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Lab Guide

Problem Management: Structured Problem Analysis With Kepner-Tregoe

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Lab Goal

This lab walks you through the Problem we will be using for this session. In this initial lab, try to find the root cause for this problem using limited knowledge & no structured approach to problem solving.

Lab 1
Solve Problem without a structured approach

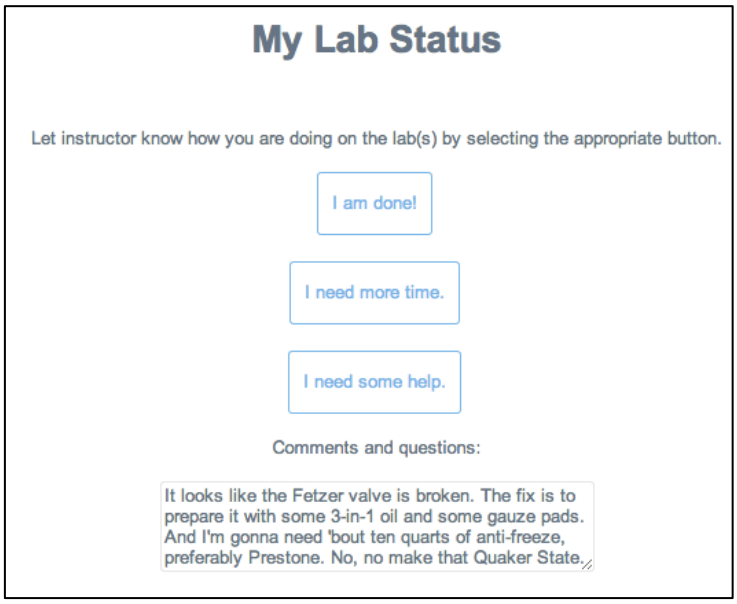
Log on to Your Training Instance.

1. Login to the instance URL on the cover page using the provided **admin** credentials.

Review Problem & Propose Solution Without a Structured Approach

1. The example problem is located in the back of this guide. Take 20 minutes & work individually or in small groups. Read through the content & propose a solution. Again, this initial lab is intended to give you a baseline before being introduced to KT.

2. Navigate to **Lab Management -> Report Lab Progress** & drop in your best guess at the problem w/ solution & your name. Click **I am Done!**



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Lab 2
Solve Problem Using KT

Lab Goal

Structured problem analysis provides a rational methodology for investigating the cause of a problem or incident. This problem solving methodology was developed by Kepner-Tregoe to help problem managers avoid making wrong decisions based on subjective opinions. **This lab walks you through the Structured Problem Analysis application that lets you track the problem analysis process through ServiceNow**

Appraise the Situation

1. Create a **New Incident** with mandatory information.
2. Right-click the form header and select **Save**.
3. Navigate to the bottom of the Incident form & locate the **Situation Appraisal** section.
4. Based on the problem use case, appraise the situation.
5. Continue to the next page to see an example.

Situation Appraisal ←
- Identify Concerns
- Set Priority
- Plan Next Steps
- Plan Involvement

Problem Analysis
- Describe problem
- Identify Possible Causes
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix

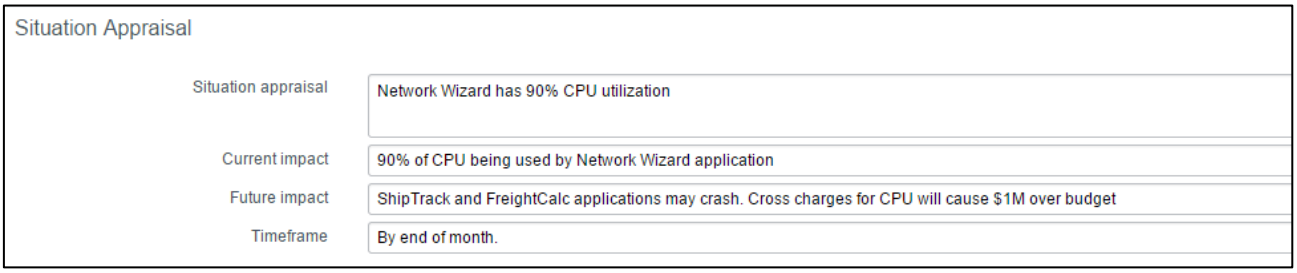
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Situation Appraisal

Situation Appraisal
- Identify Concerns ←
- Set Priority ←
- Plan Next Steps ←
- Plan Involvement ←

Problem Analysis
- Describe problem
- Identify Possible Causes
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix



- **Situation appraisal**: A brief statement of the situation.
- **Current impact**: The current impact of the situation.
- **Future impact**: Any anticipated future consequences of the situation.
- **Timeframe**: Any time constraints and deadlines.

NOTE: Appraisals should help you determine which records to use KT against!

