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A D V I S I C O N®

Chapter 1

Overview of Microsoft Project 2010

Module Overview

Microsoft Project (Project 2010) is a very robust project scheduling and schedule management software. It is designed to create, plan and manage any type of project you would want to perform.

Project 2010 is a product that functions best when the “rules” are followed. This course is designed to teach the user the best practices of creating and managing projects using Microsoft Project Standard 2010 and Microsoft Project Professional 2010. Differences will be noted when necessary during this course.

In this lesson the topics to be addressed are:

1. Project Management overview
2. Success factors for your project schedule
3. Overview of Project 2010 ribbon or the Fluent Interface
4. Exploring the Project 2010 database (.mpp file)
5. Exploring the Project 2010 views and tables

Lesson 1: Success Factors of Project Management

If you were going to build a house would you buy a piece of land, hire some contractors and tell them to build you a house? If that was your approach to building a house, what kind of house would you have built? Would it be the house you envisioned?

Another approach would be to pre-plan and design the type of house you would like and then buy the land and plan out how it would be built. You would define the work of the project and hire the contractors as needed for the work they will be performing. You would hire the right type of contractors for the job and you would be able to estimate the cost and timeline of the work.

Project 2010 is a very powerful scheduling tool. To gain the most benefit from the software, pre-planning your schedules will allow you to set goals for the output of your schedules and deliver better results.

In this lesson, Project Management and Project Schedule success factors will be discussed. Topics will include:

- What is a Project?
- Why use Project 2010?
- Formulate your individual project strategy
- Check list to achieve your success factors

What is a Project?

A “Project” is a temporary undertaking that results in the production of a product, process or event. Projects differ from on-going work or business operations in that a project has a beginning and an ending. Usually, unique talents are needed in the performance of a project and when the project has concluded, these unique talents are released from the project.

Everyone plans and executes projects at different levels of detail. Whether projects are planning a trip, building a house or developing a new

software module, all projects have the following traits:

1. A project concept is researched and a decision is made to carry out the project. Requirements as to the content of the project are described, and success goals for the project are determined.
2. Detail planning is performed to fully understand the nuances of the work required of the project and what it will take to accomplish the project. Other considerations are the amount of resources (workers) it will take to accomplish the project work, cost, risk, quality of the product being developed and timeline for the project.
3. The actual performance of the project with controls to bring the project to a successful conclusion.
4. Looking back at the project and learning from successes and errors to manage projects more successfully in the future.

There are many project management methodologies available and organizations will decide which methodology will best fit the needs of the organization.

Project Management Tools (Why use Project 2010)

Project 2010 was designed to help the Project Manager schedule the work of a project and monitor the progress of the project. Some of the high level capabilities of Project 2010 are:

1. The ability to plan and manage a project using Work Breakdown Structure (outline) format
2. Work, duration and cost planning, forecasting and tracking
3. Flexible reporting capabilities and customization
4. Ability to interface with Project Server and Project Portfolio Servers to allow for integration of projects and resource management within an organization (Professional version only)
5. Project 2010 allows for both manual and automatic project scheduling
6. Resource management – planning and forecasting
7. Budget forecasting and tracking
8. Baseline and variance reporting

9. Schedule predictability and what-if scenarios
10. Dynamic schedule management

Project management software has a flow which reflects the project management process:

1. Projects are defined and the decision is made to perform the project
2. More indept planning is conducted to elaborate the tasks, resources and work required to complete the project
3. Projects will start to be performed
4. Tracking information of how the working is getting accomplished is feed back to the project manager and updated into the schedule
5. Stakeholders request changes to the product of the project
6. Reports are produced to reflect project status and schedule
7. Steps 4-6 are repeated until the project is completed
8. When the project is completed a transition will be made to incorporate the product of the project into the businss process.
9. Reflection is made as to how the project was performed looking for process improvement.

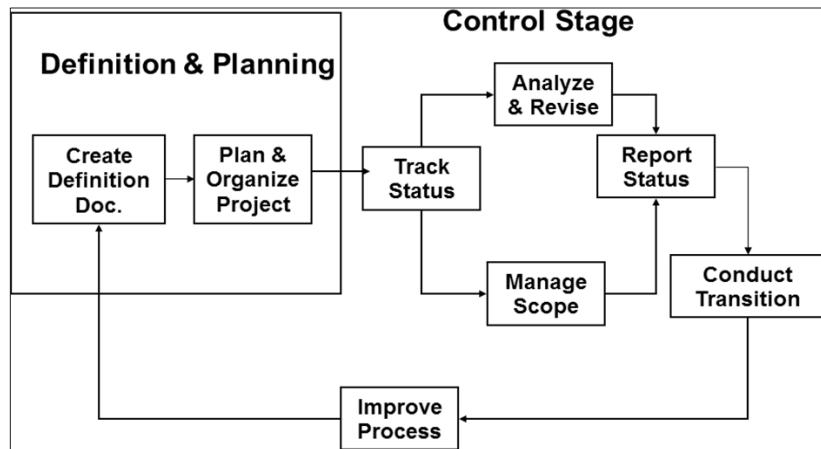


Figure 1-1 PLACEHOLDER

Project 2010 was developed in two versions of project management software:

1. Project 2010 Standard is a desktop application and is considered a stand alone schedule management tool. There are capabilities for managing individual projects as well as management of multiple projects with a shared resource pool.
2. Project 2010 Professional has all of the features of Project 2010 Standard and has the ability to allow publishing of projects to a server environ-

ment. This allows for collaboration, communication and resource sharing across projects. A web application is available for on-line project planning, resource updates, and inquiries.

Formulate a Strategy

Before a project schedule is created, define what information you are hoping your schedule will return for the work and time you devote to the using the schedule. .

Set your goals for the project schedule:

1. Define the type of information your project schedule should return?
 - a. When performing home remodeling you might be interested in when to schedule the contractors.
 - b. When developing a software module you might be interested in estimating work hours of resources and costing.
 - c. When performing annual maintenance of machinery you might be interested in the timeline and the number of resources needed to accomplish the project.
2. Different projects, by nature, require different levels of detail and tracking.
Decide what is right for the project you need to accomplish. The more detail the more complex the schedule will become.
3. What type of metrics (field values ie: work, cost, duration, earned value, etc) will your project management and post-project reporting require?
4. How will you track your project?
5. What are your Stakeholders status reporting expectations? Define at the column level.
6. How much work are you as a project manager willing to do to achieve desired results?

If Project Managers preplan the requirements and the outputs of the project schedule, the schedule will be more productive and result in more valid data.

Project Managers have a tendency to make the project schedule become the project. Preplanning will help project managers avoid this pitfall.

Success Checklist

Checklist to help plan a schedule more effectively:

1. **Goals:** Set the output goals of the schedule. Ask yourself: Management of the schedule is useful when I get what type of information from the schedule?
2. **Schedule:** Is the schedule a checklist of activities or is it tasks that will be managed? If it is a checklist, should it be an Excel list? If one task is late, should it change the dates for future related tasks?
3. **Reporting:** Request details of the content of status reporting required for the project from management. This will help in knowing which pieces of information you will need to focus on during schedule creation and management. It will also help set expectations for stakeholders.
4. **Data:** Gather requirements for data reports: by week? by department? by variance to baseline? etc. Some of this information will be standard in Project 2010 and some will be created using customization features.
5. **Tracking:** Are tasks required to be tracked by the number of hours worked per task or is tracking by percent complete sufficient? Defining the tracking of the project will be tied to the type of metrics that the project schedule will produce.
6. **Earned Value (EV):** if measuring EV is a requirement, more task details, estimating, baseline and tracking details will be required. This will likely result in more work for the project manager. Is help available for managing the project schedule?
7. **Resources:** What kind of reporting requirements will resources be responsible for during the project and how will the data be used. Will resource availability be updated collected and updated to the project schedule?
Defining output requirements of the schedule will in turn define the benefits of creating and maintaining the schedule. Establishing these goals will help the project manager focus on the benefits of the schedule for each specific project.

Lesson 2: Exploring the ribbon

Project 2010 contains a new feature called the Fluent Interface (Fl). This feature replaces the toolbars that were used in earlier versions of Project. Pull down menus which contained additional features in older versions of Project are now included within the Fl.

The Fl is divided into several sections or tabs. These sections are consistent throughout all of the MS Office products as well as Project and Project Server software:

The Fl, also known as the **ribbon** includes the following sections:

- **Task:** buttons to aid the user in building schedules and tracking schedules
- **Resource:** buttons to aid in adding resources, leveling and sharing resources
- **Project:** custom fields, links between projects, reporting and tracking
- **View:** buttons to aid in different ways of viewing schedule data
- **Format:** formatting views, format styles, visual options which change with views
- **Backstage:** save, open, close, Project print options, program options, help

The standard ribbon may be adjusted on a limited basis. If more buttons are needed or if you can't find what you are looking for, a customized section or bar may be created and buttons added as required. Buttons for macros may also be added. Exporting customized ribbons to a file provides a method for backing up ribbon bars and sharing ribbon bars with other users.

Many of the sections within a ribbon view contain a small button with an arrow in the lower right corner of the section. When this button is pressed, more options will become available.

It should also be noted that customization function allows for resetting ribbon bars to originally status if buttons are no longer needed or fail to perform as expected.



The format ribbon content will change as a result of the current view.

For example: the format Fl for the Gantt chart is different from the format Fl for the Resource Sheet.

Task Tab

The Task ribbon contains buttons which will allow functions that assist with entering, linking, scheduling and tracking tasks. Typically, the functions performed directly to tasks. Not all buttons will be available in every view.

Sections contained in the Task ribbon are:

- View
- Clipboard
- Font
- Schedule
- Tasks
- Insert
- Properties
- Editing

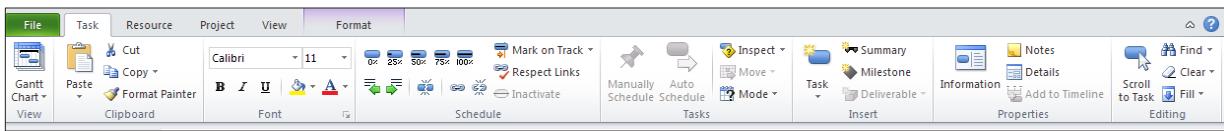


Figure 1-2 PLACEHOLDER



Above the Task ribbon name is the Quick Access Toolbar. This toolbar by default contains the buttons for Save, Undo and Redo. By clicking the arrow at the far right side of the Quick Access Toolbar, other buttons may be added. There is also an option to show this toolbar underneath the ribbon bars. Below is a view of the Quick Access toolbar. Suggestions for helpful buttons to add are: New, Open, Print, and Save As. Customization the Quick Access Toolbar will be discussed in Module 10.



Figure 1-3 PLACEHOLDER

Resource Tab

The **Resource** ribbon contains buttons which will allow functions that assist with entering, assigning, and leveling resources. Typically, the functions performed directly to resource entries.

Sections contained in the Resource ribbon are:

- View
- Assignments
- Insert
- Properties (Resource)
- Resource leveling

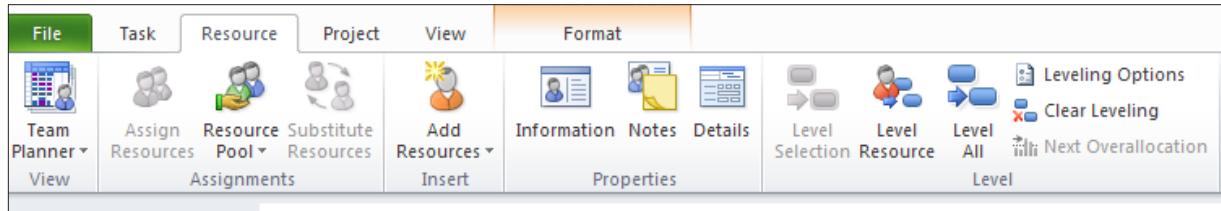


Figure 1-4 PLACEHOLDER

Project Tab

The **Project** ribbon bar contains buttons which will allow functions that assist with inserting projects into Master Projects, setting project properties, creating custom fields, creating calendars, setting baselines, tracking and reporting.

Sections contained in the Project ribbon are:

- Insert
- Properties (Project)
- Schedule
- Status
- Reports

- Proofing – Spell check

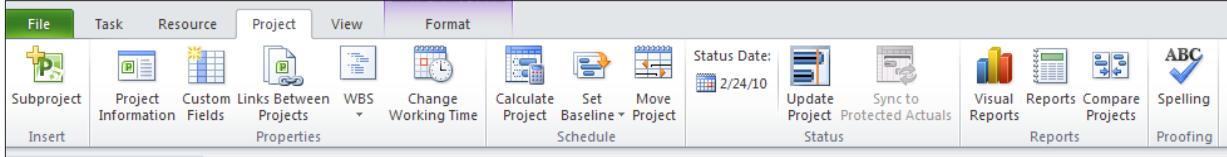


Figure 1-5 PLACEHOLDER

View Tab

The **View** ribbon contains buttons which provide easy access to views and Gantt Charts. There are buttons that allow highlighting, sorting, filtering and grouping of tasks. Additional buttons will turn the Timeline view on and off, adjust the timescale and create a temporary new window.

Sections contained on the View ribbon are:

- Task Views
- Resource Views
- Data
- Zoom
- Split View
- Windows
- Macros

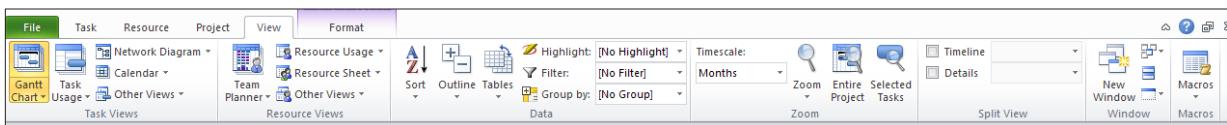


Figure 1-6 PLACEHOLDER

Format Tab

The Format ribbon contains buttons that provide functions to format custom views and Gantt charts. There are also buttons that will allow for turning on and turning off summary tasks and outline numbers. The view below is the Format ribbon when the Gantt Chart view is revealed.

Sections contained on the Format ribbon are:

- Format
- Columns
- Bar Styles
- Gantt Chart Styles
- Show/Hide
- Drawing



Figure 1-7 PLACEHOLDER

As a comparison, the view below is the Format ribbon when the Resource Sheet is shown.

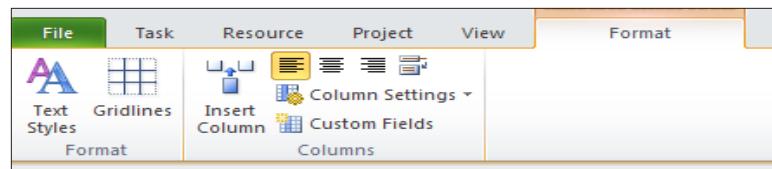


Figure 1-8 PLACEHOLDER

Backstage Tab

The **Backstage** ribbon is accessed when the File button to the left of the Task ribbon button is pressed. The Backstage contains buttons which provide functions to Save, Open, Close, Print, Customize the ribbon and Project 2010 options.

Sections contained on the Backstage ribbon are:

- Save
- Save As
- Open
- Close
- Info
- Recent
- New
- Print
- Save & Send
- Help
- Options
- Exit

The view below is the Backstage with the Info choice selected. Each selection will reveal different data. By default the last 4 project schedules that were opened will be contained in the left side of the view. The Backstage option choices are highlighted. They will appear in the blue box on the left of the view.

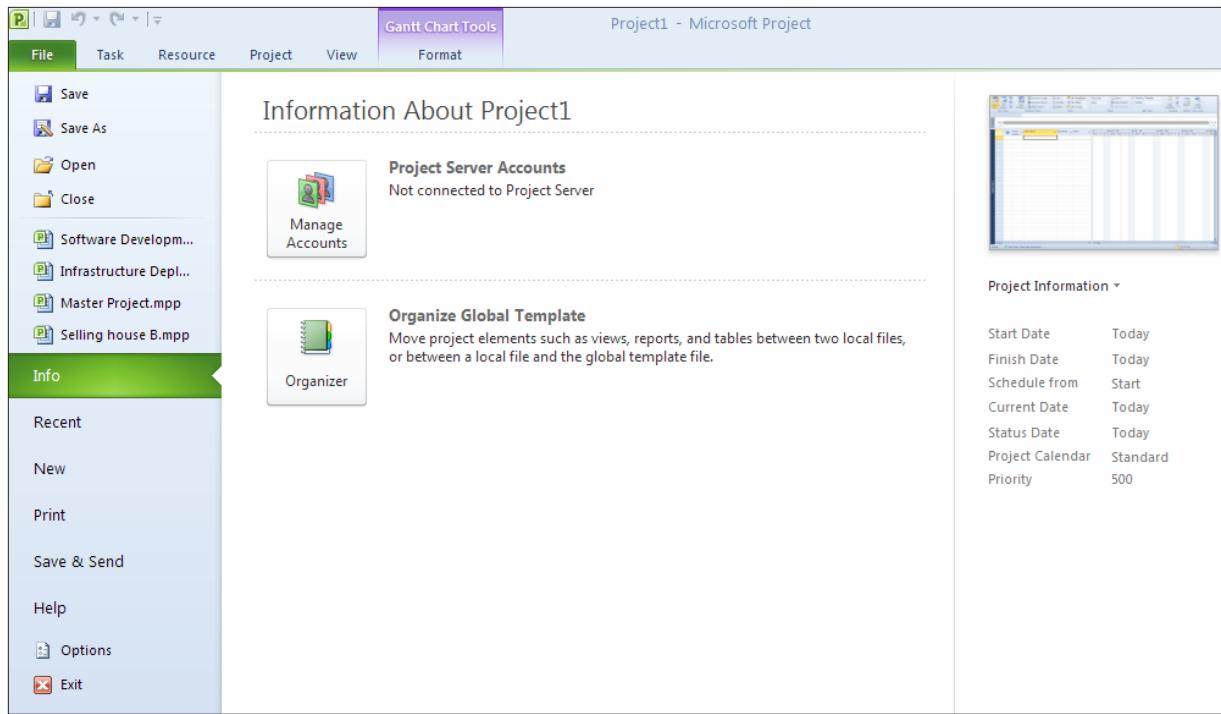


Figure 1-9 PLACEHOLDER

Lesson 3: Exploring the Project Database (.MPP file)

The most common Project 2010 file format is the .MPP file extension. Project 2010 templates are defined with an .MPT file extension. Templates are stored in the template area in the Backstage. When an .MPT file is opened, the file will open as a copy of the schedule template.

Each file is a database structure containing several parts:

- The Project section contains information that pertains to the entire project schedule
- The Task section contains information pertaining to the tasks or the work of the project – What will be accomplished.
- The Resource section contains information pertaining to the resources of the project. Who will perform the work.
- The Assignment section contains information concerning the details of resource task assignments. When and for how many hours the work is scheduled for.

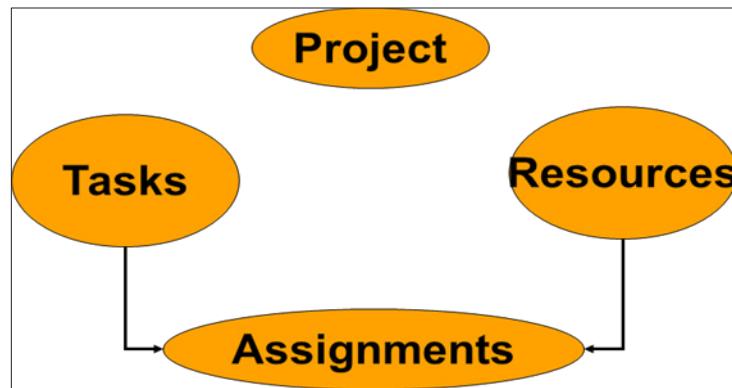


Figure 1-10 PLACEHOLDER

Project Data

Project is one of the sections of the Project 2010 database. This section will contain information that applies to the entire project schedule.

Data contained in this are:

- Project Start Date or Finish Date
- Project calendar
- Print settings
- Project options
- Project properties

Task Data

The Task section of the database is defining what work is to be completed. As each task is added to the schedule, over 300 fields of data are added for each task. Some of the fields are calculated by the Project 2010, some are static values and others are user defined fields.

Examples of task field information are:

- Task Name
- Notes
- Schedule planning fields: work, duration and cost
- Scheduling settings: task type, effort-driven setting, task calendar
- Format settings
- Baseline fields
- User defined fields

Resource Data

The **Resource** data section contains information concerning the resources that will perform the work of the project schedule. The resources are defined as the budget, workers, materials and costs required to complete the project. As each resource is added to the schedule, over 300 fields of data are added to complete the information needed for each resource. Some of the fields are calculated by the Project 2010, some are static values and others are user defined fields. Each work resource will also be assigned a resource calendar.

Examples of resource field information are:

- Resource Name and initials
- Notes
- Resource group
- Schedule planning fields: work (hours) and cost
- Resource calendars
- Baseline fields
- Cost table fields
- User defined fields

Assignment Data

The **Assignment** section of data contains the information concerning the assignments for each resource. Each assignment is defined as a resource applied to a task to establish the number of hours of work within a specific timeframe. When an assignment is created, data is populated within the assignment section of the database.

Examples of assignment field information are:

- Notes
- Number of hours of work for a task
- Dates the work is scheduled to occur
- Rate table used
- Contouring of work

- Tracking data
- Data may be time-phased.

Custom Fields

Custom fields or user-defined fields are fields designed to be adapted for individual user requirements. Customizable fields are available in both the Task section and the Resource section of the database. Field types available are:

- Text
- Cost
- Duration
- Start
- Finish
- Outline Code
- Flag
- Number
- Date

To aid custom field development, look-up tables, graphic indicators and formulas are available. When fields are created, you will have the ability to name the field and then keep the custom fields within the project in which they were created. Project 2010 contains a Global template which will allow access to the customized field for all projects on a desktop and the ability to copy these fields between project schedules.

Access to the custom field creation is found in the Project ribbon, 3rd button from the left. User-defined field creation will be discussed in Module 10.

Lesson 4: Exploring Database Views

Data in Project 2010 is accessed through **Views**. There are several types of views available. Some views are graphic in nature, such as Gantt Charts, graphs and network diagrams. Other views are tabular and resemble Excel spreadsheets. Views are designed to show a unique perspective on the data within the project schedule.

The topics discussed in this lesson are:

- What is a Database view?
- Task Views – views that display the Task section of the database
- Resource Views – views that display the Resource section of the database
- Other views – views that display more than one view

What is a Database View?

Project 2010 data is accessed through **Views**. Views are broken into categories based on which section of the database they are accessing. The major categories are Task Views and Resource Views. Knowing which view you are in and what data you are looking at will be integral to increasing success in working with Project 2010.

Most views will show one section of the database and other views will show two sections of the database. Using split views, allows the opportunity to view all three sections of the database at the same time. It is very helpful to understand the views and where the data in the view is derived from. This knowledge will be used in future chapters as we discuss other aspects of working with Project 2010.

Task Views

Task views are accessed through the **Task** ribbon and **Gantt Chart** button located under the Gantt Chart icon. An alternate access point is through the **View** ribbon. All Gantt Charts contain both the graphic side of the view as well as a table for additional data viewing. All views are available through:

Task ribbon → button under Gantt Chart icon → more views



Figure 1-11 PLACEHOLDER

The following is a summary of the most frequently used Task views:

Gantt Chart – the Gantt Chart is a graphic representation of the start and finish dates for a task. In addition to graphic bars, relationship arrows are also displayed. Gantt Charts will have a data table on the left side of the view called the Task Sheet. The default table of data is included called the Entry table which contains fields designed to aid in the planning and scheduling of tasks. The timescale in the view may be adjusted to show different time density timelines. Below is an example of the Gantt Chart view.

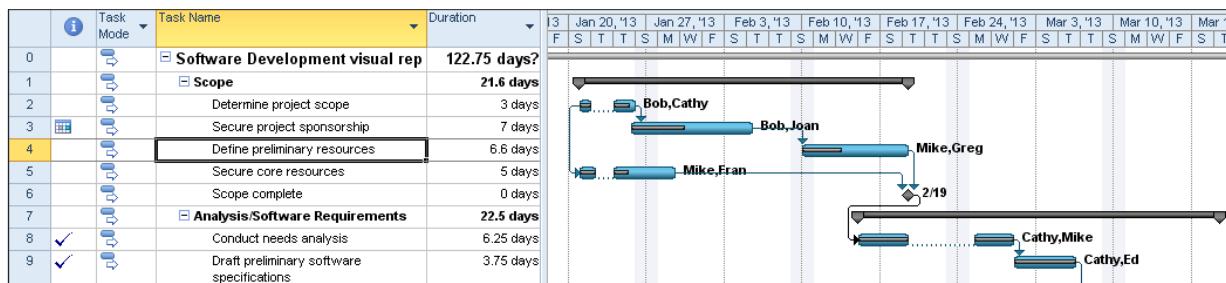


Figure 1-12 PLACEHOLDER

Tracking Gantt – this view will graphically represent of the start and finish dates of a task like the Gantt Chart above but is designed to help during the tracking phase of the project schedule. Percent complete and comparison of baseline versus actual values and future plan are displayed.

In the example below, the beige Gantt bars are the baseline and the blue bars is the running schedule.

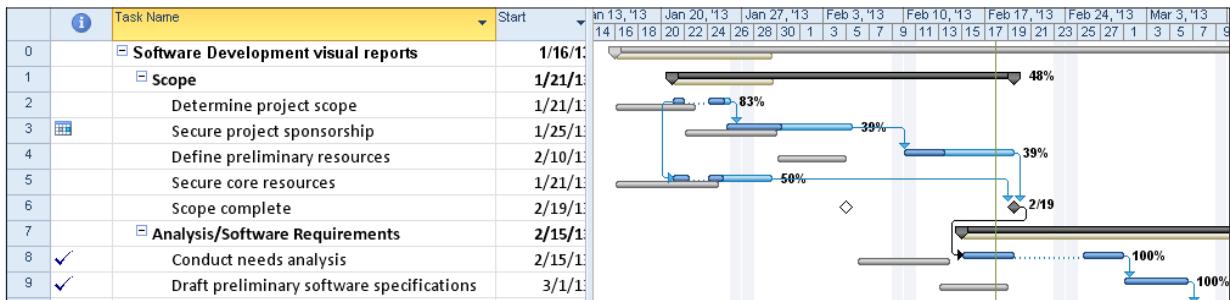


Figure 1-13 PLACEHOLDER

Network Diagram – The Network diagram is designed as a precedence diagram. It shows the predecessors and successors of tasks without regard to timeframe. When in the Network Diagram view, clicking on **Format → Box** styles will explain details about the information represented in the Network Diagram. Double clicking on a task will allow access to task information.

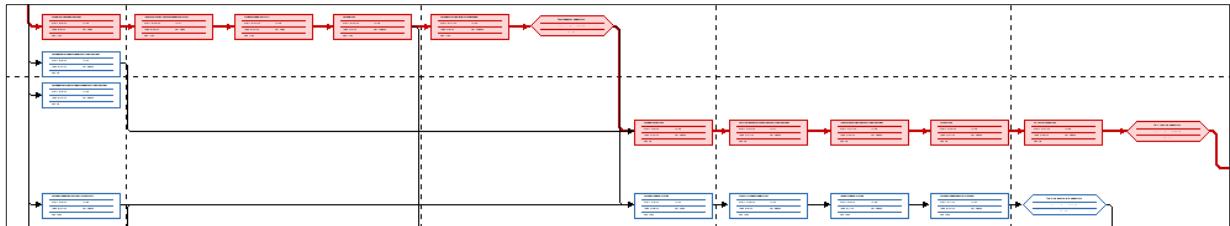


Figure 1-14 PLACEHOLDER

Calendar view – The calendar view shows the project schedule on a calendar. Date range is available as well as limited customization. Double click on any task name to see more information regarding the tasks. Some customization of the view is available.

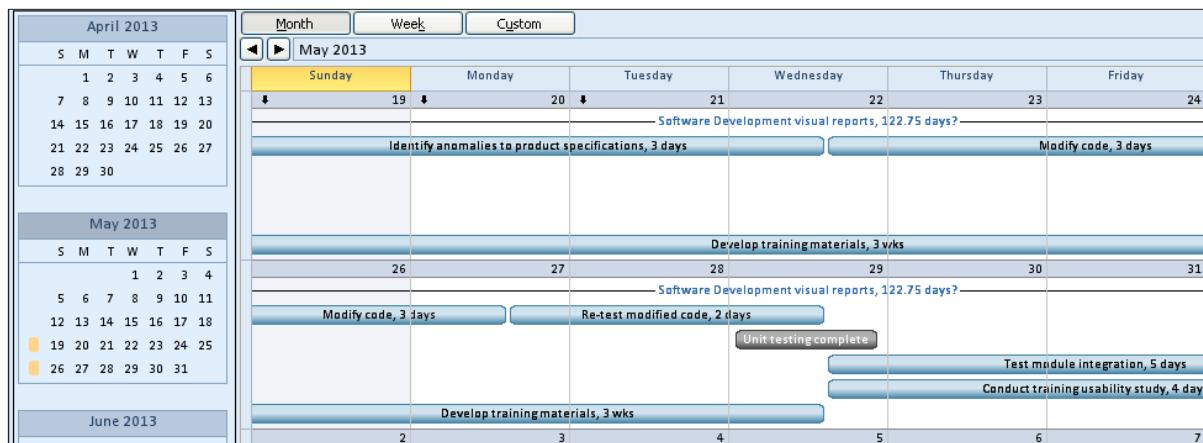


Figure 1-15 PLACEHOLDER

Task Form – The task form shows information about individual tasks. Right clicking in the view will allow changing to 8 different views for task data such as predecessor and successor, resource work, and resource schedule. The Task Form is a light version of the Detail Task Form which contains more per task data.

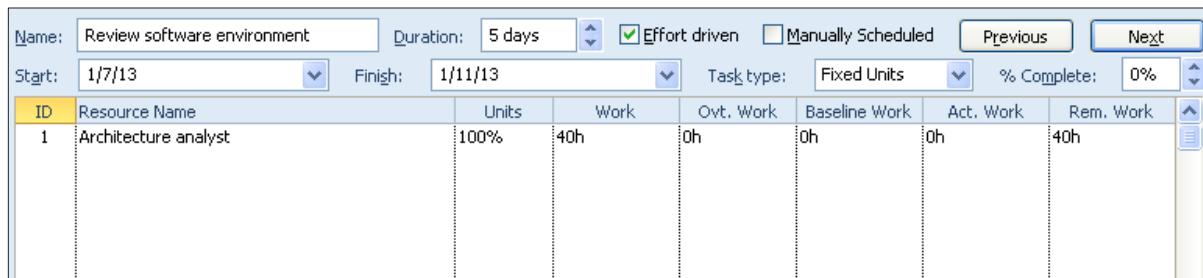


Figure 1-16 PLACEHOLDER

Task Sheet – The task sheet view looks like an Excel table. It is a table of data which is a subset of the approximately 300 fields of the task section of the database. Tables are typically 6-10 columns of data, organized by topic. Some of the most used tables are: Entry, Work, Duration, and Tracking. To switch to another table view, right click in the box above the task numbers and select another table from the list. Another access point is:

View → Tables

		Task Name	Duration	Start	Finish	Predecessors	Resource Names	Add New Column
0		Infrastructure Deployment	141.25 days	1/1/13	7/17/13			
1		Infrastructure Deployment Template	141.25 days	1/1/13	7/17/13			
2		Scope	4 days	1/1/13	1/4/13			
3		Determine project scope	1 day	1/1/13	1/1/13		Project management	
4		Secure project sponsor	1 day	1/2/13	1/2/13	3	Project management	
5		Define preliminary resou	1 day	1/3/13	1/3/13	4	Project management	
6		Secure core resources	1 day	1/4/13	1/4/13	5	Project management	
7		Scope complete	0 days	1/4/13	1/4/13	6		
8		Analysis	30 days	1/7/13	2/15/13			
9		Review Current Infrastructure	5 days	1/7/13	1/11/13			
10		Review hardware environment	5 days	1/7/13	1/11/13	7	Architecture analyst	

Figure 1-17 PLACEHOLDER

Timeline View – The Timeline View is a very flexible and customizable view. Tasks may be selected to appear on the timeline to give high level reporting capability. In addition, the timeline has the ability to highlight the timeframe it is representing. The Timeline View may be turned when needed on the from the **View** → click box to the left of the timeline option. Formatting is available to colorize the view. Comments and milestone markers may also be added. The Timeline view will be discussed in Module 10.



Figure 1-18 PLACEHOLDER

Task Usage – The Task Usage view shows tasks and the resources assigned to the task. Data in this view comes from the Task and Assignment data sections of the database. By default, the work field of data is shown on the right but additional fields may be added to customize the report and make it more usable. The example below is showing when a task is scheduled and the cost of the resource working on the task by week.

	Task Mode	Task Name	Work	Details				
				February 1		March 1		April 1
				2/3	2/17	3/3	3/17	3/31
7		Analysis/Software Requirements	236 hrs	Work	16h	100h	108h	12h
8	✓	Conduct needs analysis	100 hrs	Cost	\$1,600.00	\$10,000.00	\$10,800.00	\$1,200.00
		Mike	50 hrs	Work	16h	84h		
		Cathy	50 hrs	Cost	\$1,600.00	\$8,400.00		
				Work	8h	42h		
				Cost	\$800.00	\$4,200.00		
				Work	8h	42h		
				Cost	\$800.00	\$4,200.00		

Figure 1-19 PLACEHOLDER

Resource Views

Resource views are accessed through the Task ribbon and Gantt chart button under the Gantt Chart icon. They can also be accessed from the Resource ribbon by clicking on the words Team Planner button which is the first button on the left side of the ribbon. All views are available through:

Task ribbon → button under Gantt Chart icon → More Views



Figure 1-20 PLACEHOLDER

Resource Sheet – The resource sheet provides the table where resources are added into Project 2010. This table is a subset of the over 300 resource data fields available for resources. The default table is called the Entry table. Other tables are available by right clicking in the box above the resource number one and selecting another table. Tables are organized by topic.

		Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
1		Architecture analyst	Work		A		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2		Project management	Work		P		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
3		Deployment resc	Work		D		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
4		Procurement	Work		P		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
5		Management	Work		M		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard

Figure 1-21 PLACEHOLDER

Resource Form - The Resource Form shows information and assignments for individual resources. Right clicking in the view will allow changing to 5 different views which shows the resource assignment data in different ways. The Resource Form is very useful for viewing resource cost, work and schedule information by resource.

The screenshot shows the 'Resource Form' window. At the top, there are fields for 'Name' (Bob), 'Initials' (B), 'Max units' (100%), and buttons for 'Previous' and 'Next'. Below this is a 'Costs' section with 'Std rate' (\$100.00/h), 'Per use' (\$0.00), 'Ovt rate' (\$0.00/h), and 'Accrue at' (Prorated). To the right are dropdowns for 'Base cal:' (Standard) and 'Group:' (empty). A 'Code:' field is also present. The main area displays a table of tasks assigned to Bob:

Project	ID	Task Name	Units	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
Software Dev	2	Determine project scope	100%	20h	0h	16h	20h	0h
Software Dev	3	Secure project sponsorship	100%	41h	0h	32h	22h	19h
Software Dev	14	Obtain approvals to proceed (concept)	100%	8h	0h	4h	8h	0h
Software Dev	21	Review functional specifications	100%	16h	0h	16h	0h	16h
Software Dev	22	Incorporate feedback into functional s	100%	8h	0h	8h	0h	8h
Software Dev	23	Obtain approval to proceed	100%	4h	0h	4h	0h	4h

Figure 1-22 PLACEHOLDER

Resource Graph - The Resource Graph will show work and cost values in graphic format for individual resources. The timeline of the graphic display may be altered to show reports at the time density which is most meaningful for the report. Customization is available to change the graphic layout and data included.

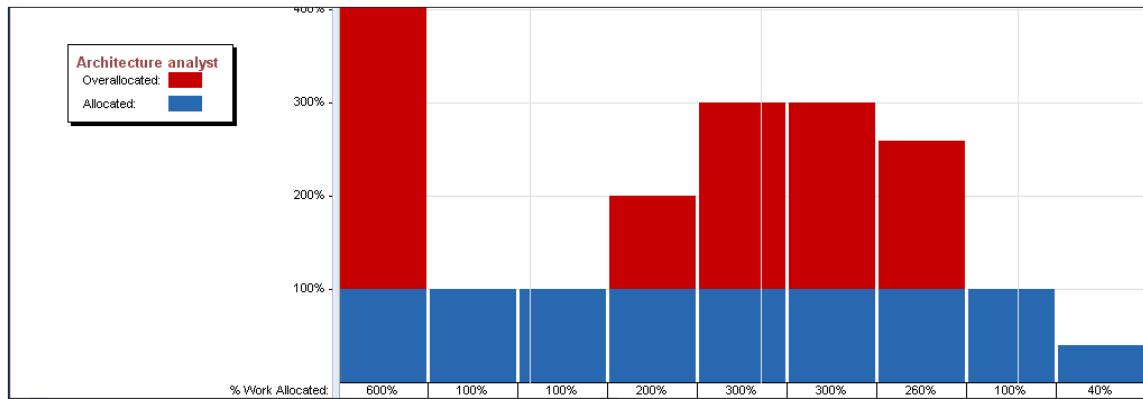


Figure 1-23 PLACEHOLDER

Team Planner – the Team Planner view is also known as a swim lane view. It will show the work of the resources in timeline format. It will also allow for moving task assignments between resources and to alternate timeframes. This will be a very helpful view for resource leveling and smoothing out work loads. It will also show tasks without assignments. This view is available for Project 2010 Professional only.

Project management		Train deployment resources in deplo	Sele	Review deployment team tasks and timeline	Deploy infrastructure co	Test infrastructure co	R	Obtain feedback	Evaluate	Dete	rmin
Deployment resources		Train deployment resources in deplo	Sele	Review deployment team tasks and timeline	Deploy infrastructure co	Test infrastructure co	R	Obtain feedback	Evaluate		

Figure 1-24 PLACEHOLDER

Resource Usage– The Resource Form is a view that shows resources and the tasks assigned to resources. Data in this view comes from the Resource and Assignment data sections of the database. By default the work column is shown on the right side of the screen. In the view below the remaining resource availability has been added.

3	Deployment resources	Work	40h	40h	36h	40h	40h	32h	40h	40h	40h	40h	18h
	Develop detailed implementation strategy	Rem. Avail.	0h	0h	4h	0h	0h	8h	0h	0h	0h	0h	22h
	Validate implementation strategy in test environment	Work	40h										
	Review implementation strategy noting other initiatives	Rem. Avail.											
		Work		24h									
		Rem. Avail.											
		Work			16h								
		Rem. Avail.											

Figure 1-25 PLACEHOLDER

More Views

Views in the system may be combined into split views to give more information viewed at the same time. The split view can be achieved by clicking the Details button on the Task ribbon or clicking the **Details** button on the View ribbon.

- If you are in a task based view and the screen is split, the task form will appear
- If you are in a resource based view and the screen is split, the resource form will appear

Two frequently used split views, noted below, that come with Project 2010 are accessed through:

Task ribbon → button under Gantt Chart icon → more views



Figure 1-26 PLACEHOLDER

Task Entry View: The top portion of this view is the Gantt chart and the lower portion is the Task Form. This view is very useful when creating resource assignments.

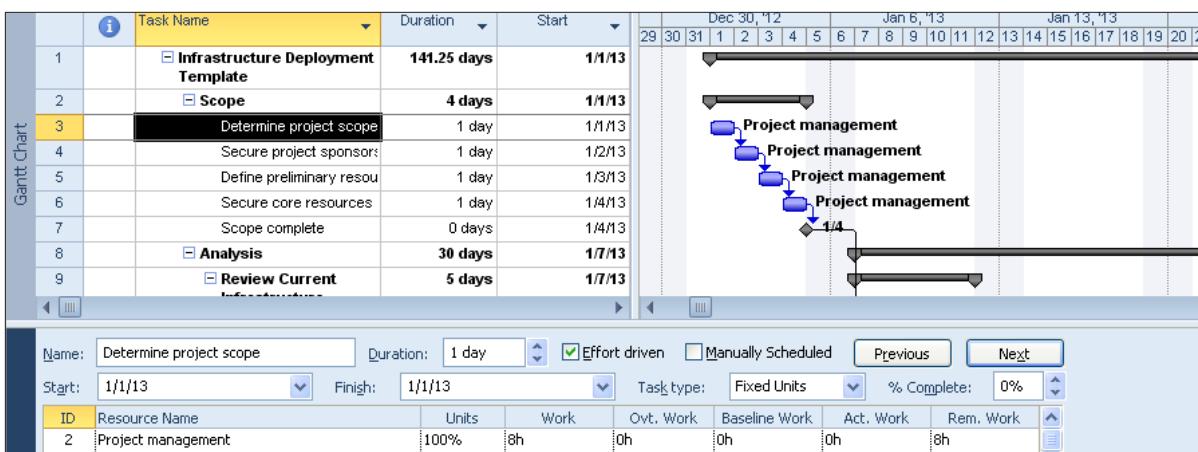


Figure 1-27 PLACEHOLDER

Resource Allocation View: The top portion of this view is the

Resource Usage View and the lower portion is the Leveling Gantt. This view is very useful when analyzing resource overallocations during the resource leveling function.

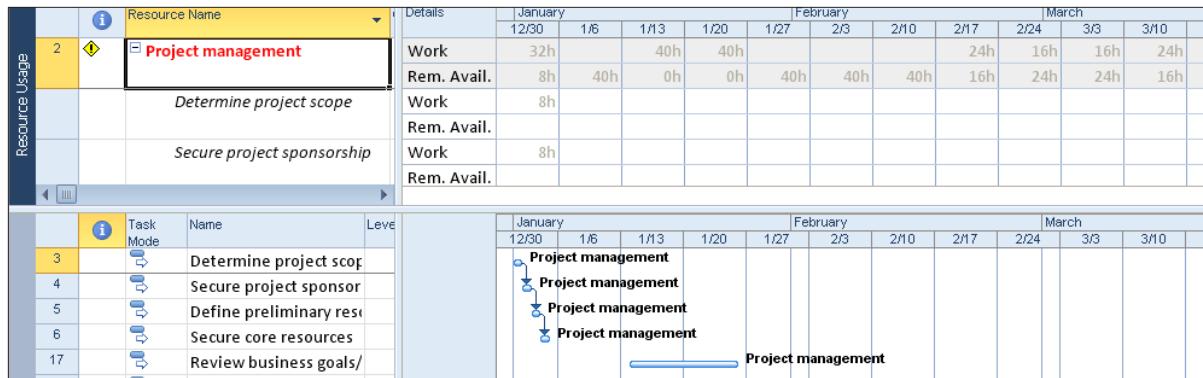


Figure 1-28 PLACEHOLDER



Be creative, virtually any 2 views may be combined to create a split screen

Any screen may be split by double clicking on the bar below the down arrow in the lower right corner of the view. To remove a split, double click on the split line in the middle of the view.



Figure 1-29 PLACEHOLDER

Practice: Title of Practice

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Setting	Perform the following
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

Understanding the structure of the data within a Project 2010 schedule will help in understanding what is being shown in the views and tables. In this short overview only the most frequently used views were discussed but there are many more views available.

In this chapter we discussed:

1. Project Management overview
2. Success factors for your project schedule
3. Overview of Project 2010 ribbon or the Fluent Interface
4. Exploring the Project 2010 database (.mpp file)
5. Exploring the Project 2010 views and tables



Chapter 2

Initializing a Project

Module Overview

When a new project schedule is to be created, it is important to prepare the schedule to receive the tasks and resources that you will be using during the project. When tasks are entered, calculations start running in the background and it is important that these calculations work the way you intend them to behave.

Each project has the ability to have its own unique set of options and values. With this in mind it is valuable to get the new project off to a good start by having the options and values correct for the unique project schedule being created.

In this module we will address the options, values and settings important to have in place BEFORE the first task is entered into your project schedule.

The objectives in the lesson are:

1. Creating and Configuring Calendars
2. Configuring Schedule/Display Options
3. Creating and Saving a Project Schedule

Lesson 1: Creating and Configuring Calendars

Calendars in Project 2010 will determine when a task may be scheduled within the project schedule. It will also influence what defines a day, a week and a month. The calendars will also work hand-in-hand with the calendar options to determine when and how the tasks will be scheduled.

In this lesson we will explore:

1. How calendars work in Project 2010
2. How to create a base calendar
3. How to Set Working Hours and Days
4. How to Set Non-Working Hours and Days
5. How to Set Calendar Options

How Calendars Work in Project 2010?

There are several types of calendars within the Project 2010 system. The following are definitions of available calendars:

- **Base Calendar:** The base calendar which may be used to as a template to create other calendars. A base calendar may also be used as a Project, Resource or Task calendar.
- **Project Calendar:** The project calendar is the calendar assigned to a project and it defines the project working and non-working days. The default name for the Project Calendar is “Standard”.
- **Resource Calendar:** Each resource will have its own calendar which may be based off of a base calendar or the project calendar. Unique resource calendars may also be created.
- **Task Calendar:** A task calendar is assigned to a task to allow for the scheduling of that task in a unique timeframe. For example: tasks which have to occur on a weekend.

How the calendars are used by the software:



A task will be scheduled based on the Project calendar until a resource is assigned to the task. At that time, the Resource calendar will control the scheduling of most tasks. Unless – there is a task calendar assigned which will override the Project and the Resource calendars.

When a project schedule is created, a default calendar of “Standard” is applied to the schedule. This is called the project calendar for the project. The default values on the Standard calendar are: Monday through Friday which are working days, and working time is 8:00 am to 12:00 pm and 1:00 pm to 5:00 pm daily. No holidays are indicated on the calendar. The Standard calendar is also the calendar that will be viewed in the background of the Gantt Chart views. The Calendar Options work hand in hand with the Project Calendar to determine number of hours in a day or week and these values should be in sync with one another. The Calendar options will be discussed in the next section.

By default, 2 additional calendars are included in Project 2010: a 24 hour calendar and a Night Shift calendar. Either of these may be used as Project, Resource or Task calendars.

FAQ's

Q: Why are there no holidays on the calendars?

A: This is an international program. Holidays vary from country to country.

Q: Is there the ability to add holidays to a calendar the way they can be added in Outlook?

A: No – this is not a capability of the software.

Q: Do I have to recreate the calendar for each project?

A: No – calendars may be created and saved through the Organizer to use in future projects.



The default calendar name for the system is "Standard". If a different calendar name is selected, each Gantt view will also require changing because Gantt Chart views are set to display the Standard calendar. This change can be made by right clicking in the Gantt view and select Non-working time and changing to the calendar to be seen in the view. Most users keep the Standard calendar because of ease of use.

Creating a Base Calendar

Creating a new base calendar gives you the ability to create a calendar with the unique values your projects require. The values of the Standard calendar are:

- Monday through Friday are working days
- Saturday and Sunday are non-working days
- Working time is 8:00 am to 12:00 pm and 1:00 pm to 5:00 pm daily
- No holidays

How to Create a New Base or copy an existing calendar:

1. Click **Project → Change Working Time**
2. Click **Create New Calendar** to the left side of the form
3. Enter in a calendar name in the name field (default name is Calendar 1)
4. Click **Create new base calendar - OR -**
Click Make of copy of and select an existing calendar
5. Click **OK** to close the form

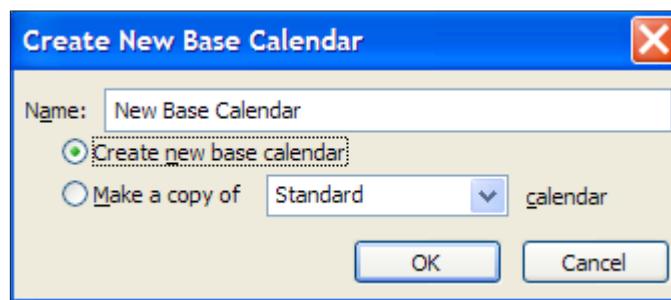


Figure 2-1 PLACEHOLDER

Setting Working Hours and Days

After the base calendar has been created, decide what the working days (business days) of the project schedule will be. Decide also, how many hours will make up a working day and what times the hours will be. By default, the working days of the calendar are Monday through Friday and the working time is 8:00 am to 12:00 pm and 1:00 pm to 5:00 pm daily or 8 hours working per day.

Ask yourself, how many hours per day do you feel your resources work productively on project work?

The average amount of productive project time in a day for a full time resource is 6 to 6.5 hours. If you are planning projects using an 8 hour day and your resources produce 6.5 hours per day are you planning an unreasonable timeline for your project schedule. After resources are assigned to tasks, the resource availability calendar will be considered in the scheduling equation and the timeline for the project schedule will alter substantially. It is expected that schedules will double in length once actual resources are assigned to tasks.

This difference to the schedule may be handled through adjustments to the project calendar, to the assignments or to the resource calendars. Consider choosing one of the methods and using it as the standard for scheduling projects. Each of the above options has their pros and cons, but it is the crossing of methods that will result in unreliable results in planning a schedule.

To Change the Working Hours of all Days on a Calendar:

1. Click **Project → Change Working Time**
2. Check to ensure the calendar you wish to change is displayed in the **For calendar** list
3. Click **Work Weeks** near the bottom of the dialogue box

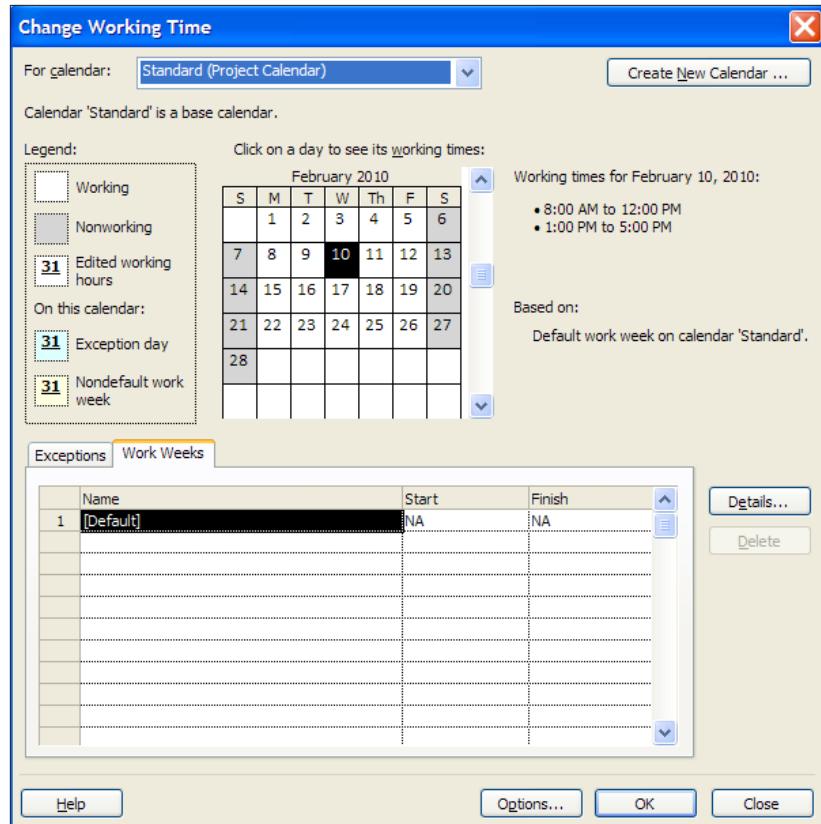


Figure 2-2 PLACEHOLDER

1. After clicking on the **Work Weeks** tab, the word **Default** should be highlighted. Click the **Details** button to the right of the form
2. Click **Monday**, press and hold the **shift** key and click on **Friday**. All of the working days will be selected
3. Click the **3rd radio button, Set day(s) to these specific working times**
4. You will see the standard working times. Make changes to reflect the new values
5. Click **Enter** or **Tab** to move away from the value you have changed
6. Click **ok** to close the form

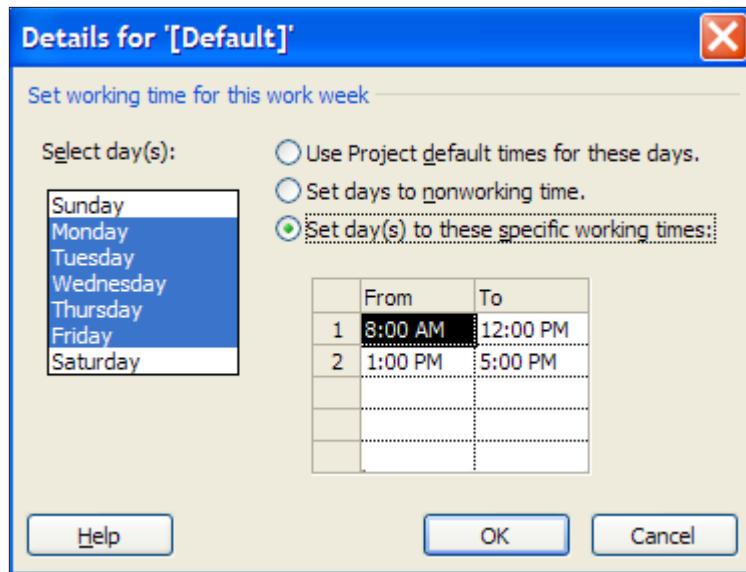


Figure 2-3 PLACEHOLDER



Military time is valid when entering hour values. To change 5:00 pm to 4:00 pm to shorten the work day, simply enter **16** where 5:00 pm is located and click **Enter** or **Tab** and 4:00 pm will appear.

Setting Non-Working Hours and Days

Non-working time is defined in the software as days where work will not be planned or performed. Examples are: national and organizational holidays, training days, company shutdowns, summer hours, etc. Adding these non-working days and times to the project calendar will allow for the scheduling of the tasks to be excluded from these dates.

A frequently asked question is: Is there the ability to add holidays to a calendar the way they can be added in Outlook? The answer is no - this is not a capability of the software. However, creating recurring holidays and

non-working times is a feature of Project 2010.

How to Create a Non-working Day for a Calendar:

1. Click **Project → Change Working Time**
2. Check to ensure sure that the calendar you wish to change is displayed in the **For Calendar** field
3. Click **Exceptions** tab near the bottom of the dialogue box

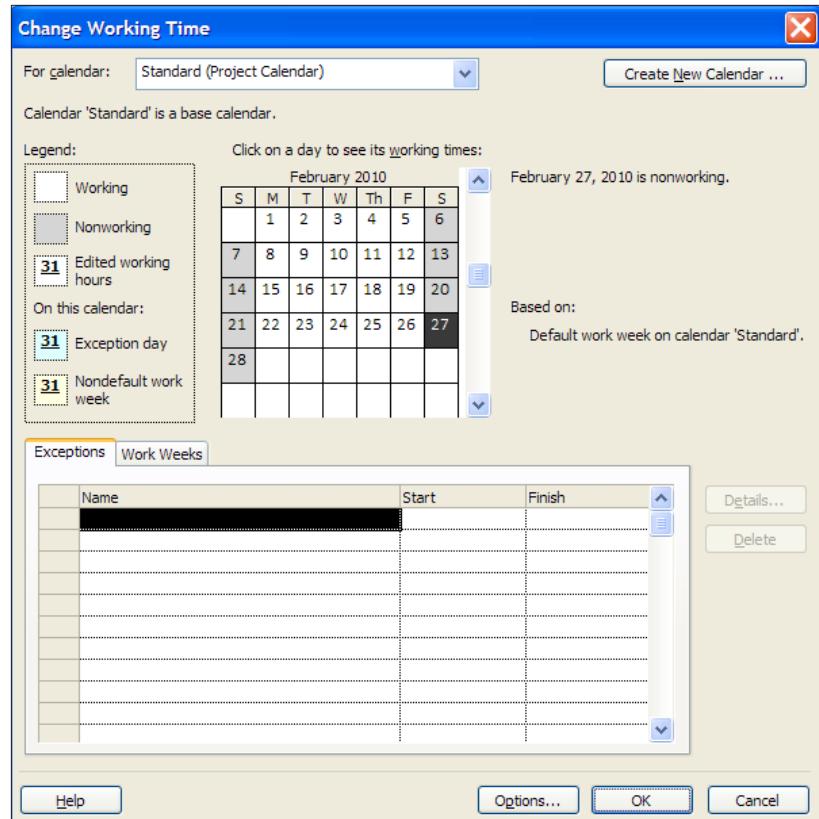


Figure 2-4 PLACEHOLDER

4. In this example, we will set April 8, 2011 as a non-working day. Move the slider on the right side of the calendar down until **April 2011** is displayed in the calendar
5. Click **April 8, 2011**
6. Click in the name field and enter a reason for the non-working day, ie: Company holiday
7. Click **Enter**
8. Repeat for additional non-working days. See the result below

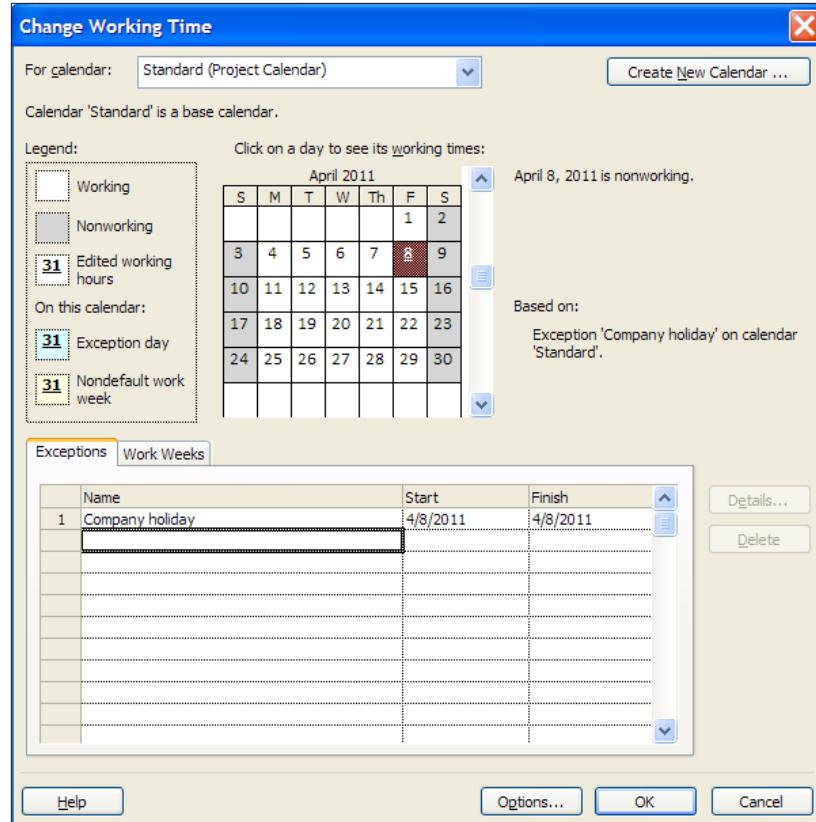


Figure 2-5 PLACEHOLDER

To Create a Recurring Non-working Day for a Calendar:

1. Click **Project → Change Working Time**
2. Check to make sure that the calendar you wish to change is showing in the **For calendar** field
3. Click **Exceptions** the tab near the bottom of the dialogue box
4. In this example, we will set January 1 (New Year's Day) as a recurring non-working day. Move the slider on the right side of the calendar down until **January 2013** is displayed on the calendar
5. Click **January 1, 2013**
6. Click in the first open line in the **Name** field and enter **New Year's Day** for the non-working day
7. Click **Enter**
8. Click back on the words **New Year's Day** and then click on the **Details** button to the right of the form

9. Click **Yearly**
10. Click on January 1
11. Enter the start date
12. Enter a recurrence value or an End by date
13. Click **ok** to close box
14. Check for the recurrence values in the Exceptions line for New Year's Day.

Setting Calendar Options

The Calendar options work hand in hand with the project calendar to determine how tasks will be scheduled. It is imperative that the calendar options match the project calendar to create a consistency in the scheduling values for tasks and assignment values.

To access the Calendar options:

Click **File** → **Options** → **Schedule**

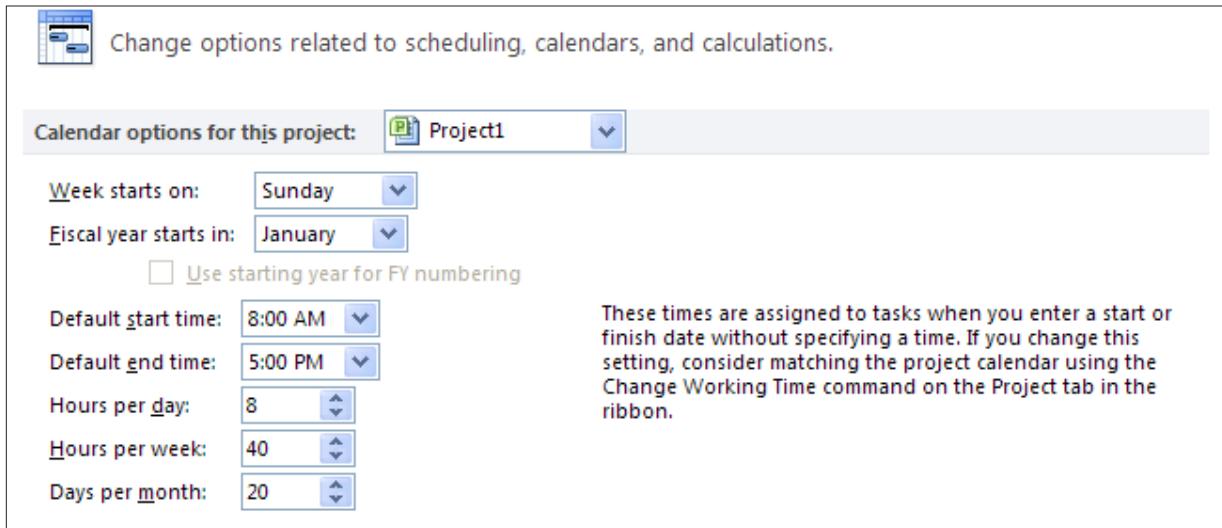


Figure 2-6 PLACEHOLDER

What the options mean:

- **Calendar options for this project:** option to select whether your option choices for the calendar will be held within an individual project or if they will be applied to all new projects.
- **Week starts on:** this choice will affect what is assigned and viewed as the first day of the week. The day chosen will be reflected on the Gantt Chart, Resource Usage, Task Usage and other calendar views.
- **Fiscal Year starts in:** if using this option, select which month will be the start of the fiscal year.
- **Default start and end times:** these values should match the time values on the project calendar. Assigning the project calendar will be discussed in the next lesson. The times stated here will be used to schedule tasks when time is not specified for a task. It will also be used to schedule tasks that do not use relationships. For example: if recurring tasks are created, the tasks will always be scheduled at the start time represented in this option.
- **Hours per day:** when 1 day of work is scheduled, how many hours should 1 day consist of?
- **Hours per week:** when 1 week of work is scheduled, how many hours should 1 week consist of?
- **Days per month:** when 1 month of work is scheduled, how many days should 1 month consist of?

Saving the Calendar

In Project 2010, the calendar that was just created is known as a “custom object”. Custom or customized objects may be saved for use in the project the object was created in and used in other projects as well. To save objects the Organizer is used. When Project 2010 was installed on your system, a file named Global.mpt was created. The Organizer is the function that will copy objects into the Global.mpt as well as between project schedules. Calendars are only one of many object types that may be customized and saved for use in other project schedules. The other objects will be discussed in Module 10. In this lesson, we will only address the Calendar.

To save the custom or customized calendar, the object must be copied

using the Organizer.

To copy a New Base Calendar into the Global.mpt:

1. Click **File** → **Info** → **Organizer**
2. Click the **Calendars** tab
3. Click **New Base Calendar** to the right and click **<<Copy**
4. Click **Cancel** to close the box

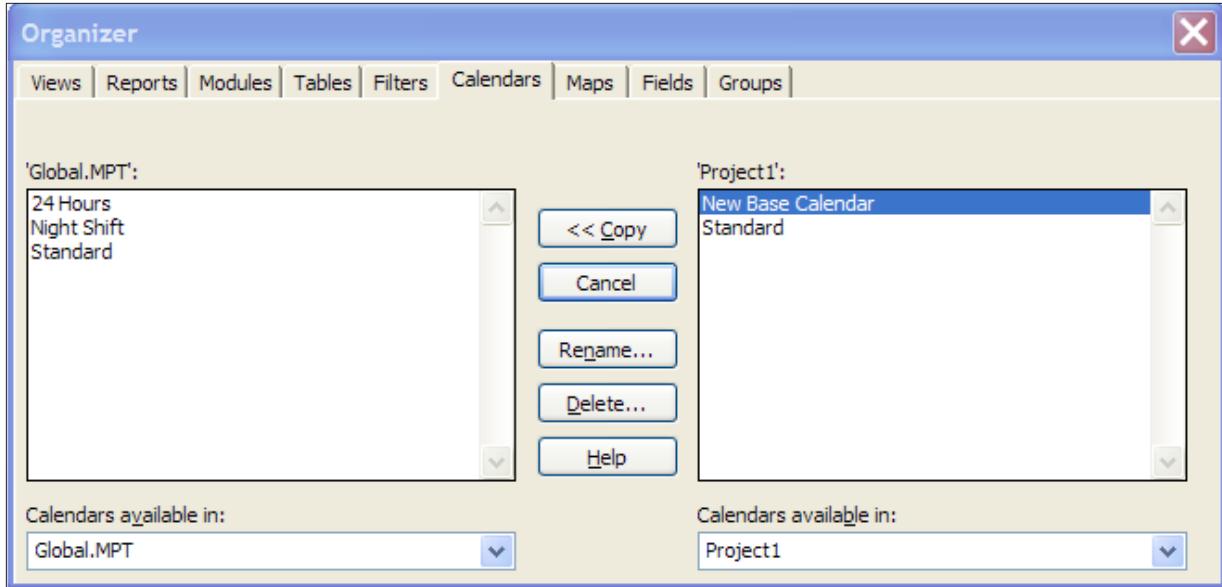


Figure 2-7 PLACEHOLDER

The Calendar will be copied into your local Global.mpt.

Practice: Creating Calendars

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile

and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 2.1 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 2: Configuring Schedule/ Display Options

Understanding the concepts that are the basis for task and resource scheduling using Project 2010 will help you create schedules easier. The option choices made will depend on the project metrics requirements, the standards of the organization, and it will control standard values within the project schedule. Making educated decisions for these values is the objective of this lesson.

Topics in this lesson are:

1. Configuring Schedule/Display Options
2. Understanding Duration vs. Work / Effort
3. What is Effort Driven Scheduling
4. Understanding Task Types
5. Setting Schedule Options
6. Setting Display Options
7. Adding Project Information
8. Working with Timescale

Understanding Duration vs. Work / Effort

To understand Project 2010's schedule engine it is helpful to understand the terms "Duration" and "Work" which is fundamental to understanding project scheduling.

Definitions:

- Duration is a length of time ie: a day, a week, or a month
- Work is the quantity of work that occurs ie: 8 hours in one day, 40 hours in a week

For example:

How many people are in this room? _____

How long are we here for today? _____

Number of people in the room x number of hours in the day

= Quantity of work performed today.

If more people come in the room, will the duration of the class day change? No

Will the number of hours of work change? Yes because more people are working

The number of hours of work is a function of how many people are performing the work and might not affect the duration of a task.

Work and effort are interchangeable terms. In Project 2010 Help, and other reference books, you will see work referred to as effort.

What is Effort Driven Scheduling?

Tasks have the option of being scheduled using Effort-driven scheduling. Effort-driven is defined as when more workers are added, the effort (or work) will be divided across the workers.

For example: A project has a task called “Moving boxes”. The work of the task is to move 100 boxes from location A to B. If one person moves the boxes, it will take 10 hours of duration. However, if 2 people move the boxes it will take 5 hours, 3 people can accomplish this task in one-third of the original time, etc. In theory, if 100 people move the boxes, we will get the task completed in a few minutes. In this scenario, however, all work is equal. Does it matter which box a worker moves? If one worker becomes unavailable, can the other workers move the rest of the boxes? This is effort-driven scheduling.

Another example is driving a car: If it takes 5 hours to get from point X to point Y, can you get there faster if you add more drivers to the car? This task by nature is not effort-driven because there is really only one worker who can perform the task at a time.

The following examples show that effort-driven scheduling will not apply to all tasks. Each task should be examined to determine if effort-driven scheduling applies and the setting altered on a task by task basis.

Understanding Task Types

Each task will be assigned a task type when the task is added to the schedule. Task types work hand-in-hand with the effort-driven option discussed on the previous page. Task types determine how a task is scheduled and will have an effect on the assignment of the resources. Task types should be considered unique per task and should be set on a task by task basis.

The software allows for the following 3 task types:

- **Fixed Duration:** A fixed duration task is a task created with a fixed length of time. Fixed Duration tasks are also tied to dates.

Example: This training class. When the time for the class is over, the work of the class is completed. If someone leaves the class for a meeting, they cannot come the day after the class is completed to make up the work they missed.

- **Fixed Units:** Units means quantity of resource. Fixed Units means that the resource assignment quantity is fixed for the task. Using this task type will result in the quantity of the units assigned to a task coupled with the availability of the resource to determine the scheduling of the task.

Example: If it takes 5 hours to drive from point X to point Y, and the driver (the resource) is available for the full 5 hours per day, it will take 1 day to get from point X to point Y. If the driver is available for 2 and a half hours per day or 50% of his availability, it will take 2 days to drive the same distance. If the driver is available for only 1 hour per day (20%), it will take 5 days to drive from point X to point Y. If there is a weekend in the middle of the task and a non-working day for the resource, it could take a lot longer to get to point Y.

- **Fixed Work:** The work of the task is fixed. Fixed work tasks, by default, are also effort-driven. The more resources assigned to the task, the less time the task will take to be completed. Fixed work tasks will be scheduled based on the quantity of the units of the resources assigned to the task and their availability based on their resource calendar.

Example: If a task called "Plan event", and has 80 hours of work, the work will be completed in 2 weeks with 1 full time resource. If a second resource is added full time, the task will be completed in 1 week. Each resource would have performed 50% of the work. The more resources, the faster the work is completed.

When task types are coupled with the effort-driven option, the

scheduling engine allows for 5 combinations of task type, effort-driven combinations:

- Fixed Duration, Effort-driven on
- Fixed Duration, Effort-driven off
- Fixed Units, Effort-driven on
- Fixed Units, Effort-driven off
- Fixed Work, Effort-driven on

The project options will allow for setting a default that each task will be assigned when the task is entered. It should be noted that each task is different and unique. The default should be considered a starting point. The schedule developer should get to know the tasks and the work of the tasks and reset the task type and effort-driven options on a task by task basis.

Setting Schedule Options

Scheduling options are per project options which establish the defaults how a project will be scheduled. These options are unique per project and should be checked before entering tasks into a project schedule.

These options also may be changed at any time over the life of the project schedule.

To set the scheduling options:

Click **File → Options → Schedule**

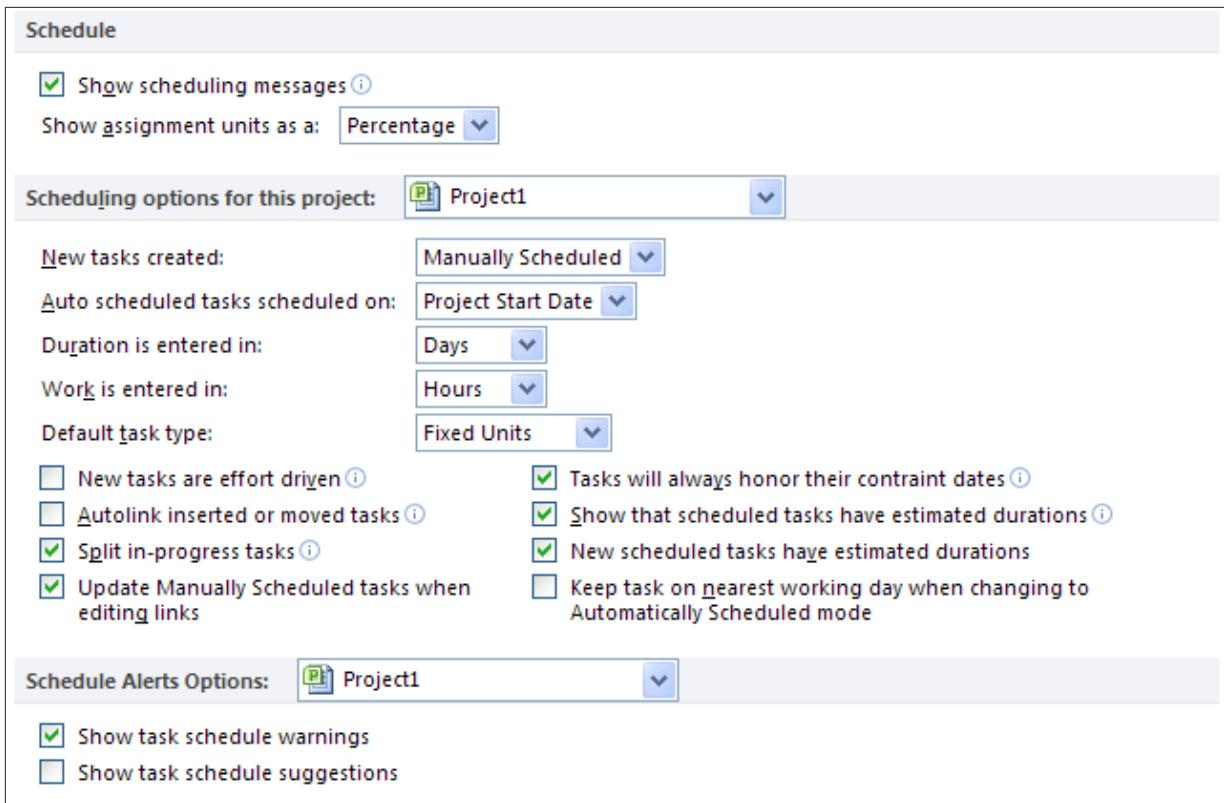


Figure 2-8 PLACEHOLDER

- **Show scheduling messages:** gives the scheduler error messages concerning scheduling inconsistencies and warnings.
- **Show assignment units as a:** options are percentage or decimal. This is user preference. It may be changed at any time without affecting the schedule.
- **Scheduling options for this project:** options that can be assigned to a specific project or all projects.
- **New tasks created:** manually scheduled or automatically scheduled. This is the default value and may be adjusted per task.
 - **Manually scheduled:** tasks will be entered without a start or finish date and without task duration. All values are entered manually.
 - **Auto scheduled:** tasks will be entered with a default duration of 1 day and a start and finish date.

- **Auto scheduled tasks scheduled on:** project state date or current date. If you are managing a long project it might be easier to change this option for all new tasks to start on the current date.
- **Duration is entered in:** minutes, hours, days, weeks, months
- **Work is entered in:** minutes, hours, days, weeks, months
- **Default task type:** Fixed Units, Fixed Duration, or Fixed Work
- **New tasks are effort driven:** check for yes
- **Update Manually Scheduled tasks when updating links:** when tasks are manually scheduled should the project schedule successor tasks based on realtionship links



It is a good idea within an organization to establish a standard for Duration and Work. When duration is discussed or appears on a report it will be easier for stakeholders to understand that duration always means hours or the value that works for the specific project. If you have a 3 year project, you probably will not be planning work at the hour level so weeks might be the duration standard.

Setting Display and General Options

General options are options which affect how the installation of Project 2010 on a desktop will operate. Display options are options that will help the user interface with Project 2010 software. The options selected are unique to each user and are a personal preference. These options do not have an influence on the ability to create a project schedule.

To navigate to General options:

Click **File → Options → General**

In the Project view section, the user may select the default view for usage of Project 2010 and the date format for dates for reports and views (tables).

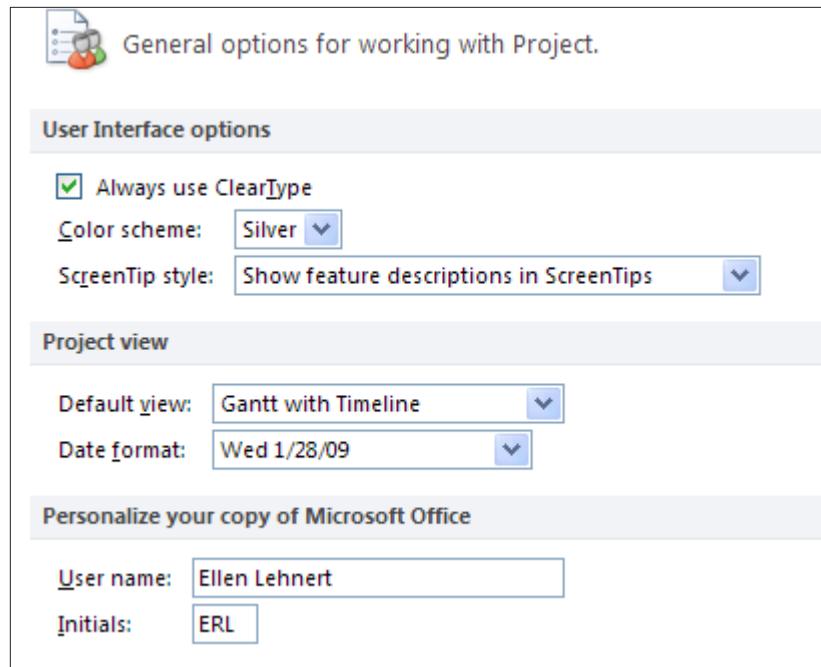


Figure 2-9 PLACEHOLDER

To navigate to Display options:

Click **File** → **Options** → **Display**

These options refer to which elements should be viewed on the screen. These options will control which indicators are shown in the indicator column, currency values and if the Entry bar is visible or not.

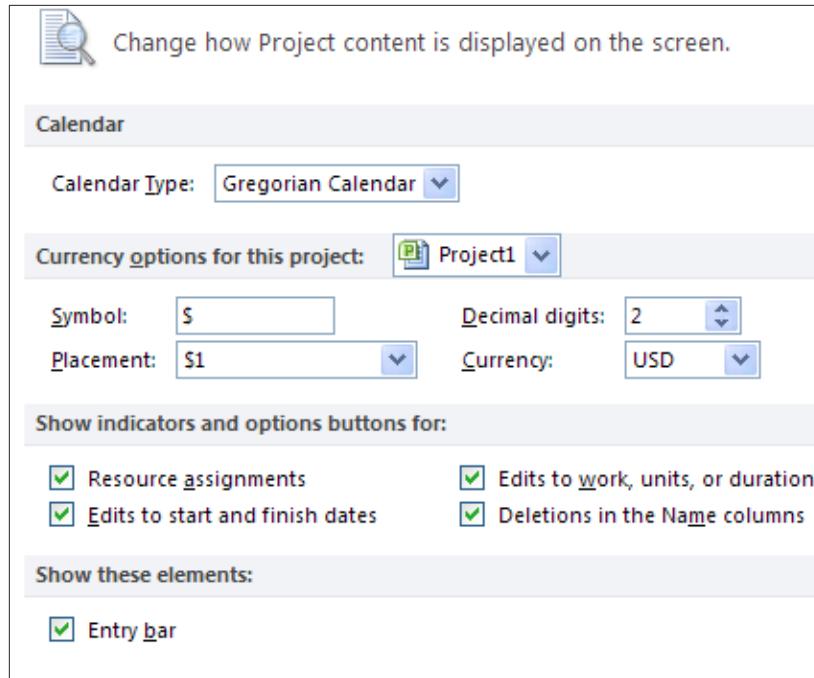


Figure 2-10 PLACEHOLDER

Additional display options are available at:

Click **File → Options → Advanced**

Some of the options that should be considered are:

- **Show this number of recent documents** – optional number, list will show in the Recent tab in the backstage
- **Automatically add new views, tables, filters and groups to the global** - recommended
- **Settings for duration label values** – Minutes, Days, etc. - may alter as needed
- **Show project summary task** – recommended

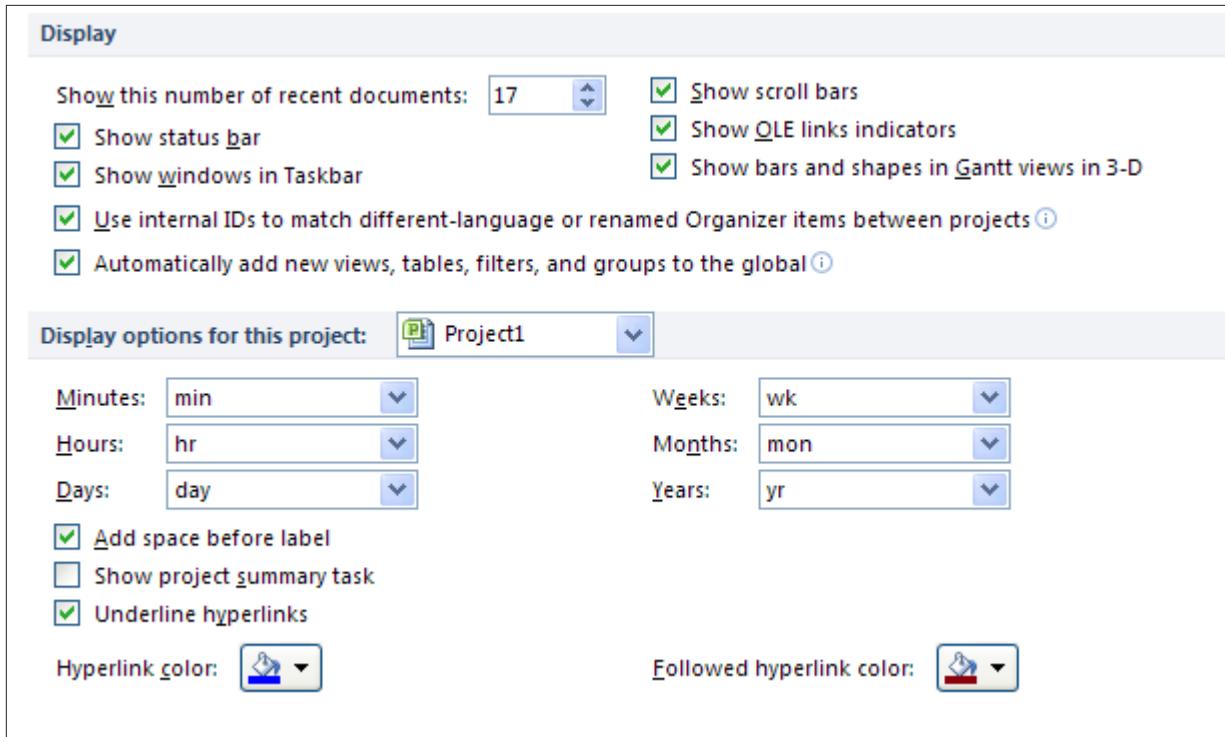


Figure 2-11 PLACEHOLDER

Best practice: Each project schedule has the ability to contain a Project Summary task. The Project Summary task is a zero level task that will serve as a constant grand total for the project schedule. The setting in the above options may be used to turn on the project summary task or use the directions below.

