

ALL
IN

CISCO *Live!*

DevNet Zone



The bridge to possible

You Know What Really Floats My Boat? Cisco Edge Intelligence.

A real customer use case for edge computing

Stien Vanderhallen | IoT Technical Solutions Specialist

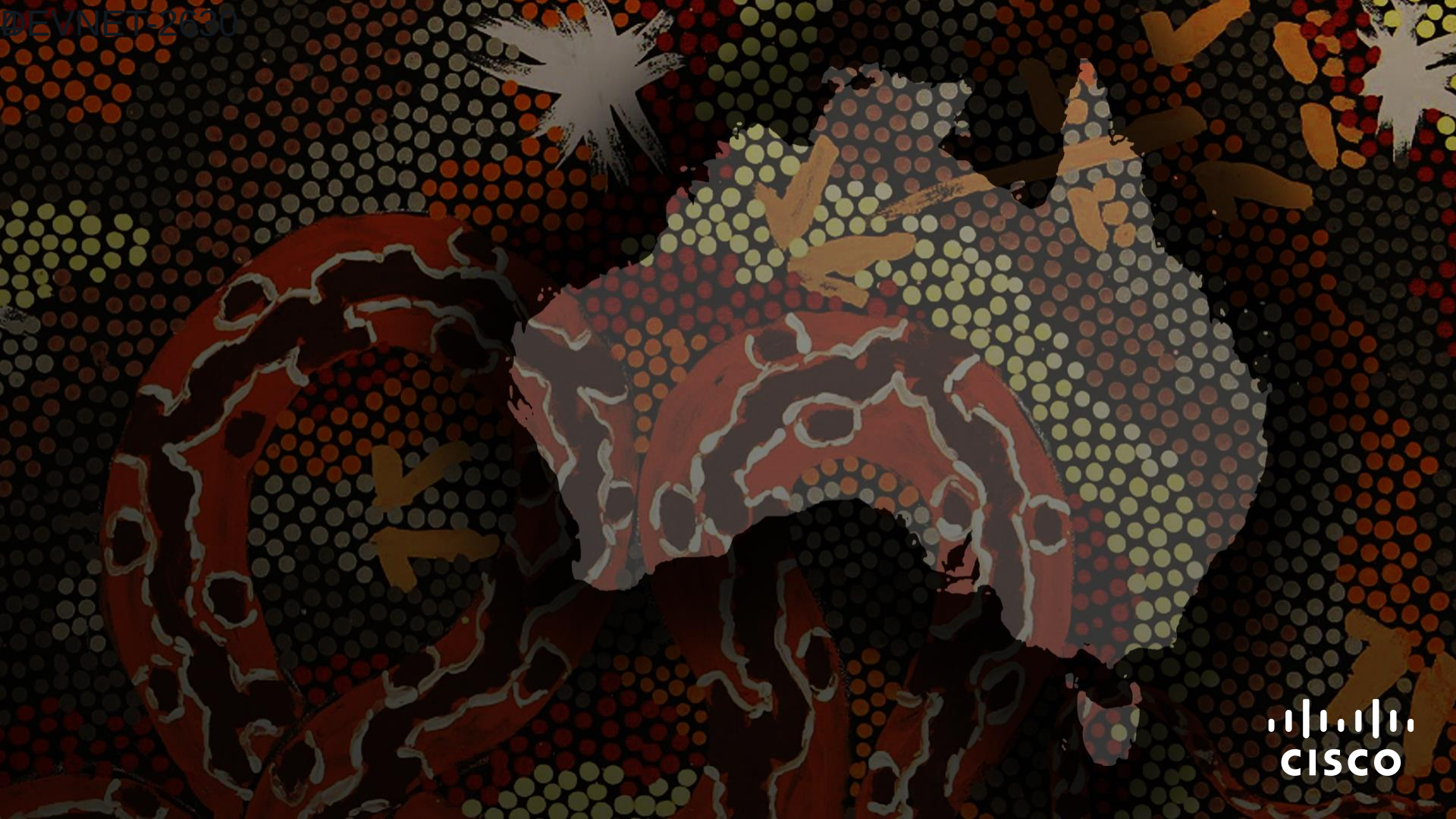
@StienVDHallen

DEVNET-2630



DevNet Zone

#CiscoLiveAPJC



Cisco Webex App

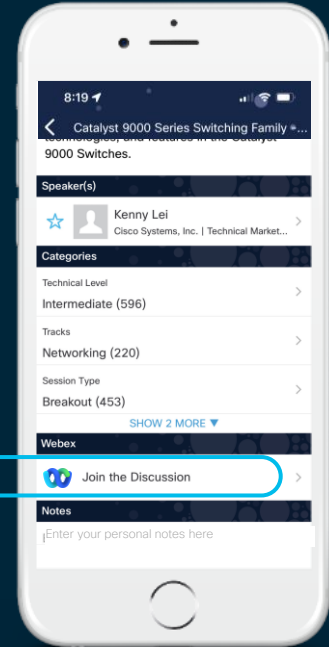
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until Thursday 22 December, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#DEVNET-2630>

NOTE: This space is
actively monitored
until December 22





The bridge to possible

You Know What Really Floats My Boat? Cisco Edge Intelligence.

A real customer use case for edge computing

Stien Vanderhallen | IoT Technical Solutions Specialist
@StienVDHallen
DEVNET-2630



DevNet Zone

#CiscoLiveAPJC



Agenda

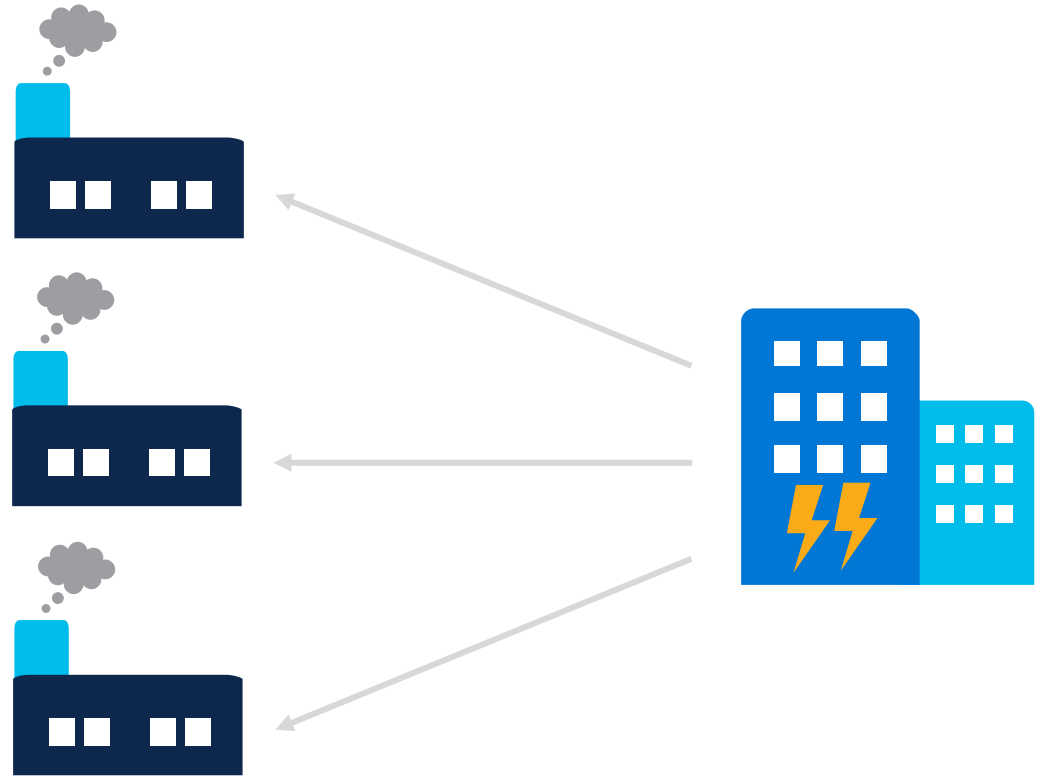
- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!



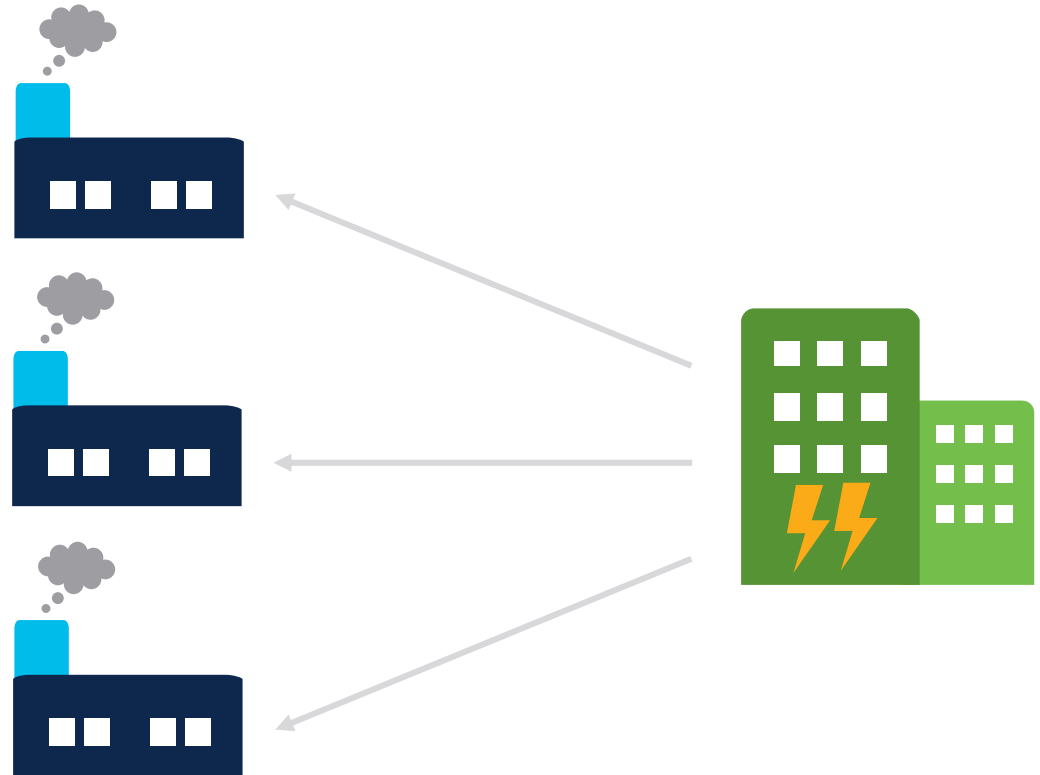
Agenda

- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!

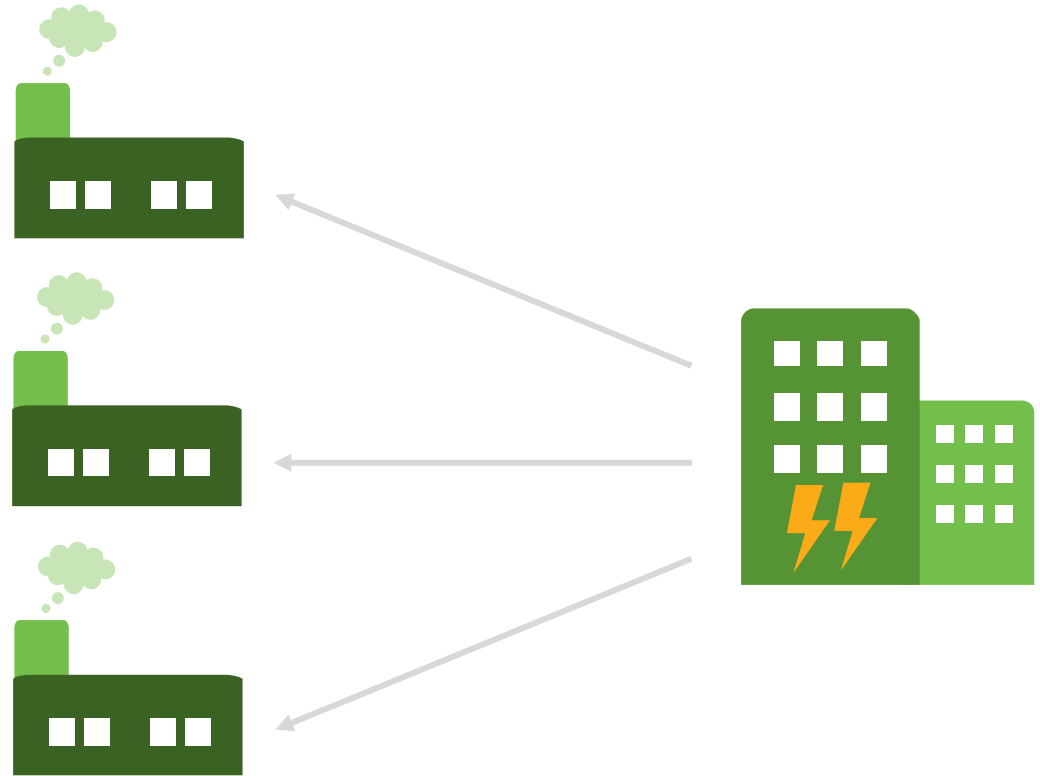
Modern companies have modern needs.



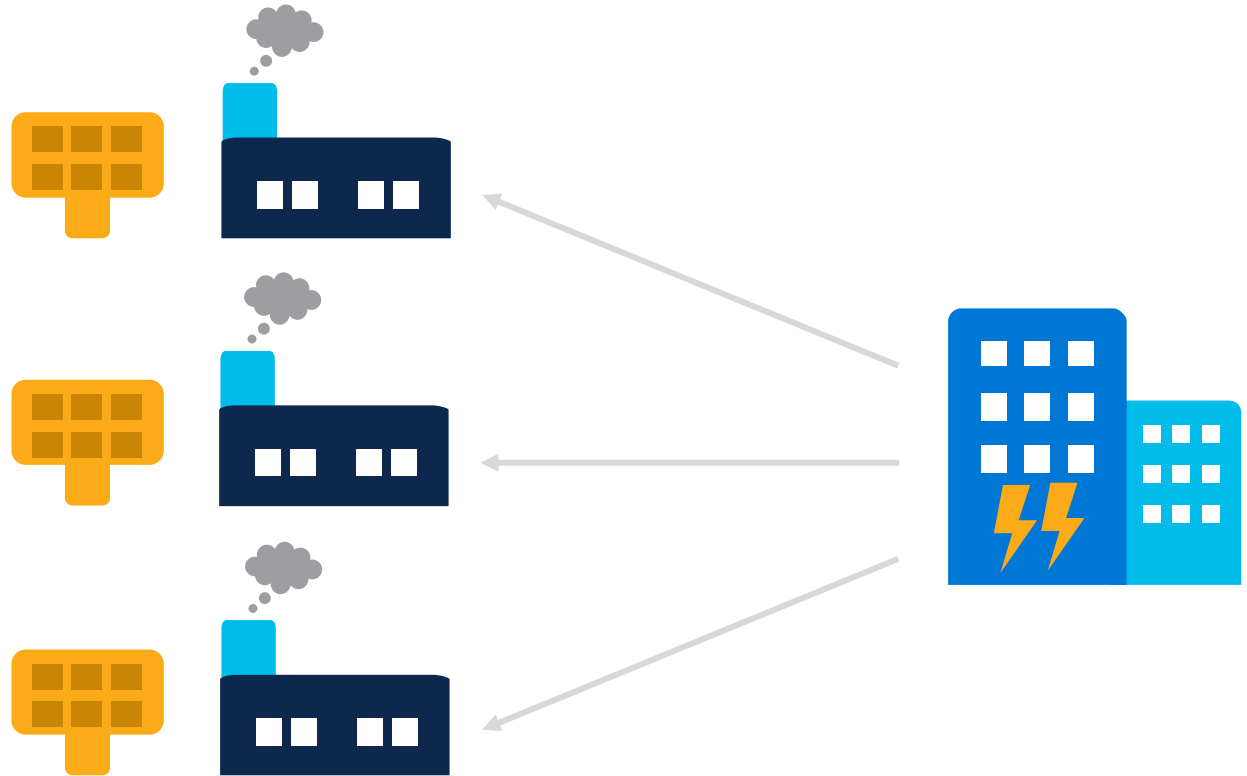
Modern companies have modern needs.



