

Dates



Release 4.6B



Copyright

© Copyright 2000 SAP AG. All rights reserved.

No part of this brochure may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft®, WINDOWS®, NT®, EXCEL®, Word® and SQL Server® are registered trademarks of Microsoft Corporation.

IBM®, DB2®, OS/2®, DB2/6000®, Parallel Sysplex®, MVS/ESA®, RS/6000®, AIX®, S/390®, AS/400®, OS/390®, and OS/400® are registered trademarks of IBM Corporation.

ORACLE® is a registered trademark of ORACLE Corporation, California, USA.

INFORMIX®-OnLine for SAP and Informix® Dynamic Server™ are registered trademarks of Informix Software Incorporated.

UNIX®, X/Open®, OSF/1®, and Motif® are registered trademarks of The Open Group.

HTML, DHTML, XML, XHTML are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Laboratory for Computer Science NE43-358, Massachusetts Institute of Technology, 545 Technology Square, Cambridge, MA 02139.

JAVA® is a registered trademark of Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto, CA 94303 USA.

JAVASCRIPT® is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

SAP, SAP Logo, mySAP.com, mySAP.com Marketplace, mySAP.com Workplace, mySAP.com Business Scenarios, mySAP.com Application Hosting, WebFlow, R/2, R/3, RIVA, ABAP, SAP Business Workflow, SAP EarlyWatch, SAP ArchiveLink, BAPI, SAPPHIRE, Management Cockpit, SEM, are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other products mentioned are trademarks or registered trademarks of their respective companies.

Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax
	Tip

Contents

Dates	5
Types of Dates	7
Settings for Scheduling Parameters.....	9
Presentation of Dates in the Graphics	12
Scheduling Functions	14
Dates in the Work Breakdown Structure (WBS)	17
Planning Basic and Forecast Dates.....	18
Entry of Actual Dates	19
Entering Actual Dates.....	20
Displaying Confirmations for the Work Breakdown Structure	21
Copying Actual Dates from Confirmations to WBS Elements.....	22
Scheduling the Work Breakdown Structure	23
Network Scheduling	24
How Is a Network Scheduled?	26
Scheduling Types	28
Factors Influencing Scheduling	30
Time Constraints	32
Dates for Activity Elements	33
Dates From Other Objects	34
Floats	35
Reduction	37
Scheduling of Finally/Partially Confirmed Activities	38
Determining Capacity Requirements During Scheduling	39
Maintaining Data For Scheduling.....	40
Scheduling Standard Networks	42
Scheduling the Overall Network	43
Scheduling with Service/Maintenance Orders.....	44
Scheduling Projects with Maintenance / Service Orders	45
Scheduling Results	46
Displaying the Error Log.....	48

Dates

Purpose

In this component you plan and check dates in the Project System.

The purpose of date scheduling is to determine the duration of phases in a project, which events are particularly important for the schedule, float times, and critical paths. You enter dates in the work breakdown structures and individual networks. You can check and change them in all stages of a project.

Features

Where do you Maintain Dates in the Project System?

Dates in the Project Definition

In the project definition you enter the outline dates (start and finish dates) for the whole project.

Dates in the Work Breakdown Structure (WBS)

As soon as you create WBS elements, you can start planning dates for them. In rough-cut planning, you specify dates for WBS elements that are binding for more detailed planning. You can use this rough-cut planning as a starting point for more detailed planning at network level. You can use several [functions in date planning \[Page 14\]](#) to compare, reconcile, or calculate dates at a later point in time.

In the Project System, you can plan with lists or with different graphical views. You can start date scheduling as follows:

- In the individual transactions for WBS scheduling by choosing *Logistics* → *Project System* → *Dates* and the relevant transaction.
- In [Structure Planning \[Ext.\]](#)
- In the [Project Planning Board \[Ext.\]](#)

Dates in Networks

The system calculates dates in [Network Scheduling \[Page 24\]](#). You can enter network dates in the network maintenance transactions or change them in the Gantt chart or the project planning board.

How is Scheduling Carried out in the Project System?

Scheduling the Work Breakdown Structure

The system calculates the dates for an entire project or a portion of the project (subtree) with all associated activities when you select the scheduling function.

See also: [Scheduling the Work Breakdown Structure \[Page 23\]](#)

Network Scheduling

Scheduling determines the earliest and latest start and finish dates for carrying out activities in the network and calculates the required capacity requirements as well as the slack time or “floats”.

Dates

See also: [Network Scheduling \[Page 24\]](#)

Scheduling the Overall Network

In overall network scheduling, the system schedules all networks which are linked with relationships.

See also: [Scheduling the Overall Network \[Page 43\]](#)

Project Scheduling

In project scheduling you can schedule the project with all assigned activities, as in WBS scheduling. Additionally you can decide whether just networks are scheduled or whether service and maintenance orders are also scheduled.

See also: [Scheduling with Maintenance Orders \[Page 44\]](#)

Types of Dates

Definition

There are different types of dates in the Project System. In order to distinguish between planning and execution in all phases of a project, it is necessary to clearly define different types of dates.

Use

The following types of dates are available in the Project System:

Basic and Forecast Dates

Basic dates are the dates that have a binding character for time scheduling and for other related areas such as capacity planning.

Forecast dates are dates that you expect based on more detailed planning or on changes during the course of the project. Forecast dates have no influence on reservations, purchase requisitions, or current capacity requirements.

You can enter basic and forecast dates for WBS elements and activities. In networks, you can also forecast values for the work as well as for the dates.

You are free to decide which type of date you use for planning and scheduling. You can schedule a network using the forecast dates, for example, or you can copy the forecast dates into the basic dates in the WBS or activity and then use them as the basis for further planning.

Actual dates:

Actual dates provide you with information on the state of the project. You enter them manually in the WBS elements or the system calculates them using confirmation data.

Scheduled Dates

Scheduled dates are the start and finish dates of activities calculated by the system in scheduling. For WBS elements the scheduled dates are determined from the scheduled dates of the activities that are assigned to the WBS element.

