



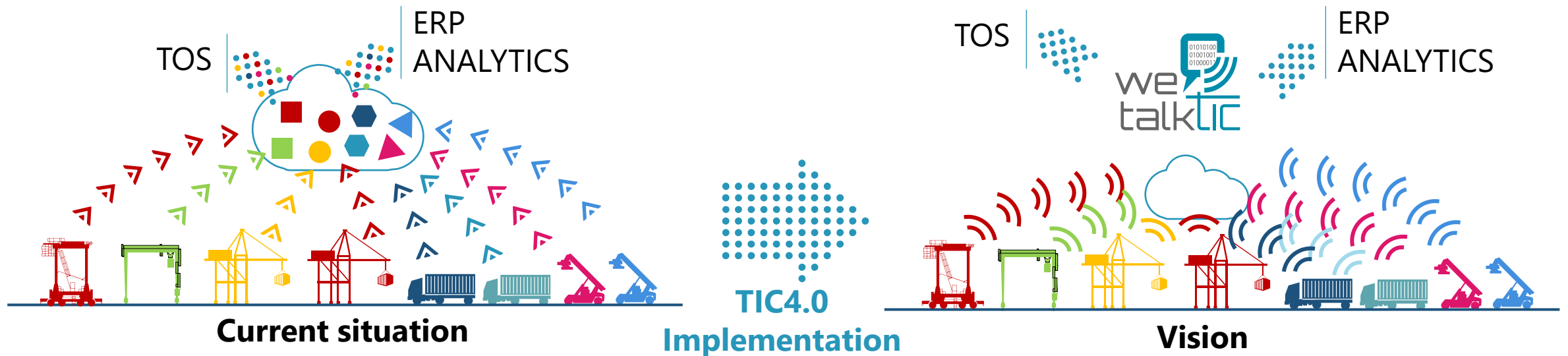
Embracing the 4th Industrial Revolution in the Port Industry

TIC4.0 MASTERCLASS

DEVELOPING A COMMON DATA LANGUAGE

To be resilient you need to be digital

- TIC4.0 is a project to define industry standards for ports and terminals
- Enabling communication for all stakeholders in Ports & Terminals



- Different Standards for every equipment provider, some might not be connected
- Difficult to compare results, since different measurement methods are used

- Single broadly accepted standard for Ports & Terminals operations
- Easy to compare results between equipment

TIC4.0 Language can represent any reality in all time instances from any point of view

Past (Performed) | **Present** (Actual) | **Future** (Scheduled, Planned, Requested, Proposed, Estimated)

```
che: [Array]
  [0]: [Object]
    id: ""
    name: ""
    number: 0
    type: ""
    family: ""
    brand: ""
    model: ""
    referencepoint: [Object]
    location: [Object]
    on: [Object]
      status: [Array]
      duration: [Array]
      counter: [Array]
      totalcounter: [Array]
      timer: [Array]
      totaltimer: [Array]
    off: [Object]
    standby: [Object]
    notstandby: [Object]
    working: [Object]
    idle: [Object]
```

Instantaneous
(no time dimension)

Box A is at location C

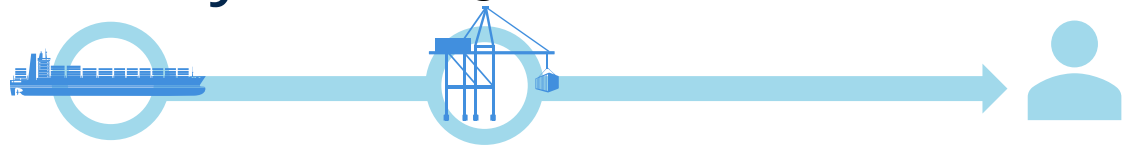
Events
(change of value)

