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# 全球玩家同服竞技

Amazon GameLift 帮你快速构建在线多人游戏

齐海澎，AWS 解决方案架构师

# 全球分布

# 什么是 Amazon GameLift?

## 基础设施管理
　　自动伸缩
　　高可用性 (Multi-AZ)
　　自动容灾
　　DDoS 防护（逻辑设计）

## 游戏会话管理
　　玩家和游戏对局管理
　　全球范围的部署
　　玩家匹配 (FlexMatch)



Upfront expenditure – Scaling for peak

Wasted $

Infrastructure $

Time

Auto scaling - More exacting capacity

Infrastructure $

Time

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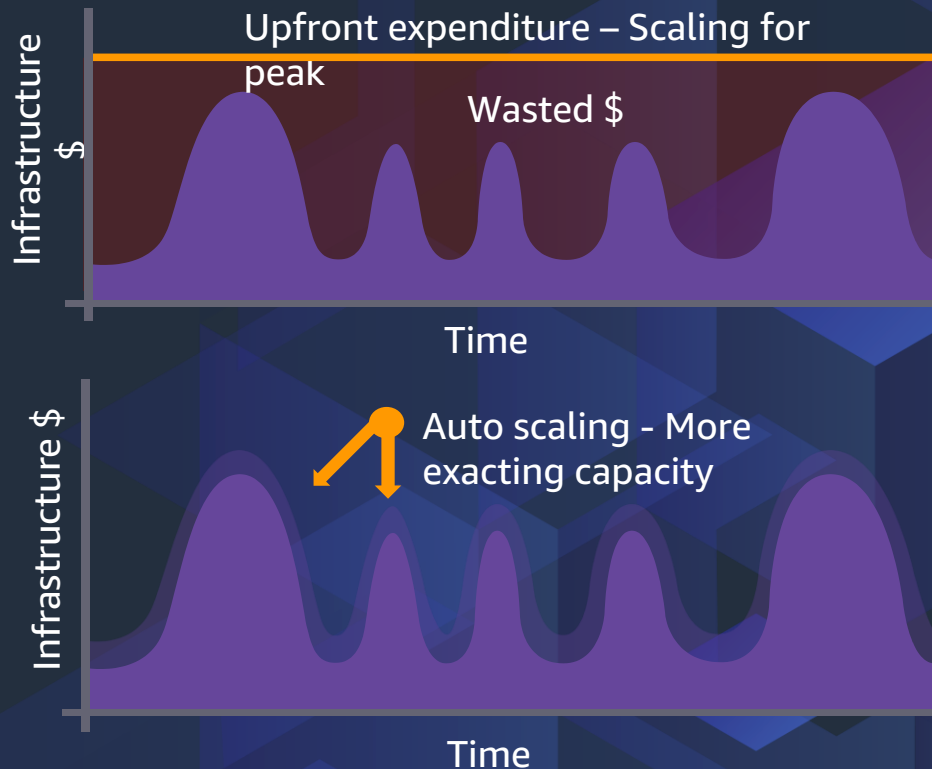
# 通常多人游戏分类和使用场景
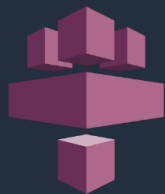## Types of games often played online:

对战类基于session游戏

回合制或非实时对战游戏

大型开放世界游戏

Amazon
GameLift

Amazon
GameSparks

Amazon Web
Services
aws

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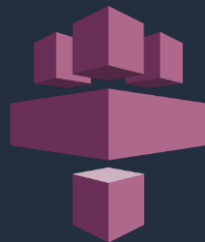
# Amazon GameLift

适合的游戏类型和主要优势

# 适合的游戏类型和主要优势

| Game Type | Example game | Suitability | Notes |
|---|---|---|---|
| FPS | Call of Duty | Excellent | 1-15分钟之间的对局非常适合Gamelift。 |
| Session based racer/sports | Gran Turismo | Excellent | 可以从客户端和服务器之间的低延迟连接中受益。 |
| Session based action/fighting | For Honor | Excellent | 支持客户端服务器之间处理多个玩家，在同一个战场或对局中同时作战。 |
| Battle Royale | Fortnite | Excellent | 如上。 |
| Instance open word/MMO/MMO RPG | GTA V | Good | 应检查会话时间长度以确保良好的成本优化。 |
| Simulation | Farming Simulator | Good - Poor | 如上。 |
| Real-Time Strategy (RTS) | Starcraft II | Fair – Poor | 应检查服务器复杂性以确保适合Gamelift。 |
| Persistent world MMO | Minecraft Realms | Fair - Poor | 使用服务器浏览器的游戏可能难以在Gamelift上以最佳方式运行，因为Gamelift无法管理服务器上的玩家密度。 |
| Turn-Based Strategy | Civilization IV | Poor | 不太可能需要专用的游戏服务器，Gamesparks回合制功能产品将更适合。 |
| Card Games | Gwent | Poor | 如上。 |
| Mobile Match 3 | Candy Crush | Poor | 如上。 |

# Autoscaling – Gamelift 监控指标

**Automatic Target Tracking –**
**Player Demand + n% game sessions**
**that can be started immediately**

**Activating Game Sessions**

**Active Game Sessions**

**Available Game Sessions**

**Percent Available Game**
**Sessions**

**Active Instances (in fleet)**

**Available Player Sessions**

**Current Player Sessions**

**Idle Instances**

**Percent Idle Instances**

**Queue depth (when using**
**queues)**

**Wait time (fleet specific)**

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# Development Lifecycle



Local Development Environment

集成游戏客户端/服务器

对客户端和服务器进行相关更改

本地测试

Local Development Environment

GameLift Local

Test matchmaking processes here

Make any necessary adjustments

捕捉日志和指标

发布到 AWS

GameLift Fleet

在GameLift Fleet测试

Local Development Environment

GameLift Fleet

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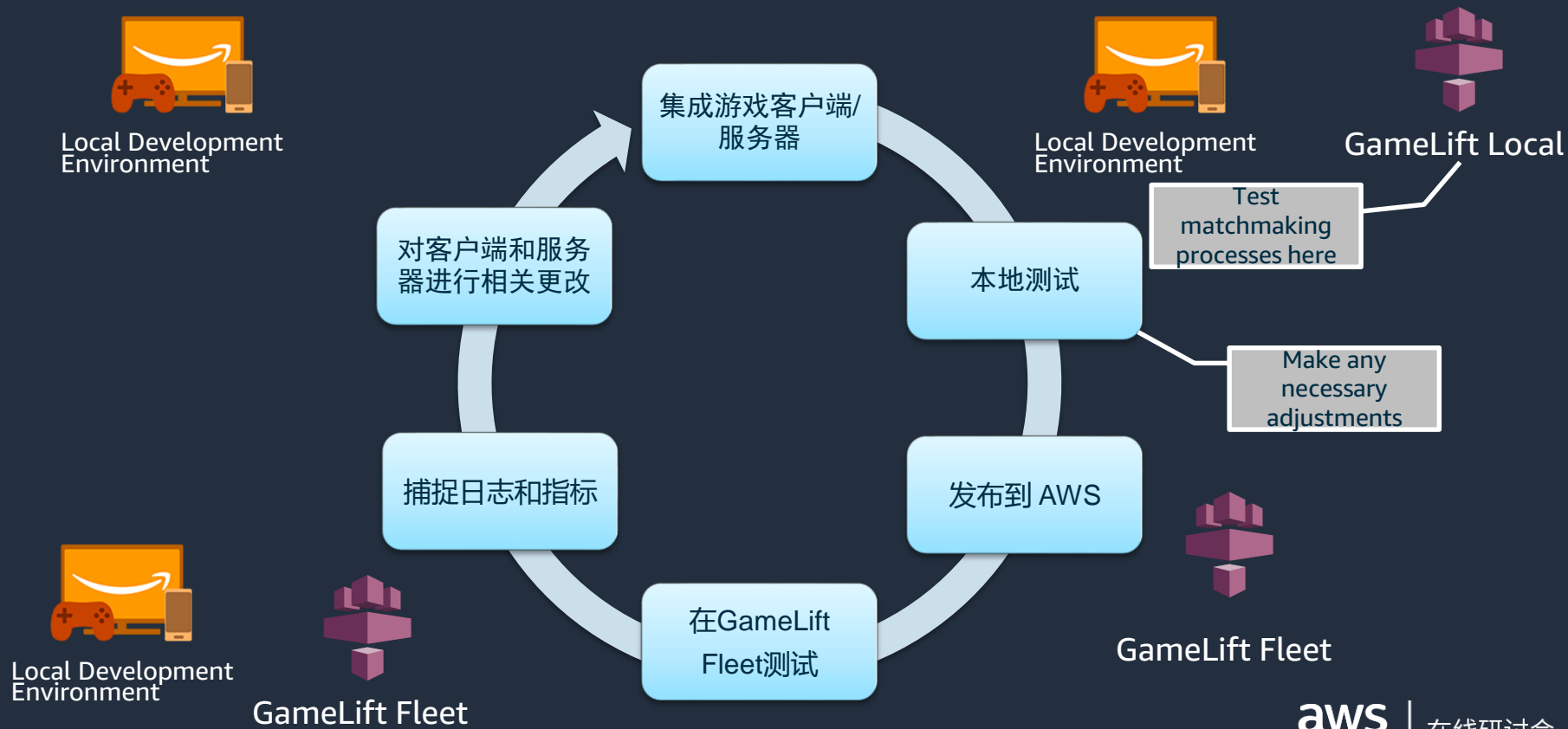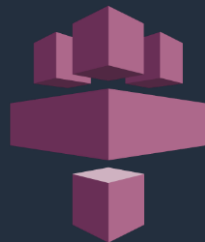
# Amazon GameLift

