

Memorandum of Understanding

Concerning Levels of Service

between

The Higher Education Funding Councils for England and Wales, the Learning and Skills Council, the Scottish Funding Council, the Department for Education, Lifelong Learning, and Skills and the Department for Employment and Learning

and

The JNT Association, trading as UKERNA

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1. Purpose

UKERNA will provide a set of computer networking and related services to the UK education and research community. The Higher Education Funding Councils for England and Wales, the Learning and Skills Council, the Scottish Funding Council, the Department for Education, Lifelong Learning, and Skills and the Department for Employment and Learning (the Funding Bodies) will be represented by their Joint Information Systems Committee (JISC), operating through its sub-committee, the JISC Committee for Networking (JCN). The JISC Executive acts on a day-to-day basis to implement the policy established by the JISC.

The Higher Education Funding Council for England will make payments, on behalf of all the Funding Bodies, to UKERNA for the provision of the services set out in this Memorandum of Understanding. The performance of UKERNA against the performance indicators and service levels set out in this Memorandum of Understanding will be monitored by the JISC Monitoring Unit.

Annexes A - H of this Memorandum of Understanding define the services to be delivered by UKERNA, as follows:

Annex A	Service Level Definitions
Annex B - D	Budget and Operational Plan Reporting Framework
Annex E	Change Control Procedures
Annex F - G	Additional Reporting Requirements
Annex H	Core Access Points

Annex I contains the list of referenced documents.

2. Definitions

In the remainder of this Memorandum of Understanding, “Community” refers to members of the UK education and research institutions which are eligible to receive UKERNA services under the terms of this Memorandum of Understanding. Those institutions, referred to as “eligible institutions”, are listed in the standing document “Institutions sponsored by the JISC” (ref. Annex I.1) which is to be kept up to date by the JISC Monitoring Unit on behalf of the JISC Executive.

3. Services to be provided by UKERNA

The services to be provided by UKERNA are:

- a) a set of operational services which allow users at eligible institutions to communicate with each other and with users at sites outside the Community;
- b) a set of information services and support services which increase the effectiveness of the use of the basic operational services;
- c) a set of network security services which provide response to network security emergencies and provide information and advice on network security matters.

The Funding Bodies require a basic set of services to be provided to all eligible institutions. The Funding Bodies may also require that charges be applied for all or part of this basic set of services. Other services will be optional; that is to say, they will be offered by UKERNA at the request of the JISC, but will only be provided when eligible institutions explicitly request them. Such optional services may be separately chargeable.

The full set of services to be offered or provided by UKERNA is listed in Annex A.

4. Service Levels

Annex A sets out the Service Level Definitions for each of the service categories defined in Section 3 above. Each Service Level Definition is described in the following terms:

- Specification
- Performance Indicators and Service Levels
- Reporting.

UKERNA shall not be required to discharge its commitments under Annex A when any event or series of events beyond its reasonable control prevents it from providing the services defined in Annex A, provided that UKERNA promptly notifies the JISC Services Operations Director of:

- a) the estimated extent and duration of its inability to discharge its commitments;
- b) the resumption of the provision of the service.

If the event or series of events are such as to affect only part of its total commitments, then UKERNA shall continue to discharge those commitments that are not affected.

Appropriate contact details for JISC staff shall be maintained at (ref. Annex I.2).

UKERNA shall alert the JISC Services Operations Director and the JCN Secretary should UKERNA become aware of the likelihood that a supplier may be unable to complete its contractual commitments and shall work with them to prepare a contingency plan.

UKERNA shall maintain a Risk Register identifying the major risks to the JANET service and, as appropriate, the mitigation mechanisms adopted thereto. UKERNA shall review the Register at periodic intervals and take reasonable steps to mitigate the potential effects of the risks so identified.

5. Monitoring and Auditing of Services

The services shall be subject to monitoring, and to audit on the following basis:

- a) One of the purposes for which the JISC has established the JISC Monitoring Unit is to monitor the services defined in this Memorandum of Understanding. The JISC

Monitoring Unit may appoint independent experts to assist it where necessary. From time to time it shall carry out a technical audit of one or more of the services defined in Annex A. The purposes of any such audit will be to assess the extent to which UKERNA has met the requirements specified for the service or services being audited and to suggest ways in which these services could be improved. Such audits will pay particular attention to the performance of UKERNA with respect to the listed indicators. The audits will also take account of the budget available for the provision of the services under review;

- b) The JISC may also request an audit of the methods and procedures used by UKERNA to measure the values of the service level parameters defined for the services. The purpose of the audit will be to confirm the accuracy of UKERNA's reports. Eligible institutions may ask the JISC Monitoring Unit to instigate an investigation in cases where they have *prima facie* evidence that the service levels are not being met. UKERNA shall receive at least 10 working days notice of any such audit;
- c) Technical audits will normally be carried out no more frequently than once per year. The auditors shall have access to all reports described in Section 10 below, to any other relevant audit reports commissioned by UKERNA (subject to the agreement of those involved) and to any material provided by UKERNA to eligible institutions as part of UKERNA's service provision. UKERNA will allow the auditors to spend reasonable amounts of time interviewing UKERNA staff. UKERNA will be given the opportunity to make comments to the auditors on a draft of the auditors' report. These comments will be included in the auditors' final report, by way of management response to the audit recommendations. A copy of the auditors' final report shall be made available to UKERNA within one month of its presentation to the JISC;
- d) The costs to the JISC Monitoring Unit of employing technical auditors and of expenses directly incurred by them shall be borne by the JISC.

6. Relationships between UKERNA and Eligible Institutions

All eligible institutions which receive UKERNA services shall have a formal agreement with UKERNA as a condition of service. Aspects of the agreement which are common to all institutions are documented in the "Terms for the Provision of the JANET Service" (ref. Annex I.3) issued by UKERNA.

UKERNA shall establish agreements with each institution individually, making their acceptance of the terms explicit and covering institution-specific details. UKERNA shall keep records, available to the JISC, of the institutions connected, and, for each institution, shall record in them:

- a) the optional services, if any, selected by the eligible institution;
- b) the financial payments, if any, to be made by the eligible institution, or by UKERNA;
- c) the contact points within the eligible institutions for dealing with fault reports and other communications;

- d) the other institutions, if any, supported by the eligible institution under the licensing procedures, and the responsibilities of the eligible institution for the services provided to those institutions.

An institution's entitlement to UKERNA services under this agreement shall cease immediately if as a result of a merger, or otherwise, an institution is no longer 'eligible'. If appropriate, and on request, UKERNA will continue to support pre-existing access link(s) (i.e. those links in place as at the date of the signing of this SLA) for the relevant period as specified in A2.9.1.

In general, UKERNA will not normally communicate with the end users of the UKERNA services, but with the central computing service (or equivalent organisational unit) in any eligible institution and with the JISC Regional Support Centres. Although UKERNA will take reasonable steps to deal with enquiries and demands from end users, such steps will normally take the form of referring the enquiry or demand to the most appropriate contact point (as defined in c) above) in the end user's or another eligible institution. Exceptions to the general rule are bookings for conference or meeting attendance and other such activities which, by their nature, involve individual end users.

If an institution does not discharge its obligations and provide the necessary information, UKERNA may be unable to provide the defined level of service. In this event UKERNA will alert the JISC Services Operations Director to any such failure on the part of an institution, and agree subsequent actions. In particular, serious breaches of the JANET Acceptable Use Policy (ref. Annex I.4) may lead to suspension of service.

7. Submission of a budget and an operational plan

The budget and the operational plan, taken together, provide a picture of the development of the service over the planning year and provide a monitoring framework for the subsequent operational year.

Annexes B – D cover the arrangements for preparation and monitoring of the budget and the operational plan.

8. Creation of new services

Any proposals to introduce new services will be agreed by the JCN before the services are incorporated into the scope of this agreement. This will enable appropriate policy decisions to be taken as to the requirement for and the prioritisation of the introduction of such services before resources are committed.

New services will normally be incorporated into this agreement as part of the budget/forward look process, although, exceptionally, they may be incorporated under the change control procedures. More speculative developments for which operational services cannot yet be planned will not normally be introduced in this way; the JISC has other programmes under which to manage such developments.

The case for the incorporation of a new service will include as a minimum:

- a) a financial plan indicating: service development costs; service set up costs; annual operating costs; savings or efficiency gains arising from the introduction of the service;
- b) an outline service definition with a preliminary indication of the expected scale and performance of the service; an indication of when definite text for inclusion in Annex A of this Memorandum of Understanding can be defined;
- c) a predicted date for availability of the service, and the level of confidence to be attached to this prediction;
- d) a plan for any commissioning and piloting necessary to establish the service;

9. Termination of Services

Any proposals to terminate services, and a timetable for effecting such termination, will be agreed by the JCN before the services are removed from the scope of this agreement, in order that appropriate policy decisions as to the implications are taken before the services are terminated. The users of the service will normally be consulted and the results of such consultation will be presented as part of the proposal to the JCN. To this end, on a case-by-case basis, UKERNA shall agree with the JISC a process for user consultation that takes account of the complexity of the service, the level of usage and the impact on the user community.

Services will normally be identified for termination as part of the budget/forward look process or the annual review process. Exceptionally, service termination may be considered under change control procedures.

10. Performance Reporting Procedure

UKERNA shall make available the following reports to the JISC Monitoring Unit at the times and the frequency indicated below.

For each of the services, the agreed information relating to the reporting items listed for that service in Annex A (using the formats defined in the document “Formats for performance reports to the JISC Monitoring Unit” (ref. Annex I.5)) shall be delivered according to the following schedules:

- a) by the eighth working day of the following month, for that reporting information that has been agreed shall be delivered each calendar month;
- b) by the eighth working day of the subsequent quarter, for that reporting information that has been agreed shall be delivered on a quarterly basis;
- c) within three months of the operational year end, a report of a quality and content suitable for general publication, including the principal activities and results of UKERNA in relation to the services listed in Annex A;
- d) as agreed between the JISC Services Operations Director and UKERNA on a case-by-case basis, other reports requested from time to time by the JISC Executive.

11. Charging Principles

Other services provided by UKERNA outwith this agreement shall not be subsidised from the funding streams associated with this agreement. Any UKERNA overhead costs shall be clearly apportioned between JISC supported services and other services offered.

Where a charge is made for service defined within this agreement, UKERNA shall collect the agreed charges and report the receipts to the JISC, analysed in terms of the services provided.

12. Sub-Contracts

UKERNA remains responsible for ensuring that the services are provided to the eligible institutions with the agreed levels of quality, even if it chooses to sub-contract for the provision of some or all of the services covered by this Memorandum of Understanding.

13. Annual Review

The JISC Services Operations Director, the JISC Monitoring Unit, UKERNA and representatives of the Regional Network Operators shall review annually the list of services given in Annex A, starting six months before the end of the operational year. Prior to this, starting eight months before the end of the operational year, the JISC Services Group shall consult with representative groups of the user community in order to ascertain user feedback on the list of services. The JCN shall be kept informed throughout the review process.

At least two months before the expiry of the existing Memorandum of Understanding, a new Memorandum of Understanding for the subsequent operational year shall be signed between UKERNA and the JISC.

Where the annual review makes significant changes to the set of services or to the service levels, a date during the following operational year on which these changes will come into effect shall be specified.

14. Change Control Procedures

The definition of the services to be provided, and of the schedules, priorities and financial bases for them are normally established during the annual cycle of budget and operational plan approvals. Minor details of these approvals may, through force of circumstance, need to be varied on a shorter timescale.

Changes to the service level definitions may be proposed by the JISC, the JISC Monitoring Unit or UKERNA and will be agreed between the JISC and UKERNA, then submitted to the JISC Services Operations Director for approval. The JISC or its advisory committees, shall be consulted, as appropriate, to obtain support for more significant changes.

A register of agreed changes will be maintained by the JISC Monitoring Unit.

Changes agreed during an operational year will be incorporated into the service level definitions for the subsequent year. If they are not, the agreed changes will be deemed to have lapsed.

The Change Control procedures detailed in Annex E shall apply.

Annex A

Operational Production Services Provided by UKERNA

A1 DEFINITIONS

The definitions of terms in this clause apply to the individual service levels defined in the remainder of this annex.

In addition to the list of eligible institutions identified in clause 2 of this agreement, there are a number of additional sites and special services listed in Annexes F and G. The term “client institution” shall, for the purposes of this annex, include the institutions listed in Annex F and the JISC funded services listed in Annex G, and individual reports of performance shall be made for them wherever reporting on client institutions is specified provided that these institutions have a connection to JANET.

Performance indicators will be calculated monthly or quarterly, depending on the period the individual data items cover, but satisfactory performance will be assessed on the basis of comparison of the service level with a twelve month rolling average of the calculated values.

Note: Where a service has not yet been in operation for twelve months, or where the definition of the service level has been changed within the previous twelve months, the service cannot be said to have failed to meet the SLA. However, analysis of trends may lead to review and negotiation before 12 months have passed in cases where it becomes clear that failure can be foreseen.

