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# Network sharing – from paper product to bottom line impact

## Northstream white paper

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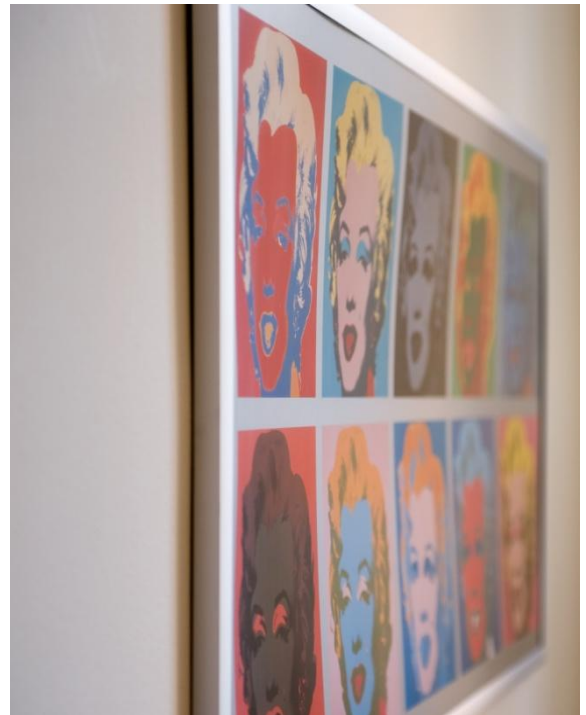
On the outset, the benefit seems obvious; Network sharing saves cost = increased profitability.

But is it always straightforward or are there pitfalls to consider? The most talked about potential downside is of course how to ensure a collaborative spirit between competitors. Another obvious one is the technical integration with the respective non-shared portions of the networks. And then there are many more, not all being visible in the early stages of Network Sharing agreements. Typical prerequisites for success are clear and thorough planning in the setup phase, agreements on how to handle CAPEX and OPEX investments, a clear decision process and steering procedure between the collaborators and the jointly owned control entity. Agreements to facilitate this setup can preferably be set up and mediated by a standalone neutral party.

This white paper outlines some of the common and well known facts about Network Sharing, but – more importantly - it also addresses some of the intricacies and their maybe less obvious resolutions

In short, we believe that two things are crucial for the success of a network sharing collaboration. The first is establishment of a careful integration and operations plan executed by a neutral party to enable a solid base for the collaboration and steer away from political sub-optimization. In addition, there is a distinct need to setup a clear and thorough governance model that dictates principles for decision processes regarding CAPEX and OPEX

investments. Both points need to be addressed in order to enable sufficient room for operator unique strategy and growth within the boundaries of the collaboration. Sharing costs does not have to mean sharing strategy, at least not if the collaboration is setup properly.



**Introduction**

Network sharing is again surfacing as a hot topic having been rather quiet since the first hype post 3G licensing early this millennium. Early out were TeliaSonera/Tele2, Telenor/3 Sweden and T-mobile/3 UK, all touting cost efficiency as a key driver for the collaborations. A recent example is Vodafone and Orange UK branches making a large scale effort to share and jointly evolve their 3G/HSPA networks.

Hype and a lot of press is of course one thing making operators ask themselves the question whether this is something for them. However, there are also real economical pain points that are pushing the question. Mobile broadband growth is putting CAPEX pressure on the operators and the cost per MB to deliver the service is now a key KPI to follow in order to make bottom line profitability on the high growth service.

So, competition is actively pursuing NW-sharing and end user behavior is pushing CAPEX and OPEX. These two facts should then be enough for every operator to ask themselves;

1. What are the potential benefits?
2. How can I do it?
3. What are the barriers and potential issues and how can I tackle them to take this from a “paper product” to an actual P&L and Balance Sheet impacting measure.

This paper focuses mainly on the more forgotten third question; What the key issues are and how to tackle them.

