

# ***Patchy McPatchBot***

## ***DE-CIX award winning automated ODF***

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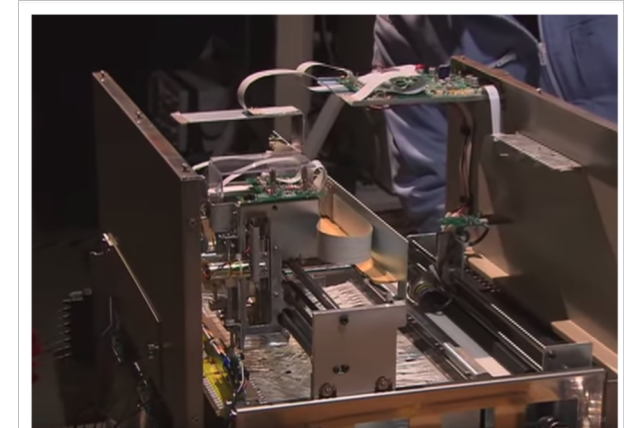
*Where networks meet*

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# ***Making patching easier ... Looking back***

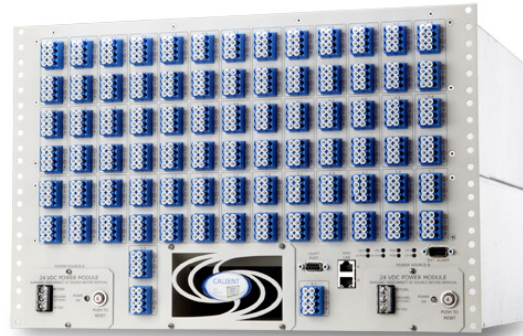
→ What has been around so far

- N x N black boxes
  - Mechanical
  - Microelectromechanical systems (MEMS)
  - N typically  $\leq 200$
- Mechanical boxes switch in the order of seconds
- MEMS boxes switch in the order of 10 milliseconds
  - Glimmerglass has been used at AMS-IX since long
  - More feature rich than just switching



# Making patching easier ... Advantages

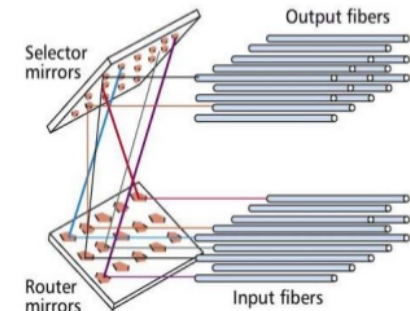
- No misconnection
- Lower operation and maintenance costs
- No wavelength dependency
- Remote manageable
- Central DB



CALIENT's S320 Optical Circuit Switch

## 3D MEMS based Optical Switch Matrix

- Mirrors require complex closed-loop analog control
- But loss increases only as a function of  $N^{1/2}$
- Higher port counts possible.
- Mirrors can be tilted to any angles
- N or 2N mirrors accomplish non-block switching.
- Good scalability



# ***Making patching easier ... Disadvantages***

- Scaling
- Scaling
- Scaling
- No manual patching
- No latching in case of photonic switches
- You still need an ODF / patch panel



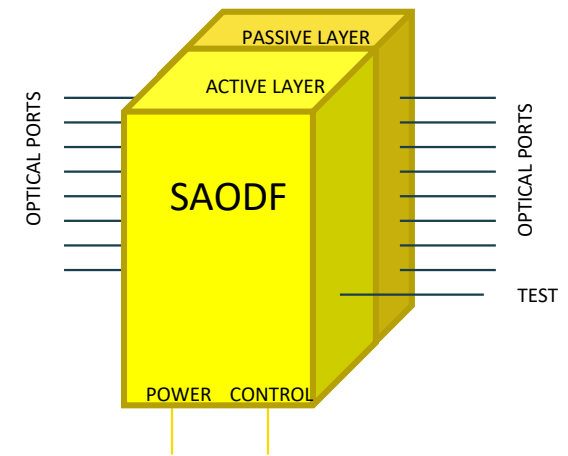
## ***DE-CIX approach***

- DE-CIX Frankfurt 12 first PoP with an Optical Distribution Frame instead of Standard-Rack and Patchpanels for Customer Interconnection
- Small footprint along a wall with a high density and integrated simple overlength management



# Adding intelligence

- Adding an active (automated) layer in front of the ODF, without the need to extend the footprint
- Manual intervention is still possible at any time
- Remote Interconnection between each Customer presentation and Equipment port provides greater flexibility



## ***Increasing speed and density***

- Customer presentation can be provided within minutes
- Provisioning or upgrading a port can be completed within six minutes
- Regularly maintenance concentrates technicians work times
- Capacity increased to 2300 customer connections on a small footprint (1,6m<sup>2</sup>)
- Any customer port can be connected to any datacenter presentation

## ***More flexibility***

- All router ports are fully precabled to the ODF
- ad-hoc and scheduled jobs to extend the port to the MMR of desired data center
- Port moves and upgrades can be performed without intervention by any field-technician (except on customer side)



*Patchy McPatchBot live*



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