

Digital Operations Collect & Control Centre

White paper



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1 Background

The 2020 meeting of the Standing Committee of the Political Bureau of the CPC Central Committee put forward new requirements for accelerating the construction of new infrastructure such as 5G networks and data centers. Big data centers were also included in the government's items for accelerating construction for the first time as part of the new infrastructure.

Empowered by information technologies such as 5G and the Industrial Internet, as well as driven by the epidemic and national policies, various industries are more actively seeking digital transformation paths that suit their own characteristics, and the digital transformation of companies continues to accelerate.

As various industries vigorously carry out digital transformation, the number of resources required by companies has increased dramatically. The number of operating nodes (physical or virtual servers and containers) generally reaches thousands, and even reaches millions for large Internet companies. The rapid expansion of data centers has put tremendous pressure on operations management. How to effectively and uniformly manage and control all nodes in large-scale data centers has become a huge problem faced by various companies.

In large Internet companies, there are many types of servers. In order to ensure business stability, all Agents do not run independently on the host machine and must be controlled by a unified Agent (called Omni Agent in Collect & Control Center). Omni Agent is used to collect the status of each Agent and reflect it to a web application called Manager Console. In larger traditional companies, there are many departments, product projects, and operations monitoring personnel, which are not unified. There are many forms of installing many agents on the same target machine, which has many disadvantages. Companies still have the following difficulties in unified collection and control management:

Lack of unified management and control backend

- **Difficulties in locating and solving problems**

Installation, deployment, upgrade and other problems occur frequently and it is difficult to quickly track, locate, and solve problems.

- **Manual installation and deployment are very costly in manpower and time**

More and more servers need to be installed and maintained, resulting in huge manpower and time costs. The previous operations method based on manual deployment and installation is no longer suitable for the operations of current large-scale data centers.

- **Multiple management backends, complex operations and high learning costs**

Similar services are scattered in different systems that are coupled to each other. They need to go to different backend systems for operations. The cost of cross-platform use and learning is high.

Lack of protection mechanism to ensure stable operation of business

- **Host failure causes business interruption**

Under cluster deployment, node failures will inevitably occur, resulting in data loss.

- **Uneven load causes overheating of single-machine nodes**

Uneven traffic distribution leads to excessive single-machine tasks, reduced collection performance, and possible data loss.

- **Collecting dirty data affects business judgment**

A lot of missing, errors and other dirty data were collected, which affected normal business judgment.

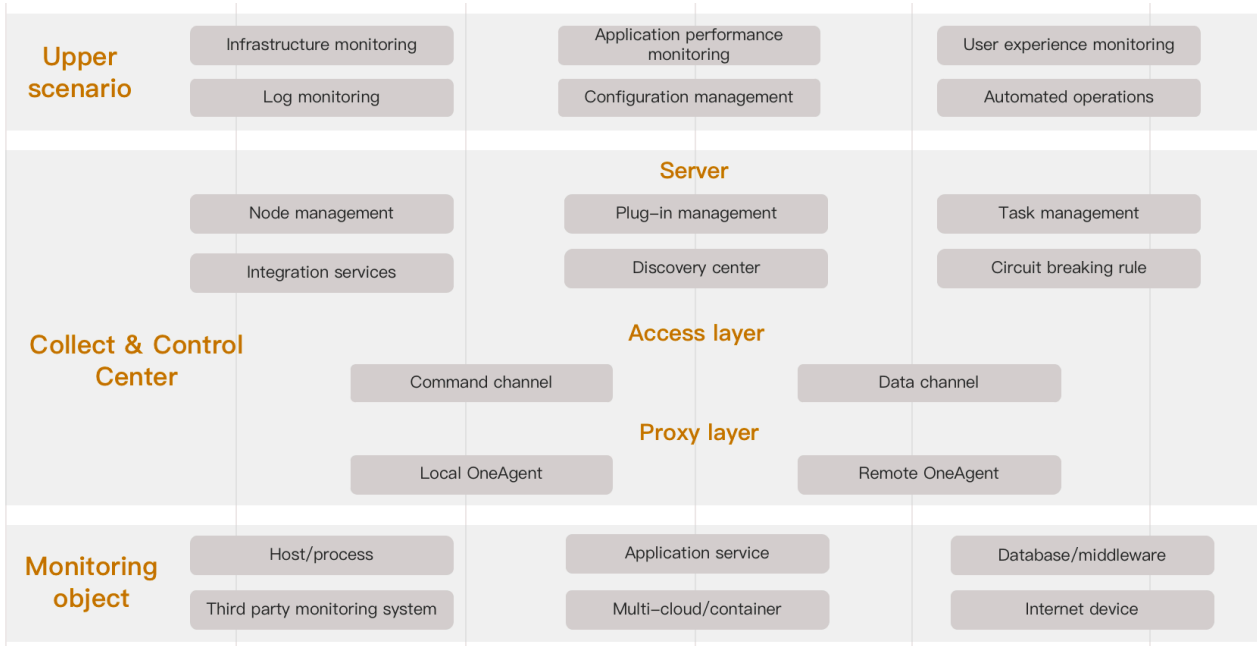
With the continuous expansion and improvement of the company's product line, the previous operations model based on manual configuration of the collection of various data sources and manual installation, deployment, uninstallation and other management of each collector (Agent), host, etc. is no longer satisfied with the effective management and control of current large-scale data centers, IDCs, cross-clouds and clusters, etc.