**Key challenges ahead that pushes need to evaluate network sharing**

As mentioned in the introduction there are some fundamental market evolutions that are pushing the need to overview CAPEX and OPEX. We have identified three key developments in the mobile market stemming from mobile broadband adoption:

- Mobile broadband build out/introduction
- Mobile broadband capacity upgrades
- Business model evolution fit with end user behavior

*Mobile broadband build out*

A large number of operators are in the midst of making massive CAPEX investments to enable 3G systems to provide mobile broadband in terms of HSPA, HSPA+ and eventually LTE. The uptake in most countries has been tremendous.

In addition, operators need to make a platform decision on whether to stay with old legacy platforms or to move to new and more future proof platforms for the delivery of mobile broadband services going forward.

*Mobile broadband capacity upgrades*

With the uptake of subscribers using mobile broadband, many operators have also moved away from an introductory and roll out mode to capacity bottleneck rinsing. There are significant CAPEX investments to handle the increasing backhaul need of mobile broadband traffic in addition to increasing the access capacity of the networks. We believe that native IP transport and Optical transport need to be considered as part of plans for future growth.

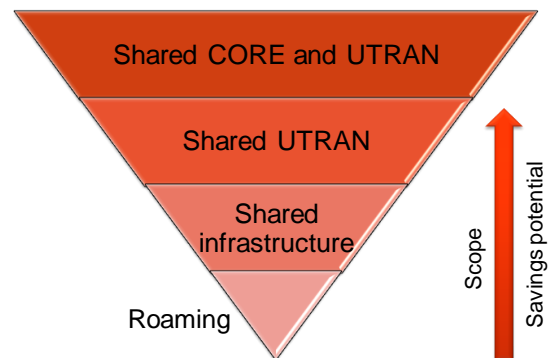
*Business models*

While the first two developments are affecting CAPEX and OPEX, the business model established for mobile broadband sees the revenue side being rather flat. Flat rate bundles of speech and data sees the *revenue side of the business scaling with the number of subscribers, not the amount of data being used*. I.e. the revenue side is linear while the cost side is looking to be exponential due to change in traffic consumption when getting a flat rate bundle. The need to balance the equation for this turns operators to reducing cost.

All three developments points to the increasing need for efficiency in using CAPEX and OPEX items directly related to delivering the services ahead. This is where Network sharing benefits come into play.

**The scope of sharing sets the boundaries for cost savings potential**

There are a number of different ways to do network sharing, all depending on how deep you want to go in the partnership agreement. The bigger the scope, the bigger is also the cost sharing potential.



National roaming is a fast way to utilize two assets as “one”. The potential cost saving is depending on how complementing the two operators’ networks are

in terms of capacity and coverage. It does not imply any shared infrastructure or joint investments.

Sharing infrastructure implies taking one step further and sharing the CAPEX and OPEX for sites. The number of sites is a key cost driving factor for large scale mobile operators and being able to share this cost is a significant improvement.

Sharing UTRAN or UTRAN/CORE implies also sharing the direct equipment cost. Joint procurement of equipment and possibility to scale up existing equipment are key cost savings parameters. It also implies a higher complexity in managing the joint networks.

In short, the bigger scope, the higher cost savings potential. Quite natural of course, but bear in mind the flipside that adding scope also means adding complexity to the collaboration.

### Network sharing revitalized

Having recognized the market and internal operator drivers for network sharing, we turn to the benefits and potential challenges.

### Network sharing upside

Network sharing can reduce both CAPEX and OPEX in a number of ways for an operator.

*CAPEX reductions can be achieved by:*

- Sharing investment in new site infrastructure. I.e. concrete, fences, masts, real estate and civil works.
- Sharing investment in new equipment. I.e. BTS/NodeBs, Transmission equipment, fiber network and switching and Core equipment. Joint procurement and scaling of the joint equipment requires less investment than two completely separate equipment setups.

