- 非限制发布 -

工作笔记

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这是一篇关于 LaTeX 的文档，风格使用 HiTeC 。

目录

1 LaTeX 应用笔记

本文档于 2021 年 7 月 3 日开始使用 LaTeX 作笔记文档。

1.1 超链接应用

超链接显示有 2 种：

- 链接和显示内容一致：https://www.baidu.com
- 链接和显示内容不一致：百度链接

1.2 枚举项应用

以下是枚举内容：

- 枚举 1。
- 枚举 2。
- 枚举 3。
- 枚举 4。

1.3 在正文中强调某个词语

我要强 abc 调这个词语。

1.4 插入 Linux 命令

```
> sudo chsh -s zsh
```

1.5 用数字表示一个范围

我要表示一个范围：$18 \sim 22$ 岁。

1.6 插入一个 Linux 信息输出框

```
On branch master
Your branch is ahead of 'origin/master' by 3 commits.
  (use "git push" to publish your local commits)
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git checkout -- <file>..." to discard changes in working directory)
```

1.7 测试 codeout

```
codeout ccc
```

```
codeout ccc
```

1.8 基本代码块测试

```
void main ()
{
    return;
}
```

1.9 测试 mycode

Listing 1: hello 工程

```
/* 这是一个hello工程 */
void main ()
{
    int cnt = 0;
    printf("Hello World: %d\n", cnt);
    return;
}
```

1.10 空行分段单个换行相当于空格

老话说生活有五味，酸甜苦辣咸。苦是生命所不能避免的一味，叔本华说：“人生就是痛苦，我们可以把痛苦转换成幸福”，努力就是转化的过程，尽管在这个过程中，我们可能会感到更加辛苦。

苦，是人生的必经过程。人生就是一个“享受”痛苦和磨难的过程，这个过程是值得体会和拥有的。人生本身就是一场与痛苦并存的旅行，并不像很多人想象的那么轻松，从生下来的那一天，我们就开始了人生的修行。

无论你生长在怎样的环境中，你都会面临人生的各种难题。面对这些难题、困境，没有人可以不流泪流汗就轻轻松松地跨过去。经历得越多，越容易发现这个世界的真理——越怕吃苦，越有苦吃。那些心灵真正富足的人，其实都不怕吃苦。

1.11 脚注命令

苦[1] 苦[2] 苦[3]

1.12 引用

> 老话说生活有五味，酸甜苦辣咸。

1.13 改变字体和字号

老话说生活有五味，酸甜苦辣咸。

1.14 定理环境

定理 1（勾股定理）一二三。

1.15 公式排版

$$a(b+c) = ab + ac \tag{1}$$

$$\angle ABC = \pi/2 \tag{2}$$

[1] 苦，是人生的必经过程。

[2] 苦，是人生的必经过程。

[3] www.baidu.com

$$AB^2 = BC^2 + AC^2 \tag{3}$$

$$90^\circ \tag{4}$$

1.16 插入图片

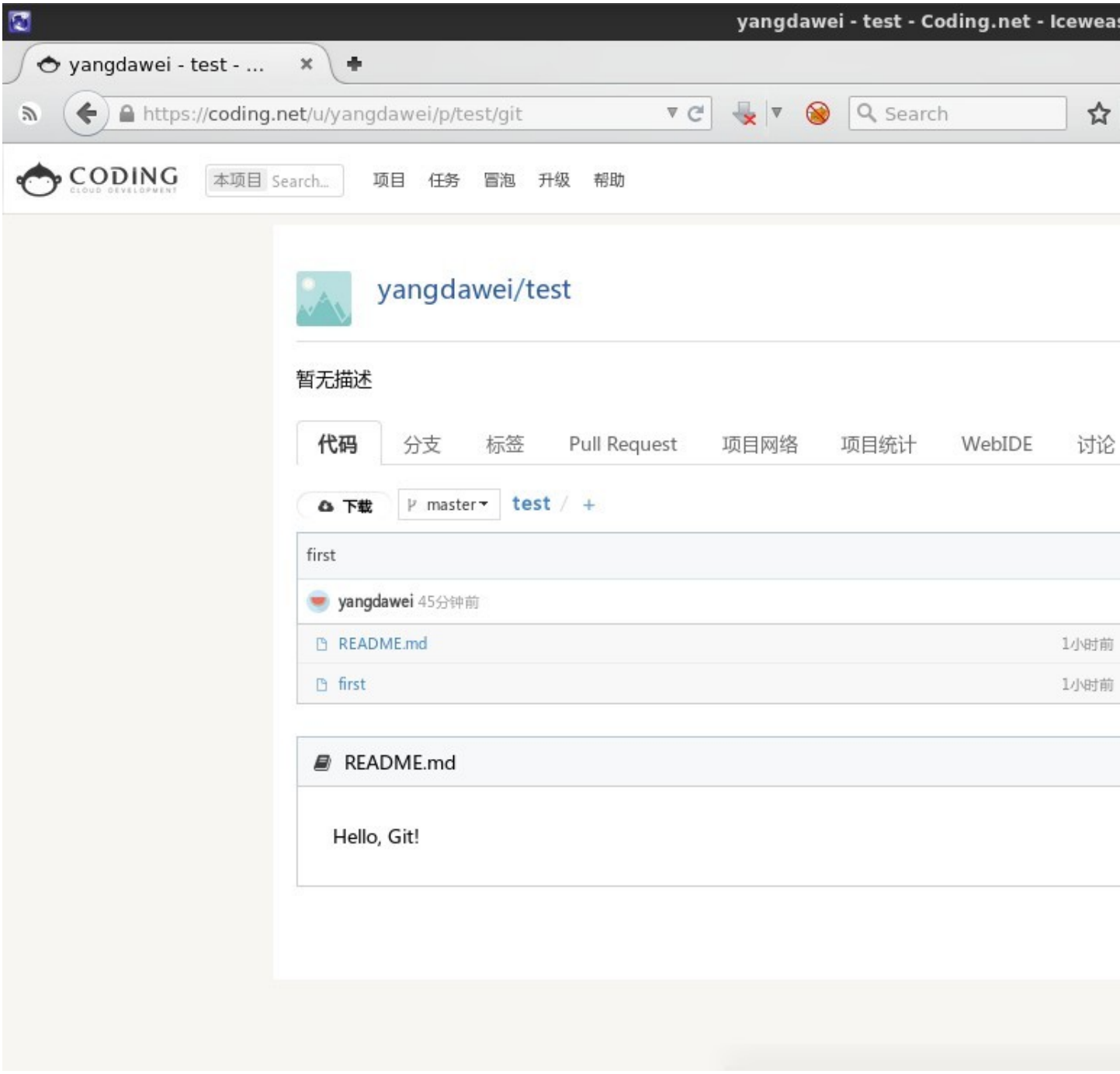


图 1: 建立项目

1.17 插入表格

直角边 a	直角边 b	斜边 c
3	4	5
5	12	13

1.18 引用公式和图表

图 3.5 表示。

公式 3 方法。

另一种引用公式（3）方法。

1.19 自定义新的命令

使用 newcommand 命令。符号度的新命令 90° 。

1.20 一些标点符号

省略号……# $ % & { } _ \

中文标点使用全角输入，破折号 shift+- ——，省略号 shift+6……

忽略每行前面的空格，后面的空格多个当成一个，TEX ing，TEX ing. TEX ing. 换行当空格 I am Tex. 汉字和字母自动添加空格 tex。

1.21 LaTeX 颜色

基本的 8 种颜色名称（后三种颜色为 CMYK 模型）			
black	red	green	blue
white	cyan	magenta	yellow
xcolor 额外可用的颜色名称：			
darkgray	gray	lightgray	
brown	olive	orange	lime
purple	teal	violet	pink

图 2：LaTeX 颜色

1.22 段落级别：subsection

这是第二级别段落；

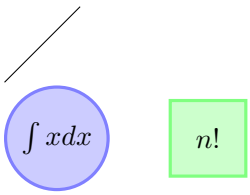
1.22.1 段落级别：subsubsection

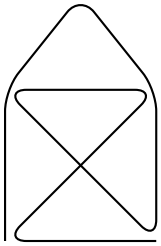
这是第三级别段落；

段落级别：paragraph 这是第四级别段落；

段落级别：subparagraph 这是第五级别段落；

1.23 使用 TikZ 画图





2 GIT 学习笔记

2.1 git push 命令

- 详细命令格式:

```
> git push <远程主机名> <本地分支名>:<远程分支名>
```

- 常用命令 1: 推送提交到远程

```
> git push origin master:master
```

- 常用命令 2: 推送提交到代码审核

```
> git push origin master:refs/for/master
```

- 常用命令 2: 推送新分支

```
> git push origin HEAD:refs/heads/case/new_branch -u
```

2.2 合并两个提交历史

- 使用情景: 有时候在开发过程中会由于不同原因会产生很多个本地提交历史:

```
commit dc7a92e627975cf7e75b6cccad872eb28a2bb13d
Author: mozhiye <mozhiye@aaa.com>
```

```
Date:   Tue Jul 28 20:43:38 2020 +0800

    [br34]: test git;

commit 93da6cc678a253467efa5165a22019e66b538f88
Author: mozhiye <mozhiye@aaa.com>
Date:   Tue Feb 25 17:12:29 2020 +0800

    [BR34]: add br34 cpu;
```

- 如果直接`push`，会造成合并工作增加，如果需要合并这两个提交历史为一个提交，使用命令：

```
> git rebase -i HEAD~2
```

- 执行`rebase`命令后，会调用`vim`显示合并信息：

```
pick 93da6cc [BR34]: add br34 cpu;
pick dc7a92e [br34]: test git;

# Rebase 995bb83..dc7a92e onto 995bb83 (2 command(s))
#
# Commands:
# p, pick = use commit
# r, reword = use commit, but edit the commit message
# e, edit = use commit, but stop for amending
# s, squash = use commit, but meld into previous commit
# f, fixup = like "squash", but discard this commit's log message
# x, exec = run command (the rest of the line) using shell
# d, drop = remove commit
#
# These lines can be re-ordered; they are executed from top to bottom.
#
# If you remove a line here THAT COMMIT WILL BE LOST.
#
# However, if you remove everything, the rebase will be aborted.
#
```

```
# Note that empty commits are commented out
```

- 由注释可以看到，如果希望把最后一个提交`test git`合并到上一个提交`add br34 cpu`；需要如下修改：

```
pick 93da6cc [BR34]: add br34 cpu;
squash dc7a92e [br34]: test git;
```

- 修改后保存退出`vim`，可以修改合并后的提交信息：

```
# This is a combination of 2 commits.
# The first commit's message is:

[BR34]: add br34 cpu;

# This is the 2nd commit message:

[br34]: test git;

# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
#
# Date:      Tue Feb 25 17:12:29 2020 +0800
#
# interactive rebase in progress; onto 995bb83
# Last commands done (2 commands done):
#    pick 93da6cc [BR34]: add br34 cpu;
#    squash dc7a92e [br34]: test git;
# No commands remaining.
# You are currently editing a commit while rebasing branch 'master' on '995bb83'.
#
```

- 合并后最终的提交信息：

```
commit c92db4f8cc0eae1d2d5d76cb5cc1c96dedf6d004
Author: mozhiye <mozhiye@aaa.com>
Date:   Tue Feb 25 17:12:29 2020 +0800

    [BR34]: add br34 cpu;

    [br34]: test git;
```

2.3 git patch 应用

- 使用情景： 当某个问题 fix 后，在本地生成一个提交或多个提交，可以将该提交的修改生成 patch 文件发给某个同事合并。

```
± git st
On branch dev
Your branch is ahead of 'origin/dev' by 2 commits.
  (use "git push" to publish your local commits)

nothing to commit, working tree clean
```

```
commit 358159bc2c426e9294f5e31789a7a92bcd94a922 (HEAD -> dev)
Author: mozhiye <zhiyemo@outlook.com>
Date:   Wed Jul 29 19:00:28 2020 +0800

    [dev]: patch 2;

commit ed9c6864c6a31854c75884d6202be42b391c88a5
Author: mozhiye <zhiyemo@outlook.com>
Date:   Wed Jul 29 17:43:15 2020 +0800

    [dev]: test patch;
```

- 把一个提交生成 patch，执行命令：

```
± git format-patch -1 358159bc2
0001-dev-patch-2.patch
```

- 生成 patch 内容：

```
From 358159bc2c426e9294f5e31789a7a92bcd94a922 Mon Sep 17 00:00:00 2001
From: mozhiye <zhiyemo@outlook.com>
Date: Wed, 29 Jul 2020 19:00:28 +0800
Subject: [PATCH] [dev]: patch 2;

---
 git.tex | 1 +
 1 file changed, 1 insertion(+)

diff --git a/git.tex b/git.tex
index 16f8908..e33d146 100644
--- a/git.tex
+++ b/git.tex
@@ -20,6 +20,7 @@
 \graphicspath{{figure/}}
 \usepackage{newenviron}

+\input{001_latex_env/latex_env}
 \input{001_latex_env/latex_env}

 %=========================================
--
2.17.1
```

- 把`0001-dev-patch-2.patch`拷到需要打补丁的工程，检查补丁状态，执行命令：

```
± git apply --stat 0001-dev-patch-2.patch
 README.md |    2 ++
 1 file changed, 2 insertions(+)
```

- 检查补丁文件是否应用成功：

```
± git apply --check 0001-dev-patch-2.patch
```

- 打补丁：

```
± git am --signoff 0001-dev-patch-2.patch
Applying: patch 2;
```

- 打补丁后结果：

```
commit f6d43d9c327f6a5959f42950e03174bcf838c05e (HEAD -> dev)
Author: mozhiye <zhiyemo@outlook.com>
Date:   Wed Jul 29 19:00:28 2020 +0800

    patch 2;

    Signed-off-by: mozhiye <zhiyemo@outlook.com>
```

- 关于 git patch 的一些其他命令：1. 使用 git format-patch 生成所需要的 patch： 当前分支所有超前 master 的提交：

```
git format-patch -M master
```

某次提交以后的所有 patch：

```
git format-patch 4e16                --4e16指的是commit名
从根到指定提交的所有patch:
```

git format-patch –root 4e16 某两次提交之间的所有 patch：

```
git format-patch 365a..4e16      --365a和4e16分别对应两次提交的名称
```

某次提交（含）之前的几次提交：

```
git format-patch  -n 07fe              --n指patch数，07fe对应提交的名称
```

故，单次提交即为：

```
git format-patch -1 07fe
```

git format-patch 生成的补丁文件默认从 1 开始顺序编号，并使用对应提交信息中的第一行作为文件名。如果使用了– numbered-files 选项，则文件名只有编号，不包含提交信息；如果指定了–stdout 选项，可指定输出位置，如当所有 patch 输出到一个文件；可指定-o <dir> 指定 patch 的存放目录；

2. 应用 patch：先检查 patch 文件：

```
git apply --stat newpatch.patch
```

检查能否应用成功：

```
git apply --check  newpatch.patch
```

打补丁：git am –signoff newpatch.patch (使用-s 或–signoff 选项，可以 commit 信息中加入 Signed-off-by 信息) 添加-s 或者–signoff，还可以把自己的名字添加为 signed off by 信息，作用是注明打 patch 的人是谁，因为有时打 patch 的人并不是 patch 的作者

3. 注意 git apply 是一种打 patch 的命令，其与 git am 的区别是，git apply 并不会将 commit message 等打上去，打完 patch 后需要重新 git add 和 git commit，而 git am 会直接将 patch 的所有信息打上去，而且不用重新 git add 和 git commit,author 也是 patch 的 author 而不是打 patch 的人)

将路径 /patch-set/*.patch 按照先后顺序打上

```
git am ~/patch-set/*.patch
```

当 git am 失败时，用以将已经在 am 过程中打上的 patch 废弃掉 (比如有三个 patch，打到第三个 patch 时有冲突，那么这条命令会把打上的前两个 patch 丢弃掉，返回没有打 patch 的状态)

```
git am --abort
```

当 git am 失败，解决完冲突后，这条命令会接着打 patch

```
git am --resolved
```

2.4 回退到某个时间点

当需要把`git`仓库`reset`到某个时间点，执行命令：

```
± git checkout 'master@{2020-07-22 12:44}'
```

repo 命令：

```
± repo forall -c git checkout 'master@{2020-07-15 12:44}'
```

2.5 GIT 配置

- git 全局配置，使用命令：

```
$ git config --global user.email "mozhiye@outlook.com"
$ git config --global user.name "mozhiye"
$ git config --global alias.st "status"
$ git config --global alias.co "checkout"
$ git config --global core.editor vim
```

- 查看 git 全局配置，打开文件`./gitconfig`

```
[user]
        email = mozhiye@outlook.com
        name = mozhiye
[alias]
```

```
        st = status
        co = checkout
[core]
        editor = vim
```

2.6 tig 使用

输入【tig 】+ 【Enter 】即可进入 tig 模式。此时展现在面前的将会是本地所有的 commit 记录以及分支的演化。

【j 】【k 】可上下切换选中的行，【Enter 】可分屏查看当前 commit 记录详情，【l 】小写的 L，全屏查看 commit 记录。

【r 】进入 refs view 模式，查看所有分支，使用【j/k 】上下切换，【Enter 】查看分支演化。

【s 】进入 status view，效果同 git status 命令，会展示所有 Untracked 和 UnStaged 文件。选中 Unstaged 的文件键入【u 】效果同 git add ，选中 staged 的文件键入

【u 】效果同 git reset，即撤销 add 操作。【Enter 】查看分屏查看当前文件的修改记录。

status view 模式下键入【C 】进入 vim 编辑器，【i 】进入编辑模式，在第一行输入 commit 信息，【:x 】退出并保存。【m 】查看 commit 记录。

【c 】进入 stash view 模式，全屏查看修改记录，可配合【s 】使用。

【t 】进入 tree view 模式，git 目录会以文件夹的形式展示。

【Enter】进入子目录，【, 】返回上一级目录。

【m 】进入 main view 查看当前分支的所有 commit 记录，使用【j/k 】上下切换，

【回车】可分屏查看 commit 详情。同样，【j/k 】上下移动，【空格】翻页。main view 可以认为是主页。

【/ 】输入关键字可进行搜索。

【R 】刷新当前页面，可退出搜索的高亮状态。

【Q 】退出 tig。

【h 】查看快捷键帮助。

2.7 查看分支历史

有时候需要查看分支的创建历史，查看分支从哪个点分出来

```
> git reflog show --date=iso origin/case/T8_pro
```

```
2ac407d refs/remotes/origin/case/T8_pro@{2021-01-20 08:50:29 +0800}: pull --rebase:
    fast-forward
b89c141 refs/remotes/origin/case/T8_pro@{2021-01-19 10:25:00 +0800}: pull --rebase:
    fast-forward
cc1b608 refs/remotes/origin/case/T8_pro@{2021-01-18 19:49:21 +0800}: pull --rebase:
    fast-forward
dc869be refs/remotes/origin/case/T8_pro@{2021-01-12 09:15:31 +0800}: pull --rebase:
    fast-forward
f252a8e refs/remotes/origin/case/T8_pro@{2021-01-08 09:04:55 +0800}: pull --rebase:
    fast-forward
e818850 refs/remotes/origin/case/T8_pro@{2021-01-04 17:30:59 +0800}: pull --rebase:
    fast-forward
58a7568 refs/remotes/origin/case/T8_pro@{2020-12-30 08:56:18 +0800}: pull --rebase:
    fast-forward
c06741c refs/remotes/origin/case/T8_pro@{2020-12-24 14:07:14 +0800}: pull --rebase:
    fast-forward
9c38ce4 refs/remotes/origin/case/T8_pro@{2020-12-15 11:00:33 +0800}: fetch origin:
    storing head
```

由显示信息看到该命令只是显示本地对该分支的操作历史，只能大概定位时间点；

2.8 cherry-pick 合并某个提交

使用场景： 在不同分支开发过程中，经常需要在某个分支上解决的 bug 合并到另外一些分支上，这时需要将某个分支的提交合并到指定分支上去

- 把某个提交应用到当前分支上

```
> git cherry-pick <commitHash>
```

- 把某个分支的最新提交应用到当前分支上

```
> git cherry-pick branch-name
```

- 把多个提交应用到当前分支上

```
> git cherry-pick <commitHash1> <commitHash2> <commitHash3>
```

- 把多个连续提交应用到当前分支上，commitHashBegin 需要早于commitEnd 提交，但不包含commitHashBegin 的提交内容

```
> git cherry-pick <commitHashBegin>..<commitHashEnd>
```

- 包含 commitHashBegin 的提交内容

```
> git cherry-pick <commitHashBegin>^..<commitHashEnd>
```

3 VIM 学习笔记

3.1 删除不符合指定格式的行

当需要删除不符合指定格式的行时，需要命令，保留`RES =`，指令格式：

```
:v/RES = /d
```

3.2 删除文件中的 ^M 符号

^M 是 windos 的 dos 文件格式特有的换行符，在 linux 上你可以通过 cat -A 文件名看到这些隐藏字符。当您的文件是 dos 格式时，就会出现这个 ^M. 所以一些 shell 脚本执行就会出现莫名其妙的问题，解决方法：

- vi filename 打开文件，执行:set ff=unix 设置文件为 unix，然后执行:wq，保存成 unix 格式。
- 批量删除命令：

```
:%s/\r//g
```

3.3 VIM 分屏命令

- 水平分屏

```
:split [FILENAME]
:sp [FILENAME]
```

- 垂直分屏

```
:vsplit [FILENAME]
:vs [FILENAME]
```

3.4 GVIM 修改配置

- 开启循环搜索，注释掉：

```
"set nowrapscan              " 禁止在搜索到文件两端时重新搜索
```

- 取消 c 语法高亮问题：

```
" ~~~C语言语法高亮
let g:std_c_en = 0
if (g:std_c_en)
Bundle 'vim-scripts/std_c.zip'
endif
```

- 解决高亮当前词跳到下一个问题：

```
nmap fd *''N
```

- 解决注释快捷键问题：

```
" ~~~注释与反注释所选内容(两个插件可以二选一)
let g:tcomment_en = 1
```

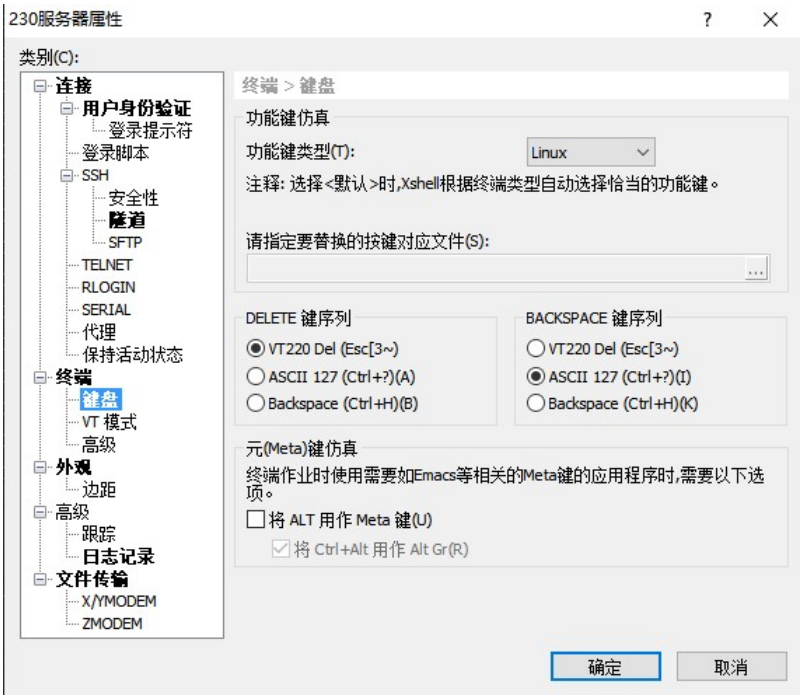
```
if (g:tcomment_en)
Bundle 'vim-scripts/tComment'
Bundle 'scrooloose/nerdcommenter' "打开该行
endif
"NERDCommenter注释快捷键
vmap // <leader>ci
```

