



Service Agreement
for
GÉANT Open

Date:

Parties:

(1) Delivery of Advanced Network Technology to Europe Ltd

(2) << Connector Name >>

THIS AGREEMENT is dated

and made between:

- (1) **DELIVERY OF ADVANCED NETWORK TECHNOLOGY TO EUROPE LIMITED**, a company incorporated in England and Wales (registered number 02806796) whose office is at City House, 126-130 Hills Road, Cambridge, CB2 1PQ (“DANTE”); and
- (2) << Connector Name >> a company incorporated in << Country of Registration and Registration Number>> whose registered office is at << Address >> the “Connector”

RECITALS:

Under this contract (the “Agreement”) between the Connector and DANTE (the “Parties”), the Connector appoints DANTE as its Subcontractor for the provision of the Service.

1. Definitions

1.1 In this Agreement the following expressions have the following meanings:

“Acceptance Tests”	means the tests to be carried out by the Connector in relation to the Service
“Availability Date”	means the date on which DANTE shall make the Service available for testing pursuant to clause 7;
“Business Day”	means a day (other than a Saturday or Sunday) when clearing banks in London are open for the transaction of general banking business;
“Commencement Date”	means the date on which this Agreement is signed by both Parties;
“Committed Delivery Date” or “CDD”	means the agreed date on which each part of the Service is contracted to be put into operation, as set out in Annex 3;
“Default Rate”	means 2% above the base rate from time to time of Barclays Bank PLC;
“Demarcation Point”	means the line-side transmit/receive interfaces on DANTE’s equipment
“Good Industry Practice”	means those standards applicable on the OSD and from time to time thereafter to the top quartile of the telecommunications industry in Europe for equivalent or comparable services together with any express standards agreed to between the Parties;
“GÉANT Network”	means the Pan-European network funded under the European Commission Framework Programme 7;
“Initial Term”	has the meaning given to it in clause 2 (<i>Duration</i>);
“Insolvency Event”	means, in relation to either Party: (a) the passing of a resolution for its winding up (except for the purpose of a solvent amalgamation or reconstruction on a basis previously approved by the other Party in writing and where the

- resulting entity is to assume all of its obligations under this Agreement);
- (b) the making of an application to the court for an administration order or the giving of a notice of intention to appoint an administrator by that party or its directors;
 - (c) a provisional liquidator, liquidator, administrative receiver, administrator, trustee or other similar officer taking possession of or being appointed over, or an encumbrancer taking possession of, the whole or substantially the whole of its property;
 - (d) a receiver being appointed over any part of its property where that appointment is (in the reasonable opinion of the other Party) likely to have a material adverse impact on its ability to perform all or any of its obligations under this Agreement;
 - (e) the appointment of a receiver by the court in relation to it or a distress, execution, sequestration or other process being levied or enforced on or against the whole or any part of its property which is not discharged within 10 days of the date on which it is levied or enforced;
 - (f) its making proposals for or entering into a company voluntary arrangement (within the meaning of Part I Insolvency Act 1986) or otherwise making proposals for or entering into a compromise with the majority by value of its unsecured creditors;
 - (g) the filing of documents specified in Schedule A1 Insolvency Act 1986 with the court with a view to obtaining a moratorium pending the making of proposals for a company voluntary arrangement; or
 - (h) an application being made to strike it off the register pursuant to s652A Companies Act 1985 or the registrar of companies taking any steps in contemplation of striking it off the register;

“Point of Presence” or “PoP”	means a building which houses terminal equipment from which the Service is delivered;
“Acceptance Certificate”	Documentation provided by the Connector to DANTE that the Service is accepted by the Connector and fit for purpose.
“Scheduled Maintenance”	means all required maintenance and repair with respect to the Service which is specifically identified as Scheduled Maintenance in Annex 5 (Operation and Maintenance);
“Service”	means the connectivity to be provided to the Connector as specified in Annex 1 (Service Description) and the Co-Location Services;
“	
“Underlying Rights”	has the meaning given to it in clause 8.2;

“Unscheduled Maintenance” means maintenance and repair work which the Connector is obliged to undertake with respect to the Customer Fibres under Annex 5 (*Operation and Maintenance*) other than Scheduled Maintenance;

2. **Duration**

- 2.1 Unless terminated earlier under clause 4 (*Termination*), this Services provided under this Agreement shall commence on the Commencement Date and shall continue to be provided for a period of 12 months (Initial Term) unless terminated by DANTE by prior written notice of not less than three months.

