Automating Workflows with Python

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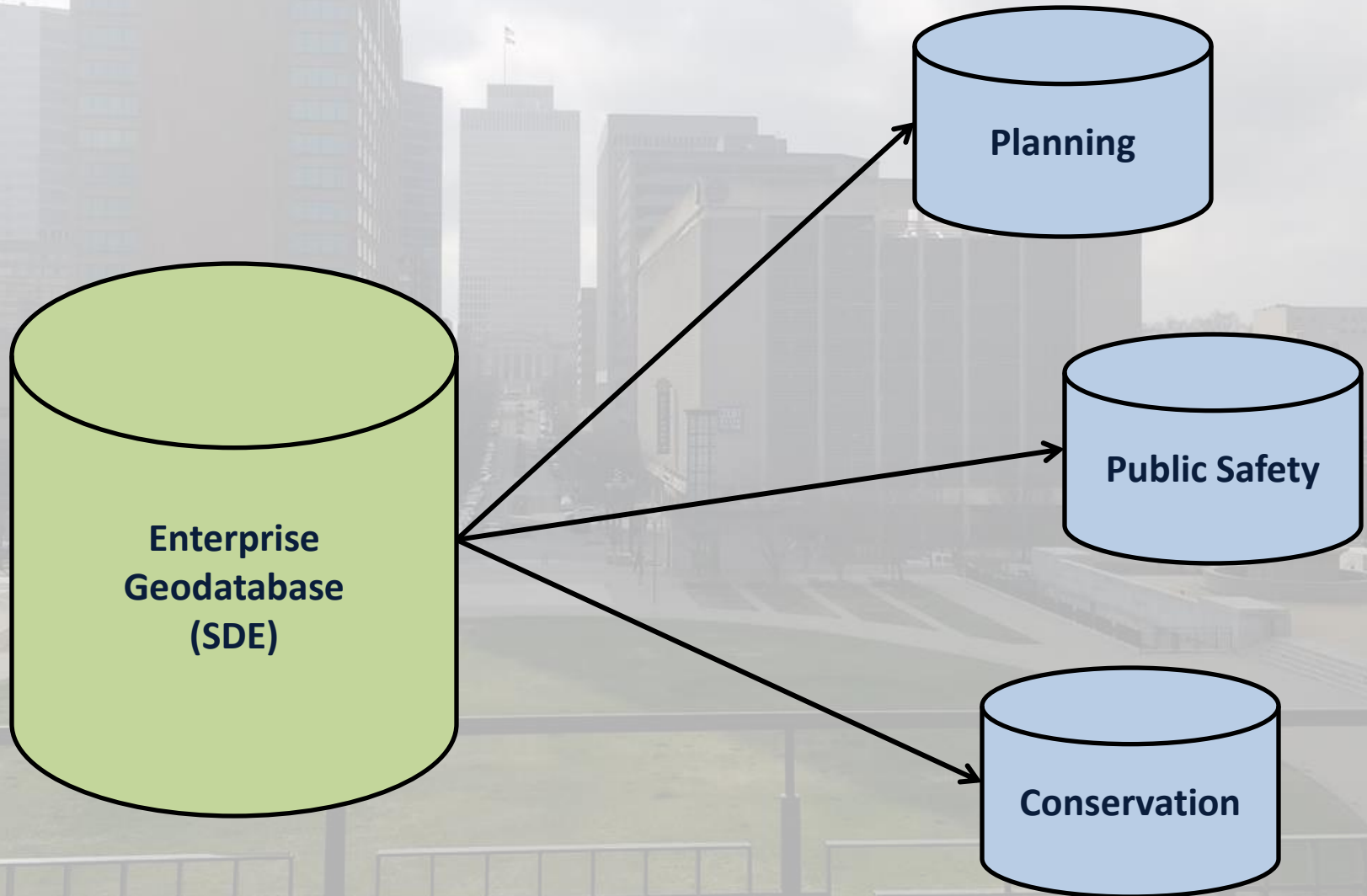https://github.com/pmacMaps

What We'll Discuss

➢ Case for automation: data replication

➢ Where to learn Python & ArcPy

➢ Recap what Python & ArcPy are

➢ Dissect a data replication script

➢ Review creating a Windows scheduled task

➢ Examples of automated scripts

What Is Data Replication?

