## 

The art of problem solving

Starting out

CSS Business & Culture Foundations

“Our mission is to empower every person and every organization on the planet to achieve more.”

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Participant Guide

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# About this module

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| Icon for module audience | This CSS Business & Culture Foundations curriculum was created for all new support engineers. It is expected that participants have already completed the Welcome to CSS Business & Culture Foundations program and all the preceding modules in Starting Out before starting this module. | | |
| Icon for module time duration | It will take approximately 2 hours and 30 minutes to train engineers.   * The art of problem solving: 145 minutes * What next: 5 minutes | | |
| Icon for module description | In this module, we will look at a few troubleshooting techniques. | | |
| Icon for module objectives | After this course/module you will be able to:   * Apply the elements of troubleshooting while working on an issue. * Recognize the dangers of anchoring and its impact on troubleshooting. * Share a hypothesis and develop an action plan. * Practice effective techniques to talk and collect information such as the matrix, and problem restatement. * Summarize the processes, tools, communication techniques and documentation skills that you learned in this module. | | |
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|  | Icons are used throughout this guide to direct you to types of information: | | |
| Icon for the time a lesson or activity will take | The time a lesson or exercise will take. | Icon for individual activity | An individual exercise. |
| Icon for resource lookup information | Resource lookup information. | Icon for an activity for teams | An exercise for teams (VILT) or groups (classroom). |
| Icon for additional note information | Additional note information. | Icon for a class activity | A class exercise. |

# Introduction

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# The art of problem solving

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| Icon for the time a lesson or activity will take | The time to complete this lesson, including exercises, is 140 minutes. |
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| Icon for learning objectives | After this lesson you will be able to:   * Apply the elements of troubleshooting while working on an issue. * Recognize the dangers of anchoring and its impact on troubleshooting. * Share a hypothesis and develop an action plan. * Practice effective techniques to talk and collect information such as the matrix, and problem restatement. |
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## Overview

This lesson introduces you to a few techniques that can be used to talk and collect information from customers and also helps you to discuss essential elements of effective troubleshooting.

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## The six troubleshooting steps

1. State the problem.
2. Specify the problem.
3. Develop possible causes from knowledge and experiences or distinctions and changes.
4. Test possible causes against the specification
5. Determine the most probable cause.
6. Verify assumptions, observe, experiment, or try a fix and monitor.

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| Icon for resource lookup information | **Important:** Probable cause is not the same as root cause analysis! Do not share your "educated guess" about root cause analysis with the customer. Performing root cause analysis is a special type of service request and is not available to all customers. For more information about root cause analysis, read this article, [Procedure: Root Cause Analysis](https://internal.support.services.microsoft.com/en-us/help/4456525). |

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### 2.8.1 Exercise: Review the steps

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| Icon for an activity for teams | Team or group exercise. Duration 15 minutes: 10 minutes to think about and answer the questions, another 5 minutes to discuss the results. Type your responses in below. |
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1. Meet with your team and discuss the questions from your participant guide.
2. Mark your answers in the participant guide and also note any questions you may have.
3. You will be given 5 minutes to discuss the questions.

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| 1. What would “Specify the problem” entail? | |
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| 2. Why is it necessary to develop multiple causes from knowledge and experience? | |
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| 3. How can we test possible causes against the hypothesis? | |
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## The W matrix

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| What |  |  |  |  |
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| Who |  |  |  |  |
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**IS having problems column**

* **What:** Describe the problem. What (machine/component) is experiencing the problem? What is not working fine? What is impacted or affected?
* **Where** is the problem occurring?
* **When** did the problem begin occurring?
* **Who**. And finally, who is experiencing (mails, users, profiles) the problem or who is being impacted by the problem?

**IS NOT having problems column**

* **What** is not the problem? / What is not experiencing the issue? / What is working fine? / What is not impacted or affected?
* **Where** is the issue not occurring? Which machine or server is unaffected though it is in the same cluster or using the same network?
* **When** was the issue not occurring? When did the component, feature, service, or product work the last time without any issue?
* **Who** is not impacted by the issue? Who (mails, users, profiles) is not impacted or affected?

**Difference column**

Now we begin to compare the working and non-working elements.

So, what’s the **difference** between the working and non-working elements. It could be machines, hardware, application running on the machine, OS, permissions, certificates, network, network routes, location etc.