3. **Service Delivery**

- 3.1 DANTE hereby grants to the Connector, with effect from the Commencement Date and for the duration of this Agreement, subject to the terms and conditions set forth in this Agreement, and in consideration of the payment to DANTE by the Connector of the charges as specified in Annex 2 (*Charges and Payment Schedule*), access to the GEANT OPEN exchange for the use of the Services defined in Annex 1.
- 3.2 The Connector shall use the Service in a manner that complies with all applicable laws and any requirements, restrictions and/or limitations and any safety, operational and other rules and regulations imposed by DANTE or by any third party in connection with the Underlying Rights, and shall not use, or intentionally or knowingly permit (to the extent permitted by law) the Service to be used for any illegal purpose or in any other unlawful manner.
- 3.3 Subject to the limitations set forth in this Agreement, the Connector may use the Service for switching of any lawful telecommunications traffic.

4. **Termination**

- 4.1 This Agreement may be terminated by either Party if the other Party fails to perform any of its material obligations under this Agreement, or is otherwise in breach of any material representation, warranty, covenant or other obligation under this Agreement which event remains unremedied (if capable of being remedied) for a period of thirty (30) days following receipt by the Party not in default of written notice of any such breach or failure. The notice shall include a detailed statement describing the nature of the breach. If both parties agree that the breach is not capable of being remedied, then the termination shall take effect thirty (30) days after service of the notice. If the breach is capable of being remedied and is remedied within the period of thirty (30) days after service of the notice, then the termination shall not take effect. If on receipt of the notice, the Party in breach notifies the other Party in writing that the breach can be fully remedied but not within the thirty (30) day notice period and the other Party agrees, again in writing, that this is the case, then termination shall not be effective if the Party in breach begins diligently to remedy the breach within that period and remedies the breach within 90 days (failure to remedy the breach within such ninety (90) day period will result in automatic termination, unless otherwise agreed between the Parties).
- 4.2 The Connector has the right to terminate this Agreement if the Service has not been accepted within 90 days of the CDD
- 4.3 Either Party shall, in addition to the grounds on which an Agreement may be rescinded in law, be entitled to terminate this Agreement in whole or in part by a written declaration forthwith and without application to a court of law if an Insolvency Event has occurred in relation to the other Party.
- 4.4 Termination or expiration of the Agreement shall mean termination, with effect from the effective date of termination or expiration, of the obligations imposed on the Parties under clauses 2, 3, 5 (but not sub-clause 5.3) and 12 of this Agreement. The remaining clauses shall survive the termination or expiration of this Agreement, for whatever reason. Termination or expiration of this Agreement shall not operate as a waiver by either Party of any breach of the provisions hereof by the other Party and shall be without

prejudice to the rights, remedies or obligations of a Party which may arise as a consequence of such breach or which have accrued under this Agreement as at the date of such termination or expiration.

5. Payment Terms and Conditions

- 5.1 In consideration for the Services defined in Annex 4, the Connector shall pay to DANTE the charges as specified in Annex 2 (*Charges and Payment Schedule*).

In respect of all sums payable by the Connector under this Agreement, DANTE shall prepare and submit to the Connector a valid VAT invoice for the amount so determined and payable (an “Invoice”). Subject to applicable law and local fiscal regulations each Invoice shall be stated in Euros and in no other currency. Each Invoice shall be calculated exclusive of value added tax (or any successor tax or equivalent local sales tax) which, to the extent applicable, shall be added thereto by DANTE at the appropriate rate and payable by the Connector.

- 5.2 Subject to the terms of this Agreement the Connector shall pay DANTE all amounts due for the period up to the effective date of expiration or termination of this Agreement, as relevant. This will be the DANTE’s sole and exclusive remedy.
- 5.3 DANTE provides no warranty for any service level, and shall have no liability to pay any credits for failure to meet any service level parameters. The Service is provided with a 4 hours on-site support, and this represents the sole service commitment by DANTE to the Service.
- 5.4 The Connector shall not be obliged to pay any sums under this Agreement, nor shall it incur any interest for late payment thereof, unless and until it has received a correct and valid VAT Invoice in respect of DANTE’s charges. The period for payment shall not begin to run until a correct and/or valid Invoice is issued by DANTE.
- 5.5 For the avoidance of doubt, the costs associated with the use of DANTE’s PoP Site (footprint, power, etc) are included in the charge for the use of the Service.

