

Excel: Display Date and Time on X-Axis of Chart

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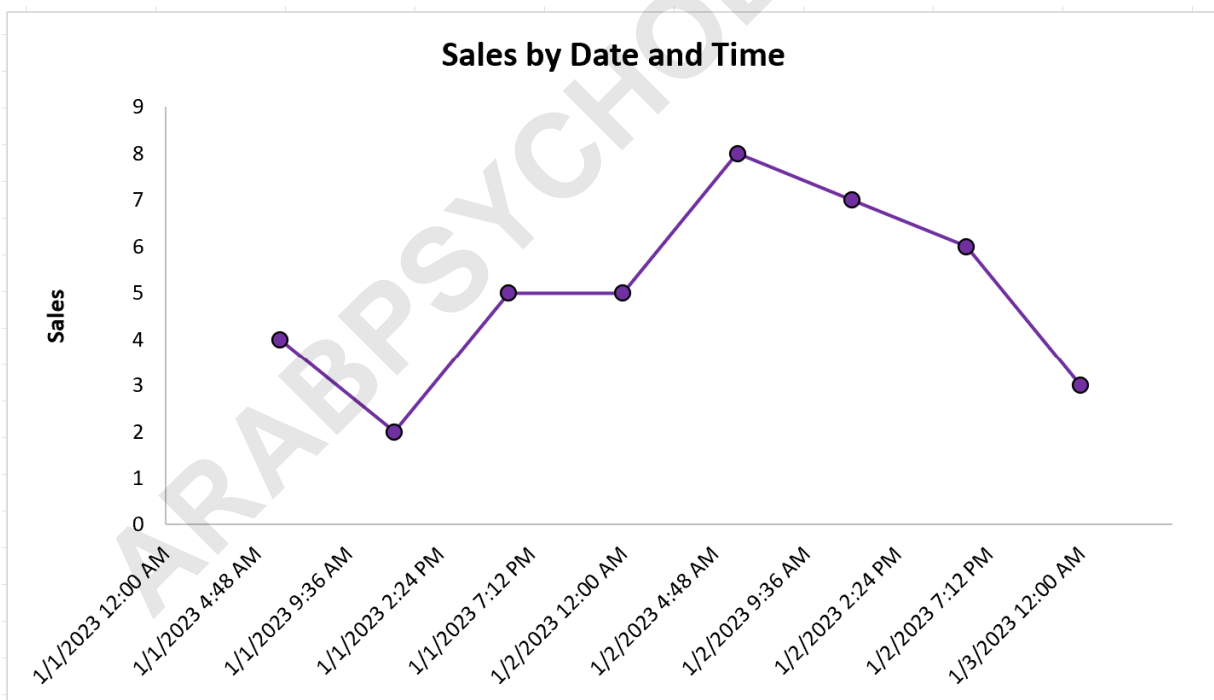
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Analyzing time-series data requires precise visualization, and often, users of Excel need to accurately display both the date and the time components simultaneously on the horizontal axis of a chart. While this seems straightforward, Excel sometimes defaults to inappropriate chart types or formatting, making the resulting visualization cluttered and difficult to interpret. Mastering this technique is essential for anyone tracking metrics that change frequently throughout the day, such as stock prices, server response times, or sensor readings.

The core challenge lies in ensuring that Excel treats the dates and times as continuous numerical values rather than discrete text labels, which is a common pitfall. When correctly implemented, the chart provides a clean, professional display of temporal fluctuations, clearly mapping the data points against the exact moment they occurred.

The following detailed, step-by-step guide demonstrates the specific method required to generate a high-quality visualization that correctly incorporates full date and time stamps onto the X-axis, along with necessary fixes for readability issues that arise due to high data granularity. This solution relies specifically on utilizing the appropriate chart type and implementing crucial formatting adjustments.



This example walks you through the practical steps, from data entry to final chart customization, ensuring your temporal data is presented clearly and professionally.

Understanding Date and Time Data in Excel

Before beginning the charting process, it is vital to understand how Excel internally manages date and time values. Unlike simple text strings, dates and times are stored as serial numbers. The date component is represented by the integer portion of the number (counting days since January 1, 1900), and the time component is represented by the decimal portion of the number (a fraction of a 24-hour day).

