# Research Report

# IT Converged Infrastructure Trends in China Market

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# Contents

# Introduction

While improving the efficiency and reducing TCO of IT, virtualization also greatly improves management level of IT infrastructure. Since organizations will operate consistently in a highly mixed environment of physical, virtual, and cloud computing resources in the evolution of data center，so how to quickly deploy applications and, guarantee the stability and security of the application performance in this mixed environment, has posed significant challenges to traditional IT infrastructure.

To improve the efficiency of IT which creates values, more and more users have chosen converged infrastructure over the past few years, accelerating IT response for business, and simplifying management, so as to ensure the dynamic configuration of workload resources in the evolution of data center, and real-time monitoring and management efficiency of the application performance. According to the survey of Chinese 683 end-users regarding The Virtualization Market Trend Report completed by Sino-Bridges Research and Consulting in March 2013, in order to reduce the complexity of virtualization deployment and management, and accelerate the virtualization deployment process, more and more China users have realized the importance of server and storage integration or convergence of IT infrastructure.

Converged infrastructure, through highly integrated or reference infrastructure of computing, network, storage, and management, decreases the complexity of deployment management of IT infrastructure. Well accepted converged infrastructure in the market includes highly integrated converged infrastructure (highly integrated servers, storage, network, and management nodes, pre-loaded with commissioning) and reference infrastructure (components of the infrastructure come from the same vendor or different strategic cooperation vendors). Traditional IT infrastructure takes application as the core, but virtualization and cloud computing are not considered as important factors in the development of IT. Relatively, converged infrastructure emphasizes improving dynamic resource allocation and distribution in the process the evolution of enterprise data centers, application deployment in a mixed environment, and management and control efficiency of business cycles, protecting the user's long-term return on investment in the process of the evolution of the data center. In addition, converged infrastructure guarantees the stability and security operations of the virtual application, efficient troubleshooting, and dynamic configuration of resources according to SLA to ensure business continuity, to realize operations management with workload performance at the core, and to ensure flexibility, high reliability, and high continuity. Meanwhile, management infrastructure with application workload as the core is not only beneficial to the improvement of virtualization, but also the foundation of cloud computing IT service delivery.

### Survey Methods

Online Q&A: With Sino-Bridges' database of 20,000 end-users, an online survey of 50 questions about the virtualization market and technology trends was conducted through Sino-Bridges' online survey platform.

### Analysis Methods

### Survey Questions

- Market drivers and deployment trends of (converged infrastructure)
- Values of converged infrastructure to enterprises
- How do enterprises consider converged infrastructure
- Three important factors in assessment of converged infrastructure
- Barriers of deployment of converged infrastructure

- Minicomputers correlation with converged infrastructure

**Partition by Enterprise Sizes**

- Large enterprises: Over 5,000 employees
- Enterprises: 1,000-5,000 employees
- Medium organizations: 500-1,000 employees
- SMEs: Fewer than 500 employees
- Small businesses: Fewer than 100 employees

## Executive Summary

In the past 20 years, the average amount of data from Chinese enterprises has risen from GBs to TBs, and a large number of enterprise customers will have PBs data in the near future. For Chinese enterprise users, IT efficiency determines the core business competence in the global market. And with the growth in the amount of data and rapid increase in business value thanks to data, as well as the evolution of the data center from physical to virtual modes, and cloud, traditional IT infrastructure deployment and management are becoming gradually unable to meet the needs of business response and dynamic allocation of resources. The survey results by Sino-Bridges also show that traditional IT infrastructure is becoming a huge obstacle for Chinese users in rapidly improving IT efficiency through virtualization and cloud computing. Determining how to simplify infrastructure deployment and management to achieve decoupling between application and infrastructure is the key within the evolution process of data centers in order to optimize IT infrastructure investment return.

What impact has the data center evolution brought to traditional data centers and what kind of changes will take place in the data center infrastructure of enterprises? What are the market trends of China's data centers and the benefits to the users? What is the driving force of China’s market to the IT infrastructure? How should enterprises choose it? Sino-Bridges Research and Consulting Ltd. (hereafter referred to as Sino-Bridges) launched a survey of the markets of IT converged infrastructure and technology trends in June 2013 among 480 Chinese end-users (568 people participated in the survey) who are IT managers and professionals from enterprises (with more than 1,000 employees) and SMEs (with less than 1,000 employees).

## Survey Conclusions

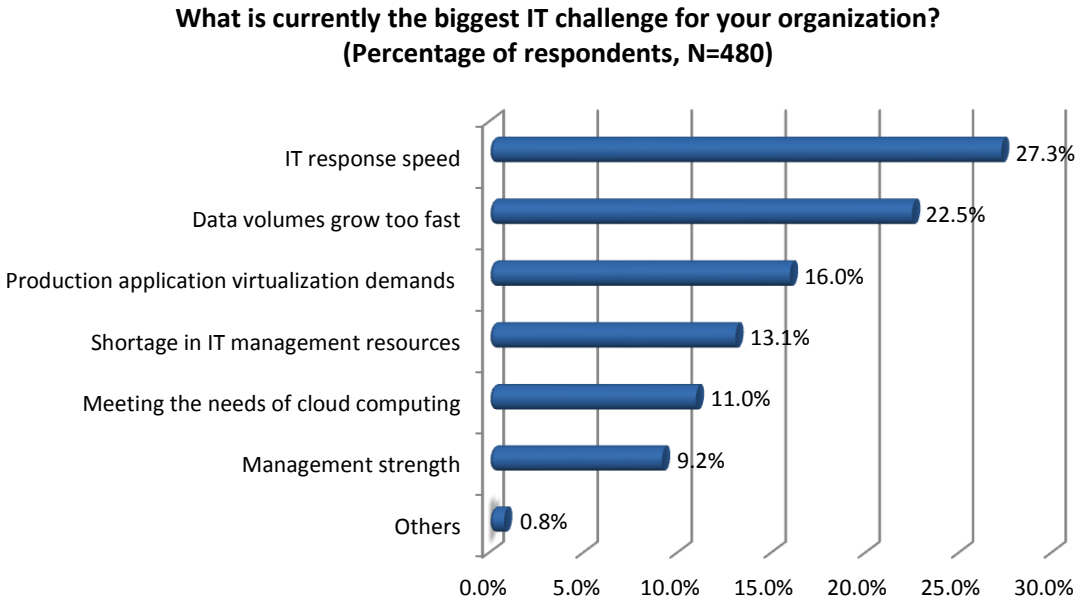
In total, 480 people participated in the survey. The research conclusions are as follows:

**IT Response Speed to Business Drives Converged infrastructure**

The survey results of the biggest IT challenge for users was shown in Figure 1. “IT response speed for business” (27.3%) ranks first among all IT challenges, followed by “Data volumes grow too fast (22.5%)” and “Production application virtualization demands” (16.0%) respectively. With the growth of data volumes, and values, and diversification of applications, and the evolution of the data center, it brings huge challenges to traditional IT infrastructure management on how to rapidly deploy applications in the highly mixed IT environment, to meet the business demands of performance and reliability, which directly leads to the low IT response to business and problems of high management costs. Therefore, determining how to repeatedly, economically, and effectively deploy applications and to allow the safe, reliable, and stable

operation of workloads in the evolution process of the data center, drives the enterprise demand of converged infrastructure.

