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Standardize • Stabilize • Economize with Envy

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Introductions/Panelists

Environments on demand

AWS	SBCTC	TBGI
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What can Envy do for you?

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Environments on demand

What is Envy?

- Envy is a massive event engine which, when applied to a standard architecture, can create PeopleSoft environments on demand.
- Envy creates completely scripted PeopleSoft environments in the AWS cloud.
- All Envy-generated environments are entirely ephemeral, including production.
- Envy was created beginning in 2015 as part of University of Arizona's PeopleSoft migration to the AWS cloud.

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What is the AWS Well-Architected Framework?

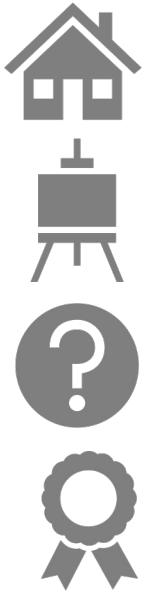
AWS Well-Architected Framework

Pillars & Lenses

Design Principals

Questions

Best Practices



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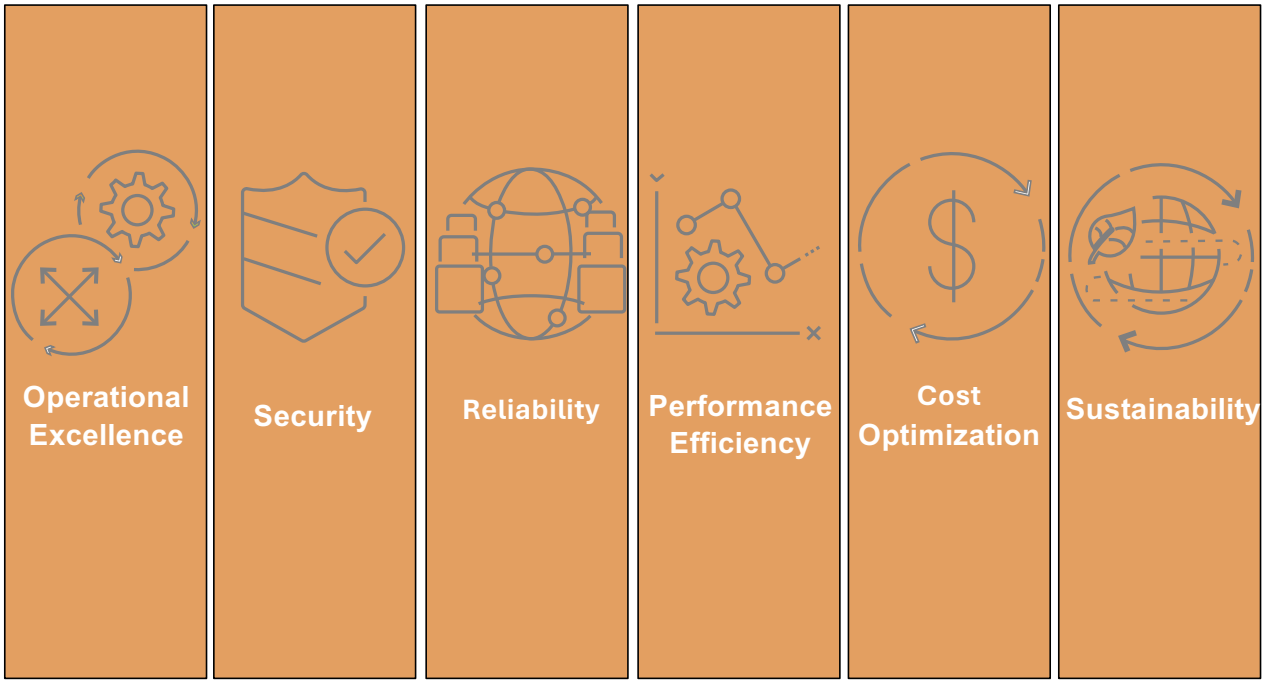
Pillars of the AWS Well-Architected Framework

