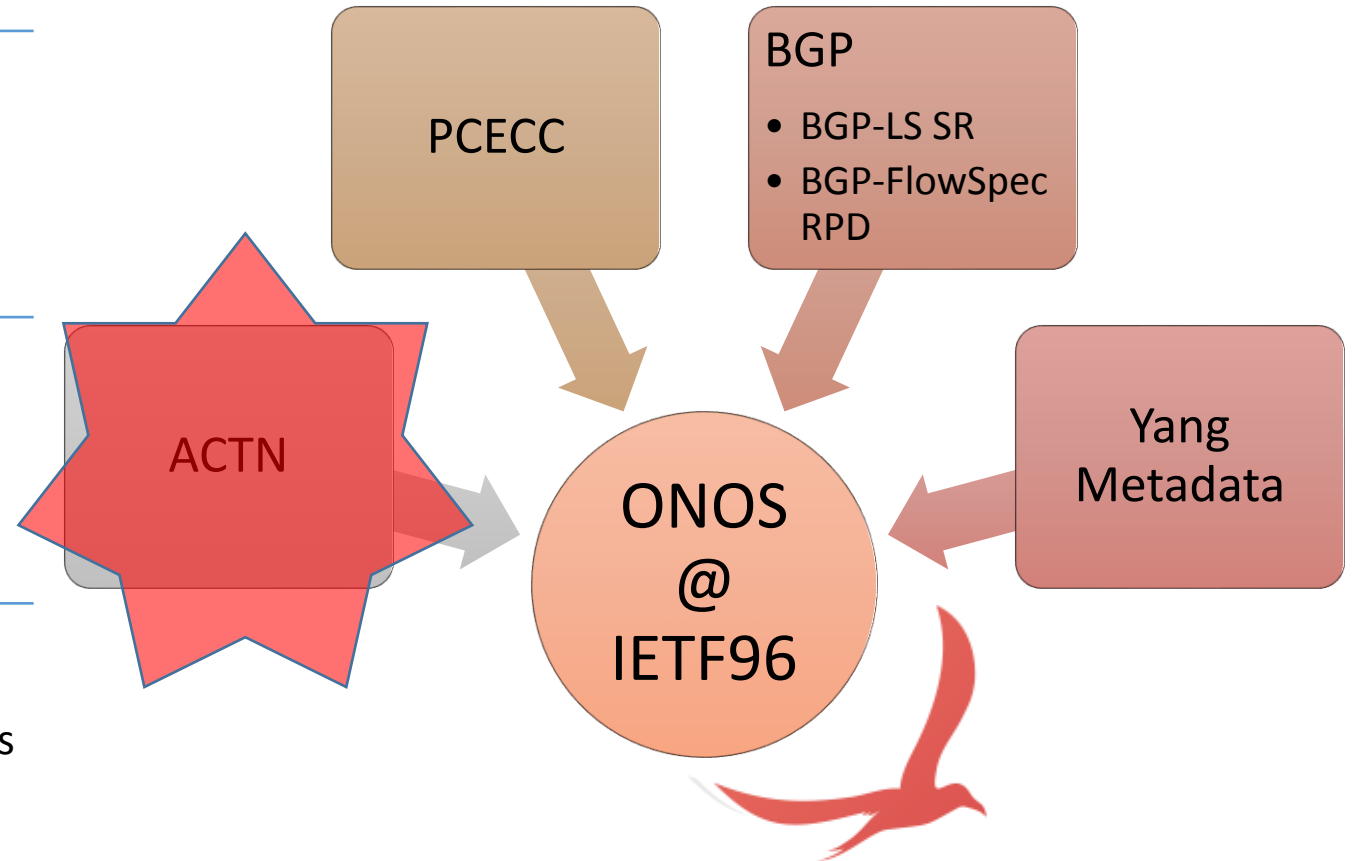# IETF 96 Hackathon

ACTN

ONOS @ Hackathon 96

The Open Network Operating System (ONOS) is a software defined networking (SDN) OS for service providers that has scalability, high availability, high performance and abstractions to make it easy to create apps and services.

