

Microsoft Project Dissected

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Schedule Analyzer Software
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Third Annual
Construction CPM Conference

Introduction

- Although Oracle/Primavera P6 is dominant
- Many contracts specify/allow MSP

Advantages of MSP

- Costs less
- User-friendly
 - Easy to start scheduling immediately
- Decent default graphics and reports
- On most US Federal Government PCs

Introduction

- Updating Task Status
 - Introduction to “Ease-of-use Features”
 - How to update correctly
- The CPM according to Microsoft
- MSP and the Data Date
- Correctly calculating the CPM
- Analyze Progress

Updating

- File based system
- Work performed in memory
 - Manual save
- Prevents simultaneous updates
 - One person at a time
- Best suited for localized, small group installations

Updating Task Status

- How are durations updated?
 - Duration
 - NOT Original Duration
 - (Actual + Remaining Duration)
 - Actual Duration
 - Remaining Duration
 - Percent Complete
 - (Actual Duration / Duration)

Task Name	Duration	Actual Duration	Rem. Dur.	Act. Start	Act. Finish	% Comp.	Aug 22, '10							Aug 29, '10							Se
							S	M	T	W	T	F	S	S	M	T	W	T	F	S	
Task 1	10 days	0 days	10 days	NA	NA	0%															

Updating Rules

- Every change involves 2 calculations
- MSP automatically links the 4 status indicators

		MS PROJECT WILL			
		Duration	% Complete	Actual Duration	Remaining Duration
IF CHANGED	Duration		Recalculate	Leave As-Is	Recalculate
	% Complete	Leave As-Is		Recalculate	Recalculate
	Actual Duration	Leave As-Is	Recalculate		Recalculate
	Remaining Duration	Recalculate	Recalculate	Leave As-Is	

Updating Tools

- 4 different ways to enter actual task data
 - Update Tasks Form
 - Task Information Form
 - Task Details Form
 - Tracking Table in the Gantt Chart

Updating Tools

- Using the Task Update Form

- Form closed after each task
- Can update multiple tasks
 - All must be the same

Update Tasks

Name: Task 1 Duration: 6d?

% Complete: 0% Actual dur: 0d Remaining dur: 6d?

Actual Start: NA Finish: NA

Current Start: Thu 1/28/10 Finish: Thu 2/4/10

Help Notes... OK Cancel

- Using the Task Information Form

- Form closed after each task

Task Information

General Predecessors Resources Advanced Notes Custom Fields

Name: Task 1 Duration: 6d? Estimated

Percent complete: 0% Priority: 500

Dates Start: Thu 1/28/10 Finish: Thu 2/4/10

Hide task bar

Roll up Gantt bar to summary

Help OK Cancel

Updating Tools

- Using the Task Details Form
 - Allows Finish Date and not 100 % Complete
 - Finish constraint automatically inserted

The screenshot displays a project management interface. At the top, a Gantt chart shows a task named 'Task 1' with a duration of 6 days, starting on Thursday, 1/28/10, and ending on Thursday, 2/4/10. Below the Gantt chart is the 'Task Details Form' for 'Task 1'. The form includes fields for Name, Duration (6d), Effort driven (checked), Previous, Next, Start date (Thu 1/28/10), Finish date (Thu 2/4/10), Constraint (As Soon As Possible), Date (NA), Task type (Fixed Units), WBS code (1.1), Priority (500), and % Complete (0%). There are also radio buttons for Current, Baseline, and Actual. At the bottom, there are two tables: one for Resources (ID, Resource Name, Units, Work) and one for Predecessors (ID, Predecessor Name, Type, Lag).

Task Name	Duration	Start	Finish	Pre
Summary	13 days?	Thu 1/28/10	Mon 2/15/10	
Task 1	6 days?	Thu 1/28/10	Thu 2/4/10	
Task 2	7 days?	Fri 2/5/10	Mon 2/15/10	2

