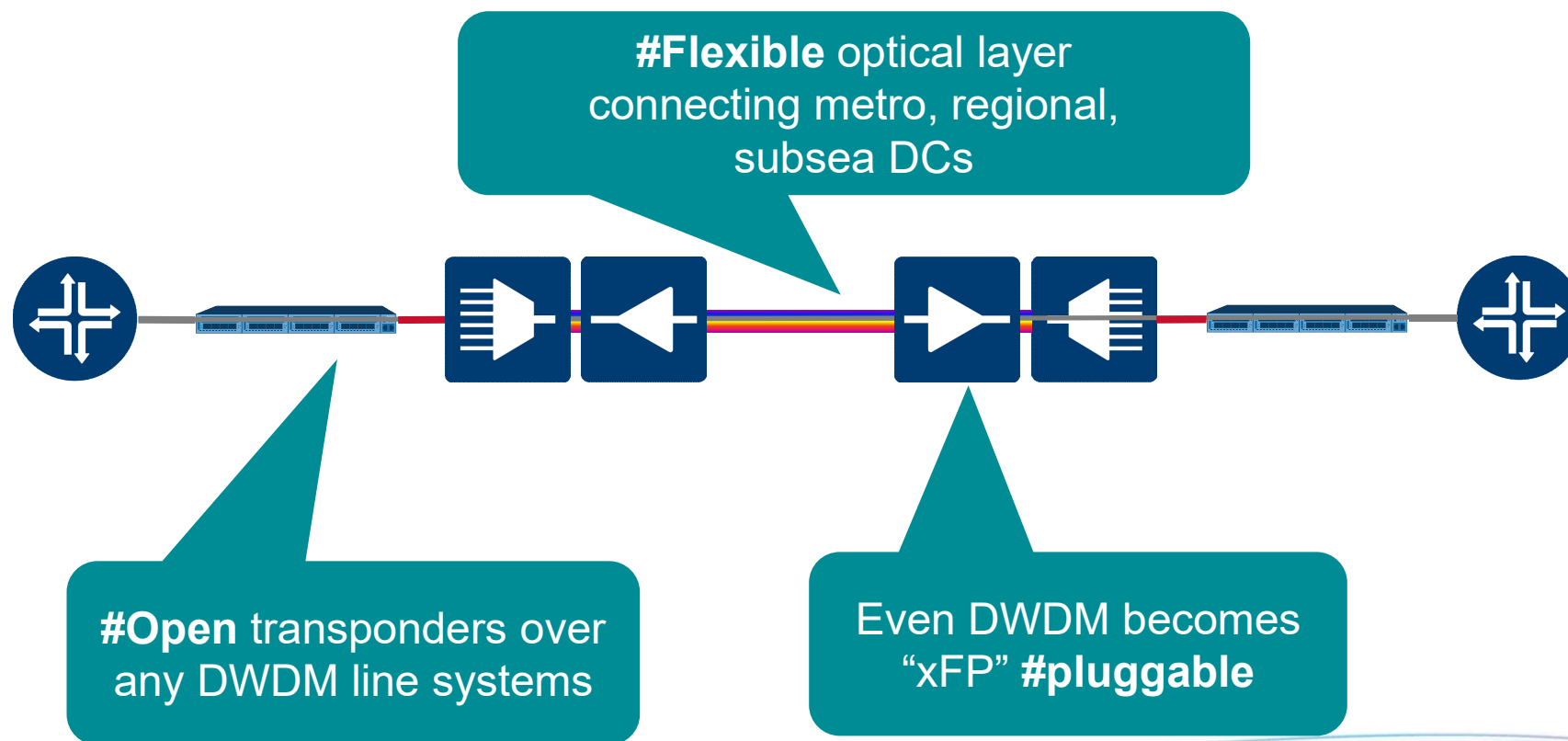


Emerging Technologies for Data Center Interconnection (DCI)