To turn on the Project Summary task:

Click **Task** → **Gantt Chart**

Click **Format** → **Project Summary Task** (on the right side of the ribbon)

Adding Project Information

The final project information that should be entered before proceeding with project schedule development is the project start or project finish date as well as indicating which calendar will be used as the project calendar. This information is entered through the Project Information box.

To navigate to the Project Information dialogue box:

Click Project → Project Information

Deciding whether to enter the Project Start date or the Project Finish date will take some consideration. There are pros and cons to either choice:

FAQ: Should I enter a project start and finish date?

Answer: Project 2010 will accept either the start or the finish date but not both.

Entering a start date will indicate that you are planning your schedule as forward scheduling. This will result in:

- All tasks will be scheduled As soon as possible
- The work of the project will determine the project ending date
- You will have a date to manage to and know when you are on time or late with the progress of the project

Entering a finish date will indicate that you are planning your schedule as backward scheduling. This will result in:

- All tasks will be scheduled As late as possible
- The ending date of the project will be locked to a date on the calendar
- You might be planning a project where each task will be required to be completed as planned to achieve the ending date goals.

The most used planning method is that projects are planned from the project start date.

Project Calendar: The default calendar is “Standard”. Whatever calendar is selected will become the scheduling calendar for the project. All tasks will be scheduled using this calendar until a resource is assigned to the task.

Click **OK** to close the box.

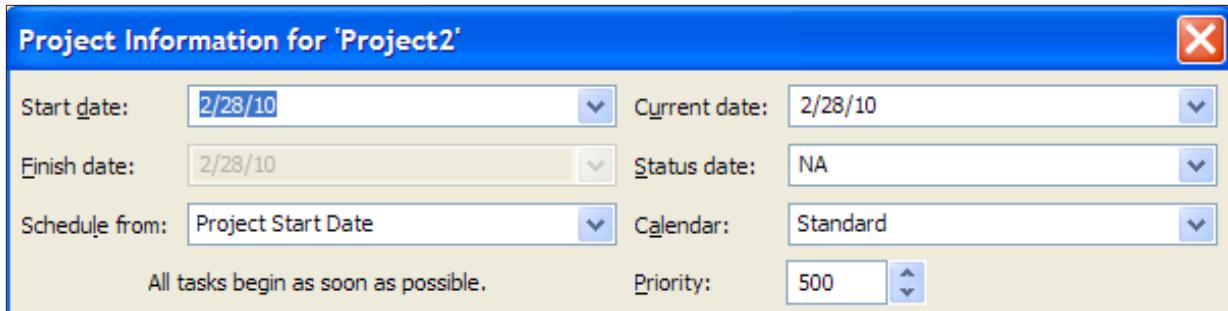


Figure 2-12 PLACEHOLDER



Most project managers have definite deadlines. Consider planning the schedule from ending date to get the schedule short term goals, deadlines and milestone dates. Then switch the project to the start date to manage. Reset the constraints to as soon as possible to enable the schedule to include slack and aid in schedule management.

Working with Timescale

Timescale is the calendar density that is viewed in all Gantt Charts, Resource Usage, Task Usage and other calendar based views. It is the calendar line that runs on the right side above the Gantt bars at the top of the view. Adjustments to the timescale will allow for viewing time in different time increments such as by week by day or by month by week. As views are changed, the timescale should be adjusted to fit your needs.

Project 2010 provides several methods to adjust the timescale:

The easiest way to adjust the scale is new to Project 2010. Use the sliding adjustment in the lower right corner of any view.

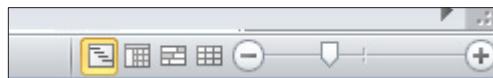


Figure 2-13 PLACEHOLDER

Another way to change the timescale is on the **View** tab on the ribbon.

On the right side are adjustments for the timescale:

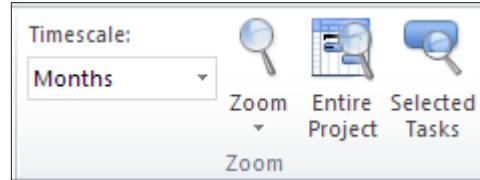


Figure 2-14 PLACEHOLDER

More detail about defining the timescale can be found in the Timescale dialogue box. Double click on the timescale (the date line above the Gantt bars) and the dialogue box below will appear:

For project schedules using a fiscal year: under **Timescale options**, **Show:** select **Three tiers** and define the top or third tier. Adjusting the timescale using this form will work best starting at the Bottom Tier and working your way through the Middle and Top Tiers to avoid errors. As changes are made, a sample of the result is shown the bottom of the box.

Click **OK** to close the box.

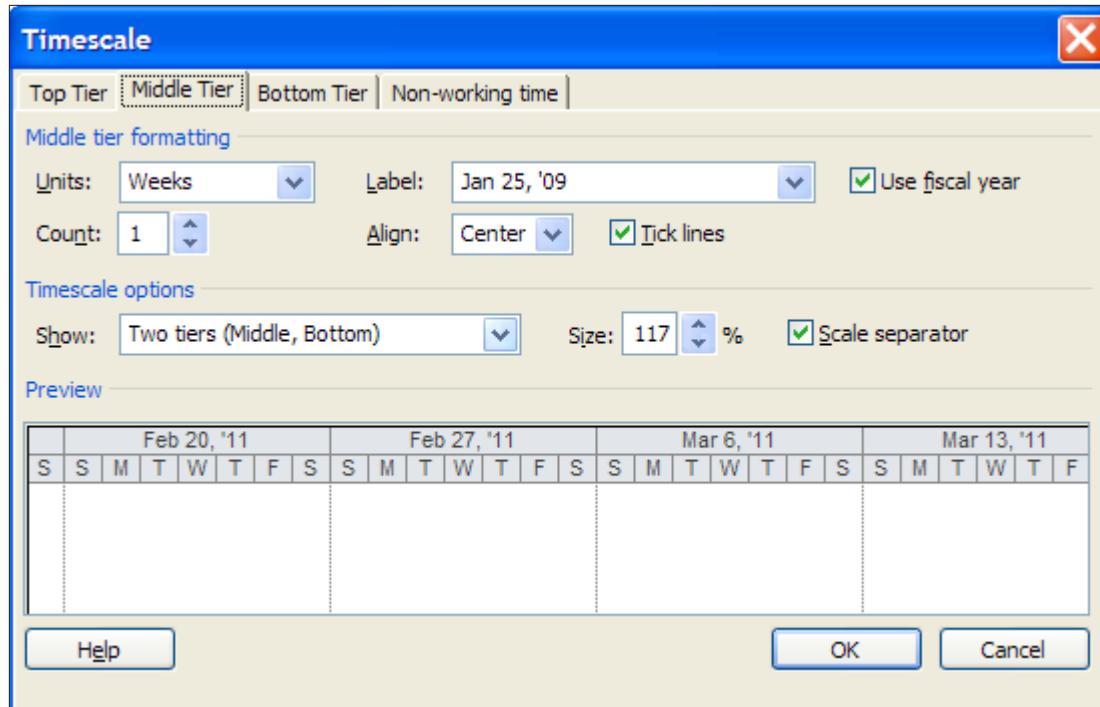


Figure 2-15 PLACEHOLDER

Practice: Configuring Schedule/ Display Options

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 2.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 2.2 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Creating and Saving a Project Schedule

At this point we are ready to new create a project. Project schedules may be started in multiple ways. If your options have been saved for “All Projects” you may use some of the importing functions to allow tasks from SharePoint lists (Pro 2010 only) or Excel to be brought into a new schedule. Creating projects using templates is an easy way to build project schedules faster.

The topics to be discussed in this lesson are:

1. Creating a Project
2. Creating a Project from an Excel Workbook
3. Creating a Project from a SharePoint Task List
4. Importance of Naming Standards
5. Setting Read-Only and Password Attributes
6. Saving the Schedule
7. Saving and Sending Options

Creating a New Project

When Project 2010 is initiated, a new blank project schedule will automatically appear.

To create a blank project schedule:

- Click **File → New**

Backstage choices shown below will give you an array of choices of where to begin a new project schedule. As you click the various choices, options and additional data will appear on the right side of the view.

- Double clicking **Blank project** or click **Blank project** and click **Create** will result in creating a blank project file
- **Recent Templates:** Create a project from a recently used template
- **My templates:** Template created by you and saved to your desktop

- **New from an existing project:** Use an existing project schedule to create a new project
- **New project from Excel workbook:** Columns in the Excel workbook will be mapped to fields within Project 2010. The import process is discussed in the next lesson.
- **New from Sharepoint task list:** Project 2010 Professional only. Tasks will be imported using the URL and security of the Sharepoint site.
- **Office.com templates:** Create a new project from a template that would be downloaded from Office.com on-line
- If the Quick Access Bar was customized to add the **New** button, pressing that button will create a new project schedule

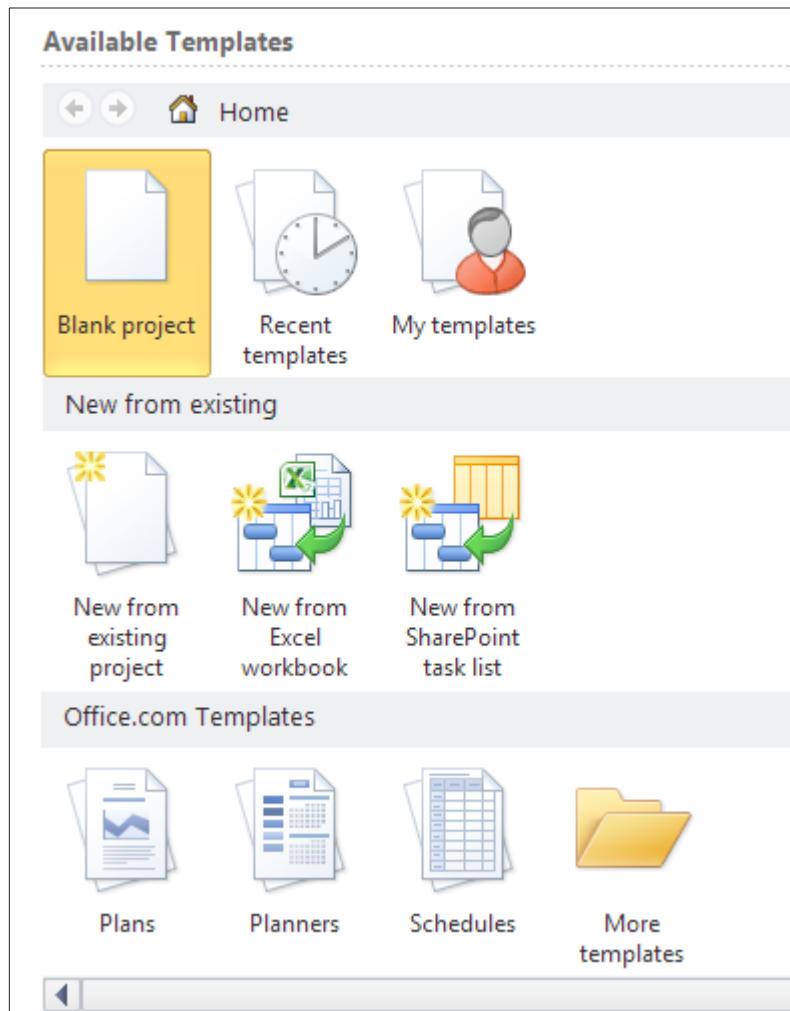


Figure 2-16 PLACEHOLDER

Creating a Project from an Excel Workbook

A project schedule can be created using an Excel Workbook task list. Keep in mind that the fields or columns that are being imported from Excel will be mapped to fields or columns within Project 2010. Pre-planning to know which Excel fields should be mapped to which Project 2010 fields would be helpful.



All options should be pre-set before importing tasks.

To create a project schedule from an Excel Workbook:

1. Click **File** → **New** → **New From Excel Workbook**
2. Navigate to the Excel file that contains the tasks to be imported into the schedule, click **Open**
3. Project 2010 Import Wizard will start running – Click **Next**
4. Select whether to use a new map that will be created or an existing Project import map. For this example we will create a new map. Click the radio button next the **New Map** and click **Next**
5. Import can start a new project file, append to the end of an existing project file or merge the data using a merge field. In this example we will create a new project schedule. Click **As a new project** and click **Next**.
6. When the data is brought into Project 2010, select if the data is to be mapped to the Task fields, Resource fields or Assignment fields. Click **Tasks**.
7. If the originating Excel file contains header or title information, click **Import includes Headers**. The system will remove this row (the first line only) as the header row. Click **Next**
8. The Task Mapping form will be used to view some of the data and map which Excel fields will be imported into which Project 2010 fields. Pull down the values in the **Select worksheet name** option and select the sheet name in Excel that contains the data to be imported. After the choice has been made, the data from the sheet will be available for viewing.
9. In the example below, the duration field from the Excel Workbook was able to be automatically mapped to the duration field in Project 2010. However, the Task Name field could not find a match. The correct field name for the

task name field in Project 2010 is “Name”. Click the red error message (**not mapped**) and select the field name of **Name**. Repeat for other fields to be imported. Not all fields are required during the import process which allows the user to pick and choose which ones are appropriate to the schedule. Click **Next** to continue after all columns have been mapped.

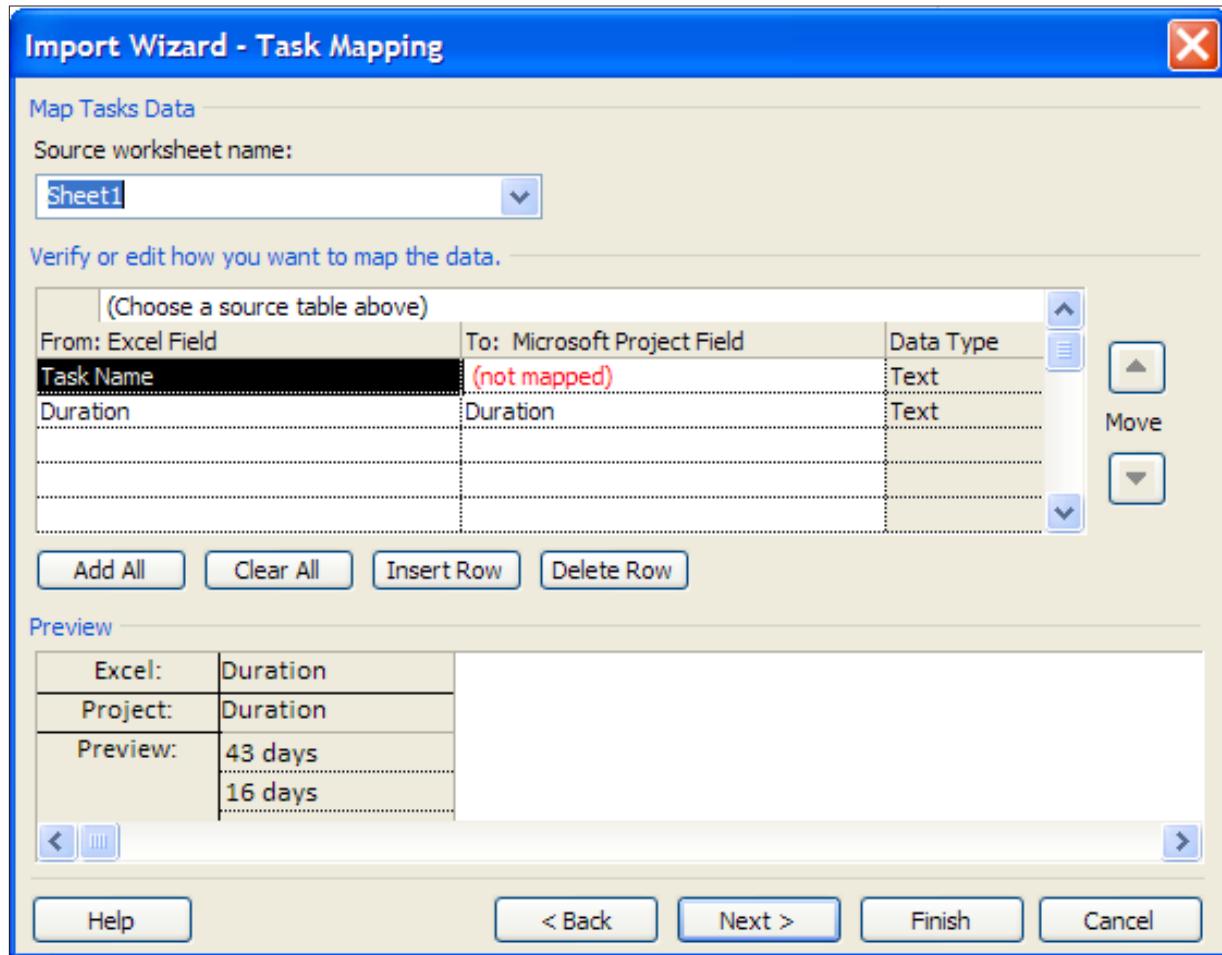


Figure 2-17 PLACEHOLDER

10. The next step offers the option to save the map for future reuse.

- To skip saving the map, click **Next**.
- To save the map, click **Save Map** and give the map a name.

An option will be available to use the Organizer to copy the import map into the Global.mpt and save it for future use. The Organizer will be discussed in Module 10.

Click **Finish** to start the import.

11. The new Project 2010 schedule will open with the columns imported.

Creating a Project from a SharePoint Task List

Project 2010 Professional allows for creating a new project by importing a task list from a SharePoint site. The user must have appropriate permissions to access the SharePoint site and the URL path to insert into the form directing Project 2010 Pro to the location of the task list.

To import tasks from a SharePoint task list into Project 2010 Professional:

1. Click **File** → **New** → **New** from SharePoint Task List

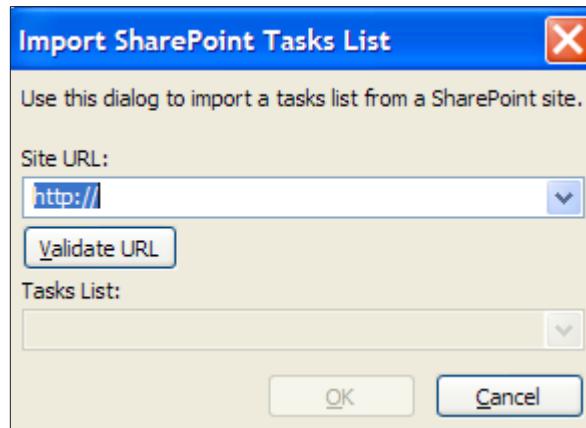


Figure 2-18 PLACEHOLDER

2. Enter the URL in the form as shown above and click **Validate url**. A list of all the task lists included in the SharePoint site will be displayed. Select the appropriate list and click **ok**.

The list will be imported from the SharePoint site.



This is Pro only – Rolly should add a screen shot here.

Importance of Naming Standards

The project name is an important consideration of the project. If given the option of naming a project, project managers will name the project whatever is comfortable for them. The name that is chosen is not necessarily comfortable for other users and viewers of the project schedule. Consideration should be given around how the project name will and should be used. Each organization should have a naming convention for projects.

Popular poor choices for project names:

- Projects named after chili peppers
- Projects named after cars
- Projects named after project managers or that include the project manager name
- Abbreviations that make sense only to the person naming the project
- Internal company speak
- 254 character project names

Popular good choices for project names:

- Project names based on what the project actually is
- 50 characters or less
- Client name, short project name, known code for new development or enhancement
- Standardized abbreviations: department name, location, short project name
- Select a name that is easily recognizable and understandable

It should be noted that project names will be seen and used in:

- Columns on reports – this will be necessary if any report will contain tasks from multiple projects.
- Header and footers for reports
- Multiple uses in Project Server 2010

Setting Read-Only and Password Attributes

When a project is saved, it may be necessary to set the project schedule as read-only to guard against other users changing attributes and data in the project schedule. Another security layer is the ability to assign a password and to always have a backup copy of the schedule created when the schedule is opened.

To set the read only and security passwords for a project schedule:

1. Click **File** → **Save as** → **Tools** (lower left of the Save As form) the following dialogue box appears:

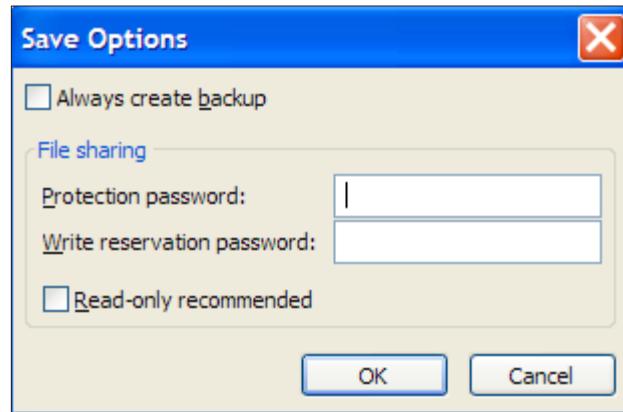


Figure 2-19 PLACEHOLDER

2. **Always create backup:** If checked a backup of the project schedule will be created each time the project is opened. No changes will be made to the original project schedule file.
3. **Protection password:** will guard against someone opening and viewing the project schedule without the password.
4. **Write reservation password:** guards against someone opening the project schedule in write mode. If the user has the first password only, they are allowed to open the schedule in read-only mode.
5. **Read-only recommended:** when checked and the file is opened the following message will appear:

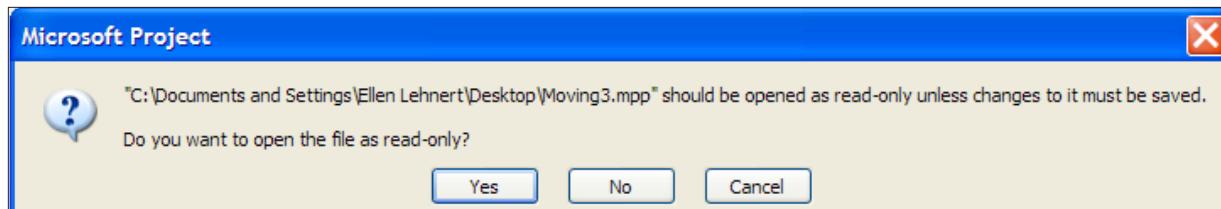


Figure 2-20 PLACEHOLDER

At this point the user may select to **Yes** or **No** to open the file as read-only. Cancel results in the file not being opened.

Saving the Schedule

Project 2010 provides multiple file formats for a project schedule. The steps to save a file are very similar to other ms Office files.

To save the Project 2010 schedule:

1. Click **File** → **Save as** → **select file location**
2. Enter the file name in the File Name area
3. Click **Save** to complete the save. The file will be given a Project 2010 default file extension of .mpp

There is also an option to save the Project 2010 schedule in an alternative file format. Some of the formats are:

- Ms Project 2007
- Ms Project 2000-2003
- Ms Project template 2010 - .mpt file extension
- Ms Project template 2007 - .mpt file extension
- Ms Excel
- PDF
- XPS
- XML
- CVS
- Text

Save and Send Options

A new feature in Project 2010 is the Save and Send from the backstage view. These options are an easy method of saving projects and sharing project schedules with others. There is also an option to send project files as an attachment to an email as well as publishing the project schedule to a SharePoint site (Project 2010 Pro users only).

To navigate to the options available for Save and Send:

- Click **File** → **Save and Send** → select one of the options offered

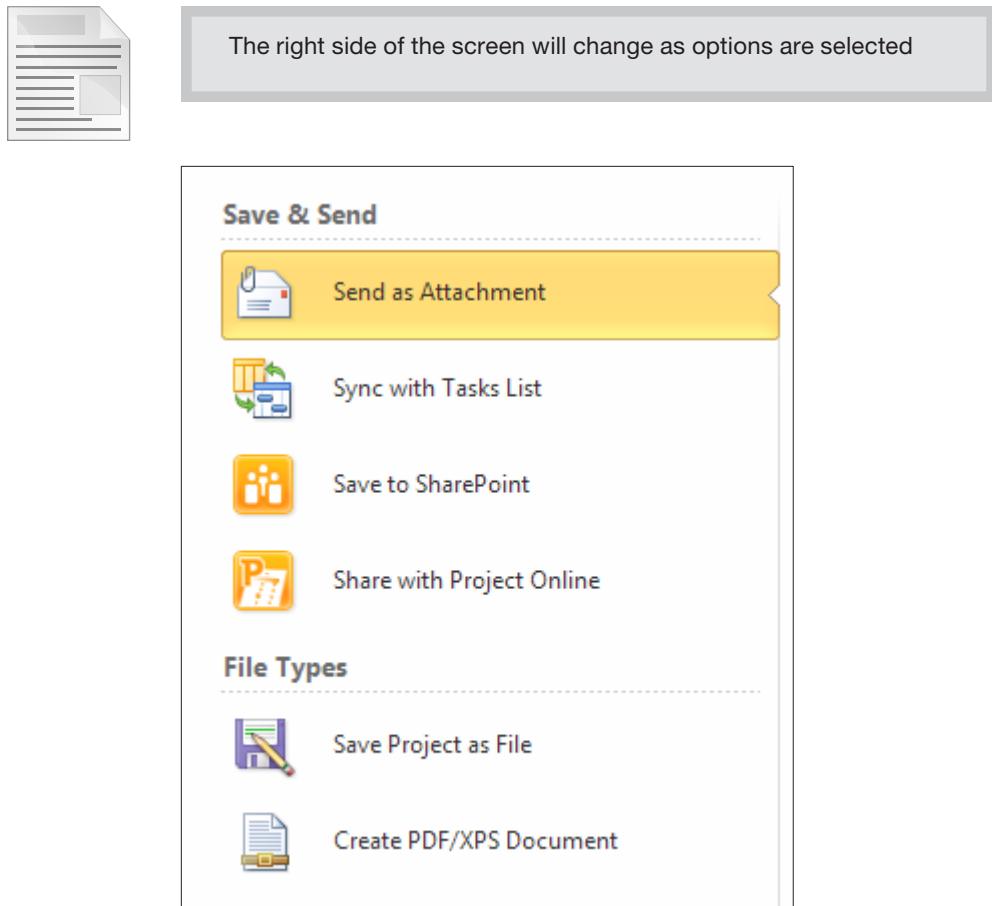


Figure 2-21 PLACEHOLDER

- **Send as Attachment:** sends the project schedule as an attachment to an Outlook email

- **Sync with Tasks List:** use this option to synchronize with a task list in SharePoint. Team members can update task status and the updates can be synchronized back to the project schedule. The URL to the SharePoint site and the task list name will be needed at the time of the synchronization.
- **Save to Sharepoint:** this option will save the project schedule to a Sharepoint site. (Project 2010 Pro users only)
- **Share with Project Online:** used with Project Server and SharePoint
Save Project as a file: when clicked the right side of the view is shown below. There are several file type options available. Click **Project** and **Save As** to start the save process.

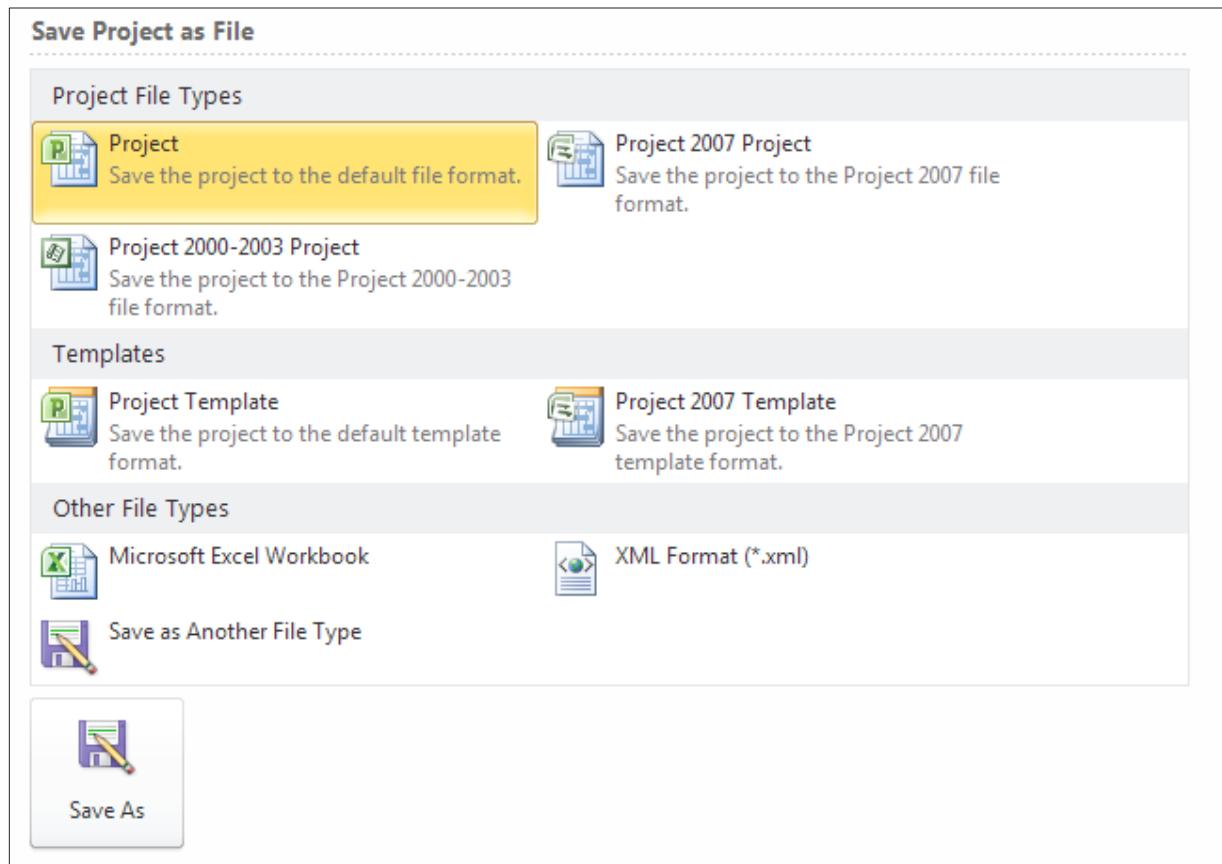


Figure 2-22 PLACEHOLDER

- **Create a PDF/XPS document:** Click Create PDF/XPS, name the file and select PDF or XPS, click OK to complete the save.

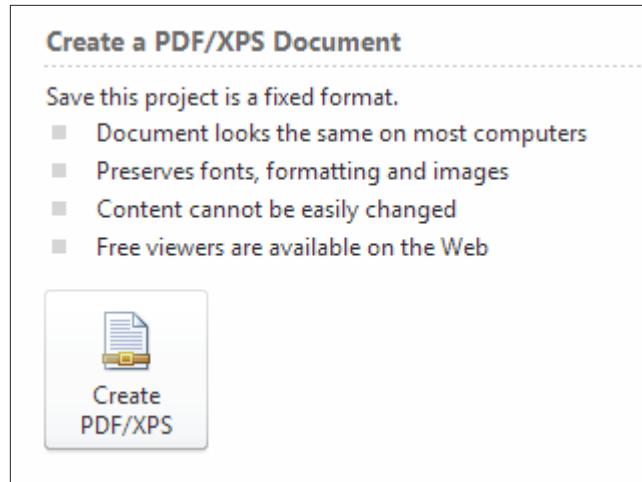


Figure 2-23 PLACEHOLDER

Practice: Creating and Saving a Project Schedule

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 2.3 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

Laying the basis for how a project schedule will function is important. Understanding the options and the result of your option choices will help the schedule deliver the value you are hoping to achieve. Forthought and planning will help create the type of schedule needed for managing your project.

In this module you learned how to:

- Create project calendars and the options that work with the calendars.
- Save a customized calendar for use by other project schedules
- Scheduling terms: Effort-driven, Fixed Duration, Fixed Work and Fixed Units
- Set the scheduling options
- Create projects from templates, SharePoint lists and Excel lists
- Establish naming conventions for project schedules
- Set security passwords for project schedules



Chapter 3

Creating a Work Breakdown Structure

Module Overview

The next step in creating a project schedule is to enter the tasks for the project. What should the tasks be, how should they be organized, are all tasks the same? These questions and others need to be answered in order to create a project schedule that can help better manage your projects.

The objectives for this lesson are:

1. Understand what a Work Breakdown Structure is
2. Best practices of creating a wbs
3. Entering tasks and creating a Hierarchy
4. Overview of estimating task lengths
5. Understand what a milestone is and how it may be used

Lesson 1: Overview of WBS

The Work Breakdown Structure is the task list of the project schedule. How this list is created will make the difference between having a manageable schedule that can help you manage your project as opposed to a project schedule that has become the project.

In this module, we will discuss:

1. What is a wbs (Work Breakdown Schedule)?
2. Task Categories
3. Task Naming Standards
4. Best Practice for creating Work Breakdown Structures



This is to be considered an overview for creating a Work Breakdown Structure (wbs) and should not replace formal training classes in wbs creation. It is meant to establish familiarity with the concept and some best practices.

What is a WBS?

Simple projects like grocery shopping might not need a plan to accomplish the project. When grocery shopping, most people will make a list of the items that need to purchase. Everything on the list is purchased and the project is completed. Not all projects are this simple.

Larger projects like building a house will require more planning and detail to accomplish the goals of the project. More tasks will be required, more detail and organization to the detail. More data will be accumulated regarding how the project was performed. To accomplish these types of projects, a work breakdown structure or wbs will be required.

The wbs is a hierarchical structure much like an outline list. This structure will contain the work of the project. How it is organized will determine how effective and helpful the project schedule will be. Within the structure will be titles and details. The structure will also contain goal points or milestones to help manage target dates.

Consider the wbs of a project the same as the foundation for a building. Without a stable foundation the building will not be stable. Having

a stable or well-planned WBS will be an asset to the performance of a project. Having an unstable WBS may adversely affect the management of the project schedule.

What are task categories?

A WBS will be made up of task entries. To facilitate the creation of the WBS, Project 2010 provides several task categories for the task entries.

The tasks categories in Project 2010 are:

Project Summary Task: considered a zero level task. It will always be the first task in the project schedule. This task acts as a grand total for the project. As tasks are entered beneath the Project Summary Task, values will be totaled in various fields concerning work, duration and cost. These values and other values will be rolled up to the Project Summary task.

Using the Project summary task can add value to a single project or when managing multiple projects.

Summary Tasks: these tasks should be considered subtotals to the project schedule. They will always roll up or subtotal data in a lower level of the WBS. They should also be treated as a section of work to be planned and completed.

Detail Tasks: the actual work of the project. These are tasks that will be estimated for work, duration and/or cost. Consider these tasks as the deliverables of the project. They will have resources assigned to the work of the tasks and will be tracked during the execution of the project. If your organization is using Project Server 2010, this task category is the only category that will appear on a resource's timesheet.

Milestone tasks: milestones are a point in time event. By definition, they have zero work and zero duration. They may be tracked and they may be used for high-level reports. Milestones may also be used as decision points (Go/No Go), convergent points with the project and they are a date target. Milestones will be discussed further in this module.

Recurring tasks: used when the same type of task must reoccur in a pattern. This task category is used for example when scheduling status meetings within the project schedule. Assigning resources to recurring tasks will allow these types of tasks to be seen on the timesheet in Project

Server as well as tracked. They will also affect resource availability.

Task Naming Standards

When creating tasks and summary tasks, it is a good practice to establish a naming standard for the tasks. In the prior module we discussed establishing a naming standard for project names. In this module, we will extend that standard to task names.

When creating tasks consider applying this simple standard:

Project Summary task: this will be the internal name of the project. Keeping with a standard of short name will have advantages. This name also becomes the title for the project schedule on printed reports.

Summary tasks: these names should be nouns that describe the work to be completed in the section of work.

Examples: Location, Network design, Clean-up, Foundations, Development, Requirements, Training, Pilot, Testing

Detail tasks: should be an action verb and a noun. Database is not a task name; it does not describe what you should do with it. An action verb descriptive is needed to explain to the team member what is expected from the resource that will be performing the task.

Examples: Build test database, Review requirements, Develop preliminary budget, Create training materials, Modify code

Milestones: should be used as goal dates within a project schedule. Completing the milestones by specific dates is achieving the goal. Naming standards for milestones should be past-tense adverbs.

Examples: Development completed, Vendors contracted, New Facility Opened, Software selected, Integration testing completed

Best Practices

By following some guidelines for creating your Work Breakdown Structure, you can achieve a more effective and manageable project schedule. A WBS's purpose is to help manage a project schedule. When created without guidelines, the project schedule is in danger of becoming another project.

Examples of a few real world project schedules that were not thought out very well:

- Consider a two-task project schedule for a 9-month project. Each task was 6 months long. The first task started on the first day of the project. The second task started during the third month of the project. The project manager could not understand why others could not manage their projects using this WBS. It was later discovered the details of the project were brought out at the weekly status meetings and only told to the team members when they needed to know them. The project manager wanted others to help manage their projects was reluctant to share the details. As a result the lack of communication had an adverse effect on the performance of all projects.
- A resource was tasked with migrating 1500 users from one email system to another. The project schedule contained 1500 tasks – one for each person who was to be migrated. When asked why each name was entered as a task the answer was that the scheduler wanted to know how long the entire project would take. The project schedule was more of a check list than a WBS. The more appropriate level would have been by department. Creating this type of schedule at a higher level would have made managing the work of the schedule more meaningful and easier to maintain.
- A PMO developed a template for their project managers to use while implementing their software packages within organizations that were their clients. Each project implementation took at least a year and each project manager managed 2 to 3 projects simultaneously. The template that was created contained 8500 tasks. The client was not using Project Server and the schedules would need to be updated and maintained manually by the project managers. The PMO created a lot of work for their project managers that would defeat the purpose they were trying to achieve of schedule management. The project schedule they created was a to-do for the projects.

To avoid some of the above problems and pitfalls, consider using some of the following guidelines:

- The wbs is not a to-do list. Are you managing tasks or are you managing a to-do checklist? Usually, tasks or deliverables are entered into the project schedule. Checklists of how to accomplish the tasks are kept in another location such as a Word Document, Excel Workbook or SharePoint list. Expect that all tasks will have checklists, supporting detail, resource requirements and activity lists outside of the project schedule. Very small lists may be kept in the notes area of the tasks.
- Identify deliverables within the wbs. Work from deliverable to deliverable in the development of the schedule.
- Arranging the tasks into summary areas can be a challenge. Imagine a deck of cards: can you arrange them by suit? By color? By number? The deck hasn't changed, just the order of the cards. There is no right or wrong answers. The answer is what will work best for you to use to manage your project.
- Break the deliverables into assignable work. If you are building a house, you might want a task called "Install Electrical" where Electricians can be assigned to the work. This would be a more appropriate level of detail than a task called "Install All Utilities" where Electricians, Plumbers, Carpenters, etc. will all be assigned. When the task is at too high a level, establishing the work, assignments, order and relationships between tasks becomes more difficult.
- Establish a standard design for each section of work. An example of this would be:
 - Summary Task
 - Detail task
 - Detail task
 - Detail task
 - Milestone task

Using this format will allow for creating high level reports (Milestone reports) easily as well as moving sections of deliverables around easily.

- Every summary task should have at least two subtasks. Tasks and milestones can be in the wbs without being part of a summary task grouping.
- Establish maximum and minimum lengths of duration for tasks. Create a rule of thumb based on the length of each project. For example: If you have a 6 month project no task should be less than 1 day and no task will be longer than 2 weeks.
- Decide if you will be creating a wbs in the rolling wave approach (develop the schedule phases as the project progresses) or a deliverable oriented schedule. The rolling wave type of schedule development is popular for schedules managing software development and other IT orientated

project schedules. It can be used for any project where all of the details of the project are not known at the beginning of the project. Alternatively, a deliverable orientated project schedule might have different organizations working on different sections of the project which all need to be completed at a specific point in time. For example: building heavy equipment. Each section of the machinery might be built by separate organizations, but all pieces must be ready for assembly by the same target date.

- Deliverables: Completing a section of work means that the deliverable of that section has been accepted. Create a task for the delivery of the deliverable and create a milestone to represent the acceptance of the deliverable. The two are rarely occur at the same time.
- Level of detail. Project 2010 will allow for a maximum of 99 levels of wbs details. Best practices for level of detail is to develop schedules at five or less levels. If a wbs were built 20 levels deep, this would mean the project manager would have to dig through 20 levels of titles before uncovering the work of the project.
- If too much detail is put into the project schedule, the schedule will become a project unto itself. In the third example above, the wbs was a check list and not based on tasks to manage. Schedules will be tracked and tasks will change over the course of the project all of which will require the project manager's attention. The more tasks, the more work.
- Use the wbs to help manage the scope of your project. If the task isn't in the project, consider it out of scope. When you enter tasks into the project schedule, ask yourself if the task is necessary.
- When planning the wbs think about just the work of the project. Many project managers like to start thinking about who will do the work and when. It is a good idea to focus on the work of the project only and think of the work as the "what" of the project. The "who" and "when" will come as the project schedule develops.
- Having the project team or the top level resources help build the wbs for a project is a win-win for the project:
 - Increases resource buy in
 - Encourages resource contribution
 - Many eyes looking at problems from different angles
 - Less probability of missing tasks
 - Encourages team building

Lesson 2: Creating the Work Breakdown Structure

Once the tasks of the project are established, the next step is to enter the tasks into the project schedule and create a WBS structure. Entering tasks may be a manual keying process or they may be imported from a SharePoint list (Project 2010 Pro only), an Excel workbook, an Outlook task list or a Word document. Tasks may also be copy and pasted into project schedules. This lesson addresses the manual entering of tasks into the project schedule.

In this lesson, we will discuss:

- Entering tasks
- The Task Information Form
- Outlining tasks into a WBS Hierarchy
- Displaying WBS code values
- Customizing WBS code numbers

Entering Tasks

Entering tasks into Project 2010 is as easy as typing the task name into the Task Name field. When entering a new task, keep in mind that data is being populated in an array of fields for that row; several hundred fields will be created and some populated. After tasks are entered they may be moved, deleted, or copy/pasted to other areas of the schedule. It is also recommended that the Project Summary Task be turned on to aid in schedule development.

To turn on the Project Summary task:

- Click on **Format → Project Summary Task** (In the show/hide section on the right)
- Click the **check box** to turn on

To enter a new task:

- Click the **Task Name** field on the row you would like to enter and type the task name.

To move a task to another location in the schedule:

- Left Click on the task number (id) in the left column. Hold the click down and wait for the 4 way arrow to appear and drag to the task to the new location. (Works well when the new location can be seen on the screen)

OR

- Click on the **task number** of the task you wish to move
- Click **copy** (or cut)
- Scroll to the new location
- Click **Paste** – Project 2010 will insert the pasted task



Entering blank lines to receive the moved tasks is not necessary. The schedule will insert the lines and move tasks down to accommodate the moved tasks.

To add blank lines schedule between existing tasks:

- Right click on the **task** below the location of the new task to be inserted
 - Click **Task → Task** – a blank row will be created above the task selected
- OR
- Click on a task
 - Click **Insert** key on the keyboard

In the view below task 38 was entered using the Task → Task insert method. Note the default data and <New Task> name entered. Task 40 was the result of clicking the Insert key on the keyboard.

		Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
36		Review modular code	5/8/13	5/15/13	4/18/13	4/24/13	14.75 days	14.75 days
37		Test component modules to product specifications	5/15/13	5/17/13	4/25/13	4/26/13	14.75 days	14.75 days
38		<New Task>	5/17/13	5/20/13	NA	NA	0 days	0 days
39		Identify anomalies to product specifications	5/20/13	5/23/13	4/29/13	5/1/13	15.75 days	15.75 days
40								
41		Modify code	5/23/13	5/28/13	5/2/13	5/6/13	15.75 days	15.75 days

Figure 3-1 PLACEHOLDER

To delete tasks from the schedule:

- Right click the task to be deleted
- Click **Delete Task** option

OR

- Click the task to be deleted
- Click the **Delete** key on the keyboard



If you have clicked anywhere within the task row and deleted the task a Smart Tag will appear to ask if you want to clear the field or delete the task.

In the view below the result of clicking on the Smart Tag (the X with the down arrow) is shown. Make your selection from the choices in the box below.

62		Review Help documentation	5/14/13	5/17/13	4/23/13
63			5/17/13	5/21/13	4/26/13
64		<input checked="" type="radio"/> Only clear the contents of Task Name Cell.	4/9/13	4/10/13	3/19/13
65		<input type="radio"/> Delete the entire task.	4/23/13	5/14/13	4/2/13
66		Review all user documentation	5/14/13	5/16/13	4/23/13

Figure 3-2 PLACEHOLDER

Project 2010 has the ability to temporarily deactivate a task from the schedule. This is an alternative to deleting a task.



This option is only available in Project 2010 Professional.

The benefits of inactivating tasks as opposed to deleting tasks are:

- The task will remain in the schedule and could be reactivated if necessary
- The inactive task will not be considered by the scheduling engine.
- Relationships will stay intact and should be removed which will be discussed in next Module 4.
- If a task was previously included in the baseline for the project, the data will stay in with the project
- If there is a question whether a task should be included it could be entered in an inactive state so it is not forgotten
- The inactive task has unique formatting to indicate that it is inactivated.

In the view below task 27 has been deactivated. Note the alternate formatting:

25		Development	62 days	1/14/13	4/9/13		
26		Review functional specifications	1 day	4/9/13	4/9/13	24	
27		Identify modular/tiered-design parameters	5 days	1/14/13	1/18/13		
28		Assign development staff	1 day	1/14/13	1/14/13		0%

Figure 3-3 PLACEHOLDER

To deactivate tasks in the schedule:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section

To reactivate an deactivated task:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section



When tasks are entered you will note that the column to the left of the task name is a column called “Task Mode”. This column will reflect the default task mode for scheduling of the tasks.

By default the task mode is manual, with the other option being automatic. The status of this mode will make a difference in the appearance of the entered task. This is an option that is controlled either on a per task basis or as a preset option as a default of the schedule. We will discuss this new Project 2010 scheduling option in Module 4.

Task Information Form

The Task Information box is a source of easy access for some of the frequently used fields on the task side of the data for a Project 2010 project schedule. Data entered in the form is the same as entering data into a column in a table for a task. Using this box is a quick and easy way to view and maintain task information.

To access the Task Information Form:

- Double click an **task data** field within a task
OR
- Click on a **task**
- **Task ribbon** → **Information**

The form below will appear:

Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields

Name: Calculate moving expenses Duration: 1 day Estimated

Percent complete: 0% Priority: 500

Schedule Mode: Manually Scheduled Auto Scheduled Inactive

Dates

Start: 3/2/12 Finish: 3/2/12

Display on Timeline
 Hide Bar
 Rollup

Help OK Cancel

Figure 3-4 PLACEHOLDER

The form contains several tabs of information, grouped by subject. Each tab will allow access to the Task name, Duration and Estimated flag.

General tab: contains Name, Duration, Percent complete, Priority, Schedule Mode, Inactive, Start and Finish dates, Display on Timeline, Hide Bar and Rollup.

Predecessors: contains information concerning task relationships.

Resources: contains information concerning resources assigned to the task.

Advanced: contains information concerning Deadlines, Constraints, Task Types, Task Calendars, Effort-driven flag, wbs number and Milestone flag for the task.

Notes: general notes area for the task

Custom fields: If task level custom fields (user-defined) were created for the project, they would be accumulated and accessible through this area.



Data may be changed in multiple tasks at the same time. Select the tasks to be changed and then click on the Information icon on the Task bar. The box that appears is called the Multiple Task Information box. Make the changes and click OK to update.

2		▶	Determine project scope	3 days	1/21/13	1/25/13	
3	█	▶	Secure project sponsorship	7 days	1/25/13	2/5/13	2
4		▶	Define preliminary resources	6.6 days	2/10/13	2/19/13	3
5	!	▶	Secure core resources	5 days	1/21/13	1/29/13	2SS
6		▶	Scope complete	0 days	2/19/13	2/19/13	5,4
7		▶					
8	✓	▶					
9	✓	▶					
10	✓	▶					
11	✓	▶					
12	✓	▶					
13	✓	▶					
14	✓	▶					
15	✓	▶					
16		▶					
17		▶					
18		▶					
19		▶					
20		▶					
21		▶					

Multiple Task Information

General | Predecessors | Resources | Advanced | Notes | Custom Fields | **X**

Name: Duration: Estimated

Percent complete: % Priority:

Schedule Mode: Manually Scheduled Auto Scheduled Inactive

Dates

Start: Finish:

Display on Timeline Hide Bar Rollup

Help **OK** **Cancel**

Figure 3-5 PLACEHOLDER

Outlining Tasks into a Hierarchy

Once tasks are entered, the WBS outline structure may be created. To create the outline structure, tasks will be indented or outdented. These buttons are located on the Task ribbon in the schedule section and are the green arrows in the lower left corner. The indent button is pointing to the right. The outdent button is pointing to the left. See below:

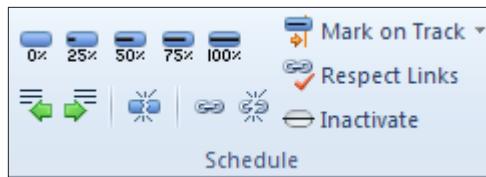


Figure 3-6 PLACEHOLDER

To indent a task:

- Click the task to be indented
- Click the **indent** (pointing right green arrow)
OR
- Place the mouse pointer over the task and a horizontal arrow will appear.
Left click and drag the task to the right

To outdent a task or remove an indentation:

- Click the task to be outdented
- Click the **outdent** (left pointing green arrow)
OR
- Place the mouse pointer over the task and a horizontal arrow will appear.
Left click and drag the task to the left

When a task has an indented task below it, the task becomes a summary task. Summary tasks are represented as black bars on the Gantt chart as shown below:

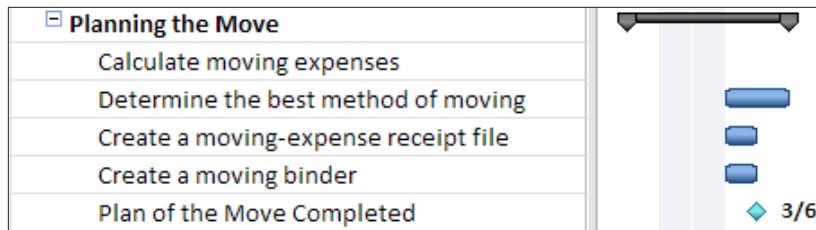


Figure 3-7 PLACEHOLDER

Indenting and outdenting can be confusing. At times it is difficult to achieve the desired structure results.



When indenting, work from the top down. When outdenting, work from the bottom up.

To see the levels of the wbs:

Project Summary tasks and Summary Tasks will have a small box to the left of the summary task name as seen in the screen above.

- Click the **plus** sign + to expand tasks
- Click the **minus** sign – to collapse tasks

Use the Outline button to jump to a level of detail:

Click on **View → Outline**:

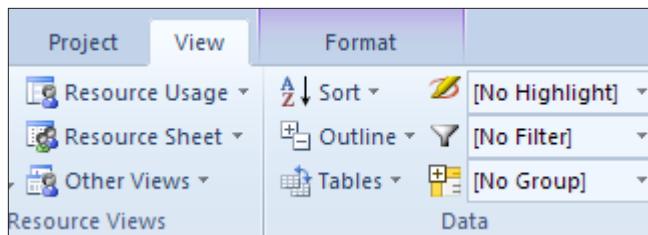


Figure 3-8 PLACEHOLDER

When the **Outline** down arrow is clicked, the following choices appear:

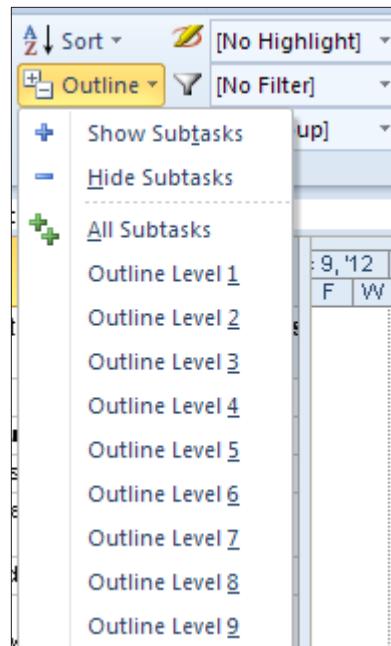


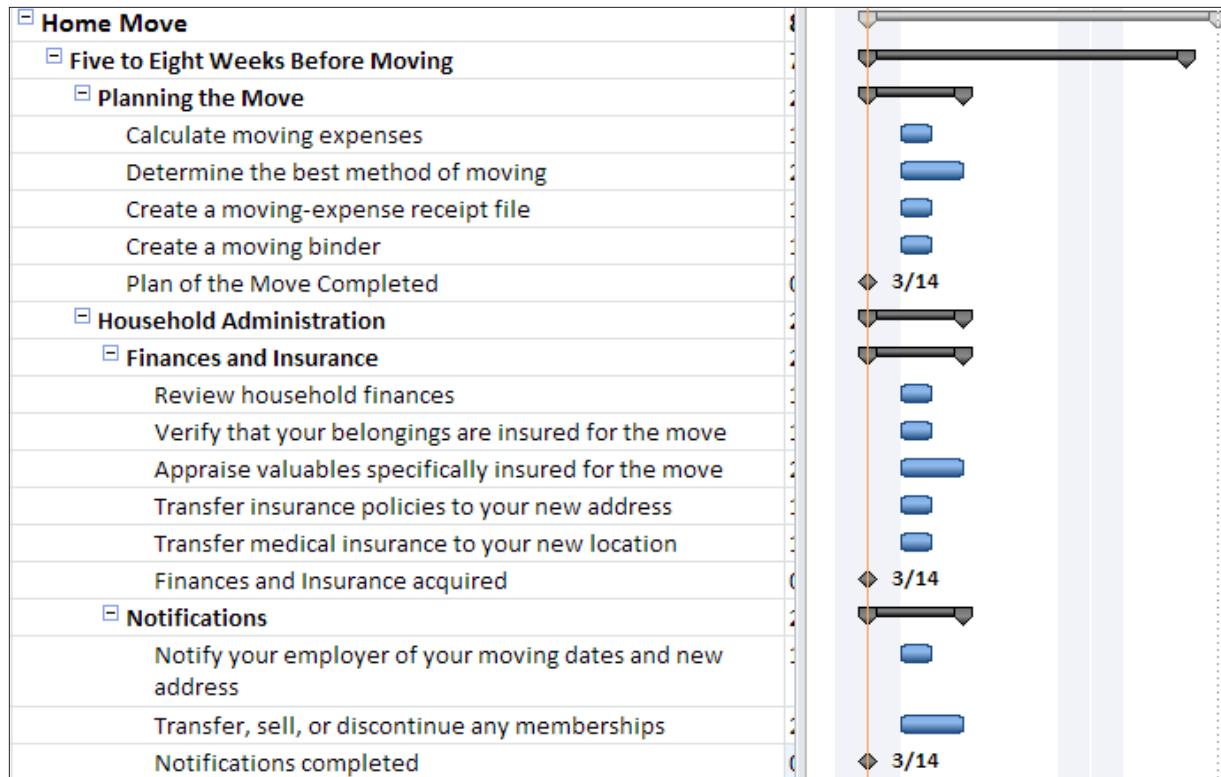
Figure 3-9 PLACEHOLDER

The following image shows a view of a collapsed wbs – **Outline level 1** was selected. Note the rolled up view of the tasks:



Figure 3-10 PLACEHOLDER

The following image shows a view of an expanded outline wbs – **All Subtasks** was selected:



Clicking **Project Summary** task and then **Hide Subtasks** will collapse the project down to just the Project Summary task.

If the outline is collapsed, clicking **All Subtasks** will show all tasks at all levels of the wbs.

The outline list offers the option to create up to 9 wbs levels. There are many more levels available in Project 2010 but it is advised that wbs levels should not exceed 5. The more wbs levels there, the more confusing and cumbersome a wbs may become.

Displaying Outline Numbers & WBS

As the WBS structure is created, an automatic numbering sequence is also created within the task list. The numbers represent where in the WBS structure the tasks reside. This is a unique numbering scheme and numbers are automatically reassigned as tasks are moved around the WBS structure.

There are default number values and customized WBS number values. In this lesson, we will address the standard WBS values; the following lesson will address the customized values available.

To view insert the WBS column into a table:

- In the Gantt chart view right click on a column heading. It is best to right column in the column to the right of where the new column should be inserted
- Select Insert Column
- Click the “W” key on the keyboard
- Select “WBS”
- Click ok

Below is an example of WBS numbering schema:

WBS	Task Name
0	<input type="checkbox"/> Municipality of Springfield
1	<input type="checkbox"/> Influent Screens
1.1	Enter order
1.2	Set-up Progress Schedule
1.3	Engineer Set-up
1.4	Drafting
1.5	Deliver Progress Schedule
1.6	Deliver Shop Drawing Submittal
1.7	HDR Review time for Submittals
1.8	Approval of shop drawing submittal
1.9	Detail Drawings & Bill of Material
1.10	Procurement of Material
1.11	Fabrication
1.12	Transportation of Equipment
1.13	Deliver Equipment to Jobsite
2	<input type="checkbox"/> O & M Manuals
2.1	Create preliminary O & M Manuals
2.2	Deliver Preliminary O & M Manual
2.3	HDR Review of Preliminary O & M Manuals
2.4	Acceptance of Preliminary O & M Manuals
2.5	Create Final O & M manuals
2.6	Deliver Installation and Final O & M Manuals
3	Completed

Figure 3-11 PLACEHOLDER

BEST PRACTICE: Because automatic wbs numbers are updated as tasks are moved or added to the wbs, it is not recommended that these numbers be used as a task tracking number. If a task tracking number is desired, consider using the field called “Unique ID”. This field is the order, in which tasks were added to the schedule and they will always be unique and will not be duplicated within a schedule.

Customizing WBS Codes

The user has the option of customizing wbs numbers using a **Code Mask** and values entered by the user. When this option is evoked, additional options to re-number the wbs, enforce value uniqueness and optimally generate wbsnumbers become available. The customized number values are helpful when managing multiple projects or if there is a need to reference numbers unique to a project schedule. They are also helpful if using templates that result in frequently used task names. These codes could indicate which tasks are members of which project schedules and where the tasks are located within the project schedule.

To customize the wbs numbers:

- Project → wbs button → Define

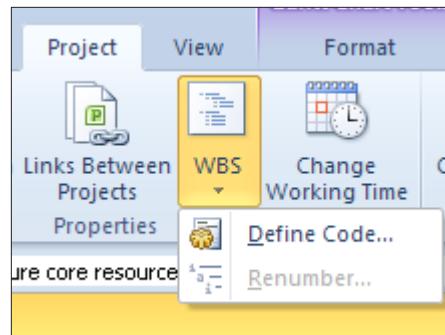


Figure 3-12 PLACEHOLDER

- **Project Code Prefix:** use this value to enter a code that will represent an abbreviation that applies to all wbs for the project schedule.
- **Sequence:** select the data type for the Code Mask to be created (ie: Numbers, Uppercase letters, lower case letters or numbers)
- **Length:** number of values for the length of the value
- **Separator:** Character symbol - . , - + or /

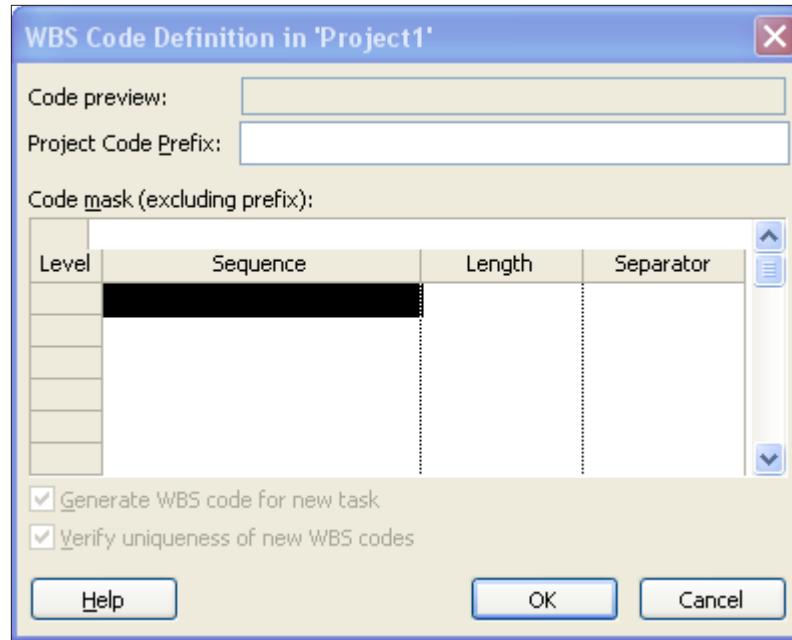


Figure 3-13 PLACEHOLDER

Select as many lines as necessary to create your “Code Mask” and click **ok**

Below is an example of a customized mask for wbs codes:

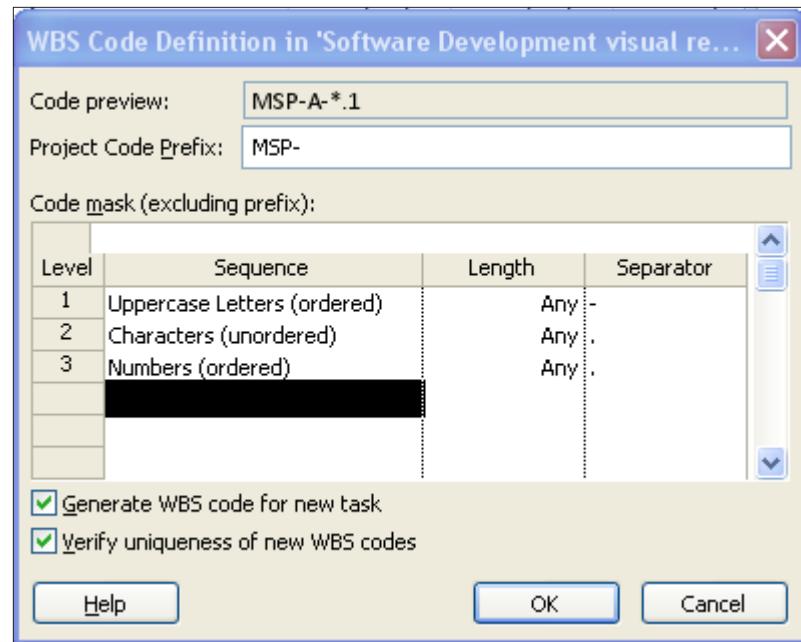


Figure 3-14 PLACEHOLDER

Below is the result of the customized wbs values:

		WBS	Task Name	Start	Finish	Baseline Start
0		MSP-	Software Development visual reports	1/16/13	7/5/13	1/1
1		MSP-A	Scope	1/21/13	2/19/13	1/1
2		MSP-A-1	Determine project scope	1/21/13	1/25/13	1/1
3		MSP-A-2	Secure project sponsorship	1/25/13	2/5/13	1/2
4		MSP-A-3	Define preliminary resources	2/10/13	2/19/13	1/3
5		MSP-A-4	Secure core resources	1/21/13	1/29/13	1/1
6		MSP-A-5	Scope complete	2/19/13	2/19/13	2/1
7		MSP-B	Analysis/Software Requirements	2/15/13	3/19/13	2/1
8		MSP-B-1	Conduct needs analysis	2/15/13	2/28/13	2/1
9		MSP-B-2	Draft preliminary software specifications	3/1/13	3/6/13	2/1
10		MSP-B-3	Develop preliminary budget	3/6/13	3/11/13	2/1
11		MSP-B-4	Review software specifications/budget	3/11/13	3/12/13	2/2

Figure 3-15 PLACEHOLDER

When a **Code Mask** is created, the options to **Generate a new wbs** for a new task and **Verify uniqueness of new wbs codes** become

available.

To renumber the tasks based on the mask values:

- Project → wbs → Renumber



Renumbering may be applied to selected tasks only or the entire project.

Be aware:

To remove a mask: delete lower level entries first and work upwards to higher levels.

After removing the mask, the wbs will not revert back to an unformatted state but will remain as the settings for the customized mask.



If wbs values are turned on as part of the task name the original non-formatted value appears and not the customized value. to turn on the wbs value as part of the task name:

From the Gantt Chart click: View → Outline number

The wbs numbers are shown below included with the task names:

		WBS	Task Name	Start	Finish	Baseline Start
0		MSP-	Software Development visual reports	1/16/13	7/5/13	1/1
1		MSP-A	1 Scope	1/21/13	2/19/13	1/1
2		MSP-A-1	1.1 Determine project scope	1/21/13	1/25/13	1/1
3		MSP-A-2	1.2 Secure project sponsorship	1/25/13	2/5/13	1/2
4		MSP-A-3	1.3 Define preliminary resources	2/10/13	2/19/13	1/3
5		MSP-A-4	1.4 Secure core resources	1/21/13	1/29/13	1/1
6		MSP-A-5	1.5 Scope complete	2/19/13	2/19/13	2/
7		MSP-B	2 Analysis/Software Requirements	2/15/13	3/19/13	2/
8		MSP-B-1	2.1 Conduct needs analysis	2/15/13	2/28/13	2/
9		MSP-B-2	2.2 Draft preliminary software specification	3/1/13	3/6/13	2/1
10		MSP-B-3	2.3 Develop preliminary budget	3/6/13	3/11/13	2/1

Figure 3-16 PLACEHOLDER

Practice: Creating a Work Breakdown Structure

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 3.1 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 3.1 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Estimating Task Lengths

Project Management is both an art and a science. Estimating tasks durations and work draw on the project managers skills and experience during the estimation process. Estimates take into consideration factors such as resource skill, history, and experience. In this lesson we will take a look at estimating duration and work. Costs will be addressed in a future lesson later in this course.

At the end of this lesson you will be able to:

1. Understand what estimating duration and work is
2. Enter estimates
3. Adjust estimates for unknown resources

Overview of Estimating

Estimating is the ability to make an educated guess as to the duration, work or duration and work of a task. It is an art to know how long a task will take and how manyresources are required and of what skills are required for a task.

How Project 2010 defines and calculates Work and Duration

It would be helpful to understand the formula that will be driving the scheduling of the tasks before you enter your estimates:

Work = Duration * Units (quantity of a resource)

OR

Duration = Work / Units (quantity of a resource)

Estimating techniques

- **Top down estimating:** used when performing the same types of projects frequently. Top-down estimating allows for estimating the length of a phase. The details for tasks will follow. Manual scheduling mode in Project 2010 allows for this type of estimating model.
- **Bottom up estimating:** estimating each task work package or deliverable of the project (this could be at the task level) will allow for the accumulated roll up of the values to create the length of the project. The roll up will accumulate at the summary task levels as totals for duration, work and cost. In turn, the summary tasks will roll up to the project summary task for a grand total for the project.

What to estimate?

- Estimate duration (length of time) in minutes, hours, days, months, etc.
- Estimate work (amount of work) in minutes, hours, days, months, etc.
- Estimate duration and work in minutes, hours, days, months, etc.

Where do the estimates come from?

Estimates may come from the project manager, team members, subject matter experts, stakeholders, historic data, experience, etc.

How do you get good estimates?

Ask the right people: look for the most experienced person in a specific skill area. Chances are, they have worked a project similar to or have actually performed the work in the past. These types of people can be invaluable to a project manager for estimating.

Ask the performing resource: if you are lucky enough to know who

your resources will be for the project, the performing resource is always the best source for an estimate. However, how you ask the resource for the estimate will make a difference. If you ask for an estimate, most people are thinking about fitting the work into their current workload. Framing the question from the point of view that the project will be worked some time in the future will result in a more accurate response. They should only consider how long (or how much work) it would take to perform the task regardless of the specific timeframe.

Ask more than one person: seeking various points of view for estimates will help define what the best estimate is. Project 2010 has an add-in feature called **PERT** which allows for 3-point estimates for task durations. The 3 points are pessimistic, most likely and optimistic. These values are feed into a formula that will result in an estimated duration of a task. The result will be three Gantt Charts: Pessimistic, Optimistic and Most likely.

Subject Matter Experts: always a good source for advice.

BEST PRACTICE: Padding, slack, and time reserve should be included in any schedule. Every organization and project management methodology has its own approach. The important point is that extra time should be built into all schedules to help manage the inevitable contingencies that will occur during the performance of all projects. If padding, slack or time reserves are not included in the planning, the schedule will not be realistic and will result in a reduced probability of completing the project as planned.

Entering Estimates

The Entry table of the Gantt chart is designed for easy entry of task estimates. Adding the work column to the view will enable adding Work estimates.

To insert the work column in to the Entry table of the Gantt Chart view:

1. **Tasks → Gantt Chart** (the default value will be the Entry table)
2. Right click on the column heading **Start**
3. Select Insert Column
4. Click on the “W” key on the keyboard
5. Click on **Work**

6. Click ok to close the box

For each task enter:

- A duration value
- A work value
- A duration and a work value

Valid entry values:

- 1m = 1 minute
- 1h = 1 hour
- 1d = 1 day
- 1w = 1 week
- 1mo = 1 month
- 1y = 1 year



Abbreviations of the time values may be customized in the Schedule options:

File → Options → Schedule

Duration entries will be scheduled as work days as defined by the project calendar.

Physical days (actual day count including non-working days) may also be achieved by using the **Elapsed** time. By placing an “E” in front of the letter in the duration field, the value will be scheduled in physical number of days. For example: 13 ed = 13 physical days.

In the example below, Task 1 is scheduled as business days (using the project calendar) and Task 2 is scheduled as physical days. Note the scheduling difference:

	Task Mode	Task Name	Duration	Start	Finish	Jul 7, '13		Jul 14, '13													
						4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Task 1	10 days	7/5/13	7/18/13																	
2	Task 2	10 edays	7/5/13	7/15/13																	

Figure 3-17 PLACEHOLDER

Other helpful information:

- When task durations are entered, a “?” will be added within the duration field. This “?” represents that the task information has not been finalized

and considered estimated. This indicator is optional and may be turned off at **File → Options → Schedule** and un-checking the following options:

- Show that scheduled tasks have estimated durations
- New scheduled tasks have estimated durations
- Some project managers plan all tasks in fixed duration. It should be noted, that fixed duration tasks will be tied to calendar dates and might be more difficult to schedule and track in the future.
- Manual scheduling mode for a task has the benefit of not requiring values in duration, start and finish columns. Text may be added as a note to the scheduler. If the task mode is changed to automatic scheduling, the text will be lost and, the software will enter a valid values. Scheduling modes will be discussed in Module 4. In the view below note the values in the duration, start and finish columns for Task 2:

		Task Mode	Task Name	Duration	Work	Start	Finish	I
1		Task 1		10 days	0 hrs	7/5/13	7/18/13	4
2		Task 2		ask Bob	0 hrs	unsure	future	

Figure 3-18 PLACEHOLDER



Inserting **Effort-driven** and **Type** columns will allow for setting these values for each task as well. As discussed in Module 2, each task will be unique in the nature of the work to be performed. As a result, these settings should be adjusted to determine what task type and effort-driven values are appropriate for a task.

Estimating for Unknown Resources

Most project managers plan the work for a project and find out what specific resources will perform the tasks in the future. Tasks might require a specific skill level but the quality of the unfamiliar resource is unknown. How do you plan for unknown resources?

When estimating tasks, consider estimating a task for a senior level

resource or a junior level resource:

- The senior level person would accomplish the task faster and would cost more.
- The junior level resource would cost less but needs more time and training.

Outsourcing resources: although there is a quantity of highly qualified contract resources, the recommendation is to estimate these tasks at the junior level. You will need to account for learning curve, assimilation into your organization and ramp up. The project manager might request a specific skill level but it is unknown whether or not that skill will be available when the project requires it.

As mentioned earlier, the PERT estimating method could give a 3 point duration estimate. Using PERT will result in 3 different reports; an optimistic Gantt Chart, a pessimistic Gantt Chart and an expected Gantt Chart. The PERT estimating module is an add-in in Project 2010 and is available at no cost as a download from Microsoft.

Practice: Entering Estimates

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 3.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 4: Entering Milestones

Milestones are an important task category in the WBS and the management of a project schedule. Milestones will be the date markers that become the achievement goals for a project. Management is more concerned with achieving target dates than they are the day-to-day progress of a project. Using milestones will result in the data to provide high level management reports.

The topics to be discussed in this lesson are:

1. How to set a Milestone
2. Applying the milestone filter
3. Best practices for Milestone usage

Setting Milestones

By definition, a Milestone has zero duration and zero work.

Milestones in Project 2010 may be set in two ways:

- Setting the task duration to zero
 - OR
 - Double click on a task to open the task information box
 - Click on the **Advanced** tab
 - Click the **Milestone** option at the bottom of the form.

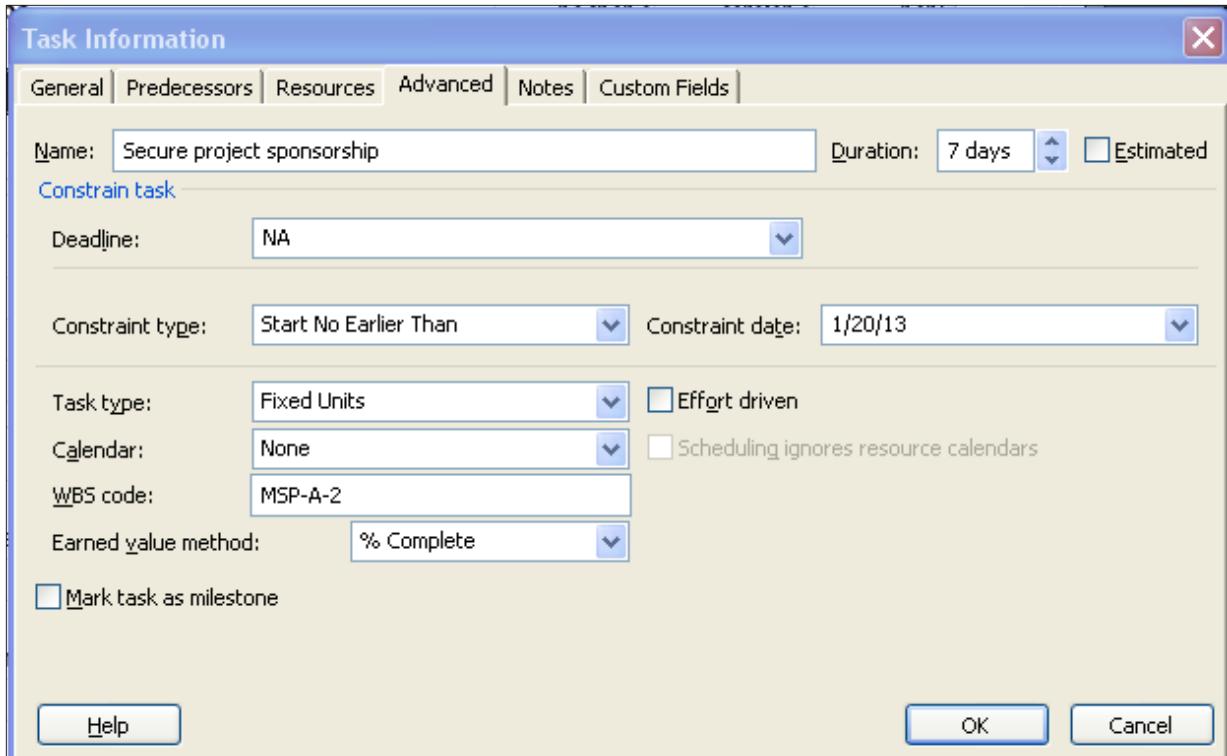


Figure 3-19 PLACEHOLDER

Automatic scheduling mode will display the milestone as a black diamond.

	Create a moving-expense receipt file	1 day	
	Create a moving binder	1 day	
	Plan of the Move Completed	0 days	3/5

Figure 3-20 PLACEHOLDER

Manual Scheduling mode will display the milestone as a teal diamond.

	Create a moving-expense receipt file	1 day	
	Create a moving binder	1 day	
	Plan of the Move Completed	0 days	3/6

Figure 3-21 PLACEHOLDER

Capability of the system meets is it a good idea: The definition of a milestone is a task with zero duration and zero work. When the milestone flag on a task is selected (in the Task Information box), the milestone task may contain duration. However, if a task is flagged as a milestone it will always appear as a diamond on the Gantt chart. You will not see the duration represented on the Gantt Chart and most people will assume zero duration. If a task does have duration, will it also have resources applied which means value work values? It should be noted, that milestone tasks do not appear on the timesheets for resources in Project Server. If a milestone must have a duration and resource assignments, consider creating another task for that value and for consistency allow milestones to remain zero duration.

In the view below Task 1 is a 10 day duration task and Task 2 is a milestone with 10 days of duration:

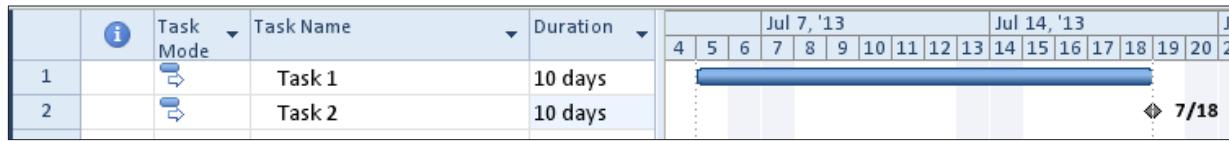


Figure 3-22 PLACEHOLDER

Apply Milestone Filter

Filters allow users to select data for viewing based on criteria. Project 2010 has multiple standard filters that are included with the software. Users also have the ability to create filters when needed to aid in their unique reporting needs. Creating custom filters will be discussed in Module 10.

Milestone reports created using the Milestone filter is a simple way of creating high level reports for management on demand.

