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Deliverable DN7.0.4,4: CD-ROM or Website Presentation of the TERENA Networking Conference 2008 (TNC 2008) Papers and Presentations



Deliverable DN7.0.4,4

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Authors: Gyöngyi Horvá (TERENA)

Abstract

This deliverable makes the presentations of the TERENA Networking Conference 2008 available, including, but not limited to, any presentations and papers at the GN2 workshop and exhibition/demonstration.

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0 Executive Summary

The GN2 project organises an annual event in conjunction with the TERENA Networking Conference. These conferences serve as a focus for the exchange of information between research and education networking organisations in Europe and in the world-wide research networking community, making them, and the Internet community at large, aware of relevant developments. The TERENA Networking Conferences are prominent annual events, offering an opportunity to present and discuss technical and strategic aspects of the provision of networks and services to the research and education community, and the corresponding research and development activities. They bring together leading people from the research and education networking community in Europe and world-wide, and provide a unique opportunity to learn about the latest developments and plans. The TERENA Networking Conferences are one of the major events at which the GN2 project is demonstrated. In particular, every year there is a specific GN2 workshop as part of the overall programme of the conference, and the GN2 project also presents itself in the exhibition/demonstration area of the conference.

The TERENA Networking Conference 2008 took place in Bruges (Brugge), Belgium on 19-22 May 2008. This Deliverable makes the presentations and papers from that conference available, including, but not limited to, any papers and presentations at the GN2 workshop and exhibition/demonstration. The papers and presentations from the entire conference are available at the conference website (<http://tnc2008.terena.org/schedule.php>), which also includes the complete programme, slide presentations, speaker information, the video archive of the live stream and a photo gallery. The same information, specifically about the GN2 workshop at the conference, is also available on a CD-ROM. A copy of that CD-ROM is attached to printed copies of this report.

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1 TERENA Networking Conference 2008 (TNC 2008) and website

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In earlier years, connectivity was the main concern of national research networking organisations but we have gone much further since then: fast, pervasive, mobile, safe and dependable connectivity has become commonplace. Hence the chosen theme of this year's TERENA Networking Conference was "Beyond Connectivity".

The TERENA Networking Conference 2008 attracted more than 520 participants. The event was hosted by the Belgian national research and education networking organisation BELNET and took place at Site Oud Sint-Jan conference centre in Bruges, Belgium. The conference programme was composed of four parallel tracks of presentations by invited speakers, complemented by presentations of selected papers. Each day, there was a plenary session in which prominent experts delivered keynote presentations introducing topics that were discussed further in parallel sessions.

Events, workshops and meetings planned in conjunction with the conference started as early as Saturday May 17th, with the annual meeting of the CCIRN (Co-ordinating Committee for Intercontinental Research Networking). The TERENA task forces TF-PR and TF-MSP held a joint meeting on Sunday, as did TF-ECS, alongside an International Federation Peering workshop, a FEDERICA - PHOSPHORUS tutorial and workshop,

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and a meeting of the TERENA Compendium Review Panel. The pre-conference meetings were well attended, with over 200 participants.

First day of the conference

There was a musical start to the opening plenary presentation at the conference, in joking reference to the headset microphone worn by Professor Paul Van Binst (Free University of Brussels, ULB) as he took to the stage. This set the scene for an amusing and personal talk that encompassed some of the history of research and education networking, as well as some consideration of present and future trends. With a series of entertaining examples to make the point, Professor Van Binst observed that users of present-day technologies and services of all kinds are generally willing to accept poor quality if the final functionality is something they like: sms messaging can require pressing three times on button 'a' in order to get letter 'c', for example, and we are happy to watch poor-definition video footage online even though a large, high-quality TV set may be in the next room. Behind the humour were some serious questions about the future of research networks. Do they need to develop more functionality? Should they think about a new business plan? Should they remain separate from other (public) services? If they do, will they die, be superseded by the more rapidly developing commercial sector, or continue alongside as a niche market?

Professor Van Binst's presentation raised more questions than it answered, but he nevertheless succeeded in holding a mirror up to the research networking world and inviting it to consider where it is going.

