CHAPTER

9

Assigning Resources to Tasks

So far, you've created tasks in Project (Chapter 6), put them in the correct sequence (Chapter 7), and told Project about the resources you need (Chapter 8). Now all that hard work is about to pay off. You're ready to turn that Project file into a real schedule that shows when tasks should start and finish—and whether they're scheduled to finish on time.

Although you may estimate hours of work or task durations early on (page 162), you don't see the whole timing picture until you assign resources to auto-scheduled tasks (page 64) in your project. The number of resources you use, how much time those resources devote to their assignments, and when they're available to work all affect how long tasks take and when they occur. And if you've set up your Project resources with costs and labor rates, resource assignments generate a price tag for the project, too.

If you manually schedule tasks (page 60), you're in complete control over when they start and finish. Team Planner view (available in Project Professional) shows who's doing what and when, which tasks aren't assigned, or who's overallocated. With manually scheduled tasks, you can change any of these situations in Team Planner view by dragging tasks to a resource or moving the tasks in the timescale.

This chapter clarifies how duration, work, and units interact, and explains how to use this information to create and modify resource assignments. Assigning resources isn't just picking a task team. You also specify how much time those lucky folks devote to their tasks. For example, once a giant construction crane is on a building site, it's available 100 percent of the time until you move it to another site. However, when you need an attorney for a few days to resolve a legal fiasco, you don't want 100 percent of her working time—or the monumental invoice that comes with it.

Assigning Work Resources to Tasks

Project lets you assign work resources in most of the usual places that you set up other task information. Once you've created resources as described in the previous chapter, all you have to do is match them up with the tasks they'll work on. The best way to do that depends on how much assignment detail you want to specify. Here are the methods and when to choose each one:

- **Using the Assign Resources dialog box.** This dialog box is the Swiss Army knife of resource-assignment tools, teeming with indispensable features. Assigning a resource to a task is as simple as clicking a resource's name, but you can also use it to search for specific types of resources, or for resources that have enough available time. This dialog box lets you assign several resources to a task, or assign a resource to several tasks at once. Moreover, you can use it to add, remove, or replace resources you've already assigned.
- **Using Team Planner view.** Team Planner view, available in Project Professional, is a slick way to assign resources, whether you want to assign them to as-yet-unassigned tasks or you want to *reassign* them to get rid of overallocations. This view shows each resource in the project and the tasks they're working on in a timescale. Unassigned tasks appear at the bottom of the view. All you have to do to assign a resource is drag an unassigned task to the resource's row. To reassign a resource, simply drag a task from one resource to another. Page 244 gives you the full scoop.
- **Filling in a task form.** When you already know the resource you want, Task Form view has all the fields you need to craft precise resource assignments. It's easy to display this view in the Details pane as a companion to almost any view. Task Form view also helps when you want to make surgically precise modifications to existing assignments (page 261).
- **Entering names in a task table.** Choosing a resource in a table like the Entry table is good only for the simplest of resource-assigning chores—assigning one or two full-time resources to a task, for example. On the other hand, such a table is ideal for dragging and copying resource assignments to several tasks (page 235).
- **Using the Task Information dialog box.** The Resource tab of this dialog box is another place you can assign resources. But since you have to open and close the dialog box for each task you want to edit, you may want to use it for assignments only when you've already opened the dialog box to make other changes to a task.

Assigning Resources with the Dialog Box

Whether you're assigning one resource to a task full time, assigning several resources to multiple tasks, or searching for the most qualified resources, the Assign Resources dialog box is the place to be. This dialog box can even remain open while you perform other actions in Project. For example, you can assign a few resources and then filter the schedule to evaluate what you've done. If you spot a problem, then you can jump right back to the dialog box to make the fix.

To assign resources in the Assign Resources dialog box, follow these steps:

1. **In the Resource tab's Assignments section, click Assign Resources.**

   When the Assign Resources dialog box opens, drag it out of the way of what you're doing. It stays put and remains open until you move it or click its Close button.

2. **In Gantt Chart view or any other task-oriented view, select the task to which you want to assign resources.**

   If any resources are already assigned to the task, they appear at the top of the list in the Assign Resources dialog box, preceded by a checkmark.

WARNING Project doesn't stop you from assigning resources to summary tasks, but doing so is more confusing than it is helpful. If you assign resources to summary tasks, the rolled-up values (like cost and work) of summary tasks won't equal the totals from all the subtasks because the rolled-up values include values from the summary task's resource assignment. Moreover, summary-task bars in the timescale area of Gantt Chart view don't show assigned resource names at the right end of the bar, so unless you customize the view, you don't even see the resources assigned to summary tasks. (You can see the names in the Entry table, though.)

3. **In the dialog box's Resource Name column, click the name of the resource you want to assign.**

   If you want to assign several resources at the same time, click the first resource's name, and then Ctrl-click additional names. If the resources you want are adjacent to one another in the list, click the first resource you want, and then Shift-click the last one.

4. **After you select all the resources you want to assign to the task, click Assign.**

   When you click Assign, Project provides several visual cues for the new resource assignment, as Figure 9-1 shows.

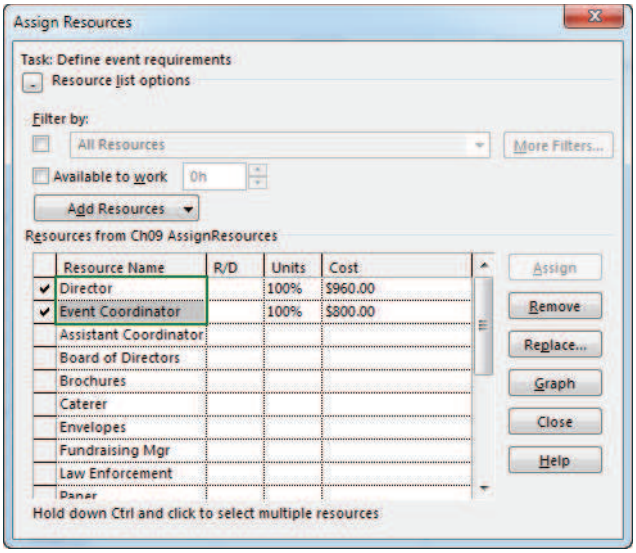

FIGURE 9-1

When you click Assign, the selected resource(s) shoot to the top of the list, above the unassigned resources. A checkmark appears to the left of the assigned resource's name and, in its Units cell, Project automatically enters either the resource's Maximum Units value (page 215) or 100% if the maximum units are greater than 100% (as they are for a team). The cost of using the resource for the time involved appears in the Cost cell.

5. **To change the units for an assignment, type the unitspercentage in the Units cell, and then press Enter or click another field to save the change.**

   To allocate half of the resource's time, type *50* (Project adds the % sign for you). Or click the up and down arrows that appear when you click the Units cell to jump to commonly used percentages. For example, if the Units value is 100%, clicking the down arrow once changes the Units to 50% and clicking it a second time changes the units to 0%. (See the box on page 231 for more about what the term "unit" means in Project.)

NOTE Units can appear as percentages or decimal values (50% and .5 represent the same allocation), but you have to stick with one format or the other. To switch to decimal units, choose File→Options. On the left side of the Project Options dialog box, click Schedule, and then, in the "Show assignments as a" drop-down list, choose Decimal.

6. **To assign another resource to the same task, repeat steps 3–5.**
7. **To assign resources to another task, select the task, and then repeat steps 3–5.**

   When you're finished assigning resources, click Close to close the dialog box.

You don't have to assign resources to only one task at a time. The Assign Resources dialog box can add assignments to several tasks, as you can see in Figure 9-2. Simply select all the tasks you want to staff by dragging across them or using Shift-click and Ctrl-click. Then use the Assign Resources dialog box as you would for a single task.

UP TO SPEED

What Project Calls a Unit

You'll see the term "units" in a couple of different places in Project: There's a Max. Units (Maximum Units) field in Resource Sheet view's Entry table, and a Units field that's located in the Assign Resources dialog box and Task Form view. It's important to understand that Project uses the term loosely. These are a couple of different types of units in Project, though they're related. Each type is a percentage of time (or the equivalent decimal). The Max. Units field applies to resources, while the Units field (and the related Peak field, which you'll learn about in a sec) apply to the assignments you give those resources. Here's how to keep them straight:

- A resource's **Max. Units** field (page 213), which appears in Resource Sheet view's Entry table and the Resource Information dialog box, is where you indicate the highest percentage of time that resource is available to work on your project. For example, 100 percent means all the resource's time is dedicated to your project; part-time availability can be any value between 1 percent and 99 percent. If you define a resource for a team of interchangeable workers, its Max. Units can even be a value like 300 percent, for three full-time workers.
- The **Units** field in the Assign Resources dialog box and Task Form view is where you record the percentage of time that the resource works on a specific assignment. This field is technically the *Assignment Units* field (even though its label simply reads "Units"), and it represents how much time you initially allocate the resource to the task. For example, a resource working on two concurrent tasks may dedicate 75 percent of his time to one task and the remaining 25 percent to the other.
- Project calculates the highest units assigned at any time during a resource's assignment in the **Peak** field, while keeping the value in the Assignment Units field set to the original value you entered for Assignment Units, as described on page 253. (The Peak field doesn't appear in any tables or forms out of the box. To see it, insert it into a table by right-clicking the table's header row, and then choosing Insert Column→Peak.)

Project flags a resource as overallocated if either the Assignment Units or Peak field value is greater than the resource's Max. Units value.

TIP If a nasty paper-cut accident puts your top assistant out of commission and you need to reassign his tasks to someone else, you can turn to the Replace button in the Assign Resources dialog box. Click the name of the resource you want to replace, and then click Replace. In the Replace Resource dialog box, select the new resource(s), and then click OK. Project removes the original resource from the task and then assigns the replacements.