2 Product introduction

Collect & Control Center is an enterprise-level digital operations data collection and task control center and the basis of the digital operationa solution.

- Collect & Control Center provides companies with one-stop configuration and automated deployment functions for various collection tasks. It supports operations such as collection, sending, monitoring, and alerting of various logs, IT infrastructure. At the same time, the collection tasks and behaviors are scheduled and controlled in a unified and standardized manner to avoid abnormal situations such as downtime caused by irregular operations and fully guarantee the normal operation of the business.
- Collect & Control Center has dozens of built-in out-of-the-box collection templates (and is constantly expanding), dozens of built-in parsing, conversion, and calculation methods, and is compatible with many different types and versions of operations such as Linux, Windows, AIX, and KYLINSOFT, as well as embedded devices, web pages, servers, programs, etc.

Architecture:



3 Main functions

3.1 Nodes

Unified management and control of deployed Agents and extensions. Deployment and management in scenarios such as physical machines, virtual machines, cloud hosts, and containers are supported.

3.1.1 Hosts

3.1.1.1 Add a host

- You only need to click on the page to auto complete the entire installation and deployment process.
- Just click on the page to automatically complete the entire installation and deployment process. Common and remote installation methods are supported.
- Remote installation supports Excel template import into the host list, and a maximum of 1,000 hosts can be installed simultaneously.
- Specified Agent and extended running users and user groups are supported.

← Add host Common installation Remote installation

● Collect & Control Center provides scripts for easy installation. You can select a plug-in integrated in the platform, and generate and copy the installation command based on the machine type to the target host for automatic installation. X

● You can perform operations such as adding extension plug-ins, specifying host tags, and selecting different configuration files for registration. If you want to use custom configurations, you must create configuration rules in [Configurations](#) first. X

▼ Agent deployment ⓘ

Access type:

Configuration file:

Plug-in:

Host tag:

* Run user:

* Run user group:

* Installation path:

▼ Query installed script ⓘ

3.1.1.2 Agent overview

- Count the number of deployed Agents and extensions.

■ Count deployed Agent and extension status.

The screenshot shows the 'Hosts' management page. At the top, there is a summary table:

Host	Sum	Linux	Windows	AIX	Status	Enabled	Offline	Exception
	9	8	1	0		5	4	0

Below the summary, there is a search bar and a table of hosts:

Host IP	Hostname	Agent status	OS	CPU	Discovery service	Actions
<input type="checkbox"/> 10.0.9.120	9.120centos7.6	● Enabled	Linux	x86	-	Install Upgrade Details More

3.1.1.3 Batch process hosts

For large-scale and ultra-large-scale data centers with many servers, it supports a maximum concurrent processing capacity of 200 hosts, including batch installation of extensions, batch upgrade, uninstallation, restart of Agent, and batch deletion of offline hosts.

The screenshot shows a list of hosts in the Cloudwise interface:

Host IP	Hostname	Agent status	OS	CPU	Discovery service	Actions
<input type="checkbox"/> 10.0.9.120	9.120centos7.6	● Enabled	Linux	x86	-	Install Upgrade Details More
<input type="checkbox"/> 10.0.9.199	node1	● Enabled	Linux	x86	-	Install Upgrade Details More
<input type="checkbox"/> 10.0.12.182	14d925e752e2	○ Offline	Linux	x86	-	Install Upgrade Details More
<input type="checkbox"/> 10.0.8.52	dccp10.0.8.52	○ Offline	Linux	arm	-	Install Upgrade Details More
<input type="checkbox"/> 10.0.7.144	loadhost	○ Offline	Linux	x86	-	Install Upgrade Details More
<input type="checkbox"/> 10.0.13.190	10-0-13-190	○ Offline	Linux	x86	-	Install Upgrade Details More

3.1.1.4 Batch process extensions

You can batch enable, disable, upgrade, uninstall, delete, and restart expansion modules.

The screenshot shows a list of hosts with their agent status and OS:

Host IP	Hostname	Agent status	OS
<input type="checkbox"/> 10.0.9.120	9.120centos7.6	● Enabled	Linux
<input type="checkbox"/> 10.0.12.182	dccc-agent-test-5fb8887b79-n2j15	● Enabled	Linux
<input type="checkbox"/> 10.0.9.199	node1	● Enabled	Linux
<input type="checkbox"/> 10.0.16.133	dccp010000016133	● Enabled	Linux
<input type="checkbox"/> 10.0.16.189	WIN-RDE70J6DSTC	● Enabled	Windows

3.2 Auto discovery

3.2.1 Network scan

By installing the remote auto discovery plug-in, you can auto discover all physical node device information (such as servers, routers, gateways, bridges, etc.) in the same network segment and the corresponding related applications and services on the node (such as databases, middleware, Agent, etc.), and the device information of the node and the service information corresponding to the node can be displayed, and you can select whether to output it to CMDB for storage.

3.2.1.1 Manage discovery tasks


By creating a new discovery task, periodically scan node devices within the IP range.