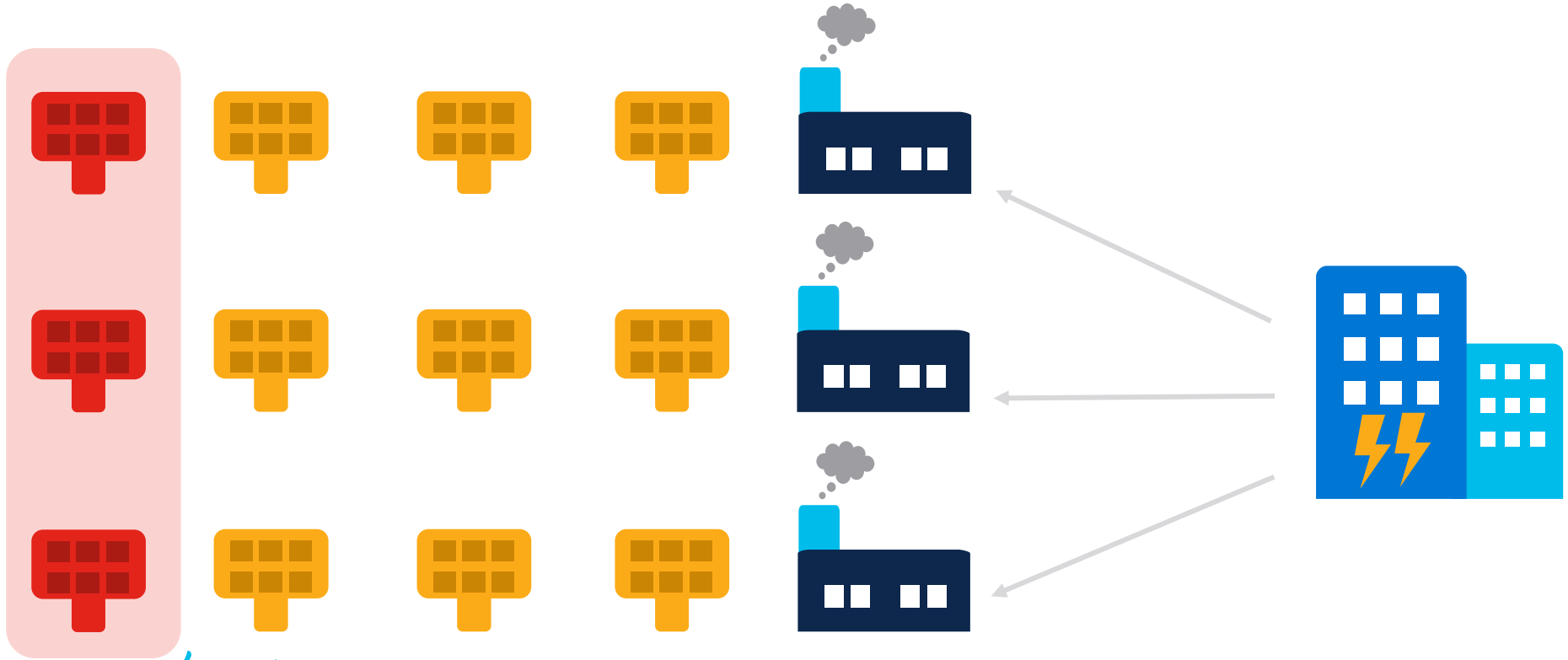
Modern companies have modern needs.



Modern companies have modern needs.



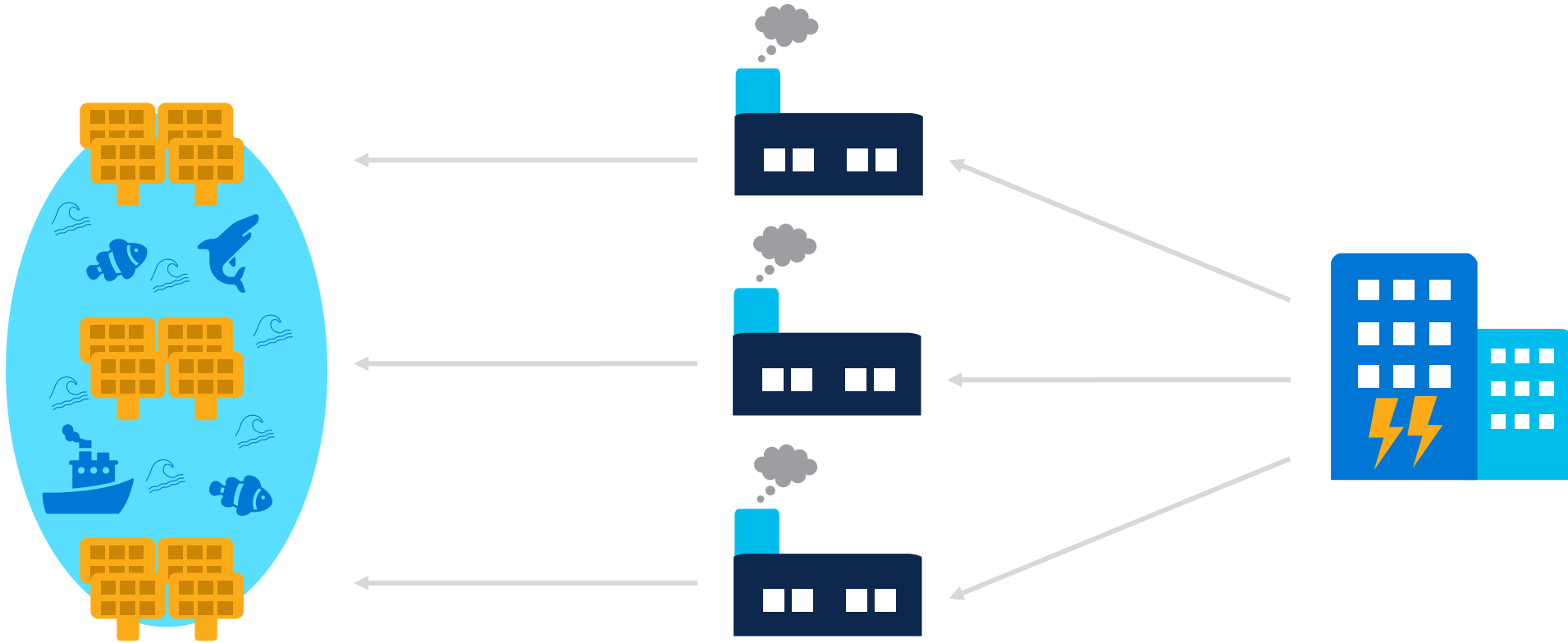
Modern companies have modern needs.



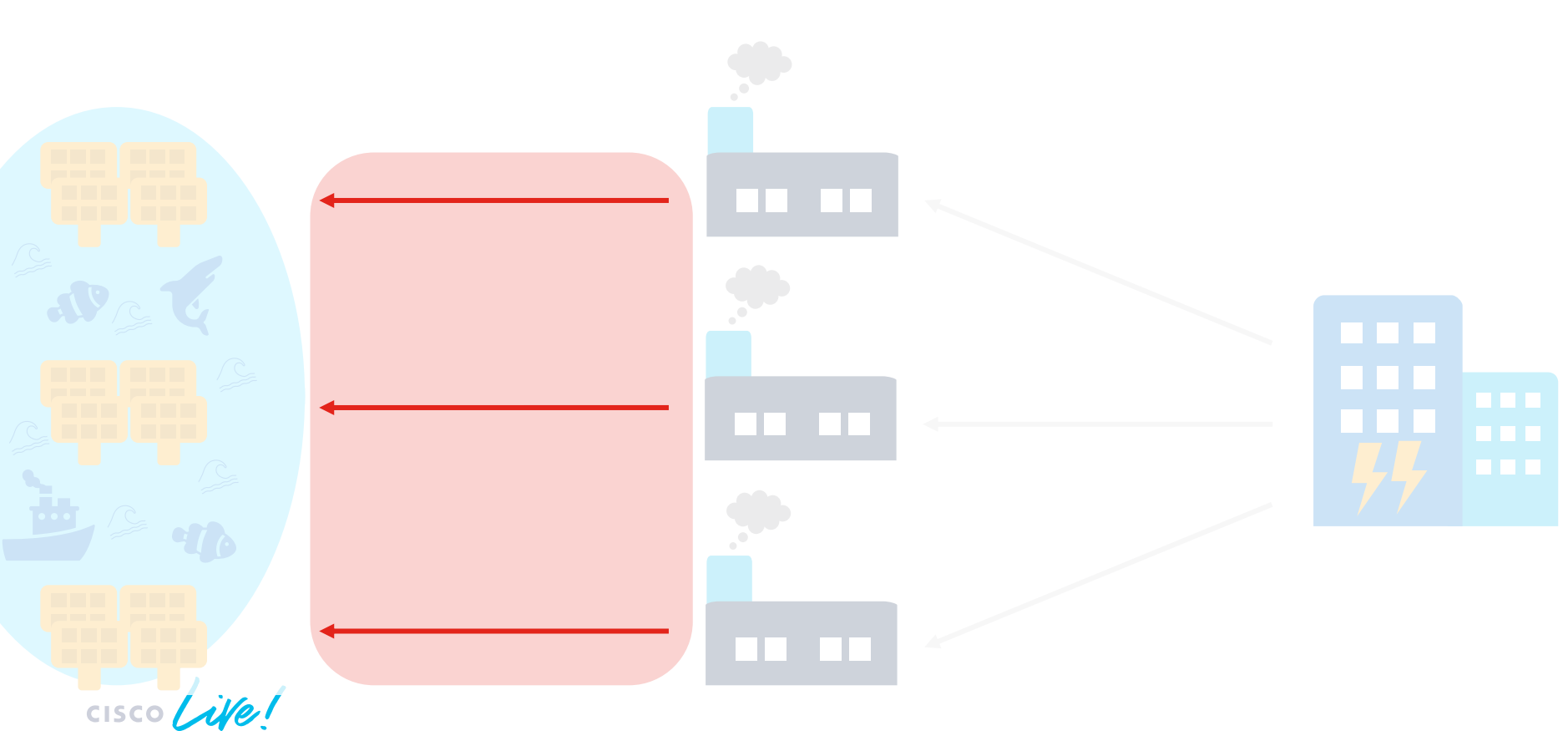
Modern companies have modern needs.



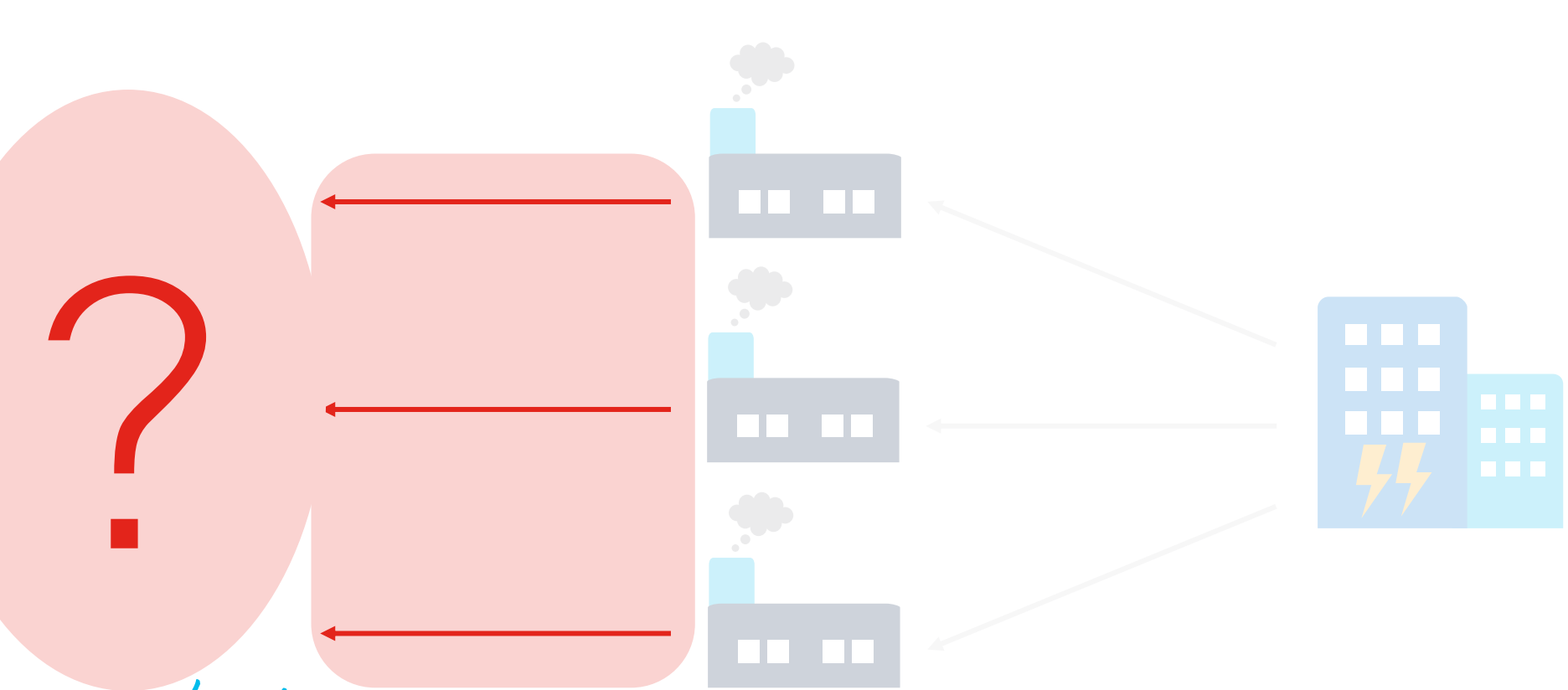
Modern companies have modern needs.



