Dell Energy Smart Solution Advisor (ESSA)

User guide and FAQ

Dell™ ESSA helps IT professionals plan and fine-tune their computer and infrastructure equipment for maximum efficiency. Offering a wide range of configuration flexibility and environmental inputs, ESSA can help right-size your IT environment.
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1 Before getting started

ESSA is a model driven tool supporting a large number of products and configurations for infrastructure sizing purposes. ESSA models are based on hardware measurements with operating conditions representative of typical use cases. Workloads can impact the power consumption greatly, meaning the same percent CPU utilization and different workloads can lead to widely different power consumption. It is not possible to cover all the workload, environmental, and customer’s data center factors in a model & provide percent accuracy figures with any degree of confidence. With that said, Dell would anticipate (NOT guarantee or claim) a potential for some variation. Customers are always advised to confirm ESSA estimates with actual measurements under their own, actual workloads.

1.1 Browser settings

Certain settings must be configured in the browser you are using to access ESSA. If these settings are not implemented, issues accessing ESSA could occur. This includes not being able to save or open solution configurations even though a current active Dell account (see Creating an account) is being used.

Click on the Start ESSA link at www.dell.com/calc. This will take you to the ESSA website where you can configure your solution.
Whenever you access the ESSA website, you will be prompted to name your solution (default is “Solution Configuration”). Select either 110V or 220V AC input voltage, temperature in Celsius or Fahrenheit, and the Kilowatt Hour Cost.

Click **OK**.
To ensure the ability to save and open solutions, please add www.dell.com and essa.us.dell.com to your trusted sites. The location for adding to the trusted sites list will depend on browser. For example, if you use Microsoft® Windows® Internet Explorer®, select Tools → Internet Options→ Security Tab → Trusted Sites and add these two links as trusted sites.

1. Click the Sites.
2. Add the necessary website address and click **Add**

![Image](image.png)

Make sure **Required server verification (https:) for all sites in this zone** is not selected. If you would like to cover most Dell sites, add *us.dell.com to the **Websites** list.

**Note:** If using Windows Internet Explorer version 9 or above and you have issues with pages not loading, Compatibility View will have to be enabled for the site: select **Tools** → **Compatibility View**.
1. Add the website to compatibility view and then click Add.

An indication that the previous compatibility view and trusted site browser settings have not been set is when saving or opening a solution you will be taken to the Dell site even though you signed in with a valid Dell account. See below:
After selecting **Sign In** a link stating **Continue** is displayed.

![Sign in dialog box](image)

When you select **continue**, you are just redirected to the Dell page. If this occurs check your browser settings.
1.2 Creating an account

When opening or saving a solution for the first time you need to create a Dell account through ESSA. When you save or open a solution and you are not signed in ESSA will prompt you to sign in. Click the Create Account link and you will be taken to the account creation page.

The account creation page is shown below.

Once all required fields are entered, select Complete Registration.
**Note:** The account password must be at least 6 characters, with at least 1 letter and 1 number. If this requirement is not met an error will be thrown.

* Please enter a password that contains at least one letter and one number. It can contain only numbers (0-9), upper and lower case letters (a-z, A-Z), dollar signs ($), question marks (?), plus signs (+), periods (.) and commas (,).

- Create New Password
  
  ****************

- Confirm New Password
  
  ****************

When the account has been successfully created, the following page will be displayed.

Once you see this page you can enter the newly created account information on the ESSA login popup and save the solution you were creating to your new account. Another option for creating a Dell account is to visit [www.dell.com/content/topics/topic.aspx/global/Dell/login/signin?c=us&l=en&s=dhs](http://www.dell.com/content/topics/topic.aspx/global/Dell/login/signin?c=us&l=en&s=dhs).
Click My Account in the top menu, then select Create an Account. Fill in the necessary information fields on the next page which is the same account creation page you will be directed to as shown when creating an account through ESSA.

