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LIS to LIS Protocol Requirements  
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Abstract

This document describes requirements for a LIS to LIS protocol and provides examples of where such a protocol is applicable.

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## 1. Introduction

The architecture of some networks results in more than one operator being involved in providing Internet connectivity to an end-point. Examples of this type of configuration are prevalent in residential broadband access environments where the physical infrastructure is owned by one operator, while a third-party ISP provides an IP address and layer 3 connectivity to the Internet. In architectures such as these, the Internet connectivity service is dependent on both providers. Similarly, both have information about the connectivity of an end-point to the network. The information that one party holds, however, is usually different to the information held by the other party, and neither party (on its own) can use the information it possesses to yield the physical location of an end-point. However, when the connectivity information held by the two parties is combined the location of the end-point can be determined.

## [2.](#) Terminology

The key conventions and terminology used in this document are defined as follows:

This document reuses the terms Target, as defined in [[RFC3693](#)].

This document uses the term Location Information Server (LIS) as defined in [[I-D.ietf-geopriv-l7-lcp-ps](#)].

Broadband Remote Access Server (BRAS). A node in a DSL network responsible for switching data streams between end-points and Internet Service Providers.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].



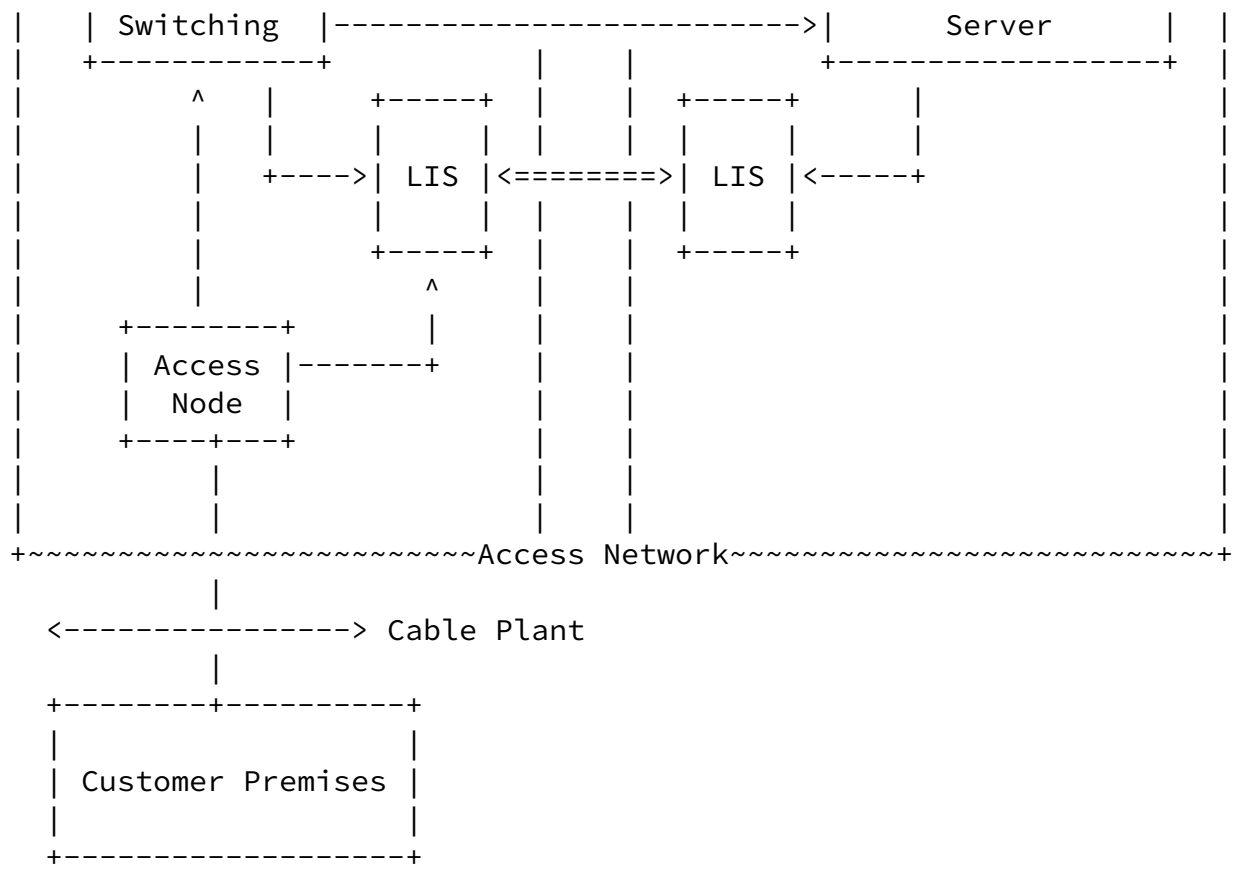


Figure 1: Multi-Operator Access Network

Figure 1 illustrates a typical multi-operator access network where physical and switched connectivity is provided by a Regional Access Network Provider, and higher layer routing functions are provided by an Internet Service provider (ISP). It is the ISP that owns the relationship with the broadband customer, the end-point, and it is the ISP LIS that will be contacted by any end-point to provide location. The ISP will know network parameters such as the IP address allocated to the end-point, and the associated NAS and port the incoming connection is terminated on; but it often will not know any information pertaining to connectivity (physical or logical) inside the regional access network. Conversely in many situations the regional access provider will not have access to information such as the IP address of the end-point or a means to correlate the IP address with other known physical parameters. The regional access provider will have access to information from the switch core, the

access node, and cable termination records, allowing the regional access provider LIS to determine a physical location. Common information between the ISP NAS and the Regional Access Provider's switching core, such as circuit identifiers, are required in order to ensure correct data transmission through the network, and these can be used as Target identifiers from the ISP LIS to the Regional Access LIS allowing the physical location of an end-point to be retrieved.

This document describes the requirements for this information flow.

