Open VSX Registry: A Vendor-Neutral, Open Source Marketplace for VS Code Extensions

White Paper
The Open VSX Registry is a vendor-neutral and publicly hosted open source alternative to the Microsoft Visual Studio Marketplace for VS Code extensions. Built on the Eclipse Open VSX project, it delivers on the industry’s need for a more flexible and open approach to VS Code extensions and marketplace technologies.
Why the Microsoft Visual Studio World Needs Eclipse Open VSX

Today, there’s growing momentum around open source tools and technologies to support VS Code extensions. Leading global organizations are adopting these tools and technologies for internal use and also as the basis for commercial offerings. This momentum has spurred demand for a marketplace that’s visually and functionally similar to the Microsoft Visual Studio Marketplace, but without its limitations.

There’s no question that Microsoft Visual Studio Marketplace is a great resource for developers. It offers more than 20,000 Visual Studio (VS) Code extensions, making it one of the world’s most popular cloud developer resources. The extensions are free and they can be easily accessed through a user-friendly, searchable website. This said, the Visual Studio Marketplace does have some limitations, including:

- **License restrictions.** The terms of use for the Visual Studio Marketplace state that only Microsoft VS products can access and use extensions. This means there is no opportunity to leverage extensions with other technologies or tools. In short, developers are locked in to Microsoft VS products.

- **Proprietary marketplace source code.** Microsoft does not provide access to the source code for the marketplace itself. As a result, the source code cannot be reused to create an internal extension registry for developers or to contribute new features and enhancements to the marketplace.
These limitations severely restrict the capabilities of organizations that have adopted open source developer tools and technologies.

In contrast to the Visual Studio Marketplace, the Open VSX Registry provides free access to VS Code extensions that can be used with any technology or tool that supports them — from VS Code and forks of VS Code like VSCodium, to Eclipse Theia, Eclipse Che, Gitpod, Coder, and SAP Business Application Studio. In addition, Eclipse Open VSX source code is open to all, so anyone can reuse and enhance the marketplace technology to meet their specific needs. They can even create an internal, private extension repository that’s connected to the upstream public Open VSX Registry.

Eclipse Open VSX source code is open to all, so anyone can adopt, adapt, and enhance the marketplace technology to meet their specific needs.

Industry Leaders Are Moving Beyond Single-Vendor Solutions

As the industry increasingly relies on and commercializes open source tools and technologies that support VS Code extensions, the need for an open source marketplace has also continued to grow. Here are five examples that highlight the industry momentum around open source tools and technologies that support VS Code extensions.

**Eclipse Theia** is an extensible platform that allows organizations to develop their own multi-language cloud and desktop IDEs using a single, open source technology stack. The software combines many of the convenient user interface features in VS Code with a modular architecture that enables far more customizations than VS Code. Eclipse Theia is the basis for well-known industry offerings, including:

- Arm Mbed Studio
- Arduino Pro IDE
- Gitpod
- Google Cloud Shell
- SAP Web IDE
Eclipse Che is the world’s first Kubernetes-native IDE designed to enable developers to build cloud native applications. It eliminates the workspace configuration complexities and challenges with Kubernetes-native development so it’s faster and easier for developer teams to create cloud native applications. Eclipse Che also integrates the Eclipse Theia software to provide an in-browser VS Code experience. Eclipse Che is the basis for well-known industry offerings like:

- IBM Cloud Pak for Applications
- Red Hat OpenShift
- Red Hat CodeReady Workspaces
- SAP Hana Cloud

VSCodium is a fully open source alternative to VS Code that doesn't collect telemetry data about how it’s being used. VS Code collects usage information and sends it back to Microsoft by default. With 11,000 stars on GitHub, VSCodium is clearly gaining in popularity.

Gitpod is an open source Kubernetes application that streamlines developer workflows by providing prebuilt, collaborative development environments in a browser. Developers can complete code reviews, mentor one another, share reproducible workspaces, and more.

Gitpod is used by leading global players, including:

- Amazon
- Intel
- Facebook
- Uber
- Google

The Coder code-server software allows developers to run VS Code on any machine, anywhere, and access it through a browser. It’s been pulled from Docker Hub more than 10 million times and has received more than 36,000 stars on GitHub.
Eclipse Open VSX Opens New Windows of Opportunity

According to Sven Efftinge, co-lead for the Eclipse Theia and Eclipse Open VSX projects, platforms such as Eclipse Theia simply don’t make sense without the ability to add extensions. “It makes no difference that the software is open source if it can’t be used by downstream adopters and inventors simply because they can’t install extensions,” he says. “Besides, it would be a very boring landscape if no one tries to innovate on top of what Microsoft does.”

The Open VSX Registry increases transparency and flexibility for extension users, extension publishers, and tool developers. Let’s take a closer look at the differences between the two and the unique benefits the Open VSX Registry provides.

Vendor-Neutral Hosting and Governance Create a Level Playing Field for All

The Open VSX Registry is hosted at the Eclipse Foundation, a vendor-neutral, not-for-profit organization that provides a proven governance framework and processes for entrepreneurial collaboration.

