

# 2<sup>nd</sup> Indo-European Dialogue on ICT Standards & Emerging Technologies

4th November 2015 • Shangri-La's - Eros Hotel, New Delhi, INDIA



## M2M/IoT @ TSDSI.

# M2M/IoT WG

## 1. Requirements of Vertical Industries (Use cases)

Utilities	Transportation	Remote Asset Monitoring
Health (Consumers & Rural)	Smart Home/Consumers	Environment Pollution Control
Agriculture	Smart Cities	Internal Security (Public Safety)
Smart Villages	Smart Governance	Industrial Automation

## 2. Naming & Addressing

## 3. Security & Privacy

## 4. Protocols, interfaces and architecture

## 5. Access Network and Core network

## 6. Data Science

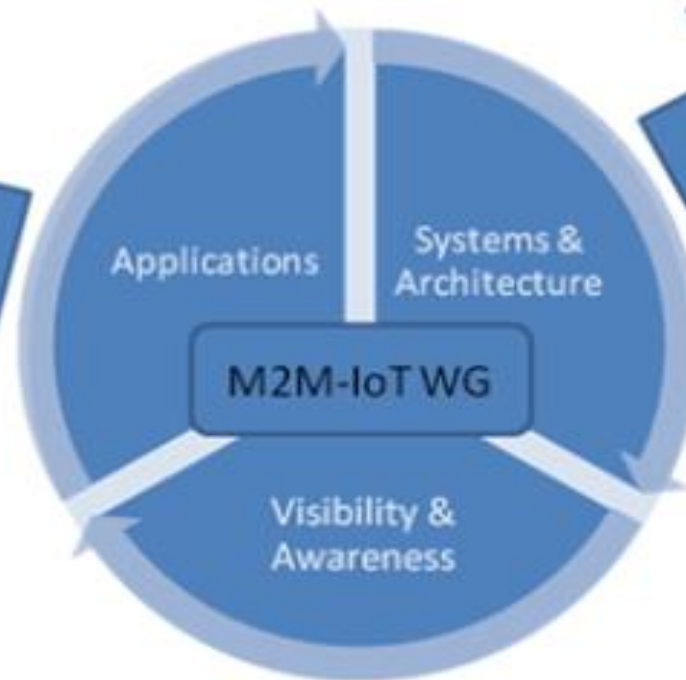
### IoT/M2M is not a Technology,

Its complex ecosystem of different verticals and horizontal technology layers working together

With few verticals and horizontals on priority.



*Liaison with domestic M2M/IoT ecosystem,  
Govt entities, vertical industry specific  
organizations, forums, associations, and  
relevant domestic SDOs.  
Responsible for collecting requirements.*



*Liaison with Global SDOs, Partner  
organizations and other TSDSI SG/WG  
Responsible for creating and maintaining  
Specifications*

Prospect users & Contributors.  
Release, Events, Webinar, Website, publications, print  
media (Work In coordination with TSDSI Marcom team)  
Responsible for creating awareness

# The Beginning....

## “India - The land of exceptions & diversities”

M2M Work Group has created its first draft of Technical Reports: “Machine-to-Machine Communication (M2M)-Study on Indian use cases” for different Verticals.

Will form the foundation of Indian requirements, for further activities towards standardization. Land of India, is ideal representation of challenges of Developed as well as a developing countries.

Create awareness among the users, from various vertical industries and involve appropriate organizations.

Till Now : M2M WG had 2 F2F Workshops in new Delhi, and 3<sup>rd</sup> to be planned soon.


Contribution to Global SDOs : Contribution made till now : to SG20 ITU, Contributions to M2M Specification from CDoT (member, TSDSI).



# ITS – Will be discussed in detail tomorrow

Vertical leader : Dr Samar Shailendra, Scientist TCS

Vice Chair M2M WG TSDSI

Name	Organisation	Name	Organisation	Name	Organisation
Aditya Babu	Happiest Minds	Alok Sethi	DIMTS	Kapil Goyal	Student SITM
Hemant Rath	TCS	Sirish Batchu	Mahindra	Prashansa Golani	Student SITM
Bindoo Srivastava	TICET	Anuj Jain	Student SITM	Arpit Jain	Student SITM
Vijay Madan	TTSL	Anantha Simbha	TCS	Subham Purohit	Student SITM
Sai Pratyush	TTSL	Shanmugasundaram M	HappiestMinds	Devendra Patil	Student SITM
Dr Vinay Vaidya	KPIT	Shirsanka Saha	TTSL	Aditya Jaiswal	Vodafone
Mr TP Malik	idiagnosis	Shivalik	Map My India	Kishor Narang	Narnix
Prof Giri Hallur	SITM	Dinesh Chand Sharma	SESEI	Anupam Vibhuti	Workxspace CPL
Sushil Kumar	TEC	Raunaque Quaiser	STMicroelectronics	Nanda Kishore	Student SITM
Rajeev Kumar Tyagi	TEC	Rashmi Chidri	HappiestMinds	Darpan Kamat	Student SITM
Abhijit Mulay	Automotive Research Association of India	Manu Tayal	HappiestMinds	Partha Shah	Student SITM
Aditya Babu	Happiest Minds	Himani	Student SITM	Darpan Kamat	Student SITM
Abhash Sharma	DIMTS	Mayank Rai	Student SITM		
Anupam Vibhuti	Workxspace CPL	Akshay Mishra	Tata IITB Center of excellence in telecommunication		 <b>SG2 WG1 - M2M WG</b>

# E health

Vertical Chair : Rahul Kumar, Telecom consultants India Limited.

