



Software Technology

A case study





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1

Introduction

Solutions



Vehicle Routing



Load Building



Workforce Scheduling



Network Design



Field Service



SAP Solutions



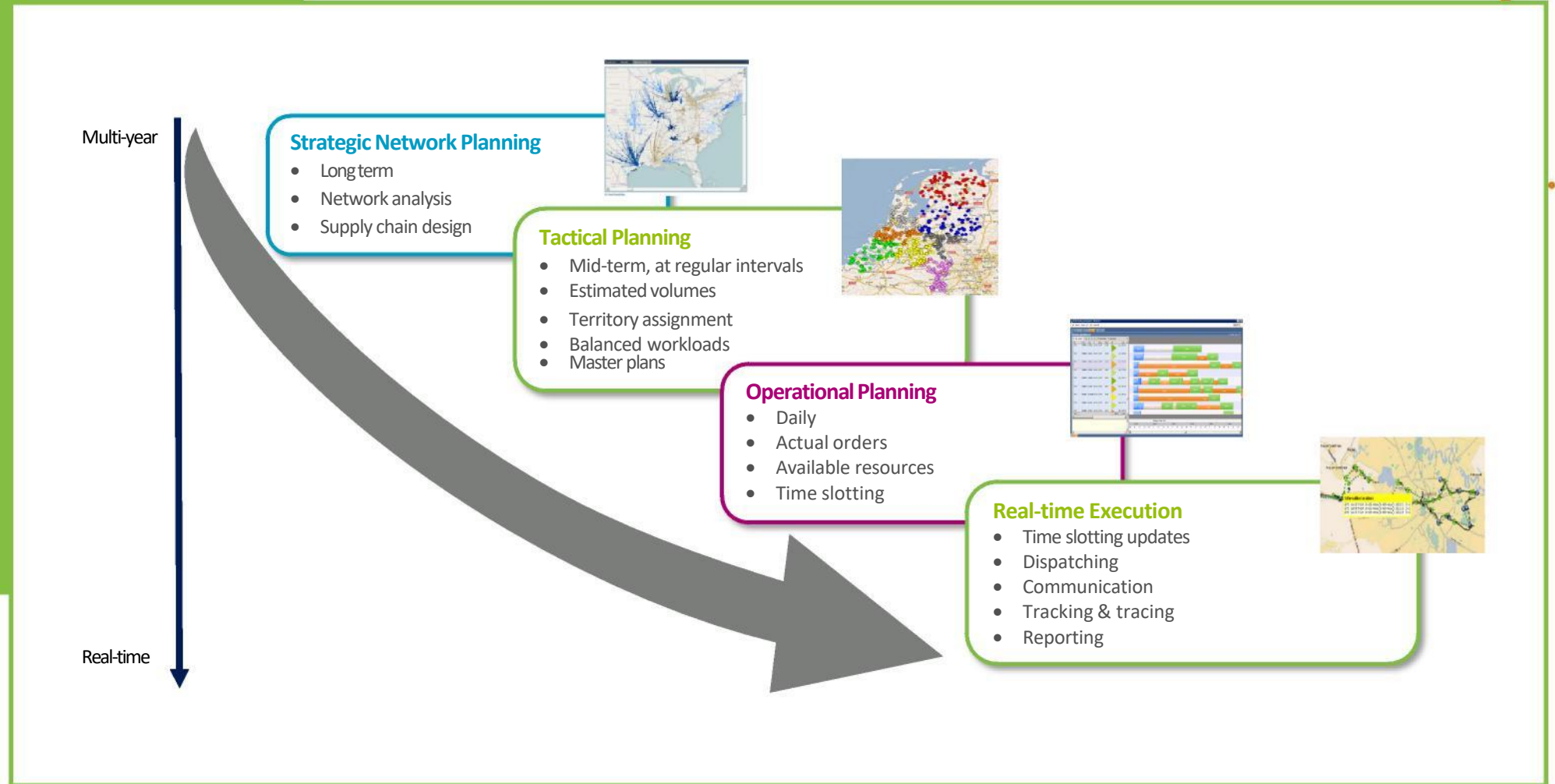
Thirty Years Experience in Field Service

A field called ... “Field Service”

A typical customer has a technicians to be deployed to their customers. How to deploy your personnel in an efficient way?

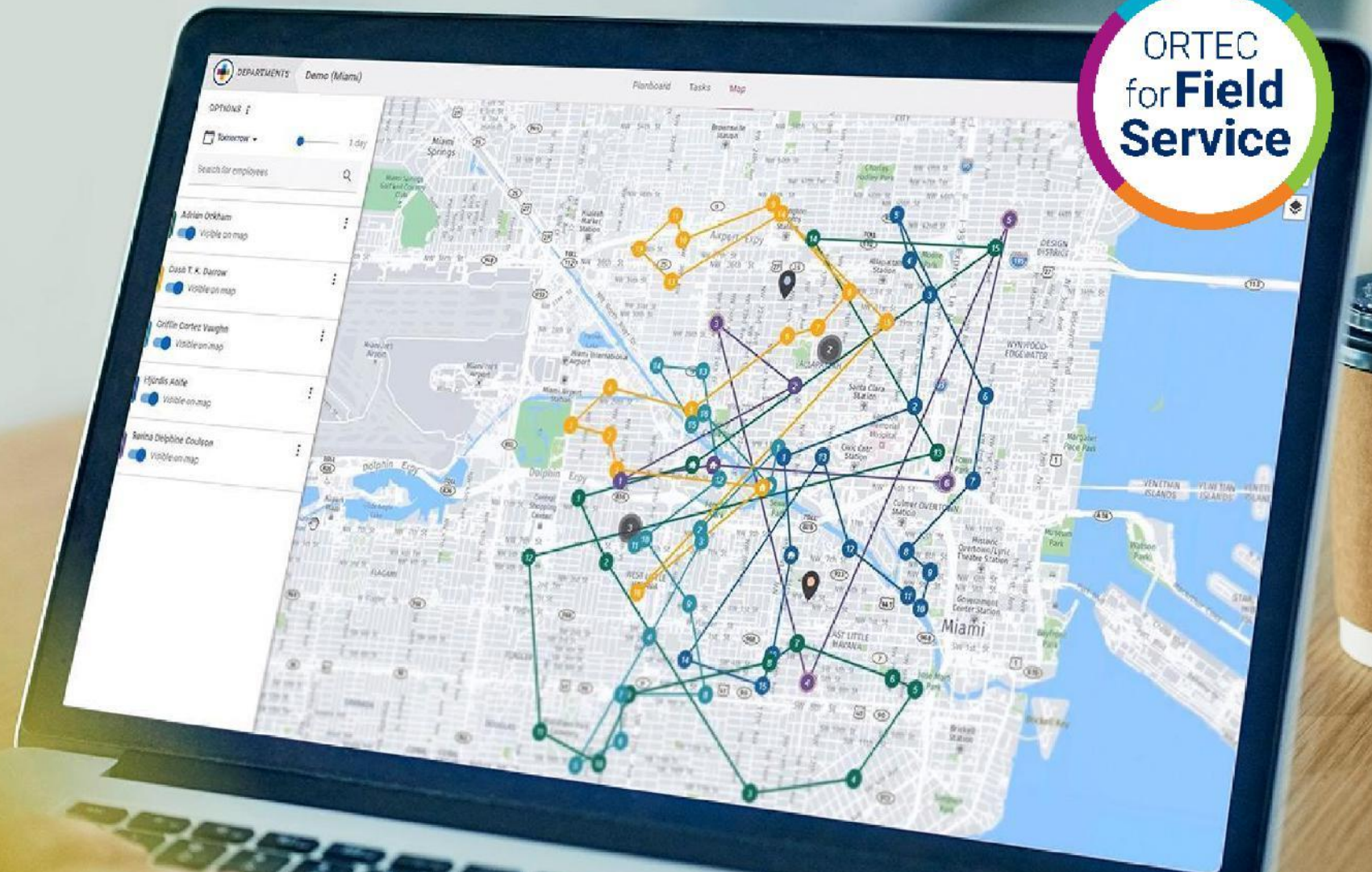
Business-to-business

From strategic to operational optimization



2 User Interface

ORTEC
for **Field
Service**



Tasks

The Tasks view facilitates customer-based selection and filtering of tasks

On selecting a date or interval, the Tasks view lists all scheduled and unscheduled tasks

Each task record displays the task information, including the time window and schedule details

