

salesforce

Achieve Operational Excellence with Salesforce Field Service Scheduling and Optimization

Boost efficiency in the back-office to increase productivity and customer delight

Next Job Assigned

Your next service task is optimized based on your skills and location. Start when ready.



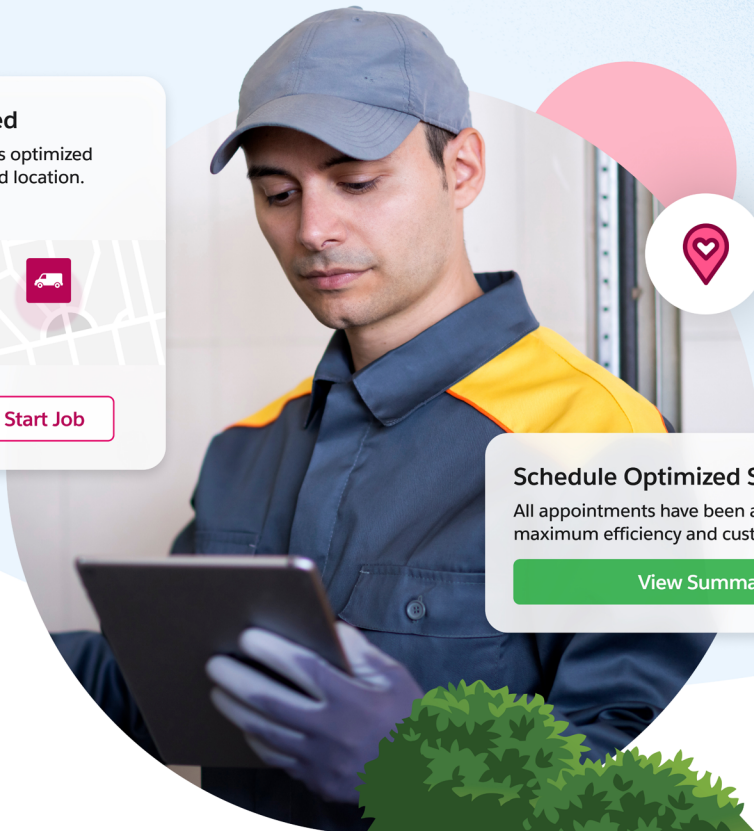
[View Route](#)

[Start Job](#)

Schedule Optimized Successfully

All appointments have been aligned for maximum efficiency and customer satisfaction

[View Summary](#)



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The Daily Scheduling Dilemma

Field service organizations face a daily challenge: efficient routing and scheduling of resources.

For just six appointments across a single resource, dispatchers must evaluate **720** different permutations. Add a second resource and six more appointments, and that jumps to over **479** million combinations.

When you factor in travel time, skill sets, and customer preferences, the complexity grows rapidly. Many organizations attempt to manually schedule their resources, but this approach is often inefficient and prone to error.

Salesforce Field Service has a unique approach to scheduling and optimization that allows customers to define precise business requirements in a flexible and extensible data model, all on one deeply unified, agent-first field service platform.

This enables best-in-class, point-to-point predictive location services and optimization layering – which ensures maximum quality at all stages in an appointment's lifecycle.

This approach improves efficiency and productivity, enhances customer satisfaction, and lowers costs.

Agent-first field service also focuses on prioritizing the needs and efficiency of field service technicians. It provides them with mobile apps, real-time data, and remote support to work more efficiently.

The approach a company takes to scheduling its resources is critical to the success of its field service organization. With poor scheduling comes inefficient workflows, burnt out employees (many who are highly-skilled and hard to come by) and ultimately, dissatisfied customers. Companies of all shapes and sizes with a cutting-edge scheduling and optimization engine at their backbone will see significant advantages over their competitors. Salesforce Field Service's powerful proprietary technology is second to none.

Optimized Route Assigned

Your new route has been optimized, reducing travel time by 12% and minimizing fuel costs.

[View Route](#)[Edit](#)

A Brief History: From Pioneer to Powerhouse

The advanced scheduling and optimization capabilities embedded in Salesforce Field Service were first introduced over 25 years ago by ClickSoftware, which Salesforce acquired in 2019. In this domain, Salesforce holds over 30 patents. When combined with Salesforce's market-leading Customer 360 platform, Salesforce Field Service is the world's most advanced scheduling and optimization solution.

