Okinawa Open Laboratory
Operation Summary and further action

FEB 2017

Okinawa Open Laboratory
Summary
(2013~2016)
### About

- **Institute Name**
  - Okinawa Open Laboratory, Incorporated institute
    Abbreviated as Okinawa Open Labo and OOL

- **Established**
  - 8 MAY 2013 at Okinawa Shinryyo Park (Suzaki, Uruma-City) by NTT Communications, NEC Corporation and iiga

- **Head Office**
  - 201 Okinawa Information and Communication Center, 61-1 Kanekadan, Uruma City, Okinawa, Japan 904-2241
    TEL: +81-98-989-1940
    Web: [http://www.okinawaopenlabs.org/](http://www.okinawaopenlabs.org/)
    Facebook: [http://www.facebook.com/okinawaopenlabs/](http://www.facebook.com/okinawaopenlabs/)

- **Representative**
  - Chairman Yukio ITO

- **Purpose**
  - Research and development for practical application and dissemination of advanced ICT infrastructure technologies

*1 Information and Communication Technology
I. Okinawa Open Laboratory is original international R&D institute to lead integration of advanced networking and cloud computing

- **Research Field (SDN/NFV+Cloud)**
  - Advanced Networking
    - SDN (Software-Defined Networking)
    - NFV (Network Function Virtualization)
  - Cloud Computing
    - OpenStack (OSS*1 Cloud infrastructure)
  
*1 Open Source Software

II. Promote “Okinawa Smart Hub Concept” by operation of above I

- Establish foothold in Okinawa to exchange person, information and technologies from both abroad and domestic enterprises
- Advance enterprises and engineers in Okinawa
Operation and Contribution

Exchange people and enterprises in Okinawa
Promote to establish and invite to Okinawa
Advance engineers and enterprises in Okinawa
Raise international name value of Okinawa

Operation
original Operation in world is conducted on Okinawa

Contribution
Okinawa Smart Hub concept is realized

Strength of Okinawa
(Geometrical location, Support by prefectural government, Environment, Human Resources...)

REF
Main Operation and Policy

- Main Operations are Research and Development, Human Resource Development and Conduct International Conference according to the purpose of establishment
- Collaborate and Cooperate with industries, institutes, academia, communities and standardization organization to collect technologies, knowhow and human resources
I. Laboratory was established in May 2013, II. Main Three operations were started at AUG 2013 by awarded “Subsidy for establishment of foothold of Cloud Open networking research and development”, III. Extend office to Jitchaku, IV. Move to Kanekadan to extend Three tenants, V. Consolidate to two-tenants

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<td>Establish and Promotion</td>
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<td>Collect members</td>
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<td>Collaborate and Cooperate with International organizations and communities</td>
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<td>Collaborate with Asia</td>
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<td>Annual Meeting</td>
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<td>Operation of Testbed</td>
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<td>Verify advanced technology and develop original technology</td>
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<td>Release development result as OSS</td>
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<td>Investigate original usecase</td>
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<td>Public Relations</td>
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<td>Human Resource Developmen</td>
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<td>International Conference</td>
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<td>original Conference oriented in Okinawa</td>
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<td>Other conference sponsored or cooperated</td>
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<tr>
<td>International Exchange meeting in Asia</td>
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# Result of FY2016

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<thead>
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<th>Item</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
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<td>OPNFV Community visit Open Labo</td>
<td>Present OPNFV summit</td>
<td>Exhibit on JANOG</td>
<td>Usecase Seminar (Block Chain)</td>
<td>Exhibit on Com Forum</td>
<td>Present on CTC Forum</td>
<td>Usecase Seminar (Machine Learning)</td>
<td>Exhibit and Present on OOD</td>
<td>Present on ICM</td>
<td>Research congress (NII co-research result)</td>
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<td><strong>Testbed Operation and Maintenance</strong></td>
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<td>Consolidate to 2 tenants</td>
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<td><strong>Human Resource Development and International Conference</strong></td>
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<td>Basic Seminar</td>
<td>Hands-on Seminar</td>
<td>SDN/Cloud Seminar (Satellite)</td>
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<td>Member Exchange meeting</td>
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<td>Result report meeting of 3 years</td>
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**Specialist produce program**

