National Research and Education Networks Transnational Education Resource Pack

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- UK Quality Assurance Agency
- Hong Kong NREN, JUCC
- Malaysian NREN, MYREN
- Singapore NREN, SingAREN

This is in addition to the ongoing support provided by the five NRENs leading the GÉANT Special Interest Group for TNE (GÉANT SIG-TNE): China (CERNET), GARR (Italy), Internet2 (USA), Jisc (UK) and SURFnet (The Netherlands).

Note

This document originates from work done by Jisc in supporting its members in their delivery of TNE. As a result, much of the information is from a UK perspective, however the themes are consistent with global TNE delivery, and endorsed by the GEANT SIG-TNE. Feedback from other countries is strongly encouraged.

This resource pack is accurate at the time of publication and is owned by the GÉANT SIG-TNE. Whilst there are no immediate plans to update this Resource Pack, we would welcome your feedback on its value and further development. To provide input, feedback or to raise queries, please contact **transnational@jisc.ac.uk**

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Foreword

According to the UNESCO **Incheon Declaration and Sustainable Development Goal 4 – Education 2030 Framework for Action** 'Mobility in tertiary education is an asset and an opportunity and should be enhanced to develop student's competencies and global competitiveness. A well-established, properly regulated tertiary education system supported by technology, open educational resources and distance education can increase access, equity, quality and relevance, and can narrow the gap between what is taught at tertiary education institutions including universities and what economies and societies demand.'

International learning is therefore moving into a new and more mature phase of flexible provision, combinations of student mobility, branch campuses, smaller hubs and wide-ranging forms of face-to-face teaching and on-line collaboration.

Many of these initiatives will be based on collaborations and consortia; all will require sophisticated, reliable and secure digital solutions. In addition, the combination of ubiquitous bandwidth and location-intelligent mobile devices will require solutions that keep pace with commercially-driven digital innovation. For most universities and colleges, these solutions will be unaffordable without shared innovation and implementation.

For you, as an institution supporting education and research, nationally and globally it is imperative that you engage with this area of activity, transnational education, which is set to grow both in terms of student numbers and across countries of the world. Technology plays a fundamental role, from basic connectivity which is not a luxury commodity in every country, but also in developing new and innovative ways of learning, where distance becomes irrelevant. Imagine a world where holographics and mixed reality form integral parts of the curriculum delivered from the very best education institutions in the world. As National Research and Education Networks you are key to making this happen, driving up the quality of education in your country, demonstrating an open and accepting attitude towards students and learners, but also forming equitable partnerships with other NRENs around the world.

At the heart of international education is the experience of the student, providing the best technology and content for the learning journey and to enable and facilitate the growth of exceptional students, globally mobile and savvy to the challenges of Industry 4.0.

This Resource Pack helps NRENs establish their position as an enabler and delivery agent of fundamental importance to TNE.

1. Introduction and background

1.1 Objectives

Global education providers are increasingly looking to transnational education to provide access to high quality education, to educate students flexibly to become globally mobile citizens, and to promote teaching partnerships and future research collaborations.

This resource pack - developed in partnership with GÉANT, National Research and Education Networks (NRENs) and institutions delivering higher education – provides information on the technological aspects and considerations of TNE delivery. It provides a resource for NRENs to assist education institutions working at all levels of TNE maturity – from those with well-established international branch campuses (IBCs) to those initiating a partnership with an overseas institution or developing an online course.

The Resource Pack:

- Advises NRENs how to develop and run a TNE support programme, highlighting some of the common challenges and pitfalls, best practices and case studies;
- Provides country-specific information on the main markets of interest, including regulatory, legal and data regimes; performance of popular technology solutions and services, and information on network connectivity; and
- Provides information on NRENs on supporting their education institutions and communities.

1.2 Definitions

As global international education increases in scope, scale and importance so does the confusion about its terminology. TNE may also be defined by different terms in different countries, for example as International Programme and Provider Mobility (IPPM), or cross-border, offshore or borderless education, or simply joint or double degree programmes.

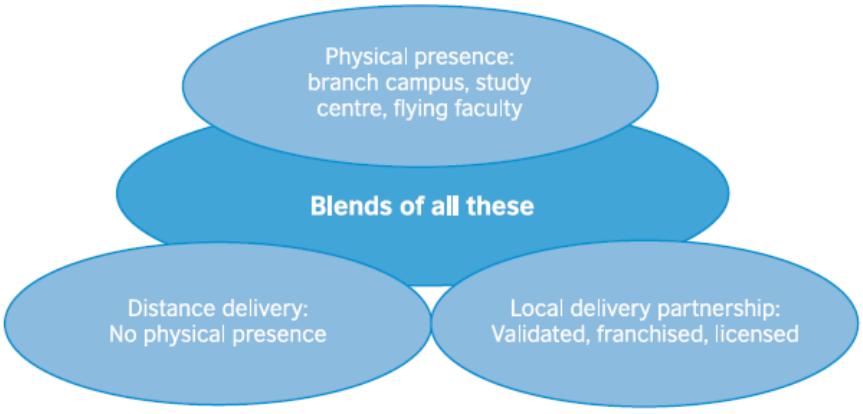
The British Council published a report earlier this year to provide some clarity on this issue and establish a common TNE classification framework. Their definition of TNE as 'the mobility of higher education programmes and institutions / providers across international borders' is useful. Fundamentally we are talking about students seeking to gain a foreign qualification without moving from their country of residence. This particular definition is useful as it has been developed as a collaboration between countries, rather than being defined by one country.

The British Council definition helpfully reflects the multidirectional nature of TNE. In recent years there has a move away from the traditional model of country A delivering education in country B towards greater levels of two-way mobility between countries.

The British Council framework work neatly divides TNE activity in to independent and collaborative in nature and can be found in the table below[1], a more detailed explanation is provided in Appendix 1: 'TNE delivery models'. So for example, an international branch campus is essentially a satellite operation of a parent university in the home country; whereas conversely a joint university is co-funded or co-developed by partners in both countries.

Independent	Collaborative
Franchise programmes	Partnership programmes
International branch campus	Joint universities/colleges
Self-study distance education	Distance education with local academic partner

As TNE has developed around the world, it has grown in diversity and complexity. TNE rarely exists in just one form, and combinations of modes of delivery, or 'blended learning' is common. TNE may be delivered by any form of education institution, whether that is higher or further education. The diagram below summarises 'blended learning':



[1] British Council and DAAD 'Transnational Education – A Classification Framework and data collection guidelines for International Programme and Provider Mobility (IPPM)'
https://www.britishcouncil.org/sites/default/files/tne_classification_framework-final.pdf

The trend is for HEIs to the share risk and cost of an initiative by focusing on a greater number of collaborative TNE activities.

Although not strictly TNE, many HEIs have 'Recruitment Offices' or small research outposts at overseas locations. Both promote international education mobility and can be treated in the same way as TNE, as addressed by this Resource Pack.

It is also important to differentiate between a 'sending' and 'receiving' country.

Sending countries are those which deliver TNE degree programmes in a host country. This may be collaborative or independent, and therefore the degree programme may be delivered in an institution in the host country which may include staff from the sending country, or fully online where the online course is developed by staff in the sending country.

For example, USA as a sending country has established a number of international branch campuses and partnerships in China, such as Duke-Kunshan University and New York University Shanghai.

Receiving (host) countries are those which host another country's TNE, students from this country (or a third, unrelated country) study here to obtain a degree or qualification from the sending country.

For example, Malaysia is the receiving country of a number of UK international branch campuses, such as University of Nottingham and Heriot-Watt. Both Malaysian students, and those from other countries such as Indonesia and Thailand will study for a UK degree in this receiving country.

A few countries both receive and send students, such as China. China has a number of partnerships with UK institutions, for example Lancaster University's joint campus with Beijing Jiaotong

University, and also hosts a branch campus from Nottingham University. China also sends TNE to the UK; Peking University has a campus in Oxford.

TNE students may obtain a degree from the sending country, a degree from the host country, or both.

This Resource Pack contains information on the top five global sending countries, and receiving countries for TNE:

Sending countries:

- United Kingdom
- United States of America
- Australia
- France
- Germany

Receiving countries:

- China
- United Arab Emirates (incl. Abu Dhabi, Dubai and Ras al-Khaimah)
- Malaysia
- Singapore
- Qatar

This information has been taken from the **'TNE data report'** produced by the GÉANT SIG-TNE. Further information can be found in Section 3: Country Profiles.

The information contained in this Resource Pack can be used by institutions of any nationality to assist in their delivery of TNE. The type of information included can also be used as a template in developing knowledge about emerging or other receiving countries.

1.3Context

GÉANT support for TNE

GÉANT is the pan-European research and education network that interconnects Europe's National Research and Education Networks (NRENs). Together GÉANT connects over 50 million users at 10,000 institutions across Europe; operating at speeds of up to 500Gbps and reaching over 100 national networks worldwide, GÉANT remains the largest and most advanced research and education network in the world.

Co-funded by the European Commission under the EU's 7th Research and Development Framework Programme, GÉANT assures world-leading connectivity between Europe and the rest of the world in support of global research collaborations in areas such as energy, the environment, space and medicine. GÉANT represents and is the central point of liaison between European NRENs, and facilitator of collaborative projects, research and service offerings.

We should not, however forget the importance of support for education in the shadow of moving volumes of data across the globe and providing e-infrastructure to support research. Research and **education** networks. Delivering new and flexible pedagogies, either within countries or between countries is becoming increasingly significant, and preparing for the future, laying the ground for learning analytics, artificial intelligence and virtual and mixed realities, and embedding the digital capabilities of both students and staff must be an NREN priority.

As such, GÉANT supports NRENs as they seek to meet the TNE requirements of their communities and members. A **Special Interest Group for TNE**, or GÉANT SIG-TNE has been established to co-ordinate this support. Led by a Steering Committee from five leading NRENs supporting TNE, China (CERNET), GARR (Italy), Internet2 (USA), Jisc (UK) and SURFnet (The Netherlands) the SIG-TNE has over 150 members and serves as a community of practice to share information, discuss key issues and be a network of best practice. The SIG-TNE meets twice yearly at key events; further information and resources can be found on the SIG-TNE Wiki site.

What are the features of TNE for both sending and receiving countries?

Institutions aim to provide the highest quality teaching and learning experience possible, regardless of location. This is referred to as equity of experience, and doing this well is important to deliver quality education, develop suitable programmes of learning and attract students and staff to institutions. This is particularly important for sending countries. For receiving countries, the provision of TNE from quality, respected institutions of other nations provides greater opportunities to teachers and learners.

Benefits to both sending and receiving countries include:

- Institutional international strategies
- National reform
- Growth of university and local economy
- Global approach
- Educational reach
- Teaching partnerships
- Curriculum development

- Academic standards
- Research collaboration
- Brand and reputation expansion
- Staff development and mobility
- Student recruitment

Benefits to students include:

- Employability
- Access to international education in home country
- Mobility
- Student experience
- Improve language skills
- Develop understanding of other cultures

Why technology is important for TNE delivery

Technology plays a key role as an enabler for education and can help HEIs achieve an equity of experience for all of their students.

- Global teaching and learning
    - Achieving the highest levels of pedagogical impact in the classroom and beyond
        - Synchronous: new pedagogical models, experiential and location based learning, hands on fieldwork in different parts of the world; simultaneous T&L across time and space
        - Asynchronous: online learning, learning platforms
- The global student
    - Supporting mobility on and off campus, in whichever country, learn collectively and opportunities to supplement and accentuate student experience
- Global administration and support
    - Shared systems e.g. student records, finance, HR, examination and enrolment systems

All of this fundamentally needs seamless, reliable, high performance, efficient connectivity, although this is generally an afterthought. Expectations and demands of students are changing, with 24/7 connections and support, more face time interaction with those delivering education, and a more digitally enabled curriculum. Improving technology that underpins TNE activities, we can improve student and staff access to materials, and providing a seamless learning environment between home and overseas operations.