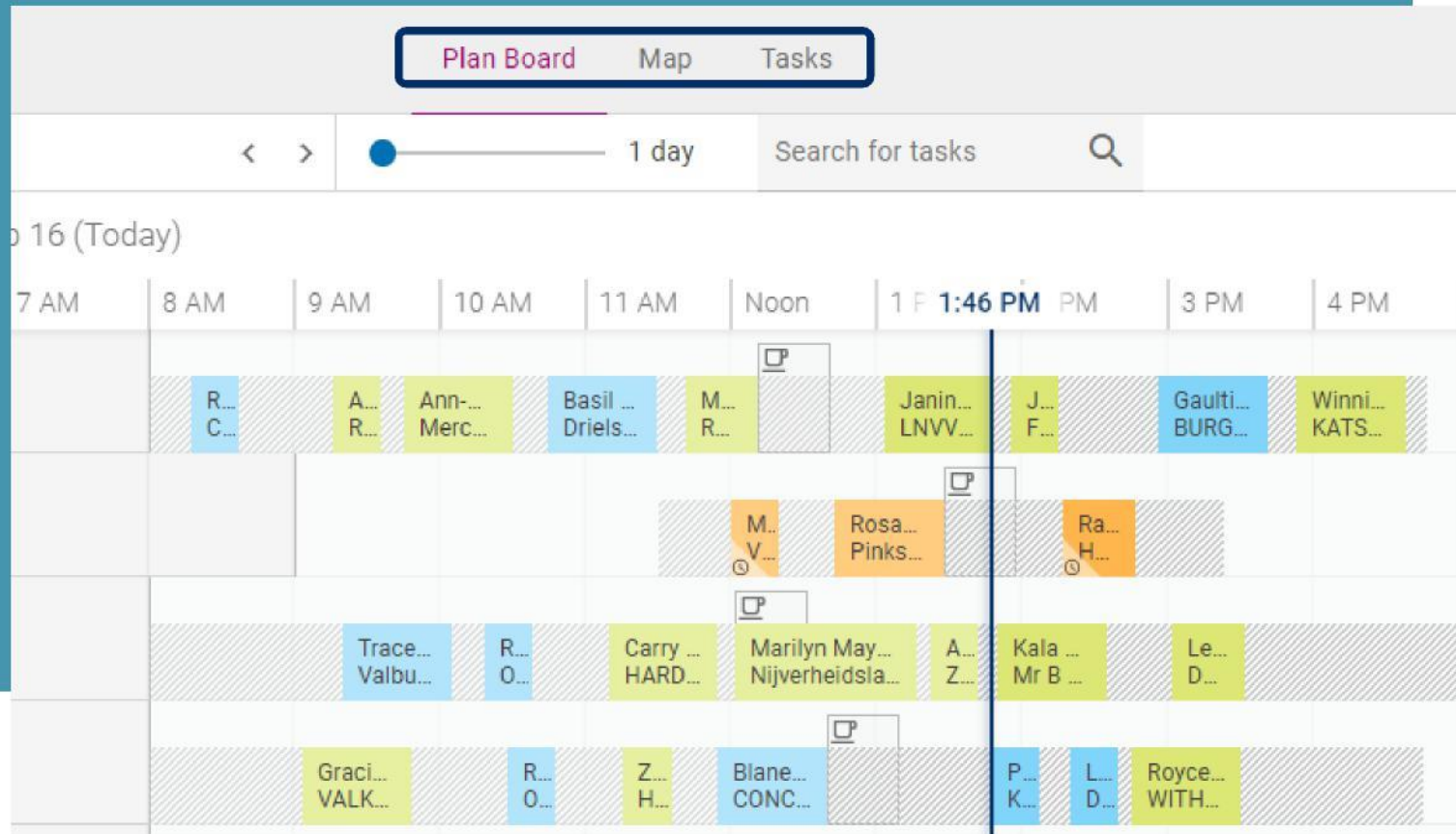
The benefit of the Tasks view enables find a customer or task that may not be immediately apparent on the Plan Board or Map

The screenshot displays the ORTEC Tasks view interface. At the top, there is a navigation bar with 'DEPARTMENT DemoNL' and tabs for 'Plan Board', 'Map', and 'Tasks'. Below this is a search bar with 'Search for tasks' and a date filter set to 'Fri, 1 May'. A filter summary shows 'ALL (1)', 'NOT SCHEDULED (0)', and 'NOT COMPLETED (1)'. The main table lists tasks with columns for Customer, Task information, Time window, Scheduled status, and Remarks. A task for 'Adrien Jekyll' is highlighted, with a modal window open showing detailed information:

Installation at Adrien Jekyll at 2102GT HEEMSTEDE, FLEHARLN 94			
Address 2102GT HEEMSTEDE, FLEHARLN 94	Time window Start: Mon, 27 Apr 08:00 End: Mon, 11 May 17:00	Scheduled Start: Tue, 5 May 14:07 End: Tue, 5 May 14:37 With: Bo Evens	External reference 000108
Customer Adrien Jekyll 088-1234674 AdrienJekyll@test.com	Duration 30 min	Preferred scheduled start No preferred time	Remarks -

At the bottom of the modal, there are buttons for 'RESCHEDULE', 'UNSCHEDULE', 'SHOW ON MAP', 'SHOW ON PLAN BOARD', and 'SHOW SHIFT DETAILS'.

Operational Planner

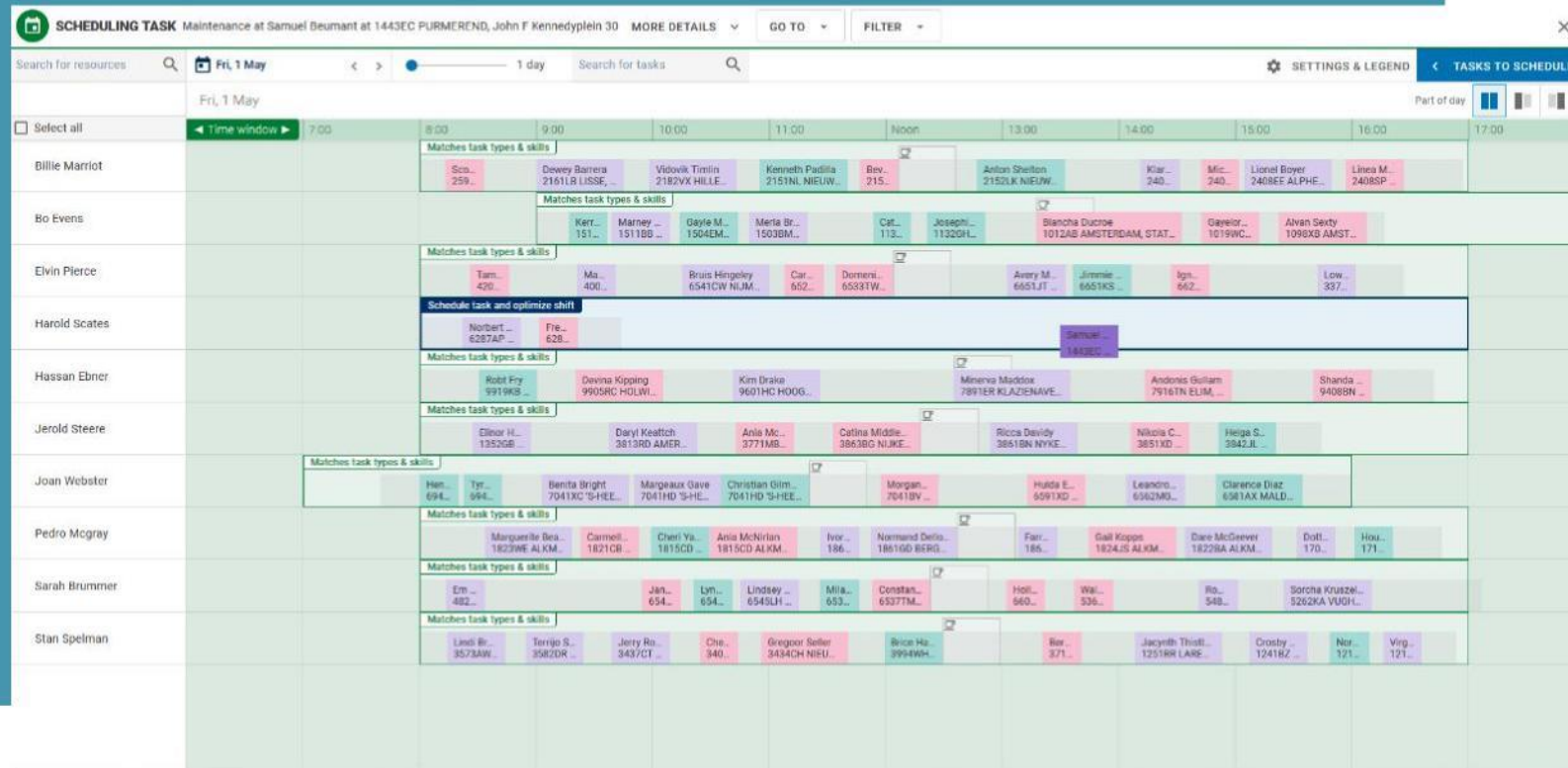


The Operational Planner interface provides three functional spaces—or views—within a browser tab for easy navigation

Each space facilitates functionalities that are specific to that view, as well as common functionalities shared by all spaces:

- the Plan Board (Gantt chart)
- the Map
- the Tasks

Plan Board



When scheduling manually through drag-and-drop, for example, the dispatcher is aided by highlighted drop zones to show resources with matching skills

Moreover, visual aids allow the dispatcher to drop a task at a specific position in a shift or, alternatively, within a zone that can trigger the optimizer to propose the best place of the task within a shift.

