Question 1:

Suntel has already begun to implement network based NGN services. These services offer hosted alternatives to all types of business which will ultimately lead to more sophisticated services being delivered to smaller businesses at lower cost. The clearest example of this is the delivery of hosted IVR and PABX services to customers allowing feature only available in advanced IP PABX's to be delivered to small enterprises.

Services can be delivered using various access technologies allowing services to be offered in all environments.

Question 2:

The current licensing regime and the charges imposed by TRCSL make investment increasingly difficult. TRCSL has allowed rates to fall for all telecommunication services and thereafter taxes the low rates so that the consumer does not feel the benefit of a low tariff pricing regime. In addition the wireless operators are disadvantaged by the high charges levied for the use of spectrum. Therefore the rate of investment in new technologies is hampered.

Question 3:

No comment

Question 4: *Do you see any issues or opportunities relating to access to, and use of spectrum now? Will issues and opportunities potentially emerge from telecommunications and broadcast convergence?*

Ideally the copper should be unbundled and made available to competitive fixed line operators such as Suntel, so that a level playing field can be established in the Fixed services arena. In our opinion this would be the fastest and the most economical way to develop Broadband services in Sri Lanka. However, we do understand that this is unlikely to happen in the near future. The quality and affordability of Broadband that suits the needs of everyone in Sri Lanka can only be realized by

creating a healthy competitive environment in which all operators can compete on a level playing field. However, SLT is enjoying an undue advantage today since no other operator has access to the copper plant. For SLT, capex required to provision a broadband connection is less than $20. Moreover, the CPE unit which is an ADSL router has to be purchased and maintained by the customer. Thus SLT has an enormous advantage on the delivery of Broadband service in Sri Lanka.

Competitive service providers such as Suntel have to rely on Wireless based networks, which are obviously far more capital intensive. Competitive service providers are barely managing to stay in the market through aggressive control of cost and waste, productivity enhancements and superior customer service. The biggest problem we are facing today is about spectrum. Firstly, we do not have sufficient spectrum to build a proper public wireless broadband network. The present allocation of 10.5MHz of 3.5GHz spectrum is insufficient to build a meaningful broadband network. Suntel' WiMAX network uses 1.75MHz channeling which means a base station sector can only support about 2 to 3Mb/s bandwidth which will be shared among all users in the sector. Therefore it is imperative that TRC takes steps to release spectrum preferably in 2.3 or 2.5GHz bands that support both WiMAX and LTE technologies. The spectrum should be made available in sufficient volumes so that a true broadband service can be delivered to the end users.

The other impediment is the cost associated with the spectrum. The annual fees payable in respect of spectrum have gone up by a disproportionate amount over the last couple of years, and this has made the delivery of broadband over wireless a commercially unviable proposition. Therefore, we feel that the overall cost of spectrum compatible with broadband wireless has to be brought down to meaningful levels in order to promote the development of such networks, which in turn would make broadband affordable to the masses.

Question 5: *Do you believe that innovative voice services such as Skype and Google represent a threat or an opportunity for the Sri Lankan telecoms market? What are the roadblocks to realizing benefits from such services?*

Internet literally puts us in contact with the whole world. When such a comprehensive network is available it is only natural that content providers and virtual service providers emerge, and start offering their services over the Internet. This unlimited potential is also the reason for Internet to be so popular today. In this context the virtual service providers such as Skype and Google have undoubtedly made the Internet more appealing to the masses. Therefore, branding them as a threat to the conventional network operators, and thereby restricting their use will only make the Internet

less appealing to the public. Our view is not to curtail their business but to recognize them as a value added service provider, which needs to be there to make the broadband business a success. We also recognize the fact that conventional network operators will have to change their business model by transforming into a network access provider. However, in order to maintain the profitability the concerns expressed under question # 4 need to be addressed first.

Question 6

The purchase of telecommunications services is not dependant on the content provided by the service provider unless the service provider has the sole rights to content that is regarded as unique. i.e if one operator had the sole rights to all aspects of Sri Lanka Cricket and the network was the only way of accessing that content.

