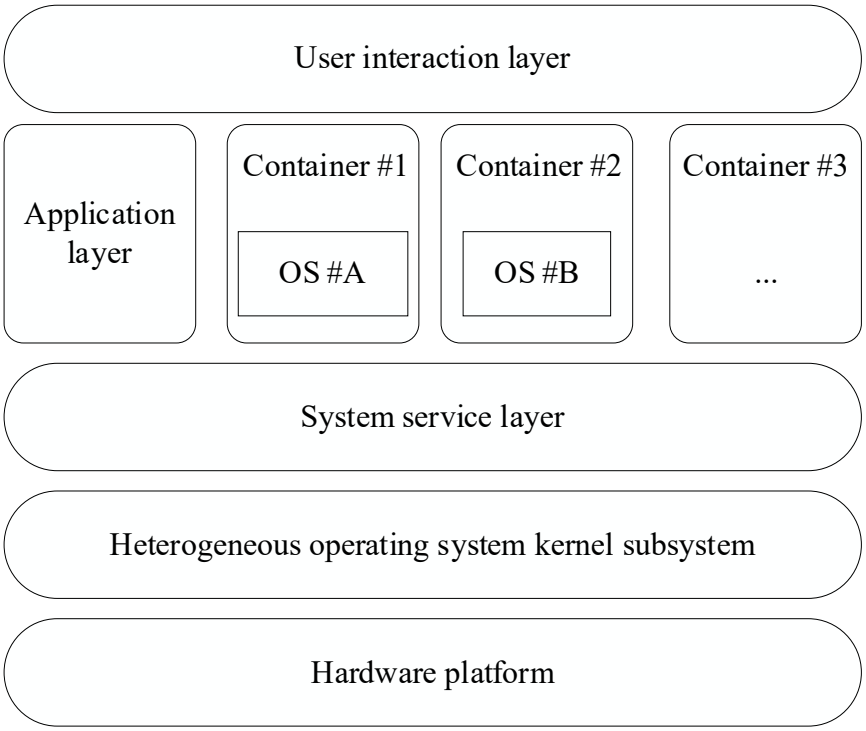
User interaction layer
Application layer
Container #1
OS #A
Container #2
OS #B
Container #3
...
System service layer
Heterogeneous operating system kernel subsystem
Hardware platform

FIG. 1

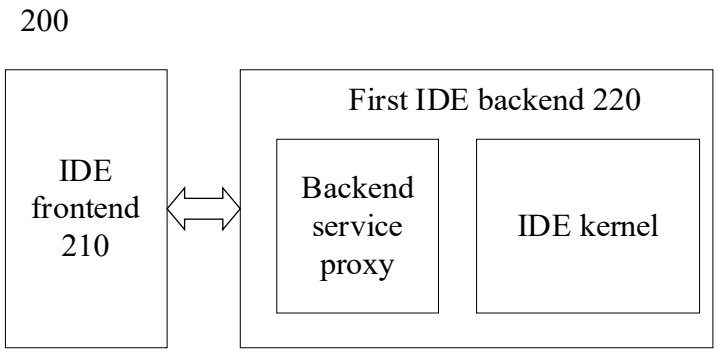
200
IDE frontend 210
First IDE backend 220
Backend service proxy
IDE kernel

FIG. 2

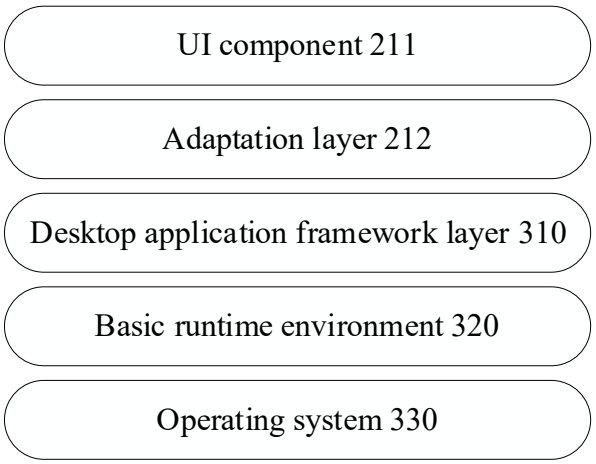
UI component 211
Adaptation layer 212
Desktop application framework layer 310
Basic runtime environment 320
Operating system 330

FIG. 3

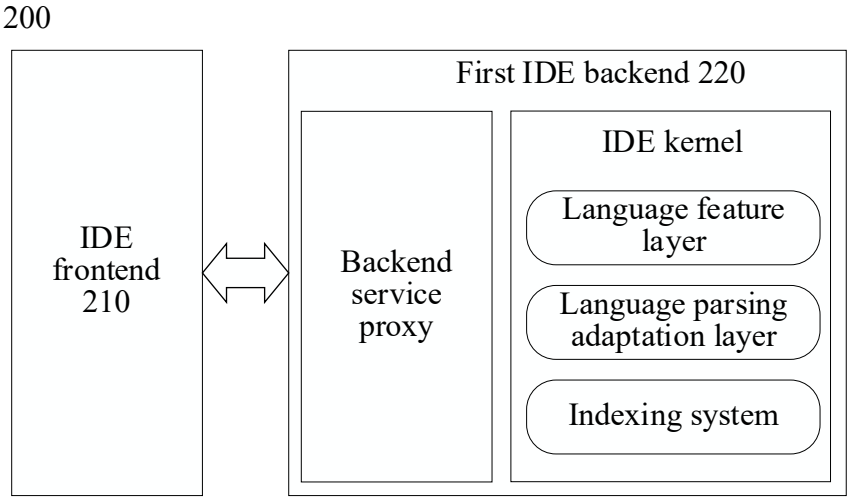
200
IDE frontend 210
First IDE backend 220
Backend service proxy
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system

