

iNNOVO Cloud

iNNOVO
CLOUD

Red

Blue

Magenta

White

Yellow

Green

Can You Read this?

Can You Read this?

Can You Read this?

Can You Read this?

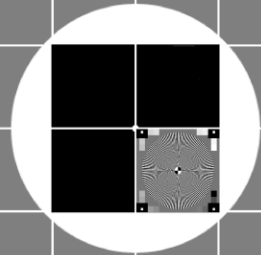
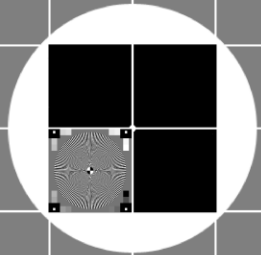
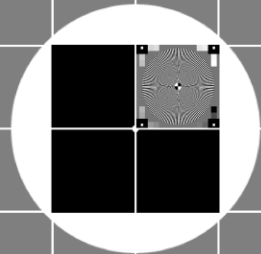
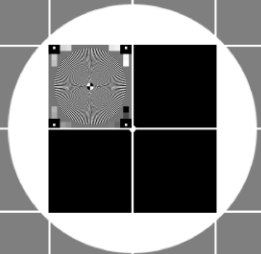
Can You Read this?

-All colors
visible?

-All circles
round?

-All edges
visible?

Beamer Testpicture 16:9





192.168.178.1/24



192.168.178.42/24
GW: 192.168.178.1

...

The Internet

The Datacenter™



10.23.0.1/24

10.23.0.46/24

10.23.0.45/24

10.23.0.44/24

10.23.0.43/24

10.23.0.42/24

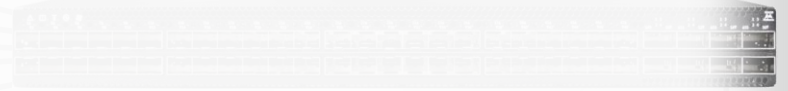
GW: 10.23.0.1

...

The Internet

Datacenter FeaturesRisks

- Portchannels/-aggregation
- VLANs
- Spanning-Tree
- QoS



10.23.0.1/24

The Internet

10.23.0.46/24

10.23.0.45/24

10.23.0.44/24

10.23.0.43/24

10.23.0.42/24

GW: 10.23.0.1

...

The Datacenter™

10.23.0.46/24

10.23.0.45/24

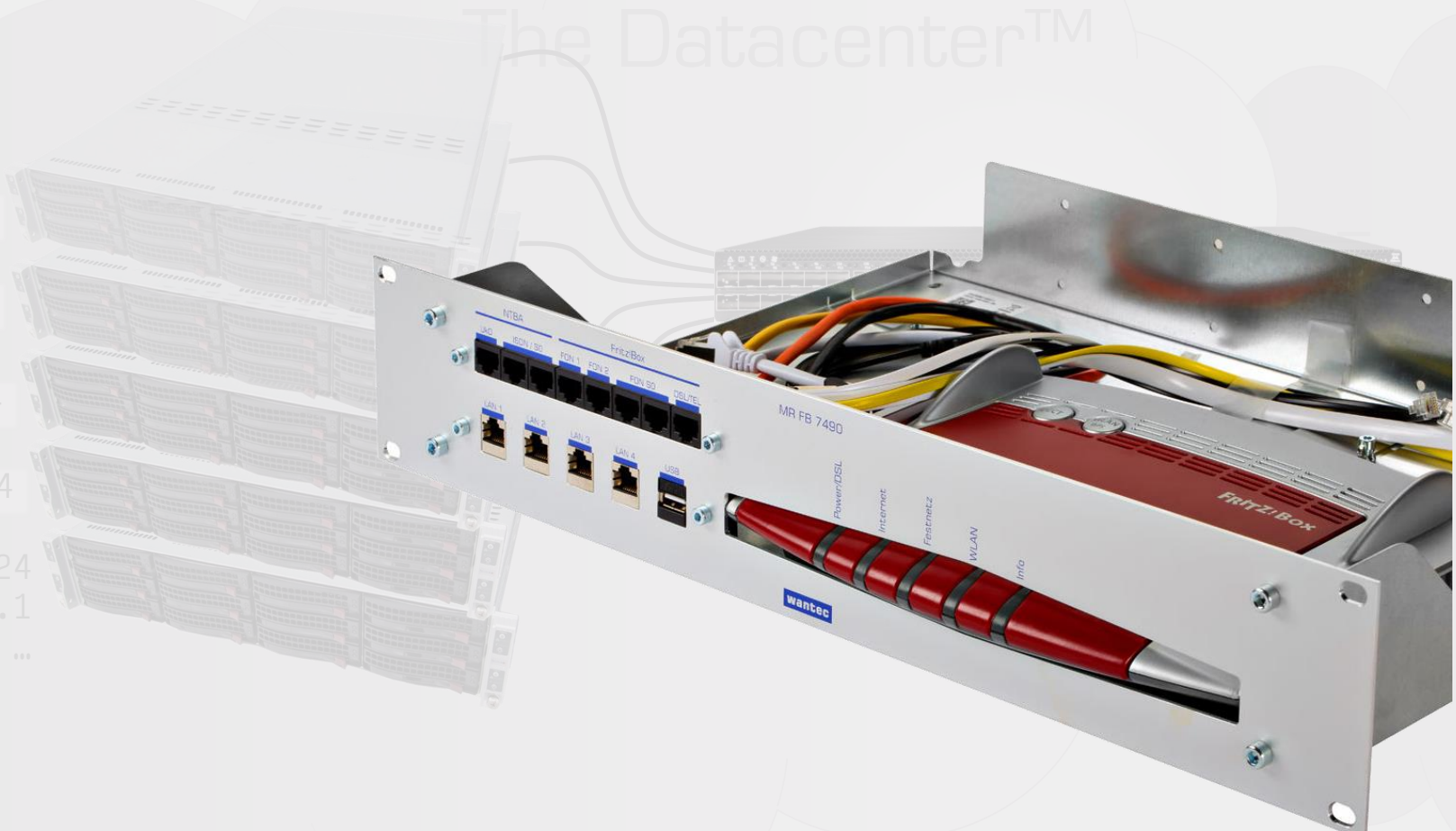
10.23.0.44/24

10.23.0.43/24

10.23.0.42/24

GW: 10.23.0.1

...



An aerial photograph of a city skyline, likely New York City, showing numerous skyscrapers and a dense urban landscape. A semi-transparent maroon rectangle is overlaid on the left side of the image, containing text.

