



# **IOT standardization in China**

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**China Electronics Standardization Institute**

# Outline

1

**Introduction of CESI**

2

**IoT Standardization Progress**

3

**Object Identifier (OID) for IoT Identification**

4

**Next work for IOT**



# Introduction (1/4)



**China Electronics Standardization Institute**

**Founded in 1963**

**Basic, public welfare and comprehensive research institutions of standardization in the field of electronic information technology**

**Employees: More than 700**

**[www.cesi.cn](http://www.cesi.cn)**





## Services (2/4)



**Strategy Research and Management Support**

**Standards Research and Formulation**

**Measurement and Calibration**

**Testing and Verification**

**Accreditaion Evaluation**

**Training and Information Services**





# Services

## --Standardization(3/4)



### National Standardization Organization

#### Secretariat of 16 National Standardization

#### Technical Committees

- SAC/TC 28 on information technology standardization
- SAC/TC 153 on Electronic Measuring Instrument
- SAC/TC 166 on Electromechanical Components for Electronic Equipment
- SAC/TC 167 on Vacuum Electronics Devices
- SAC/TC 242 on Audio, Video, Multimedia System and Equipment
- SAC/TC 260 on Information Security Standardization

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### International Standardization Organization

#### Centralized Management of 21 TCs and 33 Sub TCs in ISO and IEC.

#### Information Technology ( ISO/IEC JTC 1 )

- ISO/IEC JTC1/WG 7 Sensor Networks
- ISO/IEC JTC1/WG 9 Big Data
- ISO/IEC JTC 1/WG 10 IoT
- ISO/IEC JTC1/SC 27 IT Security Techs.
- ISO/IEC JTC1/SC 38 Cloud Computing

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# Services —Qualifications(4/4)

## International

- **CB Lab approval by IECEE**
- **FCC Testing Lab in China approved by US FCC**
- **Agent Lab in China appointed by TUV of Germany**
- **Zigbee Lab in China appointed by Zigbee alliance**
- **NEMKO EMC Testing Lab in China approved by NEMKO of Norway**
- **Testing Lab for UL, Third Party Testing Data Program (TPTDP) approved by UL**

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## National

- **National Engineering Lab for electrical Product standardization**
- **CCC Testing Organization appointed by CNCA**
- **Accredited Lab approved by CNAS**
- **National Software Standard Promotion Center**
- **National OID Registration Center**
- **National IC Card Registration Center**

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# IOT is developing rapidly!



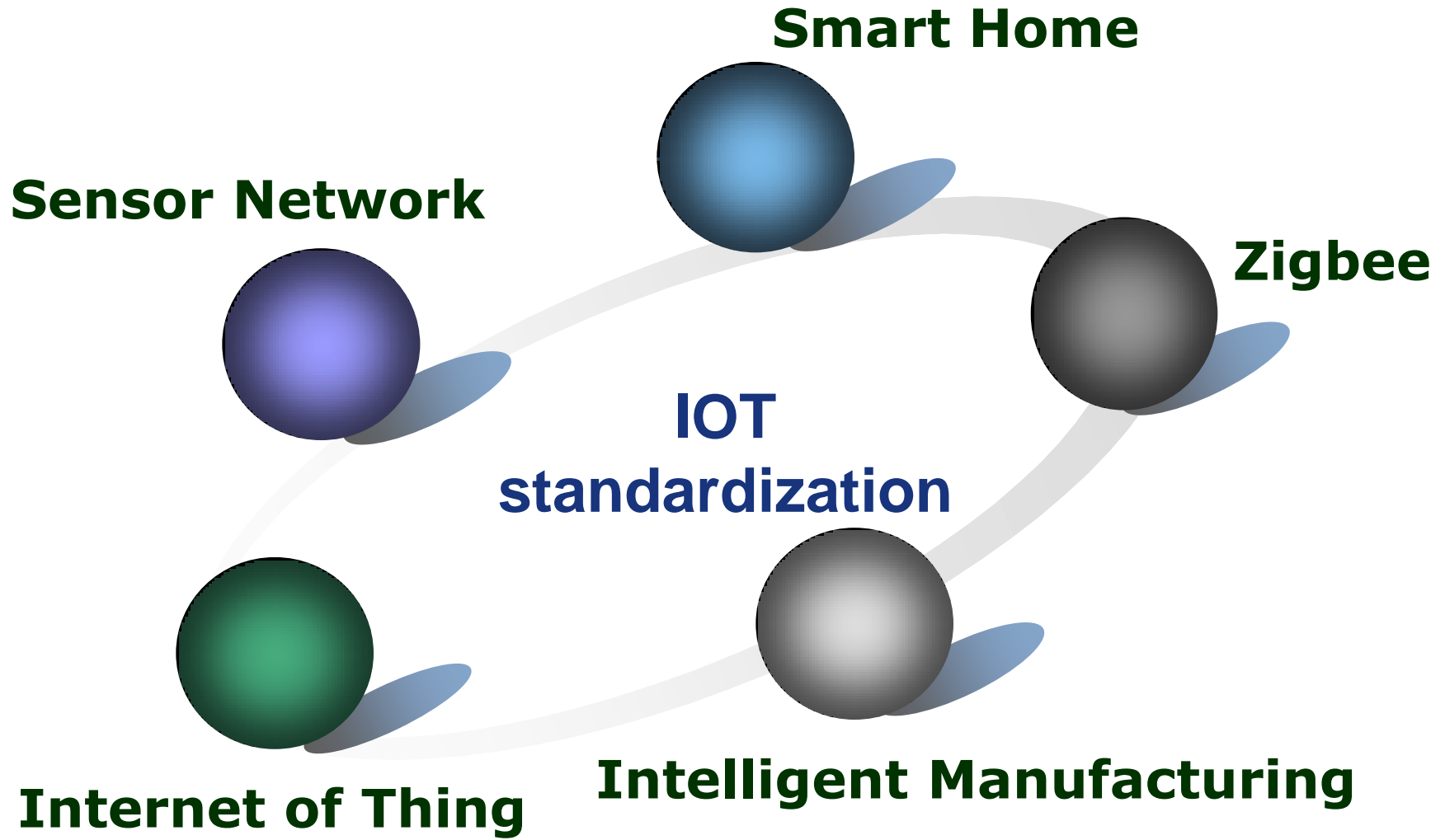
# IOT standardization is developing also!





