
NGINX Controller Lab Guide Documentation

F5 Networks, Inc.

Mar 25, 2022

F5 2022 Read The Docs Guide

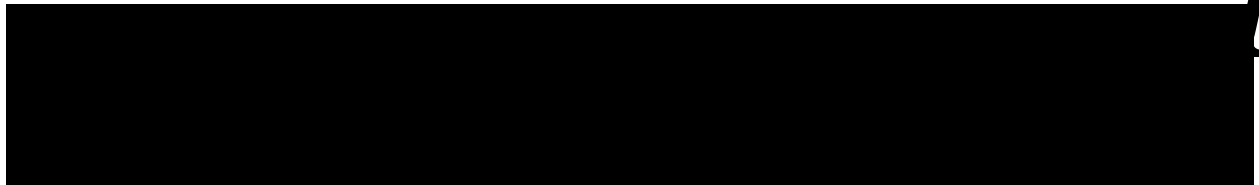
NGINX Controller Lab Guide

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????????????????????????2??????????????????????????

- Lab 1: ???Active Directory?Authentication Provider??????????????????
- Lab 2: NGINX Controller ??????????????????NGINX Controller ??????????????????
- Lab 3: NGINX Controller ??????????NGINX Plus????????????????

1.1 Lab 1 - Active Directory Authentication

??????Active Directory????????????Role Based Access Control????????????
 ?????????????????????
 ??????????????????????????????NGINX Controller????????????

Important: ???? : 5?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
 ????????????????????? F5 Labs - Index

1.1.1 Authentication Providers????????

1. jumphost?Chrome?????NGINX Controller????????????????????????????????

2. ??????????Chrome????????????

3. Bookmark??NGINX Controller UI????????????

4. NGINX Controller ?admin account????Peter Parker ??????????

Username	Password
peter@acmefinancial.net	Peter123!@#

5. ????????????????????????????????????? Platform ???????????

6. Auth Providers ?????????

7. **Edit** ??????ad-acmefinancial-net ????????????

1.1.2 Authentication Provider ????????

???????????"Authentication Provider Configuration"?????????? ????????????????????

1. Configuration ??

?????????? authentication provider?????????????????????????????:

Attribute	Description
Auth Provider Type	Define the authentication provider being used
User Format	Define if the user will login with username@domain (UPN) or domain/user (User Domain)

Note: release 3.15 ???Active Directory???Auth Provider????????????????

2. Connection ??

????????Domain?URL?SSL????????

Note: SSL Parameters ?????????????????????????????????

????????AD????????????????????

3. User Binding ??

?????NGINX Controller?Active Directory????????????????? "Bind" ??????????????????

4. Group Setup ??

?????Role Based Access Control????? Active Directory ??????????????????????Query??????????????

5. Group Mappings ??

??????Active Directory??????NGINX Controller “??(Internal)” ??????? “Roles Groups”
??????????????

??????? "Roles Groups" ? **Platform** -> **Roles** ?????????? ??????????????????????NGINX Controller
????????? managing roles ??????????

Group Mapping ??????????Active Directory Group??????Domain Controller??????

Note: ???????????Domain Controller????????????????????

Note: Add "Peter Parker" to the NGINX Controller "admin_group" Active Directory group.

1.1.3 Add

Add the NGINX Controller to the Active Directory authentication provider (detail).

[illegible]

Note: ??????????????????Windows jumphost - jumphost-1 ??????????????????
 ????????????????????? F5 Labs - Index

1.2.1 NGINX Controller

2. ??????????Chrome?????????????
3. Bookmark??NGINX Controller UI?????????????

4. NGINX Controller ?admin account????Peter Parker ????????????

Username	Password
peter@acmefinancial.net	Peter123!@#

5. ????????????????????????????????????? Platform ????????????

6. **Cluster** ????????

7. ??? “Cluster Configuration” ????????

Note: “Cluster Configuration” ??????????????NGINX Controller????????????? FQDN?API Gateway pod?????????????common name??????? ? API?????????GUI????????????????????

Important: “load balancer”?????????????NGINX Controller????????????? ?????????? ????

Note: “Nodes”?????2?NGINX Controller ?????????????????? (“controller-1” ??? “controller-2” ??????????)

1. ????? **Create Node** ??????????????????

1.2.2 ?????????????????? install command ?????

1. “controller-3” ??????????????????“PuTTY” ?????????????? **controller-3** ??????Open
 ??????????????

Important: ???Putty????????????????????????????????????? **Yes** ??????????????
 ??????????????????????????host key????????????????????

2. installer?????????install.sh ?????????????????????????????? “y” (“yes” ???) ??????????????
 ???

Important: ???????ubuntu????????????????????????????/home/ubuntu????????????



3. ???

1.2.3 View the results

1. Chrome????**Cluster** ? "Cluster Configuration" ?????????

1.2.4 (Optional) Kubernetes Cluster ???

???Kubernetes (k8s) ??????????????NGINX Controller????????? k8s ??????????????????????

1. ????????? PuTTY ? “controller-3” ??????????????NGINX Controller????????????????????

Important: ???Putty????????????????????????????????
 ?????????????????????????????host key????????????????????
 Yes ??????????????

2. ?????????????????



Note: ?????????????????k8s ??????3????????????????????????????

3. ?????????????????



Note: ?????????????????NGINX Controller????Pod?3????????????????????????????????
 ("NODE"?????????????)

1.2.5 ?????

“load balancer”????????????NGINX Controller??
 ?????????NGINX Controller???API Gateway Kubernetes service????????????????floating self-ip? “load bal-
 ancer” ?????????????????????????????????L2 Failover????????? MetalLB ?????????????? k8s? type LoadBal-
 ancer ???

1.3 Lab 3 - NGINX Plus ???

????????????NGINX Controller????????NGINX Plus????????????? NGINX Controller????????NGINX
 Plus????NGINX Plus Subscription????????????????????????????????????

Important: ?????: 15?