Earliest and Latest Dates

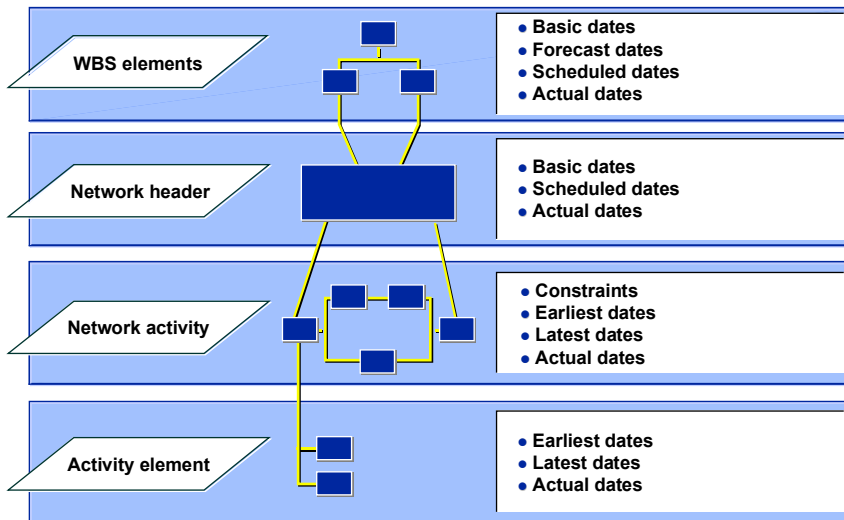
Earliest and latest dates are calculated in network scheduling and tell you the earliest or latest data that an activity must start or finish on.

Constraints

[Time constraints \[Page 32\]](#) prescribe the start and/or finish dates of the activity. When you schedule a network, the system takes the constraints on the start and finish dates and times that you specified into account.


In the graphic you can see which types of dates are supported by which project object.

Types of Dates



Settings for Scheduling Parameters

Use

Choose the  icon or *Settings* → *Options* to open the dialog box for editing the scheduling parameters. Here you see an overview of all the settings possible for scheduling. The default values are taken from the project profile. However, you can change these values during processing.



If you change the settings, the new values are saved user-specifically but are not copied to the project profile.



You have defined “open planning” for time scheduling in the project profile. In time scheduling you change the planning method to “bottom-up”. This setting is saved user-specifically. The next time you edit dates or schedule you use bottom-up planning or you have to change the settings again.

Features

On the *Scheduling* tab page you enter or change the following settings:

Scheduling scenario

There are basically three methods that you can use for scheduling projects. *Top-down* and *Bottom-up* are predefined scenarios, whose parameters are determined by the system. These parameters cannot be changed. If you choose one of these scenarios, the system uses these pre-defined parameters for scheduling in all stages of the project. You do not have to edit or check the scheduling parameters. In contrast to this, you edit all the scheduling parameters yourself in *Free scheduling*.

- **Top-Down Scenario**

The dates for scheduling are passed down from the project definition, to the WBS elements, and to the activities. The dates of the activities must be within the dates of the WBS element to which they are assigned. Similarly the dates of the WBS elements must be within the dates of the superior WBS element. All the dates in the project must be within the period formed by the basic dates of the project definition.

- **Bottom-Up Scenario**

In this case the dates are passed on from the bottom of the hierarchy to the top. The dates for activities, determined in scheduling; are checked against the dates of the WBS element to which the activities are assigned to see if the planning period defined by the dates of the WBS element include all dates from the activities. If this is not the case, the start date, the finish date, or both dates of the superior WBS element is changed. This is repeated up the WBS hierarchy to the project definition.

If a WBS element does not have other WBS elements or activities assigned to it, the system uses the basic dates of the WBS element as scheduled dates.

Settings for Scheduling Parameters

- **Free Scheduling**

You can set up the scheduling parameters as you like. You make these settings in the *Scheduling parameters for activities* section of the *Scheduling* tab page.

Scheduling Method for WBS Structure

You must specify planning methods for planning using both basic and forecast dates. This only refers to the work breakdown structure and not to the activities:


With **top-down planning**, you plan the dates starting from the highest WBS element in the project hierarchy. The dates in the subordinate WBS elements must be within the dates of the higher-level WBS elements.

With **bottom-up planning**, you plan the dates starting from the subordinate WBS elements. The start and finish dates of subordinate WBS elements and then passed on up (independently of each other), if they are outside the planning period of the superior WBS element.

With **strict bottom-up planning**, you specify that the dates from the subordinate WBS elements determine the dates for the superior WBS elements. If you have already entered planned dates for superior WBS elements, the system deletes and recalculates them based on the dates of the subordinate WBS elements.

In **open planning**, you plan dates without hierarchical dependencies. You can also check and extrapolate the dates.

Scheduling Parameters for Activities

Function	What You Should Know
WBS scheduling profile	The system displays the pre-defined scheduling profile from the project profile.
Scheduling type	<p>Determines which scheduling is taken into account first (forwards, backwards, current date etc.)</p> <p>See also: Scheduling Types [Page 28]</p>  <p>If you have set the <i>Adjust basic dates</i> indicator and are using forwards scheduling, the subsequent backwards scheduling starts at the scheduled finish date. Similarly, in the case of backwards scheduling the scheduled start date is used for the subsequent forwards scheduling. If you do not set the <i>Adjust basic dates</i> indicator the two scheduling runs occur independently of another, starting at the basic start and the basic finish dates. In this case you must have maintained both the basic start and basic finish dates.</p>



Settings for Scheduling Parameters

Scheduling method	<ul style="list-style-type: none"> • WBS determines dates In the case of forwards scheduling the earliest start date of the activities (or in the case of backward scheduling the latest finish date) is determined by the basic dates of the WBS element to which the activities are assigned. • Network determines dates In the case of forwards scheduling the earliest start date of the activities (or in the case of backward scheduling the latest finish date) is determined by the basic dates of the network header.
Maximum reduction level	Determines the maximum level used to reduce the lead time so that the project can be completed on time.
Reduction type	For detailed information, see Reduction [Page 37]
Start in past	Determines the number of days that the basic start date is allowed to be in the past.
Adjust basic dates	Specifies that in the case of scheduling based on activity dates (bottom-up scenario), the scheduled dates from the activities overwrite the basic dates of the WBS element.
Shift order	Specifies that, in the case of partially confirmed activities, the actual dates that have already been confirmed are not taken into account, if the activity is scheduled again.
Latest staging	Specifies how the requirements date for a component should lie in relationship to the dates of the activity. Set the indicator for <ul style="list-style-type: none"> • Components with a positive requirements quantity and the requirements date is the latest start date for the activity. • Components with a negative requirements quantity and the requirements date is the latest start finish date for the activity.
Automatic log	Specifies that the scheduling log is automatically displayed after each scheduling run.
Automatic scheduling	Specifies that the system automatically schedules the network or project, when you save it and you have made changes that affect scheduling.

