HOT TELECOM
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i3 forum
international ip interconnection

IP and IPX migration status report

A glimpse into the past, present and future

May 2016

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EXECUTIVE SUMMARY

Introduction

Since its inception 8 years ago, the i3forum's main objective has been to foster and accelerate the industry's transition to IP/IPX. It is now time to take stock to evaluate and understand where the carrier community stands, what their plans are when it comes to their IP/IPX migration and what would further accelerate their transition so that the i3forum can determine how it can provide additional help.

This survey was conducted by HOT TELECOM and the i3forum. This report reflects the IP and IPX migration status of the twenty i3forum carrier members who completed this survey, which was divided in 5 main sections as follows:

Section 1 - General information (demographics)
Section 2 - IP migration status
Section 3 - IP migration strategy
Section 4 - IPX migration status
Section 5 - IPX migration strategy

This report is therefore structured in two main areas. The first part discusses and outlines the results of the survey into the status and strategy of the IP migration.

The second part of the report summaries the results of the questions pertaining to the migration to IPX.

The survey was completed by 18 respondents, however take note that not all respondents answered every questions. This explains why results in terms of % may vary for each question.

The demographics of the respondents is as follows:

Type of business:

- 83% were global wholesaler and carriers
- 11% were pure voice wholesalers
- 6% were voice and SMS wholesalers

Amount of voice traffic transported:

- 53% of the respondents transport between 15-30 billion minutes
- 24% transport between 5-15 billion minutes
- 18% transport less than 5 billion minutes
- 6% transport more than 30 billion minutes

Number of international wholesale customers, at account level:

- 61% have over 300 customers
- 17% have between 200-300 customers
- 11% have between 100 and 200 customers
- 11% have less than 50 customers

IPX platform offering:

- 82% of the respondents offer IPX service
- 18% of the respondents do not offer IPX services (these did not therefore complete the second portion of the survey, which covered the IPX migration)

IP migration overview

This section of the survey had 12 questions and looked into the current status and strategy of the IP migration process.

As you will see from the results of this section, the IP migration of the backbones of most networks is well underway and there are improvements in the improved ease of migration. But there is still a lot of work to be done when it comes to migrating international wholesale interconnects and customers to IP, and this part of the work is in the early stages.

Nevertheless, the migration is seen as a key strategic priority by the carriers, even though they feel that a lack of interest from their service provider customers is the main obstacles to the migration.

IP migration results

It is clear from the survey results that the IP migration is well underway. 44% of the companies who completed the survey stated that they had already completed the migration of their internal voice platform to IP, while 72% said that their migration would be completed by the end of 2018.

Nevertheless, when it comes to the migration of their international wholesale carrier interconnects to IP, it is a very different story. This phase of the migration is only starting for many carriers, as only 6% of the respondents said that their international wholesale carrier interconnects were fully migrated to IP, while 50% said that they expected this migration to be completed after the end of 2018.The number of international wholesale interconnections still to be migrated confirms this, as 47% of the respondents still have between 25-50% of their interconnections to migrate to IP and 41% have more than 50% still to migrate.

When choosing how to interconnect their service provider customers, more use private IP. All respondents said that they interconnected at least some customers via private IP, and 6% said that all their customers were connected via private IP.

Finally, the migration of the traffic from TDM to IP is well under way, but far from completed. 20% of the respondents said that more than 75% of their outbound traffic is transported over IP, while the majority (53%) said that between 25% - 50% of their traffic was transported over IP.

We find a similar set of results for inbound traffic. However, in this case, 7% said that less than 25% of their inbound traffic is transported over IP.

Ease of IP migration

At this point in time, the respondents said that it is much faster to implement a new wholesale IP interconnection than to migrate an existing one. 18% of the respondents said that it took less than 1 month to migrate an existing interconnection, while 35% said the same for a new interconnection.

But things are going in the right direction, as 53% of the respondents said that the time needed to migrate or implement a carrier IP interconnect is getting shorter.

Also, 59% said that the migration to IP was getting easier. However, surprisingly, 6% said it was getting harder, but mainly because

bigger companies are now being migrated and therefore more tests and procedures are required.

IP migration strategy

IP migration is seen as a key strategic priority. 77% of the respondents said that migration was a key priority for their company, while 23% said that it was important. In addition, 53% said that the main driver for the migration to IP was for strategic reasons.

But there are still some major obstacles to making the IP migration a reality, as 63% said that the lack of interest from their customers slowed this process. 50% said that another obstacle was the complexity of the migration and a further 44% said that the reluctance to decommission the TDM network was also an obstacle.

Finally, when asked about their contractual strategy, in a large portion of the cases, the respondents' companies make no contractual change to cover the migration to IP of an existing interconnection. The next most popular policy is to use a new contract.

IPX migration overview

The second portion of the survey was targeted at defining the status of the IPX strategy. This section was composed of 16 questions.

What comes out of this portion of the survey process is that the migration to IPX is slowly speeding up in terms of interconnects, customer, traffic and services offered, but there is still a long way to go before the migration is completed as it is taking longer than expected. But it is obvious that some are more advanced than others.

There is still a general feeling that the lack of a convincing business case is slowing the introduction of IPX, and most still offer services on the platform for strategic reasons and not necessarily because it makes financial sense.

IPX migration status

The majority of the operators who completed the survey have between 10 – 20 IPX to IPX (i2i) interconnection agreements to extend the reach of their network. More i2i interconnections are used to terminate signalling traffic than voice, as 36% said that they had more than 20 i2i interconnect agreements to transport their signalling traffic, while only 14% said the same for their voice traffic.

21% said that they had between 5 and 10 i2i interconnect agreement to transport their voice traffic.

When it comes to the migration of customers to the IPX platform, there is still a long way to go before it is completed. The majority of the respondents have between 25 – 100 customers connected to their IPX platform, while there are still a significant number of operators who have less than 25 customers connected.

Nevertheless, some are succeeding at migrating their customers onto their platform, as 8% say they have between 100-150 customers and the same percentage say they have 150-200 customers connected.

Also, the IPX platform has definitely not yet reached a stage of mass utilisation, as 50% of the respondents said that they have less than

25% of their customers connected to their IPX platform. Here again, some are much more successful than others, as 14% said that they had more than 75% of their customers connected to their IPX platform.

Ease of IPX migration

Contrary to the results for the migration or implementation of an IP carrier interconnect, it seems to take longer to implement a new i2i interconnection than it does to migrate and existing one.

However, it is still quicker to implement a new customer to the IPX platform than migrate an existing one, as 85.7% of the respondents said that it took them less than 3 months to implement a new customer, compared with 79% who said it took them the same time to migrate one.

Finally, half of the respondents say that is the IPX migration is getting easier, while 43% say it is the same as it was 1-2 years ago.

IPX reach and connectivity

There is still some improvement to be had when it comes to directly connected voice IPX destinations, as 33% of respondents said they had less than 20 countries connected directly to terminate voice over their IPX. Here also, we find a group of operators who are much further ahead, as 17% said they had over 60 countries directly connected to their IPX platform.

In terms of interconnection, the majority of the respondents said that they preferred to use the location closest to the customer or define the interconnection point on a case by case basis. Only 7% said they interconnected customers wherever they wished.

IPX migration strategy

As was the case for the IP migration, the IPX migration is seen as a key strategic priority for the respondents. 64 % said that offering IPX services is seen as a key priority, while 86% said that they were offering it for strategic reasons. Only 7% said they were offering IPX for operational or financial reasons.

The main obstacle to offer IPX, as identified by 46% of the respondents, is the fact that there is no clear business case to do so. The next most popular choices were 'no interest from customers' and 'unclear product definition'.

IPX service offering

Most respondents offer the full portfolio of basic IPX services, however only a minority already support VoLTE and VoLTE roaming. 100% of the respondents offer voice over their IPX, while over 92% offer GRX services, while 85% support the different signalling traffic streams over IPX.

The large majority of the respondents are currently working on deploying VoLTE services over their IPX, with 64% stating that VoLTE support is on their road map and 69% say that VoLTE roaming support is presently being deployed

When it comes to value added services and capabilities, 69% offer fraud management services over their IPX platform, while 62% offer HD voice. Over 50% offer transcoding, number portability in call and signalling interoperability

Obviously, RCS is not a priority for the respondents, as none of the respondents said they were supporting RCS hubbing, although 62% said they were considering offering it.

IPX traffic evolution

There is still some way to go before the IPX migration is completed, as 86% of the respondents say that they have less than 25% of the voice traffic transported over IPX end-to-end.

7% said that their platform transports between 50-75% and the same percentage say that 100% of their voice traffic is transported over IPX, when including break-out situations.

Nevertheless, the end-to-end VoIPX traffic growth is continually accelerating, as 42% said that they saw some VoIPX traffic growth between 2012 and 2013, 67% saw traffic growth between 2013 and 2014 and all respondents saw traffic growth between 2014 and 2015. Finally, 15% saw their traffic growing by more than 50% between 2014 and 2015.