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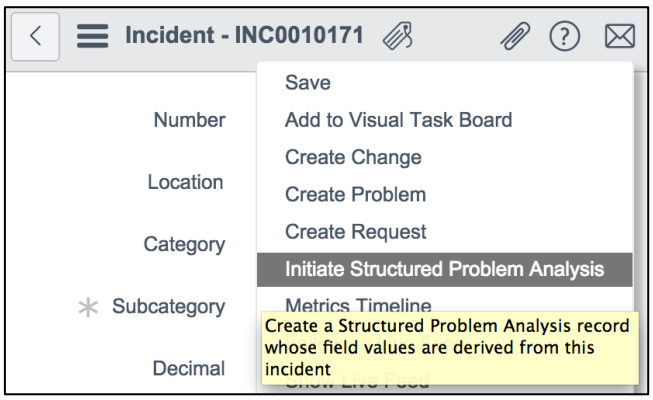
Initiate a Structured Problem Analysis

Situation Appraisal
- Identify Concerns
- Set Priority
- Plan Next Steps
- Plan Involvement

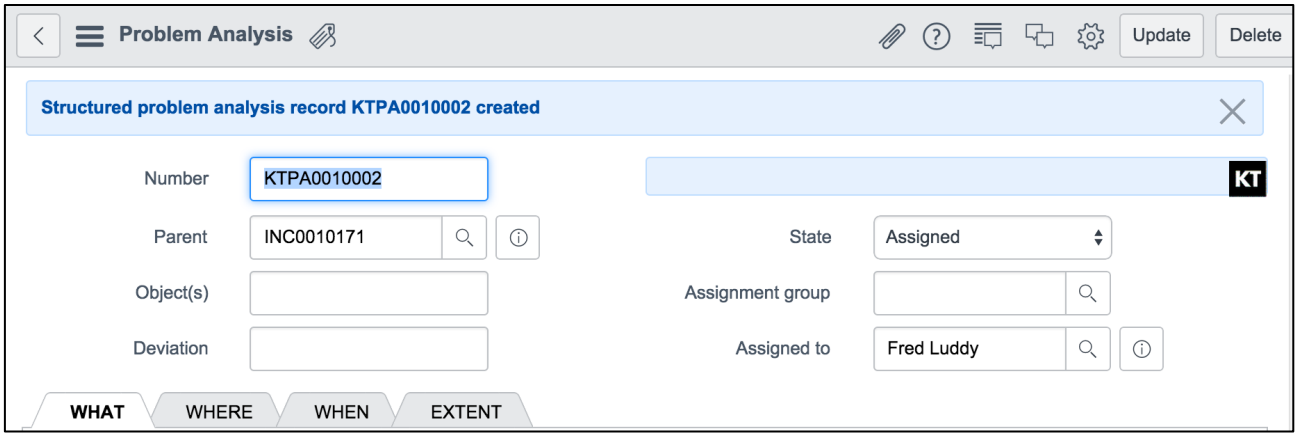
Problem Analysis ←
- Describe problem
- Identify Possible Causes
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix

1. Right-click the Incident form header bar and select **Save**.
2. Right-click the Incident form header again and select **Initiate Structured Problem Analysis**.



This creates a new **Problem Analysis record** & links it to the Incident.



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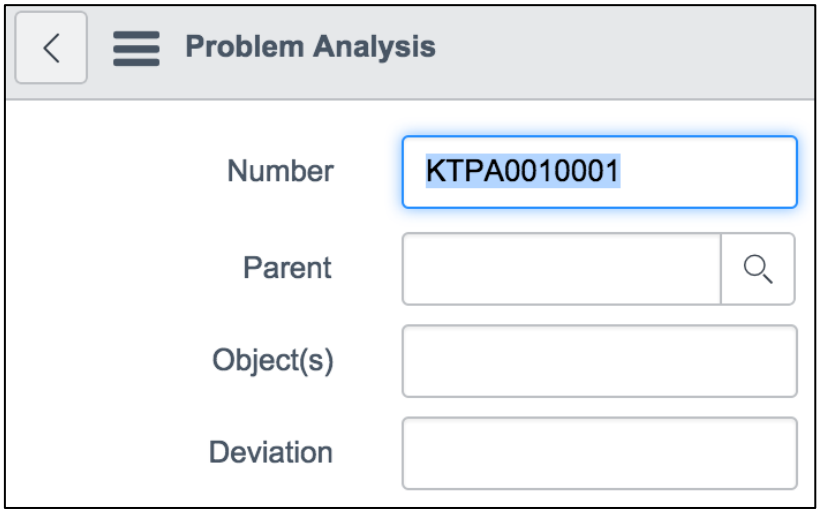
Start the Problem Analysis

Situation Appraisal
- Identify Concerns
- Set Priority
- Plan Next Steps
- Plan Involvement

Problem Analysis ←
- Describe problem
- Identify Possible Causes
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix

1. Based on the problem use case, fill in the **Object** and **Deviation**.



- **Object(s)**: A text description of the object or objects affected. Forms part of the problem statement.
- **Deviation**: The difference between the expected performance and the actual performance. Forms part of the problem statement.