Operating Openstack on an IP-Fabric

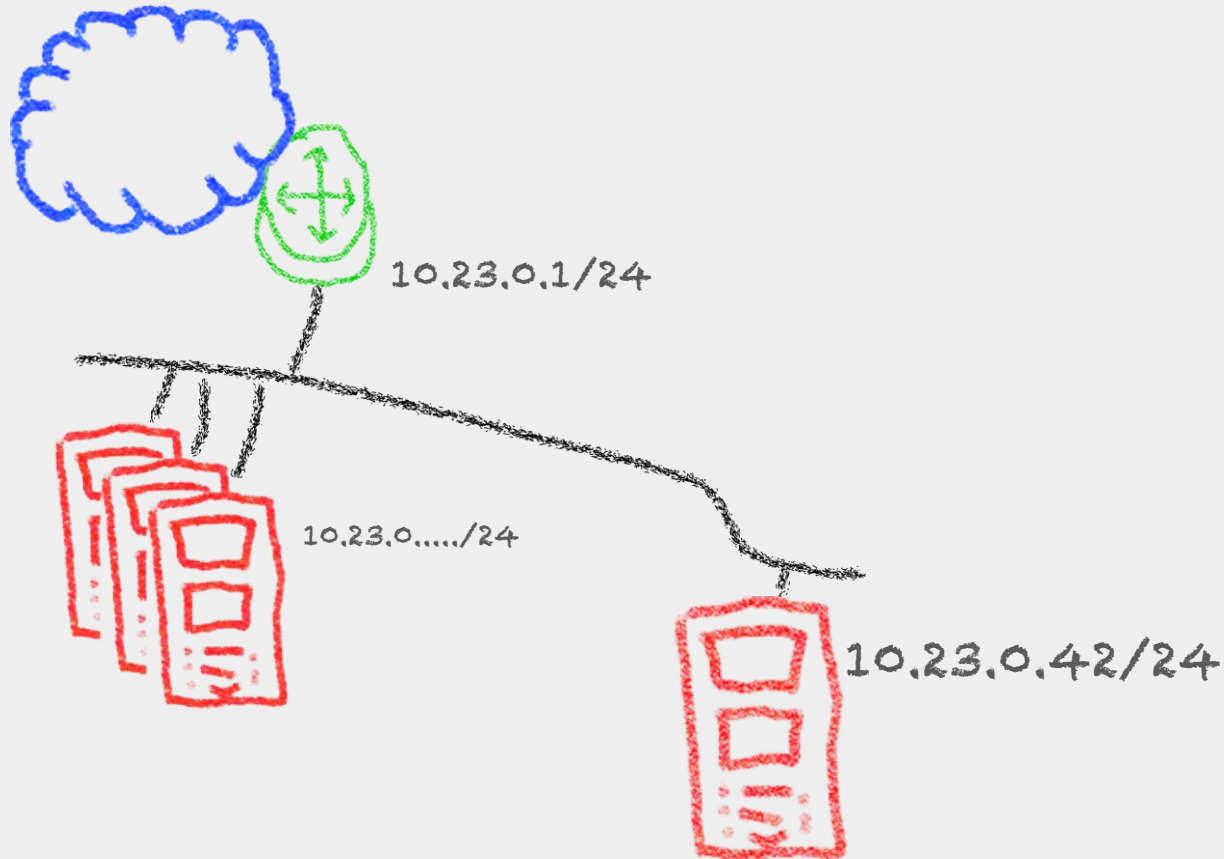
Jan.Walzer@innovo-cloud.de
twitter://@janwalzer

