FHICT – Seclab improvment and research

A project meant to create a dashboard and orchestration method for the Seclab environment used by the Fontys university. This system is used by students to access school hosted VMs.

Created by: Vlad
Created on: September 10, 2020 12:21 PM
Changed on: September 11, 2020 8:44 AM

Technology Impact Cycle Tool

FHICT – Seclab improvment and research

Impact on society
What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?
It is trying to solve the problem of sharing information about the state of the Seclab environment used by the Fontys University and make it more manageable through an interactable dashboard. Also, it automates the deployment of the VM rollout, permission management and access rights.

Are you sure that this technology is solving the RIGHT problem?
This technology is requested by the shareholders of the project and is meant to give the users better access to the data and status of the environment.

How is this technology going to solve the problem?
This technology is going to visualize the status of the environment and also give quick access to the users to their and the environment's data. This will help network managers to better understand and solve the problems of the network and will help the students better understand the way they are impacting the environment and how it works. Making it an open disclosure project. In addition, we will make it easier to have an overview of having a better outlook of the change management.

What negative effects do you expect from this technology?
This technology if not properly implemented might give access to malicious actors into data of the network that may reveal limitations or ways to exploit. As a result, they could manipulate the network data and influence the activity of the administrators or users. The automatic rollout of VMs can be a nice solution but also a possible problem if not properly implemented as it could give access to third parties that have access to it to deploy elements in the environment that exploit it or its users. The VPN could be Buggy and just inhibit the activities of the users.

In what way is this technology contributing to a world you want to live in?
This technology, the dashboard, would improve the understanding the students have of the platform. Second, the orchestration solution will help with a better management of the environment giving better control to the administrators over the different environments. Moreover, with the addition of orchestration container technologies can be added.

Now that you have thought hard about the impact of this technology

on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.
I would like to make it secure, accessible, and well compartmentalized so as to not affect and put the current system at risk of attack/abuse easily or using it without the proper permissions.

Hateful and criminal actors
What can bad actors do with your technology?

In which way can the technology be used to break the law or avoid the consequences of breaking the law?
In this case, the platform and technologies that we will be using could be used by students to prank, break or influence their rights inside the system. This would constitute breaking the rules of the University. In a worse situation, the access to the system may grant the abuser access to the emails of students or teachers and their credentials. Which in turn can be used for phishing and other malicious activities.

Can fakers, thieves or scammers abuse the technology?
Yes. if not properly implemented the information about the use of one student of their project can be copied, deleted, or judged by other students without their consent. As such the dashboard should be secure. On the other hand, the orchestration could be used to deploy additional resources for others that may badly influence them or the system itself.

Can the technology be used against certain (ethnic) groups or (social) classes?
Definitely the dashboard has access to the activity of the whole environment and that of the machines the individuals are using. As such this data can be used for individuals to judge and bully each other on the quality of their work. Also, if the information inside the system is going to be in Dutch this may seem discriminatory towards the English stream students and teachers.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.
The orchestration solution can be altered by anyone who has access to it to seem like it was used by someone else credentials. The system might also be DDOSed by users on a username basis.

How could bad actors use this technology to subvert or attack the truth?
They could use it to gain the information they are not supposed to from this system. They could also influence the traffic and influence the decisions of the users and administrators.

Now that you have thought hard about how bad actors can impact this

technology, what improvements would you like to make? List them below.

I would try to make it hard to use other people's credentials to use this technology. I would also make the dashboard implement proper authentification probably through the I-account system of the University.

Privacy

Are you considering the privacy & personal data of the users of your technology?

Does the technology register personal data? If yes, what personal data?

Not really, it monitors the data of the entire environment and the machines that the user is using. Therefore the dashboard is meant to be an open disclosure tool. The orchestration tool is meant to be used only by managers as such it does have to preserve the data they produce so if that data and credentials are leaked this could lead to more major problems.

Do you think the technology invades the privacy of the stakeholders? If yes, in what way?

It could be said that the machines deployed by the users should not be shared with everyone as they can give insight into what others are working on or maybe can be used to copy from their work.

Is the technology is compliant with prevailing privacy and data protection law? Can you indicate why?

Seeing that the data is the Universities property and it is their right to display and control the data used inside their private network if they comply with displaying it then it is lawful. Also if they want to make the orchestration process/ API code available then it is acceptable for people to have access to it. As the code can only be executed with the proper credentials.

Does the technology mitigate privacy and data protection risks/ concerns (privacy by design)? Please indicate how.

Not applicable for our project .

In which way can you imagine a future impact of the collection of personal data?

It can be used by the University to limit or control the use of certain students on the environment and this may lead to bans based on unethical or unsupervised use of the system that affects the rest of the University.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

I would try to make sure that the data is not being collected and only displayed.

Human values
How does the technology affect your human values?

How is the identity of the (intended) users affected by the technology?
Real-world identity is not affected in this project. No belief or view is pushed onto the users of this project.
However, one could argue that the 'online'-identity will be altered by anonymizing the data since every user has their own username, only known to the specific user and network administrators.