Examples of this may include:

- Underpinned by a quality connection back to the campus of the home institution's country, students are able to access the Virtual Learning Environment (VLE) to see course information, submit assignments and access activities and resources;
- Students and staff easily access their emails and other cloud-based resources, all centrally maintained by the IT team in the home institution's country.
- Students take globally synchronised exams despite being in different time zones; staff at different campuses hold videoconferences to discuss the results and enter them into a single student record hosted at the campus of the home institution's country.

Why is TNE relevant to the national research and education network community?

The global network of NRENs, cooperating and working effectively in partnership, can meet the demands of supporting greater levels of TNE forecasted for the coming years.

- Expectations and demands of students are changing, with 24/7 connections and support, more face time interaction with those delivering education, and a more digitally enabled curriculum
- Reliable, high performance connectivity is fundamental to the successful delivery of TNE.
- Improving the technology that underpins TNE activities can improve student and staff access to materials, and provide a seamless learning environment between home and overseas operations.
- Supporting TNE is not about moving big bits of data about, it's about delivering a quality education that reaches all areas of the world by using the reliable and effective networks that we have developed.
- The global network of NRENs, cooperating and working effectively in partnership, can meet the demands of supporting greater levels of TNE forecasted for the coming years. Almost all aspects of the learning experience for a TNE student depend on reliable, high-performance connectivity operating seamlessly between different countries and continents.

TNE global growth and data

Data on both individual sending and receiving countries TNE activities, and global TNE trends, is notoriously hard to obtain and in many cases, does not exist. Only the UK, China, USA and Germany have any form of data collection systems. Further complicated by confusing and inconsistent definitions and terminology, the scale of the 'data challenge' is huge. We can only hope that as global TNE delivery grows, access to better global data is established.

In the interim, and as part of the work of the GÉANT SIG-TNE, a **'TNE data report'** on the top ten countries globally engaged in TNE as host or sending countries has been developed by **Jisc** and **Internet2**. This work has collected and analysed data related to Transnational Education on a global basis rather than with a country focus. Short profiles of the TNE characteristics of each country from the perspective of relevance to NRENs are also detailed. The report can be seen on the **GÉANT SIG-TNE wiki** page.

Data sources and further resources can be found both in the Country Profiles (Section 3) and Further Resources (Section 5) of this document.

2. Planning your TNE support

This section helps you plan and tailor your TNE support for your community and members. It is a synthesis of the lessons learnt both from the experiences NRENs supporting the delivery of TNE, and staff in international, IT and library departments, and coordination roles at HEIs.

The first section is aimed at NRENs, both sending and receiving, at any stage of developing your TNE support, and sets out the considerations your institution may need to address in supporting your community. The information is applicable whether you need to support individual institutions, or plan to develop a robust TNE support programme.

The second section is advice for you, as NRENs, to give to your community. It would be advisable however to be familiar with the challenges for your communities and members, and to be able to develop and provide solutions where possible. This section, and the 'Checklist for institutions planning TNE activity' at Annex X is written from the perspective of a sending country.

In general, whether a sending or receiving NREN, the main responsibilities to support TNE will be in the order branch campuses, partnerships, and then online. In IBCs, the delivering institution will be responsible for the infrastructure, including IT, and therefore bears the costs and risks of the connection back to the home country. In a partnership, infrastructure will probably be the responsibility of the host institution, however any issues with performance requiring upgrades or changes to the infrastructure will need to be negotiated with the host by the partner agency. In online delivery of TNE, there is little control over the infrastructure that the end user is using and therefore TNE support is limited.

2.1 Key considerations for NRENs

2.1.1 Common challenges

There are many aspects for you to consider when developing your support for TNE, right from the basics of understanding your country's priorities and response to TNE, through to the extent that your member institutions have adopted technology to deliver their teaching and learning. Fundamentally, you should identify the person responsible for TNE in your NREN; this may be someone responsible for education, or global connectivity, for example.

The GÉANT SIG-TNE has scoped this work over the last few years, and therefore it may be helpful to consider TNE in terms of the following four categories:

- **TNE data – regional, national and global.** Data on TNE activities in your country is the starting point for understanding your priorities. However, data rarely exists and you should be prepared to have to do some of the groundwork yourself.

Before you do this it may also be helpful to understand your country's approach to TNE, how open the country is, what legislative and quality assurance protocols there are, and whether you predominantly send or receive TNE. The British Council **Global Gauge** contains such information on 43 countries, and has information specific to TNE as well as international student mobility and international research collaboration.

Other sources of data and information on TNE would be from the Government in your country. Is there an Education Strategy, and does it include Internationalisation? Is TNE a Government priority? Have priority countries been identified to work with? You should engage your Ministries of Education, IT, International Trade, and Science and Research for example. Do your members have a representative body, for example Universities UK in Britain? Do you have equivalent bodies such as the British Council with outposts overseas that could be helpful? Who are the Quality Assurance bodies and are they engaged in TNE? It is helpful to build up a network of contacts and engage appropriate bodies and groups in your own country to fully understand the TNE, and education landscape.

Following on from this, you will need to identify the needs of your members. Have members indicated that delivering TNE is a priority for them? Who is delivering or sending TNE? In what form? In general, the forms of TNE can be extensive and a focus on International Branch Campuses (IBCs) and Partnerships tends to be the most effective, where there is more control over network connectivity at the outset. If data doesn't exist on this already, you could consider a survey of your members. Jisc has experience of this and a report, '**An early warning system for TNE'**, generated in 2015, describes clearly the role an NREN should take in supporting TNE for its members. A collaborative Government effort would be most effective for any such survey.

- **Global TNE policies.** As NRENs, we have not yet adequately addressed how we also reflect the equitable partnerships that our institutions and members strive to achieve needed to deliver TNE, and how we develop reciprocal arrangements between ourselves as NRENs. This is complex, as there are varying levels of understanding of TNE requirements across NRENs; many have yet to engage in this area, and this tends to be driven by the country sending the TNE to support their own members. This is also challenging as NRENs themselves take many shapes and forms which will affect the level of support they are able to provide; there is a spectrum of provision from those focusing on establishing good connectivity, to those delivering services 'up the stack' through to those delivering a suite of services including the hosting of content.

  The development of consistent policies to support TNE, e.g. connectivity, services, and charging models as well as standard resources such as contracts and SLA's, is an area currently being addressed by the GÉANT SIG-TNE as well as the Global REN CEO Forum.

We would love to hear about this area specifically in the development of this area of work[2]. In the meantime, there are a number of ways that you can initiate these discussions. Firstly, you should be fully aware of your own policies for connection. Do you allow another education institution from overseas to connect to your network? If yes, then how are you defining them – as one of your own HEIs, or as a private connection? What charging tariff would you apply? Secondly, engage directly with other key NRENs that are relevant to the TNE activities of your members, either through the GÉANT SIG-TNE or at conferences and events.

- **TNE service development, challenges and opportunities.** Operationally, we also have challenges in supporting TNE, and again, this is another area of work of the GÉANT SIG-TNE. Considerations include:

  Connectivity: is your NREN connected globally to offer TNE support? Is the bandwith and capacity sufficient? What testing can be done (e.g. latency) and are global routes optimised? What are the benefits of using your connectivity in comparison to a local ISP? Are pricings comparable? Are you working with local ISPs for example who provides the last mile connection?

  A key resource for looking at global connectivity originating in Europe is the **GÉANT Connectivity Map**. This interactive map demonstrates the global reach of the GÉANT network and its links to National Research and Education Networks in 65 countries around the world.

  Currently in development is a Global R&E Interactive Map. A Working Group has been set up led by GÉANT and Canarie (Canadian NREN) with a **wiki site** open to all. The aim is to produce a dynamic/interactive map (zoomable with selectable layers and sections), which has the ability to show intra- and inter-NREN nodes and connections, including some meta information (e.g. link speed); and the ability to show connected institutions and major science infrastructure and instruments. The wiki site also contains a list of both static and dynamic maps relating to research and education networks.

  Looking forward, **Global Network Architecture (GNA)** embodies a vision and an ambition of an international collaboration of national research and education networks, interconnecting R&E networks on a global scale, based on the latest technologies and promising developments, with a five to ten-year horizon. This will enable R&E networks to align their spending for intercontinental bandwidth.

[2] Contact **sig-tne@lists.geant.org**

Interoperability: Are there identity and access management issues? Do you have/need eduGAIN? Is IPv4 sufficient or are there technological considerations in requirements for IPv6?

Operational: Do you have the right peering polices and peerings to be able to support TNE, and are these optimised with global R&E infrastructure? Is eduroam available in your country and who is responsible? Are there licensing issues, wither with software or content, and who are the main vendors?

Regulatory: Are there Government policies that HEIs need to be aware of, for example Firewall or application restrictions? Does any hardware need to be installed from the overseas location? What are the border restrictions and timescales that will be imposed?

Once these key issues have been addressed, those NRENs with more significant TNE portfolio's may consider the development of a service/service bundle. Experiences from NRENs already offering these services is imperative as in many cases, knowledge and possibly resources (such as registration forms or contracts) may be shared.

- **Tools, toolkits and resources**. As many NRENs have already been developing tools and resources in this space, much already exists to support you and your communities and members. This, again, is ongoing work of the GÉANT SIG-TNE which aims to identify tools and resources already in existence, and develop a suite of tools and resources to enable NRENs to support TNE, individually and globally, but also tools and resources to more directly support education institutions or policy stakeholders in the NREN country.

  Fundamentally you should join the GÉANT SIG-TNE which is where both NRENs and community members across the globe can identify common issues. The **GÉANT SIG-TNE Wiki** site allows you to gain access to past TNE sessions at major conferences, reports and presentations as well as articles, blogs and case studies, links and websites; and be notified of relevant events past and future where NRENs and communities get together to discuss this topic.

  You may also consider establishing local, in-country Special Interest Groups or discussion Forums, either led by yourself as an NREN or in collaboration with Government institutions such as those mentioned above. This may include members of your community in various roles within HEIs and act as a network to share best practice, provide peer to peer advice and share resources.

  Mentioned in the previous section is the **GÉANT Connectivity Map**, which can be used by both you and your community to identify connectivity originating and connected into Europe.

  Another key resource can be found at the **In the Field** website, which is a site containing case studies of NREN support both in research and education. There are a handful of TNE

case studies on the site which may be helpful, but also of importance is the section on **'Why R&E Networks?'** which can be used as a persuasive case both to members and stakeholders in your communities.

Annex X contains a survey, developed by the GÉANT SIG-TNE to gain an understanding of the scale and scope of TNE in top sending and receiving countries and provide a persuasive body of evidence for NRENs developing support for their communities. This document's use is two-fold: regional organisations such as UbuntuNet Alliance, APAN and GÉANT may use this to survey their NREN members on the state of TNE support; or individual, national RENs may use this as a 'Checklist' to understand fully the scope of support required for their own support for TNE.

2.1.2 Sending NRENs

Sending countries are those which deliver TNE qualifications in a host country. This may be collaborative or independent, and therefore the degree programme may be delivered in an institution in the host country which may include staff from the sending country, or fully online.

The main sending countries are USA, UK, Australia, France and Germany. A summary of the top ten host country profiles is contained in the **'TNE data report'**.