Dion Leung, Ph.D., VP Business Development

Hong Kong, Sept 9, 2016

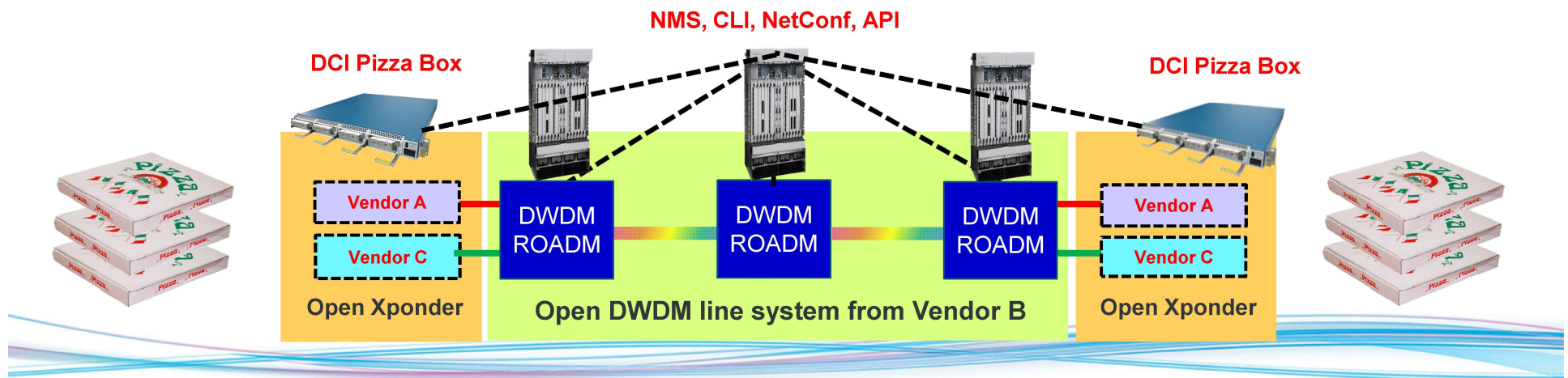
Trends for #DCI?



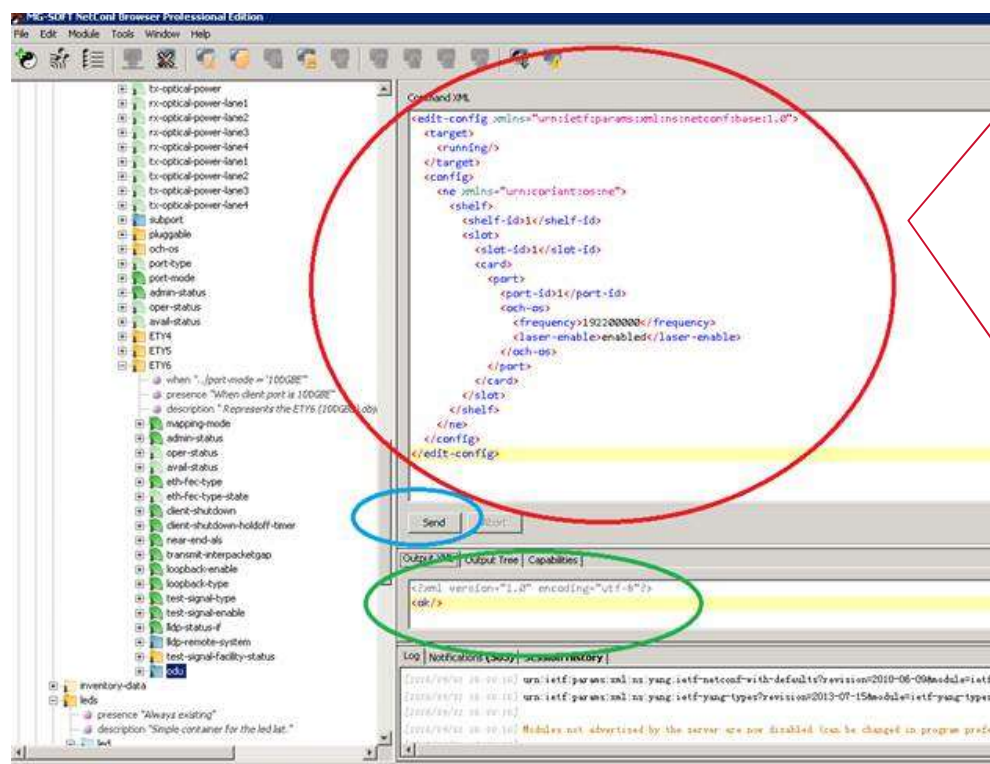
Open Line System Concept – To embrace it or not, this is not a question (anymore)...

