

# Allied Telesis SDN/OpenFlow Activity Introduction

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2018 Q2

AlliedTelesis K.K.  
Global Product Marketing 2

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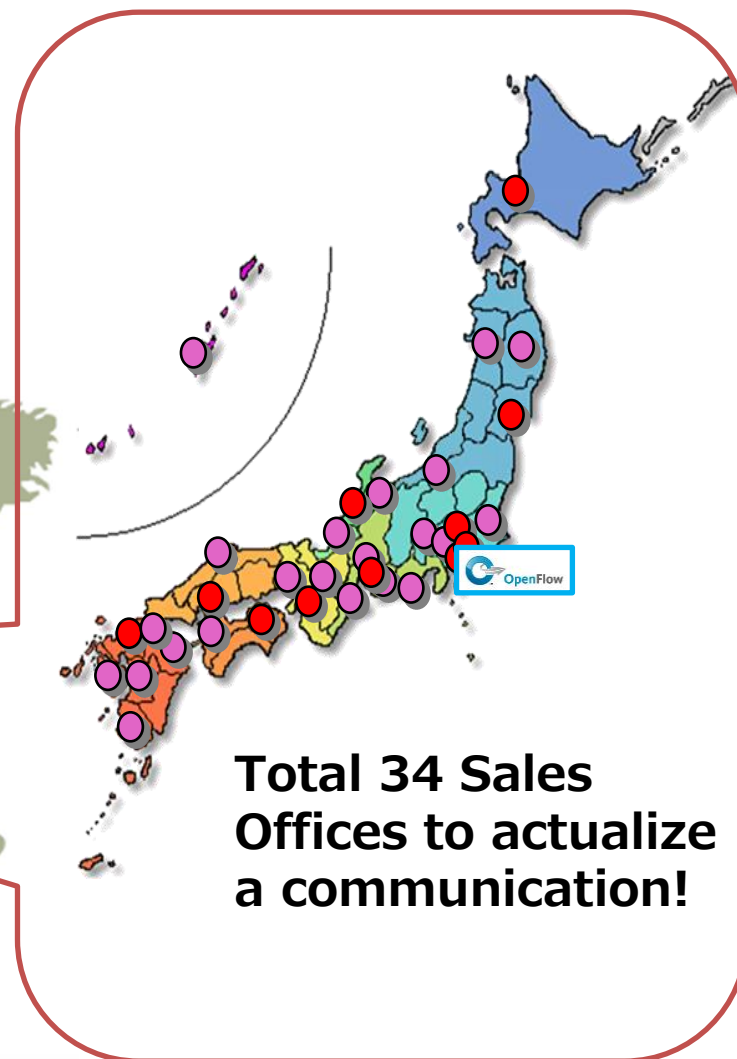
## Last2. Allied Telesis Latest Market Approach

# 0. Corporate Introduction

## □ Profile

- Company name: Allied Telesis Holding K.K
- Established: March 9, 1987
- Head Office: No2. Bldg., Shinagawa, Tokyo Japan.
- Capital: 9,988 million Yen ( as of Dec 31, 2017)
- Number of Employees: 1,621 ( as of Dec 31, 2017)
- Chairman and CEO: Takavoshi Oshima

43 Group Companies is worldwide(38 Countries)



**Total 34 Sales Offices to actualize a communication!**

# R&D Center and Factory

Promoting the R&D of Cutting edge Solution!

