

# Cloud Based IT Lab

**Werayuth Charoenruengkit, Ph.D.**

Stamford International University

Background Image removed

# Issues with building labs

## Space

- Inefficient use of lab space

## Cost

- Hardware investment
- Software license

## Management

- Lab Technician
- Hardware lost
- Maintenance
- Depreciation

Background Image removed

# Any encounter this problem...

- I need more machines
- I need more storage
- I need software on my machines quickly
- I need software licenses to educate students
- I need a way to **effective way** to evaluate students

Background Image removed

**Why stay at the problems?**

**Let's go Cloud-based ....**

Background Image removed

# Cloud-based computer labs

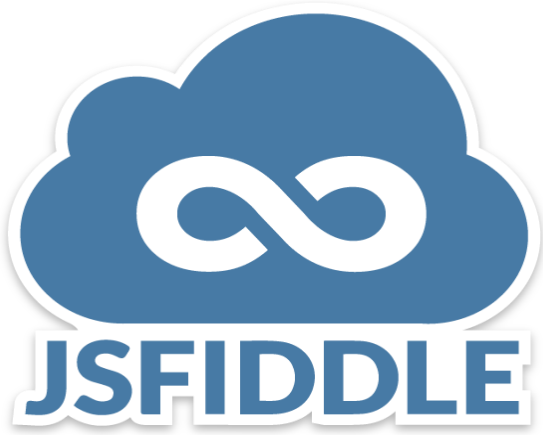
- Organizations around the world start replacing conventional labs.
- Reduce training expenses.
- Allow instructors to remotely monitor the progress of all students.
- Enable students to use the facilities 24/7.

Background Image removed

# Outline


- **Online IDE**
- **Online Collaboration**
- **Cloud based Lab with Openshift**
- **Cloud based Lab from Microsoft**
- **Cloud based Lab from Google**
- **Implementation Process**
- **Other possibilities**

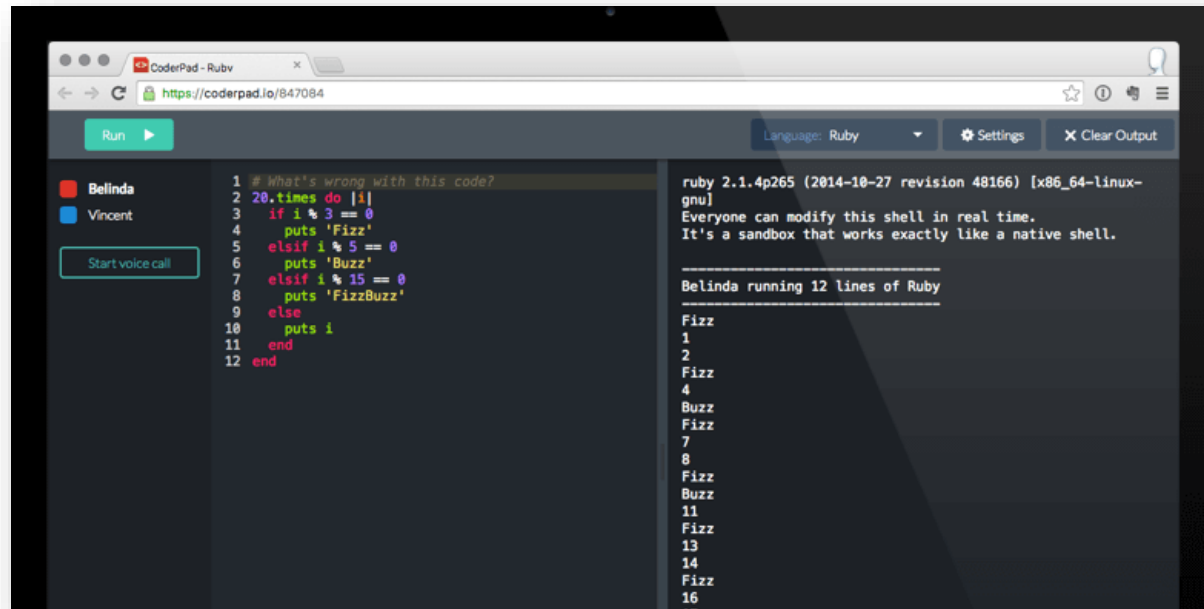
Background Image removed



- Online programming IDE and experiment ground for coding
- Encourage interactivity among students and teacher
- Submitting link of the work

## Website

- <https://jsfiddle.net> 
- <https://ideone.com/>
- <https://coderpad.io/>



The screenshot shows a web browser window with the URL <https://coderpad.io/847084>. The interface includes a 'Run' button, a language dropdown set to 'Ruby', and a 'Clear Output' button. The code editor contains the following Ruby code:

```
1 # What's wrong with this code?
2 20.times do |i|
3   if i % 3 == 0
4     puts 'Fizz'
5   elsif i % 5 == 0
6     puts 'Buzz'
7   elsif i % 15 == 0
8     puts 'FizzBuzz'
9   else
10    puts i
11  end
12 end
```

