

Build a Simple REST API Web App From Scratch

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Forward-Looking Statement

Statements regarding our product development initiatives, including new products and future product upgrades, updates or enhancements represent our current intentions, but may be modified, delayed or abandoned without prior notice and there is no assurance that such offering, upgrades, updates or functionality will become available unless and until they have been made generally available to our customers.



About Me

- Blackboard's Partner Software Engineer/ 5yrs+
- Former Learn Admin & Dev @ CSU Chico
- Scientist/Engineer @ Hewlett-Packard
 - Report Generation System and Method, US Patent# 7031979
- Grandfather, 6X marathons, hiking & gaming

Agenda

Django Web Application

- Security
- Session

BbRest

- Developer Portal Registration
- Integrate With Blackboard Learn

Django and BbRest

- Make REST API calls to Blackboard Learn
- 2-Legged OAuth & 3-Legged OAuth

DEVCON (20)

Demo!

Blackboard

#BbWorld20

Agenda

Web Application

- Security

BbRest

- Developer Portal Registration
- Integrate With Blackboard Learn

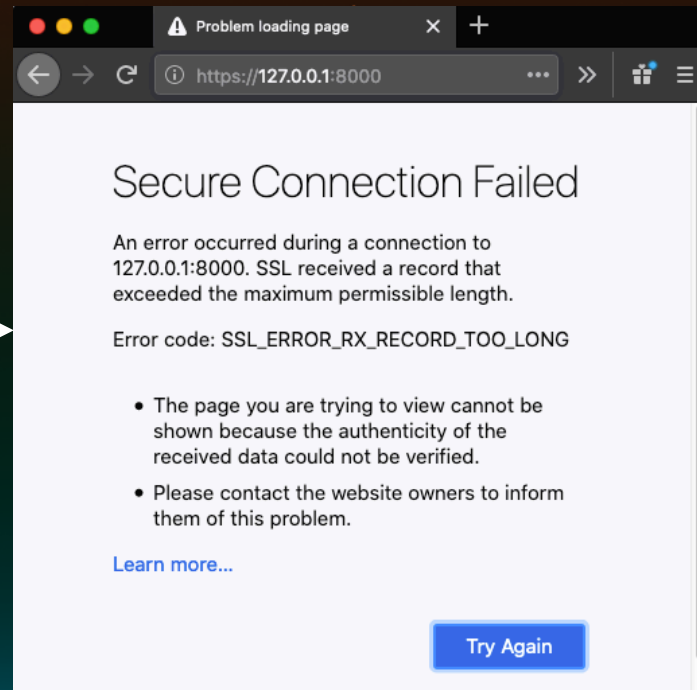
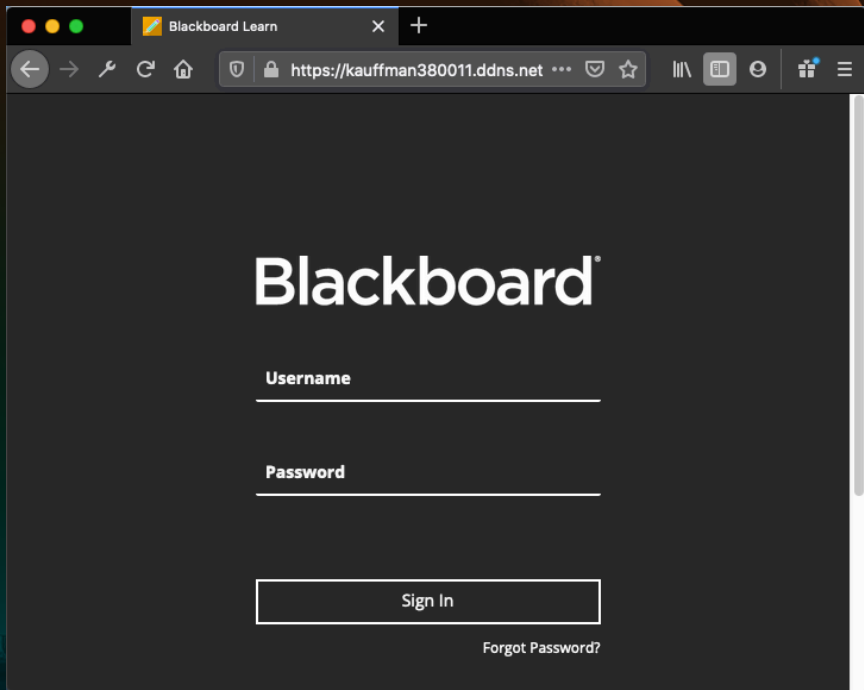
Django and BbRest