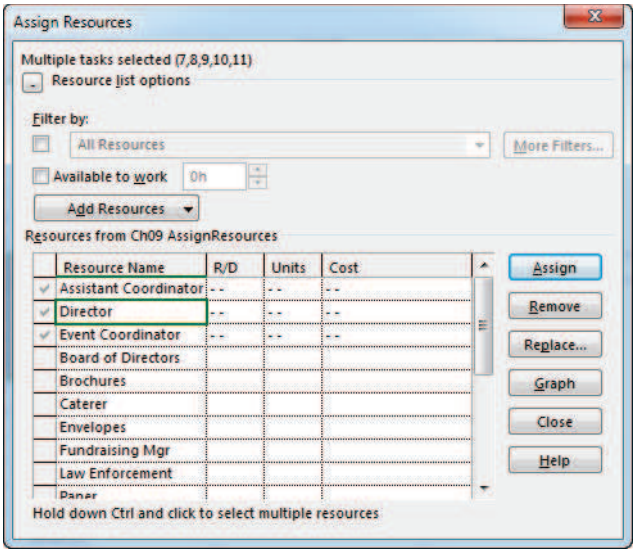

FIGURE 9-2

When you select several tasks, the label at the top of the Assign Resources box changes to "Multiple tasks selected (x,y)," where x and y are the ID numbers of the selected tasks. In addition, gray checkmarks identify all the resources that are assigned to at least one of the selected tasks.

POWER USERS' CLINIC

Creating and Assigning Resources at the Same Time

Suppose the resource you want to assign to a task is absent from the list of resources in the Assign Resources dialog box. This omission means that the person (or equipment) doesn't exist in your Project file. Happily, you can create the resource *and* assign it to a task without leaving the Assign Resources dialog box. Here are the steps:

1. In the dialog box's Resources table, click the first blank Resource Name cell, and then type the resource's name.
2. To save the new resource and select it, press Tab.
3. Click Assign. Project moves the resource to the top of the list, puts a checkmark next to it to indicate that it's been assigned, and changes its Units value to 100%.
4. If necessary, adjust the Units value.

After you've completed your assignments, you can add the rest of the information about the resources you added on the fly. To do so, double-click a resource name in the Assign Resources dialog box to see its values in the Resource Information dialog box. Or work on resources in Resource Sheet view. You can use any of the techniques described in Chapter 8 to edit or add to resource records.

The Assign Resources dialog box can also import resources from your email address book or Active Directory (if your computer is connected to an Active Directory domain). To do either, click Add Resources, and then choose either From Active Directory or From Address Book. (If you don't see the Add Resources button, click the + to the left of the "Resource list options" label to display it.)

Assigning Resources in Task Form View

Task Form view and its sibling, Task Details Form view, don't have the fancy features of the Assign Resources dialog box, but they make it easy to assign resources you've identified. The main limitation of these two views is that they let you work with only one task at a time—the one that's currently selected in Gantt Chart or another task view. (But selecting another task is as easy as clicking it.)

Here's how you assign resources in Task Form or Task Details Form view:

1. **In the Task tab's View section, choose Gantt Chart or another task-related view.**

   Task Form view is the standard view that appears in Gantt Chart view's Details pane. If you don't see Task Form view there, in the View tab's Split View section, turn on the Details checkbox (if it's not already on) and choose Task Form from the drop-down list next to it.

2. **In the table in the top pane, select the task that needs resources.**

   Task Form view displays the information for the selected task.

3. **In Task Form view, click the first blank Resource Name cell, and then, from the drop-down list, choose the resource you want to assign.**

   Clicking the down arrow on the right end of the Resource Name cell displays the drop-down list of resources. For large project teams, scrolling through this list can be tedious. When the list is open, you can begin typing a resource's name, and Project jumps to the closest matching name in the list. For example, to skip right to "Smith Brian," type *S*. If Project hasn't located the exact resource, keep typing the resource's name until it does, and then click the resource's name as soon as you see it in the list.

NOTE Out of the box, Project automatically adds new resources to your file when you type a resource name that doesn't already exist, so a typographical error may create a new—and nonexistent—resource. To prevent these phantom resources from joining your project team, choose File→Options. On the left side of the Project Options dialog box, choose Advanced. In the "General options for this project" drop-down list, make sure the project you want is selected, and then turn off the "Automatically add new resources and tasks" checkbox.

4. **To specify the percentage of time the resource devotes to the task, click the Units cell in the same row and type the appropriate number—for example, *50* for 50 percent, as shown in Figure 9-3.**

   If you want to assign the resource at 100 percent (or the resource's maximum units from the Resource Sheet), simply leave the Units cell blank. Project sets Units to 100% or the resource's maximum units automatically when you click OK. The only exception is group resources. If the group resource's maximum units are more than 100 percent, Project still fills in 100%.

The percentage in the Units cell is the percentage of the resource's work schedule, whether it's your organization's standard schedule or a special one. For example, for resources working typical full-time work schedules, 50 percent represents half time (20 hours a week for the typical 40-hour week).

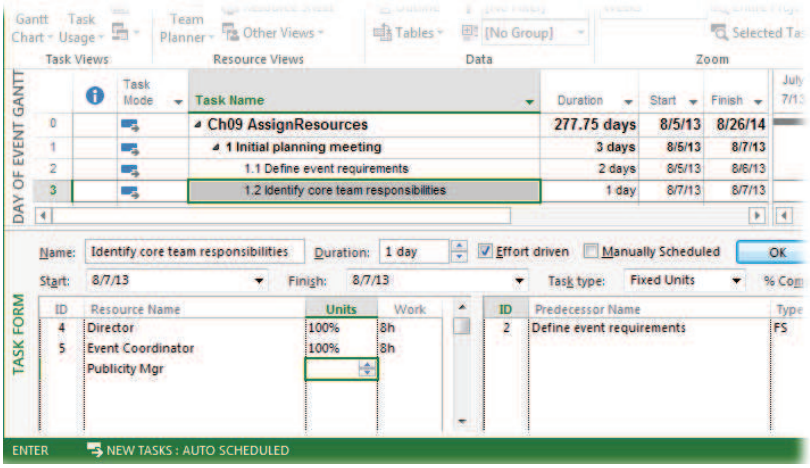

FIGURE 9-3

To assign work instead of units, click the Work cell, and then type the hours, days, or other time units. Project calculates the units based on the work and the task's duration. If you set Project's "Work is entered in" setting to the time unit you use most often (for example, "h" for hours or "d" for days), then you can simply type a number and Project will add the time unit. To set the standard time unit for work, choose File→Options→Schedule.

5. **To assign another resource to the task, click the next blank Resource Name cell, and then repeat steps 3 and 4.**

   After you assign all the resources, click OK. Project calculates the work hours for each resource based on the Units percentage and the task duration, as described in the section "Understanding Duration, Work, and Units" on page 251.

Assigning Resources in a Gantt Chart Table

The Assign Resources dialog box and Task Form view described so far give you the power to enter varying percentages in the Units field, create new resources on the fly, and so on. But if all you need to do is assign all of a resource's available time to one task, then working directly in a table in Gantt Chart view is fast and convenient. Here are the steps:

1. **In the Task tab's View section, choose Gantt Chart.**

   The standard table applied to Gantt Chart view is the Entry table, which includes columns for the task's mode, name, duration, start and finish, predecessors, and resources. If you see different columns, right-click the Select All cell (the one in the table's upper-left corner) and then choose Entry. (You can also apply a table from the View tab's Data section. Click the Tables down arrow and then choose the table you want.)

The Resource Names column is the last column in the Entry table, but it's typically out of sight (covered up by the timescale). Rather than scroll to display the column, make the table area wider so that it displays the columns for both task names and resource names. To do so, position the mouse pointer over the vertical bar between the table and the timescale. When the pointer changes to double arrows, drag the divider bar to the right until the Resource Names column is visible.

2. **In the table, click the Resource Names cell for the task.**

   Project encloses the cell in a heavy green border and displays a down arrow for the resource drop-down list.

3. **To assign a resource, click the down arrow, and then, in the list, turn on the checkboxes for the resource name(s) you want to assign.**

   The name(s) you choose appear in the Resource Names cell. Project automatically assigns the resource at the resource's maximum units (page 213) or 100% for a team resource. If the resource's Max. Units value is 100%, then the Resource Names cell shows only the resource name. However, if the resource's Max. Units value is something other than 100%, then the cell's contents look something like "Bob[50%]."

COPYING A RESOURCE TO MULTIPLE TASKS

Suppose your able assistant can handle all the tasks required to obtain the proper permits for your event, so you want to assign all those tasks to her. A table makes copying assignments between tasks easy. When you want to apply the same resource and units to several tasks, follow these steps:

1. **Click the Resource Names cell that contains the resources and units you want, and then press Ctrl+C (or in the Task tab's Clipboard section, click Copy).**

   Project copies the values from the Resource Names cell to the Clipboard.

2. **Select the other Resource Names cells into which you want to copy the assignment, and then press Ctrl+V (or in the Task tab's Clipboard section, click Paste).**

TIP If several consecutive tasks use the same resources, select the Resource Names cell with the value you want to copy. Then position the pointer over the fill handle in the lower-right corner of that cell. When the pointer changes to a + symbol, drag over the rows that use the same resources.

Finding the Right Resources

When resources are plentiful, scrolling through a long list of names to find the resource you want to assign could take a while. You can reduce scrolling by telling the Assign Resources dialog box to list only the resources appropriate for the current assignment. All you have to do is tell it what you're looking for. You can apply a

resource filter to find people who possess the right skills, belong to a specific group, or have the job code you're looking for. If you use resource outline codes (page 675) to categorize resources, you can filter by those codes, too. But even the most qualified resources don't help at all if they aren't available. Fortunately, the Assign Resources dialog box also helps you find resources with enough available time.

These filtering features may not appear when you first open the Assign Resources dialog box. To coax the Resource list options into view, click the + sign to the left of the "Resource list options" label, shown in Figure 9-4.

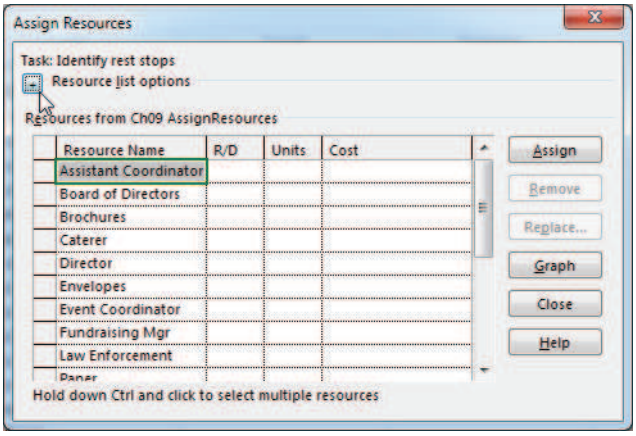

FIGURE 9-4

When the filtering options are visible (which they're not here), the + button to the left of the "Resource list options" label changes to a –, which you can click when you want to hide the options once more. The Assign Resources dialog box remembers whether you had the filtering options expanded or hidden the last time you used it, and it reopens with that same setting the next time you use it.

