

IHE Learning Lab - Integrating the Healthcare Enterprise Info Sheet



IHE Learning Lab: Inside the HIMSS Interoperability Showcase
North Building, Hall B, Booth 7946

Learning Lab Presentation Schedule

Time	Session	Organization
Tuesday, April 18th		
11:00 - 11:15 AM	The Bill Majurski Interoperability Research Advancement Program Award (IRAP) and Connectathon23	ImageTrend
1:30 - 1:45 PM	Art of the Possible - eConsent	Project Unify & Interoperability Institute
4:00 - 4:15 PM	Update on the ONC Cooperative Agreement with IHE USA	IHE USA
Wednesday, April 19th		
11:00 - 11:15 AM	IHE-NEMESIS Emergency Medical Services eOutcomes Taskforce	NEMESIS
1:30 - 1:45 PM	Open Source Tooling to Support International Patient Summary and Emergency Medical Services	Interoperability Institute & SmileCDR
4:00 - 4:15 PM	IHE Connectathon & Supportive Partners	IHE USA
Thursday, April 20th		
11:00 - 11:15 AM	Updates from IHE International Domain Committees	IHE Patient Care Coordination, Quality, Research & Public Health, and Devices Domains
1:30 - 1:45 PM	Granular Privacy Protection and Equitable Interoperability	SHIFT Interoperability

IHE International

Integrating the Healthcare Enterprise (IHE) is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical needs in support of optimal patient care. Systems developed in accordance with IHE

communicate with one another better, are easier to implement, and enable care providers to use information more effectively. Physicians, medical specialists, nurses, administrators and other care providers envision a day when vital information can be passed seamlessly from system to system within and across departments and made readily available at the point of care. IHE is designed to make their vision a reality by improving the state of systems integration and removing barriers to optimal patient care.

Optimal patient care requires efficient access to all relevant information. Despite the advanced state of technology, however, healthcare enterprises have not yet begun to realize the full potential of computer systems to reduce medical errors, improve the efficiency of care providers and enhance the overall quality of clinical care. To do so requires a framework for information sharing that meets the needs of care providers as well as patients—and gains acceptance among the companies that build the systems they rely on.

Standards provide the basis for such a framework, but alone do not solve the problem. In any standard there are gaps, options, room for conflicting interpretations. No standard maps perfectly to the complex and ever-changing information domain of a healthcare enterprise. Filling the gap between standards and systems integration has, until now, required expensive, site-specific interface development. To close that gap a process for building a detailed framework for the implementation of standards is needed. IHE provides that process. Learn more here: https://www.ihe.net/about_ihe/faq/

IHE is sponsored by associations of healthcare professionals around the world and has welcomed participation by many of the leading manufacturers of imaging and information systems. Volunteer members of these associations, including clinicians and other care providers, healthcare executives and information technology experts, play a key role in guiding the development of IHE and determining priorities for integration. They collaborate with vendor representatives to identify obstacles to integration and optimal care and remove them by developing and implementing standards-based solutions for information sharing.

IHE International, the organization overseeing the development and publication of IHE Technical Frameworks worldwide, is sponsored by the **Healthcare Information and Management Systems Society** (HIMSS) and the **Radiological Society of North America** (RSNA).

