Shanghai KAIYUN Software Service Co., Ltd.

With IBM Spectrum LSF，KAIYUN can significantly increase computing power for the chip industry and predict the future.

Overview

Requirement

Our domestic chip industry has much to do and a long way to go. Yet great disparity in technology and industrialization still exists when compared with developed countries though China has produced domestic chips and operating systems. In the chip design and manufacturing phases, the "computing" and "management" of enterprise-level EDA platform needs a core scheduling system to support.

Solution

Keeping with current conditions of domestic chip industry, Shanghai KAIYUN Software Service Co., Ltd., a partner of IBM, leverages its more than 10 years of experience in the chip industry and has created EDA hybrid cloud platform ("CClab HPC"). It provides a solution for workload scheduling and cross-platform management that is appropriate for domestic EDA ecosystem.

Strengths

The platform is highly compatible with Chinese users' operating habits, allowing for more accurate assessment of future expansion and gaining a significant increase in computing utilization rate. According to user research, the increase ranges from 5% to 15%.

As an important part of the global consumer chip market, the Chinese chip market has grown rapidly in recent years. According to the National Bureau of Statistics, China's IC production exceeded 200 billion in 2019, reaching 201.82 billion, accounting for 16.02% of year-on-year growth. As of September 2020, China's IC cumulative production reached 182.18 billion, accounting for 14.7% of year-on-year growth. Yet a great gap in technology and industrialization still exists in China when compared with developed countries, though China has produced domestic chips and operating systems.

Shanghai KAIYUN Software Service Co., Ltd., a partner of IBM, leverages its more than 10 years of experience in the chip industry and has created EDA hybrid cloud platform which is appropriate for domestic EDA ecosystem, contributing to China's chip manufacturing industry.

Shanghai KAIYUN Software Service Co., Ltd. is an entrepreneurial IT technology service company. It focuses on enterprise-level ITinfrastructure and other cutting-edge technologies, providingITinfrastructure technology service for medical, education, finance, scientific research, large manufacturing, industrial park, large enterprises and groups and marketing related products. Our team has years of experience in HPC, EDA, public cloud, private cloud, AI, big data, server virtualization, desktop virtualization, data storage, system redundancy, network, security level protection, large-scale server clusters, enterprise and institution data center construction and other related technical fields, and can provide professional technical services. The company also offers IT infrastructure software custom development services.

Challenges in leading computing industry

Electronic Design Automation (EDA) platform is an application scenario of high performance computing (HPC) technology in integrated circuit (IC) field. Both the simulation in the chip design phase and the industrial standard in the manufacturing phase (Object Linking and Embedding for Process Control, OPC) require a large amount of "computing power" to support. The large scale "computing" resources also bring about different levels of management requirements.

Solution Components

IBM Spectrum LSF

- Key to maximizing computing power in EDA platform is "scheduling system"

The EDA platform in the company is designed for multi BU and multi-user scenarios. At the same time, the EDA platform contains a large number of tools and software in various versions and modes, including graphical interactive mode and batch computing mode. A core scheduling system is required to meet the computing needs of jobs with different types of computing and interaction scenarios, and support fast, optimal and automatic allocation of computing resources for each job.

- Difficulty in managing EDA platform is its complexity

EDA platform is an application scenario of high performance computing (HPC) technology in IC field, featuring a large scale, multiple software layers and large number of users. An OPC platform with 14 nanometer technology can easily reach the scale of thousands of servers. A platform of this size contains software of various versions and types, data files of various types and dynamically changing network traffic. It is no small challenge to implement monitoring at all levels of the platform, data presentation and change management. For example, when OS version need be upgraded according to the needs of a software tool, a process must be followed including requesting work order, testing, pilot run, reporting, approval and execution, and process and system configuration must be correlated. Otherwise there may be a risk of large scale system failure.

"CClab HPC" with IBM Spectrum LSF scheduling system at its core is capable of solving industry challenges of "computing" and "management"

"CClab HPC" system is a system integration software developed by Shanghai KAIYUN Software Service Co., Ltd. The software is mainly applied to the construction, management, operation and maintenance of large computing centers. "CClab HPC" system selects IBM Spectrum LSF products as underlying core foundation for its leadership in scheduling system market, meeting the challenges of large-scale automated workload management and data reporting in EDA platform for chip industry customers. It empowers customers to assess future expansion more accurately and substantially increase utilization of computing power. According to user research, the increase ranges from 5% to 15%.

The underlying of software uses IBM Spectrum LSF basic module and license scheduling module. It can then provide such additional functions as job submission from Web console, operation query, NIS or OpenLdap account management, platform monitoring, data management, data backup, multi-cluster management, asset management, O&M work order management, O&M knowledge base, log query base, alarm panel, O&M CMDB library, hybrid cloud elastic scaling to meet Chinese users' usage habits.

