

NETGEAR®

Connect with Innovation™

Instalación e infraestructura red

PROSAFE®



Xavier Lleixa
Sales Engineer Netgear

NETGEAR

- Fundada:** 1996, NTGR on NASDAQ
- Central:** San Jose, CA con oficinas en 26 paises
- Trabajadores:** 700+ nivel mundial
- Crecimiento:** \$1Bn+, ~40% YoY growth



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Historia

- Trabajamos con 60 ISP a nivel mundial
- Más de 20 Millones de Clientes Empresariales
 - Soluciones para entornos de (1-1000 usuarios)
 - Global perspective + local support
 - Garantía de por vida
 - 24x7 soporte en castellano



Ventajas Competitivas

- I+D
- Innovación
- Diseño
- Fiabilidad
- Aproximación al cliente
- Servicios



NETGEAR Business Products

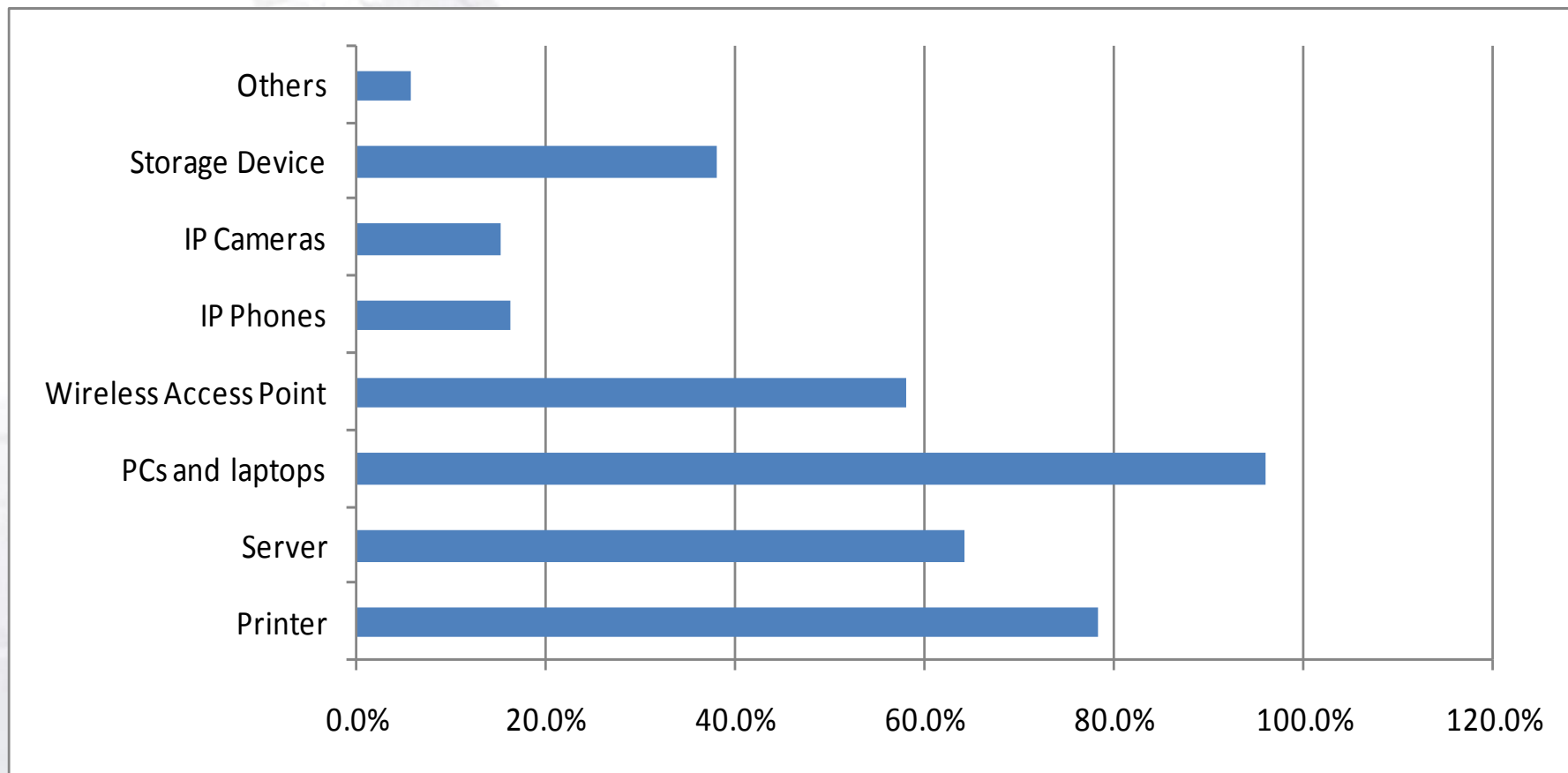
HOY :

Instalación e Infraestructura red

Nuevas oportunidades de negocio



Equipos conectados a la red IP



Agenda

- Estado y problemática redes actuales
- Diseño de redes convergentes:
 - Disponibilidad
 - QoS
 - VLAN
- Implementaciones redes convergentes
- Tendencias :
 - Ipv6
 - 10Gbps
- Ruegos y preguntas

Situación Actual

- En las PYMES el 70% de la venta de switches son no gestionable
- La red Ethernet ya no sólo transporta datos:
 - Camaras IP
 - Telefonos IP
- Necesitamos sistemas que nos permitan crecer.
- Nuevas necesidades en la red como transmisión de video
- Los switches no gestionables no nos ofrecen ningún tipo de seguridad

Problemática Actual

- *Convergencia de redes :*

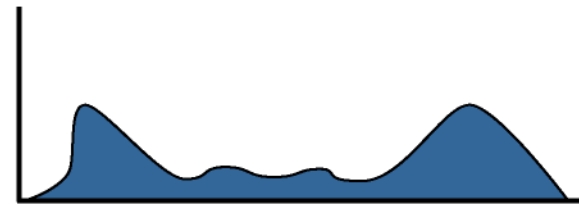
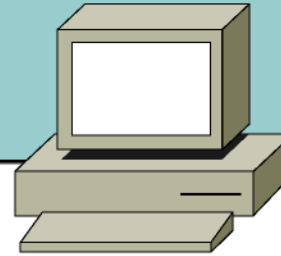
- *Telefonia IP*
- *Sistemas de Videovigilancia*
- *Datos*
- *Sistemas de Almacenamiento*
- *Megafonia IP*
- *Domótica*



Problemas redes convergentes

- Ancho de banda
- Retardo
- Variacion del retardo
- Perdida de paquetes

Data



- **Diferentes tipos de características.**
- **Diferentes perfiles de trafico.**
- **Clasificacion en diferentes perfiles**

Smooth or Bursty
Benign or Greedy
Drop-Insensitive
Delay-Insensitive
TCP Retransmits

QoS Traffic Requirements: Voice

- Latencia < 150 ms*
- Jitter < 30 ms*
- Pérdidas < 1%*



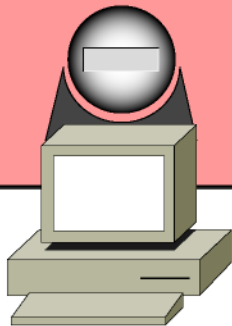
Voice



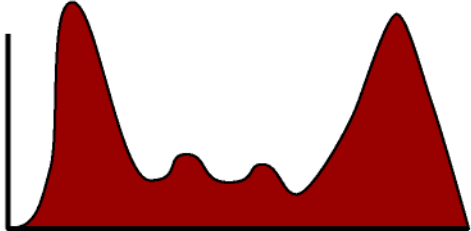
Smooth
Benign
Drop-Sensitive
Delay-Sensitive
UDP Priority

QoS Requirements: Videoconferencing

- Latencia ≤ 150 ms*
- Jitter ≤ 30 ms*
- Perdidas $\leq 1\%$ *



Video

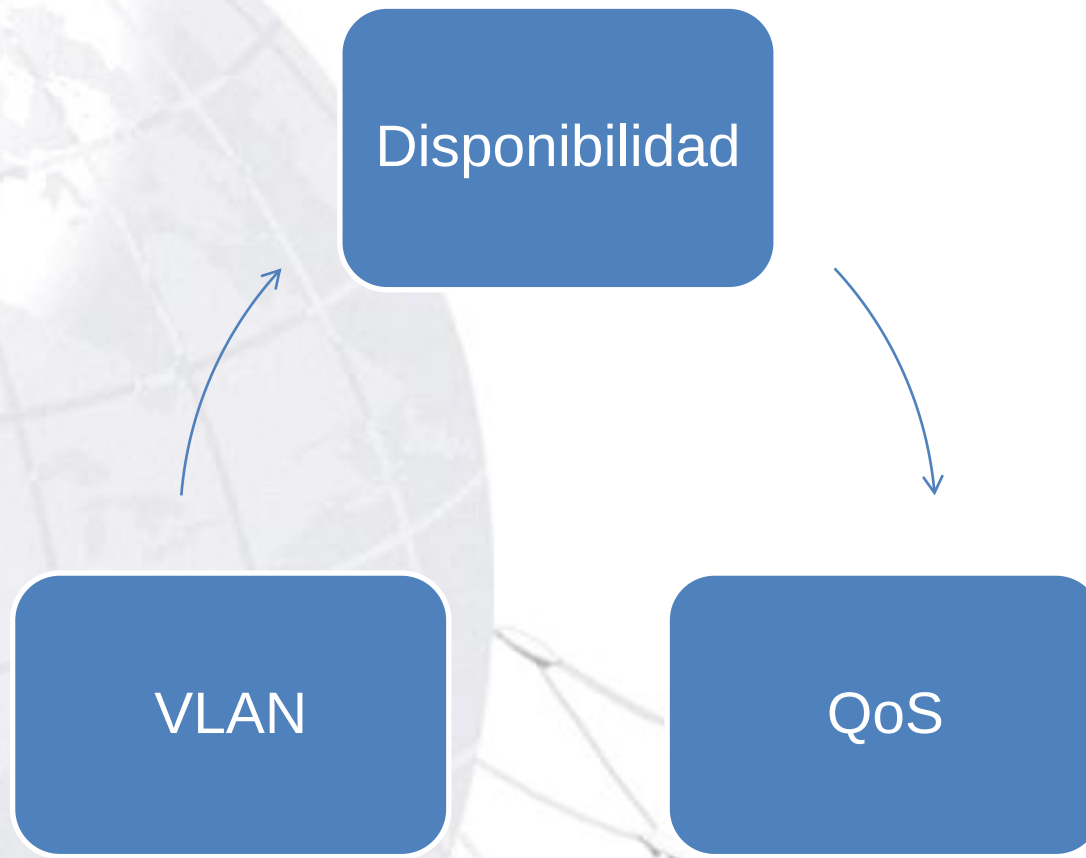


Bursty
Greedy
Drop-Sensitive
Delay-Sensitive
UDP Priority

017G_046

Redes Convergentes

Agenda



Necesidades Nuevas Redes



Disponibilidad

A cartoon illustration of a man with blonde hair, wearing a blue shirt, in a thinking pose with his hand on his chin. To his left is a purple thought bubble containing the word 'Disponibilidad'. Three small purple dots connect the bubble to the man. The background features a faint globe and a network diagram.

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LACP



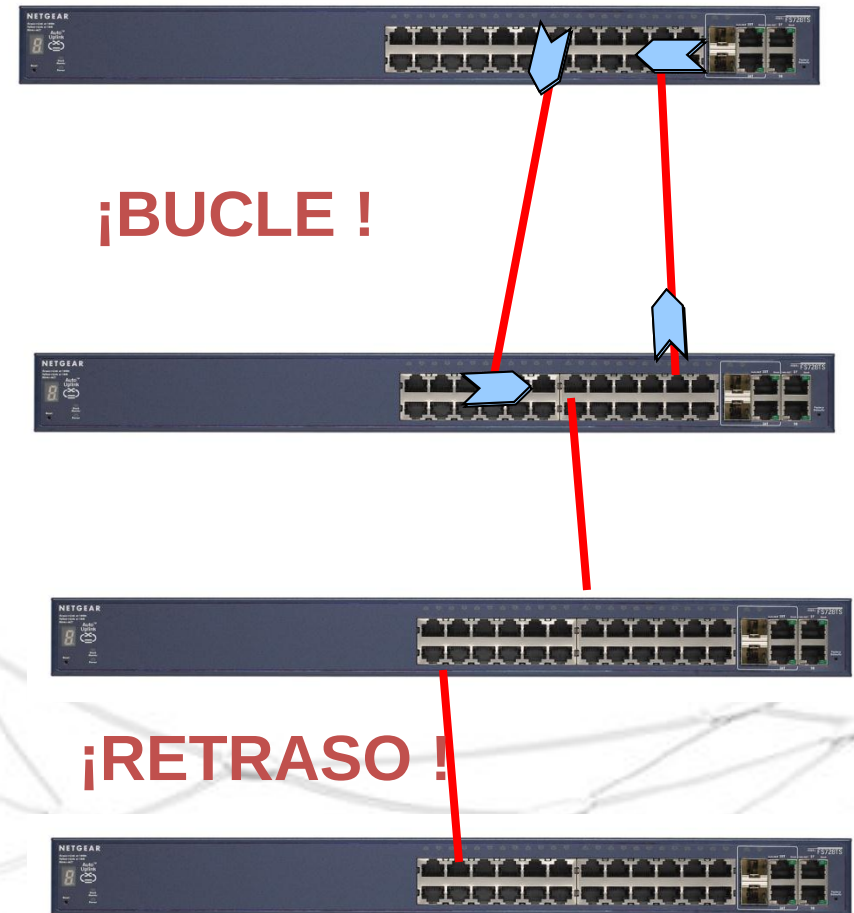
Stacking



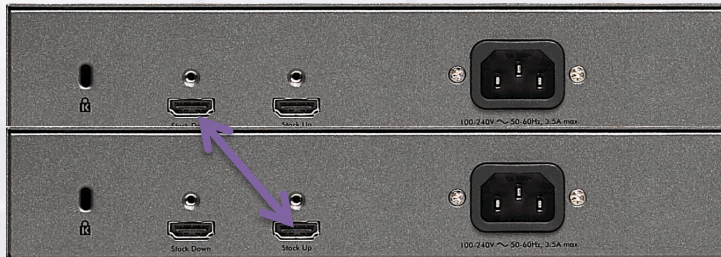
Disponibilidad

Crecimiento

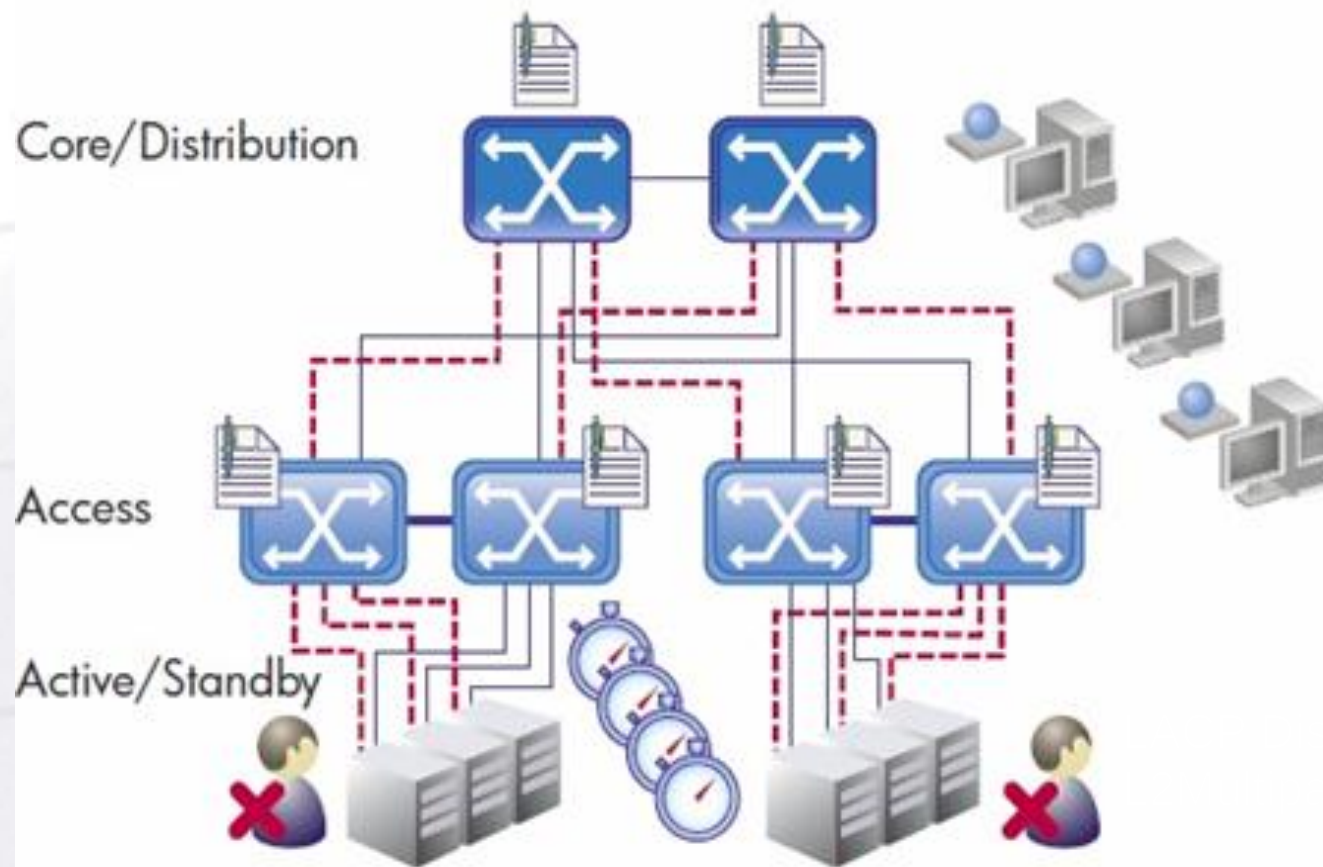
- *Switches no gestionables :*
 - *Cuello de Botella*
 - *Solo podemos unir un cable!*
- *Solución SMART:*



