# *Anycast in Internet Service Provider Environment*

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# Introduction

- ***What is Anycast ?***
  - ***Basis for large-scale content-distribution networks since early 90's***
  - ***Configuration methodology that provides redundancy and load sharing to specific types of network services on the Internet***
  - ***Assigns a common IP address to multiple instances of the same service***

# Introduction

- ***Anycast implementation***
  - ***Local server cluster, global network or global network of clusters***
  - ***Does not interfere with the existing network, it leverages it***
  - ***Clients, server and routers require no special software or firmware***

# Introduction

- ***How does Anycast work from a routing point of view ?***
  - ***Using multiple sites across the network***
  - ***Single announcement over internet***
  - ***Choosen site is determined by routing and network topology***
  - ***Internal routing decision based on IGP/BGP***

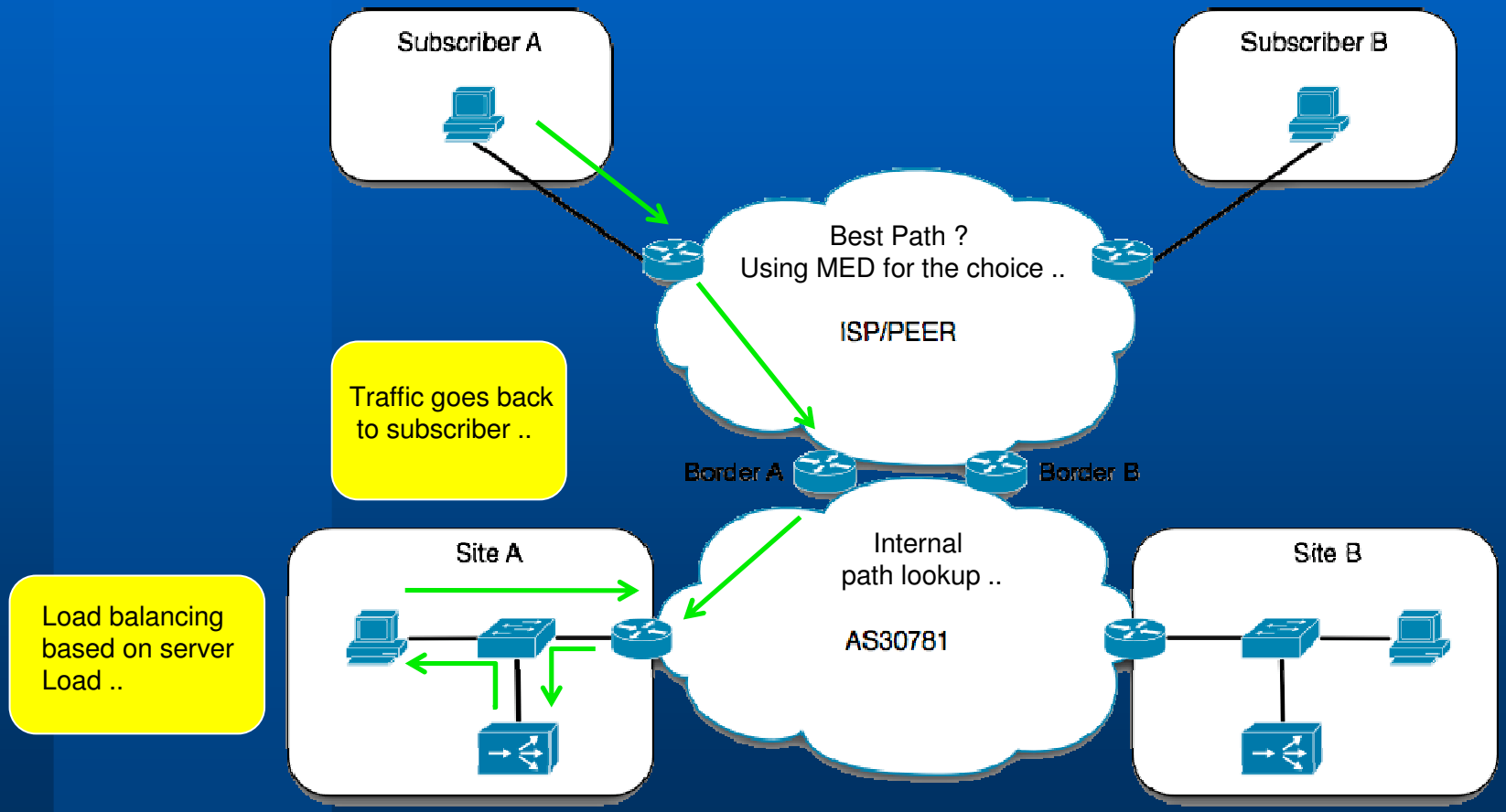
# Introduction

- ***How does Anycast work from a system point of view ?***
  - ***Multiple nodes are configured to accept traffic on single IP address***
  - ***One node receives each packet***
  - ***The node that receives the packet is determined by unicast routing & load balancing algorithm***

