

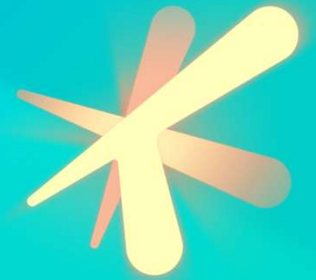


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CloudFlow Pipeline: The Catalyst for Dev Efficiency

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**Tencent
Games**



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Engineering Leader (SRE)
Global Tech Service Center

Tencent Games CROS

Tencent Games Common R&D and Operation System



Developer
Efficiency



Technical
Operations



Quality
Assurance



Security



Business
Value Add



Player
Platform

Tencent Games CROS

Tencent Games Common R&D and Operation System



Developer
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Player
Platform

Together with 2000 engineers, we provide industrial production capacity for teams from Tencent Games' 1st and 2nd party studios.

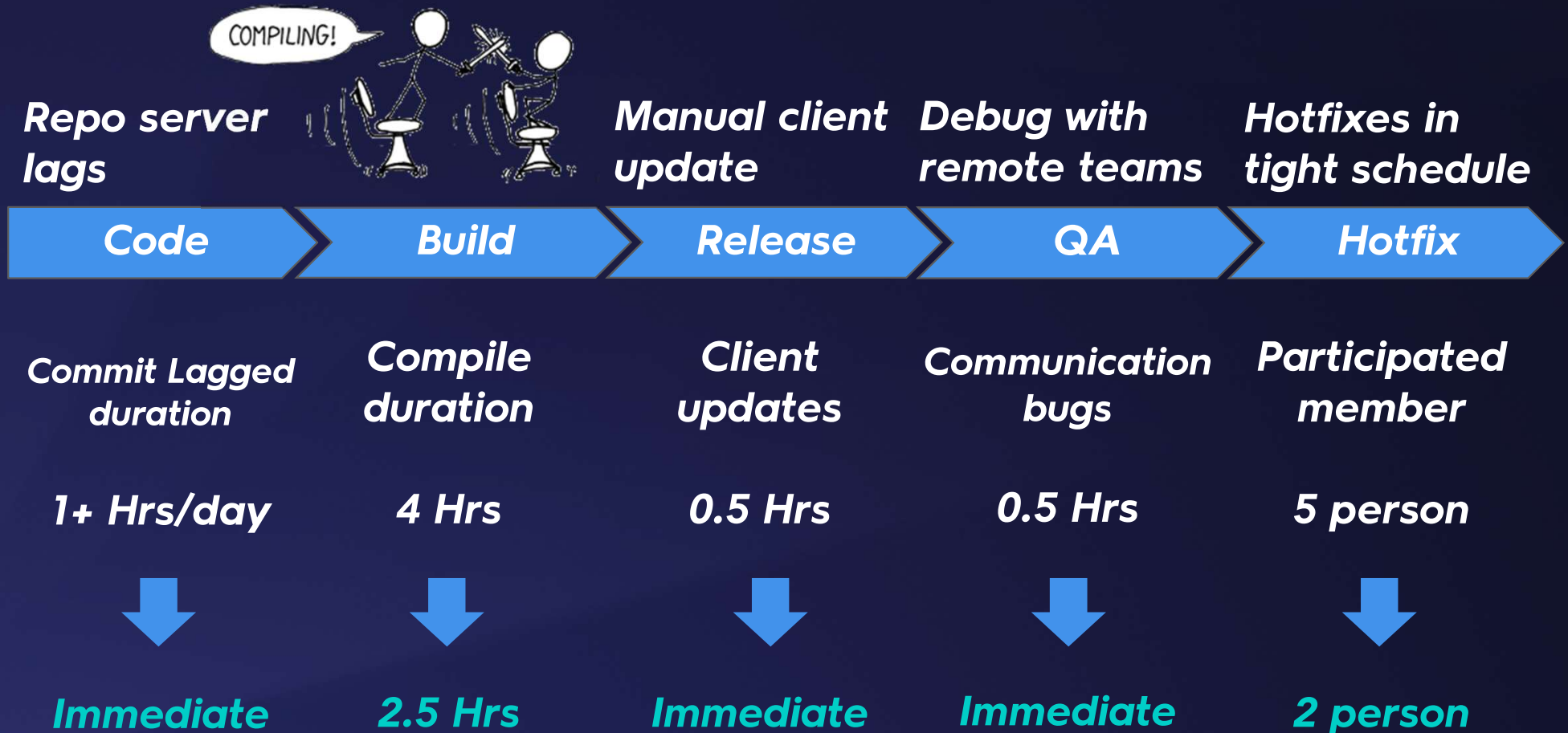
“If you want to go fast, go alone, if you want to go far, go together”.

