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Brescia, 13 dicembre 2012
Prot. R2696-012/ACO/MCA-mr-BS

Oggetto: **Metrobus Brescia – Metropolitana Automatica Leggera**
CUP H11E03000110006- CIG 28484485A5
Trasmissione Specifica Tecnica Gateway di calcolo della Service Availability – doc. 70111

Si trasmette in allegato, il seguente documento:



- 70111 - Specifica Tecnica Gateway di calcolo della Service Availability

Distinti saluti

Il Responsabile del Progetto
ing. *Andrea Cozzani*



All.^{to} Transmittal BS0E6755

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| M. Scuotto L. Meregalli | P. Marotta | G. Magro | Prima emissione | 13.12.12 | 00 | | | | | | | | | |
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| Ansaldo STS | | | | | - - - - - E 5 | | | | | | | | | |
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| Scala | | Formato A4 | | File: SA Gateway - Specifica Tecnica 1 di 2 di calcolo della Service Availability | | | | Pagina 1 di 41 | | | | | | |

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1. INTRODUZIONE

1.1. Scopo

Il presente documento ha lo scopo di definire la specifica tecnica del Gateway di calcolo della Service Availability (SA), per il progetto Metrobus Brescia da Ansaldo STS. Il Sistema in oggetto è preposto al calcolo della SA secondo la formula specificata nell'Accordo Transattivo.

1.2. APPLICABILITÀ

Il presente documento è applicabile al progetto Metrobus Brescia.

1.3. DOCUMENTI DI RIFERIMENTO

- Capitolato Speciale d'Appalto
- Accordo Transattivo
- BS0002156595064 Specifica Definizione Interfaccia per protocollo e connessione fisica ATC EDP.

1.4. ACRONIMI, TERMINI E DEFINIZIONI

- ATC : Automatic Train Control
- EDP : Electronic Data Processing
- SA : Service Availability

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2. CARATTERISTICHE TECNICHE DEL GATEWAY

La specifica Tecnica del Gateway di calcolo della SA è riportata in allegato A, Gateway Technical Specification.

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ALLEGATO A – TECHNICAL SPECIFICATION – SA GATEWAY

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Technical Specification

SA Gateway

Abstract

This document describes the Gateway for Service Availability calculation.

| | | |
|-----------------|------------------|--------------|
| Author | Document version | Last revised |
| Tzvetan Yakimov | 2.0 | 2012-12-12 |

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Technical Specification – SA Gateway**Revision history:**

| Version | Initials | Date/Time | Comments |
|---------|----------|------------|---|
| 1.0 | TZY | 2012-06-19 | Initial version |
| 2.0 | TZY | 2012-12-12 | Revised According to Ansaldo STS observations |
| | | | |
| | | | |

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The purpose of this document is to define the technical Specification of the Gateway system aimed at calculating Service Availability according to the formula specified in the Atto Transattivo.

1.2 REFERENCES

- [1] BS0002156595064 - rev.02 Specifica Definizione Interfaccia per protocollo e connessione fisica ATC - EDP.

1.3 DEFINITIONS AND ABBREVIATIONS

ATC Automatic Train Control

SA Service Availability. Is a calculation of the percentage of train departures that were “on time” according to the planned departures. The calculation is based on all train departures on all stations in a given time interval.

2 OVERVIEW

The main purpose of the Gateway System is to perform the following overall functions:

1. Calculate Service Availability (SA) based on information on actual train departures read from log files and information on planned departures.

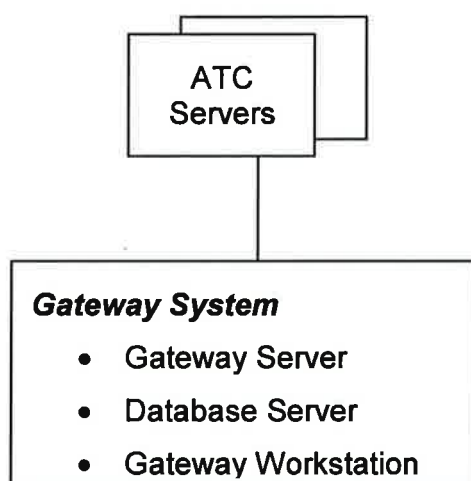
Please refer to [1] Section 2.1 (“Gateway functionality”) for a more detailed description.

The Gateway System consists of the following software components:

- The Gateway Server Software
- The Gateway Workstation Software
- The Database Server Software

The Gateway Server Software runs on one (and only one) computer in the network. The Gateway Workstation Software may run concurrently on multiple computers in the network (including the computer, where the Gateway Server Software is running). The Database Server Software only runs on one computer, which may be the same computer as the Gateway Server Software is running on, or another computer.

For the Metrobus Brescia Project, all the above software runs on a unique workstation, as illustrated in the following figure.



Technical Specification – SA Gateway

Under normal operation the Gateway System reads log files from the external systems ATC, using the File Transfer Protocol (FTP), but the Gateway System may also run “stand-alone” without any connections to external systems. In this case log files must be imported manually.

The Gateway Software (both Server and Workstation) can only be operated by users that have been defined in the system. Users may be assigned one of three access rights:

- **Operator Rights:** Denied access to some functions in the system.
- **Administrator Rights:** Full access to all functions.
- **Read-only:** Only allowed to inspect data, not allowed to modify data.

