# Thesis
# Managed MPLS vs. IPSec VPN
Future Trends and Prospects?

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**30.10.2012**

**Audatex**
*a Solera company*

# Hypothesis

The author expects, that within the next 3 years, 75% of all intranet connections of Swiss companies, will be handled by IPSec VPNs via internet instead of managed MPLS.

# Argumentation 1/4

## Usage:

1. Usage and spread of Internet has dramatically increased

On average, about 86% of businesses with 10 or more persons employed in OECD countries had a broadband connection in 2010.

**1. Businesses with a broadband connection, 2010 or latest**
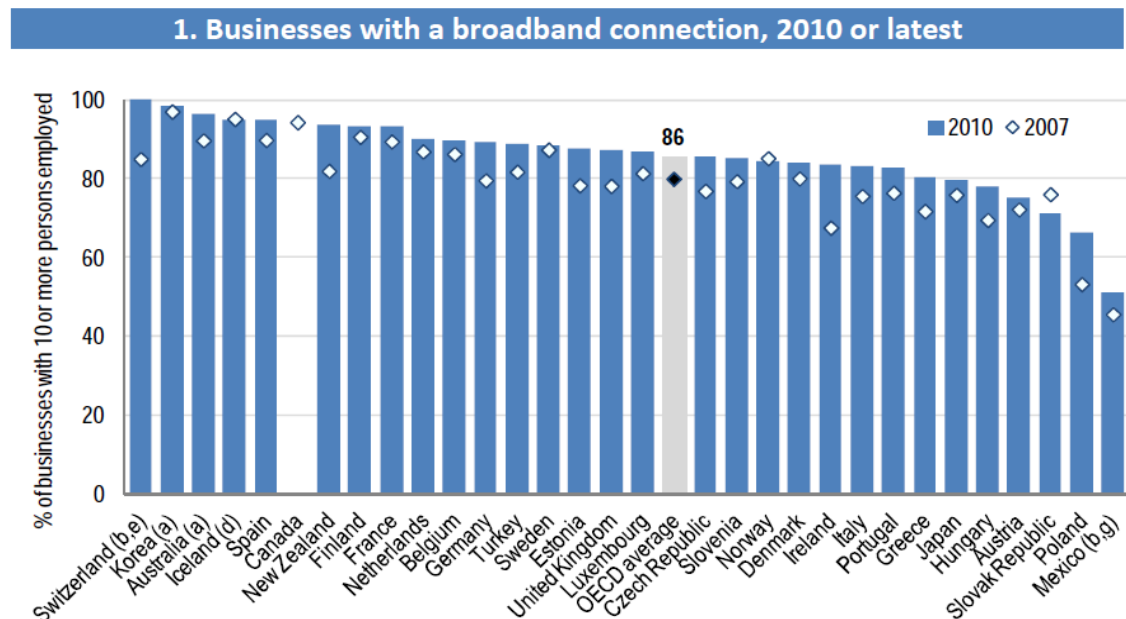


In Switzerland, Korea, Australia and Iceland, at least 95% of businesses have a broadband connection. This rate is over 90% in Spain, Canada, New Zealand Finland and France.

Source: OECD. (June 22nd 2012). *The Future of the Internet Economy*

# Argumentation 2/4

## Costs:

2. Cost are massively lower than with private line services such as MPLS

Preise MPLS Services pro Monat

| Standort | Preis / Mt. in CHF | Bandbreite in Mbit/s |
|---|---|---|
| CH-DC10 | CHF 3'000.00 | 20 |
| CH-DC20 | CHF 1'600.00 | 10 |
| DE-ZOM0 | CHF 2'550.00 | 6 |
| DE-MUC0 | CHF 1'250.00 | 2 |
| DE-DBL0 | CHF 1'100.00 | 2 |
| FR-PAR0 | CHF 1'900.00 | 4 |
| PT-LIS0 | CHF 1'800.00 | 2 |
| ES-MAD0 | CHF 1'100.00 | 2 |
| ES-DC10 | CHF 2'300.00 | 10 |
| UK-DC20 | CHF 1'000.00 | 20 |
| UK-DC10 | CHF 1'000.00 | 20 |
| US-DC10 | CHF 3'000.00 | 10 |
| AT-VIE0 | CHF 1'100.00 | 2 |
| NL-ZYO0 | CHF 1'000.00 | 2 |
| **Durchschnitt** | **CHF 1'692.86** | **8.00** |
| **Total / Mt.** | **CHF 23'700.00** | **112** |
| **Preis pro Mbit/s** | | **CHF 211.61** |

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Preise Internet Services pro Monat

| Standort | Preis / Mt. in CHF | Bandbreite in Mbit/s |
|---|---|---|
| CH-DC10-1 | CHF 3'200.00 | 400 |
| CH-DC10-2 | CHF 6'700.00 | 400 |
| CH-DC10-3 | CHF 1'800.00 | 100 |
| CH-DC20 | CHF 2'600.00 | 400 |
| CH-ZRH0 | CHF 1'200.00 | 20 |
| CH-WLN0 | CHF 1'080.00 | 40 |
| DE-ZOM0 | CHF 2'600.00 | 60 |
| DE-MUC | CHF 750.00 | 20 |
| UK-DC10 | CHF 4'000.00 | 400 |
| UK-DC20 | CHF 3'500.00 | 200 |
| US-DC10 | CHF 6'000.00 | 800 |
| Infrastructure depr. 3y | CHF 2'777.78 | |
| Staff (1FTE) | CHF 13'333.33 | |
| **Durchschnitt** | **CHF 3'810.85** | **258.18** |
| **Total / Mt.** | **CHF 49'541.11** | **2840** |
| **Preis pro Mbit/s** | | **CHF 17.44** |

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# Argumentation 3/4

## Experiences

3. Audatex made good experiences with self administered IPSec VPNs

### WAN Report Managed Sites (unmanaged sites not reported)

04.11.2011 00:00 - 04.11.2012 21:00 Europe, past 12 Months

**MPLS Attached Sites**

| | |
|---|---|
| Vienna | 99.939% |
| Zürich CHDC1 | 99.993% |
| Zürich CHDC2 | 99.919% |
| Munich | 99.365% |
| Minden | 99.915% |
| Madrid | 99.811% |
| Paris | 99.805% |
| Mumbai | 98.253% |
| Zeist | 99.068% |
| Lisboa | 99.959% |
| Harrogate UKDC1 | 99.835% |
| Reading UKDC2 | 99.782% |
| Ann Arbor USDC1 | 99.829% |
| **Average** | **99.652%** |

