



Cisco Unified Workforce Optimization

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Data Import Reference Guide

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Introduction

You can import and integrate historical and real-time data from any automatic call distributor (ACD) to the Workforce Management (WFM) database using one of the following tools.

- **GIS API.** The [GIS API](#) is used to import both historical and real-time data to the WFM database at specified intervals. WFM uses this data to generate reports and statistics.
- **Workforce Management Historical Import Tool (WHIT).** [WHIT](#) is used to convert existing historical data from a non-WFM system into data files that can be loaded into WFM. You might want to use WHIT if you are installing a new WFM system.

GIS API

The GIS API is part of WFM and requires no separate installation or executable to function.

Note: File paths shown in this document are the default file path. WFM can be installed to a custom location, so your file path might differ.

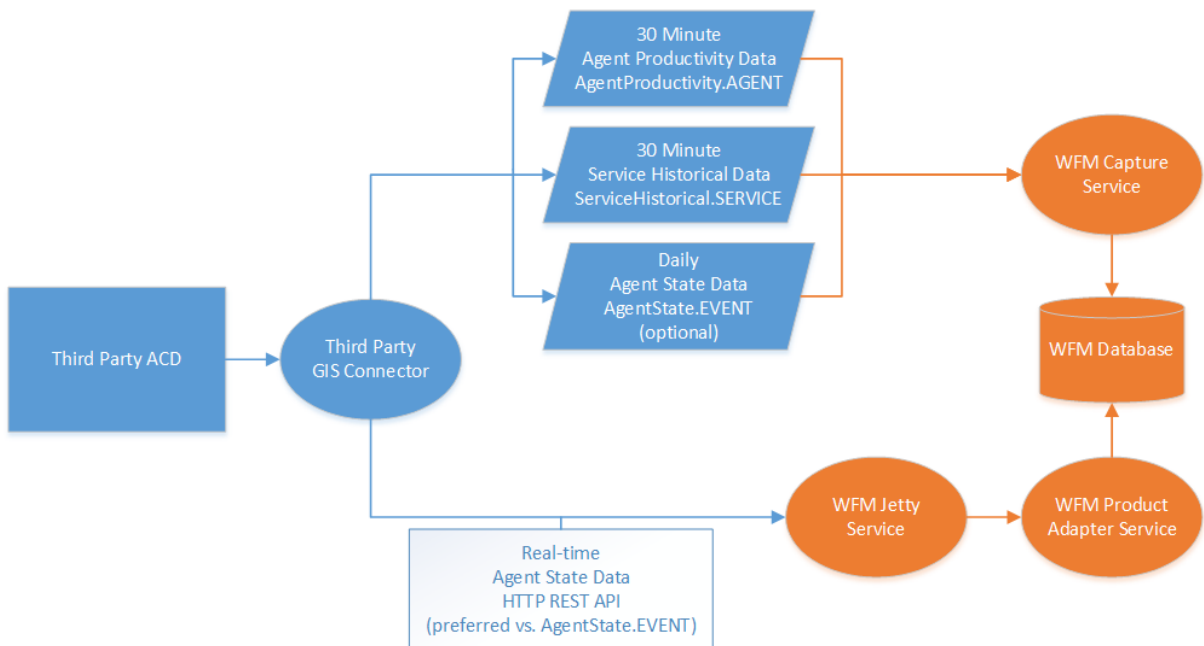
Historical Data Capture

The following tasks are required to import historical data from an ACD to the WFM database:

1. Write scripts that retrieve the historical data from the ACD.
2. Create a batch process to run the scripts at specified intervals to retrieve the historical data and convert it to the required comma-delimited text file format.
3. Place the comma-delimited text files in a predefined folder on the WFM server using FTP or some other tool.

The GIS API processes the comma-delimited text files and writes the historical data to the WFM database.

The following graphic is a high-level depiction of the historical data integration process.



Requirements

The following are conditions that must be met in order to assure successful call and non-call data capture.

- Service historical data is calculated from the summation of agent service productivity data. As a result, both the AgentProductivity.AGENT and ServiceHistorical.SERVICE files must be available for a given period for capture to take place. If both files are found, but data is missing from one, certain values might be taken to be zero (the sum of zero items equals zero). It is also important that the agent productivity and service historical data are consistent in terms of which agents and services have data.
- Only one file of each type should be written per historical period. A second file of the same type for the same period will cause data from the first file to be overwritten.
- The same ACD number should be used in the file name and file headers for all files.

File Usage

Use the three capture files as follows.

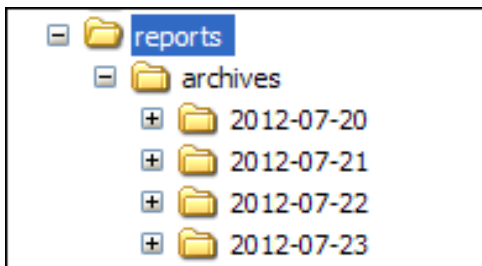
File	Use
.SERVICE	This file is required and used for service queue statistics.
.AGENT	This file is required in order to process the files for the given intervals. It is not necessary for the file to contain any data rows, only the header row. However, if you want to track individual agent productivity, then it should include data rows.
.EVENT	<p>This file is optional. It can be used as one method to capture real-time events to calculate agent conformance and adherence.</p> <p>The GIS API processes this file as soon as it drops into the Reports folder. The frequency of new files dropping into the Reports folder determines how close to real time the data is.</p> <div style="background-color: #e1f5fe; padding: 10px; border: 1px solid #ccc;"> <p>Note: The preferred method of capturing real-time events is through the use of the Real-Time Data Capture API. See Real-Time Data Capture API for more information.</p> </div>

Text File Locations

The comma-delimited text files must be placed in the following location on the server that hosts the WFM Capture service:

```
C:\Program Files (x86)\Common Files\WFM\reports\
```

When the text files are processed by WFM, they are automatically moved to the archives folder in a subfolder named for the date on which they were processed, as shown in the figure below. The format of the archive folder name is YYYY-MM-DD.



ACD Numbering

ACDs from which data is imported are assigned numbers to identify them as the data source. The ACD numbers are assigned by the author of the scripts that extract the data from the ACD and write it to the comma-delimited text files.

Even if there is only one ACD, that ACD must be assigned a number. In the examples in this document, the ACD is assigned the number 0. At this time, the ACD number is not used by the GIS API, but it might be used in the future. It is currently a best practice to use 0 in GIS file names and file headers.