————

## 服务原理

# 关键组件及其交互方式
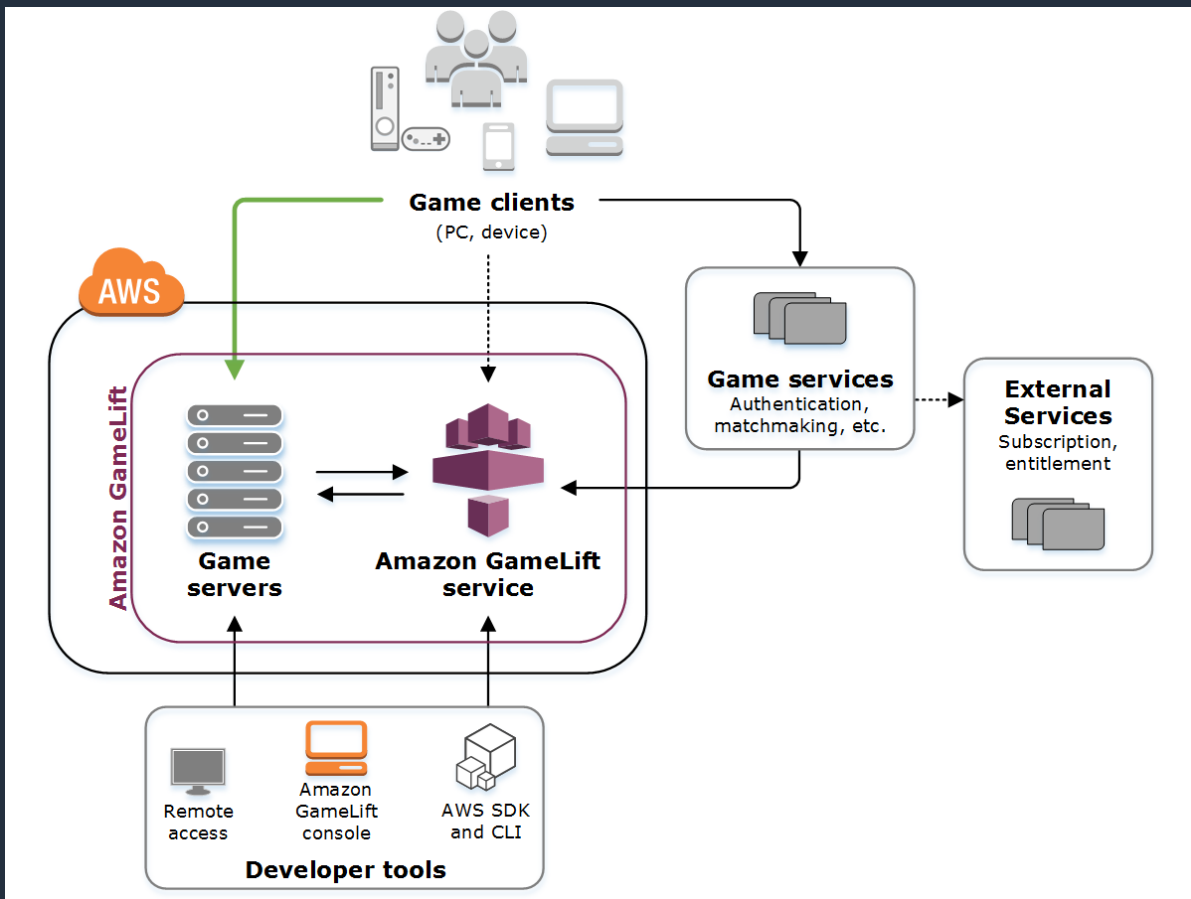
# GameLift API Interaction

| Add player | Request new player session | **CreatePlayerSession()** | | • Check for open session slot. • Create player session, set status to **RESERVED** for 60 seconds |
| | | | **PlayerSession** object Contains player session ID, IP address | |
| | Connect to game server | Request connection | Request player session validation | **AcceptPlayerSession()** | Validate player connection: • On success, set player session status to **ACTIVE** • If not validated within 60 seconds of creating player session, set player session status to **TIMEDOUT** |
| | | Success or error | | Success or error | |
| **Drop player** | Disconnect from server | Notify GameLift when lost connection is detected | **RemovePlayerSession()** | • Set player session status to **COMPLETED** • Reopen player slot in game session |
| **Stop game** | | Notify GameLift when game session ends | **TerminateGameSession()** | • Set game session status to **TERMINATED** • Update fleet utilization data • Upload game session logs |
| **Shut down server** | | Notify GameLift server process is terminating | **ProcessEnding()** | • Set server process status to **TERMINATED** • Recycle instance resources |

# aws-gamelift-sample-围棋游戏



https://github.com/aws-samples/aws-gamelift-sample

# Amazon GameLift 组件



Builds

Fleets

Aliases

Queues

Clients

FlexMatch

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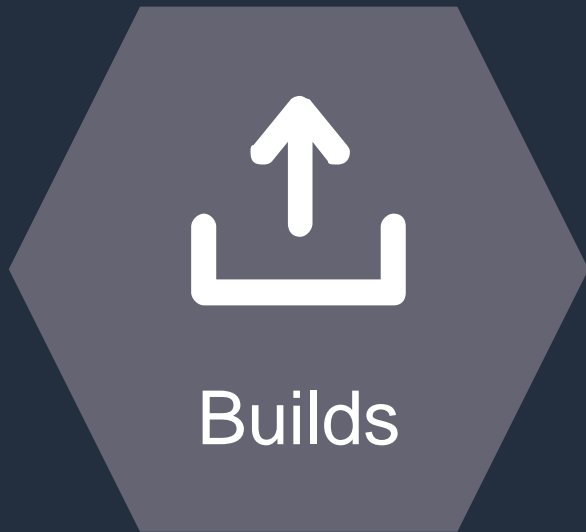
# Builds

- 可以使用AWS CLI 或者SDK上传
- 可以保存多个版本builds
- Supported Operating Systems:
    - Linux
    - Windows
- Server SDKs:
    - C++
    - C#
    - Unreal Plugin
    - Lumberyard integration
    - Unity

Builds

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# Build 控制台



| Status | | Name | | Build ID | | Version | | OS | | Size (... | | Date created | | Fleets | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | Ready | TestServer-3.1.0-Linux | | build-a84a2248-07c6-4403-856d-370819... | | 3.1.0 | | Amazon Linux 2016.03 | | 1.24 MB | | 2017-08-16 3:51:27 UTC+0100 | | 1 | |

Filter: Status: All ▾    Viewing 1 build(s)

