

# Exploring OpenDaylight

David Brockus

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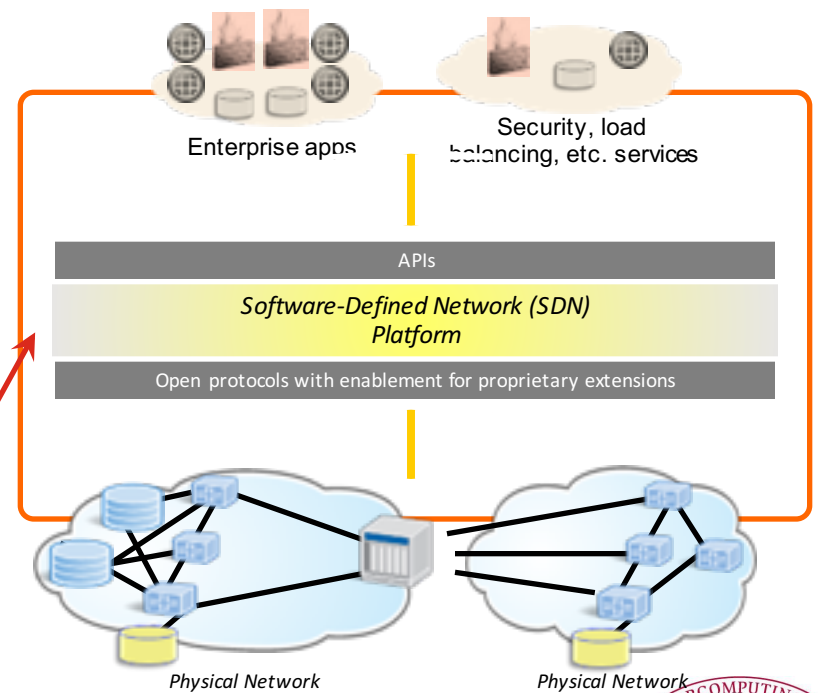
ACI-REF Virtual Residency Workshop 2015



# Why SDN?

- New architecture with separate Control and Data planes
- Open Programmable Networks and APIs
- New business models and revenue opportunities
- Efficiency in both capital and operational expenses