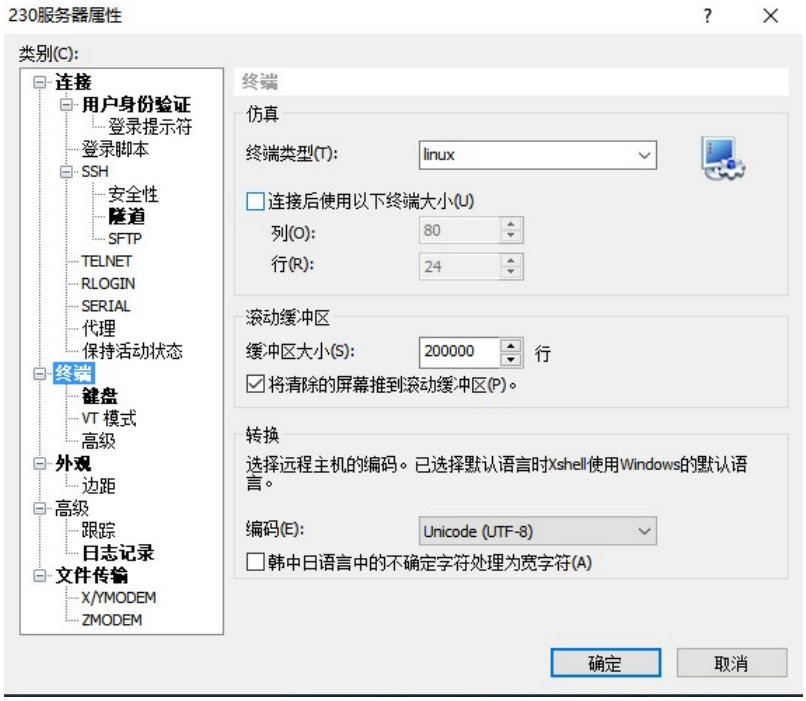
- 解决复制粘贴问题：

```
set clipboard=unnamed
```

3.5 vim backspace 问题

在 xshell 中配置如下：





4 通信协议学习笔记

4.1 IIC 通信协议

4.2 UART 通信协议

4.3 SPI 通信协议

4.4 IIS 通信协议

4.4.1 IIS 概述

I2S = Inter-IC Sound = Integrated Interchip Sound = IIS，是飞利浦在 1986 年定义（1996 年修订）的数字音频传输标准，用于数字音频数据在系统内器件之间传输，例如编解码器 CODEC、DSP、数字输入/输出接口、ADC、DAC 和数字滤波器等。其与 IIC 无关联。

4.4.2 IIS 硬件结构

IIS 是个相对来说简单的接口协议，没有地址和片选机制。在总线上，只能同时存在一个主设备和发射设备；提供时钟的设备为主设备，可以是发射设备也可以是接收设备，或者是协调两者的其他控制设备。在高端应用场合中，CODEX 经常作为主设备以便精确控制 IIS 的数据流。

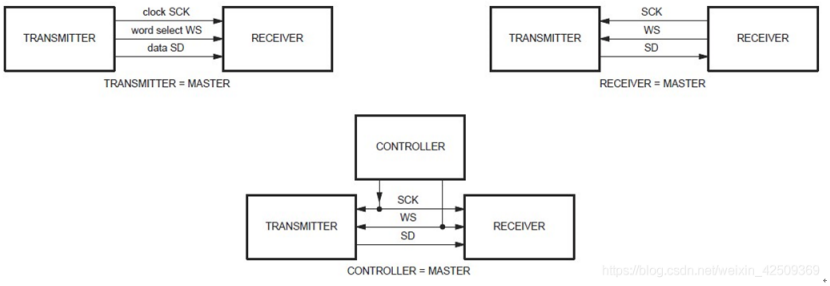


图 3: IIS 硬件 TOPO 结构

IIS 协议定义三根信号线：时钟信号 SCK、数据信号 SD 和左右声道选择信号 WS。

- WS：声道选择信号，表明数据发送端所选择的声道：WS = 0，表示选择左声道，WS = 1，表示选择右声道，同时也叫帧时钟，等于声音的采样率。
- SCK：模块内的同步信号，从模式时由外部提供，主模式时由内部产生。
- SD：串行数据，以二进制补码形式在数据线上传输；在 WS 变化后的第一个 SCK 脉冲，先传输最高位（MSB，Most Significant Bit）。

4.4.3 IIS 工作模式

IIS 的操作模式分为三种：标准 IIS 模式、左对齐模式和右对齐模式。

- 标准 IIS 模式（Phillips Standard）

  IIS 模式是标准左对齐格式再延迟一个时钟位变化来的，时序如下所示：

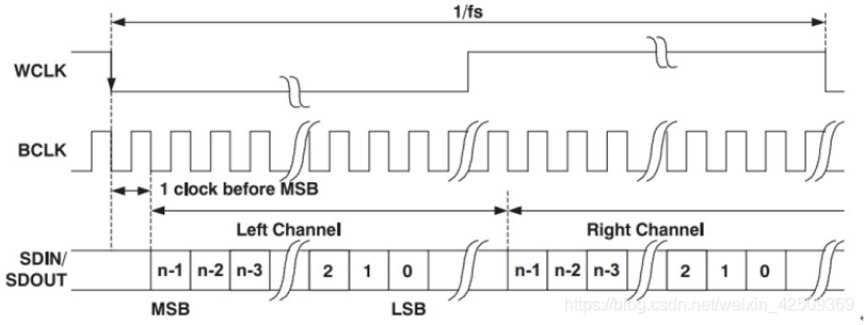


图 4: 标准 IIS 模式

左右通道的数据 MSB 均是在 WS 变化后第二个 SCK/BCLK 上升沿有效。

- 左对齐模式 (Left Justified Standard)

  标准左对齐格式的数据的 MSB 没有相对于 BCLK 延迟一个时钟。左对齐格式的左右声道数据的 MSB 在 WS 边沿变化后 SCK/BCLK 的第一个上升沿有效。具体如下图所示:

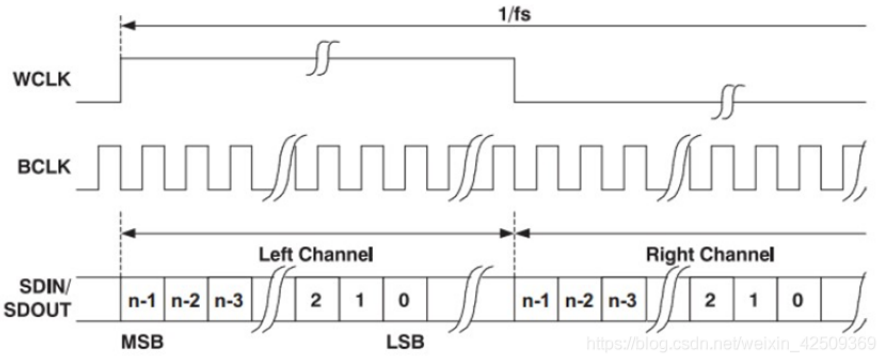


图 5: IIS 左对齐模式

支持 16 32bit 字长格式;

- 右边对齐模式 (Right Justified Standard)

  也叫日本格式，sony 格式，具体对齐方式如下图所示:

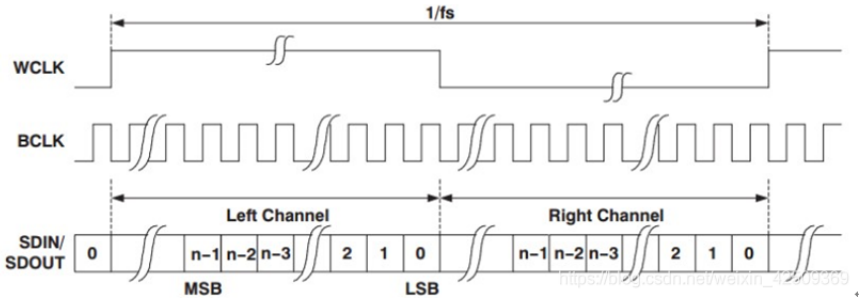


图 6: IIS 右对齐模式

接收设备必须事先知道待传数据的字长。

> 注意左右对齐模式的WS时钟高电平为左声道，低电平为右声道，刚好与标准IIS相反。

4.4.4 IIS 时钟频率计算

SCK = 采样率（48K、44.1K、16K 等）x 字长（16bit、24bit、32bit）x 2（左右两通道）；MCLK/SCK = 384 、256 等需要参考手册说明支持哪种；

4.4.5 ES9018 芯片 IIS 通信实例

ES9018 芯片数据手册链接[4]，提取码：ix8r。
ES9018 芯片 IIS 只支持 64SCLK/Frame，数据位宽支持 32/24/20/16bit 模式，时序如下：

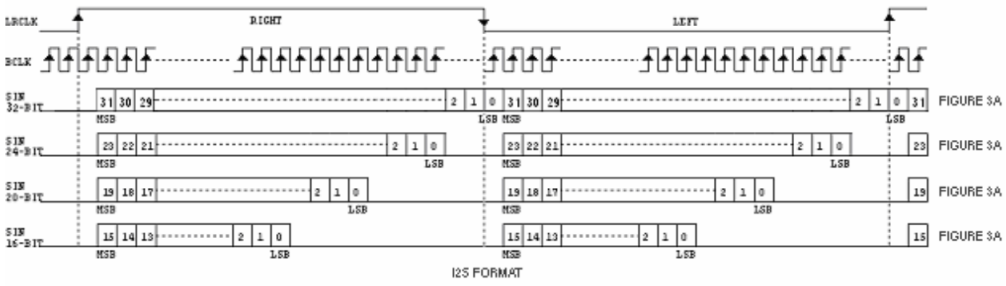


图 7: ES9018 IIS 时序图

[4] https://pan.baidu.com/s/123GuxBl2Uig3Jy3Jfp4MTw

由时序图可知，各种数据位宽都统一使用 64SCK/Frame 模式，如果主机传输位宽少于 ES9018 的数据位宽，低位应该会补全 0 或者全 1，不同接收模式可通过 IIC 通信配置，寄存器定义如下：

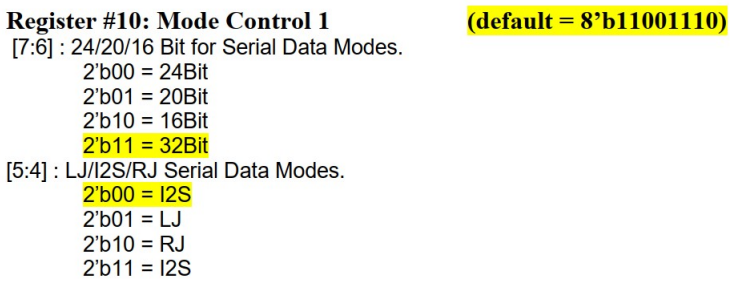


图 8： ES9018 IIS 模式配置

ES9018 IIS 默认模式是标准 IIS，位宽为 32bit 模式，默认采样率为 44.1K。

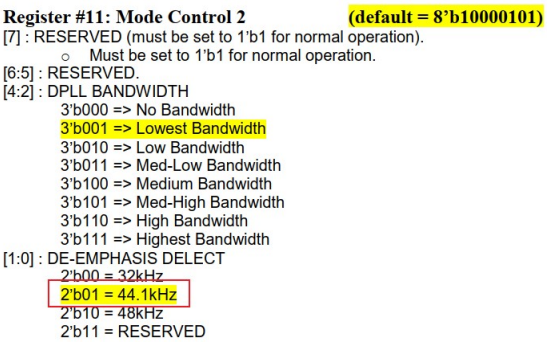
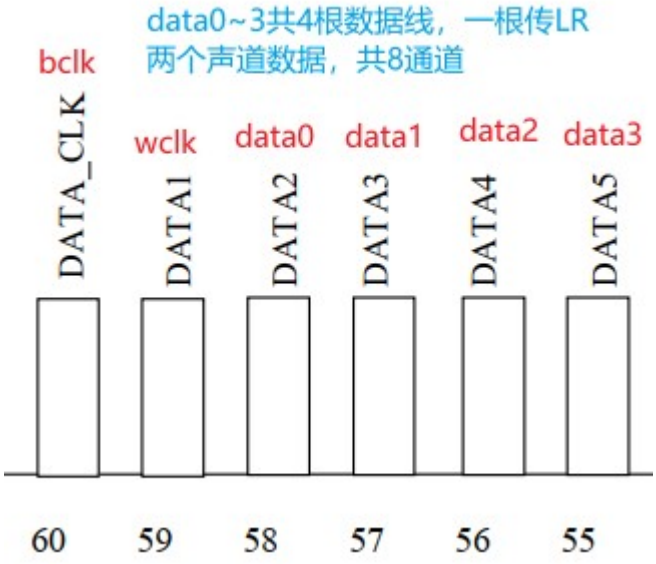


图 9： ES9018 默认采样率配置

ES9018 硬件标号标定如下：



Pin Name	Description
DATA1	Frame clock
DATA[2:5]	8-channel PCM serial data
DATA_CLK	Bit clock for PCM audio format

Table 2

图 10: ES9018 硬件 IIS 引脚

调试遇到问题：

- 用 32clk/frame 传输时数据，传输 1k 频率，44.1K 采样率的数据，ES9018 DAC 数据信号会变为 44.1K 的正弦波信号；
- 我们 Audio Link 需要需要用 64clk/frame 模式，位宽可以为 16bit，中断填数需要注意左右声道数据交错，否则会出现不可预料的问题；

4.4.6 一些问题解答

- `384, 512fs`代表什么意思？
  256fs 中“fs”就是表示 audio sampling frequency，表示在一个 LR 周期中 BCLK 的个

数，比如；数据是 32bit 位宽，2 个通道，那么 fs 就是 32 x 2 = 64fs，可以理解为一帧有多少个 sclk，fs 参数结合采样率（LRCLK）可以算出 BCLK，BCLK 与 MCLK 存在分频关系，这个关系与实际通信芯片有关；

4.5 蓝牙通信协议

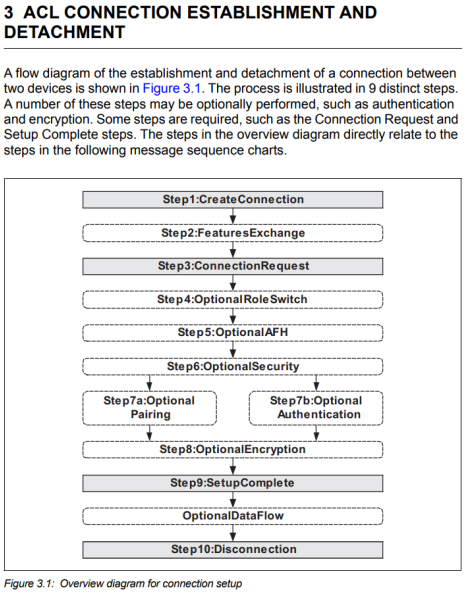


图 11：连接步骤

page_response frequencies (slave-to-master). The frequencies g(m) belong to the basic channel hopping sequence.

Step	Message	Packet Type	Direction	Hopping Sequence	Access Code and Clock
1	Page	ID	Master to slave	Page	Slave
2	First slave page response	ID	Slave to master	Page response	Slave
3	Master page response	FHS	Master to slave	Page	Slave
4	Second slave page response	ID	Slave to master	Page response	Slave
5	1st packet master	POLL	Master to slave	Channel	Master
6	1st packet slave	Any type	Slave to master	Channel	Master

Table 8.3: Initial messaging during start-up

In step 1 (see Table 8.3), the master device is in **page** substate and the slave

图 12： pagestartup

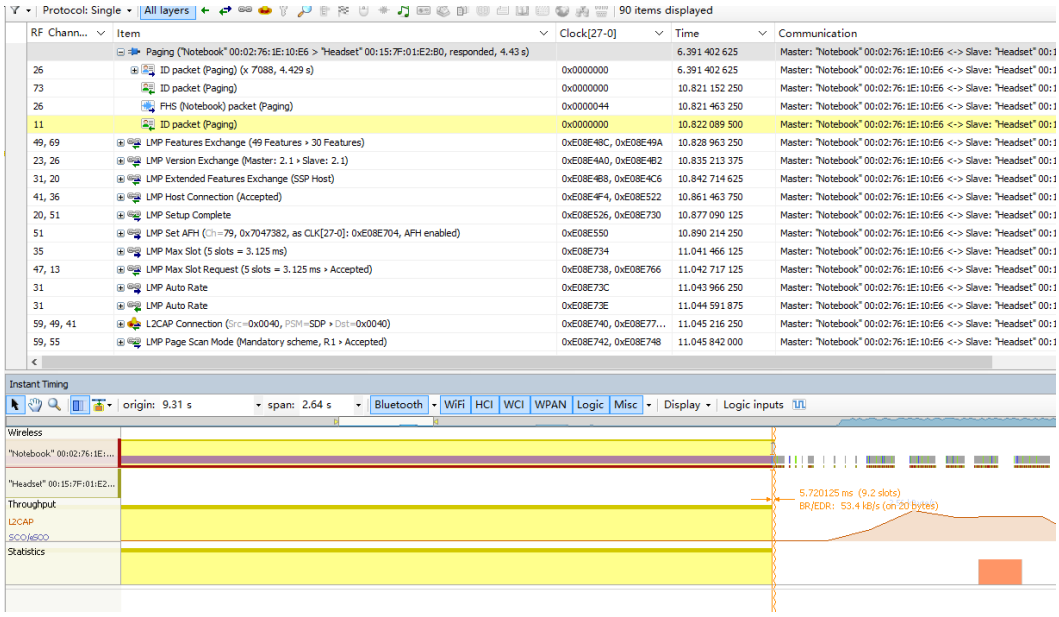


图 13： pagestartupdata

wiki 链接

Cryptographic explanation [edit]

The simplest and the original implementation[2] of the protocol uses the multiplicative group of integers modulo *p*, where *p* is prime, and *g* is a primitive root modulo *p*. These two values are chosen in this way to ensure that the resu
can take on any value from 1 to *p*–1. Here is an example of the protocol, with non-secret values in blue, and secret values in **red**.

1. Alice and Bob publicly agree to use a modulus $p = 23$ and base $g = 5$ (which is a primitive root modulo 23).
2. Alice chooses a secret integer $\mathbf{a} = 4$, then sends Bob $A = g^a \bmod p$
   - $A = 5^4 \bmod 23 = 4$
3. Bob chooses a secret integer $\mathbf{b} = 3$, then sends Alice $B = g^b \bmod p$
   - $B = 5^3 \bmod 23 = 10$
4. Alice computes $\mathbf{s} = B^a \bmod p$
   - $\mathbf{s} = 10^4 \bmod 23 = 18$
5. Bob computes $\mathbf{s} = A^b \bmod p$
   - $\mathbf{s} = 4^3 \bmod 23 = 18$
6. Alice and Bob now share a secret (the number 18).

Both Alice and Bob have arrived at the same values because under mod p,

$$A^b \bmod p = g^{ab} \bmod p = g^{ba} \bmod p = B^a \bmod p$$

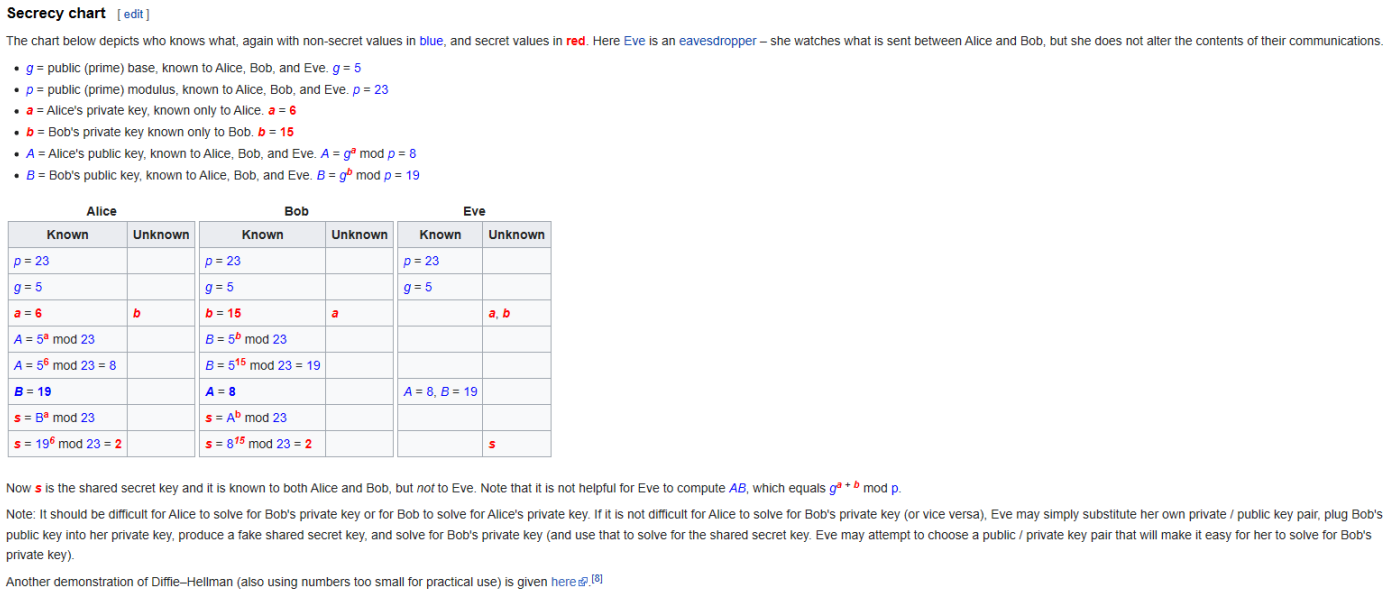
More specifically,

$$(g^a \bmod p)^b \bmod p = (g^b \bmod p)^a \bmod p$$

Only *a*, *b*, and (g^{ab} mod *p* = g^{ba} mod *p*) are kept secret. All the other values – *p*, *g*, g^a mod *p*, and g^b mod *p* – are sent in the clear. Once Alice and Bob compute the shared secret they can use it as an encryption key, known only to
messages across the same open communications channel.