Map

The Map view provides an overview of the schedule by visualizing the shifts as routes on a street map. In the Map, the routes are shown in distinct colors for easy identification

Sequentially numbered circles indicate the scheduled tasks along the way. Each circle represents a task location, and the connectors represent the travel between the stops



Map



Not only the tasks are visualized, but also the resource's start and end location, as well as optionally the resource's current location based on GPS tracking

Icons are used to describe the status of tasks, for example, in progress or completed.

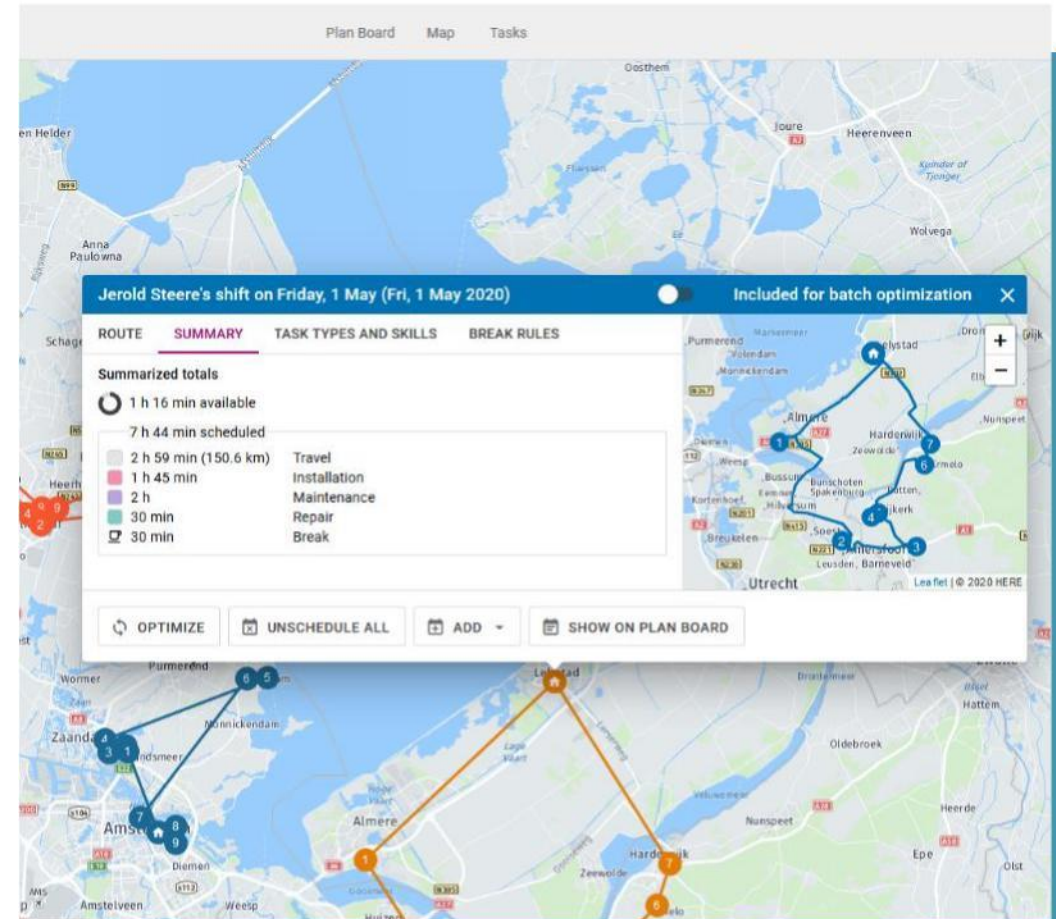
Also, tasks requiring a corrective action are visualized

Routes may be shown 'as-the-crow-flies' or as tracing the road network

Map

By click the icons, the Map view provides access to task details of the scheduled as well as the yet to be scheduled tasks

A shift details window provides the consolidated details of the shift with all its scheduled activities, in a single window. This window provides the route in list form, a summary of KPIs, and other information regarding the shift, as well as access to certain task scheduling actions



Map

The screenshot displays the ORTEC software interface in the 'Map' view. The top navigation bar includes 'DEPARTMENT DemoNL', 'Plan Board', 'Map', and 'Tasks'. On the left, a 'RESOURCES' panel lists several staff members with 'Visible on map' toggle switches. The main area is a map of the Netherlands with a blue route connecting various locations. A 'TASKS TO SCHEDULE' panel on the right shows a search bar, a date selector for 'Mon, 27 Apr', and a list of maintenance tasks with their addresses. The interface also includes a search bar for resources and a 'SHOW FILTERS' option.

The Map view is also a full-fledged scheduling tool

The benefit of the Map view is that it assists in the easy detection of those tasks that are not scheduled, relative to the available routes displayed on the Map

Through visual aids, it's possible to drag a task to either the required location in the route or to let the optimizer decide the optimal location within the route

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Architecture

The logo for ORTEC for Field Service is a circular emblem with a white center and a multi-colored border (blue, green, orange). The text "ORTEC" is in a blue sans-serif font, "for" is in a smaller grey font, and "Field Service" is in a larger, bold blue sans-serif font.

ORTEC
for **Field
Service**

ORTEC for Field Service Road to the Cloud

Plan Board

It all started (in a cave) on a wall with people gathered around a plan board



Local Desktop

The first products allowed users to plan and optimize from a desktop computer



Client-Server

With a client-server architecture, next steps could be taken in sharing, scaling and optimization



Virtualization

Virtualization, including managed services offerings, allows business to focus on their core activities and not IT