Last but not least, Diameter traffic growth is accelerating. 50% of the respondents said that they have seen the Diameter traffic transported over IPX grow by over 200% between 2014 and 2015, compared with 42% of the respondent seeing similar growth trends between 2013 and 2014

IP MIGRATION STATUS

Migration of internal voice platform to IP

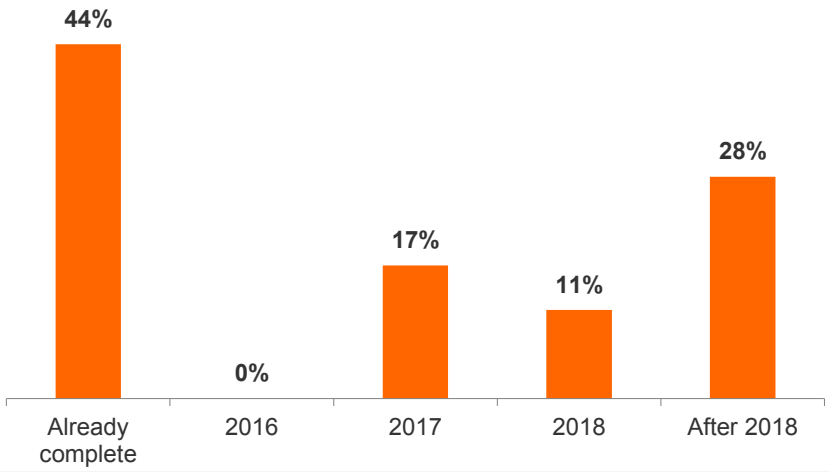
The first question of the IP migration status section asked the respondents what they saw as the time-frame for completing the migration of their internal voice platform to IP.

Main results:

The migration to IP is well underway.

- 44% of the companies' who completed the survey stated that that they had already completed the migration of their internal voice platform to IP
- From the remaining companies, 28% are planning to have completed their migration by the end of 2018
- Still a considerable number (28%) planned to complete their migration after 2018

Q1. What do you see as the time-frame for completing the migration of your internal voice platform to IP?



Migration of int'l voice wholesale carrier interconnects to IP

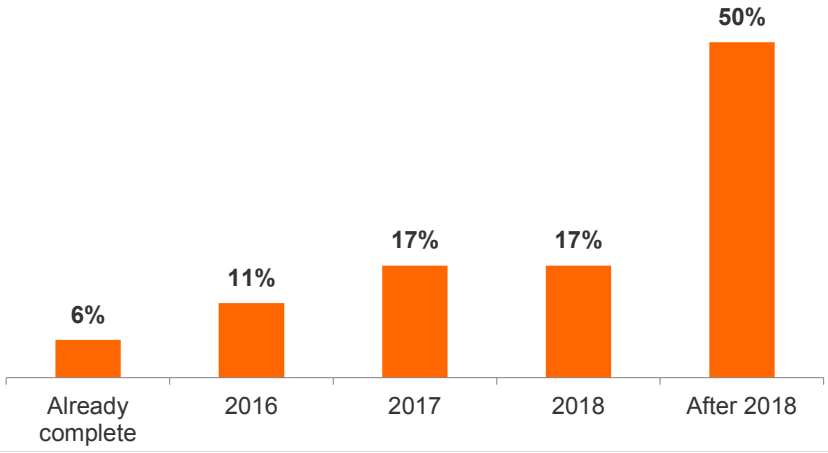
The survey then went on to ask the respondents when they expected to have completed the migration of their international voice wholesale carrier interconnects to IP.

Main results:

The result to this question was completely different. In this case, the migration is only starting.

- Only 6% of the respondent said that the migration of their international wholesale carrier interconnects to IP was already completed
- A significant 50% stated that they expected this migration to be completed after 2018

Q2. What do you see as the time frame for completing the migration of all your international voice wholesale carrier interconnects to IP?



Ratio of interconnections still to be migrated to IP

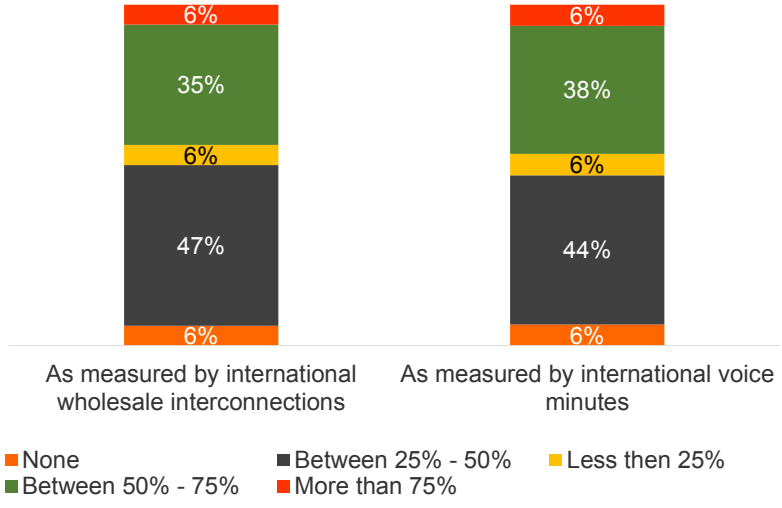
From there, the survey asked what ratio of their international carrier interconnections still needed to be migration to IP.

Main results:

It is clear that there is still a lot of work to be done before the migration of interconnections to IP is completed.

- As measured by international wholesale interconnections, 47% still had between 25% - 50% to be migrated to IP and 41% still had more than 50% to be migrated.
- As measured by international voice minutes, similar ratios are found, with 44% still having to be migrated.

Q3. What ratio of your international carrier interconnections still need to be migrated to IP?



Average time required to migrate a new wholesale IP interconnect

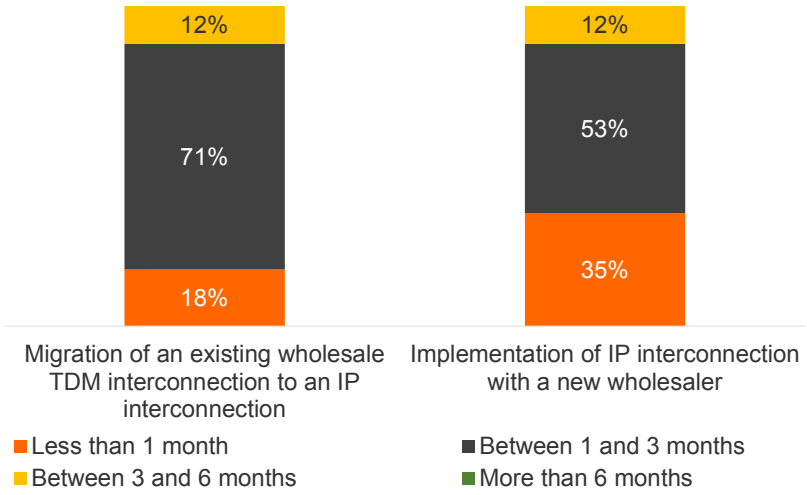
The following questioned polled how long it takes on average to migrate an existing interconnect or implement a new wholesale IP interconnect (in terms of provisioning).

Main results:

It is obvious that it is much faster to implement a new wholesale IP interconnect than to migrate an existing one.

- 18% of the respondents said that it took less than 1 month to migrate an existing wholesale interconnection to IP, compared with 35% for a new interconnect.
- 71% said that it took between 1-3 months to migrate and interconnect, compared with 53% requiring the same time for a new one.

Q4. How long does it take you on average to migrate an existing or implement a new wholesale IP interconnection (in terms of provisioning)?



Evolution of the time needed to migrate or implement a new carrier IP interconnect

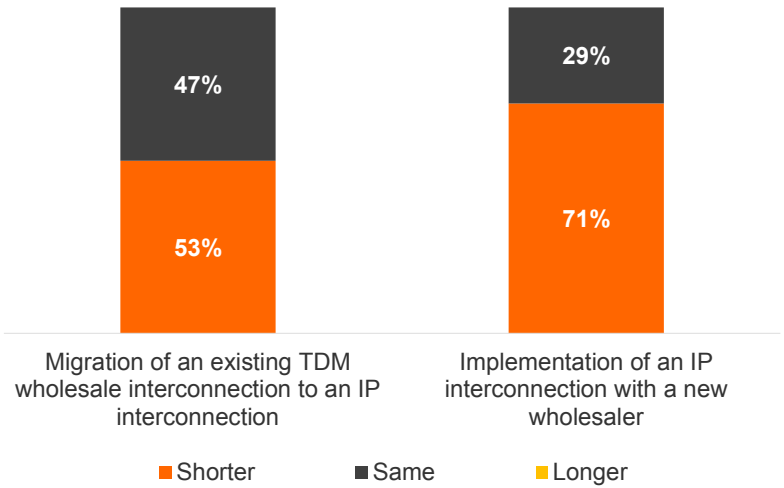
The fifth question gauged if the average time needed to migrate or implement a new carrier IP interconnection was getting longer or shorter, compared to 1-2 years ago (in terms of provisioning).

Main results:

The time needed to migrate or implement a carrier IP interconnect is getting shorter.

- 53% of the respondents said that the time to migrate an existing carrier IP interconnection was getting shorter
- While 71% said the same for a new interconnection

Q5. Is the average time needed to migrate or implement a new carrier IP interconnection getting longer or shorter compared to 1-2 years ago (in terms of provisioning)?