In 2020, Hyperforce, the next-generation Salesforce infrastructure architecture built for the public cloud, was released. This innovation allowed for further enhancement of the scheduling and optimization engine for enhanced security and compliance. It also enabled full data residency, increased reliability and availability, and faster performance.

Fast-forward to today: Salesforce Field Service currently serves thousands of customers across various industries. Our intelligent scheduling engine handles more than 17 million scheduling events and optimizes over 6 million appointments every month. Each event can include thousands of appointments, and Salesforce Field Service efficiently solves complex optimization problems millions of times each month for our diverse customer base.



17M+

scheduling events are handled.

6M+

appointments are optimized every month.

The Optimization Problem: Navigate the Complexity of Field Service Scheduling

Solving the problem of routing many resources with different skills to geographically dispersed appointments is like an incredibly complex math problem. For example, if you have one field resource that has six appointments for the day, that is 6! (six factorial) or 720 possible combinations. What happens if we add a second field resource? This increases the possible solution to over 479M+ combinations. What about five resources with six appointments each? This is a staggering 2.65×10^{32} combinations! Since this isn't humanly manageable, an intelligent compute algorithm is required for optimal scheduling.

At Salesforce, we know that optimization varies based on our customers' unique workflows, metrics, and business outcomes they seek. The Salesforce Field Service optimization engine seeks to find the "best grade" for this complex routing problem. Through the Optimization Policy, weights and measures are tied to each organization's desired goals. We assess these grades and refine the approach.

Within the time allotted to solve an organization's routes, the engine iteratively grades each scenario and uses this information to continuously refine. As seen in *Figure 1*, a small move from Point "A" to point "B" gets us marginally closer to "best grade" but can greatly enhance business outcomes, such as a reduction in annual service costs, an expanded customer reach, reduced response times, and lower SLA violations. The business metrics customers want to achieve, along with their relative weightings, mean each solution is highly specific to a given organization. What's considered a quality output for one organization may not be considered quality for another organization. To reduce the time spent trying to solve this complex problem, Salesforce employs advanced methods such as dynamic algorithms and metaheuristics to break complexity down into smaller solvable problems.

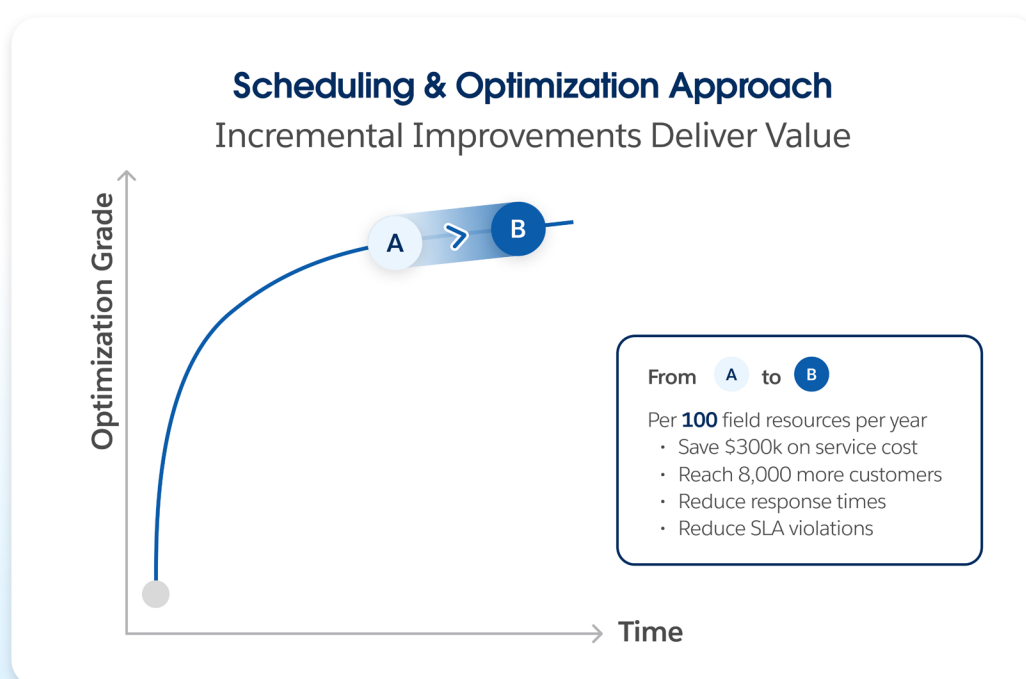


Figure 1: Algorithmic approach to schedule optimization

The Algorithm: Solve the Unsolvables

The optimization problem is an “NP-hard complexity class” problem. How does Salesforce Field Service optimization provide best-in-class quality with this complexity?

