

- ① Single-instruction, Single-data (SISD) systems
Single-instruction, Multiple-data (SIMD) systems
Multiple-instruction, Single-data (MISD) systems
Multiple-instruction, multiple-data (MIMD) systems.

* SISD

- SISD Computing System is a uni-processor machine capable of executing a single instruction.
- Most conventional computers are built using SISD model.
- All the instructions and data have to be stored in primary memory.

* SIMD

- SIMD Computing system is a multi-processor machine capable of executing the same instruction.
- Machines based on this model are well suited for scientific computing.
- For instance statement $C_i = A_i * B_i$, can be passed to all the processing elements.

* MISD

- MISD Computing system is a multi processor machine capable of executing different instructions.
- For example, $y = \sin(x) + \cos(x) + \tan(x)$
- Machines built using MISD model are not useful in most of the applications.

* MIMD

- MIMD Computing System is a multi processor machine capable of executing multiple instructions.
- Each PE in the MIMD model has separate instruction and data stream.
- Unlike SIMD, MISD machine, PEs in MIMD machines work asynchronously.

* Shared Memory MIMD machines

- All the PEs are connected to a single global memory.
- Systems based on this model are also called tightly coupled multi processor systems.
- The Communication between PEs takes place through the shared memory.

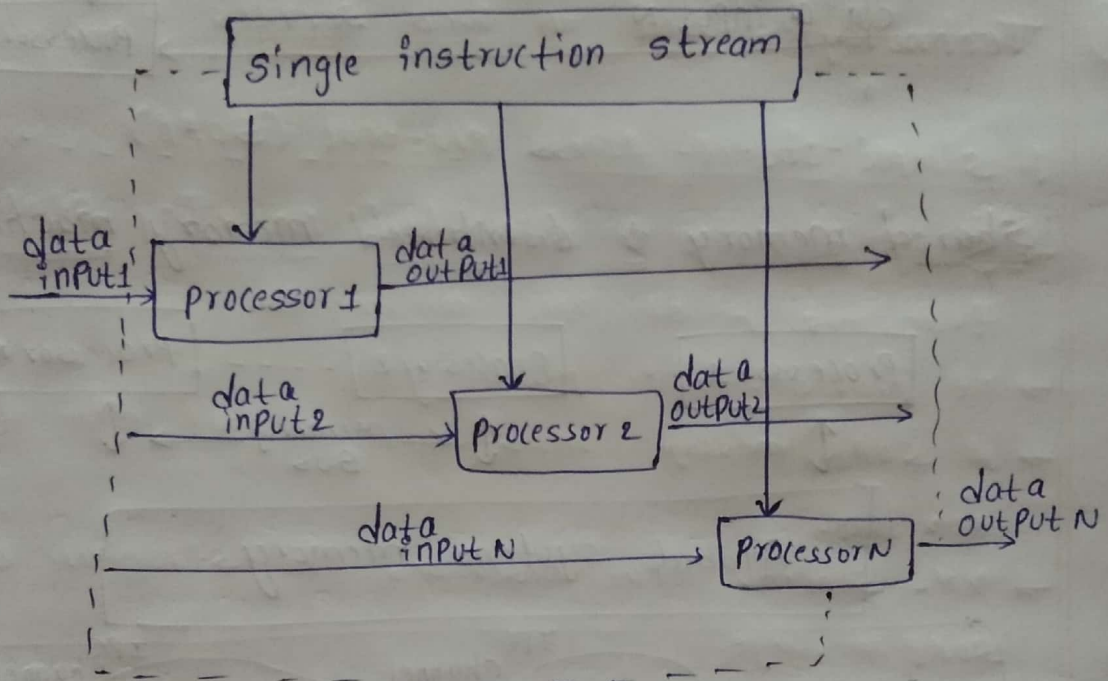
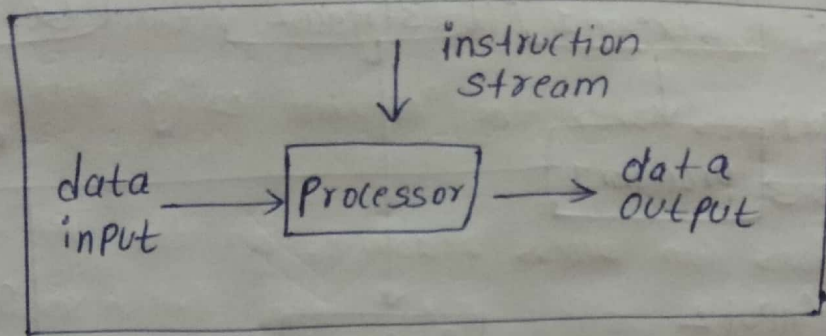
* Distributed Memory MIMD machines