Below is an example of an unfiltered report that shows all detail tasks within a schedule:

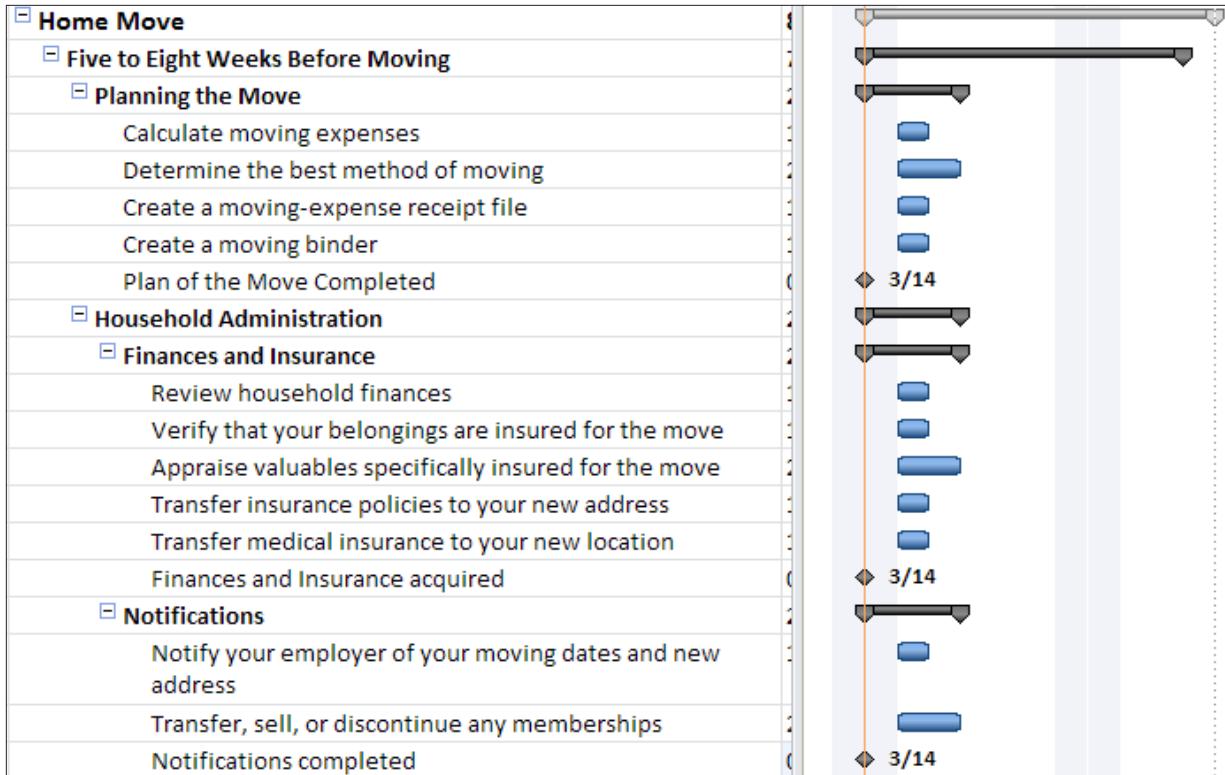


Figure 3-23 PLACEHOLDER

To filter out just the milestone tasks, apply the milestone filter:

- Click **View ribbon** → **Filter** (in the data area of the ribbon)
- Select the **Milestone** filter

The result will look like this:

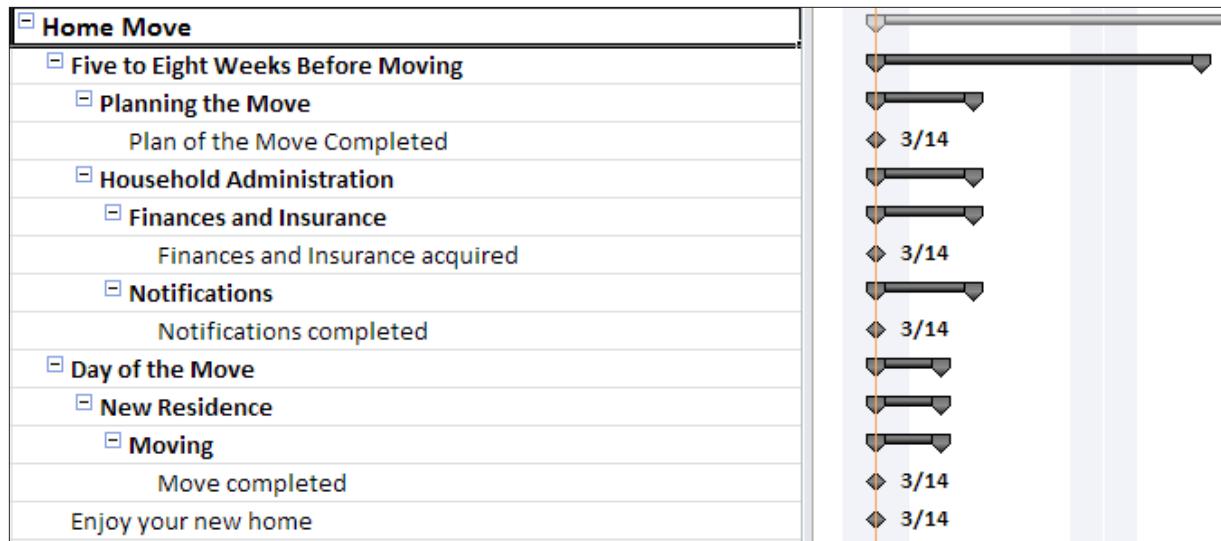


Figure 3-24 PLACEHOLDER

The detail has been hidden and a high-level report was created. As the schedule is further developed, the timeline will expand and the milestones will become short-term goal dates for the project schedule.

To remove a filter:

- Press F3 key on the keyboard
OR
- Click **View** → **Filter** (in the data area of the ribbon)
- Select the **No filter**

Best Practices

Milestones can be very helpful during project schedule creation and management of the project schedule. Below are some of the most effective ways to use Milestones within a project schedule:

Short-term goal: a quantity of work should be completed by a point in time. These will become the points in time that project progress will be measured by and work completed by.

A deliverable point: allow the milestone to represent the acceptance of a deliverable by the client.

Convergent point: a point in time where multiple projects may come together at one goal or target date point.

Go/No Go decision point: Multiple factors might come together at a point to make a decision as to the future progress of the project.

Anchors: enter a milestone at the start of the schedule and the end of the schedule These anchors will help you see your starting and finish points in the schedule.

External influence: use milestones to represent external dates or points from other schedules.

Other significant events: Pay out points, contract signing points, etc.

Drop dead dates: a can't miss date in time.

Don't overdo it!! Making every task in your schedule a milestone will result in diminished meaning or significance of the milestone and will result in a more difficult schedule to manage. Use milestones to help summarize the detail. It is also a good idea while building your WBS to apply the milestone filter periodically to check to see if you are getting the results you were hoping to achieve.

Milestones by nature will have zero duration and zero work. It is not a good practice to assign resources to milestones. Resource assignments should be on detail tasks only.

Practice: Entering Milestones

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

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2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 3.3 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

A well-constructed Work Breakdown Structure can make the difference between a project schedule that can help you manage our projects and a to-do item checklist. Spending time to create a meaningful wbs will be time well spent.

Task estimating is a skill built with time and practice. Your resources are the best source for information to help build

In this module we discussed:

- What a Work Breakdown Structure is
- Best practices of creating a wbs
- Entering tasks into Project 2010
- Creating a hierarchy structure for tasks
- Overview of estimating task lengths
- Best practices of estimating task duration and work
- Understand what a milestone is and how it may be used
- Applying the milestone filter



Chapter 4

Creating Task Relationships

Module Overview

After the work (tasks) for a project has been established, the scheduling process begins. Project 2010 allows for two scheduling methods: Manual and Automatic scheduling. These methods may be used separately or in combination. Task dependencies will be needed to help establish the order the tasks will be scheduled. Lead and lag features may be used to help fine tune the timing of the schedule.

After completing this module, you will understand:

1. Automatic vs. Manual Scheduling
2. Sequencing
3. Predecessors and Successors
4. Lead and Lag Time

Lesson 1: Automatic vs. Manual Scheduling

Project 2010 introduces the choice of manual scheduling in addition to the traditional automatic scheduling used in prior Project software versions. Each option has its strong points and drawbacks and the scheduling choice is generally dependent upon personal preference of the user. This lesson provides deeper details about automatic and manual scheduling. Understanding each scheduling method and its consequences will help achieve a more accurate and reliable project timeline.

After completing this lesson you will understand:

1. Overview of Scheduling
2. Automatic v Manual scheduling features
3. When to use automatic vs. manual
4. Setting scheduling options

Scheduling Overview

Project 2010 provides two scheduling methods for creating project schedules. The methods are the traditional or automatic scheduling and manual scheduling.

Traditional or automatic scheduling

This scheduling method was used in prior versions of MS Project and is contained in Project 2010. After tasks are entered relationships or dependencies are created between the tasks. The task durations with their relationships establish the timeline for the schedule. This scheduling method allows for bottom up scheduling where the sum of the detail tasks establishes the time line for the project.

Manual scheduling

Manual scheduling allows for top-down scheduling where summary tasks may be added first and the details of the project work is completed later. It also permits more unknowns during scheduling process and the ability to complete the details when known. Tasks do not have to contain relationships and scheduling dates may be entered.

Project scheduling mode will be selected on a task by task basis. Manually scheduled tasks and automatic scheduled tasks may be mixed within the same project schedule. Each task will contain a column called **task mode** which will establish the scheduling mode assigned to a task.

Automatic v Manual Scheduling

Whether you use Manual or Automatic scheduled tasks or a combination of both is a personal scheduling preference. Below are some of the capabilities of these scheduling modes to help you determine which method will work best for you. Projects should be looked at on a project by project basis and select the scheduling method best suited to the individual tasks and project.

Table 4.1 PLACEHOLDER

Features for scheduling tasks	Manual scheduling	Automatic scheduling
Only valid values may be entered into standard fields (duration, start, finish, etc)	Unique text values may be entered into fields such as duration, start, finish, etc. If the task mode is changed to Automatic, valid field values will replace unique text values	Yes

Table 4.1 PLACEHOLDER

Features for scheduling tasks	Manual scheduling	Automatic scheduling
Calculate project duration based on task relationships	Yes	Yes
Task may be tracked, re-scheduled and may have a baseline	Yes	Yes
Tasks can have estimated baselines	Yes	No
Possible scheduling issues will result in warnings for potential scheduling issues	Yes	No
Tasks will be scheduled based on resource availability and the assignment of the resource to the task	No	Yes
Tasks will dynamically react to duration and date changes.	No	Yes
Project Calendar non-working time will be honored during task scheduling.	Yes	Yes
Resource leveling	No	Yes
Task types are enforced	No	Yes
Changing the project start date will re-schedule the project tasks to the new date	No	Yes

Table 4.1 PLACEHOLDER

Features for scheduling tasks	Manual scheduling	Automatic scheduling
Task constraints may be assigned	No	Yes
Placeholder tasks (task name only without task details) is allowed	Yes	No
Enter values (duration, start, finish, etc) into summary tasks	Yes	No – summary tasks are calculated subtotals
Summary task values (duration, work, cost) roll up the sum of the member detail tasks	No – manual entries could be made on the summary tasks which are different than the detail task values If summary task is changed to automatic scheduling, summary totals will replace entered values	Yes
Schedules will be able to calculate a critical path	Yes	Yes
		Formatting for manual tasks v automatically schedule tasks will appear different on the Gantt Chart. Manually scheduled have a variety of format indicators used as the result of different scheduling entries.

When to Use Manual vs. Automatic Scheduling

Manual vs. automatic scheduling usage is a personal preference. The project manager's schedule management expectations, experience and goals will be included when deciding to use one method over the other. The amount of information concerning the project that is available to the scheduler when the schedule is created should also be taken into consideration. It may be advantageous to use both scheduling methods within a schedule switching between scheduling methods when needed.

Use Manual scheduling when:

- Minimal information is available about the project and you need to put your ideas into an initial schedule.
- Tasks are assigned to specific dates and you are not comfortable with the schedule moving as other tasks are entered or as resources are assigned.
- Using top-down planning – entering duration values for summary tasks followed by detail tasks and milestones to complete the work of the summary tasks.
- Using free form planning of tasks and durations to produce a Gantt chart.
- Need to build a rough schedule for a future project
- Relationships are not known.
- Manual scheduling is your most preferred method. Enter as many durations, relationships and dependencies as you need to help establish the timeline. This will help with critical path calculation as well.

Use Automatic scheduling when:

- More complete information is known about the goals of the project.
- Using bottom up planning. Enter the summary tasks names only. The detail tasks within the summaries will calculate the duration of the summary tasks.
- You want the schedule to be dynamic. Tasks will be re-scheduled based on work completed and associated dependencies. The scheduling engine will help keep you on track for the project and help you manage to an end date.
- You want the scheduling engine to calculate dates in the schedule.
- Resource allocations, earned value and more accurate metrics are needed.

Consider using a combination of both methods when:

- Initial planning could be in manual mode. As decisions are made and more detail is known, tasks may be converted to automatic mode.
- Consider converting to automatic mode when project execution begins. This may be done for the entire project, by phase or range of tasks.
 - Project files from earlier Project versions:
 - When Project 2010 opens projects schedules created in earlier versions tasks will be locked in automatic mode and the mode can not be altered unless they are upgraded to a Project 2010 file.
 - Saving the file with a new name converts the file to a Project 2010 file and the automatic/manual mode option becomes available.
 - The Type Mode field might not be visible when opening projects of earlier versions. When attempting to insert the Task Mode column into a table, the column will not be available.

Setting Scheduling Option

The column or field in Project 2010 that determines which scheduling mode a task will be scheduled by is called “Task Mode”. By default, you will see this field on the Entry table of the Gantt Chart. This column may be added to any task table.

Setting the automatic or manual scheduling mode may be accomplished in several ways:

To set the scheduling mode for a project or for all future projects:

- File → Options → Schedule

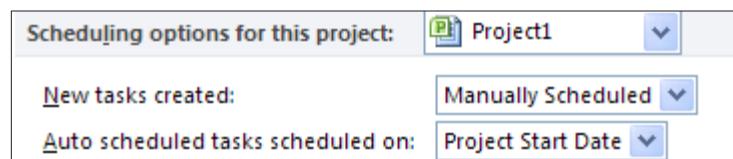


Figure 4-1 PLACEHOLDER

After several tasks are entered you may decide to switch to a different scheduling mode for the addition of future tasks for the project. This can be done quickly using the choice option at the bottom left hand corner of

the Gantt Chart view which is shown below. Changing this option will not affect existing tasks in the schedule; it will only affect future added tasks. Click on the button highlighted below for the option to change scheduling modes:

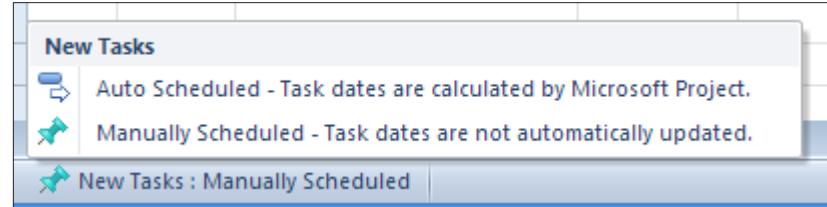


Figure 4-2 PLACEHOLDER

The default Entry Table for the Gantt Chart includes the “Task Mode” column inserted to the left of the Task Name column. This column may be inserted into any table as needed.. The indicators in this column indicate the scheduling mode for the task. In the view below the automatically scheduled tasks have a icon and the manually scheduled tasks have a icon in the Task Mode column. Hover your mouse pointer over the icon and the scheduling mode description will appear. Clicking on the icon will allow for scheduling mode changes per task. Note the different Gantt bar formats for manual v automatically scheduled tasks.

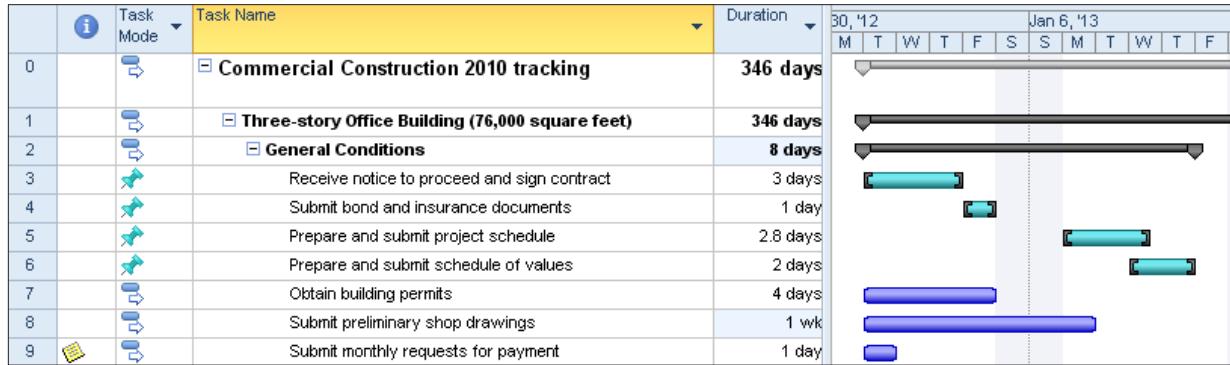


Figure 4-3 PLACEHOLDER

To change the scheduling mode from the Task ribbon:

- Click task to be changed
- Click **Task → Manual Schedule or Automatic Schedule**

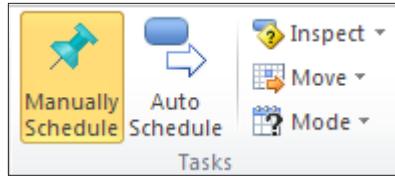


Figure 4-4 PLACEHOLDER

Another way to change the scheduling mode is to double clicking a task to open the Task Information dialogue box. An option is located on the General tab to change the scheduling mode. The options are highlighted in the view below.

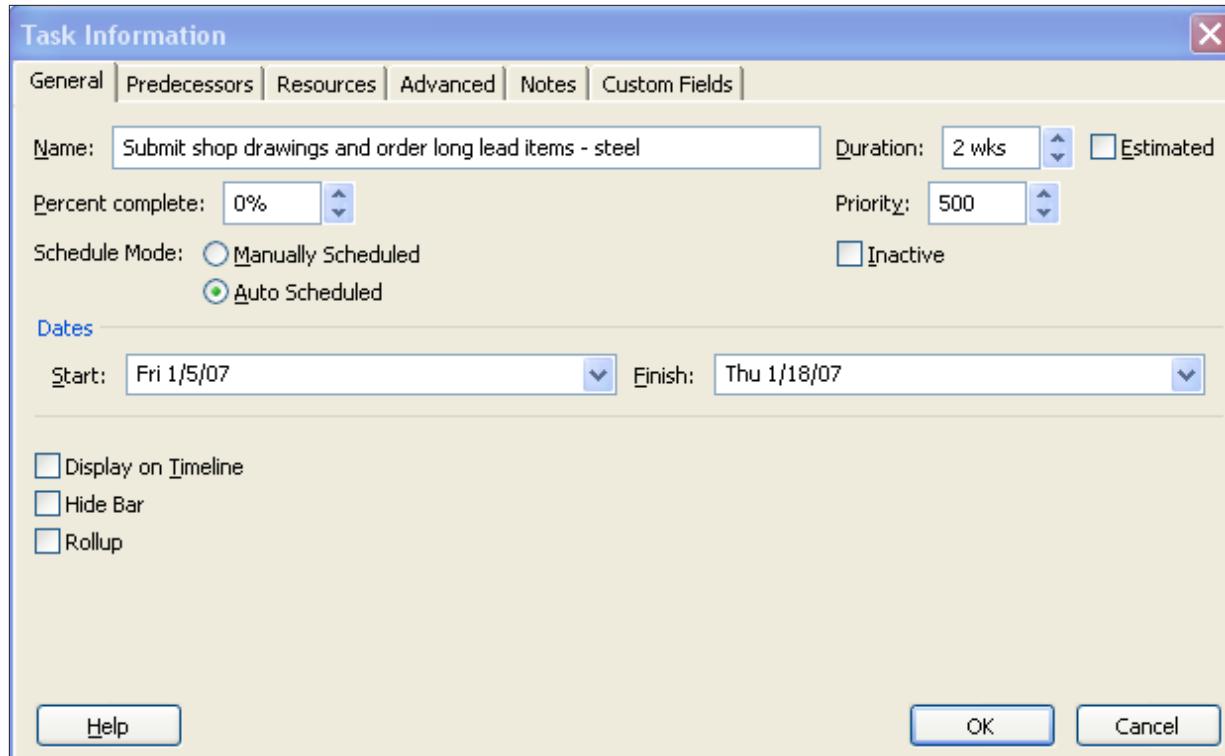


Figure 4-5 PLACEHOLDER

Adjusting Tasks in Manual Mode

Tasks in Manual mode are very free form. They can be easily moved or adjusted. Several warnings are built into tasks to alert the user of possible scheduling errors. Formatting will vary when entering a task in Manual mode depending on what the user is doing or what has been done to the task.

To enter a manually scheduled task:

Type the task name in the Task Name field and click Enter. In the view below note that the duration, start and finish fields are blank and no Gantt bars appear. This is a place holder task which can be used when task details are not known. Note that the Task Mode indicator has a "?" in the symbol indicating that the information for the task is not completed.

	i	Task Mode	Task Name	Duration	Start	Finish	F	Jul 7, '13	Jul 14, '13
1	?	Plan the Move					F	S S M T W T F	S S M T W T F

Figure 4-6 PLACEHOLDER

Text may be entered in fields that usually hold duration, work, dates, etc. to help during the planning process.

	i	Task Mode	Task Name	Duration	Start	Finish	F	Jul 14, '13	
1	?	Plan the Move	Ask Dave	Early July	Early July	Late July	F	W T F S S M T W T F	

Figure 4-7 PLACEHOLDER

When a duration value is entered in the duration field, a Gantt bar will appear and will extend for the duration entered. Note the formatting of the Gantt bar is different than an automatically scheduled task. The formatting has been altered as a way of indicating task scheduling differences.

	i	Task Mode	Task Name	Duration	Start	Finish	F	Jul 14, '13	
1	?	Plan the Move	5 days	Early July	Early July	Late July	F	W T F S S M T W T	

Figure 4-8 PLACEHOLDER

After entering a start date Project 2010 will calculate an end date.

Notice the format of the Gantt bar for the task has changed and the “?” symbol has disappeared from the task mode icon.

	i	Task Mode	Task Name	Duration	Start	Finish	Jul 7, '13	Jul 14, '13
1	?	Plan the Move	5 days	7/8/13	7/12/13		S S M T W T F S S	S S M T W T F S S

Figure 4-9 PLACEHOLDER

If only a start date is known for a task, it may be entered and the Gantt Chart will appear as below.

i	Task Mode	Task Name	Duration	Start	Finish	Jul 1, '13	Jul 8, '13
	?	Plan the Move		5/1/13		T W T	C

Figure 4-10 PLACEHOLDER

Or, if a finish date is known for the task it may be entered and the Gantt chart will appear as below.

i	Task Mode	Task Name	Duration	Start	Finish	May 12, '13	May 19, '13
	?	Plan the Move			5/14/13	S M T W	C

Figure 4-11 PLACEHOLDER

Warnings will be displayed by Project 2010 if the manual timing of tasks is questionable. Below is an example of a warning for a manually scheduled task. The error shown below occurred when the value of the duration of the summary task is less than the value of the detail task durations below. The summary task error is represented as a red bar to show what the length should be for the summary task and dots appear around the violating detailed task Gantt bars.



Figure 4-12 PLACEHOLDER

Practice: Working with Automatic and Manual Scheduling

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.

2. In the **Project Server Accounts** dialog box, click **Add**.

In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 4.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 2: Working with Dependencies

Once the tasks are entered in to the project schedule, the next step is to consider in what order the tasks should be performed. Many tasks will have a flexible order and others will have a forced order of performance. Establishing the order of the tasks is one of the factors that will help calculate the timeline of the project schedule. A dependency is the name given to the relationship established between the tasks used to establish the order of tasks. If dependencies are not created, Project 2010 will not be able to accurately predict and adjust dependent future tasks based on completed work.

In this lesson we will discuss:

1. Dependency types
2. Best practices using dependencies
3. Creating and viewing dependencies

Task Dependency Types

Project 2010 allows for 4 types of task dependencies. These dependencies establish the order that the tasks will be performed. Dependencies may also be referred to as links, relationships or relationships between tasks. The result of creating task relationships is a network of related tasks establishing a time line. When referring to linked tasks the following terms will apply:

- A task that has a relationship directly before a task is known as a predecessor task
- A task that has a relationship directly after a task is known as a successor task

In the view below there are 4 tasks. The relationships are established as link lines between tasks.

- The predecessor task or task that comes before Task B is Task A.

- The successor task or task that comes after Task B is Task C.

Pointing to a link line between tasks will reveal information regarding the relationship between tasks. See the highlighted box below which is showing the details of the relationship between Task C and Task D.

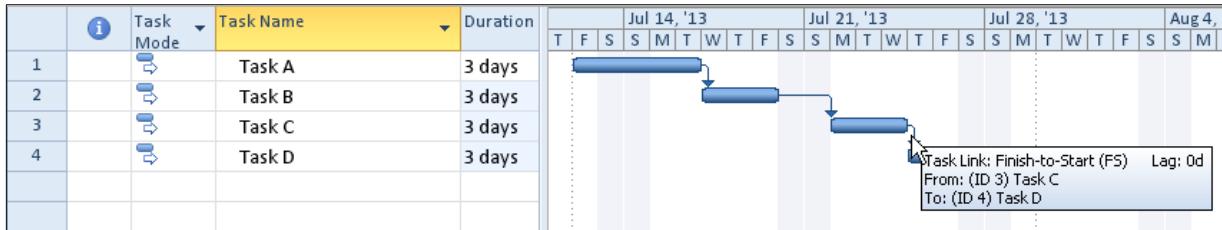


Figure 4-13 PLACEHOLDER

Not all dependencies are the same. Some tasks will start at the same time where others might be scheduled one after the next. To facilitate scheduling needs, there are 4 dependency types which are:

- Finish-to-start
- Start-to-start
- Finish-to-finish
- Start-to-finish

The details of each of the relationship types is described below:

- Finish-to-Start (fs)
 - Default dependency for the Project 2010
 - Task 1 must complete before Task 2 can begin
 - This relationship type creates a waterfall effect
 - Example: Drive to the restaurant, then eat dinner
 - Build a wall then paint the wall

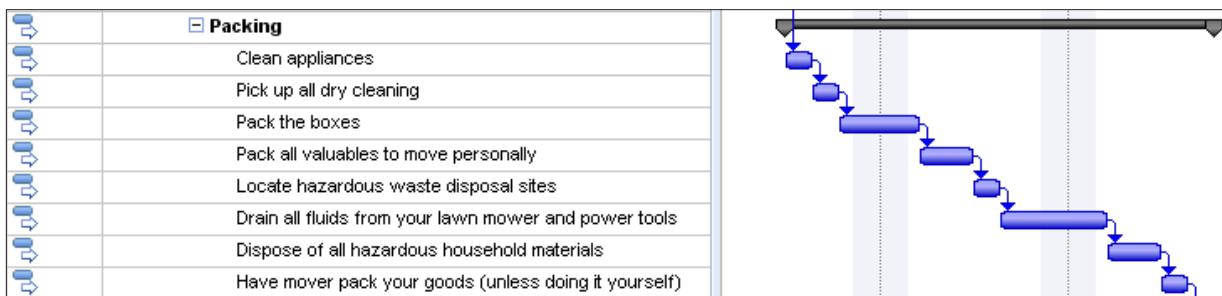


Figure 4-14 PLACEHOLDER

- Start-to-Start (ss)

- Tasks that are scheduled to start at the same time
 - Example: After the moving expenses are calculated, then determining the best moving method, create a moving-expenses file and create a moving binder may all start at the same time. All 3 tasks should be completed (in this example) to pass the milestone and move on to the next section of work. It should also be noted that the 3 tasks that are starting at the same time are not scheduled to complete at the same time. As a result, the longest task will determine when the milestone will be scheduled.



Figure 4-15 PLACEHOLDER

- Finish-to-Finish (FF)
 - Tasks that are scheduled to finish at the same time but not required to start at the same time.
 - Example: The section of work below can all start when the previous section is completed. These tasks will start at different times, but they all need to be completed by the same point in time.



Figure 4-16 PLACEHOLDER

- Start-to-Finish (SF)
 - The start date of the predecessor task will determine the finish date of the successor task.
 - This is the least used dependency type and rarely used.

- Example: When the new software module comes on line, the old software will be taken off line



When working with manually scheduled tasks, errors might result using dependencies. A warning is viewed when tasks are linked and dates are entered into the start or finish columns. The calculation of the project duration might not match the duration calculated when the entered dates are taken into consideration. Below is an example of an error created when a date was entered in the start column for Task B. The error is represented by the red line under the incorrect date and the dots around the Gantt bars.

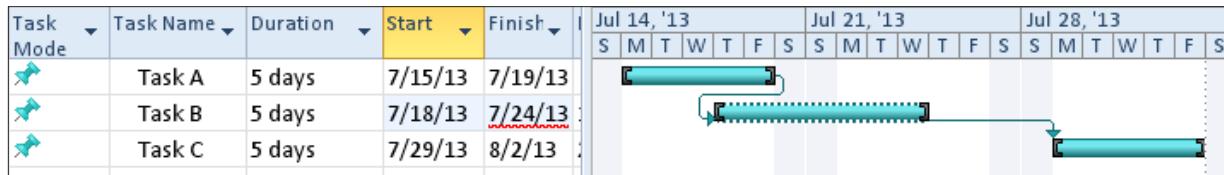


Figure 4-17 PLACEHOLDER

To correct this type of error, Project 2010 has a new feature called Respect Links. Right click on the red error line and following choices appear. Select the Respect Links option and the date will be recalculated based on the task relationships.

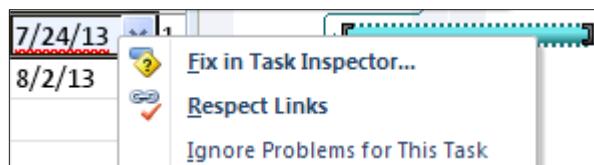


Figure 4-18 PLACEHOLDER

Below is the result of clicking on the Respect Links option for the task. Note the error message is no longer visible and the task in error has been rescheduled.

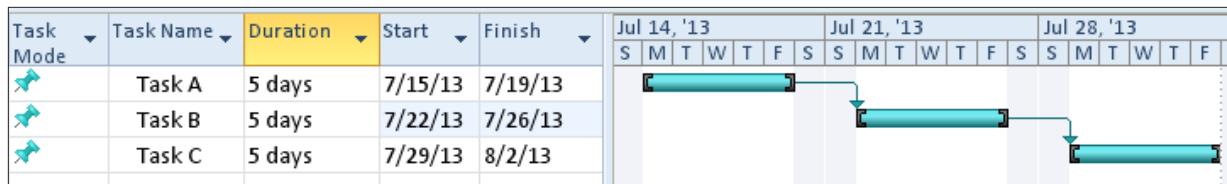


Figure 4-19 PLACEHOLDER

Best Practices for Using Dependencies

Project 2010 calculates the duration of a project based on how task dependencies are created between tasks. Establishing the order of the tasks is called Sequencing. Sequencing is concerned with establishing the order tasks should or could be performed. Arranging tasks in the most efficient order for the project is not an easy exercise. Sometimes, the order of the tasks is very evident and at other times, more complicated. Sequencing is more option than right or wrong for a project.

For example, the following tasks are tasks that someone would do when they come home after work and before they go to bed:

1. Arrive Home
2. Eat Dinner
3. Walk the dog
4. Run an errand
5. Read the mail
6. Clean up the dinner dishes
7. Cook dinner
8. Go to Sleep
9. Get the mail
10. Watch the news

Take a minute to write down the numbers of the tasks above in the order you would perform these tasks.

Things you might notice:

- You will have some forced relationships:
 - You can't eat dinner until you make dinner
 - You can't read the mail until you get the mail
- You will also notice that Arrive Home and Go to Sleep are the start and finish of the sequence.
- Some tasks can occur at any time and are not dependent upon another tasks
- Some tasks you might consider doing differently, like picking up dinner on the way home. It would accomplish the same purpose and save time.
- Can any tasks be done at the same time as other tasks to save time?
- Should any tasks be eliminated?

Next rework this same sequence of tasks knowing that someone else will help perform the tasks. Does it turn out differently? Would it take less or more time? Some tasks you have to do yourself and some tasks can be performed by someone else.

Best practices to consider when creating dependencies:

Relationship between tasks will allow you to create network of related tasks. The network will show order the tasks will occur. Below are some best practices which should be considered when creating relationships:

- All tasks should have both a predecessor and a successor. The timeline for the project is based on this concept. If tasks are not linked in the network of tasks, their duration will not be accounted for within the timeline. Making sure all task durations are accounted for will avoid surprises at the end of a project.
- When creating dependencies or relationships, apply the rule – because I can, is it a good idea? Do not link every task to every other task. In the example above, should you should have linked Arrive Home with Go to Sleep with the logic of if you don't come home, you can't go to sleep? The answer is no. Only the last task that is completed before Go to Sleep should be linked to Go to Sleep.
- Think about what task pushes or influences another task. If a task is late, what other tasks will be affected? Link only tasks with a direct affect on a successor task. Ask yourself what needs to be completed before you can do the next step and if it is late, which tasks will be affected.
- Link detailed tasks and milestones only. The completion of tasks will push the milestones or the short term goals. Linking summary tasks means that an entire section of work must be completed before the next section may be started. Ask yourself if that is true for your situation before linking at the summary level. Linking summary tasks is not recommended.

- Tasks should always be linked to push milestones. For example: define what the definition of “project completed” is. The multiple parallel paths that must be completed to conclude the project should all be linked to the ending milestone. If any of the parallel paths take longer than planned, the milestone date will be pushed out in time.

In the example below “Start the Project” is the starting milestone. The next 3 sections of work all start when the project starts. All 3 sections must be completed before the house is ready to sell. If any of the sections take longer, each section has the ability to push the ending milestone or when the house is ready to sell. The longest of the parallel paths will be considered the critical path or the section that determines the timeline of the project.

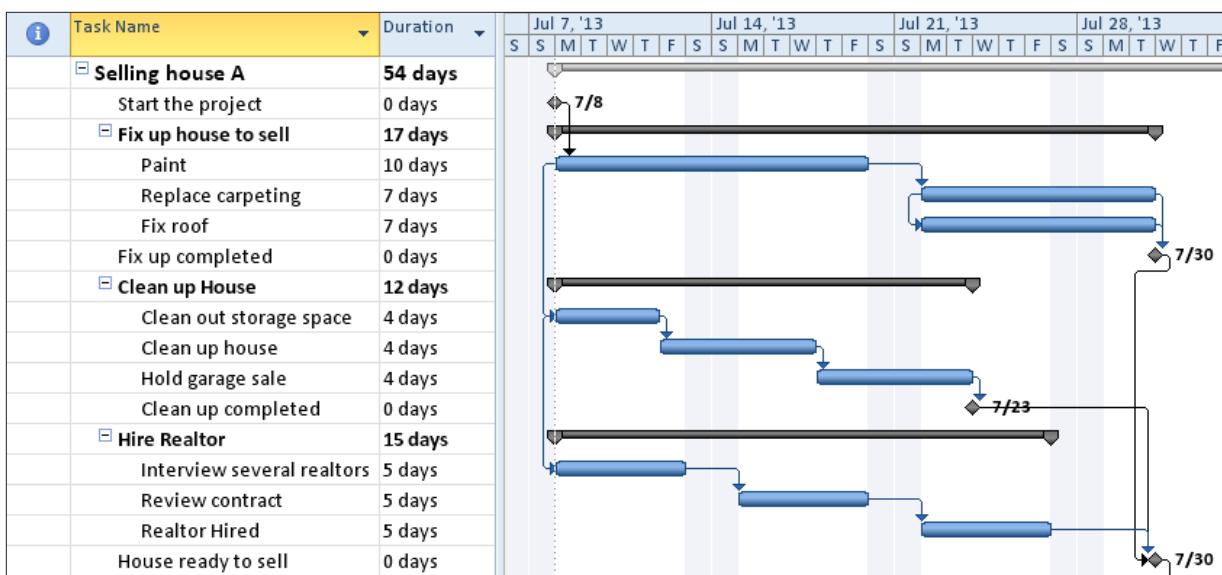


Figure 4-20 PLACEHOLDER

- Create as many parallel paths as possible to shorten the schedule. Use of the Start-To-Start and Finish-To –Finish relationships will help create parallel paths and shorten the project time line. Be aware, however, just because you can schedule tasks in parallel, you might not have the resources to perform the work and which could extend the timeline.
- Do not link tasks based on a resource. Some people will plan tasks to occur at specific times because they think that a resource will be available at that time. Chances are the expected resources will not be available at the planned point in time because other tasks for that resource have

changed. Plan the schedule for the work required and plan/arrange for required resources as the time draws nearer to when the task will be performed.

- Links may be external to the project. Project 2010 will allow dependencies to exist in other projects that are linked to tasks in your project. This is similar to links in Excel. In Excel, if links between files are created and the files are relocated, the links will be broken. Project 2010's links between project files will work the same way.



Project 2010 also offers the option for tasks that are moved or added to the schedule to automatically link in a Finish-to-Start relationship or not be linked at all. This is a personal preference and may be applied to a specific project or all projects viewed on your desktop.

To view or change this option: **File → Options → Schedule**

Scheduling options for this project: **Home Move.mpp**

<u>New tasks created:</u>	Auto Scheduled
<u>Auto scheduled tasks scheduled on:</u>	Project Start Date
<u>Duration is entered in:</u>	Days
<u>Work is entered in:</u>	Hours
<u>Default task type:</u>	Fixed Units
<input checked="" type="checkbox"/> New tasks are effort driven <small>i</small>	
<input checked="" type="checkbox"/> Autolink inserted or moved tasks <small>i</small>	
<input checked="" type="checkbox"/> Split in-progress tasks <small>i</small>	
<input checked="" type="checkbox"/> Update Manually Scheduled tasks when editing links	
<input checked="" type="checkbox"/> Tasks will always honor their constraint dates <small>i</small>	
<input checked="" type="checkbox"/> Show that scheduled tasks have estimated durations <small>i</small>	
<input checked="" type="checkbox"/> New scheduled tasks have estimated durations	
<input type="checkbox"/> Keep task on nearest working day when changing to Automatically Scheduled mode	

Figure 4-21 PLACEHOLDER

Creating and Viewing Dependencies

There are many ways to create, delete and modify a dependency. The most common methods will be discussed here. Information concerning additional methods to create dependencies may be found in the help function of Project 2010.

To create a default dependency of Finish-To-Start between 2 tasks or multiple tasks:

- For consecutive tasks:
 - Drag select tasks
 - Click **Task → Link**
 - OR
- For non-consecutive tasks:
 - Click on a task name
 - Press and hold **CTRL** key
 - Click on the task(s) you would like to link to
 - Click on **Task → Link**

The Finish-To-Start relationship created will look like this:

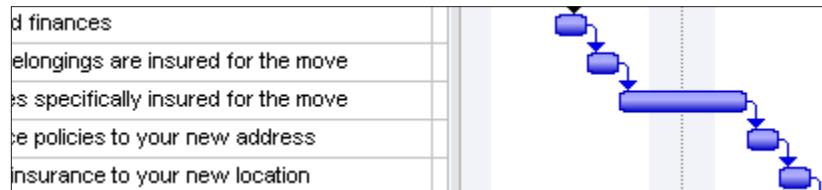


Figure 4-22 PLACEHOLDER

To delete a dependency between 2 tasks or multiple dependencies:

- For consecutive tasks:
 - Drag to select tasks to be deleted
 - Click on **Task → Unlink tasks**
 - OR
- For Non-consecutive tasks:
 - Click on a task name
 - Press and hold **CTRL** key
 - Click on the task(s) you would like to unlink
 - Click on **Task → Unlink tasks**

To alter a Finish-to-Start relationship to another dependency type:

Double click the dependency arrow between tasks.

The Task Dependency dialog box will appear as shown below. Click the down arrow for the Type field and the selections below will appear. Using this box it is easy to alter the dependency type. Hidden under the Type choices in this box is also a Delete option which can be used to delete a dependency.

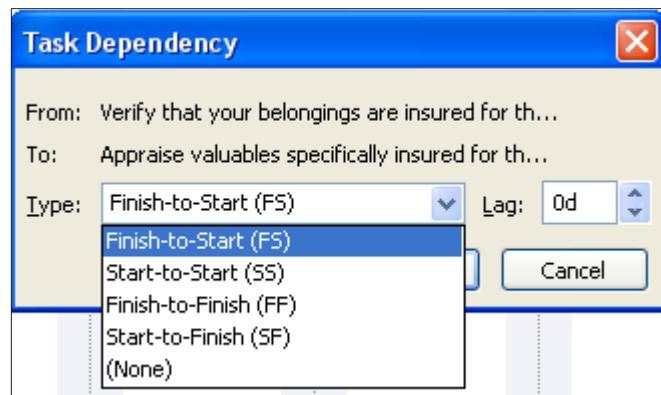


Figure 4-23 PLACEHOLDER

Hovering your mouse pointer over a link line will describe the data concerning the relationship between tasks as seen in the diagram below.

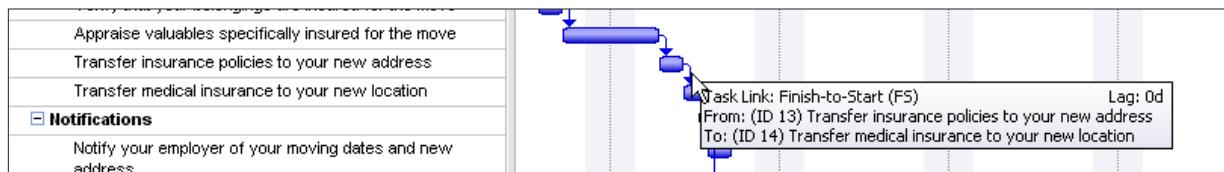


Figure 4-24 PLACEHOLDER

The predecessor column will also become a very important column of information concerning relationships. Above we discussed selecting tasks and linking them. What if the tasks cannot be viewed on the same screen? How would we link the tasks?

In the example below, task number 11 “Verify that your belongings are insured for the move” is the Predecessor or the task that comes before task number 12 “Appraise valuables specifically insured for the move”. The number 11 is in the Predecessor column for task 12. When the predecessor column shows numbers only, it is assumed that the relationship is the

default Finish-To-Start relationship. Other relationships will be shown as SS, FF or SF to the right of the predecessor number.

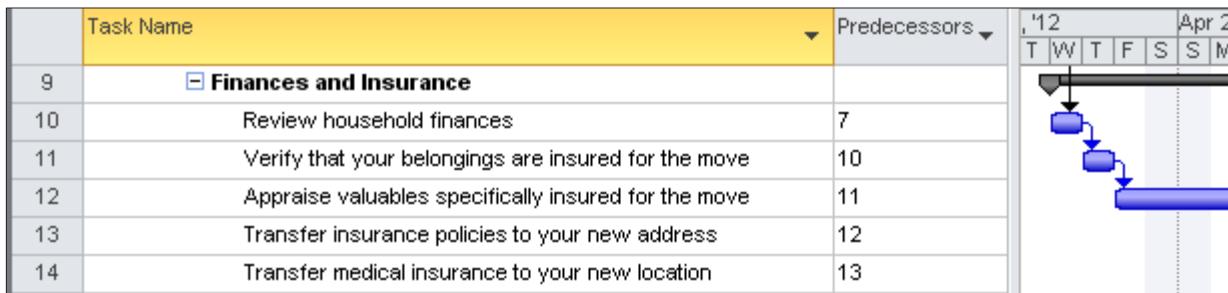


Figure 4-25 PLACEHOLDER

The following diagram is an example of a more complicated dependency. In this example task 91 “Distribute new address” has a predecessor of task 90 using a Finish-To-Finish relationship. Dependencies may also be created or altered by entering or changing the number of the task directly in the Predecessor field. Multiple predecessors may be entered using commas between numbers.

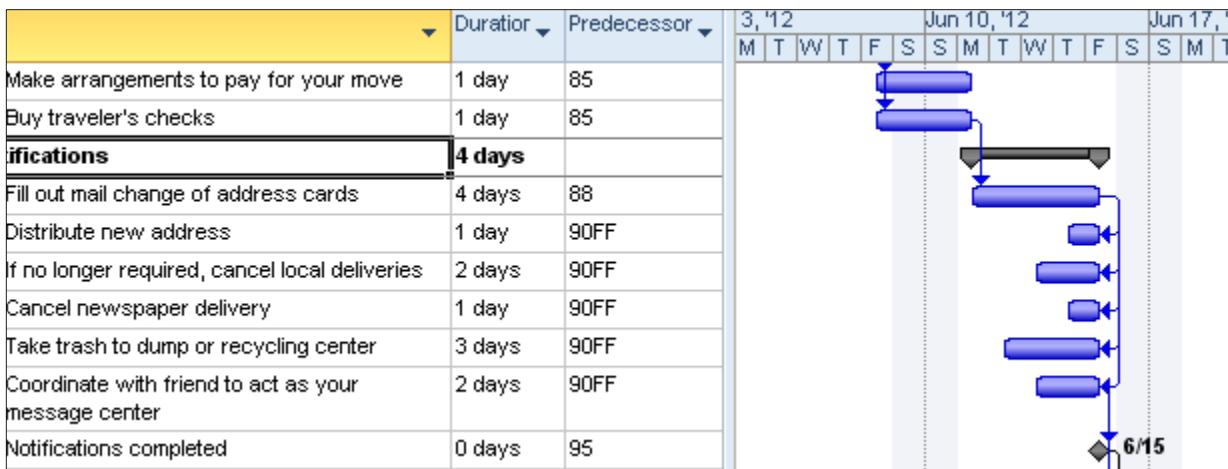


Figure 4-26 PLACEHOLDER



Tasks can have more than one predecessor and more than one successor.

After the network of tasks has been created, consider looking at the Network Diagram. The best way to get a bird's eye view of your project is to look at the print preview of the Network Diagram. The Network Diagram shows the result of how predecessors and successors are connected within a project. It will be easy to tell where relationships are missing and relationships that are not what you expected. More information regarding the details of the symbols on the Network Diagram can be found by clicking Format → Box Styles while in the Network Diagram view. The Help function of Project 2010 is another source for information.

To reveal the Network Diagram in print preview mode:

- Click **Task** → **Gantt Chart** → **Network Diagram**
- Click **File** → **Print**
- Click the Multiple Pages button in the lower right corner of the view

Below is a view of the Network Diagram

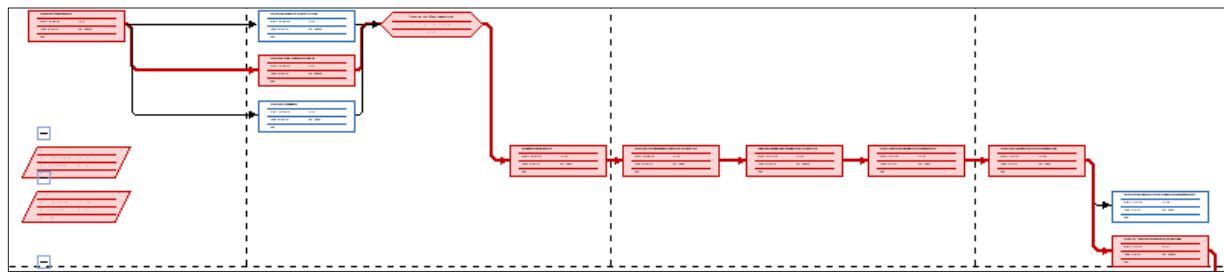


Figure 4-27 PLACEHOLDER

Practice: Working with Dependencies

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the PS07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 4.3 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Understanding Leads & Lags

Relationships between tasks are not always absolutely defined as described with relationships. Allowing for Lead and Lag time will help refine a schedule to bring it more in line with the actual timeline for the project. Lead and Lag time will allow for wait time between tasks and overlap of task activities.

In this Lesson we will discuss:

1. What is Lag time?
2. What is Lead time?
3. Best Practices for using Lead and Lag time

What is Lag Time?

Lag time is used to provide wait time between tasks. The time will be expressed in business days or valid project calendar working time. Lag time should be used to extend the timeline of the project when only duration needs to be added to a schedule and will not add work or cost. For example: New concrete is poured and you must wait 6 days before you can drive on it. The time must occur but no work or cost is added to the task. A dependency must first exist between tasks before Lag time can be created.

To create Lag time:

Double click the relationship line between tasks where you would like to add the lag time. The task dependency dialog box below will appear. In the illustration below, we see that there are 2 tasks. After the equipment is ordered there will be a 2 week delivery wait time before the equipment is received. To create this wait time, set the Lag field to 2w (2 weeks). Click **OK**.

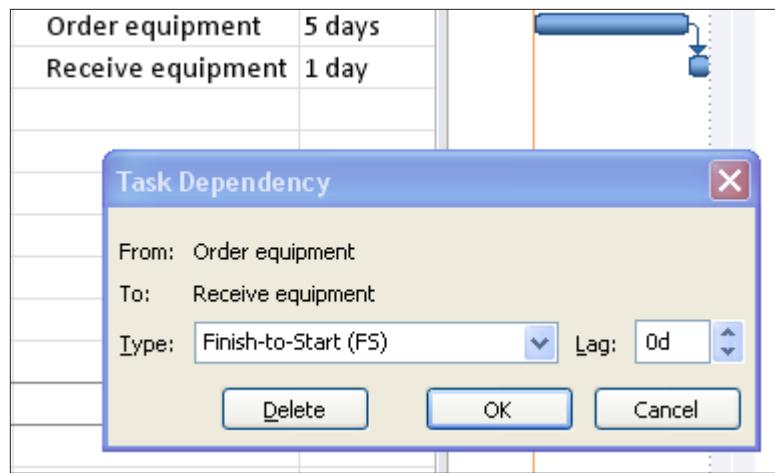


Figure 4-28 PLACEHOLDER

The result is of adding a 2 week lag shown in the illustration below.



Figure 4-29 PLACEHOLDER

An alternate method of entering lag time is by adding the value of the lag into the predecessor column as shown below:

Task Name	Duration	Predecessors	Start Date	End Date	Weekdays
Order equipment	5 days		Mar 21, '10	Mar 28, '10	F S T T S M W F S T T
Receive equipment	1 day	1FS+2 wks			

Figure 4-30 PLACEHOLDER

Lag time may also be expressed as a percentage of the duration of the predecessor task. Order equipment is a 5 day task. 50% Lag would mean that the length of the lag time would be 2.5 days or half of the 5 days duration of the Order equipment task.

What is Lead Time?

Lead time shortens the time line of the project. Consider tasks that do not need to be 100% completed before the successor task can start. Lead time is a good tool to help refine the schedule when trying to cut time from a timeline. Project 2010 does not have a field or box called Lead time.

Instead, to create Lead time negative Lag time is entered.

To create Lead time:

The diagram below allows 10 days to unpack equipment and 10 days to set up the equipment. The same resources are performing both tasks. The 2 tasks together will require 20 days to complete if the equipment was set up after all of the equipment has been unpacked. If you had more resources to work on the tasks could you get these tasks accomplished quicker? In the example below the task to set up equipment will be scheduled to start when the equipment is half unpacked.

Below is a view of the tasks before lead time is entered. The tasks are scheduled for 20 days of duration.

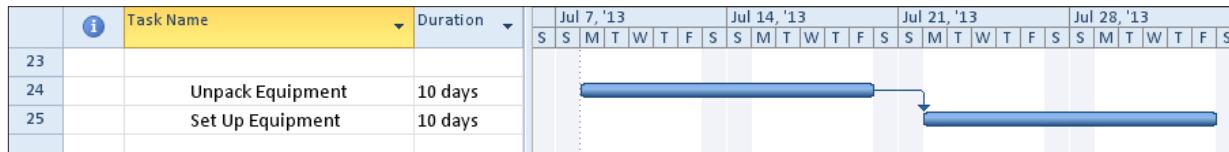


Figure 4-31 PLACEHOLDER

To enter Lead time between two tasks:

- Double click the relationship line between tasks where lead time is to be added.
- Enter “-5days” in the Lag field value
- Click Ok to close the box

The task dependency dialog box shown below will appear.

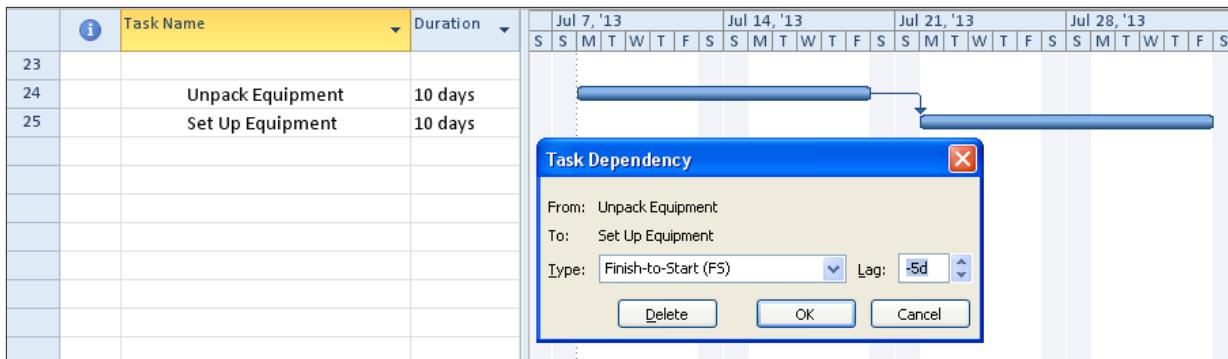


Figure 4-32 PLACEHOLDER

Below is the result of adding lead time between two tasks. Note the overlap of tasks and the total scheduling time has been shortened.

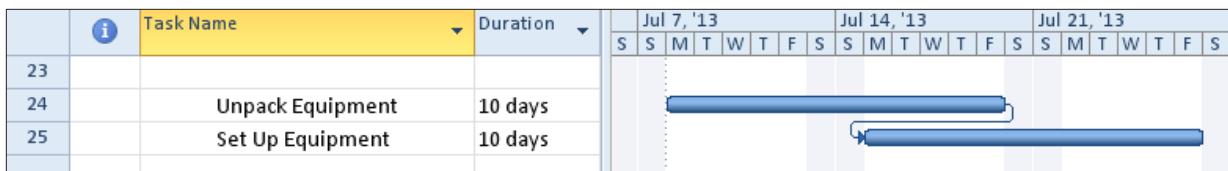


Figure 4-33 PLACEHOLDER

Lead time can also be expressed in percentages. The advantage to using percentages is if the predecessor task length changes, the successor task will automatically adjust its starting date.

For example:

- Task A is 10 days long and has a Finish-to-start relationship with Task B with -50% lead time
- Task B will be scheduled to start when Task A has 5 days of work completed
- Task A is taking longer than expected and is now scheduled to take 15 days
- Task B will be rescheduled to start when Task A has 7.5 days of work completed.

A -50% would move the successor task to the left 50% of the duration of the predecessor task. The diagram below demonstrates the result of applying -50% for Lead time to the relationship between these two tasks.

To enter Lead time between two tasks as a percentage value:

- Double click the relationship line between tasks where lead time is required.
- Enter “-50%” in the Lag field value
- Click ok to close the box

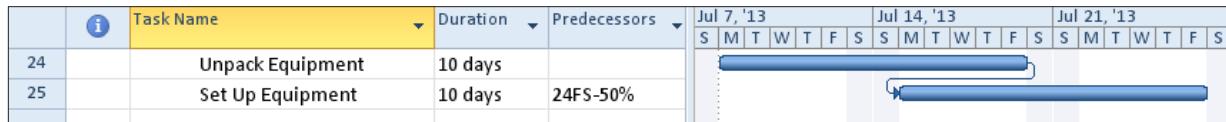


Figure 4-34 PLACEHOLDER

Best Practices

Use Lag time when extending the timeline without adding cost or work to the project.

Best practices for the use of **Lag** time in a project schedule:

- Time must go by without a work or cost applied to the time. Lag is considered to be wait time like a delivery of equipment or concrete hardening
- Adding slack into the schedule to extend the timeline to allow for possible contingencies
- Adding wait time between phases of a project
- Adding wait time between parallel sections of a project to allow others to catch up
- Lag time may also be expressed in elapsed time to allow nights and weekends to be included
- Planning the work for a factory crew. For example: the crew needs to be at work for 9 hours but 8 of that is actual work. The remaining hour is meal and breaks. Use Lag to extend the time for the work of the crew to accommodate breaks.

Use lead time when the schedule needs to be shortened. More resources will be needed to accomplish the tasks. Lead time can increase risk of re-work and could increase cost for tasks.

Best practices for the use of **Lead** time in a project schedule:

- Piece work – when X number of items or time has been completed, giving the completed work to the next group to start their work.
- Testing – when X percentage of the testing is completed and successful, giving the completed work to the next group to start their work.
- When it is not necessary for the predecessor task to achieve 100% completion before starting the successor task.

Practice: Working with Leads and Lags

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

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Exercise 1: Create Project Server Authentication Profile

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Perform the following exercise on the Ps07 virtual machine.

4. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
5. In the Project Server Accounts dialog box, click Add.

6. In the Account Properties dialog box, and complete the following settings and click ok.

Table 4.4 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

Turning a Work Breakdown Structure (wbs) into a project schedule is usually a team effort lead by the project manager. To help create a project schedule, Project 2010 has created flexible scheduling capabilities offering manual and automatic scheduling modes. Task dependencies must be created to change a task list into a dynamic schedule. Lead and lag adjustments help refine the timeline for the project schedule.

Topics that were discussed:

1. Manual vs. Automatic Scheduling
2. Sequencing
3. Dependencies
4. Lag and Lead Time



Chapter 5

Configuring Advanced Task Information

Module Overview

Once the project schedule has been created, it will need refining. Project 2010 provides multiple methods to refine the scheduling of a project. During this module we will describe information about the tools available and the best practices regarding the use of the functions.

After completing this module, you will be able to:

1. Work with Task Constraints
2. Understand what Constraints are and what types of constraints are available?
3. Create Automatic Constraints
4. Understand errors caused by Constraints
5. Establish task deadlines
6. Use the Task Inspector
7. Create task calendars
8. Use Task Form Views
9. Create Project Schedule Notes
10. Split Tasks
11. Change the start date of a project

Lesson 1: Working with Task Constraints

Project schedule constraints are used to adjust the project schedule in an effort to balance the freedoms and limitations of project delivery. Understanding how Project 2010 interprets constraint types and the affect they will have on the scheduling of a project will help avoid problems during the execution and tracking phase of the project.

In this lesson we will discuss:

12. What are constraints and when to use them
13. Know the types of constraints available in Project 2010
14. Why constraints should be used sparingly
15. Issues that constraints might cause

What are Constraints?

Constraints are defined as conditions upon which a project must be managed against which can negatively affect budget, quality, schedule and scope.

Some typical constraints might include a lack of:

16. Money
17. Skilled resources
18. Requirements for the project
19. Equipment
20. Management support
21. Time

Even though the above constraints are important to the success of a project, Project 2010 cannot account for these constraints. However, the constraints Project 2010 can help you with are dates.

Tasks may require a

target date or start at a specific date, end at a specific date, or require scheduling at the beginning or ending of a timeframe.

Date constraints can be used to refine the project schedule when greater control is needed for specific tasks start or finish dates. Using date constraints, however, will also remove flexibility from the schedule. It is for this reason that the use of constraints be kept to a minimum. Some of the date constraints are more flexible than others available. The flexible constraints will be the most beneficial during scheduling.

NOTE: Manual Scheduled tasks can not use constraints. They are used for Automatically Scheduled tasks only.

Constraint Types

Constraints are used when a task must be scheduled with a specific date in mind or within a specific time period. When setting constraints, the following pieces of information must be known:

22. Constraint type
23. Date for the constraint

There are 8 constraint types available in the Project 2010 and all are date dependent:

24. As Soon As Possible (ASAP) - default constraint applied to all tasks when a project is scheduled from the project start date. Tasks will be scheduled as early as possible within a timeframe.
25. As Late As Possible (ALAP) - default constraint applied to tasks when a project is scheduled from the finish date of the project. Tasks will be scheduled as late as possible within a timeframe.
26. Finish No Earlier Than (FNET) - applied to a task that must finish no earlier than a specified date. The constraint date will be applied to the finish date of the task and the task will move forward in time to the date specified for this constraint.
27. Finish No Later Than (FNLT) - applied to a task that must finish no later than a specified date. During tracking, tasks will move forward in the schedule. Tasks with Finish No Later Than constraints will move forward and stop at the constraint date.
28. Start No Earlier Than (SNET) - applied to a task that must start no earlier than a specified date. The constraint date will be applied to the start date of the task and the task will move forward in time to the date specified for

this constraint.

Start No Later Than (SNLT) - applied to a task that must be started by a specified date. During tracking, tasks will move forward in the schedule. Tasks with a Start No Later Than constraints will move forward and stop at the constraint date.

29. Must Start On – applied when a task has a hard start date. The task will move to the constraint date and is fixed on that date.
30. Must Finish On - applied when a task has a hard finish date. The task will move to the constraint date and is fixed on that date.

To create a task constraint:

31. Double click on a task to open the Task Information dialog box
32. Click Advanced tab
33. Click Down Arrow to the right of Constraint type and select a constraint type
34. Click Down Arrow to the right of Constraint date and assign a date for the constraint
35. Click ok

To remove a task constraint:

36. Double click on a task to open the Task Information dialog box
37. Click Advanced tab
38. Click Down Arrow to the right of the constraint title and select As soon as possible
39. Click ok

Actions That Create Automatic Constraints

The project manager will manually create constraints when entering a constraint type and date for a task. Constraints can be created in other ways as well.

NOTE: Automatic Constraints apply only when using Automatic Scheduling mode.

If a Start date is entered for an Automatically scheduled task, a Start No Earlier Than constraint will be applied to the task. If a finish date is

enteres a Finish No Earlier Than constraint will be applied.

In the example below, a finish date was entered in the finish column for task 7. The result is that a “Finish No Earlier Than” constraint was placed on the task. The task will move out to the date entered and a green triangle will be shown in the date field. The constraint is also shown by an indicator in the indicator column. Hover you mouse pointer over the indicator to see the explanation shown below.

In the next example, a start date has been entered in the start column for task 12. The result is that a “Start No Earlier Than” constraint was created for the task. Creating a constraint will often break relationships between tasks as shown below.

In both cases, the error messages shown below appeared after the date values were entered warning that the constraint created is not advised and the reason why. The error message was triggered by the Planning Wizard.

Planning Wizard messages are optional and can be turned off. If they are turned off, you will not be alerted to possible scheduling errors that might be created as a result of creating a constraint or other scheduling issues. The newer Project 2010 user will gain benefit from leaving this option turned on. As the project manager becomes more experienced, it may be turned off.

To change the planning message options for the Planning Wizard:

Click File → Options → Advanced:

When the Planning Wizard is turned off and a value is entered in the start or finish columns a smart tag will appear and offer the following options:

If your scheduling style is to enter dates on each task, it is recommended that you use a manual scheduling approach instead of automatic scheduling. This will allow for tasks to be scheduled to the dates entered and will not be subject to the automatic scheduling engine of the software. If a task is scheduled using manual scheduling, the tasks can be changed to automatic scheduling at any time. There is also an option available that will keep tasks within 1 business day of the manually scheduled date when changed to automatic scheduling.

To set the option to schedule tasks on the nearest working day when changing to Automatically Scheduled mode:

40. Click on File → Options → Schedule

NOTE: Constraints will also be entered as a result of the tracking process which will be discussed in a future module.

Effects of Constraints

Constraints may cause errors in the scheduling of a project that are not readily apparent. Look at the example below and see if you can identify the error.

There is an error in the calculation of the date for the task 9 “Initial Planning Complete”. The relationship line after task 8, “Selection of Internal Auditors” flows backwards in time. The reason for this is that task 8 is scheduled to complete on April 17, one day later than the milestone target date of April 16. Tasks that are dependent on task 9 will also be miscalculated.

Monitoring for errors of this type in the schedule is important. In the diagram below, the Total Slack column has been inserted into the table view. One of the uses of the Total Slack column is it can help monitor when task scheduling issues arise. Large positive total slack values might be an indication that dependencies have not been assigned to the task. If the task has negative total slack values, check to see if the task has a constraint.

TIP: Think about the Total Slack column as your checkbook. Positive numbers are good and negative numbers are bad.

To add Total Slack column to the view:

41. Right click on the column heading to the right of where you want to insert the column
42. Click on Insert Column
43. Click on the T on the keyboard
44. Click on “Total Slack”

In the example below, the Total Slack column shows -1 day of slack for tasks 1-9. This negative slack is caused by the constraint and resulting error on task 9.

Without the indicator column at the left, it is not evident that there is a constraint on the task. Because of this, it is good practice to insert the indicator column in tables when necessary. Below is the same view with the indicator column added to the table.

Best Practices:

45. Constraints are to be used sparingly.
46. Do not enter a constraint based on a random target date. All constraints should have a purpose and a reason why they are created.

47. If you feel you must use constraints or enter start or finish dates for most of your tasks, manual scheduling might be your scheduling style.
48. Keep the Total Slack column handy and watch for the negative values.
49. Negative total slack values are indicators of errors in the schedule. They should be resolved before the schedule is approved.

Practice: Working with Task Constraints

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.

Perform the following exercise on the ps07 virtual machine.

50. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
51. In the Project Server Accounts dialog box, click Add.
52. In the Account Properties dialog box, and complete the following settings and click OK.

Table 5.1 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 2: Advanced Task Management

Refining the schedule and fine tuning the scheduling of tasks will help resolve some scheduling issues. Schedules need to remain as flexible as possible. Using the advanced features below will help aid the scheduler in maintaining flexibility as well as offering different ways of analyzing problems within the schedule.

In this Lesson we will discuss:

- Task Deadlines
- Using the Task Inspector
- Using Task Form Views
- Task Notes
- Splitting Tasks
- Changing the start date of the project

Task Deadlines

Task deadlines are not part of the scheduling of Project 2010 and are treated differently by the software. Deadlines become an objective or a goal for a task. The scheduling of tasks with deadlines will not stop tasks from moving forward the way that other date constraints will. Deadlines enable the user to avoid some of the scheduling errors discussed in the previous lesson. Using deadlines gives the project manager a helpful way of marking target goals within a project schedule and receiving an alert when a deadline is exceeded.

To set a deadline:

53. Double click on a task to open the Task Information box
54. Click Advanced tab
55. Enter a Deadline date
56. Click ok

A deadline of April 23, 2013 has been assigned to the “Scope Com-

plete" task below. The deadline is represented by the green arrow on the Gantt Chart and does not appear in the Indicator column.

During project execution and tracking of the schedule, tasks will move forward in time. If a task with a deadline moves beyond the deadline arrow, the task will be considered late. Below is an example of the warning that will appear in the Indicator column if a deadline is not met. Notice the red diamond in the indicator column explaining that the task date has exceeded the deadline date.

Another indicator to watch would be the Total Slack column. A negative value indicates that tasks are late and have missed or exceeded the deadline. The negative value indicates how many days the deadline was missed by. It is also an indicator of the amount of recovery time required to get the project back on track.

Unlike constraints, deadlines are not part of the schedule calculation but are more of a visual indicator giving you flags when deadline targets are missed.

NOTE: Deadlines can be used in both manual or automatic scheduling mode.

Best Practices:

57. Substitute deadlines for constraints when possible.
58. Place deadlines on milestones to help manage short term goals. As long as the deadlines stay on the left side of the milestones, you are doing well.
59. When presenting high-level management reports, it is easy to see how the milestone is positioned in relationship to the deadline. It will be easy to measure how the plan is comparing to short-term goals.
60. If a deadline date has been exceeded, check the Total Slack column to see how much time needs to be made up to get back on schedule.
61. The default formatting for a deadline is a framed green arrow which is hard to see. Change for formatting to a solid green arrow for better visibility. Changes to Gantt Charts are unique to a Gantt Chart. Changing the formatting on one chart will not affect other Gantt Charts.

To change the formatting for the deadline indicator on a Gantt Chart:

62. Right click on the Gantt Chart area
63. Select the Bar Styles option
64. Scroll down in the top section until the Deadline line (it is the last line) – click on Deadline
65. In the bottom section on the left select the pull down arrow for type
66. Select Solid
67. Click ok to close the box

Using the Task Inspector

Task Inspector is new to Project 2010 and replaces Task Drivers in Project 2007. The purpose of Task Inspector is to analyze and assist in resolving scheduling issues.

Manual scheduling is very susceptible to scheduling errors because of its free form abilities. The errors shown below were a result of scheduling in Manual Scheduling mode. Task Inspector is also very effective in resolving scheduling issues for automatically scheduled tasks. The information in the Task Inspector will change based on the data in a task it is inspecting and the scheduling mode of the task.

Tasks should be inspected if there are scheduling issues or if more information is needed regarding scheduling influences for a task. Below is a list of some of the indicators to watch out for concerning scheduling issues. Some of these concerns were mentioned in the last course module.

68. Red squiggles beneath a date in the Start or Finish fields
69. Dots around Gantt bars
70. Red bar underneath a summary task means that the detail tasks will take longer than what is planned for a summary group

In the example below the task “Determine the best method of moving” is scheduled to start on April 25, which is 1 day after the scheduled completion for the summary task ‘Planning the Move’. Note the red squiggles under the date for the “Determine the best method of moving” task and the longer line under the summary task and the dots around the Gantt bar for the task. This error also affects the finish date of the milestone which ends sooner than the detail work of the summary task grouping.

When these problems arise, attempts should be made to resolve the issues. Task Inspector will help resolve some of the problems:

To activate Task Inspector:

71. Right click the red squiggle in the finish date column
72. Select Fix in Task Inspector, Respect Links, Switch Task to Auto Schedule or Ignore Problems for this Task
OR
Click on the task
73. Click on Task → Inspect
74. The following choices are returned:

The Task Inspector window will launch to the left of the view and the task number with the error will appear highlighted in yellow. Below is a

view of the Task Inspector pane for this situation. The pane information will change depending on the errors for the task, the scheduling mode, information influencing the task and solutions available.

Repair options will vary on a per task basis depending on task information available. The scheduler must determine the best solution for resolving scheduling issues. The lower portion of the Task Inspector lists factors influencing the error.

There is always the option to ignore the errors and allow them to remain in the schedule. At the bottom of the Task Inspector pane is an option to turn off future scheduling warnings for a specific task. If selected, the red squiggles and dots around the Gantt bars for error indication will no longer be visible when issues arise.

To close the Task Inspector, click the "X" in the upper right corner of the Task Inspector window.

Using Task Form Views

Task form views are very helpful in putting more information in front of the project scheduler and enabling them to make better decisions. The Gantt Chart and task tables are enabling the viewer to see only Task data. Adding the Task Form view will display resource and assignment data as well.

There are 2 views of Task form information:

- 75. Task Form
- 76. Task Detail Form

The Task Form and Task Detail Forms are very similar. They contain the same information in the lower section of the view. However, Task Detail form contains more data in the header information than the Task Form. Once the form is open, lower section of the form contains 8 sub views which provide different ways of looking at data for flexibility. Even though the Task Form may be shown as a stand alone view it is typically shown as part of a split screen view. One of the most popular split view combinations is showing the Gantt Chart view in the top pane and the Task Form in the bottom pane.

To show the Gantt Chart view in the top pane and the Task Form in the

bottom pane of a split screen:

77. Click on Task → Gantt Chart
78. In the lower right corner just below the down arrow is a small bar. Double click on the bar

The result will be the split screen below:

The default option of Resources and Predecessors appears in the Task Form on the bottom. Right click in the bottom pane and you will be offered 8 different choices for different views which will show data in different ways. The available choices are

Click in the bottom pane and the pane becomes active. Any changes that are made in the bottom pane are updated to the schedule. When a change is entered in the bottom pane, the button “Previous” changes its name to “ok” which will function as the **enter** key. Changes will not be updated until the “ok” button has been clicked. In the example below, 2 days of lag was added to the “Define preliminary resources” task. As a result the “Previous” button has changed to “ok”.

The Task Detail form contains additional information in the header which is helpful during project management and tracking. Its purpose is to put more information in front of the reader to aid in making decisions easier.

To view the Task Detail Form from the Gantt Chart view:

79. Click on View → Details

The Task Details Form header is shown below:

In addition to the information you see above, right clicking in the lower section of the view will reveal the same view options as seen in the Task Form above.

Adding Notes to Tasks

Each task has a freeform notes field. This field has no character length limitations, allowing for very detailed task notations. The notes field may contain several types of information such as objects, hyperlinks, bulleted lists, etc. Notes may be printed on reports, exported to Excel and may be used as needed throughout the life of the project schedule.

To enter a task note:

80. Double click on a task column to show the Task Information dialog box

81. Click the Notes tab

OR

82. Click on a task column while in the Gantt Chart

83. Click Task → Notes

The notes view for a task is shown below:

The Indicator column provides a visual indicator that a task note exists.

Hovering the pointer over the icon will display the first several characters of the note to give the reader an idea of its content.

Notes can be invaluable and should be used during the planning and execution of the project. After the project is completed and a post-project review is conducted, task note information will help in recalling details of what occurred during the performance of tasks.

Best Practice: Although the software allows users to insert images, documents and other objects and files into the notes, users should avoid doing so as it will significantly increase the file size. It is better to insert references or links to where the user can find associated and relevant files.

Applying Task Calendars

There will be times when a task must occur within a unique timeframe and outside of the project calendar parameters. In order to accommodate such instances, users can create a distinctive calendar that can be assigned to a task. In doing so the task will be scheduled in the unique timeframe and not affect the scheduling of the entire project.

Below are some examples of when a task calendar would be used:

84. Testing at a bank can only occur after the bank is closed 9pm to 6 am

85. A weekend cut over of a software package or upgrade

86. Testing of a product that requires a 24/7 test

87. A task that must occur on second shift

88. Task applied to an resource in an alternate time zone

The first step in using task calendars is creating the calendar using the same process described in Module 2 to create a base calendar. After the calendar is created, it then maybe applied to task. The resources assigned to the task will also be required to work in the unique timeframe. There is

an option to ignore the resource calendars and allow the scheduling of the resources to be directed by the task calendar for the specific task only.

To assign a calendar to a task:

89. Double click on the task to open the Task Information dialog box
90. Click the Advanced tab
91. Click the down arrow next the Calendar option to view the list of calendars that may be assigned as task calendars. Select the appropriate calendar.
92. If the “Scheduling will ignore resource calendars” option is needed – check the box
93. Click ok to close the box.

A visual indicator will appear in the Indicator column the Gantt chart view.

NOTE: Task calendars may only be applied to automatically scheduled tasks or manually scheduled tasks. When Task Inspector is opened, the task calendar that was used will be noted.

Splitting Tasks

There will be times during project scheduling that will require an interruption of work for a particular task. For example when planning a task, some of the work will occur on Monday and the remainder will occur on Monday the following week. In this situation two tasks could be entered or creating a split task would also work. Split tasks are designed for scheduling tasks that start then stop and start again.

When to use split tasks:

94. When the work of a long task is required to work around other tasks. Some of the work would be done before a hard date and the remaining portion of the work would be scheduled after the hard date.
95. Splits tasks may be used to help even out the resource work load
96. 100% of the work for a task is not required to be performed without interruption and could be broken up over time.

To split a task:

97. Click on Task → Gantt chart view

Click on the split task icon Task → Split task

98. Hover the split task mouse pointer over the Gantt bar of the task to be split.

The screen below will show the information box that will appear.

99. As the mouse pointer is dragged the length of the Gantt bar, the date will change in the box. Clicking the mouse pointer will split the task and leave a gap between tasks.

If the schedule has used “day” durations of tasks as the default scheduling increment, the gap in the split task will advance in 1 day increments or 1 week increments if “weeks” was used. A split task is shown in the view below.

The dots between the sections of the task are the split task indicators showing that the task has been split. The individual parts may be dragged back and forth as necessary to achieve timeframes that will work best for the task. Dragging the pieces back together to eliminate the split status for the task.

There are a few rules, however that you should be aware of when working with split tasks:

100. When a task is split, it is still one task and will be treated as such.
101. Relationships will be applied to the beginning and ending of the entire split tasks only and not to the individual pieces. The individual parts are not separate tasks and cannot have discrete relationships.
102. When resources are assigned, the work will be distributed over the total task duration and task as a whole.
103. Constraints are applied to the start or the finish of the entire task and cannot be applied to the individual parts.
104. The parts of the task may be dragged back together when needed.
105. Tasks may be split multiple times.
106. Splitting will refine the workload and the duration of the task.

There is an option to turn off the viewing of split tasks. The option may be turned on or off as necessary. Below is an example of a two day task which has been split. The work is now planned to be completed in three days.

To turn off the option to view split tasks:

107. Click on Task → Gantt Chart
108. Click on Format → Layout
109. Remove the check mark from the Show bar splits option
110. Click ok to close the box

Below is the same task with the task with the option to show the split turned off. Notice that the length of the task did not change but the split

task indicators are concealed.

NOTE: Split bars will occur during the tracking process as actual work is updated to tasks

Changing the Start Date of a Project

Typically a project start date might change between the time the project is planned and the project actually starts. There are several methods available to change the project start date. It is important that the tasks are re-scheduled to adjust to the new start date.

The easiest way to change the project start date is use the Project Information box. Changing the start date using this method will move all tasks without entered dates or constraints to be rescheduled as of the new start date.

To change a project start date:

111. Project → Project Information
112. Enter new start date
113. Click ok to close the box

Changing the project start date will not reschedule tasks which have entered dates or constraints. Project 2010 provides a function called Move Project which will move all of the tasks to the new project start date. When tasks with constraints are moved using this function, the constraint dates will be adjusted based on the new project start date.

For example: if a task has a constraint 3 months from the start date of the project and the project start date is moved 6 months the constraint date will be re-scheduled 3 months from the new project start date.

The Move Project function also has an option to move project deadlines. If this option is not selected, the Deadlines will remain at the original dates and will need to be updated manually.

To the project start date and move tasks with dates to a new timeframe:

114. Click Project → Move Project
115. Enter the new date and click ok

Practice: Working with Advanced Tasks

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.

Perform the following exercise on the Ps07 virtual machine.

116. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
117. In the Project Server Accounts dialog box, click Add.
118. In the Account Properties dialog box, and complete the following settings and click ok.

Table 5.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account

Table 5.2 PLACEHOLDER

Setting	Perform the following:
Set as default account	Select check box

Summary

Once created, the project schedule must be refined and adjusted to bring the schedule into a realistic and workable timeline. This module described some of the tools in Project 2010 to help tailor a project schedule to your needs.

In this module we discussed:

- 119. Project constraints
- 120. Project deadlines
- 121. Notes
- 122. Task Inspector
- 123. Task Calendars
- 124. Task form views
- 125. Split tasks
- 126. Changing a project start date



Chapter 6

Creating Resources

Module Overview

Projects are resource driven. Resources are defined as: people, equipment, materials, contractors and costs. A project cannot be carried out if there are no resources performing the project tasks. In the previous modules we discussed how to create and refine the tasks of a project schedule. Tasks represent the “What” of the project – what work needs to be performed. The resources are going to be doing the work and they are considered the “Who”. In future modules we will be discussing the “when” and for “how much” which are established when assignments are created.

After completing this module you will be able to:

1. Understand resource types
2. Create resources: work, cost, budget and material
3. Assign cost, budget and material resources to tasks

Lesson 1: Resource Types

Without resources doing the work projects would remain a planned schedule. Project 2010 has the ability to offer multiple types of resources to help accomplish the work of a project. The different types of resources are intended to provide flexibility to address most types of resources required during the planning and management of a project.

In this lesson we will discuss the resource types and their intended use:

1. Work resources
2. Cost resources
3. Materials resources
4. Budget resources

Work Resources

Assigning work resources to a project will allow for resource requirement forecasting and project scheduling based on resource availability. Work resources are usually human resources but can also be facilities, equipment rental and other types of resources. Resource costs can be forecasted using resource assignments to provide projected project budgets. Each work resource entry will contain a resource type, grouping, availability calendar, rate tables and other relevant data.

Effective uses of Work Resources are:

- Individual people – actual named resources
- Generic resources – these are job titles that can be used as placeholders to identify resources by skill type, skill level or if a resource is unknown. For example: DBA, Developer level 1, Event Planner, Plumber
- Group resources – used to state the quantity of a specific type of resource. For example: Helpdesk, Movers, Painters, Attendees, Members
- Facilities – a room or area that must be reserved for a period of time
- Contracted resources – external contracted labor
- Equipment – a machine used for a particular number of hours

Cost Resources

Cost Resources are defined as anything that will add a dollar(s) cost to a project. Use of Cost resources enables the scheduler to add estimated costs during the planning phase of the project. These costs will be updated into the baseline. When actual costs become available during tracking, the actual costs will be updated and compared against the original estimates to provide a variance.

Cost resources will inherently increase the cost for a task and for the project. Cost resources have no effect on work or duration. The cost value is applied to tasks as a flat amount at the time of assigning the cost expense to a task.

Effective uses of Cost resources are:

- Flat estimated cost:
 - Travel expenses estimated in advance
 - Flat amount equipment rental
 - Flat amount facilities rental
- Fees: license fees, permits
- Estimates for meetings expenses or food provided for events
- Estimates for miscellaneous project expenses
- Estimates for a flat amount for a fixed bid contracted resource when hours are not accumulated

Best Practice: Project 2010 allows for as many cost resources as needed but for simplicity try to consolidate cost resources and keep them to a limited number. The type of reporting required for the project would drive the quantity of cost resources that will be needed.

Material Resources

Material resources are defined as consumables. For example: Reference books for a new product might cost \$50 each and 20 books are needed. A material resource would be created with a cost of \$50 per book. An assignment would be entered for a task for 20 books. As a result \$1,000

is added to the cost of the project. During tracking, the actual number of books would be entered to adjust the quantity if necessary.

The cost of the material resources are added to the total cost of the project and updated into the project baseline. Material resources do not affect work or duration.

Effective uses of Material resources are:

- Construction: create a material resource for the cost of 1 foot of trim. Enter the number of feet required for the task
- Conference: create a material resource for the cost of giveaway bags. Enter the number of giveaway bags needed for the conference
- Servers: create a material resource for the cost of 1 server. Enter the number of servers needed for the project.

Best Practice: If your project will be using a large quantity of materials such as a construction project, using Excel might be less work and a more effective means of keeping track of materials.

Budget Resources

Budget resources are used to estimate the total budget of a project as work and cost values. The estimates are held by the project summary task and used for reporting and comparison purposes. Budget values can be compared to the baseline and actual values to determine project health which may be viewed as custom created reports. The budget values are assigned to the project summary task and apply to the entire project.

Effective uses of Budget resources are:

- When you want to be aware of the total cost estimated budget for a project and how it relates to baseline cost and actual costs.
- When you want to be aware of the total work estimated budget for a project and how it relates to baseline work and actual work.

Budget cost and budget work figures may be timephased and variably spread over the duration of the project schedule. The budget for a project might not be distributed evenly and the timephased ability allows for a variable distribution of the funds and work.

Budget values are entered amounts and not calculated. Once the budget values are entered they will not be recalculated by the Project 2010.

Any changes to the values are done manually.

Best Practice: Organizations should set a standard for the values used for budgets and what is included. Some organizations feel it should be the actual budget for the project. Others feel it should be the budget plus reserve amounts. There should be a consistency placed within an organization.