Presentation of Dates in the Graphics

Presentation of Dates in the Graphics

You can go to the network structure graphic or the hierarchy graphic from all the dates scheduling transactions and the project planning board. To do so,

- In the scheduling transactions choose:
 -  to go to the hierarchy graphic
 -  to go to the network structure graphic
- In the project planning board choose
Goto -> Hierarchy graphic or Network structure graphic.

In the following graphics, you can see how various dates are displayed in the hierarchy and network graphics.



You can also maintain all dates in the graphics.

WBS Dates in the Graphic

WBS element identifier				
Description				
Basic start		Basic finish		
Forecast start		Forecast finish		
Actual start		Actual finish		
ACT	ORD	MILE	DOC	

Activity Dates in the Graphic

Activity number		Control key		Scheduled duration	
Description					
Earliest start		Total float		Earliest finish	
Latest start		Free float		Latest finish	
ELEM	SUBN	MILE	DOC	MAT	

Scheduling Functions

Scheduling Functions



Use

The following table presents the general functions available in dates scheduling. You can call them up in all dates scheduling transactions by clicking on the relevant icon or in the *Edit* menu.



The functions are valid for all sets of dates. If the function is inactive, that means it is not valid for that particular set of dates.

Features

Function	Icon/Menu Path	What You Should Know
Schedule	Choose  or <i>Edit</i> → <i>Schedule</i>	You start WBS scheduling [Page 23] .
Shift Dates	Choose <i>Edit</i> → <i>Shift dates</i> → <ul style="list-style-type: none"> • <i>Shift project</i> • <i>Shift subtree</i> or • <i>Shift WBS element</i> 	<p>You can enter a new start or finish date for a project, a subtree or a WBS element.</p> <p>You can use the <i>shift dates</i> function for both basic and forecast dates, regardless of planning method.</p>
Comparing Dates	Choose  or <i>Edit</i> → <i>Compare dates</i>	<p>Use the <i>compare dates</i> function to compare the various types, for example basic dates with forecast dates.</p> <p>You can use the <i>Compare dates</i> function for all sets of dates regardless of planning method.</p>
Reconciling Dates	Choose <i>Edit</i> → <i>Reconcile dates</i> → <ul style="list-style-type: none"> • <i>Copy scheduled dates</i> 	<p>The scheduled dates from network scheduling are copied to the WBS elements as basic or forecast dates. For information about copying actual dates, see Copying Actual Dates from Confirmations to WBS Elements [Page 22]</p>

Scheduling Functions

	<ul style="list-style-type: none"> • <i>Copy top-down</i> 	<p>You can transfer the dates from one WBS element to all subordinate WBS elements.</p> <p>You can carry out this function for all sets of dates, regardless of planning method.</p>
	<ul style="list-style-type: none"> • <i>Extrapolate dates</i> 	<p>You can transfer the dates from one WBS element to all superior WBS elements, if these higher-level WBS elements do not yet have any dates.</p> <p>You can carry out this function for all sets of dates, regardless of planning method.</p>
	<ul style="list-style-type: none"> • <i>Transfer forecast dates to basic dates or</i> • <i>Transfer basic dates to forecast</i> 	<p>The basic dates are transferred to the forecast dates and vice versa.</p>
<p>Checking Dates</p>	<p>Choose <i>Edit</i> → <i>Check dates</i> →</p>	
	<ul style="list-style-type: none"> • <i>Within WBS</i> 	<p>The system checks whether the basic or forecast dates of the WBS element lie within the time frame of the superior WBS elements.</p>
	<ul style="list-style-type: none"> • <i>Activity dates for WBS element</i> 	<p>The system checks whether the basic or forecast dates of the activities lie within the time frame of the WBS element to which they are assigned.</p>
	<ul style="list-style-type: none"> • <i>Scheduled dates in project structure</i> 	<p>The system checks whether the scheduled dates of the WBS element lie within the time frame of the superior WBS elements.</p>
	<ul style="list-style-type: none"> • <i>Final confirmation WBS element</i> 	<p>Makes a final confirmation for the selected WBS element.</p>

Scheduling Functions



For actual dates, you can only use the *Final confirmation WBS* function in the *Check Dates* menu entry.

The system does **not** check whether the dates lie within the framework of the project definition.



You can also change dates in the project planning board.. To do so, in the graphic move the date bar for the relevant WBS element or activity.

Dates in the Work Breakdown Structure (WBS)

Use

You can plan dates for individual WBS elements as soon as you have entered the outline dates for your project in the project definition. In rough-cut planning, you specify dates for WBS elements that are binding for more detailed planning. You can then use this rough-cut plan as the basis for more detailed planning or scheduling using networks (see [Network Scheduling \[Page 24\]](#)). You can use several [functions in date planning \[Page 14\]](#), to compare, reconcile, or calculate dates at a later point in time.

Features

At work breakdown structure level you can:

- Create, change, or display [basic dates for WBS elements \[Page 18\]](#).
- Create, change, or display [forecast dates for WBS elements \[Page 18\]](#).
- Create, change, or display [actual dates for WBS elements \[Page 20\]](#)
- [Display confirmations for the work breakdown structure \[Page 21\]](#)
- [Copy actual dates from confirmations to WBS elements \[Page 22\]](#) (as provisional start or finish dates)

Furthermore you can carry [WBS scheduling \[Page 23\]](#) , in which you schedule a project or sub-hierarchy with all its assigned activities.

Planning Basic and Forecast Dates


Planning Basic and Forecast Dates

1. In *SAP Easy Access* choose *Logistics* or *Accounting* → *Project System* → *Dates* → *Change basic dates* or *Change forecast dates*.

The initial screen for time scheduling is displayed.

2. Enter the relevant data.

What do you want to do?	Action
Maintain dates for the whole project	Enter the project definition.
Maintain dates for a subhierarchy or a WBS element	Enter the WBS element.
Select all the activities assigned to the WBS elements	Set the <i>With activities</i> indicator.

