



Cloud Architecture Services

Your Proven Partner for Cloud Services!

As cloud adoption grows, it's important to choose a cloud services partner who brings the documented knowledge and experience to get the job done right! Business Enabled Acquisition and Technology (BEAT, LLC) is that partner.

Enabling Cybersecurity Big Data Analytics in the Cloud!

When Air Force Cyber needed a GovCloud based big data solution capable of operating across multiple levels of classification, we answered the call! B.E.A.T. worked directly with our Air Force customer to develop the requirement, establish a rock-solid plan for a proof of concept, and delivered the solution early. Our solution included cloud architecture, operations & maintenance, analytic development, user training, and full accreditation support. We smashed expectations, and ultimately helped establish a brand new weapon system providing, for the first time ever, near real-time analytics and alerting across multiple data sources from around the globe!

Agile DevSecOps in the Cloud!

Defense Health Agency (DHA) and Military Health Systems (MHS) rely upon BEAT, LLC to deliver unparalleled, superb quality service and IT support across a plethora of programs and activities. When Solution Delivery Division (SDD) had a need to establish a cloud-hosted environment to support development and testing, we delivered! The development allows ubiquitous access via VPN with multifactor authentication (MFA), as well as protocol-specific access control list (ACL) capability to provide narrow access for read-only testing.

Microservices Development in the Cloud!

BEAT, LLC is migrating the Defense Occupational and Environmental Health Readiness System – Industrial Hygiene (DOEHRS-IH), a long-established, legacy monolithic application, to a containerized, microservices architecture using Kubernetes for management and orchestration. Once again, BEAT, LLC sprang to action, established a secure development environment, created a detailed, time-based project plan, secured stakeholder buy-in, and got right to work delivering the solution.

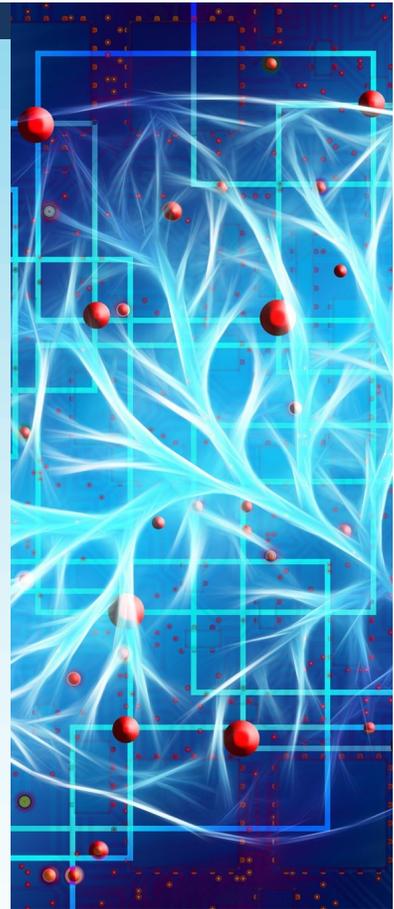
Adherence to Essential Cloud Characteristics

NIST SP 800-145 defines Software as a Service (SaaS) as “The capability provided to the consumer is to use the provider’s applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings.”

Our Approach

BEAT's SaaS infrastructure consists of purpose-built, collections of hardware and software designed to deliver *The Five Essential Characteristics of Cloud Computing*, described on page 2. Our cloud infrastructure provides 2 distinct layers:

- 1) A Physical Layer - These are the hardware resources that are necessary to support the services being hosted (i.e. servers, compute resources, storage, and networking).
- 2) An Abstraction Layer - This is the software or collection utilities, which are hosted on and supported by the physical layer components.



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Special points of interest

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)



Three (3) Aspects of Cloud Services

- 1. Infrastructure as a Service (IaaS)** enables agencies to provision processing, storage, hardware, networks and other fundamental computing resources on a third-party infrastructure they do not own, maintain, or manage.
- 2. Platform as a Service (PaaS)** allows agencies to deploy consumer-created or acquired software applications created using programming languages and tools, and to manage hosting environment configurations on a third-party infrastructure they do not own, maintain or manage.
- 3. Software as a Service (SaaS)** enables agencies to use provider's software applications running on a third-party infrastructure, accessible through a thin client interface such as a web browser.

BEAT specializes in providing SaaS solutions to deliver commodity and custom solutions based on our customer's unique requirements. This allows our customers to focus their resources on the pursuit of critical mission objectives rather than the technology required to facilitate their efforts.

BEAT has proven experience providing fully managed SaaS capabilities for activities, including enhanced security operations via a highly customized, fully integrated big data ecosystem, enabling rapid deployment of custom analytics, robust search capabilities, actionable alerting, and meaningful visualizations and dashboards complete with a graphical user interface (GUI) for user access and management functions.