Of course, much larger values of *a*, *b*, and *p* would be needed to make this example secure, since there are only 23 possible results of *n* mod 23. However, if *p* is a prime of at least 600 digits, then even the fastest modern compute
given only *g*, *p* and g^a mod *p*. Such a problem is called the discrete logarithm problem.[3] The computation of g^a mod *p* is known as modular exponentiation and can be done efficiently even for large numbers. Note that *g* need not b
in practice is usually a small integer (like 2, 3, ...).

图 14: wiki1



Secrecy chart [edit]

The chart below depicts who knows what, again with non-secret values in blue, and secret values in **red**. Here Eve is an eavesdropper – she watches what is sent between Alice and Bob, but she does not alter the contents of their communications.

- g = public (prime) base, known to Alice, Bob, and Eve. $g = 5$
- p = public (prime) modulus, known to Alice, Bob, and Eve. $p = 23$
- a = Alice's private key, known only to Alice. $a = 6$
- b = Bob's private key known only to Bob. $b = 15$
- A = Alice's public key, known to Alice, Bob, and Eve. $A = g^a \bmod p = 8$
- B = Bob's public key, known to Alice, Bob, and Eve. $B = g^b \bmod p = 19$

Alice		Bob		Eve	
Known	Unknown	Known	Unknown	Known	Unknown
$p = 23$		$p = 23$		$p = 23$	
$g = 5$		$g = 5$		$g = 5$	
$a = 6$	b	$b = 15$	a		a, b
$A = 5^a \bmod 23$		$B = 5^b \bmod 23$			
$A = 5^6 \bmod 23 = 8$		$B = 5^{15} \bmod 23 = 19$			
$B = 19$		$A = 8$		$A = 8$, $B = 19$	
$s = B^a \bmod 23$		$s = A^b \bmod 23$			
$s = 19^6 \bmod 23 = 2$		$s = 8^{15} \bmod 23 = 2$			s

Now s is the shared secret key and it is known to both Alice and Bob, but *not* to Eve. Note that it is not helpful for Eve to compute AB, which equals $g^{a+b} \bmod p$.

Note: It should be difficult for Alice to solve for Bob's private key or for Bob to solve for Alice's private key. If it is not difficult for Alice to solve for Bob's private key (or vice versa), Eve may simply substitute her own private / public key pair, plug Bob's public key into her private key, produce a fake shared secret key, and solve for Bob's private key (and use that to solve for the shared secret key. Eve may attempt to choose a public / private key pair that will make it easy for her to solve for Bob's private key).

Another demonstration of Diffie–Hellman (also using numbers too small for practical use) is given here.[8]

图 15: wiki2

4.6 USB 通信协议

5 文学摘抄

5.1 2020 年 7 月 28 日:《破窑赋》

天有不测风云，人有旦夕祸福。蜈蚣百足，行不及蛇；雄鸡两翼，飞不过鸦。马有千里之程，无骑不能自往；人有冲天之志，非运不能自通。

盖闻：人生在世，富贵不能淫，贫贱不能移。文章盖世，孔子厄于陈邦；武略超群，太公钓于渭水。颜渊命短，殊非凶恶之徒；盗跖年长，岂是善良之辈。尧帝明圣，却生不肖之儿；瞽叟愚顽，反生大孝之子。张良原是布衣，萧何称谓县吏。晏子身无五尺，封作齐国宰相；孔明卧居草庐，能作蜀汉军师。楚霸虽雄，败于乌江自刎；汉王虽弱，竟有万里江山。李广有射虎之威，到老无封；冯唐有乘龙之才，一生不遇。韩信未遇之时，无一日三餐，及至遇行，腰悬三齐玉印，一旦时衰，死于阴人之手。

有先贫而后富，有老壮而少衰。满腹文章，白发竟然不中；才疏学浅，少年及第登科。深院宫娥，运退反为妓妾；风流妓女，时来配作夫人。

青春美女，却招愚蠢之夫；俊秀郎君，反配粗丑之妇。蛟龙未遇，潜水于鱼鳖之间；君子失时，拱手于小人之下。衣服虽破，常存仪礼之容；面带忧愁，每抱怀安之量。时遭不遇，只宜安贫守份；心若

不欺，必然扬眉吐气。初贫君子，天然骨骼生成；乍富小人，不脱贫寒肌体。

天不得时，日月无光；地不得时，草木不生；水不得时，风浪不平；人不得时，利运不通。注福注禄，命里已安排定，富贵谁不欲？人若不依根基八字，岂能为卿为相？

吾昔寓居洛阳，朝求僧餐，暮宿破窑，思衣不可遮其体，思食不可济其饥，上人憎，下人厌，人道我贱，非我不弃也。今居朝堂，官至极品，位置三公，身虽鞠躬于一人之下，而列职于千万人之上，有挞百僚之杖，有斩鄙吝之剑，思衣而有罗锦千箱，思食而有珍馐百味，出则壮士执鞭，入则佳人捧觞，上人宠，下人拥。人道我贵，非我之能也，此乃时也、运也、命也。

嗟呼！人生在世，富贵不可尽用，贫贱不可自欺，听由天地循环，周而复始焉。

6 编译器特性笔记

6.1 关于 versioncheck 原理优化代码原理

Q：编译器代码优化是按照 c 文件为单位还是以函数为单位，如果以函数为单位，为什么类似于文件系统这些是以 version_check 函数调用时，整个 c 文件的函数都会被调用进来？

- 函数链接是以 _entry 标号作为入口，如果一个函数被显示调用，会把这个函数标号加进来链接，链接是以.o 为单位，如果一个函数被显示调用，会把该函数的全部标号拉进来链接（包括结构体），如果一个结构体定义了`used`属性，该标号会被最终链接进来，导致结构体里的函数指针也会被链接进来，这是使用 version_check 选择性链接的原理。
- libc.a 这个库比较特殊，一个函数就是一个.o 文件。

6.2 C 内联汇编

参考：GCC-Inline-Assembly-HOWTO[5]

一般为而言，通过 asm(...) 、__asm__(...) 、asm volatile(...) 和 __asm__ volatile(...) 来包含汇编指令模板的字符串形式，如果有额外的约束，通过： 来分割并指定。

6.2.1 内联汇编模板

```
asm ("汇编模板"
 : /* 输出操作数列表， 可空 */
 : /* 输入操作数列表， 可空 */
 : /* 修改了的寄存器列表， 可空 */
```

[5] https://www.ibiblio.org/gferg/ldp/GCC-Inline-Assembly-HOWTO.html

```
 );

asm ("nop"); // 一条 nop 指令， 没有额外的约束
__asm__ ("nop"); // 同上
 asm volatile ("nop"); // 表示不要随便移动（调度） 这条指令的位置
__asm__ volatile ("nop"); // 同上
```

在一些情况下，在内联汇编中使用了一些指令，这些指令会修改特定的寄存器，这个时候就需要在修改了的寄存器列表里面指明。这是因为内联汇编本身是字符串，并不会被解析，所以编译器内部并不能知道内联汇编的语义（即修改了哪些寄存器、有什么输入输出、做了什么事情以及是否能够被任意移动位置）。所以、我们总是需要通过输出，输入还有修改列表来指定。值得注意的是，为了实现 C 语言的调用协议，一些寄存器被用作了特殊的用途，如使用的栈指针寄存器。

```
// 下面的做法也是危险的， 因为 r0 被修改了， 但是没有指明
__asm__ volatile ("r0 = 0");
__asm__ volatile ("r0 = 0" : : : "r0"); // ok

//另外一些情况下， 我们可能不希望自己分配寄存器的使用， 可以让编译器分配， 这个是还有
    需要通过%来指明
u32 reg;
__asm__ volatile ("%0 = rets" : "=r"(reg));
printf("rets的值是 %x", reg);
 // 这个时候表示第0个操作数作为输出， 最终编译器会给%0分配一个寄存器，并替换%0。
```

上述例子中的"=r"(reg) 表示，对应的内联汇编本体会输出一个结果，并且这个结果应该放置到一个寄存器中，即"=r" 。而 (reg) 则表示，希望编译器绑定 reg 变量和保存结果的寄存器。这样我们可以而通过访问 reg 获取对应的值。

6.2.2 多条内联汇编

一些情况下，会需要写多条连续的内联汇编。这个时候正确的做法是，把这些内联汇编语句用一个 __asm__ 块来表示，而不是分开多个 __asm__ 。例如：

```
// 定义一个宏， 希望能够清空r1，r0寄存器
// 一个错误的做法：
// 下面的做法有多种错误
// 1. 应该使用一个__asm__块来， 而不是分开多个。 否则它们之间可能会插入其它的指令。
// 2. 内联汇编本体中修改了r1，r0寄存器， 但是没有通过修改列表来说明。
#define MACCLR() __asm__ volatile ("r1 = 0"); __asm__ volatile ("r0 = 0")
```

```
7
8  // 正确一点的做法:
9  #define MACCLR() __asm__ volatile( \
10 ”r1 = 0 \n\t” \
11 ”r0 = 0 \n\t” \
12 : \ // 没有输出
13 : \ //没有输入
14 : ”r1”, ”r0” \ // 修改了 r1, r0
15 );
16
17 // 更好一些的做法:
18 // pi32v2中有一条指令
19 #define MACCLR() __asm__ volatile (”r1_r0 = 0” : : : ”r1”, ”r0”);
```

6.2.3 寄存器约束

编译器来分配寄存器的时候，需要指定需要分配的寄存器类型，总结如下:

约束	pi32v2
通用寄存器 r0 到 r15	如果操作数是 32 位或以下，则是通用寄存器 r0 到 r15 如果是 64 位 则是 r1_r0 到 r15_r14
"w"	r0-r7
"W"	r8-r15
"d"	r1_r0 到 r7_r6
"D"	r9_r8 到 r15_r14

图 16: 指定分配寄存器

为了方便起见，对于一个 64 位寄存器 DR ，可以用 DR.l 来表示 DR 的低 32 位所在的寄存器，DR.h 用来表示 DR 的高 32 位所在的寄存器。例如 r1_r0.l 表示 r0，r1_r0.h 表示 r1。

6.2.4 输出约束

有些时候，我们需要利用内联汇编来获取一些值，这些值需要输出到一些地方，我们通常需要一条输出约束。

```
unsigned reg;
__asm__ volatile ("%0 = rets" : "=r"(reg));
printf("rets寄存器的值是: %x\n", reg);
// 由上面的汇编说明可以看到， 这个是 pi32v2 的汇编语法
// 表示 %0 表示第一个操作数， 这个是 : 后面开始算起的，
// "=r" 表示这个操作数需要写入到一个寄存器中，
// "=r"(reg) 表示， 输入的寄存器需要和 reg 分配到同一个
// 寄存器， 也就是可以认为把这个结果放入 reg
// 这个指令可以获取当前 rets 的值， 并放入 reg 变量中

__asm__ volatile ("%0 = sp\n" : "=r"(reg));
printf("sp寄存器的值是: %x\n", reg);
// 把 sp 的值存放在 reg 中
__asm__ volatile ("%0 = r4" : "=r"(reg));
printf("r4寄存器的值是 %x\n", reg);
// 获取 r4 的值到 reg 中

__asm__ volatile ("%0 = rets\n" : "=r"(reg));
printf("rets寄存器的值是 %x", reg);
```

6.2.5 输入约束

有些时候，我们需要指定一些输入到内联汇编中，这个时候，会需要一条输入约束。

```
unsigned retaddr = get_retaddr();
__asm__ volatile ("reti = %0\n\t"
"rti \n\t" : : "r"(retaddr));
// "r" 表示这个操作数是被读的， 表示把 retaddr 的值赋值给
// reti， 然后执行 rti 指令， 实现了跳转
```

6.2.6 earlyclobber 操作数

编译器在给内联汇编分配寄存器的时候，整块内联汇编被当做一条具有特定输入和输出的指令。并不会关心其内在的含义。例如：

```
int a, b;
__asm__ volatile (
"%0 = ~ %1\n\t"
: "=r"(a)
: "r"(b));

 //在分配寄存器的过程中， 上面的内联汇编块被当做了
 // <INLINEASM> outs{%0}, ins{%1}
 // 特定于这个例子来说， 如果后续代码不在继续使用 b的值， 而只是使用了a的值
 // 那下面的一些寄存器分配都是合理的
 // 分配方式一:
 // r0 = ~ r0 ; 因为 b 后续不在被使用了， 所以其寄存器可以被a占用
 // 分配方式二:
 // r1 = ~ r0 ; 当然， 也有可能a分配了其它的寄存器
```

另外一些时候，我们的内联汇编块中不会只有一条指令，那么指令之间可能会有先后执行的顺序。这种把所有指令当做一个整体的处理方式，可能会导致问题，例如下面的例子：

```
int a1, a2;
int b1, b2;
__asm__ volatile (
" %0 = ~ %2\n\t"
" %1 = ~ %3\n\t"
: "=r"(a1), "=r"(a2)
: "r"(b1), "r"(b2)
 );

 // 假设 b2, b1都不在这条指令之后被使用
 // 同样的， 这里在分配寄存器的时候， 还是会被当做下面的东西
 // <INLINEASM> outs{%0, %1}, ins{%2, %3}
 // 显然， 如果这个内联块能够作为一条指令整体执行完，
 // 那么下面的一些寄存器分配都是合理的
 // 分配方式一:
 // <INLINEASM> outs{r0, r1}, ins{r0, r1}
 // 即
 // r0 = ~ r0
 // r1 = ~ r1
 // 分配方式二:
 // <INLINEASM> outs{r1, r0}, ins{r0, r1}
```

```
// 即
// r1 = ~ r0
// r0 = ~ r1
// 但是这里， 第二种方式会导致错误的代码
```

上面的例子中，第二种分配方式，如果从一条指令的情况来看，是合理的。毕竟所有的输入一次性使用完毕，然后同时所有的输出被赋值完毕。但是问题在于，输入并不是一次性使用完毕，输出也不是一次性赋值完毕。而是使用一些输入（这里来说，就是第一条 not 指令），然后定义了一些输出，然后又使用了一些输入（这里来说，就是第二条 not 指令），再定义了一些输出。所以，我们需要一个方式标记一些输出，告知编译器这些输出被赋值的时候，还有一些输入没有被使用完，所以，不要让这些输出所使用的寄存器占用输入所使用的寄存器。这种标记方式就是 & 。上面的例子需要修正为

```
int a1, a2;
int b1, b2;
__asm__ volatile (
" %0 = ~ %2\n\t"
" %1 = ~ %3\n\t"
: "=&r"(a1), "=r"(a2)
: "r"(b1), "r"(b2)
);
// 假设 b2, b1都不再这条指令之后被使用
// & 表示 a1 定义的时候， 输入还没有使用完毕， 也就是说
// 不应该把 a1 定义到 b2, b1 占用的寄存器上
// 对于 a2， 因为 a2 已经是最后一个定义的寄存器， 可以不用加上&
// 因为定义a2的时候， 所有的输入已经使用完毕了
// 当然， 加上也是可以的
```

6.2.7 输入的同时是输出

有些操作数是既有读属性，又有写属性的：比如一个后加指令的基地址寄存器，在访问内存后，基地址寄存器的值会被更新，对于这些指令，我们需要两条约束来指定。

```
void t2sos16(short *in, short *out, int *coeff, int *mem, int npoint, intdstep)
{
    const int coeffQ = 20;
    const int LeftBit = 8;
    int tmp32_1, tmp32_2, tmp32_3;
    long long tmp64_1;
    asm volatile (
```

```
8       " %0 += 2<<2 \n\t"
9       " %7 = %7 << 1 \n\t"
10      "1: \n\t"
11      " \n\t"
12      " %1 = h[%8++=0] * [%0++=1<<2] (s) \n\t"
13      " %4 = %1 >> (%20-%21) (s) # %5 = [%3+0] \n\t"
14      " %5 += %4 \n\t"
15      " %1 = [%0++=-3<<2] * %4 (s) \n\t"
16      " %1 += [%0++=4<<2] * %5 (s) \n\t"
17      " %1.l = %1 >>> %20 (up) # %6 = [%3+1<<2] \n\t"
18      " %6 += %1.l \n\t"
19      " %1 = [%0++=-3<<2] * %4 (s) \n\t"
20      " %1 += [%0++=1<<2] * %5 (s) \n\t"
21      " %1.l = %1 >>> %20 (up) # [%3+0] = %6 \n\t"
22      " %8 += %7 # [%3+1<<2] = %1.l \n\t"
23      " %5 >>>= %21 \n\t"
24      " %5 = sat16(%5) (s) \n\t"
25      " h[%9++=%7] = %5 \n\t"
26      " \n\t"
27      "if (--%2!=0) goto 1b \n\t"
28       : "=&r"(coeff), // 第 0 个操作数, 对应于模板中的 %0
29      "=&d"(tmp64_1), // 第 1 个操作数, 对应于模板中的 %1
30      "=&w"(npoint), // 第 2 个操作数, 对应于模板中的 %2
31      // w 约束了寄存器分配范围, 这是指令要求
32      "=&w"(mem), // 第 3 个操作数, 对应于模板中的 %3
33      "=&w"(tmp32_1), // 第 4 个操作数, 对应于模板中的 %4
34      "=&w"(tmp32_2), // 第 5 个操作数, 对应于模板中的 %5
35      "=&w"(tmp32_3), // 第 6 个操作数, 对应于模板中的 %6
36      "=&r"(dstep), // 第 7 个操作数, 对应于模板中的 %7
37      "=&r"(in), // 第 8 个操作数, 对应于模板中的 %8
38      "=&r"(out) // 第 9 个操作数, 对应于模板中的 %9
39      : "0"(coeff), // 表示这个操作数需要和 %0 操作数分配到同一个寄存器
40      // 这是因为 %0 用作了后加访存指令的基地址操作数, 所以
41      // %0 既是一个输入, 也是一个输出
42      // "=r"(coeff) 说明了输出, "0"(coeff) 说明同时也是一个输入
43      "1"(tmp64_1),
44      "2"(npoint),
45      "3"(mem),
46      "4"(tmp32_1),
```

```
47      "5"(tmp32_2),
48      "6"(tmp32_3),
49      "7"(dstep),
50      "8"(in),
51      "9"(out),
52      "i"(coeffQ), // i 表示一个立即数
53      "i"(LeftBit)
54      :);
55  }
```

这个例子里面的 coeff 、tmp64_1 等，都是既需要读也许要写的操作数。"=&r" 表示对应的操作数在指令的输入寄存器使用完成之前就被修改了，这样编译器就不会把输入列表用到的寄存器分配给这些寄存器，这样标记不会导致一些寄存器分配的问题。值得注意的是，"0"(coeff) 之类的约束应该要放置到后面，以防影响操作数顺序。如下面的例子：

```
1   int insert(int val_dst, int val_src, int pos, int len)
2   {
3       int pat = (pos << 5) | len;
4       __asm__ volatile (
5       "%0 <= insert(%1, %2[12:8], %2[4:0])"
6       : "=&r"(val_dst),
7       : "r"(val_src),
8       "r"(pat),
9       "0"(val_dst) // 写在最后， 以防影响 %0， %1， %2 顺序
10      );
11
12      return val_dst;
13  }
```

6.2.8 访问内存

有时候，我们在内联汇编里面修改了内存，但是由于编译器不知道这个事实，将会导致一些问题。为了解决这个问题，我们需要"memory" 约束。

```
1   // "memory"
2   int *p = get_ptr();
3   put_u32hex(*p);
4   int np = *p + 1;
5   __asm__ volatile ("[%1] = %0"
```

```
: // 没有输出列表
: "r"(np), // 第零个操作数， 对应 %0
// 把 np 的值写入到 *p 的位置
"r"(p) // 第一个操作数， 对应 %1
 : "memory" // 表示内存被修改了
 );
 put_u32hex(*p); // 如果没有上面的 "memory" 可能这个的输出和上一个一样
```

当内联汇编修改了内存的时候，最好加上"memory" ，这样编译器会失效掉一些缓存了的内存的值。例如上面的 *p ，不过不指定"memory" 则编译器可能会缓存这个值（为了减少内存访问操作）。

一些例子：

```
int add(int a, int b)
{
    int c;
    __asm__ volatile (
    "%0 = %1 + %2"
    : "=r"(c) // %0
    : "r"(a), // %1
    "r"(b)); // %2

     // 即 c = a + b
     return c;
}

int add_mem(int *pa, int *pb)
{
    int a, b;
    __asm__ volatile (
    "%0 = [%2] \n\t"
    "%1 = [%3] \n\t"
    "%0 = %0 + %1 \n\t"

    :
    "=&"(a), // %0 输出， 且不能和输入同一个寄存器（见earlyclobber操作数）
    "=r"(b) // %1 输出， 可以和输入同一个寄存器
    // （因为定义 %1 的时候， 所有输入都已经使用完毕）
    : "r"(pa), // %2 只是输入
    "r"(pb) // %3 只是输入
```

```
);

// 实现了 return *pa + *pb;
return a;
}
```

6.3 CLZ 指令

```
    Rd = clz(Rm)
```

计算前导零的个数，即从最高位开始，连续出现的 0 的个数。如 0xFFF,FFFF，执行该指令后 Rd 结果为 4。

6.4 常用汇编语句

6.4.1 读写 csfr

```
 //打印调用函数入口
 void log_rets_value()
{
    int tmp;
    __asm__ volatile("%0 = rets" : "=r"(tmp));
    printf("rets = 0x%x", tmp);
}

static void enable_int(void)
{
    int tmp;
    __asm__ volatile("%0 = icfg" : "=r"(tmp));
    tmp |= 1 << 8;
    __asm__ volatile("icfg = %0" :: "r"(tmp));
}

static void disable_int(void)
{
    int tmp;
    __asm__ volatile("%0 = icfg" : "=r"(tmp));
    tmp &= ~(1 << 8);
```

```
22      __asm__ volatile("icfg = %0" :: "r"(tmp));
23  }
```

7 系统问题总结

7.1 关于系统软关机复位问题

Q：系统软关机使用内置触摸和普通 IO 关机，开机时`reset`位置有什么不同?

- 普通 IO 关机,P11 系统会掉电,指剩下 P33 维持电压,开机`reset`是从`maskrom`的`startup`开始;
- 使用内置触摸关机，P11 系统维持电源工作，这是关机之后还会大几`uA`的原因，开机`reset`也是从`maskrom`的`Startup`开始;

7.2 关于使用内置触摸开机 ROM 中 IO 状态恢复出错问题

Q：当使用内置触摸开机时，发现`PC3 IO`变为输出低状态，关机之前在 mask_IO 中已经把 IO 状态设置为高阻?