- Make REST API calls to Blackboard Learn
- 2-Legged OAuth & 3-Legged OAuth

Secure Django Applications

Search For: “how to get ssl cert and secure django web application”

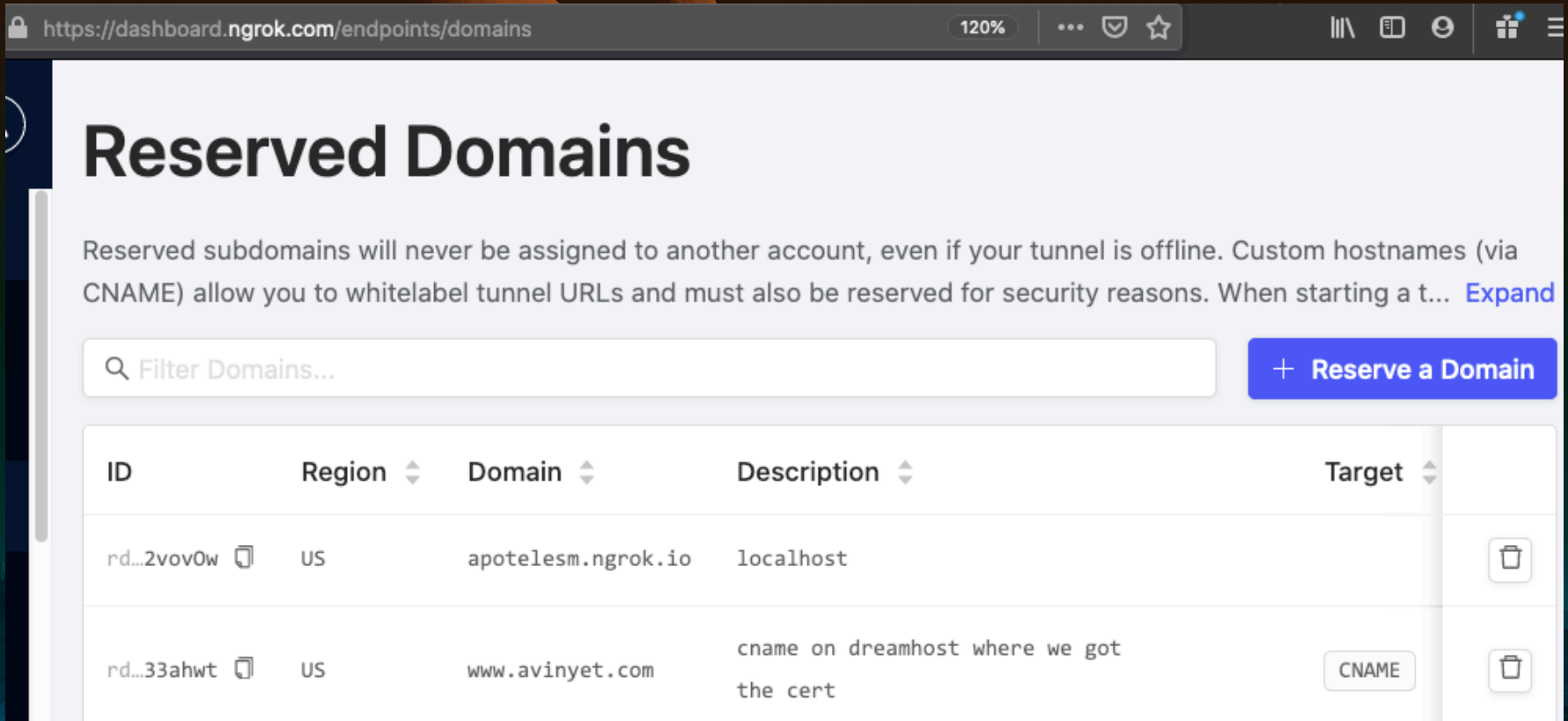
SSL/TLS



SSL/TLS - ngrok Reverse Proxy to Django on localhost:8000

- Registered a DNS Name On Dreamhost: avinyet.com
 - Got SSL Cert For www.avinyet.com
 - Created a CNAME Record For www.avinyet.com to ngrok Account
- ngrok Account
 - Custom Domain Reservation, CNAME Target @ Dreamhost DNS
 - `$ ~/ngrok tls -region=us -hostname=www.avinyet.com -key ~/avinet.rsaprivatekey.pem -cert ~/avinet.fullchaincert.pem 8000`
 - ngrok “secure introspectable tunnel” to Django on localhost