Additionally, we have experience delivering a variety of fully managed and maintained COTS and GOTS software solutions across a variety of cloud deployment models. We also led efforts to modernize existing legacy, monolithic applications by building micro-services and container-based architectures leveraging Docker, Kubernetes, Terraform, etc.

Finally, we are capable of delivering solutions which provide our customers access to highly advanced and emerging technologies, including Artificial Intelligent and Machine Learning (AI/ML), Natural Language Processing (NLP), business analytics, such as trend and link analysis, valuable integrations with other internal and external sources, like geolocation data, threat intelligence, and other highly specialized use-cases.

Cloud Computing Services Deployment Model

BEAT understands that our customer's mission requirements may inform the need for particular deployment model or models as described in NIST SP 800-145. Therefore, our SaaS offerings are specifically configured to offer a variety of deployment model options, including one or more deployment models based on our customer's unique needs.

We are capable of delivering any combination of private, community, public, or hybrid clouds environment(s) to support virtually any mission, including research & development, quality & acceptance testing, security & code analysis, production use-cases, etc.

Our **private cloud** offering provides a custom-tailored solution for exclusive use by only that customer and their authorized users. The customer may choose to purchase, own, manage, and operate their private cloud or engage BEAT or any third-party to assist them. Additionally, the customer's private cloud may be hosted on-premise or in one or more off-site facilities.

BEAT's **community cloud** is available for use by a limited community of customers who require a common cloud-based infrastructure due to shared objectives, missions, security requirements, policy, or compliance requirements. Similar to the private cloud, it may be owned, managed, and operated by any one or combination of community members, BEAT, or a third-party and may, likewise, be hosted on-premise or in one or more off-site facilities

Our **public cloud** infrastructure is available for use by virtually any individual, organization, or entity. It may be owned, managed, and operated by any customer, regardless of their use-case(s). Our public cloud is host in off-site facilities managed and operated by BEAT or other commercial cloud provider.

BEAT's **hybrid cloud** solution is any combination of two or more deployment models, such as private, community, or public) which are connected to facilitate resource sharing, expand capabilities, or provide access beyond the potentially limited scope of any specific deployment model. A hybrid cloud allows our customers to continue leveraging an existing private cloud while leveraging public or community cloud options to expand capability, provide redundancy and portability, or improve and enhance access.

The Five essential characteristics of cloud computing

According to NIST SP 800-145, the five essential characteristics of cloud computing consists of the following:

- 1) On-demand self-service
- 2) Broad network access
- 3) Resource pooling
- 4) Rapid elasticity
- 5) Measured service

BEAT provides **on-demand self-service**, which delivers to our customers the capability of defining, configuring, provisioning, deploying, and managing their hosted-components, including the scheduling of compute and storage resources programmatically. This removes the requirement for customers to coordinate directly with BEAT personnel. The result is a marked improvement in operator efficiency, reduced down-time, and simplified contract administration requirements.

BEAT's SaaS offering delivers **broad network access** by ensuring our solution provides ubiquitous network access, based on the customer's desired requirements and access controls. SaaS resources are designed to easily accessed and managed from a wide array of operating systems, devices, and platforms, including smart phones, tablets, desktop and server operating systems. The system can likewise be easily accessed from thin-clients and under-powered systems such as Chromebooks, Raspberry Pi, or older hardware running a stripped-down linux kernel. Such devices only require network access via the internet or VPN (Virtual Private Network) to facilitate access.

BEAT's solution leverages **resource pooling** to deliver advantages through economies of scale. Our storage and compute resources are pooled, which allow us to provide our offerings to several distinct customers simultaneously. Our multi-tenant solution allows resources to be dynamically assigned and reassigned based customer need. BEAT's resources are geographically distributed to provide redundancy and enhanced availability. We further provide physically separated resource pools to enable operability across a variety of classification levels and to ensure resources adhere to various Information Impact Levels (IL) as detailed in the DoD Cloud Computing Security Requirements Guide (SRG). Additionally, customers have the option to designate their preferred resources pools based on Impact Level requirements.

BEAT's solution(s) are designed to provide **rapid elasticity**. This allows storage and compute resources to be rapidly expanded or deprovisioned based on real-time resource utilization requirements, often automatically via configurable thresholds based on utilization metrics. This helps to ensure availability during periods of high or peak demand, while allowing customers more control over costs by right-sizing resources during periods of baseline utilization.

Finally, BEAT's SaaS offering(s) provide the **Measured service** characteristic as well. Detailed metrics are collected to provided valuable monitoring of resource health, availability, utilization, and access. This allows our cloud resources to be orchestrated to provide maximum efficiency and cost optimization. Metrics can be monitored to provide alerting, automate provisioning to deliver rapid elasticity, and analyzed to facilitate fact-based sustainment and planning decisions. Customers can also access pre-built dashboards/reports or create customized dashboards/reports for briefing stakeholders and decision-makers, projecting costs, or identifying resource bottlenecks or inefficiencies.



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