← Create discovery task

* Task name:

* IP range:

* Check rule:

Check rule	Port	Actions
 No data		

Add

* Host:

OK Cancel

3.2.1.2 Manage discovery results

Discovery results can be imported into CMDB.

Network Scans

Tasks Discovery results CIs

Enter task name

<input type="checkbox"/>	Task name	IP range	Check rule	CDC status	Execution host IP	Actions
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3.2.1.3 Batch process discovery results

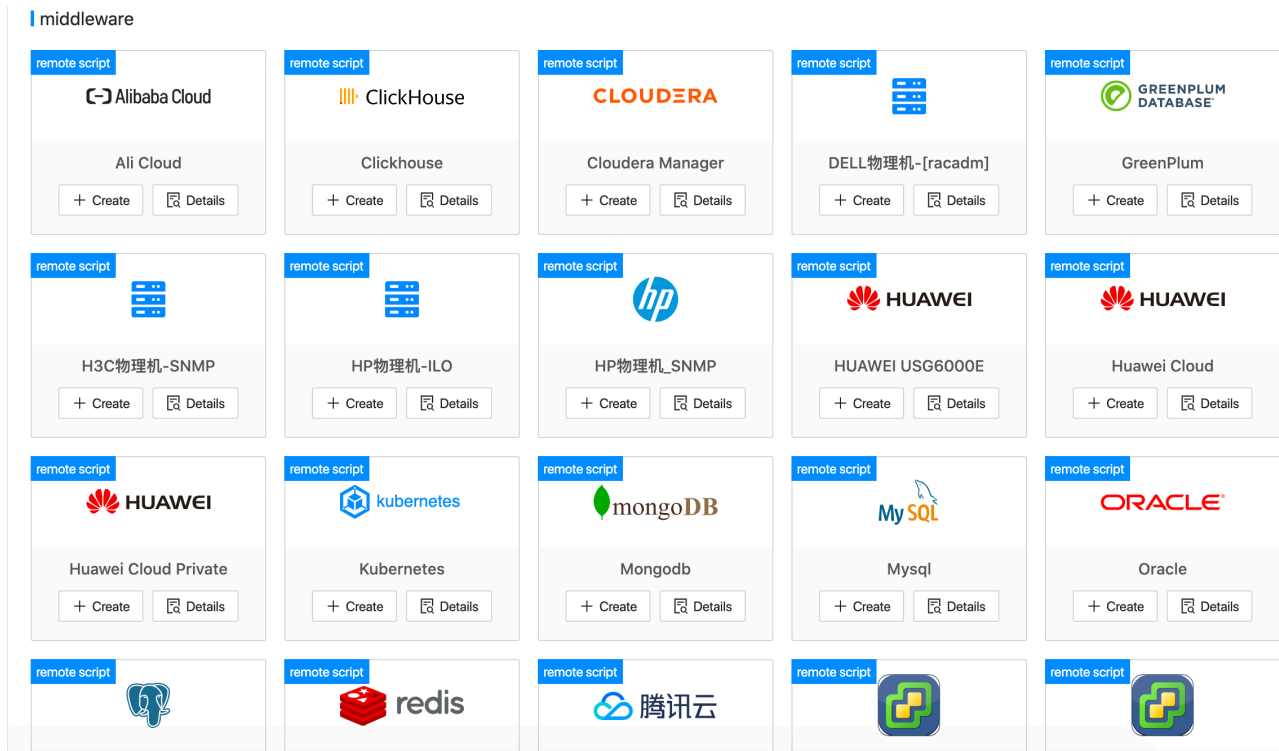
Through batch processing, attribute collection tasks are sent to network devices, local middleware (above V6.1.1, merged with general servers into a script plug-in), and general servers. You can deploy Agent and extensions to hosts through scan results.

3.2.1.4 CIs

You can view the discovered device resources of all discovery tasks and batch process CIs and import them into CMDB.