Note: ?????????????????????Windows jumphost – jumphost-1 ?????????????????????
 ?????????????????????????????? *F5 Labs - Index*

1.3.1 NGINX Plus ????????

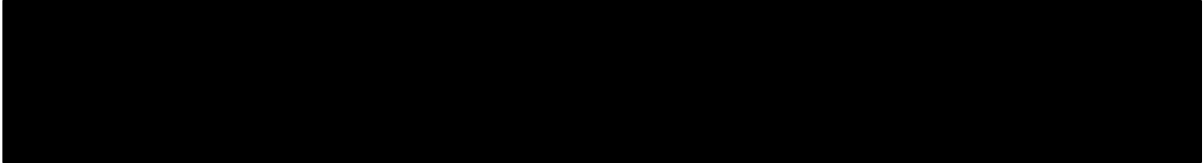
1. “nginxplus-4” ?????????????????????“PuTTY” ?????????????????? **nginxplus-4** ??????Open
 ??????????????

Important: ???Putty??? **Yes** ??????????????
 ?????????????????????????????host key?????????????????????

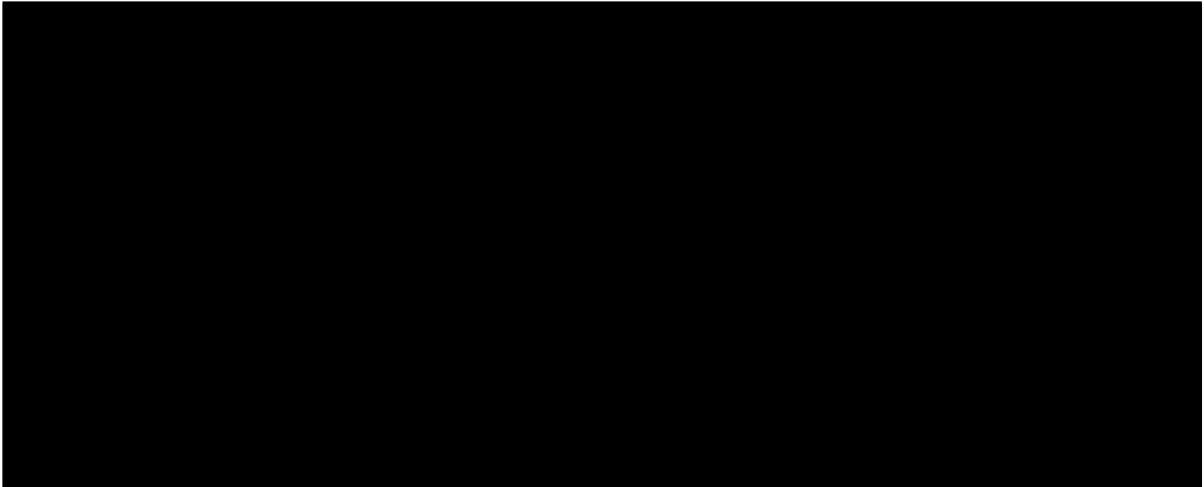
2. Curl ??????????NGINX Controller?????????Cookie????????????????????Admin??? Peter Parker ??????????



3. NGINX Plus ?????????????????????????????



4. NGINX Plus ??? NGINX Plus????????????(Ubuntu) ??????????



5. NGINX Plus ??????????????NGINX Controller ??????Version???R24????????????????NGINX Controller?????NGINX Plus?Version? Tech Spec ??????????



1.3.2 NGINX Plus?????????NGINX Controller??????

1. jumphost?Chrome?????????NGINX Controller??

2. ??????????Chrome????????????

3. Bookmark?NGINX Controller UI????????????

4. NGINX Controller ?admin account????Peter Parker ??????????

Username	Password
peter@acmefinancial.net	Peter123!@#

5. ??? Infrastructure ???????????

6. ????? Create ???????????????????

7. Add an existing instance `?????"nginxplus-4" ?????????????????????????????????????`

Field	Value
Name	nginxplus-4
Location	West Coast Data Center (OTHER_LOCATION)
Allow insecure server connections to NGINX Controller using TLS	Enable(Check)

8. Instructions ?????CURL??
 ????????????????????????????

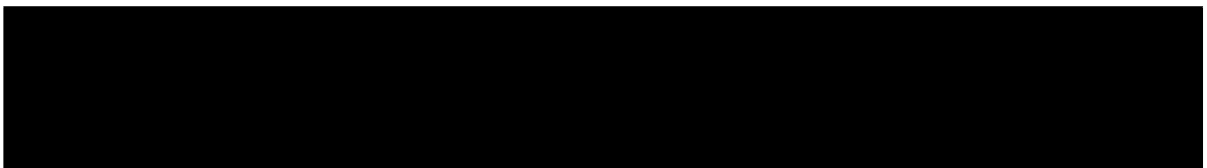
Close

11. ???(Display Name)?? **Edit** ??????????????

1.3.3 (Optional) NGINX Controller???????NGINX Plus???

NGINX Plus?NGINX Controller??

