Capacity Management

Process

The Capacity Management process consists of two procedures.

The first procedure is called "Capacity Utilization Threshold Setting". This procedure is used by capacity managers to set up a new capacity tracking overview after a new service infrastructure has been built, or to update an existing capacity tracking overview after the capacity of a service infrastructure has been changed.

The second procedure is called "Capacity Tracking". It is used by capacity managers when they track the capacity of the infrastructures of the services which capacity they are responsible for.

For more details about these procedures, click on the Process button to return to the graphical representation of this process and click on the box that represents the procedure that you would like to know more about. The graphical representation of this procedure will appear and you will be able to click on the Description button in the upper left-hand corner of your screen to read more about it.

Mission

The mission of the Capacity Management process is to avoid incidents caused by capacity shortages.

Scope

The scope of the Capacity Management process is limited to the identification of imminent problems caused by capacity shortages in service infrastructures with active SLAs.

Level of Detail

The level of detail in which Capacity Management information is to be registered is specified in the field utilization guidelines for the fields of the form that is available in the service management application for the support of this process.

The following form is available in the service management application for the Capacity Management process:

Problem

Click on the form to obtain the field utilization guidelines for each of its fields.

Roles & Responsibilities

The table below presents the only role that plays a part in the Capacity Management process, along with its responsibilities. Click on the role to review its profile.

Role	Responsibility	
Capacity manager	Creates and maintains the capacity tracking overviews for the service infrastructures of the service(s) for which he/she acts as the capacity manager. Tracks the capacity for the service infrastructures for which he/she acts as the capacity manager. Registers a problem every time a new capacity utilization threshold violation has been identified for a service infrastructure for which he/she acts as the capacity manager.	

Key Performance Indicators

The table below presents the key performance indicator (KPI) that has been selected for tracking the success of the Capacity Management process.

KPI	Definition	Frequency	Unit
Capacity tracking consistency	The number of capacity tracking overview spreadsheets that are up-to-date, divided by the number of services.	Monthly	%

Note:
To facilitate the tracking of this KPI, ensure that the capacity tracking overview spreadsheets for all services are stored in the same directory, and that the person who tracks this KPI has read-only access to them.

Beneficiaries

The roles that rely on the Capacity Management process are listed in the table below, along with their respective requirements for the Capacity Management process.

Beneficiary	Requirement
Capacity managers	Information about problems that have been identified within the capacity tracking procedure, so that they can be processed efficiently through the Problem Management process.
Service providers	Information regarding the capacity utilization of the service infrastructures.
Specialists	Information regarding problems that have been identified within the capacity tracking procedure, and that have been assigned to a specialist to find out how the problem had best be avoided (either by freeing up part of the currently utilized capacity, or by adding more capacity to the service infrastructure).

Owner

The owner of the Capacity Management process is the Service Management CAB.

This CAB is responsible for reviewing, and subsequently approving or rejecting, requests for improvement of the Capacity Management process and its supporting functionality in the service management application.

Process
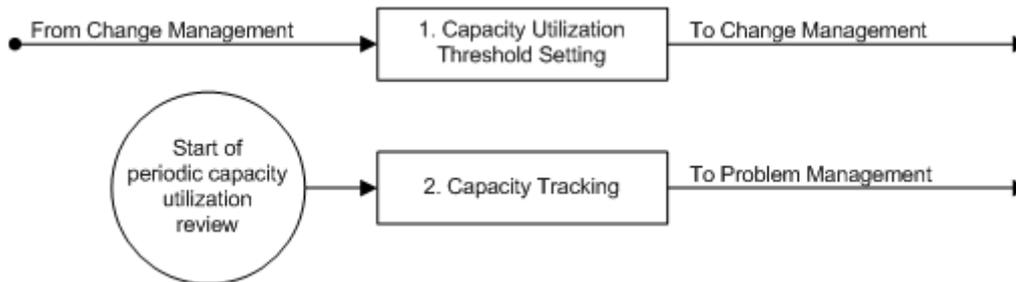
Procedure 1, Capacity Utilization Threshold Setting