Suntel believes that the model for future regulation should be based on the European model of regulation which leaves all commercial regulation to the pertinent competition authority and leaves the telecommunications regulator to resolve issues of a technical nature or various spectrum allocations.

Question 7: *Please describe your planned migration to NGN. (a) What is your technical strategy to migrate to NGN, if any? (b) What will be the key phases in your migration to NGN, and what phase are you currently in? (c) What is your anticipated timescale for each of these phases? What technical issues need to be resolved to allow you to offer the services you would like to be able to offer today, and over the next four years?*

Suntel has already invested a large sum of money on state of the art NGN and IMS platforms, and has even commenced migrating customers from legacy networks on to NGN. Suntel had little choice with regard to adopting NGN because vendors terminated their support for legacy networks years ago, and hence it was not feasible to manage the old and unreliable networks without spare parts and vendor support. However, the migration has been an uphill task due to number of reasons, but the main issue, as explained under Question # 4, has been the lack of spectrum.

Migration to NGN has many other challenges too, but these are largely of technical nature thus can be overcome. For instance FAX and POS type services that work well on TDM networks are struggling to maintain the same quality on IP networks. POS in particular is a concern because world over POS machines have been designed to work on PSTN networks.

Question 8*: What is the impact of NGN on existing telecommunications networks and services revenues, in light of the overall benefit that may be derived from the introduction of NGN? Do you think the TRCSL should play an active role in the migration to NGN? If yes, what measures should the TRCSL take during the migration and in the course of the long-term adoption of NGN technologies and services?*

From a business point of view the introduction of NGN should not have any impact on the existing revenue. However, as pointed out above there will be some technical glitches especially with regard to not having sufficient spectrum, which will have a negative impact on the whole project.

TDM networks have been operating successfully for decades mainly due to strict compliance to standards by all stakeholders. Similarly, Sri Lanka should follow one set of standards and policies in line with global trends for the development of NGN networks and subsequent adoption of its services. TRC has a clear role to play here as the regulator. The last thing the industry wants is the adoption of different standards by different operators thus making it impossible to coexist in the future.

Question 9: *What are your preferred protocols, architecture and interfaces for interconnection with the PSTN, other NGNs, and with international networks (voice and Internet)? Please describe in detail the associated timeframe for each of your choices, in relation to your overall migration roadmap described above.*

Interconnections of voice service

As previously mentioned Suntel has already deployed an NGN platform together with a state of the art IMS platform, and are halfway through migrating customers over to the NGN. Furthermore, the Interconnection Trunks have also been transferred on to NGN which interface with other operator networks via the Media Gateways. Suntel believes that TDM interconnection is the best, at least for the foreseeable future, considering the lack of regulation and immaturity of technology at present. Therefore, Suntel wishes to propose that the existing and future interconnections with local operators to be done at E1 and STM-1 level while signaling is done using SS7 as depicted in Fig 9.1. However, the industry could consider IP interconnections in the future when an environment conducive for such interconnections has been created i.e. processes are in place for monitoring quality of service, standards

4

have been clearly defined and a governing body for resolving interoperability issues has been established etc.
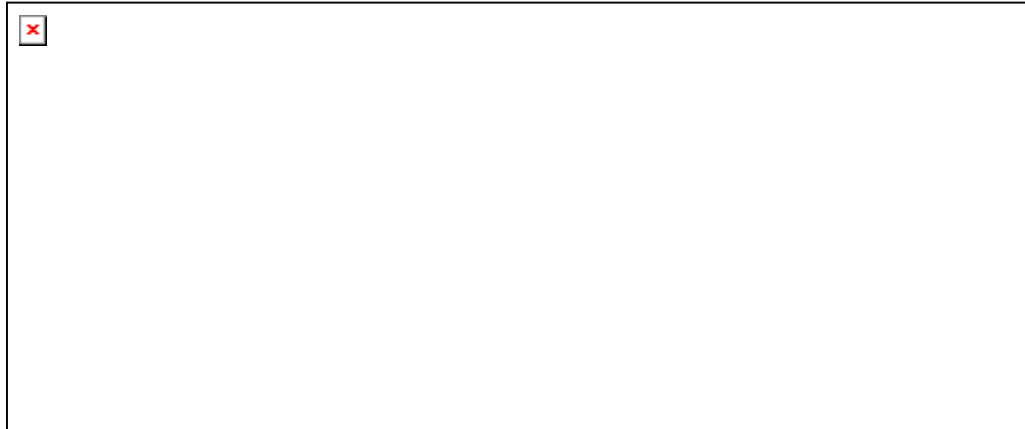

Fig 9.1 – Voice Interconnections

Furthermore, Suntel would like to make following suggestions with regard to local interconnections.

