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ARIS/GM® gate manager

Create short-term aircraft-parking plans and manage day-of-operation parking assignments in real time

The ARIS/GM gate manager plans gate, stand, remote parking-position, and departure-lounge assignments in advance and manages the assignments in real time on the day of operation.

With the ARIS/GM gate manager, you can:

- Create short-term and day-of-operation allocation plans for unlimited numbers of gates, stands, remote parking positions, and departure lounges
- Create and adjust the business rules that govern gate, stand, remote parking position, and departure-lounge allocation decisions
- Resolve conflicts caused when unplanned events, such as delays, cancellations, and equipment changes, disrupt allocation plans on the day of operation
- Link arrivals and departures automatically
- Create and analyze what-if changes to the plan before making permanent changes
- Determine which aircraft need security sweeps
- Maintain consistent parking assignments for popular flights
- Reduce fuel wasted while waiting for parking positions
- Reduce aircraft tows
- Identify aircraft that may violate FAA tarmac rules
- Produce reports about planned and actual parking assignments and aircraft movements

The ARIS/GM gate manager automates short-term planning and real-time gate-management activities critical to efficient cost-effective airport operations.

Make decisions you can trust 100% of the time

The ARIS/GM gate manager delivers decisions you can trust. This means that the ARIS/GM gate manager does more than merely notify you that a scheduling conflict exists. A combination of extensive business knowledge and advanced decision-making algorithms enables the ARIS/GM gate manager to resolve parking-position assignment problems, even those that appear to have no obvious solution, quickly and efficiently.

The ARIS/GM gate manager takes into account hundreds of interrelated factors, such as towing costs, passenger inconvenience, and disruption of parking-position assignments for other flights. You control the rules that the ARIS/GM gate manager uses to make its recommendations, and you can assign weights to them to establish their relative importance in determining a parking-position assignment strategy.

For example, you can set up hard rules that the ARIS/GM gate manager can never violate, such as never parking two specific aircraft types at adjacent gates, and soft rules that offer the ARIS/GM gate manager flexibility in making a gate-assignment decision. The result is that you can always count on the ARIS/GM gate manager to deliver a workable parking-position assignment solution. And, just as important, you can trust the ARIS/GM gate manager to provide the best possible solution for a given situation.
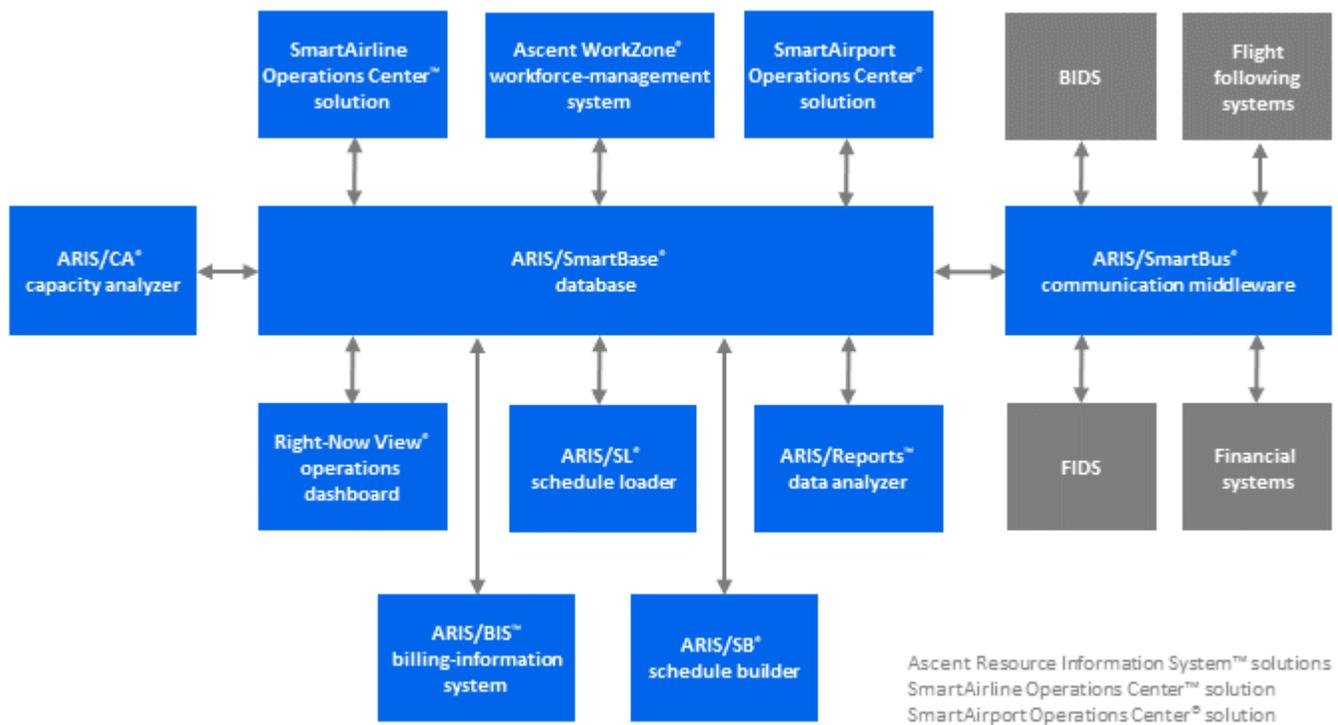
The ARIS/GM gate manager is a flexible system that adapts to a wide range of operations environments because it supports three levels of planning and analysis:

- Medium-horizon planning of gate, stand, and parking-position allocations, when aircraft-turn information becomes available
- Short-horizon planning, when estimated arrival and departure times become available
- Real-time operations management, including responding to unplanned events

Users at all levels of experience can work comfortably with the ARIS/GM gate manager because it offers three distinct modes of operation, ranging from manual to fully automatic:

- In manual mode, you make and change parking assignments yourself and use the ARIS/GM gate manager to store and display the plans you create. When one of the assignments or changes you want to make violates a constraint, the ARIS/GM gate manager alerts you, so you can correct the error.
- In semiautomatic mode, you share the planning process with the ARIS/GM gate manager, relying on the system to make recommendations to resolve scheduling conflicts and to evaluate the overall effectiveness of your plans.
- In automatic mode, you rely on the ARIS/GM gate manager to create plans that provide the best parking assignments and to provide real-time recommendations for responding to irregular operations and unplanned events.

As scheduling requirements grow in size and complexity, the ARIS/GM gate manager's advanced problem-solving strategies, especially those involving real-time resolution of parking-assignment problems, clearly differentiate it from other gate-management systems. The behavior of the ARIS/GM gate manager is determined by user-modifiable rules that are stored with all relevant flight and airport facility information in the ARIS/SmartBase® database. Because the rules are stored in a central knowledge base, rather than in the ARIS/GM gate manager or in auxiliary files, you can change rules and add or modify facility information without modifying the ARIS/GM gate manager itself.

Who we are

Since our founding more than 35 years ago by members of the Massachusetts Institute of Technology Artificial Intelligence Laboratory, Ascent Technology has helped organizations deploy costly resources as efficiently, effectively, and economically as possible. Our highly trained and capable team of technologists, problem solvers, and solution designers has broad domain expertise and substantial experience in artificial intelligence, computer science and engineering, system design, mathematical optimization, operations research, and resource optimization, planning, scheduling, and management.

SmartAirline Operations Center™ solution	Ascent WorkZone® workforce-management system	SmartAirport Operations Center® solution	BIDS	Flight following systems

| ARIS/CA® capacity analyzer | ARIS/SmartBase® database | | ARIS/SmartBus® communication middleware | |

| Right-Now View® operations dashboard | ARIS/SL® schedule loader | ARIS/Reports™ data analyzer | FIDS | Financial systems |

| ARIS/BIS™ billing-information system | ARIS/SB® schedule builder |

Ascent Resource Information System™ solutions
SmartAirline Operations Center™ solution
SmartAirport Operations Center® solution

Real-time changes to flights, such as updating estimated arrival times and changing aircraft-registration information, can be made simply by moving the pointer to the relevant screen display area and entering new information. The ARIS/GM gate manager automatically checks for conflicts and can be configured to accept a change only after confirmation. The latter feature, known as the releasable information option (RIO), is an important safeguard because it prevents unverified changes from entering related systems, such as FIDS, and potentially disrupting airport operations.