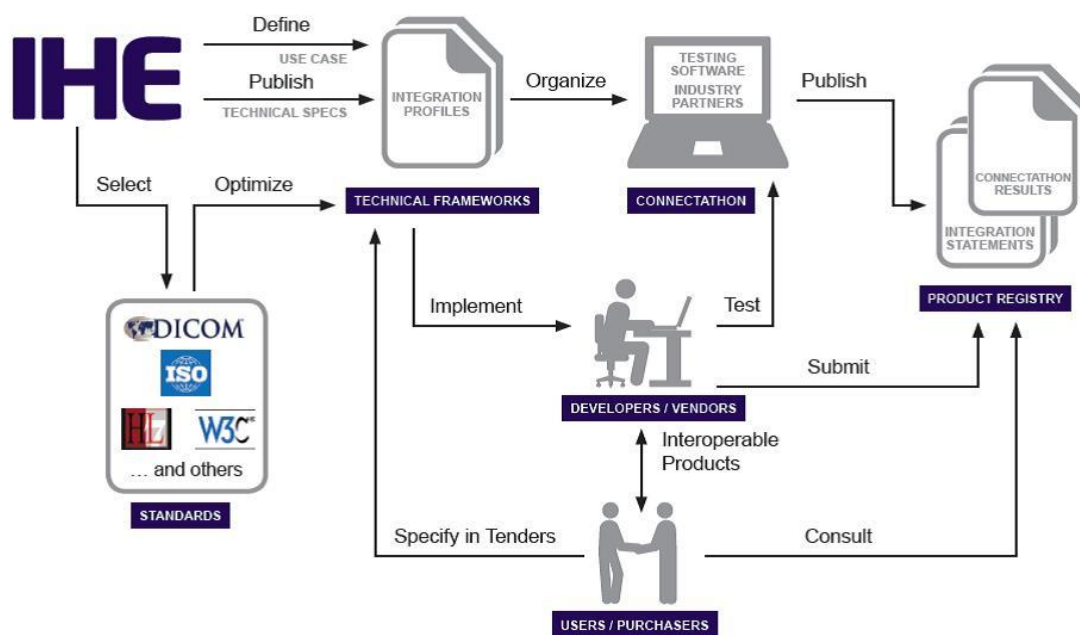
Vision: Enable seamless and secure access to health information that is usable whenever and wherever needed.

Mission: IHE enables health systems and care delivery networks to adopt interoperable digital workflows that support evidence- and value-based health services. IHE develops workflow-based interoperability specifications and provides testing and validation capabilities that support the governance of health IT ecosystems as the foundation for health systems, care delivery networks and industry to improve health outcomes.

The IHE Process

IHE brings together users and developers of healthcare information technology (HIT) in an annually recurring four-step process:

1. Clinical and technical experts define critical use cases for information sharing.
2. Technical experts create detailed specifications for communication among systems to address these use cases, selecting and optimizing established standards.
3. Industry implements these specifications called IHE Profiles in HIT systems.
4. IHE tests vendors' systems at carefully planned and supervised events called Connectathons.



IHE also organizes demonstrations of IHE-compliant systems working in real-world clinical scenarios at medical meetings and other venues.

IHE committees follow the four-step annual process to address interoperability in a variety of clinical domains:

- Cardiology
- Dental
- Devices
- Endoscopy
- Eye Care

- IT Infrastructure
- Pathology and Laboratory Medicine
- Patient Care Coordination
- Pharmacy
- Quality, Research and Public Health
- Radiation Oncology
- Radiology
- Surgery

IHE invites clinical and technical domain experts to become leaders in this work by participating in IHE domain committees or reviewing the documents they publish for public comment. Learn more here: https://www.ihe.net/about_ihe/IHE_Domains/

More than 200 [member organizations](#) – professional societies, government agencies, provider organizations, HIT companies and others – have joined the IHE initiative worldwide. Find out how to become a member organization: https://www.ihe.net/about_ihe/Join_IHE/

Integration Profiles: A Framework for Interoperability

IHE Profiles provide a standards-based framework for sharing information within care sites and across networks. They address critical interoperability issues related to information access for care providers and patients, clinical workflow, security, administration and information infrastructure. Each profile defines the actors, transactions and information content required to address the clinical use case by referencing appropriate standards.

See capsule descriptions of [current IHE profiles in each domain](#). IHE Profiles are compiled into IHE Technical Frameworks-detailed technical documents that serve as implementation guides and [Technical Frameworks](#) freely available online.

Product Registry and User Handbooks: Advice for Purchasers and Implementers

The [IHE Product Registry](#) provides essential information for IT administrators and executives responsible for purchasing and integrating systems at healthcare sites and health information exchanges. Detailed results of testing at IHE Connectathons over the past several years in Europe, North America and Asia are made available in this easy-to-use online database. These results are cross-linked to IHE Integration Statements- conformance commitments of the IHE capabilities of commercial products-from dozens of vendors worldwide.

IHE also provides domain-specific guidance for purchasers and implementers of HIT systems in the form of [IHE handbooks and white papers](#).