1. Considering the cost of Media Gateways and the insufficient or lack of IP infrastructure available in regional cities it is proposed that interconnections are carried out only in Colombo

2. Terminate interconnection traffic on two media gateways for greater network resilience

3. Interconnect at STM-1 level for simplicity and cost advantage

4. Establish a governing body to administer matters relating to interconnections

5. Conduct technical trials and document parameters required to operate various services across NGN networks in Sri Lanka

6. Plan for the IP level interconnections in the future. Consideration to be given to;

    1. Measuring and controlling QoS

    2. Use SIP as the protocol for IP interconnection

    3. Use SBC for implementing security

As for interconnecting with International operators the IP interconnection is very much a possibility. Hence, Suntel' view on this is to allow individual operators to implement what is best for them.

Interconnections for Internet service

Suntel is presently connected to the global Internet using multiple STM-1 circuits running over SEA-ME-WE Fibre cable. Connectivity with multiple offshore destinations provides increased resilience to Suntel services. Local ISPs are connected through LISPA local exchange as shown in Fig 9.2.

Suntel would like to make following suggestions with regard to ISP interconnections

1.   Enable IPV6 interoperability

2.   Deploy a local Internet exchange by TRCSL or an agency appointed by TRCSL

3.   Establish interconnection guidelines similar to voice

4.   Use BGP for local interconnection at the Exchange similar to global Internet
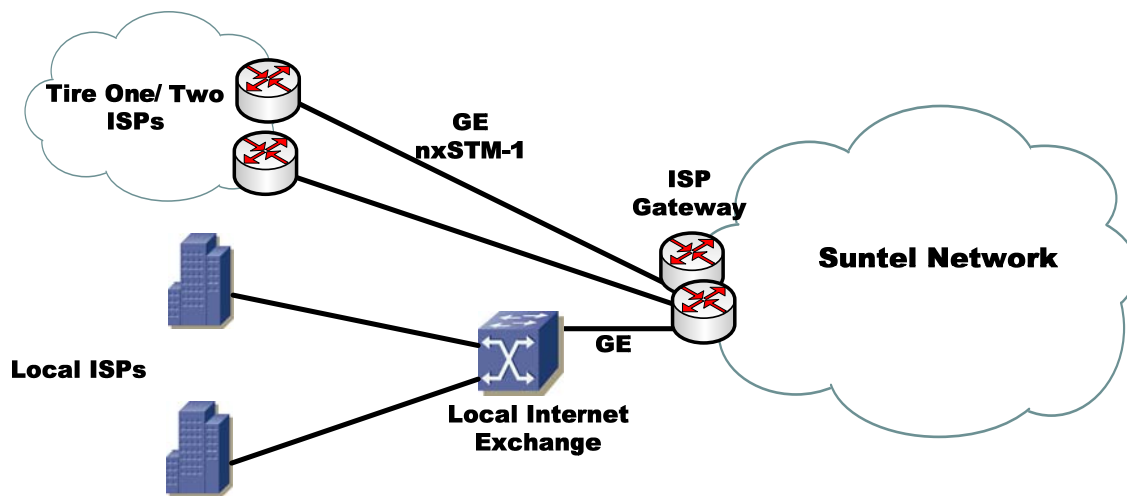

Fig 9.2 – ISP Interconnections

Question 10: Do you envisage any general issues in relation to NGN interconnect? In particular, do you envisage any issues in relation to current peering arrangements?

As stated under question 9 our view is to interconnect at TDM layer initially. Therefore, we do not envisage any general issues in the interconnect.

