

IIJ was founded in 1992 as a pioneer in the commercial Internet market in Japan. Since that time, the company has continued to take the initiative in the network technology field, playing a leading role in Japan's Internet industry. The history of IIJ is indeed the history of the Internet in Japan.

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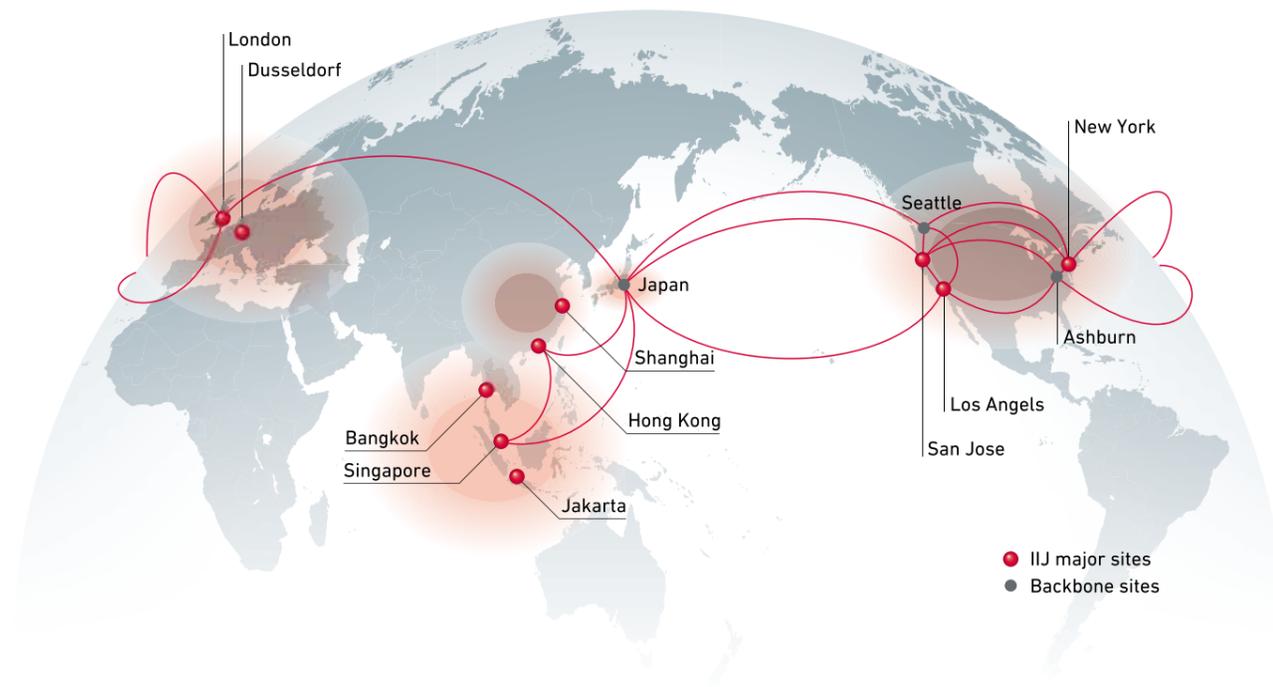
Special Guest Interview

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**Tadao Ando** Architect

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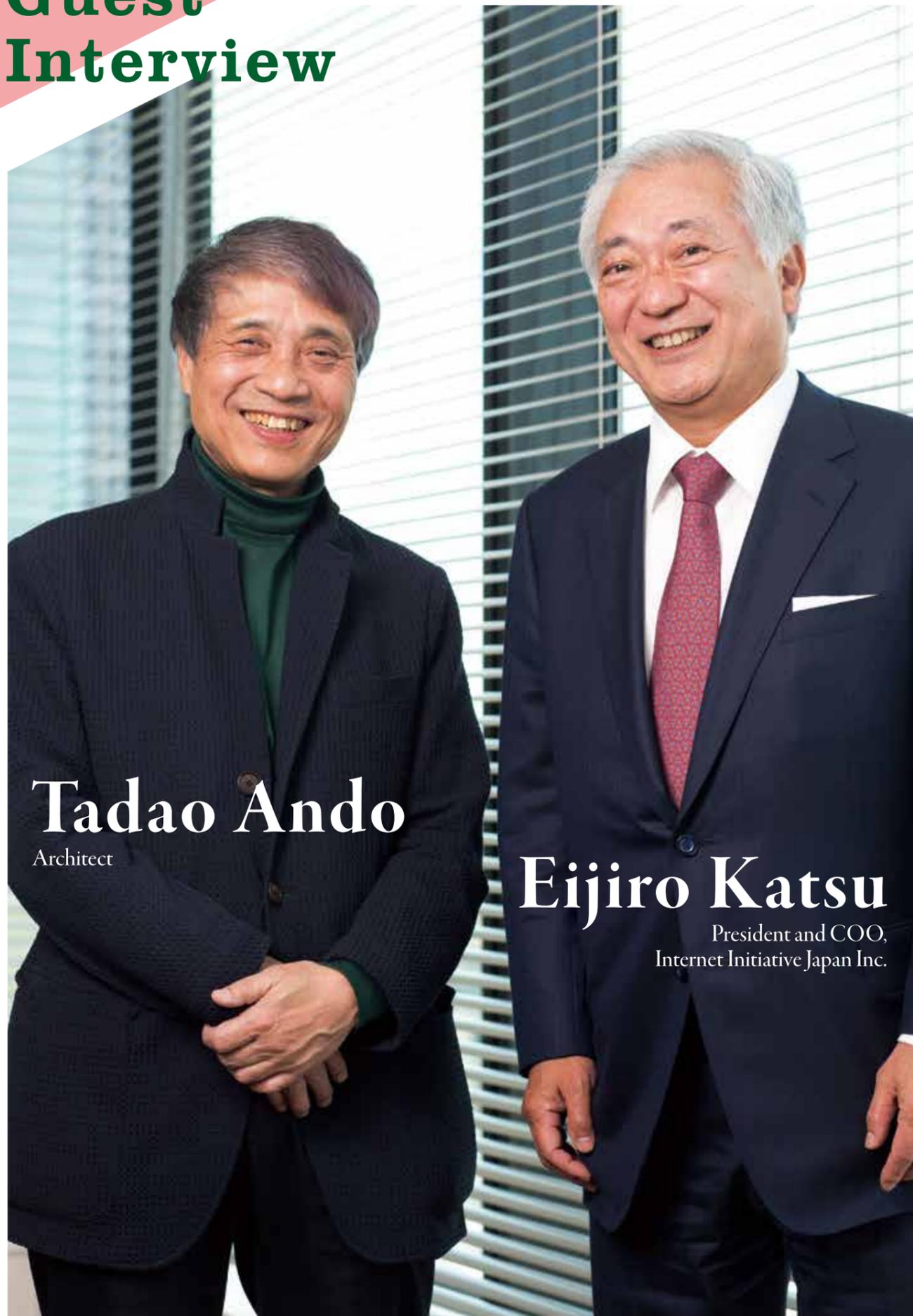
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# Special Guest Interview



**Tadao Ando**

Architect

**Eijiro Katsu**

President and COO,  
Internet Initiative Japan Inc.

Photo: Shigeki Watanabe

**In our special guest interview feature, we call upon distinguished leaders in various industries to share some insight into their wealth of specialized knowledge. For our sixth guest we invited Tadao Ando, a well-known architect both in Japan and overseas.**

## Following Two Surgeries

**Katsu:** After undergoing major surgery twice in the past few years, how are you doing Ando-san?

**Ando:** I'm fit as a fiddle. I make sure I do everything my physician tells me, so I eat everything on my plate, and if I'm told to chew 30 times I double that and chew 60 times (laughs).