FINDING RESOURCES BY CRITERIA

You can use the Assign Resources dialog box's resource filters to restrict what appears in the Resources table. For example, you can filter the resource list with a built-in resource filter like Group to see only the resources that belong to a specific group. If you've created custom resource filters (page 642), for instance to filter by the Code resource field, then you can filter the Resources table with those, too. (The box on page 191 describes another way to categorize resources so you can find them by filtering the list in the Assign Resources dialog box.)

To filter the resource list by criteria, follow these steps:

1. **With the "Resource list options" visible, turn on the top "Filter by" checkbox.**

   In the "Filter by" box, Project automatically selects the All Resources filter, so the Resources table continues to show all available resources. If the filter options are grayed out, make sure the first "Filter by" checkbox is turned on.

2. **In the "Filter by" drop-down list, choose the filter you want to apply.**

   The Resources table displays only the resources that pass the filter, as illustrated in Figure 9-5.

If a filter's name ends with an ellipsis (...), then the filter requires some input from you. For example, if you select the "Group..." filter, a dialog box opens so you can type the name of the group you're interested in. Enter the value, and then click OK.

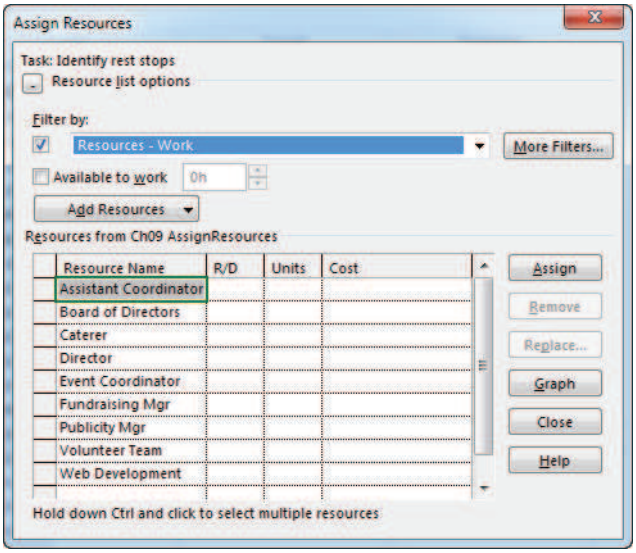

FIGURE 9-5

The "Filter by" drop-down list includes all existing resource filters. If none of these filters suit your needs, click More Filters to open the More Filters dialog box. There, you can create a new filter, edit an existing filter, or copy a filter to obtain exactly the resource filter you want—for example, to search for resources based on their Outline Code values, or to view only Confirmed resources.

3. **Once the Resources table is filtered, assign resources as you would normally (page 229).**

   To view the entire resource list again, in the "Filter by" drop-down list, either choose All Resources or turn off the "Filter by" checkbox.

FINDING RESOURCES WITH AVAILABLE TIME

Resources with the right skills aren't any help if they don't have enough time to complete an assignment. Suppose you've added some customer change requests to your schedule, and you want to find people with the spare time to complete these shorter tasks. The Assign Resources dialog box's "Available to work" checkbox is just the ticket for finding folks who are available when the task is scheduled. When you turn it on, Project searches for the resources that have the amount of time you specify available between the task's start and finish dates.

To find people who have enough hours available, do the following:

1. **Select the task to which you want to assign resources.**

   If the Assign Resources dialog box isn't open, then, in the Resource tab's Assignments section, click Assign Resources.

2. **With the Assign Resources dialog box's "Resource list options" visible, turn on the "Available to work" checkbox.**

   The box to the right of the "Available to work" label becomes active.

3. **In the "Available to work" box, type the amount of time the assignment requires, such as *4d* or *32h*, as illustrated in Figure 9-6.**

   Project updates the dialog box's Resources table to include only the resources who have that amount of time available between the task's start and finish dates.

NOTE If you don't type a time unit, Project uses the standard units for work, which is one of the program's settings. (Choose File→Options, and then choose Schedule. The "Work is entered in" box specifies the standard time units for work.) For example, if work units are hours and you type *5*, Project converts the value to 5h. If you type *5d*, Project converts the "Available to work" value to 40h.

4. **Choose and assign resources from the filtered list as you would normally.**

   To view resources regardless of availability, turn off the "Available to work" checkbox.

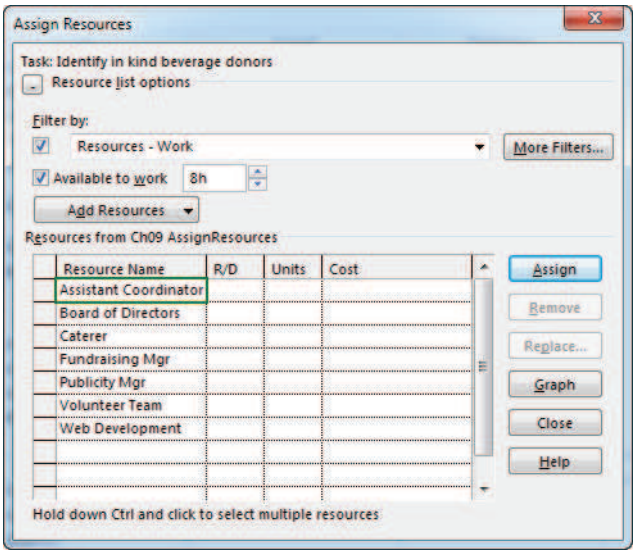

FIGURE 9-6

Although you can filter the list of resources by available time alone, filtering by type of resource and available time (as shown here) shows you the resources that are both qualified and available. In the "Resource list options" section, simply turn on both the "Filter by" and "Available to work" checkboxes. Then choose a resource filter and specify the time required.

POWER USERS' CLINIC

Building Teams with Project Server

If you use Project Server or Project Online to manage your project portfolio, you can classify resources by skillsets with *enterprise resource outline codes* and *resource breakdown structure codes*. These products also offer *multi-value resource outline codes*, which means you can assign more than one skillset to extraordinarily talented resources.

The Team Builder tool in Project Server searches the enterprise resource pool for available resources with the skills you need. If you have to replace someone on a task, Project Server's Resource Substitution Wizard looks for resources with the same skills as the resource you're replacing. For more information on these tools, see the recommended books on Microsoft Enterprise Project Management Solutions (page xix).

REVIEWING AVAILABILITY IN DETAIL

The Assign Resources dialog box doesn't see shades of gray when it filters resources by availability: Resources either have enough time available or they don't. But you can use Resource Graph view to get a better idea of whom to assign to a task. For example, if one resource is almost completely booked, then someone with more available time would give you more wiggle room should task dates slip. Or you may see that the perfect resource has *almost* enough time available and realize that the assignment may work if you simply delay it by a day or increase its duration.

Resource Graph view (Figure 9-7) shows the number of hours the resource has available during each time period. For instance, if you have a change request that requires 8 hours of work during a week, you can look for 8 available hours on a resource's graph. You can also use the graph to evaluate the work assigned to proposed resources to see how many more real resources you have to round up, as described in the box on page 240.

You can display Resource Graph view in the following ways:

- In the Assign Resources dialog box, select the resource you want to evaluate, and then click Graphs.
- In the View tab's Split View section, turn on the Details checkbox. Then, in the drop-down list, choose Resource Graph.

To see a graph of the resource's *available* time, which is usually what you want when you have an assignment to fill, right-click the background of the Resource Graph's timescale and then choose Remaining Availability on the shortcut menu. See page 623 for other ways to customize Resource Graph view.

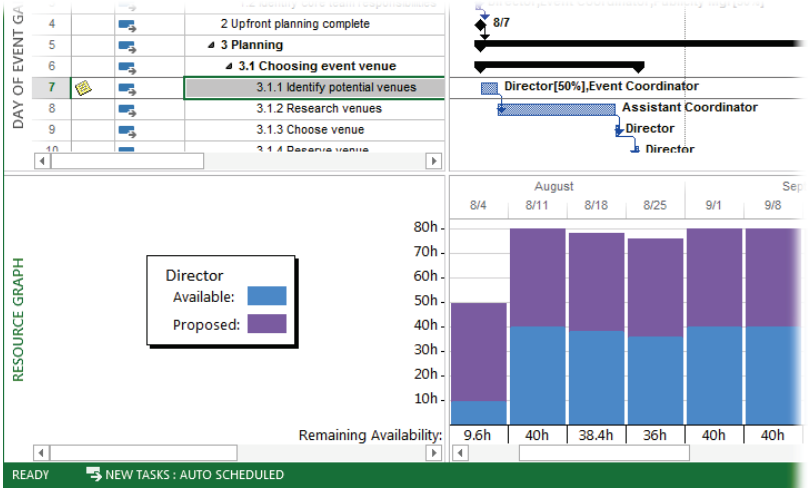

FIGURE 9-7

When you set Resource Graph view to display Remaining Availability, the graph shows available work hours and proposed hours for the selected resource during each time period. Because the graph shows availability over time, it applies only to work resources, not material or cost resources.

GEM IN THE ROUGH

Viewing Proposed Bookings

As described in Chapter 8, when you add resources to your Project file, you can specify that they're either committed or proposed resources (page 223). Committed resources are those you know are in your roster, whereas proposed resources represent resources you'd *like* to get but don't have for sure. The Resource Graph shows work you've assigned to both committed *and* proposed resources—the only difference is that the vertical bars for proposed work are purple. (Be careful about changing the status if you use a resource pool. Changing a resource to "Proposed" in a resource pool changes the resource's status to "Proposed" in *every* project to which the resource is assigned.)

Quickly Assigning Resources with Team Planner

Team Planner view is perfect for more informal assignments, when you have several tasks (manually or automatically scheduled) that you want to fling resources at in a jiffy. (To display it, in the View tab's Resource Views section, click Team Planner.) The anatomy of Team Planner view makes it easy to see which tasks are currently orphaned without resources. Then you can drag a task onto a resource's row and—poof!—you've got a resource assignment.

