

Combining Python with Other Tools



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In this Lesson ...

**Strings vs
bytes objects**

**Running a
command as a
subprocess**

**Piping in and out
of a command**

Sending mail

**Creating and
extracting tar
archives**

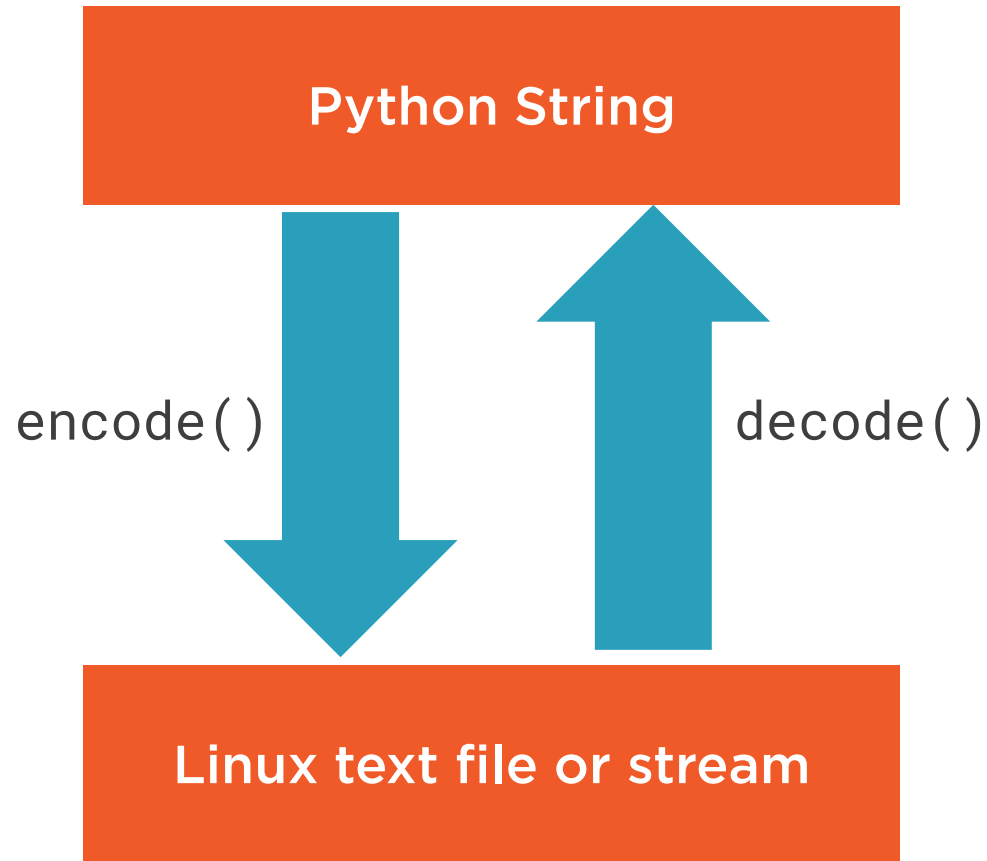


Strings vs Byte Objects

A python string
is a sequence of
Unicode characters

Codecs provide `encode()`
and `decode()` methods to
convert between the two

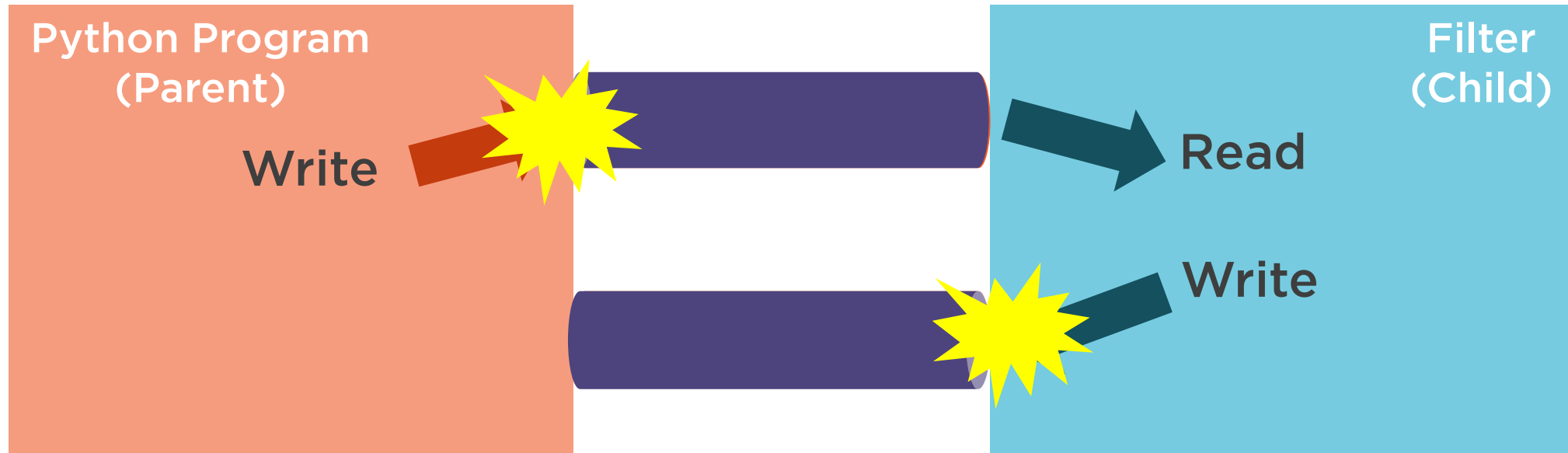
Textual data in Linux
is a sequence of bytes



