Gestión de Centro de Cómputos

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AGENDA

- **Flashback (Áreas de un Centro de Datos)**
- **Computer Rooms**
- **Principales Componentes de un Computer Room**
- **Break**
- **Topologías de Cableado de Computer Rooms**

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ÁREAS DE UN CENTRO DE DATOS

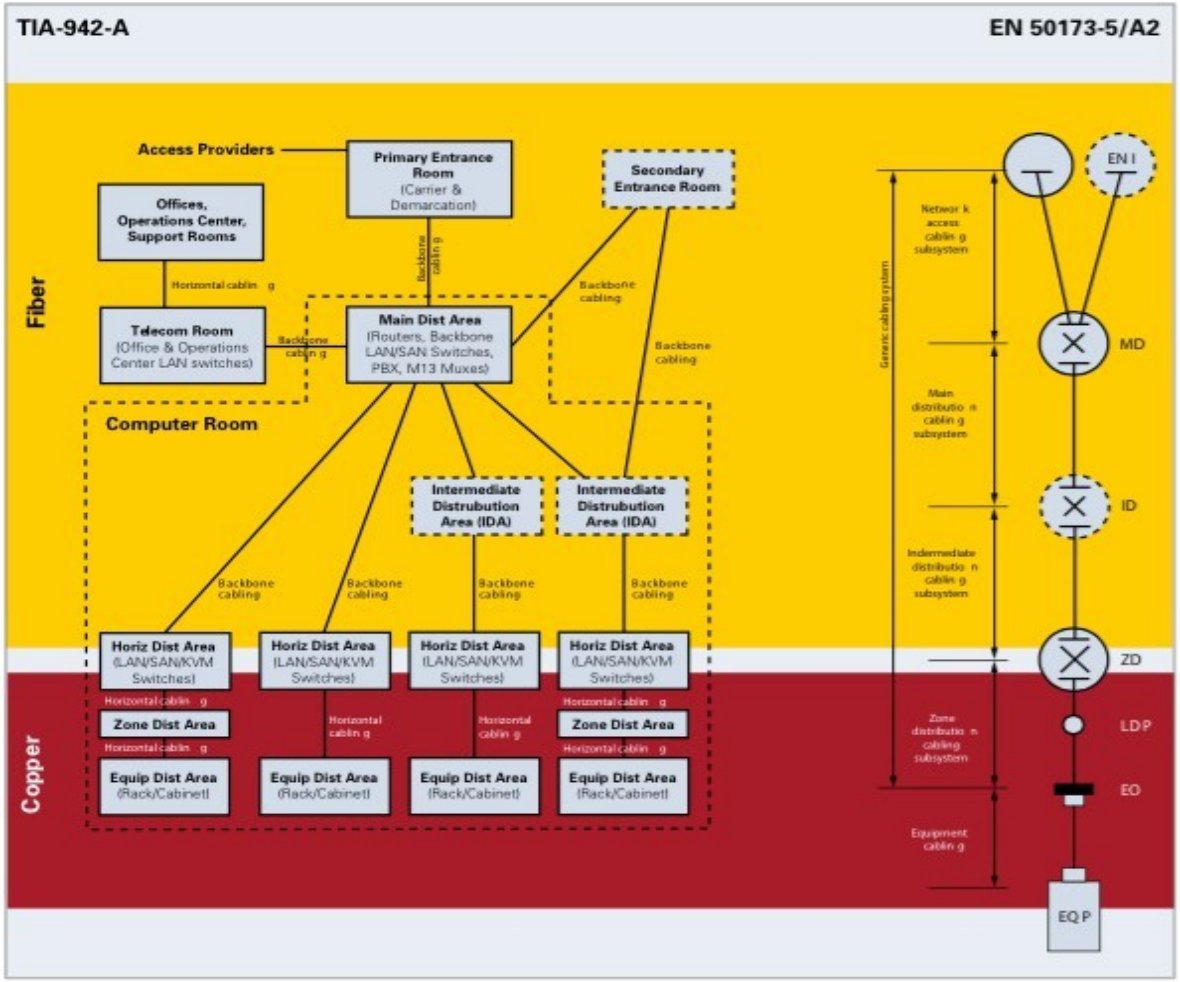


Figura 1. Sistemas de Cableado Genérico según TIA-942-A y BS EN 50173-5/

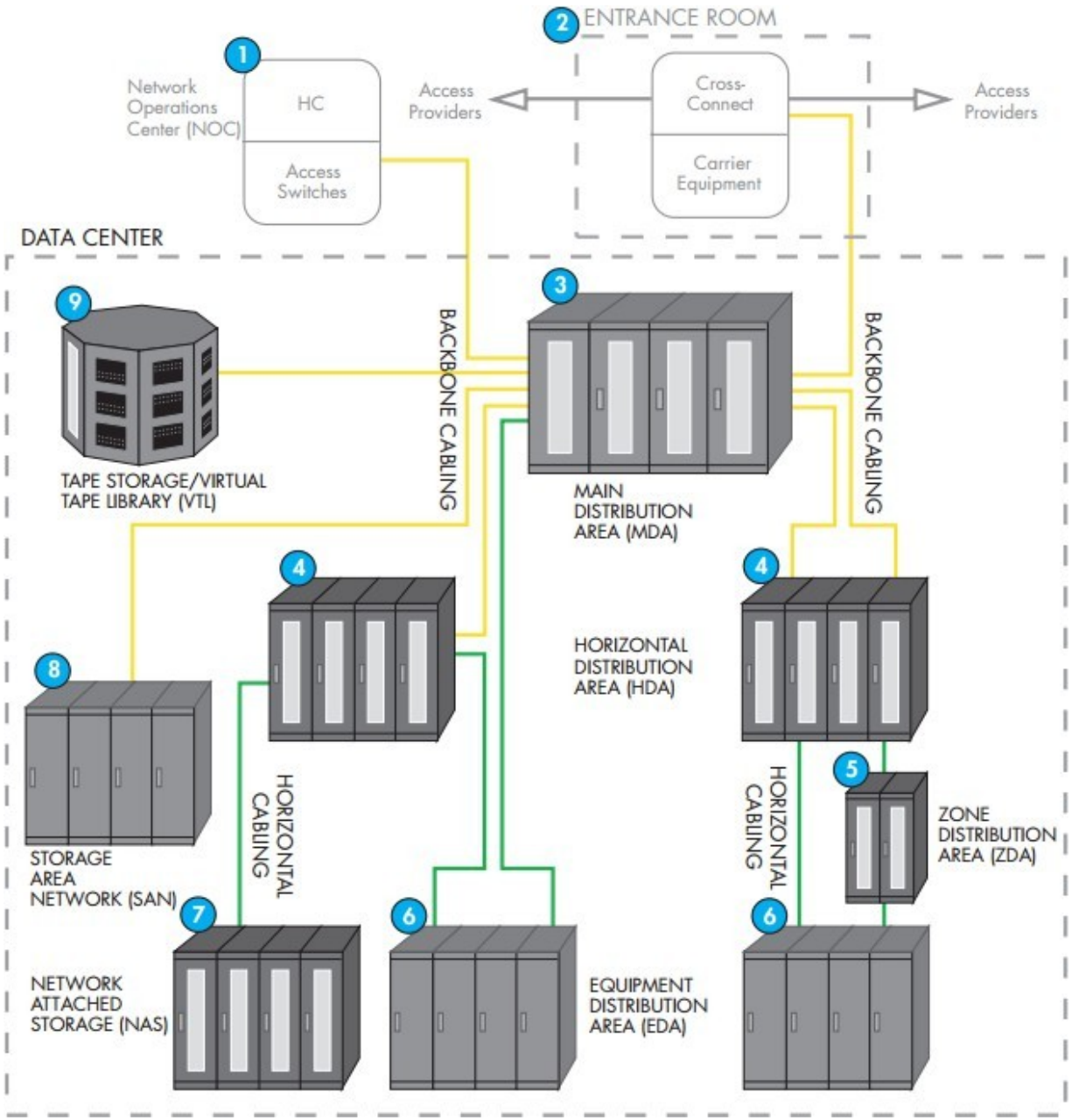


Figura 2. Sistemas de Cableado Genérico según TIA-942-A y BS EN 50173-5/A2

Entrance Room (ER)

Entrance area to the **datacenter network**.

