Taking Control of DC Cabling for Optimal Performance

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CommScope

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Agenda

- Bandwidth Challenges

- Data Center Challenges

- New Architectures for Consideration

- What that mean for Infrastructure

- Why Optical Distribution Frames

- Network Benefits

Data Center Challenges

With more and more optical connections to contend with, the challenge becomes how to add optical density while still maintaining proper accessibility, flexibility and manageability at the lowest possible cost.

- fiber counts

- density

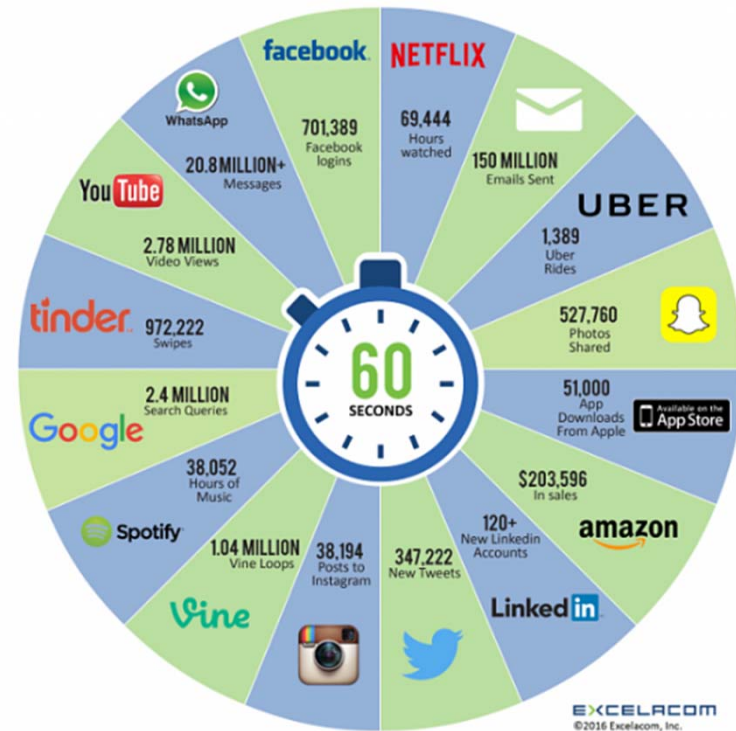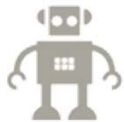- space resulting in potentially reduced availability and higher cost of operation.

The connected world

Internet of Things (IoT)

25 BILLION DEVICES *WILL BE CONNECTED TO THE INTERNET OF THINGS BY 2020.*

90% OF THE WORLD'S DATA *WAS CREATED IN THE LAST 2 YEARS; 66% IS IN THE CLOUD*

MACHINE LEARNING IS NECESSARY TO PROCESS THE ONSLAUGHT OF IOT DATA & TURN IT INTO VALUABLE INFO TO MAKE MEANINGFUL ACTIONS

ARTIFICIAL INTELLIGENCE OR MACHINE LEARNING IS ALREADY IN USE:

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Big Bandwidth Challenge

CONNECTED LIFESTYLES AND THE IOT WILL CREATE MORE & MORE DATA

BIG DATA IS EXPECTED TO GROW

800%

WITHIN THE NEXT 3 YEARS

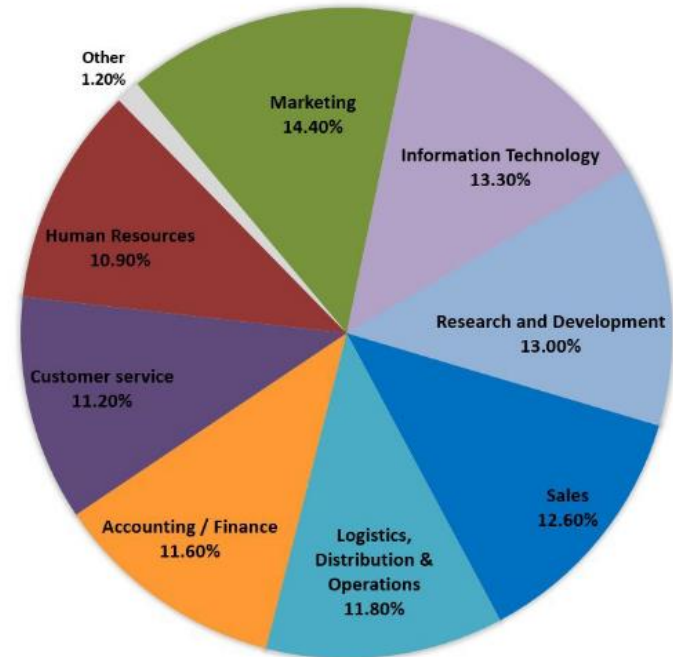ANNUAL GLOBAL DATA CENTER IP TRAFFIC WILL GROW FROM

3.1→8.6ZB

BETWEEN 2013 & 2018

TODAY'S EXISTING DATA NETWORKS AND PRESENT INFRASTRUCTURES ARE NOT READY FOR SUCH LOADS.