1. NGINX Plus??NGINX Controller Agent????????????????????????????????

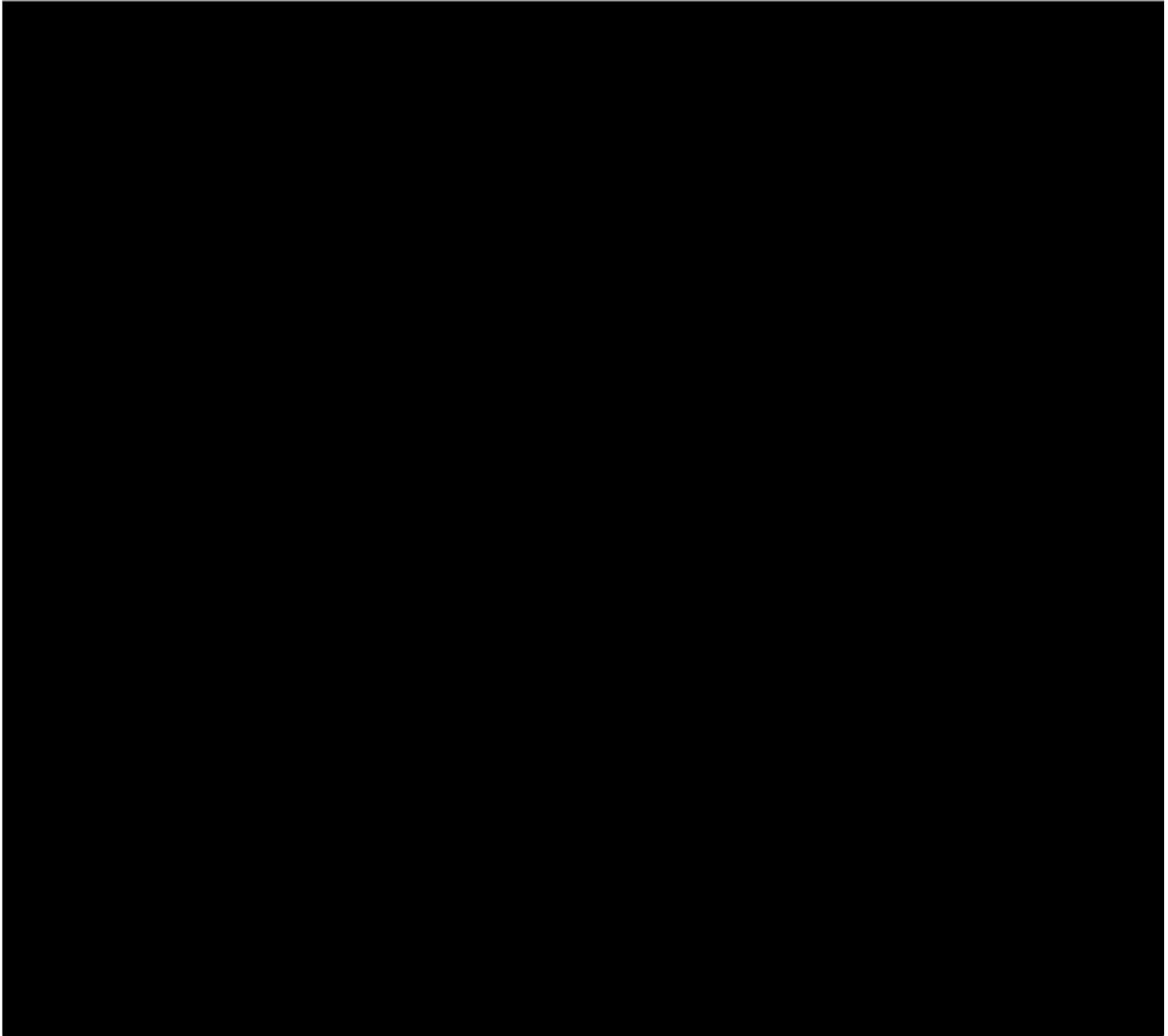


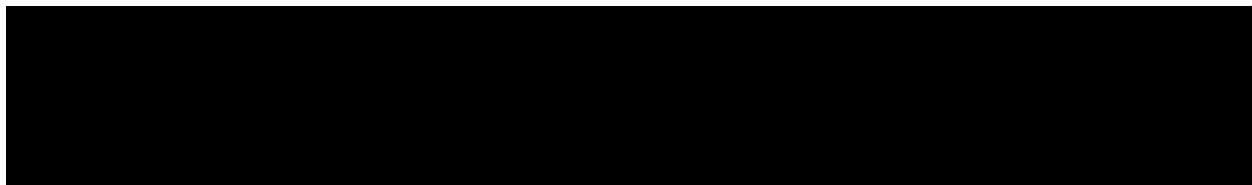
2. ??????NGINX Plus?????NGINX Controller????????????????
 module2 ??????????????NGINX Plus????????????????????????????????
 ?????????????



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(continued from previous page)





Lab 1: NGINX Controller GUI????????????????????
 Lab 2: ??????????NGINX Controller?????????????CI/CD
 Pipeline?????????????postman????????????????????
 Lab 3: ???ADC?advanced?????????????URI rewrite?HTTP Header?????????????
 Lab 4: TCP proxy / Load Balancer??????
 Lab 5: ???IP?????????Gateway????????????????????
 Lab 6: Module 324 ??????????????????????????????

```

????????????????????ADC????NGINX Controller????????????????????
NGINX Controller?????app-centric(????????????)?????????????????LB?????????network-
centric(?????????)????????????????????NGINX????????????????????

```

Important: ?????: 15?

Note: ????????????????Windows jumphost - jumphost-1 ????????????????

?????????NGINX Controller?????????????????????BIG IP?NGINX?????????????????????????????

Environments

“Environment”?????App?????????????RBAC(Role Based Access Control)????????????????? En-
vironments?????????????????????????????????????NGINX Plus?????????????????????????????
???????BIG-IP?????????????????????????????

Cert

```
SSL?????NGINX Controller????????????? "Gateway"????????????????????
```

Gateway

```

"Gateway"?????NGINX      Plus?????????????NGINX      Config      /      Directive??????
?????????????FQDN?????HTTP?????SSL/TLS?????????HTTP Parameter(buffer , body size , TCP
keepalive)???????? ????NGINX Config?"server" directive????????????? BIG-IP?TCP /
HTTP / ClientSSL Profile?????????

```

App

“App”???????????????? ???? ????????????????????????????? “App”?????????????”Component”????????????????????
 ?????????????????????NGINX Plus???????????????????????????? BIG-
 IP????????????????AS3????????BIG-IQ?”Application”?????????

Component

“Component”????????????????????????????????????URI????????????????????”Workload
Group”????? ??????????HTTP?????????(redirect, rewrite, header ??)???????????????? BIG-
IP?VS?Pool??HTTP Profile?Local Traffic Policy?iRule?????????????

5. **Services** ???

Environment?????

1. “Environments” ??????????.

2. ????? "Create" ????????????????

3. ????????????????????

Field	Value
Name	echo
Display Name	Echo Environment

4. **Submit** ??????????????????????

??????

1. "Certs" ??????????

2. ????? "Create" ????????????????

3. ?????????????? **Environment** ??????????????????????

Field	Value
Name	echoapp.net
Environment	Echo Environment

4. **Import PEM or PKC12** ????????????**Browse** ????????????????

??? (echoapp.net.crt) ? (echoapp.net.key) ?????????????????????????? (This PC -> Documents -> Certs)

Note: ??????????????????????????NGINX Controller?????????????????????????

5. **Submit** ??????????????????????????

Gateway???

1. “Gateways” ??????????

2. Click "Create" to create the application.

3. **Configuration** Click **Next** to create the application.