3. Choose .

Enlarge your screen so that you can see all the data. On the right of the table you see the indicators *Ac* and *Sd*.

- If the indicator *Ac* is set, there are activities assigned to the WBS element.
- If the indicator *Sd* is set, the dates scheduled for the WBS element are no longer current.

To update the scheduled dates for the WBS element, you must reschedule using the WBS scheduling function.

4. Enter a start or finish date for the individual WBS elements and choose .

The system checks the dates against the factory calendar and calculates the duration.

If the specified dates are later than the dates of the superior WBS element or the project definition in top-down planning, a warning is issued.



If you want to maintain other dates or basic data, you can use the relevant tab pages to go to the relevant screens.

5. Save your data.

The system checks the dates when saving. If there are schedule conflicts, you must adjust the dates.

Entry of Actual Dates

Use

To keep control over your schedule efficiently, you can compare your basic dates with the actual dates, that means, you are comparing your planned dates with the actual dates or the anticipated completion dates.

Prerequisites

Whether you can enter actual start and finish dates for a WBS element, depends on

- Whether the WBS element has been further described using activities
- Whether you have already entered actual dates for subordinate WBS elements.

WBS Elements Without Activities

- You can always enter the actual start.
- You can only enter the actual finish, if all the subordinate WBS element already have an actual finish.

WBS Elements With Activities

- You can only maintain the actual start, if all the activities that are assigned to the WBS element have the status "Partially Released" or "Released".
- You can only enter the actual finish if all subordinate WBS elements already have an actual finish and all activities for this WBS element have the system status "final confirmation".

To see if you can enter an actual finish dates for a WBS element, call up the actual date overview and check whether the indicator *PR* has been set.

Entering Actual Dates

Entering Actual Dates

1. Choose *Logistics/Accounting* → *Project System* → *Dates* → *Change WBS dates*.
2. Enter the relevant data on the initial screen and then choose *Enter*.

The work breakdown structure is displayed.

3. Enter the actual dates in the corresponding fields in the table..
4. Save your data by choosing *Project* → *Save*.

You can also enter actual dates in the project planning board. Alternatively, if you are on the tab page for basic or forecast dates you can go to the *Actual dates* tab page.



You can use the *Edit* menu to call up various [functions \[Page 14\]](#) for maintaining actual dates.

See also:

[Display confirmations for the work breakdown structure \[Page 21\]](#)

[Copying Actual Dates from Confirmations to WBS Elements \[Page 22\]](#)

Displaying Confirmations for the Work Breakdown Structure

Use

If you have added detail to a WBS element by creating activities, you can display confirmations for these activities.

Procedure

1. Choose *Logistics/Accounting* → *Project System* → *Dates* → *Change WBS dates or Display actual dates*.
1. Enter a project definition or a WBS element.
2. Select a WBS element.
3. Choose *Goto* -> *WBS confirmation*.

Result

A list of all activities with confirmation data is displayed.

Copying Actual Dates from Confirmations to WBS Elements

Copying Actual Dates from Confirmations to WBS Elements

Use

You can copy actual dates from activity confirmations to the superior WBS elements and use these dates as **provisional actual start and finish dates**.

Procedure

1. Choose *Logistics/Accounting* → *Project System* → *Dates* → *Change WBS dates*.
2. Enter a project definition or a WBS element.
3. Choose *Edit* → *Reconcile dates* → *Determine actual dates*.

Result

The provisional actual start or finish dates are copied to the corresponding fields in the table area.

Scheduling the Work Breakdown Structure

Use

You can schedule a project or a sub-hierarchy of the project with all activities assigned to it.

- The WBS element basic dates are used as the basic dates for scheduling the activities (presuming you have set the *WBS determines dates* indicator).
- If a network has activities, which are not all assigned to the same WBS element, the system treats these activities as external networks in scheduling.

Procedure

1. In *SAP Easy Access* choose *Logistics* → *Project System* → *Dates* → *Change basic dates*.

The initial screen for WBS scheduling appears on which you enter the relevant data.

What do you want to do?	Action
Maintain dates for the whole project	Enter the project definition.
Maintain dates for a subhierarchy or a WBS element	Enter the WBS element.
Select all the activities assigned to the WBS elements	Set the <i>With activities</i> indicator.


2. Choose *Actual dates*.

If there is not a basic start date for activities or WBS elements, a dialog box is displayed.

4. Choose the relevant tab page for the set of dates you want to maintain. Edit the dates.
5. Choose *Enter*.



Errors in scheduling are displayed in the error log.

5. Choose . All dates in the project are saved.



You can display an overall overview of all the dates in WBS scheduling by choosing *Extras* → *Log* → *Old/new date overview*.

Network Scheduling

Network Scheduling

Use

Scheduling determines the earliest and latest start and finish dates for carrying out activities in the network and calculates the required capacity requirements as well as the slack time or “floats”.

Features


What is Scheduled?

The following are scheduled:

- Activities
- Relationships

When is Scheduling Carried Out?

A network is scheduled:

- If you create a network.
- If you call up the  *schedule* function.
- When you save the network, depending on whether you have set the *Schedule automat.* indicator in the network header.
 - If you release the network, the indicator is set automatically and the network is scheduled each time you save it.
- If you have made a change relevant to scheduling - for example, changed a duration in the activity or a relationship - and then have saved the network. This function depends on the settings you made in the scheduling parameters (*Schedule automat.* indicator).
 - If you make changes in the network which are relevant to scheduling, the system automatically sets the status “Dates are not updated” (NTUP).

Which Set of Dates is Used in Scheduling?

In the network, you can enter **basic and forecast data** for dates, duration, units, constraints and work. For scheduling, you specify in the network header, with which set of dates scheduling is to be carried out. In network maintenance choose *Edit* → *Settings* → *Set of dates* and then either *Basic* or *Forecast*. In the project planning board choose *Settings* → *Options*, in the dialog screen the *Planning board* node and on the *Settings* tab page the relevant set of dates.

- If you create a new network, the default is always the basic dates.
- If you are working with an existing network, the set of dates with which it was last scheduled is always displayed.

For more information on the various dates in the Project System, refer to [Types of Dates \[Page 7\]](#).