No single company or vendor owns the registry servers, operates the service, or has more control over the service than any other participant:

- A governance framework, including Bylaws, a Membership Agreement, Intellectual Property Policy, Antitrust Compliance Policy, and additional policies ensure equality among all participants.
Processes for project development, specifications, and working group operation ensure companies, organizations, and individuals can work together for their mutual benefit.

In contrast, Microsoft alone has complete control over the Visual Studio Marketplace and the code within it. While there is no indication it will happen, Microsoft could, at any time, decide to start charging fees for access to extensions, stop developing the marketplace software, or completely shut down the marketplace.

Truly Open Source Software Allows Anyone to Participate

All software projects hosted at the Eclipse Foundation, including Eclipse Open VSX, are available as open source. That means any individual or organization can:

• Participate in feature, functionality, and design discussions to influence how the registry evolves. This helps to ensure the registry continues to align with participants’ top priorities. Final decisions are made by the community, following established and proven processes so no single ecosystem participant can dominate the strategic direction. Each participant has one vote, no matter how big or small the organization they represent.

• Contribute code to the registry to add features and functionality, fix bugs, or enhance existing functionality. Committers, who are chosen by community members based on merit, work with contributors to validate the code before committing it to the source code repository.

In contrast, Microsoft accepts feedback and input from marketplace users and publishers, but makes all final decisions about how features and functionality evolve. Only Microsoft employees can contribute to the code base.

Increased Publisher Transparency Avoids Conflicts

In the Open VSX Registry, namespaces are used to identify extension publishers. When a publisher creates a namespace, they automatically become a contributor to that namespace, which means they can publish extensions using that namespace.
Initially, the namespace has no owner, and is considered unverified. Ownership must be claimed by creating an issue in GitHub. Once ownership is granted, the namespace state changes to verified, and the owner controls who can publish to the namespace. The webpage of every extension on open-vsx.org clearly shows its verified/unverified status as well as the GitHub account that was used for publishing.

These measures create a public record of ownership claims, and allow anyone to report an issue with an ownership claim. The transparency of extension publishers and ownership claims reinforces trust in the offerings of the Open VSX Registry.

In the Microsoft Visual Studio Marketplace, everyone who publishes an extension is immediately granted full ownership of it and there is no opportunity for objections from other publishers.

**Even the Registry Is Open Source to Allow for In-House Hosting**

Because the Eclipse Open VSX code itself is open source, any organization can not only contribute to the registry code, but also reuse it to create an internally hosted extension registry for their in-house developers to publish VS Code extensions.

Microsoft does not provide the source code for the Microsoft Visual Studio Marketplace, so there’s no opportunity to leverage the technology to host an in-house extension registry or contribute to the improvement of the platform.

The next section provides more detail about deployment options for the Open VSX Registry.
The Open VSX Registry Benefits All Types of Users

The Open VSX Registry includes a number of features that make life easier for extension users, publishers, and tool developers, as well as organizations deploying an in-house extension registry. Together, these features help to increase developer joy, a concept that’s considered important by developers and the organizations that employ them.

Extension Users: A Familiar and Intuitive User Interface to Find Extensions

From a usability perspective, the Open VSX Registry is very similar to the Visual Studio Marketplace. Icons identify extensions and publishers, and star ratings are provided for each extension. Extensions can be found by name, tag, or description, filtered by category, and sorted by various criteria (Figure 1).
Accessing the Open VSX Registry from within development tools is also very easy. The registry is already the default extension registry for Eclipse Theia, Gitpod, and VSCodium. And it can be easily added as the default extension registry in forks of VS Code.

**Extension Publishers: Minimal Additional Effort to Reach a Broader Audience**

Publishers who add their VS Code extensions to the Open VSX Registry can expand their reach significantly with very little additional work.

Publishing to the Open VSX Registry is a straightforward process that requires just four easy, well-documented steps:

- Create an Eclipse Foundation account and sign the Publisher Agreement. These are one-time tasks that do not need to be repeated.
- Create an access token.
- Create the namespace.
- Package and upload the extension.

Broadcom, a global leader in semiconductors and infrastructure software products, has published several extensions in the Open VSX Registry. Venkat Balabhadrapatruni, distinguished engineer and chief architect for Mainframe DevOps at Broadcom, emphasizes that publishing to the Open VSX Registry gives Broadcom’s customers the flexibility to choose the optimal tools for their businesses.
“We have customers using VS Code and customers using cloud-based IDEs, such as Eclipse Che and other tools,” he explains. “We want to keep development tooling as open as possible for these customers and do not want to prescribe a specific set of tools. Rather, our goal is to enable them with choices so they can pick and choose the development tools that meet their needs. Publishing extensions to the Open VSX Registry gives Broadcom’s customers maximum flexibility.”

Balabhadrapatruni also says the publishing experience has been positive. “I think it took less than an hour from the time of the initial request to the time we had an extension published in the registry,” he says. “The feedback I received was that publishing was really easy. There’s just no good reason not to publish extensions to the Open VSX Registry.”