**Note:** You will only be prompted to enter your Email address and Password when saving or opening a solution and you are not already signed in to your Dell Account. If signed in, your solution will automatically be saved to your account when you click Save.

If you forget your password, click the Forgot Password link.
You will be taken to a page where you can enter your account email to retrieve your password. Enter your account email and click the **Continue**. A link will be emailed to your email address where you can create a new password.
2 Getting started

When first accessing ESSA, login to your Dell Account. It is important to be logged in so you can open and save solution configurations. Login through the My Account link located at the top of the www.dell.com/calc website.

Refer to the steps in the previous section for account creation instructions.

To access ESSA, go to www.dell.com/calc and click Start ESSA.

On the New Solution window, enter the following:

- Name for the solution you are building
  Note: Solution Configuration is the name of the solution by default. It can be changed to any name you would like to call your solution.

- AC Input Voltage
- Temperature
- Kilowatt Hour Cost

Click OK.
To help build your solution, ESSA provides several product options you can add to your solution. To add a product, click the Step 1: Add tab.

Select the product category, such as Servers as shown in the following example.

Select a product subcategory, such as Shared Infrastructure as shown in the following example.
Click **Add to Solution** under the product to add it to the solution.

To configure the settings of the individual products, click the **Step 2: Configure** tab to specify the settings of each of the selected products.
3 Metrics

3.1 Solution configuration

When adding products to your solution, the solution configuration will display the estimated power and airflow for the entire solution. These results are based on the initial configurations first entered when creating the new solution, and the different products that are added to the solution. You can change the original configurations at any time by selecting Options from the Solution Configuration menu. If a metric has an asterisk (*) noted beside it, hover the pointer over the asterisk for additional information about the item.

To view any errors in the solution, select the error information link on the Solution Configuration window.

To create a new solution, click New on the Solution Configuration window. Save your current solution before creating a new solution, otherwise all settings for the previous solution will be lost. See Saving a solution.
The Solution Configuration window provides the following information:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilowatt Hour Cost</td>
<td>USD ($)</td>
<td>User configurable value through Options in the Solution Configuration window; used to calculate Estimated Annual Energy Cost (Continual Operation) output in the PSU Help Me Choose pop-up.</td>
</tr>
<tr>
<td><strong>Total Input Power</strong></td>
<td>Watts (W)</td>
<td>The estimation of the power consumption of the solution under the user configurable workload condition and parameters selected on the Solution Configuration window for each of the products included in the solution. This includes all power conversion efficiencies, including power supply and voltage regulators, and fan power of the products and/or components included.</td>
</tr>
<tr>
<td></td>
<td>BTU per hour (BTU/h)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Input Current</strong></td>
<td>Amperes (amps)</td>
<td>Based upon the Total Input Power and the Input Voltage selected.</td>
</tr>
<tr>
<td><strong>Sound Power Level</strong></td>
<td>bels</td>
<td>The upper limit A-weighted sound power level (LwA-UL) calculated per section 4.4.2 of ISO 9296 (1988) and measured in accordance with ISO 7779 (1999). This estimation is based upon the Total Input Power of the solution under the user configurable workload condition and parameters selected on the Solution Configuration window for each of the products included in the solution. Note: “Sound Power Level (Partial):*” represents incomplete metrics for sound power due to one or more products not having this information.</td>
</tr>
<tr>
<td><strong>Airflow Rate</strong></td>
<td>Liters per second (l/s)</td>
<td>The total volume of air that is moved through the solution under the user configurable workload condition and parameters selected on the Solution Configuration window for each of the products included in the solution. Note: “Airflow Rate (Partial):*” represents incomplete metrics for airflow rate due to one or more products not having this information.</td>
</tr>
<tr>
<td></td>
<td>Cubic Feet per Minute (CFM)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Weight</strong></td>
<td>Kilograms (kg)</td>
<td>Represents sourcebook values for a fully loaded product or maximum weight for each of the products in the solution.</td>
</tr>
<tr>
<td></td>
<td>Pounds (lb)</td>
<td></td>
</tr>
</tbody>
</table>
3.1.1 Saving a solution

Once a solution is configured, you can save the configuration to refer to it later. You will need a Dell account in order to save a solution. If you do not have a Dell account, refer to Before getting started. To save a solution, you must first correctly configure your browser settings as shown in Before getting started. If you do not make these changes, you will not be able to save a configuration.

