



Sensors on mobile devices

An overview of applications, power management and security aspects

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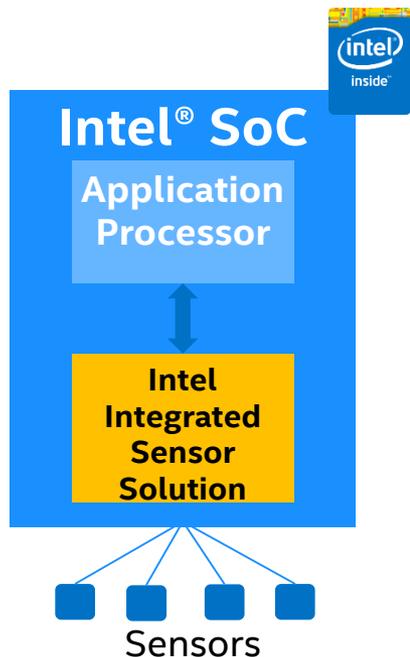


Introduction

1. Compute platforms are adding more and new sensors into their designs
2. Mobile Operating systems are evolving rapidly to use sensor fusion & context aware applications to provide immersive experience and differentiations
3. Context aware “always-on” sensing needs to run in the background at lowest power to ensure battery life is minimally impacted
4. Low power Always ON environment has to be designed with data security in mind.
 - How can we protect sensitive personal data derived from sensors?



Intel® Integrated Sensor Solution Overview



- Integration into Intel® Atom and Core
 - Low power Always On Solution
 - Robust Sensor Firmware built around RTOS.
 - Extendable sensing and advanced context fusion enhancement for new applications
- Sensors supported
 - Increasing number and type of physical sensors supported

