Before the
Telecommunications Regulatory Authority
Manama, Kingdom of Bahrain

In the Matter of	)
	)
Strategic and Retail Market Review	)
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Released 27 August 2007	)

COMMENTS OF CISCO SYSTEMS, INC.

Cisco System, Inc.

Robert Pepper
Mary Brown
1300 Pennsylvania Ave., NW
Suite 250
Washington, D.C. 20004 USA

+1 (202) 354-2923

Cameron Telecom Law

Kelly Cameron
8905 Second Ave.
Silver Spring, MD 20910 USA

+1 (301) 768-7263

Counsel to Cisco Systems, Inc.

5 October 2007

Introduction

Cisco Systems, Inc. ("Cisco"), headquartered in San Jose, California, is a worldwide manufacturer and distributor of IP-based hardware, software and services used by government, business and residential customers to communicate over IP-based broadband networks. It is a world leader in broadband wireless networking in communities, enterprises, and homes.

The Telecommunications Regulatory Authority's (TRA) Strategic and Retail Market Review consultation ("Consultation") marks an important step in the evolution of the regulatory framework in Bahrain. The Consultation presents an opportunity for the TRA to dramatically advance Bahrain's national economic strategy by promoting the growth of competition, particularly in the area of broadband Internet services.

Cisco is extensively engaged in fostering the spread of advanced IT services in Bahrain. There are currently eight Cisco Networking Academies operating in Bahrain to train hundreds of students each year to design, build and maintain advanced computer networks. The most recent Network Academy opened just a few months ago in cooperation with Batelco and the Bahrain Training Institute. Cisco is a leading provider of network equipment to government, service providers and businesses in Bahrain. Most recently, the Jebel Ali Free Zone ("Jafza") appointed Cisco as its technology consultant to formulate the overall technology strategy for its Convention Center Complex by using Cisco's Connected Real Estate framework. Cisco is similarly engaged with Amwaj

Telecom to provide connected real estate solutions to the Amwaj Islands Smart City, as well as many other projects.

Background

The TRA has found that most sectors of the Bahraini telecommunications market are not effectively competitive. The TRA's proposed regulatory approach would reduce regulation as competition increases. Promoting broadband Internet access, especially over wireless networks, is the best way for the TRA to increase competition in the market, including the voice telephony market, so that it can reduce regulation on all participants. Thus, Cisco submits, increased deployment of broadband infrastructure is the key to the success of the TRA's proposed regulatory reform.

Cisco believes that increased broadband deployment is crucial for Bahrain. The Global Information Technology Report ("GITR"), published at the World Economic Forum in 2007, revealed that Bahrain is ranked third in the region in networked readiness – an index of Information and Communication Technology ("ICT") regulatory, business, and infrastructure readiness for broadband and advanced IP-based technologies – but is ranked 50th in the world and lags far behind the United Arab Emirates (29th) and Qatar (36th). Among the most significant problems found by the GITR was the poor quality of competition in the Internet Service Provider sector, a measure in which Bahrain ranked 115th out of 122 nations evaluated.

Bahrain is already an important economy in the region, but clearly telecommunications services, and especially broadband Internet service, will be indispensable to the ongoing transformation of the Bahraini economy from one largely dependent on the energy sector to a broader-based services economy. The TRA has

already recognized the need to take action to promote increased broadband deployment in Bahrain and to increase download speeds for business and residential users alike. As Cisco will detail in these comments, competition – both in services and infrastructure – is critical to realizing these objectives.

According to the TRA's own figures, approximately 8.1% of Bahrainis were Internet subscribers at the end of 2006, almost two-thirds of whom (5.2% of all Bahrainis) were classified as broadband subscribers.[1] These statistics are disappointing, although the share of all Internet users who subscribe to broadband services is a positive factor.