Ease of migration to IP compared with 1-2 years ago

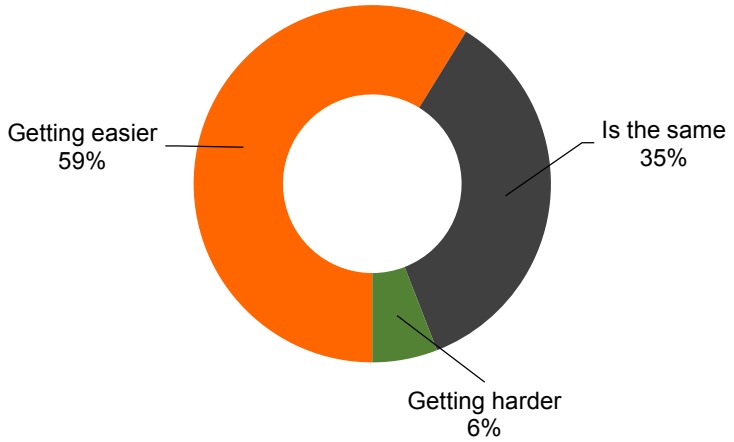
Question 6 then went on to ask if the migration to IP is getting harder compared to 1-2 years ago (in terms of provisioning).

Main results:

Here again, the results are encouraging, as the majority said that it was getting easier.

- 59% of the survey respondents said that the migration to IP was getting easier and 35% said it was the same
- Surprisingly, 6% said that it was getting harder
- Respondents said that the reason why implementations are becoming harder is because bigger companies are being migrated and more tests and procedures are required

Q6. Would you say the migration to IP is getting easier, is remaining the same or is getting harder compared to 1 or 2 years ago (in terms of provisioning)?



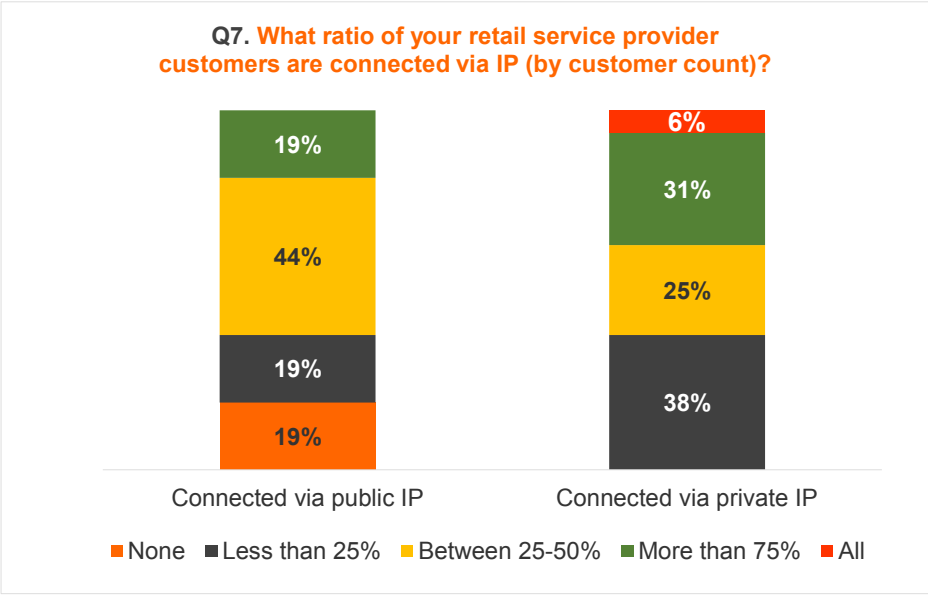
Customers connected via IP

The next question asked what ratio of the respondents' retail service provider customers are currently connected via IP (by customer count).

Main results:

The respondents interconnect their service provider customers more often using private IP than public IP.

- All respondents said that they interconnected at least some customers via private IP, and 6% said that all their customers were connected via private IP
- 19% said that they interconnected more than 75% of their customers via public IP, while 31% the same via private IP.



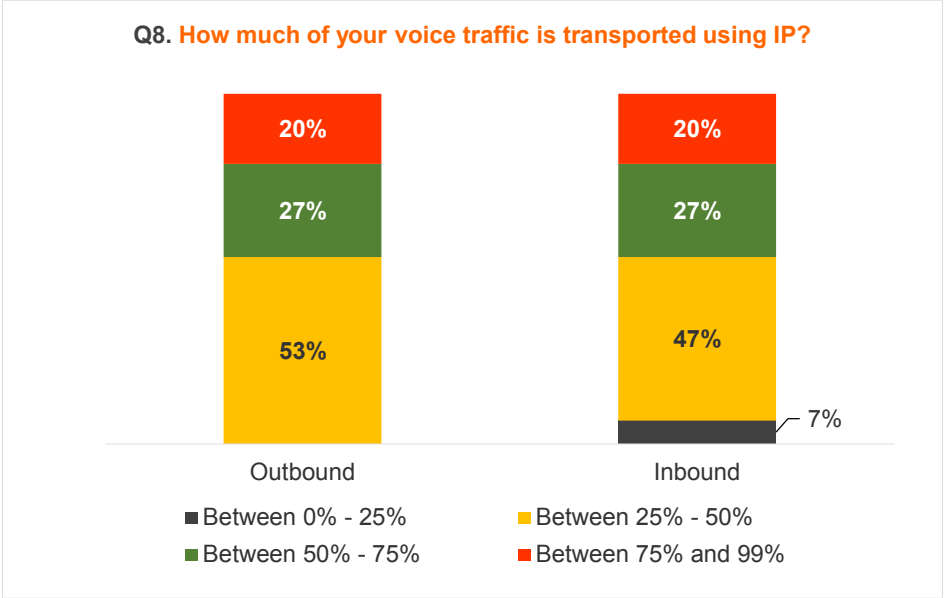
Voice traffic transported via TDM and IP

Question eight asked how much voice traffic is currently transported using IP vs TDM.

Main results:

The migration of the traffic from TDM to IP is well on its way, but far from completed.

- 20% of the respondents said that more than 75% of their outbound traffic is transported over IP, while the majority (53%) said that between 25% - 50% of their traffic was transported over IP.
- We find a similar set of results for inbound traffic. However, in this case, 7% said that less than 25% of their inbound traffic is transported over IP.



IP MIGRATION STRATEGY

Contracting policy for migration

The next four questions of this survey dive into the IP migration strategy of the survey's respondents.

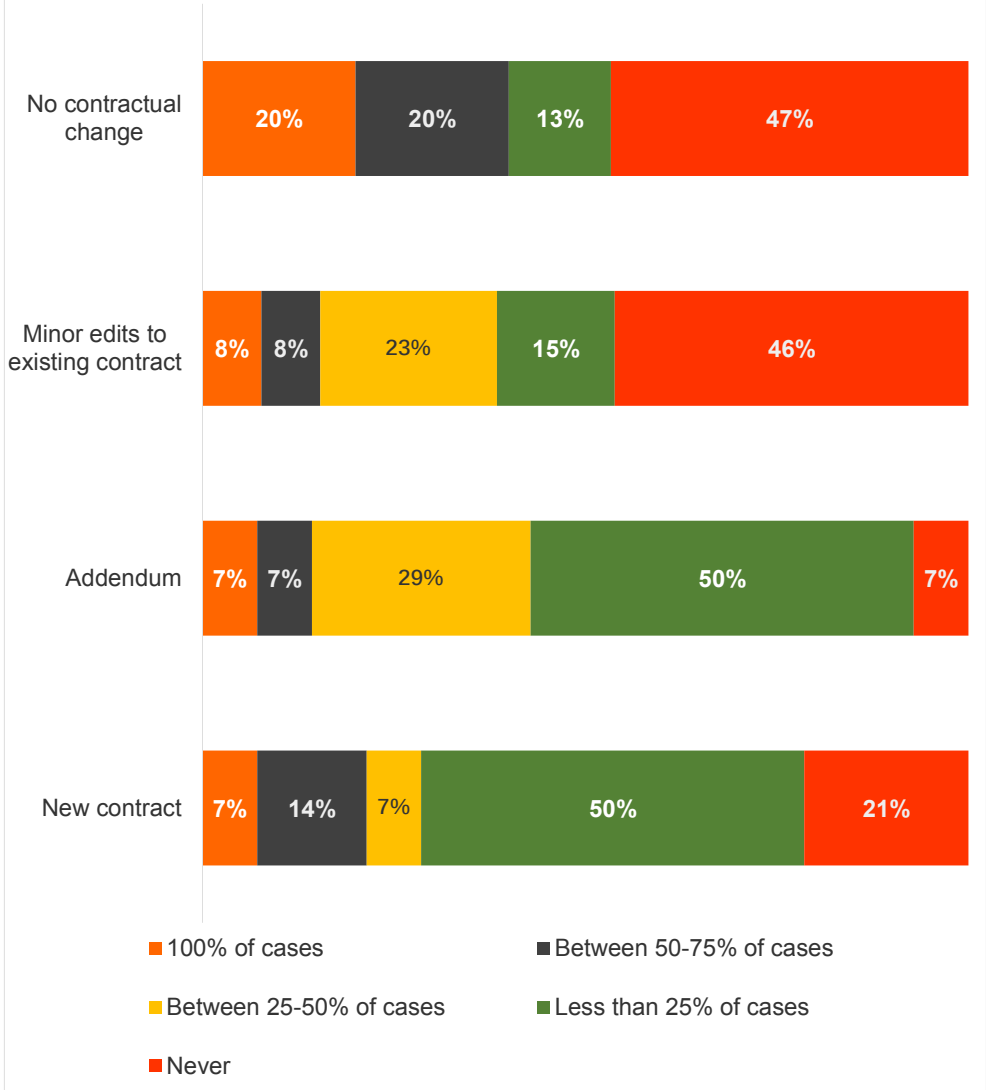
The first question in this section asked what type of contracting policy is used to migrate existing wholesale interconnections to IP.