- **Open Line System (OLS) Model**

- Open network decouples “optical layer” from “wavelength service layer”
- Open software interfaces make network management simpler
- SDN applications or customized web portals make automation at the transport layer possible
- A transponder is simply managed as a L2 switch...



Simple Netconf Example - Setting a Wavelength



```
<rpc message-id="101"
  xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">

  <edit-config xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
    <target>
      <running/>
    </target>
    <config>
      <ne xmlns="urn:coriant:os:ne">
        <shelf>
          <shelf-id>1</shelf-id>
          <slot>
            <slot-id>1</slot-id>
            <card>
              <port>
                <port-id>1</port-id>
                <och-os>
                  <frequency>192200000</frequency>
                  <laser-enable>enabled</laser-enable>
                </och-os>
              </port>
            </card>
          </slot>
        </shelf>
      </ne>
    </config>
  </edit-config>

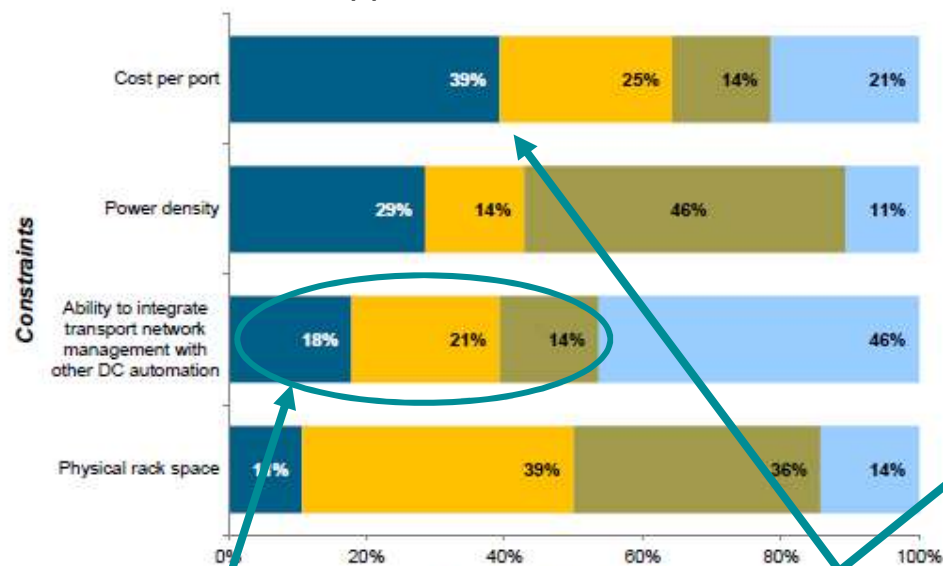
</rpc>
```



