



# CloudBread

<http://aka.ms/cbp>

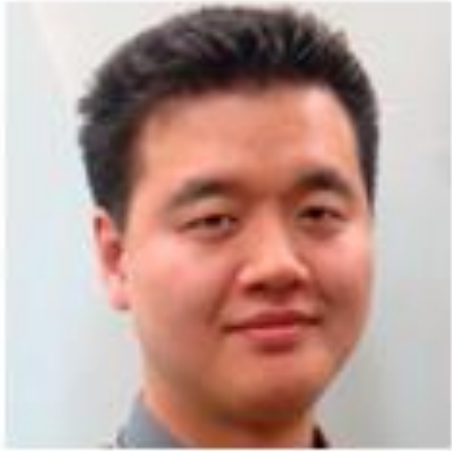
# Be with



**// Project Leader / Co-Founder**

**Jangyoon Kim ( Jay )**

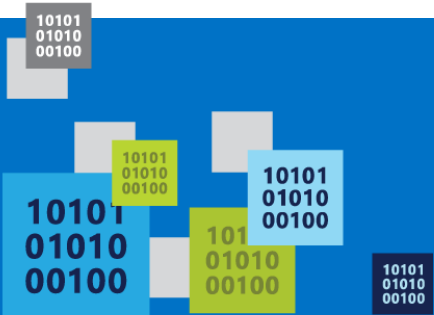




Dae Woo Kim

- CloudBread Project Founder & Leader

# Welcome to CloudBread!



# Free OSS Project- CloudBread

## Free OSS License (MIT) Project

Game server engine built for Mobile Game

### 100+ BL feature

- Focus on your game
- Support 100+ business logic by default
- Call API with parameter
- Example code and docs
- Support client SDK

### Scaling Backend

- No client code change
- Full PaaS cloud
- Scale Up - Out on your choice
- Feature choice by config

### Security / Admin Tool

- Authentication / Encryption
- GM management tool
- Batch (DAU, HAU, DARPU) support
- Free camp and hackathon



# Game Server Engine for Development Studio

<https://www.youtube.com/watch?v=x1kuy024Ryl>

Then who could be using  
CloudBread more?

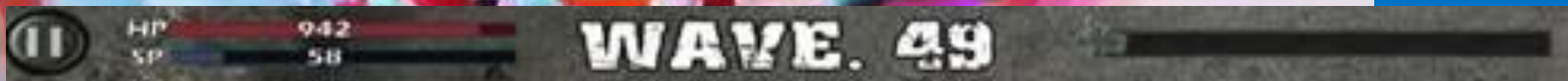


HP 942  
SP 58  
WAVE. 49



그런 부분에서 백엔드 서비스가 필요하게 되었습니다





서버개발자가 없는 클라이언트 개발자들로만 구성된 소규모 개발소에서 바로 적용할 수 있는 훌륭한 솔루션이라고 생각하고요

# And,



# Free MIT License

# 100+ game logic w/ instant API test

<https://github.com/CloudBreadProject/CloudBread/wiki>

<https://github.com/CloudBreadProject/CloudBread/wiki/CloudBread-behaviors-list>

# CloudBread “Unity” client SDK

<https://github.com/CloudBreadProject/CloudBread/wiki/How-to-use-Unity-SDK>

# How CloudBread works?

HTTP

REST API

JSON

+ Realtime Socket(P2P)

# Restful API

Get Events List API : Call SelGameEvents

HTTP Request

```
{  
    memberID = "member1"  
}
```

HTTP Response

```
{  
    EventID ="eventID1", EventName="Crystal1", duration=...  
    EventID ="eventID2", EventName="Daily event", duration=...  
    EventID ="eventID13, EventName="Invitation give", duration=...  
}
```



