

# Easy Erlang User's Guide

[www.EasyErlang.com](http://www.EasyErlang.com)

EasyErlang version 2.6

Document version 11711

## Table of Contents

Overview .....	3
CC Theory .....	4
Getting Started.....	6
EasyErlangMenus.....	11
File Menu .....	11
Graphs Menu .....	13
Graph Types.....	13
Working with Graphs .....	14
Options Menu.....	15
View.....	<b>Error! Bookmark not defined.</b>
Erlangs .....	<b>Error! Bookmark not defined.</b>
Graph Options .....	<b>Error! Bookmark not defined.</b>
Auto Save .....	17
Help Menu.....	18
Fractional Agents .....	9
Help Menu.....	<b>Error! Bookmark not defined.</b>
Advanced Topics.....	<b>Error! Bookmark not defined.</b>
Introduction to Traffic Modeling .....	<b>Error! Bookmark not defined.</b>
Terms.....	<b>Error! Bookmark not defined.</b>
Abandoned Calls .....	20
Agents .....	20
After Call Wrap Up (ACW).....	20
Busy Hour Traffic (BHT) or Peak Hour Traffic (PHT) .....	20
Delayed Calls .....	20
Queue.....	20
Call Volume .....	21
Average Handling Time (AHT) .....	21
Call Load (Call Intensity) .....	21
Average Speed to Answer (ASA) .....	21
Service Level .....	22
Index .....	24

# Overview

EasyErlang is a resource planning and forecasting calculator for call centers. It provides a simple and reliable method to determine how many telephone agents are needed to support a target service level. It also provides a detailed understanding of the customer experience, such as wait time and the number of callers that will leave before their call is answered.

Call center planners use EasyErlang to answer questions such as:

- What will be the improvement in the level of service if I hire two additional agents?
- How many agents and telephone line will I need to support the planned expansion?
- What will be the abandonment rate if I move one agent to a different shift?
- Is my staff utilization too low?

# Introduction to Call Center Resource Planning

Cars on a road, a customer line at a bank, or telephone calls arriving at a call center, share similar traffic characteristics. Load may be high, leading to long travel and wait time, or may be light and move smoothly. Highways, toll booths, telephone lines and bank tellers may be overloaded, generating long delays and providing poor service, or could be idle due to low demand. Planner and analysts must be able to estimate the right number of resources—toll booths, bank tellers, support agents and telephone lines—to provide adequate service at reasonable costs.

Traffic modeling provides the theory and practice to analyze traffic patterns and determine the necessary resources to handle it optimally. Traffic modeling originated in the telephone industry, and many of the theories still in use today were developed between 1909 and 1917 by the Danish mathematician [Agner Krarup Erlang](#).

Traffic modeling involves *sources* generating service requests and *servers* that fulfill these requests. In a telephone system, sources are the callers and the servers are the telephone company's resources that provide the dial tone and rout the calls to their destination. In a bank, the customers are sources, and the bank tellers are the servers.

In call centers, planners must establish the required number of agents and allocate the necessary telephone lines, balancing the desired level of service against the availability and operating costs of these resources.

## Telephone Lines

The computation of the required number of telephone trunks is based on the Erlang B model. The target blocking probability depends on the service model employed in the call center.

If the call center is designed as "loss" model, that is, calls that cannot be serviced immediately are diverted to a voicemail service or simply receive a busy signal, you use the Erlang B tables discussed earlier to calculate the number of telephone trunks that will provide an acceptable level of service. A blocking probability of 5% or better is usually considered adequate.

However, most call centers cannot afford the staff to operate in a pure "blocked calls lost" mode and still maintains high service levels; they must employ a queuing system and enough telephone trunks to allow callers to hold for as long as they wish. In practice, it is impossible to place an infinite number of calls on hold, so the number of lines is set so that only in rare cases will callers be denied the opportunity to wait for service and receive a busy signal.

## Staffing

In a well designed call center, some calls, especially during peak time, are queued. The first step in calculating staffing levels is to establish a target grade of service. Calculating staffing levels to support that target is an iterative process and is most easily carried out using an Erlang C software program or a spreadsheet.

The screen image below shows the output of the [EasyErlang Erlang C calculator](#). The target service level (GoS) is defined as 95% of calls should be answered within 30 seconds. The maximum allowed wait time is 20 seconds, after which we assume callers will abandon the queue. The expected call volume is 230 calls per hour (CPH), and the average handling time (AHT) is 510 seconds.

Target Service Level: 95 % of calls in 30 Seconds

Traffic: Calls per Hour 230 AHT 8:30 = 510 Seconds  
32.6 Erlangs

Shrinkage 5% Retries 10% Time to Abandon 20 Seconds

Agents	SL %	SL Time	ASA	Abandoned	Capacity	Tolerance	Queued	Q Time	Max. Q Time
43	90%	48	11	12%	217	-6%	16%	69	650
44	93%	35	7	8%	224	-3%	12%	61	622
45	95%	23	5	6%	230	0%	8%	54	607
46	97%	8	3	4%	236	3%	6%	49	593
47	98%	0	2	3%	243	6%	4%	45	580

Calculate

Using the Erlang C formula, the software calculates the GoS for different staffing and phone line combinations. The highlighted line shows that 45 telephone agents will meet or exceed the target service level. In fact, this staff will be able to answer 95% of the calls within 23 seconds, with an average speed to answer of 5 seconds. As staff is likely the most expensive call center resource, a reduced staff of 44 CSRs can deliver a somewhat degraded service level, answering 93% of the calls in 30 seconds, or 95% of the calls in 23 seconds, and ASA of 7 seconds. Note that a modest reduction of headcount by 5% to 43 agents will have a profound effect on service levels, doubling the ASA.