#### [4.](#) Assumptions

This section details the high-level assumptions made in this document.

- 1: A strong trust relationship exists between the regional access provider and ISP.

2: Targets only deal directly with the ISP LIS, and may be totally unaware of any regional access provider LIS. A regional access LIS will only ever receive location requests from an ISP LIS.



This section details the requirements that MUST be satisfied by any LIS to LIS protocol

- 1: Connections (physical and logical) from the ISP LIS to the regional access LIS require both ends to authenticate as part of connection establishment. The security of the data conveyed between the two servers MUST be ensured for both privacy and integrity.
- 2: The data used to identify a Target to the ISP MUST be able to be passed to, and be recognizable by the regional access LIS using the LIS to LIS protocol. The data used to identify a Target to the ISP MUST be consistent with the traffic aggregation method supported by the Regional Access Network Provider.
- 3: Location information returned over a LIS to LIS protocol MUST be in PIDF-LO [[RFC4119](#)] format, and MUST comply with [[I-D.ietf-geopriv-pdif-lo-profile](#)] .
- 4: The type of location information requested by the end-point MUST be relayed to the regional access LIS by the ISP LIS using the LIS to LIS protocol.
- 5: The method used by the regional access LIS to determine the location of the Target MUST be provided to the ISP LIS along with the determined location.
- 6: Any usage-rule preferences provided by the Target to the ISP LIS MUST be included in any location returned to the Target or Location Recipient.
- 7: Additional information provided by the Target to the ISP in a location request that cannot be processed directly by the ISP LIS MUST be forwarded to regional access LIS using the LIS to LIS protocol. The intention of this requirement is to support future LCP functions that require additional information from the Target.

- 8: The presentity in the PIDF-L0 returned by the regional access LIS MUST have been provided by the ISP LIS. The ISP LIS may create the presentity, or it may have received a presentity from the Target.
  
- 9: The protocol MUST provide support for returning and dealing with error conditions such as "no location found" or "timeout".

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## 6. Security Considerations

LIS to LIS communications are necessary in some network architectures and care must be taken to ensure that they are secure both from a privacy perspective and from an integrity perspective. This can be achieved in the most part with existing protocol suites, such as TLS, using certificates or pre-shared keys. Another factor that must be protected against is the ability of a legitimate ISP LIS asking for the location of an end-point associated with a different ISP. Operators of regional access servers will need to ensure that this operational requirement is met.

## [7.](#) IANA Considerations

There are no IANA considerations for this document.

## [8.](#) Acknowledgements

Thanks to Guy Caron and Barbara Stark for providing early reviews of this document. Thanks to Martin Thomson and Cullen Jennings for providing comments.

## [9.](#) References

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