API List

Game Logic = Behavior

Game Logic -> API

Easy API add/modify

# Behavior list

<http://aka.ms/cbp>

-> wiki -> Behavior list

# CloudBread DB design

<http://aka.ms/cbp>

-> wiki -> database design doc

# Game Event - “Event”



# “Event” API

## CBSelGameEvents

# Leader Board -Rank

The screenshot shows a game interface with a dark blue background. At the top, there's a 'Friends' tab with a count of (7) and a 'Message' tab with a count of (2). Below these is a table with columns: Rank, Name, Stage, Star, and Battery Points. The table lists five friends: ERIC (Rank 1, Stage 135, Star 33), STAN (Rank 2, Stage 76, Star 0), WANG (Rank 3, Stage 11, Star 6), REUBEN (Rank 4, Stage 2, Star 0), and ANNA (Rank 5, Stage 2, Star 0). Each friend has a 'Send' and 'Ask' button next to their name. At the bottom, there's a timer showing 'in: 00:06:23' and a 'Send to All' button. The game logo 'THE BOT SQUAD' is visible in the bottom left corner.

Rank	Name	Stage	Star	Battery Points
1	ERIC	135	★ 33	Send Ask
2	STAN	76	★ 0	
3	WANG	11	★ 6	Send Ask
4	REUBEN	2	★ 0	Send Ask
5	ANNA	2	★ 0	Send Ask

in: 00:06:23

THE BOT SQUAD

Invite Friend Send to All

**“Rank” - Leader board**  
**GetMemberRankbyMeberID**  
**GetRangeRankerInfo**  
**CBRank-GetTopXRanker**



# Member item inventory - “memberitem”





**“Memberitem”**  
**CBSelMemberItems**

# In App Purchase - “Purchase”



**“Purchase”**

**CBComSelMemberItemPurchase**

Member

Admin

Purchase

Item

MemberItem

GameInfo

Stage

Gift

Notice

Event

Coupon

**All test API w/  
“Postman”**

# Postman demo

Postman collection download  
and import

Postman -> import -> import from link  
-> <https://goo.gl/3F4By5>

# CloudBread Developer Guide

Postman Hands on :

<http://aka.ms/cbp>

-> wiki -> Home

# Flappy bird /w CloudBread

<https://youtu.be/umWGSm0h8kE>



# CloudBread Admin-Web Admin-Web live demo

[https://cb2-admin-  
demo.azurewebsites.net/](https://cb2-admin-demo.azurewebsites.net/)

