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Intel® DPDK Service Offerings

Calsoft Labs (An ALTEN Group company)
Introduction

Product Engineering Services

Calsoft Labs

- Product Engineering arm of the ALTEN Group
- Head quartered in Silicon Valley, USA
- Core services areas - Embedded Product Engineering, Software Engineering Services, Engineering & TD Services
- Ability to provide end to end solutions (“Chip to Cloud”) and Service (“Complete Product Life cycle Services”)
- Strong domain expertise across Telecom & Networking, Semiconductor, Enterprise ISV, Consumer Electronics, Automotive, Aerospace, Healthcare & Education

Network Intelligence Alliance

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Network Functions Virtualisation ISG (NFV)
ETSI World Class Standards

Global Delivery & Presence

- Over 1000 products delivered & more than 300 satisfied customers
- 1000+ people, 65% of Engineering team with 5+ years of experience
- Global Engineering Centers at Waltham, MA in USA and Bangalore, Chennai & Mysore in India

Telecom Practice: Key Customers

Customers

Highlights

- Broad experience across the entire value chain from product R&D to network deployment and operations support
- Focused offers to address unique requirements of OEMs and Service Providers
- Deep expertise in packet processing, multi-core processors, virtualization, cloud orchestration and management frameworks
- Pioneer in NFV and SDN technologies – engaged in some of the industry's first NFV deployments and SDN controller & application development initiatives

ALTEN Calsoft Labs:
Telecom Segment - Service Offers

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Product Engineering Services

Design
- Assessment, Architecture & PoC

Development
- VNF Development
- Optimizations
- Orchestration

Validation
- Lab Testing
- Field Trials

Deployment and Operations Support

Deployment
- Staging, Integration & Production Management

Operations Support
- Service Roll-out Management, Monitoring & Assurance

Maintenance
- L2/L3 Technical Support
- Feature Enhancements
- Bug Fixing

Governance and Program Management

PMO and Quality Assurance

Audit and Consulting

Customer Processes Services

Network Function Virtualization (NFV) & Software-Defined Networking (SDN) Expertise

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- Strong Telecom product engineering experience covering L2/L3, L4-L7, NFV and SDN
- **Worked on one of the first Virtual CPE solution deployed with a Tier-1 Service Provider**
- Pioneering work in development, testing and roll-out of Virtual Network Function (VNF) and orchestration
- Engaged with major service providers, NFV PoC/ demos
- **Delivered one of the industry's first OpenFlow enabled data center switches**
- Developing SDN Controller plug-ins and applications
- Partnerships
  - 6WIND
  - HP AllianceOne
  - Intel Network Builder
  - Qosmos
  - Red Hat

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NFV

- Architecture, Design, Integration and Testing of Virtual Appliances
- **Intel DPDK based VA optimization**
- VA instantiation and orchestration
- VA deployment support, Integration with NFV management frameworks and OSS
- Maintenance and Release Management

SDN

- Developing SDN controller applications for Security, WiFi, QoS, Load Balancing
- Expertise in integrating and staging commercial controllers
- Expertise in open source and homegrown controller for testing and emulation
- Grounds up **OpenFlow** protocol development

NFV & SDN: End-to-End Service Offerings

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- Market Research & Assessment
- Technology Consulting
- Solution Architecture & Design
- Test Strategy Planning
- Proof of concept & Demo(s)
- Advanced Training & Support

- Virtual Function Development
- Virtual Appliance Optimization
- NFV Orchestration
- Scenario based Testing
- NFV/SDN Management Framework Development

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- Service Roll-out Management
- Provisioning & Configuration
- Service Monitoring & Assurance
- L2/L3 Technical Support

- Virtual Appliance Staging
- OSS/BSS Integration
- End to End Service Validation
- Patch/Release Management

