

Affinity Space

-- Learning Metrics Integration & Development

Ruimin Zhao(rz2390) & Neng Chen(nc2734)

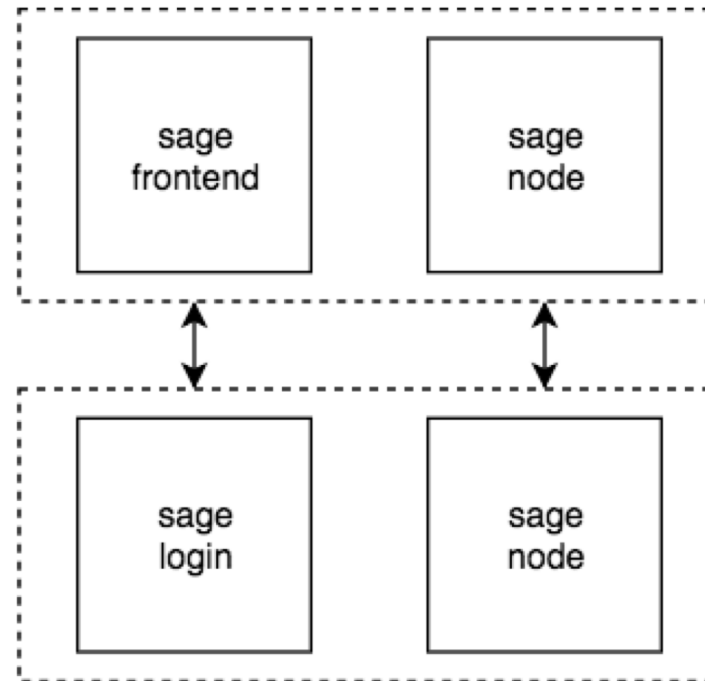
Outline

- Learning metric (sage-frontend repo & sage-login database)
- Hairball (sage-node repo & sage-node database)

Background

- 1st problem to solve: Integrate the learning metrics graph into master account without any conflicts with other features.
- 2nd problem to solve: Modify the hairball package so that it could generate game result on our sage sb2 file.
- 3rd problem to solve: Trigger the hairball assessment and store the real score for metrics graph to use (ongoing).

Architecture



Graph Reproduce

- <https://gudangdaya.atlassian.net/wiki/spaces/SAG/pages/579436651/Learning+Metrics+Badges+Reproduce>
- Here is the link to the detailed documentation for this portion.

Integration database

We made the metrics graphs able to be shown on master account at the first stage and then we cleared the database collections and fixed some errors (warning) in codebase to make this feature not conflicting with another feature developed by another team.

```
1 {
2   "_id": {
3     "$oid": "5acf8e30d3b2ac27f48e7380"
4   },
5   "name": "Class 1",
6   "description": "A new class of bright students",
7   "instructorId": "59f8c6fdc1bfb23c4ced8e20",
8   "isDeleted": false,
9   "missions": [
10     "58d8476ce9a1b743936abc2e",
11     "5a1ac8ca3d08f488b0a1fabd",
12     "5a5881f2a55ed728d4755c9e",
13     "5ab41f677be6580a68b99b2d",
14     "590a2159122c012a585324d3"
15   ],
16   "roster": [
17     "5ab2ac69dae3cc15233c2805",
18     "5ae67233949dce0dcc225c64"
19   ],
20   "__v": 0
21 }
```

Hairball Modification - run sage sb2

```
        "white %d": true,  
        "tempo": true,  
        "for each %m.varName in %s": true,  
        "glide %n secs to x:%n y:%n": true  
    },  
    "parsonsBlocks": [],  
    "children": [{  
        "objName": "Sprite1",  
        "scripts": [[5,  
            156.9,  
            ["70FC6BEA-2728-F95F-5368-050373D254CE", "wait:elapsed:from:"  
        ],  
        "sounds": [{  
            "soundName": "pop",  
            "soundID": 0,  
            "md5": "83a9787d4cb6f3b7632b4ddfebf74367.wav",  
            "sampleCount": 258,  
            "rate": 11025,  
            "format": ""  
        }]  
    }]  
}
```

