

Request for Information

Information Technology Advisory Board

Study of Peering

Senate Bill No. 289 as passed by the Nevada Legislature (2015 Session) directed the Information Technology Advisory Board (ITAB) “to conduct a study of peering that includes, without limitation, an analysis of potential benefits of peering arrangements to the State and its political subdivisions.”

As originally introduced, Senate Bill No. 289 provided, in part, “Sec. 6. 1. Each provider of Internet protocol service which serves any agency or political subdivision of this State shall interconnect and maintain a peering arrangement within this State with all other providers of Internet protocol service which serve any agency or political subdivision of this State. 2. An agency or political subdivision of this State may not obtain Internet protocol service from a provider of Internet protocol service if the provider has not complied with the provisions of subsection 1.” The foregoing text does not appear in the bill as passed by the Legislature.

Jurisdictional and Pre-emption Issues

The Federal Communication Commission, in its Report and Order released on March 12, 2015 (FCC 15-24), popularly referred to as the “Net Neutrality Order”, provided as follows in Paragraph 202, page 92-93:

As discussed, Internet traffic exchange agreements have historically been and will continue to be commercially negotiated. We do not believe that it is appropriate or necessary to subject arrangements for Internet traffic exchange (which are subsumed within broadband Internet access service) to the rules we adopt today. We conclude that it would be premature to adopt prescriptive rules to address any problems that have arisen or may arise.

Additionally, in paragraph 203, page 93:

At this time, we believe that a case-by-case approach is appropriate regarding Internet traffic exchange arrangements between broadband Internet access service providers and edge providers or intermediaries—an area that historically has functioned without significant Commission oversight.⁵¹⁸ Given the constantly evolving market for Internet traffic exchange, we conclude that at this time it would be difficult to predict what

new arrangements will arise to serve consumers' and edge providers' needs going forward, as usage patterns, content offerings, and capacity requirements continue to evolve.⁵¹⁹ Thus, we will rely on the regulatory backstop prohibiting common carriers from engaging in unjust and unreasonable practices. Our "light touch" approach does not directly regulate interconnection practices. Of course, this regulatory backstop is not a substitute for robust competition. The Commission's regulatory and enforcement oversight, including over common carriers, is complementary to vigorous antitrust enforcement. [Footnotes omitted]

The FCC's Net Neutrality Order was appealed, and, on June 14, 2016, the United States Court of Appeals for the District of Columbia upheld the order and its jurisdictional basis.

Question 1:

Does the doctrine of federal preemption effectively prevent a state from enforcing any statutory or regulatory provision affecting "arrangements for Internet traffic exchange" including peering?

Risk Reduction Issues

Various propositions were put to the Legislature in committee hearings regarding risk reduction if in-state peering were required. These propositions are generally devisable into two categories: risk reduction in the physical world (involving continuity of service) and risk reduction in the cyber world (involving wrongful access to information).

Physical world threats include destruction of internet backbone infrastructure facilities (for example, severance of a fiber link or destruction of a key microwave facility), destruction of a last-mile facility (for example, the physical link – copper wire, fiber, or wireless – connecting a government building, enterprise, or home with a larger, upstream, telecommunications infrastructure facility), and physical security of the data center within which the peering exchange of traffic takes place.

Since the earliest days of ARPANET, the internet has been designed to be self-healing. Information headed towards a destination on a path determined by the routing tables within a router will be re-routed on a secondary path if the primary path is not available. So, a packet from Clark County destined for Washoe County will be re-routed if the primary path (as determined by routing tables) is unavailable. This is true regardless of whether the primary path is via an out-of-state facility or whether the primary path is wholly within the State. Specifically, a packet travelling over a wholly in-state facility as directed by the routing table of a required in-state peering router, will be directed to an out-of-state path if the more direct in-state path is unavailable. Bottom line: restoration of public internet

connectivity will occur whether in-state peering is required or not. Caveat: the self-healing of internet backbone facilities does not apply to private or closed networks where routing is limited to those facilities included within the private network. As regards private networks, restoration of service in the event of a physical disruption is a function of network design and would not be affected by an in-state peering requirement.