SSL Required



The screenshot shows a web browser window with the URL `https://dashboard.ngrok.com/endpoints/domains`. The page title is "Reserved Domains". Below the title is a paragraph explaining that reserved subdomains are permanent and used for whitelabeling. A search bar labeled "Filter Domains..." and a blue button "+ Reserve a Domain" are present. A table lists two reserved domains with columns for ID, Region, Domain, Description, and Target.

Reserved subdomains will never be assigned to another account, even if your tunnel is offline. Custom hostnames (via CNAME) allow you to whitelabel tunnel URLs and must also be reserved for security reasons. When starting a t... [Expand](#)

Filter Domains...

+ Reserve a Domain

ID	Region	Domain	Description	Target
rd...2vov0w	US	apotelesm.ngrok.io	localhost	
rd...33ahwt	US	www.avinyet.com	cname on dreamhost where we got the cert	CNAME

SSL/TLS Required

```
$ ~/ngrok tls -region=us -hostname=www.avinyet.com -key  
~/avinet.rsapivatekey.pem -crt ~/avinet.fullchaincert.pem 8000
```

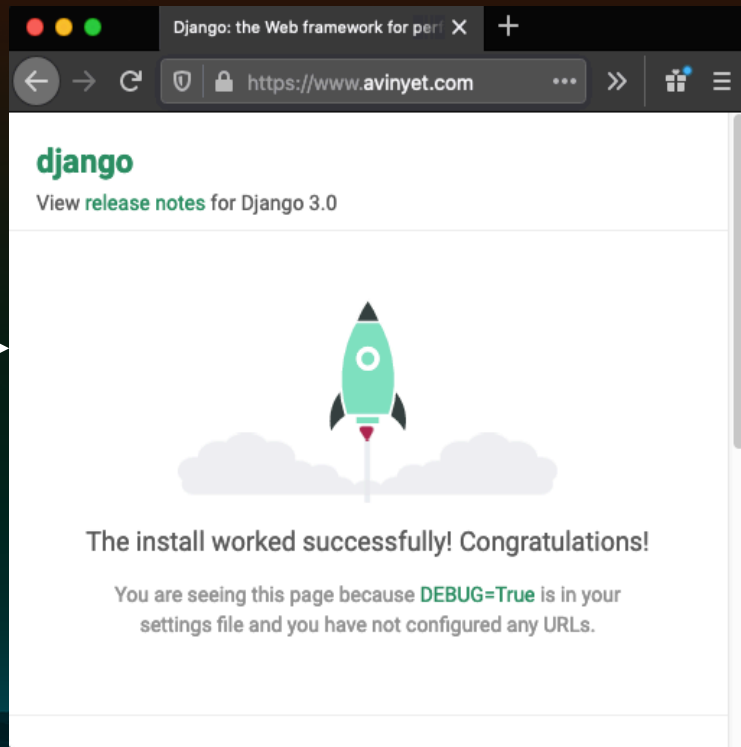
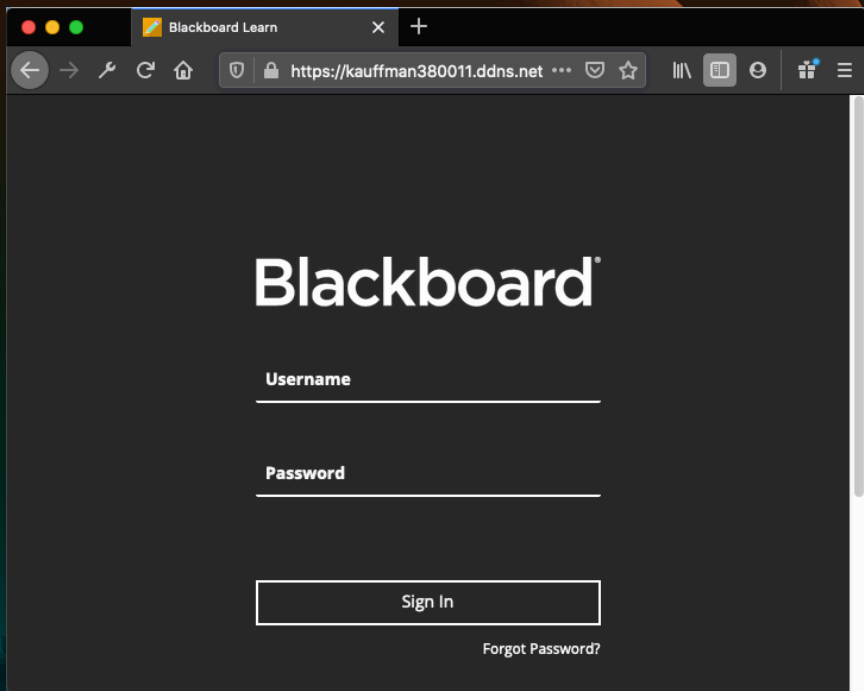
```
Default (ngrok)
ngrok by @inconsreveable (Ctrl+C to quit)

Session Status      online
Account             Mark Kauffman (Plan: Pro)
Version             2.3.35
Region              United States (us)
Web Interface        http://127.0.0.1:4040
Forwarding           tls://www.avinyet.com -> localhost:8000

Connections
```

