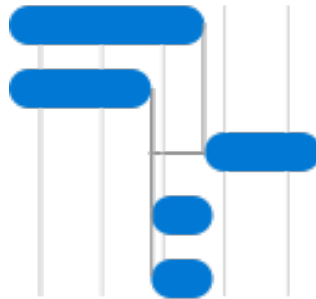


# Gantt chart Manual

Agile Parts

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## 1 Introduction

The Gantt chart plugin for Azure DevOps is a tool to visualize project timelines and dependencies.

## 2 Installation

The Gantt chart plugin is available on the Azure DevOps marketplace<sup>1</sup>. Click the green button labeled “Get” to start the installation process.

## 3 Authenticating users

Users must be authenticated to use the plugin. This can be done from the *Organization settings* page in Azure DevOps, which you can access from the link at the bottom left corner.

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<sup>1</sup><https://marketplace.visualstudio.com/items?itemName=AgileParts.gantt>

## 4 Creating a Gantt Chart

The Gantt chart plugin is build on top of the queries functionality in Azure DevOps. Follow these steps to create a chart:

1. **Create a query:** In the Azure DevOps menu, go to 'Boards', 'Queries'. Click on 'New Query'.
2. **Select query type:** The default query type is a 'flat list of work items'. If you want to see a hierarchical overview, select 'tree of work items'. This will give you some extra options, where you can set the type of tree to 'Parent/Child'.
3. **Configure the filters:** The query filters determine which work items show up the chart. If, for example, you want to see all children of a single Epic, use a hierarchical query and filter the top-level items on the ID of the Epic work item. Run the query to verify that the result contains the desired work items.
4. **Save the query:** The Gantt chart plugin works on saved queries only. Save your query in the 'Shared Queries' folder if you want your colleagues to be able to view the chart.
5. **Generate Gantt chart:** With your query in place, navigate to the 'GANTT' tab within the plugin. Click on it to initiate the automatic generation of the Gantt chart. This chart will visually represent the selected work items and their dependencies.

## 5 Chart settings

The Gantt chart plugin for Azure DevOps offers a range of settings to customize the appearance and functionality of your Gantt charts. Access these settings by clicking the 'Settings' button located above the chart, which opens a settings panel on the right side of the interface.

The settings panel has two tabs: 'Visualization' and 'Planning'. Settings under the 'Visualization' tab include:

- **Scale Slider:** Adjust the scale of the Gantt chart to display data in days, weeks, or months.
- **Annotation Dropdown:** Add text annotations after the bars. Various fields are available for annotation.
- **'Work Item Color Based On':** Select a field from the dropdown to set the color of work items. Colors are automatically determined based on the unique values present in the chart.
- **'Show Extra Columns':** Customize the columns that appear on the left side of the chart by adding fields from work items. Changes made here apply immediately to the chart.
- **'Save as Query Default':** Save the current settings for the chart, which will be applied exclusively to the current query.
- **'Save as Organization Default':** Save the settings for all queries within the organization. Queries with previously saved settings will continue to use those settings, but new queries will inherit the organization's default settings.

The following setting is available under the 'Planning' tab:

- **'Velocity':** This numeric field serves as a multiplier for the 'Story Points' and 'Effort' fields. It influences the planning process by allowing for adjustments to these relevant numeric values.

These settings enable users to tailor their Gantt charts to their specific project needs, enhancing visualization and planning capabilities in Azure DevOps.

## 6 Updating Work Items from the Gantt Chart

To update work items directly from the Gantt chart, follow these steps:

- Click on a work item in the Gantt chart, which will open a panel on the right side of the interface. In this panel, you'll find several fields that you can modify:
  - **'Starts'**: This field represents the start date of the work item. It may not necessarily match the start date set in the work item itself, as it could be calculated. A brief description just below the field will indicate the source of this value.
  - **'Ends'**: This field corresponds to the end date of the work item. It may not necessarily match the closed date or finish date set in the work item, as it might be calculated. A brief description below the field will specify the source of this value.
  - **'Estimate'**: The estimate of the work item is calculated based on various factors, such as 'Initial estimate,' 'Completed work,' 'Remaining work,' 'Effort,' and 'Story Points.' The specific calculations depend on the process chosen for the project and custom project settings.
  - **'Target'**: This field represents the target date, indicating when a work item must be ready at the latest. It might finish earlier, as denoted in the 'Ends' field. If available, it is linked to the 'Target date' field in the work item.
  - **'Predecessors'**: This is a list of work items that must be completed before this work item can start. In the work item, these can be found under 'Related Work', using the 'predecessor' type.
  - **'Successors'**: This field lists work items that must start after this work item is finished. In the work item, these can be found under 'Related Work', using the 'successor' type.
- You can make changes to these field values in the panel. As you do so, a red label will appear on the 'Changes' button located in the top bar, indicating that there are unsaved changes.
- Click on the 'Changes' button to review a list of the modifications you've made. To permanently save these changes, use the 'Save changes' button. This action will update the work item data within Azure DevOps, ensuring that your project information remains up-to-date and

aligned with the Gantt chart.

This feature streamlines the process of managing and updating work items, allowing for seamless integration between your Gantt chart and Azure DevOps project data.

## 7 Date Calculations

The Azure DevOps Gantt chart plugin incorporates dynamic date calculations for work items within the chart. This feature ensures that the Gantt chart can generate meaningful representations, even when specific date-related fields are not explicitly filled in. The chart derives start and end dates for work items from multiple sources, including inherent work item information, dependencies, project hierarchy, and iteration scheduling. This approach simplifies creating Gantt charts with minimal manual data entry while providing a reliable view of project timelines. This section will provide a detailed explanation of the dynamic date calculation mechanism for users.