Additionally, the agent identifiers (ACD ID in WFM) and service queue identifiers (Service Queue ID in WFM) in GIS text files must be unique across the WFM installation. In a multiple-ACD environment, this can be accomplished by having the scripts prepend the ACD number and a delimiter character to the agent's or service queue's identifier in the GIS text files, and setting up agents/service queues accordingly in WFM.

Text File Details

This section provides the details of the three comma-delimited text files used by the GIS API. These files are the following:

- AgentProductivity.AGENT
- ServiceHistorical.SERVICE
- AgentState.EVENT

The data in the files is by 30-minute intervals. This interval is not configurable.

Data Type Definitions

The data types noted in this section have specific definitions. These definitions are detailed in the following table.

Data Type	Definition
date	A date expressed in YYYY-MM-DD format.
double	A floating point value expressed in a manner that can be parsed as a signed double-precision floating point value. Any value allowed as a long is also allowed as a double. The + sign should be omitted.
integer	An integer expressed as a signed decimal integer value, without leading zeros, whose value is at least -0x8000 and at most 0x7fff. The + sign should be omitted.
long	An integer expressed as a signed decimal integer value, without leading zeros, whose value is at least -0x80000000 and at most 0x7fffffff. The + sign should be omitted.
nonnegative double	A floating point value expressed in a manner that can be parsed as a signed double-precision floating point value, whose value is at least 0x00000000. Any value allowed as a non-negative long is also allowed as a non-negative double. The + sign should be omitted.
nonnegative long	An integer expressed as a signed decimal integer value, without leading zeros, whose value is at least 0x00000000 and at most 0x7fffffff. The + sign should be omitted.
null	The literal value NULL (case insensitive).
positive double	A floating point value expressed in a manner that can be parsed as a positive signed double-precision floating point value. Any value allowed as a positive long is also allowed as a positive double. The + sign should be omitted.

Data Type	Definition
positive long	An integer expressed as a signed decimal integer value without leading zeros, whose value is at least 0x00000001 and at most 0x7fffffff. The + sign should be omitted.
time	A time expressed in any of the following formats: <ul style="list-style-type: none"> ■ hh:mm ■ hh:mm:ss ■ hh:mm:ss.sss
timestamp	A time stamp consisting of the following data types: <date> <time> <tzoffset> If the tzoffset is omitted, the date and time are assumed to be in the default time zone of the WFM server.
tzoffset	A time zone offset expressed in +HHMM, -HHMM, HHMM format or the literal values GMT or UTC.

AgentProductivity.AGENT File

The AgentProductivity.AGENT file contains agent productivity data by 30-minute intervals from 00:00 to 23:59.

File Name Format

<date/time><tzoffset>_<ACD#>_AgentProductivity.AGENT

<date/time>	The date and time the file was generated, in YYYYMMDDHHMM format. Example: 201301151430 (14:30 on January 15, 2013). Time is in 24-hour format.
-------------	--

<tzoffset>	<p>The time zone (where the ACD is located) date/time offset from GMT in AHHMM format, where:</p> <ul style="list-style-type: none"> ■ A is either P (positive) or N (negative), characterizing the offset from GMT ■ HH is the number of offset hours ■ MM is the number of offset minutes <p>Example: If the ACD is in GMT, then the <tzoffset> is P0000. If the ACD is in EST (GMT-0500), then the <tzoffset> is N0500.</p>
<ACD#>	<p>The ACD number. Can be zero (0) or a positive number with as many digits as desired.</p>

File Header

AGENT DATE: <date> INTERVAL: <time> TZOFFSET: <tzoffset> ACD: <ACD#>

<date>	<p>The date the file was generated, in YYYY-MM-DD format.</p>
<time>	<p>The beginning of the 30-minute interval covered by the data, in HH:MM 24-hour format.</p>
<tzoffset>	<p>The time zone (where the ACD is located) offset from GMT, in +HHMM, -HHMM, or HHMM format. If plus or minus is not specified, the offset is assumed to be plus (positive).</p>
<ACD#>	<p>The number of the ACD that is the source of the data. Currently this value is not used, but there must be a number. Use 0 as a default value if no other number is valid. It is recommended that it be the same as the ACD# used in the file name.</p>

The file header must be the first non-blank line in the file.

Note: The AGENT DATE, INTERVAL, and TZOFFSET values must represent a period start time that matches those in the file name as well as a historical period supported by WFM. It is not required that the individual values match, but only to mean the same point in time. For example, if

the file is named:

```
201301231800N0500_0_AgentProductivity.AGENT
```

and the header is:

```
AGENT DATE: 2013-01-23 INTERVAL: 23:00 TZOFFSET: 0000 ACD: 0
```

there is no error, because each is expressing the same point in time in different time zones. The time 18:00 in the time zone N0500 (a 5-hour negative offset from GMT) is the same as the time 23:00 in the GMT time zone.

Column Header

```
<columnname1>,<columnname2>,<columnname3>. . .,<columnnameN>
```

Where <columnname1> through <columnnameN> are the names of columns represented in the file.

Column names are not restricted to required and optional columns. You can add additional unrecognized columns and associated data (for example, agent names or service names) to make the GIS files more human-readable. The GIS API ignores these columns and their associated data.

Column order is not specified. The only requirement for column order is that the column names are in the same order as the data in each line.

Column names cannot contain commas, are case sensitive, and cannot start or end with a space (such spaces are automatically trimmed when the file is parsed). Column names must be unique. Duplicate column names (after space trimming) result in an error.

The column header must be the second non-blank line in the file.

Data Lines

```
<columnvalue1>,<columnvalue2>,<columnvalue3>. . .,<columnvalueN>
```

Where <columnvalue1> through <columnvalueN> are the values of <columnname1> through <columnnameN> for one row of data.

Each line of data corresponds to one data item within the file, with one value for each column, in the same order as the column header. The values are separated by commas. No value can contain a comma. Data values are trimmed of leading and trailing white space when parsed.

The third and subsequent non-blank lines in the file must be data lines. It is possible for a file to contain no data lines. This means there were no data items for that period.

Required Columns

The following table describes the columns that are required to be in the AgentProductivity.AGENT file.

