Invisible enabler

50 billion chips shipped

Extraordinary growth – from sensors to servers

22 years

100 billion chips expected to ship

5 years

50 billion chips shipped

2013

2017

2021
Hardware Enforced Partitioning with ARM TrustZone

NORMAL WORLD
- Non-Secure Application(s)
- Non-Secure Kernel

SECURE WORLD
- Secure tasks
- Secure Kernel
- Secure Peripheral Driver
- Monitor
- Secure Peripheral

Watchdogs

Source: http://infocenter.arm.com/
ROS2 on Cortex-A – easy to build

• Cross Compilation
  • Use x86 to build the ROS2 applications for arm architecture.

• Static linking
  • ROS2 application statically links with the dependent libraries.
  • Can run on any Linux distributions (same arch)

• ROS2 on light-weight Linux
  • Smaller code size, footprint – easier to integrate, lower power consumption
  • With the help of cross compilation and static linking
ROS2 on Cortex-M – code size and footprint

• Light-weight DDS implementation for Cortex-M
  • Enable and verify light-weight DDS implementation for Cortex-M

• Minimal ROS2 stack for Cortex-M
  • Scalable
  • Support RTOS
Hardware DDS Security

• Arm TrustZone secured DDS security plugin
  • Root key is stored in the secure world protected by the hardware. Can’t forge the device(node) even if Kernel is cracked.
  • Secure OS is based on TEE (Trusted Execution Environment) defined by GlobalPlatform – minimum the attack surface
Thank You!
Danke!
Merci!
谢谢!
ありがとうございます!
Gracias!
Kiitos!