Box A moved to location B

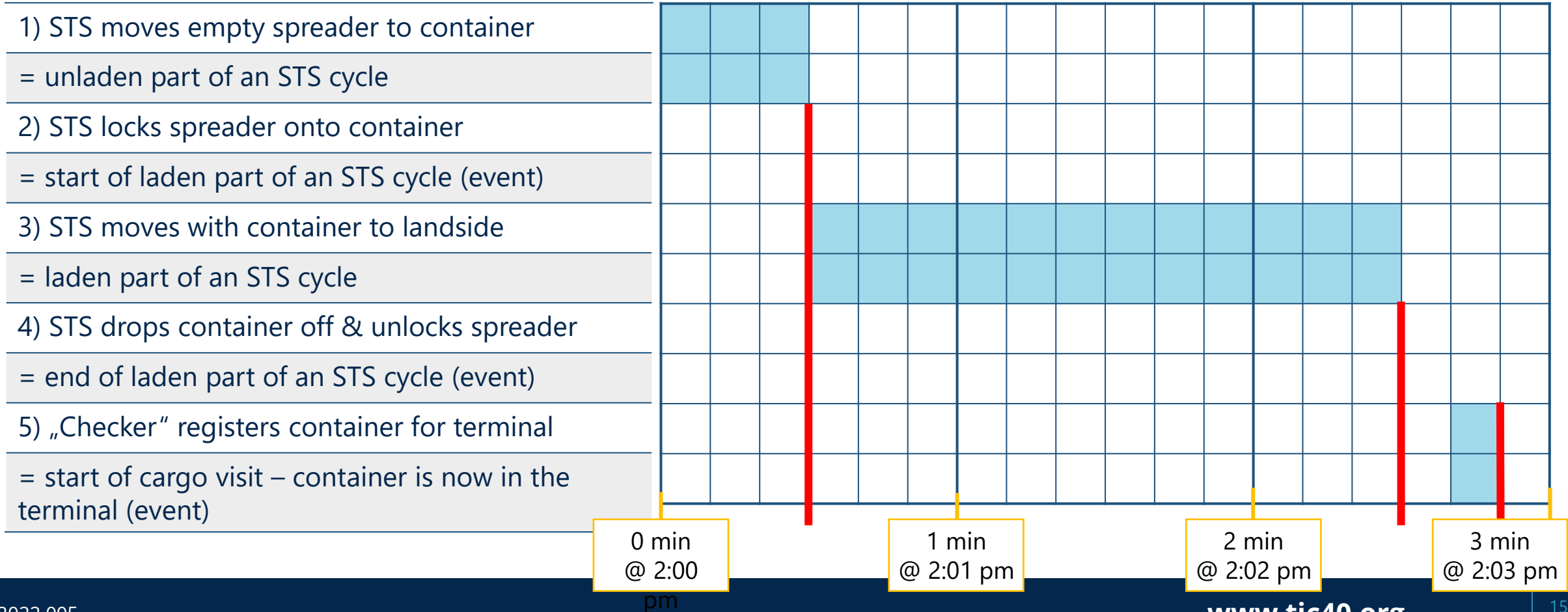
Aggregations (with time dimension)

How many boxes between 9AM and 11 AM?
How long were the boxes in the Terminal?
