

Usability test report of Openconnect VPN testing

The usability test was taken during developer conference in Brno, Devconf 2016. The testing took around 11 hours, with participation of 20 potential users of Openconnect VPN plugin. Each tester had been tested 10-15 minutes.

TASK #1

Content

Task #1 had two parts. First one was:

You are at home and you want to connect to an external network. You want to give a try to the GNOME openconnect VPN plugin, which you have never tried before. (Have you?)

To connect to the network you know this:

- the server name is devconf.nohats.ca:4443
- your user name is vpntest1
- your password is vpntest1

The second part of TASK#1 was showed to participant after finishing the first part:

Delete the connection.

General information

Number of participants	20	100%
Successful completion without any help	5/20	25%
Successful completion with help (help was offered to be able to continue with testing and have more opinions about whole functionality, but actually these users wouldn't be able to finish the task)	14/20	70%
Unsuccessful completion	1/20	5%

Conclusion

The reason of failing the task was that users in the beginning had been choosing OpenVPN instead of Openconnect. Without noticing any differences.

Another reason of failing task#1 was usually that users didn't know that field Gateway is for server address. They were confused by IPv4 field named "Server".

An another confusion came in part when they had to add a new connection → *click on "Add" button* → turn on the connection → *insert user name* → *insert password*. The majority of participants were expecting some text box, for setting up the user name and the password, in the same screen where are they inserting a server address.

There were more confusing moments for users, more about it in the part Concrete steps of this usability test report.

Recommendations

Their should be an website/page on the internet about this VPN connection with the information and steps how to connect correctly. Also except the information about VPN plugin there should be a clue, for users who are using Fedora, about where you can find the VPN at all. So that means something like: Settings → Network → there you are.

To help to users we should think about how we can change the position of two buttons with signs + and -, which are situated in left down corner of Network window. The current position is problematic and

unusual. There is a possibility that we would have hire number of content users if these buttons would be placed directly below the last feature on the left. Then we should think about how to work with this if there would be more connections, to be sure, that Add new connection button is always visible. To delete the connection could be realized easily with an cros “x” sign, as interactive small button situated on the right top of each connection. For example. Also we should consider other solutions of this interface, if there is already another interface behavior which fedora is using.

The name Cisco AnyConnect compatible VPN (openconnect) is too long. You should agree in much shorter name which can have subtitle or added information which can be longer. The main title should be short and not similar to already existing titles.

The word “Gateway” should be replaced by the words “Server address” or “Server”, because users are trying to insert a server address into that box. They are more confused by the ambiguity → Server = Gateway. Also IPv4 part of interface has text box named “Server” and that confuses user even more. Because of that we should distinguish users who are going to use Identity, when they are going to use IPv4 or IPv6. If the IPv4 and IPv6 are settings for advanced users, we should hide them a little. Also we should hide any other features which are for advanced users and we should try to clean the interface a little. To achieve more fluent work flow of your users.

Adding and connecting. Normally these two processes are connected to one → Connect. You could think about changing the interface from Add button to Connect button. Each connection could be saved and be permanent, as it is now already by clicking at Add button. Also users should have two boxes before connecting, one for user name and the other for password. User should have the possibility to let the interface to remember his password. All of that before connecting.

Concrete steps

Use of Openconnect plugin

Had use Openconnect VPN before	0
Had NOT use Openconnect VPN before	20

Paths to get to VPN

wi-fi → settings → network	16
Needed help	4

Sign + for adding a new network connection

Having problems to find out + sign (surprised)	8
Not having problems	12

Choosing VPN option

Without problems	20
Any problems	0

Choosing openconnect VPN option

Chose right – Cisco AnyConnect compatible VPN (openconnect)	8+2 (not for sure)
Chose wrong – OpenVPN	9
Couldn't choose	1

- cause of mistake to choose other option was mostly that the name OpenVPN is very similar to Openconnect VPN, for users which uses it for the first time it is actually identical
- users were complaining on low visibility, high similarity
- one user repeated the mistake even when I told him that we want to give a try to Openconnect specifically
- another one was complaining that it doesn't say anything about GNOME (like it was in task written)
- very high discomfort of users at this point

Inserting server name

Used “Gateway” with port number	9+1 (tried first IPv4)
Used “Gateway” without port number	2
Trying to use “Server” box in IPv4	7
Used name box	1

- after trying to insert a server name into Server in IPv4 the box become red and users cannot continue until they remove it from the box completely
- the word “Gateway” isn't specific or helping title for them at all
- very high discomfort of users at this point
- other users were trying to insert a port number in some other field/box, but they didn't find anything so they let it be OR they actually tried to add and use new VPN and software didn't ask for port until the connection failed
- the user who chose Gateway was complaining that it's not a best label name for server address

Clicking on ADD button to add the new connection

Adding without any doubts	8
Trying to find out user name and password boxes	11
Clicked twice Cancel instead Add	1

- during testing the button Add wasn't problematic at all, all users knew about that button and that it would probably finish the process, but they were mostly trying to find out some text boxes to set their user name and also the password (mostly decided to risk it and add the connection without setting it)