*OPEX reductions can be achieved by:*

- Reducing the number of sites. With a shared network the operators can share the number of sites that used to be needed by each one individually, ideally reducing the theoretical number of sites per operator to 50% of the pre-sharing settings.
- Reducing the cost per site and operator. In addition to this, each site cost will be shared by the two operators. Rent, electricity and potentially transmission can be shared.
- Reducing the operating cost for the network management. Joint O&M cost will be reduced by the reduced number of sites and equipment needed to maintain.

Finding a suitable collaboration form can thus be very attractive to address the OPEX and CAPEX issues mentioned previously.

### Network sharing challenges

Even though there are clear upsides in network sharing, the altered characteristics of the network as a result of the transition into a mobile broadband network need to be kept in mind. As the network needs to deliver higher and higher throughput it becomes increasingly more capacity limited, as opposed to coverage limited, which reduces the CAPEX saving potential. It is our view though that also in a mobile broadband build-out or capacity expansion scenario the network sharing benefits still remains.

With the benefits in mind, there are still a number of key questions to ask and address in order to turn the “paper product” into a real value creating decision. In particular if the intention is to go all the way to sharing RAN and/or Core equipment.

We have identified 3 key aspects to address in order to make network sharing truly successful:

#### 1. Network integration

Network sharing is proven since a number of years and is today supported by the telecom suppliers as part of their solution portfolios. Even though the solutions to handle the shared network exist there are however still issues that need to be kept in mind when planning the collaboration from a network integration point of view:

*Multi-vendor environment* – If the network sharing scenario includes multiple vendors, there are aspects that need to be considered very carefully. Multi-vendor situations may arise from combinations of multiple suppliers of the shared network and or multiple suppliers to the collaborating operators’ home networks<sup>1</sup>. Depending on the specific degree of sharing and the setup of the collaboration agreement, there can be many different kinds of multi-vendor scenarios. In any of these situations interoperability issues such as full mobility feature support (i.e. handover) and backend system integration (i.e. charging support) need to be handled. Even though this is not unique for network sharing as such and the fact that multi-vendor networks are today very common with proven solutions, the degree of complexity increases in a shared network and therefore need to be handled with great care.

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<sup>1</sup> Here we refer to home network as the part of the network that is maintained and operated by the individual operator. Depending of the level of sharing and the collaboration agreement these may be more or less widespread.

Since one of the fundamental principles for network sharing is that the collaborating operators shall get the same support from the shared network, this must always be the starting point when formulating the interoperability requirements. An example of this can be to assure the same level of handover support for the collaborating operator's customer when moving inside and across borders of the shared network.

The integration of shared infrastructure towards multiple operators requires synchronization between all parties. In case of multi-vendor scenarios this may create another level of complexity in the integration, testing and acceptance process, increasing the overall effort required. All together a multiparty integration project requires a project plan with buy-in from all parties that includes good enough margins to be ready on time to compensate for the additional complexity.

*Operator proprietary services* – Key to the possibility of upholding competitiveness and differentiating the market offering between operators is to maintain the operator proprietary services. Each of the operators thus need full support from the shared network to enable all distinct services on their commercial menus. This may require specific software development, which in turn needs to be tested and accepted by all parties.

The challenge here is perhaps not to guarantee the support but rather the administration and maintenance effort required to handle multi-operator service requirements. As an example: nuances in end-user services must be possible to deliver without compromising the confidentiality of the collaborating operator's service menu development. Needless to say, in multi-vendor situations this challenge increases even further.

We believe a key contributor to successful planning and development of a shared network setup is careful specification of the integration points to all identified interfaces between the parties, specifically keeping record of all interoperability issues that need to be solved. Participating operators should be actively involved in signing off the requirement specifications, time-plans for execution and the share of responsibility.

## 2. O&M process integration

A corner stone in the operator's possibility for efficient customer support processes is to get continuous information from subscriber-impacting network events as well as efficient handling and rectification of customer complaints. The challenge for collaborating operators sharing a network is to create a generic process that handles the O&M processes independent of customer origin but at the same time allows for operator differentiation. As the support process in itself has become a competitive tool between operators the possibility for

differentiation must be secured even if it is dependent on mutual and common processes.