All reports shall be delivered in machine readable form in a format defined in the document “Format for performance reports to the JISC Monitoring Unit” (ref. Annex I.5) which is maintained jointly by UKERNA and the JISC Monitoring Unit.

A1.1 Maintenance Time

All the continuously available services shall be scheduled to be available 365 days a year and 24 hours a day, apart from maintenance times which may be scheduled or emergency in nature. Scheduled maintenance periods are those that have been published at least two weeks in advance to all client institutions, whether directly connected by UKERNA or via a sub-contractor. Emergency maintenance is maintenance for an identified purpose that is required to be carried out in cases of extreme urgency where two weeks’ notice is not possible.

As far as possible, maintenance times shall be synchronized and shall fall during the period from 0700-0900 on Tuesdays. Service availability shall be calculated on the basis of the service time (which excludes any scheduled maintenance and emergency maintenance events).

A1.2 Staffed Periods

“Staffed Periods” are the periods from 0800-1700 on weekdays, also known as “working days”. However, the following weekdays are not staffed periods:

Christmas Day	Good Friday
Boxing Day	First Monday in May
New Year’s Day	Last Monday in May

Note: Exceptions to Staffed Periods will include the Public Holidays given in lieu when any of the above days fall on a weekend.

A1.3 Extended Service Periods

“Extended Service Periods” are the periods from 0800-2200 on weekdays and from 0900-1800 on Saturdays and Sundays. However, the following Public Holidays are not extended service periods:

Christmas Day	Good Friday
Boxing Day	First Monday in May
New Year’s Day	Last Monday in May

Note: Exceptions to Extended Service Periods will include the Public Holidays given in lieu when any of the above days fall on a weekend.

A1.4 Measurement of Availability

Although availability is defined as a fraction here, monthly reporting shall be made in terms of time lost and number of incidents, from which the availability can be calculated directly.

A1.4.1 Availability of Basic Transmission Service

UKERNA shall record the *accessibility* of each client institution from an appropriate point within the network. In this context, accessibility means that it is possible successfully to transfer data in both directions between the client institution and some point on JANET defined in the specific Service Level Definition (SLD). Whilst accessibility is important, as it is likely to closely reflect the reliability of the service perceived by end users, it cannot be equated to network *availability* for the purposes of this Service Level Agreement (SLA). This is because it includes factors outside UKERNA’s operational control, such as failures at the client institution, or delays in fixing faults due to absence of staff at a client institution.

In particular, investigation of a fault by UKERNA or its agents may be frustrated by their inability to access a client institution. In such circumstances, provided UKERNA have continued to make reasonable efforts (see A2.3.1) to contact the institution and arrange access, the period during which access is denied (the suspended period) may be considered a lack of accessibility, but not of availability.

Network availability shall therefore be determined for each client institution by discounting the following from the observed network accessibility:

- a) All periods of inaccessibility that result from the effects of service maintenance;
- b) All periods of inaccessibility that result from events local to the client institution, such as site power failures;
- c) All periods of inaccessibility which are designated suspended periods.

Network availability shall be calculated for each client institution each calendar month as:

$(\text{scheduled service time} - \text{total period of unavailability}) / (\text{scheduled service time})$.

A1.4.2 Availability of Other Services

The measurement of availability of services other than the Basic Transmission Service is more straightforward. Availability of the other services is specified as follows:

- a) A service is *available* if it can be accessed via the network and used correctly by at least one client institution that is not involved in the provision of the service. If a service is operated by one or more client institutions acting on behalf of UKERNA, it is not available if it can be accessed only from those institutions;
- b) Availability is the time that the service was *available* (as defined in (a) above) divided by the time when it was scheduled to be available;
- c) Availability shall be calculated for each service each calendar month.

Note that the availability of many services as perceived by client institutions will be the combination of the availability defined in (a) – (c) above and the network availability defined in section A1.4.1 above. UKERNA will report these two availabilities separately.

A1.5 Mean Time Between Failures

For certain services, it is useful to define Mean Time Between Failures (MTBF) as one of the Service Level parameters. In such cases, a *failure* is defined as any interruption in the operation of the service which causes a period of unavailability according to the definitions in A1.4.1, A1.4.2 and in the definition of the Service Level parameter itself.

Notes

1. UKERNA may opt to have a number of successive failures considered as a single failure for the complete period, so long as the same aggregation is applied both to availability and mean time between failures.
2. Despite the name, the mean time between failures is manipulated for the purposes of aggregation and averaging as a failure rate, in incidents per hour. Thus a target MTBF for the Basic Transmission Service of more than a thousand hours is a rate of less than 0.001 incidents per hour, and is calculated each month by dividing the

number of failures by the number of institutions and the number of hours in the month (e.g. 720). The MTBF figure for a twelve-month period is produced by averaging the rates observed in each of the constituent months of the period.

A1.6 Loss of Information

Several services operated by UKERNA accept data submitted by client institutions and then make it available to the same and to other client institutions. UKERNA takes responsibility for the safe keeping of such data once it has been accepted. All procedures by which client institutions submit new data or update previously submitted data shall include a step in which UKERNA acknowledges receipt. UKERNA's responsibility for safekeeping starts when this acknowledgement is issued.

A1.7 Non-Monitored Performance Indicators

In general, UKERNA shall routinely monitor the service categories listed in Annex A to ensure that service delivered meets the defined service levels. However in some circumstances such measurements may not be possible on a routine basis, perhaps due to cost or due to the disruptive nature of the measurements required. Where this is the case, the corresponding performance indicators shall be marked as being not monitored. However, where there is prima facie evidence that the service delivered is failing to meet a non-monitored performance indicator, UKERNA shall agree with the JISC Monitoring Unit a set of specific measurements (including the cost of such measurements) intended to determine whether the service is indeed failing to meet the appropriate service levels.

A1.8 Internet Protocol Version

Any reference to IP in this document implies Internet Protocol version 4 (IPv4), unless explicitly stated otherwise.

A2 OPERATIONAL SERVICES

A2.1 Basic IP Transmission Service

Specification for unicast transmission:

Each client institution connected by UKERNA shall be entitled to a continuous data communication service, subject to the operational limitations for maintenance time given in clause A1.1. The basic network service currently provided to all client institutions is the transmission of IP data. For the purposes of this SLA, the basic IP transmission service shall be considered to consist of two components for each client institution:

- an access component between the client institution and the JANET national backbone (see Annex H);
- a core component providing transit for client institutions across the JANET national backbone, between the points listed in Annex H.

Performance Indicators and Service Levels:

For both the core and access components of the basic IP transmission service, a network path shall be considered to be inaccessible if either:

- a) It is not possible to both transmit and receive between the two ends of the path for a period in excess of 60 seconds. Or;
- b) The performance of the path is severely degraded to an extent that the service is effectively unavailable. Severe degradation occurs where in excess of 60% of all packets transmitted on the path are lost for a period of more than 5 minutes. Or;
- c) The Round Trip Time (RTT) for a 128byte packet sent between a client institution and the nearest point on the JANET national backbone exceeds 30ms for 95% of packets over a 30 minute period

Latency is closely related to loading and, if a client institution or Funding Body chooses not to upgrade a link that is acknowledged to be overloaded, no guarantee of latency can be given. However, shared components on the access path to the Backbone Access Router might degrade the latency on that access path.

Specification for multicast transmission:

Multicast transmission forms an integral part of the basic transmission service. Multicast traffic is supported over the JANET core network and an interface provided at the edges of the core for its distribution through regional networks. Multicast rendezvous points will be configured in each Backbone Access Router. Each regional network will be able to access the multicast service by providing its own rendezvous point within the regional network that supports the necessary protocols to communicate with the appropriate backbone rendezvous point.

The multicast management interface between JANET and each regional network is positioned at the link between the Backbone Access Router and the regional network router.

Multicast is currently being used across some, but not all, parts of the access network. There are significant challenges in making this a general service due to the issues of an end-to-end service running over multiple management domains.

Performance Indicators and Service Levels:

For performance purposes, the transmission of individual multicast packets on a correctly functioning multicast group shall be subject to the same success and latency targets as for unicast transmission.

Additional service levels for the establishment and management of multicast groups will be added to the SLA in future, based on experience gained in extending multicast coverage to all regional networks.

A2.1.1 Basic IP Transmission Service - Access to Backbone**Specification:**

UKERNA shall provide a basic transmission service supporting the transmission of unicast and multicast IP traffic between each client institutions and the JANET national backbone. The service shall be provided to a designated point from the list in Annex H, via a regional network or a direct link.

Client institutions may be connected by one or more circuits for bandwidth or resilience purposes. All multiple circuits provided for bandwidth purposes will be included in the calculations of availability and traffic for the client institution. Where multiple circuits are provided for resilience, only those circuits agreed with the JISC will be included in the calculations of availability and traffic for the client institution.

UKERNA may submit for JISC's approval the details of new circuits to be provided for resilience purposes. Once JISC's approval has been given, these circuits will be included in future calculations.

Performance Indicators and Service Levels:

- a) Over the full 24 hours of operation (excluding maintenance time), UKERNA shall provide network availability of:
 - Availability of 99.7% to more than 92% of client institutions;
 - Availability of 99% to more than 96.5% of client institutions;
 - Availability of 97% to more than 98.7% of client institutions;
 - Availability of 93% to more than 99.7% of client institutions;each calculated annually from monthly averages over all client institutions sponsored by the JISC (each given equal weighting);
- b) Availability of 99% to all client institutions, calculated annually for each client institution;;
- c) Mean time between failure (period of unavailability) of at least 1000 hours provided to client institutions; (See A1.5)
- d) Time to restoration of service (duration of period of unavailability) of less than 10 hours for 90% of failures. This will be calculated as the twelve month rolling average of the percentage of reported failures in each month which are deemed to have taken less than 10 hours to restore;

Future targets for Performance Indicators:

UKERNA shall endeavour to constantly improve the availability of the Basic IP Transmission Service. The focus for this SLA period and subsequent periods will be to continue to look for opportunities to enhance resilience, at every level of the network, to reduce the number of outages affecting client institutions.

Reporting:

UKERNA shall provide on a monthly basis:

- start and finish, date and time of each incident when the client institution was not accessible for each circuit ;
- start and finish, date and time of each incident of network unavailability for the client institution for each circuit;
- start and finish, date and time of each period of inaccessibility for the client institution discounted as a result of problems of access to that client institution for each circuit;
- explanatory notes on the cause of any failure to provide at least 90% availability to a client institution during the calendar month, or for any period of unavailability for the client institution deemed to have lasted more than 10 hours for each circuit ;
- explanatory notes for any incident of unavailability that affects 10 or more client institution sites connected to the same Regional Network (where 10 or fewer sites are connected to a Regional Network, UKERNA will provide explanatory notes for any incident of unavailability which affects 75% or more of these sites);
- total traffic, separately in each direction, for each client institution.

A2.1.2 Basic IP Transmission Service - Core Network**Specification:**

UKERNA shall provide a core IP network supporting the transmission of unicast and multicast IP traffic between access points on the boundary of the core. This core network is defined in terms of the core access points listed in Annex H.

Performance Indicators and Service Levels:

- a) The availability of the core IP network from each of the core access points listed in Annex H shall exceed 99.9%.
- b) The target maximum latency for 128 byte packets between any two access points to the JANET national backbone is 25 ms, for 95% of transmissions over any 30-minute period.

Reporting:

UKERNA shall report the following each calendar month:

- utilisation of the core network taken at the 90th percentile for each link;
- incidents of network unavailability for each link within the core network including the start and finish, date and time;
- by exception, incidents that isolate core access points from the core IP network including an explanation of the incident and the start and finish, date and time;
- by exception, incidents when target latency in Service Level (b) above is not met.

A2.2 External Network Access Provision and Transmission

Specification:

UKERNA shall identify other network services of particular significance to the Community (Peer Networks) and shall aim to negotiate cost effective and resilient arrangements for access to these services with the countries or groups concerned. Such agreements shall be established to support the Community's requirements for access by its members from commercial ISP services, for international and domestic communication, and for communication with significant non-academic groupings within the EU in general and the UK in particular. Such external network services shall interwork with those offered nationally by UKERNA. UKERNA shall use its best endeavours to negotiate Service Level Agreements with the organisations with which it shares responsibility for establishing routes to or from the Community. UKERNA shall not use JISC funds to subsidise the groups with which such agreements are concluded.

UKERNA shall maintain a web page (the "Peering Web Page") that lists the connections maintained to Peer Networks (ref. Annex I.6).

Performance Indicators and Service Levels:

- a) If a Service Level Agreement has been established with another service provider, UKERNA shall conform to the terms of the Agreement;
- b) Until such a service level can be established, UKERNA shall use its best endeavours to ensure that the availability of each route shall be the same for the equivalent academic community basic transmission service; the levels defined in A2.1.1 apply to those aspects of the service under UKERNA's control.

