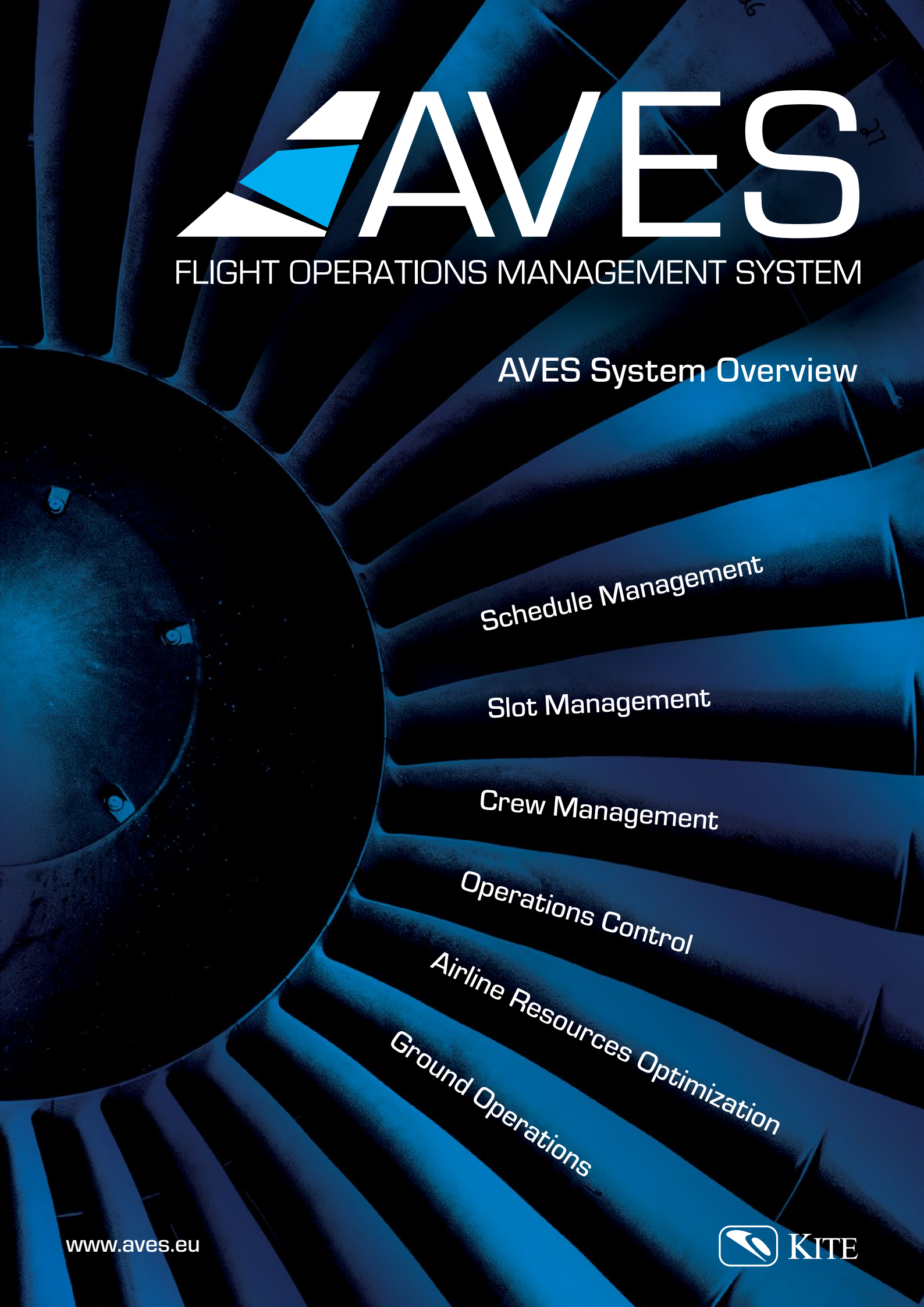
AVES
FLIGHT OPERATIONS MANAGEMENT SYSTEM
AVES System Overview
Schedule Management
Slot Management
Crew Management
Operations Control
Airline Resources Optimization
Ground Operations
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KITE

# AVES System Architecture

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AVES
FLIGHT OPERATIONS MANAGEMENT SYSTEM

## AWA (AVES Web Access Portal)

- Crew Data
- Personal Data
- Flight Data
- Fuel
- Reports


## CWA (AVES Crew Web Acces Portal)

- Viewing plans
- Confirming changes


## Extended Modules

CICOS, Station Dispatching etc.

## Add-on Modules

- Statistic
- Evaluation
- Forecasts

- XML Interface for ERP Systems
- Web Access Interface
- Web Services
- Integration Services (MQ etc.)

## Central Database

Crew Data | Flight Data | Aircraft Data

Miscellaneous Data

System Administration Data

Basic Core Data

## AVES Server

Communication Data processing
Integration Services

## AVES Scheduler

Schedule Management
Commercial Planning

## AVES OSM

Operation Schedule Management
Aircraft Rotation Management

## AVES SLM

Slot Management

## AVES CRC

Cost and Revenue Calculation

## AVES CMS

Crew Management

## AVES OPC

Operations Control

- External Communination
- Flight Information Recording System

# Outline

AVES
FLIGHT OPERATIONS MANAGEMENT SYSTEM

## About AVES

**AVES is a complete Flight Operations Management System**, provided by KITE, a Prague-based software company.

AVES has been in the market for more than 20 years. The system is being used by several airlines including its first user, Czech Airlines (CSA) - one of the oldest and most established European airlines.

The AVES system has been evolving over the many years of use by airline operation managers, dispatchers and schedule planners. The solution accommodates the requirements and practices of airline professionals and offers easy and intuitive use across all the modules.

AVES is a powerful and proven solution optionally based on Oracle or Microsoft databases.
The system is designed for mid-sized and large airlines although a scaled-down implementation for smaller airlines called **AVES Compact** is also available.