▲Start advertise ▲Mini Programming contest ▲1st Concentration meeting ▲2nd Concentration meeting

**New Testbed system Development** ▲Programm contest ▲Okinawa Open Days 2016 ▲Annual Meeting International Exchange with Malaysia ▲
Result(1)

- **Research and Development**
  - **Verification of advanced technologies > Advanced technologies based on OSS**
    - Distributed Network Controller, Multi data center connection, E2E Orchestration, Service Chaining, inter-cloud, Multi-network collaboration and so on...
  - **Development of original technology > Development of Software-Defined Anything for automated functionality**
    - OpenFlow Patch (OF-Patch): OSS, Special Award of Science division in Interop Tokyo 2015
    - OpenStack w/SDN as a Service VNF test automation, L1Patch Applied NW test system
  - **Operation and Maintenance of Testbed > Providing test environment service with large scale of servers for members**
    - Technology verification, technology development, Proof of Concept, Showcase, member forum, Human Resource Development (Hands-on Environment), ...
  - **Public Relations > Present and exhibit on Major events of cloud SDN**
    - Interop, OpenStack Summit, OpenStack Day, OpenDaylight Summit, SDN Japan, ...
  - **Research of Usecase > Research unique usecase with cross border collaboration**
    - SDSG (cross border Workshop): Tourism, Medical, Public politics, Mass media, Online Game, Academia, Community development
  - **Research environment across organization > Promote open collaboration for engineers**
    - Provide framework to promote co-development and co-verification
Result (2)

- **Human Resource Development**
  - Bottom-up skills, Expand ranges (Basic) > More than 1900 Attendees
    - Basic Seminar, Class-room Seminar, Hands-on Seminar...
  - Training for advanced engineers (Advance) > 36 attendees were produced as specialist
    - Specialist produce program, Code review, BOF/Hackathon, Program Contest, International Exchange meeting...

- **International Conference**
  - Conduct International Conference > More than 3,000 attendees
    - Okinawa Open Days, iPOP...
  - Conduct International Exchange meeting > Collaboration with community and conducted in Asia
    - OpenStack/SDN Round table, Security Hackathon, Taiwan-Japan SDN International Exchange Meeting, OpenStack Ops Meetup...
**Office Location**

- Based on 3 locations in Okinawa
  - MAY 2013 Starting Office at Okinawa IT Shinryo Park*1
  - JUL 2014 Expand office to Jitchaku*2 as research facility
  - JUL 2015 Moving Office and research facility to Kanekadan*3

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*1 Office and Research Facility (Suzaki, Uruma-City)
*2 NTT Communications Naha-Jitchaku (Urasoe-City)
*3 Okinawa Information Communication Center (Kanekadan, Uruma-City)

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In action at Kanekadan
Total 10 engineers are working on there

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More than 500 guests visited OOL facilities

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Testbed Network
- 3 branches in Okinawa (Closed WAN)
- Remote connection to Tokyo (Closed WAN)
- International Connection (Internet VPN)
Consolidation of Testbed Facility FY2016

- Main Site: NTT Com Jitchaku
  - Deploy system infrastructures and resources
- Sub Site: Okinawa Information Communication Center (Kanekadan)
  - Deploy part of resources
- Support Wide-area operation
- OF-Patch realized virtual unified data center

**Main Site:**
- NTT Com Jitchaku
- Deploy system infrastructures and resources

**Sub Site:**
- Okinawa Information Communication Center (Kanekadan)
- Deploy part of resources
- Support Wide-area operation
- OF-Patch realized virtual unified data center