- 当使用`LPCTMU`关机时，会使用`PLCNT`模块，配置了`P3_PCNT_SET0`和`P3_PCNT_SET1`两个寄存器，`PC3 IO`状态正好配置了 3，导致在 mask 恢复 IO 时设置为输出 0 状态;
- 解决办法：在`soft_off_enter`和`soft_off_exit`时加入`save`和`recover`流程即可。

7.3 br28 ass ASS_CLK_CON bit7 写完和读出来不一样问题 (bit5)

问题：在写 ASS_CLK_CON 的 bit7 置 1 时，写完读出来是 0x40，再写 bit7 置 0 时，读出来时 0x20;

解释：由于 bit5 没有用到，cpu 读会移位，在软件层面第一次写 bit7 置 1 时，cpu 行为:

Listing 2: bit7 置 1 cpu 行为

```
1   {
2       int bak = 0;
3       bak = ASS_CLK_CON;
4       bak |= BIT(7);
5       ASS_CLK_CON = bak;
6   }
```

由于 bit5 没用到，在 cpu 读时，bit6 变 bit5，bit7 变 bit6，因此写完 bit7 之后，读出来是 0b0100,0000 = 0x40，再把 bit7 写 0 时，cpu 行为：

Listing 3: bit7 置 0 cpu 行为

```
{
    int bak = 0;
    bak = ASS_CLK_CON;  //此时bak = 0b0100,0000
    bak &= ~BIT(7);     //此时bak = 0b0100,0000
    ASS_CLK_CON = bak;  //写bit7为0无效;
}
```

下次再写 bit7，将会读回来是 0b1100，0000 = 0xC0，导致出错，硬件 Bug；

7.4 br34 RVDD 电压要大于等于 DVDD 问题

如果 RVDD < DVDD 时，有的板子会出现程序跑到某个 ram 地址出现非对齐访问异常问题。

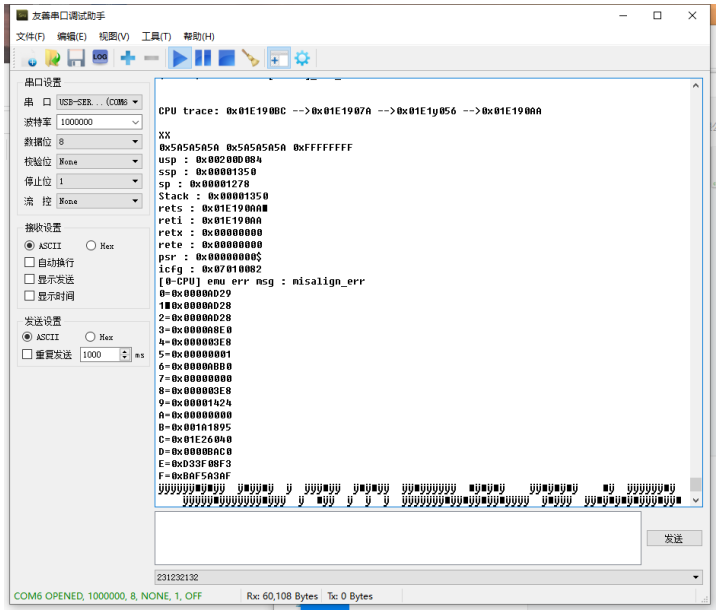


图 17: 异常打印

注意：RVDD >= DVDD。

7.5 有符号数十六进制转十进制计算方法

计算机内存数值存储方式 1）原码：一个数的原码（原始的二进制码）有如下特点：

- 最高位做为符号位，0 表示正，1 表示负
- 其它数值部分就是数值本身绝对值的二进制数
- 负数的原码是在其绝对值的基础上，最高位变为 1
- 原码表示法简单易懂，与带符号数本身转换方便，只要符号还原即可，但当两个正数相减或不同符号数相加时，必须比较两个数哪个绝对值大，才能决定谁减谁，才能确定结果是正还是负，所以原码不便于加减运算

2）反码

- 对于正数，反码与原码相同
- 对于负数，符号位不变，其它部分取反（1 变 0，0 变 1）
- 反码运算也不方便，通常用来作为求补码的中间过渡

3）补码

- 对于正数，原码、反码、补码相同
- 对于负数，其补码为它的反码加 1
- 补码符号位不动，其它位求反，最后整个数加 1，得到原码
- 在计算机系统中，数值一律用补码来存储

4）计算机系统中，数值一律用补码来存储，主要原因是：

- 统一了零的编码，0 在计算机中存储的方式：

Listing 4: zero 编码

```
1         int a = 0; int b = -0;
2         0000 0000     1000 0000
```

- 为了统一 0 的编码，计算机中没有-0 的概念
- 将符号位和其它位统一处理，在数据计算中，符号位也参与程序的计算

- 将减法运算转变为加法运算，计算机只会算加法 10+（-10）
- 两个用补码表示的数相加时，如果最高位（符号位）有进位，则进位被舍弃

5）将一个十六进制的有符号数转换为十进制数实例：

- 十六进制数：0xFFF4 = 0b1111,1111,1111,0100
- 除了符号位求反码：= 0b1000,0000,0000,1011
- 原码 = 反码 +1：= 0b1000,0000,0000,1100
- 原码十进制 = -12

8 软件安装总结

8.1 GVIM 安装

- GVIM 安装包链接：https://pan.baidu.com/s/1PcF6-taEaOIg66kbnm6EPA，提取码：66u3。
- 2020 年 9 月 26 日版本 https://pan.baidu.com/s/1dzBKE2d2CLscYkzqbdoO1A，提取码：lbb1
- 解压压缩包到任意目录。
- 运行`install.exe`

```
This program sets up the installation of Vim 8.1

Inspecting system...


Install will do for you:
 1  Install .bat files to use Vim at the command line:
 2      Create C:\WINDOWS\vim.bat
 3      Create C:\WINDOWS\gvim.bat
 4      Create C:\WINDOWS\evim.bat
 5      Create C:\WINDOWS\view.bat
 6      Create C:\WINDOWS\gview.bat
 7      Create C:\WINDOWS\vimdiff.bat
```

```
 8      Create C:\WINDOWS\gvimdiff.bat
 9      Create C:\WINDOWS\vimtutor.bat
10  Do NOT change startup file D:\Vim_8_1\_vimrc
14  Install an entry for Vim in the popup menu for the right
    mouse button so that you can edit any file with Vim
15  Add Vim to the "Open With..." list in the popup menu for the right
    mouse button so that you can edit any file with Vim
16  Add Vim to the Start menu
17  Create a desktop icon for gVim
18  Create a desktop icon for gVim Easy
19  Create a desktop icon for gVim Read-only
20  Do NOT create plugin directories
To change an item, enter its number

Enter item number, h (help), d (do it) or q (quit):
```

- 选项 14 是在文件夹空白地方右击弹出 vim，不需要点文件；
- 选项 15 是在文件夹里的文件右击弹出 vim；
- 实际选择 15 即可；
- 注意输入方法，先输入 15，回车`Enter`
- 再输入 d(do)，回车`Enter`
- 添加全局变量，在系统变量添加路径；

```
D:\Vim_8_1\vimfiles\tools
```

- 直接右击文件用 vim 打开即可，但还存在字体兼容问题；
- 安装字体，文件路径

```
D:\Vim_8_1\vimfiles\fonts\airline\UbuntuMono
```

- 可使用`RightMenuMgr`工具增加右击打开`GVIM`

- 打开 RightMenuMgr 软件，在 Explorer-> 目录-> 背景项添加 Gvim 扩展项，添加完毕，可在一个文件夹右击检查是否成功

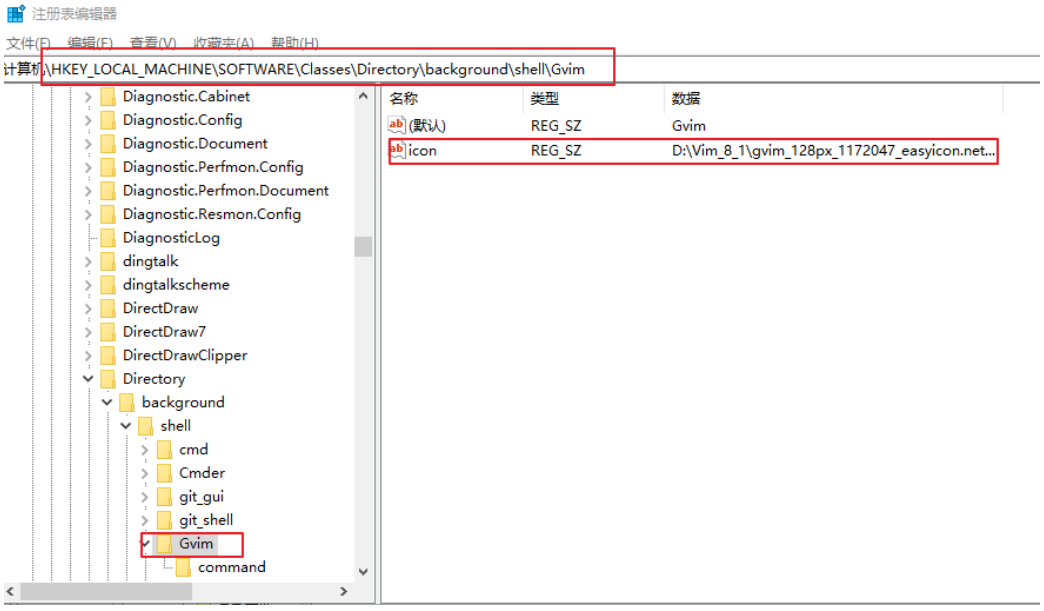


图 18: 添加右键 GVIM

- 为右键添加图标，点击 Rightmenumgr 工具，点击注册表编辑器，在该路径下添加相应的图标文件；

```
\HKEY_LOCAL_MACHINE\SOFTWARE\Classes\Directory\background\shell\Cmder
```

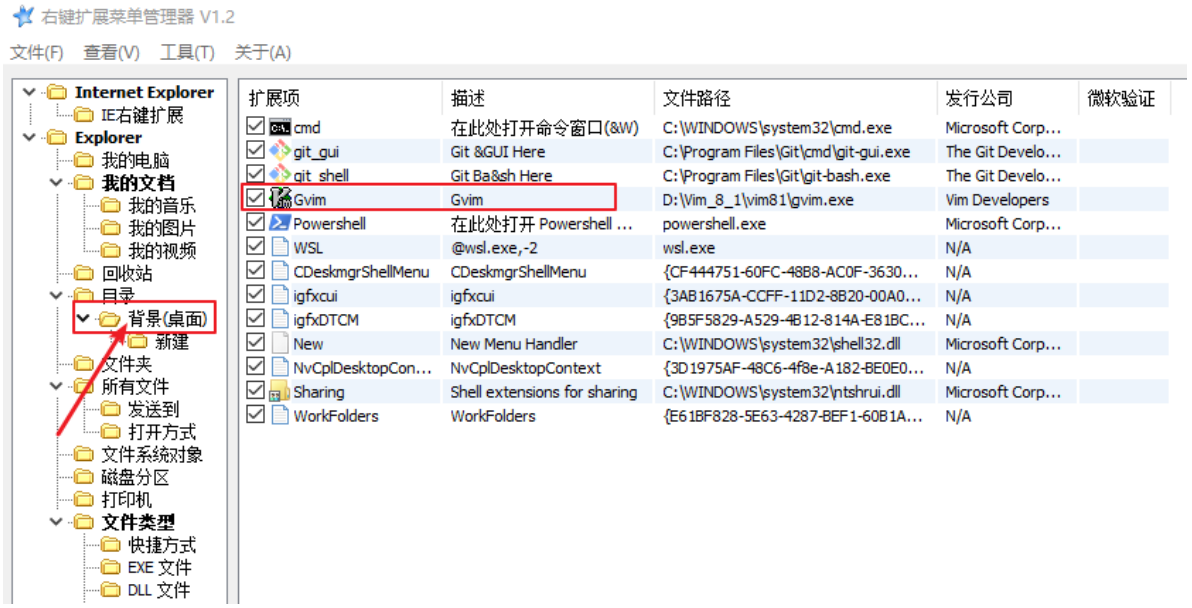


图 19: 添加右键图标

8.2 Speedpan 安装

- Speedpan 安装包链接:https://pan.baidu.com/s/1K01g_mbmILP0DaMcNbJsOg,提取码:yih1
- 解压压缩包到任意目录。

8.3 UML 安装

- UML 安装包链接: https://pan.baidu.com/s/1gTXX4B5hT3Dba6hBUOe4vA, 提取码: hz6r
- 解压压缩包到任意目录。

8.4 流程图制作工具 EdrawMax 安装

- EdrawMax 安装包链接:https://pan.baidu.com/s/1pFqdxpNXBOtgQHp6AexTRA,提取码:t9jd
- 解压压缩包到任意目录。

8.5 对比工具 Beyond Compare 安装

- Beyond Compare 安装包链接：https://pan.baidu.com/s/1rn0mArpZL_zp9Zs3QjT3FA，提取码：mm5s
- 解压压缩包到任意目录。
- 过期删除 BCState.xml 文件即可
- 定时刷新使用权限命令，在 cmd 脚本执行：

```
schtasks /create /tn "FlashBC" /tr
    D:\BeyondCompare_4.3.5.24893_64bit_Portable\flash.bat /sc DAILY /st 8:00
```

- 其中 flash.bat 内容

```
del BCState.xml
del BCState.xml.bak
copy state\* .
::copy state/BCState
```

8.6 Ubuntu 安装

8.6.1 安装系统

- Ubuntu 系统镜像安装包链接：https://pan.baidu.com/s/1rpWX2-Tb_MG5p93OJqLE4Q，提取码：9mbf
- 使用 u 盘安装即可

8.6.2 修改国内源

- 备份原来文件

```
> sudo cp /etc/apt/sources.list /etc/apt/sources.list_old
```

- 修改文件内容

```
> sudo gedit /etc/apt/sources.list
```

替换为https://mirrors.tuna.tsinghua.edu.cn/help/ubuntu/内容

```
# 默认注释了源码镜像以提高 apt update 速度，如有需要可自行取消注释
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial main restricted universe
    multiverse
# deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial main restricted
    universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-updates main restricted
    universe multiverse
# deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-updates main
    restricted universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-backports main restricted
    universe multiverse
# deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-backports main
    restricted universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-security main restricted
    universe multiverse
# deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-security main
    restricted universe multiverse

# 预发布软件源，不建议启用
# deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-proposed main restricted
    universe multiverse
# deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ xenial-proposed main
    restricted universe multiverse
```

```
deb http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe
    multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe
    multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe
    multiverse
deb http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe
```

```
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe
    multiverse

deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan main restricted universe
    multiverse
deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan main restricted universe
    multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-updates main restricted
    universe multiverse
deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-updates main restricted
    universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-backports main restricted
    universe multiverse
deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-backports main restricted
    universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-security main restricted
    universe multiverse
deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-security main restricted
    universe multiverse
deb https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-proposed main restricted
    universe multiverse
deb-src https://mirrors.tuna.tsinghua.edu.cn/ubuntu/ eoan-proposed main restricted
    universe multiverse
```

- 关于软件源地址选择
  - 搞清楚 ubuntu 的代号

```
4.10 Warty Warthog(长疣的疣猪)
5.04 Hoary Hedgehog(灰白的刺猬)
5.10 Breezy Badger(活泼的獾)

6.06(LTS) Dapper Drake(整洁的公鸭)
6.10 Edgy Eft(急躁的水蜥)
7.04 Feisty Fawn(坏脾气的小鹿)
7.10 Gutsy Gibbon(勇敢的长臂猿)

8.04(LTS) Hardy Heron(耐寒的苍鹭)
8.10 Intrepid Ibex (勇敢的野山羊)
9.04 Jaunty Jackalope(得意洋洋的怀俄明野兔)
9.10 Karmic Koala(幸运的考拉)

10.04(LTS) Lucid Lynx(清醒的猞猁)
10.10 Oneiric Ocelot(梦幻的豹猫)
11.04 Natty Narwhal(敏捷的独角鲸)
11.10 Oneiric Ocelot（有梦的虎猫）

12.04(LTS) Precise Pangolin(精准的穿山甲)
12.10 Quantal Quetzal(量子的绿咬鹃)
13.04 Raring Ringtail(铆足了劲的猫熊)
13.10 Saucy Salamander(活泼的蝾螈)

14.04(LTS) Trusty Tahr (可靠的塔尔羊)(LTS)
14.10 Utopic Unicorn(乌托邦独角兽)
15.04 Vivid Vervet (活泼的小猴)
15.10 Wily Werewolf (狡猾的狼人)

16.04(LTS) Xenial Xerus (好客的非洲地松鼠)
16.10 Yakkety Yak（牦牛）
17.04 Zesty Zapus(开心的跳鼠)
17.10 Artful Aardvark(机灵的土豚)

18.04(LTS) Bionic Beaver（仿生海狸）
18.10 Cosmic Cuttlefish（宇宙墨鱼）
19.04 Disco Dingo（舞动的灵犬）
```

```
19.10 Eoan Ermine（白貂）

20.04(LTS) Focal Fossa（专注的马达加斯加长尾狸猫）
```

- 使用命令查看本系统版本号

```
> lsb_release -a
```

- 到阿里源[6]看下这个源存在不存在，一般以第一个单词开头，注意是小写
- 镜像源模板

```
deb http://mirrors.aliyun.com/ubuntu/ TODO main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ TODO main restricted universe
    multiverse

deb http://mirrors.aliyun.com/ubuntu/ TODO-security main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ TODO-security main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ TODO-updates main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ TODO-updates main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ TODO-proposed main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ TODO-proposed main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ TODO-backports main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ TODO-backports main restricted
    universe multiverse
```

[6] http://mirrors.aliyun.com/ubuntu/dists/

- 将`TODO`替换为发行版的 Codename，如 `focal`

```
deb http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal main restricted universe
    multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-security main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted
    universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe
    multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted
    universe multiverse
```

- 更新软件列表

```
> sudo apt update
> sudo apt upgrade
```

8.6.3 ubuntu16.04 配置 vnc 远程控制环境

- 在系统搜索`desktop`

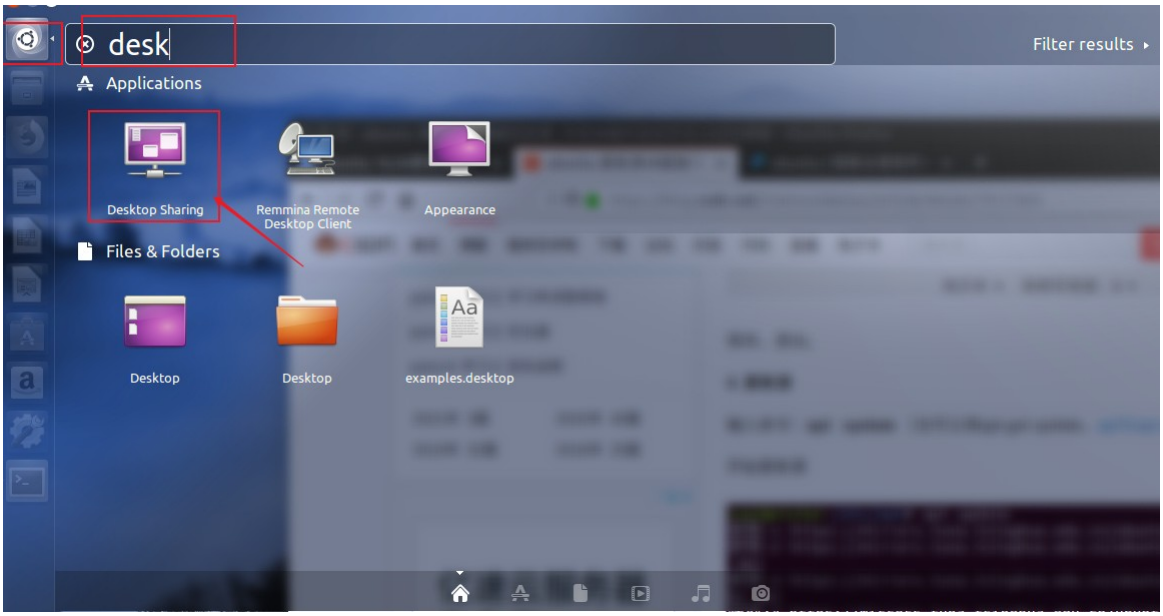


图 20: 点击 desktop_sharing

- 配置为下图所示

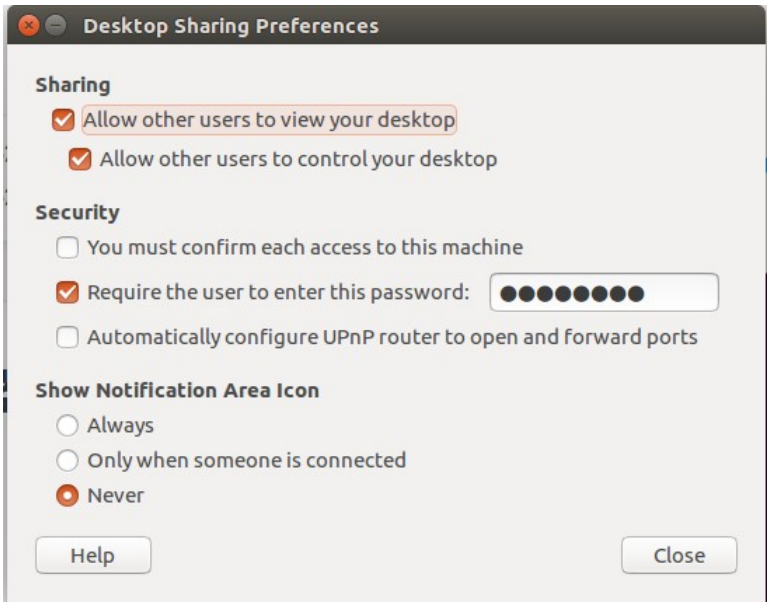


图 21: 配置如图

- 安装 vncserver

```
> sudo apt-get install xrdp vnc4server xbase-clients
```

- 安装 dconf-editor(取消权限限制)

```
> sudo apt-get install dconf-editor
```

- 搜索打开 dconf-editor

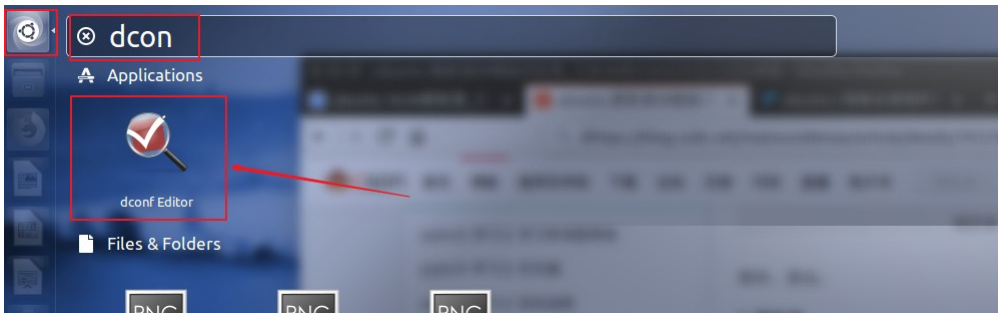


图 22: 点击 dconf-editor

- 配置 dconf-editor 如下图，路径:

```
org->gnome->desktop->remote-access
```

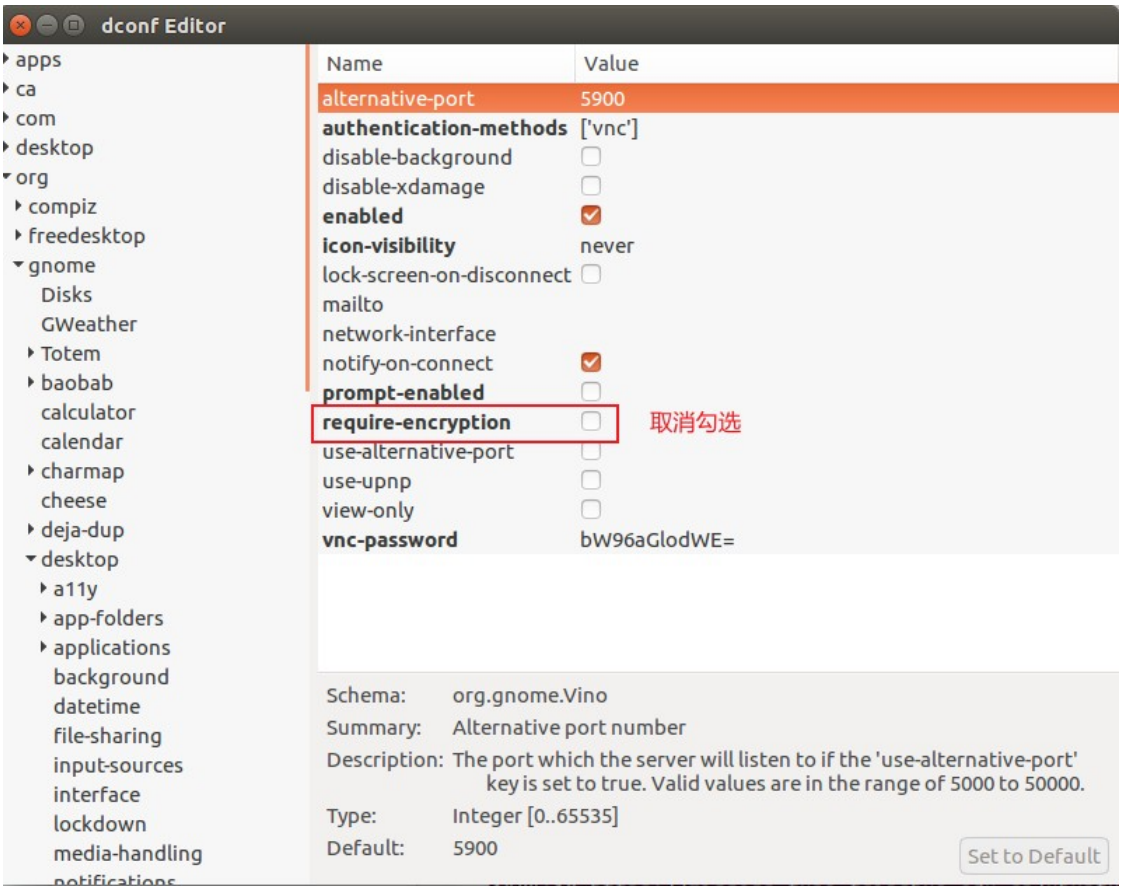


图 23: 配置如图 dconf-editor

- 电脑端使用 vnc 软件连接即可。

8.6.4 ubuntu20.04 配置 vnc 远程控制环境

- 在系统设置里面，点击共享 -> 屏幕共享

图 24: 共享设置

- 设置为如图

图 25: 配置为图中所示

- 安装 dconf-editor(取消权限限制)

```
# 安装dconf-editor
 > sudo apt-get install dconf-editor
```