African Proverb – Martha Goedert

We also help our developers optimize production pipeline



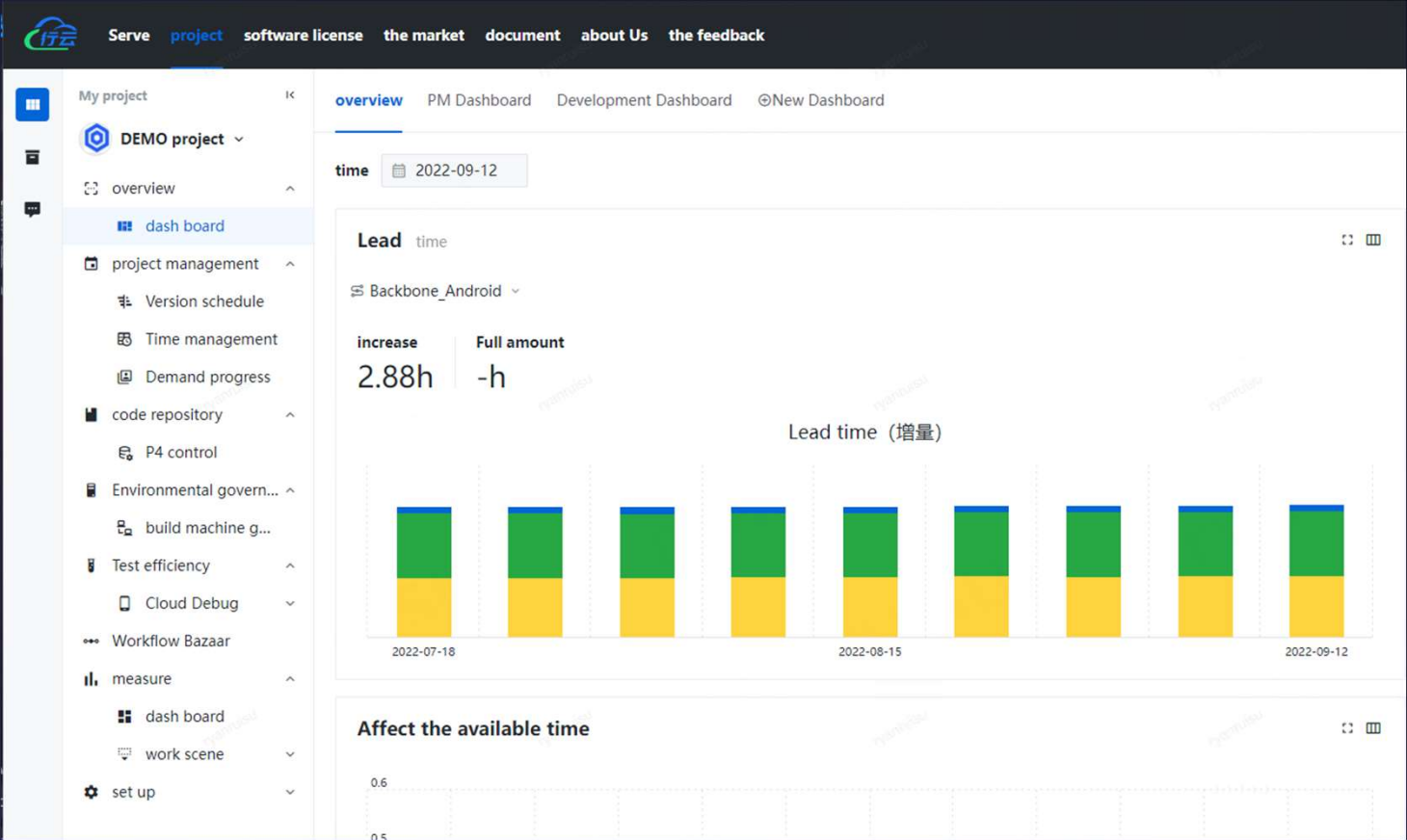
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Anti-patterns