FIG. 4A

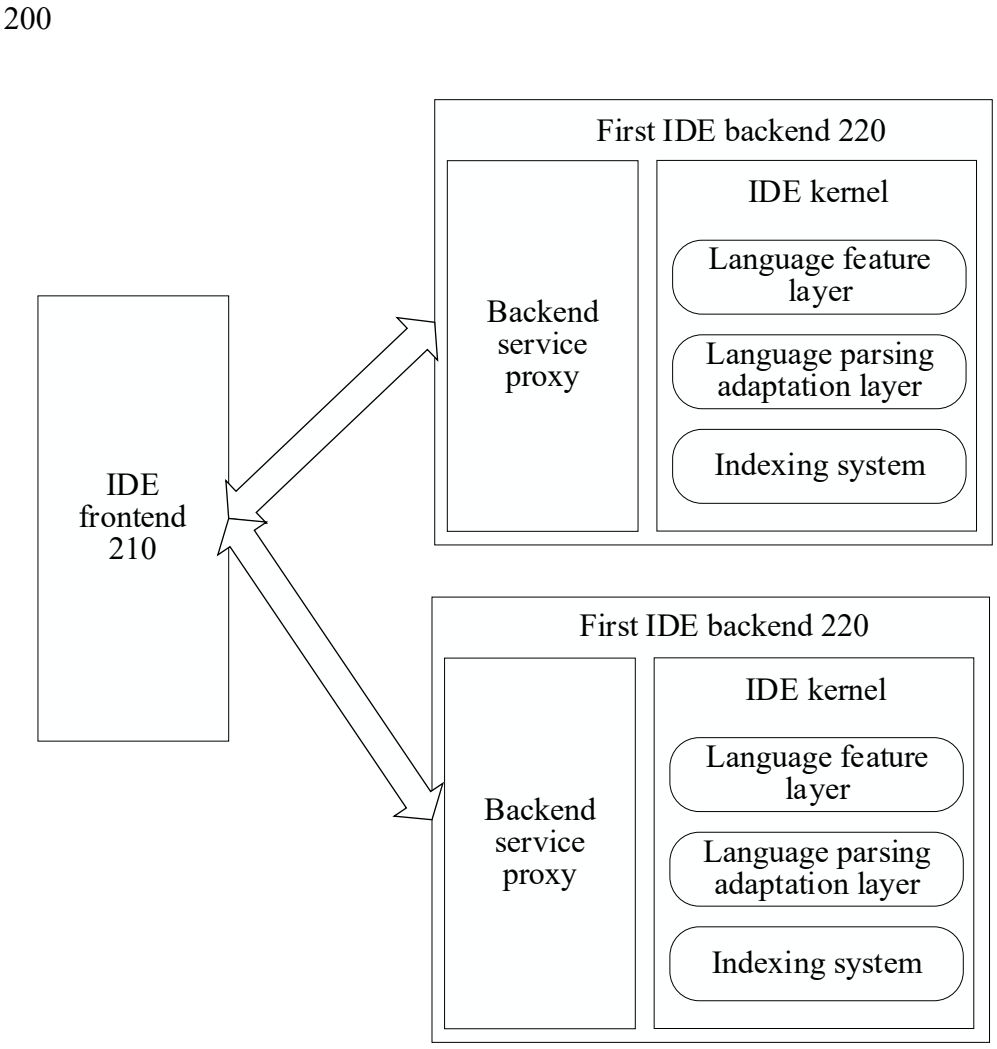
200
IDE frontend 210
First IDE backend 220
Backend service proxy
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system
First IDE backend 220
Backend service proxy
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system