In addition, the Erlang calculator shows the following parameters:

**% Abandoned** - the percentage of callers that are likely to abandon the call while waiting in the queue. This number is calculated based on Queue Time.

**% Queued** - the percentage of calls that will not be answered within the target ASA and will be queued.

**Queue Time** - the average time callers will spend in the queue while waiting to receive service.

For in-depth discussion see the article [Call Center Planning Basics](#). Additional articles are listed at the end of this User's Guide.

# Getting Started

To start using EasyErlang you need to know the call load, that is, how many calls arrive at the call center, usually referred to as Calls Per Hour (CPH), and how long the telephone agents need to clear each call (Average Handling Time, or AHT). You also need to decide on the service level, which is the percentage of calls that will be answered within a given timeframe.

In the example shown below, the target service level is to answer 90% of the calls in 18 seconds for a call volume of 120 CPH and AHT of 10 minutes. We assume that callers will abandon the call if their wait time in the queue will exceed 70 seconds, and that 10% of them will redial the call immediately.

Agents	SL %	SL Time	ASA	Abandoned	Capacity	Tolerance	Queued	Q Time	Max. Q Time
28	81%	67	27	12%	111	-8%	22%	120	840
29	87%	36	15	8%	116	-3%	15%	100	808
30	92%	4	9	5%	122	2%	10%	86	756
32	95%	0	5	3%	127	6%	7%	75	729

EasyErlang calculation shows that:

- 30 agents will slightly exceed the target service level, achieving service level of 92% in 20 seconds.
- The average speed of answer (ASA) for **all** calls will be 9 seconds
- 5% of the callers are likely to abandon the queue before reaching a live agent
- 10% of the callers will be queued for some time, with an average waiting time of 86 seconds.

These are the basic information units most users will use on an ongoing basis. However, EasyErlang calculates several additional performance metrics. Below is a detailed description of each of the information fields calculated by EasyErlang (you may need to scroll the screen horizontally in order to see some of the columns.)



Tip: When you scroll the mouse over any of the information columns, a tool-tip appears.

## Agents

EasyErlang calculates the optimal number of telephone agents (CSRs) that are needed to meet or exceed the target service level. This is the highlighted row in the middle of the results table. The rest of the information in this row provides in-depth view of the performance of the call center, the caller experience, and the utilization of the call center resources.

The software also calculates the performance information for larger and smaller headcount, allowing you to assess the impact of different call loads and headcounts.

## **SL%**

The service level column identifies the percentage of calls answered within the target service level time. In the screen sample above, the target service level is 90/18, or at least 90% of the calls must be answered within 18 seconds or less. The calculation shows that with the recommended headcount, 92% of the calls will be answered in 18 seconds or less.

Note: The SL% figure in the example means 92/18, not 92/4, which is explained below.

## **SL Time**

The service time column identifies the actual response time for the target service level. In the screen sample above, the target service level is 90/18, or at least 90% of the calls must be answered within 18 seconds or less. The calculation shows that 90% of the calls will actually be answered in 4 seconds.

Note: The SL% figure in the example means 92/18, not 92/4, as explained above.

## **ASA**

Average speed of answer (ASA) of all calls

## **Abandoned**

Anticipated percentage of callers that will abandon (hang up) the call before speaking with a live agent.

## **Capacity**

Call center staffing usually results in excess handling capacity, because staffing is designed to meet and often exceed service level targets. Moreover, headcount calculations must be rounded up resulting in additional capacity (see a discussion on fractional agents later in this Guide). The Capacity figure shows how many calls the call center can actually handle. In the sample above, the call center will be able to handle a slightly higher call load of 122 CPH.

## **Tolerance**

Tolerance shows the excess capacity in % of planned call load, or, using the same example, 2%.

## **Queued**

Calls that are not answered immediately will enter a holding queue until a telephone agent becomes available. This column shows the percentage of calls that will be queued.

## **Q Time**

The average time queued calls will wait to be serviced.

Note: This is the service time of queued calls only, and is different from ASA, which includes all calls, and, in particular, calls answered within the target service level.

## **Max Q Time**

The longest time a call is expected to be on hold before being connected with a live agent.

## **Avg. Q**

Average number of calls in the queue.

**Max Q**

The maximum number of calls expected to be in the queue.

**Utilization**

Utilization, sometimes called occupancy rate, describes the workload of the telephone service representatives (CSRs). It is the percentage of the CSR's time used to service caller requests. In a well designed call center, this time accounts for telephone time, other work required to complete a call and prepare for the next one, and reasonable time between calls.

**Trunks**

The number of trunks, or telephone lines, required to deliver the target service level.