In addition to initial assignments, Team Planner view also helps you spot unassigned tasks or overallocated resources. You can drag a task to a resource who doesn't have anything to do or move a task in the timeline to even out workloads—without messing with Project's fancier leveling features (page 339).

WARNING Moving tasks around in Team Planner is easy—maybe *too* easy. If you're working with manually scheduled tasks, dragging a task to a new date is often exactly what you want to do—for example, to nudge the task one day later so the assigned resource isn't overallocated. However, if your tasks are auto-scheduled, then dragging them around in the timeline creates date constraints (page 190), which limit Project's ability to calculate start and finish dates. So if you use Team Planner to assign or swap resources on auto-scheduled tasks, make sure you don't drag auto-scheduled tasks to different dates.

ANATOMY OF TEAM PLANNER VIEW

Team Planner view is divided into four quadrants, each with its own story to tell, as shown in Figure 9-8:

- **Resources.** The upper-left part of the view lists resources assigned to the project itself, one resource per row. If a resource is assigned to tasks that don't have start or finish dates, then those tasks appear in this quadrant's Unscheduled Tasks column.

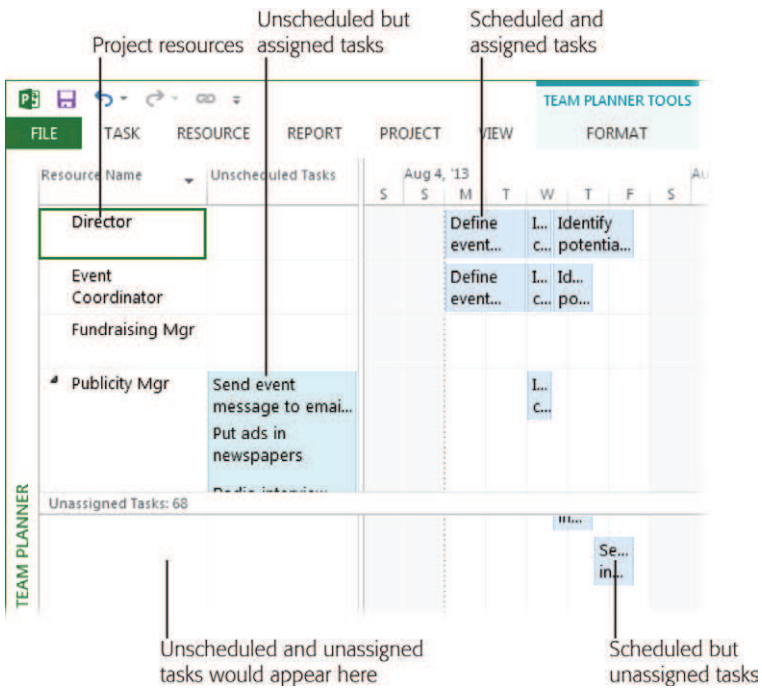

FIGURE 9-8
You don't have to assign dates to manually scheduled tasks (page 60). You can even type text like TBD (for "To be determined") in the tasks' Start and Finish fields, if you want. When you do that, in effect, you create unscheduled tasks—which appear right where you'd expect in Team Planner view: the Unscheduled Tasks column.

- **Assigned task timescale.** Similar to the timescale in a Gantt Chart view, the upper-right part of the view shows a timescale that positions bars based on tasks' start and finish dates. However, these bars are *assignment* bars, not task bars. If a task has more than one resource assigned to it, you see a bar for the task in the row for each assigned resource. The tasks in this quadrant are both assigned to resources and scheduled in time.
- **Unassigned but scheduled tasks.** The timescale in the bottom-right part of Team Planner view shows scheduled tasks that have no resources assigned. If you're trying to tie up the last loose unassigned tasks, look no further than this quadrant.
- **Unassigned and unscheduled tasks.** The lower-left quadrant is reserved for the least-defined tasks of all: ones that don't have start or finish dates, or assigned resources.

TIP You can format Team Planner view to control the information you see or to change the size of the bars. For example, after you assign all the tasks to resources, you can hide the Unassigned Tasks pane. Simply head to the Team Planner Tools | Format tab and turn off the Unassigned Tasks checkbox. To hide the Unscheduled column, turn off the Unscheduled Tasks checkbox. Or, to display a single row for each resource, turn off the Expand Resource Rows checkbox.

ASSIGNING TASKS WITH TEAM PLANNER

If a task sits forlornly unassigned in the bottom half of Team Planner, you can assign a resource to it in no time. Just drag the task from its place in the Unassigned Tasks portion of the view to the row for the resource you want to assign it to, as Figure 9-9 shows.

This technique works just as well if you want to reassign a task from one resource to another. Simply drag the task's assignment bar from the assigned resource to the row for the resource you want to assign the task to. When you reassign a task in this way, be sure to drag the bar vertically in the timescale so you don't change the task's dates.

NOTE If you drag a manually scheduled task to different dates, the only things that change are the task's start and finish dates. However, if you drag an auto-scheduled task to different dates, you add a date constraint to the task, which limits Project's ability to calculate the schedule. See page 317 to learn how to find and remove date constraints.

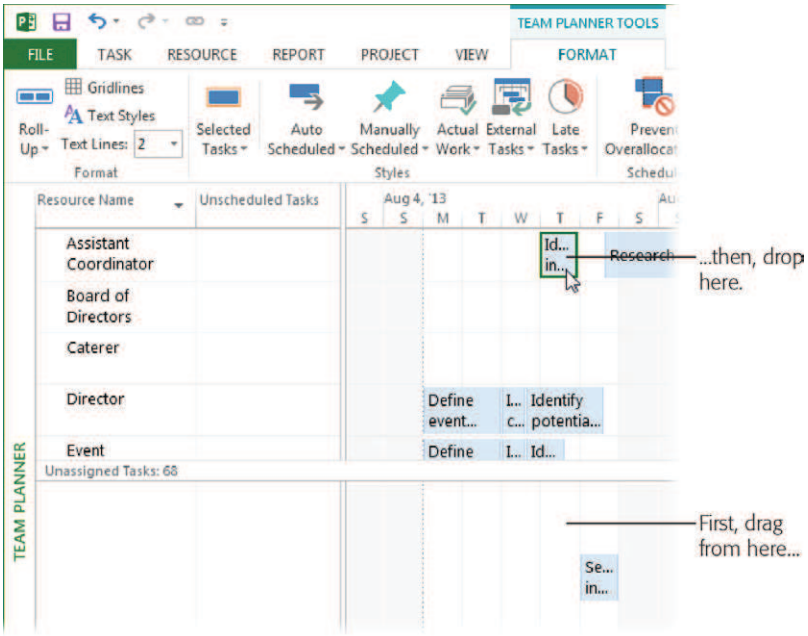

FIGURE 9-9

You can reassign tasks just as easily as setting up initial assignments: Simply drag a task's assignment bar from one resource's row to another. If you want to add a brand new task, choose Task→Insert→Task. The assignment bar for the new task appears in the Unscheduled Tasks column and in a new row in the Unassigned Tasks portion of Team Planner view.

SCHEDULING TASKS WITH TEAM PLANNER

When you figure out when you want an unscheduled task to occur (whether or not it's assigned to a resource), you can drag it to the correct date in the timescale. If it's still unassigned, simply drag it to the date you want in the unassigned portion of the timescale. If you know who will perform the task, drag the bar to the row for the resource and to the date you want in the timescale.

ELIMINATING OVERALLOCATIONS WITH TEAM PLANNER

A resource can work on two tasks at the same time without a problem, as long as neither task is full time. In such cases, each task appears in its own row, as Figure 9-10 shows. However, if the concurrent tasks take up more time than the resource has available, a red box or bracket appears around the timeframe over which the resource is overallocated. Although Team Planner view has a Prevent Overallocations feature, you're better off resolving overallocations yourself, as the box on page 245 explains.

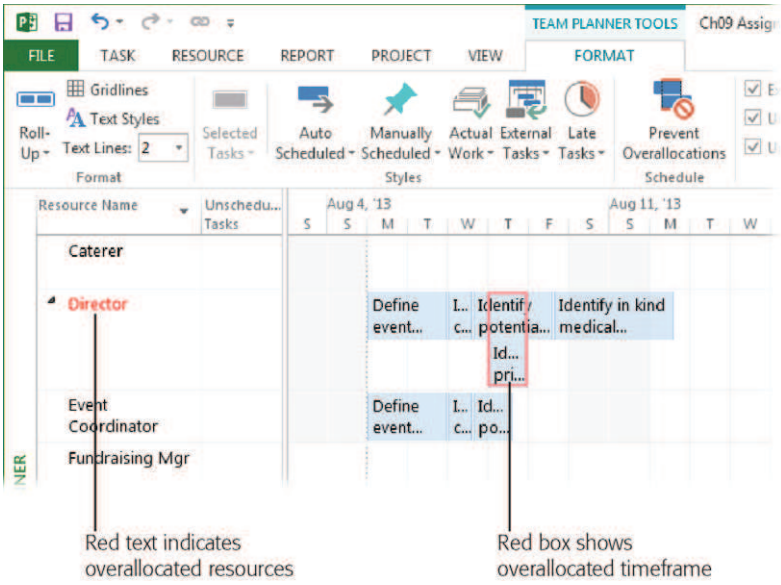

FIGURE 9-10
In addition to red brackets around overallocated assignments, you can spot overallocated resources by looking in the Resource Name column for names in red text.

Resolving overallocations in Team Planner is as simple as assigning resources in the first place. Here are the methods you can use:

- **Reassign a task to another resource.** To reassign a task to a resource who has time available, simply drag the assignment bar to the row for the new resource or right-click the assignment bar and point to Reassign To on the shortcut menu. Then, on the submenu, choose the appropriate resource.
- **Move the task to a different date.** If the resource has a short backlog, you can bump the task further into the future or move it earlier. You can reschedule a task by dragging its bar to a new date in the timescale, or you can use a Move Task Forward or Move Task Backward command. For example, to push the task ahead by a week, click the task's assignment bar to select it and then, on the Task tab, in the Tasks section, choose Move→1 Week.
- **Reschedule the task to when a resource is available.** If a resource works on a hodgepodge of short assignments, finding adjacent timeslots for a longer assignment is almost impossible. Instead, you can tell Project to chop the assignment up and slide it into a resource's open slots. To do so, select the assignment you want to reschedule. Then on the Task tab, in the Tasks section, choose Move→When Resources Are Available.