- 1. Data aren't shared between dev tools***
- 2. Tools are expensive to integrate right***
- 3. Tools' performance aren't optimized at full capacity***

CloudFlow is the one stop shop solution



CloudFlow is the one stop shop solution



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CloudFlow ❤️ *Tencent Game Developers*



*Integrate 15
different
development
tools*



*Globally
Connected
Build Services*



*Unified IAM
Engine*



*Deep
Analytics
Engine*



*API &
ChatOps*

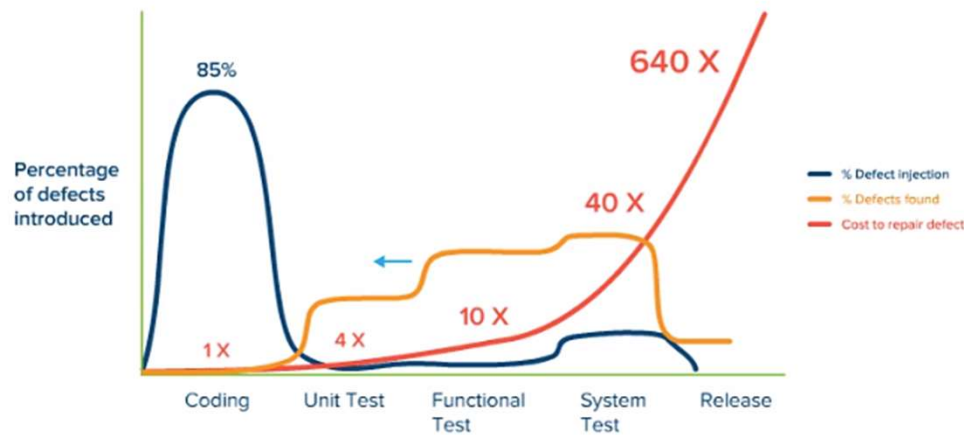
Shift left early in the development process to improve efficiency...

CloudFlow Outcome: Shift Left



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- *Design changes*
- *Art/Sound files*
- *Code*
- ...



Jones, Capers. *Applied Software Measurement: Global Analysis of Productivity and Quality*.