**Changes column**

* **What** is the change? (Updates, software updates, upgrades, installation, migration, deployments etc.)
* **Where** were changes made? Were any changes made to the working or non-working elements?
* **When**. If there was any change, when was the change made?

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| Icon for resource lookup information | Note: VILT version is first item |

### 2.8.2 Classroom Delivery Exercise: Use the matrix

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| Icon for an activity for teams | Team exercise. Duration: 50 minutes: 35 minutes for the team, 15 minutes for the wrap-up. |

Find a place with your group to discuss the exercise.

Choose one of the scenarios listed below.

1. Use the W matrix to collect the information and think about the situation. Think about questions that you would ask the customer.
2. Not every field needs to be completed. There should be at least one item in each column, but not in every cell.

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|  | IS | IS NOT | Differences | Changes |
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1. Create a hypothesis and an action plan. The action plan does not have to be detailed. It only needs to contain the next step or action that the SE is going to take to test the hypothesis.

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| Hypothesis: |
| Action plan: |

1. If you have time, follow the same steps for a second problem. The goal is to apply the tools to several different problems.
2. When you are finished, when directed by the facilitator, copy the matrices and plans you've come up with into an email and send them to the facilitator.
3. Discuss your matrices and plans with the class.

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**Problem 1**

It’s a hot day and you drive your car to work and park. When you return to the car in the afternoon you notice there is a pool of liquid on the floor just under the engine compartment. What could be the problem?

The car is fairly new and been serviced a while back. You hadn’t noticed the issue yesterday but it had been cool, windy, and raining, so you may not have seen it.

**Problem 2**

You get home to find the power is off. The rest of the neighborhood is OK and the street lights are on. You try the circuit breaker and power comes back on.

You have an office attached to the house. When you moved in you installed an Uninterruptable Power Supply (UPS) to look after your server in the home office and it doesn’t appear to have been affected by the outage. You notice the same issue a few times over the next few weeks and months. All happening at random times of the day. You have the consumer unit/fuse box changed out and an electrician tell you he can’t find a fault? The new consumer unit/fuse box allows you isolate parts of the house by separate circuit breaker.

How would you troubleshoot and what’s the problem?

**Problem 3**

You have a customer with a performance issue. Three of their servers in the same datacenter are sluggish to respond to users requests. They haven’t noticed the problems before but the datacenter is fairly new. Most of the servers in the datacenter had been moved from an older datacenter.

The customer Disaster Recovery (DR) site has identical setup and working fine.

What’s the problem?

**Problem 4**

A customer has two datacenters with two different support staff in each. There is a standard company build used to furnish both datacenters but support staff in datacenter A are complaining of issues which they believe are bug related. Datacenter B are not complaining about any issues. It’s affecting around 20 servers so far but another 100 servers in the datacenter are OK.

What’s the issue in datacenter A and why isn’t it seen in datacenter B?

## Problem restatement

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### 2.8.3 Exercise: Problem restatement

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| Icon for a class activity | Class exercise. Duration 10 minutes |

1. Review this scenario: A 24x7 systems management center shows an alarm indicating the backup software for its Intel servers has a failure at one of the remote sites that it backs up each evening.
2. Make a list of the items within this statement about which you need more clarity. In other words, items or words that could be interpreted or understood differently.
3. Discuss your list with the class.

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| List the items that need more clarification: | |
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### 2.8.4 Exercise: Clarifying questions

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| Icon for an activity for teams | Team or group exercise. Duration 15 minutes for the team, 15 minutes for the wrap-up. |

1. Meet up with your team.
2. Spend fifteen minutes to come up with questions. Come up with a list of questions to clarify the list of items you have identified in the problem statement.
3. During the discussion, your team will be asked to read out some of your clarifying questions.

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| **Answer:** | |

# What next?

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| Icon for the time a lesson or activity will take | The time to complete this lesson, including exercises, is 5 minutes. |
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| Icon for learning objectives | After this lesson you will be able to:   * Summarize the processes, tools, communication techniques and documentation skills that you learned in this module. |

## Overview

In this lesson, we talk about things you can do to continue to increase your skill in troubleshooting cases.

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Think about these four categories: tools, process, documentation, and communication. What have you learned in each category?

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