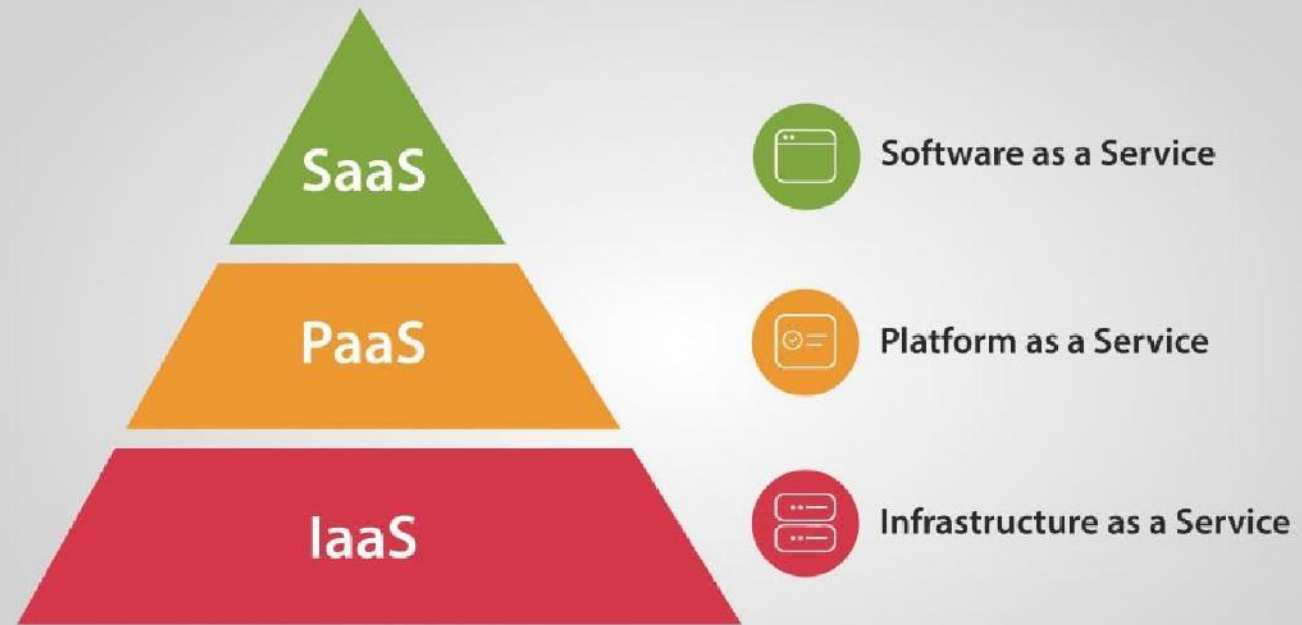


Cloud-Native

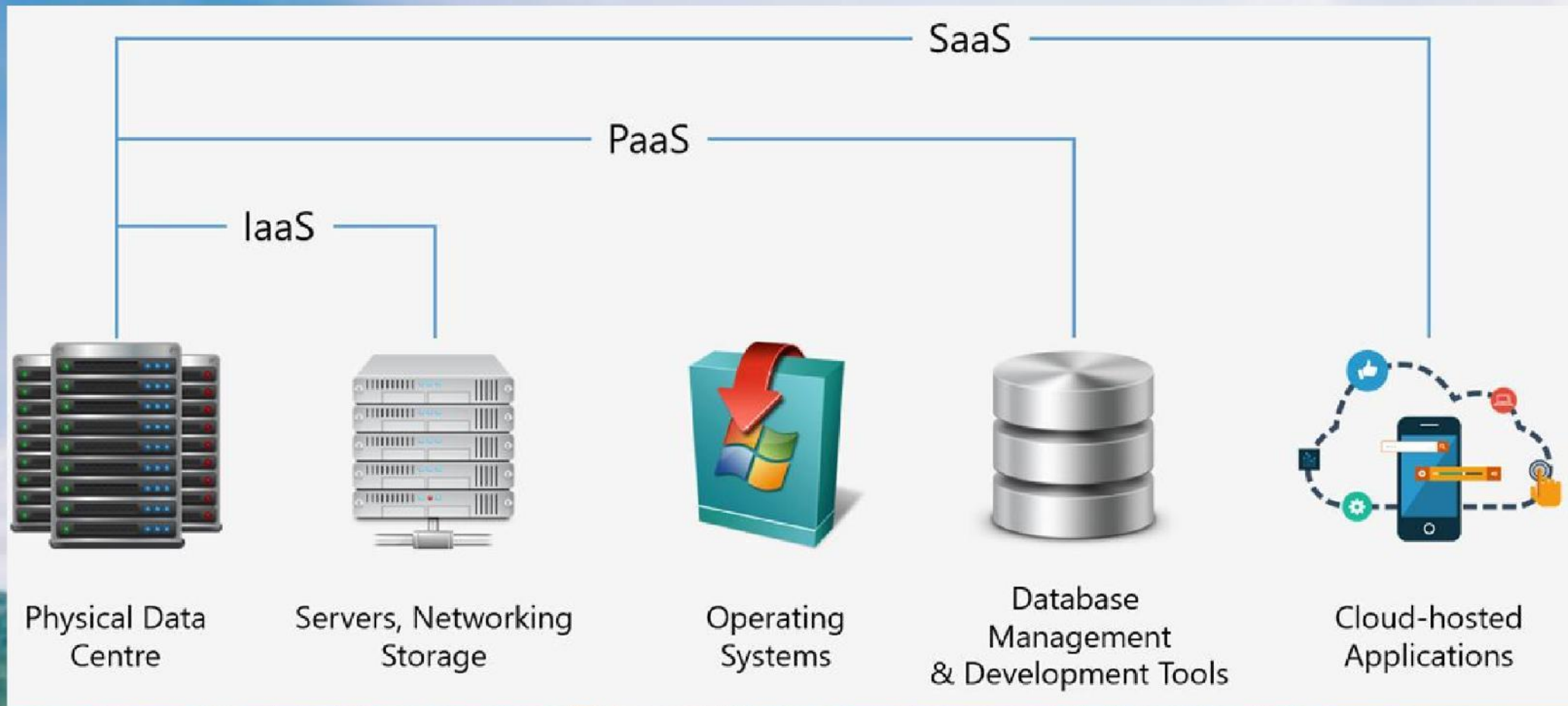
Architected to exploit the advantages of cloud computing platforms in terms of scalability and elasticity



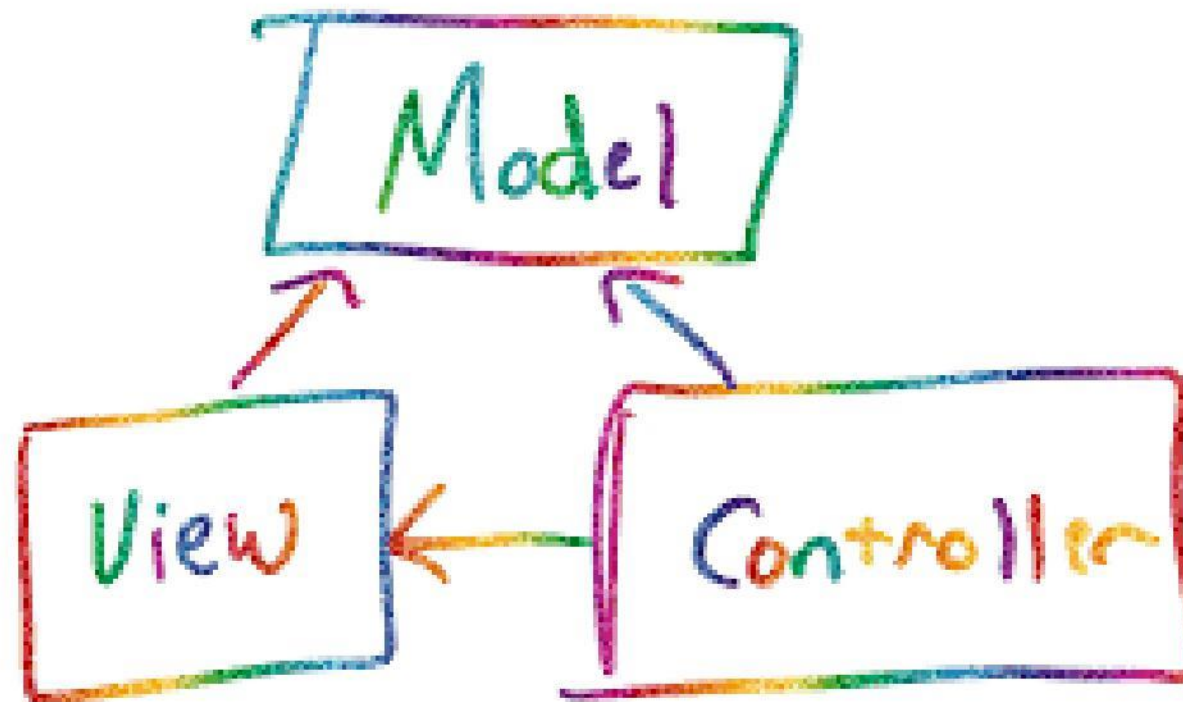
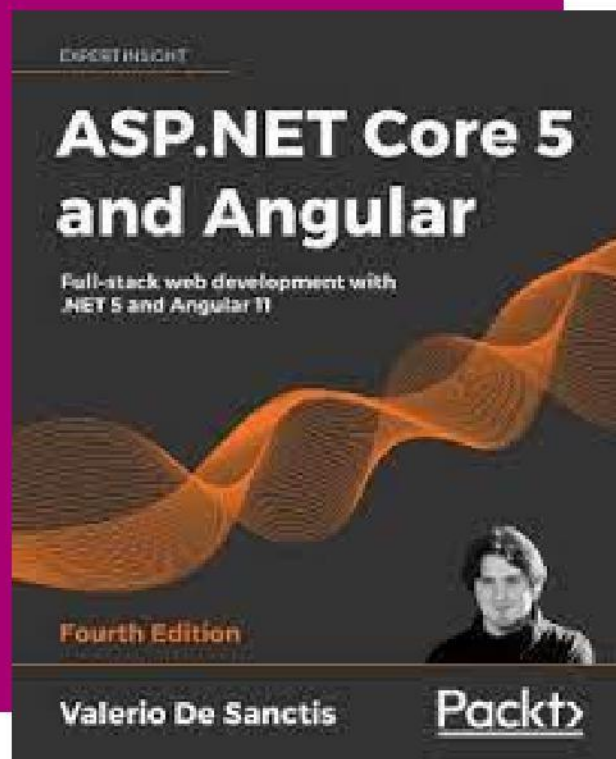
Embracing the Cloud