Focus Area  
for OpenDaylight

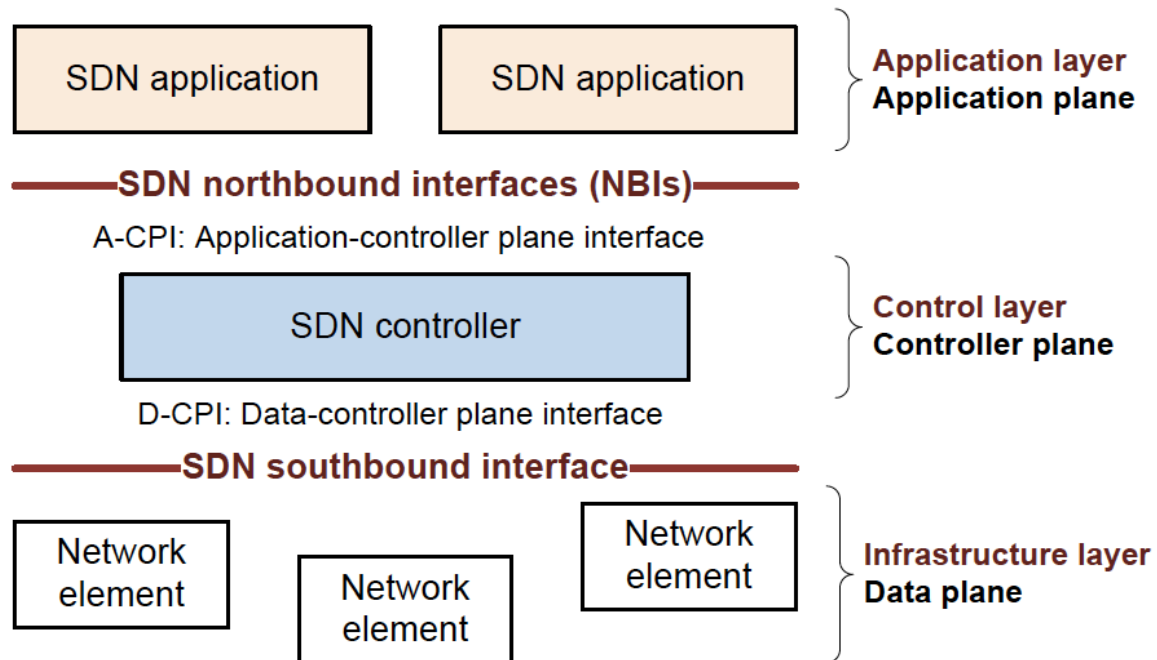


# SDN Architecture Characteristics

- Directly programmable
- Agile
- Centrally managed
- Programmatically configure
- Open standards-based and vendor-neutral



# SDN Overview



# What is OpenDaylight?

- Open source project
- Modular, pluggable, and flexible controller at its core
- Implemented strictly in software
  - Contained within its own Java Virtual Machine (JVM)
- Deployable on any hardware and OS that supports Java