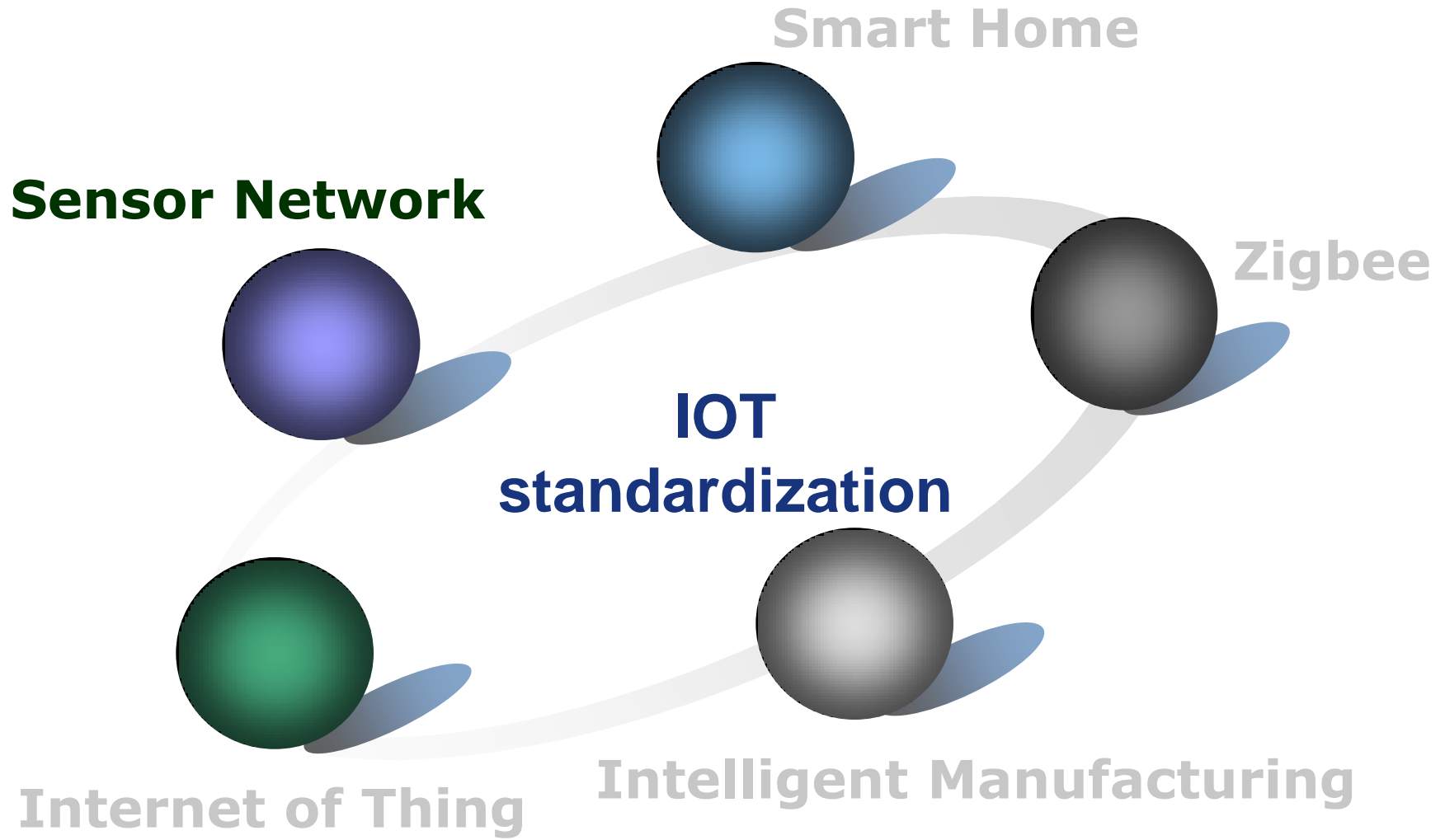


# IOT standardization



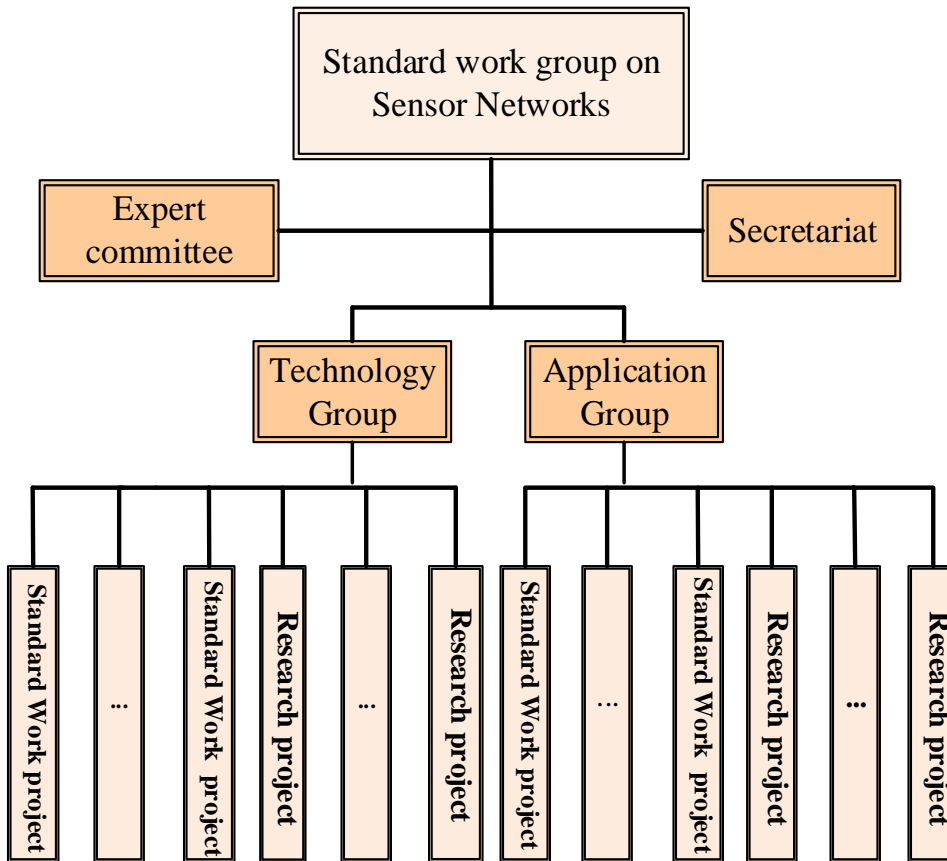


# IOT standardization



# Sensor Network

## Standard Organization



# Sensor Network

Standard Organization

Standard Progress

No.	Standard No.	Standard Name
1	GB/T 30269.1-2015	<i>Information technology - Sensor networks - Part 1: Reference architecture and general technical requirements</i>
2	GB/T 30269.2-2013	<i>Information technology - Sensor networks - Part 2: Terminology</i>
3	GB/T 30269.301-2014	<i>Information technology - Sensor networks - Part 301: Communication and information exchange: Network layer and application support sublayer technical specifications for low-rate wireless sensor networks</i>
4	GB/T 30269.302-2015	<i>Information technology - Sensor networks - Part 301: Communication and information exchange: High reliability wireless sensor network MAC and PHY specification</i>
5	GB/T 30269.401-2015	<i>Information technology - Sensor networks - Part 401: Collaborative information processing: Services and interfaces supporting collaborative information processing</i>





# Sensor Network

Standard Organization

Standard Progress

No.	Standard No.	Standard Name