FIG. 4B

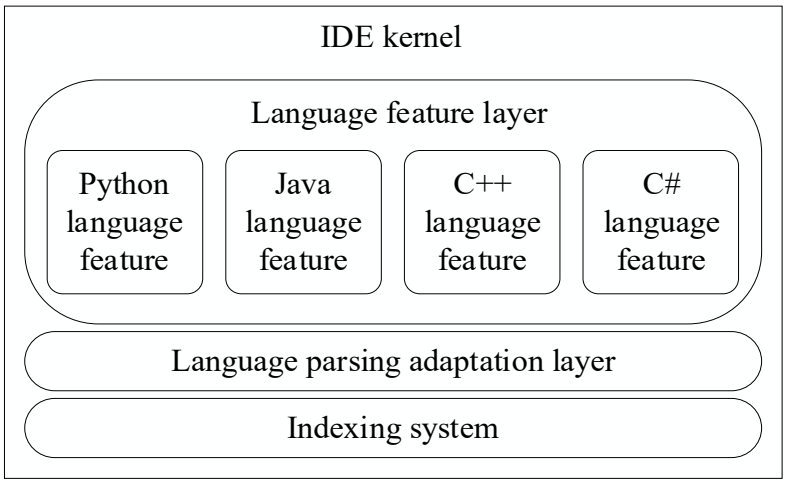

FIG. 5

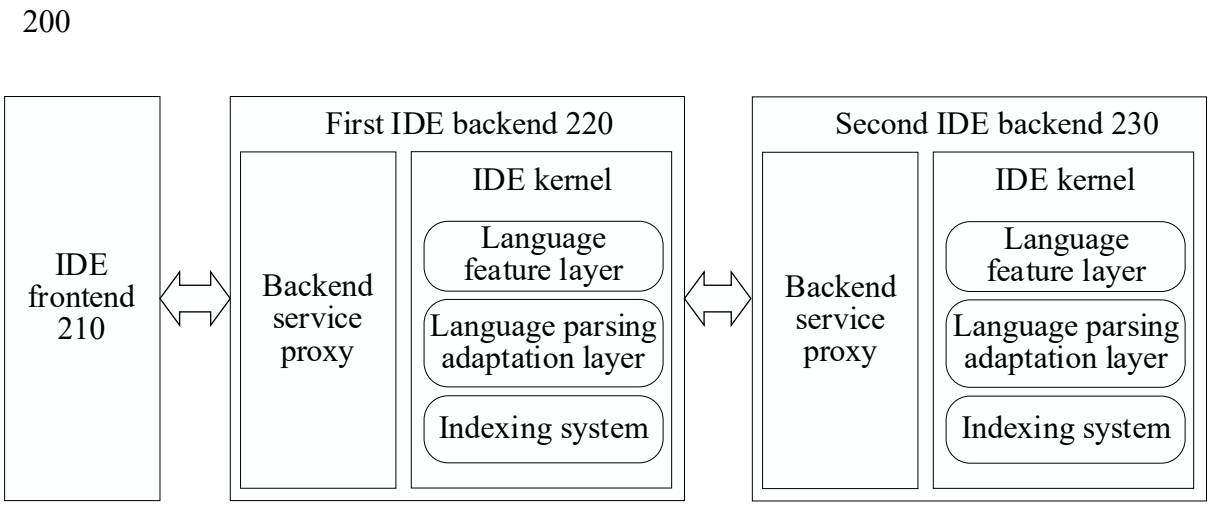

FIG. 6

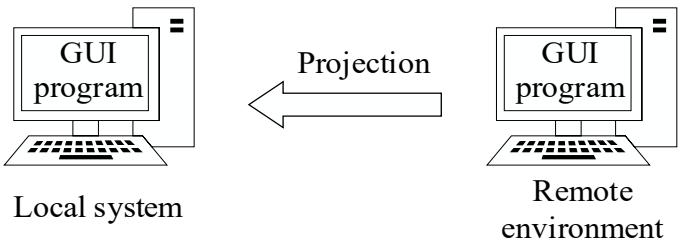

FIG. 7

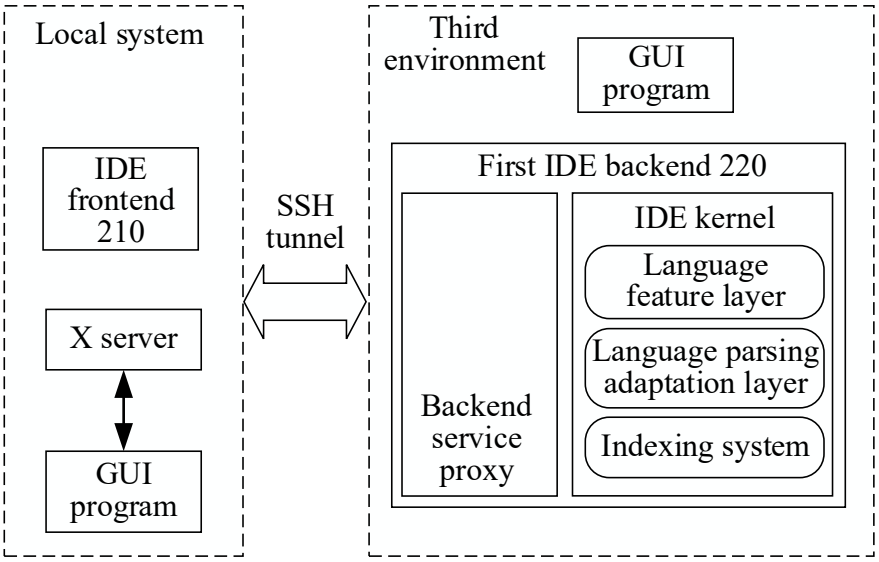
Local system
IDE frontend 210
X server
GUI program
SSH tunnel
Third environment
GUI program
First IDE backend 220
Backend service proxy
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system

FIG. 8A

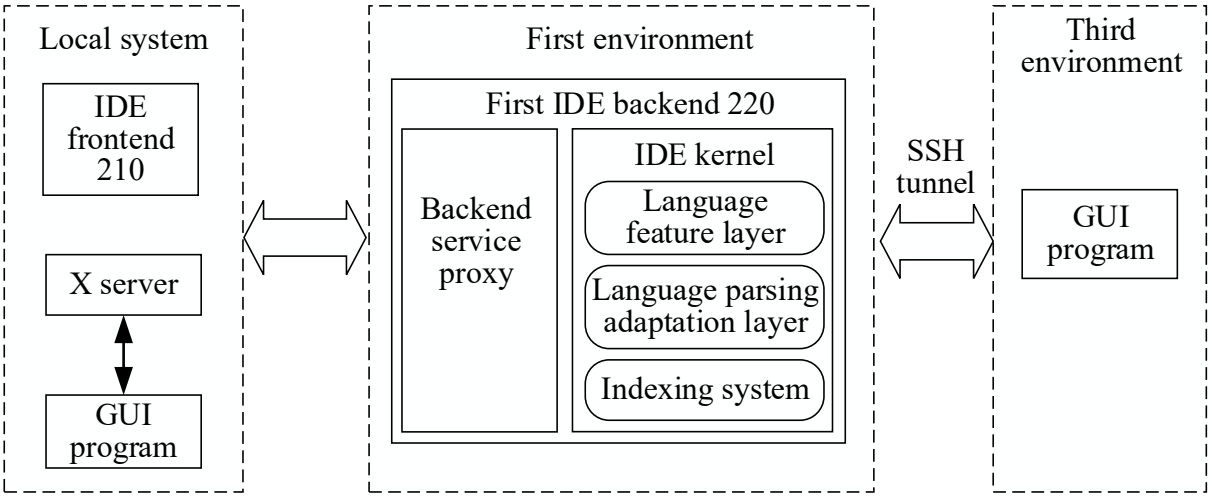
Local system
IDE frontend 210
X server
GUI program
First environment
First IDE backend 220
Backend service proxy
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system
SSH tunnel
Third environment
GUI program

FIG. 8B

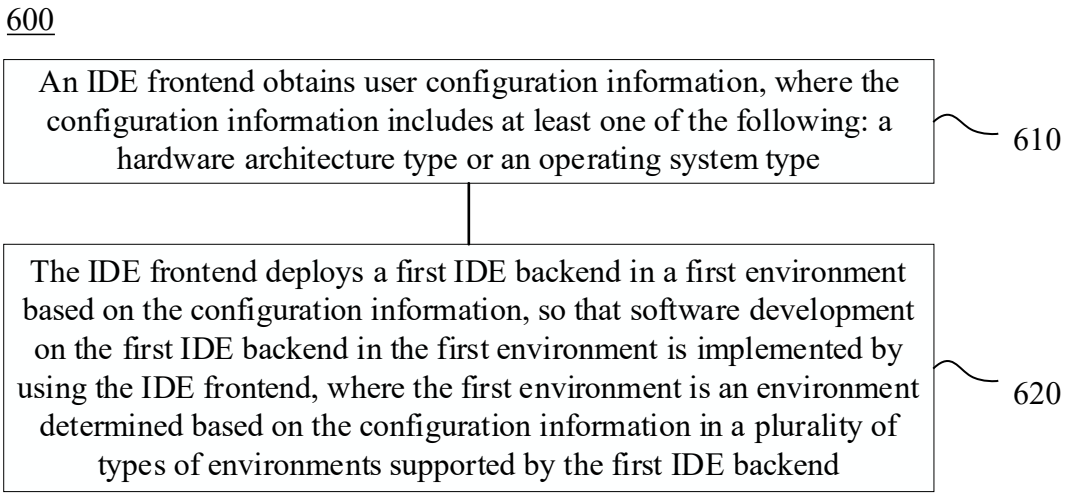
600
An IDE frontend obtains user configuration information, where the configuration information includes at least one of the following: a hardware architecture type or an operating system type
610
The IDE frontend deploys a first IDE backend in a first environment based on the configuration information, so that software development on the first IDE backend in the first environment is implemented by using the IDE frontend, where the first environment is an environment determined based on the configuration information in a plurality of types of environments supported by the first IDE backend
620