- Amazon GameLift 可展示管理build文件的信息:
    - Status
    - Version
    - OS
    - Size
    - Number of fleets using this build
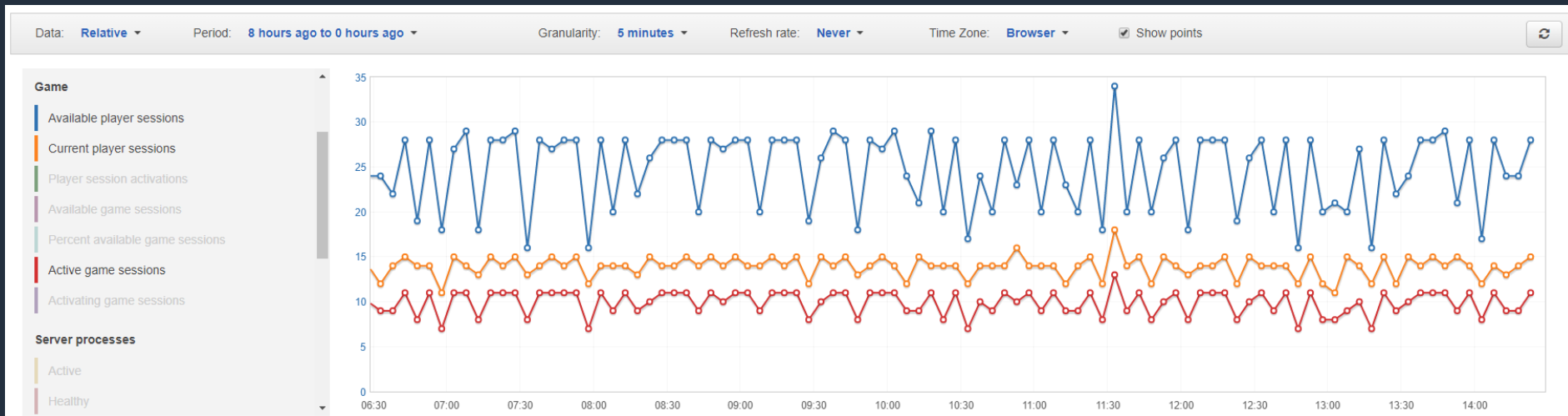
# Fleets

Fleets代表游戏构建的部署状态。 它们使您能够定义如何在Amazon GameLift中托管您的构建，包括:

- Instance Type

- Region

- Scaling Policies

- Capacity Limits

- Number of processes per instance

Fleets

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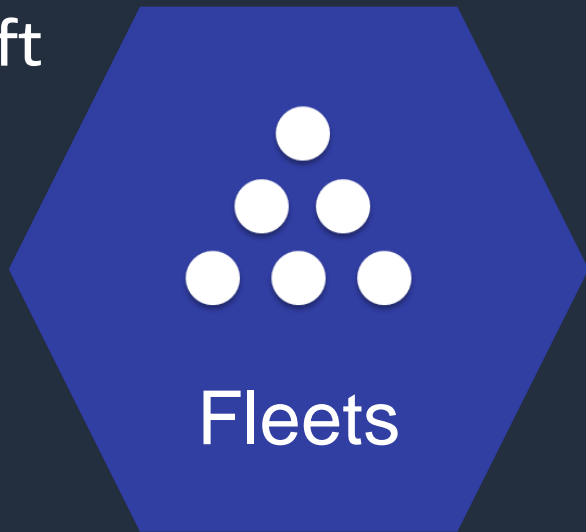
# Fleet 指标

- **Game/Player Sessions**
- Game Server Processes

- Number of Instances
- Instance Performance
- Scaling Limits

# Fleet 伸缩策略

设置与您的游戏需求相匹配的自动缩放策略。

使用扩展历史记录来告知策略成功。

可以将策略配置为使用以下度量标准类型:

- Average Player Wait Time

- Player Sessions

- Game Sessions

- Available Instances

# Fleet 事件记录

查看游戏会话或实例级别的车队中发生的事件。

记录的事件包括，并且可以在控制台上下载详细日志:

- Scaling
- Information
- Warnings
- Errors
- Crashes

| Time | Code | Message |
|---|---|---|
| 2017-12-27 2:30:51 UTC+0000 | SERVER_PROCESS_CRASHED | Server process exited without calling ProcessEnding(), exitCode(137), la... |
| 2017-12-22 9:50:36 UTC+0000 | SERVER_PROCESS_SDK_INITIALIZATION... | A process unrecognized by GameLift is attempting to make GameLift Ser... |
| 2017-12-22 8:24:17 UTC+0000 | SERVER_PROCESS_CRASHED | Server process exited without calling ProcessEnding(), exitCode(137), la... |
| 2017-12-22 8:24:16 UTC+0000 | GAME_SESSION_ACTIVATION_TIMEOUT | Game session failed to activate within 5 minutes of ActivateGameSessio... |
| 2017-12-22 8:24:16 UTC+0000 | GAME_SESSION_ACTIVATION_TIMEOUT | Game session failed to activate within 5 minutes of ActivateGameSessio... |
| 2017-12-21 22:29:21 UTC+0000 | INSTANCE_INTERRUPTED | Instance interrupted at 2017-12-21T22:33:51.784Z, instanceId(i-0e2dd2b... |
| 2017-12-21 22:29:21 UTC+0000 | INSTANCE_INTERRUPTED | Instance interrupted at 2017-12-21T22:33:45.791Z, instanceId(i-0e2dd2b... |
| 2017-12-21 22:28:54 UTC+0000 | FLEET_SCALING_EVENT | Completed update: Scaling policy Scale Down on fleet fleet-4fef0eac-22a... |
| 2017-12-21 22:28:54 UTC+0000 | FLEET_SCALING_EVENT | Completed update: Scaling policy Scale Up on fleet fleet-4fef0eac-22ae-... |
| 2017-12-21 22:28:53 UTC+0000 | FLEET_SCALING_EVENT | Started update: Scaling policy Scale Up on fleet fleet-4fef0eac-22ae-450... |

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# Fleet – Game Sessions

跟踪在fleet中实时运行的游戏会话。



| Status | Name | ID | IP address | Port | Player ses... | Uptime | Date created |
|---|---|---|---|---|---|---|---|
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1943 | 4 of 4 | 00d 00h 00m 17s | 2018-01-25 15:51:49 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1941 | 4 of 4 | 00d 00h 00m 33s | 2018-01-25 15:51:33 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1940 | 4 of 4 | 00d 00h 00m 50s | 2018-01-25 15:51:16 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1937 | 0 of 4 | 00d 00h 01m 09s | 2018-01-25 15:50:57 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1935 | 0 of 4 | 00d 00h 01m 25s | 2018-01-25 15:50:41 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1936 | 0 of 4 | 00d 00h 01m 42s | 2018-01-25 15:50:25 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1939 | 0 of 4 | 00d 00h 01m 58s | 2018-01-25 15:50:08 UTC+0000 |
| Active | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 54.191.77.91 | 1942 | 0 of 4 | 00d 00h 02m 17s | 2018-01-25 15:49:49 UTC+0000 |
| Error | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 34.217.17.82 | 1935 | 0 of 4 | 00d 11h 05m 49s | 2018-01-25 4:46:17 UTC+0000 |
| Error | AliensVSCowboys-2v2 | arn:aws:gamelift:us-west-2::gamesession/fleet-4fef... | 35.162.133.61 | 1936 | 0 of 4 | 01d 17h 19m 42s | 2018-01-23 22:32:25 UTC+0000 |

深入查看玩家会话信息。

| Status | ID | Player ID | Start time | End time | Total time |
|---|---|---|---|---|---|
| Timed out | psess-149fd4ad-9abb-4c21-ace6-ba0cc1f73739 | player-1-56ca2ec2-f6c0-4dd3-9ef4-9... | 2018-01-25 15:51:50 UTC+0000 | 2018-01-25 15:52:50 UTC+0000 | 00d 00h 01m 00s |
| Timed out | psess-d270ebf3-278b-4c7e-a164-47cc98bb4ced | player-1-3d40dbb7-dfd0-4ddd-b073-... | 2018-01-25 15:51:50 UTC+0000 | 2018-01-25 15:52:50 UTC+0000 | 00d 00h 01m 00s |
| Timed out | psess-593665a3-f0eb-4e8b-9385-19a927b0ece0 | player-1-dadccb80-e15c-4d78-b69a-... | 2018-01-25 15:51:50 UTC+0000 | 2018-01-25 15:52:50 UTC+0000 | 00d 00h 01m 00s |
| Timed out | psess-5f52de2c-b377-492e-86a3-329aa7c35b96 | player-1-20544008-d02e-4b38-b18d-... | 2018-01-25 15:51:50 UTC+0000 | 2018-01-25 15:52:50 UTC+0000 | 00d 00h 01m 00s |