Supporting Health Information Networks Worldwide

Carefully implemented interoperability standards are the foundation of EHRs, PHRs (personal health records) and health information exchanges being established around the world. IHE has developed a foundational set of profiles for secure exchange of patient information across enterprises. IHE profiles support health information networks in Canada and the U.S.A, as well as several Asian and European countries, and have been accepted as requirements by the U.S. Secretary of Health and Human Services for federal procurement of healthcare IT systems.

More info here: <https://www.ihe.net/>

HIMSS and RSNA Sponsored Domain Committees

IHE International, the organization overseeing the development and publication of IHE Technical Frameworks worldwide, is sponsored by the **Healthcare Information and Management Systems Society (HIMSS)** and the **Radiological Society of North America (RSNA)**. These organizations also sponsor specific Domain Committees involved with the IHE Process.

IHE is organized by clinical and operational domains. In each domain users with clinical and operational experience identify integration and information sharing priorities and vendors of relevant information systems develop consensus, standards-based solutions to address them.

Each domain includes a technical committee, whose primary task is developing and documenting the solutions (known as profiles), and a planning committee, whose primary tasks are long-term scope planning and organizing deployment activities (such as testing events and educational programs). Each domain develops and maintains its own set of **Technical Framework** documents. Coordination among domains is the responsibility of the Domain Coordination Committee, comprising representatives from each of the domain planning and technical committees.

IT Infrastructure (ITI) - HIMSS

The IHE IT Infrastructure (ITI) domain, established in 2003, addresses the implementation of standards-based interoperability solutions to improve information sharing, workflow and patient care.

Patient Care Coordination (PCC) - HIMSS

The Patient Care Coordination (PCC) domain was established in 2005 to deal with integration issues that cross providers, patient problems or time. It deals with general clinical care aspects such as document exchange, order processing, and coordination with other specialty domains. PCC also addresses workflows that are common to multiple specialty areas and the integration needs of specialty areas that do not have a separate domain within IHE.

Devices (DEV) - HIMSS

The IHE Devices (DEV) domain was formed in 2005 (under the name Patient Care Device) to address the integration of medical devices into the healthcare enterprise, from the point-of-care to the EHR, potentially resulting in significant improvements in patient safety and quality of care. In 2006/2007 the first profile was successfully developed, tested in a Connectathon and demonstrated at HIMSS '07, exchanging information from vital signs, physiological monitors, ventilators, infusion pumps, and anesthesia workstations with enterprise applications such as clinical information systems. This enterprise-level integration is actively being extended to point-of-care integration, as well as to new workflow integration needs, such as alert communication management.

Quality, Research and Public Health - HIMSS/RSNA

The IHE Quality, Research and Public Health (QRPH) domain addresses the information exchange and electronic health record content standards necessary to share information relevant to quality improvement in patient care, clinical research and public health monitoring.

The QRPH domain was formed in 2007 to address use cases related to repurposing of clinical data for these critical “secondary” uses. Globally there is a need to gather and report on secondary data used in public health, clinical decision support, quality measure reporting and research to improve the quality, efficiency and safety of patient care delivery.

Radiology (RAD) - RSNA

IHE Radiology was formed in 1998 to address issues of interoperability and information sharing that impact the quality of care in medical imaging. It has developed and documented standards-based solutions to these problems and organized testing and education to foster their adoption. IHE solutions are now available in hundreds of commercial radiology-related information systems and are implemented in care sites around the world.

More info on Domain Committees here: https://www.ihe.net/ihe_domains/

Connectathons

At IHE Connectathons held regularly in several locations internationally, trained technical experts supervise testing of vendor systems, making use of advanced testing software developed by IHE and several partner organizations. More than 250 vendors worldwide have implemented and tested products with IHE capabilities.

The overarching goal of the Connectathon is to promote the adoption and deployment of standards-based interoperability. The Connectathon serves as an opportunity for the participants in the health IT industry ecosystem to demonstrate, refine, test and validate their implementations and health IT solutions with those of other system and product developers. For over 20 years, from Cleveland to Kyoto, IHE Connectathons have provided a trusted venue for participants in the health IT industry ecosystem to demonstrate, refine, and formally test interoperability implementations in a structured, supervised, and collaborative environment with

other leading market suppliers and technology developers. System developers bring their products to Connectathons for the opportunity to validate their implementations and confirm that their products and solutions are capable of delivering accurate health information securely to the right entity, through the right channel, in the right format, at the right time.