FIG. 9

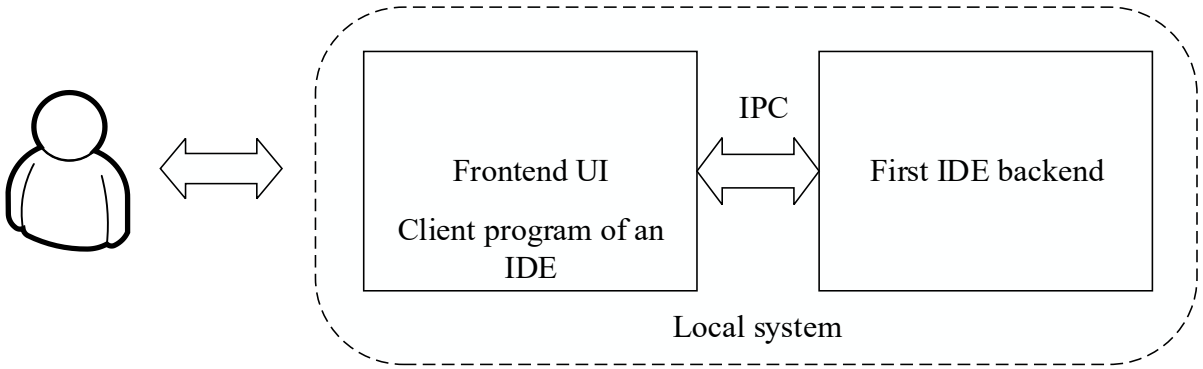
IPC
Frontend UI
Client program of an IDE
First IDE backend
Local system

FIG. 10

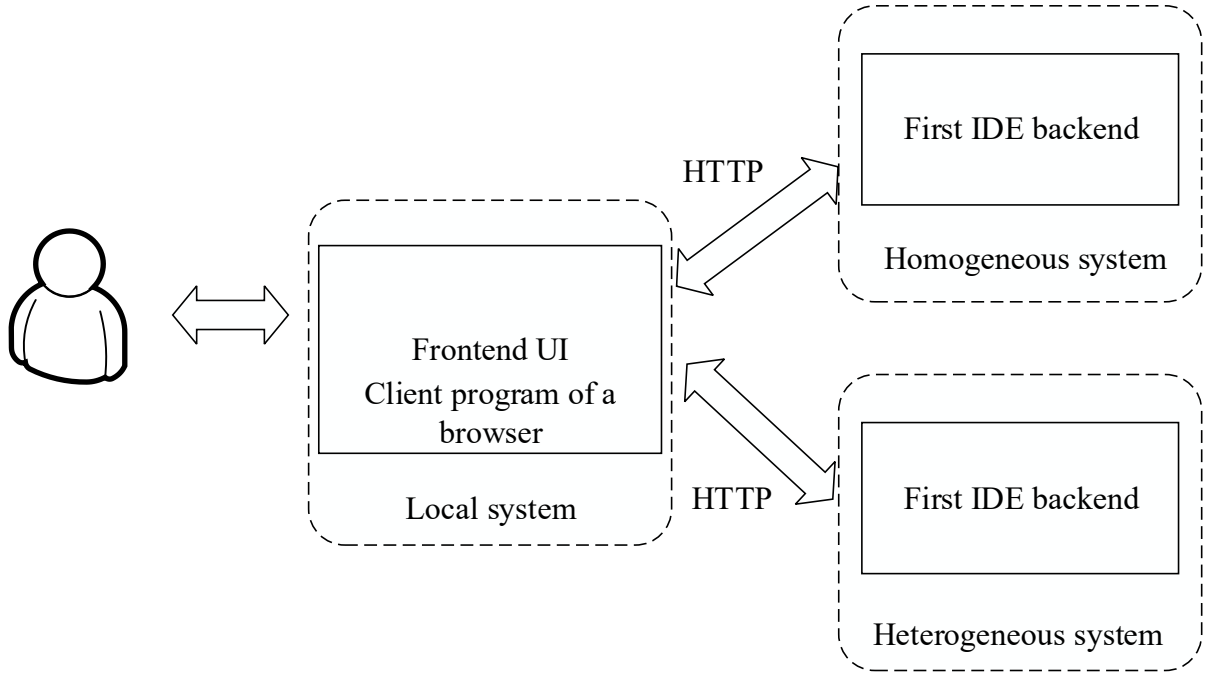
First IDE backend
HTTP
Homogeneous system
Frontend UI
Client program of a browser
Local system
HTTP
First IDE backend
Heterogeneous system

FIG. 11

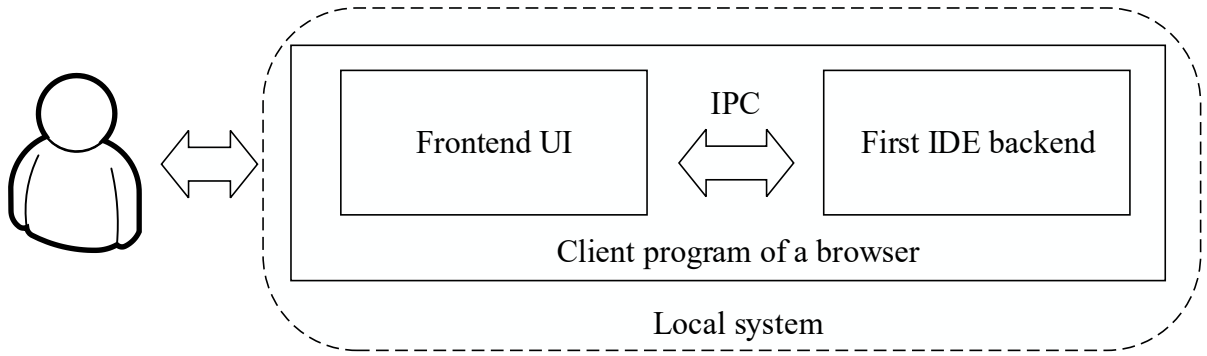
Frontend UI
IPC
First IDE backend
Client program of a browser
Local system