The Salesforce Field Service optimization core algorithm is a custom metaheuristic that is local-search-based. This algorithm combines multiple heuristics (solution hints or shortcuts) for solving more complex problems in four stages.

The **Initial Solution Generation** stage takes an existing schedule and any unscheduled appointments in the optimization request as the foundation or starting point. Next, a highly effective search process, consisting of cycles of diversification and improvement, seeks to continuously improve the schedule.

Search-Diversification makes small changes to the schedule to find a better solution, while also seeking a wider solution space. **Search-Improvement** is similar but more granular, and it applies a very specific operator to the current solution to seek further improvement.



**EQUIPMENT
SERVICES**
CENTER OF EXCELLENCE

PepsiCo Beverages North America

Pepsi Beverages North America's Pepsi Equipment Services, which staffs over 2,500 technicians and approximately 500 dispatchers, restocks and repairs fountain machines, coolers, and other assets across retail locations. With the efficiencies created with Enhanced Scheduling & Optimization, the organization conducts 10% more appointments in the same amount of time.

The algorithm will loop between these cycles until further improvement is not found, where it enters the **Disruption** stage. Disruption seeks to find a totally different solution in the same solution space by intelligently unscheduling a significant number of appointments from the schedule. Appointments are then rescheduled and the Search-Diversification and Search-Improvement stages loop once again.

Salesforce Field Service employs a metaheuristic strategy that works to efficiently find solution maxima. Through diversification and improvement, the solution space is expanded to continuously improve results and provide for the highest quality output in alignment with organizational business goals. The result is more field service worker efficiency, less drive time, and more on-time arrivals.