Scheduling Results

The system determines the following dates:

- The scheduled start and scheduled finish of the network.
- The earliest start and earliest finish (earliest dates) and the latest start and latest finish (latest dates) of the activities.
- The earliest and latest dates of the relationships.
- The reduction level used to reduce the duration in the network.
- The slack time called “floats” (total float and free float) of the activities.
- The capacity requirements for the activities.

See also:

[Maintaining Data for Scheduling \[Page 40\]](#)

How Is a Network Scheduled?

How Is a Network Scheduled?

A network is **always scheduled forwards and backwards**.

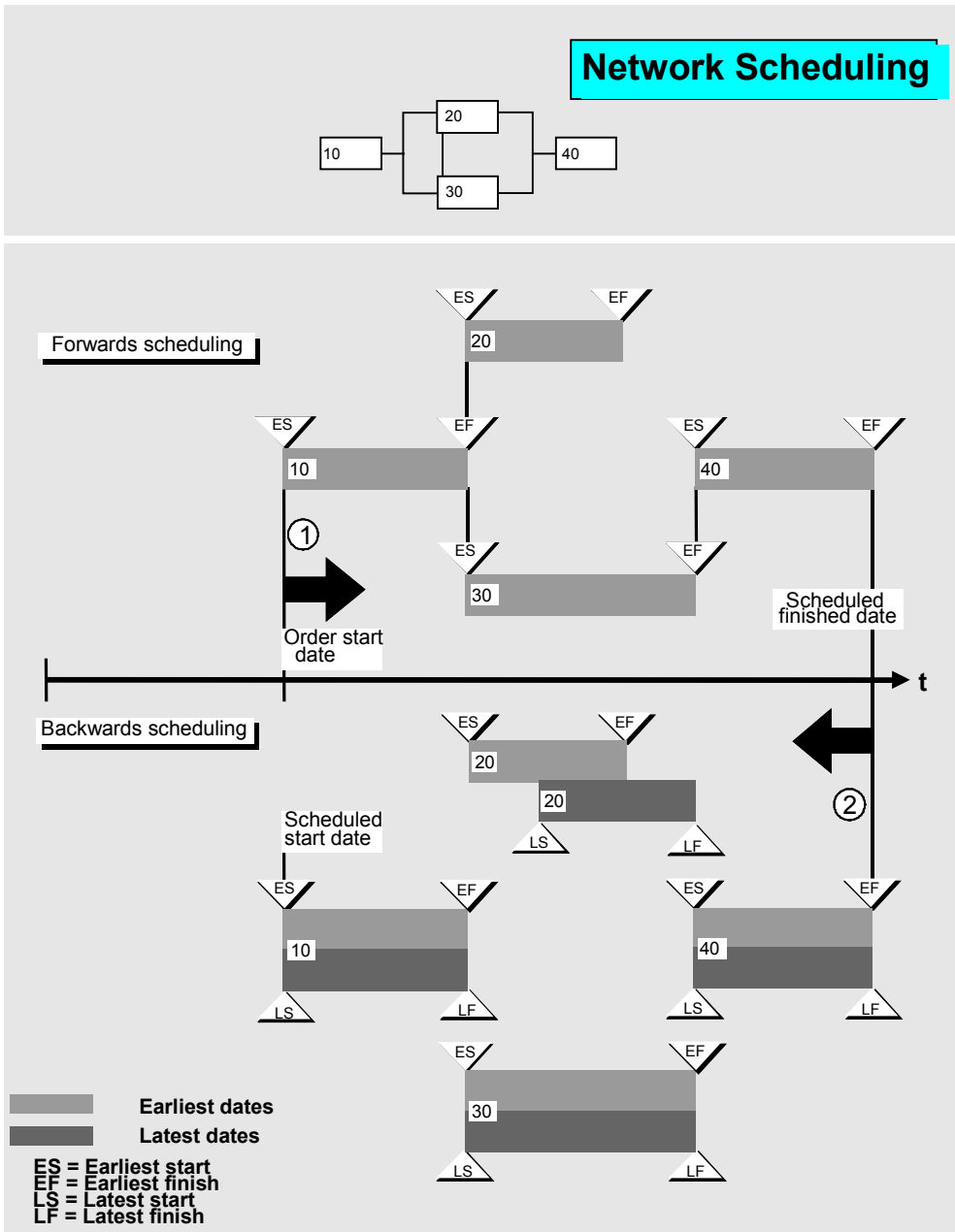
- **Forward scheduling** calculates the earliest start and finish dates of activities (earliest dates) and the scheduled finish date of the network. All activities without predecessors in the network are the starting activities. The date from which scheduling starts is the basic start date from the network header or the scheduled start date from backward scheduling, if no basic start date is specified.
- **Backward scheduling** calculates the latest start and finish dates of activities (latest dates) and the scheduled start date of the network. All activities without successors in the network are the target activities. The date from which scheduling starts is the basic finish date from the network header or the scheduled finish date from forward scheduling, if no basic finish date is specified.

With the [Scheduling Type \[Page 28\]](#) in the network header, you determine whether the network is first scheduled forwards or backwards.

The graphic shows you how a network is scheduled. In the following example the network is first scheduled forwards, a basic start date has been entered in the network header. The basic start date from the network header is the earliest start date for the start activity (activity 10). The system uses this date to calculate all earliest start and finish dates.

The network is subsequently scheduled backwards. The system starts scheduling from the latest end date in activity 40 (scheduled finish). The system uses this date to calculate all latest start and finish dates.

How Is a Network Scheduled?



Scheduling Types

Scheduling Types

Definition

The following types of scheduling are used in the Project System for scheduling networks:

Forward Scheduling

If you have specified *forward scheduling* in the network header as the schedule type, you must also specify the basic start date of the network.

The system starts from the basic start date and schedules forward in time to calculate the earliest dates of the activities and the scheduled finish first. Then it calculates the latest dates of activities and the scheduled start of the network.

If you have also specified a basic finish date in addition to the basic start date in the network header, the system uses the basic finish date as the starting point for backward scheduling.

Backward Scheduling

If you have specified *backward scheduling* as the scheduling type in the network header, you must enter the basic finish date of the network.

The system starts from the basic finish date and schedules backward in time to calculate the latest dates of activities and the scheduled start. Then it calculates the earliest dates of activities and the scheduled finish of the network.