- 搜索打开 dconf-editor，配置 dconf-editor 如下图，路径:

```
org->gnome->desktop->remote-access
```

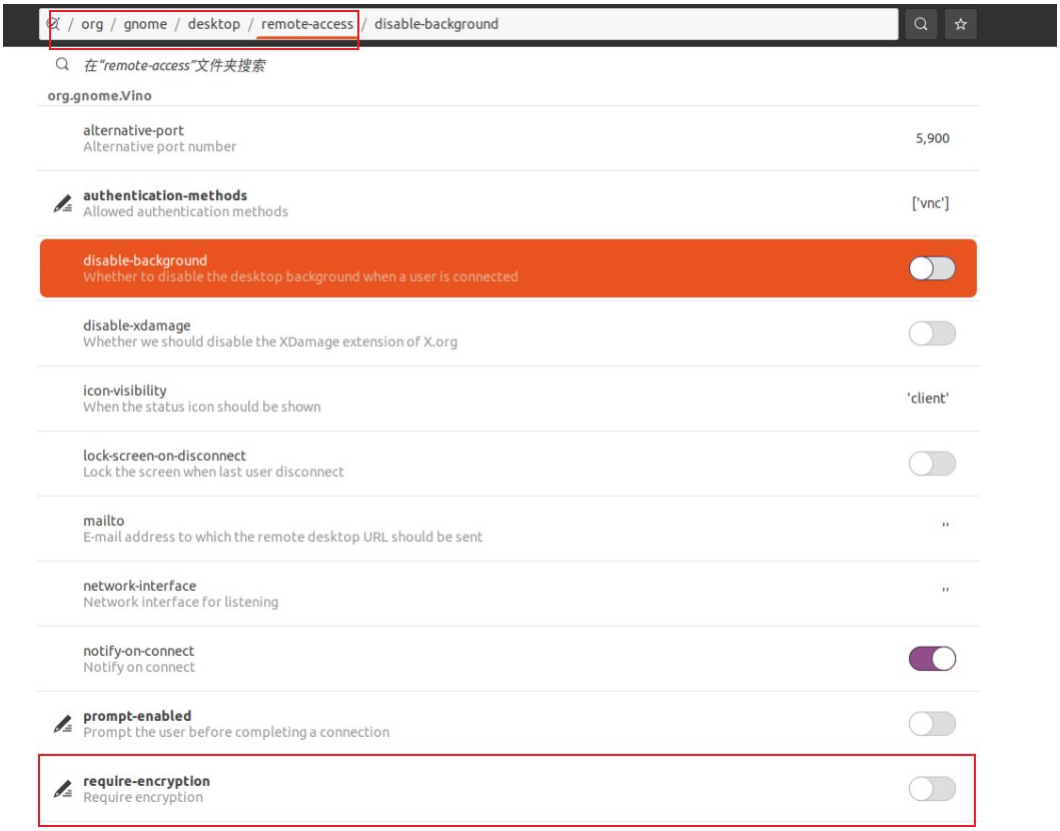


图 26: 配置如图 dconf-editor

- 电脑端使用 vnc 软件连接即可。

8.6.5 配置 ssh 远程登陆环境

- 查看 ssh 是否安装

```
> sudo sudo ps -e | grep ssh
```

如果什么信息都没有，证明没安装

- 安装 ssh

```
> sudo apt-get install openssh-server
```

- 查看配置文件，查看端口号是不是 22

```
> vim /etc/ssh/sshd_config
```

- 使用 ssh 软件登陆即可。

8.6.6 配置 samba 共享文件系统

- 安装 samba

```
> sudo apt-get install samba
```

- 配置 smb.conf 文件

```
> sudo gedit /etc/samba/smb.conf
```

在最后添加如下信息，其中 work 为对外显示的文件夹名称，访问用户名为 mozhiye

```
[work]
    comment = samba home directory
    path = /home/mozhiye/100_share_dir
    public = yes
    browseable = yes
    public = yes
    read only = no
    valid users = mozhiye
    create mask = 0777
    directory mask = 0777
    force user = nobody
    force group = nogroup
    available = yes
```

- 增加登陆用户名密码

```
> sudo smbpasswd -a mozhiye
```

输入密码即可

- 创建共享文件夹

```
> mkdir /home/mozhiye/100_share_dir
> chmod 777 /home/mozhiye/100_share_dir
```

- 重启 samba

```
> sudo service smbd restart
```

- WINDOWS 端输入 IP 访问即可。

8.6.7 安装 git

- 安装 git

```
> sudo apt-get instal git
```

- 参考 git 配置章节配置 git 环境

8.6.8 使用 LINUX_TOOLS 配置 bash 和 vim

下载 LINUX_TOOLS 文件夹放到根目录，todo：补路径，注意先要预先安装所需软件，后通过 LINUX_TOOLS 覆盖配置

- 安装 git
- 安装 vim

```
> sudo apt-get instal vim
```

- 安装 cscope

```
> sudo apt-get instal cscope
```

- 安装 ctags

```
> sudo apt-get instal ctags
```

- 安装 zsh

```
> sudo apt-get instal zsh
```

- 安装 oh-my-zsh，进入 LINUX_TOOLS/oh-my-zsh_installl/tools 目录

```
> sh install.sh
```

- 修改默认登陆 shell

```
> chsh -s /bin/zsh
```

- 运行 LINUX_TOOLS 里面的安装命令
- 退出 ssh，重新登陆
- 测试 c 语言工程插件是否会出错
- TODO: 研究 vim 复制粘贴板问题

8.6.9 关闭自动锁屏和登陆输入密码

8.6.10 安装文件传输命令 rz/sz

```
> sudo apt-get install lrzsz
```

8.6.11 安装 latex

```
> sudo apt-get install texlive-full
```

使用 latex 工程测试环境

- 使用`Crtl + D`中断编译过程
- 使用`evince`可以打开 pdf 文件
- 怎么使用系统字体，用命令生成文件查看字体族： 查看 latex 字体搜索范围

```
> vim /usr/share/texlive/texmf-dist/web2c/texmf.cnf
```

查看变量

```
% OSFONTDIR is to provide a convenient hook for allowing TeX to find
% fonts installed on the system (outside of TeX).  An empty default
% value would add "//" to the search paths, so we give it a dummy value.
OSFONTDIR = /usr/share/fonts
```

```
fc-list > font_list列出所有（输出显示格式为： 字体族中文名，字体族英文名：变体）
fc-list :lang=zh > font_ch_list 列出中文字体
fc-list -f "%{family}\n" > font_family_list 只列出字体族名
```

把命令保存为文件，在 font_family_list 文件中查看可以使用的系统字体族

8.6.12 安装 ubuntu 自定义字体

- 在 win10 系统复制字体 tff 文件
- 在 linux 路径

```
/usr/share/fonts/
```

新建文件夹

```
/usr/share/fonts/winfonts/consolas
把tff文件复制到该目录
```

- 改变 tff 文件权限

```
sudo chmod 644 /usr/share/fonts/winFonts/*.ttf
```

- 创建字体的 fonts.scale 文件，它用来控制字体旋转缩放

```
sudo mkfontscale
```

- 创建雅黑字体的 fonts.dir 文件，它用来控制字体粗斜体产生

```
sudo mkfontdir
```

- 建立字体缓存信息，也就是让系统认识新安装字体

```
sudo fc-cache -fv
```

- 在 latex 章节用 fc-list 命令查看字节是否安装

8.6.13 安装 make

```
> sudo apt-get install make
```

8.6.14 安装 make

```
> sudo apt-get install meld
```

9 VOA 文章

9.1 2020 年 8 月 25 日

原文 By Hai Do 24 August 2020 Convalescent plasma, which has long been used to treat diseases, has become the latest issue in the race to find treatment for COVID-19. On Sunday, President Donald Trump announced that the United States would permit the emergency use of convalescent plasma to treat COVID-19 patients. Trump called it ”a breakthrough.” However, the World Health Organization (WHO) on Monday warned that the treatment is still experimental. The group described the evidence in support of the treatment as ”low quality.” Trump made the plasma announcement after his administration accused the U.S. Food and Drug Administration (FDA) of delaying in order to hurt his re-election chances this November. The emergency approval makes it easier for some patients to get the treatment. However, it is not the same as full FDA approval for treatment.

图 27: ILE - Convalescent plasma from a recovered coronavirus disease patient.

In its announcement, the FDA said, ”it is reasonable to believe that COVID-19 convalescent plasma may be effective in lessening the severity or shortening the length of COVID-19 illness in some hospitalized patients.” The agency said that more human trials are needed, ”as COVID-19 convalescent plasma does not yet represent a new standard of care based on the current available evidence.” Soumya Swaminathan is Chief Scientist at the WHO. She said only a few human trials of convalescent plasma have produced results. ”At the moment, it’s still very low-quality evidence,” Swaminathan told reporters Monday. The WHO said one Chinese

study showed plasma from people who have recovered from coronavirus failed to make a difference in hospitalized patients, while another showed it can lower the risk of death. What is convalescent plasma? The treatment involves giving plasma from recovered COVID-19 patients to sick ones. Plasma is the liquid part of blood. Plasma from recovered patients is filled with antibodies, proteins that can kill harmful viruses and bacteria. The treatment was used during the 1918 flu pandemic. It was also used to fight several other infections before modern medicine found new anti-viral drugs. Earlier this month, researchers at the Mayo Clinic, in Minnesota, reported data from its experimental program to treat COVID-19 patients around the U.S. with convalescent plasma. The program called ”Expanded Access Program” was not an official study. It did not provide enough information to guarantee that the treatment cured COVID-19. It was ”designed to increase access to investigational convalescent plasma and evaluate the safety of this experimental therapy.” The health organization said 70,00 patients received the treatment. It found fewer deaths among those who received the plasma within three days of COVID-19 diagnosis. Dr. Michael Joyner is lead researcher for the program. He said, ”Our hope is that the safety findings and possible efficacy signals could inform the body of knowledge about the use of convalescent plasma to modify the course of COVID-19.” I’m Caty Weaver. Hai Do wrote this story for Learning English with additional reporting from Reuters and the Associated Press. Caty Weaver was the editor.

```
Words in This Story
convalescent - adj. recovering from an illness
plasma - n. the watery part of blood that contains blood cells
illness - n. a condition of being unhealthy, sick
standard - n. a level quality or achievement that is considered acceptable
pandemic - n. an occurrence in which a disease spreads very quickly and affects a large
    number of people around the world
access - n. a way of getting something
evaluate - v. to judge the value or condition carefully
```

翻译 Convalescent plasma, which has long been used to treat diseases, has become the latest issue in the race to find treatment for COVID-19. 长期以来一直被用于治疗疾病的康复者血清已经成为了寻找新冠肺炎疗法竞赛中的最新话题。On Sunday, President

Donald Trump announced that the United States would permit the emergency use of convalescent plasma to treat COVID-19 patients. Trump called it ”a breakthrough.” 川普总统周日宣布，美国将批准康复者血清用于治疗新冠肺炎患者的紧急使用。川普称其为“一次突破。”

However, the World Health Organization (WHO) on Monday warned that the treatment is still experimental. The group described the evidence in support of the treatment as ”low quality.” 然而，世卫组织周一警告说，这种疗法仍然处于试验阶段。该组织称这种疗法的支持证据“质量不高。”

Trump made the plasma announcement after his administration accused the U.S. Food and Drug Administration (FDA) of delaying in order to hurt his re-election chances this November. 在川普政府指责美国食品药品监督管理局故意拖延以损害他今年 11 月的连任机会之后，川普发布了这篇血清通告。

The emergency approval makes it easier for some patients to get the treatment. However, it is not the same as full FDA approval for treatment. 这次紧急批准使得一些患者更容易接受到这种治疗。然而，这与美国食品药品监督管理局完全批准这种疗法有所区别。

In its announcement, the FDA said, ”it is reasonable to believe that COVID-19 convalescent plasma may be effective in lessening the severity or shortening the length of COVID-19 illness in some hospitalized patients.” The agency said that more human trials are needed, ”as COVID-19 convalescent plasma does not yet represent a new standard of care based on the current available evidence.” 美国食品药品监督管理局在声明中表示，“有理由相信，新冠肺炎康复者血清可以有效减轻某些住院患者的病情或缩短其病程。”该机构表示，还需要进行更多人体试验，“因为根据现有证据，新冠肺炎康复者血清尚不能代表一种新的治疗标准。”

Soumya Swaminathan is Chief Scientist at the WHO. She said only a few human trials of convalescent plasma have produced results. ”At the moment, it’s still very low-quality evidence,” Swaminathan told reporters Monday. 苏米亚·斯瓦米纳坦是世卫组织的首席科学家。她表示，只有少数几项关于康复者血清的人体试验产生了效果。斯瓦米纳坦周一对记者表示：“目前，这仍然算非常低质量的证据。”

The WHO said one Chinese study showed plasma from people who have recovered from coronavirus failed to make a difference in hospitalized patients, while another showed it can lower the risk of death. 世卫组织表示，中国的一项研究表明，来自新冠病毒康复者的血清未能让住院患者产生差异，而另一项研究表明，它可以降低死亡风险。

What is convalescent plasma? 什么是康复者血清?

The treatment involves giving plasma from recovered COVID-19 patients to sick ones. Plasma is the liquid part of blood. Plasma from recovered patients is filled with antibodies, proteins that can kill harmful viruses and bacteria. 这种疗法将新冠肺炎康复者的血清注射给患病患者。血清是血液的液体部分。康复者血清中充满了可以杀死有害病毒和细菌的抗体和蛋白质。

The treatment was used during the 1918 flu pandemic. It was also used to fight several other infections before modern medicine found new anti-viral drugs. 这种疗法在 1918 年的大流感期间被使用过。在现代医学发现新的抗病毒药物之前，它还被用于抵抗另外几种感染。

Earlier this month, researchers at the Mayo Clinic, in Minnesota, reported data from its experimental program to treat COVID-19 patients around the U.S. with convalescent plasma. 本月初，明尼苏达州梅奥诊所的研究人员报告了一项实验项目中的数据，该项目利用康复者血清治疗美国各地的新冠肺炎患者。

The program called ”Expanded Access Program” was not an official study. It did not provide enough information to guarantee that the treatment cured COVID-19. It was ”designed to increase access to investigational convalescent plasma and evaluate the safety of this experimental therapy.” 这项被称为“Expanded Access Program”的项目并非官方性质的研究。它没有提供足够信息来保证这种疗法可以治愈新冠肺炎。它的目的是“推动康复者血清的调查并评估这种试验疗法的安全性。”

The health organization said 70,00 patients received the treatment. It found fewer deaths among those who received the plasma within three days of COVID-19 diagnosis. 这家卫生机构表示，有 7 千名患者接受了这种治疗。该机构发现，在新冠肺炎确诊 3 天内接受这种血清治疗的患者的死亡率更低。

Dr. Michael Joyner is lead researcher for the program. He said, ”Our hope is that the safety findings and possible efficacy signals could inform the body of knowledge about the use of convalescent plasma to modify the course of COVID-19.” 迈克尔·乔伊纳博士是该项目的首席研究员。他说：“我们希望这种安全结论和可能疗效信号可以提供关于使用康复者血清改变新冠肺炎病程的主体知识。”

音频

9.2 2021 年 1 月 4 日

图 28: An aerial view shows a Japan Self-Defence Force helicopter flying over residential areas flooded by the Chikuma river following Typhoon Hagibis in Nagano, central Japan, October 13, 2019, in this photo taken by Kyodo.

原文 By Jonathan Evans 09 November, 2019 More than 11,000 scientists are warning that the Earth, in their words, ”clearly and unequivocally faces a climate emergency.” The scientists represent several fields of study and come from 150 countries around the world. They approved a report that appeared in the publication Bioscience earlier this month. It warns that the world would face ”untold human suffering” if it does not make deep and lasting shifts in human activities that influence climate change. The new report is called the ”World Scientists’ Warning of a Climate Emergency.” Three leaders of the study are from the United States. They are ecologists Bill Ripple and Christopher Wolf of Oregon State University and William Moomaw of Tufts University in Massachusetts. The three worked on the study with scientists from universities in South Africa and Australia. This is the first time a large group of scientists have jointly used the word ”emergency” when talking about climate change. ”Despite 40 years of global climate negotiations...we have generally conducted business as usual and have largely failed to address this predicament,” the study said. ”Climate change has arrived and is accelerating faster than many scientists expected.” The report identified six areas that the world needs to deal with immediately. The scientists appealed to nations to use energy more efficiently and cut their use of fossil fuels. They suggested that lawmakers approve taxes on the burning of carbon-based fuels, such as coal, oil and natural gas. The scientists expressed support for women’s rights

and making family planning services ”available to all people.” They said this would help to reduce sudden or unexpected changes in the size of the human population. The report urges people to move toward more of a plant-based diet. Other areas of concern include preventing the destruction of forests and permanent loss of some plant and animal species. The reported noted that it will most likely take strong actions by the public to move politicians to approve lasting policy changes. The scientists added, ”We believe that the prospects will be greatest if decision-makers and all of humanity promptly respond to this warning and declaration of a climate emergency, and act to sustain life on planet Earth, our only home.” I’m Jonathan Evans. VOANews.com reported this story. Jonathan Evans adapted the story for Learning English. George Grow was the editor.

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Words in This Story
accelerating – adj. increasing in speed or rate of occurrence
address – v. to deal with; give attention to
fossil fuels – n. fuels such as coal, oil, or natural gas that formed in the earth from
    dead plants or animals
predicament – n. a difficult or unpleasant situation
prospects – n. opportunities for something to happen
shifts – n. changes in how something is done or how people think about something
sustain – v. to provide what is needed for something or someone to exist, continue, etc.
unequivocally – adv. in an unequivocal manner
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More than 11,000 scientists are warning that the Earth, in their words, ”clearly and unequivocally faces a climate emergency.” 超过 11000 名科学家发出了警告，用他们的话来说是，地球“显然并且毫无疑问地遇到了气候紧急状况。” The scientists represent several fields of study and come from 150 countries around the world. They approved a report that appeared in the publication Bioscience earlier this month. It warns that the world would face ”untold human suffering” if it does not make deep and lasting shifts in human activities that influence climate change. 来自全球 150 个国家的这些科学家们代表了多个研究领域。他们通过的一份报告发表在本月初的《生物科学》杂志上。这份报告警告称，如果不对影响气候变化的人类活动作出深刻而持久的改变，世界将面临“巨大的人类苦难。” The new report is called the ”World Scientists’ Warning of a Climate Emergency.” Three leaders of the study are from the United States. They are ecologists Bill Ripple and Christopher Wolf of Oregon State University and William Moomaw of Tufts University

in Massachusetts. The three worked on the study with scientists from universities in South Africa and Australia. 这份新报告名为《全球科学家对气候紧急状况发出的警告》。该研究的三位领导者来自美国。他们是俄勒冈州里大学的生态学家比尔·瑞博和克里斯托弗·沃尔夫，以及马萨诸塞州塔夫茨大学的威廉·穆茂。这三人与来自南非和澳大利亚各大学的科学家们一起进行了这项研究。This is the first time a large group of scientists have jointly used the word ”emergency” when talking about climate change. 这是首次有一大批科学家在谈到气候变化时共同使用了“紧急状况”这个词。”Despite 40 years of global climate negotiations...we have generally conducted business as usual and have largely failed to address this predicament,” the study said. ”Climate change has arrived and is accelerating faster than many scientists expected.” 研究称：“尽管全球气候谈判已经进行了 40 年，但我们一直照常开展业务，并且在很大程度上未能解决这一困境。气候变化已经到来，并且其加速度超过了许多科学家的预期。” The report identified six areas that the world needs to deal with immediately. The scientists appealed to nations to use energy more efficiently and cut their use of fossil fuels. They suggested that lawmakers approve taxes on the burning of carbon-based fuels, such as coal, oil and natural gas. 这份报告确立了全球需要立即处理的 6 大领域。科学家们呼吁各国更加有效地利用能源并减少化石燃料的使用。他们建议立法者批准对燃烧煤炭、石油和天然气等碳基燃料征税。The scientists expressed support for women’s rights and making family planning services ”available to all people.” They said this would help to reduce sudden or unexpected changes in the size of the human population. 科学家们表示支持妇女权利，并使计划生育服务“向所有人提供。”他们表示，这将会有助于减少人口规模突然或意外发生变化。The report urges people to move toward more of a plant-based diet. 报告督促人们朝着以植物性饮食为主的方向发展。Other areas of concern include preventing the destruction of forests and permanent loss of some plant and animal species. 其它令人关注的领域包括防止森林遭到破坏，以及防止某些动植物物种遭受永久性损失。The reported noted that it will most likely take strong actions by the public to move politicians to approve lasting policy changes. 报告指出，公众很可能会采取强有力的行动，督促政客批准可持续的政策改革。The scientists added, ”We believe that the prospects will be greatest if decision-makers and all of humanity promptly respond to this warning and declaration of a climate emergency, and act to sustain life on planet Earth, our only home.” 这些科学家们还说：“我们相信，如果决策者和全人类迅速响应这一警告并宣布气候紧急状态，采取行动维护地球这个我们唯一家园的生命，那么就会有伟大的前景。”

9.3 2021 年 1 月 5 日

图 29: 82-year-old Brian Pinker receives the Oxford University-AstraZeneca COVID-19 vaccine from nurse Sam Foster at the Churchill Hospital in Oxford, southwest England on January 4, 2021.