AWS Well-Architected Framework



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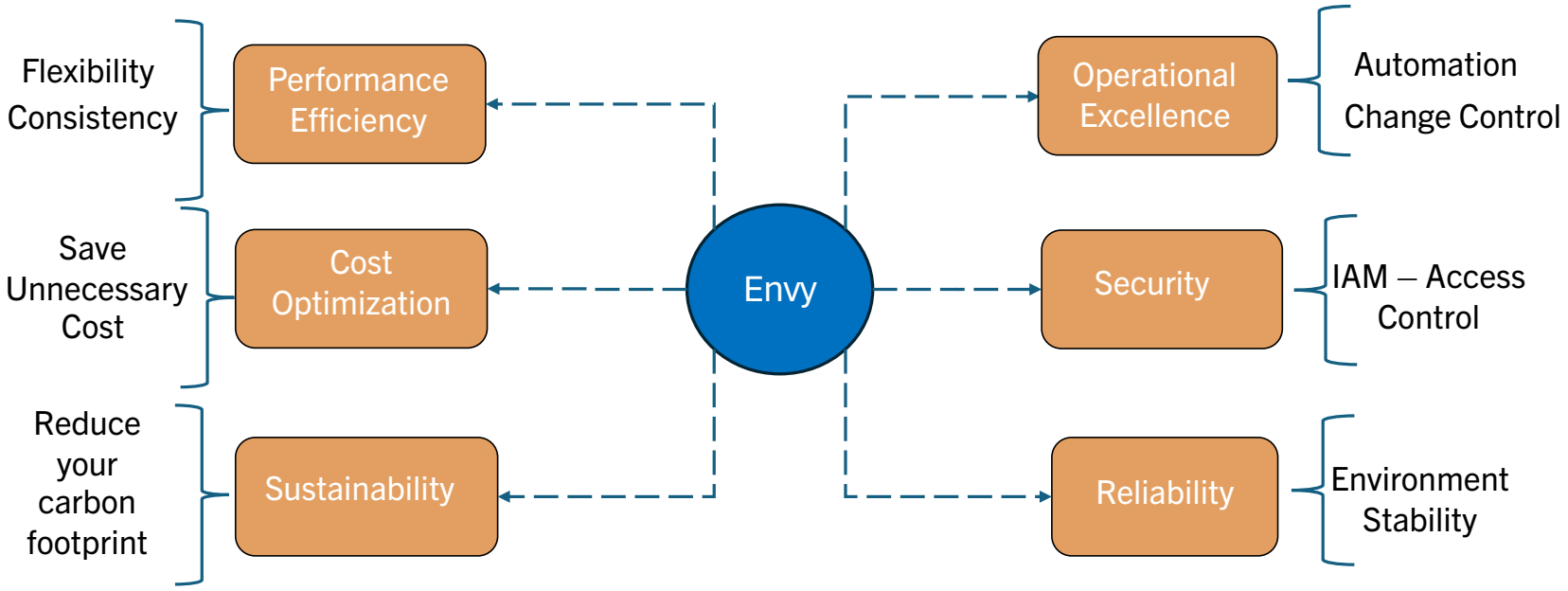
How ENVY resonates with AWS Well-Architected Pillars

Envy And AWS Well Architected Framework



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The cloud automation with Envy isn't (just) about efficiency

Envy Cloud Automation Benefits

Speed

Deploy many times a day instead once every few months

Confidence

If you're not sure whether it'll work, you'll hesitate. That slows you down and keeps you from fixing problems

Transparency

Automated processes can be measured and improved

Repeatability

Avoid error-prone manual processes for recurring operational tasks

Disposability

If it is easy to re-create something, it's also easy to get rid of it.

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What can Envy do?

Delivered Envy functionality

1. Scaling – Envy can increase or decrease the number and type of web, application and other services used to create your application environments. So massive scaling can be done hours or minutes before a new product launches, a reporting period commences, and so on. Resources can also be downscaled immediately after an event.

2. Launch – Because environments can be launched so quickly with Envy, you will not need to allow non-production environments to persist. Launching a previously seeded environment takes about 40 minutes to complete.

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What can Envy do? (Part 2)

Delivered Envy functionality

3. Shut down – By specifying only a very few parameters, Envy can shut down an environment. Before doing this, Envy will ask if you'd like to take a backup. If a backup is requested, this artifact and the metadata needed to differentiate your various environments will be the only thing remaining after an environment is shut down. A shut down takes about 15 minutes to complete.

4. Lifecycle management – Patches, PeopleSoft Update Manager upgrades (PUMs), PeopleSoft application version upgrades, and any other major or minor application upgrade that alters the state of the database must use traditional methods to make changes to the database.

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What can Envy do? (Part 3)

Delivered Envy functionality

5. Server upgrades – To upgrade your servers, TBGI revises your Dockerfiles to show the current version of the server software. We then create a new image with Docker Engine and tag it as the new version. Then we use Amazon ECS to call the new Docker image and launch the container services. When the new image is stored in Amazon ECR, the new version of the servers can be launched repeatedly for various pillars, or servers. A server upgrade takes 30 minutes with Envy.