How much energy consumed per box?

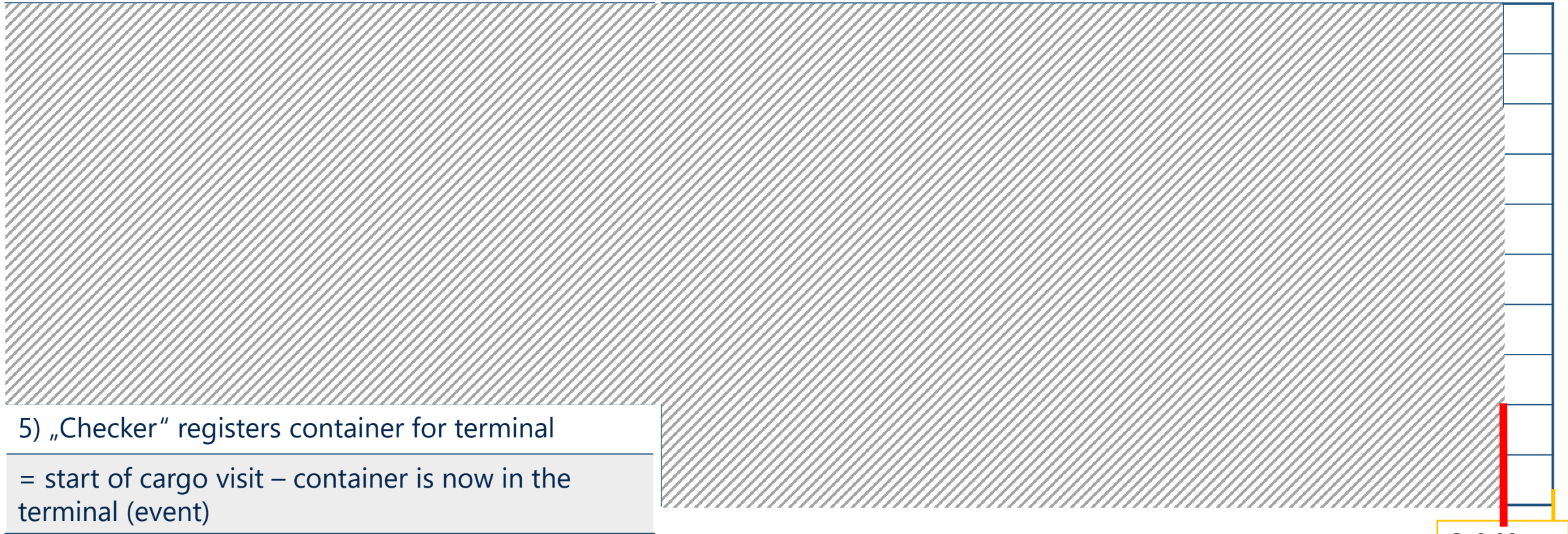
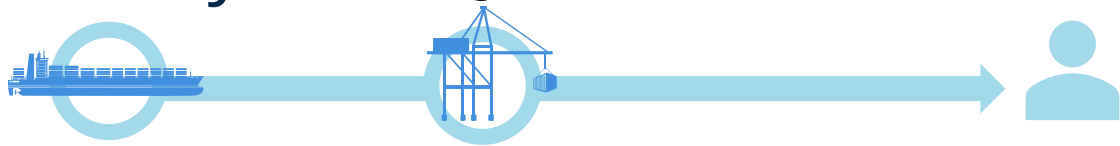
Reality: unloading a container from a vessel with an STS and doing the check-in.