Main results:

In a large portion of the cases, the respondents' companies make no contractual change to cover the migration to IP of an existing interconnection. The next most popular policy is to use a new contract.

- 20% of the respondents stated that in 100% of the cases they have no contractual change to cover the migration to IP. In addition, 20% also say that they have no contractual change in 50-75% of the migrations.
- Only 7% say that they use a new contract or an addendum to cover the migration and 21% say that they never use a new contract.
- A minority say that they use minor edits to existing contracts, as 46% say that they never use this contracting strategy.

Q9. What is your policy for contracting the migration of existing wholesale interconnections to IP?



Company strategy for transition of voice services to IP

The second question in this section asked the respondents how they would describe their company's strategy regarding the transition of its voice services to IP.

Main results:

The large majority see the migration to IP as a key priority.

- 77% said that it was a key priority for their company and 24% said it was important.
- No one said that their company's strategy was 'opportunistic, 'still being considered', 'did not desire to migrate' or 'had no strategy'

Main driver for migration to IP

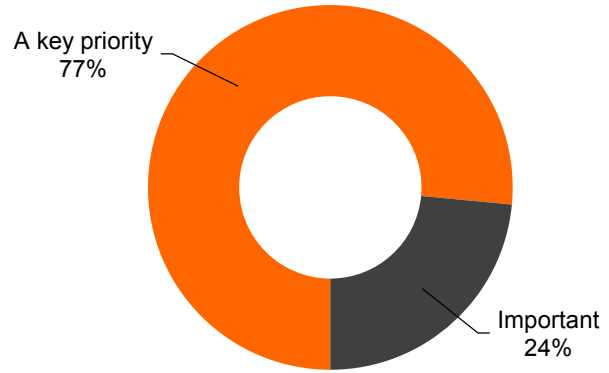
From there, the survey asked what was the main driver for their company's migration to IP.

Main results:

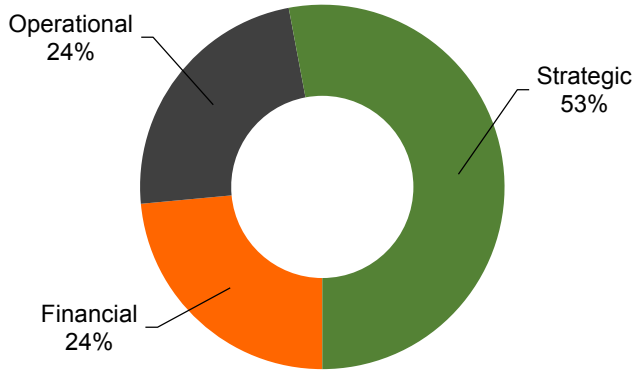
The majority see the main driver as being a strategic decision.

- 53% said that the migration was driven by strategy
- 24% said it was driven by operational reasons
- 24% said it was driven by financial reasons.

Q10. How would you describe your company's strategy regarding the transition of its voice services to IP?



Q11. Which of these is the main driver for your company's migration to IP?



Company strategy for transition of voice services to IP

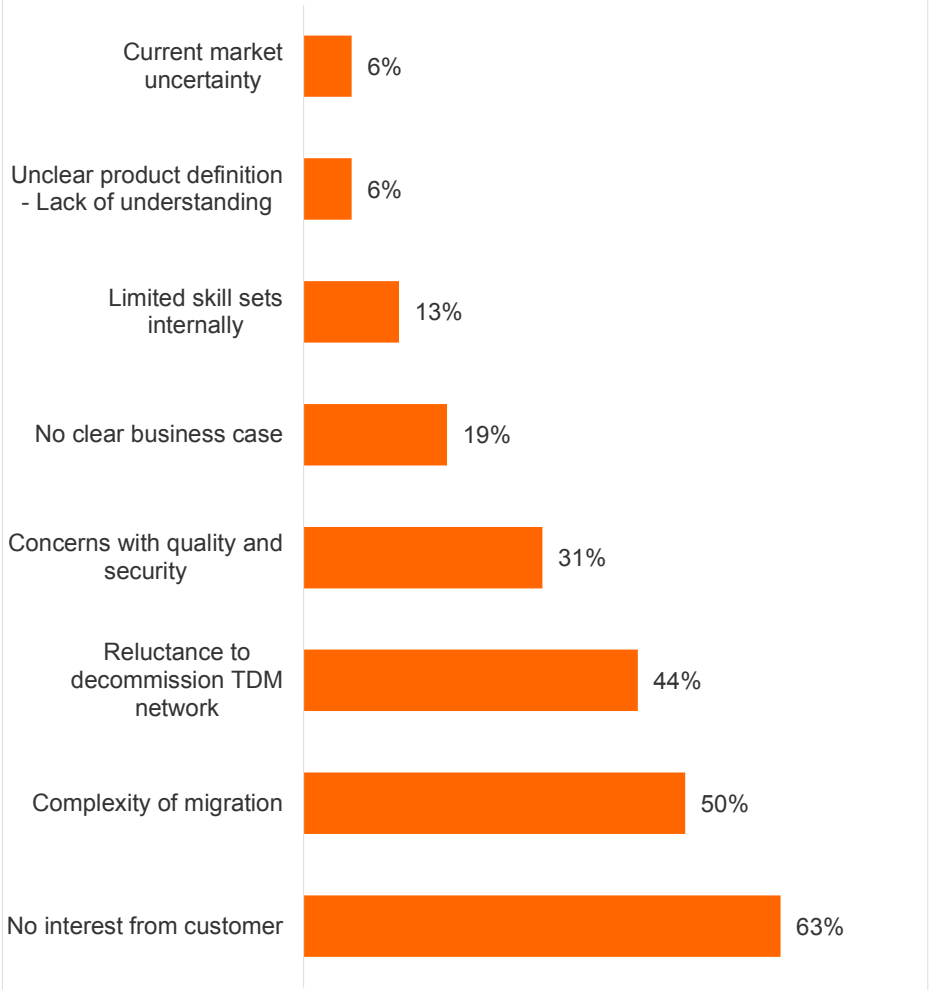
The final question of the IP migration section asked what were the main obstacles to the migration to IP.

Main results:

The three main obstacles to the migration to IP are 'No interest from customers', 'Complexity of migration' and 'Reluctance to decommission the TDM network'.

- By far the largest obstacle, from the point of view of the wholesalers, is the fact that customers are not interested in migrating, as 63% of the respondents identified this obstacle as the most important one.
- 50% said it was the complexity of the migration
- 44% said it was the reluctance to decommission the TDM network.
- The next most popular obstacle was concerns with quality and security, having been identified by 31% of the respondents.
- Only 6% of the respondents said that the biggest obstacle was the currently market uncertainty or the lack of understanding of the migration.

Q12. What are the main obstacles to the migration to IP?



IPX MIGRATION STATUS

Number of IPX to IPX interconnect agreements

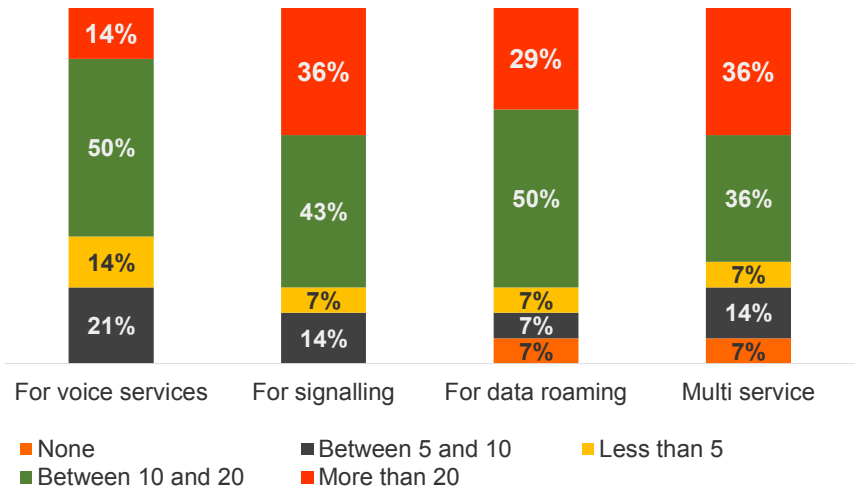
The first question of the IPX survey section asked how many IPX to IPX (i2i) interconnect agreements (which transport live traffic) the respondents have.

Main results:

The majority of operators have between 10 – 20 i2i interconnection agreements.

- 36% of the respondents said that they had more than 20 i2i interconnect agreements that transported their signalling traffic, while only 14% said the same for their voice traffic
- 21% said that they had between 5 and 10 i2i interconnect agreement to transport their voice traffic, while 7% said they had no agreements that covered multiple services

Q13. How many IPX to IPX interconnection agreements (i.e. between IPX providers) do you have (transporting live traffic)?