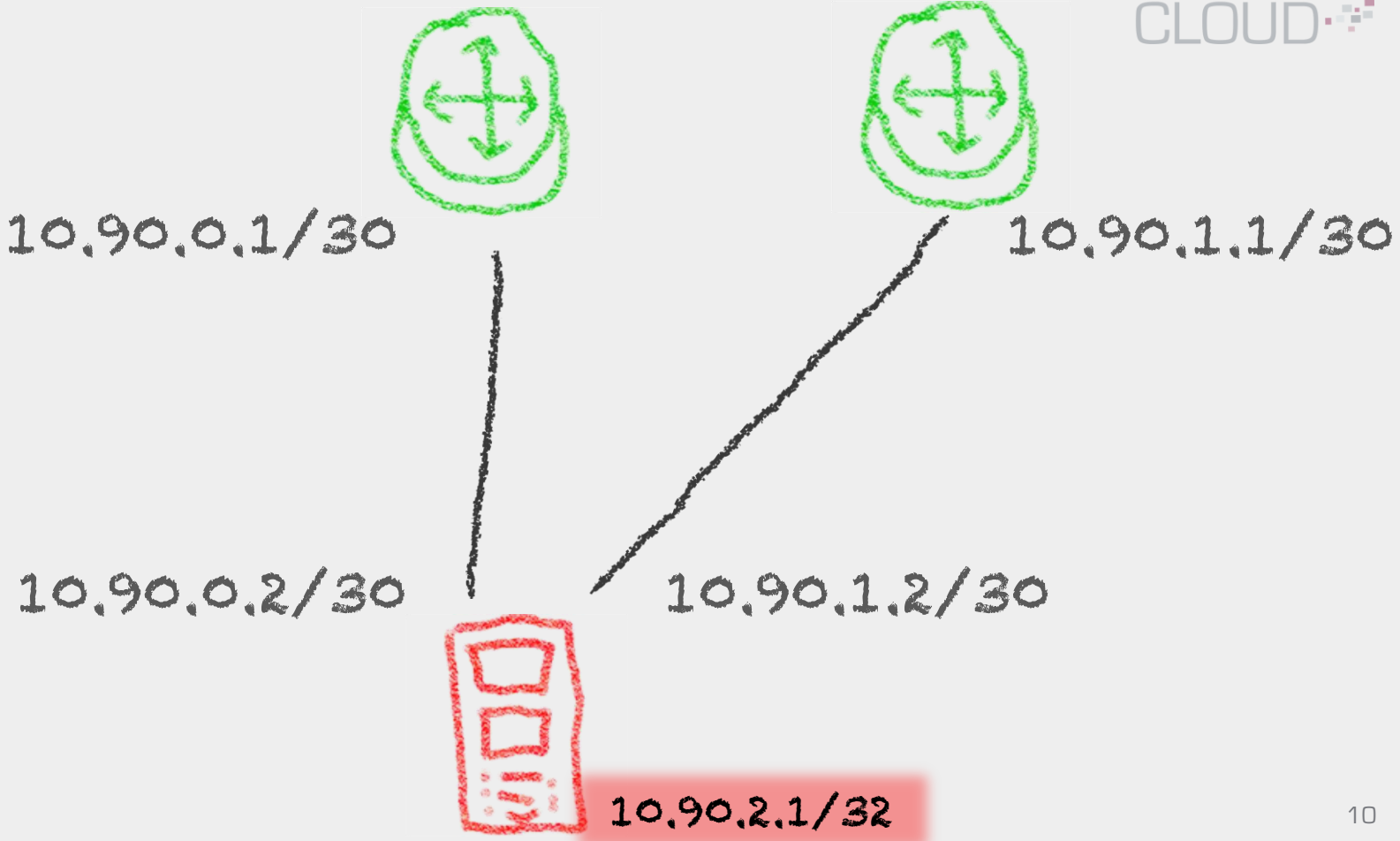
... a little Agenda

- What is an IP-Fabric
- Why
- Deployment
- Operations
- Cumulus

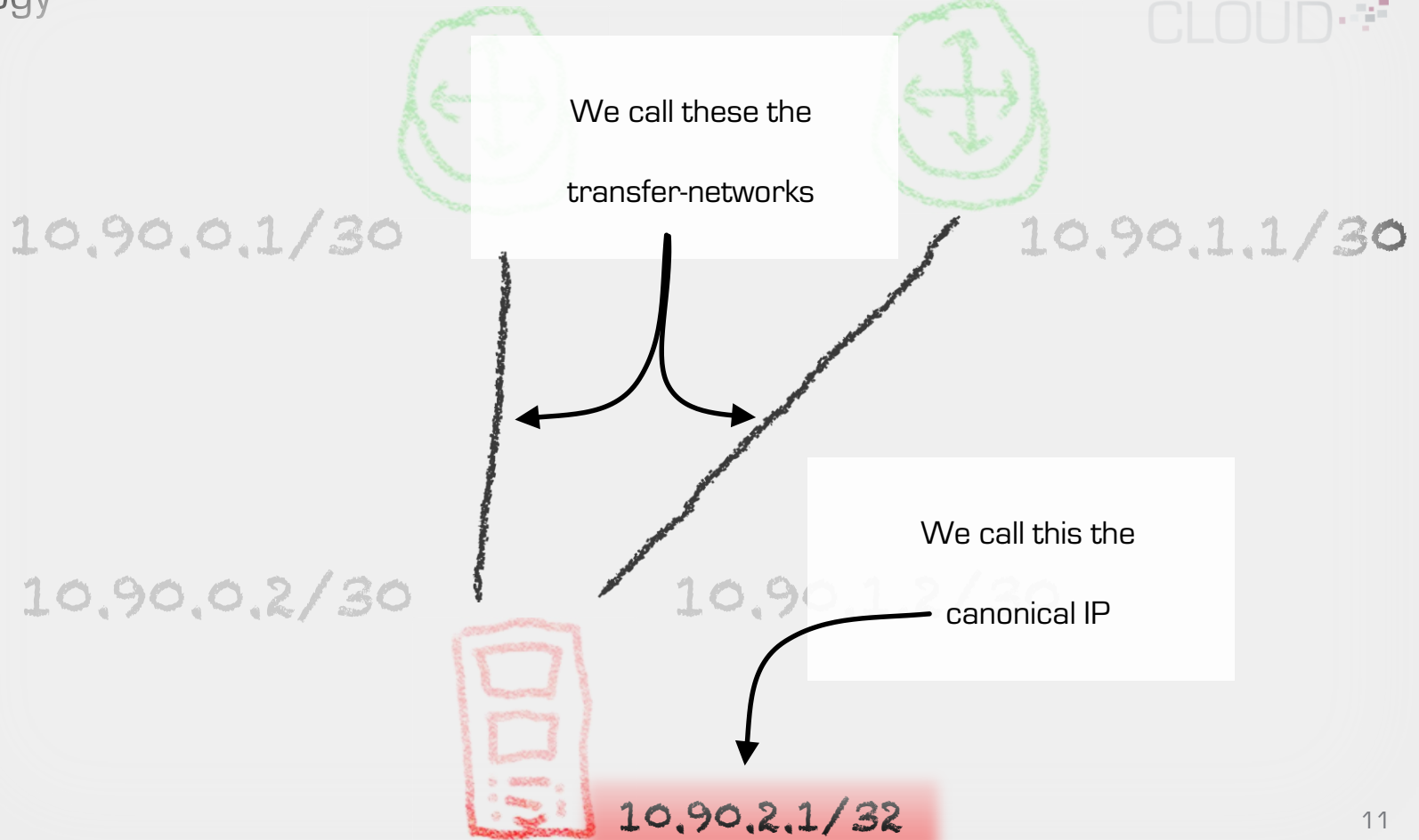


To Recap





Terminology



10.90.0.1/30

10.90.1.1/30

The IP-transfer networks
only allow 2 IPs to be used

There is NO default
Gateway

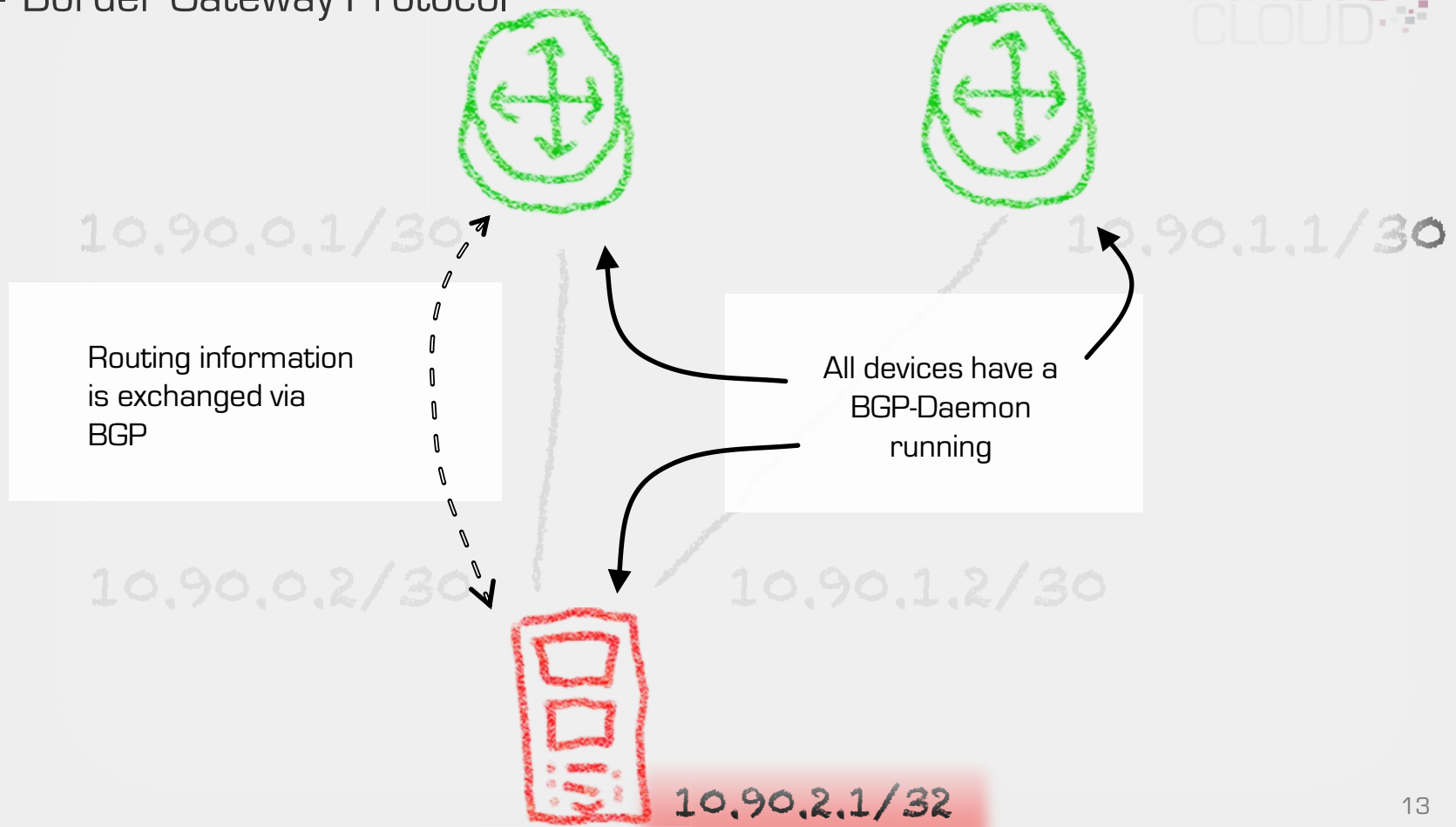
10.90.0.2/30