## AVES consists of the following subsystems:

Database and AVES Servers

AVES Scheduler - Commercial Planning
AVES OSM - Operational Schedule Management, Aircraft Rotation Management
AVES SLM - Slot Management
AVES CRC - Cost and Revenue Calculation
AVES CMS - Crew Management
AVES OPC - Operations Control
AVES CWA - Crew Web Access Portal
AVES AWA - Web Access Portal
AVES Orion – Ground Operations Control
AVES Magion – Ground Mobile Controle

**AVES is a fully modular, integrated and operationally tested system for Flight Operations Management.**

**The system provides tools for managing airline operations in the following areas:**

- Commercial Planning (IATA season schedule, rotations for logical aircrafts)
- Operational Scheduling Management – supporting both scheduled and charter flight planning as well as ACMI services and comprehensive documentation of essential changes
- Slot Management
- Aircraft Rotation Management – including revisions and maintenance planning with respect to all operational rules, restrictions and maintenance rules
- Crew Management – for managing all crew management tasks and activities (crew database, flexible rules system, manpower planning, crew scheduling, daily crew operations, check-in/check-out, crew access over Intranet/Internet and extensive and powerful optimization functions for all crew management tasks)
- Operations Controls – for monitoring, dispatching and daily operations
- Cost and Revenue Management – for scheduling, crew planning and daily operations
- Reporting, Analysis
- Interfaces for integration with MIS, ERP and airline systems including Revenue, Flight Planning and MRO systems; support for interfaces based on IBM Websphere MQ, Web services and third-party proprietary interfaces
- Extensive support of interfaces based on standard message formatting (IATA SSIM manual, SITATEX, AFTM, ACARS, etc.)

The software is created from the perspective of dispatchers and schedulers, thus resulting in a powerful intuitive tool. The AVES system is easy to use and offers accelerated task completion. The graphical software environment provides enhanced data control as well as faster and more accurate data manipulation.

Although AVES is a powerful system, it requires minimal training and computer skills to operate. Powerful and flexible optimization functions, especially those in the Crew Management system, help airlines to significantly reduce operational costs and to more effectively manage daily operations.

# AVES Server

The AVES Server can run on the hardware server that hosts the database engine or on a server dedicated for software application servers. The AVES Server provides a set of service programs

**Basic Features**

Several service programs are integrated in the AVES Server but are independent and configurable, covering the following:

- Communication within the system (AVES Change Server)
- Automatic processing of aircraft movement messages (MVT messages including PTM and LDM)
- Automatic processing of IATA SSM messages (SSIM, ASM/SSM)
- Automatic processing of AFTM slot messages
- Automatic processing of ACARS OOOI messages
- Automatic processing of weather reports
- Sending of standard IATA messages (SITATEX, e-mail)
- Sending of ACARS messages
- Online integration with selected third-party flight planning systems
- Online integration with selected third-party MRO Systems, revenue management systems and other airline systems

ERP integration

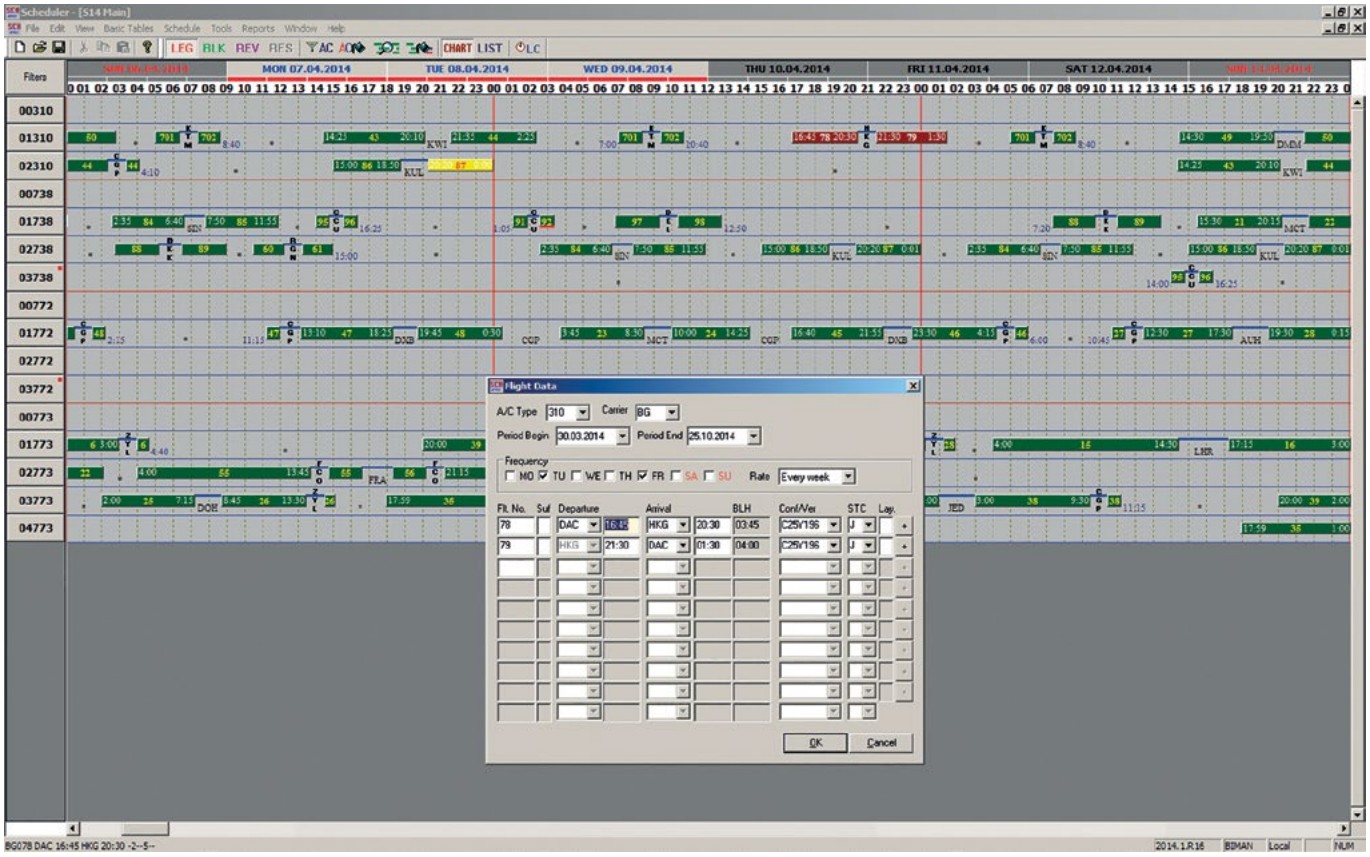
- The Change Server can also be used for integration with external systems (integration based on IBM Websphere MQ)

# AVES Scheduler

The AVES Scheduler module is used to create and maintain season schedules. The season schedules contain the rotations for logical aircrafts only. When working with a schedule, the program automatically assigns a logical aircraft to a leg/flight if one is not specified.