原文 By Susan Shand 04 January 2021 The United States says it is considering giving some people half the dose of Moderna's COVID-19 vaccine in order to vaccinate more people. Moncef Slaoui is the head the country's vaccine program. He said Sunday that officials were discussing the possible plan with Moderna and the Food and Drug Administration (FDA). Moderna's vaccine requires two doses per individual. He said that giving half of the dose to people between the ages of 18 and 55 will allow the vaccination program to "double the number of people with the doses we have." He added that just one injection causes an "identical" immunity. Moderna and the FDA could not immediately be reached for comment. The U.S. Centers for Disease Control and Prevention said it had injected more than four million people with a first dose of vaccine by Monday morning. It said it had sent out more than 13 million doses. The U.S. has also approved a two-dose vaccination treatment from drug company Pfizer. The government's vaccination plan has not been meeting its goals. Officials had hoped to have 20 million people vaccinated by the end of the 2020. Vaccine race Britain has administered about one million vaccinations since it approved the Pfizer vaccine in early December. On Monday, it became the first country to use a vaccine developed by Oxford University and AstraZeneca. That vaccine is easier to store and transport. A new surge of COVID-19 cases is threatening the country's

National Health Service. Britain is trying to vaccinate older people and others at higher risk from the disease. Prime Minister Boris Johnson's government has secured 100 million doses of the Oxford/AstraZeneca vaccine. Eighty-two-year-old Brian Pinker was the first person to get that vaccine outside of experimental use. Pinker, who has kidney disease, said he was "proud" the medicine was invented in Oxford. Israel is the world's vaccination leader. More than ten percent of its population is already vaccinated. Israel is now injecting more than 150,000 people a day. In December 2020, China approved its first COVID-19 vaccine. It is one injection and was created by drugmaker Sinopharm. The government-owned company has said its treatment is 79 percent effective against the virus. Russia has been providing its COVID-19 vaccine, called Sputnik V, since August. More than 100,000 people have been injected. In November, the government said the treatment was more than 91 percent effective. New versions Britain has seen a surge in coronavirus cases in recent weeks as officials struggle to control the spread of a new version of the COVID-19 virus. The new version is far more contagious than others. Officials have recorded more than 50,000 new infections a day since December 29. On Monday, they reported 407 deaths related to the virus. That brings the total number of confirmed COVID deaths in Britain to 75,431. Britain also reports the presence of a second new version of coronavirus. It appears that version came from South Africa. Johnson said on Sunday that more restrictions were likely, even with millions already living under the highest level of restrictions. Starting at midnight tonight, most of mainland Scotland will be in total lockdown, announced Scottish First Minister Nicola Sturgeon. Europe In Germany, government spokesman Steffen Seibert said Monday that the government does not regret its decision last year to have the European Union order vaccines for all 27 nations. He said that for a country in the middle of Europe with many borders, "everyone for themselves cannot be the way." Nearly 265,000 vaccinations have been reported since the program began one week ago. Critics are pointing to faster programs in the U.K., the U.S. and Israel. Health Ministry spokesman Hanno Kautz said 1.3 million doses of the BioNTech-Pfizer vaccine were delivered to Germany before the end of 2020 and another 670,000 are due on Friday. Germany has 83 million people. I'm Susan Shand. The Associated Press and the Reuters News Agency reported this story. Susan Shand adapted it for Learning English. Caty Weaver was the editor.

Words in This Story
dose – n. the amount of a medicine, drug, or vitamin that is taken at one time
immunity – n. the power to keep yourself from being affected by a disease
surge - n. a move that is very quick and sudden in a particular direction
contagious – adj. able to be passed from one person or animal to another by touching

The United States says it is considering giving some people half the dose of Moderna's COVID-19 vaccine in order to vaccinate more people. 美国称其正考虑给某些人接种一半剂量的新冠肺炎疫苗,以便为更多人接种疫苗。Moncef Slaoui is the head the country's vaccine program. He said Sunday that officials were discussing the possible plan with Moderna and the Food and Drug Administration (FDA). Moderna's vaccine requires two doses per individual. 蒙塞夫·斯拉维是美国疫苗项目的负责人。他周日表示，有关官员正同莫德纳公司以及美国食品药品管理局讨论这种可能的方案。莫德纳公司的疫苗需要每人注射两针。He said that giving half of the dose to people between the ages of 18 and 55 will allow the vaccination program to "double the number of people with the doses we have." 他说，给年龄在 18 到 55 岁之间的人士注射一半剂量的疫苗，将使疫苗接种计划能够将"现有疫苗的可接种人数翻倍。" He added that just one injection causes an "identical" immunity. 他还表示，只注射一针剂量会产生"完全相同"的免疫效果。Moderna and the FDA could not immediately be reached for comment. 莫德纳公司和美国食品药品管理局未能立即发表评论。The U.S. Centers for Disease Control and Prevention said it had injected more than four million people with a first dose of vaccine by Monday morning. It said it had sent out more than 13 million doses. 美国疾病控制预防中心表示，截至周一早上，已经向超过 400 万人注射了第一针疫苗。该中心称其已经发放了超过 1300 万剂疫苗。The U.S. has also approved a two-dose vaccination treatment from drug company Pfizer. 美国还批准了辉瑞制药公司的一种两剂疫苗疗法。The government's vaccination plan has not been meeting its goals. Officials had hoped to have 20 million people vaccinated by the end of the 2020. 美国政府的疫苗方案尚未达成其目标。官员们希望在 2020 年底前接种 2000 万人。Vaccine race 疫苗竞赛 Britain has administered about one million vaccinations since it approved the Pfizer vaccine in early December. On Monday, it became the first country to use a vaccine developed by Oxford University and AstraZeneca. That vaccine is easier to store and transport. 英国自 12 月初批准辉瑞疫苗以来，已经进行了大约 100 万次接种。英国周一成为采用牛津大学和阿斯利康公司所研发疫苗的首个国家。这种疫苗更易于储存和运输。A new surge of COVID-19 cases is threatening the country's National

Health Service. Britain is trying to vaccinate older people and others at higher risk from the disease. Prime Minister Boris Johnson's government has secured 100 million doses of the Oxford/AstraZeneca vaccine. 新一轮的新冠肺炎病例正在威胁该国的国民医疗服务体系。英国正尝试给老年人和其它高风险人群接种。英国首相鲍里斯·约翰逊领导的政府已经获得了 1 亿剂牛津大学和阿斯利康公司研发的疫苗。Eighty-two-year-old Brian Pinker was the first person to get that vaccine outside of experimental use. 82 岁的布莱恩·平克是实验用途之外接种该疫苗的第一人。Pinker, who has kidney disease, said he was "proud" the medicine was invented in Oxford. 患有肾脏疾病的平克表示，他对牛津大学研发的这种药物感到骄傲。Israel is the world's vaccination leader. More than ten percent of its population is already vaccinated. Israel is now injecting more than 150,000 people a day. 以色列是全球疫苗接种的领跑者。该国 10% 以上人口已经接种了疫苗。以色列现在每天给超过 15 万人注射疫苗。In December 2020, China approved its first COVID-19 vaccine. It is one injection and was created by drugmaker Sinopharm. The government-owned company has said its treatment is 79 percent effective against the virus. 2020 年 12 月，中国批准了该国第一种新冠肺炎疫苗。它是由国药集团生产的一种注射剂。这家国有企业称其疫苗对新冠病毒的有效率为 79%。Russia has been providing its COVID-19 vaccine, called Sputnik V, since August. More than 100,000 people have been injected. In November, the government said the treatment was more than 91 percent effective. 俄罗斯自 8 月份以来一直在接种一种名为 Sputnik V 的新冠肺炎疫苗。已经有超过 10 万人接种。俄罗斯政府在 11 月表示，该疫苗的有效率为 91% 以上。New versions 病毒新变种 Britain has seen a surge in coronavirus cases in recent weeks as officials struggle to control the spread of a new version of the COVID-19 virus. The new version is far more contagious than others. Officials have recorded more than 50,000 new infections a day since December 29. On Monday, they reported 407 deaths related to the virus. That brings the total number of confirmed COVID deaths in Britain to 75,431. 由于官员们难以控制一种新冠病毒变种的传播，英国近几周新冠病毒病例激增。这种新变种比其它类型病毒的感染力更强。自 12 月 29 日以来，官方每天录得超过 5 万例新增感染病例。周一，英国报告了 407 例与这种病毒有关的死亡病例。这使得英国确诊新冠肺炎死亡总人数达到了 75431 人。Britain also reports the presence of a second new version of coronavirus. It appears that version came from South Africa. 英国还报告出现了第二种新冠病毒变种。这种新变种病毒似乎来自于南非。Johnson said on Sunday that more restrictions were likely, even with millions already living under the highest level of restrictions. 约翰逊周日表示可能会出台更多限制措施，即便已经有数百万人生活在最高级别的限制措施之下。Starting at midnight

tonight, most of mainland Scotland will be in total lockdown, announced Scottish First Minister Nicola Sturgeon. 苏格兰首相尼古拉·斯特金宣布，从今晚午夜开始，苏格兰大部分地区将处于全面封锁状态。Europe 欧洲 In Germany, government spokesman Steffen Seibert said Monday that the government does not regret its decision last year to have the European Union order vaccines for all 27 nations. He said that for a country in the middle of Europe with many borders, ”everyone for themselves cannot be the way.” 在德国，政府发言人斯坦芬·塞伯特周一表示，德国政府对去年决定为欧盟所有 27 个成员国订购疫苗的决定不感后悔。他说，对于一个处于欧洲中部、边界众多的国家来说，“人人只想着自己不是解决办法。” Nearly 265,000 vaccinations have been reported since the program began one week ago. Critics are pointing to faster programs in the U.K., the U.S. and Israel. 自一周前该计划开始以来，已经报告有近 26.5 万人接种。批评人士指出英国、美国和以色列推出了更快的疫苗接种计划。Health Ministry spokesman Hanno Kautz said 1.3 million doses of the BioNTech-Pfizer vaccine were delivered to Germany before the end of 2020 and another 670,000 are due on Friday. Germany has 83 million people. 德国卫生部发言人汉诺·考茨表示，2020 年底前已经向德国交付了 130 万剂由 BioNTech 和辉瑞公司联合研制的疫苗，周五还将会交付 67 万剂疫苗。德国有 8300 万人口。

9.4 2021 年 2 月 19 日

图 30: A medical worker fills a syringe with a dose of the Pfizer-BioNTech COVID-19 vaccine at Tokyo Medical Center.(Behrouz Mehri/Pool Photo via AP)

原文 By Dan Friedell 17 February 2021 Japan began giving COVID-19 vaccinations to its people on Wednesday. Many other developed countries began vaccination campaigns back in December. Japan is behind other countries because it asked drug companies to carry out special clinical trials with Japanese people. The country only gave

permission for the vaccine on Sunday. The delay has some people worried that not enough Japanese people will be vaccinated before the proposed start of the delayed 2020 Tokyo Olympic Games. The Games are now set to begin on July 23, after being delayed by one year because of the coronavirus health crisis. The first people in Japan to get the vaccine – made by Pfizer and BioNTech – are medical workers, old people and people with health problems. The rest of the Japanese public may be able to get a vaccine in the late spring or early summer. Japan has a population of 127 million people. At the current rate, not enough people will have the vaccine by the start of the Olympics to make sure everyone is safe. Officials are struggling to fight opposition among citizens to holding the Games. Recent public opinion studies in Japan found that about 80 percent of those questioned support canceling the Games completely or delaying them again. But Japanese leaders, including Prime Minister Yoshihide Suga, say they want to move forward with the Games. They say the Olympics will be ”proof of human victory against the pandemic.” Japan also wants to show the world it can hold the Olympics before China runs the 2022 Winter Olympics in Beijing. Those Games are set to start in less than one year. Japan has dealt with the pandemic better than many Western countries. But a recent increase in cases has caused concern. Currently, some parts of Japan are under stronger restrictions than they faced during most of 2020. Japan is still doing well compared to many other countries. About one person out of every 100,000 is testing positive for the virus. In the United States, that number is almost 25 out of 100,000. One of the first Japanese people to get the vaccine was Dr. Kazuhiro Araki. He is the president of the Tokyo Medical Center. He said it did not hurt, adding ”I hope we feel more at ease.” Taro Kono is Japan’s vaccine minister. He answered criticism about the slow start to the vaccination program by saying it was important to show the Japanese people it would be safe. ”So at the end of the day we might have started slower, but we think it will be more effective,” he said. Japanese leaders say they are working to develop more vaccines in Japan instead of using doses from other countries. More vaccine will arrive next week. Almost 4 million health care workers are set to be vaccinated in March. Starting in April, the 36 million Japanese people aged 65 and older will be able to receive their shots. I’m Dan Friedell. Mari Yamaguchi wrote this story for The Associated Press. Dan Friedell adapted it for Learning English. Ashley Thompson was the editor.

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Words in This Story
clinical trial - n. a test to determine the effectiveness of a new drug or medical
    technique
pandemic - n. an occurrence in which a disease spreads very quickly and affects a large
    number of people over a wide area or throughout the world
positive - adj. showing the presence of a particular germ, condition, or substance
dose - n. the amount of a medicine, drug, or vitamin that is taken at one time
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Japan began giving COVID-19 vaccinations to its people on Wednesday. Many other developed countries began vaccination campaigns back in December. 日本周三开始给本国民众接种新冠肺炎疫苗。许多发达国家去年 12 月就开始接种疫苗。Japan is behind other countries because it asked drug companies to carry out special clinical trials with Japanese people. The country only gave permission for the vaccine on Sunday. 日本落后于其它国家，是因为它要求制药公司对日本人开展特殊的临床试验。该国在本周日才刚刚批准使用这种疫苗。The delay has some people worried that not enough Japanese people will be vaccinated before the proposed start of the delayed 2020 Tokyo Olympic Games. 这种延误使一些人担心在被推迟的 2020 年东京奥运会拟开幕前，没有足够多的日本人能够接种疫苗。The Games are now set to begin on July 23, after being delayed by one year because of the coronavirus health crisis. 这届奥运会由于新冠病毒危机被推迟一年之后，目前定于 7 月 23 日开幕。The first people in Japan to get the vaccine – made by Pfizer and BioNTech – are medical workers, old people and people with health problems. 首批接种由辉瑞和 BioNTech 联合研制疫苗的日本民众包括医务人员、老年人以及存在健康问题的人士。The rest of the Japanese public may be able to get a vaccine in the late spring or early summer. 其余日本民众也许能够在春末或夏初接种疫苗。Japan has a population of 127 million people. At the current rate, not enough people will have the vaccine by the start of the Olympics to make sure everyone is safe. 日本有 1.27 亿人口。按目前的速度，到奥运会开幕时，没有足够多人士接种疫苗以确保每个人都安全。Officials are struggling to fight opposition among citizens to holding the Games. Recent public opinion studies in Japan found that about 80 percent of those questioned support canceling the Games completely or delaying them again. 有关官员正在努力反驳市民对举办这届奥运会的反对意见。日本最近的民意调查发现，大约 80But Japanese leaders, including Prime Minister Yoshihide Suga, say they want to move forward with the Games. They say the Olympics will be ”proof of human victory against the pandemic.” 但是包括首相菅义伟在内的日本领导人表示，他们希望继续推进这届奥运会。他们表示，这届奥运会将是“人类战胜大流

行的证明。”Japan also wants to show the world it can hold the Olympics before China runs the 2022 Winter Olympics in Beijing. Those Games are set to start in less than one year. 日本还想向世界展示，它有能力在中国举办 2022 年冬奥会之前举办本届奥运会。这两届奥运会将在不到 1 年时间内接连开幕。Japan has dealt with the pandemic better than many Western countries. But a recent increase in cases has caused concern. Currently, some parts of Japan are under stronger restrictions than they faced during most of 2020. 日本在应对大流行方面要比许多西方国家都做得更好。但是最近的病例激增引发了人们的担忧。目前，日本某些地区受到了比 2020 年大部分时间都要更严格的限制。Japan is still doing well compared to many other countries. About one person out of every 100,000 is testing positive for the virus. In the United States, that number is almost 25 out of 100,000. 与其它许多国家相比，日本表现仍然不错。每 10 万人中大约有 1 人对病毒呈阳性反应。在美国，这个数字是每 10 万人接近 25 人。One of the first Japanese people to get the vaccine was Dr. Kazuhiro Araki. He is the president of the Tokyo Medical Center. 荒木和宏博士是首批接种该疫苗的日本人之一。他是东京医疗中心的总裁。He said it did not hurt, adding ”I hope we feel more at ease.” 他说，接种疫苗不疼，并补充说，我希望大家更加安心。Taro Kono is Japan’s vaccine minister. He answered criticism about the slow start to the vaccination program by saying it was important to show the Japanese people it would be safe. 河野太郎是日本的疫苗大臣。他回应了人们对疫苗接种计划启动缓慢的批评。他说，向日本民众表明接种疫苗的安全，这一点很重要。”So at the end of the day we might have started slower, but we think it will be more effective,” he said. 他说：“所以到头来我们可能会启动缓慢，但是我们认为这样做会更有效。”Japanese leaders say they are working to develop more vaccines in Japan instead of using doses from other countries. More vaccine will arrive next week. 日本领导人表示，他们正在努力开发更多日本疫苗，而不是使用其它国家的疫苗。下周会有更多疫苗面世。Almost 4 million health care workers are set to be vaccinated in March. Starting in April, the 36 million Japanese people aged 65 and older will be able to receive their shots. 日本计划在 3 月份为 400 万医护人员接种疫苗。从 4 月开始，3600 万名 65 岁及以上年龄的日本民众将能够接种疫苗。

9.5 2021 年 3 月 1 日

图 31: FILE - An artist's impression of the Cygnus X-1 system, with a so-called stellar-mass black hole orbiting a companion star some 7,200 light years from Earth. (International Centre for Radio Astronomy Research/Handout via REUTERS)

原文 By John Russell 27 February 2021 A recent study found that the first black hole ever discovered is a lot bigger than scientists first thought. Black holes are extremely massive space objects whose gravity is so powerful not even light escapes. The black hole, Cygnus X-1, was discovered in 1964. It is well-known for being the object of a friendly bet between two famous scientists. Researchers found that new observations of Cygnus X-1 showed it is 21 times our sun's mass. That is about 50 percent more massive than scientists had believed. While it is still one of the closest black holes known, the scientists found it is farther away than earlier estimates suggested. It is 7,200 light years away. A light year is the distance light travels in one year. Some black holes, like the one at the center of the Milky Way Galaxy, are extremely large. These are called "supermassive" black holes. They can be millions of times more massive than the sun. Smaller black holes are called "stellar-mass" black holes. They have the mass of a single star. Cygnus X-1 is the Milky Way's largest-known stellar-mass black hole. It is among the strongest X-ray sources seen from Earth, said James Miller-Jones of Curtin University and the International Centre for Radio Astronomy Research in Australia. Miller-Jones led the study that appeared in the publication Science. Cygnus X-1 turns so quickly that it comes close to the highest rate predicted under physicist Albert Einstein's theory of general relativity, Miller-Jones added. The black hole brings in material that comes from the surface of the star that it orbits. This

star is a ”blue supergiant,” a very large star about 40 times our sun’s mass. Cygnus X-1 started to exist 4 million to 5 million years ago as a star up to 75 times more massive than the sun. But then it collapsed into a black hole a few tens of thousands of years ago. The research included data from the Very Long Baseline Array radio telescope. It is made up of 10 observation stations in the United States. After Cygnus X-1 was first identified as a possible black hole, a friendly bet was made between two physicists, Stephen Hawking and Kip Thorne. Hawking bet against the object being a black hole, while Thorne bet that it was one. Hawking eventually admitted that the evidence suggested Cygnus X-1 was a black hole. Miller-Jones, the leader of the recent study said, ”Indeed, I did not have any wagers riding on these findings.” I’m John Russell. Will Dunham reported on this story for Reuters. John Russell adapted it for Learning English. Mario Ritter, Jr. was the editor.