10.90.1.2/30



10.90.2.1/32

BGP – Border Gateway Protocol



BGP

iNNOVO.

```
...
10.90.2.1 via 10.90.0.2
...
```

```
...
10.90.2.1 via 10.90.1.2
...
```

10.90.0.1/30

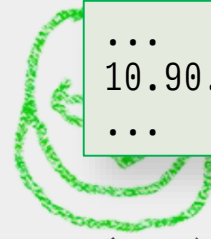
10.90.1.1/30

10.90.0.2/30

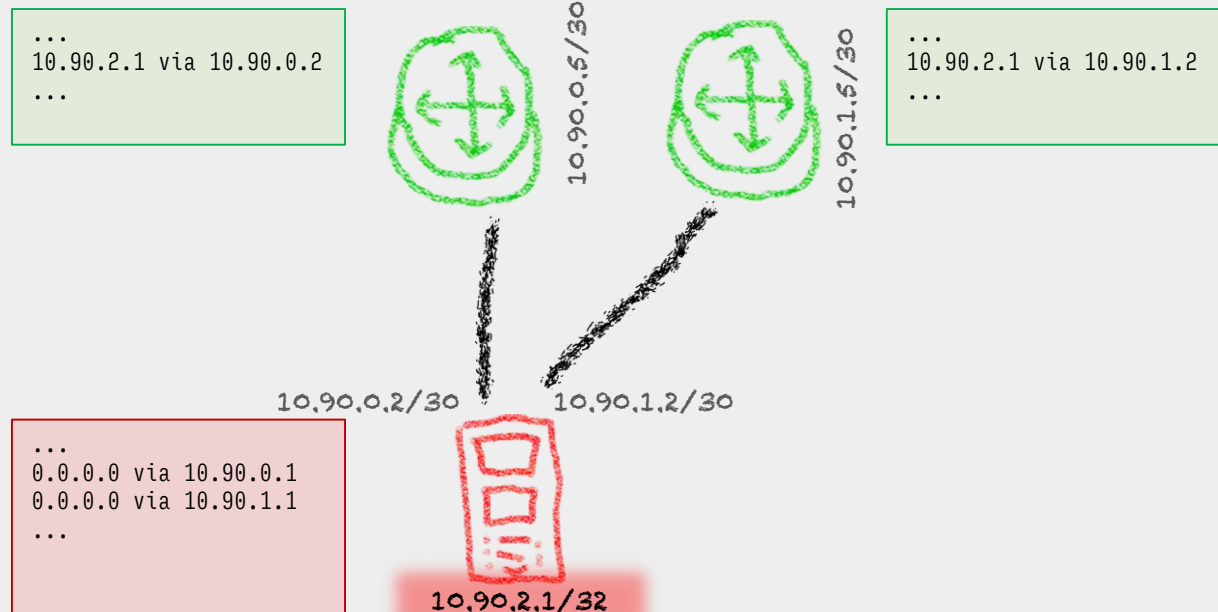
10.90.1.2/30

```
...
0.0.0.0 via 10.90.0.1
0.0.0.0 via 10.90.1.1
...
```

