PJ25-Specific iStream Components - Zurich
Maintenance Manual

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1 Operation of Zurich iStream components

iStream is used as part of the optimization of arrival management at Zurich airport during the first hour of opening. The process includes two steps:

- A strategic phase, realized the day before, provides a strategic planning.
- A tactical phase realized a few hours before the opening of the airport, provides an initial approach sequence.

1.1 iStream Synchronization Service

The operations realized by this Windows service are the following ones:

- Detect the new emails in the iStream mailbox
- Determine if these emails are inputs for the iStream process
- Integrate strategic and tactical inputs
- Compute and send strategic planning
- Synchronize Eurocontrol flight plans with iStream tactical flights

The service uses a timer job to perform the previous operations: every time the timer job expires, the service executes the operations and then reactivate the timer job to wait an interval of time. By default, this interval is defined to 5 minutes.

To detect new emails in the mailbox and to synchronize Eurocontrol flight plans, the service is linked with two others systems:

- The Skyguide Exchange server to access the iStream mailbox
- The Eurocontrol B2B system through their Network Manager service to access flight plans

1.1.1 Interaction with Exchange

For the purpose of PJ25 live trials, a Test environment was set-up in addition of the iStream production environment.
The iStream and Test mailboxes are stored on an Exchange 2013 server in the production environment and in test environment. To access the mailbox, the service used the Exchange Web Service (EWS) Managed API.

To be informed about the reception of new emails in the iStream mailbox, the service used the Exchange Pull Notifications system.

When the service is started, it uses the EWS Managed API to subscribe to receive pull notifications when events occur in the mailbox. The event used is “New Email”. Notifications are obtained at the request of the client via a “GetEvents” request. In the response, Exchange provides the identifiers of new mails arriving between the last “GetEvents” request (or the subscription request) and now. Due to the use of the timer job, the “GetEvents” requests are sent every 5 minutes.
The subscription is time-limited, its duration has to be between 1 and 1440 minutes. By default, the duration is fixed to 100 minutes. The renewal of the subscription is carried out automatically when synchronizing above its expiration.

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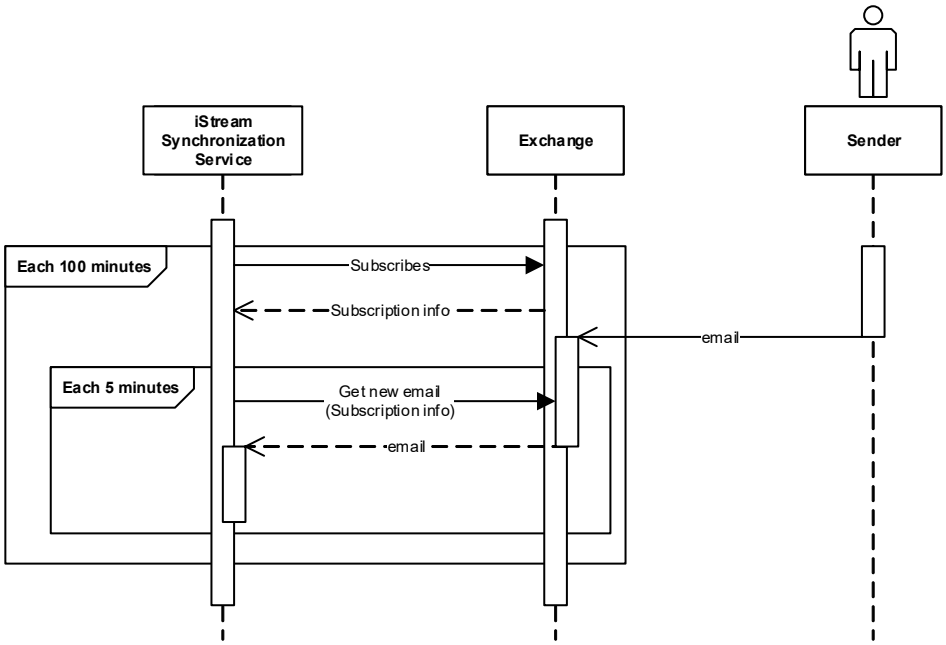

Figure 1: iStream synchronization process

To determine which emails are for the system, it uses the subject of the messages:

- For the strategic phase: “Scheduled ARR information”
- For the tactical phase: “iStream LSZH”

All other emails are ignored.

The strategic mail comes from Zurich aerodrome. It contains a CSV file in attachment with the following information:

- The Schedule Time of Arrival (STA)
- The flight call sign in IATA format
- The aerodrome of departure in IATA format

Tactical mails come from airlines operators. They can contains a CSV file in attachment or the information can be send directly in the body of the mail. In both cases, the message must contains the following information:

- The flight call sign in ICAO format
- The Initial Approach Fix (IAF) or other chosen point: The name of the point where the initial approach segment of an instrumental approach begins. This document specifies the iStream process for Zurich aerodrome, which uses IAF. There are five possible IAF at Zurich: AMIKI, RILAX, GIPOL, DOPIL and KELIP.
- The Estimated Time Over (ETO): The Estimated time over the IAF
- A crew preference: A symbol indicating if the flight can be advanced “+” or not “-“. This parameter is optional.

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Error handling and processing of these messages are described later in this document.

Note: All mails are kept in Exchange. iStream does not remove them.

1.1.2 Interaction with Eurocontrol

Calculating the initial approach sequence requires to retrieve flights plans stored at in the Eurocontrol B2B. For each expected flight, the retrieved information are:

- The Initial Approach Fix / Or the other point chosen for the process* (**Note**: this document considers IAF for ZRH environment, but it has to be adapted for the targeted environment)
- The Estimated Time Over
- The aerodrome of departure in ICAO format

Eurocontrol does not directly supply the IAF and corresponding ETO, the request sent recovers the entire route taken by the flight.
There are 3 information where the system searches the IAF and its ETO:

- Filed Tactical Flight Model (FTFM) point profile: it reflects the latest AO flight plan.
- Regulated Tactical Flight Model (RTFM) point profile: A flight has a RTFM when its flight plan changes due to regulations
- Current Tactical Flight Model (CTFM) point profile: A flight has a CTFM point profile once it is off-block.

CTFM is the most recent and is therefore taken into account in priority if informed. Otherwise, RTFM is take into account if it informed. If none of the two precedents is available, the data are taken from FTFM.
It is possible that the flight goes through several IAF but only the first is necessary.

Data synchronization with Eurocontrol is scheduled between 19:00 LT and 00:30 LT and runs every 30 minutes.

1.1.3 Parallelism of synchronization systems

During the tactical phase, the two synchronization systems operate jointly. At each expiration of the timer job, the service performs the two previous operations consecutively. Each operation can trigger the calculation of an initial approach sequence.
The following diagram shows the operation and the times at which the synchronizations are realized:

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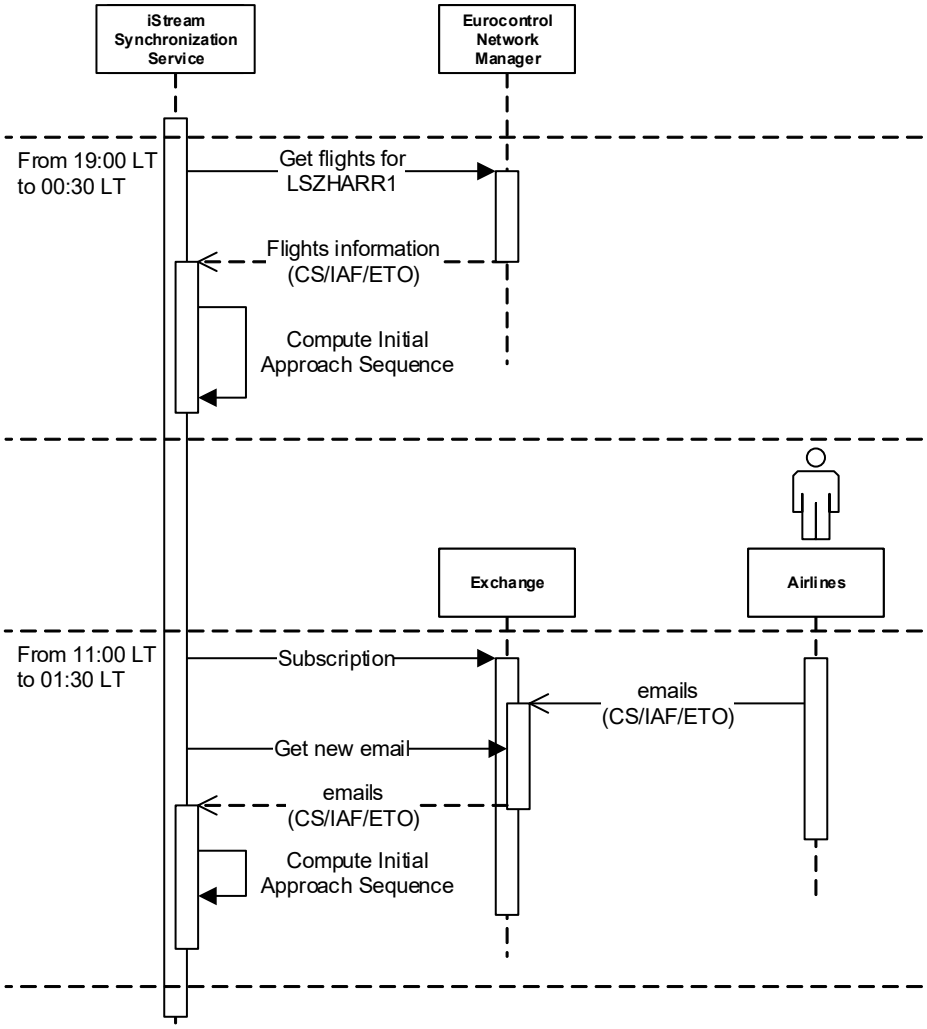

Figure 2: Synchronizations during tactical phase

The main problem that can meet the system during synchronizations is the association between strategic data and tactical data: data formats of Zurich airport and of airlines are not the same. Today, there is no system to ensure a perfect match between the two formats.

