TOPIC A

Optimize a Project Plan

Every task is important, but those tasks that directly determine the total duration of the project are especially critical. In this topic, you will discuss how to identify those tasks and then modify them to optimize the overall project plan.

The Critical Path

A *critical path* is the series of tasks that determines the calculated finish date of a project. In a project, the critical path can show if the project will finish on time and also highlight the danger points. Tasks on the critical path are called critical tasks; if one or more of these critical tasks are delayed, the project will finish late. If a noncritical series of linked tasks slips its dates, this series of tasks may become the critical path. In complex or large projects, there can be more than one critical path or critical path section, and the critical path can change many times throughout a project's life cycle.

In other words, the project duration cannot be shorter than the total duration of the tasks in the critical path. Generally, a project has a single critical path, but may have more than one.

Project automatically calculates the critical path for you. You can view the critical path in the Gantt chart by checking the **Critical Tasks** check box in the **Bar Styles** group on the **Format** tab on the ribbon. Critical tasks appear in red. In the **Network Diagram**, the critical tasks are shown by default in red.
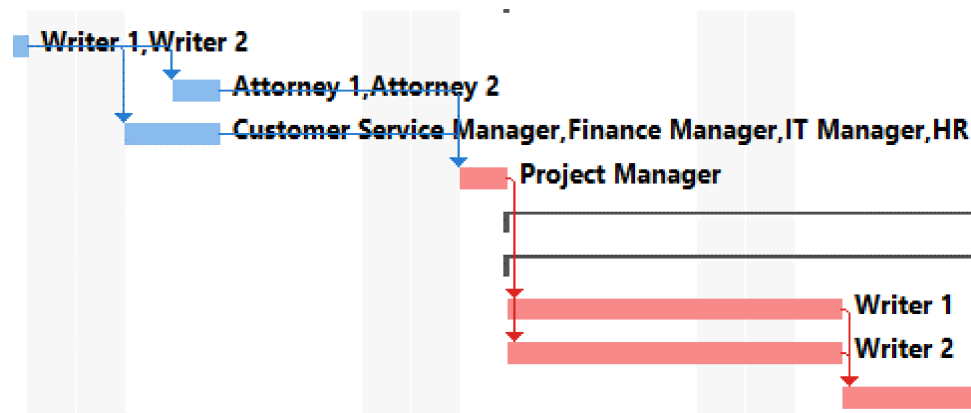

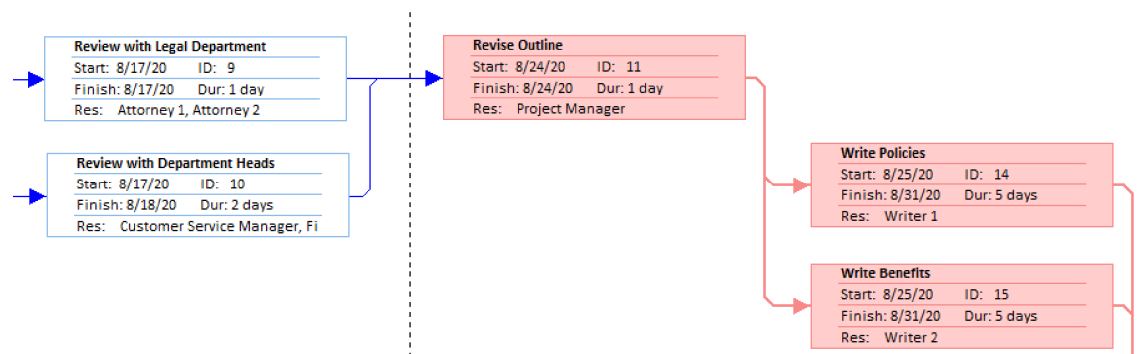*Figure 6–1: The critical path appears in red in the Gantt chart.*

Figure 6–2: The critical path appears in red in the Network Diagram.

Slack

Slack is the amount of time that a task can slip before it affects another task or the project's finish date. **Free slack** is the amount of time a task can slip before it delays another task. **Total slack** is the amount of time a task can slip before it delays the project's finish date. If total slack is a negative number, it indicates the amount of time that must be saved so that the project's finish date is not extended. Slack can be displayed in the **Gantt Chart** view and is represented by thin black bars that extend from a Gantt bar for a task.
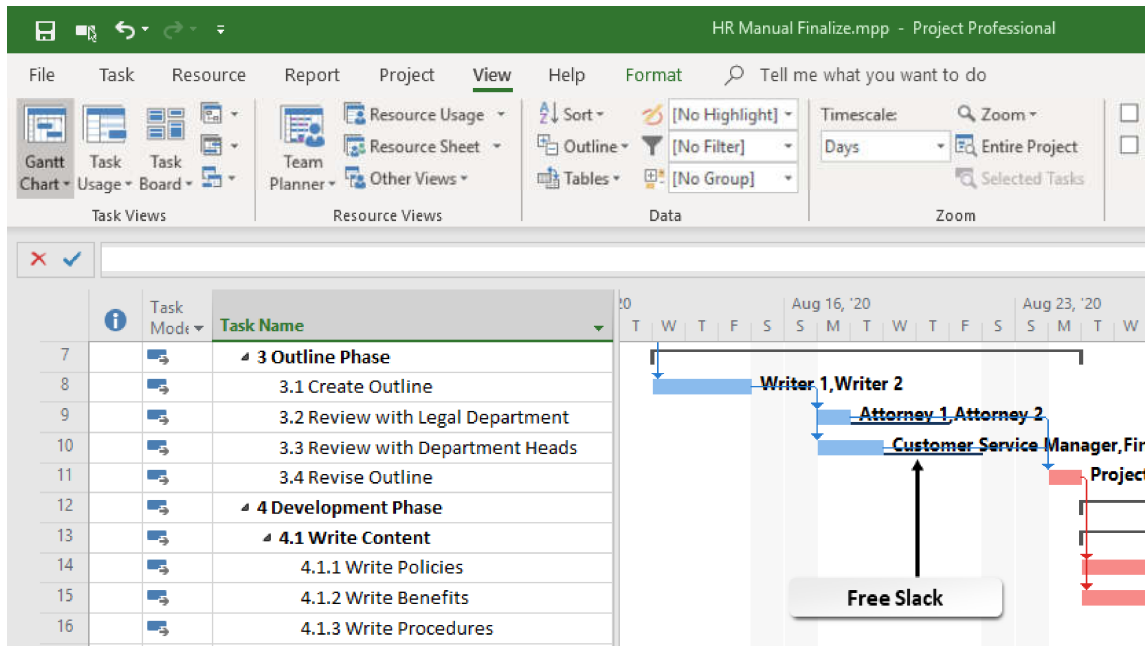