Raahul Kumar Srivastava	TCIL
Mani Rajakannu	TCS
Ashok Khanna	TCS
Narendra Saini	Sukrut Systems
Aditya Jaiswal	Vodafone
Anuj Ashokan	TTSL

Raunaque Quaiser	STMicronics
Alok Mittal	STMicronics
Sumit Dhingra	Reliance JIO
Niranth Amogh	Huawei
Bindoo Srivastava	IIT Bombay
Jayeeta Saha	TSDSI



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# E – Health

- ❖ Low latency, Ultra reliable, High bandwidth, discovery, Identification, Security and privacy, Mobility for ambulance & Wearables (Integrated with V2X and smart Infrastructure for Cities)
- ❖ Middle Mile & last mile reliable technologies for Remote areas.
- ❖ Part of Critical communication infrastructure, incase of emergency & internal security Situations. With emergency control center, Police PCR VANs, Para military, fire brigade. ETC.



# E – Health

- ❖ UC Remote Patient Monitoring (RPM)
- ❖ UC\_Rural\_Scenario
- ❖ UC\_Assisted\_Living
- ❖ UC\_Mobile\_Care
- ❖ UC\_Smart\_Wearable\_Devices
- ❖ UC\_Asset\_Tracking
- ❖ UC\_Patient\_Identification
- ❖ UC\_Clinical\_Monitoring
- ❖ UC\_Radiology\_data\_transfers
- ❖ UC\_Video\_Conferencing
- ❖ UC\_Remote\_Drug\_Delivery
- ❖ UC\_Remote\_Robotic\_Surgery
- ❖ UC\_TeleMedicine
- ❖ UC\_LIS (Laboratory information System)





# Environment and Pollution control

Vertical Chair : Akshay Mishra, CTO DSP Works

Anuj Ashokan	TTL
Bindoo Srivastava	IIT Bombay
Rajan Ma	TCS
Nandan Jha	IIT Bombay



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# Environment and Pollution control

- ❖ Delay tolerant, small packet, high density, energy efficient, disposable (Environment friendly, high range (typically to cover a city.), analytics, auto recommendation algorithms and stringent policy and regulation.



# Environment and Pollution control

- ❖ Automotive Vehicle Pollution Under Control
- ❖ Urban Garbage Disposal Management
- ❖ Portable Water Quality Monitoring
- ❖ Factory Waste Monitoring
- ❖ Remote Pollution Monitoring in Public Areas
- ❖ River Health monitoring
- ❖ Methane Gas monitoring



# Smart Agriculture

Vertical Leaders : Pooja Immadi, Scientist TCS & Santosh  
ostwal, Nano ganesh, with team.



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# Smart Agriculture

- ❖ Near real time, small & large packet, low density, highly energy efficient, low-medium range (typically to cover a village.), mesh topology, multi hop relay, edge computing, local intelligence, self sustainable network, high location detection, low mobility, auto recommendation algorithms, Local language support.



# Smart Agriculture

- ❖ Smart Irrigation
- ❖ Rural weather information system
- ❖ Agriculture Activity Detection
- ❖ Unmanned Aerial Vehicles based Crop Monitoring
- ❖ Plant Disease Forecasting System
- ❖ Rural Participatory Sensing System
- ❖ Warehouse Environment Monitoring
- ❖ Food Processing Automation
- ❖ Livestock and Poultry Management
- ❖ Smart animal farming and animal tracking
- ❖ Smart poultry and fisheries
- ❖ Smart dairy and milk productions