Calsoft Labs NFV/SDN Journey: Major Milestones

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2013 - Milestones

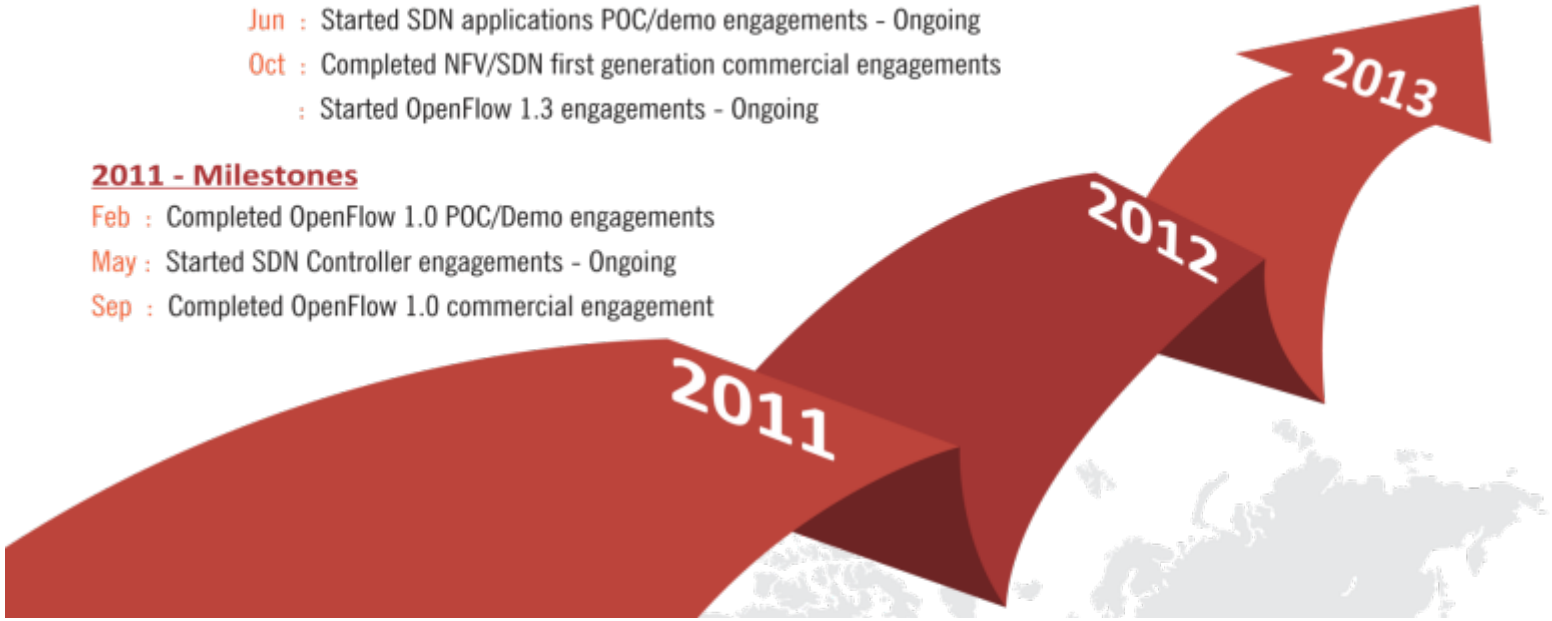
Mar : Started NFV second generation engagements – Ongoing
Apr : 6WIND partnership
May : Started Intel DPDK based PoC
Jun : Started commercial engagements with Qosmos
Sep : Red Hat SI partnership
Oct : Intel Network Builder program
Nov : HP AllianceOne partnership

2012 - Milestones

Apr : Completed OpenFlow Hybrid mode (supports OF + legacy functionality)
: Started OpenFlow 1.2 commercial engagements (with multi-instance support)
: Started NFV/SDN management framework development - Ongoing
Jun : Started SDN applications POC/demo engagements - Ongoing
Oct : Completed NFV/SDN first generation commercial engagements
: Started OpenFlow 1.3 engagements - Ongoing

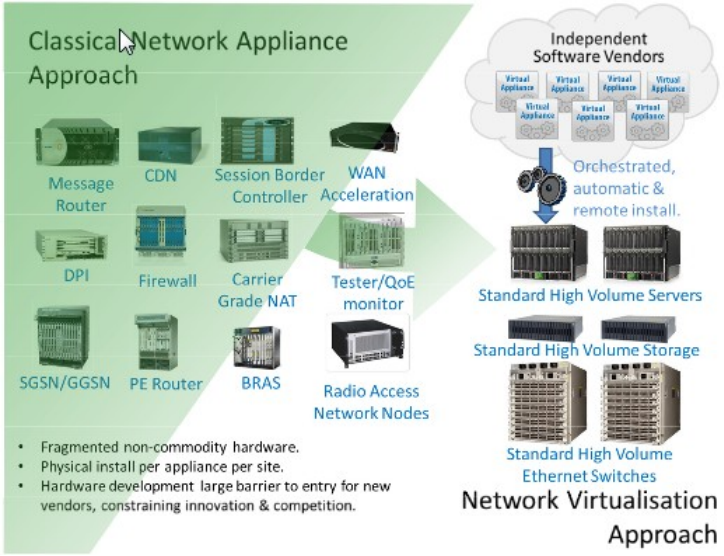
2011 - Milestones

Feb : Completed OpenFlow 1.0 POC/Demo engagements
May : Started SDN Controller engagements - Ongoing
Sep : Completed OpenFlow 1.0 commercial engagement