3 ENVIRONMENT

3.1 HARDWARE

Hardware features of the Gateway System are summarized below:

| | |
|------|-------------------------------------|
| OS | Microsoft(R) Windows(R) Server 2012 |
| CPU | Xeon Quad-Core 1,60 GHz |
| RAM | 8 GB DDR3 1333 MhZ |
| Disc | 2 Hard Disks - 250 GB each |

3.1.1 The Gateway Server Computer

The computer running the Gateway Server Software must as a minimum fulfil the following requirements:

| | |
|------|---------------------------------------|
| OS | Microsoft(R) Windows(R) Server 2003 |
| CPU | Intel Core 2 Duo (2,53GHz) |
| RAM | 4 GB |
| Disc | 120 GB + size of database (see below) |

3.1.2 The Gateway Workstation Computer

The computer running the Gateway Workstation Software must as a minimum fulfil the following requirements:

| | |
|------|----------------------------|
| OS | Microsoft(R) Windows(R) XP |
| CPU | Intel Core 2 Duo (2,53GHz) |
| RAM | 2 GB |
| Disc | 20 GB |

3.2 SOFTWARE

The software that will be running on the proposed system is summarized below:

- Windows Server Standard 2012;
- Microsoft SQL Server Standard 2012

3.2.1 The Gateway Server Computer

On the computer running the Gateway Server Software the following software must be installed:

- Microsoft Windows 2003
- Microsoft SQL Server 2005

3.2.2 The Gateway Workstation Computer

On the computer running the Gateway Workstation Software the following software must be installed:

- Microsoft Windows XP or Windows 7

4 REQUIREMENTS TO THE GATEWAY SERVER SOFTWARE

4.1 READ LOG FILES

Once started the Gateway Server Software will automatically and continuously check both ATC Servers for new log files following the naming conventions:

- ATC: "ATCLOG*.txt"

ATC server may individually be disabled/enabled in the Gateway System (See 5.5). Only servers that are enabled are checked for log files. (When all servers are disabled, the Gateway System runs "stand-alone", and log files must be imported manually).

Whenever a file is found on one of these servers, it is read by the Gateway Server Software.

When the log files are read, each line is interpreted and log messages concerning departures and log messages in the Gateway Database. All other log messages are discarded (for the format of log messages refer to section 6). When log messages are stored in the database, the following information is attached:

- Source of log file (name of server and directory)
- Name of log file
- Time
- Flag indicating an automatic import

Log messages are checked for validity:

- timestamp is checked:
 - format must be valid (YYYYMMDDHHmmSS)
 - 2000<year<2099
 - 0<month<13
 - 0<day<32
 - 0<=hour<24
 - 0<=minute<60
 - 0<=second<60

- general format is checked

Duplicate log messages from same or different log files are discarded. The Gateway Server Software sorts the log messages by time, and does not rely on any specific order of log messages in the log files.

If a log file contains one or more invalid log messages, the entire file is discarded. In this case or if the connection to one of the external systems is broken a message is written to the Gateway Event Log and an error message is displayed by the Gateway Workstation Software on the display and on all reports concerning SA-calculation. The error message can only be reset manually (See 5.13).

When a log file has been successfully read, it is optionally either moved to another directory on the same server or deleted from the server (See 5.5 on how to set this option). If one or more invalid log messages are found, the extension of the filename is changed to ".err".

The log files are transferred from the ATC servers to the Gateway Server using the FTP protocol.

4.2 CONTINUOUS CALCULATION OF SA

Once started, the Gateway Server Software will automatically and continuously calculate SA(total). The calculation is performed according to the rules described in [1] Section 2.1.

Two parameters in the system settings control the calculation interval and period:

- SAInterval: Number of minutes between each calculation (minimum 5 minutes);
- SAPeriod: Length of the period (in minutes) that the SA is calculated for.

As an example, if SAInterval is 5 and SAPeriod is 60, the Gateway Server Software will calculate the SA each 5 minutes for the last 60 minutes. Refer to section 5.5 to see how to define system settings.

For each calculation the following information is stored in the database:

- Date and time of calculation
- Calculated SA(total)

5 REQUIREMENTS TO THE GATEWAY WORKSTATION SOFTWARE

5.1 LOGIN

In order to start the Gateway Workstation Software the user must specify his username and password. The Gateway Workstation Software will only start if the username is known by the system and the password is correct.

5.2 CONTINUOUS DISPLAY OF SA

The user (administrator, operator or read-only-user) may put the Gateway Workstation Software into a mode where it continuously displays the latest 10 values of SA(total) calculated by the Gateway Server Software as described in 4.2. The user must exit this mode in order to execute any of the other Gateway Workstation Software functions.

5.3 CONTINUOUS DISPLAY OF ERROR STATE

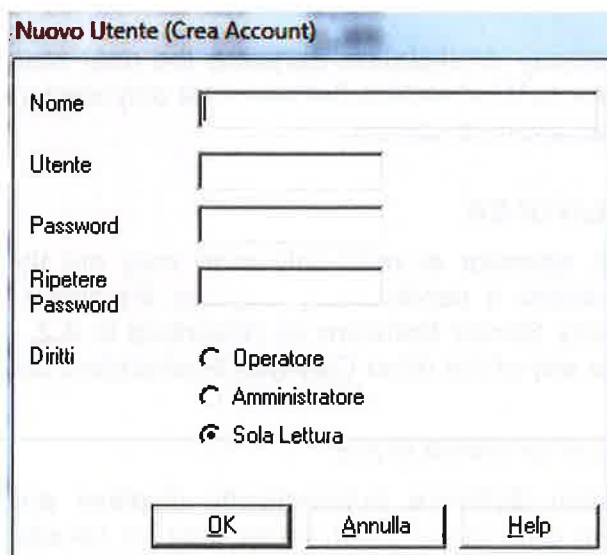
The Gateway Workstation Software automatically displays an error message if the Gateway System is in an error state. Error states may be caused for example by invalid log files.