As mentioned earlier, the main focus should be on branch campuses and partnerships in supporting your members setting up overseas. Your priorities may be determined by your approach; this may be reactive, where members contact you for support in particular countries, or proactive, where you identify and contact members engaged in TNE, particularly where there is a concentration in a host country and you may be able to aggregate needs of delivering institutions. You may consider a survey of your members to identify their needs, both now and in the future, but it is important to capture the views of both those planning TNE (e.g. international departments, decision makers) as well as those in the delivering departments (e.g. IT departments, libraries). The Jisc survey in 2015 identified two key issues:

» communication and coordination between International and IT Offices in TNE planning and delivery is poor; many IT departments were engaged at the last minute to deliver connectivity which resulted in costly and ineffective services; and

» In terms of the overseas network arrangement and management, most IT staff 'don't know' – don't know who is responsible, don't know the network arrangements, don't know the

levels of service and whether the infrastructure is included in contracts, amongst other things.

Whilst this may not be the case in every situation, it is helpful to be mindful of this when supporting your members.

It may be helpful to consider the following questions when considering your TNE support:

- What is the technological setup in the host country? Is the NREN established and has capacity and an open policy to connect my university/education institution? If not, what are the local ISPs? What are the costs and limitations? What are the respective SLAs? What are my peering policies which may be necessary?

- What information do I need to give my institution on the technical issues and challenges in the host country? E.g. blocking of certain software, prohibitions on use of VC – what do I need my institution to consider before they (i) decide to establish in that country; (ii) need to deliver in that country?

- Who can I work with in that country? Who do I contact as a liaison in the sending country NREN or ISP?

Having an in-depth knowledge of your members needs is the next step. In many cases your member may not be fully aware of the considerations for the overseas activity; Jisc has developed a 'TNE Registration Form' for those members asking for our support to capture appropriate information and contacts. This can be found at Annex X. An online version of the form is currently being developed and will be available for use in early 2019.

The TNE Registration Form may be used as a sign of commitment by the HEI requesting your support. In many cases the support required will not be clear; the Form enables you to assess whether you will be able to help. A meeting to discuss the form is also recommended.

You should establish expectations and specific needs of the HEI through the form. Expectations will typically include 24/7 365 availability of systems and support, real time communication, high quality videoconferencing, file sharing and globally synchronised exams. What are the essential services, and the 'nice to have's'?

Services required will start from establishing and optimising network connectivity, but you may also be able to offer services such as network monitoring, eduroam, videoconferencing, access and identity management, security and others depending on your home offer. You should also identify specific applications required, and how these are to be run (e.g. local server, home server, cloud, VPN), as these may be inaccessible in the overseas country. Common problems include routing

issues (which impacts on latency and therefore quality of service), and out of hours support (relating to the time difference between sending and receiving countries).

At some point you will need to consider whether you will charge for your TNE support and develop appropriate tariffs. Experience from Jisc shows that high costs for TNE services are not welcomed due to the high costs of delivering TNE in the first place. It is much more appropriate to both meet the needs of your members and support delivery of high-quality education.

As you develop your knowledge and expertise of overseas countries hosting TNE, it is important to work collaboratively with those institutions in your community that have requested your help. In this way, experience shows that working with institutions in 'Pilot Projects' which are no-cost to the institution enables good relationships to be formed and enabling you, as an NREN, to develop your support into services which may be income generating in the future. You may ask the institution for endorsement of your work, for example in the form of a case study following your help in any pilot phase.

Experience shows that your community may not want to contract directly with the provider in the home country. This is a service that you, as an NREN may offer which takes time and risk away from your community. By you managing contracts both directly with the HEI and directly with the supplier (whether an ISP or NREN), you are able to manage and monitor the service. A clear SLA from the supplier must be reflected in the HEI contract. As mentioned above, it would be good, in the future, for NRENs to have reciprocal arrangements for connection policies and charging which ensures the HEI is not charged by both sending and receiving NRENs; this is another area of work of the GÉANT SIG-TNE.

If TNE is to be a significant part of your support for your members, you may want to develop a support package. The case study below outlines a support package from a sending country.

Sending NREN Case Study: Jisc's TNE Support Programme

Jisc is a not-for-profit organisation providing the UK's national research and education network, Janet, and technology solutions for its members – colleges, universities and research centres. It is funded by the UK higher and further education and research funding bodies and member institutions.

Jisc does three main things for its members:

1. Operates and develops the ultra-fast and secure Janet Network and its built-in cyber security protection;
2. Helps save time and money by negotiating sector-wide deals with IT vendors and commercial publishers; and
3. Provides trusted advice and practical assistance on digital technology.

Historically, Jisc's service offerings have been delivered almost exclusively within the UK. However, in response to the growing demand from the education community, we have made a strategic decision to improve the support we offer for the sectors' both established, and developing, TNE activities.

Established in 2013 the initial phase of **Jisc's TNE support programme** focused on addressing requirements for cost effective, appropriate and reliable connectivity services overseas, helping overseas campuses in Malaysia, and partnership arrangements in China to be connected to home institutions in the UK.

In late 2014 Jisc and **The Observatory on Borderless Higher Education**, an international higher education research and monitoring unit, conducted a survey of the UK Higher Education (HE) sector to capture current TNE activities and future plans, including the locations of such activity. The survey included feedback on TNE delivery modes, network arrangements and the management of IT operations at overseas locations. The resulting report – **An early-warning system for TNE** – was published in January 2015.

There was clear feedback from the survey results for the need for a guide to assist UK educational institutions to understand the technological considerations for the planning and delivery of their TNE activities.

In March 2016 Jisc established the TNE Technology Special Interest Group (SIG) made of up representatives from UK universities, who have contributed to the development of Jisc's TNE support programme and a Technical Guide that supports UK Higher and Further Education institutions in their delivery of TNE. This will be available in early 2019.

Through our TNE support programme we seek to improve the technology that underpins TNE activities, with a view to improving student and staff access to materials, and providing a seamless learning environment between home and overseas operations. This fundamentally relies on cost-effective and reliable connectivity; we have already enhanced our portfolio to enable overseas campuses to be connected to home institutions in the UK. This integrates with our UK-based operations, including the Janet network and Jisc's range of services in technology and digital resources, to support TNE delivery on a global basis.

Jisc's ambition is to be the UK sector's expert and trusted advisor on technical and infrastructure information to support high quality TNE delivery. We believe Jisc is well placed to support UK HEIs in offering an equity of student experience by providing the digital architecture to support TNE.

How Jisc have supported UK universities in their delivery of TNE (case studies):

- **Queen Mary University London:** 'How Jisc's connections to China improve student experience'
- **University of Hull**: 'China link boosts global recruitment'
- **Heriot-Watt University:** 'Enabling global working at a global university'

Jisc services and projects

By listening to our members and responding to demand, we have a number of projects, some of which have resulted in specific services to help deliver a borderless education experience:

» **Global Partnership** (launched in early 2019) is a consultancy style service either offered on a one-off or annual subscription basis looking to provide support, advice and solutions on a number of different TNE topics, for example technology and connectivity, logistics and regulatory issues in the countries we have TNE experience in. The service is designed to reduce the risks and challenges of working internationally to deliver an IT infrastructure capable of supporting TNE activity that meets expected standards of teaching and student experience. The service helps optimise connectivity and integrate IT operations between an institution's global sites for a more seamless experience for students and staff in both countries. The service removes many of the headaches associated with working across time zones and borders, saving your institution time and money.

» **Global Connect** is an international brokerage service to provide network connectivity for institutions that deliver education overseas. It aims to provide seamless, reliable and secure connectivity between an institution's home and overseas TNE activities. We provide advice and guidance on local arrangements and develop optimal connectivity solutions in that country for customers. To date, Jisc have offered our Global Connect service in Malaysia and Malta. We have been extending this service to now explore connectivity in the Middle East, and in particular Dubai in the United Arab Emirates. Find out more information on the service here: **https://www.jisc.ac.uk/global-connect**

» **TNE Licensing Pilot** was initiated with response to demand from library staff that there needed to be a way to ensure equitability of access to key content that supports course requirements, no matter where a student may be located. Creating an experience for those students studying overseas which is at least equivalent to that being delivered in the home institution is a critical element of transnational education (TNE). The expectation of TNE students is that access to key resources to support course requirements, such as journals, databases and e-books, is readily available. Our colleagues in Jisc Collections are busy working with 42 libraries who are participating in the licensing pilot running until 31 July 2019, looking at how to support a common TNE nomenclature and licensing approach with the ultimate aim of negotiating with publishers to develop a simple approach to licensing and pricing for TNE student and staff access. Find out more on the project here: **https://www.jisc.ac.uk/rd/projects/tne-licensing-pilot**

- TNE Digital Experience Insights. After identifying that there is little data available on the student and staff experience of technology in TNE programmes this pilot project was set up aiming to provide meaningful and useful data on equitability of student/staff technological experience, improve student experience, address retention rates and student experience. Benefits include: ability to compare experiences based on geographical location, benchmark against other institutions and participant institutions will also receive a free license for the Jisc online survey tool. The pilot was launched in autumn 2018 and will run to April 2019 as a discovery phase. Find out more on the project here: **https://digitalinsights.jisc.ac.uk/our-service/tne-insights/**

For further information contact **transnational@jisc.ac.uk** .

1.1.1 Receiving (host) NRENs

The receiving (host) country, or the country where the qualification is delivered is that which hosts another country's TNE; students from this country (or a third, unrelated country) study here to obtain a degree from the sending country.

The main receiving countries (for the UK) are Malaysia, China, Hong Kong Singapore and Egypt; country profiles (Section 3) have been provided for these destinations. Globally, the main receiving countries are China, United Arab Emirates, Malaysia, Singapore and Qatar.

In order to ascertain the extent of TNE in your country, you will need to do some investigation into your Government's policy, and the modes of TNE allowed. Policies in this area change all the time,

for example China no longer allow branch campuses to be built and now focus on 4+0 and 2+0 degrees rather than other elements of mobility to the sending country.

When you have a good view of the types of TNE you are hosting and countries you are hosting from, then you have a good basis to form your TNE support. You may need to consider the following questions:

- Why is supporting TNE important to me, as an NREN, and my country?
- Is there the potential for supporting TNE to build capacity and capability / infrastructure and services for us as an NREN?
- What are the expectations of the sending country?
- Do we have the right capacity for supporting overseas institutions? If not can I work with local ISP's to help the sending NREN until we do have capacity?
- Do I have the right connection and peering policies? If not what do I do?
- Who do I contact as a liaison in the sending country NREN?
- What do I need to do to support my own education institutions (if for example delivering in partnership?)
- Where can I go for peer advice and assistance?

If TNE is to be a significant part of your support, you may want to develop a support package. You will need to consider whether overseas institutions fit into your membership categories, and develop a tariff accordingly. You may also need to brief your account managers on supporting overseas institutions, and what the offer is. Some form of communication with your members may also be appropriate, to both identify partnerships they may be engaged in or considering, and also

to reassure members that your support for overseas institutions will not be detrimental to the services you are offering them.

The case study below outlines a support package from a receiving country.

Case Study: CERNET's TNE Support Offer

Case for using CERNET v local ISP.

CERNET service package

Harry Hua's local IT group

2.2 Key considerations for supporting institutions in your community

There are many resources accessible for institutions planning TNE activities at the strategic level, who to partner with, where to locate etc however the more practical information, such as technological, financial and other aspects appears to be lacking. Some, country specific information may exist, but on a global level there is certainly a gap. This Resource Pack hopes to at least initiate the thinking on a number of delivery aspects of TNE, with a focus on technology.

