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Developer Summit

Tutorial: ZBus - the lightweight and flexible Zephyr message bus

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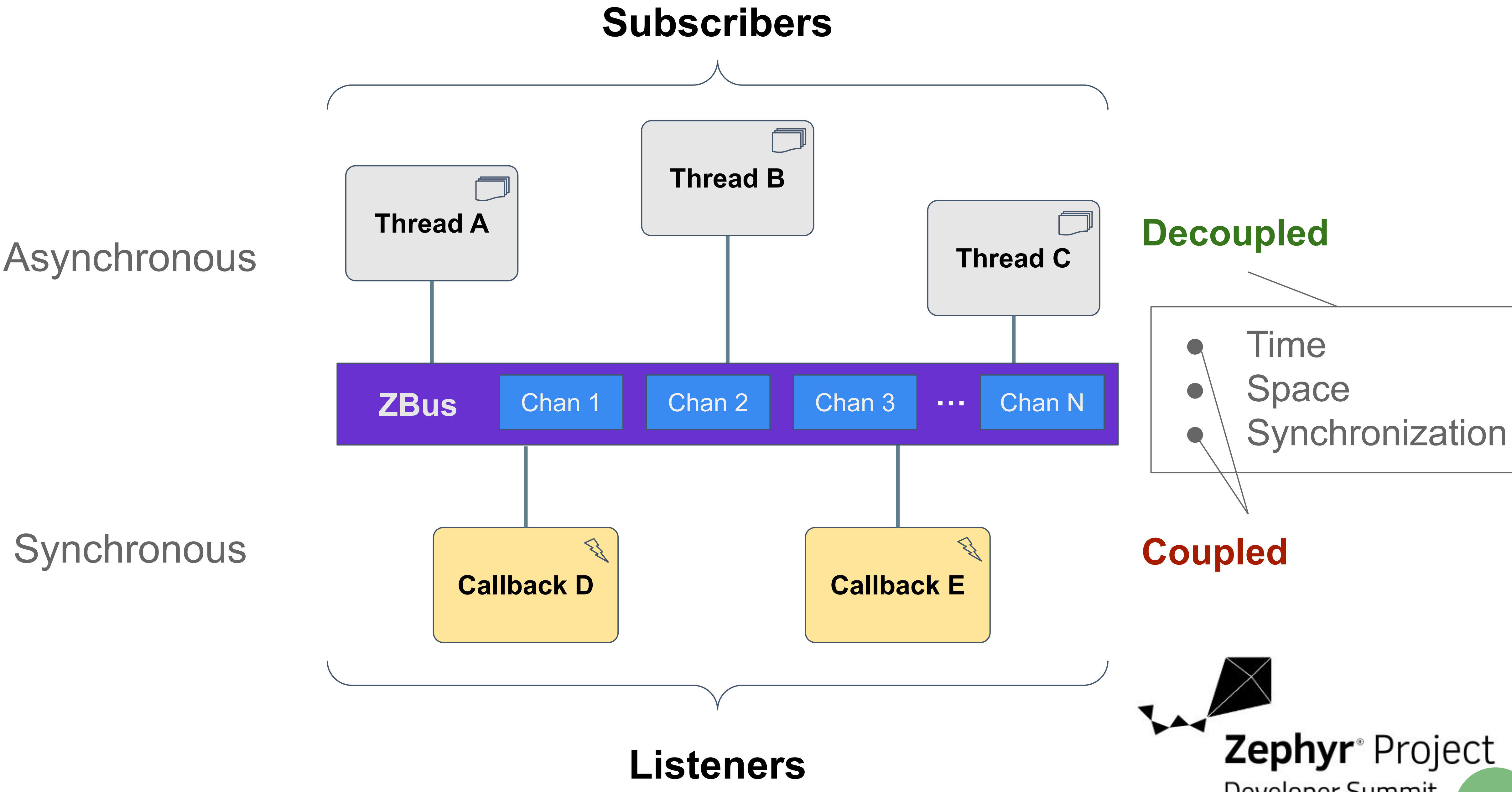
@rodrigopex



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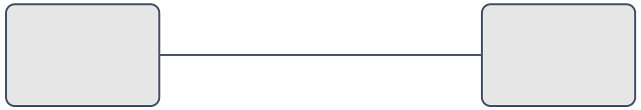
Bus topologies

✅

ONE-TO-ONE



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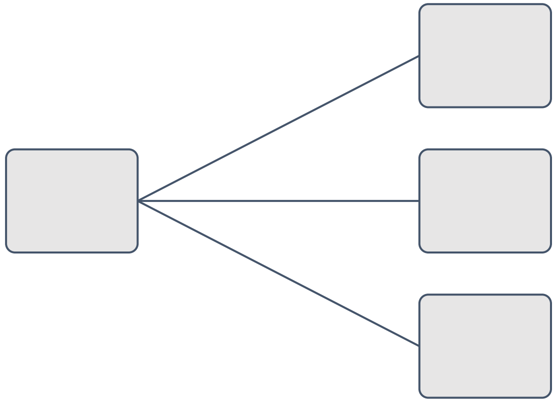
ONE-TO-MANY



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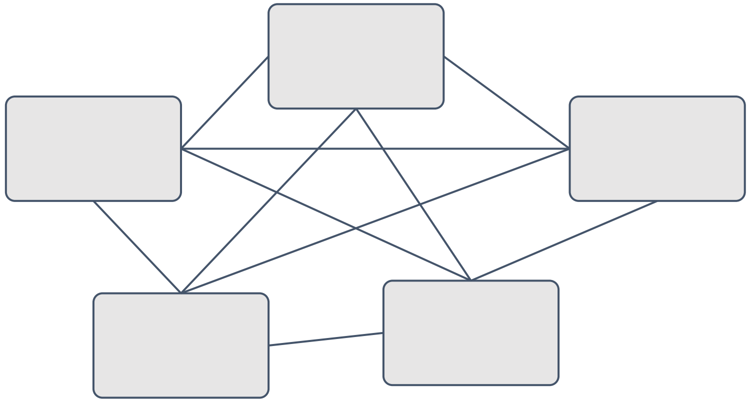
MANY-TO-MANY