If you also enter a basic finish date in addition to the basic start date in the network header, the system uses the basic start date as the starting point for forward scheduling.

Current Date Scheduling

With scheduling to current date, you can see whether the network can be completed by a certain date. In this method, the system uses the basic finish dates and schedules the network backwards and then starting with the current date, schedules forwards.

You can use the floats in the activities to determine how many days you still have or are short to make the finish date.

Only Capacity Requirements

If you specify **capacity requirements only** as the scheduling type in the network header, the system copies the basic dates from the network header into the scheduled dates and into the earliest and latest dates of all activities.



When you have the system only calculate capacity requirements in scheduling,

- Time constraints of the activities are taken into consideration
- Relationships are ignored.

Special Function: Today Scheduling

"Today" scheduling is a special function in scheduling. In Customizing for the Project System, you can specify the number the days that the scheduled start may be in the past. If the scheduled

Scheduling Types

start of a network is further back in the past than allowed, the system at first attempts to reduce the duration. If this is not sufficient, the system automatically schedules forward starting with today's date.

It is possible to have negative float times with today scheduling.



The backwards scheduling calculates a scheduled start that is in the past despite maximum reduction. Forward scheduling then calculates the scheduled finish, starting at today's date and using maximum reduction.

Factors Influencing Scheduling

Factors Influencing Scheduling

Work Centers

You can enter a work center in internal and external activities and in relationships. In the work center, the following information is important for scheduling:

- Formulas for calculating the duration of activities
- Factory calendar and operating time per workday

Duration of activities

For internal activities and general costs activities, the system schedules using the normal duration you entered in the activity. If you entered a formula for the calculation of other types of internal processing in the work center, the system uses this formula to calculate the duration.

For external activities, the system schedules using the number of delivery days you entered in the activity.

For general costs activities, the system schedules using the duration you entered for the activity.

The duration of an internally processed activity can be extended in scheduling if you have set the indicator *Flex. duration* on the detail screen. This may be the case, for example, if an activity has a free float.



If, according to the control key, the activity is not to be scheduled, the system assumes it has no duration.

Time interval of relationships

Scheduling interprets the time interval of the relationships as a minimum time interval. The system can increase the time interval during scheduling, but it cannot reduce it.

Operating Time

The operating time is the time at which work is carried out. In Customizing for the R/3 System you specify working days and public holidays in the factory calendar.

You can define the operating time at the work center per workday. You do this in the capacity category on the scheduling screen of the work center. Enter the following data:

- Work start and finish
- Break times
- Rate of capacity utilization



Since the system distributes break times entered in the work center uniformly over the day in scheduling, scheduled start and finish times can lie within a break period.

Factors Influencing Scheduling

If you set the *Exact break times* indicator, the system takes breaks into consideration when scheduling.

The following rules apply to network scheduling:

- If you specify a unit that is smaller than "day" for the duration or the time interval, the system schedules using the operating time you have entered in the work center.
- If you specify a unit that is greater than or equal to "day" for the duration or the time interval, the system schedules precisely to the day, using the calendar you entered as a basis.

Factory calendar

Scheduling uses...	if you...
the factory calendar in the work center	have entered a calendar in the work center.
the factory calendar in the activity or relationship	have not entered a calendar in the work center. you have not entered a calendar in the activity or for the relationship
the factory calendar for the plant	have not entered a calendar in the work center or activity



The system uses the Gregorian calendar when scheduling externally processed activities.

If you want to use the Gregorian calendar when scheduling internally processed activities, you must define a factory calendar that mirrors the Gregorian calendar.

Time Constraints

Time Constraints

Features

You can specify time constraints for the start and finish of an activity. When you schedule a network, the system takes the constraints on the start and finish dates and times that you specified into account.

The table shows which time constraints can be entered for start and finish dates:

Activity start	Activity finish
Must start on...	Must finish on...
Cannot start before ...	Cannot finish before...
Cannot start later ...	Cannot finish later...
Start from resource planning	Finish from confirmation

You can also specify, using a key, whether earliest dates or latest dates are used for the activity. If you set the *earliest/latest* key, the earliest dates are the same as the latest dates and the activity does not have a float.

Dates for Activity Elements

Definition

The system calculates the dates of activity elements in relationship to the start or finish date of their activity. You enter an offset to the activity start and an offset to the activity finish.

So that the dates of the activity elements lie within the time frame of the activity, you must enter a:

- **Positive** value for the offset to **start**
- **Negative** value for the offset to **finish**

Dates From Other Objects

Dates From Other Objects

Dates from WBS Elements

If network activities are assigned to WBS elements and you have entered dates for these WBS elements in time scheduling, the system will consider the WBS element dates to be constraints (such as “not before” or “not later”) in scheduling.



On the detail screen for dates you will not be able to tell whether the date comes from the WBS element.

Activity Dates From Other Networks

If the activities have relationships across networks, the dates from the activities in the other networks become fixed dates in scheduling. Refer to the scheduling error log to find out if there are any schedule conflicts.



The system ranks constraints in the following order:

- Constraints from the activity (must start/finish on), actual dates or date from resource planning
- Constraints from WBS elements or external networks

Dates in Subnetworks

The time frame of the superior activity determines the dates of the subnetwork. The dates from the subnetwork are used in scheduling the superior network. The total duration of the subnetwork is not checked against the duration of the activity.



The dates from the subnetwork are not transferred to an activity which is part of overall network scheduling.