Field	Value
Name	echoappgw
Environment	Echo Environment

4. **Placements** ????????Instance Ref ? "Development NGINX West 03 (CAS)" ??????????

5. **Hostnames**

Note: You will need to use the **Add Hostname** link pictured below to add multiple hostnames.

6. **Submit**

App?????

1. “Apps” ??????????

2. ????? “Create” ??????????????????

3. ?????????????????????? **Environment** ??????????

Field	Value
Name	echoapp
Environment	Echo Environment

4. **Submit** ????????????????????

Component?????

1. “Components” ?????????????????? “Create Component” ??????????????

2. ????????????????????????????????? Gateway Refs ????????????

Field	Value
Name	echoappcomponent
Gateway Refs	echoappgw

3. **URIs** ??????????URI? / ????????**Match Method** ????????????

4. **Workload** **Groups** ??????????????????????????????Backend URI?????Workload
 Group?????????????????????????????????????Done"???????????????

Field	Value
Name	Echo Backend
Backend Workload URIs	http://10.1.20.11:8000

5. **Submit** ??????????????????????

Echo Application???

1. `jump host-1` ??????????????????"Developer Tools"???????????

2. `curl -k -H 'Host: echoapp.net' http://echoapp.net` and `curl -k -H 'Host: echoapp.net' https://echoapp.net` Echo Application `echoapp.net` URL `https://echoapp.net`

Note: HTTP Request Web

2.2 Lab 2 - ADC App ????????????????

?????????NGINX Controller API????App Component?????
 ??????????????????CI/CD Pipeline?????????????????Proxy???Postman?????????

Important: ????: 5?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
 ?????????????????????? F5 Labs - Index

2.2.1 Trading App ???????????

1. Chrome??http://trading.acmefinancial.net ??? **Login** ?????????????????? ????"trading"
 ??????????????????

2. ?????????????????????????????????

Username	Password
matt	ilovef5

Note: ?????????????????? “Quick Money Transfer” ? “Coming Soon” ??????????????????

2.2.2 Postman????? Component ?????

1. Jumphost? **Postman** ?? **NGINX Controller 3.x**
Collection ??????????

2. Common Tasks? Admin Logon ???? Login to Controller – admin – local ????????????

3. Postman? **Send** ??????????

Note: NGINX Controller? “204 No Content” ? ??Cookie????????? Post-
man???Cookie?? (????????????Request????????Cookies?MANAGE
COOKIES??session?????????????)

4. **Retail-Development Environment, Application - trading** ?????????? **Application trading**
???????????????????? 4) **Create Component – transfers** ??????????

5. Postman????????????? **Body** ??????????????PUT ?????????????????????????????? JSON?
desiredState, logging, security, backend ?????????????????????????????? Component
?????????????????????????????

6. Postman? **Send** ???

Note: NGINX Controller? “eventual consistency model” ??????API?Postman??????? “202 Accepted” ?????????????? NGINX Controller????????????????????????????

2.2.3 Trading App ?????????

1. Chrome??<http://trading.acmefinancial.net/trading/index.php> ???????? “Quick Money Transfer” ?“Comming Soon”??Active????????????????????

2.3 Lab 3 - ADC ??????????????????(Programmability)

????????????NGINX Controller????? “advanced ADC” ?????????? ?????????NGINX Controller????????NGINX Instance????????????????????????????????

Important: ?????: 10?

Note: ??????????????????Windows jumphost – jumphost-1 ?????????????????? ?????????????????????? *F5 Labs - Index*

2.3.1 App Component???

1. Chrome???
2. ?????????NGINX Controller ?GUI?????

3. NGINX Controller ?admin account????Peter Parker ????????????

Username	Password
peter@acmefinancial.net	Peter123!@#

4. **Services** ??????????

5. “Apps” ??????????

6. “Echo Environment”?? Module 2 Lab 1 ?????? **echoapp** ??????????

2.3.2 URI Rewrite?????

1. **Components** ?????????? ?????? “echoappcomponent” ? **Edit** ??????????

2. “Advanced” ?????????? **Programmability** ??????????

```
3. Chrome???Component?????????"echo"                ?????????????????????????????
   ??????????????????????????      Chrome Developer tools  ???http://echoapp.net/example
   ??????????????????????????
```

Note: The following JSON configuration is used for the path: `"/example"` in the configuration file.

1. In the NGINX Controller, click on the "URI Rewrite" tab. In the "Add URI Rewrite" dialog, enter the following information:
 - URI: `"/example"`
 - Pattern: `"/modified"`
 - Replacement: `"/modified$1"`

2. In the NGINX Controller, click on the "Done" button. The configuration is saved. The NGINX Controller will automatically restart the service. The configuration is now active.

Field	Value
Incoming Pattern	<code>~*/example(.*)\$</code>
Rewrite Pattern	<code>/modified\$1</code>

4. Chrome??echoapp ??? "/example" ????????????Rewrite??

Note: "Echo" app?JSON????????????URI????????("/example")?????"/modified(???)????????????????????????????????

2.3.3 Request Header ??????????

1. NGINX Controller? "echoapp" App ??????????**Components** ?????????????????? "echoappcomponent" ? **Edit** ??????????????

2. "Advanced" ???????????? **Programmability** ???????????

3. Chrome???? “echo” app ??

4. NGINX Controller????????????“Request Header Modification”????????????????????upstream/pool member????????????ADC????????NGINX Plus?HTTP Header???????????? “Programmability” ? **Add Request Header Modification** ??????????????

5. ?????????????????????? **Done** ??????????

Field	Value
Action	Add
Header Name	X-Controller-Instance
Header Value	Development NGINX West 03 (CAS)

Note: “echo” App????JSON????HTTP??NG-
INX Plus????????????????HTTP Header????????????????????????????HTTP
Header??

4. **Services** ??????????????

5. "Apps" ??????????

6. “Echo Environment”?? Module 2 Lab 1 ????? **echoapp** ??????????

2.4.2 TCP Component ?????

1. echoapp ??????: ??? "Create Component" ????????"Components" ????????????????

2. ?????????????????????? **Gateway Refs** ????????????????

Field	Value
Component Type	TCP/UDP
Name	echoapptcp
Gateway Refs	echoappgw

3. **URIs** ?????????URI tcp://*:9443 ??????????