### Basic Features

- Creating and maintaining season schedules according to IATA standards
- Rotations for logical aircrafts only
- Generating seasonal flight schedules
- Operations with flights/sectors
- Operations with non-flight entities (revisions, maintenance, time blocking, etc.)
- Data imports and exports
- Optimization
- Scenario and what-if analyses
- Sending standard IATA messages
- Reports
- Integration with AVES CRC
- Integration with AVES Slot Manager



# AVES OSM - Operational Schedule Management System

The AVES OSM module is used to manage the operational schedule. The operational schedule is the only flight database in AVES shared by all modules and subsystems, with the exception of the AVES Scheduler module. A schedule created in the AVES Scheduler module can be uploaded to the operational schedule when published in the AVES Scheduler. Flights can also be loaded to the operational schedule via import functions. Deployment of the AVES Scheduler module is optional. Small airlines and charter operators can also use OSM to create and maintain all flights directly in the operational database. AVES OSM provides the functionality for handling a single flight as well as a series of flights. The OSM GUI is nearly the same as the AVES Scheduler GUI with the only difference being that the type and reason for each modification of flight data have to be specified. In addition, AVES OSM enables the creation of complete documentation for all significant changes in the schedule following publication.

AVES OSM is also used for Aircraft Rotation Management including maintenance control as well as for planning all "activities" for actual aircrafts including flight rotations, maintenance, time blocking, defects/MEL, aircraft event recording, etc.

**Basic Features**

- Managing the central operational schedule database
- Planning charter flights
- Complete documentation of significant schedule changes
- Also used for Aircraft Rotation Management including maintenance control
- Used to plan all "activities" for actual aircrafts including flight rotations, maintenance, time blocking, defects/MEL, aircraft event recording, etc.
- Logical aircraft space (LAS) and real aircraft space (RAS)
- Graphical user interface with Gantt charts
- Displaying schedules in text mode
- Planning flights, time blocks/reservations, logical aircraft revisions and data entry for defects, MEL (RAS only)
- Importing aircraft data, maintenance/revisions and MEL (XML format)
- Rules for aircraft usability, aircraft ground time, PAX connecting time, airport limitations, etc.
- Optimization functionality and conflict-solving functions
- Flight assignment to actual aircrafts (aircraft rotation management)
- Integration with the CRC module – powerful and flexible formulas with simple interface for data input (import or via GUI functions)
- Reports (print, text, excel, pdf)
- Sending standard IATA messages
- Importing standard IATA files (SSIM, ASM, SSM)