Lesson 2: Creating Resources

Resources available for assignment to tasks reside on the Resource Sheet. Resources are either entered manually or imported using Active Directory, Outlook , or copy and paste from a source like Excel or Word. This lesson will teach you how to manually enter resources on the Resource Sheet.

Fixed costs are additional flat amount costs that a project might incur. Learning how to work with fixed costs will enable you to include all projected costs for a project.

At the end of this lesson you will be able to:

1. Create a work resource
2. Create a material resource
3. Create a cost resource
4. Create a budget resource
5. Enter fixed costs for a project

Creating a Work Resource

A work resource is usually a named person or generic skill type. They are resources that will have hours of work and the following formula will apply:

$$\text{Assignment Work (hours)} = \text{Duration (days)} \times \text{Calendar} \left(\frac{\text{hours}}{\text{day}} \right) \times \text{Assignment Units (\%)}$$

Figure 6-1 PLACEHOLDER

- The resource cost is stored in the resource record on the Resource Sheet.
- The number of hours of work will come from the assignment of the resource to the task.
- Assignments units will be the quantity of the resource.

Resources are entered on the Resource Sheet.

To display the Resource Sheet:

- Click **Task** → **Gantt Chart view** → **Resource Sheet**

The default table view of the Resource Sheet is called the entry table view which is shown below. This table is a subset of many resource fields of information that are available. This table represents the most important fields that should have values entered for a resource. More information is accessible through the Resource Information dialog box.

	(i)	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base

Figure 6-2 PLACEHOLDER

To enter a resource, type the resource name in the “Resource Name” field. The Resource Name is the key field for the resource data.



Many reports and assignment views will display resources in alphabetical order. A standard of last name first name allows for easy location of resources while making assignments. The database does not allow commas or other special characters. When entering first names it is best to use full first names and avoid using nicknames.

After the name is entered, several fields will be populated with default information. The view below shows the default information that is automatically entered:

	(i)	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code
1		Smith Robert	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	Standard	

Figure 6-3 PLACEHOLDER

The values for these fields are:

Type: Work is the default and will establish Robert Smith as a work resource. Other values are material and cost and can be changed by clicking the down arrow and changing the type selection.

Material: used for Material resources only – skip for work and cost resources.

Initials: enter full initials for resources. Initials may be substituted on Gantt Charts or reports as needed to shorten reports.

Group: Group is technically a free use field. It is usually used for

department, location or skill set. It is one of the few fields populated in the task data when an assignment is created. This information is used to generate reports by groupings of resources. A best practice is that an organization set a standard for the use of this field.

Max units: The value shown above is in the default percentage format but can also be viewed as a decimal value.

To change to a decimal value: Click **File → Options → Schedule**

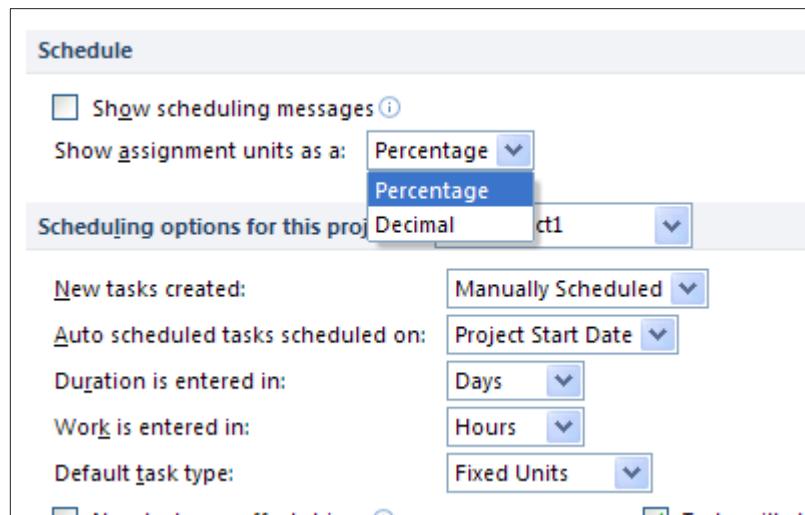


Figure 6-4 PLACEHOLDER

The Max units' value is an indicator of the quantity of a resource that is available. Typically an individual should always have a value of 1 or 100%. When entering a group resource such as the number of people on the Helpdesk, enter the number of resources in the group. Each resource represents 1 unit. The available quantity of the resource will be determined by number of hours in a day x Max units. For example if there are 5 people on the Helpdesk, enter 5 or 500% in the Max Units column. With 5 available resources each one can work 8 hours per day. Helpdesk will have 40 available hours of work per day. When Helpdesk resources are assigned to a task, the Helpdesk will not be overbooked until 40 hours have been assigned.

 Some reference sources recommend using a lesser value in the Max units field to limit a resource's availability. This can produce variable results when creating assignments.

Standard rate: Enter the loaded rate for the resource. A loaded rate is pay scale plus overhead factors. In most organizations, this figure comes from the accounting department with periodic updates. Default is rate per hour but a rate may be entered as /yr a yearly rate or /w for a weekly rate.

Overtime rate: When using overtime, a rate for the overtime hours may be entered in this field. It will affect only overtime hours entered.

Cost per use: An extra value that may be added to a task over and above the Standard Rate for the resource. For example: A repairman is called to fix a refrigerator. The repairman charges a transportation charge, and hourly rate, plus parts. The cost per use is the transportation charge and would be applied to every task the repairman would be assigned to.

Accrue at: Cost accrual is an indicator of a point in time when costs are incurred. Cost accrual settings have 3 options: incur costs at the start of the task, incur costs at the end of the task, or incur costs throughout the task (prorated). Prorated accrual is the default option.

Base calendar: Each work resource will have a resource calendar associated with it. The resource calendar is based on calendars that have been previously established for the project. The Standard Calendar is the default resource Base Calendar. If the base calendar contains company non-working time it is not necessary to reestablish company holidays, statutory holidays, etc. as all of these will be applied to the resources. Use the dropdown list to select the appropriate calendar for a resource.

The Resource Information dialog box is used to record information about a resource that is not captured in the Resource Sheet.

To view Resource Information dialog box:

- Double click the resource you wish to access

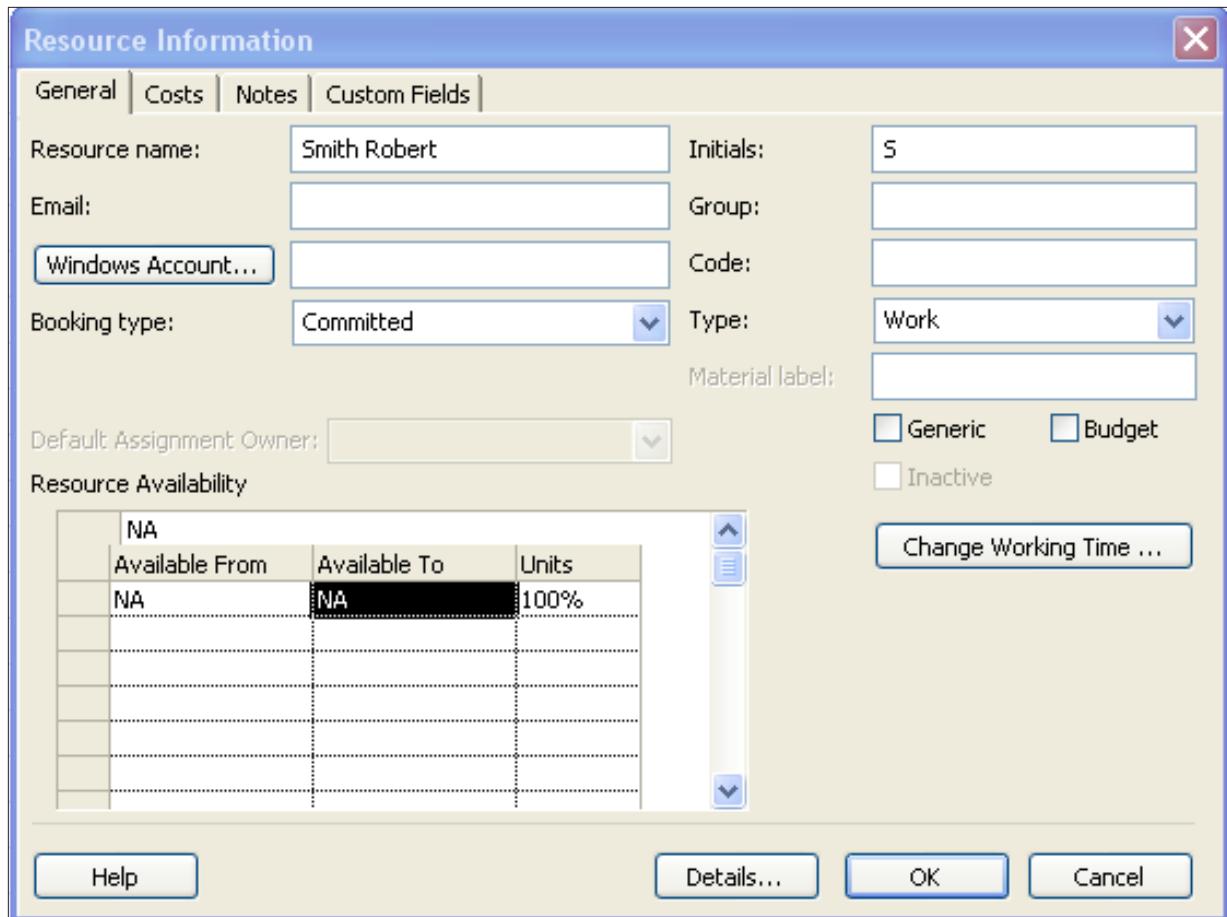


Figure 6-5 PLACEHOLDER

General tab data:

Email: reference only for Project 2010 standard

Windows Account: Project Server 2010 usage only

Booking type: Project Server 2010 usage only

Code: If you have a code associated with a resource, enter it here.

Typically this code is a cost center or department cost category. Free use field for users.

Generic: Click this field to indicate that the resource is a generic resource. A generic resource is a skill type resource to be used as a holding value until a human resource is assigned. When generic resources are used, default base calendar for scheduling.

Budget: budget resources only

Inactive: Project Server 2010 use only

Resource availability: Enter dates if the resource is only available for a particular period of time. For example: An outside contractor is hired for a specific length of time. Enter the date ranges the resource will be available.

To change the resource availability calendar:

From the **General** tab, click **Change Working Time** button. The view will appear:

The form looks identical to the form used to change project and base calendars discussed in an earlier module. The view above is the calendar assigned to Smith Robert and it uses the Standard calendar as a base build the calendar for the resource. Changes to this calendar are made in the same way that changes were made to the project calendar.

Click **OK** to close the calendar form.

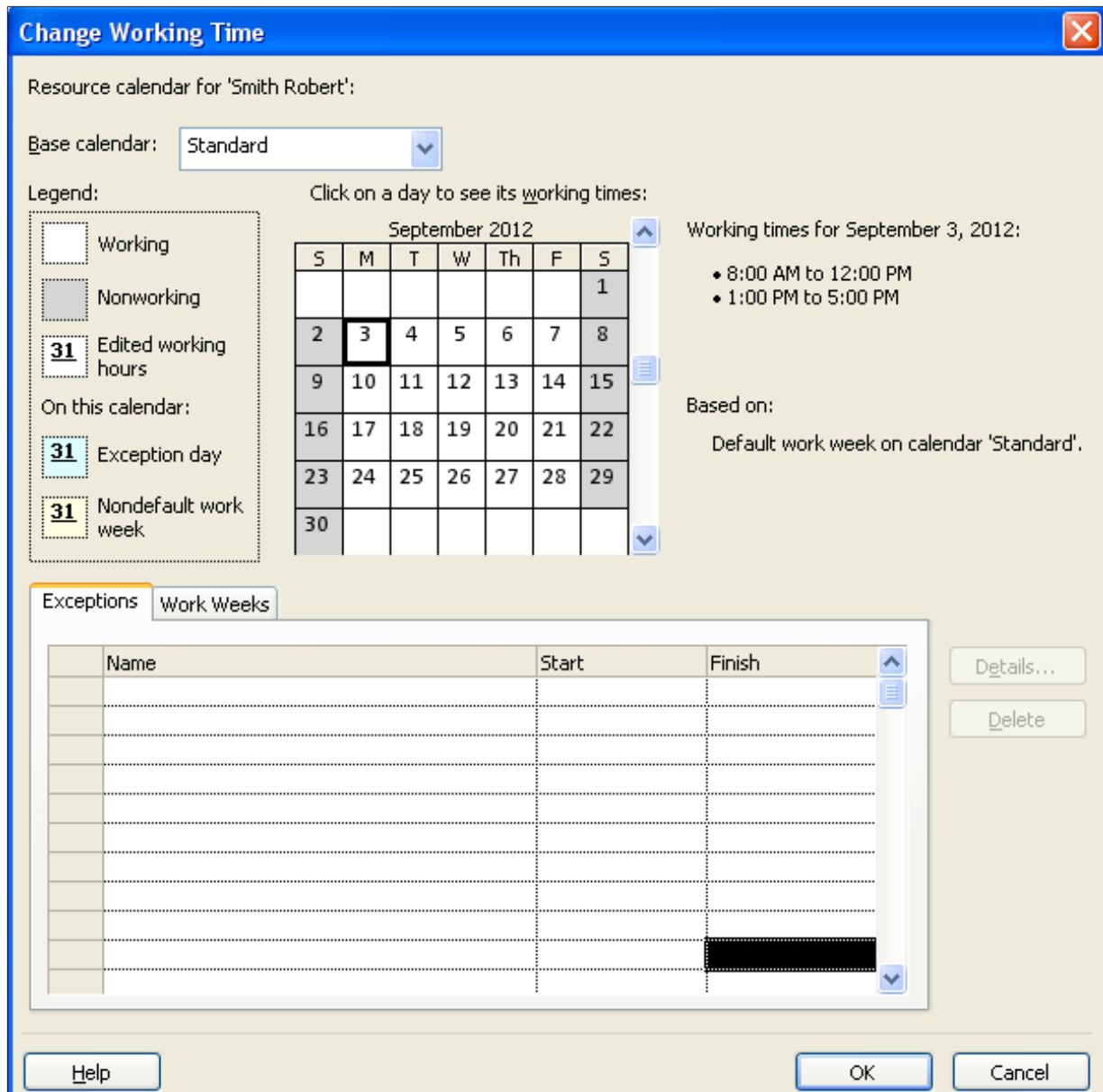


Figure 6-6 PLACEHOLDER

Cost tab data:

Resource costs are stored on the Cost tab. A resource may have up to 5 cost tables to accommodate varying rates. The tables are labeled A, B, C, D, and E. Labels may not be changed. Some resources will charge

different rates when performing different types of work. Each assignment may be assigned a rate table.



If more than one rate table is being used for a resource, enter a note on the Notes tab to help keep track of the purpose of each rate table.

Most organizations using costing experience periodic rate changes. The effective date allows early storage of future rate adjustments and become active based on a cut off date. If a project spans the cut off date, the tasks before the cut off date of the project will be costed at the earlier date rate and the remaining tasks which exceed the cut off date will contain increased rate. It is easy to see that if a project runs late, the cost of the project could increase when using rate tables.



If using resources that come on shore and off shore use the effective date to change rates for resources when they change location.

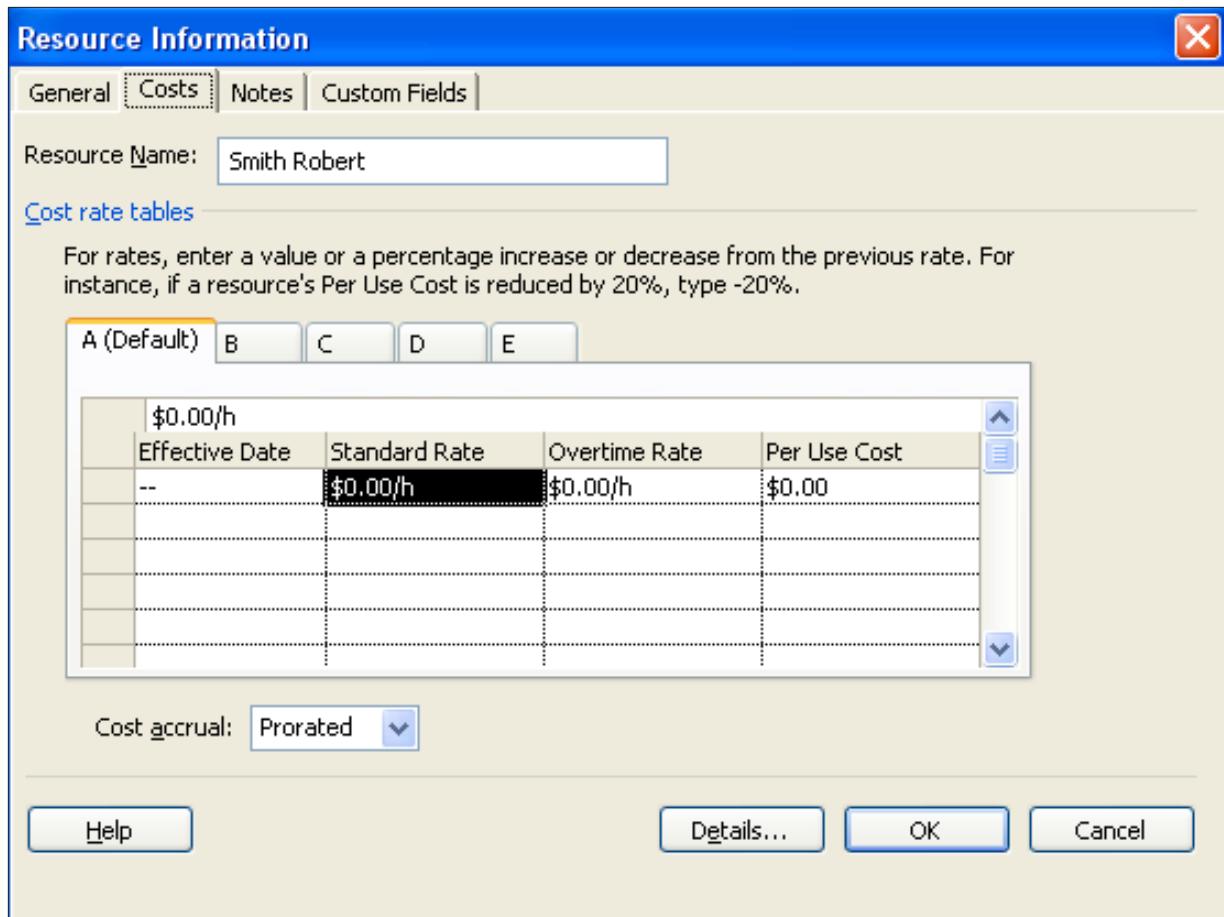


Figure 6-7 PLACEHOLDER

Notes tab data:

Resource notes are treated the same as task notes within Project 2010. Resource note data has the same formatting and flexibility as task notes.

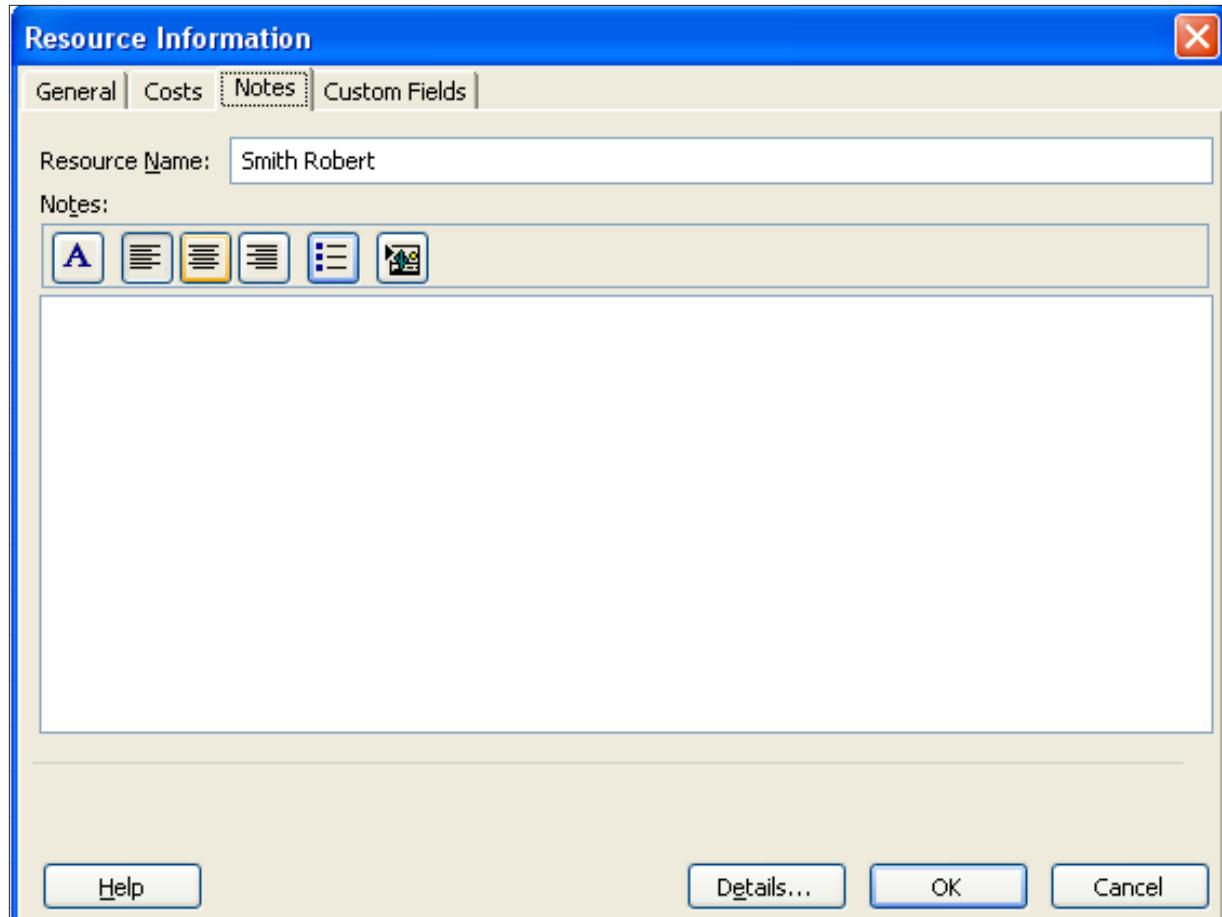


Figure 6-8 PLACEHOLDER

Custom Fields tab data:

If custom fields have been created for resources, they will be available through the custom fields tab.



Resources may be imported from Active Directory and Outlook to be added to the Resource Sheet. Once they are downloaded from these sources, additional information will be required to complete the entries for the resources.

To access the download function for resources click:

- Click **Task** → **Gantt Chart view** → **Resource Sheet**

- Click **Resource** → **Add Resources**

Add Resource options are shown below.

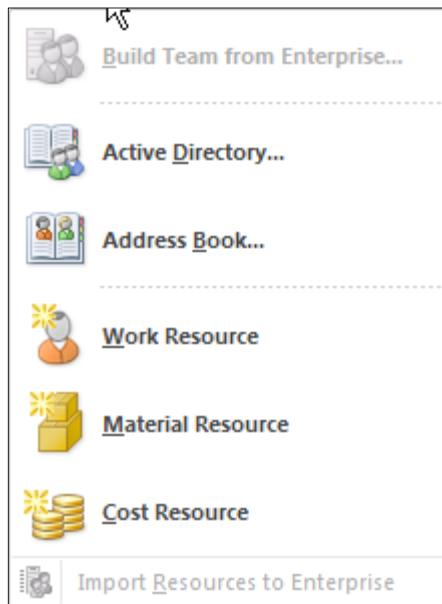


Figure 6-9 PLACEHOLDER

Creating a Material Resource

Material resources are supplies to be used by the project, such as paint, building materials, equipment, etc. Material resources are valued based on the quantity of material to be used which is assigned to a task.

Below are the fields associated with Material resources.

Resource name: name of the consumable item

Type: Material

Material label: boxes, gallons, feet, each – the label that describes the material

Standard rate: the per unit/each price

Accrue at: accrual rate for the material

Material resource entries are shown below:

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At
Smith Robert	Work		RS		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated
Paint	Material	gallons	P			\$25.00		\$0.00	End
PC's	Material	desktops	PC			\$2,000.00		\$0.00	Prorated
Boxes	Material	each	B			\$10.00		\$0.00	Prorated

Figure 6-10 PLACEHOLDER

Overview of Costing in Microsoft Project

Cost in Project 2010 acquires information from many values to accumulate a final cost value per task. Per task cost values rollup to the summary task which will in turn rollup to create a grand total stored in the Project Summary task. These calculations will occur in both manual and automatic scheduling mode.

The cost values included in the costing formula are:

- Resource work hours
- Fixed costs
- Material costs
- Cost resource values
- Overtime costs and hours

The cost formula is as follows:

Number of hours assigned to a resource X the standard rate for the resource

(Adjusted rate depending on rate tables by date) +

Number of hours of overtime assigned to a resource X the overtime rate for the resource

(Adjusted rate depending on rate tables by date) +

Value of cost resources assigned to a task +

Value of fixed cost enter for a task +

Value of material resources (units) assigned X per unit rate =

Total cost for a task



Many of the task tables contain the column “Total Cost”. However, the field is really called “Cost”. There was a visual name change to “Total Cost” to add clarity.

Creating a Cost Resource

Cost resources are used to apply estimated costs specific tasks in a project. Estimated costs are entered during the planning stage and tracked when actual costs are entered during the execution or control stage of the project.



When naming cost resources include “Cost” as the first word in the name. It will be helpful when assigning cost resources for the name to give an indication of the resource type. Resources appear in alphabetical order when creating assignments and including “Cost” as the first word ensures all Cost resources will be grouped together in the list.

To enter a cost resource:

Resource name: For example: Cost travel, Cost food, Cost room rental, etc.

Type: Cost

No other information is required. Below 3 cost resources have been added. The amount of the cost will be added at the time the assignment is created.

	i	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1		Smith Robert	Work		RS		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2		Paint	Material	gallons	P			\$25.00		\$0.00	End	
3		PC's	Material	desktops	PC			\$2,000.00		\$0.00	Prorated	
4		Boxes	Material	each	B			\$10.00		\$0.00	Prorated	
5		Cost travel	Cost		C						Prorated	
6		Cost food	Cost		C						Prorated	
7		Cost room rental	Cost		C						Prorated	

Figure 6-11 PLACEHOLDER

Creating a Budget Resource

A budget resource is intended to hold the project budget to be used as a comparison against baseline and actual cost and work values. The budget resources are the only resource type that may be assigned to the Project Summary task.

To create a Budget Work resource:

Resource Name: ie: Budget work

Type: Work

Set the budget check box:

- **Double click on the resource** to open the Resource Information dialog box
- Click **General** tab
- Click **Budget check box**
- Click **OK**

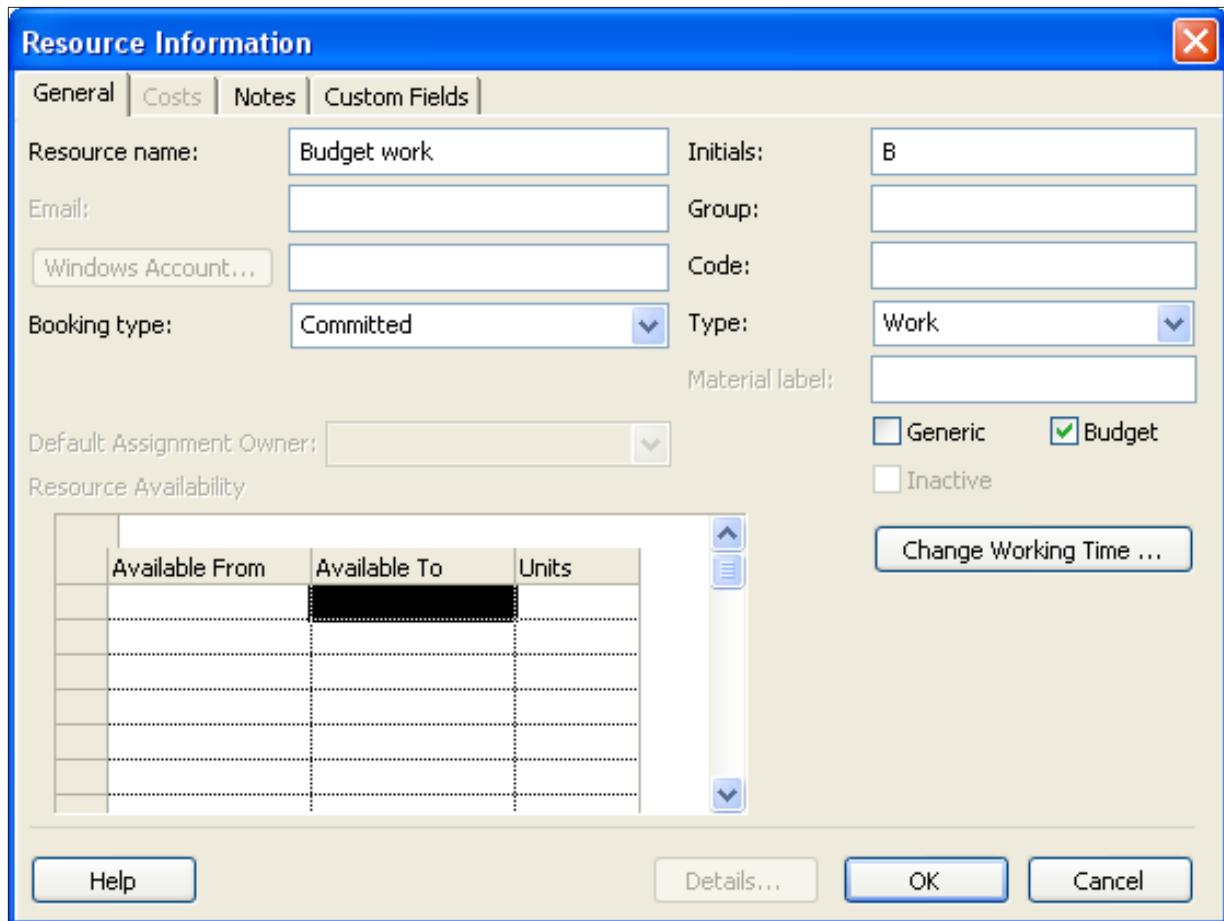


Figure 6-12 PLACEHOLDER

To create a Budget Cost resource:

Resource Name: ie: Budget cost

Type: Cost

Set the budget check box:

- Double click on the **resource** to open the Resource Information dialog box
- Click on the **General** tab
- Click the **Budget check box**
- Click **ok**

Below is an example of what these 2 resources would look like once assigned. The Budget column is inserted to show the budget settings turned on.

		Resource Name	Type	Budget
1		Smith Robert	Work	No
2		Paint	Material	No
3		PC's	Material	No
4		Boxes	Material	No
5		Cost travel	Cost	No
6		Cost food	Cost	No
7		Cost room rental	Cost	No
8		Budget work	Work	Yes
9		Budget Cost	Cost	Yes

Figure 6-13 PLACEHOLDER

Entering a Fixed Cost

A Fixed Cost is an extra flat amount value that is applied to a task when necessary. It is included in the total cost formula for a task and will roll up to the total cost for a project. Only flat amount values can be inserted into the Fixed Cost column. When multiple values are needed, they must be manually accumulated and the total entered in the Fixed Cost field.

To view Fixed Cost field:

- **View → Gantt Chart → Tables → Cost**
OR
- **View → Gantt Chart**
- Right click in the upper left corner above the task ID numbers and select Cost from the list of tables

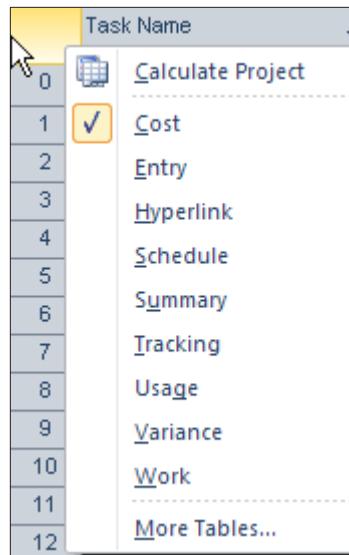


Figure 6-14 PLACEHOLDER

Below is a view of the Cost table with the Fixed Cost column indicated:

	Task Name	Fixed Cost	Total Cost
0	<input checked="" type="checkbox"/> Home Move 2010	\$0.00	\$0.
1	<input checked="" type="checkbox"/> Five to Eight Weeks Before Moving	\$0.00	\$0.
2	<input checked="" type="checkbox"/> Planning the Move	\$0.00	\$0.
3	Calculate moving expenses	\$0.00	\$0.
4	Determine the best method of moving	\$0.00	\$0.
5	Create a moving-expense receipt file	\$0.00	\$0.
6	Create a moving binder	\$0.00	\$0.
7	Planning the Move completed	\$0.00	\$0.

Figure 6-15 PLACEHOLDER

The fixed cost column is the second column from the left on the cost table. Enter in the fixed cost value for the task in the fixed cost column. If multiple values are needed the amounts must be accumulated and entered into this field as a lump sum.



When entering a fixed cost amount enter a journal note into the notes field. This note will remind you what the value of the expenses were, when they were entered and by whom.

Task 5 used \$100 in office supplies. See below the result of applying \$100 to the fixed cost field for task 5.

	Task Name	Fixed Cost	Total Cost
0	□ Home Move 2010	\$0.00	\$100.00
1	□ Five to Eight Weeks Before Moving	\$0.00	\$100.00
2	□ Planning the Move	\$0.00	\$100.00
3	Calculate moving expenses	\$0.00	\$0.00
4	Determine the best method of moving	\$0.00	\$0.00
5	Create a moving-expense receipt file	\$100.00	\$100.00
6	Create a moving binder	\$0.00	\$0.00
7	Planning the Move completed	\$0.00	\$0.00

Figure 6-16 PLACEHOLDER

The total value subtotalled into the total cost fields for the summary and project summary tasks. Note that the fixed cost column does not subtotal to the summary values for the fixed cost field.



Fixed costs that reside in an external file, such as an Excel workbook can be dynamically linked to the fixed cost field for a task by copying the external field and then **Paste → Paste Special → Paste Link → Text Data** into the fixed cost field for a task.

Whenever the source value changes, the value in the fixed cost field will also update. This method is using external links and requires that the files not be moved to avoid breaking the links.

Practice: Creating Resources

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.

Perform the following exercise on the Ps07 virtual machine.

6. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
7. In the Project Server Accounts dialog box, click Add.
8. In the Account Properties dialog box, and complete the following settings and click ok.

Table 6.1 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Assigning Material, Cost and Budget Resources to Tasks

Once resources have been entered into the resource sheet, they may be assigned to tasks to create assignments. An assignment is applying the “who” (resource) to the “what” (task) to create the “how” and “when” (assignment).

After completing this lesson you will be able to:

1. Create assignments for Cost resources
2. Create assignments for Material resources
3. Create assignments for Budget resources



Creating assignments for work resources will be addressed in
Module 7.

Assign a Cost Resource to a Task

The purpose of assigning a cost resource to a task is to add additional estimated costs that the task might incur. Tasks may have multiple cost resources applied but the same resource name may not be applied more than once. Cost resources will not affect the scheduling of a project.

There are several methods available to assign a cost resource to a task. A few are described below:

Create an assignment using the Assign Resources box:

- Click **Task → Gantt Chart**
- Click **Resource → Assign Resources** to display the Assign Resources dialog
- Click on the task you would like to assign a Cost Resource to
- Click the **Cost resource name**
- Enter the amount of the cost in the cost column
- Click **Assign**
- Click **Close to close the box**

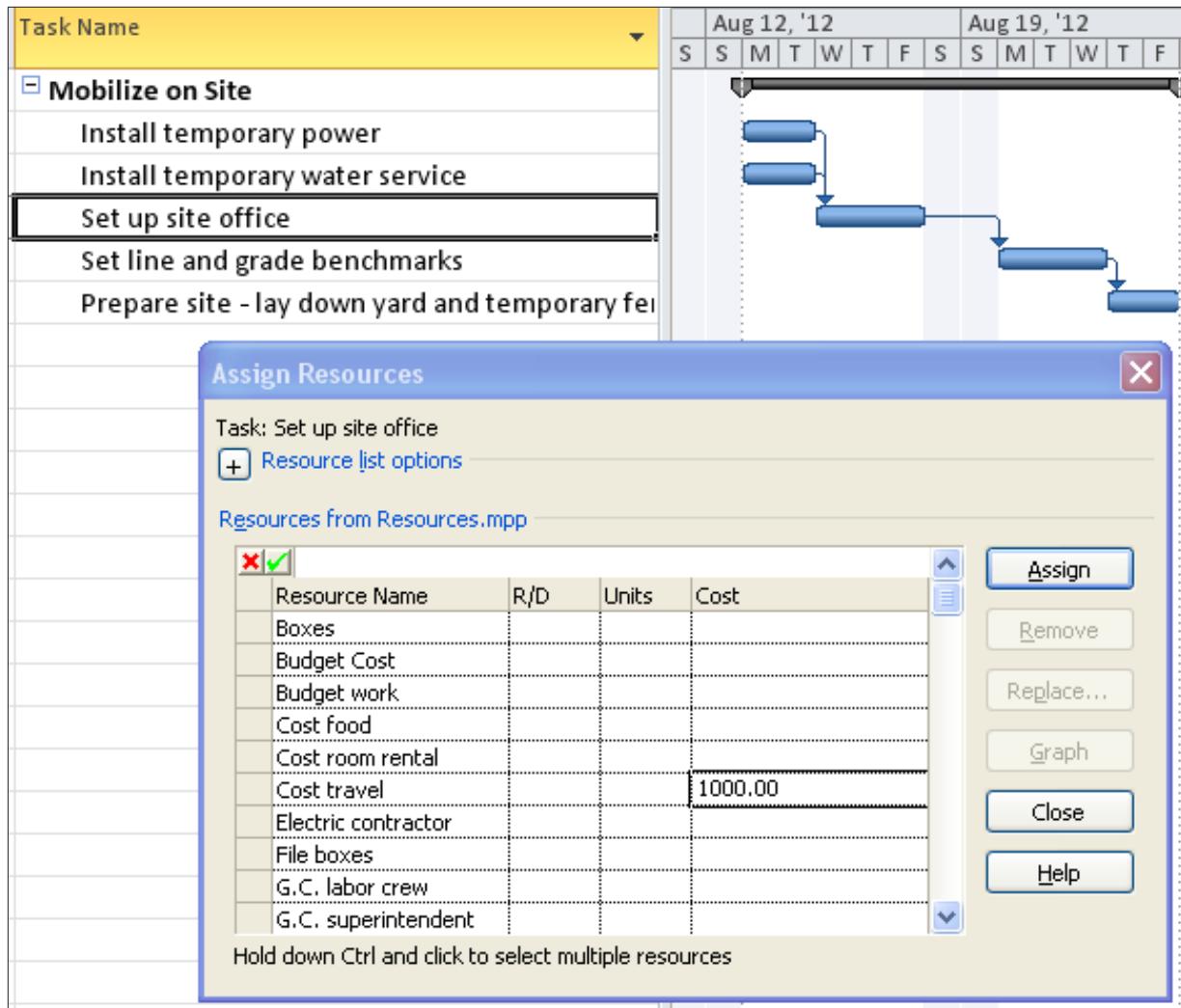


Figure 6-17 PLACEHOLDER

The result of the assignment will appear like this:

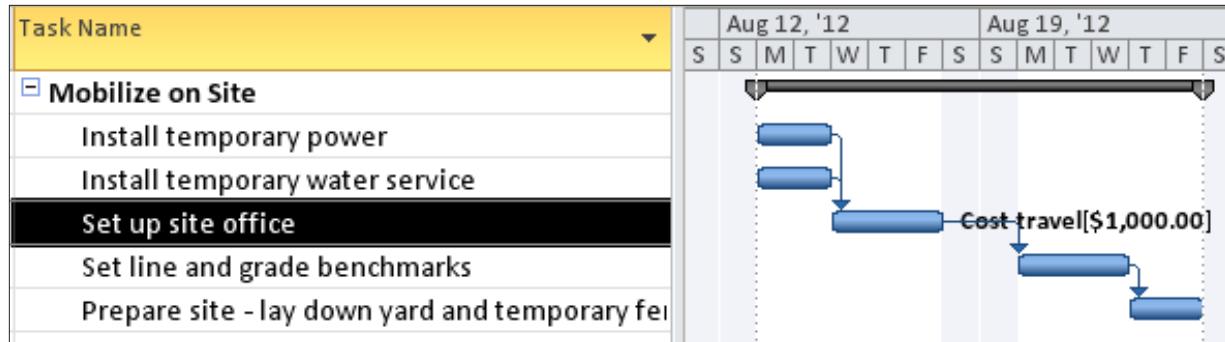


Figure 6-18 PLACEHOLDER

An alternate method of assigning a Cost Resource to a task is through the Task Information dialog box:

- Click **Task** → **Gantt Chart**
- Double click on the task you would like to assign the cost resource to
- Click **Resources** tab
- Click on the next open line and select the cost resource to apply
- Enter the cost value in the cost column
- Repeat for additional entries
- Click **OK** to close the box

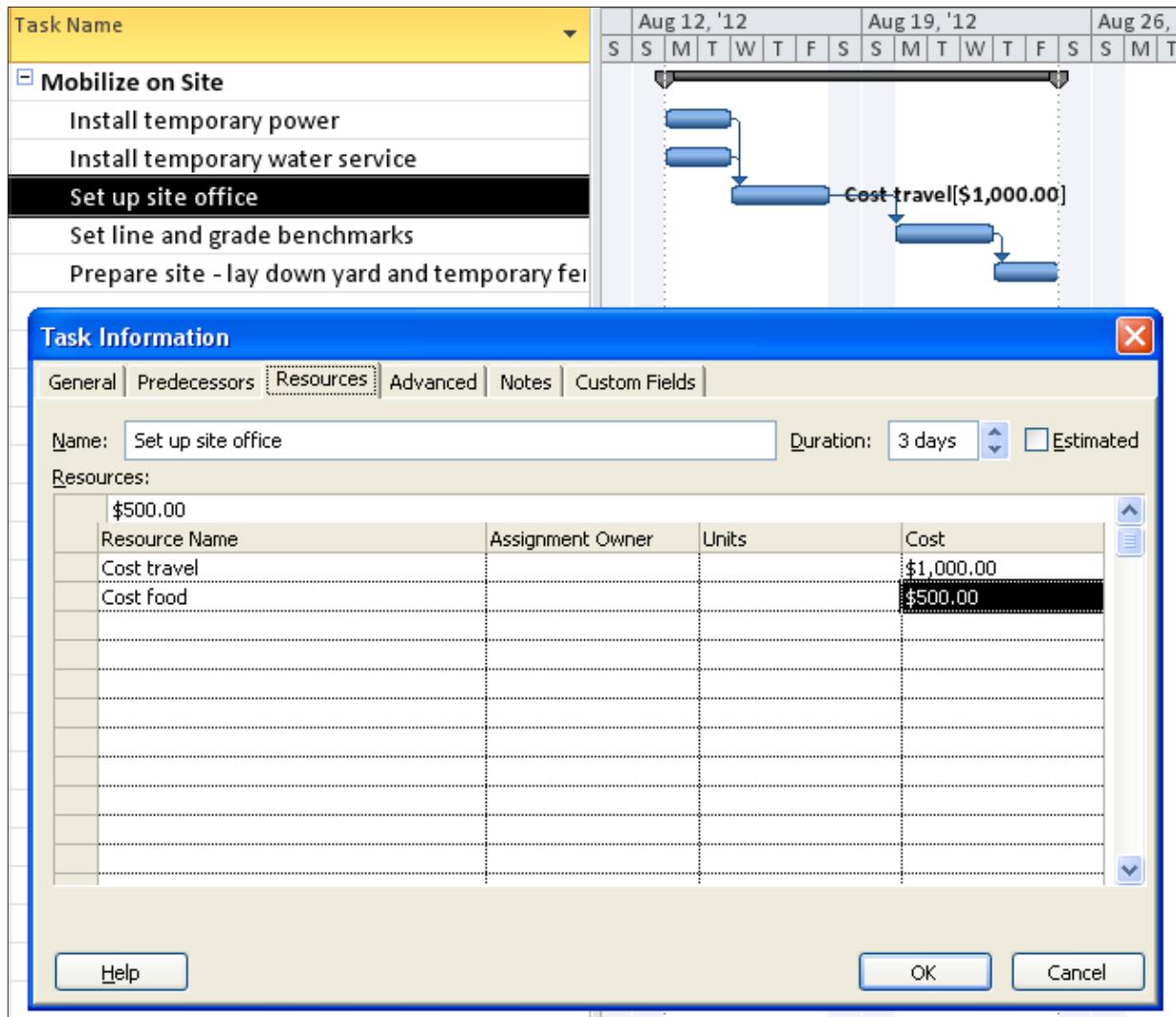


Figure 6-19 PLACEHOLDER



Project 2010 allows entering a new resource name in the Task Information dialog box or the Assign Resources box. The resource will be added to the Resource Sheet as a new resource using the default field values as a work resource which might not be correct for the resource data needed. Additional field values may also be required to complete the resource data correctly. It is a best practice is to create resources through the Resource Sheet.

Assign a Material Resource to a Task

Assignment of material resources is very similar to assigning a cost resource to a task. A material resource is assigned by entering the number of items for the material resource assignment.

There are several methods of assigning a material resource to a task. A few are described below:

Create an assignment using the Assign Resources dialog box:

- Click **Task** → **Gantt Chart**
- Click **Resource** → **Assign resources**
- Click the task you would like to assign a material resource to
- Click on the **Material** resource
- Enter the amount of the number of items in the units column
- Click **Assign**
- Click **Close** to close the box

In the example below, 200 Electrical Connectors were assigned to the Install Temporary Power task.

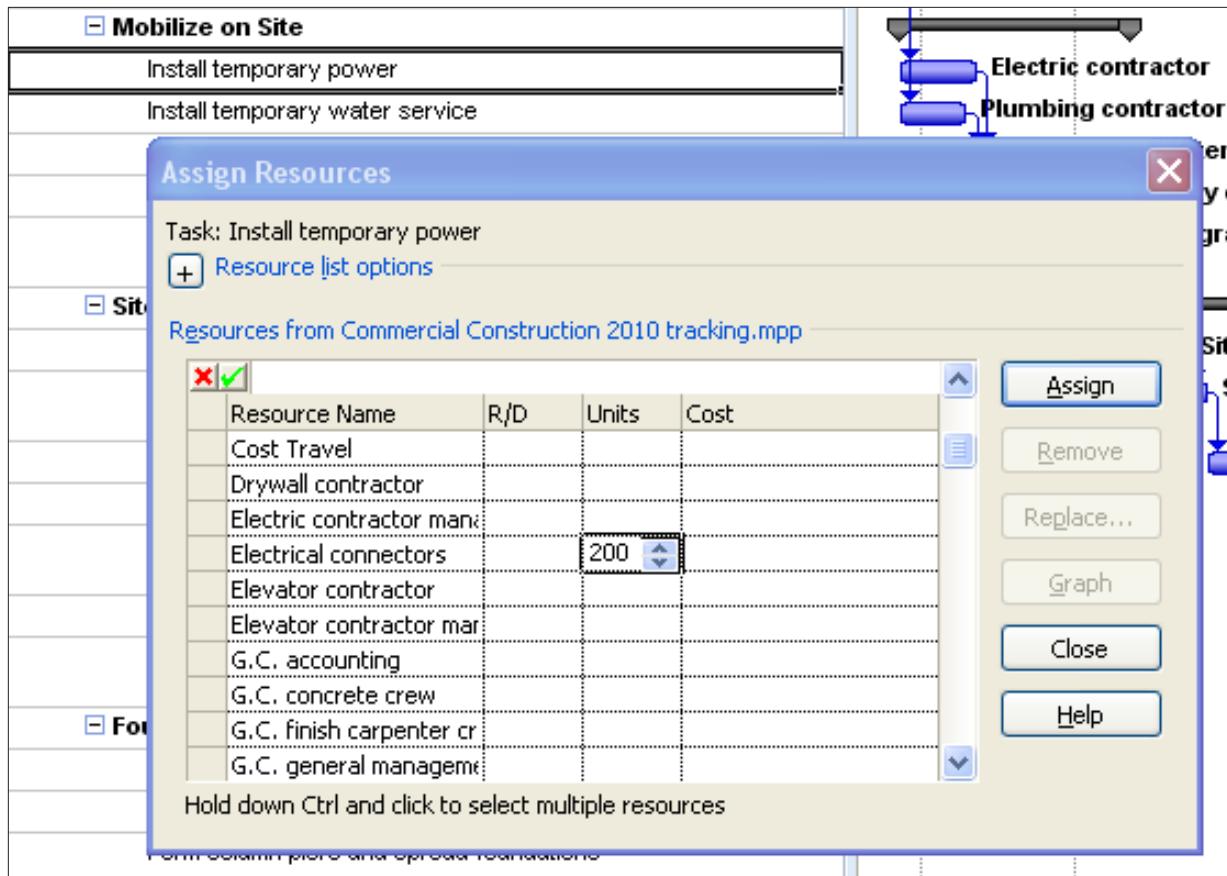


Figure 6-20 PLACEHOLDER

An alternate way of assigning a material resource can be accomplished using the Task Entry view. The Task Entry view is a preset view that displays the Gantt Chart in the upper portion of the screen and the Task Form in the lower portion. The view is shown below.

To display Task Entry view:

- Click **Task** → **Gantt Chart** → **More Views** → **Task Entry** → **Apply**
- Right click in the bottom pane and select Work

To create the assignment:

- Click the task you wish to assign the resource to
- Click **Resource Name** field in the lower pane
- Click the down arrow in the Resource Name field to display a list of resources
- Select a material resource

- Enter number of units or items in the units field
- Click **ok** button on the Task Form to enter the assignment

In the example below “Fencing material” is the material resource. On the Resource Sheet the material was entered as \$20 per foot. 400 linear feet of fencing was entered in the units column for the assignment. Below is the result of the assignment.



When creating assignments or making changes in the Task Form as part of a split screen, the second button on the right of the view will say “Previous”. As changes are made the value will change to “ok”. The “ok” button must be clicked to have the changes take effect.

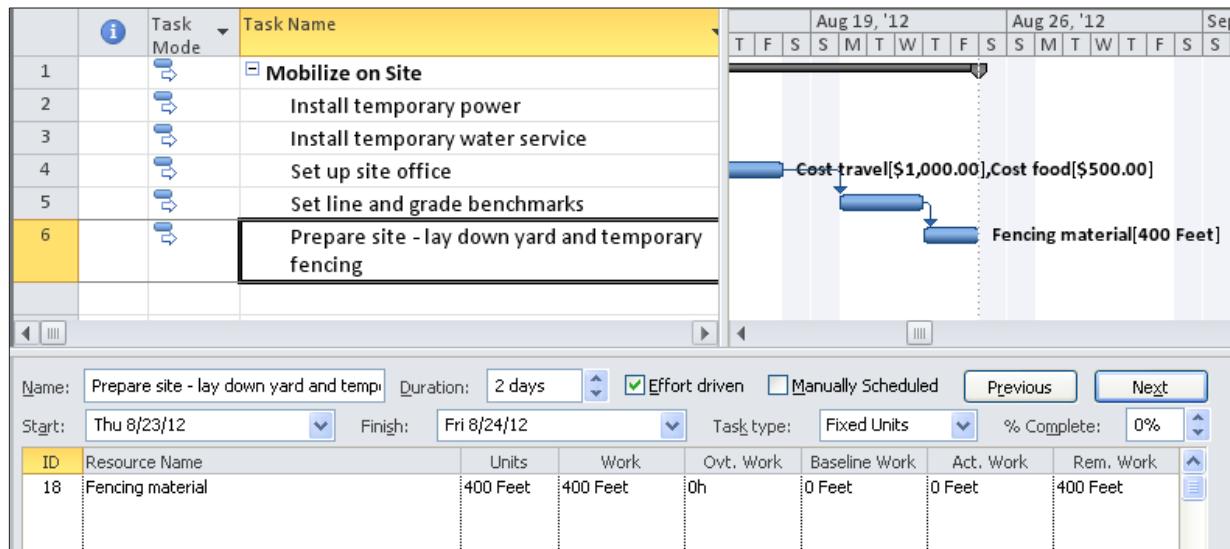


Figure 6-21 PLACEHOLDER

Right click in the bottom pane and select Cost and view will view the cost of the material.

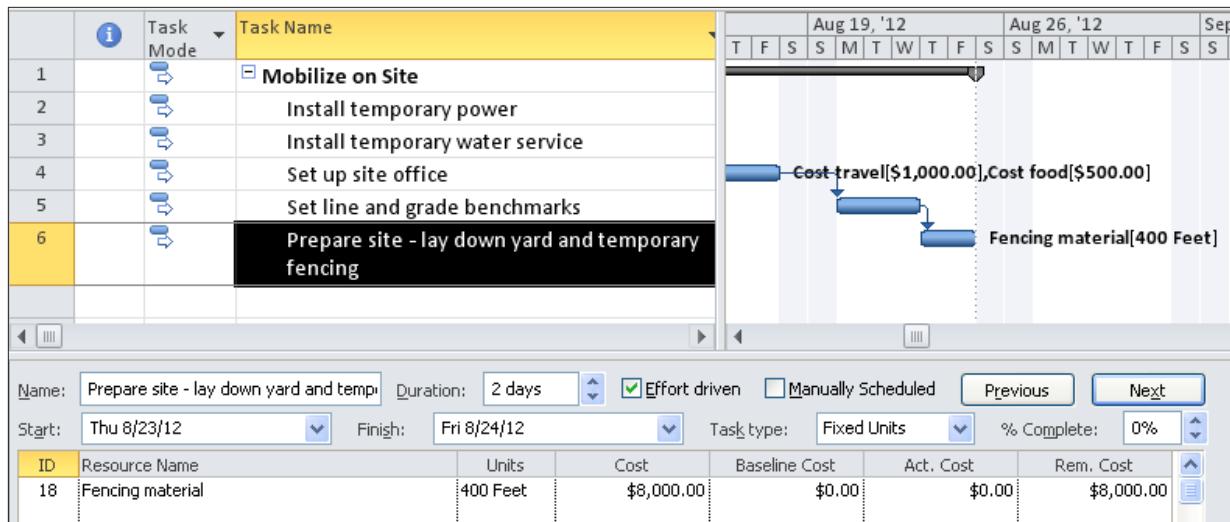


Figure 6-22 PLACEHOLDER

Assign a Budget Resource to a Project Summary Task

Budget resources are intended to apply to the entire project and are assigned to the Project Summary task only. Both budget costs and budget work values for Budget resources may be entered per project. After the budget amounts are entered they can be fine-tuned to reflect how the budgeted cost or budgeted work is distributed throughout the project schedule.

There are several steps that must be followed to ensure the assignment and values are entered correctly:

1. Create the budget resources on the Resource Sheet (explained earlier in this module)
2. Assign the budget resources to the Project Summary Task
3. Enter the work and cost values for the budget amounts

Perform the following steps from the Gantt Chart view. These steps

also assume that Budget Cost and Budget Work are budget resources on the Resource Sheet.

To view the Project Summary task:

- Click **Format → Project Summary Task**

To assign budget resources to the Project Summary Task:

- Click **Resource → Assign Resources**
- Click on the **Project Summary Task**
- Click **Budget Work** in the Assign Resources box
- Click **Assign**
- Click **Budget Cost** in the Assign Resources box
- Click **Assign**
- Click **Close** to close the box



If you are not able to assign the budget resources to the project summary task, double check the budget setting for the resources on the resource sheet. Only budget resources can be assigned to the Project Summary task. If they cannot be assigned, the budget flag isn't turned on.

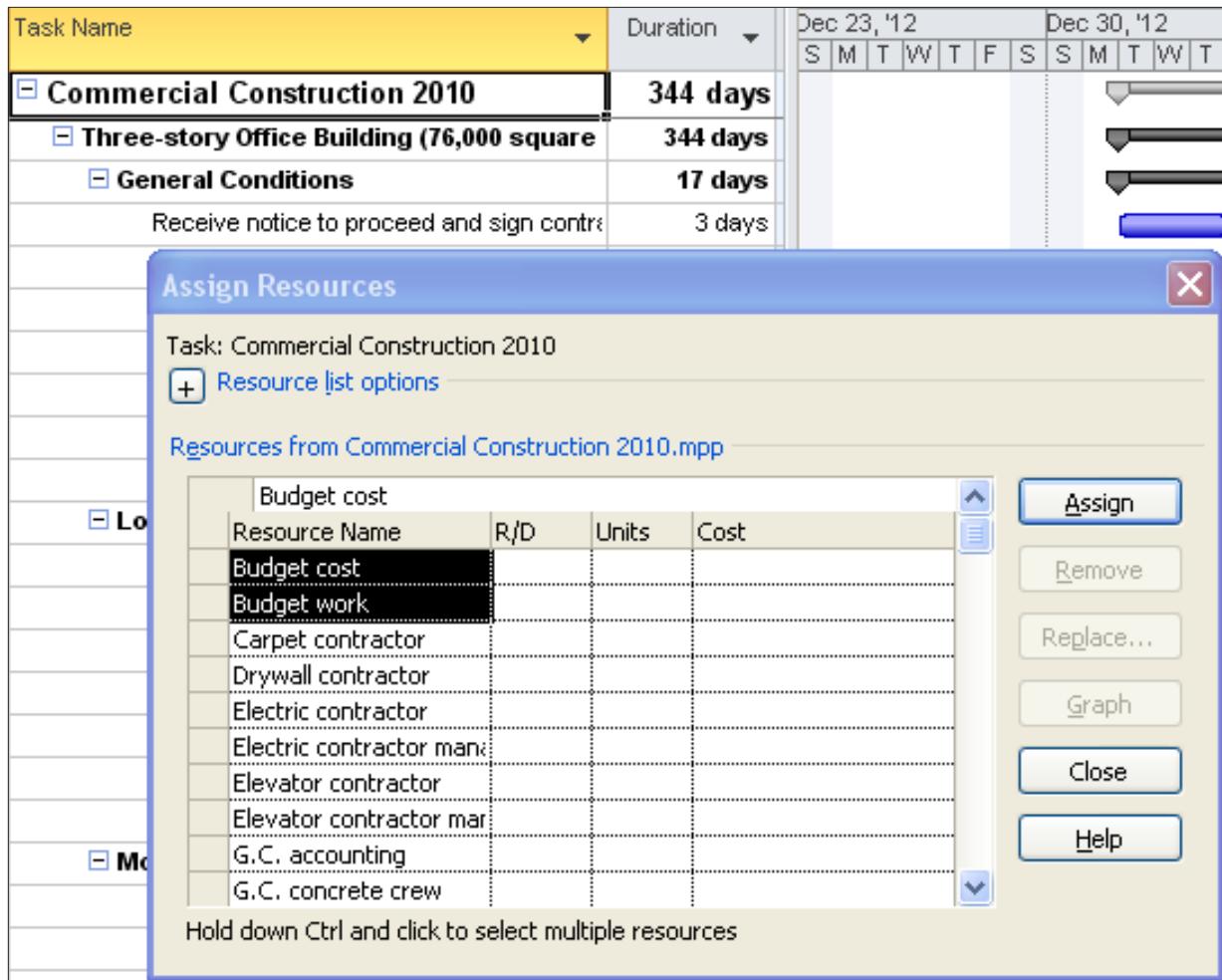


Figure 6-23 PLACEHOLDER

The resource assignment will not show on the Gantt Chart view but may be seen in the Resource Name column in the entry table.

The next step to assigning a budget resource is to enter the amount of budgeted work and budgeted cost for the budget resources. The Task Usage view, with several additional columns is best for entering these amounts. The steps are below:

- Click **Task** → **Gantt Chart** → **Task Usage**
- On the left side of the view – move the divider bar to the right to display a few columns of data.
- Right click on the **Work** column and insert the **Budget Work** column

- Right click on the **Budget Work** column and insert the **Budget Cost** column
- Move the divider bar to the left so the Task name, Budget Work and Budget Cost columns are in view.
- On the right side of the view:
 - Right click anywhere → **Detail styles** → **Available fields** → **Budget Work** → **Show** (see below)
 - Click **Budget cost** → **Show**
 - Click **Budget work** → **Show**
 - Make sure that Budget Work on Budget Cost appear in the “Show these fields” box on the right
 - Click **ok** to close the box

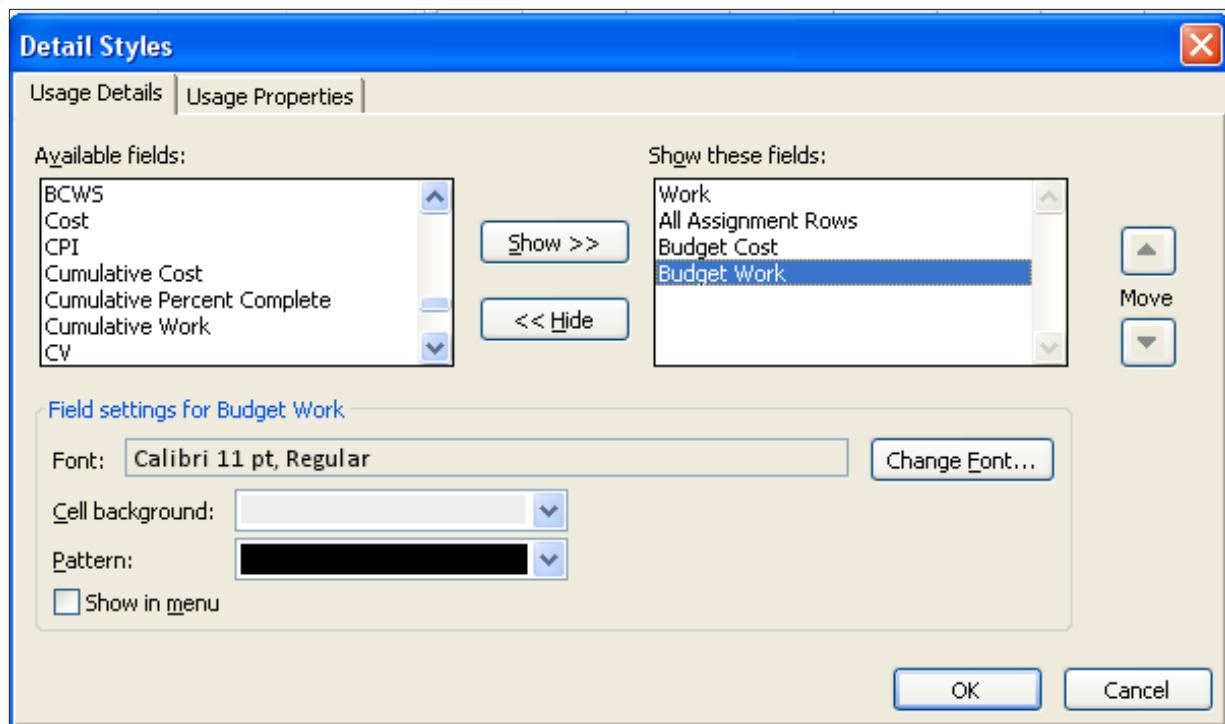


Figure 6-24 PLACEHOLDER

The result is of adding the columns to the Task Usage view are shown below. The timescale has been adjusted to show per month level of detail:

Task Name	Budget Cost	Budget Work	Details	1st Quarter			3rd Quarter
				Jan	Mar	May	Jul
Commercial Construction 2010	\$0.00	0 hrs	Work	1,113.6h	536h	454.65h	1,077.87h
			Budget Cost	\$0.00	\$0.00	\$0.00	\$0.00
			Budget Work	0h	0h	0h	0h
Budget work		0 hrs	Work				
			Budget Cost				
			Budget Work	0h	0h	0h	0h
Budget cost	\$0.00		Work				
			Budget Cost	\$0.00	\$0.00	\$0.00	\$0.00
			Budget Work				
Three-story Office			Work	1,113.6h	536h	454.65h	1,077.87h

Figure 6-25 PLACEHOLDER

The last step is to enter the budget values in the Budget Work and Budget Cost columns. In the view below \$1,000,000 was entered for the budgeted cost field and 10,000 was entered in the budget work field.

The numbers are fairly consistent with the per month values on the right side of the grid. Most projects are not this evenly distributed. For this reason, values may be entered on the right side to reflect an expected anticipated burn rate. The numbers in the Budget Cost and Budget Work columns, however, are not fixed. They are the sum total of the values entered on the right side of the grid.

Task Name	Budget Cost	Budget Work	Details	1st Quarter			3rd Quarter
				Jan	Mar	May	Jul
Commercial Construction 2010	\$1,000,000.00	10,000 hrs	Work	1,113.6h	536h	454.65h	1,077.87h
			Budget Cost	\$125,000.00	\$125,000.00	\$125,000.00	\$130,813.96
			Budget Work	1,250h	1,250h	1,250h	1,308.13h
Budget work		10,000 hrs	Work				
			Budget Cost				
			Budget Work	1,250h	1,250h	1,250h	1,308.13h
Budget cost	\$1,000,000.00		Work				
			Budget Cost	\$125,000.00	\$125,000.00	\$125,000.00	\$130,813.96
			Budget Work				

Figure 6-26 PLACEHOLDER

If the column is not wide enough to accommodate the size of the value, ##### will appear in the column. This can be resolved by dragging the column dividing lines to widen the column until the values appear correctly. This will react the same way as the autofit function for columns.

works in Excel.

Practice: Working with Resources

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.

Perform the following exercise on the ps07 virtual machine.

4. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
5. In the Project Server Accounts dialog box, click Add.
6. In the Account Properties dialog box, and complete the following settings and click OK.

Table 6.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 6.2 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

This module was intended to take an in-depth look at resources and how to best utilize them within a project schedule. As in any project, if the resources are not included, the project will not be accomplished.

In this module we discussed:

- Resource types available: work, material, cost and budget
- How to enter each of the resource types
- How to assign cost and material resources to tasks
- How to add fixed costs to tasks
- How to enter budget work and budget cost values for a project.



Chapter 7

Assigning and Leveling Work Resources

Module Overview

The creation of resource work assignments is the basis of project scheduling and resource allocations. Creating assignments can also be a detailed and complicated process. Knowing what the resource scheduling goals for the project are will help simplify how resource assignments are created.

This module explains how resource assignments are created, unique views for assignments created and resource leveling.

At the completion of this module you will be able to:

1. Understand the concepts behind resource assignments
2. Understand scheduling formula
3. Create assignments for work resources
4. Use the views in Project 2010 used to see assignments
5. Leveling the work of resource assignments

Lesson 1: Overview of Assignments

Understanding the concepts behind assignment creation will increase understanding of how assignments are formed. This lesson will help with understanding the scheduling theory, the calculations used during creating work assignments, and the software settings governing the assignments.

In the lesson we will cover:

1. Review of task typing and effort-driven concepts
2. What is an assignment?
3. The scheduling formula used by ms Project 2010

Review of Task Types and Effort-Driven Scheduling

Understanding task types and effort-driven settings are essential to understanding how assignments are created. Earlier we discussed what these terms mean and it would be helpful to review them before we discuss creating work assignments.

Effort-driven: When 1 person moves 10 boxes it could take 5 minutes per box or 50 minutes total. However, if 5 people move the boxes, it would take less time (10 minutes) because the work is divided across the resources. In this case, all work is equal. As long as the boxes are all moved, which resource moves which box is not important. The key to remember with effort-driven scheduling is: the work is divided over the resources and the time required to complete the task is shortened.

Project 2010 allows for 3 task types for scheduling:

- **Fixed Duration:** A fixed duration task is a task created with a fixed length of time. Fixed Duration tasks are also tied to dates. Resources will only be assigned if available to work between the start and finish dates of the task.
- **Fixed Units:** Fixed Units is the quantity of resource assigned to a task and is the default task type. The quantity can be expressed in hours or a percentage of a whole resource. Fixed Units means that the resource assign-

ment quantity is fixed for the task. Using this task type will result in the quantity of the units assigned to a task coupled with the availability of the resource to determine the duration of the task. If a task duration changes or if the amount of work changes, the resource units will not change for the task.

- **Fixed Work:** The work of the task is fixed. Fixed work tasks are always effort-driven by default. The more resources assigned to the task, the less time the task will take to be completed because the work is divided over the resources. Fixed work tasks will be scheduled based on the quantity of the units of resources assigned and availability as stated on their resource calendar.

When coupled with the effort-driven option, the scheduling engine allows for 5 combinations of task type, effort-driven settings:

- Fixed Duration, Effort-driven on
- Fixed Duration, Effort-driven off
- Fixed Units, Effort-driven on
- Fixed Units, Effort-driven off
- Fixed Work, Effort-driven on

To create effective resource scheduling assignments it is imperative that the task types and effect-driven settings for the tasks are correct. Different settings deliver different results during assignment creation. For this reason, understanding the work of a task is the best place to start. Once the work is understood, it will be much easier to choose an appropriate task type and resource types required to complete the task.

Inserting the Work, Effort-driven and Type columns into the Task Entry table will display all of the information in a single view to allow for proof-reading and resetting of the values as needed.

To add the Work, Effort-driven and Type columns into the Task Entry table:

- **Tasks → Gantt Chart**
- Double Click the title of the start column
- Click the **W** key
- Select **Work**
- Double Click the title of the start column
- Click the **E** key
- Select **Effort-Driven**
- Double Click the title of the start column
- Click the **T** key
- Select **Type**

The resulting view is shown below:

Task Name	Duration	Work	Effort Driven	Type	Predecessors
<input checked="" type="checkbox"/> Commercial Construction 2010 tracking	346 days	7,317.9 hrs	No	Fixed Duration	
<input checked="" type="checkbox"/> Three-story Office Building (76,000 square feet)	346 days	7,317.9 hrs	No	Fixed Duration	
<input checked="" type="checkbox"/> General Conditions	17 days	134.27 hrs	No	Fixed Duration	
Receive notice to proceed and sign contract	3 days	24 hrs	Yes	Fixed Units	
Submit bond and insurance documents	1 day	6 hrs	Yes	Fixed Units	3
Prepare and submit project schedule	2.8 days	28 hrs	Yes	Fixed Units	4

Figure 7-1 PLACEHOLDER



Summary tasks are always Fixed Duration and can not be changed.

Manually scheduled tasks vs. Automatic scheduled tasks:

The scheduling engine ignores task type and effort-driven flags for manually scheduled tasks. These values apply only to automatically scheduled tasks.

If a task is changed from manual scheduling to automatic scheduling, the task type and effort-driven values become meaningful. The value for these fields will be picked up from the options default settings when the task is entered. These values should be rechecked when switching modes to ensure correctness.

What is an Assignment?

The “what” of the project are the tasks which represent what work needs to be accomplished. The resources are the “who” or who will perform the work. The assignment is applying the resource to the task to create the “when” and for “how much ” (cost and time). How the assignment is created will result in different outcomes for the values in the assignment.

The values used in creating the assignment will drive the result for the duration, work and quantity of the resource assigned to the task.

Example: A task, “Paint the room” is estimated to take 3 days at 8 hours per day. The task type is Fixed Units, effort-driven off and 1 painter

has a rate of \$30 per hour.

The result of this assignment is:

24 hours of work for 1 painter to be completed over 3 days. The resource was applied to the task at 100% units and has full availability during the dates the task is planned.

As a result of the assignment, we now have the “when”, which is the schedule dates of the task. We also have the “how much” which is 24 hours of work at \$30 per hour or a cost of \$720 to complete the task.

If the task had been scheduled using 3 available painters to work at the same time and rate, the assignment outcome would be different:

The task would change to an effort-driven task. Each of the 3 painters will work 8 hours to complete the 24 hours of total work. They would each be scheduled for 1 day of work and the cost would remain at \$720. The task now completes in 1 day’s time and 2 days earlier.

Assignment Formula

The assignment formula contains 3 parts. Each part can be defined separately to best reflect the needs of the task. Determine on a task by task basis which pieces of information are required and which pieces should be calculated.

The 3 pieces of information are: Duration, Work and Units

The formulas are:

- Units = Work / Duration
- Duration = Work / Units
- Work = Duration x Units

Units are defined as the quantity of a resource.

- 1 or 100% = 1 full person
- .5 or 50% = ½ of a person

Assignment unit values are represented as a percentage or decimal formats. The setting is a personal preference. The setting can be switched back and forth without consequence to the assignments.

To set assignment units view preference:

File → Options → Schedule

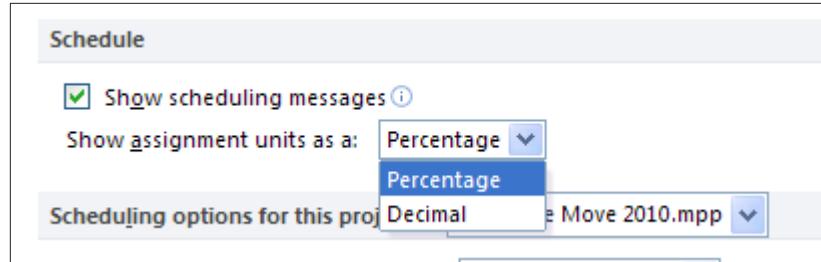


Figure 7-2 PLACEHOLDER

Below are some examples of resource assignment calculations. In all examples it is assumed that 1 day is 8 hours and resources have full availability on their calendars.

If Duration and Work are entered Project 2010 will calculate Units

Example:

- Task duration is 10 days and the work is 400 hours
- Each person can work 80 hours within 10 days
- Project 2010 will calculate 400 hours in assigning 5 people to perform and complete the work in 10 days.
- $400 \text{ hours} / 10 \text{ days} = 5 \text{ units (100\%)}$

This example answers the following question: How many people, working 8 hours per day, will it take to complete the task in 10 days? The answer is 5 people.

If Work and Units are entered Project 2010 will calculate the Duration

Example:

- Work required is 400 hours and Units is 10 full time people (FTE)

- Each person can work 40 hours per week
- The duration calculation is 5 days
- $400 \text{ hours} / 10 \text{ units (100\%)} = 5 \text{ days duration}$

This example answers the following question: How long will it take 10 people, working 8 hours per day to complete 400 hours of work? The answer is 5 days.

If Duration and Units are entered Project 2010 will calculate Work

For example:

- Duration is 5 days and Units is 10 full time people, each person can work 40 hours per week.
- The work would calculate to be 400 hours.
- $5 \text{ days} \times 10 \text{ people at 40 hours per week} = 400 \text{ hours}$

The example answers the following question: How many hours of total work will result if there are 10 people who work 8 hours per day for 5 days? The answer is 400 hours.

Resources might not be available to work full time on tasks. The examples below will calculate the examples with the resources available at 50% of their availability. In all examples it is assumed that 1 day is 8 hours and resources have full availability on their calendars.

A fixed unit task which is scheduled for 5 days and 40 hours of work.

- If the task is effort-driven off and 1 resource is assigned 100% to the task:
Result: 40 hours of work to be completed in 5 days.

- If the task is effort-driven off and 1 resource is assigned 50% to the task:
Result: 40 hours of work to be completed in 10 days.

- If the task is effort-driven off and 2 resources are assigned 100% to the task:
Result: 80 hours of work to be completed in 5 days.

4. If the task is effort-driven on and 2 resources are assigned at 100% to the task:
Result: 40 hours of work to be completed in 2.5 days. Each resource will work 20 hours full time

5. If the task is effort-driven on and 2 resources are assigned at 50% to the task:

Result: 40 hours of work to be completed in 5 days. Each resource will work 20 hours half time (4 hours per day)

The above assignments were created with the assumption that the resources were available during the scheduled times. If the resources are not available, the duration of the task for Fixed Unit and Fixed Work tasks will increase and the work will be scheduled when the resource becomes available. Fixed duration tasks are tied to dates. Resources must have availability between the dates of the task or the task might change duration to accommodate the resource availability. When scheduling a resource without availability between dates for a fixed duration task, the following error message will be returned.

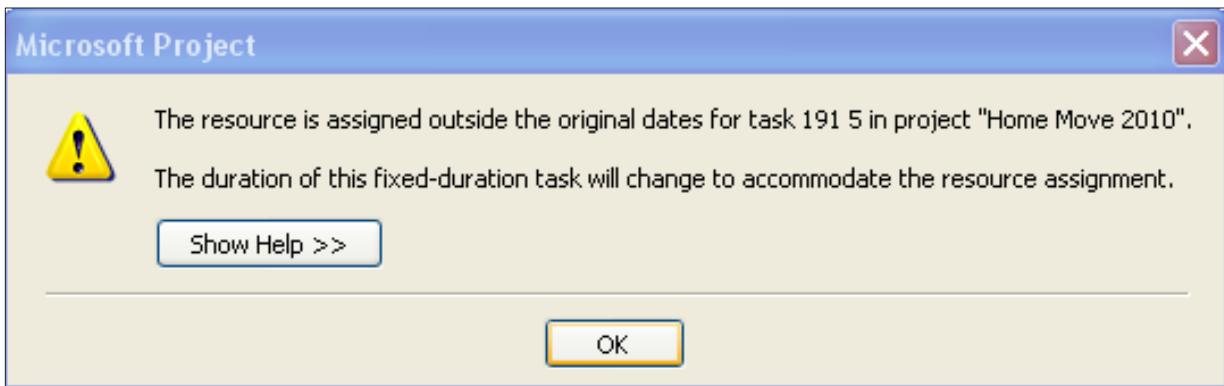


Figure 7-3 PLACEHOLDER

Calculations are very detailed and complex, and produce different results when any of the variables change. The chart below will help predict resulting changes to variables and provide an easy look-up table:

Table 7.1 PLACEHOLDER

Task Type	Modified Field	Field Recalculated
Fixed units	Duration	Work
Fixed units	Units	Duration
Fixed units	Work	Duration

Table 7.1 PLACEHOLDER

Task Type	Modified Field	Field Recalculated
Fixed duration	Duration	Work
Fixed duration	Units	Work
Fixed duration	Work	Units
Fixed work	Duration	Units
Fixed work	Units	Duration
Fixed work	Work	Duration

Below is a quick reference which will help with some of the nuances of assignments.

Table 7.2 PLACEHOLDER

Task type	Effort-Driven Setting	Field recalculated when adding or removing a source
Fixed units	On	Duration will change as resources are added to share the work. Duration will be calculated based on number of additional resources, assignment units and availability calendar.
Fixed units	Off	More resources added, more work will occur. Duration will be calculated based on number of resources, assignment units and availability calendar.

Table 7.2 PLACEHOLDER

Task type	Effort-Driven Setting	Field recalculated when adding or removing a source
Fixed duration	On	Work is shared in a limited time frame.
Fixed duration	Off	More resources added, more work will occur.
Fixed work	On always	Duration will be calculated based on number of resources, assignment units and availability calendar.



it is a good idea before assignments are created to save a copy the original values of the work and duration columns. If these columns are recalculated during assignments they will not return to the original values if the assignments are removed.

To copy the duration column:

- Right click on the Duration column heading
- Click on Insert Column
- Click the D key on the keyboard
- Select Duration1
- Right click on the column name Duration 1
- Select Field Settings
- Enter title: Original duration
- Click ok
- Click on the title for the Duration column to select the column
- Click Copy
- Paste in the Original Duration column.

To copy the work column:

- Right click on the Work column heading
- Click on Insert Column
- Click the T key on the keyboard

- Select a Text column 1 - 30 which is not used
- Right click on the column name Text (1-30)
- Select Field Settings
- Enter title: Original work
- Click ok
- Click on the title for the Work column to select the column
- Click Copy
- Paste in the Original Work column.



Figure 7-4 PLACEHOLDER

Lesson 2: Creating Assignments

The most useful view to create assignments is the Task Entry view or Gantt Chart on top and the Task Form on the bottom of a split screen. The Task Form has multiple sub views that are very helpful when creating assignments. The views are Work, Cost and Schedule. It is also helpful to add the work column to the Task Entry table of the Gantt Chart.

To display Task Entry view:

- **Task → Gantt Chart → More views → Task Entry → Apply**
- Insert the **Work** column in the top pane
- Right click in the bottom pane and select **Work**
OR
- **Task → Gantt chart**
- Double click on the bar underneath the down arrow at the bottom of the scroll bar



Figure 7-5 PLACEHOLDER

- Right click in the bottom pane and select **Work**



Assignments may be made using the Assignment dialog box, Task Information dialog box or adding resources to the Resource Name column on the Task Entry table. Using the Task Entry view to assign resources allows the scheduler to see the work, schedule and duration results of the assignment.

In this lesson you will learn to:

1. Create fixed unit assignments
2. Create fixed duration assignments
3. Create fixed work assignments

Creating Fixed Unit Assignments

When creating fixed unit assignments, the amount or quantity of the resource assigned to the task is fixed and will not change.



In the examples below, the Resource Sheet entries for each resource are Max Units of 1 or 100% and \$100 per hour is the Standard Rate. Each resource also has 8 hours per day on their availability calendar.

Task assignments are best created in the Task Entry view. This is the only view where all of the information regarding the result of the assignment is available. If the results are not what is expected this view may also be used to make adjustments if necessary.

In the example below an automatic scheduled task called “Determine the best method of moving” is a fixed unit, effort-driven off task with a duration of 5 days. Work is zero and the original schedule dates are April 23-27, 2012. The view below shows theSubview in the Task Form of Work.