Stacking

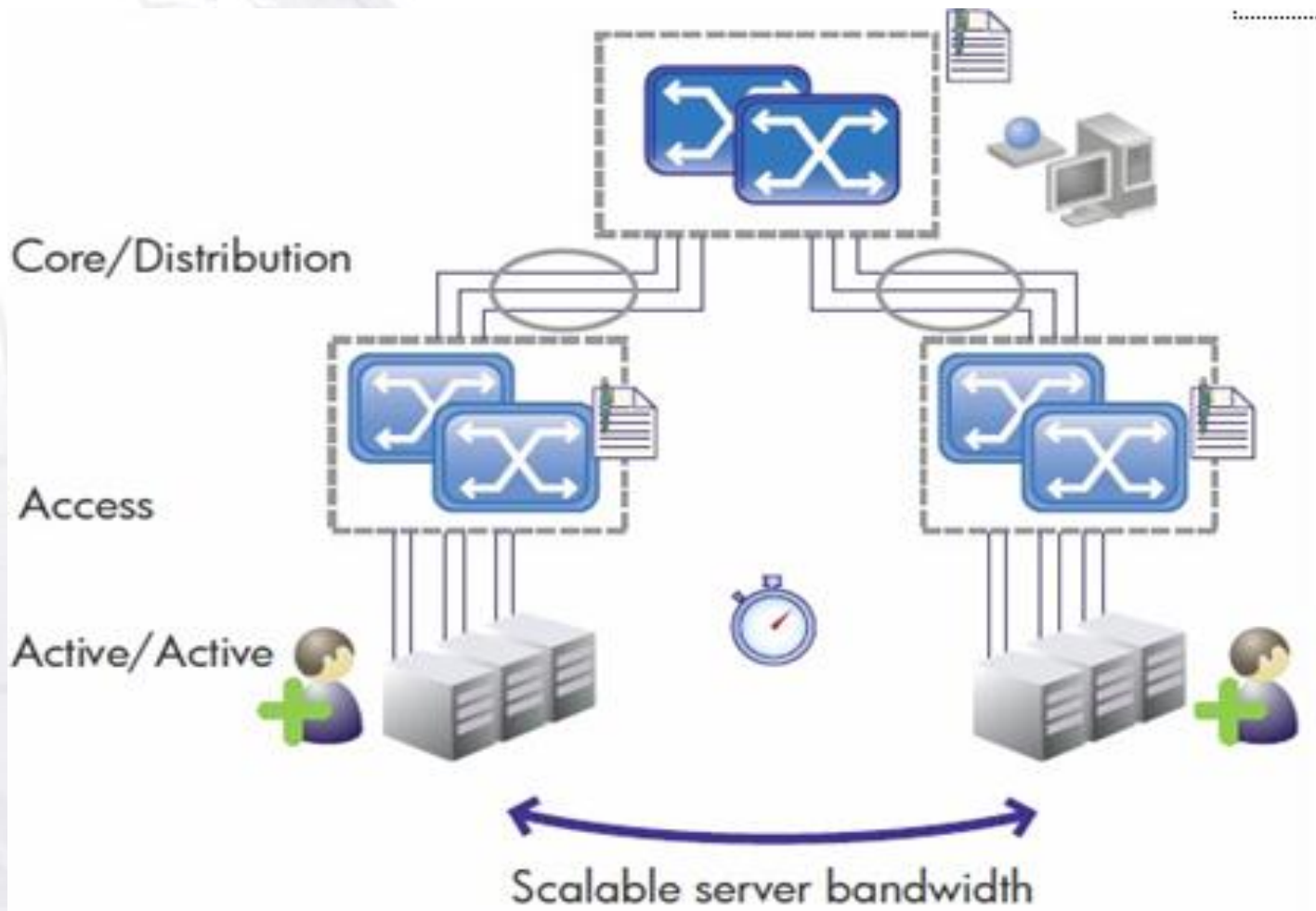


Con SPT



CON SPT

Sin PT



SIN SPT

LACP



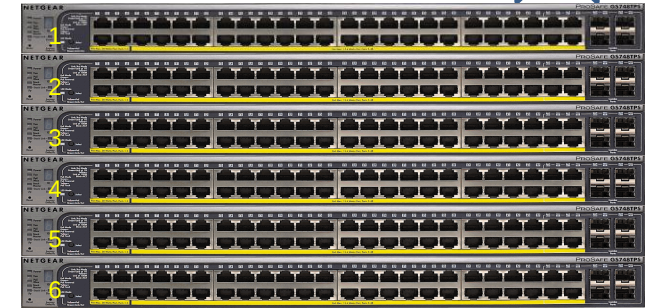
- Diferentes puertos físicos se convierten en un puerto lógico para proporcionar mayor velocidad.
- Link aggregation está definido y controlado por el standard 802.3ad

192.168.1.168

20 Gbps
Stack

Fácil reemplazo y ampliación

AUR : Automatic Unit Replacement



6 x GS748TPS
288-Port Gigabit PoE

Si una unidad falla o se amplía la pila :

- Se upgradea la pila automáticamente
- Se transmite la configuración

Sin necesidad de configuración manual

- Sin reiniciar la pila
- Sin interrupciones

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Gestión centralizada

The screenshot displays the Netgear ProSafe 48TS switch management web interface. The top navigation bar includes tabs for System, Switching (selected), QoS, Security, Monitoring, Maintenance, and Help. A secondary bar shows links for Ports, LAG (selected), VLAN, STP, Multicast, and Address Table. The main content area is titled 'LAG Membership' and features a sidebar with 'Basic' (selected) and 'Advanced' sections. The 'Basic' section contains links for 'LAG Configuration' and 'LAG Membership'. The main configuration area shows 'LAG ID' set to 1, 'LAG Name' as LAG1, and 'LAG Type' as LACP. A 'CURRENT MEMBERS' button is visible. Below this, there are sections for Unit 1, Unit 2, Unit 3, Unit 4, Unit 5, and Unit 6. Each unit section displays a grid of 48 ports (GE Port 01 to 48) with checkboxes for membership. In Unit 1, port 01 is checked. In Unit 2, port 01 is also checked. Units 3 through 6 are currently collapsed. At the bottom right, there are 'CANCEL' and 'APPLY' buttons. The footer indicates 'Copyright © 1996-2007 Netgear®'.

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PROSAFE 48TS
48 Switch

System | **Switching** | QoS | Security | Monitoring | Maintenance | Help

Ports | **LAG** | VLAN | STP | Multicast | Address Table

Basic
» LAG Configuration
» **LAG Membership**
Advanced

LAG Membership

Membership

LAG ID: 1 LAG Name: LAG1
LAG Type: LACP CURRENT MEMBERS

Unit 1

GE Port	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	X																							
GE Port	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

Unit 2

GE Port	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	X																							
GE Port	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

Unit 3
Unit 4
Unit 5
Unit 6

CANCEL APPLY

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Manage all ProSafe Gigabit Stackable Smart Switches as though they were only one unit !

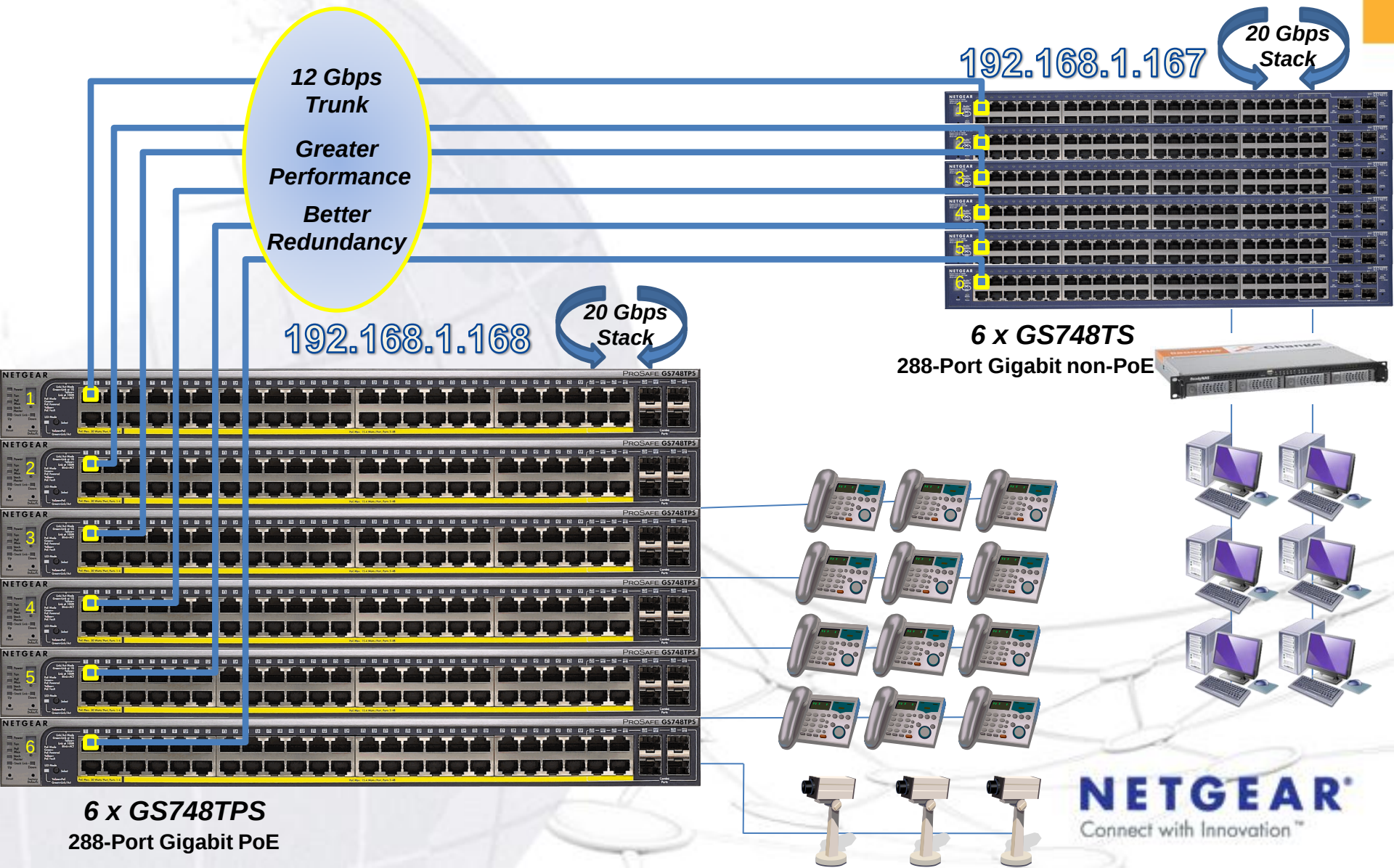
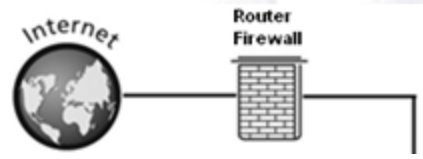
ProSafe Control Center provide comprehensive management through a streamlined Web interface that eases navigation:

LACP – Todos los switches Smart y Gestionables

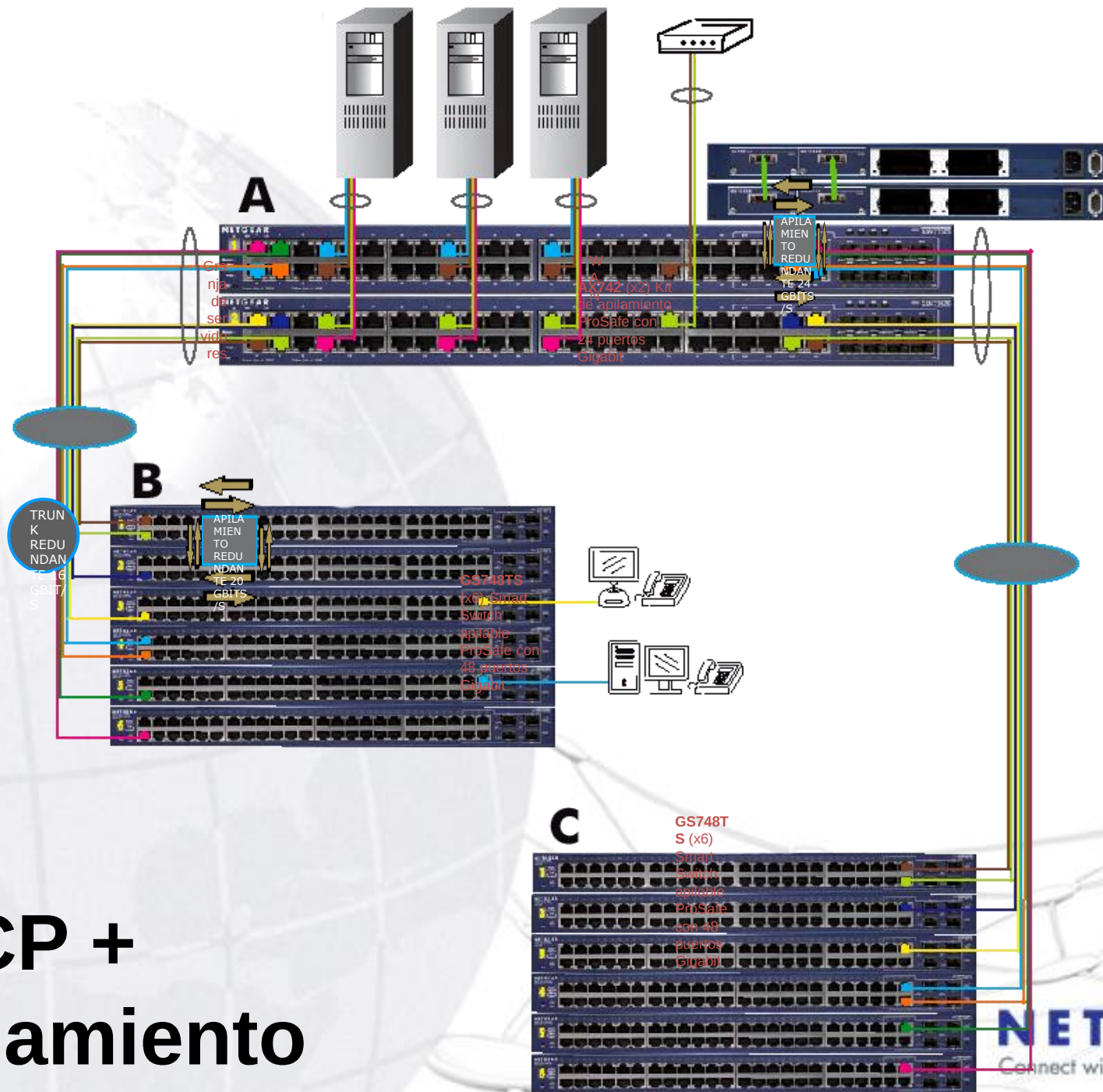


- Diferentes puertos físicos se convierten en un puerto lógico para proporcionar mayor velocidad.
- Link aggregation está definido y controlado por el standard 802.3ad

LACP + Apilamiento



LACP + Apilamiento



Necesidades Nuevas Redes

Segmentacion



Nuevo modelo

Antes:



Valor añadido



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VLAN = “Mini Switches”

