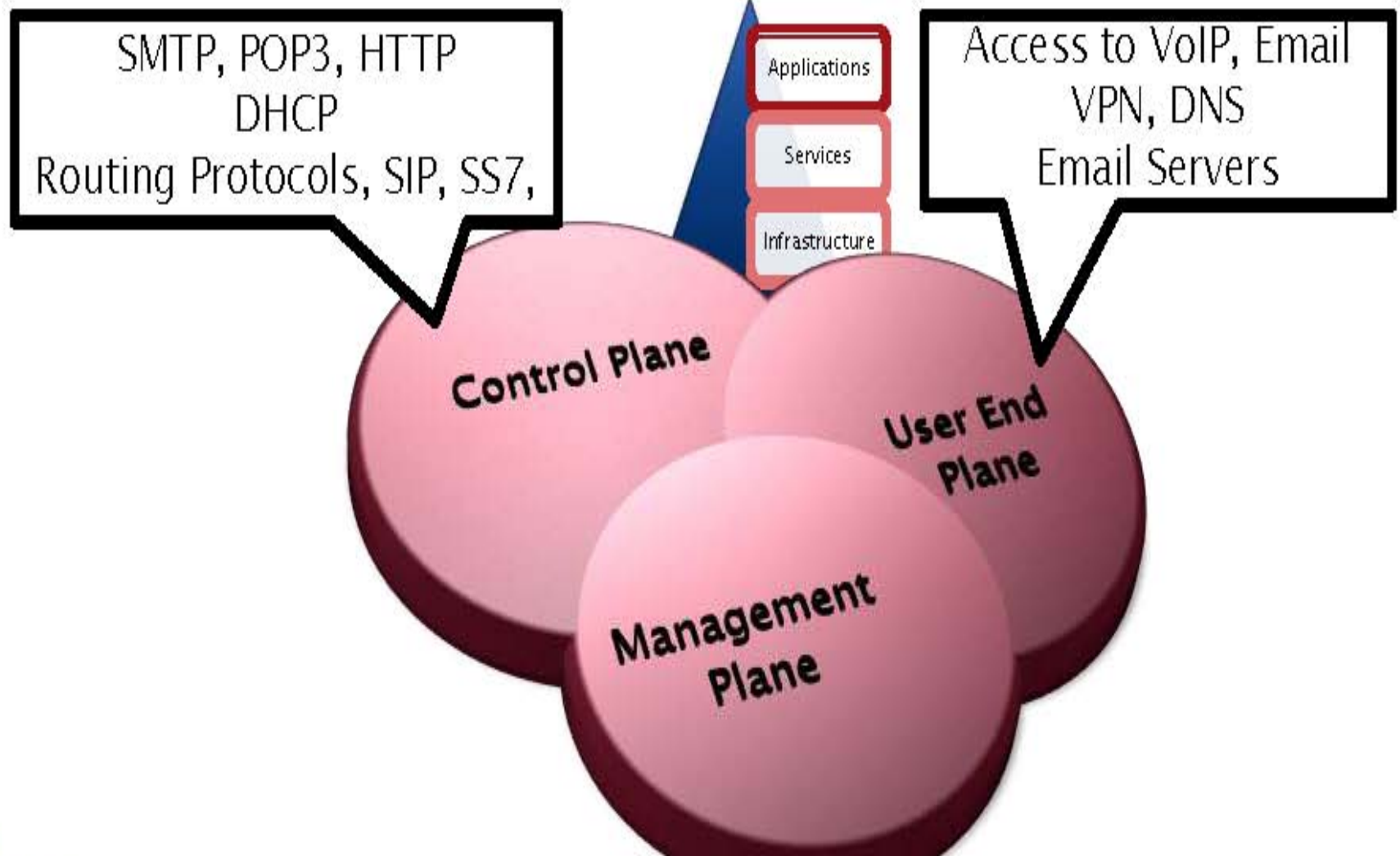
8. Privacy

What to Protect? – 3 Layers

Build on one another



Domains of Network activities in 3 Planes



4 Tier Architecture

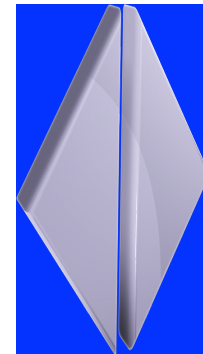
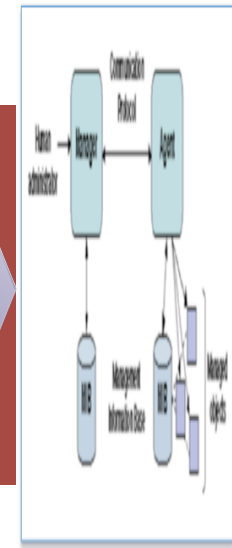
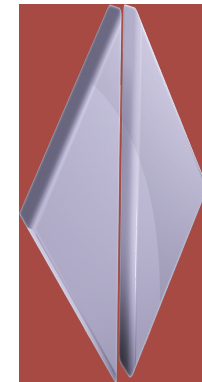
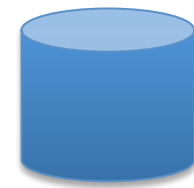
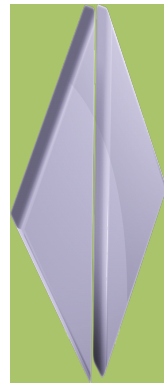
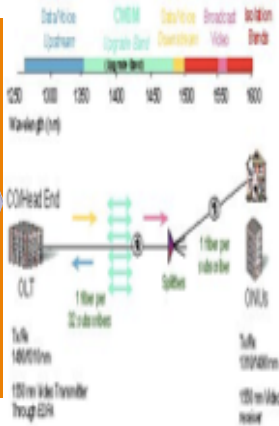
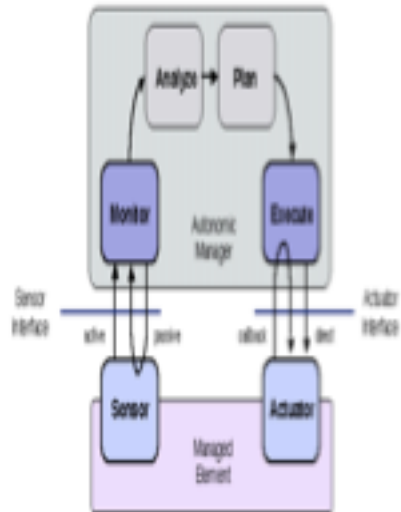
Sensor Network