Reporting:

UKERNA shall provide monthly reporting on the connections listed in A2.2.1-A2.2.2 and the Peer Network connections listed on the Peering Web Page. This reporting will include the following items:

- list of service providers involved in external network access provision, including number and speed of all links;
- start and finish, date and time and explanatory notes of incidents when each link was unavailable;
- total levels of traffic on each link in each direction.

UKERNA shall make available information on the distribution of traffic on these connections including traffic and availability reports via the Network Status Information System (see A2.3.2).

Note: In cases where there are difficulties distinguishing between flows over shared links to a number of external networks, aggregate traffic is preferable to failure to report altogether.

A2.2.1 Access to Education and Research Networks**Specification:**

UKERNA shall provide cost effective access to higher and further education and research networks and services in the European Union and North America.

Performance Indicators and Service Levels:

Service levels (a) and (b) in 2.2 apply.

Reporting:

Monthly reports as defined in A2.2.

A2.2.2 Access to the Global Internet**Specification:**

UKERNA shall provide cost-effective access to the parts of the Global Internet not covered elsewhere in this Service Level Agreement. This provision shall be in the form of a flexible managed service delivered by a suitable contractor or contractors at agreed access points within the UK.

Performance Indicators and Service Levels:

The service offered by the contractor(s) shall be subject to a Service Level Agreement. Once an SLA has been agreed, it effectively becomes part of this SLA and UKERNA is responsible (via its sub-contractor) for its delivery.

The paths from the point of delivery to the JANET core shall be subject to the performance targets given in A2.1.2, considering, for weighting purposes, those paths to form a separate group, independent of the core.

Reporting:

Monthly reports as defined in A2.2.

A2.3 Fault Handling

A2.3.1 Fault Reporting

Specification:

UKERNA shall provide a means by which client institutions may report faults on any of UKERNA's Operational Services. UKERNA shall publish procedures for fault reporting and shall organize a sufficient set of mechanisms for call out in response to faults and for escalation in response to continuing problems. These procedures shall take account of the need for users of the network to be kept aware of progress and status during periods of disruption.

Where service is provided via a sub-contractor, UKERNA shall make arrangements for fault reporting and provision of progress and status information, via the sub-contractor, or otherwise.

Wherever possible, UKERNA shall use the measurements it makes of the accessibility of each client institution to initiate fault recovery action proactively, without waiting for fault reports to be made.

Where an obligation is placed on UKERNA to contact the client institution within a given period, this obligation is dependent upon the ability of the client institution to receive such reports. If delivery is not possible because the institution is not staffed at the time, the report shall be made within one hour of the institution's staffed period. If there is no response from the client institution to a call made during a staffed period, UKERNA shall notify the client institution of the apparent inaccessibility by fax.

UKERNA shall attempt to inform the appropriate representative of the client institution within one hour of finding that the client institution is apparently inaccessible.

UKERNA shall keep a record of all communications with client institutions concerning fault reports and return to service indications.

Performance Indicators and Service Levels:

- a) Client institutions shall be able to report faults at any time. (Use by UKERNA of a telephone answering machine is acceptable as long as the other service levels (b) and (c) below continue to be met.);
- b) UKERNA shall respond to any fault report with an initial prognosis:
 - within one hour when reported during a staffed period; or
 - within one hour when there is more than one hour remaining in an extended service period: or
 - otherwise, within one hour of the start of the next staffed or extended service period
- c) Where faults are detected by UKERNA, a summary of the fault and of the action taken shall be provided to the institution affected on the same time-scale.
- d) UKERNA shall make a first attempt to inform the appropriate representative of each client institution of a return to service within 60 minutes of the fault being fixed.

Reporting:

For fault reports referring to the basic transmission (as defined in A2.1 – A2.2), UKERNA shall report the following information on a monthly basis:

- number of fault reports;
- achieved response time for the reports;
- description of any exceptional events;
- breakdown by type of fault reported, into:
 - JANET Access - access line fault reports;
 - external Access - access to hosts and service beyond JANET;
 - JANET service - problem with JANET service use/access.
- By exception, events failing Performance Indicator d)

A2.3.2 Network Status Information**Specification:**

UKERNA shall provide online web-based information on the status and performance of the basic IP transmission service on network status servers. This information shall include details of the operational status of the core IP network and the external network access provision, presented in a form suitable for end users of the JANET network. Each client institution shall have access to more detailed information for its own connection. This restricted information shall include the accessibility of the access path between the client institution and the JANET core network, and current and historical traffic figures for the access link to the client institution. This restricted information shall be made available to the JISC Monitoring Unit.

In future, the performance of the multicast service will be monitored by sending multicast traffic over the JANET core network and displaying the results as an additional data item.

Performance Indicators and Service Levels:

- a) Availability of each network status server of 99.5%;
- b) Mean time between failure of 1000 hours;
- c) UKERNA will update the configuration of the network status system to reflect new, modified, removed or otherwise amended nominated network access connections within five working days of each change.

Reporting:

UKERNA shall provide on a monthly basis:

- list of failures, by exception, to update the network status system configuration within five working days.

UKERNA shall provide on a quarterly basis:

- list of outages, including start and finish, date and time and explanatory notes for each network status server.

A2.4 Managed Router Service

Specification:

UKERNA shall provide a managed router service, on request, to eligible institutions connected to JANET. This service will have limited scope, covering initial set-up, hardware and software maintenance, minor changes to configuration and remote analysis of faults.

Where the fault is determined to be with the router, alerts will be raised to the router maintenance provider; UKERNA will monitor progress and ensure that the institution is informed once the router fault has been rectified.

The router shall be deemed to be part of the access path to the JANET national backbone. Availability of the router shall be measured as part of the availability of the Basic IP Transmission Service defined in A2.1.1.

Performance Indicators and Service Levels:

- a) UKERNA will make arrangements for the service to be provided within 2 working days of receipt of request for service and will provide the service within a further 20 working days;
- b) UKERNA will ensure that the maintenance provider is aware of a fault within one hour of a router fault being detected.

Reporting:

UKERNA shall provide on a quarterly basis:

- list of requests received for the MRS, date of request, date effected;
- the number of requests received for changes to configuration with reporting to show a zero value if applicable;
- minimum, maximum and mean time to implement changes.

A2.5 Naming and Addressing

A2.5.1 Domain Name Service and Naming Administration

Specification:

UKERNA shall provide a name service for the DNS domain “ac.uk” including the operation of the primary name server and the provision of a secondary name server function. UKERNA shall also provide coordination and administration for the naming domain “ac.uk” and within this domain shall make name allocations in the DNS.

UKERNA shall also carry out such management activities as are necessary to support the Community within this domain and to coordinate the service with appropriate national and international bodies.

Performance Indicators and Service Levels:

- a) UKERNA shall provide by replication a name service that is effectively available on a continuous basis at all times;
- b) An initial response within 4 working hours to a request for administrative services;
- c) Correctly completed new name registration requests shall be either approved or rejected within 5 working days of the request being received;
- d) Implementation of new delegations in the DNS domain within 5 working days from approval of name registration given the receipt of all necessary information and payment when applicable;
- e) Implementation of a request for a modified delegation in the DNS domain within 5 working days from the receipt of all necessary information and payment when applicable.

Reporting:

On a monthly basis, UKERNA shall report:

- the number of replicated subsystems involved in providing the service, and the list of locations and basic availabilities of each subsystem. UKERNA shall also report the start and finish, date and time and explanatory notes of any exceptional event causing the service provision to be unavailable or to supply incorrect or incomplete information.

On a quarterly basis, UKERNA shall report:

- By exception, failures of PI b)
- A list of requests for service showing:
 - the type of request (name registration or modification);
 - the domain name stated in the request;
 - the unique reference number of each request;
 - the date on which each request was received;
 - the date on which the request outcome was decided;
 - whether the request was accepted or rejected;
 - the date on which all necessary information and payment was received;
 - the date on which the domain name was implemented in the DNS.

Explanation of failure for Performance Indicators b), c) and d) should be provided.

A2.5.2 Primary Nameservers for Institutions

Note: Whilst UKERNA is firmly of the view that the primary DNS server for a client institution ought to be on that institution's campus network, nevertheless UKERNA accepts that this service may be required to provide a last-resort service for a small number of client institutions.

Specification:

UKERNA shall provide an off-site primary nameserver service, on request, to those JANET client institutions with a primary connection that are unable to make provision for such a service themselves. The service will provide a full representation of the client institution's domain.

Performance Indicators and Service Levels:

- a) Primary DNS Service availability of 99.95% to clients;
- b) UKERNA will publish the basic zone information for the client institution's domain(s) and inform the client institution when the service is configured within 5 working days of receipt of all the necessary information from the client institution;
- c) UKERNA will action any requests for modification to the entries in the primary server within 5 working days of receipt of all the necessary information from the client institution.

Reporting:

On a monthly basis, UKERNA shall report, by exception:

- start and finish, date and time and explanatory notes for each break of service.

On a quarterly basis, UKERNA shall report:

- the total number of client institutions registered to use the service;
- list of primary nameserver service requests, showing the date on which the request was received, the date when all necessary information was received and the date of service setup;
- list of modification requests, showing the date on which the request was received, the date when all necessary information was received and the date the modification was implemented.

A2.5.3 Secondary Nameservers for Institutions

Specification:

UKERNA shall provide an off-site secondary nameserver service, on request, to those JANET client institutions with a primary connection. The service will provide for only the top level of a client institution's domain.

Performance Indicators and Service Levels:

- a) Secondary DNS service availability of 99.5% to all clients;
- b) UKERNA will allocate a secondary nameserver for a client institution, providing the names and IP addresses of the allocated nameserver within 5 working days of a request being received;

Reporting:

On a monthly basis, UKERNA shall report, by exception:

- start and finish, date and time and explanatory notes for each break of service;

On a quarterly basis, UKERNA shall report:

- the total number of client institutions registered to use the service;
- list of secondary nameserver requests, showing the date on which the request was received and the date of server allocation.

A2.5.4 Domain Name Service 'whois' service

Specification:

UKERNA shall provide a 'whois' service giving additional information relating to allocations of names in the ac.uk naming domain.

Performance Indicators and Service Levels:

- a) Service availability of 99.5%;
- b) Changes to the ac.uk domain shall be reflected in the 'whois' database within 24 hours of their publication in the DNS.

Reporting:

On a quarterly basis, UKERNA shall report, by exception:

- start and finish, date and time and explanatory notes of each event causing the service to be unavailable;
- details of failures of the 'whois' database to reflect its expected content.

A2.5.5 IP Address Assignment

Specification:

UKERNA shall administer procedures for the assignment and approval of IP address allocations, allowing existing and new client institutions to apply for appropriate addresses required for their connectivity to the JANET Network.

Performance Indicators and Service Levels:

- a) Once all information has been assembled, new and existing client institutions shall have their request for IP addresses processed within 10 working days of the receipt of the request.

Reporting:

On a quarterly basis, UKERNA shall report, for each request received and processed:

- name of client institution;
- type of connection (Primary or Sponsored);
- date request received and all information assembled;
- the IP version of the address range requested (IPv4/IPv6);
- date of final response;
- whether the request was accepted or rejected;
- explanations of Performance Indicator failure.

A2.5.6 Off-site Resolver for Institutions

Note: Whilst UKERNA is firmly of the view that the resolving nameserver (Resolver) for a client institution should be on that institution's campus network, UKERNA accepts that this service may be required to provide a last-resort service for a small number of client institutions.

Specification:

UKERNA shall provide an off-site Resolver service, on request, to those client institutions that are unable to make provision for such a service themselves. The service provides a suitable number of dedicated Resolvers located in the core of JANET to answer requests for domain name resolution that come from a client institution. Each client institution approved to use the service will be asked to configure their systems to use one JANET Resolver as first choice, another as second choice and so on.

Performance Indicators and Service Levels:

- a) UKERNA shall provide by replication a service that is effectively available on a continuous basis at all times;
- b) UKERNA will enable access to the Resolvers for a client institution within 5 working days of receipt of all the necessary information from the client institution;
- c) UKERNA will inform the client institution of the Resolver IP addresses in the order of preference with which their systems should be configured when the initial set up of the Resolver is complete.

Reporting:

On a quarterly basis, UKERNA shall report:

- total number of client institutions registered to use the service;
- start and finish, date and time and explanatory notes of any event causing the service provision to be unavailable;
- off-site Resolver service requests, showing the date on which the request was received, the date that all necessary information was received and the date of service setup.

A2.5.7 Uniform Resource Name: Middleware Architecture Committee for Education - urn:mace:ac.uk namespace administration**Specification:**

UKERNA shall provide co-ordination and administration for the urn:mace:ac.uk namespace. URN allocations will be made within this namespace and must be capable of being resolved to obtain the document or specification that it identifies.