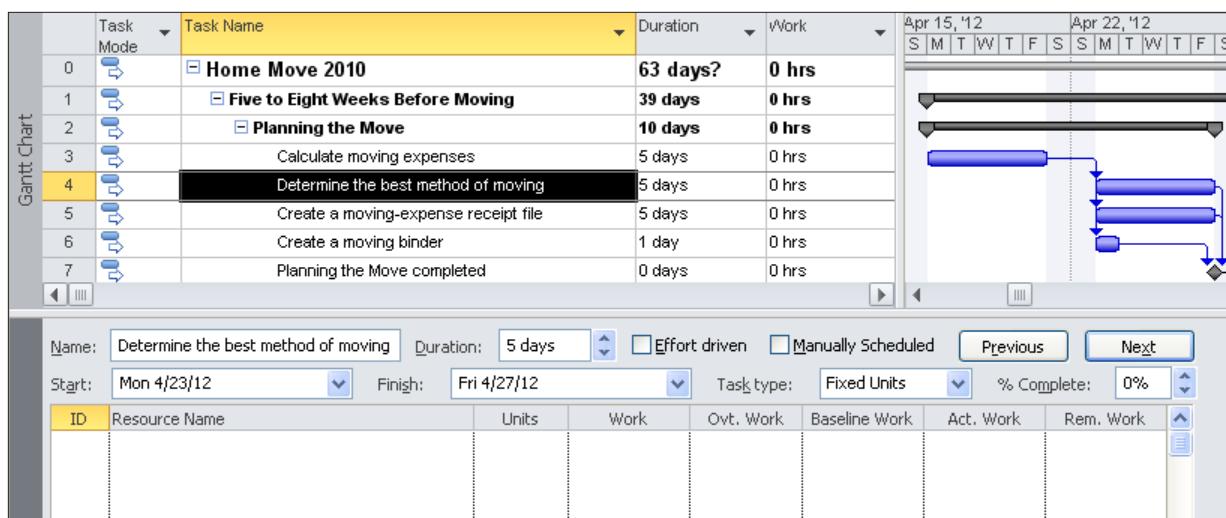


Figure 7-6 PLACEHOLDER

Click in the Resource Name area in the lower pane of the view and select a resource from the alphabetical list of resources. The button called

"Previous" will change to "ok" and was clicked to enter the assignment.

Note below the affect of this assignment. Larry Adams has been assigned to the task for 40 hours of work. There are no changes to the dates or duration of the task.

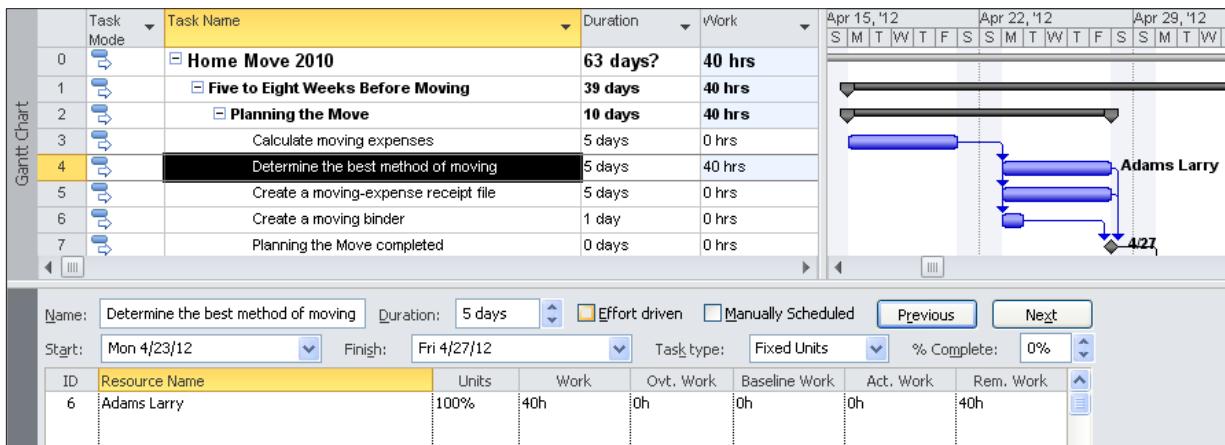


Figure 7-7 PLACEHOLDER

Assigning a second resource to the task will increase the hours to 80 hours and the duration is unchanged. There is an increased cost to the task for the additional 40 hours of work:

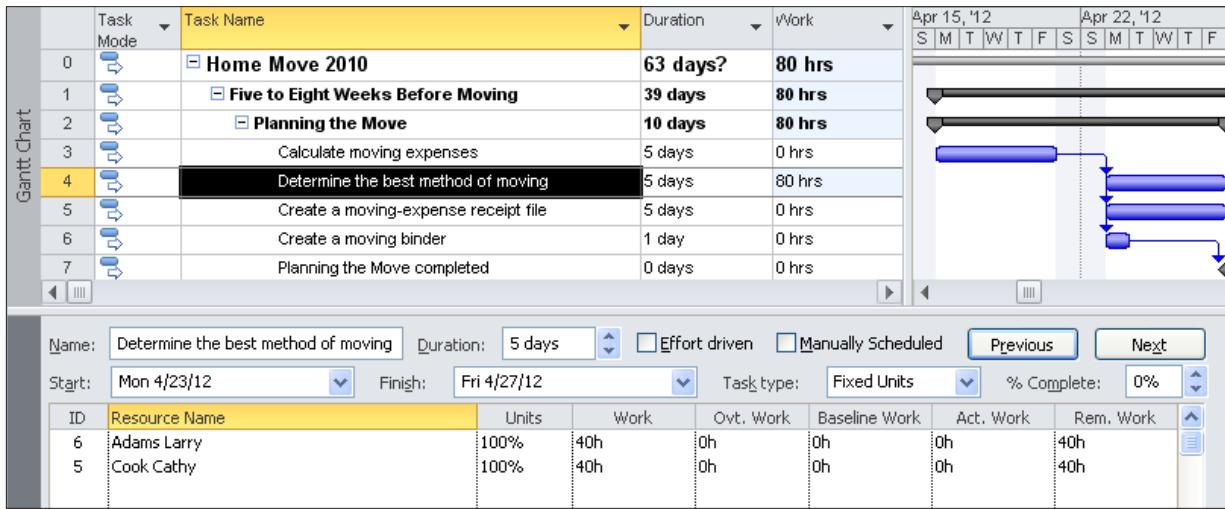


Figure 7-8 PLACEHOLDER

In the next example, the resources have removed from the assignment.

An easy way to remove all resource assignments is to click on the top resource name and click the **Delete** key on the keyboard until the assignments are removed. Click **OK** to update.

In the example below the situation is exactly the same as the first example above except the effort-driven flag has been turned on. The first assignment has been created.

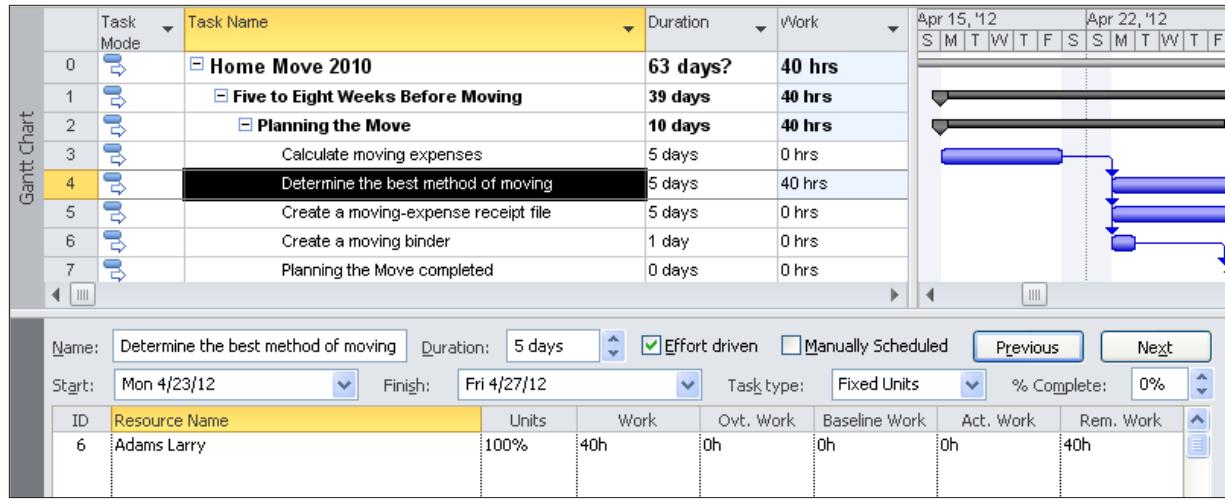


Figure 7-9 PLACEHOLDER

With only one resource, this assignment will look the same as the first example. Dates have not changed and the work is 40 hours. If a second resource is added, the total work of the task is 40 hours and will now be divided between the 2 resources assigned to the task. The task duration has been changed to 2.5 days from the original 5 days and the ending date is now April 25.

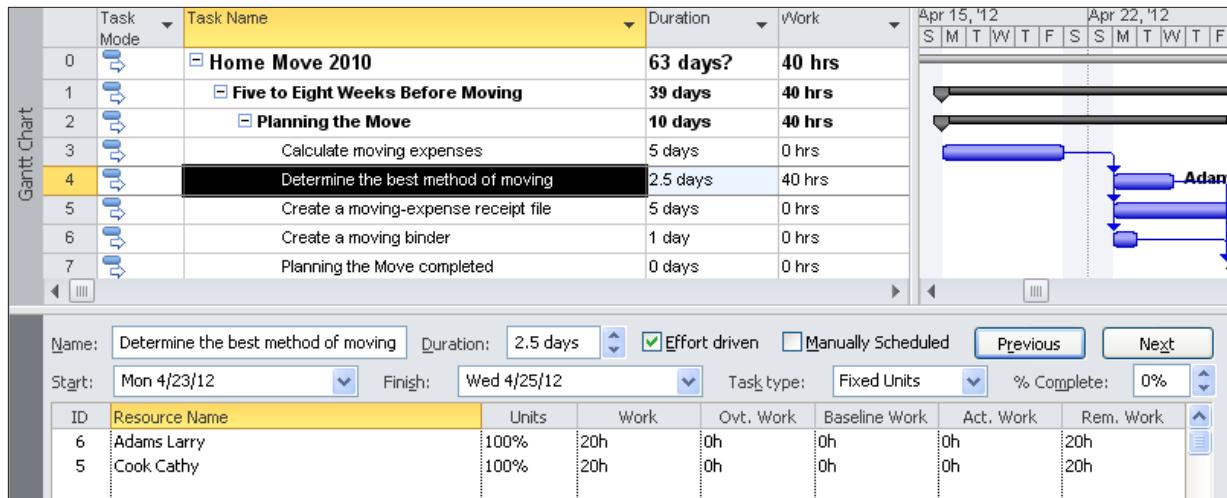


Figure 7-10 PLACEHOLDER

A third resource is assigned to the task. The work is again divided between 3 resources with each working 13.33 hours on the task. The task duration has again changed to 1.67 days and the task now ends on Tuesday, April 24. As additional resources are assigned to the task the work will continue to divide among the resources.

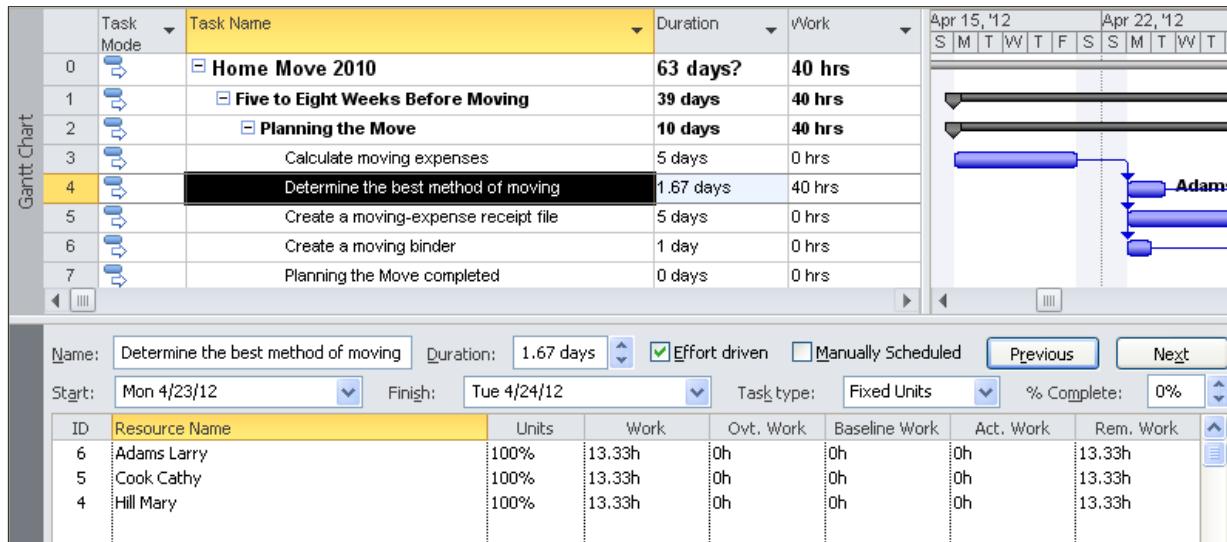


Figure 7-11 PLACEHOLDER

Multiple changes may be made in the Task Form and all changes will be updated when the ok button is clicked. This is usually not a concern for non-effort-driven tasks. However, for effort-driven tasks this will result in a difference in the amount of work assigned to a task. In the previous effort-driven task example, each resource was added one at a time clicking ok after each addition to update the assignment. In the example below, all resources were deleted. All 3 resources were added to the task and then the ok key was clicked and all 3 additions were updated simultaneously. 120 hours of work was calculated for the task for this example. The number of hours is calculated based on the first transaction. Subsequent transactions will divide the number of hours over all of the resources.

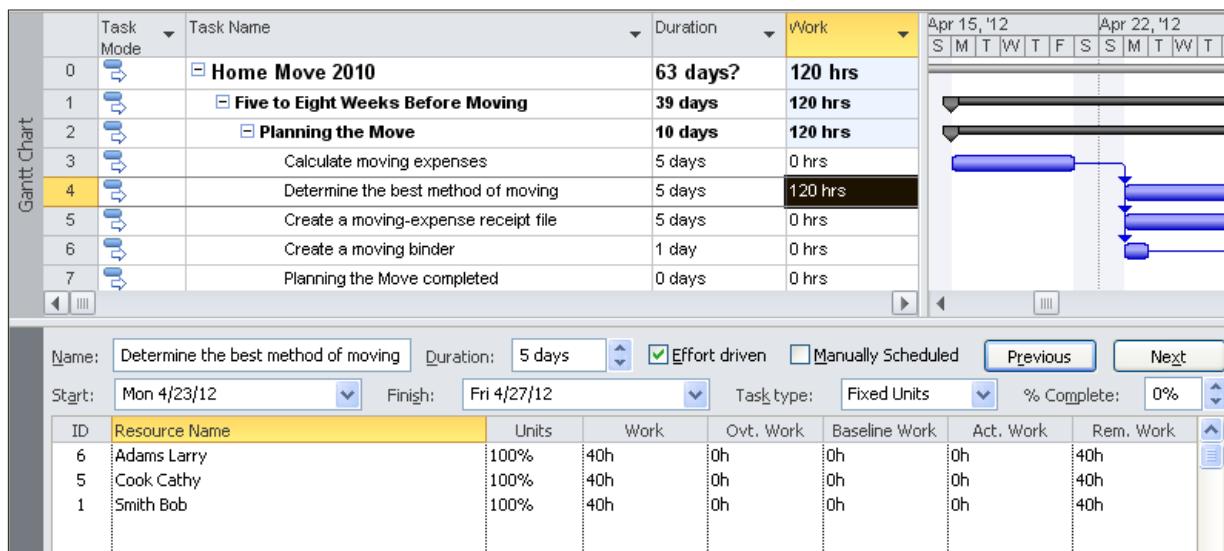


Figure 7-12 PLACEHOLDER

Care needs to be taken in creating effort-driven assignments as they could have a substantial impact on resource allocations and cost estimates for a project. Using other assignment views will not allow the scheduler to see the results of an assignment.

If the automatic calculation for an assignment returns an incorrect hours result for a task, do not hesitate to enter the number of work hours for a resource to correct the values. Click ok to update the changes.

Right clicking in the Task Form in the bottom pane will return options to see the assignment using other views. The Cost and Schedule views are very helpful to see the resource costs or dates when tasks are scheduled.

Group assignments: To create assignments for more than one

resource within a group, increase the value in the unit's column.

Example: 3 Helpdesk workers are needed to work for 5 days (40 hours each). Enter 3 in the units field in the Work view. The result will be 3 people will provide a total of 120 hours of Helpdesk labor for the task.

Generic resources: When the actual resource is not known, assign a skill type or generic resource to a task as a holding value. Using a generic resource will create the demand for the resource and add an estimated cost to the project schedule. When the human resource is acquired, substitute the human resource name for the generic name on the Resource Sheet and all assignments will transfer to the human resource.



When using generic resources, the default base calendar is used to schedule the resource. When a human resource is substituted for a generic resource and their availability is taken into consideration, there is a high probability that the tasks will lengthen. As a rule of thumb, projects could double in length when human resources are substituted for generic resources.

Creating Fixed Duration Assignments

Fixed duration task assignments have a fixed length of time. The amount of work that is accomplished between the task dates will be dependent upon the number of resources assigned to a task, number of resource units and the availability of the resources.

The following examples will continue to use the Task Entry view with the Work subview in the lower pane. In the example below, the automatic scheduled task "Verify that your belongings are insured for the move" will take 5 days to accomplish. This example is fixed duration, effort-driven off. The assigned dates are May 1 to May 7. The dates span more than 5 days because it crosses over non-working weekend days. There are also zero hours of work entered for the task.

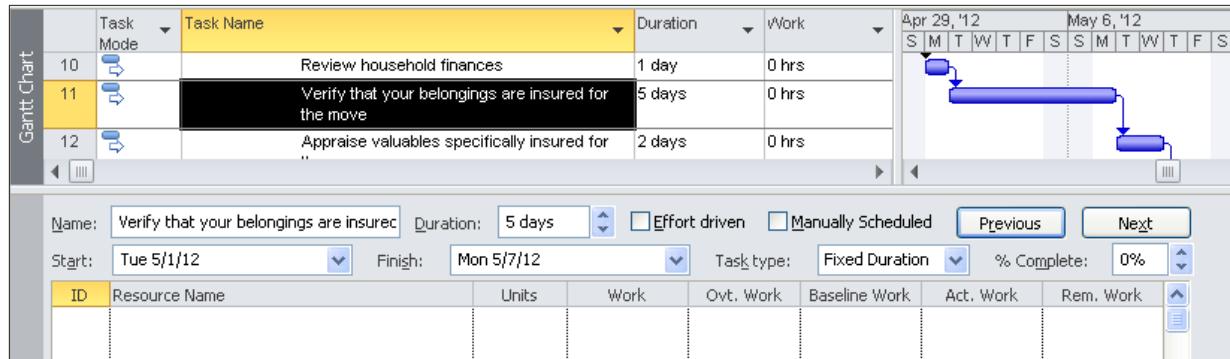


Figure 7-13 PLACEHOLDER

When one resource is assigned to the task the duration will remain the same and the work is increased to 40 hours. Note the work and duration in the view below.

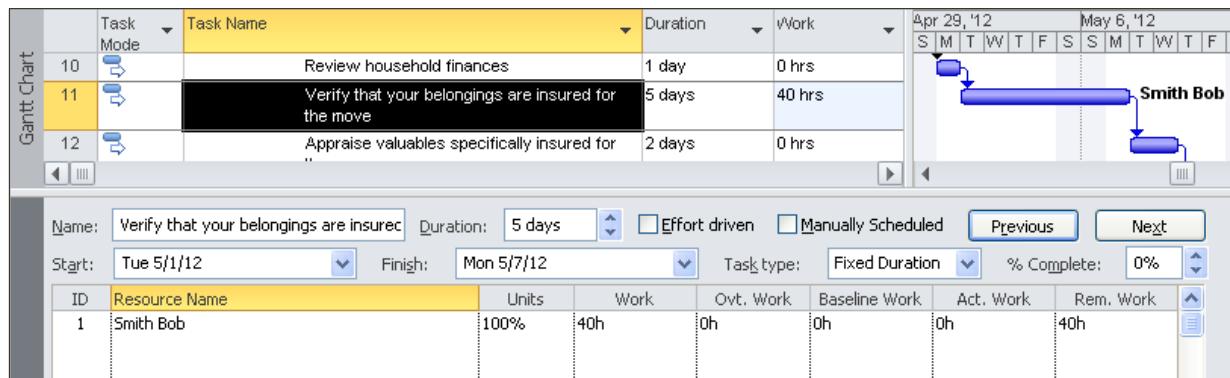


Figure 7-14 PLACEHOLDER

When an additional resources are added, the duration remains the same and the work increases again. The three assignments result in 120 hours of work for the task. The dates have not changed.

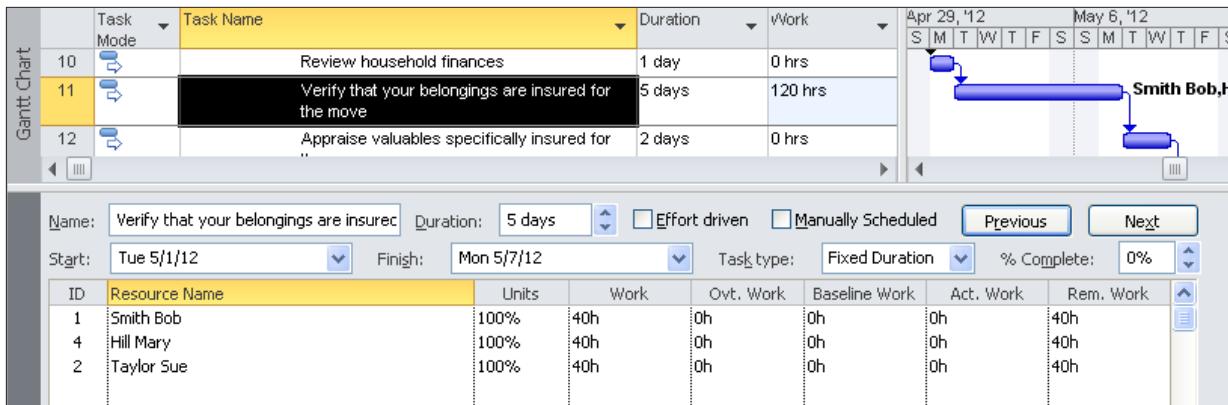


Figure 7-15 PLACEHOLDER

In the following example, all 3 resources have removed and the task type effort-driven flag has been turned on. One resource was then assigned to the task.

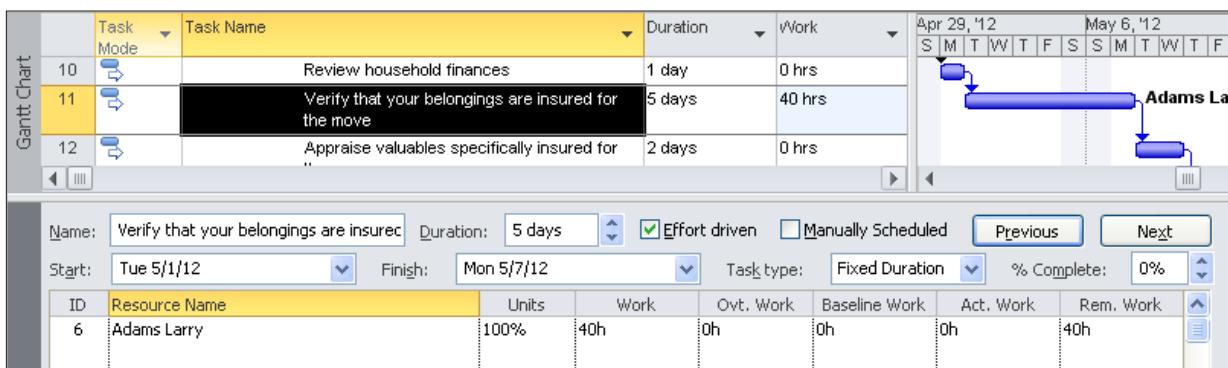


Figure 7-16 PLACEHOLDER

In the example below 2 more resources were added to the task. The task remains at 5 days duration and the work also remained at 40 hours. The work was divided between the resources. In this example, the resources were assigned one at a time.

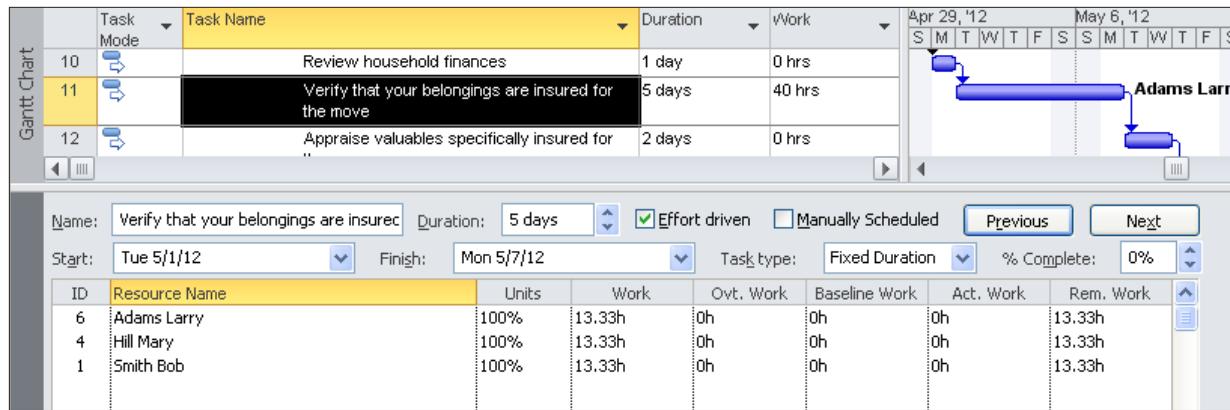


Figure 7-17 PLACEHOLDER

In the example below, the resources were removed and all 3 resources were assigned at the same time. The 3 names were selected and then OK was clicked. Note that each resource is assigned at 100% to the task. The total amount of work is 120 hours and will carry a higher cost due to the increased hours. Any additional resources assigned to this task will take a portion of the original 120 hours.

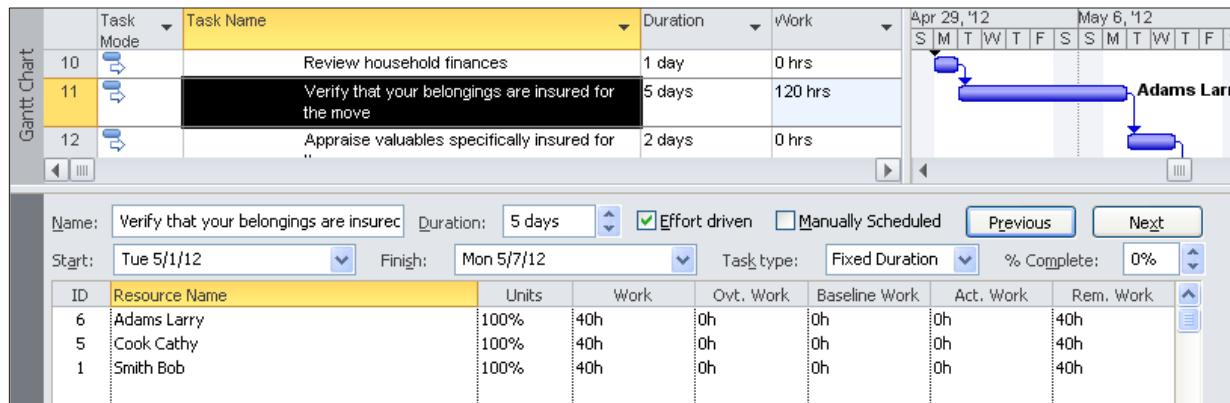


Figure 7-18 PLACEHOLDER

Creating Fixed Work Tasks

Fixed work tasks are tasks where the value entered in the work column is a fixed value for the task. Duration is always calculated based on the number of resource units assigned to the task and the status of resource availability.

The following examples continue to use the Task entry view with the subview Work. In the example below, the automatic scheduled task “Pack the boxes” is estimated at 200 hours of work. It is also a fixed work task which is always effort-driven. Notice that the task duration is 1 day. Since the duration is always calculated for a fixed work task, the value in the duration field is not important.

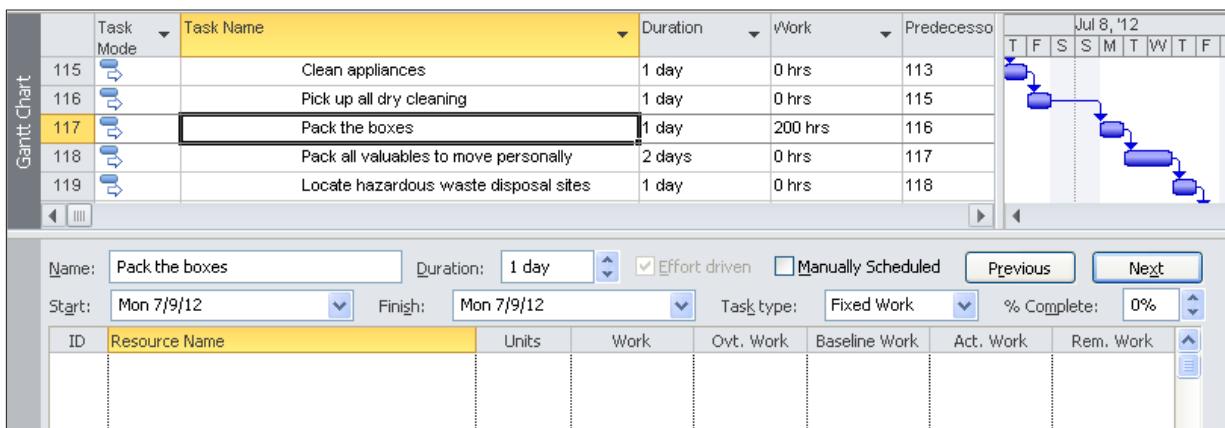


Figure 7-19 PLACEHOLDER

In the example below, 1 resource has been assigned to “Pack the boxes”. As a result, Eric will be assigned to work for 25 days at 8 hours a day packing boxes.

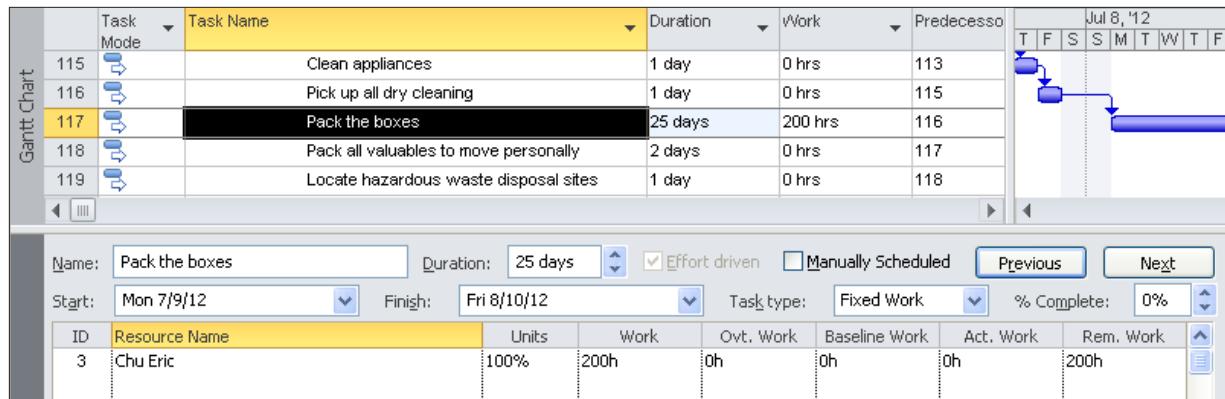


Figure 7-20 PLACEHOLDER

In the example below Eric has been given 2 people to help him with this task. The task will now take 8.33 business days to accomplish the work with each resource working 66.67 hours on this task. The work for the task has not changed. It does not make a difference whether all resources are assigned at one time or individually.

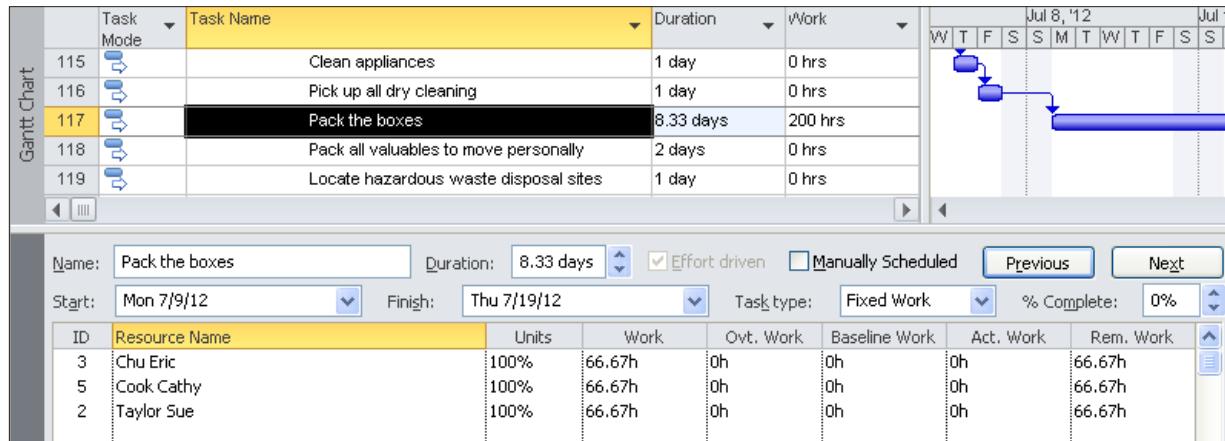


Figure 7-21 PLACEHOLDER

Manual VS. Automatic Scheduling Assignments

Automatic scheduled tasks use Project 2010's scheduling engine to calculate work, duration and cost for tasks. Manual scheduled tasks, however, are not using this calculation. New fields have been added to Project 2010 for manually scheduled tasks which determine the start and finish dates for the tasks. The fields are:

- **Scheduled Start** - Start, Finish and Duration are optional for manually scheduled tasks, read only field
- **Scheduled Finish** – Start date recommended by Project 2010, read only field
- **Scheduled Duration** - a entered duration or value calculated by Project 2010, read only field

When assignments are created for manually scheduled tasks, only the duration field is part of the calculation and work is not considered. The assignment will also use the availability of the resources as well as the assignment unit to calculate the assignment.

In the first example below, the fixed work task is using automatic scheduling mode. 1 resource is assigned to a task that has 200 hours of work. The value in the duration column before the resource was assigned was 1. The resulting calculation is, 25 days of work to pack boxes using a single resource.

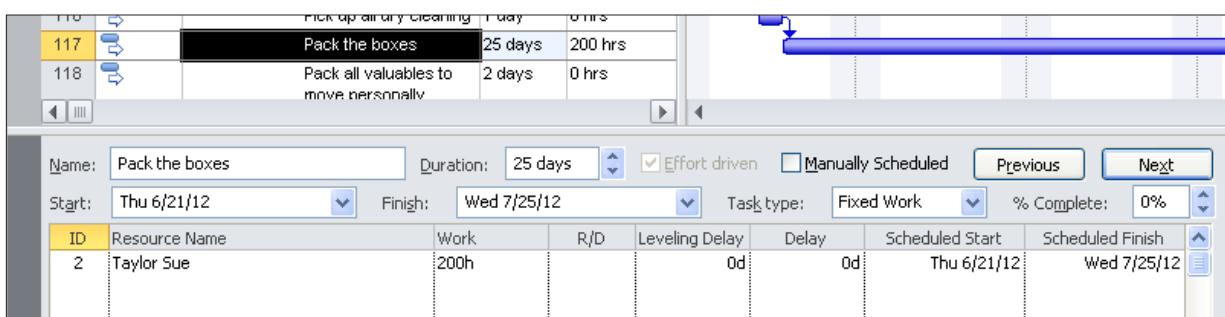


Figure 7-22 PLACEHOLDER

Below is the same task using manual scheduling mode. Before the assignment was made, duration was 1 day and work was 200 hours. The

scheduled duration column is the value used to schedule the task in manual mode. Notice how the work value was changed to 8 hours of work from the original 200 hours. Only 8 hours of work are now scheduled for this task.

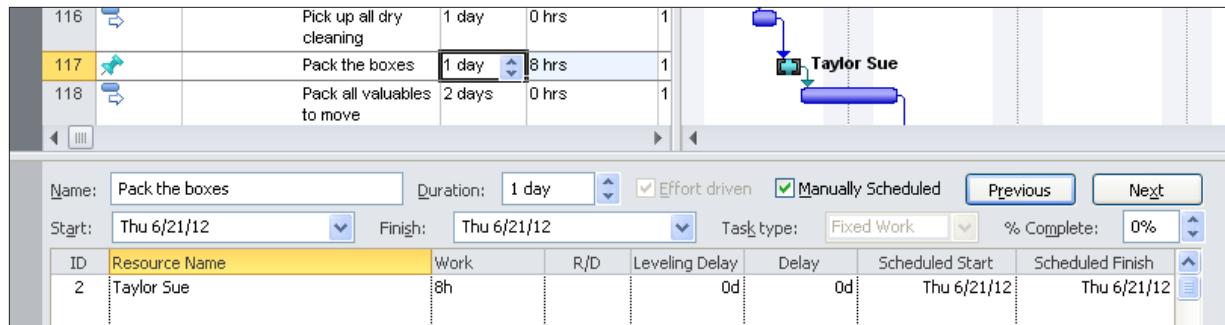


Figure 7-23 PLACEHOLDER

Below is the same task in manual schedule mode with 25 days entered in the duration column. Note that the work is now estimated to be 200 hours.

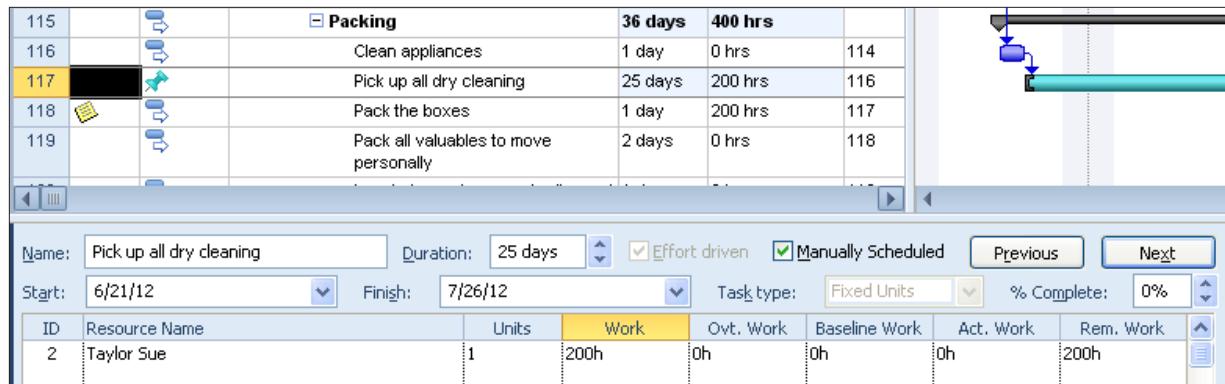


Figure 7-24 PLACEHOLDER

In this last example, the duration column has text and zero hours of work when the resource assigned was entered.

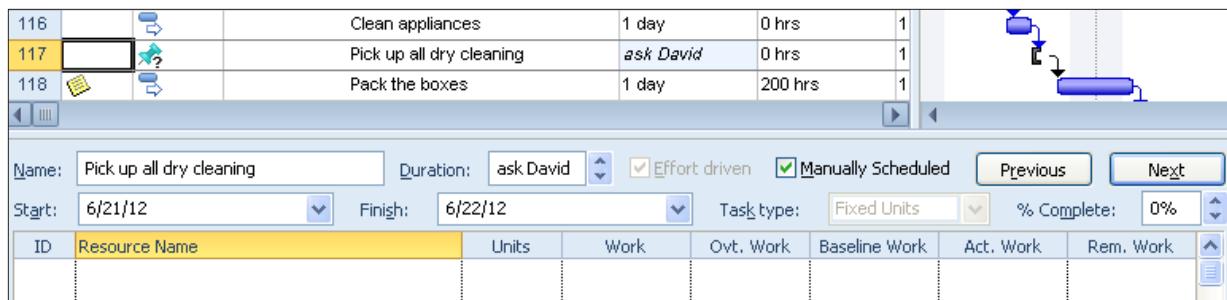


Figure 7-25 PLACEHOLDER

The result of assigning 1 resource to the task is shown below. The duration retained the original text value and work increased to 8 hours because the resource was assigned using the units value of 1. If the units value used had been 2, 16 hours would have been calculated.



Figure 7-26 PLACEHOLDER

Practice: Creating Assignments

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile

and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 7.3 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Factors that Affect Assignments

In the previous lesson, we discussed the concepts of creating work assignments. Assignments will include more nuances and concerns involved in developing a realistic project schedule. This lesson will address a variety of variables that should be considered while creating resource assignments.

In this lesson we will discuss:

1. Percentage assignments
2. How the resource calendar will influence assignments
3. How to delay an assignment
4. How Max. Units affects an assignment
5. Best Practices for creating assignments

Percentage Assignments

Resources typically are not available to work full time on a task. To accommodate this need, percentage assignments may be created. The percentage will be a percentage of the time that a resource has available on their calendar.

For example: A resource has 50% availability of their time to work on a given task. If the resources workday is 8 hours per day on their resource calendar, the assignment will result in 4 hours per day of work time on the task.

In the example below a resource has been assigned 50% to a 5 day, fixed unit task. The resource has 8 hours per day available on her resource calendar. Since she is assigned at 50% units, she will be assigned to 20 hours of work or 4 hours per day during the 5 days. The work column did not have a value entered when the assignment was created.

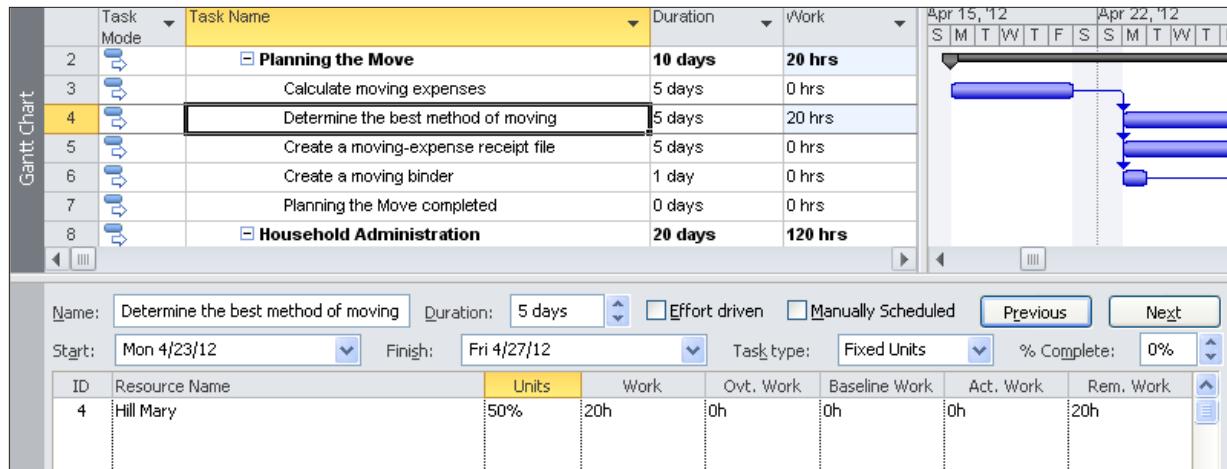


Figure 7-27 PLACEHOLDER

In the next example, the resource was removed from the task. 40 hours was entered in the work column stating that the task will require 40 hours to complete. 5 days was left in the duration column and the 50% assignment was recreated.

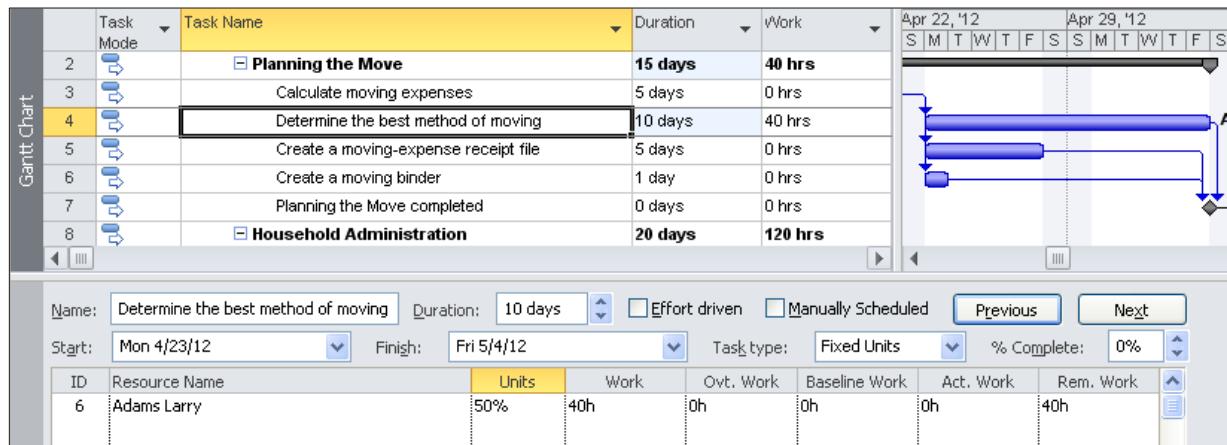


Figure 7-28 PLACEHOLDER

In the example below, the 40 hour task has a resource assigned at 50% units and the duration of the task was recalculated to 10 days. The resource is available to work 4 hours per day or 20 hours per week and it will take 10 days to complete the task. If the resource had been unavailable during the 10 day time period, the task duration would have increased to

accommodate the unavailable time.

In the Resource Usage view below, the resource detail is on the top which shows that Larry Adams will work 4 hours per day for the length of the task. In the Task View below the Schedule view shows the start and end dates for the assignment.

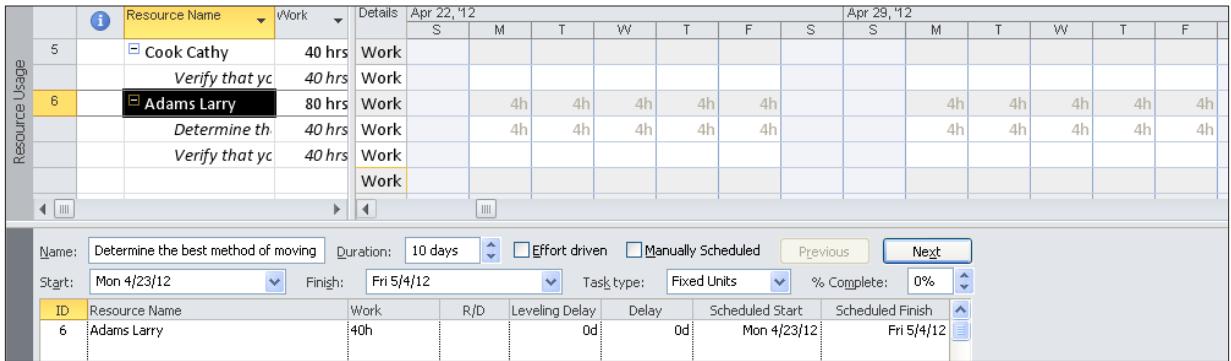


Figure 7-29 PLACEHOLDER

This view may also be used to fine tune assignments. Hours may be entered per day to contour the assignment. There is also an automatic contour function available. By double clicking on the assignment (not the resource name), the assignment information box will appear. Work contour has several options: flat (default), back loaded, front loaded, early peak, late peak, turtle, and bell. Each of these will produce a slightly different work distribution for a task. Task dates might be moved to accommodate the contour.

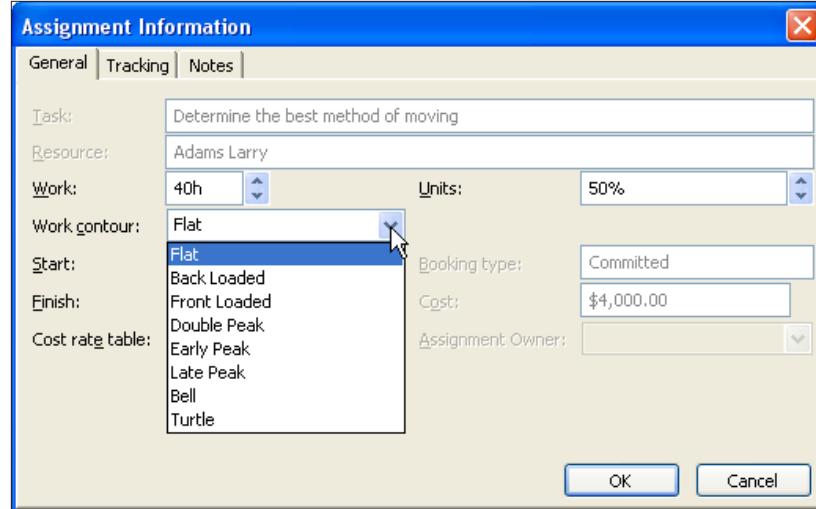


Figure 7-30 PLACEHOLDER

Below is the same assignment with the front loaded contour applied. When a contour is applied to an assignment, an icon will appear in the indicator column. Many of the contour options will also result in a longer duration for the task. The task below is now scheduled to finish on May 15.

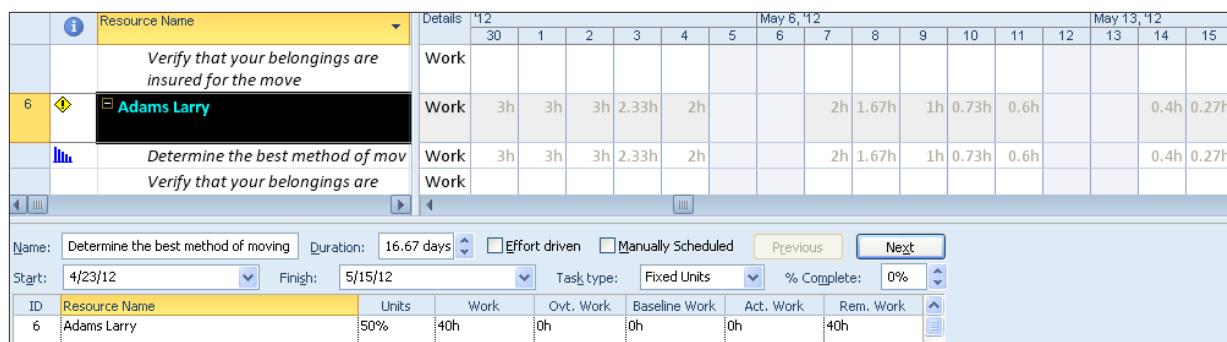


Figure 7-31 PLACEHOLDER

Delaying an Assignment

If a resource is not available during the performance of a task the work of the resource might be delayed. If the resource is one of many on the task, do all of the resources have to work together or can resources perform their work separately? Entering a delay will affect the assignment of one resource and will not affect the other assignments on the task. If the entire task is delayed, all resources assigned to the task will be affected.

To delay the assignment for the one resource, use the Task Form→ Schedule view. In the example below, 3 resources are assigned to the task “Packing boxes” which occurs May 17-29. Mary Hill has been asked to work on another task and cannot start her part of this task until the following Monday, May 21. She will need a 2 day delay in the start of her assignment.

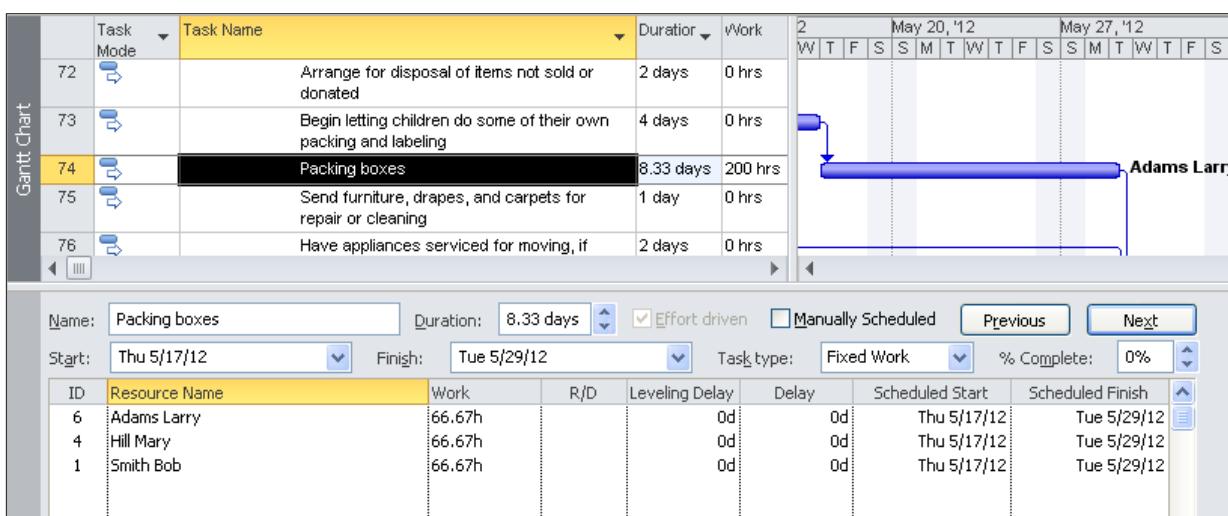


Figure 7-32 PLACEHOLDER

After entering the 2 day delay for Mary Hill, her assignment dates are May 21-31. This will result in the task taking 2 days longer and might also affect the end date for the project. Note that the delay affected the assignment of Mary Hill only and not the other resources.

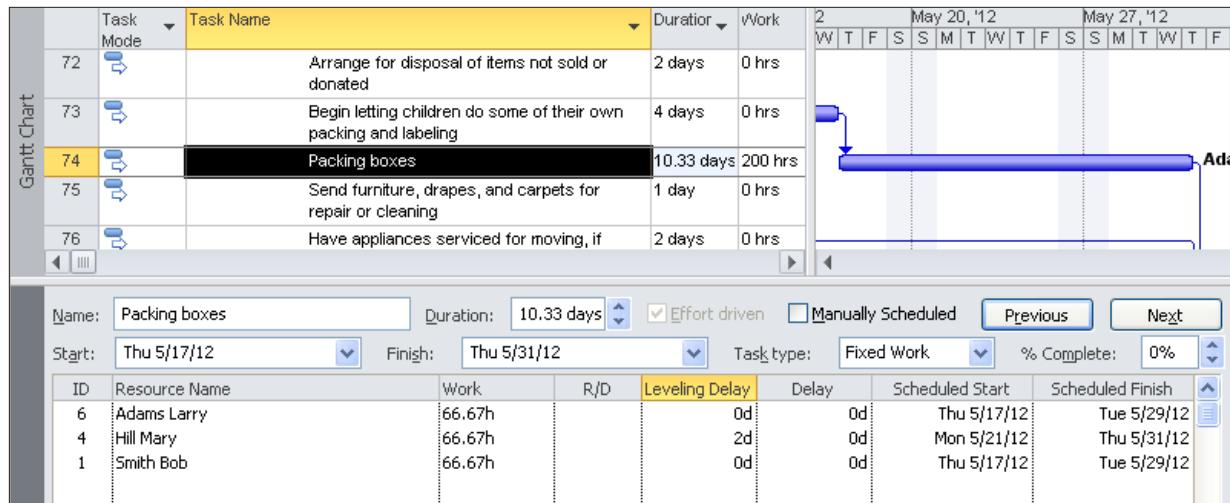


Figure 7-33 PLACEHOLDER

All delays will stay with the assignments until they are manually removed.

Resource Calendar

All assignments are created with the availability of the resource in mind. If the resource is not available, the task will be delayed until the resource becomes available.

In the example below the resource is scheduled to “Determine the best method of moving” which should take 5 days starting on April 23 and ending on April 27.

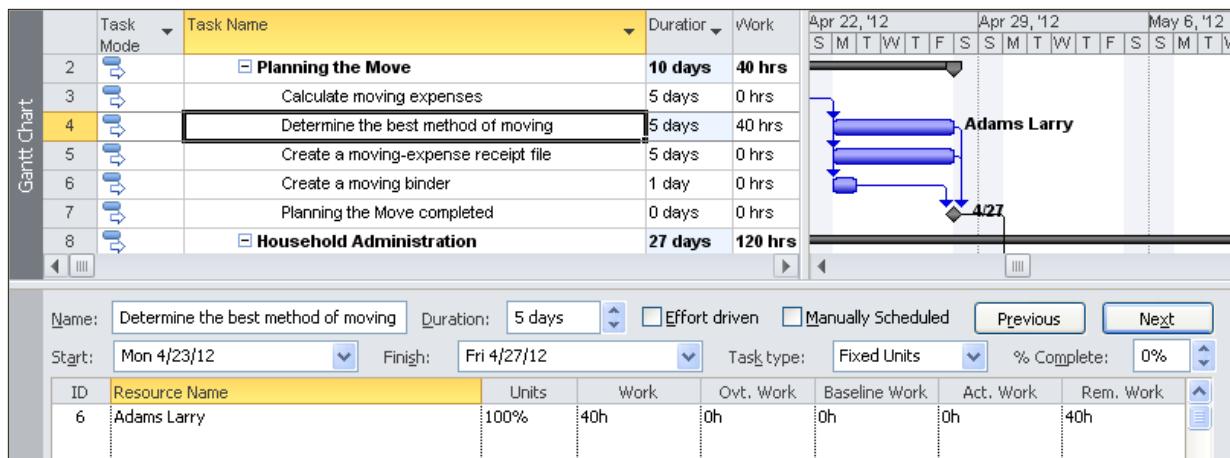


Figure 7-34 PLACEHOLDER

Larry Adams becomes unavailable for last 2 days of this assignment.

The easiest adjustment would be to update Larry's resource calendar with an availability change. The easiest way to access to the calendar is to double click on the resource name in the Task Form. As a result the Resource Information dialog box will appear and the calendar change may be made.

- Click on the **General** tab
- Click on **Change Working Time**

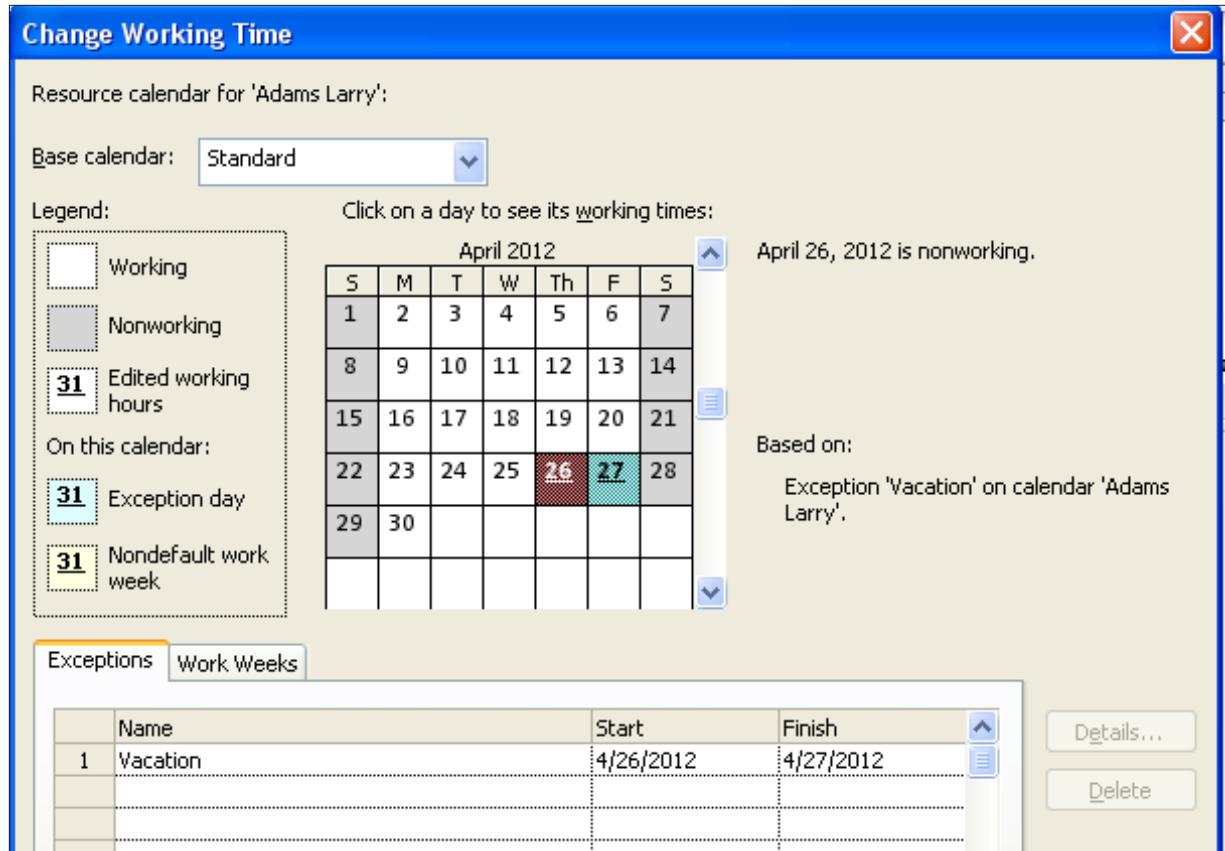


Figure 7-35 PLACEHOLDER

In the view below, the Resource Usage in the top view shows how the task is actually scheduled for this resource. The Task Form, Schedule view on the bottom shows the changed dates for the task assignment. April 26 & 27 have been deemed non-working days.

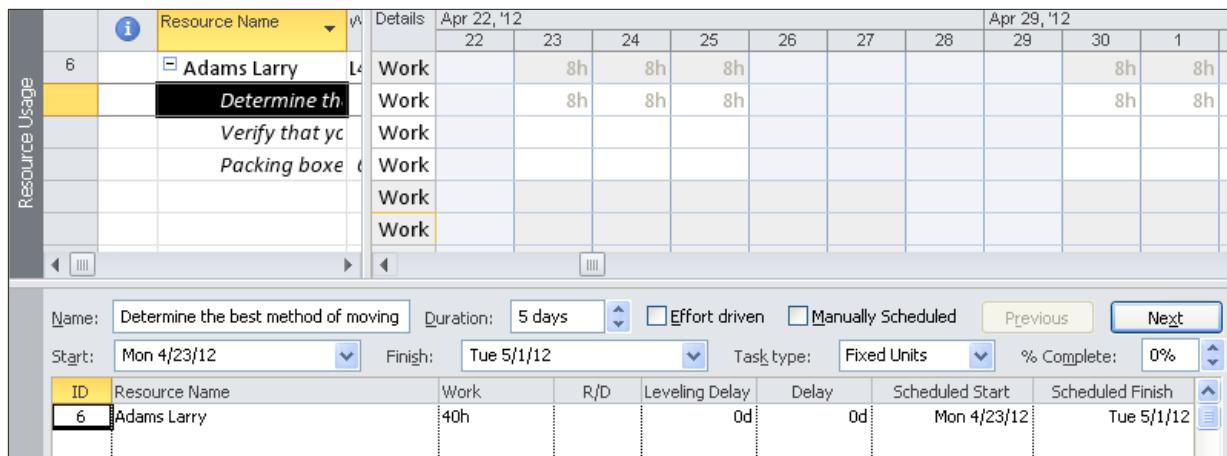


Figure 7-36 PLACEHOLDER

Resource Availability and Fixed Duration Tasks:

When a resource is assigned to a fixed duration task, the resource must have availability between the start and finish dates of the task. In the example below, when Larry Adams was assigned to a 5 day fixed duration task, he was assigned for 24 hours of work because he is available for only 3 of the 5 days required.

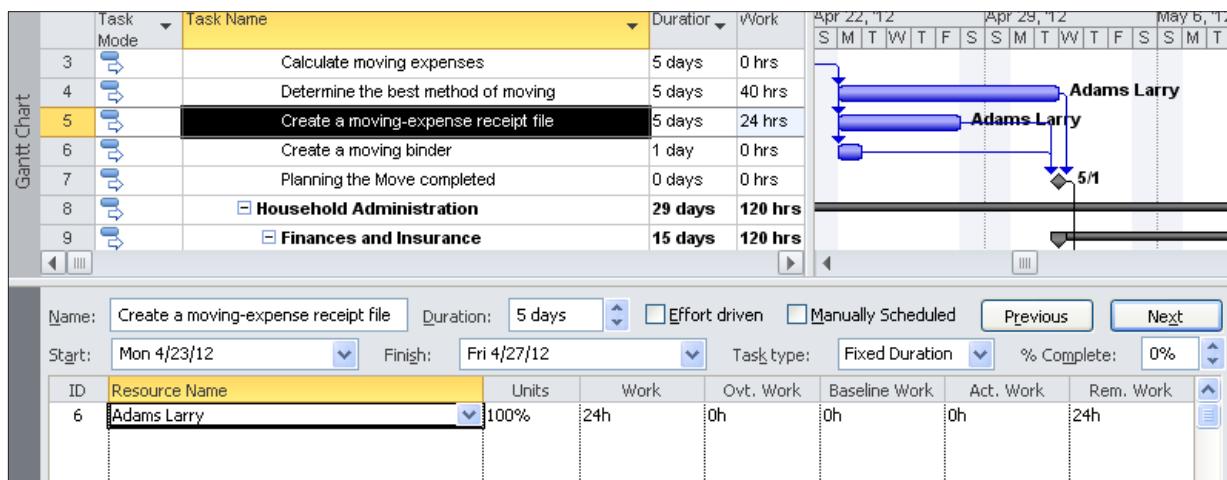


Figure 7-37 PLACEHOLDER

Below, the detail of the assignment is shown using the Resource Usage view.

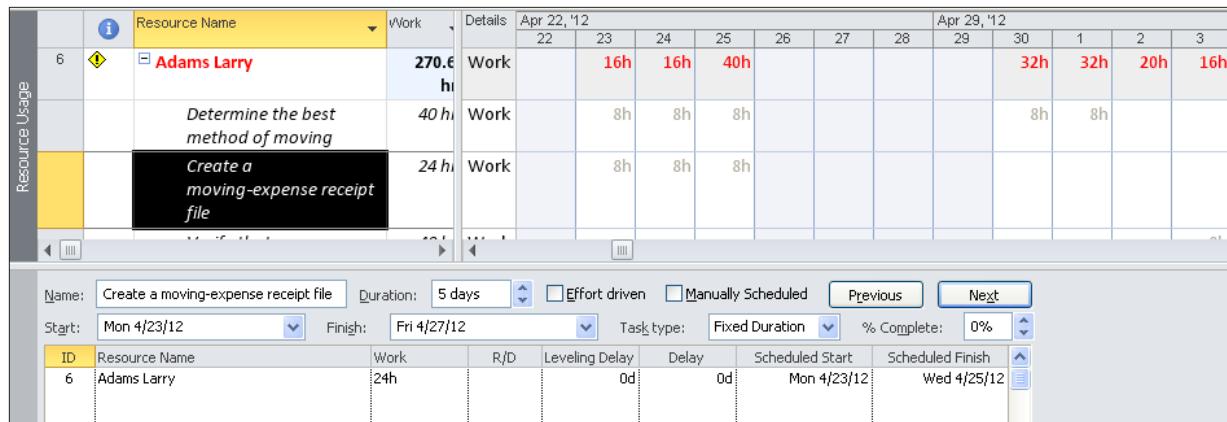


Figure 7-38 PLACEHOLDER

If a resource is assigned to a fixed duration task and the availability changes AFTER the assignment has been made, the following error message will be displayed.

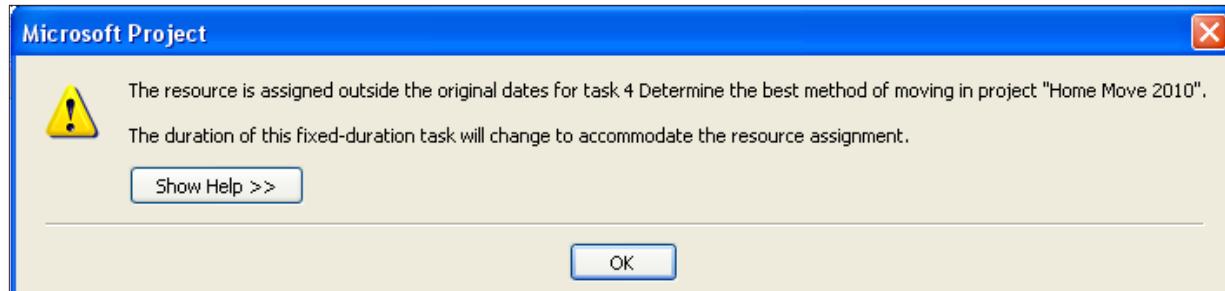


Figure 7-39 PLACEHOLDER

Max Units

The Max units column on the Resource Sheet indicates the quantity of the resource that is available to be assigned to tasks. The Max units column displays the value as either a decimal or percentage format as deter-

mined in the scheduling options for the project. The display in decimal or percentage value is a personal preference and will not affect scheduling assignments.

For example:

- **If Max units is 100% or 1:** the default assignment would be at 100% of time that is available represented on the resource calendar for the resource.
- **If Max units is 50% or .5:** the default assignment would be at 50% of time that is available represented on the resource calendar for the resource.
- **If Max units is 500% or 5:** you will have up to 5 full time resources available to assign to tasks of this type of resource.

When creating percentage assignments, the assignment is a request for part of the availability of a resource. If the Max Units column is less than 1 or 100%, the result will be a percent of a percentage available for a resource. Since resource names do not indicate the value of the Max Units column, assignment results might not be consistent.

Table 7.4 PLACEHOLDER

Max units	Hours Available	Assignment percentage	Result
1 or 100%	8	100%	8 hours
1 or 100%	8	50%	4 hours
.5 or 50%	8	100%	4 hours
.5 or 50%	8	50%	2 hours

Max units and Fixed duration tasks:

A status meeting would be a fixed duration, effort-driven off task. Mike is a 75% resource based on his Max unit setting. Joan is 50% and Ron is 25%. The project manager has 100% in his Max Units field.

The example below shows the result of each resource assignment to the task using their default settings. All attendees are required to attend for the entire 2 hours. To have this assignment work for each resource, 100% units should have been entered for each resource.

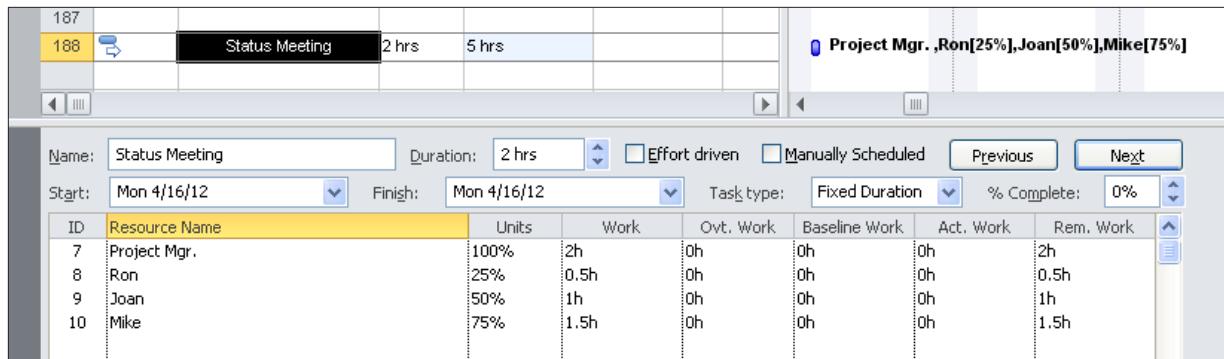


Figure 7-40 PLACEHOLDER

If the assignment was made from the Assignment dialog box, the Task Information box or by adding resource names on the task entry resource column, the details of the assignment would not be viewed. Use of Max unit percentage values for assignments should have a double check to make sure the outcomes are as expected.



Another way of handling limited availability of a resource is to limit the amount of available time on the resource calendars. This will allow uniqueness per resource and well as increased consistency in the treatment of resource assignments.

Best Practices and Rules for Creating Assignments

Project 2010 software rules for creating assignments:

- When work or duration values are recalculated, if the resources are removed, these values will not return to the original values.
- Generic resources will use the default standard calendar to schedule work, unless another calendar has been assigned to the resource. When a human resource is assigned, the task will most likely increase in length (except for Fixed duration tasks) to accommodate the availability calendar of the resource. This might result in an later scheduled project finish date.

- When assigning resources to a task using a task calendar, make sure that the option to “ignore the resource calendars” is checked. If this is not checked, the task will appear that the resources are assigned but the work values will be zero.
- Fixed duration tasks are tied to dates. When an assignment is created, the resource must have availability between the dates of the task. It is always a good idea to check the assigned work for the assignment. If the resource becomes unavailable after the assignment is made, the task length will change to accommodate the assignment.
- Manual v. Automatic scheduling task modes will return different assignment results. Switching from one mode to another might recalculate the work or duration of the task. Manual mode uses the duration value, resource availability and units to calculate assignments.
- When assigning work to Effort-driven tasks, the first assignment will establish the amount of work for the task. Other resources added after the first assignment will distribute the work of the task across the resources.
- Resources may have their availability limited by the resource availability ranges that are stored in the Resource Information box. (see below). To create a valid resource assignment, the task must occur within a timeframe that the resource is available.

Figure 7-41 PLACEHOLDER

Below is a view of a task that is scheduled to start on April 16, 2012.
The task does not have a resource assigned.

Figure 7-42 PLACEHOLDER

Below is a view of the same task with the resource assigned who is not available on the dates of the task because of the limitation of the resource

date ranges. As a result, the task has been changed to a milestone task and no work has been assigned to the resource.

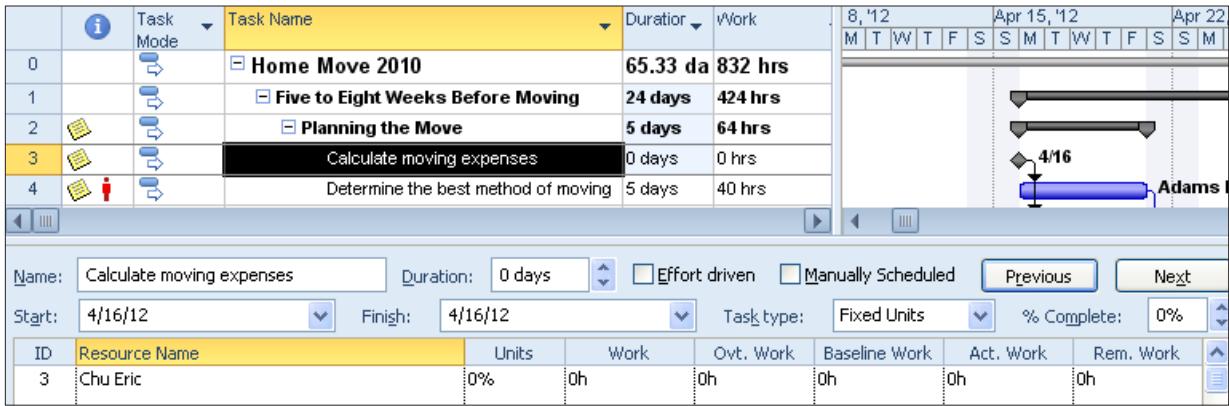


Figure 7-43 PLACEHOLDER

Best Practices for creating assignments:

- Double check task type and effort-driven flag before creating an assignment to make sure the settings are correct for the task. Double check these settings when switching from manual scheduling to automatic scheduling.
- Assignments are based on resource availability. The more accurate the resource calendars are, the more accurate the assignments will be.
- Use the Resource Usage view to refine the assignment of hours. Contouring is available.
- Use the Task Entry view. Gantt chart or Task sheet on top and Task Form or Detail task form on the bottom when creating assignments. Use the subviews of work, schedule and cost in the bottom pane. These are helpful views to use to check assignments for correctness.
- Do not assign resources to summary tasks or milestones. The software allows assignments to summary tasks, but summary tasks are subtotals and not trackable. Tracking will only be correct for Summary tasks when 0% work has been performed or 100% of the detail tasks for the summary task are completed. Milestones are 0 work and 0 duration tasks. Assigning a resource changes the meaning.
- Understand what the work of the task is before creating the assignment. Having this understanding will help in knowing if the assignment is correct for the task.
- Assign resources one at a time, at first to become comfortable with creating assignments. Assign multiples as your comfort level increases.

Remember, when assigning resources to effort-driven tasks, the way the resources are assigned can result in different work and cost values for the task.

- If you are having problems calculating the correct number of hours of work when creating assignments, do not hesitate to enter the number of hours per resource for a task.
- If the assignment gets confusing, remove all resources and start over.
- Do not change task type mid-assignment. If you feel the task type should be changed, remove the resources, change the task type and reapply the resources.
- Most project managers do not feel that resources produce 8 hours of project work in a day. If assignments are created at 8 hours per day, are you are likely creating an unrealistic schedule. Many project managers will use 75% to 80% of an 8 hour day when assigning resources at 100% availability.
- If you are assigned a resource for 50% of their time, clarify how many hours of work per day 50% represents. Does 50% mean 50% of his total work time or 50% of the time the resource has available to work on projects? Try also to clarify how many hours per week the resource may be scheduled on your project.

Practice: Working with Factors that Affect Assignments

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 7.5 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 4: Viewing Resource Assignments

Once assignments are created, refining them and looking at them from different points of view is not only helpful but necessary. If resource allocations and future resource demands are your goals for using Project 2010, taking a deeper look at the results of how the assignments were created will be essential.

In this lesson we will take a look at:

- Resource Usage view
- Task Usage view
- Team Planner view

Resource Usage View

The purpose of the Resource Usage view is to allow viewing and updating of assignments from the resource point of view. This view displays all assignments created for a resource as well as assignment details for time and cost information and enables fine tuning of assignments. Details maybe viewed at any timescale density that is appropriate for your project.

Using this view will also allow access to the Assignment information box where you can adjust the rate charts used per task and resource assignment contouring.

Some of the details available in this view will answer the following questions?

- How much availability does a resource have? Per day, per week, etc.
- What is the cost of having a resource work on a task?
- Are all of the tasks assigned to a resource appropriate for the resource?
- How many hours per day/week/month is a resource assigned to a task?
- Is a resource overallocated? (Overbooked)
- What is the future demand for a resource for this project?

- What is the total number of hours and cost for a resource assigned to the project?
- What tasks to avoid assigning resources to.
- During tracking, what is the remaining work on a task for a resource?

Looking at the view below, the G. C. Procurement manager is assigned to a quantity of work at the week level. The detail of the work is displayed to the right and the total amount of work assigned to the resource is displayed to the left. The greyed numbers at the top of each resource are the total number of hours for the timeframe. In the view below, the week of January 16, G. C. Procurement is assigned to work 36 hrs. The 36 hours is distributed over 2 detailed tasks.

	 Resource Name	Work	Details	Dec 23, '12		Jan 20, '13			F
				21	3	16	29	11	
3	 G.C. procurement	80 hrs	Work		32h	36h	12h		
			Work		32h	8h			
			Work			28h	12h		

Figure 7-44 PLACEHOLDER

Using the timescale zoom in the lower right corner of the screen (or double clicking on the timescale), to zoom to a per day or per week level of detail. This view may also be customized by adding columns of additional data on both the left and right sides of the view shown below.



Figure 7-45 PLACEHOLDER

To add columns on the right side of the screen:

- Right click on the right side
 - Select the desired column(s) from the short list
OR
 - Right click on the right side
 - Select **Detail** styles
 - Click on a column on the left
 - Click **Show**
 - With the field selected on the right, the color may be changed
- Note: the color change is for the title rows only

- Click **ok**

While in this view, there are also buttons on the Format ribbon bar which will help customize the view. The “Add Details” is the same form as the detail styles option above. Below is a view of the Format ribbon for the Resource Usage view.

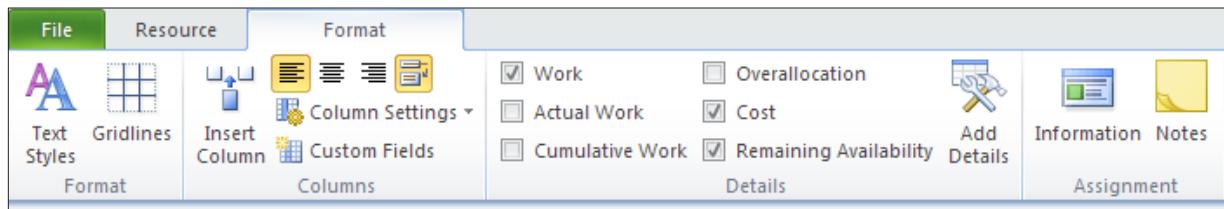


Figure 7-46 PLACEHOLDER

In the view below, the Remaining Availability and Cost fields have been added. The G. C. Procurement resource is assigned 80 hours to the project. He is also showing availability of 4 hours per day during the timeframe shown. The task “Obtaining building permits” is showing a 50% or 4 hours per day assignment. Using the resources standard rate, the daily cost to the project will be \$400.00 per day.

	i	Resource Name	Work	Details					
					7	8	9	10	11
3		□ G.C. procurement	80 hrs	Work	4h	4h	4h	4h	4h
				Rem. Avail.	4h	4h	4h	4h	4h
				Cost	\$400.00	\$400.00	\$400.00	\$400.00	\$400.00
		Obtain building permits	40 hrs	Work	4h	4h	4h	4h	4h
				Rem. Avail.					
				Cost	\$400.00	\$400.00	\$400.00	\$400.00	\$400.00
		Submit preliminary shop drawings	40 hrs	Work					
				Rem. Avail.					
				Cost					

Figure 7-47 PLACEHOLDER

Cost rate tables are assigned to resources through the Resource Sheet using the Resource Information dialog box, Cost tab. 5 rate scales are available per resource, however only one may be used per task. The rate scales are labeled A-E and cannot be renamed. Rates will have trigger dates to enable increases to be entered in advance. Using the option outlined below allows assignment of a specific rate table to a task.