Tier1
Sensor/Machine
control Gateway

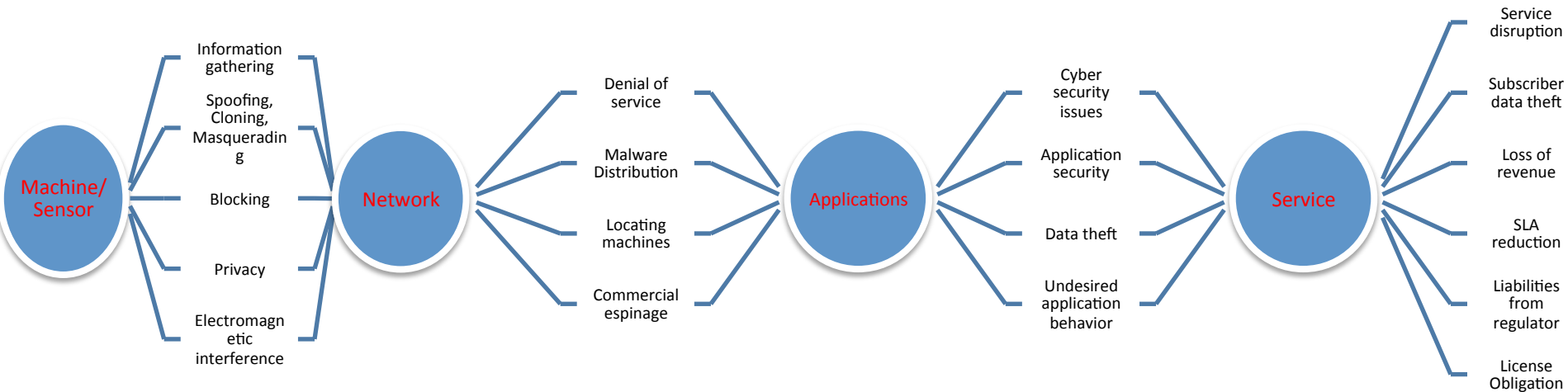
Tier2
IPV6 Network
control Gateway

Tier3
Application
control Gateway

Tier4
service
control Gateway



Security issues



Loss of confidentiality
 Loss of data integrity
 Loss of data availability
 Unintended Action

Disruption of Network
 Loss of confidentiality
 Loss of data integrity
 Loss of data availability
 Uncontrolled Actions

Application Disruption
 Disruption of Network
 Loss of confidentiality
 Loss of data integrity
 Loss of data availability
 Uncontrolled application Behavior

Loss of revenue
 Service Disruption
 Business Liability
 Legal Obligations
 Privacy law
 Lawful interception
 Public accountability