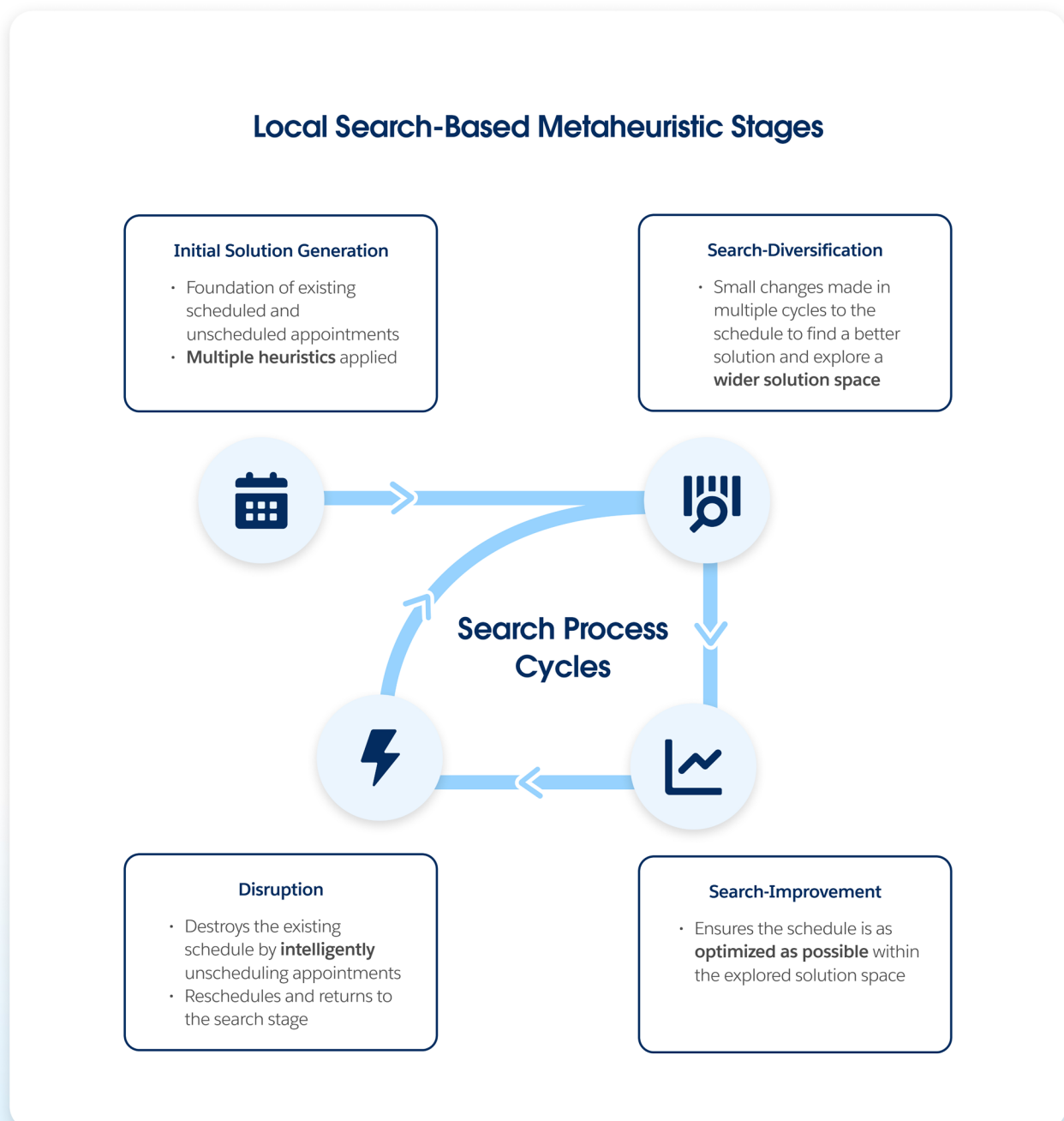


Figure 2: Salesforce Field Service's optimization algorithm combines multiple heuristics (solution hints or shortcuts) for solving more complex problems in four stages.

A Unique Approach: Custom Optimization for Every Business

Salesforce Field Service provides out-of-the-box flexibility and innovation for businesses of all types and sizes to model their organizations for optimization. No matter the industry, operations managers fundamentally think of their field organization in the same way: 'what is it I have to schedule' and 'how do I schedule it?'

The most important business objectives will inform the answers to these questions. These could include meeting service-level agreements, enhancing customer satisfaction, improving employee retention, optimizing resource utilization, reducing truck rolls, minimizing mileage, and more.

Only Salesforce Field Service captures the precise requirements necessary to model these challenges to meet business objectives. And because it's built on a unified data platform, it has the unique ability to pull in customer and company data from sales, service, marketing, and commerce, therefore reflecting customer preferences in the scheduling process.

Further, the optimization engine has powerful mapping and real-time traffic data. This is critical to ensuring that field service workers get to jobs at the proper time and that dispatchers manage in-flight exceptions. In a moment, we'll also discuss point-to-point predictive routing.

For example:

- Are they contractors or employees?
- Who's going to do the work?
- Are they crews?
- What are their skills?
- When are these resources available?
- Do we manage shifts?
- Are they capacity based?
- How do you organize them into territories?
- Do they need to move between territories?
- How is the work they're going to do structured?
- Are these one-off appointments?
- Is the work structure multi-stage or complex?
- What is my cost to serve?



Location Data Matters for Precision at Every Turn



HERE Technologies

Salesforce has partnered with HERE Technologies, the leading location data and technology platform, to provide the highest quality location data available. Salesforce uses HERE location data to drive route optimization and planning, helping field service-based organizations plan routes and optimize schedules with accurate travel times. In this environment, calculations must happen quickly, and often in real-time, to enable operators to execute their daily schedules efficiently. For example, schedules may need to be amended due to staff absence or site-specific issues, resulting in a requirement to rebook activities. This may involve selecting the most appropriate person to provide cover, taking into account relevant skills, the distance to be travelled and expected traffic conditions. Accurate real-time traffic data and effective routing options translate into more accurate schedules, higher utilization rates, reduced delays and higher customer satisfaction.