**IPSec VPN Attached Sites**

| | |
|---|---|
| Neuss | 99.973% |
| Klagenfurt | 99.782% |
| Staansstad | 99.928% |
| Prague | 99.829% |
| Döbeln | 99.926% |
| Budapest | 99.869% |
| Bucharest | 99.787% |
| Moscow | 99.841% |
| Bratislava | 99.927% |
| Kiev | 99.785% |
| | |
| | |
| | |
| **Average** | **99.865%** |

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# Argumentation 4/4
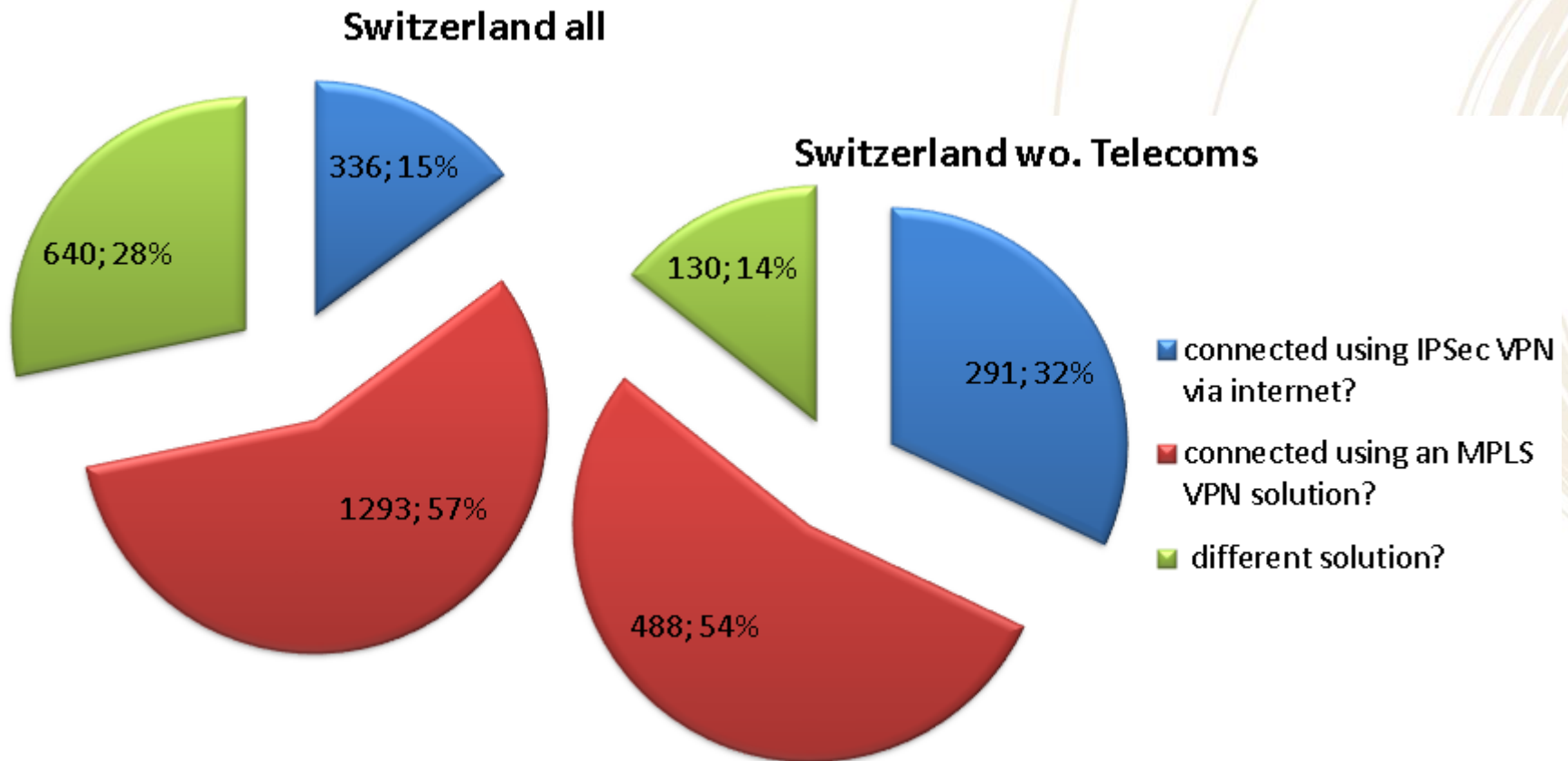
## Dependency