For instance, the date and time "January 1, 2024 12:00 PM" would be stored as a specific serial number, where the integer portion defines the day and the 0.5 decimal defines noon. This numerical basis is key because standard chart types, such as Column or standard Line charts, often fail to recognize this numerical continuity, instead treating each date entry as a unique, non-sequential category. To accurately visualize data over time, we must leverage a chart type designed for numerical plotting on both axes.

Therefore, when preparing your dataset, ensure that your time column is indeed formatted as "Date" or "Custom" within Excel's cell formatting options. If your data source provides the date and time as a text string, you must first convert it into a valid date/time format using functions like `DATEVALUE` and `TIMEVALUE`, or through Excel's Data tools, to ensure the underlying serial number is correct and continuous. This preparatory step prevents rendering errors later in the charting process.

Step 1: Preparing Your Dataset

The first practical step involves inputting and structuring the data correctly within the Excel worksheet. Your data must be arranged in two adjacent columns: one dedicated to the temporal data (Date and Time, which will serve as the X-axis values) and the other dedicated to the measured metric (the numerical value, which will serve as the Y-axis values).

For this demonstration, we will use a small dataset tracking a specific metric recorded across several time points on a single day. Ensure that your temporal data column combines both date and time into a single cell format. This comprehensive structure allows the chart to accurately plot the data points in sequential order, correctly accounting for changes that occur minute-by-minute or hour-by-hour.

Let's input the following sample data into cells A2 through B9 of your spreadsheet:

Column A: Date and Time (Temporal Variable)

Column B: Metric Value (Response Time, Temperature, etc.)

	A	B	C	D	E
1	Datetime	Sales			
2	1/1/2023 6:00 AM	4			
3	1/1/2023 12:00 PM	2			
4	1/1/2023 6:00 PM	5			
5	1/2/2023 12:00 AM	5			
6	1/2/2023 6:00 AM	8			
7	1/2/2023 12:00 PM	7			
8	1/2/2023 6:00 PM	6			
9	1/3/2023 12:00 AM	3			
10					
11					
12					
13					
14					
15					

Verify that column A is correctly recognized by Excel as a date/time format. If the cell formatting shows "General," Excel might treat the values as text, which will immediately lead to charting errors. A quick check involves temporarily formatting the column to "Number"; if the cells display high-value decimals (the date serial number), the formatting is correct. Revert the display format back to a recognizable date and time structure before proceeding.

Step 2: Selecting the Appropriate Chart Type (The Importance of Scatter Plots)

The most critical decision in this process is selecting the correct chart type. Many users instinctively choose a standard Line Chart. However, the standard Line Chart in Excel is designed to plot Y values against categories, not against continuous numerical X values. If you attempt to use a standard line chart with date/time data, Excel will simply space the labels evenly, ignoring the true time intervals between them.

To accurately plot continuous time-series data, you must use an XY Scatter Plot. The Scatter Plot is unique because it treats both the X and Y axes as continuous value axes, allowing it to correctly interpret the date/time serial numbers and position the data points according to their exact moment in time.

Follow these steps to insert the chart:

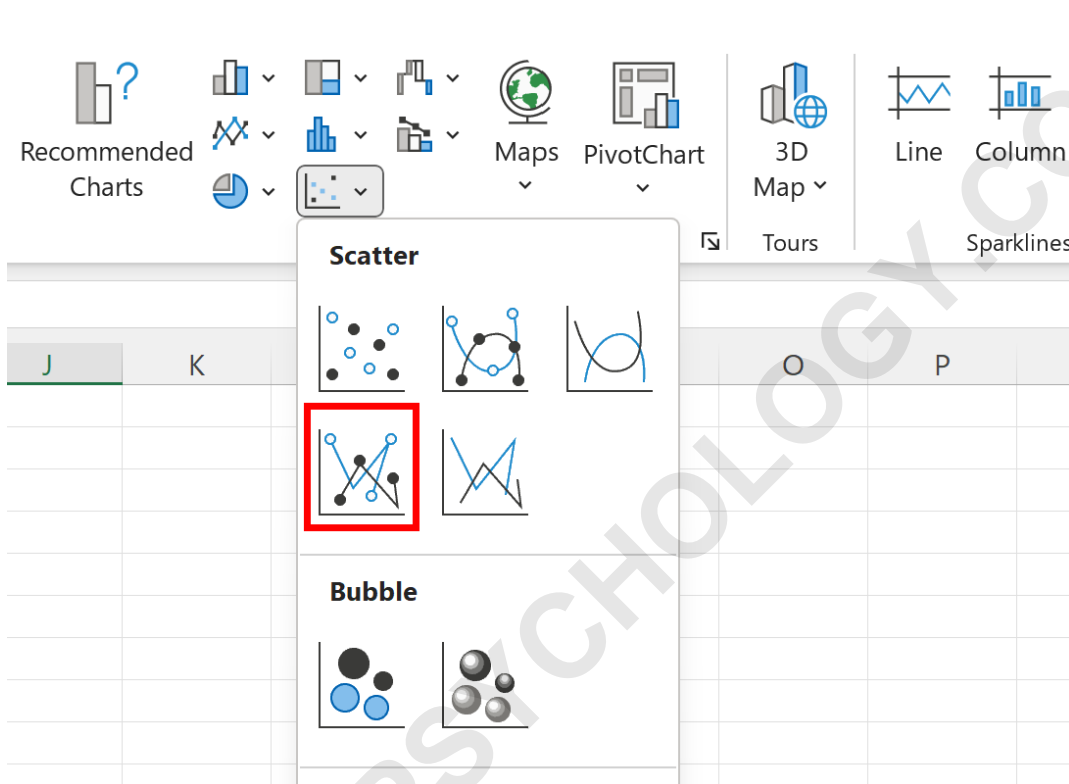
Highlight the entire range containing your data, specifically the values in the range **A2:B9**. This

selection includes both the date/time data and the metric data.

Navigate to the **Insert** tab located in the top ribbon menu.

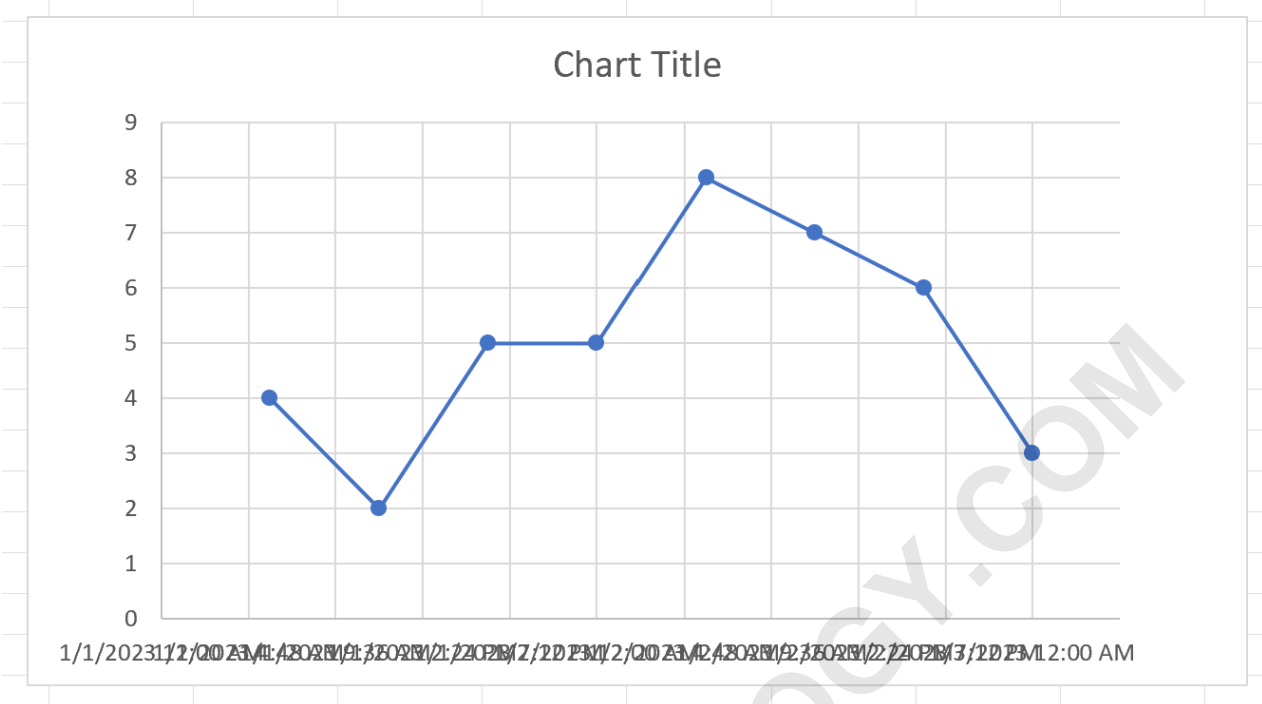
Locate the **Charts** group.

