

In 2008, when the Telecom Regulatory Authority of India (TRAI) allowed the sharing of active infrastructure, the move was seen as a big step forward for the Indian telecom industry. {K2Splitter} In 2008, when the Telecom Regulatory Authority of India (TRAI) allowed the sharing of active infrastructure, the move was seen as a big step forward for the Indian telecom industry. Telecom players, infrastructure providers as well as industry experts were of the view that active sharing would replicate the success seen on the passive sharing front.

However, today, even after three years of allowing partial active sharing, the concept has not picked up in the country. In the initial period after its launch, the lack of operators' interest was attributed to the fact that most of the operators had their respective networks in place. Each operator had deployed different equipment, had varied vendor contracts, different approaches to network planning and a dissimilar network on many fronts. Hence, even though active infrastructure sharing presented a compelling business case on financial spreadsheets, implementing it on legacy networks was a Herculean task.

Nevertheless, the government and TRAI have taken steps to boost active sharing in the country. TRAI, on its part, released its recommendations on telecom infrastructure policy and gave pointers for the development of a road map for active infrastructure sharing. The Ministry of Communications and Information Technology has recommended spectrum sharing under the draft National Telecom Policy (NTP), 2011. These steps are likely to increase the viability of active sharing as a concept.

### Current status and growth drivers

The launch of new technologies, and 3G and broadband wireless access (BWA) services is likely to provide an impetus to active sharing. Given the huge investments in the 3G and BWA segments, operators have initiated alliances for active infrastructure sharing.

Business models for active infrastructure sharing are still evolving and there is likely to be a simultaneous existence of multiple ownership models, including a combination of intra-circle roaming, sharing on the transmission side and radio access network sharing.

There are a number of factors driving the growth of active sharing. Among them, limited spectrum availability is a key factor driving the need for active sharing. 3G operators who were unable to win pan-Indian spectrum and licences have already started active sharing on the inter/intra-circle roaming model to provide 3G services to subscribers across the country. These agreements are currently under the government's scanner.

Also, the 5 MHz spectrum allotment for 3G would prove to be insufficient once the services pick up. It is a similar case with BWA services. In the BWA auction, each operator received 20 MHz of spectrum, which is inadequate to provide mobile broadband services in dense and remote areas, especially where wireline broadband has low penetration.

On the 2G front as well, the key operators continue to face capacity issues, which in turn affect the quality of services for end-users. In such environments, active infrastructure sharing agreements allow operators to pool their resources and use their spectrum assets more efficiently, through efficient network planning and deployment, which maximises network coverage and capacity.

Recognising that spectrum is a key issue, the government is likely to allow sharing and pooling of spectrum by two or more service providers under the NTP 2011. Also, TRAI, in its recommendations on the telecom infrastructure policy, has extended the purview of active sharing beyond the limits defined in the 2008 regulations. It has suggested that infrastructure providers should be permitted to install and share active network limited to the antenna, feeder cable, Node B, radio access network (RAN) and transmission system, subject to the condition that they are brought under the proposed unified access service licence regime.

It further recommends that operators should be allowed to share their backhaul from the base transceiver stations (BTSs) to the base station controller because optical fibre, though available in urban areas, is not being optimally utilised. Hence, the recommendations say that sharing should be permitted on optical fibre as well as wireless systems at certain nodes.

### Types of active sharing

#### RAN sharing

RAN sharing is the most comprehensive form of access network sharing. It involves the sharing of all access network equipment, including the antenna, mast and backhaul equipment. Each of the RAN access networks is incorporated into a single network, which is then split into separate networks at the point of connection to the core.

One of the key drivers of RAN sharing is the need to reduce operational network costs in the current scenario of increasing downward pressure on ARPUs. Sharing part, or all, of the RAN network produces substantial savings for operators and it has been estimated that the cost savings could increase free cash flow by up to 20 per cent. RAN sharing may also be commercially appealing in rural and peripheral areas with lower subscriber density and low ARPU users.

However, operators may face challenges in implementing a shared RAN network formed from existing networks, as their architectures have evolved independently. For example, there may be complications in the interworking of equipment purchased from different vendors, and operational procedures and control mechanisms. Due to these issues, RAN sharing has not seen much success in India yet.

### Intra-circle roaming

Network roaming can be considered a form of infrastructure sharing, although traffic from one operator's subscriber is actually being carried and routed to another operator's network. There is no requirement for any common network elements for this type of sharing.