ttl	opn	rt1	rt5	p50	p90
0	0	0.00	0.00	0.00	0.00

SSL/TLS



Django settings.py: `ALLOWED_HOSTS = ['127.0.0.1', 'localhost', 'www.avinyet.com']`

Django



- “Reassuringly secure.”
 - Django takes security seriously and helps developers avoid many common security mistakes
- Session Management
 - Can Save Python Objects on Session

- Settings.py

```
MIDDLEWARE = [  
    'django.middleware.security.SecurityMiddleware',  
    'django.contrib.sessions.middleware.SessionMiddleware',  
    'django.middleware.common.CommonMiddleware',  
    'django.middleware.csrf.CsrfViewMiddleware',  
    'django.contrib.auth.middleware.AuthenticationMiddleware',  
    'django.contrib.messages.middleware.MessageMiddleware',  
    'django.middleware.clickjacking.XFrameOptionsMiddleware',  
]
```

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REST Applications for Blackboard Learn

Register and Setup & BbRest

Register on developer.blackboard.com

developer.blackboard.com/portal/applications

Blackboard Community Explore APIs My Apps My Groups My Account Logout

Manage Your Applications

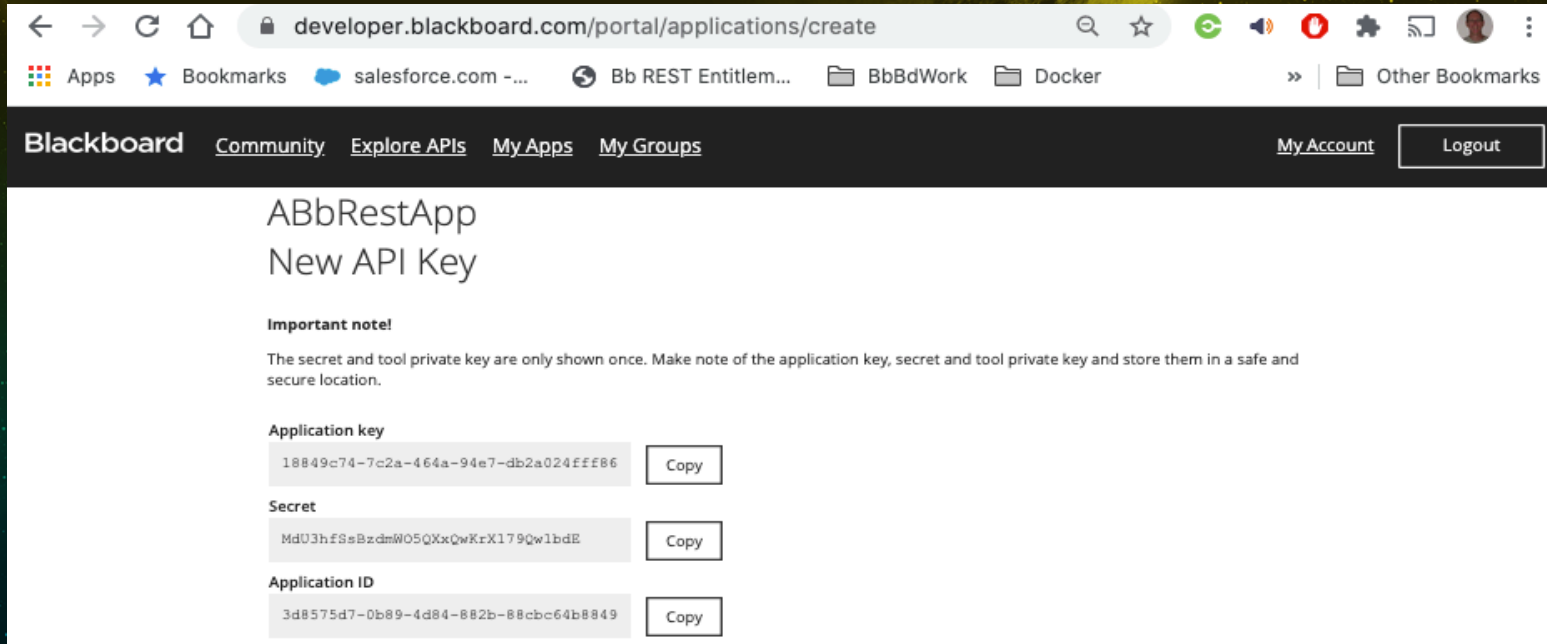
Click (+) to Register a New Application

My Applications My Site Registrations

You may edit an application's Name and Description. You can view the Schools using your application. You may also request your Application Key. Finally, you may also delete your application.

- No LTI Needed For This Workshop
- Domains: localhost[,<any domains your app may run on>]

Register on developer.blackboard.com



The screenshot shows a web browser window at the URL `developer.blackboard.com/portal/applications/create`. The page title is "ABbRestApp New API Key". A navigation bar at the top includes "Blackboard", "Community", "Explore APIs", "My Apps", "My Groups", "My Account", and "Logout".

Important note!
The secret and tool private key are only shown once. Make note of the application key, secret and tool private key and store them in a safe and secure location.