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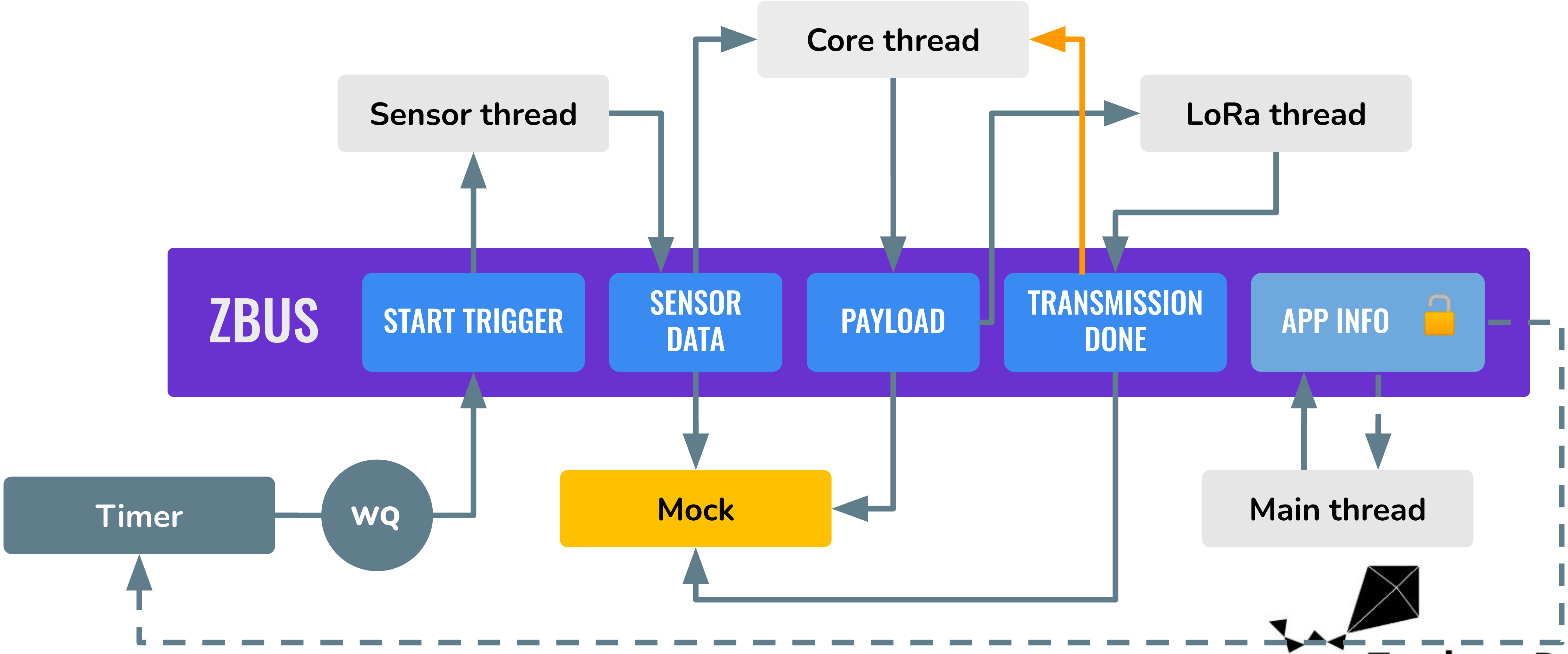
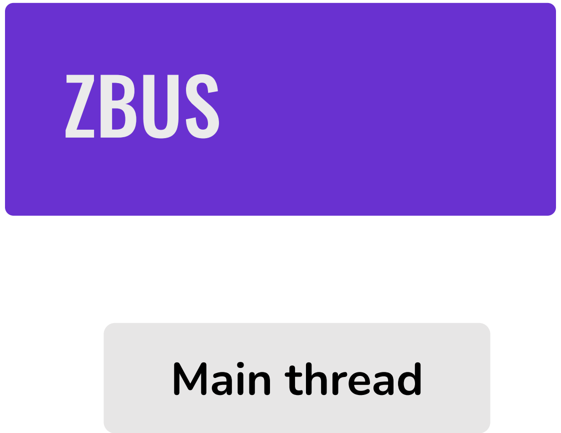
Example of use