M2M application benefits are path breaking

Imagination is more important than knowledge



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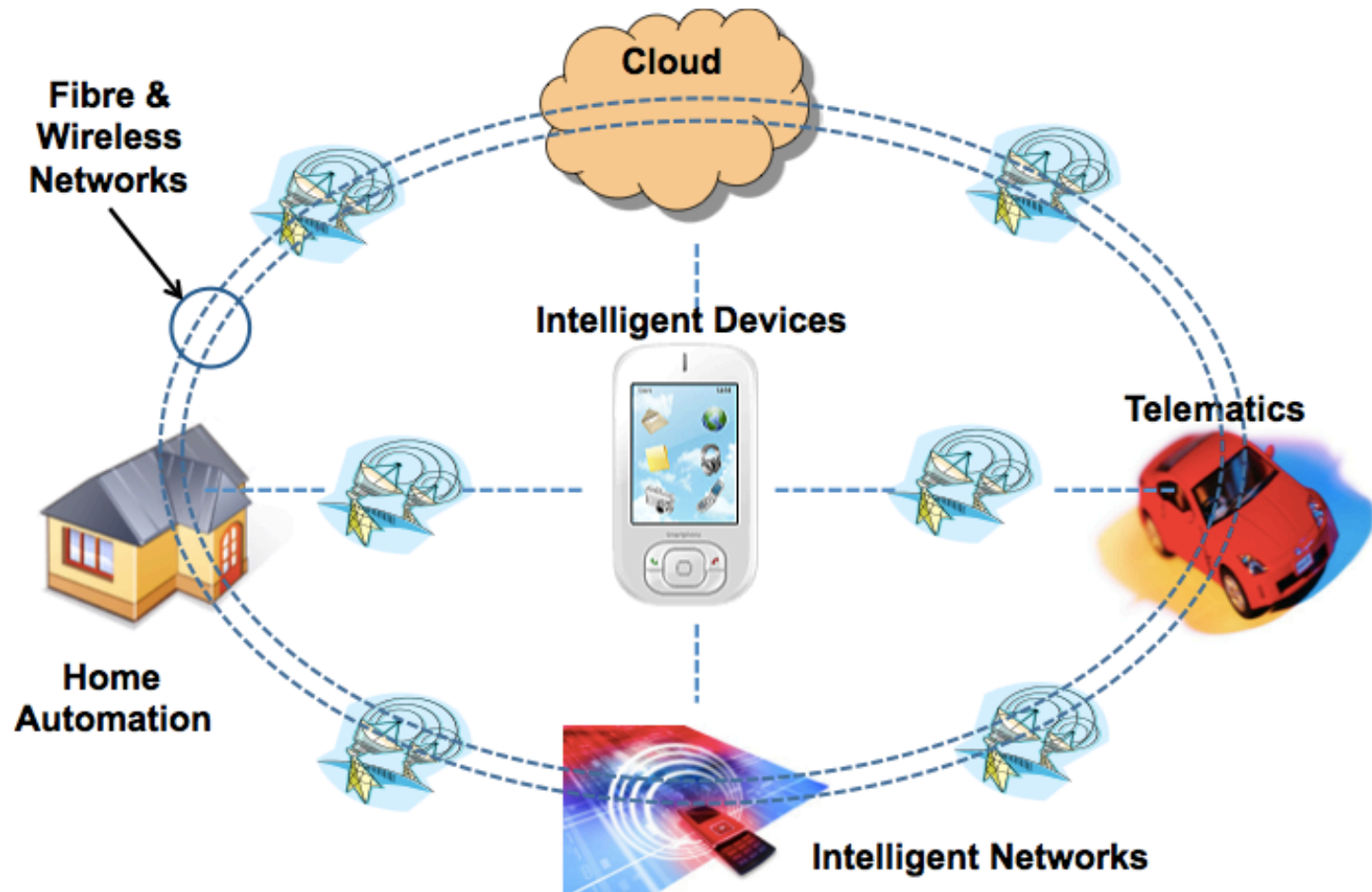
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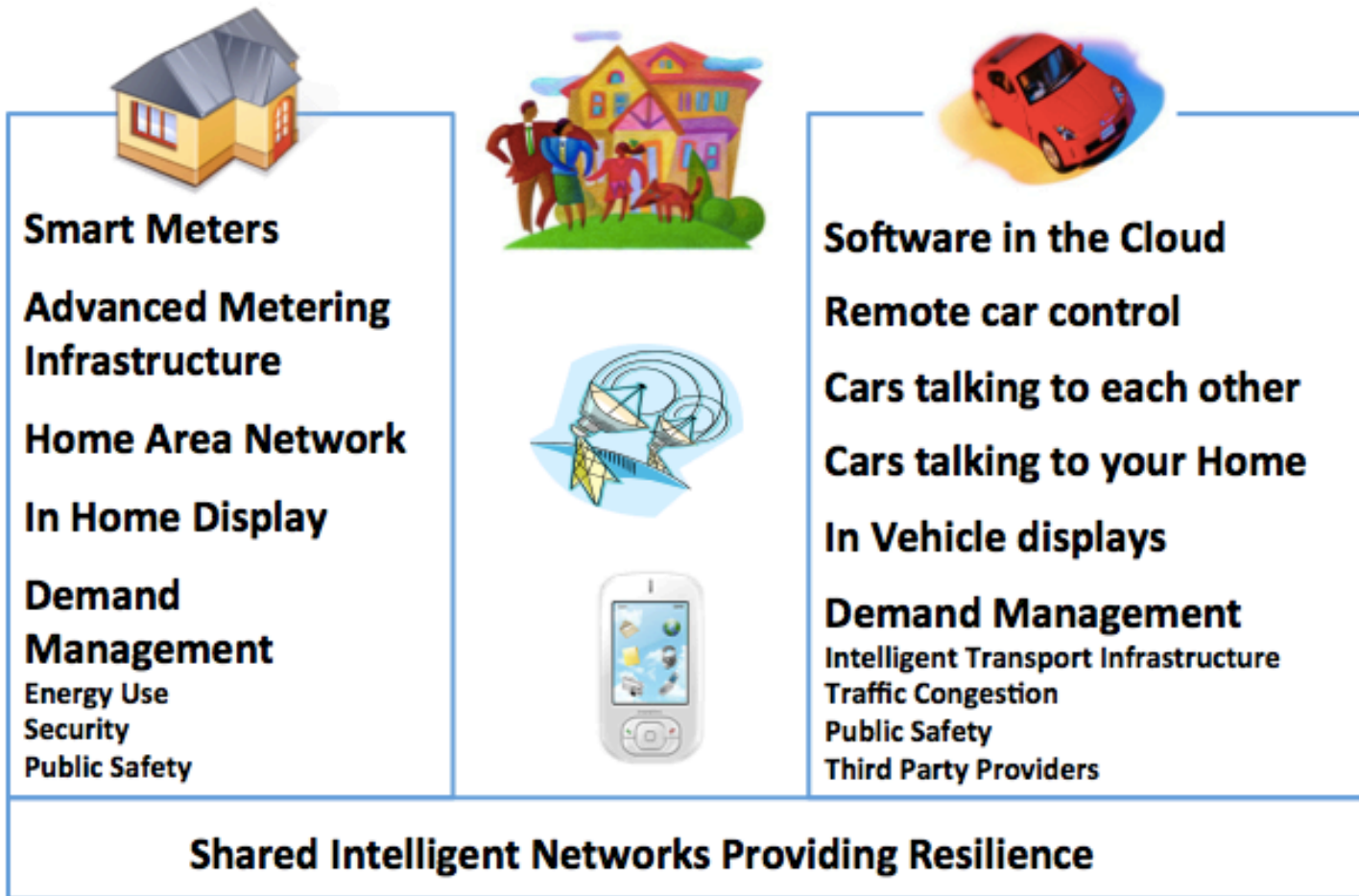
Classification of applications/Services