6. Service Quality

DANTE shall:

- (a) provide the Services in accordance with the quality and availability parameters set out in Annex 1 (*Service Description*) and Annex 4 (*Service Level Agreement*);
- (b) act reasonably with the purpose of bringing about the correction of failures; and
- (c) exercise the reasonable care and skill of a competent telecommunications provider in accordance with Good Industry Practice.

7. Installation and Acceptance Testing

- 7.1 The Connector shall carry out its own Acceptance Tests on the Service in order to confirm that the Service complies with the specifications. The Connector shall provide DANTE with reasonable advance notice (being not less than fifteen (15) Business Days) of any changes to the Acceptance Testing Start Date and DANTE shall have the right to have a representative present when the Acceptance Tests are carried out and/or to participate therein in a manner to be agreed upon between the Parties.
- 7.2 Within five (5) Business Days following successful completion of the Acceptance Tests by the Connector, the Connector shall issue a certificate (the “Acceptance Certificate”) to DANTE to that effect, together with a written report incorporating copies of the results of the Acceptance Tests.
- 7.3 If the Connector fails to complete Acceptance Tests within 10 days of the CDD, the Service will be deemed to have passed Acceptance.

8. Provisioning and Use of the Service

- 8.1 Each Party shall obtain and maintain in good standing such telecommunications operating licences, permits and other public or private telecommunications or regulatory consents, authorisations and approvals that it is required to hold, in the jurisdiction applicable to the Service under any applicable laws or regulations, to exercise their rights and perform their obligations under this Agreement.
- 8.2 DANTE warrants, represents and undertakes that;
- (a) it has obtained any and all rights, licences, authorisations, permits, easements, leases or other agreements necessary for the provision of the Service, including those that:
 - (i) provide for the occupancy of the PoP;
 - (ii) are necessary in order to permit DANTE to meet its obligations under this Agreement; and
 - (iii) are necessary to permit DANTE to deliver the Service and are permitted under this Agreement,
 - (b) no Underlying Rights impose limitations or requirements on DANTE or on DANTE's exercise of its rights under this Agreement;
- 8.3 DANTE will use all reasonable endeavours to provide access to personnel, authorised representatives, sub-contractors and agents to the PoPs. All PoP Access will be authorised by DANTE
- 8.4 DANTE will use reasonable endeavours to ensure that the Service is used at all times in accordance with all applicable laws and/or regulatory requirements.

9. Maintenance

- 9.1 From and after the relevant CDD, and during the term of this Agreement, DANTE shall perform (or cause to be performed) all Scheduled Maintenance and Unscheduled Maintenance which may be required on equipment that provides the Service, in order to ensure the continued provision of the Service in accordance with the descriptions and service levels set out in Annex 5 (*Operation and Maintenance*).
- 9.2 In the event of disruption of service due to an event of Force Majeure or other emergency or other reason, DANTE shall cause service to be restored as quickly as is reasonably possible, and shall take such measures as are reasonably necessary to obtain such objective, all in accordance with the more detailed provisions of Annex 5 (*Operation and Maintenance*).

10. Co-Location

- 10.1 The Service does not offer The Connector any space at the GEANT Open PoP. The Connector will need to establish their own presence at the PoP prior to provision of the Service.
- 10.2 DANTE will provide The Connector with access to the Service at the Demarcation Point in the PoPs. All connections at the Demarcation Points shall be performed by DANTE or its sub-contractors.

11. Warranties

- 11.1 DANTE warrants to the Connector as follows:
- (a) DANTE is a limited liability company, duly organised and validly existing under the laws of England and Wales and is qualified to do business in all jurisdictions relevant to its business (domestic and foreign) in which such qualification is required by applicable law, and has the requisite authority to execute this Agreement and to perform all of its obligations hereunder;

- (b) no order has been made or petition presented or resolution passed for its winding-up or for an administration order in respect of it, it is not insolvent or unable to pay its debts, and no receiver or receiver and manager has been appointed by any person of its business or assets or any part thereof and no power to make any such appointment has arisen and it has not assigned all or a substantial part of its business or assets for the satisfaction of creditors and there is no unfulfilled or unsatisfied judgment or court order against it;
- (c) the provisions of this Agreement, in so far as they relate to DANTE, constitute valid and binding obligations on DANTE, enforceable against it in accordance with its terms; and
- (d) its execution and performance of this Agreement shall not violate any applicable existing laws, regulations, rules, statutes or court orders of any applicable local, state, federal, national or supra-national agency, court or body.