4. Many companies success is very dependent on the availability of corporate, partner and customer internet services:
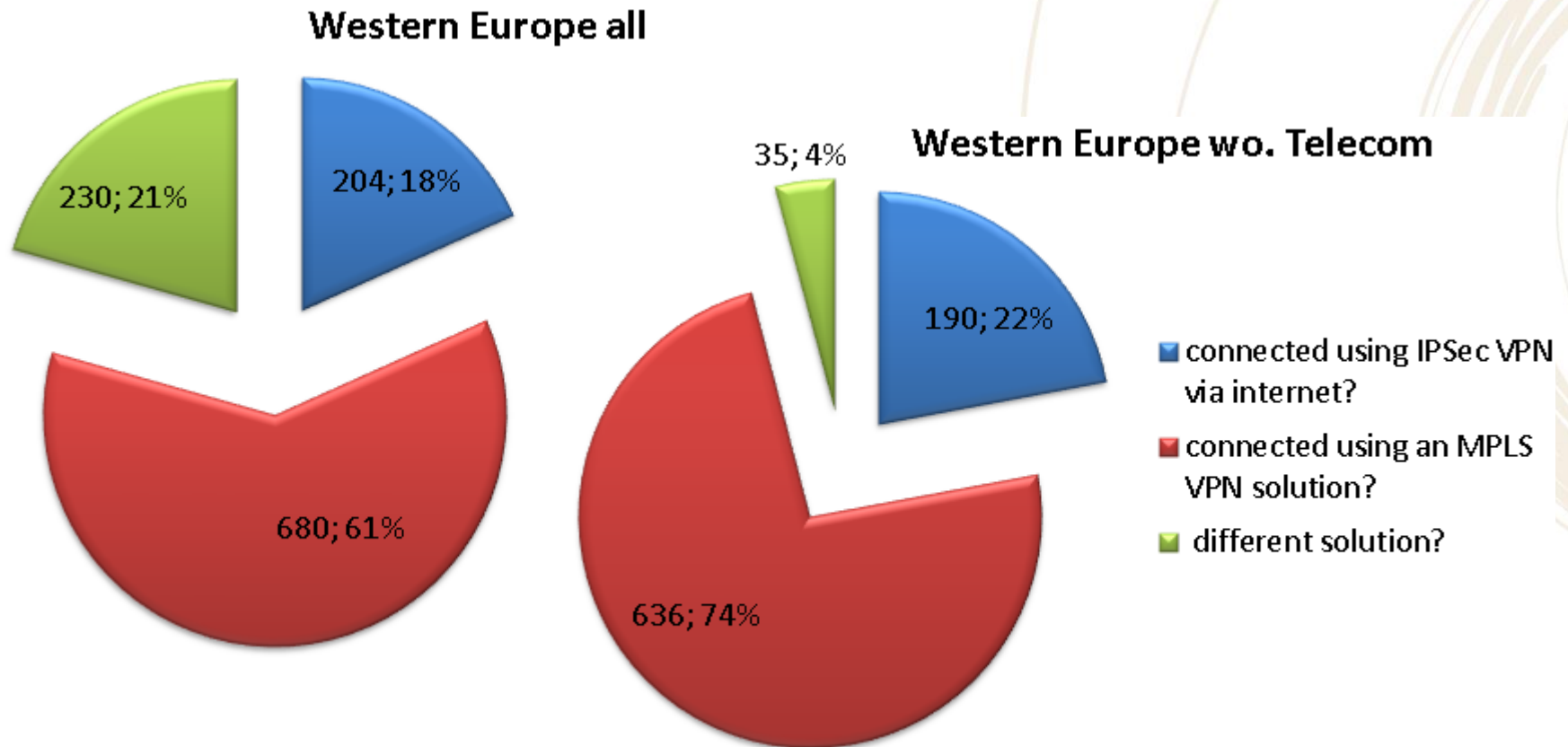
| Staff / Employees |
|---|
| Customers<br>inc. Telecom |
| Customers<br>excl. Telecom |



- Cutomers could still work (10%)
- Customers would suffer some issues (25%)
- Customers could not work (65%)

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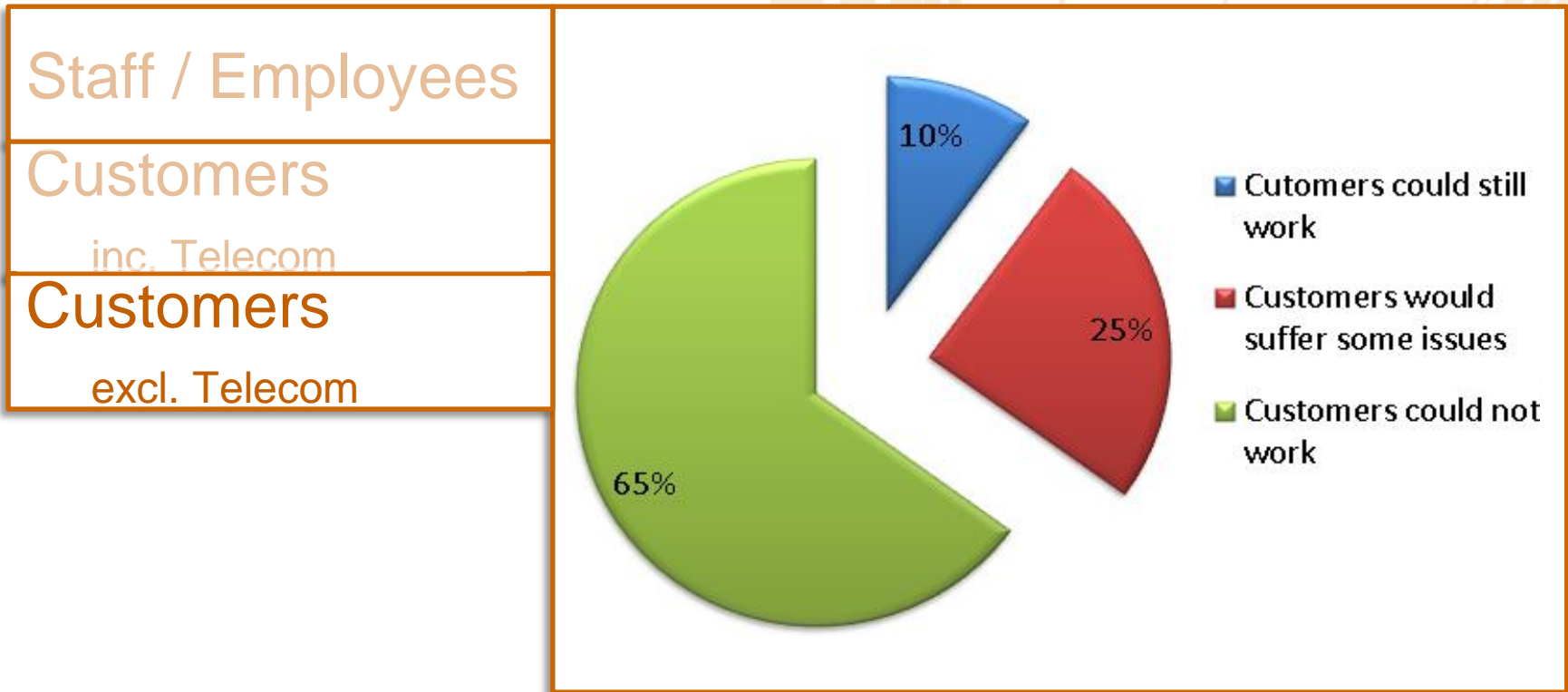
# Survey Results 1/10

Distribution of connections between IPSec VPN, MPLS and others in Switzerland:



**Switzerland all**

- 336; 15%
- 640; 28%
- 1293; 57%

**Switzerland wo. Telecoms**

- 130; 14%
- 291; 32%
- 488; 54%

- connected using IPSec VPN via internet?
- connected using an MPLS VPN solution?
- different solution?