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Words in This Story
bet – n. an agreement in which people try to guess what will happen and the person who
    guesses wrong has to give something (such as money) to the person who guesses right;
    a wager
source – n. the place where something starts from
wager – n. an agreement in which people try to guess what will happen and the person
    who guesses wrong has to give something (such as money) to the person who guesses
    right; a bet
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A recent study found that the first black hole ever discovered is a lot bigger than scientists first thought. 一项最新研究发现，人类有史以来发现的第一个黑洞要比科学家最初认为的要大得多。Black holes are extremely massive space objects whose gravity is so powerful not even light escapes. The black hole, Cygnus X-1, was discovered in 1964. It is well-known for being the object of a friendly bet between two famous scientists. 黑洞是极其巨大的空间物体，其引起是如此之大，甚至连光都无法逃脱。天鹅座 X-1 黑洞于 1964 年被发现。它因为成为两位科学家之间友好打赌的对象而闻名。Researchers found that new observations of Cygnus X-1 showed it is 21 times our sun’s mass. That is about 50 percent more massive than scientists had believed. 研究人员发现，对天鹅座 X-1 的新观测表明其质量是太阳系的 21 倍。这比科学家之前认为的要大 50While it is still one of the closest black holes known, the scientists found it is farther away than earlier estimates suggested. It is 7,200 light years away. A light year is the distance

light travels in one year. 尽管它仍然是已知最接近地球的黑洞之一，但是科学家们发现它比之前估计的要远得多。它距离我们有 7200 光年。1 光年是指光在 1 年当中传播的距离。Some black holes, like the one at the center of the Milky Way Galaxy, are extremely large. These are called ”supermassive” black holes. They can be millions of times more massive than the sun. Smaller black holes are called ”stellar-mass” black holes. They have the mass of a single star. 有些黑洞非常大，例如银河系当中的黑洞。这些被称之为“超大质量”黑洞。它们的质量可能是太阳的几百万倍。较小的黑洞被称为恒星级黑洞。它们具有单颗恒星的质量。Cygnus X-1 is the Milky Way’s largest-known stellar-mass black hole. It is among the strongest X-ray sources seen from Earth, said James Miller-Jones of Curtin University and the International Centre for Radio Astronomy Research in Australia. Miller-Jones led the study that appeared in the publication Science. 天鹅座 X-1 是银河系当中最大的恒星级黑洞。科廷大学和澳大利亚国际射电天文学研究中心的詹姆斯·米勒琼斯说，这是从地球上观测到的最强的 X 射线源之一。米勒琼斯领导了这项研究，其研究结果发表在《科学》杂志上。Cygnus X-1 turns so quickly that it comes close to the highest rate predicted under physicist Albert Einstein’s theory of general relativity, Miller-Jones added. 米勒琼斯还说，天鹅座 X-1 的自转是如此之快，以至于接近物理学家爱因斯坦的广义相对论所预测的最高速度。The black hole brings in material that comes from the surface of the star that it orbits. This star is a ”blue supergiant,” a very large star about 40 times our sun’s mass. 这个黑洞吸取了它所绕行的恒星表面的物质。这颗恒星是蓝巨星，它是一颗非常巨大的恒星，其质量约为太阳质量的 40 倍。Cygnus X-1 started to exist 4 million to 5 million years ago as a star up to 75 times more massive than the sun. But then it collapsed into a black hole a few tens of thousands of years ago. 天鹅座 X-1 的存在始于 400 万到 500 万年前，它是一颗质量是太阳 75 倍的恒星。但是在几万年前，它坍塌成了一个黑洞。The research included data from the Very Long Baseline Array radio telescope. It is made up of 10 observation stations in the United States. 这项研究包含的数据来自于甚长基线射电望远镜阵。它是由美国的 10 个观测站组成的。After Cygnus X-1 was first identified as a possible black hole, a friendly bet was made between two physicists, Stephen Hawking and Kip Thorne. Hawking bet against the object being a black hole, while Thorne bet that it was one. Hawking eventually admitted that the evidence suggested Cygnus X-1 was a black hole. 在天鹅座 X-1 最初被认定可能是黑洞之后，斯蒂芬·霍金和基普·索恩这两位物理学家进行了一项友好的打赌。霍金赌这个物体不是黑洞，而索恩赌那就是一个黑洞。霍金最终承认，有证据表明天鹅座 X-1 是一个黑洞。Miller-Jones, the leader of the recent study said, ”Indeed, I did not

have any wagers riding on these findings.” 这项最新研究的负责人米勒琼斯表示：“其实我对这些发现没投任何赌注。”

9.6 2021 年 4 月 13 日

图 32: This satellite photo from Planet Labs Inc. shows Iran’s Natanz nuclear facility on Wednesday, April 7, 2021. (Planet Labs Inc. via AP)

原文 By Bryan Lynn 12 April 2021 Iran has accused Israel of carrying out an attack on a nuclear center that damaged equipment and caused a power outage. Iranian officials called Sunday’s incident at the Natanz nuclear center an act of ”nuclear terrorism.” They said centrifuges were damaged at the plant. A centrifuge is a device used to increase the purity of uranium for nuclear purposes. Media organizations reported the Israeli government was behind the action, which was described as a cyberattack. However, Israel did not claim responsibility for an attack or comment directly on the incident. Speaking to reporters Monday, Israeli Prime Minister Benjamin Netanyahu said Israel would continue efforts aimed at preventing Iran from gaining a nuclear weapon. He said such a device would give Iran the ability ”to carry out its genocidal goal of eliminating Israel.” He added that Israel ”will continue to defend itself against Iran’s aggression and terrorism.” A former chief of Iran’s paramilitary Revolutionary Guard, General Mohsen Rezaei, said in a message on Twitter that the attack had started a fire. Iran’s Foreign Ministry spokesman Saeed Khatibzadeh said the country’s answer to the action should be ”to take revenge against Israel.” He did not comment further, but added that Israel ”will receive its answer through its own path.” Khatibzadeh confirmed that centrifuges at the plant had been damaged. The incident

took place one day after Iran announced it had launched new, advanced centrifuge machines at Natanz. Khatibzadeh said only the older centrifuges were damaged. Iran's improvements in centrifuge technology are designed to permit the country to process uranium faster. Since January, Iran has begun enriching uranium to as high as 20 percent purity, a technical step away from weapons-grade levels. The incident came after negotiations began last week in Vienna aiming to bring the United States back into a 2015 nuclear deal with Iran. The deal – which the U.S. left in 2018 under President Donald Trump – restricts Iran's nuclear program in exchange for easing U.S. and international sanctions. The U.S. reestablished economic sanctions after withdrawing from the agreement. Iran answered by violating some of the terms of the deal. In Vienna, officials from the U.S. and Iran were holding indirect talks. Also taking part were representatives from countries still in the nuclear deal – Britain, China, France, Germany and Russia. U.S. Defense Secretary Lloyd Austin arrived Monday in Israel for talks with Netanyahu and other officials. When asked by reporters whether the nuclear discussions might be affected by the incident at the plant Lloyd said, "Those efforts will continue." In a statement, the White House said it knew about the Natanz attack and that "the U.S. was not involved in any manner." I'm Bryan Lynn.

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Words in This Story
cyberattack – n. an attempt by attackers to damage or destroy a computer network or
    system
eliminate – v. remove or get rid of something
revenge – n. the act of doing something to hurt someone because that person did
    something that hurt you
advanced – adj. having developed or progressed to a late stage
sanction – n. a restriction, usually limiting trade, that are meant to cause a country
    to obey international law
manner –n. way or method that something is done
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Iran has accused Israel of carrying out an attack on a nuclear center that damaged equipment and caused a power outage. 伊朗指责以色列袭击一处核中心，破坏了设备，并造成了停电。Iranian officials called Sunday's incident at the Natanz nuclear center an act of "nuclear terrorism." They said centrifuges were damaged at the plant. A centrifuge is a device used to increase the purity of uranium for nuclear

purposes. 伊朗官员称纳坦兹核中心周日发生的事件是“核恐怖主义”行为。他们表示该工厂有离心机受到了破坏。离心机是一种提高铀纯度用于核用途的设备。

Media organizations reported the Israeli government was behind the action, which was described as a cyberattack. However, Israel did not claim responsibility for an attack or comment directly on the incident. 媒体机构报道称，以色列政府是这场被称为网络攻击的行动的幕后黑手。然而，以色列并未宣称对这起袭击事件负责，也没有直接对该事件发表评论。

Speaking to reporters Monday, Israeli Prime Minister Benjamin Netanyahu said Israel would continue efforts aimed at preventing Iran from gaining a nuclear weapon. He said such a device would give Iran the ability ”to carry out its genocidal goal of eliminating Israel.” He added that Israel ”will continue to defend itself against Iran’s aggression and terrorism.” 以色列总理内塔尼亚胡周一对记者表示，以色列将继续努力防止伊朗获得核武器。他说，这种武器将使伊朗有能力“实施其消灭以色列的种族主义目标。”他还表示，以色列“将继续抵抗伊朗的侵略和恐怖主义。”

A former chief of Iran’s paramilitary Revolutionary Guard, General Mohsen Rezaei, said in a message on Twitter that the attack had started a fire. 伊朗革命卫队前负责人莫森·雷扎伊在推特上发文表示，这次袭击引发了大火。

Iran’s Foreign Ministry spokesman Saeed Khatibzadeh said the country’s answer to the action should be ”to take revenge against Israel.” He did not comment further, but added that Israel ”will receive its answer through its own path.” 伊朗外交部发言人赛义德·哈蒂布扎德表示，作为回应，伊朗将会对以色列展开报复。他没有进一步评论。但是他还表示，以色列将通过自己的途径得到答案。

Khatibzadeh confirmed that centrifuges at the plant had been damaged. The incident took place one day after Iran announced it had launched new, advanced centrifuge machines at Natanz. Khatibzadeh said only the older centrifuges were damaged. 哈蒂布扎德确认该工厂的离心机已被损坏。事件发生前一天，伊朗刚宣布在纳坦兹核中心启动更先进的新型离心机。哈蒂布扎德表示，只有旧型号离心机受到了破坏。

Iran’s improvements in centrifuge technology are designed to permit the country to process uranium faster. 伊朗对离心机技术的改进旨在使该国更快地加工铀。

Since January, Iran has begun enriching uranium to as high as 20 percent purity, a technical step away from weapons-grade levels. 自 1 月以来，伊朗已经开始将铀浓缩至高达 20%的纯度，这是接近武器级水平的一项技术步骤。

The incident came after negotiations began last week in Vienna aiming to bring

the United States back into a 2015 nuclear deal with Iran. The deal – which the U.S. left in 2018 under President Donald Trump – restricts Iran's nuclear program in exchange for easing U.S. and international sanctions. 事件发生前，上周在维也纳开展了旨在使美国重回与伊朗达成的 2015 年核协议的谈判。这项协议以限制伊朗的核计划换取美国和国际放松制裁，川普总统于 2018 年带领美国退出了该协议。

The U.S. reestablished economic sanctions after withdrawing from the agreement. Iran answered by violating some of the terms of the deal. 美国在退出协议后重启了经济制裁。伊朗通过违反该协议的某些条款做出了回应。

In Vienna, officials from the U.S. and Iran were holding indirect talks. Also taking part were representatives from countries still in the nuclear deal – Britain, China, France, Germany and Russia. 在维也纳，来自美国和伊朗的官员进行了间接谈判。仍然留在该协议中的国家的代表也参加了这次会议，这些国家包括英国、中国、法国、德国和俄罗斯。

U.S. Defense Secretary Lloyd Austin arrived Monday in Israel for talks with Netanyahu and other officials. When asked by reporters whether the nuclear discussions might be affected by the incident at the plant Lloyd said, "Those efforts will continue." 美国国防部长劳埃德·奥斯丁周一抵达以色列，与内塔尼亚胡等官员举行了会谈。当记者问到核谈判是否会受到此次事件的影响时，劳埃德表示："谈判还将继续下去。"

In a statement, the White House said it knew about the Natanz attack and that "the U.S. was not involved in any manner." 白宫在一份声明中表示，它知晓纳坦兹核中心发生的袭击事件，美国没有以任何方式介入。

I'm Bryan Lynn. 我是布莱恩·林恩。

9.7 2021 年 5 月 6 日

图 33: This photograph shows a vial of Pfizer/BioNTech vaccine against the Covid-19 (novel coronavirus) at the health center of Elafonissos, on the Elafonissos Island, on April 23, 2021.

原文 By Bryan Lynn 04 May 2021 The United States is expected to approve the use of Pfizer's COVID-19 vaccine for young people aged 12 to 15 by next week. A federal official told The Associated Press that the Food and Drug Administration (FDA) plans to expand its emergency use authorization for Pfizer's vaccine to the new age group. The official did not want to be identified because there has been no public announcement about Pfizer's vaccine plans. The New York Times first reported on the expected timing of the plan. The official said the approval is expected to come by early next week. The person added that the FDA also plans to approve Pfizer's two-shot vaccine for even younger children later this year. The FDA's expansion of its emergency use authorization is the first step in the approval process. That action would be followed by a meeting of a federal vaccine advisory committee to discuss whether to recommend the injection for 12- to 15-year-olds. If the Centers for Disease Control and Prevention approves the committee's recommendation, the shots could begin. Those steps could be completed in a matter of days. In March, Pfizer released the first results from a vaccine study involving 2,260 U.S. volunteers aged 12 to 15. The study showed there were no cases of COVID-19 among fully vaccinated individuals compared with 18 in the group who were given a placebo, a shot of inactive substance. The 12- to 15-year-olds had side effects similar to young adults, Pfizer said. The main side effects are pain, increased temperature, tiredness and chills, especially after the second shot. The study will continue

to follow test subjects for two years to gain more information about long-term protection and safety. Pfizer is not the only company seeking to lower the age limit for its vaccine. Results are also expected by the middle of this year from a U.S. study of Moderna's vaccine in 12- to 17-year-olds. The FDA is permitting both companies to also begin U.S. studies in children 11 and younger. More than 131 million doses of Pfizer's vaccine have already been given in the U.S., where demand for vaccines among adults has greatly slowed in recent weeks. Younger people generally have a much lower risk of experiencing serious side effects from COVID-19. But they started making up a larger share of new U.S. cases as an increasing number of adults got vaccinated and some virus-related restrictions were eased. Officials hope that expanding the vaccines to young people will help efforts to safely reopen schools in the autumn. The U.S. has ordered at least 300 million doses of the Pfizer shot by the end of July, enough to protect 150 million people. I'm Bryan Lynn.

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Words in This Story
authorize – v. to give permission for something to happen
recommend – v. to suggest or propose
placebo – n. a harmless pill or medicine used as a control in testing new drugs
chills – n. a feeling of cold
dose – n. the amount of a medicine, drug, or vitamin that is taken at one time
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The United States is expected to approve the use of Pfizer′s COVID-19 vaccine for young people aged 12 to 15 by next week. 预计美国将在下周批准辉瑞的新馆肺炎疫苗用于 12-15 岁青少年。A federal official told The Associated Press that the Food and Drug Administration (FDA) plans to expand its emergency use authorization for Pfizer′s vaccine to the new age group. 一位联邦官员告诉美联社，美国食品药品监督管理局计划将辉瑞疫苗的紧急使用授权扩大到这一新的年龄段。

The official did not want to be identified because there has been no public announcement about Pfizer′s vaccine plans. The New York Times first reported on the expected timing of the plan. 这位官员不愿意透露姓名，因为尚未发布有关辉瑞疫苗计划的公告。《纽约时报》最先报道了该计划的预期时间。

The official said the approval is expected to come by early next week. The person added that the FDA also plans to approve Pfizer′s two-shot vaccine for even younger children later this year. 这位官员表示，预计将在下周初批准。该人士还表示，美国

食品药品监督管理局计划今年晚些时候批准辉瑞的两剂疫苗用于更年幼儿童。

The FDA's expansion of its emergency use authorization is the first step in the approval process. That action would be followed by a meeting of a federal vaccine advisory committee to discuss whether to recommend the injection for 12- to 15-year-olds. 美国食品药品监督管理局扩大其紧急使用授权是批准流程中的第一步。在此之后将举行一场联邦疫苗咨询委员会的会议，讨论是否建议为 12-15 岁儿童注射。

If the Centers for Disease Control and Prevention approves the committee's recommendation, the shots could begin. Those steps could be completed in a matter of days. 如果美国疾病控制与预防中心批准了该委员会的建议，则开始接种。这些步骤可以在几天之内完成。

In March, Pfizer released the first results from a vaccine study involving 2,260 U.S. volunteers aged 12 to 15. The study showed there were no cases of COVID-19 among fully vaccinated individuals compared with 18 in the group who were given a placebo, a shot of inactive substance. 3 月份，辉瑞公司发布了一项涉及 2260 名年龄在 12 到 15 岁志愿者的疫苗研究的首批结论。该研究表明，完全接种疫苗的个人当中没有发现新冠肺炎病例，相比之下注射了安慰剂这种非活性物质的小组中有 18 人感染。

The 12- to 15-year-olds had side effects similar to young adults, Pfizer said. The main side effects are pain, increased temperature, tiredness and chills, especially after the second shot. The study will continue to follow test subjects for two years to gain more information about long-term protection and safety. 辉瑞称，这些 12 到 15 岁孩子的副作用与青年相似。主要副作用是疼痛、发烧、疲倦和发冷，尤其是在注射第二针之后。这项研究将继续对测试对象进行为期两年的跟踪，以获取有关长期保护和安全性的信息。

Pfizer is not the only company seeking to lower the age limit for its vaccine. Results are also expected by the middle of this year from a U.S. study of Moderna's vaccine in 12- to 17-year-olds. 辉瑞并非唯一一家希望降低其疫苗使用年龄限制的公司。美国对 12 到 17 岁儿童进行的莫德纳疫苗研究也有望在今年年中得出结论。

The FDA is permitting both companies to also begin U.S. studies in children 11 and younger. 美国食品药品监督管理局批准这两家公司还开始对 12 岁以下儿童进行研究。

More than 131 million doses of Pfizer's vaccine have already been given in the U.S., where demand for vaccines among adults has greatly slowed in recent weeks. 美国已经接种了 1.31 亿剂辉瑞疫苗，最近几周美国成年人对疫苗的需求已经大大放缓。

Younger people generally have a much lower risk of experiencing serious side

effects from COVID-19. But they started making up a larger share of new U.S. cases as an increasing number of adults got vaccinated and some virus-related restrictions were eased. 青少年经历新冠肺炎严重副作用的风险通常要低很多。但是随着越来越多成年人接种疫苗以及放宽了一些新冠病毒相关限制，青少年开始在美国新增病例中占据较大份额。Officials hope that expanding the vaccines to young people will help efforts to safely reopen schools in the autumn. 官员们希望将疫苗扩大到青少年对秋季安全地重新开放学校会有帮助。The U.S. has ordered at least 300 million doses of the Pfizer shot by the end of July, enough to protect 150 million people. 截至 7 月底，美国已经订购了至少 3 亿剂辉瑞疫苗，足以保护 1.5 亿人口。

9.8 2021 年 5 月 7 日

图 34: Vials of the AstraZeneca and Pfizer-BioNTech Comirnaty coronavirus disease (COVID-19) vaccines are pictured in a General practitioners practice in Berlin, Germany, April 10, 2021.

原文 By Susan Shand 06 May 2021 France joined the United States on Thursday in support of easing patent protections on COVID-19 vaccines. The action could help poorer countries get more shots and quicken the end of the pandemic. On Wednesday, the U.S. government changed its own position and supported removing the protections. It brought cheers from health activists and complaints from drug companies. During a visit to a vaccine center on Thursday, French President Emmanuel Macron added, ”I completely favor this opening up of the intellectual property.” Despite his support for removing protections, Macron also said it would not solve the problem of getting more vaccines to more people around the world. He noted that places like Africa were not equipped to make COVID-19 vaccines. He said vaccine donation

should be most important. While the backing from two countries with big drug making companies is important, many problems remain to be solved. The idea of removing patent protections was first floated by India and South Africa in October. Some 80 countries, mostly developing nations, have supported the Indian and South African idea, an official who was not permitted to give his name said. However, if one country in the World Trade Organization (WTO) votes against the plan, it will block efforts to make the change. Australian Prime Minister Scott Morrison called the U.S. announcement ”great news,” but did not answer a question about whether his country would make the same decision. South Korean officials said they were also watching the Biden announcement, but did not say they would do the same. Russian President Vladimir Putin said his country would support it. The drug industry says that a faster answer to the lack of vaccines in some parts of the world would be for rich countries to start sharing their vaccine supply with poorer countries. The industry argues that production of coronavirus vaccines is difficult and cannot be increased by easing intellectual property protections. Instead, it says that reducing problems in supply chains as well as the lack of vaccine ingredients are the most important problems right now. ”A waiver is the simple but the wrong answer to what is a complex problem,” said the International Federation of Pharmaceutical Manufacturers and Associations. The organization added that the idea ”will not increase production nor provide practical solutions” to the health crisis. Intellectual property expert Shyam Balganesh is a professor at Columbia Law School. He said a WTO waiver could help but it would only go so far because of other problems in the manufacturing and shipping of vaccines. I’m Jonathan Evans. The Associated Press reported this story. Susan Shand adapted it for Learning English. Hai Do was the editor.

Words in This Story
patent – n. an official document that gives a person or company the right to be the only one that makes or sells a product for a certain period of time
summit – n. a meeting or series of meetings between the leaders of two or more governments
waiver – n. an official document indicating that someone has given up or waived a right or requirement
complex – adj. not easy to understand or explain : not simple

France joined the United States on Thursday in support of easing patent protections on COVID-19 vaccines. The action could help poorer countries get more shots and quicken the end of the pandemic. 法国周四加入美国支持放宽对新冠肺炎疫苗的专利保护。此举可以帮助贫困国家获得更多疫苗，并加快大流行的终结。On Wednesday, the U.S. government changed its own position and supported removing the protections. It brought cheers from health activists and complaints from drug companies. 周三，美国政府改变了自身立场，支持豁免这些专利保护。这引起了卫生活动人士的欢呼与制药公司的抱怨。

During a visit to a vaccine center on Thursday, French President Emmanuel Macron added, ”I completely favor this opening up of the intellectual property.” 法国总统马克龙周四在视察一家疫苗中心时还表示：“我完全赞成开放这种知识产权。”

Despite his support for removing protections, Macron also said it would not solve the problem of getting more vaccines to more people around the world. He noted that places like Africa were not equipped to make COVID-19 vaccines. He said vaccine donation should be most important. 尽管马克龙支持豁免专利保护，但他也表示，这无法解决向世界上更多人提供更多疫苗的问题。他指出，像非洲这样的地区不具备生产新冠肺炎疫苗的条件。他说捐赠疫苗应该是最重要的。

While the backing from two countries with big drug making companies is important, many problems remain to be solved. 这两个拥有大型制药公司的国家的支持固然重要，但是仍有问题有待解决。

The idea of removing patent protections was first floated by India and South Africa in October. 印度和南非在去年 10 月份首先提出了豁免专利保护的想法。

Some 80 countries, mostly developing nations, have supported the Indian and South African idea, an official who was not permitted to give his name said. 一位不愿意透露姓名的官员表示，大约有 80 个国家支持印度和南非的想法，其中大多数是发展中国家。

However, if one country in the World Trade Organization (WTO) votes against the plan, it will block efforts to make the change. 然而，如果世贸组织的某个国家投票反对这项计划，它将阻碍这种改革的努力。

Australian Prime Minister Scott Morrison called the U.S. announcement ”great news,” but did not answer a question about whether his country would make the same decision. South Korean officials said they were also watching the Biden announcement, but did not say they would do the same. 澳大利亚总理莫里森称美国的声明是“重大新闻，”但是并未回答有关澳大利亚是否会做出同样决定的提问。韩国官员表示，他们也正在观看拜登的声明，但是并未表态他们也会这样做。

Russian President Vladimir Putin said his country would support it. 俄罗斯总统普京称俄罗斯支持这样做。

The drug industry says that a faster answer to the lack of vaccines in some parts of the world would be for rich countries to start sharing their vaccine supply with poorer countries. 制药行业表示，对于世界部分地区的疫苗短缺问题，较快的解决途径是发达国家向贫困国家分享疫苗供应。

The industry argues that production of coronavirus vaccines is difficult and cannot be increased by easing intellectual property protections. Instead, it says that reducing problems in supply chains as well as the lack of vaccine ingredients are the most important problems right now. 业界认为，新冠病毒疫苗的生产很难，无法通过放宽知识产权保护来提高生产。相反，减少供应链的问题以及疫苗原料的短缺是目前最重要的问题。

”A waiver is the simple but the wrong answer to what is a complex problem,” said the International Federation of Pharmaceutical Manufacturers and Associations. The organization added that the idea ”will not increase production nor provide practical solutions” to the health crisis. 国际制药商联合会表示：“放弃知识产权很简单，但却是解决这个复杂问题的错误答案。”该组织还表示，这种想法无法提高产量，也无法提供对这次健康危机的实用解决方案。