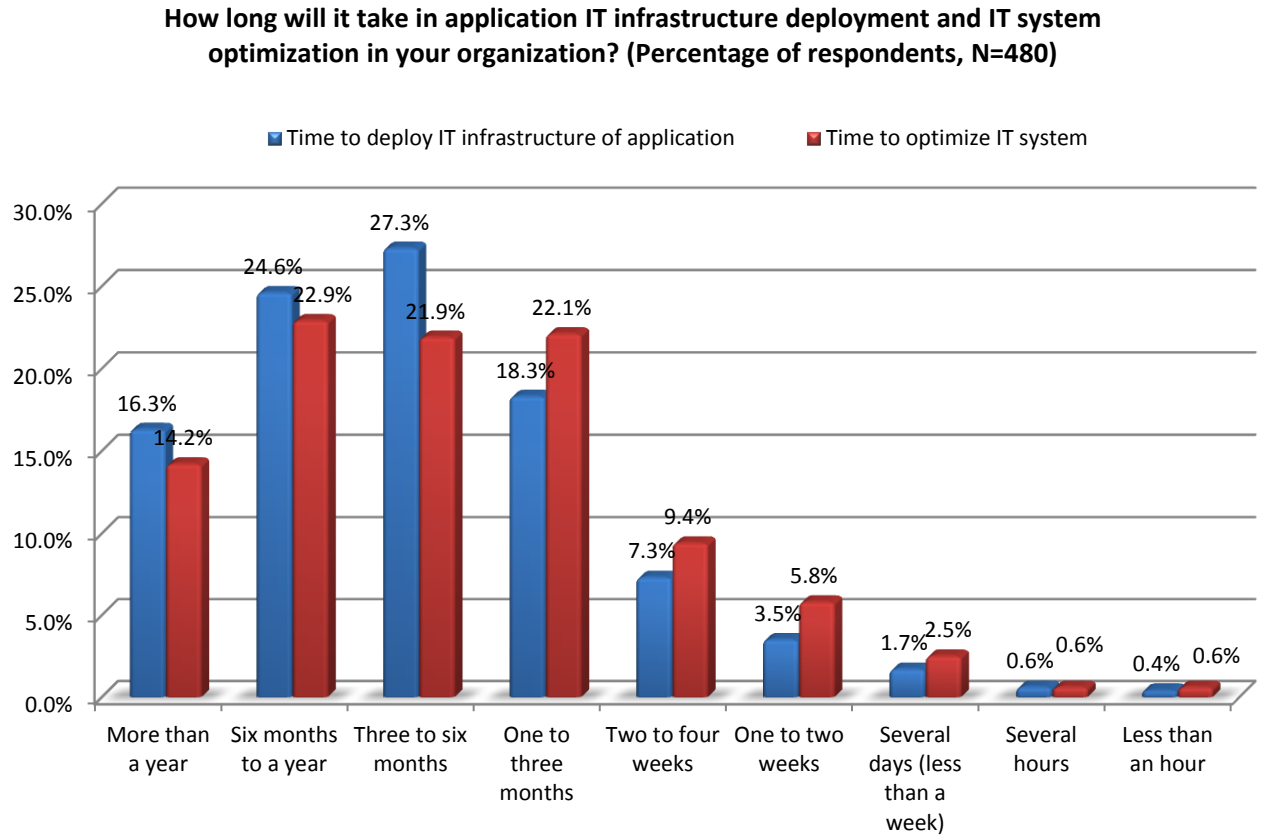
*Figure 1. The biggest challenges for Organizations*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

To further interpret which issue leads to the low IT response to business, Sino-Bridges has conducted a survey and conducted research on how long the new application deployment and resources optimization would take. The survey results are shown in (Figure2). 68.2% of respondents think the application deployment would take more than three months, and 59% believe IT resources optimization would take more than three months. It means that half of the users would take more than six months to complete the new application deployment and optimization with traditional IT infrastructure deployment and management. Among which, compared to SMEs, the deployment and optimization of enterprise users would take more (69.7% would need three months or more to deploy, 63.3% would need more than three months to optimize). The more time deployment of traditional application IT infrastructure costs, the lower resources utilization with application at its core will be, the more complex IT management will become and the more IT resources it will consume. Application deployment and system resources optimization are the key segments leading to the low IT response; meanwhile, the lengthy troubleshooting cycle of traditional IT infrastructure brings some hidden trouble for business stability and continuity.

*Figure 2. Time for New Application Deployment and Tuning*

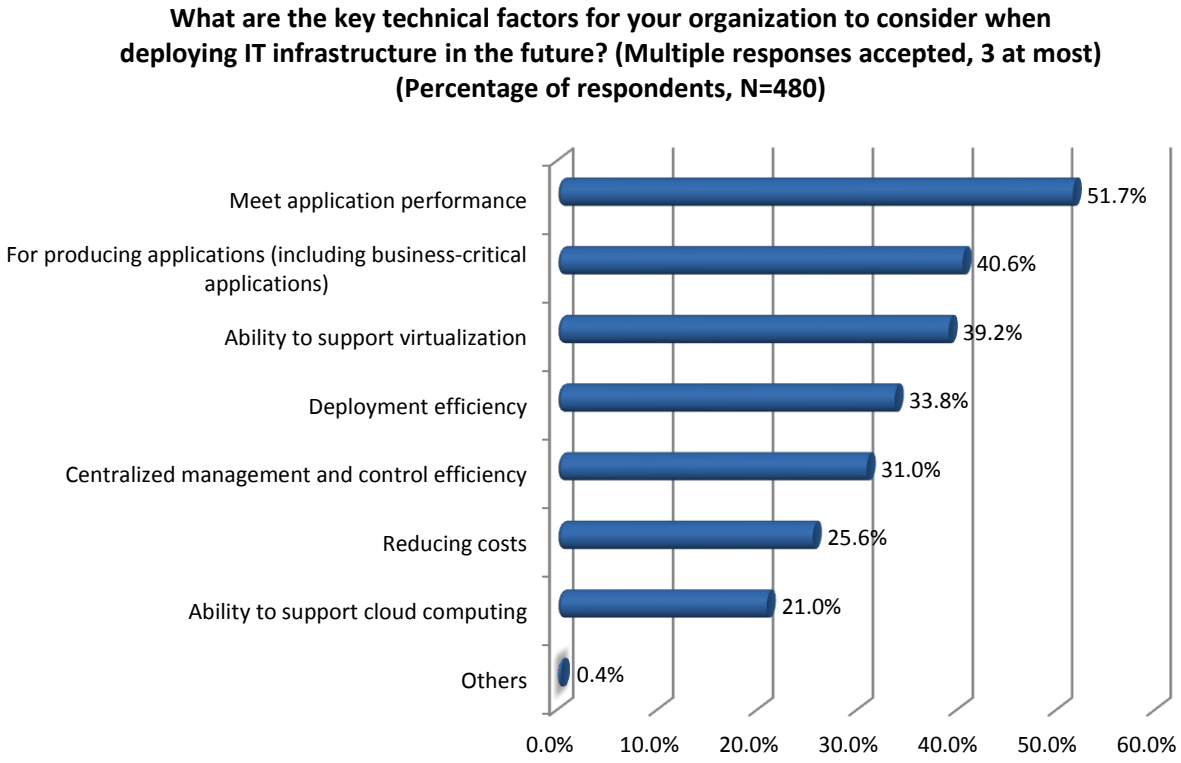



*Source: Sino-Bridges' Survey and Research Report, June 2013*

With the development of organization, more and more applications of different types need to be online under traditional IT infrastructure. The deployment and optimization not only takes a long time, but it's also very complicated to integrate so many applications. It not only impedes the entire IT infrastructure management, but also makes it difficult to secure the performance of business-critical applications. In addition, traditional IT infrastructure also has several limitations in judging and removing virtualization environment failures, which severely affects the IT service delivery as a whole. Therefore, IT converged infrastructure is of great urgency.