The platform is based on a solid architecture and has quickly matured to be feature rich and production ready.

The community has grown to include over 50 partners and collaborators that contribute to all aspects of the project including interesting use cases [http://onosproject.org/]

ACTN

PCECC

BGP
- BGP-LS SR
- BGP-FlowSpec RPD

Yang Metadata

ONOS @ IETF96

onos
Open Network Operating System

ONOS

Overview	https://www.youtube.com/watch?v=3lya-MY1cZw
Installing and Running	https://wiki.onosproject.org/display/ONOS/Installing+and+Running+ONOS
Basic Tutorial	https://wiki.onosproject.org/display/ONOS/Basic+ONOS+Tutorial
Webinar	Webinar was conducted on 8th July ONOS Architecture by Satish - link ONOS Introduction by Andrea - link ONOS with Mininet - https://www.youtube.com/watch?v=Q3ptlUWoAE8 ONOS with PCEP and BGP-LS - https://www.youtube.com/watch?v=MeW0DiWeAJM

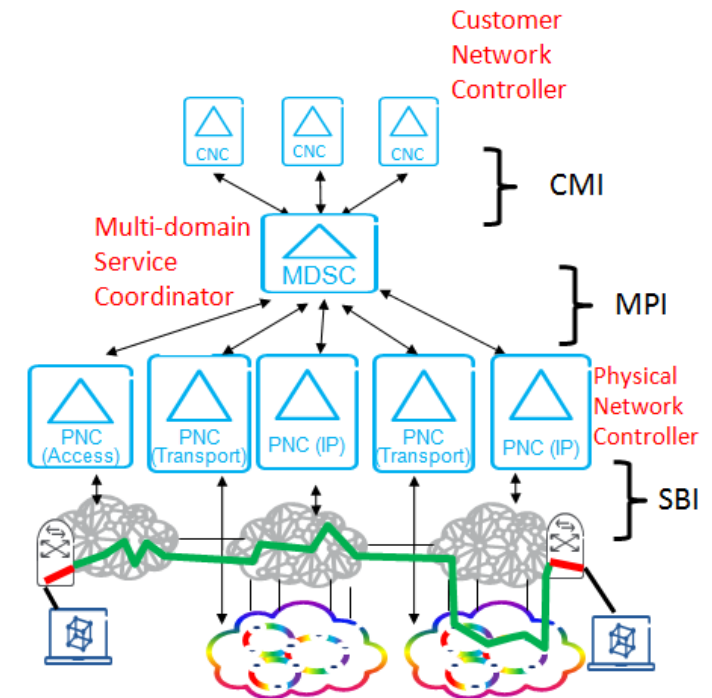# ACTN – Abstraction and control of TE networks

Description

- ACTN architecture allow coordination between multiple domain controllers with Virtual Network operations in heterogeneous TE networks.
- An hierarchal approach with a MDSC (multi-domain service coordinator – super controller) managing multiple PNC (Physical network controller – domain controller) using PCEP/BGP-LS/RestConf(yang)

TEAS WG – Requirements, Framework and Models

- draft-ietf-teas-actn-requirements
- draft-ietf-teas-actn-framework
- draft-ietf-teas-yang-te-topo
- draft-ietf-teas-yang-te
- draft-zhang-ccamp-transport-ctrlnorth-yang

## PCE WG - Applicability of stateful H-PCE and PCEP

- draft-dhody-pce-applicability-actn
- draft-dhodylee-pce-stateful-hpce
- draft-leedhody-pce-vn-association

Customer
Network
Controller

CNC   CNC   CNC

CMI

Multi-domain
Service
Coordinator

MDSC

MPI

PNC
(Access)   PNC
(Transport)   PNC (IP)   PNC
(Transport)   PNC (IP)