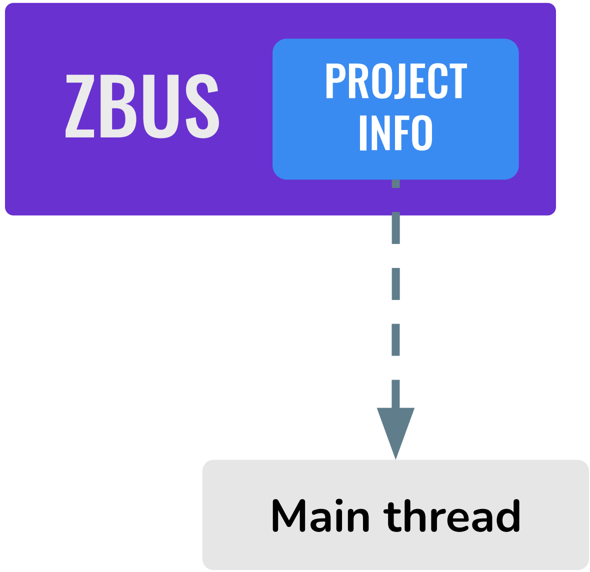
Proposed solution



Step 01



Step 02

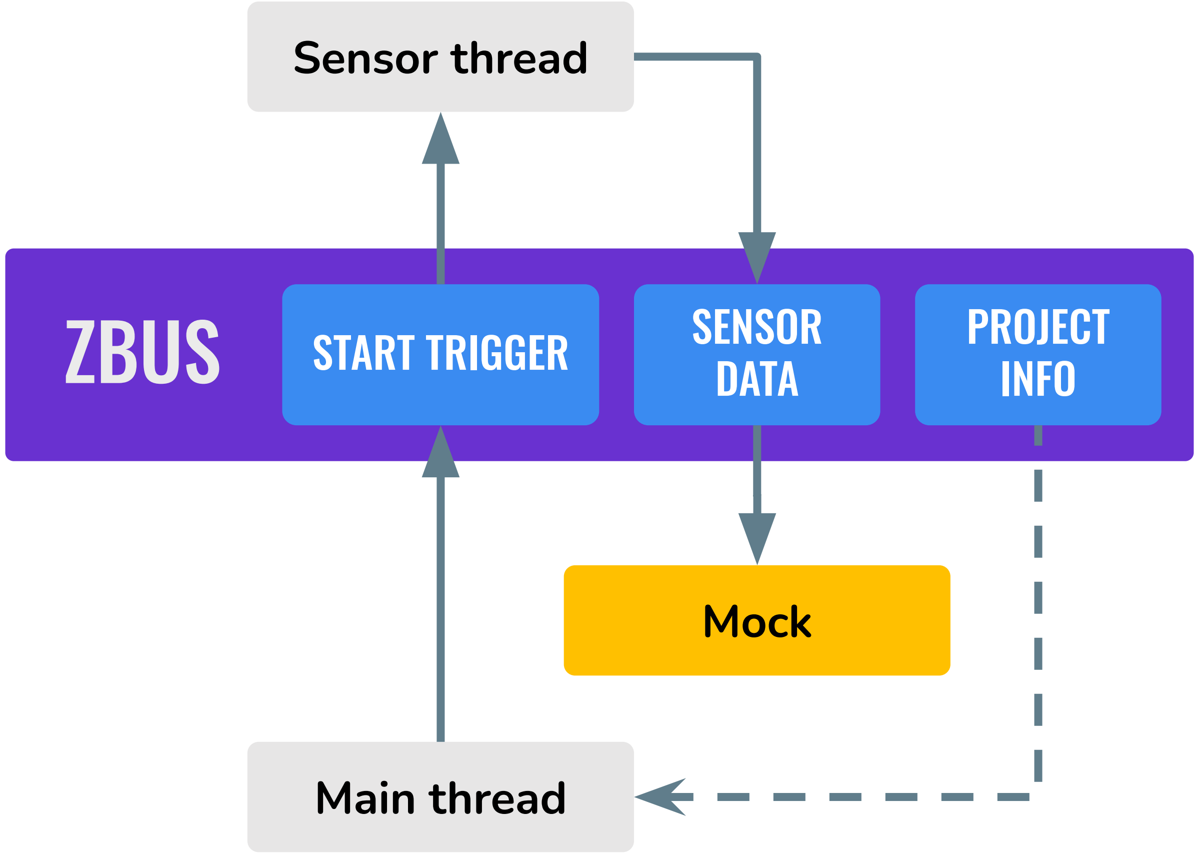


ZBUS

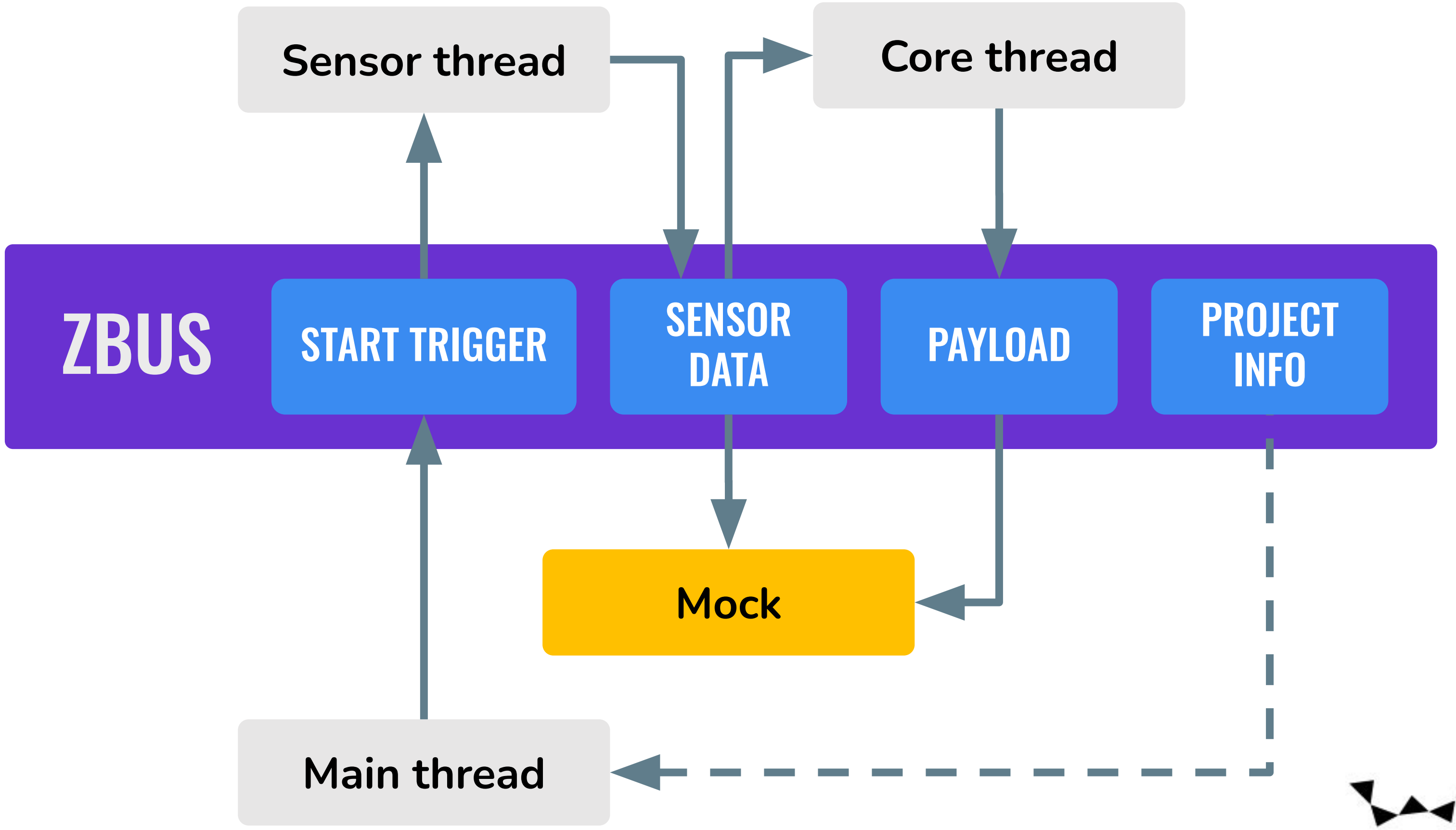
PROJECT INFO

Main thread

Step 03


Sensor thread