VLAN 1



VLAN 2



VLAN 3



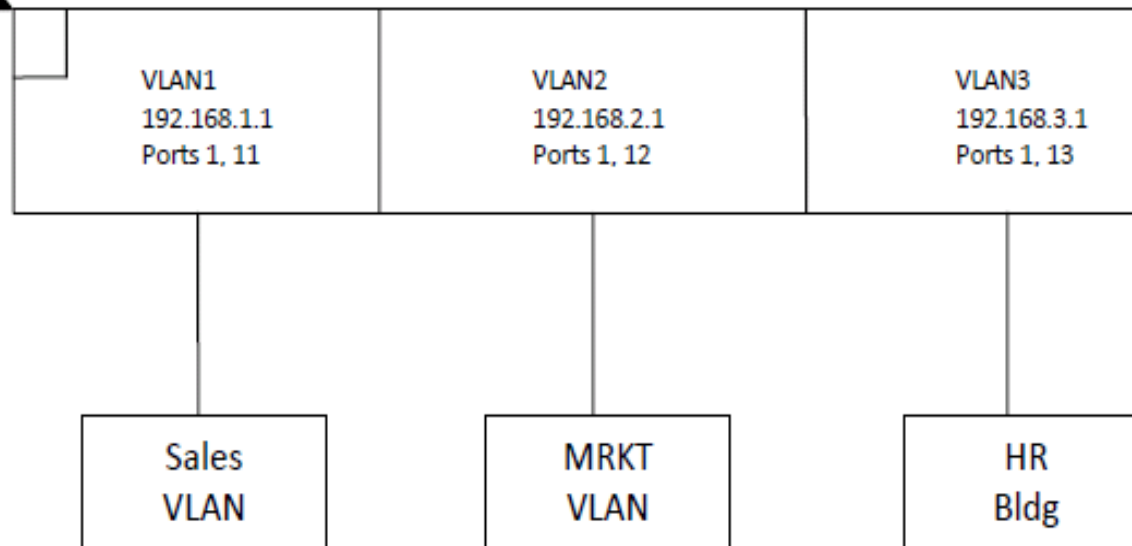


Esquema IP

UTM

192.168.1.1
255.255.255.0
Connected to
Port1 of your
switch

Switch



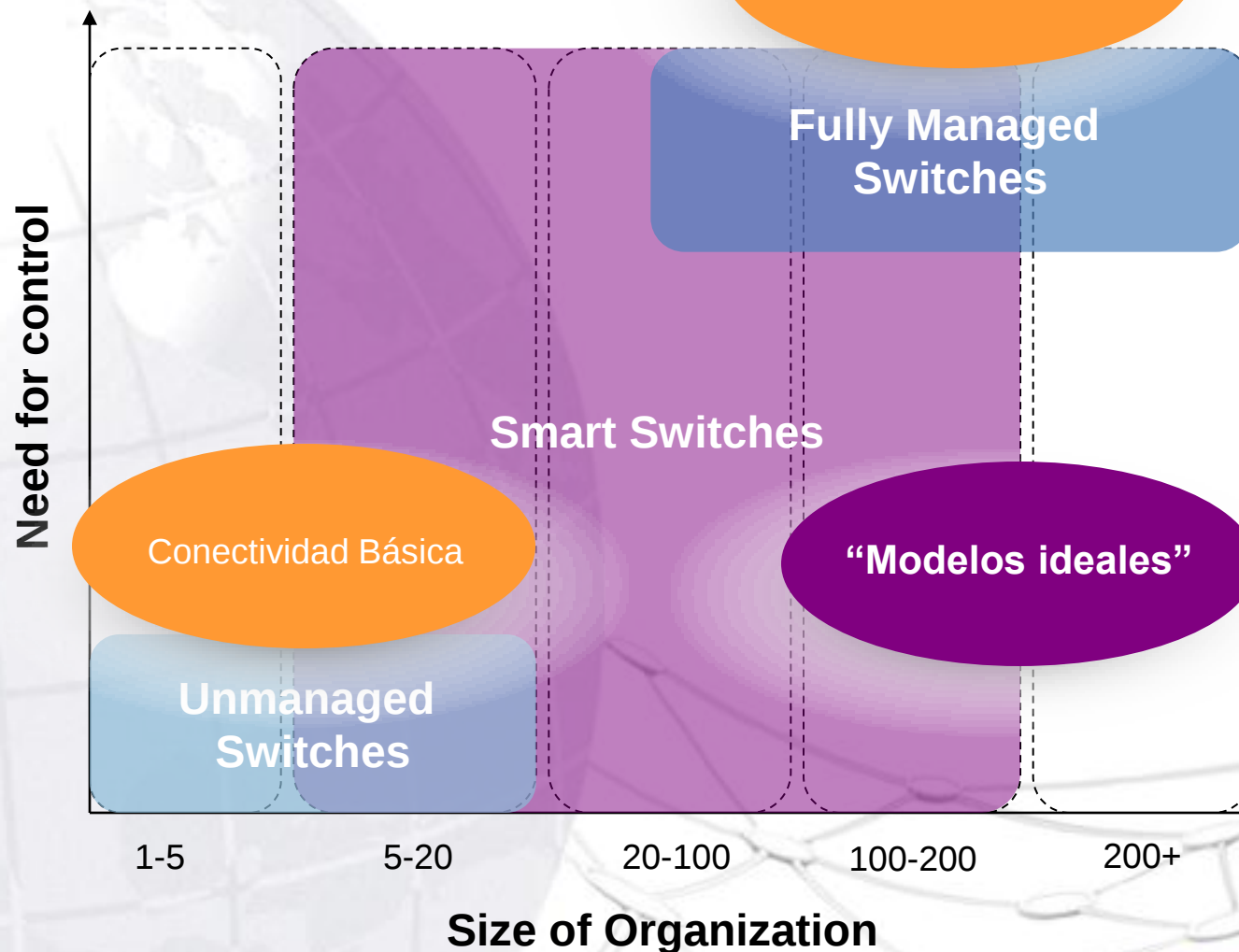
Necesidades Nuevas Redes



Priorizacion

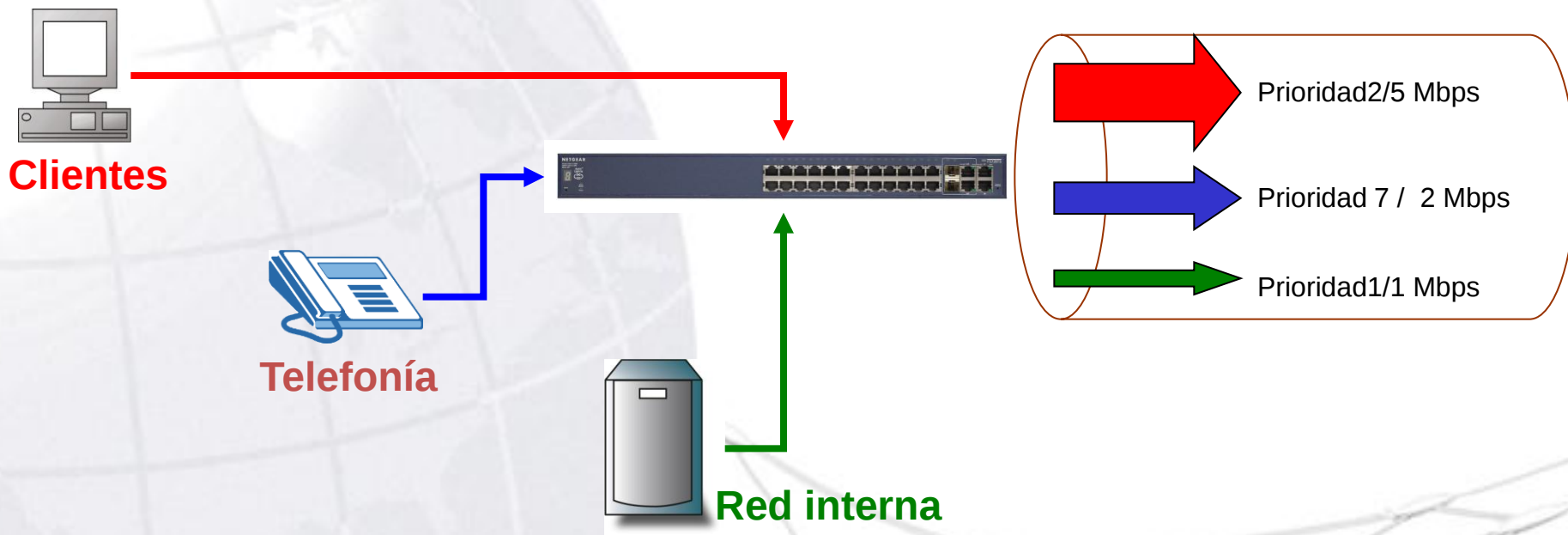
A cartoon illustration of a man with blonde hair, wearing a blue shirt, resting his chin on his hand in a thinking pose. Above him is a purple thought bubble containing the word 'Priorizacion'. The background features a faint globe on the left and a network diagram of interconnected nodes on the right.

SMB Switching Solutions



Situación ideal

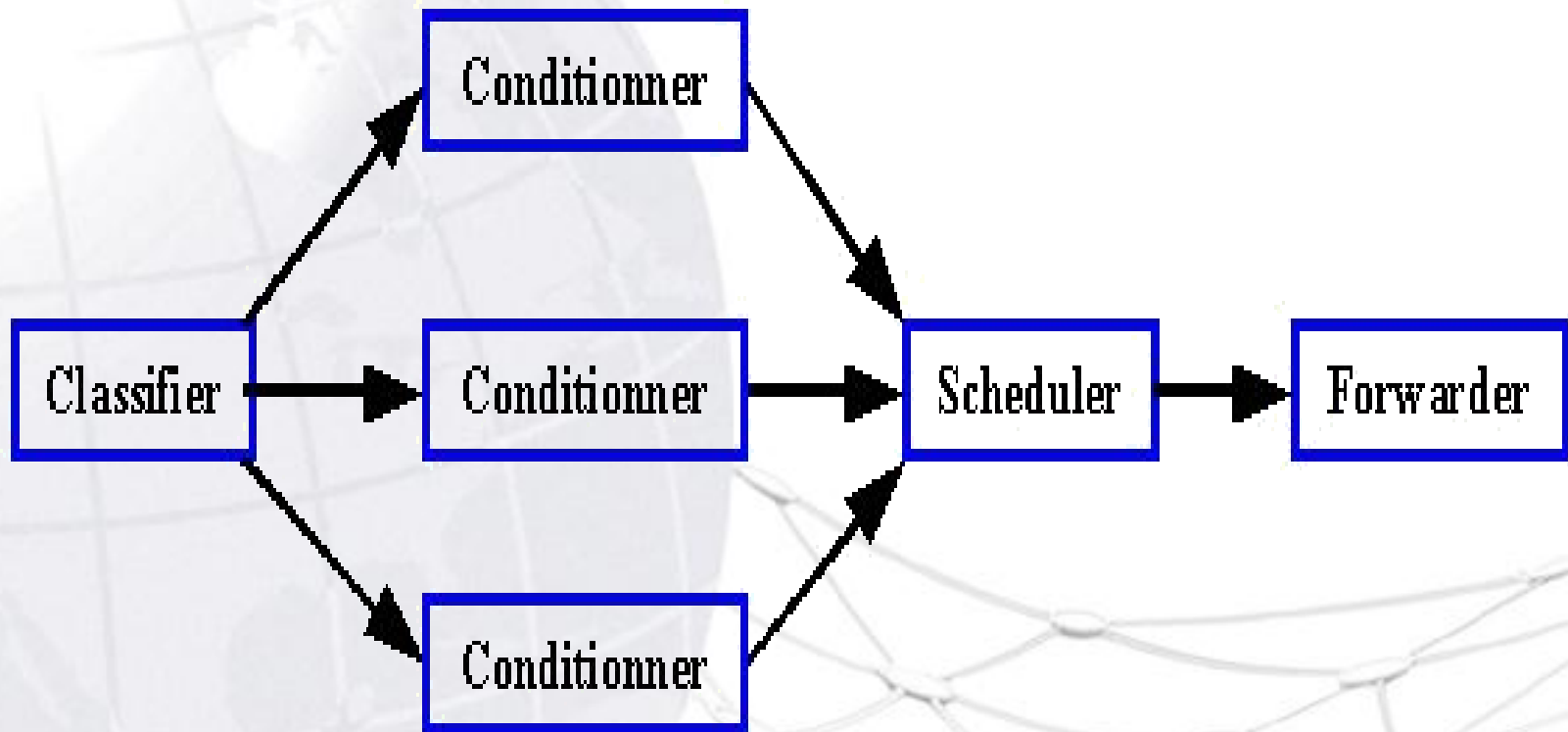
- Debemos por tanto priorizar y segmentar la red



Calidad de Servicio

- QoS significa quality of service y se refiere a de que forma podemos asegurar los diferentes servicios en nuestra red
- Se está empezando a desarrollar en los últimos años debido a la convergencia de redes
- Es un conjunto de protocolos y estándares

Funcionamiento QoS

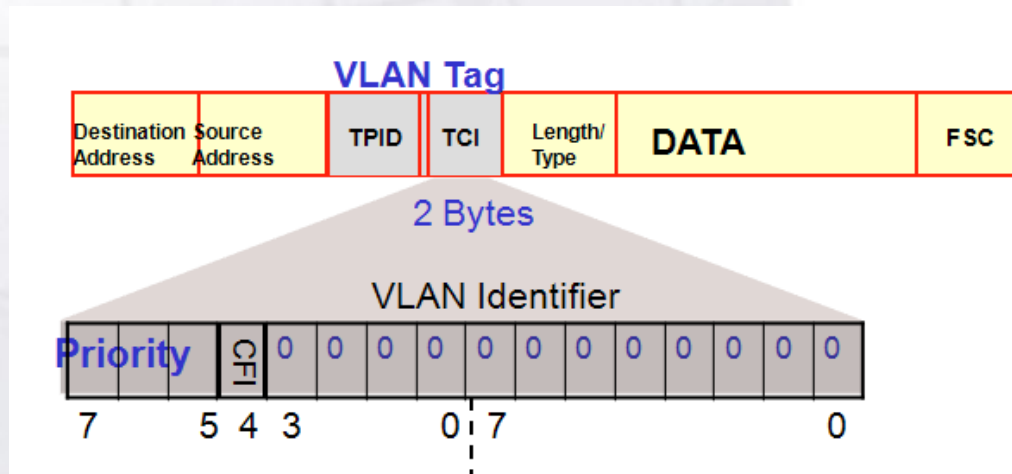


Calidad de Servicio

- Clasificación de paquetes:
 - Nivel 1: Por puerto
 - Nivel 2: CoS
 - Nivel 3: DSCP
- Política de colas :
 - Estricta
 - Round Robin

802.1p CoS

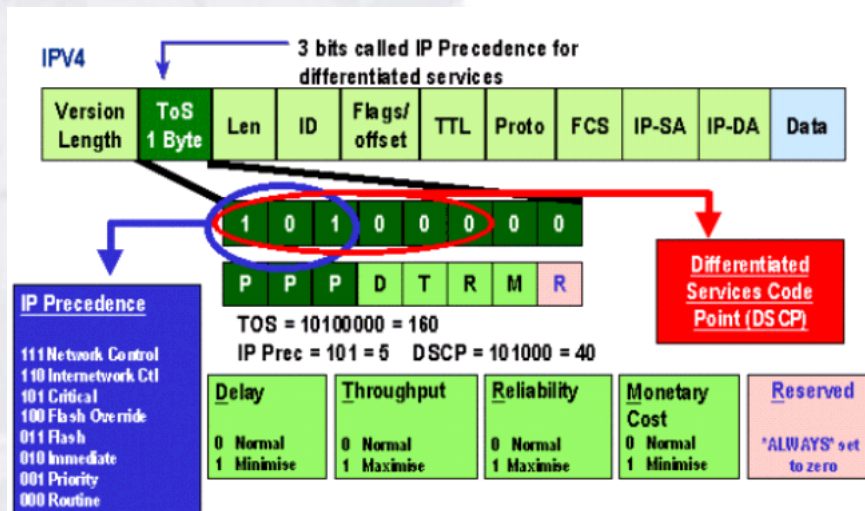
- Marcación de tramas a nivel 2
- El marcado de paquetes lo realiza el teléfono
- Se puede establecer la prioridad por puerto



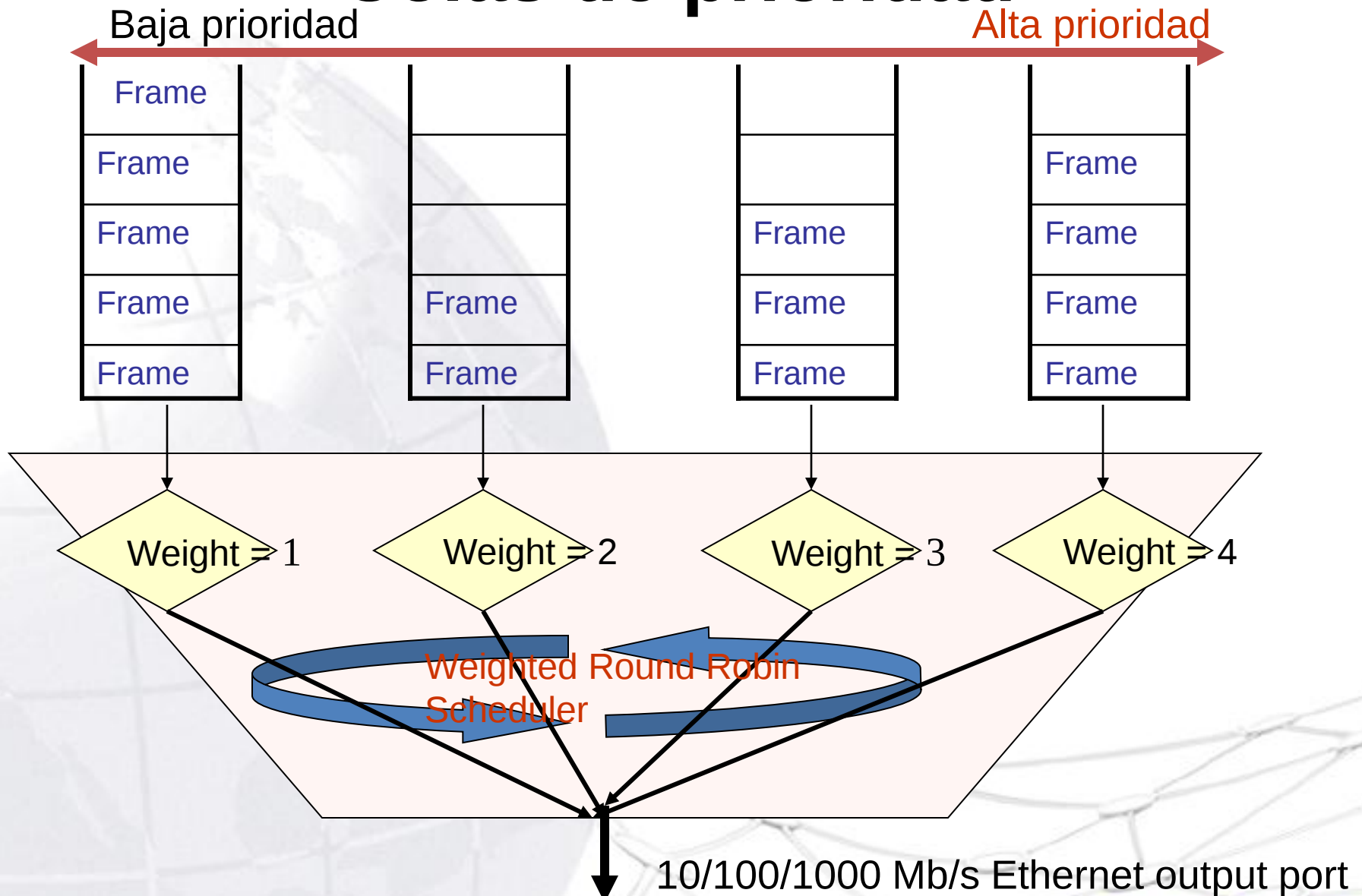
Priority	Traffic Type
7 (highest)	Network management
6	Voice
5	Video
4	Controlled load
3	Excellent effort
0 (default)	Best effort
2	Undefined
1 (lowest)	Background

Ip Precedence/DSCP L3

- Marcado de paquetes nivel 3
- La clasificación normalmente se hace en función de parámetros como la ip origen, puerto origen puerto destino



Colas de prioridad



NETGEAR Secure Remote Desktop Client

Netgear GS748TS - Windows Internet Explorer

http://172.22.25.25/home.htm

File Edit View Favorites Tools Help

Netgear GS748TS

Page Tools

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GS748TS

48-port Gigabit Stackable Smart Switch

SystemSwitchingQoSSecurityMonitoringMaintenanceHelp

LOGOUT

CoS

> Basic

> Advanced

> CoS to Queue Mapping

> DSCP to Queue Mapping

CoS To Queue Mapping

CoS	Queue	CoS	Queue	CoS	Queue	CoS	Queue
0	Lowest	1	Lowest	2	Lowest	3	Lowest
4	Low	5	Low	6	Normal	7	Normal