**Katsu:** You're looking well.

**Ando:** I've always been a tough cookie.

**Katsu:** You boxed when you were young, right?

**Ando:** I got my license in the second year of high school, and was active as a pro boxer for about a year and half. Then one day I watched boxer Fighting Harada train, and at that point I realized he was on a whole other level, so I gave boxing up. I only boxed for a short time, but it taught me to be a fighter.

**Katsu:** Do you still exercise now?

**Ando:** I walk 10,000 steps a day, and go to the gym three times a week.

You never really know what's going to happen in life. I'd never had a major illness before, then in the summer of 2009, right after talking with the conductor Seiji Ozawa over a meal about how if nothing else we had our health, cancer was discovered in my duodenal papilla.

Surgery went without a hitch, and I was getting back to my regular work pace, but then in June 2014 they found cancer in my pancreas, so I underwent surgery to remove it on the 11th of the following month.

I had actually arranged to talk with iPS cell researcher Shinya Yamanaka on July 10, the day before my second surgery. Although sick I still felt okay, so we spoke in the evening, and I attended a party until about nine o'clock. Then I had surgery from seven o'clock the next morning.

**Katsu:** What!? Is that true?

**Ando:** I hadn't told Yamanaka-san anything, so he was apparently surprised when he heard about the surgery later. Since then he's been telling me he'll make a pancreas using iPS cells as soon as he can (laughs).

**Katsu:** The surgery must have taken a toll on you I imagine.

**Ando:** I underwent anti-cancer drug treatment for six months after I was discharged from hospital, but that wasn't really a big deal either. My doctor tells me I'll get better as long as I have a goal. So it seems having a vision is indeed important. Emotional strength helps a lot when recovering. After discussing this topic here and there, all the requests I get these days are for speaking engagements about medical issues (laughs).

## A Call for Social Participation

**Katsu:** You've initiated a variety of activities that contribute to society, including the Momo-Kaki Orphans Fund<sup>(\*)</sup> (a scholarship fund for children orphaned in disasters) set up after the Great East Japan Earthquake, which has really taken off.

**Ando:** The Momo-Kaki Orphans Fund was founded by myself, Seiji Ozawa, physicist Masatoshi Koshiba, chemist Ryoji Noyori, Suntory's Nobutada Saji, Uniqlo's Tadashi Yanai, Benesse's Soichiro Fukutake, and former governor of Hyogo Prefecture Toshitami Kaihara. We sought people willing to donate 10,000 yen a year for a period of ten years. In the beginning we had a hundred applicants per day, and now there are around 30,000 benefactors.

**Katsu:** That's a lot of people.

**Ando:** All sorts of people have offered their help. One woman donates a million yen every six months. I wasn't familiar with her at all, but I did know she was quite elderly. When I sent a letter of thanks and jokingly encouraged her to keep on soldiering until she's a hundred, I got a reply saying she objected to that. Upon asking why, she told me it was because she's already 98 years and six months old! (laughs) So I wrote her suggesting she fight on until she's 110, and that satisfied her.

**Katsu:** Quite a story (laughs).

**Ando:** Yes, she obviously has a deep affection for children. I'm an architect, but I always push myself to do everything in my power outside of design work as well. I believe it's important to participate in giving back to society. I'd like to continue sending the message that we should support the next generation for our children.

**Katsu:** You've put a lot of effort into environment issues as well, haven't you?

**Ando:** Japan has seasonal climates unlike anywhere else in the world, coupled with magnificent scenery. And, Westerners admire the Japanese aesthetic knowledge of art, which is evident from the Edo period ukiyo-e artwork and kabuki plays that have greatly influenced French impressionists. As Japanese, we are responsible for how our country and culture turns out, so we must carry on the torch.

As you know, the Potomac River in Washington D.C. is lined with cherry trees that were a gift from Japan. We launched the Heisei-Era Alley of Cherry Blossoms Campaign<sup>(2)</sup> project in 2004 with the aim of creating similar rows of cherry trees along Okawa River and Nakanoshima Island in Osaka, and solicited donations of 10,000 yen. Cherry tree saplings cost 50,000 yen each, and 100,000 yen is enough for 30 years' worth of maintenance costs, so we can raise one cherry tree for a total of 150,000 yen. We had a target of 3,000 trees, and opted to attach nameplates to each indicating those who donated. In the end we received 52,000 applicants. Getting such a response to this appeal reinforces my belief that Japan has plenty to be proud of.

**Katsu:** I also think the effort you put into these causes is phenomenal, Ando-san.

## The Importance of Conceptual Ability

**Katsu:** I hear you learned architecture through self-study.



The Hill of the Buddha at Makomanai Takino Cemetery in Sapporo (left). The stone Great Buddha originally at the site (below) was encircled with a concrete hill. In early summer the area is covered with lavender.



Perhaps that's part of why you've been able to create so many original ideas. One recent example is the Hill of the Buddha at Makomanai Takino Cemetery in Hokkaido, which has a really surprising design. Where do ideas like that come from?

**Ando:** It's interesting, isn't it? The site already had a 15-meter high Great Buddha made of solid stone. My plan was to encircle the Great Buddha with a conical hill of concrete, leaving only the head protruding, and cover the surrounding area with lavender flowers. The client indicated they wanted to elicit more appreciation for the Great Buddha, therefore I designed it so visitors enter through a sea of lavender and arrive at a water court, then pass through a tunnel to reach the Buddha inside. (photos)

I wanted to make the Hill of the Buddha something evocative of Hokkaido that could only be done there. It opens this spring, but even during construction many people came to look at it, perhaps seeking a glimpse of its intrigue and beauty. I also planted the lavender together with volunteers, and a donation box is placed there so we can plant more lavender. It's important to feel that the community and visitors are involved. These days overconcentration has become a problem in Tokyo, and we should probably rethink our approach to provincial cities. Opportunities can be found everywhere. The crucial thing is to have the courage to execute creative ideas. That's why I want people with ideas to be active in society. Hokkaido has vast quantities of farm land, and if it could be utilized effectively, I believe we could improve Japan's food self-sufficiency.

**Katsu:** Hearing you talk about this makes me wonder whether you think more about nation-building than architectural design?

**Ando:** Well, advice for building a nation, perhaps.

Regarding the issue of food, I've been saying for a while that we should make the Seto Inland Sea a marine ranch. The Japan Sea borders Russia, China, South Korea and Japan, so it might be difficult there, but we could put something together in the Seto Inland Sea ourselves. Obtaining a source of protein that could sustain Japan would have to involve something as bold as raising fish throughout the entire inland sea, rather than cultivating them in netted enclosures.

I was born and raised in Osaka, so I have more fondness than the average person for that area. That said, it was quite dirty at one point.

I was taken to Naoshima for the first time by Soichiro Fukutake in the late 1980s, and all over the island there were hills stripped of vegetation. But some people's passion knows no bounds, and Fukutake-san told me he wanted to make the Seto Inland Sea clean and beautiful. He wanted to transform Naoshima into the world's foremost art museum island. To be

honest, at that time I didn't believe people would realize his dream. But Fukutake-san had genuine conceptual ability. He insisted that people would visit, and that we could make Naoshima a world-class attraction.

Naoshima is a permanent exhibit, and Fukutake-san was adamant that a generic experience wouldn't be enough to attract visitors. He had the vision to feature exhibits that you must see in person. That would offer different perspectives depending on the season, and your emotions. At the time I thought that might be hard to pull off. However, the island now has a population of 3,000 and receives tens of thousands of visitors each year, so it's clear this vision was achieved. This year they are holding the Setouchi Triennale 2016 there, so more than a million people are likely to visit. Never underestimate the power of conceptual ability.

