Running Ad Hoc Reports

Access: **WAE Live > Analytics**, click **New Report**, and choose Report Type: **Ad hoc**

Access: **WAE Live > Explore**, choose objects, and click **Run Report**

Ad hoc reports offer a flexible means of customizing reports to meet specific requirements, making them useful for a variety of use cases. For example, you can average the sum of traffic exiting grouped nodes, or determine how many times an LSP left its shortest TE path.

The basic ad hoc report creates a table of data in which each table value is the result of the time aggregation operation applied to the property over the entire report time range. Each row is an object. Each column is defined by a combination of properties and time aggregations (both of which are selected in the Data Columns fields).

This section contains the following topics:

Time Aggregation Options

Time aggregation operations vary, depending on the selected object:

- Change Count—Number of times the value changed. For example, if you choose Shortest TE Path for LSPs, you can report on the number of times it changed during the last year.

- Count—Number of times the data was collected during the specified time period. For example, if you collected traffic information once an hour for 24 hours, and the Count was 20, you would know there was a problem during 4 hours.

- P99, P98, P95, P90, P85, Maximum, Minimum, Average—Time aggregation computations based on these values.

- Last—Last value in the specified time interval.

- Percentage Growth—Computation of the percentage of growth.

To configure reports for a specific network, choose it from the Network menu (top left). If there is only one network configured, the word "default" appears.

Example: Figure 1: Example Ad Hoc Report, on page 2 shows the output for aggregating P95 Traffic In for interfaces connected to the EU_LON_BB1 node. Interface Bundle-Ether2 (row 1) has 14,249.25 Mb of P95 traffic for the last three months.

Figure 1: Example Ad Hoc Report

## Aggregating by Time Intervals

Each combination of property and time aggregation value can be aggregated by time intervals ranging from hours to years. This broadens the possibilities for how you view the data. For example, you can report on the average number of dropped packets for the last six months (Time Range), and aggregate those averages on a weekly basis (Time Interval). Sorting the Dropped Packets Out column would then show the most problematic interfaces. Another example would be to create yearly reports on a quarterly basis.

These intervals are viewable as graphs. You can graph the time-aggregation value by clicking the aggregation value, or you can graph both the raw data and the time-aggregation interval by clicking the graph icon.

Example: Figure 2: Example Ad Hoc Report with Graphed Time Aggregations Intervals, on page 3 extends the report created in Figure 1: Example Ad Hoc Report, on page 2. Here, each property and time aggregation is further aggregated into a one-week time interval. The difference is that the graph now shows the P95

aggregation applied to one-week increments across three months. By looking at these increments you can see that while the raw data fluctuations, the traffic is very steady on a per-week basis.