To build and sustain your trust in the solutions it recommends, the ARIS/GM gate manager provides tools that enable you to understand the logic behind its decisions and to exercise precise control over the subtleties in the rules and constraints that influence its recommendations. Business-knowledge inspection tools enable you to inspect the knowledge base and to view the business rules in clear, English-language statements instead of arcane symbols and codes. At any time, users can ask the ARIS/GM gate manager to explain its recommendation for a particular gate, stand, or parking assignment, and it will provide a clear and concise description of the reasons behind the recommendation.

In typical daily operation, the ARIS/GM gate manager can be loaded with a pre-planned gate and parking-position assignment schedule. Larger airports may find it efficient to create this schedule using the ARIS/SP® stand planner. Based on the daily plan, the ARIS/GM gate manager maintains consistent day-to-day assignments of gates, stands, and parking positions insofar as possible. The ARIS/GM gate manager alerts you when it must alter the plan because of flight delays, aircraft swaps, or other irregular operations. In certain situations, such as when rapidly changing weather conditions are expected to cause a major disruption of the daily plan, you can instruct the ARIS/GM gate manager to re-plan the schedule for a selected group of flights from a specified time forward or to use another set of rules automatically.

The ARIS/GM gate manager presents you with an intuitive, rapidly assimilated view of the use of gates, stands, and parking positions; everything you need to know about the current state of your operation is visible on a single display. The display provides scrollable windows that enable you to move forward or backward in time and to view the status of a virtually unlimited number of gates, stands, and parking positions. The main display area uses a familiar bar-chart format to present the information, with colored lozenges representing the aircraft and a user-selectable palette of colors and symbols to indicate essential information about each flight. You have the option of extending the bar chart across multiple side-by-side monitors, in which case the ARIS/GM gate manager supports seamless mouse movement and information synchronization across all screens.

Representative features

Flight-time display keeps you fully informed. To help you assess how well the day's operations are progressing relative to the original plan, the ARIS/GM gate manager displays all time-based information about flights. Using an innovative display technique, it can show scheduled, estimated, and actual times for flights and tows without crowding the display.

Display of next arrivals and next departures improves efficiency. You can focus your attention on the next activity without having to scroll through the GateChart to identify the next event. Two panels contain flights sorted according to which one is most likely to depart next. These panels contain indicators that show aircraft-parking and taxiing activities.

Automatic alerts warn of possible problems. The ARIS/GM gate manager automatically issues warnings, shown in red on the GateChart, when it receives information, such as changes in estimated times of arrival or departure that may create problems with scheduled allocations of parking positions. A user-configurable alert-management system warns you about upcoming problems and enables you to acknowledge each alert individually.

Gate hierarchy simplifies parking large aircraft. The ARIS/GM gate manager can combine two or more parking positions into larger ones to accommodate aircraft of any size. Multiple levels of parking position combinations are supported, enabling airports to handle larger aircraft as well as larger numbers of smaller aircraft.

Automatic aircraft swapping minimizes schedule disruptions. The ARIS/GM gate manager handles arbitrary assignments of aircraft to flights. When carriers assign or reassign aircraft, the time and cost effect on gate, stand, and parking-position allocations can be substantial, especially when tows are required to swap aircraft. The ARIS/GM gate manager re-links arrivals and departures, automatically determining the best solution to minimize the effect of the reassignments in the processing, carefully balancing passenger convenience with the cost of tows.

Departure lounges are allocated automatically. When buses are used to transport passengers to and from flights, you can allocate both a parking position for the flight and one or more waiting lounges. The ARIS/GM gate manager automatically integrates the assignment of passenger-lounge areas and aircraft-parking positions. It identifies bus gates with special graphical indicators on the GateChart and synchronizes them with flight departure times.

Schedules are adjusted for inoperative equipment. The ARIS/GM gate manager tracks problems related to inoperative airport facilities, such as malfunctioning jetways. You

can enter information about planned downtime for scheduled maintenance activities and about unplanned downtime resulting from unexpected problems. The ARIS/GM gate manager uses special graphical indicators to alert you to these problems and also reminds you when problems are scheduled to be resolved. The ARIS/GM gate manager automatically factors these problems into its gate and parking-position allocation recommendations.

Graphic display based on the familiar bar chart. New users find it easy to make the transition from manual planning systems to the ARIS/GM gate manager because it uses a schedule representation with which they are already familiar. This familiarity also reduces the amount of training time required to become proficient in using the ARIS/GM gate manager.

Color indicators help clarify information display. The GateChart display uses color coding to indicate a wide range of characteristics associated with flights and their gate-allocation status. You can select your own color preferences, and the ARIS/GM gate manager remembers them.