So what are the important technical factors enterprises needed to consider if deployment is conducted again to the IT infrastructure of the data center? The survey (Figure 3 ) results by Sino-Bridges show that, 51.7% of respondents said that meeting application performance is the most important, 40.6% believe that production applications (including business-critical applications) are very important, and ranking third is ability to support virtualization. With the deployment and widespread use of virtualization in various types of enterprises, especially the deployment of virtualization in business-critical applications, it is becoming increasingly hard for traditional IT infrastructure to meet the demand of dynamic resources deployment of virtualization with workload at its core application and the demand of automatically centralized transparent management. Therefore, a key factor that enterprises need to consider when evaluating the future IT infrastructure is meeting application performance, including production application performance demands and the ability to support virtualization.

*Figure 3. Key Technical Factors for Organizations to Deploy IT Infrastructure*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

**The Concept and Deployment Trend of Converged Infrastructure**

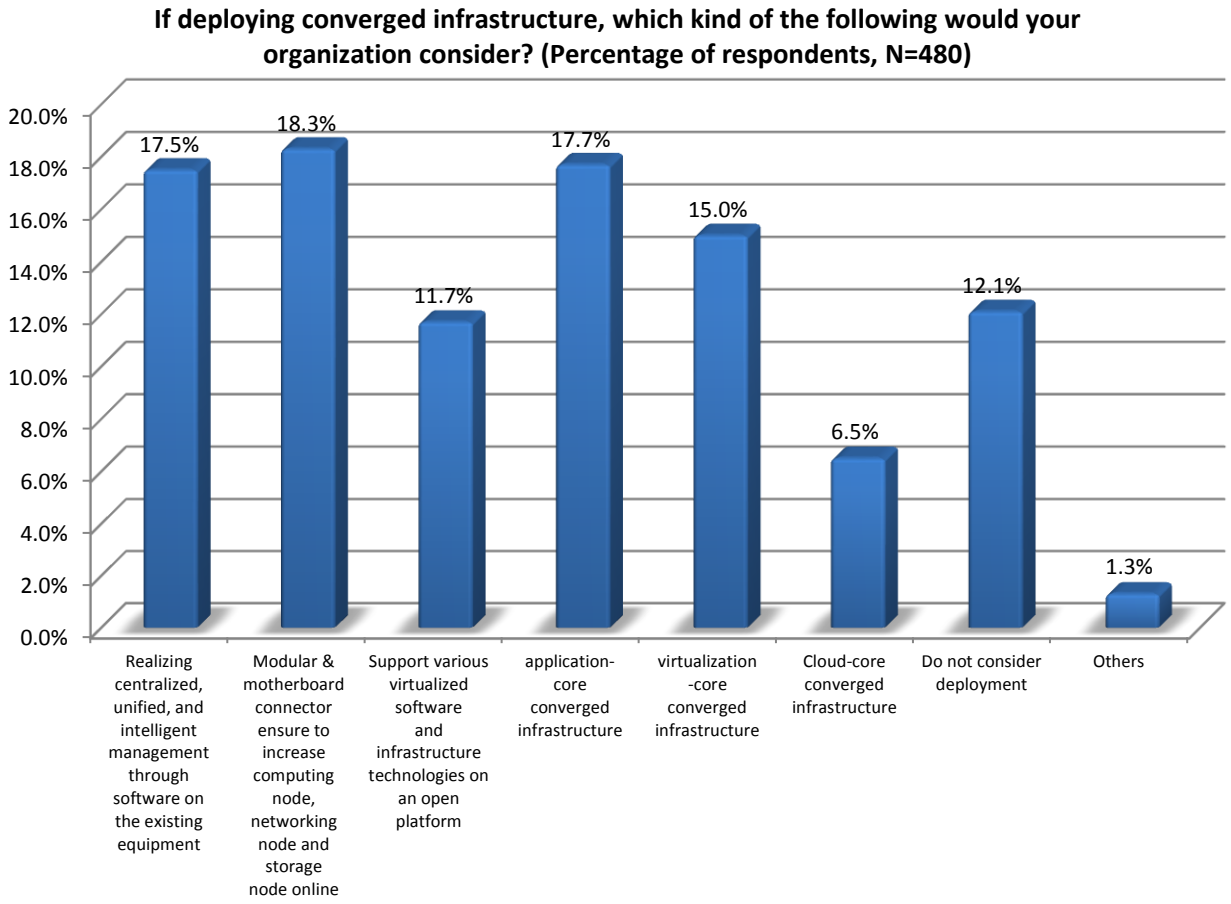
For traditional IT infrastructure, enterprise users purchase equipment in technical layers (service layer, storage layer, and networking layer), followed by integration and resources optimization. This is not only a lengthy application deployment cycle, but it's also difficult to meet the workload and performance demands for a highly dynamic environment.

Converged infrastructure is mainly presented in two ways: one is highly integrated converged infrastructure, which highly integrates computing nodes, networking nodes, and storage nodes, as well as management nodes. The primary feature of this infrastructure is minimizing the time it would take in the process of technical selection, integration, optimization, and management. The other is reference infrastructure. One or more strategic partners will introduce their verified solutions to the users through channels, usually with more flexible technical options.

The kind of converged infrastructure the enterprise chooses depends on the maturity of its information system, its existing IT resources, and main purposes for deploying converged infrastructure, as well as its available budget.

The survey results are shown in (Figure 4). 18.3% of respondents would consider deploying modular and motherboard connections to guarantee online increases of computing, networking, and storage nodes; 17.5% of respondents consider achieving centralized, unified, and intelligent management through software on their existing equipment; and 11.7% of respondents think about supporting various virtualization software and heterogeneous technologies in an open way.

