CLAIMS

[Claim 1] A task processing method performed by a scheduling device, the method comprising:

receiving device information sent by a target device;

generating, based on the device information, a runtime environment identifier corresponding to the target device;

sending the runtime environment identifier to the target device;

acquiring a target task to be deployed to the target device;

generating a confirmation signal according to the target task, the confirmation signal indicating task content of the target task; and

in response to a heartbeat request being received from the target device, sending the confirmation signal to the target device.

[Claim 2] The method according to claim 1, wherein the target devise is an edge device of a network.

[Claim 3] The method according to any one of claims 1 and 2, further comprising:

generating a dual-state record corresponding to the target task, the dual-state record including an expected state and an actual state of the target task;

receiving a task synchronization request sent by the target device, the task synchronization request indicating an execution status of the target task; and

updating the dual-state record according to the execution status.

[Claim 4] The method according to claim 3, further comprising:

determining whether the target task is abnormal by scanning the dual-state record.

[Claim 5] The method according to claim 4, further comprising:

determining whether the expected state is the same as the actual state, and in response to the expected state being different from the actual state throughout a preset period of time, triggering an exception handling mechanism; or

determining whether the actual state indicates an abnormal state, and in response to the actual state indicating an abnormal state, triggering the exception handling mechanism.

[Claim 6] The method according to any one of claims 1-5, wherein the acquiring the target task comprises:

receiving a first task sent by a console, the first task including a scheduling policy, a deployment address, and content of the first task, the deployment address pointing to the target device;

parsing the deployment address and determining a state of the target device based on the deployment address; and

in response to the target device being in a normal state, generating the target task according to the scheduling policy and the content of the first task.

[Claim 7] The method according to claim 1, wherein the generating the confirmation signal according to the target task comprises:

generating the confirmation signal according to the target task and the device information.

[Claim 8] The method according to any one of claims 1-7, wherein the device information includes information of at least one of the following: a central processing unit (CPU), a memory size, a disk size, a network link, a software development kit (SDK) version number, an execution engine, an address, a synchronization time interval, and configuration of the target device.

[Claim 9] The method according to any one of claims 1-8, further comprising:

determining whether the target device is abnormal by monitoring the heartbeat request sent by the target device.

[Claim 10] The method according to claim 9, further comprising:

in response to the heartbeat request not being received for a preset time period, determining that the target device is disconnected;

acquiring, from a preset correspondence table, a first task currently running on the target device;

storing description information of the first task to the confirmation signal; and

in response to a next heartbeat request being received from the target device, sending the confirmation signal to the target device.

[Claim 11] The method according to any one of claims 1-10, wherein the confirmation signal includes a response content field, and the generating the confirmation signal according to the target task comprises:

adding the task content to the response content field.

[Claim 12] The method according to any one of claims 1-11, wherein the sending the confirmation signal to the target device comprises:

adding the confirmation signal to a response to the heartbeat request; and

sending the response to the target device.

[Claim 13] The method according to any one of claims 1-12, further comprising:

receiving, from the target device, a task status calibration request regarding one or more tasks executed by the target device, the task status calibration request indicating an execution status of the one or more tasks after the target device restarts or recovers from an abnormal state; and

calibrating the execution status of the one or more tasks according to the task status calibration request.

[Claim 14] The method according to any one of claims 1-13, wherein the heartbeat request includes information of at least one of the following: CPU usage, memory usage, disk usage, and execution status of one or more tasks executed by the target device.

[Claim 15] A task processing method performed by a network device, comprising:

acquiring device information of the network device;

sending the device information to a scheduling device, the device information being used by the scheduling device to generate a runtime environment identifier corresponding to the network device;

receiving the runtime environment identifier from the scheduling device;

sending a heartbeat request to the scheduling device;

receiving, from the scheduling device, a confirmation signal corresponding to the heartbeat request, the confirmation signal indicating task content of a target task; and

executing the target task according to the task content.

[Claim 16] The method according to claim 15, wherein the network device is at an edge of a network.

[Claim 17] The method according to any one of claims 15 and 16, further comprising:

sending a task synchronization request to the scheduling device, the task synchronization request indicating an execution status of the target task.

[Claim 18] The method according to claim 15, wherein the device information includes information of at least one of the following: a central processing unit (CPU), a memory size, a disk size, a network link, a software development kit (SDK) version number, an execution engine, an address, a synchronization time interval, and configuration of the network device.

[Claim 19] The method according to any one of claims 15-18, further comprising:

sending the heartbeat request to the scheduling device according to a pre-configured frequency.

[Claim 20] The method according to any one of claims 15-19, further comprising:

in response to the network device having restarted or recovered from an abnormal state,

acquiring an execution status of one or more tasks executed by the network device;

generating a task status calibration request indicating the execution status of the one or more tasks; and

sending the task status calibration request to the scheduling device.

[Claim 21] The method according to any one of claims 15-20, wherein the confirmation signal includes a response content field for indicating the task content.

[Claim 22] The method according to any one of claim 15-21, wherein the receiving, from the scheduling device, the confirmation signal corresponding to the heartbeat request comprises:

receiving, from the scheduling device, a response to the heartbeat request, the response comprising the confirmation signal.