Executing Programs from a Python Script



Danger of Deadlock



Sending Mail



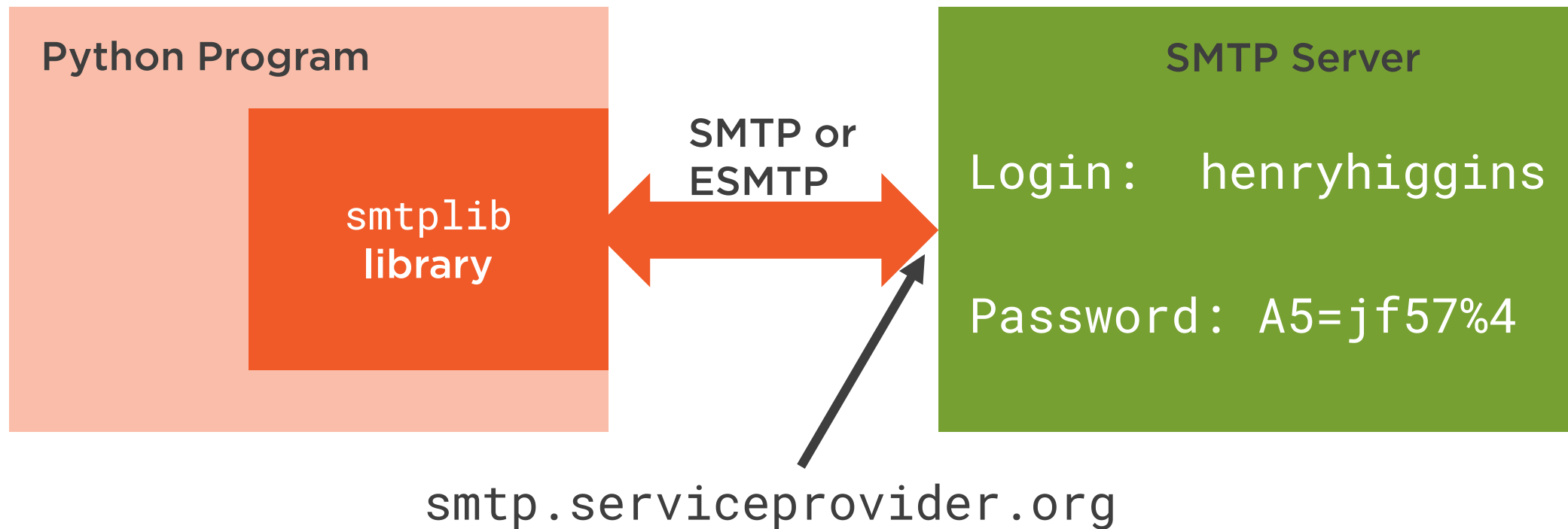
Anatomy of a Mail Message

```
Content-Type: text/plain; charset="us-ascii"  
MIME-Version: 1.0  
Content-Transfer-Encoding: 7bit  
Subject: Low disk space warning  
From: fred@thatplace.com  
To: jane@example.com
```