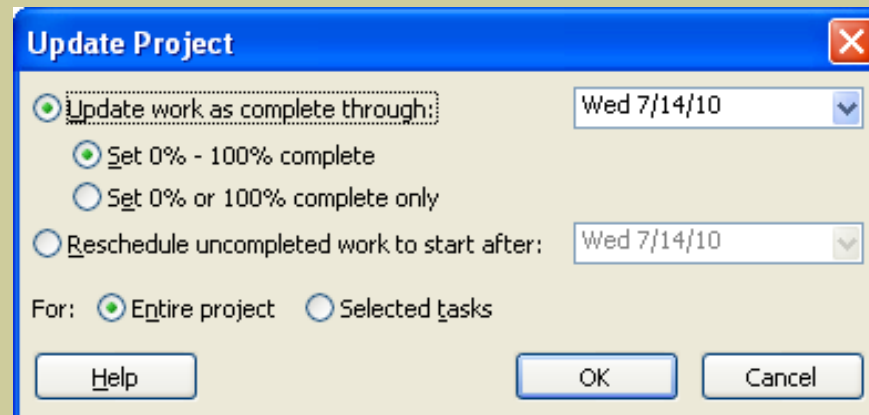
Updating Tools

- Using the Gantt Chart Tracking Table
 - Easiest and most efficient method
 - Recommend columns shown below
 - Task Name
 - Duration
 - Actual Duration
 - Remaining Duration
 - % Complete
 - Actual Start
 - Actual Finish

Task Name	Duration	Actual Duration	Remaining Duration	% Complete	Actual Start	Actual Finish	Start	Finish
Summary	13 days?	0 days	13 days?	0%	NA	NA	Thu 1/28/10	Mon 2/15/10
Task 1	6 days?	0 days	6 days?	0%	NA	NA	Thu 1/28/10	Thu 2/4/10
Task 2	7 days?	0 days	7 days?	0%	NA	NA	Fri 2/5/10	Mon 2/15/10

Automatic Update

- Automatically statuses activity as if it progressed as planned
- Automatically sets
 - Actual Start
 - Actual Finish
 - Percent Complete
 - Remaining Durations



Automatic Update

- Sets Actual date to Early Start
- “Update Work As Complete Through”
 - Set 0% -100% complete
 - Actual Duration and % Complete calculated
 - Set 0% or 100% complete only
 - Duration fixed and % Complete will be zero or 100%
- Remaining durations not considered
 - Might be scheduled complete in the past
- If applied only to ‘Selected Tasks’
 - Possibility of unstarted activities in the past

Recommended Practice

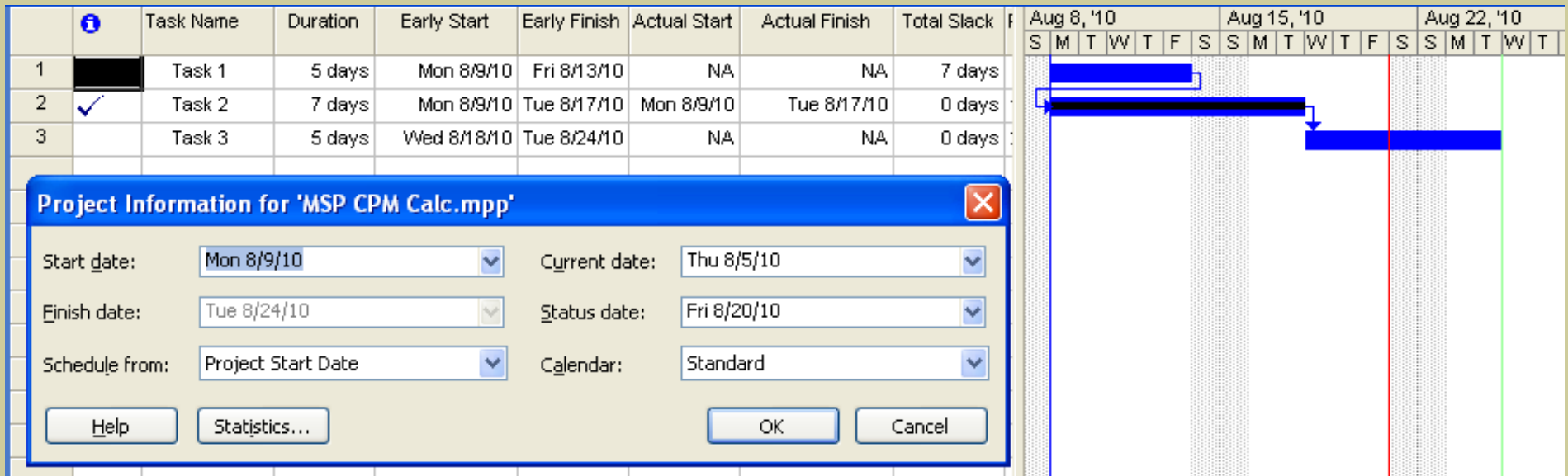
- Use the Gantt Chart Tracking Table
 - Duration
 - Remaining Duration
 - Actual Duration
 - Percent Complete
 - Actual Start
 - Actual Finish
- Enter Actual Start Date
- Calculate Percent Complete (D/RD)
- Input Percent Complete (or Actual Finish)
- Confirm all 6 fields are correct