## R&D Center

We have R&D facilities around world to promote cutting edge solution



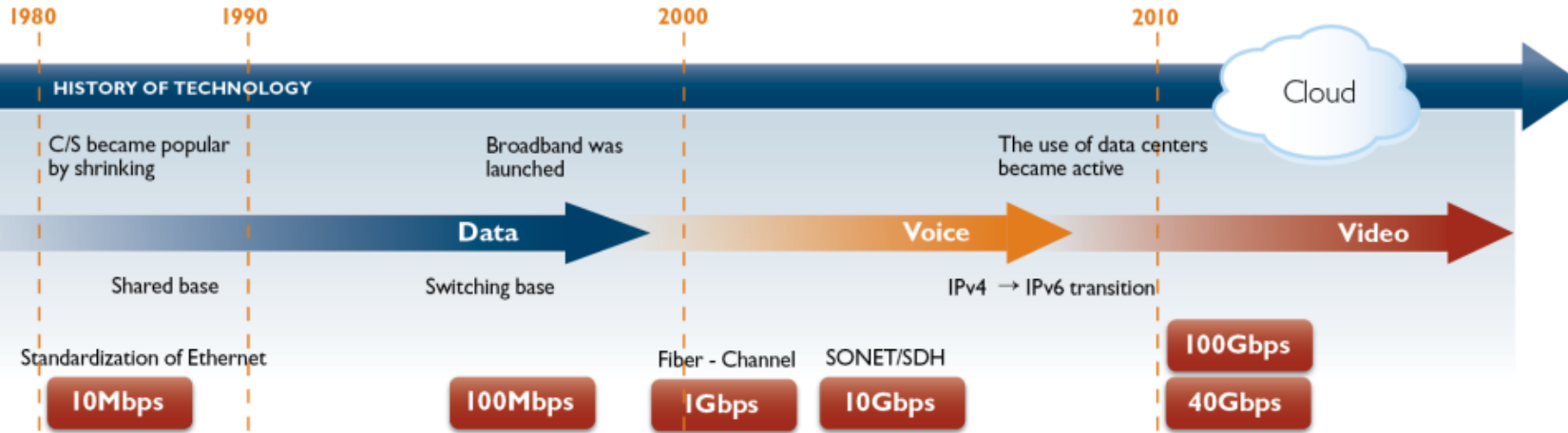
Advanced Production Technologies and Cost Competitiveness.

## Factory

We have maintained a high level of cost competitiveness in the market while providing product of Japanese Quality

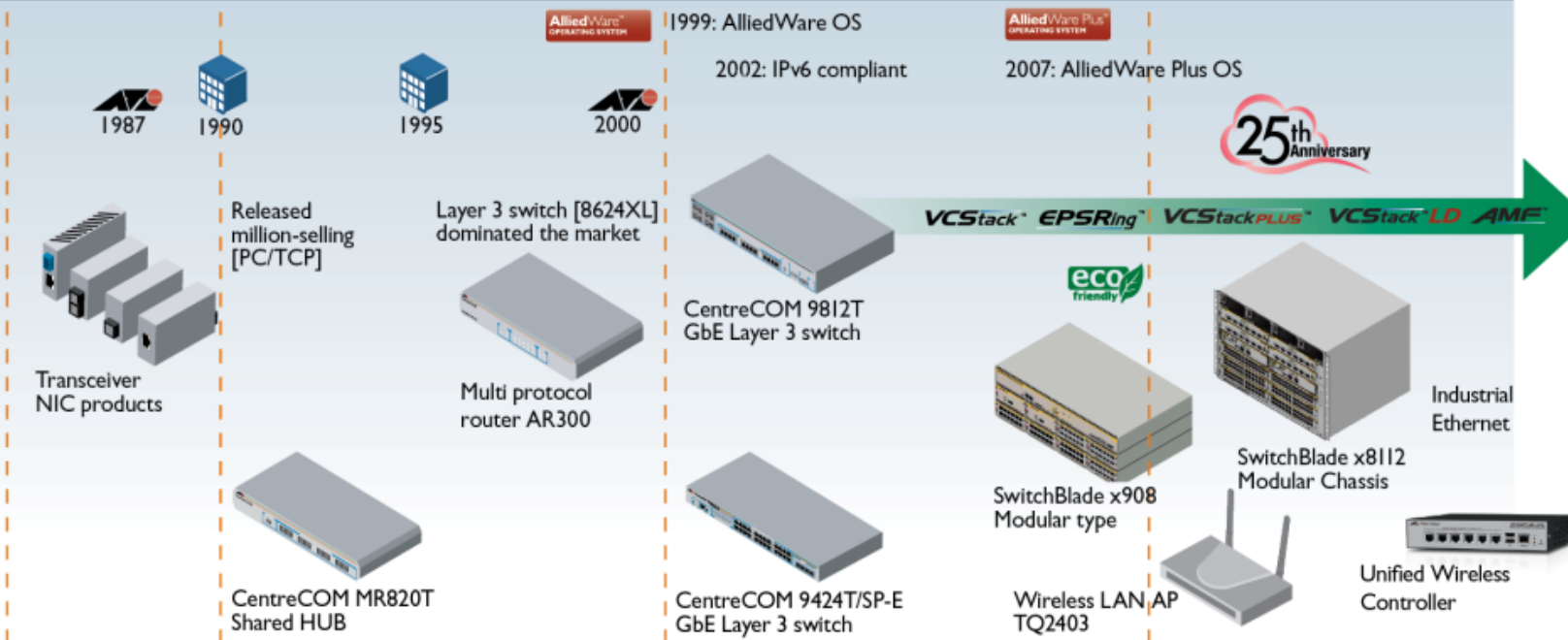


# Brief History of our technology evolution



- 1987**  
Allied Telesis K.K. established in Japan  
Allied Telesis Inc. established in U.S.
- 1990**  
Jan: First European subsidiary opened (UK)
- 1995**  
Mar: Warehouse facility in the Netherlands established
- 2000**  
Allied Telesis K.K. listed on the Tokyo Stock Exchange

