



What are Enterprise Design Patterns?

Reusable templates that guide the enterprise to implement a set of technologies in standard ways

How do Enterprise Design Patterns relate to the Enterprise?

Enterprise Design Patterns translate OI&T's strategic goals, as documented in the Enterprise Technology Strategic Plan (ETSP), into "real world" direction to guide system design

How can I learn more?

To learn more about Mobile Enterprise Design Patterns, contact Joseph Brooks
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To read the full document, see the TS website:

www.techstrategies.oit.va.gov

To ask questions about Enterprise Design Patterns in general, reach out to AskTS@va.gov

Enterprise Design Patterns: Cloud Computing Architecture

Enterprise Design Pattern Scope: The Department of Veterans Affairs (VA) requires a standard approach for adopting cloud computing services to stay abreast with evolving Veteran-centric business requirements. This Enterprise Design Pattern provides guiding principles for both business owners and OI&T to leverage a standard set of components required to adopt cloud-based Information Technology (IT) solutions. These components consist of virtual servers and storage, delivery models (Software-as-a-Service, Platform-as-a-Service, or Infrastructure-as-a-Service), and secure network connections that enable rapid development, deployment, and operations of IT solutions in accordance with VA Handbook 6500 security and privacy guidelines.

Current State: VA OI&T is evaluating pilot solutions that incorporate commercial cloud services to support business requirements. OI&T has adopted virtualization solutions within regional data centers to support a private cloud environment, but the functionality does not provide the NIST-defined essential characteristics of cloud computing. VA is preparing to leverage additional commercial cloud services that align to the NIST definition as part of its overarching IT strategy and vision documented in the Enterprise Technology Strategic Plan (ETSP). Current capabilities include virtualized environments distributed across many different regional data centers, including those leased by companies such as Centurylink, as well as many private cloud initiatives.

VA IT projects adopting cloud services will improve efficiency and agility in response to changing business needs. This approach leverages industry best practices and applies innovations developed in the private sector for future cloud expandability. Cloud-based solutions reduce development lifecycles and provide platforms that support modern applications (e.g., distributed applications composed of fine-grained, loosely coupled units known as microservices), and Development Operations (DevOps) best practices. Together, this forms the basis of the cloud computing architecture: reducing OI&T's burden of planning, provisioning, and maintaining IT infrastructure while incorporating an agile development processes.

Design Pattern Solution: This Enterprise Design Pattern documents VA's current cloud initiatives, defines the attributes of centralized cloud architecture, and provides recommendations that facilitate integrating existing cloud environments into a centralized cloud architecture. VA continues to evolve toward a true cloud environment that will realize the business needs described in Section 1 of this Enterprise Design Pattern. Section 1 outlines the benefits, architecture concept, approach, and example cloud-based tools and technologies currently approved for use in VA. An enterprise cloud computing architecture has the potential to: reduce costs; enable resource pooling; facilitate service flexibility while continuing to provide an environment that meets VA business needs and requirements; enable rapid provisioning; provide benefits from economies of scale; and centralize billing. Advantages of cloud architectures include: faster setup speed; cost reduction through reduced capital expenses and operational expenses associated with maintaining an internal IT infrastructure; and improved flexibility and scalability through automated configuration management and security.

A high level approach for establishing a cloud computing architecture includes several steps. Cloud brokerage solutions will be established in accordance with Enterprise Cloud Services Broker (ECSB) Enterprise Design Pattern. Cloud migration guidelines will be set for both production legacy systems and new applications developed in a "green field" environment. Strategic sourcing will be conducted to identify viable commercial cloud service providers that satisfy FedRAMP and VA Handbook 6500 policies for security and privacy. Business relationships will be built with commercial cloud service providers. Cloud service providers will be adopted and approved for use in the TRM. Continuous improvement will be implemented based on lessons learned.