Microsoft CPM

- P6 CPM Calculations
 - Begins with the current Data Date
 - Considers every activity, even completed
 - Then overrides calculated dates with actuals
- MSP CPM Calculations
 - Begins at Project Start Date
 - Uses actual dates instead of calculating CPM

Microsoft CPM

- A simple example:



- A potential for inherently flawed schedules
 - Remaining durations in the past
 - Actual dates in the future

Good News!

- MS can be used to simulate P6 CPM logic
 - Correct CPM settings to use
 - Schedule Options Tab
 - Schedule Calculation Tab
 - Understand MS Status Date
- Must be entered before adding tasks
 - Settings only applied when adding/modifying a task
 - No P6 'Recalc Button'
 - No 'system wide' recalculation process

Schedule Options Tab

- Default Task Type
 - **NOT** Fixed Duration
- New Tasks effort driven
 - Unchecked – Is duration a function of resources?
- Autolink inserted
 - Unchecked
- Split in-progress tasks
 - Checked
- Always honor constraints
 - Unchecked (override CPM)
- Estimate durations
 - (duration)?

The screenshot shows the 'Options' dialog box with the 'Schedule' tab selected. The dialog is titled 'Options' and has a close button (X) in the top right corner. It features a tabbed interface with the following tabs: View, General, Edit, Calendar, Interface, Security, and Save. The 'Schedule' tab is active, showing 'Schedule options for Microsoft Office Project' and 'Scheduling options for 'Project1''.

Schedule options for Microsoft Office Project

- Show scheduling messages
- Show assignment units as a:

Scheduling options for 'Project1'

- New tasks:
- Duration is entered in:
- Work is entered in:
- Default task type:
- New tasks are effort driven
- Autolink inserted or moved tasks
- Split in-progress tasks
- Tasks will always honor their constraint dates
- Show that tasks have estimated durations
- New tasks have estimated durations

Buttons: Help, OK, Cancel, Set as Default

Calculation Tab

- Updating task status ...
 - ✓ Resources not override status
- Move the end of completed
 - Prevents actual dates later than the Status Date
- and move the start of ...
 - Not applicable
- Move the start of remaining
 - ✓ Prevents uncompleted work in the past
- And move end of complete
 - Changes Actual Dates
- Calculate multiple critical paths
 - ? Are open-ended tasks critical?

The screenshot shows the 'Options' dialog box for Microsoft Office Project, specifically the 'Calculation' tab. The dialog is divided into sections for 'Calculation options for Microsoft Office Project' and 'Calculation options for Project1'. The 'Calculation mode' is set to 'Automatic' and 'Calculate' is set to 'All open projects'. Under 'Calculation options for Project1', several checkboxes are visible: 'Updating task status updates resource status' is checked; 'Move end of completed parts after status date back to status date' is unchecked, with a sub-option 'And move start of remaining parts back to status date' also unchecked; 'Move start of remaining parts before status date forward to status date' is checked, with a sub-option 'And move end of completed parts forward to status date' unchecked; 'Earned Value...' is a button; 'Edits to total task % complete will be spread to the status date' is unchecked; 'Inserted projects are calculated like summary tasks' is checked; 'Actual costs are always calculated by Microsoft Office Project' is checked, with a sub-option 'Edits to total actual cost will be spread to the status date' unchecked; 'Default fixed costs accrual' is set to 'Prorated'; 'Calculate multiple critical paths' is unchecked; and 'Tasks are critical if slack is less than or equal to' is set to '0' days. 'Help' and 'OK' buttons are at the bottom.