4. **Workload Groups** ??????????????????????

Field	Value
Name	TCP Backend
Backend Workload URIs	tcp://10.1.20.21:8000
Backend Workload URIs	tcp://10.1.20.11:8000

5. ????????? **Submit** ???????????

TCP Component???????

1. jump`host-1` ?Chrome????????? “Developer Tools” ??????????

2. `listen 80;`
`server {`
`listen 80;`
`server_name echoapp.net;`
`location / {`
`proxy_pass http://echoapp.net:9443;`
`proxy_http_version 1.1;`
`proxy_set_header Host $host;`
`proxy_set_header X-Real-IP $remote_addr;`
`proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;`
`return 200 'echo';`
`}`
`}`

Note: This is a simple HTTP Request/Response test. It is not a real web application.

[illegible]

2.4.3 ????

```

"TCP/UDP"  ????????L4  /  Stream  Proxy???????  ????????  NGINX?  stream
????????????????????????????????????????????

```

2.5 Lab 5 - ??????????????????

????????Gateway????????IP???????????????????? NGINX????????IP????????????????????
 ?????????????????NGINX plus????????IP????????????????????

Important: ???? : 5?

Note: ?????????????????Windows jumphost – jumphost-1 ?????????????????
 ????????????????? F5 Labs - Index

2.5.1 Gateway???????IP???????????

1. jumphost?Chrome???????NGINX Controller??

2. ?????????????Chrome????????????

3. Bookmark??NGINX Controller UI????????????

4. NGINX Controller ?admin account????Peter Parker ????????????

Username	Password
peter@acmefinancial.net	Peter123!@#

5. **Services** ???

Gateway?????

1. "Gateways" ??????

2. ??? “Create” ????????????

3. **Configuration** ?????????????????????? **Next** ??????????????????????

Field	Value
Name	specialapp
Environment	Echo Environment

4. **Placements** ??Development NGINX West 03 (CAS) ????????????????????

5. **Placements** ??10.1.20.213 ??????IP????????????????

Note: ??? “Development NGINX West 03 (CAS)” ????????Secondary IP????????????????NGINX Controller **Infrastructure** ?????????????????????????????????

6. **Hostnames** ? Hostname ???????????? ??????????????????????URI????????????????????TCP ? UDP????????????????IP????????????????????????????????????

7. Click **Submit** to complete.

Component ?????

1. echoapp ??????: ??? "Create Component" ??????????"Components" ???????????

2. ?????????????????????????????? **Gateway Refs** ??????????????

Field	Value
Name	wildcard
Gateway Refs	specialapp

3. **URIs** ??URI http://.*:8080 ??????REGEX ? **Match Method** ????????????

Note: URI?Port?8080?????????????ListenIP 10.1.20.213 on Port 80 conflicts with

```
an existing gateway ?????????? ???NGINX Plus?????HTTP(port 80)?HTTPS(port
443)????????????Gateway????????????????????????????????????????
IP????????????IP????Gateway????????
```

4. Workload Groups ??????????????????

Field	Value
Name	wildcard Backend
Backend Workload URIs	http://10.1.20.21:8001

5. ?????????? Submit ??????????????

Listen IP Component ??????

1. jumphost-1 ?Chrome????????? "Developer Tools" ??????????

Note: . * ??????URI????????????????IP????????????????????

2.6 Lab 6 - Security ?????????????? ??????

??

Note: ?????????????????????????????????????? ??????????????????????????????

Important: ?????: 5?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
????????????????????????? F5 Labs - Index

2.6.1 Analytics WAF Traffic Generation

Important: Module3 Analytics /

1. "loadgen-1" PuTTY" saved session **loadgen-1** **Open**

Important: Putty Yes

2. "docker" command

3. ("wrk_trading.acmefinancial.net-cas").

?????????NGINX Controller?Analytics???NetOps , DevOps ? Persona????????????????

Lab 1?NGINX Controller?????NGINX Plus instance????????????

Lab 2?Controller App Security (CAS)?????????????App?WAF????????????????

Important: Module 2 Lab 6 (*Analytics* ???? *WAF Traffic Generation* ???) ?Load Genra-
tor?????????????Lab????????????????????

3.1 Lab 1 - NetOps/Admin??Analytics

?????????NGINX Controller?????NGINX Plus instance???????????????? ??Analyt-
ics?????????NetOps????????????

Important: ???? : 5?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
????????????????????? *F5 Labs - Index*

3.1.1 Dashboard??

1. jumphost?Chrome?????????NGINX Controller??

2. ??????????Chrome????????????

3. Bookmark??NGINX Controller UI????????????

4. NGINX Controller ?admin account????Peter Parker ??????????

Username	Password
peter@acmefinancial.net	Peter123!@#

5. [Dashboard](#) > [Overview](#) > [System Metrics](#) > [Overview](#) > [NetOps](#)

3.1.2 Instance Analytics

1. ???Navigation Bar???????????????????? Infrastructure ?????????

2. ?????????????????Production NGINX East 01 ?????????? ???? “Instance Overview”
?????Bytes In?Bytes Out?CPU Usage?Memory Usage ?????????????????????

3.2 Lab 2 - DevOps/Developer??Analytics

????????? Controller App Security (CAS)????????????????NGINX Con-
troller????????????????WAF??????????????????Analytics??DevOps????????????????

Important: ?????: 5?

Note: ?????????????????????Windows jumphost – jumphost-1 ??????????????????
???????????????????????????? F5 Labs - Index

3.2.1 Dashboard??

1. jumphost?Chrome????????NGINX Controller??

2. ?????????????????Chrome?????????????????

3. Bookmark??NGINX Controller UI????????????????

4. NGINX Controller user accountNatasha Romanoff

Username	Password
natasha@acmefinancial.net	Natasha123!@#

5. NDashboardOverviewApplication MetricsDashboardDevOps

3.2.2 Critical Analytics

1. ?????Navigation Bar???????????????????????????????? Infrastructure ???????????

2. ?????????????????????**Production NGINX East 03 (CAS)** ?????????????? ??????????????NGINX App
Protect (WAF) ??????????????NGINX Plus Insntance???????????