Our sage sb2
has a unique
ID added to
each json file

We modified
Kurt library
to make the
Hairball able
to run on our
sage sb2

```
def load_block(self, block_array):  
    block_array = list(block_array)  
    try:  
        command = block_array.pop(0)  
  
        if command == 'procDef': # CustomBlockType definition  
            spec = block_array[0]  
            return kurt.Block('procDef', self.custom_blocks[spec])  
  
        if command == 'call': # CustomBlockType call  
            block_type = self.custom_blocks[block_array.pop(0)]  
        else:  
            block_type = kurt.BlockType.get(command)  
    except kurt.UnknownBlock:  
        command = block_array.pop(0)  
  
        if command == 'procDef': # CustomBlockType definition  
            spec = block_array[0]  
            return kurt.Block('procDef', self.custom_blocks[spec])  
  
        if command == 'call': # CustomBlockType call  
            block_type = self.custom_blocks[block_array.pop(0)]  
        else:  
            block_type = kurt.BlockType.get(command)
```

Hairball Modification - run json

After managed to make the Hairball run on sage sb2 file, we then tried to optimize this pipeline further - to avoid keeping all the redundant files such as images and sound files generated all together with that core json file. This is for the purpose of speeding up the frequent uploading and downloading process of that sb2 file.

```
project.json
1  {
2    "objName": "Stage",
3    "sounds": [{
4      "soundName": "pop",
5      "soundID": 0,
6      "md5": "83a9787d4cb6f3b7632b4ddfeb74367.wav",
7      "sampleCount": 258,
8      "rate": 11025,
9      "format": ""
10   }],
11   "costumes": [{
12     "costumeName": "backdrop1",
13     "baseLayerID": 2,
14     "baseLayerMD5": "de33ad43c00f8df227d445f8cd599589.png",
15     "bitmapResolution": 2,
16     "rotationCenterX": 480,
17     "rotationCenterY": 360
18   }],
19   "currentCostumeIndex": 0,
```


Assessment Trigger

After we modified the Hairball related libraries and make it able to get real score, we then started to find the correct way to trigger the assessment process so as to get that real score in program and then save them into metric collection so that our learning metrics graphs could be generated based on real score from real assessment rather than being hardcoded.

```
13
14 function getSb2File (studentId, gameId) {
15   // search sb2 file ??? storage - save a sb2 file without any association to studentId and gameId
16   return "/Users/ruiminzhao/Desktop/SAGE/sb2/simple.sb2";
17 };
18
19 function updateEveryHour (studentId, gameId) {
20   sb2File = getSb2File(studentId, gameId);
21   hairball (sb2File)
22   .then((results) => {
23     console.log("test test test!!!", results);
24     // TODO: upload to mLab - discussion: update entity (read entity, delete entity, write entity)
25   })
26   .catch((err) => console.log(err));
27 };
28
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: bash

Assessment Completed
test test test!!! { Abstraction: 0,
 Parallelization: 0,
 Logic: 0,
 Synchronization: 1,
 FlowControl: 1,
 UserInteractivity: 1,
 DataRepresentation: 0 }

refreshing game 5aa3574281e48e19b4686bc7 for 59f369cc748499467c32a414
Updating Stage sprite in game 5aa3574281e48e19b4686bc7
Game 5aa3574281e48e19b4686bc7 uploaded
POST /games/student/59f369cc748499467c32a414/game/5aa3574281e48e19b4686bc7/objective/5a5b8b17eeb30a33b4522036 200 49.837 ms

Future Work

- Finalize the way we store and assess a game from both student and teacher's perspective, and finish the database communication portion of code.
- Create more metrics graph based on different use of the hairball assessment result of a game in the front-end UI.

Q&A

- Thank You!