

HP OpenView tunes Asia's first high-quality academic research network for optimal performance

## National Center for High-Performance Network Computing success story



"HP OpenView Performance Insight creates a foundation for National Center for High Performance Computing to provide high-quality service of multiple network applications of the future."

Dr. Yen Jen Jou  
Unit Manager,  
National Center for High-Performance  
Computing (NCHC)





Speeding along with a whopping 20Gbps in bandwidth, the Taiwan Advanced Research & Education Network (TWAREN) is expected to blaze a position for Taiwan as one of the top networked countries in the world.

Besides casting Taiwan as a technology leader, TWAREN is expected to boost the country's stakes in international competitiveness which is increasingly measured by how advanced its networks and technologies are.

To optimise and maintain the network capacity of TWAREN, the National Center for High-Performance Computing (NCHC) realised that a robust network management platform is essential. After many reviews and careful consideration, NCHC chose to implement the HP OpenView suite of applications.

The award-winning HP OpenView network management system has been voted as the leading systems management software by many network professionals for several years. Built on an open platform based on a flexible modular design, it can manage a specific network system either collectively or independently under a common interface. It also has the added advantage of seamless integration with third-party software.

In addition to its position as the fastest academic network in Taiwan, TWAREN is part of Taiwan's grand plan to be the "Asian Academic Network Pivot", to take advantage of the island's strategic geographic location and hi-tech savvy to be a technological hub between South East Asia and the rest of the world.

In early 2004, TWAREN successfully completed its connection to academic networks in Canada and Ireland. It is currently the only academic network to span across Europe, Asia and North America, making it one of the first networks to span the globe.

The 2 billion NTD TWAREN inherited and expanded on the existing research network of Taiwan Research Network 2 (TANet2), Taiwan's national research network. With a bandwidth forty times the capacity of the older network, TWAREN will facilitate and increase the exchange with international research centers.

TWAREN is eventually expected to be a research platform for Grid computing to support networks like the chronic medical care network, ecosystem observation network, disaster prevention network, and multi-communication crisis management network.

#### **Massive and complex network architecture**

The current network architecture of TWAREN can be classified into four different kinds of core networks. The network system itself includes four Giga POP regions in Taiwan and 11 regional network centers. In addition, there are a large number of peripheral connections that include universities, research units, and city halls.

For the management team at NCHC, manually managing this complex network architecture 24 by 7 is a difficult and labour-intensive task. Needless to say, problems can crop up at any time. The tasks of trace management and monitoring the Cisco 7600/12000 series routers and equipment used by the four core pivots and 11 regions further increase the difficulty of the network management.

NCHC's unit manager, Dr. Yen Jen Jou drew the comparison between TWAREN and a transportation highway. He explained that while TWAREN has a large capacity to transmit massive volumes of data, the challenge for the network professionals is to keep the traffic in this backbone flowing smoothly even as it is connected to various other roads and interchanges.

When NCHC decided on HP OpenView, it also forged a partnership with Acer's networking and communication business consulting. This resulted in NCHC spending just three months to implement HP OpenView. The network diagnosis and automatic monitoring of network devices can now be carried out in the shortest possible time.

#### **HP OpenView NNM lowers network management complexity**

Tasked with the arduous job of network management, NCHC decided to implement HP OpenView Network Node Manager (NNM) as the basis of network management to collect the network topology and various performance data. NNM can also quantify the distributed network flow and equipment, to simultaneously examine network flow and ensure service quality.

Given the large number of applications operating on TWAREN that will act differently according to the network latency, HP OVPI helps to ensure reliable service quality by providing a clear picture of all networks that NCHC is monitoring, to reliably verify the availability of these networks.



Most importantly, NNM helps NCHC to automatically monitor the network and visually describes the status of all equipment. This visual approach gives the network team an immediate overview of the network, to quickly identify any network errors and problems.

Although the existing TAnet2 network management system provides the team with the network status, the red and green lights provide limited information. The team would only know whether the network is disconnected or normal. Information such as the disconnection time, location, and hardware-determined damage level cannot be determined.

In contrast, NNM uses different light signals to represent the network lines and faulty equipment functions. Even with a massive network like TWAREN, the network professionals can easily figure out the status of the network and react accordingly to resolve the problems.