Click Save, enter your email and password, and click Sign in. If you have forgotten your password, click Forgot Password and follow the instructions. To create an account, click Create an Account and follow the instructions in Before getting started. To open a saved solution, click Open for a list of saved solutions.

**Note:** It is highly recommended you save your solution configuration often to prevent solution configuration loss.
3.1.2 Opening a saved solution
You can open a saved solution to review or modify it.
To open a saved solution, click Open.
The Open Solution window lists your solutions.

Click the name of the Solution Configuration you would like to open.

### 3.1.3  Printing a solution

After creating a solution, you can print the solution summary. To print a solution, click **Print**.

You do not need to save a solution in order to print it. When you select **Print**, the Print window opens and displays the solution summary information, a legal notice, and three options for printing. The options are **Print**, **Open as PDF**, and **Export to Excel**.
3.1.4 Renaming a saved solution

Once you save a solution, it can be renamed and saved. This is similar to saving a document and renaming the document and saving on your PC.

Open a saved solution per Opening a saved solution.

Once the solution is opened click Options.

In the following pop-up you will have the ability to change the name of your solution and save it by clicking OK.
3.2 Product configuration

Each product that you add to the solution has its own configurations that need to be specified. The available configurable options will vary based on what the product is. To configure a product, click the product’s name in the Solution Configuration window, or click the Step 2: Configure tab. Limited Configuration displays only the items specifically pertaining to hardware configurations. Full Configuration displays all available options for the product including hardware, software, service plans, and so on.

Note: To create an orderable solution and to solve all errors within a solution, use Full Configuration.
The product configuration window provides the following information:

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>Watts (W)</td>
<td>The estimation of the power consumption of the product under the user configurable workload condition and parameters selected on the Solution Configuration window. For rack and tower servers and total chassis input power (such as the M1000e), this includes all infrastructure aspects like fans and power supply efficiencies as well as any other efficiency for any of the products and/or components included. For blade or node systems, this represents the DC rated value as there are no active components like power supplies or fans.</td>
</tr>
<tr>
<td>Maximum Potential Power</td>
<td>Watts (W)</td>
<td>Representative of the estimated power consumption of the product under maximum usage conditions: the most power intensive workload for the configuration defined on the Solution Configuration window.</td>
</tr>
<tr>
<td>Input Current</td>
<td>Amperes (amps)</td>
<td>Based on the selected Input Power and the Voltage.</td>
</tr>
<tr>
<td>Sound Power Level</td>
<td>bels</td>
<td>The upper limit A-weighted sound power level (LwA-UL) calculated per section 4.4.2 of ISO 9296 (1988) and measured in accordance with ISO 7779 (1999). This estimation is based on the Input Power of the product under the user configurable workload condition and parameters selected on the Solution Configuration window.</td>
</tr>
<tr>
<td>Airflow Rate</td>
<td>liters per second (l/s)</td>
<td>The total volume of air that is moved through the product under the user configurable workload condition and parameters selected on the Solution Configuration window.</td>
</tr>
<tr>
<td>Weight</td>
<td>Kilograms (kg)</td>
<td>Represents values for a fully loaded product or maximum weight of that product.</td>
</tr>
<tr>
<td>Air Temperature Rise</td>
<td>Celsius (C)</td>
<td>The amount that the air temperature increases when moving through the product under the user configurable workload condition and parameters selected on the Solution Configuration window.</td>
</tr>
<tr>
<td>Power Supply Capacity</td>
<td>Watts (W)</td>
<td>The maximum power that a power supply configuration can support.</td>
</tr>
</tbody>
</table>

