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### Determine how flight delays and cancellations affect connecting crews

The ARIS/CX crew-connection analyzer reduces departure delays caused when crews needed to staff outbound flights are delayed by late inbound flights or by long walking distances between inbound and outbound flights.

The ARIS/CX crew-connection analyzer obtains crew-rotation identifiers for each flight from the ARIS/SmartBase<sup>®</sup> database and then tracks flight crews through connecting airports. The ARIS/CX crew-connection analyzer can track flight attendants separately from cockpit crews, and it can handle split crews that combine from multiple inbound flights to staff outbound flights.

The ARIS/CX crew-connection analyzer enables you to assign aircraft-parking positions that minimize outbound delays that occur when inbound crews are on aircraft waiting for parking positions. Actual crew-connection information is supplied to the ARIS/SmartBase database from an external system, such as a crew-assignment system.

### Representative features

**Scrollable connection matrix.** The ARIS/CX crew-connection analyzer display is a scrollable matrix, containing as many as 1,000 by 1,000 cells, that displays inbound flights across the horizontal axis and outbound flights down the vertical axis. Each cell of the matrix contains separate indicators for cockpit crews and for flight attendants connecting between inbound and outbound flights associated with the cell. The scrolling capability makes it possible to maintain a cell size that is easily readable.

**Flight information.** Actual or estimated flight arrival and departure times are displayed along the edges of the matrix, enabling you to assess the extent of the delays. When you place your pointer over a flight, the ARIS/CX crew-connection analyzer indicates the original schedule time. Flight status indicators provide information about the flight, such as inbound, in range, or taxiing to a position.

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## 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.

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**Accurate connection time model.** When the ARIS/CX crew-connection analyzer is installed, models of times required for flight crews to connect from each parking position to every other parking position are entered into the ARIS/SmartBase database. Because flight crews are usually the last to deplane, the ARIS/CX crew-connection analyzer considers aircraft deplaning time as part of the crew-connection time.

**Alert indicator.** Using models, the ARIS/CX crew-connection analyzer computes the most reasonable connection times between flights and automatically selects and displays on each cell in the matrix one of four alert levels: no alert, difficult connection, unlikely to connect, and impossible to connect. Because each alert is associated with a different color, you can identify possible problems rapidly and select the best course of action.

**Connection-detail information.** When you place the pointer over connection cells in the matrix, the ARIS/CX crew-connection analyzer displays crew information, such as crew ID, rotation start date, and active or ferry status. The connection-detail information enables you to track crews and reassign crews to other flights.

**Aircraft-turn indicator.** The ARIS/CX crew-connection analyzer displays an indicator when an aircraft makes the turn from an inbound to an outbound flight. Aircraft-turn indicators may be used to identify departure times that are overly optimistic and that, if readjusted correctly, could reduce connection problems.

**Automatic sort and update.** The ARIS/CX crew-connection analyzer automatically places the most difficult connections in the upper left corner of the display. The system updates cells and flight information automatically as the ARIS/SmartBase database receives new information.

**Time-range control.** Rather than scrolling through a large matrix, you can use time-range control functions to select a specific time range for arrivals or for departures. You can view connections within each bank of flights. Because connections within the same bank of flights usually represent 95% of all connections, the bank-selection system provides a convenient way to partition the matrix.

**Report generation.** The ARIS/CX crew-connection analyzer produces hardcopy output of sections of the connection matrix. The printout, which can cover any time period, is generated by a separate program that accesses the ARIS/SmartBase database directly. Crew information is also printed on the ARIS/GM gate management system Tower Sheet report.