Therefore, iStream integrates its own system of association based on controller's experience.

1.1.4 Correspondence between flights

As seen previously, the flights call signs and airports are received in two different formats: IATA during the strategic phase and ICAO during the tactical phase. So, the synchronization service includes an algorithm to associate flights based on theirs call signs.
The system uses two reference tables IATA / ICAO: one for the aerodromes, another for the airlines. The matching algorithm takes as its point of entry strategic data received in advance of tactical data. The correspondence is therefore realized from ICAO to IATA.

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1.1.4.1 IATA

Data in IATA format are received during the strategic phase. The system tries just to find the airline associated to the flight.

First, the algorithm splits the call sign on the first two characters which generally corresponds to the IATA airline code. Two cases may occur:

- An airline is found: it is associated to the flight and the rest of the call sign is stored in an IATA flight number field.
- Any company is found: the entire text is saved in the IATA flight number field.

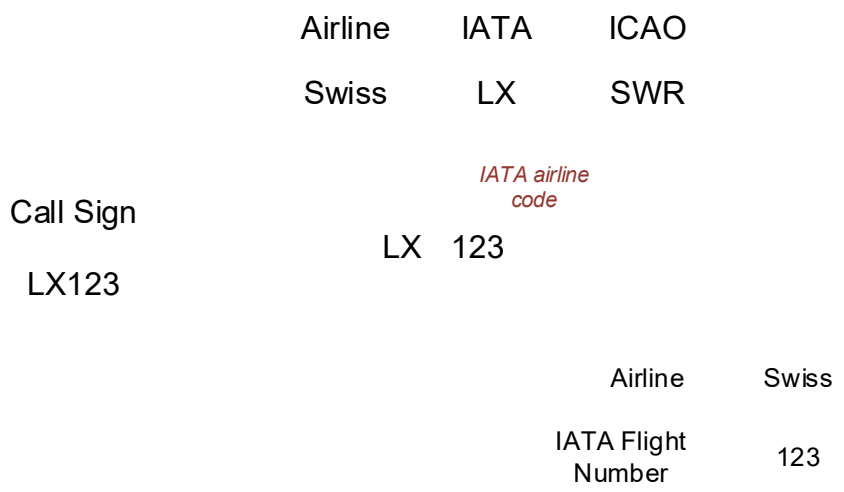

Figure 3: Correspondence between flights – Airline detection from IATA input

1.1.4.2 ICAO

Data in ICAO format are received for the tactical phase. The goal is to associate the data received from B2B and airlines emails with strategic data already in the system.

From Eurocontrol, the service retrieves the flight call sign and the aerodrome of departure (both in ICAO format). In the airlines emails, only the flight call sign is available. Because there was less information available in airlines mails, the system has been configured to synchronize with the Eurocontrol B2B as soon as possible (i.e. a few minutes after the validation of flight plans by Eurocontrol at 18:30 LT).

As previously, a flight call sign in ICAO format can contain the ICAO code of the airline on the first three characters. So, the system splits the call sign and try to match data with the following rules:

- The first three characters match an existing airline and the rest of the call sign match an IATA flight Number

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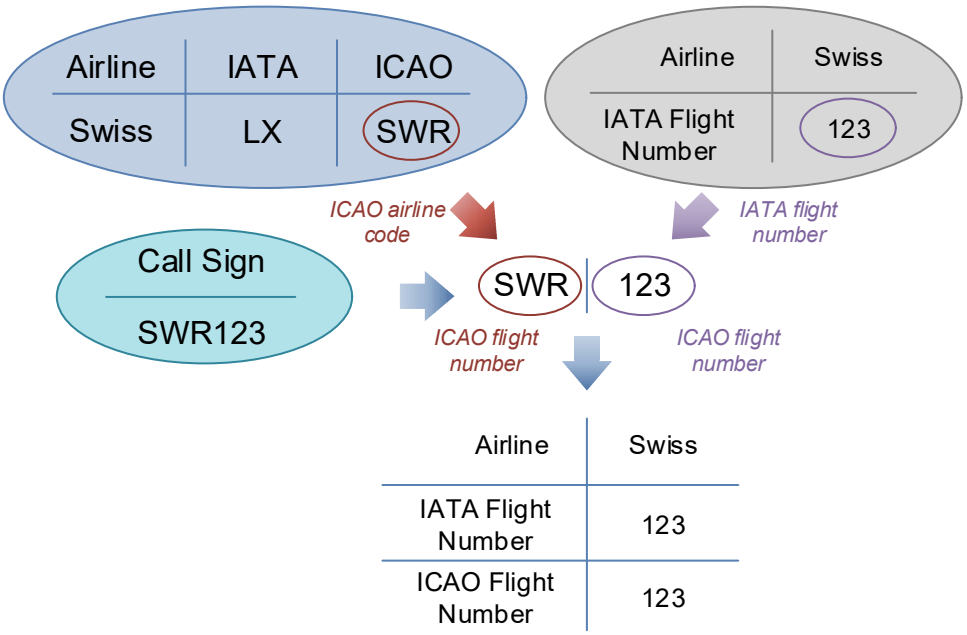

Figure 4: Correspondence between flights - Simple matching IATA/ICAO

- If any result is found, the system try to find a correspondence completing the ICAO flight number with a 0 character on the left until 3 positions.

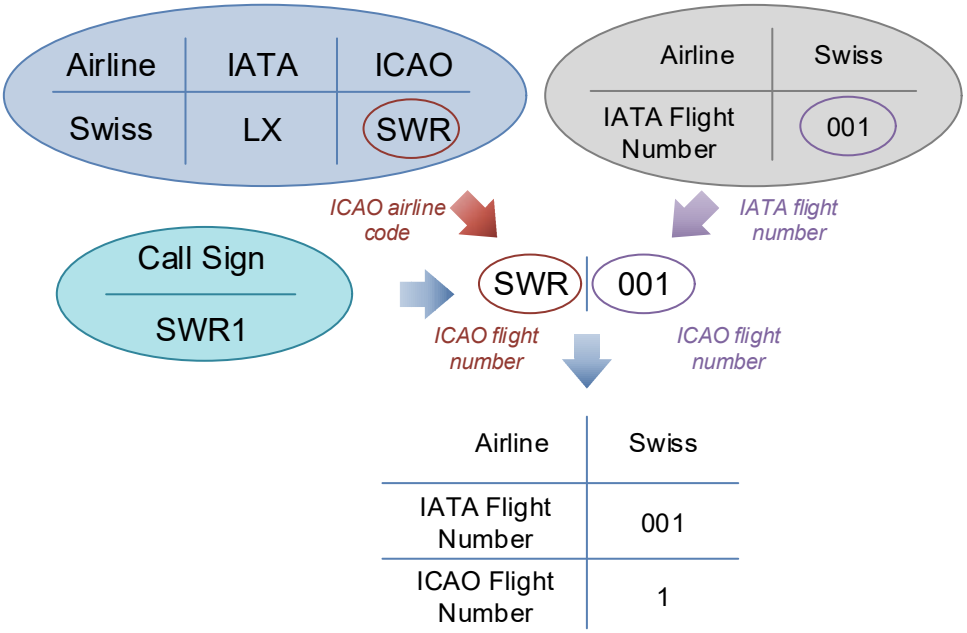

Figure 5: Correspondence between flights – Padded ICAO Flight number

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- If any result is found and the system treats a Eurocontrol response, it searches for a flight of the same airline with the same aerodrome of departure.

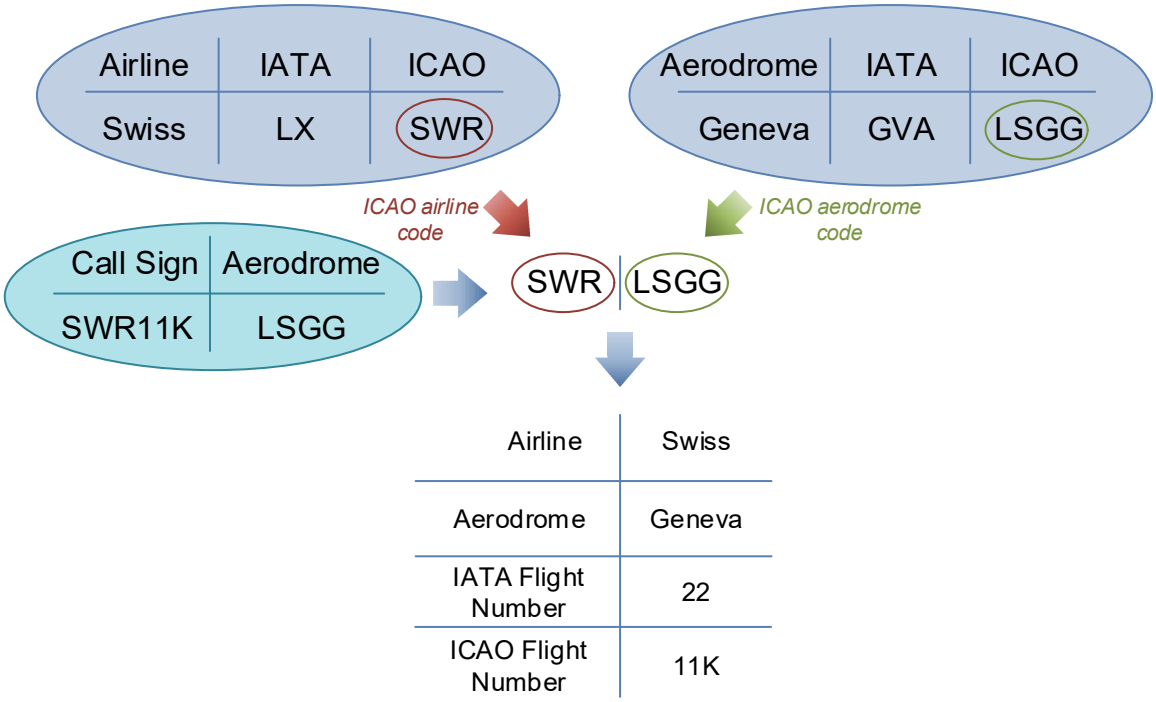

Figure 6: Correspondence between flights - Aerodrome matching

- If any result is found, the system searches for an exact matching between the full ICAO call sign and the IATA call sign.