Salesforce Field Service also uses HERE map data in conjunction with Salesforce proprietary scheduling and optimization logic and AI-based algorithms. To optimize routes, Salesforce Field Service considers details such as truck measurements and maximum load capacity, as well as accessible routes for bicycles and pedestrians.

Using accurate travel-time estimates and effective route selection, based on proven data, improves field-based scheduling, especially in dense urban areas. HERE's real-time and historic traffic data helps Salesforce Field Service optimization engine build schedules that meet specific customer operational constraints and service-level agreements, while creating accurate activity schedules for employees.

Bridge Business Objectives and Optimization Outcomes

Salesforce Field Service provides three categories of optimization: global, in-day, and immediate. This flexibility in optimization layering maintains schedule quality throughout the appointment lifecycle even as business and field conditions change.



Global optimization prepares future service days across territories and a range of dates to create the most efficient schedules. These are analyzed overnight in batches as the service delivery date nears. Due to the deep level of analysis, it can take several minutes or even a few hours to complete, supporting long-range scheduling.



In-day optimization is also full schedule optimization, but it typically runs during the day of service delivery or near-term dates. Due to its speed, it can run during business hours, while an organization is actively dispatching. It can also run on future dates to provide call center agents and dispatchers with up-to-the-minute scheduling updates for new or changed booking activity, supporting exceptions management for near-term work.



Immediate optimization monitors the current day's schedule for common events such as early finishes, late finishes, customer cancellations, high priority appointments, and other events. The engine can immediately re-optimize the day's. This is highly configurable and helps keep the field service team efficient and on schedule, while also increasing dispatcher productivity.

Salesforce has developed a unique interface between organization business objectives and optimization outcomes. The scheduling policy is a code-free methodology to capture work rules and service objectives.

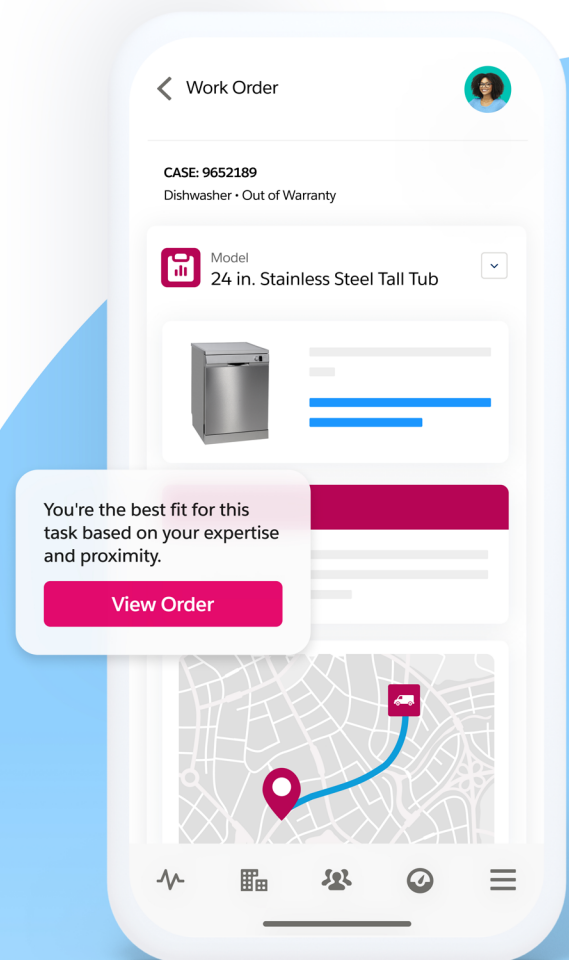
Work rules contain “yes or no” criteria, or filters, that must be followed. For example, ensure the work is assigned in the right territory to a resource with the right skills and they’re not too far from home.

Objectives are optimization hints and prioritization criteria that drive business scheduling requirements, given all the possible sets of valid schedules. Examples of objectives include minimizing travel time, reducing overtime, or choosing certain field resources based on priority.

Objectives for each appointment are scored by the optimization algorithm and are summed to provide a comprehensive score for each routing solution found. And each objective can also be ranked or weighted to drive unlimited specific business outcomes.