Column	Data Type	Description
acdAgentId	string	The ID of the agent in the ACD.
acdServiceId	positive long	The numerical ID of the service queue in the ACD.
contacts Handled	nonnegative double	The number of contacts for the service queue handled by the agent during the period.
totalTalkSeconds	nonnegative double	The total talk time on contacts for the service queue handled by the agent during the period. A contact's talk time can start in the previous period; the entire talk time is counted.
totalHold Seconds	nonnegative double	The total hold time on contacts for the service queue handled by the agent during the period. A contact's talk time can start in the previous period; the entire talk time is counted.
totalAfterContact WorkSeconds	nonnegative double	The total after contact work time on contacts for the service queue handled by the agent during the period. A contact's talk time can start in the previous period; the entire talk time is counted.

Column	Data Type	Description
totalPeriodHandle TimeSeconds	nonnegative double	<p>The total time the agent spent handling contacts (talk, hold, work) for the service queue that occurred within the boundaries of the period.</p> <p>This metric (A) is differentiated from the sum of totalTalkSeconds + totalHoldSeconds + totalAfterContactWorkSeconds (B) in that it does not include time that exceeds the period boundary. For example, if a call is answered by the agent at 09:29 and the call ends at 9:33 with no after-contact work, and if the ACD considers the call to be handled during the 09:30-10:00 period, then the call contributes 4 minutes to B (09:29-09:33) but only 3 minutes to A (09:30-09:33).</p>
totalUnprorated ReadyWaiting Seconds	nonnegative double	The total Ready/Waiting time for the agent during the period, across all service queues.
totalUnprorated NotReadyBusy Seconds	nonnegative double	The total Not Ready/Busy time for the agent during the period, across all service queues (not counting time while the agent is handling a contact or reported as Ready/Waiting on another service queue).
totalUnprorated InSession Seconds	nonnegative double	The total in session time (logged in time) for the agent during the period, across all service queues.

Optional Columns

The following table describes the columns that are optional in the AgentProductivity.AGENT file. If not included, the default value is used for the metric.

Column	Data Type	Description
periodStart	timestamp	A timestamp representing the start of the interval period. If included, this field must refer to the same point in time (although not necessarily expressed in the same time zone) as the period start time in the file name and in the file header. If it does not match, an error occurs.
contacts TransferredOut	nonnegative double	Default value = 0. The number of contacts transferred out by the agent during the period.
contacts TransferredIn	nonnegative double	The number of contacts transferred in to the agent during the period. This field is reserved for future use. Currently the value is ignored.
contactsExternalIn	nonnegative double	Default value = 0. The number of external inbound contacts to that agent during the period.
contactsExternalOut	nonnegative double	Default value = 0. The number of external outbound contacts from the agent during the period.
totalReserved Seconds	nonnegative double	Default = 0. The total reserved time for contacts for the service queue for the agent during the period. If non-zero, the reserved time is not counted as Ready/Waiting time.

Column	Data Type	Description
totalProrated WaitingSeconds	nonnegative double	<p>The total prorated Ready/Waiting time for the agent and service queue.</p> <p>When totaled across all service queues, this must be equal to the required field totalUnproratedReadyWaitingSeconds.</p> <p>If the prorated values are omitted or set to zero, the Capture service divides the unprorated values equally among the service queues for which the agent has agent-service queue productivity data during the period.</p> <p>If the prorated values are specified, and add up to the unprorated values, then the prorated values are used for the agent-service queue combination.</p> <p>If the prorated values are specified and do not add up to the unprorated values, then for each agent-service queue entry, the Capture service recalculates the prorated value as the unprorated value weighted by the specified prorated value divided by the sum of the specified prorated values for all of the service queues for which the agent has agent-service queue data in the period.</p> <p>This is most useful for ACDs that assign Ready/Waiting time to an agent for one service queue and Not Ready/Busy time for other service queues. It is important that unprorated and prorated Not Ready/Busy times do not include times when the agent is accruing Ready/Waiting or other time for other service queues.</p> <p>For ACDs that report Not Ready/Busy time for service queues when the agent is handling calls or Ready/Waiting time in another service queue, it is important to remove all of the duplicate time and</p>

Column	Data Type	Description
		report Not Ready/Busy time only when an agent is Not Ready/Busy in all service queues simultaneously. For this type of ACD, the total unprorated Ready/Waiting time is the sum of each service queue's Ready/Waiting time and the total unprorated Not Ready/Busy time is computed from the total in-session (logged-in) time less the total in-service (Talk, Hold, After Work, Ready/Waiting, and Reserved) time.
totalProratedNotReady BusySeconds	nonnegative double	The total prorated Not Ready/Busy time for the agent and service queue. When totaled across all service queues, this is equal to the required field totalUnproratedNotReady BusySeconds. For a detailed explanation of this value, see the description for the field totalProratedReady WaitingSeconds.

Column	Data Type	Description
contactsAnswered	nonnegative double	<p>The number of contacts for the service queue answered by the agent during the period.</p> <p>The difference between this field and the required field contactsHandled is up to the implementer. In WFM, contactsHandled is used for things such as forecasting numbers of contacts and computing average handle times, while contactsAnswered is used for computing average speed of answer. Some ACDs make a distinction between the two fields; for example, in some ACDs a handled contact is a contact that ends during the reporting interval, while an answered contact is a contact that is answered during the reporting interval.</p> <p>This field is reserved for future use. Currently the value is ignored.</p>
totalAnswerDelaySeconds	nonnegative double	<p>The total delay in answering contacts for the service queue for contacts the agent answered during the period.</p> <p>This field is reserved for future use. Currently the value is ignored.</p>

Example

File name: 201301151330N0600_0_AgentProductivity.AGENT

AGENT DATE: 2013-01-15 INTERVAL: 13:30 TZOFFSET: -0600 ACD: 0

acdAgentId,acdServiceId,contactsHandled,contactsAnswered,
 contactsTransferredOut,contactsExternalIn,contactsExternal
 Out,totalTalkSeconds,totalHoldSeconds,totalAfterContact
 WorkSeconds,totalPeriodHandleTimeSeconds,totalUnprorated
 ReadyWaitingSeconds,totalUnproratedNotReadyBusySeconds,
 totalUnproratedInSessionSeconds

5009,5236,7,8,0,0,0,933.728,0.000,228.718,1215.857,12.000, 102.460,1800.000

5009,5240,4,4,0,0,0,365.039,0.000,104.644,469.683,12.000, 102.460,1800.000

5073,5236,1,1,0,0,0,380.596,0.000,9.510,215.077,1.000, 1583.923,1800.000

5073,5240,0,0,0,0,0,0.000,0.000,0.000,0.000,1.000,1583.923, 1800.000

ServiceHistorical.SERVICE File

The ServiceHistorical.SERVICE file contains service queue data by 30-minute intervals from 00:00 to 23:59 for both interactive and non-interactive service queue types.