Performance Indicators and Service Levels:

- a) URN registration requests for new middleware applications and projects relating to education shall be either approved or rejected within 10 working days of receipt of all necessary information.

Reporting:

On a quarterly basis, UKERNA shall report:

- A list of namespace requests showing:
 - the date on which each request was received;

- the date of receipt of all necessary information;
- the date on which the request was decided;
- whether the request was accepted or rejected.

A2.6 Supporting Infrastructure Services

A2.6.1 NTP Time Service

Specification:

UKERNA shall operate a time reference on behalf of client institutions, in accordance to RFC 1305. This service is intended for use by institutions in constructing their own distributed time services, not for access by end users.

Performance Indicators and Service Levels:

- a) UKERNA shall provide by replication a service that is effectively available on a continuous basis at all times.

Reporting:

On a quarterly basis, UKERNA shall report:

- the number and location of the replicated subsystems involved in providing the service;
- the nature, start and finish, date and time of any exceptional event causing the service provision to be unavailable or to supply incorrect or incomplete information.

A2.6.2 E-mail Advice and Testing Service

Specification:

UKERNA shall provide assistance, advice and guidance to client institutions on the use of Internet mail, and on the configuration and operation of mail systems.

As part of the service, UKERNA operates the Spam-relay Tester and Notification system. It tests a client institution's mail server, and reports any vulnerability to unauthorised relaying it finds. It is available on client institution request, and UKERNA systematically scans certain client institutions' mail systems from time to time.

Performance Indicators and Service Levels:

- a) System availability of 99.95% during Staffed Periods.

Reporting:

On a monthly basis, UKERNA shall provide:

- start and finish, date and time of each event causing the service to be unavailable.

On a quarterly basis, UKERNA shall provide:

- number of tests requested by client institutions;
- number of tests scheduled by UKERNA;
- number of new open relays detected.

A2.6.3 Mail Abuse Prevention System

Specification:

UKERNA shall provide certain services of the Mail Abuse Prevention System (MAPS) on behalf of all the JANET community to assist mail managers in determining if their mail systems should refuse connections from certain addresses. It is based on DNS style resolution, using *rbl-plus.mail-abuse.ja.net*.

Performance Indicators and Service Levels:

- a) UKERNA shall provide by replication a service that is effectively available on a continuous basis at all times.

Reporting:

On a monthly basis, UKERNA shall report:

- for each day of the month, the daily usage of the service, showing:
 - number of individual hosts that made queries (accepted);
 - number of queries received (accepted);
- for each day of the month, the number of updates to the Real Time Blackhole List + (RBL+);
- the number and location of the replicated subsystems involved in providing the service;
- the nature, start and finish, date and time of any event causing the service provision to be unavailable;
- by exception, problems observed with receiving the RBL+ updates.

A2.6.4 JANET Mailer Shield

Specification:

UKERNA shall operate a service to help manage the mail facilities of a client institution making them more secure and robust, particularly where the client institution is small or its resources for managing e-mail are limited.

The service provides a front end to client institutions' mail servers, therefore protecting them from being misused to relay messages between two other parties. Mail messages sent to a client institution's network from the outside will first pass through a relay of the Mailer Shield service. As well as identifying the immediate source of each message, the JANET relays can add further header lines indicating whether the source is listed in any of the parts of RBL+, which the client institution or end users might choose to treat as Unsolicited Bulk E-mail (UBE).

Performance Indicators and Service Levels:

- a) 99.5% availability for each server in the service;
- b) Except for delay caused by failures in a client institution's mail system, the time between a message being transferred to a service relay and the first attempt to transfer it to the client institution mail server is to be no more than 10 minutes for 99.9% of messages transferred.
- c) The mean time between failures for each server, calculated over any period of twelve calendar months, is to be no less than 1000 hours.

Reporting:

On a monthly basis, UKERNA shall report:

- the volume of data and number of messages received from and delivered to each client institution;
- list of each system and server outage including the start and finish, date and time;
- by exception, any service failure or unscheduled maintenance events that cause delays in the first attempt of message transfer to exceed 10 minutes, together with the reason for the delay.

A2.7 Usenet News Service

Introduction:

UKERNA shall make arrangements for client institutions to be able to both read and submit Usenet News articles. The service will be managed so as to ensure:

- efficient use of JANET network connections;
- prompt availability of articles;
- prompt onward transmission of submitted articles;
- delivery methods appropriate to a variety of patterns of use;
- low probability of the availability of illegal material.

A2.7.1 Linking JANET to the Usenet News Service

Specification:

UKERNA shall operate a system of News Servers exchanging News articles with organisations outside JANET and will make arrangements for the exclusion of illegal material from the JANET news backbone, although it is recognized that it is impracticable to make any guarantee of such exclusion.

Performance Indicators and Service Levels:

- a) Service availability of 99.5%. Each server is to be available to exchange articles with external organisations and client institutions for no less than 99% of the time measured over any calendar month.
- b) The Mean Time Between Failures for each server, calculated over any period of twelve calendar months, is to be no less than 1000 hours.

Reporting:

UKERNA shall report monthly:

- external organisations with which the JANET News backbone exchanges feeds;
- the volume of news entering and leaving the backbone from and to external organisations;
- a list of outages, including start and finish, date and time, for each server in the backbone;
- client institutions that experienced a loss of service (client institution name, start and finish, date and time of each event).

A2.7.2 News Feed Service

Specification:

UKERNA will operate a continuous News Feed with designated client institutions in which they are able to exchange articles and incoming articles are offered to the client institution's system as soon as they are available in the JANET News backbone. New news articles are delivered on a continuous basis unless the client institution's reader rejects them.

Performance Indicators and Service Levels:

- a) Service availability of 99.5%. Each server is to be available to exchange articles with client institutions for no less than 99% of the time measured over any calendar month. [This is reported under Performance Indicator a) for section A2.7.1]

Reporting:

UKERNA shall report monthly:

- the volume of data and number of articles delivered to each client institution.

A2.7.3 News Reader Service**Specification:**

UKERNA shall provide servers from which a client institution can transfer newsgroup details and individual articles on its own initiative.

This shall be available to client institutions that do not operate a News Reader Service themselves and where the volume of News Reading is expected to be modest. The News Reader servers shall be updated by the News Feed Service (see A2.7.2).

Each client institution may specify a list of network addresses (netblocks or DNS subtrees) from which its users may gain access. Each client institution may also specify for each address a range of access control attributes including whether news may be posted, and access limitations for particular news groups.

Each client institution shall be provided with access to its own usage statistics.

Performance Indicators and Service Levels:

- a) Service availability of 99.5%. Each News reader server is to be available for authorised systems at client institutions to read and post articles for no less than 99% of the time measured over any calendar month;
- b) The Mean Time Between Failures for each reader server, calculated over any period of twelve calendar months, is to be no less than 1000 hours;
- c) Each newsreader server will respond to a request for any plain text article (measured from start of request to end of transfer), from a monitoring client within JANET, within an average of one second from samples taken at intervals no longer than 15 minutes.

Reporting:

UKERNA shall report monthly:

- a list of outages, showing the start and finish, date and time for each reader server;
- the volume of data delivered to each client institution;
- client institutions that experienced a loss of service (client institution name, date, time and duration of each event);
- average response times calculated per server for a plain text article;

A2.8 Video Conferencing Services

A2.8.1 Video Conferencing Services

Specification:

UKERNA shall offer a bookable JANET videoconferencing service (JVCS) supporting both IP (JVCS-IP) and ISDN (JVCS-ISDN) as transport technologies. JVCS-ISDN allows users connecting to an MCU via ISDN (not provided by JANET), at a range of access classes including 128kbit/s and 384kbit/s. JVCS-IP will be provided at a range of access classes between 128kbit/s and 2Mbit/s. The service will also provide gateway and rate matching facility support for videoconferencing between IP and ISDN endpoints at different connecting speeds.

Additionally, a dedicated IP-only instant videoconferencing resource (JVCS-OnDemand) will be offered.

In order to route calls effectively, both nationally and internationally, the service will provide a gatekeeper hierarchy to support an E.164 dialing scheme. As part of the hierarchy, the central JANET gatekeeper will provide an alternative to a gatekeeper deployed at an institution, for those that are unable to operate their own.

UKERNA shall provide a common videoconferencing booking system for both ISDN and IP based services.

Client institutions shall be able to report faults at any time when the JVCS management centre is staffed. If an initial diagnosis determines the fault lies with the JVCS facility, prompt action shall be taken by the Management Centre to ensure the videoconference concerned can continue if possible. If any other cause is found the client institution concerned will be notified of the cause.

Note: Due to the nature of the service operation, some enquiries will require immediate corrective action or investigation. Other enquiries will require more detailed investigation. All instances will be recorded in the Call Management System.

Performance Indicators and Service Levels

For both services as defined above:

- a) Availability of each Multipoint Control Unit (MCU) of 99%;
- b) Availability of the booking system of 99%;
- c) Availability of Central JANET Gatekeeper of 99.5%;
- d) Availability of Gatekeeper hierarchy to support the Global Dialling Scheme over JANET of 99.5%;
- e) A resource reservation shall be made within six (6) working hours, where working hours are hours within the staffed periods defined in (f) below, after receiving a booking request;
- f) The JVCS Management Centre shall be staffed throughout the staffed periods defined as:
08:00 – 21:00 Monday to Friday
08:00 – 17:00 Saturday
excluding the following public holidays:
New Year's Day, Good Friday, Christmas Day and Boxing Day;

- g) An initial response to any enquiries shall be given within four working hours, where working hours are hours within the staffed periods defined in (f) above;

Reporting:

On a monthly basis, UKERNA shall report:

- the start and finish, date and time of outages for each of the systems covered by performance indicators (a), (b), (c) and (d) above.
- items failing performance indicators (e) and (g) reported by exception.
- a summary of the total number of videoconferences, by number of participating end points, for each month;
- total number of requests for support;
- description of any exceptional events.

A2.8.2 Video Technology Advisory Services (VTAS)**Specification:**

UKERNA shall provide assistance, advice and guidance to the users and operators of video services and video technologies at individual client institutions, with the aim of obtaining a consistent, well-managed service from the operators of those services.

The VTAS helpdesk shall be available through JANET Customer Service described at A3.2.

VTAS shall undertake product evaluations and conduct studies into aspects of emergent and existing video technologies. During the year, UKERNA will select a number of products for evaluation and topics for study.

VTAS will maintain a repository of web based information on a range of topics related to the use of video technologies, which are of interest to both end users and technical support staff at the client institutions (ref. Annex I.7).

Performance Indicators and Service Levels:

- a) The helpdesk shall be staffed throughout the staffed periods defined in A1.2, except that it will not be available:
- before 0900;
 - on Easter Bank Holiday Monday;
 - on the last Monday in August
 - 24th-31st December
- b) An initial response to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in a) above;
- c) Client institutions shall be able to lodge telephone and email enquiries at all times when the VTAS helpdesk is not staffed;
- d) Product evaluation reports shall be placed on the VTAS web pages (ref. Annex I.8) within 10 working days of report completion.

Reporting:

On a quarterly basis, UKERNA shall report:

- number of enquiries received during the reporting period;
- number of enquiries where PI b) was not met;

- number of enquiries resolved;
- the range of topics covered by queries received within the reporting period;
- the number of accesses made to the VTAS web pages during the reporting period.

On a quarterly basis, UKERNA shall report as part of the reporting of the UKERNA operational plan (see Annex D):

- list of product evaluations with date of testing;
- list and date of publications (either the date of placement on the VTAS web pages or the date of release for other material);
- any further product evaluations or studies in preparation for publication;
- plans for forthcoming product evaluations and documents.

A2.8.3 Access Grid Support Centre (AGSC)

Specification:

UKERNA shall offer support services for the operators of Access Grid collaboration technology. The support services are provided by the Access Grid Support Centre, which: manages and operates multicast / unicast bridges; provides conversion services between different videoconferencing technologies; provides help, advice and guidance on deploying, using and managing Access Grid technology; and performs Quality Assurance tests on Access Grid nodes to enhance the experience of using Access Grid for users.

Client institutions shall be able to report faults at any time when the AGSC is staffed. If an initial diagnosis determines the fault lies with the AGSC facility, prompt action shall be taken by the Centre to ensure the session concerned can continue if possible. If any other cause is found the client institution concerned will be notified of the cause.

The Support Centre will maintain a repository of web based information about the services of the Centre. (ref. Annex I.9)

Performance Indicators and Service Levels:

- a) Availability of main multicast bridge 99%;
- b) Availability of videoconference conversion services 99%;
- c) The AGSC shall be staffed throughout the staffed periods defined in A1.2, except that it will not be available:
 - before 0900;
 - on Easter Bank Holiday Monday;
 - on the last Monday in August;
 - 24th-31st December.
- d) An initial response to any enquiries shall be given within four working hours of a staffed period.

