**Professional Codes of Ethics to improve decision-making between Moral Dilemmas and solutions in the Field of:**

# Network Engineering (Computer Networks)

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# Requirements

Ideally, being a network engineer, having a bachelor's' degree in computer science or some other focus closely related to computer science such as programming or software engineering, would be preferred, at minimum. Network engineering works heavily with the concept of computer networks, whether that be across a large network infrastructure, like at a university, or across a smaller space, for example a single household or neighborhood.

From experience, particular skills would greatly benefit one to characterize when having a career as a network engineer. One important skill to have are analytical skills, because when working with a complex network of computers, there are many possible areas when one flaw within the system can cause the whole system to fail. But then also with such a complex yet flexible system that can be implemented in a variety of ways, there is also a lot of room for improvement through the network, so having a good hand on one's analytical skills, is very valuable when working as a network engineer.

Another skill that is very important to have as a network engineer is being able to understand the importance and value of teamwork. A computer network consist of many areas that greatly vary from one another. The variation is so great that each area of the network can be become its own specialty or focus in a network engineer's career; for example, monitoring systems, wireless connections, or being in charge of the architecture of the entire network's infrastructure.

# Shouldn’t Define a Book by Its Cover

| Problem | Action to take | Code/Clause # |
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| Like in most engineering fields, in the career area of network engineering, it is male dominant field. So in such an area, one may run into the issue of being discriminated by who does not identify as male or in particular, a white male.<br>For example, from personal experience, women in such a field may be looked at as inferior, less knowledgeable in what they are doing , or delicate for any labor-intense work that may come with the job, such as lifting or installing pieces of equipment required for the network.<br>States of unconscious bias could occur, towards women, other gender defined individuals, people who come from different backgrounds that others may not fully truly understand, or any other variations. | Action that can be taken to prevent this issue, could be to have people aware of their unconscious bias towards individuals who identify as non-white males and who may also come from different backgrounds as you.<br>Having people aware of their unconscious bias, can have them rethink about what they say and do as their initial reaction to others, making their aware of their unconsciousness.<br>Another action that can be taken to prevent this problem is to have employees understand the toxic work environment that can be created due to discrimination. Possibly have training sessions including a presentation about the actions, signs, and outcomes that could occur because of discrimination towards others, and how it would lead to toxic work environment and also degrade one’s personal being from being discriminated. | The related clause 1.4 from the ACM Code of Ethics of “be[ing] fair and tak[ing] action not to discriminate” relates the best to such a moral dilemma. |

# It is all about the Money

| Problem | Action to take | Code/Clause # |
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| Money. Many problems can arise just because of the regulations and power of money. In network engineering, a moral dilemma that can happen because of the power of money, is that there is a shortage of networking equipment that is need for the field, or a lack of proper networking equipment needed based on the fact that a department can't afford to purchase or maintain such a piece or pieces of needed equipment. Unfortunately, in the network engineering field, it all come down to money. | Actions that can be taken, is that recycling old pieces of equipment may be the way to go. It may not be the latest piece of technology to use out in the field for the particular job it needs to do, but when supplies and funds are low, such action might just have to be done, and get the job done. Fortunately, a network engineer can hopefully find a piece of equipment that can be configured to do what it needs to do, similar to the actually piece of equipment that was suppose to put into place and to use, but couldn't be obtained. Such equipment can either come from past projects that are not being used, reclaimed from a past building refresh, or simply just randomly lying around the workplace or storage space that is not being used for whatever reason that it exists in the first place.<br>The other action that could been done is just to accept the fact that much else cannot be done without doing something that shouldn't or simply just cannot be done. Just wait till such a department or company comes across more money that can be spent on such needed piece or pieces of equipment. | The related clause 2.1 from the ACM Code of Ethics of "striv[ing] to achiev[ing] the highest quality, effectiveness and dignity in both the process and products of professional work" relates the best to such a moral dilemma. |