This section details key issues that will need to be considered by your institutions delivering TNE (i.e. sending countries). It is crucial that these issues are considered by HEIs in the early planning stages, regardless of the model of TNE delivery. Some of the advice and guidance outlined here is more general, and some more specific to the technical aspects of TNE delivery, but all will help your community to prepare for avoidable challenges.

It is not anticipated that HEIs in receiving countries need to address the same issues; such activities will be partnership activities and be driven by the local IT and staff at the host university, although various negotiations may be required.

A Jisc TNE Tech Guide, aimed directly at institutions delivering TNE, will be available in early 2019. This will highlight a number of case studies in various countries on specific aspects of TNE delivery.

This section is comprised of the following information:

- External and market information

- TNE planning and delivery within your institution
- Technical aspects
- Challenges specific to the different modes of TNE delivery

The wording is drafted directly addressing the HEI, rather than you as an NREN.

2.2.1 External and market information

It is assumed here that the location, and form of your TNE activities has already been agreed. However some research on the locality still needs to be done, to assess the local infrastructure, IT providers, laws and regulations, taxes and other aspects which may have an impact, and associated cost on TNE delivery. There are many institutions which may support your research, Government Departments for example which have in-country offices in the overseas location, and for the technical aspects, your National Research and Education Network may be able to offer support and advice.

Although many HEIs may be in competition to deliver TNE in a specific country, in particular where there may be a concentration of institutions delivering education in a 'Hub' or 'Economic Zone' such as in Malaysia or the United Arab Emirates, never underestimate the quality of peer to peer advice. You should identify institutions, particularly from your home country, who are already established and delivering TNE and have a discussion, preferably face to face, to identify some of the challenges you may face. Experience demonstrates that this is possibly the most effective way to identify and address common challenges, and institutions are more than willing to impart their knowledge.

For academics and those designing courses, every country has its own accreditation rules and there may be a lengthy process to receive local accreditation for your qualification. Most regulators are honest, helpful and supportive if new entrants are seen to be bringing something of value to the country.

2.2.2 TNE planning and delivery within your institution

As an institution delivering education in an overseas location, it is likely that you will be building your brand and reputation. For this, real time, professional communications is a fundamental part, and ensuring that your students have at the very least, a parity of experience to those in the home country is critical.

In order to achieve this, it is fundamentally important to both identify all internal stakeholders and involve them at the earliest planning stages, and ensure that there are regular and open communication channels to address issues as they arise and drive the project forward.

Legal structure and governance

You should understand the legal structure of the TNE activity as this will have an impact on many aspects of delivery, for example when contracting. For example, is your overseas venture a separate legal entity 'owned' by the home university or a partnership housed under an overseas partner university. If a partnership, who has the majority share? Are there venture capitalists involved? What is the governance and decision-making structure? In terms of infrastructure, is this contracted out to a third party? What influence do you have over their decisions on your requirements? If in a partnership, is the partner responsible for infrastructure? What influence do you have over their decisions on your requirements?

Involvement of academic staff

Academics need to be aware of what is and isn't possible when they are planning their courses. There may be limitations on software and applications in the host country, and if connectivity is not great, then real time teaching and examinations may be impacted.

It is also important to understand your organisation's plans in terms of courses to be delivered and growth numbers expected, in order to both address both current and future technology needs (in particular bandwidth requirements). Some elements of caution should be raised here as in many cases, TNE student number growth is slower than anticipated.

Involvement of administrative and operational staff

Understanding the business needs of finance, HR, IT, quality assurance and library staff in planning discussions for TNE activity can help avoid unnecessary challenges.

For staff in administrative or operational roles involvement is critical from the start of the planning process for any TNE activity. The tendency for individual departments to work in silos still mitigates against efficiency and it's crucial for support staff to have a greater understanding of their institution's overseas operations.

Jisc's own research in 2014 found that many IT staff are unaware of TNE activities at their institutions. By involving IT at the earliest stage complex overseas connectivity problems can be anticipated and diagnosed. Your institution will be best positioned to deploy appropriate technologies in the most beneficial and cost-effective ways to meet the requirements of the academic programme, including bandwidth demands, classroom technologies and application environments.

Access to key business administrative systems such as finance and student records systems is critical to avoid duplication and potential errors.

In many successful cases, HEIs have established a cross organisational group or individual specifically responsible for coordinating planning and delivery of TNE activity (e.g. strategic leads, international leads, academic course delivery leads, business development leads, IT lead, library staff, QA staff, finance. HR) within their institution.

Integrate staff across global sites

Integration between overseas and home country-based staff is as important as access from abroad to institutional assets such as libraries, IT support, pastoral care and careers guidance. It helps mitigate the risk of a TNE venture being perceived as an 'orphan' by staff and students at the home institution.

For branch campuses institutions will have greater autonomy to build a team of skilled teaching and support staff. They may choose to have a mix of international and national staff. It should be remembered though that for programmes delivered to part-time students, using flying faculty is a common and low-risk strategy, but it presents greater challenges for full-time undergraduate programmes.

It is more complex for HEIs working in partnership with an overseas institution. It may be the case that partner institutions do not have fully-fledged IT, library and other academic support teams or their staff may lack skills and experience in particular key areas. These factors should be considered and steps taken to address them at the earliest stage.

You should establish a frequent and reliable means of communication with your partner institution. While videoconferencing and/or telepresence technologies are no substitute for important initial in-person meetings, these technologies are increasingly affordable and ubiquitous and provide a good method for routine interactions.

You should anticipate language barriers and cultural differences. It's important to be aware of and make an effort to understand different business practices and etiquette.

Any transnational venture requires high level support at the home and host institutions. This will ensure that staff at both sites are committed to the continuing success of the activity, it has

visibility and exposure at the home institution, and by having senior figures responsible for academic affairs helps ensure common standards are applied globally.

Costing and due diligence

Delivering TNE requires significant time and resources, which carries risks in terms of finance, academic reputation and quality.

Business agreements regarding funding and support have significant impact on delivery of TNE. Staffing levels and expertise will vary greatly depending on the agreements about operating costs and how personnel are funded and accounted for. A full assessment should be undertaken leading to a detailed business case. It is crucial to go beyond skin deep and not to rely on face value.

HEIs should ensure effective legal and financial agreements are in place and there are clear reporting requirements internally and externally. Agreement should be reached with partners on how costs associated with the venture will be paid.

You should also consider whether your institution or partner institution is responsible for any local taxes and understand at the outset what currency fees and taxes should be paid in.

In budgeting for the operating costs of TNE activity it is recommended to set aside funds for more travel costs than may at first appear strictly necessary. Sending staff to the overseas site, and newly hired local staff to the home institution for familiarisation, is essential.

Equipment and other resources

For book, IT equipment and some basic technical equipment it's recommended to source as much as possible locally to avoid getting mired in complex import arrangements. However, be aware that if books are purchased locally, they won't be 'shelf-ready' so it is important to allocate staff resource on the ground to purchase and prepare books.

In many countries your institutions will be required to have a licence to import equipment. Obtaining an import licence may require a VAT registration and proof of income. This information should be available from your Government.

Licensing arrangements for overseas staff and students

Be aware that local licensing agreements (either for software or digital content) may not apply at an overseas or partner site, meaning that staff and students can't always access digital resources or

applications easily from overseas. The resources will be licensed in the home country but the license with the publisher or software company does not allow for international use. This is a complex environment and will differ per publisher and per country. This will inevitably involve hidden costs and negotiations.

Library staff need to be engaged at the earliest opportunity to manage this process. Consideration should also be given to teaching staff at the overseas partner/campus.

If students are registered at the home country university this makes the situation easier for access to digital resources, but as staff may not be employed by the home country institution, then there may be a situation whereby students but not staff can access materials.

It is important that partnership agreements between institutions consider library and content resourcing for courses. Unfortunately, these considerations are often left out of initial partnership discussions, which results in library staff being left to deal with issues when they arise further down the line. It can be a complicated area as universities will often have a long list of licensing agreements and subscriptions that they wish their TNE students to access which will need to be negotiated on an individual basis.

Jisc is running a **pilot project** to find a simpler way to license resources for UK universities' students based overseas. Jisc hope to establish centralised negotiated agreements with publishers to relieve universities of much of this TNE burden, and go a long way to increasing the availability of affordable library resources for these learners, improving the parity of overseas student experience with their UK counterparts.

2.2.3 Technical aspects

For any TNE activity, there are additional variables to consider beyond the typical constraints when planning IT projects that must be understood prior to embarking on a global effort. Culture, customers and laws may restrict use of certain technologies. For example, telephony in some countries must be provisioned by a specific carrier; network monitoring and content filtering is the norm in certain countries; and tax laws may forbid the importation of technologies from other countries.

The first port of call for any technical requirements should be your national research and education network. NRENs are reputable providers who work in the sector, and for the sector and are therefore a trusted support for you. Contact details for the main NRENs are detailed at Annex X. Your NREN may be able to provide you advice and guidance on the host country, and use their contacts to develop solutions to your technical issues. Some NRENs may also be able to provide

advice on licensing and content issues. If there are a number of HEIs requiring services in one locality or country, the NREN may be able to aggregate demand on your collective behalf and negotiate a better deal. As many NRENs are developing their support for TNE, anticipate that they may not have all the answers and will want to work closely with you to develop their own technical knowledge and expertise in this area.

General point about not replicating servers and use of cloud– refer back to academic and business needs and operating as a global university

Technology to support the student experience

Student experience is critical to successful TNE. A goal for institutions is to be able to provide the same level of learning experience in a non-home location as students would in their home country. This applies to both sending and receiving countries. The below are key areas of consideration:

Service	Likely user requirements / activities	Typical challenges when delivered overseas
Virtual Learning Environment (VLE)	Students view course information, submit assignments and access activities and resources	» Maintenance work should be scheduled carefully » Issues with students accessing VLE from accommodation
Library system	Allows students to search for, access and download resources (articles, books, journals, images etc.) held by or subscribed to by the university	» Current university licensing agreements may not apply overseas, meaning that TNE students may be prevented easily accessing all available digital resources.
Email system	Students are provided with a personal university email account and can typically log on via a web browser	» Cloud-based email systems require a quality of connection to ensure students can reliably access emails
e-assessment	Students sit online examinations and submit coursework, and receive electronic reminders about deadlines	» Students likely to submit coursework at same time putting demands on the network. Network capacity at branch campus / partnership will need to cope with demand

Service	Likely user requirements / activities	Typical challenges when delivered overseas
Student management system	Systems handle inquiries from prospective students, admissions process, student enrolment and maintains student records	» When working with partner institutions can result in the double handling of data for student registration. Difficulty to integrate and standardise systems between universities
Video streaming	Students stream video and audio files over the web, usually via a university-hosted platform.	» Students will require a quality network connection to view video files. » Access may be restricted if students are registered at partner institution rather than with home country institution
Videoconferencing system	Lecturers deliver lectures and tutorials and provide "live" support to students at remote sites	» Systems work well internally, but poorly externally » Issues with Firewalls

Network connectivity

Connectivity is a real issue when HEIs work abroad and failings often lie with local provision. Access to both local and international high-speed telecommunications networks is the most critical IT element to support TNE activity. The use of collaboration and communication tools, business systems and local technology infrastructure depends on such access being scalable, reliable and robust.

Insufficient network connectivity can be detrimental to the success of the academic programmes. There may not be the same internet experience as in the home country. It can be challenging negotiating with local commercial internet service providers and working at a distance to find a cost effective solution. Partnership arrangements are a lower risk and potentially lower cost approach than opening a branch campus, but their success will still depend heavily on sophisticated, reliable and secure digital infrastructure and systems. Insufficient network connectivity at partner institutions can be challenging as the HEI will have no control of the local provision. Typically, the network will be arranged and funded by the partner institution. The student experience may be affected as they will need the same access to course materials and resources on the home country-hosted VLE.