Reporting:

On a quarterly basis, UKERNA shall report:

- the start and finish, date and time of outages for the systems covered by performance indicators (a) and (b) above;
- total number of requests for support;
- number of enquiries where PI (d) was not met;

- the number of accesses made to the Support Centre web pages during the reporting period.

A2.9 Administrative Services

A2.9.1 Connection Services Administration

Specification:

UKERNA shall administer procedures for approval and commissioning of connection services, allowing new client institutions to join the JANET network; upgrades to existing connections, including a-end or b-end shifts; mergers and cancellations.

The A-end is the location on the network where the customer connects to JANET.

The B-end is the location of the customer end of the circuit connecting the organisation to JANET.

Performance Indicators and Service Levels:

- a) New client institutions shall receive the connection service within 90 working days of UKERNA's receipt of all necessary information unless delivery of service is prevented by reasons beyond UKERNA's control;
- b) Existing client institutions shall receive an upgrade to their connection service, including a-end or b-end shifts within 80 working days of UKERNA's receipt of all necessary information (in the case of pre-approved upgrades, within 80 working days of authorisation) unless delivery of service is prevented by reasons beyond UKERNA's control;
- c) Mergers between existing client institutions will result in one connection being cancelled within the timeframes below and once the official merger date has been agreed with UKERNA, unless cancellation is prevented by reasons beyond UKERNA's control.
 - 12 calendar months if an FE client institution
 - 3 calendar months if an HE client institution

Note: During the timescales above, the availability in A2.1.1 will be reported and measured as separate client institutions.
- d) Cancellations for client institutions will be implemented within 20 working days of approval with UKERNA unless the cancellation is prevented by reasons beyond UKERNA's control

Reporting:

UKERNA shall provide the following information each quarter, for each request received:

- name of client institution;
- client institution funding body;
- date and type of the connection service request;
- date that all necessary information was received by UKERNA (in the case of pre-approved upgrades, the date of authorisation);
- date the connection service was ready for client institution acceptance;
- connection bandwidth size;
- the nature, date and duration of any event causing Performance Indicator failure.

A2.9.2 Peer Networking Agreement Administration

Specification:

UKERNA shall administer the set of peer networking agreements made as a result of the JISC's peer networking policy.

Performance Indicators and Service Levels:

- a) Any additional information required to process a peer networking request shall be notified to the requester within 10 working days of receipt of the initial request;
- b) Peer-networking requests shall be either accepted or rejected within 20 working days of UKERNA receiving all necessary information.

Reporting:

On a quarterly basis, UKERNA shall report:

- a list of agreements processed in the period with the following dates for each agreement:
 - date of initial request;
 - date additional information requested by UKERNA;
 - date when all required information received by UKERNA;
 - date of acceptance or rejection notification.

A2.9.3 Licence Administration**Specification:**

UKERNA shall administer the sponsored and proxy-licensing scheme defined by the JISC as part of its connection policy. Individual client institutions may apply for a single sponsored licence and Regional Network Operators may apply for multiple sponsored connection licences to connect a number of sponsored organisations at a discounted rate. RNOs also have the option to then apply to connect additional sponsored organisations.

Performance Indicators and Service Levels:

- a) licence requests shall either be accepted and issued or rejected within 20 working days.

Reporting:

UKERNA shall report, on a quarterly basis:

- the number and type of licences issued or rejected in each month;
- the date of each licence request and the date of licence issue or rejection.
- explanations of Performance Indicator failure.

A2.10 Management of Maintenance Activities

Specification:

UKERNA shall ensure that client institutions are given advance notice of service changes that affect them and shall also publish warnings of unavoidable losses of service that are planned beforehand according to the timing specified in A1.1. Warnings of changes shall be disseminated by means of electronic mail distribution lists and other appropriate media.

Performance Indicators and Service Levels:

Notes:

- 1 As specified in A1.1 maintenance time comprises scheduled maintenance and emergency maintenance.
- 2 The services listed in Performance Indicator c) have no allowance for service affecting emergency maintenance.
 - a) The total service affecting maintenance time for the core IP network as defined in A2.1.2 and Annex H shall not be more than 0.5% of the service time over the SLA period of which not more than 0.1% of service time over the SLA period may be emergency maintenance;
 - b) The total service affecting maintenance time for each client institution shall not be more than 0.5% of service time over the SLA period of which not more than 0.1% of service time over the SLA period may be emergency maintenance;
 - c) The total service affecting scheduled maintenance time for access to each of the following services shall not be more than 0.5% of service time over the SLA period:
 - Global Internet transit;
 - European research network;
 - American research networks;
 - XchangePoint;
 - UK public peering at the LINX; and
 - UK public peering at MaNAP.

Reporting:

UKERNA shall report, on a quarterly basis:

- The start and finish, date and time of each service affecting maintenance period taken for each client institution and for each access point (as defined in Annex H), for each month of the quarter indicating which is scheduled maintenance and which is emergency maintenance;
- The start and finish, date and time of each service affecting scheduled maintenance period taken for each of the services defined in Performance Indicator c) above.
- Reasons for each service affecting emergency maintenance period that takes place during Staffed Periods (see A1.2).

A2.11 Bandwidth Management Advisory Services (BMAS)

Specification:

UKERNA shall provide advice and guidance to client institutions on issues relating to the management of bandwidth and advice on technical solutions.

The Bandwidth Management Advisory Service shall undertake evaluations of selected products or technical solutions and produce technical guides within the work area of the service.

Users will access these evaluations of products or technical solutions through the service's web site (ref. Annex I.10) and will be able to contact the service through the JANET Customer Service, described at A3.2.

Performance Indicators and Service Levels:

- a) An initial response to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in A1.2;
- b) Product or solution evaluation reports shall be placed on the BMAS web pages within 20 working days of evaluation completion.

Reporting:

On a quarterly basis, UKERNA shall report:

- number of enquiries received during the reporting period;
- the number of enquiries resolved;
- by exception, the number of enquiries where Performance Indicator a) was not met;
- the range of topics covered by enquiries resolved within the reporting period;
- the number of accesses made to the BMAS web pages during the reporting period.

On a quarterly basis, UKERNA shall report as part of the reporting on the UKERNA operational plan (ref. Annex D):

- list of product or solution evaluations with date of testing;
- list and date of publications (either the date of placement on the BMAS web pages or the date of release for other material);
- any further product evaluations or technical guides in preparation for publication;
- plans for forthcoming product/solution evaluations and documents.

A2.12 Multi-site Connectivity Advisory Service (MCAS)

Specification:

UKERNA shall provide advice and guidance to client institutions, particularly FE colleges, on issues relating to multi-site connectivity. The advice and guidance for FE colleges shall normally be provided through the JISC Regional Support Centres.

The MCAS shall provide users with preliminary advice and guidance on wide area communications and shall maintain information about suppliers of specialist expertise to whom enquirers will be directed for more detailed consultancy and services.

In addition, the MCAS shall commission and publish documents of interest to client institutions' IT managers such as case studies and technology reviews.

Users will access these case studies, technology reviews and generic advice and guidance through the service's web site (ref. Annex I.11) and will be able to contact the service through the JANET Customer Service, described at A3.2.

Performance Indicators and Service Levels:

- a) An initial response to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in A1.2;
- b) Completed case studies and technology reviews shall be made available on the web site within 20 working days of completion.

Reporting:

On a quarterly basis, UKERNA shall report:

- number of enquiries received during the reporting period;
- the number of enquiries resolved;
- by exception, the number of enquiries where Performance Indicator a) was not met;
- the range of topics covered by enquiries resolved within the reporting period;
- the number of accesses made to the MCAS web pages during the reporting period.

On a quarterly basis, UKERNA shall report as part of the reporting on the UKERNA operational plan (see Annex D):

- production of documents for the MCAS web pages during the reporting period, including title, date of commissioning, date of completion and date of placement on the web;
- plans for documents in the forthcoming quarter.

A2.13 Core Network Development Programme

Specification:

UKERNA shall execute a programme of development activities ('the core network development programme') to ensure that the demands placed on JANET by current and future network applications are met.

The core network development programme will focus on development of network-level technologies and services to provide support to network applications and ensure that major applications developed elsewhere for delivery over JANET receive appropriate support from the network infrastructure when rolled out.

UKERNA will specify the core network development programme work plan based on its analysis of future requirements gathered through consultation with key stakeholders, including the JCN Development Group.

Performance Indicators and Service Levels:

- a) Within the context of UKERNA's ISO 9001:2000 accredited Management framework, a review of the core network development programme will be undertaken annually by UKERNA. The review will assess whether the objectives of each of the development activities are being met.

Reporting:

On an annual basis, UKERNA shall provide as part of the UKERNA Operational Plan (ref. Annex B):

- the core network development work plan;
- a report on the annual review of the core network development programme.

On a quarterly basis, UKERNA shall provide as part of the reporting on the UKERNA operational plan (ref. Annex D):

- a summary of progress of each of the development activities within the core network against the development programme work plan.

A2.14 JISCmail

Specification:

UKERNA shall provide an electronic mailing list service for the education and research community. The service will use the world-wide-web and e-mail to enable list-members to talk to each other and to share information.

The focus of the service will be:

- Distribution of messages to lists;
- Archiving of messages sent to lists;
- Storage of files of interest to members of a list;
- A search facility to help users find relevant lists and details of 'open' lists;
- An interface to allow users to join or leave lists;
- An administrator facility to allow list-owners to manage lists;
- Provision of a real-time text-based Virtual Discussion Room for each list;
- A survey facility to allow list-owners to produce web-based questionnaires for list members to respond to.

The service will also:

- Annually perform housekeeping functions in order to maintain efficient and effective use of the service and its lists;
- Perform effective virus checking on all incoming email;
- Actively implement measures to combat Unsolicited Bulk Email (UBE) or SPAM and mail loops.
- In addition to this, a Helpdesk will be available to answer questions on the use of the service. This Helpdesk shall deal with enquiries made by telephone, fax and electronic mail. The JISCmail service will maintain a web server which will provide comprehensive information on using the service (ref. Annex I.12);
- Accept or reject proposals for the creation of new lists. The criteria for the creation of which is to be clearly set out on the service web site.

Performance Indicators and Service Levels:

- a) Service availability of 99.5%;
- b) Message Turnaround time (reported through regular hourly samples of test traffic) of 30 seconds for 95% of messages accepted for distribution;
- c) Routine updates to virus checking software will be validated and applied within 1 working day of notification from software provider;
- d) The Helpdesk shall be staffed throughout the Staffed Periods defined in A1.2, except that it will not be available:
 - before 0900;
 - on Easter Bank Holiday Monday;
 - on the last Monday and Tuesday in August;
 - 24th – 31st December.
- e) An initial acknowledgement to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in (d) above;
- f) New list proposals that meet the set out criteria will be set up within 3 working days;
- g) Enquiries shall be able to be lodged via telephone and e-mail at all times when the JISCmail Helpdesk is not staffed.

Reporting:

On a monthly basis, UKERNA shall report:

- start and finish, date and time of each incident of service unavailability;
- number of messages accepted for distribution and the number sent out;
- number of accepted messages not handled within the turnaround time;
- number of lists, number of lists with archives, number of files associated with lists;
- number of lists created and number of lists deleted;
- number of contaminated messages intercepted;
- number of viruses that reached JISCmail;
- number of software updates not implemented within 1 working day;
- number of enquiries received;
- number of enquires where PI e) was not met;
- number of new list requests, the number rejected and the number not created within 3 working days;
- number of surveys activated;
- number of virtual discussions conducted;
- number of potential spam messages detected.

A2.15 JANET Web Based Services

Note: These web based services are provided by a third party and are subject to periods of scheduled maintenance.

A2.15.1 JANET Web Mail

Specification:

UKERNA shall provide an e-mail service to client institutions that are small or whose resources for managing e-mail are limited. This will be a chargeable service, and the charging scheme will be published on the service web page.

The JANET Web Mail Service uses a standard web browser for receiving and composing e-mail messages. This means that users can send and receive e-mail from any computer with Internet access, and mail is stored and processed at the data centre where the Web Mail server is located. The web mail service can also be accessed using a standard POP3/IMAP client (e.g. Microsoft Outlook Express) and the service supports SMTP authentication to allow e-mail sent from a mail client within the client institutions. The service provides the facility for authorised individuals at each client institution to administer the creation and deletion of user e-mail accounts.

Anti-virus and anti-spam protection is built-in (provided the web-based user interface is used) to reduce the threat from virus attacks within an e-mail, and to reduce the amount of 'spam' mail received by users.

Performance Indicators and Service Levels:

- a) 99.5% availability for the service;
- b) The mean time between failures for service, calculated annually, is to be no less than 1000 hours.

Reporting:

On a monthly basis, UKERNA shall report:

- the volume of data and number of messages received from and delivered to each client institution;
- incidents resulting in a loss of service including the start and finish date and time.