5.4 ADMINISTRATOR USERS AND ACCESS RIGHTS

The Gateway Software maintains a register of users that are allowed to operate on the system. Users with administrator access rights are allowed to make changes to the register. Functions provided are described in the following. An overview of the graphical user interface to execute the functions is also provided.

Create new user:

The administrator must enter a user name, access rights and initial password:



Nuovo Utente (Crea Account)

Nome

Utente

Password

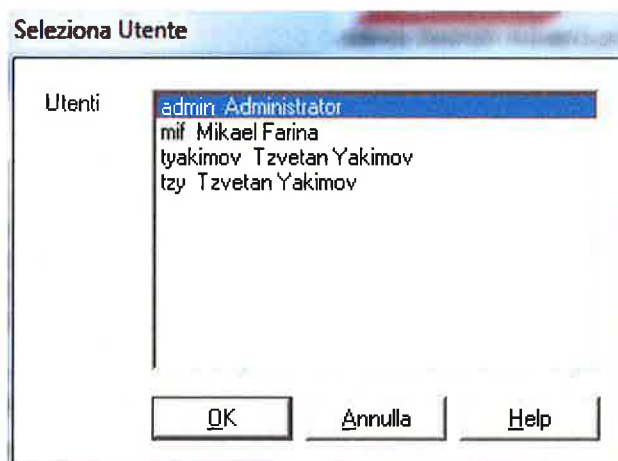
Ripetere Password

Diritti

- ☐ Operatore
- ☐ Amministratore
- ☐ Sola Lettura

Delete user:

The administrator must first select the user from a list, and then confirm to delete the user.



Seleziona Utente

Utenti

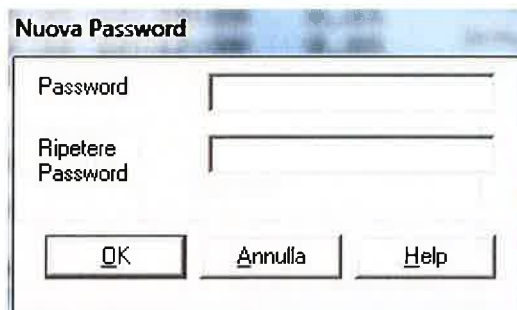
- admin Administrator
- mif Mikael Farina
- tyakimov Tzvetan Yakimov
- tzy Tzvetan Yakimov

Modify user:

The administrator may change the username, access rights and password of any user (the administrator cannot see the existing password of other users):

**Change password:**

Any user may change his own password:

**5.5 DEFINE SYSTEM SETTINGS**

Administrators may change various systems settings, accessing to "Impostazioni", and then to "ATC" or "SA" sub-menus, depending on parameters to be changed.

From the ATC submenu, the following parameters can be modified:

- FTP parameters (username, password, source directory and destination directory) for accessing



Technical Specification – SA Gateway

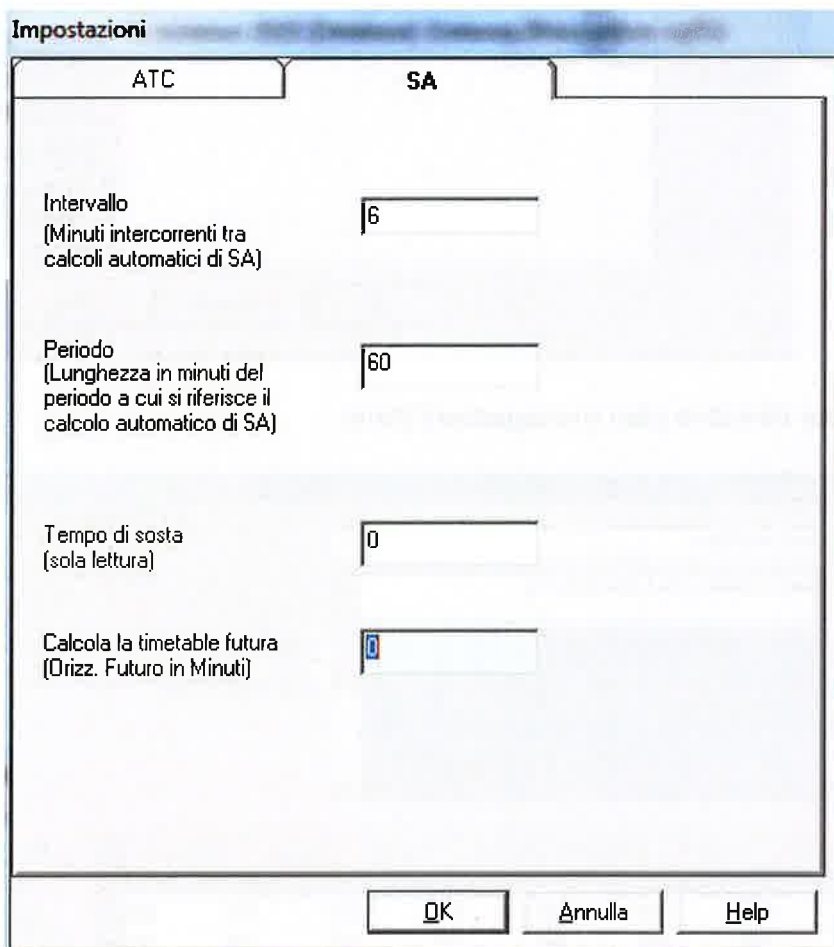
- ATC Server 1
 - ATC Server 2
- Enable/disable
 - ATC Server 1
 - ATC Server 2
- Options: Move or delete log files when read on
 - ATC Server 1
 - ATC Server 2