Application key
18849c74-7c2a-464a-94e7-db2a024fff86

Secret
MdU3hfSsBzdmW05QXcQwKrXl79Qw1bdE

Application ID
3d8575d7-0b89-4d84-882b-88cbc64b8849

- PAUSE!!
- Save This Information

Setup on Learn

Administrator Panel REST API Integrations Create Integration

Create Integration

* Indicates a required field.

GENERAL INFORMATION

* Application ID

* Learn User

* End User Access Yes No

* Authorized To Act As User Yes No Service Default (No)

BbRest

Blackboard REST APIs... for humans? (TM)

- <https://github.com/mdeakyne/BbRest>
 - Automagically Makes All Blackboard Learn REST API Endpoints Available for Your Use
 - Gets Access Token via Two-legged Authentication or Three-legged Authentication
 - Caches & Refreshes Access Token When Necessary
 - Obviates the Need for Writing Requests to /learn/api/public/v.... etc.
 - Under Active Development - Use Pull Requests

BbRest

Blackboard REST APIs... for humans? (TM)

```
git clone https://github.com/mark-b-kauffman/weblearn.git
cd weblearn/
python -m venv env
source env/bin/activate
pip install -r requirements.txt
pip install --upgrade pip
python
>>> from bbrest import BbRest
>>> key = 'your-app-key'
>>> secret = 'your-app-secret'
>>> fqdn = 'your learn server fqdn'
>>> learnfqdn = "kauffman380011.ddns.net"
>>> bb = BbRest(key, secret, f"https://{learnfqdn}")
>>> resp = bb.GetUser('userName:mkauffman')
>>> resp
<Response [200]>
>>> resp.json()
{'id': '_5_1', 'uuid': 'b0de25aa4db04043a79c667a5b0adbb3', 'externalId': 'mkauffman', 'dataSourceId': '_2_1...
```

BbRest & Django

The Best of the Best

https://www.youtube.com/watch?v=_huL5ynal8Y

BbRest & Django

Blackboard REST APIs... for humans? (TM)

- <https://github.com/mark-b-kauffman/weblearn>
- settings.py
 - Installed Apps: twoleg, threeleg
 - ALLOWED_HOSTS
- urls.py - Routing
- views.py - Logic
- templates (<html>) - Render

•Show Me the Code!

Questions?

DEVCON 20

Blackboard

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