Loss of a last-mile facility will result in loss of internet connectivity. Period. Requiring in-state peering will not address this physical risk.

Requiring in-state peering does not, by itself, address the issue of physical compromise of a data center within which peering occurs.

Question 2

If, as outlined above, the physical world threat (involving continuity of service) over public internet facilities between two points in Nevada is not realistically affected by an in-state peering requirement, should Nevada instead legislate minimum physical security requirements for data centers in Nevada where peering of public internet traffic takes place as the most effective way to reduce risk in the physical world?

Cyber threats (involving wrongful access to information) can be directed at information in transit or information at rest.

While an in-state peering requirement may well affect the route taken by packets originating in Clark County and destined for Washoe County, that requirement does nothing to reduce the cyber threat to information at rest at either the originating location or at the destination location.

The Nevada Encryption Statute, NRS 603A.215, passed in the 2009 Legislative session, was designed to protect certain data in transit by incentivizing data collectors doing business in Nevada to encrypt personal information to the current encryption standard adopted by the National Institute of Standards and Technology (NIST). The 2015 Legislature expanded the scope of protected in-transit data by expanding the definition of "personal information." The approach of Nevada in incentivizing desired behavior can be contrasted by the contemporaneous approach of Massachusetts, which put in place a detailed regulatory environment that mandated entities to adopt specified procedures in order to protect data from wrongful access.

Question 3

What percent of successful data compromises have been directed at data in transit as compared with those directed at data at rest? In Nevada as compared with the United States as a whole? How will an in-state peering requirement increase the security of in-transit data originating from, or destined for, a location in Nevada?

Service Improvement Issues

Various propositions were put to the Legislature in committee hearings regarding service improvement if in-state peering were required

All other things being equal, it is true that a shorter, more direct communications pathway over public internet facilities will theoretically reduce latency and jitter, thereby improving the end user experience when watching streaming video or participating in a voice communication. (Virtually all of what used to be described as “long distance” calls involve a at least a portion of the call utilizing Voice over Internet Protocol, or VoIP.)

However, “all other things” are seldom equal. The entire communications pathway includes facilities other than public internet facilities. The end user experience can be degraded if, for example, last mile facilities are undersized, if internal Local Area Networks or home networks are congested, or if a cellular end user is experiencing signal attenuation from being located too far from a serving cellular tower.

Question 4

Will an in-state peering requirement result in an increase in service quality that is perceptible to the end user? How do you know?

No other states currently require in-state peering.

Question 5

What would be the effect on Nevada end users if contiguous states enacted in-state peering requirements identical to those enacted in Nevada? If all states enacted identical requirements? If all countries enacted similar provisions?

Contract and Competition Issues

Various propositions were put to the Legislature in committee hearings regarding a reduction of competition among major communications carriers in the event that some did not comply with whatever final requirements an in-state peering mandate contained and, consequently, would be compelled to limit their service offerings in Nevada.

The State of Nevada operates what is likely the largest private, closed network in the state. The State’s wide area network (WAN), popularly known as Silvernet, connects state agencies to government agencies (both state and local) in all Nevada counties and municipalities. It is the only electronic pathway that provides (1) criminal justice information to law enforcement, courts, parole and probation officers and

other judicial officers (2) information supporting the de-centralized functioning of the Departments of Motor Vehicles, Health and Human Services, Training and Rehabilitation, Agriculture, Business and Industry, Public Safety (including the Division of Homeland Security), and all other state agencies.

Virtually all county and municipal governments operate their own private networks, sized appropriately for their individual needs.

All private networks operated by Nevada governments rely heavily, almost exclusively, on facilities and services that are owned or operated by major communications carriers. (The State microwave system *currently* is a significant exception.)

Question 6

To carriers (secondarily to governments): Do you provide facilities and/or services considered essential to the continued, non-degraded, functioning of government private networks? Are these facilities and/or services currently subject to competition, that is, could a competitor replace the facilities and/or services you provide?

Should an in-state peering requirement reduce carrier competition, one of the affected markets is likely to be the market for facilities and/or services necessary to support private networks (including government private networks)

A major set of intended beneficiaries of an in-state peering requirement would be end users (see Question 4 above).