Physical
Network
Controller

SBI

Multi-destination problem
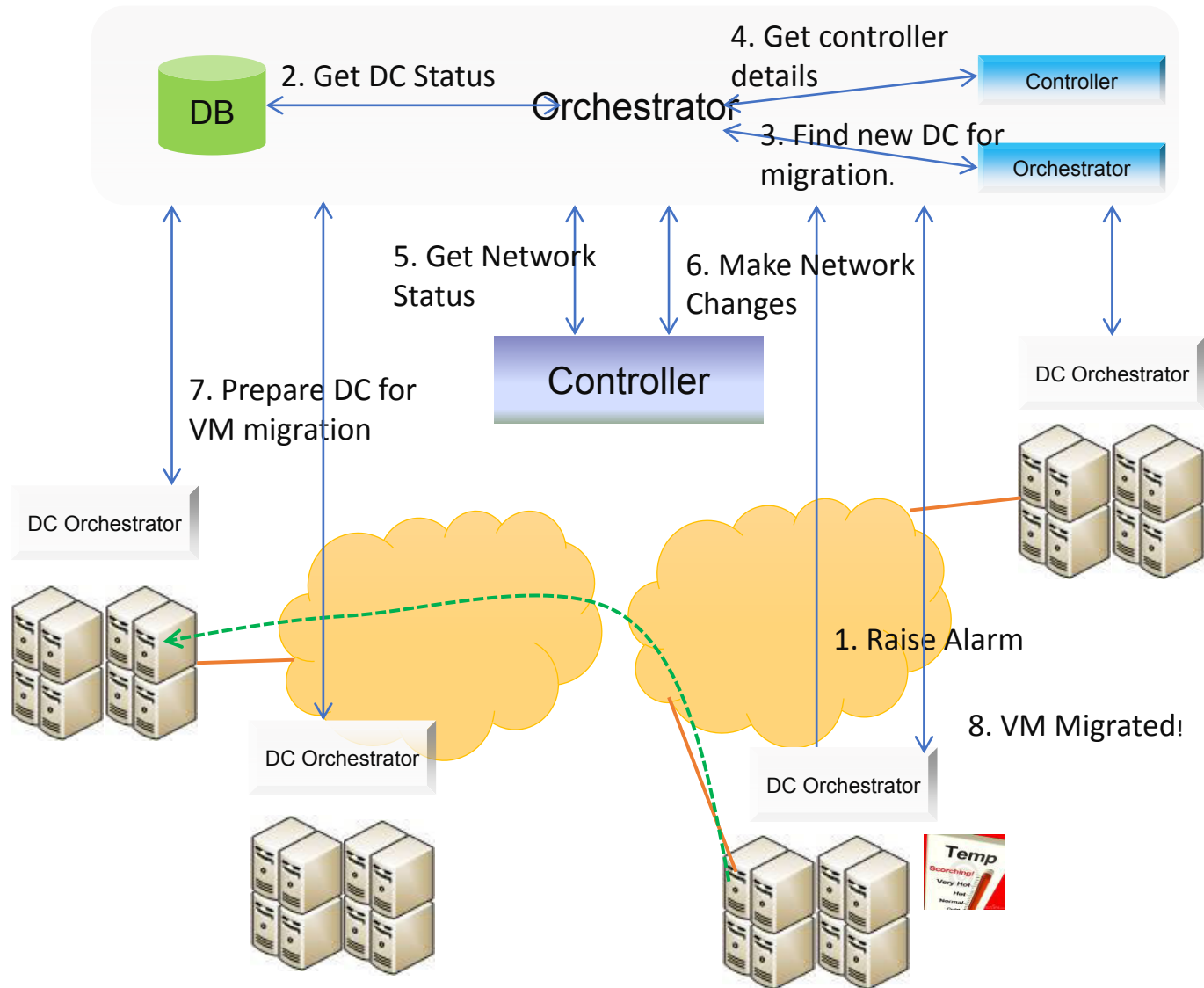
Survivability Analysis