6	GB/T 30269.501-2014	<i>Information technology - Sensor networks - Part 501: Identification: Identifier encoding rules for sensor node</i>
7	GB/T 30269.601-2016	<i>Information technology - Sensor network - Part 601: Information security general technical specifications</i>
8	GB/T 30269.701-2014	<i>Information technology - Sensor network—Part 701: Sensor interface: Signal interface</i>
9	GB/T 30269.702-2016	<i>Information technology - Sensor network - Part 702: Sensor interface: Data interface</i>
10	GB/T 30269.901-2016	<i>Information technology - Sensor network - Part 901: Gateway: General technical requirements</i>

❖ Standard work group on Sensor Networks is working on 21 standards.



# Sensor Network

Standard Organization

Standard Progress

International Standardization

ISO/IEC JTC1 WG7



ISO/IEC 29182-2 : 2013 《 Information technology - Sensor network Reference Architecture Part 2 Terminology 》

ISO/IEC 29182-5:2013 《 Information technology - Sensor network Reference Architecture Part 5 Interface 》

ISO/IEC 20005:2013 《 Information technology - Sensor network Collaborative information processing support services and interfaces 》

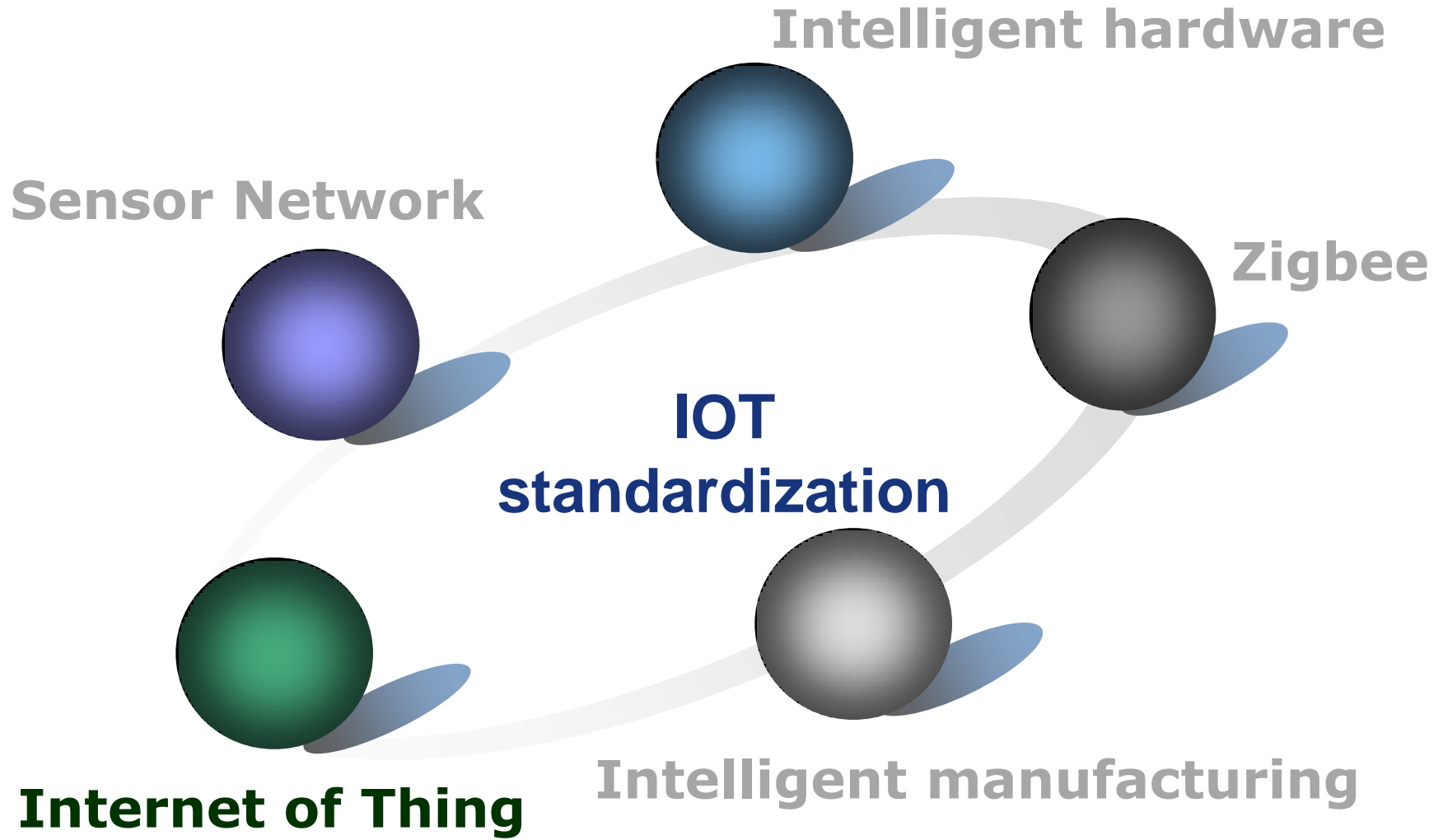
ISO/IEC 19637:2016 《 Information technology - Sensor network Testing Framework 》