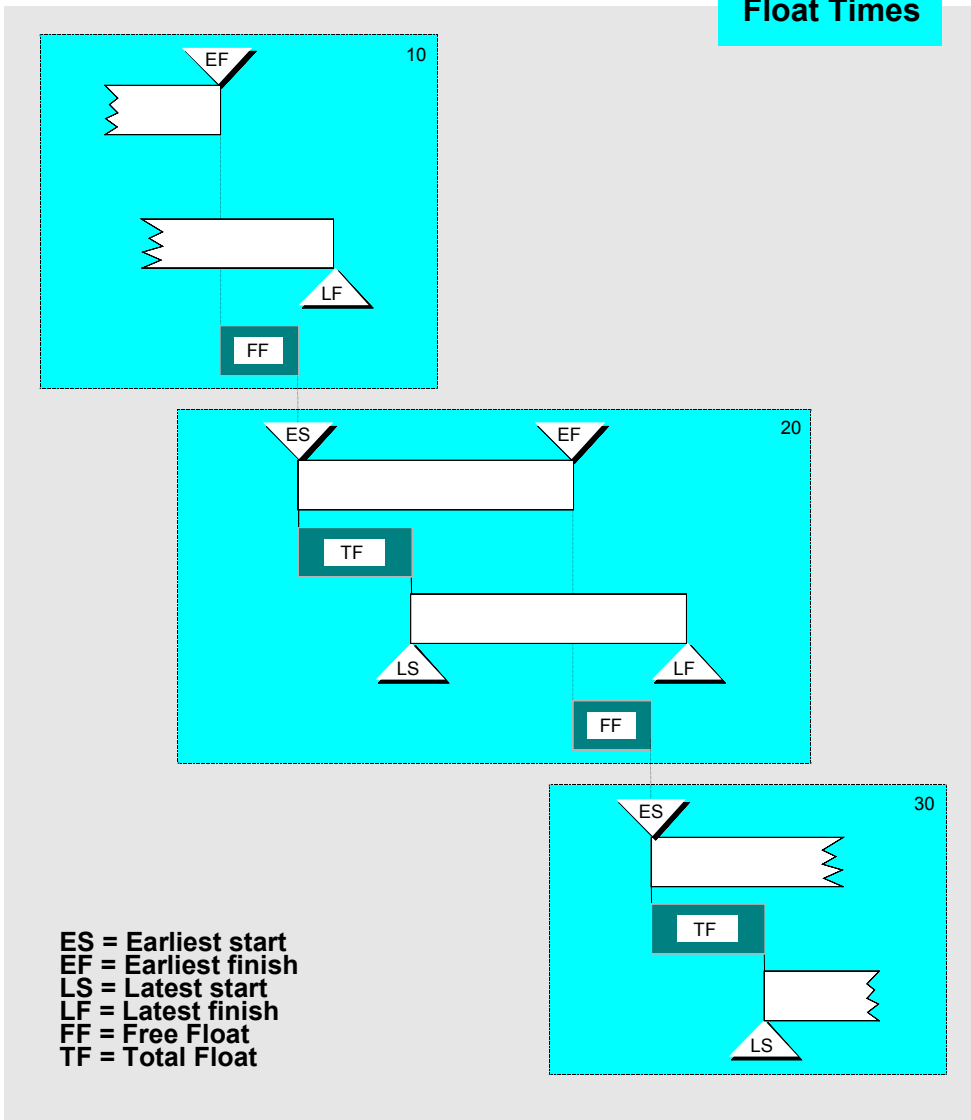
In the information system you can analyze the dates of the subnetwork together with the dates of the network.

Floats

Definition

Floats provide information on the slack time available for individual activities. You can use the floats calculated during scheduling in capacity leveling for example, to shift activities between the earliest and latest dates or to extend the duration.

Float Times



The following floats are calculated in scheduling:

Floats

Total Float

The total float is the time interval in which an activity, starting from its earliest dates can be shifted out into the future without the **latest dates** of its successors or the basic finish date of the network being affected.

The total float can be smaller than, greater than or equal to zero (total float = latest finish - earliest finish). If the earliest and latest dates of an activity fall on the same day, the total float is zero.

Activities with the smallest total float are called "**critical**".

The **critical path** is the path through the network in which the activities and their relationships are ordered so that the total float is minimum. The critical path is in general the **longest way to carry out the network**.

Free Float

The free float is the time interval in which an activity, starting from the earliest dates, can be shifted out into the future without the **earliest dates** of its successors or the basic finish date of the network being affected.

The free float cannot be smaller than zero or larger than the total float. The system first calculates the earliest start date for all successors of the activity and subtracts the offset of the relationship. The smallest of these dates subtracting the earliest start date of an activity, determines the free float.

Reduction

Use

If you have specified a basic start date and basic finish date for a network, and the scheduled dates are outside of these dates, the system attempts step-by-step to reduce the duration of the network.

By means of various reduction strategies, the normal duration of the activities is reduced until the minimum duration of the activity is reached.

Features

You enter the reduction strategy on the activity detail screen for internally processed activities. If you do not enter a reduction strategy here, no reduction can be carried out.

In Customizing for reduction strategies you define:

- By how many levels the duration of the activity should be reduced (maximum is six)
- By what percentage per level the duration of an activity should be reduced.

In the scheduling parameters for the network you define:

- The maximum reduction level to be used in the network
- The reduction type - this specifies whether all activities are reduced or just those that are on the critical path.

With the percentage, which is valid per reduction level, the normal duration is shortened until either the start or the finish date of the network can be met or all reduction levels have been used.

If, after reduction, the minimum duration is also not sufficient to meet the basic dates, negative floats result. The scheduled dates are then outside of the basic dates you specified.



If the system must carry out reduction measures, it schedules the network after each reduction level. This could lead to performance problems.

Scheduling of Finally/Partially Confirmed Activities

Scheduling of Finally/Partially Confirmed Activities

Features

If you schedule a network that has activities with final and partial confirmations, the system schedules as follows.

- For **partially confirmed activities**, the earliest start date is replaced by the actual start date from the confirmation.

The earliest finish date is equal to the actual start date plus the forecast processing time. If you have entered a forecast finish date in the confirmation, scheduling takes the forecast finish date as the earliest finish date. If neither a forecast duration nor a forecast finish date exists, the system then proceeds from the planned duration (basic dates) and adds it to the actual start date.

For the latest start and finish dates, the activities from the start date of the successor are scheduled backwards so that the floats can be calculated for the activity.

If you set the *Shift network* indicator in the scheduling parameters, you determine whether the actual dates of partially confirmed activities are taken into account. The system schedules using the remaining duration of the activities and starts with the earliest start date of the activities that it has calculated.

- For activities with **final confirmation**, the actual dates determine whether earliest or latest dates are used for the activities. The actual dates you have entered are taken into account when scheduling the predecessors and the successors.