Modern companies have modern needs.



Modern companies have modern needs.



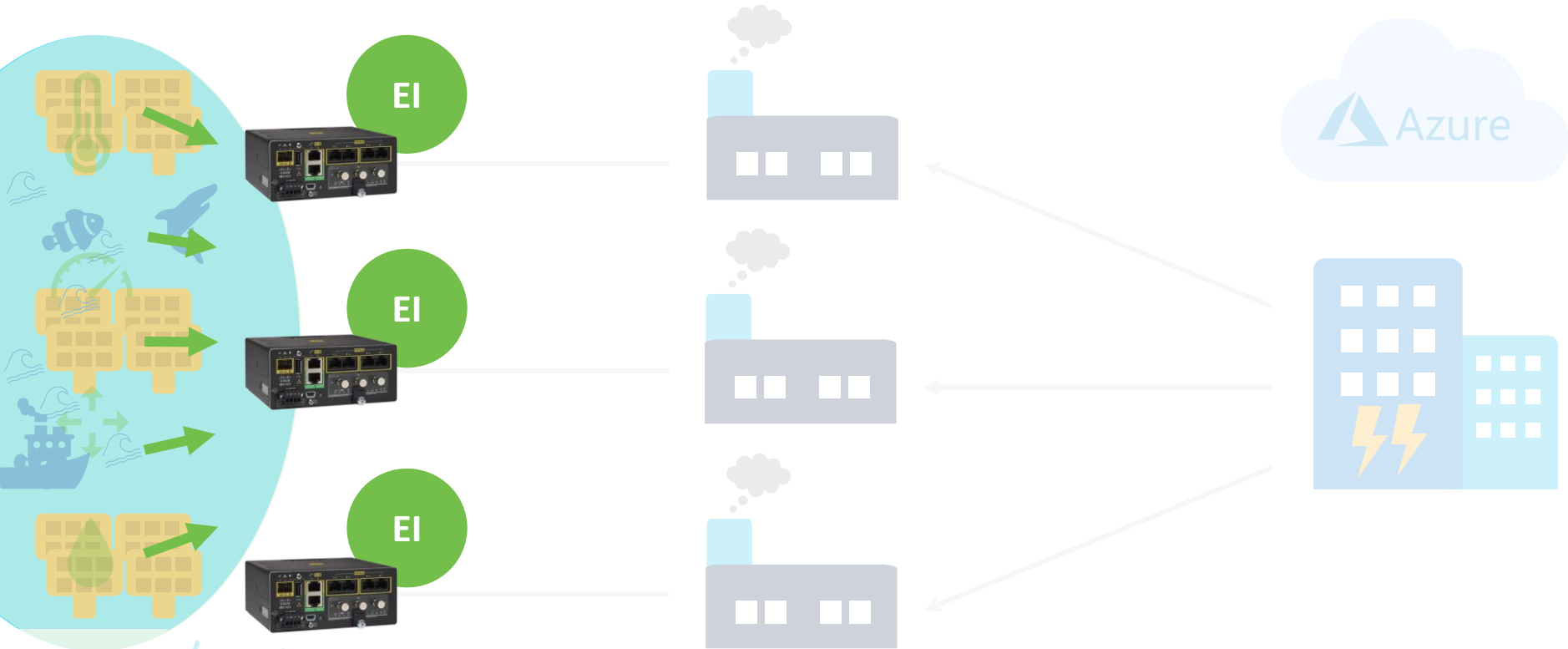
Modern companies have modern needs.



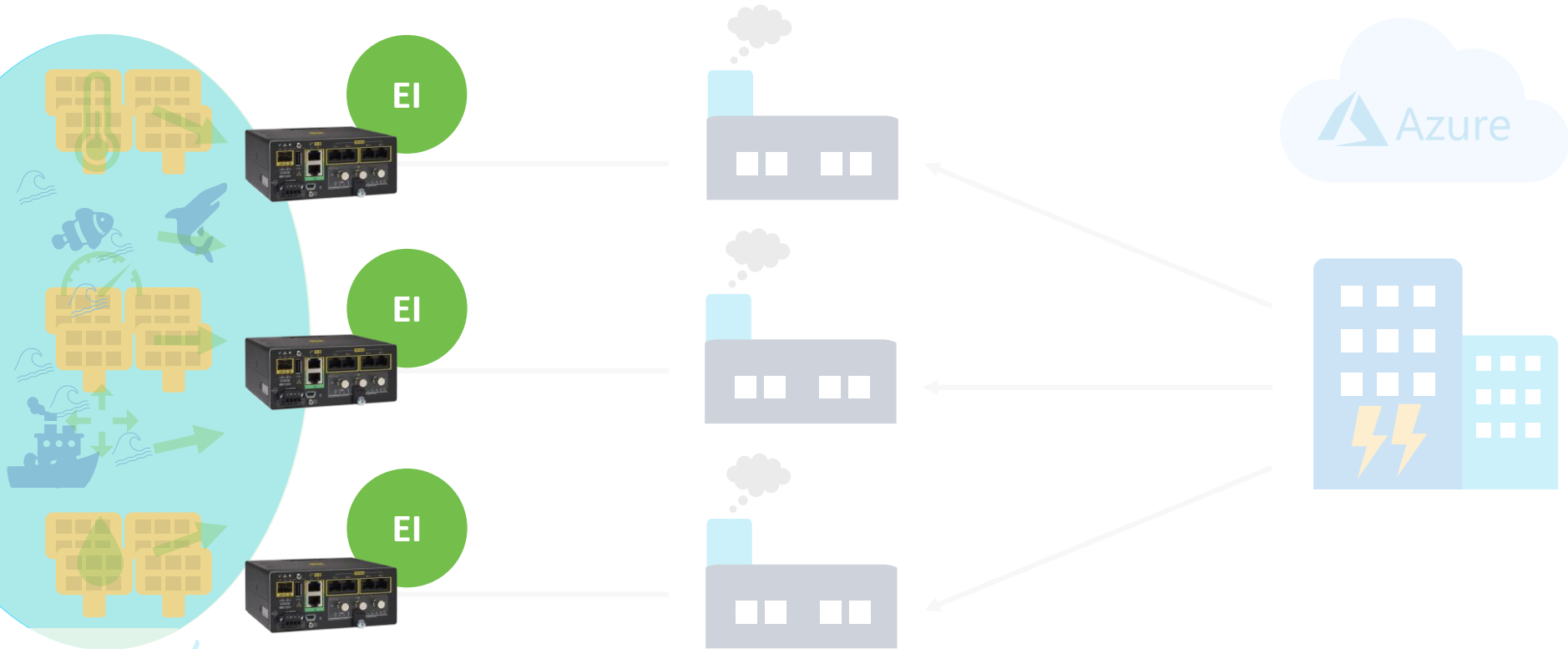
We use edge computing to meet modern needs.



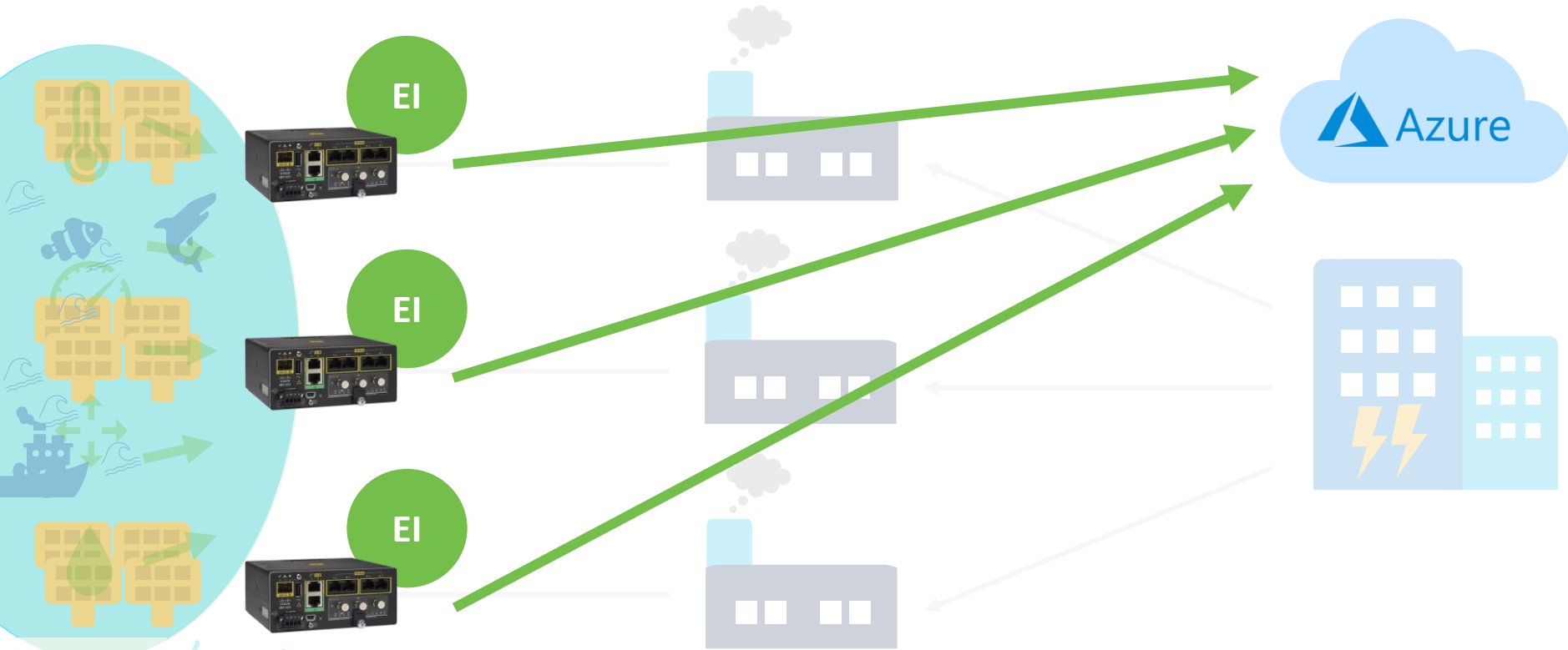
We use edge computing to meet modern needs.



We use edge computing to meet modern needs.



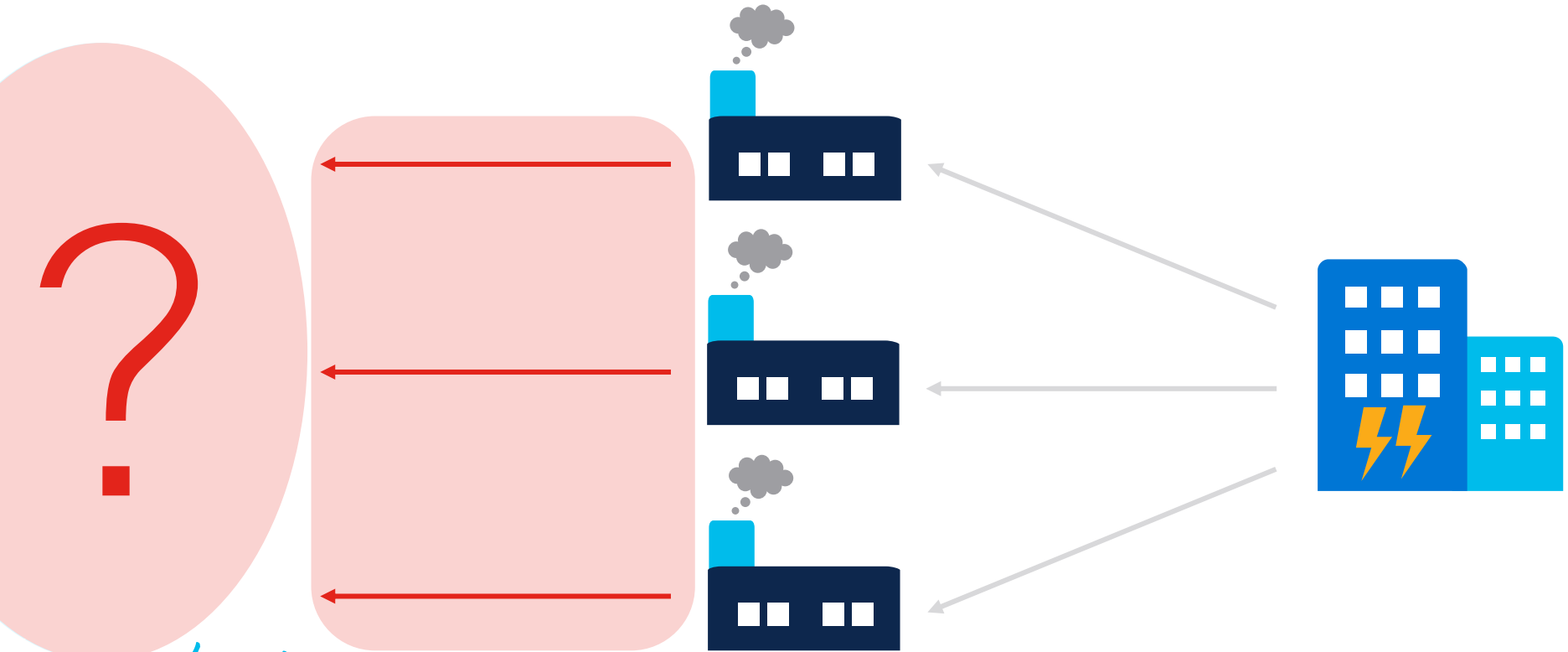
We use edge computing to meet modern needs.