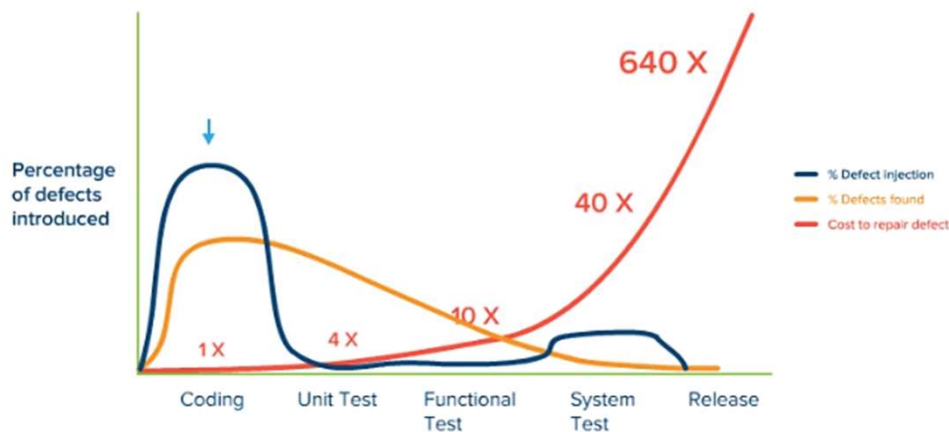
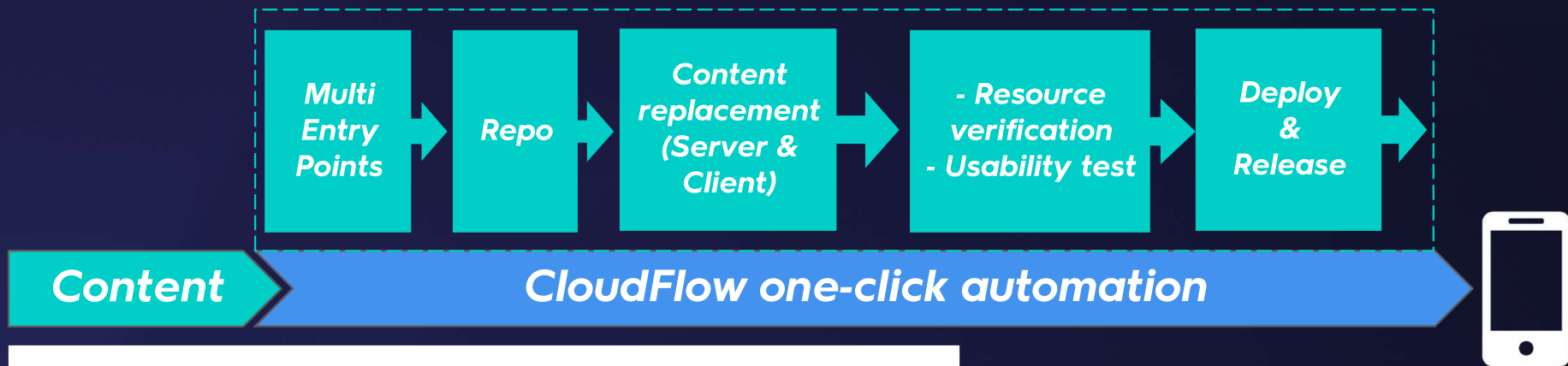
To find defects...

- *Engineer to initiate*
- *Wait for **daily build***
- ***1 iteration/day***
- ***Detect defects late***

CloudFlow Outcome: Shift Left



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Jones, Capers. *Applied Software Measurement: Global Analysis of Productivity and Quality*.