6. Database upgrades – Because Envy uses Amazon RDS to provide the database services, we can upgrade your database by simply calling the new version of Amazon RDS database. For RDS instances with multiple Availability Zones enabled, the upgrade occurs without an outage. If multiple Availability Zones are not enabled, a brief outage occurs.

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What can Envy do? (Part 4)

Delivered Envy functionality

7. Database refreshes – Refreshing a database with Envy requires specifying a source database and/or snapshot or creating a new snapshot, specifying a target database, and scheduling or launching the refresh. Refreshes take about 45 minutes to complete.
8. Database backups – Envy can perform your backup tasks according to your backup policy. Just specify the frequency for backups and the number of backups to be retained, and Envy will perform the necessary backups and deletes. Back ups take about 10 minutes to complete.
9. Monitoring and alerts – Envy uses CloudWatch Dashboards, Metrics, and Alarms to ensure all services are operating properly. Envy also subscribes to TBGI automations and AWS system events and defines a set of rules for triggering alarms. When alarms are set off, another alarm router process kicks off a customized workflow in AWS Step Functions to handle the alarm.

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What can Envy do? (Part 5)

Delivered Envy functionality

10. Amazon WorkSpaces and Transfer Family – These services are used by the technical teams to manage PeopleSoft application development and administration. PeopleSoft PeopleTools are installed on these servers.
11. Disaster recovery – TBGI recommends that snapshots of your production database, which correspond to your recovery point objective (RPO) policies, be stored in a separate AWS account. Envy will use these snapshots to launch a disaster recovery environment when needed.
12. Scheduling – All Envy functionalities can be kicked off manually or be scheduled. Scheduled functionalities can be one-off or recurring.

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Standardize with Envy

Completely scripted environments

- TBGI's custom cloud formation templates specify the network/VPC architecture for the environments.
- TBGI's custom Docker containers specify the server configurations and versions for the web and app layers of the environments. ECR and ECS are used to manage the containers.
- AWS RDS service is used to manage the database layer.
- Envy's event engine coordinates both the AWS delivered and TBGI custom components of the environments.
- This means that every environment is completely standardized as specified by the above components.

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Production architecture

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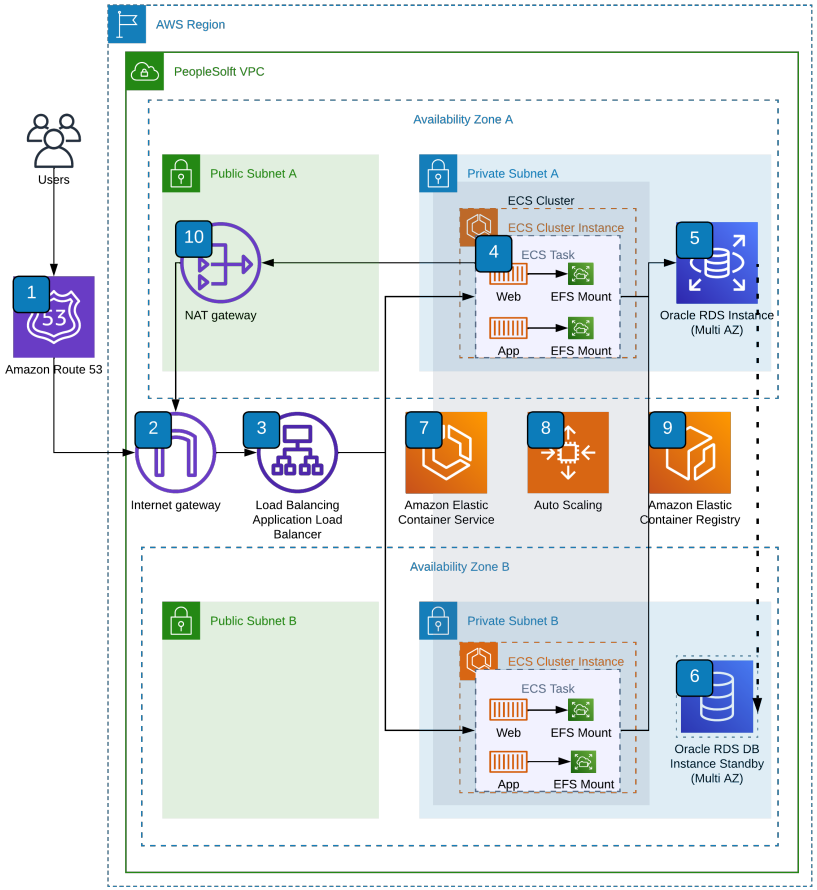
High availability



