The Other Point of Peering

By Hunter Newby

Editor's Note: *The "VoIPeer Me" series demonstrates the marriage of Ethernet and VoIP through actual VoIP peering implementations of network operators within the carrier hotels. Its purpose is to show where VoIP peering currently exist, who provides it, who uses it and how.*

VoIP peering implementations are not and do not have to be limited by using or going through only VoIP peering service providers. This is a point in fact that might have been lost in this series during the past year.

So, in the interests of being accurate and completely covering the subject, this series now will turn to focus on enterprise and/or carrier networks that have employed the use of VoIP peering techniques on their own. Many network operators have implemented VoIP within their networks for certain benefits, including provisioning efficiency, higher quality calls, more features and cost reduction. These operators most likely do not know or refer to their efforts as peering, though. This is a concept that is usually reserved for inter-network connections and not intra-network, but when a network connects its own disparate nodes over a common transport network (wide are network or backbone) that it internally controls, thus bypassing other service provider or transit networks, it has in fact employed many of the same principle techniques of peering.

These techniques and the benefits they bring are valuable information for all network operators. With this new focus on VoIP peering, some of the organizations featured in the series may or may not want to be specifically identified for secrecy, security or competitive advantage reasons, but every effort will be made to include full details of the participants for reference purposes.

As a prelude to the new independent focus this particular article will establish a set of VoIP peering ground rules. These general rules apply to any and all network operators, enterprise or carrier, and should act as a guide for others that wish to follow.

Rule #0 - VoIP does not mean "voice over the public Internet."

Understanding this is fundamental and table stakes for playing on this field. VoIP is voice over Internet protocol. Internet Protocol (IP) and the Internet are two different things. One is a programming language and the other is a global collection of networks that connect (peer) at physical points using IP. They are not synonymous or analogous, so do not confuse the two.

Rule #1 - VoIP phones, handsets and/or IP PBXs are not necessary to take advantage of VoIP peering.

Circuit-switched to packet-switched conversion through media gateways works from the PBX (private branch exchange) out. You can get the cost savings and a truly redundant network but not the special IP features to the desktop. This may not be optimal, but it avoids the scary forklift upgrade and keeps the chief financial officer happy.

Rule #2 VoIP peering does not mean, or imply, that all calls are free.

You can take calls off of the PSTN (public switched telephone network) and put them on your WAN (wide area network) to avoid the per-minute carrier fees. This is essentially free, but you still have to pay for the transport (private IP) or IP transit (public Internet) of the sessions (calls as IP).

Rule #3 SIP/Ethernet trunks replace TDM/TDM trunks between disparate sites quite nicely.

Do you already operate a network? Is it TDM (time division multiplex) based (DS-1, DS-3, OCn)? Are your calls circuit-switched TDM-based? You can swap out the TDM minutes and trunks (the local loops out to the carriers) with Ethernet transport (where available) and run voice as private IP using SIP (session initiation protocol) over that. The calls are now sessions; they're no longer metered by a carrier and you no longer pay per minute for them. Where Ethernet transport is not available, you can run private IP over clear-channel TDM point-to-point circuits and build your secure VoIP WAN that way. You still get the benefits of layer 2 failover from the carrier VoIP switch but not the cost savings and flexibility that Ethernet brings.

Rule #4 The PSTN is full of single points of failure.

The dirty little secrets are that every CO (central office) is a single point, each TDM local and long distance switch is its own, and all telephone numbers assigned to a switch stay there. If there is an outage or loss, these numbers are not so easily moved. The fiber from the incumbent carrier that enters a building (if any at all) is typically single path. Since only 5.9 percent of all buildings in the United States have competitive fiber from at least one other provider, every other carrier or service provider rides that same incumbent fiber into 94.1 percent of the buildings.

So, you might have the incumbent and two other carriers for "diversity", but all you really have is billing diversity. If the POE (point of entry), the manhole, telephone pole or any portion of the path all the way to the CO is cut, you are down. If it is really bad and service will be out for a while, good luck moving your numbers to another switch or service provider and getting back in service. That can have a serious impact on your business.

The logical thing to do is move to diverse fiber and a true layer 2 Ethernet network running IP for your voice applications. Have your phone numbers presented to you by the local carriers as SIP over an Ethernet connection in at least two separate interconnection points, one for primary service and the other for backup. That way, if a path, switch or CO is lost, your service and path can be switched by the carrier rather easily from its VoIP softswitch down to you. Your numbers still work without interruption while the primary path is restored.

It might seem incredible that this level of security and diversity does not exist in the telephone system today, but it is what it is. TDM SONET rings do help on the path side, but they still originate from a single point CO and voice switch and usually terminate through the same POE in the basement of a building, so the risks are still there.

Rule #5 This is not for everyone.

Only facilities-based carriers or enterprises with their own networks can really take advantage of these benefits. Most small to medium-sized businesses and all end users can't take advantage of this improved network architecture because they are quite simply not in control of it. They are sold a service by a provider. They don't actually create it themselves. They can ask to see their providers' network maps and look for the points of failure, though. That might not make anyone feel any better, but hey, at least you know what you're dealing with.

These six rules are not meant to cover every last detail but rather are here to provide a framework by which those that seek the truth can go about becoming educated consumers. This series will show that there are many that have already begun to implement this process. They have come to these conclusions through patient study or force from issues that needed resolution. Either way, they're better off for it and are helping to blaze the trail to freedom and security for the rest. **FAT**

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