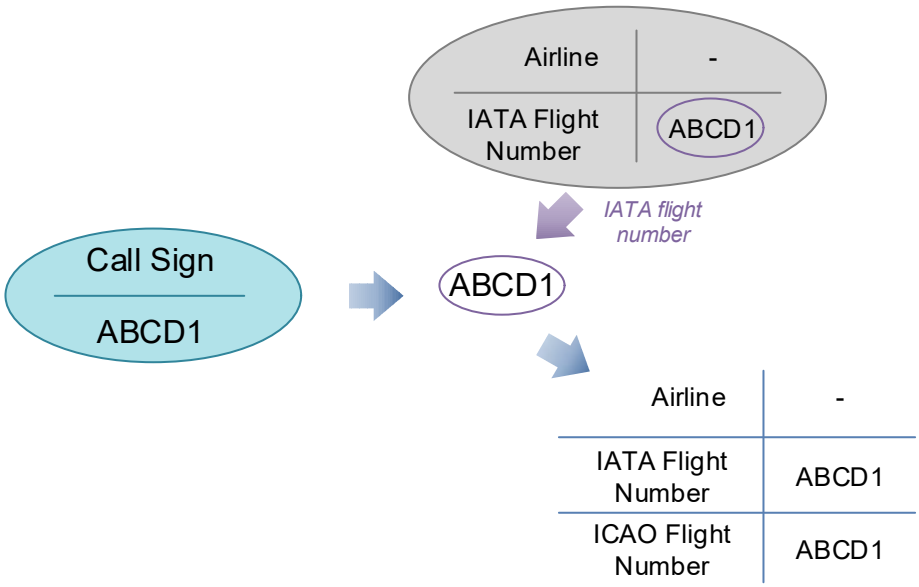

Figure 7: Correspondence between flights - Exact matching

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Sometimes, no strategic flights can be found. So, the system saves the flight as such. An information message will be displayed to the user indicating that no strategic data has been found for this flight.

1.1.5 Priority rule

As seen previously, the tactical information can be received from Eurocontrol B2B through the Network Manager or from mails coming from airlines. Usually, mails contain an update of the flight plan not reported Eurocontrol B2B.

For example, when a flight takes off with a few minutes late, the flight plan is not updated but its time over the IAF may change. So, the airline sends an update with the new ETO to inform iStream.

That's why mails from airlines are always priority over data from the Eurocontrol B2B.

1.1.6 Sending of the strategic planning

The last operation realized by the iStream synchronization service is the sending of the strategic planning.

This step is fully automated. At the reception of the Zurich airport mail, iStream computes the strategic planning and saves it into the database. Then, at a specific time (11:00 LT by default) and if the user has activated the sending, it retrieves the planning from the database and sends it to all airlines whose contact addresses have been specified.

The following diagram shows the steps in this phase:

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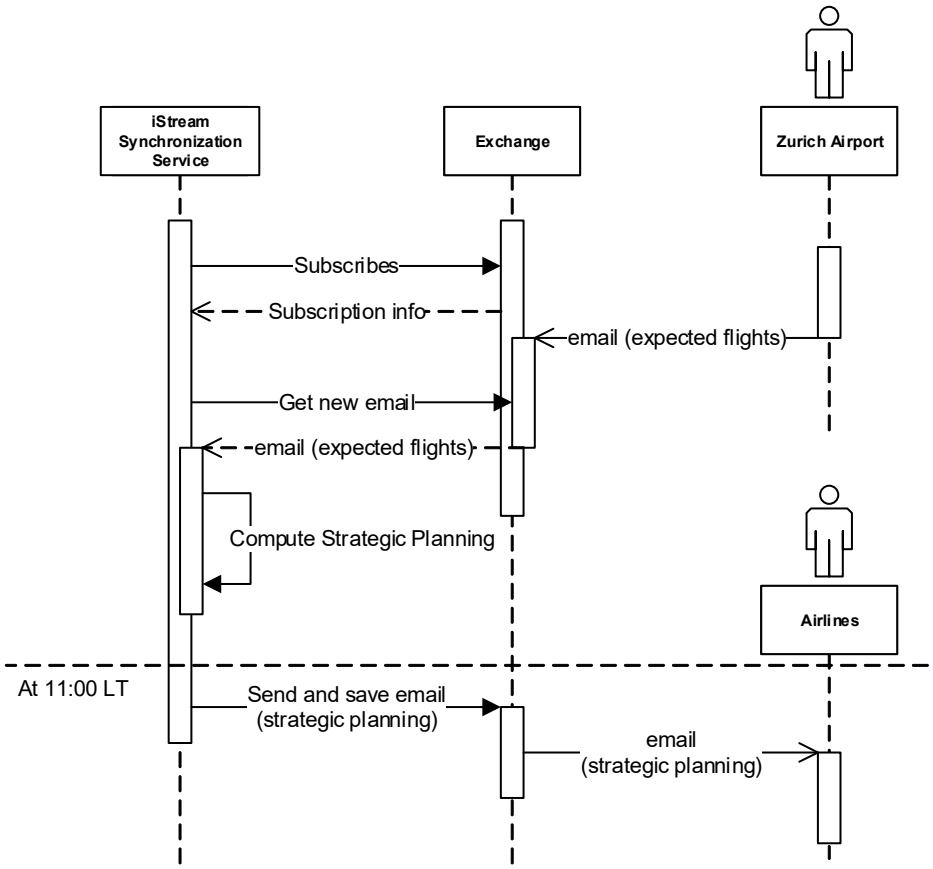

Figure 8: iStream strategic phase

Note: All strategic mails sent by iStream are saved in Exchange before sending. Administrators can found them in the “Sent items” folder of the iStream mailbox.

1.2 iStream Web Services

This is a REST (Representational State Transfer) Web Service hosted on an Internet Information Services (IIS) application server. The main role of these web services is to treat requests coming from the iStream web site.

1.2.1 Three-Tier architecture

This web services follow a Three-Tier architecture with:

- a data access layer
- a business process layer
- a service layer

The two first layers are shared with the synchronization service.

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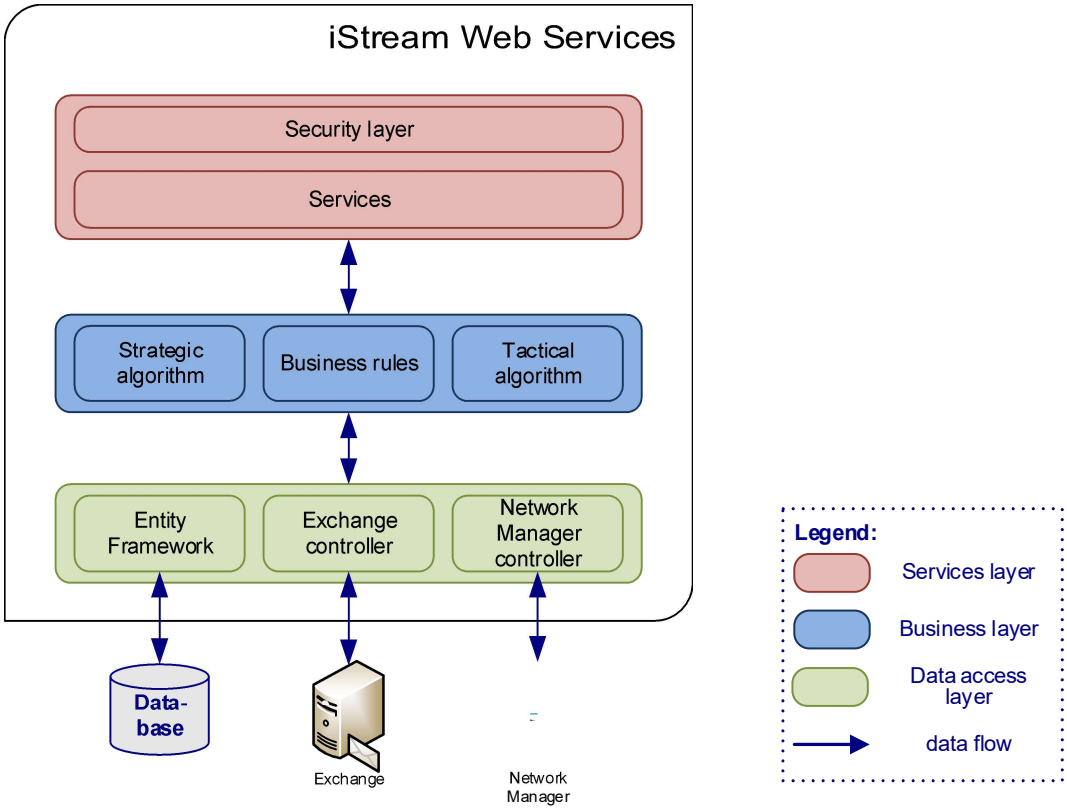

Figure 9: iStream Web Services - Three-Tier architecture

To access the database, the data access layer contains a model generated with an ORM (Object-Relational Mapper): Entity Framework. This mapper inspects the structure of the database and generates a set of .Net classes allowing to manipulate data. An encapsulation of the ORM has been realized to generalize access methods and add functionalities like execution of stored procedures and transaction management.

Furthermore, the transformation of database objects into business objects have been realized with a .Net Framework called Automapper. This simplifies the mapping of objects using reflection-mechanisms during the initialization of the application context.

Concerning accesses of Exchange and Network Manager, specific controllers encapsulate calls and processing of responses to the various services.

The business layer contains principally the implementation of the calculation algorithms of the strategic and tactical phases. It also includes the business rules to access Exchange and Eurocontrol Network Manager.

The service layer is a web services interface based on a REST architecture. It contains a dedicated controller for each module of the application. It is also at this level that is achieved the management of access rights to the services.