The challenges reviewing connectivity options and capacity should not be underestimated. Bandwidth costs vary greatly internationally and capacity in different areas will vary even more, with some locales it is unlikely that connection above 10Mbps can be secured. In these cases the use of wireless transport technologies to connect the campus to the network Point of Presence may be the most cost effective option.

Poor connectivity at an overseas site or partner institution can often mean critical systems and services are degraded. More and more HEIs are choosing cloud-based services for email and VLEs, the benefits of which enable them to have 24/7 availability and systems support, and each of their campuses to work on the same terms. Quality connectivity is fundamental to the delivery of cloud-based services.

IT teams should investigate at the earliest stage what kind of commodity internet and research and education and networking is available at an overseas site, and at what cost and reliability. IT staff should also look to understand the traffic type and, when possible, enable 'preferential routing' of traffic between the home country and partner campuses to help reduce latency between campuses.

It is important to understand who is responsible for the infrastructure in the first place, whether that is the home country university, the overseas partner, or a third party. Ensure that any contract contains sufficient IT capability and responsibility for management and upgrades as your activities grow.

Always do a site visit at the earliest opportunity to understand the general local connectivity issues and form relationships with local staff.

It is also important to consider both campus and accommodation connectivity when setting up overseas. Student accommodation is often managed by a third party and, as such, the internet connection in dorms could fall outside the control of partner institutions and be a lower quality than anticipated causing issues for students wishing to access resources off campus. However, investigating this issue at the earliest stage should help mitigate against future complications.

Latency is another element that contributes to network speed. Low latency network connection is one that experiences small delay times, while a high latency connection suffers from long delays. High latency can prevent an institution delivering quality services to their students, including upgrading from a basic VLE to enabling their home country-based lecturers to deliver a course via video streaming or conferencing.
The home country-based IT team may choose to use a network measurement toolkit to help monitor and ensure network performance across their global sites. Tools such as these can identify and isolate problems as they happen, making the role of supporting network users easier for IT teams, and increasing productivity when utilising network resources.

Furthermore an institution may choose to host their library catalogue, student record system and finance system at the home country campus – and good connectivity is required for TNE staff and students to access these resources on the equal terms as their home counterparts.

Troubleshooting can be complex, and often may be a result of multiple causes. In this case it is imperative to get first hand experience of the problem to establish the facts, even if this requires travel to the overseas site. It is sometimes difficult to get a consistent story when information is relayed across borders, cultures, language barriers and time zones. If at all possible, problems should be anticipated and diagnosed prior to 'doors opening' with significant testing prior to students arriving.

The importance of a sound technical infrastructure in supporting TNE will only increase, as teaching shifts to real-time online in the future, and new technologies such as virtual and augmented reality are used in new pedagogies. In the short term this may need local network infrastructure to be able to support more live video streaming, webinars, peer-group workshops and online examinations.

Hosting content and applications

When deciding where to host content, there are a number of solutions you may consider.

The most optimal arrangement is to host any applications and content on a server at the home or sending institution, to avoid duplication of resources and information in the host country. This of course is reliant on high quality, reliable connectivity. In such cases there are three options:

NREN (sending) – NREN (receiving) connection: In most cases your content will be hosted on the sending NREN network, and if NRENs are connected through global networks, there should be no issues of congestion as capacity will be more than sufficient. End to end monitoring is possible and there should be good performance access. NRENs working collaboratively will be able to efficiently troubleshoot and optimise routings.

NREN – ISP connection: This is reliant on good peerings and working arrangements between the ISP and NREN. In such cases you may like to consider additional security, for example use of a Virtual Private Networks (VPN) (see below). With an NREN in control at one end of the connection, there should be more leverage on managing the supplier and less risk in delivering content, with more control over routings and troubleshooting.

ISP (sending) -I SP (receiving) connection: Again reliant on good peerings, but there is significantly less control with either and between suppliers, which will come down to good contract management. There may be less control over routings and troubleshooting. Again,

in such cases you may like to consider additional security, for example use of a VPN (see below).

In some cases it may be necessary to replicate content and applications in the host country, for example if connectivity is too expensive, or insufficient. Hosting locally will require both local IT support and coordination between the home and host countries to avoid replication of data.

Cloud-based services

Use of services based in the cloud e.g. Blackboard, may have issues of connectivity reliability (e.g. there may be congestion on the link to the cloud provider network, of which there is no control); security protection (e.g. exact location of where contents are held); policy restrictions in specific countries (see Section 3: Country profiles; issues may be with Google, YouTube and Facebook). If you are using cloud providers to host contents or applications, which is becoming increasingly common, you need clarity on where your users who need to access the content and services are located to ensure your provider has good connectivity to those locations, as well as knowledge of the local restrictions.

Some receiving countries may not consider international connectivity a mission-critical service; hence risk of long outages with no mandate to repair quickly.

Some receiving NREN may not have direct peering arrangement with public cloud provider, eg. Ankabut

I wonder if saying hosting on a server at the home institution is the most optimal though, especially for applications?

For geographical resilience, and perhaps cost, another option to consider is use of public Cloud (e.g. Microsoft Azure or Amazon Web Services) that have peerings with NRENs.

Virtual Private Networks (VPNs)

Staff and students located at the partner institution may use a VPN to access files and resources hosted in the home country. There may be security concerns with individuals in another country using the VPN to access illegal online content unmonitored. From time to time governments in other countries may restrict or block the use of VPNs. Some guidance on the use of VPNs, and pro's and cons can be found **here**.

Data Protection

Your institution has a responsibility to adequately protect the personal information of staff and students. Over 100 countries around the world have enacted comprehensive data protection legislation, and several other countries are in the process of passing such laws. However, it should be noted that other countries will have different standards and legislation around data protection. There may also be challenges about storing student data outside of the host country, for example, in a student record system hosted in the home country.

Data Security

University managed mobile devices (laptops, tablets, phones) are encrypted to keep the information stored on them secure. Staff may also have encrypted other personal devices or data. However, many countries regulate the inbound use of encryption software as it can be used for military and/or criminal purposes. The **Wassenaar Arrangement** is an agreement between **42 countries** about import and export of arms and related technologies. Countries in the Wassenaar Arrangement allow you to bring an encrypted device without a licence. Some countries, such as China and India require a licence (or some other form of official approval) to bring an encrypted device into the country. Many other countries do not have a predictable policy that you can anticipate.

Before you travel, check for the most up-to-date information about travelling with encrypted devices and data. Failure to follow the requirements of the country you are visiting could result in the confiscation of the device, fines and/or other penalties, including detention.

Access and Identity Management

There can be identity management issues for staff employed in other countries. If they are not considered employees of the home institution, it could affect their access to critical business systems.

eduroam

eduroam is a global wireless network access service providing users (students, researchers, staff and faculty) in the research and education sector with mobility between participating institutions' wireless infrastructures, while removing the institutional administration burden of managing guest network access. eduroam is now available in **101 countries** and, in 2017, the eduroam system recorded over 3.6 billion national authentications and more than 834 million international authentications. Despite its expanding footprint eduroam is not yet available in all countries; a map of current penetration can be found **here**. If eduroam is not available, it is advised to check with local partners or the in-country national research and education network on the plans for eduroam deployment.

Virtual Learning Environments (VLEs)

A VLE, or Virtual Learning Environment, is an online area in which lecturers and students can interact in a range of teaching and learning activities. These may include accessing learning materials and course information, taking quizzes, submitting assignments online or participating in discussion forums. Poor network connectivity between the home campus and overseas location can result in degraded performance of VLEs, restricted access to learning and teaching resources, and ultimately a poor student experience.

IP Telephony

The use of VoIP technology such as Skype is common within organisations operating in different countries. However, it cannot be assumed that the use of IP Telephony is permitted in all countries as there may be local regulations that restrict its use to, for example, protect the local telecoms market.

2.2.4 Challenges specific to the different modes of TNE delivery

Physical presence

- **On the ground:** In many countries face-to-face interaction is an important feature of business and will help progress projects and more easily navigate challenges as they arise. When establishing an overseas or branch campus, it's recommended to have a project manager in-country overseeing everything from recruitment to construction work. From an IT perspective it is useful to have a senior IT person on the ground, at least for the project phase to ensure the design and build of the network and cabling is completed correctly.
- **Managing a global infrastructure:** You can choose to run 24/7 365 IT support from your home institution or set up standalone support at the overseas site. Managing a global operation means working with colleagues at distance, which is likely to result in issues being resolved more slowly than if working in the same country. You should consider how feasible it is for your institution to run a 24/7 global IT operation. For example, peak times on the network will occur at different times across different sites. Service downtimes will need to be carefully scheduled to allow for backups, maintenance and upgrades to take place.
- **Hardware:** When campus buildings are being designed consideration should be given to where servers and computer rooms will be located. You should make arrangements for servers on site to cope with local caching.
- **Staff digital skills and capabilities:** The digital skills of flying faculty staff should be reviewed before departure to ensure they are 'tech ready' and have a familiarity with technical set up and systems. At branch campuses non-teaching staff can often be

employed as general academic support staff and may lack the specialist IT or library skills needed to support a successful global infrastructure.

Local partnership delivery

- **Integration with departments at partner institution:** It is important to gain an appreciation of the 'norm' of your partner country and their culture and working practices. It can be challenging to integrate teams and departments in different institutions. It is important to properly understand your partner intuition's capability and processes for IT and library support and identify any gaps in capabilities. You should agree with your partner how IT issues will be recorded and tracked and understand what IT equipment they have o site. For example, establish what the printing capabilities are and whether visiting academic staff will have access to a printer.
- **End user support:** Don't assume the same model of delivering of IT, for example BYOD, exist at your partner institution. In a partnership arrangement it may not be clear who 'owns' the students and therefore should provide end user support. Your partner institution may expect to deliver their own solution, which could cause challenges integrating their systems with those hosted in the home country. Are support methods clear to all parties and appropriate for varying time zones? Support requirements should be clearly articulated and support processes agreed.

Distance learning

- **Update online learning platforms:** HEIs recognise that existing versions of online learning platforms are not often optimised for overseas learners and need updating. Institutions should develop a clear rationale for their online provision. Institutions can support online learner's success by:
    - Enabling learners to use their own devices, services and skills
    - Supporting access to rich and diverse learning content
    - Providing a digital environment that is accessible, social and personable.

- **Student support**: HEIs will have online learners registered for courses from around the world. Institutions should endeavour to create safe online spaces for learners to develop trust and a sense of belonging to the institution which will support effective interaction with tutors and other learners. They should establish a dedicated online learners support team and, where possible, with additional support provided by appointed representatives in-country.
- **Administrative and business systems:** Providers will need to adopt an institution-wide approach to ensure that operational and administrative mechanisms support online

learners appropriately. Your institution should consider what kinds of data it will collect – for example, learning analytics, demographic attendance, attendance tracking – and how it might use it.

» **Internet connection speeds:** Despite improvements in accessibility to broadband worldwide, there are still countries and regions with low internet connection speeds. Being aware of which countries online learning delivery will be more challenging will help your institution plan more effectively. Akamai – a content delivery network – has developed an interactive map showing average connection speeds in Mbps: **https://www.akamai.com/uk/en/our-thinking/state-of-the-internet-report/state-of-the-internet-connectivity-visualization.jsp**

3. Country profiles

This section provides information on the top five sending and receiving countries for TNE.

Limited information is contained in the top five global host country profiles taken from the **'TNE data report'**.