A change coordinator assigns an implementation work order for the creation of a new capacity tracking overview after a new service infrastructure has been built. Similarly, a change coordinator assigns a work order for the update of an existing capacity tracking overview after the capacity of an existing service infrastructure has been altered. These work orders are assigned to the capacity manager who is responsible for the capacity of the service for which the change was requested.
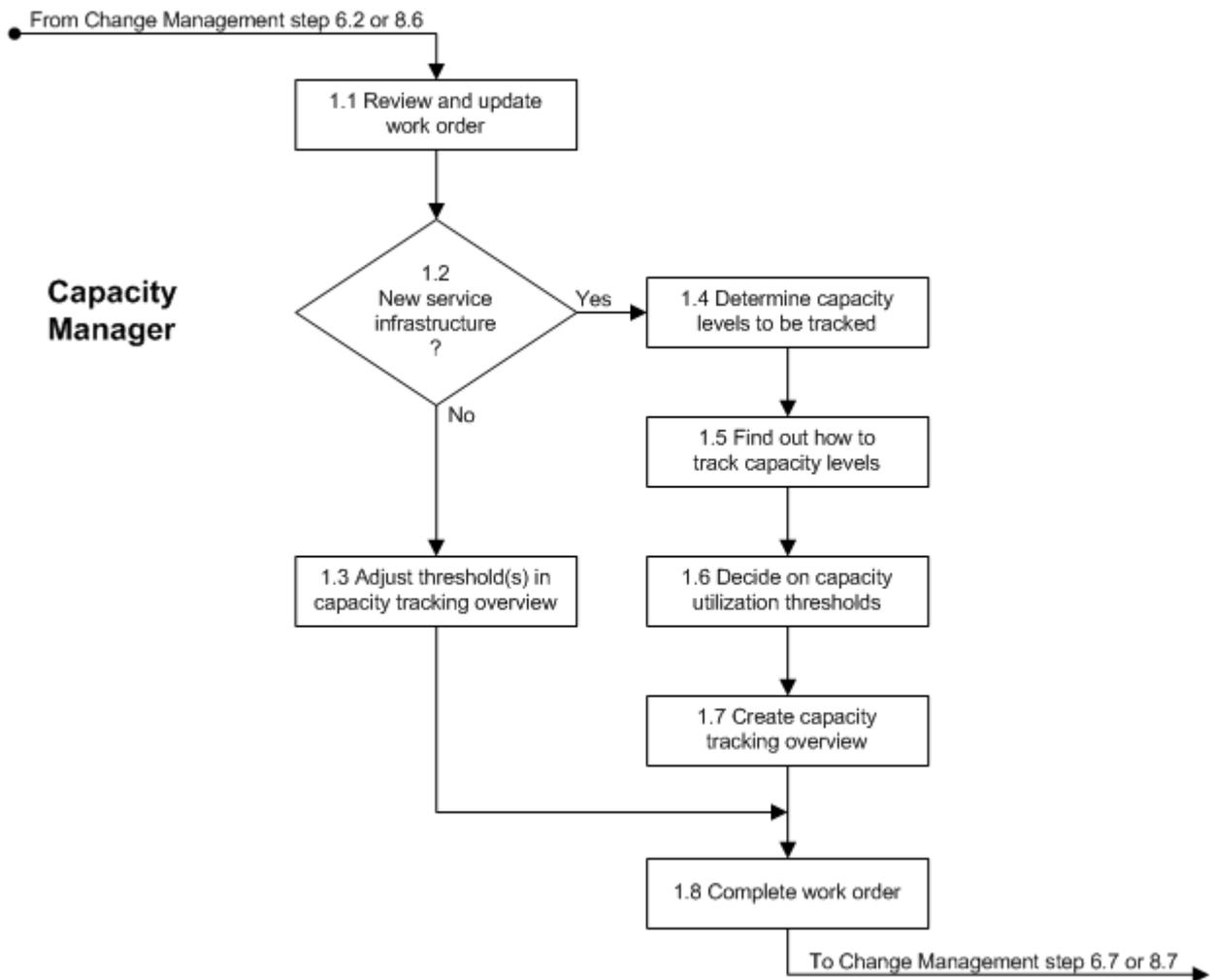
The work order is subsequently reviewed by the capacity manager who determines if a new capacity tracking overview is to be created or if an existing capacity tracking overview needs to be updated.

If a new capacity tracking overview is to be created, the capacity manager decides which capacity levels are to be tracked, finds out how to track them in an efficient fashion, decides on a practical frequency for updating the capacity tracking overview, and sets reasonable capacity utilization thresholds. With this, the capacity manager creates the new capacity tracking overview for the new service infrastructure.

