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Institutional Repository Software Comparison

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Guide to Institutional Repository Software

A comparison of the five most widely adopted IR platforms: Digital Commons, Dspace, Eprints, Fedora, and Islandora

Institutional Repositories were first developed as an online solution for collecting, preserving, and disseminating the scholarship of universities, colleges, and other research institutions. The repository quickly evolved into a platform for libraries to publish and showcase the entire breadth of an institution's scholarship including articles, books, theses, dissertations, and journals. Added support for images, video, audio, and other media has brought greater depth to repository collections. Since 2000, a number of repository platforms have been developed, each with their own set of benefits and technical criteria.

Initially it was believed that repositories had to be open source and locally installed. The open source platforms offered unlimited flexibility for developers to build custom features and collections. However, over the past decade, the platforms have been enhanced to include many of the features that would previously have required local customization. Additionally, the potential high cost of ongoing development and maintenance of locally-hosted software has led many institutions to move to hosted options. The fear of lock-in associated with specific solutions has also faded due to the success of interoperability tools, such as OAI-PMH, available on each of the platforms. IR managers, sometimes on their second or third IR platform, can attest to the relative ease with which one can move from one platform to another.

All of these changes put libraries exploring IRs for the first time in an enviable position. The products have richer feature sets, and all the major platforms are available as a hosted service, which arguably has a lower total cost of ownership and is less time-consuming than running an IR locally. Librarians are now truly free to compare platforms by focusing on the critical features that will address their needs and make their repositories successful. This guide compares the features of the major platforms and is intended to help libraries focus on which features will help facilitate the success of their repository. The comparison is divided into twelve categories to help librarians identify the features that are most important to building a successful institutional repository program at their institution.

- Infrastructure: Starting with the fundamental features of the repository platforms, the Infrastructure section covers installation, hosting, and customer support options.
- Front-end Design: The reader-facing, front-end design reflects institutional branding as well as how the reader interacts with the repository. Integrated front-ends, customizable repository designs, and mobile-optimized pages help ensure an optimal browsing experience.
- Content Organization & Control: Librarians interested in how each platform supports content, access controls, and repository structure will find relevant information here.

- Content Discovery: Identifying the key features that increase the visibility of the repository's content, Content Discovery covers tools and options that help readers and researchers discover scholarship.
- Publication Tools: Librarians and editors evaluating publishing options will discover and compare the necessary tools such as peer review, batch import, metadata options, and editorial workflows to publish high quality scholarship directly to the repository.
- Reporting: Providing feedback to administrators, editors, authors, and stakeholders is a crucial aspect of a successful repository program. This category outlines the reports available on each platform.
- Multimedia: A modern feature of the repository, Multimedia compares how each platform manages images, video, and streaming services that add greater depth to collections.
- Social Features and Notifications: Building on discoverability and search engine optimization, the social features of the repository provide a modern approach to engaging readers by providing tools to follow, share, and bookmark scholarship in the repository.
- Interoperability: Beginning with Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), the repository was built with dissemination in mind. The Interoperability category examines how each platform integrates with discovery services, researcher profiles, and other repositories hosted on the same platform.
- Authentication: Although the majority of repository content is open access, institutional login credentials remain an important aspect of how readers and researchers access content across campus systems and the repository.
- Accessibility: The ability to offer access to those with varying abilities and disabilities is a fundamental feature of the repository. VPAT statements and section 508 compliance show how each repository platform offers access to as many readers and researchers as possible.
- Preservation: From LOCKSS-compliance to format migration, the preservation category examines how each of the repository offerings preserves and maintains repository content.

Infrastructure

Each of the platforms has its own unique features and technical criteria for developing and supporting a repository program. The Infrastructure section covers the basic attributes of each repository offering.

Hosted, cloud-based solutions first became an option in 2005. Since then, cloud-based products and services have become common service solutions across the internet, and other repository developers have begun offering hosted options for their platforms. Hosted solutions allow for automatic system upgrades, as well as consistent platform versions across the community. Additionally, new features are immediately available without the need for local installation and plugins. Hosted solutions also free repository administrators and librarians to focus on the content,

rather than managing platform installation and upgrades. Another crucial component for success is the level of support available for the platform. All the platforms offer community support; however, a dedicated customer support team can increase the success of a repository. Consulting, training, and troubleshooting are common services for hosted platforms.