Access to the **public network** (Internet) is established at this point.

This access may be a **redundant connection**, depending **upon the tier level**.

In **smaller networks**, the External Network Interface can be connected directly to the **Horizontal**

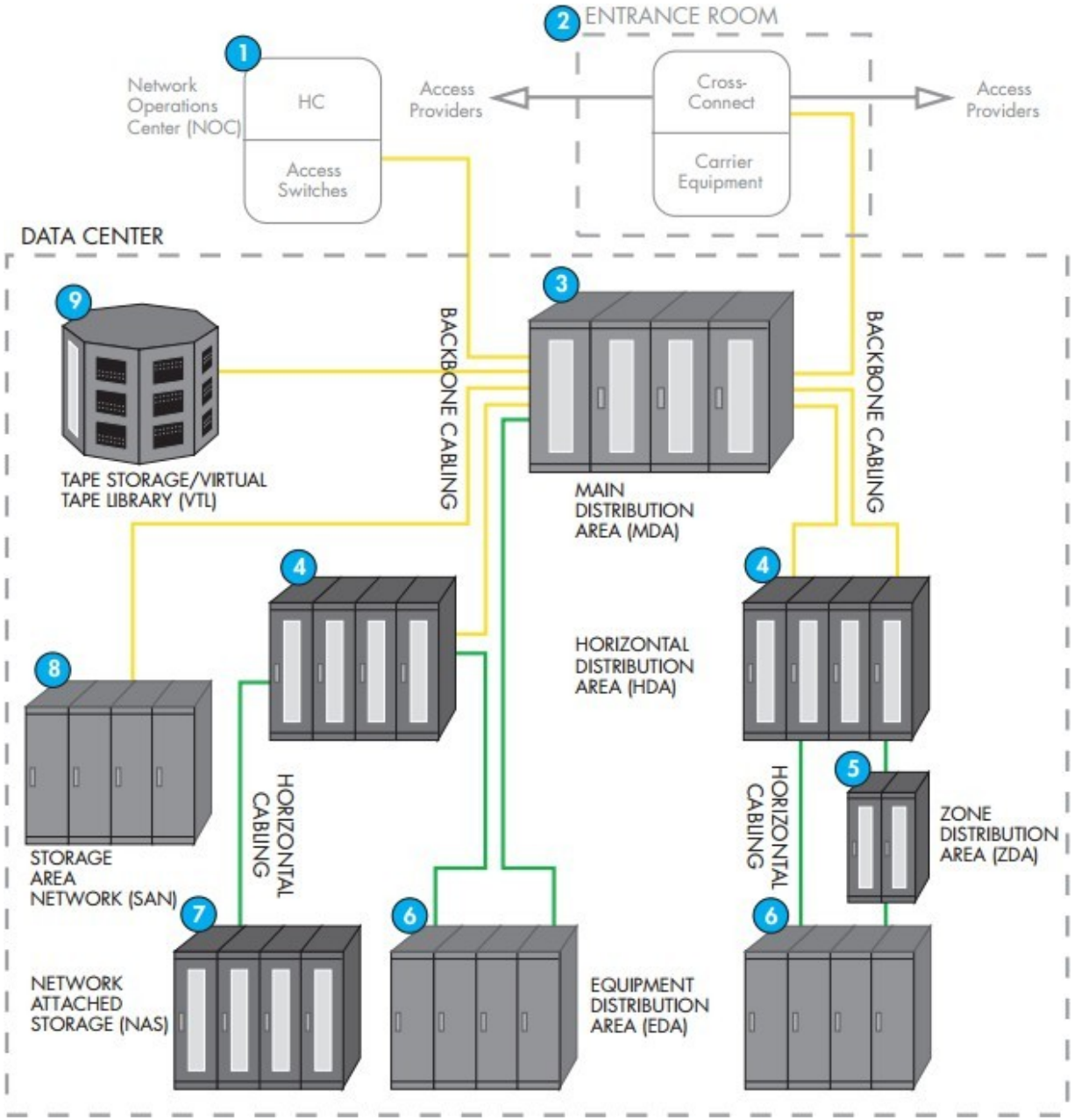


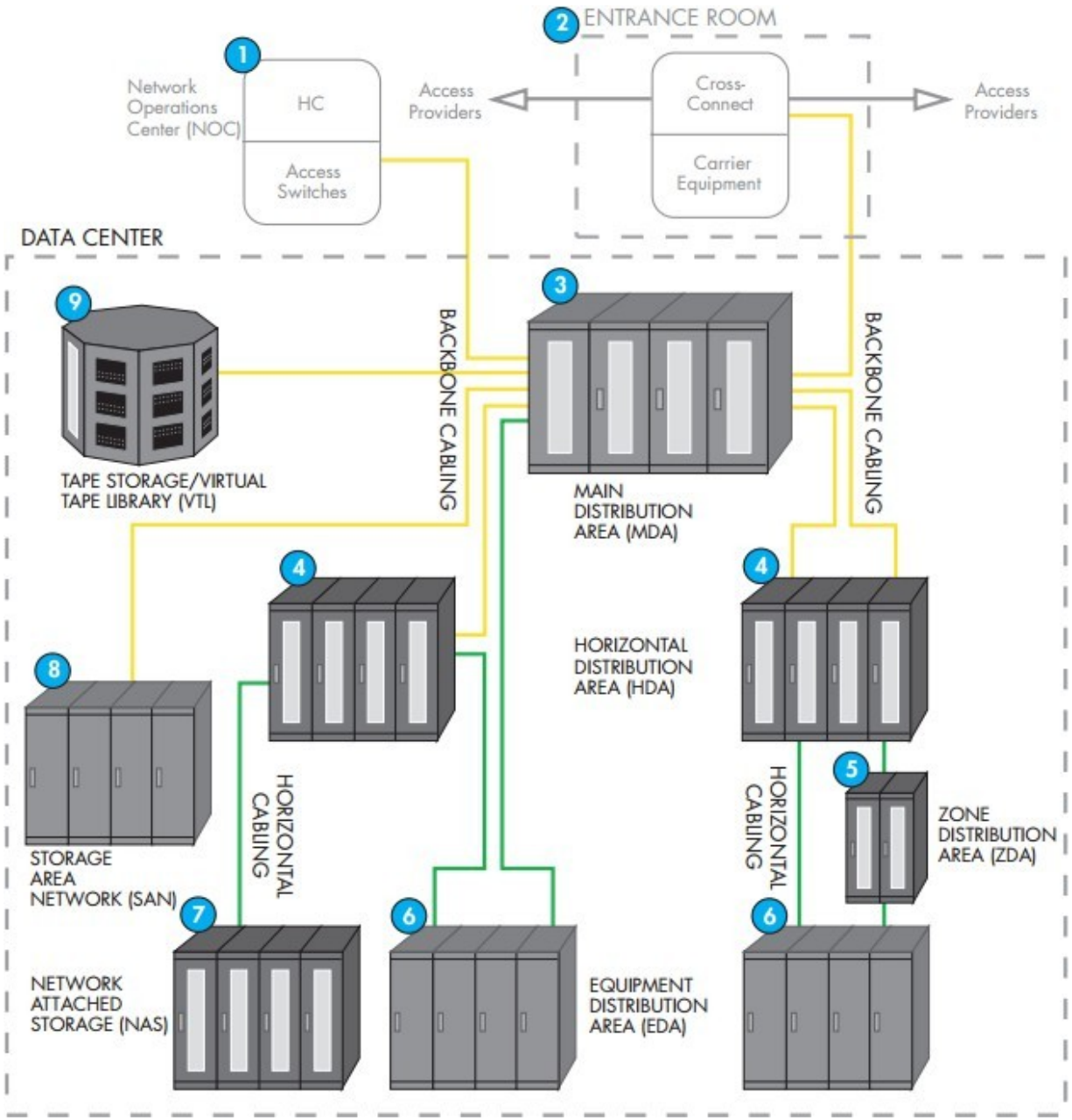
Figura 2. Sistemas de Cableado Genérico según TIA-942-A y BS EN 50173-5/A2

Main Distribution Area (MDA)

Implementation of **redundant connections** and components.

Also known as **Core Layer**, since all data traffic is managed here.

The **Aggregation Layer** (or Distribution Layer) is part of this layer. It forwards bundled data traffic from the access layer on to the core, via aggregation/distributi



Horizontal Distribution Area (HDA)

Also known as **Access Layer**.