Embracing the Cloud



The essence



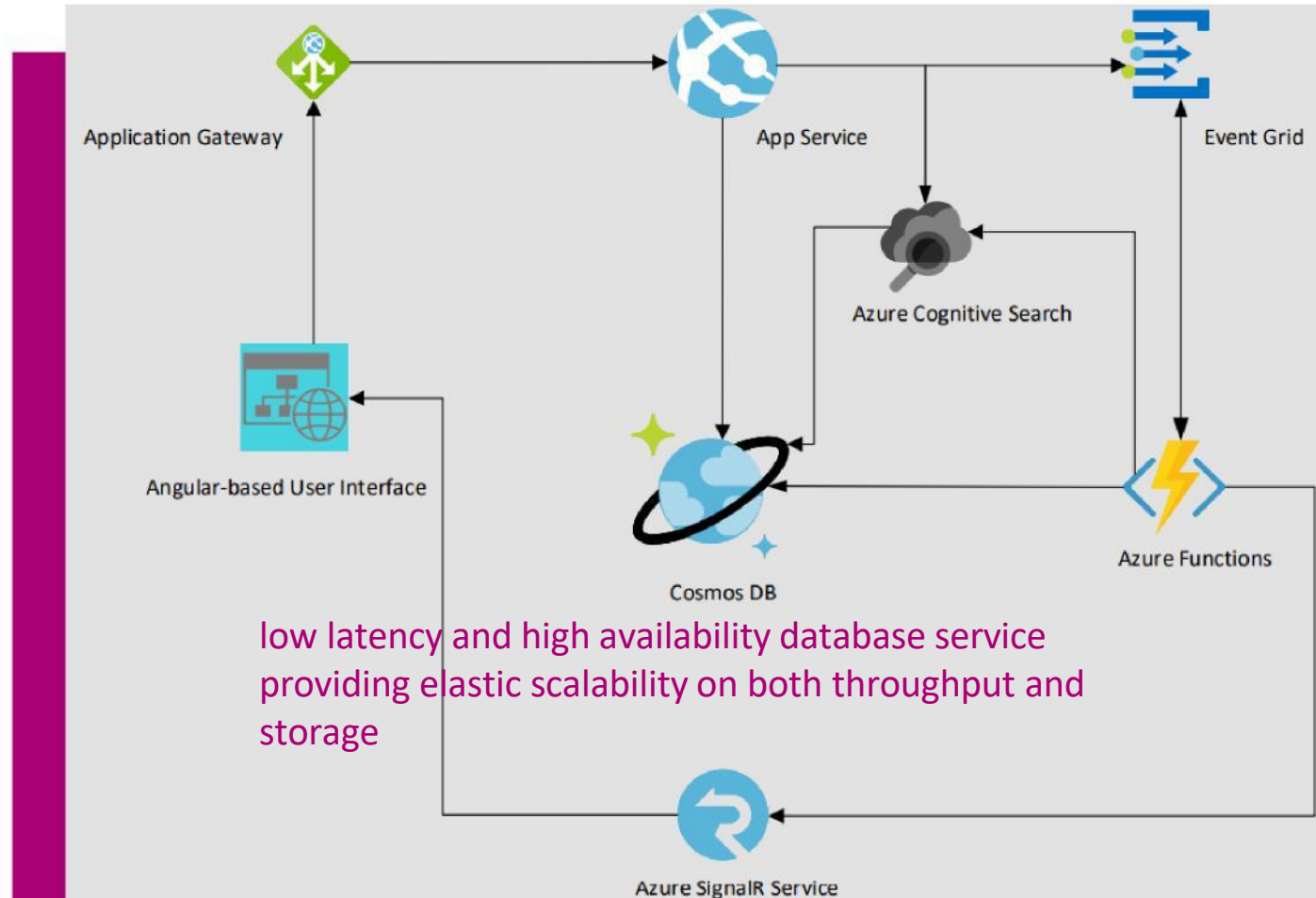
communication,
protecting against DDoS
and malicious content

allows users to
interact with the
solution

to host web applications, REST API's and
backend services for mobile applications

acts as the hub
that handles all
the events emitted,
triggering the
subscribed Azure
Functions

an event driven,
compute-on-
demand
cloud service
that provides all
the continually
updated
infrastructure
and resources
needed to run
your applications



low latency and high availability database service
providing elastic scalability on both throughput and
storage

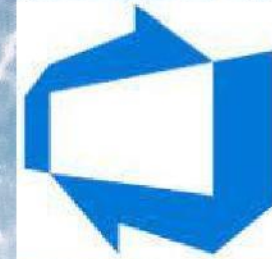
used to notify the UI in real time when data is
updated in the back end

Technologies

{RESTful API}



Visual Studio Code



Azure
DevOps



Visual Studio



Microsoft
Azure



git



5

Development Process

Boards

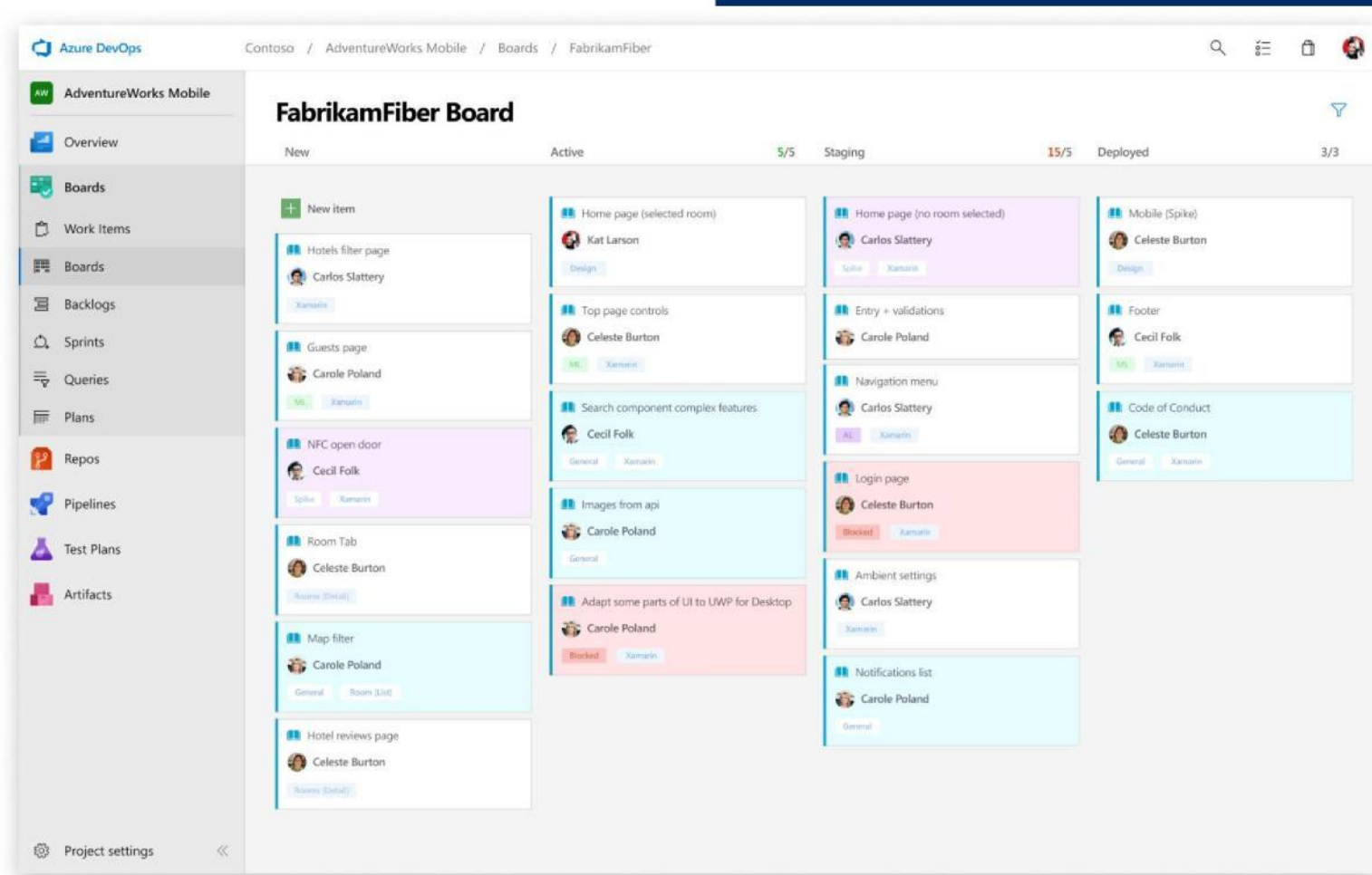
Who does what?

What is Scrum, Kanban, ...?

Responsibility

Initiative

Work as a team!



