

An Information-Resilient Big-Data Workbench with PDP-DREAM Software

Anand, Aniruddh
Taswell, Carl

Brain Health Alliance, USA | aanand@bhavi.us

Brain Health Alliance, USA | ctaswell@bhavi.us

ABSTRACT

PORTAL-DOORS Project DREAM Software, available as an open-source C#-centric codebase from a Github public repository at PDP-DREAM, implements the PDP-DREAM principles and PDP-FAIR metrics with web-enabled workbench software for distributed data repositories in the Nexus-PORTAL-DOORS-Scribe Cyberinfrastructure. PDP-DREAM Software has been developed for Microsoft platform technologies with ASP.NET Core, SQL Server, and Internet Information Server. As a web-enabled workbench, PDP-DREAM provides many features for big data management with tools and services to support information resilience in defense of truth in science and integrity in research.

KEYWORDS

PORTAL-DOORS PROJECT, NPDS CYBERINFRASTRUCTURE, PDP-DREAM SOFTWARE.

INTRODUCTION

The PORTAL-DOORS Project (PDP) began in 2006 with the mission of developing software to serve as a bridge between the lexical web and the semantic web. The original acronyms PORTAL and DOORS represented respectively the phrases “*Problem Oriented Registry of Tags and Labels*” and “*Domain Ontology Oriented Resource System*”. The 2006 architectural blueprint design for the infrastructure system was conceived with PORTAL as an analogue inspired by the IRIS registry system and DOORS as an analogue inspired by the DNS directory system (Taswell 2007). PDP now maintains this distributed data management system as the Nexus-PORTAL-DOORS-Scribe (NPDS) Cyberinfrastructure for big data and metadata repositories. NPDS can be described as a ‘who what where’ diristry-registry-directory-registrar system with Nexus diristries, PORTAL registries, DOORS directories, and Scribe registrars for identifying, describing, locating, and linking things on the internet, web and grid.

PDP-DREAM SOFTWARE

PDP-DREAM Software for NPDS from PDP has been available since its initial public release as open-source software in 2021 at a Github repository PDP-DREAM (Taswell 2021) with the acronym DREAM for the phrase “*Discoverable Data with Reproducible Results for Equivalent Entities with Accessible Attributes and Manageable Metadata*”. PDP-DREAM Software has been coded with the C# programming language for Microsoft platform technologies with ASP.NET Core, SQL Server, Internet Information Server, and a Visual Studio Solution which provides a collection of Visual Studio Projects that manage data repositories in the NPDS Cyberinfrastructure. Nexus servers built with PDP-DREAM Software provide “anonymous user read access to resource metadata in the Nexus diristries, PORTAL registries, and DOORS directories” --- see the website <https://www.portaldoors.org> for “information on the continuing design, development, and implementation of NPDS as a cyberinfrastructure for semantic computing on the internet, web, and grid.” Scribe registrar servers, which require secure https connection for authorized agent write access, provide registrar services for resource metadata and data management at Nexus diristries, PORTAL registries, and DOORS directories. Resource metadata record agents with Author and/or Editor roles may access write privileges at the BHA, GTG, and PDP Scribe Registrars, but not for management of NPDS components where write access is restricted to agents with Admin roles. In an extensible and flexible manner, other independent organizations may instantiate and manage their own problem-oriented domain-specialty NPDS servers to interoperate with those already created by Brain Health Alliance to prototype, develop, and demonstrate the NPDS Cyberinfrastructure distributed network of data repositories.

Branches and Releases

Over the course of the next year, the PDP-DREAM public repository at <https://github.com/BHAVIUS/PDP-DREAM> will follow a software development roadmap with 3 named branches Aoraki, Cervin, and Gangkhar which will be maintained respectively in Microsoft’s current .NET 6, preview .NET 7, and planned .NET 8. Thus, the branches will be named Aoraki-Net6 and Cervin-Net7 with releases in 2022, and Gangkhar-Net8 with releases in 2023. Dated releases will append an 8-digit code for the date of each software release, for example, Cervin-Net7-20221108 anticipated for same date as Microsoft’s release of .NET 7 later this year. All branches and releases will be available from the PDP-DREAM public repository.

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Aoraki-Net6

Aoraki will focus on .NET 6 web apps built with ASP.Net Core MVC Views and Telerik UI for ASP.Net Core.

Cervin-Net7

Cervin will focus on .NET 7 web apps built with ASP.Net Core Razor Pages and Telerik UI for ASP.Net Core.

Gangkhar-Net8

Gangkhar will focus on .NET 8 web apps built with ASP.NET Core Blazor and Telerik UI for Blazor.

Relevance to Information Resilience

Software from PDP for the NPDS Cyberinfrastructure has been in continuous development since 2007. Discussions in the early papers from PDP (such as Taswell 2007 and Taswell 2010) addressed concerns about the importance of distributed and democratized information systems in supporting the free flow of information without monopolization by a single person, organization, or government. Providing support with open-source software for technology platforms that help to counter the spread of false, deceptive, manipulative and/or wrongful information has since become increasingly important as a means of fighting back against the worsening information cyberwars that threaten truth and integrity when preserving the published record of information in libraries. Solutions to some of these problems with the tools available in PDP-DREAM Software will be demonstrated at the ASIS&T 2022 Online Workshop entitled “Who Are the Guardians of Truth and Integrity?” (Craig et al 2022).

CONCLUSION

PDP-DREAM Software, available as an open-source C#-centric codebase from a Github public repository at [PDP-DREAM](#), provides a Microsoft-platform implementation of the PDP-DREAM principles, PDP-FAIR metrics, and web-enabled workbench software for data repositories in the NPDS Cyberinfrastructure. Named branches of the codebase respectively for Microsoft .NET 6, 7, and 8 will be maintained with Aoraki-Net6 and Cervin-Net7 available in 2022 and Gangkhar-Net8 available in 2023. PDP-DREAM Software and the NPDS Cyberinfrastructure will continue to serve as a bridge connecting the semantic web with the lexical web while supporting the PDP mission not only to advance information technology, but also to promote truth in science and integrity in research with information resilience.

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