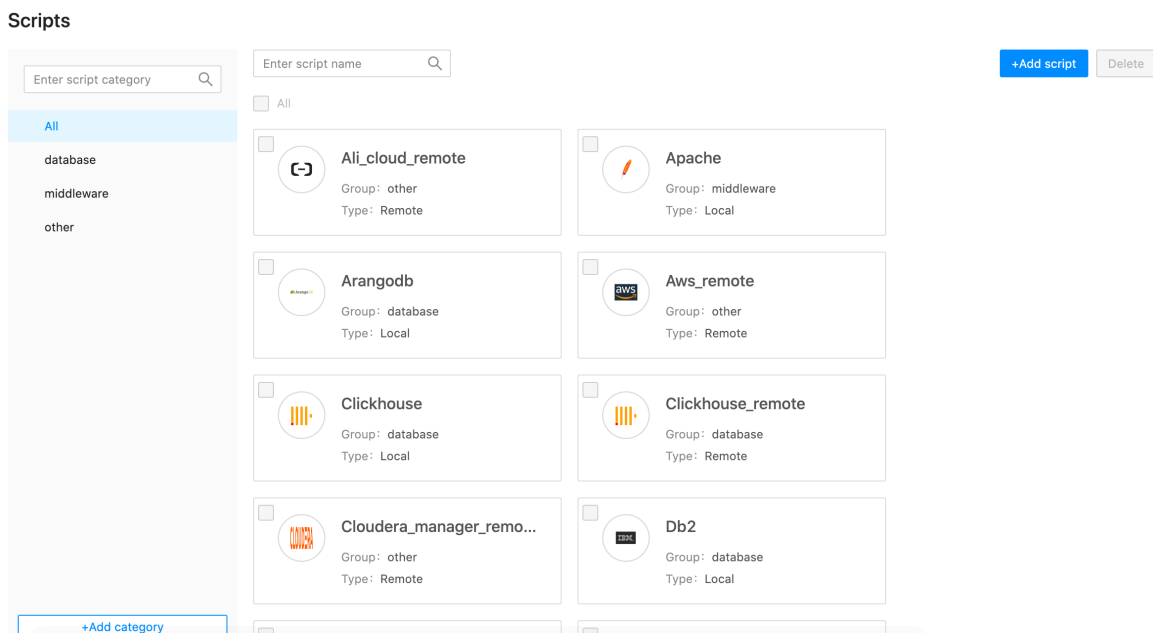
3.2.2 Deep discovery

By performing deep discovery and collection tasks on remotely discovered devices, the attribute-related information of the device is collected. The collected attribute information can be auto imported into CMDB and stored in the database. The scope of collected attributes includes several network devices, middleware, and servers. The service level supports dozens of collection templates such as various middleware, databases, Alibaba Cloud, AWS, Tencent Cloud, Huawei Cloud, private clouds, and VM virtual machines.



3.2.3 Scripts

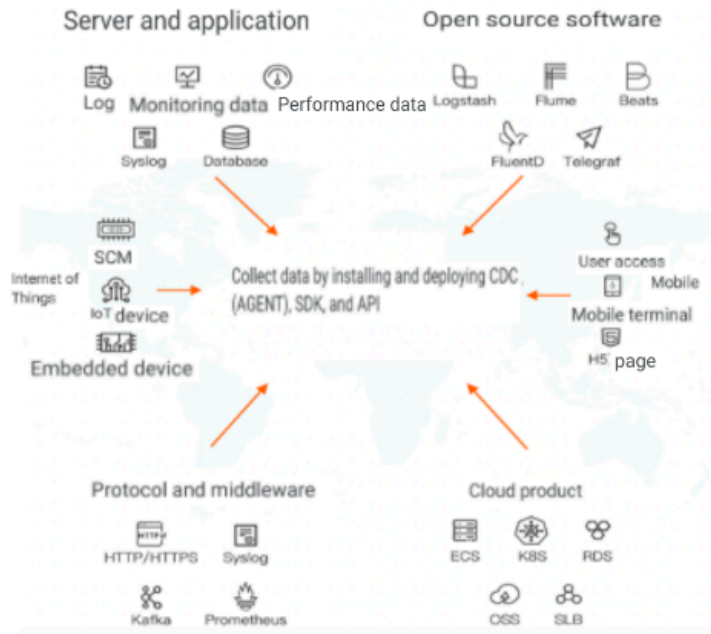
Rich built-in scripts for deep discovery of attribute collection and metric collection.



3.3 Integrations

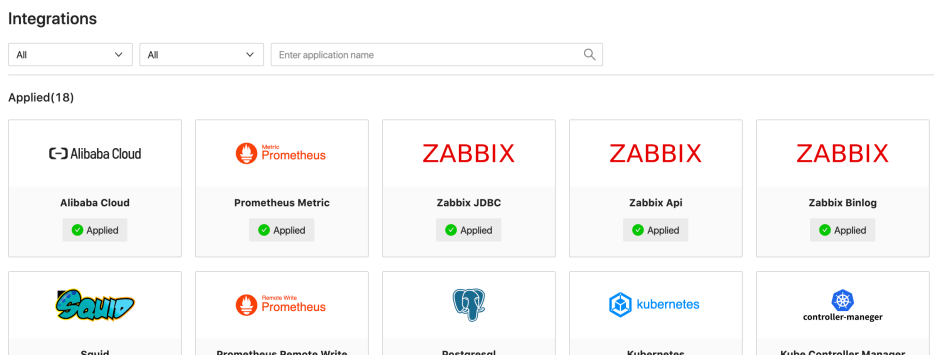
3.3.1 Data collection

On the server side , collection commands are sent to the target node device by installing and deploying CDC or providing API. After analysis, conversion and other edge computing processing on the collection end, the preprocessed data is finally sent to Kafka for consumption by the upstream system.



3.3.2 Integrated templates and customized collection templates

- The template library has hundreds of out-of-the-box collection templates (and is constantly being expanded).
- Templates mainly include standard middleware, APM, Synthetic Monitoring, prometheus, Zabbix, public cloud, and private cloud. You can preview templates and create collection and monitoring tasks directly by applying the template.