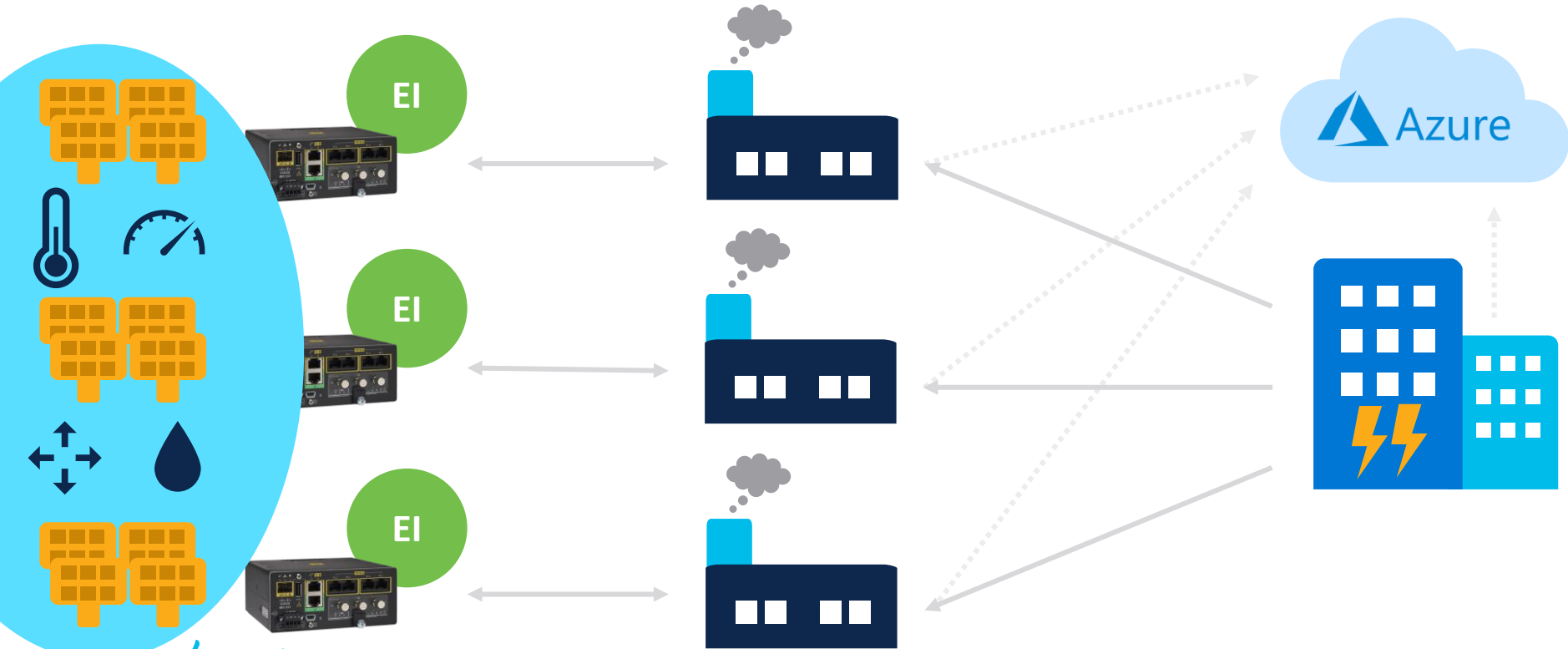
We use edge computing to meet modern needs.



Modern companies have modern needs.



We use edge computing to meet modern needs.





Agenda

- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!



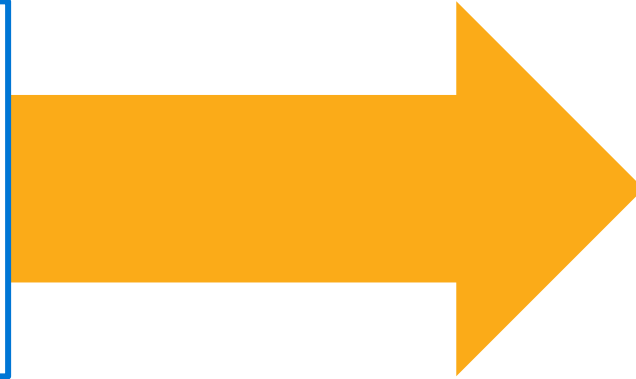
Agenda

- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!

The Edge

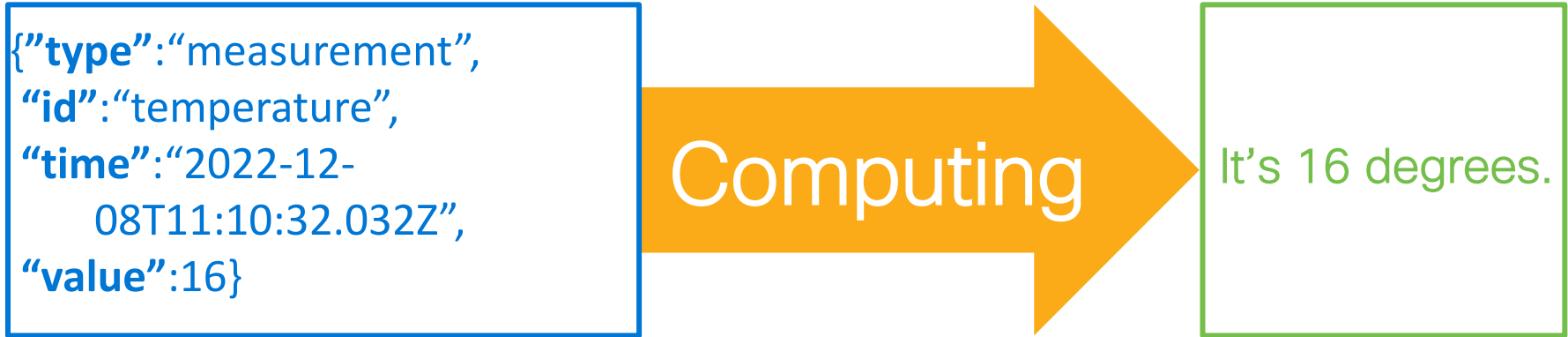
We need computing because we are not robots.

```
{  
  "type": "measurement",  
  "id": "temperature",  
  "time": "2022-12-  
    08T11:10:32.032Z",  
  "value": 16  
}
```



It's 16 degrees.

We need computing because we are not robots.



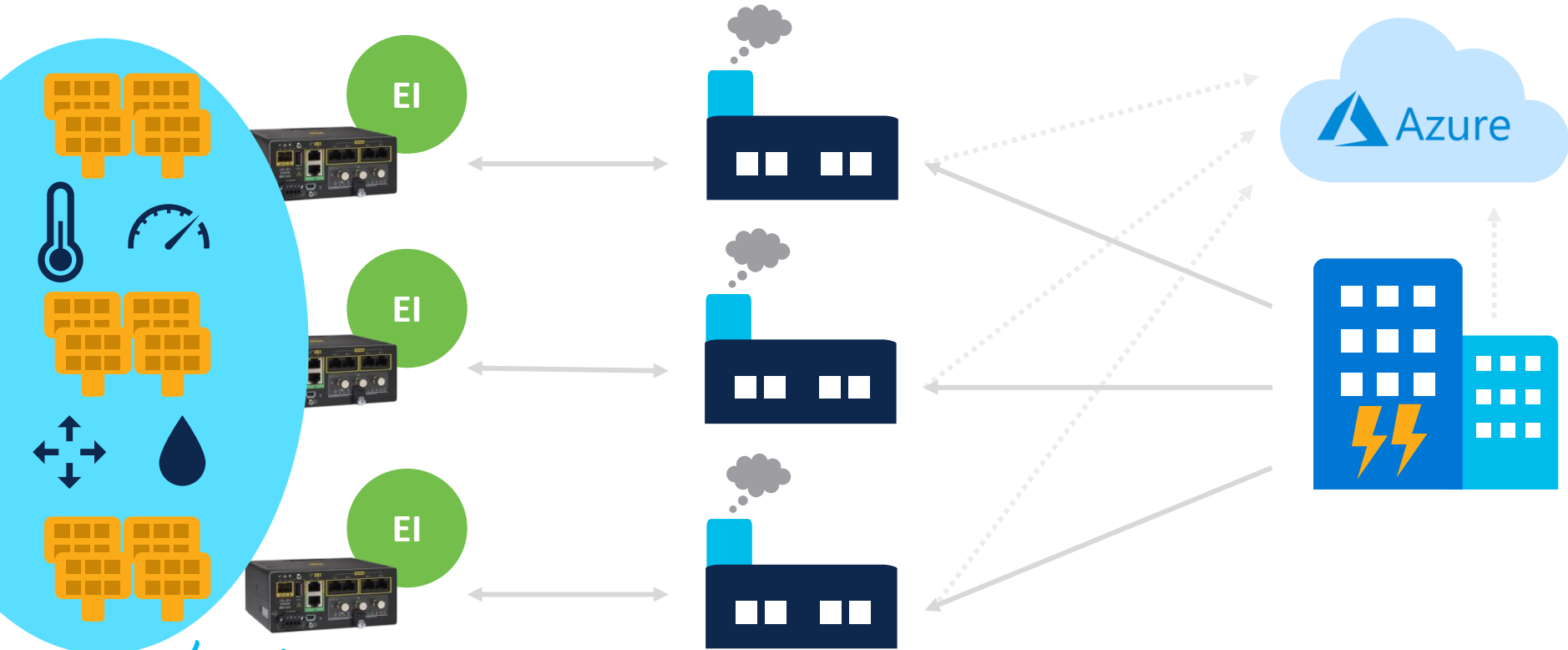
We need computing because we are not robots.

```
{  
  "type": "measurement",  
  "id": "temperature",  
  "time": "2022-12-  
    08T11:10:32.032Z",  
  "value": 16  
}
```

Computing

It's 16 degrees.
Wear a jacket!

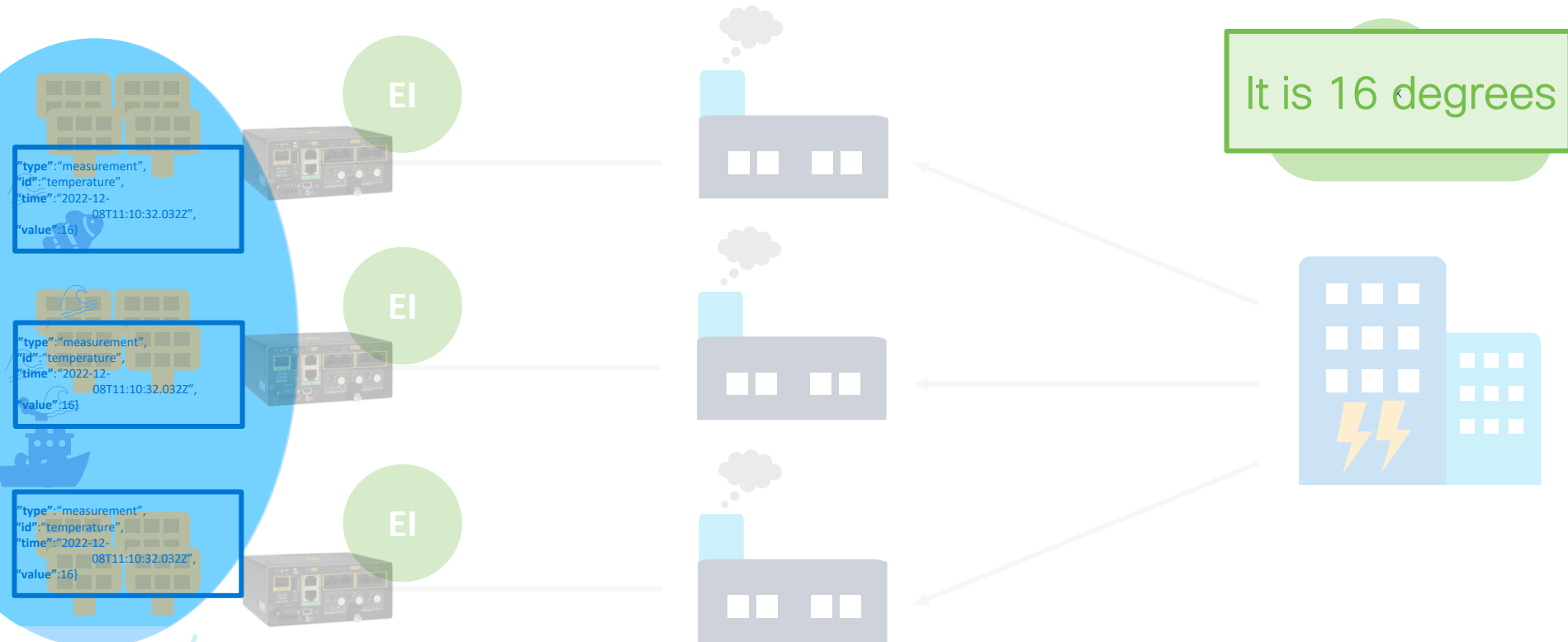
Traditionally, we opt for centralized computing



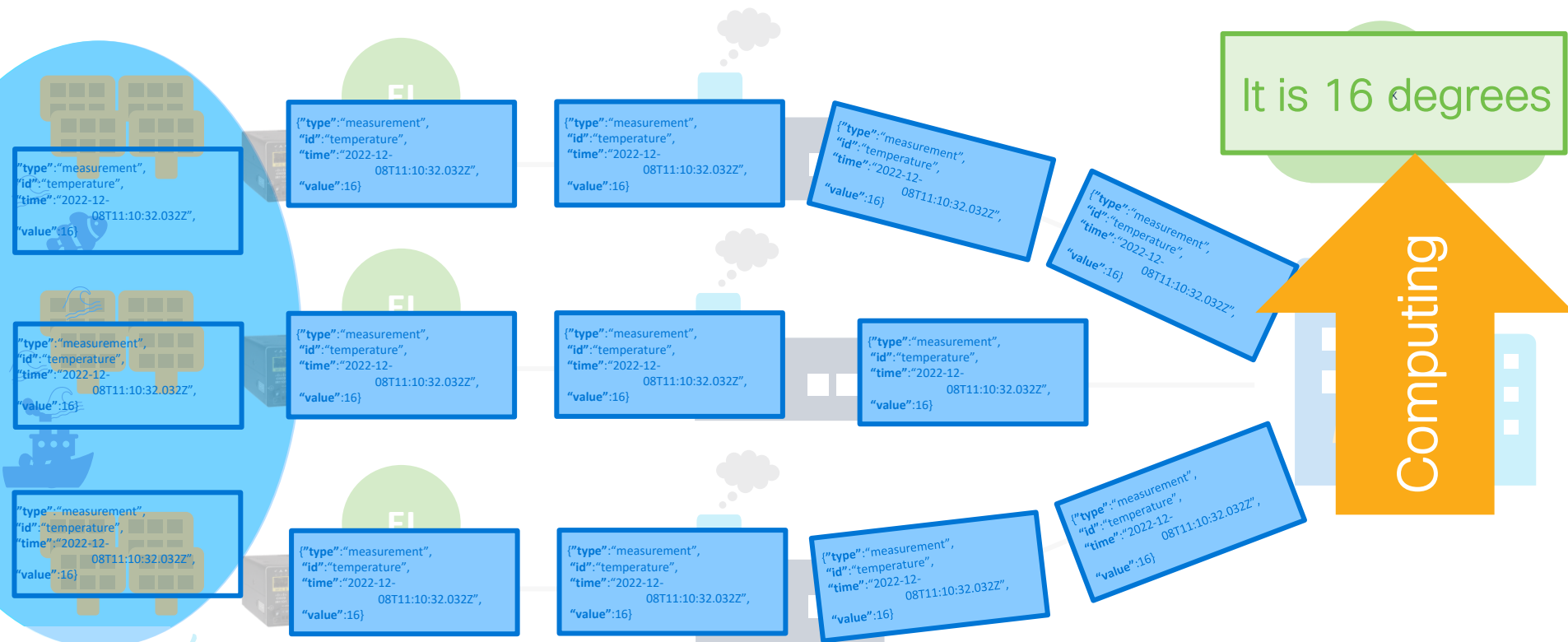
Traditionally, we opt for centralized computing