Click on the **Scatter** chart icon. From the drop-down options, select the specific subtype labeled **Scatter with Straight Lines and Markers**. This option not only plots the individual data points but also connects them, creating the familiar appearance of a line graph while retaining the numerical integrity of the X-axis.



Step 3: Initial Chart Generation and Formatting Challenges

Upon inserting the **Scatter with Straight Lines and Markers** chart, the visualization will appear automatically. You will notice that the chart correctly plots the metric values against the temporal values, demonstrating a true continuous relationship along the X-axis.



However, an immediate and common problem emerges, especially when using granular time stamps like hours and minutes: the X-axis labels overlap significantly. By default, Excel displays the full date and time stamp horizontally, and due to the limited horizontal space available for the axis, these long labels run into each other, creating an unreadable mess. This issue masks the underlying data pattern and requires immediate correction for the chart to be functional.

This challenge is amplified in datasets that contain even more data points or cover a longer time span. While reducing the number of displayed labels might seem like a solution, it reduces the precision of the visualization. The preferred, cleaner method involves adjusting the orientation of the labels themselves to utilize space more efficiently.

Step 4: Resolving Axis Label Overlap (Rotation Technique)

To mitigate the overlapping labels and restore readability to the temporal X-axis, we must rotate the text orientation. This technique allows the full date and time string to be displayed clearly without requiring an excessive chart width.

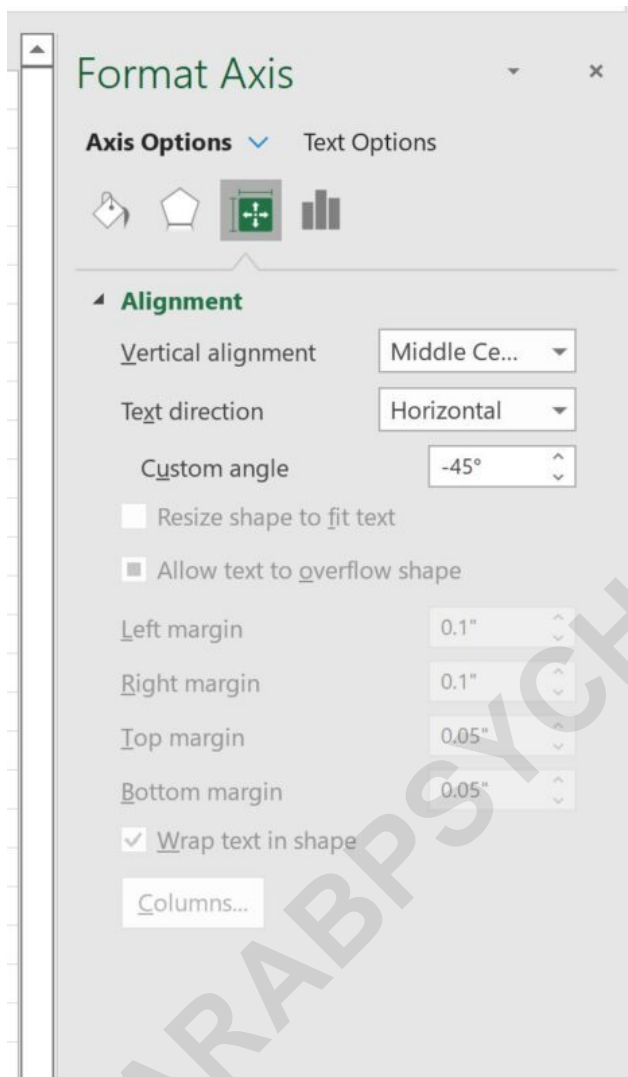
Execute the following steps to rotate the axis labels:

Access the Format Panel: Double-click any of the date/time values displayed along the X-axis. This action will open the dedicated **Format Axis** task pane on the right side of the screen.

