

PERFORCE

# Version Control in Game Development Best Practices



# The Challenge

## Managing Tons of Content and Talent

Every game studio wants to give their audience a unique gaming experience. This means working through the challenges of managing diversely talented teams, massive digital files, and multiple content types. It also means supporting a growing number of artists & designers, whose work is key in setting the finished product apart aesthetically.

This best practices guide offers advice and insights straight from some of the most innovative studios in game development. Learn how five Helix Core users — ranging from small startups to creators of the world's most popular games — accelerate game development with foundational tools, optimized environments, simplified processes for creatives, and more.



Epic Games is the creator of one of the most popular games in the world and the leading game and 3D engine, Unreal. They simplify branching using the visualization features in Perforce Streams.



Firelight Technologies uses Helix Core and Streams to simplify codeline management. Their workflow minimizes conflicts and ensures every team member is able to work efficiently.



RiffRaff Games makes inventive games by supporting their creative team with easy-to-use tools and ongoing training. Prioritizing their Helix Core server configuration has kept it low-maintenance.



Bit Fry Games Studio is behind the most comprehensively licensed sports game franchise in the world. They prioritize cross-team collaboration and reducing complexity for their creatives.

**19/20 top AAA game dev companies choose Helix Core because it manages all file types, petabytes of data, and millions of files.**

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# Utilizing Streams Visualization

## Epic Games: Leading An Industry

Epic Games is pushing the limit on innovation. They operate one of the world's largest games, Fortnite, and they're laying the foundation for other creators and problem-solvers. Their industry-leading game and 3D engine, Unreal, empowers teams in industries from media & entertainment, automotive, architecture, and more to create new worlds and fine-tune the one we live in.



# Epic Games

## Leading An Industry

## Stabilizing Release & Team Branches

Using Helix Core, Epic Games challenges their sub-teams to independently manage the different slices of their engine development, which allows them to experiment in isolation from the mainline. Each individual branch is then run through a QA process before any of the code is copied back up to the mainline track. This creates a highly stable release process for project content. Individual team branches stay more stable, too, because any changes merged down into those branches have already been vetted through the QA process.

## Alleviating Confusion with Perforce Streams

It's the visualization tools of [Perforce Streams](#) that keeps all this chaos connected and easily tracked. From Time-lapse View™, to Revision Graph, to P4Merge, Helix Core gives Epic Games a single source of truth for branch actions. As a result, content creators can stay productive in the mainline and programmers keep working efficiently in their team branches. Build managers can see it all in one place and coordinate effectively.

### TAKEAWAYS AND TIPS



#### Reduce Excessive Branching

Reduce excessive branching structures to improve efficiency and productivity.



#### Predefine Processes

Predefine processes to reduce workflow friction and delays.



#### Limit Review and Editing

Limit review and editing to specific branches/streams to improve product quality.



#### Implement Best Practices

Implement best practices: merge up/copy down to reduce errors and complications in the release stream.

### LEARN MORE

[PERFORCE STREAMS](#)

[UNREAL ENGINE RESOURCES](#)



# Keeping a Complete Code History & Simple Branch Structure

## Firelight Technologies: Powering Audio Innovation

Firelight Technologies, based in Melbourne, Australia, is behind the music and sound effects in some of the most popular video games, including the Forza Motorsport franchise, Roblox, and Minecraft. Its industry-leading tool, FMOD, provides a powerful platform for teams to implement interactive and adaptive music and sound design. Firelight Technologies aims to empower sound designers to create unique audio experiences, and their solutions run inside of the game, rendering in real-time.

[Read the full case study](#)



# Firelight Technologies

## Powering Audio Innovation

### Jumping Back In Time, Anytime with Helix Core

Being able to revisit any previous version of their code at any time is invaluable to Firelight's process. It's one of the main reasons Firelight chose Helix Core for source control, and why they even offer a Helix Core integration within FMOD — they are able to jump back in time. As changes are being made, Helix Core coordinates code changes, ensuring work is never overwritten or lost.

**“Perforce [Helix Core] history is invaluable. It protects the source code. It manages check-ins and merging. We refer to it almost constantly.” — Mathew Block, Technical Director at Firelight Technologies**

With this history, everyone on the team can understand why a feature works a certain way, who created it, and when. The accumulated history helps Firelight Technologies avoid repeating past mistakes. And teams can experiment knowing they always have a backup in case something goes wrong.

### Reducing Conflicts with Streams

To help teams move faster, Firelight uses Perforce Streams. They usually have two or three active streams at any given time. With Streams, everyone from admins to developers can worry less about conflicts. There is no guess work when wondering where changes should flow. Streams supports their branching model, allowing them to keep their main stream stable, while still supporting past releases. Fixes and patches can be pushed out without risk of refactoring.

Streams creates a natural flow of change and lets the team visualize how code evolves. A developer can look at the Stream Graph and know how to branch and where to merge. For technical directors like Block, it allows him to see how everything is laid out for his organization and help minimize the number of branches to support.

#### TAKEAWAYS AND TIPS



##### Use Streams

Use Streams to simplify codeline management by understanding when – and in what direction – code should be copied/merged between branches.



##### Keep Every Version

Keep every version of code so you can easily revert if something goes wrong.