3.3.3 Manage collection tasks

- Create collection tasks

- By integrated templates
- By 30+ customized collection methods to collect logs

- Manage tasks

You can enable/disable/modify/delete tasks

- Status

Monitor tasks and show anomaly status

The screenshot shows a web interface for managing tasks. At the top, there are tabs for 'Tasks' and 'Task operation logs', and buttons for 'Integration task' and 'Custom task'. Below the tabs is a search bar with the text 'Enter task name' and a search icon. To the right of the search bar, it says '0 selected' and there are buttons for 'Edit', 'Open', 'Pause', 'Delete', and 'Reset'. The main part of the interface is a table with the following columns: 'Task name', 'Host IP', 'Monitored component', 'Type', and 'Actions'. There are three rows of tasks listed:

Task name	Host IP	Monitored component	Type	Actions
Enabled syslog	10.35.162.75	Log in the Syslog form	Custom	0天 View Clone Edit
Enabled nginx_access_log	10.35.162.75	nginx	Log	30: View Clone Edit
Disable nginx_error_log	10.35.162.75	nginx	Log	30: View Clone Edit

At the bottom of the table, there is a pagination control showing 'Total: 3', '10/page', and navigation arrows.

- Monitor task operations and status

Record information related to task operations and execution.

Tasks

Task operation logs Integration task Custom task

Enter task name or host IP address Advanced

Operation type	Task name	Monitored component	Host IP	User	Operation time	Execution result	Details
Start collection task	syslog	Log in the Syslog form	10.35.162.75	Admin	2023-03-13 19:45:21	Done	start collector success
Start collection task	syslog	Log in the Syslog form	10.35.162.75	Admin	2023-03-13 19:43:08	Failed	task exec error agent[cdc_b63b
Start collection task	nginx_access_log	nginx	10.35.162.75	Admin	2023-01-16 18:24:10	Done	start collector success
Stop collection task	nginx_error_log	nginx	10.35.162.75	Admin	2023-01-16 18:23:58	Done	stop collector success
Start collection task	nginx_error_log	nginx	10.35.162.75	Admin	2023-01-16 18:22:03	Done	start collector success

3.4 Agents

3.4.1 Versions

Manage and control all Agents and extension versions deployed on Collect & Control Center, including batch uploading and parsing installation packages, viewing extension details, etc.

Versions

Enter agent Import

<input type="checkbox"/>	Agent name	Architecture	OS	Category	Imported	Actions
<input type="checkbox"/>	Cje_V2.2.0	x86	Linux	Collection	2023-10-20 22:19:07	Details Delete
<input type="checkbox"/>	Cdc_V4.2.0	x86	Linux	Collection	2023-10-20 22:06:45	Details Delete
<input type="checkbox"/>	Cdc_V4.2.0	arm	Linux	Collection	2023-10-20 22:06:30	Details Delete
<input type="checkbox"/>	Omni_V2.2.0	x86&arm	Linux	管控类	2023-10-20 22:04:53	Details Delete
<input type="checkbox"/>	Cjeproxy_V2.2.0	x86	Linux	Collection	2023-10-16 16:53:39	Details Delete
<input type="checkbox"/>	Cdc_V4.1.0	x86	Linux	Collection	2023-10-16 16:31:53	Details Delete
<input type="checkbox"/>	Cdc_V4.1.0	arm	Linux	Collection	2023-10-16 16:28:46	Details Delete
<input type="checkbox"/>	Omni_V2.1.0	x86&arm	Linux	管控类	2023-10-16 15:56:52	Details Delete

3.5 Settings

3.5.1 Circuit breaking

Provide a system-level protection mechanism. When the monitored CPU, memory, disk and network usage exceeds the set threshold, the circuit breaker mechanism is automatically triggered to protect the host and prevent the host system from being paralyzed due to continuous consumption of resources and affecting the business.

<input type="checkbox"/>	Agent version	System	Nodes	CPU usage	Actions
<input type="checkbox"/>	CJE_Linux_Default	Linux	0		Edit Send
<input type="checkbox"/>	CJE_Windows_Default	Windows	0		Edit Send
<input type="checkbox"/>	CDC_Linux_Default	Linux	2	20%	Edit Send

3.5.2 Configurations

After the Agent is installed and deployed, CIs of the configuration file need to be batch edited and modified based on specific usage conditions, and then sent to the target host. The sending of configuration files supports hot loading, and it does not affect the normal use of users.

Configurations

<input type="checkbox"/>	Configuration rule	Host tag	Hosts	Edited at	Actions
<input type="checkbox"/>	CJE_V2.2.0_Default	CJE_V2.2.0	0	2023-10-20 22:19:07	Details Send
<input type="checkbox"/>	CDC_V4.2.0_Default	CDC_V4.2.0	2	2023-10-20 22:06:45	Details Send
<input type="checkbox"/>	CJE_V3.0.2_Default	CJE_V3.0.2	0	2023-10-20 22:06:07	Details Send
<input type="checkbox"/>	OmniAgent_V2.2.0_Default	OmniAgent_V2.2.0	1	2023-10-20 22:04:53	Details Send
<input type="checkbox"/>	CJEPROXY_V2.2.0_Default	CJEPROXY_V2.2.0	0	2023-10-16 16:53:39	Details Send
<input type="checkbox"/>	CDC_V4.1.0_Default	CDC_V4.1.0	0	2023-10-16 16:31:53	Details Send
<input type="checkbox"/>	OmniAgent_V2.1.0_Default	OmniAgent_V2.1.0	1	2023-10-16 15:56:52	Details Send
<input type="checkbox"/>	CJE_PROXY_V2.0.1_Default	CJE_PROXY_V2.0.1	0	2023-07-20 15:25:04	Details Send
<input type="checkbox"/>	CJE_V2.0.1_Default	CJE_V2.0.1	0	2023-07-20 15:23:15	Details Send
<input type="checkbox"/>	CJE_PROXY_V2.2.0_Default	CJE_PROXY_V2.2.0	0	2023-07-20 15:18:43	Details Send