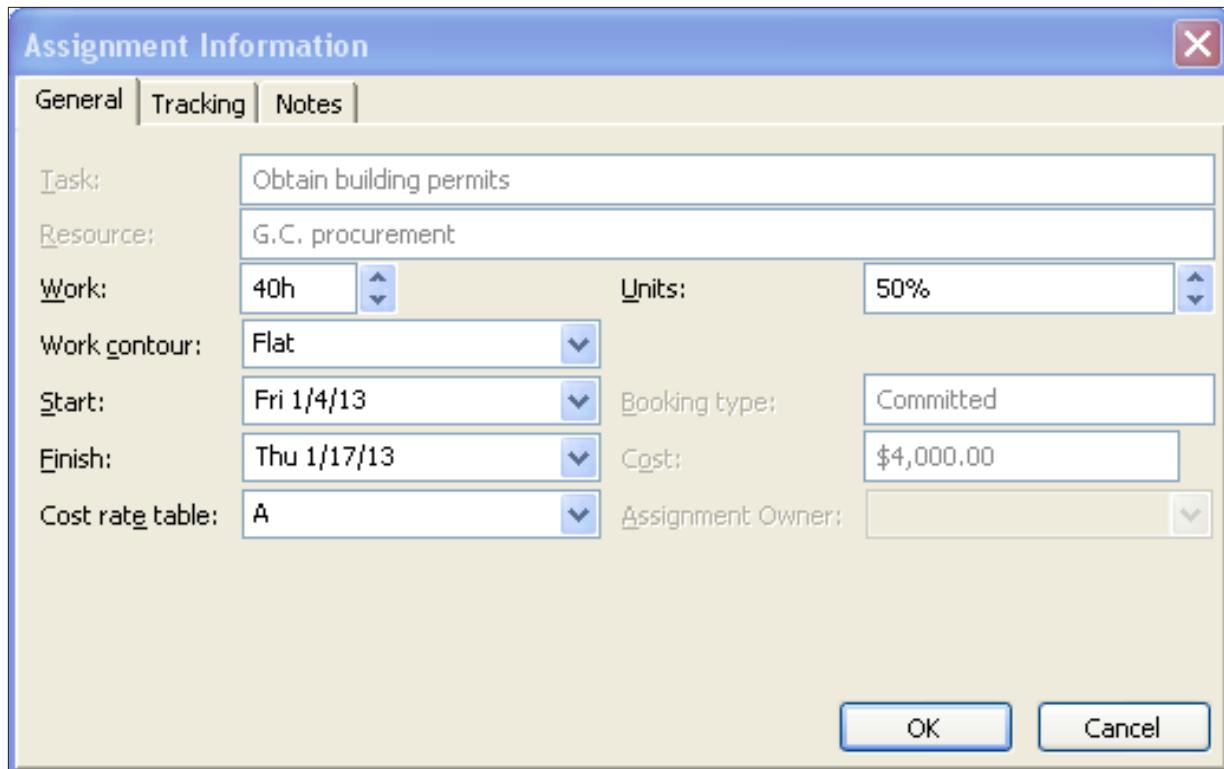


Figure 7-48 PLACEHOLDER

Below is an example of rate scale A applied to the task “Obtain building permits” and B has been assigned to “Submit Preliminary Shop Drawings”. The work of the first task is at a different rate than the work of the second task.

i	Resource Name	Cost Rate	Details					
				7	8	9	10	11
□ G.C. procurement	<i>Obtain building permits</i>	A	Work	4h	4h	4h	4h	4h
			Rem. Avail.	4h	4h	4h	4h	4h
			Cost	\$400.00	\$400.00	\$400.00	\$200.00	\$200.00
	<i>Submit preliminary shop drawings</i>	B	Work	4h	4h	4h	4h	4h
			Rem. Avail.					
			Cost	\$400.00	\$400.00	\$400.00	\$200.00	\$200.00
			Work				4h	4h

Figure 7-49 PLACEHOLDER



The Resource Usage view may be used for resource work distribution worksheets. When this view is printed, a timeframe maybe added to allow for more focused printing. Insert a page break between resources to print separate reports for each resource.

In future modules we will discuss applying filters and groupings to views which will increase value of reports obtainable from this view.

Task Usage View

Task Usage view is very similar to the Resource Usage view, however, the content is viewed from the task perspective. Each task is displayed with the resources assigned to the task. The scheduler will be able to see a complete picture of the details of assignments. This view may also be used for changing or fine tuning assignments. Details maybe viewed at any timescale density that is appropriate for your project.

Using this view will help to answer some of the following questions:

- What resources are assigned to a task?
- Which tasks are overallocated and where?
- Which tasks do not have a resource assigned?
- What are the total cost and number of hours of a task?
- What is the remaining work of a task?
- What is the Value of Baseline vs. Actual Work and Cost for a task?
- How many resources do I need to have to complete a task?
- What percent allocations are my resources assigned to tasks?

Adding column information works the same as adding information to the Resource Usage view above:

To add columns on the right side of the screen:

- Right click on the right side
- Select one of the columns from the short list
OR
- Right click on the right side
- Select “Detail styles”

- Click on a column on the left
- Click “Show”
- With the field selected on the right, the color may be changed
Note: the color change is for the title rows only
- Click ok

Project 2010 has provided a ribbon bar for the Task Usage view.

Buttons on this bar are available to help with formatting and changing the information viewed. The Details sections will add and remove columns on the right side of the grid.

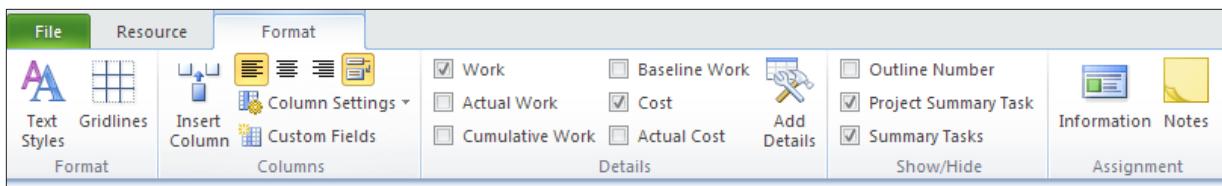


Figure 7-50 PLACEHOLDER

Below is an illustration of the Task Usage view showing work and cost for the “Obtain building permits” task. You will note that there are 2 resources assigned and they are not performing the same amount of the work and are working different times. They are also assigned different hourly rates.

	Task Mode	Task Name	Duration	Details	Jan 6, '13			
					S	M	T	W
7	➡	Obtain building permits	20 days	Work		7h	4h	7h
		G.C. project management		Cost		\$500.00	\$200.00	\$500.00
		G.C.		Work		3h	0h	3h
				Cost		\$300.00	\$0.00	\$300.00
				Work		4h	4h	4h
				Cost		\$400.00	\$160.00	\$400.00

Figure 7-51 PLACEHOLDER

In future modules we will discuss using filters and groupings to give more dimension to the reports that can be obtained from this view.

Team Planner View

The Team Planner view is new in Project 2010. The purpose of this view is to show resources and their assignments using a Gantt style format. The team planner view will help the scheduler identify overallocations within the schedule, level workloads, reassign resources to tasks and identify problems in the schedule from the resource point of view. This type of view is also known as Swim Lanes.



Team Planner view is only available in Project 2010 Professional.

Team Planner view is divided into 2 sections. The upper section contains one row for each resource, with bars to the right representing assigned work. The lower section contains bars representing tasks without resources.

To view the Team Planner:

Task → Gantt chart → Team Planner

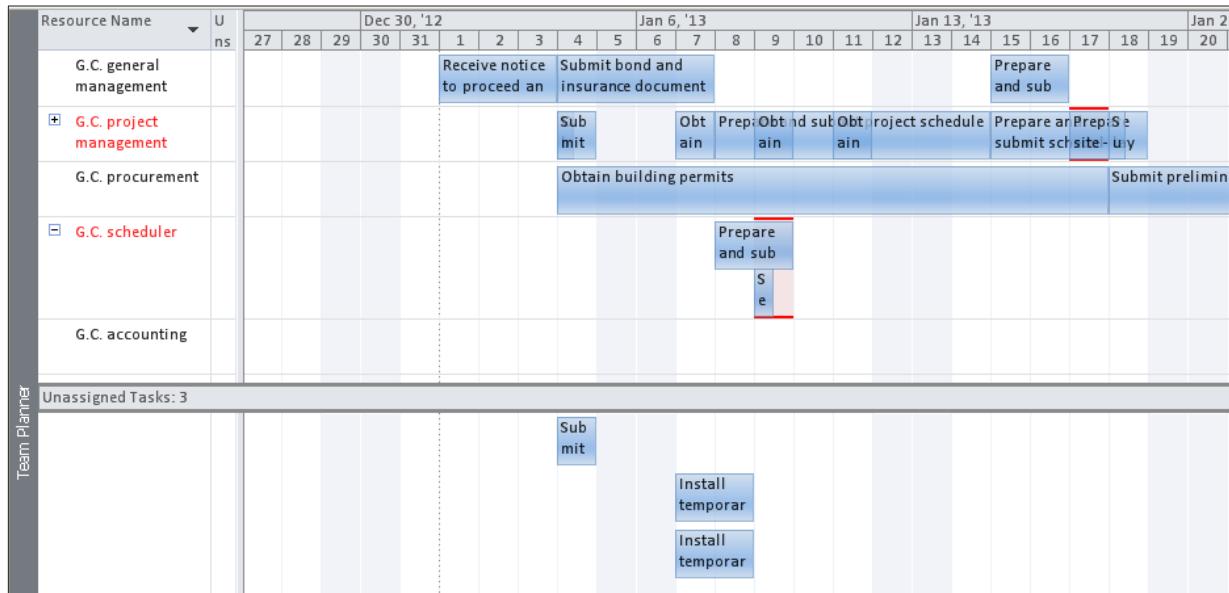


Figure 7-52 PLACEHOLDER

Below is a chart to help with understanding how to read the indicators

of the Team Planner view:

Table 7.6 PLACEHOLDER

Feature	Meaning
A vertical orange line	Today's date
Tasks colored in darker blue	Progress on the task
Teal colored tasks	Manually scheduled tasks
Gray colored tasks	External tasks
Light blue colored tasks	Un-started tasks
Gaps in timelines for resources	Under-allocated resource or unavailable
Red lines on the top and bottom of the task	Overallocated tasks
Resource name in red	Overallocated resource
Task bars colored black	Tasks that are late
Shaded day on calendar	Non-working day for the resource. This data is coming from the resource availability calendar
Top pane – pink blocks of time	Overallocated time

Below are some of the keystrokes that will help you work with the information in this view.

Table 7.7 PLACEHOLDER

Action	Result
Double click the resource name	Resource Information dialog box
Double click a work task bar	Task Information dialog box
Timescale density	Adjust as needed – lower right corner
Hover over task	Pop up of task details
Double click on timescale	Opens the timescale box to alter scale values
Right click on a task	More options:
Right click on an assignment – Reassign to:	This option presents a list of all resources in the schedule, including resources already assigned to the task. Select a resource to reassign to the task or select unassigned option and all assignments will be removed from the task.
Right click on an assignment – Inactivate:	Task will disappear from the Team Planner view. To reactive, return to Gantt chart view.

Things to know about when working with Team Planner view:

- Only active tasks will show in the team planner view.
- Bars may be dragged back and forth to even out workloads as well as move assignments from one resource to another.
- An unassigned task may also be moved (dragged) from the unassigned area (bottom) to a timeframe for a resource. The default assignment will be at 100% units.

- Unassigned tasks in the lower pane are aligned with their planned start dates.
- If automatic scheduling is the task mode for a task, the task type will come into play for the assignment when moved from one resource to another.
- When tasks are moved from one resource to another, assignments will be created for the new resource at the same percent allocation that the original resource was assigned.
- For automatically scheduled tasks, dragging tasks to change dates will create a start no earlier than constraint. This constraint might cause problems in calculating the schedule.
- Error messages will be returned when there is a relationship conflict when moving tasks.
- When moving manually scheduled tasks, all moves will be accepted and no constraints will be set.
- Tasks may be assigned to resources without being scheduled.
- A box in the upper pane represents an assignment and not a task. If a task has several resources assigned, when you move the boxes you are moving the assignment for an individual only.
- To reactivate a task, return to the Gantt view.
- Percent complete tracking will mark the tasks completed as planned. More information regarding tracking will be discussed in the tracking module.

To the right of each resource name is a column titled “Unscheduled tasks”. Unscheduled tasks may be dragged to this column to be assigned to a resource. If there is no duration value to the task, some work will be assigned to the resource. If there is a duration value on the task, the resource will be assigned at 100% and work will be calculated. Even though a work value exists for the task, the task will be considered a duration-only task.

In the example below, the task “Calculate moving expenses” is an automatically scheduled task and is not assigned to a resource.

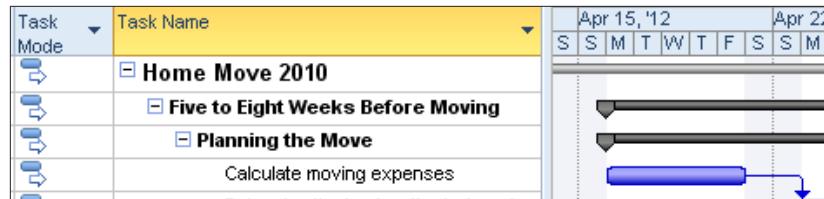


Figure 7-53 PLACEHOLDER

In the Team Planner view, a task is dragged from the unassigned area

in the lower portion of the view to the “Unscheduled tasks” column to the right of the resource name column. The task bar changes to teal to indicate that it is a manually scheduled task. Below is the team planner view with the task reassigned but not scheduled to Bob Smith. The task is not visible in the assignment bar area of the view.

Resource Name	Unscheduled Tasks	'12	Mar 4, '12	Mar 25, '12	Apr 15, '12	May				
		T	F	S	M	T	W	T	F	S
Smith Bob	Calculate moving expenses									Verify

Figure 7-54 PLACEHOLDER

The Gantt chart for the assignment is shown below. Note the task type is manually scheduled and the Gantt bar is showing a format of unknown duration.

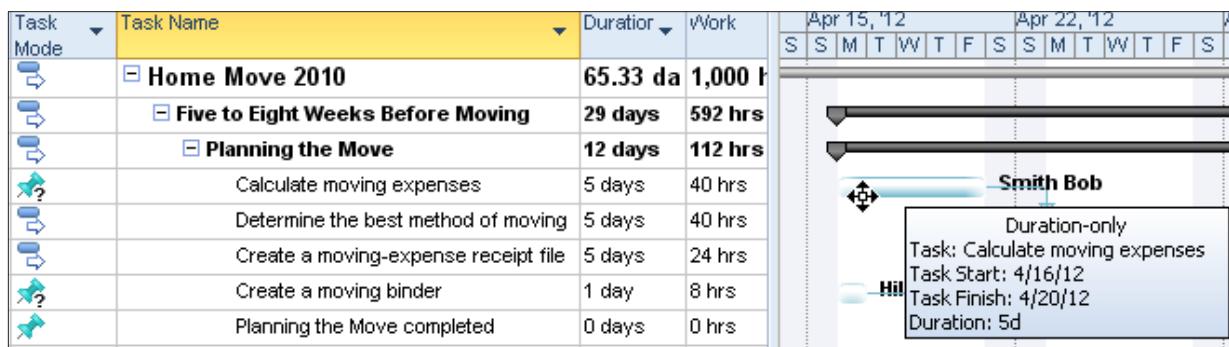


Figure 7-55 PLACEHOLDER

A ribbon formatting bar is available when using the Team Planner view. Tools are available for deeper formatting of this view. Show/Hide buttons add or remove data from the view.

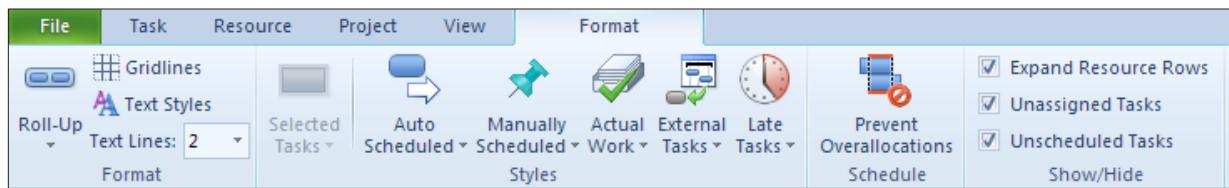


Figure 7-56 PLACEHOLDER



In future modules we will learn how to add buttons to the ribbon bars. A helpful addition to the Resource bar is adding the Scroll to task button.

Practice: Viewing Resource Assignments

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **ok**.

Table 7.8 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 5: Resolving Resource Overallocations

Most project manager's work daily to make sure that all work is covered by appropriate resources that have enough time available to do the work necessary to complete a project. When resources are overbooked they are called Overallocated.

In this lesson we will discuss:

1. Understanding overallocations
2. Views to discover overallocations
3. Manually leveling resources
4. Automatic leveling of resources

Understanding Overallocations

Each resource is assigned a calendar when entered on the Resource Sheet. The calendar is customized to contain the availability of the resource. When more work is assigned to a resource than time available on their resource calendar, the resource is considered to be overallocated. The overallocation calculation is looking at resource assignments on a minute by minute basis. If a resource is overbooked for even 1 minute, the resource is considered overallocated.

When a resource is overallocated, a red person symbol appears in the indicator column. This indicates that there is an overallocated resource assigned to the task but will not indicate which resource is affected. Even though resources are overallocated, assignments can continue to be created.

Below is a view of tasks with overallocated resources:

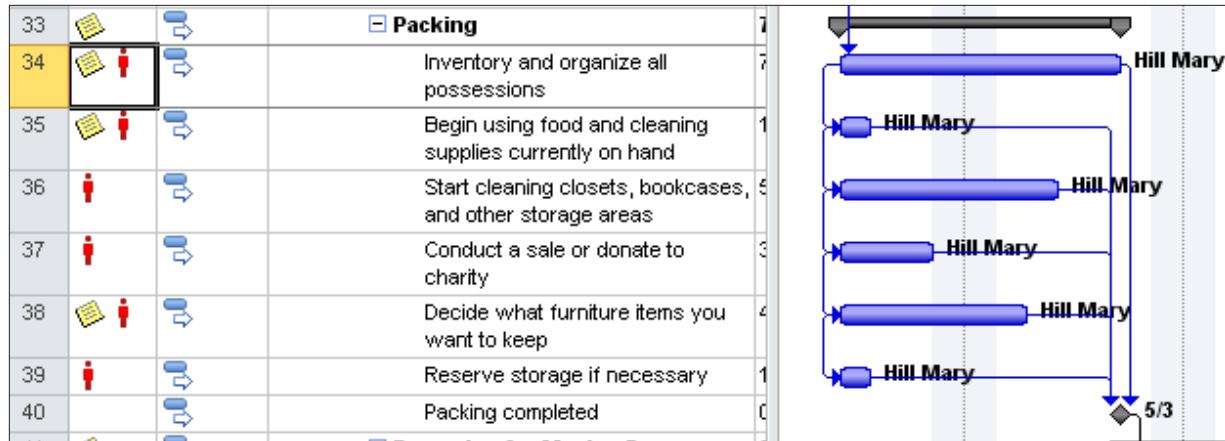


Figure 7-57 PLACEHOLDER

Views to Identifying Overallocations

There are several views in Project 2010 that will help analyze resource overallocations. After an overallocation situation is discovered, research should be carried out to understand where the overallocation exists.

The views below will help locate these problems:

- Resource sheet
- Resource graph
- Resource allocation view
- Team Planner

Resource Sheet: shows resources that are overallocated in red and will also display a yellow warning diamond in the indicators column. This indicates that the resource is overallocated on at least one assignment.

		Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Base
1		Smith Bob	Work		S		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
2		Taylor Sue	Work		T		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
3		Chu Eric	Work		C		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
4		Hill Mary	Work		H		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
5		Cook Cathy	Work		C		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
6		Adams Larry	Work		A		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
7		Project Mgr.	Work		P		100%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
8		Ron	Work		R		25%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
9		Joan	Work		J		50%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard
10		Mike	Work		M		75%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Standard

Figure 7-58 PLACEHOLDER

In the case of Mary Hill and Larry Adams, both are overallocated somewhere in the schedule. We will need to look at other views to get additional information.

The Resource Graph view will show what days a resource is over-allocated in a graphic format.

To view the Resource Graph:

Task → Gantt chart → Resource Graph

- Click the slider at the bottom of the left of the screen to scroll through the resources. Stop when a resource name is in red.
- **Resource → Next overallocation** button
- The graphic bars will advance to the first overallocated resource. Continue clicking the **Next Overallocation** button until all overallocations have been viewed. An error message will display when all overallocations are shown for a particular resource.

The view below shows Mary Hill's 100% capacity shows an indicator line. The blue bars below the line are within her 100% capacity limits.

The red bars above the line represent her overallocations based on her resource calendar. Peak Units are displayed in the lower portion of the graphic. This represents the number of resources required to accomplish the work at the current level of assignment by this resource. This example shows that we will need 600% of Mary or 6 Mary's to complete the work.

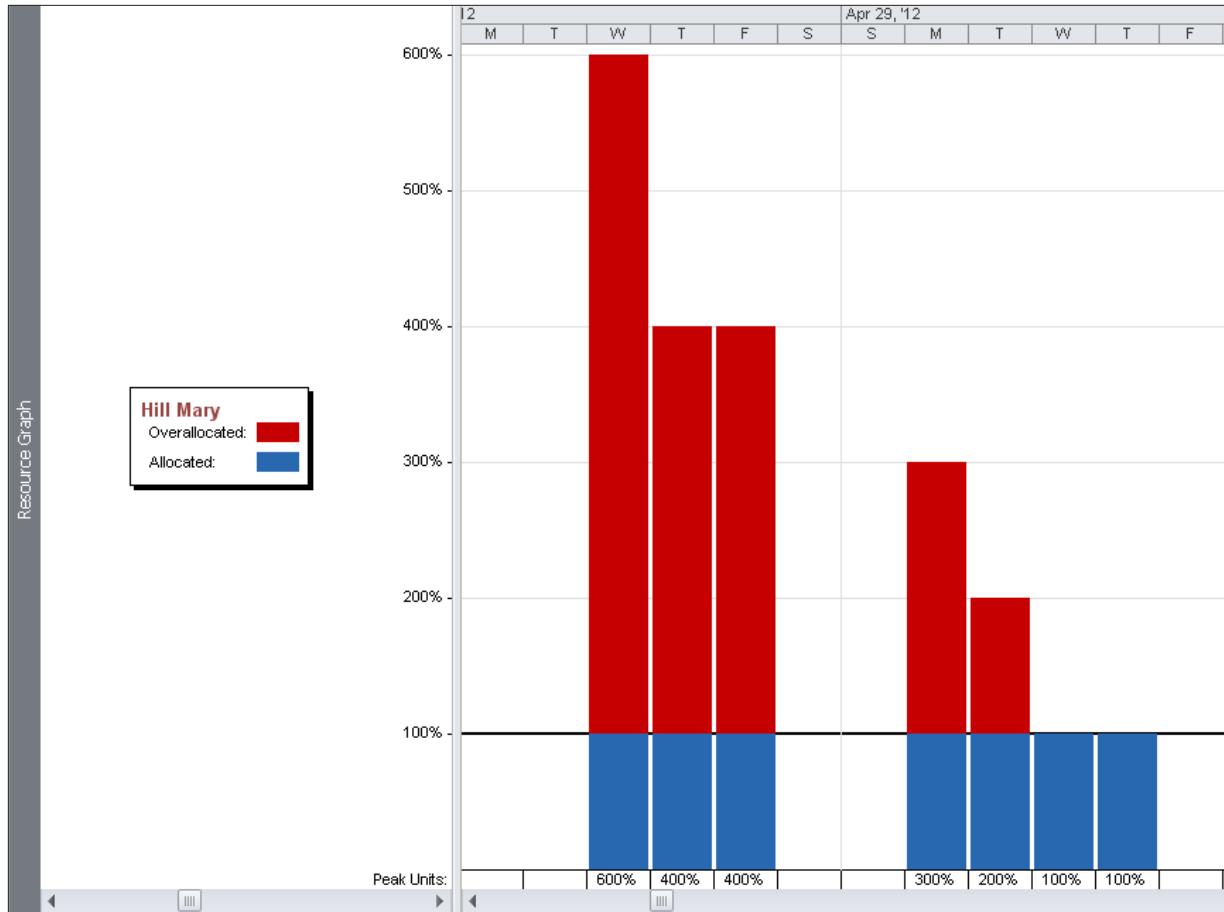


Figure 7-59 PLACEHOLDER

The Resource Graph view may also be customized by right clicking the Peak Units line and selecting other values to be shown on the graph. Below are the option choices for data that is available to be shown using this view. Further customization is also available using the format bar available for the Resource Graph shown below.

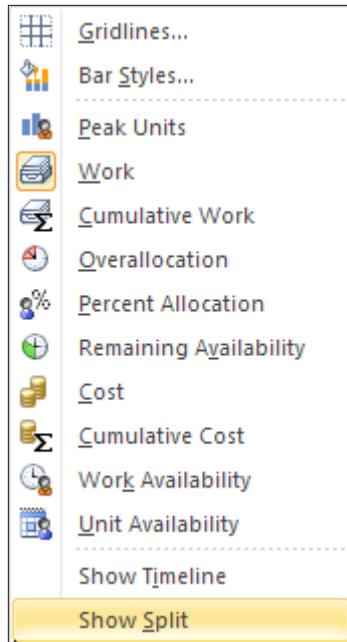


Figure 7-60 PLACEHOLDER

To resolve overallocations in the schedule, more information will be needed. We still need to find out more information about what tasks are involved and for how many hours. The Resource Allocation view is a split view with the Resource Usage view on the top and the Leveling Gantt view on the bottom. This view allows the scheduler to see what tasks are involved and when they are scheduled. Getting the full picture of what other tasks the resource is assigned to and who is assigned to the tasks with the resource, will give the scheduler more information to make an informed decision.

To reveal the Resource Allocation view:

- Tasks → Gantt chart → More Views → Resource Allocation view → Apply
- Click on the overallocated resource (in red)
- Click **Scroll to task** button to bring Mary's work into view

In the view below Mary is overallocated between April 25 and April 30. We can see that she is fully assigned at 100% to several tasks. Some of the tasks have a second resource assigned.

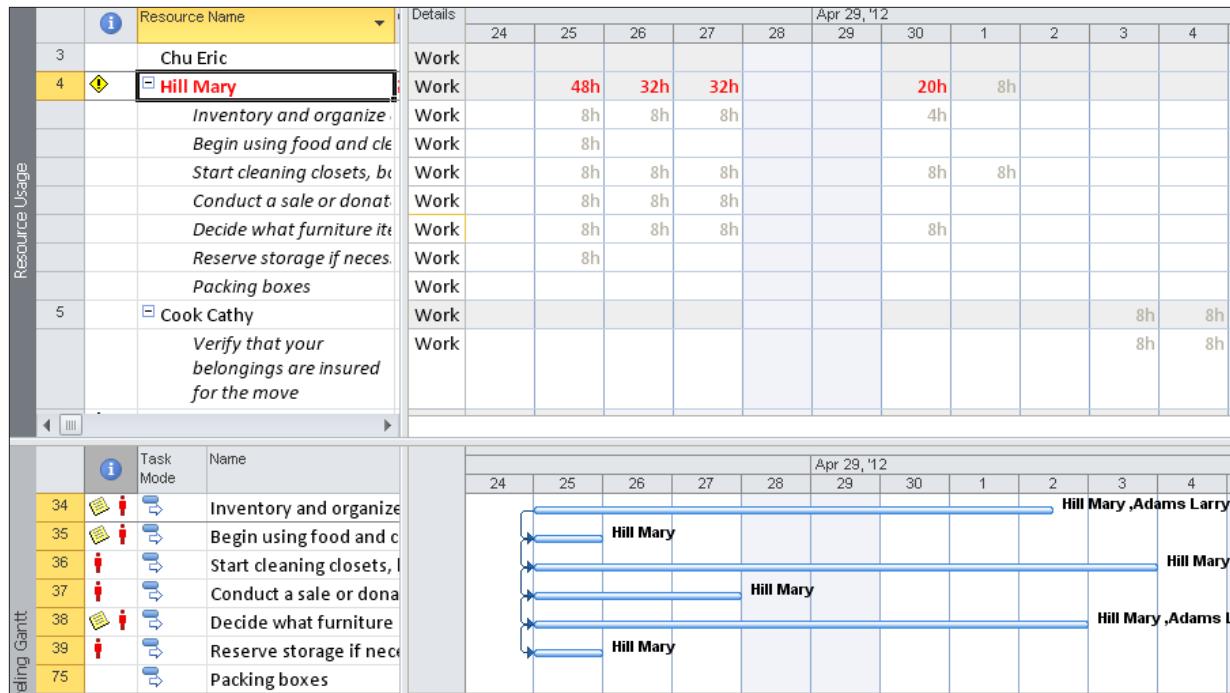


Figure 7-61 PLACEHOLDER

The following is the same information viewed through Team Planner:

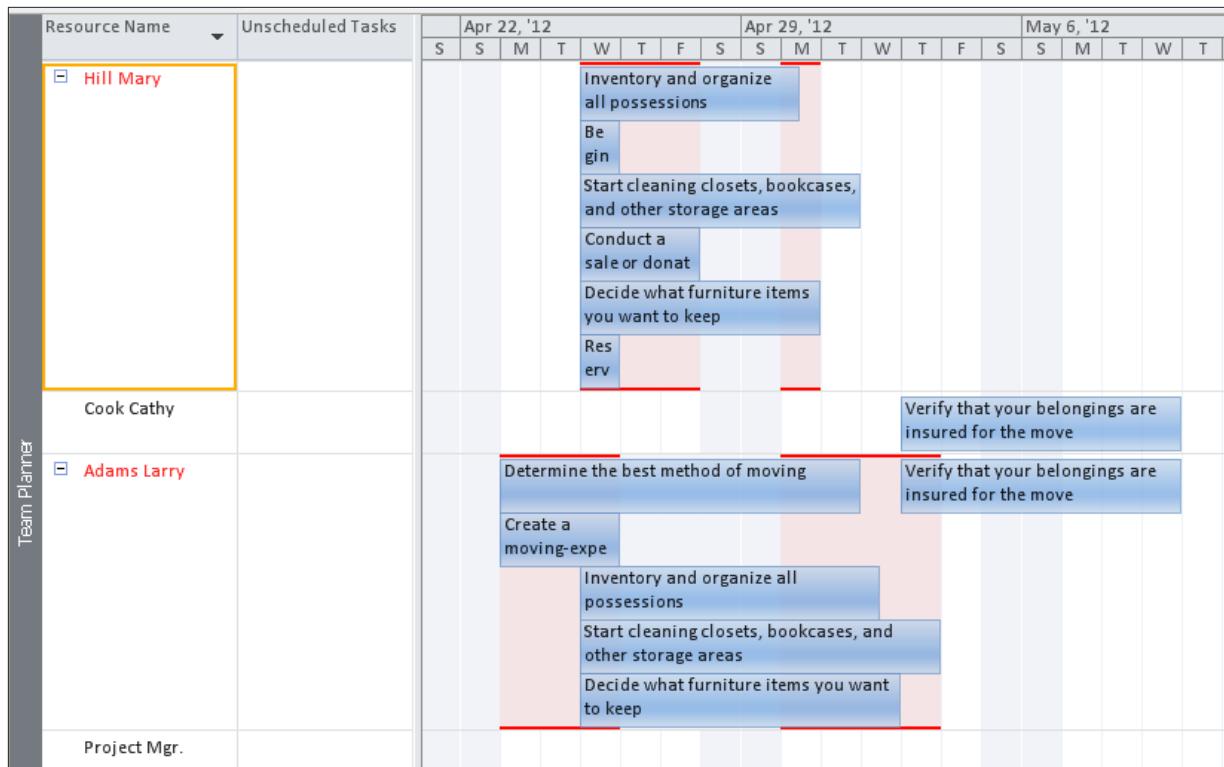


Figure 7-62 PLACEHOLDER

Mary's overallocations are flagged in red with the background in pink. Multiple task assignments may be viewed simultaneously.

Leveling Resources Manually

Project 2010 has a function called Resource Leveling that can help level the work of the resources. It is designed to move assignments forward or backward within time limits to attempt to level or smooth the workload for the resources and remove or lessen overallocations.

Automatic resource leveling in Project 2010 is designed to move resource assignments to a point in time where, based on the resource

calendar, the resource has time available. If resources have a capacity of 160 hours of work available in a month and they are assigned to 200 hours of work, the project duration will extend outwards to schedule the work via resource leveling. To level resources, and keep to the original time line, either or both of the following should occur: the percentage of capacity of the resources is increased, or more resources are added. Failure to do either will result in an inability to complete some of the planned work.

Manual resource leveling should always be tried before attempting automatic leveling. Leveling is most effective when performed by a project manager who is most familiar with the work and the people.

The following are some suggestions for effective manual resource leveling:

- Add more people necessary skills to tasks
- Obtain more time from the people you already have (nights, weekends, etc)
- Outsource a portion of the work
- Negotiate deadlines to see if extensions are possible
- Move the best resources to the most critical tasks. There is less risk and greater probability of these resources completing the tasks on time.
- Give a lesser skilled resource to a highly skilled resource as an assistant.

This is a win-win. The highly skilled resource will give the lesser skilled resource some of the lower level work. The lesser skilled resource will learn something new. Might increase cost.

- Cancel vacations
- Adjust relationships
- Break long tasks up into shorter tasks and divide the work over more resources if possible. Under-allocated resources will be better utilized
- Break long tasks around fixed dates. Do some of the work before and complete the work after.

Leveling Resources Automatically

Once the decision is made that leveling needs to occur, there are several ways to level resources within the software. The different options are:

- Team planner – manually move assignments around
- Format ribbon bar – prevent overallocations

- Resource ribbon bar – level one or all resources
- Resource ribbon bar – leveling options to control how leveling occurs
- Resource ribbon bar – clear leveling

The Gantt chart below shows a summary group of automatically scheduled tasks. The tasks are all scheduled to complete on May 3. Each task has 2 assigned resources, Mary Hill and Larry Adams. They also have indicators that each of the tasks is overallocated.

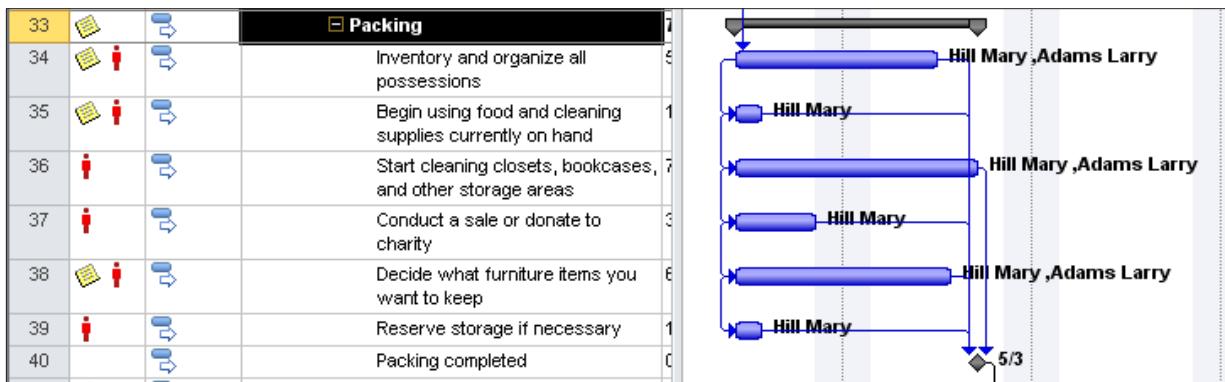


Figure 7-63 PLACEHOLDER

Team planner:

In the team planner view below, Mary Hill and Larry Adams are both overallocated and require leveling. Overallocated tasks are represented by displaying red lines around them.

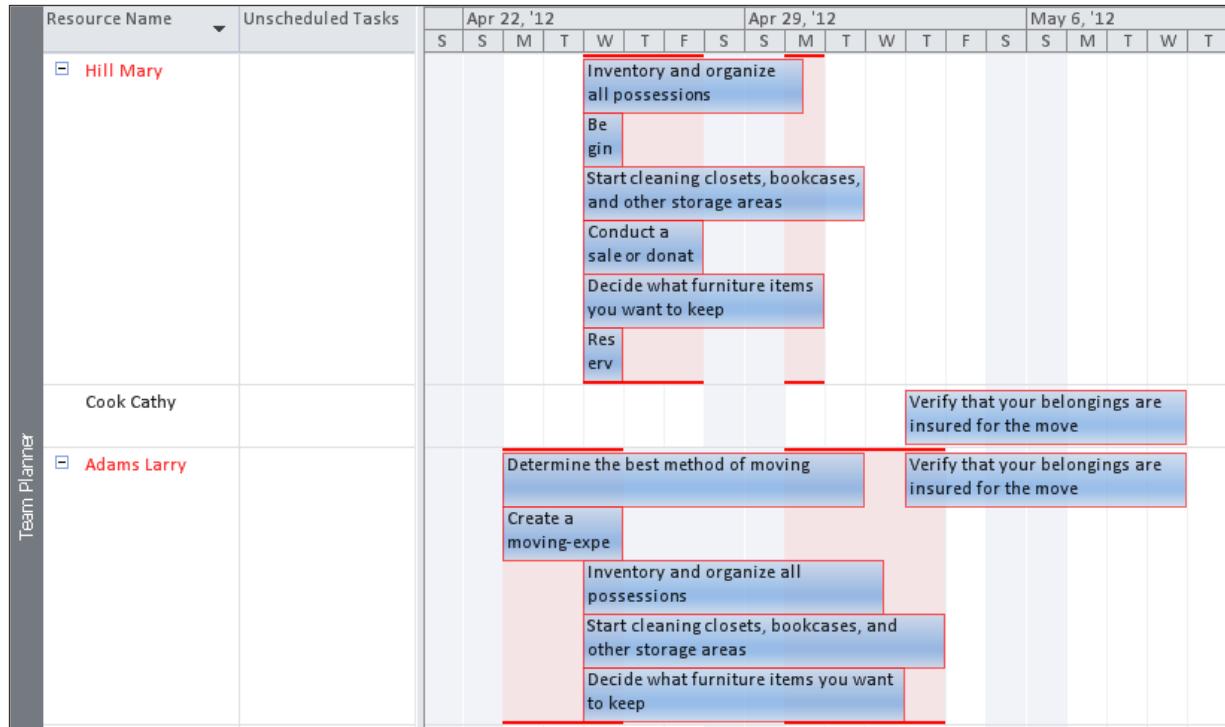


Figure 7-64 PLACEHOLDER

The resource ribbon bar offers several leveling options:

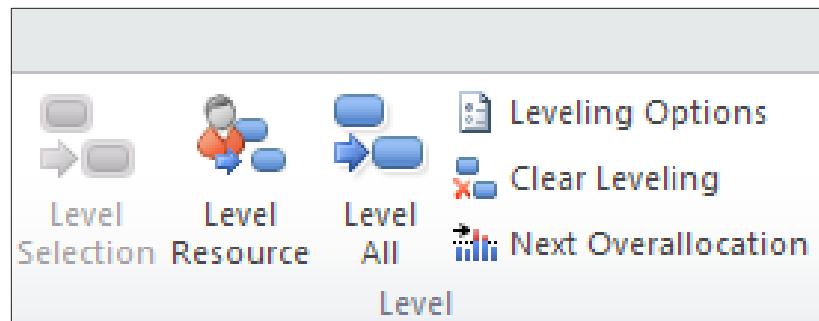


Figure 7-65 PLACEHOLDER

Select one resource and click **Level Selection**. The result is the selected resource will be leveled. When leveling resources from the Team Planner view, only the assignment is adjusted and not the entire task. Click **Level All** to level all tasks for the entire project.

Below is the Team Planner view with all resources leveled. Before leveling, the project was scheduled to complete on May 3rd. After leveling, the project will now complete on May 23rd.

Resource Name	U ns	Apr 29, '12					May 6, '12					May 13, '12					May 20, '12							
		T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W
Hill Mary							Inventory and organize all possessions	Begin				Start cleaning closets, bookcases, and other storage areas		Conduct a sale or donate to charity				Re				Re		
Cook Cathy																								
Adams Larry		Adams Larry	Inventory and organize all possessions				Start cleaning closets, bookcases, and other storage areas		Determine	Decide what furniture items you want to keep		Determine	Decide what furniture items you want to keep		Create a moving-expense receipt file									

Figure 7-66 PLACEHOLDER

Leveling does not hurt the schedule and should be tested to see the results. Leveling can be removed at any time. To the right of the Level All button, there is a Clear leveling option.

In Team Planner view, click **Format** tab to view the Format menu bar. There is an option button labeled Prevent Overallocations. When this option is turned on, all resources will be leveled and continuously re-leveled with each task change. Additional assignments are created in other views. Returning to Team Planner view will refresh leveling.

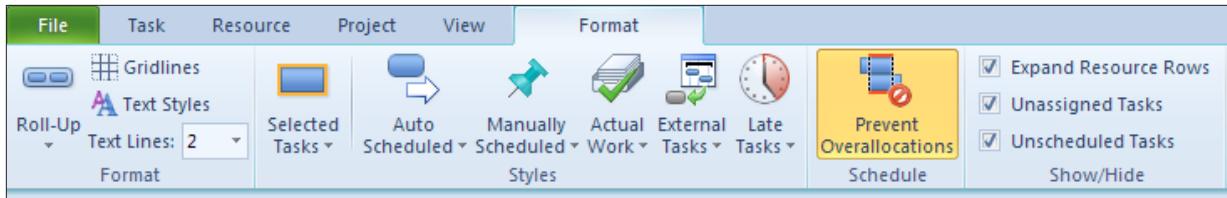


Figure 7-67 PLACEHOLDER

In the Team Planner allows drag and drop assignments to aid in the leveling process. Tasks may be manually move and reassigned as needed.

In the example below, the Resource Allocation view is shown with Mary Hill selected in the top pane. When leveling resources, the Resource Allocation view is effective for viewing the results of leveling.

To display Resource Allocation view:

Click **Task** → **Gantt chart** → **Move Views** → **Resource Allocation view** → **Apply**

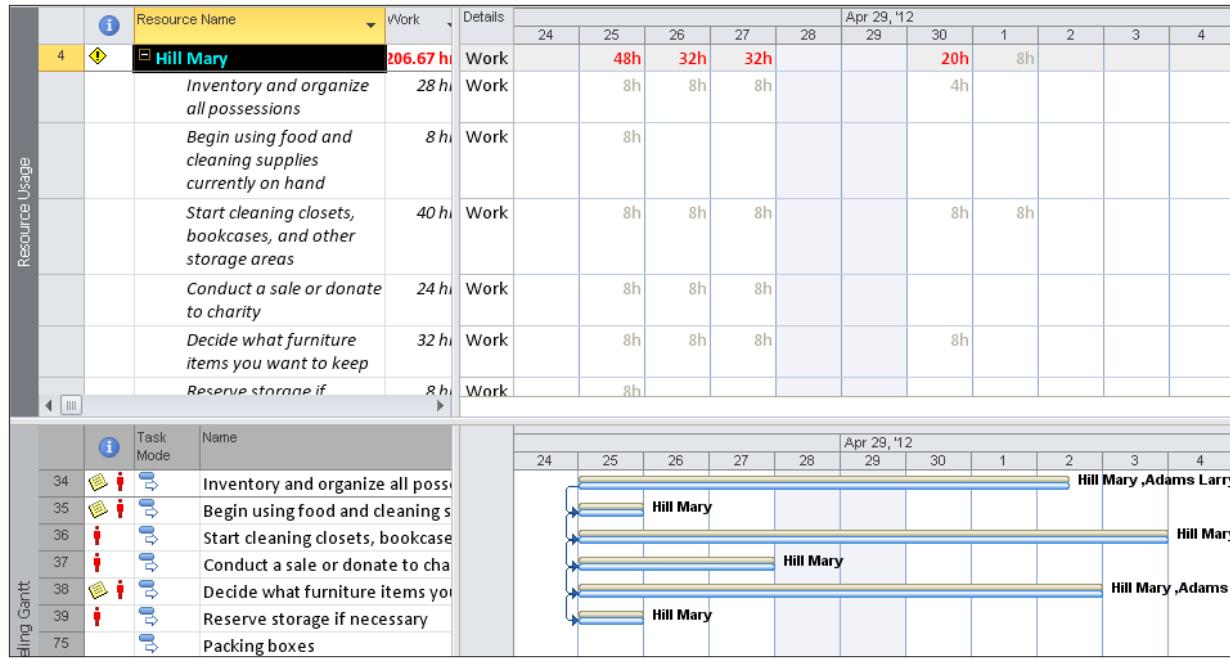


Figure 7-68 PLACEHOLDER

Another approach to leveling is Leveling Options on the Resource bar. When leveling the schedule using the Resource Leveling dialog box, leveling may be performed for resources, individual tasks or the entire project. After leveling is applied, the Leveling Gantt in the lower pane will display a comparison of the original schedule represented with tan bars and the result of leveling with blue bars.

To display Resource Leveling dialog box:

Resource → Leveling options

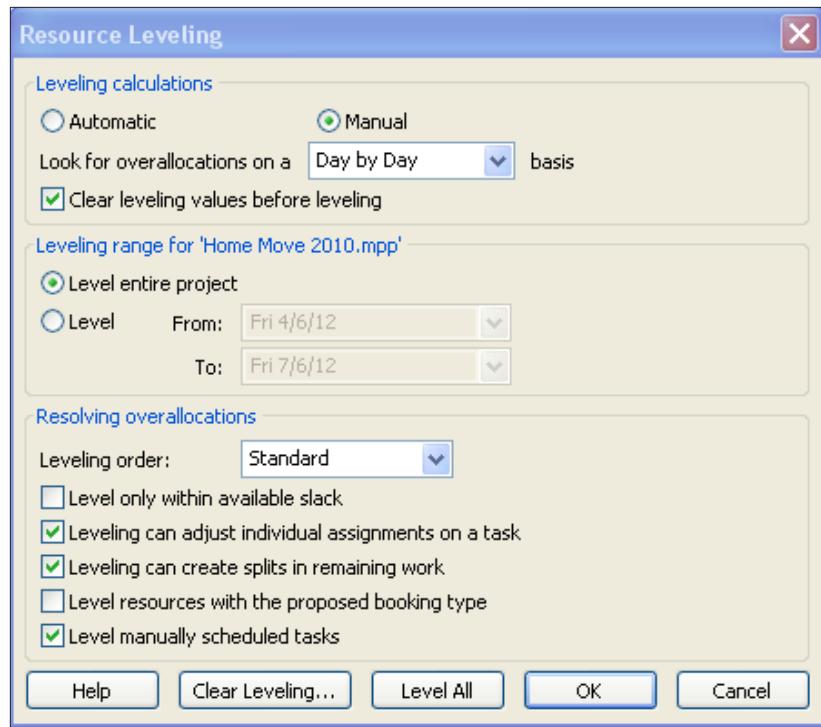


Figure 7-69 PLACEHOLDER

The values in the form are as follows:

- **Automatic or Manual:** the automatic option will level the schedule with each task change. For greater leveling control, Manual leveling is recommended.
- **Look for overallocations on a:** day by day is the default value. The program will attempt to make sure that all resources are not overbooked by even 1 minute during any day. Week by week allows some days to be longer and others may be shorter but the total hours for the week must match the availability calendar. Consider the length of the project when making this choice. A very short project is better suited to the day by day option.
- **Clear leveling values before leveling:** Clears leveling from other leveling attempts.
- **Entire project or range of dates:** Start with the entire project. Smaller timeframes may be used for future leveling actions.
- **Leveling Order:**
 - **ID Only:** levels tasks with higher ID number first.

- **Standard:** uses task duration, dependencies, slack, task dates, constraints, tasks without successors and priorities to level the tasks.
- **Priority Standard:** all tasks and projects have a priority setting of 1-1000 with 1000 being the highest. This leveling option, awards priority to the higher priority value tasks and those tasks are considered first during leveling.
- **Level within available slack:** locks the project end date and all tasks will be leveled within the current time period.
- **Leveling can adjust individual assignments on a task:** leveling will never remove or replace a resource on a task. This option refers to the concept of keeping all resources together on the task or can they perform their work individually. This option is being set for the entire schedule which might not be the case. There is a field on each task that will control this option called Level Assignments. To make this a task level value, insert the column Level Assignments and set the value for individual tasks.
- **Leveling can create splits in remaining work:** allows the remaining work of a task to be split. This option can be controlled at the individual task level using the task field Leveling Can Split.
- **Resources with Proposed booking types:** affects Project Server 2010 users only. Should planned, but uncommitted resources for the project, be included in the leveling process?
- **Level manually scheduled tasks:** includes manually scheduled tasks when leveling.

Below is a view of the post leveled tasks. Note the tan bars showing what the schedule looked like before the leveling and the blue bars representing the after status. The ending date is far beyond the original scheduled date. By dragging the split bar up to the top of the screen, the Resource Usage view will disappear and the entire view will be the Leveling Gantt. This view will show the affect of leveling for the entire project.

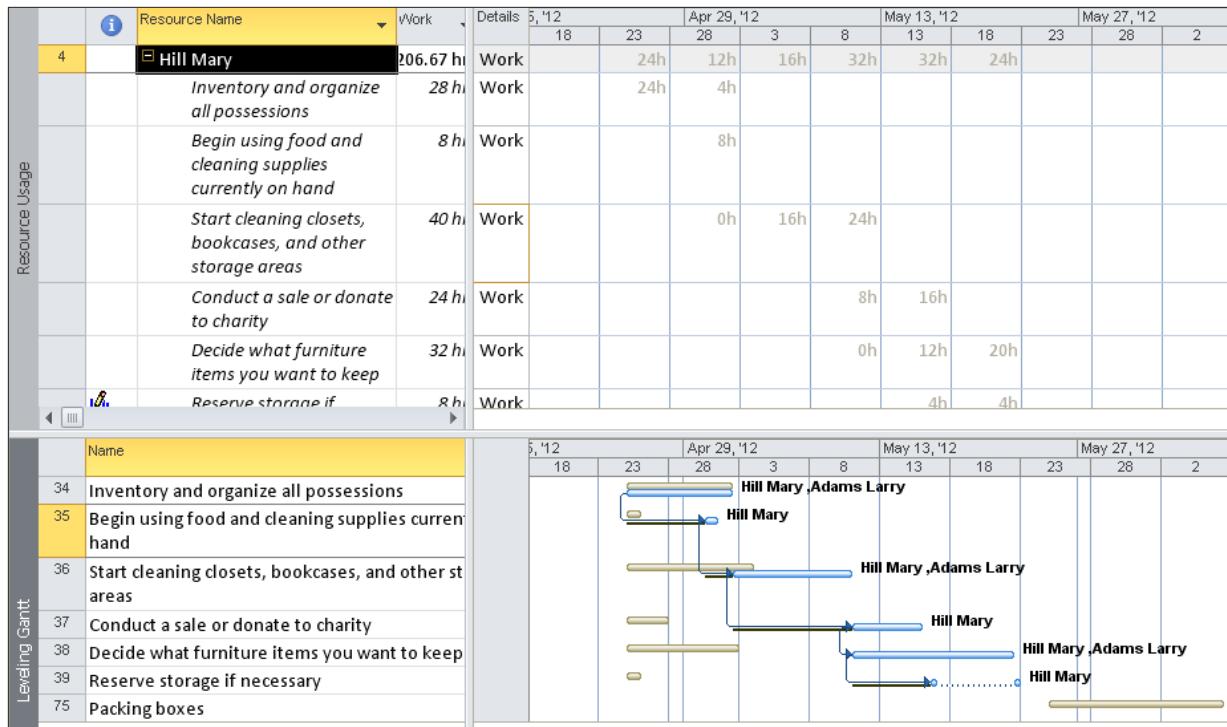


Figure 7-70 PLACEHOLDER

Practice: Resolving Resource Overallocations

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the **ps07** virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 7.9 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

The creation of resource work assignments takes practice. It is important because assignments are the basis for project scheduling, costing and resource allocations. Determine the types of assignments that will make your schedule most successful. Knowing your goals will help simplify the scheduling process.

In this module you learned:

1. Concepts behind resource assignments
2. Scheduling formulas
3. Creating assignments for work resources
4. Views in Project 2010 used to see assignments
5. Leveling the work of resource assignments



Chapter 8

Reviewing and Finalizing the Schedule

Module Overview

Once a schedule has been created, it is beneficial to look at the data from different points of view. Project 2010 has the ability to group and filter schedule data to allow for flexibility that will be needed for various reports. While the schedule is being built, a timeline is being built as well but the scheduler should determine if the timeline is correct. Once the timeline has been finalized, setting the baseline will lock down the original schedule.

In this module you will learn about:

1. Filtering and grouping schedule data
2. Examining the critical path
3. Setting the schedule baseline

Lesson 1: Working with Groups and Filters

The data in a Project 2010 schedule file can be manipulated to allow viewing data from alternate points of perspectives. Data criteria are entered as a request and data is extracted as a result of the query. When the criteria parameters are removed, the data will return to the original status for the schedule. Groups and filters may be applied to the same table simultaneously to refine the data required for reports.

This lesson examines:

1. What are groups
2. How to use groups
3. What are filters
4. How to use filters



Project 2010 has the ability to create customized groups and filters. This lesson will be addressing software groups and filters that are part of the standard software install. Customized groups and filters are discussed in Appendix A.

What are Groups?

Grouping data allows different ways of looking at the schedule data to help solve problems and answer questions. In a large schedule, grouping becomes a very valuable tool to group data from all task levels based on values within the schedule itself. Groups are created based on the value in a column and viewed through a table or a view. A column does not have to be contained in a table to be used as grouping criteria.

Criteria for Groups are provided for task, assignment and resource groupings and are not interchangeable. Only task groupings may be applied to task views, resource groupings to resource views and assignment groupings to assignment views.

Task Groups provided are:

Table 8.1 PLACEHOLDER

Group name	Grouped by criteria (column name)
Active vs. Inactive	Active
Auto scheduled vs. Manually scheduled	Task Mode
Complete vs. Incomplete	% Complete
Constraint Type	Constraint Type
Critical	Critical
Duration	Duration
Duration then Priority	Duration, Priority
Milestone	Milestone
Priority	Priority
Priority keeping outline structure	Project, Outline number, Priority
Resource	Resource Name
Status	Status

Resource Groups provided are:

Table 8.2 PLACEHOLDER

Group name	Grouped by criteria (column name)
Complete and Incomplete Resources	% Work Complete
Resource Group	Group
Resource Type	Type
Standard Rate	Standard Rate
Work vs. Material	Type

Assignment Groups provided are:

Table 8.3 PLACEHOLDER

Group Name	Grouped by criteria (column name)	Comments
Assignments keeping outline structure	Name, Task outline number	May only be used from Resource Usage view



Creating custom groupings are described in Appendix A.

How to Use Groups

To apply a Task grouping:

- Reveal a Task based view or table
 - **View → Group by** in the Data section
 - Select the required grouping
- Standard groups are highlighted below:

The screenshot shows the Microsoft Project ribbon with the 'Format' tab selected. Below the ribbon is a 'Resource Views' pane with options like 'Team Planner' and 'Other Views'. On the far right, there's a 'Zoom' button. The main area displays a 'Task Entry' table with columns for Task Name, Duration, Start Date, Finish Date, and Predecessors. A 'Group by' dropdown menu is open, showing various grouping categories such as 'Active v. Inactive', 'Auto Scheduled v. Manually Scheduled', and 'Duration'. The 'Duration' option is highlighted with a yellow box. A cursor arrow points to the 'Duration' option in the menu.

	Duration	Start	Finish	Pre
Project 2010	95.38 days	4/11/12	8/22/12	
	3.13 days	4/11/12	4/16/12	
Project scope	1 hr	4/11/12	4/11/12	
Sponsorship	1 day	4/11/12	4/12/12	2
Primary resources	1 day	4/12/12	4/13/12	3
Resources	1 day	4/13/12	4/16/12	4
	0 days	4/16/12	4/16/12	5
Requirements	14 days	4/16/12	5/4/12	
Analysis	5 days	4/16/12	4/23/12	6
Software	3 days	4/23/12	4/26/12	8
Budgetary budget	2 days	4/26/12	4/30/12	9
Budget	4 hrs	4/30/12	4/30/12	10
Feedback on software	1 day	4/30/12	5/1/12	11

Figure 8-1 PLACEHOLDER

In the example below, the Duration grouping has been applied to the Task Entry table. The group intervals are described at the top of each grouping. Clicking the small box highlighted below to the left of each grouping level title will allow for collapsing and expanding the grouping levels. The view below has the groups expanded to reveal all detail.

Task Mode	Task Name	Duration	Start	Finish	Predecessors
	Duration: 0 days	0d	4/16/12	8/22/12	
⊕	Scope complete	0 days	4/16/12	4/16/12	5
⊕	Analysis complete	0 days	5/4/12	5/4/12	15
⊕	Design complete	0 days	5/24/12	5/24/12	23
⊕	Development complete	0 days	6/25/12	6/25/12	30
⊕	Unit testing complete	0 days	7/16/12	7/16/12	40
⊕	Integration testing complete	0 days	8/1/12	8/1/12	46
⊕	Training materials complete	0 days	7/27/12	7/27/12	55
⊕	Documentation complete	0 days	7/6/12	7/6/12	65,61
⊕	Pilot complete	0 days	8/10/12	8/10/12	72
⊕	Deployment complete	0 days	8/17/12	8/17/12	79
⊕	Post implementation review complete	0 days	8/22/12	8/22/12	84
⊕	Software development template complete	0 days	8/22/12	8/22/12	85
	Duration: 0.13 days	0.13d	4/11/12	4/11/12	
⊕	Determine project scope	1 hr	4/11/12	4/11/12	
	Duration: 0.5 days	0.5d	4/30/12	5/24/12	
⊕	Review software specifications/budget with team	4 hrs	4/30/12	4/30/12	10
⊕	Obtain approvals to proceed (concept, timeline, budget)	4 hrs	5/2/12	5/3/12	13
⊕	Obtain approval to proceed	4 hrs	5/24/12	5/24/12	22
	Duration: 1 day	1d	4/11/12	8/22/12	

Figure 8-2 PLACEHOLDER

To collapse the groupings of data to obtain totals:

- View → Outline → Level 1

The collapsed view is shown below. Click the plus signs to view details within a group.

Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
	▪ Duration: 0 days	0d	4/16/12	8/22/12		
	▪ Duration: 0.13 days	0.13d	4/11/12	4/11/12		
	▪ Duration: 0.5 days	0.5d	4/30/12	5/24/12		
	▪ Duration: 1 day	1d	4/11/12	8/22/12		
	▪ Duration: 2 days	2d	4/26/12	8/1/12		
	▪ Duration: 3 days	3d	4/23/12	7/30/12		
	▪ Duration: 4 days	4d	5/15/12	7/20/12		
	▪ Duration: 5 days	5d	4/16/12	8/9/12		
	▪ Duration: 15 days	15d	5/29/12	7/16/12		

Figure 8-3 PLACEHOLDER

To restore all groupings to full detail.

- **View → Outline → All Subtasks**

To remove a grouping:

- **View → Group → No Group or Clear Groups**

Grouped reports may be printed.



Groupings have the ability to be grouped using a maximum of 10 grouping values.

What are Filters?

Filters allow the scheduler to request specific data using a column value for filter critiera. Filtered data allows focusing on data that is required for a specific report or query. The column data used to filter a report does not have to be contained in the current view or table. Some filters will request data at the time they are executed to obtain run time values. Filters may also be applied to Project 2010 standard reports and used for data exports as well.

Project 2010 provides preset filters for task, assignment and resource data. Custom filters may also be created and will be addressed in [Appendix A](#). The Autofilter, which is also a feature in Excel, is available in Project and may be used independently as a filter or in addition to other applied filters.

Filters are created as task filters or resource filters. Below is a list of

the standard filters that are part of Project 2010.

Task filters provided are:

Table 8.4 PLACEHOLDER

Filter	Criteria to filter on is contained in field	Requires value entered at run time
Active Tasks	Active	
Automatic scheduled tasks	Task Mode	
Completed Tasks	% complete	
Costs Greater Than...	Cost	X
Cost Overbudget	Cost v Baseline cost	
Created After...	Created	X
Critical	Critical	
Date Range...	Start, Finish	X
In Progress Tasks	Actual start, Actual finish	
Incomplete tasks	% complete, % work complete for the assignment	
Late tasks	Status	
Late/Overbudget Tasks	Resource Name, baseline finish, Finish v Baseline finish, Cost v Baseline cost	X
Assigned To...		
Linked fields	Linked fields	
Manually Scheduled Tasks	Task Mode	

Table 8.4 PLACEHOLDER

Filter	Criteria to filter on is contained in field	Requires value entered at run time
Milestones	Milestone	
Resource Groups...	Resource Groups	X
Should Start By...	Start v Actual Start	X
Slipped/ Late Tasks	Baseline Finish, Finish v baseline finish, BCWS v BCWP	
Slipping Tasks	Actual finish, Baseline finish, Finish v Baseline finish	
Summary tasks	Summary	
Task range...	ID (range of task ID numbers)	X
Tasks with a Task Calendar Assigned	Task Calendar	
Tasks with Attachments	Objects, Notes	
Tasks with Deadlines	Deadline	
Tasks with estimated Durations	Estimated	
Tasks with Fixed Dates	Constraint type, actual start	
Tasks without Dates	Start, Finish	
Tasks/Assignments with Overtime	Overtime Work	

Table 8.4 PLACEHOLDER

Filter	Criteria to filter on is contained in field	Requires value entered at run time
Top level tasks	Outline level	
Unstarted tasks	Actual Start	
Using Resource In Date Range...	Resource name, Start, Finish	X
Using Resource...	Resource Name	X
Work overbudget	Actual Work vs. Baseline Work	

Resource filters provided are:

Table 8.5 PLACEHOLDER

Filter	Criteria contained in field	Requires value entered at run time
Budget Resources	Budget	
Costs Greater Than...	Cost	X
Cost Overbudget	Cost v Baseline cost	
Created After...	Created	X
Date Range...	Start, Finish	X
Group...	Group	X
In Progress Assignments	Actual start, Actual finish	

Table 8.5 PLACEHOLDER

Filter	Criteria contained in field	Requires value entered at run time
Linked Fields	Linked fields	
Non-budget Resources	Budget	
Overallocated Resources	Overallocated, Assignment	
Resource Range...	ID	X
Resource - Cost...	Type	X
Resource - Material	Type	
Resource - Work	Type	
Resources With Attachments	Objects, Notes	
Resource/Assignments With Overtime	Overtime Work	
Should Start By...	Assignments, Actual Start	X
Should Start/Finish by...	Start, Finish	X
Slipped/Late Progress	Baseline finish, Finish, WCWS	
Slipping Assignments	Actual finish, Baseline finish, Finish	
Unstarted Assignments	Actual start	
Work Complete	% complete	
Work Incomplete	% complete, Work	

Table 8.5 PLACEHOLDER

Filter	Criteria contained in field	Requires value entered at run time
Work Overbudget	Work v Baseline Work	

How to Use Filters

To apply a Task filter from the Gantt Chart View:

- **Task → Gantt Chart**
- **View → Filter → Select Filter**

The list of filters shown is a short list of standard available task filters.

The screenshot shows the Microsoft Project ribbon with the 'View' tab selected. In the 'Data' group, the 'Filter' button is highlighted. A dropdown menu is open, showing various filter options. The 'Milestone' filter is selected, indicated by a yellow background. Other options include 'No Filter', 'Active Tasks', 'Completed Tasks', 'Critical', 'Date Range...', 'Incomplete Tasks', 'Late Tasks', 'Milestones', 'Summary Tasks', 'Task Range...', 'Tasks With Estimated Durations', and 'Using Resource...'. At the bottom of the menu are buttons for 'Clear Filter', 'New Filter', 'More Filters...', 'Display AutoFilter', and 'Show Related Summary Rows'.

	Duration	Start	Finish	Predecessors
Project 2010	95.38 days	4/11/12	8/22/12	
Scope	3.13 days	4/11/12	4/16/12	
Sponsorship	1 hr	4/11/12	4/11/12	
Resources	1 day	4/11/12	4/12/12	2
	1 day	4/12/12	4/13/12	3
	1 day	4/13/12	4/16/12	4
	0 days	4/16/12	4/16/12	5
Requirements	14 days	4/16/12	5/4/12	
Analysis	5 days	4/16/12	4/23/12	6
Software	3 days	4/23/12	4/26/12	8
Budget	2 days	4/26/12	4/30/12	9
Meet with team	4 hrs	4/30/12	4/30/12	10

Figure 8-4 PLACEHOLDER

In the example below, the task Milestone filter has been applied. The filter contains the criteria to filter out and show only the detail tasks that contain a value of "Yes" in the Milestone column. The filter definition also indicates that the summary tasks should be included in the view. Milestone reports are very good project status reports because they hide all of the project detail and display the goal points of the project.

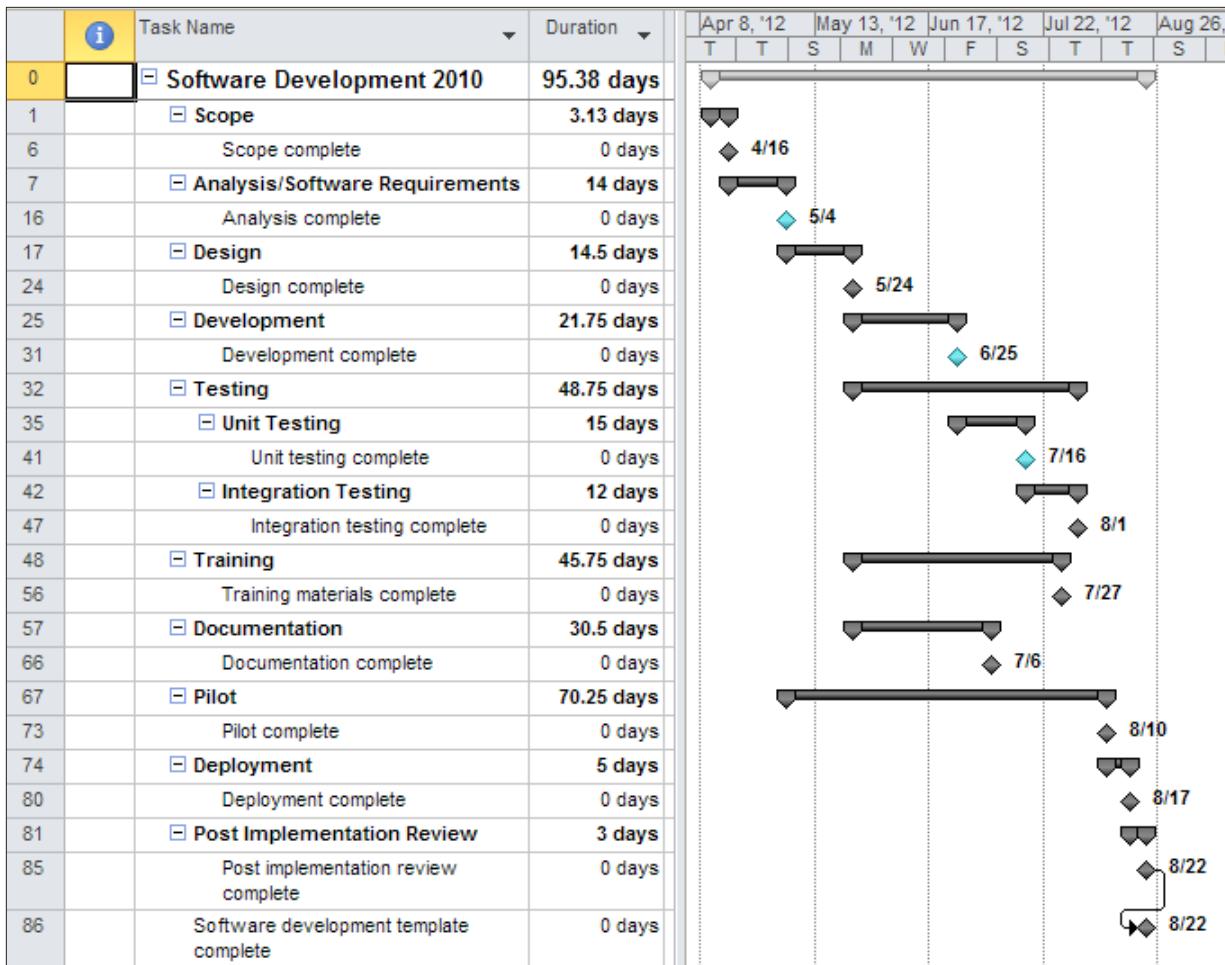


Figure 8-5 PLACEHOLDER

To remove the filter:

- Click **View → Filter → No filter or Clear Filter**
- OR
- Click F3

More filters are available by clicking **More Filters** at the bottom of the available filter list. When this option is selected, the box below will appear. In the More Filters dialog box below, there are options to select either Task or Resource filters. The list of available filters for each will be different because the filters are designed to be applied to either task information or resource information.

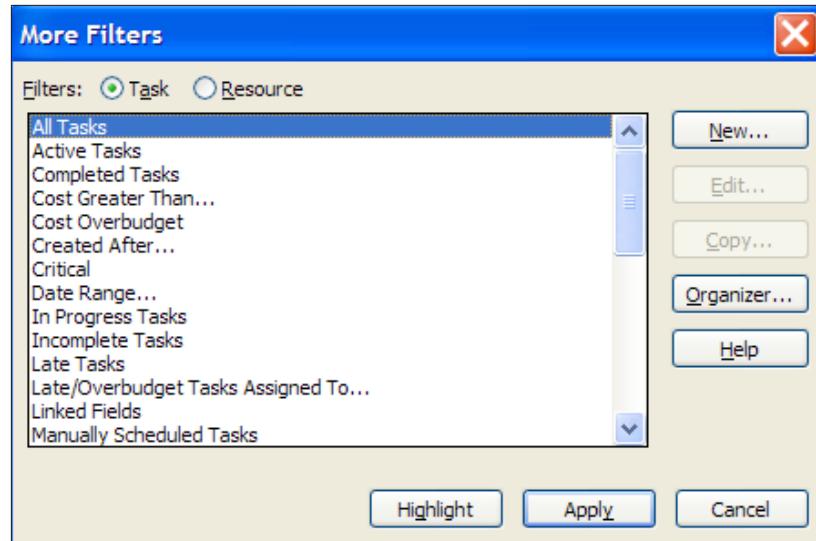


Figure 8-6 PLACEHOLDER

Another option accessible through this dialog box is to use the Highlight filter.

When the Highlight filter is applied all of the data remains visible in the view and filtered data is displayed in blue. Below the same Milestone filter was applied as above requesting the Highlight option. The Highlight filter is removed in the same way as a regular filter is removed.

5	Secure core resources	1 day	4/13/12	4/16/12	4
6	Scope complete	0 days	4/16/12	4/16/12	5
7	□ Analysis/Software Requirements	14 days	4/16/12	5/4/12	
8	Conduct needs analysis	5 days	4/16/12	4/23/12	6
9	Draft preliminary software specifications	3 days	4/23/12	4/26/12	8
10	Develop preliminary budget	2 days	4/26/12	4/30/12	9
11	Review software specifications/budget with team	4 hrs	4/30/12	4/30/12	10
12	Incorporate feedback on software specifications	1 day	4/30/12	5/1/12	11
13	Develop delivery timeline	1 day	5/1/12	5/2/12	12
14	Obtain approvals to proceed (concept, timeline, budget)	4 hrs	5/2/12	5/3/12	13
15	Secure required resources	1 day	5/3/12	5/4/12	14
16	Analysis complete	0 days	5/4/12	5/4/12	15

Figure 8-7 PLACEHOLDER

The Highlight filter may also be applied from the View bar as shown below:

- **View → Highlight → Select a filter**

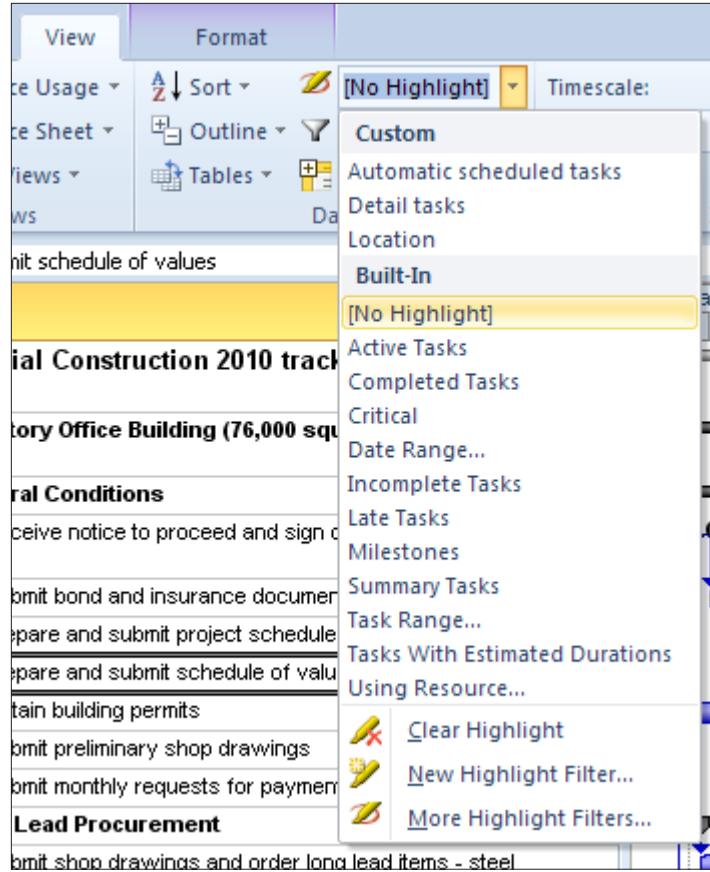


Figure 8-8 PLACEHOLDER

The Autofilter allows filtering of a specific column or multiple columns of data. The column used to filter the table must be visible in the table when using Autofilter. Autofilter cannot be applied to Project 2010 standard project reports or exports of data.

To turn on the Autofilter:

- **View → Filter → Display Autofilter**

A down arrow will appear when Autofilter is turned on.

	Task Name	Duration	Start	Finish	Predecessor
0	Software Development 2010	95.38 days	4/11/12	8/22/12	
1	Scope	3.13 days	4/11/12	4/16/12	
2	Determine project scope	1 hr	4/11/12	4/11/12	
3	Secure project sponsorship	1 day	4/11/12	4/12/12	2

Figure 8-9 PLACEHOLDER

To activate Autofilter:

- Click the down arrow for the column
- Select a value

Below illustrates the options of available when using the Autofilter to filter the Resource Name column in the Task Entry table. Every column will contain unique data and the Filters offered will change with the columns selected:

Multiple options become available:

- Column A-Z sort
- Column Z-A sort
- Group on this field
- Filters

To select the Project Manager resource only:

- Click **Select All** to clear all checkboxes
- Click **Project Manager**

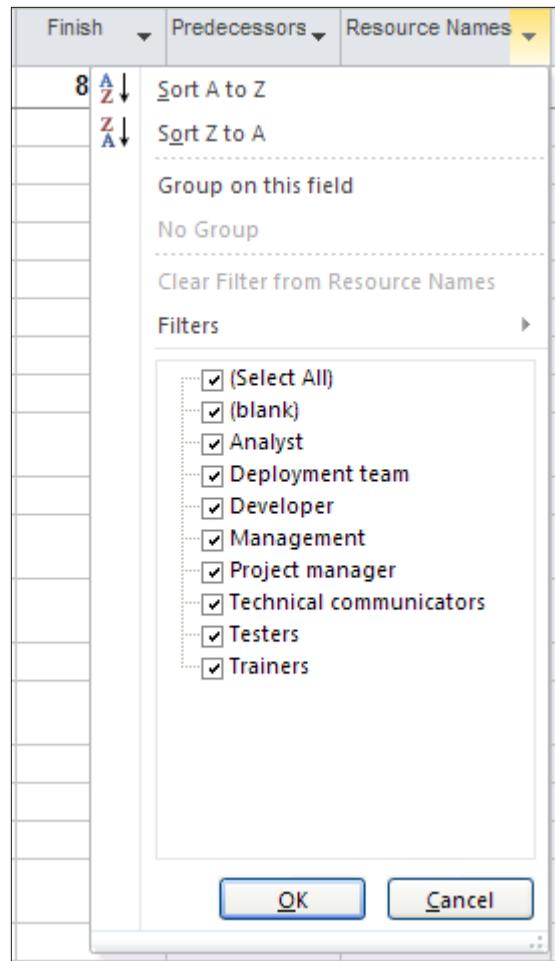


Figure 8-10 PLACEHOLDER

Below is the result of applying this filter. A funnel icon appears in the Resource Name column as an indicator to show which column is being used to filter the table. Note that all of the tasks in the Resource Name column contain the value Project Manager.

i	Task Name	Duration	Start	Finish	Predecessors	Resource Names
	Software Development 2010	95.38 days	4/11/12	8/22/12		
	Scope	3.13 days	4/11/12	4/16/12		
	Define preliminary resources	1 day	4/12/12	4/13/12	3	Project manager
	Secure core resources	1 day	4/13/12	4/16/12	4	Project manager
	Analysis/Software Requirements	14 days	4/16/12	5/4/12		
	Develop preliminary budget	2 days	4/26/12	4/30/12	9	Project manager
	Review software specifications/budget with team	4 hrs	4/30/12	4/30/12	10	Project manager,Analyst
	Develop delivery timeline	1 day	5/1/12	5/2/12	12	Project manager
	Obtain approvals to proceed (concept, timeline, budget)	4 hrs	5/2/12	5/3/12	13	Management,Project manager
	Secure required resources	1 day	5/3/12	5/4/12	14	Project manager
	Design	14.5 days	5/4/12	5/24/12		
	Obtain approval to proceed	4 hrs	5/24/12	5/24/12	22	Management,Project manager
	Pilot	70.25 days	5/4/12	8/10/12		
	Identify test group	1 day	5/4/12	5/7/12	16	Project manager
	Post Implementation Review	3 days	8/17/12	8/22/12		
	Document lessons learned	1 day	8/17/12	8/20/12	80	Project manager
	Distribute to team members	1 day	8/20/12	8/21/12	82	Project manager
	Create software maintenance team	1 day	8/21/12	8/22/12	83	Project manager

Figure 8-11 PLACEHOLDER

To clear the filter and restore the data to its original state:

- Click F3
- OR
- Click the funnel symbol
- Clear filter from <column name>

Many filters will include summary as well as detail tasks. Summary tasks may be turned off to view detail tasks only. To turn off Summary tasks:

- Format → uncheck the **Summary Task** checkbox

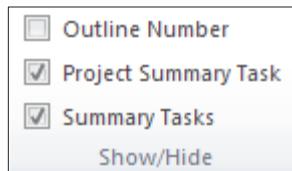


Figure 8-12 PLACEHOLDER

Practice: Working with Groups and Filters

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 8.6 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 8.6 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 2: Understanding the Critical Path Method

Once the initial schedule has been created, a timeline for the project will begin to form. It is this timeline that will determine the end date of the project. The Critical Path is the longest path of tasks through the network of tasks for the project.

In this lesson you will learn:

1. What is the Critical Path
2. Formatting views to display the Critical Path
3. Setting option for Tolerance level for the Critical Path

What is a Critical Path

The Critical Path is the longest path of tasks through the network of tasks for the schedule. It represents the timeline of the schedule and establishes the end date for the project. It is the minimum time that it will take to complete the project. Tasks not included in the network of tasks will not be included in critical path calculation. For a more accurate critical path calculation, all tasks should have a predecessor and a successor except the first and last tasks of a project. Checking the contents of the predecessor and successor columns to make sure all tasks have valid entries is helpful.

Any task on the critical path is known as a Critical Task. If a critical task slips, the end date of the project will be negatively affected.

Scheduling factors contributing to Critical Path calculation include:

- Relationships between tasks
- Lead and Lag time
- Duration of tasks
- Constraints
- Task Calendars
- Resource Availability
- Resource Assignments

Project 2010 will automatically recalculate the critical path each time a task is changed. The calculation is making a forward and backward pass through the schedule looking for time gaps between tasks. This time gap is called slack which is also known as float. If a task has slack, it is considered non-critical. When a task has no slack, it is considered critical. Slack can be both a positive or negative value.

Every project schedule should include float or slack in order to address contingencies. No project will run exactly as planned. Float or slack will provide the extra time needed to handle unknown problems that will arise during the execution of a project.

There are 2 types of slack calculated in Project 2010:

- Total slack is the amount of time a task can slip without affecting the end date of the project.
- Free slack is the amount of time a task can slip and affect only the successor task. If a task does not have a successor, free slack will be the same as total slack.