*Figure 4. Converged Infrastructure Deployment*

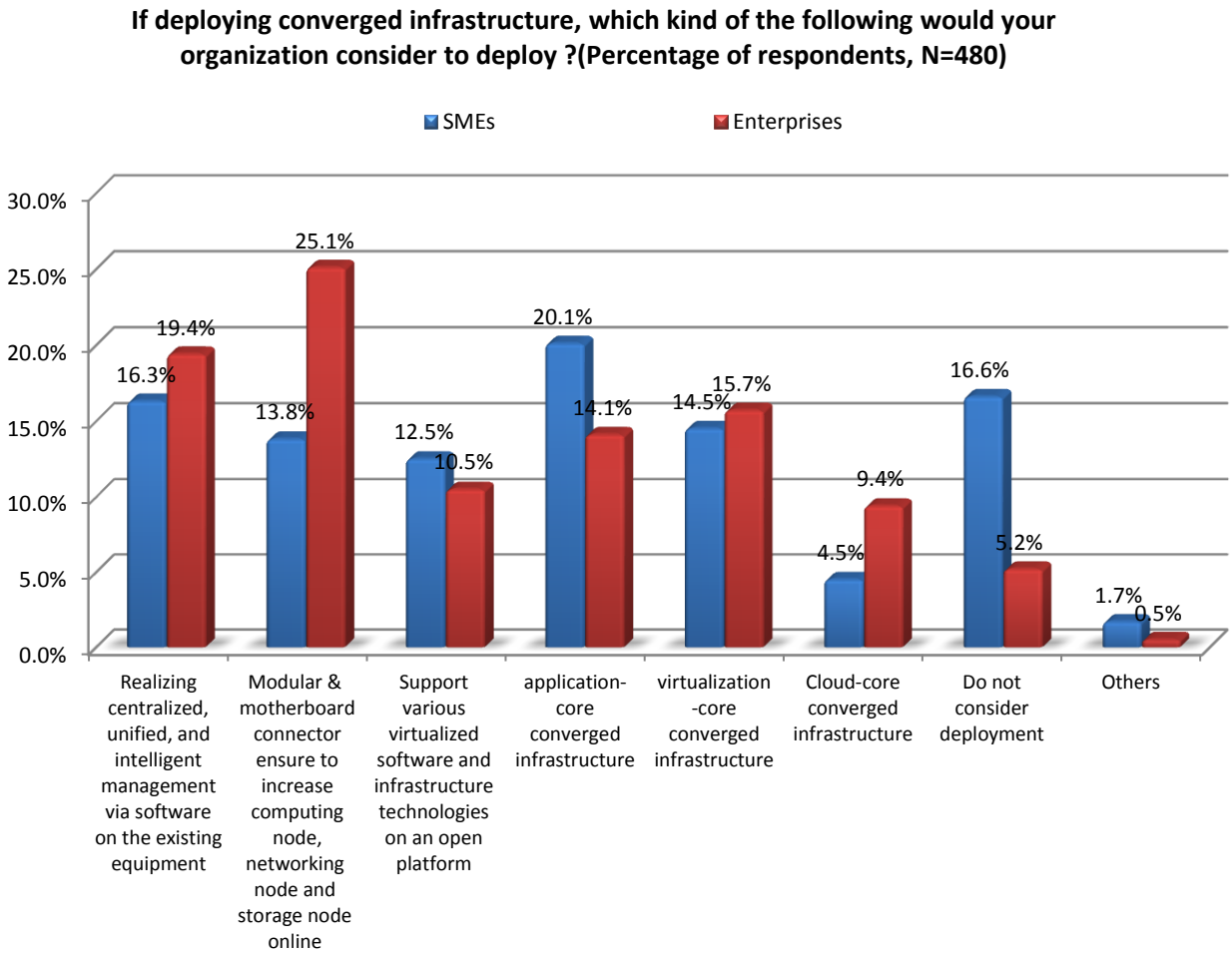



*Source: Sino-Bridges' Survey and Research Report, June 2013*

However, what is the core of converged infrastructure? ( See Figure 4) 17.7% of respondents chose to deploy converged infrastructure with business-critical applications as its core, in order to improve IT response for business, reduce the danger of business instability, and improve business continuity, as well as security of business-critical workloads; 15% chose the converged infrastructure with virtualization as its core, to simplify virtualization deployment and operation and to provide reliable infrastructure for enterprises' constantly increasing virtual machine density and production applications virtualization. Only 6.5% selected the converged infrastructure with cloud computing at its core. Almost half of the users in China mid-market consider building a cloud computing platform through open source or driving resources integration by software, which fully suggests that enterprises have currently been completely aware of the advantages virtualization can bring.

From company size angle (Figure 5), Enterprises prefer highly integrated converged infrastructure (all-in-one infrastructure), in order to maximize the efficiency of application deployment and integration. SMEs tend to reference infrastructure to reduce more added expenditure through usage of existing devices.

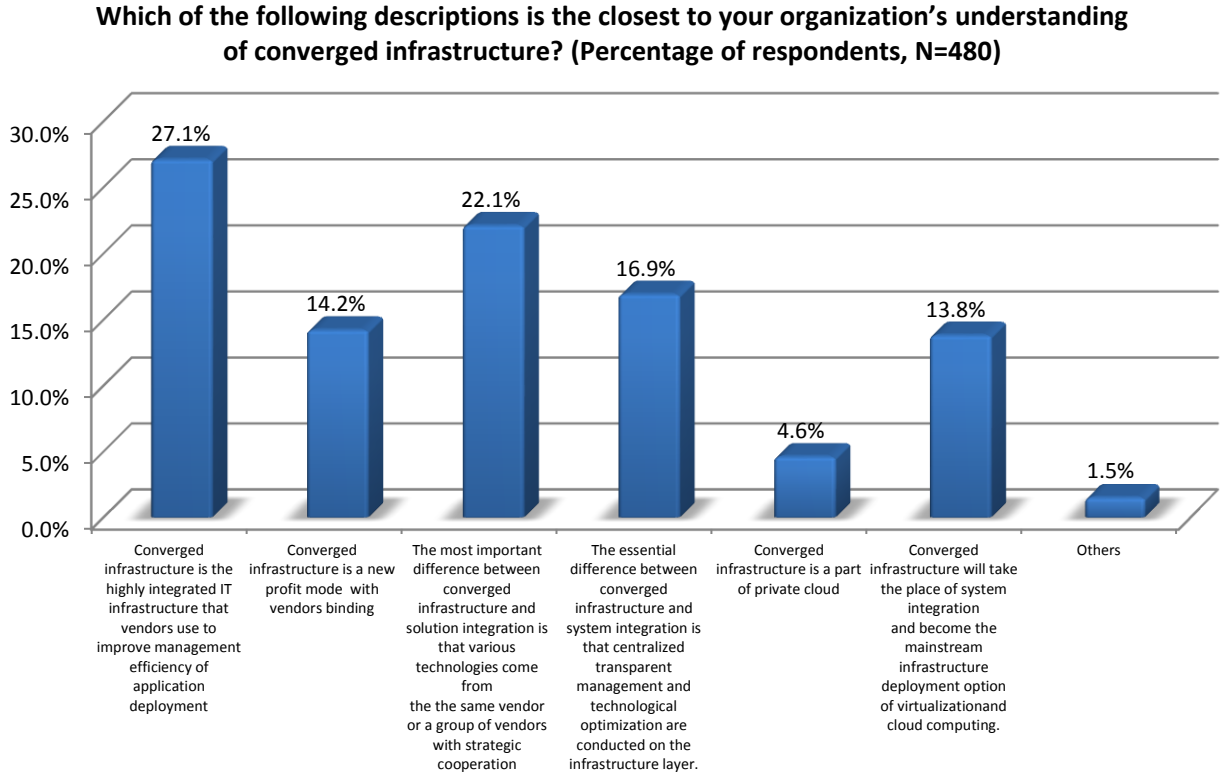
*Figure 5. Converged Infrastructure Deployment, by Organizations sizes*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

Converged infrastructure is the future deployment trend of IT infrastructure. So what is the value of converged infrastructure for enterprises? (Figure 6) 27.1% of respondents think converged infrastructure is the highly integrated IT infrastructure that vendors use to improve management efficiency of application deployment; 22.1% consider the most important difference between converged infrastructure and solution integration is that various technologies come from the same vendor or a group of vendors with strategic cooperation, so as to improve management efficiency of IT infrastructure deployment; among which, 16.9% think the essential difference between converged infrastructure and system integration is that centralized transparent management and technological optimization are conducted on the infrastructure layer. (Figure 7)