ZBUS
START TRIGGER
SENSOR DATA
PROJECT INFO
Mock
Main thread

Step 04



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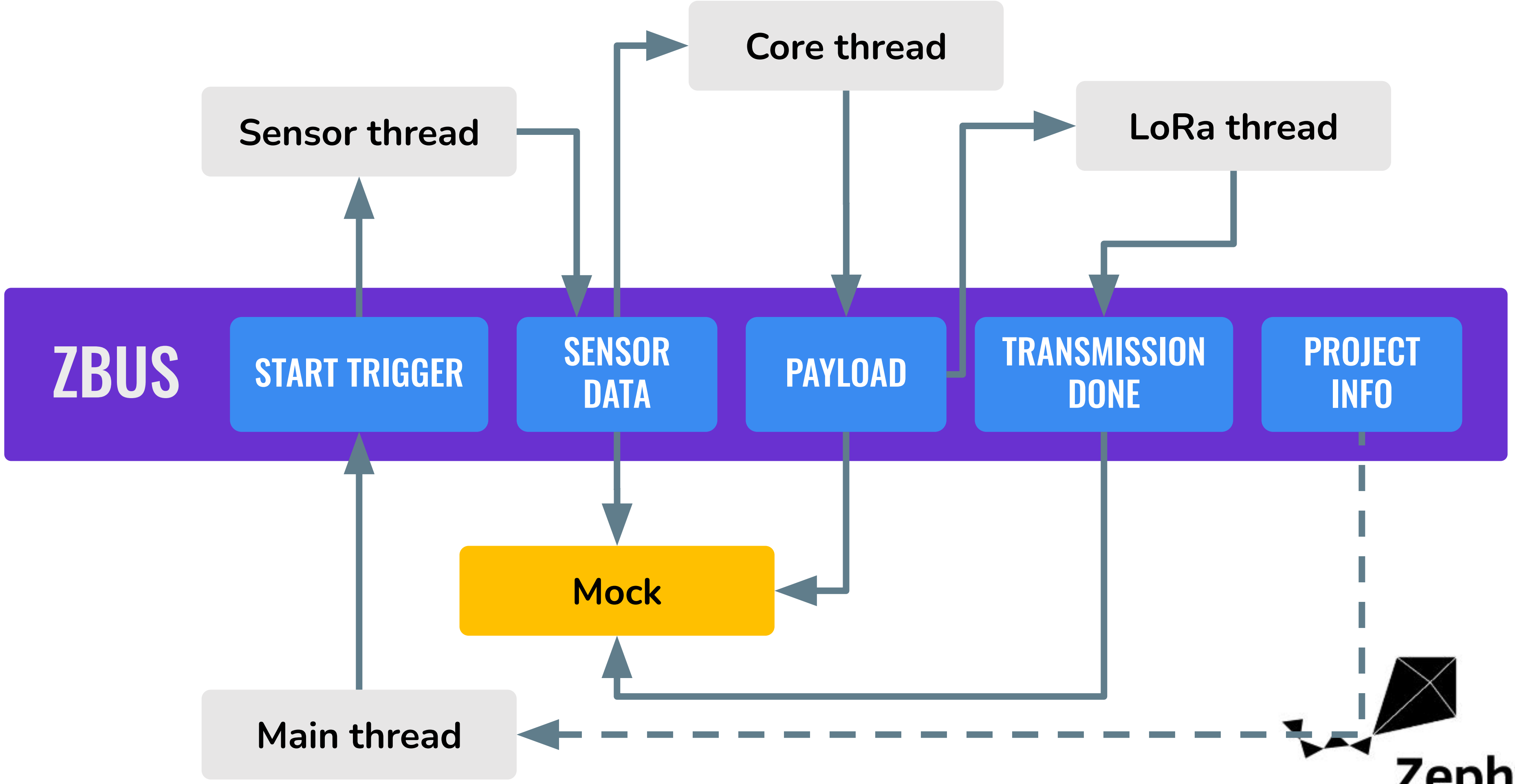
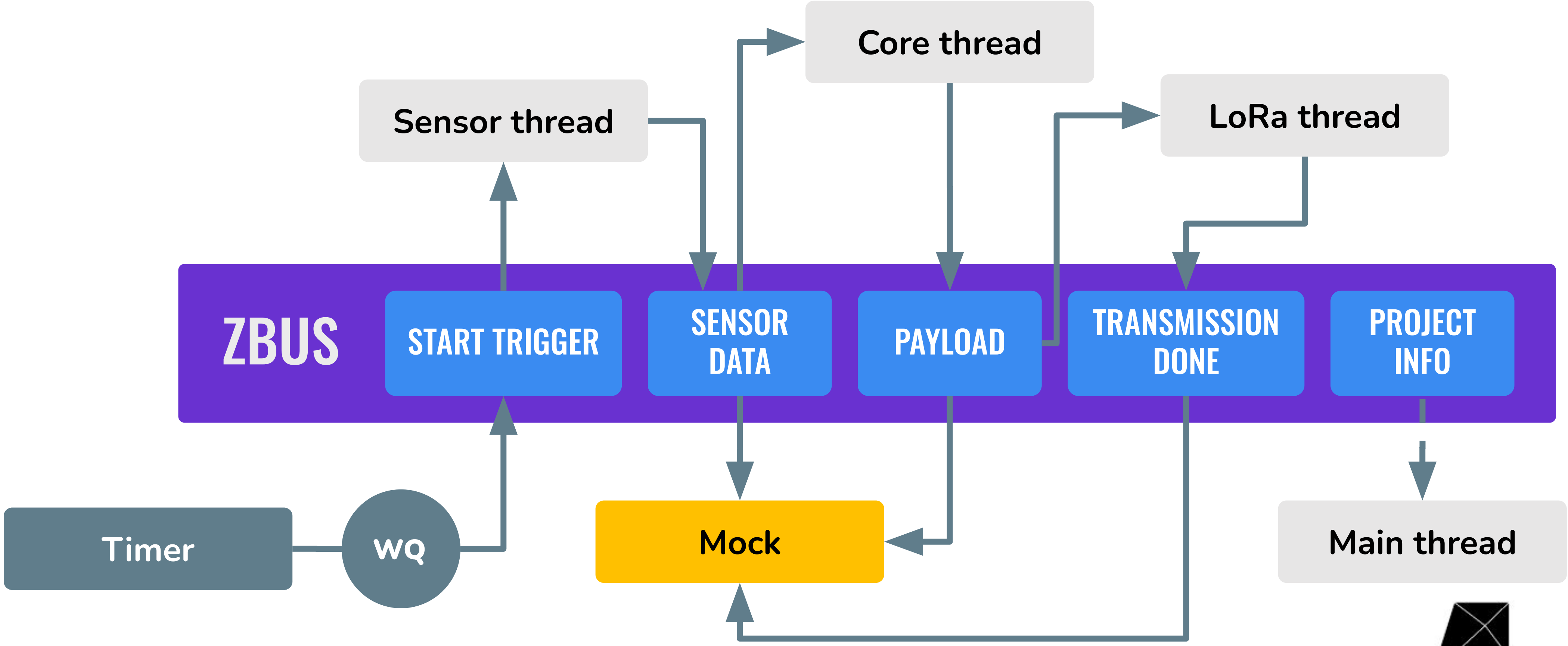
Step 05