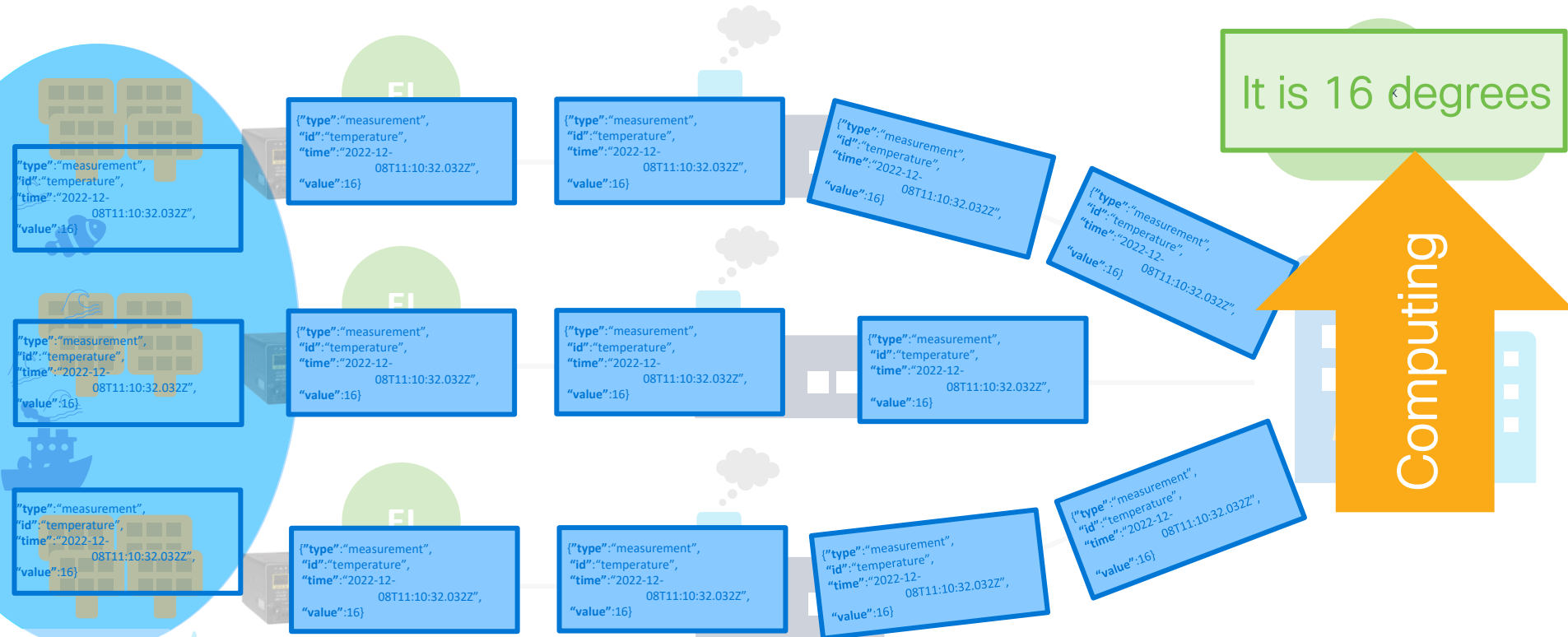
Traditionally, we opt for centralized computing



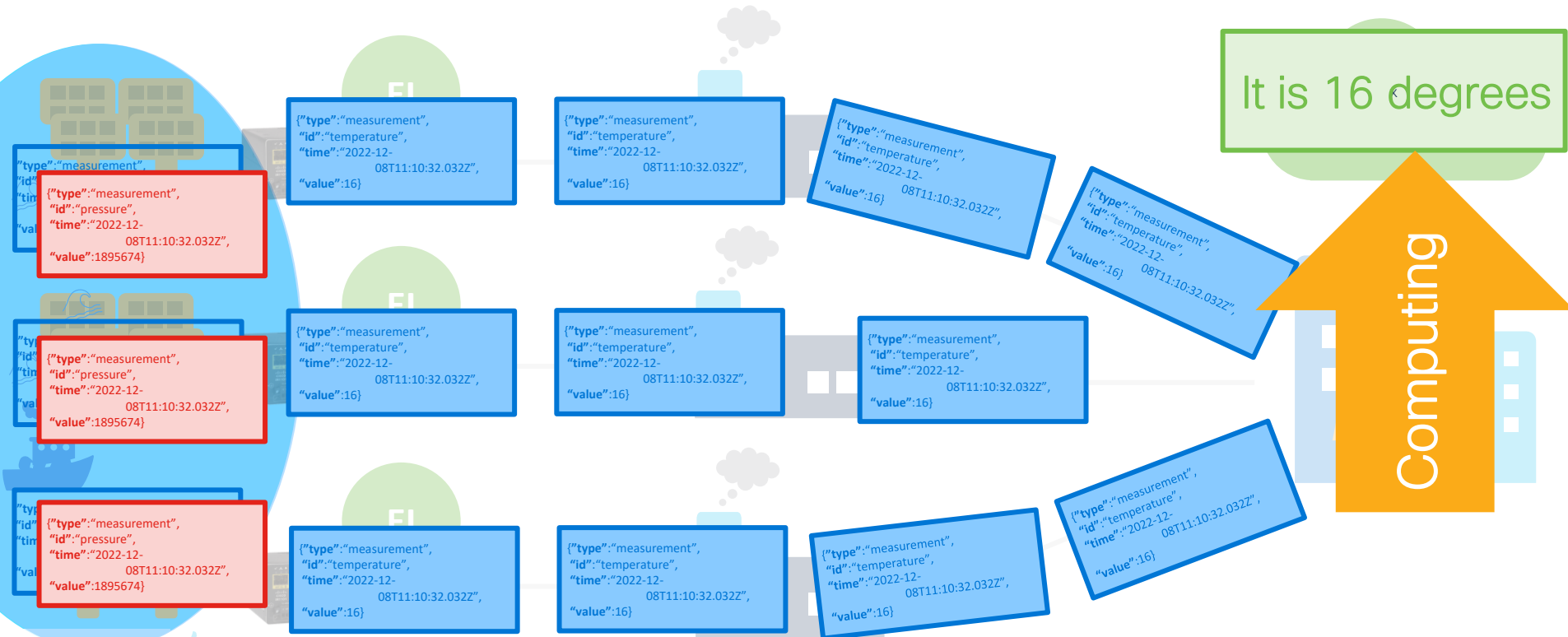
Traditionally, we opt for centralized computing



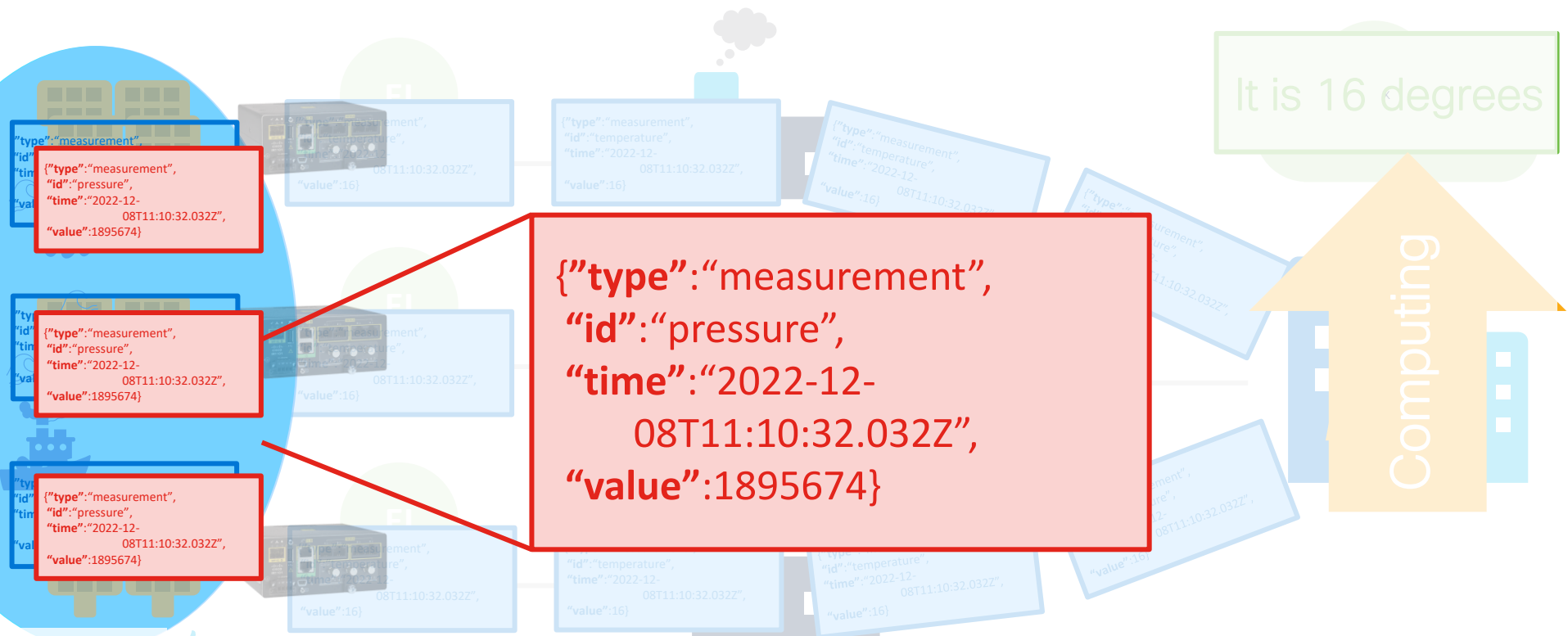
Centralized computing is complex, insecure, and does not scale



Centralized computing is complex, insecure, and does not scale



Centralized computing is complex, insecure, and does not scale



Centralized computing is complex, insecure, and does not scale

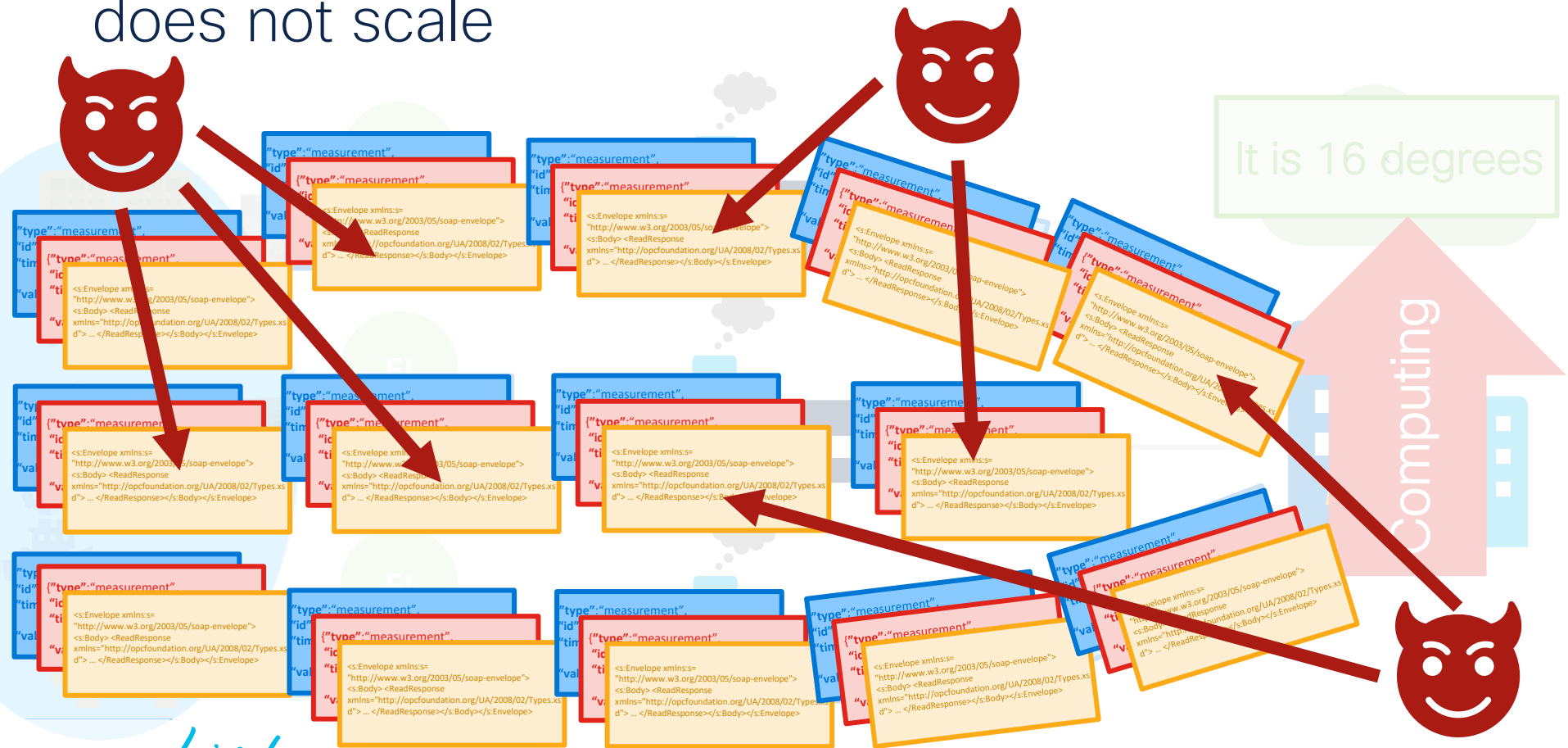
```
<s:Envelope xmlns:s=
"http://www.w3.org/2003/05/soap-envelope">
<s:Body>
<ReadResponse
xmlns="http://opcfoundation.org/UA/2008/02/Types.xsd">
...
</ReadResponse></s:Body>
</s:Envelope>
```

