Rationale for Providing NET+ Routes via the Internet2 R&E Backbone

This document is intended to provide background regarding the importance of providing the traffic from our NET+ service providers over the advanced network resources now available with the fourth generation of the Internet2 network.

Internet2 Net+, as a program offering, has been created to transform the ecology of programs and services from commercial providers to make them uniquely positioned to support the mission(s) of educational institutions and researchers.

While these service providers may transport some “non-research” traffic to members over the network, reaching the providers over commodity paths or TR-CPS paths which are provisioned like commodity paths will not achieve what the community wants with NET+. The fact that the researchers in our community expect us to deliver big bandwidth to providers like Amazon and Microsoft needs to be distinguished from the fact that these partners provide consumer-grade (or commodity) cloud services.

The Internet2 NET+ team, with advice from the NET+ regional partners, is advocating a strategy to put these services on the most flexible platform available so we can grow those services to include >10G flows and potentially aspects of the SDN network. In order to deliver the capacity our researchers are demanding this service will need to scale to 100G connections quickly. The overarching goal is to leverage the investments that Internet2 and the regional networks *have made to support advanced networking*, wherever possible, by bringing NET+ providers onto the community owned networks. Our plans to carry NET+ traffic on the R&E backbone also adds value to the NET+ provider in that it provides a high performance and well understood path between the provider and their users which can be supported with service-level targets from the provider to Internet2.

Internet2 realizes that changes in the traffic patterns of data on the Internet2 backbone may affect the engineering and business models of regional networks differently. The recent network upgrade and accompanying fee changes enable massive new headroom on the R&E network to support the capacity requirements of the next era. Using the R&E network as a base platform, Internet2 also offers flexibility in the way NET+ is delivered at both Layer 2 and Layer 3, by offering multiple VLANs that can be segmented for different services and BGP controls associated with services that are delivered on those VLANs. These controls should allow connectors to provide this traffic to their users in the way they wish.

In addition to accessing the NET+ services through the R&E network many of the NET+ providers will also be available (at standard commodity quality) over TR-CPS and the commodity Internet as well. The matrix provided below indicates the many ways in which our members can receive traffic from our NET+ providers today. We will work with any connector to establish a reasonable way to deliver NET+ in a manner that meets their needs.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **SERVICE** |  **Connection VIA:** | **AL3S** | **TR-CPS** | **COMMODITY INTERNET** |
|  |  |  |  |  |  |
|  | Box  | INTERNET2 | YES | YES/M\* | YES |
|  | Adobe | AMAZON | YES | YES | YES |
|  | Crashplan Pro | INTERNET2 | waiting MSP | YES/M\* | YES |
|  | Amazon East | INTERNET2 | YES | YES | YES |
|  | Amazon CA | INTERNET2 | TBD | YES | YES |
|  | Amazon OR | INTERNET2 | YES | YES | YES |
|  | D2L Lecture Tools | INTERNET2 | YES | NO | YES |
|  | Merit/stg,comp | MERIT | YES | NO | YES |
|  | SHI | INTERNET2 | YES | NO | YES |
|  | Fuzebox | INTERNET2 | TBD | YES/M\* | YES |
|  | Blue Jeans network | INTERNET2 | TBD | YES/M\* | YES |
|  | MS Azure | INTERNET2 | TBD | YES | YES |
|  | Aastra/L3 | INTERNET2 | YES | NO | NO |
|  | Canvas | AMAZON | YES | YES | YES |
|  | Ice Health | AMAZON | YES | YES | YES |
|  | Splunk | AMAZON | YES | YES | YES |
|  | Duracloud | CENIC | YES | NO | YES |
|  | MS Office | INTERNET2 | tbd | YES | YES |
|  | Dell Cloud on Demand | INTERNET2 | YES | NO | YES |
|  | MCNC/IBM | MCNC | YES | NO | YES |
|  | D2L Capture | AMAZON | (AZ region unclear) | YES | YES |
|  |  |  |  |  |  |
|  | \*YES/M means that TR-CPS carries it, but it does not directly connect (so it "multihops").  |