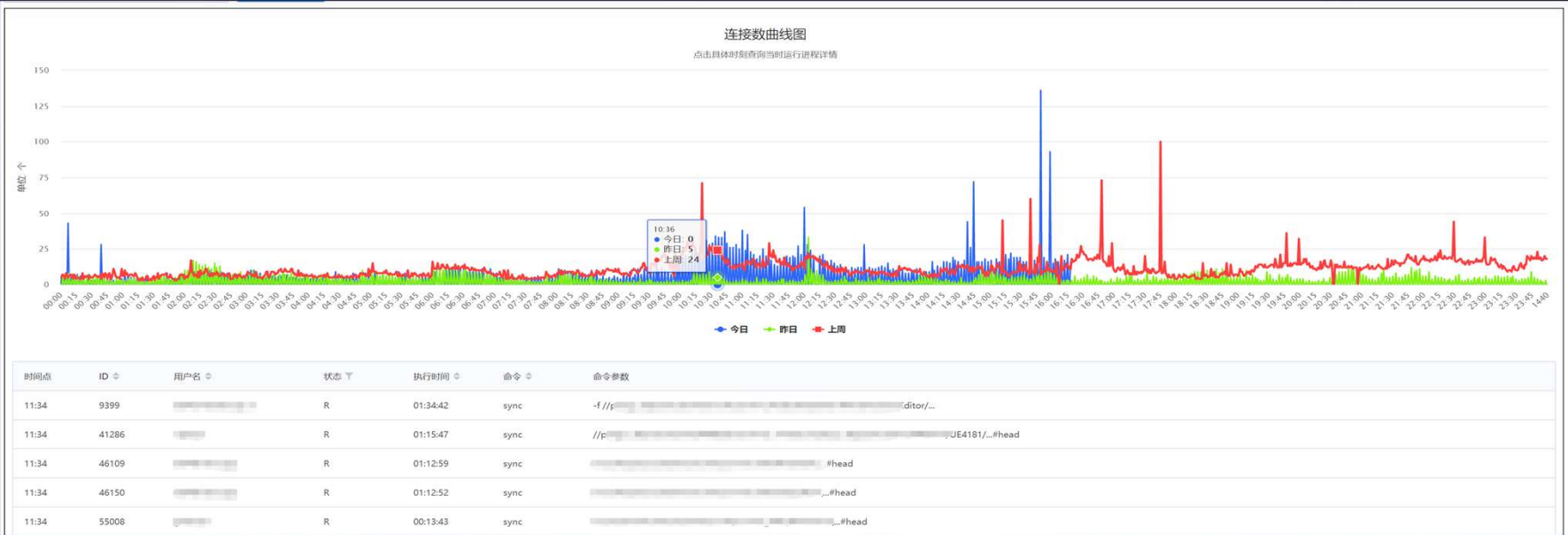
To find defects...

- **Anyone** can initiate
- **Build at anytime**
- **Multiple iterations/day**
- Detect defects early**

Observability as first-class citizen resulting in the democratization of data...