Restore Default Mapping

Restore Defaults☐

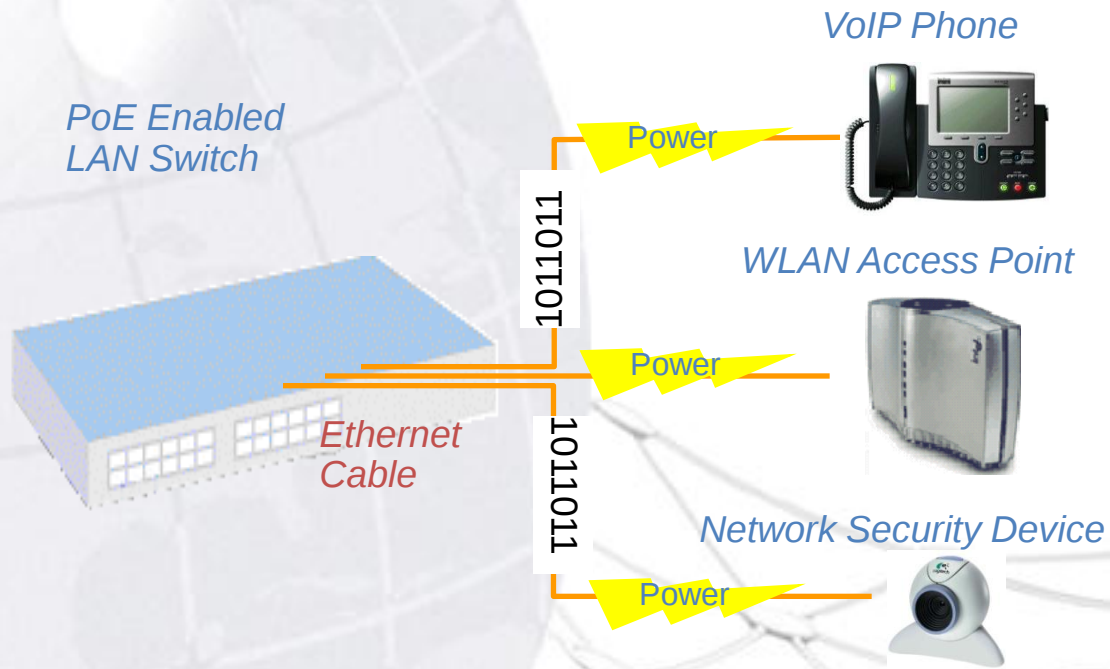
CANCEL

APPLY

Necesidades Nuevas Redes



PoE Overview

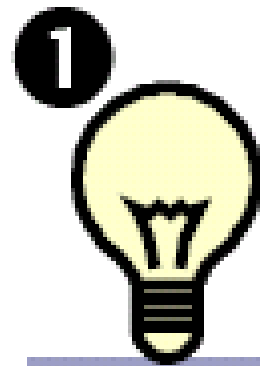


IEEE 802.3af Highlights

- PSE output: 350mA continuous, 44Vdc to 57Vdc.
- PSE continuous average output power: 15.4W min
- PD allowed consumed power: 12.95W max.



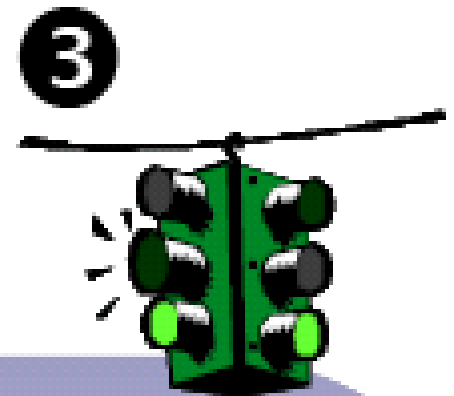
PoE Process



Detection



Classification
(Optional)

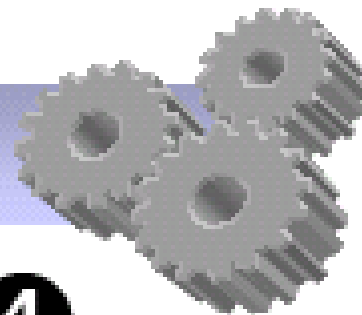


Startup



5

Disconnect



4

Operation

PoE (IEEE802.3af) y PoE Plus (IEEE802.3at)

- PoE

- Existe una gran demanda existente (AP, Telefonos IP, Camaras IP)
- En 2008 los switches Gigabit PoE superaron los Fast Ethernet PoE
- Con Gigabit PoE utilizamos todos los pares del RJ-45

- PoE Plus

- Maxima Potencia(24W or mas) sobre CAT3 y superiores
- IEEE802.3at: Será ratificado en unos meses
- Compatibilidad con equipos PoE
- Utilización de ajuste de potencia mediante LLDP-MED

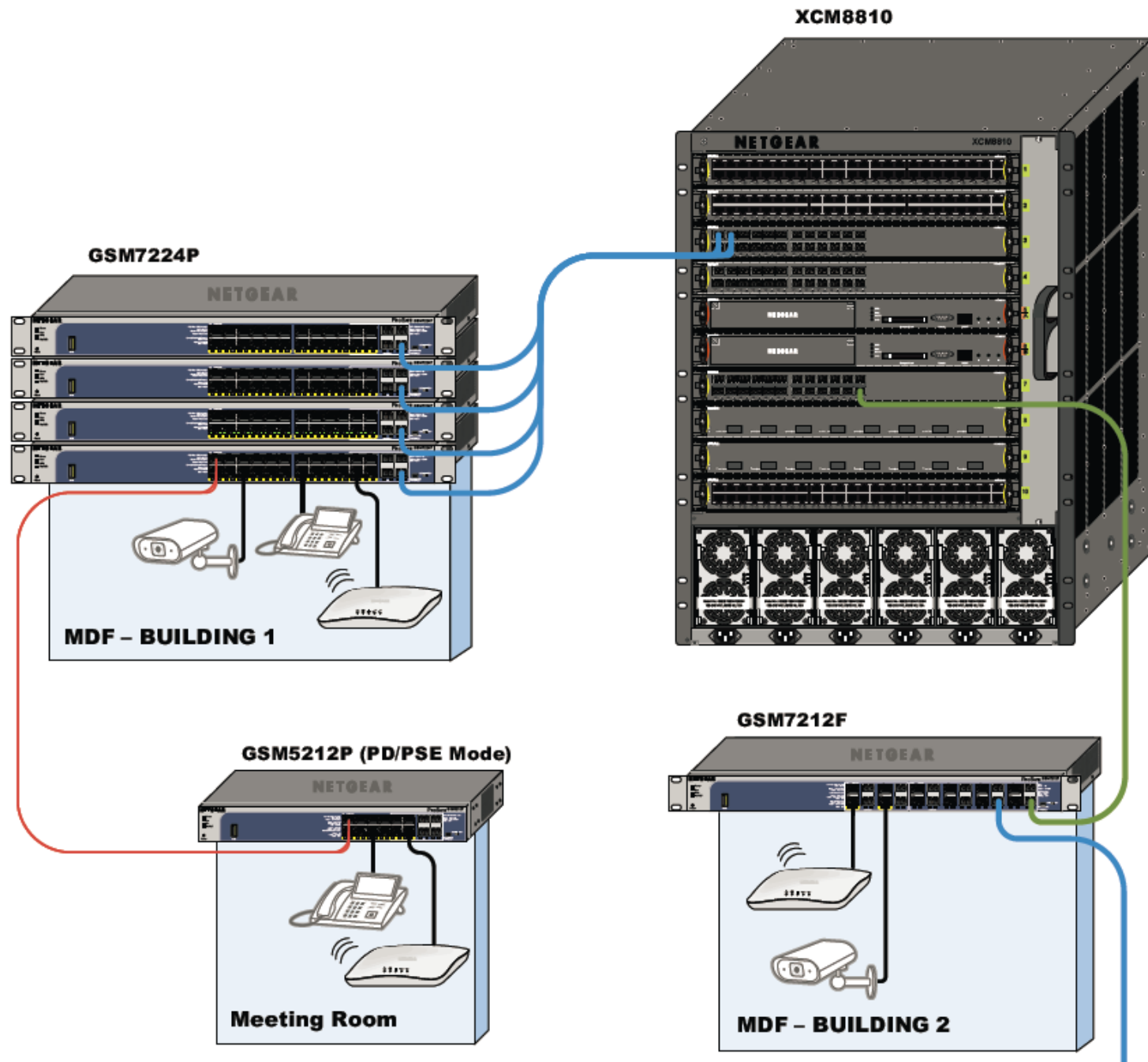
Aplicaciones para PoE+ -802.3at

- Wifi (Doble banda IEEE802.11n)
 - Con ancho de banda hasta 600Mbps
 - Ya existe equipamiento que soporta y requiere PoE+
- VideoVigilancia (Pan-Tilt-Zoom Cameras)
- Sistemas WIMAX
- Sistemas de Comunicacion
 - Sistemas de videoconferencia
 - Video teléfonos
 - Thin clients
 - Sistemas distribuidos



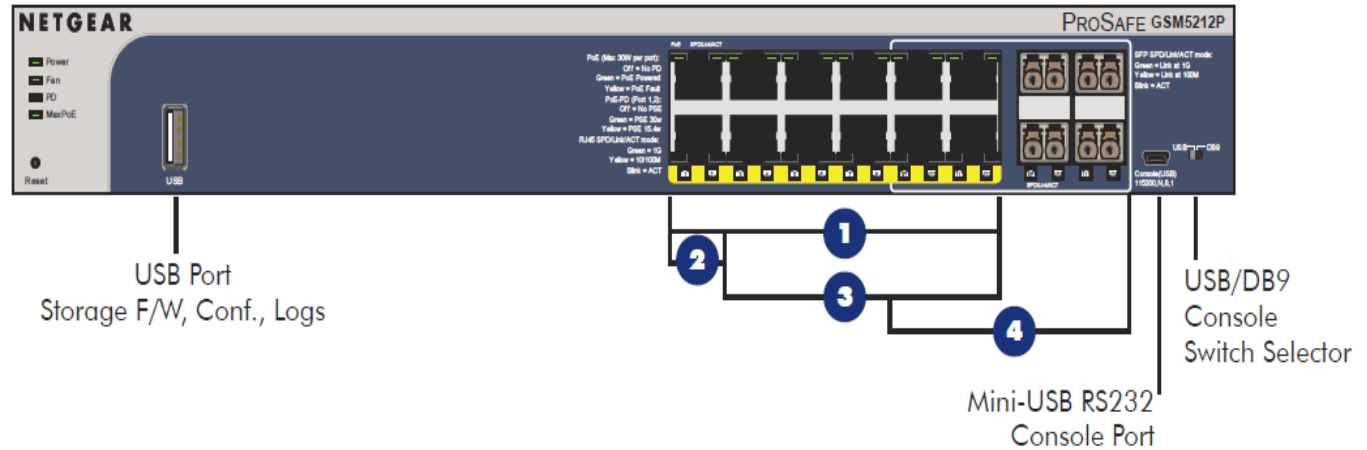
Classes de PD PoE

Class	PD Current - Classification Period [mA]	PD Power - Operation Period [W]	Note
0	0 - 4	0.44 -12.95	Default
1	9 - 12	0.44 -3.84	Optional
2	17 - 20	3.84 -6.49	Optional
3	26 - 30	6.49 -12.95	Optional
4	36 - 44	Future use	Future use



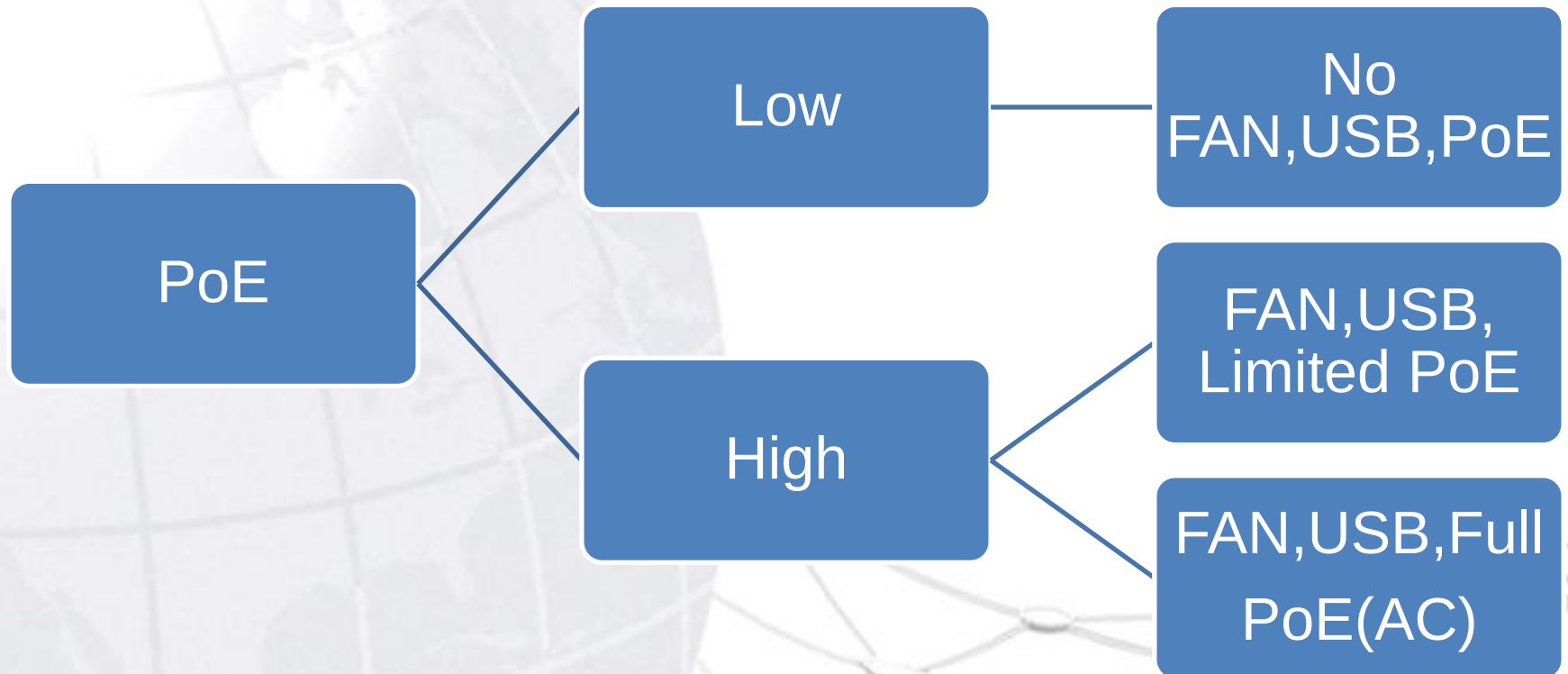
GSM5212P at a Glance

- 12 Gigabit Ports (RJ45) **1**
- 2 PoE+ ports (PD – in) **2**
- 10 PoE+ ports (PSE – out) **3**
- 4 Combo SFP Ports **4**



- **Switch Managed**
- **Layer 2+**
- **12 puertos activos con 4 SFP**

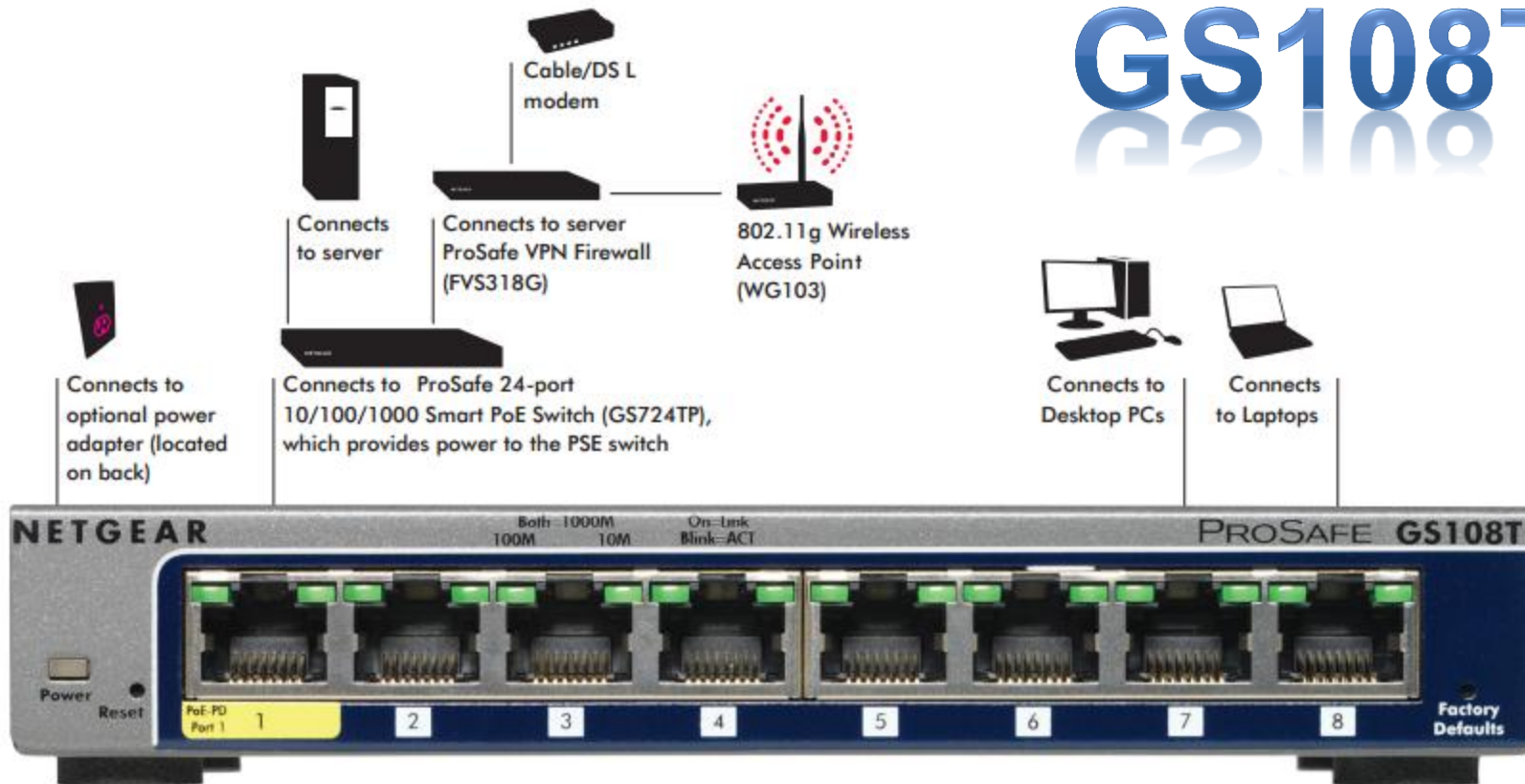
Modos Trabajo



Sistemas de Alimentación

Powering Options	PoE Input for PD Ports	Functionality	PoE Budget (output) for PSE Ports
PoE Pass-Through (No AC Power)	PD Port 1: 15.4W input	- Low-power mode - SFP ports, fans, USB ports not operational	-
	PD Port 1: 30W input	- High-power mode - All functions operational	-
	PD Port 1: 15.4W input PD Port 2: 15.4W input	- Low-power mode - SFP ports, fans, USB ports not operational	Up to 13W Port 3 through 12
	PD Port 1: 30W input PD Port 2: 15.4W input	- High-power mode - All functions operational	Up to 13W Port 3 through 12
	PD Port 1: 30W input PD Port 2: 30W input	- High-power mode - All functions operational	Up to 22W Port 3 through 12
AC Power (Power Supply)	-	- High-power mode - All functions operational	Up to 125W Port 3 through 12