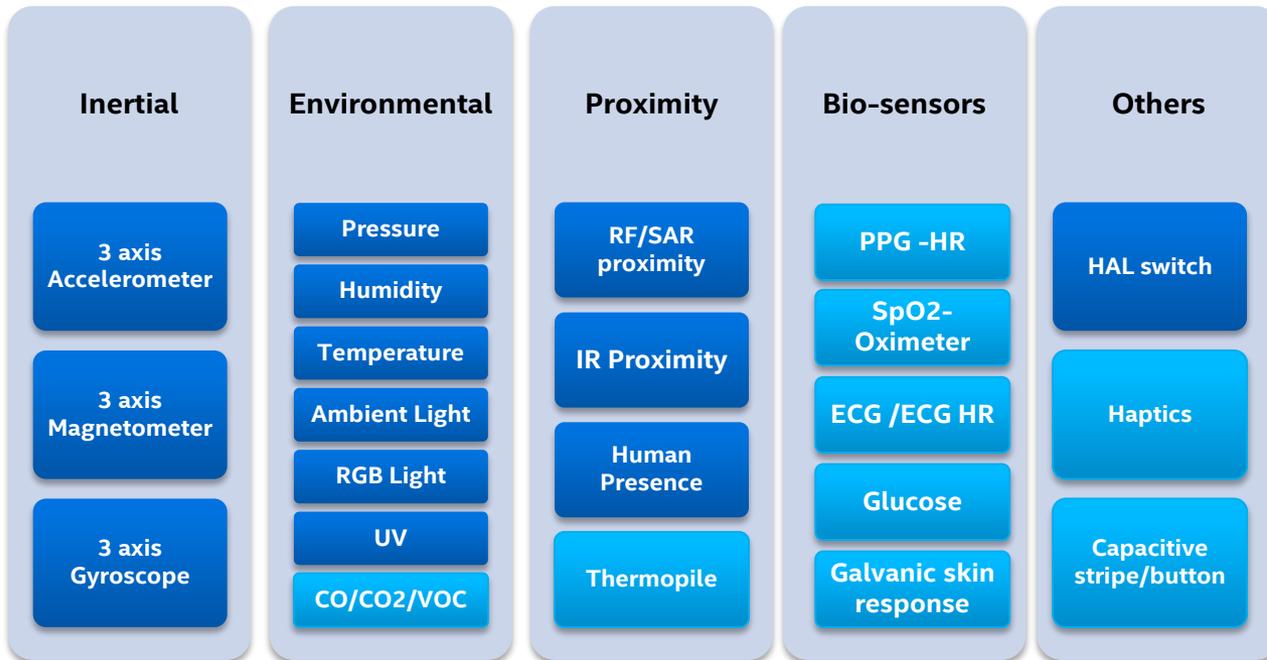
Intel® Integrated Sensor Solution

Sensors Supported

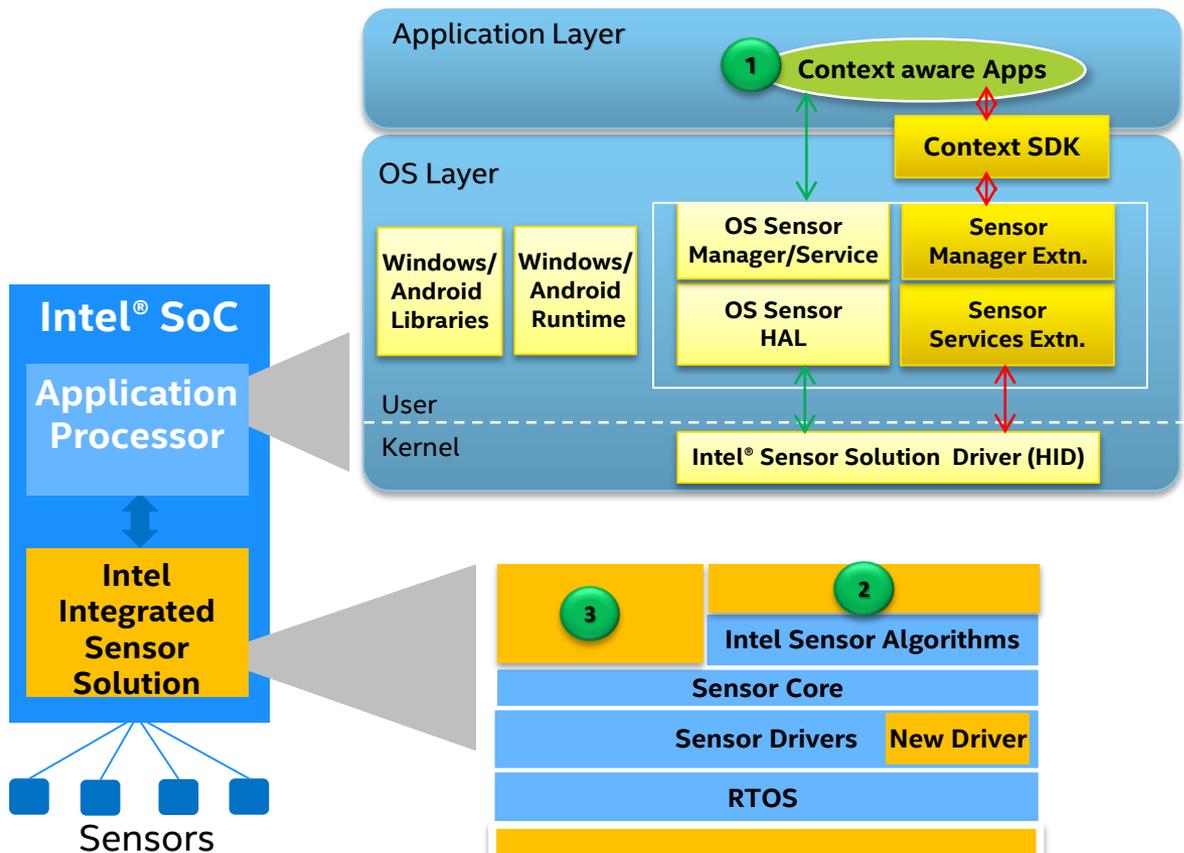
- Intel® Integrated Sensor Solution enables “always on” sensing usages with a new range of applications