Data traffic from **access switches** is passed to the aggregation layer between the backbone and horizontal cabling in the HDA.

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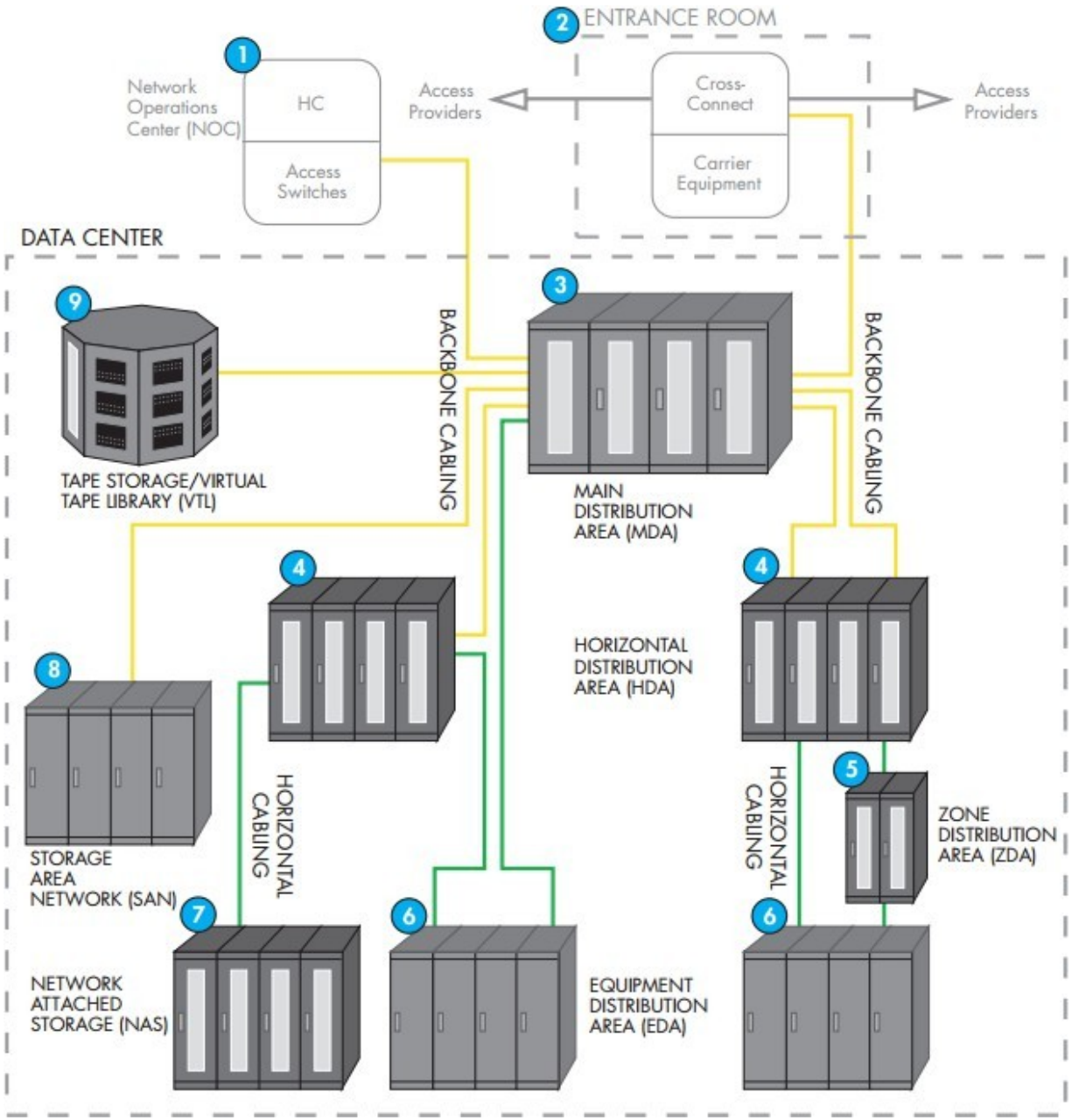

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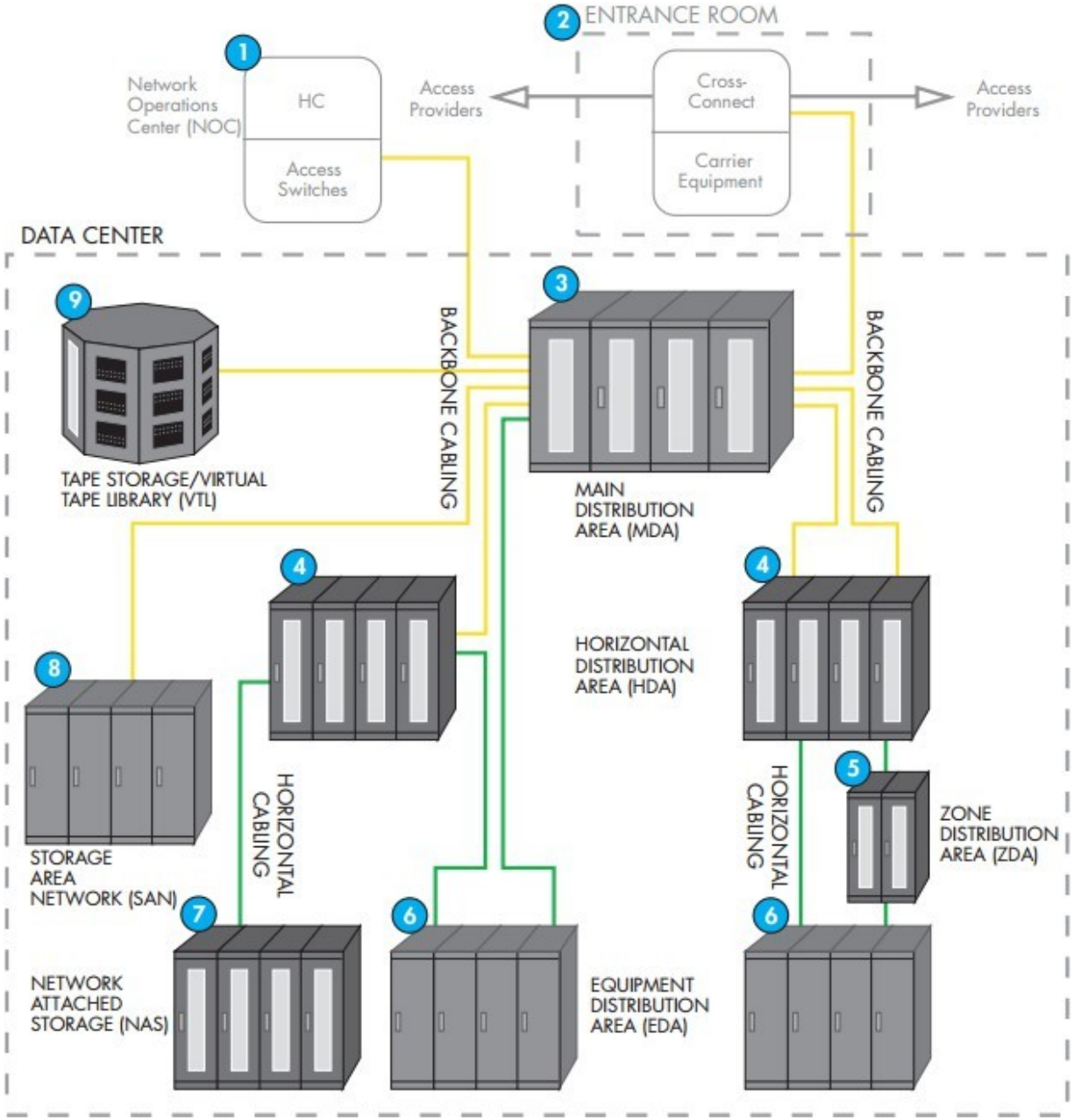
Zone Distribution Area (ZDA)

Used for intermediate distribution outside the **Equipment Distribution Area (EDA).**

Equipment Distribution Area (EDA)

Houses floor-standing computing equipment as well as rack and cabinet mounted devices such as servers and other communications hardware



Otras Áreas:

Intermediate Distribution Area (IDA)

Network Operation Center (NOC)