GS108T



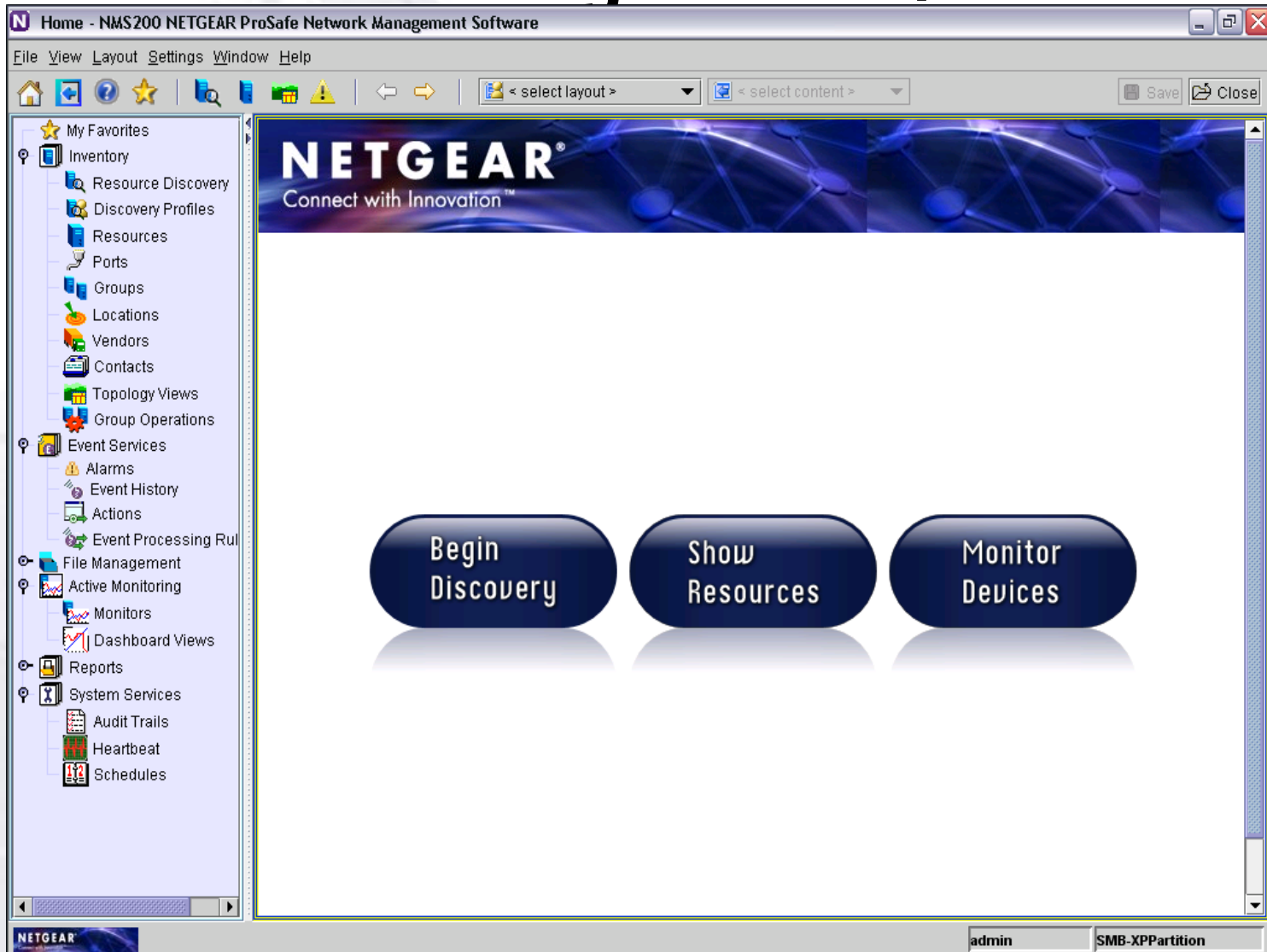
- Switch Smart 8 puertos Gigabit
- Alimentable por PoE
- VLAN y QoS

Requerimientos Implantacion



NMS200

www.netgear.com/nms200



NMS200

Begin
Discovery

Show
Resources

Monitor
Devices

DESCUBRE

- Descubre los diferentes de red
- Soporta diferentes protocolos

CONFIGURA

- Configuración centralizada
- Programación de upgrade de firmware
- Acceso directo por CLI o GUI a los equipos

MONITORIZA

- Posibles cambios de infraestructura
- Programación de alarmas

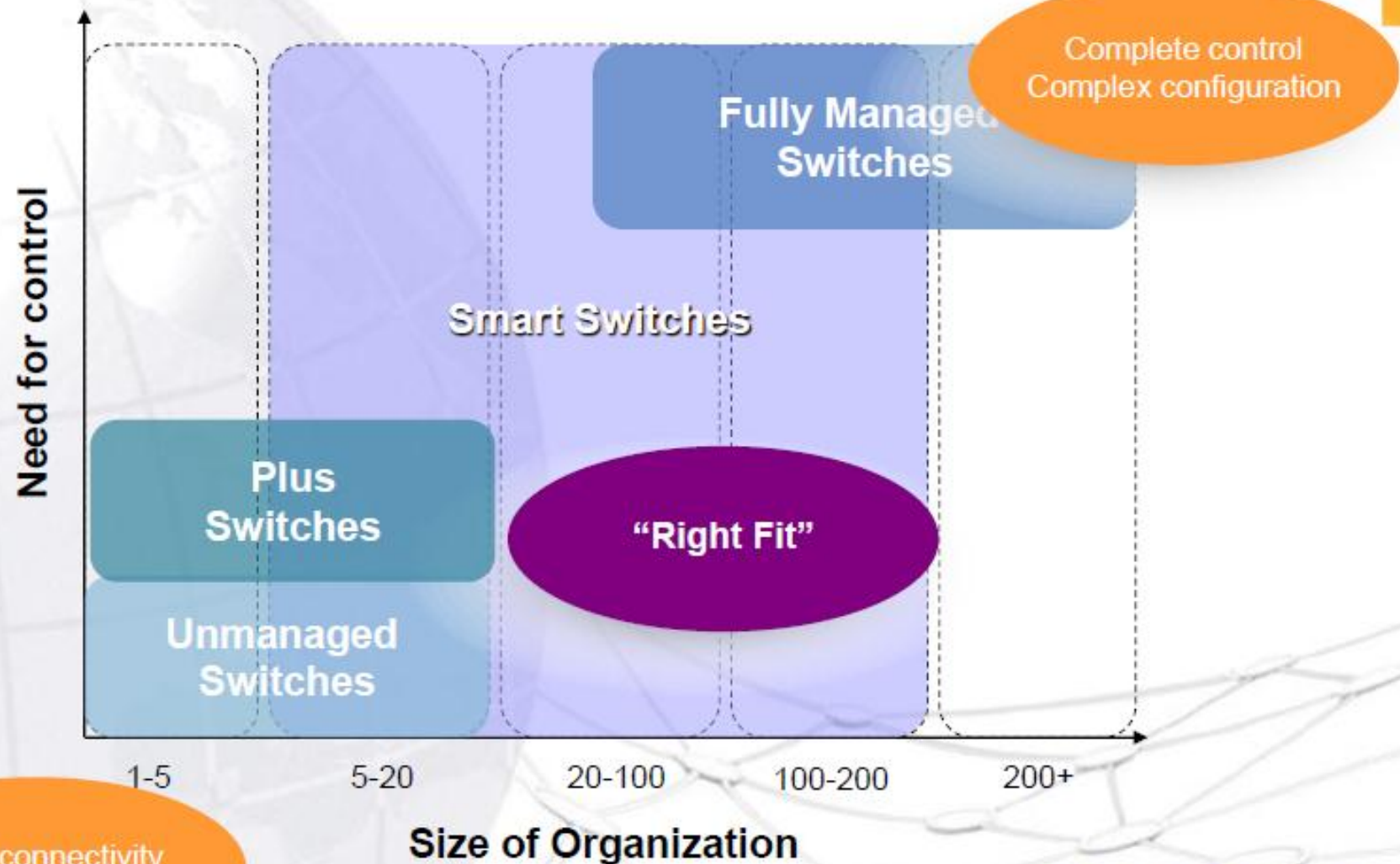
Monitorizacion NMS200





Implementacion Redes Convergentes

Business Switching Solutions



Basic connectivity
No configuration

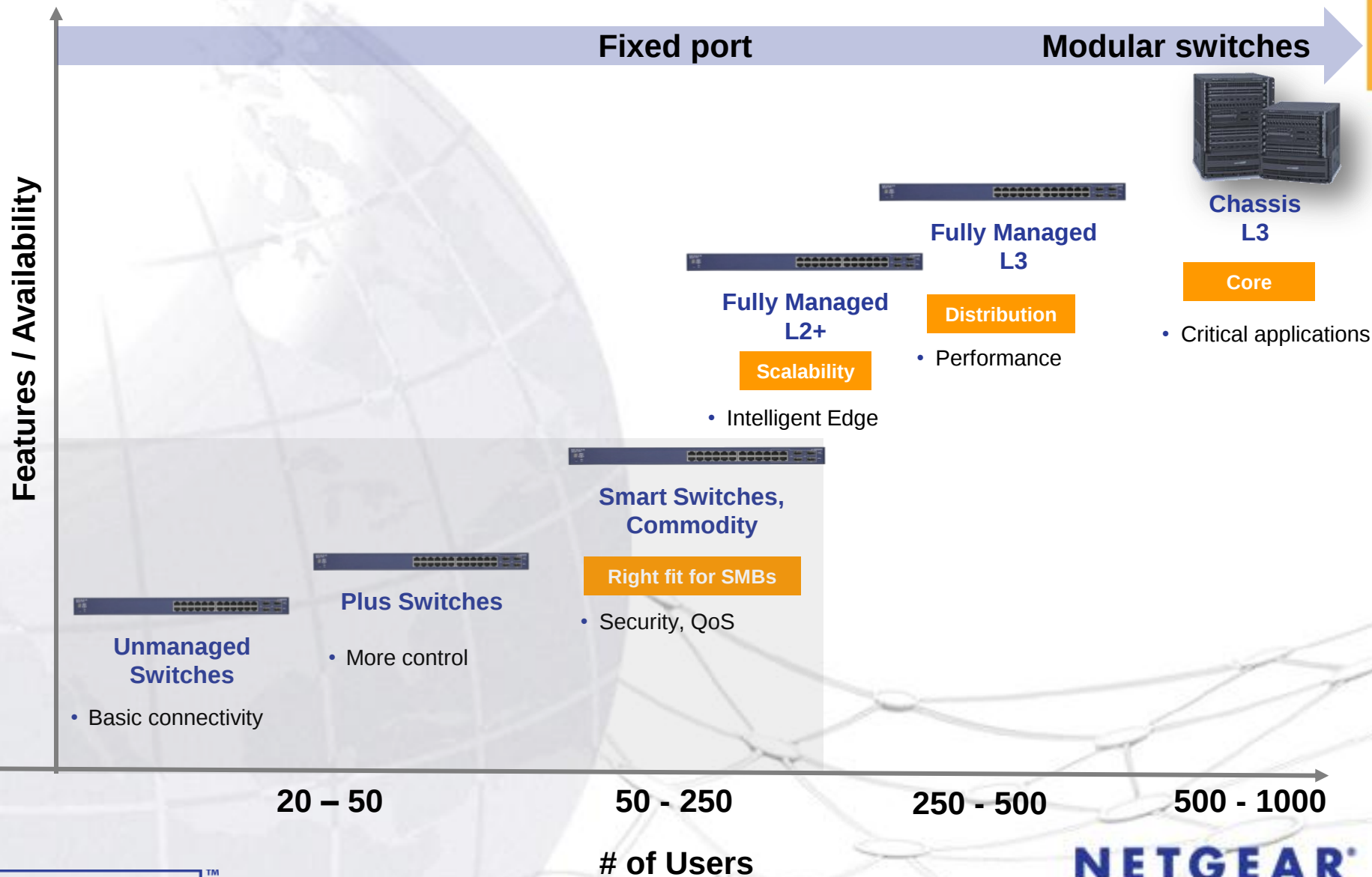
Complete control
Complex configuration

NETGEAR

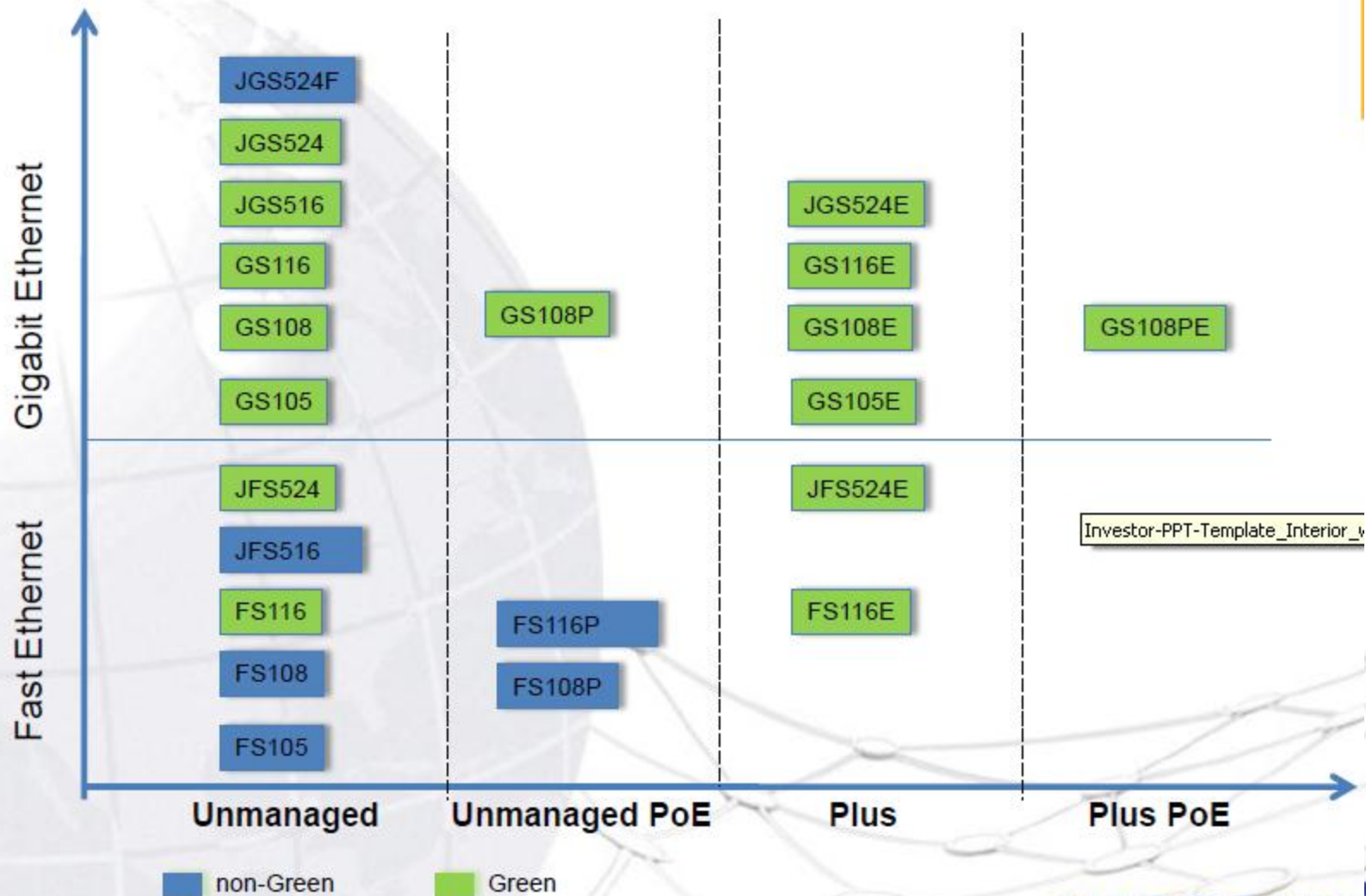
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Business Switching Solutions