Intel® DPDK - Overview

- Allows application, control, packet and signal processing to be implemented in a single scalable multi-core architecture
- Allows acceleration of Data Plane functions for high throughput
- Leverage virtualization to consolidate and upgrade legacy systems



- Benefits of using Intel silicon and Intel® DPDK:
  - Allows Network Functions to be implemented on COTS hardware
  - Consolidate workloads; Reuse the same software on future Intel platforms
  - Scale infrastructure as-you-grow, Reduce CapEx and OpEx
  - Offers greater flexibility in network design and implementation
  - Deploy next generation NFV/SDN solutions easily by leveraging best-in-class virtualization and orchestration technologies from ecosystem partners

Calsoft Labs:
Intel® DPDK Service offers

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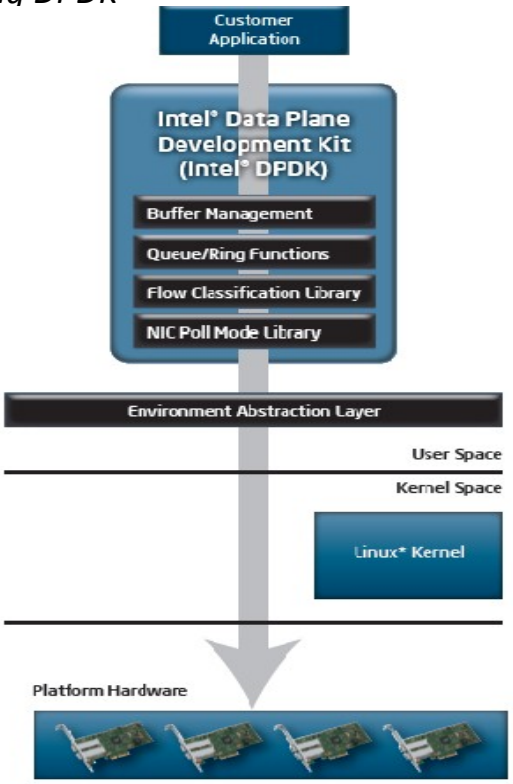
- *Professional Services for:*
  - *Equipment Manufacturers (NEMs)*
  - *Service Providers*
- *Help customers design, develop and deploy Network Functions optimized using DPDK*



Intel® DPDK Evaluation

- Intel® DPDK Training
- Proof-of-Concept/Demonstration
- Architecture & Design consultation
- Dev/Test Environment Creation

Intel® DPDK Implementation

- Product Re-engineering
- Virtual Network Function (VNF) development
- VNF Testing & Test Automation

Intel® DPDK Deployment

- VNF instantiation & orchestration
- Integration with OSS/BSS
- End-to-end Service validation
- Service Roll-out management

Intel® DPDK Operations & Maintenance Services

- Service Assurance
- Service Desk implementation
- Product maintenance/sustenance engineering

Intel® DPDK Evaluation: Calsoft Labs Services

Intel® DPDK Training

- Conduct technical sessions about DPDK and how to use it to optimize network functions
- 1 – 2 Trainers
- Fixed cost per day + travel cost (in case of onsite training)

Design Consultation

- Study customer's product roadmap
- Provide SW architecture and HLD to re-engineer product based on DPDK
- Conduct workshop to present HLD and design considerations
- Time-and-Materials based on hourly rates + travel cost (if applicable)

Proof-of-Concept/Demo(s)

- Assessment of customer product and benefits from DPDK
- Port core product functionality to DPDK to demonstrate feasibility
- Provide DPDK porting and integration roadmap
- Time-and-Materials based on hourly rates

Dev/Test Environment Creation

- Study customer's product roadmap
- Set up Development and Test Environment for the product
- Provide ongoing support, if requested e.g. develop Test Automation framework for the product
- Time-and-Materials based on hourly rates

Intel® DPDK Implementation: Calsoft Labs Services

VNF Implementation

- Re-engineer customer product port and integrate with Intel® DPDK
- Deliver a functional Virtual Network Function (VNF) with associated documentation
- Fixed cost / Time-and-Materials based on statement of work

VNF Orchestration

- Study Intel® DPDK based network function and use cases
- Develop a NFV orchestration framework for the virtual appliance
- Provide training, if requested
- Time-and-Materials based on hourly rates + travel cost (if applicable)

VNF Testing

- Scenario-based testing of customer product that uses DPDK libraries
- Test Automation development
- Bug fixing and release management, if requested
- Fixed cost / Time-and-Materials based on statement of work

VNF Maintenance

- Maintenance and sustenance engineering for a customer product
- Bug fixing, patch and release management
- Upgrade to latest version of DPDK libraries
- Fixed cost / Time-and-Materials based on statement of work/SLA