Four parallel sessions were running during the afternoon of the first day of the conference. A session on 'The general picture of identity management' featured talks on a wide range of topics, including some aspects of IT law. Each country has its own methods in dealing with electronic identity and there is currently no reliable way to compare different authentication systems, nor any list of standards that should be met. IT lawyer Hans Graux argued that countries should liaise with each other to guarantee privacy and to exchange information about citizens wishing to have a presence in another country, rather than e.g., a lawyer having to register separately to practice in other countries. During the same session, the song 'Hotel California' was quoted in connection with social networking sites such as Facebook and Myspace. In the hotel, "you can check out any time but you can never leave", while with these sites you can disable your account but the information can never be deleted. These sites charge nothing but somehow make lots of money, said Giles Hogben (ENISA). To offer an alternative, he suggested that non-commercial companies could create a similar site run on open protocols, offering the same service but allowing users to know what is inside. Finally, Ken Klingenstein (Internet2) explained how the COmanage tool gives users a single entry point through which they can access all the activities they are involved in. This will be particularly helpful for people involved in multiple projects or working in distributed environments such as Grids or short-term research activities.

During the session called 'What is Behind – Experimenting With The Network', three experimental infrastructures for trialling new networking technologies were discussed. The MANTICORE project has finished but leaves some questions unanswered, which may be taken up by the new EU-funded project FEDERICA. This project was launched in January 2008 and was introduced to the TERENA Networking Conferences here for the first time. In parallel with FEDERICA is a US project, VINI, which is the first implementation of the GENI initiative that is supported by the National Science Foundation. FEDERICA and VINI have similar principles and the project leaders explored how they could establish closer working ties.

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Second day of the conference

The British science fiction writer Douglas Adams came up with 'Four Ages of Sand' in the history of tools with which to do scientific research, with sand forming the basic material for glass lenses, transistors and now optical fibres. A fifth 'Age' was postulated on the second day of the conference by Josh Howlett of JANET(UK) during his plenary presentation. The 'Age of the Looking Glass' refers to another fictional classic, in which a mirror gives a girl access to a world unconstrained by the physical laws of the real world. This is the age we are in now, he said, with a growing number of people realising their "own little universes" in which to work and collaborate, thanks to network technology, services and applications. The problem, Josh Howlett presented, is that people need to maintain their identity in these different universes in order to move around the network in ways that are not obvious, but the current 'identity messy-system' limits this ability. The key question he addressed is how to establish trust in people's identities. Drawing metaphors about Galapagos island finches and Devonian shale rock in America, Josh Howlett showed that today's identity protocols are so numerous and specific to certain layers of the network that there is no connection between them. This places an increased burden on users and network administrators alike and means information cannot flow between the layers, potentially resulting in security problems.

Like builders installing foundations to bind different strata of rock and prevent slippage, networkers need to 'dig down in the stack' and tap into layers of identity information in order to build a stronger system of trust. "A little policy can go a long way", he suggested, and is in general a better approach than seeking technical solutions. The quest for "fewer and smarter" protocols and policies has begun, he concluded, and he invited participants to join in discussions on these issues during a 'Birds of a Feather' session in the evening.

Moving the topic from who can be connected to what can be connected, Steve Hanna of Juniper Networks explained Network Access Control (NAC) and related technologies in the second plenary presentation of the day. He discussed approaches to controlling which devices can be connected, under what circumstances, and to fixing "unhealthy" machines. These have converged into one architecture and set of standards, Trusted Network Connect (TNC). All architecture and specifications have been released and are available on the Trusted Computer Group website. Meanwhile, rapid development and compliance testing continue, he said. "I really worry about our networks", Steve Hanna continued, considering the question, "Where next beyond NAC?". Distrust of the Internet and connected devices is well founded, he said, with around 50% of PCs infected or controlled by botnets. "We would like to have automated responses to perceived attacks so that we can quarantine the system." He presented IF-MAP, a new standard, published three weeks earlier, which should achieve stronger linkage of security systems.