# Adding Detailed Information

This far we described call load using only two terms: calls per hour (CPH) and average handling time (AHT). We also made simple assumptions about agents' availability and caller behavior. By adding more information, you can improve the accuracy of staffing and service level calculations.

Shrinkage	<input type="text" value="8%"/>	Retries	<input type="text" value="10%"/>	Time to Abandon	<input type="text" value="28"/>	Seconds
-----------	---------------------------------	---------	----------------------------------	-----------------	---------------------------------	---------

## Shrinkage

Shrinkage is a term used to describe time that is "lost" due to breaks, vacation, sick days, and other unplanned events. You specify the estimated time loss as a percentage of total working time, and EasyErlang automatically adjusts the staffing calculations to account for shrinkage.

Note: You should use shrinkage to identify time lost during the time an agent is supposed to provide telephone support and no substitute is available. For instance, you may account for unplanned breaks during a shift, but if your call center has a rotating lunch break so staffing remains constant, this is not considered shrinkage.

## Retries

Some callers, once placed on hold, hang up and call back, believing, incorrectly, that this would place them in a better place in the queue. You can assess the impact of this behavior on call load by indicating the percentage of callers that you expect to redial instead of waiting in the queue. EasyErlang increases the call load and adjusts the calculations to accommodate for the additional calls generated by those callers. You can change the target service levels and the number of telephone agents to see how the number abandoned calls changes.

## Time to Abandon

One of the more critical goals of a call center is to reduce the number of abandoned calls. How long callers are willing to wait for a response from a live agent depends on a number of factors. EasyErlang calculates the number of abandoned calls based on the number of callers that will wait longer than the time you specify. You can change the target service levels and the number of telephone agents to see how the number abandoned calls changes.

## Fractional Agents

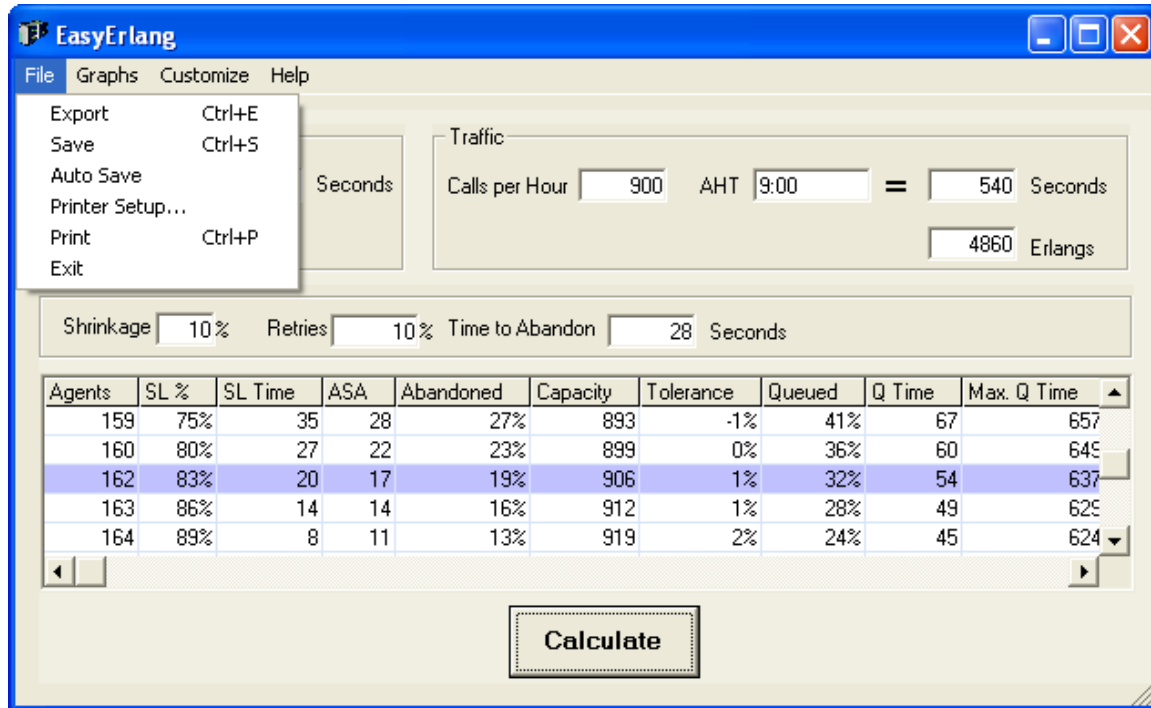
Precise mathematical calculations of Erlang models often result in results expressed as fractions, for example, 57.835 agents. Obviously, EasyErlang always rounds up the actual number of agents, and all subsequent calculations are based on that number.

This approach is fine, but you may find it useful to see the actual result in order to assess if you can try to staff for the lower headcount. You can find out the actual number of agents EasyErlang calculated by clicking and holding the right mouse button anywhere on the optimal solution (the highlighted row). The precise fraction ("fractional agents") is displayed. In the screen sample below, EasyErlang recommends 62 agents, although it appears that 61 CSRs can probably meet the need.