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Describe the Problem (What, Where, When, Extent)

Specify the problem details by entering values that are definitely true (***Is***) & values that could be true but are not (***Is not***) for:

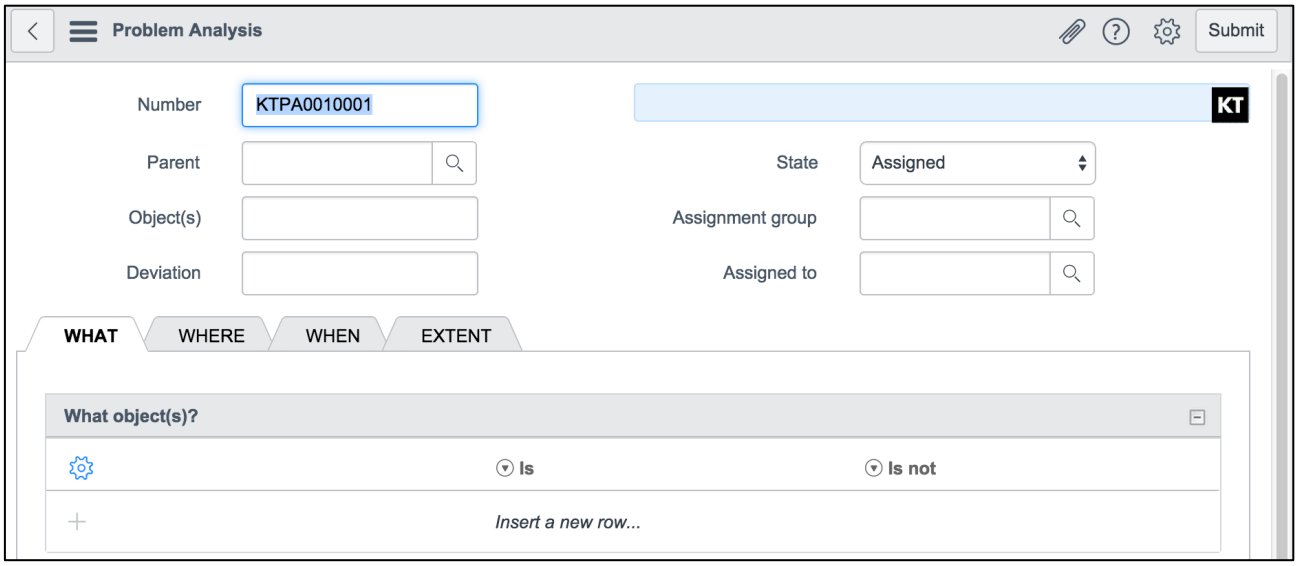
- *What* the problem is & what it is not.
- *Where* the problem occurs & where it does not.
- *When* the problem occurs & when it does not.
- *Extent* to which the problem occurs & the extent to which it does not.

Situation Appraisal
- Identify Concerns
- Set Priority
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Problem Analysis
- Describe problem ←
- Identify Possible Causes
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix

For each *is*, an equivalent *is not* question should be posed, although it may not always be answerable. These two columns aid in eliminating intuitive but incorrect assumptions about the problem.



Note: To add these values, double-click ***Insert a new row...*** on the appropriate embedded list.

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1. Navigate to the **WHAT** section.