Core thread
Sensor thread
LoRa thread
ZBUS
START TRIGGER
SENSOR DATA
PAYLOAD
TRANSMISSION DONE
PROJECT INFO
Mock
Main thread

Step 06



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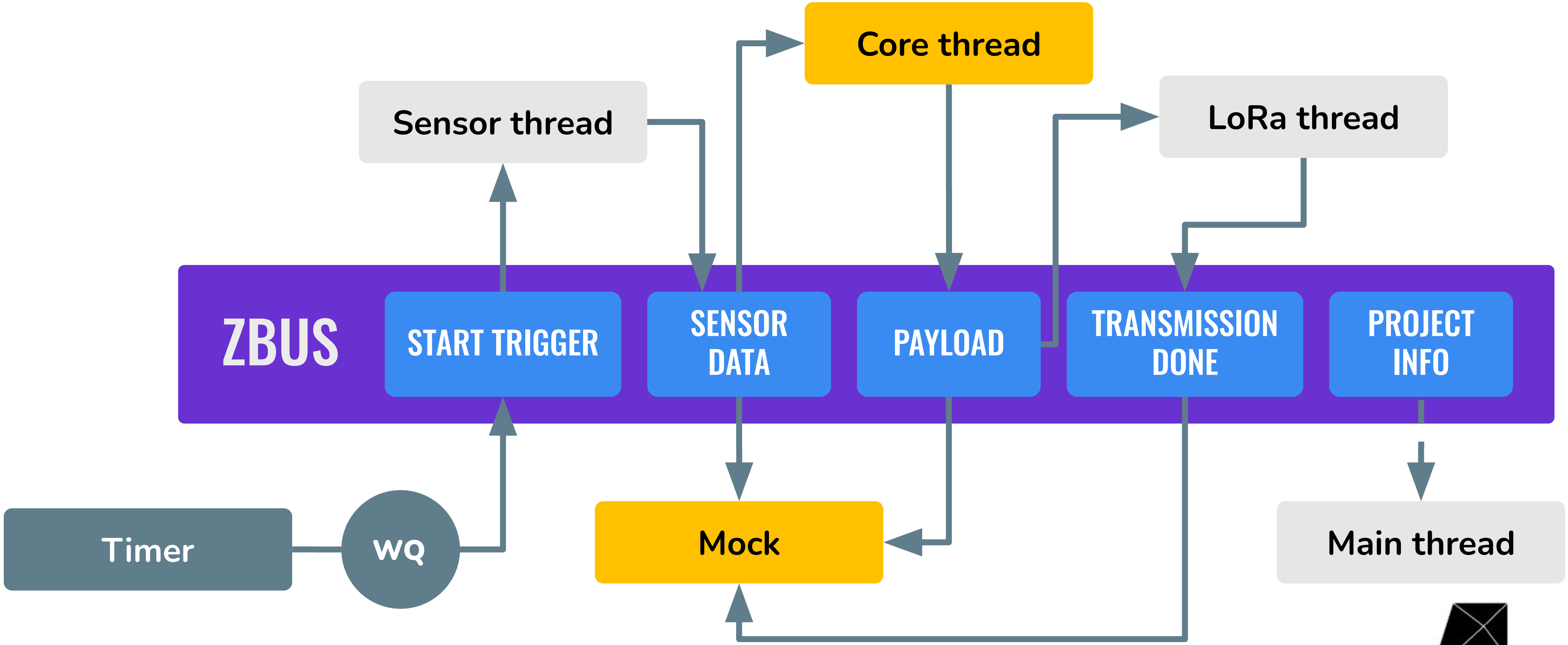
Step 07