Support Room

Offices

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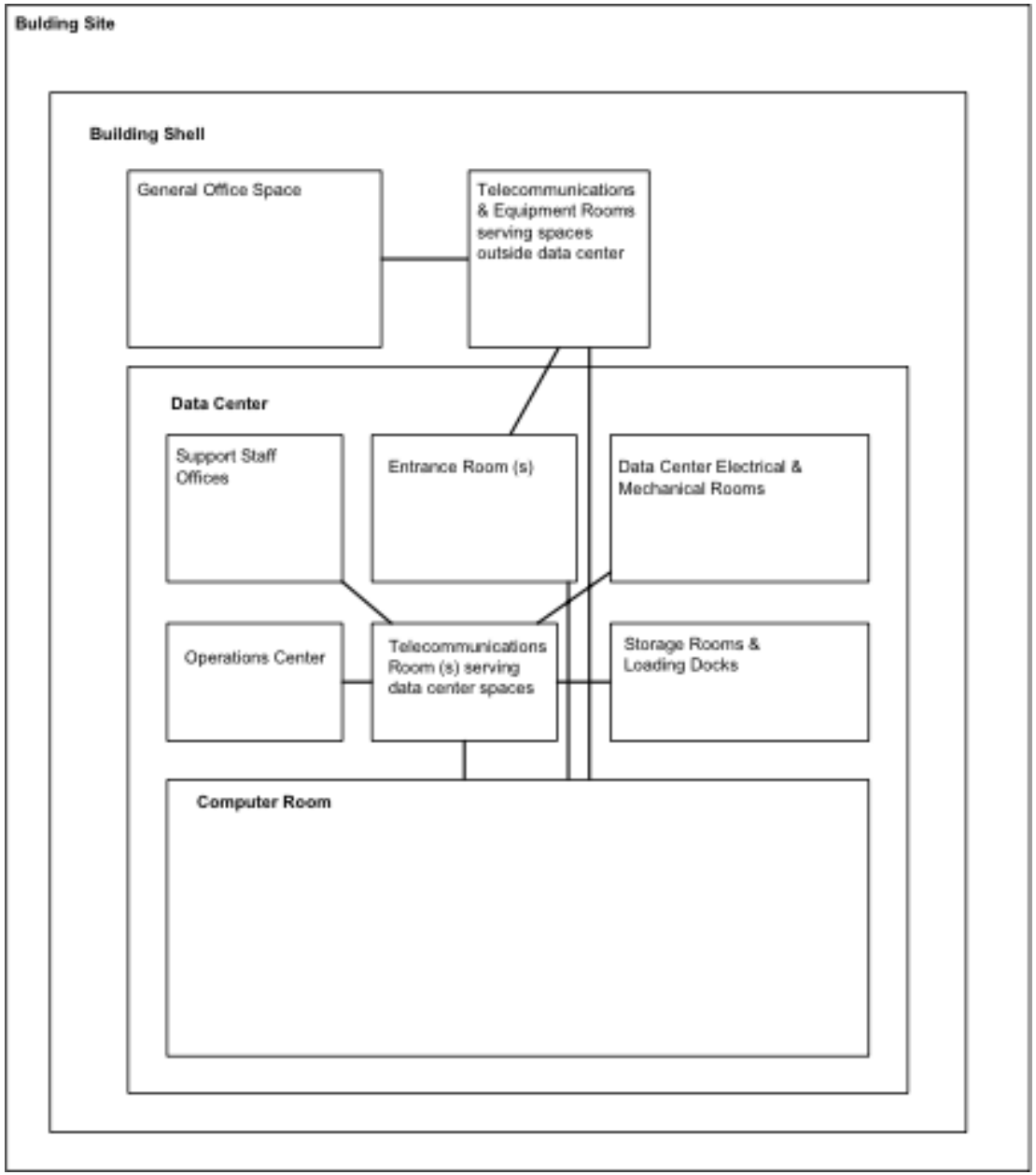


Figura 3. Relación entre áreas del Centro de Datos y otras áreas según TIA-942

Figura 4. A Computer Room at Google

Figura 5. A Computer Room at Facebook

Figura 6. Custom Servers at Facebook: http://www.opencompute.org/

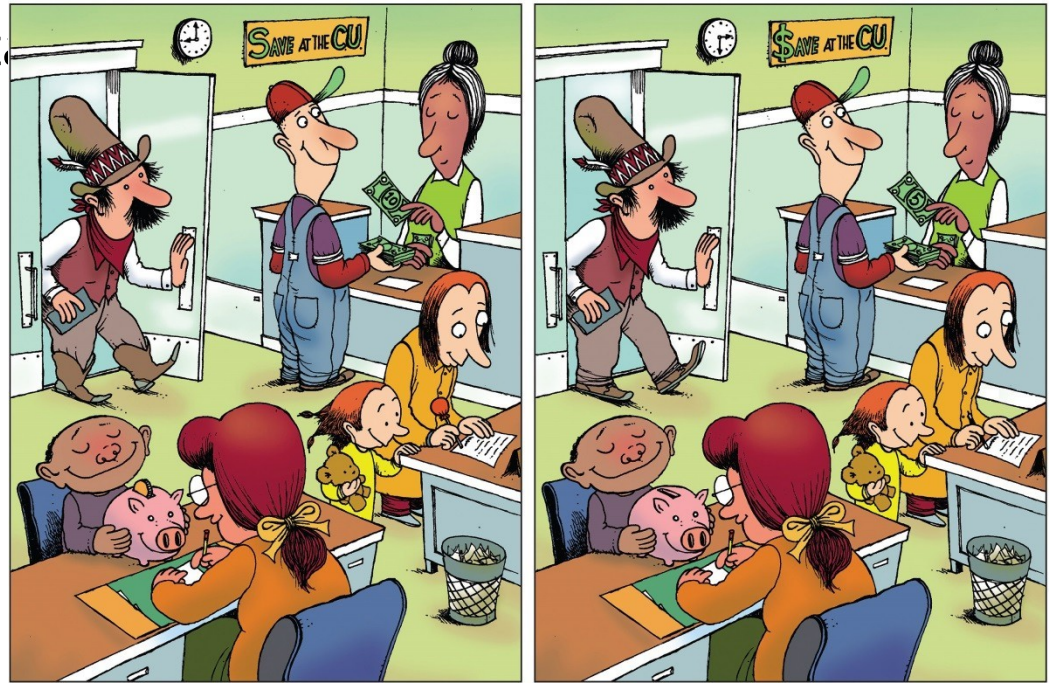
LAS 7 DIFERENCIAS

Video 1: Inside Google's

Datacenter **Video 2:** Microsoft

Datacenter Tour **Video 3:**

Facebook Dat



THE DATACENTER AS A COMPUTER

"As computation continues to move into the cloud, the computing platform of interest no longer resembles a pizza box or a refrigerator, but a warehouse full of computers. These new large datacenters are quite different from traditional hosting facilities of earlier times and cannot be viewed simply as a collection of co-located servers. Large portions of the hardware and software resources in these facilities must work in concert to efficiently deliver good levels of Internet service performance, something that can only be achieved by a holistic approach to their design and deployment. In other words, we must treat the datacenter itself as one massive warehouse-scale computer (WSC)"

Luiz André Barroso, Jimmy Clidaras, and Urs Hölzle (Google, Inc.)