GEM IN THE ROUGH

Don't Let Team Planner Resolve Overallocations

When Team Planner view is visible (in the View tab's Resource Views section, click Team Planner) and you click the Team Planner Tools | Format tab, you might have noticed the Prevent Overallocations button. Telling Project to prevent resource overallocations might sound like a free lunch. But, of course, it isn't.

If you click the Prevent Overallocations button to turn on that setting (you know it's on because "Prevent Overallocations: On" appears in the status bar) and then try to assign a task to an already-allocated resource, Project prevents the overallocation by delaying the assignment until the resource *is* available. However, delaying an assignment isn't the only way to eliminate an overallocation, and it might not be the one you would choose.

The other disadvantage to this feature is that Project could make changes when you aren't looking. Say you display Team Planner view and turn on Prevent Overallocations. Then you switch to a different view and make schedule changes that overallocate some resources. If you switch back to Team Planner view, the Prevent Overallocations feature immediately delays any overallocated assignments to remove the overallocations. But you might not notice that the program made the changes, which makes them tough to find and undo.

Assigning Material Resources to Tasks

Assigning material resources is similar to assigning work resources—with one exception: When you assign material resources, you fill in the quantity of material the task will consume instead of the time a work resource spends.

Work resources are always allocated by some unit of time, but you can dole out material resources by whatever unit of measurement makes sense: milligrams of medication, reams of paper, or gallons of water. Truth be told, Project couldn't care less about a material resource's unit of measurement. It calculates cost by multiplying the material resource's Standard Rate (page 219) by the quantity you enter in the assignment. It's your responsibility to define the unit of measurement in the resource's Material Label cell and the Standard Rate as the cost of one unit of the material. Figure 9-11 shows how the material resource fields produce cost in an assignment. (The box on page 248 explains what to do when the amount of material consumed varies with time.)

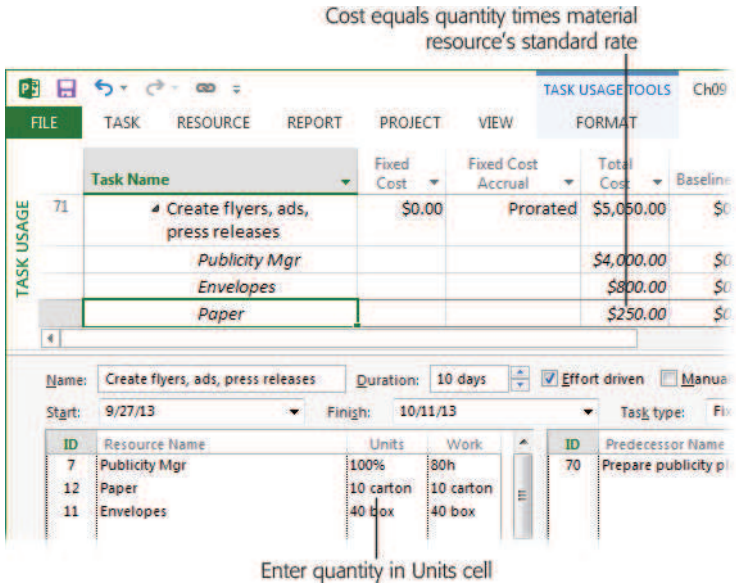

FIGURE 9-11

In Task Form view, 10 cartons of paper are assigned to the task. The Material Label for the Paper resource is "Carton" and the Std. Rate for Paper is $25 (these fields aren't shown here). To assign 10 cartons of paper to the task, you enter the quantity "10" in the Units cell. Project then multiplies the Std. Rate ($25) by the quantity (10) to calculate the total paper cost of $250.

You can assign material resources using any of the methods described in "Assigning Work Resources to Tasks" (page 228). To assign a material resource to a task using the Assign Resources dialog box, do the following:

1. **On Project's Resource tab, in the Assignments section, click Assign Resources.**

   The Assign Resources dialog box opens.

2. **In Gantt Chart view or any other task-oriented view, select the task to which you want to assign a material resource.**

   Any resources already assigned to the task appear at the top of the list, preceded by a checkmark. (At this point, you can add either work or material resources to the task.)

3. **In the dialog box's Resource Name column, click the name of the material resource, and then click Assign.**

   The material resource moves to the top of the list (just like assigned work resources do), as shown in Figure 9-12.

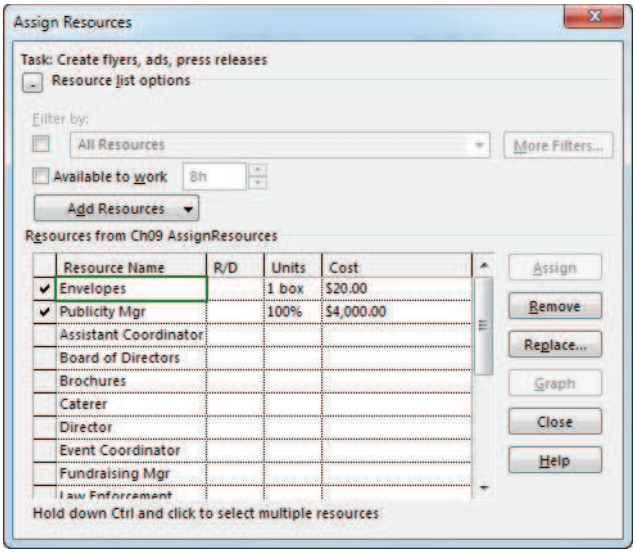

FIGURE 9-12

In the Assign Resources dialog box, Project initially fills in the Units cell automatically with the quantity "1," followed by whatever you typed in the Material cell in Resource Sheet view. To specify the quantity, type a number in the Units cell.

4. **In the Units cell, type the correct quantity. Press Enter or click another cell to complete the change.**

   Project automatically recalculates the Cost field by multiplying the quantity by the material's Std. Rate.

5. **To assign another resource, select the resource name, and then click Assign.**

   To assign resources to another task, in Gantt Chart view, select the next task. Close the Assign Resources dialog box when you're done assigning resources.

DON'T PANIC

When Material Quantity Depends on Time

With some material resources, the quantity assigned to a task is the same regardless of how long the task takes. In other words, that resource has a *fixed consumption rate*. If your task is to put up signs, the quantity of signs is 50, whether the task takes 2 hours or 8 hours. A *variable consumption rate*, by contrast, means the quantity of material varies based on the duration of the task. Say your Hummer chugs 5 gallons of gas each hour you drive around putting up signs. If you complete the job in 2 hours, you use 10 gallons of gas, whereas an 8-hour escapade guzzles 40 gallons.

You specify the units of measurement for a material resource in the Resource Sheet view's Material Label field, and the cost per unit in the Std. Rate field. But after that, entering variable consumption rates in Project gets a little tricky. Typing *gallons/day* into the Material Label cell *doesn't* tell Project to calculate quantity based on task duration. The solution—and it's a bit obscure—is to type the quantity per unit of time in the Units field when you assign the material resource to a task. For example, assign the Gasoline resource to the "Post course signs" task. Then, in the Units cell, type *5 gallons/h*. Project calculates the total cost of gasoline by multiplying the standard rate (the price per gallon) from the Resource Sheet's table by the duration in hours.

Assigning Cost Resources to Tasks

Cost resources differ from work and material resources in that you don't specify how much they cost until you assign them to tasks. Although you can use any of the methods described in "Assigning Work Resources to Tasks" (page 228) to assign a cost resource, you have one additional step to perform. To assign a cost resource to a task using the Assign Resources dialog box, do the following:

1. **In the Resource tab's Assignments section, click Assign Resources.**

   The Assign Resources dialog box opens.

2. **In Gantt Chart view or any other task-oriented view, select the task to which you want to assign a cost resource.**

3. **In the dialog box's Resource Name column, click the name of the cost resource.**

   Project displays a green border around the resource you click.

4. **In the Cost cell, type the cost for this use of the cost resource. Press Enter or click another cell to complete the assignment.**

   Unlike work and material resources, you specify the cost each time you assign a cost resource to a task, so its cost can differ for each assignment, as shown in Figure 9-13.

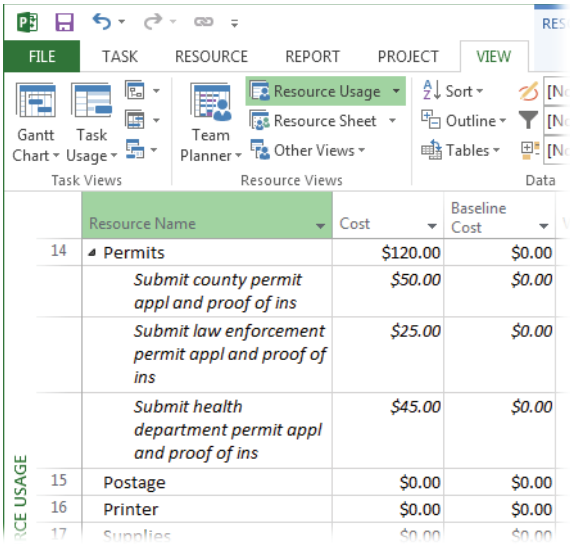

FIGURE 9-13

When you assign a cost resource (such as Permits) to a task, you specify the cost for that assignment. For that reason, the cost can differ for each assignment, such as $50 for a county permit and $25 for a law-enforcement permit. Project shows you the total you've spent on each type of cost resource, such as the $120 for permits shown here.

