

# **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.

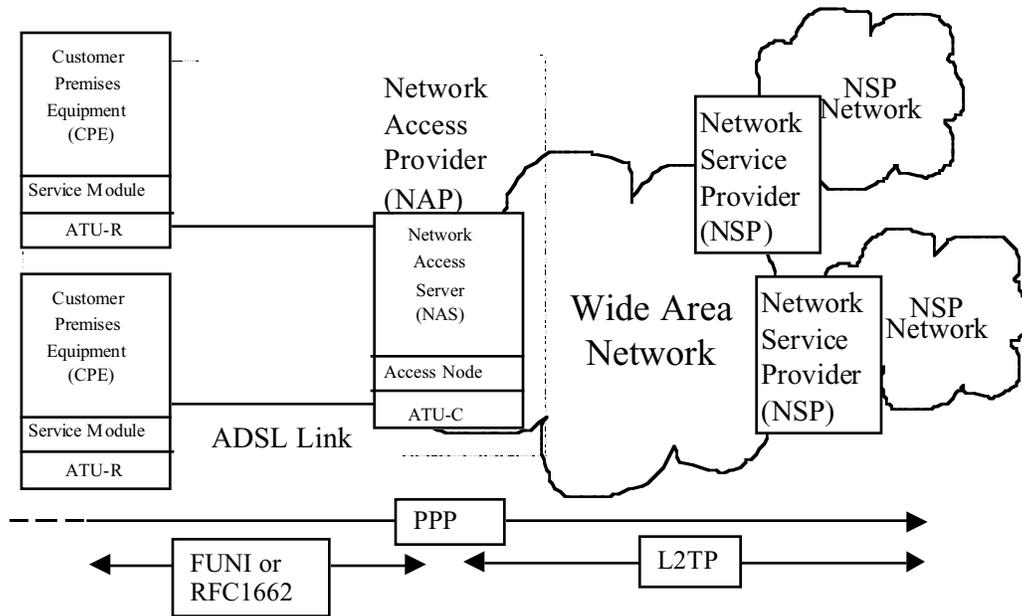


Figure 1. Network reference diagram.

### 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. TR-003: Framing and Encapsulation Standards for ADSL: Packet Mode 1997.
- [2] Hamzeh et al. Layer Two Tunneling Protocol (L2TP) IETF 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.