Continuous integration

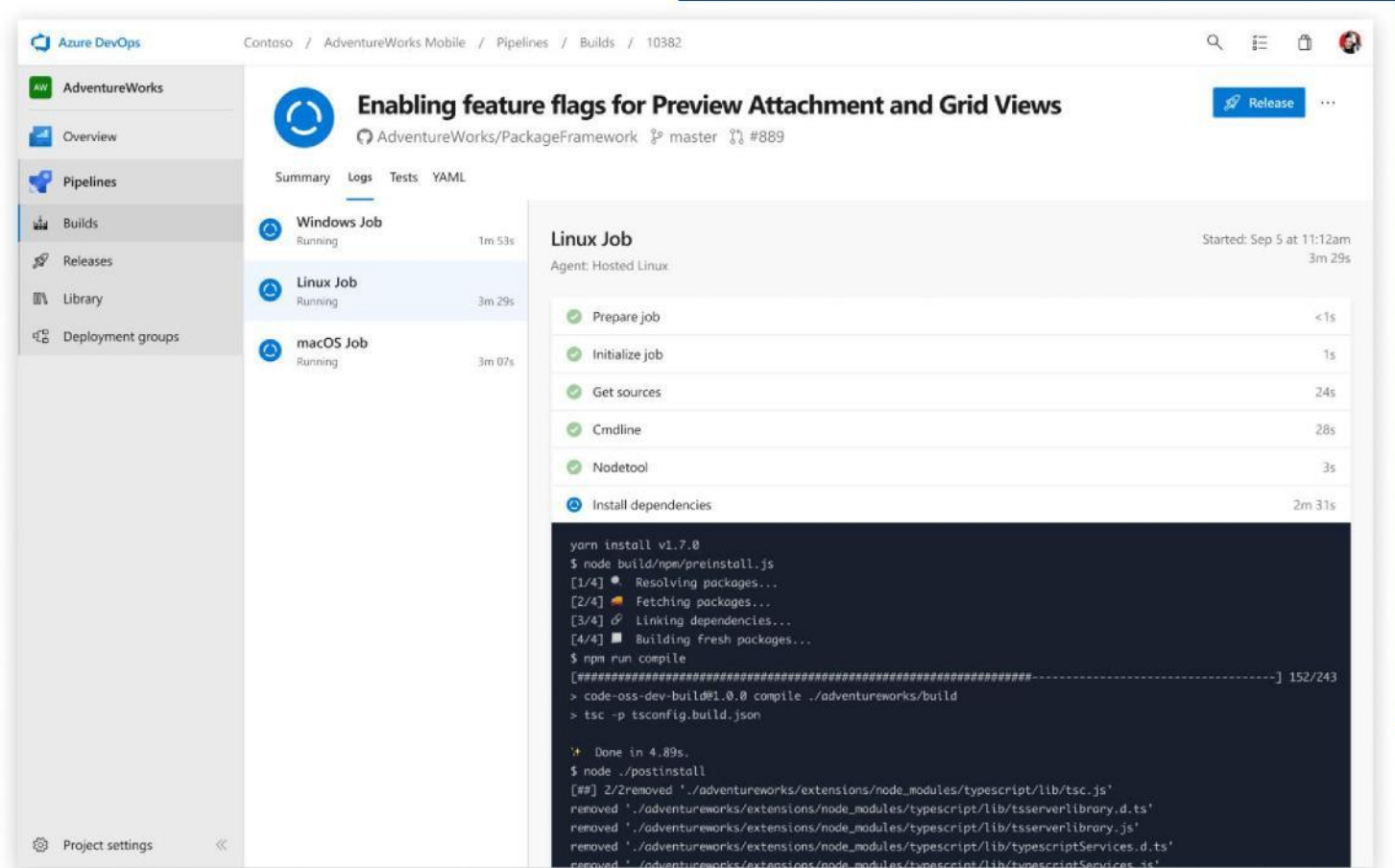
Build pipelines

Each change triggers a build

Builds include tests

Dev – Test – Acc – Prod

Deployment to customers





What is DevOps?

“DevOps is a set of practices that combines software development (Dev) and IT operations (Ops). It aims to shorten the systems development life cycle and provide continuous delivery with high software quality. DevOps is complementary with Agile software development; several DevOps aspects came from the Agile methodology.”

(from: Wikipedia)