Source: Reuters and Cisco, 2013

Source: Big Data and Advanced Analytics Survey 2015, Volume I by Evans Data Corporation

Pie chart:
- Other 1.20%
- Marketing 14.40%
- Information Technology 13.30%
- Research and Development 13.00%
- Sales 12.60%
- Logistics, Distribution & Operations 11.80%
- Accounting / Finance 11.60%
- Customer service 11.20%
- Human Resources 10.90%

Digital Transformation Requires an Agile Data Center

Data center managers need to eliminate problems

- Downtime
  - Human error
  - System failure
  - Natural disasters
  - Security breaches

- Insufficient bandwidth
  - Entering the DC
  - Within the DC

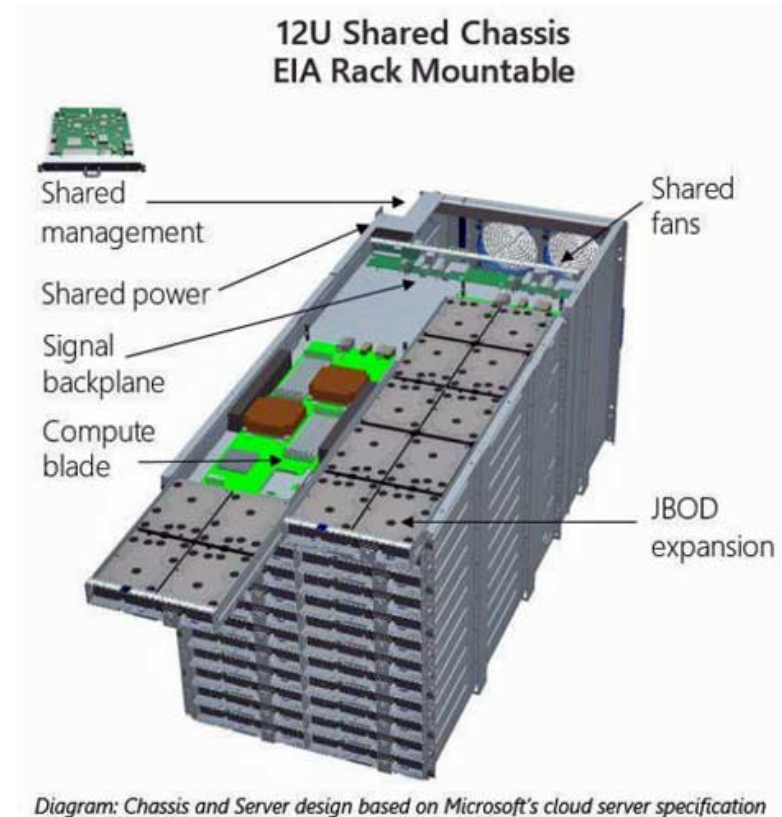- Latency

Private Cloud

Can a hyperscale design be universal?

- Scalable designs
    - Architected to be resilient to failures
    - Requires minimal manual intervention
    - Upgrades can be made on the fly

- Commodity Hardware
    - White box servers and switches

- Software Defined Networks
    - Network Function Virtualization (NFV)

12U Shared Chassis
EIA Rack Mountable

Shared management
Shared power
Signal backplane
Compute blade
Shared fans
JBOD expansion

Diagram: Chassis and Server design based on Microsoft's cloud server specification

Hyperscale Practices

In Common?
- Uniform x86
- Local HDD and Flash
- Software driven
- Scale-out design

