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Aim: Case Study on DevOps Implementation in the Real World

Topic: Call of Duty: Black Ops 3 Zombies

Company: Treyarch

Executive Summary

Call of Duty: Black Ops 3 Zombies is not just a popular game mode; it's a masterclass in modern, live-service game development that aligns perfectly with DevOps principles. Treyarch's approach to developing the base game and its subsequent DLC (Downloadable Content) packs demonstrates a mature CI/CD (Continuous Integration/Continuous Deployment) pipeline. Furthermore, the strategic decision to support Custom Zombies on PC transformed the community from passive consumers into an active extension of the development and operations team, a quintessential DevOps outcome. This case study will analyze Treyarch's processes DLC-wise and explore how Custom Zombies represents the ultimate expression of a DevOps culture.

1. The Core DevOps Philosophy at Treyarch

For a franchise as high-profile and time-sensitive as Call of Duty, a traditional "waterfall" model (long development cycles with distinct, sequential phases) is untenable. Treyarch adopted an agile, iterative approach that mirrors DevOps:

- **Cross-Functional Teams:** Level designers, artists, programmers, and QA worked in parallel on different aspects of a map (e.g., core layout, Wonder Weapons, Easter Eggs).
- **Continuous Integration:** Code and asset updates were integrated into a main branch frequently, allowing for early detection of conflicts and bugs.
- **Continuous Testing:** Automated and manual testing occurred throughout the development cycle, not just at the end.
- **Feedback Loops:** Internal playtesting and feedback from earlier DLCs directly influenced the design and balancing of subsequent maps

2. DLC-Wise Breakdown: A Continuous Delivery Pipeline

The DLC season for Black Ops 3 consisted of six major content drops (including the base game's "Shadows of Evil"). Each DLC can be viewed as a "release" in a CI/CD pipeline.

DLC	DevOps Phase	Treyarch's Implementation & Evidence
Base Game: Shadows of Evil	Plan & Code	Established the core technology stack (the modified IW engine), core gameplay mechanics (GobbleGums, specialist weapons, movement), and core narrative. This was the foundational "build" environment.
DLC 1: Der Eisendrache	Build & Test	Iteration on a Theme. Built upon the foundation of "Shadows of Evil" but simplified the core quest. Introduced elemental Wonder Weapons built from core parts (a repeatable, buildable system). This shows learning and adaptation from the first release.
DLC 2: Zetsubou No Shima	Test & Release	Pushing Boundaries. Introduced complex mechanics like plant cultivation and spider-boss enemies. This map was notably buggy at launch, indicating a potentially rushed testing phase or a failure in the CI pipeline to catch all edge cases. A valuable, if painful, lesson in the "Release" phase.

DLC 3: Gorod Krovi	Feedback & Iteration	Application of Learnings. Treyarch responded to feedback. The map featured a more straightforward setting (a war-torn Stalingrad) and refined the complex questlines. Introduced a highly challenging but fair boss fight. Shows the "Feedback Loop" in action.
DLC 4: Revelations	Operate & Monitor	The grand finale. This map was a "greatest hits" compilation, reusing assets from previous maps in a new context. This demonstrates efficient use of existing, tested assets to create a new experience, a key DevOps principle of reusability and efficiency.
DLC 5: Zombies Chronicles	Scale & Optimize	A massive operation to remaster and port eight classic maps to the Black Ops 3 engine. This required a highly optimized pipeline for updating assets, mechanics, and AI while preserving the original feel. This is a masterclass in scaling a proven platform to deliver immense value post-launch.

3. The Masterstroke: Custom Zombies as Community-Driven Operations

The single most significant DevOps-minded decision Treyarch made was the official support for **Custom Zombies** on PC. This can be viewed as providing the community with their own "development and production environment."

- **DevOps Analogy:** Treyarch provided the "platform" (the Black Ops 3 engine, assets, and mod tools), and the community became the "development teams."
- **Continuous Delivery by the Community:** The community operates its own massive, parallel, and continuous delivery pipeline. New maps, weapons, modes, and mechanics are released by community developers weekly, far exceeding the pace any single studio could maintain.
- **Innovation & Feedback:** Custom Zombies acts as an immense, free R&D lab for Treyarch. Concepts that become popular in the custom scene (e.g., specific enemy types, gameplay modifiers, new perk ideas) can be observed, tested, and formally integrated into future official titles (as seen with ideas that influenced Black Ops 4 and Cold War Zombies).

- **Extended Product Lifespan:** By empowering the community, Treyarch effectively outsourced "Operations" for a significant segment of the player base. This has kept Black Ops 3 actively played and sold years after release, a key DevOps goal of maintaining system reliability and user engagement.

4. Measurable Outcomes & Conclusion

The DevOps-inspired strategy for Black Ops 3 Zombies yielded clear results:

High-Quality, Consistent Releases: Despite the intense annual pressure, each DLC was a polished, content-rich experience (with minor exceptions that were later patched).

- **Rapid Iteration Based on Feedback:** The evolution of map design from Der Eisendrache to Gorod Krovi shows an ability to listen and adapt quickly.
- **Unprecedented Longevity:** The game, released in 2015, remains one of the most active Zombies experiences on PC due primarily to Custom Zombies.
- **Innovation at Scale:** Treyarch leveraged a global community of developers to test new ideas and extend the game's lifecycle indefinitely.

In conclusion, Treyarch's work on Black Ops 3 Zombies is a stellar real-world example of DevOps in game development. By establishing a robust internal CI/CD pipeline for DLC and then brilliantly extending their "platform" to the community through Custom Zombies, they achieved continuous delivery, innovation, and operational excellence that continues to pay dividends nearly a decade later.

5. References:

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