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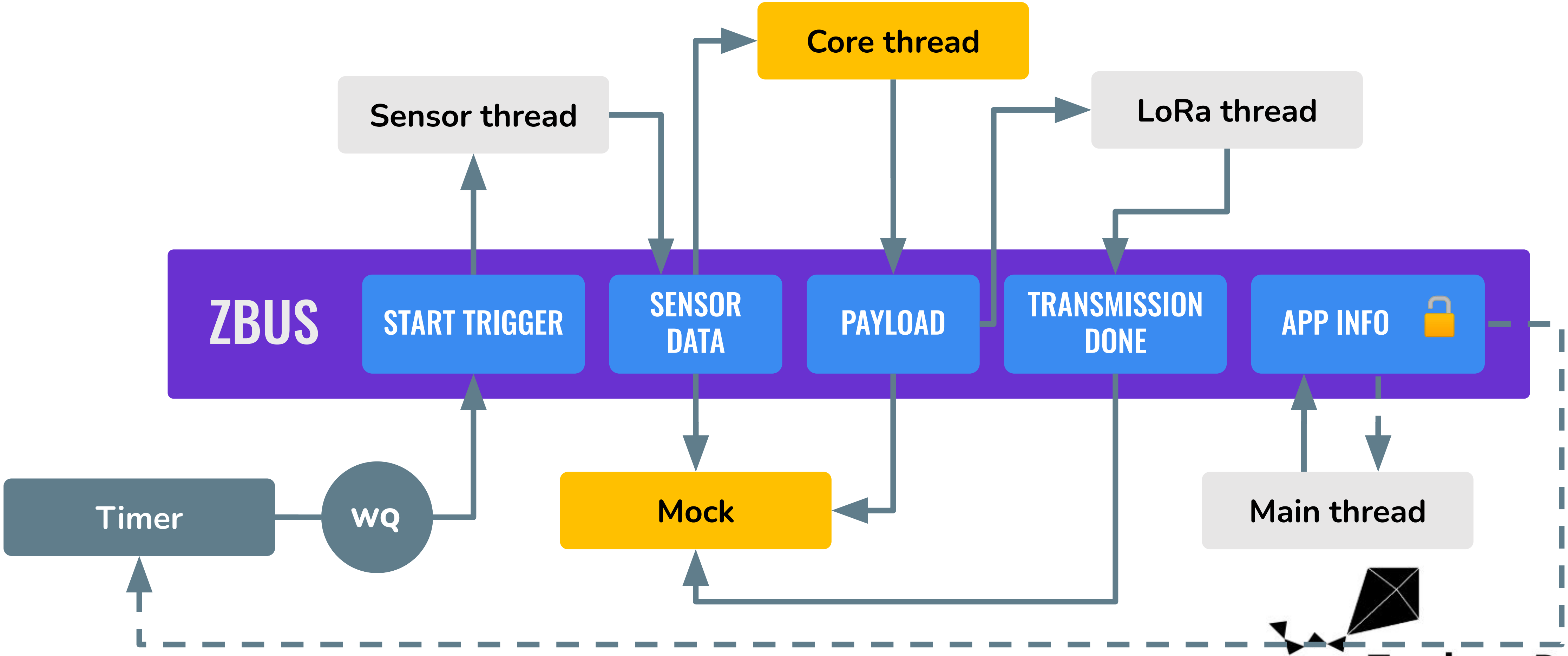
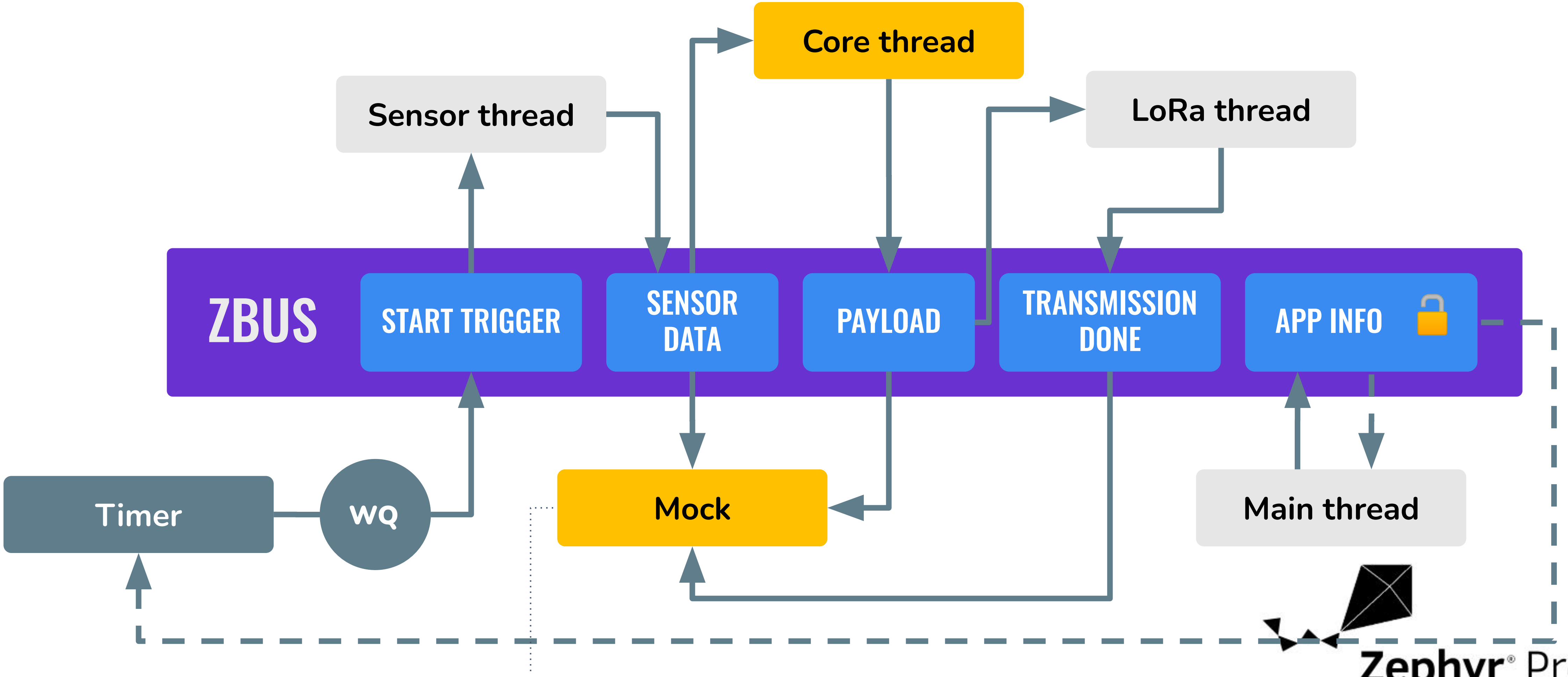
Step 08