### Naoshima Was Only the Beginning

**Ando:** When I began working on Naoshima, there were issues with the illegal dumping of industrial waste on neighboring Teshima. In light of this, I established the Setouchi Olive Foundation in 2000 together with lawyer Kohei Nakabo, as well as Hayao Kawai who would go on to become chief of the Agency for Cultural Affairs. We began planting olives and other trees on islands in the Seto Inland Sea. At this time, Uniqlo was kind enough to place collection boxes in all its stores, and some of their staff also took part in the tree planting.

**Katsu:** You've also seen fantastic results from your efforts to plant trees on reclaimed land in Tokyo Bay, haven't you?

**Ando:** We began the Umi-no-Mori (Sea Forest) <sup>(\*)</sup> project when Shintaro Ishihara was Governor of Tokyo, and solicited 1,000 yen donations to plant saplings on landfill sites. The saplings were just 30 centimeters when planted, but now they have grown to over five meters tall, becoming a forest of around 100 hectares.

This experiment with changing a mountain of waste into forest land was a world first. I think if you asked young people how they would portray Japan's beauty while taking the environment into consideration, they'd come up with some good responses. In this respect, although there are those who approve of the Tokyo Olympics and those who disapprove, I believe this will be a good opportunity to bring everyone together.

**Katsu:** If you don't mind, can you tell us what went wrong with selection process for the new National Stadium design proposal?

**Ando:** I think you can put it down to decisions being made without resolving the ambiguities such as cost management that are particular to Japan. In July 2012, they held an interna-

tional competition with an initial construction budget of 130 billion yen. I chaired the committee of 10 judges. The design was selected in November of the same year. That's where the committee's authority ended, and by this stage our role was effectively over. Design work subsequently began from June 2013, and in May of the following year I saw the cost of 162.5 billion yen being bandied about. I thought that was pretty high, but we weren't contacted about it at all. Then, when the figure of 252 billion yen emerged in June last year, I received no advance notice, and the media laid the blame squarely at my feet.

Going forward Japan will become more globalized and work all over the world, so I think we must strive to ensure there are no repeats of these ambiguities. We have to have our own ideas and take a stand.

Currently, 80 percent of the work I do is overseas, and I'm involved in around 40 sites worldwide. This kind of ambiguity isn't acceptable in other countries. You always specify what the cost is going to be.

**Katsu:** I guess you could say this is an issue that applies to all of Japanese society.

### The Environment for Raising Children

**Katsu:** Finally, what message would you send out to the younger generation?

**Ando:** First, the Japanese government has to work on raising the birth rate. When it's easy to raise children, and each household has two or three kids, the nation will stabilize.

I designed a factory for a delicatessen called Rock Field that is famous for the Kobe Croquette brand, and they have an in-house nursery that looks after children while their mothers work. They have also put into practice a dietary education program in which participants eat meals they've made themselves. These sorts of practices attract good workers. Kozo Iwata, the president (at the time) who came up with this idea 30 years ago, is a great man.

Japan doesn't yet have an environment in place that enables women to raise children while they work. Major corporations should take the initiative and build nurseries on the roof of their facilities. When I designed Tokyu Shibuya Station I proposed that nurseries be built at stations along the line, and this idea was implemented in places such as Kaminoge Station. Having child care centers at stations is convenient for working women.

**Katsu:** The government and companies probably need to show leadership on this.

**Ando:** One other thing is that due to there being fewer children in recent years, they don't become independent from their parents, who in turn aren't able to let them go. Children learn about human relationships by interacting with other children, and find out about life and nature by going fishing or investigating creatures in the wild. Getting into a top-tier university is also important, but while children are young I believe it's best to just let them be kids. Children today have no problem accumulating knowledge in their left brain (language, calculation, logic, etc.), but the competitiveness, courage, and imagination of the right brain is more difficult to nurture. Are deviation values the only method we have to measure standards of ability? If you don't get into the habit of creating free time for yourself for at least a year after entering university, you'll be left doing nothing but study until you graduate, and that's a problem.

There was a political scientist called Masataka Kosaka at Kyoto University who said you should have deep interest in your field

of work, as well as broad but shallow interest in everything else, otherwise you'll just be living for the sake of living, and not able to enjoy a long and contemplative life.

**Katsu:** I agree completely. Thank you for this meaningful and enjoyable discussion today.

**(\*) The Momo-Kaki Orphans Fund:** The name of the Momo-Kaki Orphans Fund was inspired from a Japanese proverb, "momo-kuri san-nen, kaki hachi-nen" ("three years for peaches and chestnuts, eight years for persimmons"), which observes how a certain amount of time is required for actions to bear fruit. The Momo-Kaki Orphans Fund embraces the wisdom of this proverb and aims to provide sustained support for the children until they reach at least 18 years of age.

**(2) The Heisei-Era Alley of Cherry Blossoms Campaign:** The project aims to create a new cherry blossom viewing spot in Osaka where visitors can stroll through tunnels of cherry blossoms. Paths along Okawa River and Nakanoshima Island in Osaka have been designated "Heisei thoroughfares," and around 1,000 cherry trees have been planted there through the donations of citizens and other parties.

**(3) Umi-no-Mori (Sea Forest):** This project aims to develop reclaimed landfill land in Tokyo Bay into verdant woodland, with tree planting transforming an island of garbage and surplus construction soil generated through urban activities into a beautiful forest floating in the sea.

#### Tadao Ando

Born in Osaka in 1941. He learned architecture through self-study, and founded Tadao Ando Architect & Associates in 1969. He continues to propose new approaches to architecture based on its relationship with the environment. After 1995, he dedicated his time to disaster recovery as chairman of the Great Hanshin-Awaji Ten Year Reconstruction Support Committee. From 1997 he became a professor at the University of Tokyo, where he is currently a professor emeritus. In 2011 he became chairman of the Momo-Kaki Orphans Fund.