- Interactive service queue types consist of contacts in which agents and customers have real-time communication, such as voice (call) or chat.
- Non-interactive service queue types consist of contacts in which agents and customers do not have real-time communication, such as email, fax, and social media, as well as contact activities like stuffing envelopes.

File Name Format

<date/time><tzoffset>_<ACD#>_ServiceHistorical.SERVICE

<date/time>	The date and time the file was generated, in YYYYMMDDHHMM format. Example: 201301151430 (14:30 on January 15, 2013). Time is in 24-hour format.
<tzoffset>	The time zone (where the ACD is located) date/time offset from GMT in AHHMM format, where: <ul style="list-style-type: none"> ■ A is either P (positive) or N (negative), characterizing the offset from GMT ■ HH is the number of offset hours ■ MM is the number of offset minutes Example: If the ACD is in GMT, then the <tzoffset> is P0000. If the ACD is in EST (GMT-0500), then the <tzoffset> is N0500.
<ACD#>	The ACD number. Can be zero (0) or a positive number with as many digits as desired.

File Header

SERVICE DATE: <date> INTERVAL: <time> TZOFFSET: <tzoffset> ACD: <ACD#>

<date>	The date the file was generated, in YYYY-MM-DD format.
<time>	The beginning of the 30-minute interval covered by the data, in HH:MM 24-hour format.
<tzoffset>	The time zone (where the ACD is located) offset from GMT, in +HHMM, -HHMM, or HHMM format. If plus or minus is not specified, the offset is assumed to be plus (positive).
<ACD#>	The number of the ACD that is the source of the data. Currently this value is not used, but there must be a number. Use 0 as a default value if no other number is valid. It is recommended that it be the same as the ACD# used in the file name.

The file header must be the first non-blank line in the file.

Note: The SERVICE DATE, INTERVAL, and TZOFFSET values must represent a period start time that matches those in the file name as well as a historical period supported by WFM. It is not required that the individual values match, but only to mean the same point in time. For example, if the file is named:

```
201301231800N0500_0_ServiceHistorical.SERVICE
```

and the header is:

```
SERVICE DATE: 2013-01-23 INTERVAL: 23:00 TZOFFSET: 0000 ACD: 0
```

there is no error, because each is expressing the same point in time in different time zones. The time 18:00 in the time zone N0500 (a 5-hour negative offset from GMT) is the same as the time 23:00 in the GMT time zone.

Column Header

<columnname1>,<columnname2>,<columnname3>. . .,<columnnameN>

Where <columnname1> through <columnnameN> are the names of columns represented in the file.

Column names are not restricted to required and optional columns. You can add additional unrecognized columns and associated data (for example, agent names or service names) to make the GIS files more human-readable. The GIS API ignores these columns and their associated data.

Column order is not specified. The only requirement for column order is that the column names are in the same order as the data in each line.

Column names cannot contain commas, are case sensitive, and cannot start or end with a space (such spaces are automatically trimmed when the file is parsed). Column names must be unique. Duplicate column names (after space trimming) result in an error.

The column header must be the second non-blank line in the file.

Data Lines

<columnvalue1>,<columnvalue2>,<columnvalue3>. . .,<columnvalueN>

Where <columnvalue1> through <columnvalueN> are the values of <columnname1> through <columnnameN> for one row of data.

Each line of data corresponds to one data item within the file, with one value for each column, in the same order as the column header. The values are separated by commas. No value can contain a comma. Data values are trimmed of leading and trailing white space when parsed.

The third and subsequent non-blank lines in the file must be data lines. It is possible for a file to contain no data lines. This means there were no data items for that period.

Required Columns

The following table describes the columns that are required to be in the ServiceHistorical.SERVICE file for both interactive and non-interactive service queue types.

The column names can be interpreted differently for each service queue type. For example, contactsHandled can be thought of as the number of chat contacts handled or the number of email contacts handled.

For non-interactive service queues, if columns such as `contactsAbandoned`, `totalHoldSeconds`, and `totalAnswerDelaySeconds` do not apply, then set the values in these columns to 0 (zero).

Column	Data Type	Description
<code>acdServiceId</code>	positive long	The numerical ID of the service queue in the ACD.
<code>contacts Offered</code>	nonnegative double	The number of contacts for the service queue offered to agents during the period.
<code>contacts Handled</code>	nonnegative double	The number of contacts for the service queue handled by agents during the period.
<code>contacts Answered</code>	nonnegative double	The number of contacts for the service queue answered by the agent during the period. The difference between this field and the required field <code>contactsHandled</code> is up to the implementer. In WFM, <code>contactsHandled</code> is used for things such as forecasting numbers of contacts and computing average handle times, while <code>contactsAnswered</code> is used for computing average speed of answer. Some ACDs make a distinction between the two fields; for example, in some ACDs a handled contact is a contact that ends during the reporting interval, while an answered contact is a contact that is answered during the reporting interval.
<code>contacts Abandoned</code>	nonnegative double	The number of contacts for the service queue abandoned by callers during the period.
<code>totalTalk Seconds</code>	nonnegative double	The total talk time on contacts for the service queue handled by agents during the period.
<code>totalHold Seconds</code>	nonnegative double	The total hold time on contacts for the service queue handled by agents during the period.
<code>totalAfter ContactWork Seconds</code>	nonnegative double	The total after contact work time on contacts for the service queue handled by agents during the period.

Column	Data Type	Description
totalAnswer Delay Seconds	nonnegative double	The total delay in answering contacts for the service for contacts the agent answered during the period
serviceLevel Percent	nonnegative double ≤ 100	The percent of contacts for the service during the period that were answered within the service level threshold.

Optional Columns

The following table describes the columns that are optional in ServiceHistorical.SERVICE file. If not included, the default value is used for the metric.