ACTN – Project-1
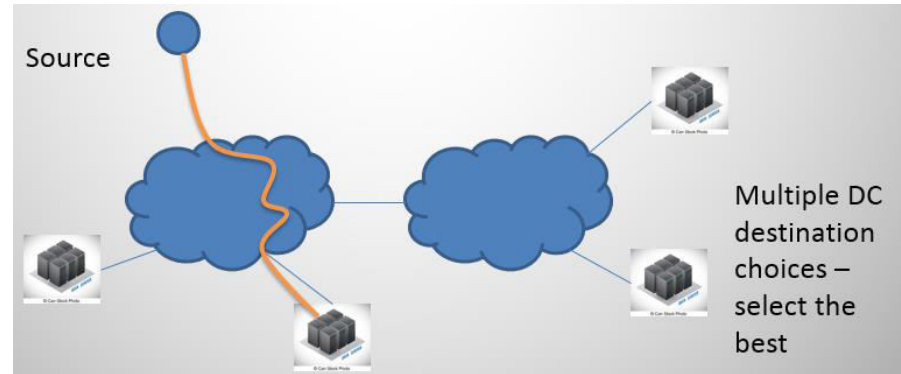
Project

- Support Multi-destination problem
  - Given a set of destinations, select the one destination based on the current state of network
  - Geographically dispersed DC selection

Testability

- Check selection of the right destination based on the network condition, tested on Network elements

ACTN – usecase

2. Get DC Status

DB

Orchestrator

4. Get controller details

Controller

3. Find new DC for migration.

Orchestrator

5. Get Network Status

6. Make Network Changes

Controller

DC Orchestrator

7. Prepare DC for VM migration

DC Orchestrator

DC Orchestrator

1. Raise Alarm

DC Orchestrator

8. VM Migrated!

Temp
Scorching!
Very Hot
Hot
Normal

API – From Multiple destination, pick the best destination based on the network condition