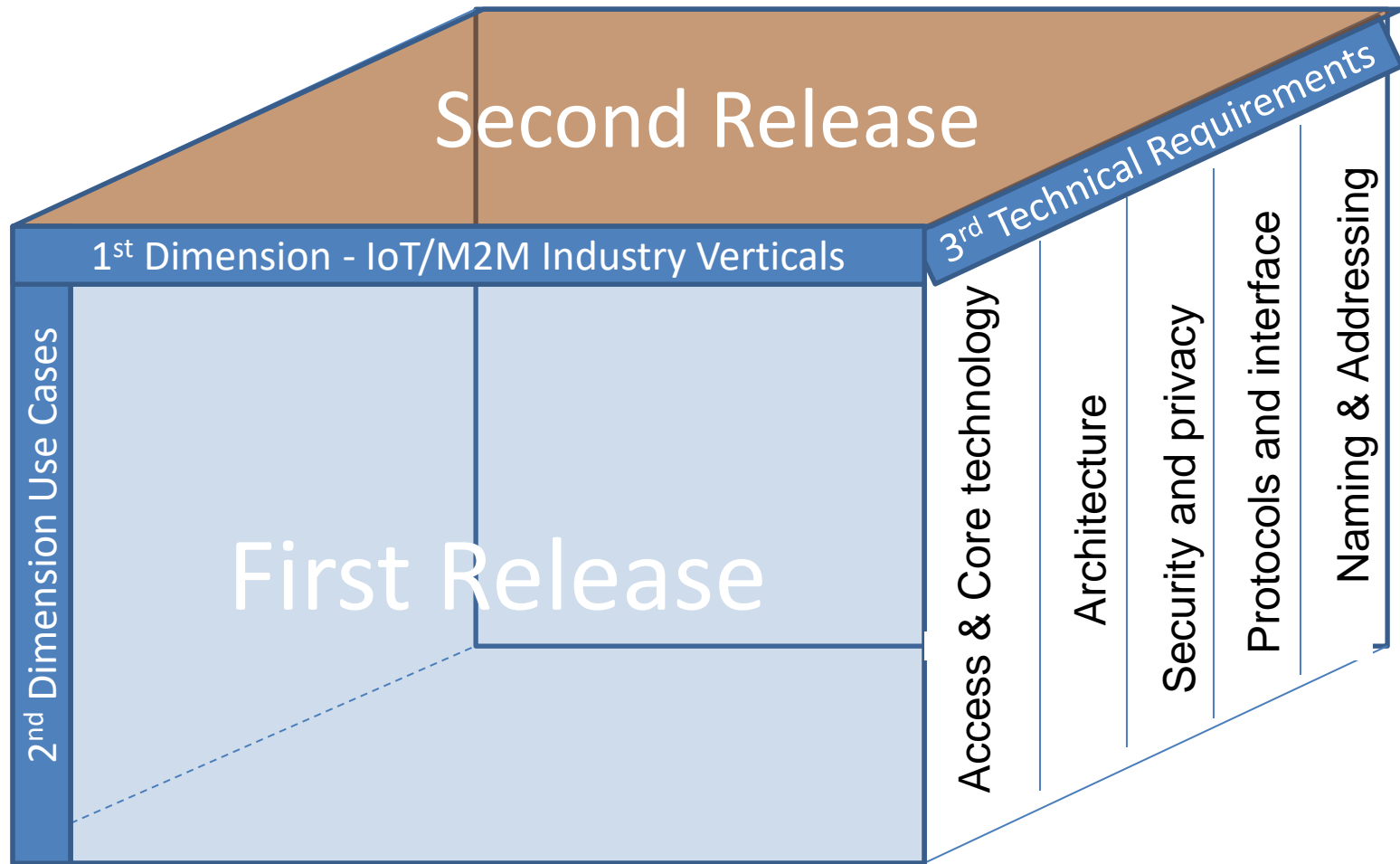


# M2M/IoT - the primary driver of next generation technologies.

- The mobility requirement will be derived as per need of IoT, Speed at which your – train or vehicles would move.
- Massive Broadband will be consumed majorly by Surveillance, streaming and in car infotainment use cases, and M2M will also it will have massive narrowband requirements where you don't need bandwidth at all.
- Low latency is needed by M2M use case, along with extreme other end of delay tolerant use cases. If data reaches with 2days delay is also acceptable.
- Unmanned devices will need energy efficiency more than anything else.
- OPEX reduction : IoT/Use cases are going to be LOW ARPU business, and reducing cost to serve is of prime importance for any Operator.
- Network based Location tracking is M2M LBS need.
- Dynamic RAN allocation is M2M use case, “door open and camera starts streaming”.. same device using different bandwidth with different triggers.
- Reduction is go to market is M2M needs. Plug & play devices, with application enablement APIs.
- Mission critical services are M2M use cases : Ambulance- Smart Grid, industrial automation, telemedicine, PCR vans.
- Ubiquitous Network : Is need of M2M as it will have multiple type of networks.
- Broadcast services will be consumes by M2M use cases like Digital signage, firmware upgrade, content delivery, Kindle.
- Dense Urban scenarios for Smart cities. Rural scenarios cannot be studies without Smart villages.
- Massive number of machine getting connected.
- Ultra reliable networks.



# 3D Requirement Gathering Approach





# Vertical and Horizontal Leaders...

- ❖ Editorial Chief : Debarati Ghosh, TCS
- ❖ Smart Cities : Bipin Gaia Smart Cities and team
- ❖ Smart Governance : Narendra Saini, Sukrut Systems
- ❖ Industrial Automation : Narayanan Rajagopal ,TCS
- ❖ Utilities : Bindoo Srivastava,
- ❖ Smart Home : Krish RIL
- ❖ Architecture : Niranth Huawei
- ❖ Naming and Addressing : Rahul Kumar TCIL
- ❖ Access Network & Core network
- ❖ Security and Privacy
- ❖ Data Science



# Link to draft technical reports

TR of different verticals : consists of exhaustive collection of India specific use cases

Consist of in-detail analysis of several important use cases

<https://akshaya.tdsi.org/index.php/apps/files/?dir=%2FStandards%2FStudy%20Groups%2FSG2>

Thank You, for your attention.

Anuj Ashokan

Tata Teleservices Ltd. (TSDSI Chair – M2M WG)

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