id : demo@cb2admin.onmicrosoft.com

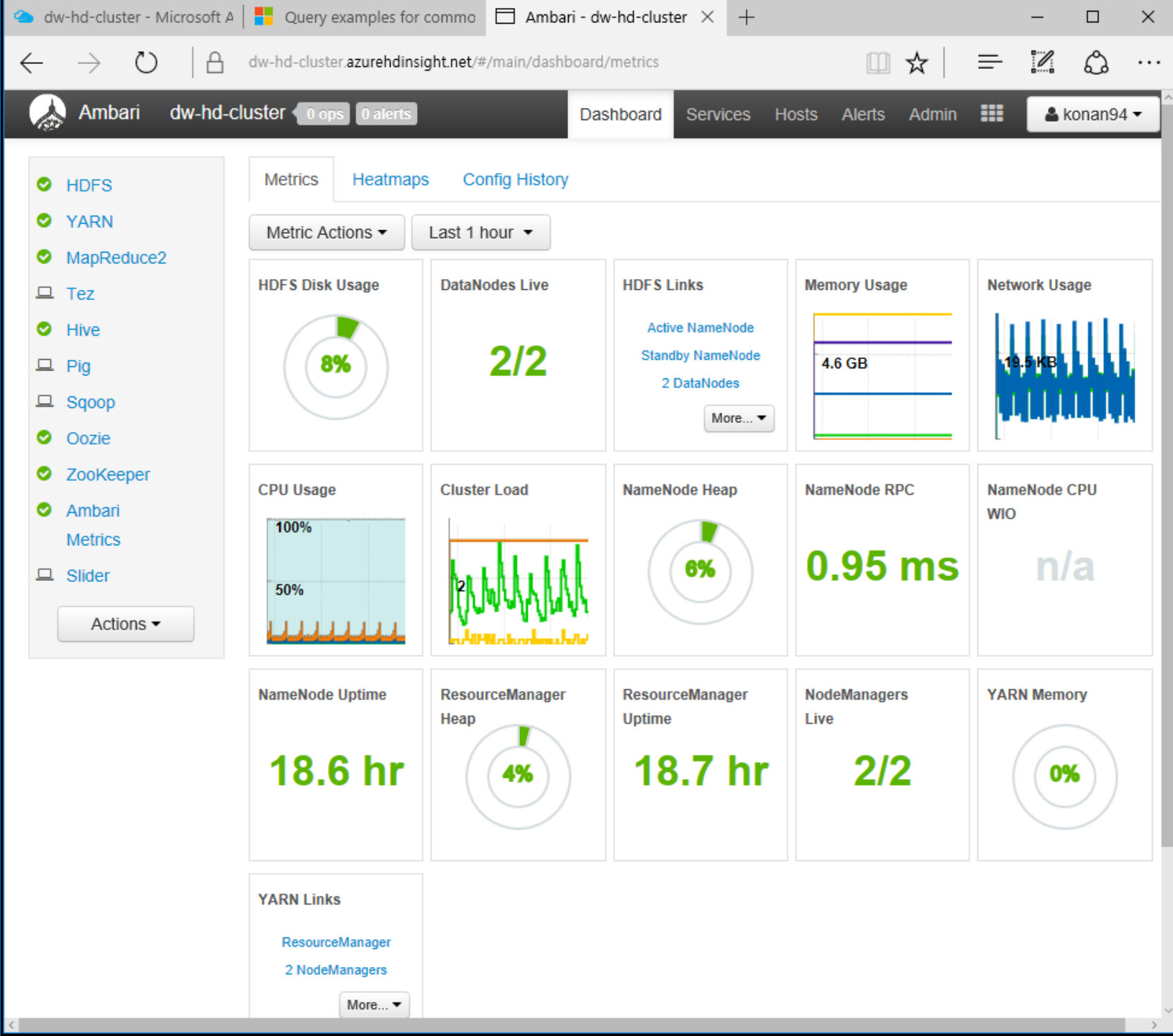
pwd : P@ssw0rd!

# Real-time Socket Communication w/ CloudBread

Live Demo: <http://goo.gl/S5OzJ0>

# CloudBread Game level design

/w big data analytics,  
Hadoop - HDInsight



dw-hd-cluster - Microsoft A

Ambari - dw-hd-cluster

+

← → ↺

dw-hd-cluster.azurehdinsight.net/#/main/views/HIVE/1.5.0/AUTO\_HIVE\_INSTANCE


📖 ☆

☰

🔧

🔔

⋮

 Ambari dw-hd-cluster 0 ops 0 alerts

Dashboard Services Hosts Alerts Admin

🗪

konan94

Hive

Query

Saved Queries

History

UDFs

Upload Table

Database Explorer

↻

default

▼

Search tables...

Databases

default

Query Editor

↗

Worksheet ✕

Load from ORC table ✕

ext data select ✕

ORC table loading ✕

orc table loading ✕

data-load from CloudBread log ✕

```
1 set hive.execution.engine=tez;
2 DROP TABLE cloudbreadlog;
3 CREATE EXTERNAL TABLE cloudbreadlog (
4   PartitionKey string,
5   RowKey string,
6   `Timestamp` string,
7   `Date` string,
8   Level string,
9   Logger string,
10  Message string
11 )
12 ROW FORMAT DELIMITED FIELDS TERMINATED BY ','
13 STORED AS TEXTFILE LOCATION 'wasbs:///example/data/';
14
15 SELECT
16 *
17 FROM
18   cloudbreadlog
19 WHERE
20   INPUT_FILE_NAME LIKE '%.csv'
21 -- where Logger like 'CBComInsMemberGameInfoStages'
22 -- AND INPUT_FILE_NAME LIKE '%.csv'
23 --order by level asc;
```

Execute

Explain

Save as...