Multi-user access. Changes made by one user are seen by all other users within a few seconds. You can share responsibility for parts of the airport or you can split the work, for example, by terminal.

Manual data entry gives you full control. Under normal conditions, flight information used by the ARIS/GM gate manager is automatically captured from external systems, such as flight-following systems and radar systems, using sophisticated connectivity software. Should the information feed be interrupted for any reason, or if you need to make on-the-fly updates, information about flight delays, new flights, returns, and cancellations can be entered manually.

Zoom function makes GateChart easy to read. During periods of high activity, the amount of information presented on the GateChart can make it difficult to view detailed information about a particular flight. With the zoom function, you can magnify a selected area of the GateChart display, while the ARIS/GM gate manager automatically restructures the display to eliminate any information overlap that could cause confusion.

Search functions and group commands increase user efficiency. Rather than having to scan the entire GateChart to find a specific flight, you can ask the ARIS/GM gate manager to search for the flight that matches one or more of nearly four-dozen conditions. You can also perform express searches based on when, where, and why questions. Group commands save time by enabling you to apply the same command to multiple flights. For example, this makes it possible to use just one command to delay all flights from a single origin by 10 minutes, rather than having to enter the same command several times.

Smooth day-to-day transitions. The ARIS/GM gate manager supports flexible day boundaries, which enables you to define an operating day with any starting and ending times you prefer. This eliminates the need to switch calendar days to handle flights arriving after midnight.

Multiple-day plans handle overnight ground stays accurately. You can work with allocation plans that span several days. This is particularly useful for airports that handle overnight international flights or flights that cross international datelines. However, because the ARIS/GM gate manager provides smooth scrolling from one day to another, it is likely that several flights with the same flight number will appear on the GateChart. To eliminate confusion, all flight information is identified by flight date.

Supports reporting and financial applications. All information processed by the ARIS/GM gate manager is stored in the ARIS/SmartBase database, which runs on the Oracle® database, where it is available for further processing and report generation by ARIS/Reports™ data analyzer. Because the ARIS/GM gate manager logs all events for all flights, it is an excellent source of accurate information for applications that invoice airlines for airport services, such as the ARIS/BIS™ billing-information system. It stores information about aircraft type, gates used, length of time spent at a gate, tows, and services performed, among other things.

Intelligent data capture from multiple sources. The ARIS/SmartBase database receives flight data via the ARIS/SmartBus® communication middleware, which ensures consistent, reliable data capture from a wide range of data sources and external systems. Built-in communications protocols enable the ARIS/SmartBase database to receive information from sources such as airline systems, airport systems, radar systems, and SITA. Information processed by the ARIS/GM gate manager can drive systems, such as FIDS, web servers, and information systems, that provide flight information to travelers, airport and airline staff, handling agents, and other service providers and partners.

What-if analysis. When you load a particular current, future, or past day, the ARIS/GM gate manager automatically assembles the business rules and airport configuration for the day without any user involvement, such as changing the database account or loading a separate airport configuration file. This feature is particularly useful when airport construction projects change the configuration of the physical assets frequently.

Central database drives all decisions. The data and decision-making rules used by the ARIS/GM gate manager are stored in the ARIS/SmartBase database. It contains easy-to-use, fill-in-the-blanks panels, which make it possible for users to populate and modify the database without programming. Data panels are used to capture flight information and attributes of the airport that affect scheduling decisions. The knowledge panels provide a convenient way to enter business rules and establish the weighting that controls how the ARIS/GM gate manager applies them to its decision-making processes.

Airport scenario support. The ARIS/GM gate manager automatically selects the appropriate set of business rules to follow for the day loaded. You can change the way the airport operates overnight, for example by adding new gates or changing the allocation rules, and the ARIS/GM gate manager selects the correct business rules to follow.

Real-time updates to and from the database. The ARIS/GM gate manager automatically synchronizes with the ARIS/SmartBase database before and after every command you issue. If your workstation accidentally shuts down, you will not lose your work.

Web-enabled for cost-effective rapid and wide deployment. You gain access to the ARIS/GM gate manager through Ascent's From Touchdown to Takeoff® cloud-hosted service, a secure, highly-available, and readily-expandable platform. When you subscribe to the service, you can gain access Ascent's entire suite of products, including the ARIS/GM gate manager, using a standard browser directly from your network without any need to install, maintain, and support on-premise hardware and software. We can readily adjust available computing power to meet your organization's changing needs, and you can easily expand your solution to accommodate additional users and to manage additional resources, facilities, and locations.