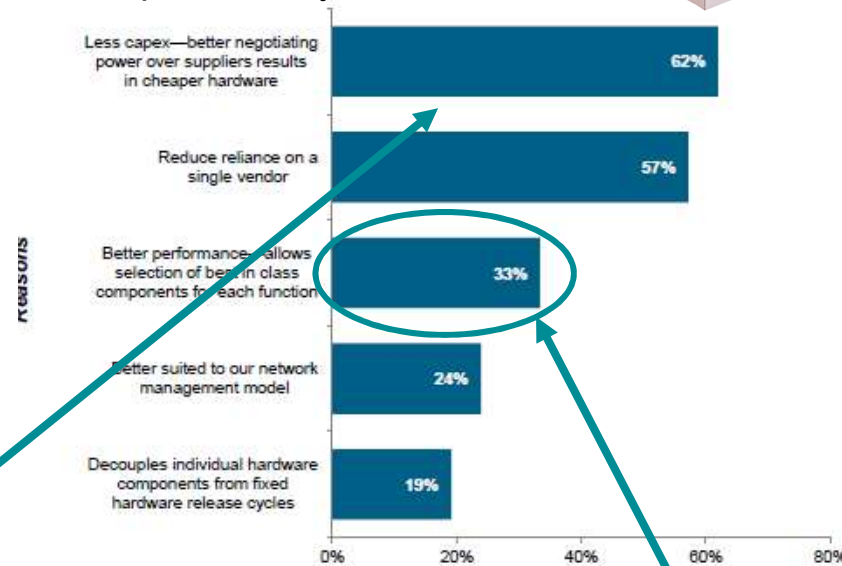
Drivers for Open Line Systems (OLS)?



DCI Applications Constraints



Open Line System Drivers



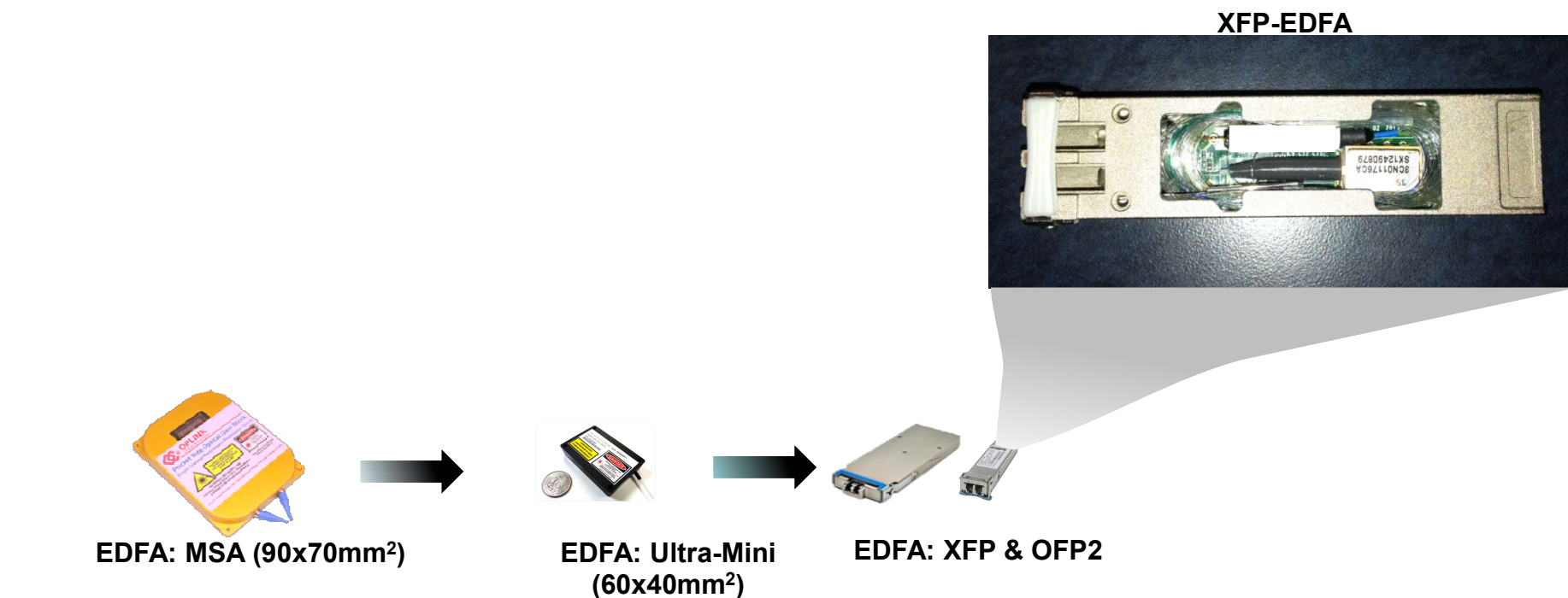
Cost/port, power, density...

