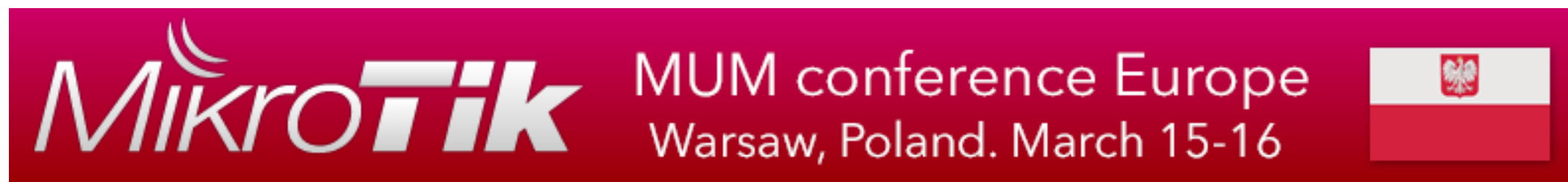# Access Point Redundancy

## by Lorenzo Busatti

# About me

**Lorenzo Busatti**

**Grifonline S.r.l., Grosseto – ITALY**

ISP for more 15 years, WISP for more 6 years

**MikroTik Certified Trainer / Consultant**

- For: MTCNA, MTCWE, MTCRE, MTCTCE, MTCUME, MTCINE

- Specialization: Wireless, Routing

# Presentation Objectives

- Raise awareness on the issue of redundancy of access points used in base stations

- Provide a starting point for a setup

# Uptime!

- The Uptime of a wireless service should be 100%.

- The more is closer to 100% the more the wireless users will be happy

# Which Wireless Users?

- WISPs users
- Hotels & Conferences Users
- Corporate Offices Users

Any user in any wireless network

# Basics common failures

- Power failure

# Basics common failures

- Power failure

Can be solved with

- The use of UPS or batteries

# Basics common failures

- Power supply failure

# Basics common failures

- Power supply failure

Can be solved with

- The use of redundant power system
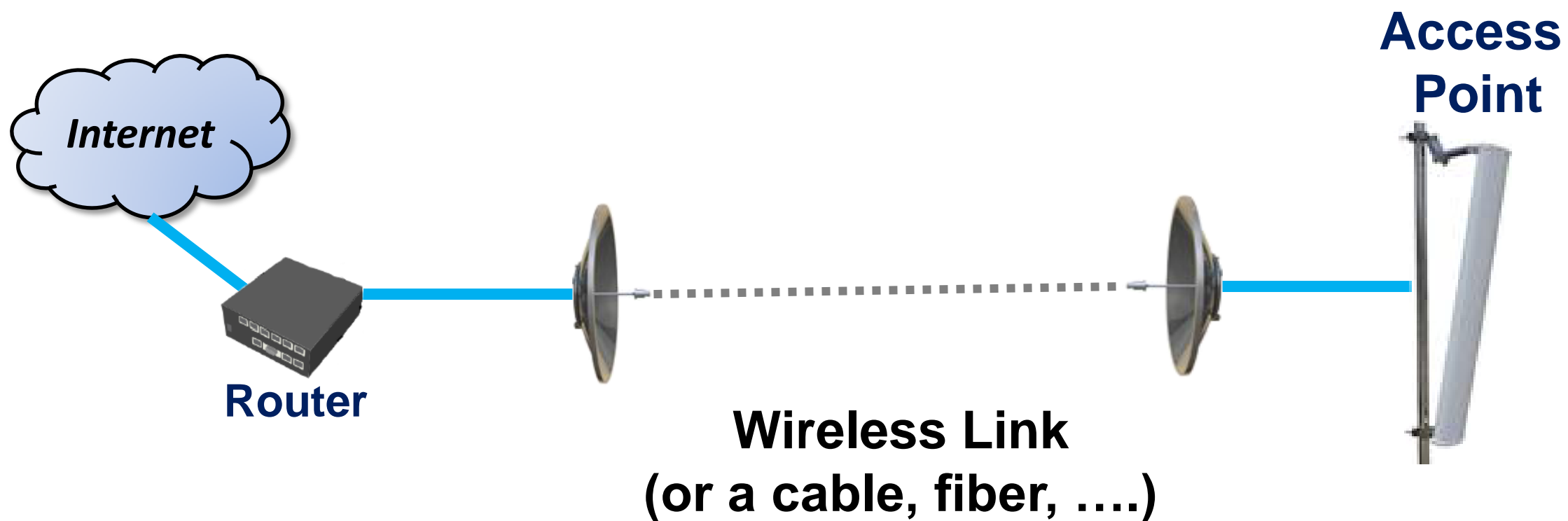
# Internet Backbone