# Survey Results 2/10

Distribution of connections between IPSec VPN, MPLS and others in western Europe:

## Western Europe all

230; 21%
204; 18%
680; 61%

## Western Europe wo. Telecom

35; 4%
190; 22%
636; 74%

- ■ connected using IPSec VPN via internet?
- ■ connected using an MPLS VPN solution?
- ■ different solution?

# Survey Results 3/10

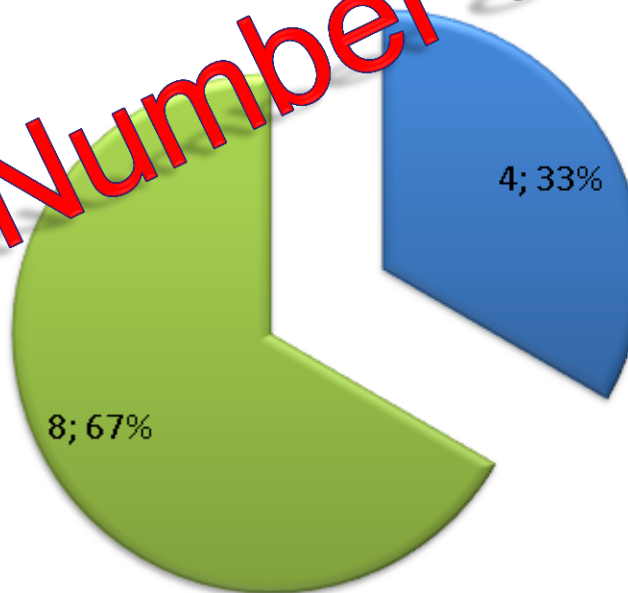Distribution of connections between IPSec VPN, MPLS and others in central and eastern Europe:
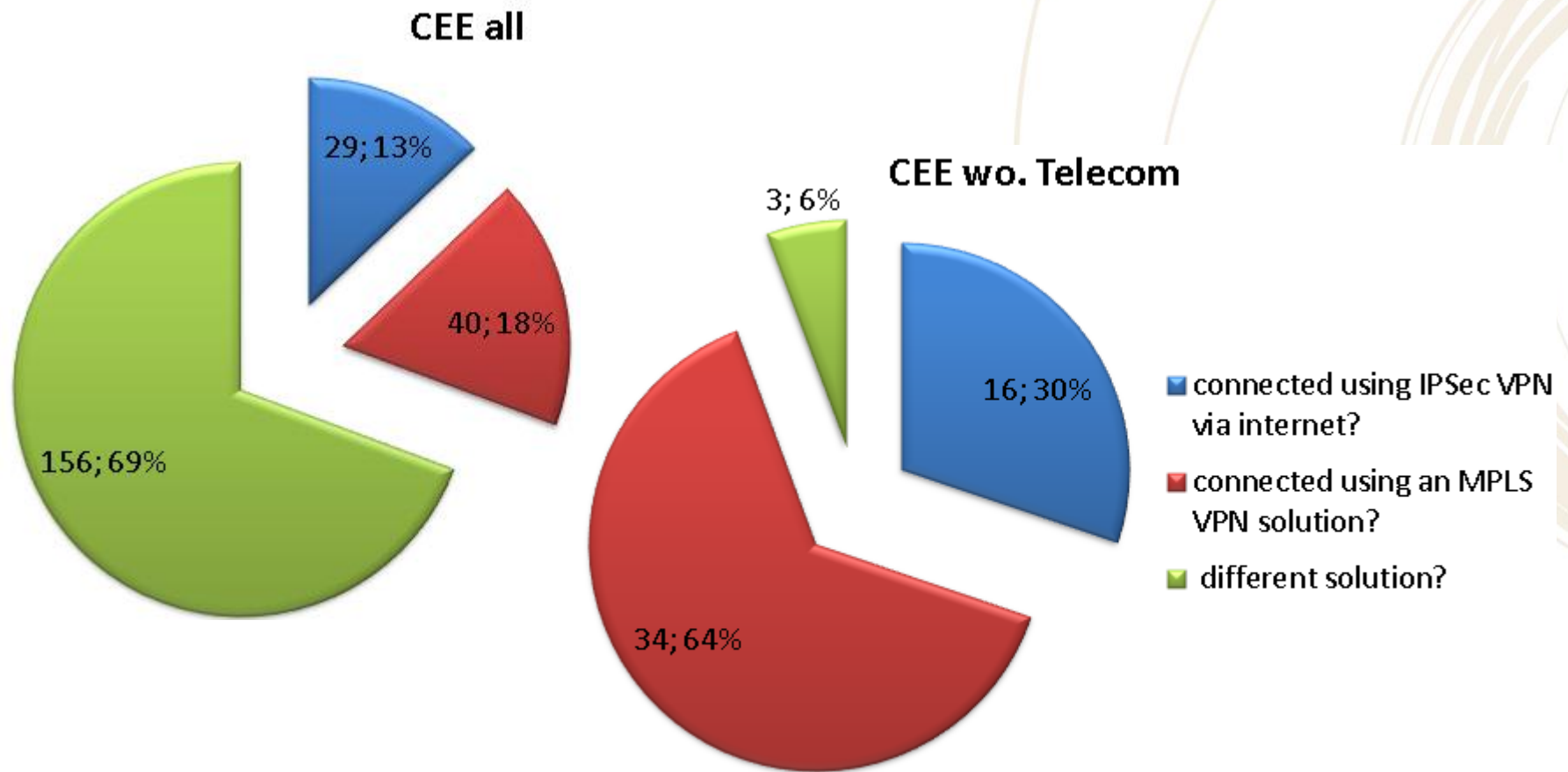
# Survey Results 4/10