**AUG 2016**
- Consolidated
  - > Scalable, Efficient

**Closed WAN in Okinawa**

- **SINET**
- **NTTCom WAN**

- **Okinawa Information Communication Center**
- **Jitchaku**
- **Taiwan**
- **Korea**

- **SINET**
- **NTTCom WAN**

- **Closed WAN in Okinawa**
  - **OIX**
- **Flexible configuration with Wide area OP-Patch**
- **Computing Nodes**
- **NW Nodes**
- **Instruments**
- **Tokyo**
Members (as of 3 FEB 2017)

Regular member

- NTT Communications
- NEC
- イガ
- CTC
- FUJITSU
- HITACHI

Cooperate member

- NTTPCコミュニケーションズ
- イーサイド
- NECソリューションスイート
- ワンダ
- Quali systems
- AlaxaIA
- Broadband Tower, Inc.
- radware
- NS Solutions

Special member

- ヨシダ
- kbc
- Okinawa県立美来工業高等学校
- 九州産業大学
- Tokyo大学大学院情報学環
- ETRI
- OGC

Total 44 members

- Member from Okinawa (Total 8)
- Member from Asia (4 organizations from 3 regions)
- New members on 2016 (6 organizations)
# Enhancement of programs for members

<table>
<thead>
<tr>
<th>Type</th>
<th>Programs</th>
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<tbody>
<tr>
<td><strong>Research and Development</strong></td>
<td>Forum</td>
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<tr>
<td><strong>Human Resource Development</strong></td>
<td>Open Forum</td>
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<tr>
<td><strong>International exchange and International Conference</strong></td>
<td>Using Testbed</td>
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<tr>
<td><strong>Information and Opinion Exchange</strong></td>
<td>Co-research (Project)</td>
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<tr>
<td><strong>Public Relations</strong></td>
<td>Engineer Dispatch</td>
</tr>
</tbody>
</table>

- Research and Development: Forum, Open Forum, Using Testbed, Co-research (Project), Engineer Dispatch
- International exchange and International Conference: Okinawa Open Days (OOD), OOD Sponsors Program, International Exchange Meeting
- Information and Opinion Exchange: General Meeting, Member Opinion Exchange, OOL Summit
- Public Relations: Co-advertisment, Joint Event

- Programs for Member only
- Programs for everyone
OOL Summit

What Japan shall contribute for future of ICT on Asia

- Location: Bankoku Shinryokan Sunset Lounge
- Date: 2, 3 SEP 2016
- Attend: Executive of members, Government of Okinawa Prefecture, Chairman of OOL III from Taiwan, Presenter, Guest Total 21

- Event for executives of members to have meeting
- Round table discussion by executives
- PoC and Proposal oriented in Okinawa
- Technology Session for 5G network and IoT

What Japan shall contribute for future of ICT on Asia
International Collaboration with communities and organizations

- Collaborate and support Research and Development activities, Human Resource Development programs and International Conference
- Organize International Exchange meeting and Joint Event

★ Member of OOL  ★ OOL Joined as member
Collaboration with community

- Establish OPNFV community labo
- Utilize as development and verification laboratory for OPNFV community in Asia wide
- Contribute to promote OPNFV in all Asia
- Publish OpenDaylight configuration guide as book
- Result and knowhow to configure OpenDaylight on Labo by OOL members were published as guide book
Maintain and Utilize Testbed (1)

- Result of Research and Development is utilized as common infrastructure of OOL activities

Utilizing Testbed

Technology verification Test Lab
Technology development
Public Relations
Usecase Research Proof of Concept
Human Resource Development (Hands-on)
International Conference (Showcase)

Maintenance and Operation for Testbed

Environment Maintenance
Basic Function development
Multi tenant/ Wide area
Efficientize / automation
SDx/ API Enhancement
System Configuration /Integration
System Extension
System improvement/Enhancement
OpenStack
ONF / OpenDaylight
OPNFV
Planning
Development
Operation
Maintenance

Technology verification
Test Lab
Maintain and Utilize Testbed (2)