# AVES SLM - Slot Management System

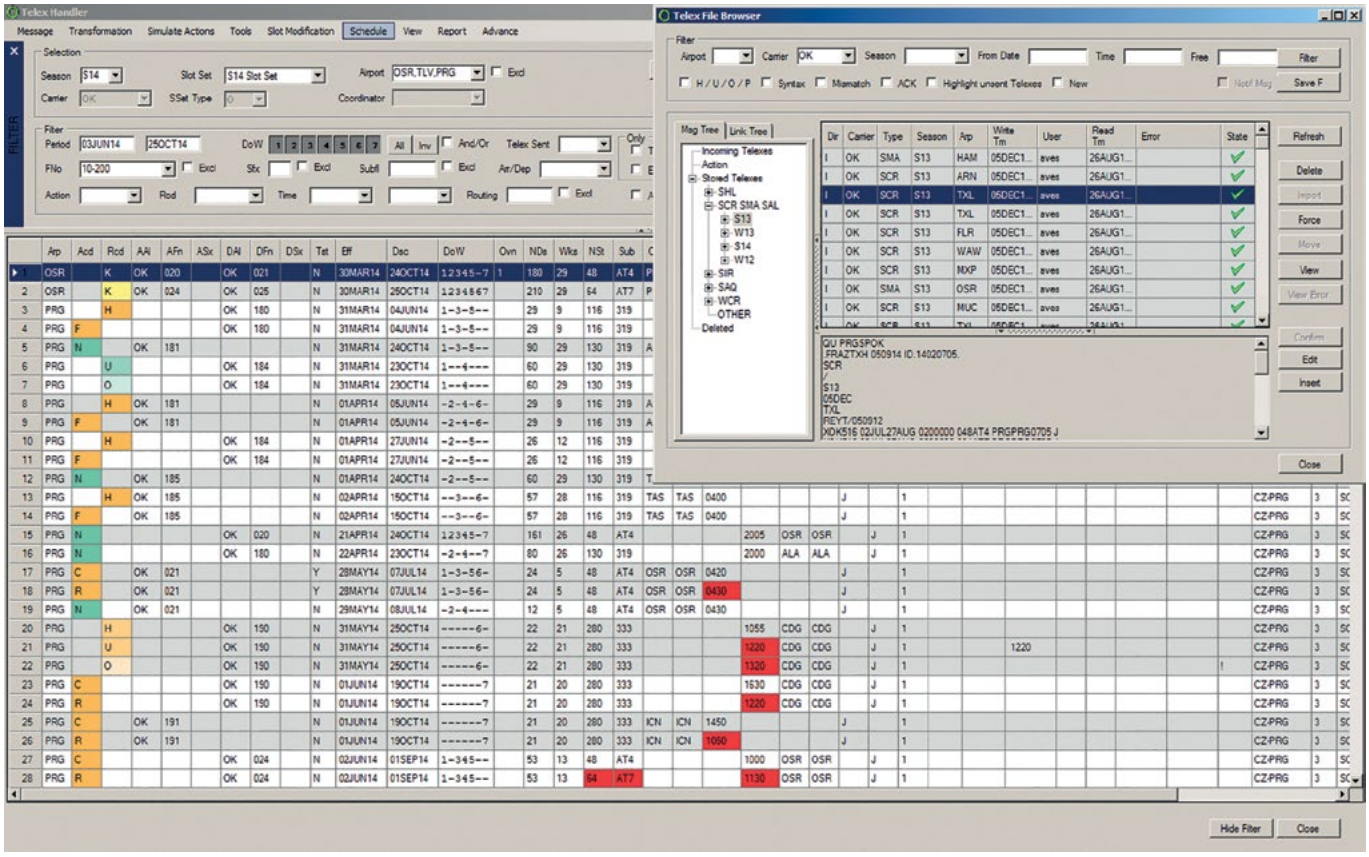
### Basic Features

- Managing airlines slot assets
- Managing messages used for communication with airport coordinators according to the procedures outlined in the IATA Schedule Manual and IATA Scheduling Guidelines including the processing of incoming messages
- Providing incoming message alerts, pairing incoming messages to outgoing messages

### Benefits

The AVES SLM, when integrated with AVES Scheduler and AVES OSM, enables the following:

- Synchronization of the schedule management and slot management process
- Ensuring slot requests are complete, accurate and on time according to slot clearance standards
- Minimization of slot loss
- Alerts concerning potential slot loss in the upcoming season



# AVES CMS - Crew Management System

AVES CMS is a fully integrated Crew Management System. AVES CMS assists in managing all crew management tasks including crew database maintenance, manpower planning, crew scheduling, crew costs, hotel and positioning management, daily crew operations and post-flight processing. AVES CMS provides the functionality for planning all crew activities (flight duties, standby/ground reserve duties, flights on simulator, training, positioning, traveling, ordered duties, briefing and debriefing) and time off (leaves, days off and time blocking).

**Concept and Architecture**

AVES CMS operates on the central operational schedule database and thus there is no need for schedule import and change management. AVES CMS offers users a single environment for both plan creation and maintenance as well as for daily operation (the AVES PLAN module). A special version of AVES PLAN is created for daily crew operations providing detailed information that is important for an operational day but not essential for monthly plan creation (AVES MON). AVES MON is also more closely linked to the AVES CICOS module for the monitoring of crew check-in and check-out.

AVES PLAN is designed with an "all-in-one" approach in mind:

- In one graphical environment, users can plan all crew activities (flight duties, standby/ground reserve duties, flights on simulator, training, positioning, traveling, briefing, debriefing and other duties) and time off (leaves, days off and time blocking) in a consistent manner.
- All the function blocks for creating a complete crew plan are available in a single module. The add-ins of other systems, such as Check-In/ Check-Out, the Vocation Award system, etc., are integral functions of AVES CMS as are the functions supporting Web publishing, a user-defined points-based system for implementing crew requests for duties, leaves and days off.
- The planners create and maintain crew plans and run daily operations in the same module. In both cases, the planners and dispatchers can modify plans in the same consistent manner.
- The optimization functions for all tasks are integrated into the system. AVES CMS offers optimization functions for pairing, rostering, and conflict solving for plan maintenance and daily crew operations, the Vocation Award system and day off fixing. Optimization results can be displayed in the graphical screen as in the case of manual planning.

**AVES CMS Components:**

- AVES BDM: Basic data management
- AVES PLAN: Planning center
- AVES MON: Dispatching center
- AVES MPP: Manpower planning
- AVES NORM: Rules system
- AVES CWA: Crew Web Access portal
- AVES CICOS: Crew Check-In/Check-Out
- AVES SPA: Hotels and positioning management
- AVES CCM: Crew cost management – add-on

## AVES BDM
## Basic Data Management

AVES BDM provides the functionality for managing basic data tables and report generation.

**Crew database**

- Basic crew data
- Crew qualifications
- Crew diplomas, visas
- Crew categorization
- Crew summary data

**System parameters management**

- Basic data management (airport categorization, twin airports, region qualification requirements, pre-flight and post-flight preparation time, crew ground time (defined for an airportand an aircraft type pair), typical delay
- FOM implementation
- Extra rules

**Rules for balancing flight duties, standby duties**

- Rules for categorizing crew members
- Rules for categorizing flight duties and standby duties
- Setting for balancing (priority of duties for balancing, divergence tolerance)
- Rules for planning leave

## AVES PLAN - Planning Center

### Basic Features

#### Graphical User Interface

- 3 basic screens: Schedule, Pairings and Crew Plan
- Gantt Charts, Select & Click
- Comprehensive information display