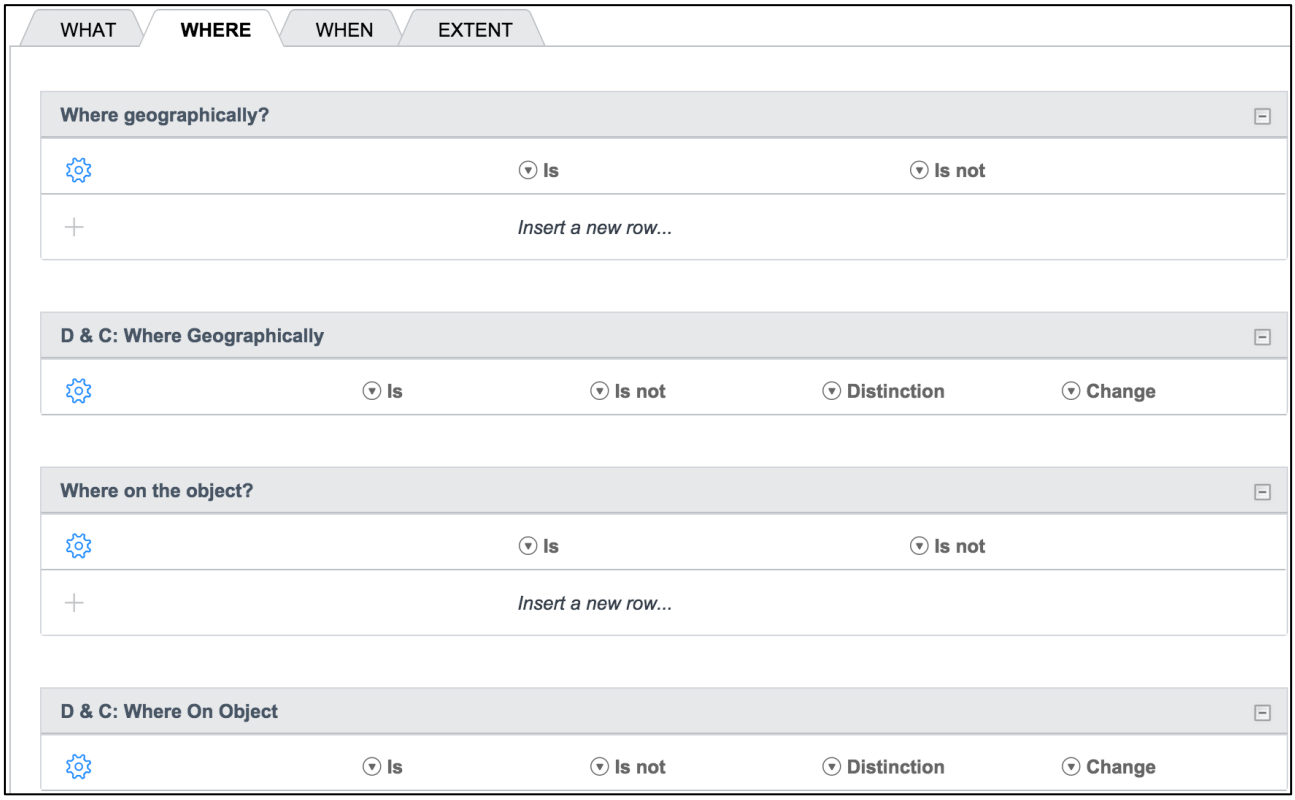
Based on the *problem use case*, fill in:

- **What object(s)?**: The objects that the problem affects.
- **What deviations?**: The deviations from expected behavior.

Skip **D & C: What Object** for now. You will revisit Distinctions and Changes later in the lab.

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2. Navigate to the **WHERE** section.



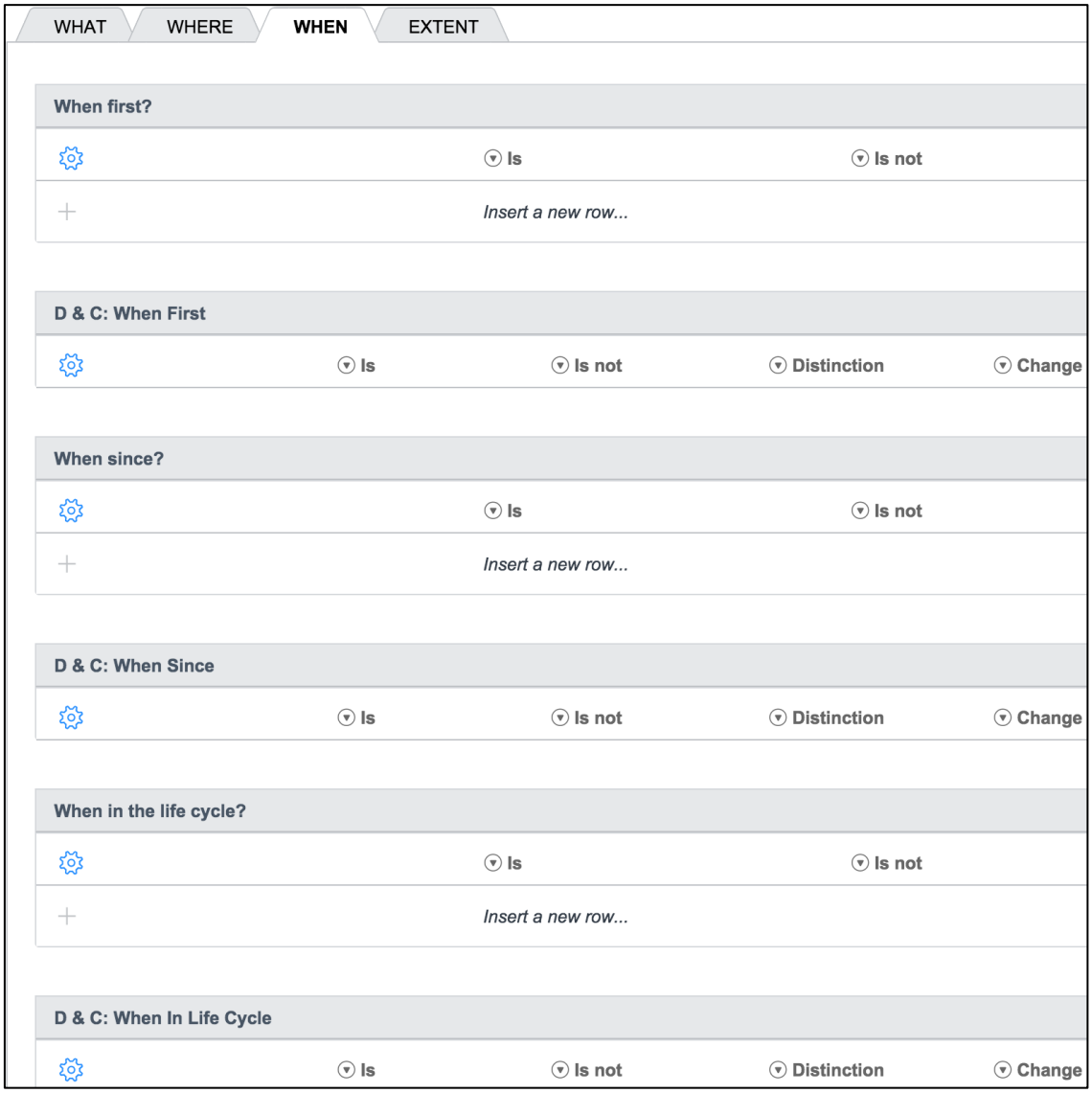
Based on the *problem use case*, fill in the **Where** sections. Refer to the sections below for help.