Question 11: *Please describe any experiences that your company has of an Internet exchange point in Sri Lanka or elsewhere. Do you foresee that your company will have an increased reliance on an IXP in the future, for Internet applications including voice? If so, are there any roadblocks to such usage in Sri Lanka today? If so, please describe those roadblocks and the means to overcome them.*

1. TRC should regularize ISP interconnections. Our recommendations are given under question 9.

Question 12: *Do you believe that the establishment of a national body to standardize interconnection between NGNs is required in Sri Lanka? If so, what do you think would be the best governance model for it?*

2. Yes, this body should look into all issues including interoperability between operators and quality issues. This body should also ensure that all service providers adhere to the specified standards.

3. The governing body should include representatives from operators, equipment vendors and TRC

Question 13: *Do you believe that the TRCSL should mandate that operator should put in place equipment to monitor its network performance in terms of delay, jitter, packet loss and bit error rate for different classes of service?*

1. Yes, Suntel believes that it is a good idea for operators to monitor the performance of their network in terms of latency, jitter, and packet loss. Any degradation of these parameters should be discussed at the forum mentioned under question 12. However, the measurement space should not be limited to aforesaid 3 parameters.

2. One of the biggest impediments in IP Telephony is echo. The issue has got even bigger with the proliferation of mobile phones where acoustic echo is dominant. Therefore, it is imperative that all operators work towards addressing the echo problem before it gets completely out of hand. As per the normal industry practice any echo should be cancelled by the same operator who was responsible for generating that echo signal.

3. It is also important that industry work together to build one NGN network capable of delivering even non voice services namely FAX and POS between any two subscribers in Sri Lanka

Question 14: *Do you believe that other network performance parameters such as network availability should also be monitored by the TRCSL? Please use examples to illustrate your answer.*

We do not believe that TRCSL should go to that extent. Monitoring parameters discussed under question 13 should ensure the delivery of high quality end user services in Sri Lanka.

Question 15: If you answered yes to the previous questions, do you believe that the national standardization body should take responsibility for specifying what should be monitored?

N/A

Question 16: What are your views on security in NGN networks? In your view does current technology, such as firewalls, provide adequate security to NGNs? Do you believe that there needs to be national NGN security policies and standards?

Security should be one of the key considerations when deploying NGN networks. Security measures should be built into the design or propose a suitable framework so that end to end security can be taken care of. The firewall alone will not address all the security concerns of a complex NGN network thus additional measures will have to be put in place at the customer site as well as in the network. Following are some of the possible threats that NGN is exposed to.

1. Visibility of the service provider network topology to external parties

2. DoS/ DDoS attacks

3. Unauthorized access

4. Visibility of information such as user names, passwords and media to the external parties

5. Over usage

Following protection mechanisms can be proposed for consideration.

1. Deployment of border elements such as Session Border Controllers (SBC)

2. Deep packet inspection, traffic qualification and pattern recognition

3. Deployment of authentication mechanisms such as AAA

4. Data encryption, VPN's, etc

5. Traffic shaping, Admission control etc

Suntel believes that there should be a national NGN security policy which could be a subsection of the National NGN Policy Framework. All applicable standards can also be built into the same document.

Question 17: Please comment on the need for revisions to numbering plans for new services, and the need or otherwise for non-geographic codes recognizing increasing user nomadicity?

1.   The present numbering system adequately addresses the requirements of today' services. However, the NGN offers much greater freedom and flexibility when it comes to call processing and delivery thus a non-geographical numbering system would suit the NGN environment best.

Question 18: How do you think the harmonisation of naming and numbering of different networks should be addressed? At what stage of your migration plan will the harmonization of naming and numbering be required? Do you think a national standardisation authority (mentioned in Section 3.5.2) should be in charge of implementing the harmonisation of the naming and numbering across the country? Do you see a future need for international coordination for any or all of Sri Lanka's naming and numbering schemes?

2.   Harmonization should be agreed and finalized, but the implementation can be done once the NGN has matured somewhat.

Question 19: Do you see ENUM as a fundamental stepping stone to true VoIP services? If yes, do you believe that ENUM should be implemented centrally by a third party (e.g. a government agency)? If no, what are your alternative plans to provide IP address look-up services (e.g. implementation of individual databases)?