Agents	SL %	SL Time	ASA	Abandoned	Capacity	Tolerance	Queued	Q Time	Max. Q Time	
60	80%	44	26	22%	343	-2%	31%	84	715	▲
61	85%	29	18	17%	349	0%	25%	73	694	
61.081	89%	16	13	13%	355	1%	20%	64	674	
63	92%	2	9	10%	361	3%	16%	58	663	
64	94%	0	6	7%	368	5%	12%	52	645	▼

# EasyErlang Menus

## File Menu



## Export

The Export command saves the entire calculation table to a Microsoft Excel (xlw or xls) file or text (csv) file. Export command always writes the result to a new file; if the file you select already exists, it will be overwritten.

## Save

The Save command writes the solution line to a text (csv) file. Save appends the solution line to the open file so you can save multiple solutions for later analysis.

The first time you select the save command, a **Save as** dialog opens. If the file you want to save to already exists, it will be overwritten.

Subsequent save operations using the **ctrl+s** shortcut appends the solution line to the open file.

Note: If you select **Save** after you have change the viewed columns (see below how to customize columns display using the Customize menu option) EasyErlang will prompt you for a new filename. If the file already exists, it will be overwritten.

Note: There are important differences between Save and Export:

Unlike the **Export** command, Save writes only the optimal solution (the highlighted line) and only the columns currently selected for viewing (see below how to customize columns display using the **Customize** menu option).

If the file you are saving to already exist, the information in the file is retained and the new data is appended.

## Auto Save

Selecting **Autosave** causes EasyErlang to save the results every time you press the Calculate button. See **Save** above for detailed description of the Save command.

## Print Setup

This command selects the printer for EasyErlang output. Erlang data table and graphs are printed to the selected printer.

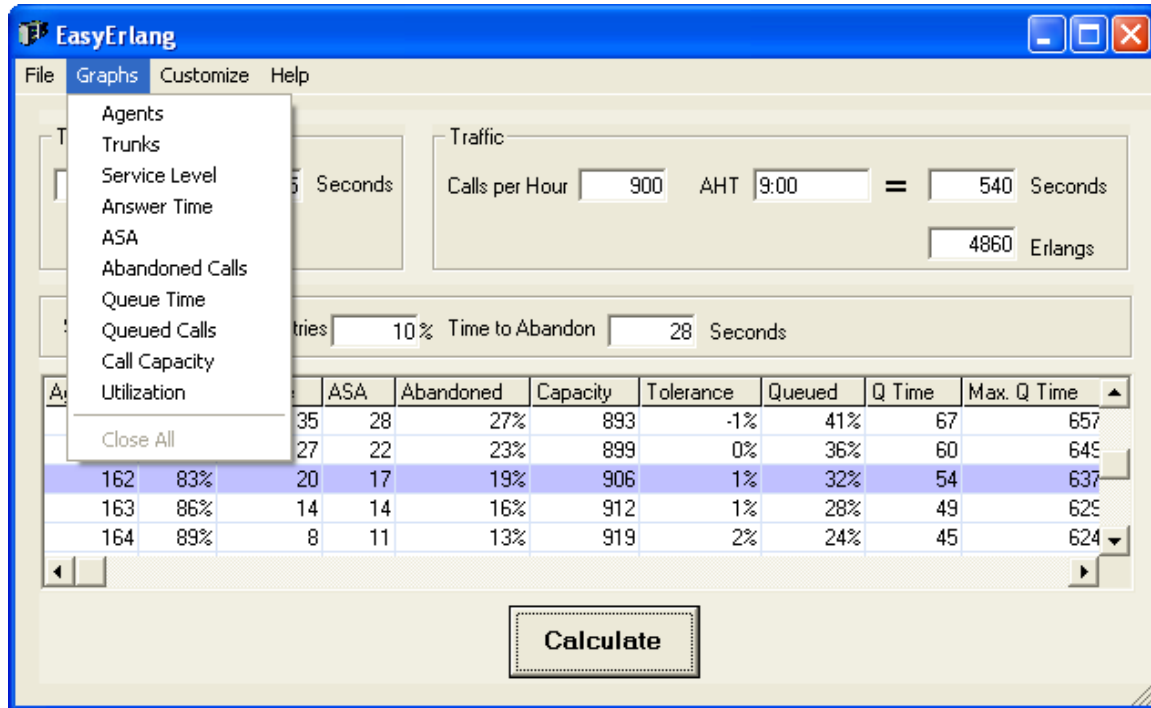
## Print

Selecting **Print** (or using the shortcuts **Ctrl+P**) prints the results of the most recent Erlang C calculation.

## Exit

Exits EasyErlang. If you are running a registered version of EasyErlang, your data is saved when you exit EasyErlang and is reloaded next time you start EasyErlang.

# Graphs Menu



EasyErlang has number of built in graphs that depict the relationship between various key metrics, and how they trend over a wider range of variables, usually as a function of the number of telephone support personnel.

## Graph Types

### Agents

Shows the number of agents required to support a range of call volume for the given level of service and call load. The range of calls per hour is typically +/-10% of the Calls per Hour field. EasyErlang may increase the range of Calls per Hour in order to show a change of at least +/-one agent.