Determining Capacity Requirements During Scheduling

Features

Scheduling determines the capacity requirements per activity and activity element if

- Work centers and work data are specified
- A formula for calculating the capacity requirements of a network is specified on the capacity screen in the work centers for every capacity
- The formula for calculating the work is entered in the work center
- The *Capacity planning* indicator is set in the control key

The dates of the activities are used as the dates of the requirements.

Maintaining Data For Scheduling

Maintaining Data For Scheduling

Where Can You Maintain Data for Scheduling?


You maintain...	In the following tab page
normal/minimum duration for internal activities	<i>Internal</i>
duration for general costs activities	<i>Costs</i>
duration for external activities	<i>Internal</i>
Constraints	<i>Dates</i>
Indicator: Earliest/latest	<i>Dates</i>
reduction strategy for internal activities	<i>Internal</i>



You enter the offset to start and finish for activity elements on the detail screens for work and general costs, and on the overview screen for external elements.

Starting Scheduling

To start scheduling, proceed as follows:

1. Call up a network.
2. Choose  or *Edit* → *Functions* → *Schedule*.

Scheduling is started.

Changing Scheduling Parameters

You can change some of the settings that you make in Customizing for scheduling in the applications by choosing *Settings* → *Options* in the project planning board, *Settings* → *Scheduling parameters (networks)* in the Project Builder, or *Edit* → *Settings* → *Scheduling parameters* in network maintenance. In the Project Builder you must have selected a network object for the menu to be active.

- Adjust *basic dates* indicator. Set this indicator if you want the basic dates to be adjusted to the scheduled dates if the scheduled dates lie outside the time frame of the basic dates.
- *Shift network* indicator. Set this indicator if you do not want the actual dates of partially confirmed activities to be taken into consideration when the network is rescheduled.
- *Start in past*: Number of days that the scheduled start may be in the past.
- *Max. redctn. level* : Maximum reduction level used to reduce lead time.




See also:

[Settings for Scheduling Parameters \[Page 9\]](#)

Scheduling Standard Networks

Scheduling Standard Networks

Procedure

1. Call up a standard network (for instance in the *Change standard network* transaction).
2. Choose  or *Edit* → *Schedule*.
The *Scheduling* dialog box appears.
3. Enter a start and/or finish date and the scheduling type and then choose .
Another dialog box appears.
4. If necessary, select an overview variant for the presentation of the dates and choose .
The standard network dates are displayed in the object overview.



The dates determined by the system when you schedule a standard network will not be saved. You can view the scheduling log by choosing *Extras* → *Logs* → *Scheduling*.

Scheduling the Overall Network

Use

In overall network scheduling, the system schedules all networks which are linked with relationships.

Procedure

In *SAP Easy Access* choose *Logistics* → *Project System* → *Dates* → *Overall network scheduling*.

1. Enter a network.
2. Choose either *Basic dates* or *Forecast*.
3. Enter the necessary start or finish date.
4. Choose *Execute*.



On the initial screen for overall network scheduling you can determine the scheduling type (backwards/forwards) and whether service/maintenance orders are taken into account.

Scheduling with Service/Maintenance Orders

Scheduling with Service/Maintenance Orders

Use

Use this function to take maintenance orders and service orders, which are included as subnetworks in a network, into account during WBS scheduling and overall network scheduling.

Features

In WBS scheduling and overall network scheduling you can specify in the *To schedule* field on the *Basic dates* screen which objects the system schedules:

- *Only networks*, to schedule the networks separately
- *Only maintenance and service orders*, if the networks have already been scheduled
- *Networks and maintenance/service orders*

During scheduling of networks together with maintenance/service orders, the system first only schedules the networks. .


The dates determined for the activities are then copied to the headers of the maintenance and service orders, which are then scheduled with these outline dates.

If errors occur during scheduling of maintenance or service orders, they are recorded in the scheduling log.

See also: [Scheduling Projects with Maintenance / Service Orders \[Page 45\]](#)

Scheduling Projects with Maintenance / Service Orders

Procedure

1. In the SAP Easy Access menu choose *Logistics* → Project System → *Dates* → Project Scheduling.
2. Enter a project definition or a WBS element.
3. Choose Basic or Forecast, according to the set of dates with which you want to work.
4. Another entry screen appears. In the *To schedule* selection box choose either
 - Only networks
 - Only maintenance and service order or
 - Networks and maintenance/service orders
5. Choose .

Scheduling Results

Scheduling Results

Features

There are several ways of displaying the scheduling results:

- Displaying dates in the **date overview** in WBS dates planning

You can display an overall overview of all the dates in WBS scheduling by choosing *Extras* → *Logs* → *Old/new date overview*.
- Displaying dates in the **Project Information System**

Call up the structures information system by choosing *Logistics* → *Project System* → *Information System* → *Structures* → *Structure Overview*. If necessary enter a PS info profile. On the selection enter the relevant data.

You can also call up a dates report in the information system from the project planning board. Choose *Extras* → *Run dates report*. A dialog box appears, in which you can select the objects for which you want to run the report.

To add new fields to the overview, choose *Change display variant* and select the required fields.
- Displaying dates in the **network header**

In the network header, the scheduled start and the scheduled finish for the whole network are displayed.
- Displaying dates for **individual activities**

The activity dates are displayed on the *Dates* tab page of the activity detail screen.
- Displaying dates in the **network graphic**

Scheduling Results

The figure demonstrates how the activity dates are displayed in the network structure graphic.

Activity number		Control key		Scheduled duration	
Description					
Earliest start		Total float		Earliest finish	
Latest start		Free float		Latest finish	
ELEM	SUBN	MILE	DOC	MAT	



If errors occur during scheduling, a scheduling log is created automatically. For more information, see Error Log.

Displaying the Error Log

Displaying the Error Log

Use


The error log gives you an overview of the errors which have occurred in scheduling. The error log

- Collects the system messages that have occurred
- Sorts the system messages according to various criteria using a **message category**

In Customizing for the Project System, you can specify that the error log is to be displayed automatically each time scheduling is carried out.

Procedure

You can access the error log from several transactions such as WBS date maintenance, network maintenance, the Project Builder, and the project planning board.

1. In each case choose *Extras* → *Logs* → *Scheduling* (in the project planning board choose ).

An overview of the collected messages is displayed.

2. Choose *Log* → *Display* or F5. A list of all errors which occurred in scheduling is displayed on the screen.
3. To display further information, double-click on a message.