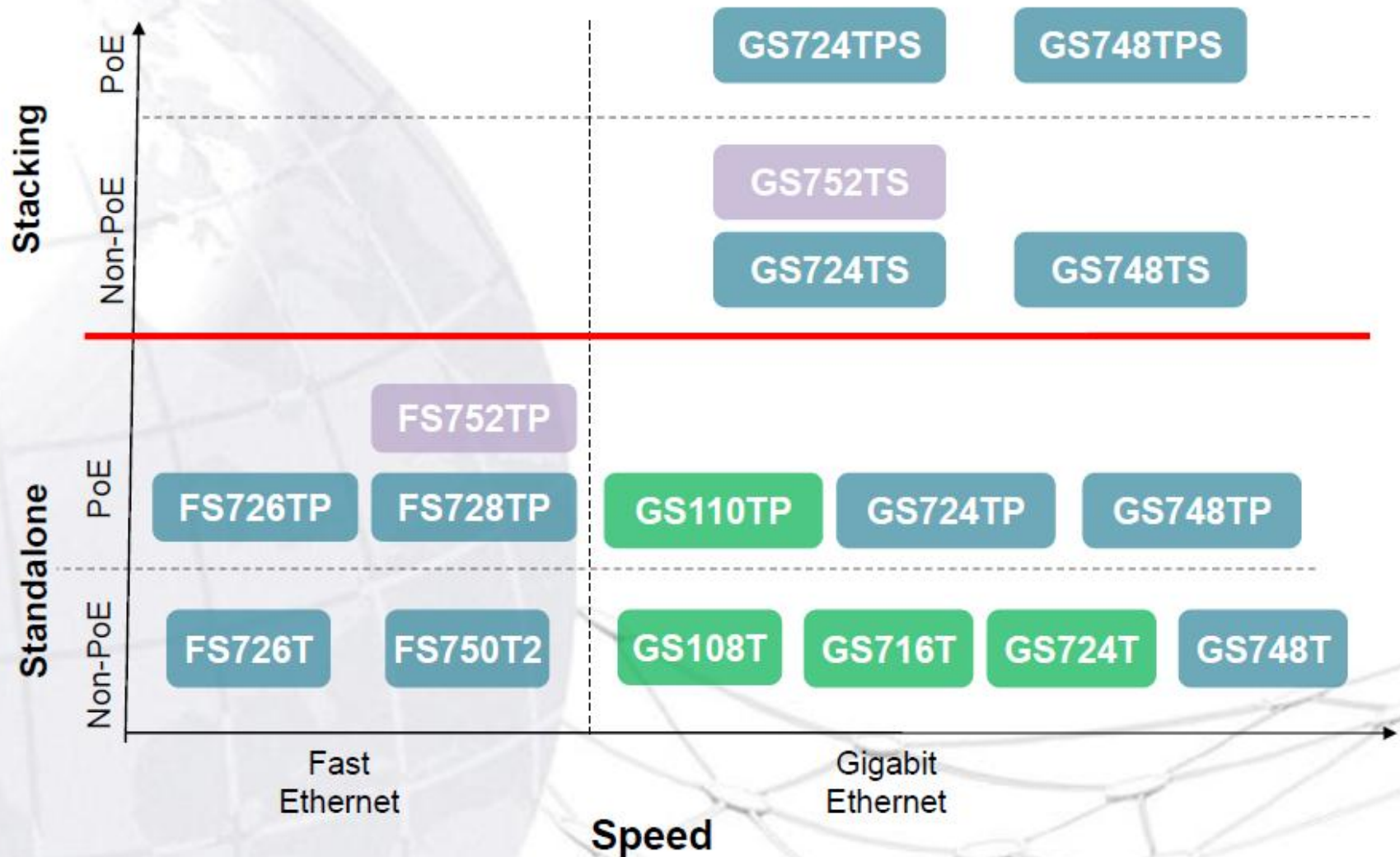


Unmanaged/Plus



Smart

Features



Managed

Core



XCM8810 and XCM8806

Stack 8 switches – 384 ports (GE) + 16 ports (10 GE)

Layer 3

Layer 2+

PoE

Non-PoE

PoE

Non-PoE

GSM7228PL

License

GSM7252PL

License

GSM7328S

GSM7352S

GSM7328FS

XSM7224L

License

GSM7228PS

GSM7252PS

Simple Access

Intelligent Edge

FSM726

Layer 2 only

GSM7224

GSM7248

T.O.R Server Edge
XSM7224S

Fast Ethernet

Gigabit Ethernet

NETGEAR
10Gigabit Ethernet
Connect with Innovation™

Products Highlights

- PoE pass-through
- 4 SFPs
- 125W with PSU

GSM5212P



**Desktop
12-p
PoE+**

- 360W Full Power
- 12x30W
- 4 SFP

GSM7212P



**Rack
12-p
PoE+**

**Gigabit L2+
VLAN routing**

GSM7224P



**Rack
24-p
PoE+**

GSM7212F

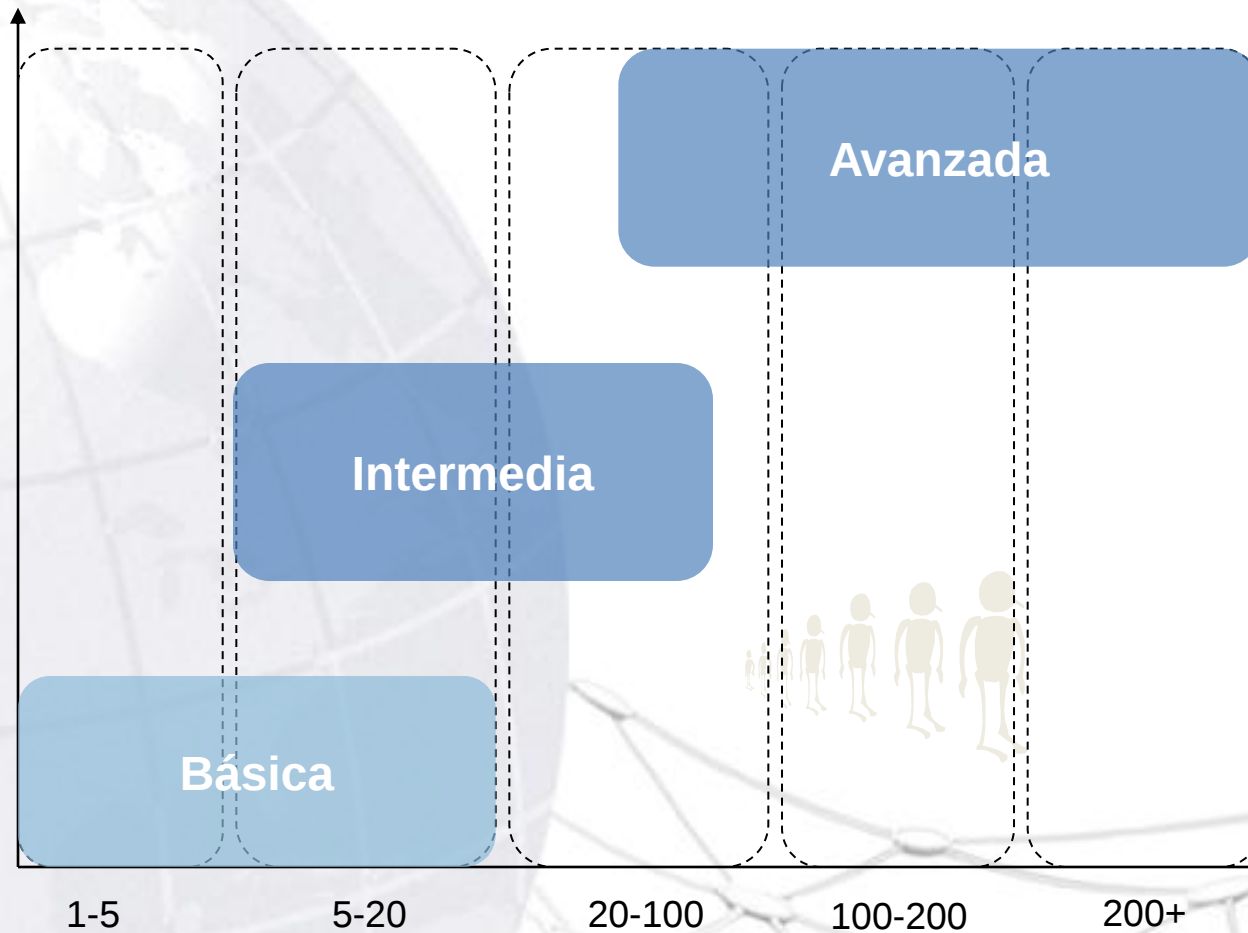


**Rack
12-p
Fiber**

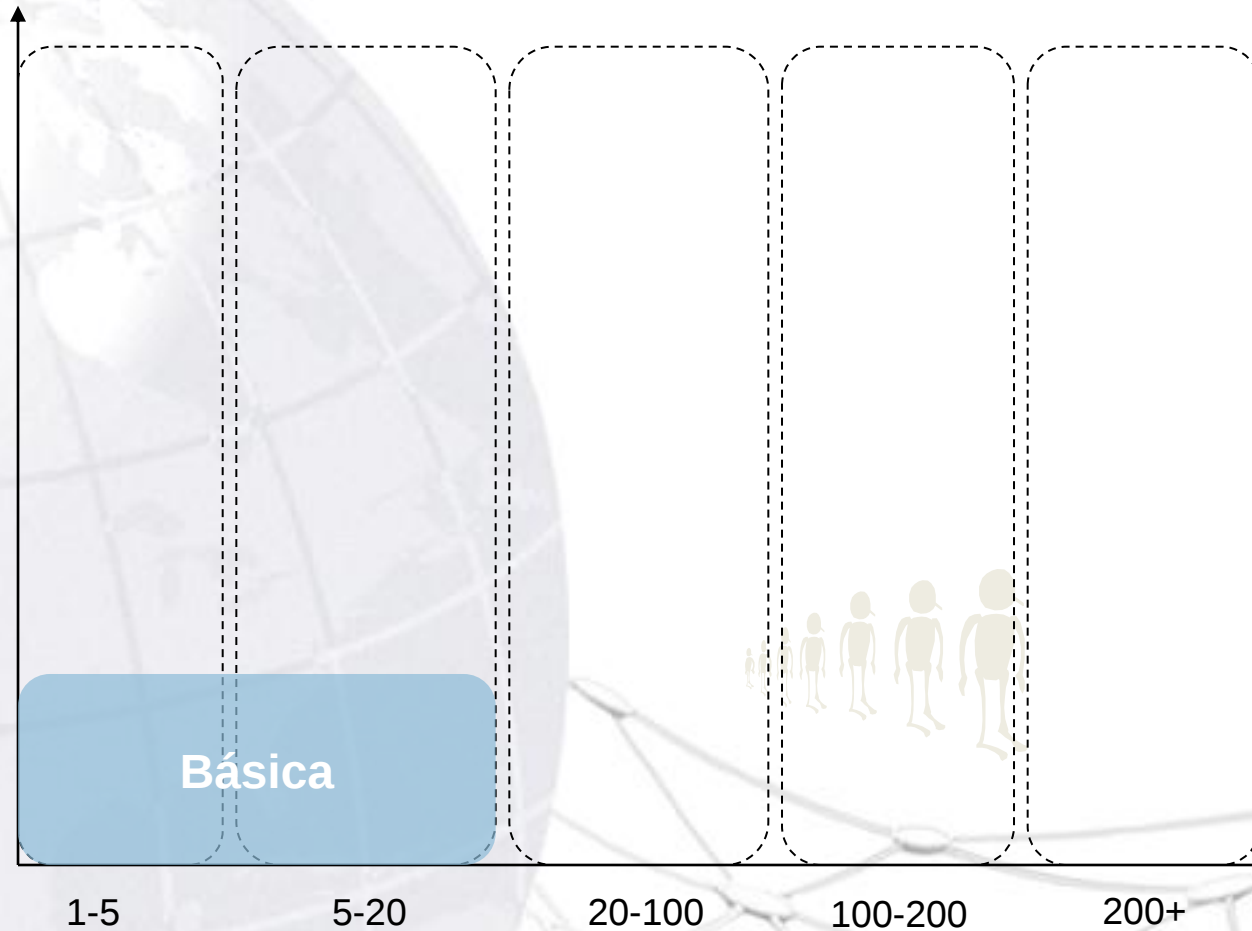
- 384W (24x16W)
- External power for 720W Full Power

- 12 SFP combo
- 4-p PoE+
- 120W Full Power

Segmentacion LANs : Soluciones



Segmentacion LANs : Soluciones

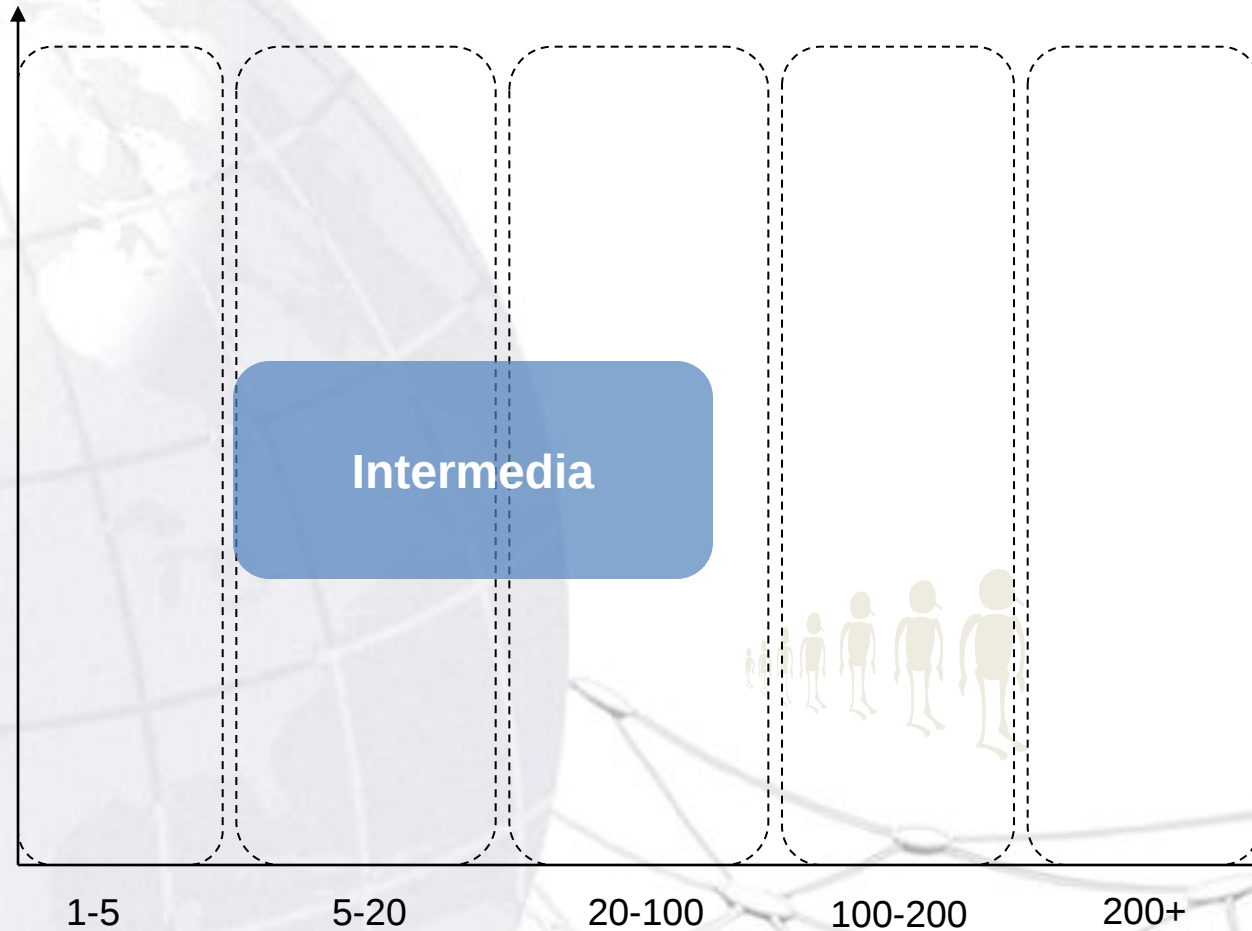


Equipamiento

- Switch :
 - ProSAFE Plus
 - Smart Switch
- Router Firewall (sin VLANs):
 - FVS318G
 - FVS336G/FVS318G/FVX538
 - Cualquier otro router