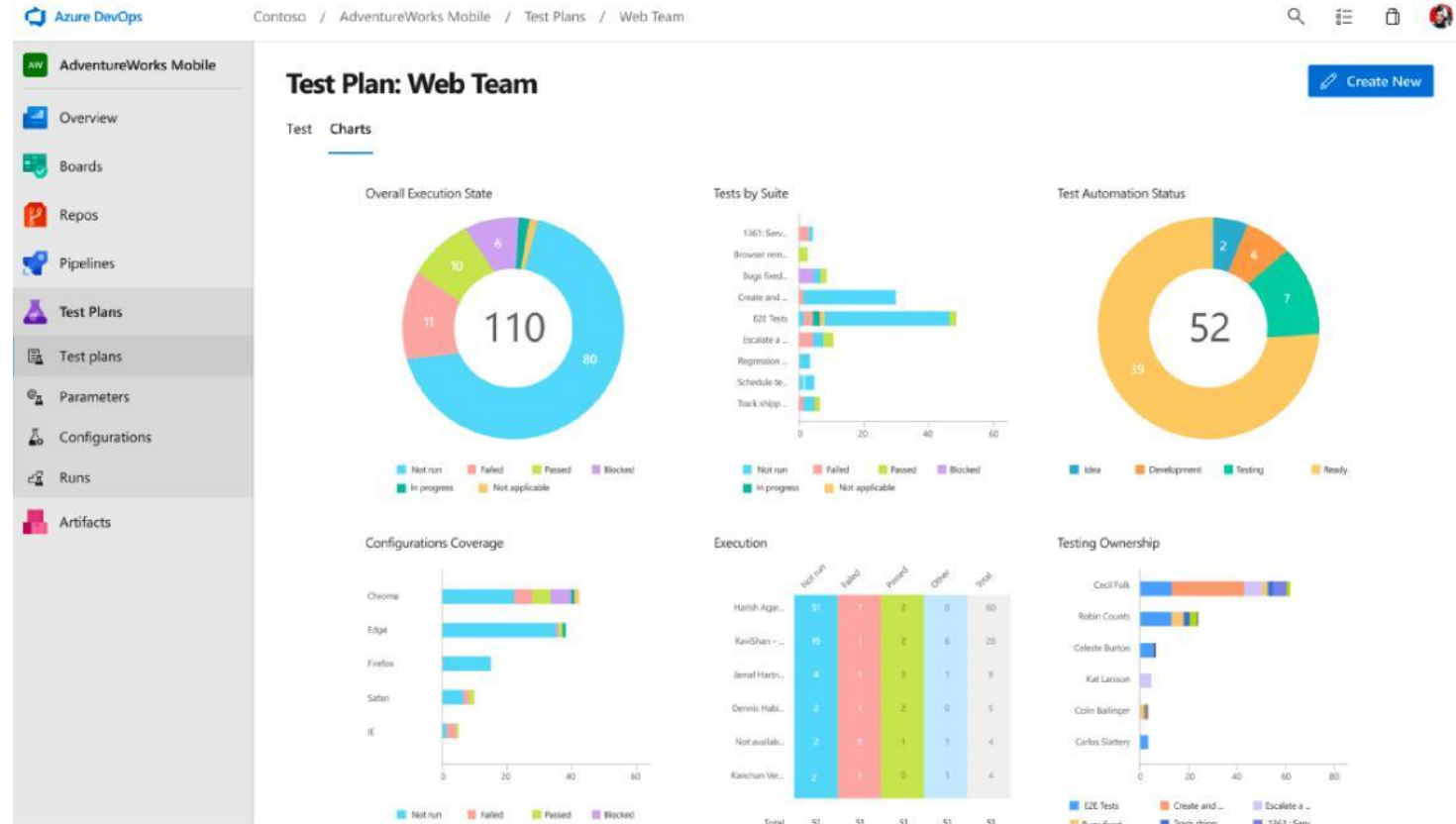
Test plans

Unit tests

Integration tests

System tests

Acceptance tests



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Computing

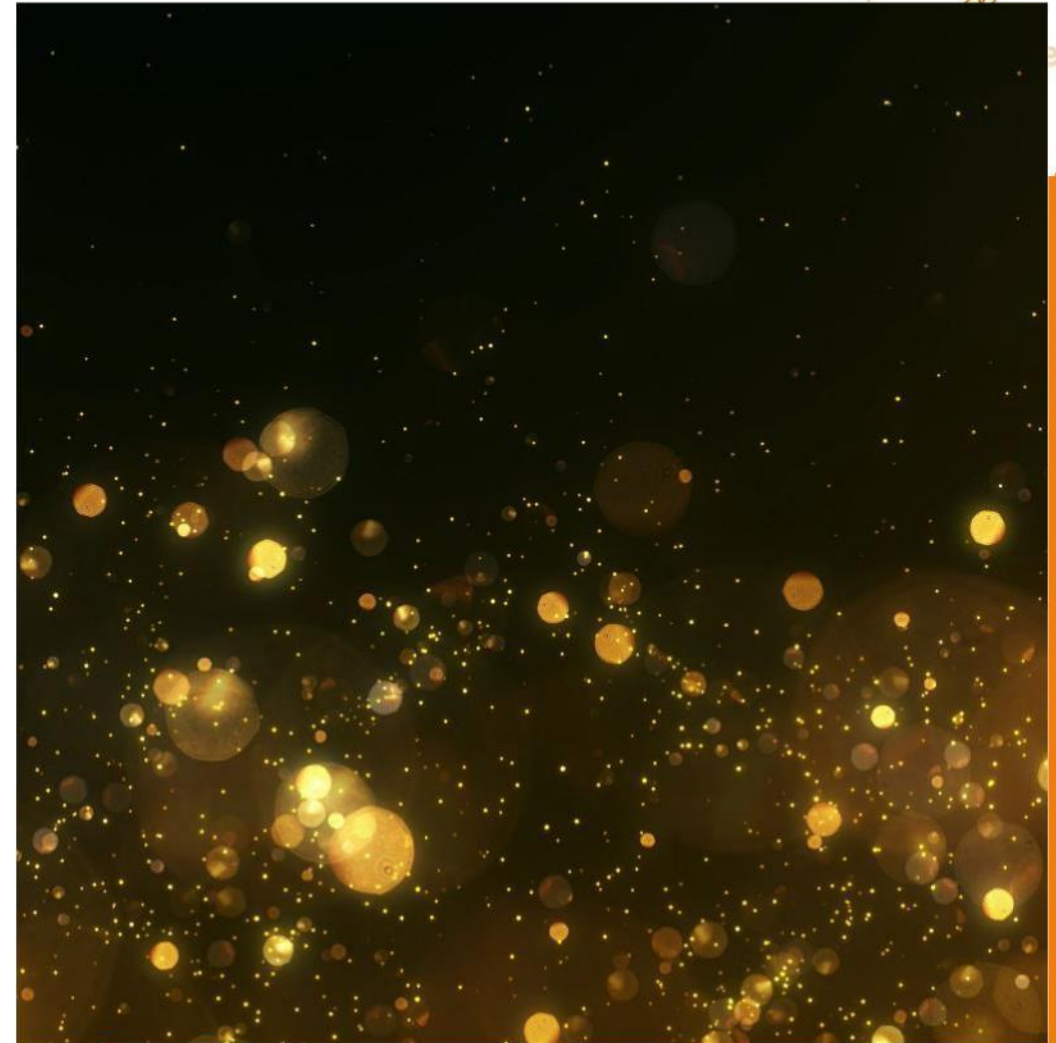


Cloud Computing

ORTEC for Field Service makes good use of several of ORTEC's standard cloud services, such as:

- The geocoding service
- The address lookup services
- The map visualization service
- The route calculation, and
- The route optimization services

This section described the route optimization service

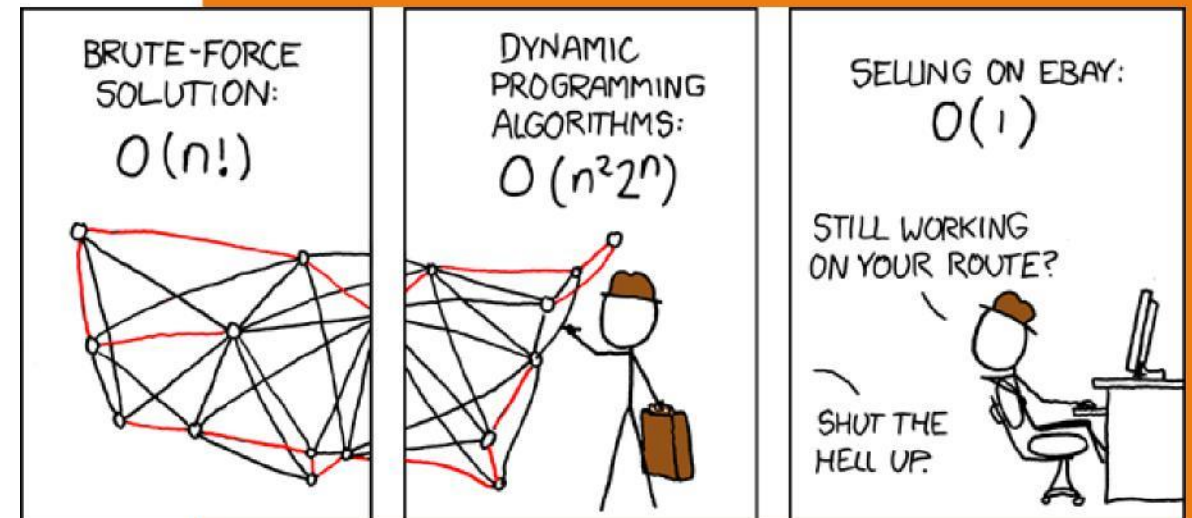


The traveling salesman

“The traveling salesman problem (also called the travelling salesperson problem or TSP) asks the following question:

"Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city?" It is an NP-hard problem in combinatorial optimization, important in theoretical computer science and operations research.”

(from: Wikipedia)



The shortest path?

The screenshot displays the ORTEC field service software interface for the 'Alblasterdam (test department)'. The main map shows a route optimization solution with a blue path connecting 20 numbered stops. A pop-up for 'Phaedra Onyx | Today' is visible on the map. The left sidebar lists resources, and the top navigation includes 'Plan Board', 'Map', 'Track', and 'Dashboard'. A 'TASKS TO SCHEDULE' button is in the top right.

Department: Alblasterdam (test department)

Plan Board | Map | Track | Dashboard

WB

OPTIONS: 1 day

Today

Search for resources

Resources:

- Adrian Cockham
- Duddy Tijm
- Dash T. K. Derrow
- Éamon Deucalion
- François Malachi-Livic
- Françoise-Athénais de Ligne de la Trémolle
- Griffin Cortez Vaughn
- Hjördís Acife
- Ioán Devereux
- Mary-Jane Faarydae
- Matthéo Eobard
- Miraç Thorou Sinclair

RESOURCES | LOCATIONS

Tasks to Schedule

Phaedra Onyx | Today

Map labels: Kinderdijk, Alblasterdam, Hendrik-Ambacht, etc.

Optimization Services

ORTEC for Field Service optimizes your tasks, whether single route optimization sequencing, multi-route (batch) optimization, incrementally adding tasks to existing route(s), reoptimizing or rescheduling unfinished tasks, or recalculating ETAs, while considering any restrictions, such as:

- Task requirements
- Maintenance or appointment time windows
- Task durations
- Route or shift start and finish times
- Break rules, for example, lunch breaks
- Capabilities, such as field worker skills
- Traffic congestion





6

Security and Authentication

Security

As a provider of data-dependent services, one of our primary objectives is to defend the digital information that is stored on or transmitted to the cloud platform.

Therefore, the CIA of data (confidentiality, integrity, and availability) represents the backbone of our security policies



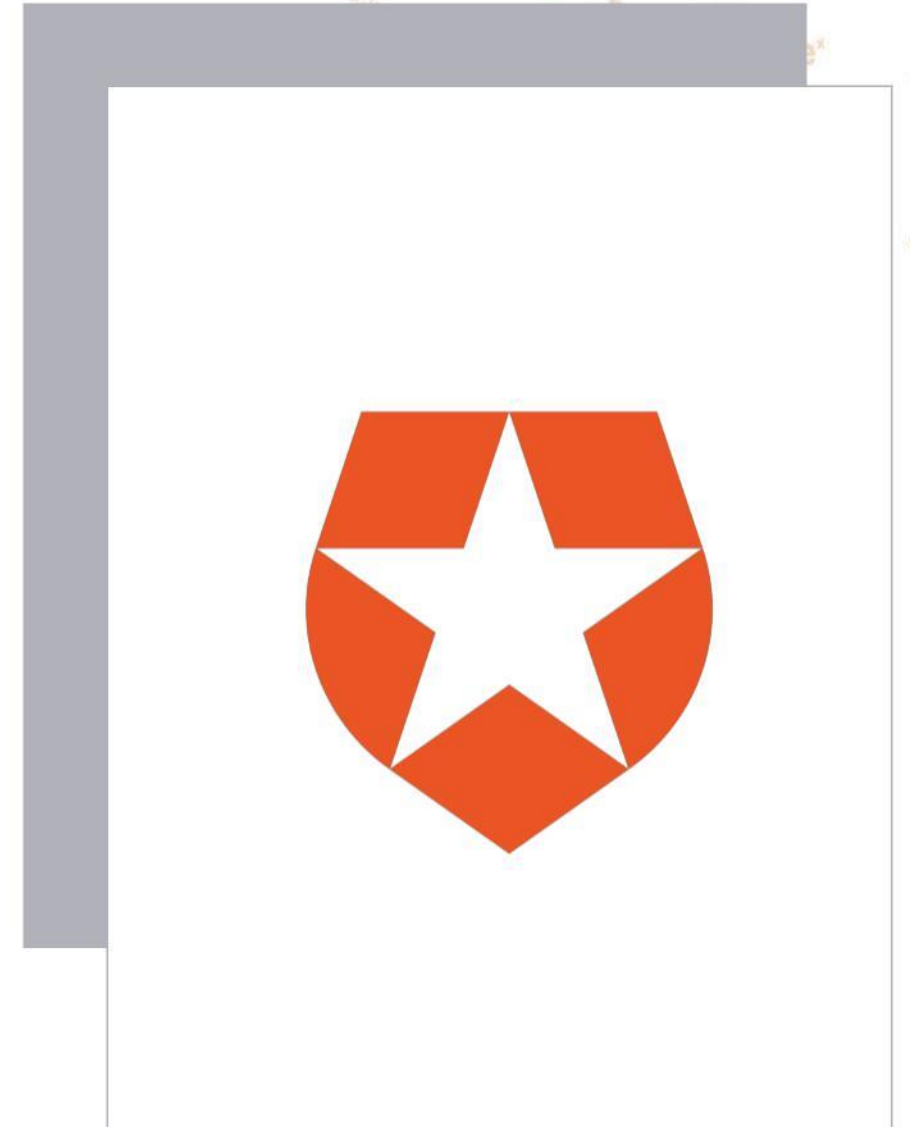
Authentication

ORTEC for Field Service is designed to support authentication via Auth0 (<https://auth0.com/>). Auth0, the organization, provides authentication and authorization as a service

