

A Guideline for Requesting Multihoming on JANET

1 Introduction

This document is a guide for organisations in the ACL (Adult and Community Learning) community that wish to have two network connections operating simultaneously, one to JANET and the other to an ISP. Such an arrangement is commonly called **multihoming**.

This document explains the points that a customer should take into consideration before submitting a multihoming request to UKERNA. A multihoming request form is provided in Appendix 1.

Due to the complex nature of establishing a multihomed connection and the amount of involvement by UKERNA, there is an additional charge for this service. Details are available from JANET Customer Service.

2 Management Overview: Multihoming Issues and Limitations

When considering the benefits of multihoming, the impact of significantly increased complexity, an increased level of internal technical support and additional costs must also be taken into account.

Organisations should be clear in their requirements for multihoming, on political, technical and financial levels. The statement that multihoming is necessary for 'resilience' does not cover all the eventualities the organisation may be guarding against.

Multihoming a site network to two different ISPs does not necessarily provide significantly increased resilience. A truly resilient solution will have different circuits to different ISPs, connected to different internal infrastructures. All equipment will be fed from separate redundant power supplies. Simply connecting a low-end router with one power supply to two different circuits only helps to prevent against certain failures. An analysis of the various models of failure will help to determine the best solution.

It is vital that staff at the organisation requesting a multihoming arrangement are sufficiently knowledgeable in the field of Internet routing, especially BGP (Border Gateway Protocol), and are capable of configuring their equipment in a suitable fashion. Without sufficient skills available at the multihomed site, it can be very difficult to maintain problem-free external connectivity.

3 Technical Essentials in Planning for Multihoming

It is essential that the organisation produces a routing policy. This should describe the number of upstream links desired and how they are expected to operate (for example, for fallback or load sharing). If the links are expected to undertake load sharing, a precise description should be included of how traffic is to be routed — both to and from the site — over each link. This routing policy is often specified as a short descriptive document, or as a RIPE-181/RPSL style routing registry database object.

Multihoming to JANET requires the use of BGP on the organisation's access router. It also requires the organisation's network to be capable of redistributing routing information to and from its internal network architecture.

Using BGP requires the use of an AS (Autonomous System) number and provider-independent IP addresses. A public AS number must be obtained from the RIPE (Réseaux IP Européen) NCC (Network Control Centre). Existing IP addresses used in the organisation's network may have to be changed to ensure traffic can be routed properly.

Configuration on the JANET routers is limited to adjusting route filters to accept and announce agreed prefixes to and from the organisation. The organisation will need to carry out the majority of the configuration work and maintenance within its own network. Commonly, BGP MEDs (Multi-Exit Discriminators) and/or AS path propensity would be used to influence how traffic is routed TO the organisation, while local preference or weighting would be used to influence traffic routing FROM the organisation.

This allows the organisation's staff to have almost total control and responsibility over their network, giving maximum flexibility for adjusting their model. It also removes the need for extra configuration on the JANET backbone, and effectively removes the JANET backbone as a source of problems should the multihomed routing not work as expected.

When a Regional Network is involved in the multihoming arrangement, the connection to JANET needs to be terminated on a nearby JANET backbone node to avoid complications. This means the organisation may have to run a longer telecommunication circuit to the nearest backbone node, and thus the cost may be higher than if it were connected to a Regional Network.

4 Procedure for Submission of a Multihoming Request

It is likely that many multihoming requests will not fit a common model, so each particular case is likely to need careful individual consideration. The procedure for submission is as follows:

- 1 The organisation submits a copy of the completed request form (see Appendix 1) to JANET Customer Service. If multihoming is required at the stage of discussing a new connection, the request should be submitted together with the other connection documentation.
- 2 The request is then forwarded to a group of IP routing experts for recommendations of possible solutions. It is important for the smooth progress of this stage that the routing plan in the request form is very specific. An unclear routing plan will require further clarification and will delay the whole process.
- 3 For a load-sharing multihoming arrangement, a meeting of technical personnel from the multihoming organisation, the JANET NOSC (Network Operations and Service Centre) and the ISP is usually required. This meeting is to discuss the technical issues of the desired solution, and to clarify individual responsibilities for achieving the multihoming organisation's objectives.
- 4 UKERNA Business Division then deals with financial issues before implementation of the preferred solution takes place.

Appendix 1

Request for Multihoming to JANET — to be completed by the requester

Section 1: Your information			
Your Name	<input type="text"/>	Telephone Number	<input type="text"/>
Your Job Title	<input type="text"/>	E-mail address	<input type="text"/>
Organisation Name	<input type="text"/>	Date of request	<input type="text"/>
Name and contact details of a technical person at your organisation	<input type="text"/>		Name and contact details of the person who is authorised to pay multihoming support fees
Funding source of your JANET connection	ie. LSC	Status of your JANET connection (please put an X in one box)	Under consideration
			Contract signed
			Link delivered
			In service
Section 2: Your other upstream service provider's information			
Name of your other upstream service provider	<input type="text"/>	Status of your other upstream connection (please put an X in one box)	Under consideration
			Contract signed
			Link delivered
			In service
IP address space in use if applicable	<input type="text"/>	Capacity of your connection to other upstream service provider	<input type="text"/>
Section 3: Multihoming planning			
Your desired objectives for multihoming	<input type="text"/>		
Is it purely for fallback? * (delete as applicable)	Yes / No * (If Yes, you do not need to fill in the remainder of the request)		
Your public AS number if available	<input type="text"/>		
Your independent IP address range if available	<input type="text"/>		
Do you plan to use separate routers? * (delete as applicable)	Yes / No *		

Details of multihoming routing plan **	
Diagram of your existing network connectivity **	
Diagram of Proposed multihoming Network **	

** Please continue on separate sheet if necessary, and attach to this form.

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