FIG. 12

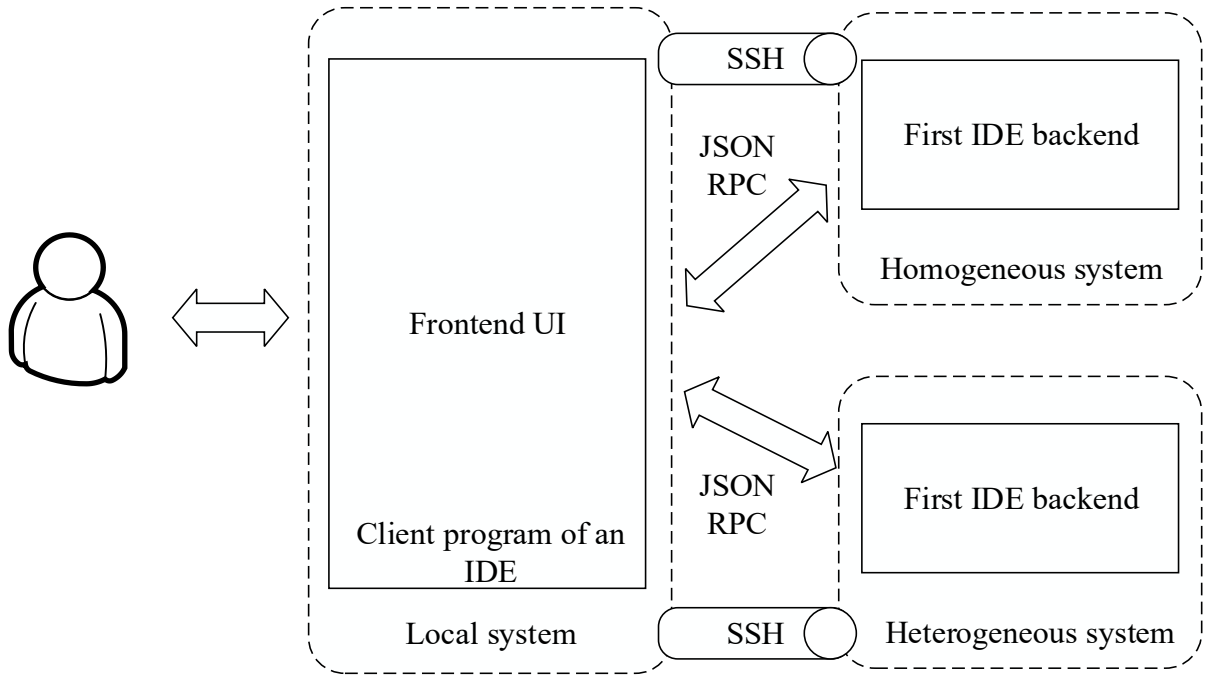
SSH
First IDE backend
JSON
RPC
Homogeneous system
Frontend UI
JSON
RPC
First IDE backend
Client program of an
IDE
Local system
SSH
Heterogeneous system

FIG. 13

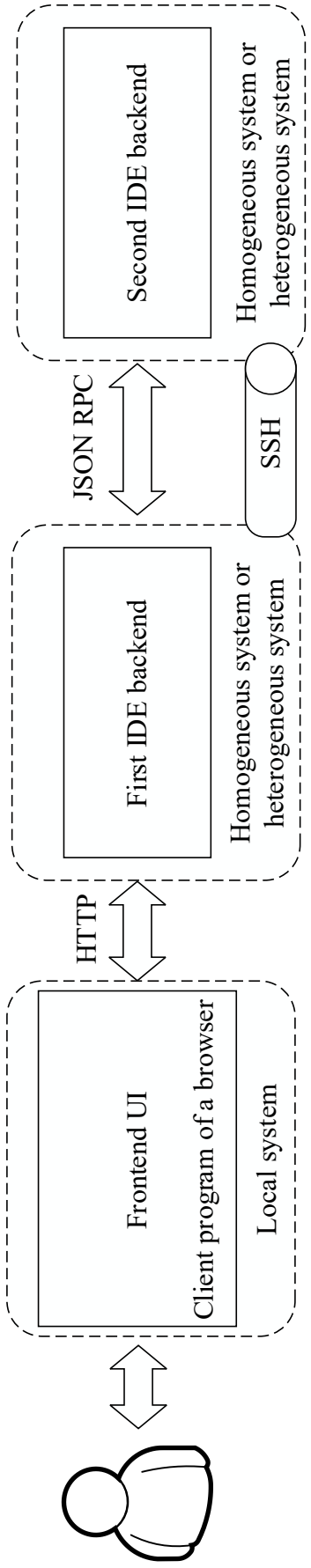
Second IDE backend
Homogeneous system or heterogeneous system
JSON RPC
SSH
First IDE backend
Homogeneous system or heterogeneous system
HTTP
Frontend UI
Client program of a browser
Local system

FIG. 14

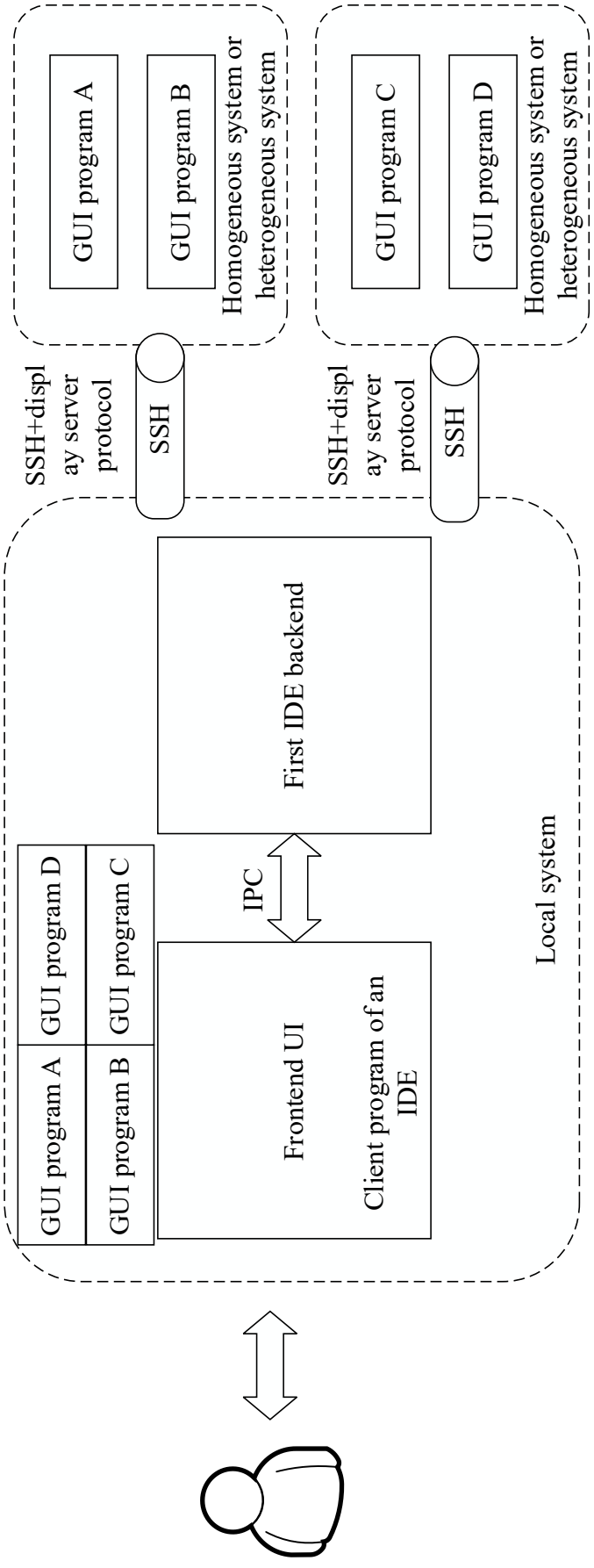
GUI program A
GUI program B
Homogeneous system or heterogeneous system
GUI program C
GUI program D
Homogeneous system or heterogeneous system
SSH+display server protocol
SSH
SSH+display server protocol
SSH
First IDE backend
IPC
GUI program D
GUI program C
GUI program A
GUI program B
Frontend UI
Client program of an IDE
Local system