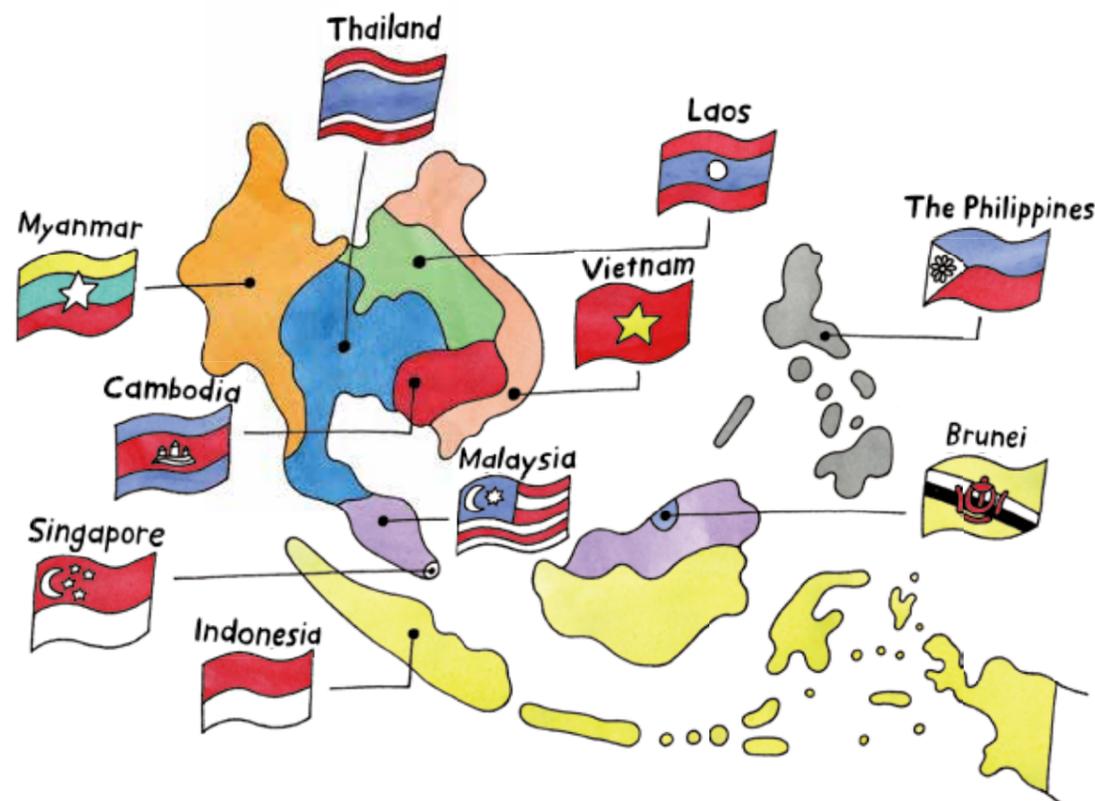


Topics

# IIJ's Global Strategy

## Takes Flight

Based on the backbone network we have in place around the world, and cloud facilities covering major regions, the global business of IIJ has undergone steady expansion. And now, IIJ is about to enter a new stage of global growth. Here we highlight IIJ's global strategy for the ASEAN market, which is showing growth in the wake of the creation of the AEC.



Feature illustrations by STOMACHACHE.

# Our Global Strategy Shifts to the Next Stage

IIJ's global business is now in its sixth year. We'd like to take this opportunity to discuss our direction including IIJ's strategy and explain how we expanded our business to this point and where we intend to go from here.

**Koichi Maruyama**  
 Director of Global Business Division  
 Executive Officer

It is now the sixth year since IIJ started making another bid to globalize its business. When we first launched our global business in 1996, the United States was the only country where we had an overseas office, but we now have bases in six overseas countries.

The year 2011 when we started our global expansion remains marred by memories of the unprecedented destruction of the Great East Japan Earthquake, and internationally there was a series of democratic revolutions in the Middle East and North Africa, as well as massive floods in countries such as Thailand. For Japanese companies it was a troubled year that made many reevaluate their global business continuity.

2011 saw the cloud market grow significantly in Japan. Amazon, a leader in the public cloud space, opened the Tokyo AWS Region as their fifth location worldwide. This was also a year in which Japanese companies that had traditionally operated on-premise systems began to see public cloud solutions as a viable option.

Our IIJ GIO cloud service also grew its subscriber base dramatically in 2011. IIJ took a step forward that year with the opening of the Matsue Data Center Park in Shimane Prefecture, adopting modular data centers as operating infrastructure for cloud platforms, to compliment conventional building-based data centers.

### The First Stage of Global Expansion

IIJ has developed its business with global expansion in

mind right from the time it was founded. In 1996 a U.S. subsidiary was established, and a year prior to that a subsidiary that aimed to construct an international Internet backbone linking the Asia region was set up. Following these global developments, for a short time resources were mostly dedicated toward business in Japan. However, from 2010 Japanese-affiliated companies that had scaled down their overseas operations due to the collapse of Lehman Brothers began expanding overseas again more rapidly, while others moved into the international market for the first time. Because of this IIJ received an increasing number of consultations regarding IT infrastructure overseas, and that's when we continued to focus our efforts towards global business.

After first establishing offices in Shanghai and Bangkok, IIJ steadily expanded its business area through mergers and acquisitions, adding locations in Singapore, Hong Kong, the U.K. and Germany in quick succession. This also spread our backbone around the world, with its extension to the U.K. via Russia dramatically reducing our latency between Japan and Europe. We have gone on to strengthen our backbone in the Singapore and Hong Kong regions of Asia, while also steadily moving forward with the global expansion of our network.

When our overseas offices were first established, our main task was to support local subsidiaries of Japanese firms. We provided services and solutions that offered extensive support to local bases of operations, including the development, maintenance and operation of office network infrastructure, system integration, and project management for the opening and

relocation of offices. IIJ GIO was added to this lineup from 2012, and starting with the United States we expanded our service infrastructure to major business areas around the world such as China, the United Kingdom and Singapore, providing services that offer the high quality and availability that Japanese customers demand.

### Issues Faced by Businesses Operating in ASEAN

While steadily growing our overseas business, we have also looked for opportunities to move into neighboring regions or enter the local market in areas where we have already established a presence. Over the course of this we have identified two issues.

The first is the insufficient technological capability of local business operators in ASEAN4 countries (Indonesia, Malaysia, the Philippines, and Thailand) where the economy is comparatively well developed. Due to the rapid spread of smartphones, demand for highly flexible cloud services is growing at an incredible pace in these countries. European and U.S. cloud providers that can meet these demands such as Amazon and Microsoft have already launched services in Singapore. However, due to an increasing number of countries in the ASEAN region prohibiting the overseas transfer of data collected within their borders, as well as communication latency problems between countries, more and more people are calling for cloud services with locally-situated infrastructure. Some local providers have already rolled out cloud services that take advantage of the ample communications infrastructure in their region, as well as the wealth of human resources, and their strong brand recognition in the local market. However, because they have little experience with the development and operation of cloud platforms, they are not yet able to provide services on a level that meets the soaring demand.

The second issue is with the communications infrastructure for local governments and for business operators in the emerging nations of CLM (Cambodia, Laos, and Myanmar) in the Greater Mekong Subregion. Each of the CLM countries have virtually no data centers that meet the standards required by companies, and even government institutions are operating systems using inefficient and unstable server rooms. Free overseas email services are sometimes relied on for business use, so establishing a network of high quality data centers is the biggest and most urgent issue for local governments and telecommunications carriers looking to further economic development.

### Reaching the Next Stage - Partnerships with Local Business Operators

IIJ has been carrying out face-to-face talks with business operators in the ASEAN region since around 2013. As the first ISP in Japan, IIJ boasts world-leading IP technology, as

well as technology for cloud development and operation, that stands out even in our domestic market. We have also developed technology for the development and operation of modular data centers designed to save space and energy. This technology capability is exactly what many ASEAN business operators are looking for. Meanwhile, IIJ now recognizes that partners with abundant resources and brand power are indispensable for expanding our business into a wider range of countries.

The next step for IIJ's global business is to aim for a leading share in local markets by forming partnerships with local business operators, and developing services that take advantage of the strengths of both companies. Targeting mainly ASEAN nations, we have been looking for partners that are likely to produce a synergistic effect.

This strategy bore fruit in a little over two years, and in 2015 we established a joint venture with a major private Indonesian telecommunications carrier Biznet Networks. Through this we began offering cloud services aimed at providing the functions required by the local market, and we have now become the number one cloud provider in Indonesia. This year we have been strengthening our enterprise-oriented cloud infrastructure, introducing innovative cloud services to China in collaboration with influential Shanghai data center provider Shanghai Data Solution.

To launch a cloud service for the Thai market we also teamed up with major Thai conglomerate T.C.C. Technology, which manages data centers and communications services. In Laos our modular data center technology has won high praise from the government, and we are carrying out proof-of-concept tests with the aim of reducing greenhouse gas emissions through the use of modular data centers. In the future we intend to continue forming strategic partnerships that leverage IIJ's technological prowess in other regions as well.