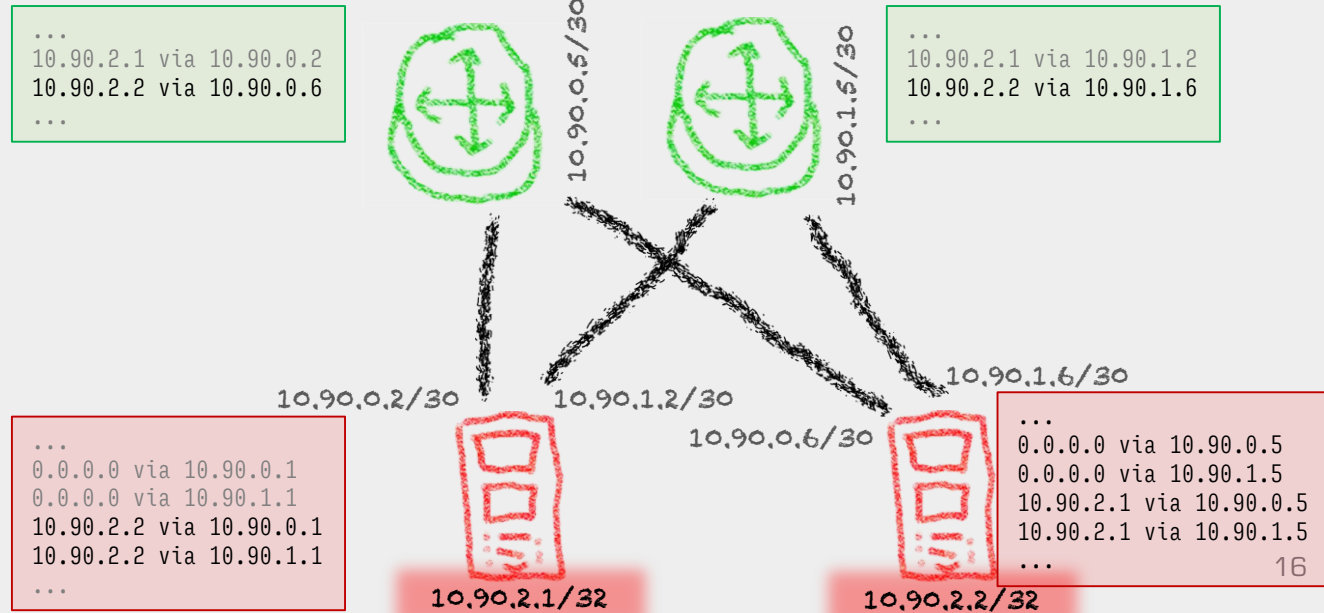
10.90.2.1/32

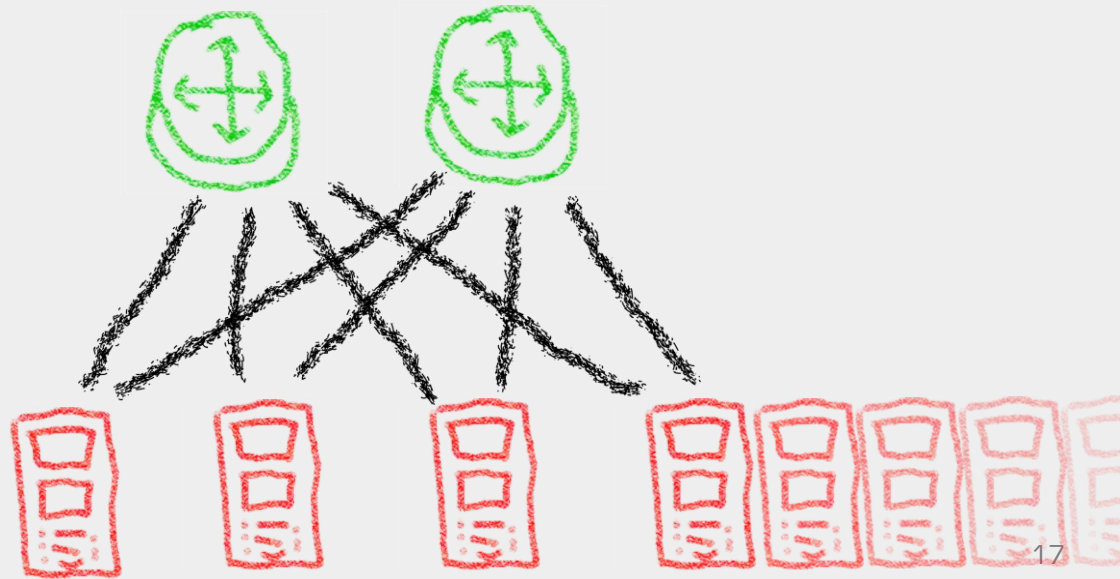


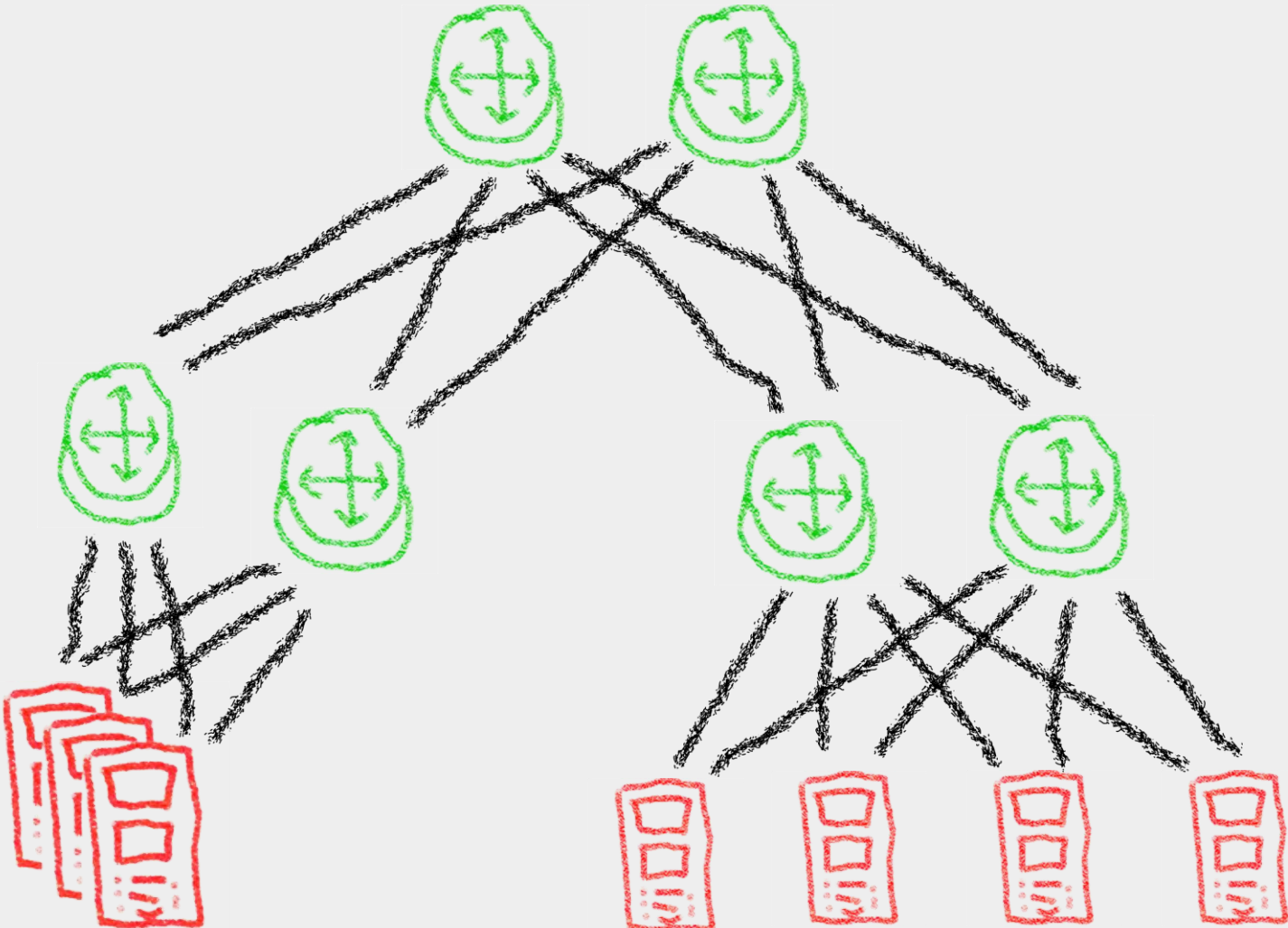
BGP

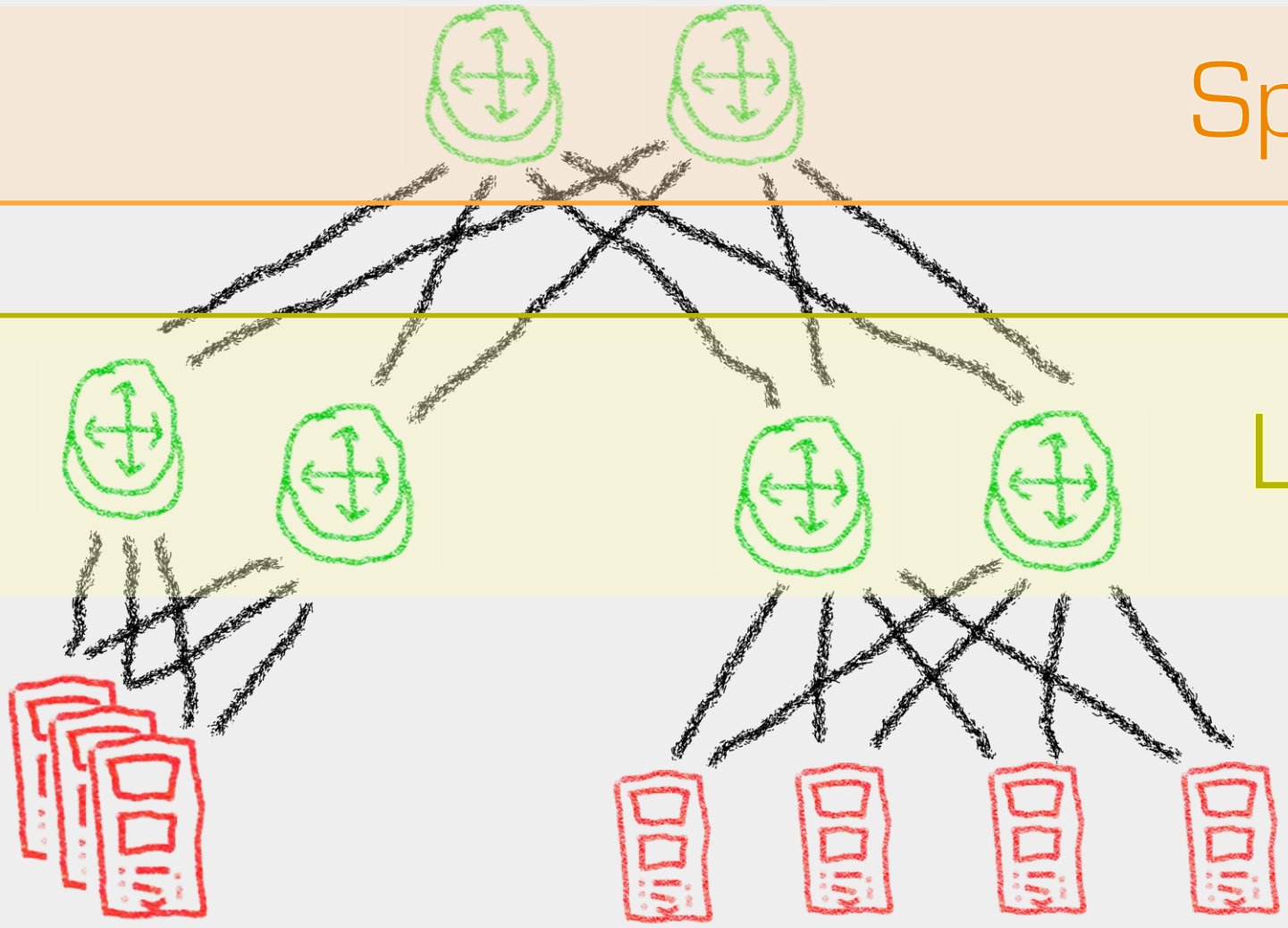


BGP









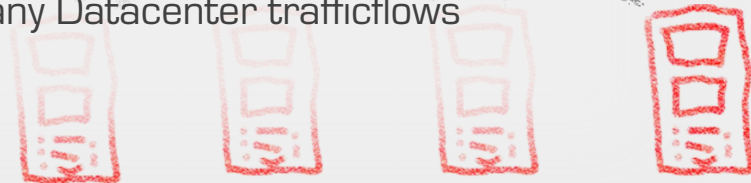
Leaf

Spine

- Consistent performance, subscription and latency between all racks

Leaf

- Consistent performance and latency with scale
- Architecture for any-to-any Datacenter trafficflows



Clos network

From Wikipedia, the free encyclopedia

In the field of computer science, a **Clos network** is a kind of multistage circuit switching network.

US patent 2244004 in 1939 and first described by Charles Clos in 1952,^[1] which represents a theoretical

practical multistage switching network. Multistage networks are required when switching needs to scale to

the largest feasible single switch.^[2] The key advantage of Clos networks is that the number of links

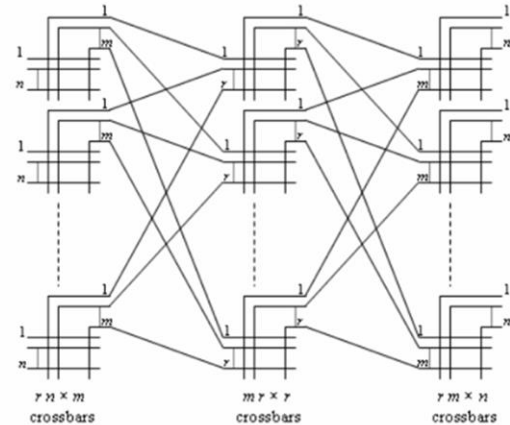
between adjacent stage crossbar switches can be chosen to be the same as the number of links between

adjacent stage crossbar switches.