11.2 The Connector warrants to DANTE as follows:

- (a) the Connector is a company duly organised and validly existing under the laws of << insert >>, is qualified to do business in all jurisdictions relevant to its business (domestic and foreign) in which such qualification is required by applicable law, and has the requisite authority to execute this Agreement and to perform its obligations hereunder;
- (b) no order has been made or petition presented or resolution passed for its winding-up or for an administration order in respect of it, it is not insolvent or unable to pay its debts, and no receiver or receiver and manager has been appointed by any person of its business or assets or any part thereof and no power to make any such appointment has arisen and it has not assigned all or a substantial part of its business or assets for the satisfaction of creditors and there is no unfulfilled or unsatisfied judgment or court order against it (or any equivalent event or circumstance under the applicable laws of its jurisdiction);
- (c) the provisions of this Agreement, in so far as they relate to the Connector, constitute valid and binding obligations on the Connector, enforceable against it in accordance with its terms;
- (d) its execution and performance of this Agreement shall not violate any applicable existing laws, regulations, rules, statutes or court orders of any applicable local, state, federal, national or supra-national agency, court or body;
- (e) there are no pending or, to the knowledge of the Connector, threatened claims, actions, suits, audits, investigations or proceedings by or against the Connector which could have a material adverse effect on the ability of the Connector to perform its obligations under this Agreement;

12. **Limitation of Liability**

12.1 Each Party accepts liability for death and personal injury caused by its negligence in performance of its rights and obligations under this Agreement.

12.2 Without prejudice to clause 8.4 above and to the obligation to pay the charges due under this Agreement, neither Party shall be liable in contract, tort (including negligence), pre-contractual or other representations (other than fraudulent misrepresentations) or otherwise arising out of or in connection with this Agreement for:

- (a) loss of revenues, profits, contracts, business or anticipated savings;
- (b) damage to date;
- (c) any loss of goodwill or reputation; or
- (d) any special, indirect, incidental, punitive or consequential loss,

in each case whether or not such losses were within the contemplation of the Parties at the date of this Agreement or suffered or incurred by a Party as a result of or in connection with the provisions of this Agreement.

- 12.3 Without prejudice to clause 8.4 above and to the obligation to pay or receive (as the case may be) the charges and/or the service credits due under this Agreement, each Party's maximum liability for damages arising in connection with the performance of this Agreement shall be limited to the payments made or received (as the case may be) in respect of the delivery of the Service for the six month period preceding the event giving rise to the liability in respect of any one event or series of related events other than any such event which gives rise to the valid termination of this Agreement provided, however, that this limitation of liability shall not apply to damages arising from the fraud or wilful misconduct of either Party; and provided further, that this limitation shall not restrict either Party's right to bring proceedings for injunctive relief.
- 12.4 If any part of this clause 12 is held to be invalid or unenforceable under any applicable statute or rule of law then it shall to that extent be deemed to be omitted, and if as a result any Party becomes liable for loss or damage which would otherwise have been excluded then such liability shall be subject to the remaining sub-clauses of this clause 12.
- 12.5 The Parties expressly agree that no claim for an indemnity or for losses or damages whatsoever in connection with this Agreement, other than in relation to or arising out of any claim brought under the provisions of clause 12.1, shall be made more than two (2) years after the date that the event giving rise to such or indemnity claim is known or reasonably should have been known to the Party making such claim.