# Prioritizing Process & Training for Creatives

## RiffRaff Games: Making Inventive and Unique Games

RiffRaff Games' mission is to be the most inventive game studio in the modern era, bringing high-concept creations and new genres to a wide audience. To set themselves apart, they look at the existing games market and ask what's missing, whether that be unique mechanics, narrative structures, stylistic designs, or tone. The challenge is coming up with fresh ideas and implementing them in new ways. One important way they achieve this is supporting the creativity of their team.

[Read the full case study](#)





# RiffRaff Games

## Making Inventive and Unique Games

### Creating a Solid Foundation

RiffRaff Games chose Helix Core because of how easy it is for indie developers to launch and start using. Studios can deploy it on-premises or in a pre-configured cloud environment. While Helix Core works well for indie teams out-of-box, RiffRaff opted to invest time up front to ensure they configured their server according to their long-term needs. Years later, “Perforce [Helix Core] is the one system with no problems the entire duration,” says their Producer, Claire Barilla.

Much of this up-front time was spent automating their backup process and staff training. “The backup process, like many things, was pretty straight forward thanks to the docs, but I spent a lot of time verifying the system and the backup results,” says Jordan Ewen, Technical Director at RiffRaff Games.

### Keeping It Simple

On the whole, they ensured their Helix Core server would remain reliable for a long time by making the setup as simple as possible. Since they don’t have a dedicated IT team, they based decisions on what would be easy to manage and maintain with limited resources. They followed Perforce’s recommended configurations of Helix Core and limited customizations. They automate as much as possible. “We have relatively few moving parts in our system,” says Ewen.

To support their artists and designers, RiffRaff takes the time to teach workflows and make sure their team feels comfortable working in both P4V and the Unreal source control tools. They teach the creative team fundamental source control concepts, Helix Core specifics, and guidelines around workspace creation.

#### TAKEAWAYS AND TIPS



##### Backup Processes

Set up backup processes early, and test them regularly.



##### Depot/Stream Hierarchy

Prioritize a depot/stream hierarchy that works for your team.



##### Teach Workflows

Take the time to teach workflows and make sure your team is comfortable with game engine source control tools.



##### p4ignore

Set up a good project/engine specific .p4ignore.



##### Automate Client Setup

Automate client setup whenever possible.

GAME DEV TOOLS FOR INDIE STUDIOS



# Supporting Collaboration & Creatives

## Bit Fry Games: Accelerating a Franchise

Bit Fry Game Studios was founded in 2013 with the desire to bring back something they found was missing from today's sports games: arcade-action titles. They started with an unlicensed baseball game set in the 1920s, and eventually wound up making the most comprehensively licensed sports game franchise ever created. They are now one of the fastest-growing original video game studios in the world. To meet their release dates, they need their teams to be able to collaborate without their tools slowing them down.

[Read the full case study](#)



# Bit Fry Games

## Accelerating a Franchise

### Prioritizing Cross-Team Collaboration

Choosing a version control system that supports collaboration between creative teams and developers has been fundamental in Bit Fry's success. With Helix Core, developers check in code more frequently, and artists upload their assets quickly. Their whole team can version everything in one central depot, making it easy for Bit Fry to enhance collaboration across disciplines.

Prior to Helix Core, all that collaboration – i.e. data – was maxing out Bit Fry's bandwidth. They didn't want to slow the entire team down, so they avoided pushing changes, meaning assets and code were left sitting outside of their server. So when they started using Helix Core, Perforce helped ensure Bit Fry's team can collaborate in real-time by setting up their architecture on-premises. This allows their teams to push changes and files frequently. Now, their teams work faster, and their depot has grown exponentially without anyone being slowed down, even as they work remotely.

### Reducing Complexity for Creative Teams

Just as important as speed is ease of use. Bit Fry's creative team versions assets quickly without complexity. Animator SJ Belen explains, "I don't need to know how all this stuff works. It's super simple. I can check out a file, get the latest files, and check them back in... We can start syncing assets whenever."

#### TAKEAWAYS AND TIPS



##### Keep Up To Date

Establish processes that keep assets up to date and keep your game stable. (It's even better if those processes don't distract your developers and artists.)



##### Creative Teams

Choose tools and processes that are easy for creative teams to adopt.

**"I don't need to know how all this stuff works. It's super simple. I can check out a file, get the latest files, and check them back in."**

**SJ Belen, Animator at Bit Fry Games Studio**

# Conclusion

Perforce Helix Core is the game development industry standard for version control.

Achieve your creative visions with a system catered to artists and designers. Establish better work pipelines through end-to-end traceability and a single source of truth for all game assets. Secure your valuable IP when collaborating with external partners. All with a system you will never outgrow.

# Conclusion

## Accelerate Development with Free Tools

[Perforce Helix Core](#) is free for small teams. That means you get the game industry standard version control system with complete functionality for 5 users and 20 workspaces. Start small and scale, or try it out before you commit.



### FREE GAME DEVELOPMENT TOOLS: INDIE STUDIO PACK

- Get the best tools for game design teams
- Deploy your way — on premises, Azure Cloud, or AWS.

[GET INDIE STUDIO PACK](#)

### OFFLOAD ADMINISTRATION: HELIX REMOTE ADMIN

Let your dev team focus on development. Offload Helix Core administration and optimization to the experts who built it.

[ASK US ABOUT HRA](#)



### FIND, TRACK, AND REVIEW ART ASSETS: HELIX DAM

Find every game art asset at a glance, track its evolution across versions, and simplify the feedback & revision process with Helix DAM.

[TRY HELIX DAM](#)