- With two or more ISP you can setup RouterOS for having a backup line, in case one of the ISPs will go down.

# Internet Backbone (as AS)

- With BGP it's easy to setup more than one Internet upstream

- If one of the peers goes down there is another one(s).

# Basic Network Example

**Clients**

**Access Point**

*Internet*

**Router**

**Wireless Link
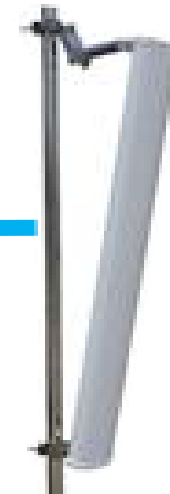(or a cable, fiber, ….)**

# Transport Redundancy

- Thanks to RSTP or OSPF or MPLS any network transport can be redunded. All transport links can be "doubled" and the network will be more reliable.
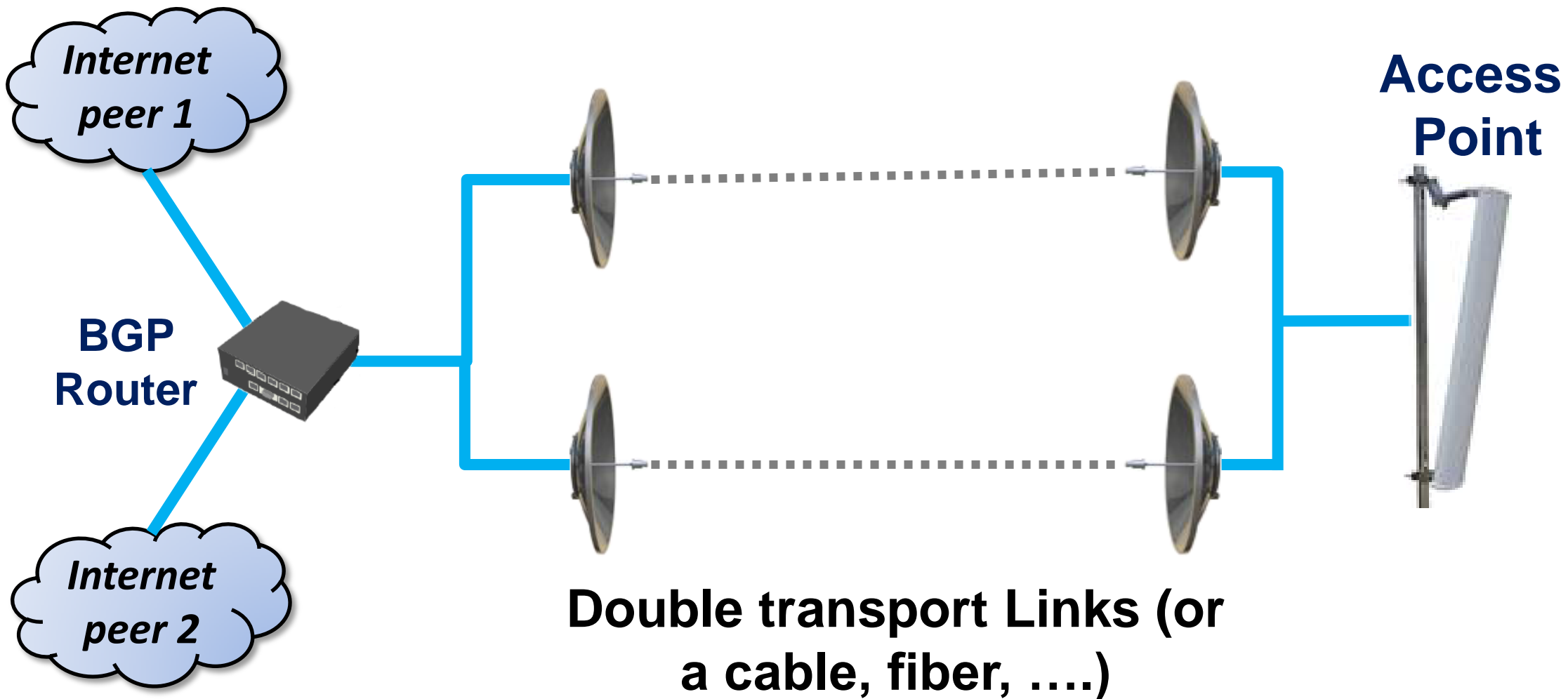
# Advanced Network Example