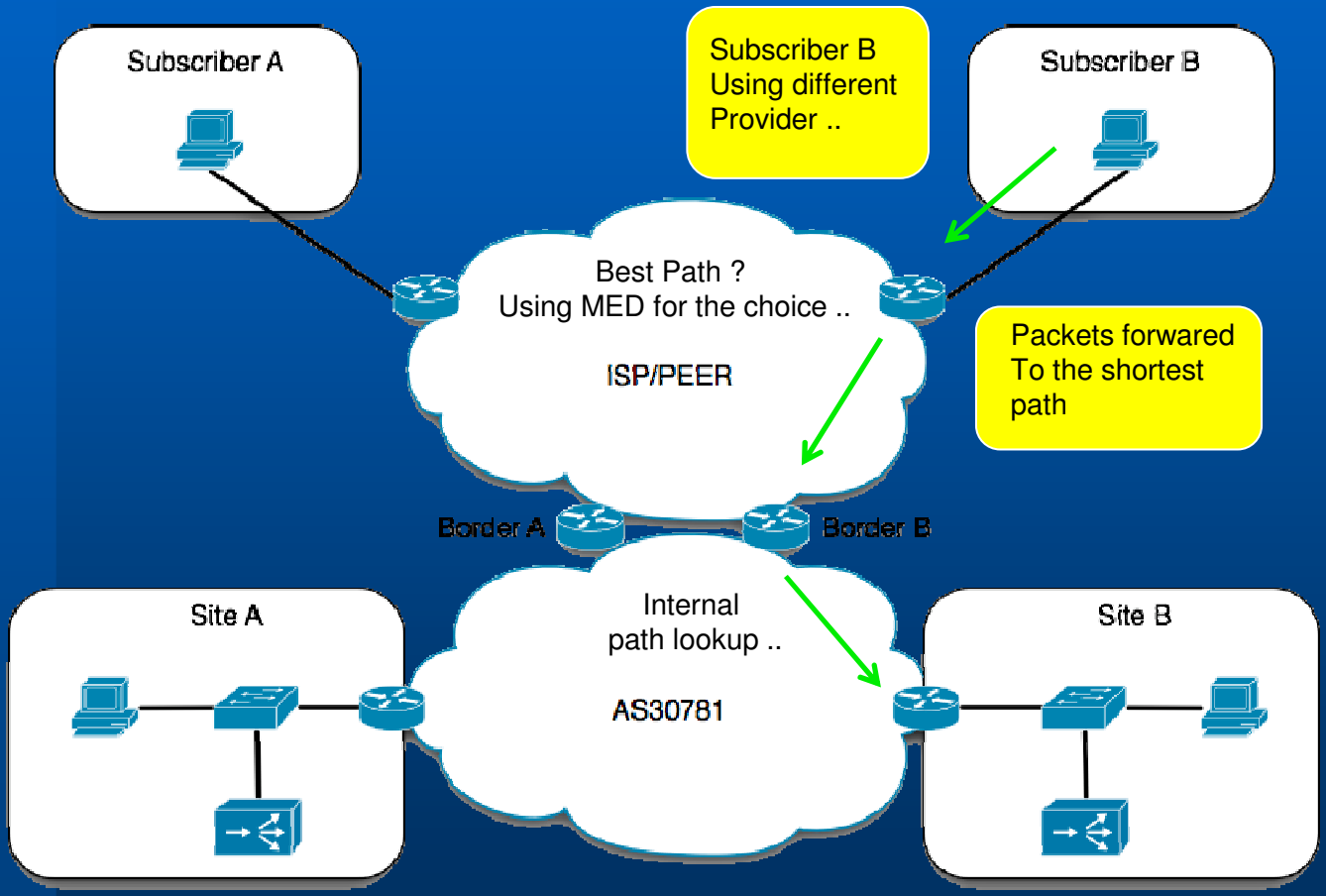
# Introduction

- ***Why Anycast ?***
  - ***Services Load balancing***
  - ***System reliability***