Later that morning, a consistent message emerged from a session about malicious traffic: the bad news is that there is a lot of it around – the good news is that a significant amount of it can be dealt with using existing tools such as filtering, IPSec and analysis of flows. Evidence for this came from a three-months' study of 28 billion packets on the Swedish national research network, which found that 50 million were obviously 'wrong', with incomplete fragments, bad source and/or destination addresses, and other things that were fairly easy to spot.

A concurrent session on medical applications included a presentation about an initiative to improve connectivity between the UK's National Health Service network N3, and the research and education network, JANET. For security reasons these sectors traditionally use separate networks, but this leads to a 'two PC' syndrome for medical personnel and researchers working in both sectors. The aim is to better integrate these sectors through

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improved authorisation and authentication mechanisms. The distribution of medical images featured in two presentations in the same session. Such images tend to be large and there are often security issues with sending them electronically, but indexing and off-site backup improve the service. MEDICUS is a system built using the Globus toolkit to distribute and store DICOM images (the standard medical imaging format) across decentralised servers. More medical images could be seen during the lunch break, with a live demonstration of high-definition video conferencing between locations in Belgium, Japan, Singapore and Italy. Surgeon Dr Shuji Shimizu of Kyushu University Hospital in Fukuoka, Japan has regularly conducted such demonstrations at APAN meetings in recent years, and last year established collaboration with the Italian national research networking organisation, GARR, but this was the first time that he and colleagues had given the demonstration specifically to a European audience of networkers.

During the afternoon two sessions on honeypots took place. These included an overview of RFID (Radio Frequency Identity) technology, its historical context, and the security issues that the current technology presents. There was also a presentation on the Leurré.com distributed honeypot system that aimed to improve understanding of cyber-attacks and to help reduce their number. Intrusion detection systems and the use of signature profiles for detecting specific types of attacks were also discussed.

Third day of the conference

Is computing going to be the next utility, available to everyone like electricity or gas? Is education becoming a consumer commodity? What would such developments mean for research networks? Reflections upon the future of research and education networking continued during the third day of the conference, with complementary plenary talks by Tim Robinson of Net North West (UK) and Richard Katz of Educause (USA). Both considered social, demographic, political and economic factors that could have an impact on education and, indirectly, research networking. Their audience included participants in Malawi, China, Spain, Italy, Indonesia and the Czech Republic, who were linked by live-stream videoconferencing via satellite, as part of the GLOBAL project's Virtual Conference Centre initiative.

Tim Robinson focused on the ever-increasing pace of technological change and asked whether the research networking community is ready for the rapid changes in governance that will accompany it. He explored the growing consumerism of information technologies and our ability to pay for information. So far we have seen no significant cost efficiencies in education as a result of the implementation of technologies, he said. And although the 'Internet boom generation' is now entering university equipped with powerful laptops and a range of technology skills, there is still a low level of information technology 'literacy' and, most importantly, critical thinking skills. These deficiencies also concerned Richard Katz. He expressed dismay at the "American Idolisation of everything": the 'democratising' power of networks to open access to education and government, for example, is also shifting the balance of power more generally, so that ideas and information are accepted "by popular vote" rather than for their truthfulness. At the same time, the business of education is becoming ever more commercialised and students seem fewer and more disengaged from their education than ever before. The challenge both speakers presented was for research networkers to lift their gaze from the networks and see to that the world has changed. "Are we building tomorrow's networks for yesterday's world, or yesterday's university?" Richard Katz asked. "How do we avoid doing that?" One suggestion he made after the plenary talks were over was to begin integrating more people from different disciplines, ethnic groups and cultures into the discussion. As the live-streaming in this session showed, the networks themselves can be part of the solution.

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A morning session on multi-domain lightpaths featured a presentation about the roll-out of SURFnet6, a hybrid network based on dark fibre. The Dutch national research networking organisation SURFnet has also established the NetherLight open optical exchange point, which provides lightpath connections to Barcelona, Chicago, New York, Prague, Russia, Stockholm and CERN, and from there to other regions. SURFnet is now working on dynamic lightpath provisioning through DRAC (Dynamic Resource Allocation Controller - developed by Nortel and SURFnet), using eDCO (electronic Dynamically Compensating Optics) and eROADM (electronic Reconfigurable Optical Add/Drop Multiplexer) technology.