Clients

Access Point

Internet peer 1

Internet peer 2

BGP Router

**Double transport Links (or a cable, fiber, ….)**

grif nline
*a real world*
Training Center

# Advanced Network Example



**Clients**

**Access Point**

*Internet peer 1*

*Internet peer 2*

**BGP Router**

**Doubled transport Links
(or a cable, fiber, ….)**

# Advanced Network Example



Clients

Access Point

Internet peer 1

Internet peer 2

BGP Router

**Doubled transport Links
(or a cable, fiber, ….)**

## And just a SINGLE AP ……

grif online
*a real world*
Training Center
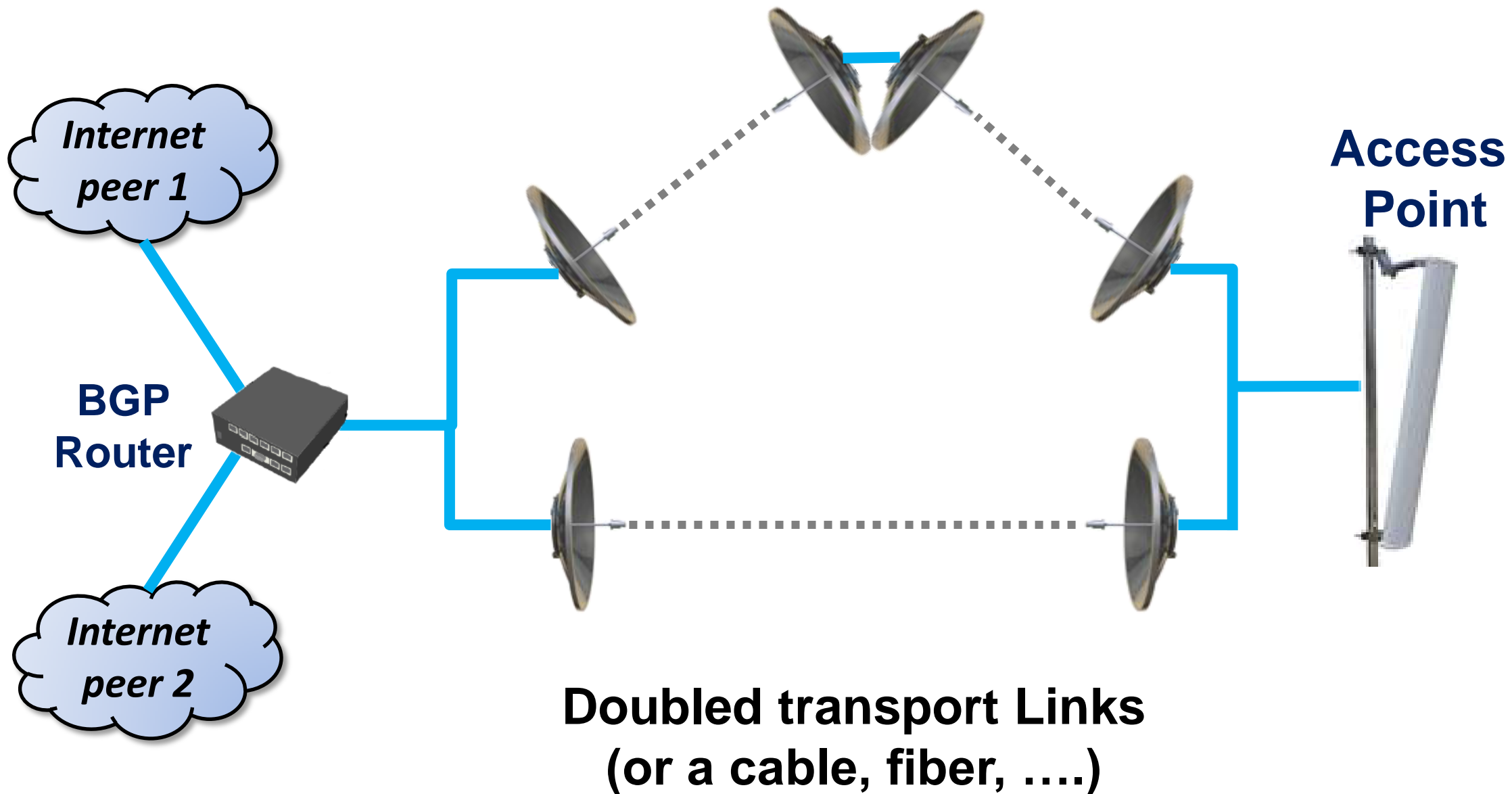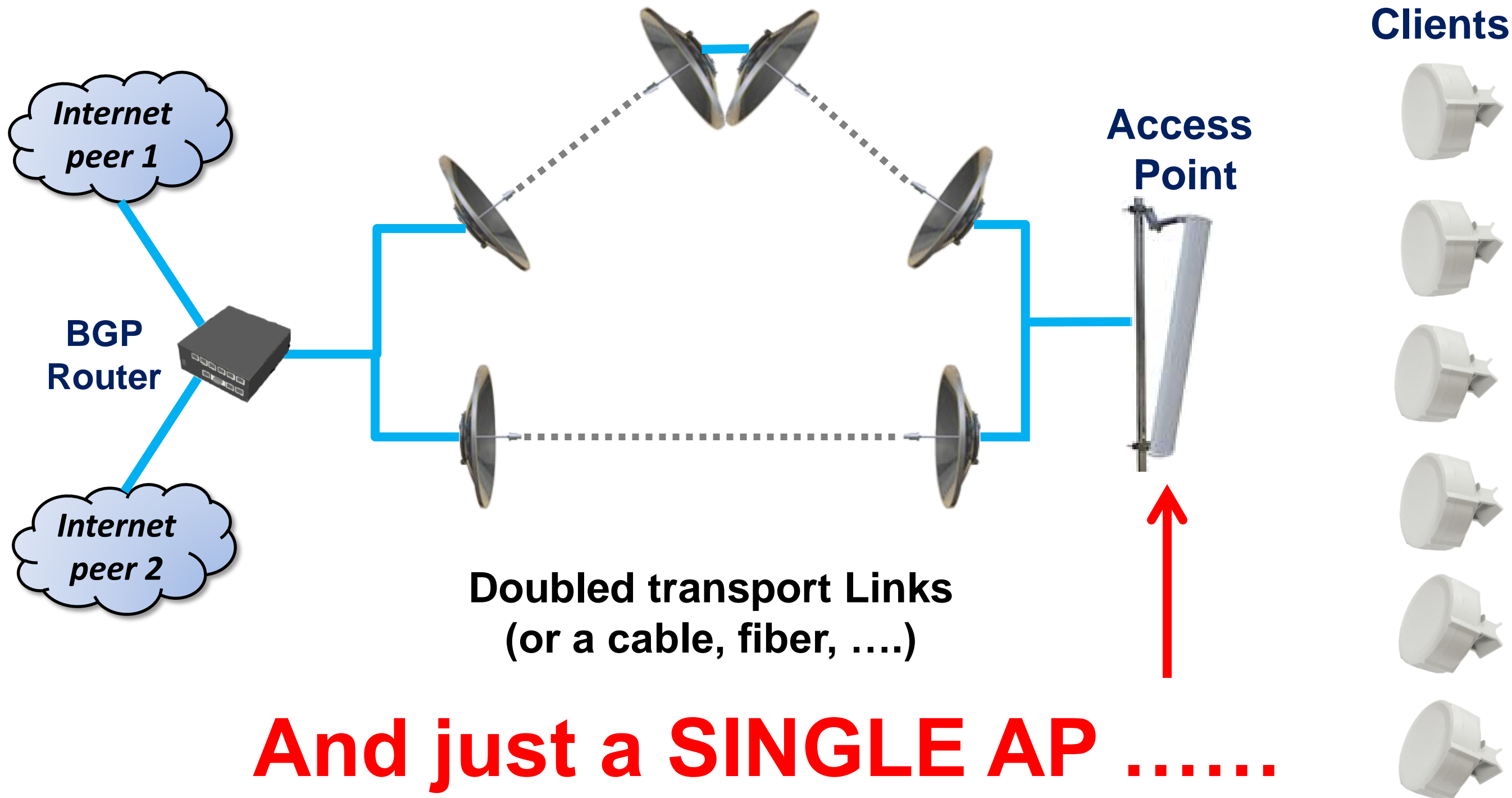
# Advanced Network Example