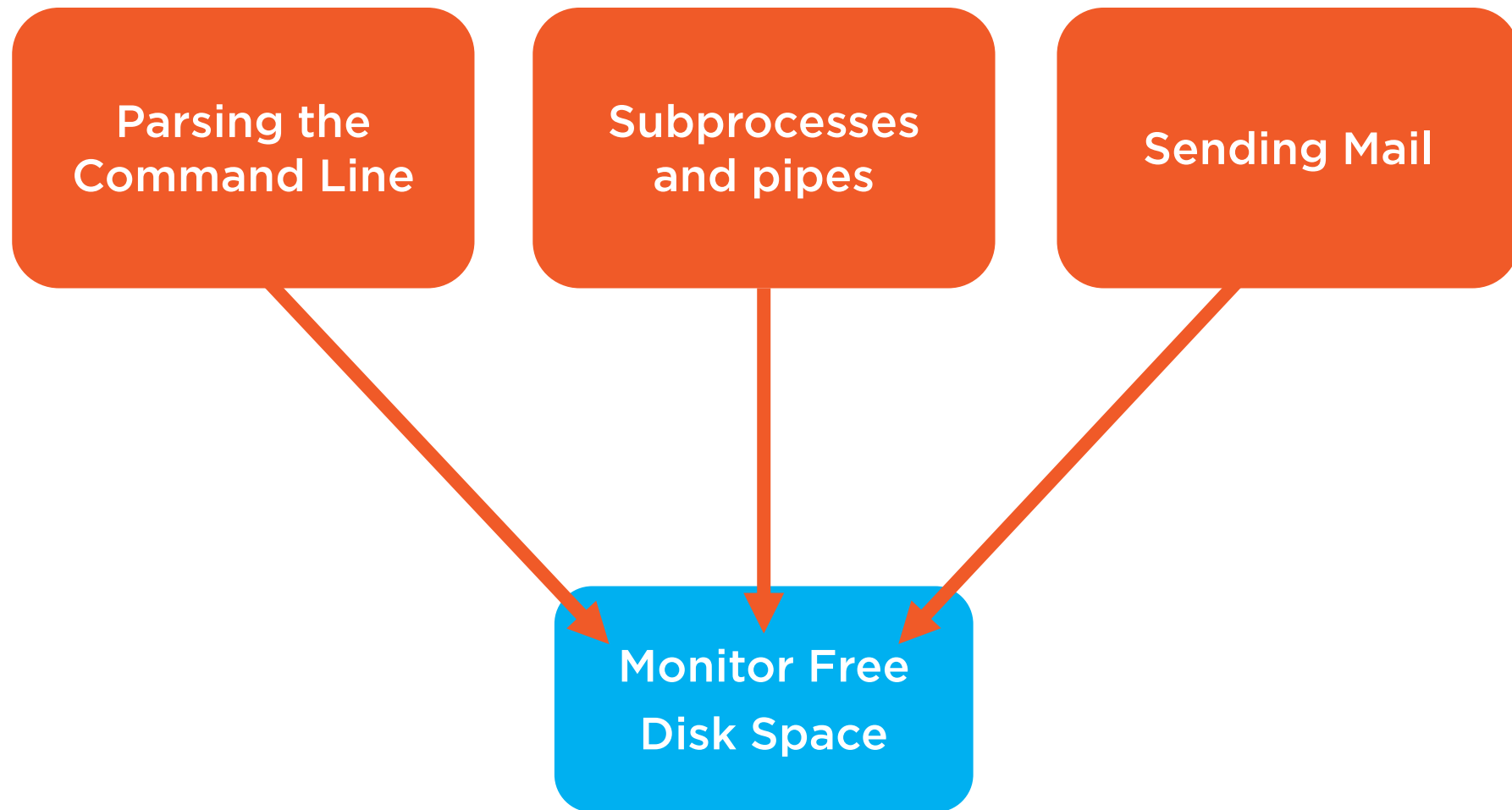
```
Disk space on your server is running low  
(less than 10% free)
```