Infrastructure					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Hosted Solution	Yes	Yes	Yes	Yes	Yes
Locally Installed Software Solution	-	Yes	Yes	Yes	Yes
Customer Support/ Community Support	Customer support: Email, phone, resource, and community support	Community support	Community support	Community support	Community support
Flexible Repository Structure	Yes	Limited	Yes	Limited	Yes
Simple and Qualified DublinCore Metadata	Yes	Yes	Simple Dublin Core only	Yes	Yes
Customizable Metadata	Yes	Yes	Yes	Yes	Yes
Open Source/ Proprietary	Proprietary	Open Source	Open Source	Open Source	Open Source
Automatic System Upgrades	Yes	–	–	–	–
Current Stable Platform Version	7.6	3.2	3.3.11	3.6.2	6.x-13.1.x and 7.x-1.1
Administrator Configurations	Yes	Yes	Yes	Yes	Yes
Supports Standard User Roles	Yes	Yes	Yes	Yes	Yes

Front-end Design

From a front-end, reader-facing standpoint, repository administrators want to guarantee that the repository has a modern design that accurately reflects the branding and organizational structure of their institution. The ability to customize repository and publication designs provides the scholarship with an official look and feel and keeps branding consistent across the institution's digital domains. Mobile-optimized designs and HTML5 web pages help the growing number of mobile researchers easily access content hosted in the repository. The flexibility of a repository

structure will dictate how easily the repository reflects the departmental structure of an institution as well as how readers and researchers access content.

Front-end Design					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Integrated Front-end	Yes	Yes	Yes	-	Yes
Full-service Front -end Design	Yes	-	-	-	-
Customizable Repository Design	Yes	Yes	Yes	Yes	Yes
Customizable Publication Design	Yes: Journals and Conferences	-	-	-	-
Mobile-optimized Design	Yes	-	-	-	Yes
HTML5 Web pages	Yes	-	-	-	-

Content Organization & Control

Since the institutional repository platform was developed, the focus on open access scholarship has been an integral part of an IR program. While most institutions encourage open access content across the repository, the need for access controls for specific content remains an important aspect of the repository. The platforms offer varying levels of pre-built and customizable access control ranging from embargo for ETDs to IP-access for campus-only content, user access, and subscription management.

Publication types available for administrators will dictate how content is organized and displayed within a repository. With simple repository structures, collections or series of papers are used to represent an entire department's scholarship. This structure works well for small collections of pre- or post-print articles, but becomes cumbersome for collections with a variety of content such as conference proceedings, journal articles, ETDs, images, and books. Many of the platforms have introduced dedicated or add-on publication types so that the original publication, such as a journal, conference, or image gallery, can be represented as a publication in the repository. The representation of publications within the repository allows for meaningful, contextual navigation of scholarship and gives the repository greater depth.

Along with publication types, the ability to manage the display of articles within a publication is a key component of the repository. A flexible document structure allows articles to be organized in a meaningful manner. Support for customizable metadata on the article page, supplemental article files such as datasets and media, PDF viewers, and custom cover page stamping provide researchers with a contextual view of the content and how it relates to the repository and platform.

Content Organization & Control					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Open Access Publishing	Yes	Yes	Yes	Yes	Yes
Access Controls	Yes: IP range, user, and domain name	Yes: IP range and user	Yes: User and request a copy	Yes: Customizable XACML	Yes: IP range, user, and customizable XACML
Auto-lift Embargo Support	Yes	Add-on services available	Add-on services available	-	-
Publication Subscription Management	Yes	-	-	-	-
Community Publication	Yes	Yes	-	Yes	Yes
Series/Collection Publication	Yes	Yes	Yes	Yes	Yes
Journal Publication	Yes	-	-	-	-
ETD Publication	Yes	-	-	-	-
Book Publication	Yes	-	-	-	-
Conference and Event Publication	Yes	-	-	-	-
Image Gallery	Yes	-	-	-	-
Supports Standard File Types (PDF, MS Word, RTF, etc.)	Yes	Yes	Yes	Yes	Yes
Flexible Document Organization	Yes	-	Yes	Yes	Yes
Customizable Metadata On Article Pages	Yes	Yes	Yes	Yes	Yes
PDF Viewer on Article Page	Yes	Add-on services available	PDF preview hover over available	Add-on services available	Add-on services available
Supplemental/ Additional Article Files	Yes	-	Yes	-	-
Custom Cover Page Stamping	Yes	-	-	-	-
Creative Commons license	Yes	Yes	Yes	Add-on services available	Add-on services available