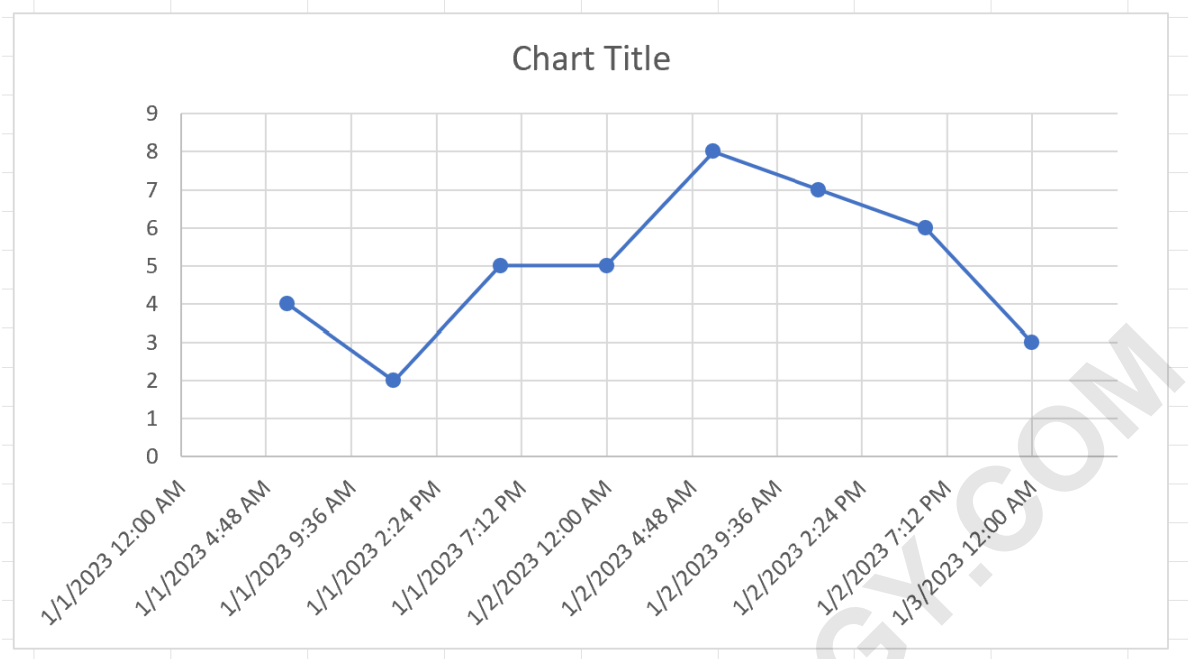
Locate Alignment Settings: Within the **Format Axis** panel, look for the icon representing **Size & Properties** (it often looks like three vertical bars or a box with arrows). Click this icon to access text

direction and alignment options.

Apply Custom Rotation: Find the section labeled **Alignment**. Within this section, locate the input box titled **Custom angle**. To achieve a widely readable angle that minimizes overlap, type the value **-45** degrees into this box. A negative angle rotates the text counter-clockwise, which is standard practice for X-axis labels.



As soon as the angle is set, the labels will instantly rotate. The text strings, which were previously colliding, now utilize the vertical dimension, making each individual date and time stamp distinct and perfectly legible.



This adjustment transforms the chart from an unreadable visualization into a clear and informative tool, proving that minor formatting changes yield significant improvements in data presentation quality.

Step 5: Advanced Chart Customization (Optional Enhancements)

While the chart is now functional and readable, several optional customization steps can elevate its appearance and clarity, transforming it into a presentation-ready graphic. These steps primarily focus on aesthetics and maximizing the data-to-ink ratio.