Average time to implement an IPX to IPX interconnect

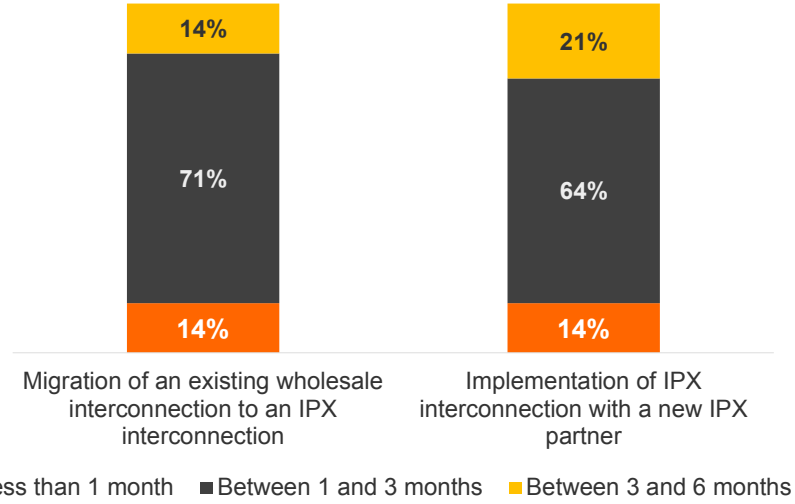
The second question of this section went on to define how long it takes on average to operationally implement a new i2i interconnection.

Main results:

When compared to the migration or implementation of an IP carrier interconnect, it appears to take longer to implement a new i2i interconnection than it does to migrate and existing one.

- 21% said it took them between 3-6 months to implement a new i2i interconnection agreement, while 14% said the same to migrate an existing one
- 14% said it took them less than 1 month for both cases (migration or new i2i interconnect agreement)

Q14. How long does it take you on average to implement a new IPX to IPX interconnection (operationally)?



Ease of IPX to IPX interconnect agreement establishment

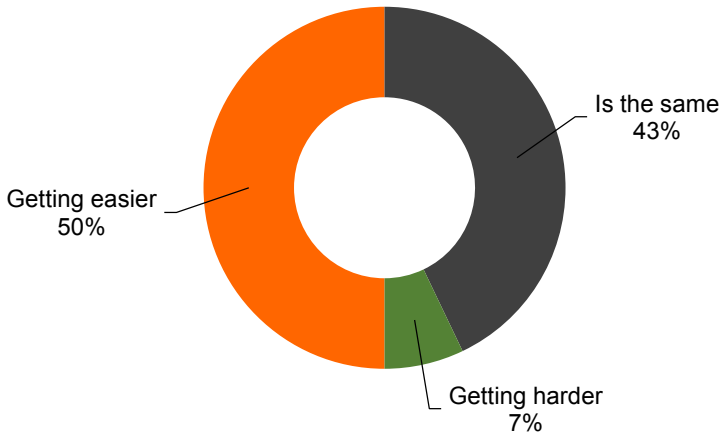
Question fifteen of the survey asked if the establishment of i2i interconnect agreements were getting easier, the same or getting harder compared to 1-2 years ago.

Main results:

The situation is improving or at least is the same as it was.

- Half of the respondents said that it was getting easier, while 43% said it was the same
- Still 7% said that it was getting harder but did not state why

Q15. Would you say the establishment of IPX to IPX interconnection agreements are getting easier, are the same or are getting harder compared to 1 to 2 years ago?



Number of IPX customers

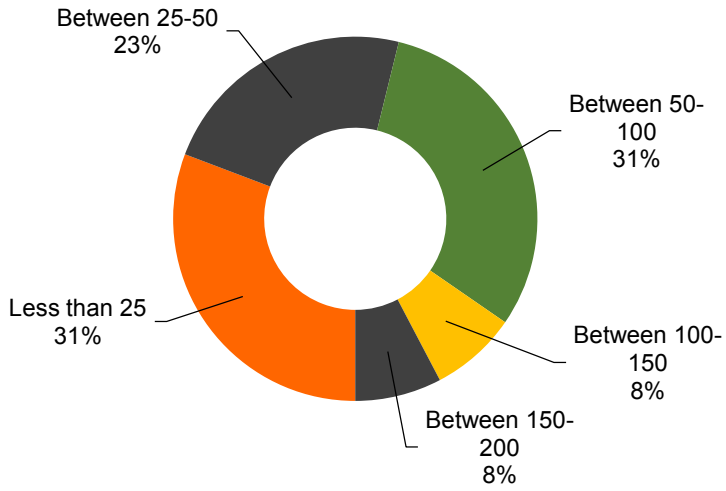
Question sixteen asked how many of the respondents' service provider customers had connected onto their IPX.

Main results:

The majority of the respondents have between 25 – 100 customers connected to their IPX platform, while there are still a significant number of operators who have less than 25 customers connected.

- 31% of the respondents say that they have less than 25 customers connected to their IPX platform
- 31% say they have between 50-100 customers connected
- 8% say they have between 100-150 customers or 150-200 customers connected

Q16. How many of your service provider customers have connected onto your IPX?



Ratio of customers connected onto the IPX

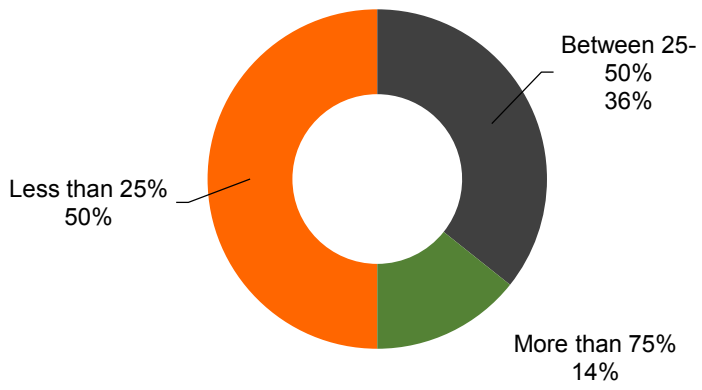
The next question went one level deeper and asked what ratio of the service provider customers were connected onto their IPX platform (by customer count).

Main results:

The IPX platform has definitely not yet reached a stage of mass utilisation, as the majority of the respondents said that they have less than 25% of their customers connected to their IPX platform.

- 50% of the respondents said that less than 25% of their customers are connected to their IPX platform
- While 36% said they had between 25-50% of their customers connected to their IPX platform
- Still, 14% said that they had more than 75% of their customers connected to their IPX

Q17. What ratio of your service provider customers are connected onto your IPX (by customer count)?



Average time required to implement a new IPX customer

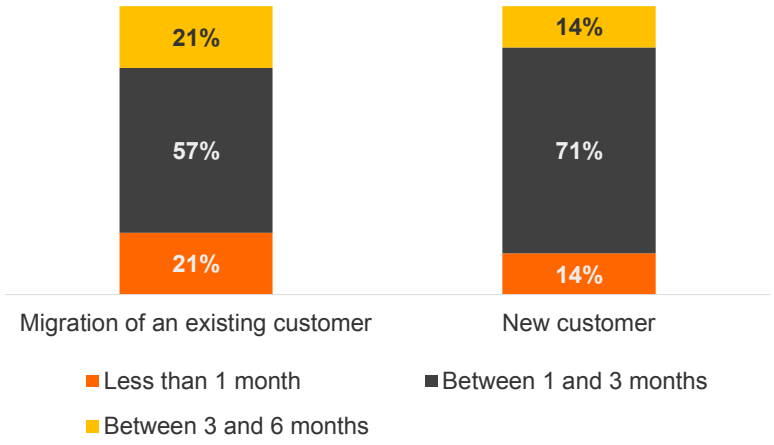
Question eighteen asked how long it takes on average to implement a new or migrate and existing customers to the IPX platform.

Main results:

Here again, it is clear that it is quicker to implement a new customer to the IPX platform than to migrate and existing one.

- 86% of the respondents said that it took them less than 3 months to implement a new customer, compared with 79% who said it took them the same time to migrate an existing one
- Within that, 21% said that it took them less than 1 month to migrate an existing customer
- 21% of the respondents went on to say that it took them between 3-6 months to migrate a customer

Q18. How long does it take you on average to implement a new IPX service provider customer?



Number of countries with direct voice termination coverage

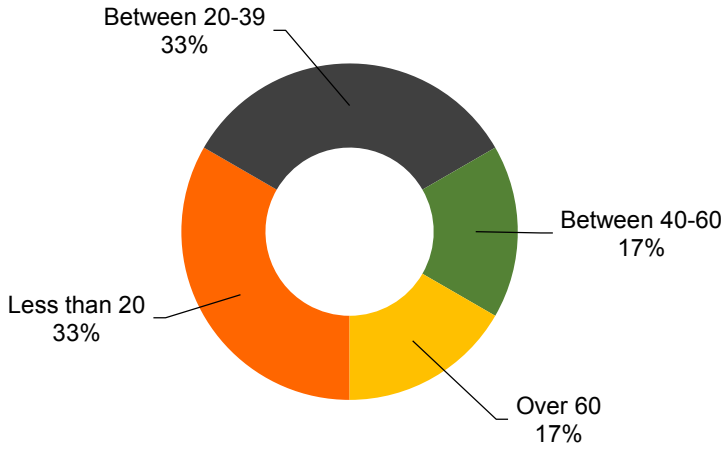
The final question of the IPX migration status section asked how many direct voice termination countries were available via the IPX.

Main results:

There is still improvement lot of work to be done when it comes to directly connected voice IPX destinations, as a large number of respondents said they had less than 20 countries connected directly to terminate voice over their IPX.

- 33% of the respondents said they had less than 20 direct termination coverage, while 33% said they had between 20-39.
- Still some have succeeded in extending their IPX network, as 17% said they had over 60 countries directly connected to their IPX platform.

Q19. In how many countries do you have a direct voice termination coverage?