New Worksheet

📘

SQL

⚙️

📈

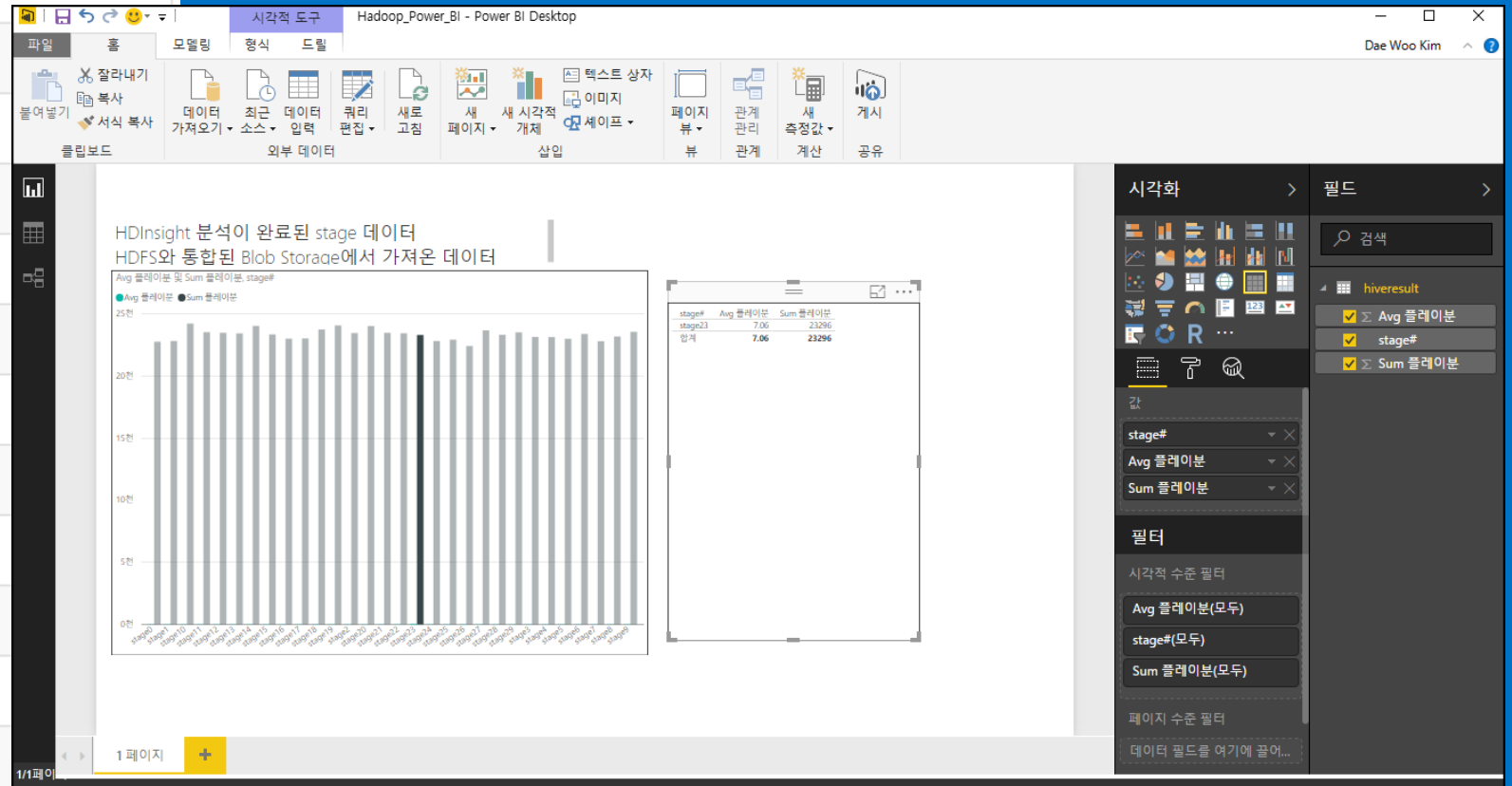
🔗

TEZ

📧

1

level	stage_play_avg_min	stage_play_sum_min
stage0	7.032447466	22757
stage1	6.923216995	22812
stage10	6.990762125	24216
stage11	6.962710861	23527
stage12	6.99791294	23471
stage13	7.04329525	23426
stage14	7.060240964	24026
stage15	7.005102041	23341
stage16	6.991793313	23003
stage17	6.954984894	23021
stage18	7.089904421	23737
stage19	7.13037037	24065
stage2	7.110673135	23451