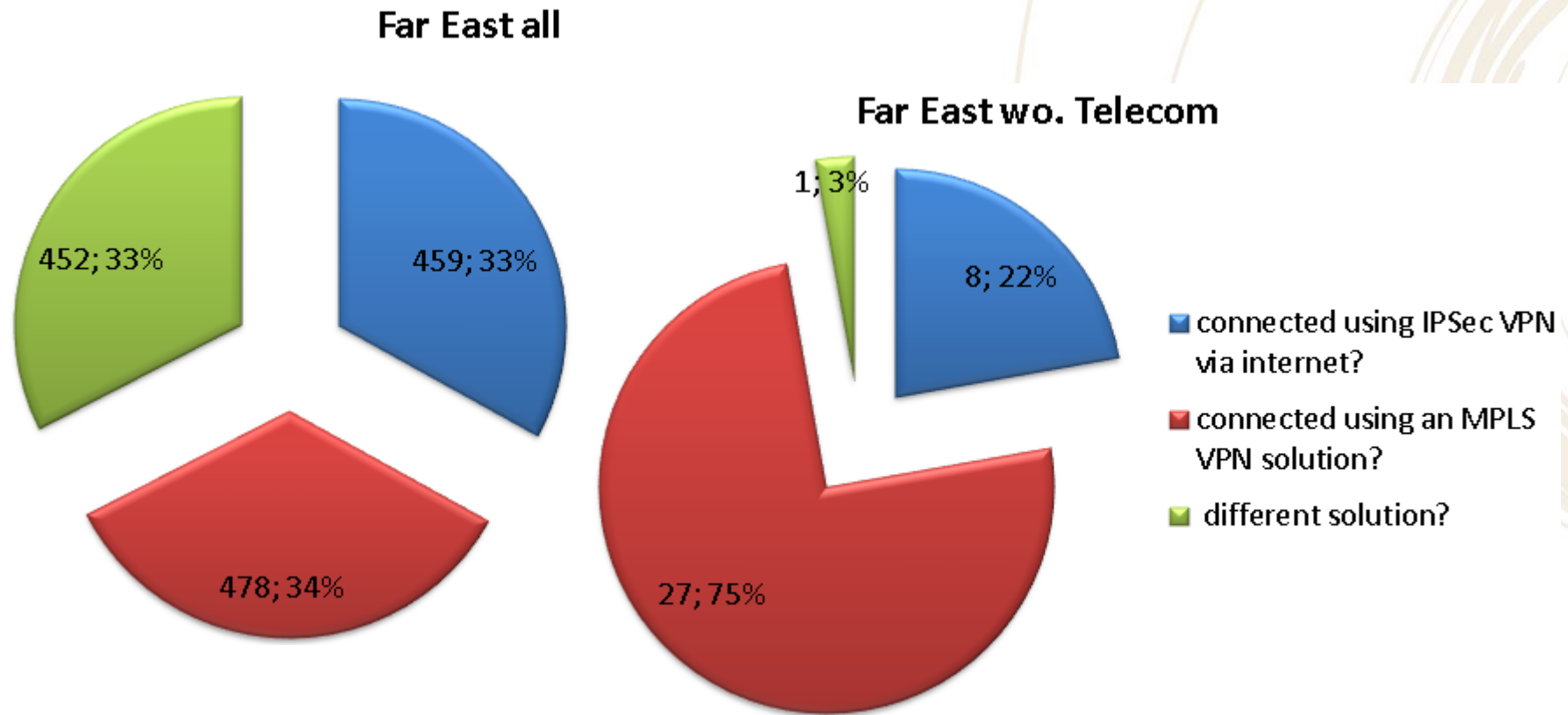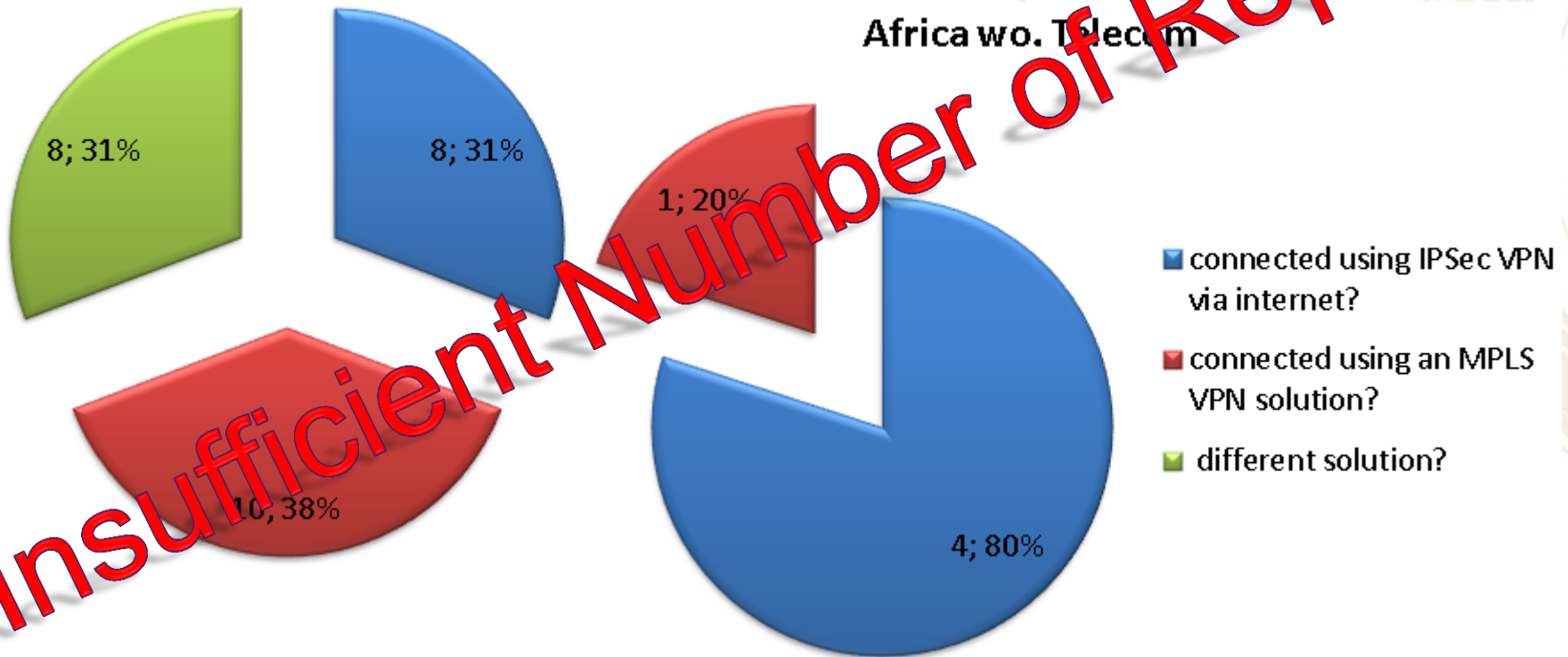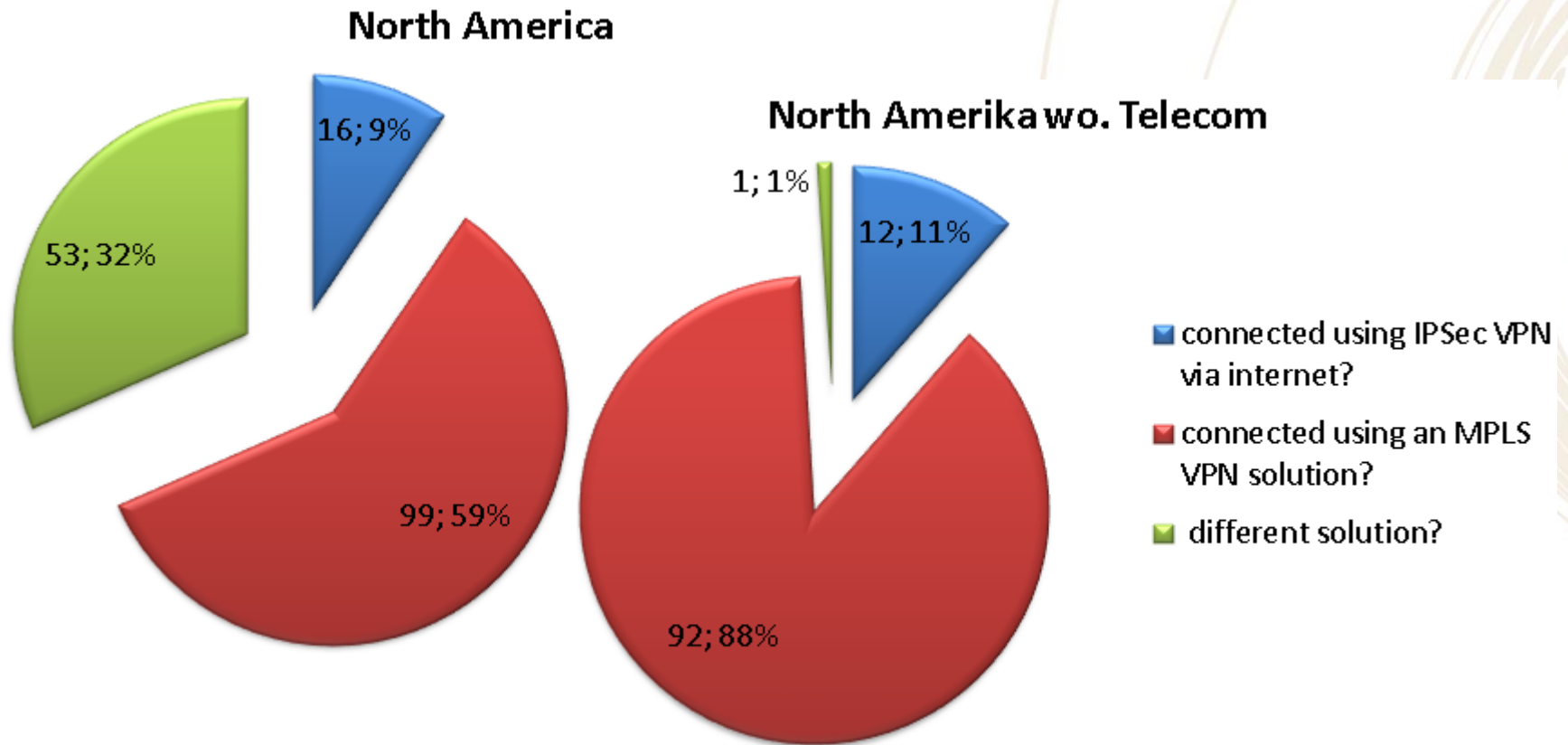Distribution of connections between IPSec VPN, MPLS and others in Near East:



**Near East all**
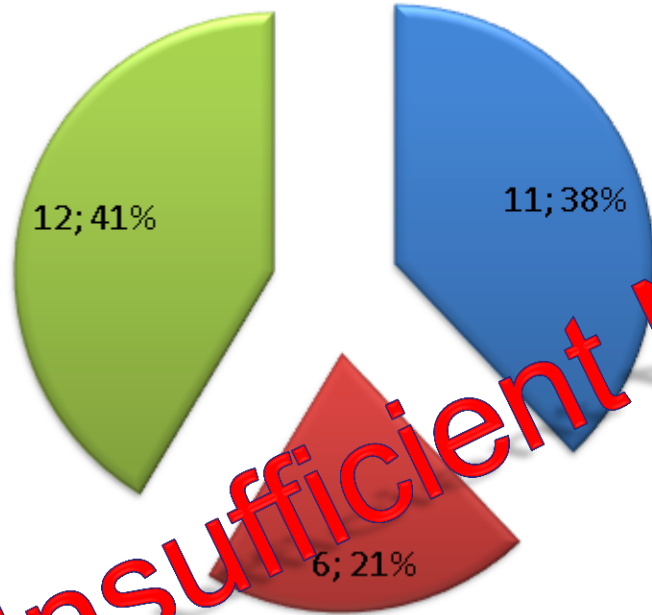
12; 41%

11; 38%

6; 21%

**Near East wo. Telecom**

8; 67%

4; 33%

- connected using IPSec VPN via internet?
- connected using an MPLS VPN solution?
- different solution?