Ways we can help you

Advisory and consulting services. We provide unbiased advice about resource allocation, optimization, planning, scheduling, management, and deployment methodologies; develop cost-benefit analyses; analyze business processes; manage projects; gather and document technical requirements; develop functional specifications; and specify hardware, software, and devices.

Project-management services. Our project-management team works closely with you, following our time-proven delivery methodology, and uses face-to-face meetings, teleconferences, web conferences, and email exchanges to keep you informed every step of the way. We believe careful project management is the key to successful on-time and on-budget deliveries of Ascent Technology's SmartAirline Operations Center™ solution and SmartAirport Operations Center™ solution.

Knowledge-engineering services. Knowledge engineering is the process of identifying your business knowledge—the business rules, policies, procedures, preferences, and requirements that guide the way your organization operates—and then codifying your business knowledge in the knowledge base at the heart of the SmartAirline Operations Center solution and SmartAirport Operations Center solution. The business knowledge in the knowledge base determines how the solutions behave. Our knowledge engineers work with you to gather and enter the business knowledge that enables the solution to behave exactly the way you want it to.

Implementation, integration, and installation services. Our implementation team provides system integration and testing services; develops product extensions, enhancements, and connectivity software for importing data to and exporting data from external systems; and creates reports. Our implementation team is also responsible for setting up an environment, customized to meet your organization's needs, and monitoring its performance, in our secure hosting center.

Training services. We provide a wide range of user, administrator, trainer, and refresher training classes at your location, at our Boston, MA, headquarters, and remotely over the web. We also provide operational training services remotely when you begin to use the SmartAirline Operations Center solution or the SmartAirport Operations Center solution in production.

Maintenance and support services. We offer premium support services for the SmartAirline Operations Center solution and the SmartAirport Operations Center solution around the clock. We provide comprehensive remote user support services via telephone, email, web conferences, and Internet, as well as software maintenance, such as product updates, patches, and releases. Our customer support community portal and ticket system enable you to ask questions and receive responses, request service, report problems, and track issues day and night.

Ascent Technology's From Touchdown to Takeoff Cloud-Hosted Service

You gain access to the Ascent Resource Information System solutions in the SmartAirline Operations Center solution and in the SmartAirport Operations Center solution over the Internet, using a standard web browser.

Ascent Resource Information System solutions SmartAirline Operations Center solution SmartAirport Operations Center solution	From Touchdown to Takeoff cloud-hosted service Browser support: Google Chrome, Microsoft Edge, and Mozilla Firefox Minimum Internet connection speed: 5 Mbps Minimum resolution: Full HD (FHD)
ARIS/AV® aerial-view display	✓
ARIS/BB® baggage-belt allocator	✓
ARIS/BIS™ billing-information system	✓
ARIS/CA® capacity analyzer	✓
ARIS/CI® check-in counter allocator (with ARIS/IQ® queue manager)	✓
ARIS/FW® flight watcher	✓
ARIS/GateView® real-time display	✓
ARIS/GM® gate manager	✓
ARIS/Reports™ data analyzer	✓
ARIS/SB® schedule builder (with ARIS/LegGen® flight-leg generator)	✓
ARIS/SL® schedule loader	✓
ARIS/SmartBase® database (with Resource Editor tools)	✓
ARIS/SmartBus® communication middleware	✓
ARIS/SP® stand planner	✓
Ascent WorkZone® workforce manager	✓
ARIS/WorkModel® workload generator	✓
ARIS/WorkNet® bid and trade manager	✓ *
ARIS/WorkOptimize® work-period generator	✓
ARIS/WorkPlan® work-schedule generator	✓
ARIS/WorkRelay® task and attendance monitor	✓
ARIS/WorkTime® workday manager	✓
Right-Now View® operations dashboard	✓
ARIS/CX® crew-connection analyzer	✓
ARIS/FR® flight-readiness display	✓
ARIS/PX® passenger-connection analyzer	✓
ARIS/TE® tug-equipment assigner	✓
Gate Chart Display™ tool	✓
Stand Assignment Optimizer™ tool	✓

* Minimum requirements: 512 Kbps Internet connection speed and SXGA resolution