[Claim 23] A task scheduling apparatus, comprising:

a memory storing a set of instructions; and

a processor configured to execute the set of instructions to cause the task scheduling apparatus to:

receive device information sent by a target device;

generate, based on the device information, a runtime environment identifier corresponding to the target device;

send the runtime environment identifier to the target device;

acquire a target task to be deployed to the target device;

generate a confirmation signal according to the target task, the confirmation signal

indicating task content of the target task; and

in response to a heartbeat request being received from the target device, send the confirmation signal to the target device.

[Claim 24] A network apparatus, comprising:

a memory storing a set of instructions; and

a processor configured to execute the set of instructions to cause the network apparatus to:

acquire device information of the network device;

send the device information to a scheduling device, the device information being used by the scheduling device to generate a runtime environment identifier corresponding to the network device;

receive the runtime environment identifier from the scheduling device;

send a heartbeat request to the scheduling device;

receive, from the scheduling device, a confirmation signal corresponding to the heartbeat request, the confirmation signal indicating task content of a target task; and

execute the target task according to the task content.

[Claim 25] A task processing system, comprising the task scheduling apparatus according to claim 23.

[Claim 26] A processor, configured to execute instructions included in a program, wherein when the instructions are executed, the program causes the processor to perform a task processing method, the method comprising:

receiving device information sent by a target device;

generating, based on the device information, a runtime environment identifier corresponding to the target device;

sending the runtime environment identifier to the target device;

acquiring a target task to be deployed to the target device;

generating a confirmation signal according to the target task, the confirmation signal indicating task content of the target task; and

in response to a heartbeat request being received from the target device, sending the confirmation signal to the target device.

[Claim 27] A non-transitory computer readable medium that stores a set of instructions that is executable by at least one processor of a computer to cause the computer to perform a task processing method, the method comprising:

receiving device information sent by a target device;

generating, based on the device information, a runtime environment identifier corresponding to the target device;

sending the runtime environment identifier to the target device;

acquiring a target task to be deployed to the target device;

generating a confirmation signal according to the target task, the confirmation signal indicating task content of the target task; and

in response to a heartbeat request being received from the target device, sending the confirmation signal to the target device.

[Claim 28] The non-transitory computer readable medium according to claim 27, wherein the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

generating a dual-state record corresponding to the target task, the dual-state record including an expected state and an actual state of the target task;

receiving a task synchronization request sent by the target device, the task synchronization request indicating an execution status of the target task; and

updating the dual-state record according to the execution status of the target task.

[Claim 29] The non-transitory computer readable medium according to claim 28, wherein the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

determining whether the target task is abnormal by scanning the dual-state record.

[Claim 30] The non-transitory computer readable medium according to claim 29, wherein the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

determining whether the expected state is the same as the actual state, and in response to the expected state being different from the actual state throughout a preset period of time, triggering an exception handling mechanism; or

determining whether the actual state indicates an abnormal state, and in response to the actual state indicating an abnormal state, triggering the exception handling mechanism.

[Claim 31] The non-transitory computer readable medium according to any one of claims 27-30, wherein the acquiring the target task comprises:

receiving a first task sent by a console, the first task including a scheduling policy, a deployment address, and content of the first task, the deployment address pointing to the target device;

parsing the deployment address and determining a state of the target device based on the deployment address; and

in response to the target device being in a normal state, generating the target task according to the scheduling policy and the content of the first task.

[Claim 32] The non-transitory computer readable medium according to claim 27, wherein the generating the confirmation signal according to the target task comprises:

generating the confirmation signal according to the target task and the device information.

[Claim 33] The non-transitory computer readable medium according to any one of claims 27-32, wherein the device information includes information of at least one of the following: a central processing unit (CPU), a memory size, a disk size, a network link, a software development kit (SDK) version number, an execution engine, an address, a synchronization time interval, and configuration.

[Claim 34] The non-transitory computer readable medium according to any one of claims 27-33, the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

determining whether the target device is abnormal by monitoring the heartbeat request sent by the target device.

[Claim 35] The non-transitory computer readable medium according to claim 34, wherein the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

in response to the heartbeat request not being received for a preset time period, determining that the target device is disconnected;

acquiring, from a preset correspondence table, a first task currently running on the target device;

storing description information of the first task to the confirmation signal; and

in response to a next heartbeat request being received from the target device, sending the confirmation signal to the target device.

[Claim 36] The non-transitory computer readable medium according to any one of claims 27-35, wherein the confirmation signal includes a response content field, and the generating the confirmation signal according to the target task comprises:

adding the task content to the response content field.

[Claim 37] The non-transitory computer readable medium according to any one of claims 27-36, wherein the sending the confirmation signal to the target device comprises:

adding the confirmation signal to a data field of a heartbeat response; and

sending the heartbeat response including the confirmation signal to the target device.

[Claim 38] The non-transitory computer readable medium according to any one of claims 27-37, wherein the set of instructions that is executable by the at least one processor of the computer causes the computer to further perform:

receiving, from the target device, a task status calibration request regarding one or more tasks executed by the target device, the task status calibration request indicating an execution status of the one or more tasks after the target device restarts or recovers from an abnormal state; and

calibrating the execution status of the one or more tasks according to the task status calibration request.

[Claim 39] The non-transitory computer readable medium according to any one of claims 27-38, wherein the heartbeat request includes information of at least one of the following: CPU usage, memory usage, disk usage, and execution status of one or more tasks executed by the target device.