Enterprise Geodatabase (SDE)

Planning

Public Safety

Conservation

Many Ways to Replicate

➢ Run from Distributed Geodatabase toolbar

➢ Run from geodatabase

➢ Run from a model

➢ Run from a script

    ➢ Can be scheduled to repeat

Time Comparison

Manual cost of **6 minutes** per week*

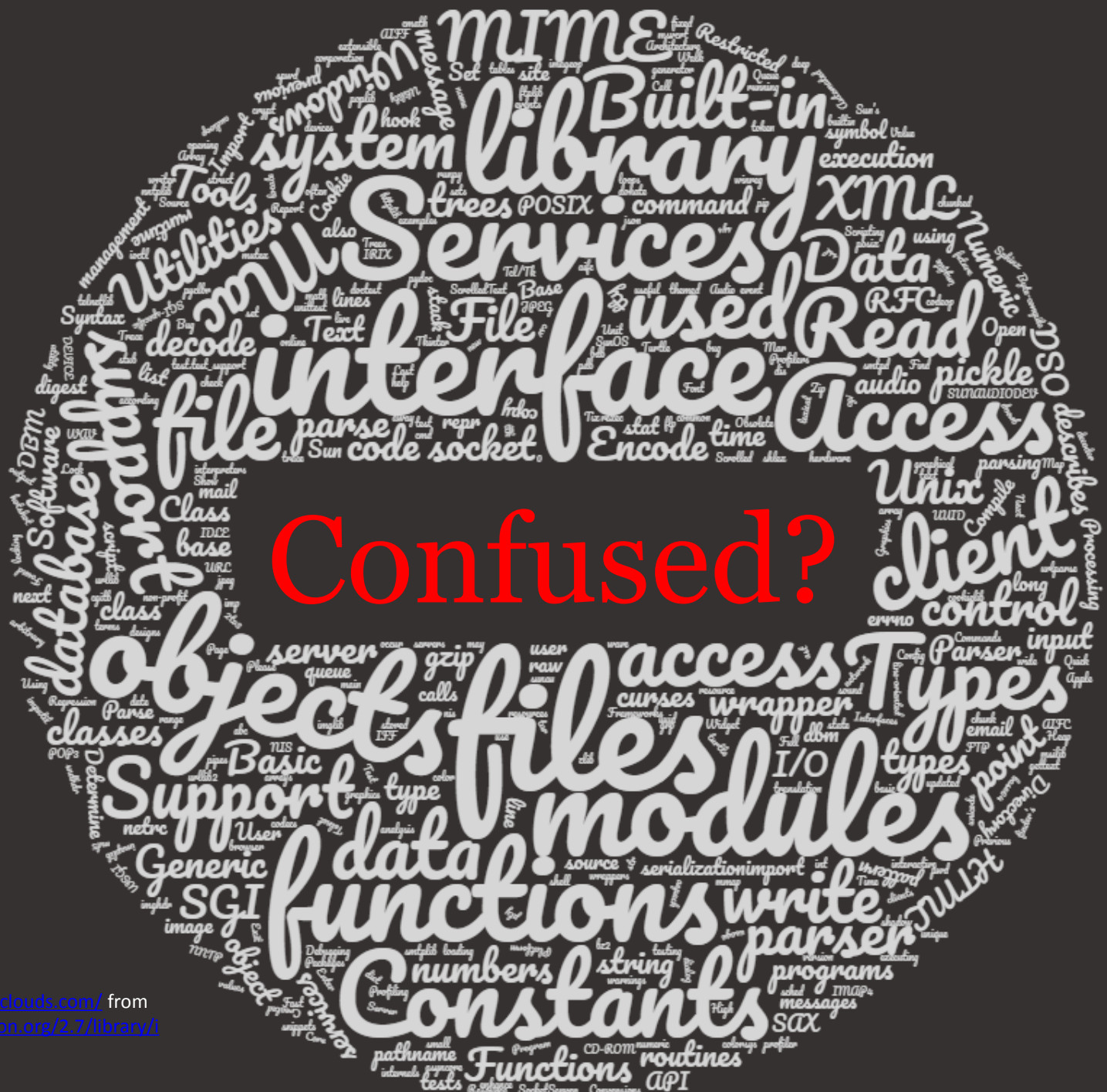## **5.5 hours per year**

And if you factor other workflows……..

Time Comparison

If it took 5 hours to create script…

1.1 years to gain time profit

The base script can be reused…

Confused?

You Can Learn Python!

codecademy

udemy

treehouse™

You Can Learn ArcPy!