"IBM Spectrum LSF ranks among the industry's top software and is the premier operation scheduling system for EDA tool. The software is outstanding in terms of functionality, performance, reliability and compatibility, and is the perfect choice to significantly improve the efficiency of users' operations"

- Qi Junhui: Co-founder & Strategic Development Officer, Shanghai KAIYUN Software Service Co., Ltd.
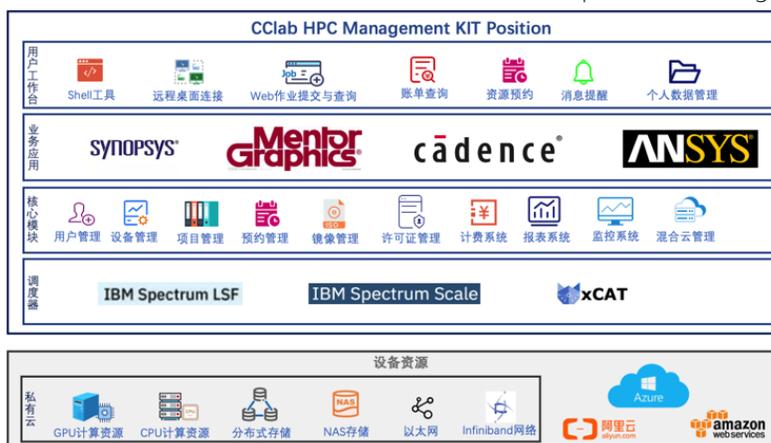

Figure 1 CClab HPC Management KIT Postition

Build top-notch scheduling integration software based on Chinese market

"CClab HPC" system software has the following main strengths:

I. Integrated with industry's top scheduling systems

CClab HPC system is embedded with industry's top commercial scheduling software: IBM Spectrum LSF, attaining industry's top level in terms of product stability, feature comprehensiveness and performance.

II. User Workbench with Visibility

It provide user workbench with visibility to reduce the complexity of using HPC system, and its operation interface is more in line with Chinese users' habits. For example, many IC design companies in China operate on project basis, and some on internal and external project basis. In such companies, project teams may request resources or make reservations before starting a project, and may also need additional approval operation. Another example is that Chinese users may need to use domestic public cloud (such as Alibaba Cloud, Tencent Cloud, Huawei Cloud, etc.) products, which has no native support from standard LSF, and domestic users usually also need to add application, approval and other process management functions, which all need to be customized to their needs.

III. Add open source software

In addition to IBM software, CClab HPC system is also embedded with some open source software such as xCAT and ganglia, further enriching the platform's functionality.

IV. Comprehensive functions

CClab HPC system provide a rich set of features for administrators, users, operators and leaders, including user workbench, administration workbench and operations support. Integration objects covers server room systems, IT equipment, HPC software, O&M services, etc..

V. Resilient cloud scaling

CClab HPC system can be docked to major public cloud platforms and support resilient scheduling of public cloud computing resources based on predefined policies to effectively meet temporary peak computing demand.

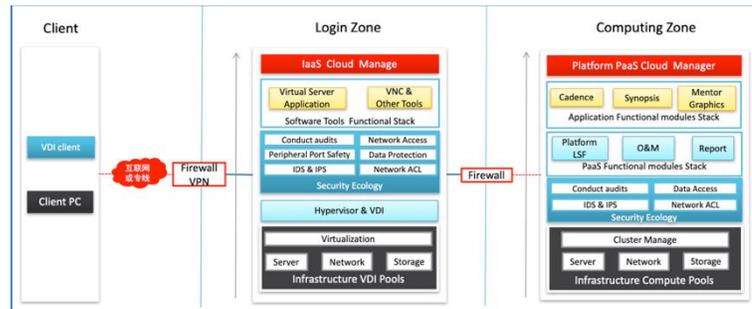The EDA platform from a chip design company can be used as an example to illustrate the details.

Figure 2 EDA Platform from a chip design company

The above figure shows the topology of EDA platform in a leading IC enterprise in China, which contains IaaS cloud platform in the login area and PaaS cloud platform in the computing area. IaaS platform uses web integrated Citrix VDI technology solution; PaaS platform uses embedded IBM Spectrum LSF as the underlying resource scheduling system to achieve advanced features such as resource reservation and licensed resource monitoring reports.

Learn more

For more information about how IBM Spectrum LSF products can help, please contact your IBM representative or IBM business partner, or visit the following Web site: ibm.com/us-en/marketplace/hpc-workload-management

Why choose IBM Spectrum LSF?

The IBM Spectrum LSF™ platform software family is a powerful workload management platform. It can be applied in demanding, distributed, and mission-critical high-performance computing environments. The main role is to carry out unified scheduling and management of hardware computing resources to maximize the utilization of hardware and software resources and efficiently solve core problems faced by all high-performance computing systems!

Call **400-810-1818 to 5133** now to schedule an appointment with IBM Spectrum LSF experts! For more information, please visit ibm.com/us-en/products/software

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