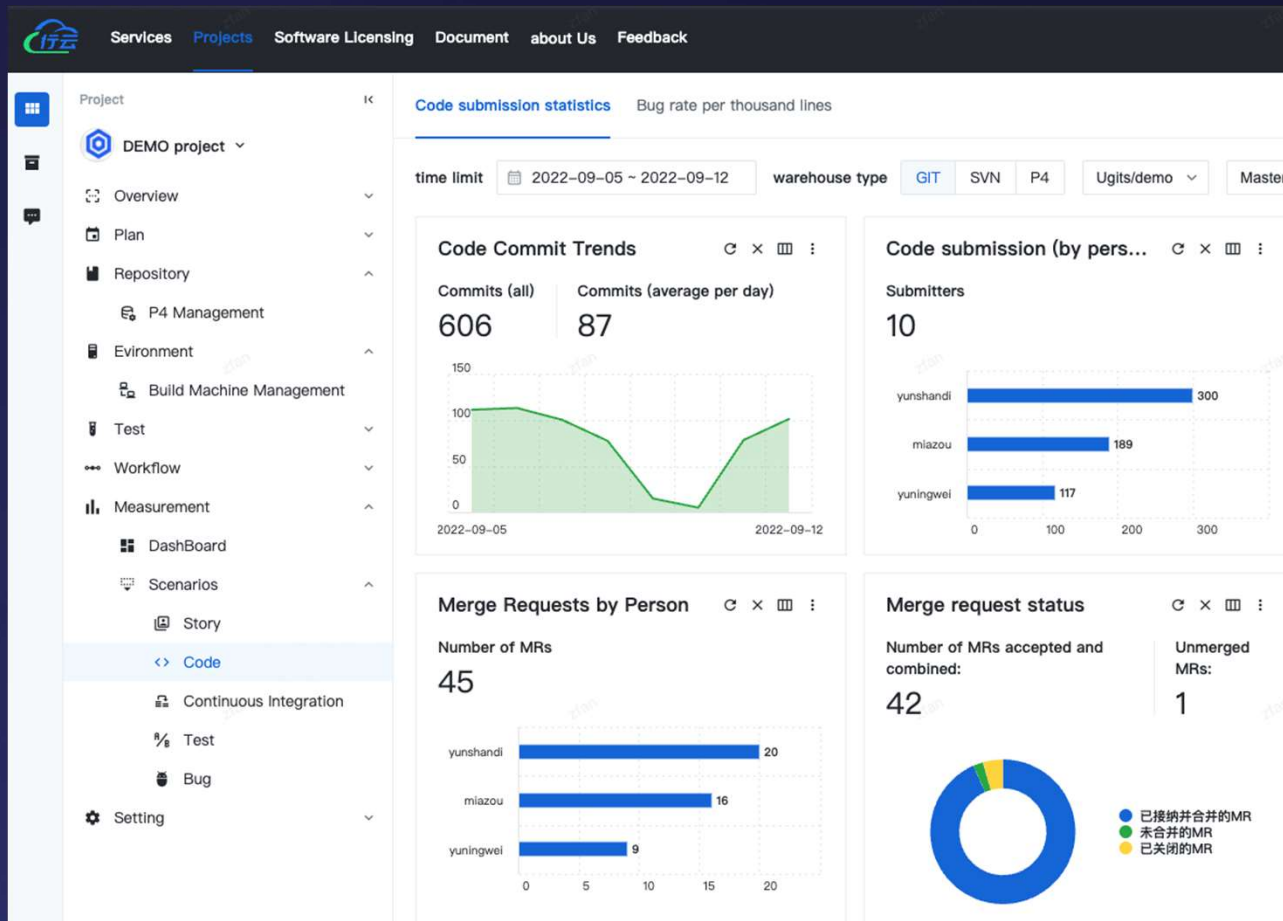


Time series data to visualize Perforce experience



CloudFlow provides Perforce pull history as triage info

CloudFlow Outcome: Observability



**Overall dev
efficiency
&
Areas for
improvement**



***Fine-grained
access control***



File size analyzer



***Alert Policy
Engine***

Enable Build Engineers and Organizations make informed decisions

***Predictable builds based on geolocation reducing
compiling time...***

CloudFlow Outcome: Predictability during compile

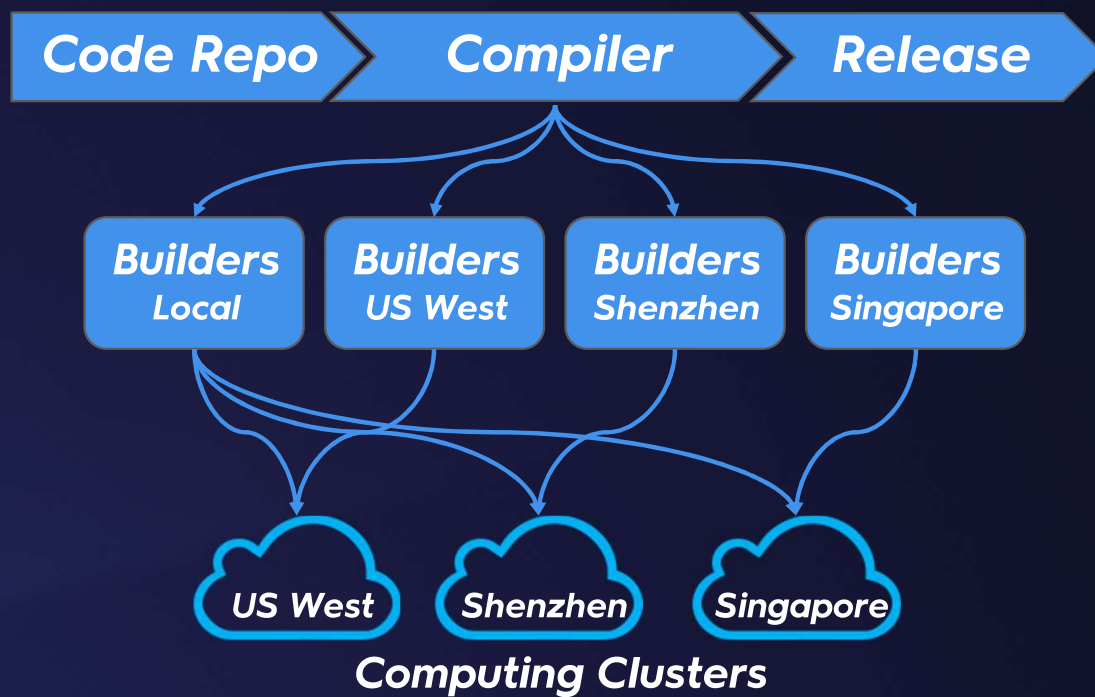


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**Scale Up:
Customized Builders**