This type of critical path calculation is based on tasks. Resources can also be critical within a project schedule. During the execution of the project, different resources will become critical at different points within the schedule. If a critical resource is not available at a critical point, the entire project could be affected as well as the ending date.

Frequently, during the execution of a project, a task that was not originally on the critical path will become critical. Careful tracking and monitoring of the critical path during the management of the project will help keep the project manager on track to achieve the goal of their projected end date.

Manually scheduled tasks and critical path

Manually scheduled tasks will be included in the critical path calculation if they have dependencies and duration. In the absence of dependencies, only tasks that push the end date of the schedule will appear on the critical path.



The default for Project 2010 critical path calculation is to recalculate the critical path every time a task is changed. In very large schedules, critical path recalculation can slow the schedule development process. For this reason, automatic calculation may be turned off and the calculation manually triggered when the scheduler is ready.

To turn off automatic schedule calculation:

- **File → Options → Schedule**
Calculation option

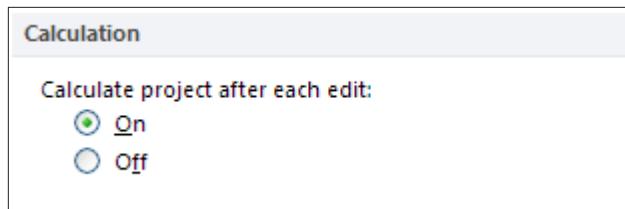


Figure 8-13 PLACEHOLDER

To calculate a project on demand:

- **Project → Calculate Project**

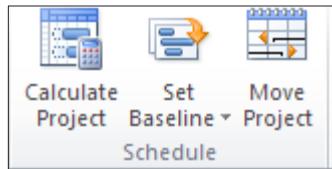


Figure 8-14 PLACEHOLDER

Formatting Views to Display Critical Path

Slack is essentially scheduling breathing space for a project. The greater the slack, the more breathing space you will have to help manage problems that will occur during the performance of the project. If a schedule fails to include slack, the plan for the schedule might be unobtainable. Since projects are never performed exactly as scheduled, slack becomes essential to achieving the goal date for the project.

Each time a task is changed in Project 2010, the critical path is recalculated automatically. There is a column labeled “Critical” that contains a Yes or No value. This column is reset as a result of critical path calculation and could change as the project progresses and changes. Formatting of Gantt Charts and other views depend on the “Critical” column to determine how view formatting should appear. Many of the views are not pre-formatted to show the critical path. The formatting may be turned on as necessary.

To turn on and show the critical path formatting:

- **Task → Gantt view**
- **Format → Critical Path**

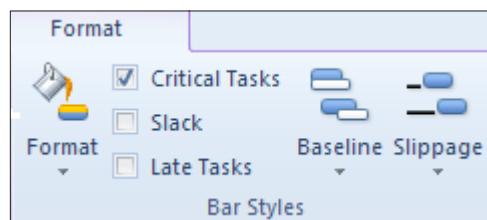


Figure 8-15 PLACEHOLDER

The critical path is shown as red Gantt bars and the non-critical tasks appear a blue Gantt bars.

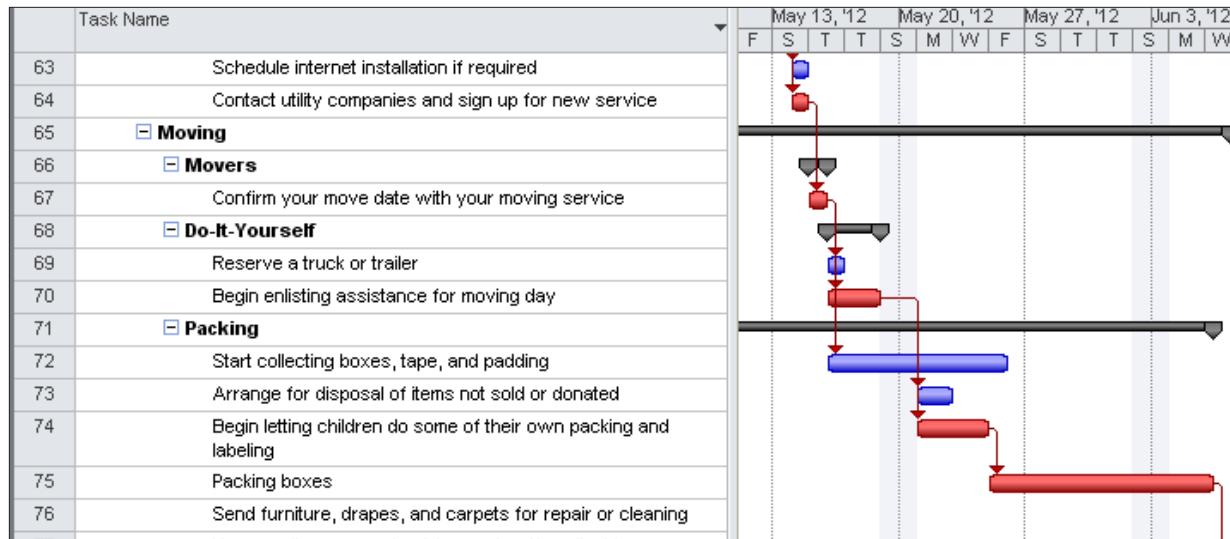


Figure 8-16 PLACEHOLDER

To get what is called a waterfall or tasks in sequence critical path, apply the critical filter and all non-critical tasks will be hidden. .

To filter the schedule for critical path:

- Task → Gantt Chart view
- Format → Filter → Critical

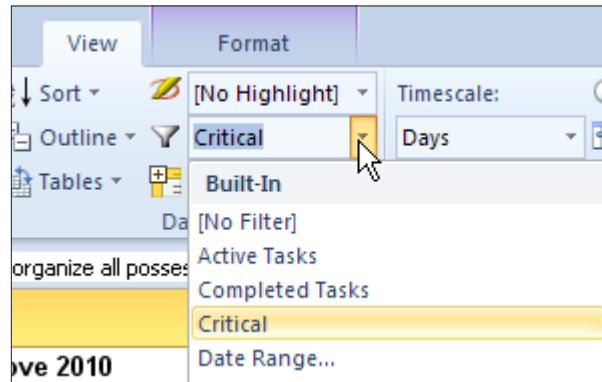


Figure 8-17 PLACEHOLDER

In the view below the Critical filter has been applied. All non-critical tasks have been hidden. The view is an example of a waterfall critical path.

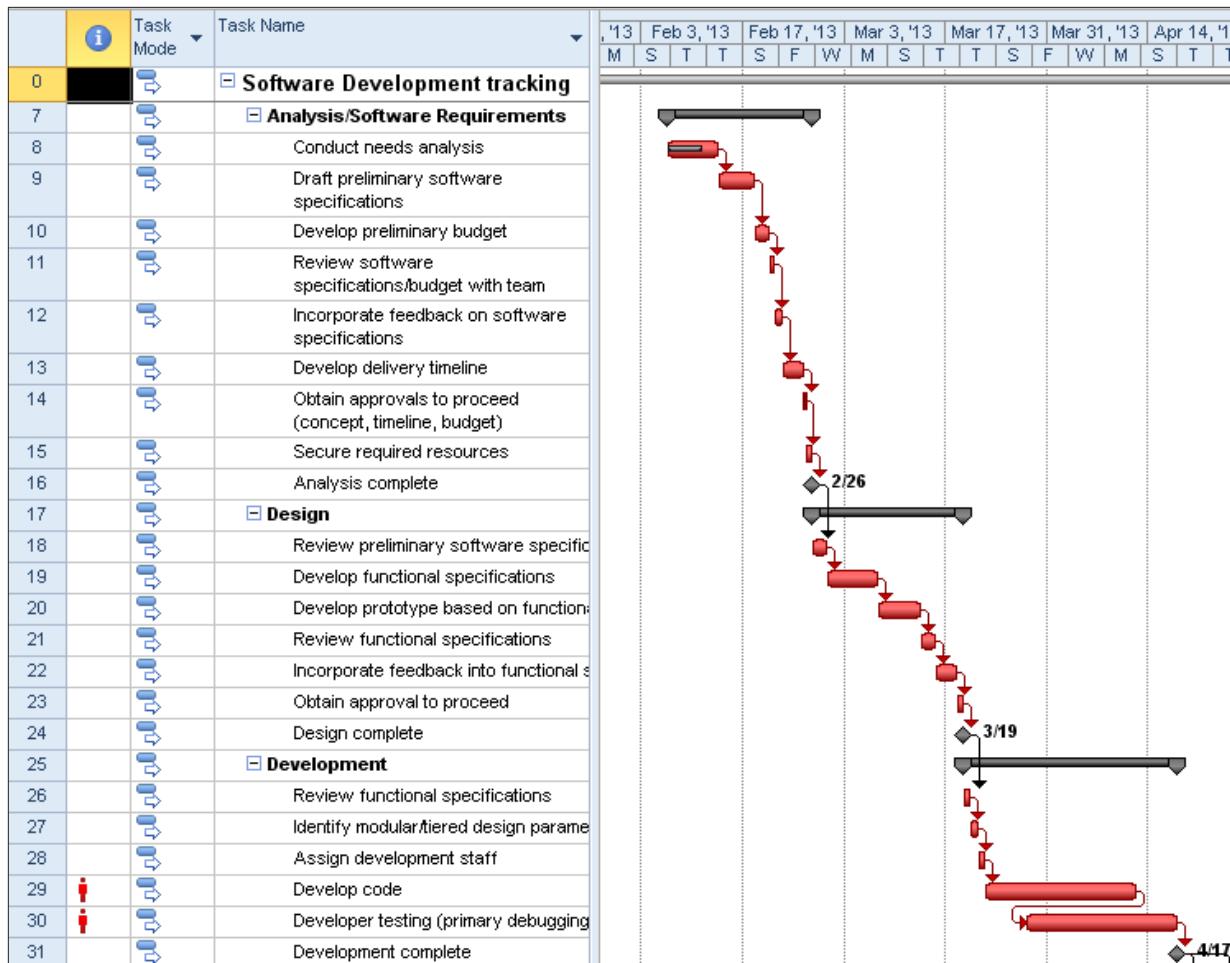


Figure 8-18 PLACEHOLDER

Turning off summary tasks is helpful as well

To turn off summary tasks shown on the Gantt Chart view:

- Format → Summary Tasks

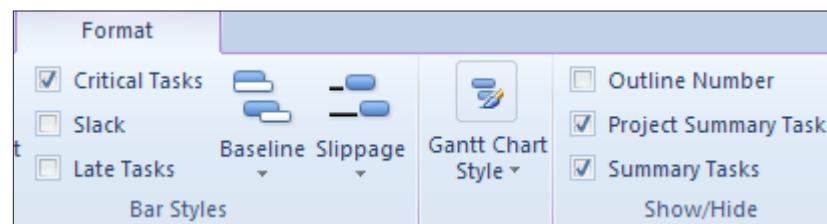


Figure 8-19 PLACEHOLDER

Knowing where slack in your schedule is located will help when making scheduling decisions.

To view the slack in the schedule on the Gantt Chart view:

- Format → Slack

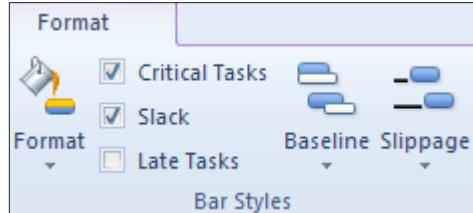


Figure 8-20 PLACEHOLDER

Below is a view formatted to show the schedule slack line indicators. Slack is represented by black lines extending to the right of the task Gantt bar. For clarity, in the example below, relationship arrow lines have been turned off.

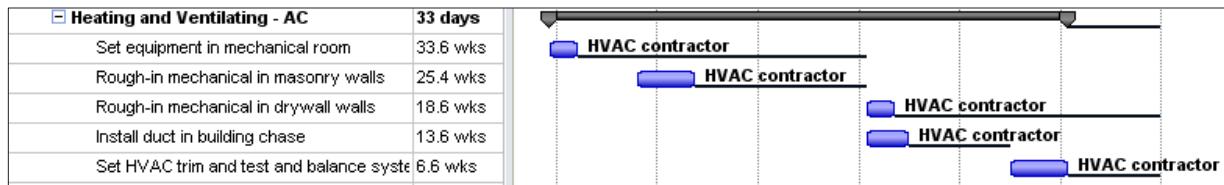


Figure 8-21 PLACEHOLDER

Setting Slack Tolerance

When a task has zero slack the task is considered critical and any change in the end date for the task will negatively affect the project end date. Tasks with slack of 1 minute or more are considered non-critical. It is unlikely that 1 minute of slack is sufficient to prevent a task from moving from a non-critical to critical state.

Project 2010 provides the ability to define a per project critical task tolerance level. This setting will allow the scheduler to control what the

tolerance point between critical and non-critical tasks should be. Using the total duration of the project as a guide, shorter duration projects should have lower tolerance points than longer duration projects. All cutoff points are stated in number of whole days only. The result of the critical path calculation is shown in the Total Slack column. The value in this column is used when calculating the Critical Path and determining when a non-critical task becomes critical.

To insert the Total Slack column into a table:

- **Task → Gantt Chart**
- Right click a column heading
- Select **Insert Column**
- Click the **T** key
- Select **Total Slack**

In the example below, the Total Slack column has been added to the table. Critical path formatting is turned on. All tasks in view are considered non-critical. Note the values in the total slack column show several tasks have less than 1 day of slack.

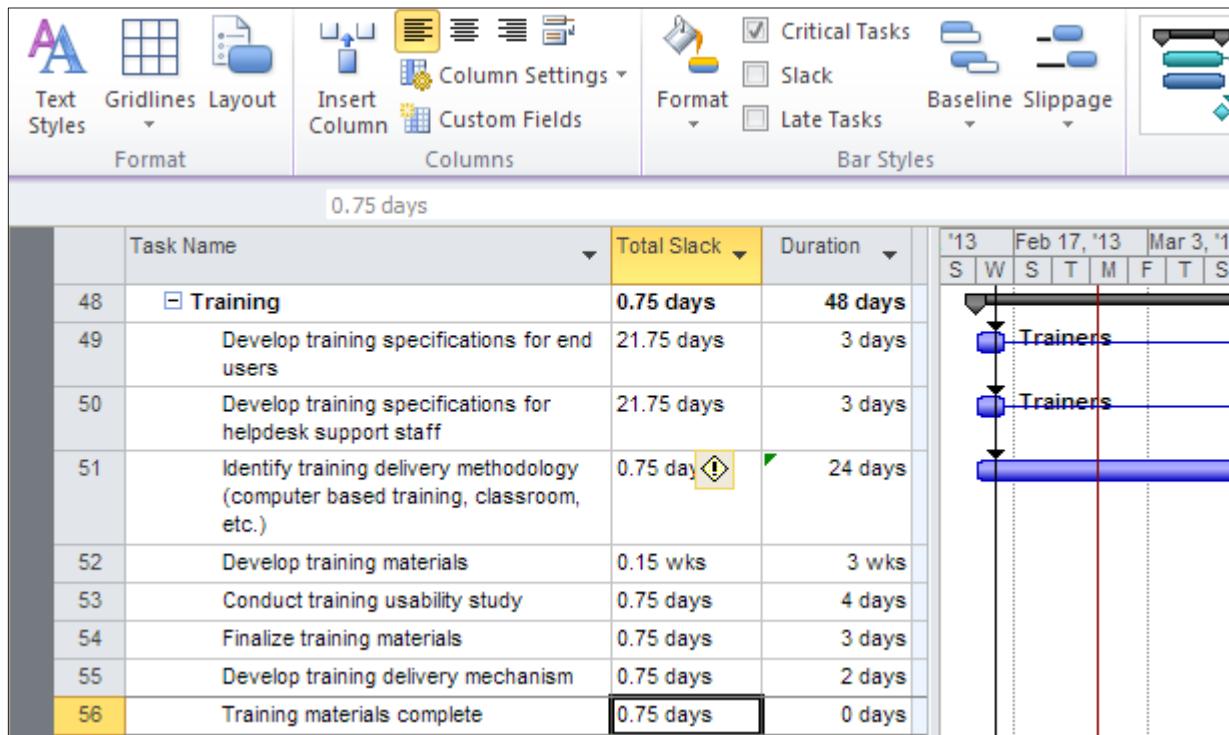


Figure 8-22 PLACEHOLDER

The task critical path tolerance setting is located in the Advanced Options section. The default tolerance value is zero days. Changes to the tolerance level are in whole days only. The tolerance level setting can be applied to a single specific schedule or all schedules.

To navigate to Advanced Options:

- File → Options → Advanced

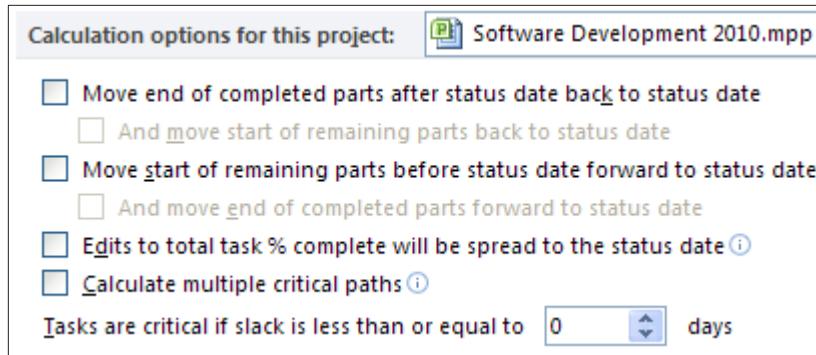


Figure 8-23 PLACEHOLDER

In the example below, the option has been changed to 3 days. Any task with less than 3 days of total slack will be considered critical. In the view below, several tasks have .75 days of slack and are not considered critical. Note the differences in the formatting of the critical path.

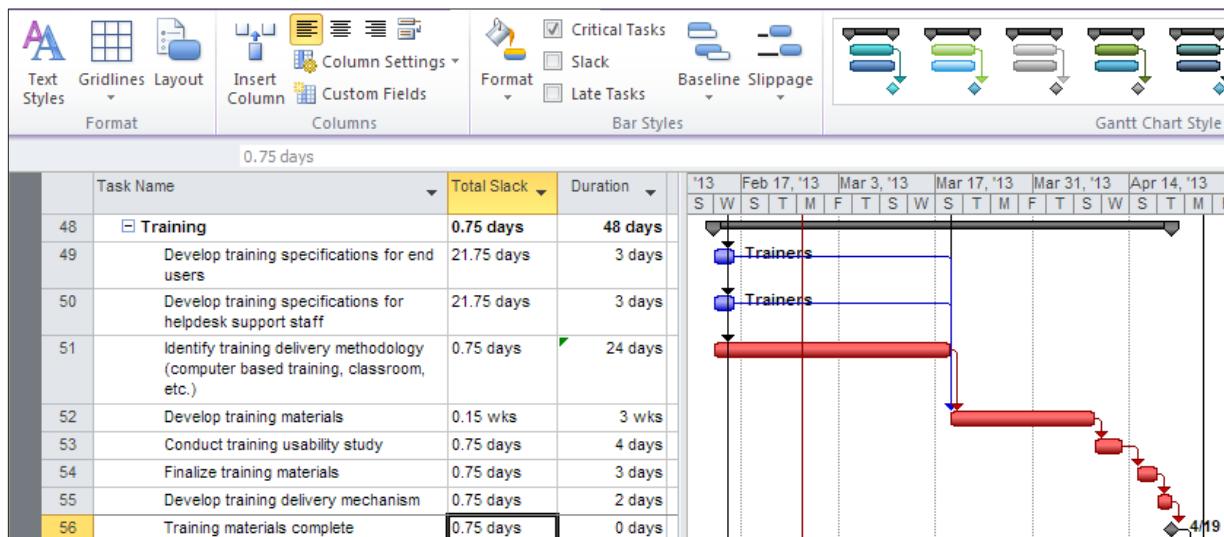


Figure 8-24 PLACEHOLDER

This formatting may be treated as an alert to knowing which tasks could have impact on the ending date for the project. Once a task is flagged as critical, it will be included in filters, grouping, and reports as a critical task.



Negative slack was discussed earlier in the module concerning constraints. Negative slack tasks will appear as critical when formatting for the critical path.

Crashing the Critical Path

Once you have displayed the critical path, you will have a better understanding of the specific tasks which are driving the ending date of your project schedule. Project Managers are usually asked to cut time out of the project schedule to shorten the critical path or length of the project. Since the critical path is determining the project length, cutting time from the critical tasks will affect the project ending date. Cutting time out of the timeline for the project is known as Crashing the Schedule. When crashing the schedule, automatic project calculation is preferred because the timeline will actively change with each task change.

Below are a few suggestions which could be applied to critical tasks to help shorten the critical path.

- Create as many parallel paths as possible. Changing task relationships to start-to-start or finish-to-finish will shorten the critical path. Beware that you may need more resources which could also in turn increase cost.
- Add as much realistic lead time as possible. Additional resources may be necessary.
- Increase working time on resource calendars. When resources are working longer hours, the work should be completed sooner.
- Remove as many constraints as possible.
- Move critical resources from non-critical tasks to critical tasks. The more experienced resources can usually accomplish the work faster and with less re-work and risk.
- Group tasks by duration as shown in this module. The longest tasks have more duration and present more opportunity to save time.

- Take long tasks and break them into smaller tasks. Try to put the smaller tasks in parallel and assign non-critical resources.
- Add evenings and weekends to gain more working time
- Question whether all tasks are really necessary and within project scope? Delete or deactivate (see below) unnecessary tasks
- Question whether the assignments are correct? Are the right people assigned to the correct amount of work? Finding errors and correcting them might reduce project time.
- Check that predecessors and successors are correct and appropriate. Blanks in the Predecessors and Successors columns indicate a missing relationship. Show all subtasks, turn off summary tasks and use the autofilter to filter for blanks. F3 to remove the filter.
- Check the Total Slack column. If the amount of Total Slack is large, there is a possibility the task is missing relationships.
- Don't be afraid to try some what-if scenarios on a copy of the file.

If it is determined that a task is might not be necessary within a project schedule, Project 2010 allows the scheduler to switch a task to inactive mode. This removes the task from the critical path calculation but leaves the task in the schedule in case it can be activated again.

In the project below, the critical path is indicated in red. The project is scheduled to end on March 22.

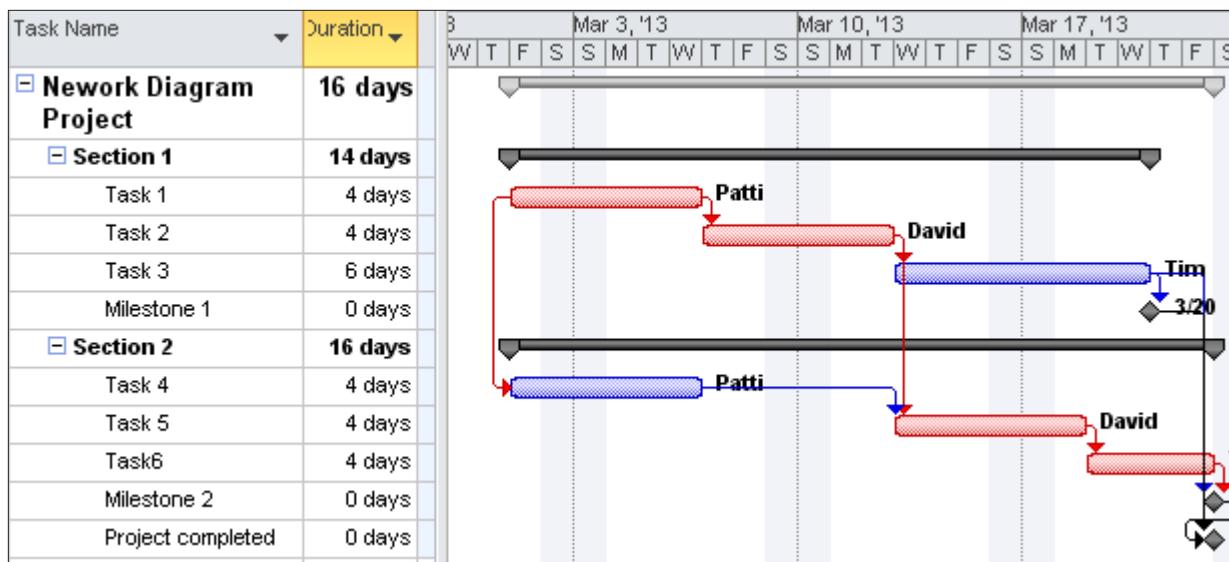


Figure 8-25 PLACEHOLDER

In the example below, we will deactivate Task 5.

To inactive a task:

- Click on the task
- Click on Task → Inactivate

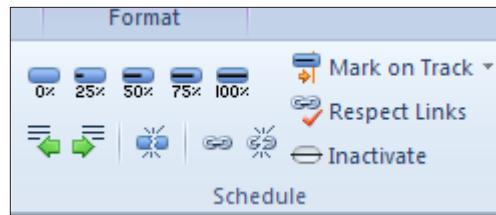


Figure 8-26 PLACEHOLDER

Below is the result of toggling the task to an inactive state:

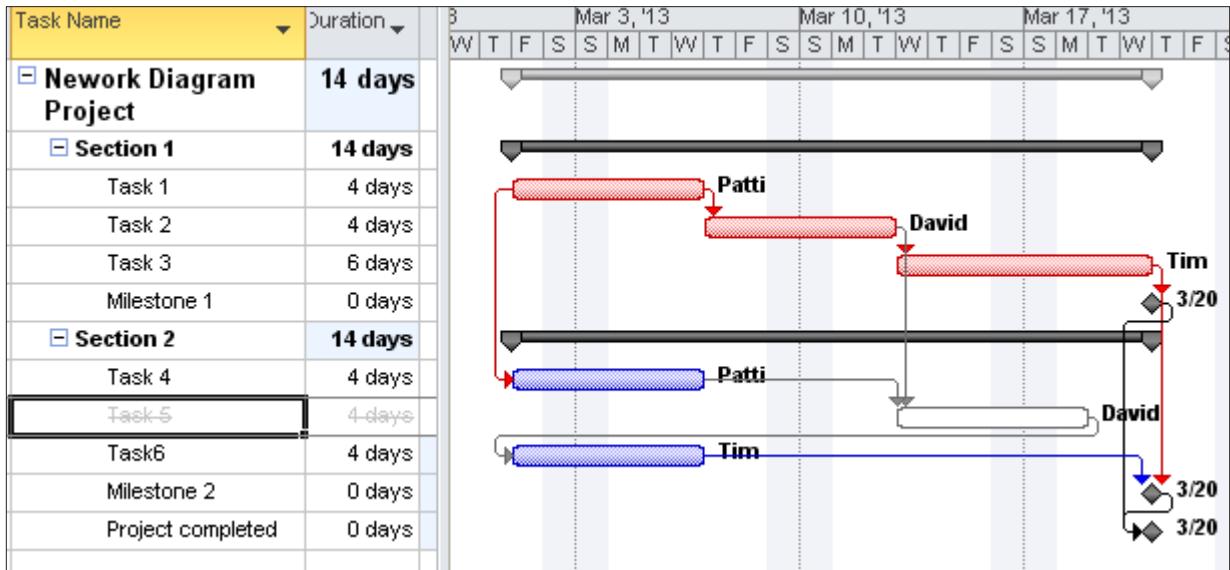


Figure 8-27 PLACEHOLDER

The task that was inactivated was on the critical path. The software now treats the task as if it is not there. The links are no longer valid and as a result the successor task returns to the start date of the project. The critical path has changed as well as the ending date. Since Task 5 is now inactive, the relationship between Task 4 and Task 6 was also eliminated and needs to be reestablished. The inactive task can remain in the schedule and may be activated if necessary.

Practice: Working with the Critical Path

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the **ps07** virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 8.7 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 8.7 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Setting a Project Baseline

The baseline of the project schedule establishes the benchmark that all progress will be measured against during the performance of the project. It will help in determining if the project is progressing on schedule and, if it is not on schedule, how far from the original scheduled plan it is.

In this lesson you will learn:

1. What is a baseline
2. Effects and benefits of setting a baseline
3. Setting a baseline
4. Updating a baseline
5. Saving multiple baselines
6. Views using baseline data

What is a Baseline?

Using Project 2010 provides the project manager more information sooner, to make better decisions. One of the integral parts of the decision making process is being aware of where the schedule stands against its original plan. The baseline is the original plan.

After the schedule has been adjusted, discussed and negotiated with the stakeholders of the project, a schedule will be agreed upon. That original approved schedule will be set as the project baseline. The project baseline becomes the schedule that the metrics for the project will measure against. It is also the plan that the stakeholders are expecting the project performers to adhere to during the project.

When an event occurs to put the project off schedule, the difference between the actual performance values and the baseline values is known as the **variance**. The variance acts as the measure of how the project is performing against original plan. Monitoring variances gives the project manager more knowledge regarding the project which in turn results in

better decision making to help the project get back on track.

Without a baseline, this knowledge would be lost. You would not be aware of how off track the schedule is from the original planned finish date and you would not have a finish date to manage the schedule against.

Project 2010 can also calculate Earned Value. Earned Value is a measure of how much of the value (cost) of the project have you earned at a point in time. Earned Value is based on the use of baselines and this data would be lost if a baseline was not set.



Earned value calculations are not available for manually scheduled tasks.

Fields Involved in Setting a Baseline

When the baseline of the project is set, it is set for all 3 areas of the data structure. Values will be set for tasks, assignments and resources. There are technically 11 sets of baseline fields in the system.

- Baseline
- Baseline 1-10

By default the Baseline fields will be used in the project variance calculations. Baseline fields 1-10 are used for Earned Value, updated baselines or are free use fields for schedulers. If updated baselines use Baseline 1-10, the option to indicate an alternate baseline used for variance calculations should be updated.

The following fields are used in the setting of the baseline for automatically scheduled tasks:

Table 8.8 PLACEHOLDER

Field	Data
Baseline Start	Planned start dates for tasks and assignments.

Table 8.8 PLACEHOLDER

Field	Data
Baseline Finish	Planned finish dates for tasks and assignments.
Baseline Duration	Planned task durations.
Baseline Cost	Planned costs for tasks, assignments, and resources. Timephased data.
Baseline Work	Planned work for task, assignments, and resources. Timephased data.
Baseline Budget Work	Saves the budgeted work hours for work resources and units for material resources.
Baseline Budget Cost	Saves the budgeted costs.

The following fields are used for manually scheduled tasks only. Although all of the above baseline fields are set when the baseline is saved, only the following fields will be used in the variance calculations for manually scheduled tasks. If manually scheduled tasks become automatically scheduled tasks the baseline values will be used for variance.

Table 8.9 PLACEHOLDER

Field	Data
Baseline estimated start 0-10	Planned Start Date
Baseline estimated finish 0-10	Planned Finish Date
Baseline estimated duration 0-10	Planned Duration Date



Project 2010 also allows for interim plans. These plans are usually used for what-if scenarios. When an interim plan is saved, only the Start and Finish field values are copied.

Setting the Baseline

When setting a baseline, the following fields will be copied and held in the following fields:

Table 8.10 PLACEHOLDER

Field	Copied to
Work	Baseline Work
Cost	Baseline Cost
Duration	Baseline Duration
Start	Baseline Start
Finish	Baseline Finish
Start	Baseline Estimated Start
Finish	Baseline Estimated Finish
Duration	Baseline Estimated Duration

A helpful view to check the status of all of the above fields used (except for the estimated fields) in setting a baseline is the Project Statistics dialog box.

To view the Project Statistics dialog box:

- **Project → Project Information → Statistics**

Below is an example of the statistics box without the baseline set.

Notice that the baseline fields are zero values or NA values.

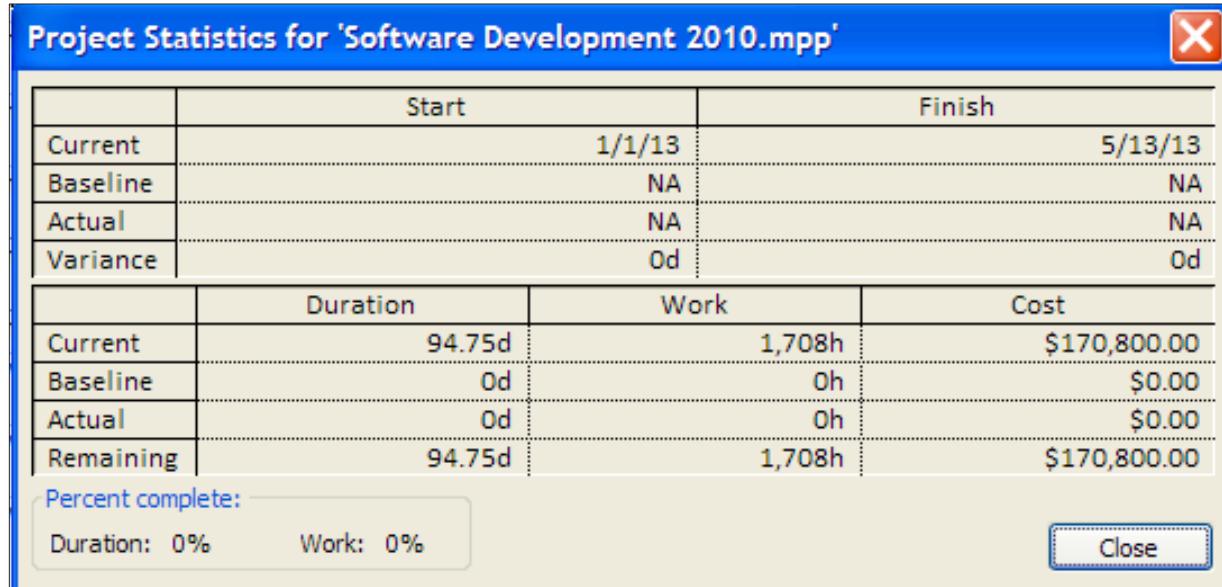


Figure 8-28 PLACEHOLDER

The Tracking Gantt is a good view to see the baseline. The view below shows the Tracking Gantt before the baseline is set.

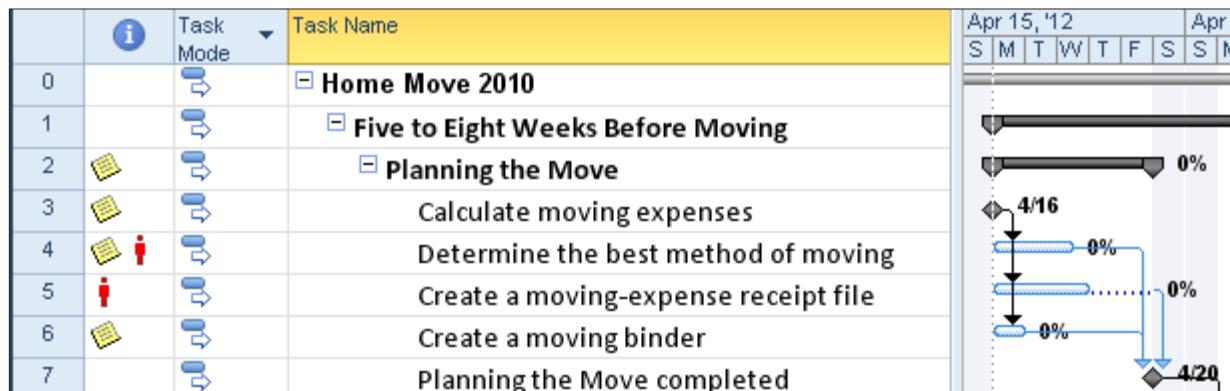


Figure 8-29 PLACEHOLDER

The baseline may be set for the entire project schedule or for a range of selected tasks. The range of tasks is helpful when a schedule contains several phases of a project or when tasks are added to a project schedule.

during project execution.

In the Set Baseline dialog box shown below, clicking the down arrow to the right of the Baseline field name will display Baseline and the other available baseline fields called Baseline 1-10. The initial baseline values should be set in the Baseline fields. The additional Baseline 1-10 fields may be used when the baseline is updated.

To set the baseline for the entire project:

- **Project → Set Baseline → Set Baseline**
- Select **Options**
- Click **ok**

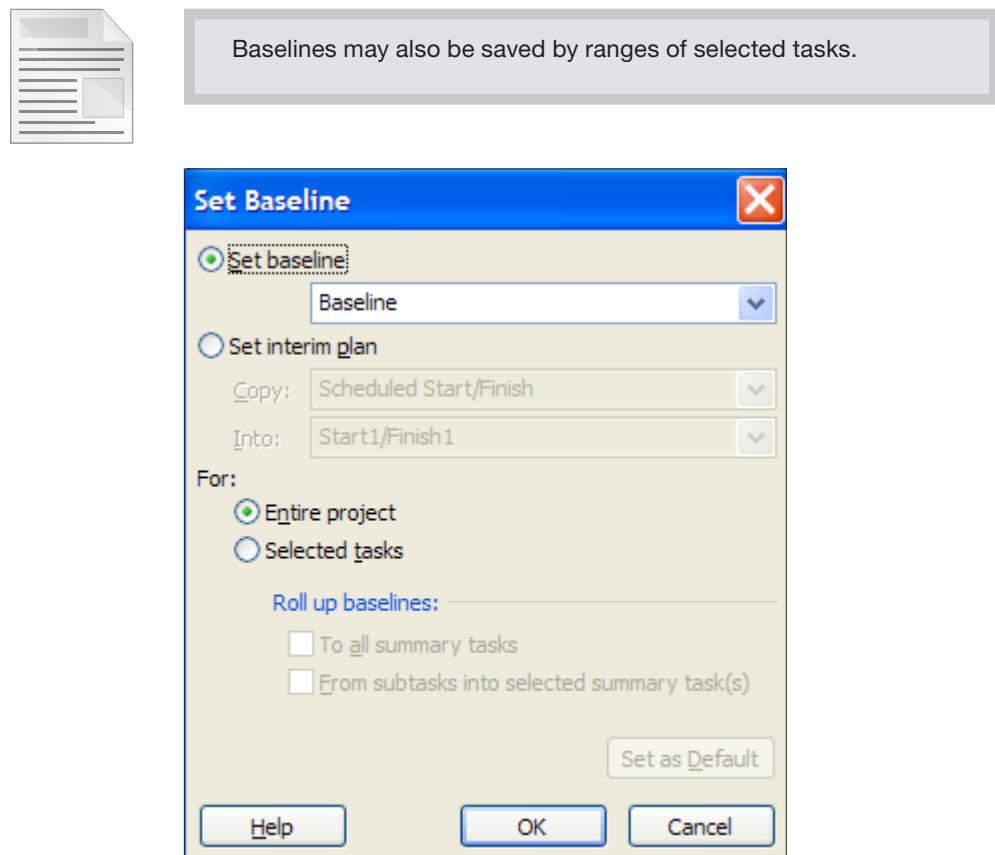


Figure 8-30 PLACEHOLDER

The saved baseline values are reflected in the Project Statistics box below:

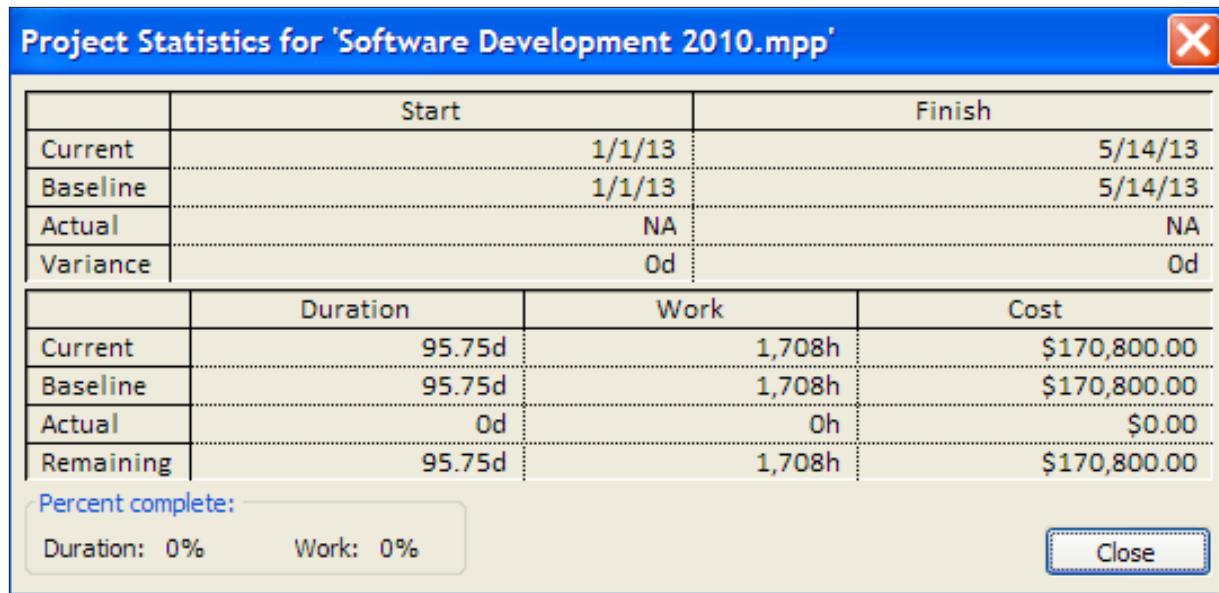


Figure 8-31 PLACEHOLDER

Below is a view of the Tracking Gantt with the baseline set. The baseline is represented as a grey bar under the task bars on the Tracking Gantt Chart.

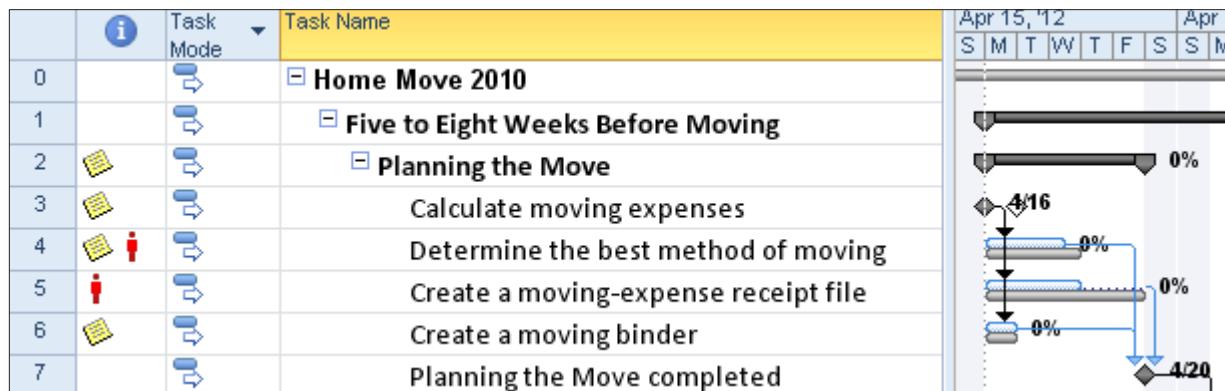


Figure 8-32 PLACEHOLDER

Updating a Baseline

When approved changes are made to the schedule, the changes might result in a change to the baseline. Each organization should have a policy in place as to when or how baselines should be updated. Baselines, at times, are misunderstood by project schedulers and organizations should clarify their policies and intended usage. Management should be aware of when a baseline is reset.

Baselines may be updated to overwrite the existing Baseline fields or the updated baseline may be set using one of the Baseline 1-10 fields. If the updated baseline using the Baseline 1-10 fields will become the baseline used for variance calculations, an option must be set to indicate this change. The Gantt chart views are configured to display only the Baseline field values. If a set of the Baseline1-10 fields is used as the updated Baseline, the views should be altered to show the desired baseline fields.

In the example below changes to current schedule values were made and a new baseline will be set using the Baseline1 fields. The original baseline field values will not be altered. The steps to make this change are:

- Set the baseline to the Baseline1 fields.
- Change the option to indicate which baseline should be used for the variance calculation.
- Change a Gantt Chart View to display Baseline1 fields.

To set the baseline value into the Baseline1 fields:

1. **Project → Set Baseline → Set Baseline**
2. Set Baseline – Baseline 1
3. For: Entire Project
4. Click **ok**

The field values discussed in the last lesson will be copied to the Baseline1 set of baseline fields.

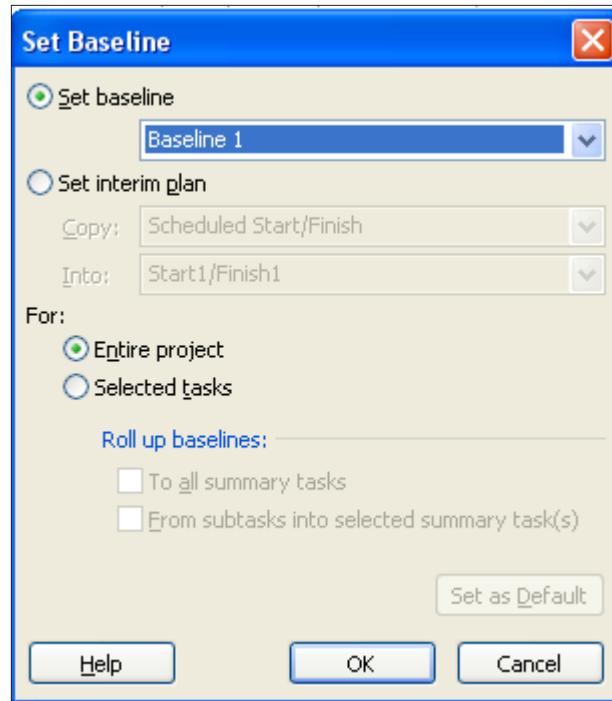


Figure 8-33 PLACEHOLDER

To select the baseline that will be used for the current baseline and for variance calculations:

- File → Options → Advanced → Earned Value option for this project:
- Select Baseline 1
- Click ok to close the box

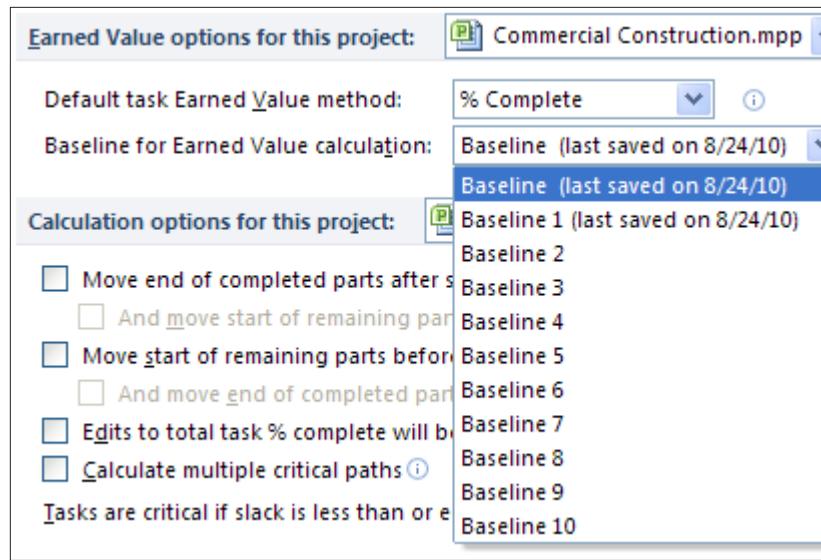


Figure 8-34 PLACEHOLDER

To view Baseline1 on a Gantt Chart View:

- Display a Gantt Chart View
- Format → Baseline → Baseline1

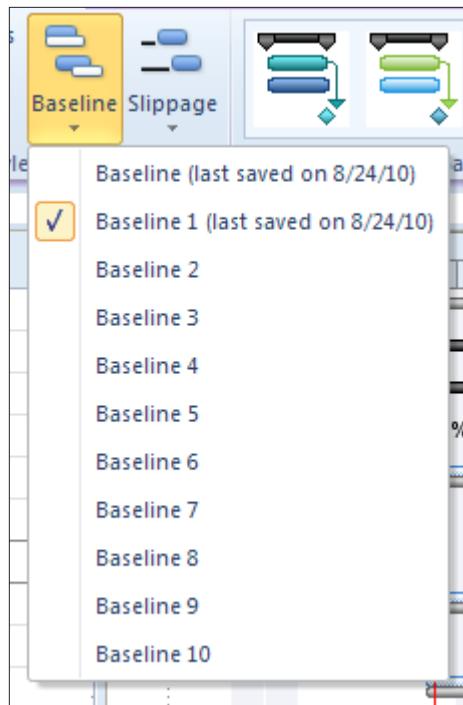


Figure 8-35 PLACEHOLDER

The Variance Table and Gantt Chart View using the **Baseline** field values are displayed below. Baseline Start and Baseline Finish display for Baseline values:



Figure 8-36 PLACEHOLDER

Changes in the schedule were made and the baseline was set using

the Baseline1 fields. The Variance Table and Gantt Chart View using the Baseline1 field values are displayed below. Note the changes to the Start and Finish Variances and Gantt bars. Baseline1 Start and Baseline1 Finish are used to display the baseline dates:



Figure 8-37 PLACEHOLDER



Once it is determined that an existing baseline should be updated, all tracking information should be updated first. Updating tracking data or the actual work that was performed will be discussed in the next module. If baselines are updated to the same baseline fields for tasks that include tracking data, the baseline on those tasks will be overwritten with the new baseline values. Since the tracked tasks were completed based on the original baseline values, care should be taken to determine if those tasks should have their baselines overwritten or if the original values should remain.

Views Using Baseline Data

Project 2010 provides many different ways to view the project baseline. Different views will display different data. The type of data requested by stakeholders should be considered when deciding which views and reports will best communicate the status of the project.

Tracking Gantt is a Gantt chart formatted to show the baseline as well as tracking data. This view shows project progress and compares baseline v current schedule. More usage for the Tracking Gantt will be discussed in

the next module when tracking is discussed. The baseline is shown as the grey bars in the view below:

- Task → Gantt Chart → Tracking Gantt

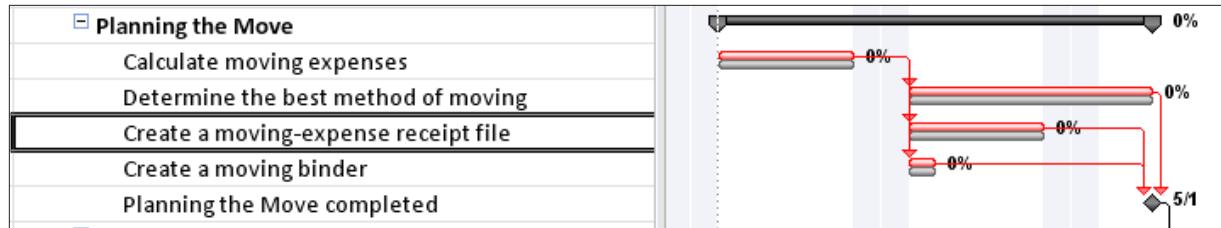


Figure 8-38 PLACEHOLDER

The Multiple Baselines Gantt view displays 3 possible sets of baseline fields. This view is used for comparison between the Baseline in blue and Baseline 1 fields in red. An optional 3rd baseline using Baseline 2 fields would appear in green if data was updated to the Baseline2 fields. Pointing with your mouse pointer at any of the Gantt bars will display more explanation regarding the detail of Gantt bars.

To view multiple baselines:

- Task → Gantt Chart → More Views → Multiple Baseline Gantt

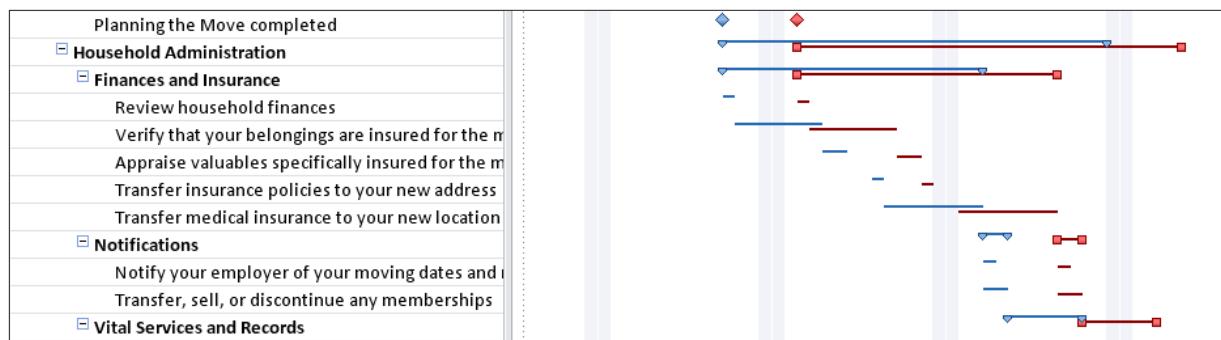


Figure 8-39 PLACEHOLDER

Baseline fields may be added to any Gantt chart view. In the view below, the Gantt chart displays only the current project schedule (Start and Finish fields) as red bars representing the critical path.

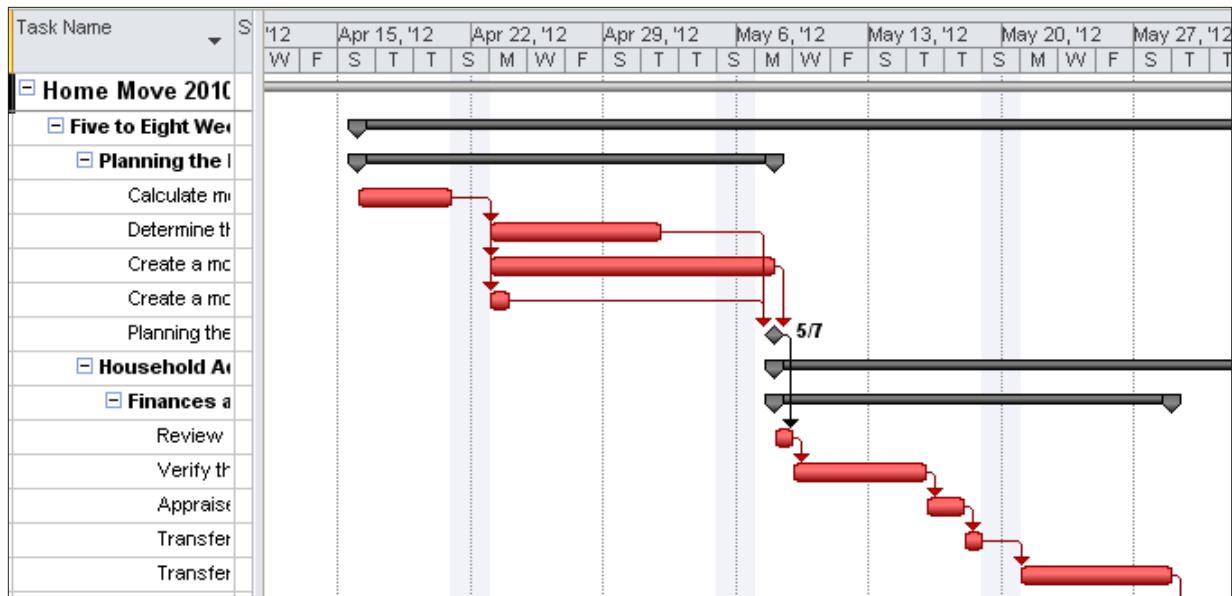


Figure 8-40 PLACEHOLDER

To add Baseline Gantt bars to any Gantt view:

- **Display a Gantt Chart View**
- **Format → Baseline → Select Baseline field value for display**

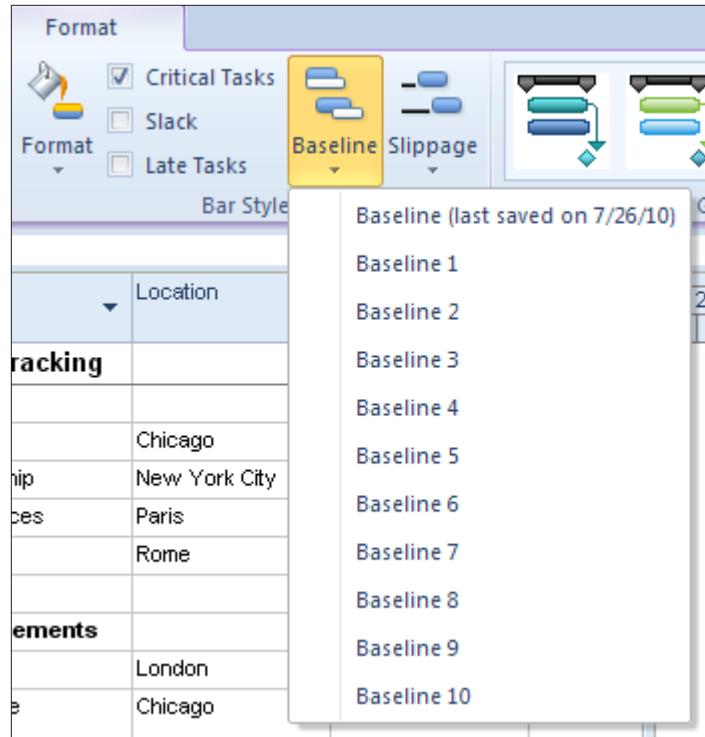


Figure 8-41 PLACEHOLDER

The result of adding the Baseline field is shown below. The baseline is represented as grey bars:

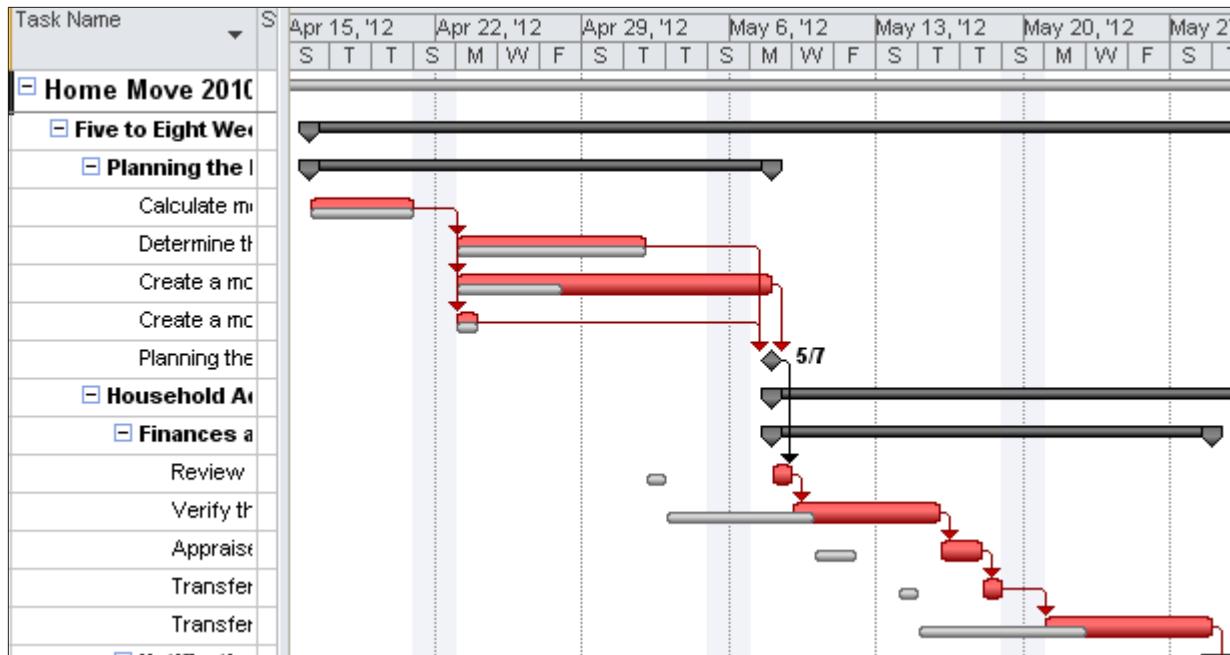


Figure 8-42 PLACEHOLDER

Baseline field values are also included in many tables:

Task tables:

- Work
- Cost
- Variance
- Baseline
- Export

Resource tables:

- Work
- Cost
- Export

Baseline fields may also be added to the Task Usage and Resource Usage views as needed. These views will display time phased data for assignment.

To add Baseline fields to the Task Usage and Resource Usage views:

- **Task → Gantt Chart → Task Usage (or Resource Usage)**
- **Format → Usage Details**
- Click **Baseline Work**

- Click **Show** – Baseline Work will be moved to: Show these fields box on the right
- Repeat to add additional fields
- Click **OK** to close

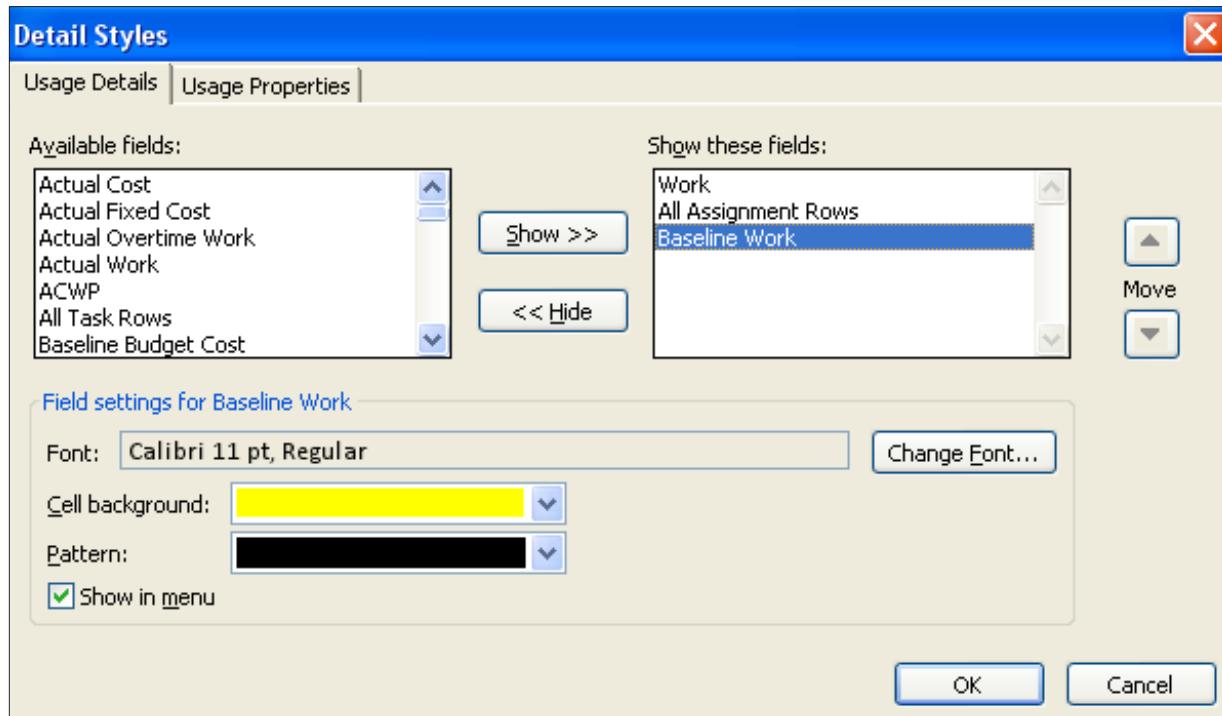


Figure 8-43 PLACEHOLDER

The view below is the Task Usage view showing the columns of Work and Baseline Work at the timephased level. These are values added per resource and can be seen at the per day level or other time interval.

1		<input type="checkbox"/>	Scope	28 hrs	Work		8h	12h
			Base. Work			8h	8h	
2	✓	<input type="checkbox"/>	Determine proj	4 hrs	Work		4h	
			Base. Work			4h		
			Management	4 hrs	Work		4h	
			Base. Work			4h		
3	✓	<input type="checkbox"/>	Secure project s	8 hrs	Work		4h	4h
			Base. Work			4h	4h	
			Management	8 hrs	Work		4h	4h
			Base. Work			4h	4h	
4	✓	<input type="checkbox"/>	Define prelimin	8 hrs	Work			4h
			Base. Work				4h	
			Project man	8 hrs	Work			4h
			Base. Work				4h	

Figure 8-44 PLACEHOLDER



Appendix B contains more information regarding printed reports which will include the baseline data.

Practice: Setting a Project Baseline

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the **ps07** virtual machine.

1. From the **Start** menu, click **All Programs** → **Microsoft Office** → **Microsoft Office Tools** and click **Microsoft Office Project Server 2007 Accounts**.
2. In the **Project Server Accounts** dialog box, click **Add**.
3. In the **Account Properties** dialog box, and complete the following settings and click **OK**.

Table 8.11 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type http://epm/pwa
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

Using filtering and groups will allow the project manager greater flexibility to viewing data in different ways to aid in creating reports. The critical path is the longest path of tasks through the network of tasks which will create the timeline of the project. Setting the baseline will copy the original approved schedule and enable Project 2010 to compare the original schedule v current schedule to help manage the project during project execution.

In this module we discussed:

1. Filtering and grouping of project data
2. Understanding the critical path
3. Steps to be taken to shorten the project timeline
4. Setting the baseline for the project



Chapter 9

Tracking and Updating Projects

Module Overview

The next step after the planning phase for the project is project execution. Once the execution of a project begins it is important to know how the project is progressing. Projects do not perform exactly as planned. It is important to know how much work has been accomplished and how much work is left to be performed to meet the finish date. The process of updating the project schedule to reflect the actual progress of a project is known as tracking.

In this module, we will discuss:

- Overview of tracking and tracking methods.
- How to enter tracking data for work resources.
- Updating costs, material and milestone tasks.
- Re-scheduling uncompleted work.

Lesson 1: Overview of Tracking Projects

If projects performed exactly as planned, tracking would be simple and straightforward. Since this is not the case, accurate tracking becomes an essential part of managing the schedule of the project. In Project 2010 there are various tracking methods available. There are also option settings that should be considered when deciding your tracking methods.

In this lesson, we will examine:

1. Overview of tracking.
2. Tracking methods.
3. Project 2010 options that affect tracking.

What is Tracking

Once a project has started to execute, it is important to manage the schedule of the project. This process is called Tracking.

When planning the project tasks, estimates were made for duration, work and costs. While performing a task, the task could take more time, less time, more resources, fewer resources, start late, finish late, start early, finish early or not performed at all. Tracking tasks in Project 2010 is the processes of letting the software know what work has been accomplished, so that Project 2010 can predict the end date of the project. Once the actual work values have been entered, the uncompleted work of the project will be re-scheduled as of a status date. This process is known as Statusing the Project.

In addition to updates to the actual work, other updates may include actual cost for cost resources and material resource assignment updates. Milestones should also be updated to reflect the dates the milestone was considered complete.

Selecting the right method of tracking for a project will be important. The reporting requirements of the stakeholders and goals for managing

the project work will determine the type of tracking method selected for a project.

Tracking Methods

Not all projects are the same. Each project has different requirements and goals for management of the schedule. Project 2010 provides three tracking methods that will accommodate most project requirements. The tracking method selected will depend on the reporting metrics the project reporting is required to produce.

Best Practice: For consistency, use only one tracking method per project schedule.

The three tracking methods are:

- Percent complete.
- Updating task data at the task level.
- Number of hours per resource per task per time period.

Percent complete

Project 2010 allows for two types of percent complete tracking:

- Percent **Duration** complete
 $\% \text{ complete} = \text{Actual Duration}/\text{Duration}$
- Percent **Work** complete
 $\% \text{ Work Complete} = \text{Actual Work} / \text{Work}$

Percent duration complete may be updated independently from percent work complete. By default, they will update at the same time. When a task is marked 100% duration complete, Project 2010 assumes that 100% of the work is also complete. The option to separate the two will be discussed in the next lesson.

Percent complete is the quickest and easiest tracking method. It is also the least accurate.

Best uses for Percent complete tracking are:

- Projects where the number of work hours are not tracked.

- Projects where flat amount contracts are used and only dates are managed.
- Projects where marking the tasks completed and knowing when the next task must start is the priority. Schedule management only.

Updating task data at the task level

Updating task data at the task level is updating duration or work for a task. This type of tracking will post actual information to a task without regard to specific resources that performed the work.

- If tracking work hours, the hours are posted to the task using the Work table of the Gantt Chart. If greater accuracy is required, entering actual start and finish dates will be helpful. While tracking hours, adjusting remaining work when necessary is essential. If remaining work is zero, the task will be considered completed.
- If tracking task durations at the task level, duration completed will be posted using the Tracking table of the Gantt Chart. If greater accuracy is required, entering actual start and finish dates will help drive the schedule. When tracking duration, adjusting remaining duration when necessary will be essential. If remaining duration is zero, the task will be considered completed.

Best uses for task level tracking are:

- Resource allocations are not the focus for schedule management.
- Focus is on remaining duration and hours.
- Projects that are looking to go a step higher in accuracy than percent complete but tracking resource hours is not realistic for the project.

Number of hours per resource per task per time period

When this tracking type is used, team members will submit their timesheets and hours will be entered per person per task per time period. Time periods are usually daily or weekly.

Best uses for Number of hours per resource per task per time period tracking are:

- Focus is on resource allocation.
- Focus is on costing and earned value calculations.
- Projects requiring specific higher level metrics.
- Obtaining estimating information to be used in creating future schedules

This tracking method will also require a more structured method of assigning work and collecting tracking information from the resources.



When selecting a tracking method, determine the type of reporting data that will be requested by the stakeholders. A more detailed level of tracking will result in greater effort required to maintain the project schedule. Be careful not to make the project schedule become the project.

Options that Affect Tracking

Project 2010 offers several options that will allow users control over how Project 2010 will react to the entered tracking data. These options can be set on a per project basis or applied to all projects. The options are discussed below:

To view Scheduling options:

- **File → Options → Schedule**

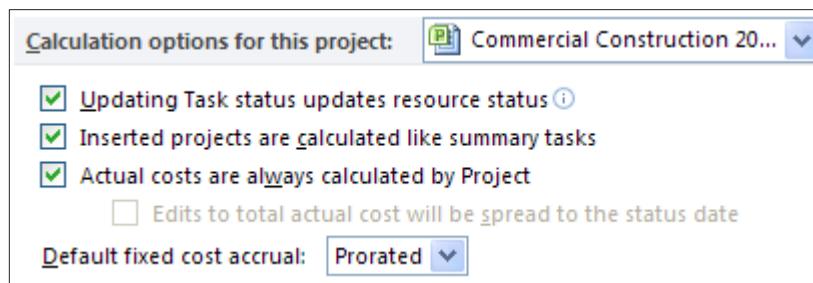


Figure 9-1 PLACEHOLDER

- Updating Task status updates resource status -
 - **Checked:** when a task is marked a percentage duration completed, the task will also update the percent work completed.

- **Unchecked:** separates the update of percent work complete from percent duration complete. The values should be manually updated separately.
 - Actual costs are always calculated by Project.
 - **Checked:** Project will automatically calculate costs.
 - **Unchecked:** Costs are calculated manually.
- To view Advanced options for tracking:
- **File → Options → Advanced**

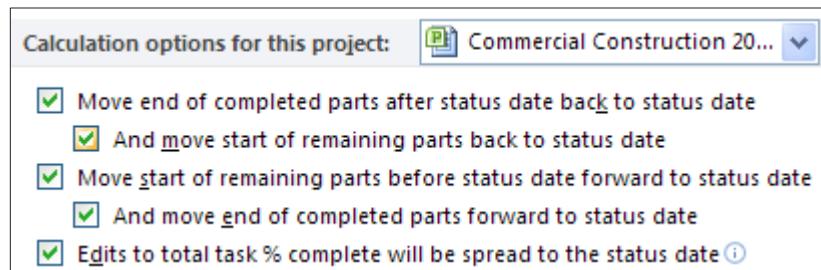


Figure 9-2 PLACEHOLDER

When using the options shown above, a Status date must be entered before tracking data is entered. Status date will be discussed in Lesson 4 in this module.

The first 4 options above, if checked will automatically reschedule uncompleted work to the status date as tracking data is entered. Unchecking these options allows the project manager to enter all tracking data and reschedule the uncompleted work manually.

Edits to total task % complete will be spread to the status date -

Checked: spreads the total percent complete to the project status date.

Unchecked: will distribute task percent completion to the end of the actual duration of the task.

Best Practices

Best Practices of Tracking:

- Decide during the planning stages how tracking will be accomplished for a project.
- Avoid mixing tracking types within a project schedule other than marking milestones completed. When tracking types are mixed, the metrics will not contain consistent data.
- Use the Notes fields to note information related to management of the tasks.
- Find out if there are standards within your organization that might direct you to one tracking method over another. The standards will likely address the type of data that is required for status reports.
- Determine your method of data collection ahead of time. Set up a process to issue work to team members and collect actual values. The Resource Usage view can be altered to print per resource assignment sheets if necessary. A data collection method will help avoid losing tracking data and provide an audit trail.
- Entering tracking data can be a lot of work. For a small project using percent complete, it is manageable for the project manager to enter the data. As projects and teams increase in size the quantity of data becomes greater in volume, the project manager will need the help of team members to enter the tracking data. It is not recommended that team members work on the schedule directly. Project Server 2010 or Sharepoint will enable team members to enter their own tracking data for the project and free the project manager from having to enter the tracking data manually.
- Pick a standard and stick to it when using percent complete tracking. When someone says they are 58% complete on a task, what does that really mean? Applying structure to the percent completed values will allow them to become more meaningful. Increased value would also be derived from getting actual start and actual finish dates whenever possible. Below are a few proven percentage update schemas :
 - 25 percent completed = the task has started
 - 50 percent completed = the task is well into progress
 - 75 percent completed = the deliverable was delivered
 - 100% percent completed = the deliverable was accepted
 - If you have shorter tasks or a short project, you might consider using 50% and 100% only.

- 50% when the task is started
- 100% when the task is completed and signed off
- Too much wbs detail could result in the schedule becoming another project of its own. The wbs is not a checklist but is a task list to manage. Keeping the wbs tasks at a higher level of detail will result in less work during tracking. If deeper detail is required, create checklists using other sources like Word, Excel and Sharepoint lists.

Lesson 2: Tracking Projects

Tracking data updates should be performed using a regular weekly cycle. Typically, tracking data is collected from resources on Friday by close of work. Project managers update the data and re-schedule uncompleted work by noon or close of work on Monday, issuing new work assignments for the week. Longer length projects might use bi-weekly or monthly update cycles. It is important to establish an update cycle and keep it consistent for the duration of the project.

In this lesson, we will examine:

1. Preparing tasks to be updated.
2. Entering percent complete.
3. Enter task level updates.
4. Entering actual hours of work per resource.

Preparing a Task to be Tracked

Once work begins on a project, the schedule has moved into the tracking phase of project management. When tasks are ready for tracking, the schedule is now used to provide information on how the project was performed. To prepare tasks to be tracked, the following actions should occur:

- Set a baseline for the tasks ready to be tracked
- Change the task types to Fixed Units

Set a baseline for the tasks ready to be tracked

As discussed in Module 6, baselines are optional but if you are using baselines in your schedule they should be set before tracking information is entered. It is important to baseline the project in order to compare project

performance against planned performance (variance) as well as earned value calculations and lessons learned to improve future project planning.

Change the task types to Fixed Units

Task types will be an influential factor in the tracking of tasks, re-scheduling the uncompleted work and resource leveling. If distribution of resource allocations is a concern, the best task type to aid in these actions is Fixed Units.

When resources were assigned to tasks, the units quantity of the resource was adjusted based on the amount of the resource units needed for the task. It will be important that the quantity of the resource assigned to a task not change during re-scheduling of uncompleted work for the project to keep your assignment consistent.

Project 2010 provides a bulk task changing capability called Multiple Task Information. Select a range of tasks and then click on the Information icon to make changes to groups of tasks simultaneously.

To change the task type for all tasks ready to be tracked to Fixed Units:

- Select all tasks ready to be tracked
- Click **Task → Information.**

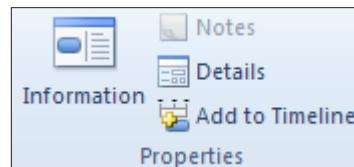


Figure 9-3 PLACEHOLDER

- Click the **Advanced** tab.
- Click the task type and select **Fixed Units**.
- Click **ok**.

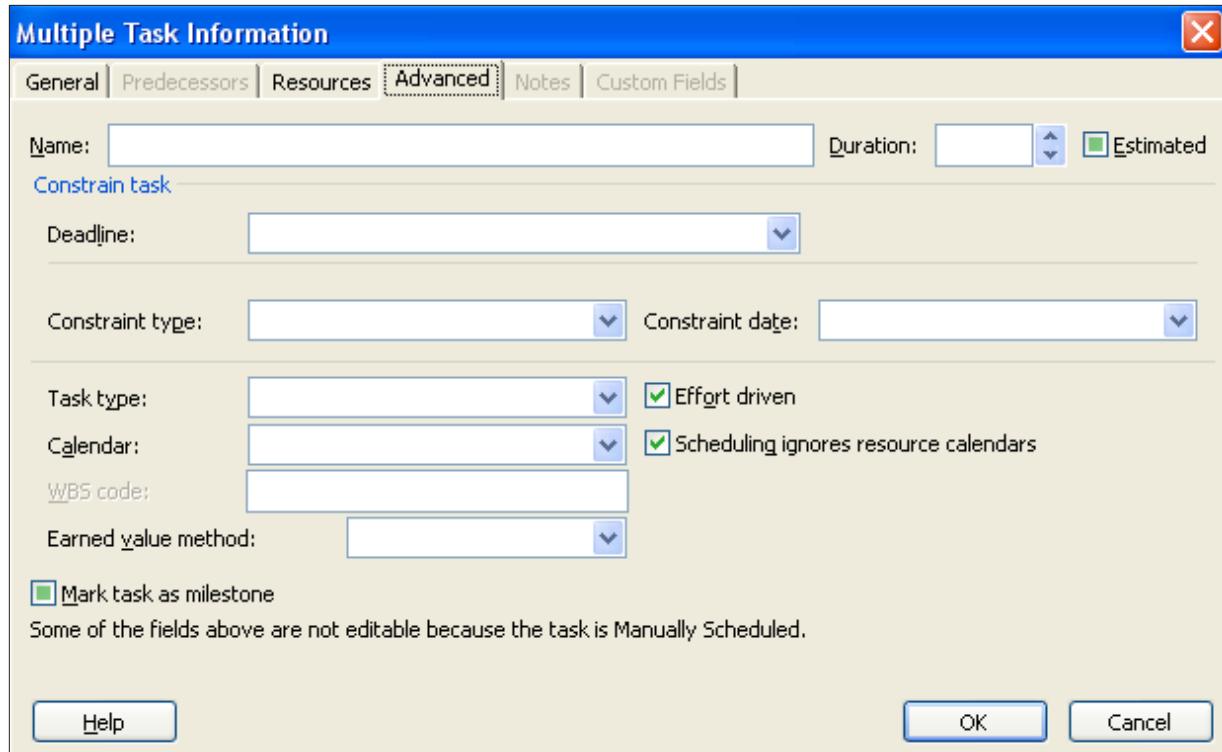


Figure 9-4 PLACEHOLDER



Use this method to do bulk changes to tasks and resources as necessary.

Using Percent of Work Complete

There are several different ways to update percent complete using Project 2010. It is important to select the method that will work best for you. Percent complete tracking functions the same for automatic or manually scheduled tasks.



All examples below have the automatic updates to status date options turned off to allow for manual rescheduling of work.

Tracking percent complete buttons are located on the Task ribbon bar. These buttons are percent duration complete.

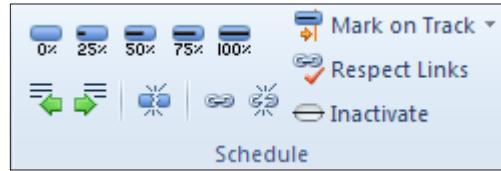


Figure 9-5 PLACEHOLDER

When marking a task percentage completed using these buttons, keep the following in mind:

- The task actual start date will use the value in the Start column. Planned Start will become Actual Start.
- The task actual finish date will use the value in the Finish column. Planned Finish will become Actual Finish.
- Each resource assigned to the task will do exactly as much work as originally scheduled, on the days they were scheduled to be performed, prorated for the percentage completed.

In the example below task 3 was marked 100% complete using the tracking buttons on the Task bar. The view is the Tracking Gantt in the top pane with the Task Form Work subview in the bottom pane. The Tracking Gantt is formatted to show the baseline as well as duration percent complete values on the Gantt bars. Note that the summary task is showing 17% of the work has been completed for the tasks included in the General Conditions summary. There is also a progress bar showing underneath the summary bar and a checkmark in the indicator column for task 3. The check mark in the indicator column reflects that the task is 100% completed. The resource was updated to show the same about of work completed as planned. Remaining work for the task is zero.