Note: NGINX Controller instance "Controller Application Security (CAS)"

3. Navigation Bar **Services**

1. **Apps** ?????????

2. **Trading Application (CAS)** app?????????"Analytics" ??????"App"?????????"Components"????????????????

3. ??????"Component"????Analytics????????????????? Components
 ?????????DevOps????????App??WAF?????????????????
 ("Natasha"?????????)

Note: NGINX Controller?????app????self-service?WAF????????????????????

4. **Trading Main Component** **Critical Analytics** **Breakout By**
Request Outcome Reason "HTTP Requests (SUM)"

Note: CAS

?????????NGINX Controller Application Security?????????NGINX App Protect?????????NGINX
Controller?Add On Module??

Lab 1: ??NGINX Controller Application Security
Module??????

Lab 2: NGINX Controller Application Security Module?API????????????????????

Important: Module 2 Lab 6 (*Analytics* ???? *WAF* *Traffic* *Generation*
???)??Analytics????????????

4.1 Lab 1 - Application Security (GUI)

???NGINX Controller Application Security Mod-
ule??????????

Important: ???? : 15?

Note: ??????????????????????Windows jumphost – jumphost-1 ??????????????????????
???????????????????????????????? F5 Labs - Index

4.1.1 Component ? Security ??????

1. Chrome?????
2. Bookmark??NGINX Controller UI??????????????

3. NGINX Controller??????????????? Natasha Romanoff ????????????

Username	Password
natasha@acmefinancial.net	Natasha123!@#

1. **Services** ??????????

2. **Apps** ??????

3. “Trading Application (CAS)” app ????????

4. Overview ??App??

5. ?????????????WAF???????????????? Components ?????????Trading Main Component ?????????

6. **Edit Component** ???????????

7. **Security** ??????????????????????WAF?????????????????????
?? DevOps/ ??? ?WAF??
("Natasha"????????????????????????????????)

Note: NGINX Controller app self-service WAF

Note: Retail Development environment WAF Acme Financial corporation Monitor Only

4.1.2 Security Analytics

1. "Trading Application (CAS)" app Components Trading Main Component

2. Security Analytics ???

4. "Top URIs Targeted" list ??????????????????????????????URI?????????????
 ???

5. "WAF Top Threats" **Attack Types** (default selection) **Signatures**

Note: "WAF Top Threats"

Note: WAF Monitor Only Mode Analytics ? Splunk Data

4.1.3 Security Events

1. **Security Events**

2. ??????????????????????Last 24 hours ??????????????????????Last 5 minutes ???????

3. ???

4.1. Lab 1 - Application Security (GUI) 127

Note: Notice that many “Event Details” data points can be used as filters. This powerful filtering feature allows for quick pattern detection.

- [illegible]

9. ????????Attack Signature??

10. ?????????????	THREAT	TARGET	????????????????????	Request	Detail
??		WAF	?????GET????????:		


```
11. ????????????????????????????????????????????????????????? URL? http://trading.  
acmefinancial.net/wp-admin/admin-post.php?do_reset_wordpress  
???????????????????????????????????????????????????????? ???? "Support ID"  
????????????????????????????????????????????????????????ID??
```

12. ??????????????????????????????NGINX Controller????????????????????Signature
ID????????????????

4.1.4 WAF policy ???????

1. ????????Security Configuration?????????Edit Config ????????????

Note: WAF ??????????????????????????????:

1. ?????30??(???
???WAF??). 404???

4.2 Lab 2 - Application Security (API)

????????????NGINX Controller Application Security Module?API????????????????

Important: ?????: 5?

Note: ??????????????????????Windows jumphost – jumphost-1 ??????????????????
???????????????????????????????????? F5 Labs - Index

4.2.1 Alter Security Settings in API

????NGINX Controller?REST API????WAF??Postman?Red
Hat Ansible??Postman?Windows jumphost????????????????????

4.2.2 Postman?????Component ? Security Settings ??????

1. jumphost? **Postman** ??????NGINX Controller 3.x Collection ??????

2. Common Tasks? User Logon ??? Login to Controller – Natasha Romanoff - AD ??????

3. Postman **Send** ??????

Note: Controller responds with a “204 No Content” response and an authentication cookie.

4. **Retail-Development Environment?** **Application - trading** ????? **Application trading**
????????????2) **Create Component - main (CAS monitoring)** ??????

5. Postman????????????? **Body** ??????????????PUT ?????????????????????? JSON?
 desiredState, security ?????????????????????????? Component ??????????????????????

6. Postman? **Send** ??????

Note: NGINX Controller? “eventual consistency model” ??????API?Postman??????? “202 Accepted” ?????????????? NGINX Controller????????????????????????????

4.2.3 ?

1. Chrome?NGINX Controller?
2. Bookmark?NGINX Controller UI?

3. NGINX Controller? Natasha Romanoff ?

Username	Password
natasha@acmefinancial.net	Natasha123!@#

1. **Services** ??????????????

2. **Apps** ??????

3. **Trading Application (CAS)** app?????Trading Main ????????**WAF Enablement Status** ?**WAF Monitoring Only Status**? "On" ??????????????

4. **Components** ??????????????????

?????????NGINX Controller v3.22.0 ?????? Caching ???????????????

Lab 1: Caching ??????????????????

Lab 2: Caching ??????GUI??????????????

5.1 Lab 1 - GUI ? Caching ?????

?????????v3.22.0 ?????????? “Caching” ?????????????? GUI/API??????????????????

Important: ?????: 10?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
 ?????????????????????? F5 Labs - Index

5.1.1 NGINX Plus ??????????????????????

NGINX Plus ???

??????????????? Trading Application ???? Caching ??????????

???NGINX ?????????????????????????

????????????????????????????? Set-Cookie

??

5.1.2 NGINX Plus ??????????????????????

1. "nginxplus-3" ??????????????????"PuTTY" ?????????????????? nginxplus-3 ??????Open
 ??????????????

Important:	???Putty??	Yes	??????????????
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????????????????????host key????????????????

2. ?????????????????????????????



5.1.3 App Component???

1. Chrome???
2. ?????????NGINX Controller ?GUI?????

3. NGINX Controller ?admin account????Peter Parker ????????????

Username	Password
peter@acmefinancial.net	Peter123!@#

4. **Services** ????????