Note: If FTP server host is empty, it means that the system is using local system copy from location defined in 'Cartella Origine'

From the SA submenu, the following parameters can be changed:

Technical Specification – SA Gateway

- **SAInterval:** Number of minutes between each automatic SA calculation
- **SAPeriod:** Length of the period (in minutes) that the automatic SA calculation is performed on.
- **MinOpenDoorsTime:** Minimum time in seconds that the doors must be opened when a train is stopped at a station in order to count a valid departure (see 6.1.3). A value of 0 means that there are no requirements to the time that the doors must be opened.



Impostazioni

ATC SA

Intervallo
(Minuti intercorrenti tra calcoli automatici di SA)

6

Periodo
(Lunghezza in minuti del periodo a cui si riferisce il calcolo automatico di SA)

60

Tempo di sosta
(sola lettura)

0

Calcola la timetable futura
(Orizz. Futuro in Minuti)

0

OK Annulla Help

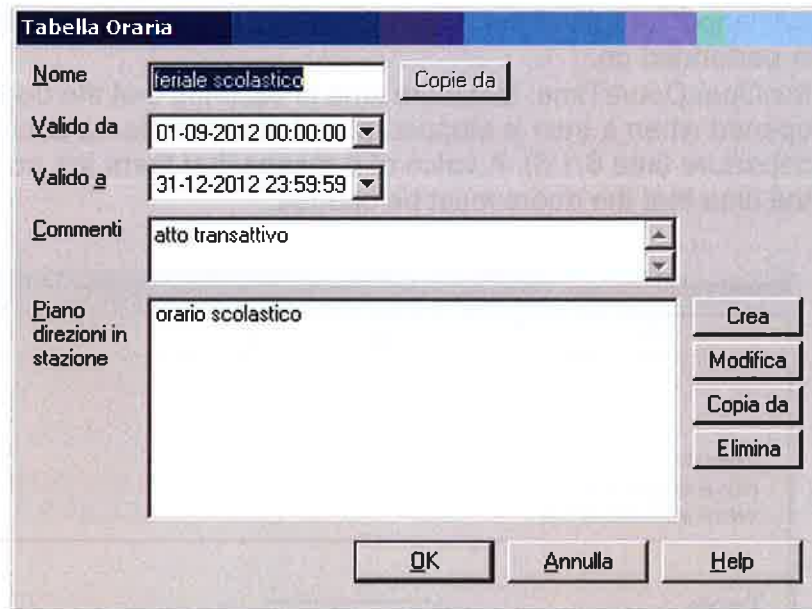
5.6 ENTER HEADWAY SCHEDULE

The administrator must enter the headway schedule(s) used to calculate the SA as described in [1].

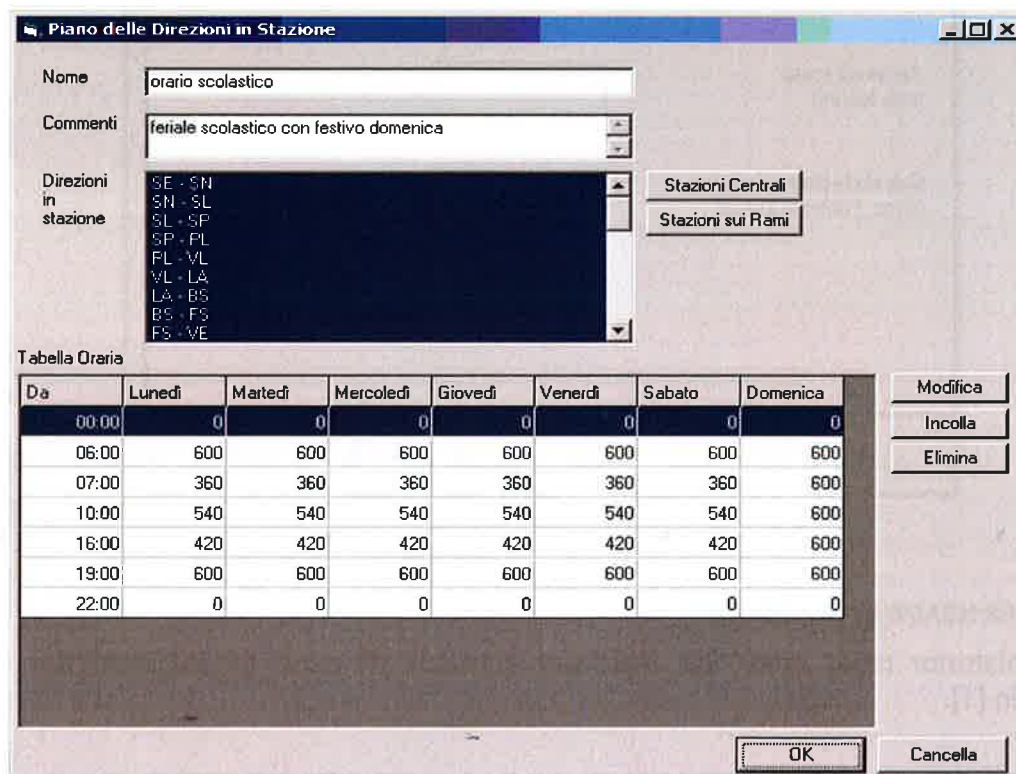
The user interface to create or manage a schedule consist of two forms:

Technical Specification – SA Gateway

1. The Schedule management form



2. The Station direction plan management form:



| Da | Lunedì | Martedì | Mercoledì | Giovedì | Venerdì | Sabato | Domenica |
|-------|--------|---------|-----------|---------|---------|--------|----------|
| 00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:00 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| 07:00 | 360 | 360 | 360 | 360 | 360 | 360 | 600 |
| 10:00 | 540 | 540 | 540 | 540 | 540 | 540 | 600 |
| 16:00 | 420 | 420 | 420 | 420 | 420 | 420 | 600 |
| 19:00 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| 22:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The Gateway Workstation Software provides functions for:

- creating schedules
- modifying headway schedules
- deleting schedules

5.7 ENTER LOGBOOK TEXT

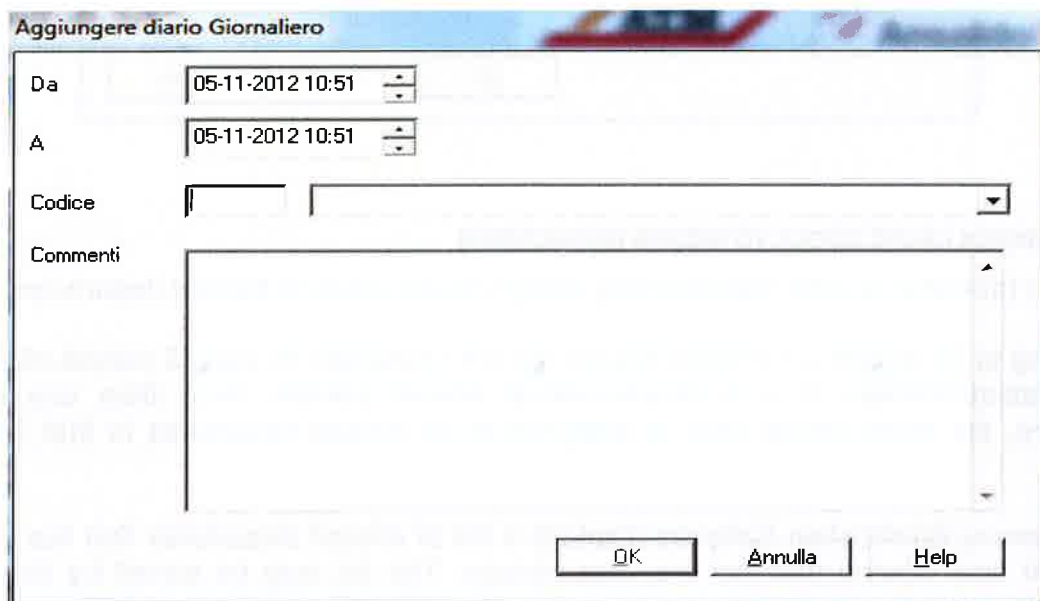
The Gateway System contains a logbook, where users (operators and administrators) can enter text describing events that are important to remember (for example when assigning cause codes to missed departures).

For each logbook text the user must enter the following information:

- Time interval that the logbook text is related to.
- A 2-digit code mapped to predefined text. Instead of entering the code the user may select the predefined text from a list.
- Optionally a text of maximum 3000 characters

When logbook text is saved to the database the following information is appended:

- Time;
- Name of user.



5.8 CREATE LOGBOOK CODES

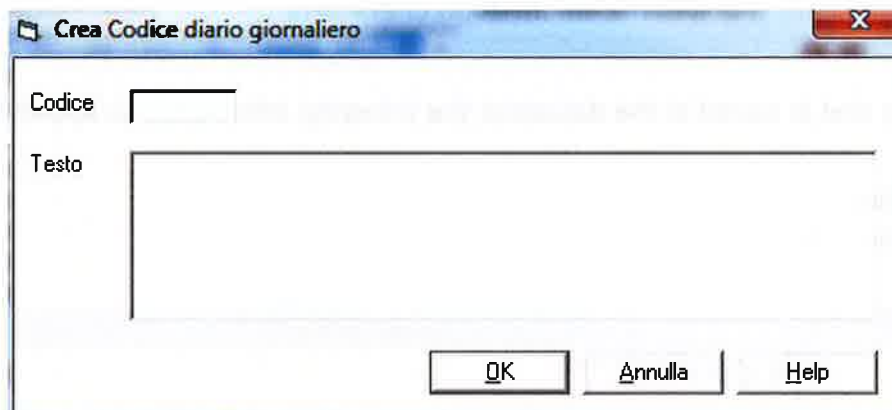
The administrator may create, delete and modify logbook codes and texts.

5.9 CREATE ADDITIONAL CAUSE CODES

The following cause codes are predefined by the Gateway System:

- Quality Exclusion
- Equipment
- Civil Works
- Operator
- Maintenance
- Other

The administrator may create additional cause codes that can be assigned to missed departures.



5.10 ASSIGN CAUSE CODES TO MISSED DEPARTURES

The user (operator or administrator) may assign cause codes to missed departures.