### Basic Functions

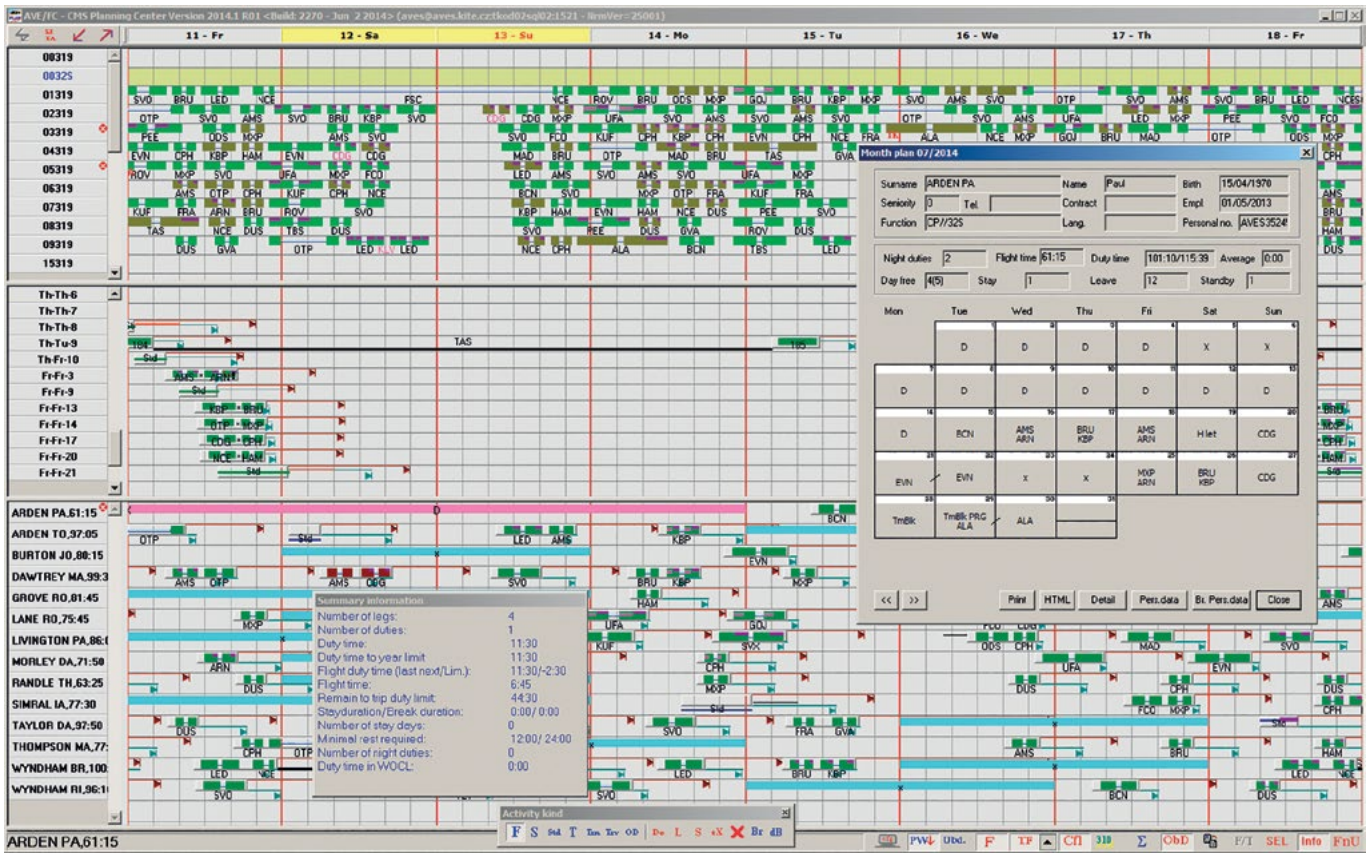
- Manual mode – planning all types of activities
- Optimization functions – daily combination, pairing, rostering, conflict solving, days off fixing, annual leave fixing, batch processing, flight duty planning, standby, positioning and training
- Reports, crew plan publishing
- Exports
- Crew requests (duties, days off, leave); point-based system
- Balancing system
- Simulation mode
- Short-term manpower planning based on simulation

## AVES MON - Dispatcher Center

The AVES MON module is used for managing daily crew operations. The AVES MON user interface is similar to that of AVES PLAN but it enables the display of more detailed information, e.g. planned and actual data, crew Check-In/Check-Out status.

### Basic Features

- Works in the same consistent manner as the AVES PLAN module
- Display of more detailed information
- Check-In, Check-Out status monitoring
- Advanced filters and sorting for quickly finding available crew members for solving problems resulting from delays, diversions or sickness of crew members
- Optimization functions: Conflict solving



## AVES MPP - Manpower Planning

AVES CMS provides the tools for long-term and mid-term manpower planning. The AVES MPP module is used for long-term crew planning. The main optimization feature of AVES MPP is the modeling of airline business plans, company crew policy and planning rules to predict crew demand as well as for drawing up recruitment plans. AVES MPP can model data for different periods and for different functions and fleets. The AVES MPP model uses the key crew indicators such as flight time, duty time, working time, etc. AVES MPP can model the needs for internal crew demand as well as the utilization of agency and freelance crew members. Mid-term manpower crew planning is based on a given schedule (and pairing if it exists) and not on crew indicator calculation as is the case for long-term manpower planning. The model is based on complete simulation of planning for an entire period; the rostering plan for all virtual crew members can be displayed. The result is not only the number of crew necessary for each month, but various reports concerning the rostering plans can also be created.

**Basic Features**

Defining models (indicators to use, target crew performance), Input/Import data

- Fixing values for various types of activities and demand recalculation
- Reporting of export data
- Publishing data for use in the crew scheduling phase

## AVES SPA - Hotels and Positioning Management

AVES SPA is a web-based application for managing hotel and positioning bookings for crew members. AVES SPA is connected to the web services provided by the AVES server to access AVES CMS data (pairings and crew plans) to ensure that appropriate number of hotels and flight tickets are booked. AVES SPA automatically handles changes in AVES CMS and provides alerts concerning the need for additional bookings, booking changes and booking cancellations. AVES SPA also maintains the status of bookings to ensure that they are properly confirmed and compiles various reports for communicating with service providers (hotels, transport companies, etc.)

**Basic Features**

- Publishing demands for accommodation and positioning, accepting demands
- Recording booking events for each demand

# AVES CWA – Crew Web Access Portal

The AVES CWA module allows crew members to access the data published for them in the AVES CMS system.

**Basic Features**

- Crew access over Intranet/Internet
- Viewing plans, confirming changes
- Placing/printing requests (for duties, days off, leave), approval status monitoring
- Viewing/printing statistics
- Check-In and Check-Out (if CICOS is not deployed)