- PEs have a local memory.
- Systems based on this model are also called loosely coupled multi-processor systems.
- The Communication between PEs in this model takes place through the interconnection network.

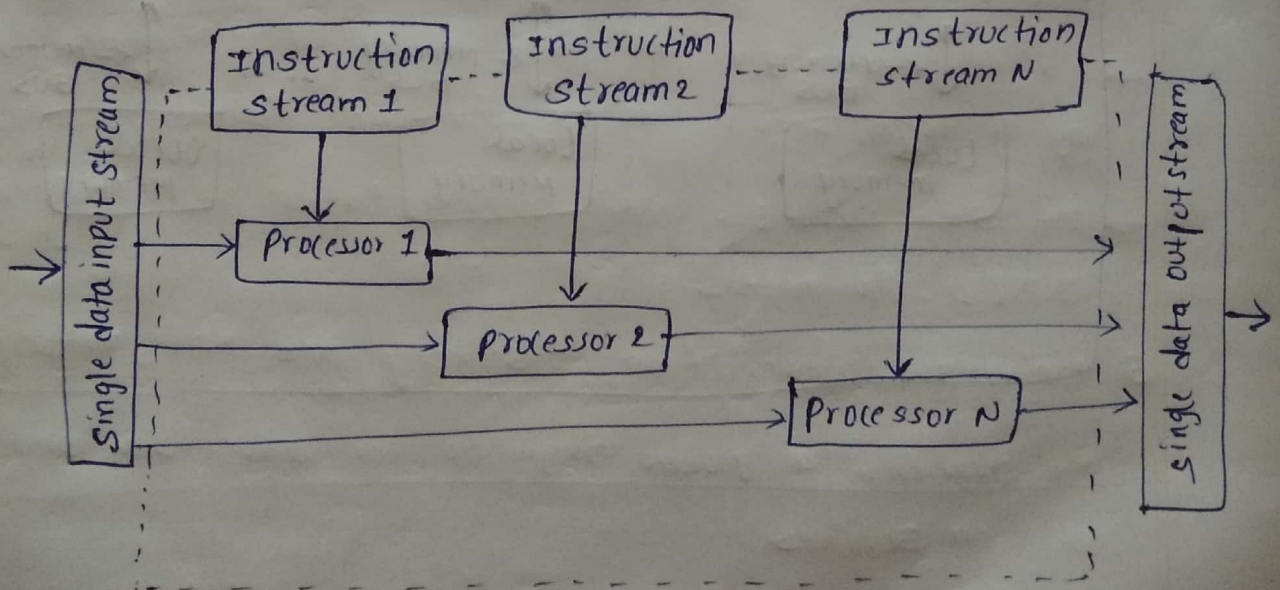
* Shared vs Distributed MIMD model