# Who is the OpenDaylight Project?

Platinum

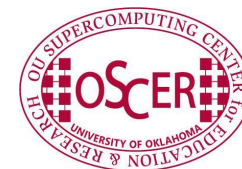
BROCADE



CITRIX



Gold

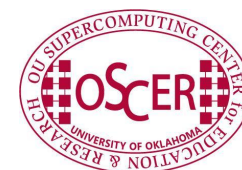


# Who is the OpenDaylight Project? (cont.)

Silver



# Who makes products based on Open Daylight?

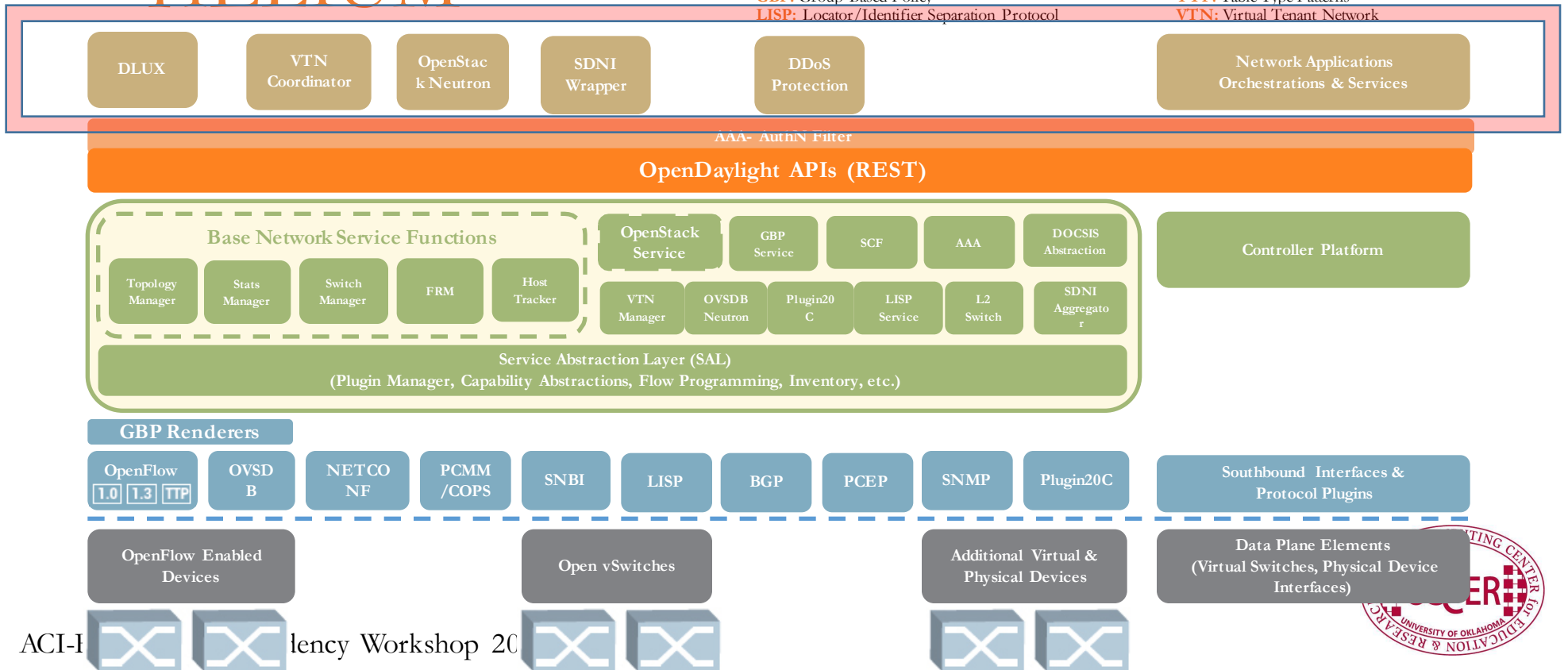






## Legend

- AAA:** Authentication, Authorization & Accounting
- AuthN:** Authentication
- BGP:** Border Gateway Protocol
- COPS:** Common Open Policy Service
- DLUX:** OpenDaylight User Experience
- DDoS:** Distributed Denial Of Service
- DOCSIS:** Data Over Cable Service Interface Specification
- FRM:** Forwarding Rules Manager
- GBP:** Group Based Policy
- LISP:** Locator/Identifier Separation Protocol
- OVSDB:** Open vSwitch DataBase Protocol
- PCEP:** Path Computation Element Communication Protocol
- PCMM:** Packet Cable MultiMedia
- Plugin2OC:** Plugin To OpenContrail
- SDNI:** SDN Interface (Cross-Controller Federation)
- SFC:** Service Function Chaining
- SNBI:** Secure Network Bootstrapping Infrastructure
- SNMP:** Simple Network Management Protocol
- TTP:** Table Type Patterns
- VTN:** Virtual Tenant Network

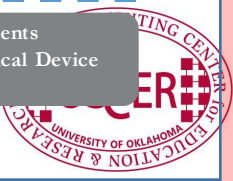
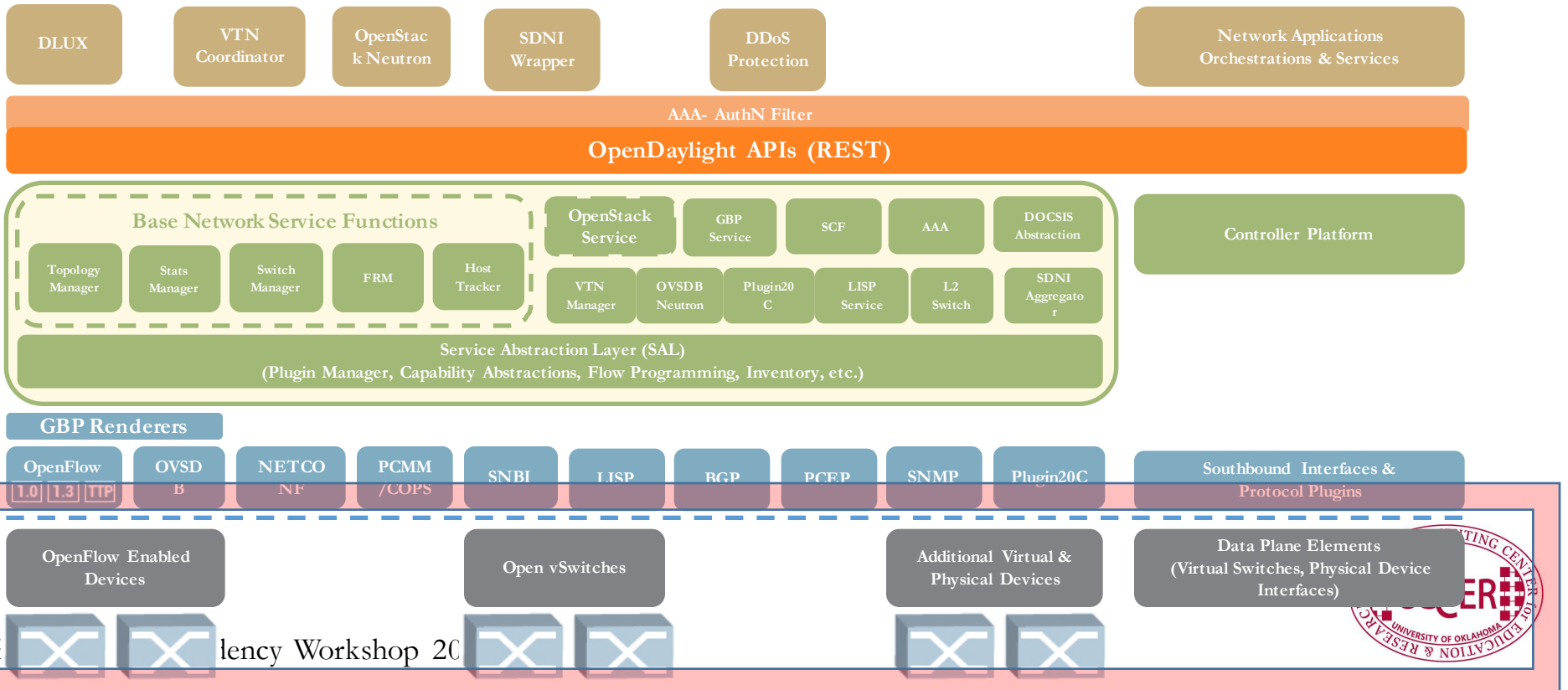