If the capacity of an existing service infrastructure has been updated, the capacity manager updates the capacity tracking overview for this service infrastructure.

After the creation of a new, or the update of an existing, capacity tracking overview, the capacity manager describes in the work order which values were put into the capacity tracking overview, before completing the work order.

From Change Management step 6.2 or 8.6

Capacity Manager

1.1 Review and update work order

1.2 New service infrastructure?
- Yes → 1.4 Determine capacity levels to be tracked
- No → 1.3 Adjust threshold(s) in capacity tracking overview

1.4 Determine capacity levels to be tracked

1.5 Find out how to track capacity levels

1.6 Decide on capacity utilization thresholds

1.7 Create capacity tracking overview

1.8 Complete work order

To Change Management step 6.7 or 8.7

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.1 Review and update work order	1.1.1 When the value in the Status field of your work order has changed from "Registered" to "Assigned", open it and read the instructions in the Information field. 1.1.2 Set the Status field of the work order to "Accepted" if you are not yet ready to start working on it. 1.1.3 As soon as you are ready to work on the work order, set its Status field to "In Progress".

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
 1.2 New service infrastructure ?	1.2.1 If the work order requests the creation of a capacity tracking overview for a new service infrastructure that has just been built, go to 1.4.1. Otherwise, if a capacity tracking overview needs to be updated because the capacity of an existing service infrastructure has been modified, continue with 1.3.1.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.3 Adjust threshold(s) in capacity tracking overview	1.3.1 Determine for which service infrastructure(s) the available capacity level(s) have been modified. 1.3.2 Open the capacity tracking overview spreadsheet for the service. 1.3.3 Update the available capacity level(s) of the affected service infrastructure(s) in the capacity tracking overview. Note: Because the capacity utilization thresholds are automatically calculated based on the available capacity values, the capacity utilization threshold(s) have now been adjusted for the service infrastructure(s). Example: The utilization threshold for disk storage capacity is 80% of the available storage space.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.4 Determine capacity levels to be tracked	1.4.1 Decide which capacity levels should be tracked for the new service infrastructure in order to avoid incidents caused by capacity shortages. Note: Examples of capacity levels that can be important to

	track for a service infrastructure are:
	Processing power,
	Internal memory (RAM),
	Disk storage,
	Database table space,
	Network bandwidth,
	Number of software licenses,
	etc.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.5 Find out how to track capacity levels	1.5.1 Find out how to keep track of the selected capacity levels for the new service infrastructure. If necessary, work with specialists who can provide you access to (output from) network and/or system management applications from which you can obtain current capacity utilization levels. If possible, ask specialists to configure the network and/or system management tools to automatically gather the capacity utilization levels.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.6 Decide on capacity utilization thresholds	1.6.1 Decide on a practical frequency with which the capacity tracking overview is to be updated for the new service infrastructure. Once every week, or once every calendar month, are examples of commonly used frequencies. Keep the frequency the same for all capacity levels that are to be tracked for the service.
	Note: The frequency with which the capacity tracking overview is updated is not related to the frequency with which network and system management applications measure the actual capacity utilization

	levels. The values that are entered in the capacity tracking overview are often derived from the data that has been collected by network and system management applications.
	Example: The bandwidth utilization over a wide area network link could be measured every second by a network management application. The value that is entered in the capacity tracking overview, however, could be calculated by taking the highest measured bandwidth utilization value, after ignoring the top 5% of the measured values.
	1.6.2 Decide on a reasonable capacity utilization threshold for each capacity level that is to be tracked for the new service infrastructure.
	Note: A threshold can be considered reasonable if, under normal circumstances, there will be sufficient time to add capacity after a threshold violation has been detected. Keep in mind that if threshold violations are not automatically detected by network and/or system management applications, the frequency with which the capacity tracking overview is updated is important to consider. If this frequency is low, the thresholds will need to be lower than if the frequency is high. This is due to the fact that it might take longer to identify a threshold violation.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
1.7 Create capacity tracking overview	1.7.1 Open the capacity tracking overview spreadsheet for the service. If one does not yet exist, because this is the first service infrastructure for this service, open a new spreadsheet.
	1.7.2 Add a new capacity tracking overview for the new service infrastructure to the spreadsheet. Use five rows of the spreadsheet for each capacity level that is to be tracked. These rows are needed for the:
	available capacity,
	value based upon which the capacity utilization threshold is calculated,
	capacity utilization threshold,
	capacity utilization,
	number of the problem that was registered after