Content Discovery

As the variety of content in the repository has grown beyond pre- and post-print articles, the discovery features within the repository have expanded to offer modern web features for readers and researchers. Features such as advanced and faceted search tools, full text indexing, graphical navigation, customizable browse options, and geolocation allow researchers to more easily browse content within the repository and have made the institutional repository a destination rather than a storage place for articles.

Dissemination beyond the repository is a key component of an IR platform. Success of a repository program is based on how readers and researchers access the scholarship. Starting with Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) repositories focused on interoperability to guarantee integration with campus discovery services. As search engines became the foundational discovery tool of the internet, optimizing the repository and its content for search engines became an important focus for hosted and software repository solutions. With optimization across major search engines, and specialized search engines like Google Scholar, repository content greatly improves in visibility and reaches a much wider researcher base.

Content Discovery					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Integrated Search Engine	Yes	Yes	Yes	Yes	Yes
Advanced Search with Facets	Yes	Yes	-	Yes	Yes
Full Text Search Indexing	Yes	Yes	Yes	Yes	Yes
Browse Options	discipline, community, publication, publication year, document type, author, and institution	communities & collections, publication date, author, title, subject, and document type	department, subject, year	collections and search facets	collections and search facets
Graphical Navigation of content	Image, icon, geolocation, and Discipline Wheel navigation	Add-on services available	Image	-	Image and icon
Geolocation Tools	Yes: Integration with Google Maps	-	Yes: Google Maps export	-	Add-on services available
Search Engine Optimization	Yes	Limited	Yes	-	Add-on services available
Indexed in Google Scholar	Yes	Yes	Yes	-	Add-on services available
DOI and Persistent URLs	Yes: Persistent URL and DOI	Yes: Handle System	Yes: DOI	Yes: Persistent Identifiers	Yes: Persistent Identifiers

Citation Export	Yes: Zotero, Endnote, and RefWorks	Yes: COinS support	Yes: BibTeX, refer, Endnote, and additional bibliography managers	Yes: COinS support	Yes: COinS support
Link Resolver Integration	Yes	Yes	Yes	Yes	Add-on services available

Publication Tools

The success of open access scholarship and institutional repositories has allowed the library to take an active role in publishing. With dedicated and add-on publications, the repository has the ability to represent journals, conferences, and galleries within the repository. Editors equipped with dedicated publication tools have the ability to manage scholarship from submission to final publication.

Flexible editorial workflows allow editors to adapt to each publication's needs. Customizable submit forms and metadata guarantee that the publication will capture all the necessary information for each submission. Integrated peer-review tools allow editors to manage and assign reviews and make final editorial decisions. Editor and reviewer notifications increase the efficiency of the peer review process by automatically notifying editors and reviewers when actions have been made or need to be taken. Finally, the automatic conversion of full text files to PDF, along with cover page stamping, will provide high quality full texts for editors, reviewers, and readers.

Additional batch publication tools also play an important role by offering tools for revision, collection, and bringing back content, such as past journal issues, to the repository. As repositories move publications online that were hosted on another platform or were previously print-only, batch import allows editors to import and publish a large amount of back content quickly. Similarly, batch revision tools allow editors to quickly make metadata or full-text changes to a large number of records. After publication, auto-collection tools allow editors to host the article in multiple publications without having to publish multiple times.