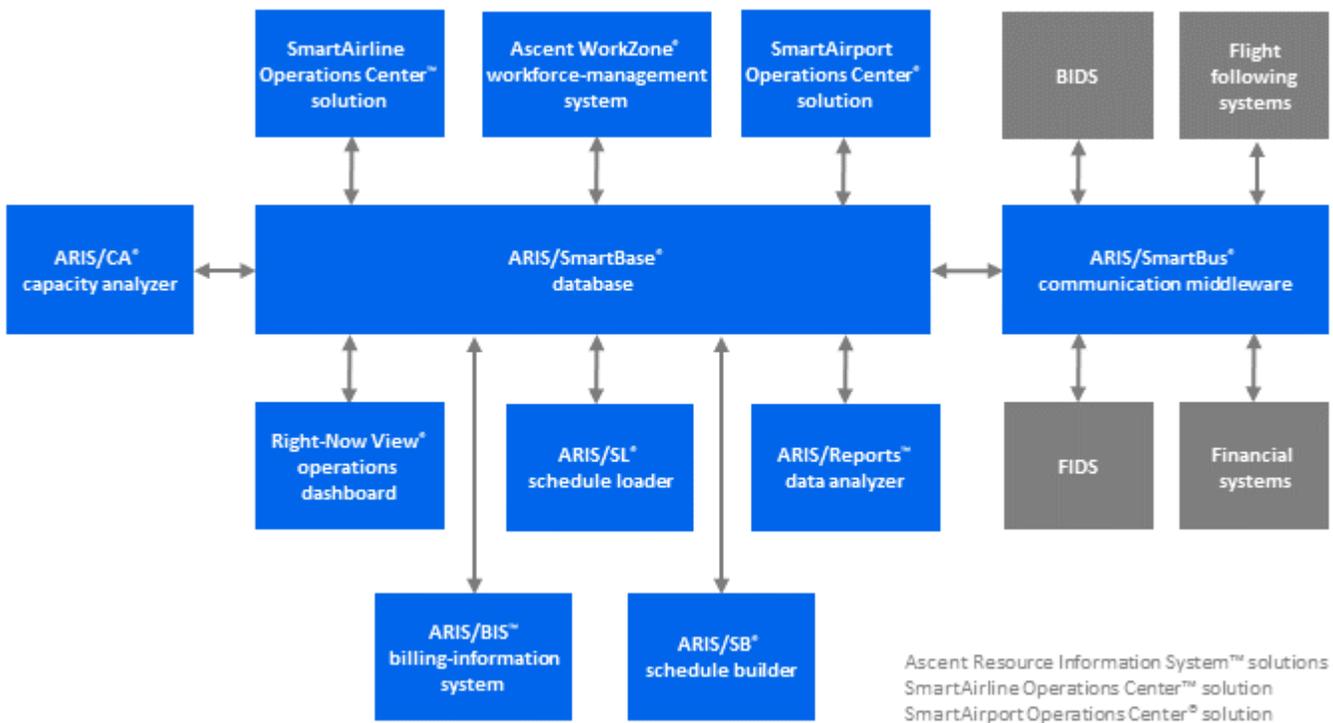
**Generalized database access.** All information processed by the ARIS/CX crew-connection analyzer is stored in the ARIS/SmartBase database, where it can be used by other ARIS® products or by external systems. You can create reports that show, for example, the average delay due to crew-connection problems.

**Worldwide capability.** The ARIS/CX crew-connection analyzer can store crew-connection information on a worldwide basis. You can monitor crew connections system-wide and locate any connection problems.

**Integration with the ARIS/PX® passenger-connection analyzer.** When the ARIS/PX passenger-connection analyzer is also running, passenger-connection information is integrated with the crew-connection matrix. By sharing the matrix with the ARIS/PX passenger-connection analyzer, a single display can monitor both passenger and crew connections.

**Collaborative decision-making.** The ARIS/CX crew-connection analyzer supports team decision-making, ensuring all users share a consistent current view of operations. You can discuss possible solutions with other users before you commit to changes

**Web-enabled for cost-effective rapid and wide deployment.** You gain access to the ARIS/CX crew-connection analyzer 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/CX crew-connection analyzer, 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 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.