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RACKS

Figura 7. Componentes de un Computer Room: Racks

Typical Server Rack Diagram

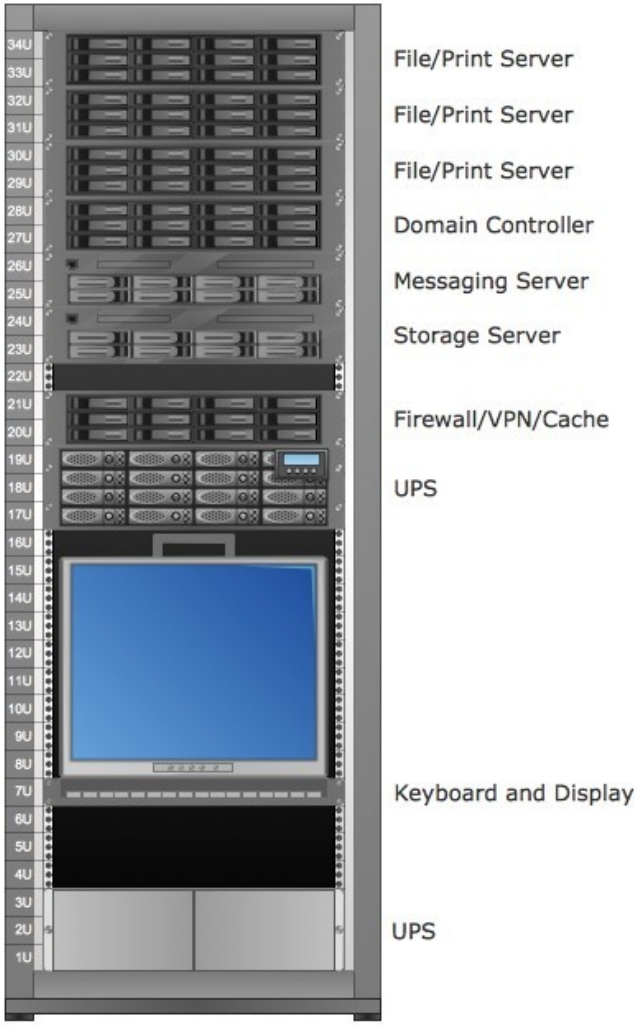

Figura 8. Componentes de un Computer Room: Diagrama de Rack

Open Rack

Mechanical Specification V1.8

Steve Mills stevem@fb.com

Define all of Facebook Mechanical requirements for Open Rack Suppliers

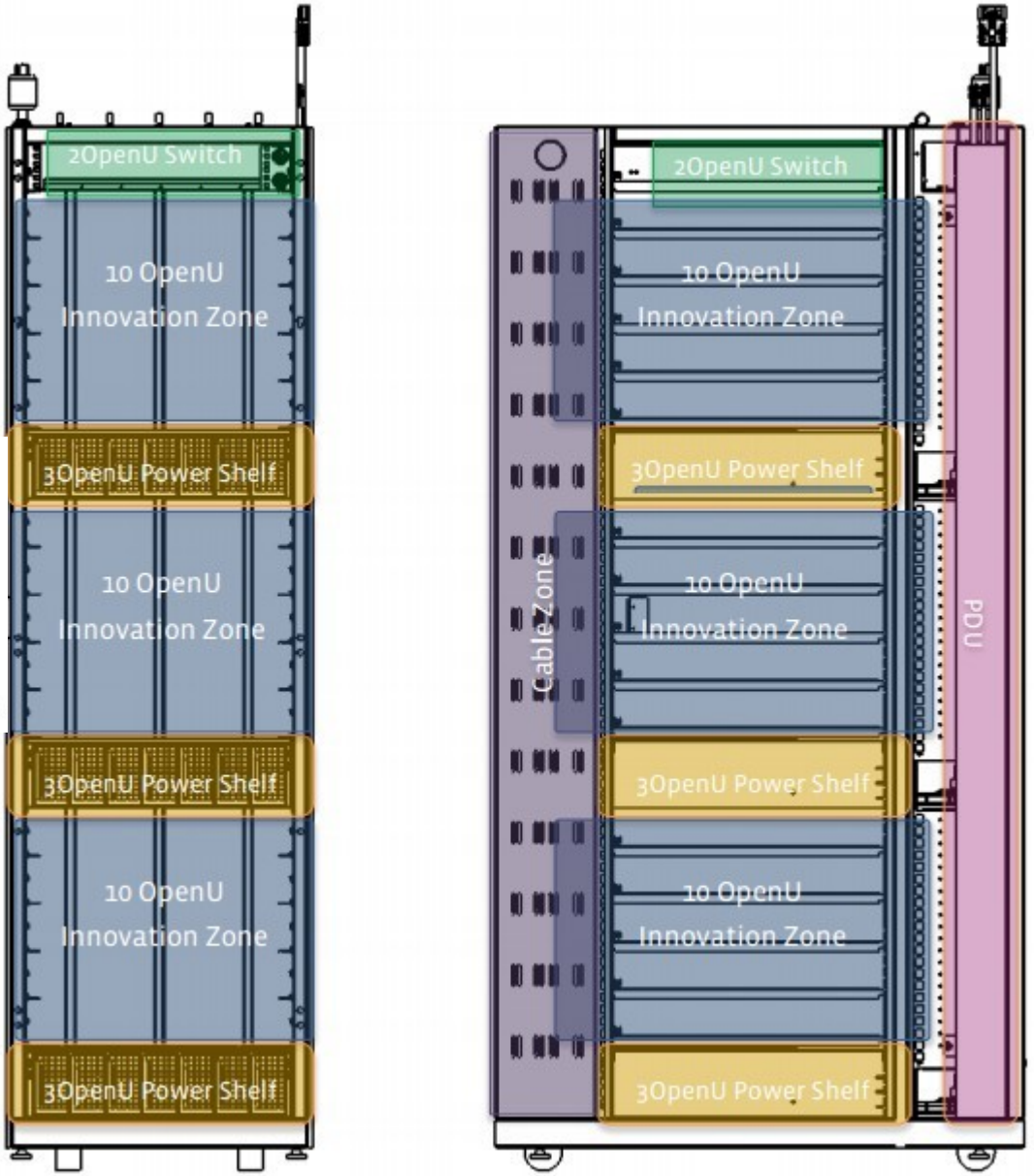

Figura 9. Overall Layout of Open Rack

PATCH PANELS

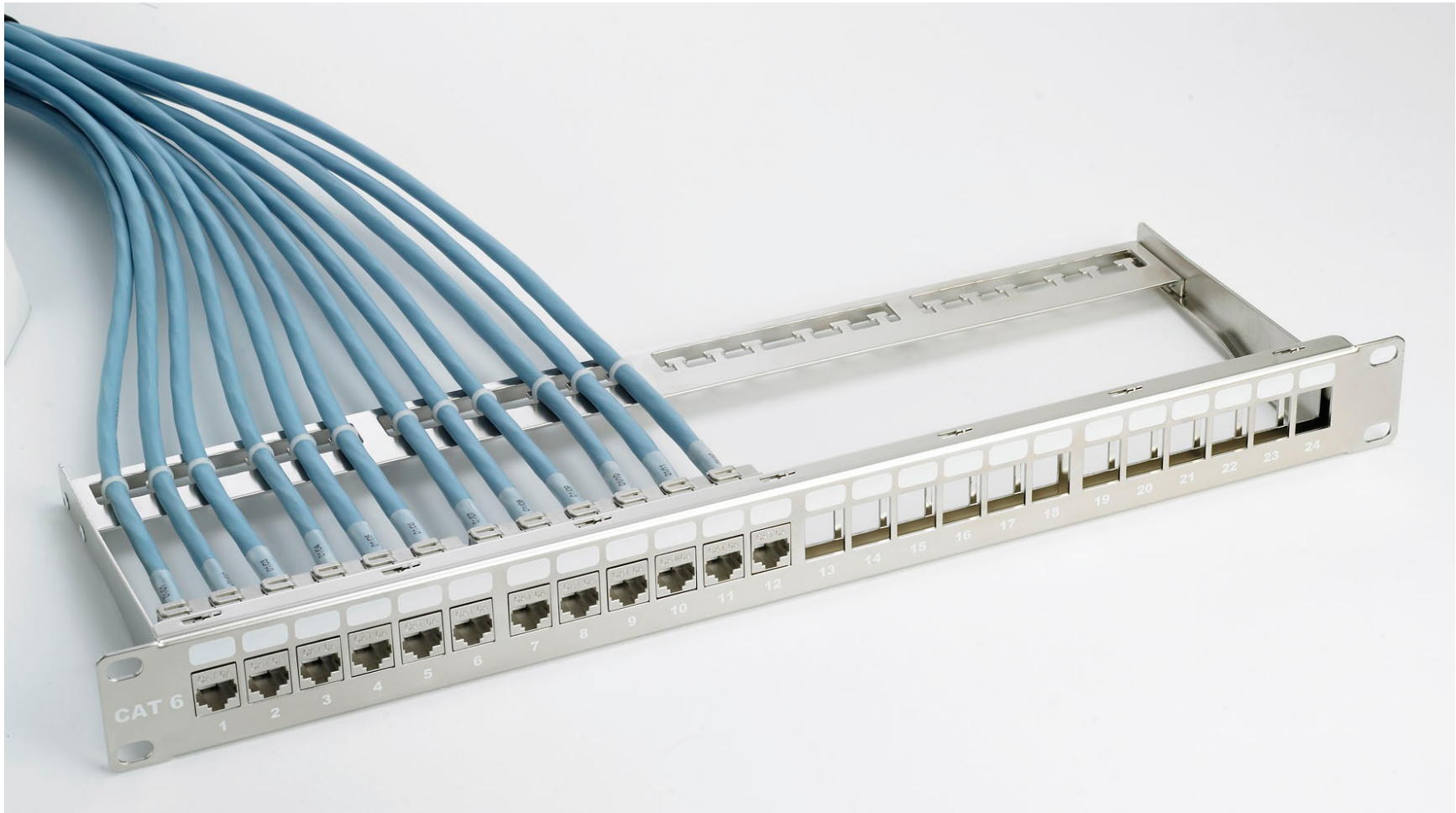

Figura 10. Componentes de un Computer Room: Patch Panel UTP

PATCH PANELS

Figura 11. Componentes de un Computer Room: Patch Panel FO

POWER DISTRIBUTION UNIT