Centralized computing is complex, insecure, and does not scale

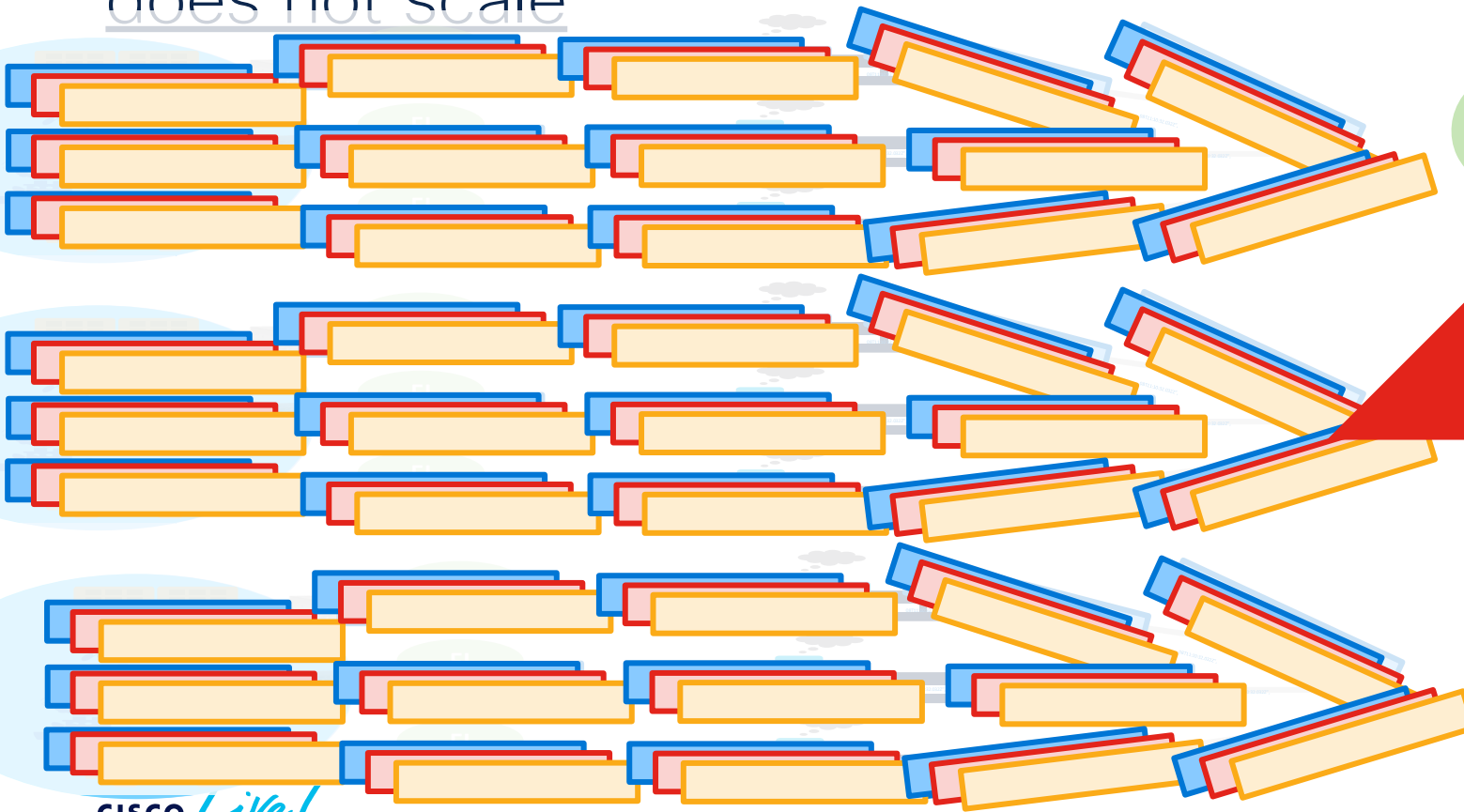
It is 16 degrees

Computing

Centralized computing is complex, insecure, and does not scale

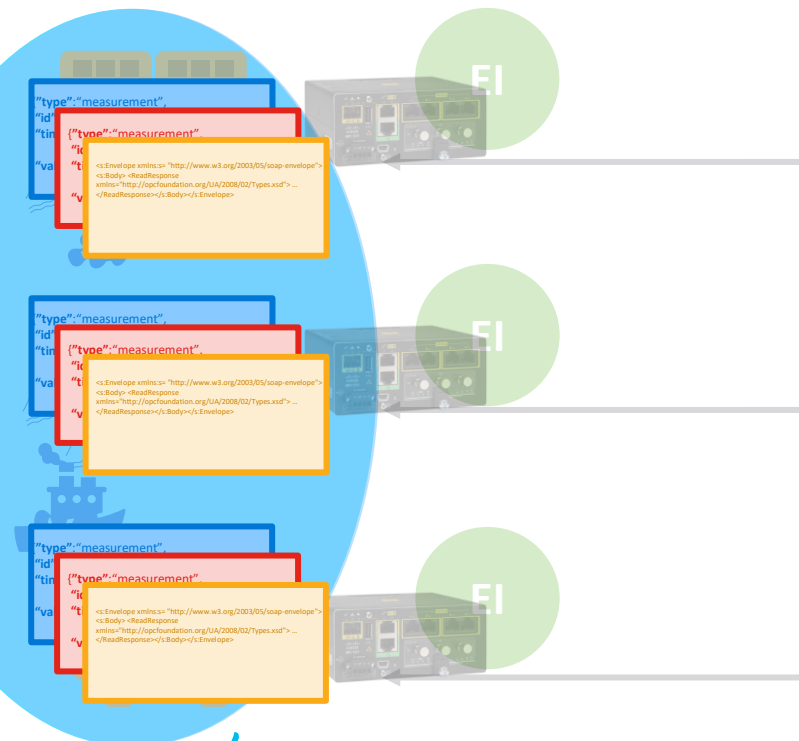
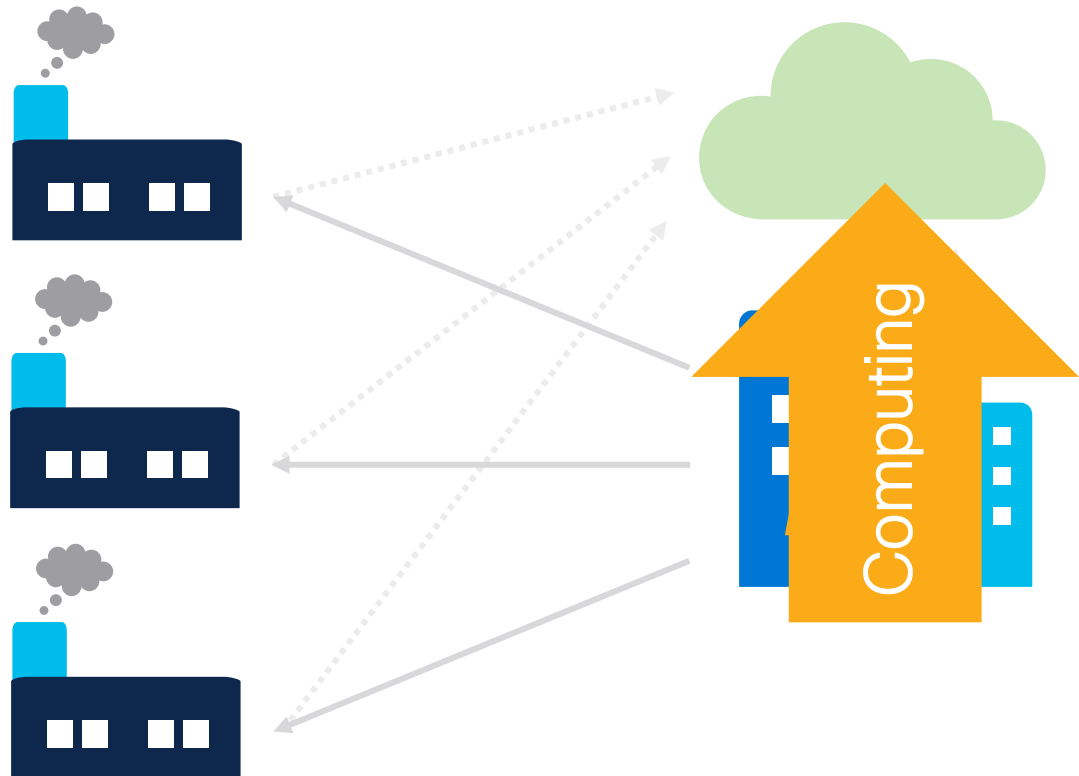


Centralized computing is complex, insecure, and does not scale



Computing

Today, we opt for edge computing



CISCO *Live!*

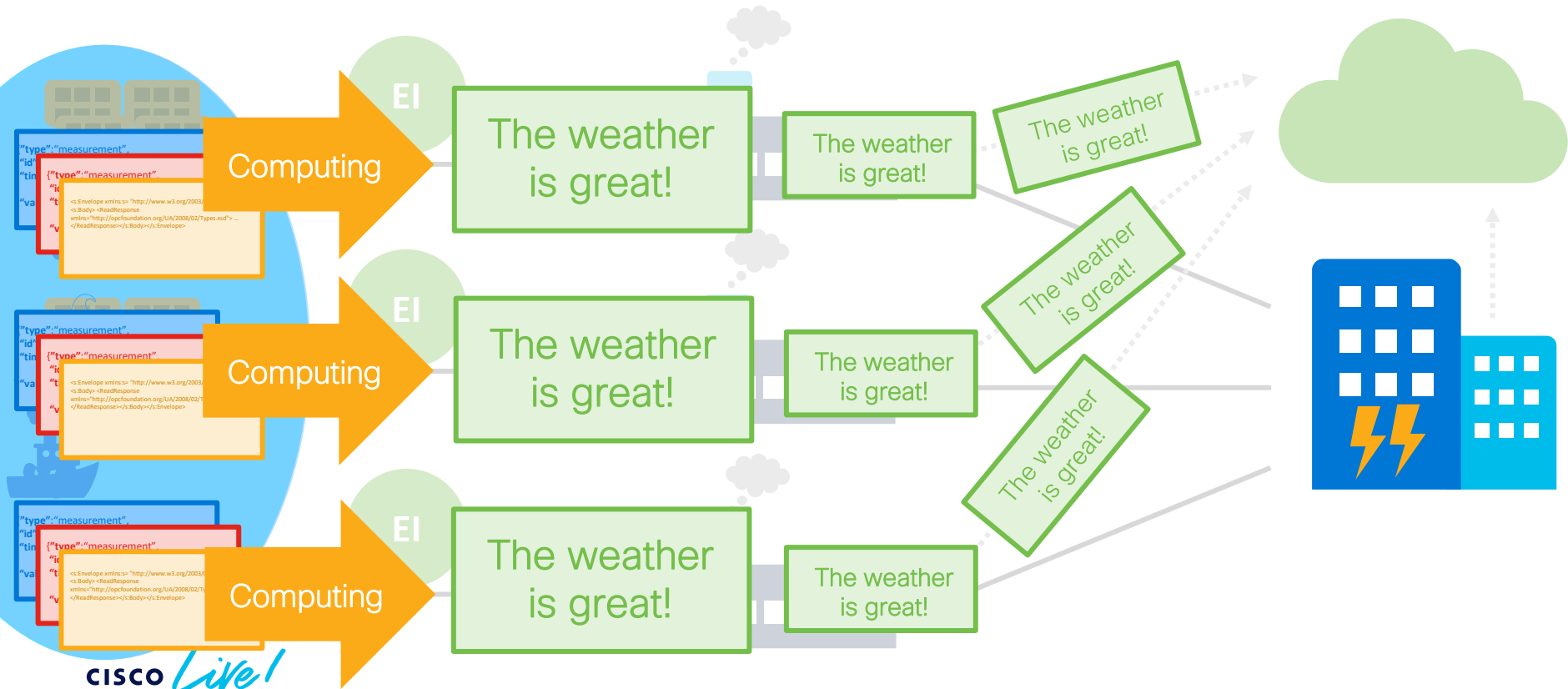
DevNet Zone

#CiscoLiveAPJC DEVNET-2630

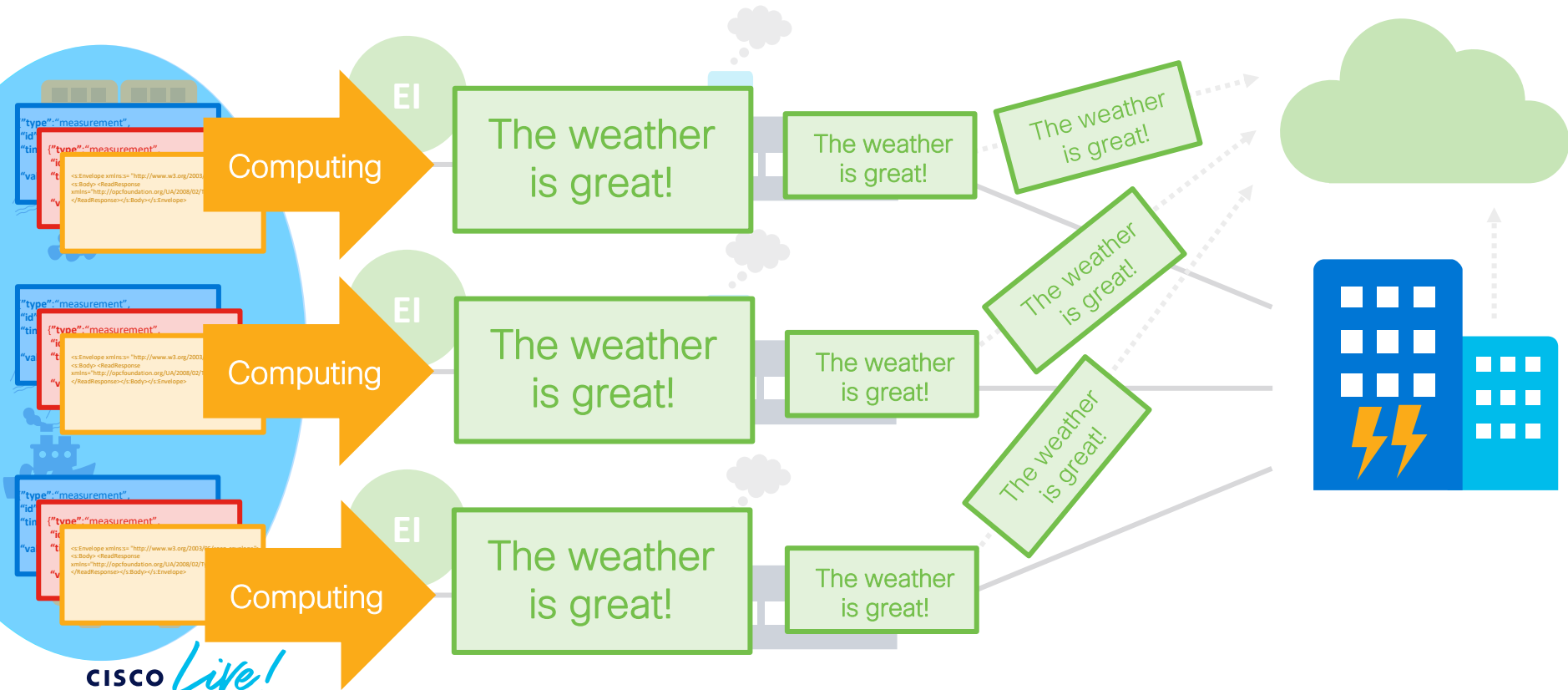
© 2022 Cisco and/or its affiliates. All rights reserved. Cisco Public