- MIAC presented Testbed as an example of best practice

Article written by MIAC
Nikkei Communication JUN 2016

Presentation slide at JUN 2016
by Mr. Minami Director-General for Policy Planning
Example of Project activity

- L1Patch NW test system Project (NW test automation PJ)
  - Abstract
    - Development of software-defined and automated network test with SDN Technology. Verify result and effect, release as open source
  - Project Team
    - OOL and engineers from 7 members shared issue, then each of them brought idea and experience of Network test to develop and verify technologies
Development of OF-Patch

Background

- 従来のパッチパネルの問題点
  - 物理的な配線を手動で切り替えるため・・・
  - 人が現地に行き作業する必要がある
  - 配線ミスが起こりやすい
  - ケーブルの取り回しが煩雑である
  - 人の作業があるためシステムの自動化ができない

- 機器の接続構成が頻繁に変更される拠点では、作業効率が悪い・・・

Basic Functionality

- OpenFlow を用いてパッチパネルの機能を実現する

Original Development, Enhancement and Maintenance as OSS on Okinawa Open Laboratory

Scaling

- OF-Patchによる大規模NWの運用を可能にする

Width-Area

- 各拠点に散在するリソースから任意の実験ネットワークトポロジを構築可能にする
- 既存のOF-Patchの問題点を解決

Leaf-Spine Network

- 直感的なGUIを開発
- 手作業と煩雑な配線を排除する
- 叶-スパイン構成マルチスイッチ化で大規模化
- 最大1920Portまで拡大

Leaf x 48

Spine x 4

48Portから最大1920Portまで拡大

Okinawa Open Laboratory
Use case Research

Various Application Use Case Solution

- Medical Healthcare
- Tourism Entertainment
- Smart City
- Mobility
- Education

Possibility to utilize Advanced ICT

Reduce limitation of distance and time, Expand possibility of human, Creation better life and entertainment

Advanced ICT

- IoT
- Big Data
- AI Machine Learning
- Robot
- Security

Need to transport huge data, computing resources
Enhance, Flexibilize and automate Functions to Collect, Store, Process Data

Enhance Network Function (SDN/NFV)

+ Cloud Computing (OpenStack)

Computer in Network

Okinawa Open Laboratory support
<table>
<thead>
<tr>
<th>Event Type</th>
<th>Date</th>
<th>Location Details</th>
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<tbody>
<tr>
<td>1st Internet Multimedia</td>
<td>20 MAY 2014</td>
<td>@NEC Shiba Club (Tokyo)</td>
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<tr>
<td>2nd Tourism, Public Politics</td>
<td>25 AUG 2014</td>
<td>@Itoki SYNQA (Tokyo)</td>
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<td>3rd Healthcare, Medical</td>
<td>12 SEP 2014</td>
<td>@Itoki SYNQA (Tokyo)</td>
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<tr>
<td>4th Media</td>
<td>28 NOV 2014</td>
<td>@Okinawa Jichikaikan (Okinawa)</td>
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<td>5th Online Game</td>
<td>28 FEB 2015</td>
<td>@IT Shinryo Park (Okinawa)</td>
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<td>6th Education</td>
<td>23 APR 2015</td>
<td>@The Beach Tower (Okinawa)</td>
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<tr>
<td>7th Community Development</td>
<td>31 JUL 2015</td>
<td>@Lequios Membership Salon (Okinawa)</td>
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- **Okinawa Open Days 2014 Special Session “Medical”**
  - 12 DEC 2014 @Okinawa Jichikaikan (Okinawa)

- **Round Table of Directors “Medical”**
  - 2 JUL 2015 @Lequios Membership Salon (Okinawa)

- **Okinawa Open Days 2015 SDSG Session “Education / Contents / Social System”**
  - 16 DEC 2015 @Okinawa Jichikaikan (Okinawa)