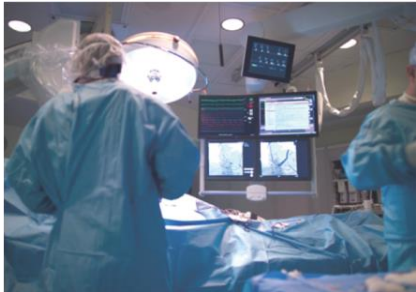
## HISTORY OF ALLIED TELESIS



- 2009**  
First Eco-Switch produced
- MEMBERSHIPS**
- FTHC  
Fiber-to-the-Home Council
- MEF  
Metro Ethernet Forum
- ATA  
Aerospace Industries Association
- ONF  
Open Networking Foundation

# Installation record/Market Share in Japan

Healthcare



Local Government

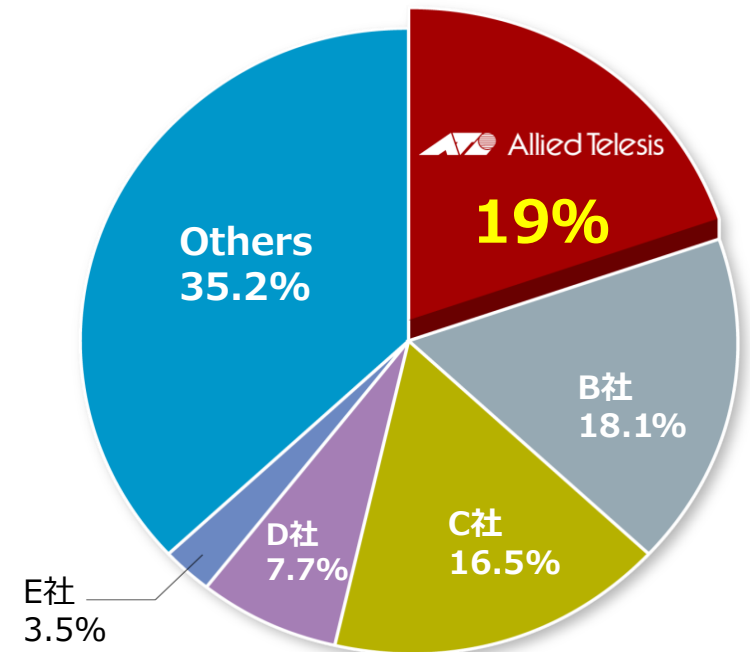


Elementary/Junior High School



●件数：最近5年間（2009年～2013年）の累積。

Number of Port Shipment



- IT専門調査会社IDCJapanの数値（単年度）をもとに当社集計。
- 国内イーサネットスイッチ市場とは国内通信事業者向け、および企業向け市場を合わせた全てを対象。（レイヤー4-7スイッチは除く。）

# 1. OpenFlow feature ready products



**SBx908GEN2  
Modular Chassis**

## Flow numbers

The maximum number of simultaneous active flows depends on the number of ACLs available. This is because active flows use ACLs. The following table shows the maximum number of ACLs available on each switch series:

SWITCH SERIES	MAXIMUM NUMBER OF FLOW TABLE ENTRIES (based on firmware version 5.4.7-1.x)
SBx908GEN2	4088
X930	2037
x510	245
DC2552XS/L3	757
x550	511
x310	117
x230	117
IE300/IE510	245



