Dated 8th August 2016

Kind Attention: Shri A. Robert J. Ravi,
Advisor (QoS)
Telecom Regulatory Authority of India
advqos@trai.gov.in

Dear Sir,

We are pleased to provide our response to TRAI consultation paper on Cloud Computing issued by authority on 10th June 2016. Cloud computing is recognized as an important emerging technology and service under the National Telecom Policy of 2012. Furthermore many aspects of the government's Digital India initiative will depend on the widespread adoption of cloud computing. We believe TRAI's consultation on Cloud Computing is an important examination of some of the policy issues around promoting the adoption of cloud computing in India. We hope our comments and suggestions would be duly considered by the authority while framing policy framework on cloud.

Regards

Priya Mahajan

AP Regional Regulatory Counsel

Verizon Enterprise Solutions

3rd Floor, A wing, Radisson Commercial Plaza

NH-08, New Delhi-110037

Priya.mahajan@intl.verizon.com

Verizon response on TRAI CP on Cloud Computing

We welcome the opportunity to submit comments on the consultation paper on Cloud computing issued by Telecom regulatory Authority of India (TRAI). Cloud computing is increasingly being adopted by business, including SME's and large enterprises, to benefit from the adoption of technology which is scalable, flexible, cost efficient and enhances the end user experience.

Cloud computing was recognized as an important emerging technology and service under the National Telecom Policy of 2012. Furthermore many aspects of the government's Digital India initiative will depend on the widespread adoption of cloud computing. Emerging IoT/M2M services depend on cloud computing, particularly to store and manage data collected from sensors and machines.

Cloud computing can play an important role for achieving economic development goals in emerging markets like India by furthering public welfare, reducing access costs, and enabling more efficient service delivery. The adoption of these technologies / services will help provide the much needed push to the growth of data and broadband services principally by reducing computing costs for end users

National Telecom Policy-2012 (NTP-2012)

NTP-2012 recognized the growing importance of cloud-based in accelerating the design and roll out of the new and innovative services on large scale. Importantly, the NPT 2012 recognized the need to reduce regulatory barriers that could impede the adoption of cloud computing in India.

Specifically,

10.3. To identify areas where existing regulations may impose unnecessary burden and take consequential remedial steps in line with international best practices for propelling nation to emerge as a global leader in the development and provision of cloud services to benefit enterprises, consumers and Central and State Governments.

The NTP further recommends that the government implement measures to facilitate a liberalized regulatory environment that will foster affordable, reliable and secure telecommunication and broadband services across the entire country. We believe TRAI's consultation on Cloud Computing is an important examination of some of the policy issues around promoting the adoption of cloud computing in India.
The following questions have been posed by TRAI in its public consultation:

Question 1. What are the paradigms of cost benefit analysis especially in terms of:
a. accelerating the design and roll out of services
b. Promotion of social networking, participative governance and
e-commerce.
c. Expansion of new services.
d. Any other items or technologies. Please support your views
with relevant data.

Verizon Response:
Verizon's recently published cloud report titled " **State of the market: Enterprise Cloud 2016"** (attached as annex-1) provides interesting insights on the benefits of expanding use of cloud computing services. The report finds that 94% of companies expect more than a quarter of their workloads to be in the cloud within two years. The cloud is now business as usual, but companies are using it to transform their business and build sustainable competitive advantage. There are interesting data points that emerge from this report, including:

- 69% of enterprises confirm that cloud has helped them significantly reengineer their business processes
- 77% of enterprise view cloud as giving them a competitive advantage
- 84% of enterprises indicate their use of cloud has increased significantly
- Financial benefits outside of potential cost savings are significant with 40% of enterprises saying it has **increased their revenue** and 36% saying it has **increased their profit margins**

Cloud is now an integral part of enterprise IT and Enterprises are looking for cloud solutions that will help make their businesses more efficient, agile, responsive, and competitive. Because every organization has different needs and objectives, enterprises are demanding solutions that address their particular needs. Tired of "one size fits all", these organizations are looking for solutions that will make them more competitive, control costs, improve customer satisfaction or grow faster.

Cloud is now firmly established as a reliable enterprise workhorse, and what's most interesting is how it is driving transformation. Organizations are using the cloud to create new customer experiences, re-engineer their business processes and find new opportunities to grow. Organizations are not just using more cloud; they are using it for applications more demanding and more critical to everyday operations and performance. This often includes multiple mission-critical applications. Advances in technology are changing the cost-benefit equation and making it easier for companies to build more powerful environments in the cloud, enabling them to move more workloads and transform more processes.

The report can be accessed online at:

http://www.verizonenterprise.com/resources/reports/rp_state-of-the-market-enterprise-cloud-2016_en_xg.pdf

Question 2. Please indicate with details how the economies of scale in the cloud will help cost reduction in the IT budget of an organization?