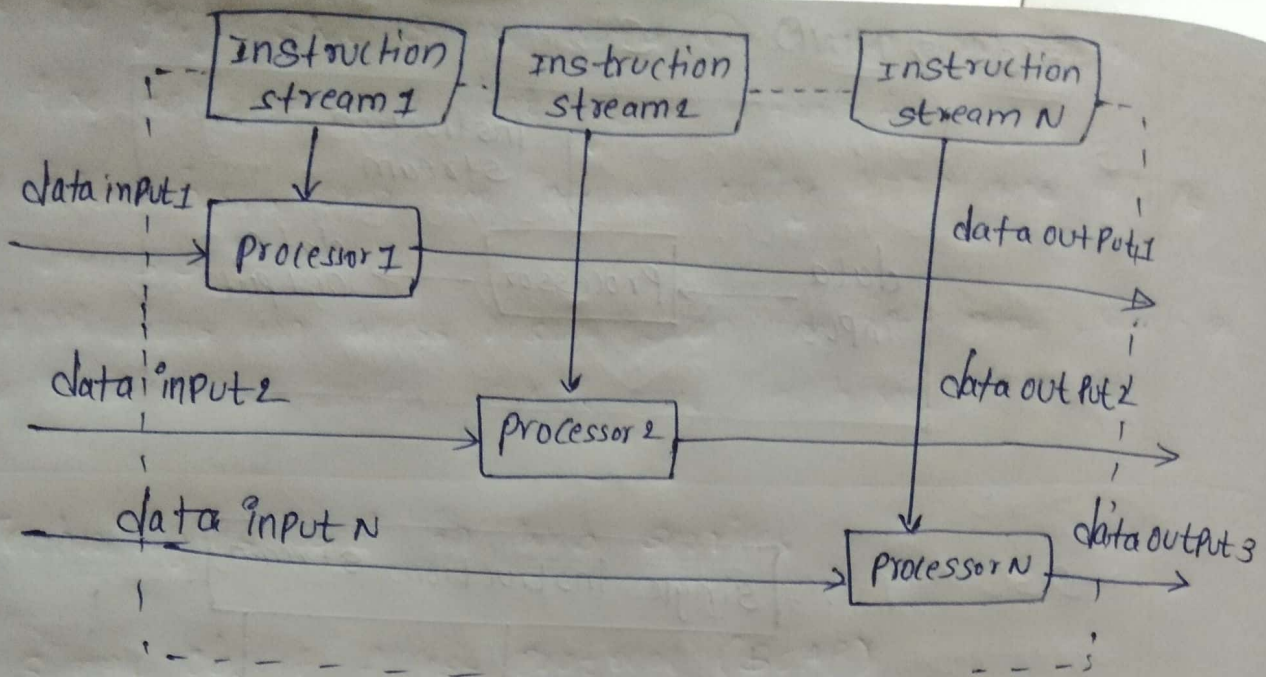
- The shared memory MIMD architecture is easier to program.
- Failures, in a shared memory MIMD affect the entire system.
- Moreover, shared memory MIMD architectures are less likely to scale.
- As a result, distributed memory MIMD architectures are most popular today.