Many fields are used in the calculations. These fields may or may not be visible on the work item details page, depending on the process (e.g. scrum or agile) and work item type (e.g. feature, user story, or bug). Advanced users may change which fields appear on which work item types using 'Boards', 'Process' in the organization settings.

### 7.1 Determining the Start Date

The start date in Gantt charts is a crucial aspect of project management, and various factors influence its determination. Here's an overview of the criteria that impact the calculation of the start date in the Gantt chart:

1. **Source Start Date:** The primary source for the start date is the 'source.startDate' value associated with the work item.
2. **Children's Start Dates:** If the work item has child items, the start date is derived from the earliest start date among its children.
3. **Finished Work Items:** If the progress of the work item is 100%, the start date is determined by subtracting the estimate from the earliest value among:
  - (a) The finish date of the work item, or one of the work item's parents.
  - (b) The closed date of the work item, or one of the work item's parents.
  - (c) The current date and time.

For example, when closing a work item with an estimate of 4 hours, the start date will be set to 4 business hours before closure, provided the parent does not have an earlier finish date.

4. **Work In Progress:** For work items with progress ranging between



0% and 100%, the start date is calculated based on the current date and time minus completed work (difference between the estimate and remaining work). In case of predecessors which are not finished, the actual start date may be moved forward to their finish date.

5. **Not Started:** When progress is at 0% (or unknown), the start date is determined by selecting the latest value from the following sources:
  - (a) Explicit start date of all parent work items.
  - (b) Explicit target date of predecessors, including predecessors of all parent work items.
  - (c) Finish date of predecessors, including predecessors of all parent work items.
  - (d) The first result from:
    - i. Start date of the current iteration.
    - ii. Start date of the parent work item's iteration.
  - (e) The current date and time minus the remaining work.
6. **Target Date Calculation:** If none of the previous criteria apply, the start date is calculated as the target date minus the estimate or remaining work.
7. **Next Business Day:** In cases where no other data is available the next business day, start of business, is used as a last resort.

## 7.2 Determining the Estimate

The 'Estimate' field in Gantt charts is crucial in project planning and scheduling. Its value is determined by specific criteria as follows:

1. **Completed Work and Remaining Work:** If both 'Completed work' and 'Remaining work' fields are filled in (possibly with a value of 0), the 'Estimate' is calculated as the sum of 'Completed work' and 'Remaining work'.
2. **Original Estimate and Remaining Work:** When 'Original estimate' is filled in, the 'Estimate' is determined as the maximum value between 'Original estimate' and 'Remaining work'.
3. **Effort, Story Points, or Size (Multiplied by Velocity):** If any of the fields 'Effort', 'Story Points', or 'Size' are filled in, the 'Estimate' is

calculated by multiplying the value by the project's velocity (from the Gantt chart settings).

### 7.3 Determining the End Date

The end date signifies the date when a work item is either completed or expected to be completed. The determination of this date follows specific criteria:

1. **Source Finish Date:** The primary source for the end date is the 'Finish Date' value associated with the work item.
2. **Children's Start Dates:** If the work item has child items, the end date is derived from the latest end date among its children.
3. **Work In Progress:** For work items with progress ranging between 0% and 100%, the end date is the current date plus remaining work. In case the work items has predecessors which are not finished, the date may be later because remaining work continues after the finish date of the predecessors.
4. **Estimate:** The end date may be determined by the start date plus estimate or remaining work.
5. **Target Date:** The end date may be determined by the target date. This is especially the case when no estimates are set, e.g. planning is done by explicitly setting start and target dates.
6. **Closed Date:** The end date is maximized by closed date, i.e. when the work item is closed, the work item's end date will not be after the date the state was changed.

It's important to note that the 'Finish date' is a default field in the CMMI process only and is not found by default in projects using the agile or scrum process. Consequently, the end date is typically determined by factors such as 'Closed date', 'Remaining work', 'Target Date', or 'Start Date' plus estimate, taking into account similar factors for child work items. Advanced users may add a rule (within the 'Organization Settings', 'Boards', 'Process') to set the 'Finish date' when the state changes to a state like 'Done' or 'Resolved'.

### 7.4 Determining the Target Date

The 'Target Date' in Gantt charts represents the deadline by which a work item should be completed. The determination of this date follows specific

criteria:

1. **Source Target Date:** The primary source is the 'Target Date' set within the work item. This value indicates the deadline set for the work item's completion.
2. **Successor-Based Calculation:** If there are successor work items linked to the current work item, the 'Target Date' is determined by selecting the earliest date among the following options for each successor:
  - **Successor's Start Date:** The 'Target Date' may be determined by the 'startDate' of the successor work item. This suggests that the current work item should be completed before the successor's start date.
  - **Earliest Date Among Successor's Children:** If the successor work item has child items, the 'Target Date' is influenced by the earliest 'startDate' among all of its children. This reflects the deadline considering the entire scope of the successor work item.
  - **Successor's Latest Acceptable Start Date:** The 'Target Date' may be based on the 'Latest Acceptable Start Date' of the successor work item. This date signifies the latest point at which the current work item should be completed to align with the successor's requirements.

## 8 Sorting of Work Items

In Gantt charts, the arrangement and display of work items are essential for project management and visualization. Work items are primarily sorted based on their start dates to provide a clear timeline view of the project. The start date serves as a foundational criterion for ordering work items, ensuring that the sequence of activities is represented accurately.

In addition to the start date, secondary sorting is applied to maintain the order specified in the original query. This dual sorting mechanism combines chronological alignment with the customized arrangement of work items as defined in the query.

When dependencies are used, the items are displayed grouped to prevent different tracks from being displayed together.