Each ingress stage crossbar switch has m outputs, and there are n middle stage crossbar

switches for a particular new call if both the link connecting the ingress switch to the middle stage

switch and the middle stage switch to the egress switch, are free.



defined by three integers n , m , and r . n represents the number of sources which feed into each

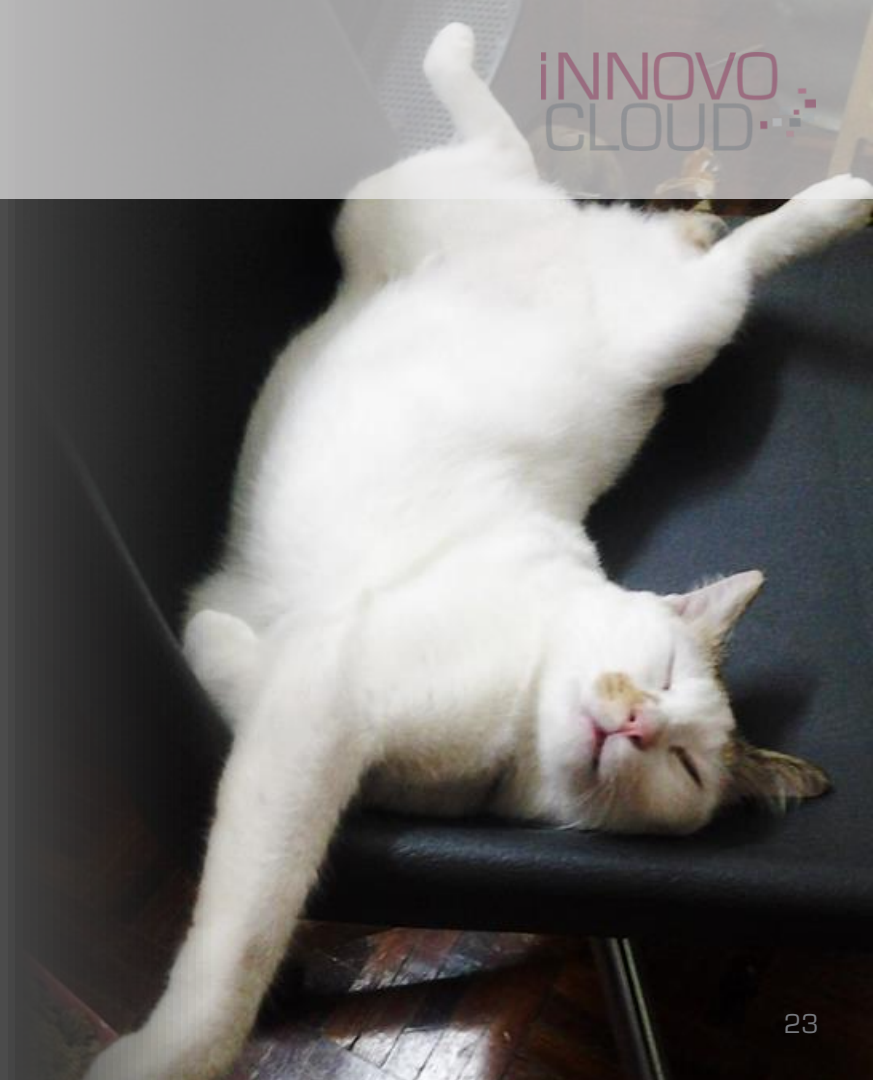
switch. Each ingress stage crossbar switch has m outputs, and there are n middle stage crossbar

switches for a particular new call if both the link connecting the ingress switch to the middle stage

switch and the middle stage switch to the egress switch, are free.

Why

- Operational Flexibility
- Redundancy & Resilience
- Scalability



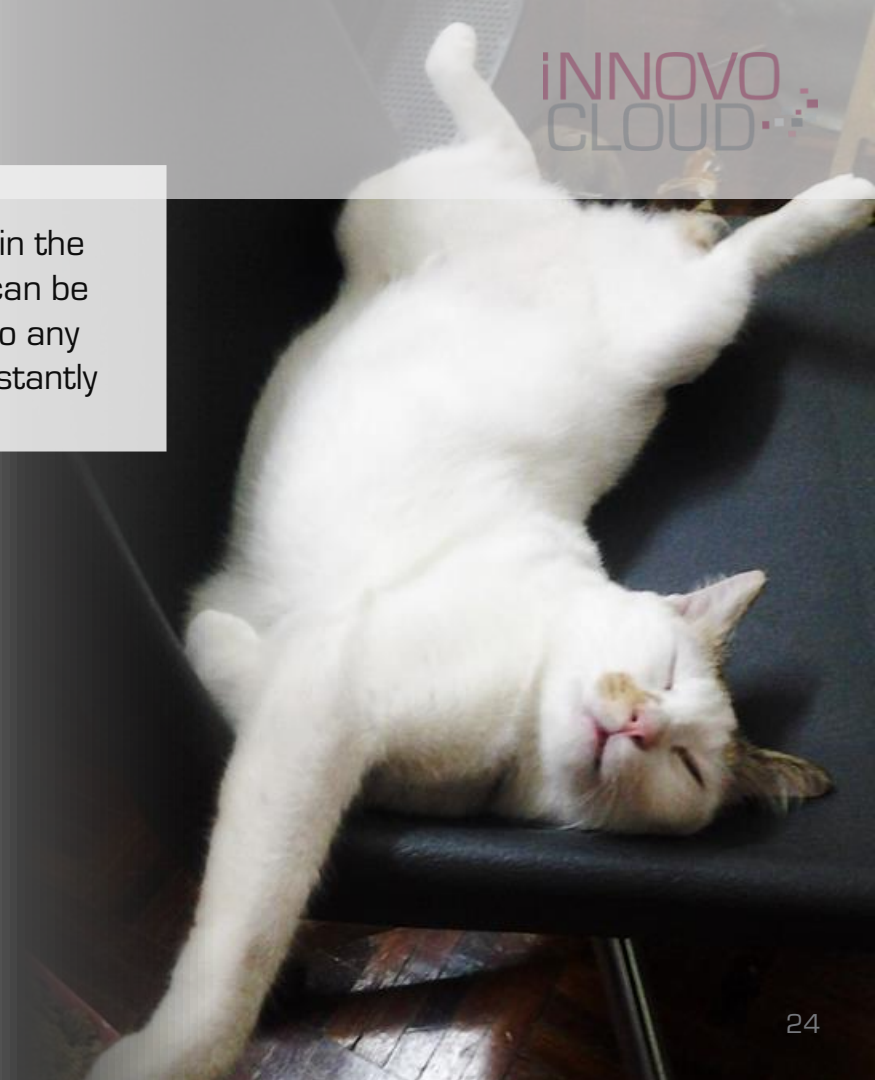
Why

- Operational Flexibility

Every IP in the Cluster can be moved to any Server instantly

- Redundancy & Resilience

- Scalability



Why

- Operational Flexibility

Every IP in the Cluster can be moved to any Server instantly

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Avoid Layer2 issues

L2 Fault Isolation

Multipathing

Anycast

- Scalability

Why

■ Operational Flexibility

Every IP in the Cluster can be moved to any Server instantly

■ Redundancy & Resilience

Avoid Layer2 issues

L2 Fault Isolation

Multipathing

Anycast

■ Scalability

The Design stays the same!

- Just add more links
- Just add more switches
- Just add more racks
- Just add more datacenters

Deployment

Tools

- IP Management:
Source of truth
- Infrastructure as
Code
 - Serverconfig
 - Switchconfig



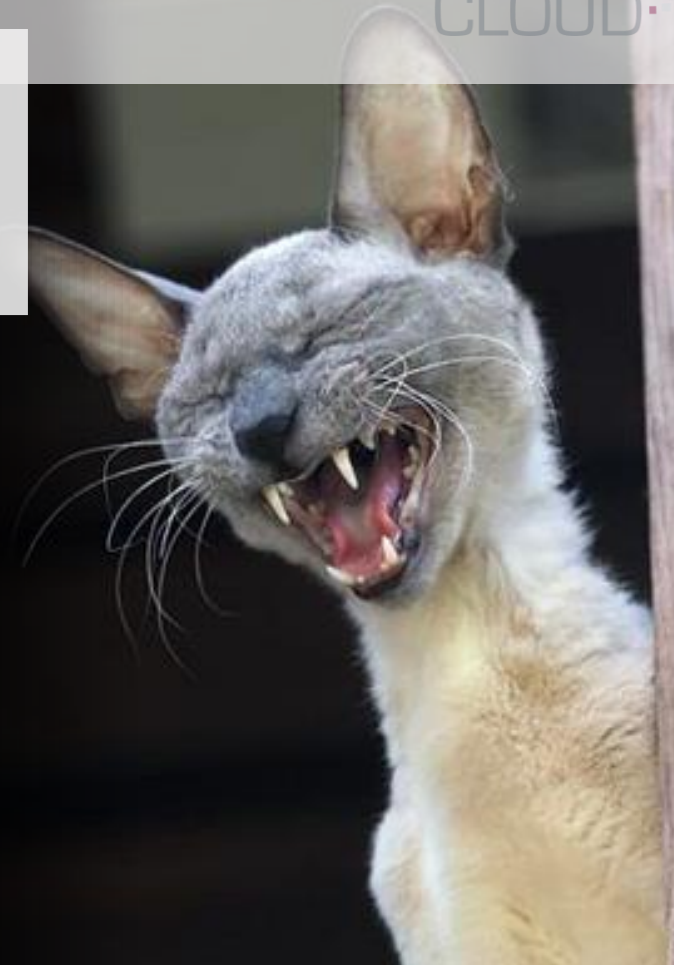
Deployment

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knows the truth ...