**AT-DC2552XS**  
1/10G SFP+ X 48Slots, 40G  
QSFP+ X 4Slots



**AT-x310 series**  
10/100BASE-TX and SFP X  
2Slots Intelligent Switch



**IE300 series**  
Industrial Switch



**AT-x930-28/52GTX/GPX,28GTSXz**  
1/10G SFP+ X 48Slots, 40G  
QSFP+ X 4Slots



**AT-x550-18XTQ/18XSQ**  
SFP+ X 16Slots | 1/10G X 16Ports  
+ 40G QSFP+ X 2Slots



**AT-x510 series**  
10/100/1000BASE-T X 24/48ports,  
SFP/SFP+ X 4Slots 10Gbe Ready  
Intelligent Switch



**AT-x230 series**  
10/100/1000BASE-T  
X 8/16/26ports, SFP X 2/4Slots  
Intelligent Switch



**AT-TQ4600-OF13**  
Wireless AP with IEEE  
802.11a/b/g/n/ac  
Support 2.4GHz/5GHz Access

# 2. Ryu score for x930.

layout: default title: Ryu Certification - AlliedTelesis x930

## Ryu Certification

Default: SinglePacket

- AlliedTelesis x930
- Configuration - See Below

	OK	ERROR
<b>Action</b>	31	25
(Required)	(3)	(0)
(Optional)	(28)	(25)
<b>set_field</b>	106	64
(Optional)	(106)	(64)
<b>Match</b>	528	186
(Required)	(107)	(1)
(Optional)	(421)	(185)
<b>Group</b>	8	7
(Required)	(3)	(0)
(Optional)	(5)	(7)
<b>Meter</b>	0	36
(Optional)	(0)	(36)
<b>Total</b>	673	318
(Required)	(113)	(1)
(Optional)	(560)	(317)

layout: default title: Ryu Certification - AlliedTelesis x930

## Ryu Certification

Special: DoublePacket

- AlliedTelesis x930
- Configuration - See Below

	OK	ERROR
<b>Action</b>	14	42
(Required)	(3)	(0)
(Optional)	(11)	(42)
<b>set_field</b>	63	107
(Optional)	(63)	(107)
<b>Match</b>	320	394
(Required)		
(Optional)		
<b>Group</b>		
(Required)		
(Optional)		
<b>Meter</b>		
(Optional)		
<b>Total</b>		
(Required)		
(Optional)		

The screenshot shows a GitHub pull request interface. At the top, it says 'osrg / ryu-certification' with navigation links for Watch (7), Star (2), and Fork (4). The pull request title is 'Adding Allied Telesis OpenFlow switches #1' and it is marked as 'Open'. The description states: 'This patch will add Ryu scores for Allied Telesis OpenFlow Switches - AT-x930 and AT-x510'. It shows the commit hash 'c2f6633de794f73adaf90ba632fc6f76e027b03' and the file 'switch/Allied Telesis\_x510.md' with 1,952 lines of code. A 'Load diff' button is visible at the bottom.



# 3. 2015 Fall OVS Con, Presentation.

## Implementing OpenFlow on a hardware switch - OVS Conference 2015



### High-level timeline

- Dec/2013 – First look at OF-DPA
- Jul/2014 – Another look at OF-DPA
- Oct/2014 – Plugfest in Wellington, NZ
- Nov/2014 – ONF plugfest, Roseville, CA
- Feb/2015-today – New OpenFlow project team in San Jose office

**Open vSwitch 2015 Fall Conference**

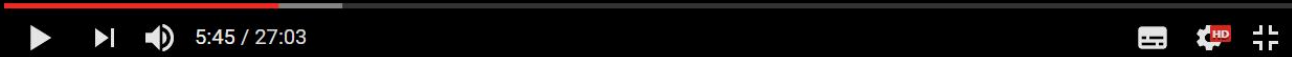
The Open vSwitch 2015 Fall Conference was held at the San Jose Doubletree on November 16 and 17, 2015.

**Schedule**

Talks on Monday, Nov. 16, 2015:

Title	Slides	Videos
Welcome (Ben Pfaff, VMware)	PDF	Video
Keynote: <b>Open vSwitch Musings</b> (Chris Wright, Red Hat)	slides.com	Video
Opening Talk: <b>Introduction to OVN, the Open Virtual Network for Open vSwitch</b> (Russell Bryant, Red Hat, Justin Pettit and Ben Pfaff, VMware)	PDF	Video
<b>Talks, Session 1</b>		
<b>Geneve: What is it and why is OVN using it?</b> (Jesse Gross, VMware)	PDF	Video
<b>Network Service Headers: Additions to OVS to support Service Function Chaining in the kernel and userspace datapaths</b> (Uri Elzur, Intel, Thomas Graf, Noiro Networks, Russell Bryant, Red Hat, Danny Zhou, Intel)	PDF	Video
<b>Using Open vSwitch to realize NFV and service chaining in a Carrier Network</b> (Jeff Peterson, Entry Point)	PDF	Video
<b>Talks, Session 2:</b>		
<b>MidoNet and the Open vSwitch Datapath</b> (Duarte Nunes, Midokura)	PDF	Video
<b>Mininet and Open vSwitch</b> (Bob Lamb, ON Labs)	PDF	Video
<b>Implementing OpenFlow on a hardware switch</b> (Tony van der Peet, Allied Telesis)	PPTX	Video
<b>Talks, Session 3:</b>		