	the identification of a threshold violation. The columns of the spreadsheet should be used to represent the capacity tracking periods.
	Note: The capacity utilization threshold should be calculated automatically based on available capacity.
	Example 1: If more than 80% of the processing power has been utilized for a period of 10 minutes or more, the threshold for processing power has been exceeded.
	Example 2: If there are less than 5 licenses in stock for the client application, the threshold for the number of software licenses has been exceeded.
	1.7.3 Fill out the first three rows of the new capacity tracking overview for its first capacity tracking period, i.e. enter the currently available capacity, the threshold calculation value, and the formula that automatically calculates the threshold.

Work Instructions

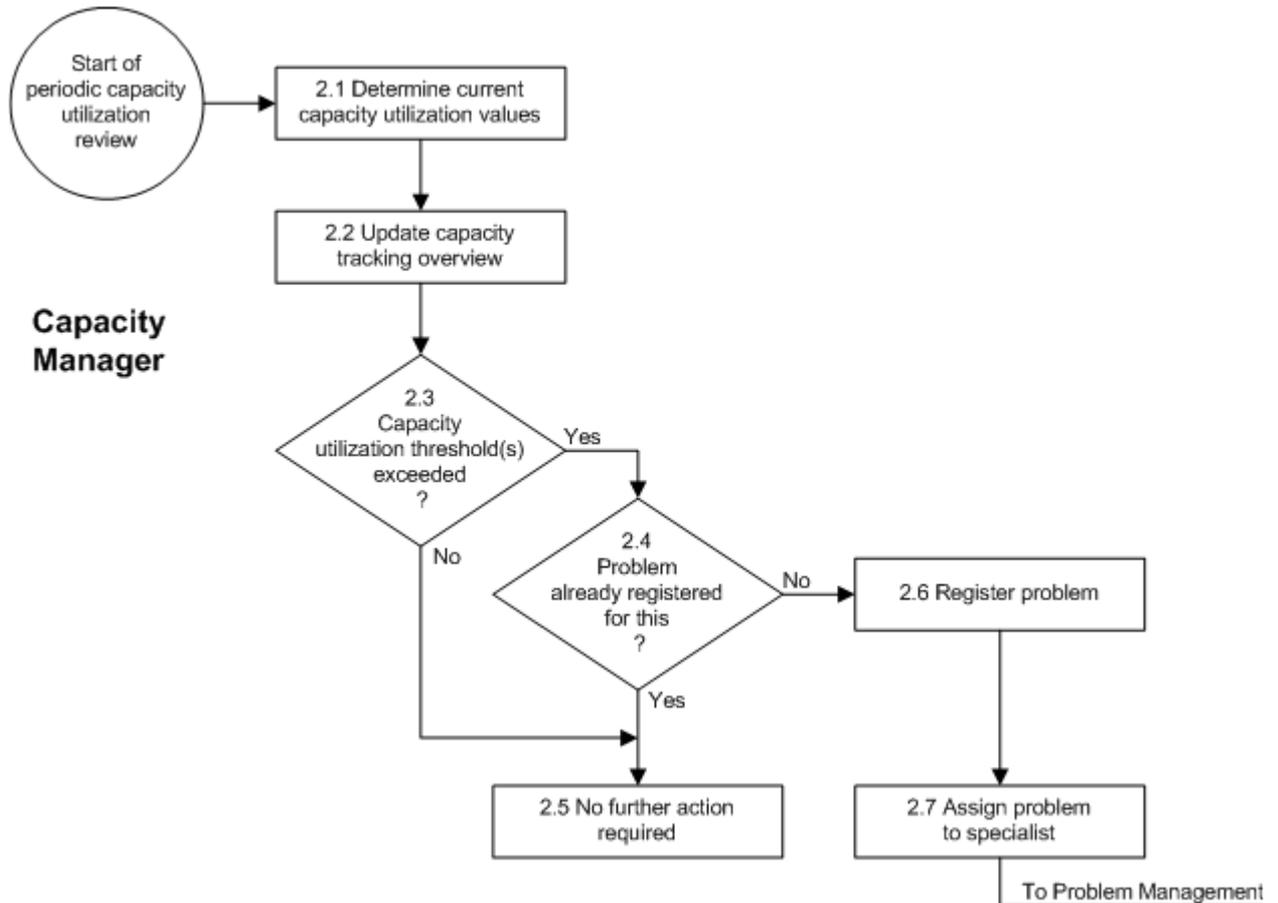| Procedure Step	Work Instructions for Capacity Managers
1.8 Complete work order	1.8.1 Summarize in the Result field of the work order what has been changed in the existing capacity tracking overview (if it concerns an existing service infrastructure), or how the new capacity tracking overview has been prepared (in case of a new service infrastructure). 1.8.2 Set the Status field of the work order to "Completed".