Access Points

Clients

Internet peer 1

Internet peer 2

BGP Router

**Doubled transport Links (or a cable, fiber, ….)**
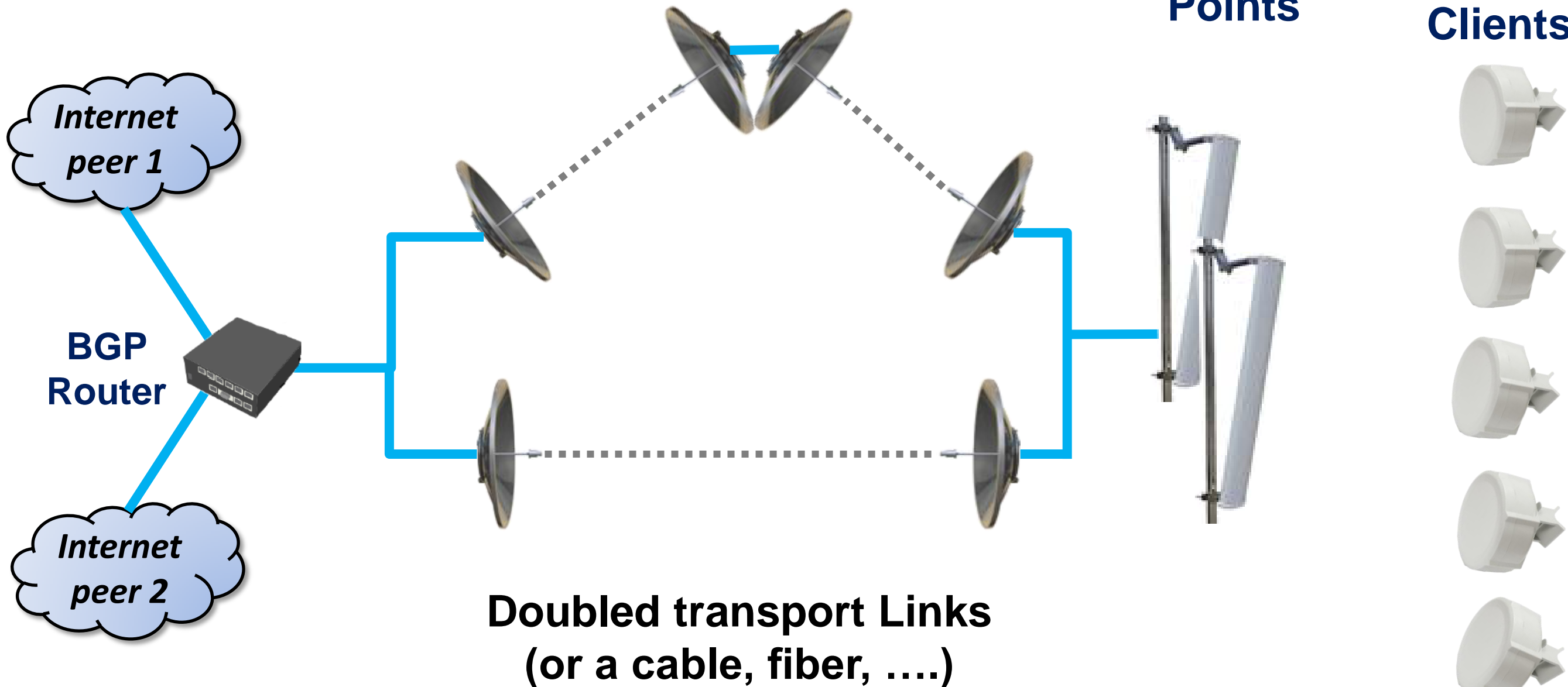
**Maybe you can add one more!**