# CloudBread /w Machine Learning

Game user churn prediction  
In-Game item suggestion



Search experiment items

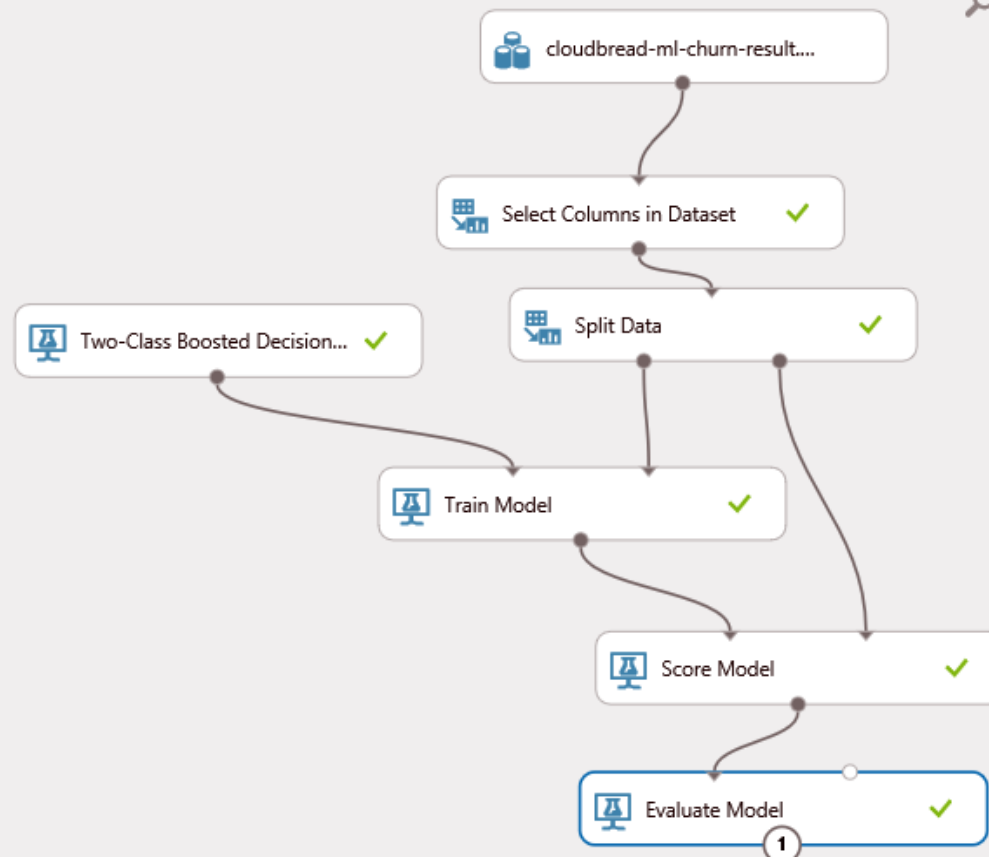
- ▶ Saved Datasets
- ▶ Trained Models
- ▶ Data Format Conversions
- ▶ Data Input and Output
- ▶ Data Transformation
- ▶ Feature Selection
- ▶ Machine Learning
- ▶ OpenCV Library Modules
- ▶ Python Language Modules
- ▶ R Language Modules
- ▶ Statistical Functions
- ▶ Text Analytics
- ▶ Web Service
- ▶ Deprecated