# Valid Reasoning

| Problem | Action to take | Code/Clause # |
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| When writing code for a piece equipment or for a functional part of the computer network overall, there is a lot of flexibility and varying reasonings that can occured. Such things that are done, may not come from a credible or legal source in the purpose of doing something to get one's work done. Cheating may occur or plagiarism. Even moral or ethical issues might happen also in order to get a certain task completed. One may not seem professionally competent that they actually are. | Being honest, ethical, and moral as an individual and employee of a company is what should be understood in any job, which also related to being a network engineer. In order to prevent this issue, starts with the engineering themselves. Being honest to yourself is where it all begins, starting at the root of the problem. And then also having peer reviews of code that has been written or any work that has been done by others can also be done in order to prevent or even solve this issue. Being a professional when being a network engineer is important not only has it being one job and career in the industry, but as to one's self, have to be true and honest to yourself, especially if that follows closely to your belief and morals. | The related clause 2.2 from the ACM Code of Ethics of "acquir[ing] and maintain[ing] professional competence" relates the best to such a moral dilemma. |

# Yes But...

| Problem | Action to take | Code/Clause # |
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| Being a network engineer, writing code for pieces of equipment or the system virtually, is required. When asking other to review one's code should be greatly considered, but some may be rude about and ask in not a so nice way for a peer review.<br>And then there is also the other hand, where one may not be nice accepting to the fact of their review which may consist of some criticism of what they wrote, mainly being the point to critique one's work and not to be personally against the person of the work originates from.<br>And then also when reviewing another person's work, some people may not be nice or honest in their reviews to others because of being lazy or just want to get something else with more importance in their mind completed. | Action that can be done to solve this issue, is to have a layout what peer reviewers should or can comment on in regards to one's code, and how critical review in important when it comes to looking over one's configuration, but being appropriate in their response is important.<br>And then also on the flip side, have an outline explaining what employees have to layout when asking for a peer review, with also being professional about it. Such an outline can include what and how a person who wants their code to be review such do and include in their request, without being rude or coming off unfriendly about it, in order to have a not so stressful work environment overall. | The related clause 2.4 from the ACM Code of Ethics of "accept[ing] and provid[ing] appropriate professional review" relates the best to such a moral dilemma. |

# Risky Business

| Problem | Action to take | Code/Clause # |
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| Especially when it comes to installing, upgrading, or reorganizing actually hardware pieces of equipment in any given location, there many physical risks involved, along with network and service risks for the infrastructure or customers and department(s) that can also be affected.<br>There are also the risks involved with not using the proper equipment needed for a particular job or task in question.<br>Some individuals when working in the area of network engineering, don't fully understand or even aware what can happen if these risks actually come into play realistically. There is a lack of unknowing or the great potential of risks, or even the lack of caring in order just to get a job or task done. Sometimes the things that don't seem very important, are actually very important and critical to consider and bring great awareness to. | Action that can be taken to reduce the lack of awareness or caring about the great importance of risk in a job, such as in network engineering, is to plan and brainstorming beforehand when an individual or group of people are about or plan to do something that involves the great amount of potential dangerous in order to do, or has possibly even cause a harm to others in the past, or has even created a handful or possibly even just one near-miss, that should not be ignore, in which it can lead to a greater accident out in the field, that can physically harm someone or break down a part of the entirety of the network in production. | The related clause 2.5 from the ACM Code of Ethics of "giv[ing] comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks" relates the best to such a moral dilemma. |

# “Hi, My Name is …”

| Problem | Action to take | Code/Clause # |
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| Some network engineers may keep certain concepts and information from their customers or the public in general, even if they are a part and/or using their equipment and services for any reason. This may be because to might just simply be too complicated to explain to someone, the network engineer may think such information secretive in general, or possibly they just simply forgot to fully inform a customer about what they have been given to use and be part.<br>A lack of provided information can cause a great amount of issues or more work of employees and others than needed, or could have needed, from the beginning. | The action of having a set procedure that would hopefully greatly help insure the needed information and more has been given to a customer and availability for anyone else that would be a part of the system, or at least should and needs to know about otherwise. And then also informing the customer in what they need to know as soon as the problem arise is key also.<br>Being professional and honest as much one can be and respectful to customers a network engineer could be working for no matter how that may seem to you legally. Explaining nicely to the customer of what they should expect, given, using with unknown pieces of equipment that is their and controls the functionality of what they are using.<br>Such actions can help prevent and/or solve such an issue. | The related clause 2.7 from the ACM Code of Ethics of “improv[ing] public understanding of computing and its consequences” relates the best to such a moral dilemma. |