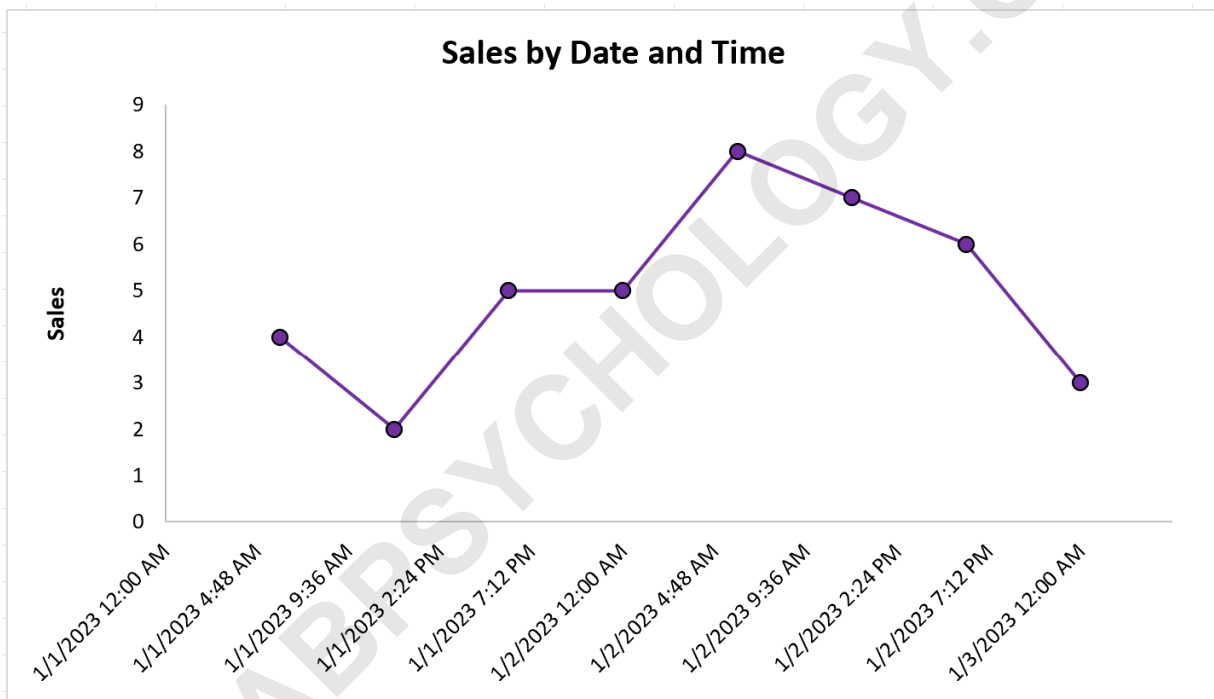
First, consider the addition of **Axis Titles**. Within the **Chart Elements** menu (accessible via the green plus sign next to the chart), activate Axis Titles. Label the X-axis clearly as "Date and Time" and the Y-axis with the name and unit of the metric being measured (e.g., "Response Time (Milliseconds)"). A descriptive **Chart Title** should also be added and positioned prominently, summarizing the data relationship being displayed (e.g., "System Performance Tracking: September 2024").

Second, focus on minimizing visual clutter. The default **Gridlines** often distract from the data line itself. You can remove the horizontal gridlines entirely, or if necessary, adjust their opacity or color to a very light gray. Similarly, you may choose to remove the chart border for a cleaner, modern look. Furthermore, review the markers on the line; if the data is dense, consider using smaller markers or removing them altogether, relying only on the connecting line to show the trend.

Third, precise control over the **Axis Boundaries** and **Number Format** is crucial for temporal data.

Within the **Format Axis** panel (under Axis Options, not Size & Properties), you can explicitly set the minimum and maximum boundaries of the X-axis using their underlying serial numbers, ensuring the chart focuses only on the relevant time period. Additionally, you can adjust the display format of the dates under the **Number** category within the **Format Axis** panel. For instance, if the data spans a short period, you might use a custom format like `hh:mm:ss` to emphasize time over date, or `mm/dd hh:mm` for a balance of both.

Finally, customize the colors of the line and markers to align with presentation standards or company branding. Utilize the **Format Data Series** panel to adjust line thickness, color, and marker style. The combination of rotated labels, clear titles, and refined aesthetics results in a highly professional time-series chart.



Conclusion

Successfully charting date and time data in Excel hinges on two fundamental principles: treating the temporal data as continuous numerical variables and selecting the correct visualization method. By using the **Scatter Plot** chart type, you ensure that the X-axis accurately reflects the passage of time according to Excel's internal serial number system, rather than treating entries as discrete categories.

The subsequent step of rotating the axis labels--a simple yet powerful technique performed within the **Format Axis** panel--is essential for transforming a cluttered initial draft into a highly readable professional graphic. This method effectively solves the spatial constraint issues imposed by high-

granularity time stamps.

Following these steps ensures that any analysis involving time-series data, whether for operational monitoring or academic reporting, is visually accurate and immediately comprehensible. The resulting chart provides an unambiguous representation of how a specific metric evolves over exact moments in time.

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