Calculation Settings

Task Name	Act. Start	Act. Finish	% Comp.	Phys. % Comp.	Act. Dur.	Rem. Dur.	Aug 22, '10							Aug 29, '10							Sep 5, '10						
							S	S	M	T	W	T	F	S	S	S	M	T	W	T	F	S	S	S	M	T	W
Task 1	NA	NA	0%	0%	0 days	10 days	[Gantt chart showing a single blue bar from Aug 22 to Sep 5]																				

- Move end of completed parts after status date back to status date
 - And move start of remaining parts back to status date
- Move start of remaining parts before status date forward to status date
 - And move end of completed parts forward to status date

Entering a % Complete value would assign an Actual start and move remaining part of the task after the Status Date

Task Name	Act. Start	Act. Finish	% Comp.	Phys. % Comp.	Act. Dur.	Rem. Dur.	Aug 22, '10							Aug 29, '10							Sep 5, '10						
							S	S	M	T	W	T	F	S	S	S	M	T	W	T	F	S	S	S	M	T	W
Task 1	Mon 8/23/10	NA	10%	0%	1 day	9 days	[Gantt chart showing a blue bar split at the status date: a small segment before and a larger segment after]																				

- Move end of completed parts after status date back to status date
 - And move start of remaining parts back to status date
- Move start of remaining parts before status date forward to status date
 - And move end of completed parts forward to status date

The task split will be removed, actual start date will be changed, and the complete portion of the task will be moved to the Status Date

Task Name	Act. Start	Act. Finish	% Comp.	Phys. % Comp.	Act. Dur.	Rem. Dur.	Aug 22, '10							Aug 29, '10							Sep 5, '10						
							S	S	M	T	W	T	F	S	S	S	M	T	W	T	F	S	S	S	M	T	W
Task 1	Fri 8/27/10	NA	10%	0%	1 day	9 days	[Gantt chart showing a single blue bar starting at the status date and ending at Sep 5]																				

Updating Result

Task Name	Duration	Actual Duration	Rem. Dur.	Act. Start	Act. Finish	% Comp.	Aug 22, '10							Aug 29, '10							Se	
							S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
Task 1	10 days	0 days	10 days	NA	NA	0%	[Progress Bar]															

Entering 20% complete will automatically assign an Actual Start date and calculate the Actual Duration and Remaining Duration.

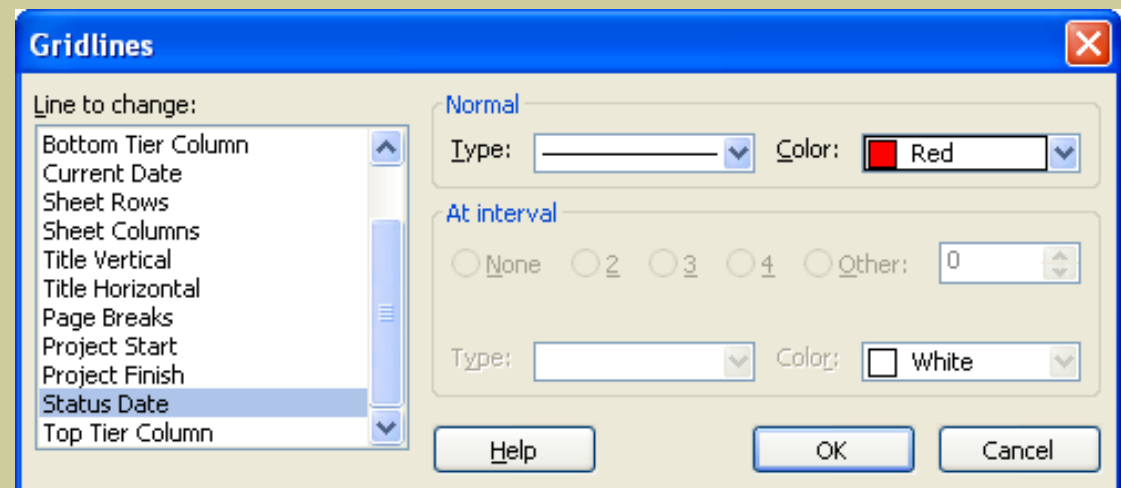
Task Name	Duration	Actual Duration	Rem. Dur.	Act. Start	Act. Finish	% Comp.	Aug 22, '10							Aug 29, '10							Se	
							S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
Task 1	10 days	2 days	8 days	Mon 8/23/10	NA	20%	[Progress Bar]															

Adjusting remaining duration to 10 days - the Duration will become 12 days as shown. This is 10 days remaining plus 2 Days actual. % Complete will be 17%, which is Actual Duration divided by Duration.