### Trunks

Shows the number of telephone trunks (lines) required to support a range of staffing level for the given service level and call load.

### Service Level

Shows the service level for a range of stuffing levels for the given service level and call load. Service level is the percentage of calls answered within the target service level response time. For example, if the target service level is 80% in 40 seconds, this graph shows the actual percentage of calls that will be answered within 40 seconds.

## Answer Time

Shows the service level answer time for a range of staffing levels for the given service level and call load. Note that graph shows the answer time for the specified target level of service and not the average speed of answer (ASA), which applies to all calls. For example, if the target service level is 80% in 40 seconds, this graph shows the time in which 80% of the calls will be answered.

## ASA

Shows the average speed of answer for a range of staffing levels for the given service level and call load. Unlike the Answer Time graph, the ASA graph shows the response time to all calls.

## Abandoned Calls

Shows the percentage of callers that will abandon the call before reaching a live agent, for a range of staffing levels for the given service level and call load and abandonment time sensitivity.

## Queue Time

Shows the average time queued calls will wait for service for a range of staffing levels for the given service level and call load.

## Queued Calls

Shows the percentage of calls that will be not receive service and will be queued, for a range of staffing levels for the given service level and call load.

## Call Capacity

Shows the actual call handling capacity of the call center for a range of staffing levels for the given service level and call load.

## Utilization

Shows the agent utilization (occupancy rate) for different staffing levels.

## Working with Graphs

To view a graph, select it from the **Graphs** menu. To hide a graph, either close the graph's window or uncheck it in the **Graphs** menu in the main EasyErlang screen. You can have as many graphs open as you need and rearrange them on the screen for easy viewing.

When you press the **Calculate** button, the open graphs are updated automatically to reflect the new data in the table.

## Printing Graphs

You can print the graph by selecting Print from the graph's window File menu, or by using **Ctrl+P** key combination.



Tip: to change the size of the printed graph, resize the window to the desired size before printing graph

## Saving Graphs

You can save the graph's image file in order to print it later or paste it into another document such as a Microsoft Word or PowerPoint. To save an image of the graph, select Save As from the graph's window File menu.



Tip: to change the size of the printed graph, resize the window to the desired size before printing graph

## Copying Graph Data

You can copy the content of any active graph to Windows clipboard and use it in other Windows programs. For example, copy the data to Excel or the graph image to PowerPoint.

*Hint:* to change the size of the printed or saved graph, resize the window to the desired size before you save or print it

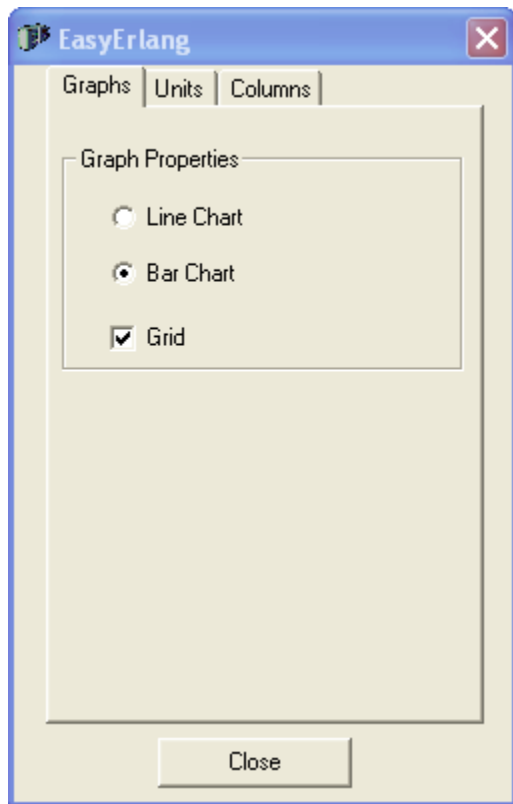
To copy the graph data to Excel follow these steps

1. Start Excel
2. Select the graph you want to copy
3. In the graph window, click the Edit menu, select Copy Data (shortcut **ctrl+c**)
4. Paste the data to Excel (shortcut: **ctrl+v**)

## Customize Menu

The Customize menu allows you to customize some of the basic operations of EasyErlang. You can customize the appearance of graphs, the calculations you want to display and the type of traffic intensity measurement units.

## Graphs



### Grid

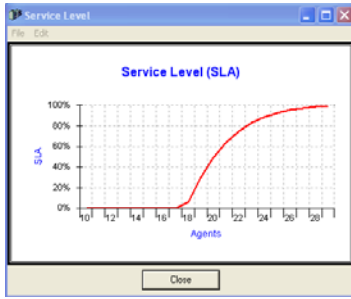
You can select whether or not to display a grid on line graphs.

### Bar / Line

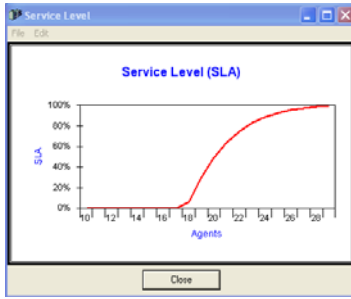
You can select whether you want graphs plotted as line or bar graph.

