

## 2 G - 4 An Examination of a Method for Private Network Management Using Address Translations.

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### 1. Introduction

To solve the problem of IP address depletion, constructions of networks with private network addresses<sup>[1]</sup> (private networks) become very popular. In general, each private address may overlap each other. When a network service provider manages network equipment in their customer's private networks from remote network manager using network management protocols, a network manager will be needed for each private network. This leads to problems of cost and inefficiency.

In this paper, we discuss an efficient method for network management of private networks using a concept of address translations.

### 2. A management method for private networks

#### 2.1 Management of private networks using address translations.

Figure 1 shows a network configuration for private network management. In this figure, a network manager manages two or more private networks. Each private network is connected to the network manager via the NAT (Network Address Translator)<sup>[3]</sup>. Each NAT translates private address space to unique address space without overlap with other global addresses. The SNMP<sup>[2]</sup> is used as a network management protocol.

RFC 1631<sup>[3]</sup> describes that, in addition to modifying the IP address in IP headers, NAT must modify the IP checksum and the TCP checksum, look out for ICMP and FTP, and modify the places where the IP address appears. It gives, however, no description of modification of the IP address in SNMP data. An implementation of NAT without modification of the IP address in SNMP data causes some problems in private network management. For example, if a network manager detects an unknown network address in information of an interface of a router, the manager may conjecture inaccurate network configuration.

#### 2.2 Address translation of SNMP data

To solve the above problem, the globally unique address mapping of SNMP data in address translation should be guaranteed. The followings are needed for existing NAT to provide the transparency of SNMP data.

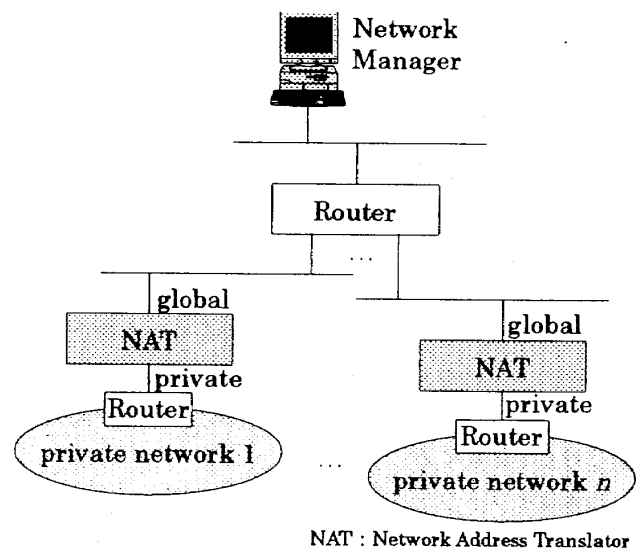


Fig. 1 A network architecture for private network management.

- To detect and translate target addresses appeared in SNMP data;
- To detect and translate net-mask correspondence to the target addresses;
- Modification of length fields in SNMP data.

Additionally, a function to register and maintain a detected new address is needed.

### 3. Conclusions

In this paper, we discussed an efficient method for network management of private networks using a concept of address translations where a network manager deals with two or more private networks.

We are now implementing functions shown in this paper, and will evaluate it under real networks.

### References

- [1] Y. Rekhter et al, "Address Allocation for Private Internets", RFC1918 (1996).
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