- **“New study case developed with local community and Human Resource Development ~Challenge of Nanjo-City on Okinawa”**
  - 25 MAR 2016 @Itoki SYNQA (Tokyo)
1st Possibility and Impossibility of Block chain technology and new social Infrastructure
Lecturer: Dr. Kenji Saito (Keio Univ, SFC Senior Researcher /CSO of Block Chain HUB Corporation)
Date: 19 JUL 2016
Location: Naha IT Sozokan (Okinawa)

2nd Machine Learning Hands-on Seminar in Okinawa
Lecturer: Dr. Makoto Otuka (Doctor of Engineering/ Freelance Researcher)
Date: 29 SEP 2016
Location: University of Ryukyus Engineering Div. (Okinawa)

3rd CivicTech – Improve City by Coding - Operation, Planning, developer and government consider example of advanced city “Kanazawa City” together at Okinawa
Lecturer: Mr. Ken’ichiro Fukushima (Chairman of Code for Kanazawa /President of iPublishing
Mr. Akira Matsumoto (ICT promotion officer at Information policy section of Kanazawa City)
Mr. Koji Nakanishi (Chief of Information policy section in Okinawa Prefecture)
Mr. Naoto Miyagi (Group Leader of Industrial policy division)
Mr. Hayato Miyagi (Supervisor of Industrial Policy division)
Date: 20 OCT 2016
Location: Okinawa International Youth Hostel (Okinawa)
Open Forum

- Ansible Workshop
  - Date: 11 NOV 2016
  - Location: OOL (Kanekadan) – Tokyo (Japan Virtualization Technology)
  - Lecturer: Mr. Hideki SAITO (Internet Initiative Japan)
  - Abstract: Tutorial, Hands-on and Workshop for Ansible Control white box switches and VNFs with Ansible

- Ansible Hackathon
  - Date: 9 – 11 FEB 2017
  - Location: OOL (Kanekadan)
  - Lecturer: Mr. Hideki SAITO (Internet Initiative Japan)
    Mr. Dai NISHINO (Broad Band Tower)
  - Abstract: Confirm and verify how network devices support Ansible
Framework of Human Resource Development

- Industry, Community and Academia collaborated to train person to be active international engineer
  - OOL planed, coordinated, organized and promoted
  - Synergy with Research and Development
    - Engineers helped Human Resource Development activities, Utilize Testbed, Present Research result, ...

International Talent

Industry/Community (International human network)

Okinawa Open Laboratory (Plan, Coordination, Organizing, Promotion)

Okinawa Prefecture (Support, Subsidy)

Academia (Selection of candidate)

University of Ryukyus, Okinawa National College of Technology, Mirai Technical High School, KBC, ...

...
FY2015 Specialist Produce Program

- Produce practical engineer with training programs and mentors
  http://www.okinawaopenlabs.org/specialist/

Schedule

- MAY Start Advertising
- 12 JUN Closed out, Selection
- 24 JUN Advanced Interview
- 1 JUL 1st Meeting
  (Introduce programs and entrants by themselves)
- JUL-AUG Theme suggestion, Level check for entrants
  Face to Face meeting (every week)
- 6 AUG 2nd Meeting (Decision of Theme)
  Internship (Applied from Entrants)
- 28 AUG Mini Program Contest (Mandatory)
- DEC Program Contest (Mandatory)
- 5 FEB OOL Annual Meeting (Present result report)

Entrants (Total: 13)

- University of Ryukyus (Special member)
- KBC (Special member)
- Kobe Institute of Computing (Special member)
- KEIO University (Special member)
- Kyoto Sangyo University
- Broad Band Tower (Sponsor member)

Executive Committee (Mentors) (Total: 12)

- SDN Expert
  Mr. Tomonari FUJITA, Mr. Yoshihiro NAKAIIMA
  NTT Software Innovation Center, NTT Advanced Research Institute

- Academia
  Mr. Shin’ichi FUCHIGAMI, Mr. Teruaki YOKOYAMA
  KBC (Special member), Kobe Institute of Computing (Special member)