A2.15.2 JANET Web Hosting

Specification:

UKERNA shall provide a service to host web sites for client institutions that require a web presence for their primary site or as a secondary site for business continuity planning purposes. This will be a chargeable service, and the charging scheme will be published on the service web page.

The service provides the facility for each client institution to manage its own web site content. It does not give them control at the operating system / application level as these will be shared servers.

Performance Indicators and Service Levels:

- a) 99.5% availability for the service to each client institution;
- b) The mean time between failures for service to each client institution, calculated annually, is to be no less than 1000 hours.

Reporting:

On a monthly basis, UKERNA shall report:

- the volume of traffic from and to the hosted web site of each client institution;
- the number of file requests to the hosted web site of each client institution;
- the number of incidents resulting in a loss of service to any client institution including the start and finish date and time.

A2.15.3 JANET Web Filtering**Specification:**

UKERNA shall provide a service to filter out inappropriate web content for client institutions that are small or have limited resources for managing on-site filtering.

The service provides the facility for each client institution to manage its own list of blocked or permitted URLs for filtering in accordance with the institution's local policy and to tailor these filters to its needs. The filter settings are managed by authorised individuals at the client institution.

Performance Indicators and Service Levels:

- a) 99.5% availability for the service to each client institution;
- b) The mean time between failures for service, calculated annually, is to be no less than 1000 hours.

Reporting:

On a monthly basis, UKERNA shall report:

- the volume of web traffic from and to each client institution;
- incidents resulting in a loss of service to any client institution including the start and finish date and time;
- the number of requests being blocked.

A2.16 JANET Roaming Service

Specification:

The JANET Roaming Service shall comprise the following elements.

UKERNA shall provide a national RADIUS proxy server service. The service shall provide three dedicated national RADIUS proxy servers located in the core of JANET. The function of the servers is to forward requests for user authentication to home institutions' RADIUS proxy servers for client users at participating visited institutions. Each client institution approved to use the service will be permitted to configure their systems to use one allocated JANET national RADIUS proxy server as first choice, another as second choice and so on. The national RADIUS proxy servers shall be peered with the European TERENA RADIUS server.

UKERNA shall provide a JANET Roaming Service support service providing advice and technical guidance to institutions on JANET Roaming Service issues and to maintain appropriate terms for institutions using the service.

The JANET Roaming Service support service shall be available through JANET Customer Service described at A3.2.

Performance Indicators and Service Levels:

- a) National RADIUS Proxy Server service availability in the JANET core of 99.5%;
- b) UKERNA will use best endeavours to enable access to the national RADIUS proxy servers for a client institution within 15 working days of receipt of all necessary information and following completion by the client institution of the configuration of their institution RADIUS proxy server;
- c) The JANET Roaming Service support service shall be available throughout the Staffed Periods defined in A1.2, except that it will not be available:
 - before 0900;
 - on Easter Bank Holiday Monday;
 - on the last Monday in August;
 - 24th-31st December.
- d) An initial response to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in (c) above.

Reporting:

On a quarterly basis, UKERNA shall report:

- time percentage availability of national RADIUS proxy server service in the JANET core;
- nature, start and finish, date and time of any exceptional event causing the whole national RADIUS proxy server service to be unavailable;
- total number of client institutions registered to use the JANET Roaming Service;
- validated JANET Roaming Service joining requests, showing the date on which the request was received, the date that all necessary information was received and the date of service setup;

- number of technical support enquiries received during the reporting period;
- number of enquiries resolved;
- number of enquiries where Performance Indicator d) was not met.

A3 INFORMATION AND SUPPORT SERVICES

A3.1 Network Information Services

Specification:

UKERNA shall provide a Web-based information service, including a user interface suitable for end users who are inexperienced or who access the service infrequently, and shall maintain documentation and operational information of interest to network users (ref. Annex I.13).

Performance Indicators and Service Levels:

- a) Service availability of 99.5%;
- b) Mean time between failures of 1000 hours;
- c) The service shall support an access rate of 15,000 queries per day.

Reporting:

On a monthly basis UKERNA shall report:

- start and finish, date and time of each incident of service unavailability;
- number of distinct files served;
- total number of accesses made to the service;
- percentage of the accesses to the service which have come from hosts in the ac.uk domain. An access occurs when a connection is made from a host directly to the web server for the transfer of any type of file (e.g. text, graphics).

A3.2 JANET Customer Service

Specification:

UKERNA shall operate a Service Desk to act as the primary point of contact for all reports, enquiries and requests for action and information from the user community concerning UKERNA services. The Service Desk shall deal with reports and enquiries made by telephone, fax, post or electronic mail (ref. Annex I.14). The Service Desk shall operate procedures to route complex queries to the appropriate service provider for resolution.

An "escalation procedure" shall be in place, and published to the Community, to ensure that unresolved queries are progressively brought to the attention of senior management (ref. Annex I.15).

Performance Indicators and Service Levels:

- a) The Service Desk shall be staffed for the full duration of the Staffed Periods (see A1.2).
- b) Client institutions shall be able to lodge telephone and email enquiries at all times when the Service Desk is not staffed.
- c) An initial response to any enquiry shall be given within four working hours, where 'working hours' is defined as the period specified in a)
- d) Enquiries shall be completed as follows:
 - 90% within 5 working days.
 - 98% within 20 working days.

Reporting:

On a monthly basis UKERNA shall report:

- number of enquiries by primary connected institutions broken down by category type;
- average, minimum and maximum time for initial response to and final resolution of queries by category type;
- number of queries outstanding >5 working days, >20 working days, >40 working days;
- details of invocation of the escalation procedure.

By exception, UKERNA shall provide details of enquiries outstanding after 60 working days. More detailed information on the source, subject and complexity of queries shall be available in annual reports or when requested by the JISC Monitoring Unit.

Note: The SLD for DNS queries is under A2.5.1 and the SLD for connection requests is under A2.9.1.

A3.3 Documentation**Specification:**

UKERNA shall provide comprehensive paper and electronic documentation including appropriate Web pages (ref. Annex I.13) describing the use of the Operational Services (ref. Section A2), the Support and Information Services (ref. Section A3) and the Security Services (ref. Section A4).

This documentation shall be of three types:

- technical and operational information which client institutions need to connect and use their equipment to exploit UKERNA services. This service documentation shall be designed to be used by IT support staff from client institutions and not directly by end users
- publications for immediate issue to end users (newsletters, pamphlets, fact sheets, etc)
- a range of technical material for technical readers in JANET connected client institutions.

All documentation should encourage feedback on its own quality and helpfulness.

Performance Indicators and Service Levels:

- a) Technical information needed by a client institution to connect its equipment to a new service to be made available one month before the start of service.
- b) Technical information relating to a major change in an existing service to be made available one month before the change takes effect.
- c) Material intended for issue to end-users to be made available to client institutions one month before the start of a new service or a major change in an existing service.
- d) Regular publications for dissemination of news and information to be produced and issued according to an annually agreed and published schedule.

- e) New and updated technical publications to be produced and issued according to an annually agreed and published schedule.
- f) Quality and range of publications satisfactory, measured by formal user feedback.

Reporting:

UKERNA shall provide a 12-month plan for documentation preparation and publication as part of the UKERNA operational plan (ref. Annex D). This plan will include technical documents, regular news and information documents.

UKERNA shall report quarterly, as part of the reporting on the UKERNA operational plan (ref. Annex D) on:

- documentation that has been prepared and published by the due date;
- documentation that has been prepared and published later than the due date;
- documentation that has not been prepared and published in full;
- documentation for which the work programme has not yet commenced;
- documentation identified since the initial plan was published.

In the case of documents that are only available on paper, a copy will be provided to the JISC Monitoring Unit.

A3.4 Technical Updating for the UKERNA Community**A3.4.1 Workshops and Conferences****Specification:**

UKERNA shall provide regular technical and other information to the Community by organising workshops and conferences, as agreed with JISC, and by participating in events organised by other relevant organisations. UKERNA shall take note of feedback from these activities in identifying requirements for specific technical initiatives.

UKERNA shall propose, in its operational plan, a programme of events for the coming year. This will include:

- regional briefing days in order to provide information on new or changed services as required, and to allow users to give feedback on the service levels achieved and provide general input to UKERNA on all matters;
- workshops and conferences to be organised by UKERNA;
- workshops and conferences to be organised by UKERNA in collaboration with other organisations;
- other events in which UKERNA will participate, e.g. exhibitions.

Normally, workshops and conferences will be organised on a cost recovery basis. In some cases, where it has been agreed between JISC and UKERNA, workshops and conferences will be subsidised in order to meet community requirements.

Regional briefing days will be funded by UKERNA. UKERNA may also undertake other events on the basis of full cost recovery.

Performance Indicators:

- a) Value of events as perceived by users;
- b) Value for money of events.

Reporting:

UKERNA shall provide a 12-month plan for workshops and conferences and other events as part of the UKERNA operational plan (ref. Annex D).

UKERNA shall report quarterly, as part of the reporting on the UKERNA operational plan (ref. Annex D):

- events by the due date;
- events later than the due date;
- events cancelled;
- new events identified since the initial plan was published;
- other events;
- attendance of each event broken down by client institution sector, i.e. HE/FE/Research Councils/Other.

Annually, UKERNA shall provide a financial statement of income and expenditure per event.

Copies of feedback sheets from delegates for events shall be provided to the JISC Monitoring Unit when requested.

A3.4.2 Training Courses**Specification:**

UKERNA shall provide a regular programme of training courses within its area of competence, to reflect the needs of the community.

UKERNA shall propose, in its operational plan, a programme of training courses for the coming year. Normally, training courses will be organised on a cost recovery basis.

UKERNA may also undertake training courses for individual eligible institutions on a full cost recovery basis.

Performance Indicators:

- a) Value of events as perceived by users;
- b) Value for money of events.

Reporting:

UKERNA shall report quarterly, as part of the reporting on the UKERNA operational plan (ref. Annex D):

- training courses by the due date;
- training courses later than the due date;
- training courses cancelled;
- new training courses identified since the initial plan was published;
- other training events;
- attendance of each training course broken down by client institution sector, i.e. HE/FE/Research Councils/Other.

Annually, UKERNA shall provide a financial statement of income and expenditure per training course, including training courses for individual institutions.

Copies of feedback sheets from delegates for training courses shall be provided to the JISC Monitoring Unit when requested.

A3.5 Liaison with the Community

Specification:

UKERNA shall attend meetings of the JANET Community (where appropriate), in order to provide information on new or changed services as required, and to allow users to give feedback on the Service Levels achieved and provide general input to UKERNA on all matters.

Performance Indicators:

-

Note:

Performance is measured through information received in the UKERNA operational plan (ref. Annex B) and reporting on the operational plan (ref. Annex D).

Reporting:

UKERNA shall report quarterly, as part of the reporting on the UKERNA operational plan (ref. Annex D):

- list of meetings attended;
- list of any exceptional actions arising out of the meetings.

A4 SECURITY SERVICES

A4.1 CERT Services

Introduction:

UKERNA will apply best current practice in relation to the security of JANET and the networks of JANET client institutions. UKERNA will regularly review the JANET security policy and will from time to time seek the agreement of the JISC, to implement changes.

The JANET Computer Emergency Response Team (JANET-CERT) is the unit responsible for IT related security on JANET. Their role is protecting the network from internal and external, deliberate or accidental attacks. The team primarily provides Incident response assistance and coordination to its constituents who suffer an IT security breach or event. They are also responsible for providing an up to date knowledge base for computer security related incidents and technical solutions to those enquiries. The team publishes advice to raise awareness and improve the security of computers and networks. It delivers training and workshops; speaks at other events related to computer security; liaises with world wide, European and UK CERTs; liaises with law enforcement organisations and provides a security information base for its constituents.

Definitions:

- Incoming Messages – All inbound communication with JANET-CERT.
- Incidents – A container to hold JANET-CERT Incident Related Reports and Investigations.
- Incident Reports – All communication received in the JANET-CERT Incident Handling system (RTIR). Taken from Incoming Messages.
- Incident Related Reports – Incident Reports that are assigned to Incidents. Taken from Incident Reports.
- Investigations – JANET-CERT requests for further information, action or responses to Incident Related Reports.

JANET-CERT service periods:

JANET-CERT full service periods are the periods from 0800-1800 on weekdays, apart from the weekdays that are not staffed periods as set out in A1.2.

JANET-CERT reduced service periods are un-staffed; call-out only periods from 1800-0000 on weekdays and from 0900-1700 on Saturdays and Sundays, apart from the Public Holidays as set out in A1.3.

A4.1.1 Incident Report Summary

Specification:

UKERNA will maintain and provide records, which will allow the formulation of a summary of Incoming Messages, Incident Reports, Incident Related Reports and Investigations from JANET-CERT.

Performance Indicators and Service Levels:

-

Note:

Performance is measured through information received in the UKERNA operational plan (ref. Annex B) and reporting on the operational plan (ref. Annex D).