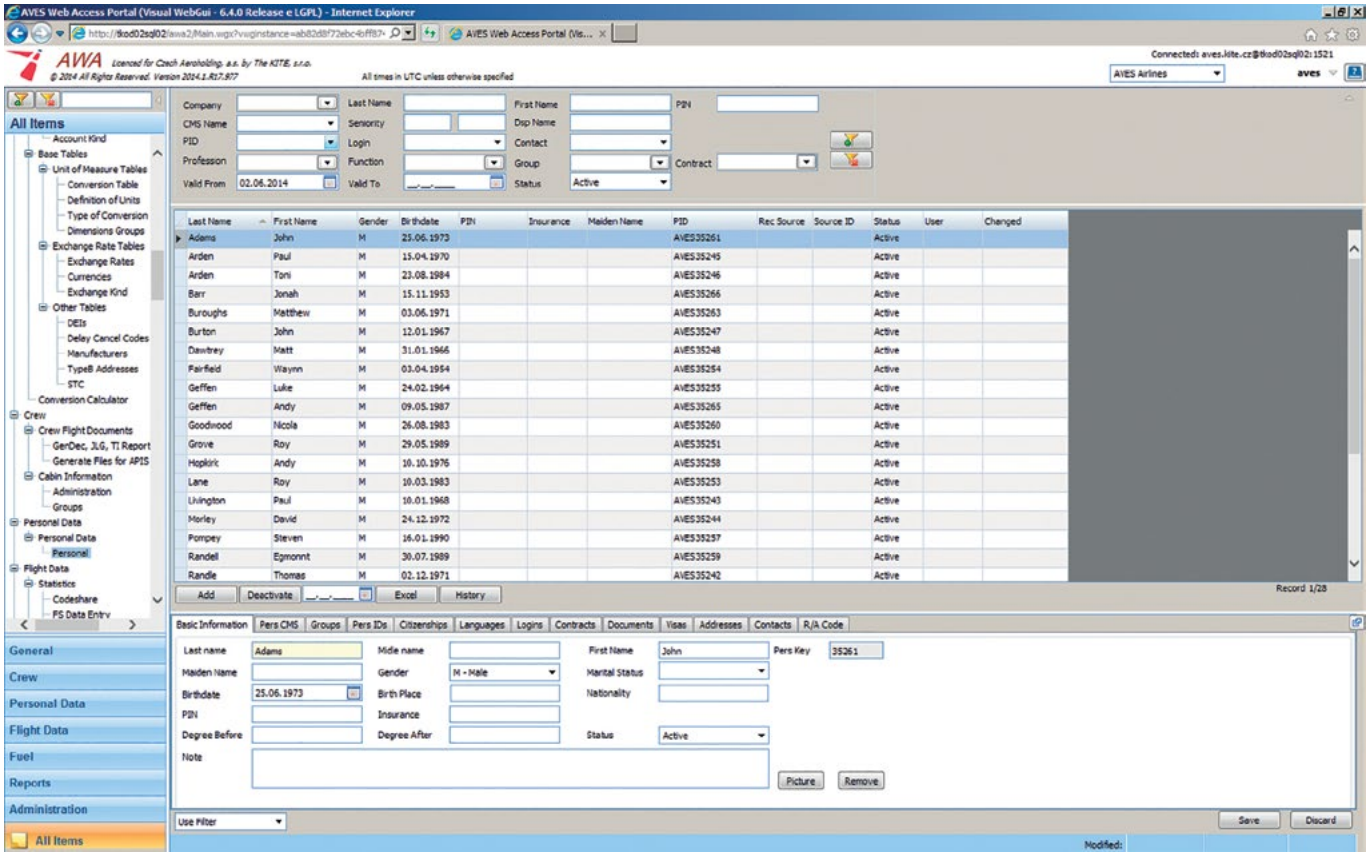
AVES CICOS - Crew Check-In/Check-Out Service

AVES CICOS is the component supplied for implementing automatic crew Check-In & Check-Out with Entry/Security cards.

# AVES AWA – AVES WEB Access Portal

AVES AWA is a large web-based application providing functionalities in these areas:

- Basic Data Management - Managing data for Aircraft, Airports and other basic data for AVES system
- Crew Flight Documents – Apis, General Declaration, Journey Log etc.
- Personal Data Management – Managing company personal data and data specific for crew planning system
- Flight Data - After flight data processing including Flight Log, aircraft statistics etc.
- Fuel Management – Fuel pricing (plats, differential and other fees), fuel planning and fuel consumption, reporting
- Reporting - Based on the MS reporting service, the report result can be saved in different formats (PDF, HTML, MS Office file formats). The system provides a large number of reports grouped on following folders:
  - Schedule reports
  - Operational reports
  - Crew reports
  - Statistical reports
  - Fuel reports
  - Exports
- Administration - User rights, User roles, User profiles, System settings