Reviewing Resource Assignments

In earlier sections you learned how to use different views to create resource assignments. However, those initial assignments might not produce the schedule you want. If that's the case, you need to examine the assignments you've made to see what tweaks might be required. Here are several methods for looking at resource assignments:

- **View assignment details as you work on your task list.** Task Form view (page 234) can show you who's assigned to a task, the units they're assigned, and the hours of work they're allocated. This view works equally well for creating, reviewing, and modifying resource assignments. To display this view below any task-oriented view, in the View tab's Split View section, turn on the Details checkbox, and then choose Task Form in the drop-down menu.
- **View assignments grouped by task or resource.** Task Usage view displays a summary row for each task and additional rows for each assignment, which is helpful when you want to see assignment details for all the resources assigned to tasks. However, you might find *Resource Usage* view handier when you're trying to smooth out the workload for an overworked resource. Resource Usage view displays a summary row for each resource and additional rows for the

resource's assignments, as shown in Figure 9-14. Another advantage to usage views is that the right side of the view is a time-phased grid that shows when work occurs over time.

- **View assignment details.** The Assignment Information dialog box lets you dig even deeper into an assignment to, for example, see a work contour (page 335) or a cost rate table (page 220) that's applied. When you're in Task Usage or Resource Usage view, double-click an assignment's row to open the Assignment Information dialog box. (If you double-click a task-summary row instead, the Task Information dialog box appears. Similarly, double-clicking a resource-summary row displays the Resource Information dialog box.)

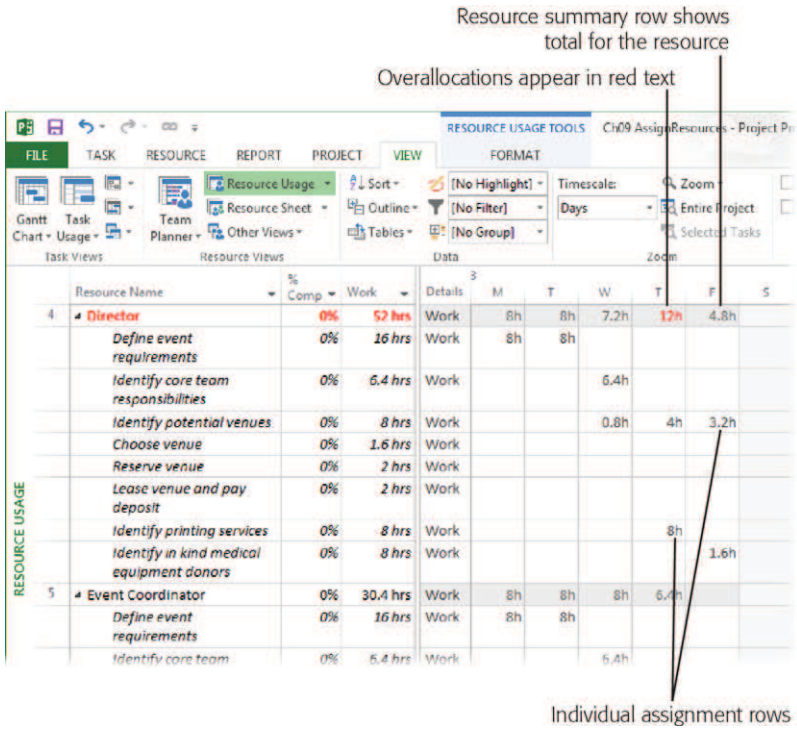

FIGURE 9-14

Resource Usage view is great for identifying the assignments that contribute to overallocations. If a resource is overallocated during a time period, the total hours in the summary row appear as red text. You can look at the individual assignments with hours during that period to see how you might resolve the overallocation.

TIP Resource Usage view is also helpful for seeing whether you're utilizing your resources fully. To do that, click the black triangle to the left of a resource's name to hide its assignments. That way, you see only the resource's summary row. Then, in the View tab's Zoom section, choose a time unit like Weeks or Months. If you choose Weeks, scan the columns in the time-scaled portion of the view. If the Work cells for most weeks are close to or equal to 40, you're all set. On the other hand, if the assigned work hours vary widely from week to week, you may want to see if you can modify your schedule to keep your resources' workloads more stable over time.

Understanding Duration, Work, and Units

Assigning one resource to a task and obtaining the results you want is relatively easy, but modifying existing assignments can be a puzzle. For example, if you assign two more people to attend a meeting in Project, the program makes the meeting shorter (as if that would happen) instead of adding those people's time to the total hours. Understanding how duration, work, and units interact is the first step toward getting the right assignment results the first time—and every time.

Project has built-in rules about which values it changes. To give you a fighting chance, it also offers features that let you control which variables hold steady and which ones change. Task duration, work (think person-hours), and resource units (the proportion of time that resources work on a task) are like three people playing Twister—when one of these variables changes, the others must change to keep things balanced.

When you first assign resources to a task, the task's duration is inextricably connected to the work and units of that resource assignment. The formula is simple no matter which variable you want to calculate. The basic algebra you learned in high school is all you need: Duration = Work ÷ Units, so Work = Duration × Units. Project calculates one of these three variables when you set the other two, as you can see in Figure 9-15:

- **Work = Duration × Units.** If you estimate task duration and specify the units that a resource devotes to that task, then Project calculates the hours of work the resource must perform. For example, a 5-day duration with a resource assigned at 100% (which, as a decimal, is 1) results in 40 hours of work for a typical workday: 40 hours = 5 days (× 8 hours/day) × 1.
- **Duration = Work ÷ Units.** If you estimate the amount of work a task requires, Project calculates the task's duration based on the resource units. For instance, 40 hours of work with a resource assigned at 50% (or .5) produces a 10-day duration based on 8-hour workdays: 10 days = 40 hours ÷ .5.
- **Units = Work ÷ Duration.** If you estimate the work involved and also know how long you want the task to take, Project calculates the units that a resource must spend on it. Eight hours of work over 4 days is 2 hours a day, or a resource assigned 25% based on 8-hour workdays. Project would prefer to not calculate units, as Table 9-1 shows. If you specify work and duration, it might look like Project is ignoring your instructions. See page 253 to learn what's really going on with units in that situation.

TIP Project includes several options for defining the standard number of work hours for different durations. See page 105 for the full scoop on telling Project how to convert different units of time.

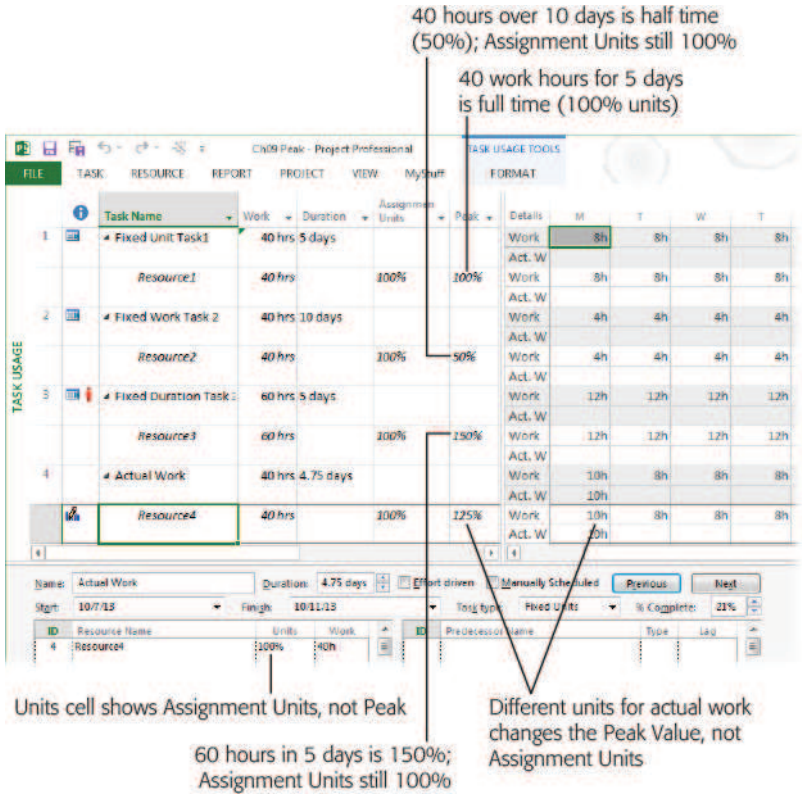

FIGURE 9-15

The formula Project uses to calculate work, duration, or units always remains the same. However, you might see values that don't seem to follow the standard formula. That's because Project has fields for two sets of units. The Assignment Units field represents the resource-allocation value you use when you assign a resource; Project uses this value if you modify the assignment later on. Project calculates the highest percentage unit value that occurs during a resource assignment and stores that in the Peak field. See page 253 for the full story.

If you leave some of the assignment fields blank, Project plays favorites when it decides whether to calculate duration, work, or units. Unless you tell Project otherwise, it first tries to change duration, then work, and, as the last resort, units. So the only time Project calculates units is when you specify both task duration and the amount of work. Table 9-1 shows how this favoritism works depending on the values you enter.

TABLE 9-1 *Project calculates duration, work, or units depending on which values you enter*

DURATION	WORK	UNITS
Project calculates	Your input	Your input
Project calculates	Your input	If blank, Project uses 100% or Max. Units.
Your input	*Project calculates*	Your input
Your input	*Project calculates*	If blank, Project uses 100% or Max. Units.
Your input	Your input	*Project calculates*
If blank, Project uses 1 day.	*Project calculates*	Your input

TIP You can download Table 9-1 from this book's Missing CD page at *www.missingmanuals.com/cds*.

Assignment Units vs. Peak

Prior to Project 2010, the program could keep track of only one value for assignment units, which often led to resource assignments that didn't do what you wanted. These days, Project can keep track of the workload you originally assigned to a resource as well as any changes made to that workload. It does that by using two sets of units for assignments: the Assignment Units field and the Peak field. Although those two fields help Project do a better job of assigning resources the way you want, they won't win any awards for most-intuitive feature. For example, you may have noticed that Project doesn't seem to follow the formula Units = Work ÷ Duration when changing a resource assignment. This section explains how Assignment Units and Peak work together to handle resource assignments.

Here's what the Assignment Units and Peak fields do:

- The **Assignment Units** field represents the units you set when you first assign a resource to a task—and the units Project uses if you later reschedule the task. For example, say you assign an 8-hour-a-day resource to a task at 100%, so a 4-day task represents 32 hours of work. If you later increase the task's duration because there's more work to do, Project assigns the resource at 100% for those days as well.
- The **Peak** field, on the other hand, represents the maximum allocation for the resource on the assignment. For example, the third task in Figure 9-15 shows that the resource's maximum allocation to the assignment is only 25%, because the resource works 8 hours over 4 days, even though the initial assignment units were 100%.

