U.S. Department of Housing and Urban Development

Source Code Policy

HUD Handbook

September 18, 2018

DOCUMENT CHANGE HISTORY

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Introduction

The United States Department of Housing and Urban Development (HUD) seeks to establish practices to address new custom-developed source code to be made broadly available for reuse across the Federal Government. This follows the Office of Management and Budget (OMB) Digital Government Strategy's Shared Platform approach, which enables federal employees to work together—both within and across agencies—to reduce costs, streamline development, apply uniform standards, and ensure consistency in creating and delivering information. Reuse of custom-developed code across the Federal Government can have benefits for taxpayers. This policy aims to decrease duplicative costs for the same code and reducing federal vendor lock-in.

Purpose

This policy complies with OMB Memorandum M-16-21 Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software.

This policy accomplishes the following objectives:

- Provide guidance on considerations that must be made before acquiring any custom-developed code;
- Require custom-developed code to be available for government-wide reuse by acquiring rights to custom code for federal reuse, subject to limited exceptions; and
- Require consideration of the value of publishing custom-developed code as open source software (OSS).

Rescission

This policy is new and does not rescind any prior Office of the Chief Information Officer (OCIO) policies. If internal manuals, memorandums, or guidance documents published before this policy conflict, this policy shall take precedence.

Applicability

This policy does not apply retroactively. Custom-developed code created before this policy is not covered by this policy as determined by the assigned date within HUD's Inventory of Automated Systems. Providing existing custom-developed code for government-wide reuse or as OSS is encouraged.

Exemptions may be applied in specific instances to exempt sharing custom-developed code with other government agencies. These exceptions must be approved and

documented by OCIO to ensure effective oversight and management of information technology resources. Acceptable exemption criteria are:

- Sharing the source code is restricted by law or regulation, including, but not limited to, patent or intellectual property law, the Export Asset Regulations, the International Traffic in Arms Regulation, and the federal laws and regulations governing classified information;
- Sharing the source code would create an identifiable risk to the detriment of national security, confidentiality of government information, or individual privacy;
- Sharing the source code would create an identifiable risk to the stability, security, or integrity of the HUD systems or personnel;
- Sharing the source code would create an identifiable risk to HUD mission, programs, or operations; or
- OCIO believes it is in the national interest to exempt sharing the source code.

Justifications will be brought to the Technical Review Sub-Committee (TRC) for review. Approval authority for exemptions is the CIO. A brief narrative justification must be provided to OMB for exemptions, with redactions as appropriate.

Effective Implementation Date

This policy is effective upon the issuance date of this policy.

Policy

A. Three-Step Software Solutions Analysis

HUD must obtain sufficient rights to custom-developed code to fulfill both the government-wide reuse objectives and the open source release objectives outlined in this policy.

HUD will conduct a three-step analysis as outlined below. This analysis should leverage existing solutions—consistent with principles of category management and shared services—and suitable commercial solutions, while mitigating duplicative spending on custom-developed software solutions. These steps follow OMB's longstanding policy on investment in major information systems. Consistent with OMB's memorandum on Technology Neutrality[1], HUD must consider open source, mixed source, and proprietary software solutions equally and on a level playing field, and free of preconceived preferences based on how the technology is developed, licensed, or distributed.

[1] Technology Neutrality, Office of Management & Budget, Executive Office of the President, January 7, 2011.

Step 1: Conduct Strategic Analysis and Analyze Alternatives

HUD will conduct research and analysis before initiating any technology acquisition or custom code development. This analysis shall consider not only the agency mission and operational needs but also external public and interagency initiatives such as Cross-Agency Priority Goals. Alternatives analysis shall then be performed to evaluate whether to use an existing federal software solution or to acquire or develop a new software solution.

Step 2: Consider Existing Commercial Solutions

If the alternatives analysis concludes that existing federal software solutions cannot meet the needs of the agency, HUD must explore whether its requirements can be satisfied with appropriate and secure commercially-available solutions. An analysis should examine configuration of cloud software-as-a-service and platform-as-a-service offerings before consideration of custom development.