# The advantages of double APs

# Failover

- With RouterOS you can have a failover system for your APs

# Failover

- With RouterOS you can have a failover system for your Aps
- Without external software or hardware

# Failover

- With RouterOS you can have a failover system for your Aps

- Without external software or hardware (~~$$$$$~~)

- Just doubling the Aps ($)

# In the Real Environments

# Advantages

- Doing long term scan
- Doing long term snooper
- Doing long term Freq. Usage
- Doing long term Spectral Scan
- Doing long term Spectral History

# Advantages

- Doing RouterOS update
- Trying different radio cards
- Avoid Antenna failure
- Avoid RF Cable failure
- Doing …. Trying …. Scan ….. ….

# Without disconnecting the Clients!

## (maybe just for few seconds ….)

# How to manage double APs (Failover)

# RouterOS HowTo

- Thanks to RouterOS's features it is possible to have "hot spare" APs in few easy steps.

- And thanks to his flexibility there are "lot" of ways to do this.

# Planning the behavior

- How do you want your "spare" AP will react?

- Don't exist exact rules, with RouterOS you are free to decide.

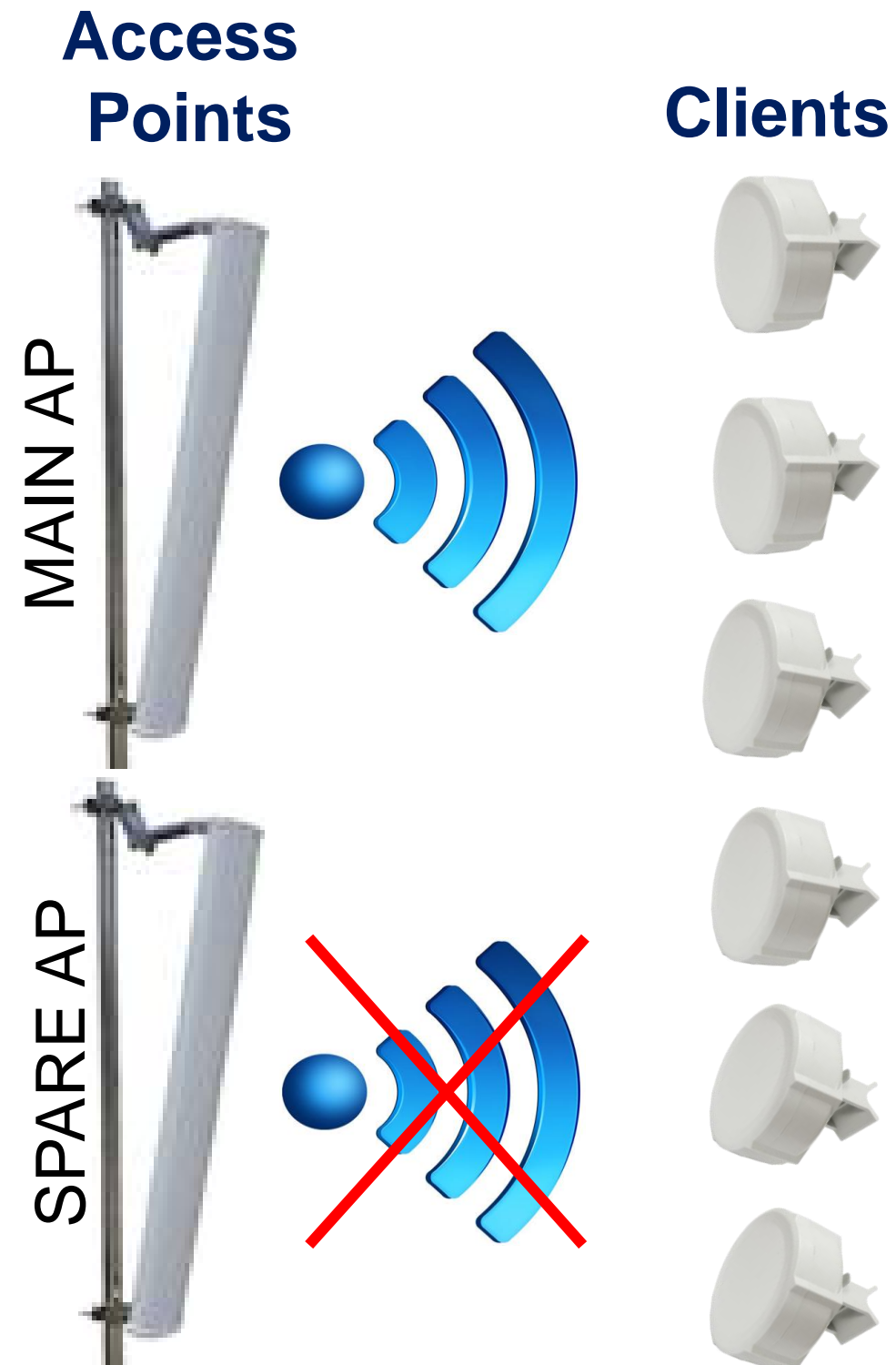- I will show you just one example, a starting point.

# Planning the behavior

- We want the "spare" AP will have the wireless OFF when the main AP is working.

**Access Points**

**Clients**

MAIN AP

SPARE AP

grif online
a real world
Training Center

# Planning the behavior

- We want the "spare" AP will have the wireless OFF when the main AP is working.

- We don't want both APs with wireless cards ON at the same time.

**Access Points**

**Clients**

MAIN AP

SPARE AP

grifonline
*a real world*
Training Center

# Planning the behavior

- We want the "spare" AP will have the wireless OFF when the main AP is working.

- We don't want both APs with wireless cards ON at the same time.

- **We want a "protection" from ethernet disconnections or failures, when the routers are powered ON**

**Access Points**

**Clients**

MAIN AP

SPARE AP

# VRRP

- With an "easy" VRRP setup you can avoid:
  - Router failures;
  - Power failures

**Access Points**

**Clients**

MAIN AP

SPARE AP

# VRRP

- With an "easy" VRRP setup you can avoid:
  - Router failures;
  - Power failures

- What about ethernet failures?

**Access Points**

**Clients**

MAIN AP

SPARE AP

# A starting point

- We can use just some simple "netwatch" and scripts for doing all the job.
- Very easy to deploy, to apply, to experiment.