During an IHE Connectathon, participating systems exchange information with partner systems in a structured and supervised peer-to-peer testing environment, performing transactions required for the roles (ie. IHE actors) they have selected to perform in carefully defined interoperability use cases (IHE profiles).

The Connectathon provides an opportunity to validate implementations and compliance with IHE profiles and relevant implementation guides. Participants for the event use testing software developed for this purpose. Connectathons offer vendors a unique opportunity for connectivity testing, removing barriers to integration that would otherwise often need to be addressed on site, at the customer's expense. Companies taking part have responded overwhelmingly that the IHE process addresses important issues in their product development plans.

IHE Profiles and Processes deliver the following value to system developers and end users:

- Workflow driven standards-based interoperability solutions, vetted through the ISO process, developed by industry consensus, and freely available in the public domain.
- Developed from a common technological framework for deploying effective solutions to close the communication gaps between information systems and to foster advanced levels of interoperability
- High quality, industry accepted documentation to constrain mature standards and resources to enable consistent implementation
- Reducing the time, effort, and costs related to custom interfaces needed between systems by agreement on a common implementation of existing standards

More information about the testing process here:

<https://gazelle.ihe.net/content/connectathon-test-process>

IHE Catalyst

IHE Catalyst is a non-profit organization set to accelerate deployment and adoption of IHE to deliver interoperability quality in Health, adding additional value to the IHE Ecosystem. It offers professional services to support IHE Members as well as national/regional authorities, local projects or any other organizations deploying IHE profiles for their ehealth projects.

IHE Catalyst is built upon a long experience in interoperability testing management and now provides the answer from IHE International to support testing continuum. Confidence about rigor testing, quality control testing provides the backbone for quality in products and in deployments.

IHE Catalyst provides the expertise, the technical support, the tools, and the test plans for all the parts to run.

IHE Catalyst offers a wide range of interoperability support services to support the evolving of healthcare, giving answers and instruments to the new needs and challenges of an interoperability framework. A Key Asset of IHE Catalyst is IHE Gazelle, providing tests and test case support to various stakeholders in Health IT Projects.

IHE Gazelle is not only a test Bed Platform, it is also a large collection of tools, most of which are contributed by third parties and partners of IHE like NIST or ART-DÉCOR, moving from laboratory tests to real world implementation.

More info here: <https://ihe-catalyst.net/>

Gazelle

Gazelle is a test bed aimed at testing the interoperability of eHealth information systems developed by IHE-Europe with the support of IHE USA, Japan, Korea and Australia. The development of the Gazelle Test Bed is the second generation of test management tooling developed by IHE.

The first generation tooling was initiated in 2002 with the development of a tool called “Kudu” based on Postgresql and PHP. This first generation tool allowed IHE to structure the Connectathon process and to improve the quality and auditability of testing performed during the Connectathon.

In 2006, with the growth in the number of participants at the Connectathon, it became clear that the tool had to move to a more robust platform in order to support the load and the scalability of such a large project. It was decided to choose Java and Jboss and a development team was established at INRIA Rennes.

In 2011, the Gazelle Test Bed project reached maturity and it was decided to move the development team to a company specialized in testing (Kereval in Rennes) in order to offer a more robust software development environment and deploy a quality management system compatible with the certification requirements of ISO 17025 and Guide 65.

More information on Gazelle here:

https://www.ihe-europe.net/sites/default/files/Flyer_Gazelle_03.pdf

Gazelle Components include:

Gazelle Test Management

The Gazelle Test Manager takes care of conformity and interoperability tests for IHE Profiles, according to their requirements. This tool also allows to manage test campaigns, generate test reports and add non-IHE tests to the set.

Gazelle Assertion Manager

The Gazelle Assertion Manager manages IHE Profiles requirements (assertions) and links them to entities covering them in Gazelle Test Management (test, test step, Technical Framework rule, model-based validation item).

Proxy

The proxy allows to register raw or SSL-TLS messages exchanged between eHealth products, in order to validate their conformance. It may be linked automatically with the validation services.

Gazelle Security Suite

The Gazelle Security Suite embeds a public key infrastructure, a SSL-TLS simulator and an ATNA questionnaire. Its aim is at verifying the conformance of IHE Security Protocols' implementation.