**Note:** Different products will have different options, workloads, and metrics. Not all metrics will be available for all products and the metrics available for a product can change based on availability.
Sample metrics for the Dell PowerEdge VRTX solution

Sample metrics for the Dell PowerEdge M1000e chassis

Sample metrics for the Dell PowerEdge R720 server
3.3 Workload for servers

In product configuration for the servers, there is the option to select a workload of transactional, computational, or memory intensive. Intended workload will impact the product configuration.

<table>
<thead>
<tr>
<th>Workload</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational</td>
<td>High CPU</td>
</tr>
<tr>
<td>Transactional</td>
<td>Minimal memory</td>
</tr>
<tr>
<td></td>
<td>Scaled ~ 50% CPU &amp; 50% Memory</td>
</tr>
<tr>
<td></td>
<td>100% = 50/50</td>
</tr>
<tr>
<td></td>
<td>50% = 25/25</td>
</tr>
<tr>
<td></td>
<td>Etc.</td>
</tr>
<tr>
<td>Memory Intensive</td>
<td>Minimal CPU</td>
</tr>
<tr>
<td></td>
<td>High memory</td>
</tr>
</tbody>
</table>

Note: Adjusting CPU loading is only available in the transactional option. Workload does not apply to other areas beyond servers since power consumption is less dependent on utilization workload.
3.4 Power supply Help Me Choose

Based on the products in the solution and the configurations made, ESSA recommends the estimated ideal available power supply option for many products. Under the **Power Supply** configuration is a **Help Me Choose** link. Click this link to see the available options and the ESSA recommended option, which is highlighted. If **Help Me Choose** is not listed, it is not available for that product.
The power supply Help Me Choose provides the following information.

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Input Power At Workload</td>
<td>Watts (W)</td>
<td>The estimation of the power consumption of the product under the user configurable workload condition and parameters selected on the Solution Configuration window. For rack and tower servers and total chassis input power (such as the M1000e), this includes all infrastructure aspects like fans and power supply efficiencies as well as any other efficiency for any of the products and/or components included. For blade or node systems, this represents the DC rated value as there are no active components like power supplies or fans.</td>
</tr>
<tr>
<td>Estimated Maximum Potential Power</td>
<td>Watts (W)</td>
<td>Representative of the estimated power consumption of the product under maximum usage conditions; the most power intensive workload for the configuration defined on the Solution Configuration window.</td>
</tr>
<tr>
<td>Estimated Annual Energy Cost (Continual Operation)</td>
<td></td>
<td>Estimated energy costs when a system is operating as configured for 24 hours per day, 365 days per year. Separate cost estimates are provided for both Input Power at Workload and Potential Power cases on products supporting these metrics.</td>
</tr>
</tbody>
</table>
4 FAQ

4.1 General

4.1.1 What is ESSA and what is it used for?
The Dell Energy Smart Solution Advisor (ESSA) is a tool that estimates power and cooling requirements for servers, storage and networking components. ESSA is for estimation purposes only. For situations that require a high degree of accuracy, testing actual hardware is recommended.

4.1.2 How do I create a new solution configuration?
There are two ways to create a new solution:

- On the Dell ESSA main page (www.dell.com/calc), click the Start ESSA link. This will open a new window with legal information and options for you to enter in a solution name, input voltage, temperature preference, and kilowatt hour cost. Click OK to accept the terms of use and options entered.
- Click New on the Solution Configuration window, and click OK to start a new solution.

Refer to Solution configuration.

4.1.3 Can I change the options I entered when I started the solution?
Yes. Click Options on the Solution Configuration window to change any value that was first entered when starting the solution. Click OK to save changes.

Refer to Solution configuration.