Figure 2: Example Ad Hoc Report with Graphed Time Aggregations Intervals
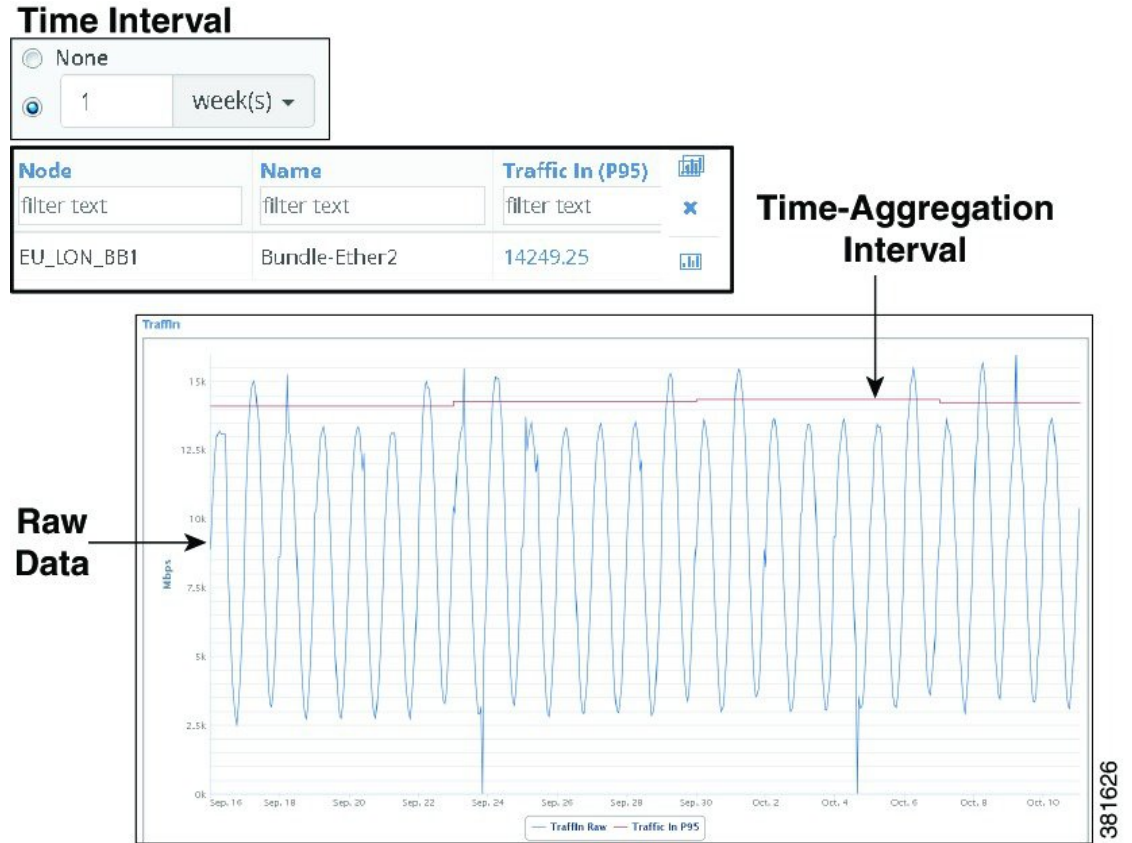
Graphing Percentage Growth

Ad hoc reports let you determine and graph the percentage of growth for any high-frequency property over a specified time range. The resulting data is based on time aggregations of the raw traffic data (for example, average traffic per day). The report tables provide additional information, such as the number of aggregated objects on which the trending is computed. They also list the percentage at which the traffic is growing or shrinking.

One potential use for the percentage growth time aggregation would be to identify how fast your traffic is growing so you can plan for increasing capacity in the future, or whether it is declining, which could be an indication of a diminishing market or service.

Example: shows the output of an ad hoc report that was grouped by node and then by capacity. The time range was 6 months, and the growth computation was based on the daily maximum traffic. Sorting on Traffic In (Percent Growth) shows that the EU_LON_BB3 node with 10,000 Mbps capacity had the largest percentage growth in the last 6 months at 223.08 percent.

Figure 3: Example Ad Hoc Report of Percent Growth

Node	Capacity	Count	Traffic In (Percent Growth) ▼
filter text	filter text	filter text	filter text
EU_LON_BB3	10000	3	223.08
EU_LON_BB3	30000	1	198.27
EU_LON_BB3	40000	2	11.99

Ad Hoc Report Tabs

Required Tabs

- For Object, Filter, and Time Range, see Configuring and Running Reports.

- Data Columns—Apply the time aggregated operation to the associated property. The selected property and time aggregation combination defines the output columns for the report. Defining each Data Column is a two-step process.

  - Add or delete properties, as needed.

  – To add a property, click the Plus icon.

  – To delete a property, click the Trash Can icon.

  For each selected property, identify how you want the data time aggregated for the report time range. See Time Aggregation Options, on page 1. If you specify Percent Growth, you must further identify how you want this growth calculated. See Percent Growth Options, on page 4.

Time Aggregation Options

Time aggregation operations vary, depending on the selected object as follows.

- Change Count—Number of times the value changed.

- Count—Number of times the data was collected during the specified time period.

- P99, P98, P95, P90, P85, Maximum, Minimum, Average—Time aggregation computations based on these values.

- Last—Last value in the specified time interval.

- Percentage Growth—Computation of the percentage of growth.