Supported

Planned



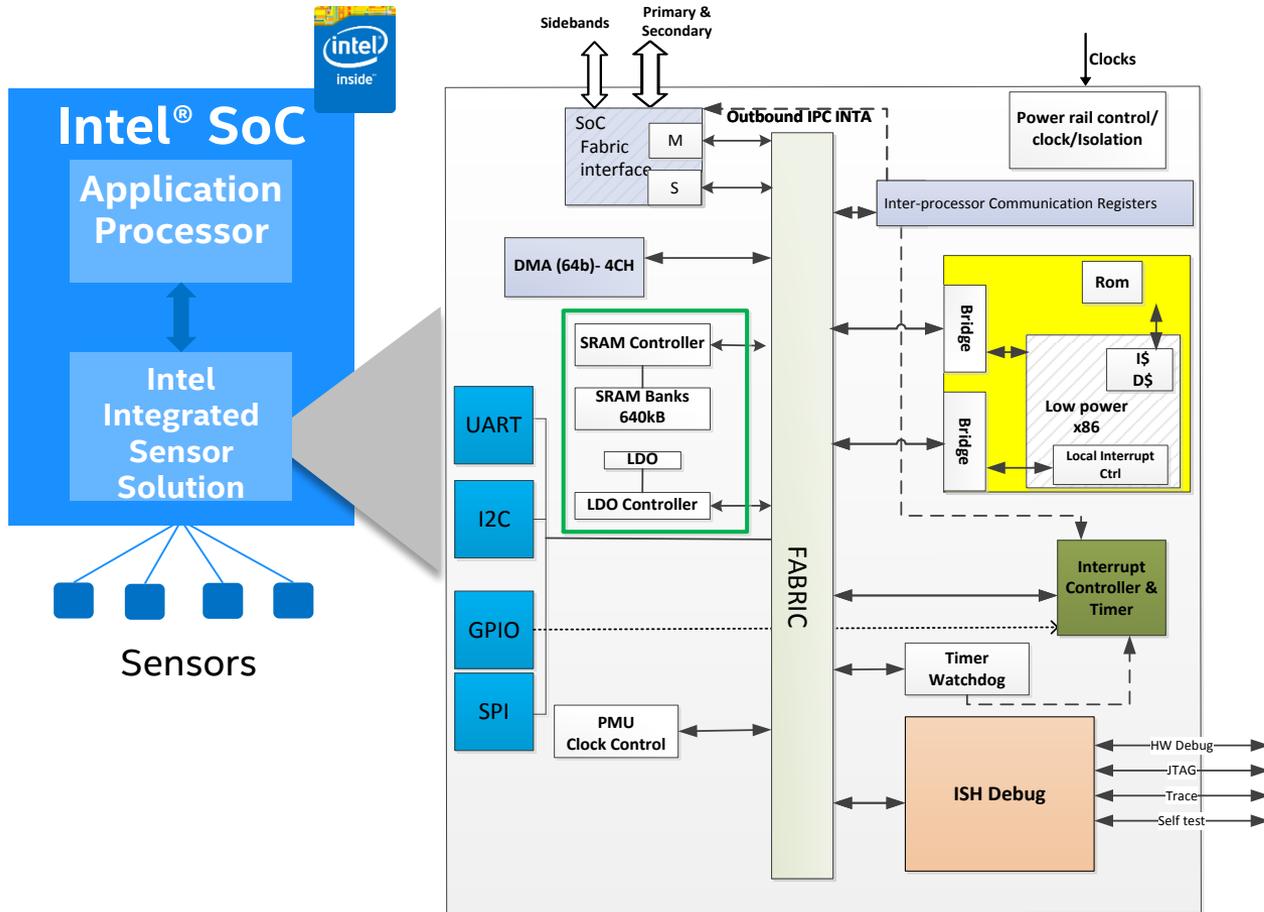
Intel® Integrated Sensor Solution Application Development



1. Intel® Context Sensing SDK enabling application with additional context processing & cloud support
2. Firmware Development Kit (FDK) for faster innovation & differentiation using Intel Sensor Algorithms and extensions
3. FDK support for fully customized solution.



