

# The Smart TV Operating System



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- Why & Vision
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# UHD In China

- UHD is developing fast China
  - Policy support
  - 2 formal UHD channels
  - Transmission Bandwidth increase
  - More than 100M UHD terminals

# UHD Trend

- Customer recognition of UHD
  - Focus more on User Experience
  - Willing to pay for UHD
- More services
  - VR/AR
  - Online Education
  - UHD games
  - ...

# Problems

- Fragmentation
  - High Cost to develop new services
  - Difficult to deploy services
  - No unified security scheme
  - ...

The main purpose of TVOS is to solve the problem of technology fragmentation

# TVOS Vision

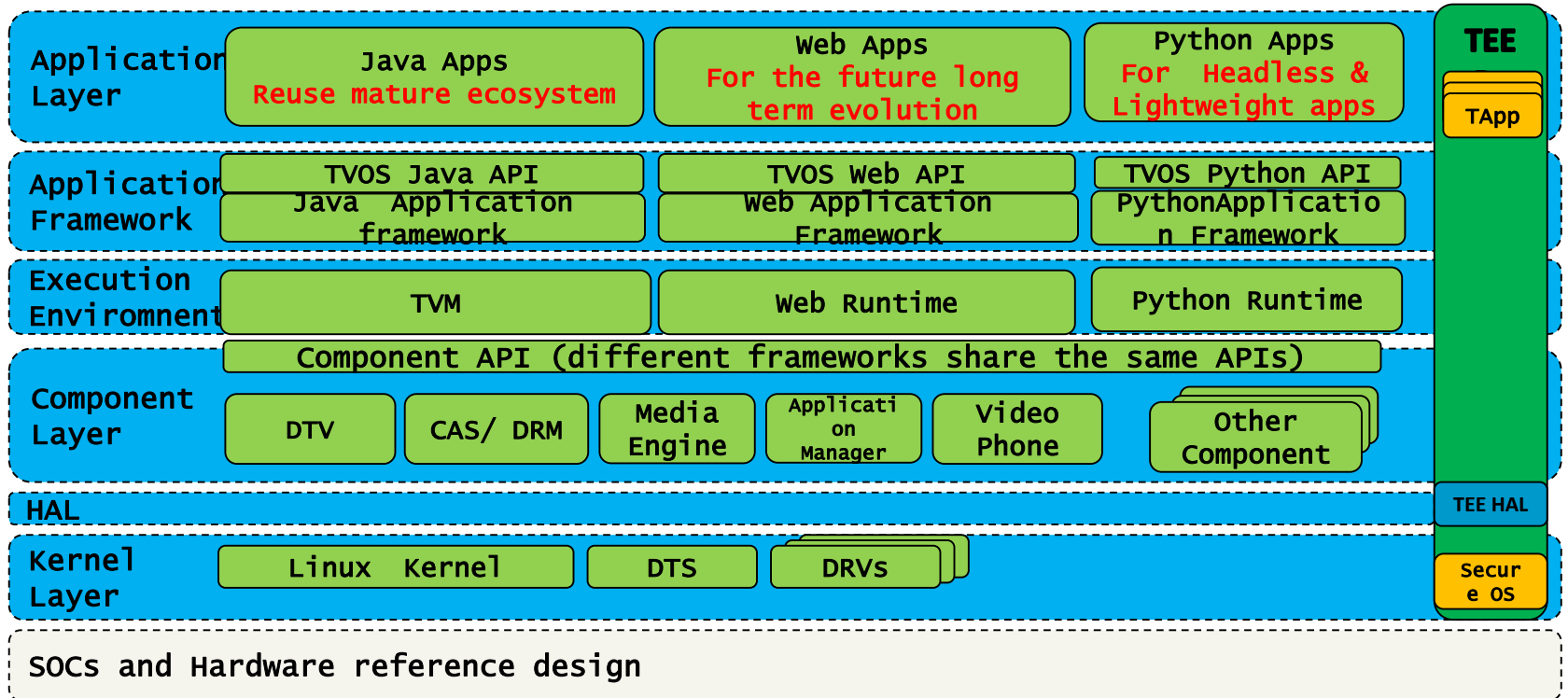
To be a global leading Smart Media Terminal OS

- ✓ Collaborate with key technologies to build a smart media terminal OS with ultimate experience, green & security, rich services, and future-oriented.
- ✓ Build an application ecosystem to support long-term development of smart media terminals.