| Event
 Instant Status
 | Time Reference



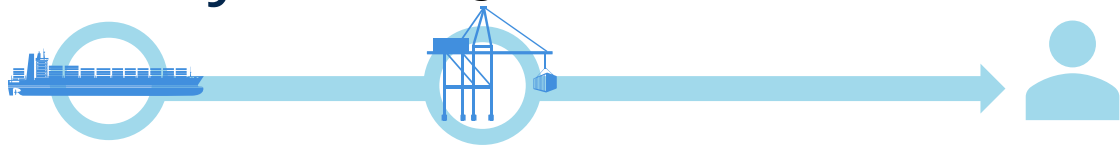
Reality: unloading a container from a vessel with an STS and doing the check-in.



5) „Checker“ registers container for terminal
= start of cargo visit – container is now in the terminal (event)

@ 2:03 pm

Reality: unloading a container from a vessel with an STS and doing the check-in



Event Instant Status Time Reference

1) STS moves empty spreader to container

= unladen part of an STS cycle

2) STS locks spreader onto container

= start of laden part of an STS cycle (event)

3) STS moves with container to landside

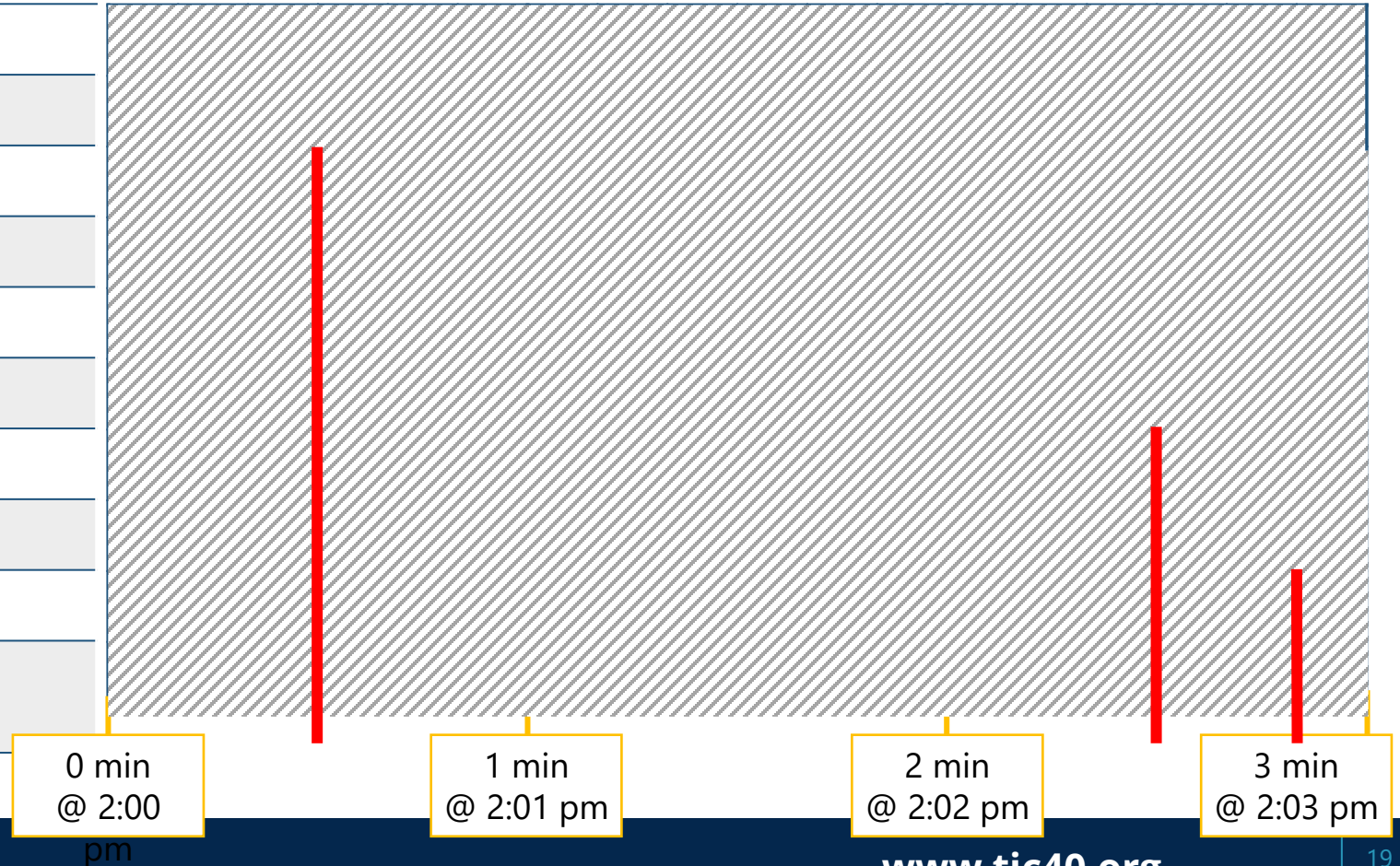
= laden part of an STS cycle

4) STS drops container off & unlocks spreader

= end of laden part of an STS cycle (event)

5) „Checker“ registers container for terminal

= start of cargo visit – container is now in the terminal (event)



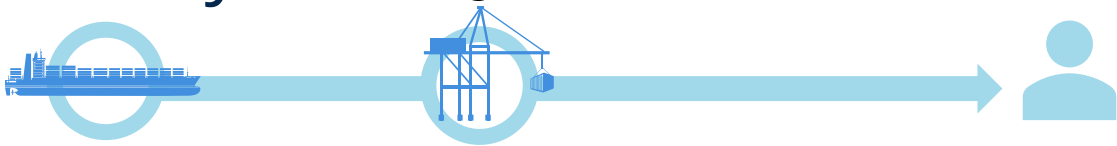


Granularity Based on instantaneous messages – Every 10 sec. 2 sec duration



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= start of laden part of an STS cycle (event)

