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## MPLS Label Stack Encapsulation in GRE

[draft-rekhter-mpls-over-gre-03.txt](#)

### **1. Status of this Memo**

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### **2. Abstract**

In certain cases it may be useful to carry MPLS packets through a GRE tunnel. This document describes how to do that using existing standards.

### **3. Encapsulation in GRE**

If one wants to establish a Label Switched Path (LSP) over a set of nodes that don't support MPLS, one could encapsulate MPLS header in GRE [[RFC2784](#)] over the parts of the path that spans these nodes. The protocol type field in the GRE header should be set to the Ethertype value for MPLS Unicast (0x8847) or Multicast (0x8848).

If GRE is extended to carry the Key field [[RFC2890](#)], then in principle the outer label in the MPLS header could be placed in the Key field, the TTL field could be placed in the TTL field of the IP header, and the value of the EXP field may be considered when setting the value of the DSCP field of the IP header. The Protocol Type field in the GRE header is set to the L3PID of the LSP. Specifically, when the MPLS Label Stack has depth of more than one, the Protocol Type field in the GRE header is set to MPLS. Of course, one could observe that in terms of the overhead encoding the outer label into the Key field doesn't offer any obvious advantages over carrying the outer label in the MPLS "shim" header and not using the Key field at all.

One could observe that the above approach also works between directly connected nodes. In this case the encoding described in the previous paragraph provides (yet another) way to carry MPLS Labels over a point-to-point or Ethernet links. However, in this scenario this encoding of MPLS Labels introduces additional bandwidth and processing overhead relative to carrying labels just in the MPLS "shim" header, and no rational benefits. And it still requires the nodes to support MPLS, as forwarding is based on the MPLS Label.

### **4. Security Considerations**

Security issues are not discussed in this document.

### **5. Acknowledgements**

TBD.



## **6. References**

[RFC2784]

[[RFC2890](#)] "Key and Sequence Number Extensions to GRE", G. Dommetry,  
[RFC2890](#), August 2000

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