IPX MIGRATION STRATEGY

Policy regarding IPX customers' interconnection points

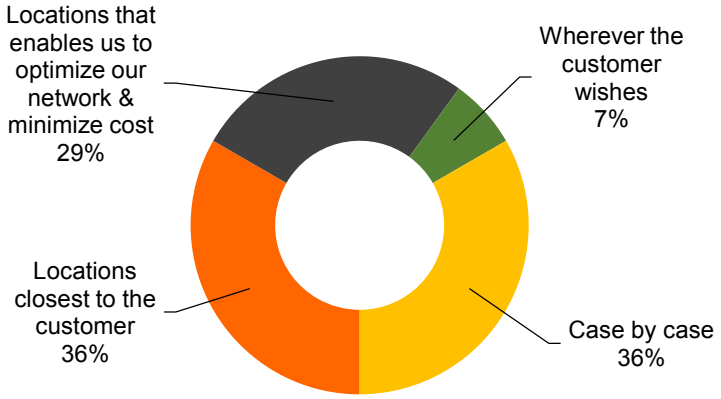
The next ten questions of this survey dug deeper into the IPX migration strategy. The first question in this section asked what policy was available when it came to choosing customer IPX interconnection points.

Main results

The majority of the respondents stated that they preferred to use the location closest to the customer or it was decided case by case.

- 36% said that either they used the location closest to the customer or it was decided case by case.
- The next most popular choice was to use a location that optimized cost
- While only 7% said they interconnected customers wherever they wished

Q20. The majority of the time, do you have a specific policy regarding retail service provider customer IPX interconnection points?



Company's strategy regarding offering IPX services

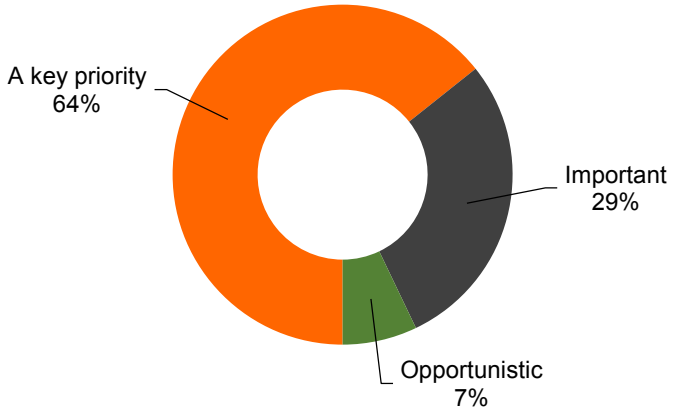
Question two of this section, asked how respondents described their company's strategy regarding offering IPX services.

Main results:

The large majority say that offering IPX services was a key priority for their company.

- 64% said that offering IPX services is seen as a key priority, while 29% said it was important
- Only 7% said it was seen as opportunistic

Q21. How would you describe your company's strategy regarding the offering of IPX services?



Main obstacles to launching IPX services

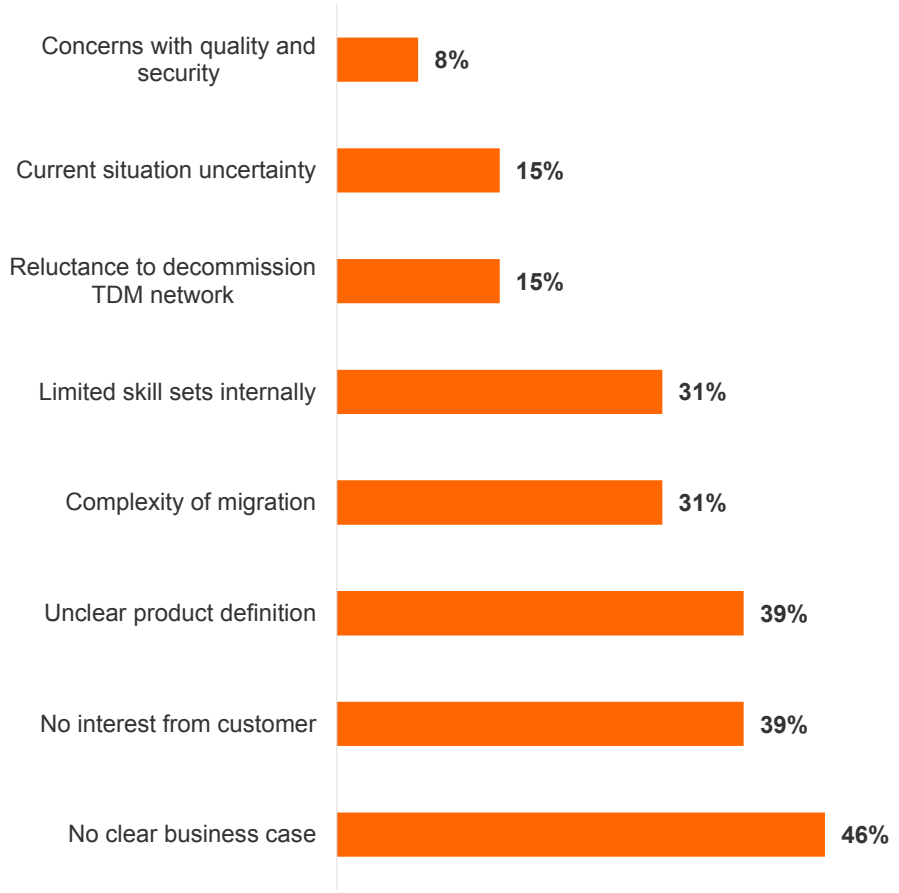
Question twenty-two of the survey asked what were the main obstacles to launching IPX services.

Main results:

The main obstacle to launching IPX services is the lack of a clear business case.

- 46% of the respondents said that the main obstacle is that there is no clear business case
- The two next most popular choices were 'no interest from customers' and 'unclear product definition' as stated by 39% of the respondents
- The following two obstacles were 'the complexity of the migration' and 'the limited skill sets available internally', identified by 31% of the respondents as a main obstacle
- Only 8% of the respondents said that 'concerns with quality and security' was an obstacle to offering IPX services
- Some also said that obstacles were 'the constraints on availability of resources and capacity' and the 'minimal on-net footprint'

Q22. What are the main obstacles to launching IPX services



Main driver to offer IPX services

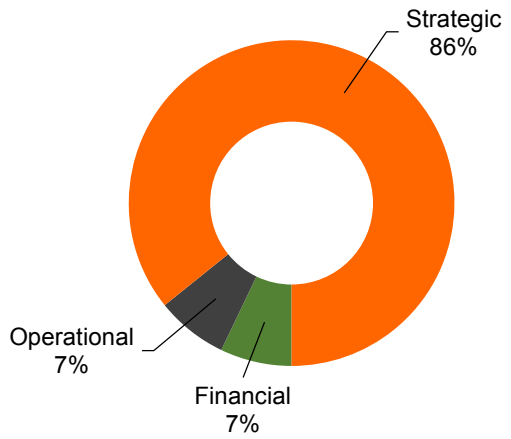
The next question polled the respondents about what they saw as the main drivers for their company to offer IPX services.

Main results:

The large majority see offering IPX providers as a strategy decision.

- 86% of the respondents said that the main driver for offering IPX services was strategic
- Only 7% said either is was for operational or financial reasons

Q23. What is the main driver for your company's to offer IPX services?