# Aliases介绍

别名允许您将游戏客户端重定向到它指定的后端集群或通知客户机群已停止运行。

通过不同的环境类型转移负载，例如，开发，测试或生产。

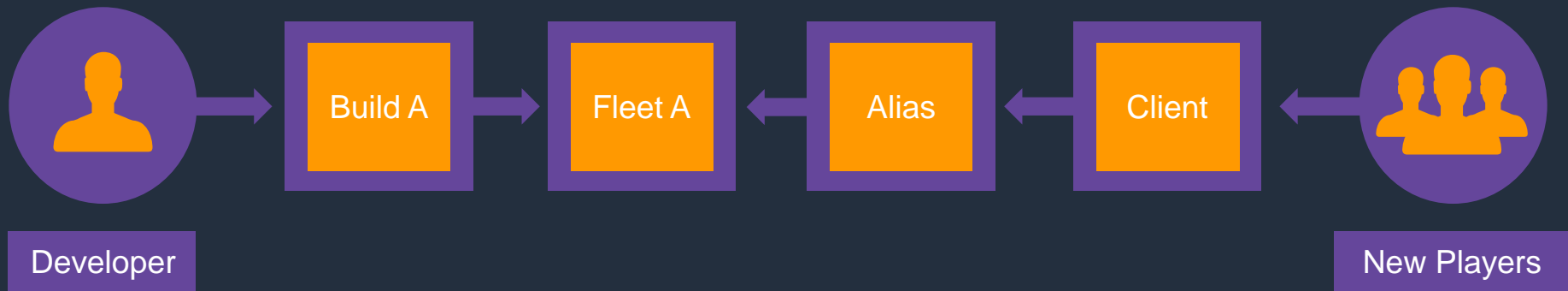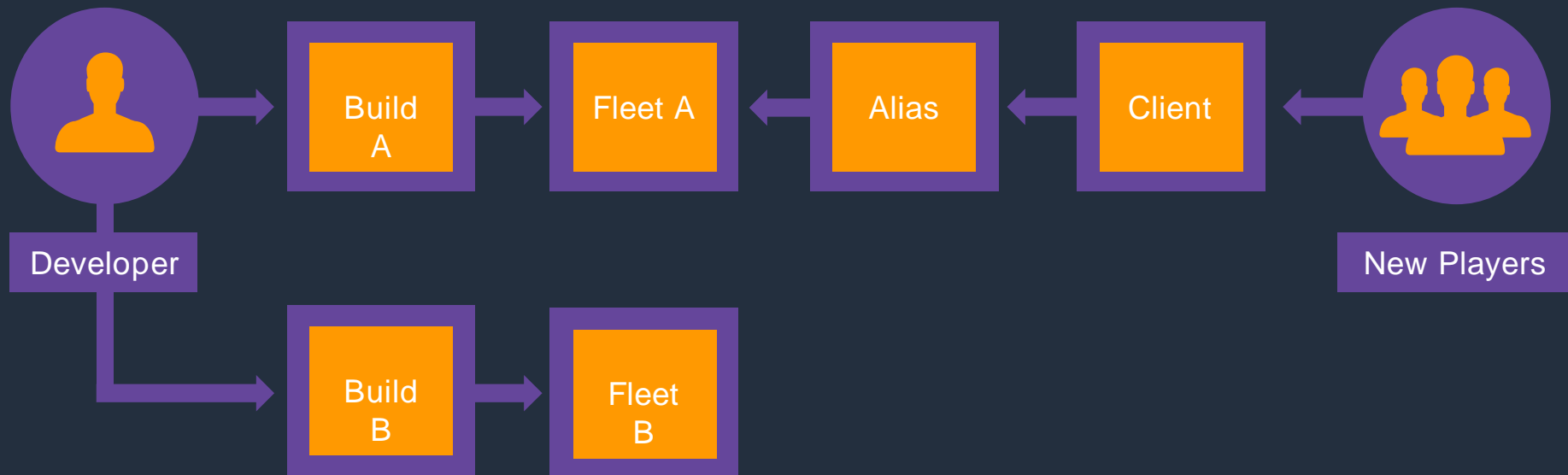有两种类型的别名：