3) STS moves with container to landside

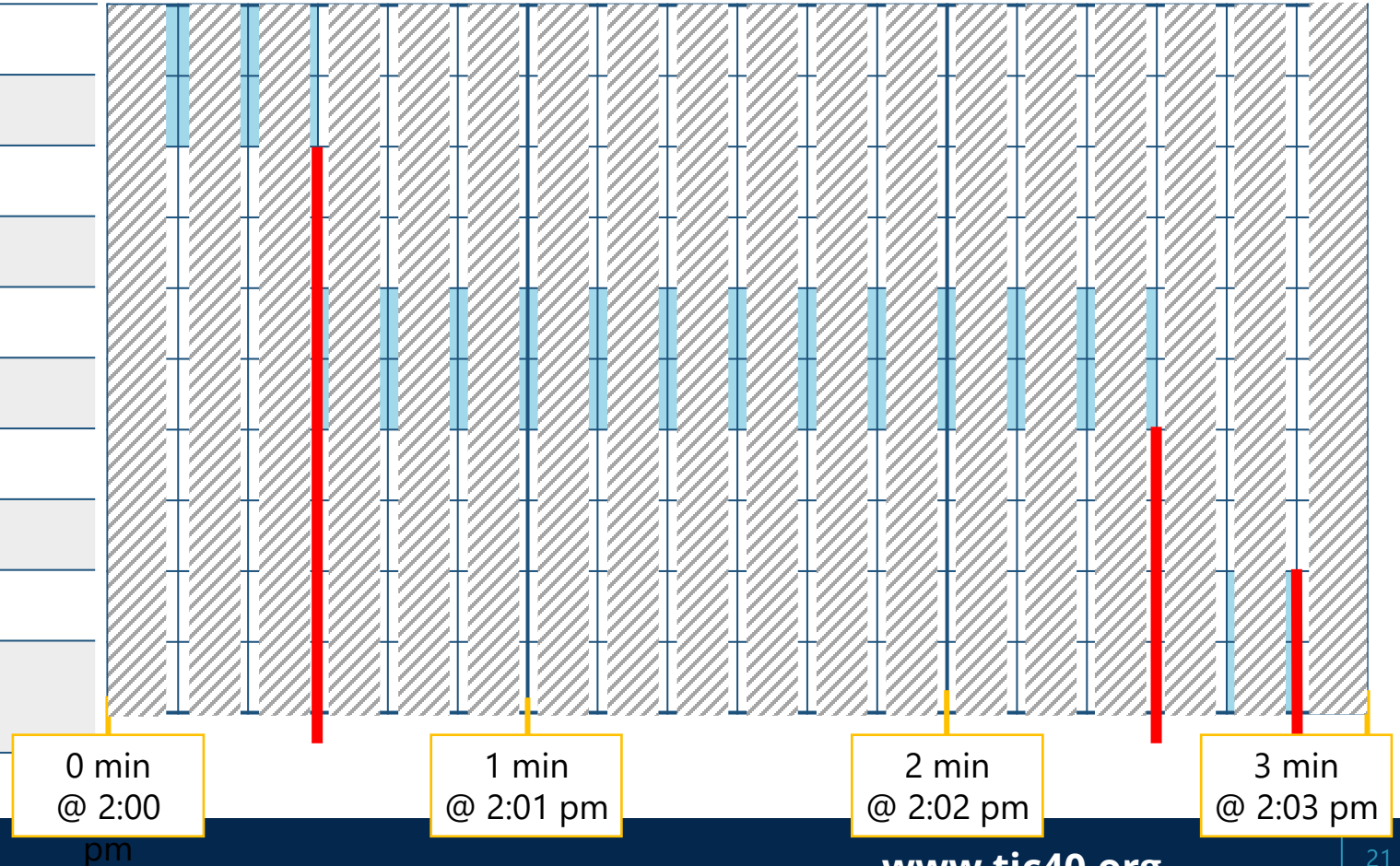
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Join us!

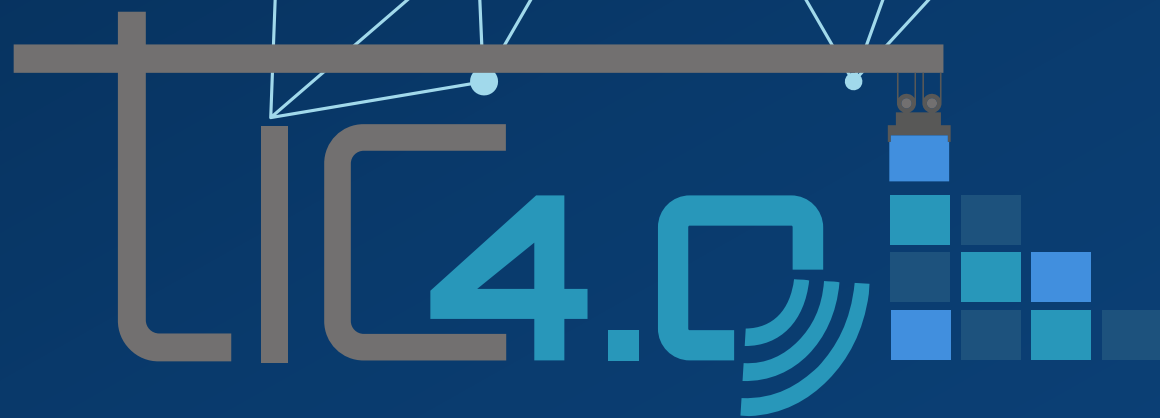


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