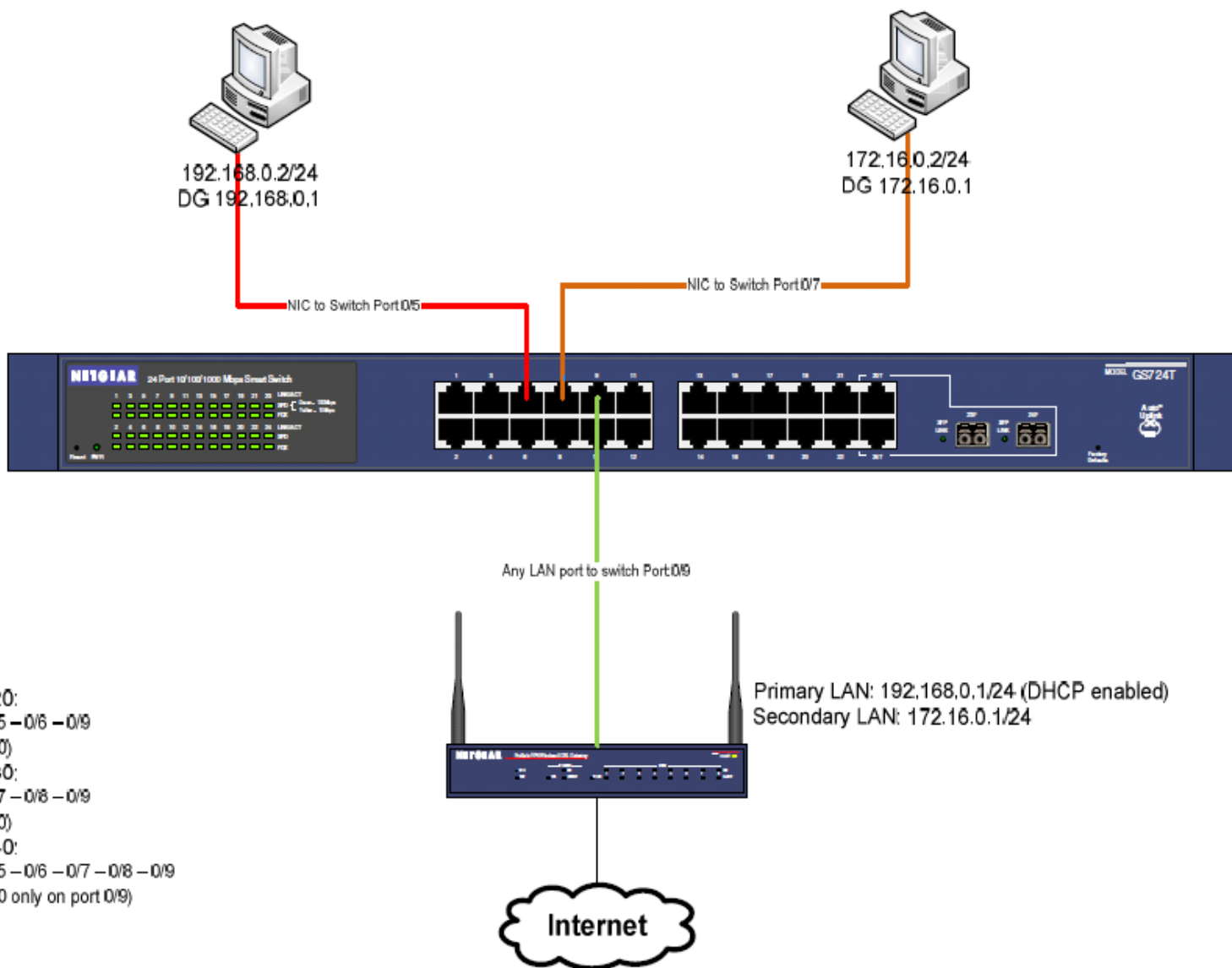
Segmentacion LANs : Soluciones



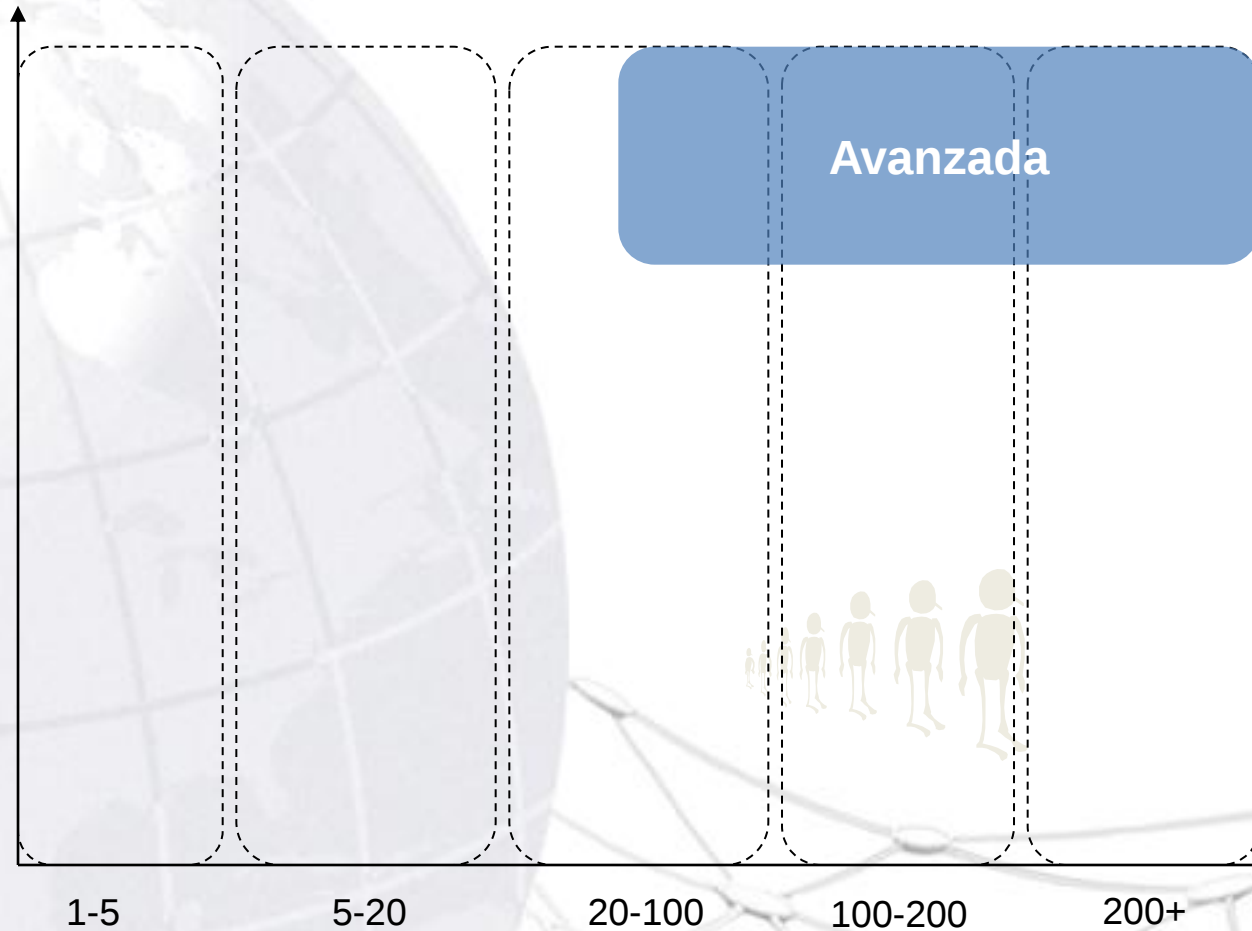
Equipamiento

- Switch :
 - Smart Switch
- Router Firewall (con VLANs):
 - UTM 5/10/25/50/150
 - SRX5308





Segmentacion LANs : Soluciones



Equipamiento

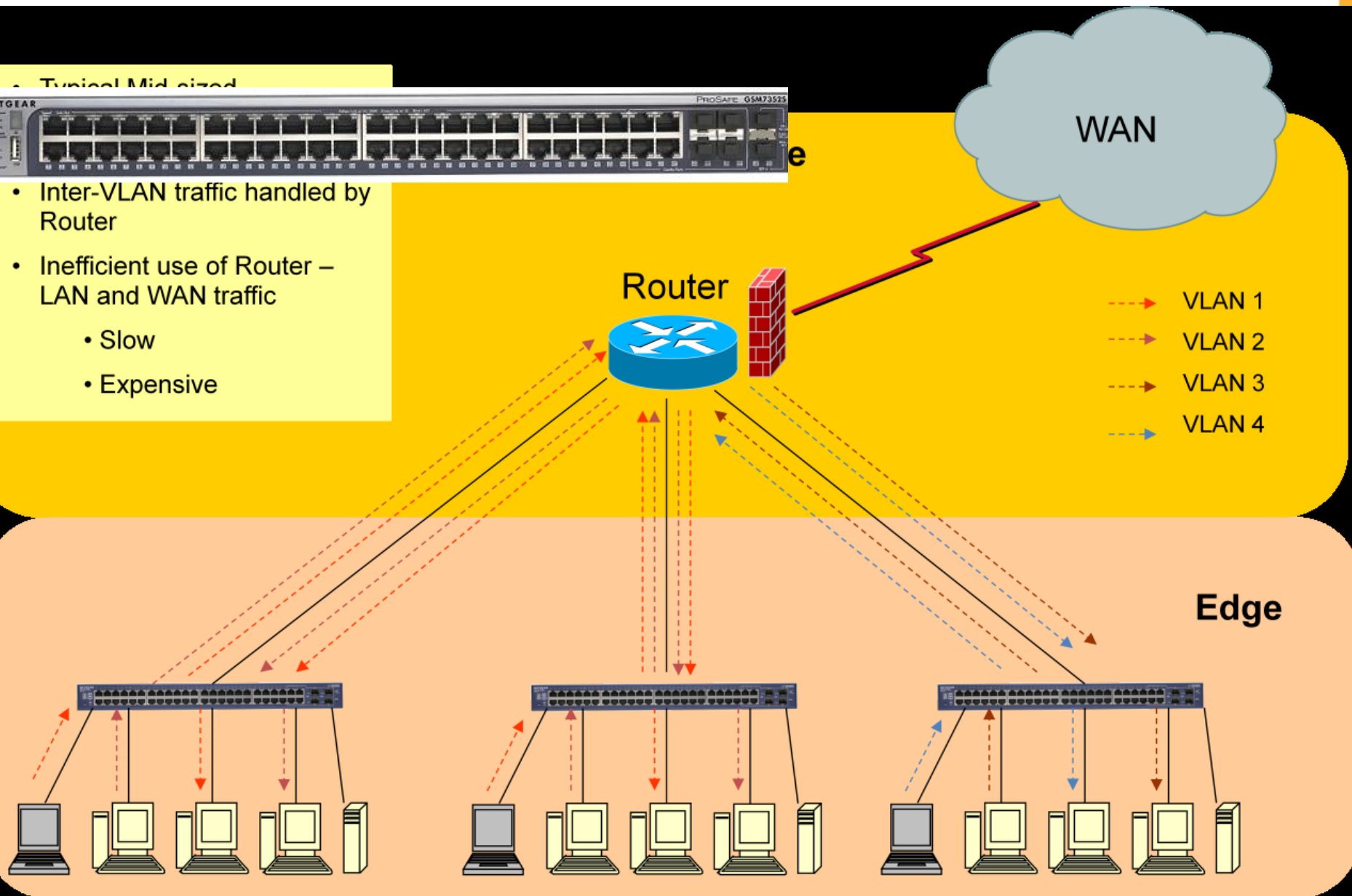
- Switch :
 - Smart Switches
 - Managed Switch
- Switch Capa 3
 - GSM7224/GSM7352S
 - GSM7352S



Typical Mid-sized



- Inter-VLAN traffic handled by Router
- Inefficient use of Router – LAN and WAN traffic
 - Slow
 - Expensive



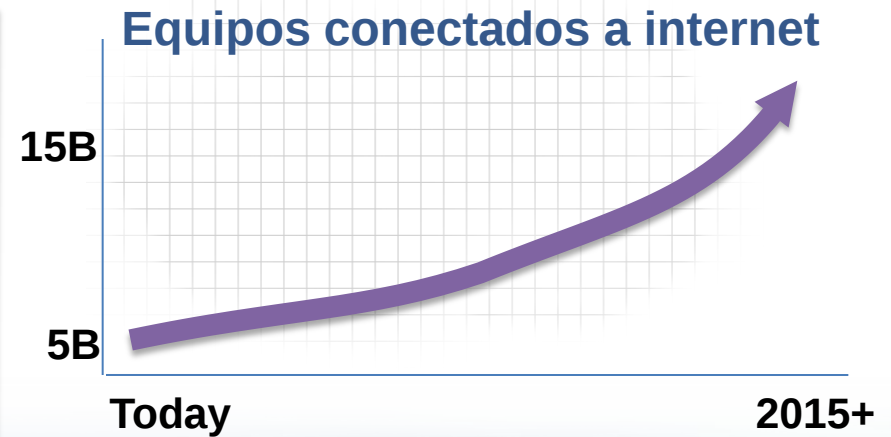
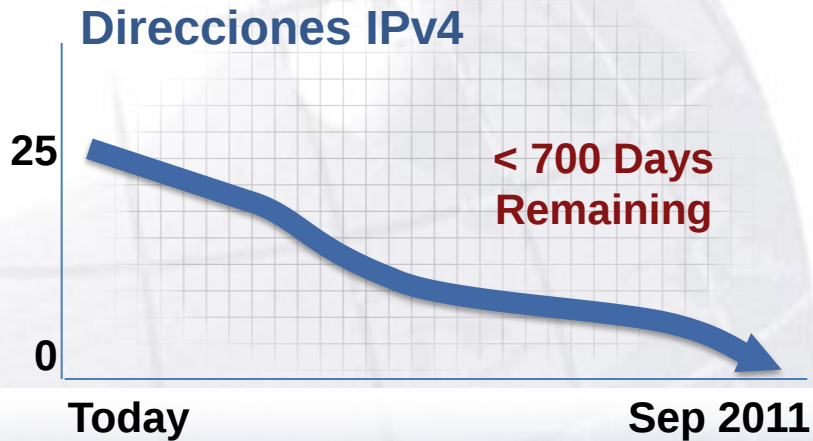
Tendencias



IPv6

Crecimiento en Internet

Cada vez quedan menos direcciones IPv4



¿Cómo está de cerca el fin?

Agotamiento IPv4 (Espanol)

INTEC Systems Institute, Inc. provides a blogpart version of "Agotamiento IPv4" that visualize the status of IPv4 address exhaustion which mashed up with the "IANA IPv4 Address Space Registry" provided by IANA and "IPv4 Address Report" researched by Mr. Geoff Huston of APNIC.

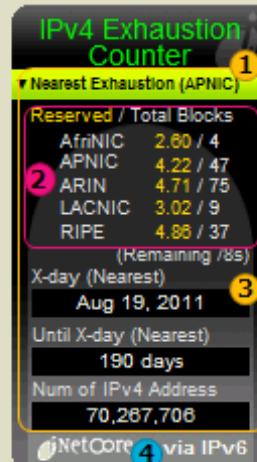
[Overview] "Agotamiento IPv4" is a blogpart that visualize the status of IPv4 address exhaustion which mashed up with the "IANA IPv4 Address Space Registry" provided by IANA and "IPv4 Address Report" researched by Mr. Geoff Huston of APNIC.

[Deployment] Please copy a following deployment code (HTML tag) into design template or entry of your blog page, and HTML file of your Web page.

[Deployment Code]

```
<script
type="text/javascript"
language="javascript"
src="http://linetcore.com/...
```

[Explanation]



① It shows a name of RIR(Regional Internet Registry) with the nearest exhaustion day.

② It shows unallocated and total IPv4 address blocks in each RIR.

③ It shows the X-day, the days until X-day and the amount of IPv4 address in the nearest exhaustion RIR (estimation).

④ It shows whether you access via IPv4 or IPv6.

Ref:IANA What is RIR?

IANA

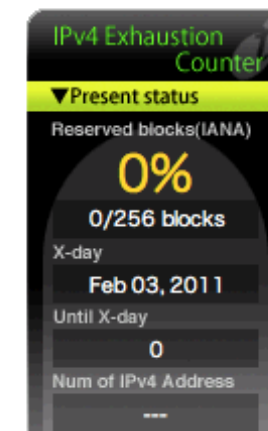
Please use a following deployment code (HTML tag) for Agotamiento

Select Language ... ▼

Agotamiento IPv4 (RIR)



Agotamiento IPv4 (IANA)



IPv6

IPv4

Direcciones Ipv4
Casi Agotadas

Private
IP

IPv6

Direcciones IPv6

56 billones por persona

Permite acceso global

Aumenta Seguridad y
eficiencia

Ventajas de IPv6

- Autoconfiguración de Direcciones y configuración de Rutas
- Enrutamiento más sencillo
- Seguridad integrada en el propio protocolo con IPSEC

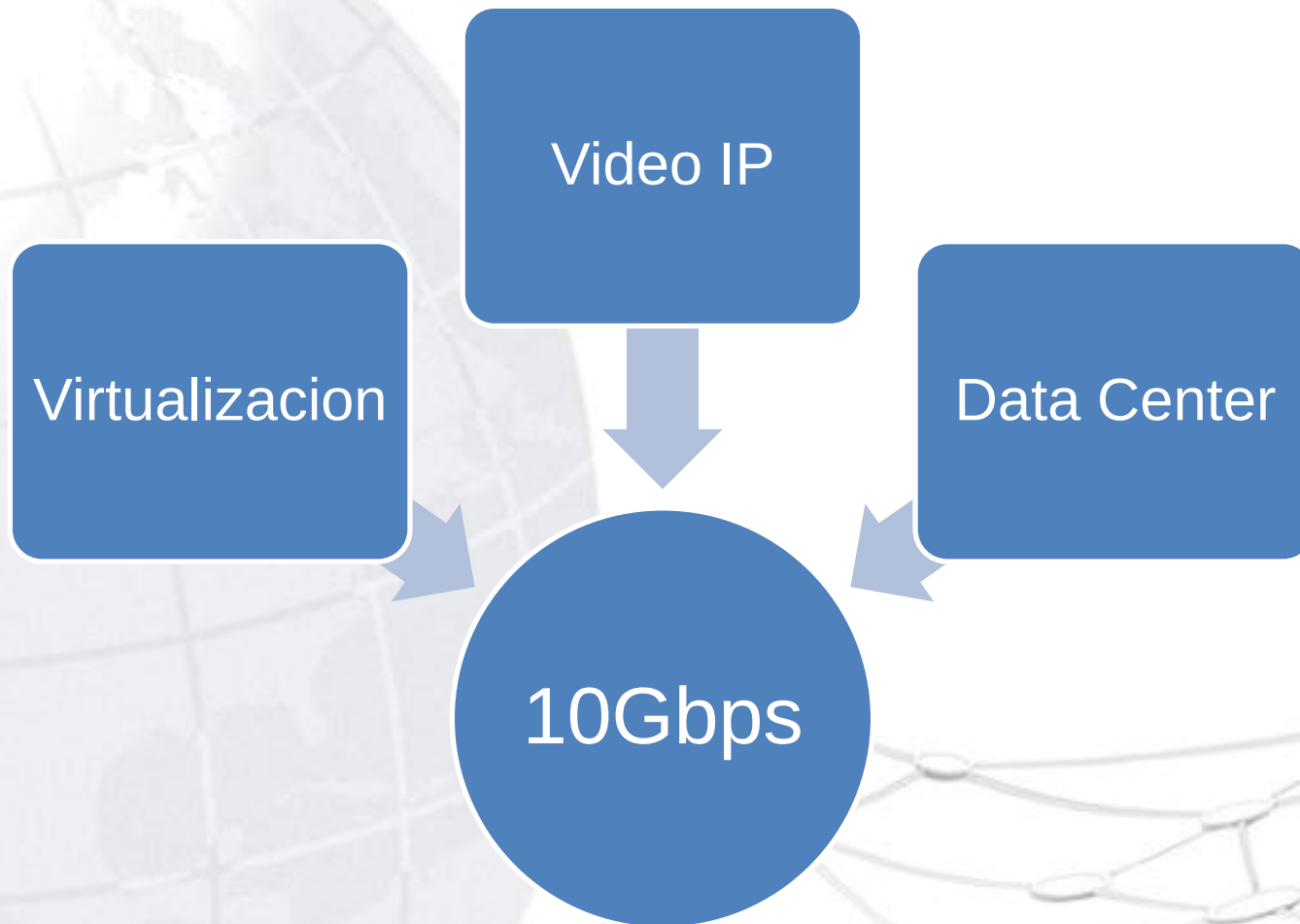
Ventajas de IPv6

- Ya no se gasta ancho de banda con Broadcasts
- Enrutamiento más rápido y eficiente gracias al procesamiento de los paquetes IPv6 en los routers
- Soporte en IPv6 para movilidad
 - Dispositivos mantienen una dirección estática incluso si cambian de ISP durante una sesión