Implementing OpenFlow on a hardware switch (Tony van der Peet, Allied Telesis)	PPTX	Video
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<http://openvswitch.org/support/ovscon2015/>

# 4. 2016 activities *Hackfest* at Bangalore.



# 5. 2017 ESnet PlugFest.

## News & Publications

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1 800-333-7638 (Inside the US)  
1 510-486-7600 (Globally)  
1 510-486-7607 (Globally)

**Report Network Problems:**  
[trouble@es.net](mailto:trouble@es.net)

**Provide Web Site Feedback:**  
[info@es.net](mailto:info@es.net)

## Berkeley Lab, Google Host Multi-vendor Interoperability Demo of FAUCET SDN Software

APRIL 12, 2017  
Contact: Jon Bashor, [jbashor@lbl.gov](mailto:jbashor@lbl.gov), 510-486-5849

In a real-time demonstration, seven vendors of network equipment came together to successfully test the interoperability of FAUCET, an open-source SDN (software-defined networking) controller. The March 30 event was sponsored by Google, LBLnet (Lawrence Berkeley National Laboratory's internal network) and ESnet, the U.S. Department of Energy's high-speed international network managed by Lawrence Berkeley National Laboratory.



Participants test the interoperability of the FAUCET SDN software in a multi-vendor environment at Berkeley Lab.

The collaborative event was organized to sustain momentum for SDN -- an emerging technology that decouples the network control plane from the actual data which flows across the network on the data plane. By doing so, SDN introduces the concept of programmability into the network, allowing application owners and network operators to customize network software to meet their needs.

For SDN to realize its potential, it must be interoperable among network vendors while bringing different (and advanced) capabilities to network operators. FAUCET enables verification of this interoperability through a common API, OpenFlow, FAUCET, originally developed at REANNZ (New Zealand's research and education network) and the University of Waikato in New Zealand with the support of Google and others, was created to bring the benefits of SDN to a typical enterprise network and has been deployed in various settings.

The SDN environment was built on switches running Openflow v1.3.x. Designed as a drop-in replacement for a non-SDN switch, FAUCET-controlled hardware provides additional SDN based functionality as well (for example, policy based L2/L3 forwarding and multi-vendor stacking). Once each vendor had demonstrated support individually, multi-vendor control and dataplane interoperability were demonstrated by building a virtual switch composed of switches from each vendor, under the control of a single FAUCET controller, able to pass real networking traffic across the room (and therefore a real network).

This demonstration of multi-vendor interoperability creates a collaborative environment between vendors and demonstrates maturity of the Openflow substrate as well as the FAUCET SDN controller, as discussed in a [2016 technical paper on deploying FAUCET](#), coauthored by Googlers Josh Bailey and Stephen Stuart, who supported the event.

FAUCET has been deployed at [multiple organizations across the world](#), and recently was used to host the [NZNOG 2017 meeting in New Zealand](#).

"This live interoperability demo led to some great technical conversations with the vendors, and the enthusiasm of all the participants made this both a productive and enjoyable gathering," said Simeon Miteff, an LBLnet network manager who was the lead organizer of the event.

Josh Bailey, a Google software engineer who is a technical lead on FAUCET and co-author of the paper with Stuart, found the hands-on demo useful as he made the rounds of vendors, answering questions and helping to debug the installs.