96 core
384 G
3.8T
NVMESSD x 1
GPU x 1

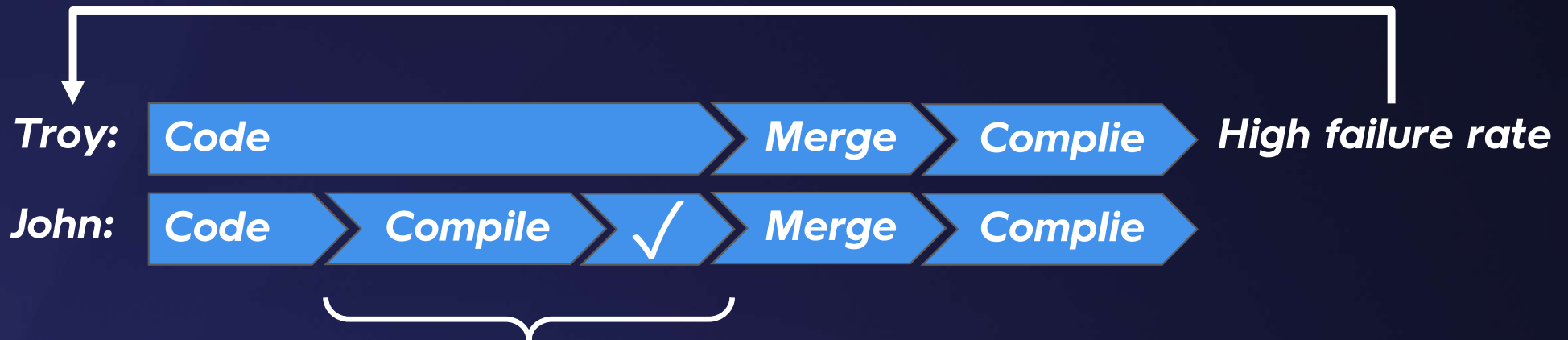
**Scale Out:
Distributed Compile**



Full build compile time reduced to 2.5Hour

***Failure domains are isolated and resolved by
developers in their own branch...***

Delays the delivery process



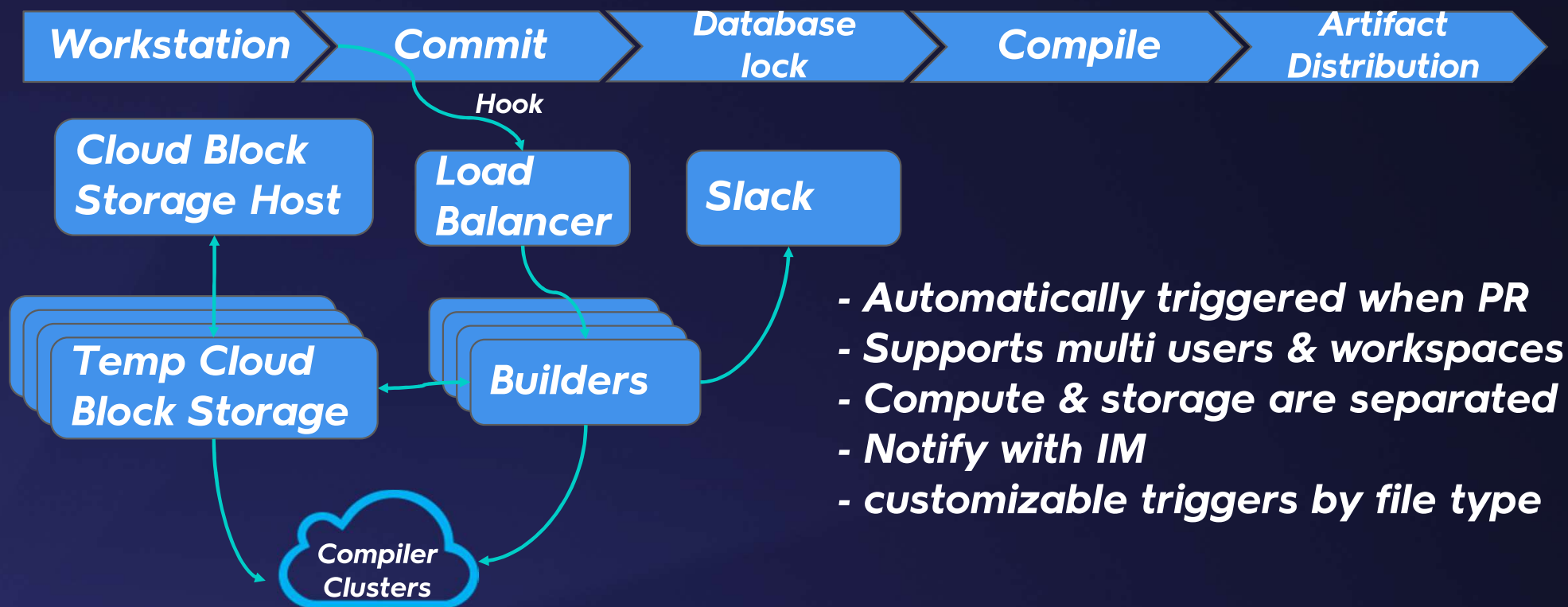
< 10 devs, policy is effective

>50 devs, software solution is necessary

CloudFlow Outcome: Reduce failure domains



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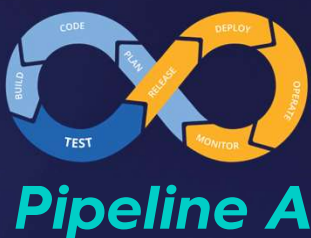
Compile failure rate reduced to 50%

Features iterations are rapidly validated through multiple dev environments ("Production like") ...

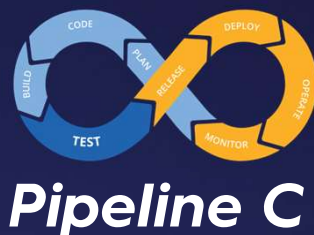
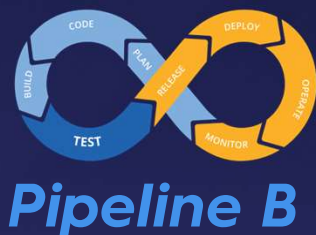
CloudFlow Outcome: Rapid Feedback



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- Customized groups
- Tasks management
- Pipeline management
- Cloud based config



Client/Unreal Engine update time reduced to 0

CROS provides 20+ dev efficiency tool to studios



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BUILD

- Shell Service **+20% Speed**
- preBuild **+30% success rate**
- Parellel Build **+50% Speed**

ENGINE

- Precomputation-based Heuristic Occlusion Culling **+10% frame rate**
- Global Illumination Baking **+15X speed**

QA

- Cloud debug **-30 mins/time**

DCC

- Art Resources Testing **-70% manhours**
- Cloud rendering (efficiency increases as the scale increases)

CloudFlow is partially available on github



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We are adding additional features to CloudFlow. However, we have open sourced the CI component.

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Thank You

James @ Bethesda
Jamie "Goose" @ Zynga
Jeff @ FiveStar
Ed @ Sky Dance Media
Enzo, Harsha, Gez @Riot
Games
Tu Yan @Tencent



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