Procedure 2, Capacity Tracking

At the end of a capacity tracking period, the capacity manager determines the capacity utilization value for each capacity level that is to be tracked for the different service infrastructures of the service(s) which capacity he/she is responsible for. The capacity manager then updates the capacity tracking overview(s) of these service(s).

If one or more capacity utilization thresholds have been exceeded, the capacity manager checks for each threshold violation whether or not a problem has already been registered for it. The capacity manager registers a new problem for every threshold violation for which a problem has not yet been registered.

Each new problem is then assigned to the most appropriate specialist (in terms of skills and availability) to find out how incidents had best be avoided (e.g. by freeing up some of the currently utilized capacity, or by adding more capacity to the service infrastructure).

Procedure 2, Capacity Tracking

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.1 Determine current capacity utilization values	2.1.1 Collect the output from network and/or system management applications for the past capacity tracking period. If necessary, also obtain data from other sources (e.g. the service management application for software license utilization). 2.1.2 Use this data to determine the capacity utilization value for each capacity level that is to be tracked for the different service infrastructures of the service for which you are tracking the capacity.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.2 Update capacity tracking overview	2.2.1 Enter the capacity utilization values for the past capacity tracking period in the capacity tracking overview spreadsheet. The spreadsheet contains a section for every service infrastructure of the service. Each section needs to be filled out. 2.2.2 Check the updated capacity tracking overview to see if any capacity utilization thresholds have been exceeded.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.3 Capacity utilization threshold(s) exceeded ?	2.3.1 If one or more capacity utilization thresholds have been exceeded, continue with 2.4.1. Otherwise go to 2.5.1.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.4 Problem already registered for this ?	2.4.1 For each identified threshold violation, check the previous capacity tracking periods in the spreadsheet to find out whether or not a problem has already been registered for it. 2.4.2 If a problem has already been registered for each threshold violation that has been identified for the past capacity tracking period, continue with 2.5.1. Otherwise go to 2.6.1.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.5 No further action required	2.5.1 Based on the results of the past capacity tracking period, there is no need to take any action as there are no new problems to be registered to prevent incidents caused by capacity shortages.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.6 Register problem	2.6.1 Open a new problem. Leave the Status field of the problem set to "Registered" (its default value).
	2.6.2 Ensure that the problem manager of the service that is going to become affected by the capacity shortage (i.e. the service for which you are tracking the capacity) is selected in the Manager field of the problem.
	2.6.3 Select the service that is going to become affected by the capacity shortage in the Service field of the problem.
	2.6.4 Enter a short description of the anticipated problem in the Description field. In the Information update field, describe which capacity utilization level has exceeded its threshold and by how much. Also specify the date on which you expect the service infrastructure to become unstable due to a capacity shortage.
	2.6.5 Select the CI that is running out of capacity in the CI field of the problem.
	2.6.6 Select the category "Proactive - Anticipated Problem" in the Category field of the problem.
	2.6.7 Select the appropriate severity level in the Severity field of the problem.
	2.6.8 Specify the problem number in the capacity tracking overview spreadsheet. Enter this number in the row below the threshold that has been exceeded and in the column that represents the past capacity

	tracking period.
	2.6.9 Repeat the above steps for every capacity utilization threshold violation that has been identified for the past capacity tracking period, and for which a problem has not already been registered.

Work Instructions

Procedure Step	Work Instructions for Capacity Managers
2.7 Assign problem to specialist	2.7.1 Determine which specialist is best suited (in terms of skills and availability) to find out how incidents had best be avoided (e.g. by freeing up some of the currently utilized capacity, or by adding more capacity to the service infrastructure). 2.7.2 Select this specialist in the Member field of the problem. 2.7.3 Set the Status field of the problem to "Assigned".

Problem

The table below lists the fields of the Problem form and provides utilization guidelines for each field.