Turning on the VPN connection

No problems	18+1(couldn't see it immediately)
Couldn't see the button (help)	1

Inserting user name

No problems	14
Surprised	4

Help	1
Failed	1

- one user canceled the login because he thought he had forgotten to insert an user name and password somewhere
- some users were surprised of the log information because they didn't know what does it mean exactly and if they have to confirm it pressing OK, based on that first information was that it failed

Inserting password

No problems	15
Surprised	4
Failed	1

- users suggested that user name and password should be displayed together confirming once both, now instead of that the interface asks user to “login” twice (high number of complaints)

Confirming connection

Confirming connected	19
Failed	1 (didn't know if it is connected)

- a user said that there is no save password option even that there is that option, so the user didn't notice it at all

Deleting connection

Deleting with sign –	19
Turning off → Deleting with sign –	1

- a user mentioned that during deleting a network there is no information box announcing that the connection is going to be deleted

TASK #2

Content

This task was similar to TASK#1 so if the particular user had problems in some point and this particular step was requested to do also in TASK#2, he/she was able to finish/do it this time, because we already helped them before with the step. Therefore this TASK#2 was more successful, but if we took it in first place, the results would be the same/similar as in TASK#1. We confirmed that these problematic steps are easy to remember, for a short time period (at least).

Also there was a GNOME bug in part. It wasn't showing the certificate because the extension of file (.p12) was different as default one. So, I told to each user in that step that they have to use a search bar to find out the certificate in files.

Task #2 was:

You are at home and you want to connect to an external network. You want to use the GNOME openconnect VPN plugin.

To connect to the network you know this:

- the server name is devconf.nohats.ca:4443

- you have the certificate (which you have downloaded into downloads file of this computer)
- your password for the certificate is 1234

General information

Number of participants	20	100%
Successful completion without any help	16	80%
Successful completion with help	0	0%
Unsuccessful completion	4	20%

Conclusion

The biggest issue of this task was if the users will notice that interface has two option to insert some certificate: the CA certificate and the User Certificate. A lot of people asked what certificate their admin gave to them, user or CA. To those users I mentioned their the admin said it's the user certificate. Other users tried to insert it somewhere, some of them find out their mistake after failed login and they add the certificate to user certificate after. The rest of the participants failed the task, because they used certificate incorrectly (they chose wrong option for their certificate).

Recommendations

We shouldn't give to users so many options to set/choose between. It creates only problems for them. We should have an easier interface and than an option saying Advanced, where would be advanced settings. Most of users have only basic knowledge about VPN. The problematic step based in choosing what certificate they actually have, the CA or user, should be solved by this (the advanced settings).

Also we should add option to remove certificate from the chosen box.

Concrete steps

The list of steps which repeated:

Click on plus sign + to create a new VPN	20/20
Choose VPN option	20/20
Choose Openconnect	20/20
Insert server name	20/20
Add a new connection	20/20
Turn on the connection	20/20
Confirm that you are connected	17/20 (failed because of wrong certificate use)

Steps which were new:

Adding a certificate

Used user certificate option	7
Used user certificate option after asking if admin gave them CA or user certificate	4

Firstly chose CA certificate, then user certificate	2
Chose CA certificate → failed → then changed adding user certificate (without help)	3
Chose CA certificate → failed	4

- when user chooses some certificate and then he wants to remove it from selected, he cannot (high number of complaints)
- a user was also asking where is a private key
- a user failed when he was trying to find out where to put a password of certificate

Finding out certificate

No problems (advice with GNOME bug)	19
Never reached this point	1

Choosing the certificate

No problems	19
Never reached this point	1

Adding certificate password

No problems	14
Find out error → changed settings moving certificate into user certificate → success	2
Failed	4

TASK#3

For this task we created 3 different interfaces how to authenticate using a smart card. Users knew they have a USB key from their admin and that their admin told them that it's a smart card and they have to authenticate using that.

TASK#3 -GREEN (file green-merged.pdf)

Classic option which is based on interface for opening certificate titles.

Preferred user flow:

User Certificate → Smart Card → Entersafe/Gemalto → user_certificate → DONE

7/7 users failed this option and instead selected a Token Authentication. They said that their next step would be to try to google the solution, then they would try to contact their admin to find out what steps they should take to solve their problems.

TASK#3 -BLUE (file blue-merged.pdf)

Preferred user flow:

Certificate Authentication → Smart Card → Entersafe/Gemalto → user_certificate → DONE

3/7 correct flow

2/7 Token mode → help that that's incorrect → correct flow

2/7 failed (trying Token mode)

TASK#3 -YELLOW (file yellow-merged.pdf)

Preferred user flow:

Smart Card → Entersafe/Gemalto → user_certificate → DONE

2/6 correct flow

1/6 Token mode → help that that's incorrect → correct flow

3/6 Smart Card → failed

Recommendations

The best solution, according to user behavior, is to use a “Smart Card” button or to implement Smart Card into “Software Token Authentication”.

Also users reacted better on bigger objects, so all possible smart cards should be displayed directly after opening/selecting Smart Card option.

So the best solution would be a combination of green, yellow and blue path.

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