*Hint:* Changing graph options affects only newly created graphs; graphs that are already open do not change, even when recalculated. This allows you select the options for each graphs separately, showing certain graphs as a line graphs and others as a histograms, and add or remove the grid from line graphs. If you want to change the type of graph that is already open, close it, change the graph type in the **Graph Options** menu, and redisplay the graph.

Line Graph



Line Graph without Grid

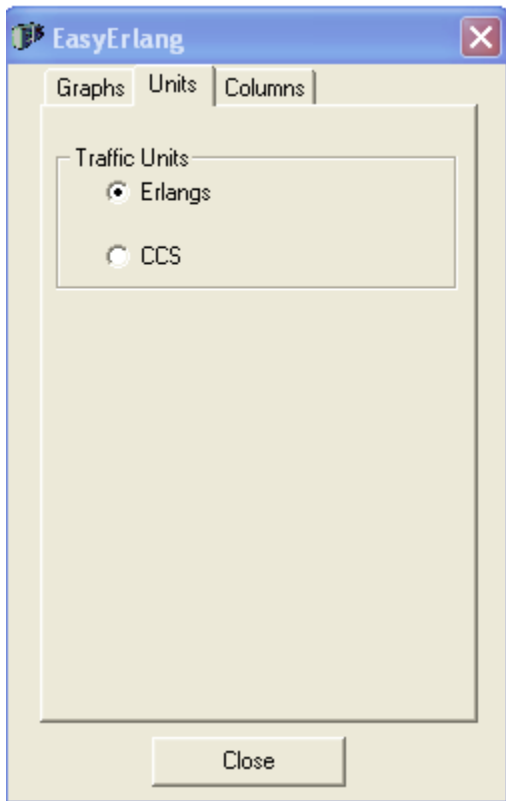


Bar Graph



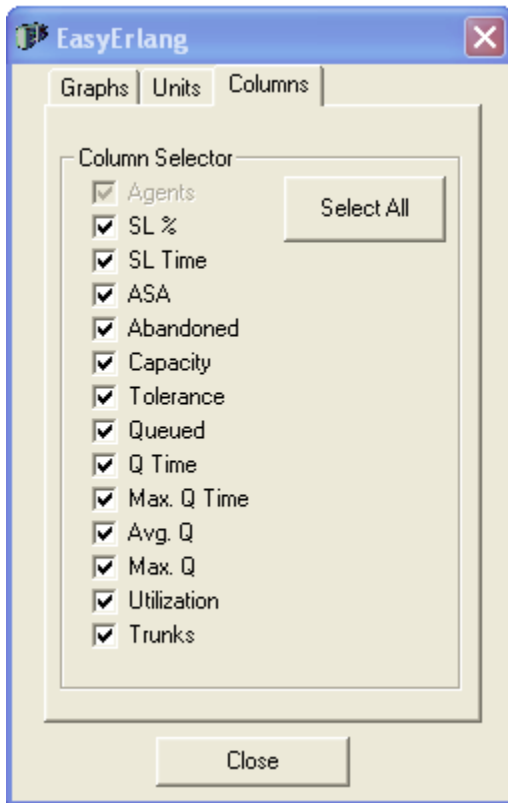
## Units

Most call center designers prefer to use Erlang units, which is the default unit EasyErlang uses. However, you can change the display to Hundred Call Seconds (CCS). 1 Erlang is equal to 36 CCS.