48

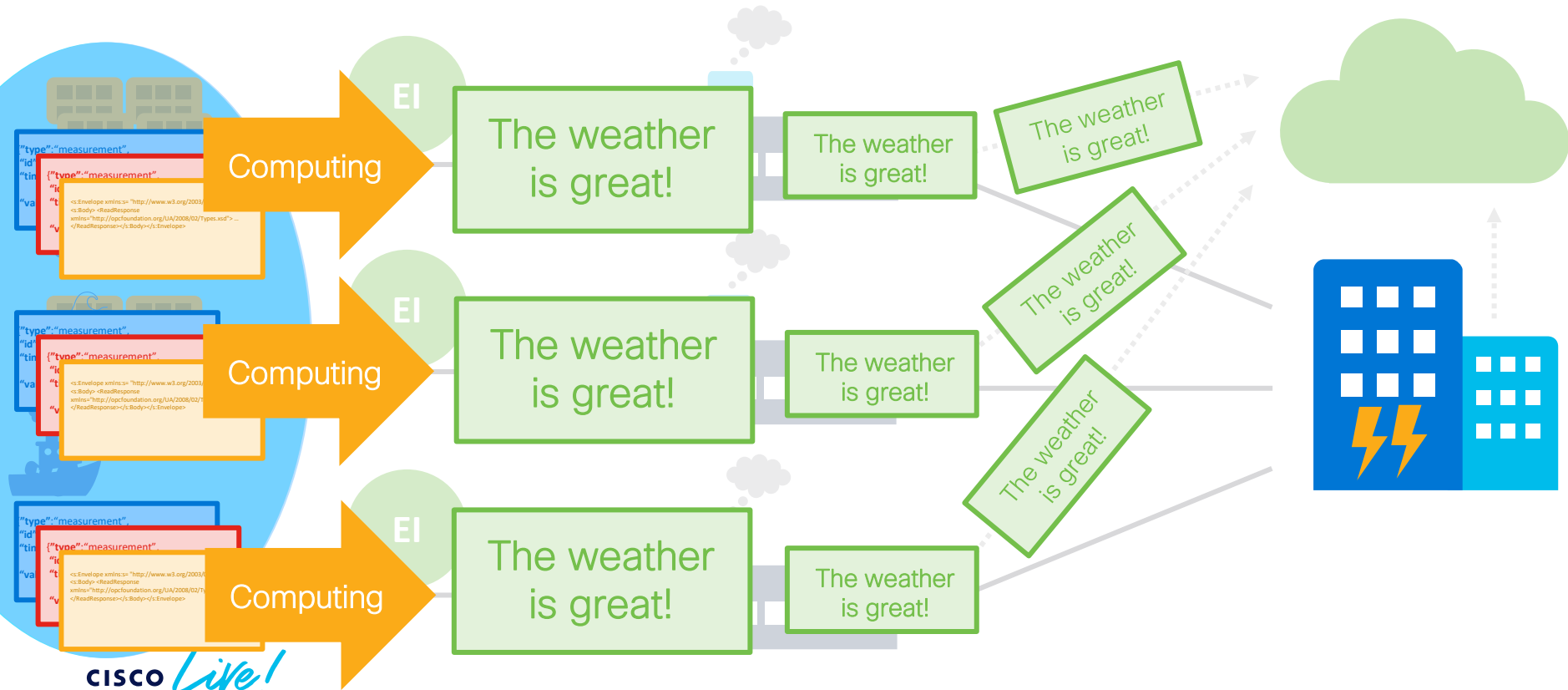
Edge computing is simple, secure, and scalable



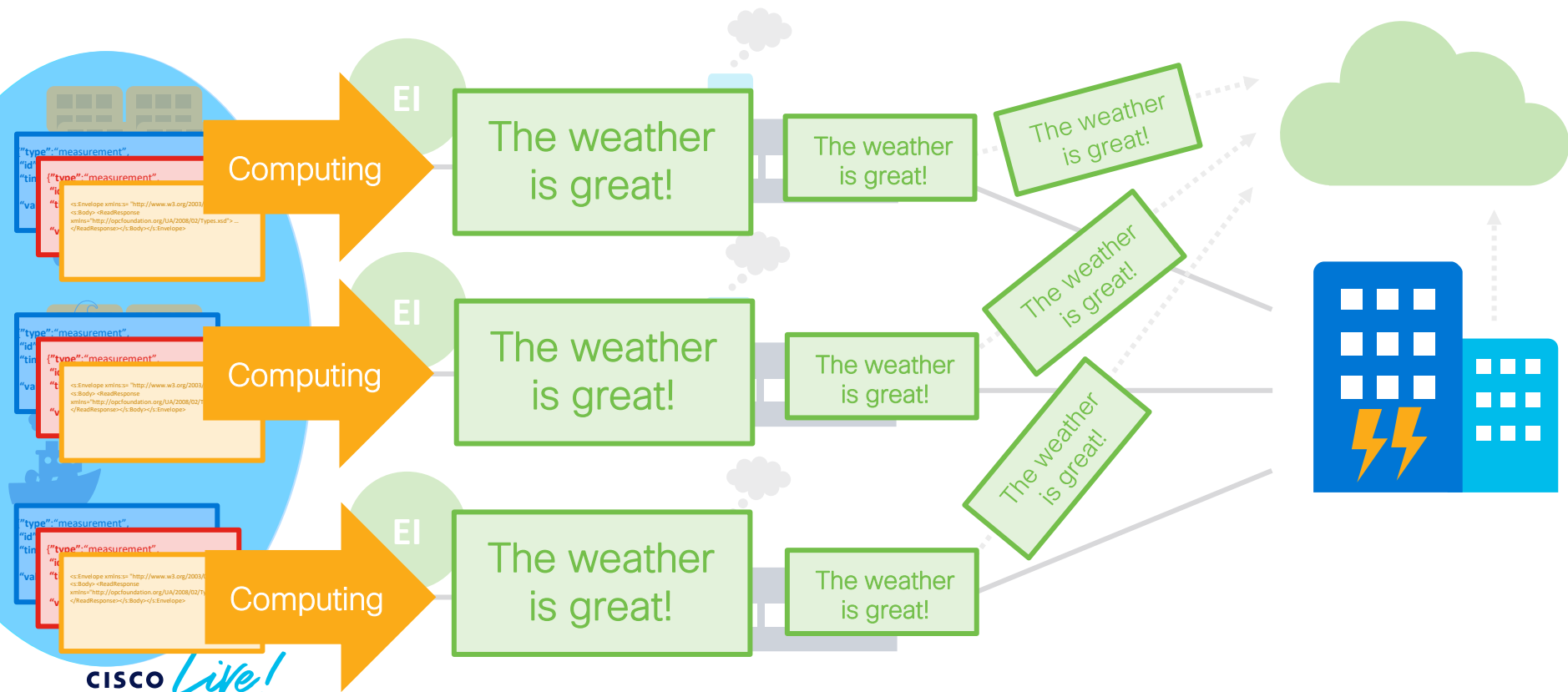
Edge computing is simple, secure, and scalable



Edge computing is simple, secure, and scalable



Edge computing is simple, secure, and scalable



The Intelligence

Industrial Routing (IR) Hardware



Designed to withstand
harsh conditions



Security built-in, not
bolted-on



Modular design for
industrial protocols

IOS-XE Operating System

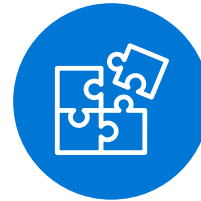
IOS-XE



Linux-based kernel

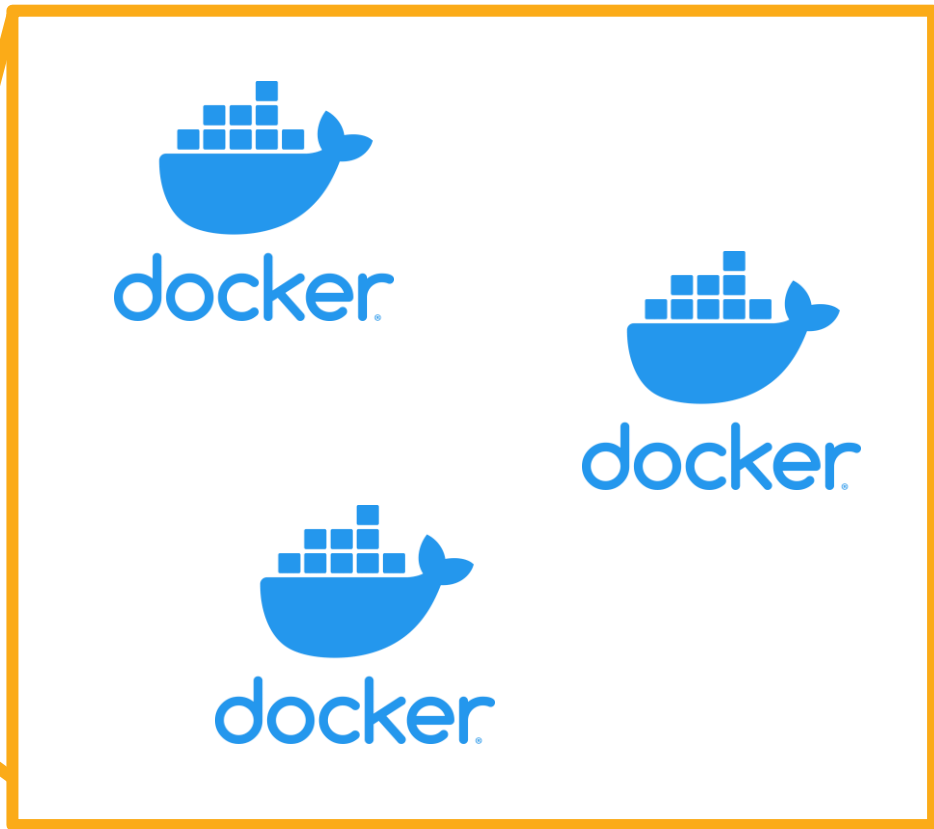


Security built-in, not bolted-on



Modular design

Cisco Application Framework (IOx)



Cisco Application Framework (IOx)

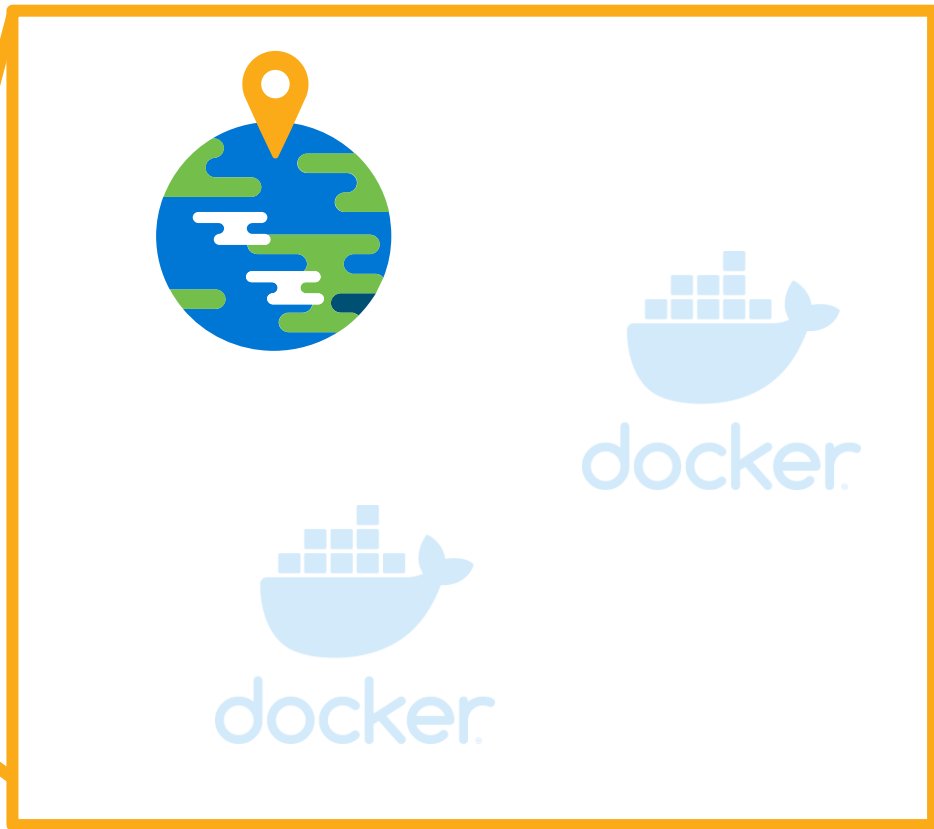
Cisco App Framework (IOx)

IOS-XE



CISCO *Live!*

DevNet Zone



Cisco Application Framework (IOx)

Cisco App Framework (IOx)