  - ***Low latency***
  - ***Best path selection***
  - ***Transparency for end users***

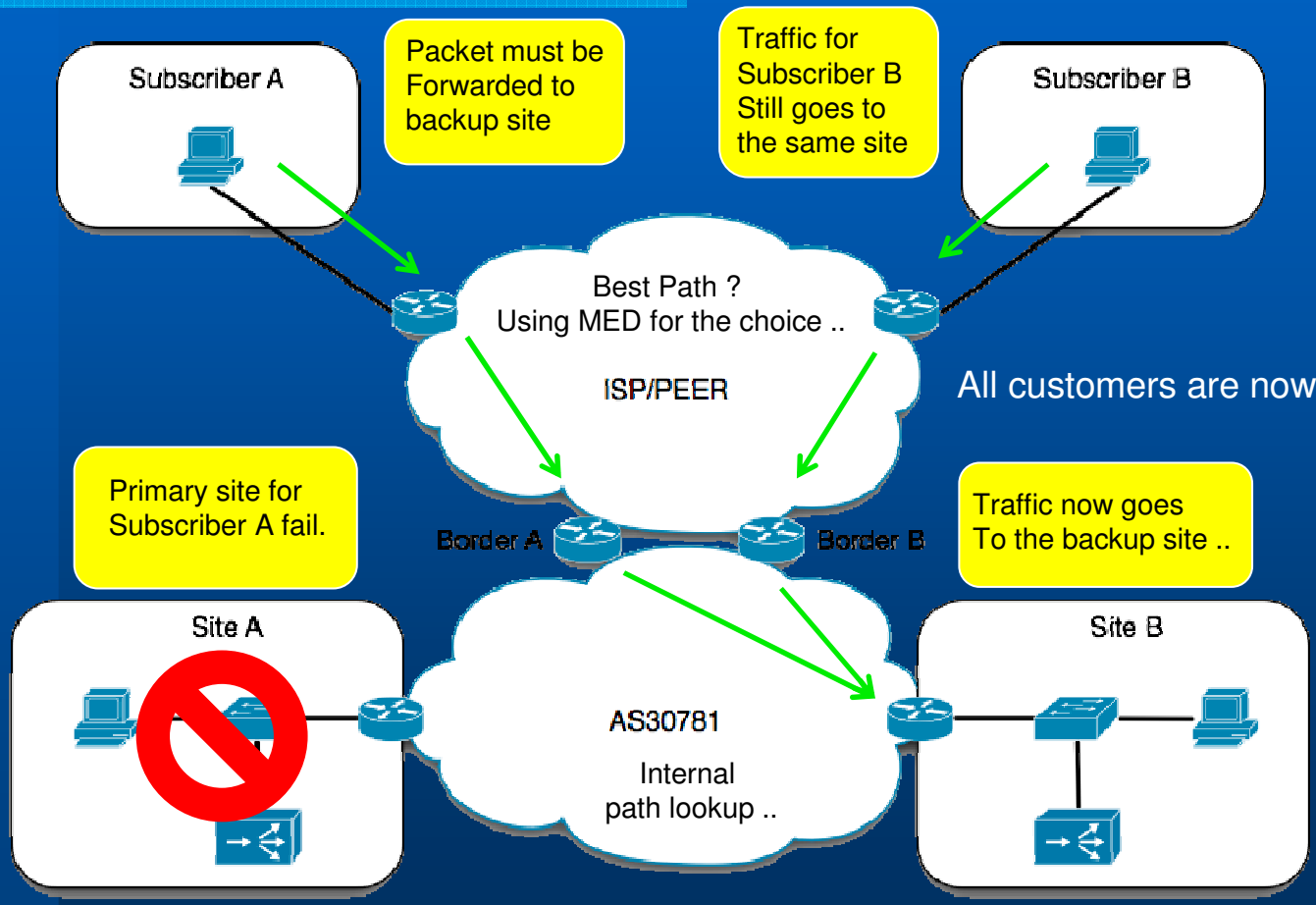
# Normal Behaviour ?