- Local Company
  Mr. Hitoshi TSUSHIHASHI
  OKIT (Sponsor member)

- Vendor
  Mr. Yoshihiro ONODERA, Mr. Yoshihiko KANAMI
  Cisco (Sponsor member), NEC (Regular member)

- Okinawa Open Laboratory
  Mr. Harumi IKEDA, Mr. Keiichi KOBAYASHI, Mr. Ryo KURAHASHI,
  Mr. Jun’ichi MATAYOSHI, Mr. Jumpei MARUYAMA
Specialist Produce Program (FY2016)

- Joined 23 entrants from 9 teams, more than FY2015

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<th>Team</th>
<th>Organization</th>
<th>Entrants</th>
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<td>Kyushu Noko Laboratory Team</td>
<td>Kyushu Sangyo University</td>
<td>3</td>
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<tr>
<td>Open Hokuriku Team</td>
<td>NTT Neomate Hokuriku Branch</td>
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<td>Mckee Team</td>
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<td>Goma Ichigo Team</td>
<td>University of Ryukyus</td>
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<td>SecLab Team</td>
<td>Okinawa National College of Technology</td>
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<td>Nantonaku Megane Team</td>
<td>Kyoto Sangyo University</td>
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<td>Stone Hill Team</td>
<td>Kobe Institute of Computing / Kyoto Sangyo University</td>
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<td>Manbo Team</td>
<td>Kobe College of Computing</td>
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- SecLab Team (Okinawa National College of Technology) won Grand Prix at Program Contest on Okinawa Open Days 2016
  - Theme: Quarantine system to mitigate information incident
    ⇒ Judges gave positive feedback for their advanced technology and outstanding presentation
  - Presentation is scheduled on International Exchange meeting in Malaysia at March
Okinawa Open Days 2015

Industry’s first, Cloud/SDN unified International Conference organized by OOL

- Location: Okinawa Shichoson Jichikaikan
- Date: 14 – 18 DEC 2015
- Support: Okinawa Prefecture and CCDS

Sponsor: 11 Organizations    Cooperation: 7 Organizations

- 49 Keynotes in 5 days, Provided simultaneous translation
- Total 815 attendees (45 attendees from 9 regions)
- Governor Onaga gave Opening address

Industry's first, Cloud/SDN unified International Conference organized by OOL
Okinawa Open Days 2016

Gather Ideas and Open technologies to change world

Location: Okinawa Shichoson Jichikaikan
Date: 5 – 8 DEC 2015
Support: Okinawa Prefecture, CCDS and IIA

Sponsor: 14 Organizations
Cooperation: 8 Organizations
Exhibition: 11 Organizations

39 Keynotes in 4 days, Provided simultaneous translation
Total 780 attendees (41 attendees from 7 regions)
Various technologies and activities were introduced with 5 themes
Open exchange forum without border of technology, organization and fields

Theme 1
Introduce of Latest trend for Open Source Platform, technologies and application

Theme 2
Activities of Open Technologies on abroad

Theme 3
Introduce and Discussion for ICT local politics

Theme 4
Introduce of Activities of Okinawa Open Laboratory

Theme 5
Discussion for latest Usecase and related technologies
Okinawa Open Days 2016 on Media

- Newspaper
  - Advertisement
    - 3 DEC Ryukyu Shimpo
    - 4 DEC Okinawa Times
  - Article of ONOS Hands-on
    - 6 DEC Ryukyu Shimpo

OOD Advertisement by Okinawa Times at 4 DEC

Article of ONOS Hands-on by Ryukyu Shimpo at 6 DEC

OOD advertisement by Ryukyu Shimpo at 3 DEC
- Introduced on Communities
  - OpenDaylight Official Site
  - OPNFV Official Site
  - Japan OpenStack User community

- Nikkei NETWORK
  - SDN engineer gathers Focus on Automated test

- News on Internet
  - “NetTester” may break through spreading of SDN (ITPro News)
Collaboration with Asia