*Insufficient Number of Replies!*

# Survey Results 5/10

Distribution of connections between IPSec VPN, MPLS and others in Far East:



**Far East all**

452; 33%
459; 33%
478; 34%

**Far East wo. Telecom**

1; 3%
8; 22%
27; 75%

- connected using IPSec VPN via internet?
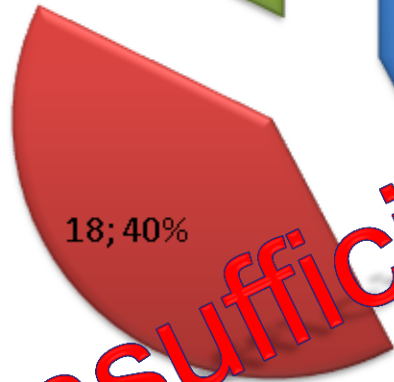- connected using an MPLS VPN solution?
- different solution?

# Survey Results 6/10

Distribution of connections between IPSec VPN, MPLS and others in Africa:

**Africa all**

8; 31%

8; 31%

10; 38%

**Africa wo. Telecom**

1; 20%

4; 80%

- connected using IPSec VPN via internet?
- connected using an MPLS VPN solution?
- different solution?

Insufficient Number of Replies!

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# Survey Results 7/10

Distribution of connections between IPSec VPN, MPLS and others in North America:



**North America**

16; 9%
53; 32%
99; 59%

**North Amerika wo. Telecom**

1; 1%
12; 11%
92; 88%
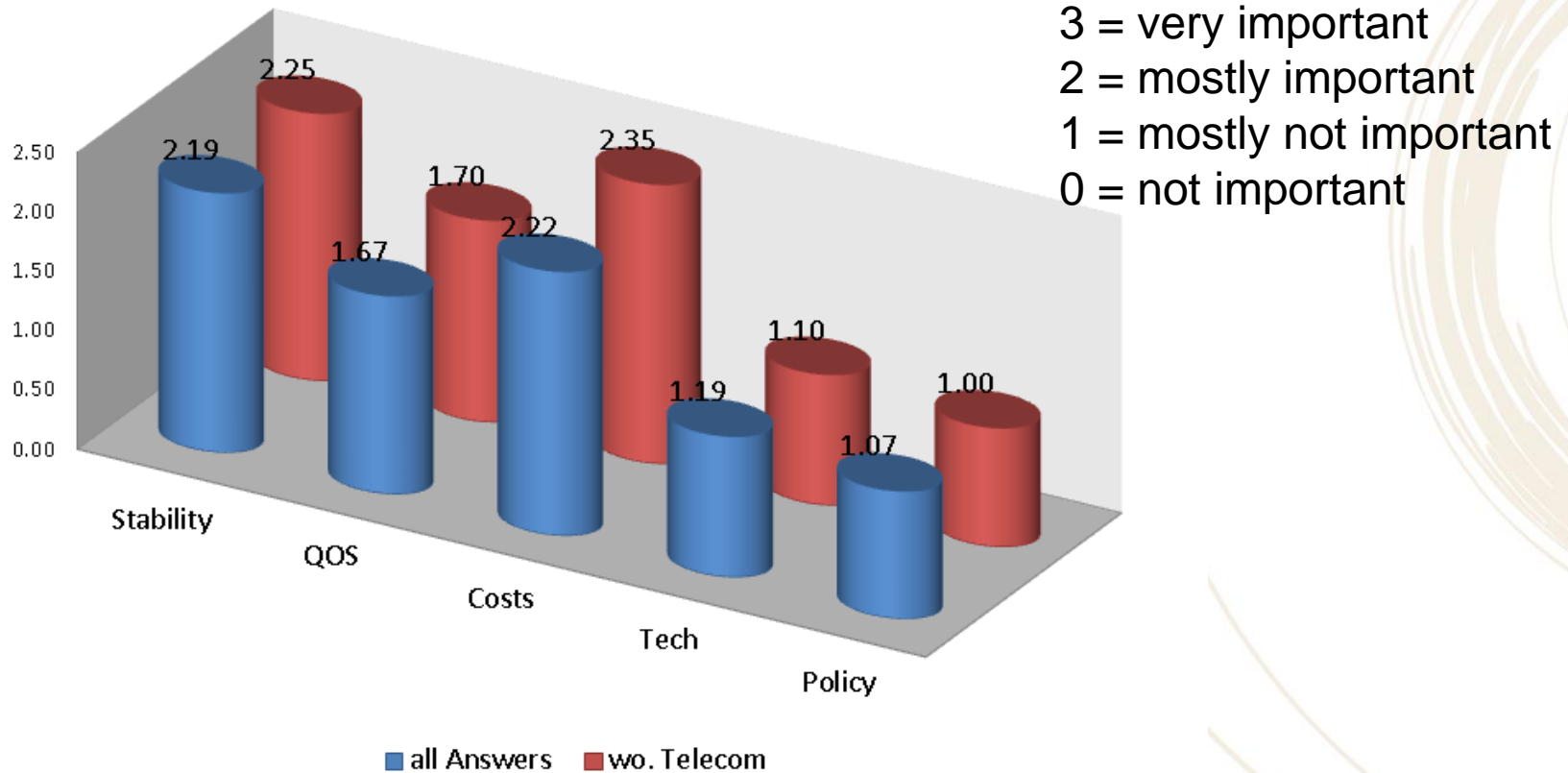
- connected using IPSec VPN via internet?
- connected using an MPLS VPN solution?
- different solution?