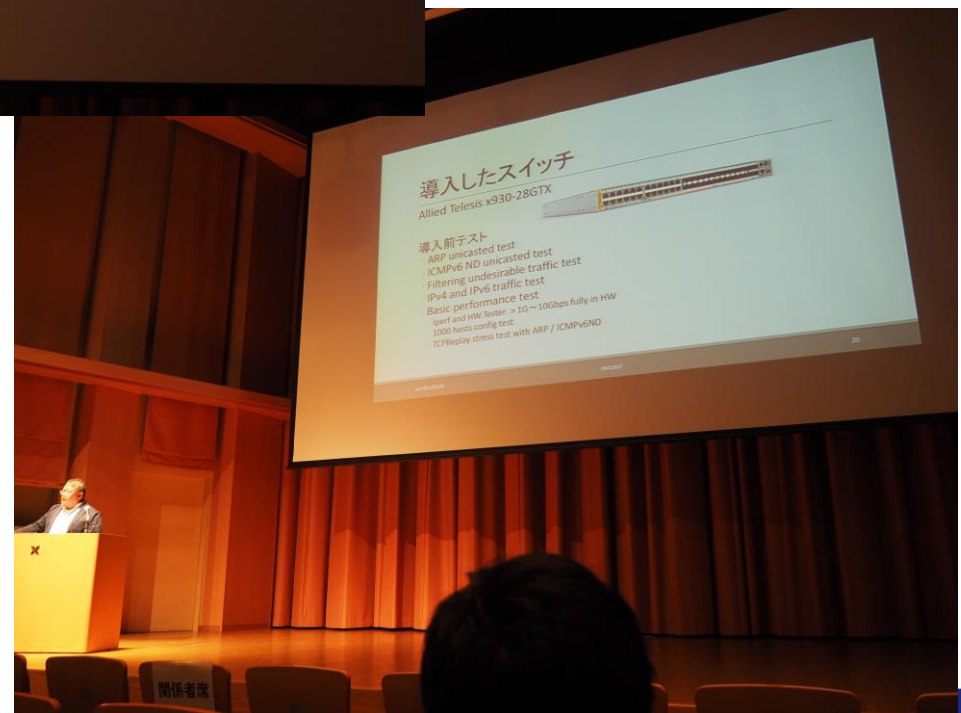
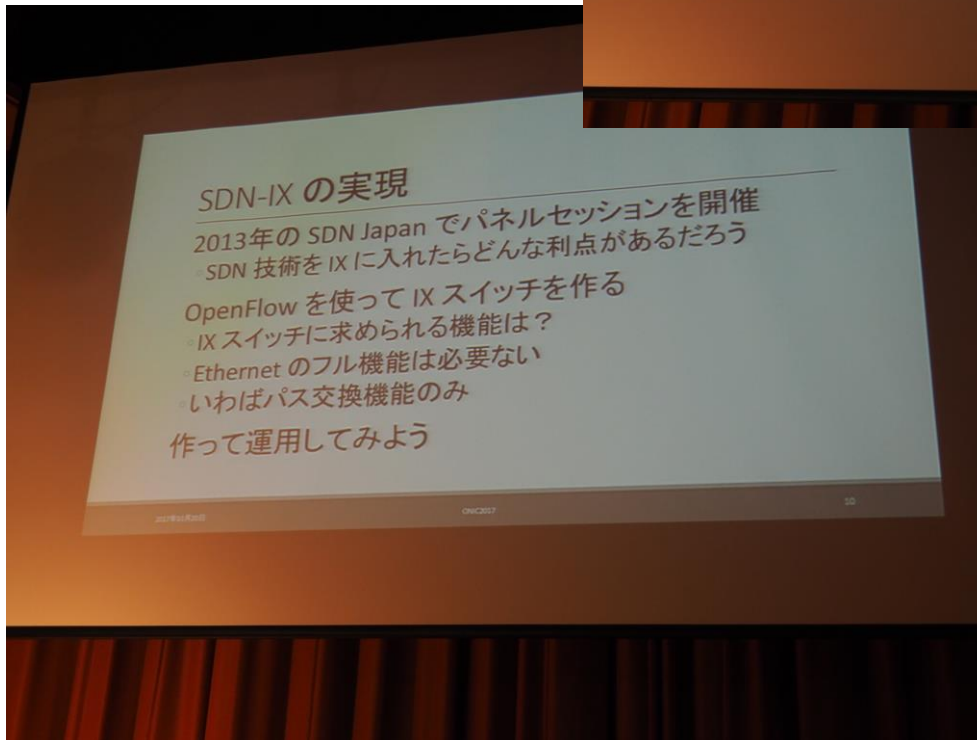
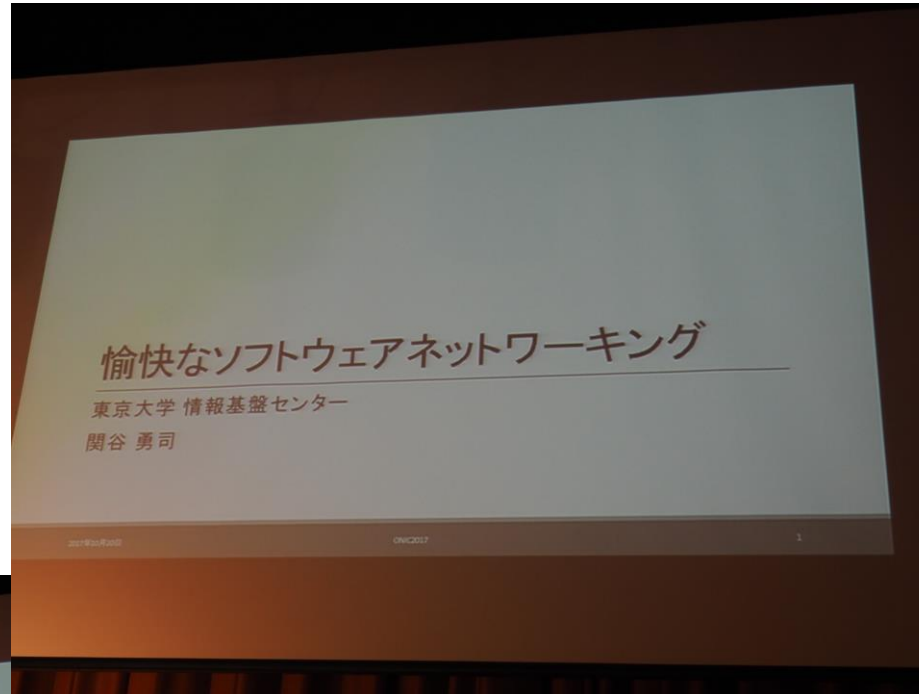
Vendors participating in the demo are (in alphabetical order) [Allied Telesis](#), Cisco, HPE (wired and Aruba wireless products), Netronome, NoviFlow and Intel OpenVSwitch with DPDK. This group plans to hold such interoperability gatherings at a yearly cadence, while continuing the momentum to add new features to the FAUCET open-source software.