Total: 18 10/page < 1 2 > Go to Page

3.5.3 High-risk commands

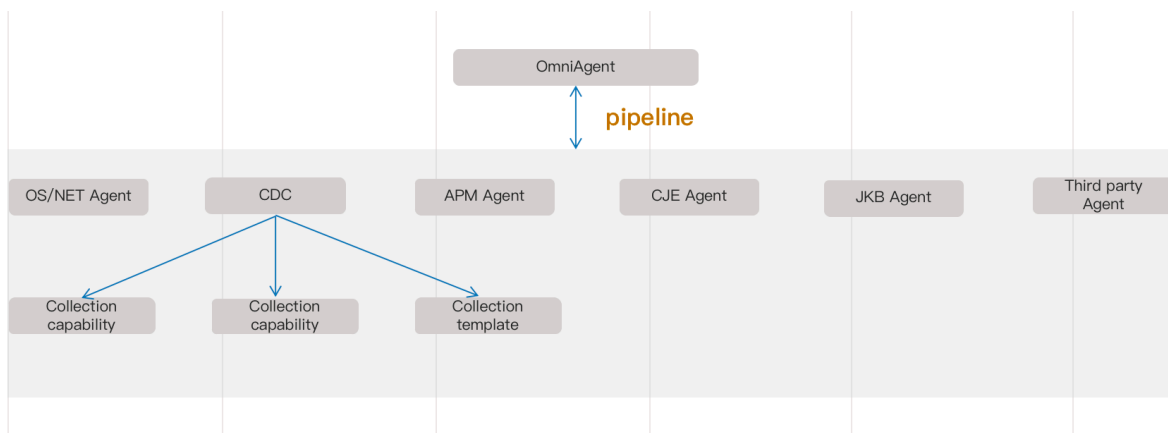
Provide 2 types of high-risk command detection. It has 27 high-risk commands, which supports users to customize high-risk commands based on the business, and flexibly and comprehensively protects the safe operation of the host and the business on the host.

Name	Command	Type	Description	Mode	Modified by	Updated at	Actions
[REDACTED]	(^[^\$]+?[\n]+?["']...)	Built-in	-	Note	Admin	2022-11-04 18:3...	Edit Delete
[REDACTED]	(^[^\$]+?[\n]+?["']...)	Built-in	-	Note	Admin	2022-11-04 18:3...	Edit Delete
[REDACTED]	(^[^\$]+?[\n]+?["']...)	Built-in	-	Note	Admin	2022-11-04 18:3...	Edit Delete
[REDACTED]	(^[^\$]+?[\n]+?["']...)	Built-in	-	Note	Admin	2022-11-04 18:3...	Edit Delete
[REDACTED]	(^[^\$]+?[\n]+?["']...)	Built-in	-	Note	Admin	2022-11-04 18:3...	Edit Delete

4 Typical scenarios

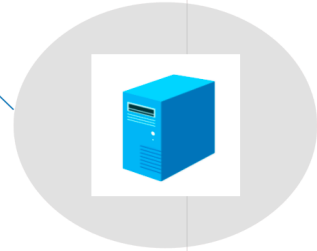
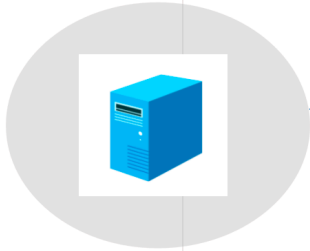
4.1 Unified data collection

Collect & Control Center supports unified collection of data such as logs, middleware, application performance data, IT device, etc. through Omni Agent and various expansion modules.



4.2 Auto installation and deployment

Provide one-click and auto script installation program. You can complete the entire Agent installation and deployment process only through page configuration.



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4.3 Intelligent control scheduling

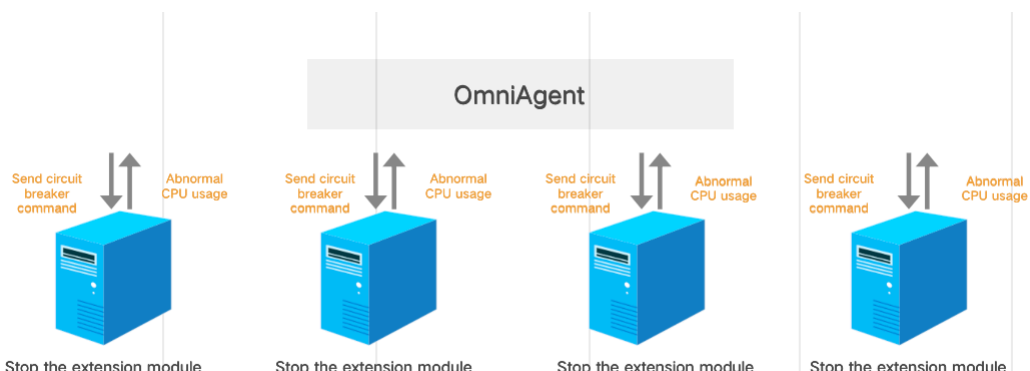
Provide unified management and control. Omni Agent serves as the "brain" and "center" to centrally manage and control all expansion and collection tasks.

