

十一、研究計畫中英文摘要：請就本計畫要點作一概述，並依本計畫性質自訂關鍵詞。

(二) 計畫英文摘要。(五百字以內)

Industrial computers are known for their strict requirements on reliability and robustness. They must be highly available even in an extreme working environment. Industrial computers have been widely used as the core components of many applications, such as the networking devices, the industrial automation control devices, and the medical electronic devices. The ADLINK technology Inc., our industrial partner of this proposed project, is the leading manufacturer of industrial computers in Taiwan. The ADLINK has been able to keep high profit margin since founded. However, the organizational management of the ADLINK have found that, cost and quality are no longer the key factors to achieve high profit margin. Instead, the ability to develop domain-specific, value-added applications for products has become more and more important in market competitiveness in recent three years. As projected by the industrial experts from the ADLINK, the ATCA blade servers with value-added virtualization technology will be one of the key products of the next-generation industrial computers since they can provide high flexibility and yet maintain high availability. However, the technology to integrate high-availability industrial computers and virtualization technology is still at its infantry stage. To improve their competitiveness in the coming three to five years, the industry of industrial computers in Taiwan will need the following four key technologies: Fine-tuning the existing virtualization technology used in the industrial computers, fault-tolerance for virtualization on the ATCA blade servers, fault-tolerance for virtualization on non-x86 servers, and various domain-specific, value-added applications and services based on ATCA blade servers. Therefore, we plan to provide value-added applications, in particular fault tolerance for virtualization, to both x86 and non-x86 industrial computers in four years. We also plan to develop new industrial-technology-oriented courses and related teaching material, and train our students accordingly. The research team of NCU has accumulated valuable experience from four prior fault-tolerance-relate projects and five prior server-virtualization projects. In addition, the research team has eight fault-tolerance-related patents. We believe that, with our experience and ability, we can develop the next-generation fault tolerance technology for server virtualization on industrial computers, and help our industrial partners add values to their products in the coming five years.

Keywords: Industrial PC; Software Fault Tolerance; Virtualization Technology