Technical Report
TR-011

An End-To-End Packet Mode Architecture With Tunneling And Service Selection

June 1998

Abstract

This technical report specifies a tunneling-based end-to-end architecture using packets between the ATU-R and the NAP and L2TP tunneling between the NAP and NSP. In addition, a method of service selection is specified which allows simultaneous, independent connectivity between multiple users at a premise and multiple NSPs.

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1   Introduction

This technical report specifies a tunneling-based end-to-end architecture using packets between the ATU-R and the NAP and L2TP tunneling between the NAP and NSP. In addition, a method of service selection is specified which allows simultaneous, independent connectivity between multiple users at a premise and multiple NSPs.

The purpose of the specified architecture is to provide PPP sessions between a customer premise and one or more NSPs. The connection between the customer premise and the NAP uses packet-based access as specified in [1]. The NAP then forwards PPP sessions through L2TP tunnels [2] to the appropriate NSPs. Tunneling provides:

⟨   A method of forwarding a PPP termination point to an NSP providing an end-to-end PPP connection
⟨   Reduced provisioning of a WAN as compared to an end-to-end PVC environment
⟨   The ability to use PPP negotiation parameters to dynamically select an NSP destination

The method of handling issues in the premise network is not addressed in this technical report.

2   Reference Diagram

The reference diagram of a network capable of supporting the service selection described in this document is shown in Figure 1. A specific requirement of this architecture is L2TP tunneling between the NAP and the NSP domains.
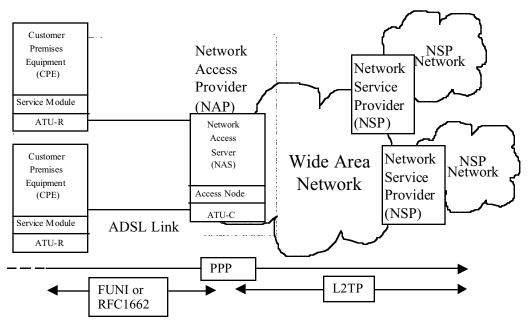
Figure 1. Network reference diagram.

3 Requirements

The following sections list the requirements for both FUNI mode and RFC1662 mode ADSL implementations.

3.1 *FUNI Mode Implementations*

3.1.1 ATU-R

1. The ATU-R shall support PPP over FUNI over the ADSL link as defined in [1].
2. To initiate a PPP session, the ATU-R shall select a locally unused FUNI frame address and begin PPP negotiation using that selected address.
3. During the authentication stage of negotiation, the user name shall be provided using the format **Error! Bookmark not defined.** as specified by [3].

3.1.2 NAP

1. The NAS shall support PPP over FUNI over the ADSL link as defined in [1].
2. The NAS shall use detection of a new locally unused FUNI frame address as the 'Link Up' event for the PPP state machine [4].
3. The NAS shall support L2TP tunneling between the NAS and the NSP.

4. If the domain name specified in the received authentication information identifies a supported NSP, the NAS shall initiate a call on behalf of the subscriber through the L2TP tunnel to that NSP.
5. If the domain name specified in the received authentication information is not supported or a call cannot be established for any other reason, the NAS must terminate the PPP session.
6. Once a PPP session is terminated, the NAS shall consider the corresponding FUNI address as unused.

3.2 RF1662 Mode Operation

The service selection method described in this document may be implemented using RFC1662 mode instead of PPP over FUNI with the limitation that only one NSP may be accessed at a given time by a premise network. The requirement changes for RFC1662 mode support are given below:

1. The ATU-R shall support RFC1662 mode over the ADSL link as defined in [1].
2. The NAS shall support RFC1662 mode over the ADSL link as defined in [1].

All other behavior is as documented in section 3.1 above, including NSP selection by the NAS using the domain name part of the user name information.

4   References

[1]   ADSL Forum. ÒTR-003: Framing and Encapsulation Standards for ADSL: Packet ModeÓ1997.
[2]   Hamzeh et al. ÒLayer Two Tunneling Protocol (L2TP)ÓIETF RFC Draft, October 1996.
[3]   Postel, J. "Simple Mail Transport Protocol", RFC821, August 1982.
[4]   Simpson, William, Editor. "The Point-to-Point Protocol (PPP)", RFC1661, July 1994.