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1.2.2 Authentication and authorization

The web services are not accessed anonymously. Only a valid application can access the services and, a valid and authorized identity is required by the system to allow access to iStream data.

User authentication is performed through a Windows NTLM authentication. This configuration is set in the IIS web site which hosts the iStream Web Services. In case of error, an HTTP error is returned: “401 – Unauthorized”. If the user is authorized, the request is transferred to the iStream Web Services which perform an application authentication.

The application authentication is made by an HTTP header. The client sends in each request a string that the service used to validate the application. If the application is recognized, the system checks the user authorizations. Otherwise, an HTTP error is returned: “401 – Unauthorized”.

User authorization is performed by the iStream Web Services using a specific database model. When the services receive a request, the user identity is used to search its roles in the database. Then, a comparison is made between its roles in the application and those allowed to call the method. If it fits, the request is treated. Otherwise, an HTTP error is returned: “401 – Unauthorized”.

The user roles management is done by administrators in a specific module of the iStream web site.

1.2.3 Execution log

Each operation performed by the services is logged in a specific file which changes each day. The management of the execution log can be done in the configuration file of the web services.

By default, the retention time is set to 30 days. Each day, a new file is created and all previous log files are renamed with an integer indicating the number of days between the date of the file and now.

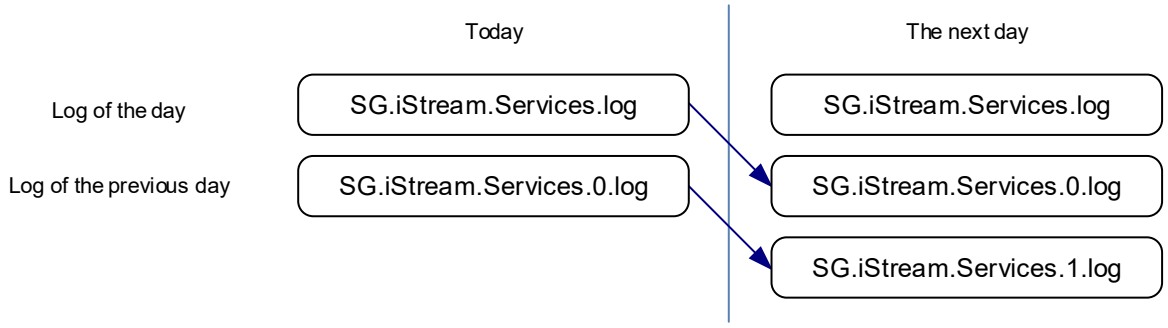

Figure 10: iStream Web Services - Execution Log

Some log levels are available: Verbose, Information, Error and Critical.

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1.3 iStream Web Site

This is a web site hosted on an Internet Information Services (IIS) application server. The principal technologies used are HTML5, AngularJS and Bootstrap.

The web interface exposes the following modules:

- A strategic module allows to visualize each day the strategic planning.
- A tactical module allows to visualize and manage each day the initial approach sequence. From this module, the user can adapt the sequence, validate or cancel the sequence and send the result to airlines which participate to the iStream process. However this is optional as the process is fully automated.
- For the iStream administrators, an administration module is available allowing them to update the application settings: settings for strategic and tactical algorithms, listing of airlines or aerodromes, user access…

1.3.1 Strategic module

This is a consultation module of the strategic planning. User can visualize the strategic planning of a specific date using the search date criterion.

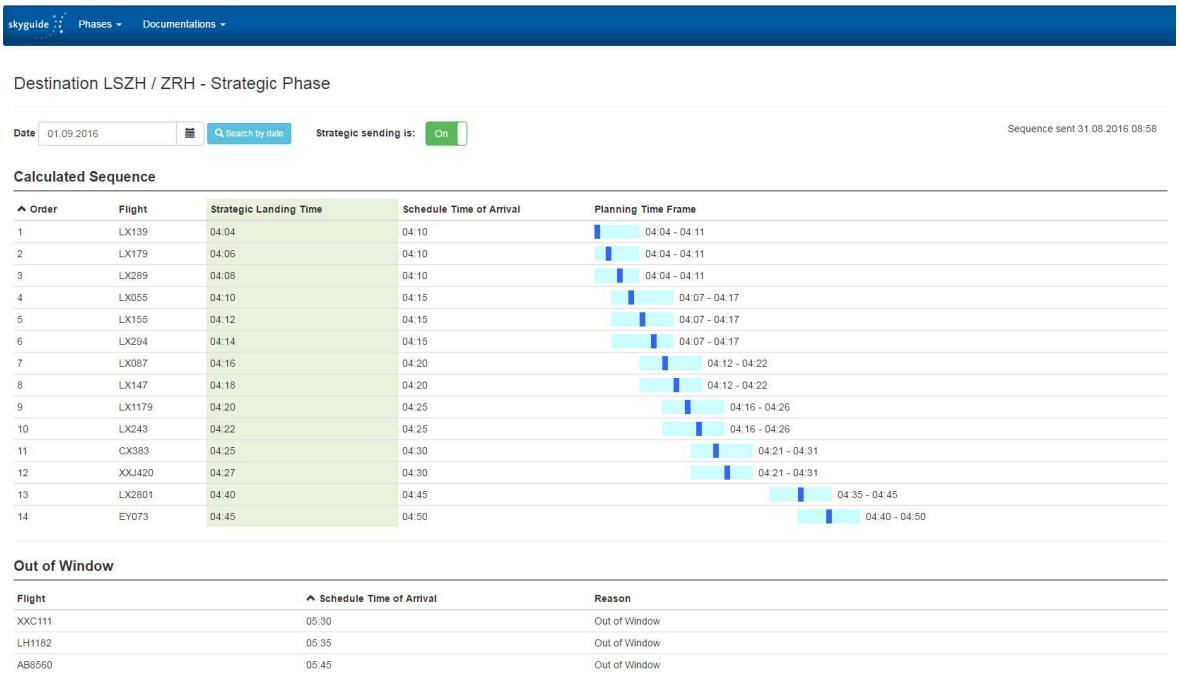

Figure 11: Strategic module

The site distinguishes flights included in the sequence (Calculated Sequence) of those excluded because expected after the period of the iStream window (Out of Window).

Concerning the visual representation of the planning, it includes:

- The schedule time of arrival computed by the system (in dark blue).
- A window of 5 minutes around the average of Strategic Landing Time (STA) for all flights having the same STA (in light blue).

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This representation is also included in the strategic mail sent to airlines at the end of the phase.

As describe previously, the sending process of the strategic planning is fully automated. However, the operator has the possibility to enable or disable the automated sending via the “On / Off” switch on the page.

1.3.2 Tactical module

This module is used to compute each day the initial approach sequence. The goal is to establish a sequence which guarantees a minimal time interval between each flight (two minutes by default). The sequence includes equally an updated Target Time Over the IAF which corresponds to the Estimated Landing Time done by the system minus the flight time from the IAF.

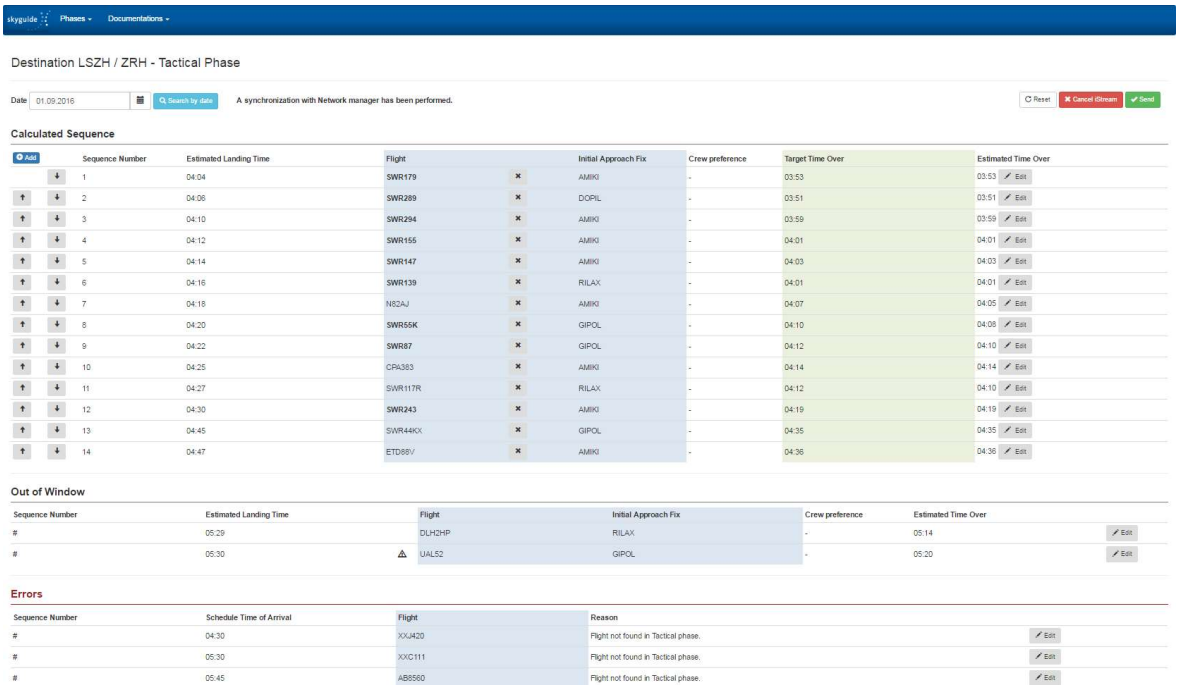

Figure 12: Tactical module

The page includes the display of an initial sequence calculated by the system. It corresponds to the last computed sequence based on the last synchronization with Network Manager and the airlines mails currently received. As for the strategic phase, the system distinguishes the flights include in the sequence (Calculated sequence) and the flights excluded because expected after the iStream window (Out of Window).

A third array has been added to display flights in error. Typically, flights that are not found in Network Manager are displayed in this array.

Even though the process is fully automated, the user still has the possibility to manage the sequence thanks to theactions described below.