... ease of integration and DC automation is key, and...

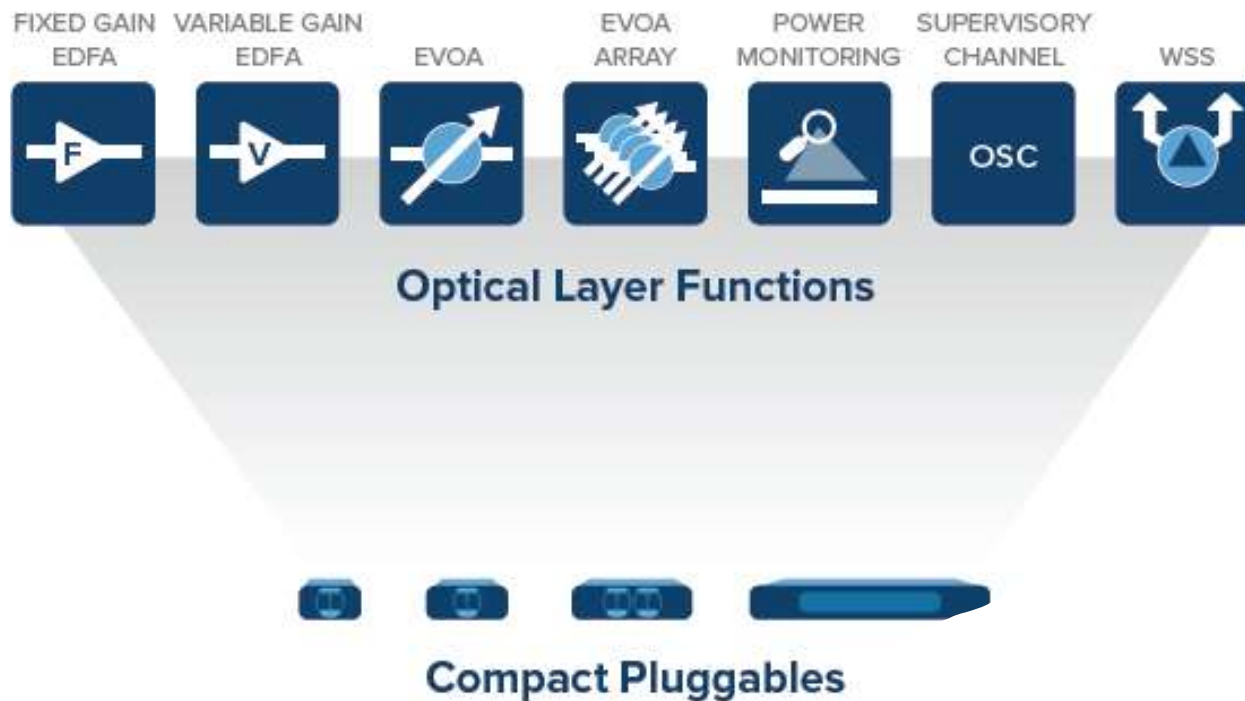
... requirement for Best-in-Class functions emerging