Task Name	Duration	Actual Duration	Rem. Dur.	Act. Start	Act. Finish	% Comp.	Aug 22, '10							Aug 29, '10							Sep 5, '10						
							S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T		
Task 1	12 days	2 days	10 days	Mon 8/23/10	NA	17%	[Progress Bar]																				

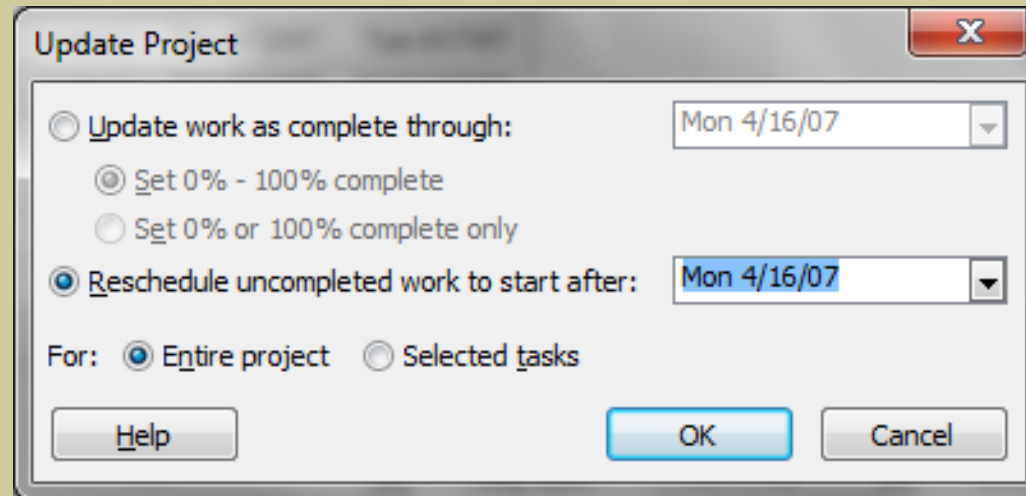
The Data Date

- MSP designed to not use the Data Date
 - Current Date
 - Status Date
- Neither used for calculating schedule
- Status date not shown by default
 - Display Status Date line
 - Hide Current date



The Status Date

- Use Update Project screen to reschedule
 - “Split in progress tasks” must be set



- Adds SNET constraint to every uncompleted task
 - Removes any existing constraint

The Status Date

- Unstarted tasks
 - Start-no-earlier-than constraint = Project Status date
- In-progress tasks
 - Resume Date set to the Update Project date
- Tasks with constraints lose set constraints

	Task Name	Duration	Early Start	Early Finish	Constraint Type	Constraint Date	Aug 8, '10				Aug 15, '10				Aug 22, '10				At				
							F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
1	Task 1	5 days	Mon 8/23/10	Fri 8/27/10	Start No Earlier Than	Fri 8/20/10																	
2	Task 2	7 days	Mon 8/9/10	Tue 8/17/10	As Soon As Possible	NA																	
3	Task 3	5 days	Mon 8/23/10	Fri 8/27/10	Start No Earlier Than	Fri 8/20/10																	

Update Project

Update work as complete through:

Set 0% - 100% complete

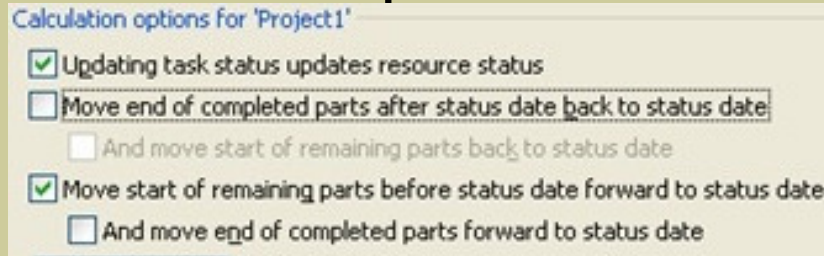
Set 0% or 100% complete only

Reschedule uncompleted work to start after:

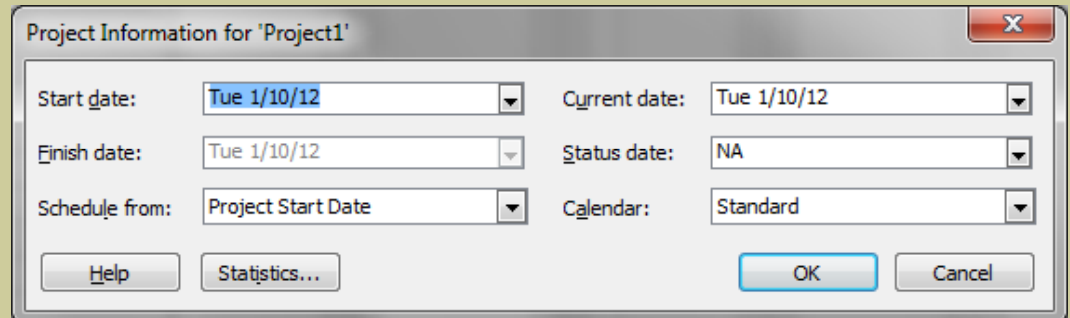
For: Entire project Selected tasks

Calculating the CPM

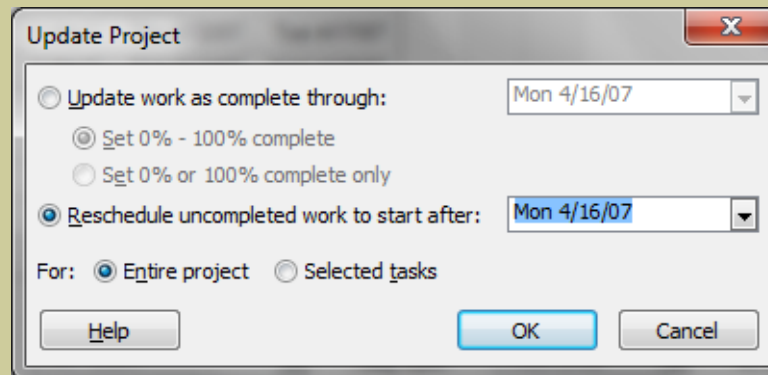
- Set CPM Options under Tools/Options/Calculation



- Set the Status Date
 - Project / Project Information



- Reschedule uncompleted work after the Status Date
 - Update Project



Calculating the CPM

For these options to function properly

- Split in Progress Tasks option must be selected
- Options must be selected before tasks are added
- Updating “Task status updates resource status” option must be checked
- Task Duration type must not be “Fixed Duration”
 - Opposite of normal P6 setting