➢ ArcGIS Desktop ArcPy [Reference](#)

➢ Esri Web [Courses](#) (free & "paid")

➢ Introduction to Geoprocessing Scripts Using Python ([Esri Instructor-Led](#))

➢ uDemy courses ([2 courses](#))
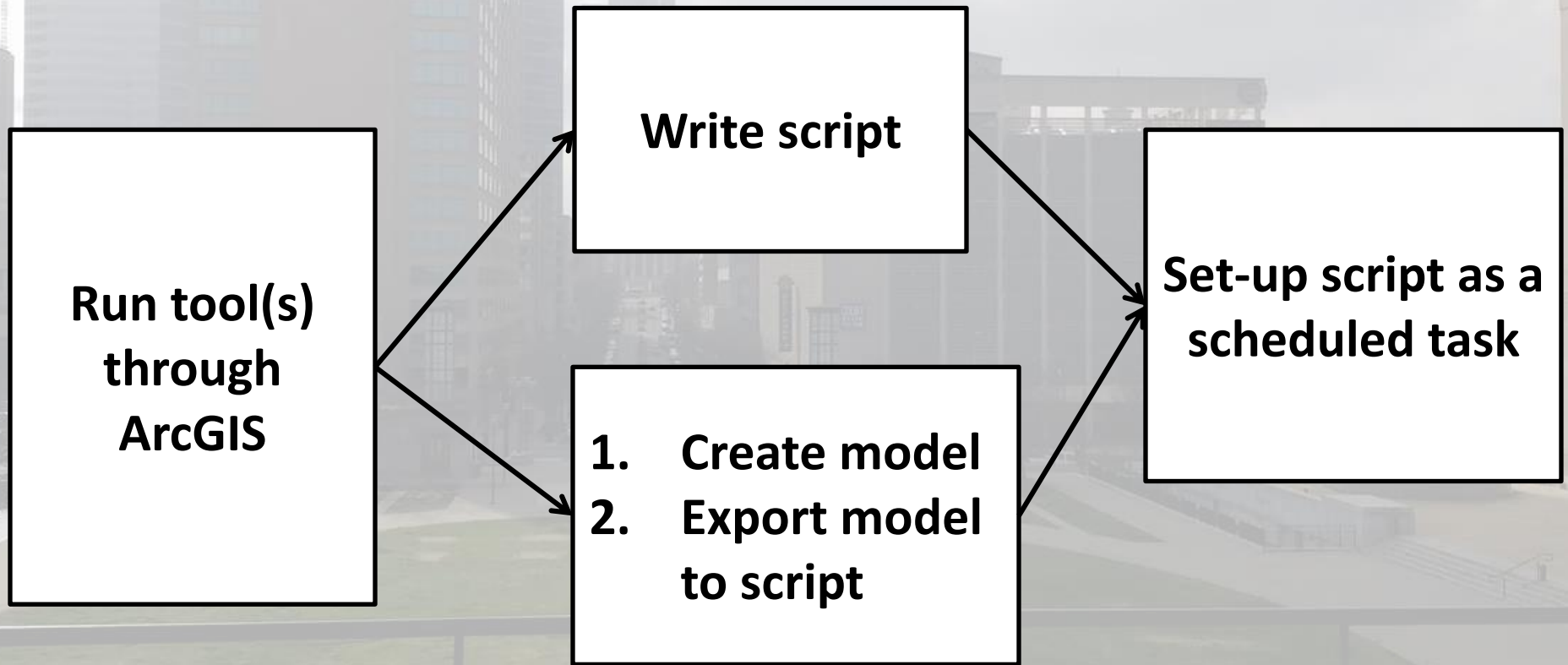
➢ [GIS StackExchange](#), [StackOverflow](#), [Geonet](#), etc.

What is Python?

➢ Simple syntax (easy to learn)
➢ Runs on Windows, Mac OS X, Linux, and Unix
➢ Allows for error handling
➢ Code can be grouped into modules and packages

What is ArcPy?

➢ Provides access to ArcGIS ecosystem within Python

➢ You can perform "analysis, conversion, data management, and map automation"