Verizon Response: See answer to question 1.

Question 3. What parameters do the business enterprises focus on while selecting type of cloud service deployment model? How does a decision on such parameters differ for large business setups and SMEs?

Verizon Response:

There are numerous factors that business enterprises consider when selecting a cloud service. As per our study, the Hybrid cloud deployment model is now the mainstream for large organizations. A hybrid cloud is characterized by a mix of models, including public and private cloud. The decision to move to hybrid cloud is influenced by several considerations.

Advances in technology are changing the cost-benefit equation and making it easier for companies to build more powerful environments in the cloud, enabling them to move more workloads and transform more processes. There are already services that enable companies to create a sophisticated environment made up of multiple clouds from multiple providers, but make it look like a seamless part of the enterprise infrastructure.

Many companies still rely on core systems built on legacy technologies that can't be moved to the cloud and which they aren't ready to refactor or replace. This can hold back transformation efforts, like improving the customer experience. With hybrid IT, these systems could be physically collocated in the same place as a private cloud, creating a reliable, high-performance solution.

Hybrid deployments can be complex to build and maintain. While the technology is already mainstream, it's still a relatively new area and there's a lack of people with the necessary skills and experience. Many companies are turning to managed service providers to help build and manage the environment they want. Taking this approach can help overcome the challenges with moving to cloud, deliver significant cost and business-agility benefits, and reduce the risk of making the wrong technology decisions. According to a recent survey by Cloud Cruiser, three quarters of companies said that they planned to include hybrid cloud as part of their strategy.

Question 4. How can a secure migration path may be prescribed so that migration and deployment from one cloud to another is facilitated without any glitches?

Verizon Response:

Cloud service providers are today offering customized solutions that deliver across the full spectrum of cloud, networking, security, and professional services on a global scale and provide specialized services that take care of the associated security issues with deployment of cloud.

One of the critical components of digital security is the flexibility to use robust encryption. We recommend that the government adopt a flexible approach to encryption that help ensures the security of data transfer, processing and storage. Telecom licensees should similarly be allowed the flexibility to use higher encryption to build security into the core of their network and services. We continue to await the publication of the government's encryption policy which we hope will empower industry with the flexibility to use encryption levels appropriate for a given application.

Question 5. What regulatory provisions may be mandated so that a customer is able to have control over his data while moving it in and out of the cloud?

Verizon Response:

When regulation is deemed necessary, it should offer maximum flexibility to move data. The ability for information to flow across borders is increasingly important to economic growth as all businesses are dependent on the flow of digital, cloud-based information for operational efficiency.

ICT services have important multiplier effects across economic sectors and thus play an important role in stimulating broader economic activity.   As digital services and global access to the Internet expand, there are enormous opportunities for economic growth. Regulatory provisions should not require ICT service suppliers to use local infrastructure, or establish a local presence, as a condition of supplying services. In order to reap the economic benefits of the growth in digital services, governments should not discriminate between national and foreign suppliers of ICT services in the marketplace, including in the use of local infrastructure, national spectrum, or orbital resources.

Given the rapid pace of innovation in digital technology and services, governments are urged to maintain a light touch regulatory approach to avoid stifling growth in the digital economy. It is important that governments find a balance that enables adequate protection for data without burdening industry with unworkable data privacy and protection obligations.

Question 6. What regulatory framework and standards should be put in place for ensuring interoperability of cloud services at various levels of implementation viz. abstraction, programming and orchestration layer?

Verizon Response:

As a rapidly scalable computing model, Cloud services are being adopted on a global scale to transform business. Regulatory frameworks should be technology neutral and let the market determine the best cloud technologies to deploy. Governments should refrain from regulation specific to cloud computing in favor of a light-touch approach that recognizes that competition and existing laws will be sufficient to protect consumers in most instances.

Question 7. What shall be the QoS parameters based on which the performance of different cloud service providers could be measured for different service models? The parameters essential and desirable and their respective benchmarks may be suggested.

Verizon Response:
Cloud Service providers typically provide their services to other businesses rather than end users directly. As such, QoS is a matter of contractual negotiation between the two parties. Any disputes arising over QoS would be settled according to the arbitration arrangements stipulated by the contract. Given the globally competitive marketplace for cloud services, government regulation of cloud computing is not necessary.

Question 8. What provisions are required in order to facilitate billing and metering re-verification by the client of Cloud services? In case of any dispute, how is it proposed to be addressed/ resolved?

Verizon Response:
As noted in the answer to Question 7, Cloud Computing services are generally provided to business and are the result of negotiated contracts. Any questions regarding billing would be addressed in the contract itself. Disputes would be resolved in accordance to the terms of the contract. Given the globally competitive nature of cloud computing, regulation in this matter is not deemed necessary.

