The following instructions detail a modified way to develop on the VM which minimizes the substantial lag and latency issues which developing in a VM may have on slower computers. This took me a bit to figure out so I figured I would post it!

**Connecting via SSH**  
  
To connect to the default Spede machine via SSH the following command is used in Microsoft PowerShell  
ssh -p 2222 [spede@127.0.0.1](mailto:spede@127.0.0.1)

This connects to the local machine at port 2222. The port should be 2222 by default, but in case you need to change it. Open the network settings in VirtualBox and select port forwarding. From there you can set Virtual box to forward any of your local ports to port 22 (the ssh port) on the virtual machine!  
  
It should be possible to use this connection to perform code editing with VS code. I have linked a guide to this as I do not use VS code.

[How to Develop on a Remote SSH Server With Visual Studio Code (howtogeek.com)](https://www.howtogeek.com/devops/how-to-develop-on-a-remote-ssh-server-with-visual-studio-code/)

However, our software development pipeline includes spede-target, a non TUI program; so while editing code is possible over SSH full testing is unfortunately not possible. However spede-target has specifically built support for remote editing in order to make use of this remote capability the following must be done.

**Configuring access to spede-target**  
  
Click on your Virtual Box settings for the Spede VM. Click on the Network settings and click "port forwarding" under the advanced tab. When you open this, there should be one rule already set by default a TCP forwarding rule from host port 2222 to guest port 22. Leave this rule alone. Press the plus button on the side and create a new rule. This new rule should have host IP set as 127.0.0.1, host port set as any port you choose. For convenience I chose 5900, and guest port set as 5900. Save your changes.

Now there is a open port which can be used to connect to the Spede target. In order to make use of this port you will need to have a Virtual Network Connection client program. There are many, but they all do the same things so just grab any one. I used TigerVNC but any VNC client will suffice. You should download this program onto your computer, not the Spede VM.  
<https://sourceforge.net/projects/tigervnc/files/stable/1.13.1/>  
  
**Connecting for a development session**

You now have everything you need to develop remotely. To start everything you need for a session perform the following steps!  
1. Launch the VM, wait till it gets to the desktop screen and then minimize it.  
2. Connect to the VM over SSH using Microsoft PowerShell or your SSH client of preference.   
3. In the SSH connection, navigate the the working directory for your Spede project. eg phase0-yourgithubusername/02-debugging  
4. In the SSH connection, launch spede-target with the following arguments: -d vnc  
5. Open your VNC client. Type in 127.0.0.1:5900 and hit connect. This should show you a black window.  
6. In the SSH connection, launch the spede-run program. Type yes if prompted for input.  
7. Switch back to your VNC client. You should see the compiled program being run!

A screenshot of a computer

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