Columns	Data Type	Description
period Start	timestamp	A timestamp representing the start of the interval period. If included, this field must refer to the same point in time (although not necessarily expressed in the same time zone) as the period start time in the file name and in the file header. If it does not match, an error occurs.
contacts Blocked	nonnegative double	Default value = 0. The number of contacts blocked for the service queue during the period.
service Level Seconds	positive double	The service level threshold in seconds for the service queue during the period. This field is reserved for future use. Currently the value is ignored.

Missing Columns

Some columns, such as totalInServiceSeconds and totalInSessionSeconds, might appear to be missing. In fact, these are values that need to be prorated; they are computed by combining other historical service queue data with agent productivity data. This is done so that per-service queue values from historical

service queue data add up to the same totals as the per-agent-per-service queue values from agent productivity data.

For example, in most ACDs, time in a Ready/Waiting state is not associated with a service queue. Rather, the agent is just in that state. In the AgentProductivity.AGENT file, this total is provided in each agent-service queue entry for the agent as totalUnproratedReadyWaitingTime. From that, we compute a proratedReadyWaitingTime for each service queue (the total unprorated value divided by the number of service queues for which the agent has agent-service queue productivity data during the period).

A similar approach is taken for totalUnproratedNotReadyBusySeconds, which is converted to proratedNotReadyBusySeconds. We use the prorated values to compute totals for a service queue. As a result, we don't count the same time twice (or more for multiple service queues) and the metrics are zero-sum.

If the totalProratedReadyWaitingTime and/or totalProratedNotReadyBusyTime values are specified, we use these as a guide to prorating the unprorated times. If they add up correctly, the specified prorated values are used. If not, we use them as a weight (using the specified prorated value divided by the sum of the specified prorated values across all the service queues for the agent during the interval) for computing the prorated values.

Implementers who want to have more control over how time is prorated, other than dividing by the number of service queues, can add the columns totalProratedReadyWaitingSeconds and totalProratedNotReadyBusySeconds to the AgentProductivity.AGENT file.

It is strongly recommended that you ensure that the sum of the totalProratedReadyWaitingSeconds values for each agent-service queue line for a given agent during a period adds up to the totalUnproratedReadyWaitingSeconds value in each agent-service queue line for that agent, and likewise for Not Ready/Busy time. It is also strongly recommended that you ensure that Not Ready/Busy time is never counted for a service queue if that time is concurrent with time in another state for other service queues.

For example, for ACDs that report Not Ready/Busy time for one service queue while an agent is handling calls in another service queue, the Not Ready/Busy time concurrent with call handling should not be included in the specified unprorated or prorated values. Likewise, if an ACD counts Ready time for one

service queue while also counting Not Ready/Busy time for another service queue, that Not Ready/Busy time should not be included in the specified unprorated or prorated values. Only the total unprorated values `totalUnproratedReadyWaitingTime` and `totalUnproratedNotReadyBusyTime` should be double counted, and only as time an agent is Ready/Waiting for some service queue, and time an agent is Not Ready/Busy for all service queues, respectively.

Example

File name: 201301151330N0600_0_ServiceHistorical.SERVICE

SERVICE DATE: 2013-01-15 INTERVAL: 13:30 TZOFFSET: -0600 ACD: 0

acdServiceId, contactsOffered, contactsHandled, contacts
 Answered, contactsAbandoned, totalTalkSeconds, totalHold
 Seconds, totalAfterContactWorkSeconds, totalAnswerDelay Seconds, serviceLevelPercent
 5236,7,8,9,0,1314.324,0.000,238.228,80929.903,0.000
 5240,4,4,4,0,365.039,0.000,104.644,35600.210,0.000

AgentState.EVENT File

The AgentState.EVENT file contains agent state data by 30-minute intervals from 00:00 to 23:59.

File Name Format

<date/time>_<ACD#>_AgentState.EVENT

<date/time>	The date and time the file was generated, in YYYYMMDDHHMM format. Example: 201301151430 (14:30 on January 15, 2013). Time is in 24-hour format.
<ACD#>	The ACD number. Can be zero (0) or a positive number with as many digits as desired.

File Header

EVENT DATE: <date> ACD: <ACD#>

<date>	The date the file was generated, in YYYY-MM-DD format.
<ACD#>	The number of the ACD that is the source of the data. Currently this value is not used, but there must be a number. Use 0 as a default value if no other number is valid. It is recommended that it be the same as the ACD# used in the file name.

The file header must be the first non-blank line in the file.

Note: The EVENT DATE values must represent the server date that matches both that in the file name and the date of all agent events in the file. For example, if a file is named:

```
20130123_0_AgentState.EVENT
```

then the file must contain only events for January 23, 2013 and no other date in the server time zone. This does not mean that the individual events must be expressed in the server time zone, only that after the events are converted to the server time zone by the Capture service, the date of the converted event timestamp must match the date in the file name and the file header.

Column Header

```
<columnname1>,<columnname2>,<columnname3>. . .,<columnnameN>
```

Where <columnname1> through <columnnameN> are the names of columns represented in the file.

Column names are not restricted to required and optional columns. You can add additional unrecognized columns and associated data (for example, agent names or service names) to make the GIS files more human-readable. The GIS API ignores these columns and their associated data.

Column order is not specified. The only requirement for column order is that the column names are in the same order as the data in each line.

Column names cannot contain commas, are case sensitive, and cannot start or end with a space (such spaces are automatically trimmed when the file is

parsed). Column names must be unique. Duplicate column names (after space trimming) result in an error.

The column header must be the second non-blank line in the file.

Data Lines

```
<columnvalue1>,<columnvalue2>,<columnvalue3>. . .,<columnvalueN>
```

Where <columnvalue1> through <columnvalueN> are the values of <columnname1> through <columnnameN> for one row of data.

Each line of data corresponds to one data item within the file, with one value for each column, in the same order as the column header. The values are separated by commas. No value can contain a comma. Data values are trimmed of leading and trailing white space when parsed.

The third and subsequent non-blank lines in the file must be data lines. It is possible for a file to contain no data lines. This means there were no data items for that period.

Required Columns

The following table describes the columns that are required to be in the AgentState.EVENT file.

Required columns

Column	Data Type	Description
acdAgentId	string	The ID of the agent in the ACD.
eventDateTime	timestamp	A timestamp representing the point in time at which the agent state event took place, consisting of the following data types: <date> <time> <tzoffset> If the tzoffset is omitted, the date and time are assumed to be in GMT time.
agentState	string, long, or null	A code representing the agent state. See Agent State Values for more information.