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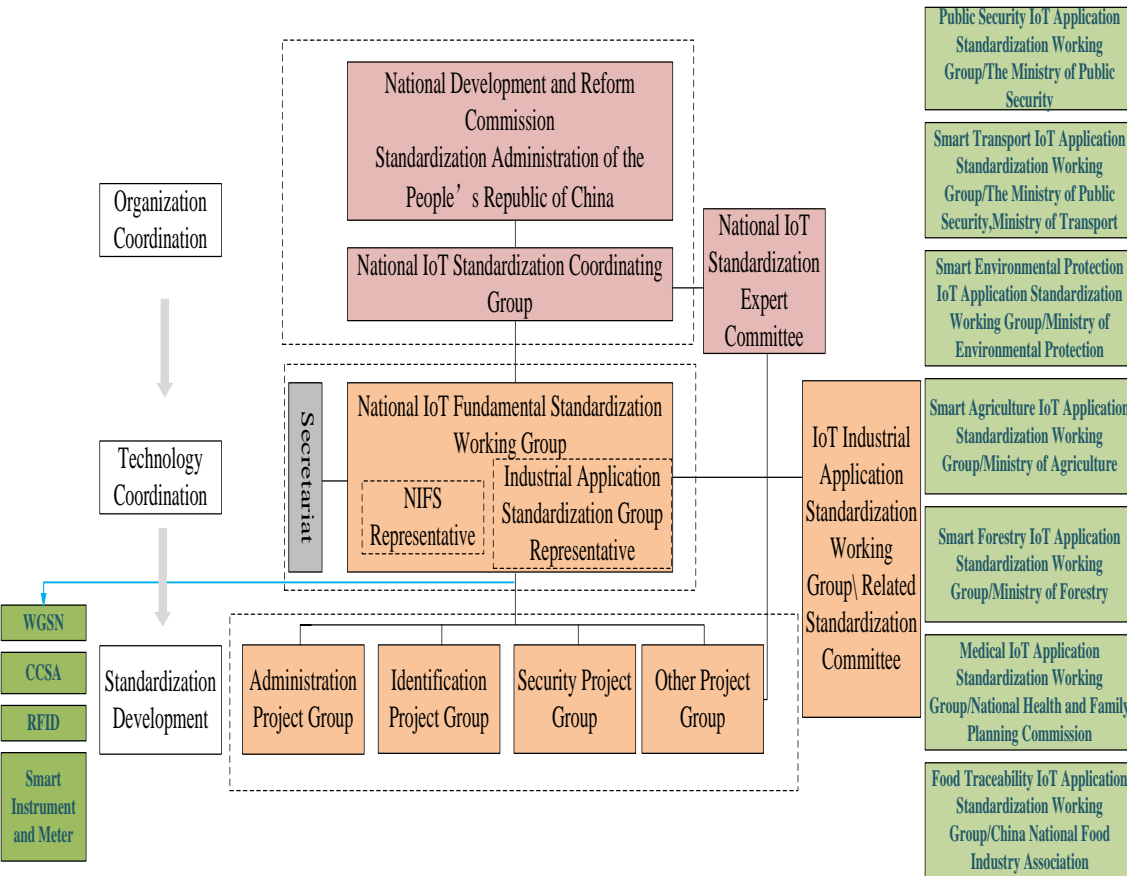


# IOT standardization



# Internet of Thing

## Standard Organization



Website: [www.iotstd.cn](http://www.iotstd.cn)



# Internet of Thing

Standard Organization

Standard Progress

No.	Standard No.	Standard Name
1	GB/T 33745-2017	<i>Internet of Things Terminology</i>
2	GB/T 33750-2017	<i>Internet of Things Guidelines for Standardization</i>

- ❖ Standard work group on Internet of Thing is working on 27 standards.