SDN software and contributor to SDN

ess products), rings at a yearly

<http://www.es.net/news-and-publications/esnet-news/2018/berkeley-lab-google-host-multi-vendor-interoperability-demo-of-faucet-sdn-software/>

# 6. 2017 ONIC Japan



# 7. 2017 ONF OpenFlow Certification



JITC  
CERTIFIED




OpenFlow  
CONFORMANT V1.3  
BASIC

Allied Telesis x930 Series Gigabit Layer 3 Switches Earn Place on the Open Networking Foundation's OpenFlow® Conformant Certified Product List

*OpenFlow Conformance Certification is the highest level of assurance today for any network product destined for SDN solution deployment.*

SAN JOSE, CA – Jan 23rd, 2018 - Allied Telesis, a leading provider of hardware and software products that allow customers to build secure, feature-rich and scalable data exchange solutions, is pleased to announce that its x930 advanced Gigabit Layer 3 stackable switches have achieved the Open Networking Foundation's (ONF) OpenFlow V1.3 Basic Certificate of Conformance. This gives the x930 switches a coveted place on the OpenFlow Conformant Product registry of certified products.

ABOUT PLATFORMS SOLUTIONS INCUBATOR PROJECTS SOFTWARE DEFINED STANDARDS GET INVOLVED

SDN OVERVIEW PRODUCT CERTIFICATION SKILLS CERTIFICATION CORD LEARNING LABS <sup>NEW</sup>

## ONF OpenFlow® Conformant: Certified Product List

The OpenFlow® Conformant Product registry provides a real time list ensuring that the following products demonstrate conformance to the OpenFlow® specifications. The OpenFlow® specification is the first Software-Defined Networking (SDN) standard and a vital element of an open software-defined network architecture. All conformance testing is performed by independent, accredited testing labs around the world, providing both impartial validation and ONF endorsement.