5. **"Apps"** ????????

6. "Trading Application (CAS)" app ????????

7. "Trading Main Component" ??????????????????

5.1.4 ADC ? Caching ?????

1. request_uri ????????"Enable Caching" ?????????????????????????????????

2. ??????????????
 - ??????

3. ?????????????DISK STORE????????????????

Field	Value
Path	/tmp/cache/store1
Max Size	10m
Min Free	10k
In Memory Store Size	5m
Is Default	TRUE

- ??????

4. ???????? Programmability ?????? Response Header Modification ????????????

Field	Value
Action	ADD
Header Name	X-Cache-Status
Header Value	\$upstream_cache_status

- ??????

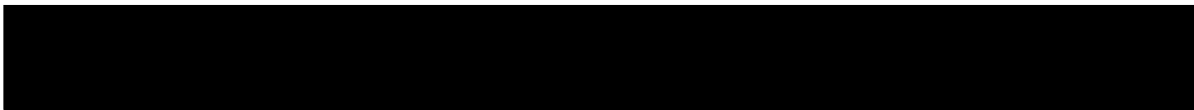
5. `proxy_cache_path` Snippets `proxy_cache_key` URL Snippets `proxy_cache_valid`

Field	Value
URI Snippet URI Snippet	<pre>proxy_cache_valid any 1m; proxy_ignore_headers Set-Cookie;</pre>
Applicable URIs	/

- `proxy_cache_key`

6. Submit

7. nginxplus-4



5.1.5

1. Chrome Secret Tab (New Incognito Window)

2. ?????????????????? ?????? (Inspect) ??? Network ??????????????

3. ?????????????? http://trading.acmefinancial.net/ ??????????????
????????????? Response Header ??????????????
section-1-bg.jpg ?????? Response Headers ? X-Cache-Status ??????????????

4. ?? Secret Tab ?????????????? Secret Tab ? <http://trading.acmefinancial.net/section-1-bg.jpg> ????? Response Headers ? X-Cache-Status ??????????????

```
?? MISS ?????????????? HIT ?????????
??? MISS: ?????????????? ????????NGINX????????????????????????????????
HIT: ?????????????????? ?????????????
```

Note:

```
???????????????? 1? ?????????????
???????????????????????????????????????????? proxy_cache_valid ?????????????
```

5.2 Lab 2 - GUI ? Caching ?????????????

????????v3.22.0 ?????????? "Caching" ?????????????

Caching????????????	App ?	Component	????????????????	????????????	Component
---------------------	-------	-----------	------------------	--------------	-----------

Important: ?????: 5?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
 ?????????????????????? F5 Labs - Index

5.2.1 App Component???

1. Chrome???
2. ??????????NGINX Controller ?GUI?????

3. NGINX Controller ?admin account????Peter Parker ????????????

Username	Password
peter@acmefinancial.net	Peter123!@#

4. Services ??????????

5. “Apps” ??????????

6. “Trading Application (CAS)” app ??????????

7. “Trading Main Component” ????????

5.2.2 GUI????????

Lab1????????????????????????

1. Overview ?????? Caching Metrics ??????

????????????????????????????

????????????????????????????

2. Cache Size: Cache ????

3. Cache Hit Responses: Cache???????Cache????????

4. Cache Miss Responses: Cache????????????Origin????????????(??Miss????????????)

5. Cache Stale Responses: Origina Server????????Stale?????proxy_cache_use_stale
 ?????????????

?????????NGINX Controller v3.22.0 ????? Snippets ???
 Snippets ??? Caching ?????????????
 ????? Snippets ???

Lab 1: Snippet??

6.1 Lab 1 - GUI ? Snippets ?????

?????????v3.22.0 ?????????? “Snippets” ?????????????

Important: ????: 10?

Note: ??????????????????Windows jumphost – jumphost-1 ??????????????????
 ?????????????????????? F5 Labs - Index

6.1.1 Snippets ?????

Snippets ?NGINX Controller ADC?GUI/API?????NGINX Config????????????? ??? ????NGINX
 Plus????????????????

Snippets ?5????????????????????? **Gateway ? Component** ?????????????????

Snippet	??	Endpoint
httpSnippet	???HTTP Block??????	Gateway
mainSnippet	???Main Block??????	Gateway
streamSnippet	???Stream Block??????	Gateway
uriSnippets	?????Gateway?Server Block??????	Gateway
uriSnippets	?????Component?Server Block ???Location Block??????	Component
workloadGroupSnippets	???Upstream Block??????	Component

Note: URI Snippets ? TCP/UDP ??????????????????????

??? Snippets ???????? About Snippets ????????

6.1.2 GUI ?????

1. Chrome???
2. ????????NGINX Controller ?GUI?????

3. NGINX Controller ?admin account????Peter Parker ???????????

Username	Password
peter@acmefinancial.net	Peter123!@#

4. **Services** ????????

6.1.3 **Gateway**????Snippet??????

1. “Gatweay” ??????????

2. **echoappgw** ????????

3. “Edit Config” ??????????????????

4. “Additional” ??????????Config Snippets ??????????????Gateway ??????????Snippets?????????????

Field	Value
Main Snippet	worker_rlimit_nofile 2048;
HTTP Snippet	allow 192.168.1.0/24;
Stream Snippet	allow 192.168.2.0/24;
URI Snippet	allow 192.168.3.1/32;
Applicable URIs	http://echoapp.net

- ??????

5. **Submit** ????????????????????

6.1.4 App Component????Snippet??????

1. “Apps” ??????????

2. **echoapp** ?????????

3. **echoappcomponent** ????????

4. "Edit Config" ????????

5. “Snippets” ? “URI Snippets” ? “Workload Group Snippets” ? **Add URI Snippet ? Add Workload Group Snippet** ?

6. Component Snippets

Field	Value
URI Snippet	allow 192.168.4.1/32;
Applicable URIs	/
Workload Group Snippet	sticky cookie echo_cookie expires=3h domain=.\$host path=/;
Applicable Workload Groups	Echo Backend (???? Select All???????????)

- ??????

—

–

7. **Submit** ??????????????????????