Step 3: Consider Custom Development

If the alternatives analysis concludes that existing federal or commercial software solutions cannot meet its needs, consideration of procuring custom-developed code in whole or in conjunction with existing federal or commercial code can occur. When commissioning new custom-developed software, HUD must consider the value of publishing custom code as OSS and negotiate data rights reflective of its value-consideration. HUD must also obtain sufficient rights to fulfill this policy's objectives related to government-wide code reuse and the open source proof of concept program. The FAR General Rights in Data[2] clause provides for "unlimited rights" in data first produced in the performance of the contract, which generally covers custom-developed code. This includes both the right to share the custom-developed code with other agencies and the right to publicly release the code for reuse subject to restrictions in an open source license. However, if an agency is not seeking, or able, to obtain the rights to publicly release the code, the rights license should still provide, at a minimum, the Government's rights to share the custom-developed code with other agencies. Rights for government reuse outside the unlimited rights clause may use the limited rights notice under Alternate II of the 52.227-14 clause. In enforcing such data rights, HUD should ensure that deliverables do not contain markings that limit rights of distribution.

Certain factors should be considered throughout each stage of the analysis:

[2] Federal Acquisition Regulations 52.227-14

- Hybrid solutions—those containing a mixture of existing federal, commercial, and/or custom-developed solutions—should be considered throughout each step of the analysis.
- Modular architecture should be an approach to solution architecture. As discussed in *Digital Government Strategy*, modularity can reduce overall risk and cost while increasing interoperability and technical flexibility.
- Cloud computing should be evaluated for safe and secure options throughout each step, as consistent with OMB cloud strategy[3].
- Open standards should be used whenever practical to increase the interoperability of all government software solutions.
- Targeted considerations must meet HUD operational and mission needs of the solution. Factors such as performance, total cost of ownership, security, privacy, and support should be taken into account.

[3] Office of Management and Budget, U.S. Chief Information Officer Vivek Kundra, "Federal Cloud Computing Strategy", February 2011. https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/egov_docs/federal-cloud-computing-strategy.pdf

B. Participation in the Open Source Community

When HUD releases custom-developed source code as OSS to the public, the code should be released in a manner that fosters communities around shared challenges. This improves the ability of the OSS community to provide feedback and make contributions to the source code. Federal employees and contractors can contribute back to the broader OSS community by making contributions to existing OSS projects[4]. In furtherance of this strategy, HUD will follow these principles:

- Leverage Existing Communities
- Engage in Open Development
- Adopt a Regular Release Schedule
- Engage with the Community
- Consider Code Contributions
- Documentation
  - Status of software (prototype, beta, release)
  - Purpose of software
  - Expected engagement level
  - License details
  - Relevant technical details on how to build, make, install, or use the software, including dependencies

HUD will release at least 20 percent of its new custom-developed code as OSS annually in support of OMB's Open Source Pilot Program. HUD will release as much OSS as possible to further HUD's commitment to transparency, participation, and collaboration. Exceptions are listed in the "Applicability" section of this document.

C. Government-wide Reuse

Contracts for custom development of software will acquire and enforce rights sufficient to enable government-wide reuse of custom-developed code. HUD must ensure contract administration and use of best practices to secure the full scope of the government's rights. This includes sharing and using the code with other federal agencies. HUD must also ensure delivery of the custom-developed code, documentation, and other associated materials from the developer throughout the development process.

Securing adequate rights to enable government-wide reuse of custom-developed code is a critical first step in gaining efficiencies in federal software purchasing. Broad and consistent dissemination of the code across the government is where

[4] Office of Management and Budget, Federal Source Code Policy, Section 5.2

efficiencies are realized. Besides securing the rights described above, HUD will create and maintain an enterprise code inventory that lists all new code that is developed for the Federal Government. This code inventory will be discoverable on Code.gov (https://www.code.gov) and provided upon request from other federal agencies.

Roles and Responsibilities

A. OCIO

The Federal Information Technology Acquisition Reform Act (FITARA) creates clear responsibilities for the CIO related to IT investments and planning and requires the CIO be involved in the IT acquisition process. OMB's FITARA implementation guidance established a common baseline for roles, responsibilities, and authorities of the agency CIO and the roles of other applicable senior agency officials in managing IT as a strategic resource. The CIO and senior agency officials, including the CAO, are positioned with the responsibility and authority to put in place the requirements of this policy. Senior agency officials should also work with the agency's public affairs staff, open government staff, web manager or digital strategist, program owners, and other leadership to properly identify, publish, and collaborate with communities on their OSS projects.

OCIO will create and maintain its inventory of agency information resources in compliance with the metadata schema published on Code.gov. This includes an enterprise code inventory that lists code developed for or by the agency after the publication of this policy. HUD's inventory will be reflected on Code.gov. The inventory will indicate whether the code is available for federal reuse, is available publicly as OSS, or cannot be made available due to a specific exception in this policy. Agencies will fill out this information based on a metadata schema provided by OMB on Code.gov. This will be provided at hud.gov/digital strategy. This activity will be managed by the Software License Manager.