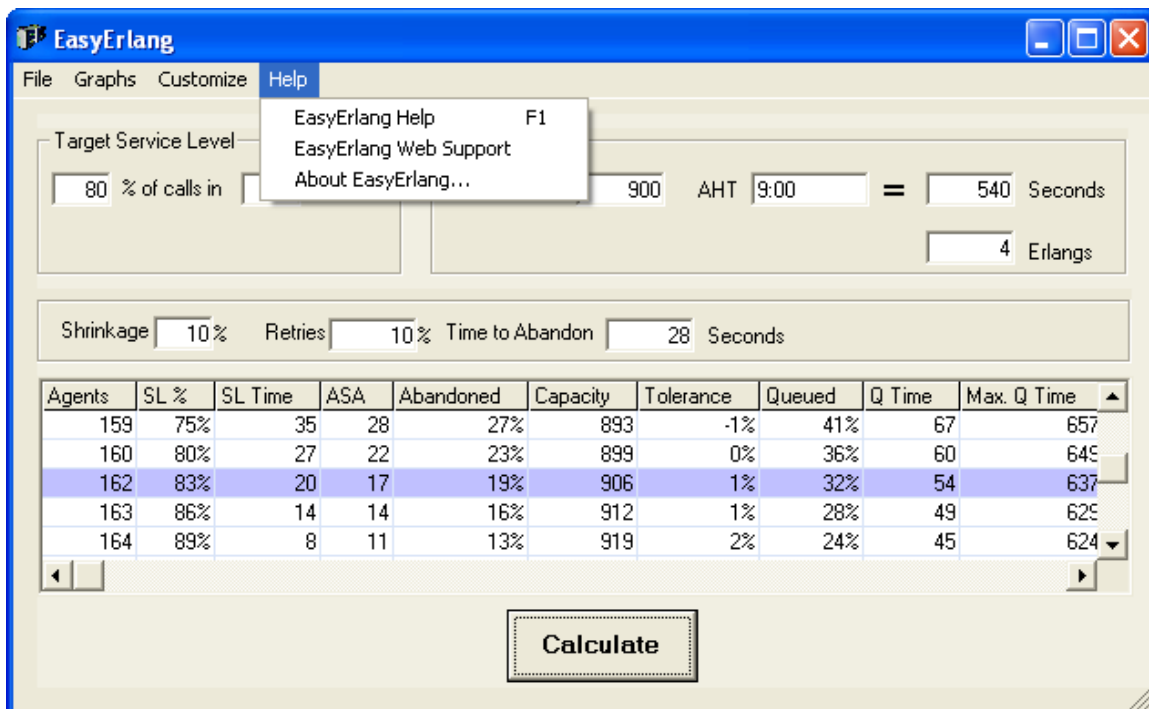


## Data Columns Selector

By default, EasyErlang displays the full set of calculations described previously. You can select the columns you want to display in this form.



## Help Menu



**EasyErlang Help** - Displays the EasyErlang User Guide (this document). You can also use the **F1** key to display Help information

**EasyErlang Web Support** - Open a browser and displays the EasyErlang Web support page at <http://www.easyerlang.com/support.htm>.

**About** - Displays the version number and the Serial Number of EasyErlang.

# Glossary

## Abandoned Calls

An incoming call becomes an abandoned call if it was answered by the ACD system, but the caller hung up before a live agent answers the call.

Abandonment occurs when the waiting time in the queue is too long.

## Agents

An Agent refers to a person that handles incoming calls. In general telephone traffic theory agents are sometimes referred to as servers.

An agent is either:

- Talking on the phone with an incoming call,
- Performing the after call work associated with the call, or
- Waiting for the next call.

Because agents are not busy 100% of their time, EasyErlang calculates their estimated utilization: the time they are busy handling calls. EasyErlang can also take into consideration the time agents are absent due to vacation, training or sickness (referred to as shrinkage) and increase staffing requirements accordingly.

If calls are answered by an automatic device, such as voice mail, the number of agents calculated by EasyErlang determines how many such devices are required to meet the desired service level.

## After Call Wrap Up (ACW)

The time that an agent spends following the telephone call to handle additional mandatory work such as logging the call and preparing for the next call.

## Busy Hour Traffic (BHT) or Peak Hour Traffic (PHT)

Peak hour is the busiest one-hour period of the day or during a single shift, when incoming service requests are most likely to be delayed or blocked and turned away. This is the load for which resources are calculated.

## Delayed Calls

The number of inbound callers that are placed in a queue and must wait before reaching a live agent.

## Queue

A queue is a waiting line for callers that cannot receive service because all the agents are busy handling other calls.

Because each caller is waiting until an agent is free to answer a call, each position in the queue requires a telephone line. When all of the trunks are in use, a new call cannot get into the queue and will be rejected or placed into voicemail.

## Call Volume

Call volume is simply the number of calls made to the call center in a given time period. It is usually specified as calls per hour (CPH). Note that call volume indicates the number of calls made, not the number of calls answered by the call center agents.

## Average Handling Time (AHT)

The average handling time is the average time that an agent spends handling one call.

Handling Time of a call includes:

- The time the agent spends talking to the caller on the phone
- The time the agent spends after the call to handle work that the call generated such as logging the call details and preparing for the new call (wrap up time).

Note that Handling Time includes the time the agent is busy researching, solving and documenting the call even if the caller is placed on hold. If the caller is not placed on hold and the agent calls back with the resolution, this time is also considered a component of AHT, because during that time the agent is unavailable to take other calls. However, in the latter case, the estimate of the number of trunks will not be accurate, and you will need to calculate them separately, using AHT that includes only the time span that the caller occupies the telephone line.

Average handling time (AHT) defines how long an agent is busy providing service to a single customer call. AHT is the time the agent provides service (talk time) plus any additional activities to complete the call and prepare for the next one (called wrap-up time or after call work). Some call centers use separate figures for actual talk time and wrap-up time. If this is the case, add these together.

## Call Load (Call Intensity)

The volume, arrival pattern, and duration of incoming service requests are the key parameters in determining the call center's resource requirements. Call load is measured in Erlang units, which represent call volume over a period of time, where one hour call time represents a load of 1 Erlang. Traffic intensity of 100 calls per hour, 15 minutes each creates a load of 25 Erlangs ( $100 \times 15 / 60 = 25$ ).

Call Volume is the product of the Average Handling Time (AHT) multiplied by call volume:

$$\text{Call Load} = \text{AHT} \times \text{Call Volume}$$

Call load is usually measured in **Erlang** units, and is the call load divided by the number of seconds in the time period.

Another unit to express call load is **CSS**, which stands for hundred call-seconds. 1 Erlang is equal to 36 CCS.

Note that the call volume is different from the number of calls handled. Call volume includes both handled and abandoned calls, and calls that received a busy signal (which, in a well-designed call center should be a very rare occurrence).

## Average Speed of Answer (ASA)

Average speed of answer (ASA) Answer is the average waiting time before being connected with a live agent.