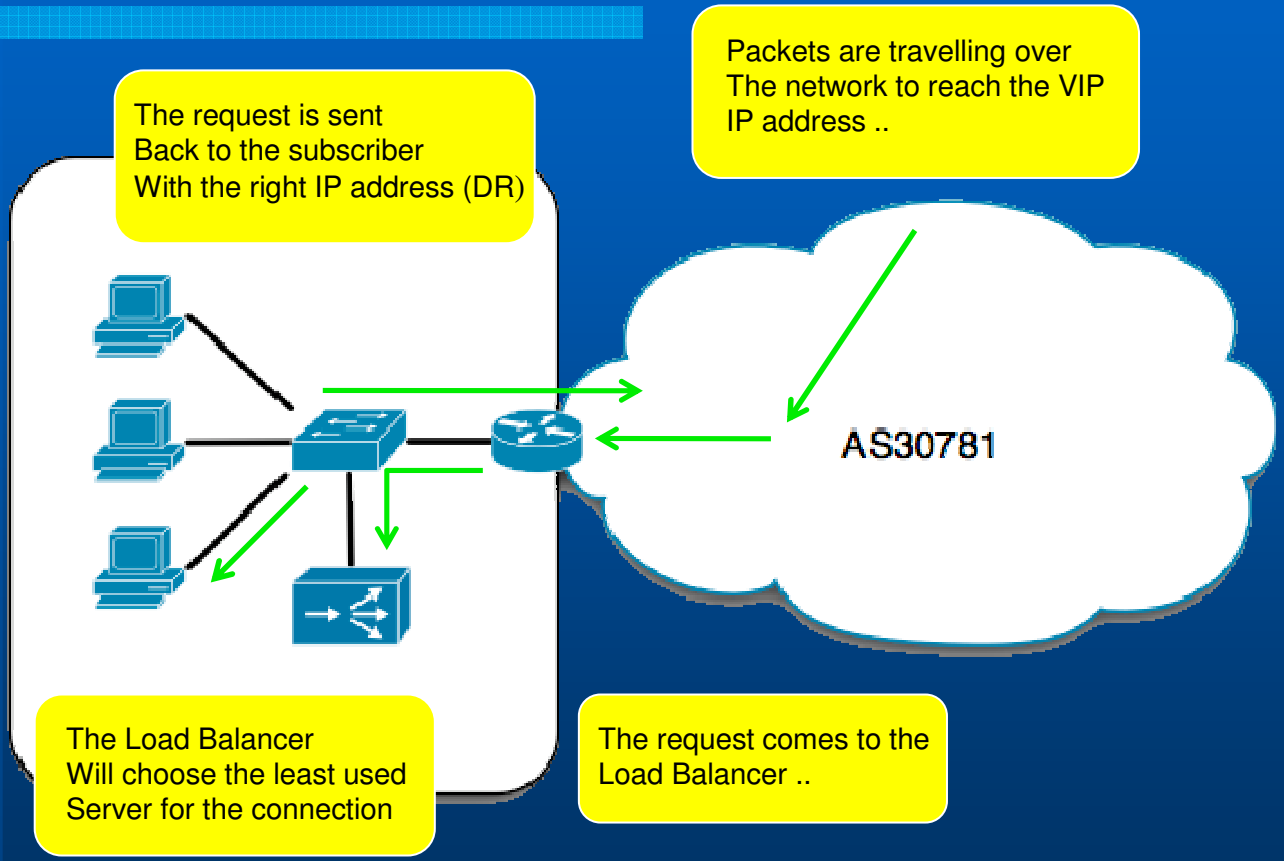
# But then ?