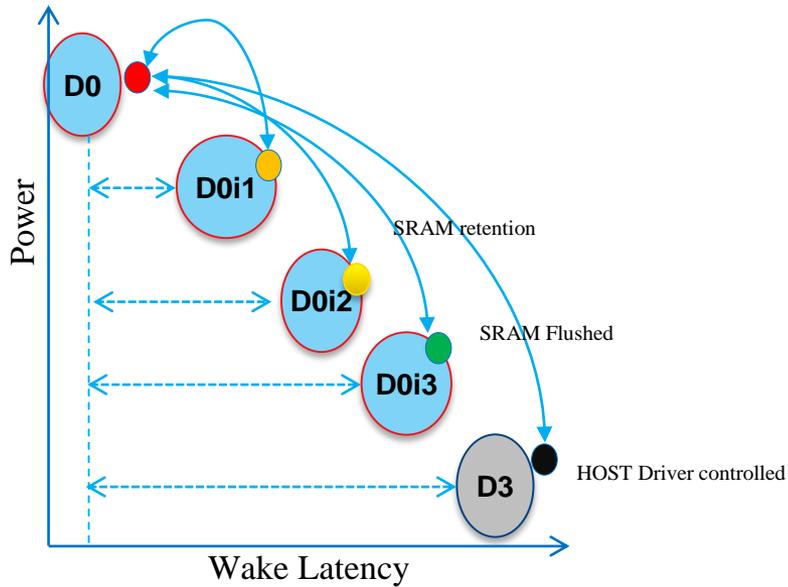
Intel® Integrated Sensor Solution – Low Power Hardware Architecture



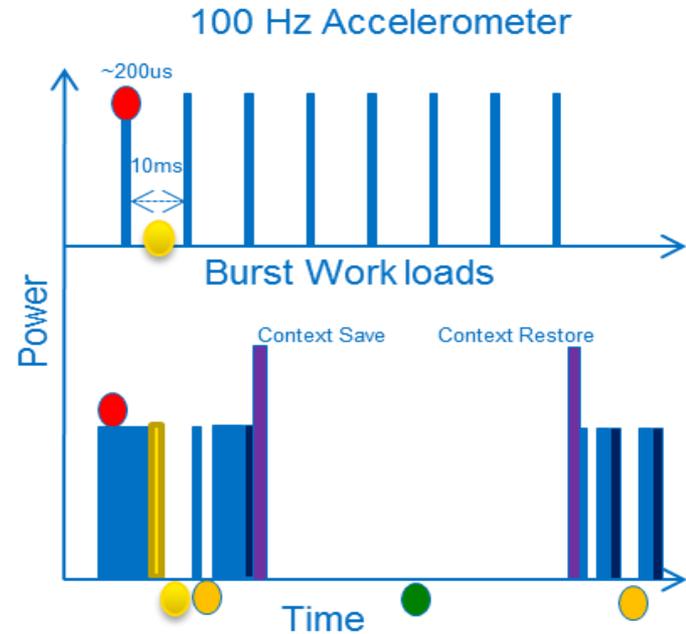
• Sensor Hub

- Low power X86 CPU @100MHz w/ internal program and data memory (640kB SRAM, 32kB L1\$, 8kB ROM)
- I/O ports for connection of sensors (I2C, SPI, UART, GPIO)
- Power management and clocking unit
- ⇒ Autonomous sub-system
 - Processing (sensor data acquisition, sensor algorithms and capable of fusion)
 - Power delivery – Sensor hub can operate while rest of SoC is in low power mode
 - Enables “Always On” Sensing