Intellectual property expert Shyam Balganesh is a professor at Columbia Law School. He said a WTO waiver could help but it would only go so far because of other problems in the manufacturing and shipping of vaccines. 知识产权专家 Shyam Balganesh 是哥伦比亚大学法学院的教授。他说，世卫组织的豁免可能会有帮助，但是由于疫苗生产和运输中的其它问题，它的作用不过如此。

10 Linux 系统使用笔记

10.1 网络传输文件

从本地复制到远程

```
scp local_file remote_username@remote_ip:remote_folder
```

或者

```
scp local_file remote_username@remote_ip:remote_file
```

从远程复制到本地

```
scp root@www.runoob.com:/home/root/others/music /home/space/music/1.mp3
```

10.2 Tmux 使用

10.2.1 Tmux 一些名词约定

- session：会话，通常我们在终端中操作一个任务的时候，一旦终端关闭，任务也就结束了，被强制关闭了，在 tmux 中使用 session 就可以解决这个问题，我们可以把当前操作的任务隐藏起来，在视觉上让它消失，任务继续执行着，当我们想返回任务做一些操作的时候，它可以很方便的回来，我们通常把上面的操作就做 session 操作，我们可以把 session 给隐藏起来，我们也可以把 session 给真的关掉。
- window：窗口
- pane：窗格，在 tmux 中有一个窗口的概念，我们可以这样要去理解窗口：当前呈现在我们面前的这一个工作区域就是一个窗口（当前的终端界面），窗口可以被不断切割，切割成一个个小块，这一个个小块我们叫做窗格（pane），这就是窗口和窗格的概念，我们把它想象成一块大蛋糕可以切成很多小块蛋糕，窗口可以被分割成很多小的窗格。

总结：一个 session 通常指一个任务里面可以有很多窗口，一个窗口又可以有很多的窗格。可能很抽象，通过下面的实践操作，相信你会加深对 tmux 的理解。

10.2.2 Tmux 命令操作

session 操作：

- 新建一个 session

  ```
  ± tmux
  ```

  名字默认用数字编号，指定 session 名

  ```
  ± tmux new -s br28_sdk
  ```

  此时从普通终端进入到 seesion 中。

- 断开 session

```
± tmux detach
```

这时从 seesion 回到普通终端，新建的 session 还在。

- 查看新建的 session 列表

```
± tmux ls
br28_sdk: 1 windows (created Sat Sep 26 14:19:21 2020) [189x37] (attached)
```

- 进入已建立的 seesion

```
± tmux attach -t br28_sdk
```

- 删除已建立的 seesion

```
± tmux kill-session -t br28_sdk
```

- 在不同 seesion 中切换

```
± tmux switch -t br28_sdk
```

- seesion 重命名

```
± tmux rename-session -t <old-session-name> <new-session-name>
```

window 操作： 一块工作屏幕我们叫做窗口 (window)，窗口是可以被分割的，当前的工作区域被分割的一块块区域就是窗格 (pane)。窗口内部操作

- 水平切割窗格

```
± tmux split-window
```

垂直切割窗格

```
± tmux split-window -h
```

- 在不同窗格中移动，向上移动

```
± tmux select-pane  -U
```

向下移动

```
± tmux select-pane  -D
```

向左移动

```
± tmux select-pane  -L
```

向右移动

```
± tmux select-pane  -R
```

窗口间操作

- 创建一个 window

```
± tmux new-window -n <window-name>
```

- 切换 window

```
± tmux select-window -t <window-name>
```

- 重命名 window

```
± tmux rename-window <new-window-name>
```

- 关闭 window

```
± tmux kill-window -t <window-name>
```

- 列出所有快捷键，及其对应的 Tmux 命令

```
 tmux list-keys
```

- 列出所有 Tmux 命令及其参数

```
± tmux list-commands
```

- 列出当前所有 Tmux 会话的信息

```
± tmux info
```

- 重新加载当前的 Tmux 配置

```
± tmux source-file ~/.tmux.conf
```

10.2.3 Tmux 配置文件

在根目录新建一个.tmux.conf 文件

```
unbind C-b
set -g prefix C-a

bind-key -n F11 previous-window
bind-key -n F12 next-window

unbind %
bind | split-window -h

unbind '"'
bind - split-window -v
#bind a rekiad key
```

```
# bind r source-file ~/.tmux.conf ; display-message "Config reloaded.."

#选择分割的窗格
bind k selectp -U #选择上窗格
bind j selectp -D #选择下窗格
bind h selectp -L #选择左窗格
bind l selectp -R #选择右窗格
#------------------------------------------------


#重新调整窗格的大小
bind C-k resizep -U 5
bind C-j resizep -D 5
bind C-h resizep -L 5
bind C-l resizep -R 5
#------------------------------------------------


#use vim keybindings in copy mode
# setw -g mode-keys vi

#status bar
#color
set -g status-bg black
set -g status-fg white

#align
set-option -g status-justify centre

# left conner
set-option -g status-left '#[bg=black,fg=green,bright][#[fg=cyan]#S#[fg=green]]'
set-option -g status-left '#[bg=black,fg=green,bright][#[fg=cyan]#S#[fg=green]]'
set-option -g status-left-length 20

# window list
setw -g automatic-rename on
set-window-option -g window-status-format '#[dim]#I:#[default]#W#[fg=grey,dim]'
```

```
set-window-option -g window-status-current-format
    '#[fg=cyan,bold]#I#[fg=blue]:#[fg=cyan]#W#[fg=dim]'

# right conner
set -g status-right '#[fg=green][#[fg=cyan]%Y-%m-%d#[fg=green]]'
set -g status-right "#[fg=yellow,bright][ #[fg=cyan]#W #[fg=yellow]]#[default]
    #[fg=yellow,bright]- %Y.%m.%d #[fg=green]%H:%M #[default]"

set-window-option -g mode-keys vi #可以设置为vi或emacs
set-window-option -g utf8 on #开启窗口的UTF-8支持

# ---持久保存Tmux会话
# for resurrect
#run-shell ~/.tmux/plugins/tmux-resurrect/resurrect.tmux
# for continuum
#run-shell ~/.tmux/plugins/tmux-continuum/continuum.tmux
#5分钟自动保存一次
#set -g @continuum-save-interval '5'

# ---tmux powerline
#set-option -g status on
#set-option -g status-interval 2
#set-option -g status-utf8 on
#set-option -g status-justify "centre"
#set-option -g status-left-length 60
#set-option -g status-right-length 90
#set-option -g status-left "#(~/.tmux/plugins/tmux-powerline/powerline.sh left)"
#set-option -g status-right "#(~/.tmux/plugins/tmux-powerline/powerline.sh right)"
#set-window-option -g window-status-current-format "#[fg=colour235,
    bg=colour27]#[fg=colour255, bg=colour27] #I  #W #[fg=colour27, bg=colour235]"
set -g default-terminal "screen-256color"

# ---Tmux Plugin Manager
# List of plugins
set -g @plugin 'tmux-plugins/tpm'
set -g @plugin 'tmux-plugins/tmux-sensible'
set -g @plugin 'erikw/tmux-powerline'
```

```
#set -g @plugin 'tmux-colors-solarized'

#set -g @colors-solarized 'light'

# Initialize TMUX plugin manager (keep this line at the very bottom of tmux.conf)
run '~/.tmux/plugins/tpm/tpm'
```

10.2.4 Tmux 快捷键

会话快捷键

- 前缀 + ?: 帮助
- 前缀 + ?: 帮助
- 前缀 + d：分离当前会话
- 前缀 + s：列出所有会话。
- 前缀 + $：重命名当前会话

窗格快捷键

- 前缀 + %：划分左右两个窗格。
- 前缀 + ”：划分上下两个窗格。
- 前缀 + <arrow key>：光标切换到其他窗格。<arrow key> 是指向要切换到的窗格的方向键，比如切换到下方窗格，就按方向键 ↓。
- 前缀 + ;：光标切换到上一个窗格。
- 前缀 + o：光标切换到下一个窗格。
- 前缀 + ：当前窗格与上一个窗格交换位置。
- 前缀 + ：当前窗格与下一个窗格交换位置。
- 前缀 + Ctrl+o：所有窗格向前移动一个位置，第一个窗格变成最后一个窗格。
- 前缀 + Alt+o：所有窗格向后移动一个位置，最后一个窗格变成第一个窗格。

- 前缀 + x：关闭当前窗格。
- 前缀 + !：将当前窗格拆分为一个独立窗口。
- 前缀 + z：当前窗格全屏显示，再使用一次会变回原来大小。
- 前缀 + Ctrl+<arrow key>：按箭头方向调整窗格大小。
- 前缀 + q：显示窗格编号。

窗口快捷键

- 前缀 + c：创建一个新窗口，状态栏会显示多个窗口的信息。
- 前缀 + p：切换到上一个窗口（按照状态栏上的顺序）。
- 前缀 + n：切换到下一个窗口。
- 前缀 + <number>：切换到指定编号的窗口，其中的 <number> 是状态栏上的窗口编号。
- 前缀 + w：从列表中选择窗口。
- 前缀 + ,：窗口重命名。

时间快捷键

- 前缀 + t：在当前的窗格当中显示时钟，非常酷炫的一个功能，点击 enter（回车键将会复原）

11 python 使用笔记

11.1 python 计算器

- 幂运算

```
>>> 2**16 - 1
65535
```

- 十六进制转换运算

```
>>> hex(16)
'0x10'
```

- 二进制转换运算

```
>>> bin(0xfe)
'0b11111110'
```

12 SVN 学习笔记

12.1 使用 externals 属性

使用情景：当在 svn 中多个目录同时引用同一个文件夹的文件，或者多个 svn 同时引用另外一个 svn 的内容，当被引用的内容需要修改时，需要去到每个文件夹修改，不方便，在 svn 中可以采用在引用的文件夹里面增加 externals 属性，引用该文件夹，设置步骤如下：

- 在需要引用的 svn 文件夹，右键，进入属性设置

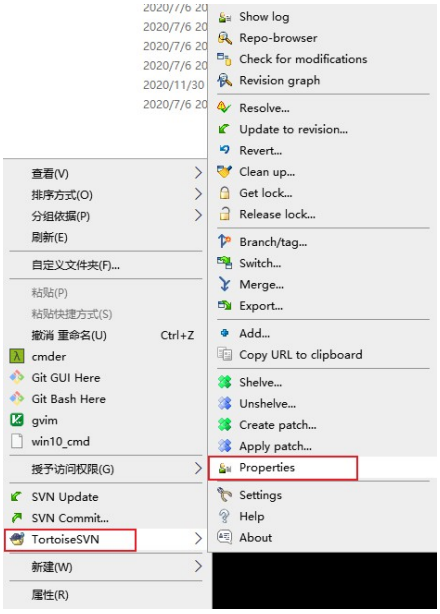

图 35：进入 svn 属性设置

- 在属性设置界面点击`New->Externals`

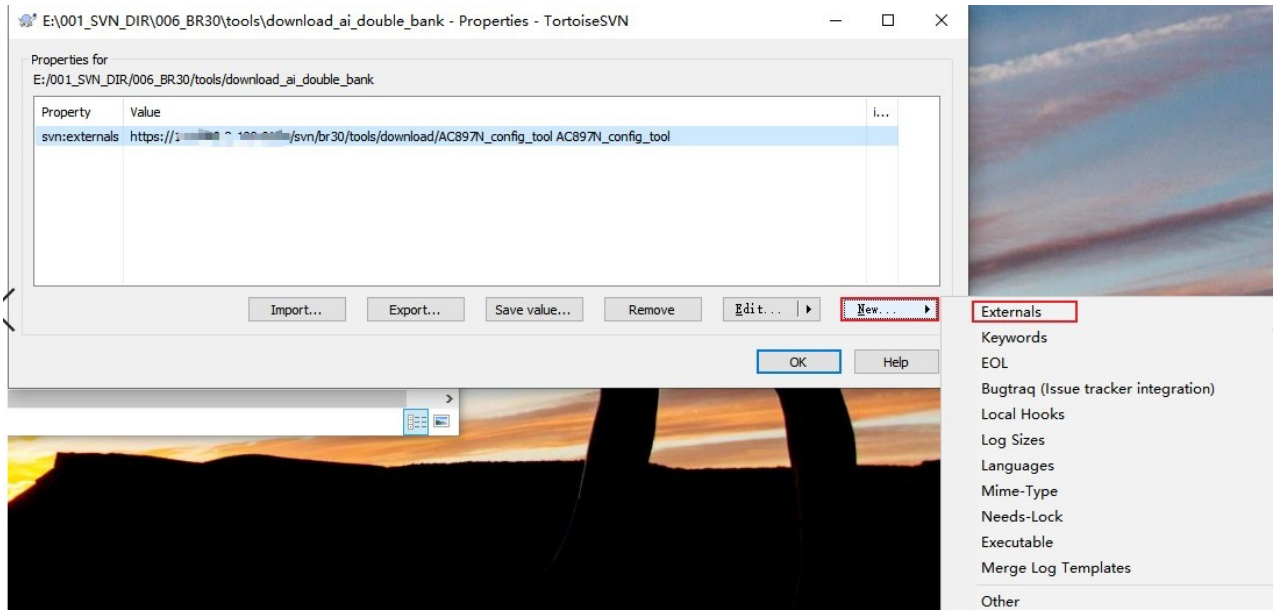

图 36: 点击 New->Externals

- 进入 Externals 界面，点击`New`

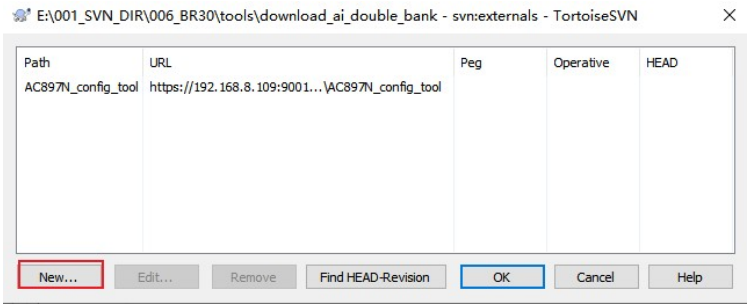

图 37: 点击 New

- 配置`Local path`和`path`

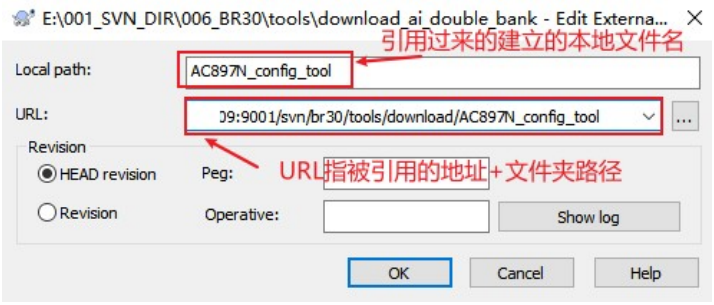

图 38: 配置引用信息

配置完后点击`OK`

- 配置完后，可以看到文件夹属性增加了一项`svn externals`

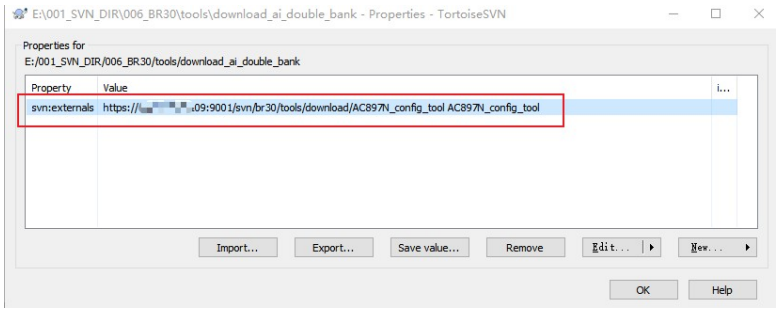

图 39: svn externals 信息

- 点击`svn update`可以把引用的内容拉取过来

图 40: svn update 拉取引用的内容

- 点击`svn commit`把文件夹增加的属性上传

图 41: svn commit 上传增加的属性

至此，svn externals 属性增加完成，有如下特性：

- 修改被引用的内容上传，相应引用的文件夹会同步被修改到；
- 修改任一文件夹的内容上传，被引用的文件夹也会被修改到；
- 只有上传之后，再更新引用的文件夹里面的内容才会更新，引用的文件夹内容同步的是远程服务器的内容；

12.2 Linux svn 命令行忽略某些文件跟踪

修改配置文件，路径：

```
vim ~/.subversion/config
```

添加配置项：

```
global-ignores = *.o *.lo *.d *.la *.al .libs *.so *.so.[0-9]* *.a *.bin *.pyc *.pyo
    __pycache__ cscope.out tags filenametags *.bc symbol.txt *resolution.txt
    *.format_orig
```

12.3 Linux svn 命令行添加 diff 工具关联

修改配置文件，路径：

```
vim ~/.subversion/config
```

添加配置项：

```
diff-cmd = meld
```

13 RK 键盘说明书

说明书链接，型号RK104Plus，谢您选择 RK 产品，为能使您快速了解并掌握本产品，敬请您务必仔细阅读本操作使用指南，若本操作说明书不够详细或令您不够理解，尽请拔打服务热线 400-829-7770，我们的服务人员将会热心解答您的疑问。本产品兼容 Windows2000、XP Vista、Win7、Win8、Win10、MacOS、Android 及 ios 等系统设备。

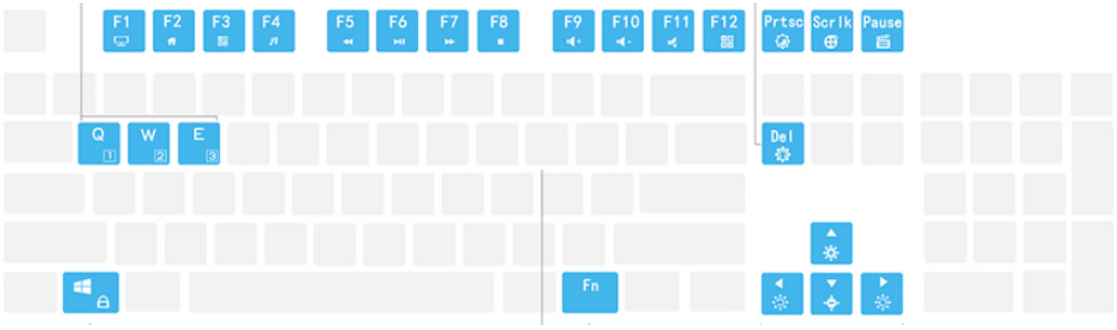

图 42: 键盘模拟图

13.1 多媒体快捷键

```
Fn+F1 计算机，Fn+F5 上一曲，Fn+F9 音量+
Fn+F2 浏览器，Fn+F6 下一曲，Fn+F10 音量-
Fn+F3 邮箱，Fn+F7 播放/暂停，Fn+F11 静音
Fn+F4 播放器，Fn+F8 停止，Fn+F12 计算器
```

13.2 三模（蓝牙/2.4G/有线）切换/配对方法

- 有线模式：连接 USB 至设备，自动强制切换为有线模式（无论背部开关处于任何状态）
- 2.4G 模式：如下图，键盘背部两个开关，开关 1 拨到 ON 状态，开关 2 拨到 G 状态。2.4G 配对方法：开关 1 拨到 ON 状态，开关 2 拨到 G 状态。FN+P 长按对码，P 键闪烁插入接收器，P 键停止闪烁即对码成功。(温馨提示：出厂时已配对好接收器，无需自行再次配对 2.4G；次方法只是 2.4G 无法连接的时候使用，首次设置即可，无需每次都设置)
- 蓝牙配对方法：

> 1.开关1拨到ON状态，开关2拨到B状态
> 2.FN+Q/W/E/R/T.任意一组长按对码，比如Fn+Q，此时Q键持续闪烁闪烁，表示已进入配对状态
> 3.打开设备蓝牙（电脑/手机/平板）搜索名为：RK-Three mode keyboard的设备
> 4.完成连接
> 以此类推：重复以上步骤，Q/W/E/R/T 可存储5组蓝牙设备，在使用切换时短按Fn+Q/W/E/R/T，
> 即可在不同蓝牙设备之间切换（温馨提示：使用切换前，请先配对好5组蓝牙）

13.3 背光设置

- Fn+Prtsc 17 种背光效果切换，可切换 17 种背光效果，依次为：常亮、呼吸、流光、下落、环形跑马、雨滴、涟漪、繁星、一字跑马、斜上跑马、左右穿插、单点亮、单点灭，波浪、环形绽放、一字绽放、劈开。
- 自定义背光录制，Fn+Scrlk 支持三组自定义背光切换:此功能可切换三组自定义背光，Fn+Pause 录制自定义背光，具体操作方法：

> 1.先通过Fn+Scrlk选择一组将要自定义的背光
> 2.按下Fn+pause进入背光录制模式，此时键盘指示灯持续闪烁，表示已开始录制背光
> 3.按下想要录制背光的按键(按一下亮，再按一下灭)，重复此步骤，录制自己想要的背光
> 4.完成后，再次按下Fn+pause，将保存并退出背光录制模式
> 以此类推，重复以上步骤可录制三种自定义背光，并且可通过Fn+scrlk随时切换

- 背光亮度/速度设置， Fn+↑ 背光亮度增加，共五档调节，调节到最大峰值时，指示灯将连续闪烁三次，表明已到最大亮度，Fn+↓ 背光亮度减小，共五档调节，支持关闭背光，调节到最小峰值时，指示灯将连续闪烁三次，表明已到最小亮度（背光关闭)。Fn+← 背光速度减小，共五档调

节，调节到最小峰值时，指示灯将连续闪烁三次，表明已到最小速度，Fn+→ 动态变幻速度增加，共五档调节，调节到最达峰值时，指示灯将连续闪烁三次，表明已到最大速度。

13.4 其他设置

Fn+Win 锁定/解锁 win 键，在键盘使用过程中，为了防止误触 windows 键，可通过 Fn+Win 停用/启用 windows 键功能，Fn+Del 恢复出厂设置，在键盘使用过程中，可通过 Fn+Del 恢复出厂设置，此时会默认为出厂状态，之前连接的蓝牙设备、自定义背光等都会被清除。

13.5 充电说明

温馨提示：本产品不配备充电器，可连接手机充电器或者电脑 USB 进行充电

1.为保障您的正常使用，第一次使用本产品前请您对产品进行充电。当您随身携带本产品时，请将产品背面开关调至off状态以便省电。
2.电量过低时，Fn键背光会持续闪烁，此时请连接充电器进行充电。
3.充电器充电时注意不可大于5V 1A，也可以直接插在电脑USB上充电
4.充电时空格红灯常亮，充满熄灭，三小时左右充满，不可为了加速充电而使用大于5V1A的充电器，否则电池寿命会有一定的损坏和影响。

13.6 节能省电

关闭键盘：背部开关拨至 OFF，本产品一分钟无操作，键盘背光自动关闭；五分钟无操作，键盘进入待机状态；十分钟无操作，键盘进入深度休眠，唤醒键盘仅需按任意键。