With a total Internet penetration rate of only 8%, Bahrain lags not only far behind developed countries in Europe and the Americas, but also other Arab countries such as the UAE (34.7% Internet penetration as of September 2005), Qatar (26.6%), Kuwait (25.6%), Jordan (13.4%), Oman (11.6%), and Saudi Arabia (10.6%).[2] Likewise, among the thirty countries of the Organization for Economic Cooperation and Development ("OECD"), Bahrain's broadband penetration rate of 5.1% is the same as that of the Slovak Republic and exceeds only Greece (4.6%), Turkey (3.8%), and Mexico (3.5%).[3] Denmark, the Netherlands, and Iceland, which like Bahrain are small and fairly densely

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1 *See* "Internet data," available at http://www.tra.org.bh/en/marketInternet.asp.

2 These statistics are derived from www.internetworldstats.com/stats5.htm, updated as of 30 June 2007 and based on data from the International Telecommunication Union (ITU). It must be noted, however, that according to the ITU, Bahrain had an Internet penetration rate of 21.0% (155,000 users) which is much better than the TRA's own statistics but still far behind comparable countries in the region and elsewhere in the world. It is not clear why the ITU's numbers diverge so widely from numbers on the TRA's own website.

3 See *OECD Broadband Statistics to December 2006*, http://www.oecd.org/documentprint/0,3455,en_2649_34223_38446855_1_1_1_1,00.html.

populated countries, lead the OECD in broadband penetration at 31.9%, 31.8% and 29.7% respectively.[4]

While the TRA's consultation explores a wide range of issues, Cisco believes that expanding access to broadband Internet service, while increasing transmission speeds and decreasing cost, will be the greatest single achievement for the TRA and the telecom industry in Bahrain. Indeed, the TRA has specifically asked commenters to address the following question:

> How can TRA incentivise sufficient investment, the adoption and roll-out of new technologies, and enhanced access to and usage of the Internet?

The right regulatory policies can advance the deployment of broadband Internet services in Bahrain, which will produce substantial benefits for the national economy. The TRA has already taken some important steps to achieve this goal and has proposed others in the present public consultation. In addition to these measures, Cisco recommends additional steps that the TRA should take to advance broadband deployment.

Discussion

The Economy of Bahrain is in Transition

The Kingdom of Bahrain has wisely recognized that declining oil and gas production require a transition for the economy from a heavy dependence on the energy sector to a more diversified base. In particular, Bahrain has focused on the development of the services sector of the economy in general, and on the financial services sector in particular.

Bahrain has already enjoyed considerable success in developing its financial services industry despite intense competition not only in the Gulf region but globally for

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[4] *Id.*

financial services businesses. Telecommunications services are an increasingly critical input in the financial services industry. As a result, Bahrain cannot afford to lag behind its neighbors or nations elsewhere in the world in the deployment of broadband Internet services if it is to remain an attractive location for financial services firms.

Similarly, the Bahrain Economic Development Board has announced that business services, education and training, health care and tourism are target sectors of the economy for development.[5] Each of these sectors is telecom intensive and will benefit from expanded availability of affordable broadband Internet access. Thus, the Kingdom's economic development goals are closely intertwined with the development of broadband Internet services.

But the interests of ordinary Bahrainis also depend on the development of more affordable and robust broadband Internet services. The TRA has noted that

> In the internet market review TRA found Internet prices in Bahrain appear high with widespread consumer dissatisfaction with internet pricing. In addition, the range of services available to consumers does not compare favorably to those available in other jurisdictions.[6]

Numerous studies in recent years have attempted to quantify the economic and social benefits of increased broadband deployment.[7] For example, in the United States, the economic benefits of universally available broadband have been estimated to be as much as $500 billion (U.S.) a year over ten years.[8] Likewise, the State of Victoria, Australia commissioned a study that found that the annual contribution of broadband to

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[5] *See* Bahrain: Reforming our Economy, 17 April 2006 (http://www.bahrainedb.com/media/pdf/Reform_Bahrain_Market.pdf).

[6] Consultation at 118.