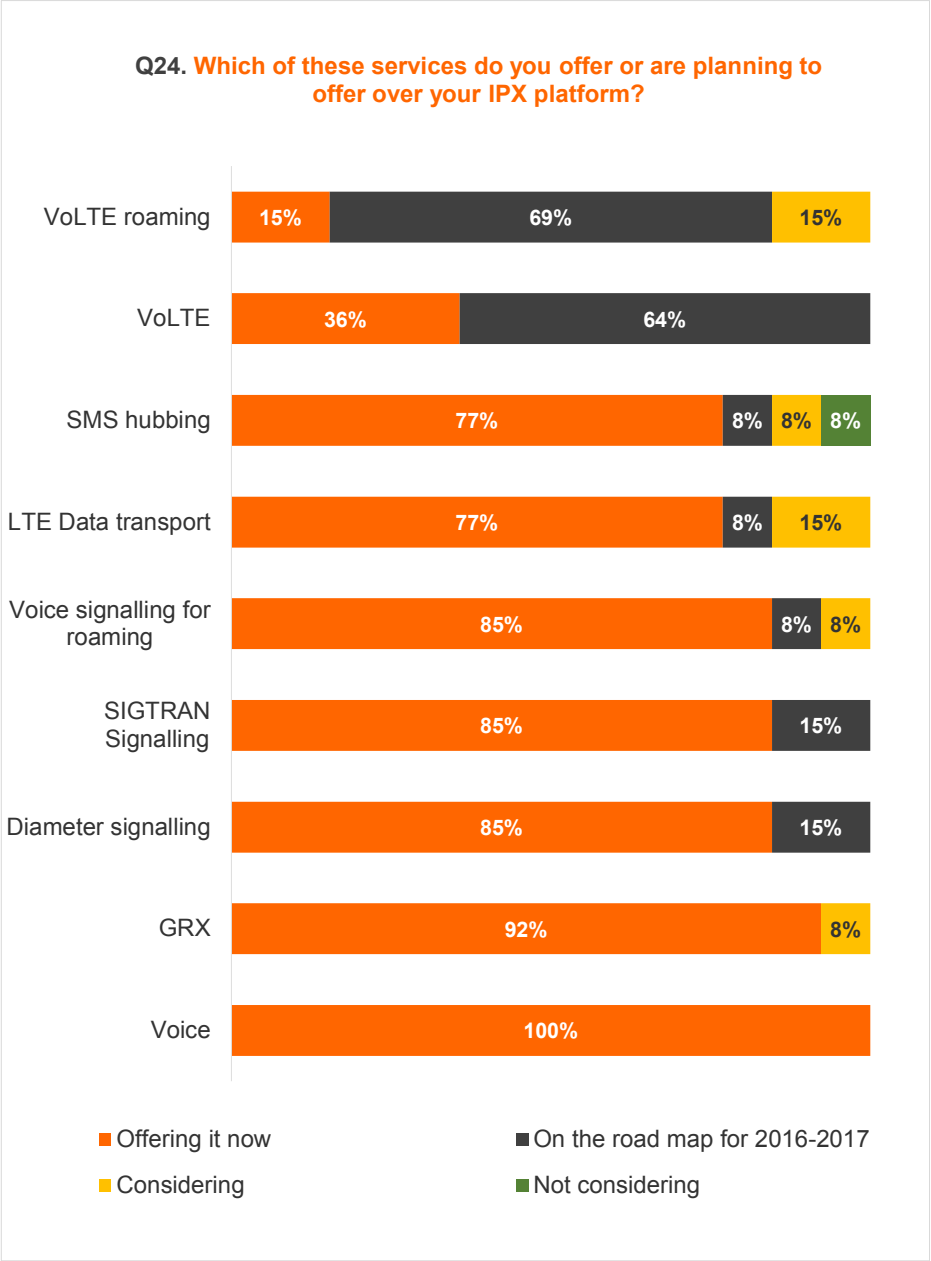
IPX services offered or planned

Question twenty-four asked which of the services did the respondents offer or were planning to offer over their IPX platform.

Main results:

The majority of the respondents offer all the basic services over IPX, however only a minority already support VoLTE and VoLTE roaming (with these two services being on many people's roadmap for 2016-2017).

- 100% of the respondents offer voice over their IPX, while 92% offer GRX services
- 85% of the respondents offer Diameter signalling, SIGTRAN signalling and voice signalling for roaming
- 33% already offer VoLTE services, while a mere 15% offer VoLTE roaming
- The large majority of the respondents are currently working on deploying VoLTE services over their IPX, with 64% stating that VoLTE support is on their road map and 69% say that VoLTE roaming support is presently being deployed
- 15% of the respondents are still considering offering VoLTE roaming support and LTE data transport services



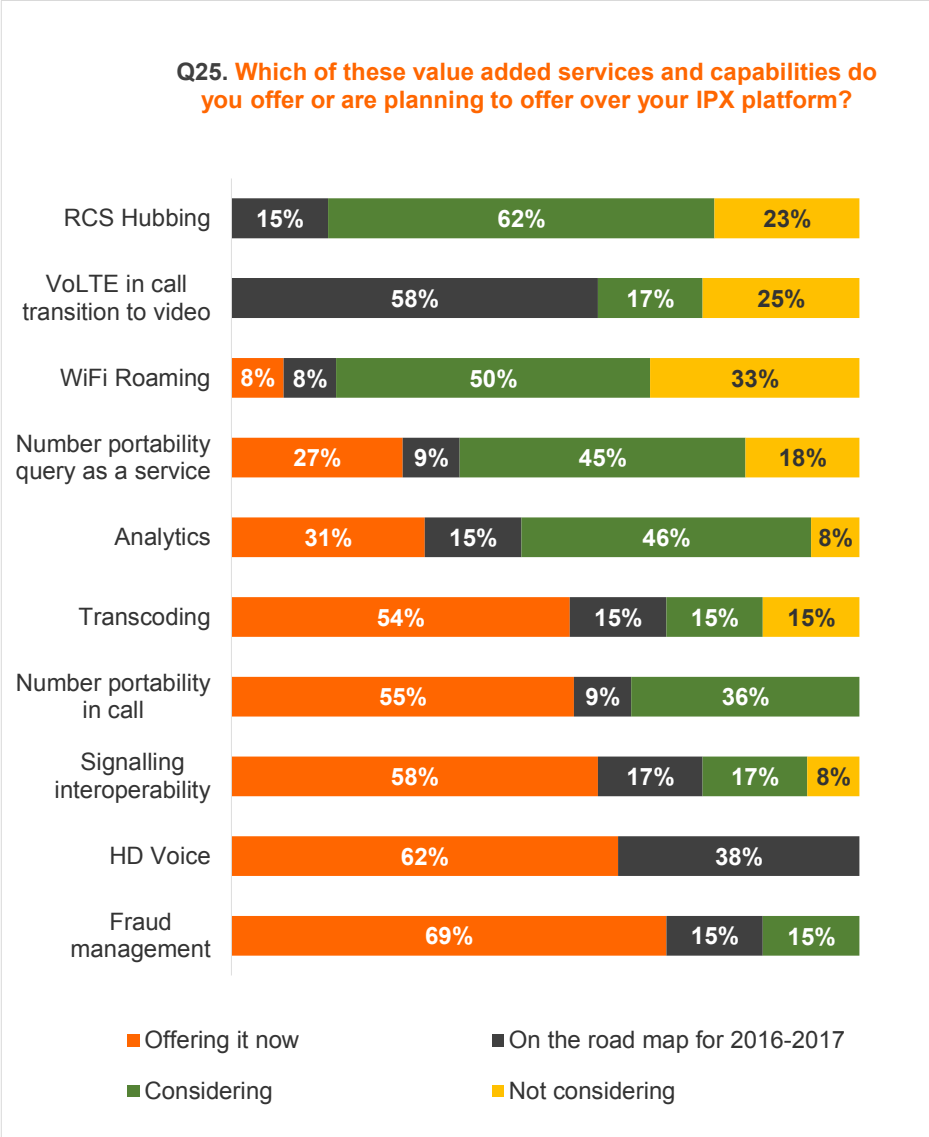
Value added services offered or planned

The follow-on question asked the respondents which value added services and capabilities they were offering or were planning to offer over their IPX platform.

Main results:

At present, the most offered value added services over the IPX platform are fraud management and HD voice.

- 69% of the respondents already offer fraud management services over their IPX platform and 62% offer HD voice
- Over 50% offer transcoding, number portability in call routing and signalling interoperability
- Only 31% offer analytics services and 27% offer number portability query services
- A mere 8% offer WiFi roaming support, while 8% are currently deploying this capability and 50% are considering it. 33% of the respondents said they were not considering offering WiFi roaming at all
- 58% of the respondents stated that VoLTE in call transition to video was already on their road map, 17% said they are considering offering the service and 25% said they were not considering it
- None of the respondents said they were supporting RCS hubbing, while 62% said they were considering offering it



Voice traffic transported over IPX

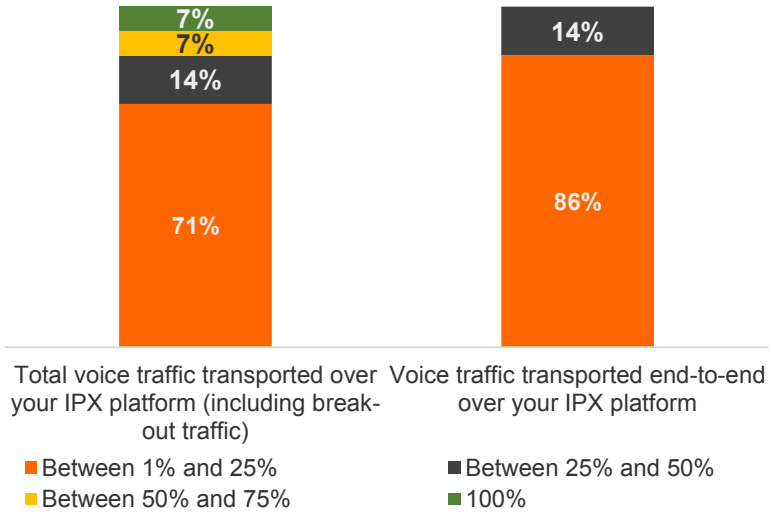
The last three questions of the survey focussed on the traffic transported over IPX. The first question in that category asked how much of the respondents' voice traffic was transported over their IPX platform.

Main results:

There is still some way to go before the voice traffic migration is completed, as the large majority of the respondents say that they only transport between 1-25% of the voice traffic over IPX

- 86% say that their IPX platform transports between 1-25% of their voice traffic end-to-end and 14% say it transports between 25-50%
- 7.% say that their platform transports more than 75% of their voice traffic, when including break-out situations

Q26. How much of your voice traffic is transported over your IPX platform?



Growth of end-to-end VoIPX traffic over the least 3 years

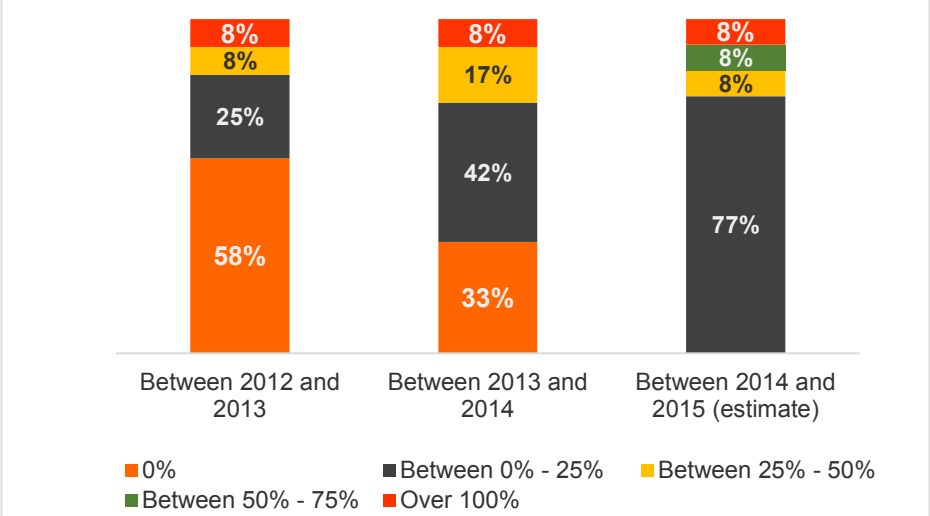
The next question asked how much the end-to-end VoIPX traffic had grown over the last 3 years.