Intel® DPDK Deployment: Calsoft Labs Services

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NFV Systems Integration

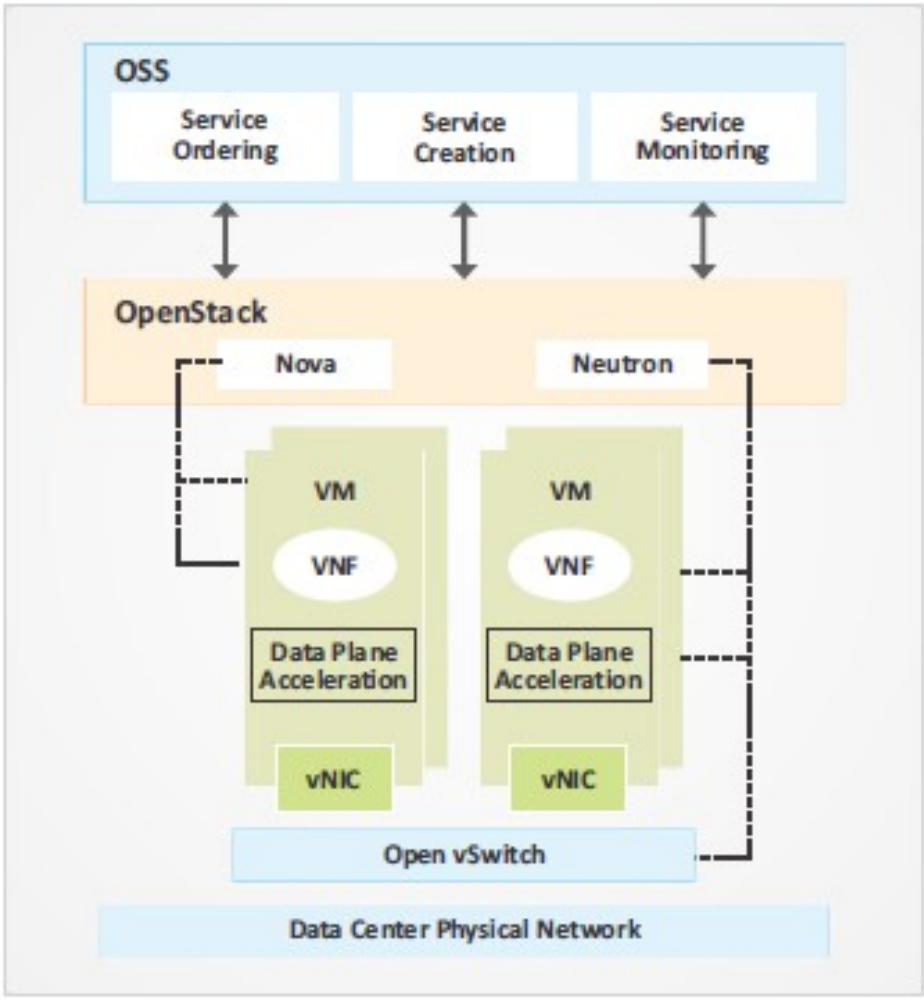
- Staging VNFs in Telco environment
- OpenStack Networking (Neutron) plug-in development
- OpenStack Heat integration
- NFV system integration with Telco Service Delivery Platform
- End-to-End Service Validation and Rollout management

openstack™

WIND

redhat.

intel inside™ Xeon®



Calsoft Labs: Ecosystem Partners

- **6WIND**
  - Calsoft Labs is a global VAR and Systems Integration partner
  - Architect and develop VNFs based on 6WINDGate™ technology
  - Supports deployment of NFV solutions based on Intel® DPDK optimized 6WIND data plane protocol stacks
- **Red Hat**
  - Systems Integration partner for NFV solutions based on RHEV® and OpenStack™ technology
  - Architect and develop Neutron plug-ins and NFV/SDN orchestration frameworks
  - Support deployment of NFV solutions in Service Provider environment and OSS/BSS integrations.
- **Dell**
  - Technology partner & VAR authorized to sell Dell server hardware & use Dell platforms to build innovative & highly competitive business solutions
  - Our partnership provides us early access to Dell's product roadmap & toolkits
  - Other benefits include access to Dell Knowledge Base, pre-sales support, post-sales Technical support, field support & preferred pricing
- **HP Alliance One**
  - Access to virtualized systems to assist in development efforts in HP's SDN environment
  - Focal point for migration- and porting-related activities, including issues around system performance and application optimization
  - Calsoft Labs supports ISVs to migrate business applications to HP's SDN infrastructure

Thank you

For more details, please visit: http://sdn.calsoftlabs.com/

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