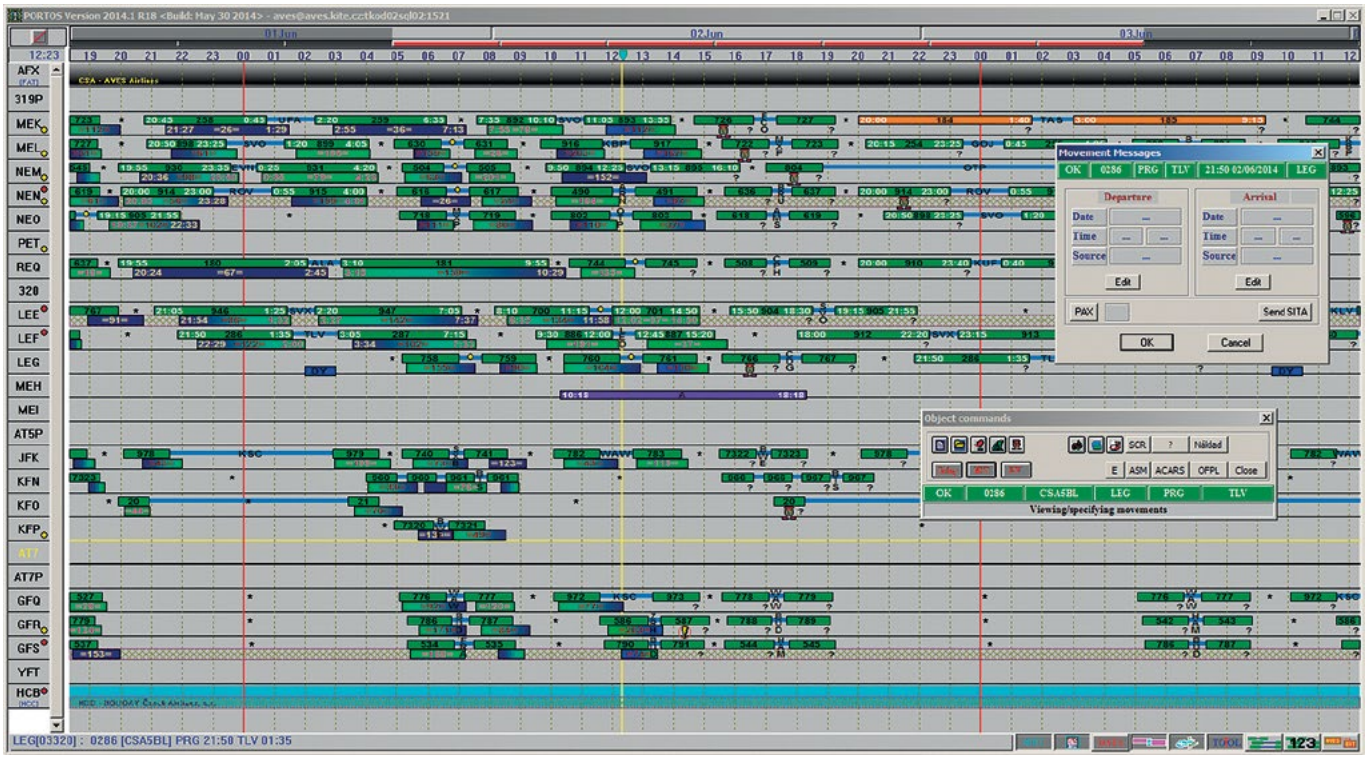
# AVES OPC - Operations Control

AVES OPC is the module for controlling daily airline operations: AVES OPC monitors all changes in the flight data as well as other factors that can impact the process of flight execution such as aircraft events, crew, PAX, flight handling, weather reports, etc. All essential information is displayed in the basic screen of AVES OPC. Depending on the configuration of the installation, AVES OPC can display the following information online:

- Flight progress and status (including flight schedule time and actual time)
- MVT messages concerning data including delays, PAX and diversions
- PTM messages concerning data and alerts concerning possible loss of transit PAX
- AFTM messages concerning slot data
- Flight plan data (OFPL, FPL)
- Data related to the implementation of the Eurocontrol CDM project
- PAX information
- Alerts concerning inclement weather conditions at airports with scheduled flight arriv. and departures
- Crew disruption

**Basic Features**

- Intuitive and comprehensive graphical display of flights and flight events
- Functions for daily operations including the modifying of flight data, cancelling or re-planning flights, entering data for unreceived messages concerning MVT data, delays, diversions, air traffic slots, etc.
- Message sending (MVT, SCR/ASM, ACARS)
- Viewing of incoming messages bound to a flight (MVT, PTM, LDM, ATFM, delays, next-info, etc.)
- Cost and revenue calculation
- Simulation of changes and evaluation of various variants from the AVES CRC viewpoint

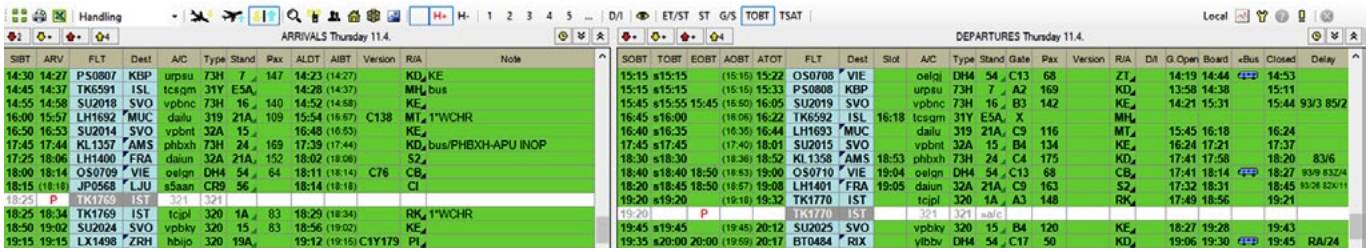


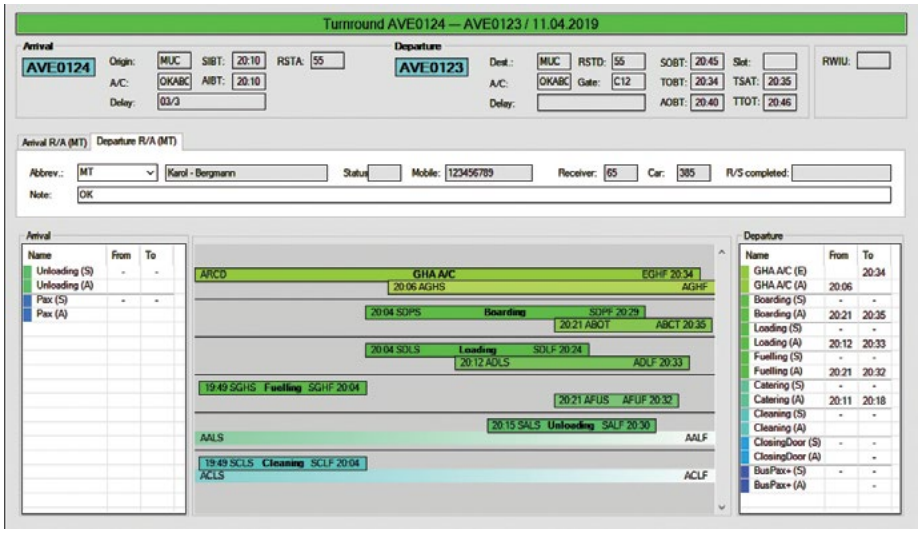
# AVES Orion

AVES Orion is designed for effective operations control of arrivals and departures dispatching for airport ground handling services providers. The application provides intuitive data entry interface and well-arranged data presentation, including workflow status and alerts, covering all needs for control of ground handling operations. Application work spaces as well as views are customizable for different user roles. Every user data element is protected only for authorized access by comprehensive roles/rights control.