Subscriber A
Subscriber B
Subscriber B
Using different
Provider ..
Best Path ?
Using MED for the choice ..
ISP/PEER
Packets forwared
To the shortest
path
Border A
Border B
Site A
Internal
path lookup ..
AS30781
Site B

# And then failure ..



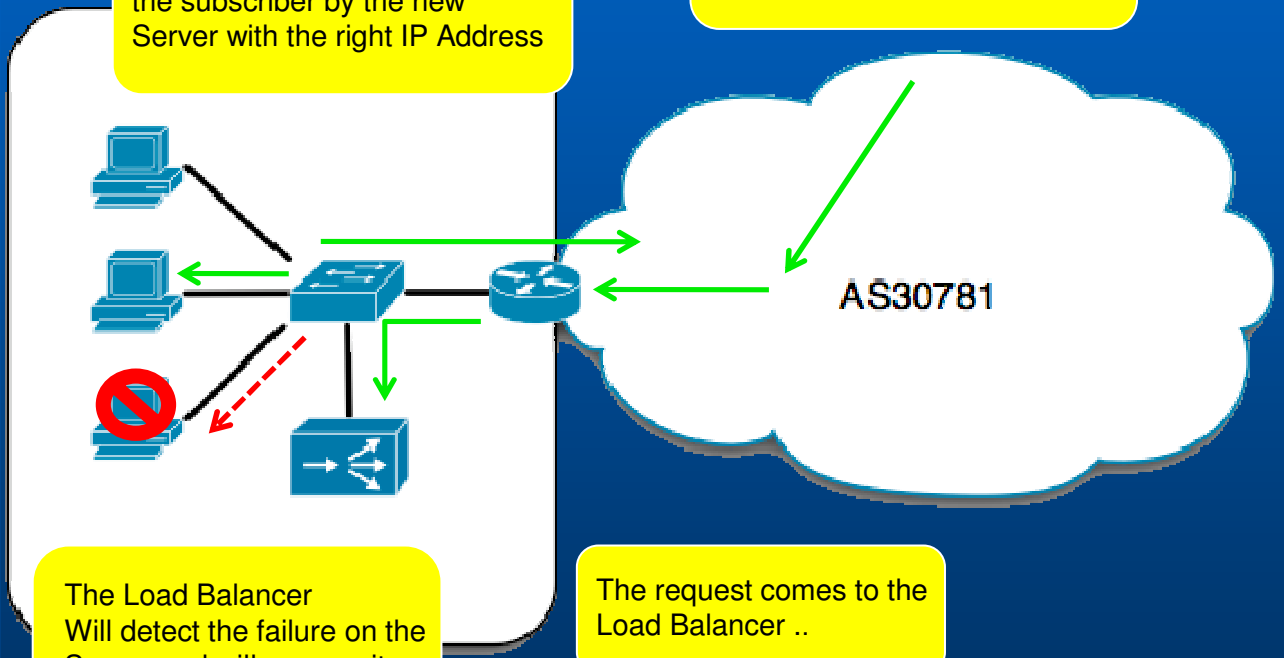
# Server redundancy ..



# Server Failure ...

Packets are travelling over
The network to reach the VIP
IP address ..