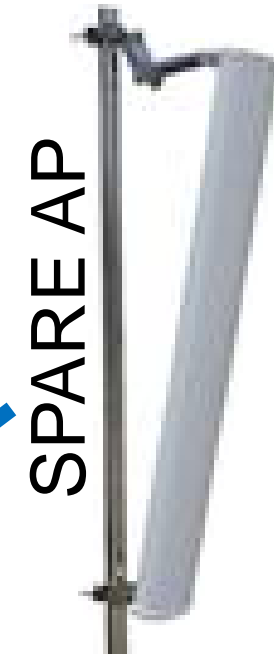- Later you can develop your own behavior and technology

# Behavior Example

- For this behavior example we need a "reference" (or fixed) point in the network.

- We can choose the internet gateway.

- If the internet gateway will fail nobody can use the network.
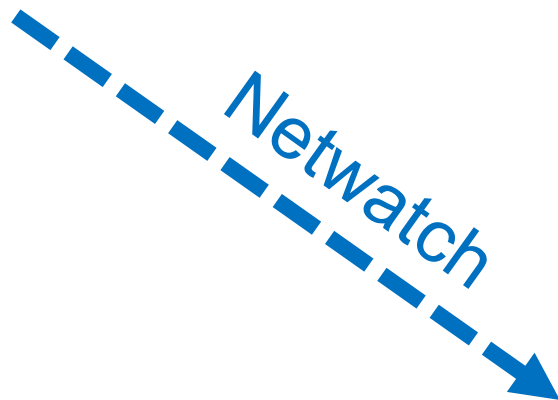
# Behavior Example



At startup:
WLAN ON

At startup:
WLAN OFF

MAIN AP

SPARE AP

Netwatch

Netwatch
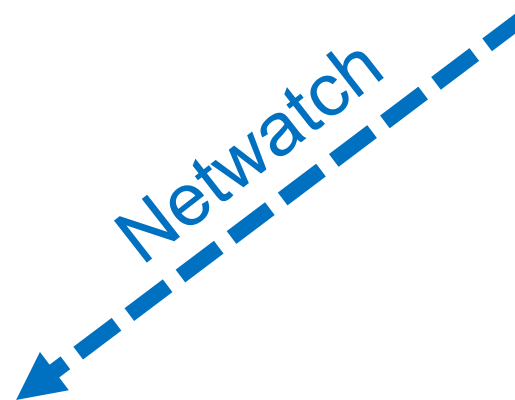
Netwatch

Internet
Gateway

If I can't ping the gateway I can turn off the WLAN

If I can't ping the Main AP but I can ping the gateway, I can turn on the WLAN

# The RouterOS Setup (MAIN AP)

```
/tool netwatch
add comment="Ping the Gateway" \
host=192.168.1.1 interval=2s timeout=1s \
down-script="interface wireless disable 0" \
up-script="interface wireless enable 0"

/system script
add name=enablewlan source="/interface wireless enable wlan1"

/system scheduler
add name=enablewlan on-event=enablewlan start-time=startup
```

# The RouterOS Setup (SPARE AP)

```
/tool netwatch
add comment="Ping the Gateway" host=192.168.1.1 interval=2s timeout=1s \
down-script="interface wireless disable 0"

add comment="Ping Master AP" host=192.168.1.2 interval=2s timeout=1s \
up-script="interface wireless disable 0"

/system script
add name=disablewlan source="/interface wireless disable wlan1"
add name=checkAP source="\
:if (([/tool netwatch get 1 status ] = "down") && ([/tool netwatch get 0 status ]
= "up")) do={ \
    :if ([/interface wireless get 0 disabled ] = true ) do={ \
        [/interface wireless enable 0] } \
}"

/system scheduler
add name=disablewlan start-time=startup on-event=disablewlan
add name=checkAP start-time=startup interval=3s on-event=checkAP
```

# End of the Settings!

- Yes, we're done all the settings for this basic example (as a starting point!).

# Live Demo

**The "Main" AP**
192.168.10.2/24

**The Internet Gateway**
192.168.10.1/24

**A Wireless Client**
192.168.10.5/24

**My Laptop**
192.168.10.4/24

**The "Spare" AP**
192.168.10.3/24

# Live Demo

Connect now with your device at the SSID
**RedundantApLAB**

# Thankyou!

# Q & A

http://training.grifonline.it
training@grifonline.it