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1.3.2.1 Function move up/move down

The operator can move forward or backward a flight in the sequence. The system always ensures that the minimum time interval between two flights is preserved. If a flight by moving generates a conflict with another, they are inverted like in the following example:

Figure 13: Move up/move down function

This operation does not force the complete recalculation of the sequence.

1.3.2.2 Manual exclusion of a flight

A flight can be excluded of the sequence using the cross button near the flight call sign. This operation results in the display of the flight in the “Errors” array.

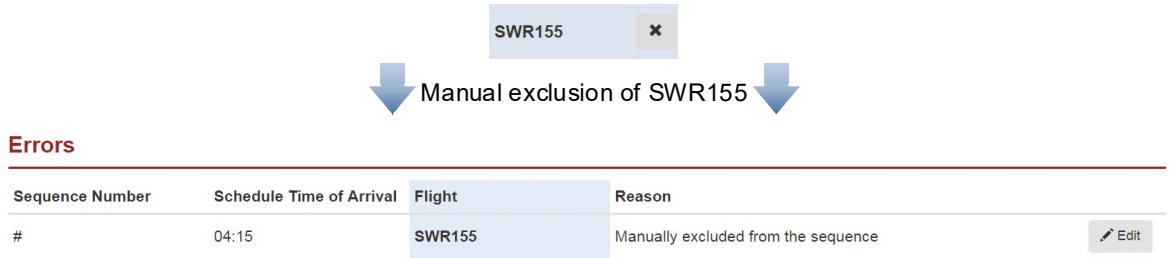

Figure 14: Manual exclusion of a flight

This operation does not force the complete recalculation of the sequence.

1.3.2.3 Edition of the ETO

The operator can edit the ETO of flight in the sequence. The “Edit” button near the ETO of the flight opens a popup where the operator can enter a new value.

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Figure 15: Edition of the ETO

This operation force a complete recalculation of the sequence. All previous changes like moving a flight or manual exclusion will be loosed. The web site contacts the web services with the updated flights list and the service computes the new sequence.

1.3.2.4 Add or edit flight information

The edition of all flight information is available for flights outside of the iStream window or for flights in errors. A popup allows the operator to change all information about the designated flight. The same popup is used when the operator wants to add a new flight in the sequence. To do this, he can used the “Add” button in the top left corner of the flights sequence.

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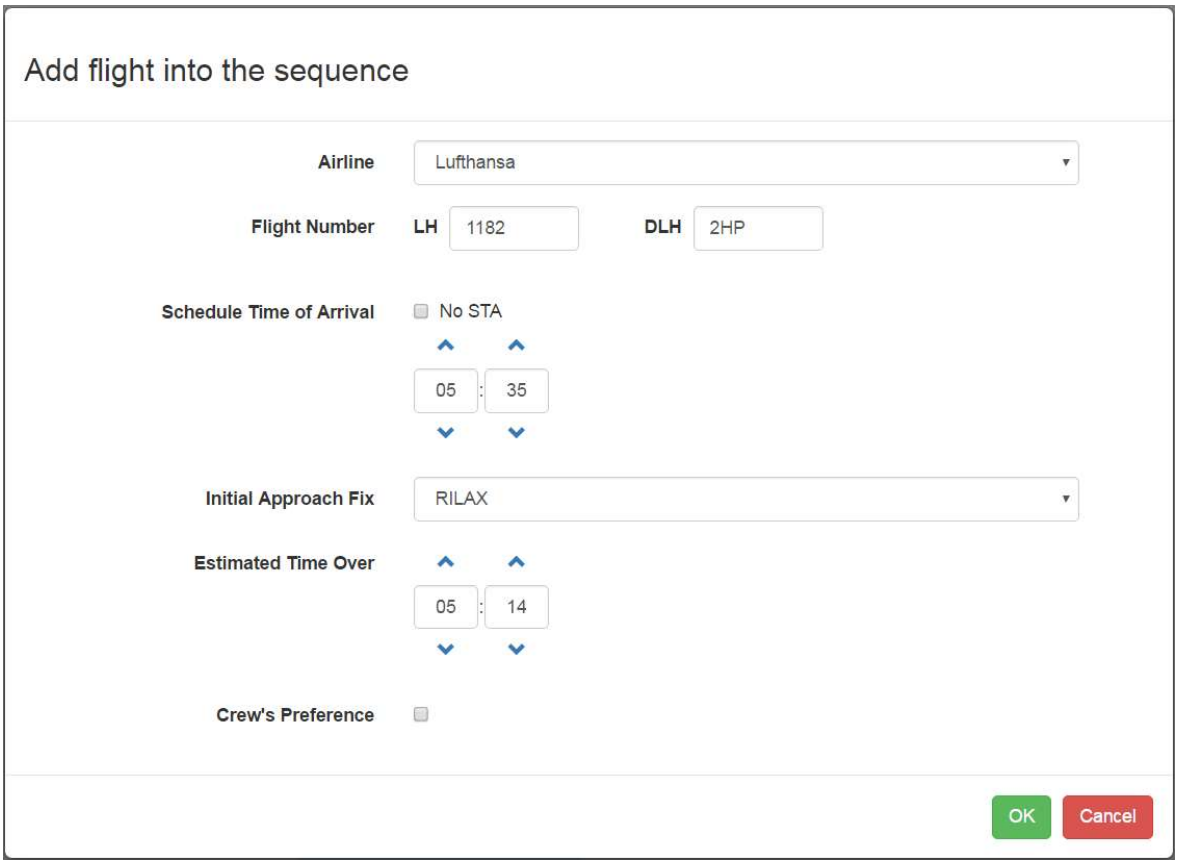

Figure 16: Add or edit flight information

This operation force a complete recalculation of the sequence. All previous changes like moving a flight or manual exclusion will be lost. The web site contacts the web services with the updated flights list and the service computes the new sequence.

1.3.2.5 Resetting the sequence

The four previous operations do not trigger the recording of the sequence. When changing an ETO or adding flight for example, services calculate a sequence from the available information on the screen. Therefore, the functionality "Reset" resets the sequence by refreshing the screen with the data present in the database.

Figure 17: Reset button

1.3.2.6 Sending and cancellation of the sequence

Both features operate with the same principle. When the operator has defined an initial approach sequence, he can decide to send it to airlines. Unlike strategic sending, only airlines concerned by the sequence will be informed (i.e. airlines that have a flight in or out of sequence).

The operator sends or cancels the sequence with the following buttons:

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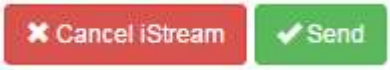

Figure 18: Cancel and Send buttons

The system will display a popup where the operator can define a message which would be added on the top of the mail. The input field is prefilled with a default message administrable in the administration module.

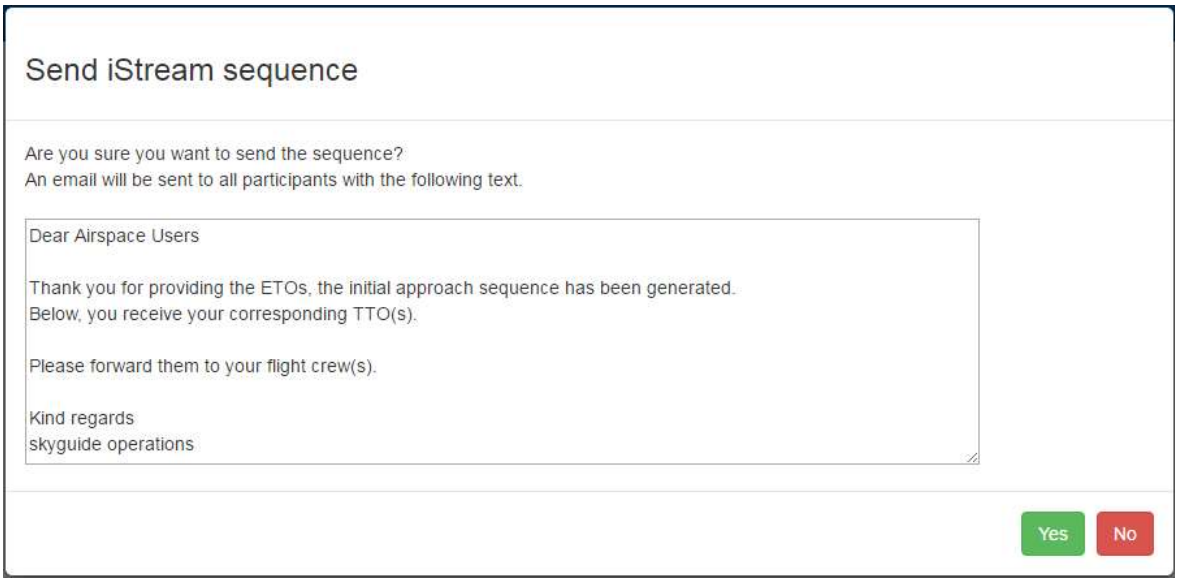

Figure 19: Sending popup

As the sequence may be different from the current in database, the final version is saved before being sent. The content of the mail is defined in an XSLT file. An XSLT transformation process is applied between this file and the XML representation of the sequence.

A copy of the message is sent to Zurich airport. This mail does not contain the previously message. So, a second XSLT file is used.

The process is the same for the cancellation of the sequence.

If the operator has not sent/cancelled the sequence by 01:30LT, the sequence is automatically validated, and sent or cancelled.

1.3.2.7 Information messages

In the tactical module, some information have been added to help the operator to define the initial approach sequence.

1.3.2.7.1 Schedule Time of Arrival

The Schedule Time of Arrival is available on mouse-over on the ELDT field.

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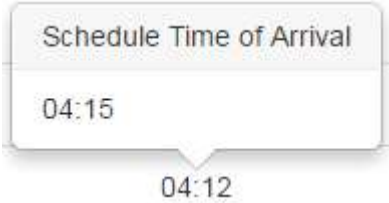

Figure 20: Schedule Time of Arrival

1.3.2.7.2 Flight call sign in IATA format

The flight call sign in IATA format is available on mouseover on the flight call sign in ICAO format.