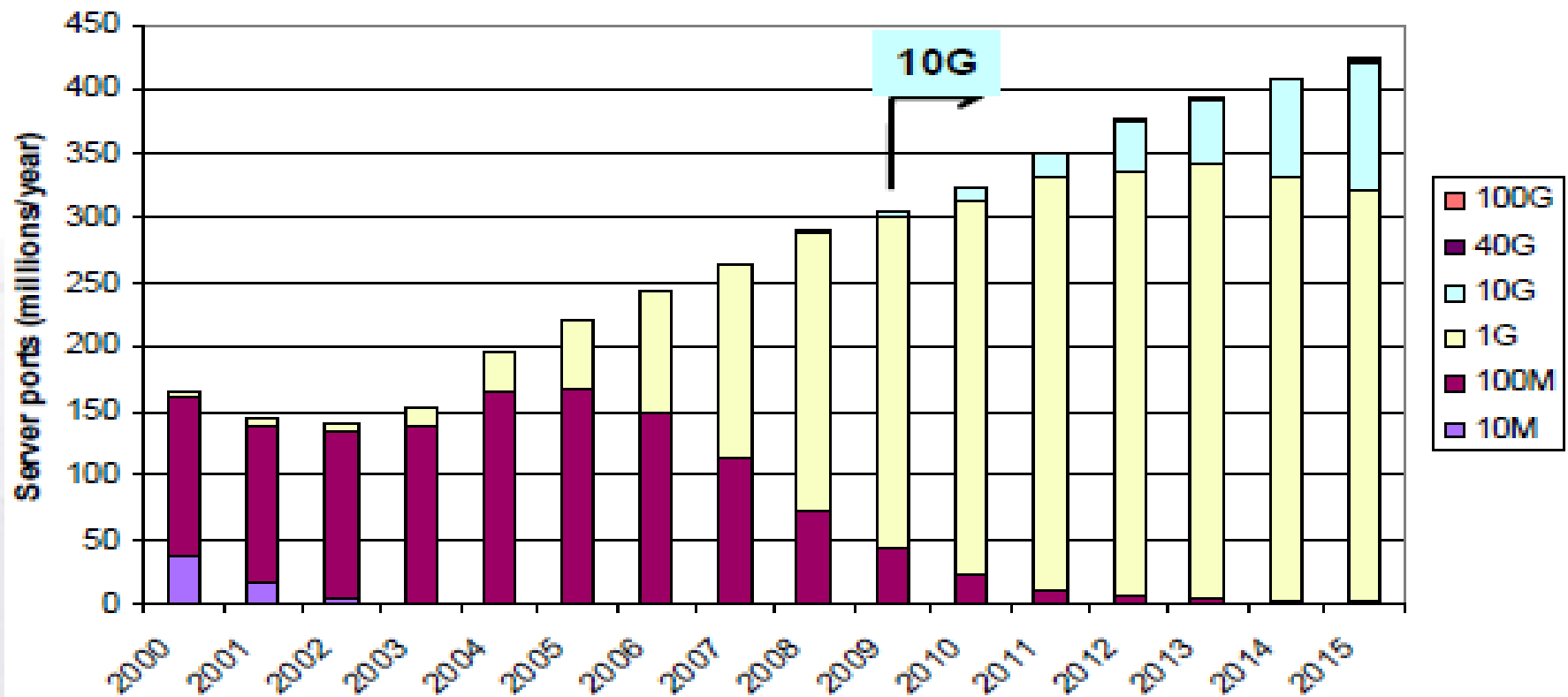
10Gbps

Introduccion



Puertos 10Gbps

Port speed in switches



Fibra

Módulos SFP+

10GBASE-SR

- Multimodo
- 50 metros



10GBASE-LR Monomodo 10 km

AXM761
(LC) SFP+



AXM763
(LC) SFP+



AXM762
(LC) SFP+



<u>Fiber</u>		10GBaseSR	10GBaseLRM	10GBaseLR
Single mode	9/125µm	✗	✗	✓ 10km
Multimode OM1	62.5/125µm	✓ 33m	✓ 220m	✓ 33m
Multimode OM2	50/125µm	✓ 33m	✓ 220m	✓ 33m
Multimode OM3	50/125µm	✓ 300m	✓ 260m	✓ 300m

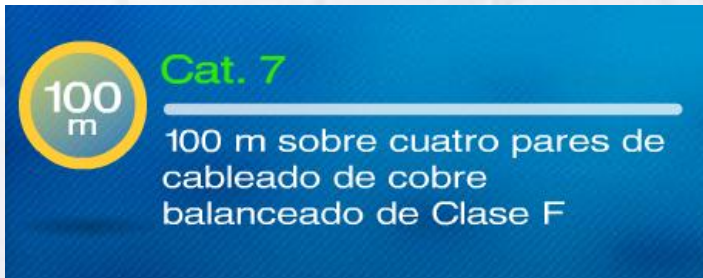
Direct Attach SFP+

- Conexión Puertos SFP+
- Distancias hasta 10 metros
 - AXC761 : 1 metro
 - AXC763 : 3 metros
- Precio competitivo
- Conectores SFP+ integrados



Par Trenzado

- 10GBASE-T
 - Estándar aprobado en 2006
 - Utiliza el par trenzado normal



100 m **Cat. 7**

100 m sobre cuatro pares de cableado de cobre balanceado de Clase F

This graphic features a blue background with a yellow circle containing '100 m' and the text 'Cat. 7' in green. Below this, a white horizontal line is followed by the text '100 m sobre cuatro pares de cableado de cobre balanceado de Clase F' in white.



55 m **100 m** **Cat. 6**

55 a 100 m sobre cuatro pares de cableado de cobre balanceado Clase E

This graphic features a blue background with two yellow circles containing '55 m' and '100 m' respectively, connected by a white arrow. To the right, the text 'Cat. 6' is in green. Below this, a white horizontal line is followed by the text '55 a 100 m sobre cuatro pares de cableado de cobre balanceado Clase E' in white.

Productos 10Gbps



XCM8800 Series

XSM7224S



GSM7XXXS



GS752TXS



NEW

NETGEAR
PROSAFE



NETGEAR
Connect with Innovation™

GSM7228PS / GSM7252PS

8 First Gigabit Ports are PoE+

1

All other Gigabit Ports are PoE

2

4 Ports Combo SFP

3

2 built-in 10 GE SFP+

4

Built-in
10 Gigabit
Ports

Console
port

2 module bays for 10 GE options
modules (stacking or uplinks)

RPS connector
(remove screws)

Replaceable
modular
power supply

AX743
SFP+ Host Module



AXM761, AXM762 or AXM763
SFP+ 10GBase-SR, LR or LRM optics



- AX743 + AXM761/AXM762/AXM763 optics in each rear slot
- Two SFP+ modules are recommended for full 40 Gbps bandwidth and complete redundancy



NETGEAR
Connect with Innovation™

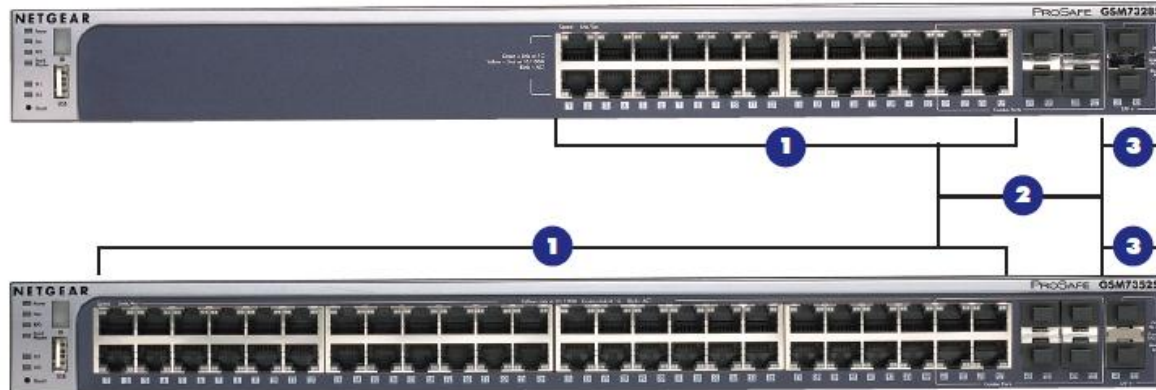
GSM7328S/GSM7352S

24 and 48
Gigabit Ports **1**

4 Combo SFP ports **2**

2 Built-in 10 GE SFP+ **3**

Built-in
10 Gigabit
Ports



Console port

2 module bays for 10 GE options
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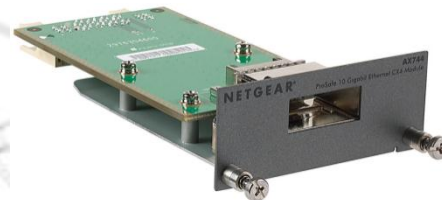
AX743
SFP+ Host Module



AXM761, AXM762 or AXM763
SFP+ 10GBase-SR, LR or LRM optics



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NETGEAR
Connect with Innovation™

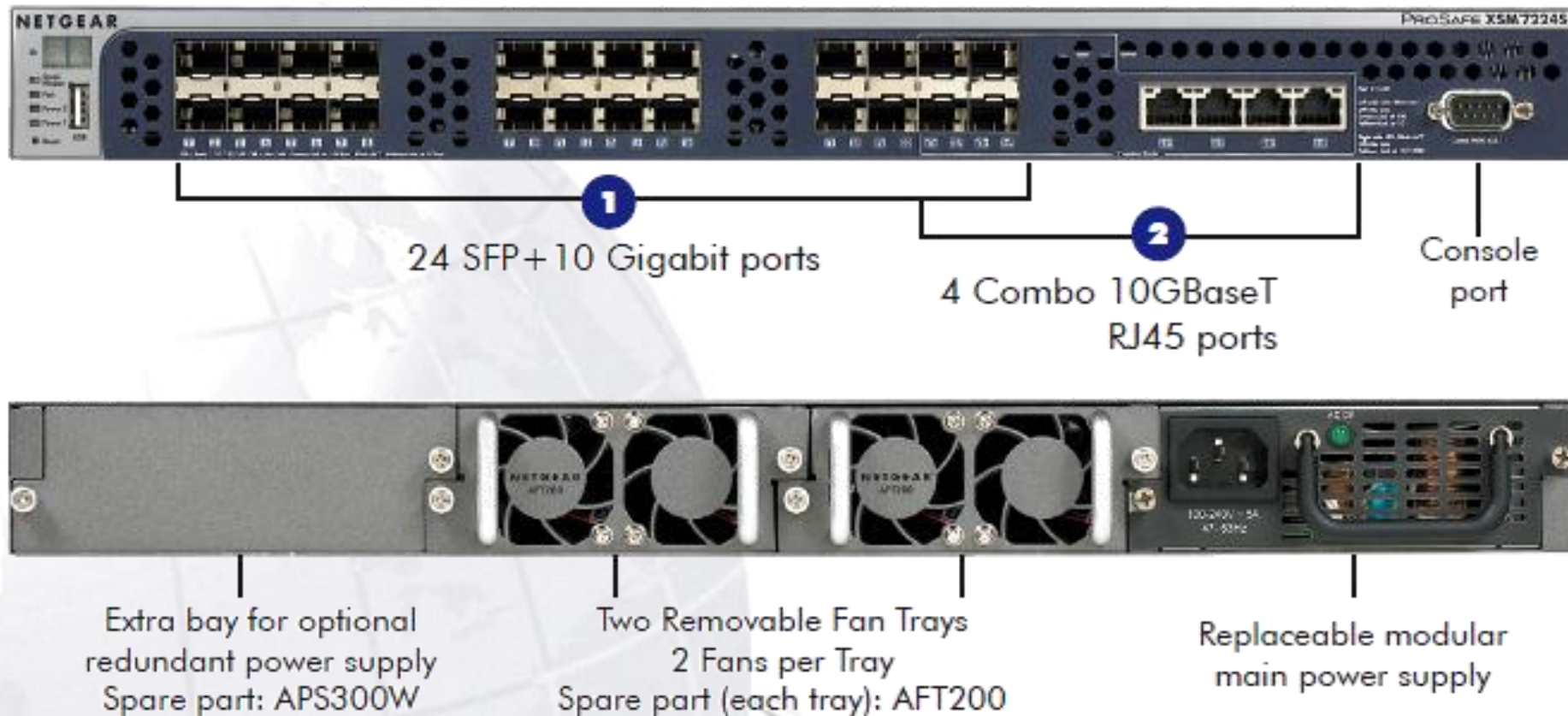
GSM7328FS



48Gbps Redundant Stack Technology

- **24 Puertos SFP**
- **4 x 10/24GE (10/24Gigabit) I/O Module bays (2 on the front, 2 on the rear)**
 - AX742 ProSafe 24Gigabit Stacking kit (2 x 24GE stack modules + stack cable)
 - AX743 SFP+ Host Module (for AXM761/AXM762/AXM763)
 - AX744 CX4 Module
- **Stack with GSM73xxS / GSM72xxPS**

XSM7224S



- 24-puertos 10 Gigabit SFP+
- 4 puertos 10GBase-T RJ45 uplinks
- Doble fuente de Alimentacion
- Apilable hasta 4 unidades

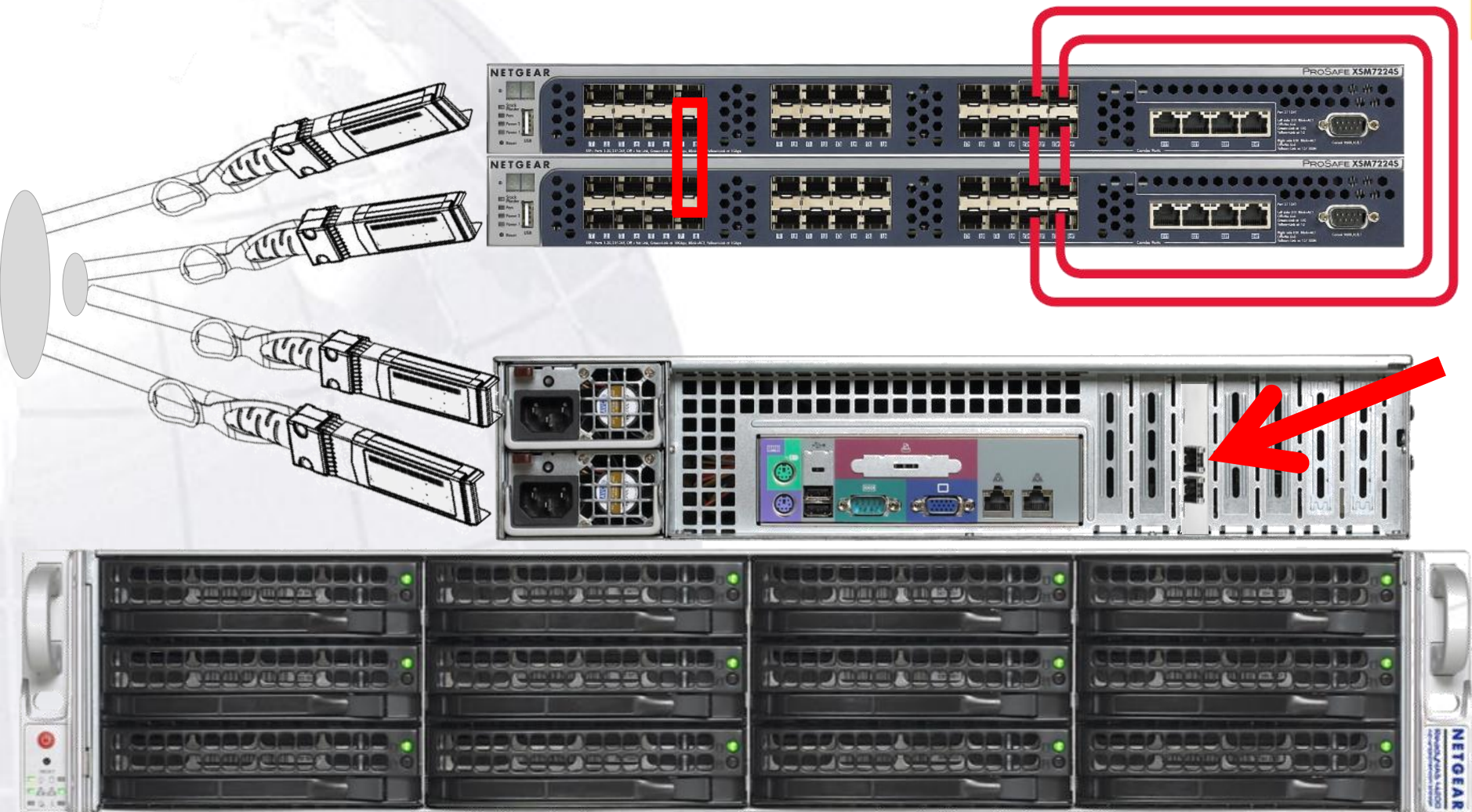
ReadyNAS 4200



- Hasta 24TB capacidad con RAID 0/1/5 y X-RAID2
- 4/12 bahías en formato rack
- Almacenamiento con doble fuente de alimentacion redundante
- Conectividad **10Gbps**



Conectividad 10Gbps



ReadyNAS 4200 with Dual 10 GE SFP+ adapter



NETGEAR®

Connect with Innovation™

Gracias

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Sales Engineer Netgear

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xlleixa@netgear.com