Omni Agent collects the status of each agent and extension, and uniformly feeds it back to the management console of Collect & Control Center, making it convenient for operations personnel to issue operations commands on the console side.



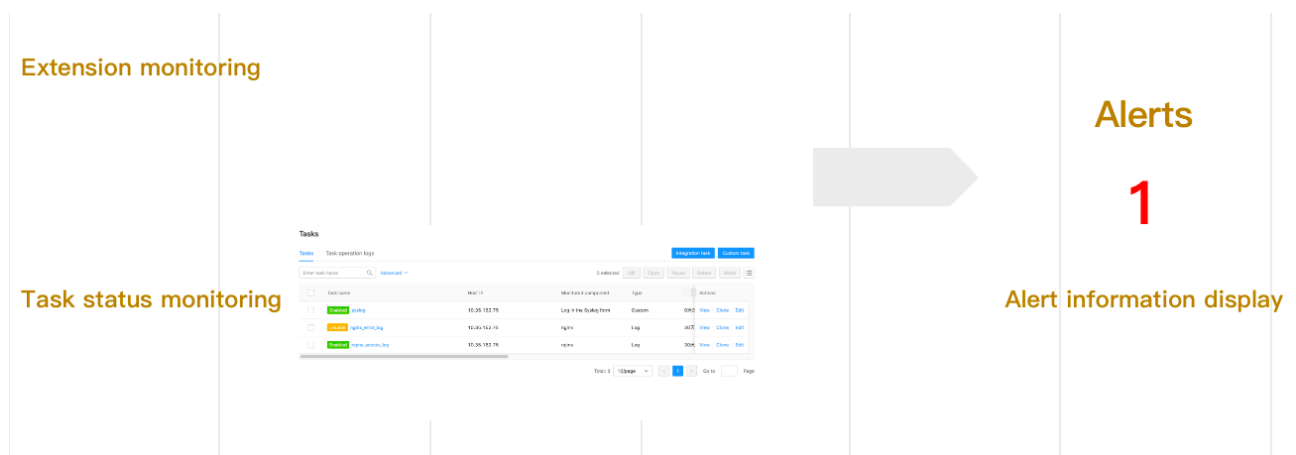
4.4 Circuit breaking

Provides a circuit breaker protection mechanism against excessive consumption of agent resources. When it is detected that the resource consumption used by the host or extension exceeds the set threshold, the circuit breaker mechanism is actively triggered to stop the operation of the extension and related collection tasks to ensure the stability and safe operation of the business.



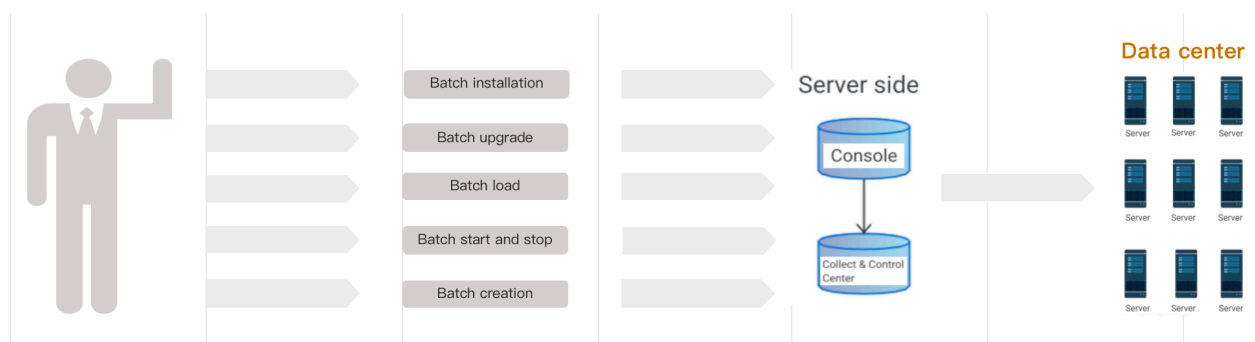
4.5 Monitoring and alert

Monitor the host status, Agent status and task status. When the alert rule is triggered, the operations personnel will be notified immediately to handle the exception.



4.6 Large-scale batch processing

For scenarios where large-scale data centers require batch processing, we provide operations such as installation, upgrade, uninstallation, starting and stopping of Agents, and distribution of collection tasks for a maximum of 1,000 concurrent hosts at a time.