Optional Columns

The following table describes the columns that are optional in the AgentState.EVENT file. If not included, the default value is used for the metric.

Optional columns

Column	Data Type	Description
reasonCode	long or null	Default value = NULL. The reason code associated with the agent state change.

Agent State Values

The agentState field accepts only certain values. If an event does not match one of these agent states, no line for that event should be written to the file. Each state has an associated integer or string code that can be used as a value. The following table describes the agent states and their associated codes.

Agent states as associated codes

Agent State	Code (Integer)	Code (String)	Description
Logging Out/ Out of Service	1	LO	The agent logs out of the ACD
Ready/Waiting	2	RE	The agent is ready to handle a contact
Talking/In Contact	3	TK	The agent is talking to a contact
Work After Contact	4	WK	The agent is performing after-contact work
On Hold	5	OH	The agent is on hold
Not Ready/Busy	6	NR	The agent is not ready to receive contacts

Only one event should be written per agent per timestamp. If multiple events are written, it is likely (but not guaranteed) that only the last event in the file for the agent for the same timestamp will be captured.

For ACDs that report an agent as Ready/Waiting or Not Ready/Busy for specific service queues, and use one of these values in one service queue while the agent is in another state on another service queue, the events must be converted to be non-service queue specific. For example, if an ACD has an agent as Talking in one service queue and Not Ready/Busy in other service queues, a single TK or 3 agentState should be written.

In general, when an agent is in multiple states for different service queues, and only one event per agent per timestamp is written, priorities are established as follows:

- Every other event takes priority over Logged Out
- Every event except Logged Out takes priority over Not Ready/Busy
- Every event except Logged Out and Not Ready/Busy takes priority over Ready/Waiting

Example

File name: 20130115_0_AgentState.EVENT

EVENT DATE: 2013-01-15 ACD: 0

acdAgentId,eventDateTime,agentState,reasonCode

[lines omitted for brevity]

5009,2013-01-15 09:00:08.977,6,3

5073,2013-01-15 09:00:08.977,3,NULL

5073,2013-01-15 09:00:25.983,4,NULL

5073,2013-01-15 09:01:13.367,2,NULL

5073,2013-01-15 09:01:14.367,3,NULL

[lines omitted for brevity]

5009,2013-01-15 16:51:24.247,3,NULL

5009,2013-01-15 16:55:43.720,5,NULL

5009,2013-01-15 16:56:04.553,3,NULL
5009,2013-01-15 17:01:51.483,4,NULL
5009,2013-01-15 17:02:02.313,1,NULL
5073,2013-01-15 17:04:55.210,4,NULL
5073,2013-01-15 17:05:20.987,1,NULL

Integrating Your HRMS with WFM

If HRMS (Human Resources Management System) integration is enabled in WFM Configuration Setup, WFM will import vacation data from your HRMS and export data on vacation hours used to a file for use by your HRMS.

Important: The agent's username as configured in WFM is the identifier for vacation hours data. It must be identical in WFM and the HRMS for the data to be written to the correct record in each.

WFM monitors the following folder for the text file sent from the HRMS:

C:\Program Files (x86)\Common Files\WFM\vacationreports

As soon as the file appears, data from the file is imported into WFM using the GIS API. The imported data overwrites any existing vacation data in the WFM database.

Best Practices: Data is exported from WFM daily. It is up to the customer to determine the frequency at which data will be imported from the HRMS to WFM. Best practice is to import the data at the interval at which earned vacation hours are calculated in the HRMS.

At the time of day configured in WFM Configuration Setup (HRMS Integration step), WFM outputs a report file that contains the number of hours used by agents for each day for the last seven days. This file also contains pending and approved hours as of the current date. Hours are considered used for schedules ending the previous day. Any schedules in progress are not counted as used.

The import files are archived for future reference. When the text files are processed by the GIS API, they are automatically moved to the archives folder in a subfolder named for the date on which they were processed.

For example:

```
...\\WFM\\vacationreports\\archives\\2013-05-02\\VacationHours_From_
HRMS
...\\WFM\\vacationreports\\2013-05-03
...\\WFM\\vacationreports\\2013-05-04
```

Vacation import files are deleted according to the schedule configured on the WFM Configuration Setup utility's Data Retention Periods step.

Vacation export files are not automatically deleted. It is up to the customer to determine when and if the export files are to be deleted.

Import and Export File Details

The following tables display the details of the import and export files.

Import File Details

File Location	C:\\Program Files (x86)\\Common Files\\WFM\\vacationreports
File Name	VacationHours_From_HRMS
File Header	VACATION FROM HRMS DATE: <date>

Column Headers	<p>login (required)</p> <p>daysOffAvailableHours (required)</p> <p>floatingAvailableHours (required)</p> <p>personalDaysAvailableHours (required)</p> <p>vacationAvailableHours (required)</p> <p>daysOffTotalEarnedHours (optional)</p> <p>floatingTotalEarnedHours (optional)</p> <p>personalDaysTotalEarnedHours (optional)</p> <p>vacationTotalEarnedHours (optional)</p> <div data-bbox="597 730 1377 961"><p>Note: If the four optional EarnedHours fields are not included in the file, WFM defaults their values to zero and overwrites the existing values. This can result in negative values when calculating the hours used for an agent.</p></div>
----------------	--

The following is an example of an import file.

```
VACATION FROM HRMS DATE: 2013-05-20

login,daysOffAvailableHours,floatingAvailableHours,
personalDaysAvailableHours,vacationAvailableHours,
daysOffTotalEarnedHours,floatingTotalEarnedHours,
personalDaysTotalEarnedHours,vacationTotalEarnedHours

jonesb,3,4,5,6,20,30,40,50
maxwells,11,4,15,3,20,50,20,30
wilsonj,13,14,15,16,20,20,20,20
```

Note: Data elements are limited to 4 digits. Errors in records are logged in the log file.

Note: Commas that are part of the HRMS import data must be escaped with a backslash (for example, "3\,000") in order to be treated as literals and not file delimiters.