1. Rout 53 is used to lookup the A Record alias to the load balancer.
2. An internet gateway provides access from the internet to the VPC with a route to the public subnets.
3. Application load balancers route traffic to the ECS tasks and manage health checks.
4. EFS mounts are created for each pillar and mounted on the Docker containers. These hold file-based data that is shared between all web/app servers. They also hold web and app server logs.
5. RDS is used for the environment databases. Automated snapshots with backup and retention policies are defined based on the requirements for the environment.
6. Multi AZ is enabled for production databases which allows for HA configuration in the event of a single AZ outage.
7. ECS services are defined for the web/app PIAs, Integration Broker PIA, and PIAs for public sites.
8. Auto scaling groups are defined with launch configurations based on requirements for environments. Non-production environments have a single ECS instance in one AZ. Prod environments have a minimum of two ECS instances and tasks for redundancy and HA. This can scale out based on the resource requirements of the environment.
9. Amazon ECR is used to store Docker images.
10. NAT Gateway is used to allow outbound connections to resources on the internet.

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Non-production architecture

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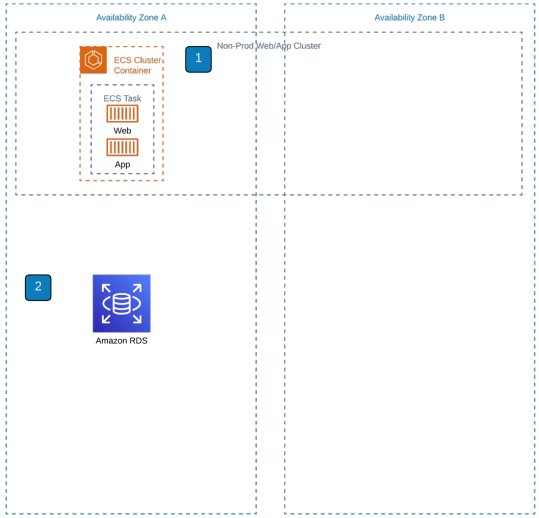
Scheduled downtown

Normal-Business-Hour Deployment

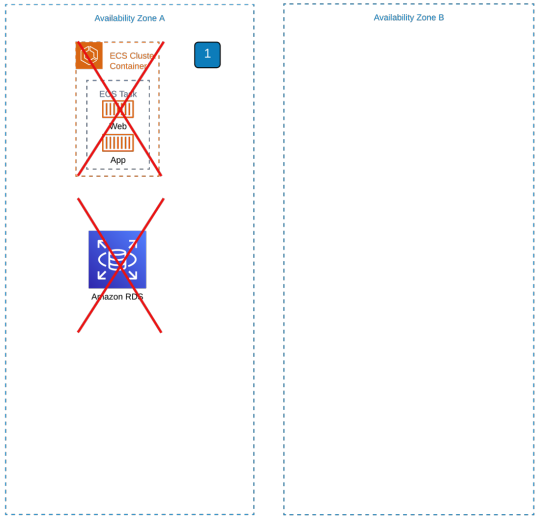


1 Non-production environments have a simplified architecture where there is only one application cluster. This cluster handles web/app, IB, and batch processing. Further, it is deployed as a single instance in a single AZ. There is no need for an active/active HA configuration in the non-production environments.

These environments are automatically built each morning and available 7AM-7PM. Then each night, an RDS snapshot is taken and the environment and all supporting resources are destroyed. This helps save cost by only keeping non-production environments up during normal business hours.

2 Also, the RDS instance that supports the environment is not deployed as a multi-AZ instance. There is no need for the active/passive HA configuration for RDS in non-production environments.

Non-Business-Hour Deployment



1 In off business hours, 7PM-7AM, the non-production environments are completely destroyed. They do not exist during that time. The only artifact that is retained is a database snapshot so the environment can be restored the following day at 7AM.

It should also be noted that the 7AM-7PM uptime is scripted and automated. The uptime schedule can be adjusted as needed to meet business needs.

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Stabilize with Envy

Proven architecture

- The Envy architecture has been in production since 2016.
- Hundreds of Envy environments are in use right now.
- The environments have proven extremely robust.
- Standardized architecture makes is easier to replicate issues.
- Envy's monitoring scheme usually identifies issues before users experience any deterioration in service.
- Envy's self healing capabilities are constantly expanding to resolve past issues in the future.