IOS-XE



CISCO *Live!*

DevNet Zone



Cisco Edge Intelligence



1 - Extract



2 - Transform



3 - Forward

Cisco Edge Intelligence



1 - Extract

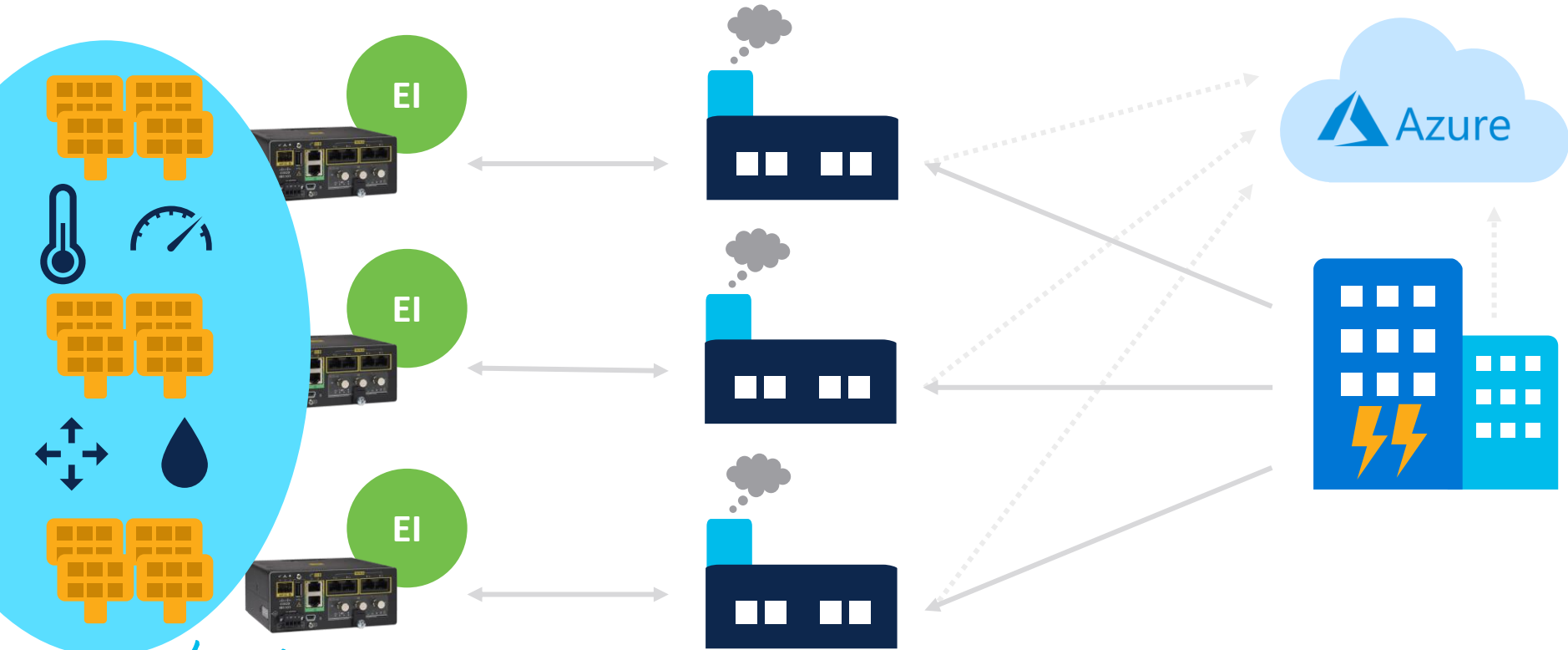


2 - Transform

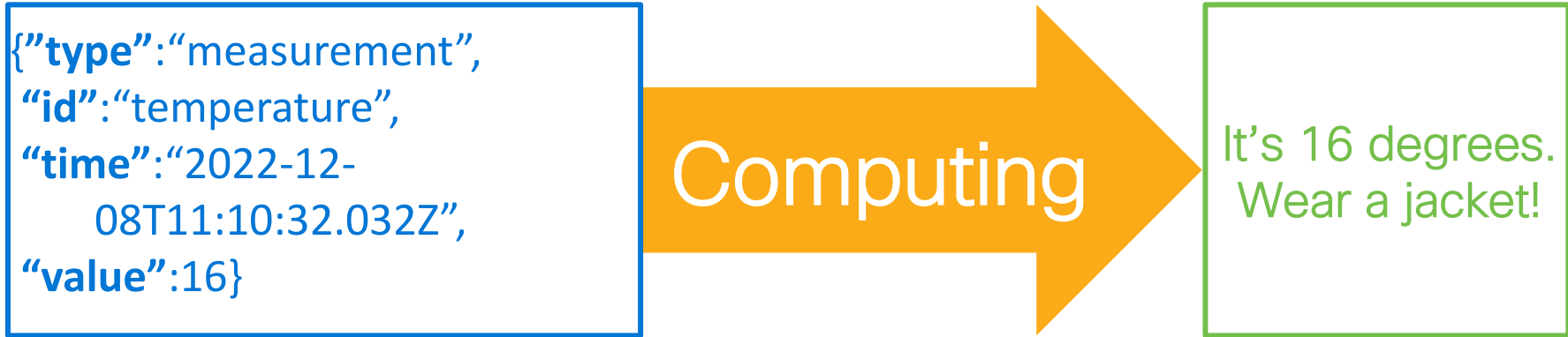


3 - Forward

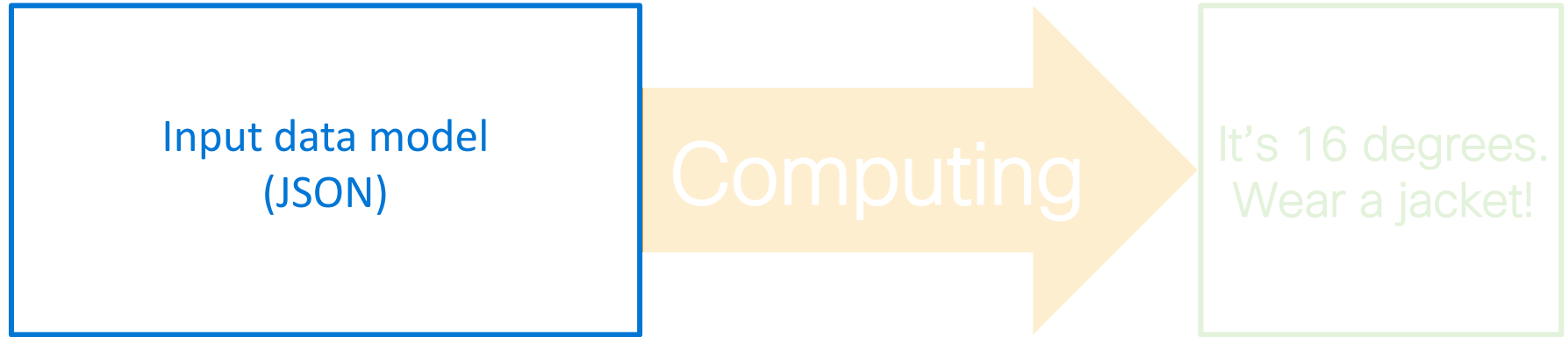
A real customer use case for Edge Intelligence



Cisco Edge Intelligence delivers maximal results with minimal code.



Cisco Edge Intelligence delivers maximal results with minimal code.



Cisco Edge Intelligence delivers maximal results with minimal code.



Cisco Edge Intelligence delivers maximal results with minimal code.



Cisco Edge Intelligence delivers maximal results with minimal code.



Cisco Edge Intelligence delivers maximal results with minimal code.

```
var readings = [null,  
  null, null, null];
```



Keep track of
sensor readings

```
function on_update() {  
  output.publish();  
}
```



Publish on
update

```
function on_time_trigger() {  
  // Data transformation  
  output.publish();  
}
```



Publish on time
trigger



Cisco Edge Intelligence delivers maximal results with minimal code.

```
var readings = [null,  
  null, null, null];
```



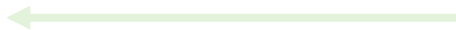
Keep track of
sensor readings

```
function on_update() {  
  output.publish();  
}
```



Publish on
update

```
function on_time_trigger() {  
  
  // Data transformation  
  
  output.publish();  
}
```



Publish on time
trigger



Cisco Edge Intelligence delivers maximal results with minimal code.

```
var readings = [null,  
    null, null, null];  
  
function on_update() {  
    output.publish();  
}  
  
function on_time_trigger() {  
    // Data transformation  
    output.publish();  
}
```

```
// Read sensor input  
var sensorReadings = [  
    JSON.parse(input.temperature),  
    JSON.parse(input.motion)];  
  
// Process sensor input  
for (var i = 0; i < sensorReadings.length; i++) {  
  
    if (sensorReadings[i] !== null  
        && sensorReadings[i]["type"] == "measurement") {  
  
        readings[i] = sensorReadings[i]["value"];  
  
    }  
};  
  
// Set Edge Intelligence output  
output.temperature = readings[0];  
output.motion = readings[1];  
output.timestamp = (new Date(Date.now())).toISOString();
```

Cisco Edge Intelligence delivers maximal results with minimal code.

```
var readings = [null,
  null, null, null];

function on_update() {
  output.publish();
}

function on_time_trigger() {
  // Data transformation
  output.publish();
}
```

```
// Read sensor input
var sensorReadings = [
  JSON.parse(input.temperature),
  JSON.parse(input.motion)];

// Process sensor input
for (var i = 0; i < sensorReadings.length; i++) {

  if (sensorReadings[i] !== null
    && sensorReadings[i]["type"] == "measurement") {

    readings[i] = sensorReadings[i]["value"];

  }

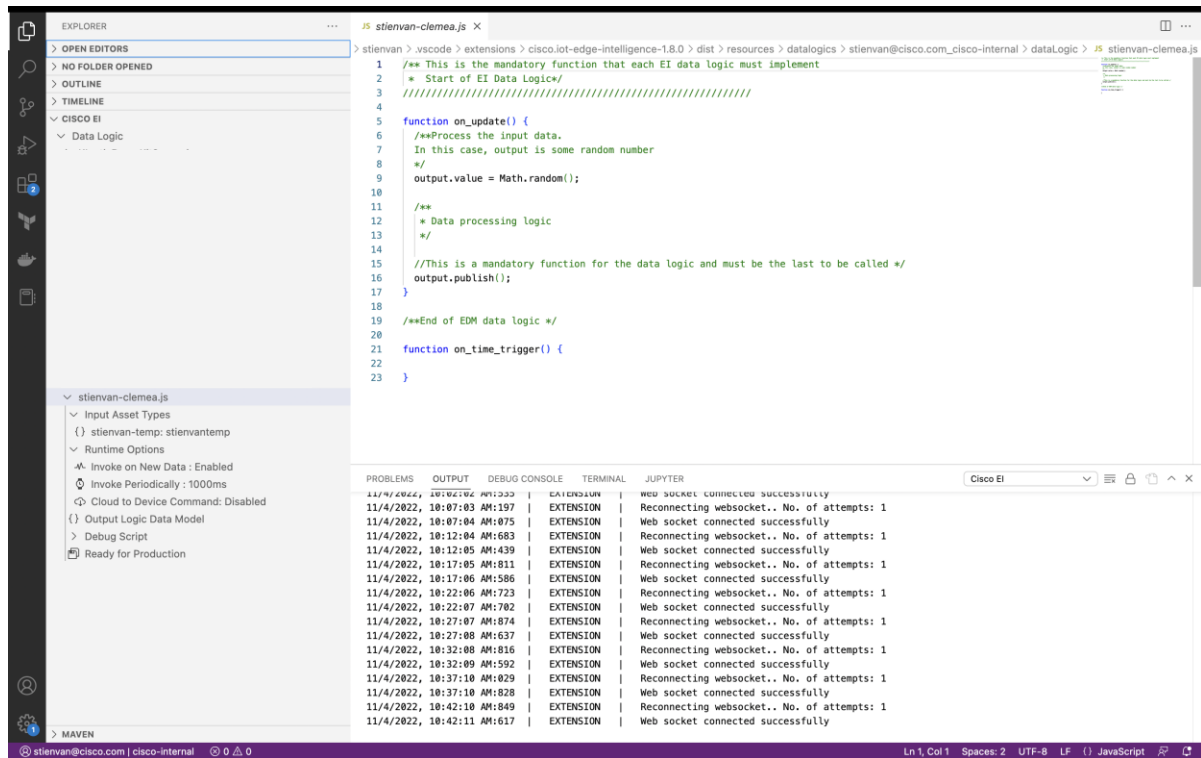
}

// Set Edge Intelligence output
output.temperature = readings[0];
output.motion = readings[1];
output.timestamp = (new Date()).getTime();
```

Input model

Output model

Cisco Edge Intelligence delivers maximal results with minimal code thanks to a VS code plugin.



The screenshot displays the Visual Studio Code editor with the Cisco Edge Intelligence plugin installed. The Explorer sidebar on the left shows the project structure for 'stienvan-clemaa.js', including 'Input Asset Types', 'Runtime Options', and 'Output Logic Data Model'. The main editor area shows the 'stienvan-clemaa.js' file with the following JavaScript code:

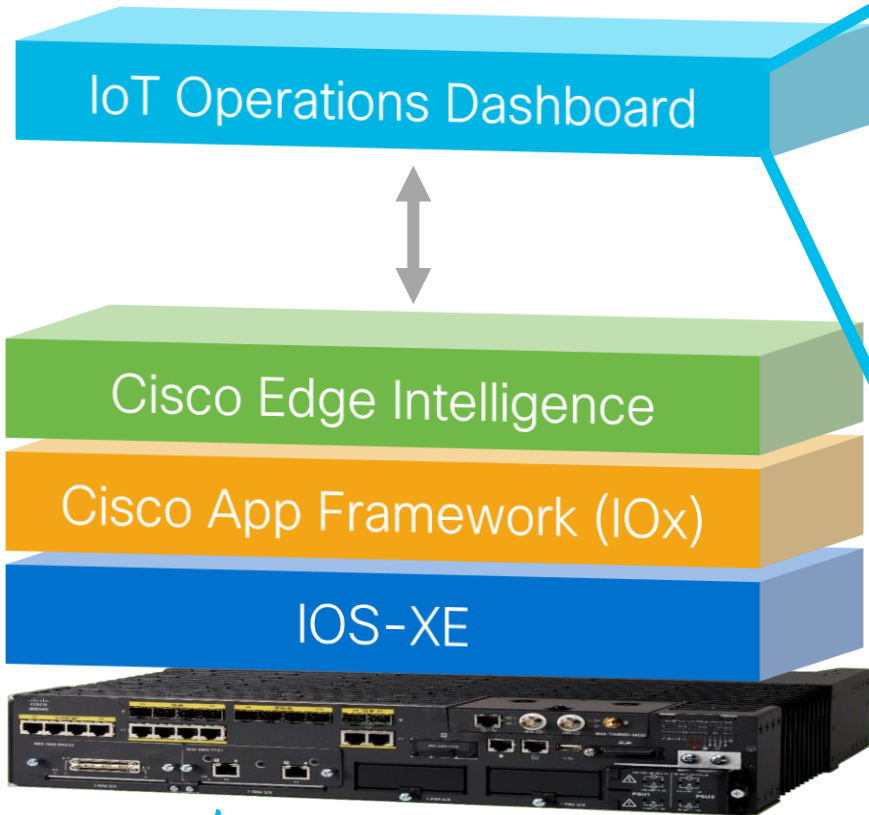
```
1  /** This is the mandatory function that each EI data logic must implement
2   * Start of EI Data Logic*/
3   ///////////////////////////////////////////////////
4
5   function on_update() {
6       /**Process the input data.
7        In this case, output is some random number
8        */
9       output.value = Math.random();
10
11
12       * Data processing logic
13       */
14
15       //This is a mandatory function for the data logic and must be the last to be called */
16       output.publish();
17   }
18
19   /**End of EDM data logic */
20
21   function on_time_trigger() {
22
23   }
```

The bottom panel shows the 'TERMINAL' tab with the following output:

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	JUPYTER
	11/4/2022, 10:02:04 AM:330	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:07:03 AM:197	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:07:04 AM:875	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:12:04 AM:683	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:12:05 AM:439	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:17:05 AM:811	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:17:06 AM:586	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:22:06 AM:723	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:22:07 AM:782	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:27:07 AM:874	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:27:08 AM:637	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:32:08 AM:816	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:32:09 AM:592	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:37:10 AM:829	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:37:10 AM:828	EXTENSION	Web socket connected successfully	
	11/4/2022, 10:42:10 AM:849	EXTENSION	Reconnecting websocket.. No. of attempts: 1	
	11/4/2022, 10:42:11 AM:617	EXTENSION	Web socket connected successfully	

Demo time!

IoT Operations Dashboard



The Boat

Demo time!



Agenda

- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!



Agenda

- Getting our feet wet
- Diving in
 - The Edge
 - The Intelligence
 - The Boat
- Smooth sailing!

Continue your education



Visit the Cisco Showcase for related demos



Book your one-on-one Meet the Expert meeting



Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs



Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Cisco Learning and Certifications

From technology training and team development to Cisco certifications and learning plans, let us help you empower your business and career. www.cisco.com/go/certs

Pay for Learning with Cisco Learning Credits

(CLCs) are prepaid training vouchers redeemed directly with Cisco.



Learn

Cisco U.

IT learning hub that guides teams and learners toward their goals

Cisco Digital Learning

Subscription-based product, technology, and certification training

Cisco Modeling Labs

Network simulation platform for design, testing, and troubleshooting

Cisco Learning Network

Resource community portal for certifications and learning



Train

Cisco Training Bootcamps

Intensive team & individual automation and technology training programs

Cisco Learning Partner Program

Authorized training partners supporting Cisco technology and career certifications

Cisco Instructor-led and Virtual Instructor-led training

Accelerated curriculum of product, technology, and certification courses



Certify

Cisco Certifications and Specialist Certifications

Award-winning certification program empowers students and IT Professionals to advance their technical careers

Cisco Guided Study Groups

180-day certification prep program with learning and support

Cisco Continuing Education Program

Recertification training options for Cisco certified individuals





The bridge to possible

Thank you

CISCO *Live!*

DevNet Zone

#CiscoLiveAPJC

CISCO *Live!*



#CiscoLiveAPJC