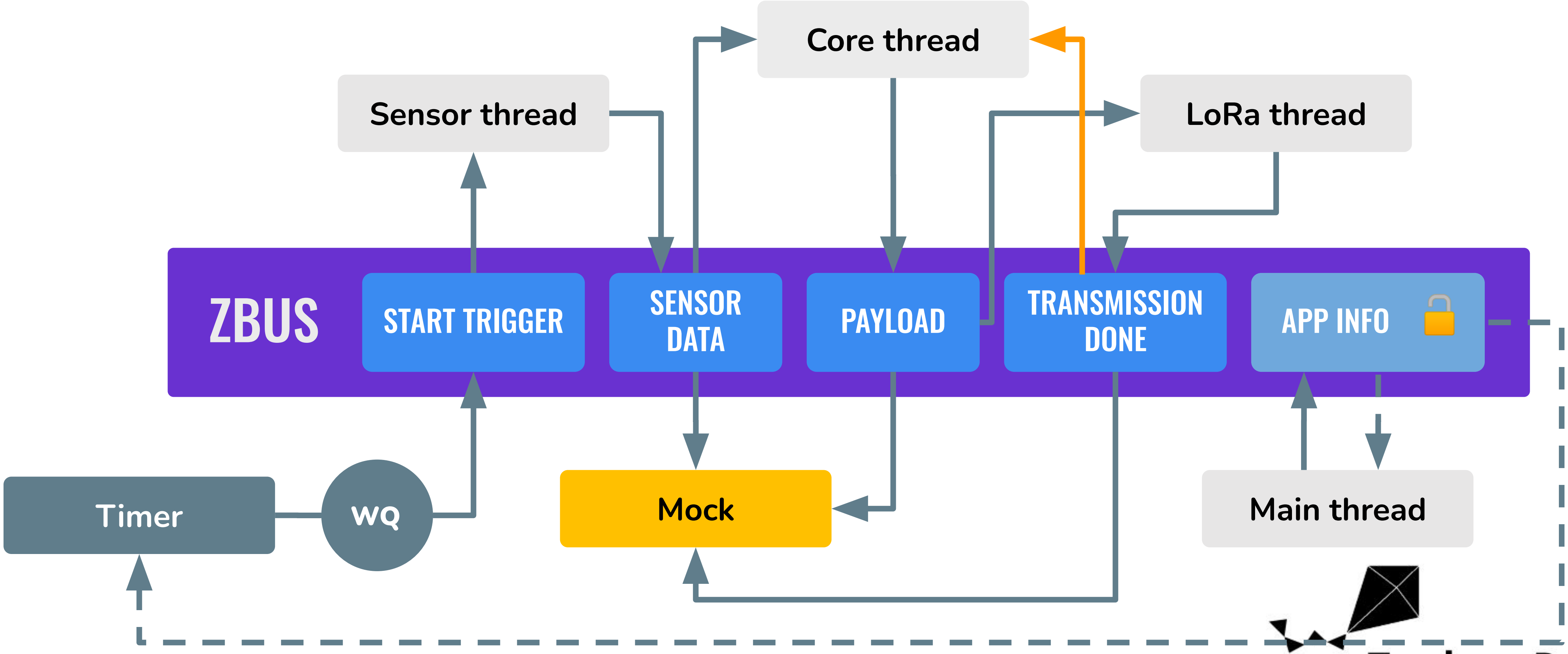

Core thread
Sensor thread
LoRa thread
ZBUS
START TRIGGER
SENSOR DATA
PAYLOAD
TRANSMISSION DONE
APP INFO
Timer
WQ
Mock
Main thread

Step 09



Fix execution sequence!

Step 10



Core thread
Sensor thread
LoRa thread
ZBUS
START TRIGGER
SENSOR DATA
PAYLOAD
TRANSMISSION DONE
APP INFO
Timer
WQ
Mock
Main thread

Tips and tricks

Listeners

❌ Avoid excessive use of them, they are running during the publishing process

❌ Do not sleep inside listeners. It will increase the publishing latency

✅ Think of them as an ISR. They must run as quickly as possible

Listeners

✅ Use a work queue or separated thread instead of executing something heavy inside a listener

✅ Use **`zbus_chan_const_msg`** inside listeners. The channels are already locked!