- United Kingdom
- United States of America
- Australia
- France
- Germany

More comprehensive data is contained in the top five global host country profiles:

- China
- United Arab Emirates (UAE) (incl. Abu Dhabi, Dubai and Ras al-Khaimah)
- Malaysia
- Singapore
- Qatar

The data is subject to constraints around the availability, consistency, and accuracy of TNE data. The diversity in the profiles mirrors the challenges in accessing, collecting and analysing TNE data; collection efforts were hampered in part by the paucity of data available for most countries profiled, whether that is due to lack of a central authority collecting the information, a difference in understanding of what TNE programmes comprise, or data being available only in an overseas language or otherwise inaccessible.

In terms of data reliability and accuracy, we can speak with confidence to information collected on International Branch Campuses (IBCs) - the most prevalent form of TNE delivery and the one of most interest to NRENs in their role of supporting educational institutions - as well as, in most countries, the number of students enrolled in these branch campuses. The remaining data should be treated as indicative of certain trends, approximative, and constantly changing.

Sources are provided and referred to for further consultation as needed. This is not aimed to be a precise ranking of countries; however, the below information should be an accurate reflection of the countries most involved in these types of activities (as well as those projected to become players on

the scene in the next few years). As such, it is our hope that our analysis will be of interest and use to NRENs which may be called upon in the future to support the TNE activities of the education institutions they serve.

Further detail beyond the top five countries listed here, as well as source data and references, can be found in the **'TNE data report'** and its annexes.

The information contained in this Resource Pack can be used by institutions of any nationality to assist in their delivery of TNE. The type of information included can also be used as a template in developing knowledge about emerging or other receiving countries.

3.1 Sending countries

Country profile #1: United Kingdom

1. **United Kingdom:** In 2015-16, around 700,000 students worldwide were studying offshore towards a UK higher education programme, and over 80 per cent of all UK degree-awarding bodies are engaged in some form in TNE[3]. Universities, sector agencies and the UK government are prioritizing TNE as a growing area of activity. UK HE TNE student numbers grew by 17% from 2012-13 to 2015-16. Distance learning programmes offered by Oxford Brookes University, Open University and University of London International Programmes account for 55% of total number of UK TNE students. Excluding these programmes, the remaining number of UK students is around 315,000, which is predominantly delivered through dual and joint programmes or other collaborative provision. 8% of UK TNE students are studying at an international branch campus. The UK's top host countries in order are Malaysia, Singapore, China, Hong Kong and Egypt. UK universities have 44 IBCs in 20 different countries.

The UK benefits from having a centralised data register for TNE activity, the **Aggregate Offshore Record** (AOR), collected by the Higher Education Statistical Agency (HESA). The AOR is a report completed by UK university administrators to capture the numbers of offshore learners studying on courses, programmes and degrees, associated with the UK university in some way. The AOR classifies a continuum of UK university course enrolment using five reporting codes (1 to 5), based on the notion of students being 'registered' at either the 'reporting provider', meaning the UK university (codes 1 -3), or at the 'overseas partner organisation' (code 4) or not required to be registered at all (Code 5). It can be viewed as mapping a level of affiliation to the reporting UK university for students in receipt of awards, running from strong (registered at an IBCs) to weak (validated through overseas partner organisation).

NREN: **Jisc**

Country profile #2: United States of America

2. **The United States** has been, alongside the UK, a leading provider of TNE abroad, particularly in China, UAE, Qatar, Canada, France (for IBCs) and in China, India, France, South Korea, Germany, and Japan (for other types of TNE programmes). Although the drive toward establishing physical presence such as IBCs abroad has slowed among US institutions, it is likely that universities will strengthen their presence abroad in other ways, particularly given that the number of foreign students enrolled in US universities on the mainland is starting to decrease (data indicates a "nearly three percent drop in first-time

[3] **http://www.qaa.ac.uk/newsroom/in-country-reviews-of-uk-transnational-education-(tne)-provision-in-ireland-hong-kong-and-malaysia#.WmosbCOZPBI**

undergraduate numbers"[4]). "A new report highlights that the world's leading study destinations – the US and UK – will continue to see their market share of internationally mobile students decline through 2025.[5]"

The US does not have any one agency responsible for collecting TNE data; the data presented in this report comes primarily from work done by the C-BERT team (assessing the number of US branch campuses abroad) and Internet2 staff's research on member universities' programmes overseas.

NREN: **Internet2**

Country profile #3: Australia

3. **Australia** is one of the pioneers of TNE and a leading sending country of higher education programmes and vocational education and training programmes. Its main TNE modes of delivery are international branch campuses (known as offshore campuses), twinning arrangements and distance learning programmes. Responsibility for curricular development and quality assurance rests primarily with the Australian universities. Australia's main TNE partner countries are Singapore, China, Malaysia, Vietnam and Hong Kong SAR, and there were approximately 110,000 students enrolled in Australian TNE programmes in 2015. It should be noted that the data collected by the Australian government only includes TNE activity through branch campus and online/distance learning provision. As such the reported numbers are significantly lower than the UK.

Australian universities do undertake other forms such as dual and joint programmes, however, the data are not systematically collected.

NREN: **AARNet**

Country profile #4: France

4. **France** has 31 IBCs abroad, with the most in Morocco, Singapore, UAE, UK, China, Spain, Germany and Tunisia. The host countries for the IBCs are not surprising given France's historical ties to many countries on this list. A 2016 report on TNE delivered by a French government agency called for a "new national strategy to expand its market share of higher education programming abroad." "French institutions currently deliver just over 600 programmes abroad [which] enrol an estimated 37,000 students, including nearly 6,000 in distance learning. Roughly 40% of France's transnational education (TNE) enrolment is in Asia, another 30% in Africa, and 20% in the Middle East. And nearly half of the students enrolled in French

[4] **http://monitor.icef.com/2017/11/record-high-foreign-enrolment-us-commencements-decline-first-time-12-years/**
[5] **http://monitor.icef.com/2016/03/us-and-uk-losing-market-share-to-regional-destinations/**

TNE programmes are found in five countries: China, Lebanon, Morocco, Vietnam, and India[6]." One of the facts hampering expansion of French TNE programmes is that currently the majority are at Master's level and delivered in French. The report suggested that a cohesive, nation-wide strategy, rather than individual schools' efforts at internationalisation, would help increase France's market share in TNE.

NREN: **RENATER**

Country profile #5: Germany

5. **Germany** has four IBCs, one each in China, Egypt, Oman and South Korea. The two largest projects in 2014 were the German University Cairo and the German Jordanian University, with 10,491 and 3,717 students enrolled.

TNE data collected is mainly branch campus data, as the agency collecting the data, the German Academic Exchange Service (DAAD), funds the branch campuses. So, for example, there is no data collection (as of now) on double degrees or other kinds of partnerships. However, DAAD in partnership with the British Council has been advocating for a unified system of collecting TNE data, co-authoring the report mentioned in the introduction to this analysis, and so it seems likely that a more cohesive dataset on German TNE activities will be available in the future.

NREN: **DFN-Verein**

3.2 Receiving countries

Country profile #6: China

1. **China**: China currently hosts a total of 31 International Branch Campuses, the largest of any host country. It has 550,000 students studying for a TNE programme delivered by an overseas provider. There is currently a total of 1,979 TNE programmes in China with 577 out of 2500 total Chinese universities involved in TNE through dual or joint programmes . "China has now edged out the UAE as the top host country, reflecting both a slight decline in IBCs in the Emirates (from 32 campuses at the end of 2010 to 31 by end of 2015) as well as a dramatic increase in IBC operations within China (from 13 in 2010 to 32 today).[7]" Growth is expected to continue in China, with five new campuses currently in development.

NREN: **CERNET** (serving higher education institutions and universities), **CSTNET** (serving the Chinese Academy of Sciences and research institutes)

[6] http://monitor.icef.com/2016/10/french-government-calls-new-strategy-transnational-education/
[7] http://monitor.icef.com/2016/11/china-now-leading-host-international-branch-campuses/

Education Landscape

China has the largest higher education system in the world. According to the People's Republic of China Ministry of Education, the total number of Chinese National Higher Institutions is 2,914, including 2,631 regular higher education institutions and 283 adult higher education schools.

The number of enrolled university students including undergraduate students, master and PhD students is 36 million in 2016.

For detailed information on the quality assurance arrangements in China, please refer to the in-depth country reports found in the UK's **Quality Assurance Agency's Transnational Education review**.

Government policies

The Chinese Government's interest and support for education, particularly higher education, has grown in the recent decades. Investment in education accounted for about 4% of total GDP in China in 2015.

The **National Plan for Medium and Long Term Educational Reforms and Development 2010-20** calls for greater internationalization, including making China a target study destination for international students, offering courses in English and boosting international collaboration through city-links and institutional partnerships.

Increasing internationalisation is one of China's key aims, with individual institutions targets including metrics against TNE programmes, faculty with international experience, students with international experience and overseas students studying at the university, and courses that use English as the medium of instruction.

Government targets:

- Improve the quality and international reputation of education and research;
- Promote different forms of international exchanges and cooperation, especially with well-reputed international education and research institutions;
- Six world class universities and disciplines **by 2020;**
- Achieve global top 15 rankings for some institutions **by 2030;** and
- China's higher education system considered among the world's best **by 2050.**

For information on the regulatory landscape in China for TNE, please refer to **QAA's country report on China** (October 2017).

TNE provision

Overseas providers in China cannot offer their own degree programmes without a Chinese partner. TNE in China generally takes the form of partnerships between Chinese and overseas universities and is termed by the Chinese Ministry of Education as 'Chinese-foreign cooperative education'. No foreign education

There are three basic models of 'Chinese-foreign cooperative education':

- Chinese-foreign joint institutes with an independent legal entity (these have independent degree-awarding powers and are often known as joint universities or branch campuses);
- Chinese-foreign joint institutes without a legal entity; or
- Chinese-foreign joint programmes.

There are currently 1,979 TNE programmes in China with 577 out of 2,631 total Chinese universities involved in TNE. There are 90 joint schools / branch campuses in China. 550,000 students in China are studying for a TNE programme delivered by an overseas provider. All TNE provision can be found on the Chinese Ministry of Education website http://en.moe.gov.cn/ (note this is in Chinese).

Network providers

National Research and Education Network

CERNET, the Chinese NREN is supported by the Chinese Government and directly managed by the Ministry of Education. Its network infrastructure mainly serves the universities, institutes, colleges and schools all over the China. http://www.edu.cn/english/

CERNET has played an important role in developing and deploying China's first IPv6-only backbone network (CERNET2), which connects over 300 academic, industrial, and Government research campuses within China. Any members of CERNET can be provided with access to CERNET2 at the same capacity as their access to CERNET at no additional cost. (CERNET may start to charge for CERNET2 access at a later date.)

China Science and Technology Network (CSTNET) offers Internet services to the Chinese education, research, scientific and technical communities, relevant government departments and hi-tech enterprises, providing services such as network access, host trusteeship, virtual host and domain name registration etc. https://en.wikipedia.org/wiki/CSTNET

Commercial Landscape

The telecommunications industry in China is dominated by three state-run businesses: China Telecom, China Unicom and China Mobile.

According to **Akamai's State of the Internet report 2017** the average peak connection speed in China was 45.9Mbps, making it the third-slowest in the Asia-Pacific region and approximately half as slow as connection speeds in Hong Kong and Singapore.