6.1.5 CLI???Snippet ????????????????

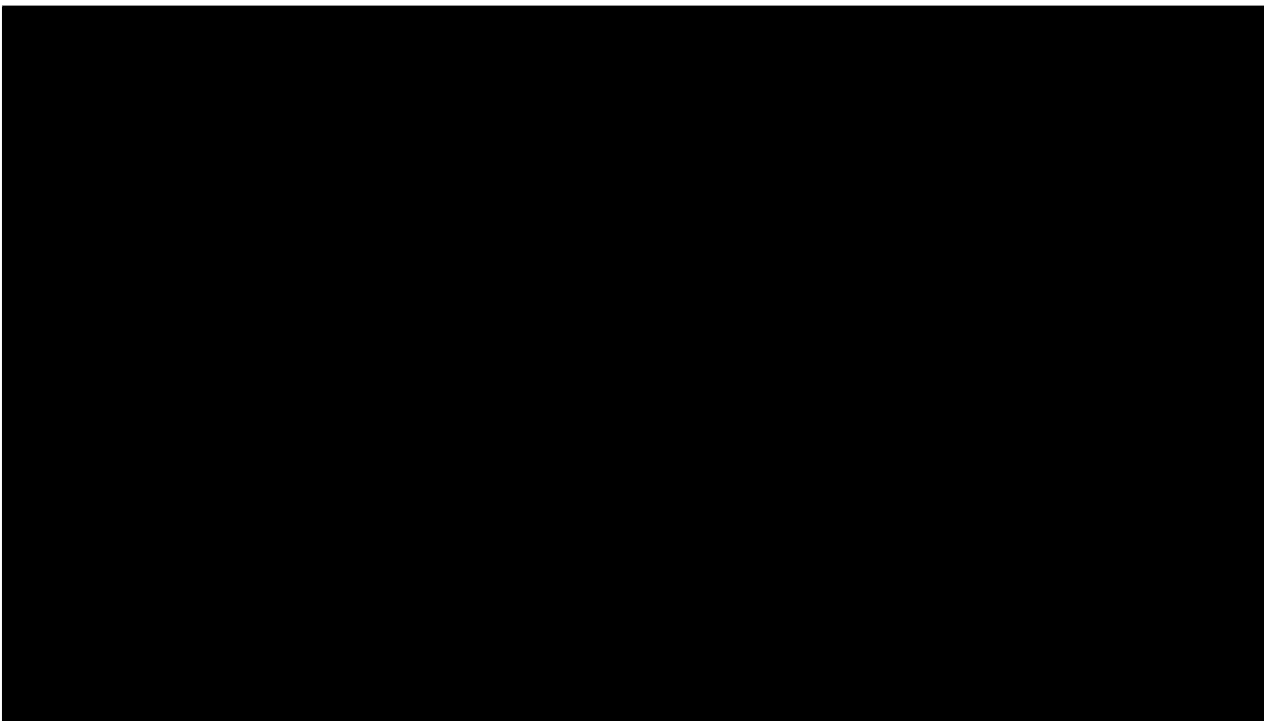
1. “nginxplus-3” ??????????????????????”PuTTY” ?????????????????? **nginxplus-3** ??????Open
 ??????????????

Important:	??Putty????????????????????????????	Yes	????????????
	????????????????????????host key????????????????		

2. ????????

Listing 1: Snippet ????????

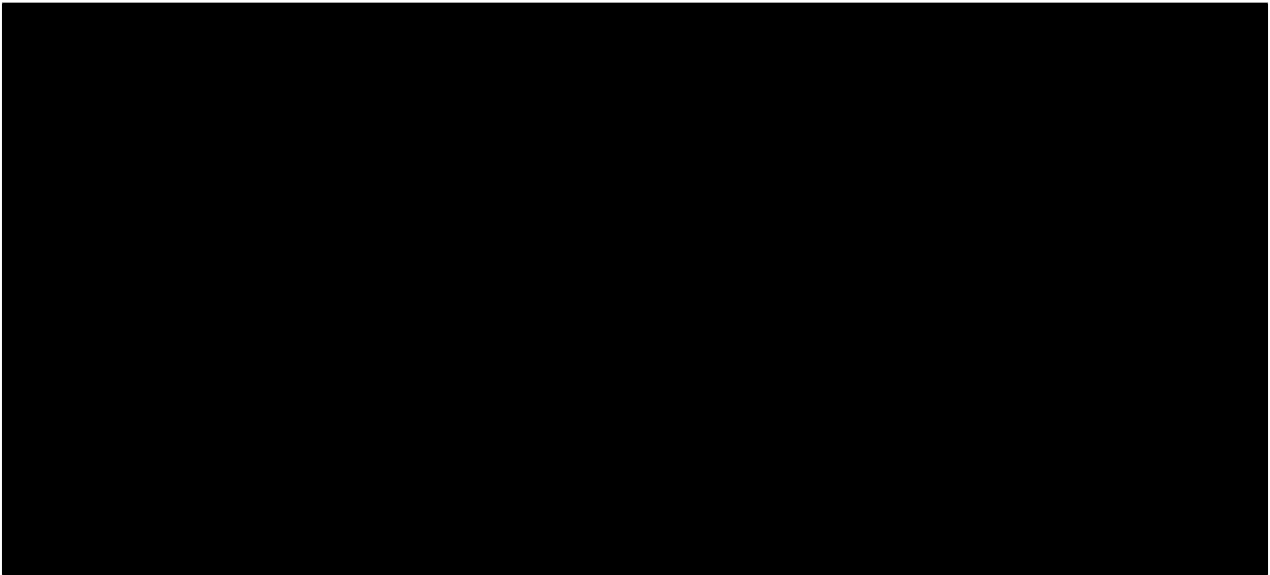
```
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
```



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??????????????

- **Gateway Snippet**

- Main Snippet ?????????38????????????
- HTTP Snippet ?????????3????????????
- Stream Snippet ?????????40????????????
- URI Snippet ?????????28???29????? Applicable URIs ?????? server_name ? listen port
????? Server Block ?????????30????????????????????

- **Component Snippet**

- URI Snippet ?????????Component????????location / ???? 25???32????????????
- Workload Group Snippet ?????????Echo Backend ?????????????????? 6????????????

6.1.6 ?????????????? NGINX Controller Lab ??????????