- **Where geographically**: The location where the problem is occurring.
- **Where on the object**: The part and location within the relevant object.

Skip **D & C: Where Geographically** and **D & C: Where On Object** for now. You will revisit Distinctions and Changes later in the lab.

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3. Navigate to the **WHEN** section.



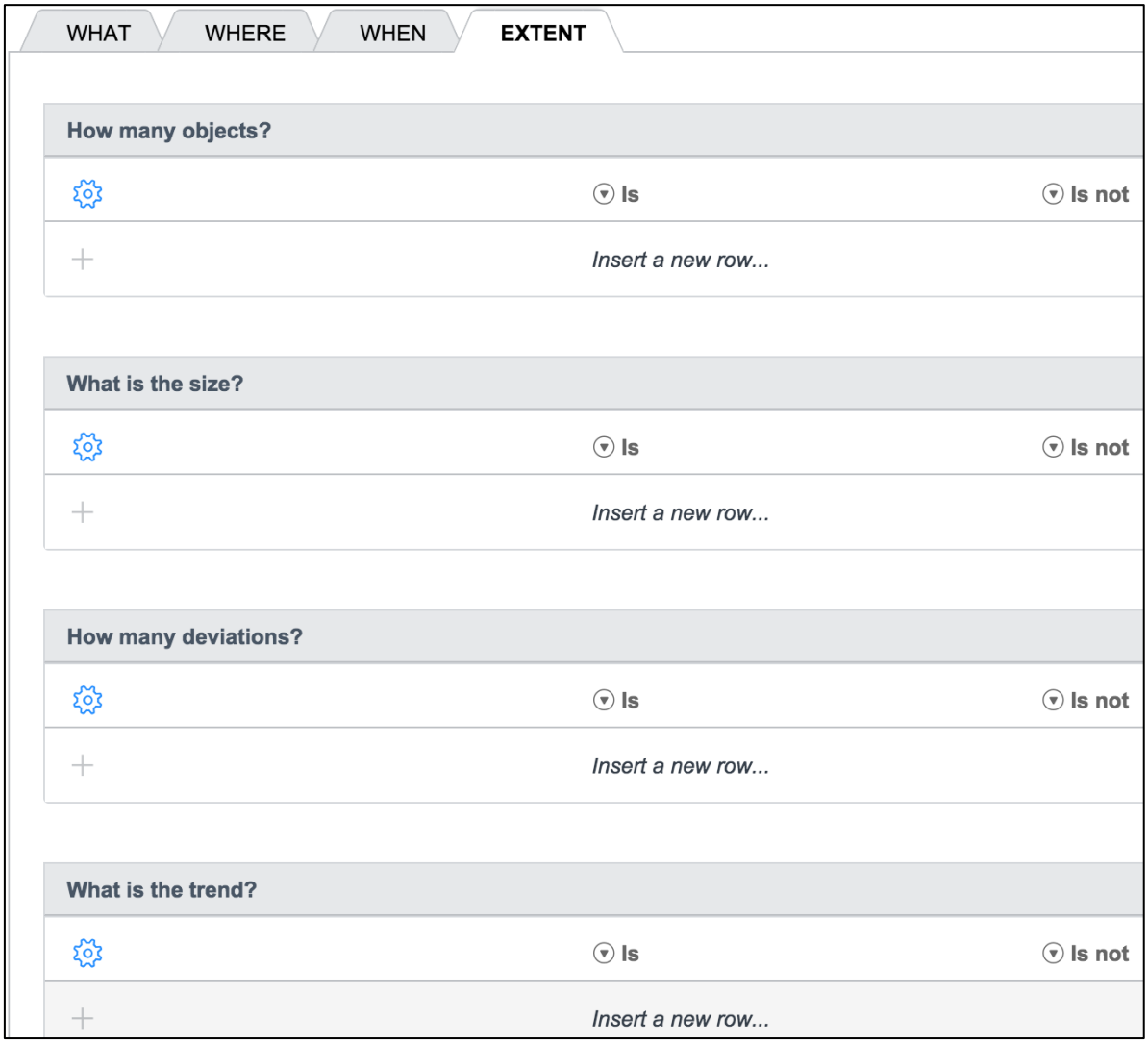
Based on the *problem use case*, fill in the **When** sections. Refer to the sections below for help.