This theme continued with a presentation of NDL (Network Description Language) and the TL1 Toolkit, which are being developed to facilitate dynamic lightpath set-up and monitoring. Examples were given of real applications where they are used, including the Large Hadron Collider and e-VLBI (Very Long Baseline Interferometry) radio astronomy.

Roaming figured prominently in the day's sessions. There was much interest in a complex infrastructure that can integrate several technologies to improve administrative processes and offer value-added ICT services to students. The University of Messina (Italy) has collaborated with the Bank of Sicily to provide 38,000 students with smartcards that can be used as a student identity card, refectory pass and credit card, among other things. In a later session, participants heard how a comment at last year's TERENA Networking Conference led to an unexpected development. During TNC 2007, the view was expressed that improvements to the RADIUS protocol would benefit eduroam by providing more security, but this probably would not gain much support from the IETF. On the contrary, Stefan Winter of RESTENA, the national research networking organisation of Luxembourg, reported that he followed up on this and the IETF has agreed to support the development of RadSec, which will enhance the RADIUS protocol. A successful project to rapidly deploy eduroam was showcased during the same session. The e-University project was started in 2003 by FCCN, the Portuguese national research networking organisation, supported by government. Since then, 92% of the Portuguese academic community has become eduroam-enabled. By the end of 2008, that figure should reach 100%. Evidence shows that almost 310,000 students are now not only enabled, but are actually using eduroam at a growing rate.

Closing day of the conference

To the jangling chords of the soundtrack from 'The Good, the Bad and the Ugly', participants filled the auditorium of a session by the same name, during the final morning of the conference. The showdown they had come to witness was a panel discussion about the "successes and shortcomings" of the GN2 project and the GÉANT2 network. In a series of short but thought-provoking presentations, the panellists fired off their thoughts on a range of relevant areas before audience members joined the fray, moderated by IT consultant Robin Arak. Although there were no casualties, many comments hit their mark. Topics with the most impact were those relating to the management and marketing of research and education networks and services. Our approach is still driven by the idea of providing technology to technologists, whereas nowadays everyone has technology and the challenge is to provide services, said Dai Davies of DANTE. National research and education networking organisations (NRENs) "have to offer what people want, not necessarily the technology that is best". In similar vein an audience member drew a comparison with the BBC, which began by making cameras and other equipment as well as actually broadcasting programmes. Once other companies could make the equipment more cheaply, the BBC had to focus on its information services, which now encompass far more than just broadcasting. NRENs are in a similar position, he said.

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In order to know what users want, NRENs should do some serious market research, several participants recommended. Marketing and communications tasks are still not taken seriously enough in the research networking world however, and are often allocated to technical staff as a part-time activity. At the same time, technical experts still dominate in other key roles and non-technical people remain generally uninvolved in the NRENs or in using their services. Furthermore, decision making is a slow process in the NREN world, several people commented. Swift change is needed to be able to achieve swifter management.

At the same time, a number of other sessions took place, including 'A word from TERENA's industrial members'. This featured presentations by Yves Poppe of Tata Communications, Jean-Marc Uzé of Juniper Networks, Jan Hof of Extreme Networks, and Gerard Jacobs of Nortel.

A live demonstration that followed these sessions achieved a 'first' in radio astronomy. Members of the EXPReS project (Express Production Real-time e-VLBI Service) linked telescopes in Africa, Europe, North America and South America to a central data correlator in the Netherlands, simulating a telescope almost 11,000 kilometres in diameter. Telescopes in Chile, Germany, Italy, the Netherlands, Puerto Rico, South Africa and Sweden simultaneously streamed data to JIVE, the Joint Institute for VLBI in Europe, at a rate of 1.44 Gb/s. There, the data was correlated in real-time, and results were transmitted to the TNC demonstration in Belgium.