Should India choose to move forward with regulation, We would recommend that TRAI to explicitly apply such consumer protection provisions to residential services (sold to consumers) vs. those services sold to business.

Question 9. What mechanism should be in place for handling customer complaints and grievances in Cloud services? Please comment with justification.

Verizon Response:
As addressed above, most cloud computing services are offered to enterprises, but in the instances where cloud services are offered on a retail basis to individual customers, existing consumer protection laws as applicable to the ICT sector are sufficient to deal with any complaints or grievances over related to a cloud service.

Building trust and confidence in digital services, as well as regulatory certainty for both individuals and businesses are essential to the success of the digital market.

We believe that sector-specific regulation should only be maintained or introduced where necessary and proportionate. In this respect the TRAI should carefully consider who and what is to be regulated rather than incrementally building on historical approaches. Indeed sector-specific regulation should not be imposed when general consumer protection rules already exist and are robust enough across sectors. Not only does a dual regime add further complexity for all users, providers and competent authorities but it also raises proportionality issues. It is important to recognize that cloud computing is simply a more efficient means of deploying computer resources to accomplish a specific task, and, as such, should not automatically require new regulation.

Question 10. Enumerate in detail with justification, the provisions that need to be put in place to ensure that the cloud services being offered are secure.

Verizon Response:

A flexible approach to encryption is required to allow for the use of strong and robust encryption
A flexible approach to encryption that enables the use of strong encryption technology is needed to ensure cloud services are secure. The government should complete its long-pending encryption policy in a way that enables maximum flexibility and empowers the growth of cloud services. We understand that the draft encryption policy issued by DeIty in 2015 and was later withdrawn and continues to be under review. We urge the government to adopt a flexible encryption policy so that cloud service providers can offer services using robust encryption in India.

Question 11. What are the termination or exit provisions that need to be defined for ensuring security of data or information over cloud?

Verizon Response:
The existing provisions under the information Technology Act 2000 related to data privacy are sufficient to deal with the security of data or information over cloud.

Question 12. What security provisions are needed for live migration to cloud and for migration from one cloud service provider to another?

Verizon Response:
Please see responses regarding the pending encryption policy. Given the ever changing cyber security landscape, contractual arrangements between cloud service providers and enterprises are best suited to provide the flexibility to adopt new security practices in any migration of data between or to a cloud-based service.

Question 13. What should be the roles and responsibilities in terms of security of (a) Cloud Service Provider(CSP); and (b) End users?

Verizon Response:
As stated previously, most cloud service providers provide services to an enterprise, not necessarily to an end user directly. As such, contractual arrangements are sufficient to address issues of security. In the instances where a cloud service provider may provide services on a retail basis to individual consumers, the terms of service shall delineate the roles and responsibilities with respect to security. Given the globally competitive nature of cloud-based services, in both instances there should be significant competitive market pressures on cloud service providers to ensure robust security.

Question 14. The law of the user's country may restrict cross-border transfer/disclosure of certain information. How can the client be protected in case the Cloud service provider moves data from one jurisdiction to another and a violation takes place? What disclosure guidelines need to be prescribed to avoid such incidents?

Verizon Response:
Seamless flows of information across borders are essential to growth throughout the global economy, since services, manufacturing, and even agriculture increasingly rely on digital communication and other data transfers. Regulatory frameworks should avoid and eliminate barriers to these data flows. Further the regulatory framework should be such that it enables the service suppliers of other countries, or customers of those suppliers, from electronically transferring information internally or across borders, accessing publicly available information, or accessing their own information stored in other countries.

The Asia Cloud Computing Association ACCA commissioned a study called **The Impact of "Data Sovereignty on Cloud Computing**" to analyze the implications of data sovereignty law and policy on the adoption of cloud computing-based infrastructures and services in Asia. By reviewing and analyzing data sovereignty regulations in 14 countries in this study, the Association identified potential bottlenecks that could slow adoption and threaten Asia's digital future. The research was compiled across 14 Asia Pacific countries (Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam) using information on data sovereignty factors that helped or hindered the adoption of cloud computing. Each country was assessed on five key assessment criteria:
(1) Cloud access,
(2) Data safety,
(3) International consistency,
(4) Cross border movement, and
(5) Regulatory stability and enforcement.
The ACCA analysis reveals that the biggest challenge to cloud computing adoption in Asia is the lack of regulatory consistency across the region and consistency with global norms on data privacy and regulatory oversight.

Thus TRAI should take note of the complexity of cloud technology and how businesses implement it while framing any disclosure guidelines. Any initiative taken to ensure privacy should not lead to uncertain and unclear laws that create unworkable and complex regulatory burdens that inhibit the deployment of innovative new services.

http://www.asiacloudcomputing.org/research/datasovereignty2013

Question 15. What polices, systems and processes are required to be defined for information governance framework in Cloud, from lawful interception point of view and particularly if it is hosted in a different country?