Figure 6–3: Free slack can be shown in the Gantt Chart view of a project plan.

Methods of Optimizing a Project Plan

Once you understand your project's critical path, you can make changes to the tasks and assignments of the path to optimize the overall project plan. For example, if a task is causing the duration to extend beyond a goal end date, you can add resources or modify the dependencies of the task. You may be able to shorten the duration of a task by adding another person to complete the task. Or, you may realize that a task can start sooner than the finish date of its predecessor. If you have resources that are dedicated to your project, you may wish to review their assignments to see if there are times when they are not working on a task and can be assigned to help on a task on the critical path. You may also want to review those resources which are scarce or expensive to optimize their usage. Finally, you may decide to reduce the scope of the project and remove or shorten some tasks as a result.

- Shorten critical path by:
    - Adding resources
    - Refining dependencies
    - Reassigning tasks
    - Removing tasks/reducing scope
- Optimize resource usage by:
    - Balancing work across resources
    - Minimizing expensive resources

Figure 6–4: Review these methods to optimize your project plan.

Note: After you build your plan and Project calculates the schedule and cost for the project, in rare instances you might have more time or an increased budget. You can choose to end the project ahead of schedule or under budget or, with stakeholder approval, you can increase the scope.

Access the Checklist tile on your **CHOICE** Course screen for reference information and job aids on **How to Optimize a Project.**

ACTIVITY 6–1
Optimizing a Project Plan

Data File
C:\091098Data\Finalizing a Project Plan\HR Manual Finalize.mpp

Before You Begin
Microsoft Project is open.

Scenario
In last week's project status meeting, the Vice President of Operations asked you to accelerate the project, because he is concerned about getting the HR manual into the hands of the employees as soon as possible. You need to see which tasks are driving the finish date, and then explore ways to fast-track any of them. You begin by displaying the critical path.

There are a number of tasks on the critical path. It looks like you can select the printing vendor faster if another resource could be assigned to that task. You can also speed the project along by starting the grammar-checking task while the graphics are being developed. You make these adjustments to optimize the plan.

---

1. Open the **HR Manual Finalize.mpp** project plan file.
   a) Select **File→Open**.
   b) On the **Open** tab in **Backstage View**, select **Browse**.
   c) In the **Open** dialog box, navigate to the **C:\091098Data\Finalizing a Project Plan** folder containing your class files.
   d) Select **HR Manual Finalize.mpp** and select **Open**.

2. Display the critical path.
   a) If necessary, on the ribbon, select the **Task** tab.
   b) Select **Format**.
   c) In the **Bar Styles** group, check the **Critical Tasks** check box.
   d) Review the highlighted tasks to understand what is driving the end date of the project.

3. Add resources to a task on the critical path to shorten it.
   a) In the **Task Entry** table, select **7.2 Select Printing Vendor** and then **Scroll to Task**.
   b) Double-click **7.2 Select Printing Vendor** to open the **Task Information** dialog box.
   c) On the **Resources** tab, in the first blank row, select **Printer Operator**.
   d) Select **OK**.
   e) Rest your cursor over the **Task Name** for **7.2 Select Printing Vendor** and select the arrow next to the diamond and exclamation mark next to the task name.
   f) Select the **Reduce the duration but keep the same amount of work** radio button.
      Notice that the project finish date has decreased from October 9 to October 8.

4. Add lead time to a task on the critical path.
   a) Select **5.1 Check Grammar, Spelling, and Proofread** and then **Scroll to Task**.
   b) Double-click **5.1 Check Grammar, Spelling, and Proofread** to open the **Task Information** dialog box.
   c) On the **Predecessors** tab, select the down arrow in the **Lag** column and set to *-2d*
   d) Select **OK**.

Note that the project finish date has decreased to October 6.

5. Save your changes as **My HR Manual Finalize.mpp**.

    a) On the ribbon, select **File→Save As**.

    b) Select **Browse** and then navigate to **C:\091098Data\Finalizing a Project Plan**.

    c) In the **File name** field, enter *My HR Manual Finalize.mpp* and then select **Save**.