# Identity Confirmed. Proceed.

| Problem | Action to take | Code/Clause # |
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| Working with an entire computer network infrastructure, allows for some employees to have a lot of power and be granted a high level of access to levels of delicate, critical, and private information of a customer, department, or even the company, that shouldn't be place in the wrong hands, or be exposed as general knowledge across a company.<br>Certain employees may not respect such a privilege and may seek to be given and granted more than what they have access to currently, providing more power, having more power than can get within the company and what they can control in general across a computer network system. | As a network engineer working in the industry, being aware and respectful of access granted based on career level or position within a company or organization is crucial, especially when it comes to preventing issues and problem explained before. Being able to understand the importance of different level of access granted professionally, is key on the individual level, which then leads to the overall structure of the company and security of the customers, company, and network information in general. | The related clause 2.8 from the ACM Code of Ethics of "access[ing] computing and communication resources only when authorized to do so" relates the best to such a moral dilemma. |

# Work, Work, Work, Work, Work

| Problem | Action to take | Code/Clause # |
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| When working in the department of network engineering, there are many projects that are heavily time-sensitive or also have deadlines that have to be met.<br>Some employees may decide to work overtime in order to complete or continue on with a certain project. But then there is also the possibility of employees being overworked due to the need for more bodies and minds for a project, even though some employee may not want to work the extra time, or had plans that now they have to cancel or reschedule because of work. Overworking employee can lead to unhealthy relationships or less motivated employees performance in the workplace, leading to a toxic work environment overall. | Action that can be taken to reduce this issue is to set limit on the amount of work hours any given employee is allowed to work for.<br>And then also having a set of employees rotate every week or so when they are on the clock for who may have to work those overtime hours for a particular project in order to reduce frustration among employees, because then, they would know ahead of time that they have the potential to work during that given time that necessarily be during business hours. Also on top of that, employees can also choose to work during that certain time if that want to, lessening workloads or covering someone else if needed also, leading to a more friendly and positive work environment in the end. | The related clause 3.2 from the ACM Code of Ethics of "manag[ing] personnel and resources to design and build information systems that enhance the quality of working life" relates the best to such a moral dilemma. |

Working in the industry of networking engineering, such a structure may not be always closely monitored, or not many individuals may be required to constantly oversee a certain part of the network. In other words, such a setup would make it for that single individual or small group of people, to get away with something that would be against the rules or set procedures that are in place of the profession. Such illicit activity might be done in order to benefit a customer, or possibly to harm a customer and their device or set(s) of equipment, being a part of the network's infrastructure. For example, someone may decide to program a system to not perform a certain task that a customer has right to, but in order to benefit either one's self or the overall layout and workings of a network, such illicit action could most likely be done in order to achieve such an outcome.

In the case where such illicit activity could have been done to harm a certain individual or department, revenge out of anger and disappointment may be done. Either to make all situations in the industry fair and/or be mainly out of revenge, the act of whistleblowing may come into play.

Consequences of such actions can result into some very detrimental career results. Less harmful being losing one's current job title or even position, which can be then carried on to degrading one's career reputation for future employers and/or co-workers, or simply just one's career name to others and not necessary being employers or co-workers, which could even then be turned into a legal matter.

# Whistle-blowing

The workable ethical theory that governs the most of the moral decision making for the majority of the eight dilemmas that I have explained, would have to be virtue. Virtue describes that it was the right thing to do, and doing good was at the best level at it could've been done at the time.

Overall, a certain thing that has to or should be done in order to solve an issue that may be cause for the good or the bad, is best described by the ethical theory of virtue.

Some ways may be easier to follow, taking shortcuts, and not following procedures that have been set in place in order to get a certain job or task done. But at times such longer methods are needed, because of money, deadlines, and/or quality required to be met.

So the concept of things needing to be done because it is the right thing to do, being the best that it can be at, best describes the idea of things should be done a certain way of a company where a network engineer works, the area of network engineering, which is virtue.

Virtue, in order to prevent overworked employees, misassigned granted access, under informed customers, increasing risks, unprofressional reviews, unthoughtout reasonings, problems with money, and discrimination across any company or business for any profession is a part, being in this case of network engineering, is a part of the solution.

# Moral Dilemmas governed by ethical theory