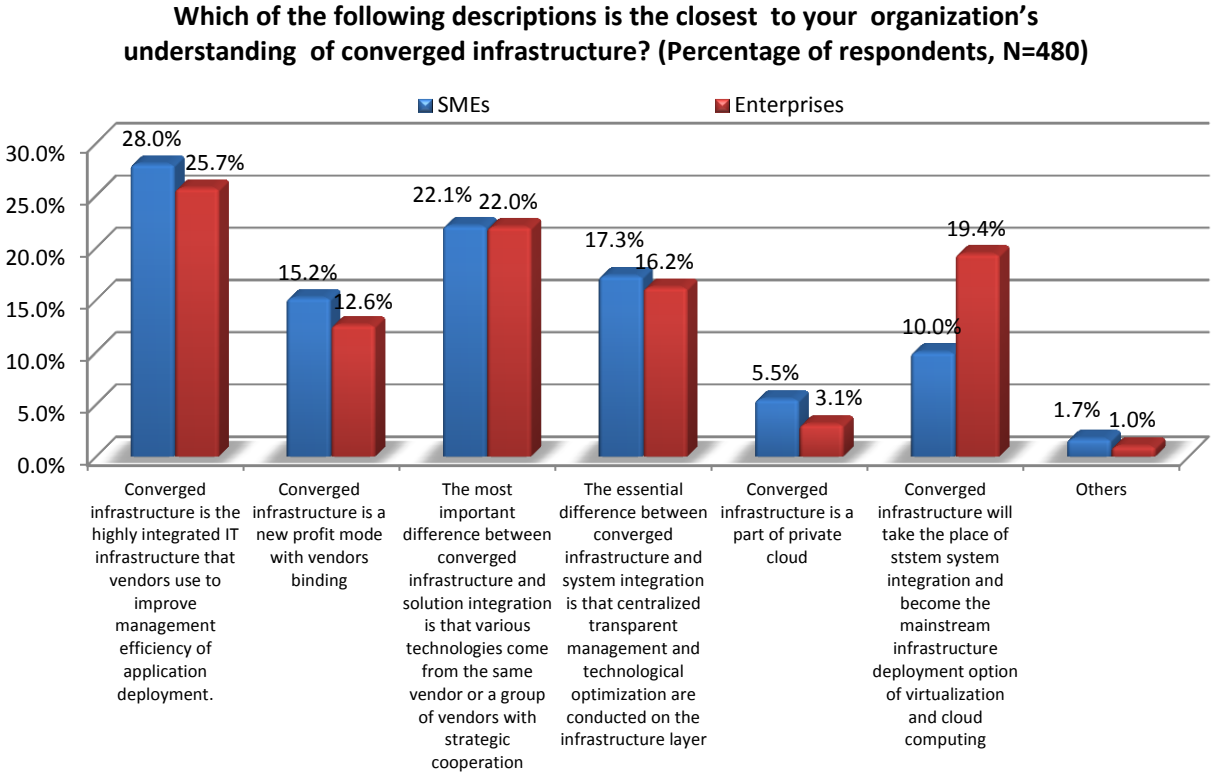
*Figure 6. The Concept of Converged Infrastructure for Organizations*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

SMEs agree with the above views, but there are a few differences among enterprise users. 19.4% of the enterprise users claim that converged infrastructure will take the place of system integration and become the mainstream infrastructure deployment option of virtualization and cloud computing.

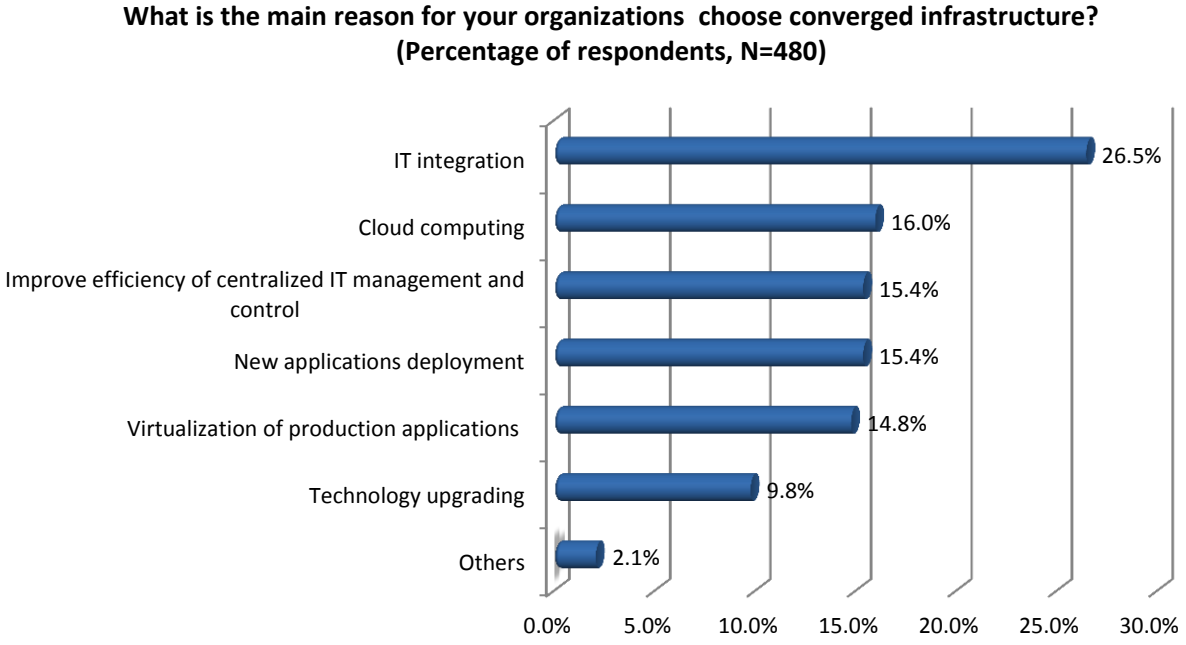
*Figure 7. The Concept of Converged Infrastructure for Organizations, by Organizations sizes*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

What drives enterprises to deploy converged infrastructure? The survey results show (Figure 8), 26.5% of respondents chose converged infrastructure mainly due to the consideration of IT integration, followed by cloud computing (16.0%), efficiency of centralized IT management and control, and new applications deployment (15.4%). It shows that with the development of virtualization and cloud computing of the enterprise data center, the value of IT converged infrastructure is becoming increasingly obvious in IT integration, cloud computing, improving the efficiency of centralized IT management and control, and new applications deployment, which happens to agree with the results of the survey on the driving forces of IT converged infrastructure.