Intel® Integrated Sensor Solution – Power Management

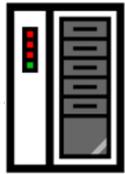


Device Power States and Latency of Intel Sensor Solution Hardware



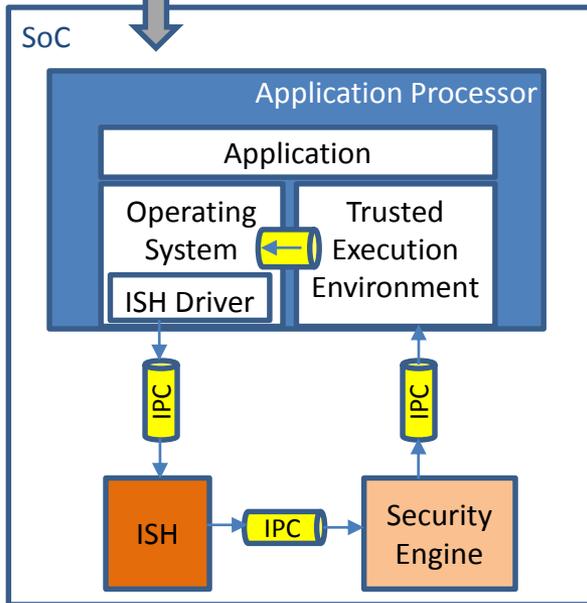
Workload based Device Power Management

Security aspects - On the Device and In the Cloud

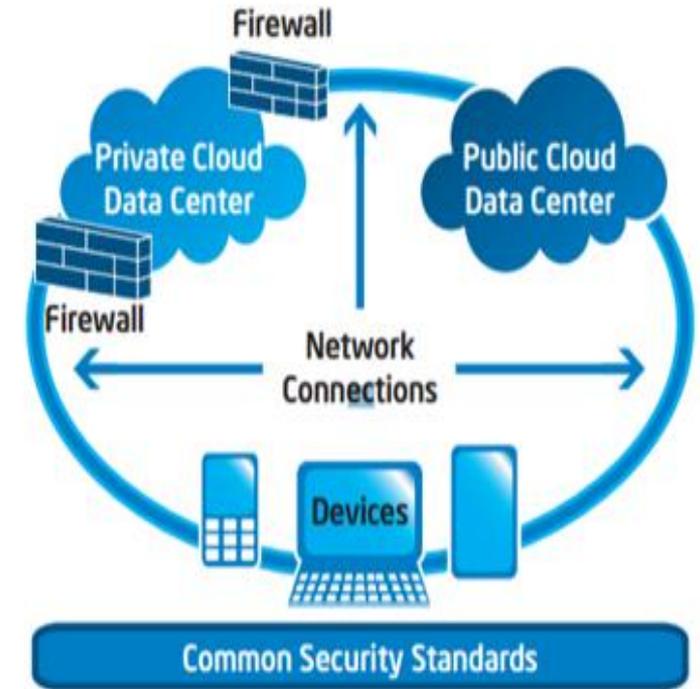


Cloud Server

1. User enrolls with service, establishes sign-on credentials, service generates session encryption keys so that confidential data is protected.
2. User data aggregation (decryption, integrity check, filtering and logging) based on the HW certificate associated with the user.



- A. Secure sensing is enabled under TEE control.
- B. TEE and the Security Engine form a Trusted Computing Base (TCB). ISH Firmware is signed and verified.
- C. Sensor data is transferred through secure channels (using encryption and/or certification).



Summary and Call to Action

- Intel® Integrated Sensor Solution is the hub for many sensors to the system and enables “always on” sensing usages
- Intel is actively working with several partners
- In order to get your innovative & exciting feature enabled on Intel Integrated Sensor Solution contact :
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Local contact in Sophia-Antipolis/France: katrin.matthes@intel.com



Thank You!

Q&A



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Rev. 4/14/15