Training experiment

Predictive experiment

## CloudBread game user churn prediction

Finished running ✓



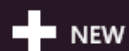
Properties Project

## Evaluate Model

START TIME 10/24/2016...  
END TIME 10/24/2016...  
ELAPSED TIME 0:00:00.000  
STATUS CODE Finished  
STATUS DETAILS Task output was present in output cache

## Quick Help

Evaluates a scored classification or regression model with standard metrics ([more help...](#))



NEW



RUN HISTORY



SAVE



SAVE AS



DISCARD CHANGES



RUN



SET UP WEB SERVICE



PUBLISH TO GALLERY



RunnerImport+BuilderTeam Library

cb2-ml-demo UserChurn x +No Environment v eye settings

cb2-ml-demo UserChurn

POST vhttps://cb2-ml-demo.azurewebsites.net/api/userchurnParamsSend vSave v

AuthorizationHeaders (8)BodyPre-request ScriptTests vCode

form-data x-www-form-urlencoded raw binaryJSON (application/json) v

1 {  
2   "MemberID" : "aaa",  
3   "LastLoginDT" : "2016-10-24 04:09:36.0547487",  
4   "Level" : "68",  
5   "Exps" : "81929",  
6   "Points" : "4454512",  
7   "SumItemCount" : "88",  
8   "SumPurchasePrice" : "372",  
9   "ChurnYN" : ""  
10 }  
11

BodyCookiesHeaders (11)Tests (1/4)Status: 200 OKTime: 5029 ms

PrettyRawPreviewJSON v

1 {  
2   "MemberID": "aaa",  
3   "LastLoginDT": "2016-10-24 04:09:36.0547487",  
4   "Level": "68",  
5   "Exps": "81929",  
6   "Points": "4454512",  
7   "SumItemCount": "88",  
8   "SumPurchasePrice": "372",  
9   "ChurnYN": "{ \"Results\": { \"output1\": { \"type\": \"table\", \"value\": { \"ColumnNames\": [ \"LastLoginDT\", \"Level\", \"Exps\",  
10   , \"Points\", \"SumItemCount\", \"SumPurchasePrice\", \"ChurnYN\", \"Scored Labels\", \"Scored Probabilities\" ]  
11   , \"ColumnTypes\": [ \"String\", \"Int32\", \"Int32\", \"Int32\", \"Int32\", \"Int32\", \"String\", \"String\", \"Double\" ]  
12   , \"Values\": [ [ \"2016-10-24 04:09:36.0547487\", \"68\", \"81929\", \"4454512\", \"88\", \"372\", null, \"Y\", \"0.962366819381714\" ] ] } } } } }"

함수 앱 - Microsoft Azu

← → ↺ | 🔒

Microsoft Azure

함수 앱

버그 보고

🔍 🔔 ⚙️ 😊 ?

함수 앱  
cb2-ml-demo-function

내 함수 검색

+ 새 함수

⚡ cb2-ml-demo-batch-input

</> 개발

⚡ 통합

⚙️ 관리

🔍 모니터

⚡ cb2-ml-demo-batch-output

🔧 함수 앱 설정

⚡ 빠른 시작

📄 새 코드

코드 (run.csx) 저장

```
124 // submit the job
125 const string BaseUrl = "https://asiasoutheast.services.azureml.net/workspaces/46d0e60b05b3.
126 var response = await client.PostAsJsonAsync(BaseUrl + "?api-version=2.0", request).Configu
127 if (!response.IsSuccessStatusCode)
128 {
129     await WriteFailedResponse(response, log);
130     return;
131 }
132
133 string jobId = await response.Content.ReadAsAsync<string>();
134 log.Info(string.Format("Job ID: {0}", jobId));
135
136 // start the job
137 log.Info("Starting the job...");
138 response = await client.PostAsync(BaseUrl + "/" + jobId + "/start?api-version=2.0", null);
139 if (!response.IsSuccessStatusCode)
140 {
141     await WriteFailedResponse(response, log);
142     return;
143 }
```