Publication Tools					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Integrated Peer Review Tools	Yes	-	-	-	-
Role-based Journal Editor Permissions	Yes	-	-	-	-
Flexible Publishing Workflows	Yes	Limited	Yes	Yes	Yes
Customizable Submit Forms	Yes	Yes	Yes	Yes	Yes

Auto-Conversion of Full text files to PDF	Yes	-	-	-	-
Retain Metadata and Full Text Revisions	Yes	-	Yes	Yes	Yes
Batch Import	Yes: XML and Microsoft Excel import tools	Yes: Bibliographic import tool and simple archive format	Yes: BibTeX, XML and additional plugins available	Yes: XML import	Yes
Batch Revision	Yes	Yes	-	-	-
Auto-Collection Tools	Yes	-	-	-	-

Reporting

The modern repository offers highly discoverable content across discovery services and search engines. Engaging, browsable user interfaces have made the repository a destination rather than a holding pen for articles. While these improvements have improved traffic and visibility of the repository, the need for reporting tools to provide feedback to administrators, editors, authors, and repository stakeholders remains a crucial aspect of proving a successful repository program. Reports for publication metadata, usage and downloads, and Google Analytics integration come in a variety of pre-built or customizable formats across the repository platforms. Author reports offer a key feedback loop that allows authors to see the impact and usage statistics of their work, providing incentive to upload more of their scholarship to the repository. Stakeholder reports provide excellent repository usage statistics to those helping fund or promote the repository on the campus.

Reporting					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Editor Reports	Yes	Add-on services available	Add-on services available	Add-on services available	Add-on services available
Usage/Download Reports	Yes	Yes	Add-on services available	Add-on services available	Yes
Stakeholder Reports	Yes	-	-	Add-on services available	-
Author Reports	Yes	-	-	-	Add-on services available
Google Analytics Integration	Yes	Add-on services available	Yes	-	Yes

Multimedia

Adding greater depth to articles and collections housed in the repository, multimedia plays an important role in the repository. Starting with supplemental content for articles, sound clips, images, and videos became a way to better supplement and represent the scholarship. Digitized image collections led the way to the development of dedicated image galleries. New features, such as graphical navigation, slideshows, and integrated streaming media services provide readers and researchers an engaging way to navigate and view media within the repository.

Multimedia					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Streaming Multimedia	Yes	Add-on services available	-	Add-on services available	solution pack available
Images	Yes	Yes	Yes	Yes	Yes
Slideshows	Yes	Add-on services available	Yes	Add-on services available	Yes
Audio	Yes	Yes	Yes	Yes	solution pack available
Video	Yes	Yes	Yes	Yes	solution pack available

Social Features and Notifications

Social networks have changed the way that we interact with content and social contacts. Adding a personal, networking layer to the internet has allowed individuals to collaborate and share content like never before. Readers and researchers of repository scholarship have taken advantage of the new social tools available to them by bookmarking and sharing content to networks, groups, collaborators, and followers. By offering tools to allow users of the repository to easily follow, share, and bookmark content on the repository, readers and researchers help expand the reach and visibility of the repository.

Social Features and Notifications					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Follow	Yes	-	-	-	-
Share	Yes	Add-on services available	Add-on services available	Add-on services available	Add-on services available
RSS	Yes	Yes	Yes	Yes	Yes
Bookmark	Yes	-	Yes	Add-on services available	Yes

Publication and Author Mailing Lists	Yes	-	-	-	-
Reader Comments	Add-on services available	-	-	-	Yes
Saved Searches	Yes	-	Yes	-	-

Interoperability

The interoperability of a product is its ability to work with and integrate with other products and services. Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) was developed at the same time as the institutional repository so platforms could easily provide a uniform output for the dissemination of content. The interoperability category examines how each platform integrates with other products through OAI-PMH, discovery services, researcher profiles, and other repositories hosted on the same platform.