To view the Tracking Gantt:

- **Tasks → Gantt Chart → Tracking Gantt**

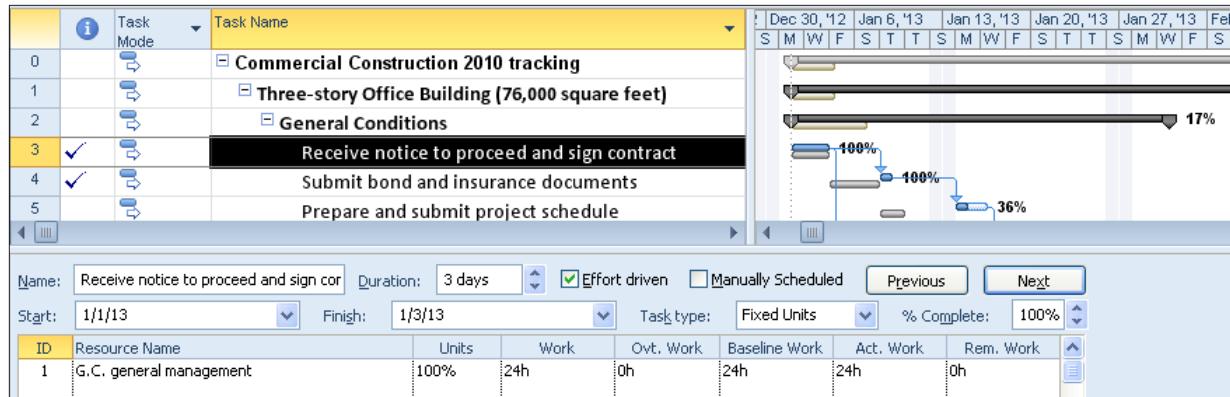


Figure 9-6 PLACEHOLDER

To remove the tracking information for a task:

- Click on the task.
- On the **Task** bar, click **0%**.

In the next example, task 4 started 2 days later than planned. It was also discovered, that additional time was going to be needed to complete the task. This information can be added to the task update information using the Update Task box.

To display the Update Task box:

- Click the task
- Click on Task ribbon → Mark on Track → Update Tasks

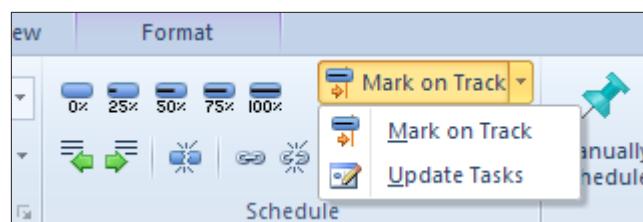


Figure 9-7 PLACEHOLDER

The Update Tasks box will be displayed:

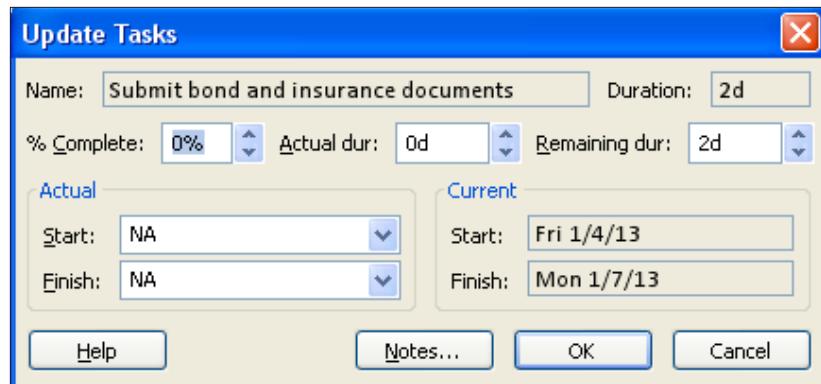


Figure 9-8 PLACEHOLDER

In the Update Tasks dialog box above, the actual start date, actual duration, % duration complete and the remaining duration may be adjusted. Entering an actual finish date will result in the task being considered 100% completed. This box will also give you access to the Notes field to be used to collect comments regarding how the tasks were performed. The note information is updated to the Task Notes field.

In the example below, Task 4 "Submit bond and insurance documents" has started 2 days late, 1 day of work was accomplished and remaining work was increased by 2 days. Total task duration is 4 days. The following information was entered in the Update Tasks dialog box:

- Start date – 2 days later than current start date
- Actual duration – 1 day
- Remaining duration – 3 days

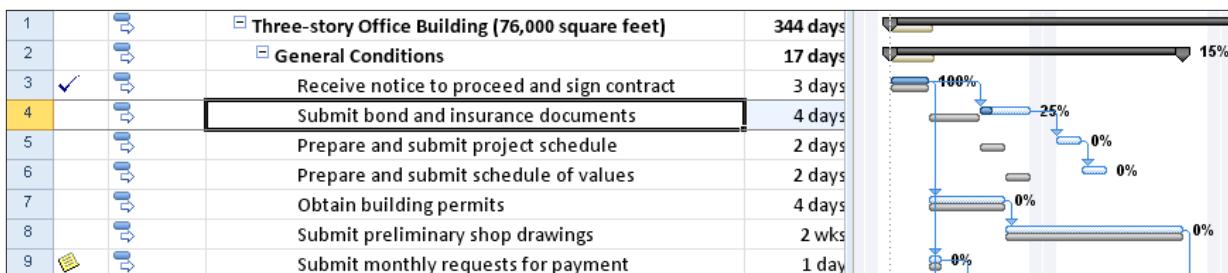


Figure 9-9 PLACEHOLDER

The result of the update information for task 4 is that the original 2 day task will now take 4 days. The task started 2 days late so it is off schedule

compared to baseline. All related tasks are now scheduled later. The task has also been marked 25 % complete.

A new feature in Project 2010 allows updating tasks to be completed as planned. This feature will mark any tasks completed through the project status date. The Project Status date must be entered through Project → Project Information before marking tasks completed as planned. After the date has been entered click on the following:

- Select a **task** or **multiple tasks**
 - **Task → Mark on Track.**



Figure 9-10 PLACEHOLDER

Another new feature in Project 2010 is the ability to update tasks using the Team Planner view. If tracking information is derived from resources, a resource might report on multiple tasks at once. The team planner view will allow for easy updating from the resource point of view.

In the example below, the G. C. Procurement resource is reporting tracking information for task “Obtain building permits” as 50% completed and starting 1 day late.

- Task → Gantt Chart → Team Planner

Figure 9-11 PLACEHOLDER

- Click the **task** to be updated.
 - **Task → Mark on Track → Update Tasks.**
 - Continue with directions for Update Tasks earlier in this lesson.

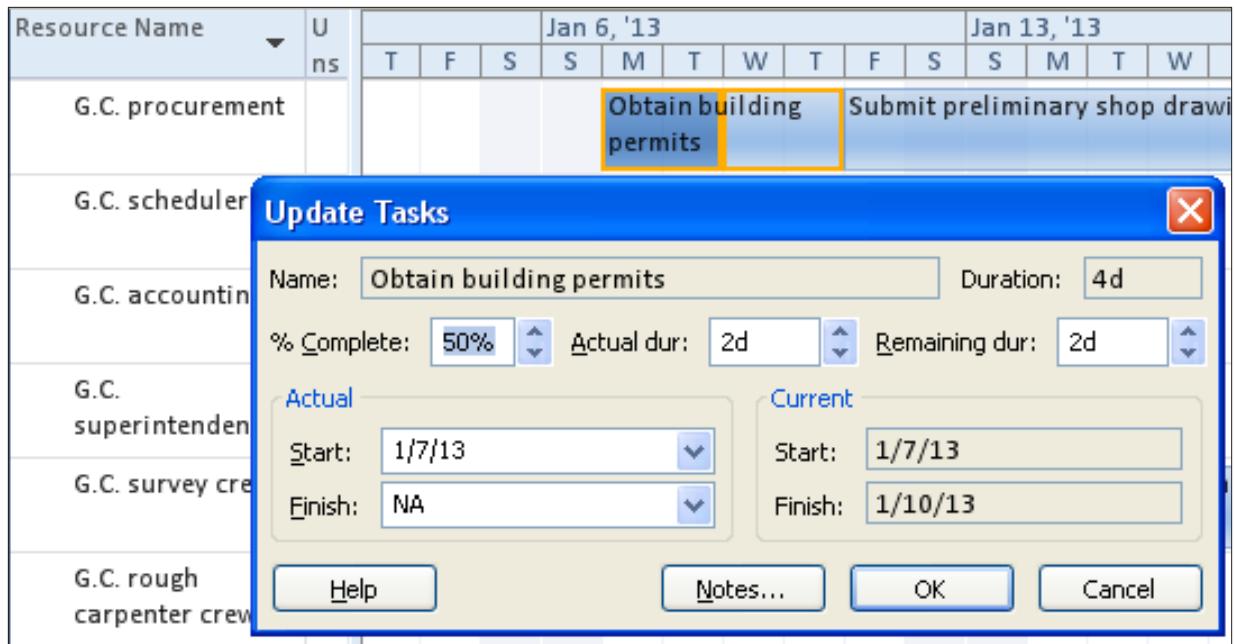


Figure 9-12 PLACEHOLDER

Updating Tracking data at the Task level

Updating task level tracking information is tracking total work hours or duration for a task without concern for individual resource performance. Percent complete will be calculated as a result of entering work hours or duration for tasks.

When updating task duration collect this information from resources:

- Actual duration completed.
- Remaining duration.
- Actual start date (optional).
- Actual finish date (optional).

When updating task work collect this information from resources:

- Actual work completed.
- Remaining work hours.
- Actual start date (optional).
- Actual finish date (optional).

Use the Tracking table to enter tracking information for duration at the task level:

- **Task → Tracking Gantt Chart.**
- Right click in the upper left corner above the task numbers.
- Select the **Tracking** table (see below).

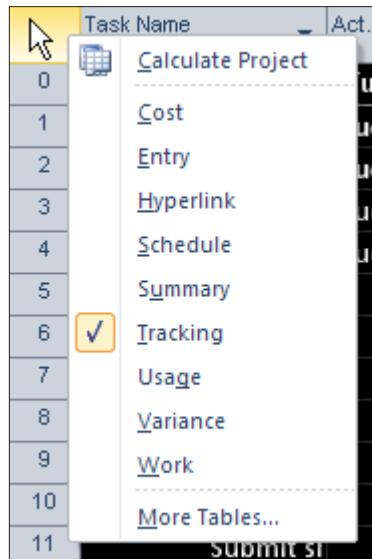


Figure 9-13 PLACEHOLDER

Tracking data was collected for Task 4 “Submit bond and insurance documents”.

- The task started 2 days late
- 1 day of work was completed
- The task will require an additional 2 days to complete.

Below is the task before tracking information is entered. Note the Rem.

Dur or Remaining Duration column contains 2 days and Act. Dur. or Actual Duration is 0 days.



Column headings names have been shorten. Hover mouse pointer over column heading to see the complete column name.

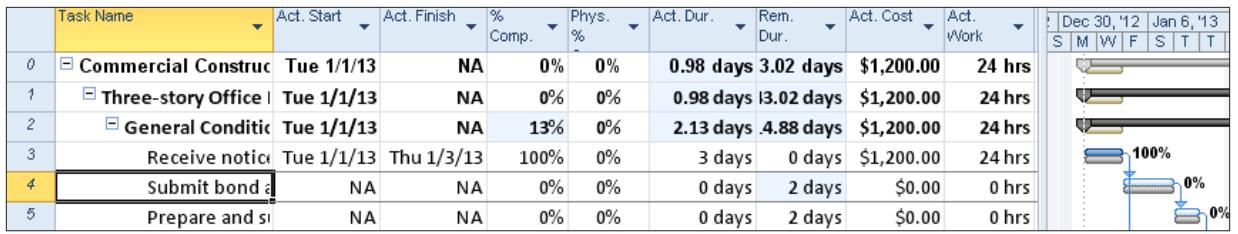


Figure 9-14 PLACEHOLDER

The following information was entered to update the task:

- Actual Start: task was planned to start on Friday, January 4 but it did not start until Tuesday, January 8. 1/8/13.
- Actual duration: 1 day.
- Remaining duration: 3 days.

Note that the task calculated 25% completed and \$300 in Actual Cost.

As a result of this update the project is off schedule from the baseline value. See the updated example below:



Figure 9-15 PLACEHOLDER

To enter tracking information for work at the task level, use the Work table:

- Task → Tracking Gantt Chart.**
- Right click in the upper left corner above the task ID numbers.
- Select **Work**.



Because every field in the table is a Work field, the word "Work" has been eliminated from the column titles. Hover your mouse pointer over the column titles to see the complete field names.

Task 5 "Prepare and submit the schedule" has been baselined for 20

hours of work. In the view below, no work has been completed on this task and % W. Comp. or % Work Completed column is shown as 0%.



Figure 9-16 PLACEHOLDER

Data for work tracking for task 5 was collected and entered as follows:

- Actual work: 10 hours
- Remaining Work: to complete the task, 18 hours will be required. This is an additional 8 hours over the original estimate. 8 was added to remaining work.

The result of entering the work tracking data is:

- Task 5 calculated work to be 36% work completed for the task.
- Actual start date was not entered. The value in the Start column was used by Project 2010 as the actual start date which was January 13.
- Work has increased from 20 hours to 28 hours. The value of the work column is remaining work plus actual work.
- The Variance column for task 5 is showing 8 hours. This number is being calculated as the difference between Work and Baseline. A positive number means that more work is being done than what was originally baselined or planned for the task. A negative number will reflect less work than originally planned.

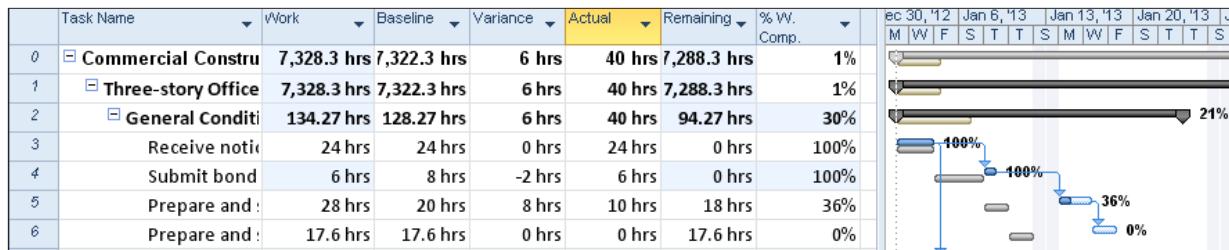


Figure 9-17 PLACEHOLDER



Task 4 above shows remaining work at zero. This means the work for this task has been completed. As a result, the variance displays a negative value meaning the task required fewer hours than originally estimated.



Actual Start and Actual Finish columns may be added to the Work table to allow date entry. Entering these values will help push your schedule forward more accurately and give you one location to enter time and actual dates.

Another view that can be used as an update view for actual work at the task level is the Task Usage view. Adding the actual work column to the right side of the view and adjusting the timescale density will give you flexibility in entering work tracking information.

To add the Actual Work column to the right side of the view:

- **Task → Gantt Chart → Task Usage.**
- **Format → Details.**
- Under **Available fields on the left**, click **Actual work**.
- Click **Show** – Actual work will move to **Show these fields on the right**.
- Customize Font, Cell background and Pattern may also be modified.

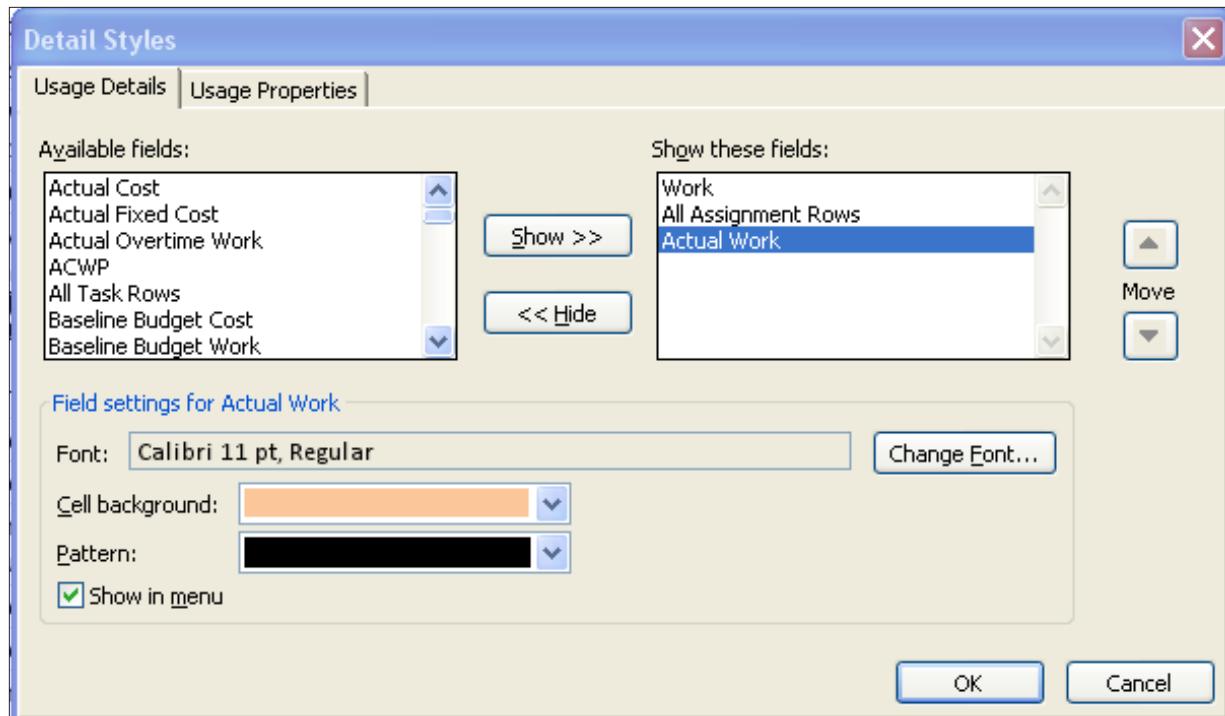


Figure 9-18 PLACEHOLDER

In the example below, the task “Set up site office” is scheduled to require 27 hours of work assigned to 2 resources.

Below is the Task Usage view of this task before updating tracking data. Note that the Actual Work columns has been added to the view.

Task Name	Work	Details	Jan 13, '13							Jan 20,		
			T	F	S	S	M	T	W	T	F	S
Set up site office	27 hrs	Work			9h			9h	9h			
G.C. superintendent	12 hrs	Act. Work										
G.C. labor crew	15 hrs	Work			4h			4h	4h			
		Act. Work										
		Work			5h			5h	5h			
		Act. Work										

Figure 9-19 PLACEHOLDER

- The task has started 1 day late.
- 7 hours of work was accomplished on day 1.

Below is the result of entering the tracking data. The 7 hours of work

entered is indicated. Note how the remainder of the uncompleted work was rescheduled for the resources.

Task Name	Work	Details	Jan 13, '13							Jan 20,		
			T	F	S	S	M	T	W	T	F	S
Set up site office	27 hrs	Work					7h	9h	9h	1.68h	0.32h	
		Act. Work					7h					
G.C. superintendent	12 hrs	Work					3.12h	4h	4h	0.88h		
		Act. Work					3.12h					
G.C. labor crew	15 hrs	Work					3.88h	5h	5h	0.8h	0.32h	
		Act. Work					3.88h					

Figure 9-20 PLACEHOLDER

Using Actual Hours of Work Complete Per Resource

Updating resources for hours per task may be performed from several different views. Work may be entered for a resource to a task in a lump sum or entered at the per day or the per week level. How data is entered will determine which view should be used for this purpose.

To enter hours on a task for a resource:

- **Task → Tracking Gantt.**
- **Task → Details.**
- Right click in the bottom pane → Work.

The following split screen will appear. In the example below, the “Install temporary power” task has been selected. This view shown is before actual work has been updated for the task. Note the Detail Task Form shown in the lower pane has more detail in the form header than the Task Form used in previous views. On the left side of the Detail Task Form multiple dates may be seen by selecting different date options. Currently this task is scheduled to start on January 4, 2013.

To turn on the Detail Task Form:

- Task → Gantt Chart
- Task ribbon → Click on Details

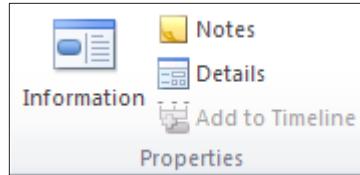


Figure 9-21 PLACEHOLDER

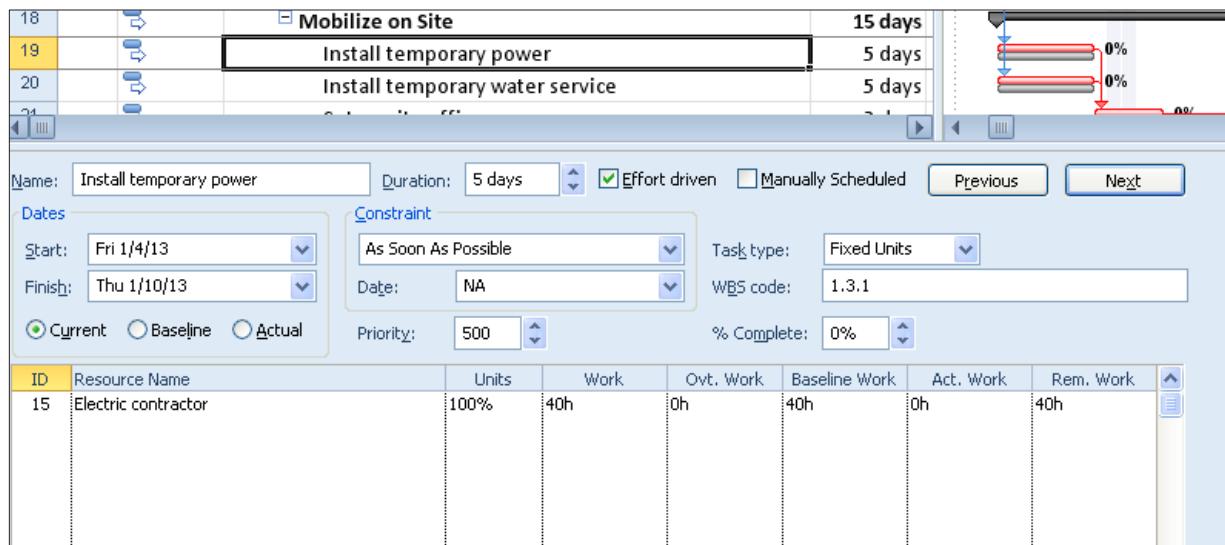


Figure 9-22 PLACEHOLDER

Hours tracking data was collected for this task as follows:

- Resource started the task 2 days late.
- Resource completed 10 hours of work on the task.

The tracking data was entered as follows:

- Under **Dates** on the left side of the lower pane, Actual dates were selected and a late start of January 8 was entered as the actual start date.
- 10 hours was entered into the Actual Work column – Work subview.
- OK was clicked to complete and update the transaction.

The update is shown below. The task is 25% completed and remaining work is 30 hours for this resource assignment.

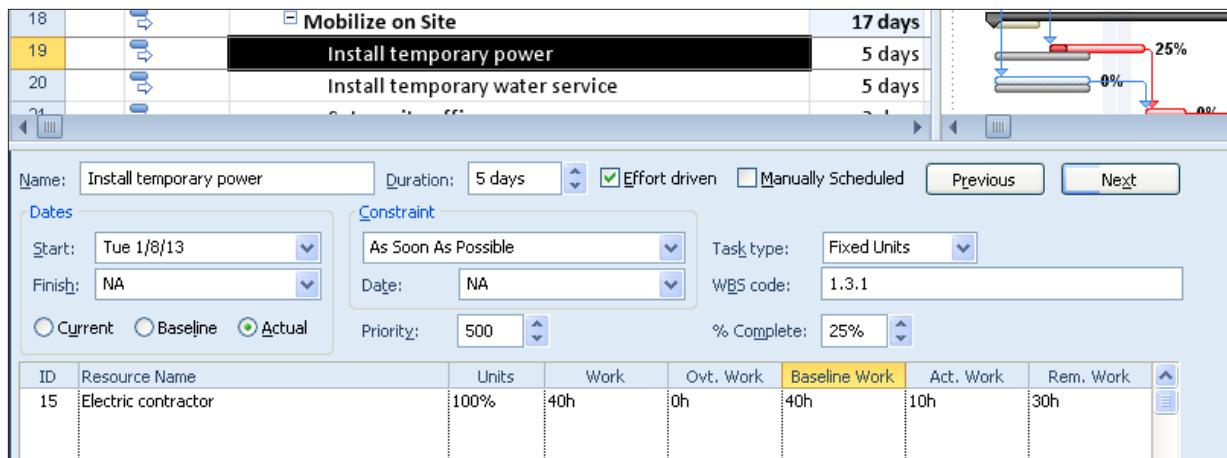


Figure 9-23 PLACEHOLDER

The current schedule for this task can be viewed by right clicking in the bottom pane and selecting Schedule. The new scheduled completion date is January 14, 2013 for this task. Multiple resource updates may occur at the same time. If resources are not available during the new scheduled dates, the work will move out in time until the resource has the open availability time to perform the task.

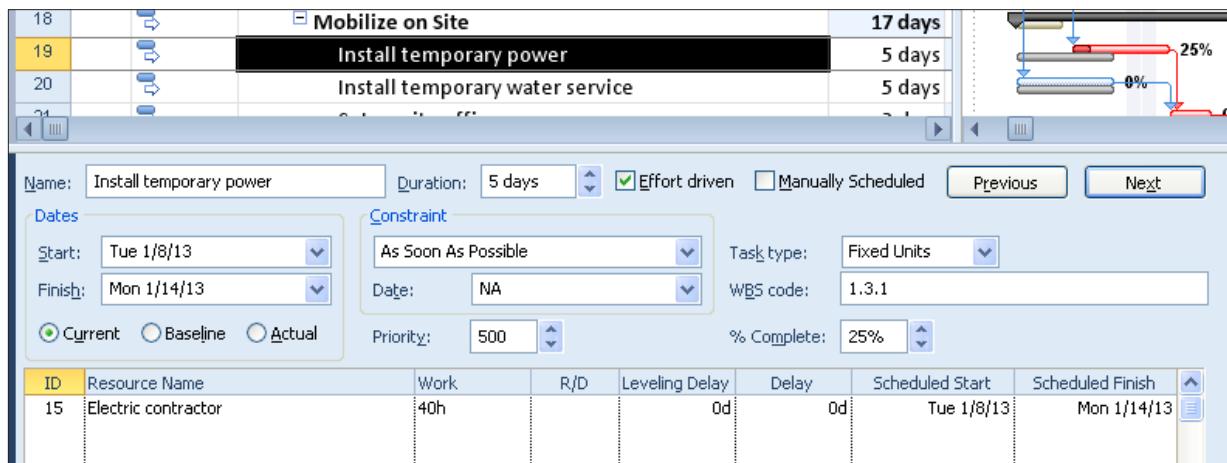


Figure 9-24 PLACEHOLDER

The most detailed level for updating the number of hours for a resource within a time period is the Resource Usage view. Use this view to

update hours at a per day or per week timescale density. By default, the standard Resource Usage view does not include the Actual Work column. This column should be added using the method previously stated.

Below is a view of the Resource Usage view showing G. C. Procurement's assigned work with the actual work column showing. The time scale is reflecting a per day setting. The timescale may be adjusted in the lower right corner by using the zoom slider. A per week setting is a more comfortable timescale for many users. Note that the task assignment "Obtain building permits" is scheduled to complete on January 9 and the successor task assignment "Submit preliminary shop drawings" is scheduled to start on January 10.

		Resource Name	Details	Jan 6, '13							Jan 13, '13			
				6	7	8	9	10	11	12	13	14	15	16
3		G.C. procurement	Work		4h	4h	4h	4h	4h			4h	4h	4h
			Act. Work											
		Obtain building permits	Work		4h	4h	4h							
			Act. Work											
		Submit preliminary shop drawings	Work					4h	4h			4h	4h	4h
			Act. Work											

Figure 9-25 PLACEHOLDER

Tracking data for the G. C. Procurement resource was collected as follows:

- The work that was scheduled to start on January 7, actually started on January 8.
- 4 hours was completed on January 8 and 3 hours was completed on January 9.

The data collected was entered as follows:

- 4 hours in actual work on January 8
- 3 hours of actual work on January 9

After the actual values were entered, the uncompleted future work was re-scheduled. The work for the "Obtaining building permits" task was re-scheduled to be worked on January 10, 11 and 12. The new start date for the "Submit preliminary shop drawings" task was rescheduled to start on January 14. Note that the resource is limited to working 4 hours per day.

The result is shown below:

	3	G.C. procurement	Details		Jan 6, '13								Jan 13, '13										
			6	7	8	9	10	11	12	13	14	15	16	6	7	8	9	10	11	12	13	14	
		Work			4h	3h	4h	4h												4h	4h	4h	
		Act. Work			4h	3h																	
		Work			4h	3h	4h	4h												1h			
		Act. Work			4h	3h																	
		Work																		3h	4h	4h	
		Act. Work																					

Figure 9-26 PLACEHOLDER

G. C. Procurement was asked to work more time to bring the schedule closer to the original schedule. Additional tracking information was collected:

- G. C. Procurement worked 7 hours on January 10. It was determined that the task was completed.

The data was entered as follows:

- January 10 Actual work – 7 hours
- January 11 Work – 0. Entering a zero in the Work column will remove the remaining work for the assignment. The assignment is considered complete.

The orginal completion date of the “Obtain building permits” task was January 9 and was not met but the task was completed on January 10. The dependent task “Submit preliminary shop drawings” that was rescheduled to start on January 14 is now scheduled to start on January 11. The result is shown below:

	3	G.C. procurement	Details		Jan 6, '13								Jan 13, '13											
			6	7	8	9	10	11	12	13	14	15	16	6	7	8	9	10	11	12	13	14	15	16
		Work			4h	3h	7h	4h												4h	4h	4h		
		Act. Work			4h	3h	7h																	
		Work			4h	3h	7h																	
		Act. Work			4h	3h	7h																	
		Work								4h										4h	4h	4h		
		Act. Work																						

Figure 9-27 PLACEHOLDER



The icon in the indicator column notes that the assignment has been edited.

Per resource time collection and entry can be a lot of detailed work. If you chose to use this tracking method, consider using ms Project Server

which would allow resources to enter their own tracking data as well as administrative and other time data. The project manager would then approve the actual work and update the project schedule.

Practice: Working with Tracking Methods

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice, you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the Ps07 virtual machine.

1. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
2. In the Project Server Accounts dialog box, click Add.
In the Account Properties dialog box, and complete the following settings and click ok.

Table 9.1 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 3: Updating Milestones, Material and Cost Resources

Milestones, Material Resources and Cost Resources should also be tracked using Project 2010. When cost and material resources were assigned during planning, values were updated to the baseline. Tracking these values will provide the variance of baseline vs actual values. When tracking these types of resources, having a standard process for collecting actual values will be helpful. Tracking milestones will help move your project schedule forward toward your ending date.

In this lesson we will discuss:

1. Updating milestones.
2. Updating material resource assignments.
3. Updating cost resource assignments.

Updating Milestones

Milestones are points in time. They are also short term goal dates within a project schedule that need to be achieved. Frequently, milestones are also the acceptance of work or a management approval. These dates should be noted. Since milestones are linked within the network of tasks, the achievement dates will help push the schedule forward. Marking milestones complete as of a specific date will support this effort as well as providing for variance calculations.

Milestones may be marked completed in several ways:

Update milestones using the Task Tracking table:

- **Task → Gantt Chart.**
 - Right click in the box above the task ID's.
 - Select **Tracking**.
- OR
- **View → Tables → Tracking.**

Task 7 below, is a milestone. It was planned to be completed on May 7.

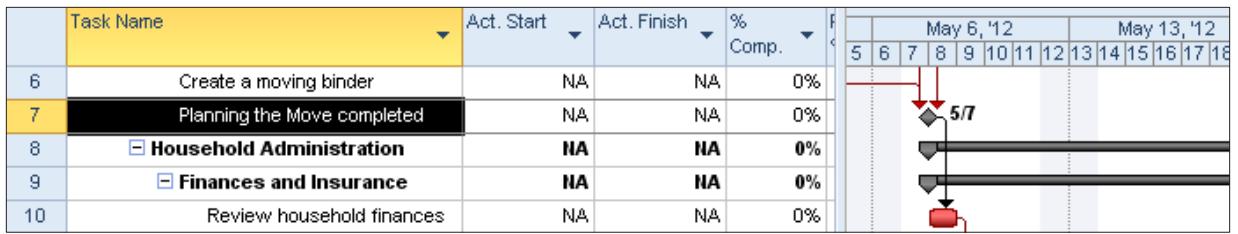


Figure 9-28 PLACEHOLDER

This milestone was not completed until May 11. Following the milestone, is a successor task, Review household finances, which was scheduled to start on May 7 and will now be delayed. If only the finish date for a milestone is entered, the start date will remain the same as the value in the Start field (May 7) and the task would appear as 4 days of duration. By entering the same date for the Actual Start and Actual Finish fields, the task retains the look of a milestone.



Figure 9-29 PLACEHOLDER

An alternate view that can be used to update tracking data for milestones is the Update Task box:

To display the Update Tasks box:

- **Task → Gantt Chart → Tracking Gantt.**
- Click the task to be updated.
- **Task → Mark on Track → Update tasks.**



Figure 9-30 PLACEHOLDER

Using the percent complete buttons is an effective method of updating milestones. This method was described earlier. However, using these buttons will assign the current values of the Start and Finish fields to the Actual Start and Actual Finish fields. If the task is off schedule, it is recommended that one of the 2 earlier mentioned methods are used because you will have an opportunity to enter alternate dates.

Updating Material Resources

Material resource assignments are the consumables of the project. When creating an assignment for a material resource, the estimated number of items required is entered. Tracking material resources will be entering the number of the consumable that was actually consumed within the project.

For example: An assignment using a material resource called “Paint” was assigned to a task called “Paint walls and woodwork” with an estimate of 10 gallons of paint and using the work resource Painting contractor. A baseline was set for this task.

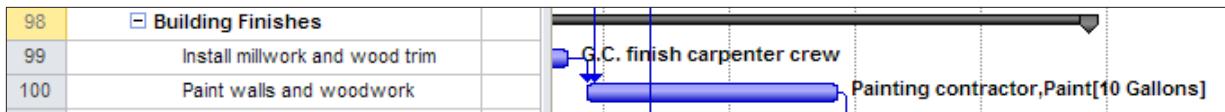


Figure 9-31 PLACEHOLDER

After the task was completed, it was discovered that 12 gallons of paint were used to complete the task. 12 gallons of paint must be updated to the task to track the difference and to update the value into the actuals.

Below is the Task Entry view showing the Paint walls and woodwork task before update of the material resource. The Work subview is showing in the bottom pane.

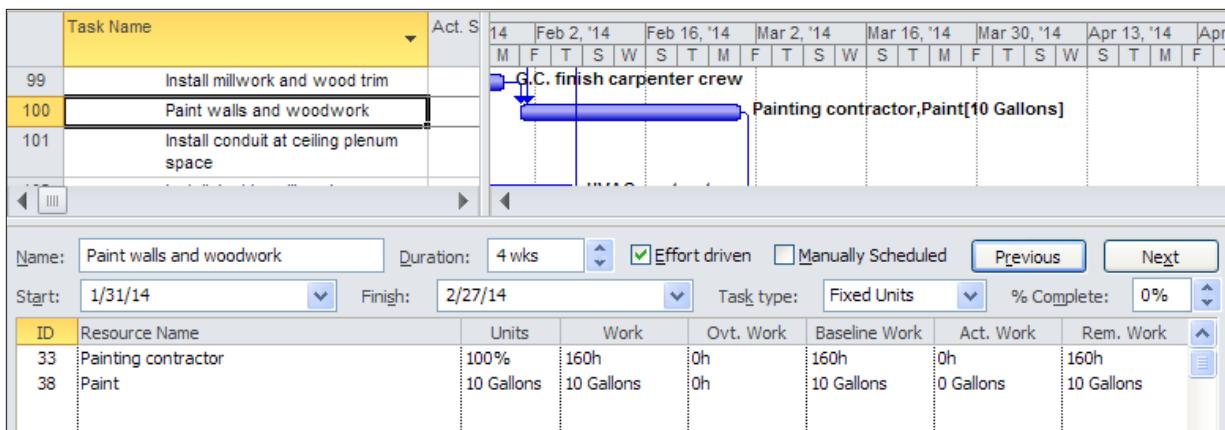


Figure 9-32 PLACEHOLDER

To update the material resource value, enter the number of actual units of the consumable in the actual work column. 12 was entered into the actual work columns. Note that the baseline is 10 and remaining work is zero. Total work and units has been increased to 12. Below is a view of the result.

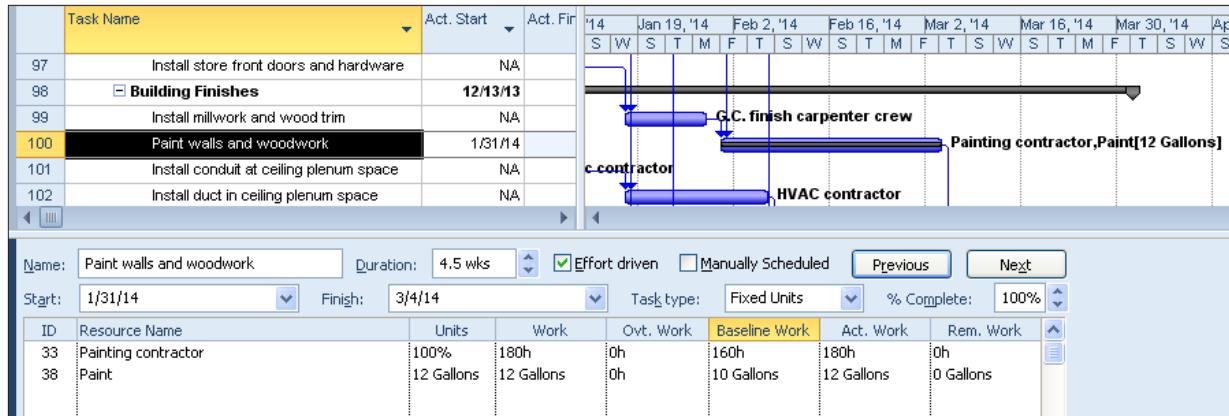


Figure 9-33 PLACEHOLDER

The increased number of items will result in an increase in cost for the materials.

To view the Cost subview in the bottom pane

- Right click in the bottom pane.
- Select **Cost**.

Below is the view showing the difference of cost between the Baseline Cost and Actual Cost values for the material resource.

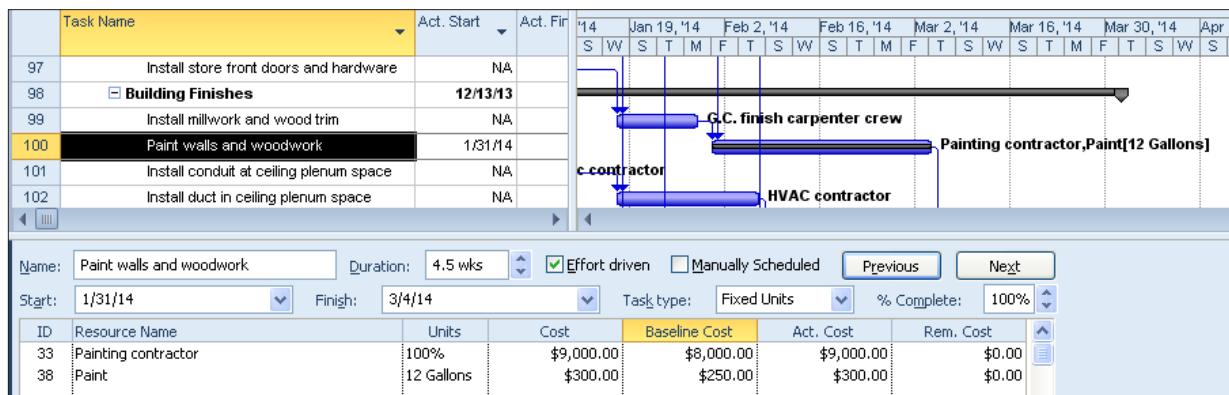


Figure 9-34 PLACEHOLDER

Updating Cost Resources

Cost resources are resources used to add additional estimated costs to tasks. These costs will roll up into the summary and project summary tasks. The values of the cost resources will also become part of the baseline value for the project. Assignments are created with a cost estimate. Actual costs are tracked into the project schedule as information becomes available.

Continuing to use the Task Entry view, below is a view of an assignment with \$4,000 of estimated travel costs. Since the baseline was saved the estimated costs have been included in the baseline.

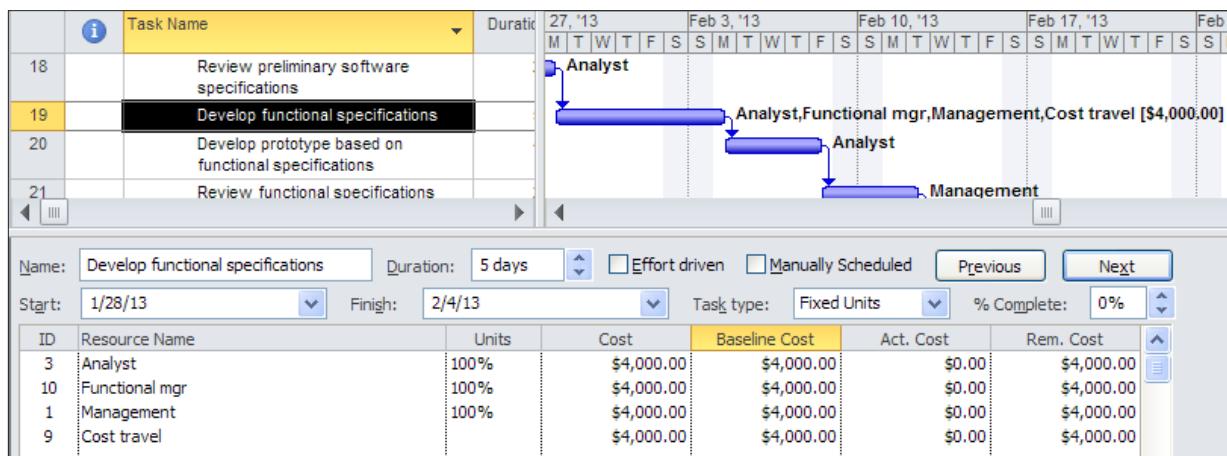


Figure 9-35 PLACEHOLDER

Travel expense reports were submitted after the task was completed. The actual cost of the travel expenses was \$4,225.00. The view below is the result of the task being marked 100% complete. Note that the Actual Cost value for the cost resource was not updated.

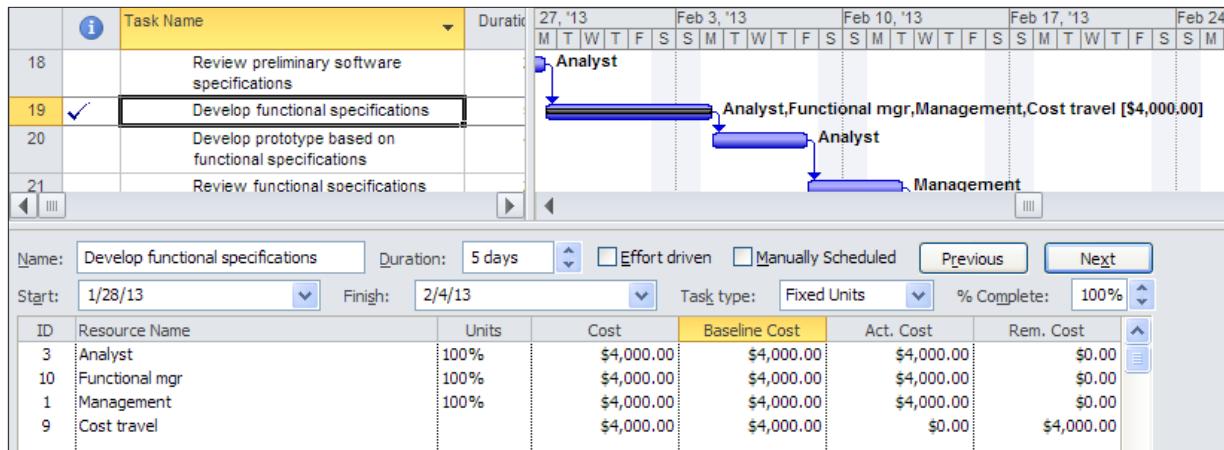


Figure 9-36 PLACEHOLDER

Costs are updated separately. Below \$4225.00 was entered in the Actual Cost column and ok was clicked to update the transaction. See result below.

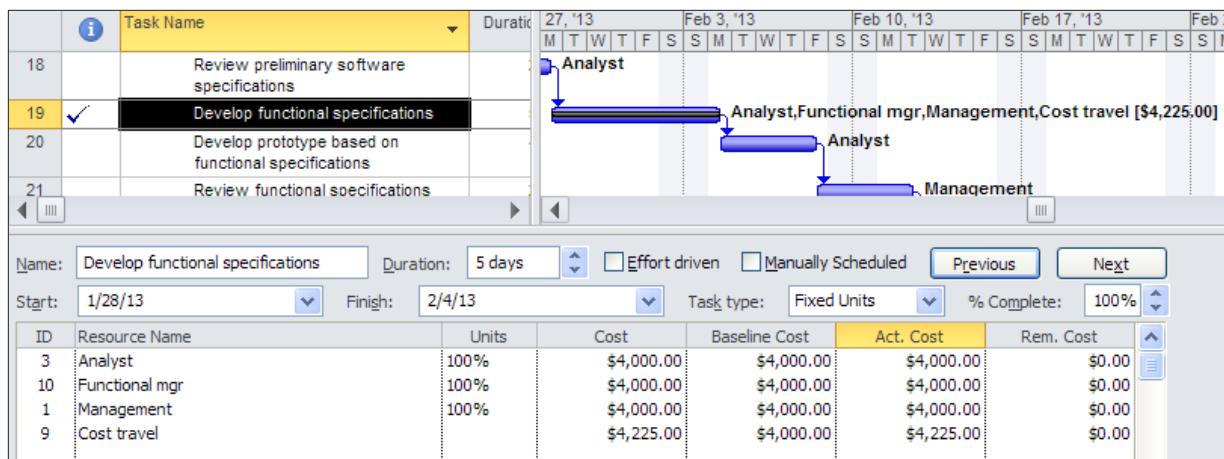


Figure 9-37 PLACEHOLDER

As an alternate view to update costs, the actual cost may be entered using the Resource Usage or Task Usage views by adding the Actual Cost column to the right side of the view.



If the task had been baselined and the estimated cost is greater than the actual cost, zero out the remaining cost field for the assignment.

Practice: Updating Milestones, Material and Cost Resources

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

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2. In the Project Server Accounts dialog box, click Add.

In the Account Properties dialog box, and complete the following settings and click ok.

Table 9.2 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server

Table 9.2 PLACEHOLDER

Setting	Perform the following:
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Lesson 4: Updating Project Status

Once the tracking information has been entered, the schedule should be updated to reflect the current status of the project. The process of status-ing a project is rescheduling unfinished work as of a date in time to reflect the current estimated timeline of the project. Many project managers are concerned about rescheduling uncompleted work because their target dates might shift. It is important to discover sooner rather than later if there is a problem reaching your target dates.

Project Management is both an art and a science. Knowing what buttons to push is the science. Knowing how to manage a project and deliver it on time is an art. The art is developed through experience. The science can help the Project Manager perform more efficiently by providing more information to make better decisions.

In this Lesson, we will discuss:

1. The update cycle.
2. Setting a status date.
3. Rescheduling uncompleted work.
4. Getting the schedule back on track.

Overview of the Tracking Cycle

Regular project status updates will help keep your project on schedule. If an organization has a PMO (Project Management Organization), they might have policies governing project status updates as part of their process. Most organizations using Project Server have policies in place that dictate the frequency of the status updates. Typically, project managers use a weekly update cycle to help keep their projects on track to meet their milestones and target dates.

A regular weekly cycle might look like this:

- Issue work assignments on Monday morning for the week.
- Resources work on the assignments during the week.

- Collect actual work values by close of business on Friday for work which occurred during the week.
- Enter actual values into project schedule and reschedule uncompleted work.
- Evaluate the schedule and make adjustments.
- Reissue new assignments by noon the following Monday.

Steps to achieve this update cycle using Project 2010 are below:

1. Actual values are collected from the resources.
2. The actual values are updated into Project 2010 for all resource types.
3. A status date is entered.
4. Uncompleted work is re-scheduled based on the status date.
5. Make any changes and adjustments to help get the project back on track.
6. New resource assignments are issued to resources.

In the absence of an organizational policy, consider establishing a frequency of how often statuses are completed tied to the length of the project schedule, for example:

- 1 month duration - status 2 to 3 times a week.
- 6 months duration - status weekly.
- 2 years duration – status monthly for the first 6 months and increase frequency as the time gets closer to the end of the project.

Setting a Status Date

The Status Date is the date used as a completed through date of when work is to be rescheduled. The Status Date will represent a timeframe where all uncompleted work in the past will be moved and rescheduled in the future. Try to always use the same day of the week for each status update. If using the regular Monday through Friday cycle, it would be helpful to always select Sunday as the reschedule date. The uncompleted work will be rescheduled starting the day after the date selected as the Status Date.

Below is a small section of a project schedule with tracking data entered and shown using the Tracking Gantt view.

- The project start date is January 14.
- The milestone goal date for this section was January 24.

- The current projected ending date for this group of tasks is January 28.
- Current date is January 28 and not all work was completed as expected.

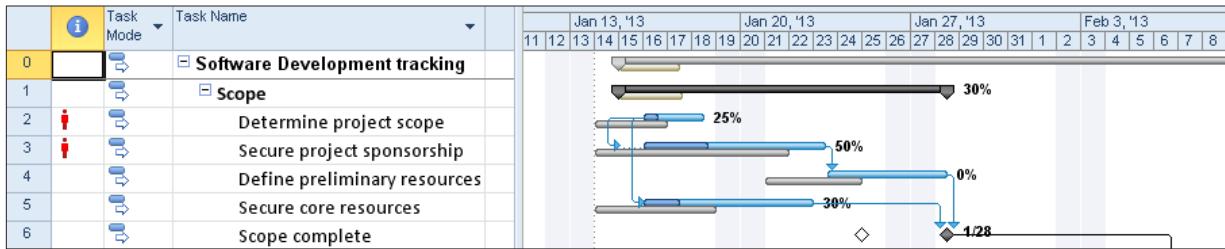


Figure 9-38 PLACEHOLDER

To reschedule the uncompleted work as of Monday, January 28, the Status Date for this timeframe will use Sunday, January 27. That date was chosen because work should be rescheduled starting on Monday, January 28 or the day after the Status Date. Below is a view of the Project Information dialog box with a Status Date of January 27 entered.

To enter the status date:

- **Project → Project Information.**
- Enter Status Date.
- Click **OK**.
- OR -
- **Project → Status Date.**

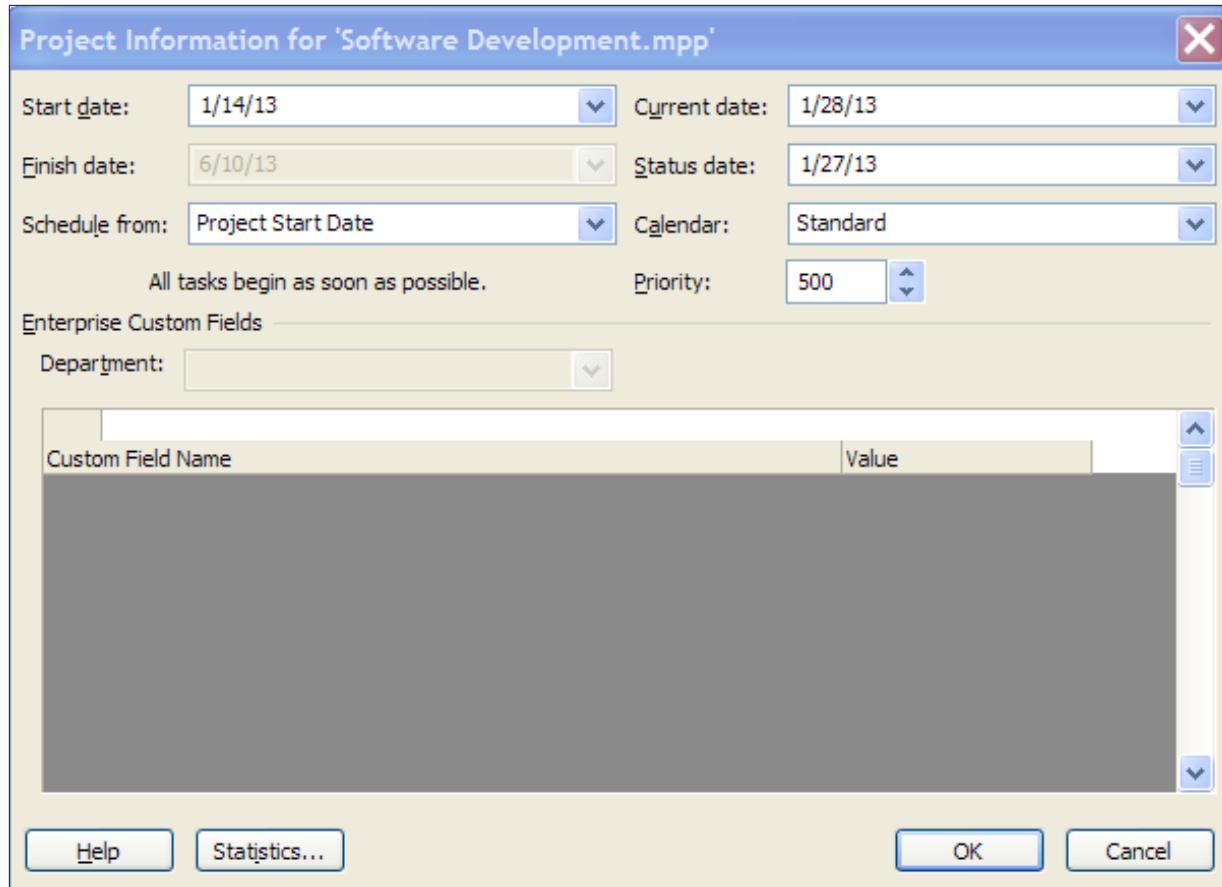


Figure 9-39 PLACEHOLDER

By default, the Status Date is not visible on the Tracking Gantt view.

To add the Status date line to the Tracking Gantt view:

- **Tasks → Gantt Chart → Tracking Gantt.**
- **Format → Gridlines.**
- **Line to change → Status Date.**
- Type (pick a line style).
- Color – select a color.
- Click **OK**.

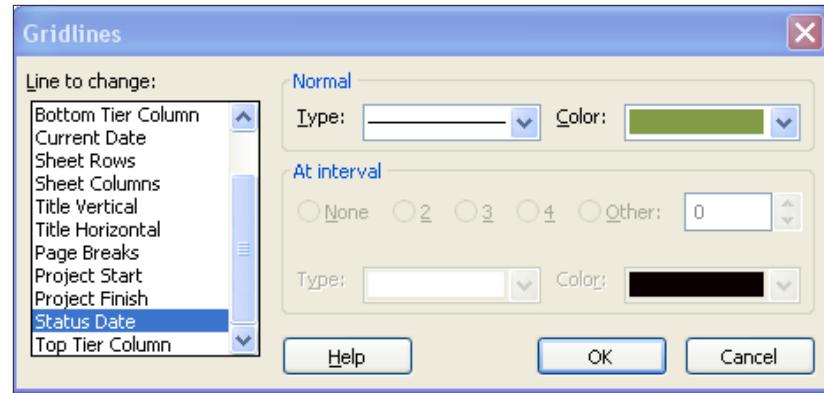


Figure 9-40 PLACEHOLDER

Note the vertical line indicating the Status Date in the view below.



If Current Date and Status Date are the same, the Current Date line indicator will be visible and the Status Date indicator is hidden. By default, the Current Date line is orange.

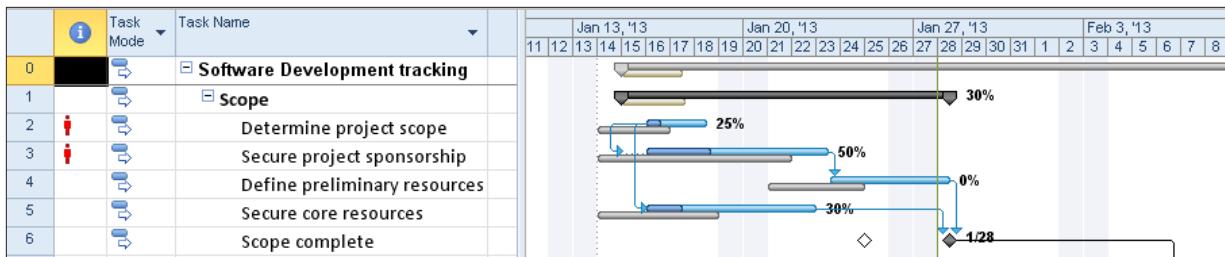


Figure 9-41 PLACEHOLDER

Reschedule Uncompleted Work

Once a Status Date is entered, the uncompleted work may be rescheduled using the Update Project dialog box.

To view the Update Project dialog box:

- **Project → Update Project.**
- Click **Reschedule uncompleted work to start after.**
- Click **ok.**

Tasks may be updated by a select group of tasks or the entire project.



If the Status Date was entered using the Project Information dialog box, the date is shown in the Update Project dialog box and will be seen on the formatted Gantt Chart as discussed in the previous lesson. If the Status Date is entered through the Update Project dialog box, the Status Date will not be visible on the Gantt Chart.

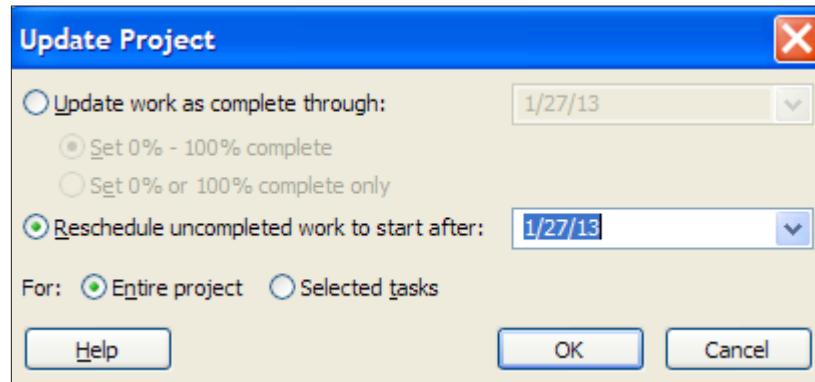


Figure 9-42 PLACEHOLDER

Once work is rescheduled all completed work is in the past. All work remaining to be completed is moved to the right of the Status Date or in the future. The projected ending date for this group of tasks is now February 4.

The result of rescheduling work is shown on the Tracking Gantt below:

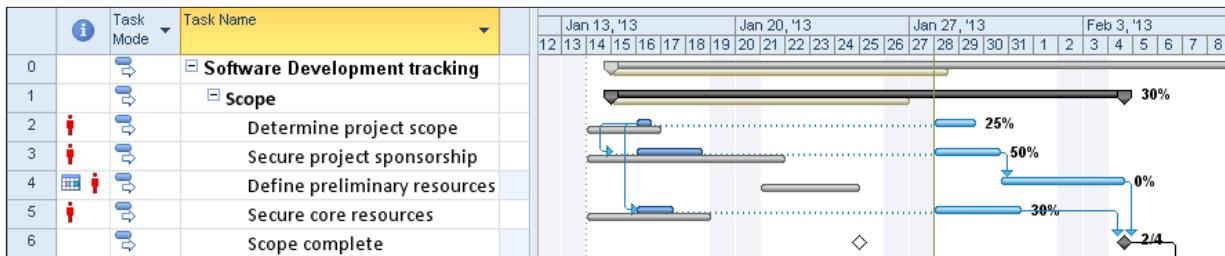


Figure 9-43 PLACEHOLDER

Project 2010 has a new feature called “Mark on Track”. When this feature is applied to a task, the task will be marked completed up to the Status Date of the project. In the example below tasks 3 thru 7 are scheduled to be completed by May 1. The Status Date is set to April 29. The work has been completed as planned. Below is a view before the tasks are Marked on Track.

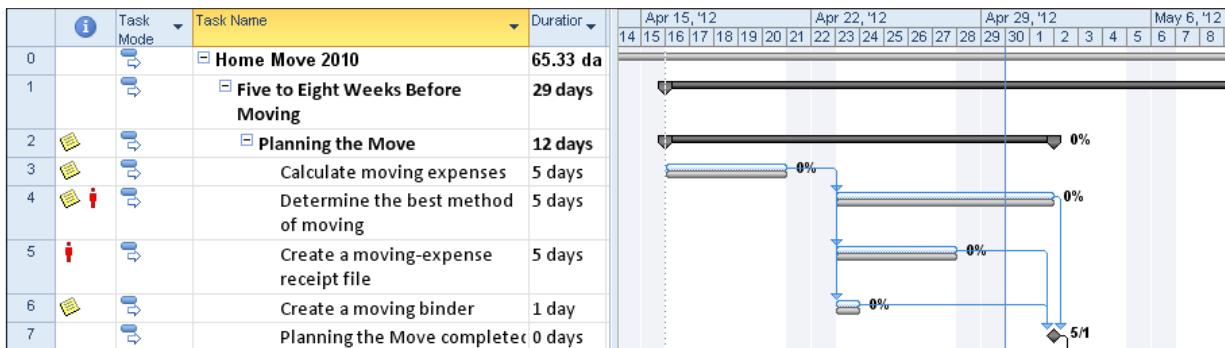


Figure 9-44 PLACEHOLDER

To mark tasks 3 thru 7 completed on track:

- Select the task or tasks to be updated.
- **Task → Mark on Track.**

Task 3 and 6 is marked 100% completed. Task 4 and 5 are 60% completed. The summary task for this group of tasks reflects that the grouping is 75% completed. As you can see, the uncompleted work was not moved to the right side of the Status Date line.

The result is shown below:

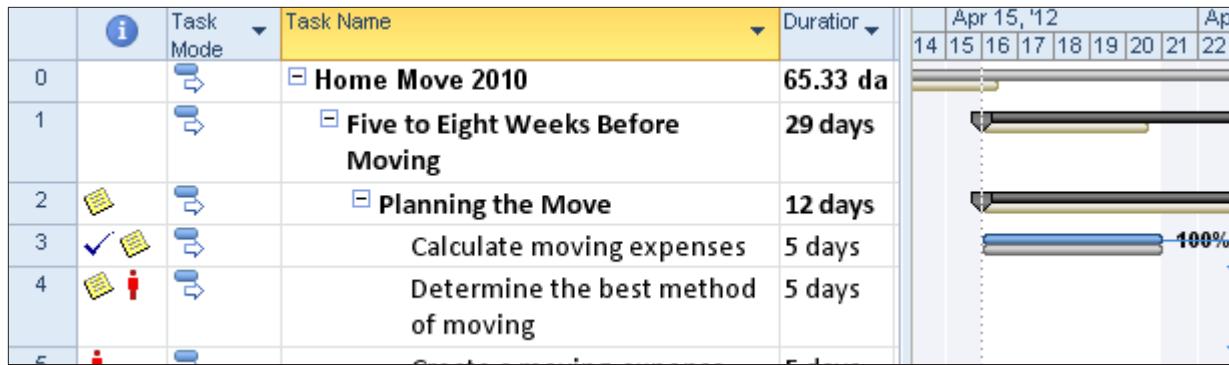


Figure 9-45 PLACEHOLDER

Getting the Project Back on Track

Once the work of the project is rescheduled, the next step is to adjust tasks based on work completed. When tasks move to the future, resources will be rescheduled using resource availability. Constraints, particularly finish type constraints, will move forward to a date and create scheduling errors. Having a baseline in your schedule will be very helpful in knowing how far off original schedule your project is performing.

Project 2010 provides many views to see information about what is occurring with a project. Techniques for shortening the schedule, resource leveling and other best practices were discussed in Module 7. Those techniques should be applied here to help get the schedule back on track. After decisions regarding adjustments to the schedule are made, new resource assignments should be issued.

The following is a list of views, columns and tables designed to help you see how the project is performing:

- Detail Gantt – slippage.
- Adding slippage to the Gantt chart.
- Changing formatting of late tasks.
- Tracking Gantt.
- Variance.

- Resource Leveling.
- Negative slack.
- Filters & Groups.

The Detail Gantt view

This view is designed to show slippage of tasks from the baseline schedule. It will show the difference between the baseline and the number of days/weeks the task has slipped. The slippage calculation is (Baseline Start – Start). The slippage will display as lines extending from the left of the Gantt bars. This view will also show where slack exists in the schedule, and display as lines extending from the right of the Gantt bars.

In the view below, link lines have been turned off to get an uncluttered view of the Gantt bars. Turning off the link lines is temporary and can be turned back on as needed.

To turn off link lines:

- **Format → Layout → Turn off the link lines → ok.**

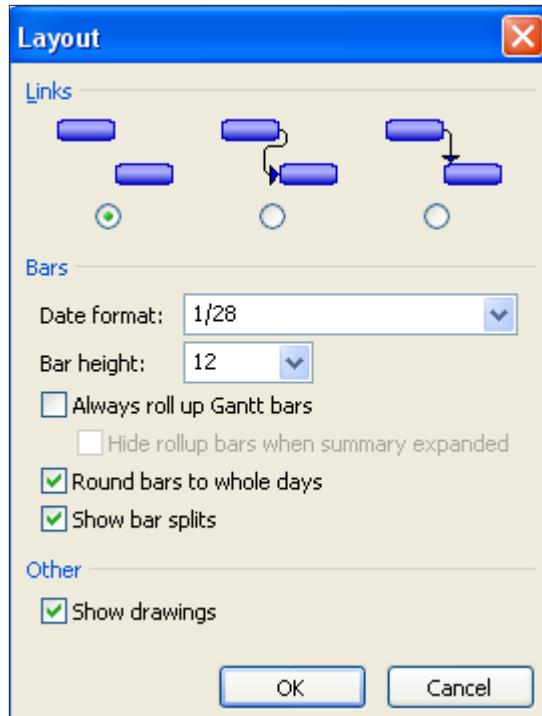


Figure 9-46 PLACEHOLDER

In the Detail Gantt view below, task 3 has slipped 3 days from the original plan but it is a non-critical task and can slip 3.5 days before affecting the end date of the project.

To show the Detail Gantt view:

- **Tasks → Gantt Chart → More views → Detail Gantt → Apply**

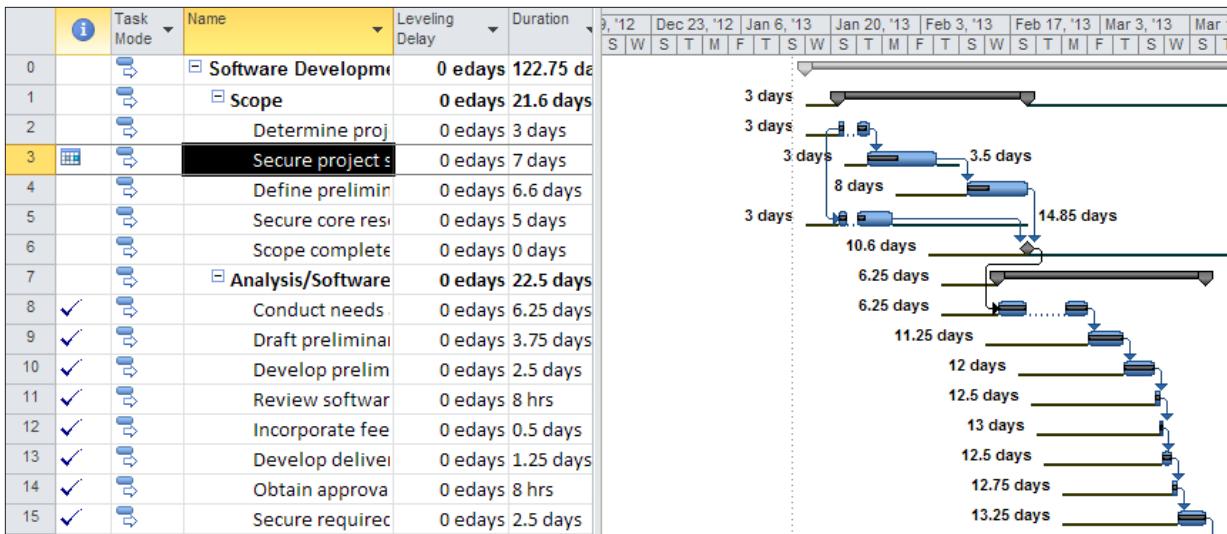


Figure 9-47 PLACEHOLDER

Project 2010 has the ability to add slippage bar indicators to any Gantt view. The option will also allow formatting Gantt charts with any of the 11 available baselines.

To add slippage to a Gantt Chart view:

- **Task** → select a **Gantt Chart** style view.
- **Format** → **Slippage** → select baseline to use for the view.

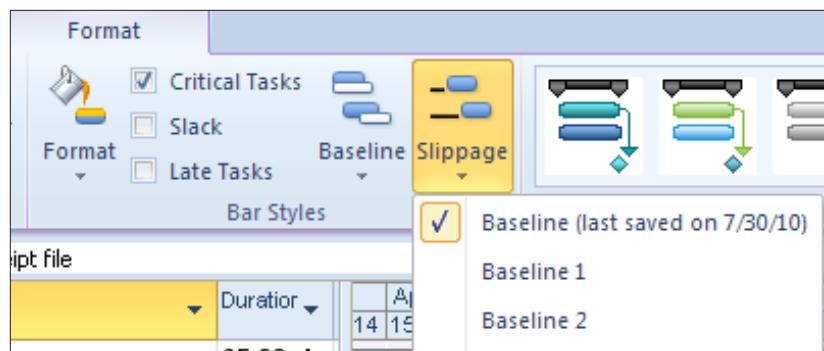


Figure 9-48 PLACEHOLDER

Below are the same tasks as above shown in the Gantt Chart view with the link lines turned off showing just slippage for the tasks. Note that the number of days is not showing as in the Detail Gantt view above. Slack

could be added to this view by clicking on the Slack check box on the Format tab.

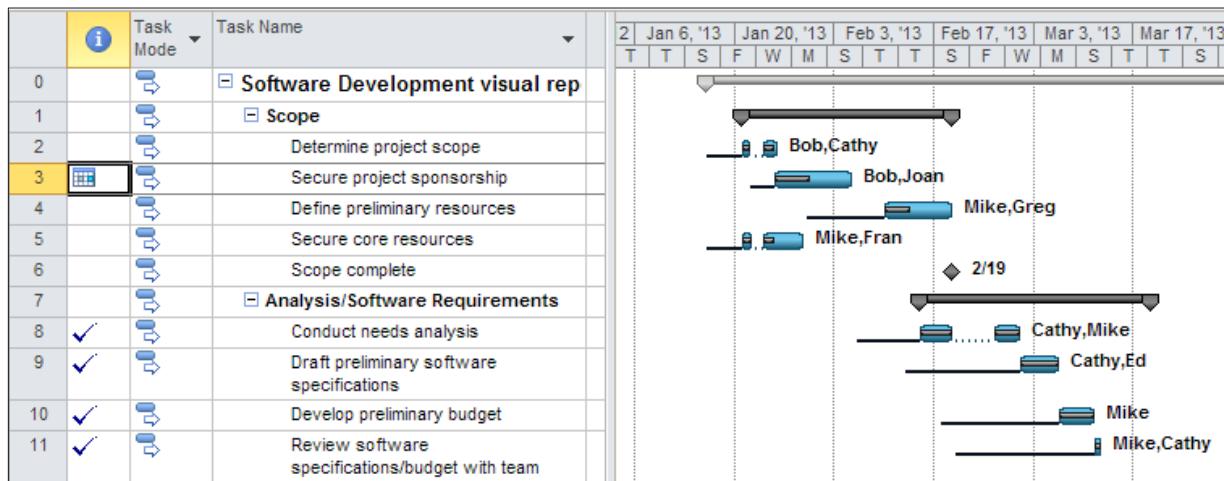


Figure 9-49 PLACEHOLDER

Tasks that should have been completed, based on the Status Date can be formatted to indicate that they are late. In the view below several tasks are running late compared to the Status Date. When clicking on the “Late Tasks” option, the late tasks will display and are formatted in black. Late tasks will look very similar to baseline formatting.



Changing the formatting color for late tasks will help eliminate confusion when viewing the Gantt Chart.

To format Gantt bars to indicate late tasks:

- **Task → Gantt Chart → Tracking Gantt.**
- **Format → Late Tasks.**

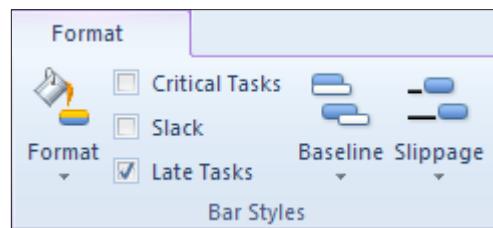


Figure 9-50 PLACEHOLDER

The late tasks are highlighted below.

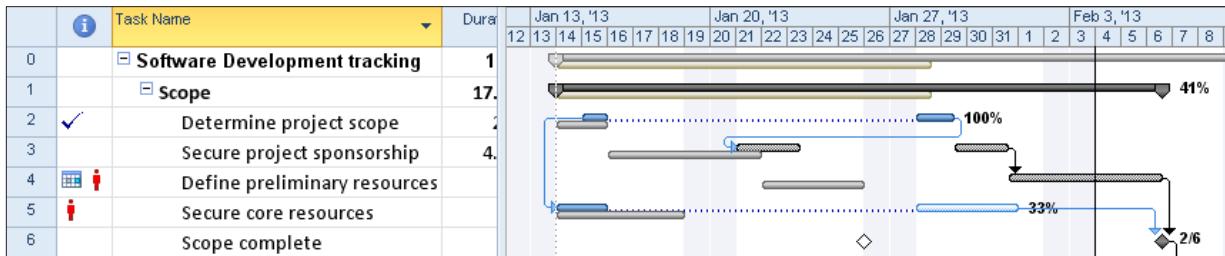


Figure 9-51 PLACEHOLDER

The Tracking Gantt will also be helpful to show which tasks are off schedule from the baseline plan. Use this view during tracking to show task percent complete and actual vs baseline variances for tasks.

To view the Tracking Gantt:

- Tasks → Gantt Chart → Tracking Gantt.

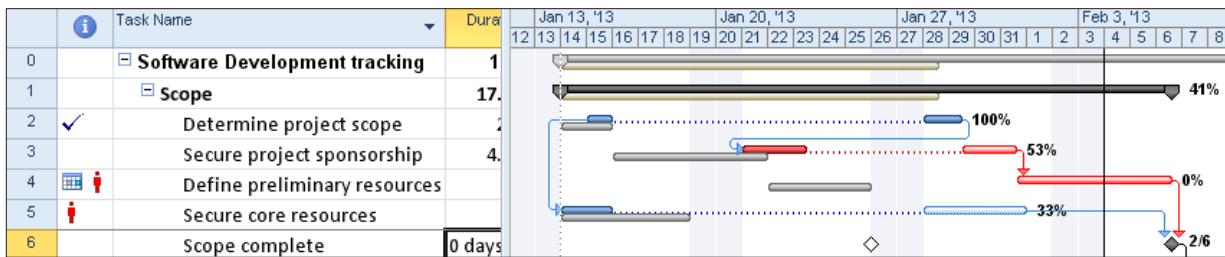


Figure 9-52 PLACEHOLDER

Variance

Checking the variance between baseline and planned dates is very useful in discovering how far off original schedule your project is performing. The Task Variance table is designed to help identify the variances.

Looking at the Start Variance and Finish Variance columns:

- Zero means the task is progressing exactly as planned.
- A Negative number indicates the task is ahead of schedule.
- A Positive number indicates that task is behind schedule.

The Variance table is shown below with the variance columns indicated.

To view the Variance Table:

- **Tasks → Gantt Chart**
- Right click in the upper left corner above the task ID's
- Select **Variance**

	Task Mode	Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
0	↳	Software Development tracking	1/16/13	6/14/13	1/14/13	6/14/13	2 days	0 days
1	↳	Scope	1/16/13	2/4/13	1/14/13	1/29/13	2 days	4 days
2	↳	Determine project scope	1/16/13	1/22/13	1/14/13	1/16/13	2 days	4 days
3	↳	Secure project sponsorship	1/22/13	1/29/13	1/16/13	1/23/13	4 days	4 days
4	↳	Define preliminary resources	1/30/13	2/4/13	1/24/13	1/29/13	4 days	4 days
5	↳	Secure core resources	1/16/13	1/24/13	1/14/13	1/18/13	2 days	3.75 days
6	↳	Scope complete	2/4/13	2/4/13	1/29/13	1/29/13	4 days	4 days
7	↳	Analysis/Software Requirements	2/6/13	2/26/13	2/6/13	2/26/13	0 days	0 days
8	↳	Conduct needs analysis	2/6/13	2/13/13	2/6/13	2/13/13	0 days	0 days
9	↳	Draft preliminary software specifications	2/13/13	2/18/13	2/13/13	2/18/13	0 days	0 days
10	↳	Develop preliminary budget	2/18/13	2/20/13	2/18/13	2/20/13	0 days	0 days
11	↳	Review software specifications/budget with team	2/20/13	2/21/13	2/20/13	2/21/13	0 days	0 days

Figure 9-53 PLACEHOLDER

Resource Leveling

After a project has been rescheduled, resources should be checked for overallocations that might have resulted from the rescheduling process. If overallocations exist, consider leveling the project schedule. Refer to the lessons regarding Resource Leveling in Module 7. Views that will help identify resource overallocations are:

- Gantt Chart indicator column – red person symbol
- Resource Sheet – resources displayed in red
- Resource Usage view – detail of the resource assignments and red names
- Resource Allocation view – Resource Usage/Leveling Gantt split view
- Team Planner – see where resources are assigned and level, look for red lines

Another quick check to see variances is the Project Statistics dialog box. The Project Statistics box displays a snapshot of where you started, how much work has been accomplished and how much work is left to be accomplished. The values in this box are also available in a printed report that will be discussed in [Appendix B](#). In the example below, a variance of 2

days in the Finish column means that the project is running 2 days late.

To view the Project Statistics dialog box:

- **Project → Project Information → Statistics**

Project Statistics for 'Commercial Construction 2010 tracking.mpp'

	Start	Finish
Current	1/1/13	4/29/14
Baseline	1/1/13	4/25/14
Actual	1/1/13	NA
Variance	0d	2d

	Duration	Work	Cost
Current	346d	7,317.9h	\$366,194.80
Baseline	344d	7,371.9h	\$5,880.00
Actual	3.38d	86h	\$4,600.00
Remaining	342.63d	7,231.9h	\$361,594.80

Percent complete:
Duration: 1% Work: 1%

Close

Figure 9-54 PLACEHOLDER

All tables can be grouped and filtered.

Useful groups to help manage tasks during schedule analysis include:

- **Incomplete and complete tasks**
- **Automatically and Manually scheduled tasks** - this grouping will be important if a mixture of scheduling modes has been used. Manually scheduled tasks are treated similar to automatically scheduled tasks during tracking. However, manually scheduled tasks might not have relationships and they are tasks that will still need to be considered as part of the timeline and critical path of the project.
- **Milestone** – displays milestone status in comparison to goal dates.
- **Status** - groups tasks by the status field. The status field is automatically calculated setting a value for the task as Complete, On Schedule, Late or a Future Task. See below for an example of status grouping:

		Task Name	Duration	Start	Finish	Predecessors	Resource Names	Status
		<input type="checkbox"/> Status: Complete						Complete
		<input type="checkbox"/> 1 Scope						Complete
2	<input checked="" type="checkbox"/>	Determine project scope	2.5 days	1/15/13	1/29/13		Bob,Cathy	Complete
		<input type="checkbox"/> Status: Late						Late
		<input type="checkbox"/> 1 Scope						Late
3		Secure project sponsorship	4.75 days	1/21/13	1/31/13 2		Bob,Joan	Late
4			Define preliminary resources	4 days	1/31/13	2/6/13 3	Mike,Greg	Late
5		Secure core resources	6 days	1/14/13	1/31/13 2SS		Mike,Fran	Late
		<input type="checkbox"/> Status: Future Task						Future Task

Figure 9-55 PLACEHOLDER

Useful filters to help manage tasks during tracking include:

- Critical
- Milestone
- Incomplete tasks
- Tasks using Resource
- Date range
- Late tasks
- Should start by (date entered)
- Should start by/finish by
- Slipped/Late/Progress
- Slipping tasks
- Unstarted tasks

Practice: Updating Project Status

The Practice page is where you write detailed instructions for completing work listed as Exercises.

Type the Exercise Title and write a brief summary what the student will be doing in the exercise. Then list your ideas what they will be doing.

SAMPLE

In this practice you will create a Project Server Authentication profile

and then configure the local cache settings in Project Professional 2007.

Exercise 1: Create Project Server Authentication Profile

In this exercise you will create Project Server authentication profile to connect to the Project Web Access site.



Perform the following exercise on the ps07 virtual machine.

7. From the Start menu, click All Programs → Microsoft Office → Microsoft Office Tools and click Microsoft Office Project Server 2007 Accounts.
8. In the Project Server Accounts dialog box, click Add.
In the Account Properties dialog box, and complete the following settings and click ok.

Table 9.3 PLACEHOLDER

Setting	Perform the following:
Account Name	Type Project Server
Project Server URL	Type <code>http://epm/pwa</code>
When connecting	Select Use Windows user account
Set as default account	Select check box

Summary

Planning a project without execution and tracking is like planning a trip and then staying home. Managing the work is essential to the outcome of a successfully run project. Tracking is a valuable tool in managing the work and the project schedule. Consider your options for managing the project schedule and select what will best suit the requirements of your project.

In this Module we discussed:

1. Overview of tracking and tracking methods.
2. How to enter tracking data for work resources.
3. Updating costs, material and milestone tasks.
4. Re-scheduling uncompleted work.