4.1.4 How do I add products to a solution configuration?
There are two main tabs to the Dell ESSA tool:

- Step 1: Add
- Step 2: Configure

If you are just starting a solution, you’ll be on the Step 1: Add tab, but you can also get back to this view by clicking the Step 1: Add tab at any time. The Step 1: Add tab has the following subareas:

- Racks & Infrastructure
- Servers
- Storage
- Networking
Click on one of these options and you’ll see a new set of subareas below each product type. For example, if you click **Servers**, you’ll see the following options:

- Modular Solutions
- Rack Servers
- Tower Servers
- Shared Infrastructure

To add a modular server to the solution, click the Modular Solutions sub-tab to see a list of modular chassis and servers. To add a PowerEdge M1000e Blade Chassis to the solution, click **Add to Solution** below the description. To add blades to this chassis, click on any of the blades associated with this chassis. For example, click **Add to Solution** below PowerEdge M620. A pop-up window will ask which chassis to add this server to. Refer to Solution configuration.

**4.1.5 How do I remove products from a solution configuration?**

Next to each product in the solution, there is a trashcan icon. Click this icon to remove the product from the solution.

**Note:** Removing racks and chassis will remove all items that are currently associated to them. Once deleted, there is no way to retrieve the specific product configuration changes that were made.

**4.1.6 Can I change the quantity of products in a solution configuration?**

Yes. Next to each product there is a text box that allows you to enter a different quantity (1 is default). Click the text box next to the product you want to change, change the number, and click **Update Quantity**.

**4.1.7 How do I save a configuration?**

Click **Save** on the Solution Configuration window, enter your email and password, and click **Sign in**. If you have forgotten you password, click the **Forgot Password** link and follow instructions. To create an account, click the **Create an Account** link and follow instructions.

**Note:** In order to save a solution configuration, add the ESSA website address to the trusted sites for your browser. If Internet Explorer version 9 or above, compatibility mode may need to be selected. Refer to **Saving a solution**.

**4.1.8 How do I open a saved configuration?**

**Note:** Be sure to save and/or print your current configuration before opening a new one. Refer to **Opening a saved solution**.

**4.1.9 Can I print a solution?**

Yes, you do have the capability of printing solutions from ESSA. Refer to **Printing a solution**.
4.1.10 What does “error(s)” mean and how do I fix it?
If you click the error(s) information link in the Solutions Configuration window, a description of the errors is displayed. Based on the error description, you can fix an error by following steps based on the description of the error.

**Note:** Use the **Full Configuration** to close all errors and make an orderable solution.

4.1.11 What do the metrics for a solution configuration mean?
Refer to **Solution configuration**.

4.1.12 What does the "*" indicate?
The "*" indicates that there is additional information available about the content previous to the "*". In order to access this additional information, move the mouse over the star to open a pop-up containing the additional information. Refer to **Solution configuration**.

4.1.13 Why do I see some metrics on some products and not others?
Metrics that are on some products and not others are normally not applicable to that product or the metrics are not available for that product at this time.

4.1.14 Why can I not save a solution? After login I am directed to the Dell Premier site and nothing is saved.
Verify that:

- Browser has [www.dell.com](http://www.dell.com) and [essa.us.dell.com](http://essa.us.dell.com) as sites under your trusted sites. Select **Tools** → **Security** → **Trusted Sites**.
- If you have a version of Windows Internet Explorer 9 or above and are having issues with viewing the pages, ensure you are accessing ESSA in compatibility mode. Select **Tools** → **Compatibility View**.

Refer to **Before getting started**.

4.1.15 Why when opening a saved solution, the $/kWh incorrectly displays “0” value?
This is an intermittent issue in ESSA and will be fixed in future releases. In order to temporarily resolve the issue, resave the solution and re-open it. Check the $/kWh again and the value should be corrected.
4.1.16 Why after a certain period of inactive time on the ESSA site, my unsaved solution no longer is available and I cannot add additional products to the solution?
The connection to the site information has timed out. Refresh the page and rebuild the solution. Best practice is to save critical solutions on a frequent regular basis.