Reporting:

UKERNA will provide monthly:

- total Incoming Messages for the period;
- number of new Incidents for the period;
- number of new Incidents resolved during the period;
- number of outstanding Incidents at the start of the period;
- number of outstanding Incidents resolved during the period;
- total Incident Reports for the period;
- number of new Incident Related Reports for the period;
- number of new Incident Related Reports resolved during the period;
- number of outstanding Incident Related Reports at the start of the period;
- number of outstanding Incident Related Reports resolved during the period;
- number of new Investigations launched for the period;
- number of new Investigations resolved this period;
- number of outstanding Investigations at the start of this period;
- number of outstanding Investigations resolved this period;

A4.1.2 Security Incident Response and Coordination**Specification:**

UKERNA will operate processes to counteract any use of JANET which is unauthorised, unacceptable or both.

UKERNA will maintain a list of contact points and service hours for other network operators, law enforcement agencies and similar bodies.

UKERNA will provide mechanisms and publish procedures to enable client institutions to report Security Incidents, at all times and seek assistance during JANET-CERT service periods.

UKERNA will operate a mechanism to facilitate correspondence with JANET client institutions and other parties and to monitor progress in resolving each Security Incident. Initial response to a Security Incident will normally include a unique Security Incident number.

Performance Indicators and Service Levels:

- a) UKERNA will ensure the adequacy of mechanisms and published procedures for Security Incident reporting, as perceived by users at JANET client institutions (ref. Annex I.16);
- b) UKERNA will allocate an Incident type to each Security Incident Related Report and respond to that report within:
 - one hour, if received during JANET-CERT full service periods;

- two hours, if received through call-out during JANET-CERT reduced service periods.
- c) UKERNA will store Security Incident Related Reports received at other times and will respond to them within two hours of the start of the next JANET-CERT full service period.

Reporting:

UKERNA will provide monthly:

- the definition of each Security Incident Related Report seen in the period;
- number and type of all new Security Incidents;
- number and type of new Security Incident Related Reports;
- number and type of new Security Investigations;
- number of new Security Incident Related Reports this period;
- number of new Security Incident Related Reports resolved this period;
- number of outstanding Security Incident Related Reports at the start of this period;
- number of outstanding Security Incident Related Reports resolved this period;
- number of Security Incident Related Reports not responded to within the SLA timeframes.

Note: Events affecting a number of client institutions may be counted either as a single Security Incident or as a number of separate ones.

UKERNA will also provide quarterly:

- The JANET-CERT assessment on reported Security Incidents;
- Actions taken to resolve major Security Incidents.

A4.1.3 Abuse Handling**Specification:**

UKERNA will operate processes to enable the Internet community to report misuse allegedly or apparently originating from or involving JANET or JANET client institution networks.

Performance Indicators and Service Levels:

- a) UKERNA will ensure the adequacy of mechanisms and published procedures for Abuse reporting, as perceived by users at JANET client institutions (ref. Annex I.16) and other Internet users;
- b) UKERNA will contact any JANET client institution implicated in Abuse in a timely manner and ensure appropriate action, as perceived by other network operators, law enforcement agencies and similar bodies;
- c) UKERNA will allocate an Incident type to each Abuse Incident Related Report and respond to that report within:
 - one hour, if received during JANET-CERT full service periods;
 - two hours, if received through call-out during JANET-CERT reduced service periods.
- d) UKERNA will store Abuse Incident Related Reports received at other times and will respond to them within two hours of the start of the next JANET-CERT full service period.

Reporting:

UKERNA will provide monthly:

- the definition of each Abuse Incident Related Report seen in the period;
- number and type of all new Abuse Incidents;
- number and type of new Abuse Incident Related Reports;
- number and type of new Abuse Investigations;
- number of new Abuse Incident Related Reports this period;
- number of new Abuse Incident Related Reports resolved this period;
- number of outstanding Abuse Incident Related Reports at the start of this period;
- number of outstanding Abuse Incident Related Reports resolved this period;
- number of Abuse Incident Related Reports not responded to within the SLA timeframes.

Note: Events affecting a number of client institutions may be counted either as a single Abuse Incident or as a number of separate ones.

UKERNA will also provide quarterly:

- The JANET-CERT assessment on reported Abuse Incidents;
- Actions taken to resolve major Abuses.

A4.1.4 Network Monitoring**Specification:**

UKERNA will operate processes to detect attempts to use JANET in ways which are unauthorised, unacceptable or both. All attempts will be classified by type. This detection process is currently manually performed and is only carried out on JANET external connections provided in A2.2.

It is an objective for the future to automate the detection process.

Performance Indicators and Service Levels:

- a) The adequacy of the monitoring mechanism as perceived by users at JANET client institutions.

Reporting:

UKERNA will provide monthly:

- A general summary of the activity detected over these network connections

It is an objective of the future to report monthly:

- The definitions of each type of attempt being monitored.
- The number and type of attempts monitored.

A4.1.5 Intelligence Analysis**Specification:**

UKERNA will regularly monitor public and private sources of information with a bearing on computer and network security. They will then relay significant changes through a dedicated web site, (ref. Annex I.16) to JANET client institutions to enable them to keep the security of their networks up to date.

Performance Indicators and Service Levels:

- a) Value and relevance of the forums and information sources used as perceived by JANET client institutions and other parties known to UKERNA.

Reporting:

The list of public information sources will be published and maintained as part of the Network Information Service (ref. Annex I.16).

A4.1.6 Distribution of Advice to Client Institutions**Specification:**

UKERNA will provide JANET client institutions with regular information on general levels of threat and on countermeasures available.

UKERNA will maintain information about current threats to the security of computers and networks and countermeasures to those threats, and will make it publicly available as part of the Network Information Service (ref. Annex I.16).

UKERNA will advise approved contacts at all JANET client institutions of current threats whose impact on JANET is likely to be severe or widespread.

UKERNA will advise contacts at individual JANET client institutions on action to be taken in respect of any apparent or actual security weakness specific to that institution.

Performance Indicators and Service Levels:

- a) UKERNA will validate and update the list of contacts at intervals of no longer than a year, in addition to interim maintenance;
- b) UKERNA will issue advisory notices about new general threats or countermeasures to the approved contacts at all JANET client institutions within one working day of the information being confirmed and available for release;
- c) UKERNA will review and update each item of advice and information provided through the Network Information Service at intervals of no longer than six months;
- d) UKERNA will operate a mailing list based on the list of contacts, for informing client institutions of current threat;
- e) UKERNA will operate a discussion mailing list for security issues, for approved client institution security contacts and other relevant customers.

Reporting:

UKERNA will provide quarterly:

- The number and title of advisory notices issued to all approved contacts;

A4.1.7 Client Institution Education**Specification:**

UKERNA will develop and provide presentations and training on computer and network security as part of the programme of Technical Updating for the JANET Community (ref. Section A3.4), and at other community events as required.

Performance Indicators and Service Levels:

- a) The value of courses and presentations as perceived by the user community.

Reporting:

- Reporting requirements are incorporated in the reporting requirements for A3.4.

UKERNA will provide quarterly:

- A list of events not part of A3.4

A4.1.8 Representing JANET Within Security Related Forums**Specification:**

UKERNA will arrange for staff with the appropriate experience and knowledge in computer and network security to attend the meetings of, and to take part in the deliberations of, formal and informal forums where such matters are discussed, and to influence decisions in such a way that the interests of JANET and its client institutions are protected and promoted.

UKERNA will participate in national and international collaborations among computer security and incident response teams for the exchange of information and to improve its response to international incidents.

UKERNA will identify and promote the use of internationally agreed standards in the field of incident response, and take part in the development and deployment of those standards.

Performance Indicators and Service Levels:

- a) The value of UKERNA's part, as perceived by the JANET user community, in promoting the exchange of information between the JANET Community, external bodies concerned with computer security and professional bodies.

Reporting:

UKERNA will provide quarterly:

- A list of meetings attended, presentations given and reports written;
- A list of any actions or other work items arising out of these meetings.

A4.2 Other Security Services

Specification:

UKERNA will provide information and advice in the area of computer security policy to:

- a) Gather information and advise on legal issues to assist the JISC in making its policy in this area;
- b) Promote awareness within the senior management of the JANET community on issues of policy related to security; and
- c) Commission and manage studies and reports relating to the above from time to time as agreed with the JISC.

Reporting:

UKERNA shall report quarterly, as part of the reporting on the UKERNA operational plan (ref. Annex D):

- an outline of the work carried out in this area.

Annex B

Preparation of the Annual Budget and Operational Plan

B.1 Objective of the documents

The budget and the operational plan, taken together, should present a complete picture of the intended development of the services over the planning period.

B.2 The budget cycle

The process for setting budget to fund services defined by the SLA between the JISC and UKERNA is as follows:

June/July	Initial meeting between the JCN Secretary and UKERNA Finance Director to discuss budget recommendations to be submitted to JCN for the next academic year but one
July/Aug	UKERNA Finance Director produces 1 st draft of budget recommendation in discussion with UKERNA colleagues. This provides broad overview of budget required and analysis or reasons for change (increase and decreases) over the current budget.
Aug	1 st draft budget submitted to and discussed with the JCN Secretary.
September	1 st draft budget submitted to JCN for discussion and agreement
October	1 st draft budget considered by JISC at October meeting who either agree or refer budget back to JISC Executive
Oct/Nov	The JCN Secretary discusses any changes that are required with UKERNA Finance Director, who produces 2 nd draft if required
November	2 nd draft budget agreed by JCN
December	2 nd draft budget agreed by the JISC
January	JISC Budget recommendations considered by funding bodies
February	JISC Executive notified by assessors of the overall JISC budget that has been agreed
March	The JCN Secretary advises UKERNA Finance Director of the budget to be allocated to UKERNA
April	SLA discussions completed
May	If SLA discussions result in the need for changes in the overall budget, proposals submitted to JCN
June/July	UKERNA Finance Director provides detailed budget (broken down by all SLA lines and operating plan) to JISC Executive
July	This budget is used by the JCN Secretary and JISC Finance Officer to set the network SLA budget for forthcoming academic year and to monitor actual against budget expenditure

B.3 The operational plan cycle

The operational plan shall be prepared by UKERNA after the end of the SLA negotiations so that any changes to the SLA and changes and developments approved by the JCN during the current operational year can be taken into account in the new operational plan. The operational plan shall then be submitted to the JISC Services Operations Director and the JCN Secretary after the SLA has been agreed and before the end of the current financial year.

B.4 Content of the budget

B.4.1

The 1st draft budget shall consist of:

- a) Background information. This will set out the environmental and other contextual framework in which the budget projections have been prepared, together with any other information required to inform the JCN in their consideration of the budget;
- b) Financial summary. This will set out estimated spend (in £M to one decimal place), classified into:
 - Operational services, further differentiating between the basic IP transmission services, external network access provision and transmission and other services;
 - Support and information services;
 - Security services.
- c) Forecast net income. This is deducted from the total of these costs to derive the net programme costs;
- d) The costs of maintaining the core networking programme are largely fixed. In this light, the supporting narrative will discuss any new initiatives or extensions proposed, for each of the headings set out in B.4.1.b above. New initiatives should be presented, as far as possible, as self-contained options, including any dependencies, to facilitate prioritisation. Financial details of new proposals should be presented as incremental costs or savings against the baseline budget;
- e) UKERNA's internal running costs are included in the total costs as presented. To facilitate a separate review of these, UKERNA shall also provide a breakdown of internal costs included in the budget, together with comparison against the actual budget for the previous year;
- f) UKERNA shall also provide a summary of staffing and details of proposed replacement and new posts in the following format:

Summary of staff costs

	JISC	Budget	Non	Budget	Total	Total Budget
	FTE	Cost £K	JISC	Cost £K	FTE	Cost £K
			FTE			
Existing staff complement						
Network Development						
Production Services						
Customer Support						
Business						
Administration						
TOTAL						
Current vacancies						
Network Development						
Production Services						
Customer Support						
Business						
Administration						
TOTAL						
New posts						
Network Development						
Production Services						
Customer Support						
Business						
Administration						
TOTAL						
Proposed staff complement						
Network Development						
Production Services						
Customer Support						
Business						
Administration						
TOTAL						
Overtime						
Promotions						
Payroll cost						

Replacement and new posts

REPLACEMENT POSTS

	JISC	Non JISC
Network Development	Detail of post	Detail of post
Production Services	Detail of post	Detail of post
Customer Support	Detail of post	Detail of post
Business	Detail of post	Detail of post
Administration	Detail of post	Detail of post

NEW POSTS

	JISC	Non JISC
Network Development	Detail of post	Detail of post
Production Services	Detail of post	Detail of post
Customer Support	Detail of post	Detail of post
Business	Detail of post	Detail of post
Administration	Detail of post	Detail of post

B.4.2

The 1st draft budget will be considered at the next following meeting of the JCN, normally around September. If the JCN raise substantive issues surrounding the indicative budget, UKERNA finance and operational management and the JCN Secretary will consider these and a 2nd draft budget shall be submitted to the November meeting of JCN.