For different organizations, some objectives are more important than others, so they’re assigned greater “weights.” These weights impact scoring to then solve for the “best grade,” discussed earlier.

To further drive schedule quality, an organization can employ multiple policies. This powerful feature, called **policy shifting** enables an organization to manage, for example, an emergency response that drops standard appointments and schedules only high-priority jobs with relaxed territory boundaries. Another example includes scheduling in-house fully loaded resources versus contractors by territory, type of work, or other custom defined cost basis. It could also include high-volume response, which can relax overtime rules to allow for more service volume.



The Good to Great Framework for Optimized Scheduling

The journey to maximize business impact through optimized scheduling follows a process. This “Good to Great Framework” has four stages: **Foundational**, **Automated**, **Accelerated**, and **Intelligent** (Figure 3).

- Your journey might start at Foundational with capabilities like drag-and-drop of appointments and guided appointment booking, or just visibility on a Gantt.
- Moving into the Automated stage can mean adding automatic scoring and scheduling of appointments, reducing the need for human dispatcher input.
- The Accelerated stage uses the unique flexibility provided by Salesforce Field Service for fully automated scheduling and optimization.
- And what’s to come*: Salesforce’s innovation doesn’t stop there. The Intelligent stage refers to when AI and [Data Cloud](#) use Customer 360 data across the enterprise to provide more personalized outcomes. [Agentforce](#) enables access to new capabilities through agents for dispatchers, technicians, and customers to use these optimization services for efficient scheduling.

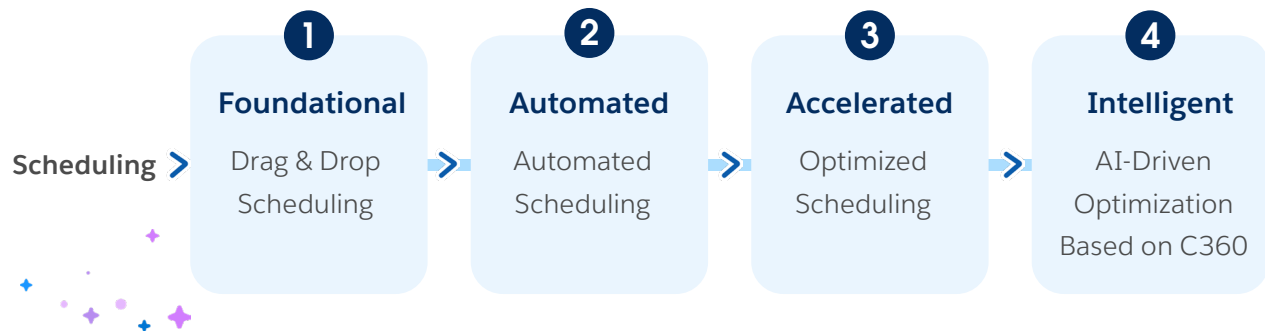


Figure 3: Good to Great Framework

It’s important to note that AI-powered agents assist in every stage. Whether in the beginning stages or more advanced, Agentforce is there the whole way, providing tools for operations, dispatchers, field service workers, and customers.

[AI agents](#), like Agentforce, can understand natural language, answer simple questions, and resolve complex issues. They can operate autonomously within the guardrails your business sets and seamlessly hand off issues to employees when necessary.

Agentforce for resource management helps dispatchers to quickly address urgent appointments using a conversational interface. The AI agent presents a Gantt chart so the dispatcher can easily identify risks and adjust appointments on a single screen, streamlining decision-making and increasing productivity.

*Forward-looking statement. Salesforce is a publicly traded company, and customers should base their purchasing decisions on products and services that are currently available.

The Future of Field Service is Smarter, Faster, Better Scheduling

Salesforce Field Service's unique approach to scheduling and optimization allows organizations to define precise business requirements within a flexible and extensible data model on a single, deeply unified platform. This precise capture allows the optimization engine to efficiently seek a "best grade" solution by leveraging dynamic algorithms aided by metaheuristics to reduce problem complexity and solution times. Point-to-point predictive location services ensure maximum granularity and unmatched accuracy in travel time calculations. **This is the Salesforce advantage.**

Ready to learn more?



Join high-performing organizations and power efficient field service operations with Salesforce Field Service.

[LEARN MORE](#)



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