- Enterprise application –within the network limit of enterprise and no connection with other networks
- Public Utility- The application owned , controlled and operated by an entity that has non telecom public utility services
- The Licensed service provider's application/services – providing services in license service area
- Defense/Security/Law enforcement agencies applications over dedicated /specialized /public/ networks
- Government Agency's public good applications/ Network for various government ministries funded by central or state Government .

M2M Real Time Always connected



The applications are numerous



Legislation & Regulation

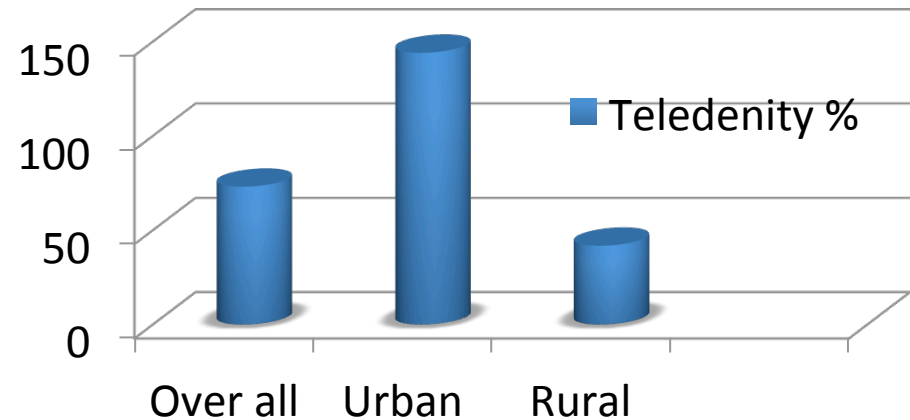
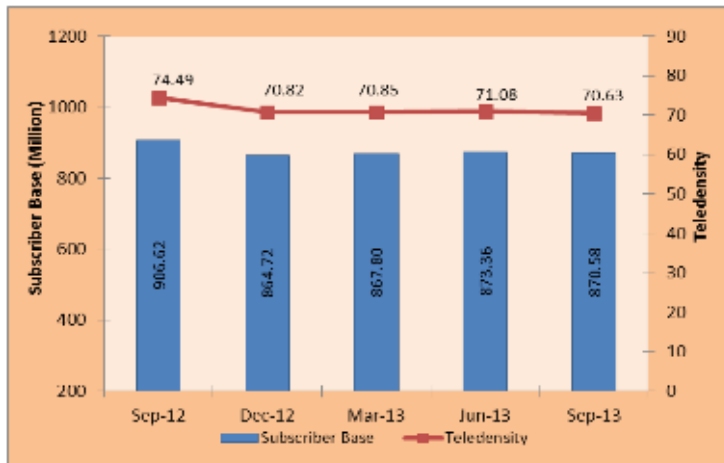
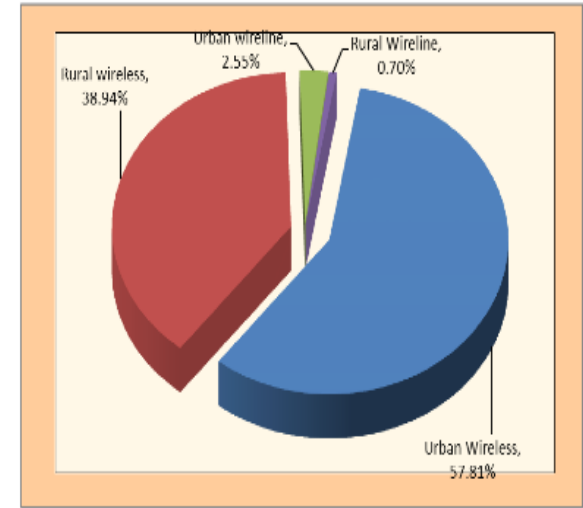
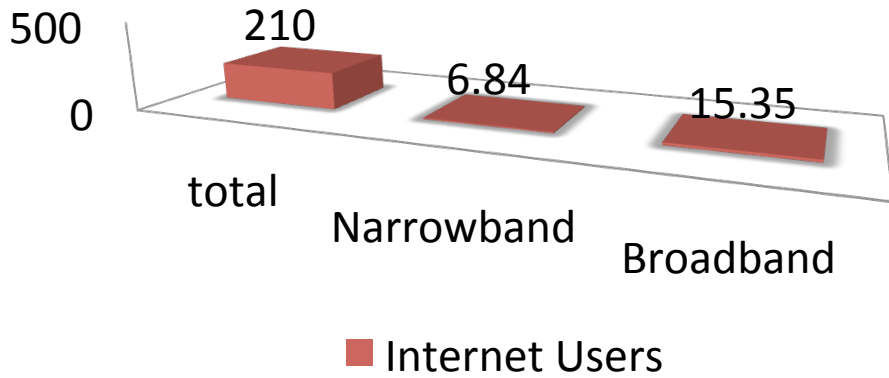
Big Data