➢ "[p]rovides access to geoprocessing tools as well as additional functions, classes, and modules that allow you to create simple or complex workflows"
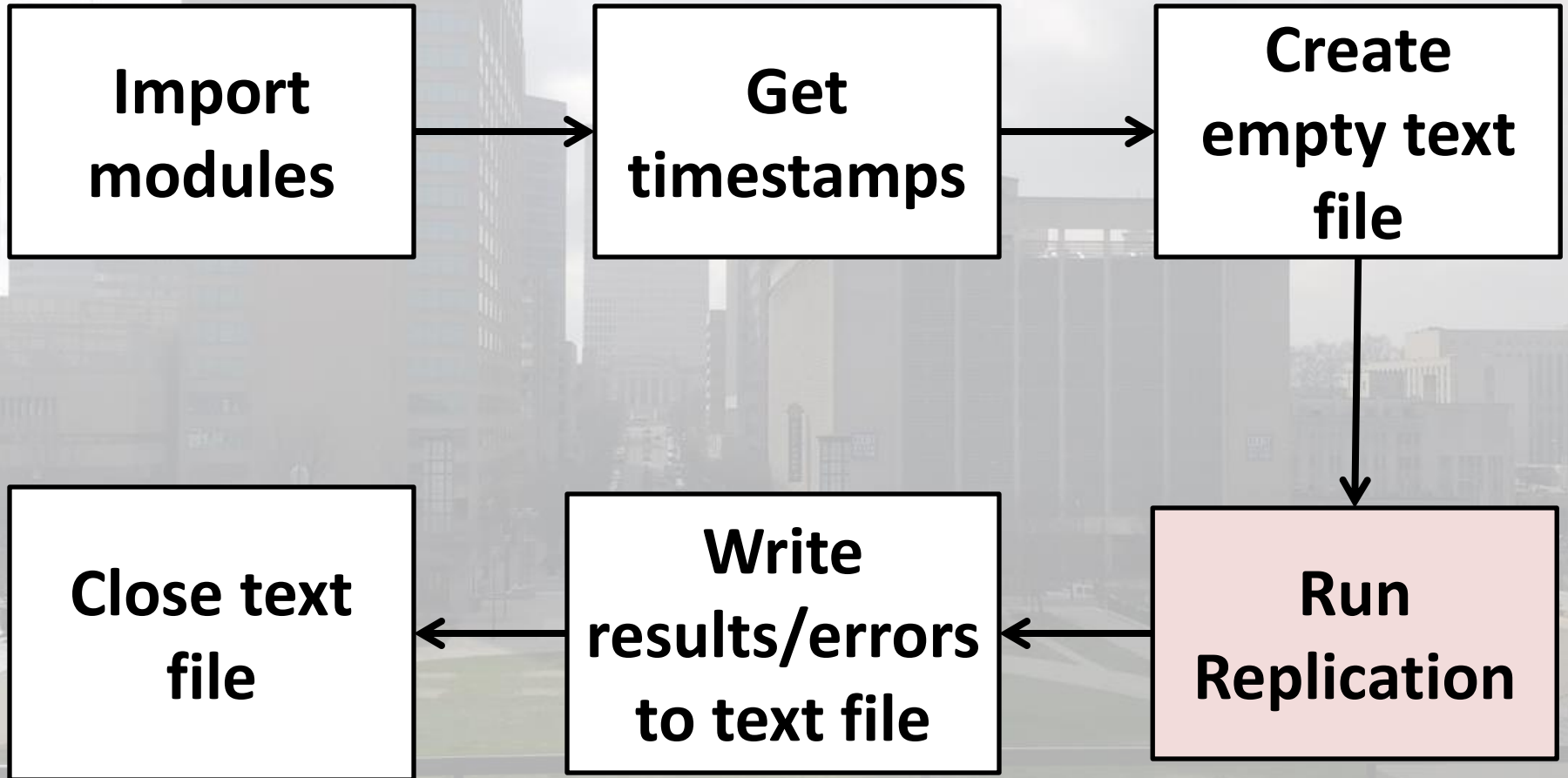
Source: http://pro.arcgis.com/en/pro-app/arcpy/get-started/a-quick-tour-of-arcpy.htm

Process Walkthrough

Run tool(s) through ArcGIS

Write script

1. **Create model**
2. **Export model to script**

Set-up script as a scheduled task

Key Concepts of Script

➢ Import modules – get access to set of code (error handling, time, operating system, etc.)

➢ Try/Except statements allow us to catch any errors and do something with them

➢ Store geoprocessing tool as a variable to access info about tool (i.e., message)

➢ Record operation of tool to a text file

Script Walkthrough

```
Import modules  →  Get timestamps  →  Create empty text file
                                              ↓
Close text file  ←  Write results/errors to text file  ←  Run Replication
```

Dissecting Replication Script

Let's review the data replication script … ([script on Github](#))

Automating the Script

➢ Scripts can be run on a schedule using Windows Task Scheduler

➢ Set-up repeatable schedule to run tasks (every Friday at 6:00 am)

➢ Use UNC paths in script

➢ Be aware of user permissions

Creating a Task

Setting a Task Trigger

Setting a Task Action

Setting a Task's Conditions

Adjusting a Task's Settings

Python Script Examples

➢ Replicate data to file geodatabases

➢ Rebuild address locators

➢ Rebuild tiles for cached map services

➢ Extract data and upload zipped geodatabase to FTP

➢ Update datasets from map services*

➢ Compress enterprise geodatabase*

* In development or example of what is possible

Get in Touch!

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