- Collaboration was promoted with Taiwan and Malaysia
  - Member
    - Taiwan, Korea, China, Malaysia: Sponsor Member(3), Special member(3)
  - People Exchange
    - Taiwan: Engineer was dispatched from III to OOL every year from 2014
  - Joint Research
    - Taiwan, Korea, China: Joint verification project via NEAOSS*1
      *1 North East Asia OSS Promotion Forum
  - Interconnection between Labs
    - Taiwan, Korea: Connected for Co-Research
  - Joint Event
    - Taiwan: International Exchange meeting was organized with III
    - Malaysia: International Exchange meeting was organized with University of Kuala Lumpur

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<th>Joint Research</th>
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Taiwan-Japan SDN International Exchange

- International Exchange meeting was conducted by invitation from III
  - Date: 10 AUG 2015
  - Location: TAF (Taiwan Air Force) Innovation base Library 2F
  - Organizer: III, NCTU/NBL (National Chiao Tung University Benchmarking Laboratory)
  - Support: DOIT/MOEA (Ministry of Economy and Technology Affair)

<Opening Ceremony>  <Keynote session of OOL>
International Exchange Meeting on Malaysia

- **Event**
  International Symposium of IoT Cloud Infrastructure Technology (IoT-CIT)

- **Date, Location**
  7 MAR 2017, University of Kuala Lumpur (UniKL)

- **Organizer**
  UniKL, OOL

- **Sponsor**
  Okinawa Prefecture, MARA (Malaysia Education Foundation)

- **Purpose**
  Establish SDN/NFV, cloud, IoT and Infrastructure technology in Malaysia

- **Program**
  - **Day1** Seminar and Hands-on (OpenStack, Trema, OpenDaylight, NFV)
  - **Day2** Keynote, Presentation, Party

- **Planned Attendees**
  - **Malaysia** UniKL, Academia, Government, Local Company
  - **Japan** OOL, OOL member (Lecturer, Presenter)
    Grand Prix Winner of Program Contest
    Okinawa Prefecture
  - **Other** OpenStack Foundation (Australia)
    OpenDaylight (India), III (Taiwan)
Further Activities
Direction of Activities

- Research and Development
  - Promote “Virtualize × Advance”
  - PoC for unique Usecase
    - Plan and Promote PoCs based on advantage of Okinawa (location, Environment)
    - Promote collaboration with various people and organizations (Companies, Communities, local government and citizens)

- Human Resource Development
  - Enhance programs by More strong collaboration of Academia, Industry and Community
    - Enhance Specialist Produce Program

- International Conference
  - Okinawa Open Days
    - Interchange of Various technology and People
    - Share and publish Usecases
  - Enhance Presence on international exchange activity on Asia
    - Taiwan, Malaysia, ...
Promotion of “Virtualize x Advance”

Contribute to spread and utilize ICT Infrastructure technology by promoting Virtualization and Advance

Virtualize x Advance
SDx technology for Anywhere

SDx x Any
AI, IoT, Security:

SDN
SDN/NFV + cloud(Unify)

Verify > Utilize > Spread
Action for PoC

Promote PoCs based on advantage of Okinawa (location, Environment) by collaboration with various organizations.

Enterprise (ICT User) ×
- Community (Open Source)
- Okinawa Open Laboratory (Testbed)
- Academia (Human Resource Development)
- Government (openData)
- Citizens (CivicTech)

Geometric condition
- cloudDC
- Submarine Cable
- Special Trade Zone
- Okinawa IT Measure PoCs
International Exchange Activities

Established close relationship with Malaysia and Taiwan. Various activities will be started after International Exchange Meeting on 7-8 MAR 2017 as a trigger.

- **People Exchange > Internship**
- **Joint Research > OF-Patch**
- **Human Resource Development > Dispatch Lecturer, Share Document**
- **Joint Event > International Exchange Meeting**