According to [1] section 2.1 missed departures are calculated for each 3 minute-interval on each station/direction. If a 3 minute-interval should contain more than one missed departure, the same cause code is assigned to all missed departures in that 3-minute interval.

The Gateway Workstation Software displays a list of missed departures that lies within a date and time interval that the user has chosen. The list may be sorted by time or by station, time.

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The Gateway Workstation Software also displays a list of logbook messages that are related to date interval that the user has chosen. The user may select one or more missed departures from the list and in one operation assign a cause code selected from a list of cause codes. Assigned cause codes may be reassigned to other cause codes or deleted. Likewise the user may select one or more missed departures from the list and in one operation assign a logbook text selected from the displayed list. Assigned logbook texts may be reassigned or deleted.

Assegnare codice delle cause per le mancate partenze

Da

A

Ordina per ☒ Tempo ☐ Stazione, direzione, tempo

| Mancate Partenze | Codice delle cause |
|------------------|-------------------------|
| | A Quality Exclusion [0] |
| | B Equipment [0] |
| | C Civil works [0] |
| | D Operator [0] |
| | E Maintenance [0] |
| | F Other [0] |

Numero Mancate partenze: 0 Numero 0 Numero mancate partenze con codice assegnato: 0

Codice diario giornaliero

5.11 ENTER MANUAL LOG FILE

The administrator may enter log files manually.

The manual log files are read and interpreted in the same way as log files automatically read from the ATC server with one exception: log messages originating from manually entered files are marked as manual log messages and identification of the file (filename) and administrator (username) is stored with the log message.

Manual log files must be placed in a local folder or a network folder pointed to by the administrator using a standard Windows browse dialog. FTP is NOT used for manual files.

5.12 REMOVE MANUAL LOG FILE

The administrator may remove log files that has been entered manually.

The administrator select the log file to remove from a list of log files that have previously been entered manually. The log files are identified by:

- Filename
- Time of import
- Name of user who entered the file

5.13 RESET ERROR STATE

When the Gateway System is in an error state, an error message is displayed by the Gateway Workstation Software on the display and in future generated SA reports. Error states may be caused for example by invalid log files.

To remove the error messages, the user (operator or administrator) must manually reset the error state.

5.14 REPORT: SA CALCULATION

The users (operator, administrator or read-only user) may generate a report containing a SA calculation. The user must specify a period for the calculation (from-date and to-date).

The report contains the following information:

- Period of calculation.
- Version number of the Gateway Software.
- Total number of planned departures, actual departures, missed departures and unplanned departures.
- Number of missed departures assigned to each cause code

Technical Specification – SA Gateway

- Calculated SA(total), SA(QE) and SA(OM) according to the rules described in [1] 2.1.
- Headway schedule(s) used in the calculation. Each headway schedule is shown in details.
- Values of system settings that affects SA calculation.
- List of all missed departures. Assigned cause codes and/or logbook texts (if any) are shown with each missed departure.
- List of all unplanned departures.
- Error message if invalid log file(s)
- List of manual log files involved in the calculation

The report is generated on the basis of log messages, assigned cause codes, headway schedules and system settings at the time when the report is generated. If log messages, assigned cause codes, headway schedules or system settings are modified, it will not be possible to reproduce the (same) report. The report shall be clearly marked with the username and date and time that it was run.

The report may be displayed on the screen, printed or saved to a file in a standard non-editable format (for example PDF).

5.15 REPORT: GATEWAY EVENT LOG

The users (operator, administrator or read-only user) may generate a report from the Gateway Event Log (see 8). The user must specify a period (from-date/time and to-date/time).

The report contains all events within the period. For each event the information contained in the report is specific to the type of event.

The report may be displayed on the screen, printed or saved to a file in a standard non-editable format (for example PDF).

5.16 REPORT: LOGBOOK

The users (operator, administrator or read-only user) may generate a report from the Logbook (See 5.7). The user must specify a period (from-date/time and to-date/time).

The report contains the following information for each logbook text:

- Date/Time when logbook text was entered.
- Name of the user who entered the logbook text.
- Time interval entered by the user.
- Code and predefined text.

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- The text entered by the user.
- Optionally a list of all missed departures that this logbook text has been assigned to.

The report shall be clearly marked with the username and date and time that it was run. The report may be displayed on the screen, printed or saved to a file in a standard non-editable format (for example PDF).

6 FORMAT OF LOG FILES

6.1 ATC LOG FILES

6.1.1 General format

The log files contains multiple ASCII lines terminated by a line feed character. Each line contains one log message.

Each log message contains one or more tokens in the form

token-id="token information"

The token information part is enclosed in double quotes and has a variable length.

Each log message must at least contain the following tokens:

- *FMT="formatted ASCII text specific for each message type"*
- *EQ="message type"*
- *TS="time stamp in the format CCYYMMDDHHmmSS"*

There may be additional tokens dependant on the message type.