Validation Services

Gazelle allows developers and integrators of eHealth information systems to verify the conformance of messages and documents they produce with a wide set of Profiles and standards. HL7, CDA, DICOM, XDS.b, XDS-I.b, SECURITY

Simulators

Gazelle provides a set of simulators to emulate IHE actors, facilitating the tests of IHE transactions supported by eHealth products. PAM, SWF.b, XDS-I.b, XDS.b, XCPD, LAW, SVS, PIX, PDQ, PIXv3, PDQv3, LTW

IHE USA

IHE USA is a 501.c.3 not for profit organization founded in 2010 that operates as a national deployment committee of IHE International. IHE USA serves as a voice representing US health IT interests and key partners in national health IT efforts for fostering the national adoption of a consistent set of information standards to enable interoperability of health IT systems. The work is managed by IHE USA's Board of Directors and committees. More information about IHE USA here: <https://www.iheusa.org/>

IHE national deployment committees have been established in 17 countries across the globe. They are sanctioned by IHE International to conduct testing, education, outreach, collaboration with local health agencies and other deployment-related activities.

More info here: <https://www.iheusa.org/>

IHE USA's Path to Production Digital Series

IHE USA has hosted the North American Connectathon, one of the largest industry interoperability testing events, for over a decade. IHE USA's Standards Acceleration Programs

explore emerging standards and implementation guidance in global, local, and personal health testing and education tracks. And in January 2022, IHE USA launched the [Path to Production](#) - a series of digital events for interoperability stakeholders at all maturity and engagement levels to have the opportunity to marshal resources and help accelerate the development and deployment of standards in critical, under-resourced areas to support better population health outcomes.

Interoperability for healthcare faces so many different challenges. Implementers tasked with deploying interoperable solutions need more resources, better specifications, improved tools, and more collaborative, open and engaging forums to advance their work. In keeping with IHE USA's mission to improve health IT interoperability, the Path to Production was designed to convene industry experts, share real-world experiences and challenges, and arrive at practical, consensus and open solutions that benefit the entire community.

Interoperability in the US is fragmented. IHE USA is focusing on tackling some of the most complex issues and addressing the gaps in our national interoperability fabric. Path to Production is a forum for all interoperability enthusiasts to get engaged so that we as an industry can contribute more diverse and extended perspectives and include the broader ecosystem in healthcare redesign, modernization, and transformation based on secure, and interoperable standards based solutions.

More info here:

<https://www.iheusa.org/initiatives/path-production-ems-eoutcomes-interoperability>

Cooperative Agreement with ONC

Under this [cooperative agreement](#), the [Office of the National Coordinator for Health Information Technology](#) (ONC) and [Integrating the Health Enterprise \(IHE\) USA](#) are collaborating to accelerate the creation of new and updated IHE profiles to support the use of the [HL7® FHIR®](#) (Fast Healthcare Interoperability Resources) standard. [IHE Profiles](#) provide a common language for purchasers and vendors to define the integration needs of healthcare sites and the integration capabilities of healthcare IT products. They provide healthcare professionals seeking to acquire or upgrade systems a convenient, reliable tool that reduces the complexity, cost and anxiety of implementing interoperable systems by providing a way to specify a level of compliance to standards sufficient to achieve truly efficient interoperability.

The goal of the [HL7](#) FHIR standard is to ease interoperability between legacy healthcare systems, make it easier to access healthcare information on a wide variety of devices, and to allow third-party application developers to design innovative medical applications which can be easily integrated into disparate systems. This cooperative agreement, launched five years into the United States' [Nationwide Interoperability Roadmap](#), reflects the ONC's strategic goal to promote the use of the FHIR standard, as well as advancing standardization through profiling, in support of better interoperability. IHE USA, a national deployment committee of IHE International, engages and supports the health IT community by promoting the adoption and

use of IHE and other world-class standards, tools, and services for interoperability. This agreement will also strengthen and streamline cross-organizational collaboration efforts between standards developing organizations (SDO), interoperability test tool developers, FHIR champions and other vital stakeholders.