Interoperability					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Harvesting (OAI-PMH)	Yes	Yes	Yes	Yes	Yes
Network of Platform Repositories	Yes: Digital Commons Network	-	-	-	-
Integration with Discovery Platforms	Yes	Yes	Yes	Yes	Yes
Integration with Research Profile Pages	Yes	-	-	-	Add-on services available

Authentication

The majority of repository content is open access and does not require user authentication to gain access; however, authentication remain an important aspect of how readers and researchers access content across campus systems and the repository. The most common institutional authentication tools compared allow users to login using institutional login credentials without the need to create a separate repository account.

Authentication					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
LDAP	Yes	Yes	Yes	Yes	Yes
CAS	Yes	Yes	Yes	Yes	-
System Accounts	Yes	Yes	Yes	Yes	Yes
Shibboleth	-	Yes	Yes	Yes	Yes

Accessibility

Web accessibly is the ability of a website to offer access to those with varying abilities and disabilities. Accessibility is a fundamental feature of the repository that dictates how screen readers and other devices can help readers and researchers view content. Accessible repositories are built in a logical structure to provide quality access to those with visual, motor/mobility, auditory, neurological, and cognitive disabilities. A Voluntary Product Accessibility Template (VPAT) statement outlines a website's compliance with 508 accessibility standards.

Accessibility					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
VPAT Statement	Yes	-	-	Yes	-
Section 508 Compliant	Yes	-	-	-	-
WCAG (Web Content Accessibility Guidelines)	Yes	-	-	-	-

Preservation

With the move from print to digital publication, preservation has become a constant topic of discussion. From basic storage on local servers to robust, digital preservation platforms, institutions around the world are searching for the most cost-effective way to maintain their digital scholarship for the future scholars of the world. Basic preservation services such as content back-ups, provide XML-based copy of content so that it can be stored and imported into other new repositories and services. Format migration tools and services help administrators migrate full text file formats, such as MS Word documents or PDFs, into a new modern format if the standard format changes. Interoperability (outlined in the Interoperability category) also plays an important role in preservation. OAI-PMH support allows for integration with preservation platforms.

LOCKSS (Lots of Copies Keep Stuff Safe), developed at Stanford, is a library-focused, open source system that allows the preservation of subscription-based material as well as open access content. The peer-to-peer LOCKSS system keeps copies of scholarship across a network of institutions to preserve and disseminate content if the original publisher or repository ceases to exist. LOCKSS support is an inexpensive yet reliable method of preserving repository scholarship.

Preservation					
	Digital Commons	DSpace	EPrints	Fedora	Islandora
Content Back Up	Yes: XML-based, quarterly content delivery	Yes: Archival Information Packages back up	Yes: XML export	Yes	Yes: XML export
LOCKSS-compliant	Yes	Add-on services available	-	Add-on services available	-
Format Migration Tools and Services	Yes	Managed by institution	Integrated format migration risks tools offer format advice for administrators	Managed by institution	Managed by institution

Conclusion

After more than a decade of expanding the reach of scholarship, the institutional repository continues to develop and offer modern tools for libraries and researchers. While the foundational elements of collection, preservation, and dissemination remain intact, the repository platform options continue to offer new and exciting ways to expand readership. Library-led publishing efforts and the desire to represent the entire breadth of an institution's research through journals, image collections, and books have made the repository a destination rather than a holding place for pre- and post-prints. With a variety of platforms available, an institution looking to start a repository program or move to a new platform has many options and features to compare. Locally hosted software offers customizations unique to the institution, but requires repository programming and IT teams to build and maintain. The cloud-based, hosted platforms offer a turnkey solution with consistent platform versions, upgrades, and customer support that will assist the library in developing a successful repository. Ultimately, the institution must evaluate its collections, technical expertise, and research distribution strategy in order to choose the platform that will best support its research goals.

Methodology

The Institutional Repository Software Comparison Guide was written for institutions evaluating repository platforms. It is intended to serve as a resource for academic libraries that are creating a repository program from scratch, as well as those looking to upgrade platforms.

Data from three sites (Registry of Open Access Repositories (ROAR), The Directory of Open Access Repositories OpenDOAR), and Repository 66) were used to determine which platforms made the short list. The list was further pared down to the final top five finalists by examining product information on the various platforms' websites and conducting extensive interviews with repository managers. Repository platforms with active user communities, the most robust feature sets, and the largest number of installations were chosen for evaluation.