The set of potentially adversely affected entities (governments operating private networks) may overlap, but is not congruent with, the set of intended beneficiaries (end users of public internet services).

Question 7

Discuss the public policy considerations that would support the financial risk of in-state peering being borne by one set of entities while the proposed benefits of in-state peering would be conferred on another set of entities.

An in-state peering requirement that uses as an enforcement mechanism the prohibition of entering into a negotiated contract with government entities, changes, directly or indirectly, or supplements, the current provisions of Chapter 332, Purchasing: Local Governments, and of Chapter 333, Purchasing: State, Nevada Revised Statutes, and their implementing regulations.

Question 8

What agency would determine whether the in-state peering requirements were met for the purpose of state procurement actions? For the purpose of local government procurement actions? How would its decisions be enforced?

What attendant statutory or regulatory changes would be required? For example, could an entity object to a contract award on the basis of non-compliance with an in-state peering requirement even though that entity did not participate in the relevant procurement process (an RFP or sole source procurement justified by a lack of vendors capable of supplying needed communications facilities and/or services)? Are the costs of the oversight and enforcement efforts justified by the likely benefits of an in-state peering requirement? (See Questions 3 and 4 above.)

Economic Development Issues

Various propositions were put to the Legislature in committee hearings suggesting that by being the first state in the country to require in-state peering, Nevada would become more attractive to firms (particularly “high tech” companies) considering relocation to Nevada.

Yet, a mainstay of Nevada’s economic development strategy is to emphasize its low regulatory environment.

Requiring in-state peering would entail state interference in a market previously the exclusive domain of privately negotiated commercial agreements – a domain that even the Federal Communications Commission has refrained from regulating. (See text preceding Question 1.)

Question 9

What benefits, attributable to an in-state peering requirement, would appeal to an enterprise considering relocating to Nevada? Conversely, what enterprises, if any, would consider an in-state peering requirement as a negative factor in determining whether to relocate to Nevada?

Obsolescence Issues

Various propositions were put to the Legislature in committee hearings suggesting that an in-state peering requirement could be effectuated once fiber infrastructure was constructed that provided a direct optical/electronic pathway between Clark and Washoe Counties.

The anticipated completion date for that infrastructure project is before the final day of the 2017 Legislative session.

Question 10

If the benefits of in-state transit are sufficiently great (see Questions 3 and 4), won’t providers of services delivered over public internet facilities negotiate

the use of wholly in-state fiber facilities in order to provide the best possible service to Nevada end users as a matter of self interest, thereby rendering an in-state peering requirement irrelevant?

Technology marches on.

Software-defined networking (SDN) and SD-WAN technology purportedly allows network administrators to decouple network control from the underlying physical infrastructure.

Question 11

Are there emerging or anticipated technologies that would replace, in whole or in part, traditional routing functions and peering arrangements, thereby rendering an in-state peering requirement obsolete? If so, in what time frame are these technologies likely to emerge as significant substitutes for existing technologies and commercial peering agreements?

Other Issues

Question 12

What other issues, not covered by the foregoing questions, do you believe are relevant to the Peering Study undertaken by the Information Advisory Board (ITAB)?

Option to appear before ITAB

Question 13

Would you like to appear before ITAB to augment your responses to the foregoing questions?

The length of your testimony will be determined by the Chair, but you should anticipate your testimony will be limited to 10 minutes.

Submission Requirements

Unlike the FCC and state public utility commissions, ITAB has no dedicated staff. Submissions will be provided to Board members and made available to the public on the web site maintained by the Enterprise IT Services Division of the Nevada Department of Administration (see, [http://it.nv.gov/Governance/dtls/ITAB/Information_Technology_Advisory_Board_\(ITAB\)/](http://it.nv.gov/Governance/dtls/ITAB/Information_Technology_Advisory_Board_(ITAB)/))

Answers to the foregoing questions are limited to a total of five pages (8"x11"), using 12 pt. Times Roman or comparable font, single spaced, 1" margin on both sides, top and bottom and submitted in electronic .pdf format.

In order to be considered, answers must be sent to **[email address]** with "ITAB Peering [Your Name]" in the subject line not later than **[date, approximately 10 days before next scheduled ITAB meeting]**

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