简单 - 一个简单的重定向指向一个相关的fleet，一个Alias解析的fleet可以随时更新

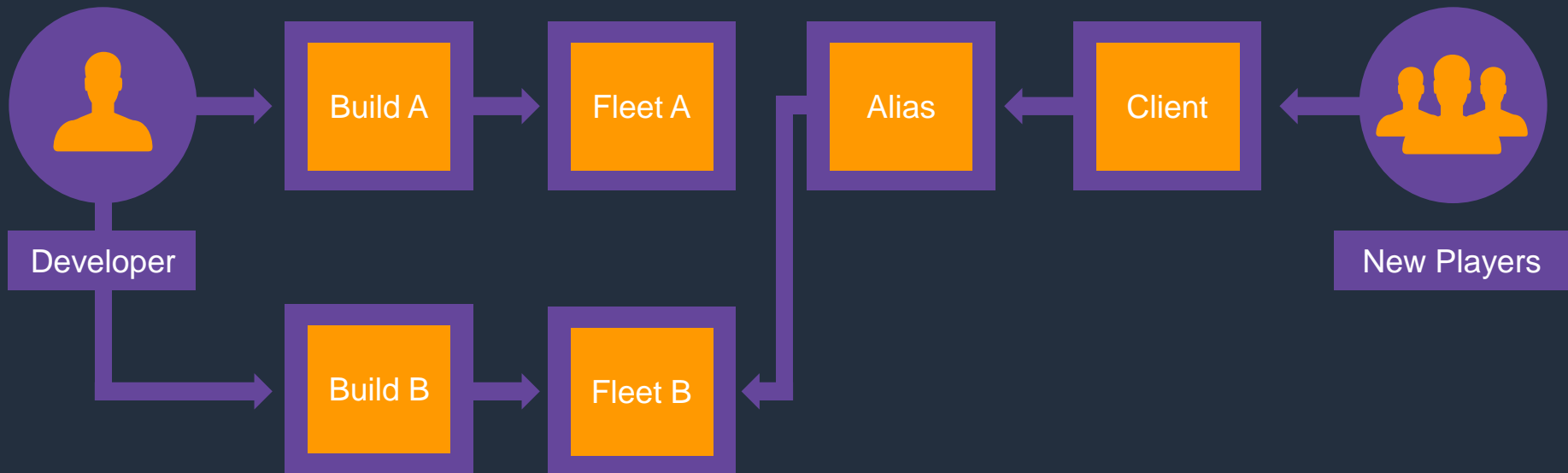终端 – 这不会修改后端连接集群，而是将指定的消息传回客户端。

Aliases

# Aliases – Simple Redirect
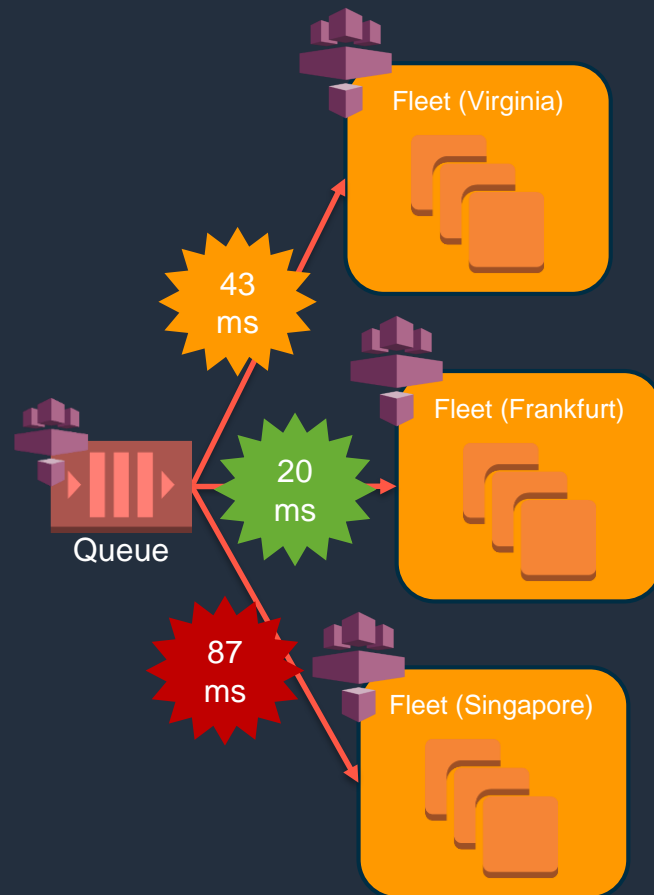
# Aliases – Simple Redirect

# Aliases – Simple Redirect

# Queues – 玩家延迟策略

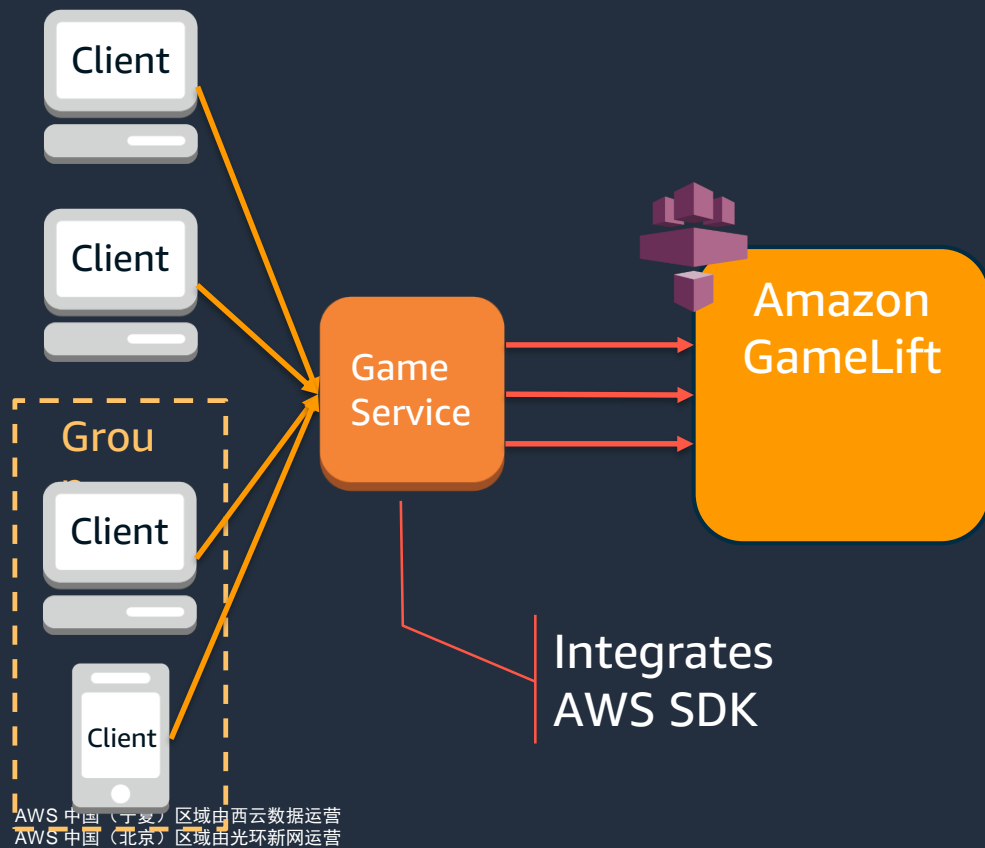- 为新游戏会话设置最大可接受的玩家延迟。
- 给指定策略设置时间值。
- 可以指定多个策略。
- 如果放置一组游戏会话延迟是平均值。

Fleet (Virginia)

43 ms

Queue

Fleet (Frankfurt)

20 ms

87 ms

Fleet (Singapore)

# Clients

Amazon GameLift支持任何能够使用
AWS支持的SDK之一的游戏客户端或游
戏服务，语言包括：

- C++
- C#
- Go
- Python
- JavaScript/Node.js
- Java
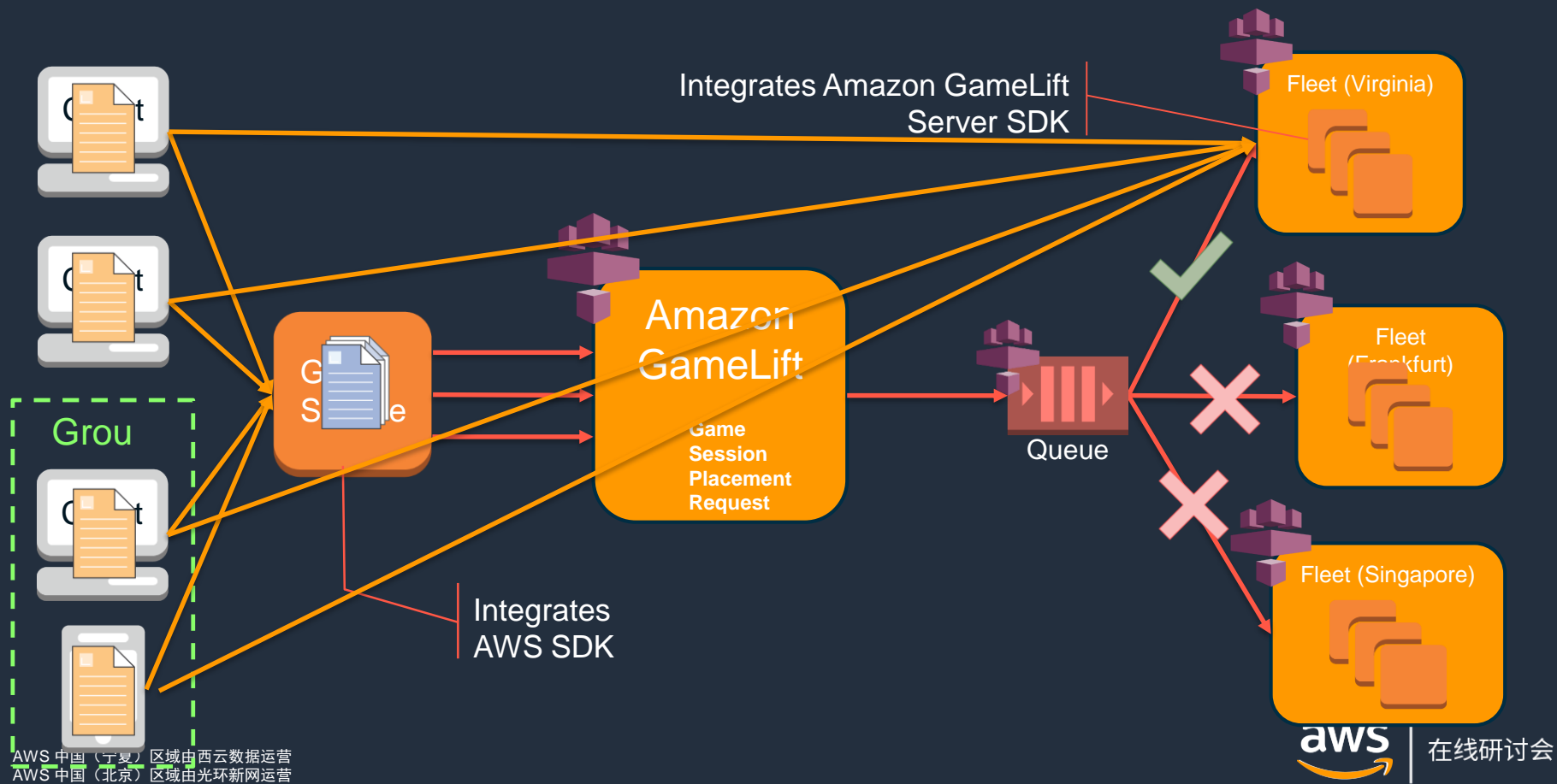


Clients

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# Clients – Best Practices



- 通过中央"游戏服务"接受客户请求
- 与游戏服务中的Amazon GameLift集成，帮助客户隔离变更
- 根据请求向游戏服务对游戏客户端进行认证和授权
- 通过ping AWS的端点在从客户端捕获玩家的延迟信息