# TVOS Target

- ✓ Service Extension Efficiency
- ✓ User Experience Consistency
- ✓ Development Efficiency
- ✓ Cross-hardware Platform
- ✓ System-level security scheme
- ✓ Sustainable development

# TVOS Architecture





# TVOS Architecture Features

- **Layered architecture:** Cross-hardware platform; Basic media services; Supports multiple application frameworks. Can be tailored and combined.
- Security framework based on REE/TEE
- Application Manager supports multiple application types
- Unified Media Engine based on Gstreamer
- HTML5 Engine based on chromium

# TVOS Key Features

TVOS embeds many Broadcast and Broadband features

- ✓ DTV broadcast(-C/-T/-ABS) with CAS
- ✓ IP broadcast (multi-cast) with CAS
- ✓ VOD through QAM
- ✓ VOD through IP(HLS/Dash) with DRM support
- ✓ Video Phone
- ✓ Cloud Game
- ✓ VR ( Local & Cloud )
- ✓ Second-screen
- ✓ ...

# The Organization of TVOS

institutions

Operators

software  
vendors

device  
vendors

Chip vendors

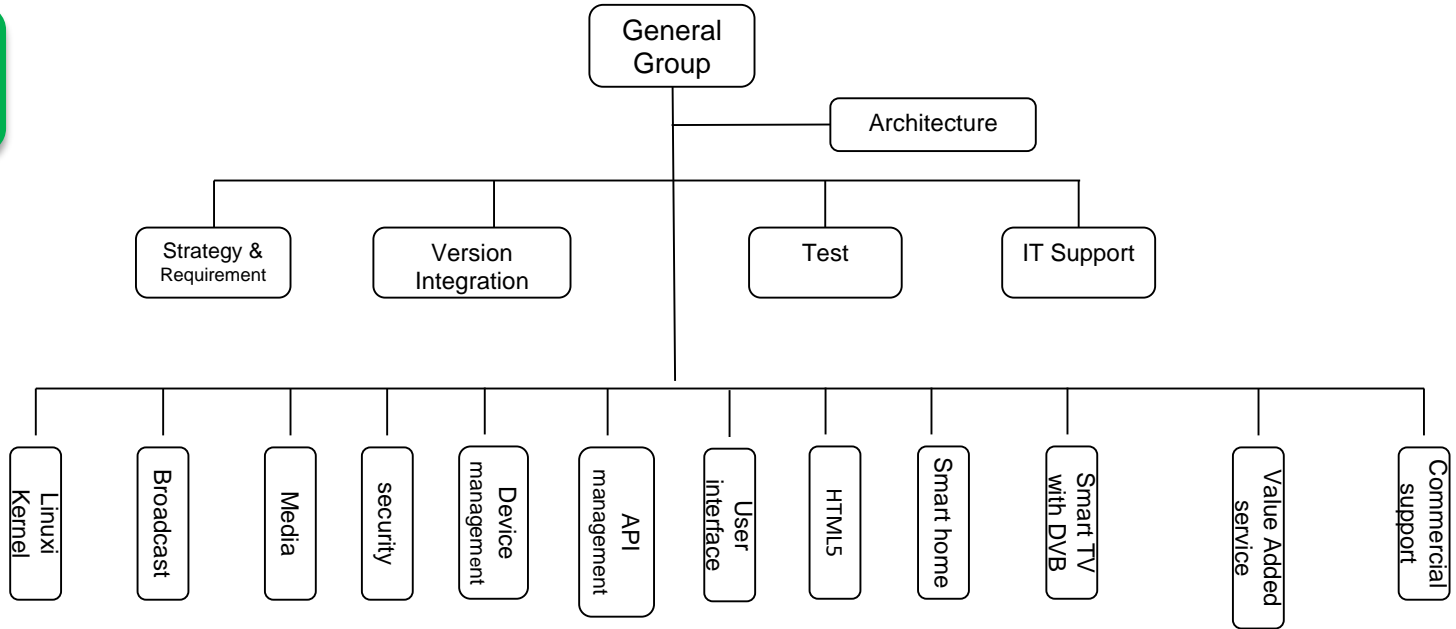
The TVOS team is officially set up by Technology Division of NRTA.