The objectives of the work done by the IHE USA Cooperative Agreement project team are to:

- Catalog IHE Profiles that utilize the FHIR standard to enable cross community health information exchange
- Identify and prioritize new profiling opportunities to leverage the FHIR standard
- Accelerate the development of robust, real world testing processes and adoption of the updated FHIR-focused IHE profiles and HL7 implementation guides
- Actively engage with HL7 and IHE International on lessons learned through profiling improvements and real-world testing
- Strengthen and streamline cross-organizational collaboration efforts between SDOs, interoperability test tool developers, FHIR champions and other vital stakeholders.

All improvements and extensions created by IHE USA will be complementary to International initiatives and made globally available through IHE publications.

[IHE International](#) oversees the development and publication of IHE Technical Frameworks worldwide. IHE USA operates as a national deployment committee of IHE International, serving as a voice representing US health IT interests and key partners in national health IT efforts for fostering the national adoption of a consistent set of standards to enable interoperability of health IT systems. The ONC/IHE USA cooperative effort welcomes all stakeholders to collaborate with our project team to make this agreement a success.

The complex, wide-ranging efforts required to achieve the goals set out in this cooperative agreement could not be completed without the support of dedicated collaborators. The following organizations support the work of IHE USA in meeting the goals of this agreement.



The 21st Century Cures Act, signed into law in 2016, is designed to enable interoperability through initiatives such as the [Trusted Exchange Framework and Common Agreement \(TEFCA\)](#), [US Core Data for Interoperability \(USCDI\)](#), and the [Interoperability, Information Blocking, and the ONC Health IT Certification Program final rule](#).

The 21st Century Cures Act requires that developers of certified health IT publish Application Programming Interfaces (APIs), a software intermediary that allows two applications to talk to each other, to be used to enable interoperability “without special effort.” The law’s certification

criterion require standardized API access for single patient and population services using the [HL7® Fast Healthcare Interoperability Resources \(FHIR®\) standard](#). The purpose of HL7 FHIR is to ease interoperability between legacy healthcare systems, making it easier to access health information on a wide variety of devices, and to allow third-party application developers to design innovative medical applications which can be easily be integrated into disparate systems.

As part of a multi-year [cooperative agreement](#), the [Office of the National Coordinator for Health Information Technology \(ONC\)](#) and [Integrating the Healthcare Enterprise \(IHE\) USA](#) are working together to accelerate the adoption of FHIR-based IHE integration profiles to drive the adoption of the FHIR standard in compliance with the 21st Century Cures Act.

[IHE USA](#) is a national deployment committee of the standards development organization (SDO) [IHE International](#). IHE USA engages the US-based health IT community to adopt and use world-class standards, tools, and services for interoperability to deliver on its vision of improved quality, value, and safety in healthcare by enabling rapid, scalable, and secure access to health information at the point of care.

[IHE Integration Profiles](#) are guides that provide a common language for purchasers and vendors to define the integration needs of healthcare settings and the integration capabilities of health IT products. IHE profiles provide healthcare professionals seeking to acquire or upgrade systems a convenient, reliable tool that reduces the complexity, cost and anxiety of implementing interoperable systems by offering a way to specify a level of compliance to standards sufficient to achieve truly efficient interoperability.

More info here: <https://www.iheusa.org/oncihe-usa-cooperative-agreement>

Strategic Partnership with NEMSIS

IHE USA and the National Emergency Medical Services Information System ([NEMSIS](#)) (powered by NHTSA's Office of EMS) are partnering via IHE USA's Path to Production to advance real-world interoperability for EMS Systems to better support First Responders, Emergency Medicine Services, and Disaster Response in the United States. IHE USA and NEMSIS will work with the EMS community to accelerate interoperability and connectivity by leveraging industry interoperability standards and integration profiles, regulatory building blocks and incentives, and existing health IT infrastructure to support the modernization of EMS systems and improved interoperability to inform analytics, business intelligence and improved patient health outcomes.

More info here: <https://www.iheusa.org/node/114>

Keep Informed and Stay in Touch!

- Interoperability for Dummies eBook:
<https://www.managementensalud.com.ar/ebooks/InteroperabilityForDummies.pdf>
- Become an IHE Member: https://www.ihe.net/participate/join_ihe/
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 - @IHE_USA
 - LinkedIn:
 - <https://www.linkedin.com/company/iheintl/>
 - <https://www.linkedin.com/company/ihe-usa/>
- Join the ZoHo Community: <https://connect.ihe-catalyst.net/home>