Usecase – when an issue at a DC because temperature rising, select which DC to be used to backup based on network condition
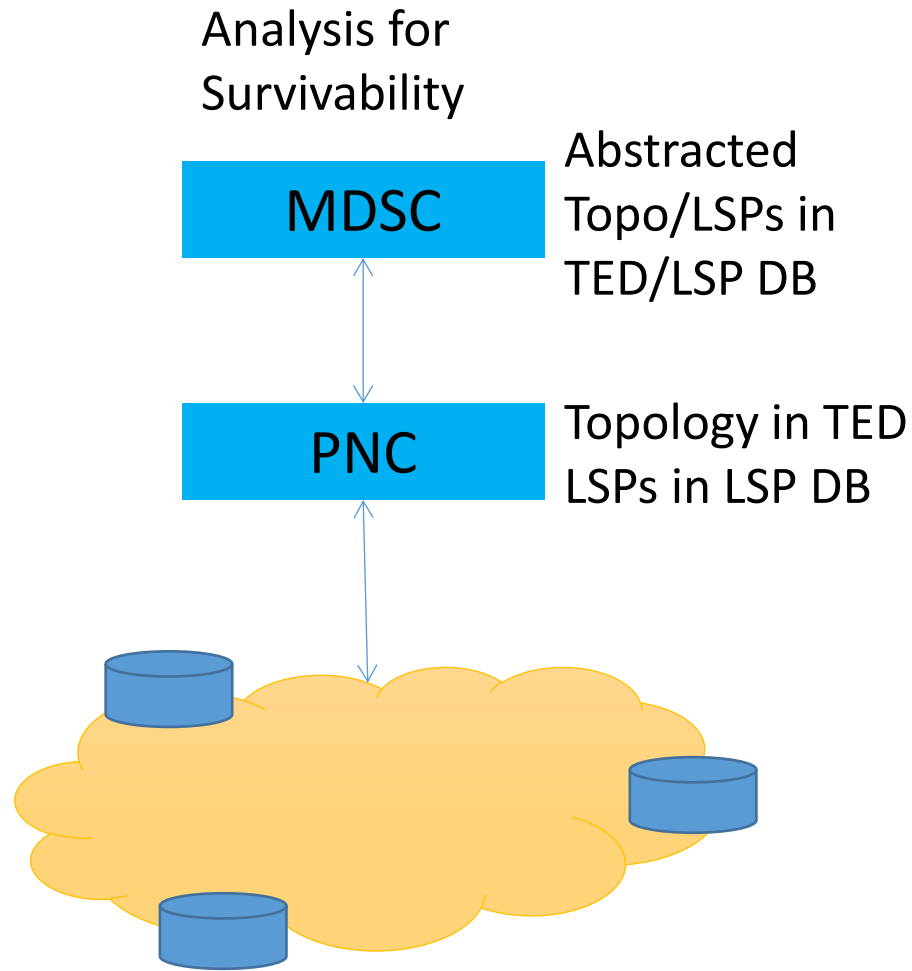
ACTN – Project – 2
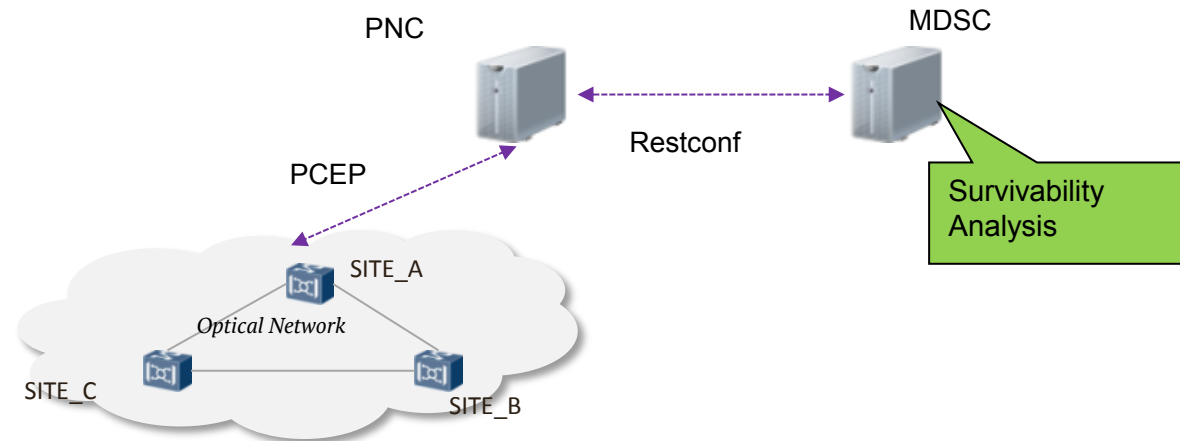
Project

- Support Survivability Analysis:
  - Given VN and LSPs already set up in the network;
  - Analyze the survivability, assuming failure on each possible link, and find out solutions

Testability

- Show which LSPs will be affected once there is a link failure;
- Show how the LSP can be re-routed

ACTN – usecase

Analysis for
Survivability

Abstracted
MDSC
Topo/LSPs in
TED/LSP DB

Topology in TED
PNC
LSPs in LSP DB

RESTconf/YANG API – support getting the topology; support getting the LSPs;