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Economize with Envy

Extra cycles
For your staff
and extended
life for your
application

- Envy will save your users time and aggravation with a reliable application experience.
- Envy will economize your infrastructure costs.
- Envy will save your staff a substantial amount of time meaning you can utilize your PeopleSoft administrative staff for other projects.
- Envy may enable you to postpone a PeopleSoft replacement project and utilize PeopleSoft longer

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Implementing Envy

A six-month migration

- Implementing Envy does require a migration into TBGI's standard PeopleSoft architecture within the AWS cloud.
- This is true even if your implementation is already located in the AWS cloud.
- Our services assume a bring your own license model for both the application and database licenses.
- Utilizing RDS will be part of the migration.
- A migration takes six months on average, but we have successfully migrated a client in three months.
- TBGI charges its regular, monthly managed services fee for an agreed number of months/project plan to perform the migration. There is no additional migration fee.

Burgundy Group is not just a vendor. They are so much more!

Kenn Nied
SBCTC

- **Embedded Team:** The Burgundy Group is not just a vendor but an extension of our team at SBCTC. Their experts seamlessly integrate with our internal IT team, working collaboratively to achieve our goals and deliver exceptional results.
- **Seamless Integration and Support:** With the Burgundy Group as an extension of our team, we benefit from seamless integration and support. Their experts are readily available to provide assistance, guidance, and expertise whenever needed, ensuring smooth operations and minimal disruptions.
- **Proactive Communication and Collaboration:** The Burgundy Group fosters a culture of proactive communication and collaboration, actively engaging with our team to exchange ideas, share insights, and work together towards achieving common objectives.
- **Expertise in AWS:** The Burgundy Group brings top-notch expertise in AWS to the table, with a team of skilled professionals who are well-versed in cloud technologies and best practices. Their deep knowledge of AWS allows them to design and implement robust, secure, and scalable solutions that align with our business objectives.
- **PeopleSoft Proficiency:** In addition to their AWS skills, the Burgundy Group excels in PeopleSoft, demonstrating a high level of proficiency in this complex enterprise application. Their expertise in PeopleSoft enables them to provide specialized support, customization, and optimization services that enhance the performance and functionality of our PeopleSoft systems.
- **Trusted Advisor:** Beyond being a vendor, the Burgundy Group serves as a trusted advisor to our organization. Their deep expertise with Peoplesoft and AWS makes them a valuable partner in helping to drive innovation, efficiency, and growth within SBCTC.

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Leveraging the event engine

Extending Envy?

- Envy can be, and has been, successfully extended to additional applications.
- Extending Envy to a new application requires establishing an ideal architecture and creating a corresponding CloudFormation template, creating custom Docker containers for the application servers, modifying the event engine to utilize these new components.
- Extending Envy to a new application can be done during a typical migration timeline. No additional time or expense is required.
- To date Envy has been extended to GoldenGate, OnBase and Kuali.

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What's next?

Managed service or platform as a service

- Envy is currently available only as a proprietary tool TBGI utilizes on behalf of its managed services customers.
- TBGI is in the process of making Envy available as a PeopleSoft environment management tool available for client use. Envy would then be available on a monthly subscription basis.
- Clients would be responsible for supporting and maintaining their PeopleSoft applications.
- TBGI would be responsible for supporting and maintaining Envy.
- A migration would still be required before clients could use Envy on a subscription basis.

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About TBGI

PeopleSoft managed services

Envy as a subscription service

- TBGI was incorporated in the State of Arizona in 1998.
- TBGI is a PeopleSoft application, Oracle database and AWS infrastructure managed and consulting services firm.
- TBGI owns a set of proprietary PeopleSoft environment management tools for the AWS cloud. We refer to these tools as "Envy" (environment management event engine).
- Envy is a proprietary tool that TBGI uses on behalf of its PeopleSoft environment management services clients.
- Envy is also available, on a subscription basis.
- See our AWS whitepaper describing our automations at: https://docs.aws.amazon.com/whitepapers/latest/automating-peoplesoft-environments/automating-peoplesoft-environments.html
- Visit us at www.tbginc.com

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Questions

Please use the chat function to ask your questions

- We'll answer as many questions as we can during the remainder of our time.
- If we can't get to your question, please feel free to contact me at jeff.davis@tbginc.com.
- We will post this presentation on our website for your reference.

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