[7] Cisco is not aware of any studies that specifically focus on Bahrain.

[8] *See* The Economic and Social Benefits of Broadband Deployment, available at http://www.tiaonline.org/policy/initiatives/broadband/documents/broadbandpaperoct03.pdf *citing* Robert Crandall and Charles Jackson, "The $500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access," Criterion Economics, L.L.C., Washington, D.C., July 2001.

the state's economy would be as much as 0.82 percent additional growth.[9] These benefits were projected to add as much as $2.5 billion (Australian) to the state's economy, increasing productivity, and boosting employment by up to 6%.[10]

Bahrain's low level of broadband adoption denies its economy these potential benefits, and the TRA plainly recognizes this problem. For example, in the Consultation document, the TRA made the following observations:

- "The principal difference between the situation in Bahrain and that in other countries with well-developed telecommunications networks is the lack of competitive broadband services over speeds of 2 Mbps and the absence of 'unlimited' broadband offerings."[11]
- "Broadband, and Internet activities in general, are widely perceived to have grown only slowly but other technological developments – such as next generation networks (NGN) and Voice over Internet Protocol (VOIP) – are beginning to impact Bahraini telecommunications."[12]

Option C is the Proper Regulatory Approach

The Consultation proposes three broad approaches to future regulation of the telecom market in Bahrain and the TRA states that it intends to pursue Option C, which is essentially the middle course between immediate deregulation and simply maintaining the status quo.

Cisco agrees that this is the best approach for Bahrain at the present time. As the TRA documents in the Consultation, despite the TRA's implementation of a comprehensive liberalization plan, only certain international telecommunications routes are now effectively competitive, while the remaining international routes and the mobile

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9 *See* "Economic Impacts of Broadband Adoption in Victoria," June 2004, available at http://www.mmv.vic.gov.au/uploads/downloads/BAO/EconomicImpactsofBroadbandREPORTFINAL2004.pdf.

10 *Id*. at 37.

11 Consultation at 3.

12 *Id*. at 13.

sector are prospectively competitive. The TRA judges the bulk of the market – including fixed line services, leased lines and Internet access – "not competitive." Under these circumstances, it is plainly too early to move to complete deregulation of the market. On the other hand, as the present policies have not been sufficient to produce effective competition, staying the course is unlikely to significantly improve the performance of the market in the foreseeable future.

As the TRA has noted, the principal difference between Bahrain and other countries with well-developed telecommunications infrastructures is the lack of competitive broadband services and the absence of unlimited broadband offerings. Further, because both fixed and wireless broadband services have the ability to offer voice as well as data services, the development of competitive broadband services is likely also to increase competition in voice services as well as Internet services. Therefore, deployment of competitive broadband services is the most likely route to achieving effective competition and allowing the TRA to eventually reduce or eliminate regulation of many services.

Infrastructure Competition

The TRA has already authorized resale and bitstream access as means of services competition in broadband. While such services competition permits new entrants to compete mainly on the basis of price, alternative infrastructure allows for technical innovation and network redundancy and enables consumers to receive new services. Of course, the TRA has already embraced infrastructure competition, both for voice telephony and broadband Internet access, by licensing two National Fixed Wireless

Service ("NFWS") providers. Cisco understands that both of these licensees are expected to commence service within the next six months.

The two NFWS licensees can be expected to become an important source of competition to existing Internet access services. Indeed, wireless services seem likely to be the only source of new entry in the broadband market in Bahrain. While many countries, like the United States and some European Union Member States, have ready-made infrastructure competition to DSL in the form of cable television, this is not the case in Bahrain.

While the establishment of NFWS services will represent a major expansion of broadband services, the TRA may still find it desirable to allocate additional wireless spectrum for broadband access. Experience around the world has shown that consumers will demand ever more bandwidth-intensive services. For this reason, the TRA should consider allocating spectrum in the 700 MHz band for broadband wireless access. This band, which is allocated internationally for television broadcasting, possesses excellent propagation characteristics and is ideally suited for broadband access. In the United States and in Europe, 700 MHz spectrum that for decades has been used for analog broadcast television is now being reallocated to other services as terrestrial broadcasters convert to digital television. One possible use of the spectrum is for the deployment of broadband Internet services.