Page	Main	
Field	**Utilization**	
Number	This field contains the unique problem number. This number is automatically generated by the application.	
Status	Use this field to select the appropriate status for the problem from the following list of options: Registered — The problem is not yet ready for analysis. Rejected — The problem had better be assigned to another group or member. Assigned — The analysis of the problem can start. Accepted — The analysis of the problem will start as soon as the member to whom the problem	

		has been assigned is ready to start working on it.
	In Progress	The analysis of the problem is currently being worked on.
	Known Error	The underlying cause of the problem has been found.
	Waiting for…	It is temporarily not possible to make any further progress with the analysis of the problem.
	Analyzed	The underlying cause of the problem has been found and a structural solution has been proposed, or it was not possible to propose a practical structural solution.
	Change Requested	The problem has been passed to the Change Management process for the implementation of the proposed structural solution.
	Change Pending	A change has been registered for the implementation of the proposed structural solution.
	Change Completed	The change that was registered for the implementation of the proposed structural solution has been completed.
	Dead-End	It is not possible to fix the problem because either its root cause cannot be found, or it is currently not possible to propose a practical structural solution.
	Fixed	A structural solution for the problem has been implemented.
	Separator	
Manager	Use this field to select the problem manager who will assume responsibility for the problem.	
Service	Use this field to select the service in which the root cause resides. Select the special service "NORECORD - Service is not registered in database" if the root cause resides in an existing service that has not yet been registered in the application.	
CI	Use this field to select the configuration item in which the root cause resides. Select the special CI with the code "NORECORD" if the CI has not yet been registered in the configuration management database (CMDB).	
	Separator	
Description	Use this field to enter a short description of the symptom(s) that are caused by the problem.	
Information	This field shows all information that was entered in the Information update field when the problem was saved. Above each entry, the application indicates who entered the text in the Information update field and when it was saved. Each new entry is inserted at the top of this field.	
Information update	Use this field to enter a detailed description of the symptom(s) that result from the problem, to provide any additional information that could prove useful for the	

	analysis of the problem, to describe the root cause of the problem, to provide information about the problem's progress towards a fix, and/or to provide details about how to fix the problem.
	Separator
Folder	This field is automatically set to the folder of the organization to which the person who created the problem belongs.
Page	*Details*
Field	**Utilization**
Category	Use this field to select the problem category from the following list of options: Proactive - Anticipated Problem Reactive - Existing Problem
Severity	Use this field to select the appropriate severity of the problem from the following list of options: For problems that caused, or are expected to cause, one or more non-critical service degradations: Low - Analyze within 28 Days For problems that caused, or are expected to cause, one or more non-critical service outages, or one or more critical service degradations: Medium - Analyze within 7 Days For problems that caused, or are expected to cause, one or more critical service outages: High - Analyze within 2 Days Note that a service is degraded when some of its functionality is not functioning, or when the response time of the service is slow. A service is down when none of its functionality can be accessed.
	Separator
Creation date	This field is automatically set to the date and time at which the problem was created.
Target date	This field is automatically set to the date and time at which the root cause analysis should be completed after the severity has been set.
Completion date	This field is automatically set to the date and time at which the problem status was set to "Dead-End" or "Fixed".
Assignment	Separator
Group	Use this field to select the group to which the problem is to be assigned.

Member	Use this field to select the person to which the problem is to be assigned.
Supplier	Use this field to select the supplier organization that has been asked to assist with the problem.
Reference number	Use this field to enter the unique reference number under which the problem has been registered by the supplier organization.
	Separator
Workaround	Use this field to describe the workaround that should be applied to resolve incidents caused by this problem until a structural solution has been implemented.
Solution	Use this field to describe how the problem has been resolved, i.e. how the root cause has been removed or permanently worked around.

Page	*Relations*
Field	**Utilization**
Relations	Use this field to create a link with support requests that have been caused by this problem (when the problem category is "Reactive - Existing Problem"). Use this field also to create a link with the support requests that have been registered to warn of this potential problem (when the problem category is "Proactive - Anticipated Problem"). This field is also used to create a link with the change that is to fix or prevent the problem.

Page	*History*
Field	**Utilization**
Registration	The application automatically specifies in this field who created the item and when it was created. The application also uses this field to indicate who last updated the item and when this was done.
History	The application automatically creates a line when an audited field is filled out or updated. For each history line the application specifies who caused it to be created and when it was created.