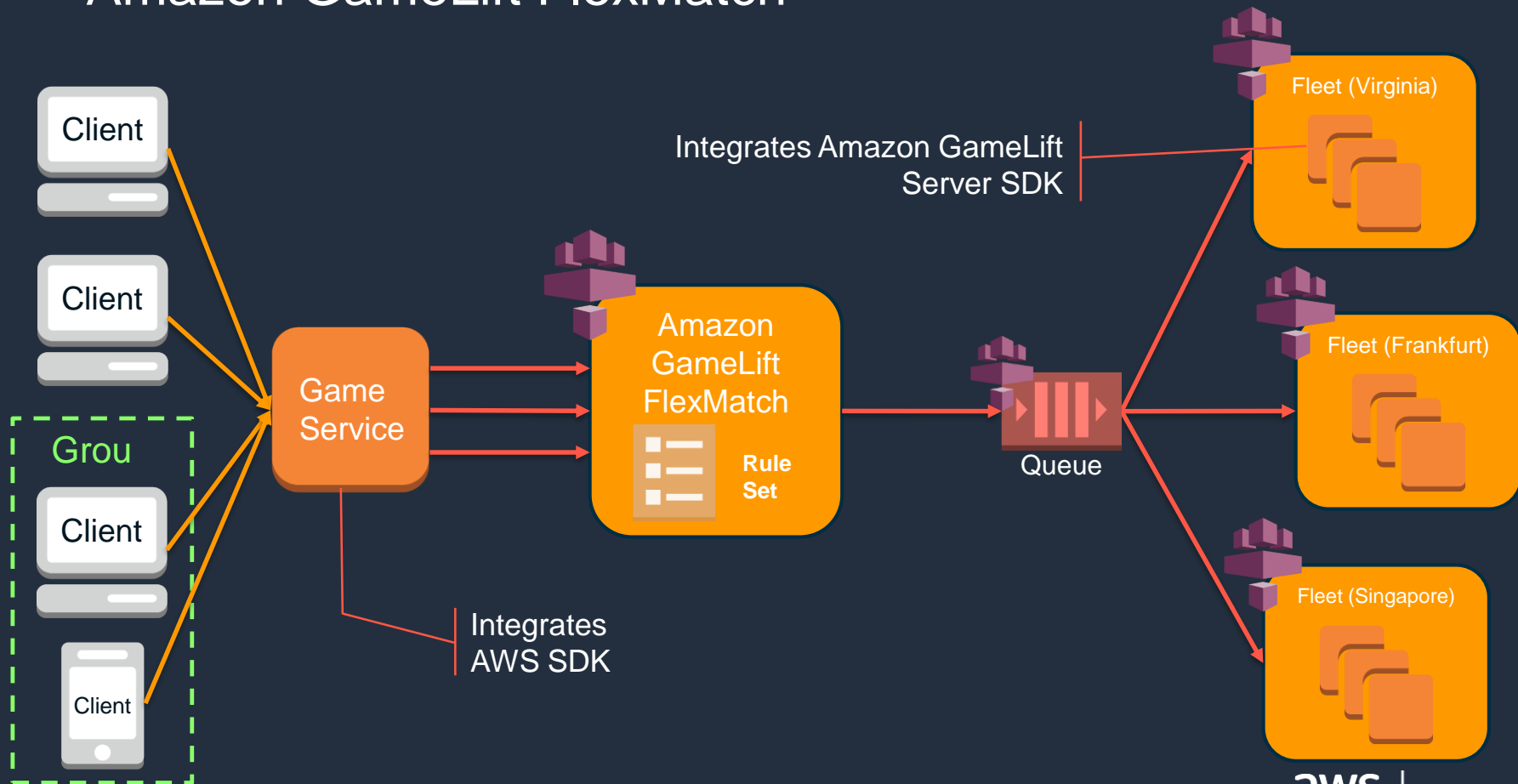# End to end – Multi Region Deployment



Integrates Amazon GameLift
Server SDK

Fleet (Virginia)

Client

Client

Grou

Client

Amazon
GameLift

**Game
Session
Placement
Request**

Queue

Fleet
(Frankfurt)

Fleet (Singapore)

Integrates
AWS SDK

AWS 中国（宁夏）区域由西云数据运营
AWS 中国（北京）区域由光环新网运营

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# FlexMatch Explained

- 可定制的匹配
- 玩家组支持
- 基于延迟的匹配
- 多级规则匹配
- 匹配接受确认
- 最佳地区位置
- 玩家通过FlexMatch完成中途加入玩家回填

**FlexMatch**

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# Amazon GameLift FlexMatch



Client

Client

Grou

Client

Client

Game Service

Amazon GameLift FlexMatch

**Rule Set**

Integrates AWS SDK

Integrates Amazon GameLift Server SDK

Queue

Fleet (Virginia)

Fleet (Frankfurt)

Fleet (Singapore)

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# FlexMatch Rule Sets



Amazon GameLift FlexMatch

Rule Sets

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
          {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
    "name": "FairTeamSkill",
    "type": "distance",
    "measurements": [ "avg(teams[*].players.attributes[skill])" ],
    "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
    "maxDistance": 10
}, {
    "name": "EqualTeamSizes",
    "type": "comparison",
    "measurements": [ "count(teams[cowboys].players)" ],
    "referenceValue": "count(teams[aliens].players)",
    "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
    "target": "rules[FairTeamSkill].maxDistance",
    "steps": [{"waitTimeSeconds": 5, "value": 50},
              {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Rule Sets



Game Service → Amazon GameLift FlexMatch — Rule Set

**StartMatchmaking**

- Unique Ticket Id
- Unique Player Ids
- Which Rule Set to use
- Custom player data, e.g. "skill"

"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill" "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
        {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
  "name": "FairTeamSkill",
  "type": "distance",
  "measurements": [ "avg(teams[*].players.attributes[skill])" ],
  "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
  "maxDistance": 10
}, {
  "name": "EqualTeamSizes",
  "type": "comparison",
  "measurements": [ "count(teams[cowboys].players)" ],
  "referenceValue": "count(teams[aliens].players)",
  "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
  "target": "rules[FairTeamSkill].maxDistance",
  "steps": [{"waitTimeSeconds": 5, "value": 50},
        {"waitTimeSeconds": 15, "value": 100}]
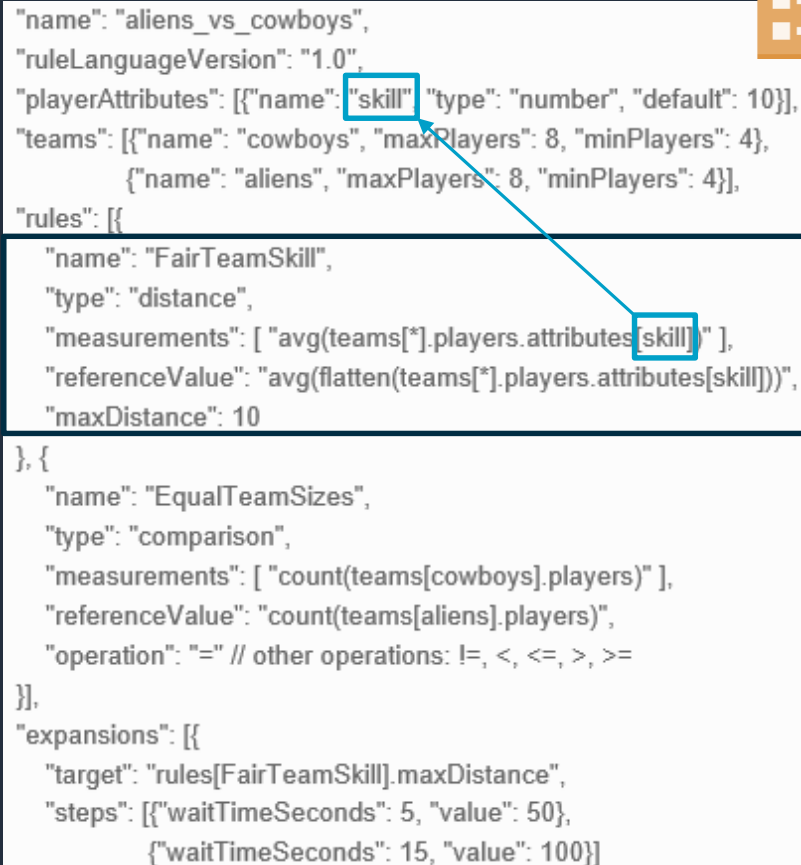
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# FlexMatch Rule Sets

玩家属性特征
队伍定义
匹配规则
放宽匹配规则

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
         {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
    "name": "FairTeamSkill",
    "type": "distance",
    "measurements": [ "avg(teams[*].players.attributes[skill])" ],
    "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
    "maxDistance": 10
}, {
    "name": "EqualTeamSizes",
    "type": "comparison",
    "measurements": [ "count(teams[cowboys].players)" ],
    "referenceValue": "count(teams[aliens].players)",
    "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
    "target": "rules[FairTeamSkill].maxDistance",
    "steps": [{"waitTimeSeconds": 5, "value": 50},
             {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Rule Sets

玩家属性特征
队伍定义
Matchmaking rules
Expansions to relax rules

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
         {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
  "name": "FairTeamSkill",
  "type": "distance",
  "measurements": [ "avg(teams[*].players.attributes[skill])" ],
  "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
  "maxDistance": 10
}, {
  "name": "EqualTeamSizes",
  "type": "comparison",
  "measurements": [ "count(teams[cowboys].players)" ],
  "referenceValue": "count(teams[aliens].players)",
  "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
  "target": "rules[FairTeamSkill].maxDistance",
  "steps": [{"waitTimeSeconds": 5, "value": 50},
           {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Rule Sets