### In This Feature

With falling stock prices and a further drop in crude oil prices since the beginning of the year, it is becoming even harder to foresee where the world economy is heading. Given this situation, it is likely that companies pursuing global expansion are searching for the optimal locations worldwide for their bases of operations.

In this feature we discussed the latest trends in the cloud services that IIJ is developing around the world. The question of how to construct and operate the IT systems that support global companies is one of the most difficult to answer, but we believe cloud services that offer a wealth of flexible options are the optimal solution for the IT systems of companies such as these. We hope this feature helps facilitate the smooth expansion of business overseas for our customers by providing tips from our experience for optimizing IT infrastructure on a global scale.

# Striving to Become the Top Cloud Provider in the ASEAN Region

ASEAN has been thrust into the limelight with the advent of the AEC. In this article we put Indonesia and Thailand on center stage and look at IIJ's initiatives in these two countries.

## Tokuo Nobuhiro

President Director  
PT. IIJ Global Solutions Indonesia

## Junichiro Fumizono

Project Manager, Global Business Development Department  
Global Business Division

Currently, ASEAN and the ASEAN Economic Community (AEC) are hot topics attracting worldwide attention. This is demonstrated politically by the territorial disputes in the South China Sea and the pro-democracy movement in Myanmar, and economically by the formation of the AIIB and the TPP agreement, etc. The AEC that was founded at the end of 2015 is a particularly ambitious project aimed at accelerating economic growth in the region to attract more foreign investment and increase competitiveness.

The ultimate goal of the AEC is to unify the ASEAN nations and enable the free flow of people, goods, services, investment, and capital, forming a single market. However, there remains a clear gap in the economic standards and status of infrastructure between countries, and governments also have varying capabilities and attitudes towards unification. Furthermore, the AEC has no common governance system or currency like the EU, so it faces a variety of challenges.

### Trends in Indonesia and Thailand

ASEAN nations are already beginning to compete with each other due to market liberalization. Indonesia, which with a population of 250 million is the fourth most populous country in the world, and Thailand, which is situated in the center of the Mekong Economic Zone, are vying for second place in the Singapore dominated ASEAN region. The nominal per capita GDP of Indonesia is 3,500 dollars, while in Thailand it has reached 5,800 dollars, and the lifestyle chang-

es that have come about due to the rise of technologies such as the Internet, smartphones, and e-commerce in each country are stimulating their markets.

Companies are proactively adopting ERP and virtualization technology, aiming to improve market competitiveness through IT innovation. Against this backdrop, demand for cloud computing is increasing, but neither country has a full-fledged domestic cloud service. For this reason telecom carriers in Indonesia and Thailand were actively looking for partner companies with advanced technology and operational experience, hoping to gain access to robust cloud infrastructure that would enable important data to be stored domestically, and raise international competitiveness.

Around the same time, IIJ had progressed to the second stage of our global expansion. With a focus on ASEAN nations, we were looking to form partnerships with telecom carriers who are highly experienced in regional matters so we can develop services appropriate for the local markets and carry out business. Taking into consideration network





circumstances between ASEAN nations, as well as the status of personal information protection laws in each country, we decided it was in the customers best interest to construct cloud infrastructure locally.

Consequently, we formed partnerships with local companies in Indonesia and Thailand in January 2015 and February 2016, respectively, and established joint ventures to launch cloud services. This strategy was aimed at providing highly competitive services utilizing their IT infrastructure and customer base to gain brand recognition and a top share of the burgeoning cloud market as soon as possible.

### Indonesia's Favorable Cloud Market

Although economic growth in Indonesia has recently been stagnant, the market for cloud solutions has still been growing at a fast pace. There is no doubt that demand will continue to increase, with the market set to reach USD \$180 million by 2019, which is triple its current size, according to international research company IDC.

In January of last year, IJJ established Biznet GIO (PT. Biznet GIO NUSANTARA) as a joint venture with Indonesia's largest private telecommunications carrier Biznet Networks, and together we began offering the Biznet GIO Cloud service in the country that May. Subscribers have been increasing at an average rate of over 70 per month, and the total number reached 777 by February this year, which is nearly four times our initial forecast.

IJJ is currently the only company that can provide services in Indonesia with the same level of quality found in Japan and delivered at rates that are competitive from a global standpoint. Biznet GIO Cloud offers the GIO Cloud auto-self provisioning public cloud service that enables flexible expansion, as well as the GIO Enterprise Cloud hosted private cloud service also used in many mission-critical business systems in Japan.

Let us discuss two main examples. First of all, a major foreign-owned electronics manufacturer chose GIO Cloud as its testing and development environment for smartphone

applications. This service offers hourly-rate pricing plans so customers can have access to the required server resources when they are needed, enabling the electronics manufacturer to minimize IT investment costs.

Another success story of GIO is Delonix Hotel Karawang, a luxury hotel in Jakarta's Karawang industrial area who adopted the GIO Enterprise Cloud service. This enables the flexible handling of detailed requirements as infrastructure for a property management system that manages a range of tasks such as organizing reservations and assigning rooms. This helped Delonix Hotel Karawang reduce costs associated with software licenses, and achieve greater work efficiency through centralized management.

Biznet GIO is also rapidly developing new services to meet the demands of fast-growing local companies. At the end of April this year, we began offering GIO Object Storage, a scalable object storage service, as well as the GIO Box, a consumer-oriented cloud storage service. We also started providing GIO Backup, which is a cloud-based data backup service, as well as cloud services at Biznet's data center in Bali.

Additionally, because partner companies will become even more crucial as Biznet GIO's operations expand, we intend to start the Biznet GIO partner program from February this year to further raise our standing in the public cloud market.

### Cloud Development in Thailand: A Driving Force in the Mekong Economic Zone

Development is progressing at lightning speed in the Mekong River Basin, which extends through major Southeast Asian countries. The Greater Mekong Subregion, also known as the land-bound part of ASEAN, is actually home to 300 million people if you include Thailand, Cambodia, Vietnam, Myanmar, Laos, and two provinces of southern China (Yunnan and the Guangxi Zhuang Autonomous Region).

Thailand is one of the most centrally-located countries, and thanks to the progressing establishment of economic avenues and the fluidization of human resources, goods, and money

due to launch of the AEC, investment there is expected to grow even further. Thailand's goal is to take advantage of intra-regional economic disparity to become a regional hub in the AEC through the international division of production with Thailand as a base point.

According to a study by IDC, Thailand's cloud market is forecasted to reach a scale of around 16 billion yen in 2015, and grow rapidly at an annual rate of about 40 percent up to 2018.

The cloud market in Thailand is currently transitioning from its dawning era to a period of popularization. There are two main reasons for Thailand leading this remarkable growth; the first being the promotion of cloud solutions and the second being the establishment of essential network infrastructure driven by the Thai government. G-Cloud is part of a Thai e-government strategy led by Thailand's Ministry of Information and Communications Technology (MICT). A plan for its introduction to 30 government-related organizations was announced in May 2013. It concerns the following four points:

- (1) Development of cloud computing for government institutions
- (2) Provision of IT infrastructure services for government institutions
- (3) Effective use of the government's IT budget
- (4) Improvements to the level of e-government in Thailand

There are also plans to build new data centers at 40 locations around Thailand as part of the digital economy strategy announced in November 2014, with the main aim being to provide cloud infrastructure to the government and self-governing bodies.

The second major factor behind Thailand's growth is the spread of mobile devices. According to the Thai National Broadcasting and Telecommunications Commission, the penetration ratio of mobile phones in Thailand was 139.3 percent in 2015, a 19.1 percent increase over 2011.