3.   Suntel recognizes that ENUM is the correct way to implement IP Telephony in the future, but there is no need for operators to rush until the technology becomes mature. The most important issue is no operator would want to invest on TDM Switches anymore firstly because they are too expensive and secondly the lack of vendor support. At the same time network expansion projects cannot be postponed until the ENUM standard becomes solid, and vendors start making compatible products. Therefore, Suntel's recommendation is to carry on with the deployment, and when the technology is mature enough move on to a ENUM system. The present NGN systems have some ENUM capability, which are capable of translating phone numbers to IP addresses and vice versa.

4.   Suntel thinks that the ENUM should be implemented at the operator level

Question 20: *How important is it for you that a subscriber can keep their current phone number when migrating from PSTN to NGN? Do you think that a change in phone number may be a barrier for the adoption of NGN services?*

5.   According to our experience retaining the same number is a very important factor for the end customer. This is especially true for enterprise customers. Inability to offer the same number would certainly impact the project negatively.

Question 21: *Do you plan to adopt IPv6 in your network? If so, when will you do so in relation to the milestones describe in your transition to NGN? What are the key transformation phases involved in migrating your IP network to IPv6?*

Migration to IPv6 was a very important consideration about 7 or 8 years ago. However, the urge has faded away a lot now since IPv4 Networks have evolved to exist in an environment with limited IP addresses. The introduction of private IP address schemes using NAT/PAT can be cited as one such groundbreaking innovations.

As such Suntel does not think that migrating to IPv6 as a mandatory requirement at this stage, but we do acknowledge that it will have to be done at some point in time in the future. Like any other operator Suntel has many network elements that aren't IPv6 compatible. However, we can state that all new network elements that we will be adding in to the network in the future will support IPv6. We would also like to suggest that TRCSL makes it mandatory for all operators to install only IPv6 compatible network elements in the future, which would make the migration to IPv6 less cumbersome in the future.

Question 23: *Please describe your current network architecture. What are your current plans to implement NGN networks and/or offer VoIP or other IP services? What are the roadblocks that you perceive to that migration? What regulations, if any, would you recommend to overcome these roadblocks?*

Suntel has both legacy and NGN networks operating side by side as depicted in Fig 23.1. Suntel has already implemented core NGN components, and even commenced migrating customers from legacy

networks. However, the migration project has been marred with number of problems, and the main issue can be cited as access to spectrum. This issue has been described in detail under question 4.

There are other issues such as acoustic echo which need to be controlled. The issue has got aggravated in the recent past due to proliferation of mobile phones. Unless all operators get together and agree on a suitable action plan to address the echo problem the transition to NGN is unlikely to be successful.
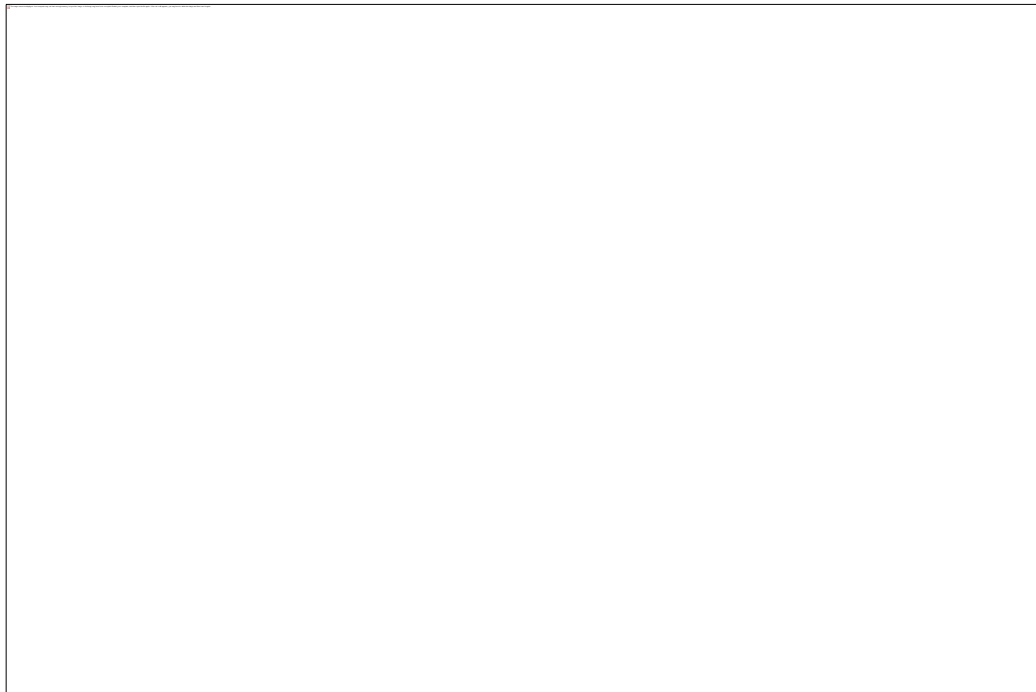
Question 24