Figura 12. Componentes de un Computer Room: PDU

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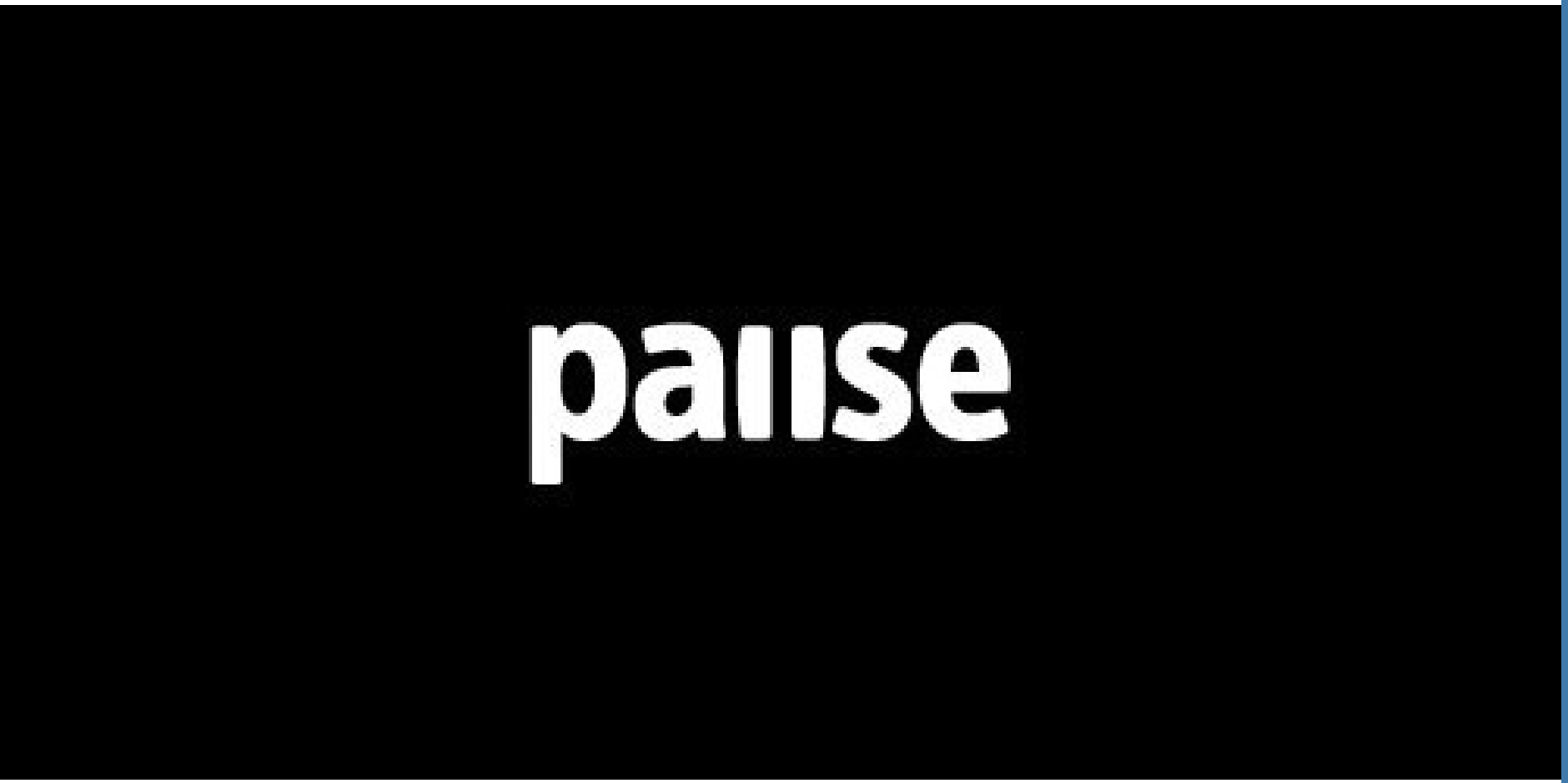
15 MINUTOS



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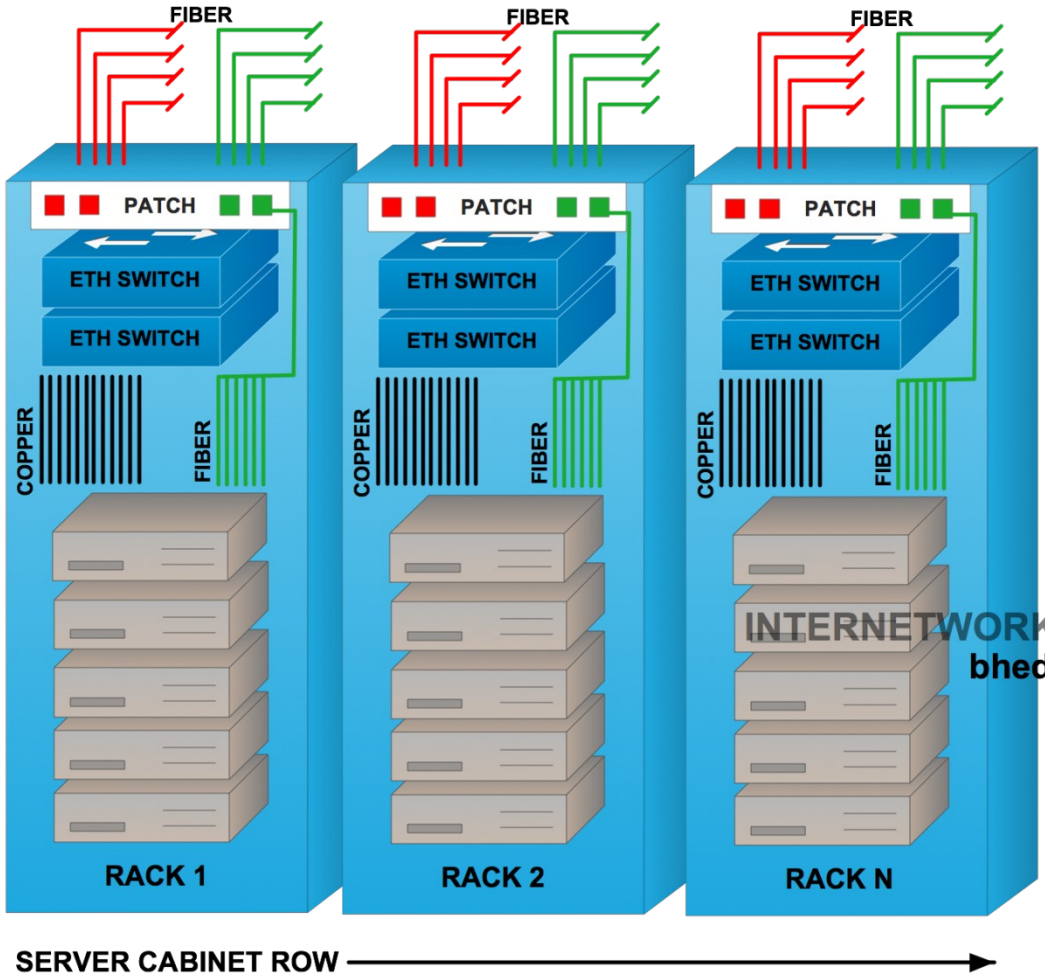
FROM PREVIOUS LECTURE

Cable type selection is a critical factor in determining the ability of the data center cabling system to grow with future needs. Definitions therefore exist both for possible communication protocols and the corresponding maximum transmission rates for various cable types. Fiber optic cable is usually the preferred medium for backbone cabling, while copper cable is used for horizontal cabling.

