Use Python to build a modern communication system

用python构建一个现代通信系统

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ABSTRACT

Python is a good language. Almost every developer know or master this kind of language. In this book, I'll try my best to show you guys how to use Python to build a modern communication system.

In this process, I'll talk about the IP, TCP, Socket, HTTP, WebSocket.

Communication System is based on protocols. Without those protocols, communication can be arbitrary and unreliable.

This book step by step demonstrates how to build a modern communication system with the support of multiple user management. It uses a technique we called RESTFul API. So it can almost be used for any programming language and devices like java in android, swift in iPhone, javascript on a web-page.

Keywords: Communication System; Python; RESTFul API; Multi-User management

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Source Code for This Book

https://github.com/yingshaoxo/use-python-to-build-a-modern-communication-system

Chapter 1 What is communication

We'll talk about the definition of communication.

1.1 In the ancient

It is an action for people to communicate with each other. One man talks to another man.

1.2 In nowadays

I would say it's a concept of information exchange.

1.3 The principle of communication

If I have to use one word to describe it, that'll be 'Stable'.

During the transmission process, you shouldn't lose any information that was originally sent.

And also, it should be as fast as possible. Say, if you have an urgent message to send to others, you definitely don't wanna others to receive that message ten days later.

And also, security is important too. You don't wanna send your message to a wrong guy, it'll cause you a lot of trouble.

1.3.1 A table for the principle of communication

principles	description
integrity	never lose information
speed	provide information at time
security	make sure no one else could see it!

1.3.2 Exceptions

But there are still have a few communication types that only follow 1 or 2 principles of communication.

For example, broadcast. As long as you send the message out, whether the audience gets that message or not, it's not your business. Because the user have a choice about when to listen to your broadcast, when not to.

Radio for entertainment doesn't need security, but radio for the military does need to secure its message.

1.4 Classification of communications

1.4.1 Distinguish by the number of end devices

Some people like to classify communication with the number of sender or receiver.

It's OK for doing that classification. 'One to one' also called 'Peer to Peer', 'One to many' also called broadcast.

1.4.2 Distinguish by the type of information

Some other people like to classify communication with the type of information being transferred.

1.5 The machine language

At the above Explanation, we only covered the basics of communication. Or how humans understood that.

In this section, I'll talk about how a machine sees that problem. Because in the end, in modern society, communication is based on computers, not humans.

For a computer, he itself is a computer, the one that he communicates with, is also a computer. So the speed of communication can be very high. At least it'll faster than human-being.

Then the problem left is how a computer could understand each other, and most importantly, to cooperate in the right way so information can flow freely and correctly.

Example 1.1: For example, if we got a phone and a computer, how do we communicate with each other? (A phone itself is also a computer actually.)

We need to create a certain method for communicating, that method is called *protocol*.

Example 1.2: How to make sure all the information we sent is correctly received by others?

We need to create a certain method to make sure the integrity of information in transferring, that method is a subsection of a *protocol*.

Question 1.1: Is there a best *protocol* for using?

No! For different scenarios, there are different transmission protocols to choose from.

1.6 Reference

For more information, check this Wikipedia [1]