Miniaturization: EDFA Technology Example

MSA / Module Based → XFP / Pluggable Based

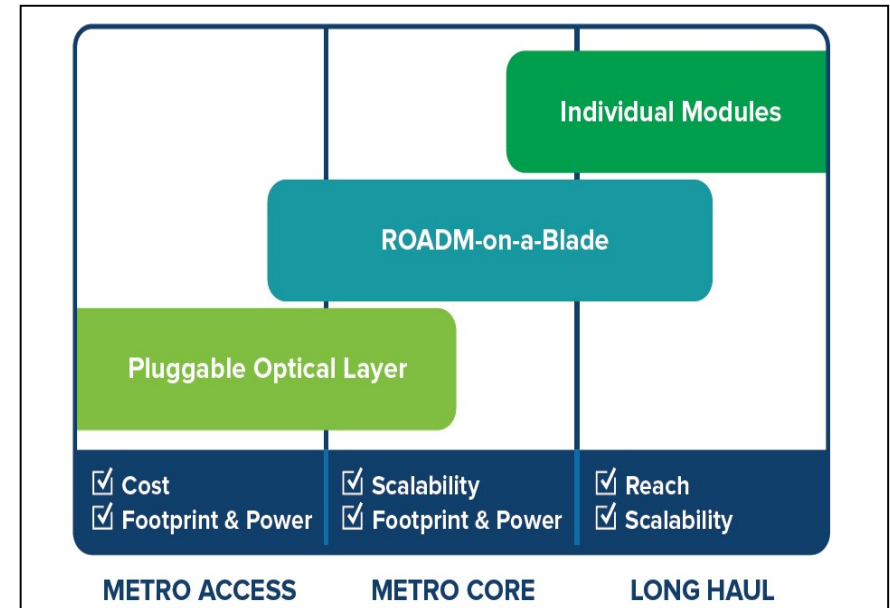


Additional Optical Layer Functions to be “Pluggable”



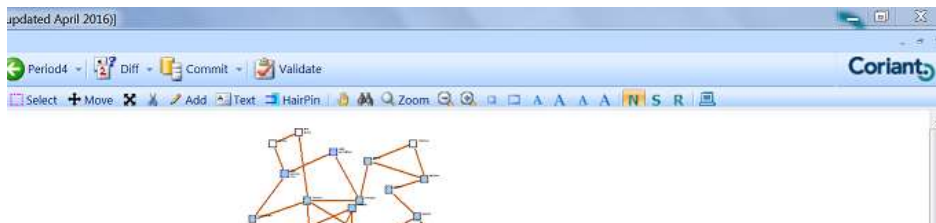
Various Kinds of Open ROADM Implementation

Footprint & Power
Flexibility (to mix & match components)
ROADM Scalability (Degrees, Channels)
Advanced ROADM Add/Drop (CDC, Gridless)
Performance/Reach
Ease of Installation
Cost of Replacing Failed Hardware/Sparing



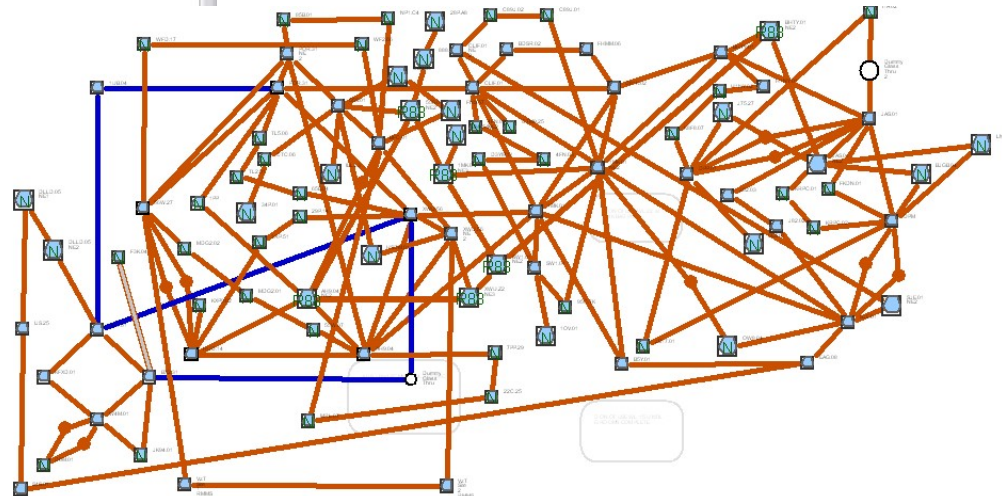
***What types of ROADM architecture is right for you?
It depends on your application and design objectives.***

A Good Optical Planning Tool “Always” Helps...



Especially if you fiber optic layer begins to grow...

... or if latest technologies, including colorless, directionless, contentionless, gridless, are considered.



Thank You.