**Tool Developers: Easy Integration With Any Developer Tool**

The Open VSX Registry provides a REST API that allows tool developers to easily integrate access to the registry into any IDE, desktop tool, or online tool. The API includes REST endpoints for creating namespaces, publishing, querying metadata, and searching.

Miro Spönemann, co-lead of the Eclipse Open VSX project, points out this is the first time tool developers outside of Microsoft can integrate access to VS Code extensions into their solutions. “With this public API, any developer can provide their users with access to VS Code extensions,” he says. “This is a significant new capability that will help developers add value to their solutions.”
Organizations: Flexible Deployment Options for an Internal Registry

Organizations that adopt the open source registry software can structure their internal extension registry in the way that makes the most sense for how they work and to best meet their business objectives. For example, they can use the registry as:

- An internal repository for proprietary and third-party extensions approved for developer use.
- An internal extension repository that’s connected to the upstream public Open VSX Registry (Figure 2). With this approach, organizations can keep their internal extensions private and offer access to them on the corporate network while still providing access to the broader public registry.

To simplify internal deployments, the three components that comprise Eclipse Open VSX are based on standard libraries and frameworks:

- The server app is based on the Spring Java framework, the PostgreSQL open source database, and the Elasticsearch search engine.
- The web app is based on the React JavaScript library and Material-UI.
- The command line tool is based on NodeJS JavaScript runtime and Visual Studio Code Extensions (vsce), the command line tool provided by Microsoft for publishing to its marketplace.

Figure 2: Providing Access to Internal and Public Extension Registries
The Eclipse Cloud DevTools Ecosystem Enables Innovation and Collaboration

Eclipse Open VSX is part of the Eclipse Cloud DevTools (ECD Tools) ecosystem. This vendor-neutral ecosystem allows anyone with a vested interest in cloud development tools to collaborate on the development of new tools and create migration paths for existing tools.

The ECD Tools ecosystem has been embraced by large corporations such as Broadcom, Ericsson, IBM, Intel, Red Hat, and SAP, as well as smaller technology specialists such as TypeFox and EclipseSource. This broad industry participation confirms the industry sees the value of a well-governed, vendor-neutral approach to open source collaboration for cloud-based developer tools.
In addition to the Open VSX Registry, Eclipse Theia, and Eclipse Che, the ECD Tools ecosystem encompasses a diverse range of adaptable, open source technologies:

- **Eclipse Che4z**, an all-in-one extension stack for Eclipse Che that makes it faster and easier for the new generation of developers to get involved in mainframe application development.

- **Eclipse Dirigible**, a cloud development platform that leverages an in-system programming model and rapid application development techniques to support the full development life cycle of on-demand applications.

- **Eclipse EMF.cloud**, a set of software tools and components that make it easier to use the Eclipse Modeling Framework (EMF) in cloud-based applications.

- **Eclipse GLSP**, an extensible graphical language server platform (GLSP) to build custom, web-based diagram editors that can be used on their own or integrated into web-based IDEs such as Eclipse Theia and VS Code.

- **Eclipse JKube**, a collection of plug-ins and libraries for building container images using Docker, Jib (Docker-less), and S21 build strategies.

- **Eclipse Orion**, which provides components, services, and libraries for building web-based development tools.

- **Eclipse Sprotty**, a next-generation, web-based diagramming framework that’s ideal for diagrams to visualize code, similar type hierarchies, component dependencies, and other relationships.

- **Eclipse Tools for Cloud Foundry**, which provides an extensible framework and common user interface to deploy applications to different Cloud Foundry targets.
Get Involved Today

There are many ways for individuals and organizations to benefit from, and get involved with, Eclipse Open VSX and the more than 380 projects hosted at the Eclipse Foundation. Options range from anonymously downloading and using the software to contributing enhancements and helping to drive strategic direction with an Eclipse Foundation membership.

Benefits of membership in the Eclipse Foundation include:

- Proven processes and best practices for open source software development
- Intellectual property management and licensing services that enable entrepreneurial collaboration and commercialization of open source software
- Mentorship, guidance, and expertise in creating and managing open source projects and in community building and support
- Marketing services that increase project visibility

Learn More

Discover the benefits of getting involved in the Eclipse Cloud Development Tools ecosystem:

To learn more about the Open VSX Registry, visit the project website and the public marketplace.

To learn more about the Eclipse Cloud DevTools Working Group, check out our latest news.

For more information about the different ways to get involved in the Eclipse Foundation, follow the links on this page.

To learn more about the benefits of becoming a member of the Eclipse Foundation, visit our membership page.
About the Eclipse Foundation

The Eclipse Foundation provides its global community of individuals and organizations a mature, scalable, and business-friendly environment for open source software collaboration and innovation.

The Foundation is home to the Eclipse IDE, Jakarta EE, and more than 380 open source projects, including runtimes, tools, and frameworks for cloud and edge applications, IoT, AI, automotive, systems engineering, distributed ledger technologies, open processor designs, and many others.

The Eclipse Foundation is a not-for-profit organization supported by more than 300 members, including industry leaders who value open source as a key enabler for their business strategies. To learn more, follow us on Twitter and LinkedIn, or visit eclipse.org.