FIG. 15

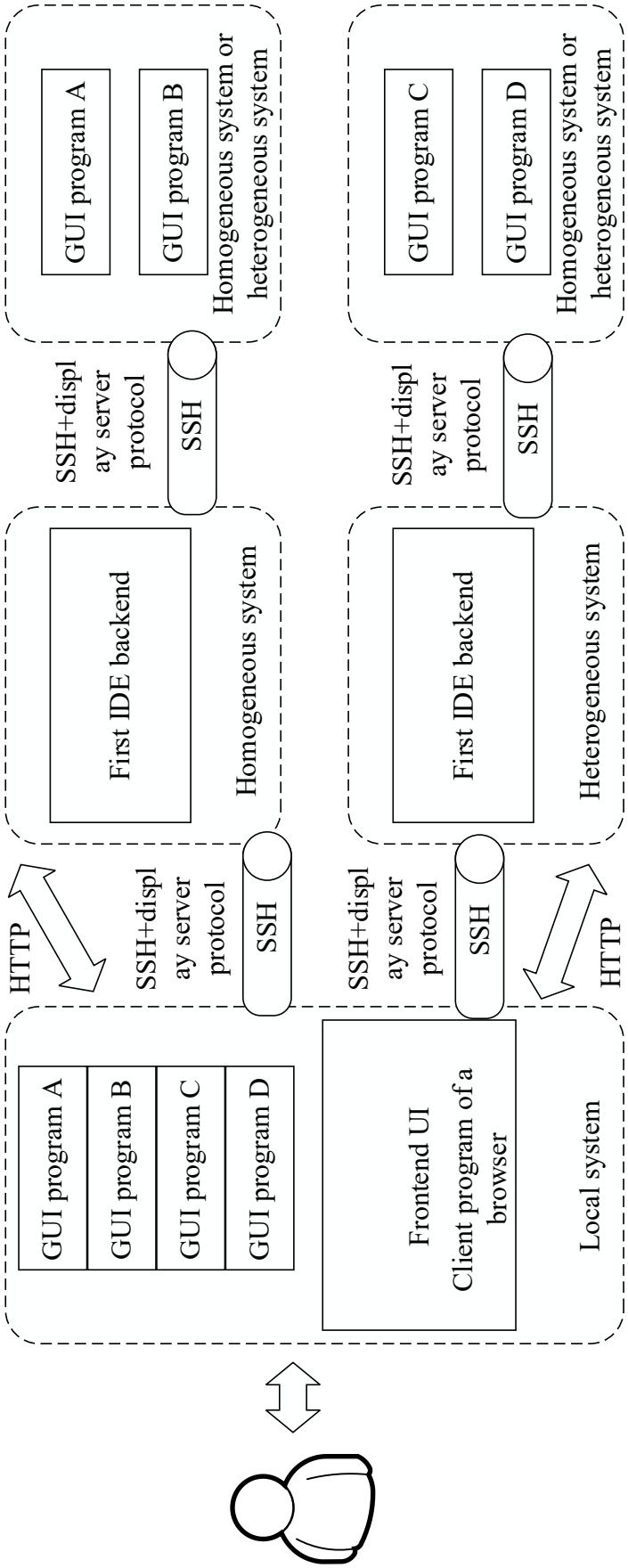
GUI program A
GUI program B
Homogeneous system or heterogeneous system
GUI program C
GUI program D
Homogeneous system or heterogeneous system
SSH+displ ay server protocol
SSH
SSH+displ ay server protocol
SSH
First IDE backend
Homogeneous system
First IDE backend
Heterogeneous system
HTTP
SSH+displ ay server protocol
SSH
SSH+displ ay server protocol
SSH
HTTP
GUI program A
GUI program B
GUI program C
GUI program D
Frontend UI
Client program of a browser
Local system

FIG. 16

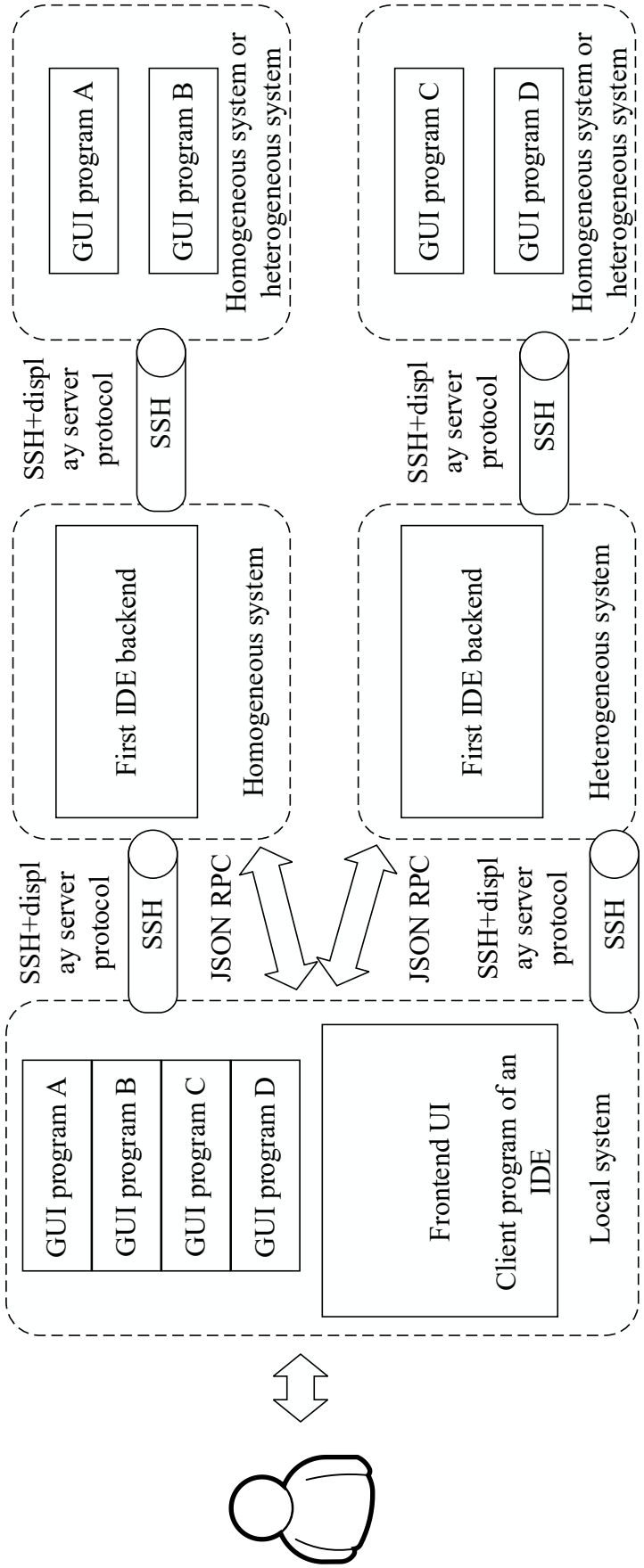
GUI program A
GUI program B
GUI program C
GUI program D
Local system
Frontend UI
Client program of an IDE
SSH+displ ay server protocol
SSH
JSON RPC
First IDE backend
Homogeneous system
Heterogeneous system
Homogeneous system or heterogeneous system