Incidentally, according to Ministry of Information and Communications Technology affiliate, the Electronic Transactions Development Agency (ETDA), the average Internet usage time of Thais is 50.4 hours per week, an increase of more than 50 percent over the 32.3 hours recorded in the previous year's survey. Smartphones were the most common Internet access method used, accounting for 77.1 percent overall. The use of mobile devices will accelerate as communication technology progresses from 3G to 4G/5G in the future, likely leading to a further increase in demand for cloud services.

To answer demand for cloud solutions in Thailand, IJJ established the joint venture Leap Solutions Asia in February 2016 with Thailand's largest data center provider TCC Technology (hereinafter TCCT), and launched cloud services in April. TCCT is involved in a wide range of business including real estate, beverages, and insurance, and is affiliated with the 60,000 employee Thai conglomerate Thai Charoen Corporation Group (TCC).

The company has data centers fitted with world-class security, power, and cooling systems at three locations in Thailand, as well as an Internet backbone linked to Europe and the U.S., and fiber optic lines connected to Cambodia, Vietnam, Malaysia, Singapore, and Hong Kong. Furthermore, like IJJ they are a SAP certified hosting/cloud service provider, and the only company with both certifications in Thailand. There are approximately 1,200 companies that run SAP ERP in Thailand, which boasts the highest number among ASEAN nations. Going forward, we would like to share knowledge with each other and gain the top share in the Thai SAP cloud market.

Around 4,000 Japanese companies have entered the Thai market, with the majority being manufacturers. Many of these companies are looking at restructuring their supply chain in the Greater Mekong Subregion while following AEC trends.

We would like to take this opportunity to assist companies in optimizing their IT infrastructure and supporting them through everything from consulting to deployment and operation.

# The Reliable, Asset-Free Private Cloud Long Awaited in China

To meet the challenge of operating IT infrastructure in China, IIJ launched new services in collaboration with an influential local company.

## Tianyi Li

Manager of the Technology Management Department  
IIJ Global Solutions China Inc.



There are a number of issues that Japanese companies typically face when entering China, and we have touched upon these in past seminars that IIJ has hosted, as well as in media articles.

With regards to communications, there is congestion at the boundary points between the communication networks of China Unicom in the north, and China Telecom in the south, which is often called the North-South Divide issue. Now that China Mobile and government-affiliated organizations are also involved the problem has become even more complex. The Great Firewall of China also impedes communications both within China and with overseas countries such as Japan. Certain communications will sometimes be blocked suddenly, and the processing capability of the Great Firewall creates a bottleneck, causing constant latency or packet loss issues.

With regard to personnel, it is tricky to secure human resources for IT departments, and staff sometimes conceal information or change jobs frequently due to career development. These factors make it difficult to maintain and operate systems efficiently. A new challenge in the past few years has been the standardization of IT governance between Japan headquarters and other overseas offices. Due to a drop in investment in the Chinese market, which was centered around the manufacturing industry, the conventional growth model is beginning to change. Investments are shifting to consumption fields such as retail, and IT system requirements are changing as well. As IT governance is applied at overseas offices in stages, offices in China that were allowed to apply their

own governance in the super high growth rate era are now being called upon to localize, reduce costs, and improve efficiency due to the economy shifting towards stable growth.

In the increasing number of inquiries related to global expansion that IIJ receives from Japanese companies, we are asked to propose cloud infrastructure packages that cover multiple countries, such as the United States, Europe, and Southeast Asia. One common concern is what to do about offices in China that exist in a unique environment. Often the topic is broached in a way that sounds like the customer is half resigned to the fact that implementation in China would be too difficult, regardless of how other offices fare.

### The Limitations of On-Premise/ Public Cloud Solutions

Let us consider how Japanese companies have operated IT infrastructure in China to date. Typical examples include the use of an internal server room, or colocation using a data center.

The hardware, OS, and applications were procured from a local SI vendor to develop systems, and maintenance and operation were entrusted to locally hired Chinese IT staff. Some companies have decided to adopt the popular VMware virtualization hypervisor and construct a virtual environment on premises. However, due to language barriers, differences in customs, and a lack of technological experience, etc., many Japanese companies are forced to tread on thin ice when it

comes to maintenance and operation. Against this backdrop, the use of public cloud solutions has gradually begun to increase. China has cloud vendors such as Alibaba, and Japanese vendors also offer public cloud services now, albeit with limited cloud infrastructure.

Through the use of cloud services, Japanese companies aimed to free themselves from the operation of internal server rooms and colocation, while also avoiding black-boxing by IT staff, and therefore improving business continuity. However, public cloud solutions provide limited options for virtual server specs and OS selection, and the issue of integration with other internal systems remains. Security problems and concerns regarding support due to sharing virtual environments with other users have also not been resolved, and I believe that many people are feeling the limitations of public cloud services.

### A Reliable, Asset-Free Private Cloud

To resolve issues faced by Japanese companies such as these, IIJ added the Virtualization Platform VW Series (hereinafter "VW Series") to our IIJ GIO CHINA Service lineup, and launched it in the Chinese market.

The VW Series provides VMware virtual environments as a cloud service, for use as a private cloud. Its main features are the user-dedicated hardware provided, as well as the secure and flexible system development and operation due to open administrator-level permissions for the virtual platform. Other benefits include improved integration with other internal systems through adoption of a 10 Gbps network interface, and support for mission critical systems due to FC connections to the datastore. You can also flexibly allocate resources as you use them, making quick system configuration possible. There are no fixed assets, and usage fees are paid on a monthly basis, so the service can also adapt to sudden changes in strategy.

This type of reliable, asset-free private cloud infrastructure means we are now closer to realizing the standardization of IT governance between Japan headquarters and other overseas offices, which was difficult to implement with conventional public cloud solutions.

### Why we Opted for Collaboration

The VW Series is made available through collaboration with influential data center provider Shanghai Data Solution Co., Ltd. (hereinafter "SDS") in Shanghai, China.

Data centers are used as facilities for cloud services, and play an extremely important role. No matter how superior a cloud solution is, it won't succeed as a service if the facilities are unstable. In China, problems can arise even at data centers that have been selected carefully in many cases, with unthinkable maintenance and operation errors occurring in areas such as the lines, on-premise network cables, and power supply in particular. In other words, a lot of failures are caused by human error rather than the specifications or performance of equipment.

Our partner in this collaboration, SDS, is a Chinese company, but the story of how it was founded is extremely interesting. It has a solid background, as the city of Shanghai is involved in its running. The teams in charge of maintaining and operating its data centers are trusted experts that follow the workflow of the global operation teams of major U.S. providers, and they have a lot of accumulated knowledge.

Solving issues with operation is a very important part of the selection process for cloud infrastructure facilities in China, and the foundation of a good service. The management of various IT industry licenses is becoming stricter in China, and SDS is licensed as a data center provider and ISP, so we can have confidence in them from a compliance perspective as well. Furthermore, SDS has a good affinity with foreign enterprises due to its origins, and they are well aware of the level of service required by companies in Europe, the U.S., and Japan. You could say they combine the high level of service found in foreign companies with the uniquely powerful ability to take action of Chinese companies.

Through extensive negotiations between SDS and IIJ to build a relationship that would enable collaboration, SDS recognized the technological capability, know-how, and track record that IIJ has with regards to cloud computing. IIJ gained SDS's dependable assistance as a partner, and started constructing and operating a new cloud service.

Going forward, we believe that by utilizing our IIJ GIO CHINA Service as private cloud infrastructure, customers will be able to operate borderless enterprise systems at their Japan headquarters and offices in China.