Export File Details

File Location	C:\Program Files (x86)\Common Files\WFM\vacationreports
File Name	Vacation_<date>_WFM
File Header	VACATION WFM DATE: <date>
Column Headers	login date daysOffUsedHours daysOffRequestedHours daysOffApprovedHours floatingUsedHours floatingRequestedHours floatingApprovedHours personalUsedEarnedHours personalRequestedEarnedHours personalApprovedEarnedHours vacationUsedHours vacationRequestedHours vacationApprovedHours employeeId acId

The output export file contains the following for each vacation type:

- **Used Hours:** The hours used for the date on the row.
- **Requested Hours:** The total hours that are pending and not yet approved at the current time. This is displayed only for the current day; previous days show a dash (-).
- **Approved Hours:** The total approved hours at the current time. This is displayed only for the current day; previous days show a dash (-).

The following is an example of an export file.

```
VACATION FROM WFM DATE: 2014-01-20

login,date,daysOffUsedHours,daysOffRequestedHours,
daysOffApprovedHours,floatingUsedHours,
floatingRequestedHours,floatingApprovedHours,
personalUsedEarnedHours,personalRequestedEarned
Hours,personalApprovedEarnedHours,vacationUsedHours,
vacationRequestedHours,vacationApprovedHours, employeeId,acdId
jonesb,2014-01-01,5,-,20,-,0,-,15,-,30,30
maxwells,2014-01-02,5,-,20,-,0,-,15,-,40,40
winlsonj,2014-01-03,5,0,5,20,15,5,0,5,20,15,5,0,50,50
```

Real-Time Data Capture API

The real-time data capture API can be used to notify WFM of real-time agent state information for any ACD. This real-time data is then used by WFM to calculate agent adherence and conformance.

The real-time API is an HTTP REST API.

Note: This API is a replacement for a similar API that existed prior to WFM 8.9. If you are using the older API, you must update your application to use this API instead.

Note: HTTPS can be used with the API as well as HTTP.

API Definition

Applications using this API must do the following:

1. On application startup, establish an HTTP session with the WFM Jetty service.
2. For the life of the application:
 - a. Monitor agent state changes using an ACD-specific integration method.
 - b. Submit agent state changes to the WFM server.
3. On application shutdown, destroy the HTTP session.

Establish Session

Before providing agent state data to WFM, you must first establish an HTTP session (log in).

To log in, issue an HTTP POST request to:

```
http://<Unified Workforce Optimization container  
host>/api/rest/authorize
```

The Unified Workforce Optimization container host is set during installation. See the *Workforce Management Installation Guide* for more information.

The body of the request must be in the following format:

```
[  
  {  
    "id":"scheduling",  
    "data":{"wfm.service":true},  
    "userId":"serviceUser", "password":"s3rv1c3P@ssw0rd!",  
    "locale":"en"  
  }  
]
```

A response of **200 OK** indicates success.

Note: The serviceUser password is not user configurable. Contact technical support if you need to change it.

Submit Agent State Information

You can submit each agent state change as a separate API request, or bundle several agent state changes into a single request. In general, sending multiple agent state changes in a single request results in higher performance.

To submit agent state information, issue an HTTP POST request to:

```
http://<Unified Workforce Optimization container host>/api/rest/scheduling/  
gis/realTimeAgentState
```

The body of the request must be in the following format:

```
[  
  {  
    "acdAgentId":string,  
    "gisStateIdentifier":string,  
    "timestamp":number,  
    "reasonCode":number  
  }, ...  
]
```

The fields in this request are defined in the following table.

Field	Descriptions
acdAgentId	The ACD identifier for the agent. This is the agent's ACD ID in WFM (Application Management > People > Agents).

Field	Descriptions
gisStateIdentifier	<p>The identifier for the agent state.</p> <ul style="list-style-type: none"> ■ 1–Logout. The agent has logged out of the ACD. In many ACDs, a numeric reason code might accompany this state to indicate the reason for the state change. ■ 2–Not Ready. The agent is not accepting contacts from the ACD. In many ACDs, a numeric reason code might accompany this state to indicate the reason for the state change. ■ 3–Ready. The agent is ready to accept contacts from the ACD. ■ 4–Talking. The agent is on a contact. ■ 5–Work Not Ready. The agent is engaged in after contact work and will enter a Not Ready state when finished. ■ 6–Work Ready. The agent is engaged in after contact work and will enter a Ready state when finished. ■ 10–Hold. The agent has placed the contact on hold. <div style="border: 1px solid black; background-color: #e6f2e6; padding: 5px; margin-top: 10px;"> <p>Note: If the ACD has an after contact work state, but makes no distinction between Work Not Ready and Work Ready, then either state can be used.</p> </div>
timestamp	The time that the agent state change took place, expressed in milliseconds since epoch.
reasonCode	An optional reason code. This can be null or blank. Valid values are 1-65535.

Examples

The following is an example of an agent state change sent as a single API request.

- Agent 5009 goes into the hold state at Wed, 27 Jun 2012 18:03:27 GMT.

[

```
{
  "acdAgentId": "5009",
  "gisStateIdentifier": "10",
  "timestamp": 1340820207000,
  "reasonCode": null
}
]
```

The following is an example of multiple agent state changes bundled together into a single request.

- Agent 5009 goes Not Ready with reason code 9 at Wed, 27 Jun 2012 18:03:39 GMT.
- Agent 5009 goes Ready at Wed, 27 Jun 2012 18:03:40 GMT.
- Agent 5002 goes Not Ready with reason code 2 at Wed, 27 Jun 2012 18:03:39 GMT

```
[
  {
    "acdAgentId": "5009",
    "gisStateIdentifier": "2",
    "timestamp": 1340820219000,
    "reasonCode": 9
  },
  {
    "acdAgentId": "5009",
    "gisStateIdentifier": "3",
    "timestamp": 1340820220000,
    "reasonCode": null
  }
]
```



```
  },  
  {  
    "acdAgentId": "5002",  
    "gisStateIdentifier": "2",  
    "timestamp": 1340820219000,  
    "reasonCode": 2  
  }  
]
```

Destroy Session

On application shutdown, you should destroy the HTTP session (log out).

To log out, issue an HTTP DELETE request to:

```
http://<Unified Workforce Optimization container host>/  
api/rest/authorize
```

A response of **200 OK** indicates success.

WHIT

WHIT is not included with your WFM installation. You must request the components from Customer Support Services and install them according to the instructions in this section.

Note: File paths shown in this document are the default file path. WFM can be installed to a custom location, so your file path might differ.