What is absent?
- Storage Networks
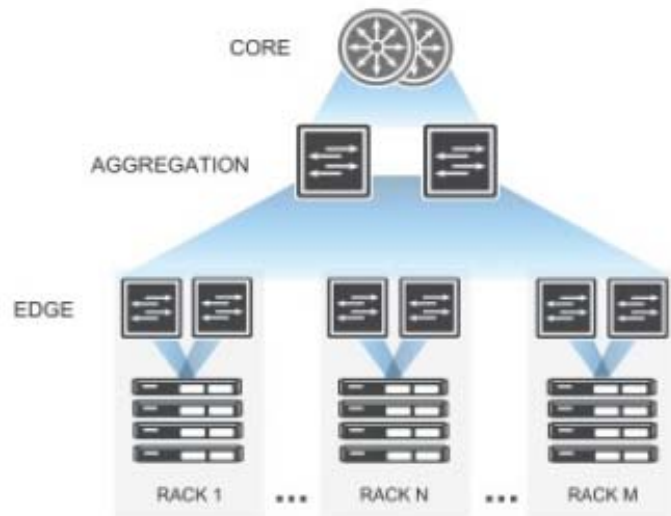- SAN/NAS controllers
- Separate Storage management
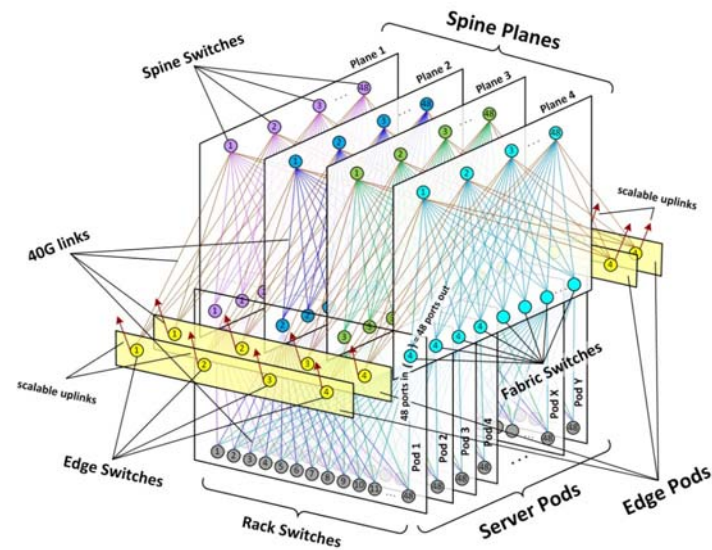
Modern Network Architecture for Enterprises

N-Tier Data Center Design
(Traditional Approach)   *Big Switch Networks 2015*

Core and Pod Design
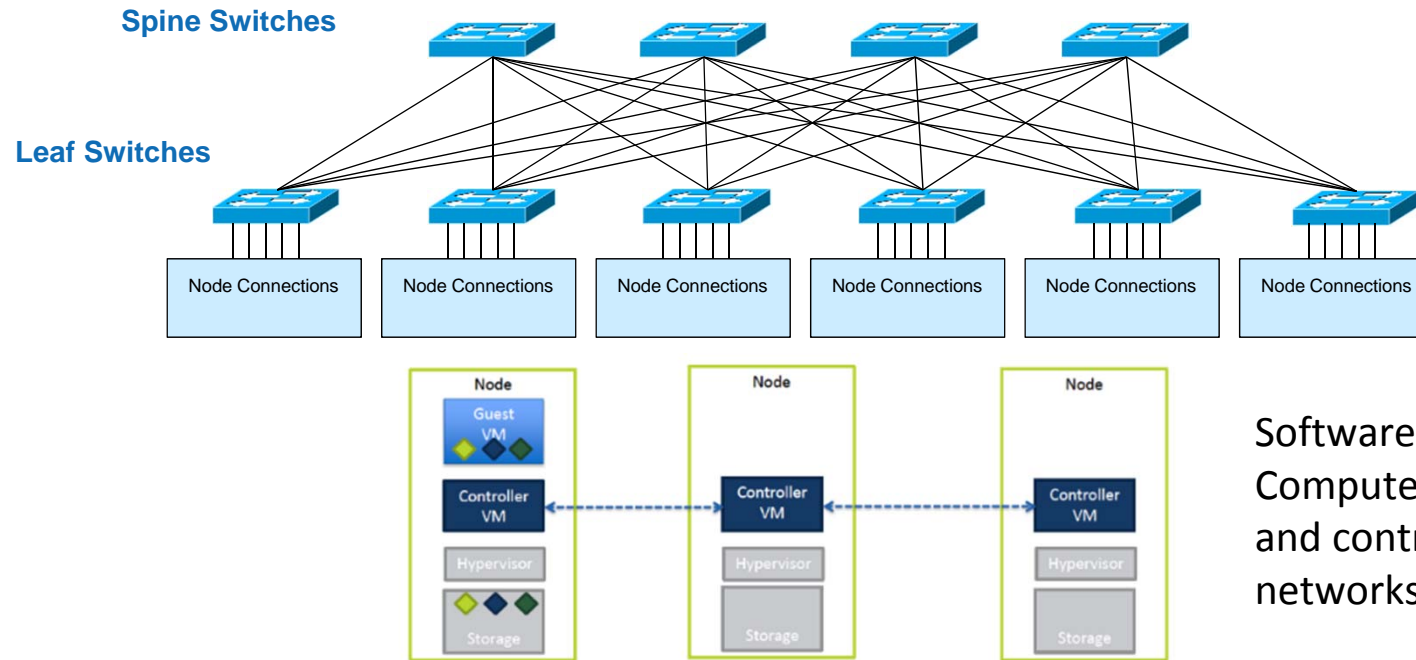(Hyperscale Approach)   *Horovits 2016*