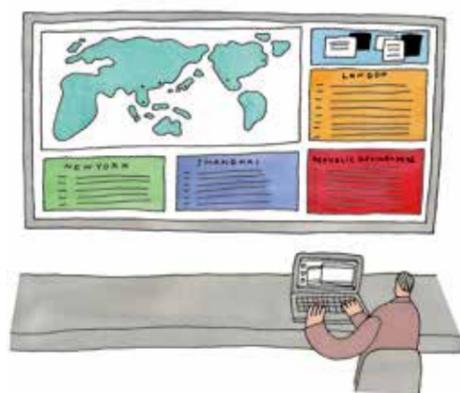
# A Virtualization Platform Service That Spans the Globe

IIJ currently provides VMware environments for the cloud infrastructure we operate around the world.

Here we discuss the circumstances surrounding this as well as the associated benefits.

## Makiko Daidoji

Deputy General Manager of the Global Marketing Department  
Global Business Division



In the first marketing materials we put together describing IIJ's overseas expansion, the only red dot indicating where our IIJ GIO cloud service infrastructure was located was on the U.S. West Coast (San Jose). More red dots have appeared in the years since then, and as of April 2016 IIJ GIO infrastructure is installed at seven locations, including six overseas countries. We have grown to the point where we provide cloud services on a global scale.

Following the launch of the IIJ GIO US Service in March 2012, IIJ rolled out IIJ GIO to four main regions worldwide (United States, China, Europe, and Singapore). Currently, we provide cloud services in five regions around the world, including Japan. The market has grown remarkably since then, and in the ASEAN region where requirements are diverse, we have established joint ventures with local partner companies in Indonesia and Thailand to launch our cloud services. This year we are working towards offering the Virtualization Platform VW Series (hereinafter "VW Series") at all locations to further the global expansion of IIJ GIO.

The VW Series is a service that provides customers with dedicated VMware environments in the form of the cloud. Because VMware vSphere / vCenter administrator privileges are provided, it is possible to use many OS's and applications that run on VMware as most business currently do. This feature makes it easy to migrate from existing on-premise VMware environments and continue the use of existing applications.

## The Story Behind VW Series Expansion

When we first launched services in the United States, China, and Europe, we offered virtual server and dedicated server options. Overseas cases at the time mainly involved the use of public services such as websites and web applications, so system requirements were simple, and we were able to fully satisfy all the needs of customers. However, due to a boom in customer demand for cloud computing, requests to move internal IT systems into the cloud spiked. Consequently, we began developing services for the overseas launch of the VW Series that had been popular in Japan. In March 2014 we rolled out our first overseas implementation of the VW Series in Singapore.

Singapore is one of the most prominent developed countries in Asia, and major European and U.S. players in the public cloud arena such as Amazon and Microsoft had already established a presence there. Although IIJ GIO was a late starter in this space, we differentiated ourselves from the competition by launching the VW Series, which could meet the system requirements for enterprise use.

Next we launched the VW Series in Europe (London) and expanded our services in October 2014 to meet the needs of more customers and partner companies. Our London office is often responsible for the EMEA (Eastern Europe, Middle East, and Africa) regions in addition to Western Europe, so flexible cloud services are required as an offering. The VW Series enables the same level of freedom as on-premise VMware

environments, so in this respect partner companies were very happy with our products. We also began initiatives to build a new community, including the establishment of the SAP User Group last year.

## Releasing a String of VW Series Products

Indonesia attracts attention as a huge ASEAN market, and in January 2015 we established Biznet GIO (PT. BIZNET GIO NUSANTARA) there as a joint venture with Biznet Networks, a major local communications service company. Since May of that year we have been offering a selection of public cloud solutions, as well as the VW Series equivalent GIO Enterprise Cloud service as our enterprise-oriented line-up.

Customer demand is split between reasonably-priced services that you can start using online easily and only pay for what you use, and flexible services that feature quality and security on the same level as existing on-premise systems so there is a minimal burden when operating and migrating infrastructure. In Indonesia we have been offering services tailored to both these needs since the initial service launch.

Around that time, a large number of extremely cheap local Chinese public cloud services appeared in China, and cloud utilization progressed in each industry. However, when shifting core IT systems to the cloud, flexible cloud infrastructure that meets high security requirements has come to be preferred over cloud solutions that are cheap but offer no guarantee of quality. The VW Series of IIJ GIO CHINA Service was launched in January 2016 to meet these needs.

Meanwhile, regarding cloud infrastructure on the East and West Coasts of North America, our VW Series became available on the West Coast from April 2016, and we also plan to launch it on the East Coast in June of this year.

To generalize the mindset of customers in the U.S., cloud service systems are almost always considered "black boxes," and when evaluating whether to move internal systems to the cloud, transparency appears to be the greatest point of concern. The VW Series also helps facilitate a smooth internal evaluation process in these cases, as it is built around the clear concept of an asset-free, visible cloud.

Furthermore, from April of this year we began offering a VW Series equivalent enterprise-oriented service selection via the Leap Solutions Asia joint venture we established in Thailand in February 2016.

As a result, IIJ is now able to provide the VW Series on all our cloud infrastructures that we operate around the world.

## Overseas Utilization of the VW Series

So what exactly is the point of offering services that share a unified concept at a large number of locations like this?

In recent years, the overseas expansion of Japanese companies has not been limited to a single country, with offices instead spread across a number of countries and regions. Despite the need for IT systems that fulfill the same functions at every location, the vast differences in the communications status, business practices, and employment opportunities for local staff in each country mean that setting up IT infrastructure takes time and money, and sometimes system rollouts don't go as planned.

One option is to piggyback on existing IT systems at the Japan headquarters, but this isn't viable in some cases due to network communication latency and issues with privilege settings when accessing the head office system from subsidiaries.

Under these circumstances, companies already using the VW Series at their Japan headquarters can enjoy a wealth of benefits by utilizing it overseas as well. Some advantages include the fact that the virtualization platforms provided can apply and utilize the same designs as Japan, as the service concept is unified around the world. This also enables system operation to be integrated with Japan. Consequently, costs can be reduced while providing stress-free support for local IT systems, and it is also possible to improve governance.

Even when the VW Series is not used in Japan, adopting VMware as the virtual hypervisor for existing IT system infrastructure results in almost the same benefits. Generally, engineer resources are not in abundant supply overseas, so it is more difficult to operate infrastructure than in Japan. Local business circumstances are also more prone to change, so it is usually not a good idea to make investments or possess fixed assets. In light of this, it is important to utilize cloud services that enable the required amount of resources to be used when they are needed.

Choosing the VW Series that is now available on a global scale enables the IT systems of all business to be moved to the cloud, even in cases where they are forced to save data locally due to regulations in that region.

IIJ will continue to develop cloud services around the world going forward.

## Modular Data Center Project in Laos

A joint demonstration project aimed at evaluating the effectiveness of greenhouse gas reduction and energy savings using IIJ's modular data center is currently underway in Lao People's Democratic Republic (Lao PDR).



### Isao Kubo

Director of Data Center Technology Department  
Service Infrastructure Division

When asked, "What is there in Laos?" by a Vietnamese, Haruki Murakami's cryptic answer was, "Nothing, and that's why I see something there." But what exactly is there in Laos?

### Demand for Energy Saving Measures

The establishment of a global framework for reducing greenhouse gas emissions is still fresh in our memory, with the adoption of the Paris Agreement at COP21 held at the end of last year. Going forward, pressure to take more energy saving measures in various fields is likely to grow.

While data centers enable IT devices to be housed and run efficiently, the power consumption can be several dozen times more compared to those of an office building or commercial facilities relative to floor area, which is said to be around 50 to 100 W/m<sup>2</sup>. Because the overall power consumption of data centers as a whole is much larger, social responsibility with regard for energy savings is a serious issue.