6.1.2 Log messages related to departures

6.1.2.1 Arrival log message

Tokens that must be contained in the arrival log message:

FMT="dt , (T) oic , train-id , Station stax at time Stopping YES/NO Loading YES/NO "
STY="T"

STRPVID="physical vehicle id"

STRTID="train-id"

EQ="TRAIN_ARRIVAL_STATS"

TS="*time stamp*"

Variable fields in the FMT-token:

| | |
|-----------------|--|
| <i>dt</i> | A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored. |
| <i>oic</i> | Object Identification Code. Is ignored. |
| <i>train-id</i> | Identification of the train. |
| <i>stax</i> | 3-letter station-id (acronym for the station) followed by platform (1 or 2). |
| <i>time</i> | A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored. |

6.1.2.2 Open doors log message

Tokens that must be contained in the open doors log message:

FMT="*dt* , (l) *oic* , *train-id* , Open Doors *stax*"
STY="l"
STRPVID="*physical vehicle id*"
STRTID="*train-id*"
EQ="TTT_OBSI_ATP_DOORS_CLOSED_OFF"
TS="*time stamp*"

Variable fields in the FMT-token:

| | |
|-----------------|--|
| <i>dt</i> | A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored. |
| <i>oic</i> | Object Identification Code. Is ignored. |
| <i>train-id</i> | Identification of the train. |
| <i>stax</i> | 3-letter station-id (acronym for the station) followed by platform (1 or 2). |

6.1.2.3 Close doors log message

Tokens that must be contained in the close doors log message:

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FMT="*dt* , (I) *oic* , *train-id* , Close Doors *stax*"

STY="I"

STRPVID="*physical vehicle id*"

STRTID="*train-id*"

EQ="TTT_OBSI_ATP_DOORS_CLOSED_ON"

TS="*time stamp*"

Variable fields in the FMT-token:

- dt* A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored.
- oic* Object Identification Code. Is ignored.
- train-id* Identification of the train.
- stax* 3-letter station-id (acronym for the station) followed by platform (1 or 2).

6.1.2.4 Departure log message

Tokens that must be contained in the departure log message:

FMT="*dt* , (T) *oic* , *train-id* , Station *stax* at *time* Stopped YES Loaded YES "

STY="T"

STRPVID="*physical vehicle id*"

STRTID="*train-id*"

EQ="TRAIN_DEPARTURE_STATS"

TS="*time stamp*"

Variable fields in the FMT-token:

- dt* A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored.
- oic* Object Identification Code. Is ignored.
- train-id* Identification of the train.
- stax* 3-letter station-id (acronym for the station) followed by platform (1 or 2).
- time* A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored.

Please note:

- Departure log messages containing “Stopped NO” and/or “Loaded NO” are ignored, since they do not describe a valid departure.

6.1.3 Identifying valid departures

In order to identify a valid actual departure, the following sequence (after sorting by timestamp) of log messages related to the same train must be received from the ATC log files:

1. Arrival
2. Open doors from same station
3. Close doors from same station. There must be at least *MinOpenDoorsTime* seconds between the open doors and close doors log message as determined by subtracting the timestamp of the close doors log message from the timestamp of the open doors log message.
4. Departure from same station.
5. Arrival to another station. This also determines the direction of the train according to the station topology (see 7)

This should handle the following examples of invalid departures:

- More than one log message for the same actual departure
- Train runs to another platform of the same station
- The train has stopped with doors open for less than the required time.
- The platform screen doors failed to open/close in the approved time.
- Train is running in the “wrong” direction. E.g. more trains in one direction than in the other direction.

As stated earlier, departure log messages with “Loaded NO” in the FMT-token are ignored. This should handle the following examples of invalid departures:

- The train runs to the Depot
- The train runs to a stabling track
- The train is a test train (not carrying passengers)
- The train is a rescue vehicle
- The train is a maintenance vehicle

6.1.4 Log messages relevant for SAP

The following log messages are stored in the Gateway database when read from log files as candidates to be exported to SAP:

6.1.4.1 Kilometer reading log message

Tokens that must be contained in the kilometer reading log message:

FMT="*dt* (*l*) *train-id* Total Kilometers for Vehicle = *kilometers* at *station stax-y*"

STY="I"

EQ="TTT_OBSI_CCU_KILOMETERS"

STRTID="*train-id*"

TS="*time stamp*"

Other tokens in this log message are ignored.

Variable fields in the FMT-token:

| | |
|-------------------|--|
| <i>dt</i> | A time stamp in the format DD/MM/YYYY HH:mm:ss. Is ignored. |
| <i>train-id</i> | Identification of the train. |
| <i>kilometers</i> | Kilometer reading for the train |
| <i>station</i> | Full station name |
| <i>stax</i> | 3-letter station-id (acronym for the station) followed by platform (1 or 2). |
| <i>y</i> | ? (ignored). |

7 STATION TOPOLOGY

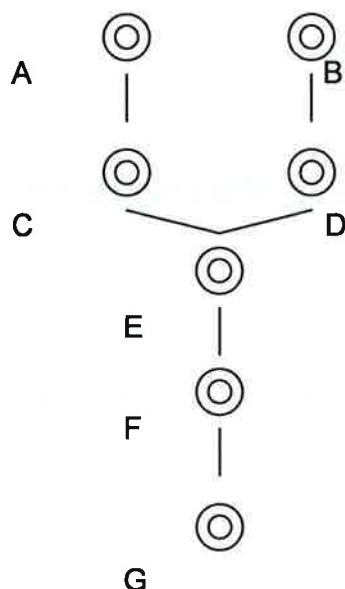
All stations are defined in the database.

For each station the following information is stored:

- Station id: 3-letter acronym
- Station name
- Number of directions
- For each direction: the next station

This information should be sufficient to both define all stations and to define the topology.

Consider the following example:



| Station | Number of directions | Next Stations |
|---------|----------------------|---------------|
| A | 1 | C |
| B | 1 | D |
| C | 2 | A, E |

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| Station | Number of directions | Next Stations |
|---------|----------------------|---------------|
| D | 2 | B, E |
| E | 3 | C, D, F |
| F | 2 | E, G |
| G | 1 | F |

There is no user interface for modifying the station topology. Modifications must be done directly in the database.