# OPEN DAYLIGHT “HELIUM”

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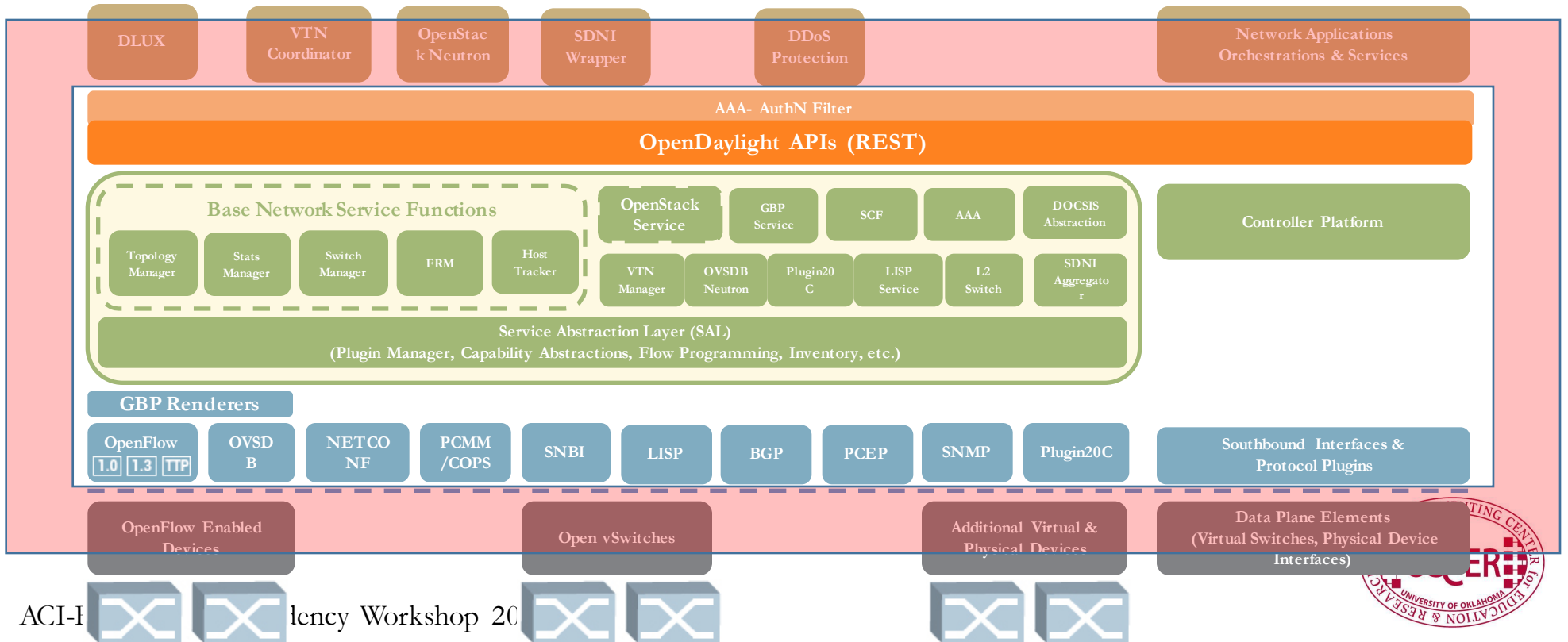
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# OpenDaylight Tools and Paradigms