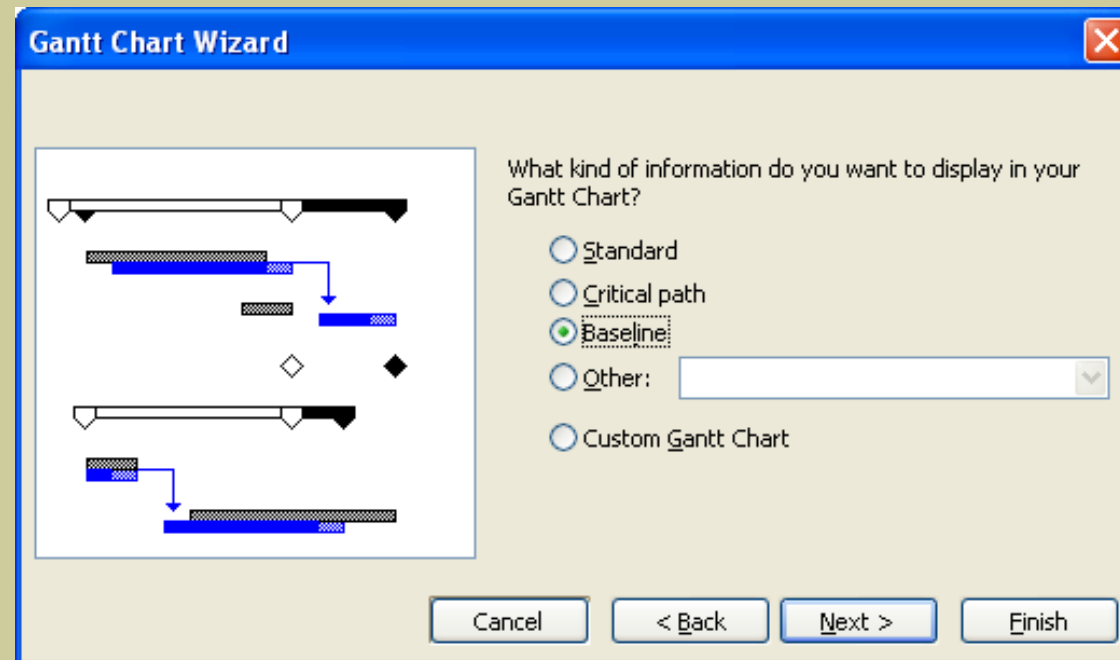
Calculating the CPM

These functions are limited:

- Options only work on new tasks
- Options only work if updating using % Complete
- Changing the options will not recalculate the CPM to display the effects of that change
- Uses the Current Date if status date not defined

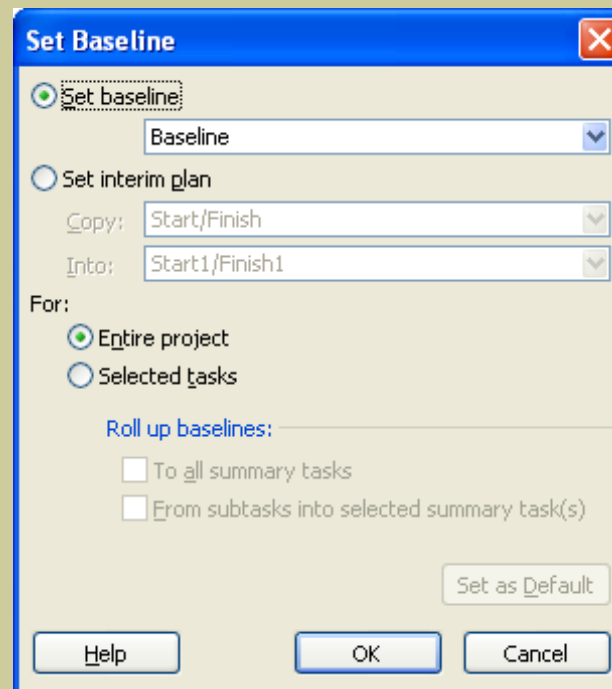
Analyze Progress

- Maintain baselines to monitor variances
- Identifying Variances
 - Start Variance and Finish Variance columns can be used
 - Can display baseline & schedule update in the same view
 - Gantt chart wizard



Analyze Progress

- MSP baseline schedules contain:
 - Early Start/Early Finish dates copied to baseline Start/Finish Date fields
 - Duration (AD + RD) copied to baseline Duration
 - Task Costs & Work copied to baseline Costs/Work fields
 - Nothing else is saved



Analyze Progress

- MSP baseline is a partial snapshot
 - It does not store
 - Late dates
 - Total Float
 - Constraints
 - Logic
 - Resources
- Not sufficient for recreating a schedule
- Not sufficient for a year's worth of updates
 - MSP allows for a maximum of 11 baselines
- Interim Plan feature saves even less

Analyze Progress

You need to compare files, not baselines

- MSP 2007: Compare Project Versions utility
 - Compares tasks and resources
 - Hard to understand; not very useable
- Built-in VBA programming language
 - Allows for development of custom comparison software
- Exporting schedules to MS Access
 - Use MS Access it to compare the two schedules
- Third-party software comparison tools

Assessment

- Updating using % Complete not good practice
- Built-in update help routines
 - Automatic insertion of made-up actual dates and RD's
 - Difficult to assume that most MSP schedules contain accurate enough status data for detailed analysis
- Data Date issues
 - Complicate the schedule update process
 - Confusing for construction schedulers
- Difficult to note uncompleted work in the past
 - Difficulties in removing status for what-ifs
 - Difficulty in identifying variances
- Baseline variance is awkward & incomplete

Assessment

- Microsoft Project is difficult to use correctly
- Microsoft Project can be used to design, status, and monitor a construction schedule
 - Easy to build a schedule
 - More difficult to status accurately
 - Very difficult to analyze progress
- The secret to success is knowledge

Questions?