Deployment

Tools

- IP Management: Source of truth
- Infrastructure as Code
 - Serverconfig
 - Switchconfig



knows the truth ...

Ansible playbooks

Toolchain

Deployment

Tools

■ IP Management:
Source of truth



knows the truth ...

■ Infrastructure as
Code

■ Serverconfig

■ Switchconfig

There is no difference

- Switches running Cumulus Linux
- No operational difference
- Applying the same roles to all devices

Ansible playbooks

Toolchain

Operations – Everything is a metric

Metric based ...

- Monitoring
- Alerting
- Logging



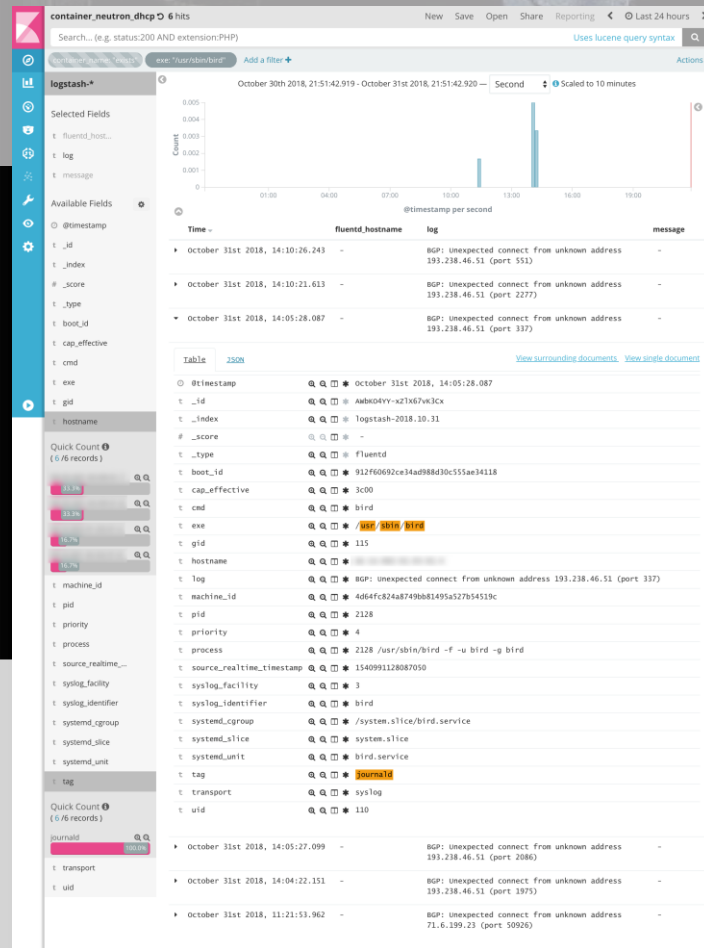
Operations – Everything is a metric

Metric based ...

■ Monitoring

■ Alerting

■ Logging



Operations – Everything is a metric

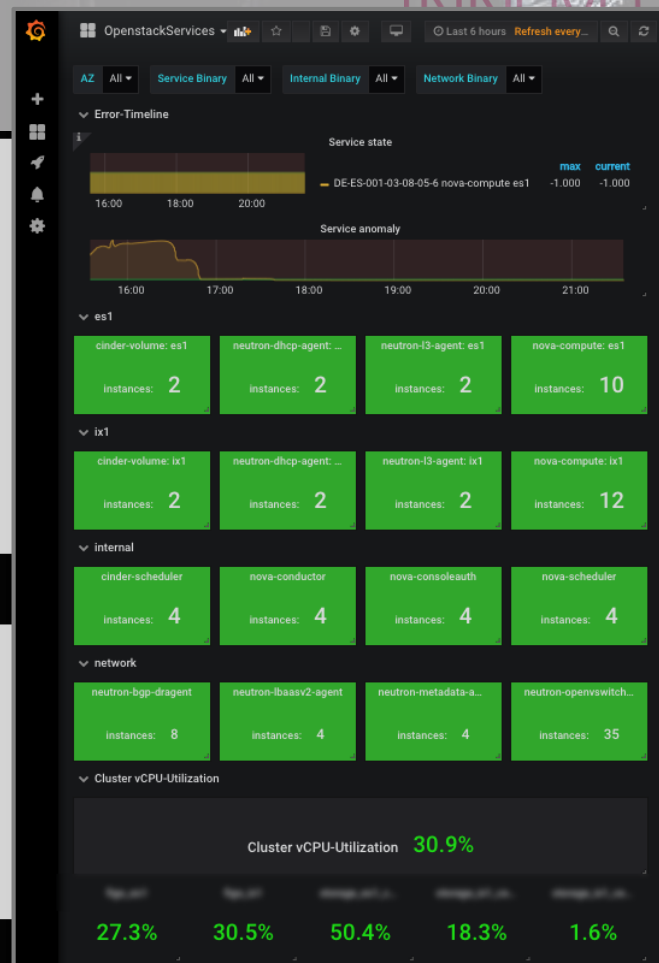
Metric based ...

■ Monitoring



■ Alerting

■ Logging



Operations – Everything is a metric

Metric based ...

■ Monitoring



■ Alerting

Prometheus
Alertmanager



■ Logging



„What makes
Cumulus Linux
so special?“

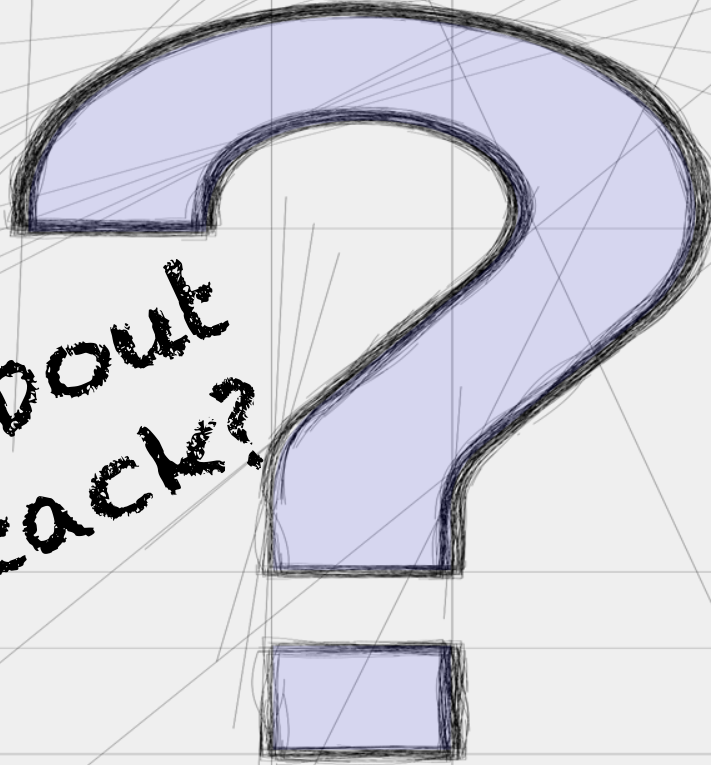
„What makes
Cumulus Linux
so special?“

- Just a normal Linux Server based on Debian Linux
- with lots of network interfaces
- deployment and configuration
- Troubleshooting: regular Linux environment
- Monitoring/Logging: Prometheus/Elastic

„What makes
Cumulus Linux
so special?“

The special thing is:
Our routers are nothing special anymore!

What about
Openstack?



The background of the slide is an aerial photograph of a city, likely New York City, showing a dense urban landscape with numerous skyscrapers and buildings. A semi-transparent maroon rectangle is overlaid on the left side of the image, containing the company name and contact information.