Innovation and not imitation -New Way forward



- Visualise Brick&Mortar to online shift
- Analyse regional preferences
- Look at the new value proposition
- Aggregation and distribution opportunity
- Indian Solution to Indian problems

Rural India is catching on Internet



Smart Villages – Optimization of farming inputs

- Through measurement , observation advise and correction in real time interactive
 - Fertilizers
 - Pesticide
 - Water
 - Tilling
 - Seed
 - Farm protection
- Payment
Advance
Insurance/Assurance
Subsidy transparency
Loan transparency

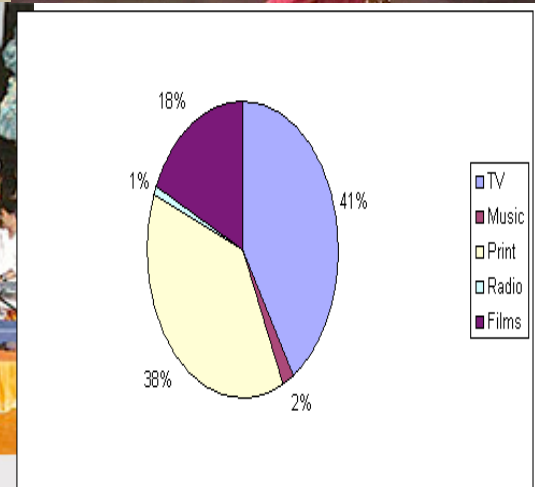
India has long history of folk entertainment



Swang



Performing Bharud



Music Distribution solution in rural village over fiber



Sangeet Damak ONT from C-DOT
Wi-Fi POP+2xTelephones +Cable
TV+4x100Mbps + 1x1Gbps+FM
Trnasmmitter+ disaster paging +
Music player+internet radio+
+2xUSB Port+Remote+ feed to
stereo+printersharing