Verizon Response:
The institutional framework to access data in other countries should be based on mutuality and reciprocity, such as through mutual legal assistance mechanisms. The scope of bilateral agreements may be enhanced for sharing information based on principles of transparency and accountability. Finding a balance is important if the full benefits of international trade in goods, services and e-commerce are to be realized by reducing unnecessary costs of doing business. Transparent and efficient mechanisms based on the rule of law are critical to building trust between countries in this area. We note that this principle was recently upheld in the United States where a court ruled that law enforcement authorities cannot compel a U.S.-based company to turn over the data of a non-U.S. citizen for data held outside of the United States. Please see Verizon's public policy blog on the decision at:
http://www.verizon.com/about/news/verizons-transparency-report-microsoft-case-and-icpa

Question 16. What shall be the scope of cloud computing services in law? What is your view on providing license or registration to Cloud service providers so as to subject them to the obligations thereunder? Please comment with justification.

Verizon Response:
In our view, Cloud computing services should be left outside the purview of license or registration. International experience has demonstrated that light touch regulatory framework has fostered the growth of new technology and services. Specific to the Indian scenario the adoption of cloud computing is still at a nascent stage..

Some of the noteworthy forward-looking government initiatives such as Digital India, MeghRaj, and Smart Cities will depend on cloud computing. Any efforts to bring Cloud services under the ambit of a license or registration could be counterproductive and would not be conducive to the growth of the sector.

Question 17. What should be the protocol for cloud service providers to submit to the territorial jurisdiction of India for the purpose of lawful access of information? What should be the effective guidelines for and actions against those CSPs that are identified to be in possession of information related to the commission of a breach of National security of India?

Verizon Response:

oI should carefully consider whether any new regulation is necessary and what existing laws may meet those policy objectives. If regulation is deemed necessary, light-touch approaches that create an enabling environment for the adoption and growth of cloud computing will be a priority and in line with the objectives set out in the National Telecom Policy 2012.

The institutional framework to access data in other countries should be based on mutuality and reciprocity. The scope of bilateral agreements may be enhanced for sharing information based on principles of transparency and accountability.

Question 18. What are the steps that can be taken by the government for:
(a) promoting cloud computing in e-governance projects.
(b) promoting establishment of data centres in India.
(c) encouraging business and private organizations utilize cloud services
(d) to boost Digital India and Smart Cities incentive using cloud.

Verizon Response:

We recommend that that the Indian government establish a public private partnership process that helps establish Indian government security performance expectations in the context of globally recognized information security standards such as ISO 27000, and enables cloud vendors to receive certification by reputable 3rd party auditors (regardless of their nationality). Some of the noteworthy government visionary initiatives such as Digital India, MeghRaj, and Smart Cities incorporate cloud computing and are a step in the right direction to increase cloud awareness and adoption

Question 19. Should there be a dedicated cloud for government applications? To what extent should it support a multi-tenant environment and what should be the rules regulating such an environment?

Verizon Response:
Generally, the answer would depend on the scope of users (government only or public) and the sensitivity of the functions. There could be different costs associated with these different approaches.

Question 20. What infrastructure challenges does India face towards development and deployment of state data centres in India? What should be the protocol for information sharing between states and between state and central?

Verizon Response:

The availability of a robust underlying network infrastructure which is scalable to cater to the cloud requirement is very critical. In addition, the government of India needs to continue to focus on creating an investment climate that addresses key infrastructure improvements in power, land ownership, taxes etc.

Question 21. What tax subsidies should be proposed to incentivize the promotion of Cloud Services in India? Give your comments with justification. What are the other incentives that can be given to private sector for the creation of data centres and cloud services platforms in India?

Verizon Response:
Government should encourage development of cloud infrastructure by providing tax incentives as well as take a light touch approach to regulation in the ICT sector to enable adoption of cloud across the Indian economy.

Summary of policy considerations

- Carefully consider if regulation is necessary beyond existing law and, if so, get the right balance between regulatory protection and flexibility for service deployment and use;

- Digital transformation possible only if we embrace innovation with the light touch regulatory approach;

- Regulatory enablement accelerates service delivery & make a meaningful impact on the lives of the citizens;

- Stimulate market development through the promotion of open and competitive markets and adequate consumer protection, wherever possible, through application of existing legal and regulatory frameworks;

- Avoid and, where possible, eliminate barriers to seamless cross border data flows;

- Avoid restrictive data localization requirements that adversely impact investment and innovation;

- Recognize distinction between services to individual consumers and those sold to businesses to avoid automatically extending consumer protection obligations to the enterprise providers;

- Consider enabling policy framework that is technology neutral and future proof. When deemed necessary regulations should be a light-touch horizontal regulatory regime that encourages investment and innovation.