TIP It's hard to follow the Assignment Units and Peak action with Project's built-in views and tables. To see what's going on with the Assignment Units and Peak values as you work on assignments, switch to Task Usage view (in the View tab's Task Views section, click Task Usage) and insert an Assignment Unit column and a Peak column into the table, as shown in Figure 9-15.

Consider the task named Actual Work in Figure 9-15 (it's in row 4). Suppose you assign the resource to work 100% of the time on the task, but he works 10 hours the first day. If Project didn't have the Peak field, it would recalculate the resource's Assignment Units to be 125%, based on the duration and work. Then, suppose you add another 40 hours of work to the task. Project would divide the additional work by the 125% Assignment Units value and add another 4 days to the task's duration.

That's where the Peak field comes in. It records the 125% allocation for posterity, while the Assignment Units field value remains 100%. That way, when you increase the task work by 40 hours, Project divides the 40 hours by 100% units and adds 5 more days to the task—just as you intended.

The Peak field also comes into play if you change assignments on tasks set to either the Fixed Duration or Fixed Work task type. Tasks set to the Fixed Units task type don't affect the Peak field. If you use Fixed Work or Fixed Duration tasks to achieve the assignment adjustments you want, you need to understand how the Peak field fits into the picture. Figure 9-15 shows the result of changing tasks set to Fixed Units, Fixed Work, and Fixed Duration task types. They're named Fixed Unit Task 1, Fixed Work Task 2, and Fixed Duration Task 3, respectively. Here's what happens if you change each type of task:

- **Changing a Fixed Units task.** If a 5-day task is assigned full time (100%), the work hours equal 40 hours. If you increase the task's duration to 10 days, Project keeps 100% units and recalculates the work to be 80 hours. Assignment Units and Peak are still both equal to 100%.
- **Changing a Fixed Work task.** Suppose you start with the same 5-day task assigned at 100%. You set the task to Fixed Work so the amount of work doesn't change. If you change the task's duration to 10 days, the work is still 40 hours, so the resource works half time. Project changes the Peak value to 50%, but Assignment Units still equals 100%.
- **Changing a Fixed Duration task.** Using the same 5-day task assigned at 100%, you set the task to Fixed Duration. If you increase the work hours to 60, Project calculates the Peak value to be 150%.

TIP Project calculates an assignment's Peak values minute by minute, so a 1-minute overallocation will flag the resource as overallocated (by displaying the red overallocation icon in a table's Indicators column). If an overallocation is short and you have your timescale set to show longer time periods like months, you won't see the overallocation—for example, in Resource Graph view or the time-phased pane of Task Usage view. However, if you expand the timescale to hours or minutes, the overallocated time period eventually comes out of hiding.

Modifying Resource Assignments

Sometimes you want to control how Project calculates resource assignments because the built-in calculations described in the previous section don't quite fit your situation. For example, if you assign two people to a 3-day task, Project initially assigns each person full time for all 3 days. Suppose what you really want is the 3-day task collapsed into 1.5 12-hour days. Using the "Task type" field, you can tell Project that you want to adjust the duration, not the work hours or assigned units.

Another factor to consider when modifying resource assignments is Project's *effort-driven scheduling*, which means that the total amount of work required for a task drives the changes that Project makes. Effort-driven scheduling keeps a task's total amount of work the same when you add or remove resources to the task by reducing or increasing the work each resource performs. But effort-driven scheduling doesn't always hold true, particularly for tasks like diabolical project meetings that refuse to grow shorter no matter how many people attend. This section explains how to integrate task types and effort-driven scheduling with duration, work, and units to modify resource assignments exactly the way you want.

TIP If you're planning to use Project's resource leveling feature, the best method for handling project admin time is to add additional time (for example, 5% or 10%) for it to your tasks. For example, if a task's estimated hours are equal to 40, you might assign the resource to work 44 hours instead. That way, Project's resource leveling feature won't have to struggle with numerous short tasks or one long task for admin time (both of which make it hard for the leveling feature to do its job).

You can modify resource assignments in all manner of ways, as described in the rest of this section: add resources to a task or remove them, modify task duration or work time, or modify a resource's allocated units (the percentage of time devoted to a task).

TIP When you change your project in certain ways, Project may ask you to clarify what you're trying to accomplish. For example, if you change the duration of a task, Project displays an *indicator* (a small triangle in the corner of the cell whose value changed—Duration, in this example). When you point your cursor at this triangle, a yellow diamond with an exclamation point appears. Clicking this diamond opens a shortcut menu with options that let you specify how to complete the change: Decrease work but keep the resources working the same amount each day, or keep the work the same while increasing the hours the resources work each day. If you don't want to see these indicators, choose File→Options. On the left side of the Project Options dialog box, choose Display, and then turn off the "Edits to work, units, or duration" checkbox. Similarly, you can turn off messages about schedule inconsistencies, like a successor that starts before the predecessor. In the Project Options dialog box, click Schedule, and then turn off the "Show scheduling messages" checkbox.

Adding and Removing Resources from Tasks

When it comes to quick assignment changes, the Assign Resources dialog box is (once again) your best friend. After you add or remove resources, Project asks you what you're trying to do and then modifies the appropriate values. Here's how to add and remove resources with the Assign Resources dialog box:

1. **Choose Resource→Assign Resources.**

   The Assign Resources dialog box opens.

2. **In Gantt Chart view or any other task-oriented view, select the task you want to modify.**

   The resources already assigned to the task appear at the top of the dialog box's list, preceded by a checkmark.

3. **To assign another resource to the task, in the dialog box's Resource Name column, click the name of the resource, and then click Assign.**

   To remove an existing resource from the task, click the name of the resource, and then click Remove. The assigned checkmark disappears, and the resource takes its place back in the alphabetical list of unassigned resources.

4. **To change the units for the new assignment, in the Units cell, type the percentage.**

   If you remove a resource, Project automatically clears the resource's Units cell.

5. **Repeat steps 3 and 4 to add or remove other resources.**

   You can add or remove several resources before you close the dialog box or select another task.

6. **When you're done, either select another task in the Gantt Chart table or close the Assign Resources dialog box.**

   In the Gantt Chart table, a green feedback triangle may appear in the upper-left corner of the Task Name cell to indicate that Project needs you to clarify what you're trying to accomplish so it can complete your change. If that happens, move the cursor over the indicator, and then click the Smart Tag indicator (a yellow diamond with an exclamation point) that appears, as shown in Figure 9-16. Then you can choose how you want Project to adjust work, duration, or units.

7. **In the Smart Tag menu, select the option for what you want Project to change.**

   If you've added resources, the first option is "Reduce duration but keep the same amount of work." This option keeps the amount of work the same, and recalculates the task's duration based on the units you specified. (Project selects this option automatically, because shortening duration is the most common reason for adding resources.)

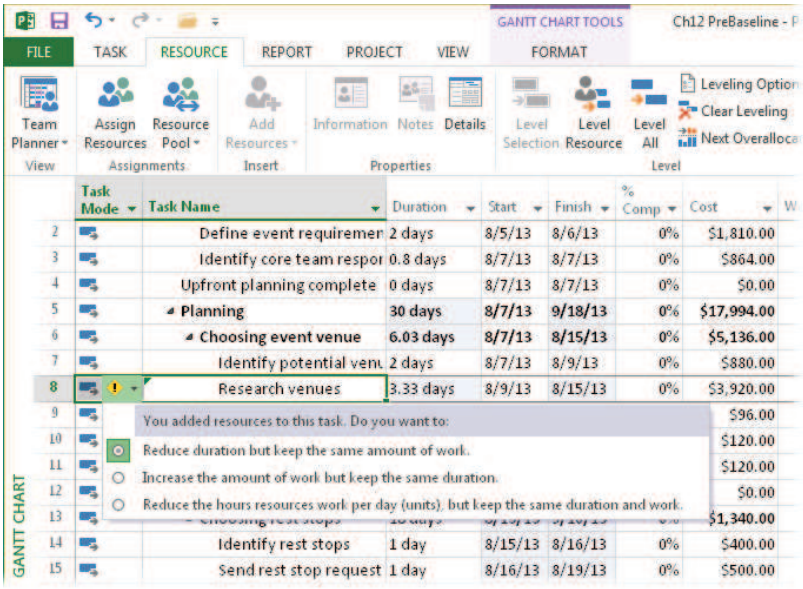

FIGURE 9-16

To tell Project what adjustments to make when you've added or removed resources, click the Smart Tag indicator (a yellow diamond with an exclamation mark inside) to the left of the task's name. Project displays a list of the changes you're most likely to make; simply select the appropriate one.

Selecting "Increase the amount of work but keep the same duration" keeps the same duration but recalculates the amount of work based on the units you specified. This option is perfect when you add resources to a task because the client asked for more features.

The "Reduce the hours that resources work per day (units), but keep the same duration and work" option calculates the units that resources work based on the duration and amount of work. This choice keeps the same duration and total work, while redistributing work to all the assigned resources.

If you remove resources, the three options are similar: The first option increases duration because you have fewer resources; the second option decreases the total amount of work; and the third option increases the units that the remaining resources work each day to compensate for the missing resources.

TIP Sometimes you don't have to add or take away resources, just replace one assigned resource with another. To do that, in the Assign Resources dialog box, select the resource you want to replace, and then click Replace. In the Replace Resource dialog box, select the new resource, and then click OK. To replace a resource in the Task Form, in the Resource Name drop-down list, just click the new resource.

When Effort Drives the Schedule

When does the amount of work control the schedule? Almost always. Project managers typically add resources to finish the same amount of work in less time. If resources disappear, the sad fact is that the work doesn't. Tasks take longer as the remaining resources shoulder the work. Project's term for this conservation of total work is *effort-driven scheduling*, because the effort (the total amount of work) drives the schedule (how long the task takes). With effort-driven scheduling, adding resources reduces the work each resource performs, and removing resources increases the work assigned to each remaining resource.

NOTE Effort-driven scheduling kicks in only when you add or remove resources from a task. Project doesn't apply effort-driven scheduling when you change resources already assigned to a task. If you modify the duration of a task, the task type determines whether the amount of work or the units change (page 259).