Figure 21: IATA flight call sign

1.3.2.7.3 Flying time

The flying time between the IAF and the runway is available on mouseover of the IAF name.

Figure 22: Flying time

1.3.2.7.4 Crew preference

The crew preference indicates if a flight can be advanced (+) or not (-) when the sequence is calculated by the system. An information popup is available on mouseover of the crew preference value whith the description of the value

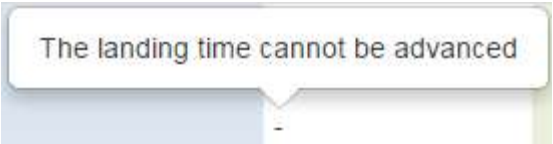

Figure 23: Crew preference

1.3.2.7.5 Updates Flights

The distinction of strategic flights coming from Eurocontrol B2B to those which received an update by mail is done by bolding the call sign of the flight.

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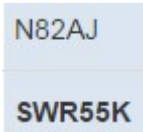


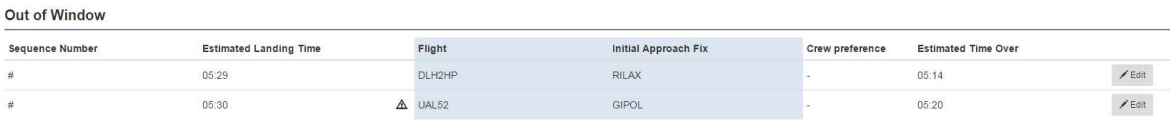
Figure 24: Updates flights

1.3.2.8 Error messages

In the tactical module, there are five possible issues:

1.3.2.8.1 Out of window.

This means that the ELDT is later than the sequence limit. The flight is display in a specific table called “Out of Window” below the initial approach sequence.



Out of Window

Sequence Number	Estimated Landing Time	Flight	Initial Approach Fix	Crew preference	Estimated Time Over	
#	05:29	DLH2HP	RILAX	-	05:14	Edit
#	05:30 ⚠	UAL52	GIPOL	-	05:20	Edit

Figure 25: Out of Window

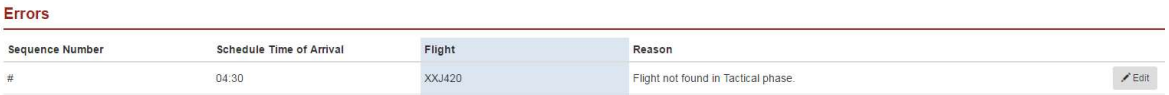
1.3.2.8.2 Flight not found in Strategic phase

This means that the flight info has not been found in the mail from Zurich airport or that the system does not found a matching call sign (IATA/ICAO). This is not necessarily an error so the flight is still displayed in the sequence with a warning next to its call sign.

Figure 26: Warning sign

1.3.2.8.3 Flight not found in Tactical phase

Those flights have been received in mail from Zurich airport but there isn’t correspondence in Eurocontrol B2B or mail info.



Errors

Sequence Number	Schedule Time of Arrival	Flight	Reason	
#	04:30	XXJ420	Flight not found in Tactical phase.	Edit

Figure 27: Flight not found in Tactical phase

1.3.2.8.4 Manually excluded from the sequence

Flight excluded by the user with the “Exclude” button.

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Errors

Sequence Number	Schedule Time of Arrival	Flight	Reason	
#	04:30	XXJ420	Flight not found in Tactical phase.	Edit

Figure 28: Flight excluded

1.3.2.8.5 Sequence cancelled

If the user cancels the sequence of the day or if the sequence has been automatically cancelled, all flights are displayed in the specific table with this message.

skyguide Phases Documentations

Destination LSZH / ZRH - Tactical Phase

Date 01.09.2016 Search by date **A synchronization with Network manager has been performed.** Sequence sent 07.09.2016 10:51

Canceled Sequence

Sequence Number	Schedule Time of Arrival	Flight	Initial Approach Fix	Crew preference	Estimated Time Over
#	04:10	**SWR289**	DOPIL	-	03:51
#	04:10	**SWR139**	RILAX	-	04:01
#	04:10	**SWR179**	AMIKI	-	03:53
#	04:15	**SWR155**	AMIKI	-	04:01
#	04:15	**SWR55K**	GIPOL	-	04:08
#	04:15	**SWR294**	AMIKI	-	03:59
#	04:20	**SWR87**	GIPOL	-	04:10
#	04:20	**SWR147**	AMIKI	-	04:03
#	04:25	SWR117R	RILAX	-	04:10
#	04:25	**SWR243**	AMIKI	-	04:19
#	04:30	XXJ420		-	
#	04:30	CPA383	AMIKI	-	04:14
#	04:30	N82AJ	AMIKI	-	04:05

Figure 29: Sequence cancelled

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EUROPEAN UNION EUROCONTROL

1.3.3 Administration module

This module is only visible for iStream administrators and includes the following features.

1.3.3.1 Strategic parameters

Those parameters are linked to the Strategic phase: algorithm, mail sending…

Key	Default value	Description
EarliestSummerLandingTime	04:04:00	The earliest landing time in summer
EarliestWinterSendingTime	05:04:00	The earliest landing time in winter
SummerTimeLimit	05:00:00	Summer time limit for calculation of the sequence
WinterTimeLimit	06:00:00	Winter time when the sequence must be sent
SummerSendingTime	09:00:00	Summer time when the sequence must be sent
WinterSendingTime	10:00:00	Summer time when the sequence must be sent
TimeWindow	00:05:00	The number of minutes that a flight can be advanced
FirstTimeWindow	00:10:00	The number of minutes allowed to advance the first flight of the sequence
Gap	00:02:00	The minimum time allowed between flights in the sequence
InEmailSubject	ScheduledARRinformation	The subject of the input email of the sequence
OutEmailSubject	iStream Strategic Planning LSZH / ZRH {0}	The subject of the output email of the sequence. Use {0} to insert the date
ReceiverForError	test@skyguide.ch	Email address of the receiver in case of wrong input
MessageForError	The system could not read the message.	The text of the message sent in case of wrong input email.
EnableSending	false	A flag used to enable/disable the sending of the strategic sequence.

1.3.3.2 Tactical parameters

Those parameters are linked to the Tactical phase: algorithm, mail sending…

Key	Default value	Description
EarliestSummerLandingTime	04:04:00	The earliest landing time in summer
EarliestWinterSendingTime	05:04:00	The earliest landing time in winter
SummerTimeLimit	05:00:00	Summer time limit for calculation of the sequence
WinterTimeLimit	06:00:00	Winter time when the sequence must be sent
Gap	00:02:00	The minimum time allowed between flights in the sequence
AirlinesInputStartSummerTime	06:00:00	Start of input period for flight data from airlines in summer
AirlinesInputStartWinterTime	10:00:00	Start of input period for flight data from airlines in winter
AirlinesInputEndSummerTime	23:30:00	End of input period for flight data from airlines in summer
AirlinesInputEndWinterTime	00:30:00	End of input period for flight data from airlines in winter
NMSynchronizationStartWindow	00:36:00	The number of minutes before the opening of the airport used during the B2B synchronization.
NMSynchronizationEndWindow	00:30:00	The number of minutes after the time limit of the tactical sequence used during the B2B synchronization.
NMSynchronizationSummerStartTime	17:00:00	The time that the synchronization with the B2B starts in summer.
NMSynchronizationWinterStartTime	18:00:00	The time that the synchronization with the B2B starts in winter.
NMSynchronizationSummerEndTime	23:25:00	The time that the synchronization with the B2B ends in summer.

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NMSynchronizationWinterEndTime	00:25:00	The time that the synchronization with the B2B ends in winter.
NMSynchronizationInterval	00:30:00	The time between two synchronizations with the B2B.
AirportAddress		The email address of the airport
InEmailSubject	iStreamLSZH	The subject of the input email of the sequence
OutEmailSubject	iStream LSZH Arrivals {0}	The subject of the output email of the sequence. Use {0} to insert the date
GenericErrorMessage	The system could not read the message.	The text of the message sent in case of wrong input email.
OutOfTacticalInputPeriodErrorMessage	The message below has been received outside of the valid reception period ({0} - {1}). It will not be taken into account.	The text of the message sent in case of airlines input arriving out of the input period. Use {0} to insert the airlines input start time and {1} to insert the airlines input end time.
SequenceAlreadySentErrorMessage	The message below has been received after the sequence has been sent and therefore was discarded.	The text of the message sent in case of airlines input arriving after sequence has been sent.
CancelledSequenceTemplate	Dear Airspace Users The sequence has been cancelled by the user Kind regards skyguide operations	Template of the mail used when user cancels a tactical sequence
SentSequenceTemplate	Dear Airspace Users Thank you for providing the ETOs, the initial approach sequence has been generated. Below, you receive your corresponding TTO(s). Please forward them to your flight crew(s). Kind regards skyguide operations	Template of the mail used when user sends a tactical sequence
CancelEmailSubject	[Cancelled] iStream LSZH Arrivals {0}	The subject of the email when user cancels the sequence. Use {0} to insert the date

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1.3.3.3 Airlines

This menu is used to administer the list of airlines recognized by the service. For each company participating in the program, the administrators can define some contact mails used as recipient of the strategic and tactical mails.