Selection of the cabling architecture determines a number of factors, including scalability of the data center. It affects both network availability as well as rack arrangement.

TOP OF RACK DESIGN



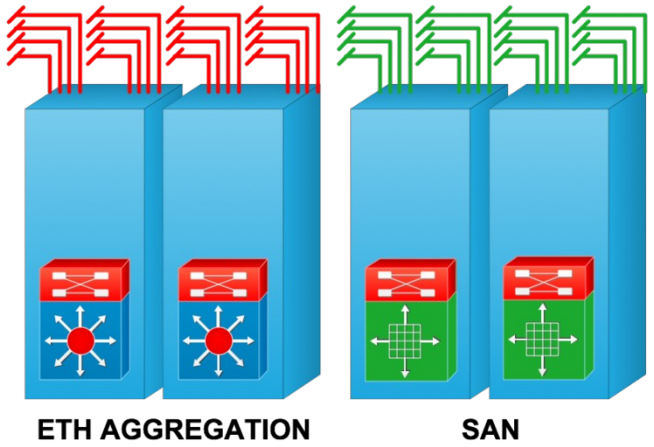
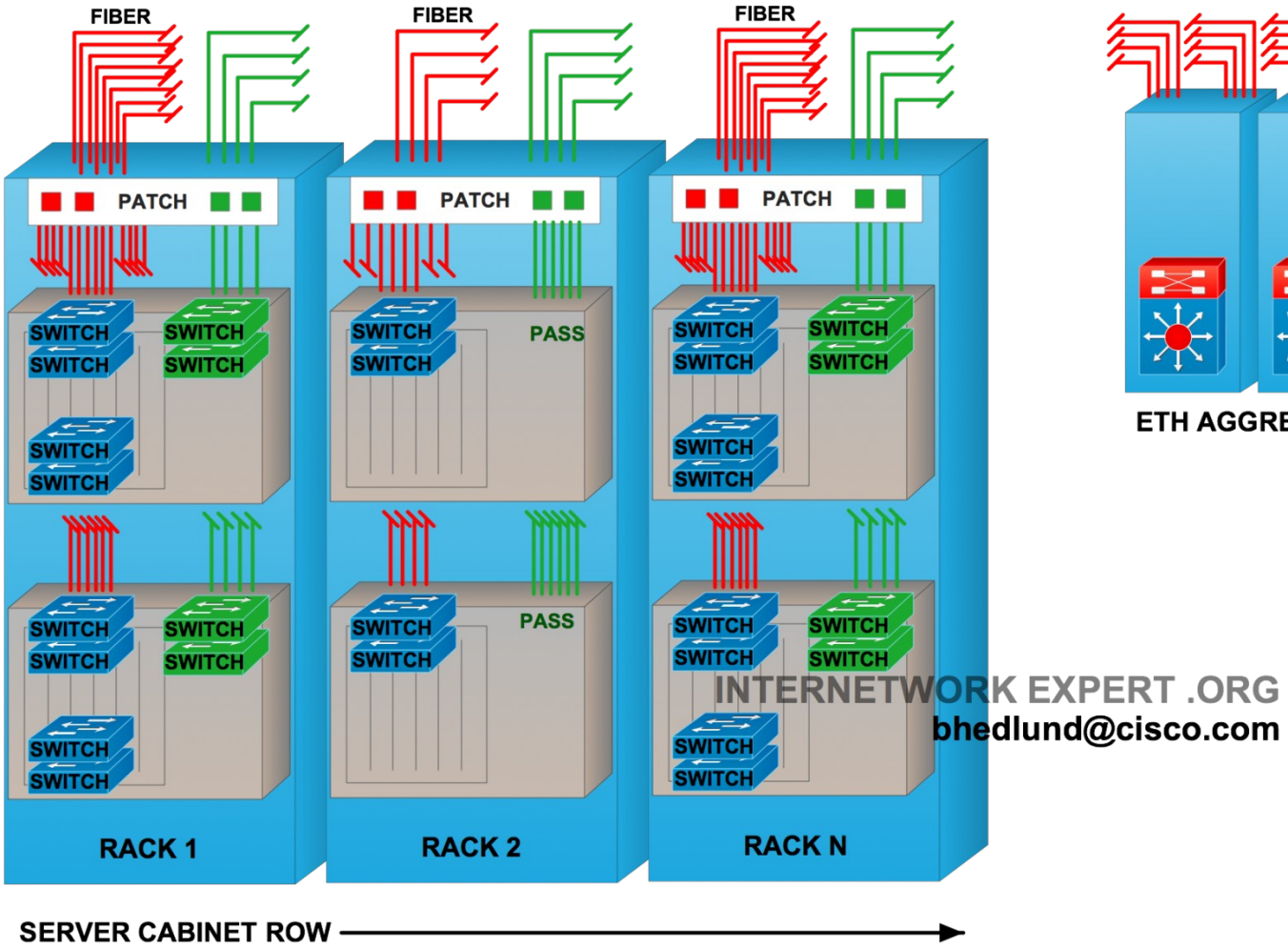


Figura 13. Top of Rack (ToR)

TOP OF RACK DESIGN



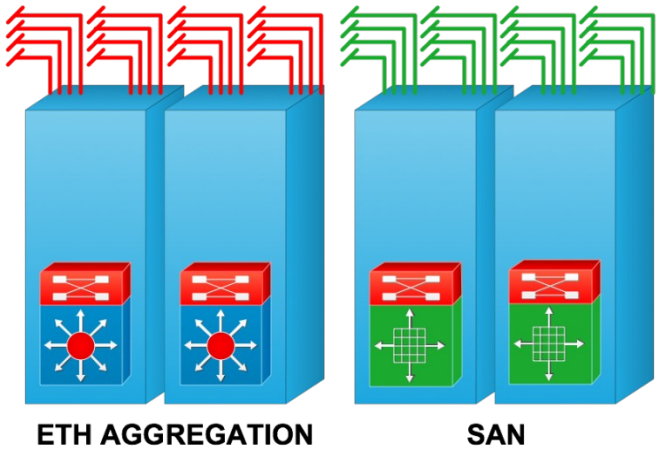


Figura 14. Top of Rack (ToR) with Blade Servers

TOP OF RACK DESIGN PRO'S

- **Copper stays "In Rack". No large copper cabling infrastructure required.**
- **Lower cabling costs. Less infrastructure dedicated to cabling and patching. Cleaner cable management.**
- **Modular and flexible "per rack" architecture. Easy "per rack" upgrades/changes.**
- **Future proofed fiber infrastructure, sustaining transitions to 40G and 100G.**
- **Short copper cabling to servers allows for low power, low cost 1oGE (10GBASE-CX1), 40G in the future.**

http://bradhedlund.com/2009/04/05/top-of-rack-vs-end-of-row-data-center-designs/

TOP OF RACK DESIGN CON'S

- **More switches to manage. More ports required in the aggregation.**
- **Potential scalability concerns (STP Logical ports, aggregation switch density).**
- **More Layer 2 server-to-server traffic in the aggregation.**
- **Racks connected at Layer 2. More STP instances to manage.**
- **Unique control plane per 48-ports (per switch), higher skill set needed for switch replacement.**