HUD will use accessible, buildable, version-controlled repositories for the storage, discussion, and modification of custom-developed code. This is critical for both the government-wide reuse and OSS goals of this policy. HUD will use recommendations from OMB published on Code.gov when choosing a repository solution. HUD will also ensure that any custom-developed code built through this policy will be compliant with Section 508 of the Rehabilitation Act.

B. Office of the Chief Procurement Officer (OCPO)

OCPO will work with OCIO to ensure that all contracts for the custom development of software will acquire and enforce rights sufficient to enable government-wide reuse of custom-developed code by the inclusion of appropriate contractual language when procuring contracts that will yield custom-developed code. HUD must ensure contract administration and use of best practices to secure the full scope of the government's rights, including—but not limited to—sharing and using the code with other federal agencies.

C. Investment Owners

In following with HUD IT Management Framework, the Executive Investment Board (EIB), chaired by the Secretary of HUD, oversees the strategic direction and investments in the IT portfolio. Supporting committees, including the Customer Care Committee, Investment Review Sub-Committee, and Technical Review Sub-Committee, must handle the consideration of open source, mixed source, and proprietary software solutions equally and on a level playing field. When developing or procuring a new IT solution, project sponsors and solution development leads should use the three-step software analysis process outlined in this document[5]. Projects developed as an open source solution should participate in the open source community when releasing open source code to the public. Guidelines for these activities can be found on Code.gov.

[5] PPM V2.0 Roles and Responsibilities https://www.hud.gov/sites/documents/PPMV20ROLES.PDF

Definitions

Code.gov: This platform is primarily intended to serve two distinct functions. First, it will act as an online collection of tools, guides, and best practices specifically designed to help agencies implement the framework presented in this policy. Second, it will serve as the primary discoverability portal for custom-developed code intended both for government-wide reuse and for potential release as OSS. Code.gov is not intended to house the custom-developed code itself; rather, it is intended to serve as a tool for discovering custom-developed code that may be available for government-wide reuse or as OSS and to provide transparency into custom-developed code that is developed using federal funds. This discoverability portal will be publicly accessible and searchable via a variety of fields and constraints, such as the name of the project, its intended use, and the agency releasing the source code. Code.gov will be accessible at https://www.code.gov and will evolve over time as a community resource to facilitate the adoption of good custom source code development, sharing, and reuse practices.

Custom-Developed Code: For the purposes of this policy, custom-developed code is code that is first produced in the performance of a federal contract or is otherwise fully funded by the Federal Government. It includes code, or portions of code, for which the government could obtain unlimited rights under Federal Acquisition Regulations (FAR) Part 27 and relevant agency FAR Supplements. Custom-developed code also includes code developed by agency employees as part of their official duties. For the purposes of this policy, custom-developed code may include, but is not limited to, code written for software projects, modules, plugins, scripts, middleware, and application programming interfaces (API); it does not, however, include code that is truly exploratory or disposable in nature, such as that written by a developer experimenting with a new language or library.

Mixed Source Software: A mixed source software solution incorporates both open source and proprietary code.

Open Source Software (OSS): Software that can be accessed, used, modified, and shared by anyone. OSS is often distributed under licenses that comply with the definition of "Open Source" provided by the Open Source Initiative (https://opensource.org/osd) and/or that meet the definition of "Free Software" provided by the Free Software Foundation (https://www.gnu.org/philosophy/free-sw.html).

Proprietary Software: Software with intellectual property rights that are retained exclusively by a rights holder (e.g., an individual or a company).

Software: Refers to: (i) computer programs that comprise a series of instructions, rules, routines, or statements, regardless of the media in which recorded, that allow or

cause a computer to perform a specific operation or series of operations; and (ii) recorded information comprising source code listings, design details, algorithms, processes, flow charts, formulas, and related material that would enable the computer program to be produced, created, or compiled. Software does not include computer databases or computer software documentation. Computer software is defined in 48 C.F.R. § 2.101.

Source Code: Computer commands written in a computer programming language that is meant to be read by people. Generally, source code is a higher-level representation of computer commands as they are written by people and, therefore, must be assembled or compiled before a computer can execute the code as a program.

Authorities and References

This policy ensures compliance with these statutes, directives, and guidance:

- Clinger-Cohen Act of 1996 (40 U.S.C 11315);
- Federal Information Technology Acquisition Reform Act, codified by the National Defense Authorization Act for Fiscal Year 2015;
- Improving Administrative Functions Through Shared Services, OMB Memorandum M-16-11; and
- Federal Source Code Policy: Achieving Efficiency, Transparency, and Innovation through Reusable and Open Source Software, OMB Memorandum M-16-21.