How does the technology influence the users' autonomy?
It does not apply to this technology. Users are free to use the technology, as long as it's in the rules of the global organization. So the technology itself does not force decisions upon users. If users are not satisfied with the technology they are free to use another one

What is the effect of the technology on the health and/or well-being of users?
It does not apply to this technology. The technology is not manipulative, distracting, frightening or can cause pain and injuries

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.
It does not apply to this technology. Since this tool does not affect human values, no improvements can be made on the impact on human values

Stakeholders
Have you considered all stakeholders?

This category is only partial filled.

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder
Donovan van Hout

How is this stakeholder affected?
Network Manager

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Stefan Beekwilder

How is this stakeholder affected?
Network Manager

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Casper Schellekens

How is this stakeholder affected?
He is the one in charge of the project from the school perspective. Our educational contact.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?

Yes

Name of the stakeholder
Miss Wolden-Kea

How is this stakeholder affected?
She is the team lead of the infrastructure and IT head . She can easily visualize the state of the network.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Students

How is this stakeholder affected?
They are the main users of the system.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Stephan Vreijsen

How is this stakeholder affected?
Mentor for the group

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Cyber security teachers

How is this stakeholder affected?

They need to understand the way it works to explain it to the students

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?
-

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.
I would consult all of them and make sure they are well aware of the state of the project

Technology Impact Cycle Tool

FHICT - Seclab improvment and research

Data
Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?
At this point, the limitations of data are if we aren't able to get the data from the entire seclab-system and all the VM's that are running. But we can only know this for sure once researching/testing statistical outputs.

How does the technology organize continuous improvement when it comes to the use of data?
The technology uses creates insight on the use of the system resources by gathering that data, this data is then displayed.
The data gathering should be passive and thus have low impact on the thing being measured.

How will the technology keep the insights that it identifies with data sustainable over time?
The main function is to display the current status of the seclab-system use. This statistical data may be summarized and stored,
this way the users can gain more insight on system use over time. For example, system data is gathered every minute is then summarized as every hour. This way a day is 24 data entries instead of 1440.

In what way do you consider the fact that data is collected from the users?
The data is collected from the machines hosted by Fontys and users are borrowing access to these machines.
The data collected while the users are using them is the property of the University.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.
I would make sure that the dashboard and the orchestration system are separated and that the data can be used for insights in the future. We also make sure that we only store and filter the data that is used for the dashboard and verify that we don't keep unuseful data with the potential to be harmful.

Inclusivity
Is your technology fair for everyone?

Will everyone have access to the technology?
Only the users that have access to Seclab and possibly need acces to it will have it. This access should be granted by the administrators.

Does this technology have a built-in bias?
Yes, by design it is used for monitoring and the Administrators are the ones that decide which students need this to use. But it is not biased based on gender, societal role, or ethnicity but rather on system permissions. Additionally, there can be a cyber security student bias as they are the most likely to affect the system negatively. Finally, there is a data bias toward useful data.

Does this technology make automatic decisions and how do you account for them?
It is not a technology that makes decisions but a technology that is used to make decisions. As such the both platforms are going.

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?
The ones that are benefiting are the students that need information on the network activities and the administrators to better understand how the system is being used and to make decisions based on that.

Does the team that creates the technology represent the diversity of our society?
yes I assume we try to make the application usable by everyone .

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.
We can stick to the original plan.

Technology Impact Cycle Tool

FHICT - Seclab improvment and research

Transparency
Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?
Students are first told about the Seclab at the beginning of the Cyber Security specialization.
They are told that everything is monitored multiple times. Also when you are connected through the VPN.
Our to be developed technology will be explained in a similar way, and might even have the source code available to students.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?
This techonolgy affects the users that need acces to it the administrators have accees to the source code and the orchestration code therefore it is fully transperent to the main users and to the others it does not need to be transperent on the contrary.

Is it possible to file a complaint or ask questions/get answers about this technology?
Yes. The current situation is through Teams/email to the system administrators.
The stakeholders have however requested this system to be updated and be made more accessible to students/employees. This would most likely involve an application where you can create support tickets and keep track of them.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?
No. And it can not yet be explained.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.
Adding the dashboard will add the needed transparency.

Sustainability

Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?
This does not affect the environment. All energy used is electrical and most likely green based.

Do you think alternative materials could have been considered in the technology?
Outside of the scope of the technology

Do you think the lifespan of the technology is realistic?
It has a lifetime of 3 to 5 years.

What is the hidden impact of the technology in the whole chain?
It affects only Fontys.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.
This is not an important objective for this technology since it is solely software based.

Technology Impact Cycle Tool

FHICT - Seclab improvment and research

Future
Did you consider future impact?

What could possibly happen with this technology in the future?
The dashboard is meant to be used by future students to help them understand the system better and for the administrators to fully be able to improve it.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.
The technology that we build will help Fontys have everything well documented and make informed decisions based on the information that we are using. It will also help the administrators to improve Seclab.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.
The system will not be used and our work will be useless.

Would you like to live in one of this scenario's? Why? Why not?
Yes, in the one where the technology is used. Since by using the technology it helps the administrators to improve Seclab.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?
Then, as the property of Fontys, it will need to follow the standards set by Fontys.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.
Make sure that the technology is easy to build upon and gives insights in time.