Percent Growth Options

WAE Live first calculates the trend at which the property value is moving (its direction and frequency), and then uses this trend to determine the percentage of growth. Set the following parameters to determine how this percentage is calculated.

- Interval— The aggregation basis for the percentage: P99, P98, P95, P90, P85, Maximum, Average, or Minimum.

- Per—The aggregation interval that is applied to the raw data before calculating the percentage of growth. This interval must be less than the report time range.

- Trending Algorithm—Algorithm used to compute the percentage of growth. Both the calculation and the graph differ, depending on which option you choose. Following is a list of how these graphs are commonly used.

  - Exponential—Commonly used when data values increase or decrease at a constantly increasing rate.

  - Linear—Commonly used with linear data that often shows a steady rate of increase or decrease.

  - Logarithmic—Commonly used when data changes by increasing or decreasing quickly and then stabilizing and leveling.

  - Power—Commonly used with data measurements that increase at a specific rate.

Optional Tabs

- Group By—Aggregate the report results by groups. The Overall option aggregates the results for all objects. For information, see Configuring and Running Reports.

  In the output, you can expand the group to see its objects by clicking the number in the Count column.

- Time Interval—Apply the time aggregation operations defined in the Data Columns by time intervals. For more information, see Aggregating by Time Intervals, on page 2.

  Example: If you choose Traffic as an LSP property in the Data Columns section and P95 as the Time Aggregation operation, and if you choose 1 week as the Time Interval, the resulting graph shows P95 traffic aggregated on a weekly basis (one data point per week, which is the P95 value of Traffic over that week).

Example: Ad Hoc Data Aggregation

If one plan file is generated per hour, then each day is comprised of 24 raw data points. If you run an ad hoc report for maximum LSP traffic for the last 12 weeks, and if you use weekly intervals, the resulting report first aggregates the maximum LSP traffic for those 12 weeks per object (provided those objects are not grouped). The number of raw data points included in this aggregation would be 169,344 (84 days * 24 raw data points per day). These aggregated values appear in the table columns. Additionally, the intervals would be aggregated per week for a total of 168 raw data points per each of the 12 weeks (168 = 7 days * 24 raw data points per day). These intervals are viewable as graphs. For information on how raw data is collected, see Understanding Objects, Properties, and Data.

Example Ad Hoc Report

Figure 4: Example Ad Hoc Report, on page 6 shows an example ad hoc report generated to determine the aggregated weekly maximum outgoing traffic per node over the past year. It also includes a calculation for the percentage of growth The totals in the resulting report are for three months, and the graphs show the traffic aggregated in weekly increments. Clicking the number in the Count column shows the names of the interfaces.

The table is filtered by EU nodes and sorted on the Traffic Out (Maximum) column to show which European nodes have the highest outbound traffic using the given aggregation. For the European nodes with the highest traffic, the table also shows that these nodes have little fluctuation in their growth, but that all but one has decreasing traffic. The node showing the greatest percentage of loss is EU_MAD_BB2 at -23.25 percent loss over the last three months. Yet, you can also determine that while it is showing a percentage growth loss over time, the node has traffic spikes.

Report Configuration	Parameters
Report Type	Ad Hoc
Object	Interfaces
Filter	Node
Time Range	Last three months
Group By	Node
Time Interval	1 week
Data columns	Traffic Out, Maximum
	Traffic Out, Percentage Growth based on a maximum interval of 1 day using a linear trend

Figure 4: Example Ad Hoc Report

Node	Count	Traffic Out (Maximum)	Traffic Out (Percent Growth)
EU	filter text	filter text	filter text
EU_LON_BB1	27	226203.00	2.12
EU_PAR_BB1	26	209134.62	-2.95
EU_PAR_BB3	16	129778.63	-6.47
EU_AMS_BB2	19	85742.99	-1.28
EU_LON_BB2	13	85254.13	-6.34
EU_AMS_BB1	12	48909.92	-7.01
EU_MAD_BB1	7	48035.67	-3.69
EU_MAD_BB2	8	41286.45	-23.25