Software Requirements

The software requirements for running the WHIT tool are as follows:

- WFM 9.3 or newer must be installed and running.
- Java 7 or later must be installed on the WFM server that hosts the WFM Capture service.

WHIT Components

WHIT consists of two components:

- WFM Historical Import Template spreadsheet
- WHIT executable

WFM Historical Import Template

The WFM Historical Import Template is an Excel spreadsheet named WFM_Historical_Import_Template.xls. Your historical data is entered in this spreadsheet and then saved in CSV (comma separated value) format.

	A	B	C	D	E	F	G	H	I	J	K	L
1	#ServiceHistoricalByInterval											
2	#ServiceNumber	#Date	#Period	#ReceivedCalls	#HandledCalls	#AvgTalkTime	#AvgACWTime	#TransferredCalls	#ASA	#ServiceLevel	#QtyOfAgents	#OccupancyRatio
3	1001	2010-12-31	08:00	16	16	74	22	0	3	94	5	17
4	1001	2010-12-31	08:30	23	23	167	124	0	1	100	6	62
5	1001	2010-12-31	09:00	28	28	136	127	0	1	100	8	51
6	1001	2010-12-31	09:30	42	42	114	2	2	1	100	7	39
7	1001	2010-12-31	10:00	35	35	140	0	0	1	100	3	91
8	1001	2010-12-31	10:30	26	22	153	1	0	15	82	2	94
9	1001	2010-12-31	11:00	35	32	166	1	1	12	81	3	99
10	1001	2010-12-31	11:30	35	28	127	1	0	20	68	2	100
11	1001	2010-12-31	12:00	43	31	151	0	1	38	58	3	87
12	1001	2010-12-31	12:30	47	47	71	1	2	1	100	2	94
13	1001	2010-12-31	13:00	28	20	157	1	1	11	85	2	88
14	1001	2010-12-31	13:30	28	24	175	1	0	8	88	3	78
15												
16	// Lines starting with // or ## are ignored when importing data.											
17	// Such lines are used to provide information to users completing this spreadsheet.											
18	//											
19	// NOTE: Fields below in red must be specified. Fields in green are optional. They may be specified or their columns may be removed.											
20	//											
21	// #ServiceNumber (required) = enter the service number (as configured in WFM, sometimes known as Skill Group or CSC) for this historical data.											
22	// #Date (required) = enter the date in YYYY-MM-DD or YYYY/MM/DD format for this historical data (so July 1 of 2010 should be 2010-07-01 or 2010/07/01).											
23	// #Period (required) = enter the period of the day in the HH:MM format for this historical data (so 1 PM should be 13:00 and midnight should be 00:00).											
24	// #ReceivedCalls (required) = enter the total number of calls received during this period on this date.											
25	// #HandledCalls (required) = enter the total number of calls processed during this period on this date.											
26	// #AvgTalkTime (required) = enter the average conversation time in seconds during this period on this date.											
27	// #AvgACWTime (required) = enter the average after call work (ACW) time in seconds during this period on this date.											
28	// #TransferredCalls (optional) = enter the total number of calls transferred during this period on this date.											
29	// #ASA (optional) = enter the average speed of answer (ASA) in seconds during this period on this date.											
30	// #ServiceLevel (optional) = enter the service level percent (as an integer between 0 and 100 inclusive) for the service during this period on this date.											
31	// #QtyOfAgents (optional) = enter the number of agents in service during this period on this date.											
32	// #OccupancyRatio (optional) = enter the occupancy ratio (as an integer between 0 and 100 inclusive) for the service during this period on this date.											
33	//											
34	// Note that the number of abandons will be automatically calculated as ReceivedCalls less HandledCalls											
35	//											
36	// When the data is complete, save a copy as a CSV file for use with the WFM Historical Import Tool.											

WHIT Executable

The WHIT executable (WHIT.exe) converts your historical data from the CSV file you create from the Historical Import Template to a set of files in the format expected by the Generic Interface Services (GIS) API, a feature that comes with WFM. The GIS API, in turn, imports the files into the WFM database.

Importing Data with WHIT

The process of importing data consists of the following tasks:

- Install WHIT.
- Insert your data into the WHIT spreadsheet and save it in CSV format.
- Run WHIT.

Installing WHIT

To install WHIT on your WFM server:

1. Log in to the WFM server that hosts the WFM Capture service.
2. Copy the WHIT executable (WHIT.exe) and the WFM_Historical_Import_Template.xls to any folder on the WFM server.

Preparing the WHIT Spreadsheet

The fields that you complete in the WFM Historical Import Template spreadsheet depend on the type of service queue for which you are importing data.

There are two service queue types:

- **Interactive:** Interactive service queue types consist of contacts in which agents and customers have real-time communication, such as voice (call) or chat.
- **Non-Interactive:** Non-interactive service queue types consist of contacts in which agents and customers do not have real-time communication, such as email, fax, and social media, as well as contact activities like stuffing envelopes.

The field names can be interpreted differently for each service queue type. For example, ReceivedCalls can be thought of as the number of chat contacts received or the number of email contacts received. Complete the spreadsheet in a manner that works best for your contact center.

To prepare the WHIT spreadsheet:

1. Open the WFM_Historical_Import_Template.xls spreadsheet.
2. Insert your historical data into the spreadsheet. A description of what

goes in each field is included in the spreadsheet.

To import historical data for interactive service queues, complete the required fields in red. You can also complete optional fields in green if desired.

To import historical data for non-interactive service queues, complete the required fields in red. It is recommended that you also complete the ServiceLevel, QtyOfAgents, and OccupancyRatio fields.

Set the values in fields to 0 (zero) for data you do not want to specify.

Note: If those fields are optional, you can remove those columns.

3. When you have added all your historical data, save the spreadsheet in comma separated value (CSV) format.
4. Copy the CSV file to the same location on the WFM Capture service server where you copied the WHIT executable.

Running WHIT

Perform this task on the WFM server that hosts the WFM Capture service.

To run WHIT:

1. Double-click WHIT.exe and follow the instructions in the application.
2. Click Import. WHIT generates GIS files and places them in the following location:

C:\Program Files (x86)\Common Files\WFM\reports

Note: This is the default location. Your instance of WFM might be installed on a different drive.

The GIS API then processes the GIS files and imports the data into the WFM database.

3. When the GIS files are processed, the GIS API removes the files from the reports folder and WHIT displays the following message:

Capture status: All files are captured. Historical import is complete.