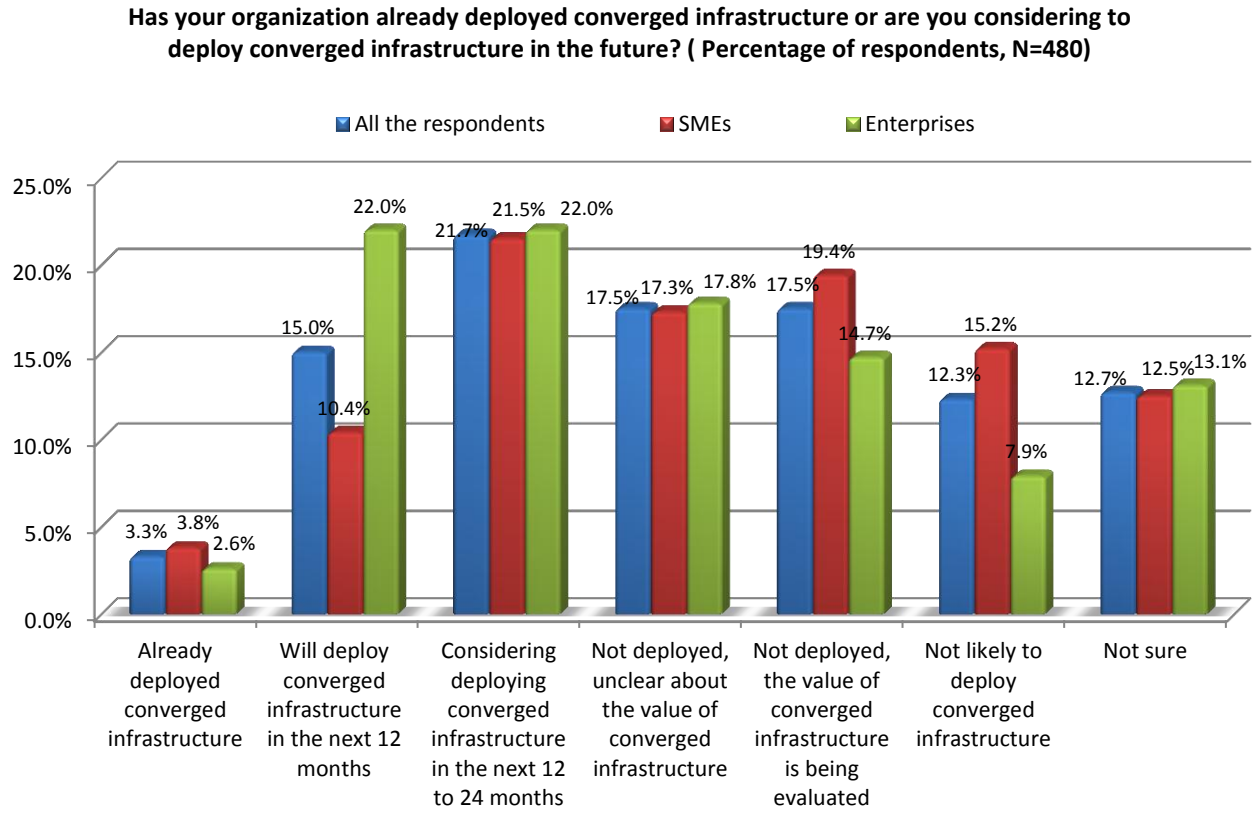
*Figure 8. Converged Infrastructure Drivers*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

Will enterprises consider deploying converged infrastructure after they have fully understood the concept of converged infrastructure? From the results of the survey on deployment trends of Chinese converged infrastructure (Figure 9), growth will occur in China IT convergence market in the next 24 months. As to the whole market, more than half (54.2%) of respondents have evaluated or planned to deploy converged infrastructure, among which, 15.0% will deploy converged infrastructure in the next 24 months, and 21.7% will deploy in the next 12 to 24 months. As compared to SMEs, converged infrastructure of enterprise markets (22.0%) will increase much more than SMEs (10.4%) in the next 12 months. According to the survey on converged infrastructure deployment in China market, recently, the deployment percentage is relatively low (3.3%). Deployment will be stimulated in the next 24 months by business diversification, virtualization, and cloud computing.

*Figure 9. Deployment Trends of Enterprise Converged Infrastructure*



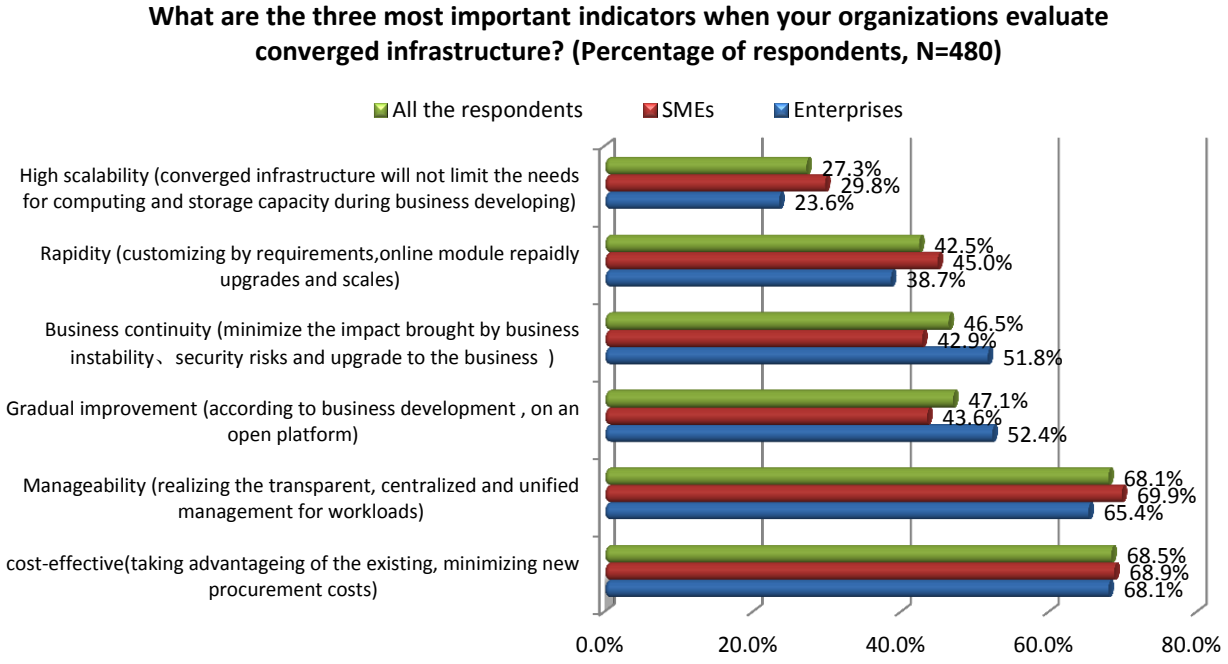

*Source: Sino-Bridges' Survey and Research Report, June 2013*

With regard to the value of converged infrastructure to users in the process of realizing IT values, China users are in greater need of converged infrastructure than European and American users in order to reduce the complexity of data center evolution process fill the gap of the data center's inadequate use and management experience in the evolution process, achieve dynamic resources allocation of physical, virtual, and cloud platforms, and intelligent monitoring of the workload, and improvement in the efficiency of IT resources' centralized and unified management.

**Key Factors Needed to Consider in the Evaluation of Converged Infrastructure**

The key value of converged infrastructure is in improving system deployment and operation efficiency. Through unified intelligent management, the dynamic allocation of resources according to SLA will be realized, and the IT response, business stability, and security, as well as business continuity of various workloads in the data center evolution process will be dynamically fulfilled. So what are the key indicators needed to consider when enterprises are evaluating converged infrastructure? The survey results found by Sino-Bridges show that （Figure 10） the key factors in respondents' evaluation of converged infrastructure are economy (68.5%), manageability (68.1%), gradual improvement (47.1%), business continuity (46.5%) and rapidity (42.5%) respectively, which fully suggests that cost is still the biggest problem troubling the enterprises in China market.

