Activity of FUJITSU in OAI

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FUJITSU LIMITED

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Japan’s largest IT services provider and No. 5 in the world. (based on vendor revenue 2015)*

We do everything in ICT. We use our experience and the power of ICT to shape the future of society with our customers.

156,000 Fujitsu people support customers in more than 100 countries.

FORTUNE named Fujitsu as one of ‘the World's Most Admired Companies’ for the fourth consecutive year.
What makes Fujitsu different?

- Global scale in technology and service capability yet with a local face
- We integrate solutions in response to our customers’ business needs

**IT Service**

- #1 in Japan
- #5 globally

**Employees**

- 156 thousand

**Data Centers**

- 121

**Service Desks**

- 74

FORTUNE named Fujits as “one of the World’s Most Admired Companies for 4th consecutive year.

Fujitsu Chosen for the Dow Jones Sustainability World Index for 16th time in 2015.

Fujitsu is a Japan-based global ICT vendor, seeking affluent society with customer by leveraging ICT technologies and our experiences.
Revenue by sector – FY2015

Device Solutions
- LSI
- Electronic Components
- Others

¥603.9 billion
US$5.0 billion

Ubiquitous Solutions
- PCs
- Mobile Phones
- Mobilewear

¥1,040.9 billion
US$8.6 billion

Technology Solutions
- Solutions / SI
- Infrastructure Services
- System Products
- Network Products

¥3,283.3 billion
US$27.3 billion

Others

¥67.2 billion
US$560 million

Note: Consolidated Revenue by Business Segment, Including Intersegment Revenue
US$1=120yen, the approximate closing rate on March 31, 2016.
FY2015 is fiscal year ended March 31, 2016.
Fujitsu’s 156,000 employees covering over 100 nations connect customers’ HQs & their offices out of Japan and support their global businesses.
Working with world class customers

Retail
- WHITBREAD
- Specavers
- DIS
- Reitangruppen
- Lidl
- Morrisons
- SOK
- JERONIMO MARTINS

Financial Services
- AIG
- UniCredit
- CaixaBank
- BGL (BANCOMPOSTA)
- UBS
- Oesterreichische Nationalbank

Transport & Logistics
- Cathay Pacific
- SNCF
- Lufthansa
- Arriva
- Schiphol Group
- First TransPennine Express

Utilities
- EnBW
- JPS (northern ireland water)
- Scottish Water
- Vinci
- Centrica

Public Sector
- Department for Work & Pensions
- Reading
- Sida
- Forestry Commission
- Generalitat de Catalunya

Manufacturing
- Siemens
- Sharp
- Daimler
- Signa/T
- Lamy
- Hyundai
- Toyota
- Audi
- Bosch
- Mazda

Communications
- Giffgaff
- Turkcell
- Orange
- O2
- China Mobile

Health
- Care4
- ArboNed
- BITMARCK
- Action Medical
- Das Diak:
- Meander
- Asklepios
Working with world class partners
FUJITSU’s products and services

Technology Solutions

Services

Our datacenters in the world

Systems platform

FUJITSU Supercomputer PRIMEHPC FX10

FUJITSU Server PRIMERGY

FUJITSU Storage ETERNUS

Ubiquitous Product Solutions

FUJITSU PC LIFEBOOK

FUJITSU Tablet arrows

FUJITSU Smartphone arrows

FUJITSU UBIQUITOUSWARE vital sign sensing bands

Device solutions

MB85RS1MT 1Mbit FRAM in very small package for wearable devices

High speed printing thermal printer FTP-62HMC153

Relay lineup
Telecommunication is the one of the oldest business domain of FUJITSU.


Hello World!
Activities using OAI
Things has been done on OAI

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- **40MHz Band Width/0.5m TTI** with Fujitsu RF Unit
- **20MHz Band Width**
- **L1/L2 Server Separation**
- **TDD Configuration2**

Others
- ✔ PUCCH format 3
- ✔ TA/ Path Searcher
- ✔ Sounding RS(UE/eNB)
- ✔ Turbo Decoder(UE) offloaded to FPGA
- ✔ Performance Improvement (Error Free)

- 84Mbps
- 42Mbps
- 15Mbps
- 3Mbps

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We have developed a Test system for 5G using OAI.
Turbo Decoder on the UE side is offloaded to FPGA Board

- DL throughput is improved by being able to process Turbo decoder in parallel.

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To Upper Layer

FPGA Board

CRC Check

Turbo Dec #0

Turbo Dec #7
FUJITSU has been working on OAI modification
- On top of OAI master 18th Jun 2016

FUJITSU reached the following performance
- 42Mbps (TDD Configuration2/BW:20MHz/TTI:1.0msec) with OAI-EPC, OAI-eNB, OAI-UE
- 84Mbps (TDD Configuration2/BW:40MHz/TTI:0.5msec) with OAI-EPC, OAI-eNB, OAI-UE
  Note: Turbo Decode in UE is offloaded to FPGA
  Note: eNB is divided into 2 servers (L1 Server and L2 Server)

FUJITSU reached the following stability (Error Free)
- Ping success ratio 100%
- No HARQ retransmission
Centralized BBU controls high-density distributed antenna units (RRH) to generate user centric virtual cells which eliminate inter-cell interference.
Challenges
Service Vision

- We plan to provide the network service to the customer by using a local LTE Network.
- We would like to use OAI to build the network.
We would like to improve OAI’s quality and add important features to realize Local LTE network by OAI.

We plan to ...

1. Develop Call Processing functions
   - 3GPP features for basic Call Processing

2. Improve OAI’s performance
   - Enhance OAI’s Specifications

3. Improve OAI’s quality for commercial use
   - Bug fixes
   - Error handling
We will combine OAI and the ICT solution of Fujitsu, and will develop services by the end of Mar. 2018.

**Application**
- Exchange/Lync/SharePoint
- SAP/Oracle... etc.

**Server / Storage**
- PRIMERGY/NetApp
- CISCO... etc.

**Network**
- Datacenters / Cloud

**Managed Service**
- Service Desk
- Remote Operation
- Onsite Maintenance

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BBU
shaping tomorrow with you