파일 보기

로그 || 일시 중지 지우기 로그 복사

```
2016-10-24T07:45:17.169 Submitting the job...
2016-10-24T07:45:19.401 Job ID: 1e9471afa7c34472ad8abc94b7c43b08
2016-10-24T07:45:19.401 Starting the job...
2016-10-24T07:45:19.863 job done...
2016-10-24T07:45:19.863 Function completed (Success, Id=d66c2751-3fe2-4c53-9be7-89d082853141)
2016-10-24T07:46:40.299 Script for function 'cb2-ml-demo-batch-input' changed. Reloading.
2016-10-24T07:46:40.455 warning AF004: Missing binding argument named 'output'. Mismatched binding argument names may l
2016-10-24T07:46:40.455 Compilation succeeded.
2016-10-24T07:47:07.337 Function started (Id=432a3698-4b55-4d4f-a765-40099e814277)
```

File Home Insert Draw Page Layout Formulas Data Review View Developer Add-ins LOAD TEST Team Design Tell me what you want to do

Share

Clipboard Font Alignment Number Styles Cells Editing

맑은 고딕 11 Bold Italic Underline Font Color Text Color Background Color

General Conditional Formatting Format as Table Cell Styles

Insert Delete Format

Σ Sort & Filter Find & Select

A4 1001-8822E80C-D1D8-46DF-BA28-5E24E9037914

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	MemberID	LastLoginID	Level	Exps	Points	SumItemC	SumPurch	ChurnYN		LastLoginID	Level	Exps	Points	SumItemC	SumPurch	ChurnYN	Scored Label	Scored Probabilities	
2	0-A14F4418	#####	80	24654	6721708	16	263	N		42666.7	80	24654	6721708	16	263	N	N	0.237285	
3	1000-7C2A5	#####	6	62972	8300495	55	67	N		42666.7	6	62972	8300495	55	67	N	Y	0.780973	
4	1001-8822E	#####	78	63084	6991491	54	189	Y		42666.7	78	63084	6991491	54	189	Y	Y	0.801408	
5	1002-968B3	#####	95	2883	8425344	65	508	Y		42666.7	95	2883	8425344	65	508	Y	N	0.052542	
6	1003-29E5EE	#####	72	93125	7071437	49	22	N		42666.7	72	93125	7071437	49	22	N	N	0.267112	
7	1004-9C118	#####	99	58240	8047461	14	7	Y		42666.7	99	58240	8047461	14	7	Y	Y	0.900263	
8	1005-1ADF0	#####	96	47296	7601545	86	265	N		42666.7	96	47296	7601545	86	265	N	N	0.206277	
9	1006-C5AAA	#####	11	19801	2991996	0	275	Y		42666.7	11	19801	2991996	0	275	Y	Y	0.924229	
10	1007-FFED7E	#####	88	11277	5652028	85	858	N		42666.7	88	11277	5652028	85	858	N	Y	0.872014	
11	1008-41528E	#####	23	17411	2358661	47	135	Y		42666.7	23	17411	2358661	47	135	Y	Y	0.743287	
12	1009-D4F7F	#####	41	76710	1365212	0	109	N		42666.7	41	76710	1365212	0	109	N	N	0.01082	
13	100-DD066E	#####	99	59560	5575917	24	842	Y		42666.7	99	59560	5575917	24	842	Y	Y	0.893613	
14	1010-F2BE2	#####	14	70180	4524248	36	119	N		42666.7	14	70180	4524248	36	119	N	N	0.019864	
15	1011-51775	#####	91	29178	2718337	79	467	Y		42666.7	91	29178	2718337	79	467	Y	N	0.493636	
16	1012-535C6	#####	88	20035	9942347	79	139	N		42666.7	88	20035	9942347	79	139	N	N	0.015788	
17	1013-5A934	#####	47	4110	207860	30	564	N		42666.7	47	4110	207860	30	564	N	N	0.033909	
18	1014-B479D	#####	33	12611	2939609	6	710	N		42666.7	33	12611	2939609	6	710	N	N	0.021689	
19	1015-43A59	#####	68	38414	8931221	29	643	Y		42666.7	68	38414	8931221	29	643	Y	Y	0.77291	
20	1016-891A9	#####	28	67703	2520534	88	690	Y		42666.7	28	67703	2520534	88	690	Y	Y	0.886287	
21	1017-35A06	#####	3	27171	2032155	58	161	N		42666.7	3	27171	2032155	58	161	N	N	0.028444	
22	1018-81142	#####	35	33738	5697096	94	320	N		42666.7	35	33738	5697096	94	320	N	N	0.346097	
23	1019-B8795	#####	4	50552	203943	36	845	Y		42666.7	4	50552	203943	36	845	Y	Y	0.99512	
24	101-B25946	#####	47	26578	9159577	45	229	Y		42666.7	47	26578	9159577	45	229	Y	Y	0.928443	
25	1020-E12E7	#####	25	84092	8180369	86	135	N		42666.7	25	84092	8180369	86	135	N	N	0.09748	
26	1021-54923	#####	83	49942	5410146	4	437	Y		42666.7	83	49942	5410146	4	437	Y	Y	0.799621	
27	1022-57817	#####	88	63993	2549689	41	910	Y		42666.7	88	63993	2549689	41	910	Y	N	0.298076	
28	1023-E4E7A	#####	0	69797	8811748	14	925	N		42666.7	0	69797	8811748	14	925	N	N	6.69E-05	
29	1024-9137C	#####	76	94779	528958	14	113	N		42666.7	76	94779	528958	14	113	N	Y	0.958864	
30	1025-5DB84	#####	35	34020	8641841	40	685	N		42666.7	35	34020	8641841	40	685	N	N	0.01163	
31	1026-6C59A	#####	42	89001	8382799	89	355	N		42666.7	42	89001	8382799	89	355	N	N	0.050244	