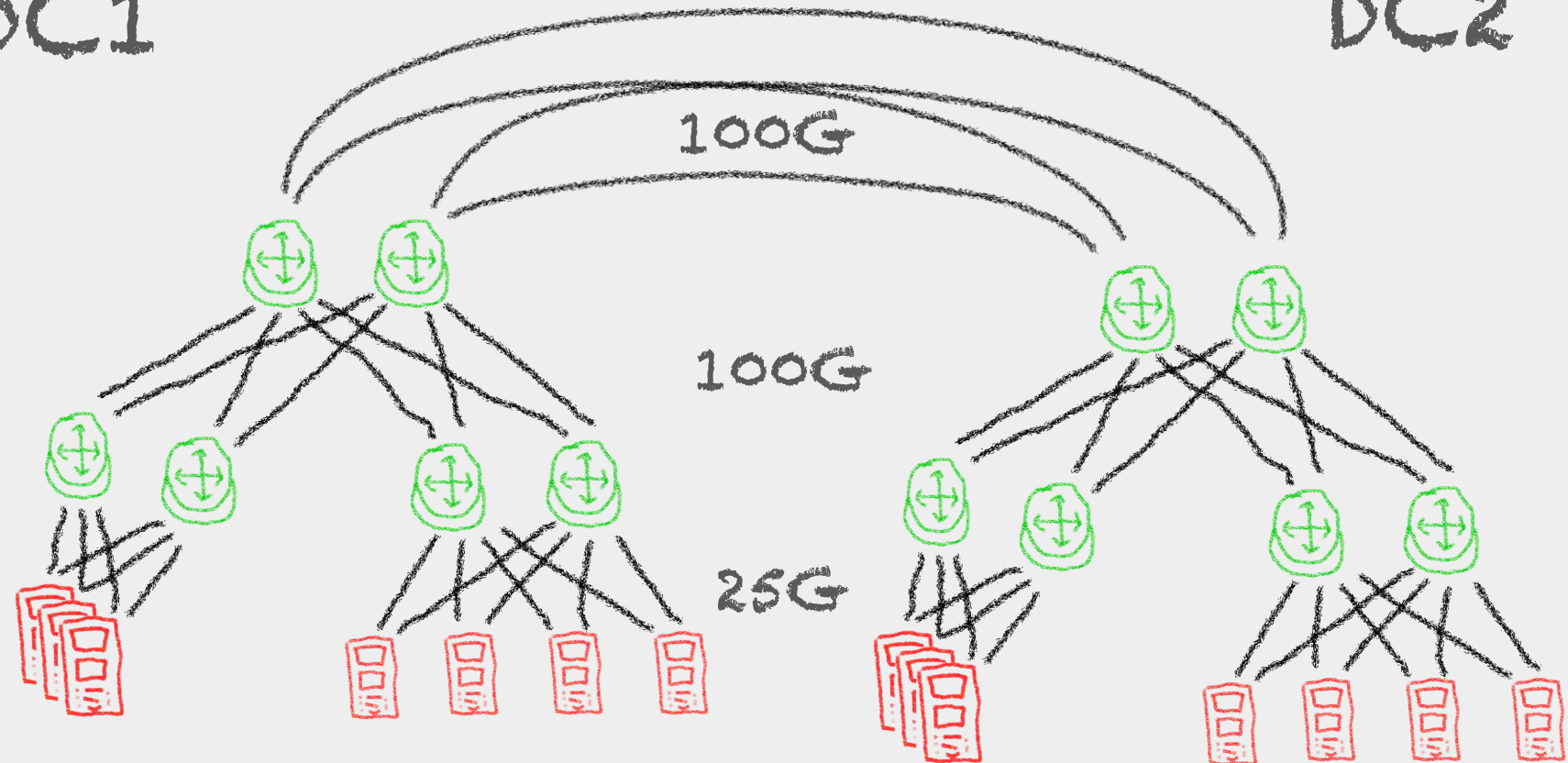
iNNOVO Cloud

We are hiring: jobs@innovo-cloud.de

Backup Slides

DC1

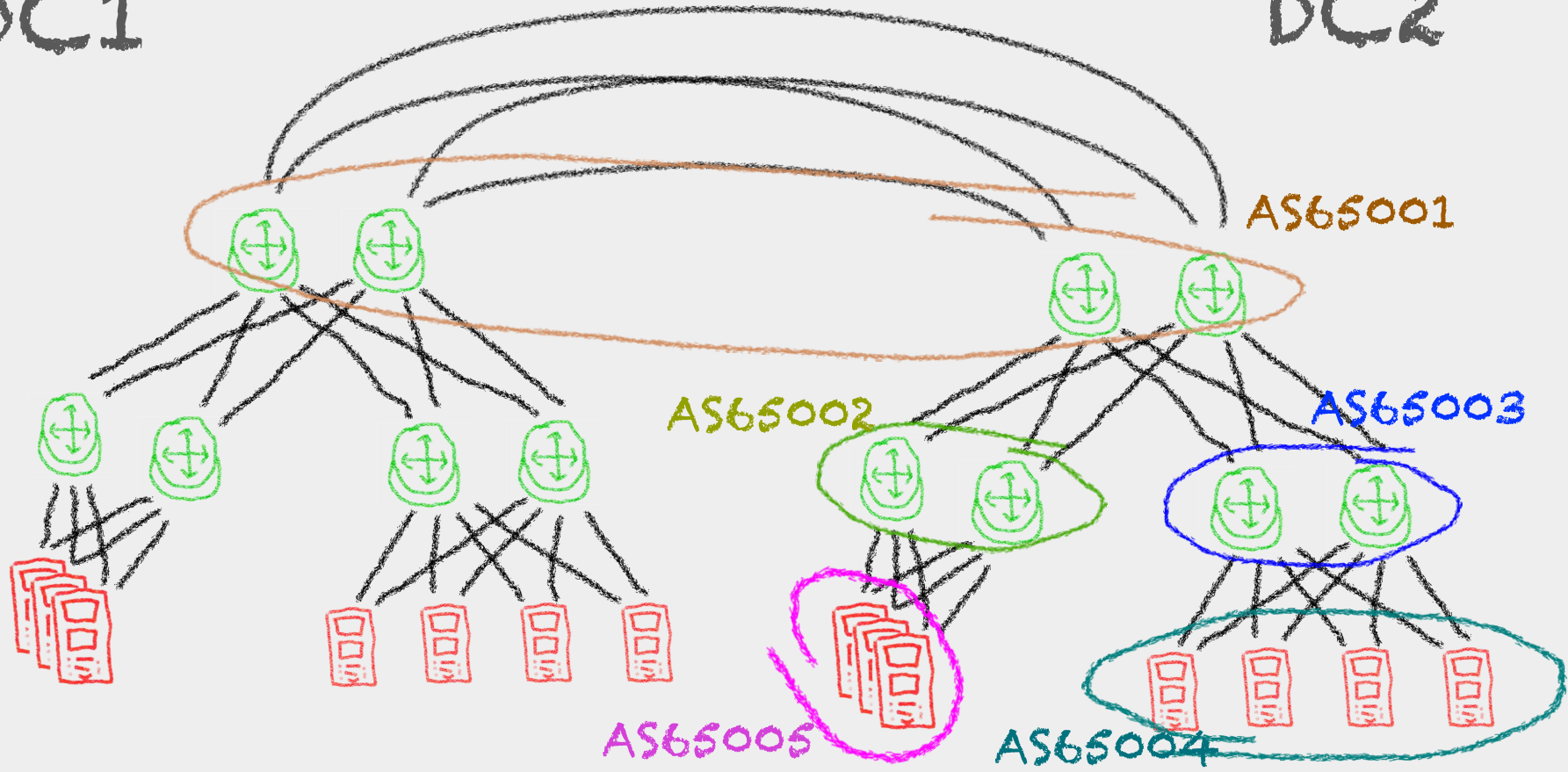
DC2



BGP AS-Numbering

DC1

DC2





Crayon-Icons are cool ...

<http://www.visguy.com/2008/08/11/crayon-network-shapes/>