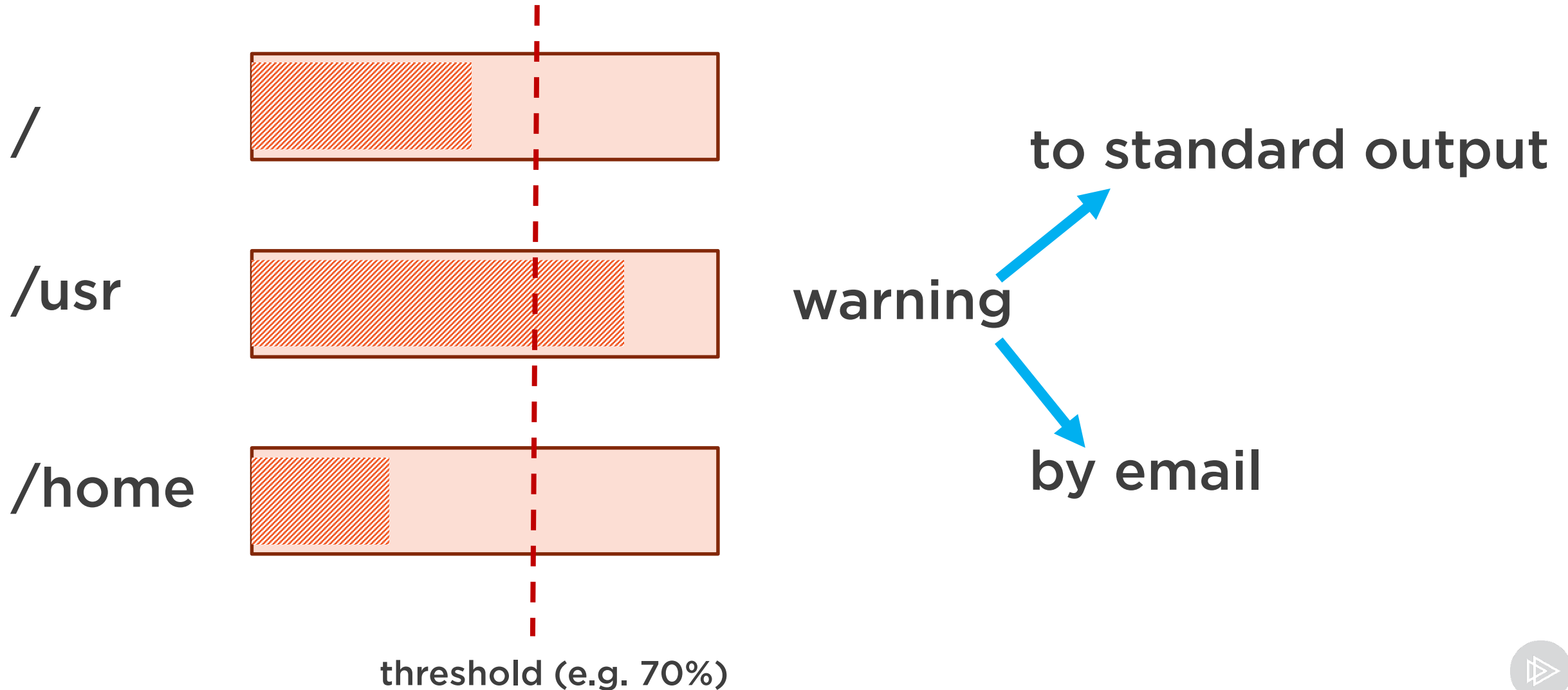
Delivering the Message



Bringing it all Together



Monitoring Disk Partitions



Our Program's Command Options

```
$ check-partitions --help
```

```
Usage: check-partitions [options] partition ...
```

Options:

-h, --help	show this help message and exit
-t THRESHOLD, --threshold=THRESHOLD	Set threshold (%)
-s, --single	just check once, don't loop
-m MAILBOX, --mailbox=MAILBOX	mail report to this mailbox



Parsing the output from **df**

```
import subprocess


threshold = 90      # default threshold (%)
partition = "/"      # default partition

df = subprocess.Popen(["df", "-h"], stdout=subprocess.PIPE)
for line in df.stdout:
    # split into space-separated fields
    splitline = line.decode().split()
    # The %full figure is in field 4,
    # the mount point in field 5
    if splitline[5] == partition:
        # this is the partition we want to check
        if int(splitline[4][: -1]) > threshold:
            print("WARNING!")
```



Proof of Delivery

<input type="checkbox"/>	☆	▢	admin	Low Disk Space Warning - WARNING: partition / is 40% full
<input type="checkbox"/>	☆	▢	admin	Low Disk Space Warning - WARNING: partition /run is 7% full



Gmail ▾

COMPOSE

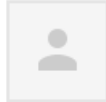
Inbox (6)

Starred

Important

Sent Mail

Low Disk Space Warning ▢

 admin@example.com

to chris ▾

WARNING: partition / is 40% full



Creating and Extracting tar Archives



Opening a tar Archive

File name

Follow symbolic links
Default is False

```
t = tarfile.open("demo.tar", "r", dereference=True, format=tarfile.PAX_FORMAT)
```

Mode, typically one of:

"r"	read, with transparent decompression (default)
"w"	Write (uncompressed)
"w:gz"	Write (with gzip compression)
"w:bz2"	Write (with bzip2 compression)
"a"	Open for appending

PAX_FORMAT
USTAR_FORMAT
GNU_FORMAT (default)



tarinfo Attributes

Attribute	Meaning
name	Name of file in archive
size	Size in bytes
mtime	Modification timestamp
mode	Permission bits
uid	User ID of file's owner
gid	Group ID of file
isfile()	Is regular file
isdir()	Is directory
issym()	Is symbolic link



Summary



Strings vs bytes objects

Running subcommands

`subprocess` module

Piping into and out of subcommands

Danger of deadlock

Sending Mail

`smtplib` module

A wrapper around the "df" program

Creating and extracting tar archives

`tarfile` module



In the Next Lesson



Strings

String literals and operators

String manipulation functions

Handling dates and times

Using regular expressions in Python