Device Profile Category: v1.3.4 Basic Single Table / Test Specification Version: v1.0

Logo ID	Approval Date	Vendor Name	Product Name & Description	Firmware Version	Product Family	Optional Support
OFS-1.3-BA-00-0175	2017-12	Allied Telesis, Inc.	AT-x930 Advanced Gigabit Layer 3 Stackable Switches with 10G and 40G Uplinks	AlliedWare Plus v5	x930 series	

<https://www.opennetworking.org/product-registry/>

# Last. OpenFlow Support Product Update



## Wired Switch OpenFlow Feature Enhancement, history and plan

- Initial release (x930, x510) 2015 Oct [5.4.5S]
- Support lower product line (x230, x310) 2018 Jun [5.4.6-ini]
- Support two SW chip model (x510, x310) 2018 Oct [5.4.6-M2]
- Hybrid OpenFlow 2018 May Rel [5.4.7-ini]
- Connection Interrupt 2018 Sep [5.4.7-M1]
- Control Plane Encryption(STD) 2018 Sep [5.4.7-M1]
- Connection Interruption (Critical Mode) 2018 [5.4.8-M1]
- ONF OpenFlow Conformant Cert 2018 On Going



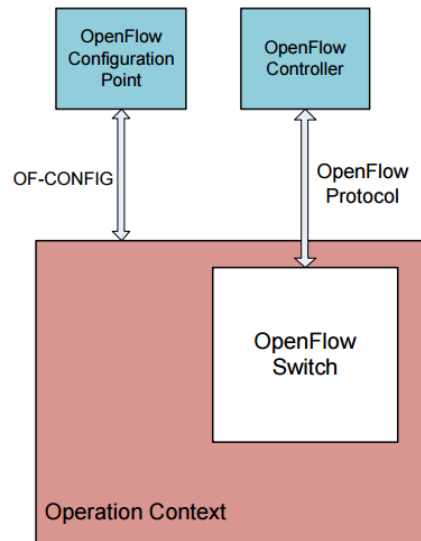
## Wireless AP OpenFlow Feature Enhancement, history and plan

- Initial release (TQ4K, 11ac models) 2015 Oct [1.0.0]
  - VAP Support, Performance Improvement, Critical Mode Support 2018 Dec [1.1.1]
  - Control Plane Encryption 2018 Nov [1.2.0]
  - Autonomous Wave Control\* 2018 Mar [4.1.1S]
- \*Central AP Management

# OF-Config/OVSDB standard, they figure out data relation image view below.

## 1 Introduction

This document describes the motivation, scope, requirements, and specification of the standard configuration and management protocol of an operational context which is capable of containing an OpenFlow 1.3 (or previous versions) switch as described in Figure 1. This configuration and management protocol is referred to as OF-CONFIG and is a companion protocol to OpenFlow. This document specifies version 1.2 of OF-CONFIG.



Pfaff & Davie Expires February 21, 2013 [Page 4]  
Internet-Draft OVSDB Config Protocol August 2012

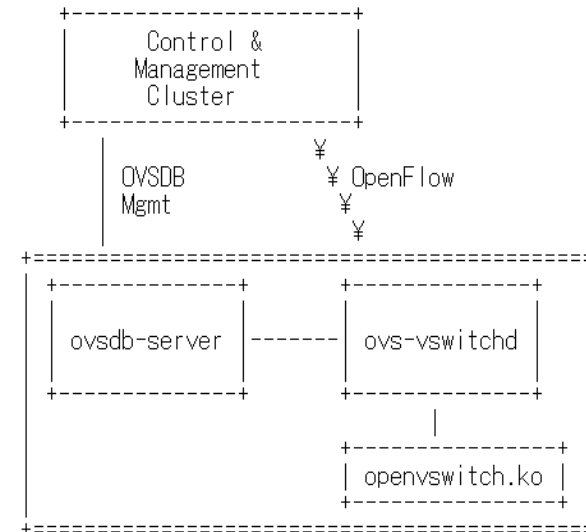


Figure 1: Open vSwitch Interfaces

Further information about the usage of the OVSDB management protocol is provided in [[DB-SCHEMA](#)].

# 2018年 真のIoT化を実現



## Smart Infrastructure

～実績ある技術でスマートに統合～

## Flexible Wireless

～新ワイヤレステクノロジーの確立～



SD-WAN Ctrl  
On VISTA

SD-WAN  
(Software Defined-WAN)

Traffic  
Optimization

SES  
(Secure Enterprise SDN)

AWC  
(Autonomous Wave Control)

SES Ctrl  
On VISTA

Security

AMF

Wireless

AWC CB  
On VISTA

Allied-Telesis  
Management  
Framework

AWC on Gen2  
AWC on RT

IoT Device Manager  
On VISTA

Unified  
Management

Visualization

AMF  
(Autonomous Management  
Framework)

VISTA  
MANAGER EX

VISTA  
on Gen2



これまでも、これからも、  
エンタープライズのお客様と共に。



<http://www.allied-telesis.co.jp/>  
<http://www.allied-telesis.co.jp/sdn/blog.html>

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