*Figure 10. Three Important Factors of Converged Infrastructure Evaluation*



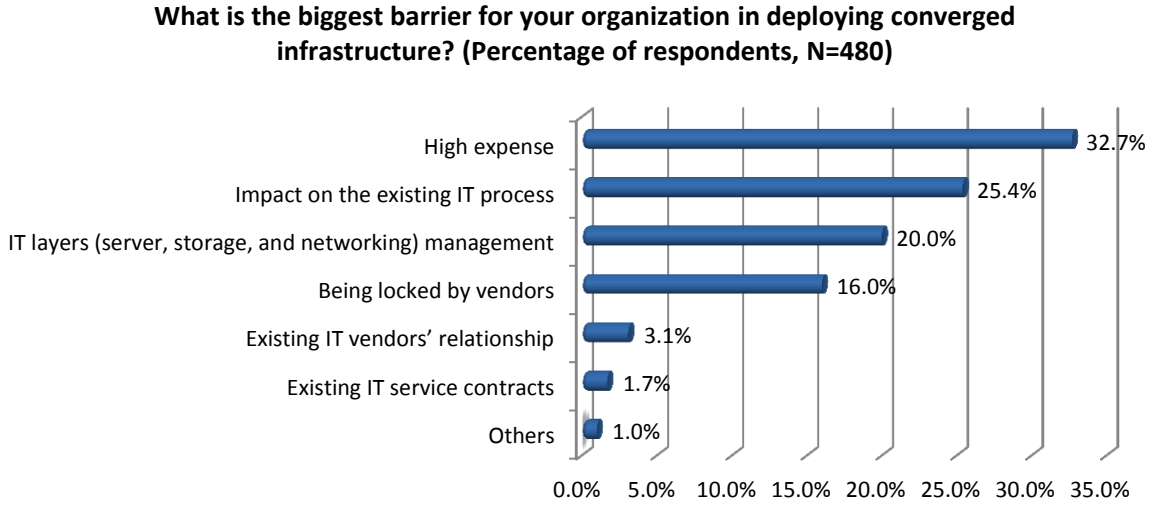

*Source: Sino-Bridges' Survey and Research Report, June 2013*

Converged infrastructure will be implemented through redevelopment and management of functions as well as IT management process integration. Reducing TCO of IT infrastructure and improving IT response speed to business will be achieved through enhancing IT management efficiency and optimizing resource utilization. The most important reason China users accept converged infrastructure is that of high performance/price ratio, which cannot only improve the efficiency of IT resources in enterprises' data centers and management efficiency, but also maintain economy. Manageability can only be achieved through redevelopment and integration of accumulating professional knowledge, which always leads to increased cost. IT infrastructure is needed to provide a more economical and effective way to reduce the complexity of management, improve application deployment and management efficiency, and minimize the increase of management costs of professional services.

With regard to different company sizes, the three most important indicators in enterprise users' evaluation of converged infrastructure are economy, manageability, and gradual improvement, respectively; while SMEs think the three most important indicators are manageability, economy, and rapidity.

Enterprises have realized the advantages converged infrastructure has brought to IT integration, cloud computing, application deployment of the data center, and efficiency of IT centralized management, and they are also willing to consider converged infrastructure as the first choice in the virtualization of IT infrastructure, but they are faced with several concerns it its deployment. What actually impacts enterprises in the deployment of converged infrastructure? The survey results (Figure 11) found by Sino-Bridges show that, high expense is regarded as the biggest barrier by 32.7% of respondents, followed by influences on the existing IT process (25.4%), IT layer (server, storage, and networking) management (20.0%), and being locked in by vendors (16.0%). Enterprises will first consider expense when deploying converged infrastructure. But from the prospective of Sino-Bridges, it should be evaluated from the whole TCO rather than procurement costs. Using converged infrastructure can continuously and obviously reduce the costs of system deployment and operation, enhance the efficiency of centralized IT management, and further reduce the entire energy consumption of the data center and TCO.

*Figure 11.The biggest barrier in deploying converged infrastructure*

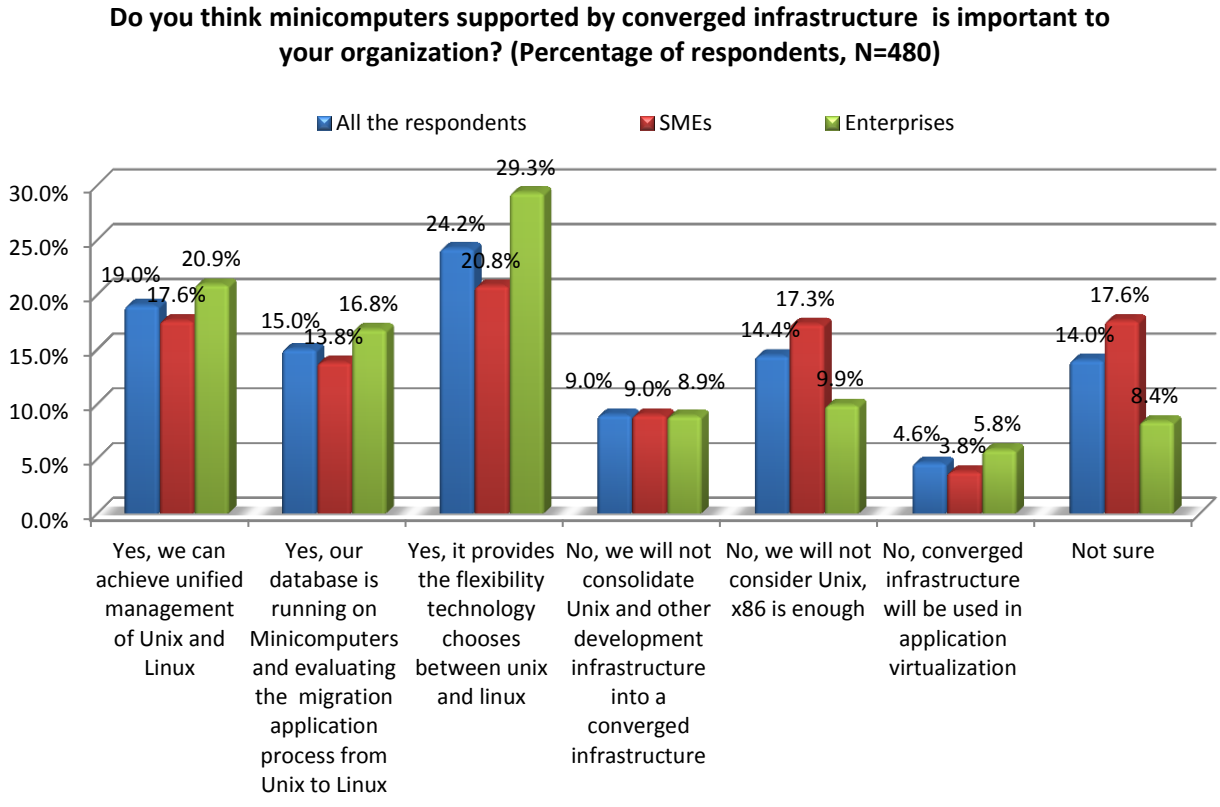



*Source: Sino-Bridges' Survey and Research Report, June 2013*

### Correlation between Minicomputers and Converged Infrastructure

Currently, the mainstream market is minicomputers. So will converged infrastructure need to support minicomputers if enterprises are deploying converged infrastructure? For this (Figure 12), more than half (58.2%) of respondents consider whether or not converged infrastructure supports the minicomputer as fairly important, especially Unix and Linux, which are of great importance in today's market. Looking at different company sizes, the percentage of enterprise users' views are much higher than that of SMEs, which also suggests that minicomputers are widely used among enterprise users.

*Figure 12.Correlation between minicomputers and converged infrastructure*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

## Sino-Bridges' Views

Application diversity, virtualization and cloud computing, as a major market driver for converged infrastructure, accelerate strong growth of converged infrastructure in China market within next 24 months. Contrasts to SMEs, Enterprises have a higher market acceptance for converged infrastructure, and their ratio of converged infrastructure deployment in the next 12 months will be higher than SMEs.

Converged infrastructure not only can greatly reduce deployment cycles and difficulty to manage applications in the application diversification process, but also allow users to deploy/migrate more productive applications to a virtualized environment, to improve virtual machine density, which achieves enhancement of IT efficiency by improving the level of virtualization for the Chinese users with limited virtualization management experience. At present, the ratio of production application virtualization among Chinese enterprise users, as well as virtual machine density, is much lower than their European and American counterparts. This limits the Chinese enterprises to improve their competitiveness through IT.