玩家属性特征
队伍定义
匹配规则
放宽匹配规则

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
          {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
    "name": "FairTeamSkill",
    "type": "distance",
    "measurements": [ "avg(teams[*].players.attributes[skill])" ],
    "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
    "maxDistance": 10
}, {
    "name": "EqualTeamSizes",
    "type": "comparison",
    "measurements": [ "count(teams[cowboys].players)" ],
    "referenceValue": "count(teams[aliens].players)",
    "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
    "target": "rules[FairTeamSkill].maxDistance",
    "steps": [{"waitTimeSeconds": 5, "value": 50},
              {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Rule Sets

玩家属性特征
队伍定义
匹配规则
放宽匹配规则

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
          {"name": "aliens", "maxPlayers": 8, "minPlayers": 4}],
"rules": [{
    "name": "FairTeamSkill",
    "type": "distance",
    "measurements": [ "avg(teams[*].players.attributes[skill])" ],
    "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
    "maxDistance": 10
}, {
    "name": "EqualTeamSizes",
    "type": "comparison",
    "measurements": [ "count(teams[cowboys].players)" ],
    "referenceValue": "count(teams[aliens].players)",
    "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
    "target": "rules[FairTeamSkill].maxDistance",
    "steps": [{"waitTimeSeconds": 5, "value": 50},
              {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Rule Sets

玩家属性
队伍定义
匹配规则
放宽匹配规则

```
"name": "aliens_vs_cowboys",
"ruleLanguageVersion": "1.0",
"playerAttributes": [{"name": "skill", "type": "number", "default": 10}],
"teams": [{"name": "cowboys", "maxPlayers": 8, "minPlayers": 4},
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"rules": [{
  "name": "FairTeamSkill",
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  "measurements": [ "avg(teams[*].players.attributes[skill])" ],
  "referenceValue": "avg(flatten(teams[*].players.attributes[skill]))",
  "maxDistance": 10
}, {
  "name": "EqualTeamSizes",
  "type": "comparison",
  "measurements": [ "count(teams[cowboys].players)" ],
  "referenceValue": "count(teams[aliens].players)",
  "operation": "=" // other operations: !=, <, <=, >, >=
}],
"expansions": [{
  "target": "rules[FairTeamSkill].maxDistance",
  "steps": [{"waitTimeSeconds": 5, "value": 50},
            {"waitTimeSeconds": 15, "value": 100}]
```

# FlexMatch Analytics

**Success/Failure Rates**
Player Demand

Time to Match
Rule Effectiveness
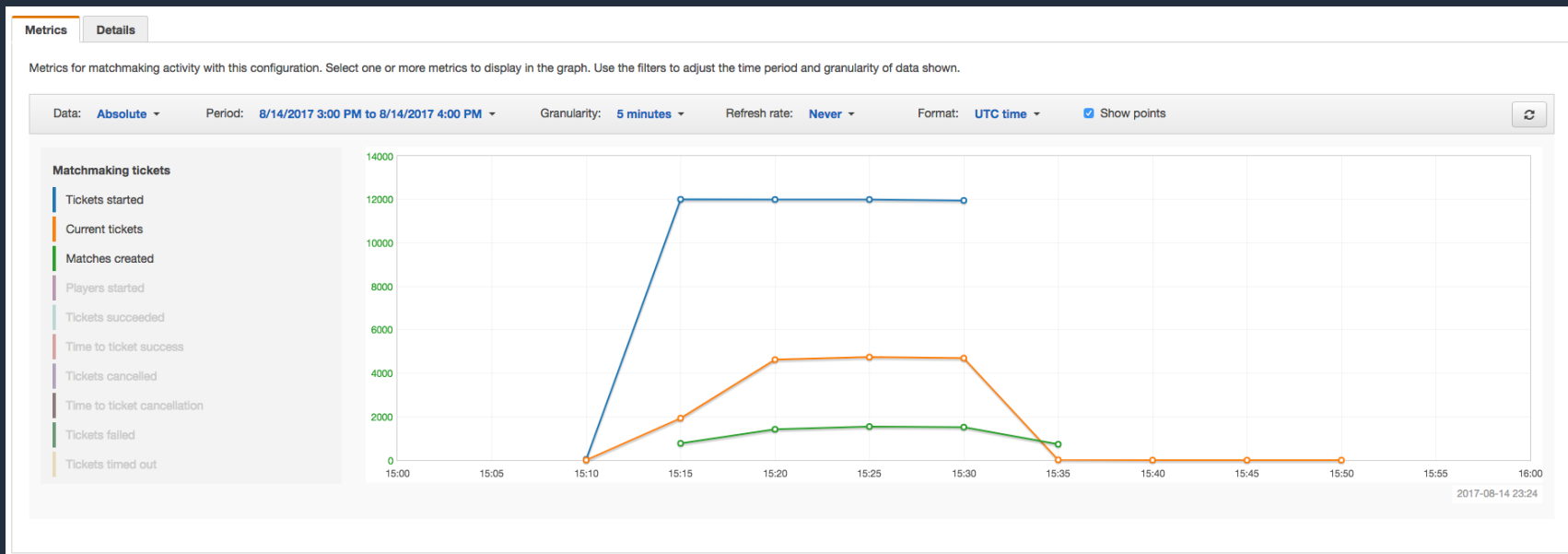
# Demo 演示



**步骤 1: 将示例游戏服务器上传到您的 Amazon GameLift 账户**

Amazon GameLift 将游戏服务器的每个版本称为生成包。第一步是上传生成包。对于此测试，我们已经创建了一个使用 Lumberyard 开发的示例游戏的生成包。生成包提供一个名称，并将其添加到下面的账户中。