4.2 Configuring product options with Dell ESSA

4.2.1 How do I configure options for a product?
After adding a product to a solution, you can then configure the product. In the Solution Configuration window, select the name of the product that you would like to configure to display the different configuration options. The two types of configurations are limited and full. Limited Configuration is restricted to just the hardware configurations themselves. Full Configuration contains hardware as well as software options and service plans.
Refer to Product configuration.

4.2.2 Why do I see some metrics on some products and not others?
Some metrics are only applicable or available for certain products.

4.2.3 What are the different workloads?
Transactional, Computational, and Memory Intensive are the different workloads for servers.
Refer to Workload for servers.

4.2.4 How do I use the Power Supply “Help Me Choose” pop-up?
Refer to Power supply “Help Me Choose” pop-up.

4.3 Other Frequently Asked Questions

4.3.1 Which Dell products are available in Dell ESSA?
The Dell ESSA main page lists the supported products, which includes blade, rack, and tower servers, storage, and rack enclosures.
Note: Future releases of ESSA will support more Dell products. Visit www.dell.com/calc to learn more.
4.3.2 What if a product is no longer being sold, will it be available in Dell ESSA?
Yes, certain products that are no longer sold are available in ESSA under the Archived section. These archived items are available for comparisons and capability checking only.

**Note:** All errors should be resolved before adding an archived product to a solution.

4.3.3 Can I configure the solution at other temperatures other than 25C/77F?
Not at this time. 25C/77F is the environment in which the solution metrics values generated by ESSA are valid.

4.3.4 Can I configure different servers within the solution to different input voltages?
Not at this time. 110V and 220V are the environments in which the solution metrics values are available in ESSA.

4.3.5 Are DC power supply units (PSUs) supported in Dell ESSA?
Not at this time. However, if the DC power supply has the same wattage, efficiency, and is constructed of the same materials as an available AC power supply, the AC power supply values can be used for the DC power supply.

4.3.6 Why is the PSU Help Me Choose only available for some products but not others?
The Help Me Choose option is only available at this time for certain products. Help Me Choose will be available for more products in future releases of ESSA.

4.3.7 How can I provide feedback to Dell about Dell ESSA?
Use the Submit Feedback link on the ESSA web page under Solution Advisor. Click the Submit Feedback link to submit feedback in the pop-up window.

**Note:** Enter your email address to receive a reply to your feedback.

4.3.8 What is the difference between Limited Configuration and Full Configuration?
Limited Configuration is restricted to only hardware configurations options. Full Configuration contains hardware configuration options as well as software, OS, and service support configuration options.
5 Glossary

5.1 General

5.1.1 Amp
Otherwise known as Ampere. A unit of electrical current which is a measure of the amount of electric charge passing a point in an electric circuit per unit time with \(6.241 \times 10^{18}\) electrons, or one coulomb per second constituting one ampere.

5.1.2 bels
A unit of sound measurement equal to 10 decibels.

5.1.3 btu/h
British Thermal Unit/hour, unit of energy equal to about 1055 joules.

5.1.4 CFM
Cubic Feet per Minute, unit of airflow.

5.1.5 Decibels
Unit of sound. Ratio of a physical quantity relative to a specified or implied reference level.

5.1.6 kWh
Kilowatt hour, a unit of energy equal to 1000 watt hours or 3.6 megajoules.
### 6 Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
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<tbody>
<tr>
<td>1.0</td>
<td>August 2013</td>
<td>Initial Release.</td>
</tr>
<tr>
<td>1.1</td>
<td>November 2013</td>
<td>Added additional information for browser settings, Dell account creation, and login to section 1 Before Getting Started and section 2 Getting Started.</td>
</tr>
<tr>
<td>1.2</td>
<td>February 2014</td>
<td>Added information to Before getting started and updated image. Added section Renaming a saved solution.</td>
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