The platforms were evaluated based on twelve categories. The categories were designed around the common themes that emerge when building and maintaining a successful repository program. The categories cover a wide range of repository management topics from infrastructure information (how the repository is installed, hosted, and maintained) to publication and preservation of content. They will enable a reader to easily evaluate the different repositories by focusing on key solution attributes. A dozen categories might initially seem excessive; however, all twelve are necessary to accurately assess the “modern repository's” expansive set of features for managing a wide breadth of scholarly output.

Each category contains a set of features that are key components of a modern institutional repository. The features were evaluated based on the most current version of each of the platforms. The information was gathered from available resources of each platform's website, community wiki pages, demo sites, developer pages, user documentation, and presentations. The three possible responses include “Yes,” “-“, or “Add-on services available”. When appropriate, additional information is provided. “Yes” responses indicate that the feature is available in the default installation of the repository. “Add-on services available” responses indicate that the feature is available by custom installation by a development team or third party company. “-“responses indicate that the feature is not available in the default installation, add-on services are not readily available, or the information was not readily available from the platform's documentation.

This guide is not intended to be used solely by IR experts. Each of the dozen categories has an introductory paragraph to ensure that even an individual researching IRs for the first time will have the required understanding of the needs that those features address.

Resources

Platforms

- Registry of Open Access Repositories (ROAR) - http://roar.eprints.org/
- The Directory of Open Access Repositories (OpenDOAR) -http://www.opendoar.org/
- Repository 66 -http://maps.repository66.org/
- Research on Institutional Repositories: Articles and Presentations - http://digitalcommons.bepress.com/repository-research/

Digital Commons

- Digital Commons Website -http://digitalcommons.bepress.com/
- Digital Commons Reference Material and User Guides - http://digitalcommons.bepress.com/reference/
- Outreach Toolkits and Tutorials -http://digitalcommons.bepress.com/toolkits/

Dspace

- Dspace Website -http://www.dspace.org/
- Dspace Resources -http://www.dspace.org/resources
- The DSpace 2013 RoadMap and 3-5 Year Vision-http://duraspace.org/dspace-2013-roadmap-and-3-5-year-vision
- DSpace 2013 RoadMap and Vision Video Overview - http://www.youtube.com/watch?v=JtnjPk9qS_k&feature=youtu.be
- DspaceDirect -http://dspacedirect.org/
- Dspace Wiki -https://wiki.duraspace.org/display/DSPACE/Home
- Dspace Training Materials -http://www.dspace.org/new-user-training

Eprints

- ePrints Website -http://www.eprints.org/
- ePrints Services -http://www.eprints.org/us/
- ePrints Wikihttp://wiki.eprints.org/w/Main_Page
- ePrints Training Materials -http://www.eprints.org/software/training/
- ePrints Demo Site -http://demoprints.eprints.org/

Fedora

- Fedora Commons Website -http://www.fedora-commons.org/
- Fedora Repository Overview PDF - http://www.duraspace.org/sites/default/files/u9/Opentech_specsht_FedoraC_12.pdf
- Fedora 3.7 Documentation - https://wiki.duraspace.org/display/FEDORA37/Fedora+3.7+Documentation
- Fedora Developer's Forum - https://wiki.duraspace.org/display/DEV/Developer%27s+Forum
- Fedora User Interface Projects - https://wiki.duraspace.org/display/DEV/Fedora+User+Interface+Projects
- Fedora Repository Development Wiki - https://wiki.duraspace.org/display/FCREPO/Fedora+Repository+Development+Wiki

Islandora

- Islandora Website -http://islandscholar.ca/
- Islandora Timeline -http://islandora.ca/timeline
- Islandora Documentation Wiki - https://wiki.duraspace.org/display/ISLANDORA/Islandora
- Islandora YouTube Channel -http://www.youtube.com/user/Islandora
- IslandoraJira Website -https://jira.duraspace.org/browse/ISLANDORA
- Islandora Sandbox Website -http://sandbox7.islandora.ca/
- DiscoveryGarden -http://discoverygarden.ca/

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