- **When first?**: When was the problem first observed?
- **When since?:** When since the first observation has the problem been observed?
- **When in the life cycle?**: When in the standard operational activities of the object does the problem occur?

Skip **D & C When first**, **D & C When since**, and **D & C When in Life Cycle** for now. You will revisit Distinctions and Changes later in the lab.

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4. Navigate to the **EXTENT** section.



Based on the *problem use case*, fill in the **Extent** sections. Refer to the sections below for help.

- **How many objects?**: The number of objects affected.
- **What is the size?**: The magnitude of the problem. Is it localized or widespread?
- **How many deviations?**: The quantity or frequency of the deviations.
- **What is the trend?**: The problem's potential for growth or shrinkage over time.

5. Go back and define **Distinctions & Changes** for each *Is* & *Is not* pair previously defined in the **WHAT**, **WHERE**, and **WHEN** sections. This information helps problem managers to focus on recent changes that may have caused the problem.

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Identify Possible Causes

After defining the problem, you should be able to find the actual confirmed cause by:

- Listing all possible causes.
- Evaluating each possible cause to find the most probable causes.
- Testing the most probable causes.
- Confirming the cause.

Situation Appraisal
- Identify Concerns
- Set Priority
- Plan Next Steps
- Plan Involvement

Problem Analysis
- Describe problem
- Identify Possible Causes ←
- Evaluate Possible Causes
- Confirm True Cause

Think beyond the fix

You may identify several causes as most probable & may confirm several causes by the end of the process.

1. Navigate to the **Causes** related list at the bottom of the **Problem Analysis** record.



Based on the *problem use case*, enter all the **Possible causes**.

Note: To add these values, double-click ***Insert a new row...*** on the appropriate embedded list.

After you submit the Cause form, the **Cause Evaluations** section is updated to list relevant information previously added to the **WHAT**, **WHEN**, and **WHERE** sections of the problem analysis record. This information is used when you evaluate causes

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Evaluate Possible Causes

Situation Appraisal
Identify Concerns
Set Priority
Plan Next Steps
Plan Involvement
Problem Analysis
Describe problem
Identify Possible Causes
Evaluate Possible Causes
Confirm True Cause
Think beyond the fix

After listing all causes, evaluate each one to determine the likelihood of it causing a deviation from an expected behavior: the problem. The evaluation should take this form:

- If <possible cause> is the true cause of <problem>, how does it explain the IS and the IS NOT?

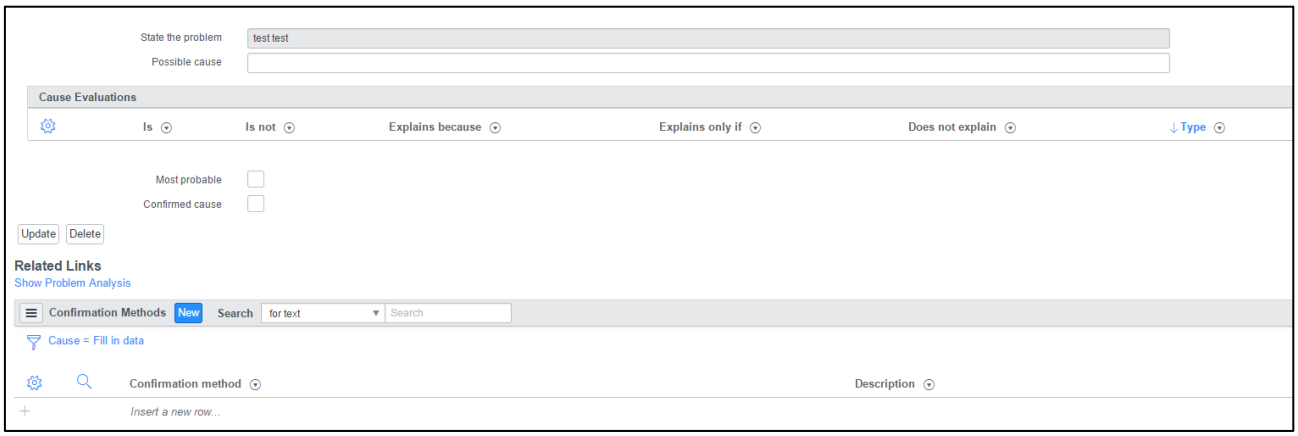
For example:

- If server upgrade is the true cause, how does it explain why the issue first started 7 days ago?
- If server upgrade is the true cause, how does it explain why only London users are affected?