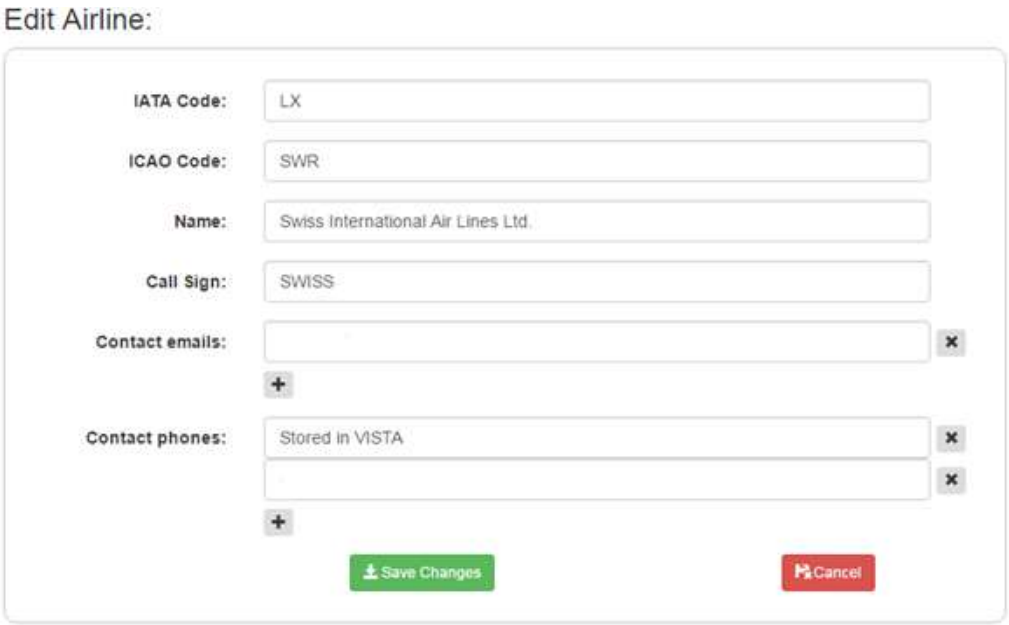

Figure 30: Administration - Edit airline

1.3.3.4 Aerodromes

This menu is used to administer the list of aerodromes recognized by the service. To facilitate the seizure of aerodromes, administrators can export the entire list as a CSV file (“Export” button) and upload the new version with the “Import” button.

Note: The import procedure replace the entire table content.

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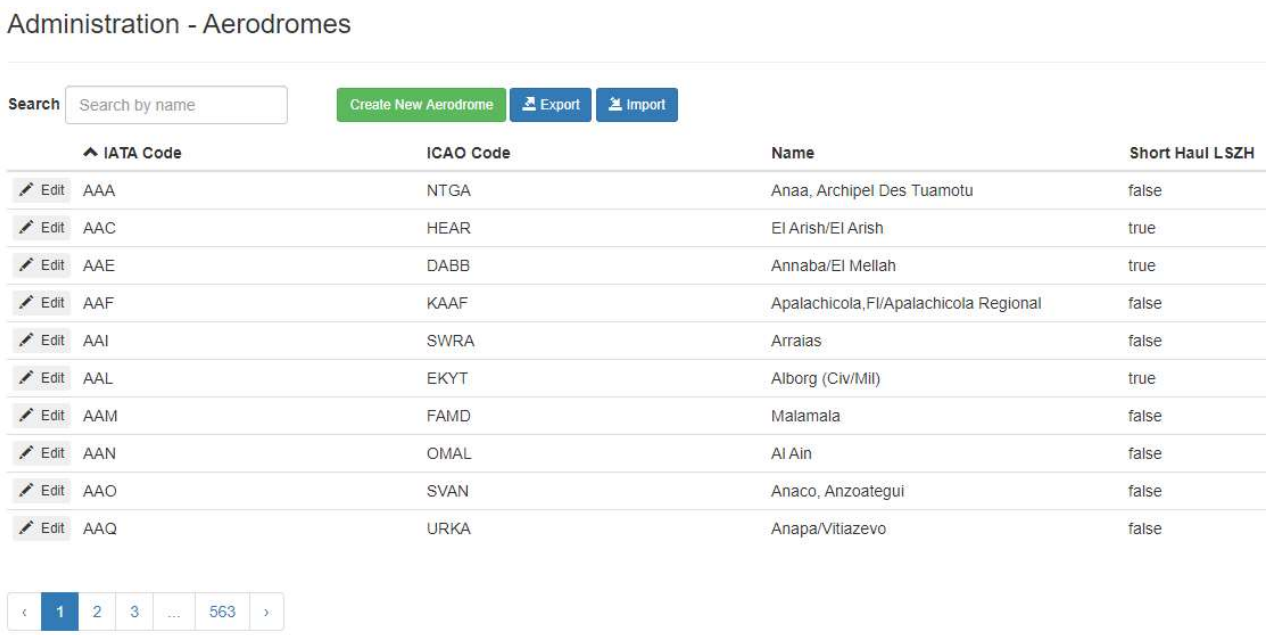

Figure 31: Administration - Aerodromes list

1.3.3.5 Users

In this screen, an administrator manages permissions to the iStream site. Two roles are possible:

- User: Visualization of the strategic planning and manage initial approach sequence
- Administrator: Access to the administration module

1.3.3.6 Documentations

This menu is used to upload a new version of the documentation “Checklist” or “FAQ”. The upload button saves the file into the database.

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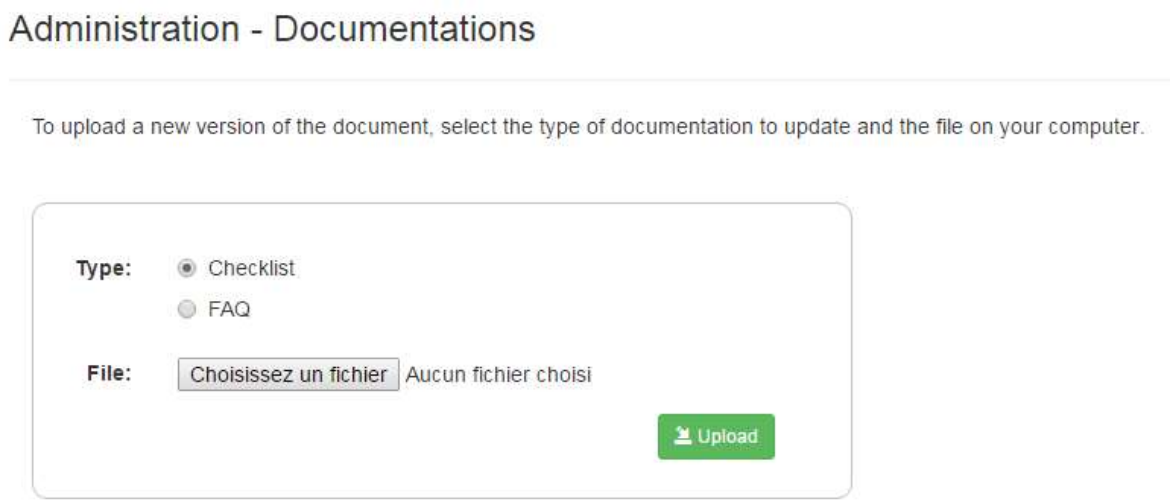
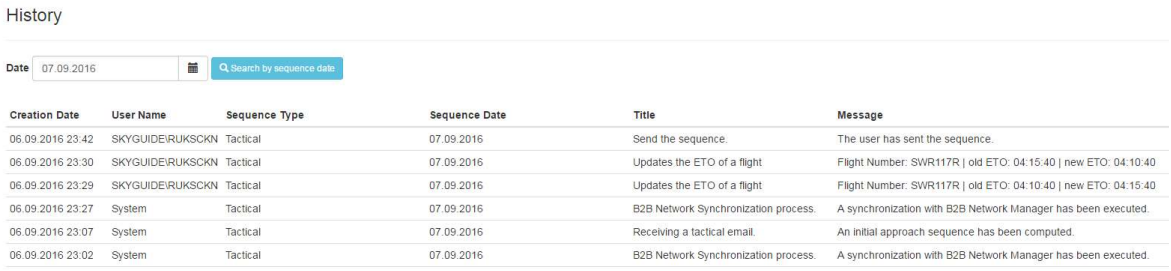


Figure 32: Administration – Documentations

1.3.3.7 History

This menu allows administrators to visualize all operations realized by the system and by users on a specify date.



Creation Date	User Name	Sequence Type	Sequence Date	Title	Message
06.09.2016 23:42	SKYGUIDE\RUKSCKN	Tactical	07.09.2016	Send the sequence.	The user has sent the sequence.
06.09.2016 23:30	SKYGUIDE\RUKSCKN	Tactical	07.09.2016	Updates the ETO of a flight	Flight Number: SWR117R | old ETO: 04:15:40 | new ETO: 04:10:40
06.09.2016 23:29	SKYGUIDE\RUKSCKN	Tactical	07.09.2016	Updates the ETO of a flight	Flight Number: SWR117R | old ETO: 04:10:40 | new ETO: 04:15:40
06.09.2016 23:27	System	Tactical	07.09.2016	B2B Network Synchronization process.	A synchronization with B2B Network Manager has been executed.
06.09.2016 23:07	System	Tactical	07.09.2016	Receiving a tactical email.	An initial approach sequence has been computed.
06.09.2016 23:02	System	Tactical	07.09.2016	B2B Network Synchronization process.	A synchronization with B2B Network Manager has been executed.

Figure 33: Administration – History

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2 Operations of Zurich PJ25 components

2.1 Purpose and scope

This document specifies how to maintain and configure the different PJ25-specific components of iStream. Everything that is common with the standard version of iStream will not be repeated in this document.

2.2 Infrastructure

This chapter presents the general infrastructure of iStream and exchanges between the various internal and external components.