The request is then sent back to
the subscriber by the new
Server with the right IP Address

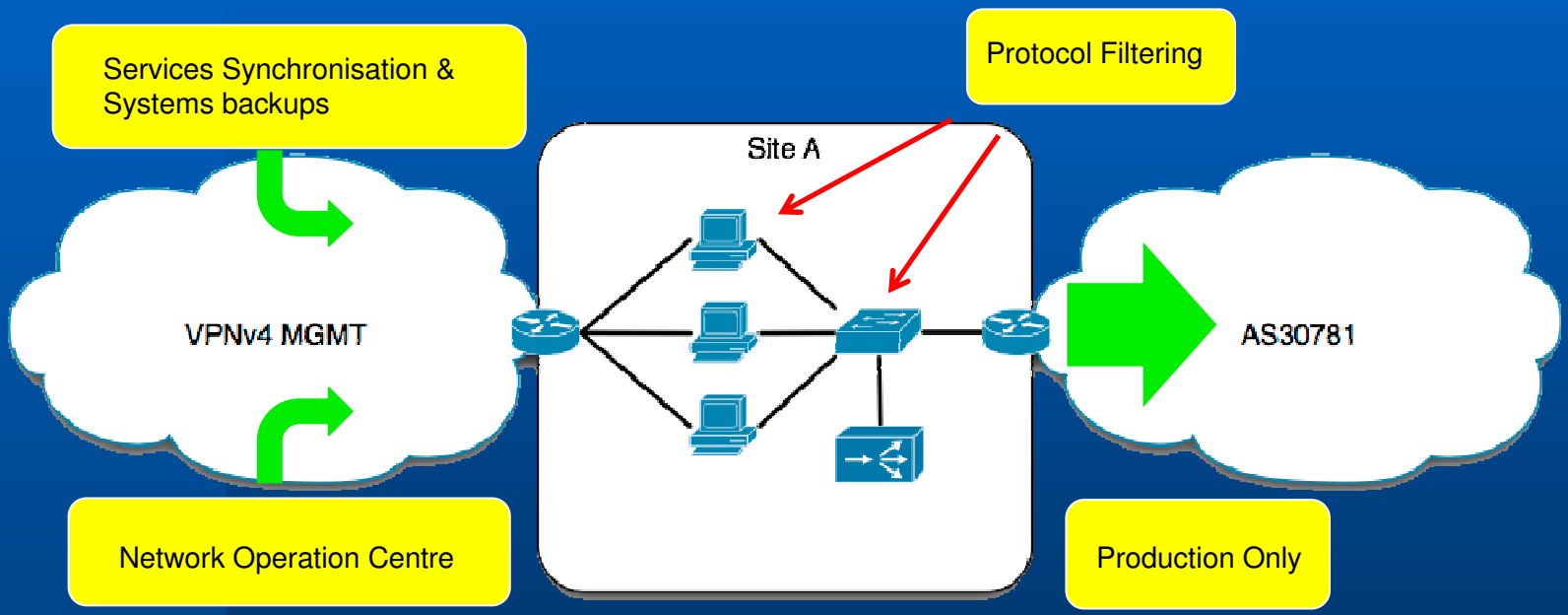



The request is then
Sent to the new server
In the pool

The Load Balancer
Will detect the failure on the
Server and will remove it
from the pool ..

The request comes to the
Load Balancer ..

# What about management ?



# Conclusion

- ***At the end anycast is ...***
  - ***... Quick, reliable, dependable***
  - ***... Necessity for any web based company that depends on web-site accessibility and uptime***
  - ***... Very efficient DDOS attack method, enables constant server availability and flawless performance of the servers while being attacked***
  - ***... Improves "cloud computing" based services (Software as a Service, GRID-utility modeling etc.)***

# *Questions ?*

**Thanks for listening !**

**Any Questions / Comments ?**

# Related Documents

- ***Related documents (IPv4)***
  - ***Concept discussed in RFC1546***
  - ***Evolution of  unicast documented in RFC2101***
  - ***Anycast DNS documented in RFC2181***
  - ***Anycast authoritative name service documented in RFC3258***
  - ***Anycast multicast RP documented in RFC3346***

# Related Documents

- ***Related documents (IPv6)***
  - ***Anycast Architecture RFC3513 was RFC1884***
  - ***Reserved IPv6 Anycast addresses RFC2526***
  - ***Anycast IPv4 prefix for 6to4 gateway RFC3068***
  - ***Source address selection RFC3484***
  - ***IPv6 Anycast DHCP services RFC3315***