FIG. 17

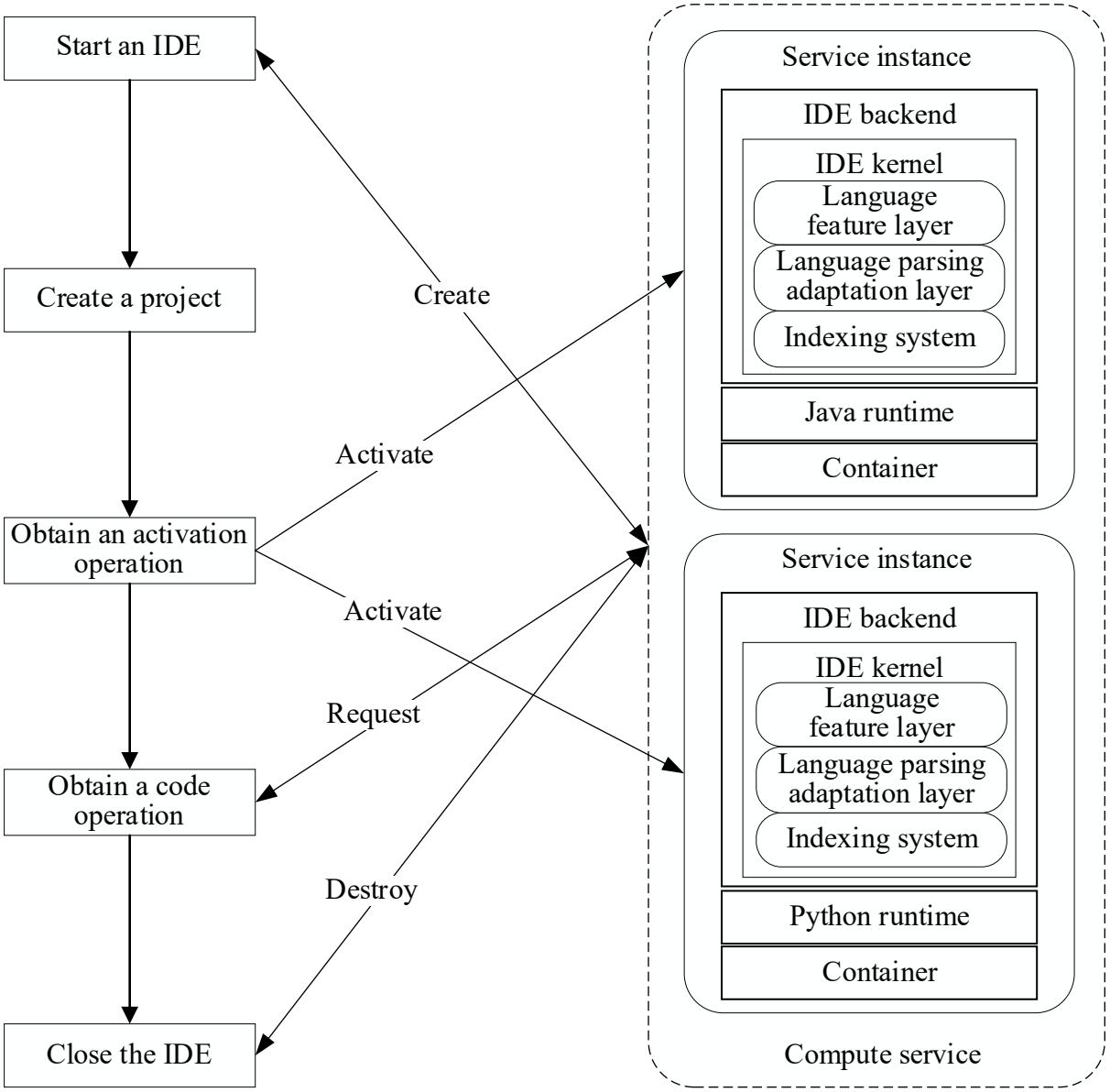
Start an IDE
Create a project
Obtain an activation operation
Obtain a code operation
Close the IDE
Create
Activate
Activate
Request
Destroy
Service instance
IDE backend
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system
Java runtime
Container
Service instance
IDE backend
IDE kernel
Language feature layer
Language parsing adaptation layer
Indexing system
Python runtime
Container
Compute service

FIG. 18

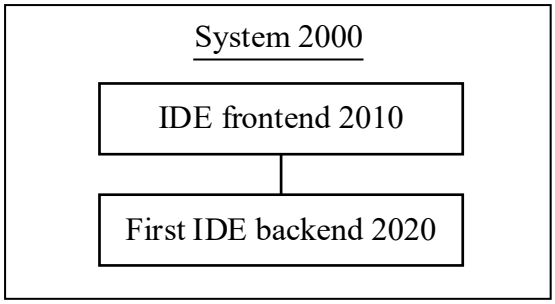
System 2000
IDE frontend 2010
First IDE backend 2020