Usecase – enable the customer to analyze the survivability according to the latest network;
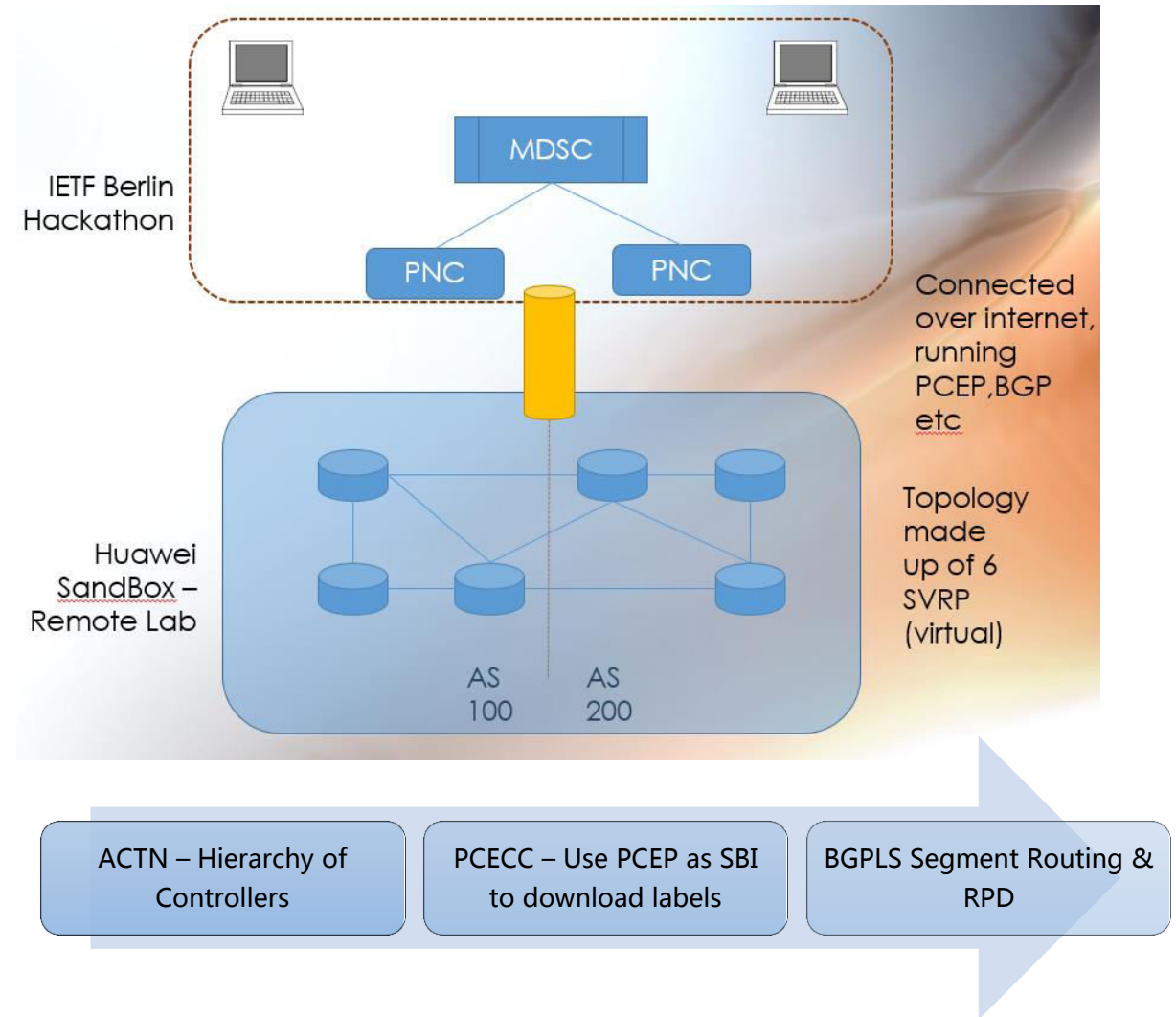
Topology with sandbox

ENVIRONMENT:

Controller : We use ONOS(https://wiki.onosproject.org/) as the SDN controller and it is in the laptop

Data plane : in project 1, we deploy data plane in Huawei SandBOX lab(http://developer.huawei.com/en/) in China , the network element is using SVRP and the connection between Controller and device is using PCEP/BGP protocol; In project 2 we deploy linc-oe that support optical features, with PCEP-LS as a solution of SBI. These can be accessible on Laptop.

IETF Berlin Hackathon

MDSC

PNC   PNC

Connected over internet, running PCEP,BGP etc

Huawei SandBox – Remote Lab

AS 100   AS 200

Topology made up of 6 SVRP (virtual)

| ACTN – Hierarchy of Controllers | PCECC – Use PCEP as SBI to download labels | BGPLS Segment Routing & RPD |

Thank You!