China Telecom is one of the largest ISPs in the world with 50 millions subscribers. CT used to provide services in the southern part of China, they are now expended their coverage to the north gradually.
China Telecom Global Limited (CTG) is a wholly owned subsidiary of China Telecom Corporation Limited for managing international business. With its headquarters in Hong Kong, CTG has set up branches in 26 countries spanning across Asia, Americas and the Europe, Middle East and Africa (EMEA) region to offer world-class integrated communication services. CTG's comprehensive portfolio of Data, IP, Voice, Internet Data Centre and ICT solutions deliver industry-leading resilience, speed, and diversity to meet the high-level requirements from our customers and partners. Leveraging on the dominant strength in global network of its mother company, CHINA TELECOM, CTG has firmly taken hold of the market opportunities of the booming mobile Internet and the increasing demand for vertical information technology solutions and has positioned itself as "a leader of smart pipes, a provider of the integrated platform and a participant in contents and applications". (http://www.cteurope.net/company-overview/)

China Unicom is the second largest, with just over 40 million subscribers. CU used to provider telecom services in the northern part of China, similar to CT, they have expended their service coverage to the whole China now.

China Unicom offers telecom services not only in the domestically market but also to the telecom operators and enterprises in Europe, Africa and Middle East countries. The services offered include the global connectivity, ICT services, cloud & data centre, as well as voice & mobility.

China Mobile is the third largest telecom service provider in China , providing full communications services across all China regions. China Mobile also provides a wide array of international telecommunications services which includes IDD, roaming, Internet, MNC services and Value Added Business around the world.

Services

Firewalls

China's legislation and projects initiated by the Chinese Government that regulate the internet in Mainland China. This has a number of implications for TNE delivery in China and impacts on student experience. Students may have problems accessing resources from China which are either blocked by the firewall. Facebook and Google services are generally blocked, which includes Googlemail, Google Apps and YouTube. Teaching material may need to be re-designed without hyperlinks to blocked URLs and websites. Large file upload and download may also be affected during busy hours due to file screening at congested international gateways. Some universities provide remote access technologies and proxy servers to allow students to circumvent those restrictions however, there are serious concerns with taking this approach.

eduroam

eduroam in China is operated by CERNET in collaboration with the global eduroam community. CERNET members are encouraged to deply eduroam at their campus and CERNET provide support if it is required.

Access and Identity Management

CARSI (CERNET Authentication and Resource Sharing Infrastructure), is an inter-institutional authentication and authorization service initiated by Peking University and aimed at Chinese universities, colleges, schools and research institutes. CARSI focuses on building an authentication and authorization infrastructure for CERNET educational institutions and users so that web resources developed by universities or deployed on internet can be visited by university faculty and students easily. The corner stone for this cross-domain authentication and authorisation infrastructure is the campus-wide identity management systems which are daily online services in most Chinese universities.

Virtual Private Networks

New regulation introduced by the Chinese Government in 2017 aims at preventing the use of illegal Virtual Private Networks (VPNs) in China. When a VPN does not perform as expected due to poor connectivity, students and staff experience will be affected. Additionally, many students access Virtual Learning Environments between home and overseas sites through the VPN.

Overseas institutions operating in China connecting back to home institutions will typically use a self-configured IPSec VPN. As part of the new regulations, self-configured IPSec VPN may be periodically checked which will result in a drop of VPN connectivity, affecting performance. Furthermore the performance of IPSec VPNs may be affected by congestion at the three international gateways in China (Shanghai, Beijing and Guangzhou). Some institutions may already use the more reliable (and consequently more expensive) provider-offered VPN services such as MPLS and Layer 2 VPNs. Use of these types of VPNs through China Telecom, China Unicom and China Mobile will be exempt from checks and restrictions through the new regulations.

Data Security

China is not part of the **Wassenar Arrangement**. Staff travelling to the country wishing to take an encrypted device should check with their local Consulate or Embassy whether an 'import licence'. Otherwise staff should carry an empty, clean computer or device, and use that to remote-access the required information over the internet.

Information on the data protection regimes in the country can be found at **DLA Piper's Global Data Protection Handbook.**

VoIP

The performance of VoIP services such as Apple's FaceTime, Viber, Skype, Facebook Messenger and WhatsApp have in recent years seen some disruption. However, Wechat, the Chinese social media application is very popular in the Chinese community both in China and overseas.

Virtual Learning Environments (VLEs)

The web access restrictions put in place by the Chinese government may also affect the accessibility of some content hosted on Blackboard. Typically a lot of content on Blackboard will be YouTube videos and, as such, is likely to be blocked. However, there are steps institutions can take to improve performance. There is the option to install a Blackboard proxy server at their joint school or partner institution in China. This would require a member of staff based in China acting as the contact point / support liaison with Blackboard. It should be noted that even with a proxy server hosted in China, Google and YouTube content will still not be available through Blackboard. Alternatively, institutions could choose to host Blackboard in the cloud via Amazon Web Service.

Internet Content Provider (ICP) licenses

ICP licences are issued by the Chinese Government, and one is required for every website hosted in China. If an ICP licence isn't applied for then the Government will block access to the website. ICP licences are only issued to legal entities in China. If you have built a branch campus in China, you are likely to be classified as a legal entity so you can apply ICP license on your own right . However, if you are working in partnership with a Chinese institution this will not be the case and will make hosting a website in China difficult for your institution.

Country profile #7: United Arab Emirates (UAE)

Education Landscape

For detailed information on the quality assurance arrangements in xx, please refer to the in-depth country reports found in the UK's **Quality Assurance Agency's Transnational Education review.**

Government policies

The

TNE provision

Sinc

Network providers

National Research and Education Network

Commerical landscape

Services

eduroam

Access and Identity Management

Virtual Private Networks

Data Security

xx is not part of the **Wassenar Arrangement**. Staff travelling to the country wishing to take an encrypted device should check with their local Consulate or Embassy whether an 'import licence'. Otherwise staff should carry an empty, clean computer or device, and use that to remote-access the required information over the internet.

Information on the data protection regimes in the country can be found at **DLA Piper's Global Data Protection Handbook**

VoIP

Blocked websites

3. **Malaysia** hosts 12 branch campuses, with nearly half of those being campuses of UK institutions, followed closely by Australian ones. The collaborations with the UK and Australia are particularly strong, because of "historical ties in the case of the U.K., and strong trade relations and geographic proximity in the case of Australia.[8]" Malaysia is quickly turning into an international education hub, due in large part to government policies supporting TNE, which were modified in the late 1990's to allow local private institutions to award degrees offered through collaborative or twinning arrangements with foreign universities. "This has resulted in an increasing number of local students with foreign degrees earned either entirely at home or partly at home and partly overseas. Malaysia is the largest market for U.K. TNE provision. Despite the fact that the U.S. is the leading country for international branch campuses, it has barely any presence in the Malaysian market – fewer than 10 U.S. higher education institutions have a transnational degree program in Malaysia[9]". In 2017, the British Quality Assurance Agency for Higher Education (QAA) singled out Malaysia as one of three countries for an in-depth, in-country review (alongside the Republic of Ireland and Hong Kong), "taking into account the strategic importance for UK TNE.[10]" Although recently the Malaysian minister for higher education called for a moratorium on building new campuses in Malaysia[11], this is likely only a temporary measure and will also not impact the development of joint or dual degree programmes.

NREN: **MYREN**

Country profile #8: Malaysia

Education Landscape

Malaysia invests heavily in education. The tertiary sector commends the largest share of the education budget with 20% of total expenditure being spent on education. Executive responsibility for higher education in Malaysia resides with the Ministry of Education.

Provision now includes 20 public higher education institutions, 497 private institutions, 34 polytechnics and 94 community colleges, with 1.2 million students in private and public higher education institutions. The aim is to increase higher education enrolment from 44% to 70% by 2025 – an increase of 2.5 million students.

Five of Malaysia's universities currently rank among Asia's top 100 universities and Universiti Malaya is included in the top 200 globally.

[8] **https://wenr.wes.org/2014/12/malaysia-shifting-mobility-with-branch-campuses**
[9] **https://wenr.wes.org/2014/12/malaysia-shifting-mobility-with-branch-campuses**
[10] **http://www.qaa.ac.uk/newsroom/in-country-reviews-of-uk-transnational-education-(tne)-provision-in-ireland-hong-kong-and-malaysia#.WpWoJSOZPBI**
[11] **https://thepienews.com/news/malaysia-imposes-moratorium-on-new-uni-campuses/**

Malaysia is quickly turning into an international hub with 170,000 international students from 163 countries studying in Malaysia.

For detailed information on the quality assurance arrangements in Malaysia, please refer to the in-depth country reports found in the UK's **Quality Assurance Agency's Transnational Education review**.

Government policies

The Malaysian government's priority is to create a higher education system that ranks among the world's leading education systems and that enables Malaysia to compete in the global economy.

Enhancing access and equity are key objectives of the government's *Malaysia Education Blueprint 2015-2025 (Higher Education).* With the advent of the digital age and the knowledge society, online learning and particularly blended learning have been identified in the blueprint as a way of widening higher education participation.

TNE provision

Malaysia is quickly turning into an international education hub, due in large part to government policies supporting TNE, which were modified in the late 1990's to allow local private institutions to award degrees offered through collaborative or twinning arrangements with foreign universities.

Malaysia has 16,259 students studying at the ten branch campuses it hosts. Nearly half of those are campuses of UK institutions, followed closely by Australian ones. The collaborations with the UK and Australia are particularly strong, because of historical ties in the case of the UK, and strong trade relations and geographic proximity in the case of Australia.

Network providers

National Research and Education Network

MYREN, the Malaysian NREN was launched in March 2005 to provide high-speed, dedicated connectivity to the education sector while expanding research capability in the country. MYREN provides connection to all public universities, polytechnics and community colleges in Malaysia.

Since 2017 MYREN, through its commercial arm MNSB, has been able offer connectivity to international branch campuses operating in the country.

Commercial landscape

Recent advancements in the Malaysian telecomms market, including the introduction of 5G and 4.5G network, had given a strong impetus to digital adoption in the country. There are 21 million internet users in Malaysia – an internet penetration of 68%.

According to **Akamai's State of the Internet report 2017** the average peak connection speed in Malaysia was 64Mbps, making it the third-fastest in the Asia-Pacific region behind Hong Kong and Singapore. This signals a marked improvement from 2017 when the country's internet was one of the slowest and most expensive in the world (behind Sri Lanka and Thailand).

The cost of connectivity is still markedly higher than the UK and other European countries.

The main commercial providers in Malaysia are:

- TIME
- Telekom Malaysia
- Digi
- Maxis

Services

eduroam
eduroam in Malaysia is operated by MYREN in collaboration with the global eduroam community.

Access and Identity Management
The Secure Identity Federation on Unified Lightweight Access maNagement (SIFULAN) Federation is a Malaysian Access Federation consisting of education and research entities (including and not limited to institutions of higher learning, research institutes, schools, and partner organizations) in Malaysia, who are users of academic e-resources, and organizations and companies (including and not limited to publishers, cloud service providers, public service departments, and other partners) who are providers of such e-resources.

Virtual Private Networks
Use of VPN for academic and research purposes is not restricted. Generally, Malaysian Internet Service Providers (ISP) such as Telekom Malaysia, Maxis and Digi do support VPNs as long as the VPNs are operating in accordance with the law.

Data Security
Malaysia is not part of the **Wassenar Arrangement**. Staff travelling to the country wishing to take an encrypted device should check with their local Consulate or Embassy whether an 'import licence'. Otherwise staff should carry an empty, clean computer or device, and use that to remote-access the required information over the internet.

Information on the data protection regimes in the country can be found at **DLA Piper's Global Data Protection Handbook**

VoIP

There are no restrictions on the use of VoIP services such as Apple's FaceTime, Viber, Skype, Facebook Messenger and WhatsApp.