游戏服务器名称：　gl-test

**已添加生成包**

**步骤 2: 部署示例游戏服务器**

游戏服务器已部署到一个或多个 Amazon EC2 实例的队组中。创建新队组，以便从下面的账户运行示例游戏服务器。这一过程耗时最多 40 分钟。

**已生成队组**　100%

**步骤 3: 下载示例游戏客户端**

队组正在激活，此时请在满足系统要求的 PC 上下载示例游戏客户端。下载的是一个 zip 文件，您将需要进行提取，然后才能玩游戏。一旦您的队组处于活动状态，4。

**下载游戏客户端**

# Demo 演示

# Amazon GameLift Sample Game

Connect to sample game server running in your Amazon Gamelift acccount. Enter a valid player session token to login and connect. If you don't have one set up a test from the Amazon Gamelift console.
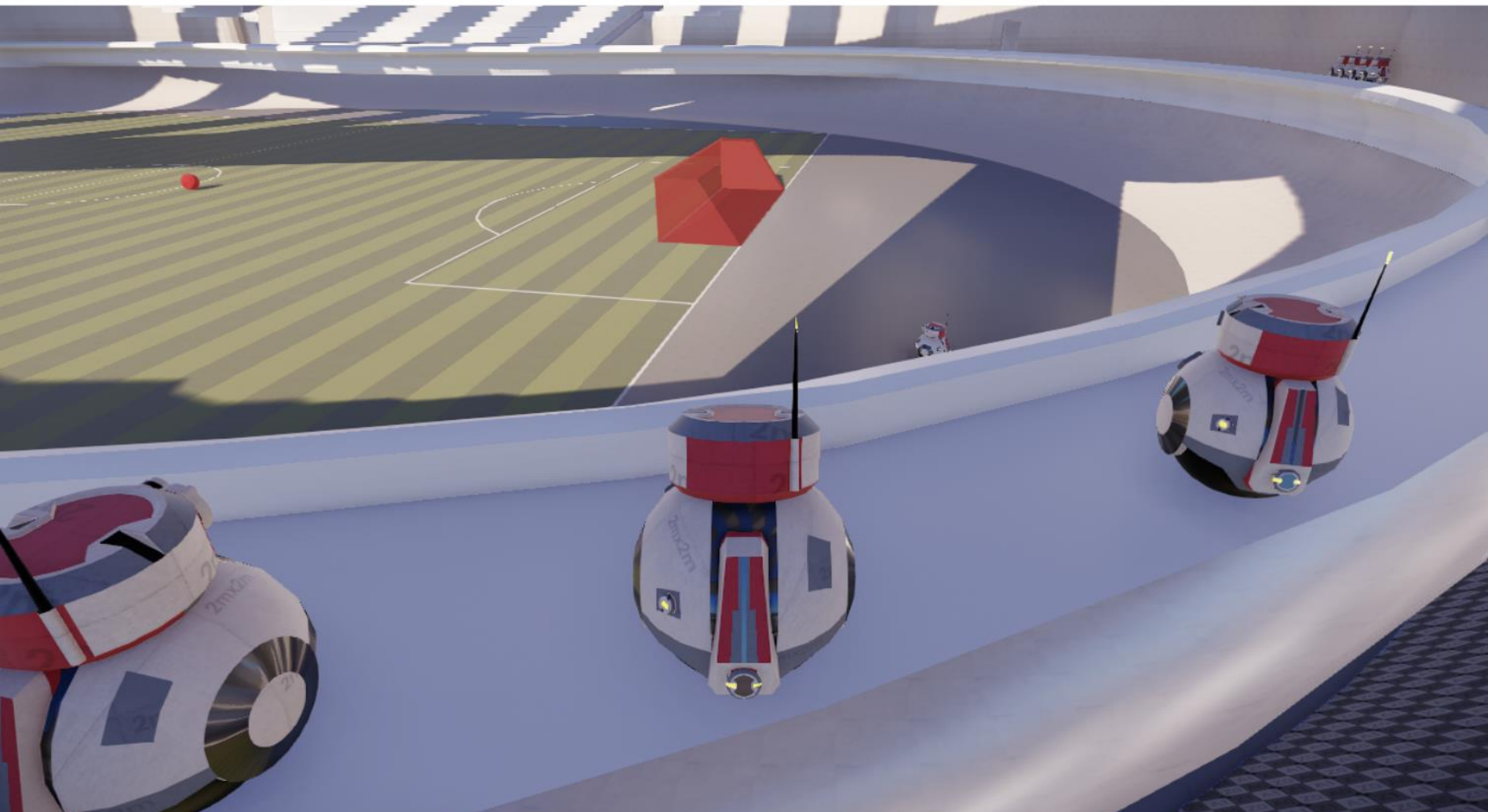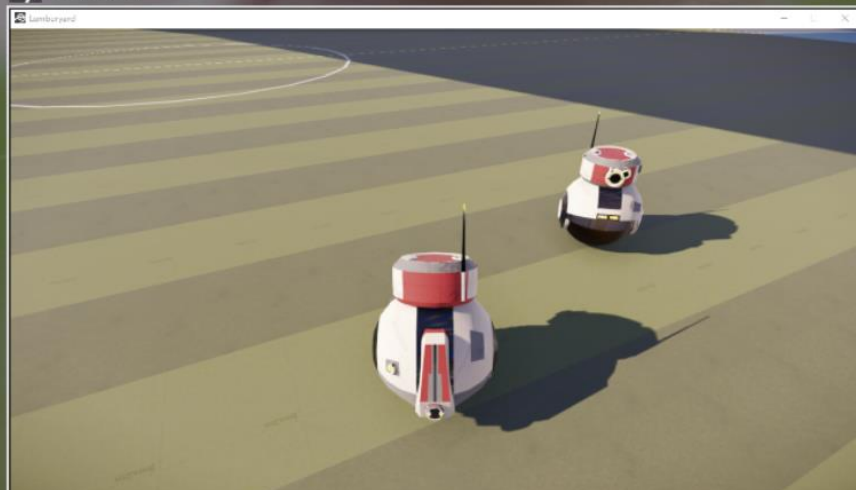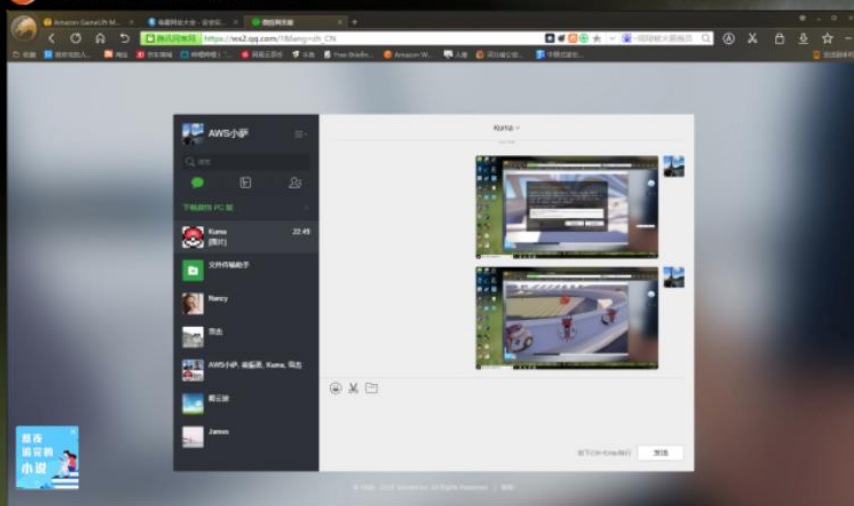
Enter Player Session Token:

```
{
    "FleetId": "fleet-7cc3c68b-1ac2-409f-98e2-28d684128bbe",
    "GameSessionId": "arn:aws:gamelift:us-east-1::gamesession/fleet-7cc3c68b-1ac2-409f-98e2-28d684128bbe/gsess-8884177c-ae8c-41c2-8d79-5f22234584ca",
    "IpAddress": "54.147.129.174",
    "PlayerId": "_|_ 5",
    "PlayerSessionId": "psess-bf3198cd-18b7-40e6-966d-c502429733b2"
}
```

[ Cancel ]     [ Connect ]

0    0
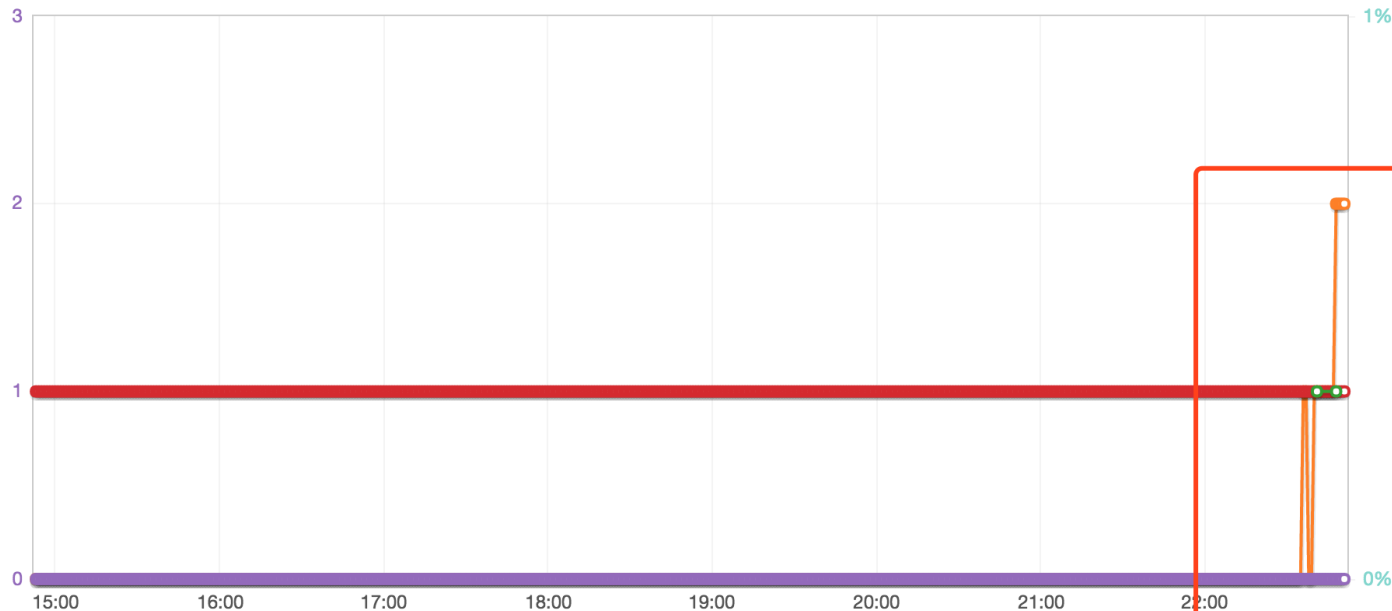
# 视频演示

Coming soon

aws | 在线研讨会

# Thank You

amazon.com/gamelift
/

# 感谢参加 AWS 在线研讨会

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