Asymmetric interconnection charges are imperative to protect smaller operators offering niche services and new entrants. The Sri Lankan regime that was recently introduced has in effect given further advantage to the largest players and made growth much harder for the smaller players as the

interconnect is a drain on cash resources. The imposition of the current interconnect regime failed to address the issue of tariff plans that were approved under the sender keeps all regime thus allowing free minutes to continue to be given to subscribers.

The rates to be imposed in an asymmetric environment should allow for a resetting of the market so that all operators have a net zero input and output this will determine the rates. Over time as market shares change the rates should be harmonised.

The main barrier to implementation is the resistance of the largest operators.

Question 25

In order to improve competition the licensing regime needs to reflect the change in technologies and the customer demands. Thus all operators should be free to operate services required by the customer. Thus the distinction between fixed and mobile licences needs to be removed.

The current license conditions are not enforced as the larger operators are offering converged services to customers. i.e fixed , data, mobile bundled together under similar brands sold through similar sales teams from using network elements that are shared. If license conditions are not enforced then in effect operators should be allowed to offer services they deem appropriate to their customers.

Question 26

Please see above

Question 27

The only element of licensing that needs to be adjusted is to allow the current licensed telecommunications operators to offer services that meet customer demands. The distinction between fixed and mobile is no longer valid with the change in technology and the introduction of converged services.

Question 28

USO services should be carefully analysed before being applied.

Question 29

Please refer to earlier answers on asymmetric interconnection.

Question 30

With the advent of NGN networks the requirement for sufficient bandwidth to be available in the transmission network is vital. In areas of high density population this is even more important. The reference to RIO in respect to interconnect is not appropriate given that the current Interconnection rules are not asymmetric in nature. However TRCSL should consider opening fibre networks to currently operated by SLT and Dialog to all competitors at predetermined prices that allow SLT and Dialog sufficient return on investment.

Question 31

Please see above

Question 32

The issue of wholesale access the access network in itself is not relevant to the NGN debate. However Suntel believes that access network sharing and teh construction of shared access networks should be encouraged by TRCSL.

Question 33

Sri Lanka should follow the global principles of net neutrality followed by the ITU.

Question 34

Please see previous answers

Question 35

The only requirement for tariff control for TRCSL should be at the level of provision of wholesale services to operators. Please see answer 30.

Question 36

NGN technology does not have any impact on the issues raised in this question

Question 37

Migrating to NGN does not have specific implications on competition.

Question 38

Suntel believes that the current licensing regime is no longer fit for purpose. The introduction converged customer offerings through the delivery of IP based services have compromised the licensing regime. Dialog for example now divides its organisation into Residential and Enterprise. Enterprise customers are offered fixed and mobile services by the same sales and service teams and this without doubt reduces operating costs and ensures cross subsidy thus giving Dialog a competitive advantage. It also puts fixed line operators at a distinct disadvantage when offering converged services as they are unable to deliver mobile or mobile centric services. The nature of NGN services is to allow operators to fulfil customer requirements using the best possible means. Thus the CPE used to deliver that service and

how the customer uses that CPE should be relevant. All license holders in Sri Lanka should operate under a technology neutral license allowing delivery of service in the most cost efficient and customer friendly manner.

Question 39

TRCSL should follow globally established standards for NGN technology governed by the ITU.

Question 40

Consumer protection has no relevance to the implementation of NGN technology.