- Java interfaces
  - for event listening, specifications and forming patterns
- Maven -
  - Build and dependency management
- OSGi -
  - Backend container framework that allows dynamically loading bundles
- Karaf -
  - OSGi based runtime



# What is an Application Programming Interface (API)?

- set of rules ('code') and specifications that software programs can follow to communicate with each other.



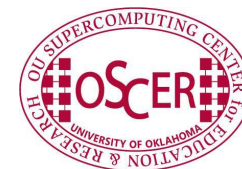
# What is a Representational State Transfer (REST) API?

- A REST API is an API in a specific architectural style
  - originally communicated by Roy Fielding in his doctoral dissertation
    - [http://www.ics.uci.edu/~fielding/pubs/dissertation/rest\\_arch\\_style.htm](http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm)



# What defines a 'RESTful' API?

- Six constraints
  - Start with Null Style
  - Client-Server
  - Stateless (Server)
  - Cache
  - Uniform Interface
  - Layered System



# What distinguishes REST?

- Emphasis on uniform interface between components
  - Four constraints
    - identification of resources
    - manipulation of resources through representations
    - self-descriptive messages
    - hypermedia as the engine of application state.





# Why a 'RESTful' API

- Principle of generality
  - Simplifies overall system architecture
  - Visibility of interactions improved



# Acknowledgments



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ACI-REF Virtual Residency Workshop 2015



# Questions? Thoughts?

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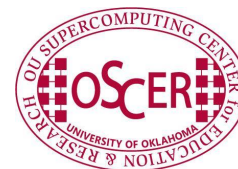
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# Extra Slides