# Internet of Thing

Standard Organization

Standard Progress

International Standardization

ISO/IEC JTC1 WG10



ISO/IEC 30141 《 Internet of things  
reference architecture 》

ISO/IEC 20924 《 Internet of things  
Terminology 》

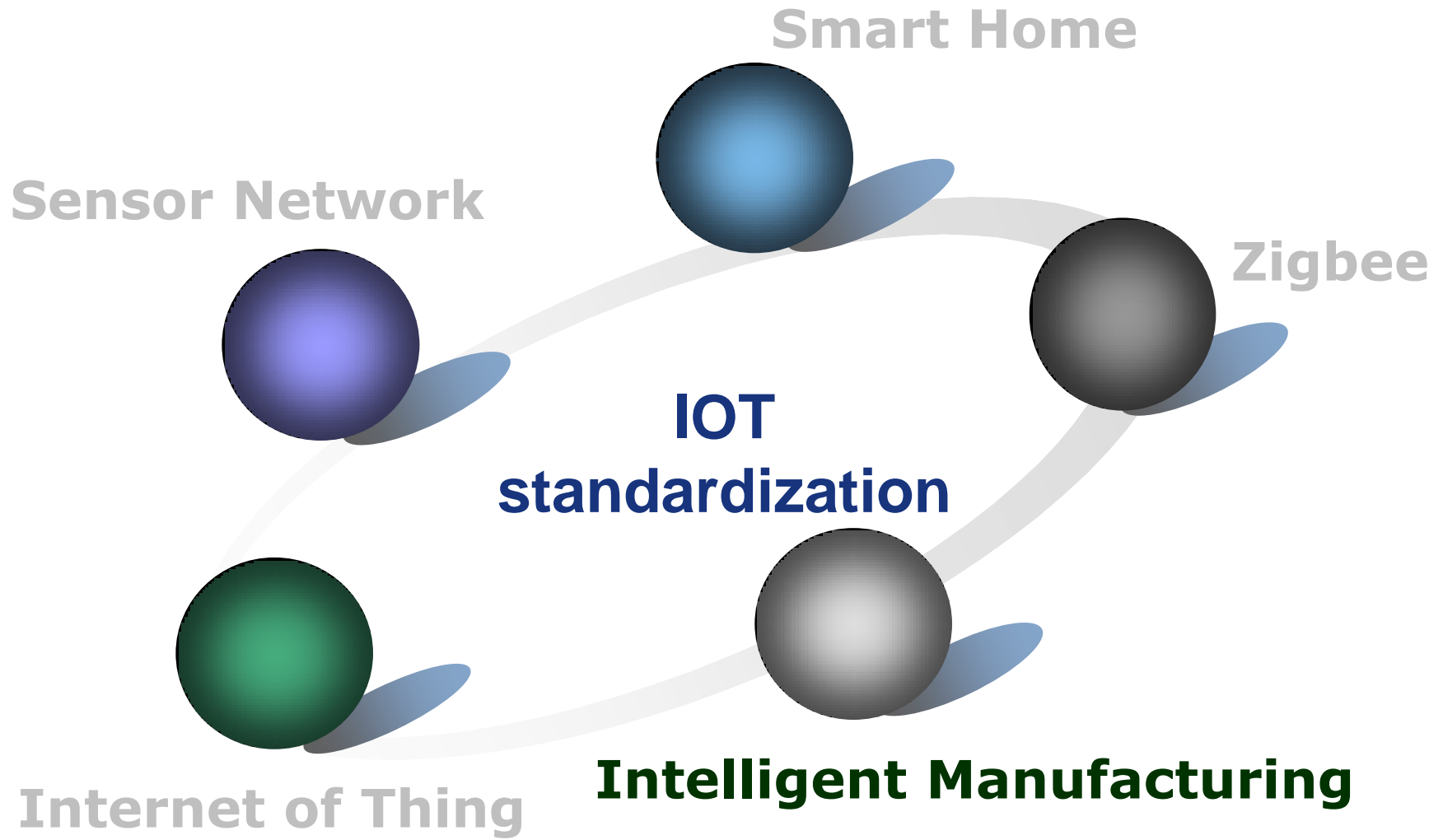
ISO/IEC 21823-1 《 Internet of things  
interoperability part 1: Framework 》



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# IOT standardization



# Intelligent manufacturing



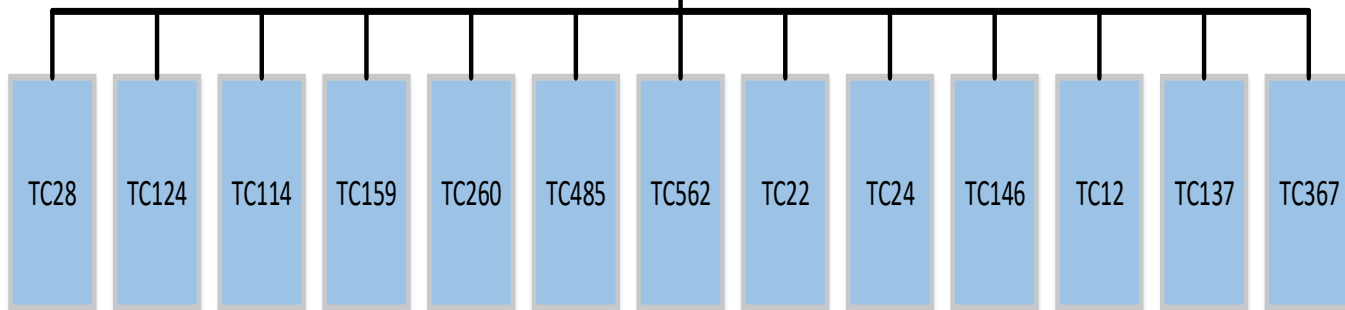
## Standard Organization



National Intelligence manufacturing standardization Coordination Group

Expert advisory group

National group on standardization of intelligent manufacturing



National Intelligent Manufacturing standardization group will promote the national intelligent manufacturing standardization work.





# Intelligent manufacturing

Standard Organization

Standard Progress

No.	Standard No.	Standard Name
1	20170057-T-469	<i>Intelligent manufacturing object identification requirements</i>
2	20170053-T-339	<i>Industrial Internet network architecture</i>
3	20170054-T-339	<i>Intelligent manufacturing Requirements for object identification analysis system</i>
4	20170039-T-604	<i>General technical requirements of digital workshop</i>
5	20170038-T-604	<i>Digital workshop machine tool manufacturing information model</i>
6	20162507-T-469	<i>Information technology industry cloud services capacity : general requirements</i>
7	20162515-T-469	<i>Information technology industry cloud service model</i>