The Next thing from CDOT -Titli Damak



FTTD fiber to the desk
Small,
beautiful ,
affordable

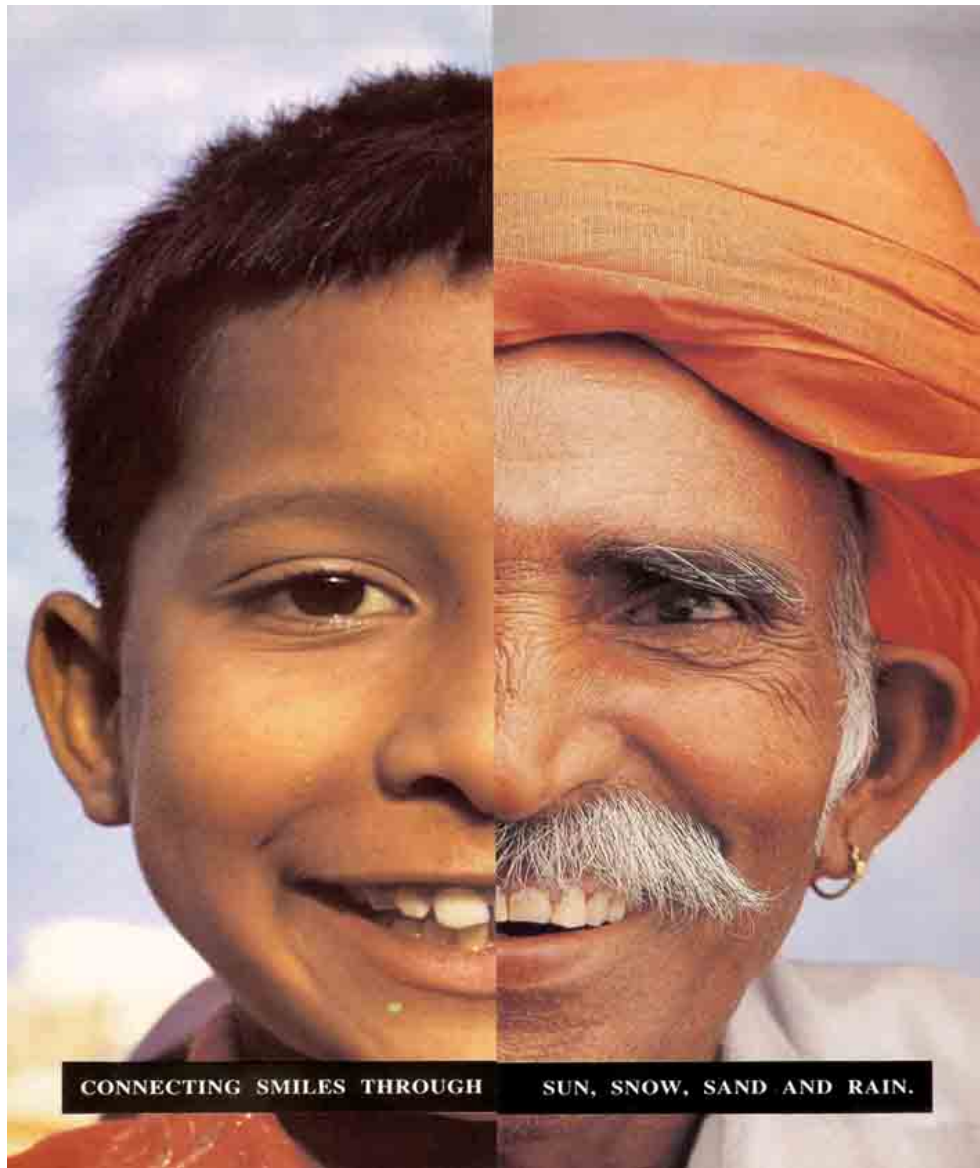
- Fiber connected
- 2Ports of 1 Gbps
- Mobile-stand and charger
- Telephone
- Videophone

This can become gateway for your Super broadband connectivity

Conclusion

- ❖ M2M will unlock the true potential of Networking and ICT through innovation and imagination
- ❖ M2M will generate new business challenges of security , control and transparency
- ❖ Regulation ,policy and standardization challenges are being addressed by various entities
- ❖ New Technology development is required for Indian/Developing countries Requirements





CONNECTING SMILES THROUGH SUN, SNOW, SAND AND RAIN.

Thank You