Main results:

The end-to-end VoIPX traffic growth is continually acceleration.

- 42% saw some traffic growth between 2012 and 2013, 67% saw traffic growth between 2013 and 2014. However, all respondents saw traffic growth between 2014 and 2015.
- Between 2014 and 2015, 15% saw their traffic growing by more than 50%

Q27. How much has the end-to-end VoIPX traffic transported over your IPX grown over the last 3 years?



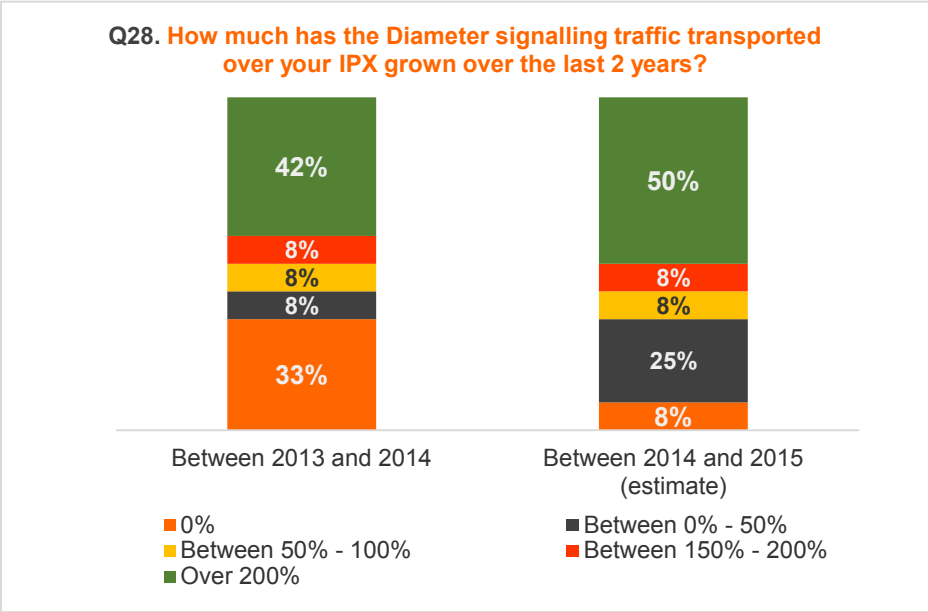
Diameter signalling traffic growth over the last 2 years

The last question of the survey asked how much the Diameter signalling traffic had grown over the last 2 years.

Main results:

Here again, it is clear that the traffic growth is accelerating.

- 50% of the respondents said that they have seen the Diameter traffic transported over IPX grow by over 200% between 2014 and 2015, compared with 42% of the respondents seeing similar growth trends between 2013 and 2014
- 33% of the respondents saw no traffic growth between 2013 and 2014, while only 8% of the respondent saw the same between 2014 and 2015



SURVEY OBJECTIVES & METHODOLOGY

Survey objectives and methodology

Since its inception 8 years ago, the i3forum's main objective has been to foster and accelerate the industry's transition to IP/IPX – for all. This transition is now well underway and has become mainstream.

However, the i3forum realizes that not all carriers are at the same point with regards to transitioning to IP/IPX, some being more advanced than others. To that effect, during March and April 2016, HOT TELECOM and the i3forum conducted a confidential online survey to understand where the carrier community stands, what their plans are when it comes to their IP/IPX migration, what would further accelerate their transition to IP/IPX and how the i3forum can help.

The survey objectives were:

- Take a snapshot of where the members are in terms of migrating to IP / IPX
- Understand the strategy and the transition plans & timeline
- Acquire an understanding of the underlying drivers, the difficulties and concerns
- Understand how i3forum's work has helped so far and what it should do to further accelerate the transition

In this process, HOT TELECOM played the role of an independent facilitator. We ensured confidentiality of the answers, collated and analysed the results and finally produce this report of the findings.

The online survey was completed by 18 i3forum members. It was composed of 34 questions in 5 main sections as follows:

Section 1 - General information

Section 2 - IP migration status

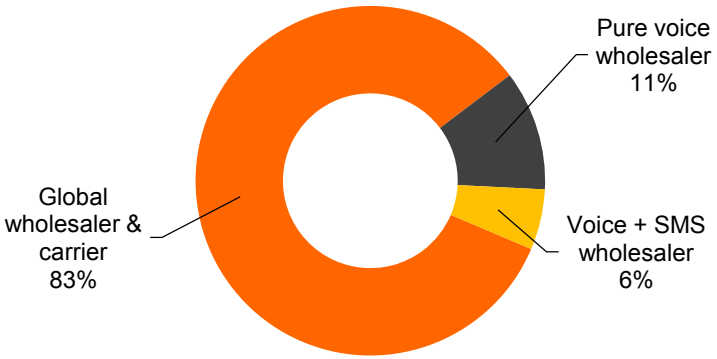
Section 3 - IP migration strategy

Section 4 - IPX migration status

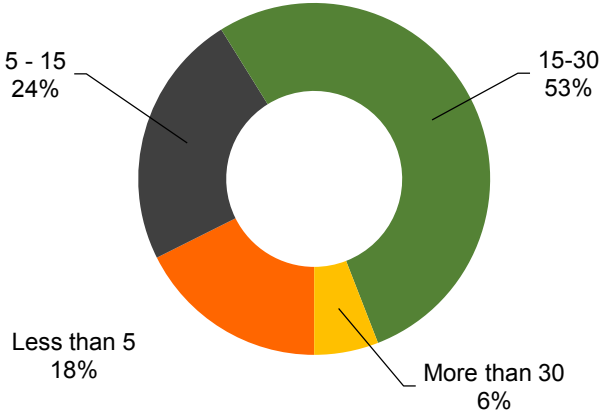
Section 5 - IPX migration strategy

The details of the survey respondents' demographics in terms of type of business, size of traffic transported and number of customers connected can be found on the following page.

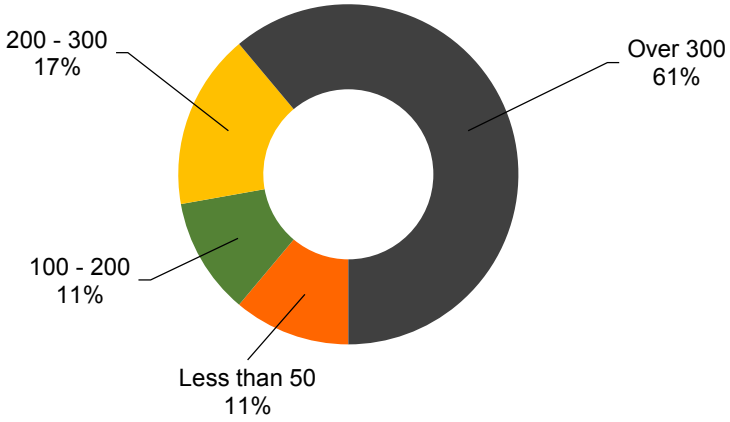
D1. How would you describe your business?



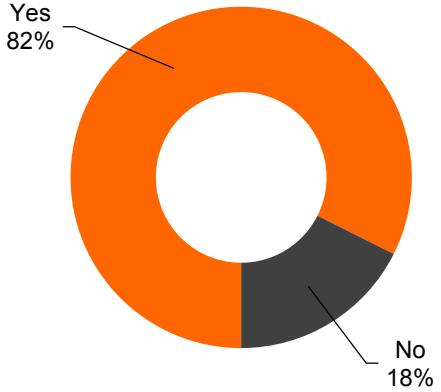
D2. How much international wholesale voice traffic do you transport on an annual basis (billion minutes)?



D3. How many international wholesale customers (at account level) do you have?



D4. Have you implemented an IPX platform?



ABOUT US

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Isabelle has worked for 22 years in the telecoms industry. Her personal expertise ranges from international wholesale through to business strategy, and marketing, along with extensive research and global consulting experience.
She has written numerous articles and spoken at many conferences on the challenges of international telecoms evolution in an all-IP world, a subject close to her heart.

i3forum

The i3forum is an organization of the international carrier ecosystem that brings together all stakeholders in order to help define best practices, promote and foster adoption of Industry transformation, and encourage innovation. The i3forum is a not-for-profit, membership funded forum. It is not a standardization body. It works closely with other industry organizations, avoiding duplication of work and focusing on actionable practical recommendations and solutions for the Int'l Carriers industry.

For more information, visit: www.i3forum.org

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We understand the challenges faced by international carriers better than anyone, and have therefore developed a number of research and advisory tools and expertise to mirror these needs, and provide the support any wholesaler requires to survive and thrive in the current environment.

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