The output pane on the right shows the execution results:

```
ruby 2.1.4p265 (2014-10-27 revision 48166) [x86_64-linux-gnu]
Everyone can modify this shell in real time.
It's a sandbox that works exactly like a native shell.

Belinda running 12 lines of Ruby

Fizz
1
2
Fizz
4
Buzz
Fizz
7
8
Fizz
Buzz
11
Fizz
13
14
Fizz
16
```

moved

# Outline

- **Online IDE**
- **Online Collaboration**
- **Cloud based Lab with Openshift**
- **Cloud based Lab from Microsoft**
- **Cloud based Lab from Google**
- **Implementation Process**
- **Other possibilities**

Background Image removed





- Group project
- Agile Process
- Teacher grades students on individual effort
- Able to monitor progress anytime
- Project extensibility

**GitHub**



Website :

<https://github.com>



<https://trello.com> Background image removed

# Outline

- Online IDE
- Online Collaboration
- Cloud based Lab with OpenShift
- Cloud based Lab from Microsoft
- Cloud based Lab from Google
- Implementation Process
- Other possibilities

Background Image removed



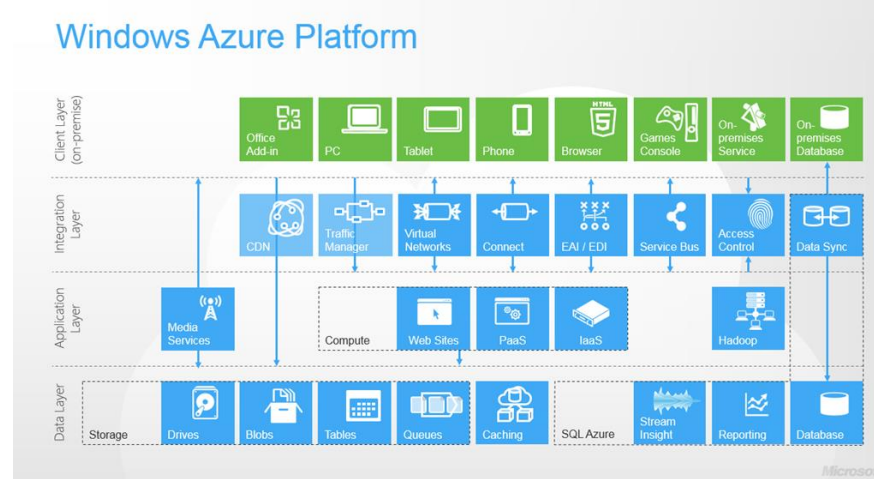
- **Platform-as-a-Service (PaaS) from Redhat**
  - Many ready-to-use software suites
- **Remote shell access : ssh, rsync**
- **Git repository**
- **Case: LAMP stack + phpmyadmin**
- **Deploy WordPress in a few clicks**

Background Image removed

# Outline

- Online IDE
- Online Collaboration
- Cloud based Lab with Openshift
- Cloud based Lab from Microsoft
- Cloud based Lab from Google
- Implementation Process
- Other possibilities

Background Image removed



- **Infra as-service, platform as-service and application as service**
- **Window Server, Ubuntu, etc.**
- **Web services**
- **BizSpark**
- **Microsoft Educator Grant Program :**  
**Azure (Currently discontinued as of Aug 2016)**

**Website:**

<https://portal.azure.com>  
[Data Minging Experiment](#)

Background image removed

# Outline

- **Online IDE**
- **Online Collaboration**
- **Cloud based Lab with Openshift**
- **Cloud based Lab from Microsoft**
- **Cloud based Lab from Google**
- **Implementation Process**
- **Other possibilities**

Background Image removed



## Google Cloud Platform



- Allow free tier using Platform as-service and Application as-service
- Individual free account requires credit card registration
- Academic grant is available

### Website:

<https://cloud.google.com/products/>

<https://developers.google.com/apps-script/>

Background Image removed

# Outline

- **Online IDE**
- **Online Collaboration**
- **Cloud based Lab with Openshift**
- **Cloud based Lab from Microsoft**
- **Implementation Process**
- **Other possibilities**

Background Image removed



# Process

- Student works locally if possible
  - Via emulator / IDE
- Post online for help from teacher and classmates
- Rework for final submission
- Submit link for evaluation
- Evaluated and graded

Background Image removed

# Outline

- **Online IDE**
- **Online Collaboration**
- **Cloud based Lab with Openshift**
- **Cloud based Lab from Microsoft**
- **Implementation Process**
- **Other possibilities**

Background Image removed

# Other possibilities

- Cloud based network labs
- Virtual class based collaboration
- Research
  - Intensive computation application
  - Large storage processing

Background Image removed

**Thank You**

Background Image removed