FIG. 19

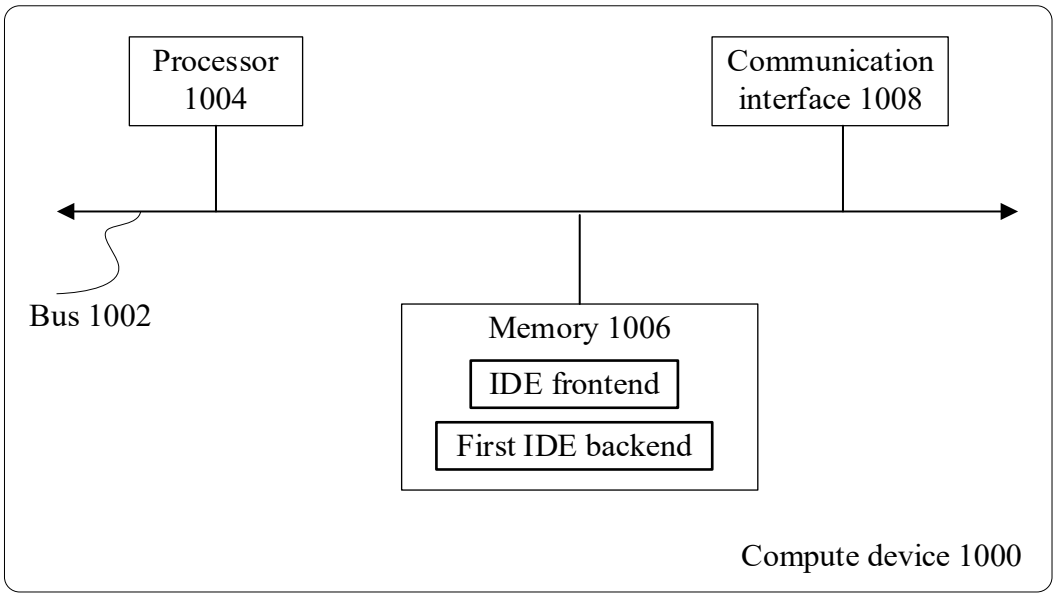
Processor
1004
Communication
interface 1008
Bus 1002
Memory 1006
IDE frontend
First IDE backend
Compute device 1000

FIG. 20

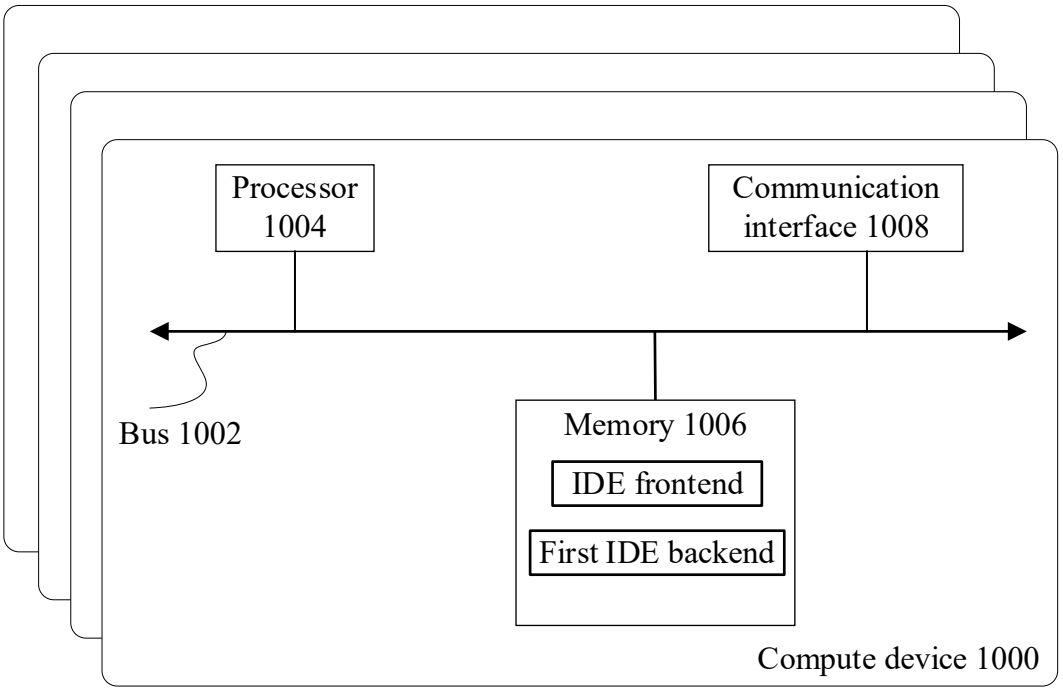
Processor
1004
Communication
interface 1008
Bus 1002
Memory 1006
IDE frontend
First IDE backend
Compute device 1000

FIG. 21

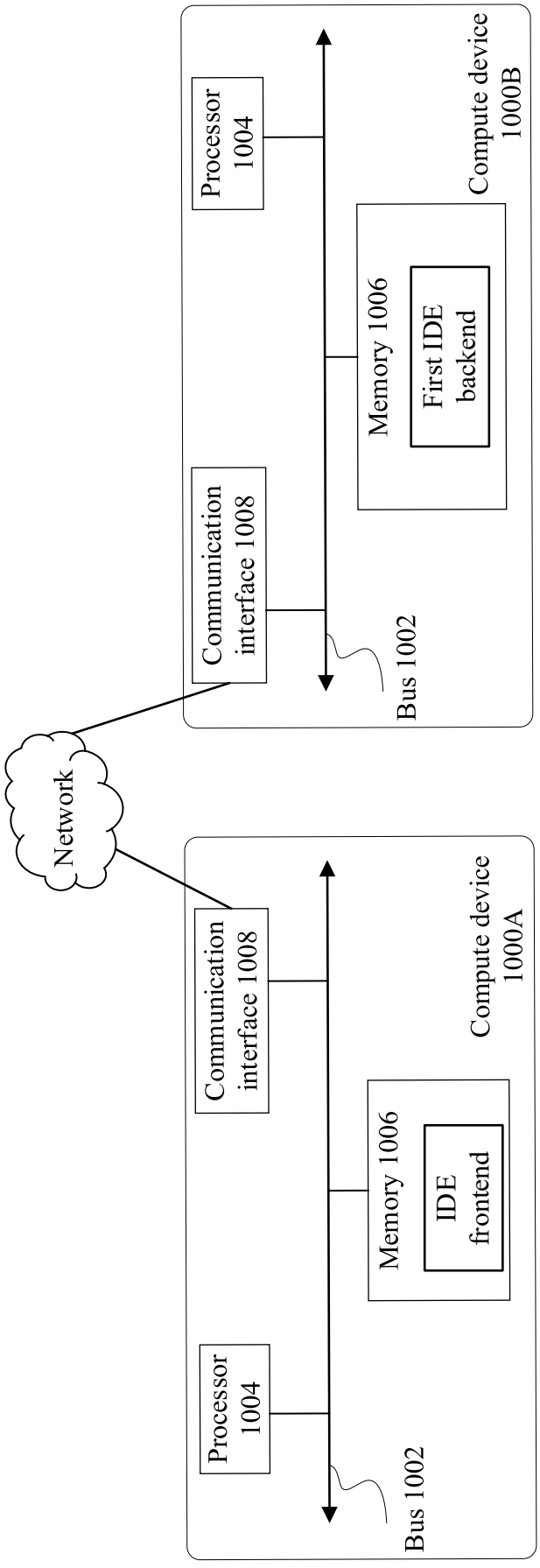
Compute device 1000B
Processor 1004
Memory 1006
First IDE backend
Communication interface 1008
Bus 1002
Network
Compute device 1000A
Processor 1004
Memory 1006
IDE frontend
Communication interface 1008
Bus 1002

FIG. 22