# Internet of Thing



Standard Organization

Standard Progress

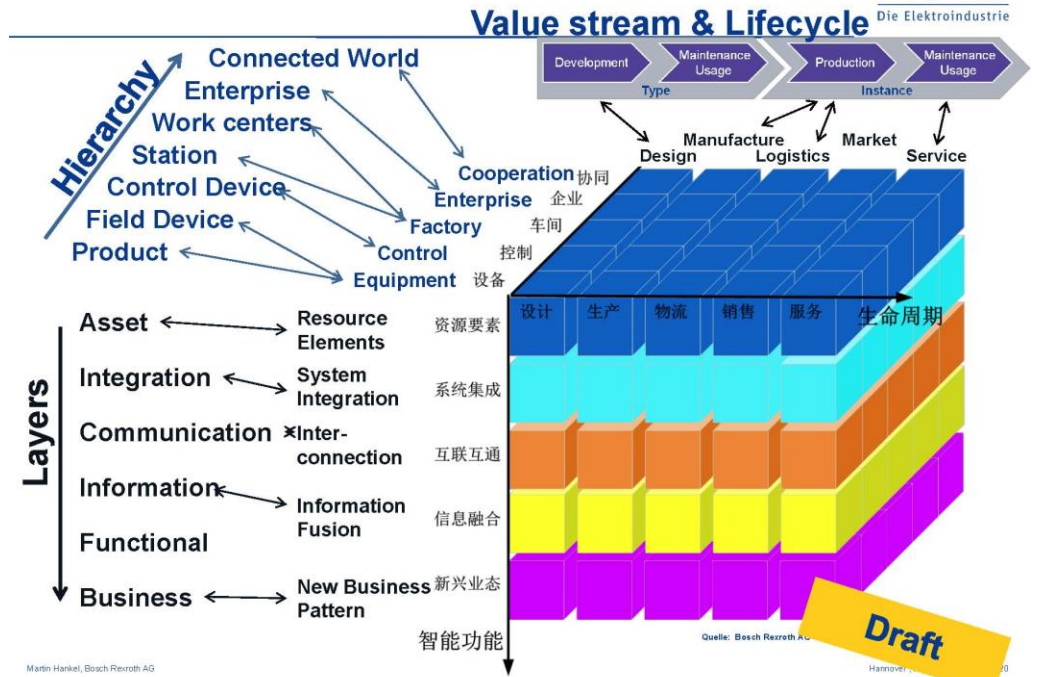
International Standardization

## National Intelligent Manufacturing Standard System Construction Guideline (Version 2015)

The screenshot shows the VDE website interface. The main content area displays the title 'Guidelines National Intelligent Manufacturing Standard System Construction Version 2015'. A sidebar on the left contains navigation links such as 'Technik', 'Industrie 4.0', and 'Einführung'. A contact information box at the bottom right lists 'Pichler, Reinhold' with a phone number and email address.

Germany's DKE website links China's national guidelines for the construction of intelligent manufacturing standards system (English Edition). Both sides learn from each other.

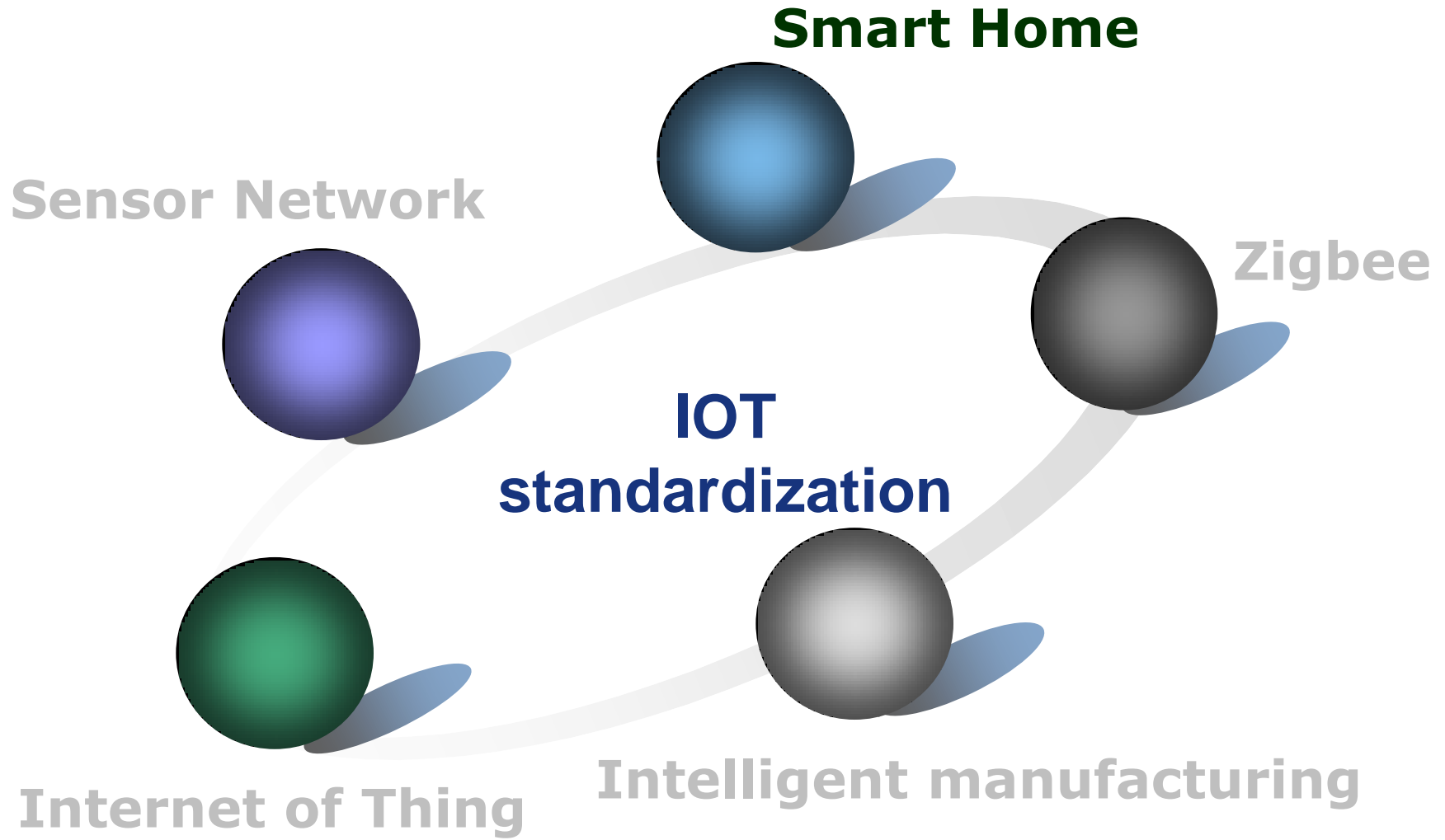
### Compare RAMI 4.0 – Systemarchitecture China



Martin Hankel, Bosch Rexroth AG



# IOT standardization





# Intelligent hardware



## Standard Organization

- ❖ IT Equipment Interconnection
- ❖ Mirror to JTC 1/SC 25
- ❖ Scope of

Home electronic system

**家用电子系统**

- 体系架构和互操作
- **智能家居**
- 设备互联和资源共享

User building cabling

**用户建筑群布缆**

- 通用布缆 Generic Cabling
- 操作和实施
- 测试

Interconnection of computer systems and ancillary devices

**计算机系统和附属设备互连**

- SCSI
- ATA
- Fiber Channel



# Intelligent hardware

- ❖ Semiconductors
- ❖ Manufactures
- ❖ Home appliances manufactures
- ❖ Cloud Service Platform (IaaS, PaaS)
- ❖ Operators
- ❖ Institutes and Colleges

## 半导体厂商

- 华为
- 中兴
- Marvell
- 联发科

## 模块厂商

- 庆科
- 顺舟
- 福睿
- .....