5 Product features

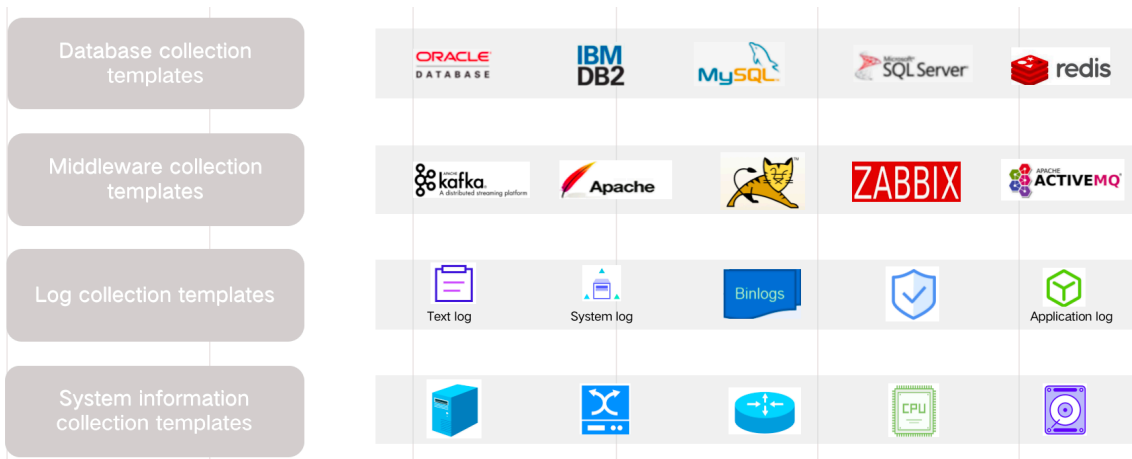
5.1 Rich ecology

The collection and monitoring of hundreds of data sources are supported. It is compatible with Linux, Windows, AIX, domestic Kirin OS, HYGON, and other operating systems of different types and platforms, as well as embedded devices, web pages, servers, programs, etc.



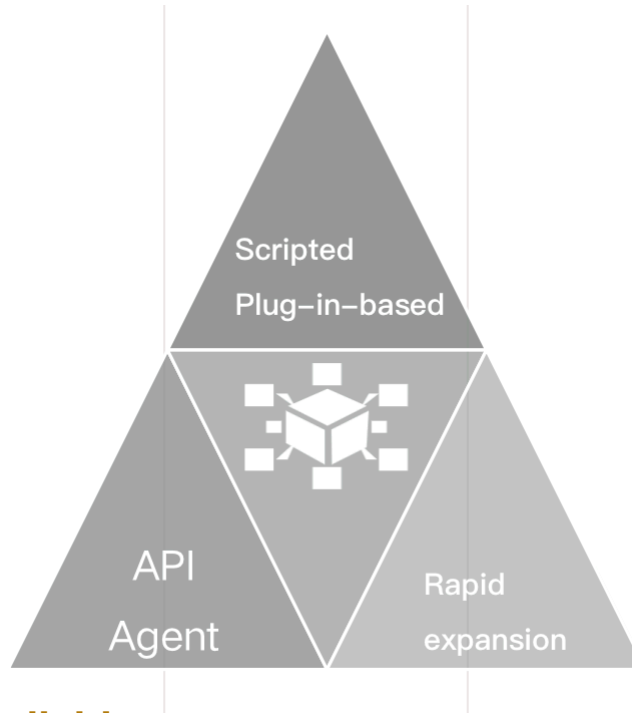
5.2 Out-of-the-box

Multiple access methods such as Agent and API are supported. It can realize a complete auto deployment and installation process in minutes. There is no need for complex code configuration, just simple operations on the page to complete the collection task configuration, which is simple and convenient.



5.3 Open and flexible




All functions can be implemented through API and Agent, making it easy to manage and configure services. The collection capabilities are scripted and plug-in-based, and can be quickly expanded based on your collection needs.



5.4 Stable and reliable

Enterprise-level security protection mechanism provides monitoring and alert, distributed scheduling, circuit breaker protection and other security measures to ensure the stable operation of the business. Under high load conditions, high throughput and stable operation are maintained for 24 hours, and collection tasks are not interrupted.

5.5 High performance

 <p>Strong real-time performance</p> <ul style="list-style-type: none">• No delay• Reach the server within 1s• 180 million/min• 540MB/s	 <p>High stability</p> <ul style="list-style-type: none">• Breakpoint resume• Auto load balancing, auto adjust the collection and sending rate based on business conditions	 <p>Edge computing</p> <ul style="list-style-type: none">• The collection end completes data cleaning, analysis, and conversion.• Distribute computing pressure to the node side to ensure server side performance
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5.6 Low cost

There is no need to build it from scratch based on an open source framework. It is compatible with mainstream commercial and open source software, eliminating high self-construction and docking costs. The flexible deployment and payment models supports SaaS and privatized deployment and various billing models such as traffic and license.

<p>SaaS</p> <ul style="list-style-type: none">• Pay-as-you-go, only pay for what you actually use• TCO reduced by more than 50%	<p>Private deployment</p> <ul style="list-style-type: none">• One-stop layout for engineers on site• Support services based on license
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6 Product value

<p>When the Agent or the collection task is anomalous, an alert notification will be sent as soon as possible.</p>	 <p>Large-scale batch installation and deployment to improve operations deployment efficiency</p>	<p>The complete circuit breaker protection mechanism prevents the server failure due to Agent anomaly and affecting the business.</p>
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