Please note that the number of directions may from station to station.



8 GATEWAY EVENT LOG

The Gateway database contains a log of internal events. This log should not be confused with the log files received from the ATC Server

The following events are logged in the Gateway Event Log:

8.1 INVALID LOG FILE

Information logged:

- Date, time
- Name of log file
- Line number
- Error description

8.2 MANUAL LOG FILE ENTERED

Information logged:

- Date, time
- Name of log file
- Name of user

8.3 HEADWAY SCHEDULE MODIFIED

Information logged:

- Date, time
- Name of user
- Identification of the headway schedule (base or validity period)

8.4 ERROR STATE RESET

Information logged:

- Date, time
- Name of user
- Description of the error that has been reset

8.5 LOG MESSAGES EXPORTED TO SAP

Information logged:

- Date, time
- Name of user

8.6 LOGBOOK CODE CREATED/DELETED/MODIFIED

Information logged:

- Date, time
- Name of user
- Description of logbook code
- Operation: Created/Deleted/Modified

8.7 ADDITIONAL CAUSE CODE CREATED

Information logged:

- Date, time
- Name of user
- Description of cause code
- Operation: Created/Deleted/Modified

8.8 CONNECTION TO EXTERNAL SERVER BROKEN

Information logged:

- Date, time
- Type of server (ATC 1, ATC 2)
- FTP parameters

9 MISCELLANEOUS REQUIREMENTS

9.1 SUMMER/WINTER TIME

The Gateway System handles summer/winter time in the following way:
In the time intervals.

- between 02:00 and 03:00 at the date of transition from winter to summer time (1 hour)
- between 02:00 and 03:00 at the date of transition from summer to winter time (2 hours)

a special headway schedule with no departures is used , and all log messages related to departures that lies within these time intervals are ignored.

The effect of this is that no planned, actual, missed or unplanned departures are counted in these time intervals, which again has the effect that the SA calculation is not influenced by these time intervals.

9.2 TEST DATABASE

The Gateway Database Server contains two databases:

- The production database
- The test database

The Gateway Software on one computer may be configured for using either database. This makes it possible to test new versions of the software without influencing the operational gateway software.

9.3 PERFORMANCE

9.3.1 Gateway Server Performance

The Gateway Server must be able to read and process a new ATC log file in 3 minutes as a maximum, not including the time for transferring the file from the ATC Server to the Gateway Server.

It is prerequisite for this requirement that:

- The log file only contains log messages for the latest 5-minute interval.

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- The log file as a maximum contains 100 arrival, 100 open doors, 100 close doors and 100 departure log messages.
- The log file as a maximum contains 100 other log messages.
- The Gateway Server is initially idle, i.e. not busy reprocessing after changes in headway schedules, system settings etc.

Processing ATC log files involves:

- Detect duplicate log messages
- Save log messages to database
- Identify valid departures
- Calculate actual departures, missed departures and unplanned departures.

9.3.2 Gateway Client Performance

The Gateway Client must be able to continuously calculate the SA(total) (See 5.2) at least each 5 minutes. The prerequisite for this requirement is that the necessary data has been prepared by the Gateway Server (see 9.3.1).

The Gateway Client must be able to generate the SA Report (see 5.14) in 5 minutes as a maximum, not including the print-out time. The prerequisites for this requirement are:

- The necessary data has been prepared by the Gateway Server (see 9.3.1).
- The period is maximum 1 month
- Maximum number of missed departures is 1000
- Maximum number of unplanned departures is 1000
- Maximum number of headway schedules involved in the calculation is 10
- Maximum number of manual log files is 10

9.4 USER-DEFINED REPORTS

User-defined reports may be generated in for example Microsoft Access or similar tools provided that the user has a good knowledge of the database design.

Microsoft Access or other similar tools are not part of the Gateway System.

9.5 USER INTERFACE

All user interfaces must be in Italian and make use of Windows menus, dialogs etc. Use of command lines or data manipulation language is not permitted.

9.6 DOCUMENTATION

The Gateway documentation will include:

- User manual (Italian)
- Technical Specification (English)

9.7 HELP TEXTS

The Gateway System User Manual in Italian and is available online from the Gateway Workstation. There is no context sensitive help.

9.8 INTERNAL DESIGN

The internal design must be modular.

10 PRODUCT BREAKDOWN STRUCTURE

| <i>Item Description</i> | <i>Level</i> | <i>Quantity</i> | <i>Part Number (OIC)</i> |
|--|--------------|-----------------|--------------------------|
| Gateway System | 1 | 1 | Not Applicable |
| Hardware | 2 | 1 | Not Applicable |
| HP Server type ML 330 G6 | 3 | 1 | GTWHDW001 |
| CPU Xeon Quad-core 1,60 GhZ E5603 64 BIT | 4 | 1 | Not Applicable |
| Memory 8GB DDR3 1333 MHz | 4 | 1 | Not Applicable |
| Ethernet board | 4 | 1 | Not Applicable |
| SATA Hard disk 250 Gb | 4 | 2 | Not Applicable |
| ATI RN50 64 Mb | 4 | 1 | Not Applicable |
| Software | 2 | | Not Applicable |
| Windows server standard 2012 (English) | 3 | 1 | GTWSW001 |
| Microsoft SQL server standard 2012 (English) | 3 | 1 | GTWSW002 |