**Features:**

- seamlessly integrated with airport information system and air traffic control based on IATA A-CDM recommendations
- configurable alerting system aiding dispatcher in-time handling issue solution
- full customizable graphical signaling of process states
- automatic processing all types of MVT/LDM/PTM messages
- facility of sending and receiving MVT/LDM messages by SITA and e-mail
- user intuitive data control with nearly real time synchronization
- resource allocation to flight (e.g. ramp agent, car, equipment, etc.)
- aircraft de-icing control
- fuel filling control with integrated online web-access for fuel suppliers
- rich user graphical interface for data displaying and filtering
- print or export to various format like PDF, Excel etc.
- comprehensive rights management
- extension possibility to integrate with other company IT systems
- "live" data history displaying for configurable time period



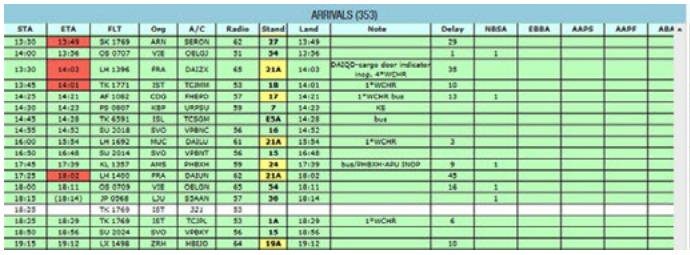



# AVES Magion/Magion Mobile

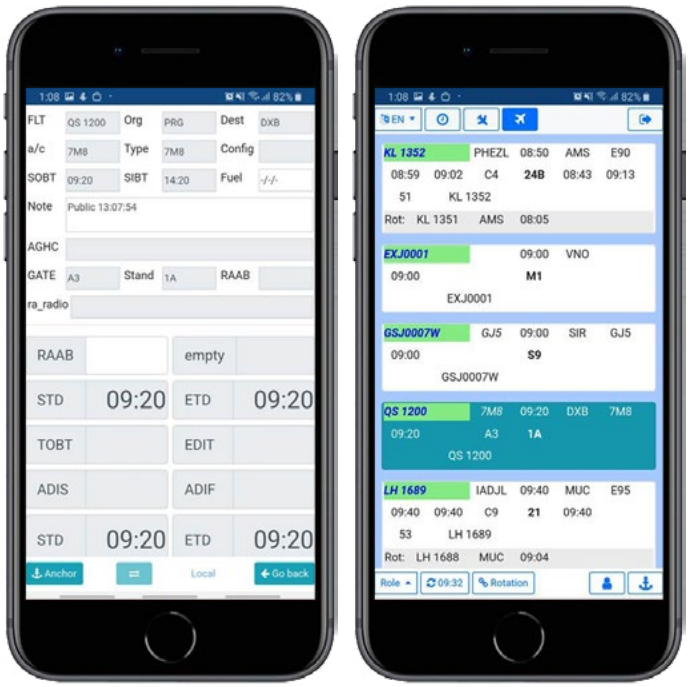
AVES Magion/Magion Mobile is designed for providing flight data as well as for enabling active access for airport staff and handling companies' co-workers to enter operational data and confirmation of services provided. The application has been developed using advanced, state-of-the-art web technologies and can be accessed from various types of equipment including mobile devices.

**Features:**

- fully user configurable roles/profiles (vertical/horizontal data partitioning, displaying)
- automatic (adjustable) data refresh capability
- unlimited and multiple number of profiles provides user capability of display different data sets for particular purposes (e.g. for ramp or check-in agent)
- passive (read-only) and active (read-write) access (with appropriate rights granted)
- secured and authorized access for external users
- fulfils high security requirements for airport information systems
- dual cloud (Microsoft Azure) and/or on-premises deployment
- seamlessly integrated with company IT infrastructure (Windows Active Domain, Azure Active Domain, ADSF, LDAP, OAuth)
- fully integrated with the AVES Orion







# Piloting Airline Operations

# System Requirements

**Server**
MS Windows or UNIX

**Database**
Oracle or MS SQL Server

**Clients**
MS Windows and Web Browser

The hardware configuration is dependent on numerous parameters and can be calculated based on the airline questionnaire.

# Licensing and Deployment

**Deployment models**
- In-house deployment model
- SaaS (Software as a Service) deployment model in our servers

**In-house deployment model**
- Standard licensing with annual maintenance and technical support contract
- Possibility of progressive financing scheme with payments spread over several years

**SaaS deployment model**
- Complete range of services including help desk, software and data update, backup or extra services on demand
- Annual contract with automatic renewal

**Price Calculation**
- Based on the number of aircrafts and aircraft types or on the number of crew members
- Requirements for customization
- Level of required additional services If you require assistance, do not hesitate to contact us. Our team is always ready to help you with the following:
- Drawing up a proposal tailored especially for your company
- Providing a demo presentation of the software to the potential users as well as a presentation of the proposal to company management
- Providing initial system training and granting access to your evaluation team for actively trying out the software on our servers via remote access and providing assistance during the evaluation
- Drawing up a final proposal based on the requirements for customizations and any extra services
- Answering all question concerning the system and related issues

## About the Company

KITE

**KITE** is a Prague-based IT solution and services provider.

KITE has developed its **AVES - Flight Operations Management System**, over the course of more than 20 years, into a comprehensive and reliable solution supporting several airlines in Europe and Asia. AVES's first implementation dates from 1992 – the first user, Czech Airlines (CSA), runs the system as the key solution for handling crew and aircraft management, as well as for support of its administration and communication. AVES covers the complete cycle of airline operations from long term planning through daily operations to post-flight statistics and analyses.

The AVES development team is comprised of technical and aviation professionals with extensive airline experience and deep understanding of airline operations.

The AVES team's solid analytical background is fully utilized to implement powerful and sophisticated optimization techniques in the planning modules. This makes the AVES system an ideal tool for resource planning (including crew management and tail assignment) and disruption solving offering superior efficiency and optimal usage in daily operations. The AVES system design provides client airlines with impeccable control over their daily operations as well as increased resource efficiency bringing significant cost savings.

KITE provides its clients with a range of additional IT services including implementation, consultancy and help desk services. All deliveries are ISO 9001:2015 certified.

Microsoft Partner | Silver Application Development, Silver Cloud Platform

CERTIFIKOVANÝ SYSTÉM EUROCERT ISO 9001 : 2015

ORACLE Silver Partner

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# Piloting Airline Operations

AVES System Overview

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