Fabric Networks

Spine Switches

Leaf Switches

| Node Connections | Node Connections | Node Connections | Node Connections | Node Connections | Node Connections |

Node

Guest VM

Controller VM

Hypervisor

Storage

Node

Controller VM

Hypervisor

Storage

Node

Controller VM

Hypervisor

Storage

Software ties
Compute, storage
and control
networks together
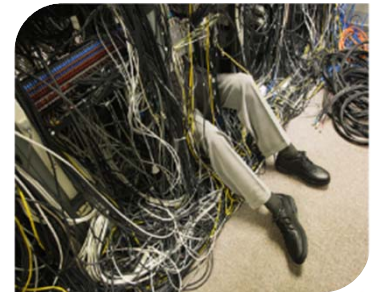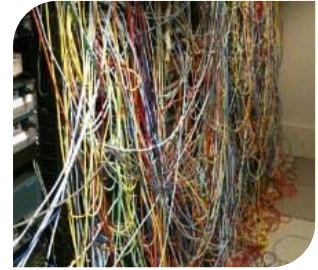
Current Solutions

The attempt to address these issues by using high-density patch panels can make the problem worse, if not done correctly.

The solution has two parts:

- Choosing a different cabling architecture.
- Having the right cross-connect solution

Haven't we all seen these situations before?

A Better Solution

In order to meet these challenges today…

- Equip facilities for future growth

- Cross connects in the MDA.

  - Optical Distribution Frame (ODF) solutions have been available for years

  - used primarily by telecommunication providers

  - similar challenges now facing data center operators

  - ODFs manage data center cabling

Why Optical Distribution Frames

- ODFs are optimized for cabling, not for equipment

- Solve large data center cable management problems:
  - those caused by migration towards parallel fiber-optic applications
  - those caused by the expected growth of the data center itself.

- More fiber in the data center
  - optimized for cable management
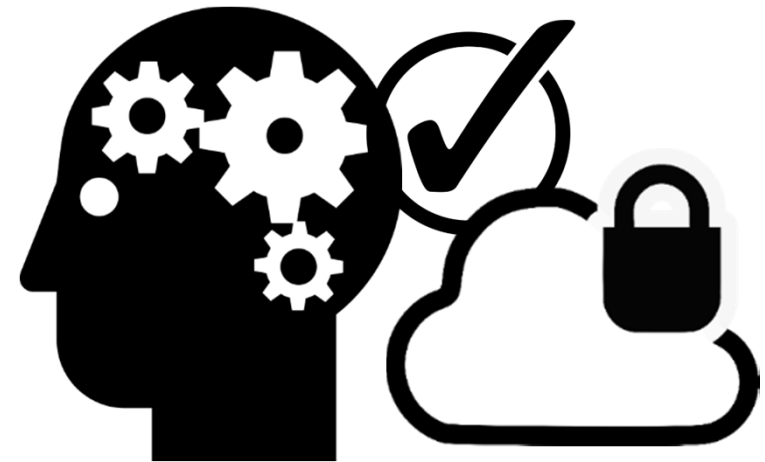 - offering bend radius protection for fiber patch cords
  - over-length storage

Network Benefits

Correctly designed, cross-connect ODFs function very effectively as the single point of distribution for all LAN, SAN and telecommunication services in the data center

- Delivering best-in-class cable management

- Reduced operations costs

- And these advantages:
  - Easy Servicing
  - Increased Availability
  - Optimal Flexibility
  - Enhanced Security
  - Intelligence

Key Take-Aways

- Have a migration plan
- With more connections comes more fiber, density and space constraints
- Brace for new architectures
- Consider a cross connect to manage connections
- ODFs can provide exceptional cable management and reduced operations costs

Thank You

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