The Average Speed of Answer applies to **all** calls: calls that were answered immediately, as well as calls that waited in the queue.

## Service Level

The average speed of answer (ASA) defines the average response time to all calls, but it doesn't accurately reflect the actual service experience of individual callers. The wide range of response times in a typical call center will often produce a reasonable ASA, yet individual callers may experience unacceptable long wait times.

A more appropriate and precise performance metric defines the service experience of the majority of the callers, and sets a desired *Service Level*, which is the percentage of calls that will be answered within a predefined time threshold. For example, a target service level may be to answer 80% of the calls within 40 seconds.

The traffic model determines the staff and telephone lines that are required to support that level of service. As importantly, it ascertains how many callers will not receive service within the 40 seconds threshold, how long they will wait to receive service, and how many are likely to abandon the call before they get to talk to a live agent.

Note that the target service level and ASA measure different aspects of the call center's performance: service level defines the performance target, which is the worst allowable performance, and ASA defines the overall average performance, which will mask the existence of "peaks" and "valleys" in performance. The relationship between the two metrics is somewhat complex. When the call center is staffed properly, a more aggressive service level target yields ASA that is shorter than the target response time, whereas setting a low service level target will increase the ASA to the point that is worse (longer) than the target. Nevertheless, the fact that the ASA is different (higher or lower) than the target response time does not reflect on the ability of the staff to meet the target service level, but will impact other performance criteria such as the abandonment rate.

## Further Reading

- [The Origin of the 80/20 Rule](#)
- [Are Abandoned Calls Important?](#)
- [Service Level Calculations](#)
- [Advanced Topics in Call Center Staffing](#)
- [Introduction to Traffic Modeling and Resource Allocation in Call Centers](#)
- [Benchmarking in Call Centers](#)
- [Does Self-Help Really Help?](#)
- [Service Level Elasticity](#)
- [An Alternative to the Erlang Traffic Model](#)

# Index

## A

Abandoned Calls, 5, 7, 9, 20  
Abandoned Calls Graph, 14  
Abandonment Time, 9  
ACW. *See* After Call Wrap-up  
After Call Wrap Up, 20  
Agent, 5  
Agent Utilization, 8  
Agents, 6, 9, 20  
Agents Graph, 13  
AHT. *See* Average Handling Time  
Answer Time Graph, 14  
ASA. *See* Average Speed of Answer  
ASA (data column), 7  
ASA Graph, 14  
Auto Save, 12  
Average Handling Time, 6, 21  
Average Speed of Answer, 5, 7, 22

## B

Bar Graph, 16  
BHT. *See* Busy Hour Traffic  
Blocking Probability, 4  
Busy Hour Traffic, 20

## C

Call Capacity Graph, 14  
Call Intensity. *See* Call Load  
Call Load, 21  
Call Volume, 21  
Calls Per Hour, 6  
Calls, Abandoned, 5, 7, 9  
Calls, Delayed, 20  
Calls, Queued, 5  
Capacity, 7  
Copying Graph Data, 15  
CPH. *See* Calls per Hour  
Customization, 15  
Customizing Data Display, 18

## D

Data Columns Selector, 18  
Delayed Calls, 20

## E

Erlang, Anger Krarup, 4  
Exit, 12  
Export, 11

## F

File Menu, 11  
Fractional Agents, 9

## G

Glossary, 20  
GoS. *See* Service Level  
Graph, Bar, 16  
Graph, Customizing, 16  
Graph, Grid, 16  
Graph, Line, 16  
Graphs Types, 13  
Graphs, Copying Data, 15  
Graphs, Printing, 14  
Graphs, Saving, 15  
Graphs, Working with, 14  
Grid, 16

## H

Help, 19

## L

Line Graph, 16

## M

Menus  
    Customize, 15  
    File Menu, 11  
        Auto Save, 12  
        Exit, 12  
        Export, 11  
        Print, 12  
        Print Setup, 12  
        Save, 11  
    Graphs, 13  
        Abandoned Calls, 14  
        Agents, 13  
        Answer Time, 14  
        ASA, 14  
        Call Capacity, 14  
        Queue Time, 14  
        Queued Calls, 14  
        Service Level, 13  
        Trunks, 13  
        Utilization, 14  
    Help, 19

## O

Occupancy Rate. *See* Utilization

## P

Peak Hour Traffic, 20

PHT. *See* Peak Hour Traffic

Print, 12

Print Setup. *See*

Printing Graphs, 14

## Q

Queue, 20

Queue Size, Average, 8

Queue Size, Maximum, 8

Queue Time, 5, 7

Queue Time, Maximum, 8

Queued Calls, 5, 7

Queued Calls Graph, 14

## R

Retries, 9

## S

Save, 11

Saving Graphs, 15

Service Level, 5, 22

Service Level Graph, 13

Service Levl, 7

Shrinkage, 9

SL Time, 7

SL%, 7

Staffing Calculations, 4

## T

Telephone Lines, 4, *See* Trunks

Tolerance, 7

Traffic Units, 17

Trunks, 8

Trunks Graph, 13

## U

Units, Traffic, 17

Utilization, 8

Utilization Graph, 14