SISD & MIMD

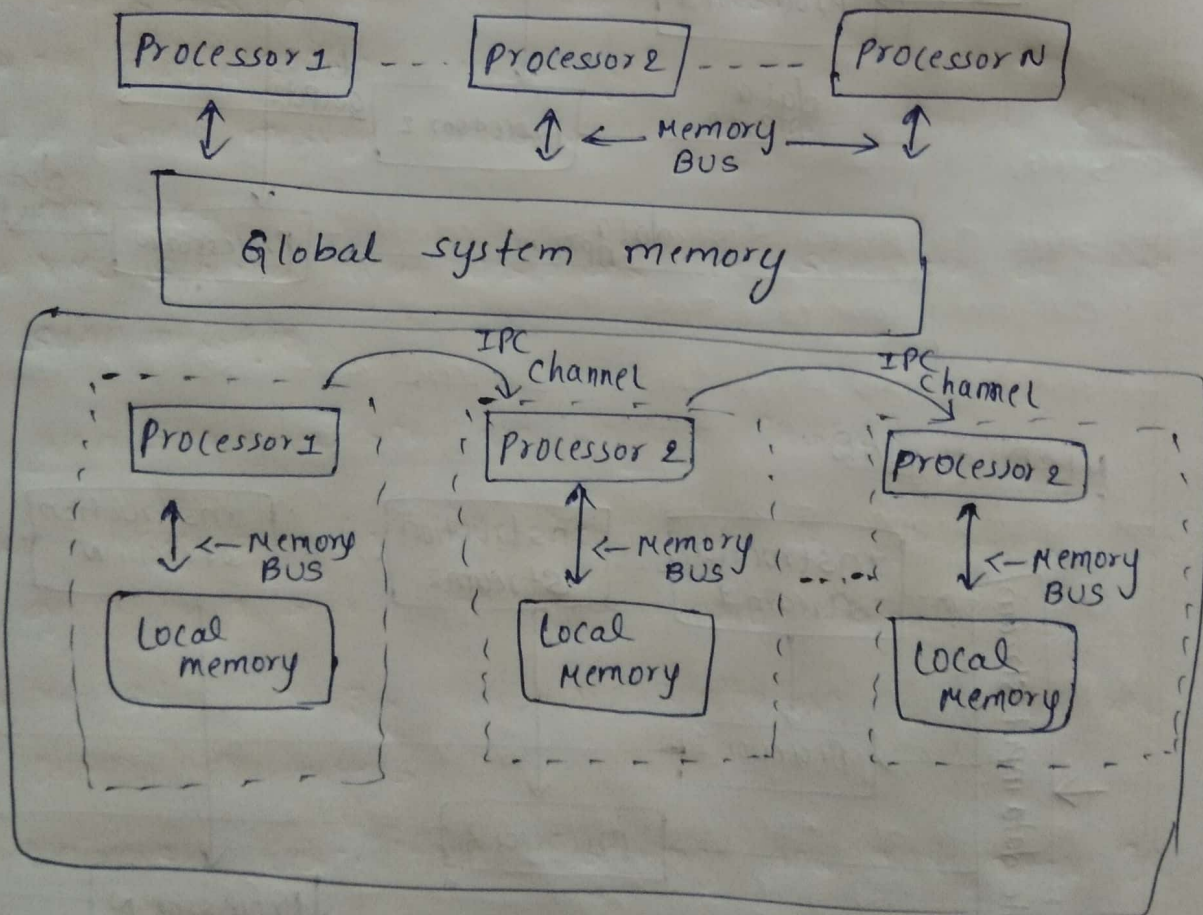


MISD & MIMD



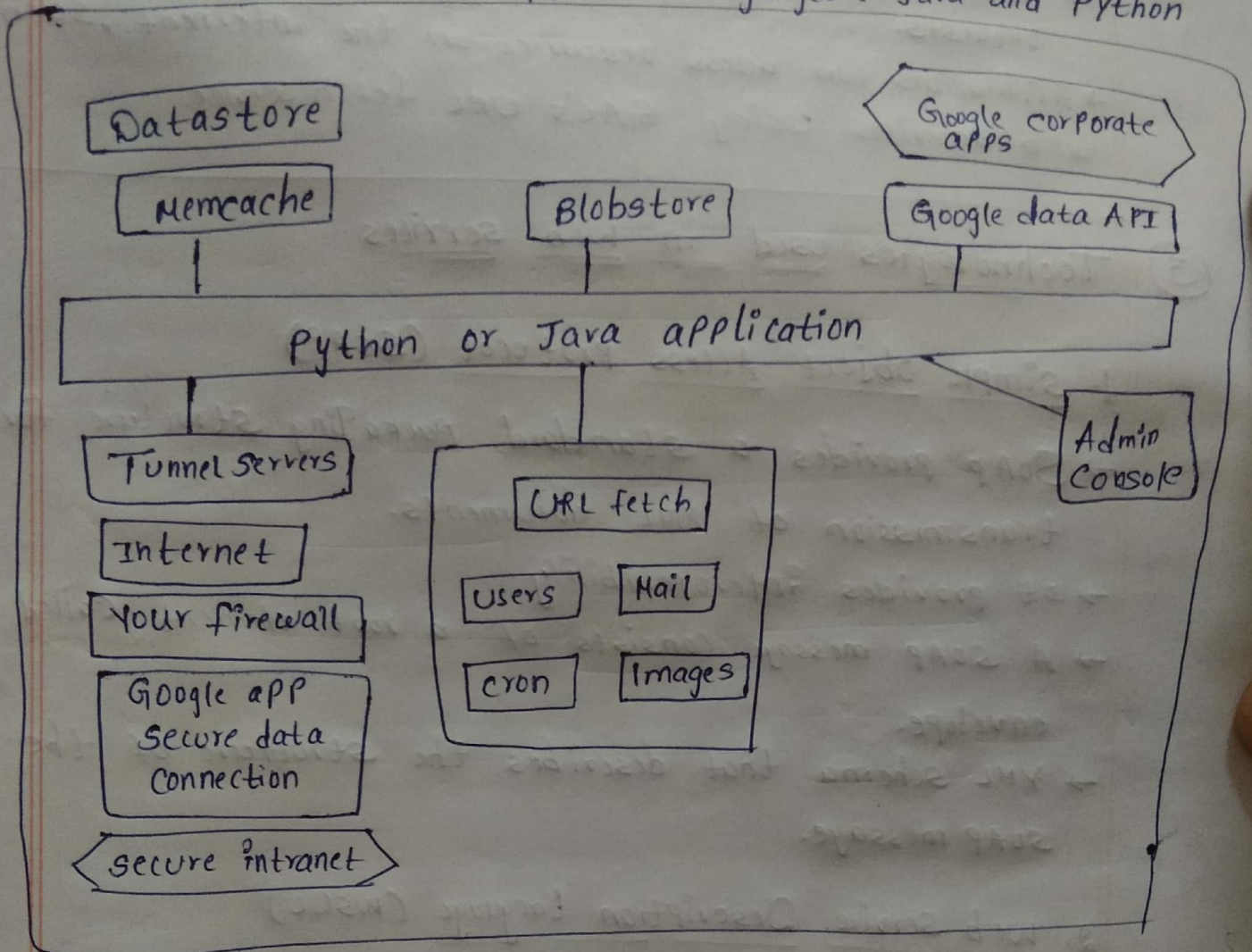


Shared memory & distributed memory machines



⑤ Programming Support Of Google APP Engine

→ It summarizes some key features of GAE Programming model for two supported languages: Java and Python



* Java : A client environment that includes an Eclipse Plug-in for Java allow you to debug.

* Python : python is often used with frameworks such as Django and cherrpy.

* The data store is a NoSQL data management system.

* The data store is strongly consistent and uses optimistic Concurrency control.

* The application can execute multiple data store operations in a single transaction.

- * The google SDC secure data Connection can tunnel through the internet and link your intranet.
- * Other hosts over the internet using HTTP and HTTPS requests
- * Applications can access resources on the internet, such as web services using GAE's URL fetch service.

③ Technologies used in web services

1. Simple Object Access Protocol (SOAP)

- SOAP provides a standard packaging structure for transmission of XML documents.
- It provides interoperability.
- A SOAP message consists of a root element called envelope.
- XML schema that describes the structure of the SOAP message.

2. Web Service Description Language (WSDL)

- It describes the interface, a set of operations supported by a web service in a standard format.
- It standardizes the representation of input and output parameters.

3. Universal Description, Discovery and Integration (UDDI)

- It provides a global registry for advertising and discovery of web services.
- By searching for names, identifiers, categories, or the specification implemented by the web service.

WS-I protocol stack

- Unlike RESTFUL web services that do not cover QoS and properties
- SOAP-based web services defines non functional requirements
- Certain level of quality in message communication as well as reliable, transactional policies, such as WS-Security, WS-Agreement, WS-Reliable Messaging, WS-Transaction, and WS-Coordination.