This revised budget submission shall consist of:

- a) A financial summary, in the same format as used in B.4.1.b in respect of the indicative budget.
- b) Commentary on the reason for the changes from the indicative budget, for each of the headings set out in B.4.1.b above.

B.4.3

This budget submission forms part of the total budget submission made by the JCN to the JISC, and subsequently the partner Funding Councils. The approval process for the JCN budget takes place during the first quarter of the calendar year immediately preceding the operational year to which the budget pertains. UKERNA shall produce the detailed budget in the July immediately preceding the operational year to which the budget pertains. This is reviewed by the JCN Secretary and, with his approval virement

between budget heads may be made at this stage. He will report any such virement to the JCN at its first meeting in the academic year to which the budget pertains. If additional funding (to that agreed by JCN and the JISC) is required at this stage (or at any time during the year) then a formal case will be made to the JCN Secretary who will refer it to the JCN and JISC Board as appropriate.

B.4.4

The JISC shall release funds to UKERNA on the basis of the final budget. If necessary, UKERNA may submit proposals for changes to the final budget. The JISC or its advisory committees shall be consulted, as appropriate, to obtain support for more significant changes.

B.5 Content of the operational plan

B.5.1

The operational plan shall contain:

- a) The work programme for the next financial year. This shall detail the specific areas of UKERNA's planned activity. It will also include, if appropriate, details of any specific programmes of work to be carried forward from the current operational plan.
- b) Details of each area of activity shall be provided, together with performance or value for money objectives to be achieved and milestones and target dates in support of these objectives.

Annex C

Reporting on the Budget

C.1 Objective

The objectives of the reporting cycle are to inform the JISC of spend against budget, on a monthly and cumulative year to date basis, to provide HEFCE with an estimate of the UKERNA cash requirement for the subsequent month and the total year, to assist HEFCE to monitor UKERNA's cash balances and to ensure that HEFCE is in a position to meet the profiled cash calls.

C.2 Timing of reports

A detailed report shall be provided monthly to the JISC Finance Officer. At less frequent intervals, a summary report shall be provided to the JCN Secretary. The frequency shall normally be approximately quarterly, although the exact timing of submission will vary depending on operational requirements.

- a) The monthly report shall be submitted to the JISC Finance Officer, to a timetable which shall be produced by the JISC Finance Officer annually in advance, and provided to UKERNA in July of each year in respect of the subsequent UKERNA financial year.
- b) The summary report shall be provided to the JCN Secretary on his request.

C.3 Content of the reports

a) The monthly report shall be presented as follows:

SLA	mm/yy	Month Actual (ex VAT)	Month Commitment (ex VAT)	Total Month (ex VAT)	Total YTD (ex VAT)	Total YTD (inc VAT)	Annual Budget (inc VAT)	Budget Remaining (inc VAT)	Next Month Req(inc VAT)
-----	-------	--------------------------	------------------------------	-------------------------	-----------------------	------------------------	----------------------------	-------------------------------	----------------------------

Ax.x
(1 row per service level definition specified in Annex A)

Total programme spend

Income received excluding grant

Collections for bandwidth

Interest received

Total income

Total funding

Total funding received in month

Total funding received Y T D

CASH BOOK BALANCE

Total funding claimed this

period

b) The quarterly report shall be presented as follows:

Period mm/yy	YTD		YTD	estimated	
	Actual		cost	cost	Remaining
	(ex vat)	vat	(incl VAT)	(incl VAT)	Budget (incl VAT)
	£K	£K	£K	£K	£K
Basic transmission					
International connections					
Security services					
Other infrastructure					
Support and information					
Total Cost					

Annex D

Reporting on the Operational Plan

D.1 Objective

The objective of the report is to inform the JISC of progress against target dates and milestones for the achievement of the objectives set out in the operational plan.

D.2 Timing of the report

Reports shall be submitted on a quarterly basis, within one calendar month of the quarter end.

D.3 Content of the report

The report shall address the objectives in the operational plan, setting out:

- a) Objectives that have been achieved by the due date.
- b) Objectives that have been achieved by later than the due date. The report shall include details of the reason for the slippage and an assessment of the impact of the slippage on the JANET service.
- c) Objectives which have not been met in full. The report shall include the extent to which the original objectives have been met, the reasons for the slippage, aspects which remain outstanding and when these are now scheduled to be implemented and an assessment of the impact of the slippage on the JANET service.
- d) Objectives for which the work programme has not yet commenced. If the target date for commencement has slipped, the report shall include details of the reason for the slippage, an assessment of the impact of the slippage on the JANET service and the revised target dates for implementation and completion.

Annex E

Change Control Procedures

E.1 Principles

Note: Client institution name changes will not be dealt with through the Change Control Procedures. The changes will be dealt with by an exchange of e-mail between the JANET Customer Services Manager and the JISC Monitoring Unit.

E1.1

Where the JISC or UKERNA see a need to change the Services the JISC may at any time request, and UKERNA may at any time recommend, such a change only in accordance with the Change Control Procedures as set out at section 2 of this annex.

E1.2

Neither the JISC nor UKERNA shall unreasonably withhold its agreement to any change.

E1.3

Until such time as a change is made in accordance with the Change Control Procedure, UKERNA shall, unless otherwise agreed in writing, continue to supply the Services as if the request or recommendation had not been made.

E1.4

Any discussions which may take place between the JISC and UKERNA in connection with a request or recommendation before the authorisation of a resultant change to the Services shall be without prejudice to the rights of either party.

E1.5

Any work undertaken by UKERNA, its sub-contractors or agents, which has not been authorised in advance by a change to the Services and which has not been otherwise agreed in accordance with the provisions of Paragraph 1.3 of this Schedule shall be undertaken entirely at the expense and liability of UKERNA.

E1.6

In general, the JISC Monitoring Unit will act on behalf of the JISC in the conduct of the Procedures.

E2. Procedures

E2.1

Within the JISC, the JISC Monitoring Unit shall create and follow suitable procedures for the administration of Change Control for the SLA.

E2.2

Within UKERNA, the process for the administration of Change Control for the SLA shall be defined in the UKERNA quality system.

E2.3

Usually, proposals for Change Control will be discussed informally between the JISC Services Group, or the JISC Monitoring Unit, and UKERNA before proceeding with the formal procedure. In the event that agreement cannot readily be reached, then the parties involved will undertake to seek wider consultation and reconvene within a reasonable period, aiming to achieve a negotiated outcome.

E2.4

The originator of a request for Change Control, whether acting on behalf of the JISC or UKERNA, shall arrange for completion of Parts 1 and 2 of the form shown at E3 of this Annex E.

E2.5

The originator of the form shall obtain a reference number for the proposal from the Change Control Administrator at UKERNA.

E2.6

The originator will then forward the completed form to the JISC Monitoring Unit, who will endeavour to obtain formal acceptance of the proposal from both the JISC and UKERNA.

E2.7

When formal acceptance has been obtained from both parties, the JISC Monitoring Unit will update the register of changes agreed by Change Control and will make any necessary amendments to the published SLA.

E3 Change Control Request
JISC/UKERNA SLA Change Control Request

Sequential number (to be inserted by the UKERNA Change Control Administrator)	FI/SLA/Amend/06/0
--	-------------------

Part 1 - to be completed by the JISC or UKERNA

Title of Change	
Originator	
Date of this Request or Recommendation	
Reason for Change	
Full Details of Change (detail on separate sheet if necessary)	
Timetable for implementation and, if appropriate, criteria for acceptance (detail on separate sheet if necessary)	

Part 2(a) - to be completed by UKERNA if request is to be rejected

Reason for rejection of request for change (detail on separate sheet if necessary)	
--	--

Part 2(b) - to be completed by UKERNA if request is to be pursued

--

Costs (ex VAT), in current financial year, of completing the change	
Anticipated costs (ex VAT), in subsequent financial years, of maintaining the change	
Schedule of payments, if appropriate	
Proposed effective date for the change, if accepted	
Impact, if any, on other aspects of the services	
Date of expiry of validity of this information	

Name of Implementing Division:	
GENERAL ANNOUNCEMENT Implementation advertised via UKERNA News and JISC Assist if applicable: YES: <input type="radio"/> NO: <input type="radio"/>	

Part 3 - Signatures

APPROVED on behalf of JISC Services			
Signed		Position	
Date			

ACCEPTED on behalf of UKERNA			
Signed		Position	
Date			

ACCEPTED on behalf of the JISC			
Signed		Position	

Date			
------	--	--	--

Annex F

Additional Site Reporting Requirements

In addition to the client institution listed in standing document “Institutions sponsored by the JISC” (ref. Annex I.1), the following sites shall be included for reporting purposes, if they are connected to JANET. The addition of sites to this list is subject to the change control procedures, but does not have implications for the operational budget.

British Library (St Pancras)

British Library (Boston Spa)

BUFVC – British Universities Film and Video Council

DANTE

DEL – Department of Employment and Learning

DELLS – Department for Education, Lifelong Learning, and Skills

Greenmount College of Agriculture and Horticulture

HEFCE – Higher Education Funding Council for England

HEFCW – Higher Education Funding Council for Wales

HESA – Higher Education Statistics Agency

LSC – Learning and Skills Council

SFC – Scottish Funding Council

UCAS

UKERNA

Annex G

Additional Service Reporting Requirements

The following National Services have dedicated connections not covered in A2.1 against the site responsible. UKERNA will, where technically feasible, provide traffic reports on all these connections.

Note: it is expected that all JISC funded services will either appear in this list or form part of the traffic reported for the site at which they are located.

JISC National Mirror Service (at Verizon Bristol)

The following National Services have been identified for separate traffic reports. At present traffic reports form part of the traffic reported for the site at which they are located. UKERNA will undertake reasonable endeavours to provide separate reports.

EDINA (at University of Edinburgh)

MIMAS (at Manchester Computing, University of Manchester)

Annex H

Nodes on the JANET Core IP Network

The basic IP transmission service (A2.1) is provided by a core IP network and a variety of access arrangements. The boundary between the core and access components is associated with one of a set of Backbone Access Routers, and is defined to be at those interfaces of the Backbone Access Routers which carry traffic of the Basic IP Transmission Service and which fall between core and the access mechanisms (i.e. the Backbone Access Routers form part of the core for the purposes of A2.1.)

The following table lists the sites at which the boundary is located:

University of Aberdeen
Queen's University of Belfast
University of Birmingham
University of Bristol
University of Cambridge
Cardiff University
University of Dundee
University of Edinburgh
University of Glasgow
University of Greenwich, Medway Campus
Inverness College
University of Lancaster
University of Leeds
University of Manchester
University of Newcastle upon Tyne
North East Wales Institute of Higher Education
University of Nottingham
University of Oxford
SSE premises, Portsmouth
University of Reading
Rutherford Appleton Laboratory
Telehouse Europe
TeleCity
ULCC

At each location, UKERNA shall assess network availability from a point close to the UKERNA core equipment and circuits at the location. The same measurement point shall be used when assessing both A2.1.1 and A2.1.2.

Annex I

The following documents are referenced in the text. The current web address or where the document may be obtained from is indicated below.

Ref	Document title or description	Source
	Current version of this document	http://www.mu.jisc.ac.uk/slas/
1	List of eligible institutions	http://www.mu.jisc.ac.uk/primary_connection_s/
2	JISC Executive contacts	http://www.jisc.ac.uk/general/index.cfm?name=people_alphabetical
3	Terms for the Provision of the JANET Service	http://www.ja.net/services/publications/policy/service-terms-index.html
4	JANET Acceptable Use Policy	http://www.ja.net/services/publications/policy/service-terms-index.html
5	Formats for performance reports to the JISC Monitoring Unit	held by the JISC Monitoring Unit
6	JANET Peering Web Page	http://www.ja.net/services/network-services/peering/external-connectivity.html
7	Video Technology Advisory Services	http://www.video.ja.net/
8	Video Products Evaluation Reports	http://www.video.ja.net/evaluation
9	AccessGRID Support Centre	http://www.agsc.ja.net/
10	Bandwidth Management Advisory Service	http://www.bmas.ja.net/
11	Multi-site Connectivity Advisory Service	http://www.ja.net/services/network-services/mcas/
12	JISCMail	http://www.jiscmail.ac.uk/
13	UKERNA documentation of JANET Services	http://www.ja.net/services/index.html
14	JANET Customer Service Contact Details	http://www.ja.net/services/connections/
15	JANET Customer Service Complaints and Escalation Procedure	http://www.ja.net/services/connections/complaints.html
16	CERT Information	http://www.ja.net/CERT/

ACCEPTED on behalf of UKERNA by:

ACCEPTED on behalf of the JISC by:

Position: _____

Position: _____

Date _____

Date: _____