13. **Force Majeure**

- 13.1 For the purposes of this Agreement "Force Majeure" shall mean any cause or circumstance whatsoever beyond the reasonable control of the Party invoking it including, but not limited to, Act of God, outbreak of hostilities, riot, civil disturbance, student disorder, acts of terrorism, the acts and/or omissions of any government or authority (including refusal or revocation of any licence or consent), the acts and/or omission of any third party not under the Party's control, fire, explosion, flood, fog or bad weather, failure or breakdown of vehicles, bankruptcy of suppliers or sub-contractors, theft, malicious damage, strike, lockout or industrial action of any kind.
- 13.2 Provided it takes reasonable steps to minimise the effect of any Force Majeure on the delivery, availability and quality of the Service, DANTE will not be liable for delay in performing or failure to perform its obligations under this Agreement if the delay or failure results from events or circumstances of Force Majeure. Such delay or failure shall not constitute a breach of this Agreement and the time for performance shall be extended by a period equivalent to that during which performance is so prevented.
- 13.3 The Connector shall be entitled to terminate this Agreement either in whole or in part by a written declaration forthwith and without application to a court of law if DANTE has invoked Force Majeure and the event of Force Majeure has continued for a period in excess of three months or sooner if both parties agree that the event of Force Majeure will last for a period in excess of three months.

14. **Relationship between the Parties**

Nothing in the Agreement shall create, imply or evidence any partnership between the parties or the relationship between them of principal and agent.

15. **Notices**

- 15.1 All notices served on either Party by the other will be in the English language.
- 15.2 Any notice to be given under this Agreement shall be in writing and shall be deemed to have been served: immediately if personally delivered, on the expiry of 7 days after being sent by registered post; or on the expiry of 24 hours after successful transmission by fax, which shall be evidenced by a successful transmission receipt. Notices shall be given to the following addresses:

CONNECTOR: address: << Address >>

fax no:
attention:

DANTE: address: City House, 126 - 130 Hills Road, Cambridge CB2 1PQ, UK
fax no: +44 1223 371371
attention: Chief Financial Officer

16. **Governing Law**

- 16.1 The Agreement shall be governed, construed and interpreted according to the English Law.
- 16.2 Both Parties undertake to attempt to resolve any questions, disputes or differences between them by direct negotiation. The courts of England shall have exclusive jurisdiction over this agreement and the laws of England shall govern the terms of this agreement.

17. **Entire Agreement**

This Agreement (including the Annexes) constitutes the entire agreement between the Parties with respect to the subject matter of this Agreement, and supersedes all prior agreements, understandings or proposals, whether oral or written, with respect to the subject matter of this Agreement. Accordingly, all other terms, conditions, representations, warranties and other statements which would otherwise be implied (by law or otherwise) shall not form part of this Agreement. Each Party acknowledges that in entering into this Agreement it places no reliance on any representation, warranty or other statement relating to the subject matter of this Agreement, save for the representations and warranties set out in this Agreement.

18. **Confidentiality**

- 18.1 Subject to clause 20.2, each Party undertakes to the other that it shall:

- 20.1.1 maintain and treat in confidence, and shall not disclose to any third party (except its professional advisers or representatives to the extent assisting it in connection with this Agreement), all information (including the terms of this Agreement) and documentation, including (without limitation) information concerning the business or trade secrets, processes, know-how or methods used by the other Party in carrying on business, obtained from the other Party pursuant to or in connection with this Agreement ("Confidential Information");
- 20.1.2 procure that its affiliates, directors, employees and professional advisers (being only those lawyers, accountants, bankers and other advisors under a professional duty of confidentiality to the advised Party), sub-contractors and agents maintain and treat in confidence all Confidential Information; and
- 20.1.3 not (and will ensure that all affiliates, directors, employees or professional advisors, sub-contractors and agents shall not) disclose such Confidential Information other than for the purposes of this Agreement and for which it was provided except with the written permission of the other Party.

- 18.2 Clause 20.1 shall not apply to any Confidential Information which:

- 18.2.1 is in or comes into the public domain other than by default of the recipient Party; or
- 18.2.2 is or has already been independently generated by the recipient Party; or
- 18.2.3 is lawfully received by the recipient from a third party on an unrestricted basis; or
- 18.2.4 is in the possession of or is known by the recipient Party prior to the date of this Agreement, to the extent that such recipient Party is not bound by any existing obligation or confidentiality in respect of such information to the other Party.