Roaming produces benefits primarily through delayed or reduced investments in network infrastructure. This is particularly beneficial for operators rolling out new networks like 3G and BWA as they can achieve a greater geographical presence with a shorter time-to-market. This model is rapidly gaining traction as it was adopted by new operators launching 2G operations and is now being used by existing operators like Bharti Airtel, Vodafone India, Idea Cellular, Aircel and Tata Teleservices Limited for the launch of 3G services at a pan-Indian level. However, the government and TRAI are opposed to such agreements as they result in a set-up similar to a mobile virtual network operator, which is not permitted under the current licence terms.

### Spectrum sharing

Spectrum sharing typically involves more than one operator sharing the spectrum for the same or different wireless services. Sharing is a viable option for two or more operators because spectrum is a scarce resource that is often underutilised by one operator in a given area.

Different varieties of spectrum sharing concepts are prevalent among service providers across the world. In the simplest form, it can be done by leasing the given quantum of spectrum in a geographical area for a given period. The other method is by pooling spectrum resources by the service providers, and effectively deploying them to provide better services to customers and economising on the number of BTSs needed to roll out services. In such cases, the dependence of operators on each other increases and such spectrum sharing is generally preceded by active infrastructure sharing among them.

The government is considering allowing operators to share spectrum to help cope with the shortage of available airwaves. The first draft of NTP 2011 talks about allowing for sharing, trading and pooling of spectrum. The guidelines for sharing may follow recommendations from TRAI, which suggests allowing spectrum to be shared between two or three operators as long as none of them individually holds more than 4.4 MHz of GSM or 2.5 MHz of CDMA spectrum.

### Backhaul sharing

Sharing of backhaul is a strategy that helps reduce costs and utilise the available infrastructure effectively. The cost of backhaul contributes significantly to operational costs, especially when traffic is low (in rural areas or when the service is launched). When towers are shared, the laying of individual backhaul networks is avoidable. The network laid by one service provider can be easily shared by all the others.

Sharing a common backhaul is very useful in rural environments, where traffic from the BTS to the base station controller is very low. A common radio frequency or optical fibre medium can be utilised, reducing costs and maintenance efforts. Also, exits from such sharing arrangements can easily be provided, if warranted, due to an increase in traffic or other reasons.

Regulatory or licensing conditions may preclude operators from sharing backhaul facilities, especially when spectrum is employed (as with microwave links). In India, sharing of radio backhaul is not permitted under the licensing conditions. Due to this, operators have to install separate antennas on towers, in addition to the antennas used to communicate with handsets. This increases the weight of the antennas on the tower, requiring higher and heavier towers, increasing the cost of construction and adding to the visual intrusion. Therefore, it may be more practical to share fibre and limit the sharing of radio backhaul facilities in low-traffic regions.

### Core network sharing

Core network sharing involves both radio and core network elements, permitting one or more partner service providers to access some or all of the mobile network, including electronic components such as optic and feeder fibre cables, radio links, network elements, backhaul, antenna and transmission equipment.

Sharing of the core network is technically possible, but it does raise some commercial concerns. The core network performs several functions in areas essential to service performance such as billing. It also contains a large amount of confidential information on the operator's business. These matters can complicate the sharing of the core network. Also, the cost drivers for core network sharing are the same as those for RAN sharing, but tend to be lower in value. Due to these factors, this concept has not gained much traction yet.

### Conclusion

Despite the benefits offered by active sharing, the concept raises a number of competition-related concerns, which have hindered its growth. Active sharing allows access to operators' networks, which leads to sharing of confidential information like network costs, operations, technology and other key data. Sharing may, therefore, provide opportunities for collusion on pricing, service packages and network development. It may also lead to other issues between the collaborating operators. For instance, there may be delays and refusals to grant access to network infrastructure, especially if one of the players possesses dominant market share and power. On the flip side, too much of collaboration between two operators may lead to anticompetitive practices and a reduction in the incentive to innovate.

Hence, for active sharing to flourish, a clear and transparent regulatory road map is imperative. A regulator, after judging market conditions, can formulate guidelines that do not affect competition parameters like prices, promotional schemes or service and network quality. The regulations should also restrict sharing of confidential information, which may lead to tariff parity or negatively influence competition in the market

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