## 智能终端 厂商

- Broadlink
- 欧瑞博
- 联想
- 飞利浦
- 海康威视

## 家电厂商

- 海信
- 长虹
- 美的

## 云服务/平台

- 阿里
- 京东
- 小米  
乐视

## 运营商

- 中国电信
- 中国联通
- .....

## 科研机构及高校

- 中科院微电子所
- 清华大学
- 华东师范大学
- .....







# Intelligent hardware



Standard Organization

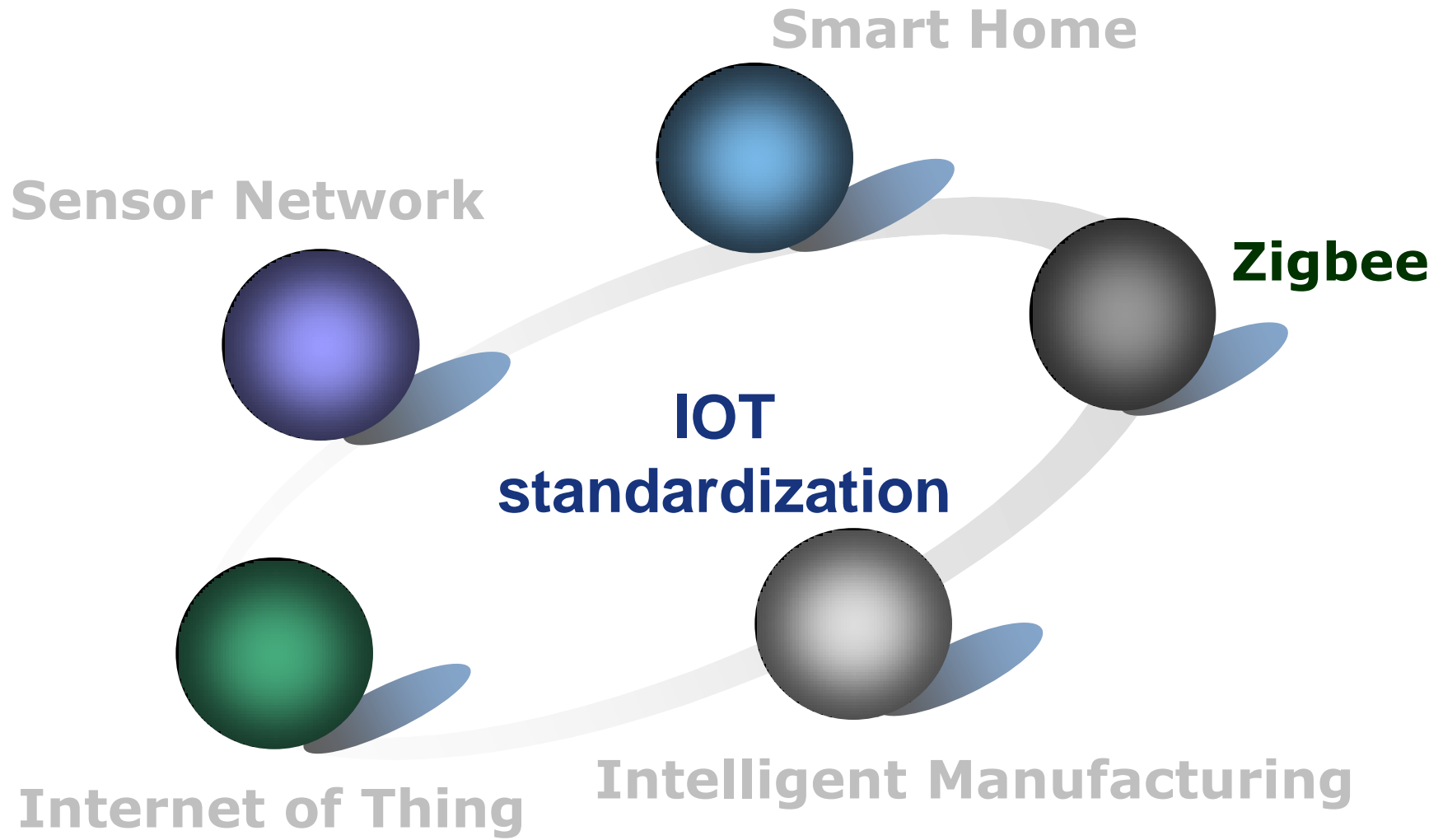
Standard Progress

No.	Standard No.	Standard Name
1	20161698-T-469	<i>Information technology--information equipment interconnection -- intelligent home electronic systems terminal equipment and terminals--unified access service platform interface specification</i>
2	20161699-T-469	<i>Information technology-- information equipment interconnection-- third party smart home electronic systems and terminals--unified access service platform interface specification</i>
3	20161703-T-469	<i>Information technology--information equipment interconnection-- intelligent home electronic system terminal--unified access service platform--general technical requirements</i>





# IOT standardization





# Zigbee



**ZigBee<sup>®</sup>**  
中国成员组

## ZigBee Member Group China (ZMGC)

ZMGC Council

Chair

Secretariat



TSG  
(Technical Subgroup)

MSG  
(Marketing Subgroup)