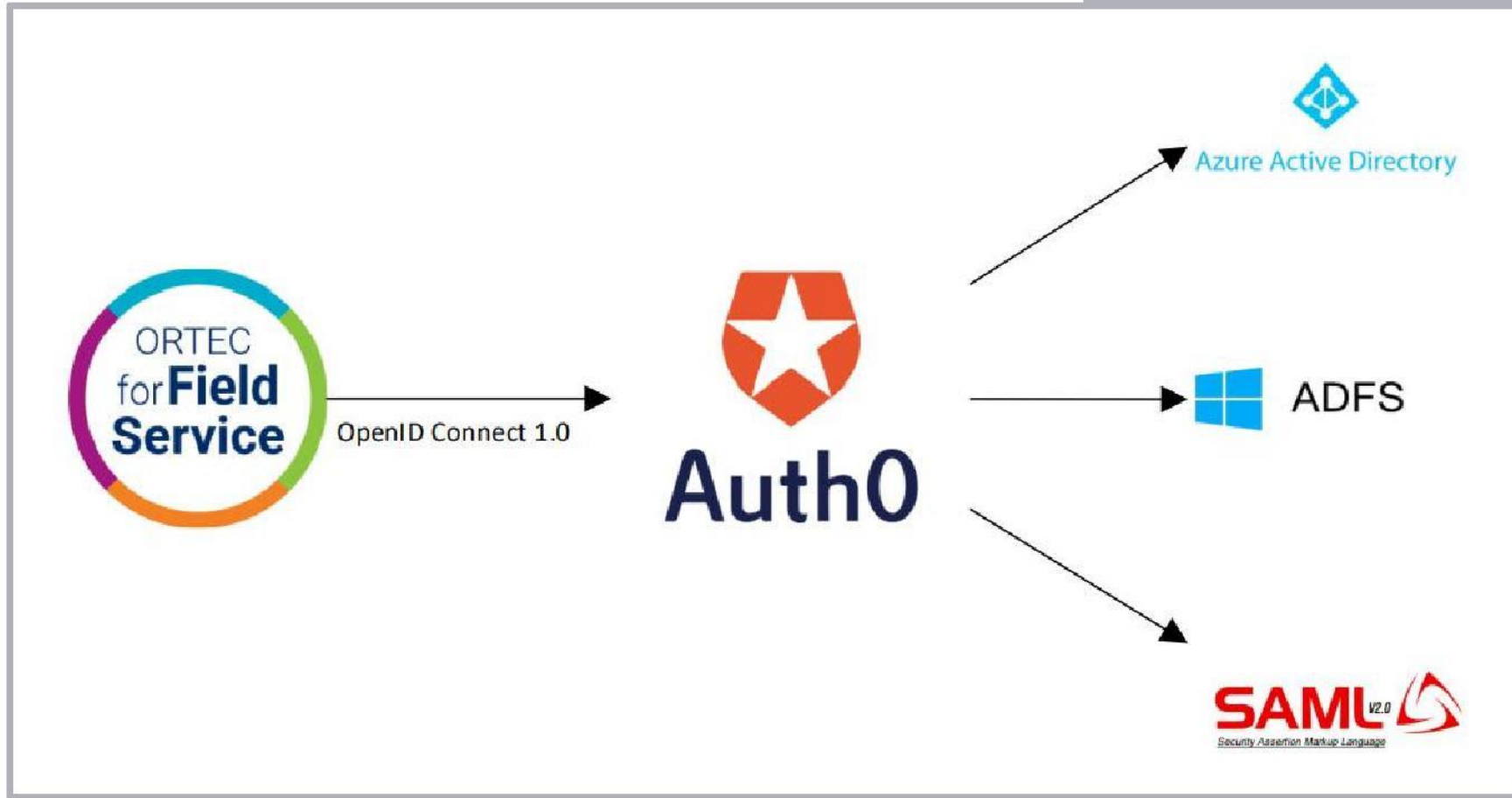
Auth0 acts as the gateway that enables ORTEC for Field Service to achieve seamless integration with your identity provider

The user interfaces and APIs provided by ORTEC for Field Service support authentication and single sign-on via Auth0. Single sign-on not only improves security but also enhances user experience

By utilizing Auth0, you can rest assured that ORTEC for Field Service is future-ready to adapt the continually evolving technology around authentication



Authentication

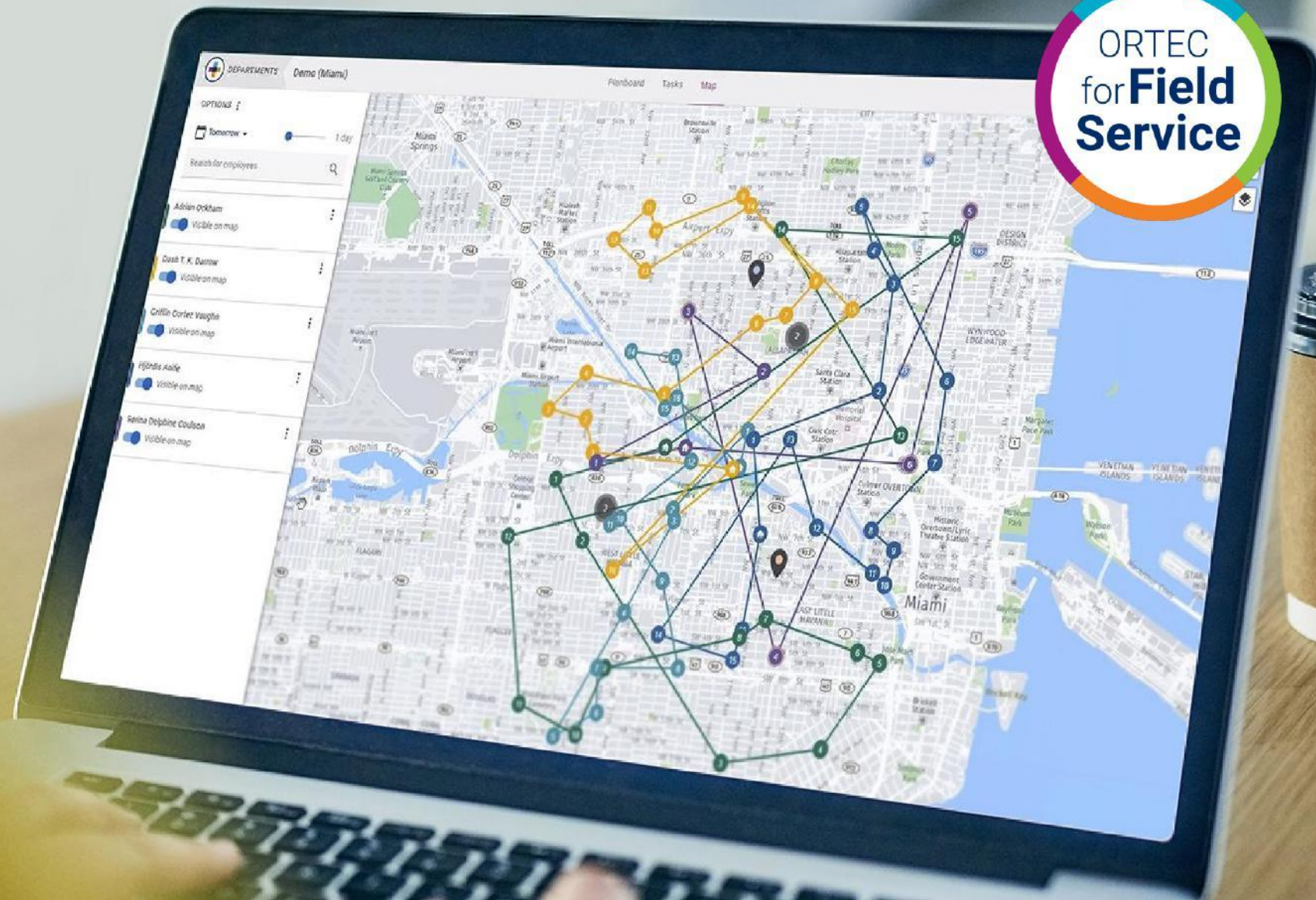


Questions?

ORTEC
for **Field
Service**

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