This was the first time that the team had carried out a live connection between four continents and detected signals that radio astronomers can work with. The telescopes in Chile and South Africa were connected to this network only within the last month before the conference, marking another ground-breaking achievement for the team - literally as well as figuratively - as long trenches had to be dug through difficult terrain.

Huib Jan van Langevelde of JIVE explained the details and the challenges involved during the closing plenary session of the conference. He said that such developments in connectivity have put Europe far ahead of other world regions in this field of research and that close collaboration with national research networking organisations and GÉANT must be continued.

These developments are extremely important for science, he added. Among other benefits, it means increased sensitivity and reduced response times of the e-VLBI system. There can now be immediate feedback, for example, allowing problems with the telescopes to be spotted within minutes rather than months. And it also significantly reduces the time to publication of results.

At the start of his talk, Huib Jan van Langevelde had observed that 2008 marks 400 years since the advent of modern astronomy, which began when Dutch spectacle maker Hans Lippershey applied for a patent for 'a certain instrument for seeing far'. Occurring just a few months short of that anniversary, and taking place in Bruges - only a relatively short distance from the town of Middelburg where Sacharias Jansen, Lippershey's neighbour and probably the true inventor of the telescope, worked - the EXPReS project demonstration could not have been much better placed or timed. Its success certainly ensured a bright end to this year's TERENA Networking Conference.

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2 GN2 sessions at TNC 2008

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In consultation with the European Commission services it was decided that, like in previous years, the GN2 workshop at the TERENA Networking Conference 2008 would not take the form of separate sessions; instead, the GN2 presentations were included in the appropriate topic-oriented parallel sessions throughout the conference programme and one whole session was dedicated to GÉANT2.

The list of presentations was as follows:

1. The Good, the Bad and the Ugly": GÉANT2 Exposed

GN2 organised an open 'round table' session offering thought-provoking and entertaining discussion about the successes and shortcomings of GÉANT2. The panellists discussed whether GÉANT2 has managed to deliver the pan-European, multi-domain networking services it intended.

2. Simple, but Secure! – simpleSAMLphp

Andreas Åkre Solberg, UNINETT (Norway)

3. A Network Security Service for GÉANT2

Maurizio Molina, DANTE

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4. eduGAIN in real life
Ajay Daryanani, RedIRIS (Spain)
5. A client middleware for token-based unified Single Sign On to eduGAIN
Sascha Neinert, University of Stuttgart (Germany)
6. Brazil's Telehealth initiative - using networks to improve medical and health education, diagnosis and treatment
Luiz Messina, Rede Nacional de Ensino e Pesquisa (Brazil)
7. Interdomain SLAs enforcement in real QoS-enabled networks
Vassiliki Pouli, NETMODE/NTUA (Greece)
8. NRENs on the AutoBAHN: case studies and requirements
Afrodite Sevasti, GRNET (Greece)
9. Global on-demand light paths – developing a global control plane
Radosław Krzywania, Poznan Supercomputing and Networking Center (Poland)
10. RadSec - enhanced security, reliability and flexibility for the RADIUS protocol
Stefan Winter, Fondation RESTENA (Luxembourg)
11. Are we REDI? Research and education development index
Jorge-A. Sanchez-P., JNP Co. (Greece)
12. The problem of overlapping eduroam networks operated by different organisations
Jan Furman, CESNET (Czech Republic)
13. educonf – coordinated support of European videoconferencing (GN2 SA6)
Dimitris Daskopoulos, GRNET (Greece)
14. mcview: A tool for visualising and de-bugging multicast
Stig Venås, UNINETT (Norway)

15. E2Emon – a perfSONAR-based monitoring system for multi-domain, point-to-point managed bandwidth services

Michael Enrico, DANTE

16. AAIEye - A monitoring tool for AAI's

Mika Suvanto, CSC (Finland)

17. Operations of multi-domain services

Marian Garcia Vidondo, DANTE

18. The PERT – evolution from a centralised to a federated organisation

Toby Rodwell, DANTE

The following information is provided on the CD-ROM:

- GÉANT2 presentations. Abstracts of the presentations, final papers (optional), slide presentations, and links to profiles of the speakers for the GN2 presentations.
- Conference programme. The GN2 presentations were tagged with a GÉANT2 logo in the printed conference programme.
- Conference schedule. The GN2 presentations were also indicated by a GÉANT2 logo in the pocket-sized folding schedule.
- Conference website. In the conference programme on the TERENA website, the GN2 presentations were indicated by a GÉANT2 logo before the presentation title and also included a GÉANT2 logo on the individual presentation pages.
- TNC 2008 Programme Committee. Melanie Pankhurst and later Dale Robertson from DANTE were members of the conference TNC 2008 Programme Committee with special responsibility for the GN2 presentations in the programme. Melanie Pankhurst took an active role in the planning of the programme, inviting speakers and reviewing papers up until the end of March, and both have participated in the conference events as well as chairing sessions.

Published papers. Selected papers from the conference will be published in the autumn of 2008 in a special edition of the Emerald Publishing Group Journal 'Campus-wide Information Systems'.

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3 Conclusions

The TERENA Networking Conference 2008 was a very successful event. The same holds for the "distributed" GN2 workshop at the conference. The GN2 presentations and the project's presence in the exhibition area have succeeded in achieving the objective of spreading information about the project and its various activities, and of raising interest with target communities.

4 Acronyms

AAI	Authentication and Authorisation Infrastructure
APAN	Asia-Pacific Advanced Network
APN	Articulated Private Network
AutoBAHN	Automated Bandwidth Allocation across Heterogeneous Networks
BBC	British Broadcasting Corporation
CCIRN	Co-ordinating Committee for Intercontinental Research Networking
CERN	European Laboratory for Particle Physics
DANTE	Delivery of Advanced Network technology to Europe
DICOM	Digital Imaging and Communication in Medicine
DRAC	Dynamic Resource Allocation Controller
eDCO	Electronic Dynamically Compensating Optics
eduGAIN	Education GÉANT Authorisation Infrastructure
eduroam®	Education Roaming ¹
ENISA	European Network and Information Security Agency
eROADM	Electronic Reconfigurable Optical Add/Drop Multiplexer
EU	European Union
EXPRoS	Express Production Real-time e-VLBI Service
FEDERICA	Federated E-infrastructure Dedicated to European Researchers Innovating in Computing Network Architectures
GÉANT	Gigabit European Academic Network Technology
GENI	Global Environment for Network Innovations
GLOBAL	Global Linkage over Broadband Links
GN2	Multi-Gigabit European Academic Network
ICT	Information and Communication Technologies
IETF	Internet Engineering Task Force
IF-MAP	Interface for Metadata Access Point
IP	Internet Protocol
IPSec	IP Security
IT	Information Technology
JIVE	Joint Institute for VLBI in Europe
MANTICORE	Making APN Network Topologies on Internet Cores

¹ eduroam® is a registered trademark of TERENA

MEDICUS	Medical Imaging and Computing for Unified Information Sharing
NAC	Network Access Control
NDL	Network Description Language
NREN	National Research and Education Networking organisation
PC	Personal Computer
perfSONAR	Performance focused Service Oriented Network Monitoring Architecture
PERT	Performance Enhancement and Response Team
PHOSPHORUS	Lambda User Controlled Infrastructure for European Research
RADIUS	Remote Authentication Dial-in User Service
RadSec	RADIUS Security
RFID	Radio Frequency Identity
QoS	Quality of Service
SAML	Security Assertion Markup Language
SLA	Service Level Agreement
TERENA	Trans-European Research and Education Networking Association
TF-ECS	Task Force on Enhanced Communication Services
TF-MSP	Task Force on Management of Service Portfolios
TF-PR	Task Force on Public Relations and Information Dissemination
TL1	Transaction Language 1
TNC	TERENA Networking Conference
TNC	Trusted Network Connect
TV	Television
UK	United Kingdom
ULB	Université Libre de Bruxelles
US	United States
USA	United States of America
VINI	Virtual Network Infrastructure
VLBI	Very Long Baseline Interferometry

Appendix A **CD-ROM “GÉANT Workshop at TNC 2008”**

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