- 18.3 Nothing in this clause 20 shall prohibit or restrict either Party from disclosing any Confidential Information to the extent to which the same is required to be disclosed by law, regulation or pursuant to an order of a competent authority, or to a professional adviser, provided the recipient provides (where practicable), in the case of disclosure by law, regulation or order, the disclosing Party with reasonable written notice prior to any such disclosure and in the case of disclosure to a professional advisor that the professional advisor undertakes to treat the Confidential Information as confidential.
- 18.4 The provisions of this clause 20 shall survive the termination or expiry of this Agreement for a period of five years.
19. **Variation**
- No variation of this Agreement shall be valid unless it is in writing and signed by or on behalf of each of the Parties.
20. **No Third Party Beneficiaries**
- This Agreement shall not create any third party beneficiaries. The Parties do not intend any term of this Agreement to be enforceable pursuant to the Contracts (Rights of Third Parties) Act 1999.
21. **No Waiver**
- Failure or delay in exercising any right or remedy under this Agreement shall not constitute a waiver or a waiver of any other right or remedy and no single or partial exercise of any right or remedy under this Agreement shall prevent any further exercise of the right or remedy or the exercise of any other right or remedy.
22. **Exclusion of Individual Provisions**
- If any of the provisions of this Agreement is found by an appropriate arbitral, judicial or regulatory authority to be void or unenforceable, such provision shall be deemed to be deleted from this Agreement and the remaining provisions shall continue in full force and effect.
23. **Counterparts**
- This Agreement may be executed in counterparts, each of which when executed and delivered shall be deemed an original. Such counterparts shall together (as well as separately) constitute one and the same instrument.

EXECUTION:

The Parties have shown their acceptance of the terms of this Agreement by executing it below.

SIGNED for and on behalf of**<< CONNECTOR >>****SIGNED** for and on behalf of**DANTE**

Name:

Name:

Position:

Position: General Manager

Signature:_____

Signature:_____

ANNEX 1 SERVICE DESCRIPTION

1. Introduction

This annex describes the individual items which constitute the Service and Dante's operational performance and management of those Items.

2. Service description

2.1 The Service

Please refer to the service description document: GÉANT Open Exchange: Service Description V 1.0

2.2 Service End Points

DANTE or its sub-contractors shall be responsible for effecting the physical connection to the DANTE Equipment.

ANNEX 2 CHARGES AND PAYMENT SCHEDULE

1. Charges and payment terms

The pricing would be applicable as per the decision and recommendation of the Cost Sharing Working Group (CSWG), after an initial free period of three months. This would be available in due course and detailed in a separate document

ANNEX 3 SERVICE LEVEL AGREEMENT

As it is a pilot, no Service Level Agreement will be included within this service. One of the purposes of the pilot is to determine a suitable Service Level Agreement. This will be done in conjunction with the users and with reference to the practical experience gained within the pilot.

Annex 4 OPERATION AND MAINTENANCE

1. Maintenance

As it is a pilot, the support level for this service will be on a reasonable endeavours basis.

- 1.1 “Scheduled Maintenance” - routine maintenance and repair of the Service shall be performed by or under the direction of DANTE. Scheduled Maintenance shall commence upon the OSD. Notice should be given ten working days prior the maintenance occurs.
- 1.2 “Unscheduled Maintenance” - Non-routine maintenance and repair of the Service, which is not included as Scheduled Maintenance, shall be performed by or under the direction of DANTE. Unscheduled Maintenance shall commence upon the OSD. Unscheduled Maintenance shall consist of:
 - (a) “Emergency Unscheduled Maintenance” in response to:
 - (i) an alarm system identification at the NOC;
 - (ii) notification by DANTE or notification by any third party of any failure, interruption or impairment in the operation of the Service. DANTE shall as soon as is reasonably practicable report the need for Emergency Unscheduled Maintenance to the Connector. DANTE will verify the problem and dispatch personnel immediately to take corrective action; or
 - (iii) any event imminently likely to cause the failure, interruption or impairment in the operation of the network,
 - (b) (“Emergency Events”) “Non-Emergency Unscheduled Maintenance” in response to any potential Service-affecting situation to prevent any failure, interruption or impairment in the operation of the Connector’s network. **Notice for this maintenance should be given 48 hours prior to when the maintenance occurs**

2 Maintenance Window (“MW”)

Scheduled Maintenance which is reasonably expected to produce any signal discontinuity, must be co-ordinated between the Parties. Maintenance windows should be agreed with DANTE in order to insure as less impact in the service as possible. The Parties will agree upon a MW calendar. It is the Parties’ intention to keep maintenance periods to the minimum required.