In addition to the difficulty of managing the TWAREN network, another challenge is to keep a lid on the pressure faced by the network professionals. The best solution is to have a network management tool with a single, integrated interface, said Yen, referring to the value that HP OpenView brings.

#### **Real-time performance analysis**

NCHC also implemented HP OpenView Performance Insight (OVPI). The implementation of OVPI is key to helping NCHC solve problems that were simply left unsolved in the past. For example, can the network personnel provide performance information? If the data volume fluctuates, how fast is the speed of change? Which network line is reaching its maximum capacity?

Where NNM is the foundation for a stable, fault-free network for TWAREN, OVPI is the key to optimising the value of the applications on the academic network. Performance Insight can transform raw data into comprehensive reports documenting load patterns and identifying the issues and trends. In addition to the standard reports like executive summary, capacity planning report and forecast report, it also provides the option of generating customised reports on the basis of available data.

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latency, HP OVPI helps to ensure reliable service quality by providing a clear picture of all networks that NCHC is monitoring, to reliably verify the availability of these networks.

“HP OVPI creates a foundation for National Center for High Performance Computing to provide high-quality service of multiple network applications of the future,” said Dr. Yen.

With the ability to analyze the entire network flow and transmission status, OVPI is like a health inspection for the network system. In addition to serving as the foundation of various network applications, it monitors the network performance at all times to keep network communication smooth and problem-free.

In reference to the transportation highway analogy, Dr. Yen said, “Only when you know the car flow, speed, and performance, will you be able to direct the traffic and increase the network quality.”

In the future, when NCHC implements a series of new network model applications, OVPI will also serve as a useful solution for performance management and analysis to solve the key problems the NCHC network professionals are likely to encounter. For future applications like VoIP (Voice over IP), network performance analysis and the ability to replicate would be a very important feature.

Currently, TWAREN’s bandwidth is not fully leveraged as it has to cater to accommodate the increasing number of new applications to be implemented in the future. The relevant service operation procedures will increase in complexity accordingly.

In addition, it is one of TWAREN’s key objectives to become the Asian pivot point of the Global Terabit Research Network. As such, more international cooperation and exchanges are expected in the near future. Network applications such as VoIP, IPv6, VPN, MPLS, multicast, network security, video conference, voice conference, and integrated multimedia will be gradually implemented onto the network.

Dr. Yen noted, "There might be hundreds of procedure management combinations in the future. Allowing the network personnel to learn the system quickly and create the procedures at the same time are our biggest challenges."

During the next six months, the first two major procedures of IT Infrastructure Library (ITIL) will be implemented to create task management and problem-solving procedures. At the same time, service quality standards will be regulated according to the defined procedures.

#### **Creating a network of the highest service quality**

With HP OpenView in place, NCHC is confident in becoming the largest and leading Internet Service Provider (ISP) among academic networks in Taiwan. Yen said that NCHC will aim towards the goal of "5 Nines", or 0.99999% shutdown time, an ideal service quality. In other words, TWAREN targets to go offline for less than five minutes each year.

Yen believes that with HP OpenView solution, NCHC has the capacity to do more. In the future, besides aiming at the goal of "5 Nines" in high quality service, NCHC plans to leverage HP OPVI to realise the optimal usage of the network and lead TWAREN towards becoming the pivot of the Asian academic network.

## User

National Center for High-Performance Computing (NCHC)

## Vertical

Academic research

## Profile

Taiwan's national institute dedicated to high-performance computing and network applications research

## Challenges

Managing 24x7, a complex network architecture that comprises four different kinds of core networks, which includes four Giga POP regions in Taiwan, 11 regional network centers, and a large number of peripheral connections including universities, research units, and city halls.

## Core solutions

HP OpenView Network Node Manager (NNM)

HP OpenView Performance Insight (OVPI)

## Benefits

HP OpenView has enabled network configuration, performance monitoring and fault elimination, covering the complete life cycle of network management. The network is automatically monitored with visual representation on the status of all equipment.

## Contact information

For more information about HP OpenView software, please call your local HP reseller or HP sales office.

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For more information on HP OpenView, visit:  
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