Up until now IIJ has put into action a range of energy saving initiatives relating to data centers. One of these is the development of the modular data center technology we call "IZmo," which achieves a high level of energy savings by fully utilizing outside-air cooling. Since April 2011, we began the operation of a commercial data center using IZmo in Matsue-city, Japan.

### Proof-of-Concept Project in Laos

In January of this year, Internet Initiative Japan Inc. together with Toyota Tsusho Corporation and Mitsubishi UFJ Morgan Stanley Securities Co., Ltd. signed a letter of agreement with the Ministry of Science and Technology of Lao PDR to build an IZmo modular data center in the capital Vientiane and to proceed with Global Warming Mitigation Technology Promotion Project, which is conducted on the basis of the commission by the New Energy and Industrial Technology Development Organization (NEDO).

Laos is a country situated northeast of Thailand with a population of a little under seven million and a GDP of ten billion U.S. dollars (less than Tottori prefecture, which is the smallest in Japan). There are no direct flights from Japan to Lao PDR, and small shops there remind us of Japan's Showa period (several decades ago), but its economy is growing with

GDP growth of eight percent. There are many tourists from Europe and the United States of America, and tourism is the second largest source of foreign currency income, with the mining industry being the first.

The mobile phone penetration rate is over 100 percent, but there is still plenty of room for growth in the IT industry. With Lao PDR being the host country for this year's ASEAN Summit, the government of Lao PDR is working on strengthening its domestic IT, and the implementation of this IZmo modular data center is expected to develop even more momentum.

Power outages are a daily occurrence in the neighboring country of Myanmar, but the power in Vientiane is relatively stable. Internet providers are also connected overseas via its international internet gateway LANIC (Laos National Internet Center). While connection can be difficult at times when connecting to Japan using hotel Wi-Fi, rollout of an optical fiber network is progressing, and Vientiane is equipped with the minimum infrastructure required for data centers.

Despite the impression of Laos being hot all year round like Thailand or Singapore, in December and January there are days when the temperature drops to around 15 degrees Celsius. The dry season including December and January is quite comfortable even during the day. Still, for over half the year temperatures like those experienced during August in Japan continue, so it is without a doubt a tough environment for energy savings.

We intend to continue with this joint demonstration project until February 2018, based on the Joint Crediting Mechanism\*. Our goal is to utilize knowledge that can only be obtained through this project and to implement the high-energy saving IZmo modular data center in Southeast Asia as well as other countries.

Now that we have finally been able to start with this project after completing a feasibility study tasked by the Ministry of Economy, Trade and Industry in 2014, we will continue our efforts so that when the question, "What is there in Lao PDR" is asked, the answer will be, "The high quality, highly efficient IZmo modular data center."

\*Joint Crediting Mechanism (JCM): Joint Crediting Mechanism: Mechanism for facilitating diffusion of low-carbon technologies, products, systems, services, and infrastructure, as well as implementation of mitigation actions in developing countries and appropriate evaluation of Japan's contributions to greenhouse gas emission reductions or removals in a quantitative manner to achieve Japan's emission reduction target.

## The Work on Upgrading IIJ's Backbone to 100G Lines Continues

IIJ is incrementally upgrading the backbone that supports the Internet. Here we discuss initiatives between Japan and the U.S. and past initiatives that were carried out on the U.S. West Coast last year.



### Makoto Kawano

Manager of Global Infrastructure Planning Section, Infrastructure Planning Department  
Service Infrastructure Division

Last year IIJ upgraded our backbone between Japan and the U.S., within the U.S., and between Japan and Hong Kong. Here we discuss our implementation of 100G lines between Japan and the U.S. and on the U.S. West Coast.

### Implementing 100 G Lines on the U.S. West Coast

In 2014, IIJ rolled out 100G lines between the core locations of Tokyo, Nagoya, and Osaka. Learning from this experience, next on the agenda was to implement lines between Japan and the United States, which carry a high volume of traffic.

First, in preparation for the Japan to U.S. 100G line connection, we rolled out 100G lines between Seattle, San Jose, and Los Angeles on the West Coast. There were more than ten 10G lines between these three locations to begin with, so all the requirements for implementing 100G lines were in place.

There were two points we were especially careful about for the installation of 100G lines on the West Coast. The first was to maintain redundancy between each line section. For 10G lines we used a redundant design for fiber routes along the same sections as the line provider, for inbound routes at data centers, and for line provider devices. However, when upgrading to 100G lines, there are fewer lines due to each supporting ten times the bandwidth, making a redundant design more difficult. Additionally, when this plan was formulated there were only two line providers that could offer 100G lines with routes distributed between Seattle and San Jose, and between Seattle and Los Angeles, because providers in the U.S. generally used 10G or 40G lines. Consequently, we held a number of meetings with line providers in the U.S., and exchanged detailed information to plan redundancy on the same level as with our 10G lines. As a result these lines have been used soundly up until now, with no major faults.

The second point concerns scheduling and maintenance work during implementation. We had already rolled out 100G lines on the Japan side, but we faced a variety of issues during work to implement these lines overseas. When establishing 10G lines in the past, there were many incidents that would be unimaginable in Japan, such as the discovery that a certain section of the line was not physically connected, as well as delays due to staff not being present on the day that line work was set to take place. In light of this, we allowed for

a longer maintenance schedule than in Japan, and put together a comprehensive switch back plan so that customer traffic would not be affected.

### Implementing 100 G Lines Between Japan and the U.S.

Next, we implemented 100G lines between Japan and the United States. As with the West Coast expansion, we formulated a plan to enable stable operation, taking steps such as breaking up the fiber route for terrestrial cable route and submarine cable sections and the submarine cable landing stations.

Over the course of this we carried out two new initiatives. The first involved connecting international lines to Nagoya, which we had made a core location. Before implementing 100G lines, Tokyo and Osaka were the connection points for Japan-U.S. lines. After we made Nagoya a core location as a disaster recovery measure for our regional bases in Japan, we connected some of the Japan-U.S. 100G lines to Nagoya. This meant that even if a major earthquake like 3/11 struck Tokyo or Osaka, we would be able to maintain redundancy between Japan and the U.S. on a city level.

The second new initiative was to implement an MPLS network\* to make traffic adjustment easier on the West Coast, which carries a large volume of traffic. Putting an MPLS network in place on the West Coast made it possible to set up virtual lines flexibly without worrying about the physical lines between Japan and the U.S., and this enabled traffic change to be carried out more easily than the previous configuration. This also meant we were ready to carry non-Internet traffic such as traffic between cloud systems over MPLS infrastructure.

Initiatives such as these mean we are able to carry customer traffic from the U.S. securely and stably, and we are ready to offer new services to customers in the near future.

Incidentally, 100G lines and interfaces are no longer a rarity now, but around 2014 when we were looking into implementing them they weren't applied to commercial solutions in the U.S. all that often.

As with this upgrade to 100 G, IIJ will continue to actively implement the latest technologies, taking the initiative in the Internet world.

\*MPLS (Multiprotocol Label Switching) networks are networks comprised of routers featuring packet forwarding technology that uses tags called labels.

## Cover Message “Cherries”

It is said that cherries take a lot of effort to grow well, and they are harvested by hand with great care. April is the season when many newly hired employees start work, and others embark on a new life. If you were to express this feeling of excitement, I think the color of cherry pink would be a good match. Although society is faced with serious issues, I believe that staying hopeful for the future could be an important factor in holding on to zest for life.

Shino Suefusa

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