Subscribers

❌ Do not use subscribers when losses and duplications cannot be tolerated

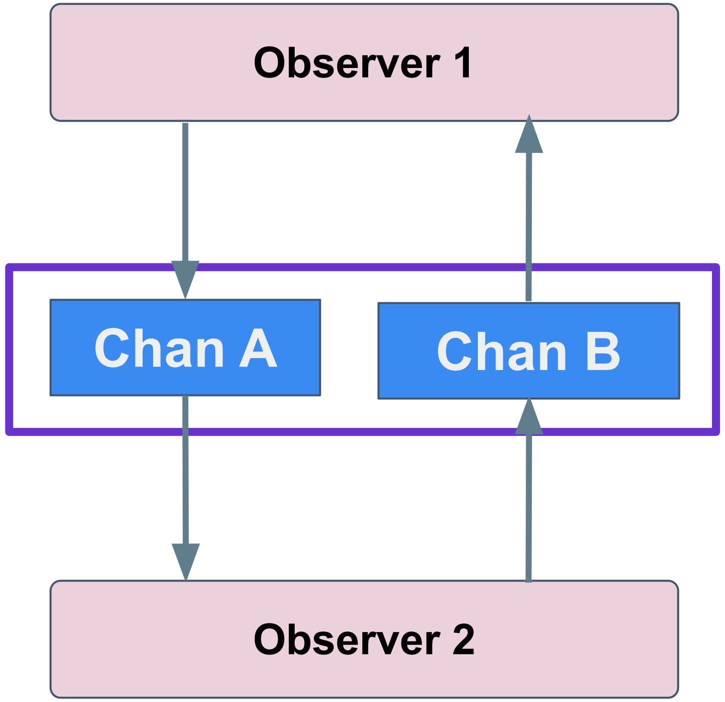
✅ Use listeners in conjunction with message queues

✅ PR with confirmed channels sample submitted

Undesired loops

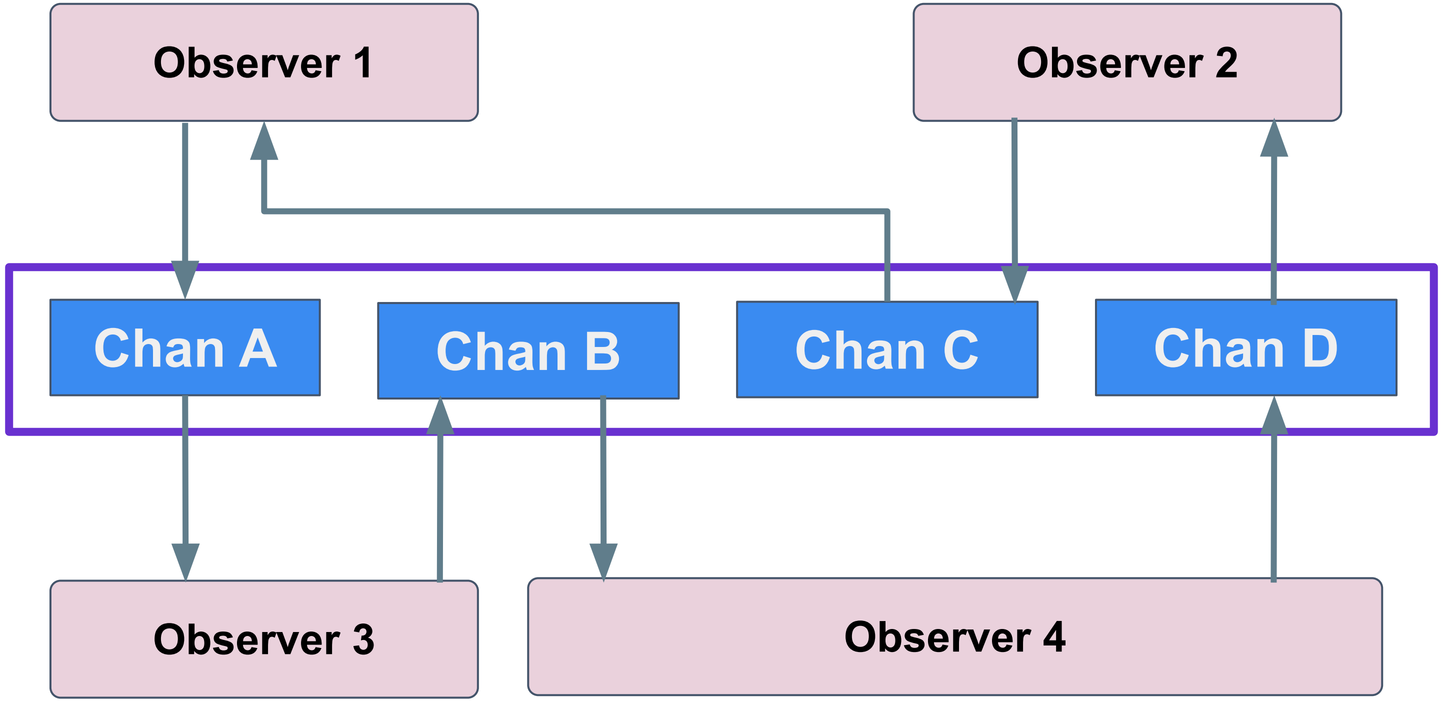
- ❌ Take care with publishing loops

- ✅ Avoid loops on the bus diagram



Undesired loops

❌ Take care with chained publishing loops



ISR

❌ Do not use ZBus functions inside an ISR

✅ Postpone that by using work queues instead

Extras

- ✅ The channels can be used as a concurrent property system
- ✅ Isolate the hardware code using channels
- ✅ Use channels as modules interface [in/out]

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Questions & Answers

Thank you!