http://bradhedlund.com/2009/04/05/top-of-rack-vs-end-of-row-data-center-designs/

END OF ROW DESIGN

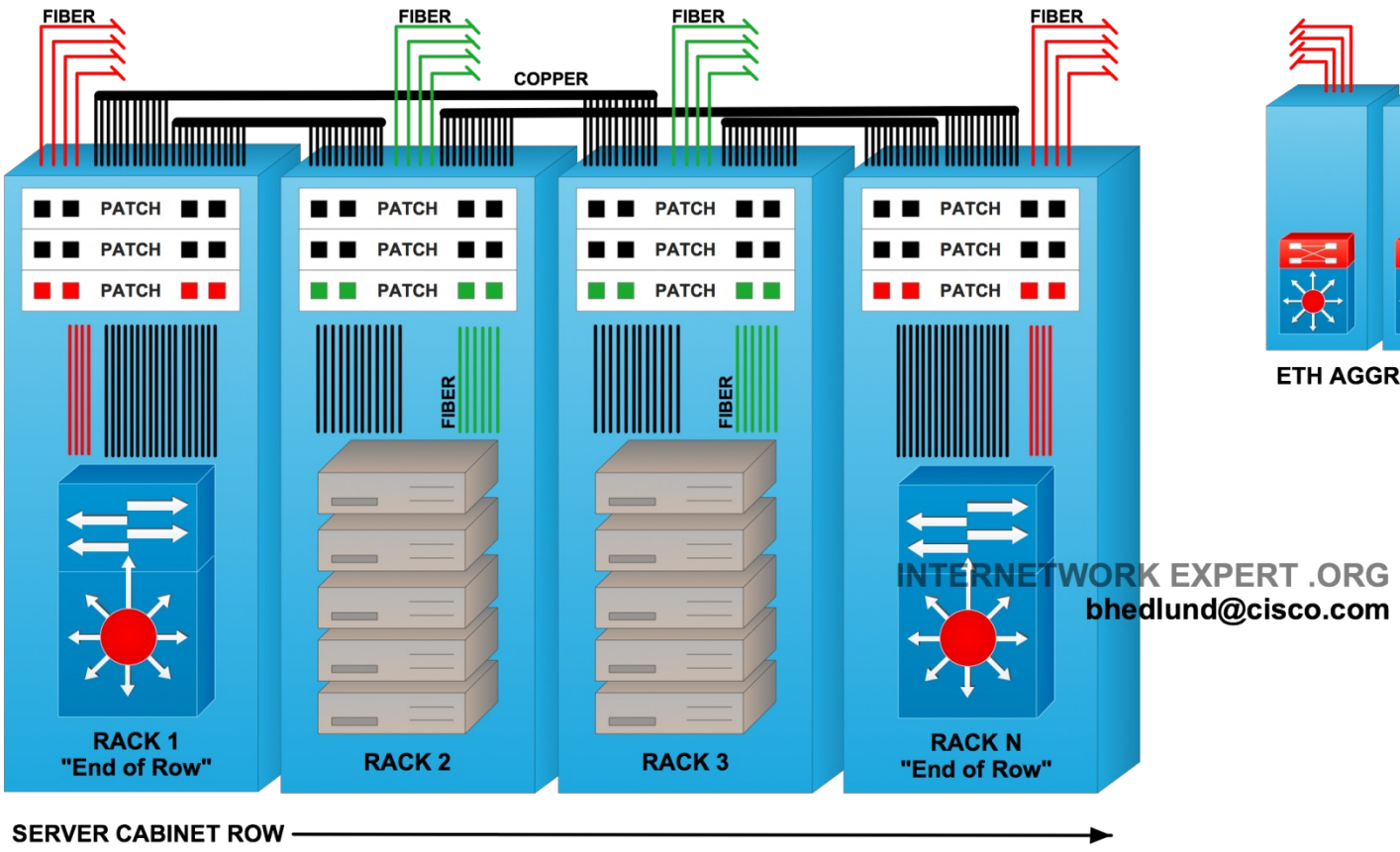


Figura 15. End of Row (EoR)

END OF ROW DESIGN PRO'S

- **Fewer switches to manage. Potentially lower switch costs, lower maintenance costs.**
- **Fewer ports required in the aggregation.**
- **Racks connected at Layer 1. Fewer STP instances to manage (per row, rather than per rack).**
- **Longer life, high availability, modular platform for server access.**
- **Unique control plane per hundreds of ports (per modular switch), lower skill set required to replace a 48-port line card, versus replacing a 48-port switch.**

http://bradhedlund.com/2009/04/05/top-of-rack-vs-end-of-row-data-center-designs/

END OF ROW DESIGN CON'S

- **Requires an expensive, bulky, rigid, copper cabling infrastructure. Fraught with cable management challenges.**
- **More infrastructure required for patching and cable management.**
- **Long twisted pair copper cabling limits the adoption of lower power higher speed server I/O.**
- **More future challenged than future proof.**
- **Less flexible "per row" architecture. Platform upgrades/changes affect entire row.**

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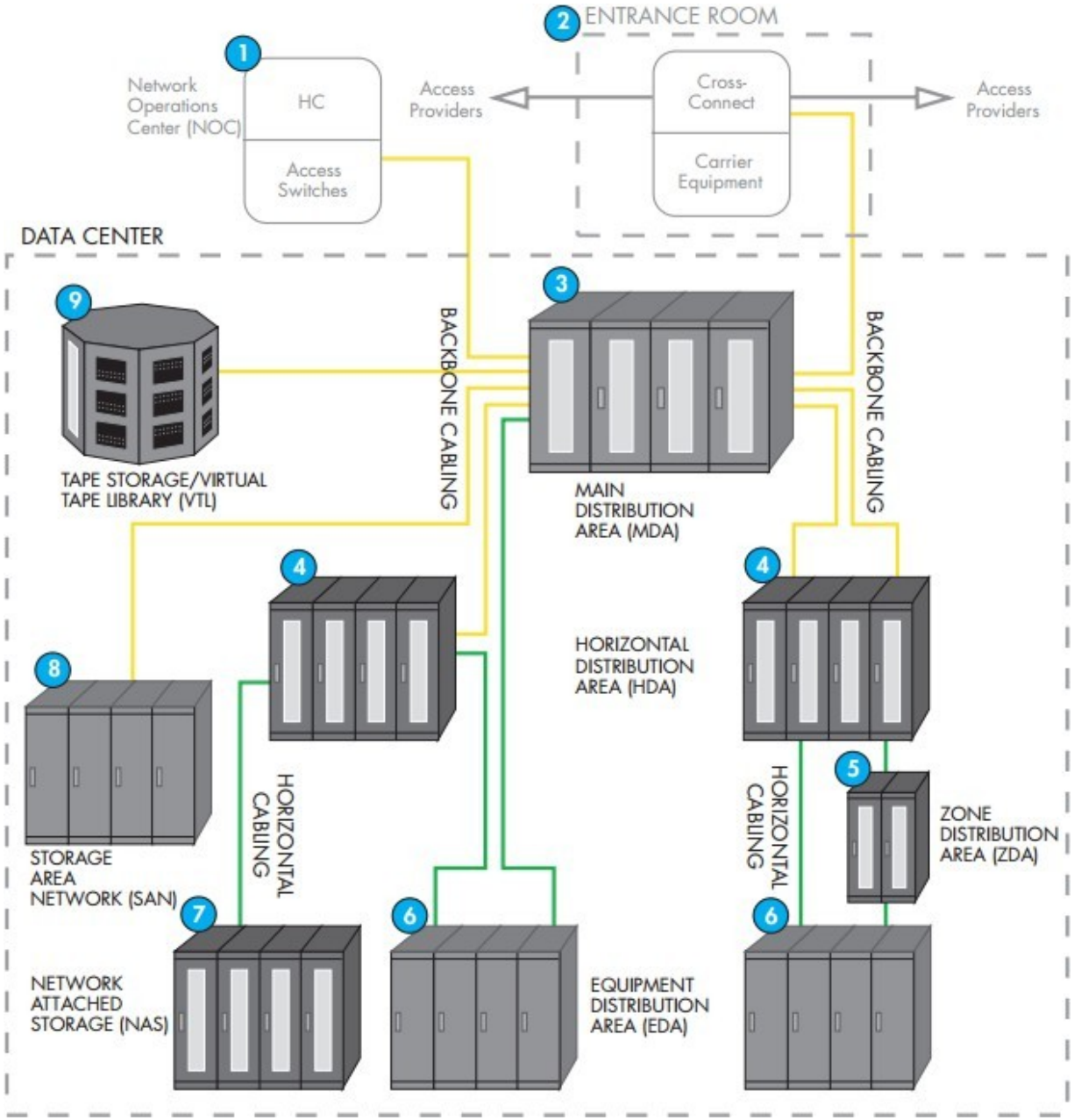

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HASTA LA PRÓXIMA

Registrarse en el sitio www.trystack.org para Laboratorio:
Modelos de Cloud Computing - Infrastructure as a Service (IaaS)