This process helps you remove any possible causes that do not explain the is and is not values and arrive at a list of one or more probable causes.

To evaluate a cause:

1. Click each **Possible cause** at the bottom of the form.



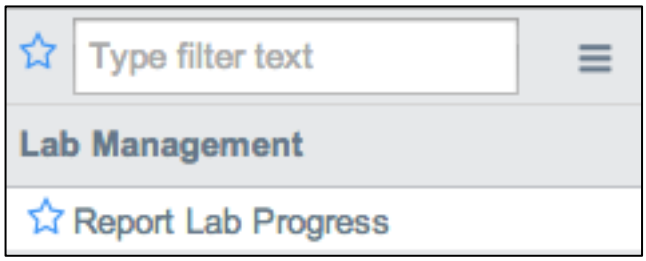
Based on the *problem use case*, evaluate all the **Possible causes**.

As a class, we will **Confirm** the **True Cause** and discuss **Thinking beyond the fix**.

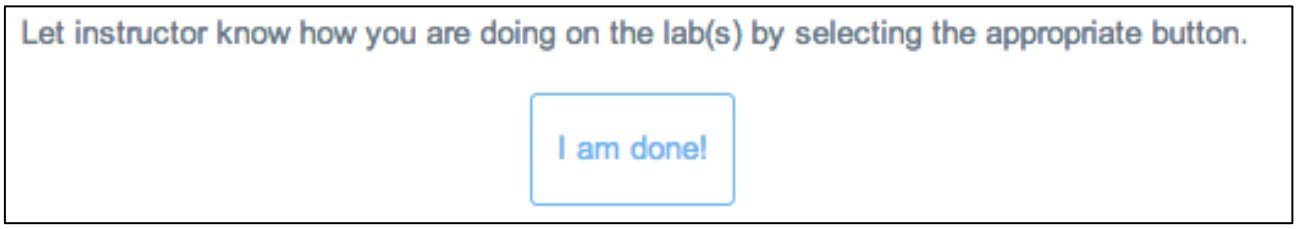
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Progress Report

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am Done!**



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Use Case Example

Network Wizard Goes Wild

Problem Solving

Systems Management International (SMI) is a worldwide software company specializing in networking business solutions whose products and services provide customers with the ability to optimize their business practices. In order to support a worldwide customer base, SMI's Technical Support organization has locations in Europe, Asia, Australia and North America. Customer support contracts are tiered, based on whether the customer has purchased premium support or standard support (SMI's workday is 8 a.m.-8 p.m., Monday – Friday in each region).

One of SMI's software products, Network Wizard, is used by customers to manage TCP/IP (Transport Control Protocol/Internet Protocol) connections, including processors, terminals, routers, mainframe stacks, printers, etc. Network Wizard integrates SNA (System Network Architecture) and TCP/IP management. It has several automated agents that perform different functions related to monitoring connections. Trip Ticks monitors the devices and calculates the round-trip time. It is used to assess response time for end users. Commander processes commands and responses from multiple servers at the same time. REALSession provides real-time detailed session diagnostics to assist in resolving end user issues. Trip Ticks, Commander, and REALSession use the NW (Network Wizard) database to store information regarding the current hardware inventory.

ShipTrack is a new application that monitors the specific location of a shipment through GPS (Global Positioning System) technology. FreightCalc monitors the current weight of a shipment in order to optimize routing and fuel costs.

SMI uses UCL (Universal Code Logic) as common services programming in several applications. Trip Ticks uses UCL for licensing and registering the SMF (System Management Facility) exit (end of processing) by generating SMF records. A problem had occurred in Network Wizard Release 3.0 whereby SMF records were not being generated. This was corrected by adding a Service Pack 5A. The new UCL code provided by Service Pack 5A was included in Release 4.0 of the Network Wizard. Commander and REALSession do not use UCL.

Roadmaster Express is a leading transporter of commercial, retail and industrial freight. In addition to the U.S, Canada, and Central America, Roadmaster is active in more than 150 countries worldwide. The company purchased ShipTrack and FreightCalc from SMI two years ago and have been pleased with SMI's commitment to quality and customer service.

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Roadmaster purchased the Network Wizard software from SMI in order to acquire a comprehensive network management tool to be used throughout their worldwide operations. They have used the Network Wizard application for about six months. Roadmaster has three data centers, one for each region. The data centers are located in Singapore, London, and Chicago. Each data center has the same configuration of applications executing on each server. This provides the ability to quickly reroute data if one of the data centers goes off-line.

The Network Wizard servers were purchased from Hardware Is Us, based in Windsor, a London suburb. The London servers (production and test) were transported by truck and the servers for Singapore and Chicago were transported by air. Hardware Is Us issued a recall in December for servers that were shipped by truck. They had received some reports of damage to the hardware memory board caused by vibration during truck transport. If the memory board has a bad contact, high CPU utilization is detected immediately when the server is booted up.