## Azure Machine Learning

← CloudBread game user churn prediction [Pr...

1. VIEW SCHEMA

2. PREDICT

Input: input1

Sheet1!A1:H10001

☒ My data has headers

Use sample data ?

Output: output1

Sheet1!J2

☒ Include headers

Predict

☐ Auto-predict☒ A few rows at a time (RRS)

As a batch (Batch)

Help Privacy Statement

CloudBread  
/w Stream Analytics

Real-time fraud detection

작업 다이어그램 - Micr

ms.portal.azure.com/#resource/subscriptions/3e6494d9-d19d-41c6-bfa6-44870aecc57b/resourceGroups/dw-fraud-detection/providers/Microsoft.StreamAnalytics/streamin

Microsoft Azure

버그 보고

리소스 검색

🔔 ⚙️ 😊 ?

cb2-fraud-stream-analytics - 작업 다이어그램

스트림 분석 작업

검색(Ctrl+/)

활동 로그

액세스 제어(IAM)

태그

설정

잠금

작업 토폴로지

입력

함수

쿼리

출력

구성

배출

로컬

이벤트 순서 지정

오류 정책

<> output

단계

<> fraudoutput

단계

output

BLOB 저장소

fraudoutput

BLOB 저장소

fraudoutput

```
1 SELECT
2     deviceid, System.Timestamp AS Now,
3     COUNT(*) AS [Count]
4 INTO
5     fraudoutput
6 FROM
7     input TIMESTAMP BY Now
8 GROUP BY
9     deviceid,
10    TumblingWindow(second, 5)
11 HAVING
12    [Count] >= 5
```

CloudBread ARM



**You:** Code (application, infrastructure)  
**Azure:** Resources (IaaS, PaaS)

# ARM DEMO & Hands on

ARM Demo :

<https://youtu.be/TvtXkRAymcg>