4. **Singapore** currently hosts 11 branch campuses and also is the location for many other TNE collaborations (including dual and joint degree programmes with foreign universities). Singapore has hitherto been a hospitable environment for TNE initiatives, although relatively recent measures have been introduced "to tighten up on the quality, financial viability and information provided by private higher education institutions in Singapore, including foreign branch campuses that offer external degrees from foreign institutions"[12]. These measures include requiring branch campuses to participate in a graduate employment survey, but do not seem to have dampened enthusiasm for continued collaboration with Singapore.

Country profile #9: Singapore

Education Landscape

Singapore is fast becoming one of the most popular destinations for higher education in Asia. Singapore has established itself as the top player in the international education market with its quality education and diversity of courses offered. There were 80,000 international students studying in Singapore 2016/17, with 25,000 Singaporean students studying overseas.

The higher education landscape comprises of:

- Six local universities, including the National University of Singapore and Nanyang Technological University each have more than 30,000 students and both are ranked among the Top 13 in the world by QS World University Rankings and Top 54 globally by THE World University Rankings;
- Two private institutions that provide post-secondary education in the arts - LASALLE College of the Arts and Nanyang Academy of fine arts; and
- Other Government-affiliated educational institutions that offer specific diploma and degree programmes.

For detailed information on the quality assurance arrangements in Singapore, please refer to the in-depth country reports found in the UK's **Quality Assurance Agency's Transnational Education review**.

Government policies

There are a number of core principles to the Singaporean Education system:

- **Meritocracy**: The academic performance is considered as the most important factor for the students' career and the objective of meritocracy is to identify and prepare young bright students for various leadership positions in the country.

[12] http://www.universityworldnews.com/article.php?story=20161021130753781

- **Bilingualism**: Bilingualism, or mother tongue policy, is another important principle of the Singapore education system. English is considered as the first language and is also the medium of instructions in academic institutions. Apart from English, compulsory mother tongue language has to be taken as a subject by a student which can be one of the three official languages: Chinese, Malay or Tamil. The objective of this policy is to promote English as the Global Language and at the same time students can learn about their own cultural values.
- **Financial Assistance**: the Singaporean education policy is framed in a manner to ensure that no child is deprived of fundamental education because of financial background.

The Singaporean Government has highlighted a number of ways to reform the higher education system:

- Experiential learning (through stronger links with industry);
- Promote digital literacy in all subjects;
- Diversify higher education pathways; and
- Encourage lifelong learning.

TNE provision

Singapore currently hosts 11 international branch campuses and is also the location for many other TNE collaborations (including dual and joint degree programmes with overseas universities). Singapore has hitherto been a hospitable environment for TNE initiatives, although relatively recent measures have been introduced 'to tighten up on the quality, financial viability and information provided by private higher education institutions in Singapore, including foreign branch campuses that offer external degrees from foreign institutions'. These measures include requiring branch campuses to participate in a graduate employment survey, but do not seem to have dampened enthusiasm for continued collaboration with Singapore.

Network providers

National Research and Education Network

Singapore Advanced Research and Education Network (SingAREN) is Singapore's NREN. SingAREN serves Singapore's research and education community through facilitating efficient exchanges of local traffic and providing international connectivity through peering arrangements with overseas RENs.

Commercial landscape

Being one of the first country to embrace the installation and application of the internet (though the country officially launched its public internet service in 1994), according to **Akamai's State of the**

Internet report 2017 Singapore once again led the Asia Pacific region and the world with average peak connection speed of 184.5 Mbps. The Asia Pacific region has some of the fastest connectivity in the world, most surveyed countries have average connection speeds well above the global average.

Currently there are four main players in the telecommunications market, namely M1, SingTel, TPG Telecom and StarHub. SingTel and StarHub are full service operators and provide a wide range of telecommunications services. Many other local and foreign telecommunications licensees have entered the market and are adding to a competitive landscape.

Services

eduroam
eduroam in Singapore is operated by SingAREN. The service is free for SingAREN members.

Access and Identity Management
The Singapore Access Federation (SGAF) service is a Federated Identity Management System for Singapore's research and education community. SGAF uses Shibboleth-based authentication and authorisation systems to enable scalable, trusted collaborations among Singapore's R&E community.

Virtual Private Networks
Use of VPN for academic and research purposes is not restricted. Generally, the use of VPNs is still legal in the country. In 2016 the Singaporean government was looking into reviewing VPN technology as part of proposed changes to Copyright Law. No further developments have been made since this time.

Data Security
Singapore is not part of the **Wassenaar Arrangement**. Staff travelling to the country wishing to take an encrypted device should check with their local Consulate or Embassy whether an 'import licence'. Otherwise staff should carry an empty, clean computer or device, and use that to remote-access the required information over the internet.

Information on the data protection regimes in the country can be found at **DLA Piper's Global Data Protection Handbook**

VoIP
There are no restrictions on the use of VoIP services such as Apple's FaceTime, Viber, Skype, Facebook Messenger and WhatsApp. The provision of VoIP services can require telecoms licensing, depending on the specific implementation of the VoIP solution.

Since fall 2017, **Egypt** has made a concerted effort to grow the number of their branch campuses. An MOU signed in January 2018 with the UK highlights the importance of the partnership to the British, and a proposed new law on international branch campuses[13] opens the door to more physical campuses supplementing the already significant number of collaborations (Egypt is the top host country in the MENA region for UK transnational education and the fifth in the world, with nearly 20,000 students studying for UK degrees through joint programmes in 2015-16)[14].

Country profile #10: Qatar

Education Landscape

Egypt

For detailed information on the quality assurance arrangements in Egypt, please refer to the in-depth country reports found in the UK's Quality Assurance Agency's Transnational Education review.

Government policies

The

TNE provision

Sinc

Network providers

National Research and Education Network

Commerical landscape

Services

eduroam

Access and Identity Management

Virtual Private Networks

Data Security

[13] https://www.timeshighereducation.com/news/egypt-seeks-attract-international-branch-campuses

[14] https://thepienews.com/news/uk-egypt-sign-agreement-world-education-forum/

Egypt is not part of the Wassenar Arrangement. Staff travelling to the country wishing to take an encrypted device should check with their local Consulate or Embassy whether an 'import licence'. Otherwise staff should carry an empty, clean computer or device, and use that to remote-access the required information over the internet.

Information on the data protection regimes in the country can be found at DLA Piper's Global Data Protection Handbook

VoIP

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Blocked websites

4. Further resources

Below are links to sector bodies and useful resources to support your TNE delivery:

GÉANT SIG-TNE Wiki site

GÉANT SIG-TNE data report and associated appendices.

GÉANT Connectivity map

British Council: Transnational Education
https://www.britishcouncil.org/education/ihe/knowledge-centre/transnational-education

British Council: The Shape of Global Higher Education: National policies framework for international education
https://www.britishcouncil.org/education/ihe/knowledge-centre/global-landscape/report-shape-global-higher-education

GÉANT
http://www.geant.org/

Higher Education Statistics Agency (HESA)
https://www.hesa.ac.uk/

i-graduate
https://www.i-graduate.org/

NAFSA
https://www.nafsa.org/

Quality Assurance Agency (QAA): International
http://www.qaa.ac.uk/about-us/international

The Observatory on Borderless Higher Education
http://www.obhe.ac.uk/

TNE-Hub
http://www.tnehub.org/

Society of College, National and University Libraries (SCONUL)
http://www.sconul.ac.uk/

Universities and Colleges Information Systems Association (UCISA)
https://www.ucisa.ac.uk/

Universities UK International
http://www.universitiesuk.ac.uk/international

GlobalHigherEd

https://globalhighered.wordpress.com/

CBert report of IBCs

UWN

British Council Global Gauge

Education Resource Information Centre and The Boston College – Centre for International Education's journal **International Higher Education** for scholarly articles may be worthwhile but the rest not so much.

5. Appendices

Appendix 1: TNE delivery models

Common TNE Classification Framework for IPPM	
Two major approaches to TNE provision – independent and collaborative	
Independent TNE provision The foreign sending HEI/provider is primarily responsible for the design, delivery and external quality assurance of their academic programmes and qualifications being offered in another country.	**Collaborative TNE provision** A foreign sending HEI/provider and host country HEI/ provider work together on the design, delivery and/or external quality assurance of the academic programmes.
Six categories of IPPM	
1. Franchise programmes Description: The foreign sending HEI/provider has primary responsibility for the design, delivery and external quality assurance of academic programmes offered in host country. The qualification is awarded by a sending HEI. Face-to-face, distance and blended education can be used. ***Commonly used terms:*** *import/export, validation, foreign, non-local, international private programmes*	**4. Partnership programmes** Description: Academic programmes in host country/ies are jointly designed, delivered and quality assured through collaboration between host and sending country partners. The qualification(s) can be awarded by either or both host and sending country HEIs in the form of single, joint or double/multiple degrees. Face-to-face, distance and blended education can be used. ***Commonly used terms:*** *joint/double/multiple degrees, twinning programmes*
2. International branch campus Description: A satellite bricks and mortar campus established by foreign sending HEI in host country. Sending parent institution provides curriculum, external quality assurance, and awards the qualification. Face-to-face, distance and blended education can be used. ***Commonly used terms:*** *satellite, private international, offshore campus, portal campus*	**5. Joint university** Description: An HEI co-founded and established in host country involving both local and foreign sending HEI/ providers who collaborate on academic programme development and delivery. Qualifications can be awarded by either or both host and sending country HEIs. Face-to-face, distance and blended education can be used. ***Commonly used terms:*** *co-developed, bi-national, co-founded, multinational, joint ventures universities*
3. Self-study distance education Description: Foreign sending distance education provider offers academic programmes directly to host country students. No local academic support available. Qualification, curriculum and external quality assurance offered by foreign sending HEI. ***Commonly used terms:*** *fully online education, open university, MOOCs, pure distance education*	**6. Distance education with local academic partner** Description: A foreign distance education HEI/provider offers programmes to host country students in collaboration with a local academic partner. Curriculum can be jointly developed and the qualification awarded by foreign HEI or by both partners. External quality assurance provided by foreign sending HEI/provider or both partners. ***Commonly used terms:*** *online or distance education with reference to local academic partner*

Appendix 2: Contacts

Wikipedia contacts – NRENs may want to update their information regularly – EJB?

General contacts:

NREN contacts:

Top 15 receiving countries from data report
China: **CERNET**
UAE: **Ankabut**
Malaysia: **MYREN**
Singapore: **singAREN**
Qatar: **QNREN**
South Korea: **KREONET**
Hong Kong: **HARNET**
Mauritius: In development
Vietnam: **VINAREN**
Egypt: **EUN**
Morocco: **MARWAN**
Botswana: Unknown
Oman: **OMREN**
Sri Lanka: **LEARN**
India: **NKN**

Top 15 sending countries
UK: **Jisc**
USA: **Internet2**
Australia: **AARNET** (Also **AAF** is the Australian Access (identity) Federation)
France: **RENATER**
Germany: **DFN**
Netherlands: **SURF**
Russia: **RUNNET**
China: **CERNET**
Canada: **CANARIE**
India: **NKN**
Ireland: HEAnet
Malaysia: **MYREN**
Switzerland: **SWITCH**
Belgium: **BELNET**
Italy: **GARR**

Appendix 3: Checklist for institutions planning TNE activity

Checklist for institutions plannin

Appendix 4: TNE Registration Form for NRENs to capture information from institutions as they begin TNE activity

NREN generic TNE-REG-Form.docx

Appendix 5: NREN Survey

TNE NREN survey
V13 Final.docx

6. References