Currently, there are more than 120 members.

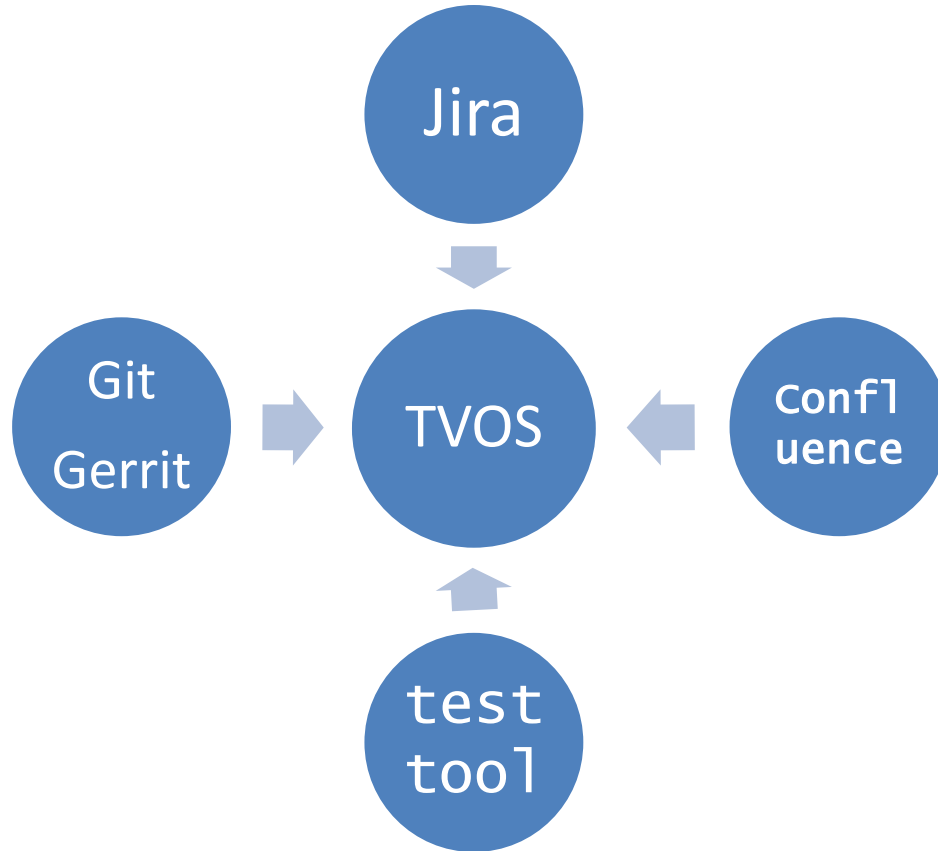
# The Organization Structure of TVOS

Mgr  
group

Topic  
Groups



# Collaborative Work Platform



# TVOS Standards

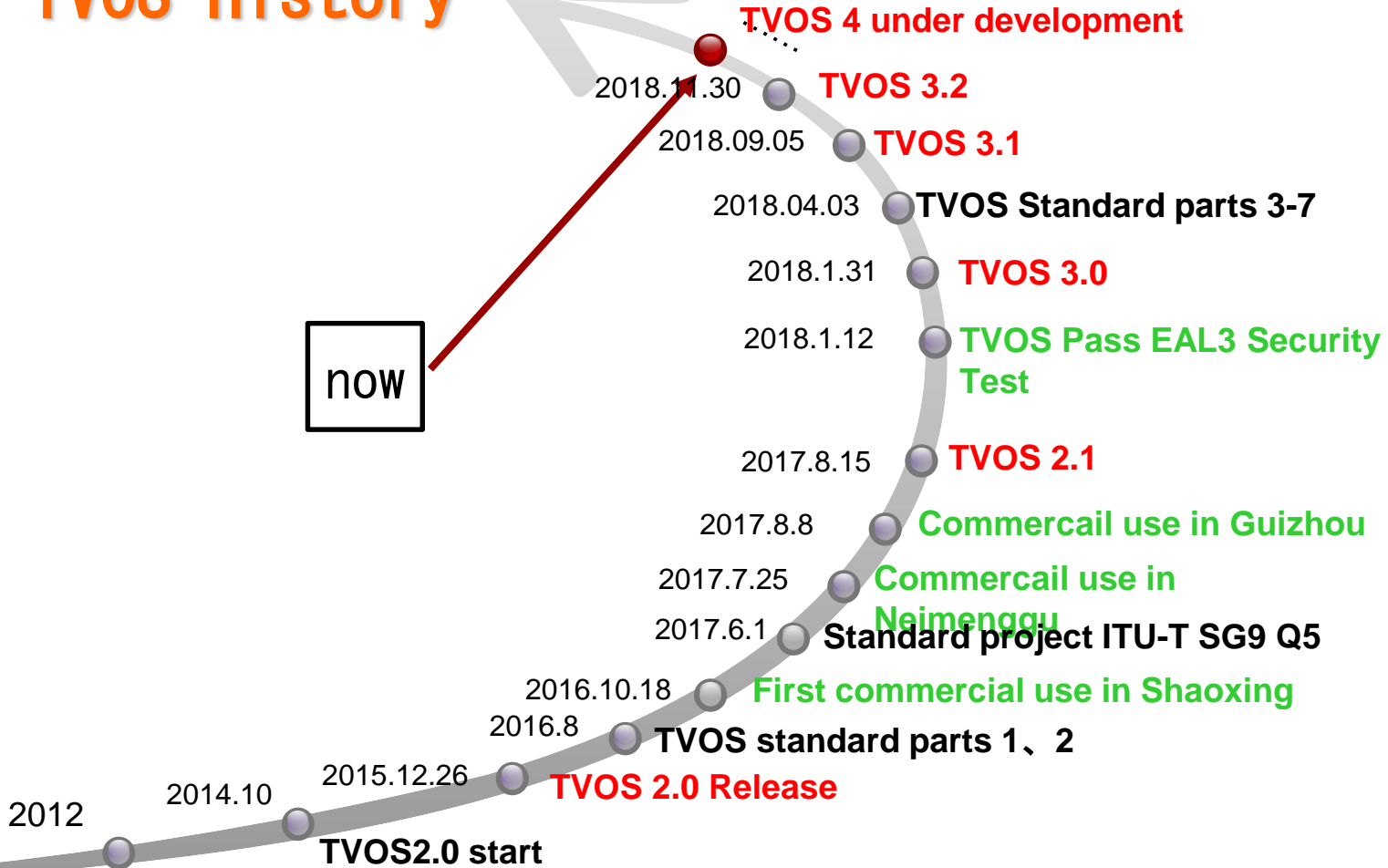
## ■ Industry standards in China

- ✓ 2016.12 GY/T 303.1 《Functions and Architecture》
- ✓ 2016.12 GY/T 303.2 《Security》
- ✓ 2018.7 GY/T 303.3 《API》
- ✓ 2018.7 GY/T 303.4 《HAL》
- ✓ 2018.7 GY/T 303.5 《Component API》
- ✓ 2018.7 GY/T 303.6 《 TEE API》
- ✓ 2018.7 GY/T 303.7 《Conformance test》

# TVOS Standards

- International Standards
  - ✓ J.1201(J.stvos-spec-req) in ITU-T SG9
  - ✓ J.stvos-spec-arch in ITU-T SG9
  - ✓ J.stvos-sec in ITU-T SG9
  - ✓ J.stvos-hal in ITU-T SG9

# TVOS History





# What's Next-Genera1

- Commercial Promotion
- Full Open Source
- Internationalization
- Application Ecosystem Construction

# What's Next-Technical

- Python Runtime
- Gateway profile
- AI framework
- Voice control framework
- Secure OS → OP-TEE
- Emulation
- Big Data collection
- TVOS link for smart home connection
- Video Communication enhancement
- Audio Manager
- ...

Welcome to join TVOS  
Thank you!