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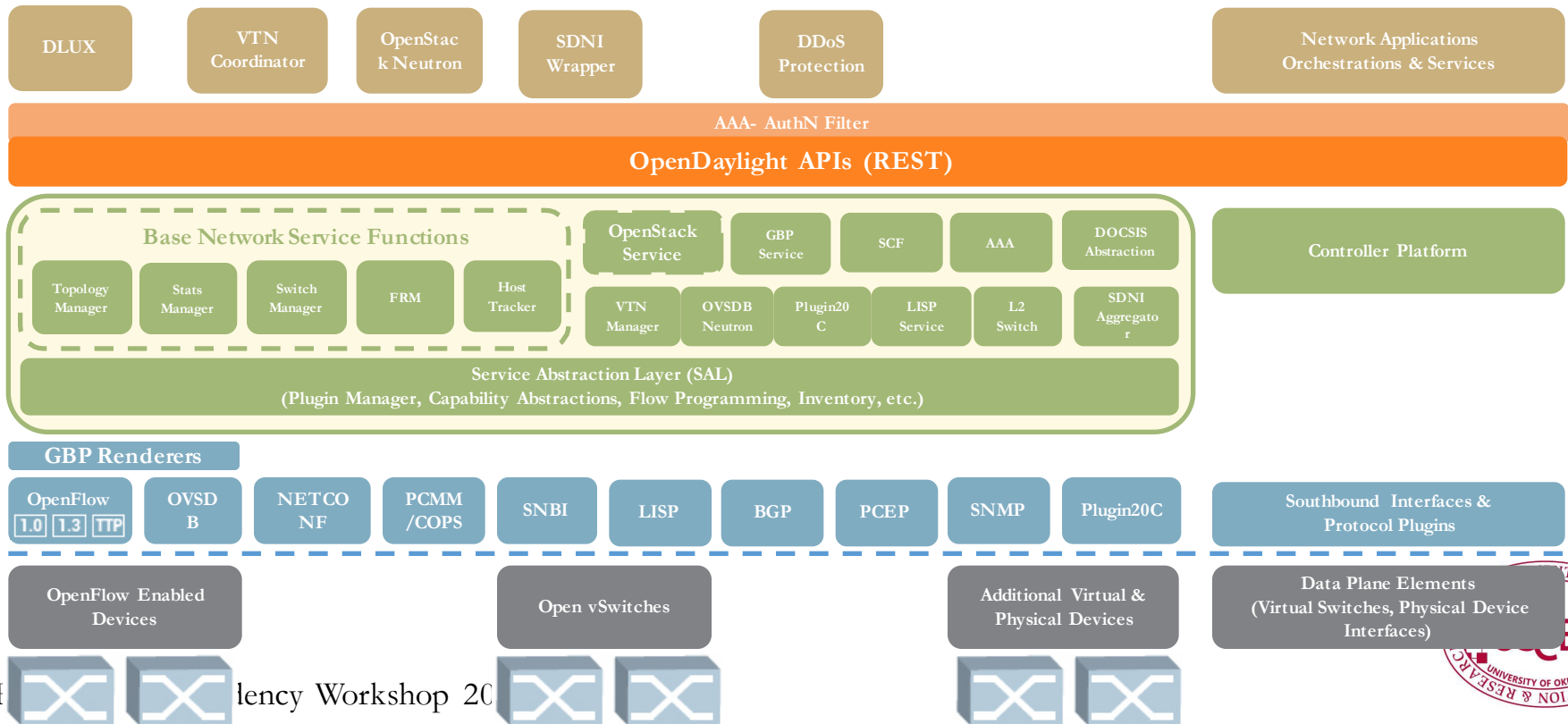


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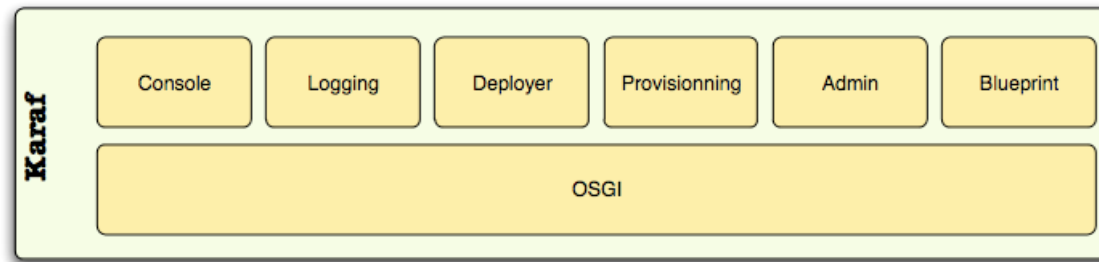
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# What is Karaf?

- Small OSGi based runtime
- Lightweight container
  - various components and applications can be deployed



# What is OSGi (Open Service Gateway Initiative)?

- Java framework for developing and deploying modular software programs and libraries
- Two components
  - Specification for modular components called bundles
  - Java Virtual Machine (JVM)-level service registry



# What are the drawbacks of REST?

- Uniform interface degrades efficiency
  - information transferred in a standardized form rather than form specific to an application's needs