2.2.1 Schema

The following diagram shows the interconnections between the various components of the equipment and the stream of data received and transmitted to partners

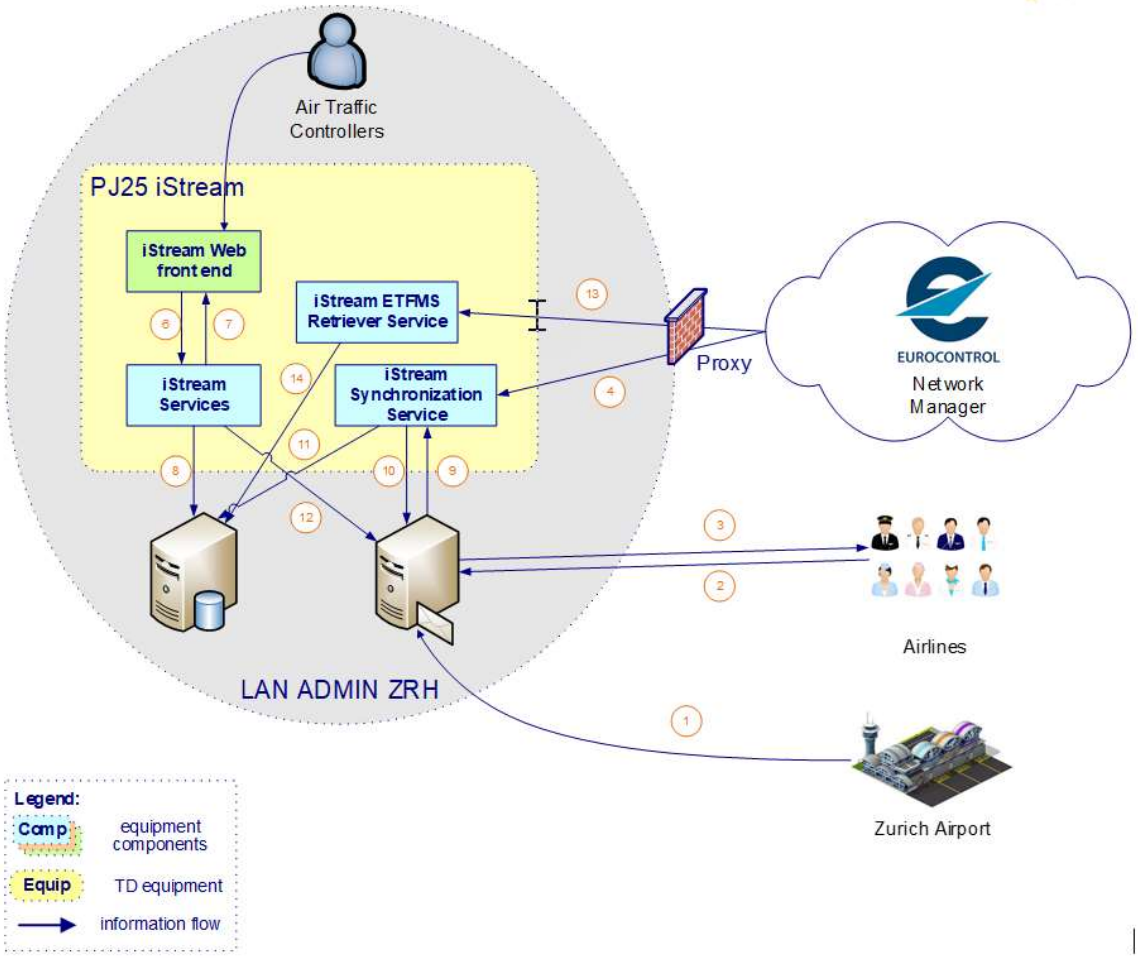

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Figure 34: Zurich xStream Infrastructure Schema

Id	Description
1	Inflow: Scheduled arrivals data as a CSV received by email from Zurich airport
2	Outflow: Strategic Planning and Initial Approach Sequence
3	Inflow: Tactical flights data (CS/IAF/ETO) received by email from airlines
4	Inflow: Flight plans from Eurocontrol through the Network Manager B2B connection
5	Air Traffic users interactions
6 / 7	iStream data
8	iStream data (saved in database)
9	Emails from Zurich airport and airlines
10	Sending emails (Strategic Planning)
11	iStream data (saved in database)
12	Sending emails (Initial Approach Sequence)
13	Inflow: Flight plans from Eurocontrol through the Network Manager B2B connection
14	Outflow: ETFMS-specific data stored in DB

2.2.2 Databases

The following databases are used:

- Production Database
- Training Database
- Test Database
- Development Database

2.2.3 Applications Servers

Internet Applications servers host following services:

- iStream Web Services
- iStream Web front end

The same servers are used to host the iStream Synchronization Service.

2.2.4 Production Platform

2.2.4.1 Web Applications

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Application	Server	Physical Path	Application Pool	URL	.Net	Port	Authentication method
iStream Web Services			SG.iStream.Services		4.5		Windows authentication
iStream Web front end			SG.iStream.UI		4.5		Windows authentication

Each web application contains a configuration file “web.config” in the root folder of the installation directory.

The web services contains specific a log file called “SG.iStream.Services.Nlog.log”.

The configuration file of the “iStream Web Service” contains the following parameters:

Section	Key/Name	Comment
<appSettings>	CrossSiteAllowedUrlReferrer	Cross Site parameter: List if URLs allowed to request the web service. Separator is “,”
	CrossSiteAllowedHeaders	Cross Site parameter: List of allowed headers of the request
	CrossSiteAllowedMethods	Cross Site parameter: List of allowed HTTP Verbs
	CrossSiteAllowedCredentials	Cross Site parameter: A flag indicating whether or not the actual request can be made using credentials
	TacticalXsltEmailTemplatePath	Relative URL to the XSLT template for the tactical mail sent to airlines
	TacticalAirportXsltEmailTemplate Path	Relative URL to the XSLT template for the tactical mail sent to Zurich aerodrome
	Domain	Domain of the user account used to access to the iStream Exchange mailbox
	UserName	Name of the user account used to access to the iStream Exchange mailbox
	Password	Password of the user account used to access to the iStream Exchange mailbox
	InboxOwnerEmail	Email of the iStream Exchange mailbox
	EWSVersion	Target version of the iStream Exchange mailbox
	CertificateSerialNumber	Serial number of the certificate used to contact Eurocontrol
	CertificateStoreLocation	Windows store location where to find the Eurocontrol certificate
	CertificateStoreName	Windows store name where to find the Eurocontrol certificate
<connectionStrings>	IStreamContainer	Connection string to the iStream database
	AuthorizationContainer	Connection string to the authorization database
<nlog>	logfile	Configuration of the logger
<system.serviceModel> <client> <endpoint>	FlightManagementPort	Endpoint configuration used to request Eurocontrol B2B Network Manager

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<system.Net> <defaultProxy>	**proxy**	URL of the proxy used when requesting Eurocontrol

The log file of the service can be found at the location specified in the `<nlog>` section. The default location is "**D:\Logs\iStream**".

The configuration file of the "iStream Web front end" contains the following parameters:

Section	Key/Name	Comment
appSettings	IStreamServicesUrl	URL of the iStream Web Services

2.2.4.2 Windows Service

Application	Server	Physical Path
iStream Synchronization Service		C:\Program Files (x86)\xxxx\SG.iStream.ExchangeSyncService

The Windows service contains a configuration file "SG.iStream.ExchangeSyncService.exe.config" at the root folder of the installation directory with the following parameters:

Section	Key/Name	Comment
<appSettings>	TempDirectoryPath	Path of a temporary directory
	StrategicXsltEmailTemplatePath	Absolute path of the XSLT template for the strategic mail sent to airlines.
	Domain	Domain of the user account used to access to the iStream Exchange mailbox
	UserName	Name of the user account used to access to the iStream Exchange mailbox
	Password	Password of the user account used to access to the iStream Exchange mailbox
	InboxOwnerEmail	Email of the iStream Exchange mailbox
	EWSVersion	Target version of the iStream Exchange mailbox
	IncrementalSyncInterval	Number of minutes between two synchronizations
	StrategicSendingSafetyMargin	Safety margin (in seconds) to add to the verification interval of the strategic sending.
	SubscriptionTimeOut	Number of minutes of the subscription to Exchange notifications. Must be between 1 and 1440.
	FirstTimerInterval	Delay in minutes after the start of the service and before the first synchronization. This setting allows complete installation service without waiting for the end of the first synchronization
	IsTestMode	A flag indicating if the service must run in test mode (if true, the strategic email is sent immediately after reception of the strategic input)
	EnableTraceMode	A flag use to enable the log of the application
	EnableEWSTraceMode	A flag used to enable the log of each request to Exchange
	CertificateSerialNumber	Serial number of the certificate used to contact Eurocontrol

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	CertificateStoreLocation	Windows store location where to find the Eurocontrol certificate
	CertificateStoreName	Windows store name where to find the Eurocontrol certificate
<connectionStrings>	IStreamContainer	Connection string to the iStream database
	AuthorizationContainer	Connection string to the authorization database
<nlog>	logfile	Configuration of the logger
<system.serviceModel> <client> <endpoint>	FlightManagementPort	Endpoint configuration used to request Eurocontrol B2B Network Manager
<system.Net> <defaultProxy>	proxy	URL of the proxy used when requesting Eurocontrol

The log file “SG.iStream.ExchangeSyncService.Nlog.log” of the windows service can be found at the location specified in the <nlog> section. *The default location is “D:\Logs\iStream"*.

2.2.5 Training Platform

2.2.5.1 Web Applications

Application	Server	Physical Path	Application Pool	URL	.Net	Port	Authentication method
iStream Web Services			SG.iStream.Training.Services		4.5		Anonymous authentication
iStream Web front end			SG.iStream.Training.UI		4.5		Windo **Anonymous** ws authentication

The log file “SG.iStream.Training.Services.Nlog.log” can be found at the location specified in the `<nlog>` section. The default location is “**D:\Logs\iStream**”.

2.2.5.2 Windows Service

There isn’t a synchronization service for the Training environment.

2.2.6 Test Platform

2.2.6.1 Web Applications

Application	Server	Physical Path	Application Pool	URL	.Net	Port	Authentication method
iStream Web Services			SG.iStream.Services		4.5		Windows authentication
iStream Web front end			SG.iStream.UI		4.5		Windows authentication

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The log file “SG.iStream.Services.Nlog.log” can be found at the location specified in the `<nlog>` section. The default location is “**C:\Temp\iStream**”.

2.2.6.2 Windows Service

Application	Server	Physical Path
iStream Synchronization Service	gesstdev14	C:\Program Files (x86)\xxxx\SG.iStream.ExchangeSyncService

The log file “SG.iStream.ExchangeSyncService.Nlog.log” of the windows service can be found at the location specified in the `<nlog>` section. The default location is “**C:\Temp\iStream**”.

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