Since geographical distribution of users and usage patterns impact the requirements for customer support, a common O&M process need to be established on SLA requirements with direct and independent input from the collaborating operators. Customer support is sometimes also differentiated with respect to subscription type (e.g. gold customer sites with extra high level of support as part of subscription terms), and in a network sharing setup these differentiation possibilities must be supported. The main challenge here is to arrange the setup in a balanced and neutral manner to avoid creating a conflict in priorities and specification of SLAs.

A developed O&M process that meets all requirements and at the same time is efficient requires a balance between compromises and priorities. The parties need to negotiate the target process and associated SLA's based on a prioritized list of requirements. It may be beneficial to use an external party to act as a neutral party and mediator and to take the necessary specification to a closing.

## 3. Decision process and interfaces

A collaboration agreement to steer and control the shared network must be based on fair principles, mutually agreed between parties. These principles need to include answers to the key questions on how to distribute the operating costs and the future developments of the shared resources. In a mobile broadband enabled network, these aspects become increasingly important since the broadband users share and consume the available spectrum (i.e. capacity limited).

As an example: the subscriber split between traditional mobile and mobile broadband services impacts the operator's requirement for broadband network development. Market strategies can therefore be quite different between the collaborating parties based on the actual uptake of traffic and thus create deviations in priorities and objectives. The collaboration agreement needs to be set up to handle these potential conflicts of interest. Key questions here relate to trigger points for functionality and capacity investments and how they are handled on a day-to-day basis.

In addition, as pointed out earlier in this paper, differences in traffic growth in relation to the revenue structure and development increase the need to reduce the CAPEX cost base, but it also reveal a potential challenge for the handling of the running cost as well. If the collaborating operators' actual share of bandwidth consumption deviates too much, this may result in a need to handle and distribute the cost based on usage rather than by share of ownership.

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The agreement structure to handle the aspects around the distribution of running costs and future investment therefore becomes very important and fundamental for a successful and flexible co-operation.

Northstream believes that a clear and early establishment of a framework for governance, decision process, responsibility and share of contribution is key to be able to tackle these potential obstacles in a mutually beneficial manner. The framework should be formed around simple and pragmatic principles to enable maximum independency for the operation of the shared network while at the same time distribute cost, both CAPEX and OPEX, according to a fair share principle. Long term strategic planning, as an integral activity part of this framework, in joint development forums, can establish a solid environment for participating operators to develop their individual business strategies without compromising their competitive edge and while still making precious savings on commonalities.

### Conclusion

Network sharing can be an efficient way to reduce cost per delivered MB to the end user. In a time where cost efficiency is high on every CFO's agenda due to exploding data volumes, investigating the potential is a "no brainer". However, to move from potential to realized impact, there are a number of practical things to consider to actually reaching the set targets.

In order to reap the potential benefits, establishment of a careful integration and operations plan executed by a neutral party enables a solid base for the

collaboration and steers away from political sub-optimization of the shared network infrastructure.

A clear and thorough governance model that dictates principles for decision processes enables efficient handling of CAPEX and OPEX related investment decisions.

Joint ownership of an executing company (netco), with undisputed integrity and solid trust, handling the shared network on behalf of its owners has been a successful model to structure such governance around. The netco acts as requirements aggregator and mediator in the process to find best possible solutions for daily and long term problems. The independency and integrity play an important role in this matter, for the netco's possibility to act in all its owners' interest while at the same time strike a balance between operator specific solutions and efficiency. The Swedish company 3GIS, a joint venture owned by 3 and Telenor, is an example where such a model have been used by its owners successfully.

To enable necessary dynamics, the steering of the netco by its owners must involve a revision process where the principles and results of the netco in terms of value add to its owners is reviewed on a regular basis. Long term stability in CAPEX and OPEX development as a result of the netco operation is one of the key criteria to monitor closely.

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