Traditional IT hierarchical management (from the budget, procurement to operation and maintenance) is one of the main reasons impeding the rapid development of converged infrastructure. Another reason is the Chinese users who assess the purchase cost rather than total cost of ownership of converged infrastructure. Compared with the traditional infrastructure, converged infrastructure is not much valuable at the hardware level, but more at technical re-development, integration and optimizing, as well as improving the efficiency in converged infrastructure deployment and centralized management. In the Chinese market, average IT management accounts for 50% of total cost of ownership (management and maintenance costs account for 75% of data center operation in European and American markets). Take it into consideration, the core values of converged infrastructure is how to reduce operation and maintenance expenses that share 50% of TCO, calculating application deployment time in days and hours instead of traditional monthly and quarterly units, thus greatly improve IT responsiveness to business.

Viewed from deployment models of converged infrastructure, when users already have a large number of heterogeneous IT resources, then they will firstly consider how to achieve converged infrastructure in heterogeneous environments through software to improve utilization of IT investments. For deployment needs with applications and virtualization (cloud computing) as the core, it can significantly improve IT responsiveness to business through highly integrated converged infrastructure, and it may reduce the risk of performance instability that integration process of infrastructure brings to the business. If the users deploy converged infrastructure primarily through integrators, IT vendors' channel coverage capabilities often have great influence on which converged infrastructure model the users will choose.

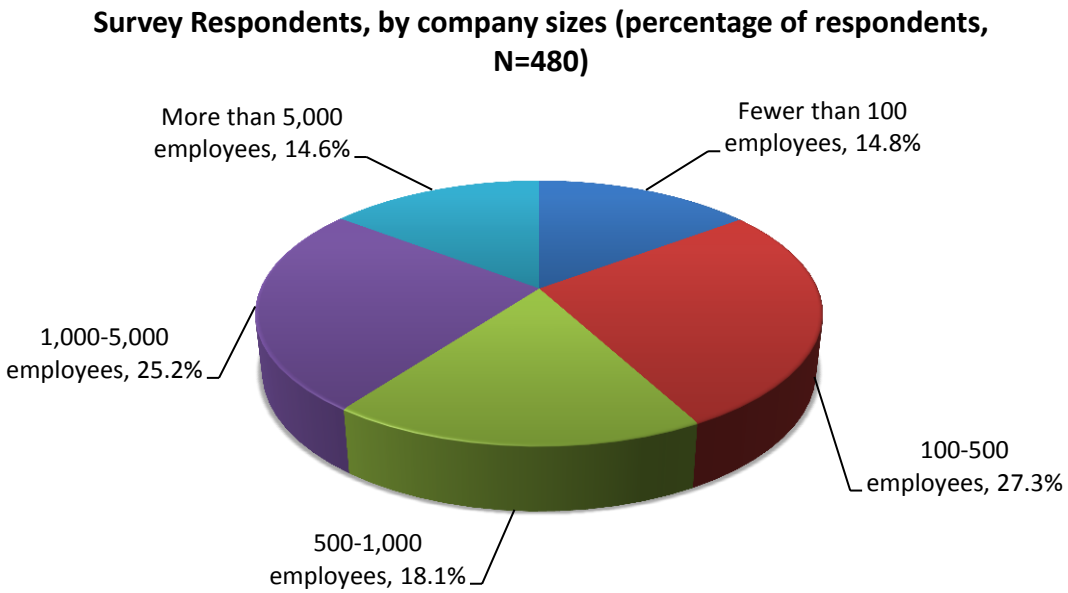
As to compute nodes of converged infrastructure, although virtualization promotes the rapid growth of x86, minicomputers are still the main backbones for business-critical applications in Chinese enterprise users. For minicomputer users, converged infrastructure helps them migrate from Unix to Linux, and achieve convergence through Unix virtualization without changing the IT management processes.

Converged infrastructure will change the technologies and competitive landscape of traditional IT market segments (server, network, storage, and data center management). For Chinese users, converged infrastructure greatly reduces demands for IT management experience. For system integrators, converged infrastructure reduces the difficulty of system integration, while it also challenges the distribution model of traditional IT value chains. For Chinese IT companies, "software-defined" and converged infrastructure can greatly reduce the difficulty of developing market segments, while greatly improves the technical difficulty of development for higher management layers (infrastructure layer, data center layer, and cross-hybrid data centers), so as to compete at a higher strategic level on the game.

# Appendix

**The Distribution of Survey Participators**

*Figure 13. Survey Respondents, by Company Sizes*




*Source: Sino-Bridges' Survey and Research Report, June 2013*

**About Sino-Bridges Research and Consulting Ltd.**

Sino-Bridges Research and Consulting Ltd., established in 2006, is a company focusing on consulting and research in the field of data centers, committed to providing forward-looking, reliable market and technology trends references, as well as an online learning and improving platform for IT manufacturers and IT professionals from a global perspective, combined with survey data and market technology (www.webinars-china.com). Its main services and research fields are focused on data center-related technology, such as storage, server, network, client facilities, business intelligence, and structure management software of data centers, etc. Its main research subjects include: virtualization, cloud, big data, data protection, IT structure, and application trends, etc.

The analysts at Sino-Bridges Research and Consulting Ltd. possess many years of accumulated research and consultation of data center technology and markets in the U.S. and Europe as well as in China. In addition, Sino-Bridges has tens of thousands of end-user data and research members, who can help to thoroughly understand China users' needs, challenges, and problems by enhancing interaction with end-users. The main services of Sino-Bridges Research and Consulting Ltd., include research reports, evaluation of products and their usage, analysis reports, and technology white papers. During the period, 2008 through 2012, the joint brand ESG-Sino (formed by the combining of Sino-Bridges and ESG), one of the world's ten largest consulting companies, provided technology and market consulting services in China. With offices in Seattle, Washington in the U.S., Beijing, Wuhan, and other places, Sino-Bridges retains customers such as IBM, Dell, HP, EMC, NetApp, and domestic manufacturers like Huawei, Lenovo, Inspur, and UIT.

For a copy of the survey report, please contact: contact@sino-bridges.com.

**Analysts**

Kim Wang is senior analyst and founder of Sino-Bridges Research and Consulting Ltd.,. She has 23 years of international management and consulting experience in Europe, South Asia, and North America, including 13 years of experience in data centers. Kim has in-depth knowledge of storage, server, networking, clients, and data center management software. In 2012, she presented more than 60 lectures on data center technology and market trends (www.webinars-china.com, online and on-site) as the most influential analyst in the field of China, which provided credible reference for users in China from a global perspective in order to speed up the assessment and acceptance of new technologies in China market.

Mary Ma is a Sino-Bridges analyst. She has a good understanding of Chinese data center technology segments. She joined Sino-Bridges Research and Consulting Ltd. in 2006 and is responsible for performing investigations of data centers and evaluations of various project planning and executions. Mary led the completion of the project planning of a number of surveys, of the designing of surveys and in-depth interviews, and the writing of evaluation reports, white papers, and survey reports.

Heng Wang is a Sino-Bridges analyst. He joined Sino-Bridges Research and Consulting Ltd. in 2007 and is responsible for Sino-Bridges' database, research platforms, and research data analysis and processing. He has participated and completed use and product evaluations of a number of solutions, as well as having planned and executed research projects.