It appears that the large majority of television viewers in Bahrain receive television via satellite and that there are, in any case, only a few licensed terrestrial television broadcast stations in the country. Depending on coordination of these frequencies with neighboring Administrations, primarily Saudi Arabia, it seems that

Bahrain may have access to a substantial amount of spectrum in the 700 MHz band that could be allocated to broadband Internet service. Despite the fact that the TRA has already licensed two NFWS providers, advanced broadband services will require large spectrum allocations. Current and future wireless broadband standards are written for spectrum footprints of 5 MHz, 10 MHz, 20 MHz, and even 40 MHz channelization plans. Depending on the technology, and the version of the technology selected, wireless broadband can deliver throughput of between 1 and 100 megabits.[13]

The Role of Technological Innovation

The TRA observes in the Consultation that technological innovation may spur competition for Internet and basic voice services. For example, the TRA notes that some forms of VoIP services offer nomadicity, which the Public Switched Telephone Network ("PSTN") does not. The TRA also observes that Wireless Local Loop ("WLL") is a form of voice telephony, and therefore one might expect WLL to be regulated in the same way as voice telephony.[14]

Both of these points are raised in connection with the principle that regulation should be technologically neutral. As a general matter, Cisco agrees that the technology used to provide a service should not dictate its regulatory treatment, except, of course, to the extent that radio-based services may require a spectrum license.

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[13] The TRA notes that lack of international capacity is currently a problem in Bahrain and that competitors to Batelco can only obtain capacity through Batelco. *Id.* at 33. The TRA notes that this is an especially acute problem for Internet services, where approximately 95 percent of websites require international access. The TRA also expresses confidence that in the near to medium term this problem will be alleviated, but does not explain exactly how. Clearly, as the TRA has recognized, the lack of international capacity is a major impediment to the development of competitive Internet services. Cisco assumes, however, that the TRA's assessment of likely remedies to the shortage of international capacity is accurate.

[14] Consultation at 86.

Cisco believes, however, that it is more important to ensure that services are not subjected to excessive regulation based on arbitrary classifications. For example, in the case of WLL mentioned by the TRA, it would make little sense to subject a new entrant providing voice telephony via WLL to the same kinds of tariffing requirements typically imposed on the incumbent operator because the new entrant lacks the market power that the incumbent enjoys by virtue of its historical monopoly and ubiquitous network. At the same time, however, the TRA should not impose the legacy regulations developed to address the incumbent's historical market power to the incumbent's new investment in broadband facilities.

In general, Cisco believes that the TRA has taken a wise approach to new technologies, for example by permitting the use of VoIP as a competitor to the PSTN. Such innovations have the potential to significantly increase competition, both for voice telephony and for advanced services, and to provide important benefits to consumers and the Bahraini economy.

Conclusion

The TRA has undertaken an important process of comprehensively evaluating its approach to regulating the telecom market in Bahrain. Despite a well-crafted liberalization plan, most segments of the telecom market in Bahrain lack effective competition.

As discussed above, Cisco believes that the development of competitive broadband infrastructure is the key to opening the Bahraini market to robust competition, both in advanced services and basic voice telephony. Robust competition, especially in broadband, will allow the TRA to reduce regulation on *all* market players. Cisco encourages the TRA to continue to promote additional entry into the market, particularly through the deployment of additional wireless broadband access services. In this way, the TRA can help to advance the continuing transition of Bahrain to a diversified, services-based economy.

Respectfully Submitted,

Cisco System, Inc.

Robert Pepper
Mary Brown
1300 Pennsylvania Ave., NW
Suite 250
Washington, D.C. 20004 USA

+1 (202) 354-2923

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