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### More information

To learn more about how Ascent Technology solutions can help you optimize your resources to greatest advantage and to schedule a demonstration of our products, send email to [sales@ascent.com](mailto:sales@ascent.com) or call our Sales and Marketing department at +1.617.395.4800.

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## 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 <sup>®</sup> aerial-view display	✓
ARIS/BB <sup>®</sup> baggage-belt allocator	✓
ARIS/BIS <sup>™</sup> billing-information system	✓
ARIS/CA <sup>®</sup> capacity analyzer	✓
ARIS/CI <sup>®</sup> check-in counter allocator (with ARIS/IQ <sup>®</sup> queue manager)	✓
ARIS/FW <sup>®</sup> flight watcher	✓
ARIS/GateView <sup>®</sup> real-time display	✓
ARIS/GM <sup>®</sup> gate manager	✓
ARIS/Reports <sup>™</sup> data analyzer	✓
ARIS/SB <sup>®</sup> schedule builder (with ARIS/LegGen <sup>®</sup> flight-leg generator)	✓
ARIS/SL <sup>®</sup> schedule loader	✓
ARIS/SmartBase <sup>®</sup> database (with Resource Editor tools)	✓
ARIS/SmartBus <sup>®</sup> communication middleware	✓
ARIS/SP <sup>®</sup> stand planner	✓
Ascent WorkZone <sup>®</sup> workforce manager	✓
ARIS/WorkModel <sup>®</sup> workload generator	✓
ARIS/WorkNet <sup>®</sup> bid and trade manager	✓ *
ARIS/WorkOptimize <sup>®</sup> work-period generator	✓
ARIS/WorkPlan <sup>®</sup> work-schedule generator	✓
ARIS/WorkRelay <sup>®</sup> task and attendance monitor	✓
ARIS/WorkTime <sup>®</sup> workday manager	✓
Right-Now View <sup>®</sup> operations dashboard	✓
ARIS/CX <sup>®</sup> crew-connection analyzer	✓
ARIS/FR <sup>®</sup> flight-readiness display	✓
ARIS/PX <sup>®</sup> passenger-connection analyzer	✓
ARIS/TE <sup>®</sup> tug-equipment assigner	✓
Gate Chart Display <sup>™</sup> tool	✓
Stand Assignment Optimizer <sup>™</sup> tool	✓

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

ARIS, ARIS/AR, ARIS/AV, ARIS/BB, ARIS/CA, ARIS/CI, ARIS/CX, ARIS/FR, ARIS/FW, ARIS/GateView, ARIS/GM, ARIS/IQ, ARIS/LegGen, ARIS/PA, ARIS/PX, ARIS/SA, ARIS/SB, ARIS/SE, ARIS/SL, ARIS/SmartBase, ARIS/SmartBus, ARIS/SP, ARIS/TE, ARIS/Tow Panel, ARIS/WorkModel, ARIS/WorkNet, ARIS/WorkOptimize, ARIS/WorkPlan, ARIS/WorkRelay, ARIS/WorkTime, Ascent Resource Information System, Ascent Technology, Inc. (stylized), Ascent WorkZone, Ascent WorkZone (stylized), From Touchdown to Takeoff, GateKeeper, Right-Now View, SmartAirline, SmartAirline Capacity Analyzer (stylized), SmartAirline Information Manager (stylized), SmartAirline Operations Manager (stylized), SmartAirline WorkZone, SmartAirline WorkZone (stylized), SmartAirport, Smartairport.com, SmartAirport Capacity Analyzer, SmartAirport Capacity Analyzer (stylized), SmartAirport Information Manager, SmartAirport Information Manager (stylized), SmartAirport Operations, SmartAirport Operations Center, SmartAirport Operations Manager, SmartAirport Operations Manager (stylized), SmartAirport WorkZone, and SmartAirport WorkZone (stylized) are registered trademarks of Ascent Technology, Inc., in the United States.

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