The fourth ZIGBEE test lab

- ZigBee Compliant Platform, ZCP
- ZigBee Light Link, ZLL



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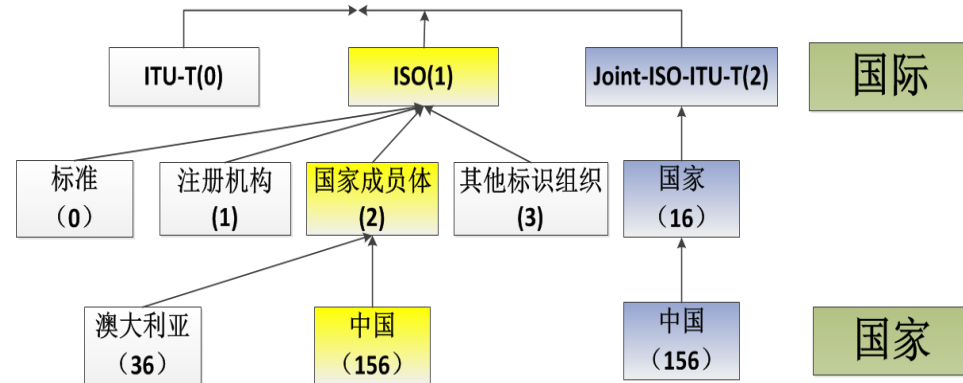
**Next work for IOT**



# OID Identification systems

## 1 ) OID Object Identifier

- Uniquely identifies object
  - the global unique value for an object
  - Precise identification object
- ✓ For example, entity objects, virtual objects, algorithms, standards, etc.



## 2 ) advantage

- **Globalization** : A global identity system shared by 202 countries
- **Universal identification** : Support different types of object encoding, such as: physical objects, virtual objects, goods, documents, etc.
- **Through the Hierarchical Authorization Mechanism for management, the management organizations at all levels have greater autonomy**





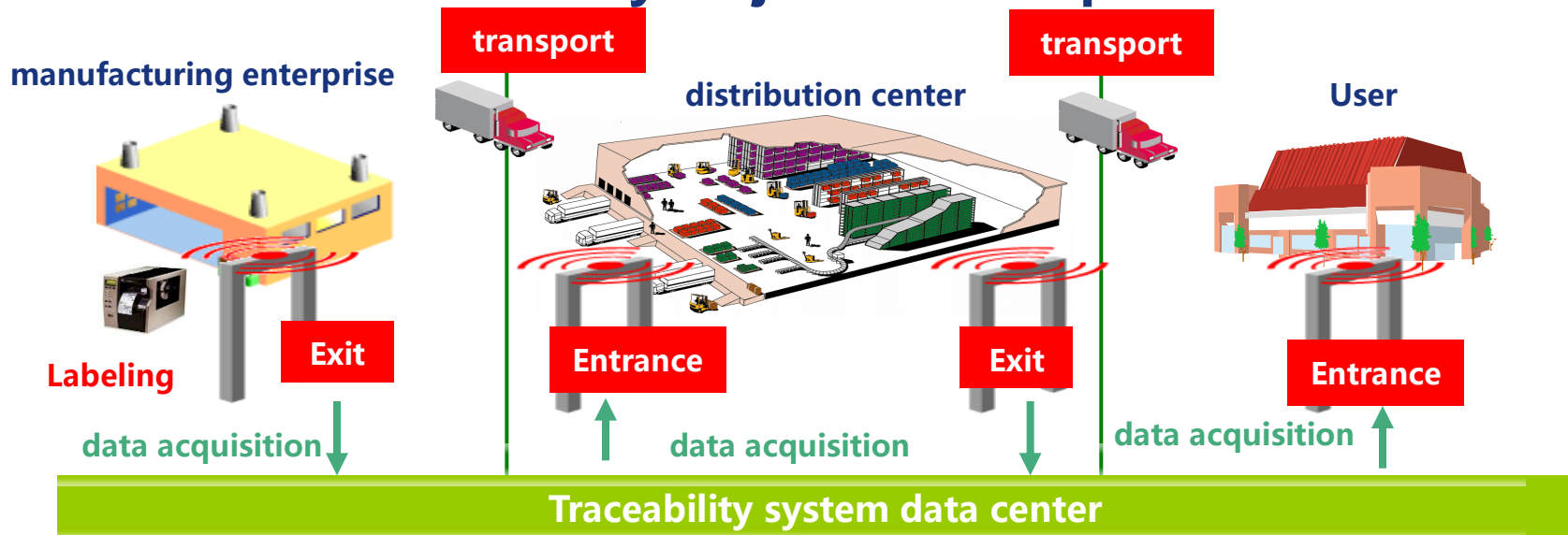
# OID Standard status

No.	Standard No.	Standard Name
1	20130057-T-469	<i>Internet of things identification system</i>
2	20154109-T-469	<i>IOT Identification System—Guideline for OID Application</i>
3	20120545-T-469	<i>Sensor network identifier analysis and management specification</i>
4	20130079-T-469	<i>Transportation -Internet of Things identification application classification and addressing</i>
5	20130078-T-469	<i>Transportation-Internet of Things Identification rule</i>
6	20153689-T-469	<i>Information technology-Software asset management - Identification standard</i>
7	20160459-T-432	<i>Internet of things in forestry-Identifier assignment specification</i>
8	20170057-T-469	<i>Intelligent manufacturing Object identification requirements</i>
9	20170054-T-339	<i>Intelligent manufacturing Requirements for object identification analysis system</i>



# OID Application status

OID is used to identify objects in the production domain



1 The system can be used to unify the coding of OID products, production batches, packing boxes and so on.

2 OID can also be used for global coding of non manufactured products, improving system automation processing ability and openness, and easy for subsequent cross system data analysis. For example: scanning equipment, operators, warehouses, warehouses, access control, trucks and so on.

3 OID can be used to identify the type of goods (similar to bar code), can also be used to identify a specific commodity, the specific name can be required to take the system, such as: traceability code, unique code, product code, etc..

4 OID encoding can be attached to the product itself via vectors such as RFID, QR codes, bar codes, etc., and can be used only within the information system.



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# Next work for IOT

- ◆ Continue to work on Basic standards of IOT
  - ◆ IOT platform
  - ◆ IOT interoperability
- ◆ Develop in depth IOT application standards
  - ◆ Smart home
  - ◆ Intelligent manufacturing
- ◆ Focus on IIOT
  - ◆ TSN(Time-Sensitive Networking)
  - ◆ .....





**Thank you !**



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