# Survey Results 8/10

Distribution of connections between IPSec VPN, MPLS and others in Latin America:
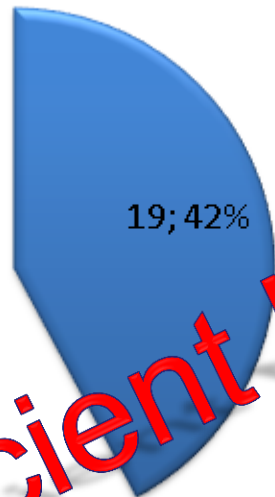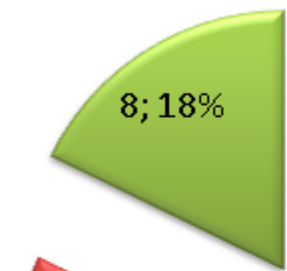
# Survey Results 9/10

## Relevance of criteria for choosing IPSec VPN:



3 = very important
2 = mostly important
1 = mostly not important
0 = not important

# Survey Results 10/10

## Relevance of criteria for choosing MPLS services:



3 = very important
2 = mostly important
1 = mostly not important
0 = not important
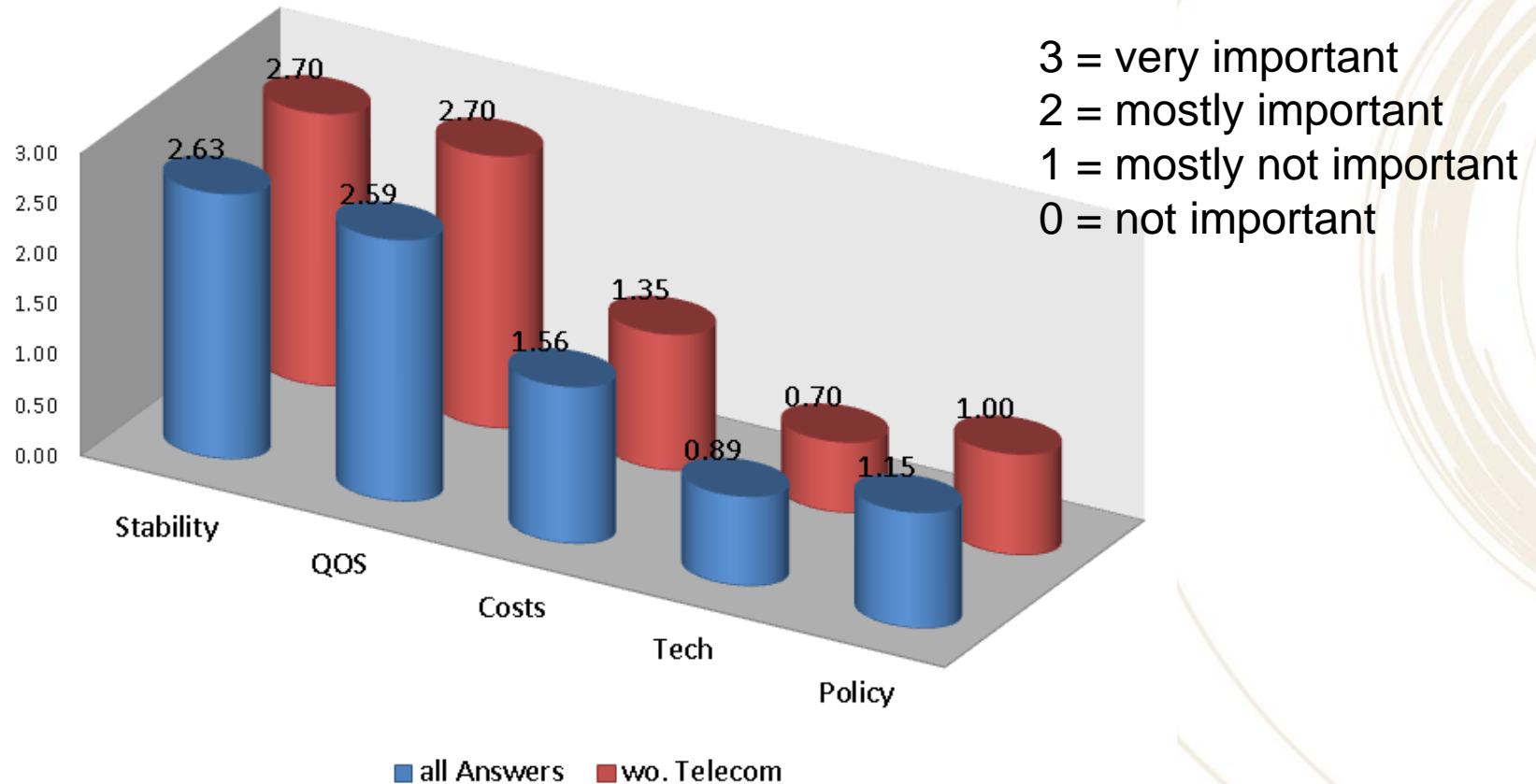
# Outcome 1/3

- Only 4 of 19 would replace their existing MPLS VPNs with internet based IPSec VPNs. Another 8 would follow if the quality of internet would fulfill their needs:



- Most companies (~60%) are very depending on the availability and quality of their internet infrastructure.

- Usage of MPLS / IPSec is also depending on regional market pricing and quality expectations of internet / leased line services.
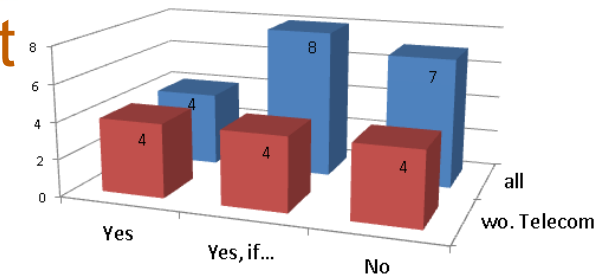
# Outcome 2/3

Claimed reasons for using managed MPLS services:

- QOS can be applied in order to support real-time traffic depending applications (VoIP, Video, others)

- SLA in place to "guarantee" a certain level of quality (low RTD, PLR, Jittering and high availability)

- Professional support available, so no extra FTEs required to support a complex network

- Easier to blame others in case quality or availability expectations can not be met

# Outcome 3/3

Claimed reasons for using self-administered internet IPSec VPNs:

- Much more bandwidth per $. Therefore QOS is not really needed to support real-time traffic depending applications (VoIP, Video, others)

- Good quality ISPs offer SLAs as well. (low RTD, PLR, Jittering and high availability)

- Rather having the specialists in house than 10 external consultants that need to be paid too

- We are the ones to blame if it fails. We are responsible, so we take the challenge

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# Conclusion

Only ¼ of all connections, that have been reported in the survey and interviews, are internet based IPSec VPNs or similar.

Even if we look at the 3 year plans of the participating companies, a 75% mark will not be reached!

The hypotheses is therefore falsified!

But…

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