Network Wizard is configured for customer issues to be entered via the Internet into the TSR (Technical Support Representative) software package. Recently, the following trouble ticket was opened:

Details	Description	Comment
February 7 2:00 PM – Ticket opened – N0207126	FGreen HSS Team	All of a sudden, the Network Wizard server is using significantly more CPU. Our NMS (Network Monitoring System) report is showing that the application is using 3 times more CPU than it had used previously. No other applications have been impacted yet, but if it gets much higher, I am concerned that other jobs on that same server will fail.

The high CPU utilization has been detected on the Network Wizard servers in all three data centers; other servers are processing normally. Last year the Network Wizard servers had high CPU utilization because of the types of applications that were running on the servers. The technical support group moved two applications from the Network Wizard server to the Point Blank server. This appeared to solve the problem. Applications still running on the Network Wizard server include ShipTrack and FreightCalc.

You are the lead Customer Support Representative for Network Wizard at SMI and have been assigned the responsibility of resolving this issue.

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Systems Management International – NWWZ TSR Screen Print					
Service Request #	N0207126	Account (Region)		Roadmaster Express	
Severity	1 – Serious	Support Plan		Standard	
Status/Sub-status	Open	Contact Person		Bobby Cifarelli	
Release	R 3.1	Contact			
Component	Network Wizard	Created (Source)	February 7 2:00 PM (Internet)		
Issue Type	System Impact	Created By	Fran Green	Ticket Owner	Dale Desai
Abstract	Network Wizard is using excessive system resources				
Description	Network Wizard is causing high CPU utilization.				
Related Knowledge Base					
Service Pack/Fixes Sent	Service Pack 5A				

Details	Description	Comment
February 7 2:00 PM – Ticket opened – N0207126	FGreen HSS Team	All of a sudden, the Network Wizard server is using significantly more CPU. Our NMS (Network Monitoring System) report is showing that the application is using 3 times more CPU than it had used previously. No other applications have been impacted yet, but if it gets much higher, I am concerned that other jobs on that same server will fail.
February 7 3:00 PM	DDesai Technical Support	What applications are running on your Network Wizard server?
February 7 3:15 PM	FGreen HSS Team	Network Wizard, ShipTrack, and FreightCalc. However, according to our NMS (Network Management System) report we are only seeing the high CPU utilization on the Network Wizard application.
February 7 4:00 PM	DDesai Technical Support	What version of the Network Wizard are you using? When did you first notice this problem?
February 7 5:00 PM	FGreen HSS Team	We are using Network Wizard 4.0. We upgraded from Network Wizard 3.0 at the beginning of January. We notice high CPU utilization on the TCP/IP stack as soon as the Network Wizard is started up each morning.

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Details	Description	Comment
February 7 5:30 PM	DDesai Technical Support	Does the CPU utilzation fluctuate or does it remain high? What date did you first notice this problem?
February 10 8:00 AM	FGreen HSS Team	The CPU peaks at 90% utilization about 60 seconds after the application is started up. It remains at about the same level throughout the day. I believe it was around January 8.
February 10 10:00 AM	DDesai Technical Support	What operating system are you using? Have you contacted your hardware provider regarding this issue?
February 10 11:30 AM	FGreen HSS Team	We are on Z/OS 12.4. We upgraded all 3 data centers from Z/OS 12.3 in the beginning of December. We contacted the hardware provider. They believe that there is some code in the Network Wizard that is not releasing storage space once the logic has been processed. Since we don't have the code for the Network Wizard, we need you to check that out.
February 10 1:00 PM	DDesai Technical Support	No other companies have reported this problem to us. I will need to research this issue. I will get back to you within 2 or 3 days.
February 13 9:00 AM	DDesai Technical Support	I have a few more questions for you. What updates (other than the Network Wizard upgrade) were done in late December or early January? Are you using any of the Network Wizard agents?
February 14 8:00 AM	FGreen HSS Team	We are using the agents 'Trip Ticks', 'Commander' and 'REAL Session'. As you know, all 3 of these applications run throughout the day. When we temporarily stop 'Trip Ticks', this problem seems to go away. We don't notice any difference when 'Commander' or 'REAL Session' are stopped. The only update we did in early January was to upgrade to Network Wizard release 4.0. We did not apply all of the Service Packs, as we were going to the new release anyway. We have a test server in our Singapore data center with version 3.0 of Network Wizard installed. We are not seeing this problem on the test server.
February 14 9:00 AM	DDesai Technical Support	I recommend that you stop and start the NW database. I believe this will correct the problem of high CPU utilization.
February 14 11:00 AM	FGreen HSS Team	We stopped and started the database. It did not lower the CPU significantly.
February 17 9:30 AM	DDesai Technical Support	I checked with our Premium Support group. If your connectivity monitoring screen is not configured properly, it can cause high CPU utilization when using Network Wizard. You need to verify the settings on your configuration monitoring screen.
February 18 1:00 PM	FGreen HSS Team	We updated our settings in late September. I will verify that no other changes have been made later this afternoon. We really need to resolve this issue. What can we do next?

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