A YANG Data Model for Reporting Utilization Scores in ISAC

GREEN WG, IETF 123

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Agenda

- ISAC Introduction
- Motivation
- Proposed YANG Module
- Next Steps

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Introduction to ISAC

- Integrated Sensing and Communication (ISAC) involves detection and tracking of targets using RF signals
  - Different use cases such as UAVs, smart factory, gesture recognition etc. are defined by ETSI [GR-ISC001]
  - Each use case has different requirements, and each sensing task runs until these requirements are fulfilled

- Sensing data is generated by taking measurements from RF signals and it may contain non-RF sensing, e.g., IoTs

- ISAC involves computation and processing of sensing data (RF, non-RF or both) to fulfill each sensing task's requirements

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Motivation

- A sensing task involves measurements of parameters such as Doppler, angle of arrival (AoA), and radar cross section (RCS), micro-doppler, range/delay], each consuming varying amounts of system resources such as memory, energy, storage, depending on the requirements

- It is important to understand the resource consumption including energy consumption per sensing task and for each sensing measurement parameter to save resources and energy and to understand the energy impact of each sensing task

- There is currently no way to know this information for each sensing task

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Proposed YANG Module

- We propose sensing devices to report sensing measurement utilization score (SMUS)
  - The score quantifies the resource impact of different sensing measurements, including compute, memory, storage, energy, and latency.

```
module: ietf-isac-utilization
  +--ro sensing-utilization
     +--ro function-score* [function]
        +--ro function                    sensing-function
        +--ro score-components
        |  +--ro compute-score?           decimal64
        |  +--ro memory-score?            decimal64
        |  +--ro energy-score?            decimal64
        |  +--ro storage-score?           decimal64
        |  +--ro latency-score?           decimal64
        +--ro weights
        |  +--ro compute-weight?          decimal64
        |  +--ro memory-weight?           decimal64
        |  +--ro energy-weight?           decimal64
        |  +--ro storage-weight?          decimal64
        |  +--ro latency-weight?          decimal64
        +--ro total-utilization-score?    uint8
```

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Discussion Points and Next Steps

- Where does ISAC YANG model fit in the broader context of GREEN WG charter?

- If the WG agrees on a base YANG model, how does this fit into it as an extension for ISAC use case
  - Currently, the proposed YANG models are about energy consumption at different hardware components but not about the processes they run

- Happy to discuss this further and align

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