Although you typically add resources to shorten duration, out of the box, Project's effort-driven setting is turned off. So the first thing you want to do is turn effort-driven scheduling on. To do that, choose File→Options. On the left side of the Project Options dialog box, choose Schedule. In the "Scheduling options for this project" drop-down list, choose All New Projects, and then turn on the "New tasks are effort driven" checkbox. Then click OK to apply this setting.

Once effort-driven scheduling is turned on, Project automatically turns on the "Effort driven" checkbox for new tasks you create, but you don't have to leave it turned on. (The "Effort driven" checkbox is located in Task Form view and in the Task Information dialog box; the following list explains how to turn it on and off.) Some tasks take the same amount of time no matter how many people you add. For example, adding attendees to a meeting doesn't shorten the meeting's duration—each attendee has to suffer through the same number of hours. For these uncompressible tasks, the total work *grows* with each resource you add. (As you watch the alarming increase in cost, you see why it's so important to keep meetings focused.) Consider a 2-hour status meeting. If you meet with two other people, the total amount of work is 6 hours—2 hours for each attendee. If you decide to invite the entire 10-person team, the total work expands to 20 hours.

Work can also increase because of things like change requests or unforeseen problems. For example, if you want to add resources to complete the change requests the client just delivered, turn off the "Effort driven" checkbox. That way, as you add resources, Project adds work based on the units you specify. Table 9-2 shows how Project adds resources with or without effort-driven scheduling.

TABLE 9-2 *How Project adds resources with the effort-driven scheduling setting on vs. off*

TASK TYPE	EFFORT-DRIVEN SCHEDULING TURNED ON	EFFORT-DRIVEN SCHEDULING TURNED OFF
Fixed units	Adding resources shortens duration.	Adding resources increases total work but keeps units and duration the same.
Fixed duration	Adding resources decreases units for each resource.	Adding resources increases total work but keeps the units and duration the same.
Fixed work	Adding resources shortens duration.	Doesn't apply. Fixed work is the same as effort-driven scheduling turned on.

TIP You can download Table 9-2 from this book's Missing CD page at *www.missingmanuals.com/cds*.

To turn off effort-driven scheduling for a task, do the following:

1. **In Gantt Chart view or another task-oriented view, select the task.**

   Task Form view in the Details pane displays the values for the selected task. (If the Details pane isn't visible, in the View tab's Split View section, turn on the Details checkbox, and then choose Task Form in the drop-down menu.)

2. **In Task Form view, turn off the "Effort driven" checkbox.**

   If you edit a task in the Task Information dialog box (which you open by double-clicking the task in Gantt Chart view or another task-oriented view), select the Advanced tab, and then turn off the "Effort driven" checkbox.

3. **Click OK.**

   Now, when you add resources to the task, its duration remains the same and each new resource represents additional person-hours. If you remove resources, the task's duration remains the same, but the task represents fewer total person-hours.

After you finish adding or removing resources, restore the "Effort driven" checkbox to its original setting.

Controlling Assignment Changes with Task Types

Depending on the assignment change you're trying to make, you may want a task's duration, work, or units to stay the same. Say you want to reduce a task's duration by adding another resource to take on some of the estimated work hours. Or perhaps you want to keep its units the same as you add more work. The "Task type" field tells Project which variable you want to anchor.

You already know that duration, work, and units are inseparable, so you won't be surprised to learn that Project has three task types: Fixed Units, Fixed Work, and Fixed Duration. This section explains how to use all three.

TIP Although the Assign Resources dialog box is a powerful tool for initial resource assignments, Task Form view and Task Usage view are better for changing assignments with precision.

KEEPING RESOURCES ASSIGNED WITH THE SAME UNITS

The Fixed Units task type tells Project to keep the same units for each assigned resource regardless of the changes you make to the task's duration or work amount. Out of the box, Project automatically sets the Task Type field to Fixed Units (you can set it in Task Form view or in the Task Information dialog box), because a resource's availability is usually the limiting factor. For example, if you add work to a task, you shouldn't expect a resource assigned at 100 percent to work 200 percent to finish in the same timeframe.

The Fixed Units task type keeps units constant. Here's what Project does to a task assigned this type, depending on whether you change its duration, work, or units:

- **Duration.** If you change the task's duration, then Project adjusts the amount of work based on the set units.
- **Work.** If you change the amount of work, then Project adjusts the task's duration based on the set units.
- **Units.** If you change the units in a Fixed Units task, then Project adjusts the task's duration and keeps the amount of work the same, because of the program's built-in bias toward changing duration before work (page 252).

MAINTAINING TASK DURATION

Suppose you lose a resource assigned to a task, and you want the remaining resources to step up to complete the work without increasing the task's duration. The Fixed Duration task type helps you do just that. Here's how a fixed-duration task behaves:

- **Work.** If you change the task's amount of work, then Project adjusts the task's Peak units to keep the set duration. (See page 253 for the skinny on the Peak field and Assignment Units field.)
- **Units.** If you change the task's units, then Project adjusts its amount of work to keep the same duration.
- **Duration.** If you change the duration in a fixed-duration task, then Project adjusts the amount of work, because of the program's bias toward changing work before units (page 252).

Here's how to modify assignments without affecting task duration:

1. **In Gantt Chart view, select the task you want to modify.**

   The values for the selected task appear in Task Form view, in the Details pane.

2. **In Task Form view, in the "Task type" drop-down list, choose Fixed Duration, as shown in Figure 9-17, top.**

   Project will keep the task's duration the same until you change the "Task type" to another value or type a new value in the task's Duration field.

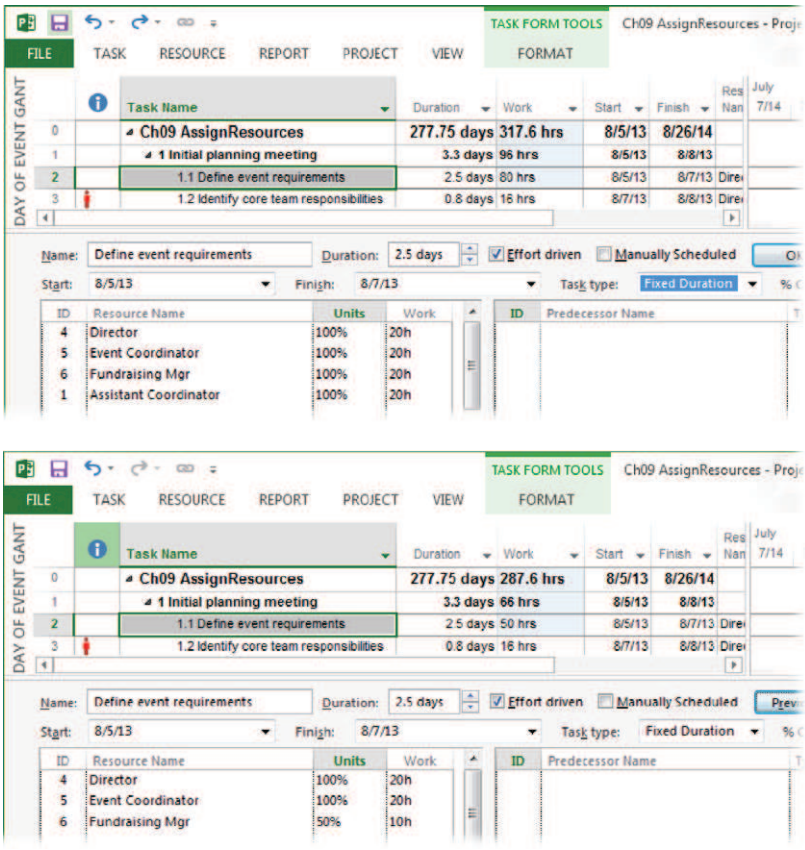

FIGURE 9-17

Top: This task's duration is 2.5 days, and its four resources are assigned at 100 percent.

Bottom: When you click OK after deleting a resource and reducing another resource's availability, Project recalculates the task's work values. Because the units for the Fundraising Manager changed to 50 percent, her work hours decreased to 10 hours. The task's duration is still 2.5 days because the task is set to Fixed Duration.

3. **To remove a resource from the task, select the resource name in the Task Form and then press Delete. If you want to reduce the percentage of time that a resource works on the task, select that resource's Units cell, and then type the new value, for example, changing units from 100% to 50%.**

   The values in the Work cells don't change just yet. The recalculations will occur when you click OK in the next step.

TIP If you add resources to the task, you can't specify their units. Project automatically fills in the Task Form's Units cell with 100% or the resource's Maximum Units. After you add the resources and click OK, *then* you can edit the assignments to modify the units.

4. **After you've made the changes you want, click OK.**

   The task's duration remains the same, and Project calculates the work assigned to each resource, as shown in Figure 9-17, bottom.

5. **In the Task Form's "Task type" drop-down list, choose Fixed Units to reset the task to its standard task type, and then click OK.**

   Restoring the task type to Fixed Units ensures that every task will behave consistently. Whenever you choose a different task type for a specific assignment change, remember to choose Fixed Units when the modification is complete.

MAINTAINING THE SAME AMOUNT OF WORK

If you've estimated the amount of work that tasks involve, you don't want Project messing with tasks' work values. Using the Fixed Work task type means you can adjust a task's duration or units without modifying the amount of time a resource spends working on it. For example, if you discover that a resource is available only 50 percent of the time, then Project can keep the amount of work the same while changing the task's duration.

Here's how a fixed-work task behaves:

- **Duration.** If you change the task's duration, Project adjusts the task's Peak units to keep the amount of work the same. For example, if a resource is assigned 40 hours of work in a week, the initial Assignment Units are 100%. If you change the task's duration to 10 days, its Assignment Units are still 100% but its Peak units drop to 50% (see Figure 9-15).
- **Units.** If you change the task's units, then Project adjusts its duration. If a resource is assigned to work 40 hours in 5 days and you change the units to 50%, the task's duration increases to 10 days.
- **Work.** If you change the amount of work in a fixed-work task, Project adjusts the task's duration, because of the program's bias against changing units (page 252).

NOTE You can change the standard task type if you typically keep a different variable steady. Suppose you estimate the work for project tasks, and you don't want Project changing those values as you adjust resource units or change task durations. To change the standard task type, choose File→Options→Schedule. Below "Scheduling options for this project" in the "Default task type" box, choose Fixed Duration or Fixed Work.